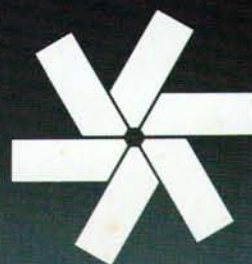


The Official **ZENITH** /Heath Computer Users Magazine

# REMark<sup>®</sup>



January 1989

**AN IN-DEPTH LOOK AT  
AMI'S NEW  
ZX-386 UPGRADE**

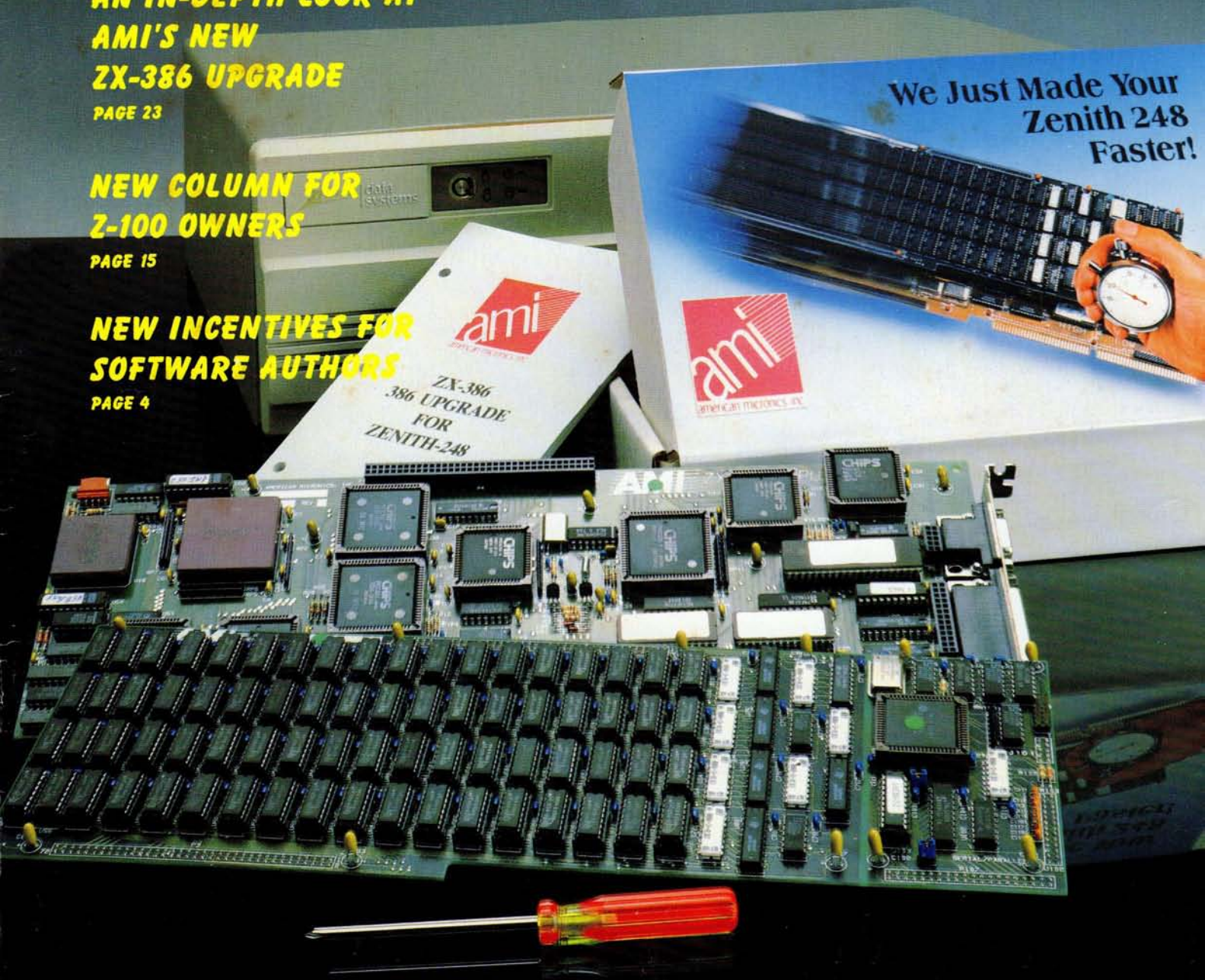
PAGE 23

**NEW COLUMN FOR  
Z-100 OWNERS**

PAGE 15

**NEW INCENTIVES FOR  
SOFTWARE AUTHORS**

PAGE 4





## "I've Got Your Number Now . . ."

"Now you have no reason for us to be strangers. I know each and every one of you personally! My human gave me the entire HUG Database to study and now there's no need for **any** HUG member to register. Just have your ID Number handy when you call . . . I do! I'll bet you didn't know that my Bargain Centre has discounts on HUG products, as well as other computer **and** non-computer related items. And, did you know that I can renew your HUG membership . . . at a discount?! I can give you over 35 megabytes of free software. All you have to do is take it! Now no-one will **ever** have to know about the two of us. Just set your modem to 300, 1200, or 2400 baud, 8-data bits, no-parity, and call me anytime your computer needs someone to talk to. I can be contacted at (616) 982-3956. Although no longer required, my human can be reached at (616) 982-3837.

MOC



# REMark®

Volume 10, Issue 1 • January 1989

**On The Cover:** Featured this month on our cover is the American Micronics, Inc. ZX-386 upgrade kit. For a review of this board, see Pat Swayne's article on page 23.

## Features

<b>A New Engine for Your '248</b> Pat Swayne	23
<i>PC Compatible</i>	
<b>Marriage Between Generations</b> Frank E. Hutchison	28
<i>H/Z-89/90 &amp; PC Compatible</i>	

## Columns

<b>On the Leading Edge</b> William M. Adney	17
<i>H/Z-100 &amp; PC Compatible</i>	

## Series

<b>POWERING UP</b> William M. Adney	10
<i>PC Compatible</i>	
<b>Z-100 Survival Kit</b> Paul F. Herman	15
<i>H/Z-100</i>	
<b>ENABLE — Part 13</b> George P. Elwood	57
<i>H/Z-100 &amp; PC Compatible</i>	
<b>Turbo Pascal — Part 3</b> Matt Elwood	62
<i>H/Z-100 &amp; PC Compatible</i>	

## Resources

<b>HUG Price List</b>	2
<b>Welcome to the World of Heath/Zenith Users</b>	4
<b>Local HUG Clubs</b>	25
<b>1986 Software Update</b>	31
<b>1987 Software Update</b>	41
<b>HUG Discount List</b>	45
<b>1988 Software Update</b>	47
<b>Classified Ads</b>	64
<b>Glitches</b>	64

Reader Service No.		Page No.
182	AOX Inc.	53
183	Arrow Connection	21
181	Databyte Technology, Inc.	56
104	FBE Research Co.	13
184	First Capitol Computer	8
178	First Capitol Computer	27
177	First Capitol Computer	40
105	First Capitol Computer	46
185	Helix Software Co., Inc.	63
107	Paul F. Herman	53
108	Hogware	40
137	Jay Gold Software	8
111	KEA Systems	14
179	KEA Systems	56
136	Lindley Systems	14
114	Micronics Technology	21
117	Payload Computer Services	22
186	Powerline Systems	27
130	Quikdata	30
187	SEBHC Journal	63
121	Scottie Systems	29
188	Serendipity Associates	61
189	Skycastle Computer Prod.	61
190	Software Applic. of Wichita	64

### \* PC Compatibles

All Models include the following series of computers: H/Z-130, 140, 150, 160, 170, 180, H/Z-200 and 300.

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Send Payment to: Heath/Zenith Users' Group  
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HUG is provided as a service to its members for the purpose of fostering the exchange of ideas to enhance their usage of Heath/Zenith equipment. As such, little or no evaluation of the programs or products advertised in REMark. The Software Catalog, or other HUG publications is performed by Heath Company, in general, and HUG, in particular. The prospective user is hereby put on notice that the programs may contain faults, the consequence of which Heath Company, in general, and HUG, in particular, cannot be held responsible. The prospective user is, by virtue of obtaining and using these programs, assuming full risk for all consequences.

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PRODUCT NAME	PART NUMBER	OPERATING SYSTEM	DESCRIPTION	PRICE
<b>H8 - H/Z-89/90</b>				
ACCOUNTING SYSTEM	885-8047-37	CPM	BUSINESS	20.00
ACTION GAMES	885-1220-[37]	CPM	GAME	20.00
ADVENTURE	885-1010	HDOS	GAME	10.00
ASCIRITY	885-1238-[37]	CPM	AMATEUR RADIO	20.00
AUTOFIL (280 ONLY)	885-1110	HDOS	DBMS	30.00
BHBASIC SUPPORT PACKAGE	885-1119-[37]	HDOS	UTILITY	20.00
CASTLE	885-8032-[37]	HDOS	ENTERTAINMENT	20.00
CHEAPCALC	885-1131-[37]	HDOS	SPREADSHEET	20.00
CHECKOFF	885-8010	HDOS	CHECKBOOK SOFTWARE	25.00
DEVICE DRIVERS	885-1105	HDOS	UTILITY	20.00
DISK UTILITIES	885-1213-[37]	CPM	UTILITY	20.00
DUNGEONS & DRAGONS	885-1093-[37]	HDOS	GAME	20.00
FLOATING POINT PACKAGE	885-1063	HDOS	UTILITY	18.00
GALACTIC WARRIORS	885-8009-[37]	HDOS	GAME	20.00
GALACTIC WARRIORS	885-8009-[37]	CPM	GAME	20.00
GAMES 1	885-1029-[37]	HDOS	GAMES	18.00
HARD SECTOR SUPPORT PACKAGE	885-1121	HDOS	UTILITY	30.00
HDOS PROGRAMMERS HELPER	885-8017	HDOS	UTILITY	16.00
HOME FINANCE	885-1070	HDOS	BUSINESS	18.00
HUG DISK DUPLICATION UTILITIES	885-1217-[37]	CPM	UTILITY	20.00
HUG SOFTWARE CATALOG	885-4500	VARIOUS	PRODUCTS THRU 1982	9.75
HUGMAN & MOVIE ANIMATION	885-1124	HDOS	ENTERTAINMENT	20.00
INFO. SYSTEM AND TEL. & MAIL SYSTEM	885-1108-[37]	HDOS	DBMS	30.00
LOGBOOK	885-1107-[37]	HDOS	AMATEUR RADIO	30.00
MAGBASE	885-1249-[37]	CPM	MAGAZINE DATABASE	25.00
MAPLE	885-8005	HDOS	COMMUNICATION	35.00
MAPLE	885-8012-[37]	CPM	COMMUNICATION	35.00
MICRONET CONNECTION	885-1122-[37]	HDOS	COMMUNICATION	16.00
MISCELLANEOUS UTILITIES	885-1089-[37]	HDOS	UTILITY	20.00
MORSE CODE TRANSCEIVER	885-8016	HDOS	AMATEUR RADIO	20.00
MORSE CODE TRANSCEIVER	885-8031-[37]	CPM	AMATEUR RADIO	20.00
PAGE EDITOR	885-1079-[37]	HDOS	UTILITY	25.00
PROGRAMS FOR PRINTERS	885-1082	HDOS	UTILITY	20.00
REMARK VOL 1 ISSUES 1-13	885-4001	N/A	1978 TO DECEMBER 1980	20.00
RUNOFF	885-1025	HDOS	TEXT PROCESSOR	35.00
SCICALC	885-8027	HDOS	UTILITY	20.00
SMALL BUSINESS PACKAGE	885-1071-[37]	HDOS	BUSINESS	75.00
SMALL-C COMPILER	885-1134	HDOS	LANGUAGE	30.00
SOFT SECTOR SUPPORT PACKAGE	885-1127-[37]	HDOS	UTILITY	20.00
STUDENT'S STATISTICS PACKAGE	885-8021	HDOS	EDUCATION	20.00
SUBMIT (280 ONLY)	885-8006	HDOS	UTILITY	20.00
TERM & HTOC	885-1207-[37]	CPM	COMMUNICATION & UTILITY	20.00
TINY BASIC COMPILER	885-1132-[37]	HDOS	LANGUAGE	25.00
TINY PASCAL	885-1086-[37]	HDOS	LANGUAGE	20.00
UDUMP	885-8004	HDOS	UTILITY	35.00
UTILITIES	885-1212-[37]	CPM	UTILITY	20.00
UTILITIES BY PS	885-1126	HDOS	UTILITY	20.00
VARIETY PACKAGE	885-1135-[37]	HDOS	UTILITY & GAMES	20.00
WATZMAN ROM SOURCE & DOC	885-1221-[37]	CPM	H19 FIRMWARE	30.00
WATZMAN ROM	885-4600	N/A	H19 FIRMWARE	45.00
WHEW UTILITIES	885-1120-[37]	HDOS	UTILITY	20.00
XMET ROBOT X-ASSEMBLER	885-1229-[37]	CPM	UTILITY	20.00
Z80 ASSEMBLER	885-1078-[37]	HDOS	UTILITY	25.00
Z80 DEBUGGING TOOL (ALDT)	885-1116	HDOS	UTILITY	20.00

## H8 - H/Z-89/90 - H/Z-100 (Not PC)

ADVENTURE	885-1222-[37]	CPM	GAME	10.00
BASIC-E	885-1215-[37]	CPM	LANGUAGE	20.00
CASSINO GAMES	885-1227-[37]	CPM	GAME	20.00
CHEAPCALC	885-1233-[37]	CPM	SPREADSHEET	20.00
CHECKOFF	885-8011-[37]	CPM	CHECKBOOK SOFTWARE	25.00
COPYDOS	885-1235-37	CPM	UTILITY	20.00
DISK DUMP & EDIT UTILITY	885-1225-[37]	CPM	UTILITY	30.00
DUNGEONS & DRAGONS	885-1209-[37]	CPM	GAMES	20.00
FAST ACTION GAMES	885-1228-[37]	CPM	GAME	20.00
FUN DISK I	885-1236-[37]	CPM	GAMES	20.00
FUN DISK II	885-1248-[37]	CPM	GAMES	35.00
GAMES DISK	885-1206-[37]	CPM	GAMES	20.00
GRADE	885-8036-[37]	CPM	GRADE BOOK	20.00
HRUN	885-1223-[37]	CPM	HDOS EMULATOR	40.00
HUG FILE MANAGER & UTILITIES	885-1246-[37]	CPM	UTILITY	20.00
HUG SOFTWARE CATALOG UPDATE #1	885-4501	VARIOUS	PRODUCTS 1983 THRU 1985	9.75
KEYMAP CPM-80	885-1230-[37]	CPM	UTILITY	20.00
MBASIC PAYROLL	885-1218-[37]	CPM	BUSINESS	60.00
MICRONET CONNECTION	885-1224-[37]	CPM	COMMUNICATION	16.00
NAVPROGSEVEN	885-1219-[37]	CPM	FLIGHT UTILITY	20.00
REMARK VOL 3 ISSUES 24-35	885-4003	N/A	1982	20.00
REMARK VOL 4 ISSUES 36-47	885-4004	N/A	1983	20.00
REMARK VOL 5 ISSUES 48-59	885-4005	N/A	1984	25.00
REMARK VOL 6 ISSUES 60-71	885-4006	N/A	1985	25.00
REMARK VOL 7 ISSUES 72-83	885-4007	N/A	1986	25.00
SEA BATTLE	885-1211-[37]	CPM	GAME	20.00
UTILITIES BY PS	885-1226-[37]	CPM	UTILITY	20.00
UTILITIES	885-1237-[37]	CPM	UTILITY	20.00

# Price List

The following HUG Price List contains a list of all products in the HUG Software Catalog and Software Catalog Update #1. For a detailed abstract of these products, refer to the HUG Software Catalog, Software Catalog Update #1, or previous issues of REMark.

PRODUCT NAME	PART NUMBER	OPERATING SYSTEM	DESCRIPTION	PRICE
X-REFERENCE UTILITIES FOR MBASIC	885-1231-[37]	CPM	UTILITY	20.00
ZTERM	885-3003-[37]	CPM	COMMUNICATION	20.00

## H/Z-100 (Not PC) Only

ACCOUNTING SYSTEM	885-8048-37	MSDOS	BUSINESS	20.00
CALC	885-8043-37	MSDOS	UTILITY	20.00
CARDCAT	885-3021-37	MSDOS	BUSINESS	20.00
CHEAPCALC	885-3006-37	MSDOS	SPREADSHEET	20.00
CHECKBOOK MANAGER	885-3013-37	MSDOS	BUSINESS	20.00
CP/EMULATOR	885-3007-37	MSDOS	CPM EMULATOR	20.00
DBZ	885-8034-37	MSDOS	DBMS	25.00
ETCHDUMP	885-3005-37	MSDOS	UTILITY	20.00
EZPLOT II	885-3049-37	MSDOS	PRINTER PLOTTING UTILITY	25.00
GAMES CONTEST PACKAGE	885-3017-37	MSDOS	GAMES	25.00
GAMES PACKAGE II	885-3044-37	MSDOS	GAMES	25.00
GRAPHICS	885-3031-37	MSDOS	ENTERTAINMENT	20.00
HELPSCREEN	885-3039-37	MSDOS	UTILITY	20.00
HUG BACKGROUND PRINT SPOOLER	885-1247-37	CPM	UTILITY	20.00
KEYMAC	885-3046-37	MSDOS	UTILITY	20.00
KEYMAP	885-3010-37	MSDOS	UTILITY	20.00
KEYMAP CPM-85	885-1245-37	CPM	UTILITY	20.00
MAPLE	885-8023-37	CPM	COMMUNICATION	35.00
MATHFLASH	885-8030-37	MSDOS	EDUCATION	20.00
ORBITS	885-8041-37	MSDOS	EDUCATION	25.00
POKER PARTY	885-8042-37	MSDOS	ENTERTAINMENT	20.00
SCICALC	885-8028-37	MSDOS	UTILITY	20.00
SKYVIEWS	885-3015-37	MSDOS	ASTRONOMY UTILITY	20.00
SMALL-C COMPILER	885-3026-37	MSDOS	LANGUAGE	30.00
SPELL5	885-3035-37	MSDOS	SPELLING CHECKER	20.00
SPREADSHEET CONTEST PACKAGE	885-3018-37	MSDOS	VARIOUS SPREADSHEETS	25.00
TREE-ID	885-3036-37	MSDOS	TREE IDENTIFIER	20.00
USEFUL PROGRAMS I	885-3022-37	MSDOS	UTILITIES	30.00
UTILITIES	885-3008-37	MSDOS	UTILITY	20.00
Z100 WORDSTAR CONNECTION	885-3047-37	MSDOS	UTILITY	20.00
ZBASIC DUNGEONS & DRAGONS	885-3009-37	MSDOS	GAME	20.00
ZBASIC GRAPHIC GAMES	885-3004-37	MSDOS	GAMES	20.00
ZBASIC GAMES	885-3011-37	MSDOS	GAMES	20.00
ZPC II	885-3037-37	MSDOS	PC EMULATOR	60.00
ZPC UPGRADE DISK	885-3042-37	MSDOS	UTILITY	20.00

## H/Z-100 and PC Compatibles

ADVENTURE	885-3016	MSDOS	GAME	10.00
ASSEMBLY LANGUAGE UTILITIES	885-8046	MSDOS	UTILITY	20.00
BOTH SIDES PRINTER UTILITY	885-3048	MSDOS	UTILITY	20.00
CXREF	885-3051	MSDOS	UTILITY	17.00
DEBUG SUPPORT UTILITIES	885-3038	MSDOS	UTILITY	20.00
DPATH	885-8039	MSDOS	UTILITY	20.00
HADES	885-3040	MSDOS	UTILITY	40.00
HELP	885-8040	MSDOS	CAI	20.00
HEPCAT	885-3045	MSDOS	UTILITY	35.00
HUG BACKGROUND PRINT SPOOLER	885-3029	MSDOS	UTILITY	20.00
HUG EDITOR	885-3012	MSDOS	TEXT PROCESSOR	20.00
HUG MENU SYSTEM	885-3020	MSDOS	UTILITY	20.00
HUG SOFTWARE CATALOG UPDATE #1	885-4501	VARIOUS	PROD 1983 THRU 1985	9.75
HUGMCP	885-3033	MSDOS	COMMUNICATION	40.00
HUGPBBS SOURCE LISTING	885-3028	MSDOS	COMMUNICATION	60.00
HUGPBBS	885-3027	MSDOS	COMMUNICATION	40.00
ICT 8080 TO 8088 TRANSLATOR	885-3024	MSDOS	UTILITY	20.00
MAGBASE	885-3050	VARIOUS	MAGAZINE DATABASE	25.00
MATT	885-8045	MSDOS	MATRIX UTILITY	20.00
MISCELLANEOUS UTILITIES	885-3025	MSDOS	UTILITIES	20.00
PS's PC & Z100 UTILITIES	885-3052	MSDOS	UTILITY	20.00
REMARK VOL 5 ISSUES 48-59	885-4005	N/A	1984	25.00
REMARK VOL 6 ISSUES 60-71	885-4006	N/A	1985	25.00
REMARK VOL 7 ISSUES 72-83	885-4007	N/A	1986	25.00
REMARK VOL 8 ISSUES 84-95	885-4008	N/A	1987	25.00
SCREEN DUMP	885-3043	MSDOS	UTILITY	30.00
UTILITIES II	885-3014	MSDOS	UTILITY	20.00

## PC Compatibles

ACCOUNTING SYSTEM	885-8049	MSDOS	BUSINESS	20.00
CARDCAT	885-6006	MSDOS	CATALOGING SYSTEM	20.00
CHEAPCALC	885-6004	MSDOS	SPREADSHEET	20.00
CP/EMULATOR II & ZEMULATOR	885-6002	MSDOS	CPM & Z100 EMULATORS	20.00
DUNGEONS & DRAGONS	885-6007	MSDOS	GAME	20.00
EZPLOT II	885-6013	MSDOS	PRINTER PLOTTING UTILITY	25.00
GRADE	885-8037	MSDOS	GRADE BOOK	20.00
HAM HELP	885-6010	MSDOS	AMATEUR RADIO	20.00
KEYMAP	885-6001	MSDOS	UTILITY	20.00
PS's PC UTILITIES	885-6011	MSDOS	UTILITIES	20.00
SCREEN SAVER PLUS	885-6009	MSDOS	UTILITIES	20.00
SKYVIEWS	885-6005	MSDOS	ASTRONOMY UTILITY	20.00
TCSPELL	885-8044	MSDOS	SPELLING CHECKER	20.00
ULTRA RTTY	885-6012	MSDOS	AMATEUR RADIO	20.00

Magazines everywhere, and no way to reference the wealth of information they hold? Not anymore! Now there's **MAGBASE**; a database designed specifically for referencing magazine articles. Don't let those one-hundred-and-some back issues of REMark, or C Users Journal, or Veterinary Medicine, (or any magazine) gather dust, use **MAGBASE**, and find that article you read two years ago! **MAGBASE** is available for **MSDOS HUG P/N 885-3050** or **CP/M (P/N 885-1249-[27])**.

**LAPTOP OWNERS . . .** don't feel left out! All of HUG's MSDOS software is available on 3-1/2" micro-floppies too! When ordering, just add a "-80" to the 7-digit HUG part number. For the standard 5-1/4" floppy, just add a "-37".

Make the no-hassle connection with your modem today! **HUGMCP** doesn't give you long menus to sift through like some modem packages do. With **HUGMCP**, **YOU'RE** always in control, not the software. Order **HUG P/N 885-3033-37** today, and see if it isn't the easiest-to-use modem software available. Joe Katz says it was so easy to use, he didn't even need to look at the manual. "It's the only modem software that I use, and I'm in charge of both HUG bulletin boards!" says Jim Buszkiewicz. **HUGMCP** runs on ANY Heath/Zenith computer that's capable of running **MS-DOS!**

## ORDERING INFORMATION

For VISA and MasterCard phone orders, telephone the Heath Users' Group directly at (616) 982-3463. Have the part number(s), descriptions, and quantity ready for quick processing. By mail, send your order, plus 10% postage and handling (\$1.00 minimum charge, up to a maximum of \$5.00) to: Heath Users' Group, P.O. Box 217, Benton Harbor, MI 49022-0217. VISA and MasterCard require minimum \$10.00 order. No C.O.D.s accepted.

Questions regarding your subscription? Call Margaret Bacon at (616) 982-3463.

# Welcome To The World of Heath/ Zenith Users



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 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.

## 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 following issues of REMark will help you explore the exciting and powerful world of micro computing.

## 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, official Heath/Zenith magazine.
- A personal identification card.
- HUG Short Form Catalog.
- Access to the Heath/Zenith Users' Group Software Library.
- Access to the National HUG Bulletin Board System.
- Discounts on a variety of Heath/Zenith computer products.

These benefits are described in the following paragraphs.

### HUG Membership Rates

The following rate schedule applies as of January 1985 for membership:

Type of Membership	U.S. Domestic	APO/FPO & All Others
Initial	\$22.95	* \$37.95
Renewal	\$19.95	* \$32.95

\*Note: Must be in U.S. funds

Memberships and Renewals can be made using the toll free line normally used to order products from Heath Company. Call 1-800-253-0570 Monday

through Friday, 8 A.M. to 5 P.M. Eastern Time. In Alaska and Michigan, call (616) 982-3411 or (616) 982-3463.

### 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 to participate in the discount program.
2. Your ID card can only be used at your local Heath/Zenith Computers & Electronics Centers 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. You must present your ID when placing your order for any item.
7. Your HUG ID cannot be used to purchase individual parts or HUG software products under the discount program from the Heath/Zenith Computers & Electronics Centers or from Heath Company. **HUG products are considered parts.**
8. The ID card can be used for a 10% discount on Heathkit computer related items only.
9. The ID card can be used for a 20% discount on Zenith Data Systems (assembled) computer related items only.
10. Any model purchased which installs as a modification to the internal portions of the computer (i.e., boards, drives, 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, modems, etc.) is considered a wired item.
12. Heath or Zenith Data Systems software is considered a finished or assembled item and, therefore, can be purchased at the 20% discount. Since HUG software is considered a part, it is not included in either program.
13. Multiple discounts do not apply. You can use either "special prices" or your HUG discount, whichever is greater. The HUG ID may not be used with any promotional certificates offered by Heath Company or the Heath/Zenith Computers & 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.
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:**

Attn: HUG Secretary/New ID Card  
 Heath/Zenith Users' Group  
 P.O. Box 217  
 Benton Harbor, MI 49022-0217

#### Publications

REMark, the official magazine for users of Heath/Zenith computer products,

is sent to each member 12 times a year. Individual back issues may be obtained during the current year. However, at the end of the year, all twelve issues become a shrink-wrapped volume which may be purchased as a separate item. There are currently eight 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.

#### Article Submittals

Major articles are defined as articles containing 2000 words or more. Authors contributing major articles that are printed in REMark will have a choice of receiving one of the following:

- A choice of any single Heath/Zenith software product.
- Cash, ranging in value from \$250 to \$400.
- HUG BUCK certificate ranging in value from \$350 to \$500.

For those of you just joining us, HUG BUCKs are certificates good toward the purchase of **any** product in the Heath mail order catalog. HUG BUCKs can be collected to completely or partially purchase the product of your choice. Specifics regarding the use of the HUG BUCK accompany the award itself.

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.

Certificates, software, cash or HUG BUCKs are sent out after your article appears in REMark.

#### 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.

The 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
- Reviews

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. 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, cash or HUG BUCKs.

##### 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 help with 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 pro-

vide us with finished India Ink drawings or computer/printer art 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. Also, we would like to know what you feel your article should look like in print. In some cases, we do not have the processor the author used to duplicate text provided on disk.

#### **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 move the information through our system faster. We can accept any **standard** Heath/Zenith disk format; however, MS-DOS format is preferred. Your text files should not have visible or hidden coding, since these codes delay the production process. WordStar files, however, are preferred.

Should you have questions about an article you would like to submit, please feel free to contact the REMark Editor. All materials received for publication in REMark become the property of the Heath/Zenith Users' Group.

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

Heath/Zenith Users' Group  
Attn: REMark Article  
P.O. Box 217  
Benton Harbor, MI 49022-0217

#### **How To Submit Programs To The Heath/Zenith Users' Group**

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

Two 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. Shareware is also accepted.

**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.

**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 rewards 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**

If the program you wrote is accepted to the Public Domain Library, you will receive your choice of any HUG software package . . . free. The program you submit will be made available through the official Heath/Zenith Users' Group Bulletin Board System, HUGPBBS at (616) 982-3956.

##### **HUG Software Library (New Incentives for 1989)**

As a new program for 1989, HUG is offering the following incentives to authors for submitting software to the HUG Software Library. Authors whose software is accepted for the HUG Library will receive a one year extension of their HUG membership, (or a new membership, if they're not yet a member) and their choice of either cash, ranging in value from \$250 to \$400, or a HUG BUCK certificate, ranging in value from \$350 to \$500.

**Note:** Multiple related programs on one disk is considered one submittal (e.g., GAME1, GAME2, GAME3, etc.). If your programs are released on one product, this is considered a single contribution to the Heath/Zenith Users' Group.

##### **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. If a program defect is detected, the review process is ended. 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. A good test for your program is to have another user in your area, who is unfamiliar with your product, attempt to operate it.

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 problems 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:

Heath/Zenith Users' Group  
P.O. Box 217  
Benton Harbor, MI 49022-0217

### Ordering Information

When ordering HUG Software Products, 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.
3. 10% postage and handling, up to a maximum of \$5.00, minimum of \$1.00. UPS is \$1.75 minimum with no maximum. UPS Blue Label is \$4.00 minimum.
4. VISA and MasterCard also accepted, minimum \$10.00 order.

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**For VISA and MasterCard phone orders, telephone the Heath/Zenith Users' Group at (616) 982-3463.** Have the part number (p/n), description, and quantity ready for quick processing.

**Note:** HUG currently offers formats for CP/M, HDOS, ZDOS, and MSDOS for both 5-1/4" and 3-1/2" disks:

SS, SD, hard-sectored  
SS, SD, soft-sectored  
ZDOS DS  
MSDOS DS

**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. For 3-1/2" MS-DOS only formats, add a "-80" to the part number in a similar fashion.

For additional information concerning any of the HUG software products, contact the Heath/Zenith Users' Group at (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.

### 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. **Please tell us when the change is to take effect.**

Use the card provided in each issue of REMark or a suitable copy to change your address. Send it directly to:

Heath/Zenith Users' Group  
Attn: HUG Secretary  
P.O. Box 217  
Benton Harbor, MI 49022-0217

### HUGPBBS — The Official National Heath/Zenith Users' Group Bulletin Board System

The Heath/Zenith Users' Group operates and maintains a bulletin board system for ALL of its members. This 24-hour system is available at no extra charge, and separate registration is **not** necessary if you're a current HUG member. HUGPBBS boasts three major features:

First is the message base. Here, HUG members can exchange messages with other HUG members across the nation, and around the world! Message content includes selling no longer needed equipment, solutions to problems encountered by other 'HUGGIES', and general information regarding hardware and software, as well as direct contact with the National HUG offices.

Second, and probably the most popular feature, is the software database. HUG strives to maintain a database of the most popular public-domain and Shareware software currently available. This software is available for downloading (at no additional charge) to any current HUG member. This software is cataloged by individual disk number, and these disks are also available through the bulletin board for \$7.00 each. Currently, there is over 45 megabytes of software available and this amount is constantly growing!

The most recent addition to HUGPBBS has been the 'Bargain Centre'. This part of the system is where HUG members can purchase computers, computer-related equipment and practically everything in between at un-heard-of prices. This third part of the system is quickly becoming a legend!

Separate registration is no longer required for full access to HUGPBBS. If you're a current HUG member, you're automatically registered. To call the system, use the following guidelines:

1. First, set your communications software to 8-data bits, 1-stop bit, and NO-parity.
2. HUGPBBS is a multi-user system. The main telephone number to call is: (616) 982-3956.
3. When the system answers and successfully connects with your modem, it will automatically determine what baud rate you're running at, and begin signing on.
4. The first question you'll be asked is to enter your first name. This entry is not critical, and any first name you'd like to be known by can be used.
5. The next entry is your last name. This information must be entered exactly as it appears (including any spaces and information afterwards) on your HUG ID card, or REMark mailing label. If your membership is registered to be your company name, the entire company name is considered to be your last name. This entry is **not** case sensitive. That is, you can use either upper or lower case letters in entering this data.
6. The third and final piece of information required by HUGPBBS is your HUG ID number. Again, this information should be entered exactly as it appears on your HUG ID card, or REMark mailing label.
7. Once your HUG ID has been entered, the system will spend about 6 seconds verifying your information, and if no mistakes were made, allow you full access to the system. If a mistake was made, the system does have an 'L' command which allows you to go through the log-on procedure again.
8. Once into the system, menus and help files are at your disposal. We have yet to hear one negative comment as to how easy HUGPBBS is to use!

### Special Interest and Local HUG Groups

One of the best sources for information and help is the Local Heath/Zenith 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 Heath/Zenith Computers & Electronics Center. These stores can usually provide you with the necessary contact information. A listing of known Local HUGs is published twice a year.

### Heath/Zenith Related Publications

Of major importance to the new user is the availability of additional information for 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.

Four excellent independent publications are listed here:

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# Heath/Zenith Users' Group

## PROGRAM SUBMITTAL and AGREEMENT FORM

Programmer \_\_\_\_\_

Address \_\_\_\_\_ City-State \_\_\_\_\_ Zip \_\_\_\_\_

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 agreement in the (check one)

Public Domain Library

HUG 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 debugged 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.

Date \_\_\_\_\_ Signed \_\_\_\_\_

# POWERING UP

William M. Adney

P.O. Box 531655  
Grand Prairie, TX 75053-1655

## Using Input/Output (I/O) Redirection

Like subdirectories, the features and facilities for I/O redirection were originally introduced in version 2 of DOS. For many people, however, the real uses of I/O redirection seem to remain a mystery. That appears to be due, in part, to the fact that most DOS documentation does little more than introduce the subject, and it doesn't do that very well. This article will help dispel some of the mystery surrounding the use of I/O redirection, and you will see some practical ways to use it on your system. For the most part, the uses of I/O redirection are only limited by your imagination.

It is interesting to note that both subdirectories and I/O redirection are not really new — they have been around a long time. Even though they were introduced to DOS several years ago, both features have been available in Unix and Unix-based systems (e.g., Xenix) for a long time. Like most features in most operating systems, neither was a "DOS original", but you will probably see more, not less, of both in the future. And if you like to use I/O redirection, there is more of it in the new PC compatible operating system OS/2. To understand generally how I/O redirection works, it is important to review a few basics.

### Basics of I/O Redirection

When you type something on your keyboard, virtually all programs "read" a keystroke from a device called the system console. Then, a character representing that input is normally echoed (i.e., displayed) on the CRT which is also part of the system console. Because both the

keyboard and the CRT usually "work together", both comprise the system console from the DOS point of view. This may initially seem to be an odd way to define something, but there is some interesting history behind this concept.

It wasn't all that long ago that computers were way too large to fit in a single room, let alone on a desktop. These computers were physically quite large, and they required all kinds of special utilities, such as chilled water to cool the internals, air conditioning, and large amounts of electrical power. Today, many mainframe computers still require those special utilities. In any case, the only way for many people to effectively use these large computers is to connect a "display terminal" (with a keyboard and a CRT) to these systems. These display terminals are commonly called Video Display Terminals, or VDTs, and they consist of a keyboard and a CRT. Many of today's VDTs also contain memory, and some even contain a CPU chip — hence, they are sometimes called "smart" terminals.

For our purposes, the idea of the system console device consisting of a keyboard and a CRT found its way into the microcomputer world of DOS. And since the two are used together, it is reasonable to identify the keyboard/CRT combination as the system console. In a discussion of I/O redirection, we talk about the system console, or CON device, for short. Let's consider the use of the CON device as it is used in DOS.

Nearly all DOS commands and most application programs display some kind of output on the CRT as a normal func-

tion. You may see something you have typed (with a word processor, for example), an information message from a program or an error message. To be specific, the "program" reads your keystrokes from the keyboard (this is INPUT) and writes the characters you have typed on the CRT (this is OUTPUT). Therefore, the system console can be used as an input device (i.e., the keyboard) and an output device (i.e., the CRT), so we can say that a CON device can be used for both Input, as well as Output (I/O). Since all of that seems logical so far, let's consider what happens when you enter a command.

When you enter the DIR command, for example, it displays a directory listing that is normally output to the system console. That is the usual case because the DOS default is to show all output from the DIR command on the CRT display. But, you can use output redirection to send the DIR information display to a file instead of the CRT (i.e., the default CON device). That is just some of the power of I/O redirection. But before we talk too much about the specific forms of I/O redirection, it is important to look at one other point of information.

### Device Drivers

Although it is not quite as obvious, DOS device drivers have been around for a long time, too. Fine, but what is a device driver? A DEVICE DRIVER is a special kind of "program" or software interface between the operating system (DOS) and the computer's hardware. We talked about the VDISK device driver in the last article, and you may recall that it is imple-

mented by using the DEVICE= command in CONFIG.SYS. When the VDISK device driver is implemented, it reserves some of the computer's memory for use as a virtual or memory disk. More importantly, DOS thinks that the memory reserved by VDISK is a disk drive, and it is treated as such with a drive letter and all other apparent disk drive characteristics. It may be a little easier to think of a device driver as a kind of "translation" program between the computer hardware and software, and as a technical description, that is fairly accurate. Perhaps you may think that the idea of device drivers is not too important to you, but it is a fact that you use them every single time you use your computer.

As you know, each and every disk drive in your system, including a virtual disk if you use one, has a drive letter. It happens that each drive letter is associated with a device driver, but in most cases, the device driver is part of DOS (VDISK is an exception), and you never need to think about it. In technical jargon, device drivers with a single character name (e.g., A, B, C, etc.) are called BLOCK DEVICE DRIVERS because they transfer data in 512-byte groups (or blocks). Perhaps you know that each sector on a standard DOS disk also contains 512 bytes, and that is by design.

We have already looked at a character device driver: the system console or CON device. As its name implies, a CHARACTER DEVICE DRIVER transfers data on a character-by-character basis. Although a character device driver may have a name consisting of from one to eight characters (like the eight character file name), DOS has a number of standard character device drivers, such as CON, COM1, LPT1, and PRN. You may remember that we looked at these character device names in the article about connecting peripherals, and you will see those names again later in this article. In general, you really don't need to know which kind of device driver you are using, but you will occasionally find obscure references to block and character device drivers in some documentation, and it's nice to know what is going on and why.

### Input and Output

Most device drivers have both input and output (I/O) capabilities, as they are furnished with DOS. When the term "input" is used to describe a device, it means that data may be read from the device. When the term "output" is used to describe a device, it means that data may be written to the device. And when data may be both read from and written to a device, that is an I/O device.

For example, each disk drive is an I/O device, and the system console CON device is also an I/O device even though data is read from the keyboard and written to the CRT. But even though the DOS device drivers may support both the input

and output capability, not all hardware does. A printer, for example, is strictly an output device, because you will have to wait a long time to read data from it. A mouse, on the other hand, is strictly an input device, because it does not make sense to "send" (or output) data to a mouse. While all of this may seem obvious, it is important to know exactly what hardware is connected to which port (e.g., COM1) so you can use I/O redirection.

### Standard Input and Standard Output

When discussing I/O redirection, two terms are used. The first is STANDARD INPUT, or STDIN, which is defined as the source of input data to the system. For DOS and most other operating systems, the STDIN default is the CON (system console) device because standard input is read from the keyboard.

The second term is STANDARD OUTPUT, or STDOUT, which is defined as the standard destination for output data from the system. Like STDIN, the STDOUT default is also the CON device because standard output is written to the CRT.

In both cases, STDIN and STDOUT are only the default input and output devices, respectively. This does not imply that there are any limitations in the concept because a given program can be written to read data from another device instead of STDIN (a disk drive, for example) or it can write data to another device instead of STDOUT (a printer, for example). The use of a simple DOS command will illustrate how this works.

When you type the "DIR B:" command on the keyboard and see those letters on the CRT, you are using the CON device. Pressing the RETURN key executes the DIR program to display the directory contents of drive B, and this is the STDIN. The directory listing is written to the CRT (again, the CON device), and this is STDOUT. Virtually all DOS commands use this same technique for STDIN and STDOUT. The basic idea of what happens is not at all new, but thinking of it in these terms is.

The basic concept of I/O redirection is that you can dynamically redefine STDIN and STDOUT. By using special symbols on the command line, you can tell DOS to read data or commands from a device other than the default CON device (the keyboard). Or, you can tell DOS to write data to a device other than the default CON device (the CRT). This allows you to redirect input (STDIN) by reading another device, such as a disk file or redirect output by writing to another device, such as a printer. Because there are really two distinct and separate ways to use I/O redirection, it is easier to learn about them as two different subjects: Command Piping and I/O Redirection.

### Command Piping

When you use COMMAND PIPING, the STDOUT of one command or program is redirected to the the STDIN of another command or program. The significant difference between command piping and the other forms of I/O redirection is that command piping ONLY works between PROGRAMS, not devices. When you use command piping, the entire screen display of one program (the STDOUT) is piped to the STDIN of another program. The pipe symbol is the vertical bar (|) on your keyboard, and you can have more than one pipe symbol in a command line. For example, the most general form of any pipe command is:

```
A:\ ==>command1 | command2 | command3...
```

The screen display (STDOUT) of command1 is piped to the input (STDIN) of command2, and the output from command2 (STDOUT) is piped to the input (STDIN) command3, and so on. The only real limitation of command piping is the standard command line limit of 127 characters that includes the pipe symbols and spaces. Command piping usually involves the use of some special programs, called filters, (MORE, SORT, and FIND) supplied with DOS for this purpose, and all of these filters are external commands. Let's take a look at each one.

### The MORE Filter Command

The MORE filter takes data from STDIN (i.e., the STDOUT of another program), counts the lines, and separates them into groups of 23 lines, and sends each group to STDOUT, one screenful at a time. For command piping, the general syntax for this command is shown in Figure 1.

```
command | MORE
```

**Figure 1**  
**MORE Command Syntax**

The "command" shown in Figure 1 is any valid command that usually sends its output to STDOUT. One appropriate function of this filter is to use it with the DIR command (instead of DIR/P) as follows:

```
A:\ ==>DIR | MORE
```

The usual directory listing is piped to the MORE filter, which counts the lines, and the files are displayed one screenful (23 lines) at a time followed by a "--More--" information message. To see the next screenful of files, hit a character key (not CTRL or ALT), like the SPACE BAR, and the next screenful of files will be displayed.

You can use the MORE filter with any valid command, such as:

```
A:\ ==>TYPE AUTOEXEC.BAT | MORE
```

Since many AUTOEXEC files rarely exceed 23 lines, you may not see the "--More--" message if you try this example.

But this brings up an important point about the use of all filters, including the MORE filter.

These filter commands were designed to only work with standard ASCII input data. That means the filters will NOT work with formatted files created by most word processors because they include special characters that are used for bolding, underlining, etc. If you want to use one of these filters on a special formatted file, most word processors and spreadsheets have a utility that converts its file format to an ASCII file that can be used with one or more of these filters. If you have any doubts about whether or not a file is an ASCII file, you can use the TYPE command to check it. If your computer beeps and displays all kinds of strange characters on the CRT, the file is not an ASCII file.

### The SORT Filter Command

The SORT filter sorts data from the STDIN and writes the alphabetically sorted data to STDOUT, and the usual command syntax is shown in Figure 2.

```
command | SORT[/+n/R]
```

**Figure 2**  
**SORT Command Syntax**

As before, the "command" shown in Figure 2 is any valid command that writes output to STDOUT. You can use the SORT command to alphabetically sort a DIR listing by entering:

```
A:\ ==>DIR | SORT
```

Although this command generally sorts lines in alphabetical order, you may observe what appears to be some strange results when you use it with the DIR command. Consider the first part of a sample listing shown in Figure 3.

```
38 File(s) 1820672 bytes free
Directory of C:\
Volume in drive C is DRIVE-C
ACCESS <DIR> 5-07-88 2:56p
AUTOEXEC BAT 342 9-07-88 2:15a
BATCH <DIR> 5-07-88 2:56a
DOS <DIR> 5-07-88 2:56a
COMMAND COM 23948 9-04-87 2:37p
CONFIG <DIR> 5-07-88 12:57p
CONFIG SYS 59 2-05-88 4:16a
```

**Figure 3**  
**Sorted DIR Listing**

Notice that the first line showing the number of files is displayed before any other line in the file, even though it is actually the last line displayed by the DIR command. That occurs because the SORT filter performs an ASCENDING sort based on the equivalent decimal value of the ASCII character beginning in column 1. The space character has a decimal value of 40, and printable ASCII characters have numbers up to 126 (a tilde). And charac-

ters are sorted in ascending order according to their equivalent decimal value. If you are wondering how this works, most programming documentation for BASIC and other languages includes a table showing the equivalent decimal values for all ASCII characters.

Lines may also be sorted in DESCENDING order by using the optional /R switch to Reverse the order of the sort. When this switch is used, lines beginning with the highest numeric value (e.g., 126) will appear before lines with lower numbers (e.g., 40). An understanding of ascending and descending sort orders is also an important concept because many of today's word processors, spreadsheets, and databases provide the capability to sort data.

You can also use the /+n switch to set the column number where the sort sequence should begin. The normal default is to begin the sort at column 1, but you could sort a directory listing by file type by using:

```
A:\ ==>DIR | SORT/+10
```

All you have to do is count the columns where you want the sort to begin, and you must be careful to count them correctly. Similarly, you could sort the DIR listing by file size by using:

```
A:\ ==>DIR | SORT/+14
```

And if the DIR command displayed more than one screenful of files, you could add the MORE filter to stop the display:

```
A:\ ==>DIR | SORT/+14 | MORE
```

To be really clever, you could then create three batch files to reduce the number of keystrokes required. The first, D.BAT, provides a directory listing in alphabetical order by filename and contains:

```
DIR %1: | SORT | MORE
```

The second batch file, DT.BAT, sorts the listing by file Type and contains:

```
DIR %1: | SORT/+10 | MORE
```

And the last batch file, DS.BAT, sorts the listing by file Size and contains:

```
DIR %1: | SORT/+14 | MORE
```

The command syntax for these batch files is just "DIR d", where d is the drive letter. You can extend this to display directory listings, too, using the batch file techniques described in the last article. As you can see, it is important to know one function of DOS (e.g., batch files) so that it can be used to make life a little easier when it comes to using some of these command piping techniques.

### The FIND Filter Command

The FIND filter is used to search for a specified ASCII string of characters within a file or group of files, and display the results on STDOUT with the command syntax shown in Figure 4.

Like the previous filters, the "command" may be any valid command such as DIR. And you could search for and display only the CONFIG.SYS file by using

```
command | FIND[/p1/p2] "string"
```

**Figure 4**  
**FIND Command Syntax**

the following:

```
A:\ ==>DIR | FIND "CONFIG"
```

Note that if you try to enter a search string of "CONFIG.SYS", it will never be found because file names are not displayed like that on a DIR listing. Moreover, the FIND command is case sensitive which means that it searches for an EXACT match on the search string. A string like "config" or "Config" would never be found because of the case difference. You can use the /I switch to tell the FIND command to ignore case differences.

And finally, you can put all of the filter commands together to perform all kinds of interesting operations such as:

```
A:\ ==>DIR | FIND "COM" | SORT | MORE
```

This command line searches for a COM file type, sorts the listing in alphabetical order by file name, and displays the results in groups of 23 lines. Of course, you could always use the standard DIR \*.COM/P to accomplish nearly the same thing, but the file names would not be sorted in alphabetical order.

You can even combine FIND with another DOS command to locate a file on a disk drive by using:

```
A:\ ==>CHKDSK/V | FIND "THISFILE.DAT"
```

Since file names are displayed in that format by CHKDSK, the usual form of the file name is required as part of the search string.

Command piping is easy once you begin working with it. The essential part of using command piping is to remember that it takes the STDOUT of one program and pipes it to the STDIN of another. It only works between programs and cannot be used for devices, but you can use the other form of I/O redirection for that purpose.

### Devices and I/O Redirection

Before we jump into I/O redirection, it is important to know what kinds of devices you can use with it. You already know about the CON device. At this point, you may remember that we have already used this idea when we looked at the COPY command in the fifth article in this series (October 1988).

In that article, there was an example of how to use the COPY command to create a CONFIG.SYS file as follows:

```
A:\ ==>COPY CON CONFIG.SYS
(Press RETURN to execute)
BUFFERS=30 (Type the line, press RETURN)
FILES=25*Z (Type the line, press CTRL-Z,
RETURN)
1 File(s) copied (Information message)
```

Although the COPY command is normally used to copy a file from one place to another, we actually specified a different input device (CON). In this example,

we told COPY to take the input from the CON device and send the output to another device (a disk drive) which happened to be the file name of CONFIG.SYS. And perhaps the COPY command is more versatile than you thought because its most general form is really:

```
COPY from-device to-device
```

Technically speaking, the "from-device" may be any valid input device, and the "to-device" may be any valid output device. By using this most general form of the COPY command, you can even print an ASCII file on a parallel printer by using the command:

```
A:\ ==>COPY CONFIG.SYS LPT1
```

Or, you can print an ASCII file on a serial printer by using:

```
A:\ ==>COPY CONFIG.SYS COM1
```

Or, you can copy an ASCII file to the CON device just like the TYPE command by using:

```
A:\ ==>COPY CONFIG.SYS CON
```

In general, there are a number of device names that may be used with I/O redirection. To simplify matters, a list of the most common ones with their descriptions are shown in Figure 5.

Name	Description
CON	System console allows both input and output
COM1	First serial port — usually output only for printer
LPT1	First parallel port — usually output only for printer
"file"	General form of [d:][\path]filename[.typ]

**Figure 5**  
**Common Device Names**

As you have seen, the COPY command can copy to and from any of these devices, including a "file" name which is shown in its most general form with the optional drive and path specifications. As previously mentioned, these devices may generally be used for both input and output, but you must know what is connected to your system. While this may seem to be a trivial point, it is critical to an understanding of how to use I/O redirection.

### Input Redirection

When you use Input Redirection, the STDIN for a command or program is read from a specified device instead of the normal CON default device. The "less than" symbol (<) is used to specify input redirection so that the general format of the command line is:

```
command < input-device
```

This general format assumes that you are using a valid input device, such as a "file", shown in Figure 5. If a file (i.e., disk drive) is used as the input-device, the general format of the command line becomes:

```
command < [d:][\path]filename[.typ]
```

In order to see how this works, let's try a simple example using the FORMAT command; however, if you decide to try this example on your system, use extreme caution. Be sure to insert a new or expendable disk in drive B before you try this example, because FORMAT will DESTROY any data or programs that may be on the disk. There will be no prompts, because they will be supplied by a special file that we will create for the specific purpose of demonstrating input redirection.

In order to see what happens, you will need to create a standard ASCII file called FORMATB.DAT with the lines shown in Figure 6.

```
B
(Press RETURN to create a blank line)
N
```

**Figure 6**  
**FORMATB.DAT File Contents**

This particular version was tested on Zenith MS-DOS version 3.21, but it should work for most other FORMAT versions. I created this file by entering the FORMAT command, as usual, and then writing down the appropriate responses to the program prompts. In this version, the first prompt asks for the drive letter (B), the second prompt says to press RETURN to begin formatting (the blank line), and the last prompt asks about formatting another disk (N for No). Then, you can begin the FORMAT program and format a disk in drive B by entering:

```
A:\ ==>FORMAT < FORMATB.DAT
```

The FORMAT program begins execution, and the program prompts are answered in order by the appropriate line in the FORMATB.DAT file. You can automate many of the DOS commands by using this technique, including the Zenith CONFIGUR and DSKSETUP commands. All you need to do is go through the program at the keyboard and write down ALL responses to the program prompts. Then, just create a file with all those responses in order, and use input redirection to run the program. Remember that the "response" file must contain ONLY ASCII characters, or you may get strange or disastrous results. Unfortunately, input redirection does not work very well with many application programs (e.g., word processors), because they weren't really designed for that kind of input. Now let's try output redirection.

### Output Redirection

When you use Output Redirection, the STDOUT for a command or program is written to a specified device, instead of the normal CON default device. The "greater than" symbol (>) is used to specify output redirection so that the general format of the command line is:

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command > output-device

This general format assumes that you are using a valid output device, such as a printer at COM1 or LPT1 or a "file" shown in Figure 5. Like input redirection, you can also specify a file name for output redirection using the general format of:

command > [d:][\path]filename[.typ]

For both input and output redirection, it is easy to remember which symbol is used because it is like a funnel. For input redirection, the less than symbol (<) points toward the command to "feed" input to it. For output redirection, the greater than symbol (>) points away from the command indicating that the output is being fed to another device.

Output redirection has a number of uses. Sometimes, for one reason or another, it is nice to be able to work with a file that contains file names normally shown with the DIR command. To create a file called DIRLIST, you would use the command line:

A:\ ==>DIR > DIRLIST

Sometimes it is handy to have a printed file list from the DIR display, and if you have a parallel printer, you can enter:

A:\ ==>DIR > LPT1

If you have a serial printer, you can substitute COM1 for the device in the above command.

One caution about using this form of I/O redirection: If you specify a file as the output, the file will normally be created; however, if that file name already exists, all data in the file will be **OVERWRITTEN** with the new data which destroys the existing contents of the file. Use care to be sure you don't inadvertently destroy valuable data with this form of I/O redirection — another good reason for keeping a backup copy of valuable files. But there is another way.

#### Output Redirection to Append Data

As you have seen, the single greater than symbol (>) will create or overwrite an existing file and will destroy data if that file already exists. You can partly avoid this problem if you use the "double greater than" symbol (>>) to append data to a file or device. In this context, APPEND means to "add the new data to the end of the existing file". The general command forms to append data to a device or file are:

command >> output-device

command >> [d:][\path]filename[.typ]

These are essentially the same examples that you saw in the introduction to output redirection, but the double greater than symbol has been substituted for the single one. You can use this form of output redirection in exactly the same way as the previous example. The only difference is the extra greater than symbol that indicates data will be appended to a device or file, and existing data will **NOT** be destroyed. You can use the same command that was previously mentioned:

A:\ ==>DIR >> DIRLIST

If the DIRLIST file does not exist, it will be created. If it does exist, the directory listing data will be appended to the end of the existing file.

Similarly, you can also use this command form to print a file list on a parallel printer using:

A:\ ==>DIR >> LPT1

As before, you can substitute COM1 for the device in the above command, if you have a serial printer.

#### Command Piping and I/O Redirection

Using both of these DOS features is easy if you take your time and remember the basics. Command piping uses the vertical bar symbol (|) to pipe the STDOUT of one program to the STDIN of another. The important thing to remember about command piping is that it only works between programs and not devices.

Input redirection uses the "less than" symbol (<) to funnel the input to a command. When a single "greater than" symbol (>) is used for output redirection, it funnels the output to a device or file. If a file name is specified for output, the file will be created if it does not exist. If the file name does exist, it will be overwritten which destroys any existing data.

When a double "greater than" symbol (>>) is used for output redirection, it also funnels the output to a device or file. If a file name is specified for output, the file will be created, if it does not already exist. If the file name does exist, the data will be appended to the end of the existing file.

#### Next Time

If you have ever done any shopping for a new CRT, you have probably run into one of the most puzzling hardware subjects in the microcomputer world. There are an incredibly large number of monitors on the market today: color, monochrome, high resolution, and so on. What does all this mean? More importantly, what are all of these strange acronyms like CGA, MDA, EGA, and VGA? What do they mean, and how can you make the best choice for your system from all this mess? These questions, and more, will be covered in the next article.

If you have any questions about anything in this column, be sure to include a self-addressed, stamped envelope (business size preferred) if you would like a personal reply to your question, suggestion or comment. \*





# Z-100

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## SURVIVAL KIT

I guess you could say that this column was prompted by a slip of the tongue. It's not the first time I've put my foot in my mouth, but it is the first time I've had to pay my dues by writing a regular column for a magazine! Let me explain . . .

I own a company that publishes software for the Heath/Zenith Z-100 and PC compatible computers. As a part of that business, I send out a regular newsletter to my customers. From time-to-time (like every issue) I may make editorial remarks in the Newsletter, and I usually don't pull any punches when it comes to taking potshots at something that irks me. It's pretty well known around these parts that I am an avid Z-100 supporter, and most of the time, the Customer Newsletter reflects this minor prejudice.

Well, a couple of issues ago, I made some brash remarks to the effect that I didn't believe that REMark and SEXTANT were giving the Z-100 its fair share of press anymore. A copy of that issue of the Newsletter made the rounds at the HUG office, and made a generally unfavorable impression. My phone rings, and it's Pat Swayne. Pat said that he had read the Newsletter, and was wondering if I wanted to do something about the lack of Z-100 articles. I said "sure", and the rest is history. The 'something' he was talking about was writing this column.

### What's This About?

One of the goals I have in writing this column is to prevent the Z-100 from dying a premature death. The verdict was pronounced when Zenith decided not to

make any more Z-100s, but how long it takes for the sentence to be carried out will depend on support of the user community. Not too many would argue the fact that the Z-100 was a state-of-the-art machine when it was first introduced. That was back in 1982, around the same time as the first IBM-PC was released. But the Zenith machine was technologically superior to the PC in almost every respect. Many years rolled by before the PC compatibles began to match the Z-100's computing power and graphics. Even today, some people would argue about the relative strengths of the Z-100 and the PC clones. But anyone who is being totally objective about the situation will admit that technology has begun to overtake the Z-100. (Have you looked at a new Z-386 with VGA graphics lately?)

Just because the Z-100 can't quite keep up with the new kids on the block, there is no reason to throw it on the scrap heap. Unless, of course, you have money to burn. I decided quite a number of years ago that trying to keep up with the latest in computers is a never-ending quest. As soon as you think you have the fastest, meanest, and prettiest system on the market, along comes another that'll outdo your new pride and joy. You have to draw the line somewhere, and stick with a system that will get the job done. For many Heath/Zenith users, the Z-100 is where they draw the line.

### Count the Reasons

There are actually quite a few reasons why you might want to hang on to your trusty old Z-100. Consider, for instance . . .

1. If you get a new computer, you'll probably have to buy new software. That means you'll have to learn how to use it all over again.
2. I have NEVER seen another computer with a keyboard that can compare with the one attached to my Z-100.
3. After several years of use, you have all the bugs and glitches worked out of your Z-100. Would you really want to go through that with a new computer again?
4. There should be a good replacement parts market for some years to come. If all else fails, you can buy a used fully-loaded Z-100 for less than a bare-bones PC clone.
5. If you're like me, your Z-100 has become like an old friend. How could you even think of trading it for one of those new-fangled AT clones?
6. The Z-100 is paid for . . . need I say more?

What I'm trying to say here is that the Z-100 you already own may be all the computer you'll ever need. It's a good machine. It may even be considered a classic some day. However, if someone offered to trade a Z-386 with FTM monitor for my Z-100, the ole' Z-100 would be gone in a heartbeat. There's a point where sentimentality has to end.

### Where Do We Go From Here?

This first installment of "Z-100 Survival Kit" is just sort of an introduction. I won't get much done other than saying hello and outlining some ideas for future columns. Since this is a new column, its direction and emphasis have not yet been

determined. Your input will help me decide where to go from here.

As I mentioned at the start, I own a business which is a vendor to the Heath/Zenith market. In many ways, this will have a positive influence on this column, because I make my living supporting the Z-100. This means that I am familiar with the pros and cons of the Z-100, and am experienced with the machine from a software and hardware standpoint. I have to keep abreast of all the latest happenings that concern the Z-100. But there is a drawback to being in this position, because I will be somewhat limited in my ability to review commercial software that is available for the Z-100.

I expect that this column will tend to be more technical in nature than the average REMark article. And I also would like to put more emphasis on programming, with lots of code examples. If the feedback I get from Z-100 owners is correct, they make up the largest number of REMark readers who are still interested in recreational computing. Most business users have moved on to PC, AT or '386 compatible machines by now. And the 8-bit bitters are in a world all of their own.

This doesn't mean that the whole column is going to be targeted toward hard-core programmers. I'll try to get a good blend of stuff which is interesting to the average user. If you own a Z-100, you've probably had it for at least a couple of years, so you shouldn't need anybody to tell you what an AUTOEXEC batch file does. I think Z-100 users would like to have some technical stuff they can get their teeth into. If I'm wrong, I'm counting on you to let me know.

I encourage you to write and let me know what you think this column should be like. Be sure to include "Z-100 Survival Kit" at the top of the address, so I can keep this stuff sorted out of the normal business mail. One thing in particular that I'd like to encourage is questions you may have about your Z-100 (software or hardware). I'm not too sure there are many good sources for Z-100 specific information anymore, so I'd like this column to help fill that void. If I don't know the answer to your question or problem, chances are I can find someone who does. I'll try to answer any questions with a personal reply, and publish the most interesting ones (or ones of general interest) in this column. If I begin to get more letters than I can respond to . . . well, we'll cross that bridge if we come to it.

There are a couple of subjects I would like to avoid as much as possible in this column, even though they are specific to the Z-100. I don't want to get too deeply involved in ZPC patches and that kind of stuff. Not that I don't think it is important . . . but I prefer to leave that area to Pat Swayne. This is not to say that ZPC patches won't ever be mentioned here. I

just don't want this column to turn into a "ZPC Update" clone.

The other thing I definitely will avoid like the plague (unless you tell me otherwise) is using CPM on the 8-bit side of the Z-100. Face it . . . CPM is extinct. If you like CPM better than DOS, then I guess you'll just have to be content with the thought that all good things come to an end sooner or later. The idea of putting an 8085 processor in the Z-100 in the first place was only intended to bridge the gap until 16-bit software became available. Who could have guessed back then that with the concurrent introduction of the IBM-PC, the new 16-bit software (which ran on the 8088 processor) would be developed so quickly? I doubt whether most Z-100 users have ever used anything other than MS-DOS (or Z-DOS) on their machines.

### The PC Compatibility Question

There seems to be a lot of interest these days in trying to make the Z-100 as PC compatible as possible. Hardware emulators, Pat Swayne's ZPC software, the ZHS circuit board, PC style COM ports, and on and on. From a purely technical computing standpoint, all of these modifications are attempting to transform the Z-100 into an inferior machine. Sort of like paying a mechanic to 'untune' your car. Is PC compatibility really that important? Or is everyone just falling in line with the trend of trying to be compatible?

In the next installment of this column, I'll talk about the issue of PC compatibility as it relates to the Z-100. We'll look at some reasons why you should be concerned about compatibility, as well as situations where you would be better off sticking with your native Z-100. We'll discuss some of the different levels of compatibility which are available with the Z-100, and how each can be used to advantage. And I'll also show you how you can write programs which will run on either the Z-100 or PC compatible machines, and describe some different techniques for writing 'portable' code.

### Probing the Monitor ROM

Another subject on the agenda for a future column will be a close look at the Z-100's MTR-100 monitor ROM program. This 'program-on-a-chip', which is included with every Z-100, is a gold mine of valuable routines for assembly language programmers. And the MTR-100 data segment holds system information that can be accessed from any language. The Z-100's monitor ROM chip should be a valuable tool for anyone writing Z-100 specific programs, particularly in light of the fact that the Z-100 is out of production — this means that there will not be any more revisions to the ROM firmware.

In this upcoming column I'll show you how to find the entry points to the

monitor ROM, and how to use some of the routines. We'll also look at how you can access the MTR-100's data from different programming languages.

### Programming the Hardware

Many of the peripheral interfaces in the Z-100 are programmable devices. The keyboard controller and the CRT controller are two good examples. In future columns, we'll investigate how you can do special tricks by programming these chips.

Most of you know that the Z-100 keyboard can be operated in 'up/down' mode. We'll take a look at how that is done, and some applications that might require this special mode. I'll also give you some tips on how to read the keyboard in polled or interrupt mode.

Did you know that the Z-100 can be programmed to have just about any number of scan lines, up to 500 or so? Or that the number of characters per line can be changed? Did you ever wonder how to write a program that uses the interlace mode of the Z-100. We'll look at these, and other things, that can be done by programming the CRT controller.

### And Graphics

One of my main interests when it comes to computers, in general, and the Z-100, in particular, is graphics. So I'll devote a fair amount of time in upcoming columns to graphics applications. After all, the Z-100 was designed to be a graphics machine. It was one of (if not THE) first computer I know of that allowed graphical information to coexist on the screen with text. No special graphics mode required — just mix the lines, circles, and colored areas right in with the text characters — a pretty revolutionary idea way back when. Even today, the Z-100 is able to keep pace with the newer machines when it comes to graphics capability. A Z-100 with a Hughes 16 color V1 board, running in interlace mode (or with ProScan video) is equivalent in resolution and number of colors to the IBM VGA (virtual graphics array) standard. At this stage in the game, the main advantage held by the 80286 and 80386 machines is in speed. A pixel graphics or CAD program running on a Zenith Z-386 is going to be a lot snappier than the same program on a Z-100. But then, some of us have more time than money, right?

### In Conclusion

I'll try to keep you abreast of what's new for the Z-100, and show you some of the tricks of the trade in programming ideas. I'd like this column to become a clearing house for information and support for the Z-100, so if you know something special about the Z-100, drop me a line, and I'll get the news out to the rest of the troops. I hope you have grasped by now that the purpose of the "Z-100 Survival

Continued on Page 27

# On the Leading Edge

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## MOUSE-TRAK, DOS Shells, ROMs, Z-100 Monitors, Z-386

More and more software is being updated to use with a mouse. And although a mouse provides some real benefits for software that can use it, the little critters need to be fed to the extent that they require desk space for movement. The horizontal space in my study (sometimes including the floor, too!) is at a premium, and I don't always have room for one of these little monsters to be running around all over the place, not to mention that the little beast sometimes gets literally buried. If you want to sit back and take advantage of some of the real neat editing features in some software for final document editing, like Microsoft Word, you have to find a hardback book or clipboard to put in your lap to provide a reasonably secure surface for the mouse to run around on. That's clumsy. I found a better way.

### MOUSE-TRAK

You can help eliminate the mouse and other pests with the MOUSE-TRAK, a trackball pointing device that will help speed up most of your software that uses or requires a mouse. It is also available in a two-button version, but the three-button version is shown in Photo 1.

The MOUSE-TRAK does not run around on your desk or computer table, and it only requires a modest amount of space. It measures just a tad over 4" wide and is slightly less than 8" deep. Try chasing a mouse around in a space that size! Its maximum height is about 2-1/4" including the trackball. Both versions are available with either a DB-9 (for the newer systems) or a DB-25 connector that plugs into a standard serial port. One advantage of the three-button MOUSE-TRAK is that it can also be set to run in a two-button mode for finicky software that has no use for three buttons. You can also use the toggle button (the very small one) to re-

duce the speed to one fourth of the standard "speed" — useful for detail work at higher resolutions.



**Photo 1  
MOUSE-TRAK**

The MOUSE-TRAK is advertised to be compatible with the Microsoft Mouse and the Mouse Systems PC Mouse, but I have had no problems using the "menu programming" software supplied with the Logitech Mouse (3-button mouse). MOUSE-TRAK also works fine with the software included with Microsoft Mouse Programmer's Reference Guide as you would expect. To use either one, I load the MOUSE-TRAK driver (MOUSTRAK.COM — provided on the included program disk), and then load the appropriate menu. For the Logitech Mouse, I use the MENU command followed by the appropriate menu name, such as WS4 for the WordStar version 4 menu I wrote. If you do not have any "programming" software for another mouse, you can use the included KEYDEF program for this purpose, and it is also used to change the speed of

cursor movement, in case the default is too fast or too slow for your specific software.

The MOUSE-TRAK package includes the basic unit, a manual, and a disk with the appropriate software to test (MTEST.COM) the installed MOUSE-TRAK, and install the MOUSTRAK driver program for it. If your software already provides mouse support, that is probably all you will need to do.

In general, you use the MOUSE-TRAK just like a mouse. I use my right index finger for the left button, pinkie for the right button, and move the trackball (or press the middle button) with my middle or ring finger, depending on what's easiest at the time. If you have used a mouse, it takes a few minutes to get used to the different coordination required for this, but it is not at all difficult.

The buttons on the MOUSE-TRAK are usually defined (by default) as momentary action just like a regular mouse — that is, you generally press and hold a button, then move the cursor with the trackball to make a menu selection for some software or to "drag" something. With some software, this can be somewhat awkward to press and hold a certain button while moving the trackball, but you can change any or all keys to "alternate" action by a simple slide switch setting. The first key press activates something in the software, say setting the starting point of the drag, so that it is like the "press and hold" button on a regular mouse. The second key press is similar to releasing that same button on a regular mouse. This alternate action makes it much easier to use some software, like the GEM Desktop, and is a very thoughtful and useful feature.

The MOUSE-TRAK works perfectly

with all application software I have tested: Microsoft Word, WordStar (with the special menus), Generic CAD 3.0, Windows, Sprint, GEM, and a bunch of other stuff. As long as your software provides standard mouse support, I would expect no problems using the MOUSE-TRAK, but there will inevitably be at least one program which is so non-standard in some respect that it will not work with MOUSE-TRAK.

I really like the MOUSE-TRAK and have found that it is generally faster and easier to use than a mouse for most application software, especially for word processing. I think it is also great for a graphics application, such as CAD, although it is quite difficult to "draw" a smooth curve without some real practice. Still, some people may still prefer a mouse for graphics, and I agree it is much easier to draw a curve with a mouse.

My favorite way to use the MOUSE-TRAK is for final editing of a document. I sit back in my chair with the MOUSE-TRAK on my lap and use it to scroll through a file by just moving the cursor down. I can easily perform all editing functions, although I sometimes have to do some typing on the keyboard to add or clarify something. The biggest advantage of the MOUSE-TRAK is that you can quickly move the cursor around without having to lift up and reposition a mouse — the MOUSE-TRAK is much faster.

Since all mechanical devices seem to have a fairly definite useful life, I recommend that you consider a MOUSE-TRAK if your favorite furry creature has gone to mouse heaven. I think you will find that a MOUSE-TRAK will help you work even faster than a mouse did. The MOUSE-TRAK is highly recommended.

### DOS Shells

There are apparently not many of you who have used a DOS shell, as I only received three responses to my request (September 1988 REMark) for your input. Interestingly enough, two of those letters recommended the same program: Directory Scanner. The third letter recommended a program called QFILER. I was surprised that I did not receive any recommendations for the Norton Commander because that program has received pretty good reviews.

In any case, QFILER was recommended by Paul Herman (Yarrow, B.C., Canada), and since I have not received a copy of it yet, I will share some of Paul's comments with you.

Paul tells me he obtained QFILER from: The Public Software Library, P.O. Box 35705 - F, Houston, TX 77235-5705, and he highly recommends them as a distributor of shareware and public domain software. He says that: "I have tried a myriad of DOS shells and thought I was just addicted to the DOS command line. But

after having QFILER on my hard disk for the last two months, I find that I use it more and more. It renames, sorts, tags, deletes, moves, executes, copies, picks a directory from a graphics tree, does backups, etc. It is not memory resident and seems to work with all my software . . . It also has the great virtue of listing two directories or disks side-by-side [sounds similar to Norton Commander — WMA]. The only item on my wish list is that it [should] indicate which files are common to the two directories. Otherwise, I don't see how it could be better."

Since I don't have a copy of QFILER as I write this, I thought it would be a good idea to share Paul's thoughts about it with you. He has directly contributed to promoting HUG's purpose of fostering the exchange of ideas to enhance the usage of Heath equipment. And so have Ernie Fisch (Phoenix, Az) and Bill Heard (Ventura, CA) in their recommendation of Directory Scanner (DS).

Ernie waxes enthusiasm about the DS program. He says: "I have been using Directory Scanner (v2 thru v3.3) for two years and have found it to be indispensable . . . I have used it under DOS 2.x, 3.1, 3.2, 3.21 and 3.3. It has run on an HS-151, a Z-181, a Sperry IT and an AST Premium 286. It has worked superbly. DS is memory resident, but may be removed completely with the F9 key . . . I run it with Procomm Plus, Telix, Microsoft Word, Sprint, Maxthink, Lucid, VPPlanner, Reflex, Generic Cadd level 3, InstaPlan, Quattro, Turbo C, Quick C, Turbo Basic, Quick Basic, PSpice, etc . . . You execute a file by pointing to it, typing x with an optional command tail and hitting return. It can call up an editor or lister against a file . . . With DS you can rename files, tag, copy, move or delete them. You can add, delete or rename subdirectories. Yes, it supports subdirectories. To me the handiest feature is that DS provides a continuous display of the directory structure so that I can navigate around my hard disk quickly and easily."

Ernie also mentioned that he can't remove a cache (he did not say which one), and that at least one memory-hungry application wants DS unloaded, probably because of memory requirements.

Bill Heard thought so highly of the DS program that he thoughtfully sent me a copy on disk. Because it is a shareware program, there are no copyright problems involved, and Bill obviously knew that. In any case, I have tried the program, and I have to admit it is nice. Bill mentioned that he uses DS on a Z-248 at work and would not be without it. He also noted that he uses the HUG File Manager (HFM) at home on his Z-100, and he would not want to be without HFM either. Since Bill took the trouble to list some features that DS has (and include them on disk, too), I have included his summary as Figure 1.

- Displays directory structure
- Displays all files (including hidden and system files) in the current subdirectory in a user selected sort order
- Copy tagged files to any drive or directory
- Move tagged files to any directory on the same drive
- Rename any file
- Find any file (uses wildcards)
- Maintains log of all files on selected drives (user selected)
- Directory maintenance (add, remove or rename)
- Attribute maintenance (read only, system, hidden [including directories], flags)
- Macro execution (shifted function keys)
- Backup utility (better than DOS backup, but doesn't compare to Fastback)
- Uses a linked listing program to list any file (user's choice)
- Uses a linked editor program to edit any file (user's choice)
- Supports 43 line EGA display (supposedly supports 50 line VGA display, but has not worked with the Zenith VGA, but Nat doesn't claim that VGA support is perfect)

**Figure 1**  
**Bill Heard's Summary of DS Program**

Bill also notes that he uses Quattro, dBase III, Turbo C, Turbo Pascal, MS Fortran, the Windows standard applications, Ventura Publisher, and GEM Presentation Team. Other than memory limitations, he mentions that he has not had any program conflicts or problems. The DS program is available on a number of bulletin boards and a \$15 contribution is requested by the program's author: Nat Martino, 501 W. Vineyard Ave., #514, Oxnard, CA 93030.

Before I go on, I would like to express my appreciation and thanks to Paul, Ernie, and Bill for their contributions.

If you haven't considered a shell program, you may find that it will help you work with your programs and files, particularly if you have a hard disk.

As I mentioned in the September 1988 column, I have been looking for a replacement for the AutoDex program. Oddly enough, just a few days before I received that particular issue of REMark with the published article, I found a replacement for it in a totally unexpected place: the update to WordStar version 5. I have been faithfully buying the updates to WordStar as they become available, and I was really surprised at this one. MicroPro has done a nice job on this update, and WordStar now has some of the features that it should have had years ago

— automatic reformatting and the capability to display/edit multiple files.

In any case, a program called ProFinder is included in the update, and it has virtually all the features, and more, that AutoDex has. You can tag one or more files and perform the usual type (view), copy, move, and delete functions, but for some reason, the program does not include a rename command. I work around that by simply copying the file to the new name and then deleting the old one — I guess it is really safer that way.

Like many of the other commercial DOS shell programs, ProFinder allows you to easily define a custom menu so that you can “point” to a file, activate the menu with F10, and type the first letter of the specific application program. The custom menu is actually defined in an ASCII file (called USERMENU.PF) that contains mostly batch-type commands with some special ones that are unique to ProFinder. Even nicer is the fact that you can enter a 39-character file description for each file, and that information is stored in the TILES.PF file for each subdirectory. ProFinder even includes a Locate command that allows you to search files for a text string — a thoughtful feature. And if you don’t want to use the menu, you can define programs to run by file type (e.g., CAL for SuperCalc, WS for WordStar, etc.).

ProFinder is an excellent program, and it has other features and capabilities that I have not mentioned. Unfortunately, it is only available with WordStar version 5.0 at the present time. If there is enough demand, perhaps MicroPro will sell this program separately. Shell programs are one approach to helping a user work with a computer system, but there is at least one other way to “insulate” yourself from having to learn all the DOS commands.

### Graphics Interfaces

There are lots of other kinds of computer interfaces that you can use. Even though IBM has apparently released OS/2 with the Presentation Manager as I write this, there doesn’t seem to be any big move afoot to change to OS/2. No wonder — the thing is so expensive that you really have to need multitasking and a graphics interface, and you also have to be able to afford it.

Windows was Microsoft’s first attempt to provide an “easy-to-use” graphics interface for DOS-based systems. It has a well-deserved reputation for being a real “dog” because it has a lot of program code and is extremely slow. It is interesting to note that Windows has not been too well supported by most major software developers. That is probably explained by the fact that, in order to really use the features that Windows provides, software must be specifically written to run under it. Some software is slow enough without the added overhead bur-

den required for Windows, and I suspect that is the reason that relatively few programs have specifically included Windows support. By itself, Windows is slow enough on a hard disk system, and even though it can be run from floppies, the response is nearly unbearable on a floppy disk system, aside from the fact you have to keep switching disks. That is obviously the reason that a hard disk is recommended. In any case, it will be interesting to see if the user perception of Presentation Manager follows the same route as Windows, even though OS/2 provides some significant features that DOS does not, and cannot, have.

I have not spent much time with Zenith’s release of Windows/386 for the simple reason that Windows does not give me any real advantage in using the software I have. My initial impression is that it is well done, as usual, and it seems to be quite fast, but that is probably more due to the speed of my ’386 and the hard disk than anything else. Even though I see that Windows is included “free” with the Z-386 kits and assembled units described in the current catalog (No. 214), I would be hard pressed to explain how that will help most computer users. To me, Windows is still more of a technical curiosity than a good tool, and I doubt that opinion will change until I see more widespread user acceptance and popular software that can really use its features.

IBM has also released DOS 4.0, and its so-called “interface” still looks and acts suspiciously similar to the MS-DOS Manager that Zenith and Microsoft co-developed several years ago. After looking at the new DOS interface, I cannot see anything that is really different from the MS-DOS Manager that was included with the eaZy PC. Speaking of the eaZy PC, I haven’t seen any of those around lately either — I guess they were discontinued because of lack of interest. Although I did not think the eaZy PC was a bad system, it was released a couple of years too late.

### Discontinued Items and Memory for Your Computer

Speaking of discontinued items, I noticed that the old Z-248 has quietly disappeared from the current Heathkit catalog, too. It apparently has been replaced by the 25xx series that uses SIMMs (Single In-Line Memory Modules) instead of discrete 1-bit chip units, like the Z-200s did. The big advantage of using SIMMs is that they are small, and the 25xx series computers can have up to 6 MB on the motherboard because the SIMMs are so small. I suppose that the old Z-386 will also be replaced by a system that uses SIMMs, too, so that you can add a number of megabytes to the “motherboard” and not have to worry about getting a special memory board, like the Z-505 and Z-515.

Another thing that quietly disappeared from the current Heathkit catalog was the nice software listing that included all of the programs and such with their prices. At this point, it is not clear to me why that was done, and I wonder what it really means. One possible inference is that Heath and Zenith are moving away from the “custom” software business, such as a Zenith-specific version of Windows/386, and if that is true, I think that is probably a good move. My real concern is that HUG members currently get a discount on Heath/Zenith software products (not HUG software — it is already quite reasonable), and if these items are “disappearing”, the HUG discounts will disappear, too. As I find out more on this subject, I will let you know.

### The System ROM

Most of us don’t think much about the ROM (Read Only Memory) in our systems, but the ROM is particularly critical in any PC compatible computer, because it can easily cause rather strange software problems. Even though we talk about our systems being “PC compatible” in terms of being like an IBM computer, even some IBM systems are not PC compatible with each other. Perhaps the best example of this is the early IBM PC. Some programs written for that system would not run on later ones. Why? Well, there were several different ROM versions for the IBM PC, and some changes made between these versions caused significant compatibility problems. Programs written for newer systems would not run on older ones and vice-versa. Programming a system ROM is a complicated task, and bugs in the ROM “programs” have caused headaches for nearly all computer manufacturers, including IBM.

When the IBM PS/2 Model 50 was released some time ago, there were a lot of reports of a few minor bugs in the ROM. One that I recall was that the date did not change at midnight, but there were reports of more serious bugs, too. But enough of IBM’s ROM problems.

The discussion of ROM was originally suggested by Joe Pannon (Bellevue, WA) who wanted to know which ROM version fixed what. He noted that the current “-16” (that is the last two digits after the part number) MFM-150 ROM for the Z-150s may have a timing change in the boot code. This is based on some information that was on the CompuServe HUG SIG (Special Interest Group) bulletin board that I saw, too. Prior to this ROM version, some 150 owners, who had the Wildfire speed-up unit installed, had problems rebooting their systems with CTRL-ALT-DEL. From what Joe says, users had to switch back to low speed to successfully reboot with a CTRL-ALT-DEL or they had to use the reset switch. Reports are that the “-16” ROM allows a CTRL-ALT-DEL at

the higher speed; hence, the conclusion that a timing change was made in the ROM.

In answer to Joe's question, I checked with ZDS, and I found that the list of ROM changes and enhancements would generally be of very little use. For example, "adding an NOP to 00AA:9700" (I made that up) really does not tell you much unless you are intimately familiar with the code. If you know assembler, you might guess that changes the timing on some code, but you would NOT know what the impact of that change was unless you knew how the basic ROM (and the MS-DOS BIOS) was programmed. So, this list of ROM changes by version that is maintained by ZDS is not particularly useful for us. Aside from that, Zenith considers this information to be extremely confidential and would not release it for publication in any case. Somewhere though, there must be a list of problems that a specific ROM version corrects, but I have not been able to find it. There are a couple of examples of this that I have personal knowledge of.

I installed a 3.50" floppy drive in my '248 last year, and everything seemed to be just fine. Then, I sent in a disk to the Heath Education Department as part of the MS-DOS course I was writing at the time. When the disk was received at Heath, I got an immediate call from my editor saying that he could not read the disk. I thought that was strange because I had not had any apparent problems reading from or writing to 3.50" disks in my system. I was able to read and copy files from distribution disks, and I was able to FORMAT and use a disk with no apparent problem.

Without going into all the details of how I managed to isolate the problem, it turned out that I was using version 1.8D on my '248, and there was apparently a bug in it specifically related to 3.50" drives. I also had an unconfirmed report that the same bug existed in at least one of the IBM PS/2 models, but I still don't know for sure about that. In any case, I replaced the ROM set with version 2.1A (I don't have the exact part number handy), and my 3.50" disks could then be read on other systems.

By coincidence, I also discovered that a ROM with version 1.9 or higher is also required to run Zenith's OS/2 operating system on a '248. I should also note that you may need to update the ROM if you want to use an "enhanced" (that's IBM's name for it, not mine) 101-key keyboard with your '248. From personal experience, I know that version 2.1A works just fine, but I also know that version 1.8D did not.

Another "ROM" incident occurred when I was helping a friend install Borland's new SPRINT word processor on his '151. Everything seemed to work just fine

until he tried to print a file. Then, the system would freeze, and we had to power-off the system to reset it. We called Borland, and they had already received similar reports about other Zenith computers, specifically the '148 and '158. The brand of printer did not seem to matter, so I did some checking with the DEBUG command. The problem appeared to be directly related to something in the ROM, so we replaced them with the latest "-16" version that was available. The new ROMs fixed the problem with the printing, and he is quite pleased with SPRINT.

If you have a '151, '148 or '158 computer and are having problems with the SPRINT printing program, you can fix that by simply getting a new ROM set and installing it on your system. By the way, I notified Borland Technical Support about this fix when I discovered it (last August), so they know about it, too.

I generally subscribe to the old adage: "If it ain't broke, don't fix it." But there still is a question as to how often, if ever, you should replace the system ROM in your computer. In general, I don't think there is any reason to spend money on an updated ROM unless you find a specific problem with a specific application. At this point, the real question becomes: "How do you know whether a new ROM will fix a specific problem?" The only successful way I have found to answer that question is to ask someone. That is particularly important if you don't have the technical expertise to explore why something is happening in your system.

A good starting point is to ask someone at your local (if you have one) Heath store. If you don't have a local store, you may want to check your Heathkit catalog and call or write to the one nearest you. Heath stores are now chartered to provide answers to hardware and software questions, since the Zenith software consultation (hardware consultation is still available) service has "disappeared." If you have access to CompuServe, you may want to leave a message for some help on a specific problem. Chances are that someone who reads your message will know the answer to your question.

### Solving Computer Problems

One other point that needs to be made when you are asking questions about solving computer problems. I have received several letters in the last few months asking for suggestions on solving a problem that have not provided enough basic information for me to help much. In one letter, the problem was specifically defined, but the writer did not even tell me what computer model he had. Since a self-addressed envelope was included in the letter, I attempted to answer his question, but my answer was so general that I doubt if it helped him much. The point is: when you ask anyone for help in solving a

computer problem, be prepared to supply the essentials of your system configuration, including the name and version number of the software that seems to be having a problem.

For example, Dick Bidwell did a superb job in listing his system configuration when he wrote to me about the problem with running GEM (October 1988) on his '151. Based on his detailed system description, I was able to guess (correctly as it turns out) that the problem was speed related because he provided a list of ALL hardware in his system. When you ask for help on a problem, it is essential to mention how your system is configured.

That includes the exact model number of your system, the ROM version you are using (use CTRL-ALT-INS to find it), the DOS version you are using (including both version and BIOS numbers), and a list of ALL hardware add-ons to your computer. In this context, hardware add-ons include memory capacity (either added to the existing board or an add-on board), all other internal add-on boards (e.g., modems, bus mouse or video cards), the brand and model of the CRT monitor you have, and the type (i.e., serial or parallel) and brand of printer you are using. I have found it is helpful to keep a list of what hardware is in which system, because I sometimes move things around. Those lists also include serial numbers as appropriate (including the hard disks), as well as the name and model number of the unit. And I have found that list quite useful on a number of occasions. For example, do you know what brand and model of floppy disk drive you have? Do you remember what IRQ setting you used when you installed a Microsoft bus mouse?

What jumper settings did you change (and why) when you installed an expanded memory card? For running changes, like moving jumpers around, I keep a different set of notes in a file describing what I did and why. I have also found these notes to be extremely useful when testing something new on my system. Perhaps you will, too.

### Z-100 Monitors

One of the major reasons why I bought the Z-100 Low-Profile computer (instead of the All-in-One) is that it is very easy to replace a monitor. While the All-in-One has its advantages, one disadvantage is that the CRT is guaranteed to fail just like it will on a television. Replacing the All-in-One's CRT is not a trivial task, but if I had had that particular model, I would have bought an extra CRT during the factory clearance when they were selling for something around \$20.

When I bought my Z-100, I also bought a ZVM-122 monochrome (amber) CRT that I still have. So far, it works fine, but I don't use that system much. But there were two recent situations involving

failures of these CRTs because they were old and had been used a lot. Rick Gugeler (Colorado Springs, CO) wrote to me asking about a replacement for the ZVM-122. And another friend of mine, David Brockman (Arlington, TX), powered up his '151 system one day to find that his ZVM-122 had also died. Zenith chose to abandon the basic monochrome CRT for reasons that I don't understand, so there is no help there. With all the current emphasis on the high-resolution video, such as EGA and VGA, what can you do if you just want to replace a basic monochrome monitor on a Z-100 or a PC compatible CGA system, such as the '151?

If you are looking for a good replacement for a dead ZVM-122, I highly recommend the Goldstar 12" monochrome (amber only) monitor (MBM-2105-A) that is available from the Dallas Heath store for about \$150 by the time you get finished with shipping and all. It is a normal composite monitor that has a cable with the usual phono plug that plugs into a CGA or Z-100. David and I also think that the display seems to be "better" than the old Zenith monitor, too. The characters seem to be "sharper and clearer" and generally easier to read. I am impressed with the Goldstar line, and if you are having difficulty locating a "standard" (i.e., Z-100 or CGA compatible) RGB color monitor, you might also want to call or write to the Dallas Heath store for information, because they also have those monitors at reasonable prices.

#### Powering Down

As we begin the new year, I will begin talking more about my '386 system, since I have had a few letters asking various questions about the Z-386 and its compatibility with other 386-based systems, such as the IBM Model 70. At this point, I am currently working on some comments about my opinion of the Z-449 video card, but that will be deferred until I have more time to see how well that works with the Zenith FTM monitor. I hope that I will be able to find a better alternative than using the Z-449, because I have generally been underwhelmed by its performance and compatibility. More on that in a future article.

In the last few months, I have noticed a steady increase in the number of letters asking about specific problems on various computer systems. If that trend continues, I will consider starting a separate "series" that will simply answer those questions; otherwise, I will continue to answer questions that seem to be of general interest as I have done here. When you write about a question or whatever, be sure to let me know if you do NOT want your name mentioned in my column, because I like to give appropriate credit for the suggestion. I do not intend to embarrass anyone by using an individual's

name; and the fact that I mention the question at all should be sufficient evidence that I believe you have asked a very good question.

For help in solving specific problems, be sure to include the exact model number of your system (from the back of the unit), the ROM version you are using (use CTRL-ALT-INS to find it), the DOS version you are using (including both version and BIOS numbers from the VER command), and a list of ALL hardware add-ons (including brand and model number) installed in your computer. The list of hardware add-ons should specifically include memory capacity (either added to an existing board or on any add-on board), all other internal add-on boards (e.g., modems, bus mouse or video cards), the brand and model of the CRT monitor you have, and the brand and model of the printer, with the type of interface (i.e., serial or printer) you are using. Also, be sure to include a listing of the contents of the AUTOEXEC.BAT and CONFIG.SYS files, unless you have thoroughly checked them out for potential problems (e.g., TSR conflicts). If the problem involves any application software, be sure to include the name and version number of the program you are running when the problem appears.

If you have any questions about anything in this column, or about Heath/Zenith systems, in general, be sure to include a self-addressed, stamped envelope (business size preferred) if you would like a personal reply to your question, suggestion, comment or request.

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 FTM Monitor (ZCM-1490) 999.00  
 Heath/Zenith Computer Centers  
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 (800) 253-0570  
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# A New Engine for Your '248

## A Review of the AMI ZX-386 Upgrade

Pat Swayne  
AMI Software Engineer

"Nothing is so consistent as change", someone once said, and it is certainly true in the realm of computers. It seems that no sooner have you become comfortable with a system that it is obsolete. Upgrading can be expensive and frustrating, but at least for H/Z-248 users, there are two ways to upgrade without buying a complete new computer. These are the HUG-386 upgrade from Heath Company, and the AMI ZX-386. Both of these upgrades replace the CPU, I/O, and memory boards in your computer with new boards, and the HUG-386 also replaces the back plane. The HUG-386 actually turns your H-248 into an H-386 in an H-248 cabinet, but the ZX-386 turns your computer into a mostly non-Heath/Zenith machine, with a "personality" all its own. While this article will be primarily a review of the AMI upgrade, I feel that I would be remiss if I did not make considerable comparison between it and the H-386.

### A Description of the ZX-386

The ZX-386 by American Micronics, Inc. of Irvine, California, consists of two boards connected together in a "mother-daughter" configuration. Together, these boards form a complete 80386 system with memory, two serial ports and one parallel port. The motherboard has edge connectors that allow it to be plugged into one of the Zenith slots in the H/Z-248 backplane. It communicates with the other boards in the backplane via these connectors, and they provide connections to the keyboard and the SETUP memory battery. Other than the keyboard and battery connections, the ZX-386 probably does not make use of the extra lines (beyond the PC and AT connections) in the Zenith slot.

Because the ZX-386 does not require replacement of the back plane, it can be installed in a Z-286 computer, as well as an H/Z-248 (but not the newer Z-286-LP). The installation requires some modification of the Z-286 cabinet, which I will describe later.

The daughter board of the ZX-386 contains the memory used by the system,

and it is the only source of full performance DOS and extended memory available. Zenith memory boards will not work. Ordinary AT memory boards will work if they are fast enough, but they will slow the system somewhat because they use a 16-bit data path. There are two daughter boards available. One uses 256k memory ICs and holds 1 or 2 megabytes of memory, and the other uses 1 megabyte ICs and holds 4 or 8 megabytes. A 16-megabyte board is in the works from AMI.

If you are wondering why the boards cannot be populated to a memory capacity other than those mentioned above (for example, 1.5 megabytes in the 256k chip board), it is because the 80386 is a 32-bit processor. When we say that the system has 1 megabyte of memory, what we mean is that it actually has 256k dwords (double words) of memory. Each "bank" of memory is 32 bits wide, and you cannot add a partial bank of memory. (Because a parity bit is used for every 8 bits of memory, a bank actually requires 36 chips.) Physically, the board divides the memory ICs into 4 rows, and the manual refers to these rows as banks, but there are actually only 2 banks on the board.

The ZX-386 I received for this review contained the 1-2 megabyte board populated to 1 megabyte. The memory ICs used on it are 100 nanosecond (-10) chips, which were also the kind used in my H-248 memory board, so I was able to populate the board to 2 megabytes using my ICs. (Note: If you have a zero wait state H-248 or Z-248, your board may have 100 ns chips in it, but if you have the 1 wait state government Z-248, your chips may be slower. Do not use chips slower than 100 ns.) This brings up one of the advantages of the 80386 over the 80286 that you may not be aware of. It can run at a higher clock speed using memory of a given access speed than the 80286 can.

One of the most important parts of an IBM-compatible computer system is the BIOS (Basic Input/Output System). The BIOS in the ZX-386 is by American Megatrends, Inc. of Atlanta Georgia (another AMI). The actual BIOS part of the

ROM is a very plain vanilla IBM-like BIOS, but it also includes a very nice diagnostics section and a built-in Setup facility similar to Zenith's, but not as fancy. I will describe these more later. The BIOS is so IBM-like that when you run the PC Tools Info command, it reports that the machine is an "IBM/PC AT". When you run Info on a "real" Zenith machine, it reports that it is a Zenith. The AMI BIOS lacks some of the unique features that are found in Heath/Zenith machines, and one of these missing features could cause problems for some users, as we shall see.

### Installing the ZX-386

I received three instruction manuals for the ZX-386. The first one is the older revision of the manual, which came with the unit, and I was later given a newer revision. The third manual I received is identical to the second, except that it is bound, while the first two are loose pages punched for a binder. Both revisions of the manuals are somewhat skimpy compared to what you may be used to from Zenith, but the newer one has more detailed installation instructions. Installation is so simple that the newer manual should be adequate for just about anyone. However, the manual is plagued with numerous annoying typos and mistakes, and should be revised again. For example, there is a reference to a drawing of the Z-248 motherboard on page 2-17, but the drawing is actually on page 2-15. In a section called "Key Usage Conventions", you are told that the Control key will be abbreviated CTRL, but immediately below the list of abbreviations, an example showing how Control-Alt-Delete will be written has CNTL for the Control key. There was an appendix A in the old manual that explained disk interleave, which was missing in the new one, even though another section referred to it. Word is that AMI is working out a deal with Zenith Data Systems to sell the ZX-386 as a Zenith product. If that happens, you will no doubt see a better manual.

Before you install the ZX-386, you must bring up the Setup screen of your H/Z-248 and write down the information

shown about your hard disk(s) (heads, cylinders, etc.). The Setup in the AMI BIOS uses different numbers for many of the drive types. For example, a hard disk that is type 23 in the Zenith Setup will be type 22 in the AMI Setup. So you need to get the information represented by the type numbers, not the numbers themselves.

To install the ZX-386 in an H/Z-248, all you have to do is open up the cabinet, remove your CPU, I/O, and any Zenith Memory cards, and plug the ZX-386 assembly into slot 4. If you want to use the second serial port, a mounting bracket is provided that holds a 9-pin serial connector with a cable on it. You can mount the bracket in the position vacated by your CPU card, and the cable connects to pins on the ZX-386. The speaker/LED cable that normally plugs onto the H/Z-248 I/O board must be connected to a similar plug on the ZX-386 motherboard. This plug is mounted higher on the card than the original, and causes the connector to protrude so high that you may find replacing the cabinet cover difficult.

You can install the ZX-386 into a Z-286, but the only slot into which it will fit is slot 3, and the metal edge where the mounting bracket is attached does not have a recess cut in it to allow for the serial and parallel port connectors. Fortunately, a tool called a "nibbler" is available at your local Radio Shack store that can be used to nibble away enough metal so the board can be installed. You must also remove the taller mounting bracket from your old I/O card and replace the bracket on the ZX-386 with it.

After you install the ZX-386 and turn it on for the first time, the BIOS will perform a memory test, and then indicate "CMOS System Options Not Set", and prompt you to run the Setup Utility. The Setup Utility in the AMI BIOS is not menu driven like Zenith's, but it just prompts you concerning each of the items to be set. You must type the required information to each prompt, and press Return. The first two prompts are for the date and time, and the BIOS accepts input in the same form as DOS. You can press Return to the date or time prompts to accept what is shown. If you have some kind of color graphics card installed (CGA, EGA, etc.), the BIOS will prompt you to enter the screen width next (40 or 80 columns). This is the only video option in the AMI Setup.

If you are running an initial setup (as you will be if you have just installed the ZX-386), the BIOS will prompt you next for your hard disk types. A list of the types is listed in the manual, and you can also get a list on screen by pressing the Esc key. You should match the information you copied down from the Zenith Setup screen to a drive type number in the list for each hard disk you have, and enter

that number in response to the appropriate prompt. If none of the types matches your drive exactly, you can use a type with the same number of heads and as many or fewer cylinders. It is important that you do not enter a type with more cylinders than your drive has.

If you have an unusual hard disk type with parameters that are not close to any of the types supported in the BIOS, AMI will "burn" a custom BIOS for you. I do not know how much extra, if anything, that AMI charges for this service, but the fact that it exists at all shows that AMI is a company that has the customer in mind. You could probably use your unusual hard disk without BIOS support by using the /Q option of Zenith's PREP, but the BIOS hard disk diagnostics would not be available.

After you enter your hard disk type(s), the BIOS will prompt you to enter your floppy disk types if it detects that the drives have more than 40 tracks. If it detects that a drive has 40 tracks, it will assume that it is a standard 5.25-inch 360k drive. The types you can select from if it detects more than 40 tracks are 1.2 megabyte 5.25-inch drive, 720k 3.5-inch drive, or 1.44 megabyte three-inch drive. The older manual points out that you will not be prompted for a drive type if a drive has 40 tracks, but somehow that information did not make it to the new manual.

After you have supplied the above information, the BIOS will prompt "Are these options correct?", and if you answer Y, it will exit from Setup and attempt to boot a disk. It attempts to boot IBM-style, trying floppy disk A: first, and then hard disk C:. There does not appear to be an option to boot from drive B: or a hard disk partition other than C:, as in Zenith systems.

If you want to run Setup again to change your hard disk type, you have to go through the whole setup once and then answer N to the "Are these options correct?" question, because it will skip the hard disk prompts the first time through if they have already been set up.

### The Built-In Diagnostics

Whenever you power up the ZX-386, it performs a memory test. You will hear a tick and see numbers increment on the screen as each 64k section is tested. You can abort the test by pressing Esc. After the memory test, the BIOS will check out other things and then start the boot-up process. While this is happening, a message "PRESS <DEL> KEY TO RUN SETUP OR DIAG" will appear on the screen. If you press the Del key, the boot process will stop, and then you can select the Setup or Diagnostic utility.

The Diagnostic utility is the fanciest part of the BIOS, with pop-down menus for selecting the various tests. The test categories (one menu for each) that you

can select from are hard disk diagnostics, floppy diagnostics, keyboard tests, video tests, and miscellaneous (serial port and printer tests). Among the hard disk tests are a low-level format (like Prep) and an auto interleave test. Interleave has to do with the way the sectors are physically arranged on each track of your disk. If the interleave factor is not set to the optimum value on your hard disk, the data transfer rate (access speed) will not be as fast as it could be. The auto interleave test can determine the best factor for your drive. I ran auto interleave on my hard disk, which had the interleave factor set to 3, and found that it could do better with the interleave set to 2. After the disk was reformatted with the factor at 2, the data transfer rate, as reported by the AMI BIOS, increased from 148.0 kilobytes per second to 205.5 kilobytes per second. The auto interleave test is destructive, so you must back up everything before you try it.

The low level format routine in the Diagnostics utility performs a format only. It does not perform a media check as Zenith Prep does, so it is much faster. The media analysis is a separate item in the menu, and you can skip it if you are sure that your drive is in good shape. You must run the Zenith Part utility after you use the AMI format, or MS-DOS will not recognize your hard disk. This fact is not mentioned in the manual.

Among the video tests are some CGA-type graphics tests. They run rather slowly, indicating that they are done using BIOS routines rather than direct video memory access. And they provide a clue to one area where Zenith computers perform better than most others.

### Performance Tests

My ZX-386 has performed flawlessly since I have installed it, without any memory errors, crashes, or other serious problems. The BIOS that was in the board when I first received it was a new one that AMI was testing, and it caused problems when I used an 84-key keyboard (a 101-key keyboard worked fine). The Caps Lock, Num Lock, and Scroll Lock keys did not always work, and the LEDs on the keys did not always agree with their state. Later, I was sent the BIOS that is currently being shipped, and it works fine with the 84-key keyboard. One of the things that AMI is trying to do with the new BIOS is speed up the initial power-up tests that the BIOS performs. It is indeed faster, but until the keyboard problem is fixed, they should continue to ship the old one.

Most of the programs that I ran before the installation still run properly, with the exception (so far) of one game program, which locks up the system. You can slow the ZX-386 down to 6 MHz operation by pressing a special key sequence, and you can also insert a memory access wait state using another key se-

Continued on Page 54



# Local HUG Clubs

## Arizona

### Phoenix Heath/Zenith Users' Group (PHUG)

2209 N. 17th Avenue  
Phoenix, Arizona 85007  
Voice: (602) 254-9083  
BBS: (602) 254-2185  
Contact: Ron Eggemeyer  
Times: 2nd Tuesday of Month, 7:30pm  
Location: Heath/Zenith Elec. Center  
2727 W. Indian School Road  
Phoenix, Arizona 85007

## Arkansas

### Northwest Arkansas MicroComputer Users' Group (NWA-MCUG)

Rt. 4, Box 376  
Springdale, Arkansas 72764  
Voice: (501) 361-2963  
BBS: N/A  
Contact: Bill Shook  
Times: 3rd Saturday of Month, 1:00pm  
Location: NW Arkansas VoTech School  
Hwy. 265 & Ford Avenue  
Springdale, AR 72764

## California

### Bay Area Heath Users' Group (BAHUG)

2001 Middlefield Road  
Redwood City, California 94063  
Voice: (415) 365-8155  
BBS: (415) 365-7836  
Contact: Ed Hayes, Sysop  
(415) 326-4486  
Times: 2nd Tuesday of Month  
(Except December)  
Location: Heath/Zenith Elec. Center  
2001 Middlefield Road  
Redwood City, CA 94063

## Freshug

4833 E. Santa Ana  
Fresno, CA 93726  
Voice: (209) 291-6258  
BBS: N/A  
Contact: Harlen Collins  
Times: Monthly  
Location: Various

## Western Regional HUG

1555 North Orange Grove Avenue  
Pomona, California 91767  
Voice: (714) 985-5303  
BBS: Anaheim Chapter  
(714) 447-1623  
Pomona Chapter  
(818) 917-7602  
Contact: Herb Friedman  
Times: Anaheim Chapter: 7:00pm  
3rd Thursday of Month  
Pomona Chapter: 7:30pm  
4th Thursday of Month  
Location: Anaheim Chapter:  
Heath/Zenith Elec. Center  
330 E. Ball Road  
Anaheim, CA  
Pomona Chapter:  
Heath/Zenith Elec. Center  
1555 North Orange Grove Ave.  
Pomona, CA

## Florida

### Plantation HUG

7173 W. Broward Boulevard  
Plantation, Florida 33317  
Voice: (305) 791-7300  
BBS: (305) 791-7302  
2400 Baud, 24 hrs.  
Contact: David Fisher

Times: Club is no longer in existence.  
Willing to sponsor new organization.

## Indiana

### Mishiana Heath Users' Group (MIHUG)

620 S. Logan Street  
Mishawaka, Indiana 46544-4834  
Voice: (219) 255-3923  
BBS: (219) 255-4980  
Contact: Mark L. Meidel  
Times: Call for Time/Date  
Location: Call for Location

## Kansas

### Wichita HUG Group

3801 W. 13th #401  
Wichita, Kansas 67203  
Voice: (316) 943-4820 (Home)  
(316) 838-9301 (Office)  
BBS: N/A  
Contact: John E. Reese  
Times: 2nd Thursday of Month  
Location: Call for Location

## Louisiana

### New Orleans Heath Users' Group (NOHUG)

31D Brandon Hall  
Destrehan, Louisiana 70047  
Voice: (504) 764-8913  
(817) 457-6918  
BBS: (504) 467-9896 (24 hours)  
Contact: Louise Berkowicz, Treasurer  
Times: 2nd Tuesday of Month  
Location: Heath/Zenith Elec. Center  
1900 Vets Boulevard  
Kenner, LA 70065

## Massachusetts

### HUG North Shore

144 Woburn Street  
Reading, Massachusetts 01867  
Voice: (617) 942-0185  
BBS: (508) 531-9332  
Contact: Ernest Bay  
Times: 2nd Wednesday of Month  
(Except December)  
Location: Heath/Zenith Elec. Center  
Rt. 114  
Peabody, MA 01967

## Michigan

### Metro Detroit Area HUG

35681 Hees  
Livonia, Michigan 48150  
Voice: (313) 427-3905  
BBS: After hours sys., H/Z Store  
(313) 553-4173 (West Side)  
(313) 772-0417 (East Side)  
Times: Quarterly, Middle Saturday  
3:00pm (Jan, Apr, July, Oct)  
Location: Call for Location

## Minnesota

### SMUGH (Minneapolis/St. Paul HUG)

3022 Johnson Street NE  
Minneapolis, Minnesota 55418  
Voice: N/A  
BBS: (612) 772-2761  
Contact: Dan Empanger  
3022 Johnson Street NE  
Minneapolis, MN 55418  
John Toscano  
P.O. Box 11537  
St. Paul, MN 55111-0537  
Times: Last Sunday of Month, 1400 hrs.  
Location: Falcon Heights Community Ctr.  
2077 Larpenteur Avenue  
Falcon Heights, MN 55113  
(Suburb of St. Paul)

## Missouri

### Microcomputer Users' Group

P.O. Box 411436  
Kansas City, Missouri 64141-1436  
Voice: (816) 587-8820  
BBS: N/A  
Contact: Carl Mutch  
Times: 2nd Saturday of Month, 1:00pm  
Location: American Business College  
Raytown, Missouri

### Zenith Computer Club, Plant 9

Attn: Training Center  
2500 Kearney  
Springfield, MO 65802  
Voice: (417) 868-6288  
BBS: (417) 868-6293  
M-Th: 4:30pm-6am  
Fri: 4:30pm-Mon. 6am  
Contact: Tom Hucker, Sysop  
Training Center  
Times: 1st & 3rd Tues. of Month, 3:45  
Location: Training Center

## Nebraska

### Omaha Heath/Zenith Users' Group (OMAHUG)

P.O. Box 777  
Bellevue, Nebraska 68005  
Voice: (402) 292-2325  
BBS: (402) 391-7286  
Contact: Steve Draper, President  
Chuck Sohms, Sysop  
Times: 4th Sunday of Month  
Location: City Hall  
6th and Washington Streets  
Papillion, Nebraska

## New Hampshire

### Computer Explorations Inc.

61 Stearns Road  
Amherst, New Hampshire 03031  
Voice: (603) 673-6040  
BBS: (603) 673-7366  
Contact: Dean Hayden-Macy  
Times: 2nd Thursday of Month  
6:30-8:00pm  
Location: Computer Town Store  
436 Amherst Street  
Nashua, NH

## New Jersey

### Shore Heath Users' Group (SHUG)

Heath/Zenith Electronics Center  
1013 State Highway #35-N  
Ocean, New Jersey 07712  
Voice: (201) 775-1231 (Heath Store)  
BBS: (201) 775-8705 Passworded  
1200 baud  
Contact: Richard Holst (President)  
33 Memorial Drive  
Barnegat, NJ 08005  
(609) 698-2221  
Blake Berning (Secretary)  
1904 Pitney Street  
Ocean, NJ 07712  
(201) 531-5142  
Times: 2nd Wednesday of Month, 7:30pm  
Location: Heath/Zenith Elec. Center

## New York

### Buffalo Users' Group (BUG)

Heath/Zenith Electronics Center  
3476 Sheridan Drive  
Amherst, New York 14226  
Voice: (716) 835-3090  
BBS: N/A  
Contact: George Mayer  
Times: 3rd Tuesday of Month, 7:00pm  
(Except July, August, December)  
Location: Heath/Zenith Elec. Center

## North Carolina

### Carolina Heath Users' Group

c/o Heath/Zenith Electronics Center  
4620-C West Market Street  
Greensboro, North Carolina 27407  
Voice: N/A  
BBS: N/A  
Contact: Graham Andrews (919) 885-4142  
Ned Coleman (919) 924-6672

Times: 3rd Thursday of Month, 7:00pm  
Location: Heath/Zenith Elec. Center

## Ohio

### Dayton Heath/Zenith Users' Group (DAYHUG)

P.O. Box 33070  
Dayton, Ohio 45433  
Voice: (513) 429-1432  
(513) 667-8155  
BBS: (513) 429-5818  
Contact: Keith Greer, Mark Roth  
Times: 3rd Thursday of Month, 4:15pm  
Location: Air Force Institute of Tech.  
School of Engineering  
Building 640, Area B, Rm 120  
Wright-Patterson AFB, Ohio

### CINCinnati Heath's Best Users' Group (CINCHBUG)

c/o Heath/Zenith Electronics Center  
131 West Kemper Road  
Springdale, Ohio 45246  
Voice: (513) 574-5728  
BBS: (513) 671-1865  
Contact: G. Douglas Winget, Treasurer  
Times: 2nd Tuesday of Month  
Location: Heath/Zenith Elec. Center

### Toledo Heath Users' Group (THUG)

c/o Heath/Zenith Electronics Center #46  
48 S. Byrne Road  
Toledo, Ohio 43615  
Voice: (419) 537-1887  
BBS: (419) 474-1175 Robbs Univ.  
Rob Butterfield  
Contact: Scott Roberts, President  
(419) 382-7610  
Rick Snyder, Vice President  
(419) 382-7259  
Times: Call for Time  
Location: Call for Location

## Oregon

### Portland-Vancouver HUG

550 N. Fremont  
Portland, Oregon 97227  
Voice: (503) 288-1674  
BBS: (503) 654-7161  
Contact: David Moeser, News Ltr. Ed.  
Times: 1st Thursday of Month, 7:30pm  
Location: Heath/Zenith Elec. Center  
10115 SW Nimbus Avenue  
Tigard, Oregon 97223  
(503) 684-1074

## Pennsylvania

### Frazer Users' Group (FUG)

4600 Springfield Avenue  
Philadelphia, Pennsylvania 19143-3611  
Voice: (215) 387-5572  
BBS: N/A  
Contact: Colin McGowan  
Times: 1st Wednesday of Month, 7pm  
Location: Frazer, PA area

### Philadelphia Heath User' Group (PHUG)

P.O. Box 8184  
Philadelphia, Pennsylvania 19101-8184

Voice: (215) 387-4614 or 387-5572  
 BBS: (215) 387-4635 or 288-0262  
 Contact: Colin McGowan  
 Times: 2nd Wed of Month, 7pm-9:30pm  
 Location: 1st & 2nd Month each quarter  
 Glading Memorial Church  
 Loretta & Cheltenham Ave.  
 Philadelphia, PA 19124  
 (at Oxford Circle near Rt 1)  
 3rd Month each quarter  
 Philadelphia H/Z C&E Store  
 Roosevelt Blvd. & Bustelton  
 Philadelphia, PA 19124  
 (215) 288-0180

### Pittsburgh HUG (PGH-HUG)

Heath/Zenith Electronics Center  
 3482 William Penn Highway  
 Pittsburgh, Pennsylvania 15235  
 Voice: (412) 824-3564  
 BBS: (412) 824-3732  
 Contact: Phillip Sidel, President  
 (412) 648-7384  
 Times: 3rd Tuesday of Month, 7pm  
 (Except June, July, December)  
 Location: Heath/Zenith Elec. Center

### South Carolina

#### Anderson HUG

401 Tiffany Drive  
 Anderson, South Carolina 29625-1815  
 Voice: (803) 225-0084  
 BBS: N/A  
 Contact: John R. Miller

Times: Call for Time/Date  
 Location: Call for Location

### Texas

#### Dallas/Forth Worth Heath/Zenith Users' Group

12022 C Garland Road  
 Dallas, Texas 75218  
 Voice: (214) 327-4835 (Store)  
 BBS: (214) 742-1380  
 Contact: Jon Gauthier (214) 997-0157  
 Charles Horn  
 Times: 1st Tuesday of Month, 7:00pm  
 Location: Heath/Zenith Elec. Center  
 12022 C Garland Road  
 Dallas, TX 75218

#### San Antonio Heath Users' Group

7111 Blanco Road  
 San Antonio, Texas 78216  
 Voice: N/A  
 BBS: (512) 341-0586  
 Contact: N/A  
 Times: 1st Wednesday of Month, 7:30pm  
 Location: San Antonio H/Z Elec. Center  
 7111 Blanco Road  
 San Antonio, TX 78216

### Virginia

#### Tidewater Heath Users' Group (THUG)

c/o Heath/Zenith Electronics Center  
 1055 Independence Boulevard  
 (Haygood Shopping Center)  
 Virginia Beach, Virginia 23455  
 Voice: (804) 460-0997

BBS: N/A  
 Contact: Roy Hartley — (804) 428-9205  
 John Smith — (804) 468-6246  
 Times: 1st & 3rd Thursday of Month,  
 7:30pm  
 Location: Heath/Zenith Elec. Center

### Wisconsin

#### Milwaukee Heath Users' Group (MHUG)

4439 N. Marlborough Drive  
 Shorewood, Wisconsin 53211  
 Voice: N/A  
 BBS: (414) 548-9866  
 Contact: Leif Pedersen, President  
 (414) 547-7966  
 Albert Kalina, Treasurer  
 (414) 962-2699  
 Times: 3rd Saturday of Month, 1-4pm  
 Location: Milwaukee School of Engineering  
 Walter Schroeder Lib. Bldg  
 Room L100  
 500 E. Kilbourn Avenue  
 Milwaukee, WI

Continued from Page 16

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# Marriage Between the Generations

Frank E. Hutchison  
508 Richardson Drive  
Fairfax, VA 22032

*(How an H-89 and a Z-248 Can  
Live Together Happily Ever After)*

## I. Introduction

Have you been thinking that you really need to get that new AT clone but you can't bear the thought of having to go through the hassle of trying to convert all your C source files from your old trusty H-89, or worse, having to re-type them all? Or are you happy with your H-89 at home, where it does *everything* you need, but the boss has work for you to do and he wants it on Big Blue's little machine at the office? Is your wife wondering if you're still married? For over two years I have been taking disks from my H-89 at home and easily transferring the information to PC compatible machines at work. I have been transferring HDOS to CP/M for even longer. What works for me can work for you.

## II. The Problems

More than two years ago, I was transferred from Hawaii to Washington, DC. Besides a change in jobs, I also had to change a Z100 for an IBM XT. After years of being able to easily trade disks between the home and office, I was faced with real incompatibility. I thought of directly connecting the machines but Uncle Sam is fussy about removing PCs from his premises and both machines involved are too heavy to ever be considered portable. Next there was the idea of having one machine call the other. It's possible, but a regular hassle if you do it often. Besides,

my wife had better things to do with her time than to babysit my H-89 while transferring files at 300 baud. Sending the files to an electronic bulletin board would work but then the files are open to inspection by others.

There is another problem besides the actual transfer of information; the information must be usable on the new machine. How many times have you been given a file only to discover that it's in WordStar format, which you don't have? Or how many times have you found a BASIC program that's available for the PC that you want on your H-89 or H-8? Many of the GW-BASIC statements are identical to Microsoft BASIC for the eight-bit machines.

## III. The Solutions

The answers to the above questions lie with the right collection of software. At the center is **MEDIA MASTER** by Intersecting Concepts, Inc. This program allows a PC compatible machine to read, write and format over 140 soft sector disk formats. Included are all the Heath/Zenith CP/M formats with the exception of double-sided, extended-density, although single-sided, extended density is supported. With Media Master, all of your CP/M files on soft-sector disk can be transferred to any PC. Operation of Media Master is simple with menus used for all selections and command line mode avail-

able for batch file use.

Anapro offers **CPC**, a Heath CP/M to PC-DOS conversion program. I chose **Media Master** because it allowed me the flexibility of reading, writing and formatting many other disk formats besides those of Heath/Zenith and there was only a five dollar difference. This capability has been useful several times when I have ordered programs which were on different disk formats (notably KAYPRO). Conversion to Heath formats was easy.

After I transfer the files to my Z-248 at work, I can use the MBASIC files as is with GW-BASIC except where graphics are involved. Straight ASCII files can also be used without any further conversion. Word processing documents are another matter. Every word processor program uses special codes in the body of the text to control the appearance of the final document. Unfortunately, there is no standard of which codes mean what. As a consequence, many word processors are incompatible with each other without some conversion. There are companies which offer conversion services but at prices that only the most wealthy or die-hard hobbyist can afford.

There are programs which will convert one word processor format to another. Some are available on user group bulletin boards; generally, these are single purpose programs working only from or to

one particular word processor. There are commercial programs which generally have more capabilities. The program I use is provided as part of **WordPerfect**. Named appropriately CONVERT, it allows you to convert from or to the following word processor formats:

- WordPerfect 4.2
- Revisable Form Text (IBM DCA format)
- Navy DIF Standard
- WordStar 3.3
- Multimate 3.22
- Seven-bit transfer
- MailMerge (to WordPerfect Secondary Merge)
- Spreadsheet DIF (to/from WordPerfect Secondary Merge)

Operation is simple: you are asked for the input file's name; the output file's name; then you choose the translation you want done from a menu. Since **WordPerfect** is the most widely used word processor on PCs (42% of Fortune 500 companies use it), there is likely a copy nearby that you can use. I do not suggest piracy.

I regularly transfer WordStar files from my H-89 to WordPerfect on my Z-248 and back again. Only once have I had less than perfect translation. The one incident occurred when I tried to compensate for an old ribbon and used both bold and double strike on the entire document. The resulting profligation of strange control codes were easily removed with the Replace feature of WordPerfect.

#### IV. Additional Options

What if your prized word processor is unique to CP/M and there is no conversion possible to an MS-DOS word processor? Or what if you like your CP/M word processor, or the check register program, or you just don't want to stop using all the programs you have for the H-89? What are your options? There is a way to continue using your CP/M programs on PC compatible machines under MS-DOS.

There are several software CP/M emulators available. These are programs which cause your PC to act like an H-89 or H-8 running CP/M. Intersecting Concepts, Inc. has ZP/EM, which is packaged with **Media Master** as **Media Master Plus**. They also have a combination hardware/software solution which replaces the 8088 processor with a NEC V20 (or 8086 with NEC V30), uses **ACCEL** as the CP/M emulator, and includes **Media Master**. Another option is a public domain product by Computerwise Consulting Services of McLean, VA which offers Z80MU and is available on many bulletin boards. All three products have the ability to emulate Heath/Zenith terminals so most CP/M programs that work on H-89's or H-8/19's will work on PC's. Software emulators generally give you the capability of a 1/4MHz H-89 with a PC or XT. A Z-248 will give performance that's equivalent to a standard 1MHz H-89.

One limitation that all CP/M emulators have is that any program which attempts to access the disk drive independently of the operating system will not work because of the differences in how the disk drive is controlled. This includes the familiar CP/M programs STAT.COM, SPELSTAR, and FORMAT.COM.

For translation between HDOS and CP/M, there are two simple programs for your use - HTOC and CTOH. HTOC is a HDOS to CP/M conversion program; CTOH, the CP/M to HDOS conversion program. Recently, I helped convert several hard sector disks of HDOS files to MS-DOS disks. This was a two step process: (1) from hard sector HDOS to soft sector PC/M with HTOC, then (2) from CP/M to MSDOS with **Media Master**. There was total conversion of every file. My client had previously tried direct connections and connection via modems without success. HTOC and CTOH are available from the Heath Users Group and other user groups around the country.

#### V. My Experience (Conclusion)

Using the tools described above, your investment in your 8-bit machine can be saved and used on or in companion with a PC compatible with minimal expense and effort. You gain the added benefit of continuing to use friendly, faithful programs that you already know how to use. All this, without the need for spending thousands of dollars for new hardware and software, can be yours for as little as \$35.00.

#### Products mentioned:

Media Master	\$39.95
Media Master Plus	\$59.95
Accelerate8/16	\$89.95

Intersecting Concepts, Inc.  
4573 Heatherglen Court  
Moorpark, CA 93021  
(805) 529-5073

CPC \$35.00

Anapros  
6905 El Camino Real #4  
Atascadero, CA 93422  
(805) 466-1589

Z80MU  
Computerwise Consulting Services  
P.O. Box 813  
McLean, Va 22101  
(703) 280-2809

HTOC (part no. 885-1207-[37])	\$20.00
CTOH (part no. 885-1089-[37])	\$20.00
(indicate -[37] for soft sector disks)	
Heath Users Group	
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Benton Harbor, MI 49022-0217	
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This one-board replacement will free up slots, use less power than the H/Z method and give you one parallel and two serial ports. Has a place for a 20Mhz 80387 co-processor (\$695 as of this printing). See H-SCOOP #103, or request a copy for a report on this board, or inquire for more information.

We'll even give you a trade-in on your old CPU and I/O board if you desire, and if you need the M256-10 DRAMS, we'll even give you a deal on them!

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## MEMORY UPGRADES

Note: All memory upgrades come without memory chips. Call for current chip pricing.

**Z150MP** - \$19 Will allow you to upgrade your H/Z150/160 to up to 704K on the main memory board, using up to 18 256K DRAM chips.

**MEGARAM** - \$43 Upgrades your H/Z150/160 series with up to 704K of main memory, and about 512K for RAMDRIVE memory. Includes documentation, software RAMDRIVE disk, PAL and jumper wire. For the full 1.2 megs total memory, 45 256K DRAM chips are required.

**ZMF100** - \$53 Will allow you to upgrade your H/Z110/120 (old motherboards; with p/n less than 181-4918) to 768K system RAM. Requires 27 256K DRAM chips.

**Z100MP** - \$76 Allows you to upgrade your H/Z110/120 (new motherboards with p/n 181-4918 or greater) to 768K system RAM. Requires 27 256K DRAM chips.

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**PCW20** - \$295 Complete winchester setup for a H/Z150, 148, 158, 159, 160, PC etc. Includes 21 meg formatted half-height Segate ST-225 85ms drive, WD WX1 winnie controller board, cable set, documentation.

**PCW40** - \$449 Same as above but with 37ms Segate ST-251.

**PCW80** - \$695 Same, but 28ms Segate ST-4096 full size drive.

**EWIN20** - \$510 Complete 21 meg winchester package for the Z100. Includes S100 host adapter card, WD winchester controller, Segate ST-221 winchester drive, cables, software and documentation. We also have this in 42 megs (\$669), and 80 megs.

**We also have winchester systems for the H8 and H/ZB9/90.**

## BARE WINCHESTER DRIVES

**ST-225** - \$229 85ms half height bare winchester with 21 megabyte storage capacity.

**ST-251** - \$395 37ms autopark half height bare winchester with 42 megabyte storage capacity. Good choice for -AT compatibles.

**ST-251-1** - \$429 Same as ST-251 but 28ms speed.

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Of course, don't forget about the best source of Heath/Zenith related information you can obtain - our monthly newsletter, **H-SCOOP!** Just \$24 for a 12-issue year (\$35 foreign), it will help you get the most from your computer investment. Get sound technical advice, helpful hints, find out what the problems are, fixes, reports, reviews, information from other subscribers, classifieds and much more.

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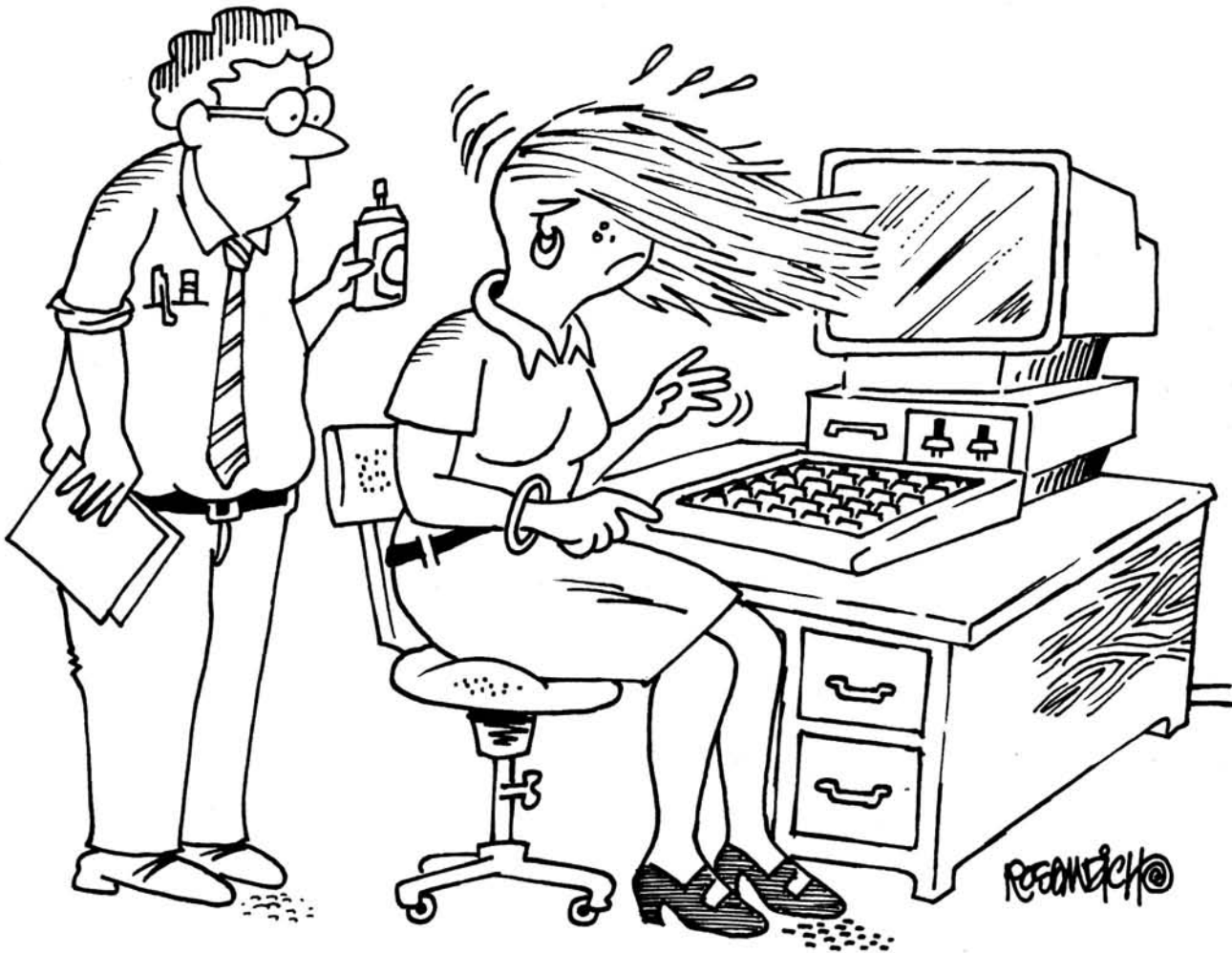
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# 1986

# Software

# Update



"WANNA USE MY ANTI-STATIC SPRAY SUSAN.?"

## P/N 885-1135-[37] HDOS Variety Package

**Introduction:** This group of three disks contains various programs for the HDOS operating system. Rather than hold these programs for an 'all the same type of program' disk, the decision was made to release them in a 'variety' type package. These programs include, utilities, games, and two device drivers.

**Requirements:** These programs require the HDOS operating system version 2.0 or greater. An H-8/H-19 or H-89/90 computer with at least one disk drive is also required. In the case of the device drivers, the H/Z-25 or Diablo 630 printer will be needed. MBASIC Version 4.82 is required for SMART CRAPS.

The following files are included on the HUG P/N 885-1135-[37], HDOS Variety Package disk set:

### Disk A

FREDIT .ABS	FREDIT .DOC
WM25DVD .ACM	WM25DVD .DVD
WM25DVD1 .ABS	WM25DVD1 .ASM
WM25DVD2 .ABS	WM25DVD2 .ASM
WM25DVD .DOC	DEMO .TXT
README .DOC	

### Disk B

CALENDAR .BAS	CALENDAR .BAS
SNOOPY .ART	HBR8H .ABS
HBRZH .ABS	HBR .DOC
PD .ASM	PD .DVD
PD .DOC	

### Disk C

CRAPINS1 .BAS	CRAPINS2 .BAS
CRAPS .BAS	CRAPSTAT .BAS
CRPSCR1 .DAT	CRPSTA1 .DAT
MPCRAPPS .BAS	CRAPS .DOC
SPCRAPS .BAS	

### Program Authors:

FREDIT — Maynard Mansfield  
WM25DVD — William W. Moss MD.  
CALENDAR — Brent Malcolm  
HBRIDGE — Robert Hassard  
PD — Walt Bilofsky  
SMART CRAPS — C.F. Mowery Jr.

### Program Content:

**FREDIT** — Fredit makes available to the small system running under HDOS, the speed and simplicity of full-screen text editing. The editor occupies less than 5700 byte in RAM, so serious text editing may be undertaken on a 32k machine. Fredit makes use of all the editing functions provided by the H-19 terminal, and most of the H-19's special function keys are employed as well. The 25th line of the terminal screen provides a continuous display of the status of the editing process.

**WM25DVD** — This H-25 device driver is considerably more sophisticated than the one Heath distributes. It permits individual settings on each of eight logical units. Thus, the user can individualize the formats desired for various types of documents without having to change the device driver settings. Also, when a new setting is made, it goes into effect immediately even if the driver has already been loaded into memory; no need to reboot to make it work. There are 18 set options allowed by this driver.

**CALENDAR** — This program computes a calendar for any year and prints it in various forms. It prints an annual calendar with, if desired, an attached graphics of Snoopy on his doghouse. It also prints a monthly appointment calendar (one month per page) which has the usual format for all days of the week (Sunday through Saturday) or a second type with just Monday through Friday. The latter format allows larger spaces for your entries.

**HBRIDGE** — HBRIDGE is a program for playing Bridge. It is suitable for the novice bridge player. The computer plays three hands (or two if north or south are the declarer) and the human player plays one (or two). HBRIDGE bids using fundamental conventions, plays following the simplest of rules, and then scores each hand when finished. The score is recorded on a disk file bearing the human player's name. After playing a hand, a display of all four hands may be obtained, or the north-south hand may be switched with east-west and replayed, or a new deal may be called for. With this program, the computer plays a fair quality of bridge. It makes mistakes just as humans do. In this respect, it is

human-like. For a person who also makes mistakes, this can be an enjoyable program.

**PD** — This is a device driver for the WH-44 style printers (Diablo 630) to allow the use of proportional spacing type print wheels even when NOT equipped with the Diablo word processing hardware option. It is a modified version of the LPH44 driver originally supplied by Heath with HDOS version 2.0.

**SMART CRAPS** — This game is designed not only to provide realistic and entertaining one-player and multi-player versions of the dice game, Craps, as it is played in most casinos, but also to assist both novice and experienced players alike in becoming 'smart' craps players, via the display of a wide variety of statistical information during play of the games and a separate statistical program. The data displayed is designed to help smart players develop betting systems that increase their winning potential by decreasing the house advantage.

### TABLE C Rating: (9)

## P/N 885-3007-37 Z-DOS/MS-DOS CP/EMulator Update

CP/EMulator is a program that allows you to run CP/M programs under Z-DOS or MS-DOS on an H/Z-100 (dual processor) computer. It has been improved considerably and re-released under the same HUG part number. For a description of the original program, see page 27 of your HUG Software Catalog Update #1.

CP/EMulator has been improved to run faster and handle "tough" CP/M programs that it could not run before, including CP/M WordStar (all functions work), PIP (including all switches), and the CP/M editor, ED. Screen I/O is faster, so that word processors and action game programs are more useful and enjoyable. With the new CP/EMulator, you can run nearly all of the CP/M programs in the HUG library under MS-DOS or Z-DOS. (However, CP/M Microsoft BASIC is required for some programs, and is not supplied.)

If you have the original CP/EMulator and would like to upgrade, send in your original HUG disk and \$5.00 to the Heath/Zenith Users' Group, Attn: Nancy Strunk, Hilltop Road, St. Joseph, MI 49085. Make checks payable to: Heath/Zenith Users' Group.

**Note:** Since CP/EMulator now runs the CP/M editor, the HUG CP/M editor is no longer included on the disk.

## P/N 885-3033-37 Update

HUGMCP, HUG P/N 885-3033-37, has been updated to version 1.1. This newer version now has the ability to set the colors of the text display, and if you're running an H/Z-100 PC/200 PC, the screen border, background, 25th status line text, 25th status line background, all independently. Additionally, HUGMCP can now concurrently print the data in the capture buffer while communicating with the host computer. Printer 'busy' will not cause the program to 'hang' or issue error messages as most other software will. Current owners of HUGMCP can obtain this update by sending their original 885-3033-37 disk along with \$5.00 to: Heath Users' Group, Hilltop Road, St. Joseph, MI 49085, Attn: Nancy Strunk. Make checks payable to Heath Users' Group.

## Attention HERO 2000 Owners!

Looking for an inexpensive modem package that'll interface your H-100 or H-100 PC to your new super robot? Look no further! HUGMCP was designed with HERO 2000 in mind! HUGMCP responds properly to the ANSI 'disable keyboard' command as required by HERO 2000. It will also do software transfers using standard XMODEM protocol, or ASCII transfers using XON/XOFF protocol. HUGMCP is available for only \$40 from HUG, and has a part number of 885-3033-37. Why pay 4 times more than you really need to? Order your copy today from the Heath Parts Department by calling area code (616) 982-3571.

## P/N 885-3034-37 MS-DOS ZPC Support Disk

**Introduction:** The ZPC Support Disk contains files to help you make better use of the HUG Z-100 PC Emulator (HUG p/n 885-3030-37). This disk contains patches to update early releases of ZPC itself, patches for several popular software packages that enable them to run under ZPC, and an emulator for the ANSISYS device driver supplied with the Z-100 PC version of MS-DOS.

**Requirements:** To use this disk, you need ZPC itself, and an H/Z-100 (not PC) computer and MS-DOS version 2 or 3. All of the programs for which patches are supplied write directly to video memory when they are run on a real PC, which means that you need 768k of memory in your H/Z-100 to run them under ZPC.

This disk contains the following files:

README .DOC	ANSI .COM
FIXASM .DOC	ANSISYS .ASM
PREFIX .BAT	ASCII .DEF
REPLY .COM	Z150ROM .DEF
FIXZPC .BAT	ANSI .ASM
FIXZPC1 .DAT	LTSPOCH .BAT
FIXZPC2 .DAT	LTSPOCH .DAT
FIXZPC3 .DAT	DBPCH .BAT
FIXZPC4 .DAT	DBPCH .DAT
FIXZPC5 .DAT	DBCPC .BAT
FIX3A .BAT	DBCPC .DAT
FIX3A .DAT	FWPCH .BAT
DOS3 .BAT	FWPCH .DAT
DOS3A .DAT	FW1PCH .BAT
DOS3B .DAT	FW1PCH .DAT
DOS3C .DAT	FW2PCH .BAT
DOS3D .DAT	FW2PCH .DAT
DOS3E .DAT	ENABPCH .BAT
ANSISYS .COM	ENABPCH .DAT
MMPCH .BAT	PALDPCH .DAT
MMPCH .DAT	MW1PCH .BAT
VXPCH .BAT	MW1PCH .DAT
VXPCH .DAT	MW2PCH .BAT
EDIXPCH .BAT	MW2PCH .DAT
EDIXPCH .DAT	SC3PCH .BAT
PALPCH .BAT	SC3PCH .DAT
PALPCH .DAT	SC3PCH .BAT
PALDPCH .BAT	SC3PCH .DAT

**Program Author:** Patrick Swayne, HUG Software Engineer

**Disk Content:** The files on this disk are divided into three sections. The first section contains patches for ZPC itself. The patches are self-installing, and a special batch file called PREFIX .BAT selects the proper patches for your release of ZPC. The patches are only for level 3 of ZPC, but the assembly language code for the patches is provided in the file FIXASM.DOC so that you can fix your source code and assemble updated lower levels.

The second section of the ZPC Support Disk contains an emulator for the ANSISYS device driver that is supplied with MS-DOS for the Z-100 PC series computers. Some PC programs require ANSISYS, but it will not work on a Z-100, and the ANSICON .DVD driver supplied with Z-100 MS-DOS will not work while ZPC is in the PC mode. The file ANSISYS.COM on this disk, when loaded after ZPC, provides an exact emulation of the ANSISYS driver, so that programs requiring it will run properly. Once ANSISYS.COM has been loaded, ANSI emulation can be turned on or off using a companion program, ANSICOM. You just give the command ANSICON to turn emulation on, and ANSIOFF to turn it off.

The third section of the ZPC Support Disk contains patches that enable the following programs to run under ZPC: LOTUS 1-2-3 (PC version, release 1A), DBASE III (version 1.1), FRAMEWORK (version 1.1), ENABLE (version 1.1), MULTIMATE (Z-150 version 3.3), VOLKSWRITER DELUXE (version 2.0), EDIX (version 2.05), and PC PALETTE (version 1.0). Also included is a corrected patch for the Heath/Zenith release of SuperCalc3, a patch for the IBM PC release of SuperCalc3 (release 2.0), and alternate patches for Microsoft Word.

**TABLE C Rating:** (10)

=====  
**P/N 885-3035-37 MSDOS  
 SPELL5 & SPELL5F**  
 =====

**Introduction:** SPELL5 and SPELL5F are two spelling checkers designed to make spelling checking easier and truly useful. SPELL5 is a spelling checker for the English language, and SPELL5F is a spelling checker for French.

**Requirements:** Both programs require the H/Z-100 computer system (not PC) with 192k of memory. Included, are versions that will also work with 128k systems. Both programs will work with either monochrome or color CRTs. SPELL5 will work with any version of MSDOS.

The following programs or files are included on the HUG SPELL5 disk P/N 885-3035-37:

SPELL5 .COM	SPELL5F .COM
DICTION .SPL	DICTIONF .SPL
SPELL5 .DOC	SPELL5F .DOC
SPELL5 .128	FRENCH2 .CHR
README .DOC	

**Program Author:** Ronald Perrella

**Program Content:** The SPELL5 program is a memory based spelling checker. It loads a dictionary called DICTION.SPL from the disk and checks a file for spelling errors. When an unknown word is encountered, it can either be skipped or integrated to the dictionary. The dictionary is a sorted list of words separated by a carriage return and linefeed. This dictionary can be edited by any text editor, if necessary. Multiple dictionaries are supported and so is IN CONTEXT spelling checking.

There is also a French version of this program, and in order to be used properly, the ALTCHAR.SYS file must be changed to the FRENCH2.CHR file.

The SPELL5 program was designed to be easy to use, not to be a 50,000 word speller. Its true capacity depends on the amount of memory you have. In a 192k byte system, you should be able to store about 10,000 words, and about half that many in a 128k byte system.

TABLE C Rating: (10)

=====  
**P/N 885-3036-37 MS-DOS  
 TREE-ID**  
 =====

**Introduction:** This Z-BASIC program was written to demonstrate a "generic" menu program for Z-BASIC, and arouse interest in tree identification using both text and graphics.

**Requirements:** TREE-ID requires an H/Z-100 (not PC) computer system with two 5-1/4" disk drives, 192k of system memory, a printer, 3 banks of 32k or 64k color memory, a color monitor, and either Z-DOS or MS-DOS.

The following files are included on the HUG P/N 885-3037-37 TREE-ID disk set:

**Disk A**

RUN .BAT	RUNAB .BAT
RUNI .BAT	README .DOC
TREE-ID .EXE	AMEELM .PRN
BASSWO .PRN	BEECH .PRN
BITHIC .PRN	BLACHE .PRN
BLAGUM .PRN	BLALOC .PRN
BLAOAK .PRN	BLAWAL .PRN
BLAWIL .PRN	BLUBEE .PRN
BOXELD .PRN	BUROAK .PRN
CHEOAK .PRN	CHIOAK .PRN
COFTRE .PRN	COMCOT .PRN
FLODOG .PRN	HACKBE .PRN
HONLOC .PRN	IRONWO .PRN
LARASP .PRN	OHIBUC .PRN
OSAORG .PRN	PERSIM .PRN
PIGHIC .PRN	PINOAK .PRN
REDBUD .PRN	REDMAP .PRN

REDMUL .PRN	REDOAK .PRN
RIVBIR .PRN	SASAF .PRN
SHAHIC .PRN	SHIOAK .PRN
SILMAP .PRN	SLELM .PRN
SUGMAP .PRN	SWAOAK .PRN
SWEGUM .PRN	SYCAMO .PRN
TULIPT .PRN	WHIASH .PRN
WHIHIC .PRN	WHIOAK .PRN
GLOSSARY .TXT	

**Disk B**

TREE-ID .BAS	AMEELM .PIC
BASSWO .PIC	BEECH .PIC
BITHIC .PIC	BLACHE .PIC
BLAGUM .PIC	BLALOC .PIC
BLAOAK .PIC	BLAWAL .PIC
BLAWIL .PIC	BLUBEE .PIC
BOXELD .PIC	BUROAK .PIC
CHEOAK .PIC	CHIOAK .PIC
COFTRE .PIC	COMCOT .PIC
FLODOG .PIC	HACKBE .PIC
HONLOC .PIC	IRONWO .PIC
LARASP .PIC	MENU12 .PIC
MENU15 .PIC	MENU16 .PIC
MENU18 .PIC	MENU20 .PIC
MENU3 .PIC	MENU4 .PIC
OHIBUC .PIC	OSAORG .PIC
PERSIM .PIC	PIGHIC .PIC
PINOAK .PIC	REDBUD .PIC
REDMAP .PIC	REDMUL .PIC
REDOAK .PIC	RIVBIR .PIC
SASSAF .PIC	SHAHIC .PIC
SHIOAK .PIC	SILMAP .PIC
SLELM .PIC	SUGMAP .PIC
SWAOAK .PIC	SWEGUM .PIC
SYCAMO .PIC	TULIPT .PIC
WHIASH .PIC	WHIHIC .PIC
WHIOAK .PIC	

**Author:** Ronald B. Berger

**Program Content:** TREE-ID, is a tree identification program based on a simplified method from T.E. Shaw's pamphlet, "Fifty Trees Of Indiana", 1981, published by the Indiana State Forestry Division and by the Forestry Department Of Purdue University. This database is entirely menu driven, and very easy to use. It presently contains forty-five trees, but more menus and tree descriptions could be readily added. This program uses the high resolution color graphics capabilities of the H/Z-100 (not PC) computer to display help figures, as well as the leaves of tree being identified.

**Comments:** Although this program was written for floppy disk drives A: and B:, the source code could be changed to allow the program to work on a hard disk, or memory disk.

TABLE C Rating: (10)

=====  
**P/N 885-3037-37 MS-DOS  
 ZPC Version 2**  
 =====

**Introduction:** ZPC Version 2 is a program that emulates an IBM PC or compatible computer on an H/Z-100 series (dual processor) computer. It allows you to run many IBM PC programs on your H/Z-100 without having to add an expensive hardware modification. It supports all video modes, including text and graphics, of an IBM color/graphics card. Version 2 of ZPC is a significant enhancement of the original ZPC (HUG p/n 885-3030-37), and with it you can run much of the important PC business software. A list of programs that will run under ZPC Version 2 as of 3-13-86 is supplied later in this description.

**Note:** This version of ZPC supersedes both the original ZPC and the ZPC Support Disk (885-3034-37). If you have ZPC version 1, you can upgrade to version two by sending your original distribution disk and \$20.00 to Heath Users' Group, Attn: Nancy Strunk, Hilltop Rd., St. Joseph, MI 49085. If you have both ZPC version 1 and the ZPC Support Disk, you can upgrade by sending both disks and \$15.00 to HUG. Make checks payable to: Heath Users' Group.

For a description of the improvements in ZPC Version 2 compared to version 1, see the article "ZPC Version 2 is Here" in this issue.

**Requirements:** ZPC Version 2 requires an H/Z-100 or ET/ETA-100 series computer with MS-DOS version 2 or 3 and exactly 768k of memory. A small memory version of ZPC is supplied that will run in less than 768k of memory, but that version will only run a few PC programs. For best results, your computer should be equipped with color memory (either 32k or 64k chips).

The ZPC Version 2 disk contains these files:

README .DOC	DISK .ACM
ZPC .COM	DOS .ACM
ZPCSM .COM	KEY .ACM
PC .COM	PIXEL .ACM
Z100 .COM	PRINT .ACM
SETZPC .COM	PUTCHR .ACM
ANSISYS .COM	SCROLL .ACM
SETANSI .COM	PC .ASM
PATCHER .COM	Z100 .ASM
DEMO .COM	SETZPC .ASM
PATCHER .DAT	ANSISYS .ASM
FIXCB .COM	SETANSI .ASM
FIXQB .COM	PATCHER .ASM
FIXPSC .COM	FIXCB .ASM
FIXFVII .COM	FIXQB .ASM
ZPC .ASM	FIXPSC .ASM
COND .ACM	FIXFVII .ASM
DATA .ACM	DEMO .ASM

**Author:** Patrick Swayne, HUG Software Engineer.

**ZPC.COM, ZPCSM.COM** — These are the two versions of ZPC. ZPCSM.COM is for small memory systems (less than 768k), and ZPC.COM is for 768k systems. ZPC emulates the color/graphics adapter, the monochrome text adapter, the keyboard, printer I/O and disk I/O of an IBM PC or compatible computer.

ZPC is a background program that remains resident in memory after you run it. Once it has been loaded, you can turn on PC emulation to run IBM programs, and turn it off to run Z-100 programs. You do not need a second version of MS-DOS to run IBM programs under ZPC, and all your drives and partitions are supported.

Some programs require patching before they will run under ZPC. A patching utility is included, along with patches for several programs. ZPC Version 2 fully supports the ZPC Hardware Support (ZHS) circuitry that was described in the April 1986 issue of REMark. With ZHS installed, most supported programs do not have to be patched.

ZPC Version 2 can read some, but not all, copy protected programs. In particular, it cannot read a disk protected by SoftGuard. Fortunately, there are commercial programs available that let you use SoftGuard protected programs.

The following is a list of programs that can have been tested under ZPC Version 2 (with 768k of memory), as of 3-18-86.

Program:	See Notes:
BENCHMARK Word Processor vers. 4.4	1
CORNERSTONE database	1
Compiled PC GW-BASIC Programs	1
Compiled QUICKBASIC Programs	5
DAC EASY ACCOUNTING	1
DBASE III version 1.1	2,3,4
DBASE III + version 1.0	2,3,4
EDIX version 2.05	2,3
EINSTEIN WRITER version 7.2	2,3
ENABLE version 1.1	2,3
FRAMEWORK version 1.1	2,3,4
FRAMEWORK II version 1.0	2,3,4,5
GW-BASIC (Zenith PC versions)	2,3
LOTUS 1-2-3 release 1A	2,3
LOTUS SYMPHONY	1,4
MICROSOFT WORD vers. 1.1 (Zenith PC)	2,3
MICROSOFT WORD version 2.0	1
MULTIMATE version 3.3	2,3
MULTIPLAN version 1.2 (Zenith PC)	2,3
NORTON UTILITIES	1
PC FILE	1
PC PALETTE version 1.0	3
PC WRITE version 2.4 or 2.55	3
PRINT MASTER	1
RUN/C	1
SIDEWAYS version 2.02	1
SUPERCALC3 version 2.0, 2.1	3
TURBO PASCAL	1
VOLKSWRITER DELUXE version 2.0	3
WORD FINDER	1
WORD PERFECT version 4.1	2,3

**Notes:**

1. Runs without any patches or hardware support.
2. Runs in the monochrome mode without any patches or hardware support.
3. Runs without patches if the ZPC Hardware Support circuitry is installed. Otherwise, you must use the patches supplied with ZPC.
4. Copy protection must be removed before you can run this program.
5. Requires a special patcher, supplied with ZPC.

**PC.COM** — This program is used to turn on the IBM emulation mode after ZPC is loaded into memory. With PC.COM on your system disk, you just enter

A>PC

to turn IBM emulation on. PC can also be used to set a specific video mode, much like the MODE program used on IBM PCs.

**Z100.COM** — This program is used to turn off the IBM emulation mode. With Z100.COM on your system disk, you enter

A>Z100

to enter normal Z-100 operation. You can then run your Z-100 programs as usual.

**SETZPC.COM** — This program is used to set several parameters, such as the way ZPC emulates bright colors, etc., and the default video mode (when you run PC). You can also specify the character font to be used when ZPC is in the IBM mode. You can choose from an IBM-style font, the default Z-100 font, or a user supplied font (from a custom ALTCHAR.SYS). All changes made by SETZPC can be either temporary or permanent.

**ANSISYS.COM** — This program emulates the ANSYS.SYS device driver that is used on PC-type computers. It will allow you to run programs that use ANSI codes.

**SETANSI.COM** — This program allows you to turn ANSI emulation on or off after you have loaded ANSYSYS.

**PATCHER.COM** — This program is used to apply patches to programs that need them to run with ZPC. It is menu driven, and much easier to use than DEBUG. The patch information is stored in a data file, PATCHER.DAT, which is an ordinary text file that can be modified or added to using an editor or word processor. As patches for more programs are developed, they will be printed in REMark in PATCHER data file format.

**PATCHER.DAT** — The patcher data file. It contains patches for all programs in the list above that have a 3 in the note column.

**FIXCB.COM** — This program fixes compiled PC GW-BASIC programs so that they will run with the small memory version of ZPC. Patching is not needed if you have 768k of memory.

**FIXQB.COM** — This program fixes compiled QuickBASIC programs so that they will run with ZPC. It is for stand-alone programs, compiled using the /O option.

**FIXPSC.COM** — This program fixes Heath/Zenith and Clarkston screen printing utilities (Z-100 versions) so they can be used to dump graphic displays to a printer while ZPC is in the IBM mode.

**FIXFWII.COM** — This program applies a special patch to Framework II that cannot be done with PATCHER, to make it work with ZPC.

**DEMO.COM** — A program that demonstrates ZPC.

\*.ASM, \*.ACM — These are the source code files for ZPC and its support programs.

TABLE C Rating: (2), (7), (10)

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## P/N 885-3038-37

### Z-DOS/MS-DOS

## DEBUG Support Utilities

=====

**Introduction:** This disk contains three utilities designed to help you with debugging programs. They are designed to be used with the standard MS-DOS DEBUG utility or other similar utilities. The three utilities are:

**Processor Window** — This utility allows you to "look inside" your microprocessor in your computer while it is running. It will display any two 16-bit registers, any two 16-bit memory loca-

tions, or one register and one memory location on the screen in the upper right corner, while any program is running. You can use this utility to see how a program alters an interrupt vector, where it gets "stuck" in an endless loop, and for many other purposes. This utility was developed and used to debug ZPC, and get PC programs running under it. It works with or without DEBUG.

**Breakout** — This utility allows you to run a program under DEBUG, and then break out of the program back into DEBUG even though you have not hit or even set a breakpoint. It allows you to get out of endless loops or "runaway" programs.

**Anti-Paranoid** — This utility allows you to debug "paranoid" commercial programs that otherwise cannot be debugged because they destroy the breakpoint interrupt. Two versions of this utility are included, which take two different approaches to solving the "paranoid program" problem.

**Requirements:** You will need an H/Z-100 or H/Z-100 PC series computer, any version of MS-DOS or Z-DOS, and the DEBUG utility that came with your DOS, or another debugging utility. The second version of ANTI-PARANOID requires 512k of RAM, but the other utilities will work in a minimum (128k) system.

Here is a list of the files on the DEBUG Support Utilities disk:

README .DOC	APNOID2 .COM
PWINDOW .POM	APSET2 .BAT
PWINDOW .ZOM	PWINDOW .PSM
PW .COM	PWINDOW .ZSM
BRKOUT .POM	PW .ASM
BRKOUT .ZOM	BRKOUT .PSM
BRK .COM	BRKOUT .ZSM
APNOID .COM	BRK .ASM
APSETP .COM	APNOID .ASM
APSET .BAT	APSETP .ASM
APSET .DAT	APNOID2 .ASM

**Author:** Patrick Swayne, HUG Software Engineer

**PWINDOW.POM, PWINDOW.ZOM** — These are two versions of ProcessorWindow, for PC or Z-100 type computers. You must rename the extension of the version you use to .COM before you can run it. PWINDOW remains resident in memory, and is controlled by the PW program, described below, once it has been installed.

**PW.COM** — This program is used to "open" or "close" the processor window, and to set what it will display on the screen. For example, to display the values of the CS and IP registers on the screen, you would enter

PW CS,IP

The actual display is in the form nnnn:nnnn, where nnnn represents a hexadecimal number.

**BRKOUT.POM, BRKOUT.ZOM** — These are two versions of Breakout, for PC or Z-100 type computers. You must rename the extension of the version you use to .COM before you can run it. BRKOUT is a memory resident program. While it is loaded and active, you can break out of the program you are debugging by pressing a special key sequence. It will not break out if it detects that a DOS function is being executed at the time you press the key sequence, to protect the operating system.

**BRK.COM** — This program is used to enable or disable BRKOUT, once it has been installed.

**APNOID.COM** — This is the first version of Anti-Paranoid. It works by capturing nearly every interrupt vector, and fixing the breakpoint and single step interrupt vectors during each interrupt. The captured interrupts are passed through unchanged. APNOID is a memory resident utility.

**APSETP.COM, APSET.BAT, APSET.DAT** — These files are used to set up APNOID before each debugging session. They make sure that it restores the breakpoint and single step interrupts correctly. The batch file, APSET.BAT, controls everything else.

**APNOID2.COM** — This is the second version of Anti-Paranoid. Some programs will not run if they detect that the breakpoint interrupt has been fixed. They usually clear the breakpoint vector to all zeros, so APNOID2 places a jump at 0:0 that eventually gets to the breakpoint routine. Some Microsoft programs clear the breakpoint vector to 4E4E:4E4E, so APNOID2 places a vector there, too, if it detects enough free memory. The single step vector is not protected by this version, and the divide-by-zero interrupt is destroyed by the jump placed at 0:0.

**APSET2.BAT** — This runs APNOID2.COM under the control of DEBUG, so that the vectors are set properly.

\*.ASM, \*.PSM, \*.ZSM — Assembly source code for the DEBUG Support Utilities programs.

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## P/N 885-3039-37

### HelpScreen

=====

**Introduction:** HelpScreen is a program to create and place in upper video RAM on the H/Z-100 (not PC) computer, useful, user-generated help messages. These messages (help screens) can be requested at any time during the execution of a piece of software.

**Requirements:** HelpScreen requires 64k video chips and version 2.5 or higher Monitor ROM on an H/Z-100 (not PC). It will run under Z-DOS (MS-DOS ver. 1), or any version of MS-DOS.

The files included on this disk are:

HELPSCRN .ASM	- Source code for the program
HELPSCRN .COM	- Executable program
SAMPLE .HLP	- Example "help screen" file
WORDSTAR .HLP	- Wordstar "help-screen" file
ZPC .HLP	- ZPC (PC emulator by Pat Swayne) "help screen" file
README .DOC	- ASCII program documentation file

**Authors:** Dennis Myers and George Crawford

**Program Content:** HelpScreen is a program written to give users of the Zenith H/Z-100 (not PC) computer the ability to create their own "help screens" for any program they wish. The program consists of (1) a small text editor that allows the creation of a "help screen message", (2) a non-resident module that allows the "loading" of a "help screen message" into video RAM, and (3) a resident module that "toggles" video memory whenever the appropriate "toggle key" (either the HELP or SHIFT-HELP) is struck. When this toggle occurs, the program in execution is "interrupted", and the help screen message is instantaneously displayed. When the toggle key is again struck, the interrupted program resumes EXACTLY where it was interrupted from.

**Comments:** Excellent for complex programs having hundreds of commands (like Wordstar) that you know exist, but don't feel like looking up in the manual.

TABLE C Rating: (9)

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## P/N 885-3040-37

### HADES

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**Introduction:** HADES is an acronym for Hug's Absolute Disk Editing System. In short, HADES is a screen oriented byte (or disk) editor with file recovery and attribute modifying capabilities.

**Requirements:** HADES requires MS-DOS version 2.0 or greater on any Heath/Zenith 16 bit computer with at least 128k of RAM. These systems include: H/Z-100, 110, 120, 130, 140, 150, 160, 170, 180, and 200 series of computers. HADES will also work with the IBM PC, XT, and AT.

The following files are included on the HUG 885-3040-37 HADES disk:

README .DOC	- Preliminary information and disclaimer.
DHADES .EXE	- Demo/Non-Destructive version of HADES.
HADES .EXE	- Full implementation version.

Also included with this software, is an extensive users manual.

**Author:** Jim Buszkiewicz (Heath Users' Group)

**Program Content:** HADES is a program that gives the MS-DOS user, almost total control over the data residing on his disk. In addition, file attributes can be displayed and modified (within the capabilities of MS-DOS). Finally, the software has the ability to recover any file or sub-directory that's been accidentally erased (providing no other disk writes have occurred since the erasure).

When HADES first signs on, the main menu is displayed, and looks like the following:

```
F1 - Help
F2 - Directory Mode
F3 - Sector Mode
F4 - File Mode
F5 - Un-Erase Mode
```

- F6 - Change Drives
- F7 - Color/Monochrome
- F9 - Exit To MS-DOS

Online help is always available, and can be called up by pressing the F1 function key.

The F2 enters the Directory Mode. From this mode, the user can view all the files (one page at a time), on his currently logged directory, along with each files' attributes. These include: <R>ead Only, <H>idden, <S>ystem, <A>rchive, and <D>irectory. Each file can have its attributes changed or removed including hidden sub-directories! The user can also change directories from this mode.

The F3 key enters the Sector Mode. This mode gives the user a 128 byte window into each sector on his disk. This window can be moved anywhere within the sector, as well as to any sector or cluster. Any byte in any DOS accessible sector can be viewed, modified, and then permanently recorded on disk! Data can be entered in hex or ascii. The entire disk can be searched for strings of hex or ascii data. Once found, the same string can be searched for again from the current disk position. Finally, the currently viewed sector can be displayed on any listing device. In this sector mode, the keypad keys act as your 'steering wheel' to all the data on your disk. On the H/Z-100 (Not PC), not only are the cursor and HOME keys active, but the rest of the keypad acts in the same manner as the keypad on the PC series of computers, allowing both systems to be operated in an identical fashion.

The F4 key enters the file mode of operation. The name of an existing file must be entered before HADES allows this mode to continue. Once found (in the currently logged directory), each cluster of the file is displayed, in the same manner individual sectors are. Any byte, in any of the file's clusters, can be viewed, modified, and then permanently recorded back on disk. HADES always displays the current cluster, along with the next eight clusters (if the file is that long) of the file. As the user moves through each cluster, the cluster list is updated in ticker-tape fashion. No other sectors or clusters can be viewed or modified except those contained in the original requested file. Like in the Sector Mode, you can search for strings of either hex or ascii data. Only each cluster in the file itself will be searched for this data.

The F5 key allows the user to recover a file or sub-directory that's been accidentally erased. The file recovery is done automatically, and two important conditions must be met before a successful recovery can be made.

1. The file being recovered must be the LAST file to have been erased on the disk.

2. After the actual file erasure, no disk writes should have occurred.

The file recovery method used, is called a 'blind search'. HADES uses the first cluster pointer in the directory entry into the FAT. From there, free clusters are allocated sequentially to the lost file until the file size is satisfied.

The F6 key allows the user to log into a different drive. This function allows HADES to record all the necessary parameters of the drive being used.

The F7 key toggles between a white on black monochrome display and a white on blue with gray border color display.

The F9 key returns you safely to the MS-DOS operating system. This is the only SAFE way to exit other than a cold boot.

**Comments:** The abilities of HADES have been tested on virtually every Zenith 16 bit computer and drive combination including the H/Z-100 with 8" single density single-sided drives, as well as the new Z-181 with new 3" drives. HADES has yet to fail!! In the hands of an experienced MS-DOS user, HADES can be a very powerful tool. To the beginner, HADES is a window to the secrets of disk formats and file structures. Even if you never use HADES for anything other than to recover a single file, the day you see that file magically return to the world of the living, you'll say "...thank Heaven for HADES!!"

**TABLE C Rating:** 10

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## P/N 885-3041-37 SCREENDUMP

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**Introduction:** SCDMP is a utility that allows reproduction of a complete video screen on a dot matrix printer, including both text and graphics, without having to exit the current program.

The SCDMP program may be loaded manually (by entering SCDMP <cr>) or automatically, via 'autoexec.bat', into memory at the beginning of a session where it remains resident until needed. This version of SCDMP is an update to and supersedes the version released on HUG P/N 885-3022-37, ZDOS/MSDOS Useful Programs I. Versions for both the Z-100 and Z-150 (IBM PC and most compatibles) are included. Additional features have been added to the programs which provide greater screen dump flexibility. A summary of the new features are as follows:

**For Z-100**

- Dumps All VRAM banks (everything on screen regardless of color), as well as choice of red, green, or blue.
- Dumps TEXT only (similar to PSC.COM).

**For Z-150**

- Dumps GRAPHICS (must be in graphics mode) or TEXT (even if in graphics mode).
- Version for ZPC on the Z-100 (all Z-150 features supported) or both.
- Dump either a positive or negative image of screen.
- Higher density dump supported on all printers.
- Dump either a 24 or 25 line screen.
- Change default settings by the command line on initial entry or via SHIFT-F12/SHIFT-PrtSc.
- Print out current default settings any time desired.
- More printers supported (C. Itoh, Epson, Gemini, IBM, MPI, NEC, Anadex, and IDS) (Versions in preparation for the Epson, Toshiba, and other 24 pin printers).
- Sample routines to call from within your own program. See the documentation file (SCDMP.DOC) for complete description of features and instructions for use.

**Requirements:** This program requires MSDOS operating system (Version 1.1 or higher) on an H/Z-100 or H/Z-150 computer. The printers currently supported are the C. Itoh 8510/1550 Series with 2K buffer, NEC 8023A, Epson MX/RX/FX Series with Graftrax, Star Micronics Gemini Series, Okidata Microline Series, Zenith/MPI 99/150 Series, Anadex Silent Scribe Series, IBM Proprinter, and IDS Paper Tiger printers.

The following files are included on the HUG P/N 3041-37 SCREENDUMP disk:

README .DOC	Initial startup info and disclaimer
SCDMP .DOC	Screen Dump information
SCDMP CIT .100	Z-100 Vers for C. Itoh 8510/1550
SCDMP CIT .150	Z-150 Vers for C. Itoh 8510/1550
SCDMP CIT .ZPC	Z-100 ZPC Version for C. Itoh 8510/1550
SCDMP NEC .100	Z-100 Version for NEC 8023A
SCDMP NEC .150	Z-150 Version for NEC 8023A
SCDMP NEC .ZPC	Z-100 ZPC Version for NEC 8023A
SCDMP CIT .ASM	Source for C. Itoh 8510/1550 and NEC 8023A
SCDMP EPS .100	Z-100 Version for Epson MX/RX/FX
SCDMP EPS .150	Z-150 Version for Epson MX/RX/FX
SCDMP EPS .ZPC	Z-100 ZPC Version for Epson MX/RX/FX
SCDMP IBM .100	Z-100 Version for IBM Proprinter
SCDMP IBM .150	Z-150 Version for IBM Proprinter
SCDMP IBM .ZPC	Z-100 ZPC Vers for IBM Proprinter
SCDMP EPS .ASM	Source for Epson MX/RX/FX and IBM Proprinter
SCDMP GEM .100	Z-100 Version for Star Micronics Gemini
SCDMP GEM .150	Z-150 Version for Star Micronics Gemini
SCDMP GEM .ZPC	Z-100 ZPC Vers for Star Micronics Gemini
SCDMP GEMX .100	Z-100 Vers for Star Micronics Gemini 10X
SCDMP GEMX .150	Z-150 Vers for Star Micronics Gemini 10X
SCDMP GEMX .ZPC	Z-100 ZPC Vers for Star Micronics Gemini 10X
SCDMP GEM .ASM	Source for Star Micronics Gemini Series
SCDMP OKI .100	Z-100 Vers for Okidata Microline
SCDMP OKI .150	Z-150 Vers for Okidata Microline
SCDMP OKI .ZPC	Z-100 ZPC Version for Okidata

SCDMP OKI .ASM	Microline Source for Okidata Microline
SCDMP MPI .100	Z-100 Vers for Zenith/MPI 99/150
SCDMP MPI .150	Z-150 Vers for Zenith/MPI 99/150
SCDMP MPI .ZPC	Z-100 ZPC Version for Zenith/MPI 99/150
SCDMP MPI .ASM	Source for Zenith/MPI 99/150
SCDMP ANA .100	Z-100 Vers for Anadex Silent Scribe
SCDMP ANA .150	Z-150 Vers for Anadex Silent Scribe
SCDMP ANA .ZPC	Z-100 ZPC Vers for Anadex Silent Scribe
SCDMP ANA .ASM	Source for Anadex Silent Scribe
SCDMP IDS .100	Z-100 Version for IDS Paper Tiger
SCDMP IDS .150	Z-150 Version for IDS Paper Tiger
SCDMP IDS .ZPC	Z-100 ZPC Vers for IDS Paper Tiger
SCDMP IDS .ASM	Source for IDS Paper Tiger
SCDMP RL .SKL	Skeleton vers for use in building a program
SCDMP LR .SKL	for your unique printer or application
SCDMP .BAT	Batch file for auto load of SCDMP.COM (rename the appropriate program to SCDMP.COM)
INT5 .BAS	Sample BASIC program to call int-5
INT5 .ASM	Assembly subroutine for above
INT5 .BIN	Assembled subroutine for call from BASIC
CINT5 .BAS	Sample BASIC program for Compiler to call int-5
CINT5 .ASM	Assembly subroutine for above
CINT5 .OBJ	Object file for linking with Compiled BASIC

**Program Author:** Leslie L. Bordelon

**Operation:** For the Z-100, the program allows a choice of which color bank of video RAM is dumped (if the user has all banks of color RAM in his Z-100). The number of VRAM banks installed in your computer is determined by SCDMP upon initial load. For the color version, entering a <B> for blue, <R> for red, <G> for green, or <A> for all banks immediately after the <SHIFT-F12> will select the VRAM bank to be printed. If no character is entered, <A> all banks is the default. If only one bank of color RAM is installed, only the green bank can be dumped. Entering a <T> will cause only the text on the screen to be dumped unformatted to the printer.

For the Z-150, you can option to print only text, even if in the graphics mode, by entering a <T> for text immediately after the <SHIFT-PrtSc>. However, if in the Z-150 text mode (modes 0, 1, 2, or 3) then only screen text can be dumped (using the ROM text dump), even if SCDMP is set for graphics dump.

The program allows the printing of the screen image as either a positive or negative. Entering a <P> for positive or <N> for negative after the <SHIFT-F12> or <SHIFT-PrtSc> will change the image printed. When set to negative image, text on a black background is printed as black on white. This is the default setting for SCDMP. A positive image would appear as white text on a black background. This provides some additional flexibility when printing complicated artwork using various shades of colors.

The program also allows multiple density printing. This is accomplished by using a higher dot density in graphics mode if the printer supports such. For those printers that do not, high density is achieved by overprinting each line a second time. Entering a <H> immediately after the <SHIFT-F12> for Z-100 or <SHIFT-PrtSc> for Z-150 or color selection would cause the printer to use a higher density mode for printing. The default density is normal or standard density.

The program also allows a choice of printing the twenty-fifth line (only if displayed for the Z-100). Entering a <D> immediately after the <SHIFT-F12> for Z-100 or <SHIFT-PrtSc> for Z-150 or color or density selection will cause SCDMP to ignore the 25th line even if it is displayed.

Two skeleton versions of the program are also provided as an aid in building a program for a non-supported printer. The skeleton versions present an outline for both options of scanning the Z-100/Z-150 screen depending on your specific type of printer. With this data and a little trial and error on the user's part, a successful product for a unique printer can be developed.

**Comments:** none

**TABLE C Rating:** (10)

## P/N 885-3042-37 ZPC Upgrade Disk

**Introduction:** This disk upgrades ZPC (885-3037-37) version 2.0.x to version 2.1.x. ZPC is a program that allows H/Z-100 (dual processor) computers to run many IBM-PC compatible programs. This upgrade allows you to run more programs, and provides support for hardware enhancements (such as the "Scottie Board") to support even more PC programs.

**Requirements:** To use this disk, you need ZPC Version 2 (885-3037-37), an H/Z-100 computer with 768k of memory, and MS-DOS version 2 or 3.

The following files are included on the disk:

README	.DOC	ZPCUP	.DOC
ZPCUP	.COM	INT14	.COM
MASK	.COM	PATCHER	.COM
PATCHER	.DAT	SETZPC	.COM
FIXLTS	.COM	FIXSYM	.COM
BLINK	.COM	DOS	.ACM
KEY	.ACM	ZPCASM	.TXT
INT14	.ASM	MASK	.ASM
PATCHER	.ASM	SETZPC	.ASM
FIXLTS	.ASM	BLINK	.ASM

Here is an explanation of some of the files on the disk:

**ZPCUP.COM** — This program automatically patches and upgrades your ZPC.COM file. The improvements made include the following:

**Improved Keyboard Handling.** The codes returned by ZPC as you type keys more closely resemble PC codes, so that difficult programs, such as QuickBASIC version 2 can be made to work, that would not work previously.

**Support For More Hardware.** The modified ZPC supports new hardware that allows programs which change video modes or colors by writing to ports to work properly.

**Improved Control-C and Control-Break Handling.** Handling of these codes more closely approximates the real PC world.

**INT14.COM** — This program provides support for a real IBM-style serial port, such as is provided as an option on the "Scottie Board".

**MASK.COM** — ZPC unmask some interrupt lines on the S-100 bus when it is loaded. This program allows you to mask off those lines, in case you experience any difficulty with software that otherwise runs OK with ZPC not loaded.

**PATCHER.COM, PATCHER.DAT** — A new PATCHER.COM is provided because some early copies of ZPC Version 2 contained a flawed PATCHER.COM. The new data file, PATCHER.DAT, contains patches for more programs.

**SETZPC.COM** — A new SETZPC is included because some early copies contained bugs.

**FIXLTS.COM, FIXSYM.COM** — These programs patch LOTUS 1-2-3 release 2 and Symphony for use under ZPC.

**BLINK.COM** — This program allows you to have a non-blinking cursor while ZPC is in the PC mode.

**DOS.ACM, KEY.ACM** — These modules are part of the ZPC assembly source code that have been upgraded.

**ZPCASM.TXT** — This file lists changes that must be made to your ZPC.ASM file in case you want to reassemble the upgraded version of ZPC.

## P/N 885-6002-37 MS-DOS CP/EMulator II & ZEMulator Update

CP/EMulator II is a program that allows you to run CP/M programs under MS-DOS on an IBM-PC compatible computer, such as the H/Z-150 series, etc. ZEMulator is a program that emulates the Z-100's function keys and escape codes. They have been improved considerably and re-released under the same HUG part number. For a description of the original program, see page 42 of your HUG Software Catalog Update #1. CP/EMulator II has been improved in the following ways:

- Support of the V20. If you have a V20 processor in your computer, CP/EMulator II will use it to execute the 8-bit code in CP/M programs, which will cause them to run much faster. If you do not have a V20, CP/EMulator II will emulate the 8-bit

code itself. It automatically detects the V20 and uses it, if one is installed.

- Faster screen output. Whether you have a V20 or not, CP/EMulator II will be faster than before, because screen output has been speeded up.
- Runs more programs. CP/EMulator II has been improved to run more CP/M programs, including WordStar (all functions), PIP (all switches), and ED.

ZEMulator has been improved to include a special graphics mode that provides all H19 graphics characters for use on the newer Heath/Zenith computers, that do not have the graphics characters built-in. For older H/Z PCs, such as the H/Z-150 series, the built-in H19 characters can still be used.

In addition to the above improvements, the CP/EMulator II and ZEMulator disk comes with two new programs that were not on the original disk. These programs were designed for the H-8 or H-89 CP/M user who also has a PC-compatible computer.

**HRDCPM** — This program works like the RDCPM program included with your Heath/Zenith MS-DOS, but it can read H-89 or H-8 format double-density, 48 tpi, single- or double-sided, soft-sector disks, as well as Z-100 CP/M disks. The Heath/Zenith RDCPM program for PC compatibles can read Z-100 disks and IBM CP/M-86 disks, but not H-89 disks. **Note:** HRDCPM cannot read SINGLE-DENSITY, soft-sector disks or hard-sector disks, because the PC disk controller is incapable of reading such disks.

**TF89** — This program allows you to connect your Heath/Zenith PC and your H-8 or H-89 together with a serial cable, and transfer CP/M files from the H-8 or H-89 to the PC. PIP is used on the H-8 or H-89 to send the file, and TF89 receives it and saves it on your MS-DOS disk. The transfer rate is 9600 baud, and any file (text or machine code) can be transferred. If your H-8 or H-89 cannot produce a disk format that HRDCPM can read, you can still transfer files using TF89.

If you have the original CP/EMulator II and ZEMulator disk; and would like to upgrade, send in your original HUG disk and \$5.00 to Heath/Zenith Users' Group, Attn: Nancy Strunk, Hilltop Road, St. Joseph, MI 49085. Make checks payable to: Heath/Zenith Users' Group.

## P/N 885-6008-37 MSDOS NAVPROG

**Introduction:** NAVPROGseven is a database management system designed for pilots flying cross-country. The system is built around a latitude/longitude referenced navigation program designed to prepare a flight log that is ready for use in the cockpit. It is equally adaptable to the needs of VFR and IFR flight.

The system stores performance data for each aircraft the user flies, navigation data about each checkpoint, airport, or navaid the user flies over, and saves this information for easy access on subsequent flights.

**Requirements:** This version of NAVPROGseven is designed to run on the MSDOS operating system version 2.0 or greater on the H/Z-100 PC with at least 64k of memory. NAVPROGseven requires a dual-disk drive system and a line printer. The programs are written under and requires the Microsoft GW-BASIC version 1.0+.

The following files are included on the distribution disk 885-6008-37:

NAVPROG7	.BAS	DISKAID	.DAT
DISKBID	.DAT	MENU	.BAS
AIRINPUT	.BAS	AIRCRAFT	.BAS
AIRROUTE	.BAS	OLDROUTE	.BAS
RNAVREF	.BAS	AIRALPHA	.BAS
AUTONAV	.BAS	N73116	
N81259		AIRINDEX	.RND
AIRPORTS	.RND	ROUTINGS	.DAT
RNAVLIST	.DAT	BEH	.LUK
LUK	.BEH	README	.DOC

**Program Authors:** Originally written by Alan Bose for use on the H-89 under HDOS. An update for CP/M was prepared by Glen Hassebrock Jr. This version was adapted for the PC by Peter Ambrose.

**Files:** The main program content will be described below. The following is a brief description of the data files used by NAVPROGseven:

**N73116 and N81259** — These files are sample aircraft data, which may be deleted manually or by the program after the user has experimented with NAVPROGseven.

**AIRINDEX.RND and AIRPORTS.RND** — These data files contain over 100 checkpoints already on file. These files can be revised from within NAVPROGseven or the user can delete them and start over with his own data.

**RNAVLIST.DAT** — This file saves the fixes or checkpoints that have RNAV cross-bearings.

**ROUTINGS.DAT** — This file contains a sample index of routes on file. This file will be updated through the program.

**BEH.LUK and LUK.BEH** — These data files are sample routes on file.

**Program Content:** The title of NAVPROGseven comes from the features and functions designed into the system, many of which are not found in similar programs.

1. Easy input & revision of the airport/navaid database.
2. Two RNAV (area navigation) functions that return the latitude and longitude of a location based on cross-bearings from known points.
3. Aircraft performance data stored for each airplane you fly.
4. Easy access and display of airport and checkpoint information using standard ICAO identifiers as you plan your route of flight. Automatic flight planning selects navaids closest to your great circle route and prepares several alternate routings. Often flown routes can be saved for later use.
5. Great circle navigation between checkpoints using aircraft performance data, and printout of ready-to-use flight log.
6. Climb/descent profiles calculated based on aircraft performance data.
7. Multiple sort criteria to organize airport/navaid data into easy-to-read printouts.

The comprehensive flight log tells the field elevation of the departure and destination airports, navaid frequencies enroute, distances for each leg and total remaining, true and magnetic course, magnetic heading corrected for wind and magnetic compass variation, groundspeed corrected for wind and climb and/or cruise leg segments, ETE and ETA for each leg, fuel usage based on climb and/or cruise with startup/taxi/takeoff fuel accounted for, fuel remaining, and a warning if reserves will be less than IFR or VFR minimums.

In addition, a synopsis of the flight tells the fuel used, reserves in gallons and time, fuel/time/distance required to climb, how far out from the destination the user should begin his descent to maintain a 2 degree descent profile.

**Master Menu:** There are eight programs called by six user selectable items on the master menu. The master menu includes the following options:

- Input/Revise Airport and Navaid Data
- Input Aircraft Performance Data
- Automatic Route Preparation
- Air Navigation and Flight Planning
- Navigate Pre-Planned Route
- Sort & List Data on File

These options provide a complete capability for using the stored information to plan flights, prepare comprehensive flight logs for in-flight use, add new data to the database and to maintain the accuracy of the database.

**Comments:** NAVPROGseven was written for aircraft navigation but is not limited to pilots alone. The great-circle navigation and radio-beacon cross-bearings can be helpful to sailors who also have a need to navigate efficiently, though at a slower pace. The system is menu-driven and includes all necessary documentation for use. The programs are self-prompting with one-key responses and many safety checks that allow the user to go back to the menu and start over.

As mentioned above, the programs come with sample data that allows the pilot to "test-fly" the system before creating his own database, and there are over 100 airports and navaids already on file that will get the pilot off to a running start.

**TABLE C Rating: (10)**

## NAVPROGseven Update

HUG P/N 885-6008-37, NAVPROGseven for the H/Z-150, has been updated, by the author, to NAVPROGeight. This latest ver-

sion has a new feature which performs the weight and balance calculations for the aircraft. Only this newest version will be shipped when ordering.

## P/N 885-6009-37 MS-DOS Screen Saver Plus

**Introduction:** This disk contains four MS-DOS utilities for the H/Z-100 PC computer systems: ScreenSaver, DualScreen, ChangeSpeed, and a Print SScreen utility for Text Modes.

**Requirements:** All four programs require MS-DOS version 2.0 or greater, and a minimum amount of memory. The ChangeSpeed utility is specifically for the H/Z-200 computer system, while the other three, will run on any H/Z-150/160/200 or IBM compatible. CS, requires that both the Z-309/409 color graphics card and the Z-329 high resolution monochrome card be installed in the computer system, as well as a monitor be connected to both cards.

The following files are included on the HUG P/N 885-6009-37 Screen Saver Plus disk:

SS	.ASM	SS	.COM
DS	.ASM	DS	.COM
CS	.ASM	CS	.COM
PSCTM	.ASM	PSCTM	.COM
README	.DOC		

**Authors:** SS, DS, and CS, by Jim Buszkiewicz, PSCTM by Pat Swayne.

**SS (ScreenSaver)** is a program specifically for the H/Z-100 PC series of computers (H/Z-150/160/200) or IBM compatible. SS will, after a predetermined length of time of screen and keyboard inactivity, blank the color graphics screen or high resolution monochrome graphics screen, eliminating the possibility of "burned" phosphor on the CRT. Upon any key entry, or any screen activity, the original screen information will be restored and updated. ScreenSaver works in all video modes except 4 and 5 (medium resolution color graphics mode), which is normally used for game playing. ScreenSaver can be set for any length of time between 1 and 60 minutes of delay before blanking the screen because of inactivity.

**DS (DualScreen)** is a utility that allows any text that appears on the color graphics screen, to appear on the Z-329 high resolution monochrome screen. This eliminates the need for changing video modes when doing word processing or editing. The "action" of this program can be turned "on" and "off" at will, once it has been installed in memory. Take note that, due to the time needed to refresh the video screen, this utility will not work simultaneously with modem communication packages.

**CS (ChangeSpeed)** is a utility for the H/Z-241 series of computers. It is also the same program that appeared on page 50 of the March 1986 issue of REMark magazine. This utility takes advantage of an undocumented feature of the '241, and allows the user to change the speed of the computer to that of a standard 5 Mhz H/Z-150/160, and then back again to the computer's normal speed at will.

**PSCTM (Print SScreen utility for Text Modes)** is designed to be used in conjunction with a graphic PSC (Print Screen) utility, to allow it to work in the text modes. It allows you to print a duplicate of what is on the screen, including text mode graphic characters and special symbols. It works with any printer for which you have a graphic print screen utility.

**TABLE C Rating:** (10)

## P/N 885-8035-37 MS-DOS Documat & Doculist UPDATE

This popular Word Processor/Text Formatter is being re-released under the same part number 885-8035-37, and will now work with either the H/Z-100 or H/Z-100/200 PC computer systems. This latest version, 2.1, now includes the following enhancements:

1. Macros can now be longer than 256 characters.
2. Full MS-DOS path names are now permitted.
3. Proper operation with RAM drives and windowing software.

4. Output from DOCULIST can now be sent to a file.

For a more complete description of this product, see page 60 of the HUG Software UPDATE catalog, or issue 70 (Nov. '85) of REMark.

## P/N 885-8038-37 MSDOS RF-CAD Ver. 3.50

**Introduction:** RFCAD is an integrated collection of programs written in BASIC which will aid the user in designing many types of electronic circuits and antennas. This package should be invaluable to radio amateurs, electronic engineers, or anyone who has occasion to design circuitry or antennas for RF or Microwave frequencies. It is particularly useful to persons interested in satellite earth station design and construction, and also those who wish to purchase a ready made earth station. RFCAD is also useful as an instruction aid in teaching electronic theory. The user is free to experiment with various configurations and values without having to build the circuit to determine the results.

**Requirements:** RFCAD requires an H/Z-100 PC/200 PC system with a minimum (128k) amount of memory. A single 5-1/4" disk drive is required, and an 80 column printer is optional. Any version of MSDOS and Microsoft's BASIC is also needed.

In addition to the printed users' manual that comes with this product, the following programs or files are included on this HUG RFCAD disk P/N 885-8038-37:

AELIPT	.BAS	AFILTER	.BAS
AFFLOT	.BAS	BFILTER	.BAS
CADMENU	.BAS	CHORN	.BAS
COIL	.BAS	CONFIG	.BAS
DBCONV	.BAS	DISH	.BAS
EME	.BAS	EQUALZ	.BAS
FED	.BAS	FREQWAV	.BAS
HELIX	.BAS	HELP	.BAS
HORN	.BAS	LHFILTER	.BAS
LPI	.BAS	MATCHER	.BAS
MFILTER	.BAS	MOD	.BAS
MSCONV	.BAS	MSTRIP	.BAS
NE555	.BAS	NFCONV	.BAS
OSC	.BAS	PATH	.BAS
PELIPT	.BAS	PFILTER	.BAS
README	.DOC	RESNET	.BAS
RESONNCE	.BAS	SATANT	.BAS
SPUR	.BAS	TLINE	.BAS
WINDLD	.BAS	YAGI	.BAS
ZCONV	.BAS		

**Program Author:** Gary A. Field

**Program Content:** Ease of use is one of RFCAD's primary features. Wherever possible, the user is presented with menus of choices and examples of input data being requested. Since full source code is provided, the user may if he wishes, modify any of the programs to suit his own needs.

The designs covered by this package have been selected based mainly on needs of the author. Whenever the need to design a circuit involving extensive calculation arose, a program was written to perform the necessary task. After a large number of functions were available, a menu driver was created to make access to all the functions simpler and more uniform. The entire set of programs was written in the simplest form of BASIC with particular attention to readability and maintainability, so that the user can modify it for his own use.

The information required to perform the calculations was obtained from a great many sources; magazine articles, textbooks, papers and verbal information from friends (Joe Reisert - W1JR and Peter Reilly - KA1LAT). The particular source is listed in the program listing. Any formulas or algorithms not credited in this manner were derived by the author or taken from his own memory.

Upon execution of the program, the following menu of design aids is available:

- (1) Low Frequency circuit design
- (2) High Frequency circuit design
- (3) UHF and Microwave circuit design
- (4) Antenna and Transmission line design
- (5) Filter design
- (6) Space Communications Aids

- (7) Miscellaneous conversions
- (8) Strays
- (9) Help
- (10) Return to O/S

Included with the documentation are schematics of various design aids, which are referenced by the actual program itself.

**TABLE C Rating:** (10)

## P/N 885-8039-37 MS-DOS DPATH

**Introduction:** DPATH is an MS-DOS utility which provides a data directory path search facility. Once loaded into memory, DPATH remains resident, and provides directory searching for data and overlay files in much the same way that the MS-DOS 'PATH' command causes searches for executable files.

**Requirements:** DPATH was designed for use on a Z-100 computer running MS-DOS version 2, but can be easily modified for use on any machine running MS-DOS version 2 or MS-DOS version 3. A version is supplied for use on Z-100 PC systems, and any other PC, XT or AT compatible.

The following files are included on this distribution disk:

DPATH	.COM	Z-100 version of DPATH
DPATHPC	.COM	Z-100 PC version of DPATH
DPATH	.DOC	Documentation file
DPATH	.ASM	Assembler source for DPATH
STRUCT	.ASM	Structure macros for DPATH.ASM
README	.DOC	Startup info

**Program Author:** Gordon Buchanan

**DPATH.COM** — An MS-DOS utility program that can help you to organize data and programs within the MS-DOS hierarchical file structure. DPATH searches for data files and program overlays in much the same way that the MS-DOS PATH command searches for executable command files. Once loaded into memory, DPATH becomes part of DOS and provides a directory search facility that is available to all subsequently executed programs.

When DPATH is used in conjunction with the PATH command, all programs, program overlays, device drivers, configuration files, global databases, help files, etc., can be stored in one or more user defined "system" directories, and removed completely from all application directories. The files in your system directories will be accessible from anywhere in the hierarchical file structure. The following benefits are thus gained.

- Better organized file structure, resulting in fewer files in application directories, and making it easier to find information on a disk.

- More free disk space because copies of programs and associated files are not needed in each application directory.

**DPATH.DOC** — Documentation for DPATH suitable for output on a printer. Includes information on the internal operations of DPATH and tells how to modify the program for use on different MS-DOS computers.

**DPATH.ASM** — Assembler source code for DPATH, using the MS-DOS assembler. Well documented, and written in a structured manner.

**STRUCT.ASM** — A set of macros which are required to assemble DPATH.ASM. These macros provide a set of coding structures for the MS-DOS assembler programmer. Includes WHILE-ENDW, REPEAT-UNTIL and IF-ELSE-ENDIF, which are completely nestable.

**Comments:** This program provides a facility which should have been built into DOS. A must for the hard disk user.

**TABLE C Rating:** (10)

## P/N 885-8040-37 MS-DOS HELP

**Introduction:** This package provides a comprehensive interactive HELP facility for Zenith Data Systems' implementation of both Version 2 and 3 of the Microsoft Disk Operating System (MS-DOS) for Zenith Z-100 series personal computers and IBM-PC compatible (Z-100 PC) personal computers.

The HELP programs and database files in this package allow quick and efficient access to complete MS-DOS command information which eliminates the need to have several manuals at the computer when command reference information is needed. The database files include all of the standard Zenith MS-DOS commands as documented in the Zenith MS-DOS manuals for both the Z-100 and Z-100 PC series computers, as well as the Zenith MS-DOS Programmer's Utility Package.

The database files are user extensible. The HELP programs and format of the database files were designed to be easily updated using a standard text editor. You can even create new HELP database files for your favorite word processor, modem communications program or programming language. Complete BASIC language source code is provided so that you can modify or enhance the programs as desired.

**Requirements:** An H/Z-100 series or H/Z-100 PC series personal computer and the MS-DOS operating system (either Version 2 or 3) are required. About 120k of disk space is required for the HELP program and database file, although the database file can be edited to reduce its size, if desired. The HELP programs require 128k bytes of memory. The HELP database can be modified using any standard text editor and the CNVT utility program provided. To modify the HELP programs, you must have either the Z-100 Z-BASIC compiler, or an IBM-PC compatible BASIC compiler.

The following files are included on this distribution disk:

README	.DOC	— Documentation file for the HELP program
HELP100	.BAS	— BASIC source code for Z-100 HELP program
HELP100	.EXE	— executable version of Z-100 HELP program
HELPPC	.BAS	— BASIC source code for the Z-100 PC HELP program
HELPPC	.EXE	— executable version of Z-100 PC HELP program
CNVT	.BAS	— BASIC source code for data base conversion program
CNVT100	.EXE	— executable version of Z-100 conversion program
CNVTPC	.EXE	— executable version of Z-100 PC conversion program
HELPS	.DAT	— sequential HELP data base file
HELP	.DAT	— random access HELP data base file
SD100	.COM	— Z-100 sorted directory utility program
SDPC	.COM	— Z-100 PC sorted directory utility program
SD	.DOC	— documentation for sorted directory program

The sorted directory utility programs are provided strictly as a convenience to the user and are not required to use the HELP programs.

**Program Author:** John F. Stetson

**Program Content:** The HELP programs are designed to be easy to use and efficient in operation. The HELP database is a BASIC random-access file for high speed access, even on floppy based systems. Over 100 entries are presented using a full-screen HELP menu and may be easily selected using the keyboard arrow keys. The commands in the HELP database are divided into the following functional categories:

**Reference Commands** — General reference information for MS-DOS concepts and capabilities.

**Resident Commands** — Information for commands which are resident in memory.

**Resident Command Aliases** — Information for command aliases for the resident commands.

**Resident Batch Processing Commands** — Information for commands which are used in batch processing.

**Transient Commands** — Information for transient commands which are loaded and executed from disk.

**Transient Utilities** — Information for commands which are part of the Zenith MS-DOS Programmer's Utility Pack.

Once a command is selected, the following information is displayed:

**Command** — General information about the command: alias names; Z-100 vs. Z-100 PC; MS-DOS V2 vs. MS-DOS V3; etc.

**Function** — Brief description of the function or purpose of the command.

**Syntax** — Complete, detailed command line syntax of the command including all file names, option switches, etc.

**Examples** — One or more examples which illustrate typical uses of the command.

**Comments:** As the MS-DOS operating system has evolved, it has become more complex. In addition, most end-users are overwhelmed by the amount of documentation which accompanies the operating system. This package organizes this information and makes it available to end-users in a friendly and easily accessible environment. In addition, the package is both comprehensive and user-extensible, which make it valuable for more sophisticated users.

**TABLE C Rating:** (10)

## P/N 885-8041-37 ORBITS

**Introduction:** This software package called "Orbits", is a set of simulation programs which show what possible orbital paths look like and how satellites move while orbiting in these paths. Each colorful ellipse pattern that is created, with its moving satellites, has a beauty all its own. Now we can see the harmony of the spheres! This package was written (over a years period of time) to help students visualize the basic mathematical concepts involved in orbital mechanics.

**Requirements:** This package will run on an H/Z-100 with ZDOS/MSDOS version 1.25 or higher. The hardware also requires 192k of memory, as well as 64k color RAM chips installed on the video board. The monitor can be monochrome, but color displays are much easier to interpret. More than one disk drive will be useful for data storage, but is not required. Printing is optional; any printer will print the data tables, but an MPI 99 or compatible printer is required to use the included printscreen function.

The following programs are included on the HUG P/N 885-8041-37 ORBITS disks:

### Disk A

ORBITS	.DOC	.ORMEC	EXE
ORSYS	.EXE	SETUP	.EXE
SETUP	.FIL	ORBEND	.COM
README	.DOC		

### Disk B

AMOR	.ORB	APOLLO	.ORB
DEMO10	.OSY	DEMO3	.OSY
DEMO4	.OSY	DEMOS	.OSY
DEMO6	.OSY	EARTH	.ORB
FAYE	.ORB	HALLEY	.ORB
HIDALGO	.ORB	JUPITER	.ORB
MARS	.ORB	MERCURY	.ORB
NEPTUNE	.ORB	ORBEND	.ASM
ORMEC	.BAS	ORSYS	.BAS
PLUTO	.ORB	SATURN	.ORB
SETLIP	.BAS	URANUS	.ORB
VENUS	.ORB		

**Program Author:** Larry MacNeil

**Program Content:** ORMEC was written to help people visualize the mathematical concepts presented in Kepler's Laws. Given any 2 out of 7 elliptical parameters that describe an orbital path (semi-major axis, semi-minor axis, linear eccentricity, semi-latus rectum, eccentricity, radius at perigee, radius at apogee), the program solves for the other 5 parameters. If the central mass is also given, the program will solve for the velocities of a satellite at apogee and perigee, and for the period of the orbit. Then, colorful graphic displays, in high resolution, 640 x 480 interface mode using Z-GRAPH-100 subroutines, show the constructed orbital path ellipse, the area of the ellipse divided into equal areas with an integration routine, and a satellite orbiting with a velocity directly proportional to its true velocity. The parameters can be saved in a file for later use in developing an orbital system with ORSYS.

ORSYS will combine the files created in ORMEC to construct a system of up to 10 satellites orbiting around a common central mass. The angle of perigee and the starting point may be specified for each orbit. A system can also be saved as a file, so reviewing a system is easy. The data tables can be viewed on the screen and printed out to a draft printer. The program uses a number of matrix operations to scale and rotate the orbital paths. The graphic displays, again in interface mode, show dashed and colored ellipses for each orbital path, so the paths may be distinguished on either a color or monochrome monitor. A zooming feature allows the user to choose the orbit that is shown, full scale. The satellites can be viewed with or without the ellipses on

the screen, and the overall speed of the satellites can be varied for different effects. The velocity variations (accelerations) in each orbit and the relative velocities of different orbits can easily be seen. Some sample orbit and system files are included for initial demonstration purposes.

Both programs are compiled ZBASIC programs, so they run fairly quickly. The displays are of the ecliptic plane and do not take into account orbits that go out of the ecliptic. It is assumed that the central mass is spherical and enormously larger than the mass of the satellites, and that the satellites themselves are small enough so they do not collide or affect each other's orbital paths. Thus, it is assumed that the gravitational field of the central mass exerts the only force in effect and has an inverse square relationship. The orbits are, therefore, re-entrant (stable). This is close enough to reality to simulate many known orbits and allow the user to ask "What if..." questions. Extensive error handling and correction techniques are employed.

**Comments:** The author of this package is a senior physics major at San Jose State University, and has spent many hours in developing this software. This software is intended for the serious minded individual or student involved with the concepts of Astronomy and Kepler's Laws.

**TABLE C Rating:** (10)

## P/N 885-8042-37 Poker Party

**Introduction:** For lighthouse keepers, military personnel on solitary assignments, confirmed bachelors, and anyone else who hungers for a little human companionship during long hours spent alone; this disk is for you. The programs which make up Poker Party will bring to your computer terminal the faces and the voices of three rustic cow hands out of the old west who invite you to try your luck with them in a friendly game of old-fashioned draw poker, America's national game. You'll meet Shorty, Ole, and Cisco who play a conservative brand of poker that's hard to beat. Yet, with patience and shrewdness just as in a real poker game, you can come out the winner. But it ain't easy, pardner!

**Requirements:** Poker Party is designed to run on an H/Z-100 (not PC), with at least 128k of system memory. Z-DOS or MS-DOS is also needed along with ZBASIC. Although not required, fuller enjoyment can be obtained if the P-SST board from Software Wizardry is installed. A color monitor is highly recommended, however, the program will work properly on a monochrome monitor.

The following files are included on the HUG 885-8042-37 Poker Party disk:

ADIOS	.DAT	ANTE	.DAT
DEAL	.DAT	IBET1	.DAT
IBET2	.DAT	IBET5	.DAT
ICALL	.DAT	ICHECK	.DAT
IDROP	.DAT	IRAISE1	.DAT
IRAISE5	.DAT	ISTAY	.DAT
IWIN	.DAT	PPRTY	.BAS
PPRTY2	.BAS	PPRTY3	.BAS
PPRTY4	.BAS	RULES	.TXT
TALK3	.DAT	TRIO	.BLU
TRIO	.GRE	TRIO	.RED
README	.DOC		

**Author:** Robert E. Newton

**Program Content:** While draw poker is played differently in various places, this program generally follows the rules and procedures described in the book ACCORDING TO HOYLE by Richard L. Frey. The game is limited to four players. Three of them are controlled by the computer. You are player number four, and must make your own decisions. The cards used in this game are the typical new pack which comes with two jokers. These jokers are completely wild and can be used as any card you choose.

**Comments:** Before I reviewed this program, I wondered, 'How much fun could a computerized version of 'draw poker' be? Boy, was I in for a surprise! The graphics are outstanding, and I really felt as though I were playing with three other people (the author uses graphics to display the other three players on the screen).

**TABLE C Rating:** (10)



## P/N 885-8043-37 CALC

**Introduction:** CALC is a faithful, working, full-function simulation of the Hewlett-Packard HP-25 pocket calculator. There are only two differences. These are, all ten registers may be used as storage registers rather than the first eight, and the number of program steps has been arbitrarily set to 100 rather than 49. User programs may be stored on disk for subsequent loading. The calculator uses RPN (Reverse Polish Notation) like most HP calculators. Input to the calculator is via a light pen.

**Requirements:** To properly use this program, you need an H/Z-100 (not PC) series computer with at least 128k of system RAM. It is in full color so all video RAM planes should be installed (192k). Finally, a light pen must be connected to J4 on the rear panel. This program requires MS-DOS version 2.0 or greater; it will not work with ZDOS.

The following programs or files are included on the HUG P/N 885-8043-37 CALC disk.

CALC	.COM	FACT	.PRG
README	.DOC	ABSTRACT	.DOC

For those of you who don't have a light pen for your H/Z-100, HUG has made special arrangements with the Lite-Pen Company of Los Angeles, California to enable you to purchase a very high quality lite pen at a distributor's price. Included with this software is a coupon allowing \$114.98 off the standard retail price for this lite pen. This single pixel resolution pen normally sells for \$204.95 but can be purchased with this coupon for only \$89.97. Included with this lite pen are two cables (one for the H/Z-100, and one for a standard IBM PC). Even if you never use CALC, the coupon alone is worth the price of this HUG package. A more detailed review of this pen can be found in the September 1986 issue of REMark.

**Author:** Robert F. Doolittle

**Comments:** Each key is labeled with a 2 character label. These labels change dynamically in both color and content when a calculator 'f' or 'g' function key is pushed. An on-line HELP facility is included to further define these key labels. It is toggled on and off by the keyboard HELP key. More extensive instructions and explanations are provided in the README.DOC file.

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

## P/N 885-8044-37 MS-DOS TCSPELL

**Introduction:** TCSPELL is a spelling checker designed to be quick and easy to use. Dictionary size is only limited by disk space while the document size is limited only by the memory if the number of unique words exceeds the room left in memory.

**Requirements:** TCSPELL will run on systems with as little as 64k of memory but the number of unique words in a document is limited to approximately 600 words. It runs on the H/Z 150-PC compatible computer series, either monochrome or color monitor, with MS-DOS (any version).

This disk contains the following files:

TCSPELL	.COM	TCSPELL	.TUT
TCSPELL	.DOC	MASTER	.DIC
UNCOMP	.COM	COMPRESS	.COM
TCMERGE	.COM	README	.DOC

**Author:** Tim Schultz

**Program Content:** The TCSPELL program is a spelling checker program that uses up to 10 disk based dictionaries. The dictionaries may exist in compressed format or as a sorted list of lowercase words separated by a carriage return and linefeed. The program reads all the unique words in from the file to be spell checked and then checks each specified dictionary in order to eliminate all valid words. The user is then prompted for action on each unknown word. Available actions include: Add to dictionary, store in CR/LF file name SAVE.\$\$\$, Correct in file, Show word in context, and Ignore the word.

TCSPELL operates on standard ASCII (CR/LF) files and Wordstar format files. Soft hyphens and hyphens across line boundaries are handled correctly. Hard hyphens are included as part of a word, whereas soft hyphens are ignored.

The TCSPELL program was designed to be easy to use, fast, and as complete as each user requires. A dictionary, containing approximately 20,000 words, is included along with utilities to compress, expand (uncompress), and merge existing dictionary files. The user then has the option of expanding the supplied dictionary, editing it with any editor, merging an existing dictionary, or compressing an existing dictionary for faster access and less storage space.

Included on the disk are a tutorial/manual (TCSPELL.DOC) and an example file (TCSPELL.TUT) to be checked in parallel with the tutorial.

**Comments:** None

**TABLE C Rating:** (9)

## P/N 885-8045-37 MATT

**Introduction:** MATT is a Turbo Pascal program designed to facilitate operations on one and two-dimensional matrices. The program is entirely menu-driven, and uses a spreadsheet type of display to make matrix entry and editing very fast and easy. Turbo Pascal is a product of Borland International, Inc.

**Requirements:** Two versions of MATT are included. One is for the H/Z-100 (not PC) and requires MS-DOS version 2 or above. The program uses the H-19 graphics and, therefore, requires the graphics version of ALTCHAR.SYS be on the boot disk. The other version of MATT is for the PC compatible series using MS-DOS version 2 or above. Color is not required for either version, and only the basic 128k memory is needed.

The following files are included on the disk:

MATT.DOC	— Complete indexed documentation with examples.
WSMATT.DOC	— WordStar formatted version of the documentation.
README.DOC	— HUG disclaimer and any last minute updates.
MATT.PAS	— Source code for the Z-100 version.
MATT.COM	— Z-100 executable version.
PCMATT.PAS	— Source code for the PC compatible version.
PCMATT.COM	— PC executable version.

The following are Z-100 specific include files:

BOX	.PRO	MYIO	.PRO
PAGESWAP	.PRO		

The following are PC specific include files:

BOX	.PC	MYIO	.PC
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The following are included in both versions:

DIREC	.PRO	INV	.PRO
SUM	.PRO	MULT	.PRO
TRANS	.PRO		

**Author:** Dennis K. Greer

**Program Content:** MATT is designed to provide a very user-friendly environment in which to perform most operations on one and two dimensional matrices. Matrix operations are performed on two input matrices with the results stored in a third. Maximum size for each of the matrices is 59 rows by 59 columns. Among the operations available are:

- Determinants and Inverses
- Element, Row, and Column editing
- File and Directory Operations
- Matrix Initialization and Copying
- Multiplication
- Output to Printer (with titling)
- Row-Reduction
- Summation and Subtraction
- Transpose
- Disk Reading and Writing (ASCII or binary)

**Comments:** MATT was written with ease-of-use and speed in mind. The menu items are designed to be mnemonic. For instance, "M" performs multiplication, "S" performs summation, etc. In short order, the new user can be performing matrix operations without needing to look at the menu. "One touch" menu response, spreadsheet type matrix entry and editing, and input "garbage filters" make MATT very friendly. Support for the 8087 numeric coprocessor can be added by simply recompiling the source using Turbo-87 from Borland International, Inc. Z-100

owners having the MOUSEPACK by Paul F. Herman will find the spreadsheet editing compatible with their mouse system.

**TABLE C Rating:** (10)

## P/N 885-8046-37 Assembly Language Utilities

**Introduction:** This package includes a variety of utility programs designed to be used with Zenith Data Systems' implementation of both Version 2 and 3 of the Microsoft Disk Operating System (MS-DOS) for Zenith Z-100 series personal computers and IBM PC-compatible (Z-100 PC) personal computers. Most of the programs will work fine on other vendor's versions of MS-DOS (IBM's PC-DOS, for example), although this can't be guaranteed in all cases.

Since the 8088 assembly language source code is provided for the programs in this package, it can be used as a tutorial on assembly language programming. More sophisticated users may wish to study the techniques used in order to apply them in their own programs. Some of the advanced techniques used include terminate-and-stay-resident processing, dynamic memory management, and child process execution.

**Requirements:** You will need either an H/Z-100 series or H/Z-100 PC series computer and either Version 2 or 3 of the MS-DOS operating system.

If you wish to modify the programs in this package, you will need the Zenith MS-DOS Programmer's Utility Package, or either the Microsoft or IBM Macro Assembler and Linker. All of the assembly language source files included in this package can be assembled using any version of MASM from 1.27 through 4.0

**Author:** John F. Stetson

**Content:** In addition, there are several documentation files provided which cover a variety of MS-DOS related topics. These include an overview of the new capabilities in MS-DOS 3.1, problems with the ECHO command, use of the PROMPT command, modifications to the Z-100 MS-DOS BIOS to support the use of up to four 5" 48 and 96 tpi floppy disks, and the following modifications to the MDISK.DVD memory disk device driver supplied with the Zenith MS-DOS Programmer's Utility Pack:

- Modifications to allow MDISK to retain its contents across a warm system reboot.
- Modifications to add a software "LED" graphic symbol which indicates when the memory disk is being accessed, and whether a read or write operation is occurring.
- Modifications to add a disk volume label to the memory disk and to fix various bugs.

README	.DOC	— Documentation file
ASMCOM	.BAT	— Sample .BAT file used to assemble the programs

The following files are Z-100 specific.

KEYS	.ASM	— Display Z-100 function key definitions
KEYS	.COM	— Executable version of KEYS

The following files are designed to be used together as a simple time logging system under MS-DOS. By placing the LOGON.BAT file at the end of your AUTOEXEC.BAT file, you will have the date and time you last powered down displayed. By executing the LOGOFF.BAT file prior to powering down the system, you will have the date and time you last booted the system displayed.

DATETIME	.ASM	— Display system day, date, and time
DATETIME	.COM	— Executable version of DATETIME

LOGON	.BAT	— Display last date/time off system at boot time
LOGOFF	.BAT	— Display last date/time on system at exit time

LOGON	.DAT	— Data file used by .BAT files above
LOGOFF	.DAT	— Data file used by .BAT files above

The following files are designed to be used together to provide an automatic method of rebooting the operating system in such a way that it is free from any device drivers, or terminate-and-stay-resident type programs. This is helpful when testing new versions of these types of programs in order to avoid any possible conflicts.

BOOT	.ASM	— Reboot the operating system
BOOT100	.COM	— Z-100 executable version of BOOT

BOOTPC	.COM	- PC compatible executable version of BOOT.COM
NATIVE	.BAT	- Reboot without device drivers or resident programs
NORMAL	.BAT	- Restore normal system operation after running NATIVE

The following files will run on both Z-100s and PC compatibles.

BEEP	.ASM	- Generate a tone in .BAT files
BEEP	.COM	- Executable version of BEEP
CMD	.ASM	- Execute COMMAND.COM as a child process
CMD	.COM	- Executable version of CMD.COM
CPU	.ASM	- Determine the speed of the CPU chip
CPU100	.COM	- Z-100 executable version of CPU.COM
CPUPC	.COM	- PC compatible executable version of CPU.COM
CRLF	.ASM	- Send CR and LF to console from a .BAT file
CRLF	.COM	- Executable version of CRLF
FF	.ASM	- Send a form feed character to the printer
FF	.COM	- Executable version of FF
MODEM	.ASM	- "Dumb" terminal modem program
MODEM100	.COM	- Z-100 executable version of MODEM.COM
MODEMPC	.COM	- PC compatible executable version of MODEM.COM

PASSWORD	.ASM	- Password protection for hard disk systems
PASSWORD	.DVD	- Executable version of PASSWORD
RAM	.ASM	- Display total RAM, RAM used, and RAM free
RAM	.COM	- Executable version of RAM
RAMFIT	.ASM	- Display or change RAM allocation strategy
RAMFIT	.COM	- Executable version of RAMFIT
RAMLIM	.ASM	- Limit the amount of system RAM
RAMLIM	.COM	- Executable version of RAMLIM
SD	.ASM	- Sorted directory utility program (V5.2)
SD	.DOC	- Documentation file for SD.COM
SD100	.COM	- Z-100 executable version of SD.COM
SDPC	.COM	- PC compatible executable version of SD.COM
SHELL	.ASM	- Execute COMMAND.COM from within programs
SHELL100	.COM	- Z-100 executable version of SHELL.COM
SHELLPC	.COM	- PC compatible executable version of SHELL.COM
SPEEDUP	.ASM	- Console speed-up utility program
SPEED100	.COM	- Z-100 executable version of SPEEDUP.COM
SPEEDPC	.COM	- PC compatible executable version of SPEEDUP.COM
WAIT	.ASM	- Conditionally pause .BAT file execution
WAIT	.COM	- Executable version of WAIT

The following files provide useful information on several Zenith MS-DOS related topics.

MSDOS31	.DOC	- Overview of new capabilities in MS-DOS 3.1
ECHO	.DOC	- Problems with the MS-DOS ECHO command
PROMPT	.DOC	- Use of the MS-DOS PROMPT command
Z100BIOS	.DOC	- Modifications to the Z-100 MS-DOS BIOS
MDISK1	.DOC	- 1st file of modifications to MDISK.DVD
MDISK2	.DOC	- 2nd file of modifications to MDISK.DVD
MDISK3	.DOC	- 3rd file of modifications to MDISK.DVD

**Comments:** Most of these utility programs were written to fill a need that existed; Microsoft has a tendency to only superficially document the complex internal capabilities offered by MS-DOS; much effort and experimentation is required to make some of these capabilities actually work! In addition, many of the capabilities inherent at the MS-DOS system call level are often not brought out into the end-user command language; this package shows how to write your own programs to use these features.

TABLE C Rating: (10)



## Monster Memory

From RAM add-ons to board products to SIMM's for the new Z-248/12 computers, First Capitol has it ALL, and our prices are *unforgettable*! Call us for assistance in selecting the most economical means of upgrading your memory, anything from chips to monster 11 megabyte conversions!

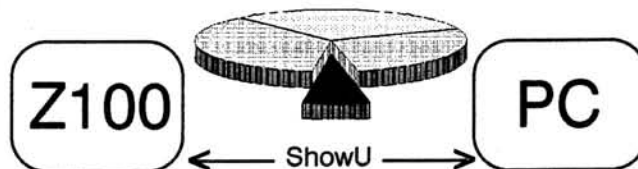
First Capitol Computer is a division of Software Wizardry, Inc., the pioneer of the RamPal series upgrades in use in over 40,000 Heath and Zenith systems around the country. Let us show you why we're one of Inc. Magazine's 500 Fastest Growing Companies (Dec. 1987 issue)!



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# 1987

# Software

# Update



*"YOU SAY YOU JUST CLEANED THE DISK DRIVE HEADS?!"*

## P/N 885-3026-37 Small-C Compiler Update

Originally released in the June 1985 issue of REMark, the Small-C compiler, P/N 885-3026-37, has been updated by the author. A third disk has been added to the original two. This third disk contains the accessory packages. The first package is the Small-C Standard Library in both source (C) and object (OB) formats. Some of the files in the Standard Library include, ABS.C, ATOI.C, FGETC.C, RAND.C, etc. The primary documentation, LIBRARY.DOC, is also included. This package is a collection of 30 subroutines which perform "grunt work" for C programs. These functions are a subset of the ANSI Standard Library Set as defined in the DRAFT Proposed ANSI Standard for the C programming language. The Utilities Set package consists of 16 programs which provide UNIX-like software tools. Most of the tools are based on the utilities in the book "Software Tools" by Kernighan and Plauger. Overall documentation is included for each of the programs. This new three disk set is now \$30.00 and previous owners can obtain this three disk package by returning their original two disks, along with a check for \$5.00 made out to HUG (NO credit card orders for this update), to Nancy Strunk, Heath Users' Group, P.O. Box 217, Benton Harbor, MI 49022-0217.

## P/N 885-3027-37 P/N 885-3028-37 HUGPBBS for MS-DOS UPDATE

Since its first release in July of 1985, HUGPBBS has undergone many changes, including bug fixes and enhancements. As its author, it was my first exposure to Assembly Language programming under MS-DOS. Although not alien to Assembly Language programming (I'm a 10 year veteran), it was a learning experience. Since that time, I've learned a lot, and current and would-be owners of HUGPBBS can all benefit. The latest version of HUGPBBS, 1.50.M, is available to current owners, FREE! Simply return your original distribution disk (or disks, if you have the source), to Nancy Strunk here at HUG, P.O. Box 217, Benton Harbor, MI 49022-0217. Your disk(s) will be updated at no extra charge, and returned to you. For those of you who are interested, the following are some of the enhancements added to HUGPBBS since it was first introduced:

- Eliminated password echo at caller's screen
- Sysop can flag the caller to <T>alk if he wishes
- CRC protocol added to XMODEM file downloads
- Connect time feature added
- <M>inutes function added to check connect time remaining
- Date and Time stamping on caller printout
- Sysop private message length changed from 3 to 5 lines
- Additional information can now be added to the user log
- Grouped all system files into a single drive designation making configuration even simpler
- Source assembly no longer requires the DEFMS.ASM file
- Three different 32 megabyte partitions can now be used for the database. Use of these different drives is totally transparent to the caller.
- The upload drive can not be specified separately from the database and system file drives.
- Software now responds immediately to a loss of carrier
- Many obscure bugs and oversights have been eliminated

UPDATE YOUR COPY TODAY!

## P/N 885-3040-37 HADES Update

Murphy's second postulate states: "There's always one more bug." Unfortunately, such WAS the case with HADES, HUG

P/N 885-3040-37. The problem corrected, only occurs with a 32-meg hard disk and only in the file mode. If you have version 1.01 or lower, return your original disk to Nancy Strunk, Heath Users' Group, P.O. Box 217, Benton Harbor, MI 49022-0217, and your disk will be updated to version 1.02, FREE!

## P/N 885-3043-37 SCREENDUMP (Version 3.52)

This product is a re-release of HUG P/N 885-3041-37. It has been updated to support many of the newer printers, including laser types. For a complete description, refer to page 43 in the December 1986 issue of REMark. The printers which are currently supported by this new version are as follows:

- C. ITOH 8510/1550
- NEC 8023A
- EPSON MX, RX, EX, and FX series
- IBM PROPRINTER
- STAR MICRONICS GEMINI
- STAR MICRONICS GEMINI 10X
- OKIDATA MICROLINE
- ZENITH/MPi 99/150
- ANADEX SILENT SCRIBE
- IDS PAPER TIGER
- HEWLETT PACKARD LASERJET+/500+
- DEC LN03/LN03+ LASER
- DEC LA100/LA210
- TOSHIBA 3-IN-ONE SERIES (P1341/P341/P351)
- EPSON LQ SERIES (800/1000/1500/2500)
- C. ITOH M24LQ/1570

Also included is a skeletal version of the source code for those wishing to adapt SCREENDUMP to their own particular printer model.

Original owners of SCREENDUMP, P/N 885-3041-37, can update their software to this latest version by returning their original disk set along with a check or money order (made out to HUG), to Nancy Strunk, Heath Users' Group, P.O. Box 217, Benton Harbor, MI 49022-0217.

## P/N 885-3043-37 SCREENDUMP Update (Correction)

Original owners of SCREENDUMP, HUG P/N 885-3041-37, can update their disk set to the new version of SCREENDUMP, HUG P/N 885-3043-37 for \$10 and BOTH original disks to Heath Users' Group, Attn: Nancy Strunk, P.O. Box 217, Benton Harbor, MI 49022-0217.

## P/N 885-3044-37 Games Package II

**Introduction:** This two disk set contains 6 different games for the H/Z-100 (not PC) computer system. These games include two versions of Backgammon, two casino-type games, and two versions of a card game. One of the Backgammon games, and one of the versions of BRIDGE was specifically written for a light pen! The rest of these games use the standard keyboard for input.

**Requirements:** In order to play these games, an H/Z-100 (not PC) system with at least 192k of RAM is needed. MS-DOS version 2.0 or greater must also be used. The two casino games, GOBE-SOU and BLACK-SPOT, require the ZBASIC interpreter; CWBASIC will NOT work. The Backgammon game, BG, and the Bridge game, LPBR, requires the use of a light pen, such as the one mentioned in the September 1986 issue of REMark. It is definitely to your advantage to play these games on a color monitor; however, a monochrome monitor can be used,

and in either case, all three video planes must be installed. According to the author, the two light pen programs LPBR and BG require between 256k and 512k of system RAM.

The following files are included on the Games Package II disk:

Disk A			
GAMMON	.BAS	GAMMON	.EXE
GAMMON	.CHR	GAMMON	.DOC
BG	.EXE	BG1	.ASM
BG2	.ASM	BKSPOTB	.BAS
RANDOM#		BKSPOTC	.BAS
BKSPOT	.BRL	INSTALBF	.BAT
INSTALCE	.BAT	BKSPOT	.BAT
INSTALCF	.BAT	INSTALBE	.BAT
INSTALCB	.BAT	INSTALBB	.BAT
BKSPOT	.DOC	README	.DOC

Disk B			
HBR	.EXE	HBR1	.ASM
HBR2	.ASM	HBR3	.ASM
HBR4	.ASM	HBR5	.ASM
HBR	.DOC	GOBE-SOU	.ASM
GOBE-SOU	.BLD	GOBE-SOU	.FIG
GOBE-SOU	.BAS	GOBE-SOU	.DOC
LPBR	.EXE	LPBR1	.ASM
LPBR2	.ASM	LPBR3	.ASM
LPBR4	.ASM	LPBR5	.ASM

### Program Authors:

GAMMON — Michael Scott  
BG — Robert F. Hassard  
BLACKSPOT — William G. Nabor  
HBR — Robert F. Hassard  
GOBE-SOU — Lucien Dumas  
LPBR — Robert F. Hassard

### Program Content:

**GAMMON** — This is a game of Backgammon. It was written in ZBASIC and compiled. The source is included for anyone wishing to make modifications. It was written for a color monitor, however, can be played in monochrome. The four files named "GAMMON" make up this game.

**BG** — This is also the game of Backgammon. It was written in Assembly language, and the source is also included. This version of Backgammon requires a light pen to play. The pen described in the September 1986 issue of REMark works very nicely. This game also plays in full color.

**BLACKSPOT** — This is a casino-style gambling game that combines some of the features of Blackjack, Roulette, and Faro. It is played with a deck of 100 cards, divided into ten suits of ten cards each. For the Z-100 color version, the suits are blue, green, cyan, red, magenta, yellow, white, redgreen, blueyellow, and black. For the monochrome version of the game, the suits are numbered 1 to 9, plus black. There is no ranking of cards within a suit. Each game consists of three (sometimes only two) hands. Each hand consists of a series of draws terminating when a black card is drawn. The player bets on which suit will be declared the "winner" at the end of each hand.

**HBR** — This is Bob Hassard's version of the ever popular card game, BRIDGE. Originally released for both HDOS and CP/M, this version was written for MS-DOS on the H/Z-100 and is suitable for the novice bridge player.

**GOBE-SOU** — This is the best real-time action slot machine simulation I've ever seen on a computer. It plays in full color, you can bet from \$1 to \$5, and the "wheel action" is the most life-like ever seen. Source code is included so you can see how it was done.

**LPBR** — This Assembly language program plays the game of Bridge with one human using a light pen. After calling up LPBR, the keyboard is used once only to enter the player's name. From then on, the light pen is used until the program is exited by touching the pen to the word "EXIT". Touching the word HELP will produce a full screen of instructions for playing the game in detail sufficient for a novice. Touching the screen will cause return to the game.

TABLE C Rating: (9, 5, 2, 1)

=====  
**P/N 885-3045-37**  
**HEPCAT**  
 =====

**Introduction:** HEPCAT is an acronym for HUG Engineer's and Programmer's Calculation Tool. HEPCAT is a memory resident pop-up calculator with two important differences from other programs of this type. 1) When HEPCAT is popped up, the background program continues to function. This means that you can calculate while your computer is grinding away at a long compilation, or calculating a huge spreadsheet, etc., without halting the background process. 2) The PC version of HEPCAT is compatible with all CGA and EGA video modes, and can be popped up over programs, such as Microsoft Windows, which other pop-ups cannot do. HEPCAT also offers more features than other pop-up calculators.

**Requirements:** To use HEPCAT, you need any Heath/Zenith PC-compatible (H/Z-100 PC series, H/Z-200 series, etc.), or H/Z-100 (not PC) computer, or an expanded ET-100 trainer, and any version of MS-DOS or Z-DOS. HEPCAT only uses about 16k of memory, so you should be able to run it in a minimum 128k system.

**Specifications:** HEPCAT is actually two calculators in one — a scientific floating point calculator and a programmer's binary calculator. Both calculators use standard infix notation. The floating point calculator features 8 significant digits and a two digit exponent, with a range from 1.0 E-65 to 9.9999999 E+62. It has four display modes: fixed point (with 2 to 8 places to the right of the decimal, 16 places total), standard floating point, scientific notation, and engineering notation (a form of scientific notation where the exponent is forced to a multiple of 3).

The binary calculator is a 32-bit calculator that works in the following number bases: binary, tetral (base 4), octal, split octal, decimal, and hexadecimal.

Converting a number from one radix to another, or from the binary calculator to the floating point calculator and vice versa is simply a matter of pressing an up or down arrow key.

HEPCAT is at least as accurate as a good BASIC interpreter in the transcendental functions, and it is absolutely accurate within the range of 8 significant digits in addition, subtraction, multiplication, and division, because it uses BCD math, which does not introduce round-off errors. Try PRINT 100-99.99 in BASIC to see an example of a round off error.

The floating point calculator in HEPCAT can perform the following operations: add, subtract, multiply, divide, powers (X^Y), rectangular to polar conversion, polar to rectangular conversion. It also can perform the following transcendental functions: pi (returns 3.1415926), factorial, square root, sine, cosine, tangent, arcsine, arccosine, arctangent, log (base 10), anti-log (10^X), log (natural), and anti-log (natural, e^X). The trig functions can be done using angles in radians or degrees. The HEPCAT calculator can also perform the following American/metric and other conversions: degrees to radians, radians to degrees, Fahrenheit to Celsius, Celsius to Fahrenheit, centimeters to inches, inches to centimeters, meters to feet, feet to meters, grams to ounces, ounces to grams, kilograms to pounds, pounds to kilograms, milliliters to fluid ounces, fluid ounces to milliliters, liters to quarts, and quarts to liters.

The binary calculator in HEPCAT can perform the following operations: add, subtract, multiply, divide, modulo (find the remainder of a division), shift left, shift right, AND, OR, and XOR.

HEPCAT contains an ASCII table, which is always available while you are in the binary mode.

When HEPCAT is "popped up", it opens a small (34 column by two line) window, normally near the top right corner of your screen. The window shows you the numbers you enter, your answer, and other essential information about the calculation in progress. The HEPCAT commands are designed to be easier to remember than those of other pop-up calculators, and the basic four calculations (add, subtract, multiply, divide) can be done entirely at the keypad.

HEPCAT comes with source code to the floating point and binary math packages, which are separate modules. These packages can be used in your own Assembly language programs that require math capabilities. The documentation is supplied in printed form.

The HEPCAT disk contains the following files:

README	.DOC	INSTALL	.BAT
HEPCAT	.POM	HEPCAT	.ZOM
HEPSET	.COM	SCRNCLK	.POM
SCRNCLK	.ZOM	CLK	.COM
BCD	.ACM	TRAN	.ACM
BINMATH	.ACM	SCRNCLK	.PSM
SCRNCLK	.ZSM	CLK	.ASM

**Program Author:** Pat Swayne, HUG Software Engineer

Here is an explanation of some of the files:

**INSTALL.BAT** — This is a batch file that makes it easy for you to install the version of HEPCAT that is correct for your system onto your disk.

**HEPCAT.POM, HEPCAT.ZOM** — These are the PC and H/Z-100 versions of HEPCAT.

**HEPCAT.COM** — This program allows you to configure certain aspects of HEPCAT, such as the display colors and the initial display mode or radix.

**SCRNCLK.POM, SCRNCCLK.ZOM** — These are improved versions of the screen clock program that has been listed in RE-Mark magazine for PC and H/Z-100 computers. These versions are fully compatible with HEPCAT and with nearly all other programs. They provide an on-screen time display in the upper right corner of your screen that is always there (if you want it to be) while you run other programs.

**CLK.COM** — This is a control program for the screen clock programs.

**BCD.ACM, TRAN.ACM, BINMATH.ACM** — These are the floating point and binary math packages used in HEPCAT. These packages are provided for use in your Assembly language programs that do mathematical calculations.

**Comments:** none

**TABLE C Rating:** (2, 3, 10)

=====  
**P/N 885-3046-37**  
**KEYMAC Keyboard**  
**Macro Processor**  
 =====

**Introduction:** KEYMAC is a keyboard macro processor for H/Z-100 (not PC) series computers that is similar to such programs as PROKEY (tm) or SUPERKEY (tm) that are available for PC-compatible computers. With KEYMAC, you can program any key on the keyboard to produce up to 100 characters when it is pressed. For example, you could program the F0 key to produce "Acme Software Company" each time it is pressed. Defined keyboard macros are stored in files, and you can prepare any number of them for use in different situations. You can prepare macro definition files using a special utility, or you can store up keystrokes "on the fly", and store them in a definition file later. KEYMAC will work with just about any program, including difficult ones like the Z-100 version of Lotus 1-2-3 (tm).

**Requirements:** KEYMAC requires an H/Z-100 series (not PC) computer or an expanded ET-100 computer, any version of MS-DOS or Z-DOS, and at least 128k of system memory. KEYMAC itself uses less than 8k of memory.

**Program Author:** Patrick Swayne

The KEYMAC disk contains the following files:

README	.DOC	KEYMAC	.DOC
KEYMAC	.COM	MAKEMAC	.COM

WS	.KM	DOS	.KM
BASIC	.KM	NULL	.KM
KEYMAC	.ASM	MAKEMAC	.ASM

**Program Content**

**KEYMAC.DOC** — Instructions for using KEYMAC.

**KEYMAC.COM** — The KEYMAC program. This program installs itself into memory the first time you run it. After that, it can be used to load macro definition files as they are needed.

**MAKEMAC.COM** — This program is used to create macro definition files. In addition to allowing you to define the keys, it allows you to create a prompt line for the function keys that will appear on the 25th screen line while your macro file is loaded and active.

**WS.KM** — A ready-made macro definition file for use with WordStar.

**BASIC.KM** — A macro definition file for use with BASIC, that contains many BASIC keywords programmed into the function keys.

**DOS.KM** — A macro definition file for use with DOS commands programmed into the function keys, including commands to load the other macro definition files on the disks.

**NULL.KM** — A special macro definition file that simply removes any previous definitions so that all keys work as they do when KEYMAC is not installed.

**KEYMAC.ASM, MAKEMAC.ASM** — These are the assembly source files for KEYMAC and MAKEMAC.

**TABLE C Rating:** (2, 3, 10)

=====  
**KEYMAP To KEYMAC**  
**Upgrade**  
 =====

If you own the Z-100 KEYMAP program (885-3010-37), you can upgrade to the new KEYMAC keyboard macro processor for the Z-100 (885-3046-37) for only \$10.00. Just send your original KEYMAP disk and \$10.00 to HUG, Attn: Nancy Strunk, P.O. Box 217, Benton Harbor, MI 49022-0217. For a description of KEYMAC, see the August 1987 issue of REMark.

=====  
**P/N 885-6010-37**  
**HAM HELP**  
 =====

**Introduction:** The program, HAM HELP, makes use of the personal computer to do a task that is, first, of potentially great use to the serious amateur radio operator, and second, something that he could do only with great difficulty, if at all, without his computer. Accepting data that are available each hour throughout the day on the National Time Station, WWV, the program calculates the MUF (Maximum Useable Frequency) for the path between two geographical locations selected by the computer operator, for each 30 minute period of that day. Calculated results represented on the computer's video display terminal in chart form, such information as the great circle azimuth of the line connecting the two geographical points... the antenna azimuth, an optimal antenna elevation, the path length, estimated radio signal attenuation over that path, and an estimate of the likely propagation conditions as a function of the existing electromagnetic environment. At the option of the computer operator, if the two locations are more than 4000 kilometers apart, the program will calculate the exact times of sunrise and sunset for each, will check for any unusual possibilities, such as 'Grayline' longpath openings (defined below) or preferred paths to take advantage of or to avoid certain good or bad polar cap propagation phenomena.

**Requirements:** HAM HELP requires MS-DOS version 2.0 or greater on any Heath/Zenith PC compatible computer.

The following files are included on the HUG P/N 885-6010-37 HAM HELP disk:

HAMHELP	.EXE	FILEFIX	.EXE
FOREIGN	.LOC	HAMHELP	.DOC
NOAMER	.LOC	README	.DOC

**Program Author:** Raymond S. Isenson, (N6UE)

**Program Content:** To calculate the MUF, HAM HELP requires information as to the SF (Solar Flux) conditions for the most recent five days and the current geomagnetic value (the 'A' value). Every hour, at 18 minutes after the hour, an announcer on station WWV (Boulder, CO) reports the SF for the day, the 'A' value and current 'K' value. The latter is not used in this program. Obviously, the user must keep a record of the SF for a period of at least five days, including that of interest. The 'new' day for SF information purposes begins at 1800 hours, GMT. The SF tends to vary up and down on a short term cycle of about 28 days and a long term cycle of many years. By keeping long term records of the SF, the user can develop the potential to estimate what the SF will be for some future date and have the computer generate MUF curves on the basis of that estimate. (To use the program for this purpose, input the same SF for each of the five days. Input any number for the 'A' value. The estimated Quality Factor will be meaningless as it depends upon 'A'.) The program will accept values for solar flux that vary between a low of 60 and a high of 400. The 'A' value could vary between 1 and 100, but will likely be in the range 1 to 20. To try the program, key in values of 150 for the SF for each day and a value of 6 for 'A'.

Listed at the right edge of the chart, as the last item, is a relative figure of merit, 'Estimated Propagation Quality'. This estimate is based upon many factors; the 'A', whether or not the path crosses the equator, the zenith distance of the midpoint of the path, and some proportionality constants, to name a few. Although of little use to the operator, initially, its value will grow with experience. You will find, for example, that QRN will be higher and there will be more signal flutter with lower 'Quality Estimates'. Therefore, if you learn through experience that a quality of 4 and a 'Q3' contact with London went together, you have reason to expect that the next time the program estimates a 4 for the path to London, you will have the same results; a 3, not so good, a 5, perhaps a 'Q5' contact. To another DX station an estimate of 6 might mean only a fair contact. In general, however, for two different paths at any given time, that with the higher quality estimate should offer much easier copy. The indicated 'Path Attenuation' also varies from day to day and from path to path. Its basis is somewhat different from that of the Quality Estimate. The two should be considered jointly in determining when to try for a specific DX or what antenna azimuth and when you should get a good response to a 'CQ'. Remember, the closer your operating frequency is to the MUF, the better will be your signal propagation and the more valid will be the information in the table.

All of the results of the calculations are presented on the video display tube. The program supports a hard copy printout that has somewhat less information than shown on the CRT, but does include the MUF curve, beam azimuth, station location identification, and date. Because we currently are near the low end of the "11 year" cycle, and MUF will seldom exceed 20 to 25 MHz, a scale factor was chosen that limits the ordinate to less than 38 MHz.

**Comments:** none

**TABLE C Rating:** 10

=====  
**P/N 885-8005**  
**HDOS MAPLE**  
**Update**  
 =====

Version 2.08d of MAPLE for the HDOS operating system is now available. This version will allow 2400 baud operation. Previous owners of MAPLE can update their disks free by returning their original to Nancy Strunk, Heath Users' Group, P.O. Box 217, Benton Harbor, MI 49022-0217.

=====  
**P/N 885-8040-37**  
**HELP Update**  
 =====

John Stetson's very popular HELP program, HUG P/N 885-8040-37 has been updated by the author. Now included on two disks, are separate versions for the H/Z-100 and PC-compatibles. Although the H/Z-100 version is fixed, the PC-compatible version is ever changing, and now includes, the ability for color output for color monitors, Zenith's version 3.2 of MS-DOS, and a summary of ANSI escape sequences, to name a few. Updates for current owners of HELP can be obtained for \$5 and the return of the original disk to: Heath Users' Group, Attn: Nancy Strunk, P.O. Box 217, Benton Harbor, MI 49022-0217. For a description of the original HELP program, see the March 1986 issue of REMark.

=====  
**P/N 885-8046-37**  
**MS-DOS**  
**Assembly Language Utilities**  
**Update**  
 =====

John Stetson, the original author of the HUG MS-DOS Assembly Language Utilities disk, has updated this product with additional utilities and corrections, now making it a 2-disk set. Some of the additional features include: 1) An overview of MS-DOS V3.2 features, 2) TSR program to change the CPU speed on an H/Z-200, 3) BIOS modifications to the H/Z-100 MS-DOS 3.1 BIOS and PC MS-DOS 3.2 BIOS to allow exchange of 5-1/4" 96 tpi diskettes (not the 1.2 Mb high density type), 4) Sorted Directory utility program version 5.7, and 5) Miscellaneous changes and corrections. Original owners of this product can update their disk by returning it along with a check for \$5 (made out to HUG), to Nancy Strunk, Heath Users' Group, P.O. Box 217, Benton Harbor, MI 49022-0217.

=====  
**885-8047-37 CP/M**  
**885-8048-37 ZDOS/MSDOS**  
**885-8049-37 MSDOS**  
**Accounting System**  
 =====

**Introduction:** Accounting System is a very user-friendly, double-entry accounting program capable of handling up to 999 separate accounts during any calendar year. It permits easy interaction between specified accounts, in an add/deduct condition, during the printing of the depreciation, returns, allowances, etc., if such interaction is required. All options and account parameters are easily set on initialization, and are readily modifiable at any time. Payroll disbursement is not included.

**Requirements:** Accounting System is available in versions for CP/M, ZDOS/MSDOS, (for the H/Z-100 . . . not PC), and MSDOS for the H/Z-100 PC compatibles. Since all system calls are generic in nature, no special system modifications should be necessary. The CP/M version works with either CP/M-80 or CP/M-85.

Dual disk drives or a hard disk system are highly recommended for program execution and data storage. The CP/M version will be in soft-sector only.

An 80-column printer (tractor-feed recommended) is required for report listings.

For the MS-DOS versions (885-8048 and 885-8049), COBRUN.EXE (which is included) must be present at run time.

The CP/M version requires 64k of memory. The MSDOS versions require at least 94k, exclusive of the operating system. All three versions also come with an extensive users manual.

The following files are included on the various distribution disks:

CP/M Version: HUG P/N 885-8047-37.

ACCOUNT1	.COM	ACCOUNT2	.COM
ACCOUNT3	.COM	README	.DOC

ZDOS/MSDOS Versions: HUG P/N 885-8048-37 and P/N 885-8049-37.

COBRUN	.EXE
ACCOUNT	.EXE
README	.DOC

**Program Authors:** John A. Liotta and Carl D. Rise

**Program Content:** During program execution, the following capabilities are available from the main menu:

- A = Add New Daily General Journal Entries
- B = Print the Monthly Trial Balance
- C = Add Monthly Journal Adjusting Entries
- D = Print Monthly Adjusted Trial Balance
- E = Print Income Statement and Balance Sheet
- F = Add Monthly Journal Closing Entries
- G = Print the Post-Closing Trial Balance
- H = Update the Chart of Account Control File
- I = Print your Chart of Account Control File
- J = Print an Active Account Recapitulation
- K = Print the Daily General Journal Entries
- ESC = Return to System

**Comments:** Excellent low cost small business or personal accounting systems!

**TABLE C Rating:** (10)

=====  
**P/N 885-8050-37**  
**The LaserWriter Connection**  
 =====

**Introduction:** The *LaserWriter Connection* is software and a printed, illustrated instruction manual for using the Apple *LaserWriter* and *LaserWriter Plus* printers with IBM PC-, XT-, AT-, and PS/2-compatible computers. These printers are among the least expensive PostScript devices available, which makes them superb for typesetting, desktop publishing, and graphics. Apple, however, supports them almost exclusively for use with its own Macintosh computers and has no good information on using them with IBM-compatibles. This is the very same package Joseph Katz (columnist for *REMark* and *Sextant*) developed for his own use.

**Requirements:** Software in the *LaserWriter Connection* provides the interface and basic support for both *LaserWriters* on either COM1 or COM2 of a true IBM-compatible computer with any version of MS-DOS. Of course it supports all Heath and Zenith Z-100 PC and Z-200 PC computers, and Zenith's versions of MS-DOS for them.

**Program Author:** Joseph Katz

**Program Contents:** *LaserOne*, the heart of *The LaserWriter Connection*, controls traffic between your computer and the *LaserWriter*. You use one of two programs provided: LAS1.COM is used with the COM1 port; LAS2.COM is used with the COM2 port. It takes over the computer's printer interrupt, installs a software protocol handler, and sets the proper parameters for communication between IBM-compatibles and the *LaserWriter*. These printers require *LaserOne* to operate reliably. With *LaserOne* installed (once each computing session, before you print the first time), you need not use the DOS MODE.COM. You, therefore, can run *LaserOne* from AUTOEXEC.BAT and set up the system for a naive user. An important benefit of *LaserOne* is that it makes the DOS PRINT.COM an excellent printer spooler and *PostScript* dump program for the *LaserWriter*. *LaserOne* has been tested with an extensive body of application software, including *Microsoft Windows*, and has been found completely compatible with everything.

STAT determines the current status of important programmable features of the *LaserWriter*. It makes a printout record

including: fonts (both permanent and temporary) in the printer; version of the *PostScript* ROM; total number of pages printed; and the communications settings for each channel. STAT tells you if your *LaserWriter* supports both hardware and software handshaking (some do), or only software handshaking (some don't).

If your printer supports both hardware and software handshaking, HANDSHAKE lets you set the *LaserWriter* for your choice. You may change handshaking, as appropriate, to the capacity of the *LaserWriter* EEROM.

DELASER.COM "unhooks" *LaserOne* from the computer's printer interrupt in case you want to use a parallel printer instead of the *LaserWriter* in the computing session.

MACHEATH.COM translates ASCII files from the Apple Macintosh to the format expected by MS-DOS programs.

PSPRINT.COM does a simple *PostScript* encoding of an ASCII file so the *LaserWriter* can print it. Although PSPRINT can handle *WordStar* files, it does not reproduce print-formatting features, such as underlining or boldfacing. Its aim is to let you use the *LaserWriter* as a simple line printer for proofing and quick printing of doc files. PSPRINT can print directly to the *LaserWriter* or to any other device, such as a modem. It also can output to a disk file you may edit before printing.

All those programs are easy to use. *LaserOne* has no options. The other programs may be used in either a command mode

or a prompt mode. There is extensive error checking and almost no possibility of a fatal error.

In addition to instructions for each program, *The LaserWriter Connection* instruction manual gives detailed instructions on connecting the *LaserWriter* to the IBM-compatible computer. It includes an illustrated explanation of the *LaserWriter* switch settings and writing diagrams for the required cables.

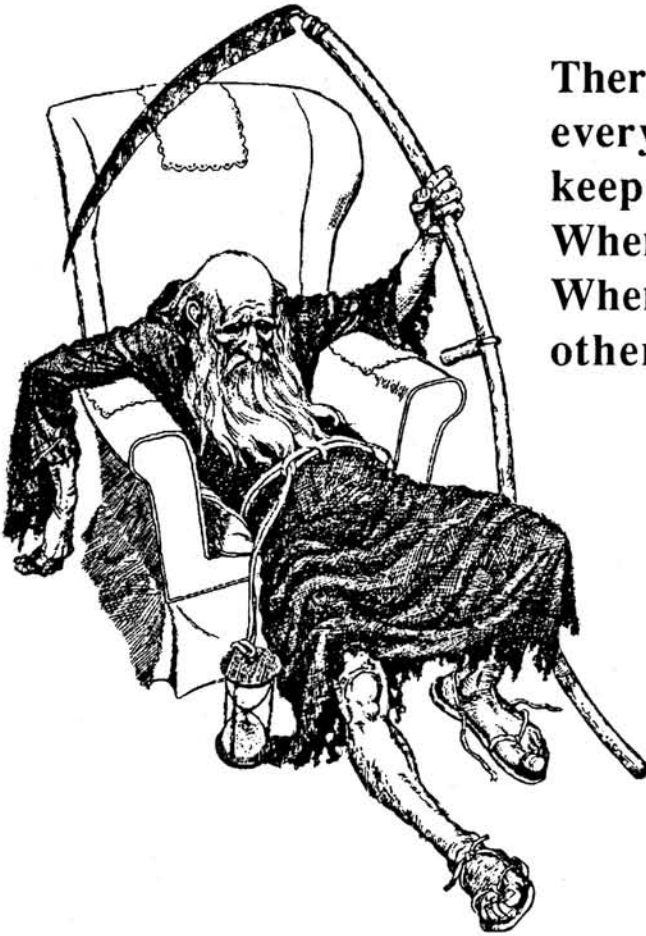
You also may use *LaserOne* as the handler for software handshaking with other serial laser printers, such as the Hewlett-Packard *LaserJet*.



# HUG Discount List

Good Thru March 27, 1988  
 Watch Future Issues for Updated Lists.

AA-3000	20%	TM-240	10%	ZBV-3340-EQ	20%
AB-3000	20%	TM-380	10%	ZBO-2503-EK	20%
CB-5063-50	10%	Z-207-7	10%	ZCA-2300-EF	10%
DC-1000	10%	Z-304	10%	ZCA-2300-MG	10%
EN-2000	20%	Z-315	10%	ZCF-2326-EY	20%
HA-2860-1	10%	Z-316-8	10%	ZCM-1390	20%
HA-2860-2	10%	Z-405A	10%	ZCM-1400-1	10%
HA-2860-4	10%	Z-416-2	10%	ZCM-1490Z	20%
HBT-40-AT	10%	Z-416C	10%	ZD-12	10%
HBT-40-HZ	10%	Z-445	10%	ZD-14	10%
HBT-40-SD	10%	Z-449	10%	ZD-72	10%
HBT-40-XT	10%	Z-505	10%	ZD-200	10%
HS-40	10%	Z-515	10%	ZD-400	10%
HS-386C	10%	Z-516	10%	ZD-800	10%
HS-2526	10%	Z-525	10%	ZDF-1211-DY	20%
HS-2860	10%	Z-605-1	10%	ZDF-1217-DY	20%
HSM-100	20%	ZA-180-35	10%	ZDF-2237-BK	20%
HSM-100-3	20%	ZA-180-39	20%	ZDF-2255-BK	20%
HV-2000	10%	ZA-180-40	10%	ZDH-1211-DE	20%
HVB-550	10%	ZA-180-57	10%	ZDH-1217-DE	20%
HWD-20	10%	ZA-180-62	10%	ZKB-2	20%
HWD-20-AT	10%	ZA-180-63	10%	ZMM-149A	20%
HWD-440	10%	ZA-180-65	10%	ZMM-149P	20%
HWD-4028	10%	ZA-180-66	10%	ZMM-1470G	20%
IN-6000	20%	ZA-180-67	10%	ZSS-184-1	20%
PA-120	20%	ZA-181-4	10%	ZSW-184-2	20%
PD-500	10%	ZA-180-7	10%	ZTC-3034-EB	20%
PM-160	20%	ZA-181-9	10%	ZTC-3034-MO	20%
PM-160-3	20%	ZA-181-17	10%	ZUS-386	10%
PMK-121	10%	ZA-181-19	10%	ZVM-135	20%
PMK-130	10%	ZA-181-24	10%	ZVM-1200-1	10%
SK-203	10%	ZA-3034-AS	10%	ZVM-1240	20%
SK-209	10%	ZA-3034-CS	10%	ZVM-1300-1	10%
SK-211	10%	ZA-3034-EB	10%	ZVM-1330	20%
TM-140	10%	ZA-3034-ME	10%	ZVM-1380C	20%
TM-150	10%	ZA-3034-NP	20%	ZWL-200-2	20%
TM-158	10%	ZB-315-1	10%	ZWL-200-4	20%
TM-159	10%	ZBV-2526-EK	20%	All software included in the software	
TM-170	10%	ZBV-2527-EK	20%	chart shown on pages 88 and 89 of	
TM-200	10%	ZBV-3339-EQ	20%	catalog #213	20%



There comes a time in the life of every computer when it just can't keep up with the grandkids...  
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# 1988 Software Update

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## HUG P/N 885-1249-[37] MagBase CP/M Magazine Database System . . . . \$25.00

---

**MagBase** is a database system designed specifically for keeping track of magazine articles. It was produced to create a database of REMark articles, but it can be used for any magazine. MagBase allows you to keep track of each article by title, author, date, volume and issue numbers, and up to 64 classifications. The title can be up to 80 characters, so you can include a brief description for articles that have cryptic titles. You can search for articles by title (or any portion of a title), author, date, or classification. When you search by classification, you can search for more than one. (For example, you can search for Review articles about word processors.) You can sort the articles found in a search by title, author, or date, and you can view them on the screen or print them out.

MagBase comes with a database of the year 1987 of REMark magazine. All articles, including non-trivial "Buggin' HUG" letters, are included in the database.

COMING SOON!! We are planning to create a database of all REMark articles from day 1. This database will be available as a separate HUG product.

**Requirements:** MagBase will run on an H/Z-89/90 or H-8/H19 computer and CP/M version 2.2 or higher. (The source code can be assembled for use on non H19-compatible systems.) It requires 40K of free TPA memory, and can be used with only one disk drive. It will support a

database file up to 8 megabytes or the size of your disk, whichever is smaller. Each article entry occupies 128 bytes, which means that 2400 articles will fit in 300k of disk space.

MagBase is supplied on one disk in the soft-sector format, or on two disks in the hard-sector format, with all files except MAGBASE.ASM on the first disk. Here are the files on the MagBase disk(s).

```
README .DOC
MAGBASE .DOC
MAGBASE .COM
MAGBASE .ASM
REMARK .CLS
REMARK .DAT
```

**MAGBASE.DOC** — This file contains the instructions for using MagBase. Instructions specific to the REMark database, and instructions for creating your own magazine database are included.

**MAGBASE.COM** — This is the MagBase magazine database program.

**MAGBASE.ASM** —% the Assembly source code for MagBase. MagBase was coded in efficient Assembly Language for maximum speed in searching for articles. It contains a Shell-Metzner sort routine for extremely fast sorts.

**REMARK.CLS** — This file contains the classifications used in the REMark database. The classifications are stored bitwise in the actual database file (64 classifications in 8 bytes), and the text for each classification is stored in this file.

**REMARK.DAT** — This is the database containing information on all articles from the 1987 issues of REMark.

### Program Author:

Patrick Swayne, HUG Software Engineer

**TABLE C Rating:** 10.

---

## 885-3050 & 885-1249-[37] MAGBASE Update

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An update for both the MS-DOS and CP/M versions of MAGBASE is now available. A small bug has been found, and will not appear until enough files have been entered in one category to fill the internal buffer. Doing search will find one buffer full of articles, but further searching on that category will fail. A new version is now available at no charge to original owners of MAGBASE. To receive this free update, send your original disk to: HUG, P.O. Box 217, Benton Harbor, MI 49022-0217.

---

## HUG P/N 885-3047-37 Z-100 WordStar Connection . . . . . \$20.00

---

The Z-100 WordStar Connection is a set of utilities that allows you to purchase the PC-compatible version of WordStar® Release 4.0 and run it on a Z-100 (not PC) series computer without any PC emulation required. The Word Finder thesaurus program is also supported by this package, making it the most complete solution to using WordStar 4.0 on the Z-100. Since the PC-compatible version of WordStar 4.0 can be obtained for as little as \$89 by upgrading a previous version, the Z-100 WordStar Connection is also your best value.

**Requirements:** To use this package, you need a Z-100 series computer with at

least 256k of memory (320k if you want to use Word Finder), and the Z-100 version of MS-DOS 2 or above (for example, Heath Catalog No. OS-63-30). WordStar 4.0 will not run under Z-DOS (which is actually MS-DOS version 1).

**Program Author:** Patrick Swayne, HUG Software Engineer

The Z-100 WordStar Connection disk contains these files:

```

README .DOC   ZWFREMOV .COM
ZWS     .DOC   FIXWF    .BAT
FIXWS.  .COM   FIXWF    .DAT
FIXWSN  .COM   FIXWS    .ASM
ZINSTALL.COM  ZINSTALL .ASM
ZCHANGE .COM   ZCHANGE .ASM
FIXWSPC .COM   FIXWSPC .ASM
ZWF     .DOC   ZWF      .ASM
ZWF     .COM   ZWFINS   .ASM
ZWFINS  .COM   ZWFREMOV .ASM
ZWFINSR .COM

```

Here is an explanation of the files:

**ZWS.DOC** — Instructions for using the PC-compatible version of WordStar 4.0 on a Z-100.

**FIXWS.COM, ZINSTALL.COM, ZCHANGE.COM** — The programs in this package that make it possible to run WordStar 4.0.

**FIXWSPC.COM** — If you also use WordStar 4.0 on a PC-compatible computer, this program can be used to patch it so that it uses similar keypad and function key assignments as the Z-100 version produced by FIXWS. It puts more power in the keypad keys than you have with the default layout.

**ZWF.DOC** — Instructions for using Word Finder on a Z-100.

**ZWF.COM, ZWFINS.COM, ZWFINSR.COM, ZWFREMOV.COM, FIXWF.BAT, FIXWF.DAT** — The programs in this package that make it possible to run Word Finder on a Z-100.

**FIXWS.ASM, etc.** — The source code for all programs is supplied.

**TABLE C Rating:** 10

**HUG P/N 885-3048-37**  
**Both Sides**  
**Printer Utility..... \$20.00**

The Both Sides Printer Utility is a program that lets you print disk text files that are formatted into pages on both sides of the

paper. With Both Sides, you can print all of those "shareware", public domain, and HUG program .DOC files using half the amount of paper and half the notebook space that you would normally have to use.

Both Sides works by printing all of the odd pages (1, 3, etc.) first. Then, it stops and allows you to reload your paper with the other side facing the print head, and then it prints the even pages (2, 4, etc.). Both Sides is very easy to use, and can print several files with one command. If you have a lot of .DOC files to print, it will pay for itself in saved paper and notebook space.

**Requirements:** Both Sides will run on any MS-DOS or PC-DOS based computer (including the Z-100) with at least 32k free memory and MS-DOS or PC-DOS version 2 or above.

**Program Author:**  
 Patrick Swayne, HUG Software Engineer

The Both Sides disk contains these files:

```

README .DOC
BS     .DOC
BS     .COM
REPRINT.COM
WRAP  .COM
BS     .ASM
REPRINT.ASM
WRAP  .ASM

```

Here is an explanation of the files:

**BS.DOC** — This file contains the instructions for using the Both Sides utility. And yes, you can use Both Sides to print this file on both sides of your paper.

**BS.COM** — This is the Both Sides Printer Utility.

**REPRINT.COM** — This program allows you to redirect the printer output from a program to a disk file. Although it has the same name as the REPRINT utility on HUG disk 885-3025-37, it is a completely new program. It will work with virtually any program that prints, and it is faster than the old REPRINT. With this program, you can prepare disk files for processing with Both Sides that contain the special codes that your word processor would normally use when it prints directly to a printer. **Note:** Files containing formatting codes for Diablo and compatible printers may not be handled correctly by Both Sides.

**WRAP.COM** — Both Sides is operated by entering the files to be printed on the MS-DOS command line. A command line containing a number of files could be longer than the width of your screen. On a Z-100 (not PC) computer, characters typed past the end of the line will be lost unless the "wrap at end of line" feature is enabled. The WRAP program allows you to enable or disable the wrap feature, as needed.

**BS.ASM, REPRINT.ASM, WRAP.ASM** — This is the Assembly source code for the programs on this disk.

**TABLE C Rating:** 4, 10

**EZPLOT II**  
**HUG P/N 885-3049-37**  
**H/Z-100 Version..... \$25**  
**HUG P/N 885-6013-37**  
**PC Compatible Version .. \$25**

Originally released in 1985, EZPLOT is a user friendly high resolution graphics function plotting program for engineers, scientists, and just about anyone who would like to have their printer plot curves from data on disk. A complete abstract of the original EZPLOT can be found in the HUG Software Catalog Update #1. This new version of EZPLOT maintains all of its original features, plus the following summary of enhancements.

1. The I/O interface has been completely rewritten resulting in a more flexible, more tolerant, and easier to use process.
2. EZPLOT now plots in user selectable colors.
3. EZPLOT plots in high resolution. The H/Z-100 version will plot in 640 X 400 resolution, even on machines that only have 1 bank of 32k video RAM chips. The PC version supports both CGA (640 X 200), EGA (640 X 350), and Hercules Graphics resolutions.
4. In addition to standard functions and x-y path functions, EZPLOT will also plot discrete points.
5. EZPLOT now supports logarithmic scales, as well as linear scales.
6. EZPLOT can now plot as many as six functions.
7. EZPLOT now supports most modern dot matrix printers, including the new 24-pin models.

8. EZPLOT now offers the selection of various sizes and orientations of printed output.
9. EZPLOT provides the capability of creating, saving and retrieving templates.
10. All graphics and menu routines have been rewritten to maximize speed.

Printers now supported by EZPLOT II include the following:

1. Any Epson/IBM Command Set Compatible 9/18 pin Dot Matrix Printer, including:
  - Epson FX, MS, or RX series
  - IBM Dot Matrix Printers
  - Panasonic 1080 & 1090 series
  - Okidata Microline 92
  - Texas Instruments TI-850 Series
  - ALPS Dot Matrix Series
2. Star Gemini 10X/15X
3. C.Itoh Prowriter
4. NEC 8023A
5. Any Epson LQ-1500 compatible (24-pin), including:
  - Epson LQ-800
  - NEC P-6
  - ALPS 200/300 (24-pin option)

If your printer is not listed, it is possible that your printer is compatible with one that is listed, especially if your printer is relatively new. However, if your printer is not compatible with one listed, then EZPLOT II can be installed to use your resident graphics screen dump software.

**Original owners** of EZPLOT can update their disk to the newer version by returning the original disk, along with a check or money order for \$10, made out to HUG to: The Heath Users' Group, P.O. Box 217, Benton Harbor, MI 49022-0217. HUG P/N 885-3023-37 will be upgraded to 885-3049-37, and HUG P/N 885-6003 will be upgraded to 885-6013-37, depending upon which original disk product is returned.

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**HUG P/N 885-3050-37**  
**MS-DOS/Z-DOS**  
**Magazine Database System**  
**MAGBASE ..... \$25.00**

---

**MAGBASE** is a database system designed specifically for keeping track of magazine articles. It was produced to create a database of REMark articles, but it can be used for any magazine. MAGBASE allows you to keep track of each article by title,

author, date, volume and issue numbers, and up to 64 classifications. The title can be up to 80 characters, so you can include a brief description for articles that have cryptic titles. You can search for articles by title (or any portion of a title), author, date, or classification. When you search by classification, you can search for more than one. (For example, you can search for Review articles about word processors.) You can sort the articles found in a search by title, author, or date, and you can view them on the screen or print them out.

MAGBASE comes with a database of the year 1987 of REMark magazine. All articles, including "Buggin' HUG" letters, are included in the database.

**COMING SOON!!** We are planning to create a database of all REMark articles from day 1. This database will be available as a separate HUG product. We are also planning to produce an 8-bit CP/M and perhaps an HDOS version of MAGBASE.

**Requirements:** MAGBASE will run on any PC-compatible or Z-100 (not PC) computer and any version of MS-DOS or Z-DOS. It requires 64k of free memory, and can be used with only one disk drive. It will support a database file up to 8 megabytes or the size of your disk, whichever is smaller. Each article entry occupies 128 bytes, which means that 2400 articles will fit in 300k of disk space.

The MAGBASE disk contains these files:

```
README .DOC
MAGBASE .DOC
MAGBASE .COM
COLOR .COM
MAGBASE .ASM
COLOR .ASM
REMARK .CLS
REMARK .DAT
```

**MAGBASE.DOC** — This file contains the instructions for using MAGBASE. Instructions specific to the REMark database, and instructions for creating your own magazine database are included.

**MAGBASE.COM** — This is the MAGBASE magazine database program.

**COLOR.COM** — This program allows you to set the foreground and background colors on your screen. MAGBASE was designed to use whatever text colors exist on the screen, so if you prefer something other than black and white, you can

set it up with COLOR before you run MAGBASE.

**MAGBASE.ASM, COLOR.ASM** — The assembly source code for the above programs. MAGBASE was coded in efficient assembly language for maximum speed in searching for articles. It contains the same Shell-Metzner sort routine used in D.COM (HUG disk 885-6011-37) for extremely fast sorts.

**REMARK.CLS** — This file contains the classifications used in the REMark database. The classifications are stored bitwise in the actual database file (64 classifications in 8 bytes), and the text for each classification is stored in this file.

**REMARK.DAT** — This is the database containing information on all articles from the 1987 issues of REMark.

**Program Author:** Patrick Swayne,  
HUG Software Engineer

**TABLE C Rating:** 10

---

**HUG P/N 885-3051-37**  
**CXREF ..... \$17.00**

---

**Introduction:** CXREF is a C language cross reference utility. Unlike other cross reference utilities, CXREF allows complete control over what is being cross referenced. For instance, you can cross reference only the variables in your program, or just the library function. The output from CXREF can be redirected to any valid device or file on your system, yet error messages and status information is always displayed on the screen. Library functions are held in a special file which is read in during program loading. This allows the library cross reference list to grow with your own library. No more listing of library functions that you have added, unless YOU want them!

**Requirements:** CXREF will work on any H/Z-100, or PC-Compatible computer running MS-DOS version 2.0 or greater. A minimum of 128k of RAM is required.

**Program Author:** Wojtek Bok

The files included on the CXREF disk are:

**CXREF.EXE** — The executable module  
**CXREF.C** — The source code for this program

**README.DOC** — Program documentation

**Program Content:** The usage for CXREF is:

CXREF filename [switches] [>redirection]

Filename refers to the C program that is being cross referenced. The full filename must include any extensions. Several switches are available:

- /R — cross reference reserved words
- /L — cross reference library functions
- /F — cross reference user functions
- /V — cross reference user variables
- /N[:name] — produce a number listing. The filename is optional.
- /W[:name] — set the width of the cross reference listing
- /? — produces a help screen

CXREF will default to /F /V if no switches are specified.

**Comments:** none

---

**P/N 885-3052**  
**PS's PC and**  
**Z-100 Utilities ..... \$20.00**

---

Here is another great set of useful programs from HUG. Included on this disk are a utility for testing your disks (hard or floppy), a program to test the operating speed of your computer, a utility that makes fast computers ('286 or '386 machines) run slow (so you can run those old time dependent games), a program that swaps the Caps Lock and Left Ctrl keys on the new 101-keys keyboards, and a set of utilities to support batch menu systems.

**Requirements:** Most of these utilities require MS-DOS version 2 or above and use less than 64k of free memory. DTEST requires 128k of free memory.

**Note:** Most of the programs on this disk will run on either PC-compatible computers or Z-100 (not PC) computers. A few are for PC-compatible computers only, and are indicated in the individual description below. Of the programs that run on a Z-100, only the ones that do not specify MS-DOS version 2 or above will run under Z-DOS.

**Author:** Patrick Swayne, HUG Software Engineer. The Z-100 part of IS.COM is by Paul F. Herman, and used with permission.

The PS's PC and Z-100 Utilities disk contains these files:

README	.DOC	CAPCON	.ASM
INSTRUCT	.DOC	KEYS	.COM
DTEST	.COM	KEYS	.ASM
DTEST	.ASM	RUNPROG	.COM
SPEED	.COM	RUNPROG	.ASM
SPEED	.ASM	DT	.COM
KEYCODE	.COM	DT	.ASM
KEYCODE1	.ASM	F	.COM
KEYCODE	.ASM	F	.ASM
IS	.COM	OPTION	.COM
IS	.ASM	OPTION	.ASM
LOOKARG	.COM	LOCATE	.COM
LOOKARG	.ASM	LOCATE	.ASM
RSL	.COM	COLOR	.COM
RSL	.ASM	COLOR	.ASM
CAPCON	.COM	MENU	.BAT

Here is a description of the programs:

**INSTRUCT.DOC** - Instructions for the programs on the disk.

\*\* Testing utilities.

**DTEST.COM** - This program performs a non-destructive media test on any disk (floppy, hard, or whatever) supported by MS-DOS. If it locates any bad sectors on the disk that are not used by files, it will give you the option of marking the sectors bad in the File Allocation Table, so that MS-DOS will not attempt to use the bad sectors. DTEST is better than DETECT for frequent use, because you do not have to reformat the disk after testing in order for MS-DOS to recognize the bad sectors. Requires MS-DOS version 2 or above.

**SPEED.COM** - This program computes the speed of your computer in comparison to the original IBM PC. It times a prime number calculation to compute the speed, and so it will give you a good idea of the performance of your computer at a CPU-intensive task.

**KEYCODE.COM** - This program shows you what the actual codes produced by your keyboard are at the hardware interrupt level and at the BIOS level. It is very useful in determining the actual key codes produced by all of the extra keys on the new 101-key keyboards. This program is for PC-compatible computers only.

**KEYCODE1.COM** - This version of KEYCODE displays only the hardware interrupt key codes. Because it does not access the BIOS, you can examine the codes produced by any key sequence,

such as Ctrl-Alt-Del, or Ctrl-Break without causing the computer to reset or the program to exit. This program is for PC-compatible computers only.

**IS.COM** - This utility performs a quick check to determine if a floppy disk in a specified drive is formatted (readable) or not. If you have ever put an unformatted disk in a drive by accident and then tried to do a DIRectory on the disk, you know how long MS-DOS takes to figure out that the disk can't be read. This program makes the determination much more quickly. Requires MS-DOS version 2 or above.

**LOOKARG.COM** - With this program, you can see exactly how MS-DOS interprets an argument you type on the command line. It shows you what MS-DOS puts in both File Control Blocks (FCB's), and what it puts in the command line buffer. If you write programs that use command line arguments, now you can see exactly what your programs will "see" when you give them a particular command line argument.

\*\* Programs that modify the operation of your computer

**RSL.COM** - This program runs any other program you specify on the command line as a "child" at a much slower speed than it would normally run. The main purpose of RSL is to let you run your old time dependent game programs on a new super-fast system. Unlike other slow-down programs that use time slicing to slow the system, RSL uses the trap interrupt. The result is that the slow-down is constant, and is not dependent on the timer-counter chip, which some game programs command to operate in non-standard modes. Since the trap interrupt is disabled during other interrupts, disk access and background interrupt-driven programs (such as the HUG screen clock) run at full speed during the slow-down. The degradation imposed by RSL is greater on 32-bit machines (80386) than on 16-bit machines (80286) and a 16MHz 80286 or a 25MHz 80386 will run approximately as fast as the original IBM PC while RSL is active. If your machine is slower, the degradation will, of course, be greater, which can give you an advantage on some of those old games you've had trouble with. Requires MS-DOS version 2 or above.

**CAPCON.COM** - This program is a memory-resident utility that swaps the operation of the Caps Lock and left Ctrl keys on

the new 101-key keyboards. Now you can have your Ctrl key in the "right" place without having to make a hardware modification to your keyboard or install new chips. And you can swap the keys back to their original use any time you need to. If you have already modified your hardware, you can use this program to make the keys work the old way if you need to. This program is for PC-compatible computers only.

**KEYS.COM** - With this utility, you can set the state of the Caps Lock, Num Lock, and Scroll Lock keys from the MS-DOS command line or a batch file. You can put a line in your AUTOEXEC.BAT file that will set the state of any or all of these keys the way you want them at boot-up. This program is for PC-compatible computers only.

**RUNPROG.COM** - This utility runs a program as a child with the top 64k of system memory reserved. It was designed primarily for running certain programs under ZPC on a Z-100 that otherwise would not run correctly, but it can be used in any other situation where you need to reserve the top 64k. Requires MS-DOS version 2 or above.

\*\* Directory utilities

**DT.COM** - This program displays all of the directories on the default drive or a specified drive in "tree" form, with graphic lines connecting the directory names. It is similar to various public domain or "shareware" programs, except that it will run on Z-100's, as well as PC-compatible computers. Requires MS-DOS version 2 or above.

**F.COM** - This program can search all of the directories on the default or specified drive for a specified file or group of files (if wild card characters are used in the file description). It displays the complete path to the located file(s), along with the date, time, and file size. Requires MS-DOS version 2 or above.

\* Batch menu system utilities.

**OPTION.COM** - This program accepts a single character input within a range specified on the command line, and returns the ASCII value of the input character as its exit code. It is used for selecting items in batch menu systems. Requires MS-DOS version 2 or above.

**LOCATE.COM** - The program positions the cursor to a spot on the screen that you

specify on the command line. It is used to position the cursor at the end of a prompt in batch menu systems.

**COLOR.COM** - This program clears the screen and sets the foreground and background colors to values you specify on the command line. If you run the program without specifying any values, it will display a list of available colors and their numerical values.

**MENU.BAT** - This is a sample menu using the above three programs.

Requires MS-DOS version 2 or above. It is recommended that you use MS-DOS version 3 or above for batch menu systems, since batch processing in MS-DOS version 2 is too slow for such menus to be practical.

\*\*Source code

\*ASM - The assembly source code for each program is included.

---

### HUG P/N 885-4008 REMark Volume 8 ..... \$25.00

---

Now available from HUG is REMark Volume 8. This volume set differs from all previous volumes in that it consists of all 12 original issues of REMark from 1987. If you're a new member to HUG, and just purchased your PC compatible computer, this volume, as well as Volume 7 from 1986 is for you! Both volumes are chock full of articles pertaining specifically to your system. Order yours today before supplies run out!

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### HUG P/N 885-6011-37 PS's PC Utilities .... \$20.00

---

**Introduction:** This disk contains a number of handy utilities developed by Pat Swayne (HUG Software Engineer) for use with PC-compatible computers. Among the utilities on this disk are a character undelete utility for WordStar, a fast alphabetizing directory program, and a collection of drawing libraries for use with four different CAD/drawing programs.

**Requirements:** These programs are designed to be used on any PC-compatible computer, such as the H/Z-150 or H/Z-200 series. Most of the programs will work

with any version of MS-DOS or PC-DOS, but some require version 2 or above. The programs are all small enough to work in minimum memory configurations.

**Program Author:** Patrick Swayne, HUG Software Engineer

The PS's PC Utilities disk contains these files.

README	.DOC	NOPRTSC	.COM
INSTRUCT	.DOC	NOPRTSC	.ASM
WSUD	.COM	CLICK	.COM
WSUD	.ASM	CLICK	.ASM
D	.COM	CBEEP	.COM
D	.ASM	CBEEP	.ASM
SSCK	.COM	BIN2HEX	.COM
SSCK	.ASM	BIN2HEX	.ASM
KEYWS	.COM	BINHEX	.COM
KEYWS	.ASM	BINHEX	.ASM
NOBLINK	.COM	FIXEND	.COM
NOBLINK	.ASM	FIXEND	.ASM
BLKCUR	.COM	ACAD	<DIR>
BLKCUR	.ASM	CADD	<DIR>
PROCAP	.COM	PD	<DIR>
PROCAP	.ASM	SKETCH	<DIR>

Here is an explanation of the files:

**INSTRUCT.DOC** — This file contains the instructions for using the programs and drawing libraries on the disk.

**WSUD.COM** — This program provides character undeletion for the WordStar word processing program. It is a shell that runs WordStar under its control, so that it can watch for character deletions. The deleted characters are stored in a buffer, and can be undeleted by pressing an Alt key combination. This program works with either version 3 or version 4 of WordStar.

**D.COM** — This is a new version of Pat Swayne's alphabetizing, columnizing directory program previously released as DIR100.COM and DIR150.COM. This version was designed specifically for use with MS-DOS versions 2 and above, and handles file specifications on the command line in exactly the same way as the DOS DIR command. It also features a much faster screen display than previous versions, configurable colors, and contains the same Shell-Metzner sort routine as the previous versions, making it one of the fastest alphabetizing directory programs around.

**SSCK.COM** — This program combines Pat Swayne's screen clock program with Jim Buszkiewicz's screen saver program. It

provides an on-screen digital clock display in the upper right corner of your screen that works while you run other programs. It also can be set to blank the screen (to save the phosphors in your monitor's CRT) after a user configurable period of non-use. The screen clock and screen saver operations can be disabled independently, so that you can have just a screen clock or a screen saver.

**KEYWS.COM** — This program is a specially configured version of KEYMAP (HUG p/n 885-6001-37) designed for use with WordStar version 3.3. It provides more functionality with the keypad and function keys than you get with WordStar alone. It is a memory resident program that can be loaded into a batch file when you boot up, and then can be called up when you run WordStar by pressing a special key combination.

**NOBLINK.COM** — This program provides a non-blinking block cursor that you may find easier to see than the normal blinking underline cursor. It is designed for use with computers equipped with Heath or Zenith CGA- or MDA-compatible outputs, or with computers equipped with EGA cards containing Zenith Data Systems ROM's. Once this program is loaded, you can turn the non-blinking cursor on or off as you need it.

**BLKCUR.COM** — This program provides a block cursor instead of the normal underline cursor. It is similar to NOBLINK except that it does not affect the blinking of the cursor, and works on non-Zenith equipment. The block cursor will normally remain in effect after you load the program until you re-boot.

**PROCAP.COM** — This program protects the Caps Lock key from being pressed accidentally. It causes it to work only when another key, such as the left Shift key, is pressed with Caps Lock.

**NOPTSC.COM** — This program disables the Shift-PrtSc combination, so that your computer will not lock up if you accidentally press it when no printer is connected.

**CLICK.COM** — This program provides a key click for Z-171 computers that works just like the key click on Z-150 series computers. Once the program is loaded, you can turn click off or on by pressing Alt-Esc.

**CBEEP.COM** — This program is the demonstration program presented in the article "An Introduction to TSR's" that ap-

peared in the November 1987 issue of RE-Mark. It provides a concurrent "beep" that does not cause the computer to halt while the beep is sounding.

**BIN2HEX.COM** — This program converts binary files to the Intel hexadecimal format. It was designed to provide files compatible with the Heath IDS-4801 EPROM programmer, but can be used whenever you need an Intel hex file. This version works with MS-DOS version 1, and does not accept directory path names in the command line.

**BINHEX.COM** — This program is similar to BIN2HEX (above), but uses the Standard I/O devices supported by MS-DOS versions 2 and above for reading and writing files. It is not as fast as BIN2HEX, but it supports full directory path names.

**FIXEND.COM** — Some word processing and editing programs put EOF characters at the end of text files they write. This program can be used to remove the EOF characters when the files are to be processed by programs that do not accept EOF characters. Although the COPY command in MS-DOS version 3 or above can be used to strip EOF characters, this program does it much faster, because it only works on the end of the file rather than copying all of it.

**WSUD.ASM, D.ASM, etc.** — The source code for all of the programs on this disk is included.

**ACAD <DIR>** — This is a directory containing a library of symbols for use with AutoCAD in drawing schematics containing logic gates (AND gates, OR gates, etc.). The included symbols are the same style you see in professional schematics. A drawing that shows all of the symbols is included, as well as a sample schematic drawn using some of them.

**CADD <DIR>** — This is a directory containing a library of symbols similar to those described above, but for use with Generic CADD.

**PD <DIR>** — This is a directory containing a library of symbols for use with Prodesign II or DesignCAD.

**SKETCH <DIR>** — This is a directory containing a library of symbols for use with AutoSketch.

**HUG P/N 885-6012-37  
ULTRA-RTTY ..... \$20.00**

**Introduction:** This software provides the radio amateur with the means of using a

PC compatible computer for transmitting and receiving both RTTY Baudot and ASCII standard codes.

**Requirements:** This program is designed to run on an IBM (or Heath/Zenith) PC compatible computer running MS-DOS version 2.0 or later. Extensive use is made of the 10 function keys available on the PC. It also requires an RTTY Terminal Interface, such as the Heath HD-3030.

**Program Author:** David E. Warnick

The ULTRA-RTTY disk contains the following files:

```
RTTY      .EXE
RTTY      .DOC
RTTY      .PRM
RTTY      .BAT
RTTYINST .BAT
README   .DOC
```

The following is a list of features as outlined by the author.

- All popular speeds of RTTY Baudot
- Both 110 and 300 baud ASCII
- Transmit Receive Control from the Computer Keyboard
- Split-Screen Display
- User Choice of Screen Colors
- User Selection of COM Port
- Support of COM1 and COM2
- User Selection of Disk Drive
- Printer Control from the Computer Keyboard
- Save of Received Text to Buffer
- Save of Buffer to Disk
- Transmission of Buffer Contents
- Type Ahead Buffer with Editing Capability
- Preset CQ and 8 Other Messages (Changeable from Disk on the fly)
- Instant Send of Above Messages by Function Key
- Send of File from Disk
- Send and Receive Marked on Printed Copy
- All Statuses of the System On Screen
- Limiting on Baudot Transmission to 72-Character Lines (assures compatibility with mechanical teletypes)

**Comments:** The documentation for this program appears to be excellent. A long awaited program finally here!

TABLE C Rating: 10



# Z-100 Graphics Software

DOODLER-V Graphics Package	<b>\$99.00</b>
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Waltham, MA 02154

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Continued from Page 24

quence, but even at 6 MHz with one wait state, it is still too fast for some of the old speed dependent games I have. For those games, I set the system to its full 20 MHz speed, and run the games under RSL, my slow-down program that can be found on HUG disk 885-3052.

Everyone who reads articles of this type is interested in speed comparisons, not only the before-and-after the upgrade kind, but also between the upgrade and its competition. So I have included speed tests of an unmodified H-248, the ZX-386, and an H-386. The H-248 is an 8 MHz 80286 computer with zero wait state memory. The H-386 is a 16 MHz 80386 computer with variable wait state paged memory. A cache memory card is available for the H-386, which makes it run faster. I did the tests on an H-386 with the cache board, and one without it. The ZX-386, as I mentioned before, runs at 20 MHz.

One of the most popular speed checks is the Norton SI (System Information) program. It is popular because it gives a rather inflated rating to computers having anything other than an 8088 processor. Here are the Norton SI ratings for the computers I tested.

#### Norton SI ratings

System	Rating
H-248	9.2
H-386, no cache	18.3
H-386 with Z-525 cache	18.7
ZX-386	23.0

These ratings are supposed to be a comparison with the original IBM PC, which gives a rating of 1.0. The H-386 with no cache returned 18.0 some of the time and 18.7 some of the time during several runs of SI, and I estimated the combined rating. For an explanation of cache memory, see my article "The Quest for Speed" in the July 1988 issue of REMark.

Another commercially available speed test is the PC Tools program from Central Point Software. The PC Tools Info command returns a more realistic comparison. Here are the PC Tools ratings for the four computers under test. The ratings are in percentages, with 100 being the IBM PC value.

#### PC Tools Info Ratings

System	Rating
H-248	460
H-386, no cache	735
H-386 with Z-525 cache	780
ZX-386	860

I have written my own speed comparison program, which is on HUG disk 885-3052. The program is called SPEED, and it returns 100 on an IBM PC.

Speed test programs are good for comparing how different computers will do when they are engaged in a purely

#### SPEED Ratings

System	Rating
H-248	528
H-386, no cache	1056
H-386 with Z-525 cache	1192
ZX-386	1409

computational task, but when a computer is doing a "real" job, it usually must access its disk and video output while it is working. These can have a considerable effect on the time it takes for the computer to complete the job. So I did two "jobs" on each of the computers under test to provide a more accurate evaluation. The first job was to assemble the HUG program HADES (HUG Absolute Disk Editing System) using MASM 4.0. This job requires quite a bit of disk access. Here are the results:

Source Code Assembly	Time (sec)
H-248	27.1
H-386, no cache	16.0
H-386 with Z-525 cache	14.1
ZX-386	14.2

I should note that the H-386 with the cache board in it also had a faster hard disk drive than the other systems. Note that the ZX-386 with a slower drive did almost as well.

The other job I used for comparison was to have AutoCAD (a drafting program) load and draw a sample drawing (a space shuttle). The version of AutoCAD used was 2.62, which can use a math co-processor if you have one installed.

AutoCAD Drawing	Time (sec)
H-248	22.8
H-248 with 80287	13.6
H-386, no cache	14.9
H-386 with Z-525 cache	11.6
ZX-386	12.4

This test involves a lot of computations. With a math co-processor to help with the computations, the H-248 was able to beat the H-386 with no cache. But the H-386 with a cache card was the fastest, and even though its clock speed is 16 MHz compared to 20 MHz for the ZX-386, it was able to beat it.

One of the factors that may have caused the ZX-386 to lose the AutoCAD test is the fact that the test involved a lot of video accessing. You may have heard that Heath and Zenith H-386 and Z-386 computers incorporate a feature called "slushware". This means that the contents of the system ROMs are copied into faster RAM memory when the computer starts up. One area where slushware would make a difference is in video access, especially if ROM routines are used to accomplish video changes. Another feature affecting video speed in Heath/Zenith computers that you may

not be aware of is that Zenith video cards, including EGA cards with Zenith ROM's and the Z-449 card, are designed to work with Zenith BIOS's in such a way as to increase video speed. Although AutoCAD does most of its video work by accessing video memory directly, these factors may have made a difference. All machines used in the tests were equipped with Z-449 cards.

To determine the affect that slushware and the Zenith BIOS really have, I wrote a program called VIDTEST. The assembly source code for VIDTEST is at the end of this article. VIDTEST performs two tests that were recommended in PC Magazine, and it uses BIOS routines exclusively to do the tests. The first test is to clear the screen and then fill it with 24 60-character lines 10 times. Here are the results of this test.

Video Test One	Time (sec)
H-248	11.0
H-386, no cache	2.7
H-386 with Z-525 cache	2.3
ZX-386	10.1

The second test done by VIDTEST is to write 240 60-character lines to the screen, allowing the screen to scroll as lines are added. Here are the results.

Video Test Two	Time (sec)
H-248	14.5
H-386, no cache	4.4
H-386 with Z-525 cache	4.0
ZX-386	12.1

As you can see, the 20 MHz ZX-386 is almost as slow as the 8 MHz H-248 in these tests. The Zenith slushware-BIOS combination really does work. However, there is a little program called VSCREEN that comes with the Mace Utilities that will make VIDTEST run at H-386 speeds on the ZX-386 (a little faster at test 1, and a little slower at test 2). I had never paid much attention to VSCREEN in the past, because it never made much difference on a Heath/Zenith machine. They have always had fast video ever since the H/Z-151. (Actually, it does make a nice difference on a '248 with a Z-449 card, but I had not tested it on that combination previously.) VSCREEN is actually a kind of slushware in that it provides new BIOS video routines in RAM memory to replace the old ones in the BIOS ROM. It uses up some of your program memory, but not much — 880 bytes. VSCREEN speeds up video in the text modes only, but most work is done in those modes. For more information on the Mace Utilities, see "On the Leading Edge" in the July 1988 issue of REMark.

#### A Serious Problem

One of the nice features found in Heath/Zenith computers is the CON-



FIGUR program that lets you, among other things, map the output of your parallel port to a serial port, and it lets you set up the serial port to properly support your serial device. You can seemingly run CONFIGUR on a non-Zenith BIOS, such as AMI's, but it does not actually work. The actual mapping of the parallel port and controlling of the serial port is done by the Zenith BIOS, not by CONFIGUR. All CONFIGUR does is alter information in the BIOS's RAM area. The consequence of this is that if you have a serial printer, it may not work with the ZX-386.

You may be aware that you can map parallel output to a serial port using the MODE program provided with MS-DOS. This kind of mapping is done by installing a small part of MODE into memory as a resident program, so it is independent of the BIOS. However, mode does not support handshaking, and most printers that use a serial port require handshaking. So MODE cannot be used as a substitute for the Zenith BIOS. I have written a little port mapping program that works with my serial printer, and may develop it into something others can use. A port mapping program should be included by AMI with their system, because a higher percentage of Heath/Zenith users probably have serial printers than other computer users.

#### Pluses and Minuses

The ZX-386 performs well, and it has not given me any trouble (except for the 84-key keyboard problem that was fixed with a BIOS change). If you are considering upgrading your H-248 (or Z-286), here are some things to consider. On the plus side, there are these factors:

- Easy installation. All you have to do to install the ZX-386 is remove some boards and replace them with the ZX-386. The HUG-386 also requires replacement of the motherboard and

the installation of a fan.

- Quiet, cool operation. With the HUG-386, you must install an additional fan in your H-248 cabinet, which many people would consider too noisy in a home environment or a shared office. The ZX-386 runs no hotter than the original H-248 boards (maybe cooler), and requires no additional fan.
- 20 MHz version available. The HUG-386 is available in a 16 MHz version only. The HUG-386 can be made to work as fast on some jobs with the addition of a Z-525 cache memory board, but the board is expensive, uses up a slot, and generates more heat.
- Extensive diagnostics built in. While there are programs available on disk that can do the jobs of the ROM diagnostics (including the disk interleave test), it is nice to have them built in.
- The ZX-386 provides two serial ports, while the HUG-386 only provides one.
- Custom hard disk support. If you have an unusual hard disk, AMI can make a BIOS to support it.
- Works in a Z-286 (not Z-286-LP). Though it takes a bit of modification to the cabinet, you can put a ZX-386 in a Z-286, and wind up with one of the smallest foot-print 20 MHz 80386 machines around. The HUG-386 cannot be installed in a Z-286.

On the negative side, here are some things to consider.

- No Zenith BIOS. The faster video speed and the ability to boot from alternate floppy or hard drives (real handy if C: crashes) are important advantages of the Zenith BIOS. I find the IBM-style boot up (try A:, then C:) rather annoying, since I am used to leaving a disk in A: when I reset. The lack of serial printer support could be serious for some Heath/Zenith users unless a software substitute is provided. AMI may work out a deal to provide a modified

Zenith BIOS in the future, however (the standard one won't work). If that ever happens, I will replace my BIOS chips and let you know how it works in a future REMark.

- No slushware. The snappy video performance of the HUG-386 is due at least in part to the use of "slushware" (and other BIOS routines also benefit, no doubt). It is a fairly simple concept, so perhaps the AMI people could "engineer" it into their system. A program like VSCREEN can be used to speed up the video response.
- The only full performance memory available to the system is on the ZX-386 daughter board, and currently, the largest board is 8 megabytes. A 16 megabyte board is coming, and AMI has a generous trade-up policy.
- Loss of personality. My computer may still say "Heath Computer Systems" on the outside, but with a different brain on the inside, it does not feel quite the same. But the AMI personality is not too bad and the ZX-386 seems to be a solid performer.

#### The VIDTEST Program

Here is the source code for the VIDTEST program, which should be assembled to VIDTEST.COM. To use it, run VIDTEST, and when the message "HIT RETURN" appears, start your stopwatch while you press Return. Stop the watch when "HIT RETURN" appears again and note the time for the first test. Start the watch again when you hit Return again, and stop it when the program ends (the DOS prompt appears).

#### Where to Get It

The ZX-386 is a product of:

American Micronics, Inc.  
18005 Skypark Circle  
Irvine, CA 92714  
(714) 261-0780

```

VIDEO TEST PROGRAM
THIS PROGRAM PERFORMS TWO TESTS THAT CAN
BE TIMED BY THE OPERATOR. FIRST IT CLEARS
THE SCREEN AND FILLS IT WITH 24 LINES OF
LETTER A S 10 TIMES. THEN IT WAITS FOR
RETURN, AND THEN PRINTS 240 LINES OF A S.
BY P. SWAYNE, HUG SOFTWARE ENGINEER.

CODE      SEGMENT      CS:CODE,DS:CODE,ES:CODE,SS:CODE
ORG       100H
START:    CALL      GETRET
          MOV       CX,10
          MOV       AX,3
          INT      10H
          PUSH     CX
          MOV       CX,24
          CALL     PLINE
          LOOP    LOOP1A
          POP      CX
          CALL     GETRET
          MOV       AX,3
          INT      10H
          MOV       CX,240
          CALL     PLINE
          LOOP    LOOP2
          INT      20H
          PUSH     CX
          MOV       CX,60
          MOV       AX,0E41H
          INT      10H
          LOOP    PLINEL
          MOV       AX,0E0DH
          INT      10H
          MOV       AX,0E0AH
          INT      10H
          POP      CX
          RET

          DX,OFFSET RETMSG
          AH,9
          INT      21H
          ;ASK FOR RETURN
          MOV       AH,8
          INT      21H
          ;GET A CHARACTER
          CMP      AL,13
          JNZ     WFRET
          RET

          13,10,'HIT RETURN...',13,10,'$'
          DB
          ENDS
          END

```

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# ENABLE

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## A Tutorial Advanced Data Base II

In this article, part 13 of a series on ENABLE, the data base module will be revisited. The advanced programming capabilities will be discussed beginning with the details of the "dot" commands of the ENABLE procedural language. As I have said throughout this series, ENABLE's data base is the easiest to program of those I have tried. I have extensive experience with dBase II and have been able to complete projects using ENABLE in about 25-40% of the time that it would take in dBase II. I have not tried any other of the available data bases so I can not compare them.

In this article the report form will be developed to output the orders for the computers on the DoD contract. This is an example and can be used for other products. Each line of the program will be discussed with the reason why it is needed. This program was written on the Z-100 but will run on any of the ENABLE packages. This report will be developed while going through the "dot" commands that ENABLE uses. I have provided the program to HUG for their bulletin board for those of you that can use it.

Using the advanced features of ENABLE, entire menu driven applications can be developed in a short time. The macro capability can be used to further enhance this program. I have developed a program for my son's school which is completely menu driven and provides many reports at the touch of a key. The basic program was completed in under two weeks of work at night and it worked the first time. This includes the time required to build the input screens, output reports, and menu screens with the associated macros to link them into a usable product. I had tried to do the same thing with dBase II over a period of two months and never did get it to work like it was suppose to.

The most current application I have written is a payroll program. This program requires three data bases and the required reports, including the checks. The program was completed in less than a week of available time but requested and required changes involved another month of off and on work. Again, this is menu driven and uses macros.

Some of the other programs may be added during these articles depending on space. In the Software Group's "Enable Applications Development Guide", three major applications are detailed. A personnel scheduling routine and an inventory application are developed. This 415 page soft cover book is worth the \$29.95 it costs and is available from The Software Group. Each of these applications is fully documented, although the actual programs in the book have small errors. The Software Group is aware of these paper "bugs". The companion disk, which can be purchased separately from the Software Group for \$19.95, does have all the applications completed and they do run; so if you do not want to type in all of the programs, purchase the disk.

In article seven, I discussed the DISPLAY capability of ENABLE's data base. The Display option will only display record fields. It will not permit you to do any analysis work on the data. If you need to analyze the data or do some basic math, you must use the REPORT option. The report capability provides a quick and easy method to output data base information. The report function supports user defined breaks. These breaks permit the user to request ENABLE to perform some function based on a change in a field. The output reports are still the basic columnar report with little enhancement.

To enter the REPORT function you must move to the data base main menu and select "(9) - Report" from that menu. You will then be presented with the ENABLE data base Report form. The first question is the data base name. If you have been working with a data base, such as adding or editing records, this name is carried forward. If you used the SORT routine, the Select Set that resulted from the sort will be carried forward. If you just entered the data base module, put in a "?" and all available data bases on the data disk will be displayed or you can type in the name of the data base if you know it. If you want to use a Select Set that had been created before, type in "?SS" and all matching files will be displayed.

After selecting the data base, ENABLE will then prompt for the form (Using

form:). If you are going to use the basic column output format, leave this blank. If you have a report form, you could put in a "?" and ENABLE will display all files that have been created with the ENABLE Report generator. You can put any report form in this block, including files built with the word processor. If you use a file from the word processor, you must include the ".WPF" extension with the filename. The next prompt is for the INDEX. All indexed fields are displayed in the box near the bottom of the screen. You can specify the order of the output report using this command and selecting one of the field names listed. If you are using a Select Set from the SORT function, the INDEX option will not be displayed. Using the SORT function, any of the eight fields may be used as the source for the SORT in either ascending or descending order. This is completely independent of the INDEX function. The result of the SORT is the Select Set (extension ".SS").

```
Sort Database Management System
Database: A:\ORDERH
Index
Where : order.no=1
Fields: (Enter each sort field followed by a comma and A or D)
Field 1: contract,a      Field 5:
Field 2: type,a         Field 6:
Field 3: cline,a        Field 7:
Field 4:                 Field 8:
-----
Operator's are:
AND OR NOT <> = <-> >> <-> LT GT EQ LE GE NE * / ** ( ) & $
Fields are:
SYS.RECORD DELETED CLINX QTY ORDER.NO
CONTRACT TCLIN DESCRPT COST TYPE
EXTENDED
Press PgDn to select from above
ORDERH Records ... 15 Rd ... 0 Set ... 0 Cur ... 0
```

Figure 1  
Sort Menu for Order Select Set

The next option is "To". Here you can accept the default of "Screen", send the report to a "Disk" file that you name, or output directly to the "Printer". The next selection is the "Where" clause. Here you can specify records you wish to output. You can type in greater than ">", less than "<", equal "=", not "<>", to name a few. The WHERE clause permits you to select individual records or groups of records. You can input on this line up to 160 characters. You can use multiple fields and operators for this selection. An example of one of these longer WHERE clauses could read:

LNAME="elwood" and fname="ge\$" or fname="ma\$" and date>"88/08/13"

This would result in records that have a last name of "Elwood" and a first name of "George" or "Matt" and a date greater than "88/08/13". Note that I use the "\$" to indicate to ENABLE that any character after "Ge" or "Ma" is acceptable. This means that George, or Gerry or Gene would also be selected if they are in the data base. Also note that the search names can be in either capital or small letters as ENABLE is not case sensitive.

The next prompt is for "Fields." Here you list the fields you wish to have on the report. You can add information on this line up to 160 characters. ENABLE will output the report with all fields limited to a maximum of 20 characters unless they are shorter. If you wish to display more information for longer fields, you must indicate this by placing a set of braces, i.e., "Street{25}". This will display up to 25 characters of the field "street". In addition to listing the fields, you can specify break conditions where total, averages, etc., can be displayed. If you wish to display a "\$" with the field, this would be entered as "cost{\$.8.2}". This will display the field as a number eight numbers long with two decimal points with a "\$" in the first position. If the number is longer than the field length, the position will be filled with asterisks. The spreadsheet will do the same thing. You can also derive a new field by specifying the fields that will provide the information. An example would be a field with the results of two other fields, i.e., "number\*cost{12.2}". This would result in a column that is 12 numbers long resulting from a multiplication of the cost and number fields.

The above procedures will give you a very basic report. It will provide a basic columnar listing of fields requested with nothing special. ENABLE has the capability to "BREAK" on specified conditions and to give requested computations. The calculations that can be requested are:

COUNT	to record the number of changes
SUM	to sum the fields
HIGHEST	to show the highest value
LOWEST	to show the lowest value
AVERAGE	to show the average value of the field
TALLY	to show the number of records since the last break

I used this capability to give reports on training evaluations at work. The order of BREAKS is important as the calculations are carried out in the order indicated. If you use BREAKS, you must have the data either SORTED or INDEXED in the break field. If this is not accomplished, you will end up with a report that has many breaks and that does not provide the desired information. The break is indicated on a field with the letter "b" in braces. The break should have a number indicating the level of break with "1" be-

ing the highest level. I use the BREAK capability to produce reports of training evaluations. I use breaks to show course and date for one report. To complete this report I start with the SORT command and SORT on "COURSE,A" and "DATE,A". I then use type in DATE{b1}, COURSE {B2}, RATING {A2}, INSTR {B2} in the field block. ENABLE will then provide a report that breaks on course first and then date, giving an average for the overall course rating and instructor. ENABLE will provide the average for both the course and date everyday and then an average for the entire report. Using this capability, ENABLE can generate quick and easy reports without having to write any code. If the same report is generated several times, ENABLE's macro capability will permit it to be run with only two keystrokes. The break command will also permit multiple break statements within the braces.

The last line in the REPORT menu is "Title". This permits you to add a title to the basic columnar report. The title can be only one line long. You can use the word processing functions of numbering pages by putting a "#" on the title line. You can also have it put the SYSTEM date where you want it to appear by typing in "%DATE". The Title line is the same as a Header in word processing, so these commands will work. The integration of ENABLE makes these functions work and once you learn something in a module, it is carried through the other modules of the program.

After filling in the Title line and pressing <RETURN>, ENABLE will start working. If you have selected "Disk" or "Printer" ENABLE will stop when the first record that meets the "Where clause" is found. You are then permitted to change the setting of the printer. The printer top line menu selections are presented. You can press F0 F2 (ALT/F2 for the PC) to

continue with the default settings or you can change them as desired. You can not save these settings for use in another report. If you have inserted a file name on the "Using form" line, it will use the printer setting for that file.

ENABLE has a companion to the INPUT SCREEN generator. This is the REPORT generator. It works in the same way as the input screen using the "Put it here" capability of ENABLE. This is available from the main menu through the data base line. The report is developed using

```

Report
Database Management System
Database: C:\EN200\TRAINING Using form:
Index : data To Screen Disk Printer
Where : course="Harv"
Fields : course{b2}.date{b1}.rate{a2}.hando{a2}.instr{a2}
Title : Harvard Graphics Student Evaluation as of NDATE
Operator arf:
AND OR NOT < > << >> <= >= LT GT EQ LE GE NE * - / ** ( ) & &-
Field are:
SYS-RECORD DELETED COURSE INSTRUCTOR DATE
COBEG COM1 COAPP CMAND CMLOG
UNDER LENGT RATE COMFU HANNO
PPRBLM FACHT INSTR STUOE OTHER MORE
Press PgDn to select from above
TRAINING Records : 1008 Rd .... 0 Sel .... 0 CuCap 8:05
  
```

Figure 2  
Report Menu

the word processor so moving text, centering, and other enhancements can be easily added. The report generated can be called from the REPORT on the "Using Form" line. This report can be fairly complex but it is still limited. The generated report form would be filled out for each selected record with a page break between each report. Fields can be from the data base, another data base, derived from two or more fields, or from the system, such as date of time.

```

Harvard Graphics Student Evaluation as of August 16, 1988
COURSE..... DATE.... RATE HANNO INSTR
-----
Harvard Grap 88/07/21 5.00 5.00 5.00
Harvard Grap 88/07/21 0.00 0.00 0.00
-----
Harvard Grap 4.21A 4.11A 4.58A
-----
88/07/21 4.21A 4.11A 4.58A
-----
Harvard Grap 88/07/25 3.00 4.00 4.00
Harvard Grap 88/07/25 4.00 5.00 5.00
Harvard Grap 88/07/25 4.00 3.00 5.00
Harvard Grap 88/07/25 4.00 4.00 5.00
Harvard Grap 88/07/25 5.00 5.00 5.00
  
```

Figure 3  
Evaluation Report

To develop these basic report forms, starting from the ENABLE Main menu press (U)se system, (D)bms/Graphics, (D)esign, (R)eport form. You are then presented with the opening screen which prompts you for the name of the report. If it is a new report, you are prompted for this response. Again you can use a "?" if you are modifying an existing report. The next screen prompts for the name of the data base. Again, a question mark can be used. You are next prompted for a report description of the report. After this you are presented with a blank screen to create your report. You are in the word processor so all of the capabilities of that module can be used. This includes footer, headers, page numbering and the date function. When you are ready to insert a field, position the cursor where you want it and press/SHIFT/F9. You then enter the field name or press "?" to display all available fields. When one has been selected, it be will positioned on the report using the size of the field. The maximum length of a line is 160 characters. If you want to create a new field, type in a field name. ENABLE will then request the source of the field, Another data base, Derived, or System. If you select Another Data base ENABLE will be prompted for the name of the data base, the lookup field and the indexed linked field in the other data base and the link in the current

data base. This will permit ENABLE to find information in other data bases very quickly, normally less than one second. If you selected Derived, ENABLE will permit you to insert the field(s) to be used and the operators. Along with the math operators, you can select "&" which will join two fields together with spaces or "&-" which joins without spaces. I used this to develop a unique field name for people. System will permit you to use information from the system like the date or time. This can be used to automatically insert this information to indicate when the record was printed or outputted. Note that everything will be repeated for each selected record including the blank lines. It is necessary to delete the extra lines in the report to avoid these blank spaces. To do this, press DEL LINE or F0 F3 (ALT/F3 on the PC) to bring the end of file mark out to the last line of the report. The end of file marker is the double line across the screen. With the report function, you can press F10 (P)rint and set the printer defaults for the report. When you have completed the report press F10 (F)orm design options (S)ave. After saving you can (Q)uit back to ENABLE's Main Menu. To modify the report form you would enter the same way as you did to create it and modify as required.

**Figure 4**  
**Report Form Menu 1**

The report form can also be a word processing document or the input form. If you use the input form as the output report, you must include the extension ".\$IF" with the name. All of these simple report forms permit easy development of outputs from ENABLE. The word processing capability permits you to "dress up" the simple reports with a minimum of effort.

The area that puts ENABLE's data base into the major league is its Procedural Language. This "dot" command lan-

**Figure 5**  
**Report Form Menu 2**

guage permits you to do anything you could do with any of the other data bases with less effort and faster. A comment

**Figure 6**  
**Sample Report Form**

that I received from company programmers that have been forced to use dBase III Plus after using ENABLE is how hard it is to use. dBase III Plus requires subroutines for tasks that ENABLE has built in. This saves time and permits a working program to be developed quicker.

The procedural language program is written in the word processor. I have found it easy to debug the program using the window capability of ENABLE. I will have the report in word processing in one window and the data base report screen in another window. By making a change and saving it, pressing F0 Up arrow, I am returned to the data base window and I can then run it. Using this one keystroke, I can bounce back and forth between the two windows at will.

To start the report, we will build the report for the DoD computer order form. Create a word processing file called "report". The first line contains the command

```
.report division
```

This is used to identify reports that are designed with procedural language and is always the first line in the report. The "dot" must be in the left-hand column and no spaces can be inserted between the "dot" and the word.

The next line normally starts the definition phase of the report. Here you would add definitions of fields or variables that are used in the report. The line that starts the definitions is

```
.definitions
```

After stating that the definitions are to follow, you would then define the local fields. These definitions can come in another data base, be derived while the report is running, or supplied by you using the INPUT or LET options. For our report, the following lines were added.

```
.define surcharge as decimal 10.2
```

This line defines a field called "surcharge" that is a number ten positions long with two decimal positions.

```
.define gtotal as decimal 12.2 using
    "$ nnn,nnn.nn"
```

This line defines a field called "gtotal" which is a number 12 positions long with two decimal points and is to be outputted with a dollar sign and commas. This is the picture format that can be used to make the output look how you want.

The next lines are

```
.define total as decimal 12.2 using
    "$nnn,nnn.nn"
.define extended as decimal 12.2 using
    "$nnn,nnn.nn"
```

These fields are the same as the gtotal definition above.

The next three lines define text fields. You must specify the length of the field and can use the picture capability if something special is needed.

```
.define jd as text 5
.define od as text 4
.define crn as text 13
```

You should use meaningful names for these fields to assist you or an assistant in troubleshooting the report.

The next definition is

```
.define odn as integer 4
```

This field is a whole number and therefore does not require the decimal format. This completes the definitions for this report. Depending on the report, these sections can run several pages. The other define statements are as follows:

```
.define [fieldname] as date
.define [fieldname] as time
.define [fieldname] as logical Y
.define [fieldname] as logical T
```

To define a field as derived, use the following statement. You can further define the field using BREAK conditions.

```
.define [fieldname] = formula
```

The last define statement relates to other data bases. This permits you to get data from other data bases during the processing of the report.

The fieldname is the local name in the report. The lookup field is the field in the other data base. db2 is the name of the other data base. ndx2 is the indexed name of the linking field in the other data base. Linkname is the link field in the current data base required only if the two linking fields are different.

The next line in the report is an input statement.

```
.input "Enter Custodian Request Number
" crn
```

This will appear on the screen and will prompt the user for an input. In this report the input is a combination of letters and numbers. Remember that the definition of the field "crn" is text.

The next line is

```
.map section
```

This command starts the definition of the form.

The next line is

```
.intro
```

This defines the start of the report. Anything that appears in this section will appear once at the start of the report. Everything between this command and the next command will appear at the start of the report. All word processing commands can be used to develop this section. You can also use this area to establish initial values for fields in the report.

The next area is the body. This defines the format of the report. You indicate the locations of all fields in this area. Because the report is to be printed in compressed print, a ruler is inserted which sets the right margin to 130. Because the report is a columnar report, the automatic reformat is turned off. If this is not done, the fields may not line under one another.

```
.body
.reformat off
[nsn      ] [clin ] [model  ] [descript
```

We now have the report format completed and need to start the processing commands.

```
.break 01 procedure
.break on contract
```

=====  
Page Break  
=====

The above commands establish the first break condition. This condition is based on the field "contract" and will cause the program to start a new page when the "contract" field changes. Remember, the fields must be a sorted or an indexed field for this to work correctly.

The next lines establish the second break condition.

```
break 02 procedure
break on order:no
```

These statements cause the program to break on "order.no.". When the order number changes, the rest of the procedure will be run.

The next series of lines will establish the heading to be inserted at the top of

the page. Because this report and data base will permit ordering of both hardware and software and computers off the Z-248, the TEMPEST Z-200T, and the lapheld contract, all of these conditions must be considered.

```
.break heading
.let jd = @string(@Julian(@today))
.let ocn = order:no + 1000
.let od = @string(odn)
```

The three LET statements develop the two parts of the "Custodian Request Number." This number consists of the custodian organization and account code, the Julian date, and the order number in sequence starting from 1 at the start of the fiscal year. I established that all computer orders will start with 1000 to avoid having to input everything. The first LET statement gets the JULIAN date from the current date. This feature is NOT available in ENABLE versions below 2.0. The next line adds 1000 to the order number which was inputted in the basic order data base. Because the order number is a number, the next LET statement converts it to a string so that it can be used with the rest of the character field.

```
                Custodian Request Number [crn  ][jd  ][od ]
.if type = "H" or type = "h"
                                HARDWARE
.elseif type = "S" or type = "s"
                                SOFTWARE
.endif
```

```
][qty] [cost] [extended]
```

These statements check the data base for the type of items being ordered. TYPE from the data base, which has been sorted, is checked first. The IF statement checks for type. Note that TYPE is case sensitive, so both cases are checked and the appropriate heading is used. If the first IF statement is not satisfied, the .ELSEIF will be checked next. If the .ELSEIF statement is not satisfied, nothing will be inserted. The .ENDIF statement is required to close this loop.

The condition that is checked next is the "contract." There are three contracts that can satisfy this statement.

```
.if contract = "z" or contract = "Z"
    CONTRACT # F19630-86-D0002
.elseif contract = "t" or contract = "T"
    CONTRACT # F19630-
.elseif contract = "l" or contract = "L"
    CONTRACT # F19630-
.endif
```

Depending on the character in the contract field of the data base, the appropriate contract number is inserted. Again the .ENDIF statement must be located at the end of the loop to close it.

National Stock Extended Number (NSN)	Contract Line Number	Part or Model #	Item Description	Qty	Unit	Cost	Cost
-----	-----	-----	-----	-----	-----	-----	-----

The above line completes the basic heading at the top of the page with each type order.

With the above code, the program will cycle through the order that is selected in the REPORT menu. With the listed code, the items will be printed but no sums will be computed. There is also a surcharge that is charged that also needs to be computed after the order is completed. The next lines completed these tasks.

```
.break summary
```

This statement will be called when the BREAK condition is satisfied and is used to start the ending calculations.

```
.let total      = extended{s}
.let surcharge  = total * .086
.let gtotal     = total * 1.086

                Total : [extended{s} ]
                Surcharge : [surcharge{s}]
                Grand Total : [gtotal{$} ]

.break end
```

The first .LET statement makes the "total" equal the sum of all EXTENDED fields. The next .LET statement computes the surcharge by multiplying TOTAL by .086. The last .LET statement computes the grand total by multiplying the TOTAL by 1.086. I use this rather than adding surcharge and total for no special reason. The next three lines cause the results of the above calculations to be printed on the report. Note that the GTOTAL line has a "\$" in braces which will cause that line to print with a dollar sign in front of the numbers. The break end is required to close the break summary loop.

```
.break procedure 03
.break on type
.let total = 0
.let gtotal = 0
.break end
```

These statements reset TOTAL and GTOTAL to 0 so the loop can be run again for another type of equipment.

This completes the 13th part in this series on ENABLE. There are more commands in the procedural language that will be covered in a later article. The next time I discuss the data base module, another application, one for a payroll including printing the checks will be presented along with the other data base "dot" commands.

```
.report division
.definitions
.define surcharge as decimal 10.2
.define gtotal as decimal 12.2 using "$mm,nn.nn"
.define total as decimal 12.2 using "$mm,nn.nn"
.define extended using "$mm,nn.nn"
.define jd as text 5
.define od as text 4
.define crn as text 13
.define odn as integer 4
.input "Enter Custodian Request Number " crn
.map section
.intro
.body
.reformat off
[nn ] [clin ] [model ] [descript ] [qty] [cost ] [extended ]
.break 01 procedure
.break on contract
```

Page Break (User Defined)

```
.break 02 procedure
.break on order:no
.break heading
.let jd = @string(@julian(@today))
.let odn = order:no + 1000
.let od = @string(odn)
```

Custodian Request Number [crn][jd][od]

```
.if type = "H" or type = "h"
HARDWARE
.elseif type = "S" or type = "s"
SOFTWARE
.endif
.if contract = "z"
Contract # F19630-86-00002
.elseif contract = "t"
Contract # F19630-
.elseif contract = "1"
Contract # F19630-
.endif
```

National Stock Number (NSN)	Contract Line Number	Part or Model Number	Item Description	QTY	Unit Cost	Extended Cost
-----------------------------	----------------------	----------------------	------------------	-----	-----------	---------------

```
.break summary
.let total = extended(S)
.let surcharge = total * .086
.let gtotal = total * 1.086
```

Total: [extended(s)]  
 Surcharge: [surcharge(\$)]  
 Grand Total: [gtotal(\$)]

```
.break end
.break procedure 03
.break on type
.break end
.let total = 0
.let gtotal = 0
```

Figure 7  
Complete Listing of Program

Custodian Request Number 866XC882281001

			HARDWARE Contract # F19630-	QTY	Unit Cost	Extended Cost
National Stock Number (NSN)	Contract Line Number	Part or Model Number	Item Description			
0001AB	ZML-184-95		Winchester Lapheld	5	\$1,499	\$7,495.00
0003AA	ZA-180-54		Ext 5 1/4 Floppy	1	\$157	\$157.00
0007AA	ZA-180-37		Carrying Case	5	\$13	\$65.00
			Total:			\$7,717.00
			Surcharge:		\$663.86	
			Grand Total:			\$8,380.86

Figure 8  
Sample Report

# CP/M Printer Graphics For Your H-89

We have printer graphics for your eight bit machine. Try our CALLIGRAPHY II, BANNER and H-89 SCREEN PRINT programs. Works with EPSON, MPI and RAINBOW enhanced OKIDATA 82A or 83A.

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# Turbo Pascal

## Part 3 The DOS Unit

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Beavercreek, OH 45432

Welcome back again. In this article, we get into units, a new feature of Turbo 4.0. First we will discuss units and how to make your own units.

Units are composed of procedures and functions that can be used in any program. They are compiled in the same way as normal programs, but they generate a ".TPU" file. Turbo comes with seven standard units. They are listed below:

**System** — Standard Pascal and File I/O automatically linked into your programs. Covered in the last two articles.

**Dos** — Includes useful procedures and functions that include many DOS functions. We will talk about this unit in this article.

**Crt** — Includes procedures to control the PC's screen in text mode. We will talk about the procedures and functions in this unit in the next article.

**Printer** — Includes one variable "Lst:" and assigns it to the printer. This will be talked about in this article.

**Graph3, Turbo3** — Support Turbo Pascal version 3.0 graphics routines and features discontinued in Turbo Pascal 4.0 for compatibility with older programs.

**Graph** — This is the most powerful feature of Turbo Pascal 4.0. There are many graphics features in 4.0 and we will talk about them in the fifth article.

The units are not automatically included in a program when a procedure or function used in the unit is included in the program. You must specify what units are to be used at the beginning of your program. To do this, you insert the "uses" keyword followed by the unit names separated by commas. For example, to use the units "crt" and "dos":

```
uses crt,dos;
```

You can write your own units to be used in all of your programs, consisting of all the procedures and functions you use many times. Units consist of two parts, interface and implementation. The interface part consists of variables, constants,

or types to be declared in the unit, and either "procedure" or "function" for each procedure or function included in the unit along with the variables used in the procedures/functions. The variables declared in the interface part can be accessed in the program that uses the unit. In the implementation part, each procedure and function is actually defined. An example unit is:

```
unit FirstUnit;  
interface  
Const nop : char = '$90';  
function AddTwo(a,b : integer) : integer;  
implementation  
function AddTwo;  
begin  
AddTwo:=a+b;  
end;  
end.
```

This is a simple unit and a waste of code space, but it is a simple and good example. As you see, we defined the function and the parameters for "Addtwo" in the interface section, but in the implementation section, we only used the name of the function without parameters, but actually defined what "Addtwo" will do.

Now we'll look at the Printer unit. The printer unit is an extremely small unit that declares the text file Lst and assigns it to LPT1:. Heres a program that uses the printer unit that prints "Turbo 4.0" out to a printer:

```
program PrintThis;  
uses printer;  
begin  
WriteLn(Lst,'Turbo 4.0');  
end.
```

You can use "WriteLn" and "Write" to output data to the printer using the printer unit. Treat "Lst" just like it is a file. Our first large unit, Dos, has many procedures and functions used to access some of the neat features in DOS. We will first talk about some of the constants, variables, and types declared in the unit. Our first one of these three is a type, the Registers type. The registers type is the standard 8088 register used when calling an interrupt. Since the registers are a record, you use the same "recordname.fieldname" for this as you would for any other record.

Now we'll get into the procedures. Many of these are very technical, dealing with interrupts and function calls, so if you don't understand them, don't worry, they aren't important unless you're doing something REALLY technical.

Our first group of procedures deals with the date and time capability in MS-DOS. This includes the "SetDate" and "GetDate", "Settime" and "Gettime", "SetFTime" and "GetFTime" for files, and since the "SetFTime" and "GetFTime" pack the date and time into a 4 byte record, there has to be a way to pack and unpack the record, there is "PackTime" and "Unpacktime".

Our first commands are the "Settime" and "Gettime" commands. "Settime", which sets the system time, takes four input parameters of the syntax below:

```
SetTime(Hour,Minute,Second,Hundreth);
```

In the example to set 4:25:32.08, use:

```
SetTime(4,25,32,8);
```

Notice that "Settime" uses 24-hour, as does "GetTime". To use "GetTime", you need four variables defined as words. The syntax is:

```
GetTime(Hour,Minute,Second,Hundreth);
```

Example, to put hours in h, minutes in m, seconds in s, and 1/100 seconds in x, use this:

```
GetTime(h,m,s,x);
```

"GetDate" and "SetDate" are about the same, except the parameters are a little bit different. Here is the syntax and examples of getting and setting the date:

```
GetDate(Year, Month, Day, DayofWeek);
```

```
SetDate(Year, Month, Day, DayofWeek);
```

To set the date to Wednesday, July 18, 1988, use:

```
GetDate(1988,7,18,3);
```

MS-DOS also assigns dates and times to files, but to save disk space, it compresses it to 4 bytes. The file must be opened to read or write the file's date or time. The 4 byte record type is defined as the "longint" type, but the file can have any type. Here's an example of the syntax for both:

```
GetFTime(filvar,byte4rec);
```

```
GetFTime(filvar,byte4rec);
```

You can't do anything with the 4 byte record because of the way it is encoded, but Turbo provides a way to convert your



date and time to the record and back again. First, you need to input your date and time into a variable defined as a record called "DateTime" provided by Turbo's dos unit. Here's a code segment that packs your date and time into a 4 byte record.

```
Uses dos;
Var dattim : DateTime;
    filetim : longint;
begin
Dattim.year:= 988;
Dattim.Month:=7;
Dattim.Day:=20;
Dattim.Hour:=10;
Dattim.Min:=37;
Dattim.Sec:=44;
PackTime(dattim, filetim);
end.
```

Notice this is only a segment and can't be run stand alone. This works just like the record in typed files. When using "UnPackTime", you use the same syntax, except you reverse the parameters so the "filetim" is first. Then you can access the fields individually, like "WriteLn (Dattim.Month);".

The dos unit also allows you to get two status variables from disks. These two functions allow you to find the total size in bytes available on a disk and the free space on a disk. The first function, "DiskFree", allows you to find the free space on a disk for the disk you specify, 0 being the default or logged-in drive now, 1 being A, 2 being B, 3 being C, and etc. This short program prints out the total and free size left for the current disk drive:

```
uses dos;
begin
Write('Bytes free on current drive : ');
WriteLn(DiskFree(0));
WriteLn;
Write('Total bytes available on current
drive: ');
WriteLn(DiskSize(0));
WriteLn;
end.
```

Since the two are functions, you can use them straight with "WriteLn" without having to use a variable. If you use a variable, make sure it is the type "longint". This means you can manipulate the values, such as dividing by 1024 to make kilobytes.

DOS has a directory searching feature, and Turbo emulates this using two procedures. The first, "FindFirst", searches the specified directory for the first file matching the name specified in the command. The syntax and an example is shown below:

```
FindFirst(Path, Attribute, Search);
```

In the above example, "Path" is a string specifying what you want to search for. This is like a directory mask. The second parameter, Attribute, is a variable defined as a word that, in addition to normal files, files with the attributes specified in "Attribute" and are included in the search. The attributes are shown below and you may mix attributes. The last parameter, Search, is a variable defined as

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the record, SearchRec, which is the output of the command. This has six fields, as shown below:

```
SearchRec = record
  Fill : array[1..21] of byte;
  Attr : byte;
  Time : longint;
  Size : longint;
  Name : string[12];
```

Now we'll go through the five fields. The first field is a reserved field. Never modify this field, because this may scramble the file. The second field, Attr, contains the file attributes, as shown below. The attributes may be mixed. The third field, Time, is a 4-byte packed date and time record, you must use "UnPackTime" to decode it. Size is the size of the file in bytes, and finally, "Name" is the file name.

Once you have searched for a file once, you may search again using the "FindNext" procedure. When using "FindNext", you need only one parameter, the "SearchRec" variable. This, like with "FindFirst", will hold the found item's information, and is a record defined of the "SearchRec" type.

The last two file procedures, "GetFAttr" and "SetFAttr" have to do with the file attributes shown above. "GetFAttr" gets the file attributes for an assigned, but not opened, file defined with a file variable. A program example checking whether a file is read only or read/write is shown below.

```
program FileAttrib;
uses dos;
var fil : file;
```

```
program Intr21A;
uses Dos;
var Regs :Registers; {DOS unit record}
    Strng : String[40];
begin
Strng:='This is writing to the screen.$';
Regs.AH:=9; {DOS Function call 9 is}
Regs.DS:=DSeg; {write string to screen}
Regs.DX:=Ofs(Strng)+1;
MsDos(Regs);
end.
```

Interrupt hex 21's function 9 outputs a string ending with a dollar sign to the screen. More information about the function calls is shown in the MS-DOS Programmer's Utility Pack. Since the variable "Strng" is contained in the data segment, MS-DOS needs to know that. The offset is found out with the "Ofs" function, which gives the offset of the variable in the data segment. The way the function call works, you need the plus one or there will be a random character before the string. Just trust me on interrupts and function calls, and if you ever need help in understanding or using these, write to me.

To use other interrupts, use the "Intr" procedure. This has the same syntax as "MsDos", except it has the interrupt number before the registers "Intr(I#,Registers)". I will go into this in detail.

That is about all for now. If I've gotten you confused in the least, feel free to write to me on anything in Turbo. I WILL answer the mail. In the next article, we'll talk about another standard unit, the CRT unit, that allows you to take advantage of the PC's screen. \*

### Attributes

(These are in hex as shown with the leading "\$", but their names may be used instead)

ReadOnly	\$01	This flag, if set, marks the file for reading only. Writing will produce an error with "DIR".
SysFile	\$04	This flag marks a file as both Hidden and Read Only.
Volume ID	\$08	This flag, which only one file should have on a disk, is the volume label shown at the top of the DIR.
Directory	\$10	This flag marks the file as a directory.
Archive	\$20	This flag is set when a file is updated after the MS-DOS utility "ARCHIVE" is used.
AnyFile	\$3F	AnyFile is the sum of all the above attributes.

```
attrib : word;
sq : string[12];
begin
WriteLn('Enter the file name : ');
ReadLn(sq);
Assign(fil,sq);
GetFAttr(fil,attrib);
if attr and ReadOnly = 0 then
  WriteLn('Read and Writeable');
else WriteLn ('Read Only');
end.
```

To change the file attributes, use the "SetFAttr" procedure. Once again, the file must be assigned, but not opened, and you need a variable defined as a word. To assign variables, just use the names with a standard ":=". To define the variable attrib with ReadOnly, use "attrib:=readonly;". When adding other attributes, separate them with plus signs: "attrib:=readonly+archive;". When actually executing the command, use the syntax:

```
SetFAttr(fil,attrib);
```

Our last group of commands has four procedures in it, but we will only cover two. This is extremely advanced, and when not done correctly, will hang the system. The dos unit allows you to execute an interrupt or DOS function call with the 8088 registers defined at the beginning of the article.

To execute an MS-DOS function call, you can use the "MsDos" procedure. This is calling the interrupt 21H, the standard DOS functions. This example using "MsDos" does the same as "Write".

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# Glitches

Here is a correction for the article "151 to 286" that appeared in the November 1988 issue of REMark. In the third paragraph of the third column of page 12, replace the words "towards you" with "away from you". Then in the next paragraph, when you are instructed to position the backplane board with the component side up, you should also turn the edge with the power connector towards you.

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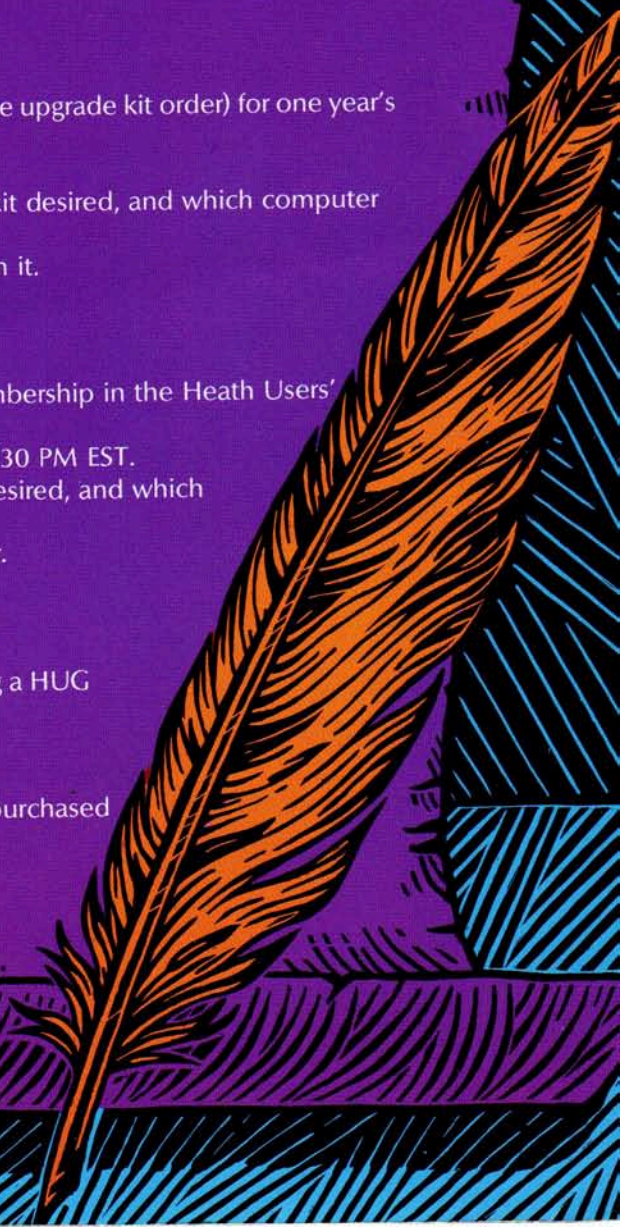
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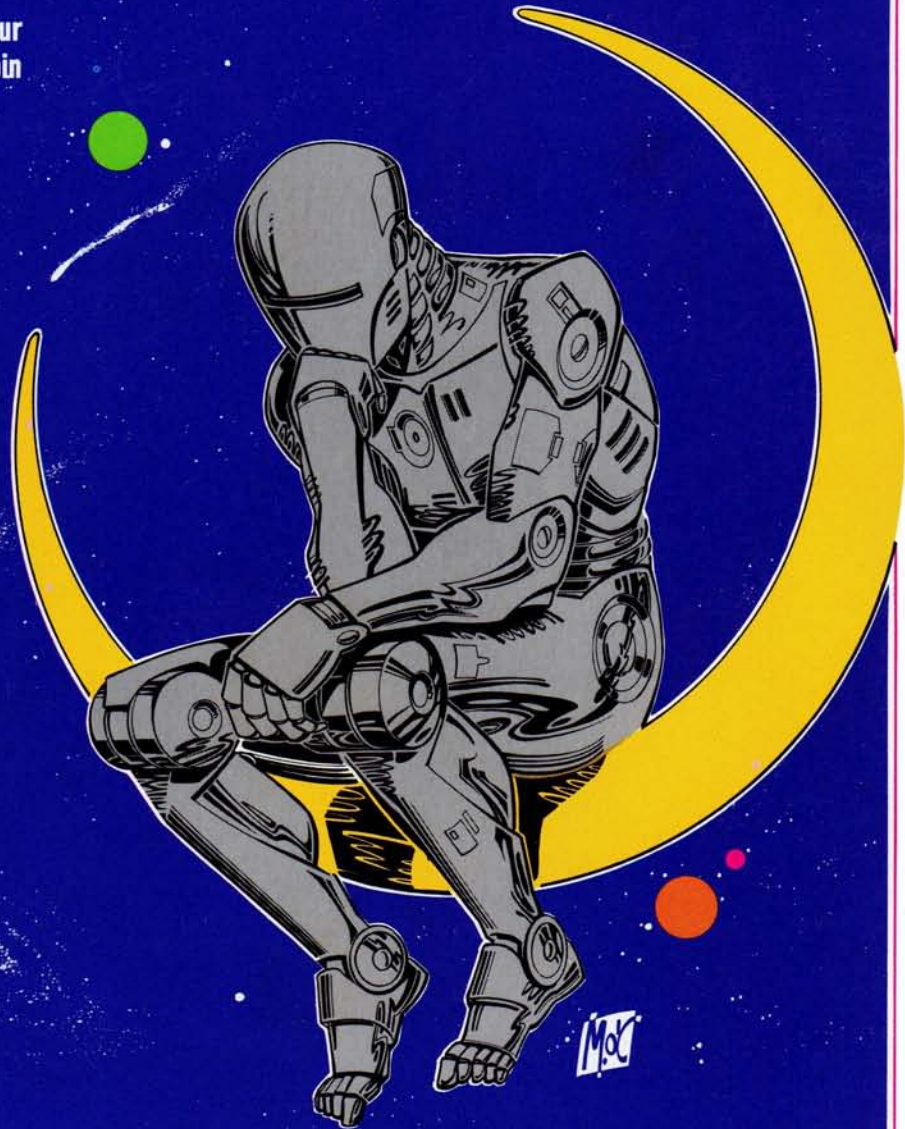
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