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Heath/Zenith Users' Group

Policy & Reference Issue

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Software Engineer ..... Pat Swayne
HUG Bulletin Board
and Software Developer .... Terry Jensen
Software Coordinator ..... Nancy Strunk
HUG Secretary ..... Margaret Bacon

REMark Editor ..... Walt Gillespie
Assistant Editor ..... Donna Melland

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Send Payment to: Heath Users' Group
Hilltop Road
St. Joseph, MI 49085

616-982-3463

REMark®

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PAST PRESENT FUTURE

QUIKDATA has been there in the **past.** In fact, we're the oldest independent H/Z vendor in the business, serving thousands of satisfied customers every year! We're still here now, the **present** - And it's not by luck or chance. It's only because of our customer's trust in us. Why? Dedicated service; 24 hour order shipping turnaround; total support; full consultation; dependable fact filled monthly newsletter to give you the whole **SCOOP;** Much more. The **future**? We'll be right there to hold your hand, just like now - just like in the past. That's our promise. We won't leave you stranded. Join the thousands of satisfied customers who choose **QUIKDATA** as their one stop headquarters - join the **WINNERS**!

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Tell The World!

Hardly a week goes by that I don't receive three or four letters from HUG members concerning advertising of Heath/Zenith computers. I won't attempt to argue here the merits of Heath or Zenith Data Systems' advertising practices. The respective departments are headed by trained professionals who have to work within normal budgetary constraints. What I would like to address is what you as a satisfied user can do to help.

A letter from Bruce Nevin, Menomonie, Wisconsin, appeared in the October issue of Small Systems World Magazine (a copy follows this editorial). With his testimonial, Bruce has produced many times the desired response that a slick advertisement would. When customers are willing to take the time to write about their satisfaction with a product, others will sit up and take notice.

Don't write to us, we already think the H/Z-89 and H/Z-100 are great. But, you can imagine what would pass through the mind of the editor of a magazine, which has ignored the H/Z units, if he received 5000+ letters saying that "Heath/Zenith Computers are the greatest!"? With over 19,000 members (and still growing), we could produce such a positive flood of praise, plus tell owners and potential purchasers of other brands that we think ours is best.

If you feel like Bruce does, write someone out there. Tell the world. Maybe it's time for the mouse to roar!

Walt Gillespie
Editor

(Reprinted from the October issue of Small Systems World, 950 Lee Street, Des Plaines, Illinois 60016)

Zenith Is Better Than the IBM PC

I can not take it any longer! After reading so many articles about Lotus 1-2-3 for the IBM PC, I feel dizzy and angry.

Lotus 1-2-3 is for more than just the IBM PC. As a matter of fact, the people around here who have a PC and Lotus can not get the graphics to work at all. The video board they purchased with the PC (to get it to display on a screen) is not compatible. What they have to do now is throw out this board and purchase a different one. Now they need a graphics printer or a plotter. But they already have a letter-quality printer and a modem attached to I/O boards (also extra with the original purchase). But now they have to purchase an additional I/O card for the graphics device.

They were angry with the PC when they found that the keyboard is almost impossible to use for word processing (because of the nonstandard layout). Needing two additional boards on a computer that is less than one-year-old has made them really upset.

Zenith has superior hardware and software, but inferior marketing to IBM. I'll take only eight colors when all eight and text are available at all times. I also prefer a letter-quality printer, plotter, and modem that don't require any additional I/O hardware. It's nice to find that when the CP/M software came on 8-inch disks, a friend's 8-inch drive plugged in to an extra plug on the stock drive controller and read those disks!

It's nice to have 16-bit Z-DOS (MS-DOS) and 8-bit CP/M without any additional board purchases filling those precious expansion slots. Oh, and by the way, it's nice to have S-100 expansion slots.

I like to go to IBM PC user group meetings and talk about Zenith's configure program. S-100 card slots, 8 and 16 bit capability, 8 color graphics, two RS-232C serial ports, a Centronics parallel port, a good standard keyboard with 12 special function keys, 10-key pad, help key, and two 322K disk drives—all standard. It's nice to have Lotus 1-2-3 under a Zenith cover that worked right out of the box—with full 8 color graphics.

Bruce Nevin
Menomonie, Wisconsin

Welcome to the Heath/Zenith Users' Group

It is our pleasure to present the following information to fellow members and the newcomers to the National Heath/Zenith Users' Group. The January Issue of REMark will provide you with compiled material especially designed to update your records with a cross-reference index to all previous articles found in REMark, the HUG Software Library abstracts as presented in the previous year, a listing of companies that provide Heath/Zenith related hardware and software products, a listing of Local Heath/Zenith Users' Groups, related publications information, and a variety of small but useful tips for contacting knowledgeable individuals who are familiar with Heath/Zenith equipment.

Bob Ellerton
HUG Manager

For the New Member:

This Issue of REMark will be your first contact with the Heath/Zenith Users' Group. The material contained herein represents a good look at the number of people, clubs, and organizations supporting the Heath/Zenith Computer Product Line. Further, HUG has selected that information which you may find most helpful to get you familiar with our organization. This Issue, along with the Software Catalog and following issues of REMark provided as a part of your membership, will help you explore the exciting and powerful world of micro-computing.

Walt Gillespie
REMark Editor

For the "Oldtimer":

The material contained in this Issue of REMark will help previous members stay current with new HUG policies, available HUG software, additional Local HUG Clubs, and the new support activities from companies that may be of particular interest. The HUG Software Catalog, as well as the January Issue of REMark, are a permanent part of the HUG membership package provided to any user joining the HUG community.

General Heath/Zenith Users' Group Information

Membership Eligibility

A bona fide interest in Heath/Zenith computer related products is all that is necessary for membership eligibility. You need not be an owner of a Heath/Zenith product to join. Membership is open to any individual or company representative.

As a member, you will receive:

- A subscription to REMark, the official Heath/Zenith magazine
- A HUG binder
- A personal identification card
- HUG Software Catalog
- Access to the Heath/Zenith Users' Group Software Library
- Access to the HUG Bulletin Board via MicroNET
- Discounts on a variety of Heath/Zenith computer products

These benefits are described in the following paragraphs.

Margaret Bacon
HUG Secretary

Pat Swayne
Software Engineer

Nancy Strunk
Software Coordinator

Terry Jensen
Software Developer

Donna Melland
Assistant Editor

HUG Membership Rates

The following rate schedule applies as of January, 1984 for membership:

Type of Membership	U.S. Domestic	Canada and Mexico	International
Initial	$20.00	$22.00 *	$30.00 *
Renewal	$17.00	$19.00 *	$24.00 *

* Must be in U.S. funds

The initial membership package includes the HUG binder, the HUG Software Catalog, a Heath Parts Order Form, and a copy of the January Issue of REMark.

Identification Card

When your membership is accepted, a computer generated ID card is issued. The ID card is sent to you separately via first class mail. This card identifies you as a member of the Heath/Zenith Users' Group. It contains a unique number which can be verified for membership. **(Allow several weeks for the processing and delivery of your personal ID card.)**

Your HUG ID Card entitles you to discounts on a variety of Heath/Zenith computer products. Please review and retain the following information for your records.

HUG Discount Rules and Regulations:

1. You must be a member of the Heath/Zenith Users' Group for a period of 90 days before you can use your HUG ID to participate in the discount program. If you renew your membership in the Heath/Zenith Users' Group, you may use your ID card immediately to participate.

2. Your ID card can only be used at your local Heathkit Electronics Center, both Canadian and U.S., or through mail order purchases placed with Heath Company. Telephone orders **will not** be accepted.

3. Your discount applies to the first $5,000 of products purchased per year. The $5,000 ceiling on purchases is based on the current list price of the products you purchase at the date shown on the invoice.

4. You may purchase only one of any given product per year, (e.g. one "Z" or "H" 100 series computer per year).

5. Your HUG ID card is not transferable. You will be required to show both your HUG ID and another suitable piece of identification to receive the benefits of the discount program.

6. You cannot make a purchase at the discounted rates without your HUG ID card.

7. Your HUG ID cannot be used to purchase individual parts or HUG software products under the discount program from the Heathkit Electronic Centers or from Heath Company. HUG products are considered parts.

8. The ID card can be used for a 10% discount on kit computer related items only.

9. The ID card can be used for a 20% discount on assembled computer related items only.

10. Any item purchased which installs as a modification to the internal portions of the computer (i.e. boards, drives, ROMs, etc.) is considered a kit item.

11. Any item (unless purchased as a kit) which is an external addition to the computer as a system (e.g. complete wired drive enclosures, printers, modems, etc.) is considered a wired item.

12. Software (with the exception of HUG software) is considered a finished or assembled item and therefore, can be purchased at the 20% discount.

13. Unless stated specifically in "sales specials" that other discounts do not apply, the HUG ID can be used in addition to discounts offered through local Heathkit Electronic Centers or through the Heathkit Mail Order Catalog. However, the HUG ID may not be used with any promotional certificates offered by Heath Company or the Heathkit Electronics Centers.

14. Heathkit Mail Order Catalog purchases must be accompanied by your HUG ID card and a self-addressed stamped envelope for return of your ID once the order has been processed.

15. If you lose your ID card, you can only receive a replacement by purchasing a new membership to HUG at the current renewal rate. You may however, use this ID immediately if you have been a HUG member for more than 90 days.

16. To receive a replacement ID, send your request along with your **HUG ID number (found on your REMark mailing label) and renewal fee to:**

Attention: HUG Secretary / New ID Card
Heath Users' Group
Hilltop Road
St. Joseph, MI 49085

Publications

REMark, the official magazine for users of Heath/Zenith computer products, is sent to each member 12 times a year. The January Issue is designed as a cross-reference to the previous issues and contains valuable information that you may need. Individual back issues may be obtained during the current year. However, at the end of each year, all twelve issues become a single bound REMark Volume which may be purchased as a separate item. There are currently four REMark Volumes available.

A subscription to REMark is included with your membership. The magazine is sent via bulk mail, as are most other organization's publications. Bulk mailing means your REMark **will not be forwarded should you move.** Therefore, please notify the HUG Secretary of your address change and the date which you wish the change to take effect.

We encourage each member to use REMark to communicate with other users. You can do this by submitting articles for publication. We strongly encourage any comments which you feel would benefit other users. We welcome your letters, hardware descriptions, software enhancements, applications programs, and other material you may wish to share.

Major Article Program

Major articles are defined as articles containing 2000 words or more. Authors contributing major articles that are printed in REMark will receive a "Certificate of Recognition and Appreciation" from the Heath/Zenith Users' Group and their choice of any single Heath/Zenith software product FREE.

Those individuals that contribute smaller articles will receive the "Certificate of Recognition and Appreciation" from the Heath/Zenith Users' Group. As you can see, we feel that any information you send us is important.

Sometimes, good things come in small packages. Therefore, all articles appearing in REMark are eligible for the "Article of the Year" award presented to the individual that develops the most popular material during the year.

Certificates and software are delivered **after** your article appears in REMark.

"Article of the Year" Award!

Win a $500 Gift Certificate!

The December Issue of REMark will include a ballot card for selecting the "Article of the Year". Fill in your choice for the article that you found most useful or interesting during the year. HUG must receive your ballot before February of the following year. The results of the vote and the winner of the $500 gift certificate will be announced in the March Issue of REMark. Give your favorite author your vote of appreciation!

How to Submit Articles to REMark

What Subject?

Feel free to submit article manuscripts on any subject matter that you think will be of interest to the Heath/Zenith Users' Group community. Tutorial or How-To articles tend to be the most popular. Highly technical articles, although acceptable, do not have a broad readership base.

If you choose what might be considered a highly technical subject, try not to use terms which the average user would not be familiar with. If you should feel the need to use such terms, give a definition. Be kind to those who might not understand your application and explain your special programming tricks with a little extra detail. It's these "tricks" that help others to comprehend programming techniques and to be better programmers themselves.

If you feel that you have a unique program or hardware application, sit down and write about it. Do you have a special program for the bowling team, softball league, maybe a different business or farm program? Possibly you have interfaced your computer to some special machine to gather data for later evaluation. These are just some of the things other HUGgies are interested in reading about.

Following is only a sample list of possible subjects:

Software:

Application
Modification
New approaches
File handling
I/O handling
Enhancements
Reviews

Hardware:

Special applications
(Schools, Business, Handicap, etc.)
Enhancements
Interfacing
Problem solving

Review past issues of REMark. See what subjects have been covered. Try not to cover the same subject unless you have a better or totally different approach. Don't be a "me too" writer, open new doors.

How Big?

To qualify for the "Major Article Program", your manuscript must be 2,000 words or more (listings not included). Articles in excess of 5,000 words generally need to be broken into installments for separate publication.

Articles of less than 2,000 words and "Buggin' HUG" letters are acceptable. However, this type of submittal does not qualify for HUG reimbursement of a Heath/Zenith software product.

How About Photos?

If a photograph will help explain, include it. Clear, sharply focused,

black and white photos reproduce best but, color photos can be used. Include a caption with each photo to further the explanation. Any photographs become the property of REMark and cannot be returned.

What About Drawings?

If a drawing, like photographs, will help, include it. We request that you provide us with finished India Ink drawings suitable for reproduction. Should you feel you are not capable of supplying finished artwork, check with a local high school drafting class. Generally these students are anxious to display their talent. REMark, in some cases, will provide artwork but, this will delay publication of your article.

Is Hardcopy Necessary?

Yes! We request that any submittal include a printout of all files.

Is A Disk Copy Needed?

Yes! REMark uses the latest techniques for the preparation of copy. Submitting your manuscript on disk along with all pertinent files moves the information through our system faster. We can accept any standard Heath/Zenith disk format. Your text files should not have visible or hidden coding since these codes can delay the production process.

Should you have questions about an article you would like to submit, please feel free to contact the REMark Editor.

Once you have completed your article, send it directly to:

The Heath Users' Group
Attention: REMark Editor
Hilltop Road
St. Joseph, MI 49085

How to Submit Programs to the Heath Users' Group

After you have developed a program and before you submit it, check it thoroughly. Be reasonably sure that it is error free.

Three methods of submitting programs to the Heath/Zenith Users' Group are available for your selection based on your judgement of the finished program and its value to other members. Your program may be contributed under the following categories:

Public Domain Library — free distribution to the membership via bulletin boards or other means available to HUG with the possibility of inclusion into the HUG Software Library.

HUG Software Library — for development by HUG as a finished software product to be offered for sale to other individuals as source for HUG income to further develop the users' group.

Royalty Software Library — author supported, finished, reliable software with a signed contract paying the author for availability of the program to users of Heath/Zenith computer products.

Submit your program by **completely** filling out the submittal form included in this issue of REMark. Send your program on disk. Include with your submittal a complete listing of the contents on the disk and any additional documentation that you feel will be helpful for our records. Submit a sample "run" of your program from a hard copy terminal when possible. If one is not available, hand copy as much as you feel necessary to give us an idea of how the program is supposed to perform. Be sure to sign and date the completed submittal form and check the category that you feel is appropriate for your program.

Once we receive your program, you will be notified. On the completion of the review, we will contact you with the status of your program. Remember, the person submitting the program is expected to handle any programming problems.

If your program is accepted and used by the Heath/Zenith Users' Group, you will be eligible for certain types of reward based on the category you have selected on the submittal form. Please note however, that no reward can be made until the product is released to the members of the user community through an announcement in the "New HUG Products" section of REMark.

Rewards for Program Contributions:

Public Domain Software Library—

You will receive a copy of the disk volume of public domain software that your program is included on when released to other members of the Heath/Zenith Users' Group.

HUG Software Library—

One year extension of your HUG Membership.
One year membership if you are not already a member.
A free copy of your program as released by HUG.
Your choice of any single Heath/Zenith software product.

Royalty Software Library—

You are paid on a quarterly basis for the number of disks sold during a three month period. Checks are generally sent 30 days after the end of each quarter. Since you are paid for your program submittal, no other compensation applies.

Notes on Software Submittals

HUG receives literally hundreds of programs each year for possible distribution to the user community. As you know, to review a software package requires learning the package. The review cycle is extremely time consuming. Therefore, we look for packages with the following attributes that are critical to the success of your program as a HUG Software Product:

- We begin the review process as "beginners". In other words, your package must contain information that instructs the user through the set up and operation of the program from a very basic point of view. Remember to include information about your system that will enable the user (in this case the reviewer) to duplicate the system requirements that made the software respond. Include operating system and version (e.g. CP/M 2.2.03), language and version (e.g. MBASIC 5.21), your machine type, and your memory requirements for the program.

- Beyond set up and operation of the program itself, we look for thorough documentation as to what the program is going to do. If, for example, the program is a game; the user must know the rules, what is to be expected, what is the object of the game, and what input is required to make the game playable.

- Next, we review the operation of the program. If the set up and operational instructions are good, there should be no problem getting the program to perform as expected. In many cases, reviewers are stymied not because the program will not perform but, because the documentation for set up and operation did not give sufficient detail to allow a thorough operational check.

- A First-Time-Through-Section, although optional, is most advantageous for the reviewer and the end user. The First-Time-Through-Section should include the basics of setting up the program(s). It also should detail a mock run through your program with "dummy" data. This section should touch on most of the important options of your program. All option details should be explained in the documentation.

- After we have made basic operational tests, we begin looking for undocumented "bugs" in the program itself. Any program fault that we find could be a reason for rejection of your program. Be sure to document operational peculiarities both for the reviewer and the

end user. An example of one common program fault would be the lack of testing for both upper and lower case keys (e.g. "Y" or "y" for YES). There is nothing wrong with a program that only responds to upper case as long as the user is informed that the CAPS LOCK key should be down when operating the software.

These points are some of the most important you should consider when generating software to be submitted to the Heath/Zenith Users' Group. As you can see, developing a solid software product requires a new attention to detail whether you intend your product to be released through HUG or whether you intend to offer it through other channels. We have found that software which was developed following the basic information supplied here generates fewer user contacts and, in general, gains the acceptance and respect of a vast majority of the user community.

Once you feel that your software will meet the requirements of the various HUG Software Libraries, please submit your material to the following address:

The Heath/Zenith Users' Group
Attention: Software Coordinator
Hilltop Road
St. Joseph, MI 49085

Ordering Information

HUG Software Products are ordered as a standard Heath Company Part. The order can be mailed on a Heath Company Parts Order Form or on a separate sheet of paper. When ordering, include with your payment the following information:

1. The part number (p/n), quantity, and description of the product to be ordered,
2. your name, address and HUG ID number, and
3. 10% postage and handling, up to a maximum of $3.50.
4. Visa & MasterCard also accepted, minimum $10.00 order.

Send the order to:

Heath Company Parts Department
Hilltop Road
St. Joseph, MI 49085

For Visa and MasterCard phone orders; telephone Heath Company Parts Department at (616) 982-3571. Have the part number (p/n), description, and quantity ready for quick processing.

Note: HUG currently offers formats for CP/M, HDOS, and ZDOS 5 1/4 inch disks:

Single sided, single density, hard-sectored
Single Sided, single density, soft-sectored
ZDOS double sided

To order soft-sectored, add a "-37" to the part number (p/n) of the product; e.g."885-1207-37". Your order is processed by part number (p/n), not by description, so please be sure to include the "-37" when ordering soft-sectored. This includes the new 885-3000 (H/Z-100 series) numbers; e.g. "885-3003-37".

The Heath Company Parts Department is NOT capable of answering questions regarding software. For additional information concerning any of the HUG software products, contact the Heath/Zenith Users' Group (616) 982-3463.

If you should have a problem with a HUG product, please call HUG to determine if you have a bad disk or another problem before you return the product for replacement. A call may save you a lot of time and money. If it is determined that your disk requires replacement, return the original disk along with the invoice directly to the Heath/Zenith Users' Group, Attention: Software Coordinator.

Change of Address

If you change your address, be sure to let us know. REMark is sent via bulk mail and is not forwarded. It takes approximately six weeks for our system to cycle through. Therefore, take this delay into consideration along with mail delays when notifying us.

Use the form in the back of this issue or a suitable copy to change your address. Send it directly to:

The Heath/Zenith Users' Group
Attention: HUG Secretary
Hilltop Road
St. Joseph, MI 49085

HUG Bulletin Board via MicroNET

MicroNET is a time-share system of CompuServe Inc., which most anyone, located near a major city, can access through a telephone link. The National HUG Bulletin Board or SIG (Special Interest Group) on MicroNET provides a way of sharing ideas, questions, and information with over 2000 other members, by simply dialing a number and leaving a message.

MicroNET membership applications are available through the HUG Library or through any Heathkit Electronics Center as HUG part number 885-1122 (HDOS), 885-1224 (CP/M), or 885-1224-37 (CP/M Z-100 soft-sectored). The package includes free modem software as well as the necessary information about CompuServe and one hour of free time on the system. This membership is separate from the HUG membership application. For further information about CompuServe, contact the Heath/Zenith Users' Group, or CompuServe Inc., 5000 Arlington Centre Blvd, Columbus, OH 43220, (614) 457-8600.

A new booklet of the HUG Bulletin Board commands and command descriptions is now available from the Heath/Zenith Users' Group. This handy reference can be used while on the system to save you both time and money. Since changes are made to the system on occasion, the material contained in the booklet may require some modification by the user in the form of notes as the changes are implemented. The BB-Reference is available as HUG part number 885-4700.

Special Interest and Local HUG Groups

One of the best sources for information and help is the Local Heath Users' Groups which are becoming a major voice for the Heath/Zenith user community. Many of the local groups can be contacted through your nearest Heathkit Electronics Centers (HEC). These stores can usually provide you the necessary contact information. A listing of known Local HUGs is published twice a year with new additions appearing under the category of "Local HUG News" found in most issues of REMark.

Heath/Zenith Related Publications

Of major importance to the new user is the availability of additional information for the Heath/Zenith computer products. Many of the Local HUGs publish newsletters on a regular basis. Using the Local HUG Club listing appearing in this issue, the user can select those clubs that may produce additional documentation.

Three excellent independent publications are listed here:

BUSS Newsletter
Rates: 20 issues/year $28.00

Sextant
Rates: 8 issues (six/year) $19.94
Editor: Charles Floto
Phone: 202 544-0900
Address: 716 E Street SE
Washington, DC 20003

H-Scoop
Editor: Henry Fale
Phone: 414 452-4172
Address: 2618 Penn. Circle
Sheboygan, WI 53081
Rates: $20.00/year
($27.00 overseas)
12 issues/year

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Chain LISP	S Schwartz	18		●	●				●									●									●			
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An Educators Best Friend, P.I.L.O.T	K Albrecht	28		•	•				•	•					•			•										•			
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			H-11	H-8	H/Z89-Z90	H/Z100	OTHER	CASSETTE	HDOS	CP/M	CP/M-85	ZDOS	OTHER	BH BASIC	MBASIC	ZBASIC	ASSEMBLY	OTHER	TERMINALS	PRINTERS	MODEMS	DISK DRIVES	OTHER	UTILITY	APPLICATION	GAMES	REVIEW	MODIFICATION	GEN. INTEREST	HERO-I
2nd Natl HUG Conference	B Ellerton	7																										●	
Conference Registration		7																										●	
Buggin' HUG		8	●		●				●	●					●		●	●		●	●				●	●		●	●	
Questions & Answers		9		●	●				●	●					●							●			●				●	
Modem Tutorial 83	W Jung	11																			●		●				●		●	
The WCCF in HUGger Perspective	T Jensen	15																											●	
Teaching HERO a Thing or Two	P Swayne	17					●										●								●					●
Intro to Z-BASIC Part VI	G Kabelman	21				●						●				●											●			
H/Z 37 Controller on Standard 8" Drives	E Blayer	23			●																	●					●	●		
New HUG Products		26		●	●		●		●	●							●							●	●					●
Computer Aided Instruction Part 2	W Gillespie	29																											●	
Datetime for ZDOS	F Clark	31				●						●					●							●						
A Review of RT-11, Version 5	E Judge	34	●										●														●			
Getting Started With Assembly Language #2	P Swayne	36		●	●					●							●										●			
CheapCalc Revisited	C Lundberg	39		●	●				●	●					●													●		
Putting the H-8 LED's To Work	G Roberts	41		●					●								●										●			
"ESCape" with FORTRAN & PASCAL	J Sams	44		●	●				●									●									●			
Heath Related Products	T Huber	50		●	●	●				●	●				●			●		●		●	●		●	●		●		
Pilot Corrections		27																										●		
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Registration Thermometer		7																										●		
Conference Registration																												●		
Buggin' HUG		8			●	●			●	●		●		●	●			●									●	●		
Grocery Shopping Using SuperCalc	J Johnson	9		●	●					●							●								●		●			
Out in the Boonies w/a Single Drive	B Pinkston	11		●	●				●	●					●								●		●		●			
Getting Started w/ASM Language #3	P Swayne	15		●	●				●								●			●							●			
Intro to Z-BASIC Part VII	G Kabelman	19				●						●				●											●			
Using Binary Files w/ B H BASIC	D Sandage	23		●	●				●					●													●			
New HUG Products		26		●	●				●								●	●	●				●		●	●				
A New Column is Coming	D Warnick	29		●	●					●					●													●		
Helpful Hints for Builders of HERO	I CHUG	30																									●			●
The Best Book I've Ever Read on CP/M	J McGraw	31								●																	●			
Morse Code Practice in MBASIC	B Horn	33			●				●	●					●											●	●			
Using 'C' for Fast Action Games	C Pepper	35		●	●					●								●									●			
Get Rid of Echo on Delete in CP/M 85	P Swayne	42		●	●	●				●	●				●													●		
A Look At The FAC	H Freidman	43		●	●				●						●		●								●		●			
Set Up Utilities as Device Drivers	C Horn	45		●	●				●								●							●			●			
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Heath Related Products		49		●	●	●			●	●	●				●			●		●	●	●		●	●					
HERO I Chats Corrections		10																										●		●
ETLOAD Correction		47					●																					●		

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The 2nd Natl HUG Conference Approached	B Ellerton	5																											●	
Keyword-based Filing & Retrieval	J Tysinger	13			●			●																●		●				
A Z-100 Font Editor	M Aagenas	19				●					●				●									●		●				
Using the H/Z29 Terminal	P Swayne	25	●	●						●				●		●			●							●				
The Wand vs. The Star	J Immerwahr	29	●	●						●										●							●				
Personal Checks and Balancing	D Thomas	33	●	●				●						●										●							
Millionaire: A Stockmarket Simulator	T/D Huber	37			●	●					●																	●			
Getting Started w/Assembly Language #4	P Swayne	40	●	●						●							●			●							●				
A Simple Separate Keyboard f/H/Z89	E Duesterhoeft	43			●																							●			
Changing Gears in Your 4MHz H89	P Shkabara	45			●					●							●											●			
Using AUTOEXEC.BAT	G Kabelman	47				●						●				●								●							
Addressing Envelopes/Labels	K Romer	48	●	●						●				●						●				●							
Programming Graphic Shapes	D Warnick	55	●	●						●				●										●							
Patch Page	P Swayne	59	●	●				●						●														●			
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Give HERO Something to do with His Time	P Swayne	71															●							●						●	
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Discussion Group Schedule		8																											●		
Conference Registration		9																											●		
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Programming Simplified Using Flow Charts	D Warnick	11						●		●					●										●		●		●		
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An Introduction to 'C'	B Polk	30	●	●				●										●									●				
The Time Saver	G Stephenson	31	●	●						●															●						
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		PAGE	HARDWARE					OPERATING SYSTEM						LANGUAGE					OTHER HARDWARE					TYPE OF ARTICLE						
			H-11	H-8	H/Z89-Z90	H/Z100	OTHER	CASSETTE	HDOS	CP/M	CP/M-85	ZDOS	OTHER	BH BASIC	MBASIC	ZBASIC	ASSEMBLY	OTHER	TERMINALS	PRINTERS	MODEMS	DISK DRIVES	OTHER	UTILITY	APPLICATION	GAMES	REVIEW	MODIFICATION	GEN. INTEREST	HERO-I
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Buggin' HUG		8		●	●	●			●	●		●		●	●	●			●	●								●	●	
Load & Use USR Functions	J Britton			●	●				●						●		●								●		●			
A ZDOS Modem Package..MTERM	T Jensen	16				●						●									●						●			
PeachText 5000 Part 1	H Bauman	18				●						●													●		●			
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Getting Started W/Assembly Language #7	P Swayne	23		●	●					●							●								●		●			
Standards For Terminal Control	D Warnick	25							●	●			●	●				●	●					●		●				
What's an Algorithm	J McGraw	28													●														●	
Echoes of the Crash	M Hess	30													●														●	
The CP/M Directory Structure	D Pelowitz	31		●	●					●												●					●			
HUG New Products		34		●	●	●			●		●			●			●	●	●				●	●	●					
Heath/Zenith Related Products		38		●	●	●			●	●	●	●			●					●			●	●	●					
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PeachText 5000 Part II	H.W. Bauman	21				●						●					●						●				●			
An Introduction to 'C' Part III	Brian Polk	24		●	●					●	●	●						●							●					
HUG New Products		26		●	●	●			●	●		●			●	●	●							●	●					
COBOL Corner III	H.W. Bauman	29		●	●	●				●		●						●							●					
Cassette Modem Software	Pay Swayne	32		●	●			●						●			●				●				●					
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Those Special Function Keys	David Warnick	36			●					●					●				●						●					
Getting Started With Assembly Language (#8)	Pat Swayne	40		●	●				●								●			●		●			●					
Heath Related Products		43	●	●	●			●	●	●	●			●	●	●	●		●		●	●	●	●	●				●	

Heath/Zenith Users' Group

PROGRAM SUBMITTAL and AGREEMENT FORM

Programmer: _____

Address: _____

Company (if any): _____

Telephone: _____

Program Name: _____

Please describe your program in sufficient detail so that other users may understand its intended purpose and use. The following outline is suggested as a guide to help you in preparing an abstract of your program(s), should your program(s) be selected as a future release of the HUG Software Library. Your outline of the abstract should be prepared and submitted on an attached sheet of paper with this Submittal Form. Be sure to fill out all the information requested on this form.

Suggested Outline:

Introduction:
Requirements:
  Software
  Hardware
List of the Programs:
Program Content:
  Include Special Notes
Comments:

Note: Refer to the HUG Software Catalog for examples and details in using this outline.

Brief information for the Software Evaluator of your program(s):

Prepared on/for computer model: _____

Special hardware/software configurations, if any: _____

_____

Program requires: _____ **bytes of memory**

Language: _____ **Version:** _____

I would like you to include the program(s) described on this aggreement in the (check one)

☐ Public Domain Library
☐ HUG Software Library
☐ Royalty Software Library

I understand and agree that HUG may distribute it at nominal cost to HUG members.

I assure you that the program is my own design, that I have run and de-bugged it, and that I will answer questions any library user may have about it. You may modify and adapt the program at your option to make it more suitable for your use and the library.

I represent that the program is mine to submit and that any necessary permissions for its use and sale have been obtained.

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  FORM-REL for PORTRAN-80
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If you put two computer dealers in the same room, and they BOTH tell you that "they won't be undersold", then one thing you can be sure of is that at least one of them is full of it! We won't make such a silly claim, but it is true that our prices are consistently amongst the lowest — and very often ARE the lowest around!

2. Does your dealer solve problems, or create them?

When you are just learning a computer system, one thing you DON'T need is a dealer that you have to TRAIN! On our staff we have no one with a background in computer sales, but we DO have people with backgrounds in computer science and engineering! In place of hard-sell, you'll get solutions. If it doesn't sound like much, ask yourself if you'd trust your accountant to recommend a good compatible printer to you!

3. Do you receive merchandise on time?

Wizardry normally can (and WILL) ship stock items within 24 hours, and most items ARE in stock. In most cases we ship standard UPS, but we also can ship UPS Blue or even Federal Express when you're really in a pinch, for delivery within a mere 2 days to your door!

4. Is your supplier a proven performer?

We're proud of our past record, and our reputation. Many of the same people now developing products for the Z-100 got their start in a computer from us. These guys know where the best single-source for pricing, support, and service is — and they keep coming back for the same reason. Our support is legendary, and we've literally won awards for end-user support to our customers.

5. What are your dealer's references?

If we listed just the major firms and institutions that purchase their products from us, we'd fill this page with just their names. Scratch a knowledgeable computer consumer, and you're apt to find a Software Wizardry customer there.

6. Isn't $1,000 worth a few minutes of your time?

That's how much we can save you on an average system sale! All it takes is a letter or phone call to receive our FREE catalog. In it you'll find over 450 compatible Z-100 products, probably many you didn't even know existed! We LOVE the Z-100 computer, and think the Zenith users are the best in the world! That's why we know our future is secure, the best users sooner or later find their way to the best dealers. We wouldn't have it ANY other way!

Software Wizardry
THE MAGIC TOUCH

ZENITH | data systems
AUTHORIZED SALES & SERVICE

MasterCard VISA

122 Yankee Drive
St. Charles, MO 63301
(314) 946-1968

HUG Price List

The following is a complete price list of HUG products available as of January 1, 1984.

HDOS

Part Number	Description of Product	Selling Price
885-1010	Adventure Disk	$10.00
885-1022[-37]	HUG Editor (ED) Disk	$20.00
885-1025	RUNOFF Text Processor	$35.00
885-1029[-37]	Disk II Games I	$18.00
885-1030[-37]	Disk III Games 2	$18.00
885-1031	Music 8 and 89 Disk	$20.00
885-1038[-37]	WISE on Disk	$18.00
885-1042[-37]	PILOT on Disk	$19.00
885-1044[-37]	Utilities Disk VI	$18.00
885-1047	Stocks (BHBASIC)	$18.00
885-1048	Personal Accounting Disk	$18.00
885-1049	Income Tax Records	$18.00
885-1052	H11/H19 Support Package	$20.00
885-1055[-37]	MBASIC Inventory Disk	$30.00
885-1056	MBASIC Mailing List	$30.00
885-1059	FOCAL-8 Interpreter	$25.00
885-1060[-37]	Disk VII Utility Package	$18.00
885-1062[-37]	Disk VIII Utility Package	$25.00
885-1063	Floating Point Disk	$18.00
885-1064[-37]	Utilities Disk IX	$18.00
885-1065	Fixed Point Package	$18.00
885-1066[-37]	Utilities Disk X	$18.00
885-1067[-37]	Graphic Games Disk XI	$18.00
885-1068	MBASIC Graphic Games	$18.00
885-1069	Disk XIII Misc. Utilities	$18.00
885-1070	Home Financial Package	$18.00
885-1071[-37]	MBASIC SmBusPk III	$75.00
885-1075	HDOS Support Package	$60.00
885-1077	BASCON/TXTCON Disk	$18.00
885-1078[-37]	Z80 Assembler	$25.00
885-1079[-37]	Page Editor PAGED	$25.00
885-1082	Programs For Printers	$20.00
885-1083[-37]	Disk XVI Misc. Utilities	$20.00
885-1085	PILOT Documentation	$ 9.00
885-1086[-37]	Tiny PASCAL	$20.00
885-1088[-37]	MBASIC Graphic Games Disk XVII	$20.00
885-1089[-37]	Utilities Disk XVIII	$20.00
885-1090[-37]	Utilities Disk XIX	$20.00
885-1091	Grade and Score Keeping (MBASIC)	$30.00
885-1092[-37]	Relocating Debugging Tool (RDT)	$30.00
885-1093[-37]	Dungeons & Dragons (MBASIC)	$20.00
885-1094	Fig-Forth	$40.00
885-1095	See P/N 885-1121	
885-1096[-37]	MBASIC Action Games	$20.00
885-1097[-37]	Education Quiz Disk (MBASIC)	$20.00
885-1098	H8 Color Graphics ASM	$20.00
885-1099	H8 Color Graphics Tiny PASCAL	$20.00
885-1103	Sea Battle	$20.00
885-1105	Device Drivers Disk	$20.00
885-1106	See P/N 885-8016	
885-1107[-37]	LOGBOOK and TMS	$30.00
885-1108[-37]	Info Systems and Tele & Mail Sys (MB)	$30.00
885-1109	Retriever DBMS	$40.00
885-1110	Autofile (Z80 only) DBMS	$30.00
885-1111[-37]	MBASIC Graphic Games	$20.00
885-1112[-37]	Graphic Games Disk	$20.00
885-1113[-37]	Fast Action Games	$20.00
885-1114	H8 Color Raiders and Goop	$20.00
885-1115[-37]	NAVPROGseven Aircraft DBMS (MB)	$20.00
885-1116	Z80 Debugging Tool (ALDT)	$20.00
885-1117	No Longer Available	
885-1118[-37]	MBASIC Payroll	$60.00
885-1119[-37]	BHBASIC Support Package	$20.00
885-1120[-37]	"Whew" Utilities	$20.00
885-1121	Hard Sectored Support Pkg	$30.00
885-1122[-37]	MicroNET Connection	$16.00
885-1123	XMET Robot Cross Assembler	$20.00
885-1124	HUGMAN & Movie Animation Pkg	$20.00
885-1125	MAZEMADNESS	$20.00
885-1126	HDOS UTILITIES by PS:	$20.00
885-1127[-37]	Soft Sector Support Pkg	$30.00
885-1128[-37]	DISKVIEW	$16.00
885-1129[-37]	CVT Color Video Terminal	$20.00
885-1130	HDOS Star Battle	$20.00
885-1131[-37]	CHEAPCALC	$20.00
885-8001	Screen Editor (SE)	$25.00
885-8003	BHBASIC to MBASIC Utility	$25.00
885-8004	Universal DUMP (UDUMP)	$35.00
885-8005	Modem Appl. Effector (MAPLE)	$35.00
885-8006	SUBMIT	$20.00
885-8007	EZI-TRANSfer	$30.00
885-8008	Farm Accounting System (MBASIC)	$45.00
885-8010	Checkoff (Checking Account)	$25.00
885-8015	TEXTSET Formatter	$30.00
885-8016	Morse Code Transceiver Ver 2.0	$20.00
885-8017	HDOS Programmers Helper	$16.00
885-8021	Student's Statistics Pkg	$20.00
885-8022	SHAPES	$16.00
885-8024	BH BASIC Utilities Disk	$16.00

CP/M

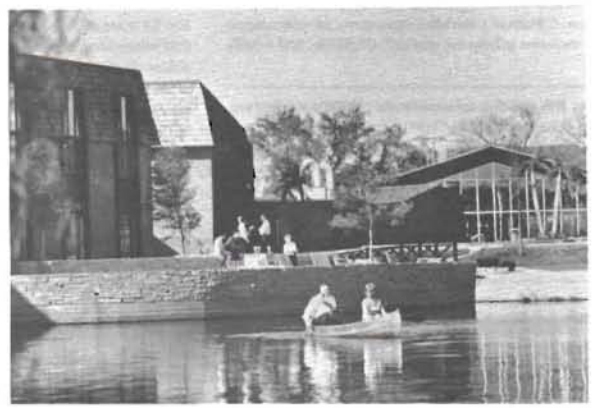
885-1206[-37]	MBASIC Graphic Games	$20.00
885-1207[-37]*	TERM & HTOC	$20.00
885-1208[-37]*	Fig-Forth	$40.00
885-1209[-37]	Dungeons & Dragons (MBASIC)	$20.00
885-1210[-37]	HUG Editor (ED)	$20.00
885-1211[-37]	Sea Battle	$20.00
885-1212[-37]	Utilities Disk (* MPLINK)	$20.00
885-1213[-37]	Utilities Disk	$20.00
885-1214[-37]	MBASIC LOGBOOK	$30.00
885-1215[-37]	BASIC-E	$20.00
885-1217[-37]*	Disk Duplication Utilities	$20.00
885-1218[-37]	MBASIC Payroll	$60.00
885-1219[-37]	NAVPROGseven Aircraft (MB)	$20.00
885-1220[-37]	Action Games (BASIC-E)	$20.00
885-1221[-37]*	WATZMAN/HUG H19 ROM	$30.00
885-1222[-37]	Adventure Game	$10.00
885-1223[-37]	HRUN HDOS Emulator	$40.00
885-1224[-37]	MicroNET Connection	$16.00
885-1225[-37]	Disk Dump & Edit Utility (DDEU)	$30.00
885-1226[-37]	CP/M Utilities by PS:	$20.00
885-1227[-37]	Casino Graphic Games	$20.00
885-1228[-37]	Fast Action Games	$20.00
885-1229[-37]	XMET Robot Cross Assembler	$20.00

Part Number	Description of Product	Selling Price
885-1230[-37]	Function Key Mapper	$20.00
885-1231[-37]	Cross Ref. Utilities for MBASIC	$20.00
885-1232[-37]*	CVT Color Video Terminal	$20.00
885-1233[-37]	CHEAPCALC	$20.00
885-3003[-37]	ZTERM Modem Commun.	$20.00
885-8009[-37]	Galactic Warrior by EVRYWARE	$20.00
885-8011[-37]	CHECKOFF	$25.00
885-8012[-37]*	MAPLE Modem Commun.	$35.00
885-8018[-37]	FAST EDDY Text Editor and BIG EDDY	$20.00
885-8019[-37]	DOCUMAT Formatter & DOCULIST	$20.00
885-8020[-37]	RF Computer Aided Design	$30.00
885-8023-37	CP/M-85 MAPLE	$35.00
ZDOS		
885-3004-37	ZBASIC Graphic Games Disk	$20.00
885-3005-37	ETCHDUMP	$20.00
885-3006-37	CHEAPCALC	$20.00
885-3007-37	CP/EMulator	$20.00
885-3008-37	Utilities	$20.00
MISCELLANEOUS		
885-0004	HUG 3-Ring Binder	$ 5.75
885-1008	Volume 1 Documentation	$ 9.00
885-1037	Volume IV Documentation	$12.00
885-1058	Volume V Documentation	$12.00
885-4001	REMark Volume 1, Issues 1-13	$20.00
885-4002	REMark Volume 2, Issues 14-23	$20.00
885-4003	REMark Volume 3, Issues 24-35	$20.00
885-4600	Watzman/HUG ROM	$45.00

CP/M products marked with (*) will not run on an H/Z-100 series machine with CP/M-85 or -86.

Thinking about your next vacation?

Plan now to attend the Third International HUG Conference!



The Third International HUG Conference will be held at a family resort facility from July 27 through July 29, 1984. Activities for the family include golf, tennis, softball, horseshoes, racquetball, horseback riding, river boat excursion, volleyball, and health club facilities. More than adequate night life is available for your enjoyment. Historic settings, found in the immediate area, provide an abundance of antique and gift shops. More information will be available later, so watch REMark.

Plan your vacation, bring the family and join the fun with Heath/Zenith computer users from all over the world!

1983 HUG Releases

B

UPDATE
P/N 885-1110 HDOS
AUTOFILE Data Base (Z80 only)

This is an announcement that AUTOFILE has been updated to version 3.0. AUTOFILE is a data base management system (DBMS) for organizing, filing, and retrieving information.

The functional description in the HUG Software Catalog is still accurate. No function has been removed. This version has significant new features, two of which are:

1) The ability to search multiple data bases with one definition or a search argument. A dismount/mount feature makes it possible to search as many data bases as the user wishes.

M

2) A significant feature for unloading and deleting items, controlled from the hit list display. This feature makes it much easier to modify data base content.

This version OF AUTOFILE is completely compatible with version 2.0. The documentation has been enhanced to clarify program function for the benefit of users having little prior experience with data base systems.

AUTOFILE requires HDOS 2.0 on an H/Z-89 with 48K of memory. It makes extensive use of the Z80 instruction set, and therefore will run on H/Z-89s or H8 Z-80 based systems only.

Note: The programs are written using the Zilog mnemonics. The source files and .ACM files are included.

To anyone wishing to update from AUTOFILE version 2.0 to 3.0, send your original two disks and $10.00 to Nancy Strunk, HUG, Hilltop Road, St. Joseph, MI 49085.

TABLE C Rating: (0),(1),(2),(3),(5),(10)

U

P/N 885-1121 HDOS
Hard Sector Support Package

Introduction: The HUG Hard Sector Support Package is a collection of software designed to help users get the best use from a hard sector 5.25 inch disk system. It features the HSY.DVD device driver, an enhanced version of the original HUG SY: device driver written by Dean Gibson of UltiMeth Corporation. Several support programs are included to help the user test, duplicate, and modify disks.

Requirements: This two disk set requires the HDOS operating system, version 2.0, on an H8/H17 or H89 with 32K of memory. Only one disk drive is required, however two are recommended. A line printer is not required but is recommended due to the large amount of documentation files, which could be printed.

Note: The H8 requires the extended configuration option or the Heath Z80 board to used double sided drives. The H19 terminal is not required.

This package is a two disk set. Disk B contains the assembly source code for the files on Disk A.

Disk A

README	.DOC	DUMP	.ABS
HSY	.DOC	DUMP	.DOC
HSY	.DVD	SDUP	.ABS
HSY3	.DVD	SDUP	.DOC
HSY4	.DVD	TEST40	.ABS
SETDSK	.ABS	TEST80	.ABS
INITAUTO	.ABS	TINIT	.ABS
PRINIT	.ABS	COMBINE	.ABS

Disk B

README	.DOC	SETDSK	.ASM
HSYDVD	.ASM	DUMP	.ASM
HSYINIT	.ASM	SDUP	.ASM
MFREADY	.ACM	TINIT	.ASM
MFDVD	.ACM	COMBINE	.ASM
MFINIT	.ACM	ROMSUBS	.ACM

Authors:
HSY.DVD — Dean K. Gibson, modified by Patrick Swayne
SETDSK, SDUP, TINIT, COMBINE — Patrick Swayne
DUMP — HUG/Heath Staff, modifications by Patrick Swayne
INITAUTO, PRINIT, TEST40, TEST80 — Modifications of Heath/Zenith software. INITAUTO modifications by Dean Gibson.

HSY — The HSY.DVD device driver is a replacement for the standard 5.25 inch hard sector device driver provided by Heath, and offers many additional features. The features are supported under HDOS 2.0 without any changes except replacement of the existing hard sector device driver, and the disk drives, if higher capacity drives are to be used.

Some of the features are as follows:

A 35 percent reduction in time to load large single block files, such as MBASIC.ABS, and when copying such files with PIP.

The ability to SET the step rate, motor on time, and head delay time for each unit. A long head unload delay time allows the head to remain loaded during rapid multiple disk accesses, reducing head and media wear.

The step time is recorded in the boot track, resulting in faster booting for fast drives.

A media check can be performed during INIT, eliminating the need to run TEST17 just for that purpose.

Support for double sided and/or double track density (80 track, or 96 tracks per inch) drives, such as the H17-4. Single sided disks can be read and written in double sided drives, and 40 track disks can be read but not written in 80 track drives.

Note: The H-8 requires the extended configuration option or the Heath Z80 board to use double sided drives.

Improved error recovery, which temporarily increases the seek step time during error retries.

This new version is fully compatible with the Heath and other soft sector 5.25 inch disk device drivers.

HSY3 and HSY — These are 3 and 4 MHz versions of the device driver, for the programmable 3 and 4 MHz modifications presented in REMark. They will also work with conventional 3 and 4 MHz modifications, providing that the H17 ROM is also modified.

SETDSK — This program allows the user to change the boot configuration on a disk, so that he can make changes in the hardware without having to re-initialize the disks.

The current configuration of the drives is written into the boot track of any disk that is initialized with HSY.DVD. For example, if SY0: and SY1: are each 40 track drives, and SY2: is an 80 track drive, that information is written into the boot tracks of the disks. If the drives are changed, either by changing the programming jumpers or by replacing a drive with another type, the information in the boot track will have to be modified to the new system. The program SETDSK is provided for this purpose.

INITAUTO — This program is a modification of the standard INIT program. A disk initialized by it, when SYSGENed, will boot without prompting with the ACTION <BOOT> message.

PRINIT — This is another modification of INIT that allows the user to make his own boot code patches, and then transfer them to another disk when INITializing. PRINIT will work even if the target disk is of another type.

DUMP — This program allows the user to patch any file or area on a disk by track and sector. It is a modification of the DUMP program which was released on the HUG P/N 885-1062. This version recognizes 80 track and/or double sided disks.

SDUP — This a disk duplication utility. It can duplicate any size disk supported by HSY.DVD, and can duplicate in one drive, if necessary.

The source disk can be placed in any drive capable of reading the disk (for example, a 40 track single sided disk in an 80 track double sided drive). The destination must be placed in a write compatible drive.

SDUP uses the device driver for all disk reading and writing, and has its own initialization routine for formatting the destination disk. Rather than copying a disk one track at a time as some DUP programs do, it reads as much as will fit in memory, and then writes it to the destination disk. To verify disks, it calculates a checksum of all data read on each pass, then reads the destination disk and calculates a checksum on its data and compares the two.

TEST40 and TEST80 — These are modified version of TEST17 that allow the user to test any kind of disk supported by HSY.DVD. TEST40 is for 40 track disks, and TEST80 is for 80 track disks. The improvements are outlined in the documentation.

TINIT — This is a special disk initialization program for preparing disks for TEST40 and TEST80. It initializes double sided disks with the same track numbers on each side so that each side can be tested independently. TINIT must be used if the user wants to test double sided disks/drives.

COMBINE — This program is required when the user re-assembles the device driver. Instructions are including in the re-assembling documentation.

Comments: This package is a must for any HDOS user who has high capacity disk drives. Some of the features will be of practical use to H17 type drives also.

TABLE C Rating: (5),(10)

P/N 885-1122 HDOS
MicroNET Connection

Introduction: This package provides the user with a User IDentification number to access the CompuServe timeshare system. The package includes a modem utility package, a CompuServe User ID and secret password to get on the system, plus some limited documentation to help the user get started using the system.

Requirements: This package contains a diskette that requires the HDOS operating system version 2.0 on an H19/H8/H17 with a four port serial card or H/Z-89 or Z90 with 32k of memory.

To use the software package, a modem capable of originate mode with FULL duplex at 300 baud operation will be needed. (This is a standard and minimum feature on most modems.) There are acoustic and direct modems. The user is responsible for choosing a modem which fits his particular needs.

The following files are released on the HUG P/N 885-1122 HDOS disk:

README	.DOC
HTERM	.ABS
HTERM	.DOC
FIRSTIME	.NET

Refer to P/N 885-1089 in the new HUG Software Catalog for a description of the modem program HTERM.

Package Description: This package has been put together to allow any member of HUG to get on the CompuServe timeshare system as soon as he/she receives the package, provided he/she has a modem as explained above.

The CompuServe User ID and secret password are sealed in an enclosed envelope in the package. The user is responsible for filling out and mailing the "Service Continuation/Request and Agreement" form to CompuServe.

CompuServe is a large timeshare data base system that has many areas of service, information, interest and fun. The HUG Special Interest Group (SIG) or Bulletin Board (BB) is a part of the CompuServe system. The member can leave, retrieve, search, scan, and reply to messages on the BB. In addition, the HUGBB has a large data base of programs on CompuServe, of which the HUGBB member can download from the host. The HUGBB also has the facility for the member to upload files to the system for others to download.

To access CompuServe the user must have a telephone number that links to CompuServe. There are direct numbers, TYMNET, and TELENET numbers that access CompuServe. TYMNET and TELENET are two telephone services that link to remote systems. For their services, they have a surcharge per hour over the cost of CompuServe.

Note: To find out if you have a telephone link in your area, call the CompuServe Customer Service Toll Free number 800-848-8990 or 614-457-8650. For general information about CompuServe call 800-848-8199.

There is documentation included with the package that shows step by step what the user will see the first time on CompuServe (the host computer). This file could be studied before going on Com-

puServe to help in understanding what the host timeshare system is doing. The sample link will show how to get to the HUG BB as well as some other options, which are significant to HUG members.

Documentation about the system is available from CompuServe for an additional charge:

1) CIS (CompuServe) User Guide
2) Personal Computing Guide
3) Special Interest Group (SIG) Manual

Refer to FIRSTIME.NET for help in ordering documentation and prices while on the system or contact CompuServe directly.

Special Note: CompuServe charges are around $6.00 an hour for regular hours and open areas. (The rates are subject to change.) Parts of CompuServe have additional charges. Any member of the HUG Bulletin Board (or SIG) receives a $.50 an hour discount for the time spent while on the HUG Bulletin Board.

The user may already have a modem package. HTERM is supplied for the new users convenience. The source code is not included, but is available on the part number 885-1089[-37].

Comments: This package will introduce a user to the timeshare system of CompuServe and access to the features of the HUG Bulletin Board.

TABLE C Rating: (0),(1),(5),(10)

P/N 885-1123 HDOS XMET Robot and ET-3400 Cross Assembler

Introduction: XMET is a 6800 cross assembler that includes mnemonic representations of the ET-18 Robot's "Robot Language" codes, to make writing programs for the HERO 1 robot or the ET-3400 easier. It is provided in both HDOS and CP/M versions (see P/N 885-1229), and is supplied with printed documentation.

A detailed look at the cross assembler is described in the May REMark Magazine, Issue #40, under the article "Teaching HERO a Thing or Two" by Pat Swayne.

Requirements: This version requires the HDOS operating system, version 2.0, on an H8/H17/H19 or H/Z89 with at least 32k of memory and one disk drive.

The ET-3400 or ET-3400A with the ETA-3400 accessory is not required but can be useful for loading programs created with the cross assembler into the HERO-I robot. See details below.

The source code files are included.

The following files are included on the HUG P/N 885-1123 XMET Robot and ET-3400 Cross Assembler disk:

README	.DOC	HEXMIK	.ASM
XMET	.ABS	EZHEX	.ABS
XMET	.ASM	EZHEX	.ASM
ABSHEX	.ABS	RSAMPLE	.XET
ABSHEX	.ASM	ESAMPLE	.XET
HEXMIK	.ABS		

Author: Patrick Swayne

XMET.ABS — This is the XMET cross assembler. The XMET program is actually a translator, not a true cross assembler. It translates the source file into a list of DB statements that can be assembled by the HDOS 8080 assembler. Utility programs are provided to convert the result into MIKBUG(tm) format hex files (for downloading into the robot using the method described below) or an easy-to-read hex format for manual keying in of the program.

If there is anything in the source program that XMET cannot recognize, the line containing it is passed through unchanged. That means that you can include special directives for the 8080 assembler that will be used to assemble the translated program.

The XMET cross assembler will assemble all of the 6808 processor's instructions using standard 6800 mnemonics, and has additional mnemonics to represent all of the codes in ET-18 Robot Language. A list of the Robot Language mnemonics is included with the cross assembler or refer to page 18 of REMark Issue 40.

In addition to mnemonic representations of Robot Language instructions, the XMET cross assembler also has three special pseudo opcodes that cause the inclusion of special definitions. The opcode RMOT causes motor definitions to be included, such as HEAD, which equals the bits required to select the head motor. Speed and direction definitions are also included. The opcode RRAM adds definitions of special RAM locations and ports used by the robot, including the motor position counters and the clock ports. The opcode RROM adds the definitions of the user available ROM subroutines.

Downloading with the ET-3400 — The ET-3400 or ET-3400A Microprocessor trainer with the ETA-3400 accessory can be used to load programs developed with XMET into the HERO-I robot. First, the assembled robot program must be converted into MIKBUG(tm) format using the utility supplied with XMET. Next, the ETA-3400 serial input must be connected to the modem output of the H8 or H/Z89 computer. A terminal program (such as HTERM) must be used to make the computer the terminal for the ETA-3400. The next step is to start the ETA-3400 monitor program and enter "LO" to load a MIKBUG file. With the transmit feature of the modem program (e.g. HTERM) the MIKBUG file can then be sent to the ETA-3400. Once the program is in the ETA-3400, a cassette tape of the program can be made, which can then be read by the robot. Another option is to connect the ETA-3400 tape output directly to the robot tape input. Then by starting a tape load on the robot and a tape save on the ETA-3400, the program will be transferred directly.

XMET.ASM — The source code for XMET.

ABSHEX.ABS — This program will convert an assembled .ABS file to Intel HEX format.

ABSHEX.ASM — The source for ABSHEX.

HEXMIK.ABS — This program converts Intel HEX files to Motorola MIKBUG(tm) format files.

HEXMIK.ASM — The source for HEXMIK.

EZHEX.ABS — This program converts Intel HEX files to a format that is easy to read (for manual entry of programs into the robot or ET-3400).

EZHEX.ASM — The source for EZHEX.

RSAMPLE.XET — A sample robot program in XMET source format.

ESAMPLE.XET — A sample ET-3400 program in XMET source format.

Comments: The XMET cross assembler not only makes it easier to write robot programs, but it makes it easier to modify them. What can you say!! This program is a must for any HERO/Heath computer user.

TABLE C Rating: (5),(6),(10)

P/N 885-1124 HDOS HUGMAN and Animated Movies

Introduction: HUGMAN is a video game similar to the popular arcade game PACMAN™. The player accumulates points while eating peanuts, power pills, fruit, and monsters, without being eaten by one of the nasty monsters. The player has the ability to design new HUGMAN boards.

Three additional programs allow the user to create animated "movies" on the screen of the H/Z-19 or H/Z-89.

Requirements: This disk requires the HDOS operating system version 2.0 on an H8/H19/H17 or H/Z-89 with a minimum of 32K of memory. Only one disk drive is required.

The programs have been written in Tiny PASCAL (HUG P/N 885-1086) and the source code is available for some of the programs. The executable (.ABS) files are included. Extensive documentation is included to aid the player in running HUGMAN and the animated package.

The following files are included on the HUG P/N 885-1124 HDOS HUGMAN and Animated Movie disk:

README	.DOC	HUGLIB	.TPI
HUGMAN	.DOC	MOVIE	.DOC
HUGMAN	.ABS	CAMERA	.ABS
HUGMAN	.TPS	CAMERA	.TPS
MAKBRD	.ABS	SPLICE	.ABS
MAKBRD	.TPS	SPLICE	.TPS
INTRO	.PIC	MOVIE	.ABS
HUGMAN1	.PIC	SING	.MOV
HUGMAN2	.PIC	CONST	.TPI
HUGMAN3	.PIC	VIDEO	.TPI
HUGVAR	.TPI	CONSOL	.TPI
HUGCNT	.TPI	INKEY	.TPI

The source is not included for MOVIE.ABS due to the lack of room on the disk.

Author: Gary Cramblitt

HUGMAN — The documentation of HUGMAN will explain how to get started playing HUGMAN. There are some brief instructions which must be followed to run HUGMAN.

Once HUGMAN has been started, the screen will display the first board for playing the game. The monsters are shown on the screen as the letters B, P, W, and M which stand for Bob, Pat, Walt, and Margaret, respectively, of the HUG Staff. Peanuts, fruit, and power pills are scattered throughout the maze. The player must eat these while evading the nasty monsters.

HUGMAN becomes "energized" whenever a power pill is eaten. This allows him to turn on the monsters and eat them. The power pill, of course, has a limited effect before HUGMAN returns to normal.

The arrows on the keyboard are used to manipulate HUGMAN around the board. The program keeps track of the score and awards an additional HUGMAN at the score of 10000.

MAKBRD.ABS — This HUGMAN program gives the player the feature of creating custom playing boards for HUGMAN. The documentation contains rules for designing custom boards.

MOVIE and ANIMATION — The movie and animation package can be used to create custom slide shows or animated "movies" on the screen.

The program CREATE is used to "paint" pictures on the screen. Reverse video and graphic characters are supported. The program has facilities for saving the pictures on disk. In addition, animated or "moving" displays can be created by making small changes to the picture, then saving the resulting "frames" one at a time.

SPLICE.ABS will join two or more animated sequences into one sequence.

The program MOVIE will show a picture of animated sequence on the screen. Projection speed can be adjusted and the sequence can be displayed over and over again in continuous mode.

SING.MOV is an example of animated sequence. The documentation contains detailed instructions on creating your own "movies".

Comments: This entire disk will provide many hours of enjoyment for those who wish to play the existing games. It will provide many more hours of enjoyment for those who wish to create their own HUGMAN and MOVIES.

TABLE C Rating: (0),(1),(2),(10)

P/N 885-1125 HDOS MAZE MADNESS

Introduction: The programs on this disk produce a number of mazes of fast action fun. One or two players must try to make their way through the mazes without being caught.

The author has provided instructions for modifying the maze games. The documentation is easy to follow.

Requirements: This disk requires the HDOS operating system version 2.0 on an H8/H19/H17 or H/Z-89 with 32K of memory. Only one disk is required.

The programs are written in assembly language and the source code is included. The author provides instructions for modifying the source for anyone not familiar with assembly language.

The following files are included on the HUG P/N 885-1125 HDOS MAZE MADNESS disk:

README	.DOC	MAZEMAD	.ABS
MAZEMAD	.DOC	H8MAZE	.ABS
MODIFY	.DOC	MAZEMAD1	.ABS
H8MODIFY	.DOC	MAZEMAD2	.ABS
MAZEMAD	.ASM	MAZEMAD3	.ABS
MAZEMAD	.ACM		

Author: John Sirera

MAZEMAD — MAZE MADNESS will generate any size maze from 1 by 1 to 39 by 11 cells. Each maze is inhabited by one to nine creatures, depending on its size. The player must work his way through the maze to only one exit point.

There are three types of creatures within the maze; KILLERs, WARPERs, and BLOCKERs. If caught by a KILLER, the player is instantly killed. To survive, the player must avoid each KILLER at all costs.

The WARPER will transport the player to another part of the maze. The new location may or may not be in a more advantageous spot in the maze.

The last creature is a BLOCKER, which if encountered will freeze the player for a brief time. While the player is unable to move, he is at the mercy of the KILLERs which are still free to move about.

Two players can play at one time. The 2, 4, 5, 6, and 8 keys on the keypad are used to move around the maze for one player. A

second player will use the A, S, D, W, and Z keys.

The program MODIFY provides detailed instructions for changing the source code to modify existing parameters which creates the mazes. H8MODIFY explains how to prepare MAZEMAD for use with the H8 computer (8080 processor).

MAZEMAD1, MAZEMAD2, and MAZEMAD3 provide additional unique features to the mazes which are created.

Comments: The random mazes which are generated from MAZEMAD will provide endless hours of "frustration" and fun!

TABLE C Rating: (0),(1),(2),(10)

P/N 885-1126 HDOS HDOS UTILITIES by PS:

Introduction: This disk contains a collection of HDOS utility programs for listing files on a disk, examining text files, and testing memory.

Requirements: These programs require the HDOS operating system version 1.5 to 2.0 and will run on any H8/H17 or H/Z-89, 90 with at least 32K of memory. The H/Z-19 or H/Z-29 terminal is required to use the DIR19 and SEE programs with an H8. The SEE program will also work on H/Z-100 computers under HRUN. The ALLRAM program is only for ORG-0 compatible H/Z-89, 90 computers with 64K of RAM.

The following files are included on the disk.

README	.DOC	SEE	.ABS
DIR19	.ABS	SEE	.ASM
DIR19	.ASM	PPRT	.ABS
PDIR	.ABS	PPRT	.ASM
PDIR25	.ABS	ALLRAM	.ABS
PDIR	.ASM	ALLRAM	.ASM

Author: All programs are by Patrick Swayne, HUG.

DIR19 — This is a program for displaying the files on a disk that takes advantage of Heath/Zenith terminal features to list as many files as possible on the screen in an easy-to-read format. In addition to file names, the size in sectors and the flags for each file are shown. DIR19 displays up to 80 files on the screen, and if there are more than 80 to show, it prompts the user to hit RETURN to show another "page" of files, and will continue this process for up to 255 files. Files can be listed alphabetically or in their actual directory order. DIR19 can take "wild card" arguments to allow the user to show specific groups of files or individual files.

DIR19 divides the screen into 6 sections using graphic lines. At the top of the screen, a one-line section holds the drive name (SY0:, etc.), the volume number, and the disk label. In the middle of the screen are four vertical blocks that hold up to 20 files each. DIR19 fills each block from top to bottom in turn until all files requested are displayed or the screen fills up. At the bottom of the screen, a one-line section displays the count of files shown, the total size of the files, and the free space on the disk. The user can include switches in the command line to show system files, show allocated disk usage, and/or to suppress alphabetizing.

PDIR and PDIR25 — This program works like DIR19, but its output goes to a printer. PDIR25 uses H/Z-25 graphics, while PDIR is for any printer.

SEE — This program is a replacement for the TYPE command normally used to examine text files that uses Heath/Zenith terminal features. It was inspired by a similar program called "SC" by John Stetson, but was developed independently. With SEE, the user can press function keys to scroll forward or backward in a text file by lines or 24-line pages, jump immediately to the top or bottom of a file, search for words or phrases in the file, or print individual screens on a printer. It also provides horizontal scrolling so that lines longer than 80 characters can be viewed. Files that are too large to fit in available memory can be viewed in segments. SEE counts the lines in a file and displays the number of the line that is currently at the top of the screen on the 25th line, along with key prompts and the name of the file. The line numbers are maintained sequentially when you view large files that take up more than one memory segment.

SEE automatically determines what kind of computer or terminal it is being used on and optimizes its operation for that particular computer or terminal. It also makes sure that the key prompts displayed on the 25th line match the computer or terminal's function keys. On H/Z-29 terminals and H/Z-100 computers, the prompts are labeled since the relationship between the keyboard and screen may not be fixed.

Note: SEE was written for use with both HDOS and CP/M. It will eventually be released on a HUG CP/M disk, but you can use the HDOS version on CP/M by copying the file SEE.ASM to a CP/M disk with a utility such as HTOC (885-1207) and re-assembling it with the CP/M assembler.

PPRT — The Push-Pop RAM Test is a special memory test designed to help you find speed sensitive memory failures. It uses the processor's PUSH and POP instructions for reading and writing memory, which are more taxing on slow components than other instructions. This test may be useful if you performed one of the speed modifications detailed in REMark Issues 34 and 38.

Note: Like SEE, PPRT was written for use with both HDOS and CP/M. You can copy PPRT.ASM to a CP/M disk and re-assemble it for use with CP/M.

ALLRAM — This program allows an H/Z-89 or Z90 user with 64k of RAM and ORG-0 capability to access all of his computer's memory as RAM under HDOS. It frees up a small area that can be used for such things as USR space for MBASIC, etc. It also helps in trouble shooting speed modification problems.

TABLE C Rating: (0),(1),(3),(10)

P/N 885-1127[-37] HDOS Soft Sector Support Package

Introduction: The HUG Soft Sectored Disk Support Package is a collection of programs built around a modified version of the original DKH37 device driver for soft sector 5.25 inch (H/Z37 type) disks provided by Heath Co. on the HDOS update (HOS-5-UP). The Package includes the device driver and programs to test, modify, and duplicate disks while using the driver.

Requirements: This package requires the HDOS operating system version 2.0 on an H/Z89 or Z90 computer with the Z89-37 disk controller, or an H8 computer with the WH8-37 controller.

This package is a two disk set with printed documentation. Disk A contains all of the executable files, and Disk B contains all of the source files except those on Disk A.

Disk A		Disk B	
README	.DOC	README	.DOC
H37	.DVD	HUG37	.ASM
H37P6	.DVD	INIT37	.ASM
H37P9	.DVD	H37LIB	.ACM
SETUNIT	.ABS	H37DEF	.ACM
SETUNIT	.ASM	HROM	.ACM
INITAUTO	.ABS	SDUMP	.ASM
PRINIT	.ABS	COMBINE	.ASM
SDUP37	.ABS	LABEL	.ASM
SDUP37	.ASM		
SDUMP	.ABS		
TESTCON	.ABS		
TESTH37	.ABS		
COMBINE	.ABS		
LABEL	.ABS		

Authors:

H37.DVD, SDUP37, SETUNIT, COMBINE, SDUMP, LABEL — Patrick Swayne, HUG.

INITAUTO, PRINIT, TESTCON, TESTH37 — Modifications of Heath/Zenith software. INITAUTO modifications by Dean Gibson, Ultimeth Corp.

Program Content:

H37.DVD — The H37.DVD device driver is a replacement for the standard 5.25 inch soft sector device driver provided by Heath, and offers the following features.

** Faster operation: There is a 77% reduction in time to load large single block files (compared to DKH37.DVD), such as MBASIC.ABS, and when copying such files with PIP. Boot time is also reduced more than 50%. For example, to load MBASIC (from the time you press RETURN until the OK prompt appears) takes about 13 seconds under DKH37, and 3 seconds with H37.DVD (on a fast two sided drive). Boot time on a fast two sided drive goes from 31 seconds to less than 15 seconds.

** Expanded SET options: The step rate can be set for each unit. The head unload delay time can be set to up to 4.5 seconds to prevent "head banging" during rapid disk accesses. The motor on delay time and the number of retry attempts before a hard error can also be set. The SET HELP option shows the current value of each setting.

** New INIT options: The boot step rate can be specified when you run INIT to reduce boot time on fast drives. A fast media check can be performed during INIT so that you do not have to run TEST37 just for that purpose.

** Full HDOS 2.0 compatibility: The patches supplied with HOS-5-UP for HDOS.SYS are not required to use this driver. It will work with standard HDOS 2.0.

** Speed mod compatibility: Versions of the driver are included that are compatible with the programmable 4MHz modification for the H/Z89 presented in REMark issue #34, and the 3MHz H8 modification in issue #38.

SETUNIT — The H37.DVD driver will support a maximum of 4 drives. When you boot, HDOS allocates 256 bytes of space for a table called the GRT for each unit of each disk device driver, whether the drives for those units actually exist or not. The SETUNIT program can be used to reduce the number of drives supported by the driver so that memory space is not wasted. Later, if you add more drives, SETUNIT can be used to adjust the number of units supported again. SETUNIT can also be used with other disk device drivers besides H37.DVD to match the number of units supported to the number of drives.

INITAUTO and PRINIT — These are disk initialization programs that work like the one supplied with HDOS except that INITAUTO produces an auto-boot disk that does not prompt you with the ACTION <BOOT> question when you boot. PRINIT allows you to make your own auto boot patches on one disk and pass them to other disks when you initialize, even if the target disk is of another type. The boot patches must be outside the boot driver area (first two sectors).

SDUP37 — This is a new disk duplication utility that can duplicate any kind of soft sector disk supported by H37.DVD. The source disk can be placed in any drive capable of reading the disk (for example, a 40 track single sided disk in an 80 track double sided drive). The destination must be placed in a write compatible drive.

SDUMP — This is a sector oriented patch utility that lets you alter any HDOS disk by track and sector or any file on the disk.

TESTCON — This program performs a quick check-out of your soft sector controller.

TESTH37 — This program is a modified version of the TEST37 program provided with HOS-5-UP. The Seek test has been modified so that you can enter the seek time you wish the test to start with. This means you do not have to wait for the test to go through the slow seek speeds when you are testing fast drives, such as the H17-4 drive. After the seek test is done, the fastest successful rate is used for all other tests until you use the "U" option to select another drive. If you run a test at the fastest possible rate, it provides a more accurate check of your drive's capability.

LABEL — This is the disk label utility that was originally published in REMark Issue #35. It has been modified so that the auxiliary information byte (which contains the number of sectors per track on the disk) is not overwritten by long labels.

COMBINE — This program is required to re-assemble the driver. Instructions are included in the documentation.

Comments: This package is a must for any HDOS user who has a soft sector disk controller and wants to get the best performance from it.

TABLE C Rating: (5),(10)

P/N 885-1128[-37] HDOS DISKVIEW

Introduction: DISKVIEW is an advanced disk catalog program that lets the user see and manipulate all of the files from two disks at the same time. It lets the user scroll back and forth through the catalogs of one or two disks, sort the catalog in order of name, extension, size, date, or flags. By placing the moveable cursor on a catalog entry, the user can list to the screen, print to a printer, or copy to a disk the file that is marked. Files can be deleted, flags changed, or disks reset.

Requirements: This disk requires the HDOS operating system on an H8/H17/H19 or H/Z89 with 48K of memory. Only one disk drive is required, however, it is written for any number and type of disk drive formats. A printer is not necessary.

The programs are written in "C" and the source files are included. The programs have been compiled and are ready to run. To recompile the programs, the Software Toolworks C80 "C" compiler version 2.0 will be required. Also needed would be the Microsoft Assembler M80 and Linker L80 to assemble and link the various files into an .ABS file.

Note: The H/Z19 terminal is required.

The following files are included on the HUG P/N 885-1128[-37] HDOS DISKVIEW disk:

README	.DOC	TERMCTL	.C
DISKVIEW	.ABS	CURSOR	.C
DSKVW	.C	GETNAM	.C
COPY	.C	SEXIT	.C
FLGFIL	.C	DSKVIEW	.CDF
DELFIL	.C	DIRLIST	.CDF
SORT	.C	DIREC	.CDF
NEWDRV	.C	DEVTBL	.CDF
READIR	.C	USDT	.CDF
DATESTR	.C	DVHELP	.MAC
DIRENT	.C	SUBSTR	.C
FMTSCR	.C	INDEX	.C
LINE25	.C	GETS	.C
FSPACE	.C	PUTS	.C
TITLE	.C	FPUTS	.C

Author: Dave Hildebrand

Program Content: This advanced disk catalog program displays two disk catalogs on the screen at the same time. If there are more than 22 files on either disk, the program will scroll back and forth through the catalog listing. There are a number of options available to the user once the program has begun.

The arrow keys of the keypad allow the user to select a desired disk and file. Once selected the user can delete, change flags, view it on the screen, transfer to another disk, copy with a new name, or send it to the printer. The catalog listing can be sorted. Each of these options are selected by depressing one of the special function keys.

In the catalog mode there are a two things different than when CAT (or DIR) is entered from HDOS. First, the number of sectors shown is always the number of sectors actually allocated to the file. Second, the DATE shown in the catalog mode is the last date the file was updated.

The SORT option will sort the catalog in ascending order by name and extension. It will sort in descending order by date, size, and flags.

The COPY mode will allow the user to view ASCII (text) files or binary (absolute) files in HEX format. Files longer than 23 lines can be controlled with the SCROLL key, either advancing one line at a time or an entire screen. In addition, files may be copied to another disk, sent to the printer, or sent through any HDOS device driver.

Compiling the source code files is not recommended for anyone not familiar with the "C" compiler. The executable file should be complete for most applications.

Comments: This is a unique and helpful program for maintaining and manipulating disk files. (E.G. With this program, you can sort by date and delete only those files with a particular date.)

TABLE C Rating: (0),(1),(3),(10)

885-1129[-37] HDOS CVT Color Video Terminal

Introduction: CVT (Color Video Terminal) is a program that allows you to operate HA-8-3, HA-89-3, or similar color boards for the H8 and H89 computers as if they were a color version of an H19 terminal. It allows you to create a color display using nearly all printable H19 characters including the graphic characters. It makes creating displays with your color board as easy as creating displays on your H19 or H89. CVT is available in HDOS and CP/M (see P/N 885-1232) versions, which are virtually identical.

Requirements: You will need the HDOS operating system, at least 32K of RAM, and a color graphics board such as the HA-8- 3 for the H8 or the HA-89-3 for the H89 (Z89/Z90). An H19 or H29 terminal is required for proper operation with an H8.

The following files are included on HUG P/N 885-1129[-37]:

README	.DOC	CVT	.PIC
CVT8	.ABS	GRAPH	.PIC
CVT89	.ABS	MCVT	.ABS
CVT	.DOC	MCVT	.ASM
CVT	.ASM		

Author: Pat Swayne, HUG

CVT8 and CVT89 — These are ready-to-use versions of CVT for use with the HA-8-3 and HA-8-89 and compatible color boards. CVT will work with either the TMS-9918 or TMS-9918A video processor so that it will work properly on older HA-8-3 boards. The following specifications may help you in determining the usefulness of CVT in your application.

Color Processor required: TMS-9918 or 9918A.
CVT Modes used: Text or Pattern (G1).
Characters/line: 40 (text) or 32 (pattern).
Lines/screen: 24 (H19 25th line not supported).
Colors/screen: 2 (text - foreground, background), 15 (pattern).
Character set: All normal letters, numbers, and symbols. All graphic characters except the plus/minus and divide signs. The opposite corner squares missing from the H19 set are provided. Reverse video supported.
Character matrix: 6 by 8 (text), 8 by 8 (pattern). Letters, and numbers are formed within a 5 by 7 matrix.

CVT supports most of the H19 escape codes and adds extra ones for setting modes, colors, etc. In addition, the function keys on your H19/H89 can be used to set up modes and colors while you are drawing a picture. In the pattern mode, the foreground and background colors of groups of patterns can be set to change the colors of textual or graphic characters. In the text mode, only the foreground and background colors of the entire screen can be set.

CVT can load a picture you have created directly from the HDOS or CP/M prompt, and can link to another program after loading the picture. This allows you to draw scenes with CVT and then use them in other programs. A memory map of CVT's usage of the video processor on the color board is provided in the .ASM file so that advanced users can manipulate the picture directly. CVT itself can also be utilized by other programs to take strings of ASCII text and process them into the picture.

In addition to being able to load its own files, CVT can load and display ordinary text files on the color screen. These files can contain escape codes to control not only normal H19 parameters, but also CVT modes and colors. (Files created by CVT are not text files, but are direct dumps of the video processor's memory to disk.)

CVT.PIC and GRAPH.PIC — These are sample pictures created with CVT. You can view these pictures by typing

CVT CVT

or

CVT GRAPH

MVCT — This is a program which demonstrates the ability to manipulate a picture after it is created. When you enter

CVT CVT MCVT

CVT loads in CVT.PIC and then links to MCVT.ABS (or MCVT.COM). This program causes parts of the picture to change color and creates a flashing sigh effect.

Comments: CVT adds an excellent dimension to anyone having an H/Z89 or H8 with a color monitor.

TABLE C Rating: (0),(1),(3),(5),(10)

P/N 885-1130 HDOS Star Battle: The Motion Program

Introduction: STAR BATTLE is a game which you fight against alien ships. The player must solve math problems in order to fire at an enemy or move to another quadrant.

Requirements: This program requires the HDOS operating system on an H8/H17/H19 or H/Z89 with 48K of memory. Only one disk drive is required.

The program is written in Tiny PASCAL and the source code is included. The executable file is included. It is not necessary to have Tiny PASCAL to run this program.

Note: The H19 (H/Z89) terminal is required for the graphics and use of the special function keys.

The following files are included on the HUG P/N 885-1130 HDOS Star Battle games disk:

README	.DOC
STARBATT	.ABS
MATHTREK	.PAS

Author: Paul J. Dalton

Program Content: STAR BATTLE uses the special function keys (f1 through f4) to enter commands that aid in fighting and evading the enemy ships. The options are as follows:

f1 — Warp out. This command will move you to another quadrant. Before you can warp out, you must solve a math problem that sets in your course. If you get it wrong, the enemy can take a shot at you.

f2 — Refuel from base. If you happen across a friendly starbase, you can refuel and repair damages.

f3 — Shoot Phasers. This option will shoot at the enemy ship causing damage to the ship.

f4 — Shoot Torpedoes. This command also causes damage, but is most useful for the kill. Before a torpedo can be fired, you must solve a math problem.

The math problems that must be solved in order to complete a command could be addition, subtraction, or multiplication problems.

Comments: This game interacts with the user by requiring a solution to math problems to continue.

TABLE C Rating: (0),(1),(2),(3),(9)

P/N 885-1131[-37] HDOS CHEAPCALC

Introduction: CheapCalc is a minimal but useful "spread sheet" program that can introduce you to spread sheet computing at little cost. It was developed from the program that originally appeared in the February 1983 issue of REMark (#38), and has been improved considerably and compiled. With CheapCalc, your computer screen becomes the window to a large worksheet onto which you can write mathematical problems and have them solved almost immediately.

Requirements: The HDOS version requires 56K of RAM in an H/Z-89 or 90 computer or an H8 with a Heath/Zenith terminal (H/Z-19, H/Z-29, etc.).

The following files are included on the CheapCalc disk HUG P/N 885-1131[-37]:

README	.DOC
CC	.ABS
CC	.HLP
SAMPLE	.CAL
CC	.BAS

Program Authors:
Original program by William V. R. Smith
First Heath version by Bob McFarland
Compilable version by P. Swayne, HUG

CC.ABS — This is the compiled, ready-to-use CheapCalc program. It runs by itself without BASIC or any other language required. It supports a worksheet containing 40 rows and 15 columns. Operations supported are addition (+), subtraction (-), multiplication (*), division (/), exponential (↑), and SUM. (The SUM operator lets you add up to an entire row or column of numbers.)

All calculations are done in double precision with 16 significant digits. Numbers can be displayed on the screen in 4 formats: Floating, Dollars-and-Cents, Integer, and Graphic (a line of asterisks represents each number). In the dollars-and-cents mode, rounding off to the nearest cent is done to correct possible binary floating point errors. (To illustrate this kind of error, run MBASIC and enter PRINT 100-99.99).

CheapCalc lets you enter comments as well as formulas and numbers into the worksheet, and the width of any column can be adjusted to any width from 4 to 30 characters to accomodate your entries. The contents of any "cell" on the worksheet can be copied or replicated to another part of the sheet. CheapCalc can save the data in a worksheet in a disk file, and can load previously saved files. It can print all or part of a worksheet on your printer.

CC.HLP — This is a file containing instructions for CheapCalc. When you use the Help command while running CheapCalc, this file is loaded and displayed on your worksheet (without destroying any data you have entered), so you can get help at any time while running the program.

SAMPLE.CAL — This is a sample worksheet that will help you to understand the workings of CheapCalc.

CC.BAS — This is the source code for CheapCalc. It can be run using MBASIC (HDOS), but with performance considerably degraded compared to the compiled version.

Comments: CHEAPCALC will not only introduce the user to the workings of a spreadsheet, but will provide many useful applications of a spreadsheet.

TABLE C Rating: (0),(1),(3),(10)

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UPDATE
P/N 885-1211[-37] CP/M Sea Battle

Introduction: This version of SEA BATTLE will execute on the H8, H/Z-89, and the H/Z-100 computers.

SEA BATTLE is a video action game that uses the H19 graphic features. The role of the SEA BATTLE player is to command a destroyer force in opposition to an aircraft carrier and its escort. The escort includes fighters, bombers, and submarines, all of which attack the player ship.

Requirements: SEA BATTLE requires the CP/M operating system, version 2.2.02 or later, on an H19/H8/H17 or H89 with 32K of memory. Only one disk drive is required.

For the H/Z-100 computer, SEA BATTLE requires the CP/M-85 operating system. The H/Z-100 requires the soft-sectored disk format. (Order with a "-37" suffix.)

The program is written in assembly language and the source code is included.

Note: The H19 (H89) terminal is required for the graphics codes of the game.

The following files are included on the HUG P/N 885-1211 CP/M Sea Battle graphics game disk:

README	.DOC
SEABATTL	.DOC
SEABATTL	.ASM
SEABATTL	.COM

The SEABATTL.DOC file gives detailed instructions of the game. Most players will have fun learning by trial and error.

Author: Victor Abell

Program Content: SEA BATTLE is a very interactive game which requires the entire screen of the H19 terminal. The outline of the game structure is as follows:

A) The Aircraft Carrier and its Escort

The escort consists of an endless number of fighter planes, five heavy bombers, and a number of submarines. The fighter planes are replenished from the aircraft carrier as each is shot down. Each time the aircraft carrier is hit a submarine appears on the horizon.

B) The Player Ship

The player ship has two guns which may only be fired one at a time. The ship moves back and forth across the bottom of the screen dodging the shells and bombs from the air force. The player ship can take a few hits from the fighters, but is destroyed when hit by a bomb. The player ship must flee from the submarines.

C) Scoring

The score (and other data) is displayed on the 25th line throughout the game. The following is the scoring table:

Down a Fighter Plane—5 points
Down a Bomber—50 points
Hit the Carrier—50 points
Sink the Carrier—250 points plus Variable Bonus

The Variable Bonus is determined by the success of staying within the center of the screen, where the most action takes place. The program sets a timer and the player must stay within the marks or the countdown begins.

D) Sinking the Carrier

The aircraft carrier will sink when it has been hit by fifteen shots from the player ship guns. Once the carrier has been sunk, the player can watch it sink into the sea. Then another carrier is there to replace the previous carrier. The next carrier escort, more aggressive than the previous carrier's escort, appears on the screen.

E) Sinking the Player Ship

The player ship may be sunk by 12-15 hits from the shells of the fighters, by a single hit from a bomber, or by being caught by a submarine.

F) Summary

The player must find a battle strategy which will lift him in victory over as many aircraft carriers as possible. Each successive carrier is more dangerous than it's predecessor.

Comments: SEA BATTLE is one of the finest games which has been released from HUG.

TABLE C Rating: (0),(1),(2),(10)

P/N 885-1222[-37] CP/M Adventure Disk

Introduction: This version of ADVENTURE has been adapted for the H/Z-89 CP/M and CP/M-85 for the H/Z-100.

ADVENTURE is one of the most well known and best liked computer games. It is an adventure through a giant cave to search out and find treasures. Many dangers are in store for the user who ventures into its midst.

Requirements: This game requires the CP/M operating system, version 2.2 or later, on H8/H17, H/Z-89, OR Z-90 with a minimum of 24K of memory. Only one disk drive is required.

For the H/Z-100 computer, CP/M-85 is required. The soft-sectored disk format is required. (Order with a "-37" suffix.)

Note: The H19 terminal is not required to play this game.

The following is a list of the files on the HUG P/N 885-1222[-37] CP/M Adventure Game disk:

README	.DOC
ADVENT	.COM
ADVENTUR	.DTB
NEWGAME	.CAV

Authors: This program was originally developed by Willie Crowther. Most of the features of the current program were added by Don Woods (Don @ SU-AI). This microprocessor version was done by G. Letwin of Heath Company.

Program Content:

ADVENTURE

Somewhere nearby is a colossal cave, where others have found fortunes in treasure and gold, though it is rumored that some who enter are never seen again. Magic is said to work in the cave. I will be your eyes and hands. Direct me with commands of one or two words. I should warn you that I look at only the first four letters of each word, so you'll have to enter "northeast" as "NE" to distinguish it from "north", "dnstream" for "downstream", etc. Should you get stuck, type "help" and "info" for some general hints.

HELP

I know of places, actions, and things. Most of my vocabulary describes places and is used to move you there. To move, try words like forest, building, dnstream, enter, east, west, north, south, up, or down. I know about a few special objects, like a black rod hidden in the cave. These objects can be manipulated using some of the action words that I know. Usually you will need to give both the object and action words that I know. Usually you will need to give both the object and action words (in either order), but sometimes I can infer the object from the verb alone. Some objects also imply verbs; in particular, "inventory" implies "take inventory", which causes me to give you a list of what you're carrying. The objects have side effects; for instance, the rod scares the bird. Usually people trying unsuccessfully to manipulate an object are attempting something beyond their (or my!) capabilities and should try a completely different tack. To speed the game, you can sometimes move long distances with a single word. For example, "building" usually gets you to the building from anywhere above ground except when lost in the forest. Also, note that cave passages turn a lot, and that leaving a room to the north does not guarantee entering the next from the south.

SUGGESTIONS

Try "ENTER BUILDING".

When you see an object, pick it up.

Go "DNST" (downstream) if you want to find the cave.

HELPFUL WORDS

INVEntory—List items you are carrying
SCORe—Show your current score
LOOK—Type a long description of your current loaction
BACK—Go back the way you came
QUIT—Stop the game and give final score

COMMAND STYLE

Remember, ADVENTURE takes one or two word commands, only. Make them straight-forward, like:

ATTACK DRAGON
EAT BIRD
THROW AXE
GET GOLD
WEST
UNLOCK GRATE
DOWN

INFO

If you want to end your adventure early, say "QUIT". To see how well you're doing, say "SCORE". To get full credit for treasure, you must have left it safely in the building, though you get partial credit just for locating it. You lose points for getting killed, or for quitting, though the former costs you more. There are also points based on how much (if any) of the cave you've managed to explore; in particular, there is a large bonus just for getting in (to distinguish the beginners from the rest of the pack). I may occasionally offer hints if you seem to be having trouble.

****** GOOD LUCK ******

Comments: ADVENTURE will provide many months and even years of fun trying to reach the 350 points.

TABLE C Rating: (10)

P/N 885-1223 CP/M HRUN HDOS Emulator

Introduction: HRUN is a CP/M program that emulates the Heath Disk Operating System (HDOS). It allows virtually any non-hardware dependent HDOS program to be run on a CP/M compatible computer. For a complete description of HRUN, see the article by Patrick Swayne, "HDOS For Everyone", in the February 1983, Issue 37 of REMark magazine.

Requirements: HRUN requires the CP/M operating system, version 2.0 or higher. It will run on H8, H89, Z89/Z90, and H/Z100 computers using Heath/Zenith, Magnolia, or other suitable CP/M. Since it uses no BIOS calls, it should also run on MP/M-II systems (HTOC is not MP/M compatible). At least 32K of memory is required. Two disk drives are recommended unless you have Heath/Zenith CP/M configured for one drive operation.

HRUN is distributed on three 5.25-inch disks containing the following files:

Disk A

README	.DOC
HRUN	.COM
HRUNT	.COM
HRUN100	.COM
HRUN100T	.COM
HTOC	.COM
PIP	.ABS
DIR	.ABS
MAKEDIR	.ABS
SUBMIT	.ABS
HELP	.ABS
SET	.ABS
FLAGS	.ABS
MAKESYS	.SUB
ERRORS	
BASIC	.ABS
EDIT	.ABS
ASM	.ABS
XREF	.ABS
PATCH	.ABS
XFORM	.ABS

Disk B

README	.DOC
HRUN	.ASM
H17ROM	.HEX

Disk C

README	.DOC
HTOC	.ASM
DIR	.ASM
MAKEDIR	.ASM
SUBMIT	.ASM
HELP	.ASM
XFORM	.ASM
HOSDEF	.ACM
HOSEQU	.ACM
ESVAL	.ACM

Authors: PIP, SET, FLAGS, BASIC, EDIT, ASM, XREF, and PATCH are Zenith Data Systems programs. HTOC is by Bob Mathias, William W. Moss, and P. Swayne. All others are by P. Swayne, HUG.

Program Contents: HRUN, HRUNT, HRUN100, and HRUN100T are pre-assembled versions of HRUN with various parameters set. The letter T in the program name means that tabs are expanded to spaces by HRUN's printer driver. The number 100 in the name means that HRUN is assembled for use on H/Z100 computers, or other computers that do not allow level 2 interrupts (RST 2).

All versions of the HRUN program emulate parts of HDOS. They combine the functions of HDOS.SYS, the HDOS overlays, and five (5) device drivers into one program. The following five pseudo device drivers are included in HRUN:

SY: — The directory (disk) device. Unit numbers are mapped to corresponding CP/M drive letters. (e.g. 0=A, 1=B, etc.)

TT: — The console device. Output to the CRT screen, and input is the keyboard.

LP: — The printer device. It uses the CP/M LST: device. Provision is made to expand tabs to spaces (within HRUN) for printers that cannot handle tabs.

AT: — The alternate terminal device. It uses the CP/M TTY: device. AT: can be used to drive a second printer in some applications.

ND: — The null device. This device can be used to test the readability of a disk file by copying it to ND:, or to create an empty directory entry by copying ND: to a disk.

HDOS users will notice that there is only one disk device driver. Since HRUN works through CP/M, only one disk device driver is needed, which will "talk" to any drive that CP/M can access. That means that the drive DK0: under real HDOS might be SY3: under HRUN.

HRUN was designed to emulate HDOS in the command mode, in addition to running programs. When running HRUN.COM under CP/M, HRUN signs on normally, and prompt for entries with the standard HDOS prompt (>).

Since HRUN runs under CP/M, any HDOS program to be run under it must be copied to a CP/M disk from its HDOS disk. A new version of HUG's HTOC program is included with HRUN for accomplishing the task. The program can then be executed under HRUN, not from CP/M directly. In addition, a program that requires the Microsoft BASIC interpreter version 4.82 under HDOS, will have to have the MBASIC 4.82 interpreter transferred to CP/M through HTOC to run the MBASIC program under HRUN.

HRUN comes with several other support programs. Some of the support programs are the actual programs supplied with real HDOS. Several other utility programs are included to make HRUN more useful.

MAKEDIR.ABS — This program constructs an HDOS disk directory (DIRECT.SYS) from the CP/M disk directory. DIRECT.SYS is required to view the directory via PIP (the CAT command) or to use wild cards in PIP operations, or the FILES command in HDOS Microsoft BASIC.

DIR.ABS — With this program, the directory on a disk can be viewed without having a DIRECT.SYS file present. HRUN is set up so that the command DIR uses DIR.ABS to show the directory, and CAT uses PIP.ABS to show the files in DIRECT.SYS, in standard HDOS format.

SUBMIT.ABS — This program is a command file processor for HRUN. Its operation is nearly identical to the CP/M SUBMIT program except that it allows commands to be passed on to any HDOS program.

XFORM.ABS — This program converts text files from CP/M format (a CRLF after each line) to HDOS format (LF only after each line) and vice versa. It allows you to use CP/M editors and word processors to create text files for HRUN.

HELP.ABS — This program prints a list of built-in HRUN commands on your console when you type HELP.

MAKESYS.SUB — This is a SUBMIT file that makes it easy for you to generate new HRUN system disks by copying the files used in normal operation to a new disk.

HTOC is a program that copies files from HDOS disks to CP/M disks. Programs that are to be run with HRUN must reside on a CP/M disk.

PIP, SET, FLAGS, BASIC, EDIT, ASM, XREF, and PATCH are programs normally supplied with HDOS.

ERRORS is a list of HDOS system error messages.

HOSDEF, HOSEQU, and ESVAL are files required to assemble some of the source files on disk C.

Comments: HRUN opens most of the HUG Software Library to all CP/M users, including the H/Z-100 series.

TABLE C Rating: (10)

P/N 885-1224[-37] CP/M MicroNET Connection

Introduction: This package provides the user with a User IDentification number to access the CompuServe timeshare system. The package includes a modem utility package, a CompuServe User ID and secret password to get on the system, plus some limited documentation to help the user get started using the system.

Requirements: This package contains a single sided hard-sectored diskette which requires CP/M version 2.2 or later on an H19/H8/H17 or H/Z-89 with 32k of memory. Only one drive is required.

The P/N 885-1224-37 contains a single sided, 48 tpi soft-sectored diskette which requires CP/M version 2.2.03 on an H19/H8 or H/Z-89 or Z90 with the soft-sectored controller card.

The P/N 885-1224-37 will execute on the CP/M-85 operating system of the H/Z-100 series computer.

General Requirements: To use this package the user will need a modem capable of originate mode with FULL duplex at 300 baud operation. (This is a standard and minimum feature on most modems.) There are acoustic and direct modems. The user is responsible for choosing a modem which fits his particular system.

The following files are released on the HUG P/N 885-1224 CP/M hard and soft-sectored disk:

README	.DOC
ZTERM8	.COM
ZTERM89	.COM
ZTERM100	.COM
ZTERM	.DOC
FIRSTIME	.NET

Refer to P/N 885-3003 in the January 1984 issue of REMark for a description of ZTERM.

Package Description: This package has been put together to allow any member of HUG to get on the CompuServe timeshare system as soon as he/she receives the package, provided he/she has a modem as explained above.

The CompuServe User ID and secret password are sealed in an enclosed envelope in the package. The user is responsible for filling out and mailing the "Service Continuation/Request and Agreement" form to CompuServe.

CompuServe is a large timeshare data base system that has many areas of service, information, interest and fun. The HUG Special Interest Group (SIG) or Bulletin Board (BB) is a part of the CompuServe system. The member can leave, retrieve, search, scan, and reply to messages on the BB. In addition, the HUGBB has a large data base of programs on CompuServe, of which the HUGBB member can download from the host. The HUGBB also has the facility for the member to upload files to the system for others to download.

To access CompuServe the user must have a telephone number that links to CompuServe. There are direct numbers, TYMNET, and TELENET numbers that access CompuServe. TYMNET and TELENET are two telephone services that link to remote systems. For their services, they have a surcharge per hour over the cost of CompuServe.

Note: To find out if you have a telephone link in your area, call the CompuServe Customer Service Toll Free number 800-848-8990 or (614) 457-8650. For general information about CompuServe call 800-848-8199.

There is documentation included with the package that shows step by step what the user will see the first time on CompuServe (the host computer). This file could be studied before going on CompuServe to help in understanding what the host timeshare system is doing. The sample link will show how to get to the HUG BB as well as some other options, which are significant to HUG members.

Documentation about the system is available from CompuServe for an additional charge:

1) CIS (CompuServe) User Guide
2) Personal Computing Guide
3) Special Interest Group (SIG) Manual

Refer to FIRSTIME.NET for help in ordering documentation and prices while on the system or contact CompuServe directly.

Special Note: CompuServe charges are around $6.00 an hour for regular hours and open areas. (The rates are subject to change.) Parts of CompuServe have additional charges. Any member of the HUG Bulletin Board (or SIG) receives a $.50 an hour discount for the time spent while on the HUG Bulletin Board.

The user may already have a modem package. ZTERM is supplied for the new users convenience. The source code is not included, but is available on the part number 885-3003[-37].

Comments: This package will introduce a user to the timeshare system of CompuServe and access to the features of the HUG Bulletin Board.

TABLE C Rating: (0),(1),(S),(10)

P/N 885-1225[-37] CP/M Disk Dump and Edit Utility (DDEU)

Introduction: DDEU is a versatile disk dump and edit utility for CP/M that is completely compatible with all Heath/Zenith disk hardware except the Z-67 Winchester. (Forthcoming versions of DDEU will be compatible with the Z-67.)

Requirements: DDEU requires the CP/M operating system version 2.2.02 or later on an H/Z19/H8 or H/Z89 with 32K of memory. Only one disk drive is required.

DDEU is compatible with the H/Z-100 computers under CP/M-85. (Order soft-sectored; i.e. 885-1225-37.)

The source code for DDEU.COM consists of five separate modules as listed below.

NOTE: DDEU requires the H/Z-19 terminal or the H/Z-100 screen display.

The following files are contained on the HUG P/N 885-1225[-37] Disk Dump and Edit Utility disk:

README	.DOC	SKIPLIB	.MAC
DDEU	.COM	SYSCALL	.MAC
DDEU	.MAC	EQUATE	.MAC
DSUB	.MAC		

DDEU.MAC — contains the main program module and all data associated with it.

DSUB.MAC — contains the functional subroutines for DDEU.

SKIPLIB.MAC — contains all of the general subroutines for DDEU. (These are terminal ESCape sequences for the most part.)

SYSCALL.MAC — contains MACROS used in DDEU.

EQUATE.MAC — contains all of the EQUate statements relating to the other modules.

DDEU Program Content: This disk dump and edit utility allows disk access in three different ways:

1) direct track and sector access,
2) sector by sector display of a filename, and
3) sector by sector display of a selected group number.

In all modes of operation, sectors and tracks are numbered starting at zero. Sectors are logical CP/M sectors. In the edit mode, both the cursor and bytes that have been changed are highlighted in reverse video. The sector display consists of both a hexadecimal table and an ASCII table, with editing done in either table. Any change made in either table will appear in the other, after the changes are written to the disk.

DDEU may be run from any drive and after a return to CP/M via a warm boot, it will return to the logged drive. DDEU is completely menu driven. Cursor movement in both HEX and ASCII tables is facilitated by arrow keys and the HOME key.

The main menu of DDEU is as follows:

f1	File Dump
f2	Track/Sector Dump
f3	Group Dump
WHITE	Exit to CP/M

---

f1 - File Dump — This option allows the user to access any legal filename on a disk. Once a file has been selected, the screen displays the first logical sector of the file. The entire filename, group number, logical file sector number, track number, sector number and last file sector number will also be displayed.

The commands available to the user in the display mode are displayed on the 25th line in reverse video and are as follows:

f1 — advance one logical sector into the file,
f2 — move backward one sector,
f3 — GOTO any other legitimate file sector,
f4 — hexadecimal edit mode,
f5 — ASCII edit mode,
White — return to the main menu.

f2 - Track/Sector Dump — This option allows the user to access any sector on any track on a disk. The program prompts for the track number and then the sector number, while displaying the largest track and largest sector which can be accessed.

The following commands are available for the track/sector dump option:

f1 — advance one logical sector,
f2 — move backward one logical sector,
f3 — GOTO any track and sector,
f4 — hexadecimal edit mode,
f5 — ASCII edit mode,
White — return to main menu.

f3 - Group Dump — This routine allows the user to access the sectors which comprise a selected group number. The prompt asks for the group number.

The following options are commands for the group dump routine:

f1 — advance one sector into the group,
f2 — move backward one sector in the group,
f4 — hexadecimal edit mode,
f5 — ASCII edit mode,
White — return to main menu.

White - Exit to CP/M — When exiting to CP/M, the console is reset to the power up configuration, the screen is blanked, and CP/M does a warm boot and returns control to the CCP.

Comments: This is a screen oriented, disk dump and edit routine for CP/M.

TABLE C Rating: (0),(1),(3),(10)

P/N 885-1226[-37] CP/M UTILITIES by PS:

Introduction: This disk contains a collection of CP/M utility programs for listing directory files, controlling printers, and testing disk drives.

Requirements: These programs require the CP/M operating system version 2.0 or higher on 32K of memory on an H19/H8/H17 or H/Z-89. The soft-sectored format [-37] will run on the H/Z-100 computers. Only one disk drive is required.

Note: The H19 graphics capability (H19, H/Z89,90, H/Z100) is required for DIR19.

The following files are included on the HUC P/N 885-1226[-37] CP/M utilities by PS.

README	.DOC	PSETMX	.COM
DIR19	.COM	PSETMX	.ASM
DIR19	.ASM	TYPER	.COM
PDIR	.COM	TYPER	.ASM
PDIR25	.COM	PWHEEL	.COM
PDIR	.ASM	PWHEEL	.ASM
DISKID	.COM	WSCON	.COM
PSET25	.COM	WSCON	.ASM
PSET2S	.ASM	ROTATE	.COM
		ROTATE	.ASM

Authors: All programs are by Patrick Swayne, HUG, except DISKID.COM, which is by Marvin Fichter.

DIR19 — This is a disk directory program that takes advantage of Heath/Zenith terminal features to list as many disk files as possible on the screen in an easy-to-read format. In addition to file names, the size in K and the attributes of each file are shown. DIR19 displays up to 80 files on the screen, and if there are more than 80 to show, it prompts the user to hit RETURN to show another "page" of files, and will continue this process for up to 255 files. Files can be listed alphabetically or in their actual directory order. DIR19 takes "wild card" arguments to allow the user to show specific groups of files or individual files. A user number can be specified after the drive and/or file specifications, to show files in different user areas.

At the top of the screen, DIR19 shows the drive name. It also shows the disk volume number and label, if they have been created with DISKID (see below). At the bottom of the screen, the number of files found, the total disk space used by files, and the free space on the disk are shown.

PDIR — This program works like DIR19, but its output goes to a printer. PDIR25 uses H/Z25 graphics, while PDIR is for any printer.

DISKID — This program lets you create a volume number and label on a CP/M disk (for filing purposes). The DIR19 and PDIR programs display the volume number and label when you use them to look at the files on the disk.

DISKID was formerly released on disk 88S-1213.

PSET25 — This program allows you to set options on your H/Z25 printer before use. You can set the character spacing to 10, 12, 13.2, or 16.5 characters per inch; or the line spacing to 6 or 8 lines per inch. The program is very easy to use. For example, to set 12 characters per inch, you enter PSET25 12.

PSETMX — This program allows you to set options on your MX80 printer before use. You can set compressed, double strike, emphasized, or normal printing; and you can set line spacing to 6 or 8 lines per inch, or to 7/72 inch spacing for graphics. Like PSET25, this program is easy to use.

NOTE for HRUN users: *The programs DIR19, PDIR, and the two PSET programs can be re-assembled for use with HRUN. Instructions are included in README.DOC and the .ASM files for the programs.*

TYPER — This program lets you type information at your keyboard and send it to your printer. You can include any escape sequences or control codes required by the printer to set up its options.

PWHEEL — This program prints all of the characters on a daisy wheel printer's printwheel in two columns on a single page (including the two "hidden" characters on 96 character Diablo printwheels). An optional heading describing the printwheel can be entered, to be placed at the top of the page.

WSCON — With this program, you can convert ordinary text files created on any editor into the format used by WordStar for document files, so that the file can be justified or processed by WordStar.

ROTATE — This program lets you test and/or adjust the rotation speed of any 5.25 inch drive on any Heath/Zenith computer (H8, H/Z89,90, H/Z100) using a Heath/Zenith controller (H17, H88-1, Z89-37, or H207 [H/Z100]) and Heath/Zenith CP/M. If you are having trouble with a disk drive, it could be that your rotation speed is off, and a simple adjustment will restore it to normal operation. The ability to adjust drive speed under software control was formerly available only to HDOS users.

Comments: These utilities cover a wide range of uses. The ROTATE program can be utilized by the majority of Heath/Zenith users.

Table C Rating: (0),(4),(10)

P/N 885-1227[-37] CP/M Casino Games

Introduction: This disk contains three Casino type gambling games that use the graphic features of the H/Z-19 terminal; KENO, POKER, and VEGAS.

Requirements: This disk requires the CP/M operating system version 2.2 or later on an H19/H8 or H/Z-89 with 48K of memory. Only one disk is required.

The soft-sectored format will run on the H/Z-100 computer series. KENO and POKER use the function keys which are defined for the H/Z-19 terminal. The function keys of the H/Z-100 will work but are defined differently from the H/Z-19 terminal.

The programs are compiled versions of BASIC-80. Hardcopy source code listings are included as part of the package.

Note: The H/Z-19 terminal is required. BASIC-80 is NOT required for executing these programs.

The following files are included on the HUG P/N 885-1227[-37] Casino Graphic Games disk:

README	.DOC
KENO	.COM
POKER	.COM
VEGAS	.COM

Authors:
KENO and POKER — Tom Dornback
VEGAS — Larry Wakeford

KENO — This game is a simulation of a Las Vegas KENO Slot machine. A "bowl" of 80 numbers is displayed on the screen. The player selects from 1 to 10 of the numbers. The computer will then randomly choose 20 unique numbers. If enough of the numbers that the player selects are picked by the computer, the player wins.

The player can start the game with any amount from $5.00 to $1,000.00, betting either Quarters or Silver Dollars. The computer keeps track of winnings (and losses). The amount the player can win (or lose), depends on how much is bet and on good luck.

The game uses the special function keys, the 25th line, and other features of the H/Z-19 terminal.

POKER — This game is a simulation of a Las Vegas POKER game. Five cards are dealt face down. After the player makes a bet the cards are shown. The player can STAND (or HOLD) or draw any number of new cards up to the five cards. The player can start the game with any amount from $5.00 to $1,000.00. The computer keeps track of winnings and losses.

The game uses the special function keys and other features of the H/Z-19 terminal.

VEGAS — This program is a simulated BLACKJACK card game. Seven players can place their bets against the dealer (computer). The computer keeps track of winnings and losses.

Comments: No comments.

TABLE C Rating: (0),(1),(3),(10)

P/N 885-1228[-37] CP/M Fast Action Games

Introduction: This disk contains disks that will test the users reaction speed. The games are modifications to games already available in HDOS.

Requirements: This disk requires the CP/M operating system version 2.0 or later on an H19/H8/H17 or H/Z89,90 or H/Z100 with at least 48K of memory.

All the programs are in executable form and do not need any language to run the programs. The source codes for all but one program are included. Refer to the documentation for details on the languages used.

Note: The H/Z19 terminal graphics are used.

The following programs are included on the HUG P/N 885-1228[-37] Action Games disk:

README	.DOC
BREAK19	.COM
BREAK19	.PAS
SNAKE	.COM
SNAKE	.ASM
BOB	.SNK
ACKACK	.COM
ACKACK	.ASM
SKI	.COM

Authors:
BREAK19 - Lyle E. Wilkinson
SNAKE - Michael Paabo
ACKACK - Frank Bielsik II
SKI - P. J. O'Connor

BREAK19 — This is a variation of the "Breakout" TV game. The player is served a "ball", which he must hit with a "paddle". The ball strikes a barrier, breaking out part of it, then it returns for the player to hit again. The object of the game is to break out as many blocks in the barriers before all the balls are used up.

This program was written in HUG Tiny Pascal (885-108S), and translated into SuperSoft Tiny Pascal for the CP/M version (P.O. Box 1628, Champaign, IL 61820). SuperSoft Tiny Pascal is not needed unless the player wants to make changes and re-compile the program.

SNAKE — In this game, the player controls the movements of a "snake" as it crawls around the screen. The player guides the snake to a block of "food" without hitting the barrier wall or looping back on the growing snake. Each time the food is hit, it jumps to a new place on the screen. The object of the game is to hit the food as many time as possible.

This version of SNAKE has the ability to save games which have been played on a disk for re-loading and reviewing at a later date. The file BOB.SNK is a game that was actually played by HUG manager Bob Ellerton.

ACKACK — This is an anti-aircraft artillery game. The object is to shoot down the airplanes before they bomb the players gun emplacements. Additional guns are awarded for each hundred points of score achieved.

SKI — This game simulates a slalom ski race. The object of the game is to stay within the slalom course.

Comments: No comments.

TABLE C Rating: (0),(1),(2),(3),(10)

P/N 885-1229[-37] CP/M XMET Robot and ET-3400 Cross Assembler

Introduction: XMET is a 6800 cross assembler that includes mnemonic representations of the ET-18 Robot's "Robot Language" codes, to make writing programs for the HERO 1 robot or the ET-3400 easier. It is provided in both HDOS (see P/N 885-1123) and CP/M versions, and is supplied with printed documentation.

A detailed look at the cross assembler is described in the May REMark Issue #40 under the article "Teaching HERO a Thing or Two" by Pat Swayne.

Requirements: This version requires the CP/M operating system, version 2.2 or later on an H8/H17/H19, H/Z89 or Z90 with 32k of memory and one disk drive.

The ET-3400 or ET-3400A with the ETA-3400 accessory is not required but can be useful for loading programs created with the cross assembler into the HERO-1 robot. See details below.

The source code files are included.

The following files are included on the HUG P/N 885-1229[-37] XMET Robot and ET-3400 Cross Assembler disk:

README	.DOC	EZHEX	.COM
XMET	.COM	EZHEX	.ASM
XMET	.ASM	RSAMPLE	.XET
HEXMIK	.COM	ESAMPLE	.XET
HEXMIK	.ASM		

Author: Patrick Swayne

XMET.COM — This is the XMET cross assembler. The XMET program is actually a translator, not a true cross assembler. It translates the source file into a list of DB statements that can be assembled by the CP/M 8080 assembler. Utility programs are provided to convert the result into MIKBUG(tm) format hex files (for downloading into the robot using the method described below) or an easy-to-read hex format for manual keying in of the program.

If there is anything in the source program that XMET cannot recognize, the line containing it is passed through unchanged. That means that you can include special directives for the 8080 assembler that will be used to assemble the translated program.

The XMET cross assembler will assemble all of the 6808 processor's instructions using standard 6800 mnemonics, and has additional mnemonics to represent all of the codes in ET-18 Robot Language. A list of the Robot Language mnemonics is included with the cross assembler or refer to page 18 of REMark Issue 40.

In addition to mnemonic representations of Robot Language instructions, the XMET cross assembler also has three special pseudo opcodes that cause the inclusion of special definitions. The opcode RMOT causes motor definitions to be included, such as HEAD, which equals the bits required to select the head motor. Speed and direction definitions are also included. The opcode RRAM adds definitions of special RAM locations and ports used by the robot, including the motor position counters and the clock ports. The opcode RROM adds the definitions of the user available ROM subroutines.

Downloading with the ET-3400 — The ET-3400 or ET-3400A Microprocessor trainer with the ETA-3400 accessory can be used to load programs developed with XMET into the HERO-I robot. First, the assembled robot program must be converted into MIKBUG(tm) format using the utility supplied with XMET. Next, the ETA-3400 serial input must be connected to the modem output of the H8, H/Z89 or Z90 computer. A terminal program (such as ZTERM) must be used to make the computer the terminal for the ETA-3400. The next step is to start the ETA-3400 monitor program and enter "LO" to load a MIKBUG file. With the transmit feature of the modem program (e.g. ZTERM) the MIKBUG file can then be sent to the ETA- 3400. Once the program is in the ETA-3400, a cassette tape of the program can be made, which can then be read by the robot. Another option is to connect the ETA-3400 tape output directly to the robot tape input. Then by starting a tape load on the robot and a tape save on the ETA-3400, the program will be transferred directly.

XMET.ASM — The source code for XMET.

HEXMIK.COM — This program converts Intel HEX files to Motorola MIKBUG(tm) format files.

HEXMIK.ASM — The source for HEXMIK.

EZHEX.COM — This program converts Intel HEX files to a format that is easy to read (for manual entry of programs into the robot or ET-3400).

EZHEX.ASM — The source for EZHEX.

RSAMPLE.XET — A sample robot program in XMET source format.

ESAMPLE.XET — A sample ET-3400 program in XMET source format.

Comments: The XMET cross assembler not only makes it easier to write robot programs, but it makes it easier to modify them. What can you say!! This program is a must for any HERO/Heath computer user.

TABLE C Rating: (5),(6),(10)

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P/N 885-1230[-37] CP/M KEYMAP Function Key Mapper

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Introduction: KEYMAP is a program that lets the user define the computer's function keys and keypad keys. Once defined, the keys will send the sequence of characters the same as if the characters were typed from the keyboard. Versions are included for using KEYMAP with BASIC and Wordstar.

Requirements: KEYMAP requires the CP/M operating system and runs on any Heath or Zenith desk top computer that can run standard CP/M, including the H/Z-89, 90 and H/Z-100. An H/Z-19 or H/Z-29 terminal is required for use with an H8/H17 computer.

Instructions are included for implementing KEYMAP with your computer system.

The following files are included on the HUG P/N 885-1230[-37] KEYMAP disk.

README	.DOC	KEYMAP	.DOC
KEYMAP	.COM	STATLIN	.COM
KEYMAP	.ASM	STATLIN	.ASM
KEYBAS	.COM	KEYWS	.100
KEYBAS	.DOC	KEYWS	.29
KEYBAS	.89	KEYSYS	.COM
KEYBAS	.100	KEYSYS	.DOC
KEYBAS	.29	KEYSYS	.89
KEYWS	.COM	KEYSYS	.100
KEYWS	.DOC	KEYSYS	.29
KEYWS	.89		

Author: All programs are by P. Swayne, HUG.

Program Content: KEYMAP is a program that lets you define the characters that are produced by your computer's function and keypad keys. Up to ten characters can be produced by each mappable key, including control characters. The keys that can be mapped are the ERASE (or F0) key, the F1 through F8 keys, the keypad 1 through 8 keys, and also the separate arrow and HOME keys if you have an H/Z-100 or H/Z-29. You can define any one of these keys as a "function shift" key, which allows every other mapped key to produce two responses each. If you wish, KEYMAP can place a message on the status line (25th line) of your screen indicating the responses of the function keys. KEYMAP becomes part of "the system" when it is loaded so that you can run any program with it to take advantage of the mapped keys. Provision is made to temporarily disable mapping and even to run more than one KEYMAP at a time to provide special responses for different programs.

KEYMAP has a special set up mode that makes it easy to define your own responses for each mapped key. Pre-configured versions are included for use with BASIC and WordStar, along with a version for general CP/M use.

KEYMAP.COM — The KEYMAP program in unconfigured form (key responses are not altered).

KEYMAP.ASM — The source code for KEYMAP.COM

KEYMAP.DOC — Instructions for configuring and using KEYMAP.

STATLIN.COM — A program to generate status line (25th line) messages that can be used by KEYMAP.

STATLIN.ASM — The source for STATLIN.COM.

KEYBAS.COM — A pre-configured version of KEYMAP that produces BASIC keywords (PRINT, GOTO, etc.) when function and keypad keys are pressed. 37 different keywords are instantly available to simplify entry of BASIC programs.

KEYBAS.DOC — Instructions for using KEYBAS.

KEYBAS.89, KEYBAS.100, KEYBAS.29 — Status line messages for use with KEYBAS.COM. KEYBAS.DOC explains which one to use for your system.

KEYWS.COM — A pre-configured version of KEYMAP that produces WordStar control characters to allow cursor movement with the arrow keys and easy use of many WordStar features. Indenting, centering, paragraph reform, and file scrolling are only a few of the functions mapped to function and keypad keys.

KEYWS.DOC — Instructions for using KEYWS.

KEYWS.89, KEYWS.100, KEYWS.29 — Status line messages for use with KEYWS.COM.

KEYSYS.COM — A pre-configured version of KEYMAP that produces CP/M system commands (DIR A:, PIP, etc.) when function keys are pressed. The RETURN code is included in each response so that the functions are acted upon immediately when you press the appropriate key.

KEYSYS.DOC — Instructions for using KEYSYS.

KEYSYS.89, KEYSYS.100, KEYSYS.29 — Status line messages for use with KEYSYS.COM.

Comments: The pre-configured KEYMAP programs are only a sample of what you can do with KEYMAP. It brings the power of programmable function keys to every Heath/Zenith CP/M user.

TABLE C Rating: (0),(1),(3),(10)

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885-1231[-37] CP/M Cross Reference Utilities for MBASIC

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Introduction: This disk contains two programs which will provide the Microsoft BASIC programmer with tools for aiding in the development of their programs. The first is a VARIABLE cross reference utility, and the second is a BRANCH statement cross reference utility.

Requirements: The programs require the CP/M operating system version 2.2 or later on an H8/H19 or H/Z-89 or Z90 with a minimum of 32K of memory. A printer is not necessary but is recommended for a hardcopy listing of the output. Only one disk drive is required.

The programs will also run under CP/M-85 on the H/Z-100 unit with one drive.

The BASIC source file must be saved on the disk in ASCII form for XREF or BRNCHREF to process. Both utilities utilize the amount of memory available.

Note: The source code is included. The programs have only been tested on MBASIC versions 5.2 or greater.

The following programs are contained on the HUG P/N 885-1231[-37] CP/M Cross Reference Utilities for MBASIC:

README	.DOC
XREF	.COM
XREF	.ASM
BRNCHREF	.COM
BRNCHREF	.ASM

Author: Rudi Daniel
Additions and modifications by Pat Swayne
Output modified by Terry Jensen

Program Contents: The following descriptions will provide an explanation of the program options:

XREF - This program will scan a BASIC program for variables used and will print all the line numbers the variable is referenced in. The listing is in alphabetical order with the line numbers referenced in sequential order.

Variables to a length of 14 characters may be processed to allow for the lastest version of BASIC-80. The maximum number of variables is dependent on the amount of memory.

The BASIC file must be stored in ASCII form before XREF or BRNCHREF can process it.

BRNCHREF - This program will scan a BASIC program for branch statements and will print all the line numbers the branch references. Branch statements included are GOTO, GOSUB, THEN, ELSE, and RESUME.

The source file must be in ASCII form.

Comments: This program is a must for CP/M BASIC programmers. The output listings contain paging for long source files that contain a large number of variables and branch statements.

TABLE C Rating: (0),(4),(10)

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885-1232[-37] CP/M CVT Color Video Terminal

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Introduction: CVT (Color Video Terminal) is a program that allows you to operate HA-8-3, HA-89-3, or similar color boards for the H8 and H89 computers as if they were a color version of an H19 terminal. It allows you to create a color display using nearly all printable H19 characters including the graphic characters. It makes creating displays with your color board as easy as creating displays on your H19 or H89. CVT is available in HDOS (see P/N 885-1129) and CP/M versions, which are virtually identical.

Requirements: You will need the CP/M operating system, at least 32K of RAM, and a color graphics board such as the HA-8- 3 for the H8 or the HA-89-3 for the H89 (Z89/Z90). An H19 or H29 terminal is required for proper operation with an H8.

The following files are included on HUG P/N 885-1232[-37]:

CP/M
885-1232[-37]

README	.DOC
CVT8	.COM
CVT89	.COM
CVT	.DOC
CVT	.ASM
CVT	.PIC
GRAPH	.PIC
MCVT	.COM
MCVT	.ASM

Author: Pat Swayne, HUG

CVT8 and CVT89 — These are ready-to-use versions of CVT for use with the HA-8-3 and HA-8-89 and compatible color boards. CVT will work with either the TMS-9918 or TMS-9918A video processor so that it will work properly on older HA-8-3 boards. The following specifications may help you in determining the usefulness of CVT in your application.

Color Processor required: TMS-9918 or 9918A.
CVT Modes used: Text or Pattern (G1).
Characters/line: 40 (text) or 32 (pattern).
Lines/screen: 24 (H19 25th line not supported).
Colors/screen: 2 (text - foreground, background), 15 (pattern).
Character set: All normal letters, numbers, and symbols. All graphic characters except the plus/minus and divide signs. The opposite corner squares missing from the H19 set are provided. Reverse video supported.
Character matrix: 6 by 8 (text), 8 by 8 (pattern). Letters, and numbers are formed within a 5 by 7 matrix.

CVT supports most of the H19 escape codes and adds extra ones for setting modes, colors, etc. In addition, the function keys on your H19/H89 can be used to set up modes and colors while you are drawing a picture. In the pattern mode, the foreground and background colors of groups of patterns can be set to change the colors of textual or graphic characters. In the text mode, only the foreground and background colors of the entire screen can be set.

CVT can load a picture you have created directly from the HDOS or CP/M prompt, and can link to another program after loading the picture. This allows you to draw scenes with CVT and then use them in other programs. A memory map of CVT's usage of the video processor on the color board is provided in the .ASM file so that advanced users can manipulate the picture directly. CVT itself can also be utilized by other programs to take strings of ASCII text and process them into the picture.

In addition to being able to load its own files, CVT can load and display ordinary text files on the color screen. These files can contain escape codes to control not only normal H19 parameters, but also CVT modes and colors. (Files created by CVT are not text files, but are direct dumps of the video processor's memory to disk.)

CVT.PIC and GRAPH.PIC — These are sample pictures created with CVT. You can view these pictures by typing

CVT CVT

or

CVT GRAPH

MVCT — This is a program which demonstrates the ability to manipulate a picture after it is created. When you enter

CVT CVT MCVT

CVT loads in CVT.PIC and then links to MCVT.ABS (or MCVT.COM). This program causes parts of the picture to change color and creates a flashing sigh effect.

Comments: CVT adds an excellent dimension to anyone having an H/Z89 or H8 with a color monitor.

TABLE C Rating: (0),(1),(3),(5),(10)

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P/N 885-1233[-37] CP/M CHEAPCALC

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Introduction: CheapCalc is a minimal but useful "spread sheet" program that can introduce you to spread sheet computing at little cost. It was developed from the program that originally appeared in the February 1983 issue of REMark (#38), and has been improved considerably and compiled. With CheapCalc, your computer screen becomes the window to a large worksheet onto which you can write mathematical problems and have them solved almost immediately.

Requirements: The CP/M version requires 64K of RAM in an H/Z-89 or 90 computer or an H8 with a Heath/Zenith terminal (H/Z-19, H/Z-29, etc.), and will also work on an H/Z-100 with CP/M-85.

The following files are included on the CheapCalc disk HUG P/N 885-1233[-37]:

README	.DOC
CC	.COM
CC	.HLP
SAMPLE	.CAL
CC	.BAS

Program Authors:
Original program by William V. R. Smith
First Heath version by Bob McFarland
Compilable version by P. Swayne, HUG

CC.COM — This is the compiled, ready-to-use CheapCalc program. It runs by itself without BASIC or any other language required. It supports a worksheet containing 40 rows and 15 columns. Operations supported are addition (+), subtraction (-), multiplication (*), division (/), exponential (↑), and SUM. (The SUM operator lets you add up to an entire row or column of numbers.)

All calculations are done in double precision with 16 significant digits. Numbers can be displayed on the screen in 4 formats: Floating, Dollars-and-Cents, Integer, and Graphic (a line of asterisks represents each number). In the dollars-and-cents mode, rounding off to the nearest cent is done to correct possible binary floating point errors. (To illustrate this kind of error, run MBASIC and enter PRINT 100-99.99).

CheapCalc lets you enter comments as well as formulas and numbers into the worksheet, and the width of any column can be adjusted to any width from 4 to 30 characters to accomodate your entries. The contents of any "cell" on the worksheet can be copied or replicated to another part of the sheet. CheapCalc can save the data in a worksheet in a disk file, and can load previously saved files. It can print all or part of a worksheet on your printer.

CC.HLP — This is a file containing instructions for CheapCalc. When you use the Help command while running CheapCalc, this file is loaded and displayed on your worksheet (without destroying any data you have entered), so you can get help at any time while running the program.

SAMPLE.CAL — This is a sample worksheet that will help you to understand the workings of CheapCalc.

CC.BAS — This is the source code for CheapCalc. It can be run using MBASIC (CP/M), but with performance considerably degraded compared to the compiled version.

Comments: CHEAPCALC will not only introduce the user to the workings of a spreadsheet, but will provide many useful applications of a spreadsheet.

TABLE C Rating: (0),(1),(3),(10)

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P/N 885-3003[-37] CP/M ZTERM

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Introduction: This disk contains a modem package for the H/Z-100 series computers, which enables a user's computer to communicate with another computer. Versions for the H/Z89, Z90, and H8 computers are also included. ZTERM is a modification of the popular CP/M TERM package for the H/Z89/H8 computers.

Requirements: This disk requires the CP/M-85 operating system for use with the H/Z-100 series. CP/M version 2.2.03 is required for the H8/H19, H/Z89, or Z90 with 32K of memory. The H8 computer must be equipped with either the H8-4 serial interface board or the WH8-47 board. Only one disk drive is required for ZTERM.

The disk contains assembled, ready to use, versions for the H/Z-100 and H/Z89/H8 computers. The programs are written in assembly language and the source codes are included. The user may modify ZTERM to execute on most any terminal.

ZTERM100.COM — for use on the H/Z-100 version.
ZTERM89.COM — for use on an H/Z-89, Z90 or H8 using port 330Q.
ZTERM340.COM — for use on the H8 using port 340Q.

Note: The H/Z19 terminal is **NOT** required for ZTERM with the H8 computer, but is highly recommended.

Author: Jim Buszkiewicz

Program Content: This modem communication package allows the user to "talk" or communicate to another Heath/Zenith computer or to some other host computer system, e.g. CompuServe and the SOURCE. The package allows the user to change the port used, the baud rate, plus other parameters.

Editor's Note: CompuServe and the SOURCE are two timeshare systems (mainframes) that allow hundreds of individuals to access the host computers at a single time. They provide services for these members, e.g. the HUG Bulletin Board.

ZTERM allows the user to download a file from the host and it will let the user transmit a disk file to the host. The modem package will enable the user to communicate, in the normal fashion with a host, from the main console keyboard. The direct type communication can be either half or full duplex.

For anyone who uses TYMNET and/or MicroNET, ZTERM will automatically sign on to both systems by entering one simple escape character sequence. The same is true for those using TYMNET and the SOURCE.

General System Requirements: In order to use ZTERM, the computer must have a standard serial RS-232 I/O port. Either an unused or line printer port will suffice. Normally on a Heath/Zenith computer, the user would use the DTE port on the back of the computer.

For systems other than the H/Z-100 series, an H19 terminal is advantageous but not necessary. The main console must be capable of accepting lower case characters correctly, even though it may convert them to upper case.

Aside from the standard computer system, the only other hardware that is needed is an interconnecting cable, a host computer, and modem.

Configuring ZTERM: ZTERM includes an auto log-on feature, which configures ZTERM to send the User ID number and password. This may be done for MicroNET and/or the SOURCE. Selecting the baud rate is also software selectable. A menu will display the possible baud rates.

If there are other hardware or use requirements that are not met by the pre-assembled versions of ZTERM, the user can alter the assembly source code to meet the requirements. ZTERM was designed to run on just about any computer that can run CP/M, and there are several assembly options that make it easy to configure it to a particular system. The following are some of the possible source code changes:

1) Set for non-Heath system,
2) Set pause character,
3) Set abort character,
4) Set for a control-H (010Q) in place of delete (07fh),
5) Set for ZTERM to strip the high order parity bit,
6) Set for type and length of data word,
7) Set port value, and
8) Set baud rate.

Using ZTERM: ZTERM is not a fancy program that uses graphics or the computer horn, but it does get the necessities done in the most efficient manner. When ZTERM signs on, it displays the size of the storage buffer in decimal bytes. This buffer is used to store characters when down-loading data from the host computer.

While in direct communications mode, ZTERM has nine basic commands available. These commands are executed by entering the appropriate function key across the top row of the H/Z-100 or H19 keyboard. The command summary is as follows:

Note: The function key columns refer to the H19 and H/Z-100 terminals respectively.

H/Z-19	H/Z-100
f1	f1—auto-log-on to MicroNET
f2	f2—auto-log-on to the SOURCE
f3	f3—Duplex toggle - half or full
f4	f4—Store all terminal display in buffer
f5	f5—Transmit disk file to host
ERASE	f0—Display Command Summary
BLUE	f6—Save the buffer to a disk file
RED	f7—Clear the buffer
WHITE	f8—Warm boot CP/M

When downloading files, no type of handshaking is needed. Characters are immediately stuffed into memory eliminating this need. When uploading files to a host, ZTERM will pause when it encounters a pause character.

Comments: ZTERM provides the H/Z-100 CP/M-85 user (or anyone else) with a useful modem communication package.

TABLE C Rating: (1),(2),(3),(5),(10)

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P/N 885-3004-37 ZDOS ZBASIC Graphic Games Disk

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Introduction: This ZBASIC graphic games disk has a number of games which have been modified to use the special commands of the powerful ZBASIC graphics.

Requirements: This disk requires the ZDOS operating system on an H/Z-100 series computer with a minimum of one disk drive. The programs require ZBASIC.

Note: When ordering this disk, you must include the "-37" in the part number.

The following programs are included on the HUG P/N 885-3004-37 ZBASIC Graphic Games disk:

README	.DOC	HANOI	.BAS
AUTOEXEC	.BAT	TICTAC	.BAS
MENU	.BAS	QUBIC	.BAS
HNIM	.BAS	HUGDICE	.BAS
SINK	.BAS	BATTLE	.BAS
HOTHELLO	.BAS	HSLOTS	.BAS
HANGMAN	.BAS		

Program Authors:
HNIM (NIM) and HOTHELLO (OTHELLO) — Richard Musgrave
HANOI and SINK — William C. Zurney
HANGMAN — Dale Grundon

TICTAC — Daniel Schlichtig
QUBIC — originally the idea of Sam Cox and was adapted for MBASIC and H19 graphic features by Bill Phillips.
HUGDICE (DORNBACK) — Thomas F. Dornback
BATTLE — originally the idea of Frank R. Newcomer with graphics added by Bill Phillips
SLOTS — Perry S. Phipp

These programs have been adapted from the HUG P/N 885-1068. All modifications to ZBASIC have been done by Gerry Kabelman.

AUTOEXEC.BAT — This program when copied to a system disk will automatically load ZBASIC and run the MENU.BAS program.

MENU — This is a menu driven program to select all of the games on the disk. All the programs must be copied to the system disk.

HNIM — This game is adapted from the robot NIM game. The game displays three rows of HERO-1 Robots. The computer takes turns with the player on destroying any number of robots from one row. The object is to remove the last robot from the screen.

The graphics for his game are superb. The computer is very difficult to beat.

SINK — The object of this game is to sink the ships that cross the screen. The CRT is intended to simulate a torpedo screen. The program has five skill levels and uses the keypad to aim and fire the torpedo guns.

HOTHELLO — This game is played on an 8 X 8 checker board, with the rows numbered 1 to 8 and the columns A to H. The initial board is all blank, except the center four squares.

The object is for the player to try to place his piece so that it "outflanks" the computer, creating a horizontal, vertical or diagonal run of the computers pieces bounded at each end by at least one of the players pieces. This move will flip the computers pieces, turning them into the players.

The OTHELLO game has five skill levels, of which even the first level is difficult to beat the computer.

HANGMAN — This program is a graphic version of the familiar game of HANGMAN, which most everyone has played while in grade school. It has three skill levels.

The opponent chooses a word and the computer places spaces on the screen for each letter of the word. For each incorrect guess, the program displays a new member of a body.

HANOI — In this game, the player is given three pegs (on the screen). On the first peg are two to 12 (user selectable) disks of different sizes stacked in descending order (smallest at the top to the largest at the bottom). The object of the game is to move the disks from the first peg to the third peg in as few moves as possible, following these rules:

1) Only one disk may be moved at a time.
2) A disk can only be placed on another one if it (the top one) is smaller than the bottom disk.
3) The middle peg is a temporary place to put disks. Rule two applies here as well.

The user may choose to have the computer play the game. The program prints the number of moves it takes and the minimum moves possible.

TICTAC — This is a computer version of TIC-TAC-TOE game for two players.

QUBIC — This game is a computer implementation of a three dimensional TIC-TAC-TOE. It is played on a 4 X 4 X 4 playing cube. The object is to place four markers in a row in any direction.

The program will allow one player to play against the computer or another player. When playing against the computer, the computer is very defensive and difficult to beat.

HUGDICE — This program simulates a version of the popular game YATZEE™. Two players can play, with the program maintaining and displaying the scores of each player.

BATTLE — This game of BATTLESHIP is played on a 9 X 9 grid, with the object of the game to locate and sink the ships hidden on the grid. The grid is identified with letters and numbers for coordinates.

There will be from four to eight ships hidden on the grid, with each ship from one to six units long. One version of the game requires that each unit (or part) of a ship be hit in order to sink it. The other version requires a single hit to sink the ship.

HSLOTS — This program is a simulated game of a slot machine using the computer to spin the wheels. This shows the excellent graphic capabilities of the H/Z100 computer. The player may bet from one to five dollars per "pull".

Comments: These programs show the features of ZBASIC and should spark interest in updating or writing of new software in ZBASIC.

TABLE C Rating: (0),(1),(2),(3),(10)

P/N 885-3005-37 ZDOS ETCHDUMP

Introduction: The ETCHDUMP programs, Etch-a-Sketch and Screen Dump, are paired into a complete graphics package for the Z-100 (ZDOS) and the MX-80. The ETCH program facilitates the quick and easy drawing of all types of complex designs on the screen of the Z-100, which can then be saved to a disk file. The SCREEN program reads a disk file created by the ETCH program and transfers the contents to an MX-80 printer, with GrafTrax, allowing very precise and detailed hardcopy records.

Requirements: ETCHDUMP require the ZDOS operating system for the H/Z-100 computers. Etch-a-Sketch is written in ZBASIC, while Screen Dump is written in assembly language. Only one drive is required.

The following files are contained on the HUG P/N 885-3005-37 ZDOS ETCHDUMP programs:

README	.DOC
ETCHDUMP	.DOC
ETCH	.BAS
SCREEN	.COM
SCREEN	.ASM
CONVERT	.BAS
READ	.BAS
WRITE	.BAS
PIC	.SCN

Authors:
ETCH, CONVERT, READ, WRITE - Frank T. Clark
SCREEN - Scott Cutshall

ETCH — With simple one-letter commands the ETCH program uses the graphics of ZBASIC to construct and combine detailed drawings. The screen contents of any video plane can be saved to a file and restored for later editing or for printing with the SCREEN program.

The program has an alphanumeric and graphics mode and three types of commands. The following is a list of the mode commands:

Graphic Commands

NUMERIC KEYPAD — entering a number moves the cursor one pixel in one of the 8 possible directions relative to the "5" key as the center.
A(lphanumeric) — enter the alphanumeric mode.
B(ox) — draw a box
C(ircle) — draw a circle
D(ot) — place a dot at the current position
E(llipse) — draw an ellipse
F(ill) — fill an area
H(idden) — toggle hidden cursor mode
I(ndex) — change the horizontal motion index (pitch)
K(olor) — change the default foreground and background color
L(ine) — draw a line
M(ark) — remember the current cursor position for subsequent commands
P(oint) — remember the current cursor position for subsequent commands
Q(uit) — clear the screen and quit
R(ead) — read the contents of a file into a video plane
S(ize) — input the aspect ratio for drawing circles and ellipses
T(rack) — toggle tracking mode
W(rite) — write the contents of a video plane into a file
X(Y-addressing) — input a specific x-y coordinate for new cursor location

Alphanumeric mode

LINE FEED — return to the graphics mode
RETURN — move the cursor to the beginning of the next row
DEL or BS — erase the previous character

CONVERT, READ and WRITE — These three subroutines may be merged into a ZBASIC program for working with a screen file created with ETCH.

PIC.SRN — an example screen file created with ETCH.

SCREEN — The SCREEN program can take a file image of a video plane and print it to the MX-80 printer using GrafTrax with very high resolution matching that of the Z-100 monitor. A pseudo gray scale even simulates the color monitor or monochrome gray scale.

The command line can contain up to three file names which will be merged into one picture. The three files can be either separate video planes or the same file to make a darker picture.

Command line arguments or switches allow the user to select a border to appear around the picture plus the type of border. Another option allows for multiple drawings to be combined on a single page.

The aspect ratio for the MX-80 is different than that of the monitor. A circle that appears visually correct on the monitor will appear oblong on the printer. Changing the aspect ratio will produce circles that appear visually correct on the MX-80 but oblong on the monitor.

Comments: This ETCHDUMP utility can be a versatile program even if the user does not have an MX-80 printer.

TABLE C Rating: (4),(5),(10)

P/N 885-3007-37 ZDOS CP/EMulator

Introduction: CP/EMulator is a program that lets you run standard 8-bit CP/M programs under Z-DOS. Nearly every program that runs under CP/M-85 will work under CP/EMulator including MBASIC, word processors, assemblers, debuggers, etc. It offers the convenience of having your most used programs, whether CP/M or Z-DOS, on the same disk, and lets you do such things as editing Z-DOS files with CP/M editors, etc.

Requirements: CP/EMulator requires Z-DOS on an H/Z-100 series computer and 128K of RAM. (CP/EMulator will not work on the ET-100.)

The following files are included on the HUG CP/EMulator disk:

README	.DOC	HDSCOPY	.EXE
CPM	.COM	HDSCOPY	.ASM
CPM	.DOC	EDIT	.COM
CPM	.ASM	EDIT	.ASM
CMD	.SYS	EDIT	.DOC
CMD	.ASM		

Program Authors:
CPM - Robert A. Metz, Modified by P. Swayne, HUG
CMD - Developed from ZCPR by P. Swayne, HUG
HDSCOPY - Carl H. Eaton
EDIT - HUG Staff

Program Content:

CPM — This is the CP/EMulator program. It supports nearly all BDOS calls of real CP/M and the I/O-related BIOS calls. It also supports a CP/M-85-style Tic counter, which allows you to run HUG action games designed for CP/M-85. It can be used in two modes: the direct mode and the command mode. In the direct mode, it runs a single CP/M program and returns to Z-DOS when the program is finished. In the command mode, it loads in the file CMD.SYS, which provides a CP/M-like environment with the regular CP/M commands such as DIR, SAVE, etc. available, and you can run any number of CP/M programs. The command BYE returns you to Z-DOS when you are through running CP/M programs.

CP/EMulator has certain advantages and disadvantages over real CP/M. Some of the advantages are:

1. You can put your favorite programs, whether Z-DOS or CP/M, on the same disks.

2. CP/EMulator provides a very large 63K TPA. This means that programs have more memory space than under CP/M-85.

3. CP/EMulator allows you to use CP/M editors and word processors on Z-DOS files.

Some disadvantages of CP/EMulator are:

1. Extension programs such as DESPOOL or HUG's KEYMAP may only work while you are running programs that use BIOS calls for I/O, such as MBASIC. Use of such programs with CP/EMulator is, therefore, very limited.

2. Programs that use non-I/O BIOS calls (including disk calls) will not work at all. This includes many utility programs and some directory programs. However, HUG's DIR19 program works because CP/EMulator constructs simulated disk parameter and allocation tables. Other programs requiring these tables may or may not work.

CMD — This program is a system command processor for CP/EMulator that provides the usual CP/M command such as DIR, ERA, SAVE, etc. It was developed from the public domain program ZCPR, and has many of its advanced features. Because it uses no Z-80 code, it could possibly be used as a replacement for the CCP of CP/M-85, but no development has been done in that direction.

HDSCOPY — This program is similar to RDCPM except that it copies files from HDOS disks instead of CP/M disks. It is included on this disk because HUG's HRUN HDOS emulator will run under CP/EMulator, and it provides a way to get HDOS programs to your

Z-DOS disks. However, it is somewhat limited in that it can only read 5.25-inch soft sector double density, single or double sided HDOS disks.

EDIT.COM — The standard CP/M editor ED will not work properly under CP/EMulator, and since we have not been able to determine why, we have included HUG's EDIT program on this disk.

Comments: CP/EMulator is a program to add greater flexibility to the serious ZDOS and CP/M-8S user.

TABLE C Rating: (10)

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P/N 885-3008-37 Z-DOS Z-DOS UTILITIES

Introduction: This disk contains several utilities to aid the Z-DOS user, including two Modem communication programs, a Menu executive, printer control programs, a directory program, and a screen dump program for IDS Prism color printers.

Requirements: These programs will run on any H/Z-100 computer with Z-DOS and standard equipment. The printer programs require the specific printer they were intended for use with.

The following files are included on the Z-DOS Utilities Disk:

README	.DOC	XA	.BAT
TERMZ100	.COM	XM	.BAT
TERMZ100	.ASM	AUTOEXEC	.BAT
KTBL	.ASM	BUILD	.BAS
TERMZ100	.DOC	SDUMP	.COM
DTERM	.COM	SDUMP	.ASM
DTERM	.ASM	MENU	.BAS
MENU	.COM	B	.BAS
MENU	.ASM	D	.BAS
LODR	.ASM	F	.BAS
MENU	.DOC	L	.BAS
MENU	.DAT	P	.BAS
MENU	.TBL	PSET25	.COM
X	.BAT	PSET25	.ASM
S	.BAS	PSETMX	.COM
T	.BAS	PSETMX	.ASM
PRISM	.COM	DIR100	.COM
PRISM	.ASM	DIR100	.ASM
PRINTEK	.COM	COLOR	.COM
PRINTEK	.ASM	COLOR	.ASM

Program Authors:
TERMZ100, DTERM, MENU, SDUMP,
PRISM, PRINTEK, COLOR — Robert A. Metz
PSET25, PSETMX, DIR100 — P. Swayne, HUG

TERMZ100 — This is a modem control program patterned after the Heath/Zenith CPS program. Features include function key control of operating commands, emulation of different terminals via a user alterable table, user selectable baud rate, ASCII file upload and download, and binary file upload and download with other computers using TERMZ100.

DTERM — This is a "dumb terminal" modem program, provided for those who want a modem program that does not intercept control characters, escape sequences, etc. This program intercepts only Control-E, which is used to return control to Z-DOS.

MENU — This program provides the ability to run other programs from a screen menu. Once installed, you only need to move an indicator to the name of the function you want to perform with the arrow keys, and press the RETURN or ENTER key. This program could be of help to your friends who are new users and are unfamiliar with computers. However, a knowledgeable person will be required to set the program up for the user. The .BAT files on this disk are for use with MENU, and MENU.BAS is for creating menus.

SDUMP — This is a screen dump utility for IDS Prism color printers. Included with the program are modified versions of the Zenith demonstration programs that will dump their displays to the printer when the F10 key is pressed.

PRISM — This is a program that allows you to set up several parameters on an IDS Prism printer before using it. Some of the selectable parameters are ribbon select, ribbon advance, normal or enhanced characters, fixed or proportional spacing, draft or quality mode, justify mode, character size, and lines per inch.

M

PRINTEK — This is a program that allows you to set up parameters on a PRINTEK printer. Selectable parameters include normal or enhanced characters, draft or quality mode, character size, fixed or proportional spacing, and lines per inch.

PSET25 — This is a Z-DOS translation of the PSET25 CP/M program previously released by HUG. It allows you to set up character size and lines per inch on an H/Z-25 or H/Z-125 printer.

PSETMX — This is a Z-DOS translation of HUG's PSETMX CP/M program. With it, you can set compressed, emphasized, double strike, or normal characters, and lines per inch on an MX-80 printer.

DIR100 — This is a Z-DOS translation of the DIR19 disk directory program from HUG. It can display up to 80 files on the screen, and allows you to "page" through screens of files for disks with more than 80 files. It can alphabetize files, or present them in their "natural" order, and can show hidden files. File size information is shown for each file, and for the whole disk. Graphic lines are used to make the display more readable.

Comments: This ZDOS utilities disk brings many useful utilities to the ZDOS user.

TABLE C Rating: (1),(3),(4),(5),(10)

P/N 885-4600 Watzman/HUG ROM

Introduction: This product contains the integrated circuits (IC'S) to the Watzman/HUG ROM. The two (2) IC ROM set is the replacement parts for the code and keyboard encoder ROMs in the H19, H19A, or Z19 terminal, or the Terminal Logic board in the H89, H89A, Z89, or Z90. It can greatly add to the capabilities and usefulness of the terminal.

Requirements: The ROMs can be replaced in an H19, H19A, or Z19 terminal, or in the H89, H89A, Z89, or Z90. The documentation contains complete instructions for the installation of the ROMs.

Program Content: The WATZMAN/HUG H19 adds several new features to the H19 terminal. These include:

1) Greater baud rate selection. Rates from 75 to 38400 may be selected by software or switch settings, including 134.5.

2) On screen digital clock. A digital time display is maintained on the 25th line which does not interfere with terminal operation or use of the 25th line. The clock is controlled by escape codes and can be set and read. The display can be turned on or off.

3) Native mode keyboard operation. With this mode, each key produces a unique 8-bit code instead of the 2-code escape sequences produced by some keys.

4) Added transmit features. In addition to the ability to transmit a page and transmit the 25th line, the WATZMAN/HUG H19 ROM can transmit the current (cursor) line and transmit the character at the cursor. The single character transmit feature sends the character as an 8-bit code that allows the user to determine whether it is a graphic and/or reverse video character.

5) Cursor operation. Software selectable blinking or steady cursor, in underline or block format.

6) Duplex selection. Software selectable half or full duplex operation. This makes the H19 more useful in certain remote communication applications.

7) Software selectable handshaking. The user can select either the normal Xon/Xoff handshaking or hardware handshaking via RTS (pin 4).

8) Word length. Switch selectable 7 or 8 bit word length.

9) Transparent mode. In this mode, each 8-bit code from 0 to 255 produces a unique visible character.

10) Upward compatability. The escape codes for all of the new features (except 134.5 baud select, handshaking select, and transparent mode) are in accordance with Heath/Zenith standards, so most of the features are compatable with similar features on newer Heath/Zenith products, including the ZT-1 and Z100 series computers.

The documentation contains a Configuration Chart for the S401 switch on the Terminal Logic Board. The instructions also include a complete summary of the WATZMAN/HUG H19 ROM escape codes

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Comments: The WATZMAN/HUG H19 ROM will greatly increase the usefulness of the H19 terminal line for those who are intrigued with the new features.

TABLE C Rating: (0),(3),(5),(10)

885-8012[-37] CP/M Maple (Modem Applications Effector)

Introduction: MAPLE is a modem program designed to allow the H8/H19 or H/Z89 computer to communicate effectively with another computer, over the telephone or by direct connection.

Requirements: MAPLE requires the CP/M operating system, version 2.2 or later, on the H19/H8/H17 or H/Z-89 or 90 with 32K of memory. When transferring files, 48K or more of memory is recommended. Only one disk drive is required. A line printer device is not required but is recommended for downloading files from the host computer.

This version of MAPLE will not run on the H/Z-100 computer. See P/N 885-8023-37 for the H/Z-100 CP/M-85 version of MAPLE. The [-37] is required for soft-sectored drives on the H/Z-89 or Z90.

To use MAPLE, a modem and appropriate connector will be required to communicate to another system. MAPLE can be set to run on interrupt 3, 4, or 5 of the DTE connector, port 330Q.

The program is written in assembly language and the source code is NOT included. The instructions are contained in a hardcopy documentation manual.

Note: The H19 terminal is required due to the use of the function keys and other escape codes.

The following file is included on the HUG P/N 885-8012[-37] MAPLE disk:

MAPLE.COM

Author: Dr. William C. Parke

Program Content: MAPLE is a modem communications package, which can be used to connect the users Heath computer system to another Heath system or to a time-share host system, e.g. CompuServe or the SOURCE, via the telephone lines. (Time-share host systems can have several hundred users on-line at a single time.)

MAPLE, when executed, enters the communications mode, with full file send and receive control. The mode and options are displayed on the 25th line of the terminal and are invoked by depressing the appropriate function key. The main communication "menu" function keys displayed on the 25th line are as follows:

f1 - .page—Send to the printer, a disk file, or remote computer any text displayed on the screen. The user may edit the screen display before sending.

f2 - COPY—Store all screen activity in memory.

f3 - SHOW—Display on the screen the text which has been stored in memory with the COPY function.

f4 - P.PAD—Send the text saved in memory to an output device, (generally the printer).

f5 - **STORE**—Save the text in memory to a disk file.

ERASE - CLEAR—Clear the text stored in memory.

BLUE - SEND—Send a disk file to the host computer. The file may be sent in block, line, or segment mode.

RED - Exit—Exit to CP/M.

WHITE - Set—Set or change communication options. These options include this second level menu:

f1 — convert between ASCII, APL, TAPE, and HEX character sets,
f2 — set mode for sending a disk file,
f3 — set the prompt character in sending a file,
f4 — select line printer device,
f5 — select disk drive,
ERASE — set options selected, and return to conversation,
BLUE — select parity check bit,
RED — select baud rate,
WHITE — set the number of bits per byte, and
BREAK — echo all terminal input.

BBREAK - break—Send a hard break to the host system. This will stop any transmission by the host and return the user to the host's command prompt. (This feature may not work for all host systems.)

The following are additional notes and features of MAPLE:

1) Both the file SEND and COPY functions have a "text", "absolute", "line", "block" and "wards" (for Ward Christensen's protocol) settings.

2) Modem handshaking can be controlled with the "Set" mode. Handshaking options are "none", "xon/xoff", "ack/nak", "DSR" or "CTS". Thus, direct computer to computer ties, as well as remote connections, need not suffer data loss due to a high baud rate.

3) The COPYPAD buffer and disk files can be displayed or reviewed page-by-page or line-by-line.

4) The modem signal is constantly monitored. The 25th line and a ring of the bell indicate a change.

5) Under the Ward Christensen file transfers, the user may elect to display the transferred characters.

6) Remote control of MAPLE is now available, so that a remote system can send commands which will initiate file transfers. A password is required. Remote controlled exit to the CP/M operating system is allowed following a correct password. The remote

system will then have remote terminal capabilities for operating the local computer.

MAPLE uses a number of control characters and escape sequences to do a number of functions. The user can refer to the written documentation for details. Patch Instructions are included with the manual to aid the user in customizing MAPLE to his requirements.

Comments: MAPLE, one of the most complete modem packages, includes most any feature required for computer communications. The 25th line display "menu" and documentation make it a very user friendly package.

TABLE C Rating: (0),(1),(2),(3),(5),(10)

P/N 885-8015 HDOS TEXTSET Formatter

Introduction: TEXTSET is an interactive formatter that will take a text file and format it to the users specifications. It has a number of features which are explained below. TEXTSET is used with a Diablo Printer to produce high quality printing for any size file. The special features of the Diablo printer are controlled by the program. No hardware modification needs to be done.

Requirements: TEXTSET requires the HDOS operating system version 2.0 (but should run on 1.6) on an H8/H17/H19 or H/Z89 with 56K of memory. Only one disk drive is required, however, two drives are recommended.

Note: A Diablo printer 1640 ksr, 1630, or RO 630 (Heath # WH-54) is required for use with TEXTSET.

The user will also need a text editor (e.g. HUG P/N 885-1022) or a word processing system that runs under HDOS. If you are not familiar with or do not have a favorite editor, the HDOS EDIT program comes with the HDOS operating system and has instructions in the HDOS manual.

The following files are contained on the HUG P/N 885-8015 HDOS TEXTSET Formatter disk:

TEXTSET	.ABS
TEXTSET	.PSU
PICA	.PSU
ELITE	.PSU
PLASTIC	.PSU
METAL	.PSU
DEMO1	.DOC
DEMO2	.DOC
TEXTSET	.REF

Author: Terry W. Wilk

Program Content: TEXTSET will format a text file created from an editor and print it to a Diablo printer. It will do microspace justification, proportional spacing of the characters, automatic formatting of the text within a selectable width, double striking, bold striking, underlining, centering, and right justification of lines. No special print wheels are necessary. However, the selectable proportional spacing can be used effectively with special print wheels.

TEXTSET requires interaction with the user to produce a final text format. It is designed this way to give the user flexibility in working with formatting text. The program pauses for each question and allows the user to make any of a number of selectable options. TEXTSET allows the user to select:

1) the PSU (Proportional Spacing Unit) Table
2) the WIDTH of formatted text
3) the OFFSET (amount of space between characters)
4) the SPACE (PSU for the space character)
5) the BLANK MAX (the maximum space between words, before adding tiny spaces between characters)
6) the LINES (total lines per block to be processed)
7) the FORCE BR (set a force break after each line)
8) SET VMI (change the line feed value of the Diablo)
9) SET LEFT MARGIN
10) LINE FEED (send any number of line feeds to the printer)
11) SEND LINE (type and send a line, e.g. a header or page no.)
12) EXIT, RESTART, PROCESS, OUTPUT, SKIP, and CHANGE

TEXTSET will not automatically do page numbering or auto headers/footers. These features are possible, however, through the SEND LINE command of TEXTSET.

There are other features of TEXTSET which make this package useful. TEXTSET checks for user input errors and errors in the input text file. Predefined PSU (Proportional Spacing Unit) files are included on the disk. The user can customize or create PSU Tables to any spacing unit.

Most importantly, the documentation is very user friendly and contains step by step instructions on the use of TEXTSET. Two example files and one reference file (DEMO1.DOC, DEMO2.DOC, and TEXTSET.REF, respectively) are explained and processed through the instructions. The documentation also explains how to implement TEXTSET with one or two disk drives.

Comments: TEXTSET is a must for any user who needs a formatter that will use the special features of the Diablo printer to produce a professional formatted text file. The documentation is one of the best instructions manual that the reviewer has seen.

TABLE C Rating: (4),(5),(6),(10)

P/N 885-8016 HDOS MORSE CODE Transceiver Ver 2.0

Introduction: This is an all new major upgrade of the previously released Version 1.1 under part number 885-1016. Many new user friendly improvements and extensive features have been added. The program allows the user to change custom data (e.g. the station call sign) at any time from the keyboard. Some of the other new features are listed below.

MORSE CODE Transceiver version 2.0 is an 8080 assembly language program which provides the operator with the ability to send or receive morse code. The program is intended to be used by Amateur Radio Operators to facilitate communication by morse code over a wide range of code speeds, dot/dash ratios, interference, and noise conditions. In addition, the precision speed feature is intended to be used whenever extreme transmit code speed accuracy is required.

The precision morse code speed algorithms used in this program were originally developed as part of a set of custom H89 programs for the American Radio Relay League's Maxim Memorial Station 'W1AW' at A.R.R.L. Headquarters in Newington, CT.

Requirements: This program requires the HDOS operating system version 2.0 on an H19/H8/H17 or H89 with 48K of memory. Only one drive is required, however, two are recommended.

All I/O is at RS232C levels via the DTE port. External equipment is required to interface the RS232C level I/O signals to the amateur station equipment. Design details were published in REMark Issue 33, October 1982, page 17.

Note: The algorithms used for morse code decoding depend on timing from the internal clock. Therefore, this program will perform properly only on a standard machine running at 2.048 MHz.

The following files are included on the HUG P/N 885-8016 MORSE CODE Transceiver disk:

README	.DOC	TXLOP	.ACM
CW	.DOC	TXSPEED	.ACM
CW	.ASM	RXINT	.ACM
CW	.ABS	RXLOP	.ACM
CWDATA	.DAT	DISPLAY	.ACM
SAVMSG	.DAT	STATDPY	.ACM
KBIN	.ACM	CODETBL	.ACM
SPKEY	.ACM	VARTBL	.ACM

Some additional HDOS 2.0 XTEXT files are required for assembling CW.ASM.

Author: Robert R. Anderson K2BJG

Program Content: MORSE CODE Transceiver can receive and transmit standard morse characters as well as special morse characters such as (AR), (SK), (BK), (KN), (BT), and (AS). Both upper and lower case key input and screen display is allowable.

The CWDATA.DAT disk file contains eleven multi-character groups which can at any time be read to the currently selected buffer and display screen. This file contains commonly used abbreviations and space for the station call sign and station location.

Two transmit buffers selected by the 'f2' key will transmit up to 254 characters. Ten message buffers can be loaded or cleared under control of the 'f1' key. Any selected message buffer can be transferred to the transmit buffer. These 10 buffers are saved in the SAVMSG.DAT.

Disks can be changed and ASCII disk files can be loaded without leaving the program. The memory buffer extends from the end of the program to the top of available memory.

The receive program operates in three modes: LOCK, TRACK, and HOLD. The transmit program operates in two modes: NORMAL and DISK FILE. The modes can be manually switched to any of the modes.

The available precision fixed Tx speeds are: 5SP, 05, 7.5, 10, 13, 15, 18 WPM, and 20 through 70 WPM in 5 WPM steps. The morse code speed standard used in fixed speed mode is in accordance with amateur practice of one word being defined as consisting of 50 elements.

The screen display is split into three areas for viewing the receive or transmit data, the selected transmit pre-type data, and the selected message buffer data. The screen is also used as the command screen and for display of error messages. The program will not allow for improper keyboard commands to take place.

The documentation is contained on the disk. A listing of the instructions will be recommended for learning the MORSE CODE Transceiver program.

Comments: The author had done a superb job on the MORSE CODE package.

TABLE C Rating: (0),(1),(3),(5),(10)

P/N 885-8017 HDOS Programmers Helper

Introduction: The H89 Programmers Helper (PH.DVD) is an interrupt device driver that may be called from the command or program mode of Benton Harbor BASIC, EDIT, DBUG, or most any other host program by typing the BREAK key. PH.DVD will perform any of its functions and then return control to the host program. The functions are listed below.

Requirements: This program requires the HDOS operating system version 2.0 with an H19/H8/H17 or H89 with a minimum amount of memory. Only one drive is required.

Note: The H/Z-19 terminal is required to run PH.

The following programs are included on the HUG P/N 885-8017 HDOS Programmers Helper disk:

README	.DOC
PH	.DVD
PH	.ASM

Author: Richard H. Livingston

Program Content: PH.DVD will perform a number of functions to aid the programmer. It is invoked by entering the BREAK key or a CTRL-@. The functions that it will perform are as follows:

1) Number Base conversions: convert between Binary, Octal, Split-Octal, Decimal, Hexidecimal, and ASCII

2) ASCII conversion: echo the value for the key depressed

3) Flag conversion: convert the numerical value of the Flag register to the logical state of each Flag

4) DCA conversion: line and column numbers are converted to the proper ASCII escape sequence for direct cursor addressing

5) 16 bit positive integer arithmetic: addition, subtraction, multiplication, and division

6) Logic functions: 1's Cmp, 2's Cmp, AND, OR, XOR

7) Graphic mode: displays the graphic character set and associated key characters on the 24 and 23 lines, respectively

A second BREAK key or CTRL-@ will return control to the host program. PH.DVD must be loaded before it can be used. The instructions are included on the disk.

Comments: This device driver provides the programmer with an excellent tool for doing number base conversion and other functions at the press of the BREAK key.

TABLE C Rating: (0),(1),(3),(10)

P/N 885-8018[-37] CP/M FAST EDDY Text Editor and BIG EDDY

Introduction: FAST EDDY is a text file screen editor that was written for everybody. It was written using the basic commands and keypad keys, so that anyone, even with no experience with an editor, can learn to use it while reading the instructions.

For those files that are too large for your computers memory, BIG EDDY will handle the breaking up of the text for editing with FAST EDDY.

Requirements: This disk requires the CP/M operating system version 2.2 or later, on a H8/H19/H17 or H/Z-89 or Z90 with 32K of memory. A printer is not required, but both FAST EDDY and BIG EDDY have printer options. Only one disk drive is required.

BIG EDDY can be used with large files. A second drive (or high

density drives) may be required to break up large files which cannot fit into memory. The original file is not changed or deleted.

FAST EDDY may work on the H/Z-100 under CP/M-85, however, the options have not been documented. The user would be responsible for learning the options for use under CP/M-85.

The following files are included on the HUG P/N 885-8018[-37] CP/M FAST EDDY Text Editor and BIG EDDY File Handling Utility:

EDITOR	.COM
BIGED	.COM
TUTOR1	.DOC
TUTOR2	.DOC
TUTOR3	.DOC

Author: Hubert L. Reeder

FAST EDDY — This text file screen editor and its documentation have been designed for anyone not familiar with using an editor. The program uses commands and keys that are easy to remember and use.

The editor contains a limited number of commands, however, the commands are designed to provide a useful, easy to use editor. It does not have complex options that require time and effort to use. The editor contains a command mode and edit mode. The following are a brief list of the options:

COMMAND MODE

Typed Commands:

LOAD filename.ext (load file)
SAVE filename.ext (save file)
SAVE XX filename.ext (save XX number of lines)
MERGE filename.ext (merge two files)
PRINT NN (print enter file, NN lines per page)
PRINTD NN (print double spaced)
PRINT NN XX (print XX lines, NN lines per page)
FIND anyword (find the first occurence of a word)
MARGIN nn xx (set left margin, nn, right margin, xx)
BYE (exit to CP/M)

Key Commands:

Up arrow — enter EDIT mode at first line of text
Down arrow — enter EDIT mode at last line of text
HOME — enter EDIT mode at pointer (last cursor location)

EDIT MODE

Key Commands:

Up arrow — move cursor up one line
Down arrow — move cursor down one line
Right arrow — move cursor to the right one character
Left arrow — move cursor to the left one character
HOME — return to COMMAND mode
IL — insert line
DL — delete line
IC — insert character
DC — delete character
f1 — align paragraph within left and right margins
f2 — margin on
f3 — margin off
f4 — find next occurence of word, after FIND of COMMAND mode
f5 — MBASIC line split (insert MBASIC logical line extension)
BLUE — right justify paragraph text
LINEFEED — split line
ERASE — block erase

These are most of the basic commands of FAST EDDY. Please note that it has the ability to align paragraphs to new margin settings and then the option of right justifying the paragraph text.

Details of how to use these options are contained in the documentation. The TUTOR1, TUTOR2, and TUTOR3 documentation files are included with the disk to give the user experience in using FAST EDDY while reading the doc files.

BIG EDDY — This program is a utility to work with text files which are too large to be edited by FAST EDDY directly because of memory limitations. BIG EDDY can be used to browse a file of any size of which the user can break the large file into smaller parts for editing with FAST EDDY.

BIG EDDY asks for the input filename and an output filename. It keeps track of the subfiles and names them accordingly.

BIG EDDY has some useful options to aid the user in preparing the text for smaller files. The BROWSE mode is similar to the EDIT mode of FAST EDDY, except that no editing can be done to the file.

The following are a list of the commands of BIG EDDY:

SAVEALL — save the entire text in memory to the disk
SAVEPART — save part of the text in memory to disk
NOSAVE — discard part of text
PRINT — same as FAST EDDY's print commands
BYE — exit to CP/M

With the SAVEPART command, the user can save the text by subject or modules of his choice. Using the CP/M PIP program, the subfiles can be assemble the files into any order.

Comments: FAST EDDY, with the align paragraph and right justify, allow simple formatting, e.g. doing letters or other papers that do not require specific formatting capabilities.

TABLE C Rating: (0),(1),(3),(7),(10)

885-8019[-37] CP/M DOCUMAT Formatter and DOCULIST

Introduction: DOCUMAT is a word processor which formats text to specific parameters. The numerous options make this formatter one of the most powerful of its kind. DOCULIST will preview and print files that have been processed with DOCUMAT.

Requirements: These programs require the CP/M operating system version 2.2 or later on an H8/H/Z-19 or H/Z-89 or Z90 with a minimum of 32K of memory. A printer is not required to execute the programs, however, hardcopy printouts of the text will require having a printer. Only one disk is required, however, DOCUMAT will access any size file including multiple disk files.

The programs have not been tested on the H/Z-100 but should run with no problem.

The following programs are included on the HUG P/N 885-8019[-37] CP/M DOCUMAT Formatter and DOCULIST disk:

DOCUMAT	.COM
DOCULIST	.COM
MACLIB	.DOC
TESTFILE	.

Author: Neal A. and Susan Van Eck

DOCUMAT - This program is a wordprocessing system which will produce neatly formatted documents. DOCUMAT takes a file of text (which is created with an editor), including DOCUMAT commands, and formats it for final printout according to your specifications.

The program allows for a number of options including great flexibility of page layout and text control. The commands allow for margin control, paragraph indentation, soft-hyphenation, page size, use of tabs, underline, and bold facing. Sentences are automatically capitalized and separated by two spaces. New pages are started automatically or whenever you wish, and can be set for front and back paging, while maintaining a running header for each page.

The program allows for setting for right justification of text. It provides a set of ten counters (numeric and alphabetic) for use in number pages, sections, chapters, prefixes, etc. It allows up to nine (9) footnotes per page, automatically numbering them as they appear. It automatically generates a Table of Contents of the text. It has the facility to INCLUDE (or merge) a separate file anywhere in the main text. It provides for interactive sessions while processing. The most useful tool is the powerful macro facility.

DOCUMAT has Global Commands, which apply to the entire text, and Control Commands, which control the text immediately following the command. The following is a list of some of these commands available for the DOCUMAT formatter:

GLOBAL Commands:

CTRk - set numeric counter k
CTRn - set alphabetic counter n
CYCLE - cycle page numbers for facing pages
HEAD - print the running head
JUSTIFY - set for right justification
LINES - set maximum number of lines per page
LMARGIN - set left margin
NUMBER - print page numbers
PAGE - format paging parameters
PARAGRAPH - indent paragraphs
PSPACING - line spacing between paragraphs
SHIFT - indent all text for right & left pages
SPACING - spaces between lines
TMARGIN - set top margin for first line per page
WIDTH - set the number of characters per line

CONTROL Commands:

A - all lines of text following will be copied without change
AR - align right (move the text to the right margin)
B - begin boldface text
C - center current line
Dn - set dot leaders (for ..... example)
Hn - indent each successive line after current line
In - indent n spaces each line including current line
Jn - jump n lines
Ln - start a new line leaving n-1 blank lines
N - start a new page immediately
P - start a new paragraph
R - reset, start new line and turn off temporary options
S - justify current line and start new line
Tn - set tab, space to column n
U - begin underlining
Wn - skip to new page

The ability to define and use macros is the most powerful facility in DOCUMAT. This feature is not found in most other wordprocessors. A macro is a predefined set of text or a procedure, which can be used in the text file wherever and whenever called.

With macros, you can automatically generate numbered chapter and section headings, ensure consistency, and include predefined text and control commands - even macros of macros. You can create printer control macros to send control codes for your printer. DOCUMAT also provides for "structured" writing. (MACLIB.DOC is a file of predefined macros of general use.)

Details of all commands are contained in the instructions. The disk contains a file and the manual contains a tutorial to give the user hands-on experience using many of the commands.

DOCULIST - This program allows you to preview or type the formatted output text of DOCUMAT. The PREVIEW mode will pause after every 24 lines until you are ready to go on. You also can shift the display for lines that are longer than 80 columns.

DOCULIST can be used to display or print any text file. The PREVIEW and TYPE options can be started at any desired page number.

Comments: DOCUMAT will require some study to master its many commands. Once you have learned the commands, you will know how to use one of the most powerful formatters.

TABLE C Rating: (0),(4),(10)

885-8020[-37] CP/M RF Computer-Aided-Design Package

Introduction: RFCAD is a collection of 35 programs written in Microsoft BASIC which aid the user in designing many standard audio, HF, VHF, UHF, and microwave circuits and antennas. These programs are made readily accessible by use of a user-friendly menu. This package is primarily aimed at electronic engineers and Ham's who have frequent need to design circuits and antennas. It will also be of tremendous benefit to electronic students who want to experiment with circuit configuration to see what happens. Several programs are also included which will be helpful to anyone interested in setting up a satellite earth station.

Requirements: These programs require the CP/M operating system on an H8/H17/H19, H/Z89 or Z90 with 40K of memory. Two 5 1/4 inch single-sided drives are required to run from the menu program. A printer device is not required.

The programs are written in Microsoft BASIC and will run on version 5.03 or newer. The only ESCape code or cursor control used for the H19 terminal is the "clear screen". At least 11K free bytes of MBASIC program memory space are required by the largest program.

These programs have not been tested on the H/Z-100 but should run with no problem. Be sure to include the "-37" for soft sectored.

Note: The H19 terminal is required for the clear screen control used in the program. The clear screen code can be changed so that the H19 terminal would not be required.

The following files are included on the HUG P/N 885-8020[-37] CP/M RF Computer-Aided-Design package. (This is a two disk set.)

CADMENU	.BAS	LPI	.BAS
AELIPT	.BAS	MATCHER	.BAS
AFILTER	.BAS	MFILTER	.BAS
AFPLOT	.BAS	MOD	.BAS
BFILTER	.BAS	MSCONV	.BAS
CHORN	.BAS	MSTRIP	.BAS
COIL	.BAS	NE555	.BAS
DBCONV	.BAS	NFCONV	.BAS
DISH	.BAS	OSC	.BAS
FED	.BAS	PATH	.BAS
FREQWAV	.BAS	PELIPT	.BAS
HELIX	.BAS	PFILTER	.BAS
HELP	.BAS	RESNET	.BAS
HFILTER	.BAS	RESONNCE	.BAS
HORN	.BAS	SATANT	.BAS
LFILTER	.BAS	WNDLD	.BAS

TLINE	.BAS
YAGE	.BAS
ZCONV	.BAS

Author: Gary A. Field, WA1GRC

Program Content: The subjects covered in the RFCAD program list are as follows.

Active filters,
Passive filters,
Pi and Tee attenuators,
Power dividers,
L, Pi & Pi-L matching networks,
NE555 circuits,
Yagi, Horn, Helix and Dish antennas,
Microstripline matching,
Receiver front end design,
Wind loading on antennas,
Radio path loss calculator,
Beam heading and distance to remote station,
Oscillators, and
Inductor design.

There are also several handy conversion utilities which convert between electrical units such as dB, dBm, dBmV, Watts, Volts, VSWR, and degrees Kelvin, as well as dimensional units like meters, centimeters, feet, and inches.

The documentation for RFCAD contains schematic diagrams which are referred to by the programs. This package has been in use in an R.F. Research and Development group for over a year and is believed to be thoroughly debugged.

TABLE C Rating: (9)

885-8021 HDOS
Student's Statistics Package

Introduction: This package is a collection of programs which conveniently calculate the most needed basic statistics. The programs cover the most frequently used statistical analysis covering most of the designs included in introductory statistics textbooks. The programs are menu driven.

Requirements: These programs require the HDOS operating system version 2.0 on an H8/H17, H/Z-89, or Z90 with 48K of memory. The menu program is written for a two 5 1/4 inch single-sided drive system, however, the user has the option of selecting one disk drive in the menu program. A line printer is required for hardcopy output.

The programs are written for either Benton Harbor BASIC or Microsoft BASIC.

Note: The H19 terminal is not required for these programs. An 80 character by 24 line terminal is assumed.

The following files are included on the HUG P/N 885-1021 HDOS Student's Statistics Package:

STATMENU	.BAS	TTEST	.BAS
BASTAT	.BAS	A1	.BAS
BASALT	.BAS	A1R	.BAS
CORLTN	.BAS	A2	.BAS
LINREG	.BAS	A2R1	.BAS
CHISQR	.BAS	NORRND	.BAS
STDSCR	.BAS		

Author: Theordore J. Stolarz

Program Content: The following is a brief description of each program available in this statistics package:

BASTAT — Basic Statistics for a Single Variable - This program computes basic descriptive statistics and builds a frequency distribution and graph of the data with expected frequencies calculated from the normal curve.

BASALT — Alternate for program BASTAT - This is a less elaborate program than BASTAT and will handle data that may not run on BASTAT. It does not provide a frequency distribution or graph of the output.

CORLTN — Linear Correlation - This program provides a correlation matrix for 2 to 20 variables and provides both Fisher's Z' for each value of r and a test for the significance of each correlation coefficient.

LINREG — Linear Regression (2 variables) - This program provides both regression equations for a 2 variable correlation problem. It allows for predicting unknown values of both X and Y using the equations. It will accept raw data for input or previously calculated statistics.

CHISQR — The CHI SQUARE Statistic - This program calculates the value of Chi Square for both the Row only (1xC) and the contingency table designs. Yate's correction for discontinuity is provided as an option where appropriate.

STDSCR — Standard Score Conversion Program - This program converts a set of scores to Z scores or standard scores with any base. It also provides descriptive statistics on entered scores.

TTEST — T-tests for Mean Differences - This program calculates the value of Student's t for both independent and dependent samples. It provides degrees of freedom and descriptive statistics for the samples.

A1 — Single Factor Analysis of Variance - This program provides a single factor ANOVA on any number of independent groups with any number of subjects. For unequal sample sizes, a choice of the weighted or unweighted means analysis is provided.

A1R — Single Factor within Subjects Analysis of Variance - This program provides a single factor ANOVA for the within subjects or repeated measures design.

A2 — Two Factor Analysis of Variance - This program provides a factorial ANOVA for the two factor design. The unweighted means analysis is used for unequal sample sizes.

A2R1 — Two Factor Mixed Design Analysis of Variance - This program provides an ANOVA on the "split plot" or mixed within subjects - between subjects two factor design.

NORRND — Normal Distribution of Random Numbers - This program provides pseudorandom numbers selected from a population with a specified mean and standard deviation. Also generates the usual rectangular distribution of random numbers.

The documentation contains sample sessions using the programs, as well as example output from the execution of the program.

TABLE C Rating: (10)

P/N 885-8022 HDOS
SHAPES

Introduction: SHAPES is an educational program for preschool children, ages two to five. The program is designed to teach basic shape recognition, while at the same time being fun for the child to play. It can also be used to teach the concepts of up, down, left, and right. This program can serve to introduce the very young to the world of computers.

Requirements: This program requires the HDOS operating system version 2.0 on an H8/H17/H19 or H/Z89, Z90 computer with a minimum 16K of memory. Only one disk drive is required.

The program is written in 8080 assembly language and the source code is included.

Note: The H/Z19 terminal graphics are used.

The following files are included on the HUG P/N 885-8022 HDOS SHAPES disk:

SHAPES	.ABS
SHAPES	.ASM
REFN	.ACM
INTROD	.ACM
MENU	.ACM
INSTR	.ACM
FORM	.ACM
BLANK	.ACM
GROUP	.ACM

Author: Charles Stout, Jr.

Program Content: The SHAPES educational program for preschool children has six different shapes (or figures) arranged together to form a group at the top of the screen. Each of the six shapes is displayed one at a time at the bottom of the screen. The child must move the shape to its correct position by use of the arrow keys of the keypad.

The program has eight selections from the menu drive program. These include versions of Beginner, Intermediate, Advanced, and Random. The child can play a particular level continuously or return to the menu and choose another level.

Comments: This is a very clean KID'S DEVELOPMENT program.

TABLE C Rating: (0),(1),(10)

P/N 885-8023-37 CP/M-85
MAPLE
(Modem Appl. Effector)

Introduction: The popular modem package, MAPLE, is now available under CP/M-85 for the H/Z100 computers. MAPLE is a program designed to allow the H/Z100 computer to communicate effectively with another computer, over the telephone or by direct connection.

Requirements: This program requires the CP/M-85 operating system on an H/Z100 series computer. A printer device is not required but is recommended for producing a hardcopy of anything from the online time.

The user is required to have a modem capable of connecting to the DTE connector on the back of the H/Z100 for telecommunicating with another computer. The modem can be 300 or 1200 baud. (MAPLE is capable of any number of selectable baud rates for direct connect.)

The following program is included on the HUG P/N CP/M-85 MAPLE disk:

MAPLE.COM

The instructions are included in a manual.

Author: Dr. William C. Parke

Program Content: MAPLE is a modem communications package, which can be used to connect an H/Z100 computer to another microcomputer or to a time-share host system, e.g. CompuServe, via the telephone lines.

MAPLE, when executed, enters the communications mode, with full file send and receive control. The mode and options are displayed on the 25th line of the terminal and are invoked by depressing the appropriate function key.

The following are the options displayed on the 25th line while in communication mode:

f0 — toggle (on and off) outgoing communication

f1 — type an ASCII file to the screen (the file will NOT be sent to the remote system)

f2 — this is the COPY function, which allows the download of files or data from a remote system; MAPLE has three COPY selections:

text - copy ASCII characters
abs - copy full eight bit words (absolute files)
wards - copy using Ward Christensen protocol

All characters will be saved in a COPYPAD area.

f3 — redisplay any text in the COPYPAD

f4 — send text in COPYPAD to printer

f5 — store to disk the text in the COPYPAD

f6 — clear contents in COPYPAD

f7 — send file to remote

f8 — exit to CP/M-85

f9 — set user options

KEYS - set keyboard setting; ASCII, APL, TAPE, and HEX
CPY - set COPY options; text, abs, wards
SND - set SEND options; e.g. line, block, wards, abs
PROMPT - set 'Line' mode prompt
PRINT - select current output device
DRIVE - select default disk drive
PARITY - select parity check bit
BAUD - set baud rate
WORD - set number of bits per byte and stop bits
ECHO - toggle terminal echo

BREAK — send hard break code to remote.

These are the main options available to the user. There are many other features of MAPLE that are helpful, e.g. the use of the keypad to send predefined messages or instructions to the remote.

MAPLE uses control characters and escape sequences to do a number of functions. A CTRL-P entered while on-line will toggle the printer output. An ESC CTRL-P will send the control-P to the remote.

Comments: MAPLE is one of the most complete modem packages to allow your computer to communicate with another computer.

TABLE C Rating: (0),(1),(3),(5),(10)

U

P/N 885-8024 HDOS BHBASIC Utilities Disk

Introduction: This Benton Harbor BASIC Utilities disk is designed to facilitate the BASIC programmer in developing modulized BASIC programs, creating and utilizing a simple library of subroutines, construction of CHAIN overlays, and in eliminating memory storage requirements for REM statements in executing BASIC programs.

Requirements: This package requires the HDOS operating system on an H8/H17/H19 or H/Z89 computer with 32K of memory. Only one disk drive is required. A printer is not required.

The program is written in Benton Harbor BASIC.

Note: The H/Z19 terminal is required.

The following files are included on the HUG P/N 885-8024 HDOS BHBASIC Utilities disk:

BASICUTI	.BAS
TESTDATA	.1
TESTDATA	.2
TESTDATA	.3
TESTDATA	.4
TESTDATA	.5
TESTDATA	.6

Author: Terence Bordelon

Program Content: This Benton Harbor BASIC utility includes commands which are selected from a command menu. The menu is as follows:

(0) END PROGRAM
(1) RENUMBER
(2) REM-OUT
(3) COMBINE
(4) SPLIT
(5) DIRECTORY

Options one through four require input from one or two files and output to one or two files depending on the command selected. The file names may consist of any disk device, file name, and file extension. At each input or output file prompt, the user can ask for verification that the name does or does not exist on the disk.

Each one of these commands provide the user with the option of viewing all changes. If selected, each source line is displayed with the resultant line immediately following. At the end of the command, the program issues a count of the lines processed for user notification and verification.

RENUMBER — This command renumbers an entire BASIC program. The user provides the starting line number for the new file and the line number increment. Any warning messages may be stored to a separate file. (Note: The original file is still intact after the RENUMBER operation. A new renumbered file will have been created.)

REM-OUT — This command strips out all REM statements within a BASIC program and stores the resultant program in one file and the REM statements in another file. The COMBINE option will restore the REM statements to the BASIC file.

COMBINE — This command takes two BASIC files and combines them into one file. The lines from the two source files are written to the destination file in ascending line number order.

The COMBINE command has two operating modes. One mode combines two BASIC program files. The other combines a REM file with its corresponding BASIC program file. (See REM-OUT.)

SPLIT — This command splits one source file into two destination files. The split is based on block starting and ending line numbers. One or more blocks consisting of one or more lines may be split out. At completion, the source file will be intact.

DIRECTORY — This option allows the user to do a directory of any disk drive while in the program. The user can select to see files not flagged or all files including files flagged by the "S" flag.

Comments: The program has been written entirely in BASIC and is commented throughout.

TABLE C Rating: (9)

B

P/N 885-3006-37 ZDOS CHEAPCALC

See P/N 885-1233 For Details

Current Local HUG Clubs

*(**NOTE:** This listing is current as of December 1, 1983. If your club is not listed or you are forming a new club and would like to have it included in our list, please send the proper information to: Heath/Zenith Users' Group, Attn: Nancy Strunk, Hilltop Road, St. Joseph, MI 49085.)*

AK, Eagle River
Alaska HUG
206 E Firweed Ln., Suite 208
Anchorage, AK 99503
907 276-5917 Group Size: 15
Contact Person: Roger Pickels or Ben Sevier
RBBS 9pm-9am Pacific time 907 276-5917

AK, Ft. Greely
COLD HUG
C/O Stan Lockhart P. O. Box 229
APO Seattle, WA 98733
907 895-3284 Group Size: 4
Contact Person: Stan Lockhart
Meet Bldg. 856 Apt. B Ft. Greeley
Newsletter, willing to exchange

AL, Birmingham
BEARHUG (Birmingham HUG)
C/O Jack Goertz Rte. 19, Box 248
Birmingham, AL 35244
205 991-5519 Group Size: 20
Contact Person: Jack Goertz
Meeting time and place varies

AL, Huntsville
Huntsville, AL HUG
Rt. 1, Box 427
Lacey's Spring, AL 35754
205 498-2199
Contact Person: Jeff Hamilton
Meet 2nd Thurs. at Intercon Research Corp
Jeff's work # 205 453-2576

AL, Mobile
MOBHUG Mobile HUG
3636 Linden Lane
Mobile, AL 36608
205 344-5065 Group Size: 21
Contact Person: Bud Hobdy
Meet 3rd Sun. at 2 p.m.
Just starting, new members welcome

AL, Montgomery
HUG/M (HUG of Montgomery, AL)
2948 Willow Lane Drive
Montgomery, AL 36109
205 272-6964 Group Size: 30+
Contact Person: Ronald E. Travis
Meet 1st Tue. at 7 p.m.
Meet Air Force Logistics Management Ctr.

AR, Little Rock
Little Rock HUG
C/O David Schade P. O. Box 15478
North Little Rock, AR 72231
501 758-4500 Group Size: 32
Contact Person: David Schade
Meet 2nd Sat. 12:00 noon at AR College of Tech.

AZ, Phoenix
PHUG (Phoenix Heath Users' Group)
C/O Will Summers P.O. Box 37783
Phoenix, AZ 85069
Group Size: 75
Contact Person: Will Summers, President
2nd Tues. at 7:00 p.m. at Phoenix HEC
Membership $5 initiation $12/year

AZ, Sierra Vista
HuacHUGa
1964 Viola Dr C/O Gerald King
Sierra Vista, AZ 85635
602 459-2119 Group Size: 25
Contact Person: Gerald King
Meet monthly at homes of members

AZ, Tucson
SUNHUG (Tucson HUG)
7109 E. Broadway
Tucson, AZ 85710
602 325-0096 Group Size: 40
Contact Person: Allan Anderson
Meet even months first Sunday 2:00 p.m. Tucson HEC
Meet odd months first Tues. 7:00

CA, Anaheim
ANAHUG (Anaheim HUG)
330 E. Ball Road
Anaheim, CA 92805
213 330-8118 Group Size: 103
Contact Person: Bob Chamberlain, Sec.
3rd Thursday 7:30 p.m. at HEC
BB 714 774-7860

CA, Campbell
San Jose HUG
2350 S. Bascom Avenue
Campbell, CA 95008
408 377-8472 Group Size: 70
Contact Person: Gerlene York, Sec.
Meet Ist and 3rd Wed. 7:00 p.m. HEC Campbell

CA, El Cerrito
ECHUG (El Cerrito HUG)
6000 Potrero Avenue
El Cerrito, CA 94530
415-236-8870
Contact Person: Alan Biocca
4th Wednesday at HEC

CA, El Monte
ETUG (ET/ETA 3400 Users Group)
11231 Oak Street
El Monte, CA 91731
Group Size: 100
Contact Person: Charles Van Dyke
Newsletter 4 times year

CA, Fresno
FresHUG (Fresno HUG)
4833 East Santa Ana
Fresno, CA 93726
209-291-6258 Group Size: 4
Contact Person: Harlen Collins

CA, Glendora
Southern CA H11 Users Group
430 W. Highland Avenue
Redlands, CA 92373
714-886-4766 Group Size: 40
Contact Person: Dr. M. J. DiGirolamo
Meets at 625 E. Palm, Glendora, CA

CA, Los Angeles
Los Angeles HUG
4469 E. Olympic Blvd
Los Angeles, CA 90023
213 248-1580 Group Size: 20
Contact Person: Doug Holser
1st Thursday 7:00 p.m. at HEC
BB 213 749-8442

CA, Los Angeles
LAETUG (Los Angeles ET3400 GP)
2309 S. Flower
Los Angeles, CA 90007
213 749-0261
Contact Person: Gilbert Murillo
Other contact Charlie at 213 443-2237
Contact for meeting time and place

CA, Monterey
Naval Pstgrd. Sch. Hobby Com. Clb.
Rec. Services Offices
Monterey, CA 93940
408 646-2466 Group Size: 65
Contact Person: Tex Moore, President

CA, Pomona
Pomona HUG
1555 N. Orange Grove Avenue
Pomona, CA 91767
714 985-5303 Group Size: 110
Contact Person: Herb Friedman, President
Meet 4th Thursday each month at 7:30 p.m. at HEC
BB 714 629-1943

CA, Redding
Redding Heath Users' Group
22526 Bridlewood Lane
Palo Cedro, CA 96073
916 547-3461 Group Size: 6
Contact Person: Dave Ballard
Meet monthly various locations

CA, Redwood City
BAHUG Bay Area HUG
2001 Middlefield Road
Redwood City, CA 94063
415-365-4915 Group Size: 219
Contact Person: Bob Bance, Sec.
2nd Tuesday 7:00 p.m. at HEC

CA, Riverside
Tri-HUG
5705 Via Sotelo
Riverside, CA 92506
714-683-2929 Group Size: 20
Contact Person: Kenny Adcock

CA, Sacramento
SHUG (Sacramento HUG)
1860 Fulton Avenue
Sacramento, CA 95825
916 662-7220 Group Size: 35
Contact Person: Gloria Stewart, Sec.
Meet 2nd Wed. 7:30 p.m. at Sacramento HEC

CA, San Diego
San Diego HUG
P. O. Box 33046
San Diego, CA 92103
619 588-0674 Group Size: 170
Contact Person: Al Brengle
Meet 1st Wed. 7:00 p.m. at Kearny
Mesa Rec. Ctr. Newsletter, monthly speaker

CA, Santa Maria
4168 Glenview Drive
Santa Maria, CA 93455
805 937-6938 Group Size: 18
Contact Person: Raymond S. Isenson
Meet 1st Mon. 7:00 p.m. at Vandenburg Air Force Base

CA, Visalia
Visalia HUG
29924 Road 168
Visalia, CA 93291
209 747-3235 Group Size: 3
Contact Person: Peter Shkabara
Meeting time and place not established yet

CA, Woodland Hills
LUVAHUG
22504 Ventura Blvd.
Woodland Hills, CA 91364
213 883-0531 Group Size: 40
Contact Person: Paul S. Townsend
2nd Thursday 7:00 p.m. at HEC

CO, Colorado Springs
CSHUG (Colorado Springs HUG)
Colorado Springs, CO 80906
303 632-3019 Group Size: 25
Contact Person: Richard Evers
Meet last Thurs. each month 7:00 p.m.
Have 24 hr. BB (303) 634-1158

CO, Denver
DENHUG (Denver HUG)
PO Box 449 Contract Station 22
Denver, CO 80221
303 426-7404 Group Size: 160
Contact Person: Bob Eson Sec/Treas
BB 303 423-3224 24hrs Support newsltr exchange
Meet 2nd Monday 7:00 p.m. at HEC

CO, Ft. Collins
FT.HUG (Fort HUG)
822 E. County Road 30
Ft. Collins, CO 80525
303 669-4116
Contact Person: Ted Benglen, II
Meet once a month at present

CT, Avon
CONNHUG (Connecticut HUG)
395 W. Main Street
Avon, CT 06001
203 589-3824 Group Size: 50+
Contact Person: Bob Conlon, President
1st Wednesday at 7:00 p.m. at HEC
BB 203 674-8915

CT, Mystic
Mystic ZDS/HUG
14 Holmes Street
Mystic, CT 06355
203 536-6953
Contact Person: Matthew H. Trask
Meet last Wed. 7:00 p.m. at 14 Holmes Mystic, CT

FL, Cocoa Beach
Brevard Heath Users' Group
680 Java Road
Cocoa Beach, FL 32931
305 783-6352 Group Size: 25
Contact Person: Gene E. Stillman
Meet last Sun. of each mo. at 7:00 p.m.
Meet at Patrick AFB, Comet Rec. Ctr.

FL, Fort Myers
SWFHUG (Southwest Florida HUG)
P.O. Box 05-37
Tice, FL 33905
813 334-6190 Group Size: 20
Contact Person: Robert Sloat
Meet 2nd & 4th Thurs. 7:30 p.m.
Meet at J. Hamilton Welch Academy

FL, Fort Walton
NWFHUG (NorthWest Florida HUG)
812 Cherokee Road
Eglin AFB, FL 32542
904 651-2108 Group Size: 30
Contact Person: George A Repasy, Pres.
Meetings 2nd Wed. at DATATEC Inc. 7 p.m.

FL, Jacksonville
JUG (Jacksonville Users Group)
8262 Arlington Expressway
Jacksonville, FL 32211
Group Size: 150
Contact Person: Harry Walker
Meet 1st Wed. at 7:00 p.m. at HEC Jacksonville
BB 904 725-4995 24 hrs

FL, Miami
Miami Amateur Computer Club
4705 W. 16th Avenue
Hialeah, FL 33012
305 823-2280 Group Size: 35
Contact Person: Emileo Crespo
Meet 2nd Thurs. each month 7:00 p.m. at HEC
BB (305) 823-2281

FL, Orlando
HUG of Central FL Computer Sc.
121 Talmeda Trail
Maitland, FL 32751
805 644-6848 Group Size: 11
Contact Person: Joseph Walker, Pres.
4th Wednesday at various locations

FL, Pensacola
221 E. Government
Pensacola, FL 32501
Contact Person: John Causey
Meet 2nd Tue. each month 7:00 p.m. at above address
Meet at Professional Business Sys.

FL, Plantation
PHUG Plantation HUG
7173 W. Broward Blvd.
Plantation, FL 33317
305 791-7300 Group Size: 20
Contact Person: Paul Price
Meet 2nd Tues. 7-9 p.m. at HEC
BB 305 791-7302 24 hrs. on H/Z100

FL, Tallahassee
Tally-HUG
C/O TACS
P. O. Box 6716
Tallahassee, FL 32314
904 562-1412 Group Size: 10
Contact Person: Bill Hill
Meet every 3rd Thurs. 7:00 p.m.
Godby High School, Bldg. 400 Rm. 10
BB in conjunction with TACS 904-386-2618

FL, Tampa
Al Lynch HUG
415 Shore Crest Drive
Tampa, FL 33609
813 253-0093 Group Size: 65
Contact Person: H. Glenn Tanner, Sec.
Meet 1st and 3rd Wed. 7:30 p.m. at Tampa HEC
Dues: $10.00 year

GA, Atlanta
HUG-GA (Georgia HUG)
2775 NE Expressway Apt. 0-3
Atlanta, GA 30345
404 325-8781 Group Size: 30
Contact Person: James Affuso
Meet 2nd Mon. at 7:00 p.m. at HEC
BB 404 252-4345 24 hrs.

GA, Augusta
CSRA Computer Club
P. O. Box 284
Augusta, GA 30903
803 648-3603 Group Size: 10
Contact Person: Dave Howard
Meet 4th Wed., location rotates
BB 803 279-5392

GA, Warner Robins
MGHUG Middle Georgia HUG
P.O. Box 92
Warner Robins, GA 31099
912 922-6470 Group Size: 30
Contact Person: Victor M. Felarca
Meet 3rd Tues. at Nola Brantley Public Library
Forming local CP/M Users' Group

HI, Hilo
BIHUG (Big Island HUG)
P. O. Box 4271
Hilo, HI 96720
808 959-8985 Group Size: 10
Contact Person: R.A. Curtis
Meet 1st Thurs. 7:00 p.m. at HELCO Conference Room
BB 808 961-4818

HI, Honolulu
HUGH (HUG Hawaii)
1255 Nuuanu Avenue #1405
Honolulu, HI 96817
808 531-8843 Group Size: 87
Contact Person: Jim Branchaud, Pres.
Meet 3rd Wed. 7:00 p.m. at Pearl City HEC
BB 808 487-8755

IA, Des Moines
DMA HUG (Des Moines Area HUG)
10275 NE 23rd Avenue
Mitchellville, IA 50169
515 266-2382 Group Size: 21
Contact Person: Harold Dykens
Meet third Mon. each month 7:00 p.m.

IL, Champaign
CCCC (Champaign Cty Comp Club)
C/O James Bartlett, Jr., 2109 Branch Road
Champaign, IL 61821
217 398-5956 Group Size: 110
Contact Person: James Bartlett Jr., Pres.
Meet 1st Wed. 7:30 p.m. at Urbana Civic Ctr.
24 hr. BB 217 359-9090

IL, Davis
NI-HUG Northern IL HUG
427 Lockwood Rt. 1
Davis, IL 61019
815 248-2241
Contact Person: Jim Isenhart
Just starting

IL, Downers Grove
I-HUG (Illinois HUG)
6116 Lane
Downers Grove, IL 60516
312 971-1660 Group Size: 15
Contact Person: Len Bateman
3rd Wednesday at various locations

IL, Downers Grove
HUG Metro (Local Chicago)
15 W. 780 Fillmore
Elmhurst, IL 60126
312 985-2381 Group Size: 30
Contact Person: Larry Shipinski, President
Meet 2nd Mon. of each mo. 7:30 p.m. at HEC

IL, Peoria
CIHUG (Central Illinois HUG)
2422 Willow
Pekin, IL 61554
309 347-3366 Group Size: 17
Contact Person: John Cole, Jr.
3rd Sun. at 3 p.m. (Jan, Mar, May, Jul, etc.)

IL, Springfield
217 753-5795
Contact Person: Bobby Wright
Club just forming

IN, Indianapolis
Indiana HUG (IHUG)
11425 Lakeshore Dr. West
Carmel, IN 46032
317 852-3530 Group Size: 75+
Contact Person: Charles C. Hillman, Jr.
Meet 2nd Wed. 7:30 p.m. at HEC

KS, Mission
MUG (Mission Users' Group)
5960 Lamar Avenue
Mission, KS 66202
913 649-0879 Group Size: 80+
Contact Person: Charles L. Bennett
Meet last Sun. of the mo. 2:00 p.m. at Mission HEC
BB 913 362-9583 and Newsletter

KS, Wichita
Wichita HUG
1909 Siefkin
Wichita, KS 67208
316 681-3456 Group Size: 18
Contact Person: David Horwitz
2nd Sun. of odd months 2:00 p.m. at E. Pike Bldg.
Corner of Webb and Kellog in Wichita

LA, Lafayette
ZUG (Zenith Users' Group)
318 W. St. Mary Blvd.
Lafayette, LA 70506
318 948-7804 Group Size: 40
Contact Person: Tommy Billiodeaux
Meet every other Tues. 6:00 p.m.
Meet at Zenith Computer Depot

LA, New Orleans
NOHUG
1900 Veterans Blvd.
Kenner, LA 70062
504 467-6321 Group Size: 60
Contact Person: Nathan Gifford
1st Wednesday at 7:30 p.m. at HEC

MA, Northampton
Hampshire Computer Club
37 Drewson Drive
Northampton, MA 01060
617 584-6227 Group Size: 80
Contact Person: George Scheurer
2nd Tuesday 7 p.m. at McConnel Hall Smith College
Beginners Group 1st Tuesday

MA, Peabody
HUG North Shore
6 Susan Drive
Saugus, MA 01906
617 233-2941 Group Size: 60
Contact Person: Hal Messinger, Pres.
BB 617-531-9332 24 hours
2nd Wednesday Hilltech Bldg Danvers

MA, Pittsfield
BerCHUG (Berkshire County HUG)
73 Waverly Street
Pittsfield, MA 01201
413 443-1862 Group Size: 12
Contact Person: Paul E. Ouellette, Pres.
Meeting place and time vary

MA, Wellesley
HUG'EM
165 Worcester Ave
Wellesley, MA 02181
617 237-1510 Group Size: 200
Contact Person: Malcolm Partridge, Director
3rd Wed. 7:00 p.m. at HEC
BB 617 237-1511 24 hrs.

MD, Baltimore
Baltimore HUG
6106 Marlora Road
Baltimore, MD 21239
301 323-6093 Group Size: 50
Contact Person: William Frey
2nd Mon. 7:00 p.m. at Park School - Old Court Road

MI, Ann Arbor
A-SQR-HUG
895 Starwick Drive
Ann Arbor, MI 48105
313 769-6052 Group Size: 15+
Contact Person: Leonard E Geisler
Meet last Thurs. 7-9:30 p.m. Jun-Aug Huron High Sch
Meet Sep.-May at Northside School

MI, Detroit
Metro Detroit Area HUG
7716 Winona
Allen Park, MI 48101
313 928-7423 Group Size: 50
Contact Person: Chuck Dattolo

MI, Kalamazoo
SMHUG (Southwest Michigan HUG)
623 Wildwood Place
Kalamazoo, MI 49008
616 349-3535 Group Size: 50
Contact Person: Al Jacobs, Sec./Treas.
4th Saturday 1 p.m. at Western Michigan Univ.
Moore Hall, Rm. 1034, Newsletter

MI, Saint Joseph
BLHUG (Blossomland HUG)
P.O. Box 414
Saint Joseph, MI 49085
616 983-0161 Group Size: 50
Contact Person: Vance Fisher, Chair Person
1st Tues. 7:00 p.m. at St Joe High Sch. Cmptr. Classrm
$15.00 dues/yr., Monthly Newsletter

MN, St. Paul-Minneapolis
SMUGH
5085 Fern Drive
Loretto, MN 55357
612 479-2127 Group Size: 150
Contact Person: Mary or Gene Hess
Meet last Sun. 2:00 p.m. at Falcon Hgts. Comm. Ctr.
BB 612 778-1213 7 p.m.-8 a.m.

MO, St. Louis
SLHUG (St. Louis HUG)
3794 McKelvey Road
Bridgeton, MO 63044
618 259-8113 Group Size: 120
Contact Person: Brad Pulaski, Treasurer
Meet 2nd Wed. 7:30 p.m. at HEC

NC, Charlotte
HUG Charlotte
2152 Malvern Road
Charlotte, NC 28207
704 375-1581 Group Size: 100
Contact Person: Jim Simpson
All types of computers, H/Z owners comprize 25%
Meet 1st Tues. 7:30 p.m.

NC, Fayetteville
Cape Fear Computer & HUG
2454 Vandemere Avenue
Fayetteville, NC 28304
919 485-4586 Group Size: 25
Contact Person: Jerry Mills, Pres.
Varies, monthly

NC, Glen Alpine
Western Piedmont HUG
Rt. 2, Box 371
Morganton, NC 28655
704 584-3684 Group Size: 10
Contact Person: Bill Poteat
Meeting time and place varies
Just getting started. Will have BB

NC, Hillsborough
HUG-RTP
Rt. 3, Box 39A
Hillsborough, NC 27278
919 73-6678
Contact Person: Joe Williams
Meeting place and time unknown

NE, Omaha
OMAHUG (Omaha HUG)
P. O. Box 777
Bellevue, NE 68005
Group Size: 85
Contact Person: Phil Evans, Pres.
3rd Sun. odd mos. 6:30 Bellevue W HS or Offutt AFB
Meet even mos. Amer. Red Cross 6:30 p.m.

NJ, Fairlawn
HUGNJ (HUG of New Jersey)
124 Mohawk Drive
Cranford, NJ 07016
201 791-6935 Group Size: 155
Contact Person: Mel Beiman
BB 201 791-6936 evenings
3rd Monday 8:00 p.m. at HEC

NJ, Ocean
SHUG (Shore HUG)
1013 State Hwy. 35
Ocean, NJ 07712
201 775-1231 Group Size: 71
Contact Person: James J. Jones, Jr., Sec.
Meet 1st Wed. 7:30 p.m. at Ocean HEC
BB 201 775-8705 24 hrs.

NM, Albuquerque
Albuquerque HUG
7205 Minuteman NE
Albuquerque, NM 87109
505 821-7393 Group Size: 25+
Contact Person: Jim Pomerleau
Meet 3rd Sun. at members homes

NY, APO New York
BWHUG (Bentwaters HUG)
PSC Box 3703 RAF Bentwaters
APO New York, NY 09755
Contact Person: Sgt. Rodney Jones

NY, Buffalo
BUG (Buffalo Users Group)
223 Clark Road
Kenmore, NY 14223
Group Size: 75
Contact Person: Bob Allen
Meet 3rd Sun. 1:30 p.m. at Amherst HEC

NY, Long Island
Jeri-HUG (Jericho HUG)
5 Helen Place
Glen Cove, NY 11542
516 676-5616 Group Size: 75
Contact Person: Alan Scott Dodge, Sec./Treas.
Meet 2nd Thurs. 8:00 p.m. Jericho Pub. Library
Monthly newsletter, software library

NY, North White Plains
North White Plains HUG
Elliott Ser. Co. 720 White Plns. Rd.
Scarsdale, NY 10583
Group Size: 50
Contact Person: Peter Abramson
Meet 2nd Tues. ea. mo. 7:30 p.m. at HEC

NY, Potsdam
CCT HUG (Clarkston College)
Woodstock Vlg Apt 3B24
Potsdam, NY 13676
315 268-6455 Group Size: 60
Contact Person: Marc A. Rubin
Meet monthly-call for date, time and place
Club just getting started

NY, Rochester
RHUG (Rochester HUG)
937 Jefferson Road
Rochester, NY 14623
716 424-2560 Group Size: 50+
Contact Person: RHUG Editor
Meet last Tues. each mo. 7:30 p.m. at HEC
BB 716 424-2576

NY, Schenectady
Schenectady HUG
C/O T. Budge 715 Sanders St.
Scotia, NY 12302
518 377-4273 Group Size: 20
Contact Person: Walter Whipple
Meet 3rd Wed. 7:30 p.m. at above address
BB 518 457-3803

OH, Cincinnati
Cincinnati HUG
10133 Springfield Pike
Woodlawn, OH 45215
513 771-8850 Group Size: 90
Contact Person: President
2nd Tues. 7:00 p.m. at HEC, $10.00 dues/year
Newsletter, 24 hr. BB 513 772-6190

OH, Cleveland
NOHUG (Northeastern Ohio HUG)
4705 Tanglewood Place
Lorain, OH 44053
216 282-4790 Group Size: 70
Contact Person: Art Petkosek
Meet 2nd & 4th Thurs. 7 p.m. at St. Gregorys Church

OH, Cleveland
Cleveland HUG
28100 Chagrin Blvd.
Cleveland, OH 44122
216 291-1612 Group Size: 10
Contact Person: Gerry Ciganko
First Thurs. 7:00 p.m. at HEC
BB 216 292-7553 24 hours

OH, Columbus
Columbus HUG
2500 Morse Road
Columbus, OH 43229
614 475-7200 Group Size: 25
Contact Person: President
Meet 2nd Mon. at HEC
BB 614 475-7201 after store hours

OH, Dayton
Wright-Patterson HUG
4110 Spruce Pine Court
Dayton, OH 45424
513 236-4915 Group Size: 75
Contact Person: Jim Moore, President
Meet 1st Thurs. 4:00 p.m.
Meet Bldg. 640 Rm. 121 W-P AFB

OH, Toledo
THUG (Toledo HUG)
48 S. Byrne Road
Toledo, OH 43615
419 729-4621 Group Size: 300
Contact Person: Ryck Zarich
Meet last Sun. of the mo. at 7:00 p.m. at HEC
BB 419 537-1888 24 hrs. also 729-4221

OK, Oklahoma City
OKC TUGS
C/O Bill Cadwallader P. O. Box 1171
Lawton, OK 73502
405 848-7593 Group Size: 40
Contact Person: Bob Perry
2nd Sunday at 1:00 p.m. at HEC
BBS 405-848-9329 24 hours

PA, Allentown
Lehigh Valley HUG
1425 N. Broad St
Allentown, PA 18104
215 770-5993
Contact Person: James Batug
2nd contact Carol Bloch 215 770-4640
Just getting started

PA, Frazer
FUG (Frazer Users Group)
1641 Princess Anne Drive
Lancaster, PA 17601
717 397-3146 Group Size: 80
Contact Person: Dave Hendrie, Pres.
1st Saturday 4:00 p.m. at Frazer HEC
BB 215 644-7661

PA, Harrisburg
CPaHUG (Cent Pennsylvania HUG)
7540 Mourningstar Dr. %E. Asper
Harrisburg, PA 17112
717 545-2764 Group Size: 7
Contact Person: Ernest E. Asper
Meeting time & place varies
Club just getting started

PA, Philadelphia
Philadelphia Heath Users'Group
6318 Roosevelt Blvd.
Philadelphia, PA 19149
215 288-0180 Group Size: 135
Contact Person: Henry F. Beechhold, Pres.
Meet 2nd Wed. each mo. 7:00 p.m. at HEC 8

PA, Pittsburgh
PittsburgHUG
3482 William Penn Highway
Pittsburgh, PA 15235
412 793-6781 Group Size: 35
Contact Person: John C. Schultz, Pres.
Meet 3rd Tues. at 7:00 p.m. at HEC
BB 412 824-3565 after store hours

RI, Warwick
HUG-FRI' (HUG of Rhode Island)
558 Greenwich Avenue
Warwick, RI 02886
401 738-5150 Group Size: 150
Contact Person: Leo Therrin/Dave Haskell
2nd Wednesday 8 p.m. at HEC

SD, Sioux Falls
Sioux Falls Area HUG
2001 S. Spring Avenue
Sioux Falls, SD 57105
605 336-8629 Group Size: 20
Contact Person: Lorin Dobson
Meet once a month on Sat. Time and place varies
BB 605 336-3935 M-F 3pm-12am

TN, Knoxville
ETCHUG East Tenn Central HUG
7608 Luscombe Dr.
Knoxville, TN 37919
615 690-3864 Group Size: 20
Contact Person: Walter M. Scott III
Meet 3rd Thurs. 7:30 p.m.
Meet at John XXIII Center

TN, Memphis
Memphis HUG
6874 Kirby Brooks Drive
Memphis, TN 38115
901 362-8860 Group Size: 16
Contact Person: Morris Proctor
Meet 2nd Tues. 7:00 p.m. at The Computer Center

TN, Nashville
Mi Te HUG (Middle Tenn HUG)
C/O Radio Ser. Ctr. 116 17th Ave. S
Nashville, TN 37203
615 242-0556
Contact Person: Charlie Wolf
Meet 2nd Mon. 6:30 p.m. at Radio Service Center

TX, Austin
AHUG Austin Heath Users Group
4206 Tamarack Trail
Austin, TX 78759
512 255-0376 Group Size: 40
Contact Person: George Koehler
Meet 1st Thurs. 8:00 p.m. Univ. of Texas
Meet at Robert Lee Moore Hall

TX, Dallas
DFW HUG (Dallas-Fort Worth)
2715 Ross Avenue
Dallas, TX 75201
214 826-4053 Group Size: 70
Contact Person: Henry Gardiner, Pres.
1st Thurs. and 15 days later (Wed.) at 7:30 p.m.
At HEC BB 214-742-1380

TX, El Paso
MOBHUG Mobile HUG
3636 Linden Lane
Mobile, AL 36608
205 344-5065 Group Size: 21
Contact Person: Bud Hobdy
Meet 3rd Sun. at 2p.m.
Just starting, new members welcome

TX, Ft. Worth
FWHUG
6825A Greenoakes Road
Ft. Worth, TX 76116
817 737-8822 Group Size: 40
Contact Person: Larry Lands
Meet fourth Thurs. 7:30 each month

TX, Houston
HUG-H
7798 Braniff
Houston, TX 77061
713 644-5689 Group Size: 75
Contact Person: Tom McCormick, Pres.

TX, Houston
NHHUG (North Houston HUG)
8110 Tattershall Circle
Humble, TX 77338
713 446-1787 Group Size: 50+
Contact Person: Paul Eustace
Meet 3rd Tues. 7:30 at HEC
2nd contact Mark Shafer 713 583-1163

TX, San Antonio
San Antonio (SAHUG)
7111 Blanco Road
San Antonio, TX 78216
512 341-8876 Group Size: 65
Contact Person: Tom Schneider
First Tuesday at HEC, 7:30 p.m.

TX, Wichita Falls
NORTEX HUG (N. Texas S. Okla)
2413 Kemp Blvd. in Office World
Wichita Falls, TX 76309
817 322-1007 Group Size: 24
Contact Person: Alan D. Martin
Meet third Sat. 9 a.m. at above address

UT, Castle Dale
Castle Mesa Computer Group
670 N. 90 E. Box 123
Castle Dale, UT 84513
801 381-5173 Group Size: 10
Contact Person: Doug Sorensen
Meet 3rd Thurs. 5:30 p.m. above address

UT, Midvale
UHUG (Utah HUG)
58 E. 7200 South
Midvale, UT 84047
801 262-8810 Group Size: 130
Contact Person: Wayne Newland
2nd Wednesday 7:00 p.m. at HEC
BB 801 566-4551

VA, Christiansburg
New River Valley HUG
C/O CCS Data Sta. 8 Roanoke St.
Christiansburg, VA 24073
703 382-4234 Group Size: 35
Contact Person: Ted Fleshman
Meet 1st Thurs. 7:30 p.m. Christiansburg High School

VA, Fairfax
CHUG (Capital HUG)
P. O. Box 2653
Fairfax, VA 22031
703 759-6176 Group Size: 600+
Contact Person: Mike Supley, Pres.
3rd Monday 7:30 p.m. at Fairfax H.S.
Large Software Library (150+ disks)

VA, Richmond
RHUG (Richmond HUG)
4302 Smithdeal Avenue
Richmond, VA 23225
804 231-6759 Group Size: 20+
Contact Person: Carlos Chafin
Meet 3rd Mon. 7:30 p.m.
Meet at Alpha Audio 2049 W. Broad

VA, Virginia Beach
THUG (Tidewater HUG)
1055 Independence Blvd.
Virginia Beach, VA 23455
804 467-4232 Group Size: 115
Contact Person: Skip Kelly
1st & 3rd Tues. 7:30 p.m. at HEC

WA, Bellevue
PNHUG Pacific-Northwest HUG
Bellevue, WA 98006
206 643-6651 Group Size: 250
Contact Person: Barry Dupler
Meet 2nd Thurs. odd mo. at Tukwila HEC
Meet 2nd Mon. even mo. at Seattle HEC
Both at 7 p.m. BB 206 682-5215

WA, Spokane
SPOHUG (Spokane HUG)
S. 3810 Havana
Spokane, WA 99204
509 448-9727 Group Size: 25
Contact Person: Charles Ballinger
Meet last Thurs. 7-9 p.m. at Acme Business Computers
BB 509 927-0367 24 hrs.

WA, Vancouver
Portland-Vancouver HUG
516 SE Chkalov Drive
Vancouver, WA 98663
206 254-4441 Group Size: 30
Contact Person: Dan Heims
1st Thursday at 7:30 p.m. at HEC
Portland OR and Vancouver Area

WA, Walla Walla
HUG/ZUG of Walla Walla
112 N. Division
Walla Walla, WA 99362
509 525-8404 Group Size: 8+
Contact Person: Pat Hanna
Meet 2nd & 4th Tues. 8p.m. at 112 N Division
2nd contact Pete Parcells 509 527-5267

WI, Madison
Madison Area HUG
3519 Tally Ho Lane
Shorewood Hills, WI 53705
608 233-4588 Group Size: 9
Contact Person: Thomas Gans
Meet 1st Wed. 7:30 p.m. at Wisconsin Union South

WI, Milwaukee
MHUG Milwaukee Heath Users Gp.
9040 N. Lake Drive
Milwaukee, WI 53217
414 352-3346 Group Size: 65
Contact Person: Marvin Olson, Treas.
Meet 3rd Sat 2:00 p.m. at Milw. Sch. of Eng. Rm. L-100
BB 414 873-7564 6:00pm-6:00am

WI, Mosinee
CWHUG-Central Wisconsin HUG
2294 CTH DB
Mosinee, WI 54455
715 693-3429 Group Size: 10
Contact Person: Edward Ignace Porwit
Meet last Sun. 3:00 p.m. in Ed's livingroom
BB coming soon

CANADA, Calgary, ALBERTA
HUG (Heath Users of Canada)
101 5809 Macleod Trail South
Calgary, Alberta T2H 0J9 CANADA
403-252-2688
Contact Person: Gary Selman

CANADA, Ottawa, ONTARIO
HUG FO' (HUG Ottawa)
866 Merivale Road
Ottawa, ONTARIO K1Z 5Z6 CANADA
613-728-3731 Group Size: 30
Contact Person: Brian Fultz, Pres.
2nd Wednesday 8:00 p.m. at HEC

CANADA, Toronto, ONTARIO
THUG (Toronto HUG)
1480 Dundas Street E.
Mississauga, ONT. CANADA L4X 2R7
416 273-3797 Group Size: 25
Contact Person: Bill Smith

CANADA, Vancouver BC
VANHUG (Vancouver HUG)
3058 Kingsway Attn. Robert Hudak
Vancouver BC, CANADA V5R 5I7
604 437-7626 Group Size: 50+
Contact Person: Robert J. Hudak
Meet last Tues. 7:30 p.m. at HEC

CANADA, Vancouver, BC
Vancouver Island HUG
2022 Douglas St.
Victoria, BC CANADA V8T 4L1
604 384-4711
Contact Person: Greg Greene, Pres.
Meet each month at Excalibur Systems Ltd.
For further info call above number

HOLLAND, Apeldorn
Dutch HUG
Hofstraat 30
7311 KW Apeldorn HOLLAND
Group Size: 70
Contact Person: Evert Jan Stokking

HONG KONG
Compudragon
273 Prince Edward Road
11/C Kowloon, HONG KONG
3-711-8904
Contact Person: K. T. Lee
Club just organizing

NETHERLANDS
Dutch Heath Users' Group
NIEUWE KERKHOF 16
9712 PV Groningen, NETHERLANDS
050-180203 Group Size: 107
Contact Person: Evert Jan Stokking
Meet quarterly at Amersfoort

NEW ZEALAND
HUG New Zealand
94 Dowse Dr
Maungaraki, Lower Hutt, NEW ZEALAND
695-924 Group Size: 1
Contact Person: Mr. R. Siebers
Would appreciate New Zlnd REMark readers contact
Eager to expand group

OKINAWA
OKIHUG (Okinawa Users Group)
C/O Carl Eaton Box 376 USAFSO
APO San Francisco, CA 96331
Group Size: 22
Contact Person: Carl H. Eaton
Meet one Friday month at 7:00 p.m.
Meeting place varies

PANAMA CANAL
Canal HUG
P.O. Box 1112
APO Miami, FL 34001
84-4094 Group Size: 6
Contact Person: Michael Gulick, Pres.
1st Tuesday 7:30 p.m. at Howard Air Force Base

PUERTO RICO, Rosario
PRHUG (Puerto Rico HUG)
Calle La Paz #706, Miramar
Santurce, PR 00907
809 725-1612 Group Size: 21
Contact Person: Joseph Gonzalez
Meet 2nd Sunday of odd numbered months

FRANCE, Paris
GUFIH Groupe des Utilisateurs Francophones d'Informatique
Heath-Zenith 34
Boulevard Saint-Jacques 75014
Paris
1-336-39-68 Group Size: 300
Contact: Dr. Bernard Pidoux
Meet every Wed. at above address
Computerized BB (1) 336-32-02
Weekly newsletter

W. GERMANY, Frankfurt
Frankfurt HUG
American Consulate General FRDCO
APO NY, NY 09757
566187 Group Size: 3
Contact Person: Carl Lovett

W. GERMANY, Sprendlingen
HUG-Deutschland
Robert-Bosch-Strasse 32-38
D-6072 Dreieich W. GERMANY
06103-34037 Group Size: 200
Contact Person: Lydia Luguet

West Germany
BAHUG Bad Aibling HUG
C/O Louis J. DeMichele
Unit AA Box 561
APO NY 09098
Phone: 08061-4519/6340 (W. Germany)
Contact Person: Louis J. DeMichele
Group Size: 10

WI, Madison
UWHUG (Univ. of WI HUG)
109 N. Few
Madison, WI 53703
608 257-0373 Group Size: 30
Contact: Walter Burt
Meet 1st Wed. every mo. 7:30 p.m. at Union
South, Univ. of Wis.-Madison
Group newly formed in December, 1983

Interested In Starting a Local Heath/Zenith Users' Group?

Read on for some more helpful hints....

Many HUG members have been writing requesting that we give some kind of help or ideas when they start to organize a local HUG. With the helpful ideas of Bill Johnson, former President of the Capitol Users' Group as presented at the National Heath/Zenith Users' Group Conference, and questions we have received; the National HUG has the following suggestions.

What you are about to do is form a local independent group for the purpose of sharing your Heath/Zenith computer experiences. Your group will have no formal ties with the National Heath/Zenith Users' Group. The National Heath/Zenith Users' Group exists to provide the Heath/Zenith computer user with a point of help, information, and access to other users' experiences and programs through the REMark magazine.

We can only offer suggestions and tell you what you can or cannot do with programs from our library. If you have questions regarding policy that effects the Heath/Zenith company, we are here to help you find the answer.

Local groups around the country function differently depending on what their membership wants - and that is what you have to determine; what will your group want from their local club? What do they want enough to do it? If your goals are for more than the individual members of the group are willing to work for, it won't succeed. So please, be realistic.

Suggestions For NEW Local Heath/Zenith Users' Groups

1. Don't get too formal too soon. Give yourselves a chance to get to know each other before you start electing officers other than temporary ones. Make your temporary officers in charge for 3-4 months. By then you will have a better idea of who will make good officers and your temporary officers will know if they can handle the load.

2. Your purpose is to provide each other with support, but that is limited to reasonable services. If you try to do too much for each other, the group will exhaust itself. Exchange information, have educational programs, workshops, and classes.

3. Reasonable services include a library, group purchases, some service to machines, and some consultation.

4. Library — it is possible to contact other HUG groups (groups listed in this issue of REMark) to help you start your library. However, try to get your members to build most of it. Beware of copyrighted materials and problems in distributing it. Contact a local lawyer to help you.

5. Group purchases — if you are small, go together with other groups to make group purchases advantageous to your group.

6. Service and consultation — don't encourage your members to 'hog' your experts time and talents, it's a sure way to lose that talent.

7. Distribute the work load as much as possible. There are lots of things non-technical people can do, all the little things that make a group work well, that don't take an expert to accomplish. And maybe they can help the technical people and develop their skills.

8. Newsletter — don't feel bashful about 'borrowing' from other newsletters, but do give them the credit. It probably wouldn't hurt to get their permission first. Get on their mailing lists, it won't cost much. Your newsletter can be monthly, bimonthly, or quarterly.

9. You do need a person to act as a sounding board. Someone to be contacted about problems, who has a knowledge of where to send the problem for help.

10. Check with a local attorney for help with all the legalities — tax status, insurance to protect yourselves against copyright problems, etc.

11. Programs — what do the members want to learn about? Local suppliers are very often happy to come and discuss their products and how they work. Local companies and universities often have someone who can help your group learn something the group is interested in. Also, many vendors travel around the country, contact them, they may be willing to talk to your group when they are in the area.

12. Try to meet at the same time and place each month, it is easier to remember. Also consider name tags, it is easier for new people to get to know you that way.

13. Have a central Post Office box or address for club mail.

14. Keep business matters to a minimum at club meetings. Save these things for board or committee meetings. Nothing kills a group more than all business, and learning nothing during or after the meeting.

H/Z Compatible Disk Drives & Formats

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Sheboygan, WI 53081

I have been finding myself spending lots of time answering individual letters and requests for information on the Heath/Zenith compatible disk drives and associated formats. I am going to address this subject in this general purpose article to hand out as requests warrant. Please excuse the informality of this.

To conserve space, please note the following standard abbreviations:

SS: Single Sided	DS: Double Sided
SD: Single Density	DD: Double Density
ST: Single Track (48 TPI)	DT: Double Track (96 TPI)
TPI: Tracks Per Inch	DOS: Disk Operating System

Introduction

In the beginning was the Heath H8 computer complete with front panel and cassette tape interface. This was a good low cost entry into the computer world, and at that time, the only 'mass storage' available. Some disadvantages of cassette storage are unreliability, slow operation and serial access, to name a few.

Heath then introduced their H17 disk controller board standard with single H17 drive (5" SS ST SD), but expandable to another drive. Along with this came the Heath Disk Operating System (HDOS) software to allow the H8 to work with the disk drives. Although we now tend to take disk drives for granted, anyone who went from cassette to disk drive was probably amazed, excited, speechless and dumfounded for a time. Now that drives are standard and most computerists start their first system with a drive, they don't know what the old world was like.

Disk Drive Background

What exactly is a disk drive? It is an auxiliary electro-mechanical storage device with random access capabilities. A cassette tape must serially access the tape to get to a certain point. It cannot jump to different sections instantly for data storage and retrieval. A disk drive on the other hand, contains a movable head(s) on an arm that can rapidly access any part (track) of a magnetic floppy diskette and either read or write to it. Since the diskette 'directory' knows where everything is, under computer control any data can be rapidly accessed for both reading and writing (providing the diskette is write enabled). The diskette rotates at a precise and constant speed (300 RPM for 5" drives and 360 RPM for 8" drives), thus digital information is written and read in circular patterns (called tracks) depending on where the head is positioned at that instant. Think of this as a phonograph, where the rotating record is the magnetic floppy disk and the needle is the head. A few major differences are 1) whereas the phonograph is read only (playback), the drive is read and write (R/W); 2) the record pickup is a mechanical vibration sensor whereas the drive works off magnetic principals similar to a tape recorder; 3) the record has actual 'grooves' which can be compared to the drives invisible circular tracks. If you look at the disk, you can't actually see the tracks, but the precise head alignment can exactly center on them. Timing and synchronization is very critical to proper operation of disk drives, but that's the job of the DOS programmer and the hardware people who design the drives and controller cards, and beyond the scope of the information to be presented here.

Obviously, a **double sided** drive (two heads) can store twice the amount of information a single sided drive can, and a **double track** drive can store twice the amount of information a single track drive can. When speaking of the tracks, ST which is also known as 48 TPI holds 48 distinct and individual tracks within a one inch travel of the head. In practice, however, an entire inch is not used, thus you end up with 40 usable tracks. Likewise, in a DT or 96 TPI drive, you get exactly twice the number of tracks, the usable number being 80 tracks. The tracks available are both a function of the drive type and the software, working together. The DT drives use the same space as the ST drives, but place an additional track between each standard 'single track'. Because the tracks are squeezed close together, reliability can suffer, but again, this is beyond the scope of this article. Double density is a different story. Most disk drives can be used for either single or double density. The double or single density operation is more the function of the controller card being used and not the drive.

Heath Drives & Formats

Now we finally get past the introduction and into the actual issue. The standard Heath format that first came out for the H8 was called H17, which was 5" SS, ST, SD hard sector. The H17 disk drive controller is a single density hard sector controller. I won't go much into sectoring here, suffice it to say the hard sector H17 formats require diskettes sold as 10-hole hard sector, where double density controller cards use single hole soft sector disks. The H17 yielded about 100K of storage on one diskette, which was ample in the beginning - but then so was 16K memory! It wasn't long before more storage was needed and they added another drive so the system could access 200K, plus now have the benefit of 'copying' diskettes (or programs, software, etc.) back and forth very easily.

Well, that storage soon became insufficient for many people, especially those running business type software, and the cry for more storage space was echoed far and wide in the Heath/Zenith

world. CP/M then became available, thus more business software became available along with more software requiring high density drives. Heath had not yet released a soft sector double density controller. Everybody said more storage was not possible without going to great expense and a different controller card (soft sectored double density) which was not to appear until much later. Meanwhile we, (Quikdata, Inc.) were not satisfied that it could not be done, and we made the proper connections with Dean Gibson of UltiMeth Corp. who developed the necessary HDOS drivers (not possible until HDOS 2.0 came out with it's independent SY disk driver), Ray Livingston of Livingston Logic Labs who developed the necessary CP/M BIOS modifications, and Tandon for supplying disk drives of different varieties. We pioneered the project and marketed the new hardware and software - others were soon to pick up on our idea and the 400K systems soon flooded the H/Z users. This now allowed the same single density hard sector controller to be able to use anything up to double sided and double track drives for up to 400K storage on one drive (TM-100-4 variety).

Since this is the most frequent question asked, I'll dwell on the 400K subject a bit. The hardware did not need to be changed at all, and although not generally recommended, the same diskettes being used presently could still be used for these drives. This meant adding a different drive to the system, which was very low cost considering the storage space it gave, and adding the driver software modifications was all that one needed to do to benefit from our project. For the H89, it is simply a matter of plugging in the extra drive(s), setting up the driver software and presto - more storage. For the H8, it requires the optional org-0 card or the Z80 CPU card, both of which gave the needed side select signal that was previously missing in the H8. We thought we'd sell a few of these software/hardware packages, but it exploded beyond our wildest dreams, to the point where we sold thousands of drives (but only hundreds of software packages since piracy became a way of life with many). This 400K format indeed became the 'standard' of the industry for high capacity hard sector drives. Just as a word of mention, the 400K drives can read a diskette created on the 100K type drives (SS, ST), but not write that format.

Heath finally developed the H37 soft sector double density controller card for the H89, and later for the H8 (requires a Z80 CPU). This gave more storage on the 5" floppy drives, about 160K on an SS ST, to about 640K on a DS DT drive. You'd expect double density to be able to store double that of the single density formats, however, more overhead is required on the diskette for soft sector operation, thus you loose some space. The hard sector single density was compatible between H8 and H89, and the soft sector double density was also compatible between H8 and H89. However, under no circumstances can a 10 hole hard sector disk be read in a soft sector environment. Although we now had more storage, many incompatible formats became a problem. Under the soft sector double density, you could also place a 48 TPI disk in a 96 TPI drive and read it, but again, not write to it.

Meanwhile, H/Z developed the H47 drives for the H8 and H89 which were 8" soft sector formats giving about 980K under CP/M and 1.2 megabytes under HDOS. The reliability of the Remex drives in the H47 proved this to be a very expensive bombshell, about as reliable as the H10 paper tape I/O mass storage device for the H8; both had about the same short lived life.

Coming to the rescue were both Magnolia MicroSystems and CDR, who developed double density controller cards which would handle both 5" and 8" drives, but unfortunately for many, made only for the H89. This opened a new world for 8" storage that would give standard 8" CP/M compatibility (SS SD) and standard H/Z H47 formats, along with 5" support of many formats including H37. The Magnolia card, for instance, comes with their own very powerful full blown CP/M, and will support four 5" drives and four 8" drives in any varieties and formats, along with the ability to still talk to the H17 hard sector controller, for a total of 11 drive support.

Enter Z100 line of computers using the Tandon TM-100-2 drives, which are double sided, single track drives operated in H37 compatible double density format, thus there is a compatibility between CP/M files and H8, H89 and Z100 soft sector 48 TPI DS formats.

There's more to mention such as transfer speed, but that again is beyond the scope if this article. Briefly, double density transfer rate is twice as fast as single density on 5" drives, and 8" transfer speed is again double the DD five inch drives. Winchesters are much faster yet.

Which way to go? Depends on what you have in mind for your present use and what you plan for future use. If you really need storage, there's also Winchester drives - we market several units. H/Z has the old technology, but reliable H67 which includes an H47 compatible 8" drive. Magnolia has several Winchesters out, and there is a 10 meg unit available for the Z100 computers. Take your pick.

Summary Information

Controller Type	Drive	HDOS	CP/M
H17 Hard Sector	SS ST SD	100K	90K
H17 Hard Sector	DS ST SD	200K	180K
H17 Hard Sector	DS DT SD	400K	388K
H37 Soft Sector	SS ST DD	165K	160K
H37 Soft Sector	DS ST DD	330K	320K
H37 Soft Sector	DS DT DD	660K	640K
MMS Soft Sector	DS DT DD	660K	720K
8" Soft	SS ST SD	256K	256K
8" H47 Soft	DS ST DD	1.0M	980K
8" MMS Soft	DS ST DD	1.0M	1.2M

Note: 8" drives do not come in double track format - yet!
All size values only approximate.

Microcomputer Diskette Control

T. McCormick

(Note: The following material was taken from The Capital Heath Users' Group Inc. Newsletter, CHUG, P. O. Box 2652, Fairfax, VA 22031)

Control of computer libraries is well developed in large computer operations. Only tiny operations can get by without specific rules for naming programs and data files, segregating test files from production, indicating as-of dates, etc.

With the rapid growth of microcomputer use, and with the continual improvement in disk storage capacity per dollar, many business and hobby users are discovering that with no library plan, too much time and effort is wasted looking for the right version, starting to run the wrong version...again, etc.

It is possible to acquire and store more files and programs than you can manage without some library system.

Micro operating systems, editors, and utilities offer an occasional assist in one way or another such as creating .BAK backup file copies automatically. But the user is left to put his library control scheme together by himself. He often lacks the experience which comes from years of grappling with these problems, and is forced to discover solutions one at a time. This results in a weak start, and continual change.

I have made many mistakes related to computer libraries, and have seen many others. As computer center manager for a nationwide accounting firm, we were working daily with files from all kinds of outside program libraries. I would like to pass on a few suggestions based on my experience with about 300 computer libraries over an eleven year period.

The following is not intended as an exact prescription for you, you will have to decide what fits, and what does not. I'll use my library control methods as an example, knowing that you will have to adapt it to your circumstances.

Here is a summary of important rules:

1. Never alter a "distribution" diskette in any way. A distribution diskette is one you receive from someone else, and for which you usually have paid money. You may have to send it back to get a new release at the "update" price rather than buy another license! You may not be able to read it next year and you want a fresh copy at nominal charge. You may want to get a bug fixed at no charge. DO NOT change anything on this diskette.

N O T H I N G.

2. A program that is one bit, one byte, or one statement different from another MUST have a different name. There is no such thing as "same as..., except". Resist the temptation to leave the names the same when they are "only slightly" different. Subtle differences are hard to sort out six months later! Subtle differences may be much harder to find than large differences or gross errors.

3. Follow your system rigidly.

4. Label things immediately, while they are fresh in your mind. Little peel-off dots and labels are inexpensive, and easy to use. Office supply stores have a rainbow assortment (Avery is one of the brand names) and they are cheap. Color coding can segregate test from permanent files, release 2 from release 3, etc., without any writing.

5. Begin library control at once. It gets harder geometrically as you acquire more stuff.

6. When you initialize/format a diskette, place a small peel-off label (I use one-inch dots) on it indicating the operating system version you used, date, and density or format if you have more than one. Eventually, you will have more than one.

7. Specifically label backup copies, and write-protect them. Store them separately from daily-use diskettes. Store them inside, where the humidity and temperature are fairly constant. Exchange backup storage with another user, if you can. Do not store diskettes or cassettes in your car trunk!

Why bother with backup? Have you ever entered:

```
A>ERA *.*    instead of    A>ERA B:*.*
```

or

```
A>PIP A:=B:*.*(V)    instead of    A>PIP B:=A:*.*(V)
```

HUMMMMM? You say you're not that stupid??? O.K.

8. Establish categories, and label your diskettes accordingly. For example, Proprietary software such as MBASIC, CP/M, etc. could be replaced by a dealer. Your modifications, and custom programs could not. They should be protected to a greater degree.

9. Never keep all your backup in one place. Two suitcases ten miles apart are more secure than one bomb-proof vault. Remember, with all the electrical equipment in one computer room, a small fire could destroy a lot of diskettes in a hurry. Bet you've got them stored close by so they'll be nice and handy too!

10. I recognize three flavors of diskettes:

a) never used,
b) initialized/formatted, not used, and
c)in use, contains one or more files.

Come up with a scheme to indicate each of these. I do not put a peel-off file label on never-used diskettes. If I see a diskette with no peel-off label at all, I know it has not been initialized/formatted. When I initialize/format a diskette, I place a one-inch colored dot on it indicating the operating system version, today's date, and the recording format/density with which it was initialized/formatted. Such diskettes have a directory, but do not have any files. Every diskette of mine which contains a file has a large peel-off label indicating the name(s), or something else indicative such as "SYSTEM", "WORK", "MBASIC", etc.

FREE CP/M-Plus™

from MAGNOLIA MICROSYSTEMS

New Reduced Prices

Prices effective 1/1/84

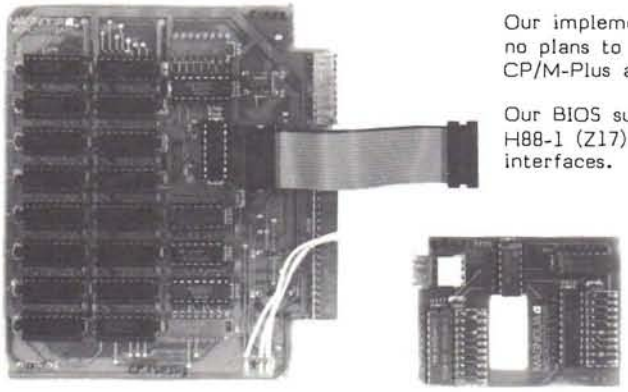
With purchase of 128K RAM Board at ~~$595~~ Now $495

Digital Research's list price for CP/M-Plus is $350, but it will be included AT NO EXTRA CHARGE with purchase of our 77318 128K RAM board

CP/M-Plus™ support is available for Z89 and Z90 computers with our 128K RAM board and either the Z89-37 (Z90) or our own 77316 Double Density disk controller. Over 700K of files are included, so it will not be distributed on Hard Sectored media.

Using banked RAM, disk performance is enhanced through Hashed Directory tables, Directory Buffers, and LRU Data Buffers.

New utilities and features include a 'Help' command; optional Password protection and Time and Date Stamping of files; Console Redirection to or from disk files; and many others.



Our implementation of CP/M-Plus REQUIRES the use of our 128K RAM board. We have no plans to implement an un-banked memory version, most of the advantages of CP/M-Plus are neither available (nor practical) in an un-banked version.

Our BIOS supports both our 77316 and Zenith's Z89-37 Double Density controllers, Heath's H88-1 (Z17) Single Density controller, and our 77314 CORVUS and 77320 SASI-bus interfaces.

We are including the SOURCE code for our BIOS, together with Digital Research's MAC, RMAC, LINK, and SID software development tools, you may customize it to your specific application.

Orders must specify the Double Density controller and boot drive: the Z89-37 (as used in the Z90) or our 77316 (5-inch or 8-inch).

Earlier purchasers of the 128K RAM board, who are registered owners of Magnolia Microsystems CP/M 2 (S/N 2-175-xxxx) can update to CP/M-Plus for $100 (plus shipping and handling).

DISK INPUT/OUTPUT (I/O) BOARDS

These boards are made available apart from our subsystems for use by 'Systems Integrators'. End-users should carefully consider their skills and desired level of involvement before undertaking this responsibility; purchasing a complete subsystem from a qualified integrator may be a wise choice.

Although similar in name and apparent function, these boards fall into two distinct classes:

- INTERFACE boards connect a disk subsystem (containing a controller) to the computer. These boards include the Z89-47 and Z89-67 and our 77314, 77317, and 77320 interfaces.
- CONTROLLER boards actually control a plain disk drive. These boards include the H88-1 (Z17) and Z89-37, and our 77316 Double Density Controller.

All Magnolia I/O boards use proprietary techniques to expand the 89's I/O addresses, allowing use of more than Zenith's 5 (3 serial ports, 2 disk controllers). Since our INTERFACE boards also contain 3 RS232 ports (replacing the machine's H88-3) allowing expansion of the I/O capability without using an additional card slot.

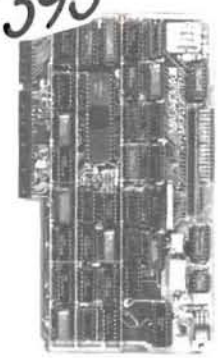
Each Magnolia I/O board package includes:

- The disk I/O board itself
- A new I/O decoder PROM
- A new Monitor EPROM
- A copy of MMS CP/M 2.2

Magnolia's CP/M software supports over 20 soft-sectored media formats, including all existing Zenith formats.

Double Density Disk Controller
order number 77316

$395 ~~$495~~

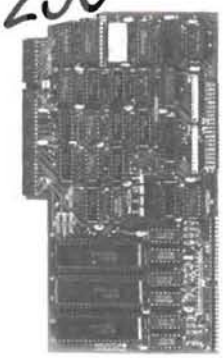


This board adds complete hardware and software support for four 8" single- or double-sided AND four 5" SS or DS, 48- or 96-track-per-inch (40- or 80- track) drives, at both single and double recording densities.

This controller is compatible with 8" drives by Shugart, Qume, and Tandon; 5" drives by Siemens, Tandon, and MPI; and most other 'industry standard' drives (possibly depending on the skill level of the experienced 'Systems Integrator').

SASI-bus Winchester Interface
order number 77320

$250 ~~$350~~



This board (functionally replacing the Z89-67 interface) contains 3 RS232 ports and can support up to 8 SASI-bus disk controllers, with up to 4 drives on each!

It is compatible with Winchester controlers by Xebec, DTC, Shugart, and others, as well as Zenith's Z67. CP/M software support for popular controller/drive combinations is included.

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What Can You Do With Only One Disk Drive?

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Many times since becoming a Heath User, I have been asked by one of the local HUG members, "What can you possibly do with only one disk drive?". The answer is a lot more than you might think. The basic H/Z-89 "all-in-one" microcomputer in its simplist configuration can do a lot of things, some which are supposed to require two or more drives. Before getting into nuts and bolts, let me begin with a little background.

My work involves time sharing use of a network of medium size mainframe computers. Many of my professional associates have personal computers, but my interest was first tweaked by an old friend who acquired a used micro. This first generation device used an audio recorder and worked, it seemed, at its own whim. We spent many hours pounding in programs and debugging. Sometimes the files we tried to save could be reloaded and sometimes they were lost. It was frustrating, but the bug had bitten. I began reading the adds in computer magazines.

Most of the lower priced machines looked like toys compared to the professional terminals at the office. The units with full 80 column displays, disk drives, and quality keyboards were priced out of reach. Some machines appeared to be excellent for games, and others more suited to word processing and home management. I shopped for several months and decided on about four different machines. I was in the process of negotiating for delivery of a new Super Blaster 64 with a casette deck, when a Heathkit catalog arrived. The local Heathkit Center was having a sale, and the prices looked inviting. I am familiar with Heathkit products, having several in my ham shack. This is where the story begins.

The H-89 came with my choice of any two software packages. Naturally, I ordered two of the most expensive with the kit and purchased the comparatively cheaper CP/M operating system separately. Two weeks after taking delivery, I was all set to get started with CP/M, Compiler BASIC, and Magic Wand. The first thing I discovered was a disease called "Diskus Swapicus" or single drive elbow. More on this later. Secondly, according to the Microsoft Compiler BASIC Users Manual, a two drive system was required. I decided to see if I could get it to work on my one drive system.

Study of the manual revealed no reason why BASCOM could not be used on a single drive system. I found that several of the files on the distribution disks were not essential for everyday use. Two disks are needed (not two drives). The first disk should be bootable and should have BASCOM.COM, PIP.COM, and ED.COM. Other editors and copy programs can be used, but they must not require much disk space. Disk II, also bootable, should contain BASLIB.REL and L80.COM. With these files, Disk I will have 39k bytes free, and Disk II will have 28k. Source files are edited and compiled on Disk I, and then copied to Disk II where they are linked.

As an example, lets compile and run the PI.BAS program provided on the distribution disks. Copy PI.BAS to Disk I, then enter the command

A>BASCOM =PI <cr>.

This will generate a compiled relocatable file PI.REL on Disk I. An alternate form of the command is

A>BASCOM <cr> ,

a ready character, * , will appear, then enter

*=PI <cr>.

This has the same effect as the shorter command above. Neither of these commands will produce a listfile, PI.PRN, on Disk I. The listfile resembles an Assembly Language program corresponding to the compiled BASIC, and can be quite long. Even with 39k bytes free, large programs will not compile unless the listfile is omitted. The listfile can be produced if the program is small enough for it to fit, or it may be sent to a printer instead of to disk. The more general form of the compile command is

*RELFILENAME,LISTFILE,=SOURCEFILE <cr>.

Use Disk II to link the relocatable file. The BASLIB.REL file must be present while linking. BASCOM uses many calls from this library even if your source program doesn't call any special functions. The command to link is

A>L80 RELFILENAME,BASLIB/S,COMFILENAME/N/E <cr>.

The switches, /S, /N, and /E cause the L80 program to search BASLIB for the necessary routines, name the output file COMFILENAME.COM, and then exit to CP/M. For our example, copy the PI.REL relocatable file to Disk II, and then the command would be:

A>L80 PI,BASLIB/S,PI/N/E <cr>.

Some programs can be too long for this technique. The linked file will be too large for the available space on Disk II. In this case, simply use the logical drives B: and C:. For example, the command

A>L80 B:PI,A:BASLIB/S,C:PI/N/E <cr> ,

can be used with logical disk B: containing the PI.REL file, and the resulting PI.COM file being written to logical disk C:. CP/M will prompt for disk swaps as they are needed. Several other procedures will also work. This looks more difficult than it really is, with a little practice compiler BASIC on a single drive system works quite nicely.

The Heathkit Catalog indicates that a two drive system is necessary for Microsoft's FORTRAN. One of the members of the local HUG has the F80 compiler. I was telling him of my experience with BASCOM and he consented to let me try single drive FORTRAN on his system. It took only a few minutes to disconnect his external drives and configur a bootable single drive system disk. After my experience with BASCOM, the rest was easy. We put an editor, PIP, and the compiler, F80, on one disk and the library, FORLIB.REL, and linker, L80, on the other. The FORTRAN files are even a bit smaller than their BASIC counterparts. A PI.FOR program is included with the FORTRAN compiler. This is similar to the PI.BAS provided with

BASCOM. This program provided our first test example. After copying PI.FOR to Disk I, the command

A>F80 =PI <cr>

loads the compiler and compiles PI.FOR. The compiled relocatable file is again called PI.REL. The longer command sequence is

A>F80 <cr> ,

at the ready character, * , type the command

*RELFILENAME,LISTFILENAME=SOURCEFILENAME <cr> .

Again, it may be necessary to omit the listfile or send it to the printer. The linker appears to be the same as the one included with BASCOM. The link procedure is the same except that the FORLIB should be used instead of BASLIB. The command is

A>L80 RELFILENAME,FORLIB/S,COMFILENAME/N/E <cr> .

An obvious comparison can be made concerning the relative speed of execution of the two PI.COM files. The FORTRAN holds a slight edge with an execution time of about 40 seconds, while the compiled BASIC program took just over 48 seconds on my system. Bear in mind that the programs were run on different machines, and the time required to load the programs from disk and to warm boot afterwards is included. I later learned that the PI.BAS program runs under MBASIC in about 42 seconds, not including the time required to load the program.

I decided to do another speed comparison. A series of articles in REMark ("A Kiss for Assembly Language Programming," REMark, Vol. 15-18) presented an assembly language program which rings the console bell five times. The program executes a timing loop between each beep by counting from 255 to 0, 256 times. We wrote a similar FORTRAN program which printed an X after each timing loop. The timing loop in the Assembly Language program takes 0.48 seconds. The FORTRAN took 2.2 seconds. I wrote a similar program in BASIC with declared integer indices. After compiling, this program executed with the timing loop requiring 3.9 seconds.

Another high level language useable on the single drive H-89 is JRT System's PASCAL. This PASCAL is an unbelievable value for the price. There are some interesting features including an automatic search of all logged-in disks for any external procedures called by an executing program. Again, two bootable disks are needed. The first contains the compiler JRTPAS2.COM and several other files essential to the compile process. These include PASCAL.LIB and PASCAL0.INT - PASCAL4.INT. These files on a bootable hard sectored disk occupy all but 8k of the available space. The second disk includes an editor, a file transfer utility, the run time monitor, EXEC.COM, and the library file, PASCAL.LIB. With PIP and ED this disk will have 36k bytes of free storage. The JRTPAS2 compiler produces an intermediate code which is then interpreted by the EXEC.COM program during execution. For short programs, the procedure is to edit the source program on Disk II, copy it to Disk I, compile it, and then execute. The command to compile is

A>JRTPAS2 PROGRAM <cr> ,

where the default source file extension is ".PAS". The intermediate files are about the same size as the source files and will have the same root name with default extensions of ".INT". Some programs can exceed the available space on Disk I. In this case, it is possible to make use of the logical drives available under CP/M. For example, after editing LONGPROG.PAS on Disk II, enter the command

A>B:JRTPAS2 A:LONGPROG <cr> .

CP/M will prompt for disk swaps as needed, and the compiled intermediate file, LONGPROG.INT, will be left on Disk II. In either case, the command

A>EXEC PROGRAM <cr> ,

is used to execute the program.

I decided to test the execution speed of JRT PASCAL. A program similar to the Assembly Language "BELL" executes requiring 108 seconds for the timing loop. This appears to be really slow compared to the compiled BASIC and FORTRAN codes. I suspected that my programming technique exaggerates the difference in speed. To complete the test I wrote the following program:

```
(*pi*)
program pi(output);
var
    sides, sum, n, ssq, temp, term : real;
    fact, k, slength, pilow, piup : real;
function sqrt ( x : real ) : real ; extern ;
begin
    writeln(' BOUNDS ON PI - 14 DIGIT BINOMIAL THEOREM
    VERSION');
    writeln;
    write(' N SIDES SIDE LENGTH');
    writeln(' PI-LOWER BOUND PI-UPPER BOUND');
    sides := 4.0 ;
    sum := 2.0 ;
    n := 3.0 ;
    while n <= 20.0 do
begin
    sides := 2.0 * sides ;
    ssq := sum ;
    sum := 0.0 ;
    term := 0.25 * ssq ;
    k := 1.0 ;
    temp := term + sum ;
    while sum < temp do
    begin
        sum := temp ;
        fact := (2.0 * k - 1.0)/(k + 1.0) ;
        term := fact * ssq * term / 8.0 ;
        k := k + 1.0 ;
        temp := term + sum;
    end;
    slength := sqrt(sum) ;
    pilow := 0.5 * sides * slength ;
    piup := sides * slength / (2.0 - slength) ;
    writeln(n:4:0, sides:9:0, slength:19:12,
    pilow:19:12, piup:19:12);
```

```
    n := n + 1.0;
  end;
end.
```

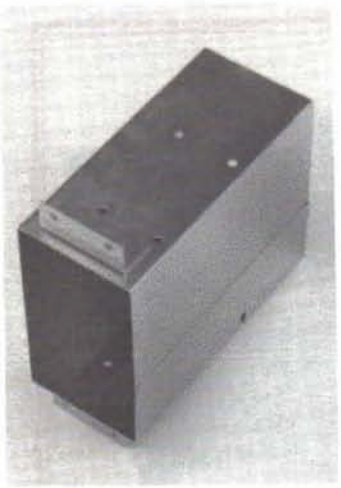
This program does essentially the same thing as the PI.BAS and PI.FOR codes provided with Microsoft's BASCOM and F80. After compiling, this program executes in about 42 seconds including the time to load the program from disk and to reboot afterwards. This compares with the BASIC and FORTRAN run times. Other programs run quickly enough for practical use. I should point out that this program when compiled and run under JRT PASCAL, exhibited numerical instability for n greater than 13. The same source code was tested on my employer's mainframe with no numerical problems. In any case, JRT PASCAL is an excellent value for those who want to try this structured language.

Magic Wand is a joy to use on the single drive H-89. Two working disks were necessary for the programmed instruction in the User's Manual. A minimum of swapping was necessary to perform the exercises. For normal use, however, only one diskette is needed for my applications. I use Magic Wand to write letters, reports, and even articles for my work or just for fun.

My all-in-one also serves as a terminal for dial up access to my company's network of mainframe computers. Software to make the H-89 emulate a terminal is available from several sources. Some CP/M programs, such as MODEM7, are available in the public domain. Other software is available from HUG, Heathkit, or independent vendors. I have several programs, but prefer the TERM program on HUG disk number 885-1207. Some of the so-called "smart modems" use escape sequences from the terminal which may also be used by the communications program.

The tedium of disk backup and file transfer is probably the biggest disadvantage of the single drive system. The PIP utility calls for at least two disk swaps for every file transferred. Fortunately, after preparing working disks, the file copying tapers off. A full backup of a disk containing many small files remains quite a chore. There are, however, several utilities available which make this procedure less painful. Some of these like WASH and MFT are public domain. ONECOPY is on several of the CP/M (and HDOS) HUG utilities disks. There is also a nice single drive disk duplicating program which comes with SUPERCALC. Most of these utilities are more specialized than PIP. For example, WASH combines a directory and copy utility in a single program. ONECOPY is a single drive single file copy utility which requires fewer disk swaps than PIP. The Multiple File Transfer, MFT, program allows the use of wildcards and is useful for making multiple disk copies from a single source file. MFT will also copy more than one file per disk swap. Both ONECOPY and MFT can be used for single drive copying on a system configured for multiple drives. This can be helpful when one drive is down.

A look through your Heathkit Catalog, the HUG software library listings in REMark, or any of a number of microcomputer magazines will yield a wealth of other programs which can be run on the single drive H-89. The spectrum ranges from games through utilities to home finance, high level languages, and more. In addition, public domain CP/M programs can often be had for the price of the media. I'm sure there are a few programs which cannot be used on a single drive system, but most can. Additional drives mean added convenience more than added capability.



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MicroFILE • This program is a high performance file manager system capable of storing over 65,000 records. It is used by simply generating a screen prompt and a printout template with any convenient text editor. The program then uses these templates to do all the setup work. Some common uses for MicroFILE are: mail lists, drawing index, inventory descriptions, parts lists, instrument index, piping line lists, etc. MicroFILE can also be used to generate input for other programs.

MicroFILE is self-prompting and menu driven with single key stroke commands to ADD, CHANGE, REPEAT, or FIND (and replace) records. Other commands: GOTO - move to a specific record number; SORT - resort the file with up to three fields in either ascending or descending order; PRINT - print the formatted output to either a printer, disk or the screen using the specified template. The program has many other features.

This package comes with a "try it before you accept it" demo program. As long as the main program disk packet remains unopened, the product can be returned for full refund (contact us for details).

MicroFILE (specify computer system and disk format, some may be unavailable at this time) ..... $150.00 ea.

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An Introduction to Assembly Language on the H/Z-100 Computer

Using ZDOS and the 8088 Macro Assembler

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Prologue

With the introduction of the new 8/16 and 16-bit computers such as the Heath/Zenith 100 series and the IBM PC, the debate over the "best" microprocessor chip has taken a new lease on life. Many critics of the microcomputer scene contend that the choice of the 8088 microprocessor for the Heath/Zenith (which I'll call the H/Z-100 from now on) and IBM's PC was less than an inspired one, with slow math operations and limited expansion inevitably dooming their owners to the shadowland of inferior performance. And for Heath to put the older 8085 in the 8-bit side of the H/Z- 100 instead of the flashier Z80 borders on disaster. I don't agree. For most of us, in most of our applications, we'll never notice the difference. Only in the benchmark environment will processor speed differences be crucial, and few of us make our living that way. In the real world of applied computer programming, there are really only two considerations: do you require a quick answer to a one-time question, or do you need to develop a "permanent" software solution that you will use repeatedly. If the former is true, then BASIC is generally the best choice. If the latter, then you again have two choices. First, use a higher level language such as Pascal to do a first class professional job in a language that's portable, easily structured, and reasonably fast. However, if the program isn't too large or if the program needs to execute more quickly than a program in BASIC or Pascal, then assembly language is your best bet.

Before you pale at the prospect of writing assembly language programs for your computer, pause to think that most of the programs you routinely run were written in that language and, like any other, assembly language is actually learnable, given time and application. The main requirement is a desire to learn, and the chance to get some practice. My theory of learning computer languages probably gives computer science professors nightmares, but I've found that the hands-on approach works best. If you have an H/Z-100 computer, follow along and give assembly language a try. We'll take a look at everything you have to do and know to write your first program, and when you are done, you will have a program in your library that will do something useful and that you can modify to suit other future needs.

Remember before we start that when you're writing software, it's impossible to hurt the computer (unless you pick it up and throw it against the wall). The worst thing that can happen is that the system will crash or hang up somewhere, and you'll have to reboot and begin again. In rare cases you can inadvertently tell the operating system to overwrite something on the disk, which is one excellent reason for keeping back-up copies of your valuable software. With that in mind, let's begin.

Getting Started

The H/Z-100 computer is a thoroughly modern computer. Unlike the older H8, there's no front panel the user can use to "talk" directly to the CPU. Unlike the H/Z-89 and -90, there is no off line key to allow the user to send something directly from the keyboard to the terminal. The H/Z-100 is a true software controlled machine, with which the user can communicate only via software. This is the underlying reason for the extreme versatility and capability of the computer, but it can also create difficulties for the first-time user who may not be prepared to take advantage of the H/Z-100's power and sophistication.

In a previous article (October Issue 45), we looked at a way to do this under CP/M-85. Recall that one way was to write a short program such as the one in Listing 1 that would send out the required escape code. This worked fine, but had the drawback of taking several seconds to load BASIC, then load the program and run it, and return to the operating system. Clearly not a procedure you'd want to go through very many times. This lead me to do a bit of research into what else was available.

```
10 PRINT CHR$(27);"x2"   ' Send escape command to computer
20 SYSTEM                ' Return to CP/M via warm boot
```

Listing 1. Defeating the key click in ZBASIC.

ZDOS and the 8088

The first Great Truth is that the 8088 will not run 8085 code, and Microsoft's Macro Assembler (MASM) won't assemble 8085 source code. So we'll need to write a new program in 8088 assembly language. There have been a lot of unfavorable things said about how difficult 8086 and 8088 assembly language is to write, and given the magnitude of improvement in capabilities, that's not hard to understand. However, it's not all that bad, as I hope the following example will show. Remember, as with our earlier 8085 example, this is intended as more of an "ice- breaker" than a complete tutorial, and there are probably better ways to do what we're about to do here. With that in mind, on to the 8088 and ZDOS.

First, another quick look at the manuals. When my H-120 arrived, it took me quite a while to work my way through the thousand or so pages of documentation that accompanied the system. When I finally reached Appendix P of Volume II of the ZDOS reference manual, I found something of great usefulness. Appendix P is devoted to "Notes on Writing ZDOS Programs". Just what we need.

The Program

There are two basic approaches to writing 8088 code. One produces

what Microsoft and Heath/Zenith call executable programs or code (.EXE files) and the more common .COM files. The main difference is that .EXE files require 512 bytes more memory, but can access more main memory directly, and .COM files are shorter but restricted to the first 64K of main memory. In the case of our short program, this is of no real importance, so for our purposes, we'll work with the latter. All you need note for now is that there is a difference in programming techniques for the two file types. Appendix P makes that more clear.

If you look at the program listed on page P.5 of the manual, you'll see an example of a program that will assemble into a .COM file. This is the one we'll use as the basis of our program. For those of you who don't have a manual handy, Listing 2 shows the program as we're going to modify it. Refer to that as we look at what's going on.

```
        TITLE   RESET.COM        ;A program to set the H/Z-100
                                  ;key click feature to off.
        PAGE    ,132              ;Set .LST width to 132 characters.

        .XLIST                    ;Don't list INCLUDE files.
INCLUDE DEFASCII.ASM              ;Useful definitions that we
INCLUDE DEFMS.ASM                 ;can use.
        .LIST                     ;Turn list on again.

PGMSEG  SEGMENT                   ;What memory segments to be used.

        ASSUME  CS:PGMSEG,SS:PGMSEG,DS:PGMSEG,ES:NOTHING

        ORG     100H              ;Starting memory location of program.

START:
        MOV     DX,OFFSET MESG    ;Get address of control string.
        MOV     AH,DOSF_OUTSTR    ;Get function to output text.
        INT     DOSI_FUNC         ;Print the control string.
        INT     DOSI_TERM         ;Terminate program.

MESG    DB      CC_ESC,'x2','$' ;Control string to kill key click.

PGMSEG  ENDS
        END     START
```

Listing 2. The basic 8088 assembly language program to turn off the key click.

First, in looking at Listing 2, note the PAGE ,132 statement. This is what's called a pseudo-instruction. It's not a real 8088 statement (hence the term "pseudo"), but it causes MASM to create a listing of the program that's 132 columns wide. This statement is helpful in tailoring the listing to your printer's characteristics. If you have an H14 or an MX-80 printer, you should change this to PAGE ,80 or leave it out altogether (the default width is 80 characters). The comma after the word PAGE means that we've left out the length of page specification. The default length is 50 lines.

The next thing to notice is the INCLUDE statement. This is how we refer to other files that contain useful pieces of code that we can use without having to retype them each time. Aside from the time wasted in retyping commonly used code, there's an all too great a risk of introducing errors. Also, by using such common blocks of code, we can shorten the program in listings like the one we're using here; it's not necessary to list all the INCLUDEd code, since it's already on your distribution disk. In our example, we have two INCLUDE files, DEFASCII.ASM and DEFMS.ASM. DEF is a name convention that tells you that the file is a set of definitions, rather than a block of code that performs some action. DEFASCII.ASM contains the code EQUates or equivalences of the ASCII characters we'll want to use in all sorts of programs. This saves us having to set up EQU statements in each program we write. DEFMS.ASM contains the most commonly used "hooks" or features of the operating system, ZDOS, itself. Thus we don't have to insert code calling for an output routine to communicate with the CRT. It's a little like the SYSCALLs or function calls of CP/M, but more sophisticated.

The next part of the program reveals the greatest difference between the 8085 and the 8088. The 8088 can directly address vastly more memory than the 8085 can, and it must have some way of managing all that memory. Program segments (PGMSEG) are one way to do this. A short digression to examine the architecture or structure of the 8088 might be useful at this point. Take a look at Figure 1. It shows how the segment registers are organized.

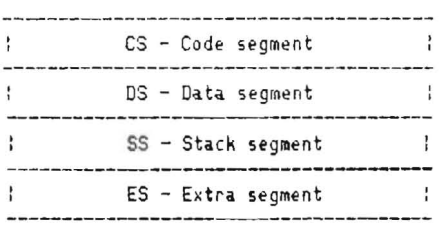

Figure 1. The 8088 segment registers.

The ASSUME assembler directive in our program tells the assembler that it can plan to use the code segment, the data segment, and the stack segment, but that we don't intend to use the extra segment. This is a memory directive, and is used to organize the computer memory. For more on assembler directives, see page 10.90 in the ZDOS reference manual. For now, just type it in as shown.

The ORG statement does for the 8088 assembler just what it did for the 8085 assembler. It tells the assembler where to locate the start point for the generated code. In this case, it's to be started (ORiGinated) at memory location 100 hex, or 256 decimal. This is the normal starting location for user programs like this one.

START: is another assembler directive. It tells the assembler that the code to be generated starts here, at the real starting point of the code. Our program STARTs with two MOV instructions which tell the computer to MOVe something into one of the CPU registers. In our example, it's telling the computer first to MOVe the address of the control string we want printed into register DX, and then MOVe one of ZDOS's function calls into register AH. Figure 2 may help make this a bit clearer.

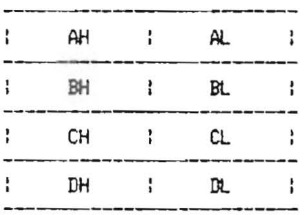

Figure 2. The 8088 general registers.

Figure 2 shows the layout of the general registers the 8088 uses to keep track of data and instructions and addresses. AH and AL stand for the high and low byte of the A register, respectively. The first MOV statement loads into the DX register the two byte address of the memory location in which the program stored the control string we want to send to the computer. The control string itself doesn't move anywhere. The next MOV calls the ZDOS routine DOD-#OUTSTR that prints data at the terminal. This is very much like a CP/M system call (SYSCALL) or function call in that it represents a frequently used subroutine that we don't have to invent and write out each time we want to send something to the terminal. Next, the INTerrupt command tells the computer to execute the DOS#OUT-STR function. Finally, the last INTerrupt command terminates the program by returning to ZDOS.

Next comes the actual message we want to send to the computer. This is the control string ESCape x2 that we need to send to the termi-

nal to turn off the key click. The CC#ESC is the assembly language expression for the ESCape character, and the ,'x2' is the remainder of the string we need. The '$' tells the assembler that this is the end of the string.

Finally, two lines to tell the assembler that this is the end of the ProGraM SEGment and the end of the program.

For those of you already familiar with CP/M-85 or CP/M 2.2, you might note that in this example we used the equivalent of the CP/M function 9, the character string output to the console. This is a more efficient approach, especially in 8088 code.

Assembling the Program

Now we're ready to get to work. First, type in the program just as it appears in Listing 2. You can use the editor that comes with ZDOS, or any other you may have available. After typing the program, save it to your disk under the name RESET.ASM. You could use any name, but this one made sense to me.

With the program saved to disk, we're ready to assemble it. Here are the steps you need to take. First, call the assembler by typing the following:

```
MASM RESET <return>
```

where <return> just means press the RETURN key.

After a certain amount of disk work, you should see a message on your screen that looks like Figure 3. If you get an error message, it means you typed the program incorrectly. Call the editor, review the program and locate the problem, correct it and resave the program on the disk and reassemble.

```
The Microsoft MACRO Assembler
Version 1.07, Copyright (C) Microsoft Inc. 1981,82

Object filename [RESET.OBJ]:    <return>
Source listing  [NUL.LST]:      <return>
Cross reference [NUL.CRF]:      <return>

Warning Severe
Errors  Errors
0       0
```

Figure 3. Screen output for MASM. Note that we just pressed the RETURN key in response to each of the assembler's questions. We could have given other names to the .LST and .CRF file, thereby creating those files on the disk.

Next, we have to link the object code produced by the assembler. Since the object code produced by the assembler is relocatable, the link process resolves all the memory location references and "fixes" the program to run in a certain location. Here's where those segment registers are important. To link the object file, type the following command:

```
LINK RESET <return>
```

Notice the output from LINK, in Figure 4. It tells us that we have an error resulting from the fact that the object code module doesn't contain a statement allocating stack space in memory, but we used the stack definition in the ASSUME directive. For some programs this might be serious, but in our small program it doesn't make any difference and we can safely ignore it. I've left it here because when you run the Heath/Zenith examples, you'll get the same error.

We now have a linked code file in an .EXE format, but we have to do one more thing before we can run RESET. We need to convert the .EXE file to a .COM file. Like CP/M, ZDOS recognizes .COM files as immediately executable programs that reside in what CP/M calls the transient program area, or TPA. To convert our program, type this command line:

```
  Microsoft Object Linker V1.10
(C) Copyright 1981 by Microsoft, Inc.

Run File [RESET.EXE]:   <return>
List File [NUL.MAP]:    <return>
Libraries [.LIB]:       <return>
Warning: No STACK segment

There was 1 error detected.
```

Figure 4. Screen output for LINK. Again, we simply pressed RETURN in answer to each of the options offered. We could have created the optional files by giving them names other than NUL.MAP. We would identify any libraries we wanted to link to our program at this point. See text for the explanation of the error.

```
EXE2BIN RESET.EXE.COM <return>
```

Once this is completed, you will have the following four new files on your disk:

RESET.ASM - the original source code file.

RESET.OBJ - the object code file produced by MASM.

RESET.EXE - the result of the LINK operation.

RESET.COM - the executable file produced by running EXE2BIN.

We can now test the results of our work by typing RESET. There will be a brief disk access and the ZDOS prompt should drop down a line. Now when you press a key, the key click will be silenced. Success!

You might want to make note of the fact that we could have generated some other files as a result of our assembly work. You have the option of producing a listing of the assembled program (a .LST file) that is often useful for debugging and for retaining a record of the program. This listing contains the hexadecimal equivalents of the machine language code produced by the assembler. You can also generate a cross-reference file (a .CRF file) that can be used with the ZDOS CREF utility to produce a sorted cross-reference listing of all the variables you used and where they appeared in the program. This is also useful for debugging, since it tells you all the references to the other files used by the INCLUDE statement. We won't list the contents of these files here because they're fairly long, but I encourage you to re-run the assembly procedure and generate all the optional files just to see what they look like.

AUTOEXEC

Now that you have a working program, you may wish to have the computer run it whenever you first boot the system, without your having to type anything. In CP/M we had the ability to install a command line that would be executed upon either a cold or a warm boot. ZDOS has a similar capability; it can process almost any instruction that it finds in a special file called AUTOEXEC.BAT. This is a "batch file" that can contain any command that you could type in from the keyboard. This means that if we created an AUTOEXEC.BAT file that contained the command RESET, it would run our RESET program upon boot-up. To do this, use your editor to create a one line text file containing just the word RESET. Save this file under the name AUTOEXEC.BAT. Now reboot your computer. When you press a key after the boot is complete, the key click will be off.

These have been simple examples of how to create assembly language programs that do something useful that would be cumber-

some or impossible to do any other way. Even these little programs could be made to do a great many other things by sending different command lines to the computer terminal. I'll leave it as an exercise for you to write a similar program that would turn the key click feature back on. Hopefully, after going through this procedure, assembly language programming on the H/Z-100 computers won't seem such a formidable task.

Interfacing Between the GC1000 Most Accurate Clock And An H/Z-100

Jim Schuster
2804 Killarney Drive
Cary, IL 60013

This is a MACRO-86 assembler program that provides a software interface between the Heath GC1000 Most Accurate Clock and an H/Z-100 running Z-DOS. The input is accomplished through serial channel B at 9600 baud. The GC1000 may be configured for either 12 or 24 hour mode with this program providing the necessary conversion for Z-DOS. There is also an adjustment made to the received time that compensates for the one second delay that the GC1000 has between a request for the time/date and the actual time. Finally, the time and date are displayed on the console in the same form as transmitted by the GC1000. This is written in "COM" file format for minimum disk space, and in fact only occupies 254 bytes. The correct cable connections and GC1000 DIP switch positions are given in the text of the program listing.

Prepared on/for an H/Z-100. Special hardware/software configurations: A non-standard 3 wire cable was used to interconnect the GC1000 to serial channel B.

Program requires 304 bytes of memory, occupies 254 bytes of disk space, and uses MACRO-86 version 1.07.

```
        page    ,132
        title   GC1000 - H/Z100 Interface       V1.0

; Written Dec 02, 1983 by
; Jim Schuster
; 2804 Killarney Drive
; Cary, Illinois  60013

; This program is intended for use as an AUTOEXEC.BAT function to set the
; time/date at boot-up by reading the ASCII data from the GC1000 (mac) clock.

; Configuration of serial port B is accomplished by this program.
; An attempt was made to use the ZDOS dosf_auxin function,
; however, that function call frequently results in incorrect data.
; I suspect that ZDOS is doing something that I'm not aware of.
; However, taking control of the port works flawlessly.

; CONFIGURATION:

; GC1000        Serial port B
; pin 2         pin 3
; pin 5         pin 20
; pin 7         pin 7

; The GC1000 is configured for 9600 baud, 1 stop bit, NORMAL mode.

; DIP switch: 7 6 5 4 3 2 1 0
; set to:     1 1 1 X X X X 0
;              \ \ \ \ \ \ \ \__Normal mode
;               \ \ \ \_\_\_\__year since 1983
;                \_\_\__9600 baud
; J401 - OPEN

; The following commands will create the GC1000 program after it has been
; entered into the file GC1000.ASM using your favorite editor:
;       masm GC1000;
;       link GC1000;
;                       Note: LINK may/will produce a 'No STACK segment' error
;                             which may/should be ignored.  (A deficiency in
;                             the Zenith documentation.)
;       exe2bin GC1000.exe.com
;       erase GC1000.exe

        .xlist
        include defms.asm
        .list

pgmseg  segment
        assume  cs:pgmseg, ss:pgmseg, ds:pgmseg, es:nothing
        org     100h

; Serial port B addresses
epcib_dr        equ     0ECh            ;data register
epcib_sr        equ     0EDh            ;status register
epcib_mr        equ     0EEh            ;mode register
```

```
epcib_cr        equ     0EFh            ;command register

; The GC1000 sends a 24 character ascii sequence consisting of the following:
; (example) 09:24:32.1 AM  11/27/83(cr), where the (cr) is a single hex 0D.
; It then reads 24 charcters and tests the 24th character, which
; must be a (cr).  If it recieves the (cr) before the 24th character, then
; the program starts all over.

; When the program has finally recieved a valid 24 character sequence, it is
; then converted in to the ZDOS time and date formats.  The time and date are
; both displayed, in the format as recieved from the GC1000.

; It should be noted that the GC1000 may be used in either 12 or 24 hour mode,
; and this program will convert the 12 hour mode reading into the required 24
; hour format.

start:
        cld

; Since we have taken control of the port, we must disable the interrupt.

        in      al, 0F3h                ;read IMR
        or      al, 00100000b
        out     0F3h, al                ;disable port B interrupt

; In the event of a read error, we will loop back to here.

repeat:
        in      al, epcib_cr            ;reset control register sequencer
        mov     al, 01001110b           ;1 SB, no parity, 8 bits, 16X async
        out     epcib_mr, al
        mov     al, 11111101b           ;9600 baud
        out     epcib_mr, al
        mov     al, 00010000b           ;reset command register
        out     epcib_cr, al

        xor     cx, cx                  ;reset timer to zero
        xor     dx, dx
        mov     ah, dosf_stime
        int     dosi_func
wait:
        mov     ah, dosf_gtime          ;The GC1000 handshake input line is R-C
        int     dosi_func               ; coupled.  Wait 50 milliseconds for
        cmp     dl, 50                  ; this time constant to settle.
        jl      wait

        mov     al, 00000110b           ;enable Rx, dtr starts GC1000 (mac)
        out     epcib_cr, al

        xor     cl, cl                  ;character counter
        mov     si, offset out_buffer   ;ascii string storage
        push    si
        mov     di, offset in_buffer    ;bcd string storage
        push    di
in_loop:
        mov     ah, dosf_stcon          ;terminate on keyboard request
        int     dosi_func
        cmp     al, 0ffh
        jnz     in_loop_wait
        int     dosi_term               ;exit on keyboard request
in_loop_wait:
        in      al, epcib_sr            ;wait for RxRDY
        and     al, 00000010b
        jz      in_loop

        in      al, epcib_dr            ;read the character
        and     al, 07fh
        mov     [si], al                ;save in ascii string storage
        inc     si
        inc     cl                      ;character counter
        sub     al, 030h                ;strip off ascii
        stosb                           ;save in bcd storage
        cmp     al, 0dh-30h             ;check for end
        jne     in_loop

        cmp     cl, 24                  ;must have 24 characters
        jne     repeat

; convert time to ZDOS format

        pop     si                      ;reset pointer to in_buffer
        call short convert              ;get hours
        mov     ch, al                  ;put into ZDOS format
        mov     al, out_buffer+11
        cmp     ch, 12                  ;test for AM/PM format and --
        jne     not_12                  ;-- convert to 24 hour mode

        cmp     al, 'A'
        jne     time_ok
        sub     ch, 12
        jmp     time_ok
```

```
not_12:
        cmp     al, 'P'
        jne     time_ok
        add     ch, 12

time_ok:
        call short convert_si           ;minutes from in_buffer+3
        mov     cl, al

        call short convert_si           ;seconds from in_buffer+6
        mov     dh, al

; Adjust time by one second to compensate for mac's delay in sending.  If
; the time rolls over to 24:00, then repeat to get the new date.
; No attempt is made to do this correction to the displayed time.  I don't
; want to use more than 256 bytes of disk space.  And besides, the correct
; time is right there next to you--on the clock!
        add     dh, 1
        cmp     dh, 60
        je      adjust_min

time_ret:
        inc     si
        mov     ah, [si]                ;get 1/10 second
        mov     al, 0
        aad
        mov     dl, al

        mov     ah, dosf_stime
        int     dosi_func
        cmp     al, 0ffh
        je      print_error_msg

;convert the date into ZDOS format

        mov     si, offset in_buffer+15
        call short convert              ;month
        mov     dh, al

        call short convert_si           ;day
        mov     dl, al

        call short convert_si           ;year
        mov     cl, al
        xor     ch, ch
        add     cx, 1900

        mov     ah, dosf_sdate
        int     dosi_func
        cmp     al, 0ffh
        jne     print_info

print_error_msg:
        mov     cx, 10
        mov     si, offset error_msg
        jmp short pr_loop

print_info:
        pop     si                      ; out_buffer
        mov     cx, 24
pr_loop:
        mov     ah, dosf_conout
pr_loop2:
        lodsb
        mov     dl, al
        int     dosi_func
        loop    pr_loop2

        mov     dl, 0ah
        int     dosi_func
        int     dosi_term

adjust_min:
        xor     dh, dh
        add     cl, 1
        cmp     cl, 60
        jne     time_ret
        xor     cl, cl
        add     ch, 1
        cmp     ch, 24
        jne     time_ret
        jmp     repeat                  ;date wants to roll over

; subroutine to convert bcd word at si into binary byte in al.
; uses si, ax

convert_si:
        inc     si                      ;skip one byte

convert:                                ;convert bcd to binary
        lodsw                           ;get bcd word
        xchg    al, ah                  ;reverse
        aad                             ;convert
        ret

error_msg       db      'Set error',0dh
in_buffer       equ     $
out_buffer      equ     in_buffer+25

pgmseg  ends

        end     start
```

ZENITH

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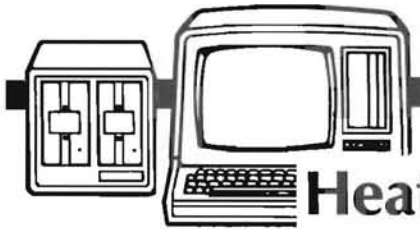
For complete product descriptions, check our full-line 20 page illustrated catalog or call anytime during our normal business hours from 9:30 to 5:30.



Heath/Zenith Related Vendors

ARE SEA Software
10549 S. Homan Ave.
Chicago, IL 60655

Contact: Roy Coleman Phone: 312-239-2220 or -2221
After 3 p.m. 312-238-2305

Comments: Software and consultation available. Products: Smart terminal H-89—Mainframes running Wylbur, MUSIC, TSO, CMS, or UNIX. Download, upload, select duplex, etc. H-89—600+ card/minute, 80 column, EBCDIC card reader. Cost is $35.00 each on 10 hard sector disks only.

Ackerman Digital Systems, Inc.
216 W. Stone Court
Villa Park, IL 60181

Contact: David Swoch Phone: 312-530-8992

Comments: Hardware, Software, and consultation available. Products: ADS hardware is S-100 bus, i.e. compatible with the Z- 100. We have CPU, Memory, PROM Programmer, Disk Controller, etc. Our software supports CP/M, OS-9, and Flex. Distribution: National and International.

Acme Computers
1727 E. Sprague
P. O. Box 4347
Spokane, WA 99202

Contact: Jim Phone: 509-535-4122

Comments: Hardware, Software, and consultation available. Products: Zenith computers, printers, and software. Authorized Zenith Data Systems service.

Air Captial Computer
1909 Siefkin
Wichita, KS 67208

Contact: David L. Horwitz Phone: 316-681-0011

Comments: Hardware, Software, and consultation available. Products: Full Zenith Data Systems product line, also C.Itoh and Epson printers. We specialize in Medical and Aviation software and turn key systems. A live person normally answers the phone between 8:00 and 10:00 p.m. Central Time. Caution, a computer controlled answering machine answers at other times.

Analytical Products
29924 Road 168
Visalia, CA 93291

Contact: Peter Shkabara Phone: 209-747-3235

Comments: Hardware, Software, and consultation ($35/hr.) available. Products: Kits for H89—Automatic Key Repeat, Real Time Clock, 4MHz Conversion. Discounts on CDR Controller and Software Toolworks. 4MHz patches for CP/M, printer setup utilities. Send for catalog, we pay domestic postage on all products.

Apogee Software
Box 15124
Savannah, GA 31416

Contact: William Gartelmann, Jr. Phone: 912-925-3765

Comments: Software and consultation available. Products: Utilities and arcade-style games for H8, H89, and Z100 systems, including Gravitron II, a color game for the Z100.

Applied Computing
P. O. Box 75
Codorus, PA 17311

Contact: David E. Warnick Phone: 717-229-2969 (after 6)

Comments: Software and consultation available. Products: The Classic Series of Mini Data Bases for Ham radio, stamp collectors, investors, etc. $24.95 each. CP/M hard or soft sector. Write for catalog.

Arkay Engravers, Inc.
2073 Newbridge Road
P. O. Box 916
Bellmore, NY 11710

Contact: Ken Kaplan Phone: 516-781-9859
516-781-9343

Comments: Consultation available for custom keyboard layouts. Products: We custom engrave keytops for the H/Z-89 keyboards and will have keytops for the H/Z-100 soon. Custom layouts can be sent in for quotes. Write or call us for price list.

Aspen Ribbons, Inc.
1700 N. 55th St.
Boulder, CO 80301

Contact: Peter C. Williams Phone: 303-444-4054

Product: Ribbons for computer printers.

Aurora Engraving
16410 E. Warren
Detroit, MI 48224

Contact: Clyde J. Hipwell Phone: 313-882-2225

Products: We make "Mode of Operation" plates on silver metal with black letters (only $10.00). "SY1:", "SY2:", "SY3:", "SY4:" (only $2.00 each). All have two sided tape. We will make any tag, plate, or sign in plastic or metal. Call or write for quote.

Beeline Services
5718 Ponderosa Drive
Stevensville, MI 49127

Contact: Mary Gillespie Phone: 616-429-6461

Comments: Manufacturers and distributors of PaperWare™ Paper programming aids; Video Layout shts., Flow chart, Printer layout plus others printed in fade-out blue, padded in 50's. The PaperPorter single sheet tractor feeder plus Form-Start for no loss on first tractor form. Catalog available.

Ralph W. Boyd
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Miami, FL 33169

Contact: Ralph W. Boyd Phone: 305-652-5828

Comments: Software and consultation available. Products: SUBMARINE—a real time game on naval warfare for the H8/H89/H100. BLAST—a color graphics flying saucer game for the HA-8-3 & HA-89-3 color boards. HURRICANE TRACKING—color graphics program for the HA-8-3, HA-89-3, & THE ENTERTAINER. Write for details on hardware & software specifics before ordering.

Business Support Services, Inc.
705 Butternut Ave.
Royal Oak, MI 48073

Contact: Evelyn S. Kennedy Phone: 313-585-4736

Products: Ribbons, printwheels, and thimbles for letter quality printers—Diablo, Qume, NEC, and Ricoh. Free catalog has ribbons and printouts of printwheel or thimble type styles. Include printer model.

C.D.R. Systems, Inc.
7210 Clairemont Mesa Blvd.
San Diego, CA 92111

Contact: Marc Brooks Phone: 619-560-1272

Comments: Hardware, Software, and consultation available. Products: FDC-880H Double Density 8" and 5.25" H/Z-89, Z-90 Floppy Drive Controller—$495. 10 Megabyte Hard Disk System— $2495. 8" Slimline Drive Package for Z-100—$1495. See C.D.R. Systems' advertisements in this magazine for further information.

CJW Software
P. O. Box 20874
San Jose, CA 95160

Contact: Colin J. White Phone: 408-997-7837

Product: STATES AND CAPITOLS — Educational software for the H8, H89, Z90, H100 (CP/M-85).

William N. Campbell, M.D.
855 Smithbridge Road
Glen Mills, PA 19342

Contact: William N. Campbell, M.D. Phone: 215-459-3218

Comments: Software and consultation available. Products: "Getting Started With CP/M & MBASIC Random File Handling". Includes ready to run disk containing mail list programs and demo. pgms. 56 page manual of tutorials included. Runs with H89, CP/M-85, and with ZDOS on Z-100. Complete instructions. Specify hard or soft sector disk. Price: $25.00. "Getting Started With HDOS & Assembly Language Programming". 36 page tutorial. Price: $15.00

Chaos Computers
P. O. Box 2106
Woodbridge, VA 22193-0160

Contact: Gregory J. Marsh Phone: 703-590-3360

Comments: Hardware, Software, and consultation available. Products: 256K Memory Disk. Upgrade for six drives on hard sector controller. SYSCMD.SYS replacement. Test programs for H8/H89. Utilities. Those who mention seeing this receive 10% discount. Group/Club discounts available.

Cherry Engineering
P. O. Box 216
Laurel, MD 20707

Contact: Janet/Ray Cherry Phone: 301-498-4236 (evenings)

Comments: Software and consultation available. Products: Extended Screen Editor for ZDOS; mailing list support. CP/M software for H89—sort, bulletin board, data entry. MCALL modem program for CP/M or ZDOS. Edit wide lines and huge files with ESE. Demo disk available.

Chief Manufacturing Inc.
14310 Ewing Avenue South
Burnsville, MN 55337

Contact: Dale Glomsrud Phone: 612-894-6280

Comments: Hardware available. Chief's Micro-Set™ 35mm projector stands are available in two and three tier versions as well as individual base and extension units. The units are available in four series: MSU for Ektagraphic III projectors, MS for Ektagraphic II's, MSS for Singer and Leitz, MSE for multi-voltage S-AV projectors, and a modular break-apart version for MSU/MSS and MSE series.

Church-Related Computer Programming
730 Sixth Ave.
Sweet Home, OR 97386

Contact: Larry Monk Phone: 503-367-4330
INA 503-367-3073

Comments: Software and consultation available. Products: Church financial and membership programs for churches of under 350 members, requiring H/Z-89, BASIC or MBASIC under HDOS or CP/M, and a printer. $20 to $75. Specializing in producing quality software at affordable prices for smaller churches.

Codewright
231 Couch Ave.
St. Louis, MO 63122

Contact: Dale Wilson Phone: 314-965-3612

Comments: Software and consultation (for customers only) available. Product: ZT is a modem utility for Z-DOS which is extremely easy to use, yet reasonably powerful (and inexpensive!). Assembly language or C programming by contract. Other Codewright products, including Palette and Chronologic, are available through Software Wizardry.

COLORWORKS
5337 E. Bellevue Ave.
Tucson, AZ 85712

Contact: Thelma Anderson Phone: 602-325-0096

Comments: Software and consultation available. Product: H/Z-100 owners with 128K and MSDOS (Z-DOS) operating system, we have

the "Z3D" program for you. H-8 and H/Z-89 owners, we have THREED for you, too. Send for software listing and description. Specify hardware requirements.

COMMSOFT, Inc.
2452 Embarcadero Way
Palo Alto, CA 94303

Contact: Curt Bowersock Phone: 415-493-2184

Comments: Hardware, Software, and consultation available. Products: COMMSOFT provides software designed for amateur radio communications and genealogy. Programs include RTTY89, CIPHER89, CW89 (for hams and shortwave listeners), and ROOTS89 or ROOTS/M (for genealogists). Free MasterCharge/VISA order numbers: 800-227-1617, ext. 585, or in California 800-772-3545, ext. 585.

CompuCover
P. O. Box 310
Mary Esther, FL 32569

Contact: Robert Helms, President Phone: 904-243-5793

Comments: Consultation available. Product: CompuCover is a producer of quality made custom fitted dust covers. Each cover is made of the finest materials available. CompuCover covers them all. Custom design department and silkscreen services available. Inquiries may be directed to the above address.

CompuTech
P. O. Box 2027
55 Charles Parish Drive
Poquoson, VA 23662

Contact: Steve Meyerson Phone: 804-868-8055

Comments: Software and consultation available. Products: dBASE II Programmer's Notebook with complete mailing list/label program listing, $12.95 (+$7 for disk version). Also custom dBASE II programming.

Computer Associates, Inc.
1814 S. Main St.
P. O. Box 328A
South Bend, IN 46624

Phone: 219-232-7921

Comments: Hardware, Software, and consultation available. Products: Market computers and software to pharmacies, lawyers, doctors, and CPA's. Equipment includes Z-100 systems, Digital PDP11, and VAX Systems. Also market a complete line of supplies and accessories for all computers.

Computer Connection, Inc., The
P. O. Box 290010
San Antonio, TX 78280

Contact: Hale Guenter Phone: 512-366-3355

Comments: Hardware, Software, and consultation available. Products: The Computer Connection, Inc. is a computer hardware and software buying service specializing in quantity discounts on computers, printers, modems, terminals, software, and accessories. Most items are available for immediate shipment. VISA, Master Card, check, or Money Order accepted.

Computer Dynamics, Inc.
105 South Main Street
Greer, SC 29651

Contact: Kurt S. Priester Phone: 803-877-7471

Comments: Hardware, Software, and consultation available. Products: 5 Megabyte hard disk subsystem for Heath 89/90. Designed for easy add-on for CP/M-based systems, expandable to 10 Megabytes, easy to install, features Shugart 8" technology, available in kit or assembled and tested versions ($1695). The BAKUP Package is a set of archival programs for CP/M Z80-based computers. Used for file backup operations with systems using hard disk and floppy disk storage ($50).

Computer Place
115 Shorewood Drive
Menomonie, WI 54751

Phone: 715-235-6043

Comments: Hardware, Software, and consultation available. Products: Screen Dump Utility, takes green plane of screen and puts it on NEC 8023, Epson, Infoscribe, MPI, or Prowriter Printer. .ASM source for print driver included ($39.95). Z-Sketch, graphics editor for Z-100, WordStar-like commands, A CAD-like program with horizontal & vertical text and full color ($29.95). Z-FONT, remap the keyboard and change the screen display for your Z-100 keyboard, saves the result to ALTCHAR.SYS or a file of your choice ($29.95). High Resolution Graphics Work Sheets, graphics work sheets just for the Z-100, 50 sheets/tablet ($5.50). We are a full line Zenith Data Systems Dealer, call for quotations.

Computer Programs
P. O. Box 7323
Madison, WI 53707

Contact: Robert J. Stalder Phone: 608-241-5483

Comments: No hardware. Software and consultation available. Software maps out on your terminal, 8 lines of information on the computer byte or word. Input can be in octal numbers or decimal bit numbers. Requires EIS, 192kb. 80 or 132 character/line terminal, 8 inch single density floppy disk system for H11.

D-G Electronic Developments Co., Inc.
700 S. Armstrong
Denison, TX 75020

Contact: Bruce Denton Phone: 214-465-7805

Comments: Hardware, Software, and consultation available. Products: D-G Heartbeat Computer, D-G Super 89 CPU board for the H/Z-89, H8 static and dynamic memory boards, H8 Z80 CPU board, MP/M II, Electronic Disk software. Many of our products may be purchased through Heathkit Electronic Centers, including our new Heartbeat computer system.

Data Management, Inc.
P. O. Box 406
Croton Falls, NY 10519

Contact: David Wong Phone: 212-294-8087

Comments: Hardware, Software, and consultation available. Products: H-8, H-89, Z-100, and S-100 BUS hardware and software. Send name and address with SASE for free listing.

Digital Information Systems
416 E. State St.
Redlands, CA 92373

Mail Order Address:
P. O. Box 189
Loma Linda, CA 92354

Contact: Richard D. Foerster, Owner Phone: 714-798-0033

Comments: Hardware, Software, and consultation available. Zenith Data Systems dealer. Products: SCDMP—Screen Dump Package for Z-100's with source listing. Z-BASIC & Assembler versions available. Q-DATA—Data Manager in Compiled BASIC with source. Optional modules: Q-MM, Q-GL, Q-PM. SCDMP requires Gemini or NEC-8023 type printer & Z-DOS. Q-DATA requires Microsoft BASCOM license & CP/M.

dilithium Press
8285 SW Nimbus, Ste. 151
Beaverton, OR 97005

Contact: Tracy Barats Phone: 800-547-1842

Comments: Software and consultation available. Products: Each software package includes the book, diskette or cassette, loading instructions, warranty card, and our Forever Replacement guarantee. All you have to do is return your warrenty card, and we will replace any defective or destroyed disk or cassette for $5.

Dimensional Business Systems, Inc.
250 N.W. 4th Diagonal
Boca Raton, FL 33432

Contact: Ralph Avery Phone: 305-368-0270

Comments: Software and consultation available. Products: A property & casualty insurance agency automation system. Includes a fully interactive accounting package; customer on-line transaction & policy profile. Requires CP/M. Starting price: $1500.

Directory Database, Inc.
Box J
Navesink, NJ 07752

Contact: J. B. Runyon Phone: 201-291-1208

Comments: Hardware, Software, and consultation available. Products: Magazine (free) on DEC computers. Covers hardware, software, etc.

EHP Computers
218 Summit Ave.
Fords, NJ 08863

Contact: Mark Emanuele Phone: 201-738-4740

Comments: Hardware, Software, and consultation available. Products: Hard disk subsystems for all Z80 CP/M systems and Z- 100 systems. H-8, Z-89, Z-90, and Z-100.

Eigenware Technologies
13090 La Vista Drive
Saratoga, CA 95070

Contact: Karl L. Remmler Phone: 408-867-1184

Comments: Software and consultation available. Products: Language processors including BDSC, CIC86, AztecC. Pascal and C tutorials, callable libraries, editors, and utility programs. Other programs for finance, real estate, and engineering applications. Write for special HUG member discounts, bonuses, and current list of selected products.

Elektrokonsult A/S, Inc.
Box 846
Konnerudgt. 3
N-3001 Drammen, Norway

Phone: (47) 3 83 15 00

Comments: Software and consultation available. Products: DISK UTILITY PACKAGE works on any disk format, CP/M only. FILE MOVER transfers files between microcomputers, even if they use different operation systems. Available for CP/M, CP/M-86, and Z-DOS (PC-DOS) on most popular diskette formats.

Phillip L. Emerson
3707 Blanche
Cleveland Heights, OH 44118

Contact: Phillip L. Emerson Phone: 216-321-5038

Comments: Software and consultation available. Products: Morrty Communications Program for H89 with serial interface— telephone, RTTY, ASCII, Baudot, disk file send-receive, keystring detect, and auto answer. Many other conveniences.

Evryware
P. O. Box 5204
Olympia, WA 98503

Contact: Dave Murry Phone: 206-459-2395

Comments: Software and consultation available. Products: Seven fast action arcade style graphic games for Heath/Zenith computers. Games include "Missile Control", "Galactic Warrior", "Y-Wing Fighter", "Space Odyssey I", "Exterminator", "Y-Wing II", and "Zeetle-Deet". Available at all Heath/Zenith stores or from The Software Toolworks (see address in this issue).

FBE Research Company, Inc.
P. O. Box 68234
Seattle, WA 98168

Contact: Dave Brockman Phone: 206-246-9815

Comments: Hardware, Software, and consultation available. Products: For H/Z-89; SPOOLDISK™89 Microprocessor-Controlled Electronic-Disk Printer-Spooler Printer-Interface Card. H89RAM 16K Memory Expansion. Low Cost Parallel Printer Interfaces. Printer Driver Software. Authorized Epson printer dealer.

FEN Reloading
11931 Spruce Haven Court
St. Louis, MO 63146

Contact: Frederick E. Nelson Phone: 314-567-6070

Comments: Hardware and consultation (for ribbon related problems) available. Products: Ribbon Cartridge reloading service for m/s and fabric ribbons, also sell supplies for users to reload their own cartridges for most popular printers. We are beginning to add new cartridges to our product line; send SASE for price list.

FLJ Software Co.
P. O. Box 3293
Hialeah, FL 33013

Contact: Frank Loforte, Jr.

Comments: Software and consultation available. Product: FLJSOFT—$19.95. Graphics and printing utilities to modify the interactive business graphics package from Zenith to provide printing of the graphs and pie charts. Software required: Z-100 customer demonstration disk. Hardware required: Epson MX-80 with Graftrax, Epson FX-80.

Fairbrother Associates
Box 685
Northampton, MA 01060

Contact: J. Fairbrother, E. Judge

Comments: Hardware, Software, and consultation available. Products: H11/11-03/11-23/(11-73) stuff, WH27 (RX01) conversion to (RX02/03), RT11 timesharing, Relational Databases, Utilities, Public Domain software, disc systems to 2GB, tape systems, everything Q-Buss. Send $2.00 and SASE w/60 cents postage for booklet and latest price list.

FINA Software
16144 Sunset Bl. #3
Pacific Palisades, CA 90272

Contact: Larry Fina Phone: 213-454-6393

Comments: Hardware, Software, and consultation available. Products: CMDS—a High Speed Command Utility SYSCMD. NPIP—a new PIP with eleven more switches. H25 EPROM Support, augmented features and Alternate Character Fonts.

Floppy Disk Services, Inc.
741 Alexander Road
Princeton, NJ 08540

Contact Sales for Info. Phone: 609-799-4440

Comments: Hardware and Software (for operating systems only) available. Products: Disk drives, enclosures with and without power supply, controller cards, cables, connectors, parts, computer furniture, diskettes. We sell half height systems for Heath's H-89 and 8" systems for Heath's Z-100. Our toll free phone number for orders only is 800-223-0306. For technical help or information call 609-799-4440.

Friendliware
P. O. Box 21206
Lansing MI 48909

Contact: Bob Griewski Phone: 517-882-1675

Comments: Software and consultation available. Products: Recreational and educational puzzles and simulators for use on the H/Z-89 or equivalent, running CP/M operating system. Telephone/direct mail order. 5 1/4 in. 10 hard sector distribution media. Checks, money orders, VISA, and MasterCard accepted.

Generic Software
P. O. Box 790 Dept. 14R
Marquette, MI 49855

Contact: David J. Powers Phone: 906-249-9801

Comments: Peripheral hardware sales and support. Software available and consultation available from 10 a.m. to 5 p.m. EST (weekdays except holidays). Offer wide range of data entry, database, business/financial, educational, game, and utility software for H8/H19, H89, and Z100 systems running HDOS or CP/M. Also market high quality software from outside authors. Authors should send for FREE Software Author's Kit. Software available at Heathkit Stores and many other Zenith dealers. Call or write for FREE catalog. Dealer inquiries are welcome.

Jay Gold Software
Box 2024
Des Moines, IA 50310

Contact: Jay H. Gold, M.D. Phone: 515-279-9821

Comments: Software and consultation available. Products: A complete Home Finance System that keeps track of checking accounts, asset accounts, and credit account payments. Writes checks, includes many reports. Requires H/Z-89/90, HDOS 2.0, MBASIC. Soon available in CP/M.

GROFFics: Innovative Graphic Software
Rt. 4, Box 515
Chapel Hill, NC 27514

Contact: Terry R. Groff, M.D. Phone: 919-942-0650

Products: Shuttle Lander—this real-time, graphic flight simulator lets you land the *Space Shuttle* using only the numeric pad and special function keys! Price: $25.00. For H/Z- 89/90 or H-8/H-19 with 64K, one H-17 disk drive, HDOS or CP/M, & MBASIC.

H-SCOOP
2618 Penn Circle
Sheboygan, WI 53081

Contact: Subscription Dept. Phone: 414-452-4172

Comments: H-SCOOP, the #1 rated independent newsletter for Heath/Zenith computer support is mailed monthly via first class mail. Contains general information, new product news, technical forum, good guys & bad guys, tips & ideas, user feedback, etc. $20 for 12 issues per year, USA & Canada. $27—foreign Air Mail. 8 to 14 page issues. Back issues available. Visa/MC accepted.

H/Z WARE
11 Terry Lane
Rochester, NY 14624

Contact: Rick Indiano Phone: 716-594-1389

Comments: Hardware, Software, and consultation available. Products: Most popular products from reputable H/Z vendors such as Software Toolworks, Sunflower, Apogee, Micro Widget Works, and others all at up to 20% off list price. Call or write for a free catalog of our products.

Hall Design
250 Maple Avenue
Wilmette, IL 60091

Contact: Dr. Fred Levit Phone: 312-337-1611

Comments: Software and consultation (by phone) available. Product: RXWRITER is a sophisticated set of programs for writing prescriptions. When used by a physician, it speeds up prescription writing, makes prescriptions more accurate and legible, and provides a disk file of prescriptions which can be searched by computer. Forty page indexed tutorial manual. Availability: H/Z-89 5 1/4" hard sector CP/M, 8" single density CP/M, Z-100 for CP/M-85, and Z-100 for Z-DOS.

Hilgraeve, Incorporated
P. O. Box 941
Monroe, MI 48161

Contact: Matthew H. Gray Phone: 313-243-0576

Comments: Software and consultation available. Product: ACCESS™, a versatile, menu-driven communications program, allows

simple control over all types of communication. Features: auto-dial/log-on, text/hex file transfers, configurable protocol, and much more. Versions available for every H/Z computer; requires CP/M or Z-DOS w/48K RAM. $39.95 + $2.00 shipping.

R. A. Horner
4871 Hialeah Drive
Pittsburgh, PA 15239

Contact: Rodney Horner Phone: By Mail Only

Comments: Software available. Product: Working accept from date function for COBOL language. Correct date, time, or day prompted for operator input during execution. ACPDAT.MAC for CP/M MS-Cobol-80 runtime library. Printed, not disk. Send SASE for more info. Assembler listing with instructions—$15.00.

Husker Systems of Nebraska, Inc.
5208 Hamilton St.
Omaha, NE 68132

Contact: David M. Winchell Phone: 402-558-5702

Comments: Hardware (dealer, not manufacturer), Software, and consultation available. Products: Wide range of H89 and Z100 software, including games, educational tools, business systems, communications systems, and a subscription service. Also retail ZDS and other fine hardware products. We offer consulting services and custom-programmed systems also. Our specialty is communications and networking.

HyDisk
4540 Kearny Villa Road #204
San Diego, CA 92123

Contact: R.Hancock/R. Kennedy Phone: 619-277-8753

Comments: Hardware, Software, and consultation available. Products: The Z-11 co-processor allows the DEC LSI-11 and Heathkit H-11 users to run the popular Digital Research CP/M-2.2 operating system. The Z-11 dual wide board and a licensed copy of CP/M-2.2 are priced at $695, qty. 1. Easy installation—insert board, insert disk, and boot—Z80A CPU—No LSI-11 operating system support required.

Siebert Ickler
P. O. Box 1571
Corpus Christi, TX 78403

Contact: Siebert Ickler Phone: 512-852-0182

Comments: Software and consultation available. Products: XSC, utility allows command files with SuperCalc (like SUBMIT/XSUB). QuizGallery, table driven drill and practice target game. FullScreen, copy screen to disk and/or printer. 5 1/4" hard only. XSC—CP/M Z80—$19.95. QuizGallery—HDOS H89—$14.95. FullScreen—HDOS H89—$7.95.

InchSoft
64 Fanchers Street
Pickerington, OH 43147

Contact: Richard E. Lucka Phone: 614-837-8446
Evenings, Sundays

Comments: Software and consultation available. Products: EDT—HDOS Full Screen Text Editor (requires Z80 CPU and HDOS 2.0). SAVE—HDOS Disc to Disc Auto File Backup Utility. CNVRT—HDOS Interactive Number System Converter and Calculator.

InnoSys Incorporated
2150 Shattuck Avenue, Suite 601
Berkeley, CA 94704

Contact: Joseph Mancini Phone: 415-843-8122

Comments: Software and consultation available. Product: Money Maestro® is a single entry record keeping system for home, personal, and very small business use. Menu-driven, extensive on-screen help, user defined category and payee lists, full budgeting, tax reports, prints personal-style checks. Price: $125, or Apple DOS—$100. CP/M 2.x, Apple DOS 3.3, CP/M-86, and PC-DOS. Machine compatibility—Z-80, 8080, 8088, 8086, 6502.

Interaction Dynamics Systems, Inc.
Drawer 2459
Kailua-Kona, HI 96745

Contact: Patrick M. McNally

Comments: Consultation available by mail. Products: SLEDGE™, general ledger. SofTouch™, key remapping utility (Z100). 89/STAR & Z/STAR, WordStar enhancements. Z/BASE, Epson/WordStar enhancement. FLIGHT, simulator. Most programs are available in Z-DOS and CP/M. Write for complete descriptions and price lists.

Interactive Micro Systems
P. O. Box 21007
Columbus, OH 43221

Contact: Brian Lockrey Phone: 614-846-0902

Comments: Software and consultation available. Products: QUIZZER, Computer Assisted Instruction; KEY-WIZ/SORT-WIZ, multi-keyword index and retrieval system; GAMES #1; EXPRESS, number base calculator; C-XREF, cross reference; SUPER-SUB, high level command language; RECIPE-MASTER, recipe index; FORTRAN Resequencer. Write for complete product list.

KEA Systems Ltd.
Dept. ZRD-1
#311 - 811 Beach Avenue
Vancouver, B.C. CANADA V6Z 2B5

Contact: E. Alexandre Phone: 604-687-2744

Comments: Software and consultation available. Product: ZSTEM—Z100 SMART Terminal Emulator. Emulates: VT52, VT100, D100/200 with parallel and serial printer support, bi-directional disk transfers and programmable softkeys. 8088 Code under ZDOS. Provides local or remote connection to mainframes, micros, time-sharing services. RCS-89 provides terminal communication with serial printer and bi-directional disk file support. Written in 8080 assembler code for CP/M or HDOS. Provides local or remote connection of Z89/90 to mainframes, micros, time-sharing services. Both products are user configurable.

Kandueazy Computer Software Services
6218 Blossom Lane
Alexandria, VA 22310

Contact: James E. Kandul Phone: 703-922-9450

Comments: Hardware, Software, and consultation available. Products: Disk to tape and tape to disk file backup/restore (TAPEIO). Text formatter with 36 commands (PRINTIT). Structured programming preprocessor for assembly language (STRUCTUR). Line drop out and surge protector (GRAY BOX). All Heath/Zenith software/hardware discounted 10-30%. Custom made leatherette dust covers. Above software is for CP/M only; hard or soft sectored.

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21st

RESCUE & REPAIR

RESCUE RECOVERS "LOST" WORK IN SECONDS! REPAIR FIXES IT FOR REEDITING IN MOMENTS!

Have you ever:

"Quit" by mistake?

Forgotten to "Save" or "End"?

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Lost your work because of "DISK FULL" or "DIRECTORY FULL" or "WRITE ONLY"?

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If you write programs in any language, or use a word processor, or do extended data entry, then you need **RESCUE & REPAIR.**

IF YOU VALUE YOUR TIME OR YOUR SECRETARY'S TIME, RESCUE & REPAIR WILL PAY FOR ITSELF THE FIRST TIME YOU USE IT.

Available for most computers using CP/M 2.2.

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ERROR FREE DATA TRANSFER BETWEEN ANY TWO CP/M COMPUTERS WITHOUT MODEMS.

You can install a new computer and transfer all your old files to the new format.

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- One additional disk required for each additional computer.

Available for most computers using CP/M 2.2.

21st CENTURY DATA, INC., P.O. Box 1139, Dept B, Solana Beach, CA 92075 (619) 755-6218

TO ORDER:

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Disk† and manual	$45.00

†Specify computer make, model, and drive type.

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Two disks* and manual	$47.50
Each additional disk*	$25.00

*Specify computer make, model, and drive type for each disk.

Shipped postpaid in the U.S., Canada, and Mexico. Other countries please add $5.00 per disk for shipping. California residents add 6% sales tax.

LAS Project Management Services (PTY) Ltd.
P. O. Box 7069, ROGGEBAAI 8012
Cape Town, South Africa

Contact: R. Lowther Phone: South Africa (021) 497517

Comments: Hardware, Software, and consultation available. Products: Electrical Cable Design and three dimensional cable routing. Computer aided electrical design package for large and small construction projects. Z100, full colour graphics, minimum of 128K RAM, metric dimensions. BMX—complete control of BMX races starting from contestants data entry and following through to sorting, motor sheets, scores, points, quarter, semi-finals, and finals. Runs on Z89 and Z100, minimum 64K RAM.

Lab Data Systems
P. O. Box 1234
Kirkland Lake, Ontario
Canada P2N 3M7

Contact: Gerry Killoran Phone: 705-567-3497

Comments: Software and consultation available. Products: Applied Statistics I, HDOS-CP/M-MBASIC, $59.95. Descriptive Statistics, Significance Tests, ANOVA, Linear Regression, Editing, and Transformations. Applied Statistics II, CP/M- MBASIC, $99.95. All of I plus, e.g., Weighted linear regression with unlimited simultaneous discrimination intervals. Special Notes: Manual, built-in data base, no tables required. Used in univerisities, research, industry. (Also available from Sunflower Software.)

Labsoft
P. O. Box 5026
Oxnard, CA 93031

Contact: Robert Hanan, M.D. Phone: 805-487-8776

Comments: Software and consultation available. Product: Clinical Laboratory Data Processing System for HDOS, ZDOS, and CP/M.

Langley-St. Clair Instrumentation Systems, Inc.
3472 Winterwood Way
Marietta, GA 30062

Contact: Thom Hartmann Phone: 404-977-4508
800-221-7070

Comments: Hardware and consultation available. Products: Amber- phosphor replacement CRT's for Heath/Zenith terminals and monitors. Anti-glare, no-radiation tubes; easy installation, no technical knowledge required. Free literature available, call 1-800-221-7070.

Lindley Systems
21 Hancock Street
Bedford, MA 01730

Contact: William Lindley/Robert Lindley
Phone: 617-275-6821
Evenings & Weekends

Comments: Hardware, Software, and consultation available. Products: Z-UTIL (IBM PC emulator); DIAMOND Accounting System; Printer drivers for HDOS and CP/M 2.2.03; Disks; TEAC, Remex, Siemens Disk Drives; Gemini printers; Printer ribbons & cartridges; Microfazer buffers. Write or call for a complete catalog, free of charge.

LINKS COMM
P. O. Box 2028
Reston, VA 22090

Contact: Dale Grundon Phone: 703-437-3710

Comments: Software and consultation available. Products: TAXEZ 1983 is a series of income tax preparation worksheets that are designed to operate with Microsoft's MultiPlan program. Over 20 IRS forms. Price—$26.00. Requires Microsoft MultiPlan, ZDOS or CP/M versions. Dual drives recommended. Annual updates at reduced cost.

Little-Man Software
P. O. Box 7181
Ft. Gordon, GA 30905

Contact: Dwight Sorrell Phone: 404-790-4834

Comments: Software and consultation available. Products: Property Management—$39.95, Cataloging System—$19.95, Graphic Games—$19.95, Utilities—$19.95, Auto Dialer (for DC Hayes, CP/M)—$24.95, Smart Modem program (CP/M)—$29.95. CP/M and HDOS unless otherwise noted.

Loven-Murphy, Inc.
1815 Park Drive
Charlotte, NC 28204

Contact: James Loven, Edith Murphy Phone: 704-847-8763

Comments: Software and consultation available. Product: Spreadsheet template for real estate investment analysis. Comprehensive analysis of before and after tax projections. Patterned after Realtors National Marketing Institutes format. Very versatile. Available on VisiCalc, SuperCalc, Multiplan, and Lotus 1-2-3 on most popular formats.

M & M Software
17 Hopewell St.
Taunton, MA 02780

Contact: Roger E. Marrotte Phone: 617-823-9233

Comments: Software and consultation available. Products: Fast 8080 and Z80 Disassemblers producing files ready to assemble from either memory or "RUN" files. 8085 OP codes also supported. For HDOS and CP/M, H/Z89 and H8. Available in H17 5 1/4" hard sector format. Requires 32K memory minimum.

MLM Associates
1811 Willowtree, B6
Ann Arbor, MI 48105

Contact: William S. Hall

Comments: Software and consultation available. Products: MORSE 80—a complete Morse code transceiver program for amateurs and short wave listeners. H/Z-8/89/90, HDOS, & CP/M. C-ARCH—a backup and restore system for disk files, H-8/89/90, HDOS, & CP/M. Z-100/120, CP/M-85.

MRD Microcomputer Service
10172 Mardel Drive
Cypress, CA 90630

Contact: Wayne Martin Phone: 714-527-4622

Comments: Hardware and consultation available. Specialize in floppy disk repair. Also sell floppy disk drives and printers at discount prices.

Now you can program HERO 1™ from your computer.

It's a breakthrough by the crack robotics team at Virtual Devices! Meet MENOS I: the control system that brings HERO to life.

MENOS I's software makes HERO more fun to operate.

It's as fast and easy as programming your PC. Because MENOS takes full advantage of a computer's keyboard, memory, and disks—to save you months of time and frustration.

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A split window display of motor positions and sensor readings lets you monitor HERO's execution of your program. Or you can simulate the execution right on your computer screen. So you don't even need a robot to learn robotics!

MENOS I's hardware gives HERO a mind of its own.

Besides a more powerful microprocessor and an RS-232 port, you get 34K of memory, with 3 operating systems in ROM—including an upgrade of HERO's own. Plus 4 expansion slots for more breakthroughs.

Our fee is very reasonable.

Especially now through March 31,1984, when the introductory price is just $395. With a 30-day money-back guarantee and a full year's warranty on parts and labor.

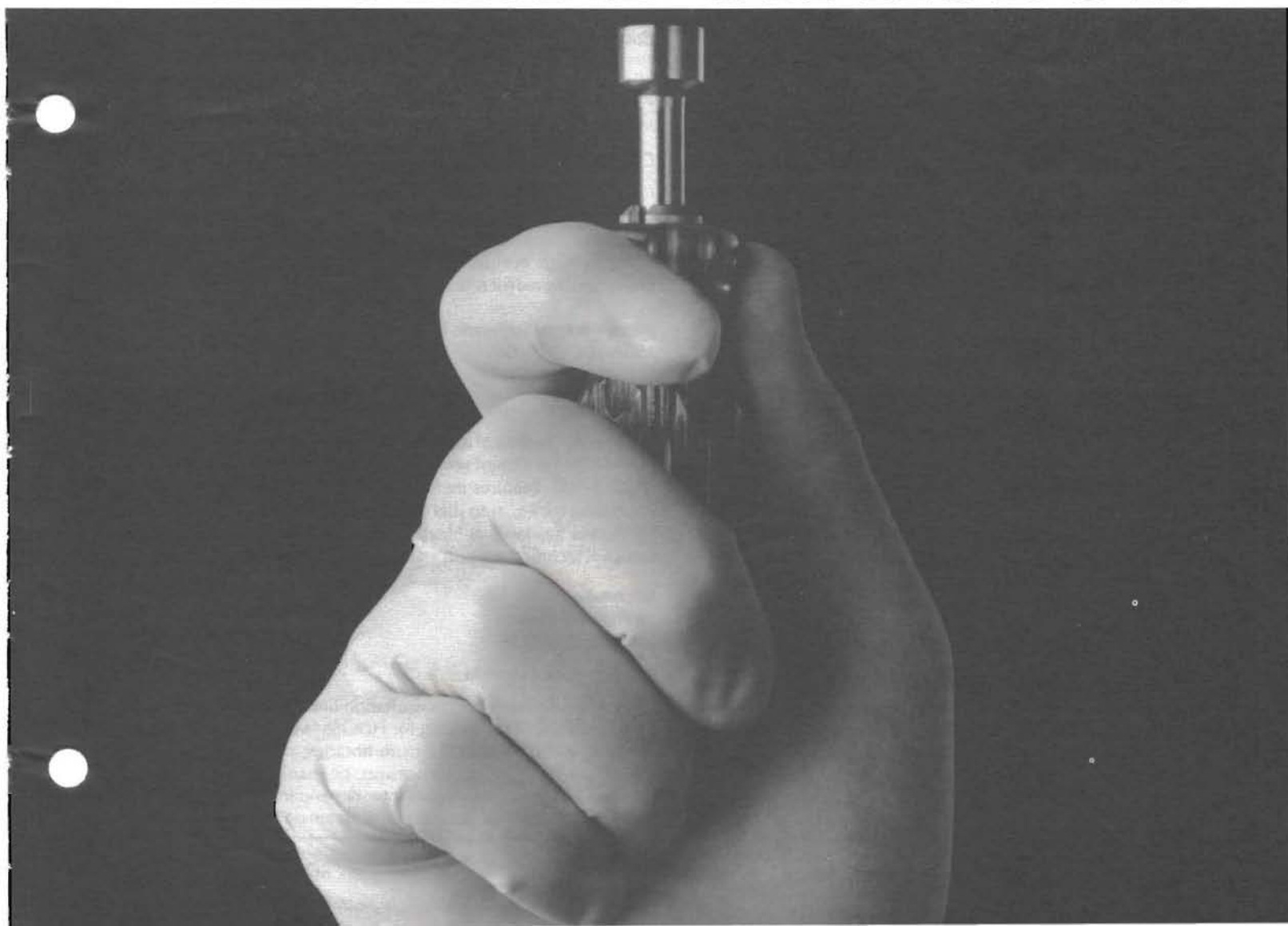
To find out more, call us or write us at P.O. Box 30440, Bethesda, MD 20814. Better still, order today. And get ready to perform a heroic feat of surgery.

Call toll-free: 1-800-762-ROBO.

In Maryland, 301-986-1702.

VIRTUAL DEVICES INC.

WORLD'S FIRST BRAIN TRANSPLANT PERFORMED ON ROBOT.



Maps For Micros
2348 Hooke Way
Sacramento, CA 95822

Contact: Lester L. Brown Phone: 916-451-4215

Comments: Software and consultation available. Products: Data bank of 80,000 eight-place numerical pairs on disk describe the coastlines of the world in radians of latitude/longitude with high resolution. Menu driven software for data management, flat- bed map projection, and scaling. Catalog of files—$2.00.

Meridian Technical Associates Inc.
2 Southboro Lane
Glen Rock, NJ 07452

Contact: J. Fitzpatrick Phone: 201-445-8645

Comments: Software and consultation available. Products: Meta Input Controller (MIC)—command file processor for HDOS batch, "submit" functions. Intelligent Modem Program (IMP)—for terminal communication to mainframes, minis, other micros (CP/M or HDOS). Business applications, communications, and integration into mini & mainframe enviromnents is our specialty.

Micro Access Systems
P. O. Box 304, Eighth Street
Bingham Lake, MN 56118

Contact: Jerome Holtz Phone: 507-831-5819

Comments: Hardware, Software, and consultation available. Products: We carry the following product lines. CompuPro, Eagle, TeleVideo, Amdek, Sanyo, USI-PI, Anchor Automation, Hayes, Lexicon, Novation, Hazeltine, Qume, Anadex, Diablo, Mannesmann Tally, Okidata, Texas Instruments. Also carry for Heath/Zenith computers the Micro Access Systems Integrated Business Software Accounting package for $300.00. We have a 14 page Software Catalog, CP/M software, IBM, Apple, Atari. Also a Hardware Catalog.

Micro Architect Inc.
6 Great Pines Avenue
Burlington, MA 01803

Contact: Tony Pow Phone: 617-273-5658

Comments: Software and consultation available. Products: Accounting, payroll, inventory, data base manager, mailing list, and word processors on HDOS, CP/M-80, and MS-DOS.

Micro Doc
3108 Jackson Street
Bellevue, NE 68005

Contact: Fred Pospeschil Phone: 402-291-0795

Comments: Software and consultation available. Products: GRAPH-PAC-I and GRAPH-PAC-II software for HA-8-3 and HA-89-3 color graphics boards. Multi-language interface for all hardware capabilities plus fast line, circle, and font generation. GRAPH- PAC-II supports Pascal MT+, COBOL, FORTRAN, C80 V.2.0 (HDOS & CP/M); MBASIC (CP/M). GRAPH-PAC-I is Tiny Pascal 4.1G graphics compiler (HDOS).

Micro Innovations
2455 Sylvania Ave.
Toledo, OH 43613

Contact: N/A Phone: 419-471-1245

Products: H/Z-89 Graphics Package for Epson printers. CP/M- 80/85 WordStar Enhancement Package. Development of utilities and packages for Z-DOS are underway! Write for free catalog. Visa and MasterCard phone orders are welcome.

Micromation, Inc.
9104 Red Branch Road
Columbia, MD 21045

Contact: Marilyn Oskard Phone: 301-730-1237

Comments: Hardware, Software, and consultation available. Products: Hero MEMCOM Board—RS232C serial I/O and 30K memory expansion ($295.00). Hero Voice Command System—Voice recognition board (micro-processor controlled) and Voice Command Language ($595.00). Apple-Hero Communicator and several software products available. Call or write for free catalog.

MicroMotion
12077 Wilshire Blvd. #506
Los Angeles, CA 90025

Contact: Lyndell or Linda Phone: 213-821-4340

Comments: Software available. Product: MicroMotion offers a standard implementation of the FORTH computer language. Meets the most modern standard for several operating systems. 200+ pages of documentation included. $150.00.

Microservices
P. O. Box 7093
Menlo Park, CA 94026

Contact: Larry Shoenberger Phone: 415-851-3414

Comments: Software and consultation available. Products: Color Graphics Software for H/Z-100 computers. Now offering ZANIMATE (color animation), ZPALETTE (paint 92 hues), and ZPATTERN (color monitor evaluation). All programs use ZBASIC. Additional products planned for release in 1984.

Micro-Systems Software, Inc.
4301-18 Oak Circle
Boca Raton, FL 33431

Contact: Sales Department Phone: 800-327-8724

Comments: Technical assistance available at 305-983-3390. Product: MTERM is a smart terminal program that runs on the 16 bit side of the Z-100. Features include 64K buffer, spooled printer output, translation tables, auto dial support, auto-logons, and macrokeys. MTERM is available at Heathkit Electronic Centers. MSS provides users full technical support and bi- monthly newsletters.

Microtran
76 Flintwell Way
San Jose, CA 95138

Contact: Rick Lutowski Phone: 408-226-4122

Comments: Software and consultation (limited amounts) available. Products: FORTRAN support for HDOS: "MICRO-CORE" graphics package; AM9511/AM9512 math libraries; overlay package; console I/O, sorting, metric conversion, bit manipulation, and HDOS interface libraries. Libraries are inter-dependent, and include source code, documentation, and sample program on H17 disk.

PERSONAL ROBOTS

Peripherals and Software for Personal Robots

NEW

VOICE COMMAND SYSTEM FOR HERO

MICROMATION proudly presents a new peripheral for HEATHKIT'S® HERO-I robot which elevates the robot to a new level of sophistication. We call this peripheral a Voice Command System (or VCS) because it not only consists of a voice recognizer, but also an advanced level machine language program for the robot which actually allows you to program robot movements by voice. We call the voice recognizer VOREC and the voice driven program VOCOL (VOice COmmand Language). Highlights of these two important parts of the VCS are described below.

VOREC*

VOREC is a powerful, microprocessor controlled, speech recognition board which mounts next to, and interfaces with, our HERO-I MEMCOM BOARD. The recognizer has the following principal features and specifications:

- Speaker-dependent recognizer with nearly instantaneous word recognition rates.
- Recognition accuracy about 98%.
- Vocabulary of up to 256 words (stored as 16 word groups with 16 words in each group for greater recognition accuracy).
- 16K of onboard static RAM of which 14K is battery backed to retain recognized word parameters during power down.
- RS232 port for receiving commands from, and reporting status and words recognized to, the host (HERO).
- Highly sensitive audio input circuitry requires only an external speaker for audio input rather than a microphone. (This allows robot to receive commands from up to 15 feet away.)
- Utilizes state-of-the-art high speed (HC) CMOS chips and the new CMOS 65CO2 microprocessor for ultra low power consumption. Complete board consumes an incredibly low 45 ma while active and 1 ma when inactive.
- Speech recognition is accomplished by a software algorithm contained in a 2K EPROM. (Future product updates will require only replacement of this EPROM.)

*These products are compatible with all personal computers

VOCOL

This software is even more amazing than the voice recognition hardware. VOCOL is like a high level language for the robot (such as BASIC) which supports both deferred and immediate execution modes. The only difference is in BASIC you "write it," and in VOCOL you "speak it." The software is provided on an EPROM which plugs into a memory socket on our HERO-I MEMCOM BOARD. VOCOL has the following principal features:

- When first run, the robot talks to you through a voice training session in which you are asked to repeat words in his command vocabulary three (3) times.
- Following this training session, you can literally talk in a program of movements for later execution, or command immediate movement by voice.
- The robot prompts you for a command and when received, repeats it back to you for verification. If verified and if in immediate execution mode, the robot will execute the movement. If in deferred execution mode, the robot proceeds to write a machine language program in his memory for later execution. When your program of movements is complete, you signify this with a "STOP" command. A "GO" command will then cause the robot to execute the program it wrote in memory. After execution, the robot returns to the command mode.
- Complete instructions and installation manual.

The Voice Command System manual contains a complete description of how to use the VOREC board under program control from HERO. The 6808 Source Code for VOCOL is available on an APPLE® DOS 3.3 disk at additional cost. This source code is compatible with the SC-6800 CROSS ASSEMBLER.

VOCOL Source Code **$55.00** (not sold separately)

TOTAL SYSTEM PRICE $595.00

NEW

POET

This is an Artificial Intelligence program similar in concept to STORYTELLER, but more advanced. The program uses an advanced self-programming technique which allows the robot to speak self-generated, random three line Haiku poems on an endless list of subjects. After HERO speaks a poem and likes it enough, he will make a comment about it or do some meaningful body movement.

PRICE: TAPE (machine code) **$20.00**

PRICE: DISK (source code) **$30.00**

HERO MEMCOM BOARD*

This product provides a means to develop programs for the robot using a personal computer, and expands the robot's memory with an additional 30K of RAM. This product includes:

- Two 8-bit bi-directional parallel ports with handshaking lines for superfast data transfers between the robot and a computer (connects directly to our APPLE-HERO COMMUNICATOR board), plus two 16-bit timers.
- An RS232 serial port for two-way communications between the robot and any computer having an RS232 serial port.
- Serial communications software in an onboard EPROM which allows uploading/downloading of programs via the serial port.
- Complete instruction manual and schematics.

PRICE $295.00

*These products are compatible with all personal computers.

APPLE-HERO COMMUNICATOR

This product provides the hardware and software necessary to implement two-way high speed parallel communication between an APPLE® computer and a HERO-I robot equipped with our HERO MEMCOM BOARD. It includes:

- A peripheral card for an APPLE that contains two 8-bit parallel ports with handshaking lines, and two 16-bit timers.
- Data transfer software for the APPLE board and for the HERO MEMCOM BOARD burned into two 2716 EPROMS. These programs provide ultra fast two-way communications.
- A disk containing heavily commented 6808 and 6502 source codes for the communications software. These source codes are compatible with the S-C MACRO ASSEMBLER and the S-C 6800 CROSS ASSEMBLER available for the APPLE from the S-C SOFTWARE CORPORATION.

PRICE $159.00

Send check or money order to:

MICROMATION INC.

9104 Red Branch Rd.
Columbia, MD 21045

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Add $3.00 for shipping.

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Mailing: P. O. Box 15185, Santa Ana, CA 92705

Contact: Marva or Steve Bard, Micro Net PPN 70125,241
Dale Kimsey, Micro Net 73565,751

Phone: 714-544-8252

Comments: Consultation is available 6:00 p.m. to 10:00 p.m. Mon.- Fri. and Sat. 9:00 a.m. to 3:00 p.m. (Pacific Coast time). Hardware is available for H8, H89, and Z100 and includes Real Time Clock, Expansion Interface, 256K Memory/Clock Calender, Arithmetic Processor, Analog to Digital Converter, Modems (1200/300 baud), Anadex Printers, any type of cable, and more... Software includes Micro-Pro, Ashton-Tate, Microsoft, Peach Tree, and more...

Micro World Publishing
1102 Winona St.
Northfield, MN 55057

Contact: Linda Seebach Phone: 507-645-5496

Comments: No hardware, software, editing, or consultation available. Will typeset your text files from any H/Z disk format, via modem (300/1200) from any computer, or via CompuServe. Insert simple typesetting commands to ensure complete control of text and typesetting. Save money.

Miketronics Digital MicroSystems
8113 Baywood Drive
Norfolk, VA 23518

Contact: D. C. "Mike" Michielson Phone: 804-588-4977

Comments: Software and consultation available. Products: MIKETRONICS/TCS "Big Four" Accounting System Version 5.1— General Ledger, Accounts Receivable, Accounts Payable, Payroll, for Heath/Zenith 8080/Z80 microcomputers. Also custom dBASE II programs. Requires 56K RAM, CP/M 2.x, MBASIC 5.x, 2 disk drives, and 132 column printer.

Mockingbird Data Systems
2296 Hoover Road
Grove City, OH 43123

Contact: Jerry Mercier Phone: 614-875-0753

Comments: Software and consultation available. Products: Custom business programming in Z80 or 8080 Assembler, COBOL, FORTRAN, or BASIC. Also experienced in IBM 370 Assembler under MVS. We are developing multitasking, networking operating system for the H89 (H100 version to follow).

Mountain View Press, Inc.
P. O. Box 4656
Mt. View, CA 94040

Contact: Roy Martens Phone: 415-961-4103

Comments: Hardware and Software available. Product: FORTH computer language, books, and manuals.

Najay Systems
3136 Vermillion St.
W. Covina, CA 91792

Phone: 714-594-9564

Comments: Hardware, Software, and consultation available. Products: 4MHz upgrade for H/Z89 computer. Also products for Z100.

Nanos Systems Corp.
P. O. Box 24344
Speedway, IN 46224

Contact: David P. Nanos Phone: 317-244-4078

Comments: Consultation available. Products: We publish microcomputer system reference cards. We currently have 18 different reference cards. They are complete summaries of all the manuals that come with the computer, and then some. These quick reference cards are invaluable to the programmer. Wholesale prices are available for quantity purchases.

Neff Software
P. O. Box 29
Centerport, NY 11721

Contact: Bert L. Neff Phone: 516-757-3696

Products: H/Z-89/90 Edit & Word Processor, Fast Sort Package, FORMULA-PACK Worksheet program fixed or floating point. All HDOS or CP/M. Last two also Z-DOS. Free detailed brochure available.

Naso Computer Systems
1115 Gray Avenue
Yuba City, CA 95991

Contact: Vincent Naso Phone: 916-673-6276

Comments: Hardware, Software, and consultation available. Products: Naso Computer Systems is a Hardware/Software dealer specializing in CP/M, Z-DOS software for Agricultural & Farming Industry. We offer several custom programs for Business/Accounting. We also carry Crop Data Management Systems which specializes in Farming Data Management.

Newline Software
P. O. Box 402
Littleton, MA 01460

Contact: Ron Rocheleau Phone: 617-486-8535

Comments: Software (blank diskettes, too) and consultation available. Products: More than 40 products designed especially for the H8, H/Z-89, H/Z-100, and HERO-I robot. Available directly from Newline or from your local Heathkit or Zenith Data Systems dealer. For complete details, write to Newline Software for FREE product catalog. Do it now!

North Coast Intelligence Inc.
1201 Cherokee Trail
Willoughby, OH 44094

Contact: David J. Wroblewski Phone: 216-946-7756

Comments: Hardware available. Products: Serving the Heath H88/89 community with HFDC-100 floppy disk controller. Blending minimal power consumption, and reliability for a high performance/value product.

OASYS Consulting, Inc.
P. O. Box 1191
Chicago, IL 60690

Comments: Anthony Shaneen Phone: 312-398-5152

Comments: Software and consultation available. Products: Life Insurance and Annuity Sales Illustration System for Insurance Agents. Rates and Vales File Maintenance System for Life Insurance products. CP/M based, 64K and 2 drives required.

OMNI Resources Corp.
50 Howe Avenue
Millbury, MA 01527

Phone: 800-343-7620
In Mass. 617-865-4451

Comments: OMNI is a manufacturer of high quality Floppy Diskettes. Other services available include: software duplication, formatting, and private labeling services.

Optimal Technology Inc.
Blue Wood 138
Earlysville, VA 22936

Contact: A. Charlton Phone: 804-973-5482

Comments: Hardware, Software, and consultation available. Products: EPROM programmers. Serial interface, Model EP-2B-87. Parallel interface, Model EP-2A-79. Software driver available.

PC & J Graphics Co. Inc., The
P. O. Box 108
Deer Park, NY 11729

Contact: Pat Caputo, Pres. Phone: 516-667-8076

Product: Third Party hardware and software for Heath, Atari, Apple. Also, general programming aids, ribbons, disks, etc. We can also be contacted on The Source—TCK755 and Compuserve—70330,175.

Payload Computer Services
15006 Sun Harbor
Houston, TX 77062

Contact: Charles Porter Phone: 713-486-0687

Comments: Hardware, Software, and consultation available. Products: Zenith computers, peripherals, and software at low prices. Tandon, Qume, Mitsubishi disk drives. Internal dual drives for H-89. 8" drive systems. Magnolia Microsystems dealer.

Polybytes
3427 Bever Avenue S.E.
Cedar Rapids, IA 52403

Contact: Larry C. Reeve Phone: 319-366-3077

Comments: Software available. Products: EDT, a feature laden full screen program editor for the Z100 (ZDOS). Lucidata Pascal for HDOS, CP/M, and CP/M-85. Pascal graphics utilities. Graphics utilities for Lucidata Pascal require HA-8-3 or HA-89-3 graphics boards from NOGDS.

Powerline Systems
P. O. Box 97
Lincroft, NJ 07738

Contact: John Preusse Phone: 201-747-2063

Comments: Software available. Products: JUPITER—Data base management program handling over 25,000 records of personal information. Built-in screen editor and many conveniences for data entry, searching, sorting, and reporting. For H/Z-89, CP/M. $145.00 at Heathkit Electronic Centers.

Pressure Applications
2478 Briarwood Drive
San Jose, CA 95125

Contact: Charles Stanley Phone: 408-269-6107

Comments: Software available. Products: Electrical engineering and plotting programs for the H/Z-89 and IDS printers. Circuit Analysis—An AC frequency analysis program for resistors, capacitors, inductors, op-amps, transformers, and transistors. EE Series—10 electrical engineering programs such as filter design, class A biasing, microstrip line calculations and power supply design. Schematic Drawing—An on screen graphics program for drawing electrical symbols or creating your own with output capability to a printer. Graphplot—A 4 quadrant X-Y plotting program with scaling, labels, adjustable size and placement for the IDS 460,560 and PRISM printers. All programs written in MBASIC with source code included. An update notice is included.

Quest Computing
P. O. Box 1323
Freeport Center Station, UT 84016

Contact: Byron Hellewell Phone: N/A

Comments: Software and consultation available. Product: A completely integrated business accounting system. "Complete Accounting System" with general ledger, accounts receivable, accounts payable, and payroll with job cost accounting. Written in BASIC. Only $99.00. For H/Z-100 or H/Z-89. Requires CP/M, printer, and (2) 5 1/4" disk drives.

Quikdata, Inc.
2618 Penn Circle
Sheboygan, WI 53081

Contact: Sales Dept. Phone: 414-452-4172

Comments: High Tech innovative mail order company (oldest H/Z independent in the business) with complete support and service facilities, handling a wide variety of lowest priced hardware and software products for H/Z systems. Winchester drives, disk drives, cabinets and cables, printers, computers. Zenith Data Systems dealer. Consulting and custom dBII programming available. Visa/M/C accepted.

RCK Associates
640 Trephanny Lane
Wayne, PA 19087

Contact: Robert C. Koestler Phone: 215-687-3194

Comments: Software and consultation available. Products: PORTFOLIO MANAGER—on entry of current stock prices, prints a one page report containing 20 different catagories of stock info and data. PEDIGREE MANAGER—maintains a 4 generation pedigree for small animal breeders. Male and female pedigrees are automatically combined to give the pedigree of the offspring. MORSE CODE TUTOR—your H89 sends code lessons. No hardware modifications needed. SETLP—configures the Epson FX80 printer. includes downloadable character set, script, and allows hundreds of options.

Real Estate Agent Computer Service
10275 NE 23rd Ave.
Mitchellville, IA 50169

Contact: Harold Dykens Phone: 515-967-6042

Comments: Software and consultation available. Products: Programs to aid the Agent/Broker qualify the Buyer. Residential Ownership Analysis, Wrap-Around Loan, etc.—$135.00. Multiple Listing Software Package—$325.00. Customized for your MLS book, add $65.00.

Reichert Digital Systems
29 Blazier Road
Warren, NJ 07060

Contact: R. S. Reichert Phone: 201-469-3854

Comments: Software and consultation available. Products: CPA II—Personal Accounting System. XYPLOT-BARPLOT—plotting system for screen or printer. LOGIC—logic circuit simulation. PERMDEX—permuted-index generator. NAVIGATE—flight-planning system. Programs require MBASIC (for CP/M or HDOS); ZBASIC (for ZDOS). Other software also available.

Richmond Computerware
15807 Kenbrook
Missouri City, TX 77489

Contact: Jerome E. Banasik, P.E. Phone: 713-437-8188

Comments: Hardware, Software, and consultation available. Products: Hardware — disk drives, H-89 disk drive mounting/shielding kit. Software — MicroFILE, high performance file management system; TERM+, communications and automatic file transfer; engineering programs. Can develop clients' engineering programs.

Rogers Engineering
Rt. 4, Box 195
Ava, MO 65608

Contact: Charles Rogers Phone: 417-683-5676

Comments: Software and consultation available. Products: Programs for agriculture, personal accounting, text editing. Each is sold with professionally written operator's manual, adaptation notes, and source code. Write for free brochure. Engineering firm selling non proprietary versions of copyrighted software developed for clients.

Ross Custom Electronics
1307 Darlene Way - Suite A12
Boulder City, NV 89005

Contact: J. D. Ross Phone: 702-293-7426

Comments: Hardware, Software, and consultation available. Products: IntelliBurner Microprocessor based EPROM, EEPROM & Microcontroller Programmer—$269. DumBurner II EPROM & EEPROM Programmer—$189. 16K/32K DumBurner for 24 pin EPROMs only— $139. DumBurner II PC Boards & Software—$39. 16K/32K DumBurner PC Board & Software—$25. Software supplied with all units. Avail. in all H8/H89/Z100 formats for HDOS and CP/M.

S-A Design Books
515 West Lambert, Bldg. E
Brea, CA 92621-3991

Contact: Larry Atherton Phone: 714-529-7999

Products: Consumer books for Zenith/Heath computer products. S-A Design is looking for writers. If you can write clearly and understand computers, give us a call.

S & K Technology, Inc.
4610 Spotted Oak Woods
San Antonio, TX 78249

Contact: Steve Robbins Phone: 512-492-3384

Comments: Software and consultation available. Products: WatchWord—a word processor and editing tool for the Z100 under ZDOS. EDIT19—an editing tool for the Z89 under HDOS. Both products written in assembly language for fast response.

Sandia Computer Products Company
4913 Danube Ct. NE
Albuquerque, NM 87111

Contact: Ernie Kunstadt/Nick Pchelkin Phone: 505-243-9493

Comments: Hardware and Software available. Products: "The Entertainer", color graphic and sound board. Model 408A—8- channel, 12 bit A/D Converter. "Filecat", disk catalog utility for both HDOS and CP/M disks operating under CP/M.

Sammish Data Systems, Inc.
P. O. Box 70382
Bellevue, WA 98007

Contact: Richard H. Schweitzer, Jr. Phone: 206-644-2442

Comments: Hardware and Software available. Products: Developers of the Census Data System, an interactive data extraction, display, and analysis system for 1980 Census of Population, Housing Data, and 1981 County Business Pattern data. Have a Statistical Mapping package to map any data by zip code, census tract, and counties.

Satellite Software International
288 W. Center St.
Orem, UT 84057

Contact: Karen L. Acerson Phone: 800-321-5906

Comments: Software and consultation available. Product: WordPerfect—word processing with speller, math, mail-merge, macros, footnotes, and text columns fully integrated. Designed to be automatic and effortless. Screen looks like printed document. Automatic reformatting, underlining, and boldface type. Greek, math, and foreign characters supported.

Secured Computer Systems
12011 Aclare St.
Cerritos, CA 90701

(mail & phone order) Phone: 213-924-6741
(technical & retail) Phone: 714-952-3930

Contact: Ken

Comments: Hardware, Software, and consultation available. Products: 16K RAM expansion, 2 port serial, 3 port parallel interface, real time clock, 4 MHz upgrade, and I/O expansion. Secured Computer Systems has been offering quality products and support for 3 1/2 years.

SigmaSoft and Systems
4488 Spring Valley #107
Dallas, TX 75234

Contact: C. D. Montgomery Phone: 214-392-1025

Comments: Hardware, Software, and consultation available. Products: The Universal Parallel I/O Board for the H/Z-89 features two Centronics ports for printers, joysticks, Trackballs, etc. We also offer a full line of cables and support software for both HDOS and CP/M, including very powerful printer graphics drivers for the Epson and IDS printers. All of our graphics drivers are also available for use with any other parallel or serial interface.

Sjulstad Engineering
503 East Fremont
Northfield, MN 55057

Contact: Mike Sjulstad Phone: 507-334-2783

Comments: Hardware, Software, and consultation available. Products: 16K Memory Board—$59.95, 320K Memory Expansion—$699.00, Remote Video Output—$59.95, Alternate character generator, and special design products.

Skill Data
P. O. Box 1943
Olympia, WA 98507

Contact: Claude T. Abbott Phone: 206-352-0669

Comments: Software and consultation available. Products: Function-key software for WordStar (WSKEY), dBASEII (DBKEY), ZIP (ZIPKEY), QuickCode (QCKEY), and SuperCalc (SCKEY). "Peek and poke" software with screen print capability (QuickLook). All software (both CP/M and Z-DOS) under $30. VISA and MasterCard accepted.

Soft Firm, The
P. O. Box 1125
Picayune, MS 39466

Contact: Dot Holyer Phone: 601-798-0740

Comments: Software and consultation available. Products: Disk Support Systems providing CP/M disk diagnostic and data recovery utilities. CP/M File Transfer Utility for transfer of files between systems with incompatible media formats.

SoftShop
35 Shadow Oak Dr.
Sudbury, MA 01776

Contact: Jim Teixeira Phone: 617-443-9693

Comments: Software and consultation available. Products: Software for the H-8, H-89, and Z-100 for HDOS, CP/M, CP/M-85, and ZDOS. Products include Utilities, Educational, Printer Drivers, Printer Spoolers, and Program Languages. Free catalog is available. Products can be purchased at Heathkit Stores or directly from SoftShop.

Software Place, The
4770 Biscayne Blvd. #600
Miami, FL 33137

P. O. Box 151006
Tampa, FL 33684

Contact: Brian L. Griffin Phone: 813-238-3818

Comments: Hardware, Software, and consultation available. Products: Business Software. Accounts Receivable—750 subaccounts. Accounts Payable—750 subaccounts. General Ledger—228 lines. Inventory—1000 items. Point of sale— integrated with all of the preceeding. Property Management. Mailing Lists management—limited by disk space. Customization of all of these products or creation of new products is also available.

Software Seeker, The
720 West Indian School Road
Phoenix, AZ 85013

Contact: Robert M. Zucker Phone: 602-265-0200

Comments: Hardware, Software, and consultation available. Products: Software for all Heath/Zenith computers including Communication Packages, Terminal Emulation Software, Specialized Accounting Software, and Medical Practice Management. Custom Programming Services including Design, Coding, and Documentation are available.

Software Subscription, The
P. O. Box 5379
Richmond, CA 94805

Contact: James R. Guggemos Phone: 415-237-2115

Comments: Software and consultation available. Products: VIPROC includes VISED (Unix vi style visual editor), TPROC (roff style text processor), $50.00/Z-89, $75.00/Z-100. XREFBAS (BASIC Cross Referencer) $30.00 for Z-89 & Z-100. Shipping postpaid. Visa, M/C accepted. California residents add tax. Specify CP/M- 80, HDOS, ZDOS, CP/M-85.

Software Wizardry, Inc.
122 Yankee Drive
St. Charles, MO 63301

Contact: Tom Jorgenson Phone: 314-946-1968

Comments: Hardware, Software, and consultation available. Products: Products for the entire Heath/Zenith community including: Z100 lightpens, Palette, ALTCHAR, ZLYNK-11, ULTRA ROM, HDOS Toolkit, Chronologic, the P-SST board, and more. Write for catalog. Software Wizardry, Inc. is an authorized ZDS dealer and service center.

Stress Analysis Associates, Inc.
285 N. Hill Ave., Suite 201
Pasadena, CA 91106

Contact: Ms. M. Cleary Phone: 213-684-2478

Comments: Software and consultation available. Products: Five published computer programs designed for the Engineering and Scientific community. Proven and tested with program listings presented along with full documentation and validation. Interactive programs with ample prompts written in BASIC language make it possible for any Engineer to follow.

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Stuart Software
25381-G Alicia Parkway
Suite 316
Laguna Hills, CA 92653

Contact: John S. Mays Phone: 714-855-4753

Comments: Software and consultation available. Products: "PICK'EM" ($19.95) and "NBA PICKS" ($19.95) predict outcome of NFL and NBA games, respectively. "QBD" ($49.95) provides main-frame decision support tools to the Heath/Zenith user. "QBD" requires MBASIC. VISA/MasterCard accepted. CP/M and HDOS versions for all products available.

Studio Computers, Inc.
999 South Adams
Birmingham, MI 48011

Contact: Ray Massa Phone: 313-645-5365

Comments: Hardware, Software, and consultation support for all Heath/Zenith computers. Products: MPI graphic printers, Z100 screen dump software, Pro-Driver modem utility, Spellbinder, Personal Pearl Database, and much more. Factory authorized distributors for MPI printers and accessories.

Superior Computer Services, Inc.
1823 West 68th St.
Hialeah, FL 33014

Contact: Jorge M. Hierro, Pres. Phone: 305-822-7461

Comments: Software and consultation available. Products: English to Spanish translation of programs and manuals, professionally prepared, is available to software authors and distributors wishing to expand their market to Latin America. Heath/Zenith formats available. Spanish version fully tested before shipping.

Systems Design Network
P. O. Box 31232
Independence, OH 44131

Contact: Douglas C. Huber Phone: 216-447-1319

Comments: Software and consultation available. Products: DMZ80—FORTRAN based CRT forms package. CRTZ80—remote access facility. SofCheck—personal finance bookkeeping package. SofTouch—4th generation language. RMFZ80—record management for FORTRAN users. SofTouch will not be available until 2nd Quarter, 1984.

Systems Integration Unlimited
P. O. Box 24421
San Jose, CA 95154-4421

Contact: James R. Murdock Phone: 408-448-2541

Comments: Hardware, Software, and consultation available. Products: We provide Engineering Prototype of hardware and/or software to your specifications and provide full documentation for production. We make your ideas a reality! We specialize in Heath/Zenith, S100 BUSS, STD BUSS, CP/M, and complete systems or stand alone units.

TBT Digital
741 Oakwood Ave.
Hurst, TX 76053

Contact: Ted J. Mieske

Comments: Hardware, Software, and consultation available. Products: We do custom writing in MBASIC, CB80, ASM, dBASE II. Also graphic design layouts. Have a good background with WordStar 3.0/3.3 and do custom boiler plates or give support on how-to's of MailMerge.

TCS Software, Inc.
3209 Fondren Road
Houston, TX 77063

Contact: Sales Dept. Phone: 713-977-7505

Comments: Software available. Product: The TCS product line includes the TCS™ Total Accounting System (TCS Total Ledger, Total Receivables, Total Payables, Total Payroll, Total Inventory, Total Sales, Total Materials, Total Utilities, Simple, Q/Label™, and Q/Word™) and the TCS Client Ledger System. The TCS Total Accounting System is completely integrated, providing customized reporting and maximum versatility.

William N. Tavolga
5151 Windward Ave.
Sarasota, FL 33581

Phone: 813-349-6221

Comments: Software and consultation available. XWORD and ACROSTIC: Crossword and acrostic puzzle solving aids, also help in creation of puzzles. HDOS or CP/M; soft or hard sector; H8/H19, H/Z89 or Z-100/120; $14.50 p.p. each; $25.50 for both on one disk.

Technical Micro Systems Inc.
366 Cloverdale
P. O. Box 7227
Ann Arbor, MI 48107

Contact: Lee Hart Phone: 313-994-0784

Comments: Hardware, Software, and consultation available. Products: The H-1000. A Z80/8086 upgrade for the H/Z-89. 128K RAM standard; expandable to one megabyte RAM on board. Faster program executions; 2/4MHz or 8MHz. Plug-in replacement for old CPU board; no modifications required. Runs all Heath/Zenith software without modification.

Tex-Matics Micro Systems
3059 W. 15th, Suite 100
Plano, TX 75075

Contact: Ken Patrick Phone: 214-985-1811

Comments: Hardware, Software, and consultation available. Products: Specialists in business computer systems, software search services, after-sale support; DFW/HUG Board; MCP/MIG Board.

J. J. Thompson
281 Warren Ave.
Kenmore, NY 14217

Contact: Jack Thompson Phone: 716-873-0380
After 5 p.m. Eastern Time

Comments: Software available. Products: Conversion utilities to convert files between operating systems. HOSCOPY.COM (HDOS to CP/M); ZCOPY.COM (ZDOS to CP/M); CPMCOPY.ABS (CP/M to HDOS). Send SASE for more information.

K. Stephen Tinius
6614 Edgemere Drive
Temple Hills, MD 20748

Contact: K. Stephen Tinius Phone: None

Comments: Hardware and consultation (by mail) available. Products: H8-Z80 adapter for H8. Double-sided plated-thru plug in Z80 card for H8 8080 CPU board. Bare board, kit or ready to use, $30, $75, $90. See October 1980 Kilobaud. Compatible with static RAM, DG and Trionyx dynamic RAM and Livingston 8" controllers. K. Stephen Tinius lives and works in Germany but can receive mail through the above address. His German address and phone are: K. Stephen Tinius, Eichenweg 11, D-8956 Germaringen, Federal Republic of Germany; phone—(49)-08341-64501.

USS Enterprises
6708 Landerwood Lane
San Jose, CA 95120

Contact: Louise Cate Phone: 408-997-0264

Comments: Hardware, Software, and consultation available. Products: The Critical Connection™ allows an Atari (400 or 800) to use the disk drives, printer, and keyboard of any computer system running CP/M. $175. Brochure available. Hardware, software, and documentation included. Automatic install for many systems, 19,200 baud serial port required.

Universal Radio Co.
10528 Tomwood Ave.
El Paso, TX 79925
Mail:
P. O. Box 26041
El Paso, TX 79926

Contact: Wallace Thompson Phone: 915-592-1910

Comments: Software available. Products: *COMPRESS*— compression program for MBASIC programs, $19.95. *HBBS*—H/Z89 bulletin board, HDOS, MBASIC, $29.95. Dragon II—MBASIC maze game, $19.95. Lazerblast—HDOS ABS action game, $19.95. All programs for H/Z89, supplied on 5.25" HDOS hard sector disk, Lazerblast also available in CP/M.

Westcomp
23441 Golden Springs, Suite 300
Diamond Bar, CA 91765

Contact: Dave Lovison Phone: N/A

Comments: Software and consultation (for purchased products at this time) available. Products: Select games, utilities, tools, and languages. 16 bit software only (no 8 bit CP/M).

Westwind Computer Services
856 S. Washington Street
Greencastle, PA 17225

Contact: James R. Frederickson Phone: 717-597-9376

Comments: Hardware, Software, and consultation available. Products: Zenith computers, accessories, and software; Magnolia Microsystems products; NEC printers, supplies. Software by IMS, Peachtree, and custom. Single and multi user systems. Custom cables made. We specialize in complete systems for the professionals.

Wheeler Associates, Ltd.
P. O. Box 9512
Alexandria, VA 22304

Contact: Dick Stanley Phone: 703-751-6168

Comments: Hardware, Software, and consultation available. Products: Selectone typewriter/computer interfaces. OMNI, PULSE disks (flippies, too!). Ribbons. Paper: full, mini, micro packs. Insurance Property, Business management software and SuperCalc™ templates. True discount pricing on everything. Finest documentation anywhere! Newsletter, "The Effective User", $19.50/year.

Xtrasoft Inc.
553 Weddell Dr.
Sunnyvale, CA 94089

Contact: Ron Johnson Phone: 408-747-1400

Comments: Software and consultation available. Products: Xtrasoft markets the Storeminder™, a proven fully integrated software package for retail sales and inventory management that runs on most business microcomputers. The Storeminder™ consists of the Salesminder™ - a point of sale package, the Stockminder™ - the inventory management package, and the Mailminder™ - a customer data base.

Youngstrand Services
P. O. Box 15882
Honolulu, HI 96815

Contact: Marvin L. Youngstrand Phone: 808-523-8971

Comments: Hardware, Software, and consultation available. Products: Development of software for large/small data base systems. Setup/development of hardware/software systems. Turn-key systems development. $25/hour or bid/contract pricing.

Zeducomp
P. O. Box 68
Stirling, NJ 07980

Contact: Stephen E. Hesterman Phone: 201-755-2262

Comments: Software and consultation available. Products: ZED, ZED-85, ZED-16: Word Processor/Text Editor for Z89, Z90, H8/Z19 (CP/M), $35; for Z-100 (CP/M-85) $35; and for Z-100 (Z-DOS) $50. DEZIGN: Structured Program Designer for Z89, Z90, H8/Z19, Z-100 (CP/M), $70. ZSS, ZSS-16: Student Scheduler for Z-89, Z90, H8/Z19, Z-100 (CP/M) $350; and for Z-100 (Z-DOS) $500. Available from Zeducomp and from many Heath/Zenith dealers. VISA, MasterCard, Check. Dealer inquiries welcome.

Zephyr Software
406 South Beaver
Flagstaff, AZ 86001

Contact: Bruce Grubbs Phone: 602-774-7809 (business hrs.)

Products: Software Tools for H89 or H8/H19. Disk Screen Editor, Disk Duplicator. For either HDOS or CP/M, all disk formats supported. Prices $15-$25, ppd. Source always included as well as complete documentation on disk. Catalog free.

Late Arrivals

Cleveland Codonics
18001 Englewood Dr.
Cleveland, OH 44130

Contact: Mike Kolberg Phone: 216-243-1198

Comments: Hardware, Software, and consultation available. Products: High resolution (504H by 247V), intellegent graphics retrofit unit for H/Z-19 terminals and H/Z-89, 90 computers. Also for H/Z-29 terminals, a super high resolution (672H by 500V) with pan and zoom capabilities along with optional parallel ports and Tektronix 4010/4014 emulation. All graphics boards are economical and immediately available.

C C M, Inc.
P. O. Box 2308
Reston, VA 22091

Contact: Cary Green Phone: 703-620-3403

Comments: Hardware and consultation available. Products: For H8—CP88 8088 coprocessor card, $325; APU-H 9511 math card, $325; AD-8/4H 8 channel A/D converter, $125.

Merit Data Systems
19622 Plymouth Road
Detroit, MI 48228

Phone: 313-838-6026

Comments: Hardware and Software available. Products: Factory authorized sales and factory trained service of Zenith Data Systems products.

Paul Pennington
2912 Palmetto Drive
Martinez, GA 30907

Contact: Paul Pennington Phone: 404-863-1254

Comments: Software and consultation available. Products: Adaptations of public domain MODEM programs for the Heath/Zenith computers. Cost is $5 per disk if you provide the disk, or $10 if I provide the disk. MODEM-7 or MODEM-9 available for H/Z- 89/90/100 on hard or soft sectored 5 1/4" or 8".

Young Investment Research
P. O. Box 670
Glen Ellyn, IL 60138

Contact: Fredric S. Young Phone: 312-469-1654

Comments: Software and consultation available. Products: Programs for daily stock market analysis and individual stock trading signals. Uses proven and original technical indicators. Demonstration disk ($20.00) includes modem-data edit program. Young Investment Research is registered with the S.E.C. as an investment adviser.

New Orleans General Data Services, Inc.
7230 Chadbourne Drive
New Orleans, LA 70126

Contact: David or Jean Troendle Phone: 504-241-9495

Comments: Hardware, Software, and consultation available. Products: H-8 and H/Z-89 Color Graphics Boards. H-8 Music Synthesizer Systems. Pascal/MT+ for HDOS. GRAPH-PAC-1 and GRAPH-PAC-II Software Packages for H-8 and H/Z-89 Color Graphics Boards. Joysticks for H-8 and H/Z-89 Color Boards. 8-Voice Music Compiler for H-8 Music Board.

Technology Services, Ltd.
2010 Woodstock Ln.
Tallahassee, FL 32303

Contact: Bill Hill

Comments: Software and consultation (limited to my customers) available. Products: TSL supplies all Mycroft Labs products to the H/Z community including MITE, BYE, MITE/BYE (communications); MADS (modular assembler) et al. All are available for CP/M-80, CP/M Plus, CP/M-86, and soon for Z-DOS. Discounts available to HUG members and subscribers of BUSS or H=Scoop with proof (mailing labels).

Viking Software
2243 South Belair Drive
Salt Lake City, UT 84109

Contact: Grant Phone: 801-484-9573 (after 5)

Comments: Software, Hardware, and limited consultation available. Products: ZDOS & HDOS copy to CP/M, HDOS printer drivers, One- Drive kit, Compare Utilities (5), Autoscribe Update, MBASIC Sorting, WordStar Keys CP/M or ZDOS, C/80 Clibrary for CP/M & M80, HDOS & CP/M 4MHz kit, and EPROM Programmer. Free 20-page catalog: HDOS, ZDOS, CP/M. CRASH-83 H17/37/47 distributed by Software Wizardry.

Sextant Publishing Company
Dept. R
716 E. Street SE
Washington, DC 20003

Contact: John Gill Phone: 202-544-0900
800-341-1522 (orders only; M-F 8 a.m.-9 p.m. EST)

Products: Independent publications with technical and how-to programming and hardware construction articles, product review, program listings, user community news, advertising, and more exclusively for Heath/Zenith users. U.S. prices: Sextant magazine, 6x/year, $14.95; Buss newsletter, 20x/year, $28.

CCS DATA STATION, Comprehensive Computer Services
8 Roanoke Street
Christiansburg, VA 24073

Contact: Priscilla Fleshman Phone: 703-382-4234

Comments: Hardware, Software, and consultation available. Products: Full ZDS line of hardware and software, Star, CITOH, Okidata, Silver Reed, NEC printers, moderns, supplies, and the ZORBA portable computer. Local Service Center, personal support and handholding, educational discounts.

H & H Computer Enterprises, Inc.
P. O. Drawer H
Blacksburg, VA 24060

Contact: Cherie Hassall Phone: 703-552-0599

Comments: Hardware, Software, and consultation available. Products: The ORIGINAL thinline Disk Storage Multiplier family. Put two 40 or 80 track drives in H/Z89/90 cabinet. Kits complete with all needed items, including software as appropriate. Drives fully checked before shipment. The ORIGINAL serial/parallel interface board. Kits are complete with all items; bare board also available. Software for most popular printers. Daisy wheel and dot matrix printer packages available. Group purchase discounts available.

Mycroft Labs, Inc.
P. O. Box 6045
Tallahassee, FL 32314

Contact: Don Waldo (Technical Assistance)
Phone: 904-385-1141

Contact: Keith A. Ackerman (Place Orders)
Phone: 904-385-1411

Comments: Software and consultation available. Products: MITE is a menu-driven data communications pkg. for CP/M-80 and CP/M-86 based computers. It supports four binary protocols, allows for auto dial and auto logon, text file upload and download, and much more. BYE is a program which allows you to grant remote access to your CP/M microcomputer. BYE provides password protection, baud rate selection, start-up program selection, and file transfer capability.

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- **DG Static 64**
  Fully Static, High Capacity, Bank-selectable RAM. Also can be used as EPROM/PROM board (2716 type EPROMS). Priced from $199.00 (0K) to $499.00 (64K).
- **DG-32D/32K RAM Board**
  Low cost, Dependable RAM for the H8 32K Version Only $179.00.
- **DG-ADP4**
  H17-4 MHz disk adaptor — $19.95

THE SUPER 89

The DG SUPER 89 is a replacement central processor board for the Heath/Zenith 88-89 series of computers. The DG SUPER 89 offers advanced features not available on the standard Heath/Zenith 88-89 such as 4 MHz operation, real-time clock, optional AM9511A arithmetic processor, up to 256K of bank selectable RAM with parity check, and HDOS, CP/M and MP/M compatibility. By incorporating current state-of-the-art technology available for the Z80, the DG SUPER 89 offers the user increased speed and system reliability for years to come. Full compatibility with all Health/Zenith software and hardware products is designed into the DG SUPER 89. Electronic Disk Software included. Priced from $829.00 (128K) to $989.00 (256K).

HEARTBEAT

The DG Heartbeat is a compact computer system designed to be hardware and software compatible with the popular Heath/Zenith Z89/90 computer product line. The Heartbeat offers advanced features not found on the standard Heath/Zenith computer such as 4 MHz operation, real-time clock/calendar, two RS-232 serial ports, five peripheral expansion slots, 128 Kbytes (expandable to 256 Kbytes) parity checked RAM and provisions for an optional AM9511 Arithmetic Processor. Compatible with HDOS, CP/M and MP/M II (Multi-user) operating systems. Electronic Disk Software included. The Heartbeat may be used with most popular video terminals on the market although the Heath/Zenith H/Z19, H/Z29 and ZT-10/11 video terminals are recommended for full Heath/Zenith software compatibility. The Heartbeat cabinet design provides for inclusion of hard and/or floppy disk drives as well as other desired peripheral interfaces and is color-coordinated for use with the Zenith Z29 and ZT-10/11 video terminals. Priced from $1350.00 (Basic Unit).

D·G ELECTRONIC DEVELOPMENTS CO.

Ordering Information: Products listed available from DG Electronic Developments Co., 700 South Armstrong, Denison, Tx 75020. Check, Money Order, VISA or MasterCard accepted. Phone orders call (214) 465-7805. Freight prepaid. Allow 3 weeks for personal checks to clear. Texas residents add 5%. Foreign orders add 30%. Prices subject to change without notice.

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