REMark

Issue 1 • 1978

Official magazine for users of Heath computer equipment.

✳REMark

CONTENTS

All prices shown in REMark are U.S. mail order prices. Products sold through Heathkit Electronic Centers are slightly higher. For international orders, contact your nearest Heath Co. distributor or the Heath International Division, P. O. Box 440, St. Joseph, Mi. 49085.

COVER: The popular LSI-11 packaged by Heath into a simple-to-build kit.

Official magazine for users of Heath computer equipment

Editorial

I'm glad we can finally send you this first issue of REMark, the official Heath User's Group magazine. You should find many useful articles in it and in future issues that will enhance your Heath product. At present, we are concentrating on articles related to computer products. However, it is possible that sections may be added to include information on other Heath products. We could do it. What do you think?

I have talked with many fellow Heath enthusiasts within the past few months, in person at shows, and on the telephone. There is also a lot of correspondence coming in. With all of this contact, there is one common message: The Heath User's Group will have a lot of support from its users. I am encouraged, to say the least.

So where do we go from here? The biggest job to tackle now is to get programs for the library. Programs for all Heath systems: H8, H11, and ET-3400.

Program writing is not easy, it takes experience; and it takes time to build up this experience. We have a pretty good cross section of members now, ranging from no experience at all to very experienced programmers. The experienced ones can tell you that perseverance, reading, and practice are the keys to learning programming. The rewards? Indescribable! I have seen the most euphoric expressions come over people when all they did was set a light bulb to light! But they got it to light by computer!

I'm not trying to discourage you. I'm simply saying that the only way to learn programming is to program. Do simple things at first. Then you can start putting the simple blocks together to make a more complete final program. You'll find out how to do that as time goes on.

Meanwhile, we're planning a series of articles that should help you. They will be product orientated so even the most experienced programmers should gain something from them.

Again, I'm pleased that I can contact you through this magazine. We intend to keep you informed. Since this is a user organization, I suspect that you would like to keep each other informed. You can do this by sending your correspondence directly to me. I would like to know specifically what others are doing with their systems. Wouldn't you like to know too?

Robert W. Finton

HUG Manager

A Message From
The Computer Products Director

HUG: What's In It For You?

With this first issue of REMark we begin what we hope will be a worthwhile venture for all owners of Heathkit Computer products. REMark is HUG's main mode of communication. It has two key purposes:

1. To help Heath bring useful information to you about new products, software patches, other important data.

2. To help you communicate with other Heathkit computer owners so you can share ideas on hardware, software, and applications.

Why is such a communication media needed? Simple. A computer is a general purpose device. Its application is not fixed. It is variable, or open-ended. You can make your computer do an almost infinite variety of things. Its application is limited primarily by your own imagination and programming skill. But you can get a lot more out of your computer by implementing the ideas of others too — making their hardware modifications, running their programs, or duplicating their applications. It is through REMark that you can get this valuable information.

There is only one thing that makes this neat system work — YOU. You must develop ideas and share them. If you use your computer at all, you will generate more ideas than you ever thought possible. Computers do that you know. You will surely come up with some hardware modification that improves either performance or convenience. You will also develop many programs. They could be simple subroutines, games, or elaborate applications programs. You might even come up with a great new piece of systems software. Whatever it is, send it in. Share it. Nothing is too small or simple. We can all learn and benefit from whatever it is you develop.

It is a terribly trite thing to say, but what you will get out of HUG will be proportional to what you put in. You can be sure that we, here at Heath, will be contributing our share. The "goodies" in this issue are only a hint at what's to come. Wait'll you see the next issue! The following issues will depend entirely on you. So get hot. Send your contributions to HUG Manager, Bob Furtaw. And if you have any suggestions for new products, accessories, software, etc., you would like to see Heath develop, let me know personally.

Have fun with your computers. Use them. Share what you develop. Let's make HUG something to be proud of.

Lou Frenzel

Director, Computer Products

Introducing HUG:

The Heath User's Group

After you assembled your Heathkit Computer and had it in operation for a while, you probably became increasingly more aware that this is a remarkably versatile device. You can program it to do an almost limitless variety of operations. And as you discover more and more uses for it, it becomes more and more fascinating, and its value to you increases accordingly.

The Heathkit User's Group, HUG, was organized to help you get the greatest possible value from your Heathkit computer investment by:

- Making it possible for you to share applications and program information with other users.

- Providing a regular means of communication between you and other users so you can exchange software and hardware ideas.

- Keeping you up to date on new products, as well as software and hardware enhancement for present products.

- Making the HUG software library available to you.

Anyone interested in computers, even if they do not own a Heathkit computer, can join HUG. The membership fee is $14.00 for the first year and, for each year after that, only $11.00. To join, simply fill out the HUG application form supplied in all Heathkit computer products and the ET-3400 Microprocessor trainer. If no form is available, write to HUG (Heathkit User's Group, Hilltop Road, St. Joseph MI 49085).

The magazine you are reading, REMark, is thz main communication medium for HUG members. Some of the articles and announcements in it will be generated here at the Heath Company. But since this is **your** magazine, your contributions, suggestions, and ideas are essential to making it a valuable service to everyone. Feel free to submit articles, letters, or information in any form for publication.

REMark will be published quarterly, at least initially. If the volume of information and demand is great enough, monthly or even bi-monthly publication will be considered.

The software library, which will be developed and maintained by HUG, is another major benefit you will receive from membership. Programs will be submitted by Heath Company and by all Heathkit computer owners. We encourage you to submit applications software that you have developed. Use the standard HUG submittal form for any program, regardless of the type, that you wish to share with others. These forms are supplied with your HUG membership package.

All of the software in the library will be available to HUG members. The cost is nominal and primarily that of program duplication. Software will be available on various media compatible with the Heath computer systems. A software catalog will be issued periodically with a list of programs available.

Owners of the Heathkit H11 computer, which incorporates the DEC LSI-11, are also eligible for membership in Digital Equipment User's Society (DECUS). DECUS and HUG are not affiliated in any way. DECUS, like HUG, publishes periodical newsletters and maintains an extensive software library. Programs developed for the H11 should be submitted to both DECUS and HUG simultaneously.

HUG also encourages you to form local user's organizations. If you are interested in starting a local HUG club, notify HUG for information. A notice of interest will be published in the newsletter to notify others in the same geographical area. ✳

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The DEC Connection

Heath Company and Digital Equipment Corporation (DEC) have combined their resources to bring you, in the hobby and personal computer market, one of the most powerful computing systems available. Heath Company incorporates the popular DEC LSI-11 microcomputer in its H11 computer. DEC software is also provided as a part of this package. Here's how this all came about.

In searching for a way to implement a 16-bit computer for the personal computer market, Heath Company investigated a number of the traditional minicomputer companies. The DEC LSI-11 microcomputer appeared to offer the best prospect for an extremely powerful and popular system. Therefore, Heath Company approached DEC with the possibility of using the LSI-11 and associated software in a sophisticated personal computer for the serious hobbyist.

Bill Johnson, Vice-President of Marketing for Heath Company, who negotiated the contract with DEC, with the KD11-F LSI-11 Microcomputer and 4K memory board.

While Heath was searching for a 16-bit computer, DEC was searching at the same time for the proper marketing and distribution system to reach the hobby and personal computing market. Typically, DEC does not sell directly to the consumer or hobby market. DEC sells primarily to business, industry, government, and educational institutions. Therefore, an affiliation between Heath and DEC seemed to offer mutual benefits. Using DEC's LSI-11 and related software to implement a computer product would provide Heath Company with a very competitive product for the personal computer market. At the same time, Heath's marketing horsepower through its mail order efforts and retail store operations offered DEC the opportunity to sell its existing products in a new market place. Thus, the relationship between the world's largest electronic kit manufacturer, Heath Company, and the world's oldest and largest minicomputer manufacturer, DEC, was formed.

In addition to the LSI-11, Heath also markets the popular LA-36 DEC Writer II printing terminal. This unit is not a kit; it is DEC's standard terminal product sold at one of the most attractive prices available. It makes reliable hard copy output available to the hobby and personal computing field.
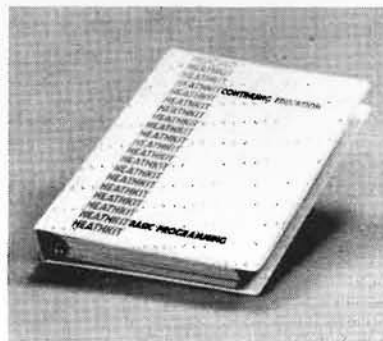
The Heath/DEC relationship will continue as long as we can fulfill our mutual needs and yours. As we identify DEC hardware and software products suitable for the personal computing market, Heath Company will attempt to build kits around them or market them directly. Watch for future Heath/DEC products. ✺

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Need To Learn Programming?

Your Heathkit Computer system, like any digital computer, is an extremely versatile general-purpose machine. You can program it to perform literally any operation. But, until you can write programs that will give you the results you want, its value to you will be quite limited. You **must** have a good working knowledge of programming.

Heath Company recognized early that this programming skill was essential for its new-to-computer customers and prepared several self-instructional programming courses: Basic Programming, 8080 Programming, and LSI-11 Programming. These courses

Textbook for the Basic Programming Course

have one basic purpose: to help you learn to write practical applications programs. After you complete one of these programs, you will be able to define an application problem and write a suitable program to implement it. The courses not only teach you the popular programming languages, but also the creative or problem solving aspects of programming.

The BASIC Programming course teaches the BASIC language and is applicable to any computer using BASIC. BASIC is implemented on both the H8 and H11 digital computers as well as other hobby and personal computers.

The 8080 Programming course teaches machine and assembly language programming of computers based on the popular 8080 microprocessor. This includes the H8 as well as nearly a half dozen popular personal computers.

The LSI-11 Programming course teaches machine and assembly language programming for the LSI-11. It applies to the H11, the DEC PDP-11/03, or any other LSI-11 based machine.

Many individuals are purchasing personal computers simply to learn more about how computers operate. And particularly, they are interested in learning how to program. Certainly the best way to learn programming is to get your own computer and use it. These popular programming courses, combined with our computers, give you one of the most effective and efficient ways to learn computer programming. Once you have learned how to program, the applications for your computer system are limitless. What better value could you ask for?

The Basic Programming course (EC-1100) is available now for $29.95. Watch for the 8080 course later this year. The LSI-11 course will follow that. ✺

Most Frequently Asked Questions About
The Heathkit H8 Computer

The introduction of the Heathkit computer system has stimulated considerable interest in the hobby and personal computing field. Initial response and sales have simply been excellent. The products have also generated some questions about specific features and characteristics. There seems to be a lot of interest in knowing the reasons behind some of our design decisions. The most often asked questions about the H8 computer and our answers are given below.

1. Q. — Why did you use the 8080 microprocessor?

   A. — This is not an easy question to answer. In early 1975 when the development of the H8 started, the two primary 8-bit microprocessors available were the 8080 and the 6800. We chose the 8080 over the 6800 because it was lower in cost, had more second sources, and was far better documented. In addition, there was far more software available for the 8080 than the 6800. Since software is the key to getting practical value from a digital computer, the software issue was probably the most important. The 8080 won.

   Another way this question is asked is why did you use the 8080 instead of the Z80 microprocessor. But when the H8 development was starting, the Z80 had not been announced and was not available. In fact, it was totally unknown and, as a result, was not among our available choices. When the Z80 appeared on the scene, there had been far too much time and money invested in both hardware and software development to abandon the 8080. We were not about to delay our development program and thus product introduction, or waste the time and money already spent on the 8080, to change over to a new microprocessor from a totally new and unknown company (Zilog).

   The 8080 is still, by far, the most widely used microprocessor. This is particularly true in hobby and personal computing equipment. There are more 8080-based microcomputers than any other type. Some estimates indicate that over 60% of all 8-bit microprocessors in use are 8080s. The 8080 is also widely known and many people are familiar with it. In addition, there is plenty of documentation available in the form of articles, books, and courses; reference material is easy to come by. And best of all, the software base has continued to increase over the years. There is probably more software available for the 8080 microprocessor than any other type. Software is more important than the type of CPU. It is the software that gets things done.

   Even today, with many improved microprocessors available, the 8080 is still an excellent choice. True, the Z80 is faster and more powerful. But few hobbyists will ever take advantage of or need this sheer raw computing power. An 8080-based machine can do everything the Z80 machine can do. It may do it slower and require a few more instructions, but the outcome is the same. In hobby and personal computing applications, most hobbyists will not even begin to tap the power of even the rather simple 8080.

And finally, most hobbyists program using the BASIC language. BASIC is supplied with all personal computers and is by far the fastest and easiest language to use. Many programs are available in BASIC. Because most applications are concentrated in **CPU independent** languages, it is almost irrelevant which microprocessor is used. When operating under BASIC or any other higher level language, the CPU is effectively invisible to the user. The user does not get involved with the actual instruction set or architecture of the microprocessor. Of course, the CPU does affect execution speed. Its instruction set and architecture effectively determine the size of the program. But for most microprocessors, speed and memory sizes are not critical factors. When using BASIC, a customer does not know or care just how fast a program executes as long as it appears nearly instantaneous to him. Only in very long sophisticated programs does processing speed make any difference. If it does, the difference may simply be in terms of seconds. For this reason, the 8080 is just as good as the Z80, or any other microprocessor for that matter, when you are using a higher level language.

Since a Z80 can run 8080 software, it is possible to develop a Z80 CPU for the H8. It doesn't seem necessary, but it is a possibility for the future, as is the 8085 replacement for the 8080.

2. Q. — Why didn't you use the S100 bus?

A. — The S100 bus refers to the 100-line bus design incorporated in the MITS Altair computer. The Altair is considered to be the first personal computer. While it was not exactly the first, it was one of the earliest available. Many other manufacturers such as IMSAI, Processor Technology, Polymorphic and others adopted this bus design. In addition, many small companies make computer accessories such as memories and I/O interfaces that are compatible with the computers using this bus design. The S100 bus is very popular and widely used. Because of the wide availability of a variety of accessories, many users feel that it is desirable to choose a computer using this bus. Although the bus is not a formal standard, it has become an informal or defacto standard in the hobby and personal computing field.
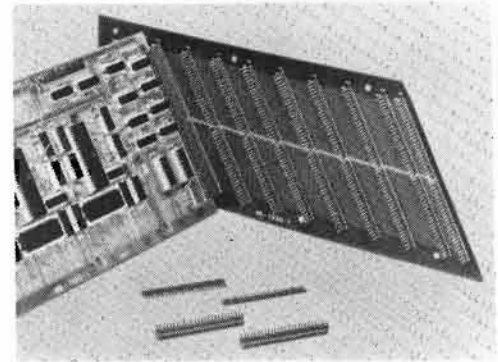
Bus System used in the H8

When the development of the H8 computer began, the MITS Altair computer had just been announced. No other competition was around and that bus design was certainly not as well known or recognized as it is today. Heath engineers evaluated the Altair bus during the initial design phases and determined that it was not suitable for our computer. The bus design was obsolete, expensive, and far larger than required. It also had technical problems that had not been resolved. As a result, Heath designed its own unique bus. The Heath H8 bus is a 50-line bus that is far better in all respects. It is lower in cost, cleaner electrically, and easier to interface. While S100 accessory cards cannot be used with the Heath bus, the H8 user need not be concerned. Heath Company plans to offer a wide variety of memory, I/O interface, and other accessory cards for the H8 bus in the future, virtually duplicating most of the accessories for S100 bus computers.

3. Q. — Why does the H8 incorporate a front panel?

A. — Many hobby and personal computers are supplied without a formal front panel. Most of these computers feature a built in ROM monitor that allows most front panel's functions to be accomplished through an attached video terminal. Many users feel that the front panel is not necessary for this reason. Nevertheless, we decided to incorporate a full front panel on the H8. This panel features a nine-digit octal LED display and a 16-key keyboard. It even includes a speaker that the user can program and also provides an audible feedback for data entry. The H8 and the front panel is, in fact, a mini-terminal built into the computer. It allows you to operate the H8 without a terminal. The keyboard, display, and speaker are treated as I/O ports and each is interrupt-operated in a multi-tasking mode.
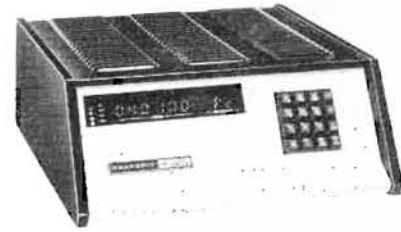
The main reason for including a front panel on the H8 is that it allows you to use the computer without a terminal. For those just beginning in personal computing, a complete system may be more than an individual can initially afford to spend. The computer alone is a modest investment. With this minimum system, you can learn machine language programming and how computers work. As your programming expertise and finances permit, you can expand this H8 into a complete system by adding an H9 terminal or equivalent and a variety of additional memory and I/O accessories. The H8 alone makes an excellent training device for individuals in the use of the 8080 at minimum cost.

The front panel is very useful even in a complete system with a terminal. It is ideal for loading simple programs and program debugging. Besides allowing you to examine and change any memory location or 8080 register from the front panel, the H8 offers two unique features that no other computer front panel has.

First, you can use the front panel on the H8 to dynamically monitor memory locations or registers. This means that you can observe memory or register content during program execution. Second, a single instruction step feature has been included to simplify program development and debugging. Each time you press the single step button, one program instruction is executed. The keyboard also includes single button load and store functions that allow you to load or store programs from the external audio cassette or paper tape reader/punch. You absolutely must see and use the front panel in order to appreciate it.

4. Q. — Why is octal notation used instead of hexadecimal notation?

A. — Octal notation was selected over hex for several reasons. First, the 8080 machine language instructions are formatted in octal notation. Whenever you are programming in machine language, octal designations for the instructions make more sense and are more intuitive. Another reason for the selection of octal is that most people feel that octal is easier to understand than hex. Octal is more "decimal like" than hex. As you recall, the hex number system uses sixteen digits, the numbers 0 through 9 and the letters A through F. The letters tend to confuse many individuals.

Another reason for choosing octal is that Digital Equipment Corporation used octal notation with the LSI-11 microcomputer. We felt that it was desirable to use the same notation on both of the H8 and H11 computers.

The octal versus the hex discussion will never be fully resolved. Many individuals favor one system over another simply because that is what they are used to. Our position here at Heath is that an individual professionally or avocationally involved with computers should be able to use octal or hex notation equally as well. There is no particular handicap or benefit to either system. ✳

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Heathkit Continuing Education Announces. . .

New Microcomputer Learning System

Heathkit Continuing Education, the educational division of Heath Company, recently announced that its new microprocessor course and trainer, a complete system for learning about microcomputers, is now available. This self-instructional course can teach you all about microprocessor operation, programming, and interfacing, how microprocessors work, and how to connect them to the outside world. Once you have learned to interface them to external devices, you learn how to program the microprocessor to perform a wide variety of data processing and control functions.

This course is heavily hardware oriented, but, the important subject of programming is also introduced. It is designed for technicians, engineers, or scientists. Even hobbyists and experimenters will find it interesting and useful. While designed for individual self study, it can also be used in school courses and industrial training programs. The prerequisite for this course is the Heathkit Digital Techniques course or some equivalent training or experience in basic digital circuitry.

The text for this course is written for self study and includes self-test exercises and examinations. Several audio/visual units are also supplied. These consist of audio cassette tape lectures supplemented by colorful printed visuals. Finally, the course includes a set of both hardware and software experiments that are implemented on the ET-3400 microprocessor trainer. These experiments give you practical, hands-on experience in digital circuit interfacing and in writing a variety of practical programs. Over 60 parts, including 17 MSI/LSI integrated circuits, are supplied with the course.

The ET-3400 trainer features the popular Motorola 6800 microprocessor. The unit comes with 256 bytes of static RAM. The memory is expandable to 512 bytes. The additional memory is supplied with the microprocessor course. The trainer also features a 6-digit hexadecimal display and a 17-key keyboard. The trainer is supplied with a breadboarding socket that permits fast, easy, solderless connection of interface circuits. All pertinent microprocessor signals, such as the address bus, data bus, and control lines are terminated on the trainer front panel.

Since the ET-3400 is a complete digital computer in itself, users of this unit are eligible for membership in the Heath User's Group. REMark will regularly feature articles on software and hardware ideas for this unit.

The EE-3401 microprocessor course is priced at $89.95. The ET-3400 trainer sells for $189.95. A package consisting of both units ETS-3400 sells for $269.95.

Involvement

The Key To Satisfaction In Hobby And Personal Computing

Personal computing is one of the most interesting and challenging hobbies available to you anywhere. Its many facets can simultaneously satisfy a wide range of your interests. If you are interested in hardware and digital equipment, a personal computer is just what you need. It will also satisfy anyone primarily interested in software and programming. It is an appealing hobby and one with almost endless application.

This hobby involves a lot more than simply building and using your own computer system. It means getting involved in other hobby activities as well. Such activities can broaden your knowledge of these activities and further increase your enjoyment. How do you get involved? Consider the following.

Read the Publications

Many personal computing magazines are published. No doubt you have already seen some of them. The best way to find out what's going on in the personal computing field is to regularly read the available publications. The articles are designed to enhance your knowledge of your personal computing system. They provide many ideas about hardware and software modifications or additions that you can incorporate. You will learn news of the industry and about new products. Reading the publications is an absolutely essential part of the personal computing. Some of the most popular publications in this field are listed below. Buy them and read them regularly. You can obtain them either by mail order subscription or from your local computer stores.

BYTE
70 Main Street
Peterborough NH 03458

Creative Computing
P. O. Box 798-M
Morriston NJ 07960

Interface Age
13913 Artesia Blvd.
Cerritor CA 90701

ROM
Route 97
Hampton CT 06247

Dr. Dobbs Journal
1263 El Camino Real
P. O. Box E
Menlo Park CA 94025

Elementary Electronics
P. O. Box 2630
Greenwich CT 06830

Kilobaud
Peterborough NH 03458

Microcomputer Interface
1415 Second Street
Santa Monica CA 90401

Personal Computing
167 Corey Road
Brookline MA 02146

Peoples Computers
1263 El Camino Real
Box E
Menlo Park CA 94025

Popular Electronics
P. O. Box 2774
Boulder CO 80302

Visit a Computer Store

Computer stores are springing up all across the country. Try to visit one of them. You'll learn about all the various types of equipment available, meet other hobbyists, and find a wide variety of magazines and books for sale. The Heathkit Electronic Centers are now official computer stores for Heathkit computer equipment and related items.

Join a Computer Club

Computer owners are forming clubs in many of the larger cities. The clubs provide a forum where members can help one another by sharing their services and common information. Many clubs sponsor courses in programming or other subjects and often enable group discount purchases of computers and related items. Clubs regularly feature speakers and presentations that can be helpful to you. Check the club listings in the hobby magazines or on the bullentin board at your local computer store to learn about clubs in your area.

Attend a Personal Computing Conference

Personal computing shows are terrific experiences. Equipment manufacturers display their wares; and users come to see them and listen to speakers on a wide variety of subjects. Most of them are held in major cities around the country. Watch for announcements of such shows in the personal computing magazines and in your local newspaper. Such shows are extremely interesting and worthwhile. Try to attend one if you can. Some forthcoming shows are:

Conference	For Information, Write To:
Business and Personal Computer Sale & Exposition Philadelphia, Pennsylvania Feb 27—March 1, 1978 City Line Holiday Inn	
Compcon Spring '78 San Francisco, California Feb. 28—Mar 2, 1978	Compcon Spring '78 P. O. Box 639 Silver Spring MD 20901
Second West Coast Computer Faire* San Jose, California March 3—5, 1978 San Jose Convention Center	Computer Faire Box 1579 Palo Alto CA 94302
Percomp '78 Long Beach, California April 28—30, 1978 Long Beach Convention Center	Percomp '78 1833 E. 17th Street Santa Anna CA 92701
Personal & Small Business Computer Expo — South Orlando, Florida May 19—21, 1978 Exposition Hall	Felsburg Associates, Inc. P. O. Box 735 Bowie MD 20715
1978 National Computer Conference Anaheim, California June 6—8, 1978 Disneyland Hotel Complex	A FIPS Headquarters 210 Summit Ave Montvale NJ 07645

* NOTE: Heath will be exhibiting at this conference.

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Configured Vs. Distribution Tapes
What's The Difference?

By definition, a tape that you receive from Heath Company is called a DISTRIBUITON tape. It is manufactured in quantity on a special high-speed machine. Because of the differences between this machine and yours, the users, do not be concerned if programs don't load occasionally from this tape. It is meant only as a transfer medium. We suggest that you make a copy of each program on another tape using the front panel monitor (PAM-8). After making this memory image tape, you will find loading and dumping tapes very reliable. A copied tape is still called a distribution tape.

When you load a distribution tape into the computer, and install the patches, you can run the program successfully. However, before you run it, make a copy that includes the patches you just installed. This copy is called a PATCHED DISTRIBUTION tape. Some users prefer to use this tape each time they load a program.

In each of the software packages, some system configuration questions are asked. After you answer these questions, use the SAVE command to save a CONFIGURATION tape. If you use it for loading programs, the configuring questions will not be available because they were wiped out during the save process. The program also occupies less memory space.

If you make a change involving memory size in the system, you will have to load a distribution tape to take advantage of it. The high end of memory is automatically searched only when you load a distribution tape. This address is then fixed when the tape is saved. Therefore, the program will not know or be able to take advantage of any new memory unless you use a distribution tape.

An important point! Don't use the original distribution tape for repeated loading of programs. You would not want to accidentally erase this tape! Make copies as soon as possible. Suit yourself for the version that you like the best. ✻

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Heath Floppy Disk System

Heath is presently working on two different Floppy Disk systems. Model H17 will be used with the H8 Computer and will be available in June of 1978. Model H27 will be used with the H11 and will be available in the fall of 1978.

It will be an easy task to install these disk systems into an existing H8 or H11 system. For a wired version, you just plug the disk controller into the bus, install the software, and you are up. - - These products are being given the highest priority at Heath because we know you are asking for them. Both are coming along nicely. And because it always takes considerable time to develop and perfect a kit manual, the wired versions will be available first, with the kits following several months later.
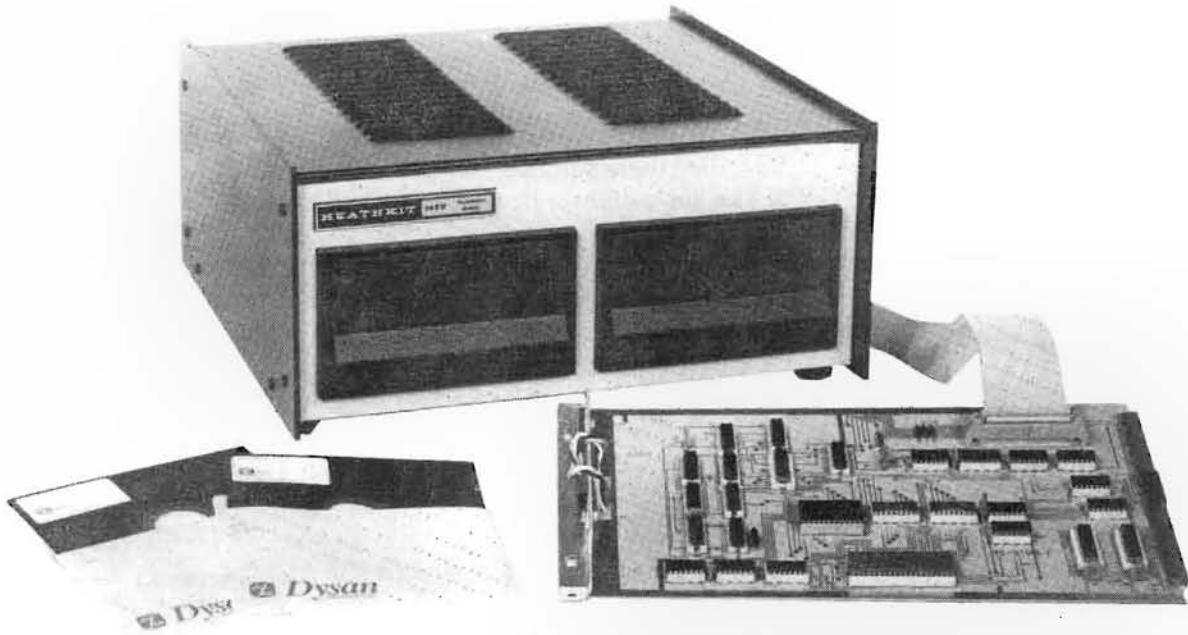
H17 Disk System with Controller

A disk system makes any computer "come alive," We are anxious to place these systems into your hands! Here are some of the preliminary specifications:

MODEL H17 (H8 Floppy)

- Mini-floppy size (5.25″ disk).

- Hard Sector Format (40 tracks).

- 102K bytes per disk.

- Single or Dual configuration.

- Complete with Bootstrap loader.

- Controller/Interface plugs into H8 bus.

- Full cabinet enclosure, with power supply.

- Operating system software includes HASL-8 Assembler, TED-8 Editor, Bug-8 Debug, and Ex B.H. BASIC.

MODEL H27 (H11 Floppy)

- Full size drives.

- Single or Dual configuration.

- Standard soft sector format.

- 256K bytes storage on each drive.

- Controller/Interface compatible with any LSI/11 base computer.

- Full cabinet enclosure, with power supply.

OPTIONAL OPERATING SYSTEMS FOR H11/27

- Standard Heath Disk Operating System (HDOS) featuring full file capability. Includes the software presently supplied with the H11.

- Advanced Heath Operating System. Developed in cooporation with DEC; similar to RT-11. Includes BASIC and FOCAL.

Installing Ex. B. H. BASIC Patches

The original Ex. B. H. Basic was shipped with patches that bring the level up to 10.01.01. If you have already installed these patches, you need only to install the patches indicated by the asterisks (*). The sub-numbers briefly explain the reasons for the changes.

If you have not installed any changes since you received your original tape, or if you have any question as to whether all the changes are installed, you can go ahead and reinstall all the changes listed.

These changes bring the level up to 10.01.02.

REQUIRED PATCHES FOR
EXTENDED BENTON HARBOR BASIC

UPGRADING 10.01.00.
TO   10.01.02.

YOU MUST INSTALL THESE PATCHES AFTER YOU
LOAD THE DISTRIBUTION TAPE

NOTES: *   CHANGES LEVEL NUMBER.
       *1 COMMAND COMPLETION TURNS ON IN REM STATEMENTS.
       *2 PAUSE SOMETIMES SKIPS.

	041167	252							
	043216	005							
*2	047200	175	273	314	274	103			
	054106	157							
	056256	242	103						
	057355	000	000	000					
	062021	265	103						
*1	062307	303	253	103					
	065005	106							
	973131	322							
	103242	072	071	040	247	302	360	070	361
	103252	311	322	313	062	361	365	200	107
	103262	303	313	062	361	315	011	100	303
	103272	364	061						
*2	103274	174	272	300	341	311			
*	103377	062							
*	107023	062							
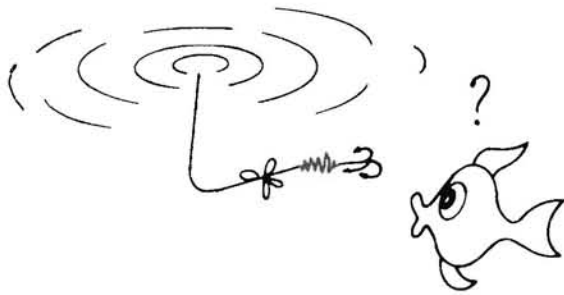
BYTE SIZE

Hug Software Contest

To stimulate the growth of the HUG software library, we are announcing our first official software contest. All members of HUG are eligible to enter. Just submit one or more H8 programs to HUG before March 10, 1978. Programs for the H11 and the ET-3400 trainer are not eligible for this contest.

Three prizes will be awarded in this first contest.

1st prize	8K Memory (H8-1 plus H8-3)
2nd prize	Parallel Interface (H8-2)
3rd prize	4K Memory (H8-1)

RULES:

You must submit a source and object tape if the program is in machine language, or a "dump" of the program if it is in BASIC. Using both sides of a cassette tape is OK. Supply a hard copy listing and a sample run if possible. Programs must run directly on the H8. Value is based on:

- Program usefulness and popularity.
- Program stability.
- Ease of program use.
- Completeness of work.
- Use of minimum external hardware.

All winners will be determined by a committee at HUG. All winners are final. Schlumberger/Heath employees and relatives are not eligible for prizes. All programs will be considered for HUG library entry.

Deadline date for submitting programs is April 10, 1978. Winners will be announced by special mailing.

TMS-4044 Memory

The H8-1 4K memory board contains eight TMS-4044 IC's. You can also add eight more identical IC's to make it an 8K board. An expansion package, Model H8-3, is available from Heath for this purpose.

Some of our customers have purchased 4044 IC's from other sources, at prices between 90¢ and $3.00 each. However, when received, they found these IC's were not the same as the TMS 4044's, but are actually CMOS 4044; a quad S/R latch. Obviously, these will not work. We caution you not to be lead astray.

New Ex. B. H. BASIC

Announcing Extended B. H. BASIC version 10.02.00. This new version of EX. B. H. BASIC version 10.01.02 is upward compatible and includes all the patches previously issued. It also contains the following additional commands:

DUMP — Same as the earlier version except that the format is different.

LOAD — Same as the earlier version except that the format is different.

OLD LOAD — Allows you to load 10.01.02 tapes.

GET "name" — "Loads" the data base.

PUT "name" — "Dumps" the data base.

FDUMP "name" — Combines DUMP and PUT.

FLOAD "name" — Combines LOAD and GET.

LOCK — Protects the program from accidental inputs.

UNLOCK — Allows you to use all commands.

We expect to be shipping this program by early March.

Model HC8-13 $20.00

H8 Owners —Important Notice

Have you used the TED-8 text editor software supplied with your H8 yet? If not, you've got a surprise coming. It may be the most useful piece of software you have, depending upon your applications. Now you can learn how to use it. Dr. William Campbell, an enthusiastic H8 owner from Pennsylvania, has written a primer on how to use TED-8. The title of this publication is "The Fox Hills Farms Guide to the Heath H8 Computer System." This easy-to-understand book leads you step-by-step through the use of Heath's text editor. It shows you how to develop, maintain and and manipulate files; and how to write and edit letters, lists, reports, or any text. It also tells you how to develop a mailing list for use under Extended Benton Harbor BASIC. Get more valuable use out of your H8 with this superb book.

How do you get a copy? Just fill in the green "Heath User's Group" form/envelope supplied with this magazine. Put #855-5 for the "HUG Software Number," put 1 under "Qty," and put N/C under "Price Each." NOTE: Disregard the statements on the green form that tell you to remove the mailing label from this issue of REMark.

Classified Ads

Would you like to place a classified ad in REMark? Ad placement is free to all subscribers. Send your ad typewritten or clearly printed to the Heath User's Group. Allow 10 weeks for the ad to appear. We reserve the right to reject any ads that do not serve the best interest of Heath Co. or any individual.

Two Heathkit User Organizations??

You may have noticed that there are two entirely separate organizations for Heathkit computer users. HUG is the official Heath sponsored organization. The second organization publishes a periodic news letter called BUSS. This second organization is not affiliated with Heath Company in any way. Neither is it approved, sanctioned, or recommended. Heath Company bears no responsibility for the material it publishes or the advice it gives. The official, inside word will always come through HUG. If you want the latest word on new products, software updates, and other juicy news, keep reading REMark.

Guess What?

While HUG was being developed and was still only a gleam in the eyes of a chosen few here at Heath, the styling department designed the official HUG logo, shown above and on Pages 1 and 2. If you recognize what this symbol represents, you can win a free universal software development pad. These pads have been designed by the software engineers at Heath and are presently used for development.

Send your best guess to us before February 28, 1978. Only one guess per member will be allowed. Some have called it a starburst or snowflake-like. Not so. But it does have a special significance. Let us hear from you.

THE MAIL BOX

December 6, 1977

Dear Bob:

HELP! I am using BH Extended BASIC with all the patches, including the one that corrects the problem for 'command-completion' on the REM statement (which you gave me over the phone), but I still get two other problems I can't seem to shake.

1)—The PAUSE feature occasionally fails to operate in the correct manner. By that, I mean that it fails to work at random intervals, skipping right through the pause.

2)—When listing a program on my ASR-33 TTY, the H8 will output an occasional, additional line feed, causing the TTY to advance the paper when the print head is nowhere near the end of the line. As I mentioned over the phone, the TTY is not set up for an auto-line feed at the end of line, nor at the reception of a carriage return; and I know, on a recent program especially, I did not hit the return key twice when inputting the program. Again, as a point of interest, I mention the fact that a program that will just print directly onto the TTY does not exhibit this double line feed anomaly.

I would appreciate anything that you could do to help me solve these two problems, Bob, and thanks for all the assistance rendered so far. Good luck with HUG.

Sincerely,

Mr. Craig A. Pearce
Berwyn, Illinois

Mr. Pearce:

Elsewhere in this issue of REMark is a listing of patches for EX B. H. BASIC. It includes two problems that you mentioned; 'command completion' turns on after you backspace in a REM statement, and the PAUSE command sometimes skips.

The problem occurs with the ASR33 when you try to use it with another I/O device requiring a different number of stop bits. Optional patches in the original documentation allows for one or the other, but not both.

Bob

Dear HUG Readers:

The following questions have been asked so many times that I've just put them in question and answer form below.

Q — When programming in BASIC, I use the back arrow to correct for a mistyped letter on my H9. But when I LIST the program later, the error returns. How come?

A — The back arrow is a hardware circuit that positions the cursor one place to the left *in the terminal only*. No information is sent to the computer. To back space properly, use CONTROL H (press H while holding the control key down).

Q — I noticed in HASL-8 that an F error is sometimes flagged when I use an asterisk in the first column. I thought an asterisk meant that anything following it was a comment.

A — True. Although you did use an asterisk, you are still in the label field and must not overflow it. You can often clear this problem by using a space within seven characters after the asterisk. An asterisk followed by an immediate tab to the operator field provides an easily readable comment.

Q — Although I find the command completion a clever feature, there are times when I would like to turn it off. Is this possible?

A — We looked into this and spent some time trying to disable this feature. But we found that command completion is much too imbedded into each program and we had to abandon the project. We will keep this in mind for future products.

Bob

SOFTWARE DEPT.

New Software For Your Old Money

A NUMISMATIC INVENTORY

By: Leon Cray
    5558 Paw Paw Lake Rd.
    Coloma MI 49038

Numismatics is the science of coins and medals. This program was written to help any of you who are collectors keep a running inventory of your collection. It also lets you call out and examine or work on any specific part of the collection. It was intended to run under Ex. B. H. BASIC version 10.01.01.

RUNNING THE PROGRAM

You can call the inventory in four different ways:

- REPORT #1 will list all of the coins in the collection. For each coin it will print out: the date and mint mark if any, the condition of the coin, the purchase price, the date of the purchase, and the indentification number. No other inputs are needed.

- REPORT #2 will list all the coins of a specific design (liberty head nickels, for example), the date, condition, etc.

- REPORT #3 will list all coins, of any design or denomination, for a specified date and mint mark, if any.

- REPORT #4 will list all of the coins in the collection, and identify each coin by its identification number. No other inputs are needed.

COLLECTION SIZE

The subscript (100) used in the DIMENSION statement is the maximum number of variables this program is set up to handle. To change this number, simply rewrite the DIM statement to the size of your collection.

DATA STRUCTURE

All of the inventory is contained in the DATA statements. To change the contents you must rewrite these statements. These statements are structured as follows:

EXAMPLE: DATA "BARBER 10", "1892—1916"

DATA 2

DATA "1909","G",1.75,"11/3/77",45

DATA "1916","VG",2.10,"12/17/77",46

The first line contains the design of the coin and the years issued. These are both strings and should be in quotes.

The second line tells how many lines are to follow the first line. This is a numeric value and may be written without quotes.

In the third and fourth lines, each line is arranged as follows: date and mint mark if any, condition, purchase price, purchase date, and identification number. . . . The date, mint mark, condition, and purchase date are strings; therefore, they must be in quotes. The purchase price and identification number are numeric values and, as such, do not need to be in quotes.

Please limit all statements to less than 14 characters.

```
10 REM THIS IS THE NUMISMATIC INVENTORY PROGRAM
20 REM   CREATED BY LEON CRAY 10/27/77
25 REM   C/O HEATH CO. BENTON HARBOR MI 49085
30 REM THE FOLLOWING VARIABLES ARE USED IN THIS PROGRAM
40 REM A$=DESIGN (DESCRIPTION)
50 REM B$=DATE OF ISSUE
60 REM A=NUMBER OF COINS (WITH ANY GIVEN DESIGN) IN INVENTORY
70 REM C$=DATE OF COIN
80 REM D$=CONDITION OF COIN
90 REM B=PURCHASE PRICE
100 REM E$=DATE OF PURCHASE
110 REM C=IDENTIFICATION NUMBER
120 REM T=TOTAL NUMBER OF DESIGNS IN COLLECTION
130 REM Q=TOTAL NUMBER OF COINS IN COLLECTION
140 T=11
150 Q=34
160 DIM A$(100),B$(100),A(100),C$(100),D$(100),B(100),E$(100),C(100)
170 PRINT TAB(20)"1 = LIST OF ENTIRE COLLECTION"
180 PRINT TAB(20)"2 = LIST BY DESIGN"
190 PRINT TAB(20)"3 = LIST BY DATE"
200 PRINT TAB(20)"4 = LIST COLLECTION BY I.D.NUMBER"
210 PRINT :PRINT :PRINT
220 INPUT "  WHICH REPORT WOULD YOU LIKE TO RUN ?   ";G
230 PRINT :PRINT
240 IF G=1 THEN 290
250 IF G=2 THEN 440
260 IF G=3 THEN 560
270 IF G=4 THEN 670
280 PRINT :PRINT :PRINT :PRINT :GOTO 170
290 PRINT "DESCRIPTION"TAB(14)"DATE ISSUED"
300 RESTORE
310 FOR I=1 TO T
320 READ A$(I),B$(I),A(I)
330 PRINT
340 PRINT A$(I),B$(I)
350 PRINT
360 PRINT "DATE"TAB(13)"COND."TAB(26)"PUR.PR."TAB(42)"PUR.DT."TAB(56)"I.D.#"
370 FOR I1=1 TO A(I)
380 READ C$(I),D$(I),B(I),E$(I),C(I)
390 PRINT C$(I),D$(I),B(I),E$(I),C(I)
400 NEXT I1
410 NEXT I
420 PRINT :PRINT :PRINT :PRINT
430 GOTO 170
440 LINE INPUT "  WHAT DESIGN DO YOU WANT TO LIST ?  ";G$
450 PRINT "DATE"TAB(13)"COND."TAB(26)"PUR.PR."TAB(42)"PUR.DT."TAB(56)"I.D.#"
460 RESTORE
470 FOR I=1 TO T
480 READ A$(I),B$(I),A(I)
490 FOR I1=1 TO A(I)
500 READ C$(I),D$(I),B(I),E$(I),C(I)
510 IF A$(I)=G$ THEN PRINT C$(I),D$(I),B(I),E$(I),C(I)
520 NEXT I1
530 NEXT I
```

```
540 PRINT :PRINT :PRINT :PRINT
550 GOTO 170
560 LINE INPUT "  WHAT DATE WOULD YOU LIKE TO LIST ?  ";F$
570 RESTORE
580 FOR I=1 TO T
590 READ A$(I),B$(I),A(I)
600 FOR I1=1 TO A(I)
610 READ C$(I),D$(I),B(I),E$(I),C(I)
620 IF C$(I)=F$ THEN GOSUB 780
630 NEXT I1
640 NEXT I
650 PRINT :PRINT :PRINT :PRINT
660 GOTO 170
670 FOR X=1 TO Q
680 RESTORE
690 FOR I=1 TO T
700 READ A$(I),B$(I),A(I)
710 FOR I1=1 TO A(I)
720 READ C$(I),D$(I),B(I),E$(I),C(I)
730 IF C(I)=X THEN GOSUB 780
740 NEXT I1
750 NEXT I
760 NEXT X
770 PRINT :PRINT :PRINT :PRINT :PRINT :PRINT :PRINT :PRINT :GOTO 170
780 PRINT :PRINT
790 PRINT A$(I),B$(I)
800 PRINT C$(I),D$(I),B(I),E$(I),C(I)
810 RETURN
1000 DATA "HALF CENT","1793-1857"
1010 DATA 1
1020 DATA "1803","G",16.75,"10/14/73",17
1040 DATA "LARGE CENT","1793-1857"
1060 DATA 2
1080 DATA "1796","VG",112.45,"9/6/70",1
1100 DATA "1804","G",245.00,"12/17/71",8
1120 DATA "LINCOLN CENT","1909-DATE"
1140 DATA 2
1160 DATA "1909","BU",8.50,"11/21/71",5
1180 DATA "1913-D","AU",17.00,"11/21/71",3
1200 DATA "SHIELD 5","1866-1883"
1220 DATA 1
1240 DATA "1871","G",29.35,"5/7/75",28
1260 DATA "LIBERTY 5","1883-1913"
1280 DATA 3
1300 DATA "1883 NC","U",37.50,"1/11/74",25
1320 DATA "1883 WC","VF",10.50,"1/18/74",27
1340 DATA "1912-D","F",4.70,"1/11/74",26
1360 DATA "JEFFERSON 5","1938-DATE"
1380 DATA 3
1400 DATA "1939-D","VF",4.25,"10/27/77",32
1420 DATA "1950-D","VF",7.95,"10/27/77",33
1440 DATA "1968-S","PR",4.35,"12/31/71",6
1460 DATA "ROOSEVELT 10","1946-DATE"
1480 DATA 1
1500 DATA "1946-S","VG",.75,"9/4/77",16
1520 DATA "WASHINGTON 25","1932-DATE"
1540 DATA 1
1560 DATA "1959-D","AU",1.05,"3/15/73",15
1580 DATA "KENNEDY 50","1964-DATE"
1600 DATA 3
1620 DATA "1964","AU",.50,"10/29/77",34
1640 DATA "1966","BU",1.50,"3/17/76",31
1660 DATA "1970-D","BU",18.55,"4/21/71",2
1680 DATA "MORGAN 1$","1878-1921"
1700 DATA 3
1720 DATA "1881","VF",5.00,"5/13/75",29
1740 DATA "1884-S","EF",21.15,"3/21/76",30
1760 DATA "1890","VF",7.00,"7/29/72",10
1780 DATA "IKE 1$","1971-DATE"
1800 DATA 1
1820 DATA "1971-S","BU",4.00,"6/29/72",9
10000 END
```
*

MASTERMIND

By: Hughes B. Hoyle, III
716 S. Elam Ave.
Greensboro N. C. 27403
(919) 378-1050

Mastermind is a game in which, with six colors to choose from, you must guess four colors and have them in the proper sequence. This program has a complete message system for the user. It was written for an H8, H9, and a minimum of 16K of memory.

Leave out line 131 and 132 to run in 12K. The operation of the program is self explanatory.

```
1 DIM X(4)
2 DIM Y(4)
3 DIM Z(4)
4 DIM W$(4)
5 DIM G$(15)
6 DIM N(15)
7 DIM M(15)
8 DIM A(4)
10 PRINT "YOU ARE GOING TO PLAY THE GAME OF MASTERMIND.  I WILL CHOOSE A"
20 PRINT "SEQUENCE OF FOUR COLORS AT RANDOM, AND YOU WILL TRY TO GUESS WHAT"
30 PRINT "MY SEQUENCE IS.  I HAVE SIX COLORS TO CHOOSE FROM AND I MAY USE"
40 PRINT "A COLOR MORE THAN ONCE, EVEN FOUR TIMES IF I WANT TO.  I WILL"
50 PRINT "NOW CHOOSE MY SEQUENCE.  PLEASE EXCUSE ME."
100 GOSUB 700
105 PRINT "I HAVE PICKED MY SEQUENCE OF COLORS.  WHEN I TYPE A QUESTION MARK,"
110 PRINT "YOU TYPE A SEQUENCE OF FOUR COLORS SEPARATED BY SPACES AND PUSH"
115 PRINT "RETURN.  I'LL TELL YOU HOW MANY COLORS YOU HAVE IN EXACTLY THE"
120 PRINT "RIGHT PLACE AND HOW MANY COLORS ARE RIGHT BUT IN THE WRONG"
125 PRINT "PLACE.  THE COLORS ARE RED, YELLOW, BLUE, GREEN, BROWN, AND"
130 PRINT "ORANGE.  O.K.  LET'S BEGIN.  GOOD LUCK."
131 PRINT "BE SURE YOU PUT JUST ONE SPACE BETWEEN EACH COLOR AND NO SPACE"
132 PRINT "AFTER THE LAST COLOR."
133 LET P=1
134 GOTO 165
135 PRINT "SEQUENCE"," "," ","CORRECT","RIGHT COLOR, WRONG PLACE"
136 PRINT "--------"," ","-------","------------------------"
138 LET G$(P)=W$(1)+" "+W$(2)+" "+W$(3)+" "+W$(4)
139 FOR Q=1 TO P:PRINT G$(Q),N(Q),M(Q):NEXT Q
140 IF N(P)=4 THEN 145
141 LET P=P+1
142 PRINT "PICK YOUR NEXT SEQUENCE."
143 GOTO 165
145 PRINT "YOU HAVE MY SEQUENCE EXACTLY RIGHT."
146 PRINT "YOUR FINAL SCORE IS ";P;"."
147 PRINT "IF YOU WISH TO PLAY AGAIN, TYPE YES; OTHERWISE TYPE NO."
148 LINE INPUT ;H$
149 IF H$="YES" THEN 152
150 GOTO 155
152 PRINT "PLEASE WAIT."
153 GOTO 100
155 PRINT "I ENJOYED PLAYING WITH YOU.  PLEASE PLAY AGAIN SOMETIME."
156 END
165 GOSUB 900
170 LET J=1
174 LET Z(J)=0
175 IF W$(J)="RED" THEN LET Z(J)=1
180 IF W$(J)="YELLOW" THEN LET Z(J)=2
185 IF W$(J)="BLUE" THEN LET Z(J)=3
190 IF W$(J)="GREEN" THEN LET Z(J)=4
195 IF W$(J)="BROWN" THEN LET Z(J)=5
200 IF W$(J)="ORANGE" THEN LET Z(J)=6
201 IF Z(J)<>0 THEN 206
202 PRINT "YOU MUST NOT HAVE TYPED A SEQUENCE OF FOUR ALLOWABLE COLORS WITH"
203 PRINT "ONE SPACE BETWEEN EACH TWO COLORS. PLEASE TRY AGAIN."
205 GOTO 165
206 LET J=J+1
210 IF J=5 THEN 220
215 GOTO 174
```

```
220 N=0
225 K=1
230 Y(K)=X(K)
235 K=K+1
240 IF K=5 THEN 250
245 GOTO 230
250 LET L=1
255 IF Y(L)=Z(L) THEN 290
260 LET L=L+1
265 IF L=5 THEN 307
280 GOTO 255
290 LET Y(L)=0
295 LET Z(L)=0
300 LET N=N+1
305 GOTO 260
307 LET M=0
310 LET K1=1
315 IF Z(K1)<>0 THEN 330
320 LET K1=K1+1
322 IF K1=5 THEN 370
325 GOTO 315
330 LET O=1
332 IF Y(O)=0 THEN 340
335 IF Z(K1)=Y(O) THEN 350
340 LET O=O+1
342 IF O=5 THEN 365
345 GOTO 335
350 LET Z(K1)=0
355 LET Y(O)=0
360 LET M=M+1
365 GOTO 320
370 LET N(P)=N
375 LET M(P)=M
```

```
380 GOTO 135
700 I=1
705 GOSUB 800
710 X(I)=Z
715 I=I+1
720 IF I=5 THEN 730
725 GOTO 705
730 RETURN
800 Z8=INT(1000*RND(1))
805 Z1=1
810 IF 7*Z1>Z8 THEN 825
815 Z1=Z1+1
820 GOTO 810
825 IF 7*(Z1-1)=Z8 THEN 800
830 Z=Z8-(7*(Z1-1))
835 RETURN
900 PRINT "YOUR SEQUENCE IS"
901 LINE INPUT ;U$
905 R=1
910 S=4
915 IF RIGHT$(LEFT$(U$,S),1)=" " THEN 930
920 S=S+1
921 IF S=10 THEN 202
925 GOTO 915
930 LET A(R)=S
935 LET W$(R)=LEFT$(U$,A(R)-1)
940 LET U$=MID$(U$,A(R)+1)
945 R=R+1
950 IF R=4 THEN 960
955 GOTO 910
960 LET W$(R)=U$
970 RETURN
*
```

MINI-NIM

By: Hughes B. Hoyle, III
716 S. Elam Ave.
Greensboro, N. C. 27403
(919) 378-1050

Mini-Nim has often been played in the past with matches or tooth picks. One of the players picks a number and the others then take turns subtracting either one, two, or three from this number. The loser is the player who is left with a quantity of only one.

The program was written to run on Ex. B. H. BASIC ver. 10.01.01. The game includes all the needed instructions and, therefore, is self explanatory.

```
10 PRINT "MY NAME IS AGGRAVATION BUT YOU MAY CALL ME AGGIE FOR SHORT."
20 PRINT "LET'S PLAY A GAME.  I KNOW A GOOD ONE.  LET'S PLAY MINI-NIM."
30 PRINT "YOU PICK A NUMBER AND WE TAKE TURNS SUBTRACTING 1, 2, OR 3"
40 PRINT "FROM IT.  WHOSE EVER TURN IT IS WHEN THE NUMBER LEFT IS 1"
50 PRINT "LOSES."
60 PRINT "WHEN I TYPE A QUESTION MARK, YOU PICK ANY NUMBER BETWEEN"
70 PRINT "15 AND 30, TYPE THE NUMBER AFTER THE QUESTION MARK, AND"
80 PRINT "PUSH RETURN.  GOOD LUCK."
120 INPUT A
```

```
121 GOTO 700
130 PRINT A "IS AN INTERESTING CHOICE."
140 PRINT "AFTER YOU GIVE ME INFORMATION I ASK FOR,ALWAYS PUSH RETURN."
150 LINE INPUT "DO YOU WANT TO GO FIRST?" ;B$
190 IF NOT (B$="YES" OR B$="NO") THEN 220
200 IF B$="YES" THEN 250
210 IF B$="NO" THEN 430
220 PRINT "NO!   TYPE YES OR NO AND PUSH RETURN."
240 GOTO 150
250 PRINT "SO YOU WANT TO GO FIRST.   THE NUMBER WE HAVE IS" A "."
260 LET Z = A
270 PRINT "WHEN I TYPE A QUESTION MARK, YOU DECIDE HOW MANY YOU WANT TO"
280 PRINT "TAKE AWAY, TYPE 1, 2, OR 3, AND PUSH RETURN."
285 INPUT "HOW MANY DO YOU WANT TO TAKE AWAY?";C
310 IF (C=1 OR C=2 OR C=3) THEN 360
320 IF NOT (C=1 OR C=2 OR C=3) THEN 330
330 PRINT "YOU DID NOT TYPE A 1, 2, OR 3 AND PUSH RETURN.   PLEASE TRY AGAIN"
350 GOTO 285
360 LET Y = C
370 PRINT "SO YOU ARE GOING TO TAKE AWAY" Y "AND THAT LEAVES" Z-Y
390 GOTO 900
400 PRINT "LET ME THINK A MINUTE."
405 GOTO 415
410 PRINT "NOW LET'S SEE. WHAT SHOULD I DO?"
415 LET E = Z - Y
420 GOTO 461
430 PRINT "SO YOU WANT ME TO GO FIRST. YOU CERTAINLY ARE MAKING THIS TOUGH."
440 PRINT "LET ME THINK."
450 LET  E = A
461 IF  E<=4 THEN 463
462 IF E>4 THEN 500
463 IF  E=1 THEN 465
464 IF E>1 THEN 475
465 PRINT "SO YOU WON.   I ENJOYED PLAYING WITH YOU."
466 GOTO 477
475 PRINT "I WILL TAKE AWAY" E-1 ",  AS YOU CAN SEE THIS ONLY LEAVES 1.   SO"
476 PRINT "I HAVE WON.   PERHAPS NEXT TIME YOU'LL WIN."
477 LINE INPUT "DO YOU WISH TO PLAY AGAIN?" ;D$
478 IF D$="YES" THEN 60
480 END
500 LET X=1
510 IF 4*X < E THEN 530
520 IF 4*X >= E THEN 550
530 LET X=X+1
540 GOTO 510
550 LET G = E - ((4*(X-1))+1)
560 IF G=0 THEN 580
570 IF NOT (G=0) THEN 590
580 LET G=G+1
590 PRINT "I WILL TAKE AWAY" G "AND THIS LEAVES" E-G ".   IT'S YOUR TURN."
630 LET Z=E-G
650 GOTO 285
700 LET W=15
701 IF W=A THEN 130
702 IF W=30 THEN 800
703 LET  W=W+1
704 GOTO 701
800 PRINT A "IS NOT A WHOLE NUMBER BETWEEN 15 AND 30."
801 PRINT "PLEASE PICK ANOTHER NUMBER AND PUSH RETURN."
802 GOTO 120
900 LET X1=INT(100*RND(1))
905 LET J1=1
910 IF 3*J1>X1 THEN 950
915 LET J1=J1+1
920 GOTO 910
950 LET J2=X1-(3*(J1-1))
955 IF J2=0 THEN 400
960 IF J2=1 THEN 405
965 IF J2=2 THEN 410
*
```

SORTING STRINGS

BY: Dr. Wm. N. Campbell
249 Smithbridge Rd.
Glen Mills, Pa. 19342

This program lets you put character strings in alphabetical order. When you want to sort out words, names, book titles, or abbreviations (etc.), it can save you a great deal of time and effort.

All the strings to be sorted are located in the DATA statements. Lines 200 to 240 already contain some strings to show you how the Data is placed. You can change these lines and add others as needed between lines 140 and 9998.

```
10 REM SORTING (ALPHABETIZING) STRINGS - COPYRIGHT 1977 BY FOX HILL FARMS
20 REM
30 CNTRL 4,0:DIM D$(300):FOR P = 1 TO 300
40 READ D$(P):IF D$(P) = "000" GOTO 60
50 NEXT P
60 Z = P - 1
70 Y = 0:Z = Z - 1
80 FOR X = 1 TO Z
90 IF D$(X) <=D$(X+1) GOTO 120
100 Y$ = D$(X):D$(X) = D$(X+1):D$(X+1) = Y$
110 Y = 1
120 NEXT X:IF Y = 1 GOTO 70
130 FOR C = 1 TO  P:IF D$(C) = "000" THEN 9999
140 PRINT TAB(10) D$(C):NEXT
200 DATA "CAMPBELL","ADAMS","HOBERG","JOHNSON","WORRILOW","EMMICH"
210 DATA "SAMMONS","BARLOW","GANNT","MINNICH","ALESBURY","FINCH"
220 DATA "JONES","SMITH","WARREN","SICKEL","LANCE","RAFFERTY"
230 DATA "ALLISON","WINTERS","ALDERFER","ALDERING","FURTAW","ALDERFIN"
240 DATA "ALLEXIS","WINTER","KABELMAN","NURSE","FRENZEL"
9998 DATA "000"
9999 END
*RUN
          ADAMS
          ALDERFER
          ALDERFIN
          ALDERING
          ALESBURY
          ALLEXIS
          ALLISON
          BARLOW
          CAMPBELL
          EMMICH
          FINCH
          FRENZEL
          FURTAW
          GANNT
          HOBERG
          JOHNSON
          JONES
          KABELMAN
          LANCE
          MINNICH
          NURSE
          RAFFERTY
          SAMMONS
          SICKEL
          SMITH
          WARREN
          WINTER
          WINTERS
          WORRILOW

END AT LINE  9999
*
```

An Advance Notice
New Applications Software

Biorhythm (16K): The theory of biorhythm states that from birth to death you are influenced by three internal cycles or rhythms — physical, emotional, and intellectual. This BASIC program computes and displays your personal biorhythm chart on the screen. These three cycles have different periods, and the biorhythm pattern (with its good days and critical days) is a combination of the three different rhythms.

Model PA-82. Shipping now. $10.00

Game Set #1 (8K): This cassette contains eight machine-code games: Hangman, Craps, Nim, Hexapawn, Tic-Tac-Toe, Orbit, Hamrabi, and Derby. Craps and Derby are competitive games that can be played by up to eight people. The other games are played against the computer by one or more individuals.

Hangman — A word game where you try to guess a word selected at random by the computer. With each incorrect guess, the computer assembles another portion of a picture of a hanging man. If the picture is completed, you lose the game. When the word list is no longer novel, you can change it and dump it back onto the cassette.

Craps — This game is self-explanatory in that it follows Las Vegas rules. You can place three types of bets: line, odds, and number. You may also elect to make a pass, nopass or a place bet. The computer will roll the dice, compute the losses and payoffs, and list the standings.

NIM — An old barroom game in which a number of piles of markers are stacked up, and then removed in turn by the computer or the player. Each removes as many markers as desired from any one of the piles, at each turn. The object is to make the last move by emptying the last pile.

Hexapawn — A board game played with three chess pawns on each side. The object is to move one pawn to the computer's side of the board, block the computer so it can't move, or capture all of the computer's pieces. As you play each set, you have the option of allowing the computer to learn from its mistakes.

Tic-Tac-Toe — An old standard, except that the computer decides who moves first.

Orbit — In this game, your objective is to shoot down an invisible orbiting spacecraft. You have eight shots, in which you select an angle from 0 to 360 degrees, and an altitude of 100 to 300 miles. The computer fires each missile and reports the miss-distance. In order to win the game, a missile must explode within 50 miles of the spacecraft.

Hamrabi — A game in which the player is appointed King of Sumeria. The city-state has a starting population, a given amount of land, and a supply of grain. The object is to buy and sell land, and plant enough grain to insure the success of the city-state, and the well-being of the population. Warning: Any mistakes will be dealt with harshly.

Derby — A horserace with eight famous mounts, from Citation to Seabiscuit. Players may place up to eight bets, to win, place, or show. Each player has an initial bankroll of $200, and is out of the game when it is lost. The computer takes the bets, keeps track of the horses, and posts the standings.

Model PA-84. Shipping now. $10.00

Space War (24K): The Heath version of the famous Star Trek game, played by computer-fanatics everywhere. This is a particularly complex version, with 10 levels of play and a high degree of randomization. The level of play determines the likelihood of being attacked by Klingons, the amount of movement of Klingons, stars and starbases, the energy required to destroy Klingons, and the amount of time the captain is given to respond to each new situation.

The game is played in a galaxy consisting of 64 quadrans, with each quadrant containing 64 sectors. At the beginning, the Klingons, stars and starbases are randomly distributed throughout the galaxy. It is the captain's duty to search out and destroy anywhere from 40 to 70 Klingons in a given number of stardays, without running out of energy. Starbases are provided for refueling and repairs, and must be defended from the evil Klingons.

There are a number of surprises in store for the starship Enterprise and her gallant captain, including tribbles, supernovae, space-storms, space/time discontinuities, damage from Klingon attacks, and the deadly Romulans.

As an example of the continuing challenge of this game, the individual who wrote it has played approximately 100 times at level 10, with only 3 wins to his credit. However, don't despair; levels one through three are designed specifically for beginners and children.

Model PA-83. Shipping now. $10.00

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