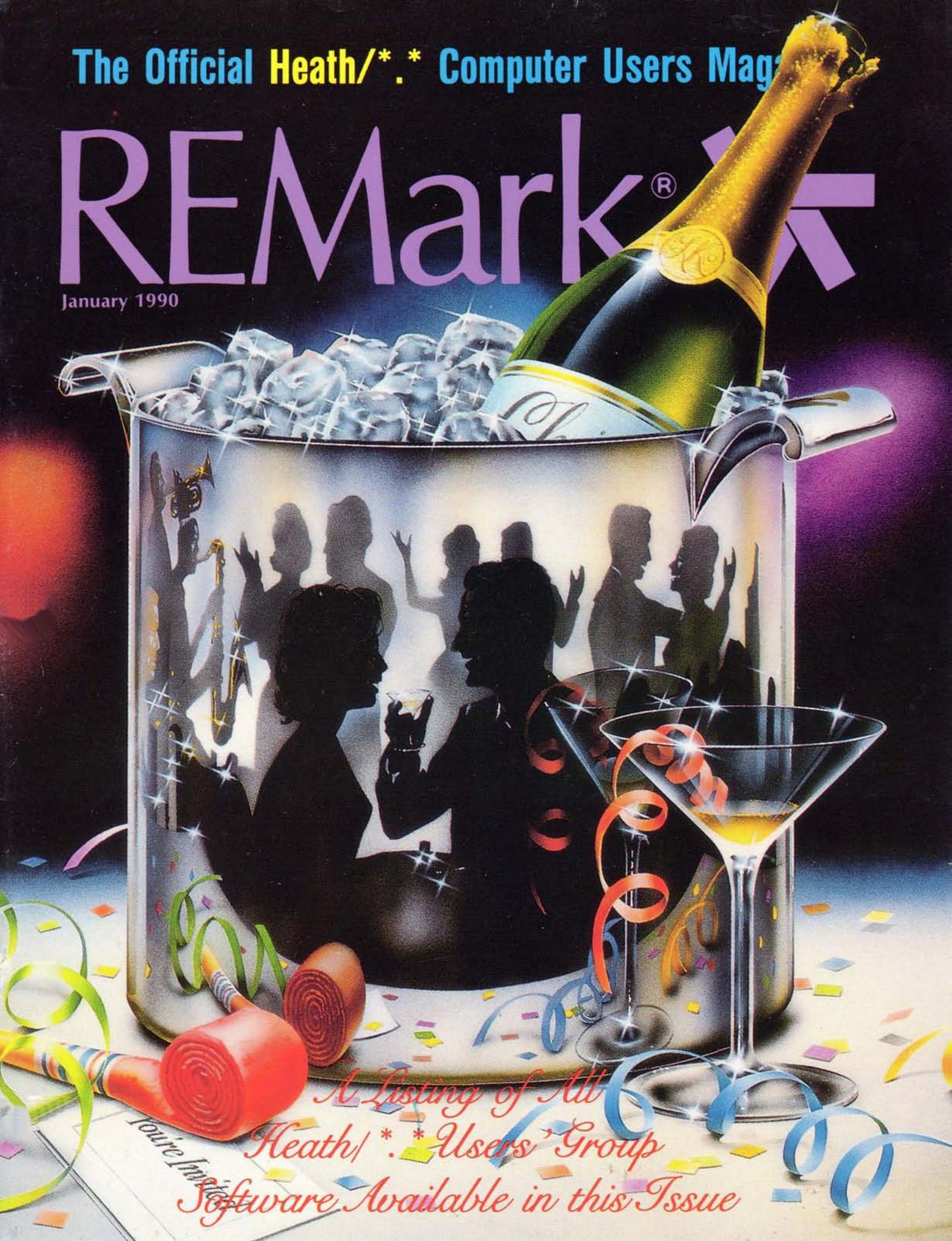


The Official Heath/*.* Computer Users Magazine

REMark®

January 1990



*A Listing of All
Heath/*.* Users' Group
Software Available in this Issue*



"How Can You Take Advantage of Me?"

"... If you don't call? I have everything you could possibly want! My software selection continues to grow, and remains my most popular feature. I'm fast, but, if you don't have the time to download, these software disks can now be purchased for a small copying charge! My message base has also become quite popular. Through it, HUGgies are exchanging more information than ever before. Finally, there's my legendary Bargain Centre. It alone, will make you come back for more! Did you know how inexpensive I am? Why pay \$14 per hour connect time to someone else when your phone company charges less than \$12 per hour (less on weekends) from anywhere within the continental U.S.!

So, go ahead and take advantage of me.

Just set your modem for 300, 1200, or 2400 baud (8N1) and call (616) 982-3956.

You needn't type anything, I'll know you're there!"

M&C

REMark®

Volume 11, Issue 1 • January 1990

PC Compatible

Adding External Floppy Drives (and Other TurbosPort 386 User Tips)	
<i>Ron Siebers</i>	7
Powering Up	
<i>William M. Adney</i>	9
How to Use EMM.SYS	
<i>William M. Adney</i>	49
NUM LOCK off Revisited	
<i>Bill Hall</i>	69
Installation of Hard Drive(s) in a Z-386	
<i>Richard L. Mueller</i>	75

H/Z-100 and PC Compatible

Mouse Capability for ENABLE	
<i>Earl R. Zimmerman</i>	13
On the Leading Edge	
<i>William M. Adney</i>	55
Getting Started With . . . Assembly Language — Part 2	
<i>Pat Swayne</i>	61

H/Z-100

Z-100 Survival Kit #10	
<i>Paul F. Herman</i>	65

General

10 Ways You Can Cause a Computer Failure	
<i>Robert C. Brenner</i>	72

PC Compatibles

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

Resources

HUG Price List	2
Welcome to the Heath/*.* Users' Group	4
HUG Discount List	6
Local HUG Clubs	16
HUG Software Listing	18
Classified Ads	78

<i>Reader Service No.</i>		<i>Page No.</i>
174	Alpha Products	12
196	Covox, Inc.	15
197	DMA Technologies, Inc.	80
104	FBE Research Co., Inc.	17
107	Paul F. Herman, Inc.	68
136	Lindley Systems	54
114	Micronics Technology	14
117	Payload	23
130	QuikData, Inc.	30
193	QuikData, Inc.	15
176	QuikData, Inc.	8
188	Serendipity	14
153	Surplus Trading Corp.	8
149	WS Electronics	38

**Want New & Interesting Software?
Check Out HUG Software**



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Send Payment to: Heath/Zenith Users' Group
P.O. Box 217
Benton Harbor, MI 49022
(616) 982-3463

Although it is a policy to check material placed in REMark for accuracy, HUG offers no warranty, either expressed or implied, and is not responsible for any losses due to the use of any material in this magazine.

Articles submitted by users and published in REMark, which describe hardware modifications, are not supported by Heath/Zenith Computers & Electronics Center or Heath Technical Consultation.

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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HUG

PRODUCT NAME	PART NUMBER	OPERATING SYSTEM		DESCRIPTION	PRICE
H8 - H/Z-89/90					
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
AUTOFILE (Z80 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 (Z80 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
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

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
DUNGEONS & DRAGONS (ZBASIC)	885-3009-37	MSDOS	GAME	20.00
ETCHDUMP	885-3005-37	MSDOS	UTILITY	20.00
EZPLOT II	885-3049-37	MSDOS	PRINTER PLOTTING UTILITY	25.00
GAMES (ZBASIC)	885-3011-37	MSDOS	GAMES	20.00
GAMES CONTEST PACKAGE	885-3017-37	MSDOS	GAMES	25.00
GAMES PACKAGE II	885-3044-37	MSDOS	GAMES	25.00
GRAPHIC GAMES (ZBASIC)	885-3004-37	MSDOS	GAMES	20.00
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
SPELLS	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
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
BACKGROUND PRINT SPOOLER	885-3029	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 II	885-3040	MSDOS	UTILITY	40.00
HELP	885-8040	MSDOS	CAI	25.00
HEPCAT	885-3045	MSDOS	UTILITY	35.00
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
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
Z100 WORDSTAR CONNECTION	885-3047	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
LAPTOP UTILITIES	885-6014	MSDOS	UTILITY	20.00
PS's PC UTILITIES	885-6011	MSDOS	UTILITIES	20.00
POWERING UP	885-4604	N/A	GUIDE TO USING PCS	12.00
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

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.

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. They say it's so easy to use, they didn't even need to look at the manual. "It's the only modem software that I use, and I'm in charge of the HUG bulletin board!" 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

Heath Users' Group

It is our pleasure to present the following information to fellow members and the newcomers to the National Heath Users' Group. The January Issue of REMark will provide you with a list of Local Heath Users' Groups, related publications information, and a variety of small, but useful, tips for contacting knowledgeable individuals who are familiar with Heath equipment.

For The New Member

This issue of REMark will be your first contact with the Heath Users' Group.

The material contained herein represents a good look at the number of people, clubs, and organizations supporting the Heath 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 Users' Group Information

Membership Eligibility

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

As a member, you will receive:

- A subscription to REMark, official Heath magazine.
- A personal identification card.
- The current year's January issue of REMark Magazine. This issue contains abstracts for all the current PC Compatible software in the standard HUG Software Library.

- Access to the Heath Users' Group Software Library.
- Access to the National HUG Bulletin Board System.
- Discounts on a variety of Heath computer products.

These benefits are described in the following paragraphs.

HUG Membership Rates

The following rate schedule applies as of January 1990 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 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 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 Users' Group to participate in the discount program.
2. Your ID card can only be used at your local Heath 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 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 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 Users' Group
P.O. Box 217
Benton Harbor, MI 49022-0217

Publications

REMark, the official magazine for users of Heath 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

We are constantly seeking articles for publication in REMark magazine. If you feel that you have a topic to share with other users, please don't hesitate to call (616) 982-3837 if you need assistance, or more information. Reimbursement for articles is similar to that of other major publications, and is issued upon acceptance of your article.

How to Submit Article to REMark

What Subject?

Feel free to submit article manuscripts on any subject matter that you think will be of interest to the Heath Us-

ers' 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:

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- 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.

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The Heath 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 data base. 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 or 3/\$5.00. Currently, there is over 100 megabytes of software available and this amount is constantly growing!

The most recent addition to HUG-PBBS 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

Continued on Page 15

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Adding External Floppy Drives

Ron Siebers
Woodbury, Minnesota

(and Other TurboPort 386 User Tips)

I work in Corporate Research at 3M Company of St. Paul as a technical writer and department computer support person. Recently, I was asked to order a laptop computer system for one of our researchers. The researcher wanted a fast laptop computer with a large hard drive that he could also use as a desktop computer. For desktop use, he wanted a full-sized VGA color monitor, a 101-key keyboard, a 2400 baud modem, a mouse, and a 5.25" floppy drive for compatibility with existing computers. He also wanted portability, the ability to easily detach the laptop and take it home or to a manufacturing plant for use.

After checking several vendors spec sheets, I found none that had VGA graphics allowing connection of a VGA color monitor, plus the other features we wanted. There probably will be by the time you read this. The SupersPort series from Zenith Data Systems has the optional expansion chassis which would allow use of up to three PC-style slot cards. This would allow an addition of a VGA color card and use of the Zenith ZCM-1490 FTM monitor, a personal favorite of mine.

I considered the SupersPort 286 and TurboPort 386. There turned out to be several trade-offs between the units. The 286 was smaller, lighter, had a connector for an external 5-1/4" floppy drive and had an easily detachable battery pack; but it was somewhat slower than the 386, had an adequate LCD screen, but somewhat inferior to the 386, and could not use an external keyboard. The faster TurboPort 386 came with 2 Meg of memory, supported multi-tasking software and OS/2, had a superior Page White LCD screen, could accept the full size 101-key Zenith keyboard; but did not have an external floppy drive connector, was much heavier, had a less easily removable battery pack and was more expensive.

I chose the TurboPort 386 with the idea I could add a floppy controller to the expansion chassis to run the external 5-1/4" floppy drive. The author felt we did not need battery operation, and so I would remove the battery pack, making the unit 4 or 5 pounds lighter. The TurboPort 386 is Zenith Data System's top of the line laptop computer. It fea-

tures a CMOS 80386 CPU operating at 12 MHz clock speed, a 1.44M 3.5" floppy drive, a 20 or 40 Meg hard drive, "Page White" backlighted supertwist LCD screen, 2 Meg of memory and a parallel and serial port. It has options including a 2400 Baud Hayes-compatible internal modem card, a 1 Meg memory expansion card, a 3-slot expansion chassis for 8-bit slot cards, a connector for a CGA color monitor, a 101-key keyboard or a 24-key keypad addition to the standard 79-key keyboard. I ordered the 101-key keyboard, ZCM-1490 FTM monitor with Paradise VGA-16 color video card, Expansion Chassis, 5-1/4" External Floppy Drive, the new contoured Logitech 3-button mouse, and the carrying case. The researcher also chose to order the new Hewlett Packard Deskjet Plus 300 DPI inkjet printer.

After receiving the system, you can imagine my surprise after reading the expansion chassis manual, that Zenith stated you cannot use a second drive controller card. They correctly stated that a second controller card would have the same interrupt number as the TurboPort internal controller, creating an unusable conflict. I then remembered reading and saving copies of articles in the November 1988 issue of Radio-Electronics and the March 1989 issue of Popular Electronics which described a CompatiCard floppy controller. There may have been mention in REMark also, but I could not find it. This controller has the feature of allowing you to jumper it to any of 4 interrupts, allowing use as a second, third or even fourth floppy controller in a computer. The controller supports up to two internal and two external floppy drives of all current types including 8" drives. Since the article included information on the manufacturer, Micro Solutions, Inc. 132 West Lincoln Hwy., DeKalb, IL 60115, (815) 756-3411; I called them and they confirmed these features, but were not aware of anyone using their card with the TurboPort 386.

I decided to gamble and order the CompatiCard. The 1/2 length 8-bit card has four drive connectors, including a 37-pin D-connector for external drive connection. Since the cable supplied with the 5-1/4" drive had a 25-pin D-connector at one end, it would not work with the CompatiCard. The Zenith Data Systems

dealer Quickdata in Sheboygan, Wisconsin quoted \$109 for the CompatiCard. The 37-pin to 37-pin cable I needed proved difficult to find, so I decided to order the "standard" external drive cable they stocked for an additional \$20. This cable has a 37-pin D-connector on one end and two floppy drive edge connectors on the other end. It includes the IBM standard 4-wire twist to the last connector that identifies the zero or "A" floppy drive.

Installing the CompatiCard

Installation of the CompatiCard in one of the three Expansion Chassis slots was easy after I changed the interrupt jumper to floppy controller 2 according to the CompatiCard manual. The 37-pin D-connector on the new cable connected to its mate on the back of the CompatiCard. I then removed the cover of the external floppy drive and removed the short ribbon cable. It connects from the back of the drive to a 37-pin connector mounted through a cut-out in the rear of the chassis. Removing the chassis connector allowed me to route the new cable through the connector hole and attach the first (untwisted) edge connector to the floppy drive. I had to remove the three screws mounting the power supply heat sink to the bottom cabinet and lift the heat sink up to get enough clearance to install the connector on the floppy drive. I routed the remaining cable along the right side of the drive. I double folded the ribbon so that the second edge connector rested on the drive chassis in a blank space near the front. I completed the external drive connection after remounting the heat sink and the drive cabinet.

The last part of this installation involved copying a software driver called CCDRIVER.SYS to the DOS directory on the TurboPort hard drive and adding a DEVICE=CCDRIVER.SYS command to the CONFIG.SYS file. This allowed MS-DOS to recognize the presence of the second drive controller. After rebooting, I could switch to drive D: and access 5-1/4" floppies. What a thrill to have a gamble pay off! DOS automatically changed the Vdisk RAM drive to E:, giving me drives A:, C:, D: and E: to select from.

The Resulting System

The result of this work was a fast desktop computer system with 40 Meg of hard drive storage, both 3.5" and 5-1/4" floppy capability, over 1.2 Meg of Expanded memory, VGA color graphics on a 14" FTM monitor with its superb anti-reflective screen attributes, a Logitech 3-button mouse (connected to COM 1), built-in 2400 baud modem (COM 2), and an HP Deskjet Plus 300dpi inkjet printer connected to the parallel port. Desktop use has all the normal features including the built-in 40 Meg hard drive, the high density 1.44M/720K 3.5" floppy drive and optional 2400 baud Hayes-compatible modem which configures as COM2. The expansion chassis houses the VGA video card for the FTM VGA color monitor, and the CompatiCard for the external 5.25" drive. The latter allows use of media from other computers and loading programs from new software that supplied 5.25" disks. The printer connects to the parallel port and the mouse to the serial port. The researcher can easily disconnect the expansion chassis, the printer, the computer AC power supply and the mouse; pack up the computer, mouse and AC power supply in the carrying case and take them elsewhere for use. While this system was certainly more expensive than a desktop system, it was less expensive than two separate high performance computer sys-

tems, which is why I chose to go this route.

One potential problem is the change from using the built-in monochrome LCD double scan CGA screen to the VGA color monitor. This turned out to be less of a problem than I thought it would, for two reasons. Reason one is the foresight of the Zenith designers to provide an auto-sensing dual set-up menu system in the ROM. You set up the normal laptop operation in one menu screen and then another full set-up menu screen when connected to the expansion chassis. When you push the "start" button, the TurboSport automatically checks for connection to and power on in the expansion chassis. If detected, the alternate set-up is loaded; if not, the main set-up is loaded. The set-up menu also features the ability to lower the battery power draw during portable use by configuring automatic shutdown of certain systems. The hard drive and display backlight can be set to shut down xx seconds after no use. The modem circuit can be shut off if you are not going to use it. This maximizes the battery life and helps you run longer than most competing 386 laptops. The second reason is that many business software programs use set or configure modules that allow alternate configurations to be loaded. Lotus 1-2-3 is an example, using the 123.set module normally, but allowing you to name a dif-

ferent set-up module call when you load the program.

The HP Deskjet Plus Printer

This new product from Hewlett-Packard is a fast, quiet inkjet printer that provides high quality 300 dpi printouts comparable to the laser printer output from the very popular HP Laserjet II, but at less than 40% of the cost. The Deskjet Plus lists for \$995, can be ordered by mail for less. This is an improved version of the original Deskjet that has been available for about a year and a half. The Deskjet Plus has several significant improvements over the previous model, the most important of which is faster output. Text printing is up to twice as fast, and graphics printing up to 4 times faster. It includes 6 sizes of the Courier font in portrait mode and 4 sizes in landscape mode. Landscape printing required an expensive font cartridge in the previous model. A variety of font cartridges are available for the Deskjet Plus, some of which won't work on the old Deskjet. Font sizes now go up to 30 point, larger than previously possible. The major problem with new printers is the time lag to get printer drivers for the popular business software. HP includes some drivers with the printer, the previous Deskjet driver will work if your existing software has one and you can order an optional Epson FX-80 printer emulation

Continued on Page 74

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Powering Up

Volume 2

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Using Special Zenith and MS-DOS Key Sequences

By now I hope everyone is familiar with the key sequence required to boot a computer: CTRL-ALT-DEL. As it turns out, there are a lot of special key sequences in MS-DOS, and Zenith has added a number of special key-sequence commands, like CTRL-ALT-INS, that do certain things on most Zenith and Heath computer systems. This article includes a discussion of the general key sequences available in DOS, which can be used on any MS-DOS computer. You will also see how to use some of the DOS key sequence commands in a practical way which I hope will give you ideas on other uses. The special Zenith commands that are actually part of the ROM Monitor are only available on Zenith and Heath computers, except for the eaZy PC and the Z-171 laptop.

To be sure that everyone understands some fundamentals of when and how to use these key sequences, let's begin with a look at keyboards.

Keyboard Differences

There are a lot of funny, or not-so-funny, stories and cartoons about beginning computer users and keyboards, depending on your point of view. My favorite cartoon is about the "Strike any key to continue" message. This cartoon shows a computer displaying that message with an intensely irate user standing over the keyboard with a HUGE hammer. That's one way to follow instructions, but I don't recommend it. Even long-time computer users get frustrated (at least I do) with this particular message because it usually is preceded by an error message saying that you can't do what you want to do.

There is also the ever-popular (and true!) story that virtually all technical support departments receive about this message. Picture a first-time computer user who has just taken a brand new computer out of the box, powered it up (after reading the instructions of course), and sees a

message to "PRESS ANY KEY TO CONTINUE." Then, this first-time user spends a considerable amount of time reading the manual and searching the keyboard for a key labeled ANY KEY. Since that key label cannot be found, and there is no information in the manuals about what ANY KEY is, the user eventually calls or writes to a technical support department about the problem. What this message really means is to press any *character* key, and I usually recommend typing the SPACEBAR to respond to this prompt. Yes, a space is a character, and I personally like to use the SPACEBAR because it is large and easy to find. In talking with lots of technical support folks, nearly every one of them has a story concerning this message, and I have been asked this same question too. That's one of the problems with developing software and writing about computers — sometimes it is difficult to know where to begin. For that reason, I always try to include sufficient detail in all articles so that just about everyone can figure out how to use the ideas, suggestions, and concepts on their own systems.

At first glance, many keyboards may look the same, but they are not. When you talk about keyboards, most people usually define them in terms of how many keys are available. In general, there are two basic groups of keyboards: 84-key and 101-key. The 84-key unit may actually have 83, 84 or even 88 keys, but I will identify it as an 84-key unit in this article. The standard 84-key keyboard is generally easy to identify because the Function Keys F1 through F10 are located in two rows on the left side.

The second group of keyboards is generally referred to as a 101-key (IBM calls it "enhanced", but a lot of other people don't) keyboard, even though it may also contain more or less than 101 keys. The standard 101-key keyboards are generally easy to identify because they have 12 Function Keys in a row across the top

and an additional cluster of keys (arrow keys, etc.) inserted between the keypad and the main keyboard. For purposes of this article, it is important for you to clearly understand which kind of keyboard you have and know how to use it.

The 101-key keyboard has a couple of features that you can use in place of some of the DOS key sequences. For example, most 101-key keyboards have a PAUSE key that can be used instead of CTRL-S. Most 101-key keyboards also have a *dedicated* PRINT SCREEN key, instead of the combined asterisk (*) and PRT SC key that was located on the keypad on most 84-key units. And most 101-key keyboards also have a PAUSE key that stops screen scrolling just like CTRL-S. But there is one other important difference in various keyboards, other than just the number and names of the keys.

The keyboard class. There is a technical difference between keyboards designed to work with 8088-based computers and those keyboards that work with 80286 and 80386 computers. I call it the keyboard class. Practically speaking, you cannot use an 84-key keyboard from an 8088-based computer, such as a Z-150, and use it on an 80286 (e.g., Z-248) or 80386 computer because it simply will not work. The reverse is also true. In other words, there is a PC-keyboard class and an AT-keyboard class. For 84-key keyboards, one of the easy ways to determine the class of keyboard is to look for a key label like "SYS REQ" (system request). The 84-key PC-class keyboard does *not* have the SYS REQ key, but the AT-class does. If you are interested in learning more about keyboards and their differences, you can refer to my "On the Leading Edge" column beginning on page 11 of the May 1989 REMark.

The keyboards that I have mentioned so far are specific to desktop computers, but to complicate matters, there is also a third group of keyboards — the ones you

will find on laptop computers. Even though you will find a general degree of standardization on keyboards for desktop computers, there is still a considerable difference in key placement, depending on the manufacturer. For laptops, there is very little standardization because manufacturers try to cram all of the required keys into a smaller physical space. Each manufacturer has different ideas on how a laptop keyboard should be designed, and key placement and usage can range from a little different (compared to a desktop system) to nearly unusable. All things considered, I think the SupersPort 286 keyboard is pretty well designed, except that I wish Zenith would put the CTRL key back beside the A key where it belongs, or at least provide a switch that will interchange these keys. In any case, you may need to refer to your Owner's Manual on how to use some of these key sequences on a laptop system.

Using the Keyboard

To be sure that everyone is beginning at the same place, let's review the convention used in nearly all manufacturer's manuals to describe how these key sequences are entered. When you see a key sequence, like CTRL-ALT-DEL or ALT-Z or CTRL-S (sometimes shown as ^S, where the caret (^) means CTRL), you should press and hold the first one or two keys named. For CTRL-ALT-DEL, press and hold both CTRL and ALT, then type (as in a momentary press and release) the DEL key. In the second example (ALT-Z), you press and hold the ALT key, then type the Z on the keyboard. In the third example (CTRL-S), you press and hold the CTRL key, then type the S on the keyboard.

The important point to remember about this convention is that both CTRL and ALT are *modifier* keys, which change the meaning of a key just like the SHIFT key. When you type the letter "A" shown on the keyboard, it will be displayed as a lowercase "a". When you use the SHIFT-A sequence, it will be displayed as an uppercase "A". CTRL and ALT work the same way. Of course you normally don't expect to see a capital A keystroke represented as SHIFT-A because the case of the letter is understood by the symbol itself.

General and Zenith-Specific Commands

Before we jump into how to use all of these key sequences, it is important to understand that there are two different kinds of commands included in this article. The first kind, general commands or key sequences, are part of virtually all DOS versions and will work on any brand of computer that uses DOS. The second kind, Zenith-specific hardware commands, are part of the computer's ROM and will work as described only on a Zen-

ith or Heath computer. These commands will not perform the functions discussed here on any other brand of computer. Most of the general commands can be used on all DOS-based Heath and Zenith computers, including the Z-100, so we will begin with these standard key sequences.

General Commands

All commands and key sequences described in this article have been tested on a number of different Heath and Zenith computer models using MS-DOS 3.3 Plus. Because most commands are part of DOS (i.e., not in the ROM), they should work in the way described for just about any DOS version or brand of computer. However, I would encourage you to experiment with these commands so that you will know how your specific system (and keyboard) responds to these commands.

Many computer users are not aware that there are a considerable number of CTRL-key sequences that can be used to perform different things. Some users know about CTRL-P (or CTRL-PRT SC) that can be used to echo the DOS display to the printer, but there are a lot of other CTRL-keys that can also be used. In fact, there are really four types of general commands: Substitute commands, Scrolling commands, Printing commands, and Other commands. Substitute commands — those special CTRL-key sequences that can generally be used to substitute for other labeled keys, such as the BACKSPACE — are shown in Figure 1.

Key Sequence	Function
CTRL-C	Abort command — same as CTRL-BREAK or CTRL-SCROLL LOCK
CTRL-H	Same as BACKSPACE key
CTRL-I	Same as TAB key
CTRL-J	Line Feed — same as CTRL-RETURN
CTRL-M	Same as RETURN (ENTER) key
CTRL-Z	ASCII End-of-file character — same as F6
CTRL-[Same as ESCape key

Figure 1
Substitute Commands

A couple of important notes about all of these CTRL-key sequences and this discussion. First, these commands are described in terms of how they control the screen display and programs when they are used on the DOS command line or during execution of a program supplied as a part of DOS. For example, CTRL-C will abort (i.e., cancel) most DOS programs during execution (e.g., DIR, FORMAT, batch files, etc.), but the CTRL-C command has a completely different meaning in some application programs (e.g., WordStar). Second, I encourage you to experiment with these commands in order to

really understand how they can be used in your system, and in most cases, the DIR command is a good example because it can be used to demonstrate most of the CTRL-key features.

In virtually all DOS-based computers, CTRL-C can be used to abort most DOS commands and batch files during execution. That's useful if you have entered a command, such as DIR or COPY, and find that it is not doing what you expected. Most PC compatible computers also allow the CTRL-BREAK key sequence where the word "BREAK" is usually found on the SCROLL LOCK key as a reminder. For that reason, some documentation refers to the CTRL-BREAK sequence as CTRL-SCROLL LOCK, but I have always thought that was clumsy and difficult to remember. I think it is much easier to remember CTRL-C which, as a general rule, can be used interchangeably with CTRL-BREAK. For touch typists, it is generally easier to type CTRL-C because it requires less hand and finger movement.

If you looked at Figure 1 carefully, you probably noticed that there are several CTRL-key sequences that perform the same functions as other labeled keys on the keyboard. CTRL-H works just like the BACKSPACE key to delete a character to the left of the cursor when editing a DOS command line or a subcommand in EDLIN or DEBUG. CTRL-I works just like the TAB key to insert a tab character (effectively eight spaces on the screen) and can be used for that function when using EDLIN to edit an ASCII file.

The CTRL-J (Line Feed) command does exactly what its name implies — it moves the cursor to the next line on the CRT, but does not send the line to the command processor for execution like the RETURN key (or CTRL-M) does. I have found it occasionally useful when entering a long command where I want to see everything on the same line or in editing an ASCII file with EDLIN where I don't like the line breaks that EDLIN uses. The CTRL-J command can be useful if you need to enter a command longer than the screen display (80 characters), and you want to see specific parts of the command shown together. For example, the DOS command line can contain up to 128 characters, and some forms of the BACKUP command can get quite involved, so that it is easy to split the lines containing the *from* parameters and the *to* parameters. For PC compatibles, you can also use the CTRL-RETURN sequence, as well as CTRL-J. I encourage you to try this particular command at the DOS command prompt.

CTRL-M performs essentially the same function as the RETURN (sometimes called ENTER) key and can be used to execute a DOS command line. Some application software, like SuperCalc, may

also interpret these key sequences in exactly the same way, and it is sometimes useful to know that there are "alias" key sequences that can be used in place of the usual dedicated keys. For example, I had a keyboard problem one time that resulted in no response from the RETURN key — the switch for that key had suddenly stopped functioning when I was in the middle of working on something in a SuperCalc file. After trying several things in an attempt to save the data I had been working on, I remembered that CTRL-M should act like the RETURN key to execute SuperCalc's /Save command. I was able to save the file and exit from SuperCalc in almost the normal way, which saved me a considerable amount of time in recreating what I had done. Although this kind of situation is admittedly rare, it is one example where this kind of information can help save lots of time. This kind of information is also necessary in setting up some kinds of files where you must have one of these commands, but the program will not accept the labeled key.

Two other general commands are sometimes useful. CTRL-Z (same as F6 on a PC compatible) generates the ASCII End-of-file character that is required to use the COPY CON command described on page 52 of the original *Powering Up* book. And sometimes it is useful to know that CTRL-[(left bracket) is functionally the same as pressing the ESCAPE key. When used on the DOS command line, the ESCAPE key voids or cancels the current template as discussed on page 39 of the original *Powering Up* book. Because the same character sequence is generated by pressing ESC and CTRL-[, some software will accept either command.

Scrolling Commands

There are several ways to control screen scrolling when it occurs with commands that generate screen displays longer than the number of lines available on the CRT. The DIR command even has the /P (Page) switch that stops the screen scroll so you can read a long directory display. You can also use the MORE filter to stop the screen display with command piping, such as:

```
DIR | MORE
```

There are occasions, such as a long display using DEBUG or the TYPE command or even DIR, when it would be more convenient to use a keyboard command to stop the scrolling. Fortunately, there is such a command, and CTRL-S is easy to remember because the "S" means to Stop scrolling. To continue the display, you press any character key, and I like to use the SPACEBAR for this as mentioned earlier. Apparently, this is such a useful feature that it has also been implemented in other ways, depending on which key-

board you are using, but I find that it is much easier to use CTRL-S (and the SPACEBAR) because it is easier to type and find, especially on a laptop. The screen scrolling commands are summarized in Figure 2.

Key Sequence	Function
CTRL-S	Stop screen scroll — Same as CTRL-NUM LOCK or PAUSE (Press any character key to restart scroll)

Figure 2
Scrolling Commands

Most PC compatible keyboards also allow the use of CTRL-NUM LOCK to stop scrolling. And virtually all 101-key keyboards also have a PAUSE key that performs the same function. Regardless of which keyboard you are using, you can still press any character key, like the SPACEBAR, to resume the screen display.

Printing Commands

There are actually two different ways to print a CRT display. The first is a hardware function contained in the ROM that allows you to "dump" the screen display to a printer. For those who like technical details, this function is implemented as INT 5 in PC compatible ROMs. This "screen dump" function is particularly useful for printing the values displayed by the SETUP command in 80286 and 80386 computers. If you don't have a printed listing of the SETUP values for your computer, you may find it quite difficult to set up the system when the backup battery eventually fails.

Before getting into the key sequences used for printing the screen, there is one important note about using these functions. Printers that do not support graphics in the "normal" mode, such as Epson printers, will display graphic lines as italicized alphabetic characters. For those who have at least 80286 computers, the SETUP screen that is printed with this function will not have the nice graphics lines that are displayed on the screen. That's because many printers have other functions that are more oriented towards word processing than graphics. In the technical sense, these characters are actually stored in a printer's ROM, and some printers, like the Epson, use that memory to store the italics and other characters. Other printers, such as the IBM Graphics Printer, use those same character values for graphics instead of italic characters. And some printers, like the Epson FX-850 that I recently bought, have the capability to switch between a text mode and a graphics mode.

How you actually use the screen dump feature depends on what keyboard you are using. On the old 84-key keyboards, there was an */PRTSC key that

was usually located on or near the keypad. For these keyboards, the usual command to dump the screen is SHIFT-PRTSC. Most of the new 101-key keyboards have a dedicated key labeled something like PRINT SCREEN, so all you have to do is press that key to send the display to a printer. I suggest you take some time to figure out how this works on your keyboard because you never know when you might need it. For example, you might be right in the middle of working when, for some reason, the system suddenly appears to freeze. If you haven't saved your work to disk recently, you may lose it, but there is one chance. Because the screen dump function is part of the hardware, you may be able to save part of your work (whatever is displayed on the screen) on the printer by using this feature. Just be sure that the printer is powered on and has paper before you try it. Sometimes it works and sometimes it doesn't — it depends on what caused the system to freeze in the first place. I have used this trick with about a 50% success rate to recover some data from a system freeze.

The other useful print feature provides the capability to echo the screen display to a printer. CTRL-P, or CTRL-PRTSC, will echo whatever is displayed on the CRT to the printer, including the DOS prompts. This is particularly useful to keep a directory list of the files on a disk with that disk, although I normally use another technique for reasons that will become obvious in a minute. To turn off the echo feature, just use the CTRL-N (such as in No printing) command. The various print control CTRL-KEY sequences are summarized in Figure 3.

Key Sequence	Function
SHIFT-PRTSC	Screen dump to printer (84-key keyboard)
Print Screen	Screen dump to printer (101-key keyboard)
CTRL-P	Echo display to printer — Same as CTRL-PRTSC
CTRL-PRTSC	Echo display to printer — Same as CTRL-P
CTRL-N	Cancel printer echo (started by CTRL-P or CTRL-PRTSC)

Figure 3
Printing Commands

One caution about using these commands for printing — be sure that your printer is powered on, online, and has paper ready for printing. Otherwise, your system will appear to "freeze" and may not accept any additional commands. If you forget to turn on the printer, you can usually turn it on after entering these commands to recover from the apparent freeze.

In order to avoid a situation where the CTRL-P/CTRL-PRTSC feature some-

Continued on Page 77

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Introduction

Back in the February 1988 edition of REMark, I wrote an article on how using a Paul Herman's Mouse Driver Package greatly improved my productivity with the Z-100 version of Enable 2.0. I thought it was great how I could call up the top line menu or pull down a menu and select a command with the click of a button. However, I found that software companies just weren't making Z-100 versions of the more popular software packages and there were no plans to upgrade the Z-100 version of Enable. Alas, I said goodbye to my old friend and bought an IBM compatible Zenith computer and the PC Version of Enable. One of the prices I had to pay for changing computers was that I had to give up using a mouse with Enable, because there wasn't a commercially available or public domain mouse driver that would work. However, my decision proved to be correct when I received a copy of The Enable Times, which Enable Software sent me. The Enable Times had an advertisement for a mouse menu driver from a company called Topotech. I decided to try it. I'm glad I did because it is a vast improvement over the mouse driver I used with my Z-100.

One of the nice features of the mouse menu driver is that there are separate menus for Enable versions 2.0, 2.15 (government version), and Enable 3.0 (Enable OA) on the same disk. There are also monochrome and color menus for each version. In addition, you can order the driver for either a Logitech Mouse or a Microsoft Mouse. This article will mainly highlight the features found in the Logitech Mouse version of the Enable 2.15 menu. I'll assume you are an avid reader of REMark and have read some or all of George Elwood's excellent articles on Enable and are somewhat familiar with the various integrated packages. After all, why would you be reading this article if you didn't own Enable?

Requirements and Installation

In addition to having one of the aforementioned versions of Enable, you must have version 3.4 or higher of the Logitech Plus Package. The driver is not guaranteed to run on versions lower than this. This could result in an additional investment of \$39 if you need to order an upgrade from Logitech. For the latest upgrade prices, you can call the following toll free number (800) 231-7717, in California call (800) 552-8885. You must have the Plus Package because the menu driver requires the CLICK command.

You also need to make some changes to your AUTOEXEC.BAT file in order to use the mouse menu. Normally, the MENU.COM file (which loads the menus) sets aside 5,000 bytes for your mice menus, however, since the Enable menu is large, it requires 20,000 bytes. Consequently, you must enter a memory parameter of /20 to MENU.COM as follows:

```
MENU /20
```

You also have to add the CLICK command in the next line of your AUTOEXEC.BAT file. In short, CLICK configures mouse hardware so an application that needs the mouse can read the signals the mouse sends.

In addition, depending on what mouse driver version you are using, you may also have to update the CLICK.SRC file according to the instructions given in the READ.ME file on the disk and in the Logitech manual.

Menu Features

The mouse menu covers over 98% of the commands used in Enable, including the expert commands. As much as I love using Enable, I still have a hard time remembering some of these expert commands, I find I have to check the reference card or I just use the top line menu. It's much quicker to click a mouse than depress a couple of keys.

The mouse menu takes over as soon as you reach the Enable sign-on screen. You can get a file, run one of a possible 36 macros you may have created, call up a default menu you have created, or the help screen for the sign-on screen. There is also an option called MOUSE INFO. When MOUSE INFO is selected a screen will pop up telling you what the various mouse keys do.

The left mouse button serves the same purpose as the RETURN (ENTER) key, the middle button calls up the Popup Menus, while the right button key serves as the ESCAPE key. When the left and right buttons are depressed together, the Enable Top Line Menu (F10) appears. When the left and middle buttons are depressed together, the screen Pages Down. When the middle and right buttons are pressed simultaneously the screen Pages Up.

Word Processing Features. The word processing menu is excellent. It allows you to call up help screens, function key help screens, the Enable (F10) top line menu, position the cursor, and set hanging indents. Secondly, you can also display features found in profiles, i.e. comments, page breaks etc., print files (Alt/F2 or Print Setup), toggle between draft and final mode, call up special attributes or spelling checker, as well as set line spacing (1-6 lines), use special character sets, and center a line. In addition, you can also perform all the delete, find, save, and block functions that are found in the Top Line Menu.

What's really sharp is the windows function. You can open, close, go to, copy, and size windows, as well as determine their status. You even have easy access to the File Directory functions and extended functions. Finally, like the menu that can be called up at the sign-on screen, you can run up to 36 word processing macros you have created and get information on what the mouse keys do.

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Spreadsheet Features. The spreadsheet menu is also well done. Like the word processing menu, it allows you to call up help screens and function key help screens, perform windows commands listed previously, split windows, access the file directory and Enable Top Line menu, and run up to 36 macro commands. I've found no problems with the window feature when going from one Enable module to another. In fact, that's how I'm writing this article. I keep two windows open. After performing a spreadsheet function, with the mouse driver in window #2, I jump back to the word processing document in window #1 and update my document.

The spreadsheet portion of the driver also has its own unique features. The HOME and GOTO Functions enhance cursor movements, while the INSERT and DELETE features insert or delete columns or rows. The LIST function lists formulas or range names. The CALC feature is used when you set your global spreadsheet calculation to manual as opposed to automatic recalculation. Selecting this option calculates all the formulas on the spreadsheet when you are done making changes. The SWITCH function is used to jump between the halves of a split window in a spreadsheet. It performs the same function as the F6 Function key in the spreadsheet module. There are also additional features that let you edit cells, center labels and numbers, set ranges, or copy and move information.

Setting ranges, copying or moving portions of a spreadsheet is very easy with the mouse driver. First, select either range, copy, or move from the mouse Top Line menu. A dialog box appears that tells you that when Enable is in the point mode, use the middle button to anchor the cursor and the left mouse button to set the range. Secondly, follow this instruction when selecting the from and to ranges. There is no need to manually enter the ranges.

DBMS Features. The DBMS portion of the mouse driver is also top notch. It is very useful in designing databases and input forms, but it really shines when you reach the DBMS Command Chart. If you depress the middle mouse button, a mouse driver Top Line menu will appear. It is very similar, but better than the Enable Top Line menu.

Like the Enable Top Line menu, the master DBMS mouse menu has display options, edit options, batch options, and window (MCM) options. However, it also has a utility option. Some of the features under the utility option include: archive, backup, destroy, export, rename, and restore. Enable Software should have had the foresight to add this to the Enable Top Line menu. In addition, it has the help, directory, macro, and Enable Top Line options I mentioned previously.

There are also numerous submenus in the DBMS portion. There is a menu for the Add, Edit, and Verify functions. From this menu, you can access help on function keys and the help index, erase information in a particular field (DEL RESPONSE function), erase changes you made to a record (IGNORE function), access windows or macros, or goto the next, present, or last record, and save your entries.

Especially nice is the menu you can use when you are displaying the records in a database. With this menu, you can control the cursor movements, mark records, clear marked records, and edit a field in a record. This menu also includes all the features I listed under the master DBMS mouse menu.

Telecommunications Features. The telecommunications features are average. It is not surprising, because Enable did not design many telecommunication functions to work with function keys or expert commands. The mouse driver supports going to a word processing file, hanging up the phone, breaking signals to remote computers, data capture features, selecting terminal displays, turning the printer on or off, as well as accessing the Enable Top Line menu and macros. Also, from the main menu of Enable you can select TP files to reach any setups you may have created. However, more could be done from a mouse menu. For instance, there could be an option much like the Tele option in the Enable Top Line menu. You should be able to select automatic answer, call, or hangup. There should also be a feature similar to the Enable Files option where you can request files be uploaded or downloaded, as well as the communication protocol you wish to use.

Conclusion

The Enable mouse driver is a real productivity improvement for Enable. While there are some shortcomings in the telecommunication module, the other modules more than compensate for them. The mouse driver is also well supported as the author recently upgraded it for use with the three dimensional spreadsheet in Enable OA. The only other major drawback to the mouse driver is that you must have at least version 3.4 (Plus Package) to use this driver. Also, the price may scare you away because it retails for \$69.00 + \$2.50 shipping and handling. However, Topotech offers a substantial price reduction if multiple copies are ordered or a site license is purchased.

Ordering Information

Topotech Inc.

3209 East Lee Street

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Versions are available for the Logitech and Microsoft Mouse.



Continued from Page 6

it appears (including any spaces and information afterwards) on your HUG ID card, or REMark mailing label. If your membership is registered to 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 lowercase letters in entering this data.

- 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.
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Special Interest and Local HUG Groups

One of the best sources for information and help is the Local Heath Users' Groups, which are becoming a major voice for the Heath user community. Many of the local groups can be contacted through your nearest Heath Computers & Electronics Center. These stores can usually provide you with the necessary contact information.

Heath Related Publications

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

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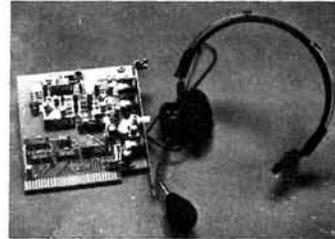
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Northwest Arkansas Microcomputer Users' Group
Rt. 4, Box 376
Springdale, Arkansas 72764-9307
Voice: (501) 361-2963
BBS: N/A
Contact: Bill Shook
Times: 3rd Saturday of Month, 1:00pm
Location: Northwest AR Votech School
Springdale, AR

California

San Diego Heath Users' Group
(Affiliated with San Diego Computer Society)
P.O. Box 33046
San Diego, California 92103-0340
Voice: (619) 272-2115
BBS: (619) 560-8929
Contact: Bob Frye, President
Times: 1st Wednesday of Month, 7:30pm
Location: Kearny Mesa Recreation Ctr.
3170 Armstrong Street, S.D.
Between National Guard Armory
and Mesa College

Florida

Northwest Florida Heath/Zenith Users' Group (NWFHUG)
P.O. Box 3275
Fort Walton Beach, FL 32548
Voice: (904) 863-3456 or
(904) 682 6013
BBS: N/A
Contact: John White, President or
Allen White, Vice President
Times: 2nd Wednesday of Month, 6:30pm
Location: SAIC Office Bldg.,
1247B North Eglin Parkway,
Shalimar, Florida

Kansas

Wichita HUG Group
3801 West 13th #401
Wichita, Kansas 67203
Voice: (316) 838-9301 Ext. 209 (Work)
(316) 943-4820 (Home)
BBS: N/A
Contact: John E. Reese
Times: 2nd Thursday of Month, 7:30pm
Location: Call for Location

Louisiana

New Orleans Heath Users' Group (NOHUG)
P.O. Box 640561
Kenner, Louisiana 70064
Voice: (504) 737-4295 or
(504) 652-7408
BBS: (504) 467-9896
Gene Brandt, SYSOP
Contact: David Rainey, President
(504) 652-7408 after 5:00pm
Times: 2nd Thursday of Month
Location: Heath/Zenith Elec. Center
1900 Veterans Boulevard
Kenner, LA 70065

Missouri

S.L.H.U.G.
Shirley Rubenstein, Secretary
1000 Olde Coventry Drive
St. Charles, Missouri 63301
Voice: (314) 946-2639
BBS: (314) 291-8653
Contact: Shirley or Monte Rubenstein
(Librarian)
Times: 3rd Thursday of month, 7:00 pm
Location: 3794 McKelvey Road
Bridgeton, MO 63044

Microcomputer Users' Group of Kansas City
P.O. Box 411436
Kansas City, Missouri 64141-1436
Voice: (816) 587-8820
BBS: (913) 362-9583
Contact: Carl Mutch
Times: 2nd Saturday of Month, 1:00pm
Location: 9100 West 91st Place
Kansas City, MO 6414

New Hampshire

Computer Explorations, Inc.
P.O. Box 3128
Nashua, New Hampshire 03061-3128
Voice: (603) 673-6040
BBS: (603) 883-4466
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/Zenith Users' Group (SHUG)
c/o Heath/Zenith Computers & Electronics
1013 State Highway #35-north
Ocean, New Jersey 07712
Voice: (201) 775-1231 (Heath Store)
BBS: (201) 775-8705 (2400/1200 baud)
Contact: Rich 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, 7:45pm
Location: Heath/Zenith Elec. Center
1013 State Highway #35-North
Ocean, NJ 07712

New Mexico

Albuquerque Zenith/Heath Users' Group
2818 Carolina NE
Albuquerque, New Mexico 87110
Voice: (505) 884-9108
BBS: (505) 298-4234
Contact: Mark Kroska
Times: 7:00 pm
Location: Northside Presbyterian Hospital
5901 Harper Drive, NE
Albuquerque, NM

New York

Rochester Heath/Zenith Users' Group
937 Jefferson Road
Rochester, New York 14623
Voice: (716) 424-2560
BBS: (716) 424-2576
Contact: Ron Doerschug, President
Lanse Tryon, Editor
Dick Gosler, SYSOP
Times: Last Tuesday of Month
Sept. thru June, 7:30pm
Location: Heath/Zenith Elec. Center
937 Jefferson Road
Rochester, NY 14623

North White Plains HUG

c/o Heath/Zenith Electronics Center
7 Reservoir Road
North White Plains, New York 10603
Voice: (914) 761-7690
BBS: N/A
Contact: Janusz Piotrowski, Treasurer
Times: 2nd Thursday of Month, 7:30pm
Location: Heath/Zenith Elec. Center
7 Reservoir Road
North White Plains, NY 10603

North Carolina

Western Piedmont Heath Users' Group

c/o Bill Poteat
Rt. 2, Box 371
Morganton, North Carolina 28655
Voice: (704) 584-3684 or
(704) 754-5002
BBS: (704) 437-4378
Contact: Bill Poteat or Gary Suddreth
Times: 1st Friday of month, 7:30pm
Location: Western Piedmont Comm. College
Morganton, NC

Ohio

Dayton Heath/Zenith Users' Group (DAYHUG)

P.O. Box 33070
Dayton, Ohio 45433
Voice: (513) 429-1432 or
(513) 233-0170
BBS: (513) 429-5818
Contact: Keith Greer or Guy Hunter
Times: 3rd Thursday of Month, 4:15pm
Location: Air Force Institute of Tech.
School of Engineering
Building 640, Area B, Rm 121
Wright-Patterson AFB, Ohio

Oregon

Portland-Vancouver HUG

550 N. Fremont
Portland, Oregon 97227
Voice: (503) 288-1674
BBS: (503) 654-7161
Contact: David Moeser, News Ltr. Editor
Times: 1st Thursday of Month, 7:00pm
Location: Heath/Zenith Elec. Center
10115 S.W. Nimbus Avenue
Tigard, OR 97223
(503) 684-1074

Pennsylvania

Central Pennsylvania HUG (CPAHUG)

15 Garland Court
Carlisle, Pennsylvania 17013
Voice: (717) 243-1641 or
(717) 776-6765
BBS: N/A
Contact: Herb Olson or George Dias
Times: Selected Saturdays, 1:30pm
Location: 15 Garland Court
Carlisle, PA or other

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/Fort Worth Heath Users' Group

c/o N. Burton
419 Gettysburg Street
Mesquite, Texas 75149
Voice: (214) 287-8000 (days)
(214) 285-9954 (eves.)
BBS: (214) 742-1380
Contact: Nate Burton, Secy/Treas.
Times: 1st Tuesday of Month, 7pm
Location: H/Z Computer Center
12022-C Garland Rd. (near SAM's)
Dallas, TX 75218
(214) 327-4835

Virginia

Capital Heath/Zenith Users' Group (CHUG)

P.O. Box 16406
Arlington, Virginia 16406
Voice: N/A
BBS: (703) 550-9164 (Fido-Net)
(703) 764-3182 (Members Only)
Contact: Eric Litt
(703) 620-4328
Jim Nielsen
(703) 538-5307
Times: 3rd Monday of Month, 7:00pm
Location: Fairfax High School
Fairfax, VA

Tidewater Heath Users' Group (THUG)

c/o Harold Raizer
1323 Glyndon Drive
Virginia Beach, Virginia 23464
Voice: (804) 420-7576 or
(804) 468-6246
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HUG

The following is a complete numerical listing of abstracts of all MS-DOS (Z-100 & PC Compatible) software in the HUG standard library.



Software Listing

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

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

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

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

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

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

Program Authors:

HNIM (NIM) and HOTHELLO (OTHELLO) — Richard Musgrave
 HANOI and SINK — William C. Zurney
 HANGMAN — Dale Grundon
 TICTAC — Daniel Schlichtig
 QUBIC — originally the idea of Sam Cox and was adapted for MBASIC and H19 graphic features by Bill Phillips.
 HUGDICE (DORNBACK) — Thomas F. Dornback
 BATTLE — originally the idea of Frank R. Newcomer with graphics added by Bill Phillips
 SLOTS — Perry S. Phipp

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

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

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

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

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

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

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

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

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

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

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

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

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

The user may choose to have the computer play the game. The pro-

gram prints the number of moves it takes and the minimum moves possible.

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

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

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

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

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

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

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

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

TABLEC Rating: (0),(1),(2),(3),(10)

P/N 885-3005-37 ZDOS ETCHDUMP

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

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

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

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

Authors:

ETCH, CONVERT, READ, WRITE - Frank T. Clark
 SCREEN - Scott Cuihall

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

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

Graphic Commands

NUMERIC KEYPAD — entering a number moves the cursor one pixel in one of the 8 possible directions relative to the "5" key as the center.

Alphanumeric — enter the alphanumeric mode.

Box — draw a box

Circle — draw a circle

Dot — place a dot at the current position

Ellipse — draw an ellipse

Fill — fill an area

Hidden — toggle hidden cursor mode

Index — change the horizontal motion index (pitch)

Kcolor — change the default foreground and background color

Lline — draw a line

Mark — remember the current cursor position for subsequent commands

Point — remember the current cursor position for subsequent commands

Quit — clear the screen and quit

Read — read the contents of a file into a video plane

Size — input the aspect ratio for drawing circles and ellipses

Track — toggle tracking mode

Write — write the contents of a video plane into a file

X(Y-addressing) — input a specific x-y coordinate for new cursor location

Alphanumeric mode

LINE FEED — return to the graphics mode

RETURN — move the cursor to the beginning of the next row

DEL or BS — erase the previous character

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

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

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

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

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

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

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

TABLEC Rating: (4),(5),(10)

P/N 885-3006 CP/M CHEAPCALC

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

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

The following files are included on the CheapCalc disk HUG P/N 885-12331-37:

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

Program Authors:

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

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

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

point errors. (To illustrate this kind of error, run MBASIC and enter PRINT 100-99.99).

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

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

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

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

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

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

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

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

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

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

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

Program Authors:

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

Program Content:

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

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

1. You can put your favorite programs, whether Z-DOS or CP/M, on the same disks.
2. CP/EMulator provides a very large 63K TPA. This means that programs have more memory space than under CP/M-85.
3. CP/EMulator allows you to use CP/M editors and word processors on Z-DOS files.

Some disadvantages of CP/EMulator are:

1. Extension programs such as DESPOOL or HUG's KEYMAP may only work while you are running programs that use BIOS calls for I/O, such as MBASIC. Use of such programs with CP/EMulator is, therefore, very limited.
2. Programs that use non-I/O BIOS calls (including disk calls) will not work at all. This includes many utility programs and some di-

rectory programs. However, HUG's DIR19 program works because CP/EMulator constructs simulated disk parameter and allocation tables. Other programs requiring these tables may or may not work.

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

HDSCOPY — This program is similar to RDCPM except that it copies files from HDOS disks instead of CP/M disks. It is included on this disk because HUG's HRUN HDOS emulator will run under CP/EMulator, and it provides a way to get HDOS programs to your Z-DOS disks. However, it is somewhat limited in that it can only read 5.25-inch soft sector double density, single or double sided HDOS disks.

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

Comments: CP/EMulator is a program to add greater flexibility to the serious Z-DOS and CP/M-85 user.

TABLE C Rating: (10)

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 885-3008-37 Z-DOS Z-DOS UTILITIES

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

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

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

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

PRISM	.COM	DIR100	.COM
PRISM	.ASM	DIR100	.ASM
PRINTEK	.COM	COLOR	.COM
PRINTEK	.ASM	COLOR	.ASM

Program Authors:

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

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

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

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

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

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

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

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

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

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

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

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

885-3009-37 ZDOS ZBASIC Dungeons & Dragons (DND)

Introduction: DND is the HUG version of the popular game "Dungeons and Dragons", played in real-time. This version displays graphic representation on the screen of the rooms, halls, and doors in the area which the player is in. The object of DND is to find the lord master of the Dungeon.

Requirements: This game requires the ZDOS operating system on an H/Z-100 computer. DND requires the ZBASIC interpreter. Only one drive is required.

These programs have been compiled with the ZBASIC compiler. To use the compiled version, the timing loops in the program will need to be increased.

The following programs and files are included on the HUG P/N 885-3009-37 ZDOS DND disk:

README	.DOC	DNDBW	.BAS
MENUBW	.BAS	DNDC	.BAS
MENUC	.BAS	DND	.DAT
STARTBW	.BAS	DND	.DOC

STARTC .BAS INSTALL BAT

Note: The BW files indicate the programs are written for Black and White monitors versus the C files which are for Color monitors. Details are contained in the README.DOC file.

Author: Robert E. Wild
Modified for ZDOS ZBASIC by Richard Evers

Program Content: The search for the lord master of the Dungeon is made by exploring the 50 level dungeon, with the search beginning on level 1. DND is played in real-time, which means the program waits only a short time for a response and will continue playing without a response.

At the starting point there is a roadside tavern with many other taverns located on level one. It is at these taverns that treasures are cashed in for experience points. An accumulation of experience points will allow the player to become a higher level character, which will increase the chance of survival as the user moves deeper into the dungeon.

During the quest for the lord master, many obstacles will be encountered. The obstacles will include monsters which may try to steal any treasures which the player may have. Sometimes the monster may attack, first. The player may fight, cast a spell, or evade. The player must watch his Hit Points and Spell Units to determine which option is best. These units can be refreshed by returning to a tavern or worshipping at an altar.

The user will find objects along the way which may be of help with the search. As easily as the objects appear, they may disappear.

The lord of the dungeon will be found in a HEATHKIT VAULT. As the game progresses, the combination to the safe will be given. The lord master may not be in that vault as there are many vaults throughout the dungeon.

The DND.DOC file contains information on some of the areas of the game. It is recommended that a hardcopy of the documentation be made for future reference. There are useful tables that will be nice to reference while playing the game.

There are many aspects of the game that must be learned while exploring the dungeon in DND.

Comments: DND is an excellent adventure game with the added feature of the graphic display with real-time mode. A "Dungeons and Dragons" master player informed HUG that this version is the best computer implementation of the game he has seen.

TABLE C Rating: (1),(2),(5),(7),(10)

885-3010-37 Z-DOS KEYMAP Function Key Mapper

Introduction: Z-DOS KEYMAP is a program that lets you designate the responses produced by your computer's function keys. It works like the KEY command in ZBASIC except that more keys can be defined, and the defined keys are part of the "system" and can be used with any program, not just with ZBASIC.

Requirements: Z-DOS KEYMAP requires the Z-DOS operating system on an H/Z-100 series computer or an ET-100/ETA-100 computer and at least 128K of user memory.

This disk contains the following files:

Table listing files: README.DOC, UNMAP.COM, KEYMAP.DOC, KEYMAP.COM, KEYCON.COM, KEYWS.COM, KEYBAS.COM, KEYSYS.COM, KEYSYS.DOC, DATETIME.COM

Author: Patrick Swayne, HUG

KEYMAP - This is the executable KEYMAP program, provided in unconfigured form so that you can set up the keys the way you want to. It allows you to define a response of up to 20 characters for each of the following keys: F0 through F12, SHIFT-F0 through SHIFT-F11, I CHR, D CHR, INS LINE, DEL LINE, HOME, the Arrow keys, and the HELP key. If the keypad is shifted, the 1 through 9 keys can also be defined. You can designate one of the keys as an alternate response key, which gives all of the other keys two responses of up to 20 characters each. A total of 35 different responses can be produced without an alternate response key, or 69 responses with one. In addition to the ability to define keys, Z-DOS KEYMAP offers

these other features:

** Off/on toggle. A control code (normally CTRL-SHIFT-6) is provided to toggle KEYMAP on or off, so that it can be temporarily disabled to allow other programs to control the function keys.

** Off line toggle. A control code (normally CTRL-\) is provided to allow the terminal section of your computer to be taken "off line" so that you can enter escape sequences to set terminal characteristics, etc. This function duplicates the badly missed OFF LINE key found on earlier Heath/Zenith computers.

** Coexistence with other programs. Not all of the keys must be configured with KEYMAP. Some can be left "unconfigured" so that KEYMAP can coexist with programs such as Z-BASIC. For example, if you configure only the shifted function keys, the ZBASIC KEY command will still work properly with the unshifted function keys.

KEYCON - This program is used to configure the KEYMAP program, and allows you to designate the response of each mappable key.

KEYWS - This is a pre-configured KEYMAP for use with WordStar. The requirement to use hard-to-remember control codes is practically eliminated. Cursor and text movement, indenting, centering, underlining, and many other functions are available at the touch of function or keypad keys. Even if you use the new version of WordStar with programmable keys, you will find that KEYWS gives you more programmed keys in an easier-to-use layout.

KEYBAS - This is a pre-configured KEYMAP for use with ZBASIC. 33 BASIC keywords are "programmed" into your keys without interfering with the ZBASIC KEY command or the editing keys.

KEYSYS - This is a pre-configured KEYMAP for use with the operating system. Commands such as DIR, DATE, TIME, etc. are available at the press of a key. One of the keys runs the DATETIME program that was published in REMark. DATETIME is included on the disk.

UNMAP.COM - A program that disables KEYMAP. It lets you change from one KEYMAP to another without re-booting.

Comments: Ever since Pat wrote the CP/M KEYMAP program, we have had many requests for a version under ZDOS. Well, here it is! ZDOS KEYMAP is a program that every H/Z-100 ZDOS user should have.

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

885-3011-37 ZDOS ZBASIC Games Disk

Introduction: This ZDOS disk contains a few graphic games which will bring hours of entertainment to the young and old. Spend a few hours on the job as an Air Traffic Controller, then relax while playing a few games of Blackjack. Practice your typing speed and accuracy or shoot it out with other tanks on the battlefield.

Requirements: These games require the ZDOS operating system on a Z-110 or Z-120 computer. The programs are written in and require the ZBASIC interpreter. The programs are written using the color commands.

Note: You will need to have color memory chips in your Z100 in order to view the games as written. Without the color chips, the games may not be playable.

The following files are included on the HUG P/N 885-3011-37 ZDOS ZBASIC Games Disk:

Table listing files: README.DOC, STOREWD.BAS, BLACKJCK.BAS, WORD.DAT, ATC.BAS, TYPING.DOC, ATC.TXT, BATTLE.BAS, ATC.DOC, BMENU.BAS, TYPING.BAS, HISCORES.DAT

Authors:

BLACKJCK -- John Kappers
ATC -- Del Tapparo
TYPING -- Diana Hsu
BATTLE -- Nathan Vedder

BLACKJCK - This version of Blackjack uses the full capability of the Z-100 graphics to display the playing cards. A maximum of three players is allowed.

ATC - This program was inspired from the "Air Traffic Controller" game by David Mannering, distributed by Creative Computing Software. Although similar in design, the program is the original work of Del Tapparo.

In this real time simulation, you are an air traffic controller responsible for directing the flow of air traffic over a city containing two major airports. You are given a 20 minute shift to direct 6 to 26

aircrafts safely to their destinations. You choose the number of aircrafts according to your ability as a controller.

Air Traffic Controller is a realistic simulation demonstrating the stress involved with the job. The major difference being, in the event of a tragedy, you simply "press return" for another game.

TYPING - A game designed to help you improve your typing speed and accuracy. The computer will randomly choose one word (from WORD.DAT) to descend down the screen. You must type the word as fast as possible before the word reaches the line. If you misspell the word, you receive no points. The score is based on the player's speed of spelling the word correctly.

STOREWD is a program which will allow you to store your own vocabulary of words in the random file WORD.DAT. You can edit or add your own words to the file. The new WORD.DAT file can then be used with TYPING.

BATTLE - This Battlefield game sets your tank against a host of enemy tanks. You are to move your sites onto the enemy tanks and shoot. The enemy tanks are continually moving, therefore you may have to shoot in front of the tank to destroy it. The tanks also may shoot back, so you must move in hurry.

Note to ZBASIC programmers: This program has some real potential for any of you game writing enthusiasts. The program could be enhanced to include many other features, such as aircraft to fight, more tanks, different tank positions, etc. See what you can come up with.

Comments: This games disk offers a variety of graphic games for the game enthusiasts.

TABLE C Rating: (2),(9)

=====

885-3012-[37] HUG Editor

=====

Introduction: The HUG Editor is a fast command mode character editor originally derived from a public domain CP/M Users' Group editor. It resembles the CP/M ED editor somewhat in operation, but more closely resembles the Intel ISIS-II editor. It is not a "screen" editor, and uses no function or arrow keys. It is designed mainly for writing source code for assemblers and compilers.

Requirements: The HUG Editor requires the Z-DOS or MS-DOS (for 885-3012-37) or CP/M-86 (for 885-5002-37) operating system, and will run on any computer compatible with those operating systems (it is not machine dependant).

The following files are included on the HUG Editor disks:

Table listing files for 885-3012-37 and 885-5002-37: README.DOC, EDIT.COM, SPEDIT.COM, EDIT.DOC, EDIT.ASM, README.DOC, EDIT.COM, SPEDIT.COM, EDIT.DOC, EDIT.A86

Authors:

Z-DOS Version -- Patrick Swayne, from CP/M-86 version
CP/M-86 Version -- Jim Buszkeiwicz, modified by P. Swayne

These versions were translated from the HUG CP/M version, which originated from a CP/M Users' Group program.

EDIT.COM or EDIT.COM -- This is the HUG Editor program. It is a command mode editor, which means that all text manipulation is done via commands, and none is done directly on the screen. All commands consist of only one letter each, and are easy to memorize. Command iteration is supported with nesting so that complex operations can be carried out with a single command line entry.

In translating this version from the CP/M version, text movement sections were optimized using 8088 string instructions with the result that this version is approximately three times faster when doing multiple search-and-replace commands (both versions running on a Z-100). For such operations, it is one of the fastest editors available.

The HUG Editor automatically creates a back up of the file you are editing. Files can be any size up to the size of one disk, and input and output can be on separate drives.

The HUG Editor supports true backspace, and backspaces correctly through tabs, and even through carriage returns to the previous line while you are inserting text.

SPEDIT.COM or SPEDIT.COM -- This is a modified version of EDIT

that works a little differently from the regular version if you backspace through a carriage return.

EDIT.DOC -- These are the instructions for using EDIT.

EDIT.ASM or EDIT.A86 -- This is the assembly source code for EDIT.

Comments: This editor has been around in some form or other for some time, and is popular with "old timers" in the microcomputer community. It is not easy to use as some screen editors, but all of the commands are logical and easy to remember. The HUG Editor is an excellent replacement for EDLIN for use with Z-DOS.

Note: This editor is public domain and its use is not restricted by copyright or other legal hindrances.

TABLE C Rating: (10)

885-3013-37 Z-DOS Checkbook Manager

Introduction: Checkbook Manager is a ZBASIC program that has the capability of displaying your checkbook register with as many as nine entries at a time. Items can be individually entered and/or edited, and after entering transactions, checks are printed in a format suitable for window mailing envelopes. There is a reconciliation routine which is used at the end of the month which marks cleared transactions, inputs bank statement data (ending balance, bank charges, etc.), then prints a reconciliation statement.

Checkbook Manager is easier to use than other accountant programs because of the on-screen display of multiple transactions, the ability to search and edit individual entries, and the use of H/Z-100 graphics to display the register.

Requirements: This program requires an H/Z-100, color or monochrome, 128K of RAM, ZBASIC, and a printer if check printing is desired.

The following files are included on the HUG P/N 885-3013-37 Checkbook Manager disk:

README	.DOC
AUTOEXEC	.DOC
CM	.BAS

Author: Stephen Ruks

Program Content: With Checkbook Manager, you can essentially discard your checkbook ledger. All normal checkbook functions are performed by this program. The following is the main menu extracted directly from Checkbook Manager:

1. Enter Transactions In Checkbook
2. Search For Transactions
3. Edit Transactions
4. Print Checks
5. Reconcile Bank Statement
6. Start New Disk File
7. Change Account Disk
8. Reconfigure (Color/Mono)
9. End Program

The SEARCH and EDIT features are particularly useful. Transactions can be searched for by check number, date, payee, or amount. Once the proper transaction is found, you are then given the option of editing it. The balance is calculated after each entry is made thus maintaining the correct figures on screen at all times.

Comment: The program is self-prompting and no problems encountered the first time through.

TABLE C Rating: (0),(9)

885-3014-37 Z-DOS MS-DOS UTILITIES II

Introduction: This disk contains several useful Z-DOS utilities. Most of them will also run under MS-DOS on a Z-150.

Requirements: An H/Z-100 type computer with Z-DOS, or a Z-150 or Z-160 or IBM PC with MS-DOS (PC-DOS) (except as noted).

This disk contains the following files:

README	.DOC	CLOCK	.ASM
FONTED	.EXE	DATETIME	.COM
FONTED	.BAS	DATETIME	.ASM
IBM	.CHR	SEE	.COM

H19	.CHR	SEE	.ASM
DIR150	.COM	ONECOPY	.COM
DIR150	.ASM	ONECOPY	.ASM
PDIR	.COM	SWAP	.EXE
PDIR25	.COM	SWAP	.ASM
PDIR	.ASM	ERA	.COM
DISKID	.COM	ERA	.ASM
DISKID	.ASM	ZBREF	.COM
SCRNCLK	.WHT	ZBREF	.ASM
SCRNCLK	.RED	BRNCHREF	.COM
SCRNCLK	.ASM	BRNCHREF	.ASM
CLOCK	.COM	ASM	.BAT

Authors:

FONTED, SWAP - Mark Aagenas, Heath Co.

DATETIME - Frank Clark, ZDS

DIR150, PDIR, DISKID, SCRNCLK, CLOCK, SEE, ONECOPY, ERA

- Patrick Swayne, HUG Software Engineer

ZBREF, BRNCHREF - Original program by Rudi Daniel Z-DOS versions by P. Swayne

FONTED - This is a compiled version of the character font editor presented in REMark magazine. It allows you to easily create new character fonts or modify the keyboard response on your H/Z-100 type computer. This program will not run on Z-150's.

IBM.CHR - This is a replacement for ALTCHAR.SYS, created with FONTED, that provides IBM-like characters. These characters are bolder than normal and some may find them easier to read, especially on color monitors. H/Z-19 graphic characters are supported. For H/Z-100 only.

H19.CHR - This character set provides true H/Z-19 style characters, with full descenders on p, y, etc. for your H/Z-100. Since the H/Z-100 has only 9 scan lines per character instead of 10 like the H/Z-19, the catch is that the tops of the characters are on the top line, with the result that reverse video does not look as good as normal. For H/Z-100 only.

DIR150 - This program is like the DIR100 program released on the first HUG Z-DOS Utilities disk except that this version will run on H/Z-100's or Z-150's (and IBM PC'S). It provides an easy-to-read alphabetized directory with graphic lines separating columns of files. If a label was created on the disk by DISKED (below), it is displayed at the top of the screen. Disk space usage information is presented at the bottom of the screen. Up to 80 files can be displayed on the screen, and if there are more, the program will prompt you to hit RETURN before displaying a new screen of files. DIR150 can handle up to 1024 file names.

PDIR25 - This program is similar to DIR150 except that its output goes to a printer. PDIR25 is for H/Z-25 and H/Z-125 printers, and uses graphic lines to separate file columns. PDIR is for other printers.

DISKID - This program lets you write a volume number and label to a disk, which are displayed at the top of the screen or page by DIR150 and PDIR.

SCRNCLK - This is the screen clock program that was presented in the May 1984 issue of REMARK. It provides a digital clock display at the upper right corner of your screen that runs while you are running other programs. This version is improved over the published version, and does not "mess up" the top line of text on the screen like the other version occasionally did. SCRNCCLK.WHT produces a white clock display, and SCRNCCLK.RED produces a red display. For H/Z-100 only.

CLOCK - This program can turn the screen clock off and on after SCRNCCLK is loaded. For H/Z-100 only.

DATETIME - This is the program presented in REMark that maintains the latest time and date in a directory entry called DATETIME.TMP. If you create an AUTOEXEC file that runs DATETIME at cold boot, your date and time will always be set to the latest date and time on your disk when you boot up.

SEE - This is a replacement for the TYPE command, for examining text files. It allows you to scroll forward and backward through a file, to search for text strings in the file, and to print screens of the file on a printer. It can scroll sideways to show lines up to 132 characters long.

ONECOPY - This is a single drive file copy utility. It is useful in situations where one drive of a two drive system is bad, and the "system" still thinks there are two drives. Files up to the maximum allowable size in Z-DOS may be copied.

SWAP - This is the console swapper program that was presented in REMark magazine. It allows you to use an external terminal on your computer, and to switch back and forth between the main keyboard/screen and the other terminal.

ERA - For CP/M users who have switched to Z-DOS/MS-DOS, this

program allows you to erase files by typing ERA instead of DEL or ERASE.

ZBREF - This is a variable cross reference utility for ZBASIC or GWBASIC. It lists all of the variables in a program in alphabetical order followed by the line numbers on which the variable can be found. Output can be sent to a printer or the screen. It can quickly process large BASIC programs.

BRNCHREF - This utility lists all of the branch statements (GOTO, GOSUB, etc.) in a program along with the line numbers they reference.

ASM.BAT - This is a batch file that lets you assemble programs from start to .COM file in one command line entry. Not for use with .EXE programs.

Comments: none.

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

885-3015-37 ZDOS SKYVIEWS

Introduction: SKYVIEWS is a Z-BASIC program for plotting the positions on the observers horizon of sun, moon, planets, and selected stars, with constellations marked. Using graphics, the observers horizon is plotted on the Z-100 screen.

Requirements: The program requires an H/Z-100 with 192K of system RAM, Z-DOS Version 1.25, one disk, and a color monitor, although the displays will work on a monochrome monitor.

The following programs are included on the HUG P/N 885-3015-37 SKYVIEWS disk:

SKYVIEWS	.EXE
PLANET	.BAS
CSTNM	.BAS
BRIGHTST	.BAS
SKYVIEWS	.BAS
SKYVIEWS	.DOC

Author: Eugene L. Davis

Program Content: SKYVIEWS.EXE is compiled Z-BASIC program for calculating and plotting the positions of sun, moon, major planets, and stars brighter than 4.0 Magnitude on the observer's horizon and the observer's zenith (overhead). The phases of the moon are shown in the plots. The major constellations in the northern and southern hemispheres can be marked for viewing on the screen. For aid in telescope viewing, the azimuth and elevation angles, as well as the right ascension and declination of the major planets are displayed at the time and for the place selected for the viewer. The data input requirements are simple: date, local standard time, latitude and longitude, and time zone of the observer. The program is menu driven and all data inputs have default values for ease of data entry and demonstration purposes. The algorithms and equations used in this program were taken directly from the ASTRONOMICAL ALMANAC for 1984, and references are commented into the source.

The source program is included and can be executed directly under the Z-BASIC interpreter. New default values can be added by creating a new default value file.

Comments: Extensive documentation is included with SKYVIEWS making this an ideal program for beginning Astronomers as well as seasoned ones.

TABLE C Rating: (0),(7),(9)

P/N 885-3016-37 Z-DOS Adventure Disk

Introduction: Adventure is one of the most well known and best liked computer games. It is an adventure through a giant cave to search out and find treasures. Many dangers, as well as puzzles to solve, are instore for the user who ventures into its midst.

Requirements: This game requires the Z-DOS operating system on an H/Z-100 computer. This game will also work properly with the MS-DOS operating system on an H/Z-150/160. In either case, this program requires around 75k of memory. Only one 5.25" drive is required.

The following is a list of the files on the HUG P/N 885-3016-37 Z-DOS Adventure Game disk.

PAYLOAD * PAYLOAD * PAYLOAD * PAYLOAD

Seagate HARD DRIVES

MODEL	CAPACITY/FORMAT/SPEED/SIZE	DRIVE ONLY	XT KIT
* ST-125	21.4 MEG / MFM / 40 MS / 3.5"	\$228.00	\$278.00
* ST-138	32.1 MEG / MFM / 40 MS / 3.5"	\$271.00	\$321.00
* ST-151	42.5 MEG / MFM / 24 MS / 3.5"	\$380.00	\$430.00
* ST-138R	32.7 MEG / RLL / 40 MS / 3.5"	\$263.00	\$323.00
* ST-157R	49.1 MEG / RLL / 40 MS / 3.5"	\$312.00	\$372.00
* ST-225	21.4 MEG / MFM / 65 MS / 5.25"	\$199.00	\$249.00
* ST-251-1	42.8 MEG / MFM / 28 MS / 5.25"	\$324.00	\$374.00
* ST-4096	80.2 MEG / MFM / 28 MS / 5.25" FH	\$548.00	\$598.00
* ST-238R	32.7 MEG / RLL / 65 MS / 5.25"	\$216.00	\$266.00
* ST-277R-1	65.5 MEG / RLL / 28 MS / 5.25"	\$366.00	\$426.00
* ST4144R	122.7 MEG / RLL / 28 MS / 5.25"	\$628.00	\$688.00

* All 3.5" drives are shipped with a 5.25" frame kit for mounting.
* XT KITS include drive, controller, cables screws and manuals.

*** ZENITH PC COMPUTER UPGRADES ***

SmartWatch from FBE RESEARCH

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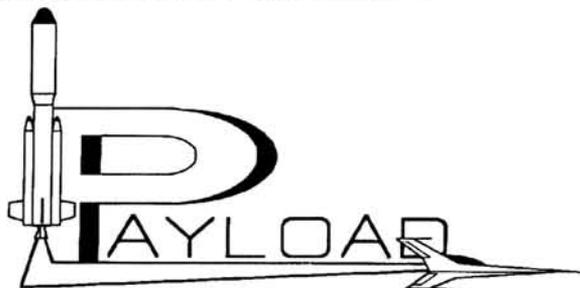
⇒ For the Z-150 or Z-160 only. Not required for the Z-157/158/159 computers. A small piggyback board which replaces the scratch pad memory on your current video card. This allows the removal of the original Zenith video card and replacement with an EGA, VGA or any other 8 bit video card. Order VCE-150 \$54.00

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⇒ Memory chips are once again at reasonable prices. The market prices have been changing daily, therefore we are only able to list estimated prices. Please call for the current price before placing your order. We buy in large quantities and work on the smallest of margins in order to bring you great values.

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High Density 1.2 Meg Drives

⇒ External floppy drive set-up complete with drive, power supply, case and cables.
⇒ Ready to connect to your 8" floppy controller. Single Drive Unit \$217.00
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⇒ A modification package which allows 256K chips to be used on the old-style motherboard (part number 85-2653-1) to reach 768K. Simple assembly with no soldering or trace cutting. Compatible with Easy PC and Gemini Emulator. Order 27 256x1 RAM chips to complete this kit. ZMF100A \$80.00

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⇒ Complete Hard Disk System for mounting inside your Z-100. Includes S-100 bus board, matched XT hard disk controller, EasyWin software, manual and Misc installation hardware. Order a hard disk (ST-125 or ST-138 recommended) under the SEAGATE HARD DISK DRIVE ONLY listing to complete the kit. \$288.00

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⇒ Run your Z-100 Computer at 7.5 MHz. Installs easily with no soldering. Externally switchable between Speed and Normal mode. \$44.00

Z-100 SERIES SOFTWARE

⇒ PART NUMBER DESCRIPTION	LIST PRICE	SALE PRICE
⇒ MS-463-1Z-Basic (16 bit)	\$ 175.00	\$ 10.00
⇒ MS-253-1B-Basic-80 (8-bit)	\$ 175.00	\$ 10.00

⇒ Please Mail, Phone or FAX your order. All hardware carries the manufacturers warranty plus the PAYLOAD 90 day guarantee. No surcharge on credit card orders. COD shipments on request. Add \$5.00 to all prepaid orders for handling and shipping in the Continental USA, we pay the balance. Actual shipping costs for foreign, overseas and net billing orders. We accept purchase orders from schools, government and approved accounts. Mail or phone your order for prompt friendly service. Texas residents please add 8.0% state sales tax.

PAYLOAD * PAYLOAD * PAYLOAD * PAYLOAD

ADVENT .EXE
 AINDX .DAT
 ATAB .DAT
 README .DOC

Authors: This program was originally developed by Willie Crowther. Most of the features of the current program were added by Don Woods (Don SU-AI). This microprocessor version was done by Brian Barnes and Dave Sandage of Zenith.

Preparation: To run ADVENTURE under Z-DOS or MS-DOS, simply copy the three adventure files, ADVENT, AINDX, and ATAB to a bootable disk and type ADVENT at the system prompt.

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

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

Suggestions: Try 'ENTER BUILDING'. When you see an object, pick it up. Go 'DNST' (downstream) if you want to find the cave.

Helpful Words:

INVENTry List items you are carrying
 SCORE Show your current score
 LOOK Long description of current location
 BACK Go back the way you came
 QUIT Stop the game and give final score

Command Style: Remember, ADVENTURE takes one or two word commands only. Make them straight foward like:

ATTACK DRAGON
 EAT BIRD
 THROW AXE
 GET GOLD
 WEST or W
 UNLOCK GRATE
 DOWN or D
 etc.

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

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

Comments: Adventure will provide many months and even years of fun trying to reach the 366 point goal.

TABLE C Rating: (10)

=====

P/N 885-3017[-37] ZDOS Games Contest Package (2 Disks)

=====

Introduction: These two disks contain color graphic games that were sent in as entries to our game contest. All of these programs

use the color graphic capabilities of the H/Z-100 system. Some are real time, fast action, like Worm and NYAG. Others use passive input like Bowling and Blackjack. Young and old will enjoy these disks full of fun.

Requirements: These games use the ZDOS operating system. Some of them use ZBASIC and others are compiled. The H/Z-100 with color memory and a color monitor is also needed.

The following programs are included on the HUG P/N 885-3017-37 Contest Games Disks.

Disk 1

ELEVATOR	.EXE	PLAYER1	.DGM
ELEVATOR	.BAS	MAN-WB	.DGM
ELEVATOR	.DOC	PLAYER2	.DGM
WORM	.BAS	PLAYER4	.DGM
WORM	.DOC	SIMPLE	.DGM
WORM	.EXE	TITLE-PG	.DGM
WORM	.SCR	MAIN-M	.DGM
REF	.BAS	PLAYER3	.DGM
REF	.BAS	THE-NW	.DGM
REFINST	.BAS	Z-150	.DGM
REF	.EXE	STILL	.DGM
REFINST	.EXE	SKIER	.DGM
REF	.DOC	ILUSADY	.DGM
BLKJAK	.BAS	MOUSCN	.DGM
BLKJAK	.DOC	NYAG	.BAS
BOWLING	.BST	NYAG	.DOC
BOWLING	.DOC	DOODLES	.BAS
BOWLING	.BAS	DOODLES1	.DOC
PINS	.DAT	DOODLES2	.DOC
README	.DOC	RDATLANT	.BST
		RDATLANT	.BAS
		CARS	.DAT

Disk 2:

DRAW-ME	.EXE	TRACK G	
DRAW-ME	.BAS	RDATLANT	.DOC
DRAW-ME	.DOC	README	.DOC

Authors:

ELEVATOR	- Wojtek Bok
DOODLES	- Arleigh E. Luckett
BLKJAK	- Rober Sully
REF	- Michael Osborne
WORM	- Morris Proctor
NYAG	- Matt Newell
DRAW-ME	- Phil Winninghoff
BOWLING	- Joseph T. Frank
RDATLANT	- Joseph T. Frank

ELEVATOR: This is basically a two player game. The object is to move your player between different floor levels by moving according to dice rolls. Watch out however, landing on one of the many elevators can move you from the top floor to the bottom. This game can be quite frustrating.

DOODLES: This program can be used by the younger crowd to draw or "doodle" simple shapes using circles and lines. These shapes can then be painted in with different colors.

BLKJAK: This version of Blackjack uses liberal Las Vegas Strip casino rules and displays the cards using brilliant color graphics.

REF: Reflections is a logic game for one person. The object of the game is to guess the positions of the balls hidden in a square grid using a minimum number of 'probes.' This game comes with an extensive 'doc' program and playing it doesn't appear to be a 'push over.'

WORM: Actually, you start with what looks like a multi-bodied snake. The object is to eat all the apples on the screen by directing the movement of the snake with the keypad keys. The problem is, every time your snake eats an apple, it grows some new body parts making it longer. Needless to say, after a couple of screens of apples, 'snaking' your way around becomes difficult. This is an addictive fast action game.

NYAG: "Not Your Average Game" is the only way this one can be described. It appears that the object of this game is to move around a playing board and, in doing so, perform different randomly selected tasks. One of these tasks is to catch falling bricks on your head by moving your man across the video screen. As previously said, "not your average game!"

DRAW-ME: The object of this game is to recreate a line drawing which appears on the screen. A cursor is moved, by pressing the arrow keys to points in a playing area which correspond to the end points of lines making up the displayed figure. Up to four players can participate at the same time. Scoring is kept track of by the amount of moves needed to complete the drawing. In addition, there is a full screen creator mode where individuals can create their own line drawings and save them in a disk file.

BOWLING: Watch your bowling ball travel down the alley to meet the pins in this exciting version of the ever popular sport of Bowling. Throw curves, hooks, put spin on the ball. All you'll miss is the sound of the pins crashing.

RDATLANT: This game takes advantage of the color graphics capability of the H/Z-100 computer to simulate a sports car road race at the Road Atlanta race track. You may race against a live opponent, or you may select a car for the computer to race against you. You control the speed of the car by entering acceleration values, or braking values.

Comments: None

TABLE C Rating: (0), (1), (2), (3), (7), (9)

=====

P/N 885-3018-37 ZDOS Spreadsheet Contest Package

=====

Introduction: This ZDOS Spreadsheet Contest disk contains five different spreadsheets which were sent in as entries to our contest. Four of these programs are for Lotus 123 and one is for Peachtext 5000.

Requirements: Each of these spreadsheets require an H/Z-100 system with the Z-DOS operating system. The program, PERSONAL EXPENSE TRACKING requires Peachtext 5000. The other four, TAXPRO, PAYROLL, REAL ESTATE INVESTMENT, and CRYSTAL BALL need Lotus 123. All of these spreadsheets will work with a minimum of 128k of memory, except for CRYSTAL BALL, which requires a full 192k of RAM.

This package is a three disk set. Since most of the files had the same extension, they were renamed to show which files belong to which spreadsheet system. The documentation explains how to rename the files back to their original names. The following files are contained on the HUG P/N 885-3018-37 ZDOS Spreadsheet Contest disks:

Disk 1

SCHEDYJ	.WK1	OHIOTAX	.WK1
SCHEDX	.WK1	TAXPRO	.WK1
SCHEDY	.WK1	INCOME	.WK1
SCHEDYS	.WK1	README	.DO1
FEDTAX	.WK1	SUBMITTA	.DO1
PAYROLL	.WK2	P192	.XQT
README	.WK2	P256	.XQT
WORK	.WK2	FINYR	.KY1
LETTER	.WK3	FINYR	.KY2
README	.WK3	FINYR	.KY3
REALEST	.WK3	FINYR	.DAT
INSTRUCT	.DOC	FINYR	.MLB
P128	.XQT	README	.DOC

Disk 2

FIN128	.BAT
FIN192	.BAT
FIN256	.BAT
FIN128	.CAL
FIN192	.CAL
FIN256	.CAL

Disk 3

CRYSTAL	.B&W	EXPENSE5	.PIC
REPORT	.PRN	INCOME1	.PIC
CRYSTAL	.WKS	BALANCE	.PIC
EXPENSE1	.PIC	INCOME2	.PIC
CRYSTAL	.DOC	INCOME3	.PIC
EXPENSE2	.PIC	TABLE1	.PRN
EXPENSE3	.PIC	TABLE2	.PRN
EXPENSE4	.PIC	TABLE3	.PRN

Authors:

TAXPRO	- George P. Elwood
REAL ESTATE INVESTMENT	- Joel Schulman
PAYROLL	- Charles McClain
PERSONAL EXPENSE TRACKING	- Richard Donaldson
CRYSTAL BALL	- Terry Robert Groff

Program Content: The following information was taken from the authors description of each spreadsheet.

TAXPRO: This is an interactive worksheet that permits the user to input data on income, withheld taxes, interest received, dividends, donations, and interest paid to project the taxes for the current year. The program projects the Federal and Ohio State Income taxes

based on the 1983 tax forms. Four of the seven modules are combined to provide the entire worksheet.

REAL ESTATE INVESTMENT: This worksheet program uses the what-if capabilities of Lotus 123 to analyze the potential for profit in a real estate investment purchase. By entering only data regarding price, proposed financing, estimated appreciation rate, and marginal tax rate, the economic viability of an investment can be determined.

PAYROLL: This template is a full service payroll module, capable of handling up to 2000 employees on a weekly payroll system under maximum RAM in Lotus 123. It is fully flexible in terms of employee information, capable of accommodating temporary or regular employees, on salary, hourly, or piecework basis. It accounts for married or single, variable dependent count, and personal deductions/advances. PAYROLL calculates FICA, SDI (State Disability Insurance), Federal and State (California) income tax for both married and single employees, working from computed gross and taxable income to yield weekly net.

PERSONAL EXPENSE TRACKING: A total of 120 classifications are provided, including two autos and a professional section. Tax deductible items are covered where they cross over into your personal life. The area for income has room for multiple incomes such as interest, husband and wife, stock, etc. Dining out is graded A thru D to study eating out habits carefully. List Manager also keeps address, telephone, and account number information for all expenses. It will also produce reports from that information for such things as applying for new credit. Tax time is made much easier with all of your expense information on the spreadsheet.

CRYSTAL BALL: This worksheet forecasts annual household financial management and cash reserve. It is entirely menu driven, and can be useful as a budgeting and financial forecasting tool.

Comments: None.

TABLE C Rating: (0), (9)

=====

885-3020-37 MS-DOS HUG Menu System

=====

Introduction: The HUG Menu System is a set of programs that allows you to perform all normal computer operations from menus. The menus themselves are generally operated by using the arrow keys to move an indicator to the desired function, and then pressing the RETURN or ENTER key. Using the HUG Menu System, an experienced user can set up disks for inexperienced users that can be used without knowledge of the operating system, etc. The HUG Menu System consists of the menu system itself, a sophisticated menu driven file manager, and a console setup utility.

Requirements: The HUG Menu System requires MS-DOS version 2.0 or higher, and will run on either Z-100 or Z-100 PC (Z-150) series computers. The programs are usable on systems having 128k of memory, but 192k or more is recommended.

The following programs are included on the HUG Menu System disk.

README	.DOC	SETCON	.COM
MENU	.COM	MDISK	.DVD
MENU	.DOC	CONFIG	.SYS
MENU	.MNU	AUTOEXEC	.BAT
MENU	.RAW	MENU	.ASM
UTILITY	.MNU	MAKMENU	.ASM
UTILITY	.RAW	HFM	.ASM
MAKMENU	.COM	SETCON	.ASM
HFM	.COM	MACROS	.ASM
HFM	.DOC		

Authors: The menu system programs were originally written by Robert Metz, and considerably modified and enhanced by Patrick Swayne, HUG.

MENU.COM — This is the menu program itself. It uses separately prepared menu files that contain the screen display and commands. It is based on the menu program on HUG disk 885-3008-37, but has been greatly expanded. Using this program, the following operations can be performed from menus.

1. Run a program. Programs can be executed directly by MENU.COM, and batch files are not required as with the menu program on 885-3008-37. Any .EXE or .COM program can be run and any required arguments to the program can be included in the command.
2. Change menus. A sub menu can be set up for selection

from the current menu.

3. Change directories. You can change to other main menus in other directories and from them branch to sub menus. In this way, a complex menu system can be built.
4. Change disks. Provision is made to remove one menu disk and insert another. This feature makes possible a menu driven collection of games or other programs on several disks.
5. Utilize COMMAND.COM to perform tasks. Any task that can be performed at the system prompt can be performed from a menu by loading the system command processor (COMMAND.COM) and having it perform the task.
6. Enter manual commands. A menu selection can be set up that will allow the user to temporarily leave the menu system and enter commands manually.
7. Provide on-screen help for each menu item. The user just has to move the indicator to the selected item, and then press the help key (Z-100) or F1 key (Z-100 PC) to see information on that item.

Setting up a menu is simply a matter of creating a menu definition file using any text editor. You can design what the menu will look like on the screen, and write your own prompts for the keys used. The commands to be executed by MENU.COM and the on-screen help text are placed in the definition file.

MENU.DOC — This file contains instructions for setting up menus.

MENU.MNU — This is a sample menu file.

MENU.RAW — This is a menu definition file that was used to create MENU.MNU. This file was made using WordStar(TM).

UTILITY.MNU — This is a sample sub menu file. A selection on the main menu (MENU.MNU) takes you into this menu.

UTILITY.RAW — The definition file used to create UTILITY.MNU.

MAKMENU.COM — This program turns menu definition files into menu files usable by MENU.COM. If you draw boxes around parts of your menu screen display using dashes (--) and bars (|), MAKMENU turns them into graphic line boxes.

HFM.COM — Move over, Wash, Sweep, and others of that ilk. The HUG File Manager is here! The HUG File Manager is a menu driven file maintenance utility that allows you to copy files, delete files, rename files, create and remove directories, create or change disk labels, type (on the screen) and print files, list files in hexadecimal, and sort or unsort the directory. HFM displays all of the files (or as much as will fit) from the selected directory on the screen and highlights one of them. You can move the indicator (highlighted entry) using the arrow keys to select a file to operate on, or flag several files for multiple copy or delete operations. Commands are executed by moving a second indicator (using Space or Back Space) to select a command and then pressing Return or Enter. You can also execute a command by pressing its first letter. (This method of command selection is modeled after Multiplan(TM) or Microsoft Word (TM).)

HFM allows you to page through screens of files if there are too many to fit on the screen. You can change disks, change the logged drive, and change directories from HFM, and you can copy files from the current directory to any valid path, including non-disk devices.

HFM can provide an alternate method to BACKUP and RESTORE for backing up hard disks. You just flag as many files as will fit on a disk and then copy them all at once, and repeat the procedure until all files are backed up. HFM displays the total number of bytes occupied by flagged files, so you know when you have flagged enough to fill a disk.

HFM.DOC — Instructions for the HUG File Manager.

SETCON.COM — This utility allows you to set up certain console parameters on your computer. On a Z-100, you can set the cursor type (line or block, blink or steady), screen wrap or no wrap, key click (on/off), and auto repeat (on/off). On a Z-100 PC, you can set the video mode, the scroll mode, and the cursor type (normal, single line, block).

MDISK.DVD — The MENU and HFM programs require the MS-DOS command processor, COMMAND.COM, for some functions. These functions will be performed faster if COMMAND.COM is copied to a memory disk. This memory disk is a small one (20k) with just enough room to hold COMMAND.COM

without using up too much program memory space. Instructions for patching it to other sizes are included.

CONFIG.SYS — This file can be copied to your system disks to cause MDISK to be installed, or use it as a guide for modifying your own CONFIG.SYS.

AUTOEXEC.BAT — This file can be copied to your system disks to cause COMMAND.COM to be copied to the memory disk, and the COMSPEC parameter set up to indicate that COMMAND.COM is on the memory disk. Use this file as a guide to modifying your own AUTOEXEC file, if you use one.

MENU.ASM, MAKMENU.ASM, HFM.ASM, SETCON.ASM — Source code for the HUG Menu System programs.

MACROS.ASM — Macros required to assemble the above source codes.

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

885-3021-37 ZDOS/MS-DOS CARDCAT

=====

Introduction: CARDCAT is a program which permits the user to organize information in a manner similar to a library's card catalog. The entries are stored on disk, and can be edited and searched using the program's routines.

Requirements:

- Software: ZDOS (Ver. 1.0) or MS-DOS (Ver. 2.0)
- Hardware: H/Z-100 computer or H/Z-150/160
- 1 disk drive (2 recommended)
- 128k of RAM (192k really recommended)
- Line printer recommended (132 characters per line capacity)

The following files are included on the CARDCAT disk:

README	.DOC	CARDCAT	.EXE
HELP	.EXE	CARDCAT	.FOR
HELP	.FOR	CARDCAT	.ONE

Author: Mark Dershwitz, M.D., Ph.D.

Program Contents:

CARDCAT.EXE — This is the compiled version of the card catalog program. For each "card" entry, the program will accept a title up to three authors, up to two subjects, and a "location", a reference to an alphanumeric code relating to the entry, such as its Dewey Decimal System number. The entries are stored on disk, with each disk having a capacity of 2700 entries. Each entry can be examined for correctness and edited, if necessary. There is no limit to the number of disks that can be used to store data. The disks can be searched for all entries containing a specific title, author, subject, or location, and the output list can be displayed on the screen, sent to a line printer, or saved on disk. For use with MS-DOS version 2.0 or higher.

HELP.EXE — This is the compiled version of the detailed operating instructions for CARDCAT. The instructions can be displayed on the screen and/or sent to a line printer.

CARDCAT.FOR — This is the FORTRAN source code for CARDCAT. This would enable the user who has the MS-FORTRAN compiler to alter the program to his or her own specifications, and reassemble the program.

HELP.FOR — This is the FORTRAN source code for HELP.

CARDCAT.ONE — An alternate version of CARDCAT.EXE for users who only have version 1.0 of ZDOS or MS-DOS. Each file disk has a capacity of 2400 entries.

Comments: CARDCAT is an inexpensive alternative to the commercially available filing programs, and permits the user to keep track of collections of books, records, journal articles, etc. The searching routines are particularly useful for readily locating information.

TABLE C Rating: (9)

=====

HUG P/N 885-3022-37 Z-DOS/MS-DOS Useful Programs I

=====

Introduction: This two disk product is a collection of utility and application programs for the H/Z-100 computer system. Even

though some of the utilities have been written in ZBASIC, they have been compiled, and the interpreter itself is not needed for their proper execution.

Requirements: These programs require the H/Z-100 computer system running Z-DOS or MS-DOS (Version 1.0 or later). At least one disk drive is required also.

The HUG P/N 885-3022-37 Z-DOS/MS-DOS Useful Programs I disks contain the following files:

Disk 1

```

ATD      .ASM      ATD      .COM
ATD      .DOC      ATD-CHRO .DOC
CHRONO   .BAS      CHRONO   .DOC
CHRONO   .EXE      DEFCHR  .ASM
DEFMS    .ASM      GC1000 .ASM
GC1000   .BAS      GC1000 .DOC
GC1000A  .COM      GC1000B .COM
PHONE    .BAS      PHONE   .DOC
PHONE    .EXE      ZCAT    .DOC
ZCAT     .EXE      README  .DOC
  
```

Disk 2

```

ASMP     .BAT      BSHARP  .ASM
BSHARP   .DOC      CVDT    .ASM
CVTNUMBZ .ASM      DEFASCI .ASM
DEFMS    .ASM      DLIST   .ASM
DLIST    .DOC      DLIST   .EXE
EXPTAB   .ASM      GETARGS .ASM
PRINTL   .ASM      PRINTL  .COM
PRINTL   .DOC      PRINTL  .EXE
SCDMP    .BAT      SCDMP   .DOC
SCDMP-LR .SKL      SCDMP-RL .SKL
SCDMPPEPS .ASM    SCDMPPEPS .COM
SCDMPGEM .ASM      SCDMPGEM .COM
SCDMPGMX .ASM      SCDMPGMX .COM
SCDMPNEC .ASM      SCDMPNEC .COM
SCDMPPOK1 .ASM    SCDMPPOK1 .COM
SCDMPPOK2 .ASM    SCDMPPOK2 .COM
SCDMPPRO .ASM      SCDMPPRO .COM
  
```

Authors

ATD — Larry D. Wakeford
 CHRONO — Larry D. Wakeford
 GC1000 — Jim Schuster
 PHONE — Frank Dreano Jr.
 ZCAT — Mark C. Morrow
 DLIST — Carl H. Eaton
 PRINTL — David A. Wallace
 BSHARP — David A. Wallace
 SCDMP — Leslie L. Bordelon

Program Contents:

ATD is an automatic time/date assembly language program that reads the current time and date from a Hayes chronograph clock/calendar attached to serial port B of an H/Z-100 computer. It uses 'his time and date information to set the ZDOS time and date function. This eliminates the need to manually enter this data and the correct time and date are always available for system and program usage.

CHRONO is a compiled ZBASIC program that allows setting and testing of all the chronograph functions from the H/Z-100 keyboard. The program is menu driven and all functions are selected by pressing a single key. If a syntax error is detected in a command sent to the chronograph or if the write protect switch is enabled, you are informed of these conditions. This program also expects the chronograph to be at serial port B.

GC1000 is a MACRO-86 program that interfaces the Heath GC-1000 Most Accurate Clock to the H/Z-100 computer. There are many new features of this version that were not contained in the first version as published in REMark (Vol. 5, Iss. 1, Pgs. 73-75). (1) The ability to set and read the current year in the directory entry, thus ignoring the GC-1000's DIP switch settings. (2) Detection of the transmission of a '?' from the GC-1000 in the 1/10 second digit, and the subsequent zeroing of that digit. (3) Detection and correction of the months-with-30-days error as received from the clock. (4) Transparent port configuration — the selected port is configured as required and restored to its original configuration at program termination. This allows port sharing with other devices such as a MODEM.

PHONE. The following is an excerpt from the author's original program description: "It was my hope that by using a computer to simulate the actions of an everyday item, namely the flip-phone-book present on every desk in the government. I have to admit I find myself using this program quite a bit considering I have D-BASE II and LOTUS in my repertoire. The 'Phonebook' never forgets a name, address, or phone number. It is never illegible or dog-eared from use, and it never gets filled with

crossed-out or out-of-date entries. Needless to say it was an immediate success at my workplace." This program draws (in full color), a picture of a 'flip' type phone directory. Access is done using the H/Z-100 keypad, and since it's compiled, comes up immediately without the need of the ZBASIC interpreter.

ZCAT is a diskette file librarian which assists you in keeping track of the locations of all your diskette files. It is extremely fast, being composed of compiled BASIC and assembly code, and it features a rich selection of command options which are of use in a cataloging utility. ZCAT is faster than an interpretive BASIC program and will handle 1000 disks and 1300 disk files. It permits catalog information to be sent to the screen, to a printer, or to a disk file for later use. ZCAT maintains file creation dates and times along with the filenames. If you wish, ZCAT will allow you to only see a portion of a disk directory to the catalog. The program accepts filenames and dates from the keyboard, if you wish to only insert a few specific file locations into the master catalog. It will also allow you to do file deletions or searches in the catalog using "wildcard" formatted filenames. ZCAT provides extensive editing facilities during user data-entry and provides recovery methods for most input errors. ZCAT notifies you if you start to catalog a diskette number which is already in the catalog. You then may tell it to delete the old catalog listings for this disk, or add the current disk contents to the catalog anyway, or to assign a new diskette number to the diskette currently being added to the catalog. ZCAT provides an option to only catalog a given diskette file if it is a later revision than the one already in the catalog. Finally, ZCAT lets you run the program from a hard disk environment. (Note that ZCAT is a diskette cataloger that can be resident and operational from a hard disk.)

DLIST is another program designed for cataloging disks. DLIST continuously asks for disks to be placed into the drive of your choice and it reads all the disk directories into its buffer. Upon termination of this mode, it will sort the directory entries as prescribed by several switching options available to you and then store the entire listing onto disk. It will create a new listing name for each iteration thru the program. The listings utilize a typical system 'DIR' like format with some additional information provided for your convenience.

PRINTL is a program that formats, paginates, and optionally line numbers all (or part) of an ASCII text file and prints the report thus produced on the LST device. It is based on a similar utility by the author which was written for HDOS. This program provides several capabilities not directly achievable with standard MS-DOS commands. First, it provides pagination; printing to an ASCII data file (as opposed to a ".LST" file created by a translator or the output from a word processor program) with the standard MS-DOS PRINT command, does not provide top and bottom margins to accommodate the perforations of an unburst form. Second, the program provides a page heading, which identifies the report by file name and date created, and which numbers the pages. Third, PRINTL will keep track of the current print position and continue output on the next printed line if the forms width is in danger of being exceeded. Fourth, PRINTL can print out a portion of a file instead of the whole thing; you may specify the portion as a range of lines, or as a range of pages. Fifth, PRINTL can accept wildcards in the file name specifier and will print each file as a separate report. Last, the program will (unless otherwise specified) print a line number to the left of the line of text, making the report useful for later editing and for references.

BSHARP is a macro language containing a series of macro definitions which provide an "almost-but-not-quite-C" language facility (for those who are musically inclined, the term BSHARP now becomes obvious). Of the C-language control-of-flow features, only the switch/case statements, the oft-abused goto and the do...while statement are not implemented in these macros. Declarations and argument passing is very primitive (all variables are automatic unless defined with DB, DW, or DD statements and all arguments are 16-bit values). The macro set is assuming the 8080 memory model (as in .COM files).

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. To print a desired stationary screen, simply press the 'SHIFT' key and 'F12' simultaneously, which generates an interrupt-5 and activates the screen dump. The program allows a choice of which color bank of video RAM is dumped (if the user has color RAM in his H/Z-100 and the COLOR switch is set to TRUE during assembly of the program). For the color version, entering a for blue, <R> for red, or <G> for green immediately after the <SHIFT-F12> will select the VRAM bank default. If the COLOR switch is set to false, only the green bank can be

dumped. The program also allows multiple density printing for some printers. Entering an <H> immediately after the <SHIFT-F12> or color selection would cause the printer to use a higher density mode for printing. Approximately two seconds is allowed after initiation of SCDMP before the default values are assumed. The default density is normal or standard density. SCDMP can be aborted with the <ESC> key. The printers presently supported on this disk set are: C. Itoh 8510A Prowriter, NEC 8023A, Epson MX Series, Star Micronics Gemini, Star Gemini 10X, Okidata 80, Okidata Microline Series, and a Skeleton version for use in building a program for your unique printer or application.

Comments: These programs make up the most diversified utility disk set I feel HUG has ever offered. Each one of these routines alone is worth the price of the entire package!

TABLE C Rating: (0), (1), (3), (4), (6), (10)

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885-3024-37

Interactive Code Translator

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Introduction: The programs on this disk can translate the assembly source code for CP/M programs into 8088 assembly language, for operation under MS-DOS or Z-DOS. They have a feature not found in similar programs, the ability to prompt the user to make decisions that will optimize the code during the translation process.

Requirements: These programs will run on either a Z-100 or Z-150 series computer, and MS-DOS or Z-DOS with at least 128k of memory.

The following programs are on the disk:

```

README  .DOC      ICT      .DOC
ICT      .COM      ICT      .ASM
ICT2     .COM      ICT2     .ASM
WSCON   .A80
  
```

Author: P. Swayne, HUG

Program Content: **ICT (Interactive Code Translator)** is a program that translates CP/M 8080 assembly language code into MS-DOS 8088 assembly language code. During the translation process, ICT watches for opcodes that do not translate exactly into 8088 equivalents, and prompts you to make decisions on how you want them translated. For example, to translate the 8080 code PUSH PSW exactly requires the following lines of 8088 code:

```

LAHF
XCHG   AL, AH
PUSH   AX
XCHG   AL, AH
  
```

However, if the program you are translating only needs the accumulator saved, a simple PUSH AX instruction will suffice to translate PUSH PSW. ICT allows you to select from 3 options on a menu whenever it encounters a PUSH PSW instruction. Other 8080 with optional translations are POP PSW, INX, DCX, DAD, and all jump instructions. By allowing you to optimize the program during translation, ICT can help you omit hundreds or even thousands of bytes of non-essential code and save hours of optimizing work after the translation. ICT can also be used in a non-interactive mode, in which it translates all codes to exact equivalents. In this mode, it is probably the fastest translator available.

ICT also translates the expression CALL BDOS into a valid MS-DOS system call. Because of this, programs need little or no editing after the translation to produce a program that will work under MS-DOS.

ICT2 is a special version of ICT that works only under MS-DOS version 2 and allows you to specify full path names for the input and output files.

WSCON.A80 is the source code for the CP/M version of the WSCON text to WordStar translation program. It is provided to give you practice in translating programs. After you translate it, make a few edits, and assemble it, you will have a working MS-DOS version of WSCON.

TABLE C Rating: (10)

885-3025-37 MS-DOS/Z-DOS Miscellaneous Utilities

Introduction: This disk contains a generous collection of utilities for MS-DOS and Z-DOS users.

Requirements: Most of the programs on this disk will run on either a Z-100 series computer or Z-100 PC series (Z-150 series) computer, using the MS-DOS or Z-DOS operating system with at least 128k of memory. A few of the programs are specific to the Z-100 or Z-150 computers.

This disk contains the following programs:

README .DOC

Z-100 Only Programs:

FASTIO .COM SETFAST .ASM
FASTIO .ASM FIXPRT .COM
SETFAST .COM FIXPRT .ASM

Z-150 Only Programs:

SCRNCLK .COM CLOCK .ASM
SCRNCLK .RED COLOR .COM
SCRNCLK .ASM COLOR .ASM
CLOCK .COM

Programs for both systems:

HFM2 .COM HSORT .ASM
HFM2 .ASM WSCON .COM
HFMJR .COM WSCON .ASM
HFMJR .ASM TAB2SPC .COM
ATTRIB .COM TAB2SPC .ASM
ATTRIB .ASM TYPER .COM
REPRINT .COM TYPER .ASM
REPRINT .ASM MACROS .ASM
HSORT .COM

Authors:

REPRINT: R.A. Metz The HFM programs were developed from the original HFM program: R.A. Metz and P. Swayne All other programs: P. Swayne, HUG

FASTIO — This program speeds up all non-disk input/output under MS-DOS or Z-DOS on a Z-100 computer. It can make word processors and editors scroll faster and print faster. With FASTIO installed, standard WordStar(tm) will work as fast as when patched as described in REMark, without the patches. If your word processor or editor seems to work slower under MS-DOS than under Z-DOS, it will work faster with FASTIO installed on either operating system. Even typing files to the screen or listing the disk directory works faster with FASTIO. FASTIO intercepts all I/O system calls 1 through 12, plus the MS-DOS version 2 Xenix compatible read and write calls (when they refer to standard I/O devices), and performs the operations itself as fast as the system will allow.

Some other advantages of FASTIO are that it provides the Xenix read and write calls (to standard I/O devices only) under Z-DOS, and it provides CP/M-like line editing (Control-X to erase a line, Control-R to repeat it, etc.) when DOS function 10 is used. Some disadvantages are that I/O cannot be redirected under MS-DOS 2 while it is active, and that printing files via PRINT.COM under MS-DOS 2 is slowed down. However, the SETFAST program, described below, can remove these disadvantages. For Z-100 only.

SETFAST — This program can disable and re-enable FASTIO once it has been installed. It can even be used while the MS-DOS 2 version of PRINT.COM is in the process of printing a file, to select faster printing or faster screen I/O as desired. For Z-100 only.

FIXPRT — If you are using version 2.13 or 2.15 of MS-DOS, printing may still be slower than it should be even with FASTIO installed. When you run this program, it temporarily installs a patch that makes these versions of MS-DOS print as fast as the later versions. For Z-100 only.

SCRNCLK — This program provides a digital clock display on your screen that is always there, even while you are running other programs. It is highly compatible with PC programs, and has been used with such programs as PC PALETTE and SIDE-KICK. SCRNCCLK.RED is the same as SCRNCCLK.COM, except that the clock display is red instead of white. The .ASM file can be altered to make other colors. For Z-150 only. A Z-100 version of this program is available on HUG disk 885-3014-37.

CLOCK — This program can be used to disable and re-enable the SCRNCCLK clock display.

COLOR — This program allows you to change the colors of the characters and background on the screen while you are in the text mode. It works like the GW-BASIC color command. For Z-150 only. A Z-100 version of this program is on HUG disk 885-3008-37.

The following programs are for both Z-100 and Z-150.

HFM2 — This is a new version of the HUG File Manager that was released on the HUG Menu System disk (885-3020-37). This version works like the original version, but does not require COMMAND.COM or a separate HEXLIST utility to work. It, therefore, is more efficient in systems with little memory. In addition, this version gives you the choice of printing files using PRINT.COM or directly. The original version always uses PRINT.COM. For MS-DOS version 2 only.

HFMJR — This is a junior version of the HUG File Manager for those who are using Z-DOS or MS-DOS version 1.25. It has all of the features of the original HUG File Manager except the ability to work with tree directories, to use PRINT.COM for printing files, or to change disk labels. For all versions of MS-DOS/Z-DOS.

ATTRIB — This program allows you to change the attributes on any file, so that you can patch system files, etc. It works like the FLAGS program that comes with the Programmer's Utility Pack. For MS-DOS version 2 only.

REPRINT — This program permits you to redirect output to the printer under MS-DOS version 2 in the same way that you normally can with screen output. A good use for this program is to run WordStar and have its printer output go to a disk. The result is a disk file with all of the printer controls in it for special effects (underline, bold, etc.), that can be then copied to a printer any number of times. For MS-DOS version 2 only.

HSORT — This program is an MS-DOS translation of the original HUG Sorter program that was originally released for CP/M and HDOS. It sorts lines of text rapidly into alphabetical order. It uses a Shell-Metzner sort routine. For MS-DOS or Z-DOS.

WSCON — This is a translation of the original CP/M WSCON program from HUG. It translates an ordinary text file into the format used by WordStar in its document mode. The program changes all spaces except for one space after words and two after periods to "soft spaces", and it changes all carriage return characters within paragraphs to "soft returns". The result is a file that can be processed by WordStar's reformat command. WSCON can translate a file of any size, and is very fast. For MS-DOS or Z-DOS.

TAB2SPC — This program converts tabs in a text file to an equivalent amount of spaces, so that the appearance of the file is retained. This program can be used on a file before WSCON, if it has tabs in it. For MS-DOS or Z-DOS.

TYPER — This program is useful whenever you want to type a few lines and have them printed. It allows you to include any special codes to set up effects on your printer. For MS-DOS or Z-DOS.

MACROS.ASM — Required to assemble REPRINT.ASM.

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

P/N 885-3026-37 MS-DOS SMALL-C Compiler

Introduction: This set of diskettes forms a complete compiler for the SMALL-C language. The compiler converts a file of statements in SMALL-C into a file of statements in MS-DOS assembly language code. Assembling the generated file, along with the runtime support library code (included), creates an executable file. The SMALL-C language is a true subset of the UNIX C language of sufficient power and complexity to write useful programs, including the SMALL-C compiler in which itself was written. Many example programs and massive documentation is provided with the compiler package. The full source code for this compiler is also included so the compiler can be modified and reassembled.

Requirements: The SMALL-C compiler requires the MS-DOS operating system (Version 2.0 or greater) on an H/Z-100 computer system. The computer should have at least 128k of memory. It should also have at least two 5" disk drives

The following program and files are included on the HUG P/N 885-3026-37 MS-DOS SMALL-C Compiler disks:

Disk A

C88 .COM STDIO .H
CRUN .OBJ HELLO .C
BUG2 .C WDCNT .C
SEE .C EXAMPLES .DOC
SMALLC .DOC README .DOC
SMALLC88 .LIB CMAKE .BAT
PARROT .C BUG1 .C
SSORT .C CHARCNT .C
C88USE .DOC CRUN .DOC

Disk B

COMPILER .LNK C88MAINT .DOC
CMAINT .BAT

Disk B (COMPILER)

C88A3 .C C88B2 .C
C88F1 .C C88E1 .C
C88G1 .C C88H1 .C
C88DEFS .H C88 .H
C88A3 .OBJ C88B1 .OBJ
C88D1 .OBJ C88E1 .OBJ
C88H1 .OBJ C88H2 .OBJ
C88D1 .C C88A1 .C
C88B1 .C C88C1 .C
C88H2 .C C88DEFS .H
C88I1 .C C88A2 .OBJ
C88A1 .OBJ C88C1 .OBJ
C88B2 .OBJ C88G1 .OBJ
C88F1 .OBJ C88A2 .C
C88I1 .OBJ

Disk B (RUNTIME)

PARSE .ASM IODEFS .H
CRUN .C SMALLC88 .LIB
CRUN .OBJ

Author: David A. Wallace

Program Content: The author of this package derived this compiler from Ron Cain's Version 1.1 SMALL-C Compiler, which was published in two issues of Doctor Dobb's Journal in 1980. He transcribed the original code and all published fixes to it, added several enhancements of his own, and retargeted the compiler to produce assembly code compatible with MS-DOS's assembler. The runnable compiler is on Disk A, along with the standard I/O definitions file, STDIO.H. There's also an explanatory or "getting-started" file, README.DOC, on that disk.

C88USE.DOC explains how to run the compiler, SMALLC.DOC is a description of the language itself, CRUN.DOC describes the runtime library, and EXAMPLES.DOC explains the included sample programs.

Disk B contains the files necessary to modify or reconstruct the compiler and runtime support library files. Two subdirectories are included on this disk: (COMPILER) (contains the compiler source files) and (RUNTIME) (contains the runtime source files). This disk is included with this product for those programmers and experimenters who are quite knowledgeable in the "C" language, as well as assembly language and are not required for the proper operation of the compiler itself.

According to the author, the compiler is entirely compatible at the source code level with the UNIX C compiler; it supports a true subset of UNIX C.

Comments: None

TABLE C Rating: (10)

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 (OBJ) 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.

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P/N 885-3029-37 MS-DOS HUG Bkgnd Print Spooler

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Introduction: The HUG Background Print Spooler (HBPS) is a program that allows you to assign some of your computer's memory (any amount from 4k to 512k) to be used as a print buffer. With HBPS loaded, when a program sends text to the printer (via normal DOS functions), it does not go directly to the printer, but into the HBPS buffer. HBPS then takes the characters from the buffer and sends them to your printer. Since HBPS can accept characters into its buffer more rapidly than the printer can accept characters, your computer can complete a print operation faster than without HBPS, and go onto other tasks while HBPS is printing characters from its buffer. HBPS gives you the advantages of a hardware print buffer without the hardware.

Requirements: HBPS requires an H/Z-100 series, or H/Z-100 PC series (H/Z-150, etc.) computer, at least 192k of system RAM, and the MS-DOS or Z-DOS operating system. If Z-DOS is used, it must be the latest release. The maximum amount of memory assignable to HBPS with MS-DOS version 1 or Z-DOS is 64k (512k with MS-DOS version 2).

This disk contains the following files:

README	.DOC	HBPS	.Z1F
HBPS	.Z2F	HBPS	.Z1S
HBPS	.Z2S	HBPS	.PC1
HBPS	.PC2	HBPS	.DOC
SETSP	.COM	PR	.COM
BASPATCH	.COM	WSPATCH	.COM
WRDPATCH	.COM	SCRNCLKZ	.WHT
SCRNCLKZ	.RED	SCRNCLKZ	.GRN
CLKZ	.COM	SCRNCLK	.WHT
SCRNCLK	.RED	SCRNCLK	.GRN
CLK	.COM	HBPS	.ASM
SETSP	.ASM	PR	.ASM
BASPATCH	.ASM	WSPATCH	.ASM
WRDPATCH	.ASM	SCRNCLKZ	.ASM
CLKZ	.ASM	SCRNCLK	.ASM
CLK	.ASM		

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

HBPS.Z1F, HBPS.Z2F, HBPS.Z1S, HBPS.Z2S, HBPS.PC1, HBPS.PC2 — These are versions of HBPS for use on different equipment, and under different situations. Instructions for selecting a version, and for using HBPS are in the file HBPS.DOC.

Note: Some programs are slow in sending characters to a printer. If your printer is faster than a particular program, using HBPS or any other print buffering method will not result in a time savings. However, if a program prints slowly because of operating system overhead, such as Z-100 WordStar when used with MS-DOS version 2, there may be a time savings when HBPS is used. The slower your printer is, the more time will be saved by using HBPS.

HBPS.DOC — Instructions for using HBPS.

SETSP.COM — This is a program for controlling HBPS once it is loaded. It allows you to empty the HBPS buffer to suspend printing, or to disable HBPS so that a program's printer output goes directly to the printer.

PR.COM — This is a program that allows you to rapidly copy disk files to the HBPS print buffer. Because the system command processor does not output to the printer via the normal DOS "channel," using the COPY command, as in

A>COPY FILENAME.EXT

where FILENAME.EXT is the name of the file to print. If PR is used under MS-DOS version 2, a full path name can be used. Very large files can be "printed" in seconds using HBPS and PR.

BASPATCH.COM — The BASICA program (GW-BASIC) does not go through the normal DOS "channel" when it sends characters to the printer, so it bypasses HBPS. This program can patch BASICA so that the LLIST and LPRINT commands will output via the DOS. It does not affect other forms of printing, such as printing to "PRN" as a device. BASPATCH can patch all versions of BASICA sold by Heath/Zenith.

WSPATCH.COM — This program patches the Z-100 PC (Z-150, etc.) version of WordStar so that its printer output will work with HBPS. **Note:** The Z-100 version of WordStar does not have to be patched.

SCRNCLKZ.WHT, SCRCLKZ.RED, SCRCLKZ.GRN — This is a modified version of the SCRCLK program for the Z-100 originally published in REMark and released on HUG disk 885-3014-37. The original version is slightly incompatible with HBPS in that the display cannot be turned off if it is loaded before HBPS. This version can be loaded before or after HBPS. When loaded, it causes a digital clock display to appear in the upper right corner of your screen. The file name extension determines the color of the clock display.

CLKZ.COM — This program is used to control the Z-100 SCRCLK program. It can be used to turn the clock display off or on.

SCRCLK.WHT, SCRCLK.RED, SCRCLK.GRN — This is a modified version of the SCRCLK program for the Z-100 PC (H/Z-150 PC, etc.) originally published in REMark. It is the same program that was released on HUG disk 885-3014-37. The original REMark version is slightly incompatible with HBPS in that the display cannot be turned off if it is loaded before HBPS. This version can be loaded before or after HBPS. The extension determines the color of the clock display.

CLK.COM — This program is used to control the Z-100 PC SCRCLK program.

HBPS.ASM, SETSP.ASM, PR.ASM, BASPATCH.ASM, WSPATCH.ASM, WRDPATCH.ASM, SCRCLKZ.ASM, CLKZ.ASM, SCRCLK.ASM, CLK.ASM — These are the assembly language source files for the above programs.

TABLE C Rating: (2), (4), (10)

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885-3031-37 Z-DOS/MS-DOS Graphics

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Introduction: Graphics is a Z-BASIC application program used to create drawings by allowing the user complete "keyboard" control of the Z-BASIC advanced color graphic capabilities. The function and numeric keypad keys are used to control the drawing process, and the two top text lines of the screen are used for parameter display. The program is completely Menu driven from the function key line and is partitioned into separate "Specialty" routines (Trace, Line, Circle, Figures, etc.), each with its appropriate menu and parameter display. The screen drawing position is referenced by a "cross-hair" type graphic cursor, controlled from the numeric keypad keys. The drawing (and the parameters for up to twenty each), circles and figures can be saved and/or loaded from disk at any time. This software comes with an extensive users manual.

Requirements: The H/Z-100 series computer (not PC) with one disk drive is a minimum requirement. Z-DOS or MS-DOS with ZBASIC is also needed. To take full advantage of the program capabilities, color memory and a color display are very highly recommended.

The following files are included on the HUG P/N 885-3032-37 ZDOS/MS-DOS GRAPHICS Disk:

README	.DOC	SNOOPY	.GRN
GRAPHICS	.BAS	SNOOPY	.RED
STAR	.GRN	SNOOPY	.BLU
STAR	.CIR	CIRCUIT	.FIG
STAR	.FIG		

Author: Jon R. Rehage

Program Content: When Graphics first signs on, a main menu appears on the 25th line. From this menu, the following commands are available:

F1-TRACE: This routine is used to draw lines and/or paint with a defined rectangular area called the "paint brush". The process occurs as you move the graphic cursor by depressing the keypad keys.

F2-LINE: The line routine is used to draw lines and boxes in a "from/to" manner, by drawing on command from the function keys after the graphic cursor is exactly positioned.

F3-CIRCLE: The circle routine is used to draw circles, ellipses, arcs, single dots, horizontal and vertical lines, and lines at any defined angle. To accomplish this, the circle routine allows control of all the Z-BASIC "Circle" statement arguments from the keyboard. Twenty circles can be defined and used at a time. These twenty circles can be saved on disk for future use.

F4-FIGURS: The figure routine is used to define and draw figures using the capabilities of the Z-BASIC "Draw" statement. Twenty figures can be defined and used at a time. The figures are created by defining a "string expression" for each desired figure, using the "movement commands" defined for the Z-BASIC "Draw" statement. As in the circle routine, the twenty defined figures can be saved on disk for future use.

F5-IMAGE: The image routine is used to "capture the image" of a desired rectangular area of the screen, and then transfer that image to other areas of the screen. The Image routine uses all the capabilities of the Z-BASIC "Get/Put" statements. Control of the "Put" statement's action verbs (PSET, PRESET, AND, OR, and XOR) allow the creation of some very unusual drawings.

F6-PAINT: The paint routine is used to fill "bounded" areas of the screen with any of the eight colors defined for the Z-BASIC "Paint" statement.

F7-TEXT: The Text routine is used to type on the screen with alpha/numeric or graphic characters with complete control of the typing direction, location and foreground/background colors. The Text routine is especially useful for "framing the

drawing" using the graphics characters.

F8-CLEAR: This routine simply clears the drawing area of the screen.

F9-Z-DOS: Exits the program and returns to the operating system. Any command that affects the drawing's existence, such as the CLEAR, Z-DOS, etc. always requires a confirming Yes/No answer.

F10-FILE: The File routine is used to show, save, load, and kill disk files created by this program.

F11-GRID: The F11 key puts a grid reference on the screen by placing cursor images "+" at equally spaced positions. The F11 key is a toggle operation to display the grid, if not on the screen, or to remove the grid if on the screen.

F12-EXIT: The F12 key exits the current routine and returns you to the previous routine (in most cases, the main graphics menu). The function of keys F11 and F12 are always used as defined above and are not displayed on the 25th menu line.

Comments: This drawing program just about has it all!!!

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

=====

P/N 885-3032-37 MSDOS Halley's Comet Locator

=====

Introduction: This disk contains the program for locating Halley's Comet that was presented in the September 1985 Issue of REMark. Versions for both H/Z-100 and H/Z-150/160 series computers are provided, and the programs have been compiled for faster operation.

Requirements: The Halley's Comet Locator requires an H/Z-100, H/Z-150/160, or IBM PC compatible computer, 128k of RAM, and the Z-DOS or MS-DOS operating system. The H/Z-100 version will run in color on a computer equipped for it. The HUG Skyviews program (885-3015-37 for H/Z-100 or 885-6005-37 for H/Z-150/160) is recommended as a companion program to aid in locating the comet.

This disk contains the following files:

README	.DOC	HALLEYZ	.EXE
HALLEYPC	.EXE	HALLEYZ	.BAS
HALLEYPC	.BAS		

Printed documentation is enclosed with the program.

Author: Jim Tursa. Modified for H/Z-150 by P. Swayne.

HALLEYZ.EXE, HALLEYPC.EXE — This is the compiled Halley's Comet Locator, ready to run. HALLEYZ is for H/Z-100 com-

puters, and HALLEYPC is for H/Z-150/160 computers. This program can plot the course of Halley's Comet in two ways: A right ascension-declination chart for locating the comet, and a space view that lets you see how the comet looks in space as it approaches and leaves the sun. The space view can be plotted from any angle at a user selectable distance from the sun. All of the planets in the solar system can be plotted in addition to Halley's Comet.

HALLEYZ.BAS, HALLEYPC.BAS — These files are the source for the above programs in BASIC. They will run in ZBASIC and/or GW-BASIC on the appropriate computer, but much more slowly than the compiled versions.

TABLE C Rating: (10)

=====

P/N 885-3033-37 MS-DOS HUGMCP

=====

Introduction: HUGMCP, or HUG Modem Communications Package, is a program that allows your computer to communicate with another computer, either by way of direct RS-232 interconnection or by way of a modem. Uploading and downloading data is also supported.

Requirements: HUGMCP will work on ANY H/Z-100 PC Compatible computer with one disk drive. The minimum amount of memory is required. This package requires the MS-DOS operating system (version 2.0 or greater) and Borland's TASM (version 1.0 or greater), if you wish to reassemble the source code. Finally, some sort of modem will be needed to access timeshare systems via phone.

The following files are included on the HUG P/N 885-3033-37 MS-DOS HUGMCP disk.

HUGMCP.EXE — Unconfigured executable file
HUGMCP.ASM — Source code
DEFMS.ASM — Definition file required for source reassembly
FIRSTIME.NET — Accessing CompuServe the first time info.
README.DOC — Basic information and disclaimer

Author: Jim Buszkiewicz, HUG

Program Content: HUGMCP is a modem communications package, written in assembly language under the MS-DOS operating system. Due to its large input buffer and interrupt driven modem port, HUGMCP is able to communicate at all standard baud rates with NO handshaking! This capability enables you to communicate with the ID-4801 EPROM Programmer at 9600 baud; a capability not found in other modem packages running under MS-DOS! Other features have been added to make this communications package compatible with future Heath/Zenith products.

HUGMCP is capable of uploading and downloading files using the standard XMODEM file transfer protocol. The program automatically switches between CHECKSUM and CRC error testing depending on which method the host is capable of. Data files can also be transferred using standard XON/XOFF (Control-S, Control-Q) protocol, and response to that protocol can be disabled at the user's option. Data can also be captured in HUGMCP's storage buffer. This buffer can be opened and closed with a single keystroke. This storage buffer, by the way, is as large as the amount of free memory your computer has at the time of execution. Typically, with a fully loaded H/Z-100, you could have a buffer greater than 600K!!

Auto log on to CompuServe is also supported by HUGMCP. By entering your ID number and password, HUGMCP will automatically log you into CIS with two keystrokes. Fourteen additional 32 character messages can be stored by HUGMCP and transmitted with two keystrokes. These short messages may contain any printable character, and is terminated with a carriage return (CR). These messages can be used for initializing modems, auto dialing, etc. In addition, one of these messages can be flagged to be immediately sent whenever the program is executed. This feature is quite useful for modems that need to be initialized upon power up.

One of the options available in HUGMCP is the 'setup' option. This allows the user to configure the software to 'his' computer system, as well as the host he plans on communicating with. Under this option, the user is allowed to modify the word length, word parity, baud rate, the auto-messages, some miscellaneous functions, and save the modifications on disk, if so desired. If the user has an H/Z-100 PC system, he is also given the option of using either COM1 or COM2 for his modem port. Under the setup option, you can also view the present settings of each modifiable option.

Although an extensive users' manual comes with this software, 'help' screens are available whenever applicable, making this software very 'user-friendly', and very easy to 'setup'.

HUGMCP maintains a concise help list, the open/closed status of the storage buffer, and the 'communications' (COM) status on the 25th line of the screen

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

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

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

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

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

Documentation about the system is available from CompuServe for an additional charge, and more information regarding this documentation can be found in the file: FIRSTIME.NET (in this product). More information can also be obtained from CompuServe directly, while on the system.

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

Comments: This package does it all, quickly and efficiently, without a lot of unnecessary frills. It will also introduce a user to the timeshare system of CompuServe.

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

=====

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.

=====

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
OSADORG	.PRN	PERSIM	.PRN
PIGHIC	.PRN	PINOAK	.PRN
REDBUD	.PRN	REDMAP	.PRN

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SWEGUM .PRN	SYCAMO .PRN
TULIPT .PRN	WHIASH .PRN
WHIHC .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
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SLIELM .PIC	SUGMAP .PIC
SWAOAK .PIC	SWEGUM .PIC
SYCAMO .PIC	TULIPT .PIC
WHIASH .PIC	WHIHC .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 ALTCCHAR.SYS). All changes made by SETZPC can be either temporary or permanent.

ANSISYS.COM — This program emulates the ANSI.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 ANSISYS.

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.

FIXFVII.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)

=====

P/N 885-3038-37

Z-DOS/MS-DOS

DEBUG Support Utilities

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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 Processor Window, 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.

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)

P/N 885-3040-37 HADES

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

P/N 885-3040 HADES II..... \$40.00

The original version of HADES (Hug's Absolute Disk Editing System) has been updated to HADES II. The original version of HADES, although works properly under new MS-DOS 3.3 PLUS,

it cannot handle disk partitions larger than 32 megabytes, and will exit back to MS-DOS when attempting to do so. Now enters HADES II. This new version of HADES retains all of the features of the original version and adds a few extras described as follows:

HADES II will now work with MS-DOS partitions larger than 32 megabytes. Only limited by DOS, HADES II will now operate on disks as large as 0.5gb (512 megabytes) having as many as 1 megasectors!!

You can now recover an erased file by manually reconstructing it from recognizable sectors or clusters.

HADES II no longer uses the disk header sector to obtain its internal information. This means that HADES II will now work with 'headerless' MS-DOS disks, such as those created with "Fastback".

HADES II now has an option in the main menu to display all the important internal information about the currently logged disk drive. Some of this information includes: disk capacity, sectors per disk, sectors per cluster, number of FATs, starting sector numbers for the FAT, root directory, and data, bytes per sector, etc.

HADES II still works without modification on any computer that uses MS-DOS, including the Z-100!! NOTE: The Z-100 is still limited by MS-DOS to a maximum 32 megabyte partition.

The original abstract for HADES can be found in the January 1989 issue of REMark on pages 34 and 35.

Older versions of HADES can be updated to HADES II by returning your original HADES distribution disk, along with a check or money order for \$15 to: The Heath Users' Group, P.O. Box 217, Benton Harbor, MI 49022-0217.

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 unmasks 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 885-3043-37 SCREENDUMP

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
SCDMPICIT	.100	Z-100 Vers for C. Itoh 8510/1550
SCDMPICIT	.150	Z-150 Vers for C. Itoh 8510/1550
SCDMPICIT	.ZPC	Z-100 ZPC Version for C. Itoh 8510/1550
SCDMPNEC	.100	Z-100 Version for NEC 8023A
SCDMPNEC	.150	Z-150 Version for NEC 8023A
SCDMPNEC	.ZPC	Z-100 ZPC Version for NEC 8023A
SCDMPICIT	.ASM	Source for C. Itoh 8510/1550 and NEC 8023A

SCDMPEPS	.100	Z-100 Version for Epson MX/RX/FX
SCDMPEPS	.150	Z-150 Version for Epson MX/RX/FX
SCDMPEPS	.ZPC	Z-100 ZPC Version for Epson MX/RX/FX

SCDMPIBM	.100	Z-100 Version for IBM Proprinter
SCDMPIBM	.150	Z-150 Version for IBM Proprinter
SCDMPIBM	.ZPC	Z-100 ZPC Vers for IBM Proprinter
SCDMPEPS	.ASM	Source for Epson MX/RX/FX and IBM Proprinter

SCDMPGEM	.100	Z-100 Version for Star Micronics Gemini
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SCDMPGEM	.150	Z-150 Version for Star Micronics Gemini
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SCDMPGEM	.ZPC	Z-100 ZPC Vers for Star Micronics Gemini
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SCDMPGMX	.100	Z-100 Vers for Star Micronics Gemini 10X
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SCDMPGMX	.150	Z-150 Vers for Star Micronics Gemini 10X
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SCDMPGMX	.ZPC	Z-100 ZPC Vers for Star Micronics Gemini 10X
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SCDMPGEM	.ASM	Source for Star Micronics Gemini Series
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SCDMPOKI	.100	Z-100 Vers for Okidata Microline
SCDMPOKI	.150	Z-150 Vers for Okidata Microline
SCDMPOKI	.ZPC	Z-100 ZPC Version for Okidata Microline

SCDMPOKI	.ASM	Source for Okidata Microline
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SCDMPMPI	.100	Z-100 Vers for Zenith/MPI 99/150
SCDMPMPI	.150	Z-150 Vers for Zenith/MPI 99/150
SCDMPMPI	.ZPC	Z-100 ZPC Version for Zenith/MPI 99/150

SCDMPMPI	.ASM	Source for Zenith/MPI 99/150
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SCDMPANA	.100	Z-100 Vers for Anadex Silent Scribe
SCDMPANA	.150	Z-150 Vers for Anadex Silent Scribe
SCDMPANA	.ZPC	Z-100 ZPC Vers for Anadex Silent Scribe

SCDMPANA	.ASM	Source for Anadex Silent Scribe
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SCDMPIDS	.100	Z-100 Version for IDS Paper Tiger
SCDMPIDS	.150	Z-150 Version for IDS Paper Tiger
SCDMPIDS	.ZPC	Z-100 ZPC Vers for IDS Paper Tiger
SCDMPIDS	.ASM	Source for IDS Paper Tiger

SCDMP-RL	.SKL	Skeleton vers for use in building a program
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SCDMP-LR	.SKL	for your unique printer or application
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SCDMP	.BAT	Batch file for auto load of SCDMP.COM (rename the appropriate program to SCDMP.COM)
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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

SCDMP	.BAT	Batch file for auto load of SCDMP.COM (rename the appropriate program to SCDMP.COM)
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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

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

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

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 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 set-

ting 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 an <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)

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

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P/N 885-3044-37
Games Package II
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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; GWBASIC 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)

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P/N 885-3045-37
HEPCAT
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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 match 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)

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

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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)

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KEYMAP To KEYMAC Upgrade

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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.

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HUG P/N 885-3047[-37] Z-100 WordStar Connection \$20.00 (For PC WordStar Users, too!)

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Note: This is a re-release of the Z-100 WordStar Connection disk first offered in 1988. It now supports release 5.0, as well as release 4.0 of WordStar Professional. If you have already purchased the previous release of this package, you can obtain this new version by sending your original Z-100 WordStar Connection disk and \$7.00 to HUG.

The Z-100 WordStar Connection is a set of utilities that allows you to run the PC compatible version of WordStar Professional 4.0 or 5.0 on a Z-100 (not PC) computer without any PC emulation required. All of the major features of WordStar 5.0 are supported, including Page Preview.

This version of the Z-100 WordStar Connection represents a different approach to the problem of running PC WordStar on a Z-100 computer. The old version applied a considerable amount of patches to WordStar, but this version uses a "parent" program to run WordStar as a child after only a few

patches are made. With the new Z-100 WordStar Connection, you can make your WordStar work in almost exactly the same way it does on a PC, and all 40 of the PC function key assignments are supported.

The new Z-100 WordStar Connection adds two features to WordStar that make it even better than it comes out of the box.

The first added feature is character undelete. characters deleted one at a time using the Backspace key or Delete are stored in a buffer, and they can be restored by typing a special key combination.

The second added feature is dynamic function key prompting. This feature shows you the usage of all 40 function key assignments using only a single screen line. Normally, WordStar shows 20 assignments using two screen lines.

A "parent" program for use on PC compatibles is provided that adds character undelete and dynamic function key prompting to WordStar on those systems. It also gives you the option of configuring your keypad to work in the same H19 mode that was supported by the old Z-100 WordStar Connection, but without any patches to WordStar itself outside of the normal patch area.

Requirements: To use this package, you need a Z-100 series computer and the Z-100 version of MS-DOS version 2 or above. To run WordStar 4.0, you need at least 256k of memory, or 320k if you want to use Word Finder. To run WordStar 5.0, you need at least 384k of memory. WordStar comes configured for 512k of memory, so it is best to have at least that much installed. If you want to use the Page Preview feature of WordStar 5.0 with this package, your Z-100 must be fully populated with 768k of memory.

This package does not support TelMerge or PC Outline on a Z-100.

Program Author:
Patrick Swayne, HUG Software Engineer

The Z-100 WordStar Connection disk contains these files:

README	.DOC	WSPC	.DOC
WSZ100	.DOC	WSPC	.COM
WSZ100	.COM	PC	.PAT
WINSTALL	.COM	WINSTALL	.ASM
WSCHANGE	.COM	WINSTALL	.ASM
Z100	.PAT	WSCHANGE	.ASM
COLORS	.PAT	WSLIST	.ASM
KEYS	.PAT	FIXWSL	.ASM
WSLIST	.COM	PRCHANGE	.ASM
FIXWSL	.COM	PDFEDIT	.ASM
PRCHANGE	.COM	LSRFonts	.ASM
PDFEDIT	.COM	PF	.ASM
LSRFonts	.COM	PFINST	.ASM
PF	.COM	READ	.ASM
PFINST	.COM	WSPC	.ASM
READ	.COM		

Here is an explanation of the files:

WSZ100.DOC — Instructions for using WordStar on a Z-100.

WSZ100.COM — This program is the parent program that runs WordStar (WS.EXE) on a Z-100. For normal operation, you would rename this file to WS.COM so that WordStar could be run using the normal WS command.

WINSTALL.COM — This is a parent program that runs WINSTALL.EXE on a Z-100.

WSCHANGE.COM — This is a parent program that runs WSCHANGE.EXE on a Z-100.

Z100.PAT — This is an auto-patch file for use with WSCHANGE. The patches in this file must be applied before WordStar will work with WSZ100.COM on a Z-100.

COLORS.PAT — This is an auto-patch file that sets up the colors used in WordStar so that they look good on a Z-100. This patch can also be used with WordStar on a PC compatible, so that WordStar has the same colors on both computers. A color scheme is used that does not involve intense colors, which are not supported on a Z-100.

KEYS.PAT — This is an auto-patch file that sets up the keypad so that it works like the H/Z-89 version of WordStar 3.3. This method of using the keypad is more versatile than the PC layout. This patch can also be used with WordStar on a PC compatible when it is used with the WSPC.COM parent program (described below).

WSLIST.COM — This is a parent program that allows the WSLIST.COM provided with WordStar 5 to run on a Z-100.

FIXWSL.COM — This program patches the WordStar 5 WSLIST program so that it can run under the WSLIST parent (above).

PRCHANGE.COM — This is a parent program that PRCHANGE.EXE on a Z-100.

PDFEDIT.COM — This is a parent program that runs PRCHANGE.EXE on a Z-100.

LSRFonts.COM — This is a parent program that runs LSRFonts.EXE on a Z-100.

PF.COM — This is a parent program that runs Pro Finder (PF.EXE) (supplied with WordStar 5) on a Z-100.

PFINST.COM — This is a parent program that runs the Pro Finder installation program (PFINST.EXE) on a Z-100.

READ.COM — This is a parent program that runs the README.COM program supplied with WordStar 5 on a Z-100. README.COM is used to display or print a file containing additional documentation not found in the manual.

WSPC.COM — This file contains instructions for using the WSPC.COM parent program on a PC compatible computer to add features to WordStar.

PC.PAT — This is an auto-patch file containing a patch to WordStar to allow it to work with WSPC.COM. The patch is applied using WSCHANGE.

***.ASM** — The assembly source code files are provided for all .COM files on this disk.

TABLE C Rating: 3, 7, 10

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HUG P/N 885-3047

Z-100 WordStar Connection

UPDATE

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The HUG Z-100 WordStar Connection, which will allow the PC compatible version of WordStar to be used on Z-100 series (non PC compatible) computers has been upgraded to support WordStar release 5.5. The new Z-100 WordStar Connection provides support for all WordStar features that it supported before, including Advanced Page Preview. It now also provides limited support for Inset™, the graphics program provided with WordStar 5.5, which allows you to add graphic illustrations to your documents. If you have a hard disk, the new Z-100 WordStar Connection allows you to use the new WSSETUP utility, which makes installation a snap. If you have the old Z-100 WordStar Connection and would like to upgrade, send in your original Z-100 WordStar Connection disk and \$7.00 to HUG. New buyers can still get it for \$20.00 (plus shipping).

The Z-100 WordStar Connection requires a Z-100 series computer with at least 384k of RAM and the Z-100 version of MS-DOS 2.0 or higher. To run Page Preview and the view and preview features of Inset, you need 768k of memory. For a more complete description of the Z-100 WordStar Connection, see the February 1989 issue of REMark.

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HUG P/N 885-3048-37

Both Sides

Printer Utility \$20.00

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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

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EZPLOT II

HUG P/N 885-3049-37

H/Z-100 Version \$25

HUG P/N 885-6013-37

PC Compatible Version .. \$25

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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: 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 Data Base System

MAGBASE \$25.00

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MAGBASE is a data base system designed specifically for keeping track of magazine articles. It was produced to create a data base 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 data base of the year 1987 of REMark magazine. All articles, including "Buggin' HUG" letters, are included in the data base.

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 data base 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 data base, and instructions for creating your own magazine data base are included.

MAGBASE.COM — This is the MAGBASE magazine data base 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 data base. The classifications are stored bitwise in the actual data base file (64 classifications in 8 bytes), and the text for each classification is stored in this file.

REMARK.DAT — This is the data base containing information on all articles from the 1987 issues of REMark.

Program Author:
Patrick Swayne, HUG Software Engineer

TABLE C Rating: 10

P/N 885-3050 MagBase Update

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 885-3051-37 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] — produces 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

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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.

Program Authors: 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.

Modify Operation of 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 (80386) and a 16 MHz 80286 or a 25 MHz 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

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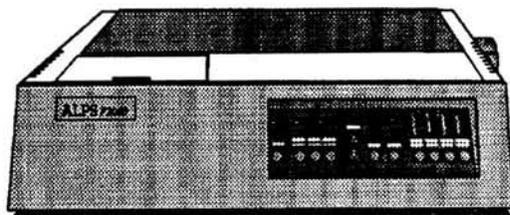
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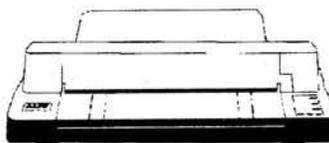
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command line or a batch file. You can put a line in your AUTOEXEC.BAT file that will set the state of any or all of these keys the way you want them at boot-up. This program is for PC compatible computers only.

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-100s, 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 system, 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.

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HUG P/N 885-4008

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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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P/N 885-4604

POWERING UP \$12.00

By Bill Adney

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Abstract: The POWERING UP series of articles in this book is specifically designed to help a new computer user select, set up, and use a computer system. These articles are specifically designed to focus on the basic features and capabilities of the

Heath and Zenith PC compatible microcomputer systems, and center on the "need-to-know" information with an emphasis on the practical aspects of using your system. For example, some articles include practical examples of specific DOS (MS-DOS and PC-DOS) commands, with explanations, so that even a novice or beginning user can immediately take advantage of advanced features without a lot of technical background or knowledge. Other articles include hardware-related subjects, such as how to add more memory to your computer (and what kind to add), how to set up a printer, and how to set up and use a hard disk. Even advanced microcomputer users will see some practical tricks and techniques that can improve their productivity significantly. And if you are a new user, the information provided in this book can help you graduate from the novice to the advanced (power) user!

These articles use the practical, how-to approach with very limited (if any) technical explanation as to why something works the way it does, except when necessary to help you troubleshoot a problem. In short, you will learn information that you must know in order to successfully set up and use a microcomputer system.

The 15 chapters in this book are titled as follows:

1. Setting Up Your Computer System
2. Powering Up Your System
3. Using File Names and Subdirectories
4. The DOS Command Line
5. Important DOS Commands You Must Know
6. Connecting Peripherals to Your Computer
7. Using Batch files and CONFIG.SYS
8. Using Input/Output (I/O) Redirection
9. Understanding Video Hardware
10. Adding More Memory to Your Computer
11. How to Select Application Programs
12. How to Select Utility Programs
13. Selecting and Setting Up a Hard Disk
14. Other Useful DOS Commands
15. Maintaining Your Computer System

Program Author: William M. Adney

Comments: This is the book you've been waiting for. It's the PC compatible hardware/software manual for those people that don't like to read their manuals! It's the book for beginners and advanced users alike.

TABLE C Rating: 10+

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885-6001-37 MS-DOS

Z-150 KEYMAP

Function Key Mapper

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Introduction: Z-150 KEYMAP is a program that lets you designate the responses produced by your computer's function keys. It works like the KEY command in GW-BASIC (BASIC) except that more keys can be defined, and the defined keys are part of the "system" and can be used with any program or the operating system, not just with BASIC. For example, you could have the F1 key produce the command DIR A: (including the RETURN), so that a single press of that key would give you a list of the files on your disk.

Requirements: Z-150 KEYMAP requires the MS-DOS or PC-DOS operating system (version 1.25 or higher) on an H/Z-150, H/Z-160, or any PC-compatible computer, and at least 128k of memory.

This disk contains the following files:

README	.DOC	KEYCON	.ASM
KEYMAP	.DOC	UNMAP	.ASM
KEYMAP	.COM		
KEYCON	.COM		
KEYSYS	.COM		
KEYSYS	.DOC		
KEYBAS	.COM		
KEYBAS	.DOC		
KEYWS	.COM		
KEYWS	.DOC		
UNMAP	.COM		
KEYMAP	.ASM		

Author: Patrick Swayne, HUG

KEYMAP -- This is the executable KEYMAP program, provided in unconfigured form so that you can set up the keys the way you want to. It allows you to define a response of up to 20 characters for each of the following keys: the Arrow keys, Home, PgUp, PgDn, End, Ins, Del, F1 through F10, SHIFT-F1 through SHIFT-F10, CTRL-F1 through CTRL-F10, and ALT-F1 through ALT-F10. You can designate any one of those keys as an alternate response key, which gives all of the other definable keys two responses of up to 20 characters each. A total of 50 different responses can be produced without an alternate response key, or 99 responses with one. In addition to the ability to define keys, Z-150 KEYMAP offers these other features:

** On/Off toggle. A control code (normally CTRL-SHIFT-6) is provided to toggle KEYMAP on or off, so that it can be temporarily disabled to allow other programs to control the function keys.

** Coexistence with other programs. Not all of the keys must be configured with KEYMAP. Some can be left "unconfigured" so that KEYMAP can coexist with programs such as GW-BASIC. For example, if you configure only the shifted function keys, the GW-BASIC key command will still work properly with the unshifted function keys.

** Optional 25th line prompt. If you wish, you can have KEYMAP display a prompt on the 25th screen line designating the response of the keys F1 through F10, like KEY ON in GW-BASIC. While the prompt is on, output to the screen appears on the first 24 screen lines, and the 25th line remains under the control of KEYMAP, until a program accesses it directly.

** "Scan code" mapping. A key can be mapped to its own or any other "scan code." ("Scan codes" are the codes normally produced by function or keypad keys when KEYMAP is not in use.) For example, you could reverse the functions of the left and right arrow keys, and have each one produce the other's code.

KEYCON -- This program is used to configure the KEYMAP program, and allows you to designate the response of each mappable key. It is self prompting, and makes setting up custom key responses easy.

KEYSYS -- This is a pre-configured KEYMAP for use with the operating system. Commands such as DIR, DATE, TIME, etc. are available at the press of a key.

KEYBAS -- This is a pre-configured KEYMAP for use with GW-BASIC. 30 BASIC commands are "programmed" into your keys, without interfering with the KEY command or the editing keys.

KEYWS -- This is a pre-configured KEYMAP for use with WordStar. It provides more control via the function and keypad keys than you get without KEYMAP, and is similar to the configuration used in other releases of KEYMAP. Use it as is, or use it as a guide to setting up WordStar to your own preferences.

UNMAP -- This program disables KEYMAP, and lets you install a differently configured KEYMAP without re-booting.

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

NOTE: For use on other Heath/Zenith computers, HUG offers the following KEYMAP programs:

885-1230-37 -- CP/M KEYMAP, for use on an H8 (with Heath/Zenith terminal), H/Z-89,90, or Z-100 and 8-bit CP/M.

885-3010-37 -- Z-DOS KEYMAP, for use on a Z-100 series computer under Z-DOS or MS-DOS.

885-5001-37 -- CP/M-86 KEYMAP, for use on a Z-100 series computer under the Heath/Zenith release of CP/M-86.

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885-6002-37 MS-DOS

CP/EMulator II

And ZEMulator

=====

Introduction: CP/EMulator II is a program that lets you run standard 8-bit (8080) CP/M programs under MS-DOS on any MS-DOS compatible computer, and does not require an 8-bit processor. ZEMulator is a program that provides most of the Z-100's keyboard functions, escape code functions, and block graphic (H19) characters on any IBM-PC compatible computer, including the Z-150 and Z-160, and does not require the Z-319 video card. Together these programs add greatly to the number of programs that you can run on your Z-150 or other PC compatible computer.

Requirements: CP/EMulator II requires any version of ZDOS or MS-DOS 1.25 or higher on any Heath/Zenith or other MS-DOS compatible computer. The computer should have at least 128k of RAM. ZEMulator requires an H/Z-150, H/Z-160, or any IBM-PC

compatible computer, 128k (min) of RAM, and MS-DOS/PC-DOS 2.x or 1.25.

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

README	.DOC	ZEM1	.COM
CPM2	.COM	ZEM	.DOC
CPM2	.DOC	ZEM	.ASM
CPM2	.ASM	SETZEM1	.COM
COMD	.SYS	SETZEM2	.COM
COMD	.ASM	SETZEM1	.COM
ZEM1	.COM	SETZEM	.ASM
ZEM2	.COM	ZTEST	

Program Authors:

CPM2 -- P. Swayne, HUG. Developed from the first CP/EMulator by Robert A. Metz.

COMD -- Developed from ZCPBR by P. Swayne, HUG

ZEM -- Original program by Robert Metz. Enhanced and modified by P. Swayne, HUG.

SETZEM -- P. SWAYNE, HUG

CPM2 -- This is the CP/EMulator II program. It supports nearly all BDOS calls of real CP/M version 2.2 and non-disk BIOS calls. The Set DMA and Select Disk BIOS calls are also supported. It will run most CP/M programs including MBASIC and editors. It can be used in two modes: a direct mode that allows you to run a CP/M program directly from the MS-DOS prompt, and a command mode that provides a CP/M-like environment with the regular CP/M commands such as DIR, SAVE, etc.

CP/EMulator II interprets the 8080 code in the CP/M program and runs everything using the 16-bit processor. It, therefore, allows you to run 8-bit programs on Z-150 or ET-100 computers which have no 8-bit processor. It offers Z-150 owners an alternative to purchasing an expensive CP/M board from a non-Heath manufacturer in order to run CP/M programs. Note: H/Z-100 owners should use the original CP/EMulator program (885-3007-37), instead of this program to run CP/M programs under Z-DOS/MS-DOS.

CP/EMulator II offers the following advantages:

1. You can put your favorite programs, whether they are CP/M or MS-DOS, on a single disk.
2. CP/EMulator II provides a very large 63.5k TPA. Your programs will have all the memory space they need.
3. CP/EMulator II allows you to use CP/M editors on MS-DOS files.

Some disadvantages of CP/EMulator II are:

1. Because the 8080 code in the CP/M program is interpreted, it will run slower than under a real 8-bit processor. Some programs, such as CP/M WordStar, are slowed down so much as to be impractical. With others, the slow-down is hardly noticed.
2. Extension programs, such as DESPOOL or the CP/M version of KEYMAP, will not work except under rare circumstances.
3. Programs that use BIOS disk routines (except set DMA and select disk) will not work.
4. No TIC counter is supported. Game programs that require the TIC counter provided on some Heath/Zenith computers will not work.

COMD -- This program is a system command processor for CP/EMulator II that provides the usual CP/M commands such as DIR, ERA, SAVE, etc.

ZEM1, ZEM2, ZEMI -- These are versions of the ZEMulator program.

ZEM1 and ZEM2 are for H/Z-150 and H/Z-160 computers only, and provide the full H19 graphic character set along with Z-100 escape codes and key codes. The two versions cover variances in video configurations that have been encountered. ZEMI is for use with any PC-compatible computer, and provides a partial H19 graphic character set. That is, some of the characters are not the correct shape, and all of them are derived from the IBM-PC block graphic character set. ZEMI provides the same keyboard and escape code capability as the other versions.

Zemulator allows you to run many programs that were written for the H/Z-100 on your H/Z-150 or IBM-PC. These programs include editors such as HUG's Fast Eddy or Z-100 WordStar version 3.21 (note: Z-100 WordStar version 3.3 requires a Z-319 card), and any CP/M program you might want to run under CP/EMulator II that requires H19 graphics or the function keys. ZEMulator supports both expanded output (escape codes) and the non-expanded mode (8-bit codes) of the Z-100 keyboard. Note: ZEMulator does not require the installation of a Z-319 video card to operate. However, Z-100 programs that utilize video memory directly, whether for graphics or text, will not work without the Z-319 card.

SETZEM1, SETZEM2, SETZEMI -- This program is used to disable and re-enable ZEMulator once it has been installed. SETZEM1 and SETZEM2 are for the H/Z-150 versions, and SETZEMI is for the PC-compatible version.

ZTEST -- This is a text file that lets you determine which of ZEM1 or ZEM2 is correct for your H/Z-150 or H/Z-160.

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

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 885-6004-37 MS-DOS CheapCalc

Introduction: CheapCalc is a minimal but useful "spreadsheet" program that can introduce you to spread sheet computing at little cost. With CheapCalc, your computer screen becomes the window to a large worksheet onto which you can write mathematical problems and have them solved almost immediately.

Requirements: An H/Z-150 or other PC-compatible computer with MS-DOS and at least 128k of system RAM.

The following files are included on this disk:

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

Authors:

Original program by William V. R. Smith

First Heath version by Bob McFarland

H/Z-150 version by P. Swayne, HUG

CC.DOC -- This file contains instructions for using CheapCalc.

CC.EXE -- This is the compiled, ready-to-use CheapCalc program, which runs by itself without BASIC or any other language. It supports a worksheet containing 40 rows and 15 columns. Operations supported are addition, subtraction, multiplication, division, powers, and SUM. Fractional powers can be used for roots (25^*.5 for the square root of 25). The SUM function allows you to add rows or columns of numbers.

All calculations are done in double precision arithmetic, with precision equivalent to that supported by GW-BASIC. Numbers can be displayed in 4 formats: floating, dollars-and-cents, integer, and graphic (a line of asterisks represents each number). In the dollars-and-cents format, rounding off to the nearest cent is done to correct possible binary floating point errors.

CheapCalc lets you enter comments as well as formulas and numbers into the worksheet, and the width of a column can be adjusted to any width from 4 to 30 characters to accommodate your entries. The contents of a "cell" on the worksheet can be copied or replicated to any other cell. You can save your worksheet to a file, load previously saved worksheets, and print all or part of a worksheet on your printer.

CC.HLP -- This file contains instructions for CheapCalc which are displayed on the screen when you use the Help command while running CheapCalc. You can get help at any time without destroying your worksheet data.

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

CC.BAS -- This is the source code for CheapCalc. It can be run using GW-BASIC, but the performance is considerably degraded compared to the compiled version, and the arrow keys do not work when you use the interpreter to run it.

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

Note: These other versions of CheapCalc are available:

885-1131[-37] -- HDOS CheapCalc, for H8, H/Z-89,90.

885-1233[-37] -- CP/M CheapCalc, for H8, H/Z-89,90, and CP/M-85, CP/M-86 (on Z-100).

885-3006-37 -- Z-DOS CheapCalc, for H/Z-100 and Z-DOS or MS-DOS.

P/N 885-6005-37 MS-DOS Skyviews

Introduction: Skyviews is a program that plots the positions of major stars (4.0 magnitude or brighter) and the sun, moon, and planets. In addition to providing a graphic view of the celestial objects, Skyviews provides right ascension-declination, azimuth-elevation, and other information about the objects that is useful to astronomers. The program will mark major constellations on the screen to aid in locating them.

Requirements: A H/Z-150 or similar computer, MS-DOS, and at least 192k of system memory. The high resolution monochrome graphic mode is used.

Authors: Eugene L. Davis. Z-150 version by P. Swayne, HUG.

This disk contains the following files:

README	.DOC	SKYVIEWS	.DOC
SKYVIEWS	.EXE	PLANET	.DAT
CSTNM	.DAT	BRIGHTEST	.DAT
OBSLOC	.DAT	SKYVIEWS	.BAS

SKYVIEWS.DOC -- Instructions for using SKYVIEWS.

SKYVIEWS.EXE -- This is the compiled ready-to-use Skyviews program. When you run it, it will prompt you for the date, local standard time, time zone, longitude, and latitude of the observer. You have the choice of calculating the positions of the sun, moon, and planets; or the sun, moon, planets and major stars.

PLANET.DAT, CSTNM.DAT, BRIGHTEST.DAT, OBSLOC.DAT
— These are data files used by SKYVIEWS when it runs.

SKYVIEWS.BAS — This is the BASIC source for SKYVIEWS. It can be run using GW-BASIC, but at a reduced performance level when compared to the compiled version.

Table C Rating: (10)

Note: Skyviews is also available for H/Z-100 computers, as part no. 885-3015-37. This version provides even more information, by using color to indicate star magnitude.

P/N 885-6006-37 MS-DOS Cardcat (PC Version)

Introduction: Cardcat is a program which permits the user to organize information in a manner similar to a library's card catalog. The entries are stored on disk and can be edited and searched using the program's routines. This version of Cardcat is for the H/Z-150 PC, and has a number of enhancements as compared to the version for the H/Z-100: Detailed help screens are incorporated into the program, file disk capacity is increased, a faster routine is used for alphabetizing the lists of entries, and several versions of the program are included to take advantage of larger amounts of RAM.

Requirements: This program requires MS-DOS 2.11 or greater on the H/Z-150 PC computer. One 5 1/4" disk drive is required, however, two are recommended. The computer should have at least 192k of RAM, and a line printer is also recommended.

The following files are included on this disk:

README .DOC	GOODIES .ASM
CARDCAT .192	CONVERT .EXE
CARDCAT .320	CONVERT .FOR
CARDCAT .640	STUFF .ASM
CARDCAT .FOR	

Author: Dr. Mark Dershwitz

CARDCAT.192 is the compiled version of the card catalog program. For each "card" entry, the program will accept a title, up to three authors, up to two subjects, and a "location", a reference to an alphanumeric code relating to the entry. The entries are stored on disk, with each disk having a capacity of 2800 entries. Each entry can be examined for correctness and edited, if necessary. There is no limit to the number of disks that can be used to store data. The disks can be searched for all entries containing a specific title, author, subject, or location, and the output list can be alphabetized and displayed on the screen, sent to a line printer or saved on disk. The output list is limited to 500 entries. Help screens are available from almost everywhere within the program without interrupting data already entered. For use with systems having 192k or 256k of RAM.

CARDCAT.320 is an alternate version of Cardcat for systems having 320k to 576k of RAM. The output list is limited to 1500 lines.

CARDCAT.640 is an alternate version of Cardcat for systems having 640k to 704k of RAM. The output list is limited to 4100 lines.

CARDCAT.FOR is the FORTRAN source code for CARDCAT .640.

GOODIES.ASM is the assembly language source code for the assembly language portion of CARDCAT.640

CONVERT.EXE is a utility program that allows file disks made with the H/Z-100 version of Cardcat to be converted so that they may be used with the H/Z-150 PC version of Cardcat.

CONVERT.FOR is the FORTRAN source code for CONVERT .EXE.

STUFF.ASM is the assembly language source code for the assembly language portion of CONVERT.EXE

Comments: Cardcat is an inexpensive alternative to the commercially available filing programs, and permits the user to keep track of collections of books, records, journal articles, etc. The searching routines are particularly useful for readily locating information.

Table C Rating: (1), (3), (10)

P/N 885-6007-37 MS-DOS DND (Dungeons & Dragons)

Introduction: DND is the HUG version of the popular game "Dungeons and Dragons" (tm), played in real-time. This version displays graphic representation on the screen of the rooms, halls, and doors in the area which the player is in. The object of DND is to find the lord master of the dungeon.

Requirements: DND requires the MS-DOS operating system and the GW-BASIC interpreter version 2.0 or greater on the H/Z-100 PC series computer (H/Z-150/160 etc.).

The following programs and files are included on the HUG P/N 885-6007-37 MSDOS DND disk:

DND .BAS	DND1 .BAS
DND2 .BAS	LAIR .BAS
DND .DAT	DND .DOC
README .DOC	

Authors: Original by Robert E. Wild, this version by Robert J. Sciamanda.

Program Content: The search for the lord master of the dungeon is made by exploring the 50 level dungeon, with the search beginning on level 1. DND is played in real-time, which means the program waits only a short time for a response and will continue playing without a response.

At the starting point there is a roadside tavern with many other taverns located on level one. It is at these taverns that treasures are cashed in for experience points. An accumulation of experience points will allow the player to become a higher level character, which will increase the chance of survival as the user moves deeper into the dungeon.

During the quest for the lord master, many obstacles will be encountered. The obstacles will include monsters which may try to steal any treasures which the player may have. Sometimes the monster may attack first. The player may fight, cast a spell, or evade. The player must watch his 'Hit Points' and 'Spell Units' to determine which option is best. These units can be refreshed by returning to a tavern or worshipping at an altar.

The user will find objects along the way which may be of help with the search. As easily as the objects appear, they may disappear.

The lord of the dungeon will be found in a HEATHKIT VAULT. As the game progresses, the combination to the safe will be given. The lord master may not be in that vault as there are many vaults throughout the dungeon.

The DND.DOC file contains information on some of the areas of the game. It is recommended that a hardcopy of the documentation be made for future reference. There are useful tables that will be nice to reference while playing the game.

There are many aspects of the game that must be learned while exploring the dungeon in DND.

Comments: DND is an excellent adventure game with the added feature of the graphic display with real-time mode.

Table C Rating: (1), (2), (5), (7), (10)

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 885-6010-37 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

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HUG P/N 885-6011-37
PS's PC Utilities \$20.00

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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' 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 reboot.

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.

NOPRTSC.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 appeared in the November 1987 issue of REMark. 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.

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HUG P/N 885-6012-37
ULTRA-RTTY \$20.00

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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 100 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 anical teletypes)

Comments: The documentation for this program appears to be excellent. A long awaited program finally here!

TABLE C Rating: 10

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EZPLOT II

HUG P/N 885-3049-37

H/Z-100 Version \$25

HUG P/N 885-6013-37

PC Compatible Version .. \$25

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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 rela-

tively 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: 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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P/N 885-6014

HUG Laptop Utilities . \$20.00

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This disk contains a collection of utilities designed to make life with your laptop more enjoyable and productive. Included on this disk are utilities to make your cursor more visible, your graphics better looking, and your keyboard friendlier.

Requirements: These utilities will run on any Zenith or Heath laptop computer and should work on most other brands. Some of the programs utilize features that are unique to Zenith and Heath models. MS-DOS version 2 or above is required.

Program Author:
Patrick Swayne, HUG Software Engineer

Program Content: Here is a description of the programs on this disk.

CURSOR.COM — This program provides different ways to make your cursor more visible. You can make the cursor bigger, make it blink more slowly, or make it a non-blinking block cursor. You can also disable this utility if it should conflict with a particular program, and then re-enable it later. **Note:** Non-Zenith laptop computers may not support slow blinking (a function of the Zenith hardware), or the non-blinking cursor (maintained by this program).

REVSCRN.COM — Your laptop screen was designed to make text displays look better, but graphic displays sometime come out looking like photographic negatives. REVSCRN allows you to instantly reverse the shade tones on your screen (just press Ctrl-Shift R) so that your graphics will look like they should. REVSCRN works while the screen is in text or (CGA compatible) graphics modes.

LAPSTAT.COM — Certain Zenith and Heath model laptop computers support an extension to the ROM BIOS called ZBIOS. LAPSTAT uses ZBIOS to provide certain information about your computer, including the internal modem status, the processor speed, the LCD palette, the Zenith code name for your computer (such as DRAGON or BADGER), and the ROM version number. The computer models that support ZBIOS (as of this writing) are the SupersPort 286 and the TurbosPort 386.

CAPCON.COM — This program allows you to reverse the functions of the Caps Lock and left Ctrl keys on computers that do not provide a reversal switch. The keys can be swapped back to their default positions when required.

KEYS.COM — With this utility, you can set up the default state of Caps Lock, Num Lock, and Scroll Lock from the command line or in a batch file. You can make your computer boot up with the keys the way you want them.

D.COM — This is the HUG alphabetizing, columnizing directory program, always a handy thing to have on any computer.

DT.COM — This program prints a graphics tree display of your directories. Great for hard disk users.

F.COM — With this utility you can locate a file on a large disk without having to search each directory individually.

HFM.COM — This is an improved version of the HUG File Manager, a utility that makes it easy to keep up with the files on a large disk. HFM can copy or delete selected groups of files

or individual files, rename files, create or remove directories, label disks, and more.

SEE.COM — This utility is a fancy replacement for the TYPE command for examining text files. You can move forward or backward in a file, search for text, and print selected text.

DTEST.COM — This is a non-destructive disk testing utility that can be used anytime you want to check the condition of a disk (hard or floppy). If you travel around with a hard disk laptop, you can check your hard disk after each trip. DTEST can also mark bad sectors that it finds in unused areas of the disk so they will not be used as you add more data. This is a new version of DTEST that supports partitions larger than 32 megabytes.

SCLK.COM — This is a new version of the HUG screen clock program that works great with laptop computers (works great with desktops too). It maintains a digital clock display in the upper right corner of your screen while you run other programs. This version of the screen clock will not interfere with your cursor setting (whether done by the CURSOR program or another way), or any other program on this disk.

TABLE C Rating: 10

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885-8028-37 ZDOS

SCICALC Scientific Calculator

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Introduction: SCICALC is a program designed to turn the H/Z-89 or H/Z-100 computer into an extremely powerful and easy to use 14 digit scientific calculator. Besides providing six arithmetic operators, SCICALC supports a large variety of transcendental functions, trigonometric functions, statistics functions, U.S. to metric and metric to U.S. conversion formulae, and key mathematical and physical constants. It has also been pre-programmed to solve problems related to geometry (both plane and solid) and statistics (including linear regression and percentile calculations), and can perform arithmetic in base 8 and base 16.

Requirements: SCICALC will run under HDOS and ZDOS.

HDOS: This version of SCICALC requires the HDOS operating system version 2.0 on an H/Z-89 or H8/H17/H19 with 56K of memory. Only one hard-sectored disk drive is required. No printer is required.

The Microsoft BASIC (MBASIC) interpreter version 4.82 is required.

Note: To H8 users, the H19 terminal is required.

ZDOS: This version SCICALC requires the ZDOS operation system. Only one drive is required. A printer is not required.

This version requires the ZBASIC interpreter release 1, version 1.25.

The following files are contained on the P/N 885-8027 HDOS and P/N 885-8028-37 ZDOS SCICALC disks:

HDOS	ZDOS
SCICALC.BAS	SCICALC.BAS
HDOS	ZDOS
SCICALC.BAS	SCICALC.BAS

Hardcopy documentation is included with the both versions.

Author: Brian Downs

Program Content: SCICALC utilizes a four-level stack for arithmetic operations, along with nine registers for saving intermediate results, and a "Last X" storage location for remembering the argument to single parameter functions. Complex arithmetic expressions can be easily and quickly entered without the use of parentheses since SCICALC employs the "Reverse Polish" expression entry technique (also employed by Hewlett-Packard calculators).

All registers, stack and Last X storage locations are continuously updated and displayed by SCICALC and in the format designated by the user. The informative display especially makes this powerful calculator easy to learn and use. The current "state" of the calculator (i.e., the values of all stack and register locations) can be saved for use at a later time.

The following is a partial list of the common functions of SCICALC's MAIN menu:

X to the Y power
 1/X (inverse)
 ln(X)
 log(X)
 e to the X power
 Square Root of X
 Cube Root of X
 X squared
 sin(X)
 cos(X)
 tan(X)
 cot(X)
 sec(X)
 csc(X)
 Degree/Radian conversion
 Arcsin(X)
 Arccos(X)
 Arctan(X)
 X! (X factorial)
 Change percent
 %+
 %-
 logY(X)
 Base 10
 Base e
 Base 16
 Change sign
 sum X
 Int(X)
 Frac(X)
 Round(X)

The following is a list of the conversion functions:

in to cm	cm to in
ft to m	m to ft
mi to km	km to mi
lb to kg	kg to lb
oz to g	g to oz
qt to l	l to qt
deg to rad	rad to deg
floz to ml	ml to floz
lb/in to atm	atm to lb/in
atm to mmHg	mmHg to atm
BTU to cal	cal to BTU
J to cal	cal to J
Fahr to Celc	Celc to Fahr
Kelv to Celc	Celc to Kelv
km to light yr	light yr to km
ft ² to acres	acres to ft ²
acres to hectares	hectares to acres
hp to watts	watts to hp

The following is a list of the constants from the CONSTANTS Menu:

Pi
 e
 Velocity of light
 Velocity of sound
 Acceleration due to gravity
 Radius of the earth
 Circumference of the earth
 Distance to the moon
 Distance to the sun
 Density of water
 Heat of fusion of water
 Heat of vaporization of water
 Volume of one mole of gas
 Gas constant
 Mechanical equivalent of heat
 Charge of one electron
 Charge/mass ratio
 Atomic mass unit
 Mass of electron
 Mass of neutron
 Mass of proton
 Avagadro's number
 Bohr radius
 Boltzman's constant
 Euler's constant
 Faraday's constant
 Planck's constant
 Rydberg's constant
 Golden Ratio
 Angstrom
 Micron
 Multiplication factor for milli-
 Multiplication factor for micro-
 Multiplication factor for nano-

Multiplication factor for pico-

The following are a list of calculations of some of the advanced functions of the MATH Menu:

Circumference of a circle with a given radius.
 Area of a circle with a given radius.
 Surface area of a sphere with a given radius.
 Volume of a sphere with a given radius.
 Area of a cylinder of a given radius and height.
 Volume of a cylinder of a given radius and height.
 Area of a cone of given height and radius of base.
 Volume of a cone of a given height and radius of base.
 Approximate the circumference of an ellipse.
 Area of an ellipse.
 Length of the third side of a triangle.
 Length of the second side of a right triangle.
 Area of a triangle given all three sides.
 Area of a triangle given the base and height.
 Distance between two Cartesian coordinates.
 Equation of a line given two points on the line.
 Equation of a line given one point and the slope of the line.
 Intersection of two lines given the line equations.
 Prime of X.
 Hyperbolic sine, cosine, and tangent.

Convert split octal to base 10 and base 10 to split octal.
 Convert Cartesian coordinates to polar coordinates.
 Convert polar coordinates to Cartesian coordinates.

Calculate the accumulation of a money market funds, given number of months, yearly interest, initial principal, and monthly deposit.

The following are statistical functions of SCICALC:

Calculate the probability that a normally distributed random variable of a given mean and standard deviation will equal X.

Calculate the probability that a Poisson distributed random variable with a given mean will equal X.

Calculate the probability of observing x occurrences out of n trials of some event that has probability p of occurring.

Calculate the number of combinations of m things can be chosen out of n (different) things (without replacement).

Calculate the number of permutations of m things can be chosen out of n (different) things.

SCICALC performs all internal arithmetic using double precision variables. This affords approximately 16 digits of accuracy. However, math functions provided by most BASIC interpreters, including MBASIC 4.82 and ZBASIC 1.0, return only single precision values. These functions are what are used directly to provide many of the MAIN menu functions, and indirectly, to provide many of the ADV MATH menu functions.

SCICALC provides for error checking, if the user try's either an illegal programming option or mathematical function.

Comments: This is an excellent package, well done! The documentation leads the user through simple arithmetic functions to familiarize the reader with how SCICALC works. Then the user is introduced to the other functions and options.

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

885-8030-37 ZDOS MATHFLASH

Introduction: MATHFLASH is an H/Z-100 color educational program designed for use by children who are learning the basic mathematical operations of addition, subtraction, multiplication, and division. It emulates the traditional "flash card" method of learning.

Requirements: MATHFLASH requires the Z-DOS operating system on an H/Z-100 computer, 128Kb of RAM, one disk drive, and a video monitor (either color or monochrome, though color is recommended).

The following files are included on the HUG P/N 885-8030-37 MATHFLASH disk:

README	.DOC
MATHFLAS	.EXE

Author: Mark C. Morrow

Program Content: MATHFLASH offers the following features:

* MATHFLASH allows complete user control of the colors used for each character on the monitor screen.

* MATHFLASH remembers which problems are answered incorrectly and repeats them occasionally, interspersed among other problems, until the child answers them correctly.

* MATHFLASH works with true random sequences of exercises which do not repeat; i.e., answers can not be "memorized" by successive program sessions.

* MATHFLASH will perform any user-selected combination of addition, subtraction, multiplication, and/or division. For example, "+" and "/" may be selected for drill, excluding "-" and "X"; "+" and "-" may be selected, excluding "X" and "/"; "+" may be selected, excluding the other three operations, etc.

* MATHFLASH allows you to specify the operands used for specific operations. For example, the "+2's" may be requested, or the "X7's" and "/7's" interspersed, or any other conceivable combination of operands (0,1,2,...,9) and operators (+,-,X,/).

* MATHFLASH entertains children while they practice in the areas you have specified.

* MATHFLASH statistics are available at any time in the program showing:

- 1) Number of problems worked.
- 2) Percent of total answered correctly.
- 3) Average elapsed time required by child to answer the problems.
- 4) Exactly which problems were missed and have not yet been answered correctly. This feature allows you to review your child's progress and to emphasize the areas he/she may be having difficulty in.

These statistics are saved on disk for review after the program has finished.

Comments: From all appearances, this program is child-proof, so to speak. Wrong entries will do no harm to the program itself or its data file. Typing CTL-C is the only way to exit the program. An excellent child education addition to your software library.

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

P/N 885-8034-37 MS-DOS DBZ (Database For The Z-100)

Introduction: DBZ is a sophisticated, menu-driven Database Management System (DBMS) designed to be quick, easy to use, flexible, and user interactive. It is ideal for personal use in the home and powerful enough for a small business office environment with the capability to handle up to 500 records, up to 26 categories per record, and up to 1199 characters per record. DBZ stores all database information in memory while executing, which results in minimal disk drive access with almost instantaneous response to any user command. DBZ was designed with the user in mind; therefore, it can be up and running with minimal set-up time (on the order of minutes). DBZ makes extensive use of linked menus, the HELP key, single function keys, visual/audible prompts and numerous safety checks which allow the user to spend time manipulating the data rather than manipulating the software.

Requirements: DBZ requires MS-DOS or Z-DOS (any versions) and will run on any H/Z-100 (not PC) system. DBZ also requires a minimum of 128k of RAM, a monochrome monitor (a color monitor is optional) and one single- or double-sided disk drive. A daisy wheel or dot matrix printer is optional to produce hard copy reports.

The following files are included in this package:

DBZ Disk I

README	.DOC	SAMPLE	.DAT
DB *	.BAT	DBZ	.EXE
RESET	.BAT	DINSTALL	.EXE
DCONFIG	.SYS	ZAPPER	.COM
DBZL	SCHEDULE	.COM	DBZM
.EXE	DBZ-DBII	.COM	DBZE
.EXE			

DBZ Disk II

DBZ	.DOC	SCHEDULE	.DOC
DBZM	.BAS	DBZ	.BAS
SCHEDULE	.PAS	TUTOR	.TXT
DBZ-DBII	.BAS	ZAPPER	.DOC
DINSTALL	.BAS	DBZE	.BAS
ZAPPER	.PAS		

Authors: Edward A. Mahoney and Richard J. Komar

DBZ.EXE — This is the central control program for DBZ. It contains the opening menu which is the user's link to other menus. The opening menu contains the following commands:

- * Create a database
- * Edit a database
- * Modify a database
- * Directory
- * HELP to display help menu
- * HOME to exit DBZ

DBZE.EXE — This is the information editor overlay for DBZ. DBZ automatically calls up this overlay when the user presses the highlighted 'E' key from the opening menu. The following commands are then available:

- * Display records
- * Add records
- * Order of records
- * Report
- * Save the database
- * Forms
- * HOME to exit this database

DBZM.EXE — This is the database modifier overlay for DBZ. The configuration of any database can be changed at any time through the use of this menu driven modifier. The following commands are then available:

- * Add a new category
- * Delete a category
- * Move a category
- * Rename a category description
- * Save the database
- * Change a category width
- * HOME to return to opening menu

DINSTALL.EXE — This is the program which customizes DBZ for a particular monitor and printer configuration. The user can install printer codes, screen color codes and a warning beep option for his system. Data entry can be in the form of decimal, hexadecimal or alphanumeric codes. The installation procedure is completely menu driven and can be done in a matter of minutes.

DBZ.DOC — This is a detailed user's manual for DBZ which contains easy to follow, step-by-step instructions and multiple examples. Designed for the user, not the programmer.

SAMPLE.DAT — This is a sample database of computer vendors and products.

DBZ-DBII.COM — This program transfers DBZ files to dBase II.

ZAPPER.COM — This is a program which can be used to examine, and/or modify the contents of any MS-DOS or Z-DOS file.

SCHEDULE.COM — This is an electronic "appointment book and calendar"

DCONFIG.SYS — This is a file created by DBZ during the installation process. This file contains the screen and printer codes.

DB.BAT — This is a batch file to start up DBZ.

DBZL — This is the DBZ logo.

RESET.BAT — This batch file resets the Z-100 to its pre-DBZ configuration upon exiting DBZ.

TUTOR.TXT — This is a sample session for the first time user.

DBZ.BAS, DBZE.BAS, DBZM.BAS, DINSTALL.BAS, DBZ-DBII.BAS, ZAPPER.PAS, and SCHEDULE.PAS are the complete source codes for DBZ!!

Comments: DBZ is extremely flexible. At all times, the user knows what options are available. DBZ will even anticipate a user's next request and suggest an action. The HELP key is always active to remind the user of special DBZ functions and commands. DBZ employs several safety checks which remind the user to routinely save his databases. This feature also prevents the accidental erasure of valuable data. Any command given DBZ can be aborted at any time by pressing the HOME key with no adverse effects on the data.

TABLE C Rating: (10)

P/N 885-8037-37 MS-DOS Grade

Introduction: Grade allows the teacher to enter grades into his or her gradebook in random order just as he used to do in his old-fashioned pencil and paper gradebook. It provides a hard copy suitable for permanent records, as well as scores and summaries suitable for display to the class. The program is fully menu driven and is fairly self explanatory. The maximum number of entries is 100 students and 60 scores for each student. Students are identified by a consecutively numbered "STUDENT INDEX" and all score entries are identified by a consecutively numbered "SCORE INDEX".

Requirements: This version of GRADE requires the MS-DOS operating system and GW-BASIC version 1.0 or greater on an H/Z-100 PC series computer (H/Z-150/160 etc.). A total of 320K of memory is needed along with one disk drive.

In addition to the printed users' manual that comes with this product, the following programs or files are included on the HUG P/N 885-8037-37 MS-DOS Grade Disk:

```
GRADE .BAS
ELEC103
README .DOC
```

Author: Robert R. Ludeman

Program Content: When Grade is executed, the following commands or menu is available:

- A Add A Student To Present Class File
- B Build A New Class File
- C Change A Student's Score In Present Class File
- D Delete A Student From Present Class File
- E Enter A New Score Set Into Present Class File
- F Fixed Order Score Entry Into The Present Class File
- H Help - Prints This List
- K Kill (Deletes) An Entire Class File From A Named Disk
- L List Student Scores
- O Order Score Sets By Date In The Present Class File
- P Print Scores And Score Summary On Printer
- R Recall A File Previously Stored On A Named Drive
- S Save Present Class File On A Named Drive
- X Exit This Program
- Z Zap (Deletes) A Score Set From The Present Class File
- / Terminates Any Activity And Returns To Command Prompt

ELCT103, a sample class data file is also included with this disk.

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 over-

lays 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)

HUG P/N 885-8040 HELP Update \$25.00

Introduction: The author of HELP for MS-DOS has updated it to Version 3.30b. This new version contains many enhancements, and now includes complete coverage of Zenith's new MS-DOS Version 3.3 Plus. Laptop computer information has also been included. The H/Z-100 (not PC compatible computer) portion of HELP remains unchanged. Original owners of HELP can obtain an updated disk by returning their original distribution disk to the Heath Users' Group, along with \$7.00 (made out to HUG). REMEMBER, Laptop owners can obtain this software on a 3-1/2" disk just by adding a "-80" to the basic HUG model number (885-8040-80).

HELP.EXE — Executable version of the PC compatible HELP program.

HELP.DAT — Random Access HELP data base file.

HELPS.DAT — Sequential HELP data base file.

HELP.DOC — Documentation file for HELP.

HELPCNVT.EXE — Executable version of PC compatible conversion program.

README.DOC — HUG documentation file for this disk.

The files on disk B: are for the H/Z-100 (not PC) version of HELP. The following is a list of those files:

HELPCNVT.BAS — BASIC source code for data base conversion program.

HELPS.DAT — Sequential HELP data base file.

HELP.DAT — Random access HELP data base file.

HELP.DOC — Documentation file for HELP.

README.DOC — HUG documentation file for this disk.

HELP.BAS — BASIC source code for Z-100 HELP program.

HELP.EXE — Executable version of Z-100 HELP program.

HELP.EXE — Executable version of Z-100 HELP program.

HELPCVNT.EXE — Executable version of Z-100 conversion program.

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

Author: John F. Stetson

Program Content: The HELP programs are designed to be easy to use and efficient in operation. The HELP data base 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 data base 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 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 885-8040-37 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 885-8041-37 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	DEMO5	.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 interlace 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 interlace 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, partner!

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. Newlon

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 Schultze

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 ALTCCHAR.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
-----	-----	------	-----

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
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LOGOFF	.BAT	— Display last date/time on system at exit time
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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.COM

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

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P/N 885-8046-37

MS-DOS

Assembly Language Utilities

Update

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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.

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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)





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Want New And Interesting Software?

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HOW TO USE EMM.SYS

WILLIAM M. ADNEY

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Although this article was originally planned to be in my November "On the Leading Edge" column, scheduling problems prevented it from being published in that issue. Since this article was originally written, I have noticed a considerable amount of additional interest in this topic from other sources, notably some letters published in "Buggin HUG." Because of the high degree of interest in this topic, it seemed appropriate to published this particular article separately so that all HUG members would have additional information available on the subject of expanded memory and its special relationship to the Zenith EMM.SYS expanded memory device driver. For the most part, this article is unchanged from the original, except for minor editing changes and additions.

I have received an unusually large number of letters asking about the Zenith MS-DOS EMM.SYS device driver. Many of these letters cite "considerable confusion" about how to use EMM.SYS on Zenith or Heath computers, but since many of these letters did not have any specific questions, it was difficult to provide a complete answer in a response because of length. For that reason, I promised some of you that I would write an article about the subject, and this article contains all of the details you need to know about EMM.SYS.

Many of these letters have also mentioned both extended and expanded memory as if they were the same thing. For that reason, a discussion of extended memory is included in this article too. Although definitions and explanations of ALL kinds of memory are discussed in Chapter 10 of *Powering Up* (Adding More Memory to Your Computer), it appears that many new HUG members may not have seen the original publication of that article in *REMark*. And perhaps they are not aware that all of the original *Powering Up* articles are available in complete book form from HUG.

This article is designed to be a "tutorial" on when, why, and how to use EMM.SYS on various Zenith computers. For consistency, I will use some of the same definitions published in the original *Powering Up* article. That article included a general discussion of memory: RAM, ROM, extended, and expanded memory.

For this article, I will assume that you generally understand how memory is used in a computer because only extended and expanded memory (with EMM.SYS) will be discussed. This article will also focus directly on systems that have at least an 80286 MPU (Micro Processor Unit), and you will need to check your computer manual to see what kind of MPU your computer has. Although the general information provided in this article about different types of memory is appropriate for even the older 8088-based computers (e.g., Z-150 series, etc.), you cannot use the EMM.SYS device driver on those systems because Zenith never developed an expanded memory board for them. And my research also indicates that Zenith never developed a memory board that supported expanded memory for the Z-200 series. The instructions for the Z-405 board (for my Z- 241) clearly indicates that the board cannot be configured for expanded memory, and the Z-445 board (for the Z-248) also does not support expanded memory. Both boards support extended memory only, and this was discussed in one of my "On the Leading Edge" columns several years ago. One of the basic requirements --as documented in the Zenith MS-DOS manual-- is that you *must* use a Zenith memory board. For the newer systems which use SIMMs to add memory to the Zenith motherboard, the EMM.SYS driver may also be used.

Configurations Tested

Although I was fairly certain about the results before any testing, some of the

specific information in this article is based on my own Z-386/16 and SupersPort 286. Of course the model-specific hardware information in this article does not apply to any of the older 8088-based Zenith computers, like the Z-150 series, or the Z-200 series; although the examples shown on how to use expanded memory generally apply to all Zenith computers with that kind of memory installed.

To get back to a more general "base configuration" for testing, I pulled all of the extra memory (a 4 MB Z-515 card) from my Z-386/16 except for the standard 1 MB memory card included with the system. The SETUP program now shows that I have 640 KB of memory with 0K (zero kilobytes) of expansion memory. For testing purposes, I now have the standard 1 MB memory which is also the same for my SupersPort 286. The Z-386 testing configuration includes ROM version 2.6E with Zenith MS-DOS 3.3 Plus. The VER command reports that I have MS-DOS version 3.30 with BIOS version 3.30.05. Although I have other hardware installed, it is not really important to this discussion.

The SupersPort 286 is the completely standard version that includes a standard 1 MB of memory and a 40 MB hard drive. The SupersPort has ROM version 2.3D and I am using the same Zenith MS-DOS 3.3 Plus version of the operating system as the Z-386/16.

I have selected these two systems because I think they are fairly representative of the current Zenith computer models. In general, you should find that the information included in this article applies to ALL current Zenith computer models that have at least an 80286 MPU and include the standard 1 MB of memory. Although you may find some very minor differences depending on which specific model you have, the details that I discuss for my own computers will help you figure out what to do on your own comput-

er. I encourage you to experiment a little based on the information provided here, so you will see EXACTLY how your own system works.

Zenith MS-DOS 3.3 Plus

ALL of the testing and specific information in this article is based on using the EMM.SYS included with Zenith MS-DOS 3.3 Plus. Earlier MS-DOS versions may be similar, and you should be sure to check your MS-DOS manual for any differences in any other version, especially command syntax and limitations, if any.

For this version of EMM.SYS, the Zenith Expanded Memory Specification (EMS) driver included with this MS-DOS version supports EMS version 4.0, which is sometimes called Enhanced EMS or just EEMS. The driver also supports application programs compatible with EMS version 3.2. Be sure to check the software manuals for whatever application programs you want to use to be sure that the programs are compatible with one of these EMS versions.

As mentioned earlier, older systems which have Zenith memory boards that support expanded memory can use EMM.SYS. Newer computers that use SIMMs (Single Inline Memory Modules) satisfy this requirement because the memory is simply plugged into a Zenith board. For both the discontinued Z-241 (6 MHz) and Z-248 (8 MHz) model computers, EMM.SYS will not work with the appropriate Zenith memory board, like the Z-405 or the Z-445. Both these memory boards were designed as extended memory only and did not support expanded memory. If you want to use expanded memory on these systems, you must add a third-party memory board that does support EMS, and you will of course have to use the EMS device driver supplied by the manufacturer of that board.

For the Z-386/16 and the SupersPort 286, you may have installed additional memory (above the standard 1 MB), but it is not required because you can still use a modest amount of expanded memory with no additional hardware.

In short, if the memory BOARD does not have a Zenith label, you CANNOT use EMM.SYS in any Zenith MS-DOS version with it. For non-Zenith memory boards, you should have received a floppy disk with an EMS driver included with the expanded memory board. These memory boards should have included an EMS driver that supports only specific EMS versions, and you will need to contact the manufacturer of that board to obtain a new EMS driver for later versions, such as EMS 4.0. This is an important point because many Zenith computer users, especially for older computers (i.e., the Z-200s, Z-150 series and other 8088-

based systems) have non-Zenith expanded memory cards in their systems. I don't recall that Zenith ever made an expanded memory card for these systems, probably because of the wide variety of EMS cards developed by other manufacturers that also included an EMS driver.

Because I have also received letters about other computer brands using Zenith MS-DOS, I should again mention that EMM.SYS will *only* work on Zenith and Heath computers. Don't expect EMM.SYS to work on a DataBasher 2000 computer with a Whatsit expanded memory board. For those of you who have already figured this out from the Zenith manuals and my previous articles, I apologize for beating a dead horse into a bloody pulp.

Some of the newer Zenith and Heath computers, like the HS-2526, use a Single In-Line Memory Module (SIMM) to add memory up to 6 MB without using an additional memory board. Assuming that you have correctly configured the system (using SETUP) to access any additional memory that has been installed, EMM.SYS will work in those systems too. The actual "brand" of the SIMM does not matter so long as they are the correct "size" (e.g., 1 MB x 9) for the system. For memory requirements beyond (i.e., more than 6 MB) what can be added to the motherboard on these systems, you will still need to get a Zenith memory board when (or if) they become available, in order to use EMM.SYS.

These are the basic prerequisites for using EMM.SYS in any Zenith MS-DOS version. But some of the letters I've received indicate that at least a few people are spending thousands of dollars for extended and/or expanded memory without having any idea what to do with it. To be sure that we're all on the same wavelength, we'll begin by looking at the ONLY reason to add extended or expanded memory to your computer.

Why Add Memory?

There is one, and ONLY one reason to add either extended or expanded memory to your computer: there is some kind of additional memory requirement (beyond 640 K) imposed by the software you want to use. For example, you are using a spreadsheet program and have developed a spreadsheet that is too large for the usual 640 K of conventional memory. After looking at the documentation for that spreadsheet, you find it can use expanded memory for large spreadsheets. That is a very common and valid reason for buying a Zenith memory board to use with EMM.SYS. The important point is that there is a specific reason for spending money to buy additional memory.

Another reason for buying a Zenith memory board is because you are running out of memory within the 640 K limit.

Some memory-resident programs can use expanded memory (e.g., SideKick Plus), which will free up memory within 640 K memory area, and that memory can be used by other programs. Check your documentation to find out because not all software can be configured to use expanded memory.

A more obscure, but very important, reason for buying additional memory for a computer is because some software requires it. For example, early versions of OS/2 have a requirement for about 2 MB of installed memory. Later versions that include Presentation Manager work best with at least 4 MB of installed memory. Unlike other software I have mentioned so far, OS/2 requires EXTENDED memory, not expanded memory.

I assume everyone using a computer today knows that 640 K of conventional memory is recommended, and in a few cases required, to run some of the current programs, even some word processors and spreadsheets. In some cases, you must have the maximum 640 K of conventional memory installed before you can even consider adding expanded memory. For the Zenith Z-200 series computers, you can use one of the Zenith memory boards to "fill out" the remaining 128 K of memory (the Z-200 had a standard 512 K of memory like the IBM AT), and the remainder (1.5 MB) can be used for extended memory only.

At this point, you should have defined the requirement as to whether you need extended or expanded memory for some specific purpose. The requirement is based on information contained in the manual with the software. Now that you know you need extended or expanded memory (based on reading a manual), it is important to understand the definitions of these terms.

Definitions

EXPANDED MEMORY is used to "expand" conventional system memory beyond the normal 640 K barrier. It can be used on nearly any PC, AT or any other generally compatible system like the Z-200 series or the Z-386. Expanded memory can be used on nearly all Zenith computers except for systems that have hardware expansion or space limitations like the eaZy PC or Z-171. For systems that do not have a standard 1 MB of installed memory, like the Z-150 series or Z-200 series, you must add a third-party expanded memory card. For systems that do have at least 1 MB memory in the standard configuration, like the Z-386, HS-2526 or the SupersPort 286 (and TurbosPort 386), you can easily install about 256 K of expanded memory by installing the EMM.SYS device driver with NO additional hardware.

Expanded memory is frequently

called EMS for Expanded Memory Specification that was developed jointly by Lotus, Intel, and Microsoft (LIM). For that reason, it is sometimes referred to as the LIM/EMS. There is also an Enhanced Expanded Memory Specification (EEMS) that is sometimes referred to as EMS 4.0. Some software manuals mention these terms, and you need recognize what they mean.

In contrast to expanded memory that is used to "expand" the 640 K limit, *EXTENDED MEMORY* can only be added to a computer system that is capable of addressing more than one megabyte of memory. That means you **MUST** have at least an 80286 MPU (or an 80386) in your computer because of the one megabyte limitation of the 8088-based computer. For example, you can add extended memory to a Zenith Z-200 series computer, or a Z-386, but you *cannot* add it to older PC compatible systems like the Z-151, 158, 148, and so on.

Expansion Memory

After doing some research and reading a lot of your letters, one thing stands out very clearly. Much of the confusion and many of the problems that a lot of people are having seems to be a direct result of Zenith's indiscriminate use and changing definition (depending on the computer) of the term "Expansion Memory" in the documentation and in the SETUP program. After some looking, I found a definition of "Expansion memory" on page 5 of the Glossary in the back of the SupersPort 286 Owner's Manual. Here, "Expansion memory" is defined as: "RAM installed in addition to the 640 K of base memory." That explanation looks very straightforward, but it is not, and even worse, it is not complete or consistent with the SETUP program!

Most computer users have learned through hard experience to be quite precise and accurate in using computer terms, but whoever came up with that definition did not do any homework at all. As defined in the documentation, this term is not even consistent with the SupersPort 286 SETUP program example (page 3-5 in the Owner's Manual) showing the "Exp. RAM" value set to "Extended" and the "Exp. RAM size" set to 0K. And if you really want a challenge, try to figure this out as you peruse the "explanation" of these fields on page 3-7, especially if you have found that EMM.SYS will apparently not work on the SupersPort. It does work, and I'll show you later in this article how to do it.

More Definitions

After considerable testing and general fooling around, I decided to develop a definition of Expansion Memory that was completely consistent and valid for all my

Zenith computers, SETUP programs, memory boards, and the definitions already given for extended and expanded memory. But first I had to develop a better definition for Base Memory than I was able to find in any manual.

BASE MEMORY is all computer memory that can normally be used by DOS, up to and including a maximum of 640 kilobytes on a PC compatible or 768 kilobytes on a Z-100. Base memory is sometimes referred to as conventional memory, system memory, random access memory, and RAM. For computers that have less than the maximum of 640 K (or 768 K) of base memory, the term "Base Memory" also includes any additional conventional memory, including an add-on memory card, required to increase the conventional memory to the maximum value of 640 K or 768 K. A few of the older Zenith computers, specifically the Z-241 and Z-248, were equipped with a standard 512 K of base memory, and their SETUP programs included a field that was called "Base Memory". For these computers, a memory card (e.g., the Z-405) could be added to "backfill" base memory up to 640 K (by adding 128 K) and the remainder could be used as extended memory.

There are two important points to understand about the definition of Base Memory. First, it can never exceed 640 K, regardless of how much memory the computer is equipped with. For example, the Z-386/16 and the SupersPort 286 are equipped with a standard 1 MB of memory, but only 640 K of that is actually Base Memory under this definition.

The second point is that this definition of Base Memory is actually used by the SETUP command in some systems, which is the only reason for defining it. For computers that already have 1 MB of memory installed (using that size RAM chips), the term "Base Memory" is almost useless because they all have 640 K of Base Memory. Even though the SETUP command on my Z-386/16 displays the Base Memory field, it is interesting to note that the SETUP command on my SupersPort 286 does not -- probably because the design is specified to have at least 1 MB of memory, and the 640 K of Base Memory is already included in that. Contrast Base Memory with Expanded Memory and Extended Memory.

In Zenith terminology, *EXPANSION MEMORY* is any memory hardware -- a board or SIMMs -- that is physically added to a computer above the Base Memory limit of 640 K, regardless of what the standard (minimum) memory configuration is for any computer. Again, this definition is based on what is specified by the SETUP command in the "Expansion Memory" field (used to define the size or amount of expansion memory) for vari-

ous Zenith and Heath systems. For newer Zenith computers that have the usual (minimum) memory configuration of 1 MB, the amount or size of Expansion Memory is always zero (0) as defined by the SETUP program because no memory hardware was added to the system. In these systems, you only have to update the size of the Expansion Memory whenever you have more than 1 MB in the system. For older Zenith computers, like the Z-241 or Z-248, you had to update the Expansion Memory field with the appropriate number any time you added either extended or expanded memory (because it was above 640 K), regardless of whether you used a Zenith or third-part memory card. As you have probably noticed, there is an unavoidable, built-in subtlety in the definition of Expansion Memory because there are two requirements in its definition: it must be physically added to the computer and it is always above 640 K.

Understanding the software requirements for additional memory, and the definitions used by the SETUP command for defining it, are essential to being able to effectively use any add-on memory. A standard 1 MB standard memory configuration -- such as included with the SupersPort 286, Z-386/16, and other later computer models -- permits the use of expanded memory (EMS) with the EMM.SYS device driver included with Zenith MS-DOS. For memory beyond 1 MB, Expansion Memory is determined by switch settings on the memory board (i.e., as either extended or expanded) and/or by the SETUP program.

For the computer systems with 1 MB of standard memory, it is probably easiest to remember that expansion memory currently refers to any memory hardware that is added to a computer and let it go at that. That will probably change in newer ROMs because I expect they may have a SETUP program that more closely resembles the laptops, like the SupersPort 286. If you understand how to implement expansion memory as described in this article, you will probably be able to successfully implement any kind of memory -- expanded or extended -- on any Zenith computer, regardless of any ROM changes that may be made in the future. Extended memory is a little easier to discuss, so I'll start with it first.

Extended Memory -- General

Extended memory is fairly easy to implement. In all cases where an existing computer has 1 MB or less memory installed, you add extended memory by simply installing a memory board, such as the Z-505 or Z-515 for the Z-386/16, or by adding SIMMs, or by adding a special Zenith memory module to a laptop. For the memory boards that I mentioned, you **MUST** set Switch SW 401 to disable EMS

(section 2 off), so that the memory is defined as extended memory. Then, you run the SETUP program to define how much extended memory was actually added.

The general description of implementing extended memory sounds really simple because it is. Unfortunately, the details get kind of tricky, depending on exactly which computer you have. Adding extended memory makes more sense with a desktop computer, like the Z-386/16, so I will begin with that.

Extended Memory -- Z-386/16

The Z-386 has a standard Z-505 memory card (1 MB) included with the system. If you need to add extended memory in the first place, you will probably want to get the 4 MB Z-515 card, so you will have a total of 5 MB of memory. I won't bore you with the details except to say that section 2 of Switch SW 401 on BOTH memory cards needs to be set to OFF to disable EMS memory on the cards. In any case, the installation guide included with the Z-515 card is quite excellent, and you should have no trouble with the installation.

After the installation is complete, you then run SETUP. Use the arrow keys to move the highlight to the "Expansion Memory" field (it should be zero now), and use repeated taps on the Space Bar until the value is displayed as 4096K, which is 4 megabytes. Type ESC, Y, and RETURN to save the configuration, and you will be returned to the ROM Monitor prompt. Boot the system, and that's all you have to do to install the extended memory. Using extended memory is another matter that I'll talk about in a minute.

Extended Memory -- SupersPort 286

The SupersPort 286 has an optional 1 MB expansion card (ZA-180-66) which I have not personally bought or installed. To be candid, I have not been able to afford it, and that's not all bad because I really haven't found a real need for more memory in my SupersPort anyway. Nearly all software that I use when traveling can't use any additional memory, so it would probably be a waste of money for me to buy additional memory.

In any case, it is no big trick to set up extended memory in the SupersPort after it is installed. Start the SETUP program, and use the down arrow key to move the highlight to the "Exp. RAM" field. Use the Space Bar to toggle the value to *Extended*, if it is not already set that way. Use the down arrow key again to move the highlight to the "Exp. RAM Size" field, and use repeated taps on the Space Bar until the value is displayed as 1024 K, which is 1 megabyte. Type ESC, Y, and RETURN to save the configuration, and you will be returned to the ROM Monitor prompt.

When you reboot the system, the installed extended memory is available, but it is not too useful unless you have software that is programmed to use extended memory.

Using Extended Memory

Now that you have successfully installed extended memory in a computer, what can you do with it? Unless you are using the OS/2 operating system with programs specifically designed to take advantage of its features, the answer is: "Not much!" About the only common DOS programs that can effectively use extended memory are those supplied with Zenith MS-DOS and some other DOS versions. Adding extended memory for DOS is not particularly cost-effective, unless you have a specific need for a special function.

For example, you could create a large RAM disk by adding a command to the CONFIG.SYS file like:

```
DEVICE=C:\DOS\VDISK.SYS SIZE=1024 SECT=512 DIRS=64 /E
```

This example expects to find the VDISK.SYS file in the \DOS subdirectory on drive C. Although the Zenith manual doesn't say so, you can use "comments" as I have shown to create a 1 MB (1024 K) RAM disk with 512 byte sectors and 64 directory entries. The /E switch installs the RAM disk in extended memory. Because of the possibility of software conflicts, the Zenith manual clearly states that "some interrupts may be lost" if frequent interrupts occur during data transfers to and from extended memory. This means there is a possibility that software may not perform correctly, which could cause data loss or some other strange problem. As a result, I do not recommend using extended memory as a RAM disk under any circumstances because of the possibility of data loss and unpredictable problems, depending on the software used. The best alternative is to use expanded memory instead, if you need a RAM disk.

You can also use extended memory as a cache to help improve disk drive performance for both floppy and hard drives. A large memory value for a cache is a waste of memory, and a very large value may actually reduce drive performance. You can install the Zenith cache utility in extended memory by adding the following line to CONFIG.SYS:

```
DEVICE=C:\DOS\ZCACHE.SYS 64 /E/F/P:4
```

This command installs a 64 kilobyte (the default size) cache in extended memory (/E). The default is to provide caching for hard drives only, but you can include caching for floppy drives too with the /F switch. The Zenith manual suggests that you may not want to use the /F

switch in a hard drive system because the code takes up more space in conventional memory and you probably will not be using floppy drives that often — a good suggestion. The /P "Page size switch" sets the cache size to 4 sectors. Although it is not really required because the default is 4, and it need not be entered, I have shown it in this example for the sake of being complete. The manual suggests that you may need to adjust this value for best performance, depending on the software you are using, and I should note that these values may be different for different programs.

The capability for DOS to use extended memory is quite limited as you can see and is confined to these device drivers. Although you might find some application programs which can use extended memory with DOS, these programs will be the exception rather than the rule. Now to move on to expanded memory.

Expanded Memory -- Z-386/16

The physical installation of a Zenith Z-515 memory card is pretty much the same, regardless of whether you want expanded or extended memory. Aside from the fact that you need to set section 2 of Switch SW 401 to ON to enable EMS, that's about the only physical installation difference when you need expanded memory. Even if you don't add a memory card to this system, you can still use expanded memory if that switch is set properly on a standard 1 MB system.

Use the SETUP program to configure the "Expansion Memory" field as described for extended memory, and you're just about ready to use it. Making this expanded memory available for use is something I'll discuss in a minute.

Expanded Memory -- SupersPort 286

You don't really need to add any memory to the SupersPort 286 in order to use expanded memory. All you need to do is run the SETUP program and be sure to set the value in the "Exp. RAM" field to EMS if it is not already set that way. If you also added the optional 1 MB expansion card (ZA-180-66), you will need to also change the "Exp. RAM Size" field to 1024 K as discussed earlier.

-By now you have probably noticed that there is really little difference in adding extended or expanded memory to either the Z-386/16 or the SupersPort 286. In both cases, you need to set the "Expansion Memory Size" to the appropriate value for the physical memory you added. For the SupersPort, you also need to define whether you want the additional memory to be expanded or extended with the SETUP command. For the Z-386/16, that's set on the Z-505 and Z-515 cards when they are

installed, but I expect to see new Zenith computers use the SETUP command to define the type of memory, rather than physical switches on the boards. That is much more convenient because you can quickly change it if required.

Using Expanded Memory

One additional step is required before you can use expanded memory on any computer system -- you MUST install the appropriate EMS device driver. Even if you have not added any memory to the Z-386/16 or SupersPort 286, you still must install the device driver to use it. This is a special feature of computers that have a standard 1 MB of memory, and you can have about 256 kilobytes of expanded memory at no additional cost on these systems. If you have installed more expanded memory, that's fine, but you must still do one more thing before you can use ANY expanded memory.

Assuming that a Zenith memory board or option has been installed, you must add a line to the CONFIG.SYS file similar to:

```
DEVICE=C:\DOS\EMM.SYS
```

As before, this example assumes that the device driver file is located in the \DOS subdirectory on drive C. To be sure that everything works correctly with expanded memory, I recommend that a command like this always be the very first DEVICE= command in the CONFIG.SYS file. If you don't know why, the details are discussed in Chapter 10 (page 91) of the *Powering Up* book. After you have installed the Zenith Expanded Memory Manager (EMM), expanded memory is available to any program that can use it.

For example, you could create a large RAM disk in expanded memory by adding a command to the CONFIG.SYS file like:

```
DEVICE=C:\DOS\VDISK.SYS SIZE=1024 SECT=512 DIRS=64 /A
```

The only difference from the previous VDISK example is the /A switch, which specifies that expanded memory is to be used.

Expanded memory can also be used as a cache by adding the following line to CONFIG.SYS:

```
DEVICE=C:\DOS\ZCACHE.SYS 64 /A/F/P:4
```

Again, the only difference from the previous ZCACHE example is the /A switch, which specifies that expanded memory is to be used.

The real key to being able to effectively use expanded or extended memory is to understand what kind of memory can be used by your software. In other words, be sure to define the memory requirements before you spend a wad of

money on memory that you may not be able to use. Also be sure that you understand how to install the memory in your computer, and that includes both the physical installation and the SETUP command if appropriate. For expanded memory boards, you must use an expanded memory device driver supplied by the manufacturer of that particular memory board. And if you are installing expanded memory, be sure that the DEVICE= command containing the EMS driver name (e.g., EMM.SYS) precedes all other DEVICE= commands to avoid problems.

Device Driver Cautions

All device drivers are basically memory-resident programs. Depending on what a specific device driver does, it may conflict with another device driver, an application program, or another memory-resident program that you load in the AUTOEXEC.BAT file or on a DOS command line. When you start having strange problems with your computer system (e.g., program or system "freezes"), it is good practice to always suspect memory-resident program conflicts first, unless you obviously have a hardware problem.

The Zenith manual mentions a possible problem with the VDISK device driver when used in extended memory. When I see something like that, even an indication of a potential problem, I avoid it like the plague. There are enough possible problems in a computer system without deliberately tempting fate, especially when it is specifically mentioned in the manual.

For technical reasons, I also recommend not having any cache program, like ZCACHE.SYS, installed when you are running any program that fools

around directly with a disk. These programs fall into the general categories of "disk utilities" that recover deleted files, "optimize" or "organize" a hard drive, and disk level editors. Packages like Mace Utilities, Norton Utilities, and HUG's HADES are in these categories. Although I have not had any problems with them during some short testing, I just do not use ZCACHE when I need to run them. Here's an easy way to make sure about that.

Write a couple of batch files to make it easy -- I call mine NOTHING.BAT and NORMAL.BAT, and they are in the batch directory on drive C. Even though I rarely install memory-resident programs in the AUTOEXEC.BAT file because of potential program conflicts, it is still best to have the absolute minimum in both the AUTOEXEC.BAT and CONFIG.SYS files for testing and using some of these disk utilities.

Except for the AUTOEXEC.BAT file, all of my other batch files are found in the \BATCH subdirectory on drive C. I even keep a copy of both AUTOEXEC.BAT and CONFIG.SYS files in the \BATCH subdirectory, just in case the files in the root directory "disappear" (e.g., DEL *.*) for some reason. NOTHING.BAT and its associated files are quite simple as shown in Figure 1.

These are very simple files, and I trust you will be able to see what they do without much explanation. All of these NOTHING*. * files are part of the process. NOTHINGA.DAT is a basic AUTOEXEC file with a reminder to me that I am running a basic configuration. NOTHINGC.DAT is a very basic CONFIG.SYS file for my system.

To restore my normal production configuration, I use NORMAL.BAT as

NOTHING.BAT File Contents

```
@ECHO OFF
ECHO Setting basic AUTOEXEC.BAT and CONFIG.SYS file configuration
CD C:\
C:
COPY CONFIG.SYS CONFIG.SAV
COPY AUTOEXEC.BAT AUTOEXEC.SAV
REM Copy basic AUTOEXEC file with PATH and PROMPT only
COPY C:\BATCH\NOTHINGA.DAT C:\AUTOEXEC.BAT
REM Copy basic CONFIG file with FILES and BUFFERS only
COPY C:\BATCH\NOTHINGC.DAT C:\CONFIG.SYS
ECHO          Use CTRL-ALT-DEL to reboot the system
```

NOTHINGA.DAT File Contents

```
@ECHO OFF
ECHO Booting with basic AUTOEXEC.BAT and CONFIG.SYS files
ECHO Run NORMAL.BAT to reset standard production configuration
PROMPT $P $Q$Q$Q$
PATH C:\;C:\DOS;C:\BATCH
```

NOTHINGC.DAT File Contents

```
BUFFERS=40
FILES=30
```

Figure 1
NOTHING.BAT and Associated Files

NORMAL.BAT File Contents

```
@ECHO OFF
ECHO          Setting normal AUTOEXEC.BAT and CONFIG.SYS configuration
CD C:\
C:
COPY AUTOEXEC.SAV AUTOEXEC.BAT
COPY CONFIG.SAV CONFIG.SYS
DEL *.SAV
ECHO          Use CTRL-ALT-DEL to reboot the system
```

Figure 2
NORMAL.BAT

shown in Figure 2.

If you suddenly have problems with programs doing strange things in your system, you should always start by getting rid of all "extra" commands in both the AUTOEXEC.BAT and CONFIG.SYS files, unless you just installed new hardware or software of course. If a problem occurs immediately after the installation of any new hardware or software, that is the most likely culprit.

Using these batch files is a feature that I use all the time. I always run the NOTHING.BAT file before I use any programs that fool around directly with my hard drive. It's easy to return to my production configuration with the NORMAL.BAT file.

Powering Down

As a final note, most of the informa-

tion included in this article applies to nearly all computer brands that can use extended memory, expanded memory, or both. What type of memory you can really use depends on what type of computer you have (e.g., 8088, 80286 or 80386), the specific DOS version and brand, and which applications you are using. The comments about Zenith's EMM.SYS device driver generally apply to all Zenith MS-DOS versions that included it, but you should check your documentation because command examples in this article are specific to Zenith MS-DOS 3.3 Plus. And it is important to remember that EMM.SYS will only work with Zenith or Heath systems that have a Zenith memory board or have additional memory installed with SIMMs on a Zenith motherboard.

For help in solving specific computer 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 parallel) 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 questions about anything in this column, or about Zenith or Heath 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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Computer Model Numbers, SupersPort 286, MS-DOS 3.3 Plus

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Each January, *REMark*, contains a lot of information about HUG, the magazine itself, and various information that HUG members either find interesting or may need to know. For example, the January issue contains specific information about changes and updates to the discounts on Heath and Zenith hardware and software, which is one of the very good reasons for joining HUG. Because the January issue is chock full of information that all HUG members — especially new members — need to know, the January *REMark* is sent out to all new members, regardless of when they join HUG during the year. For that reason, I have decided to include specific information in this column that is of special interest to new HUG members. I hope this January column becomes a continuing feature, like the popular December column that I customarily devote to providing gift suggestions for Heath and Zenith computer users. But before we get too far along, I think it might be a good idea to introduce myself again for the benefit of our new members.

An Introduction

Regardless of what my byline says, my friends call me Bill, and I would be pleased if you would do so. I have over 22 years' experience in various computer-related and data processing functions ranging from systems analysis and design to management. During this time, I have worked for various companies like Honeywell, McDonnell Douglas, TransAmerica, and Atlantic Richfield Company (ARCO). My educational background includes a B.S.E.E. (Electrical Engineering) degree from Purdue University and an M.B.A. from West Coast University in Los Angeles, California. And I have written over a dozen books or courses, as well as several hundred computer-related articles of one kind or another.

I am currently a Senior Consultant with TAP, Incorporated (Total Assets Pro-

tection) in Arlington, Texas. TAP provides just about all kinds of services for computer systems ranging from the design/build of major data centers to communications to the analysis and development of information security and disaster recovery programs to protect data. My personal specialty is the analysis and development of information security and disaster recovery programs for large mainframe data centers. As a result of this consulting experience, I have also worked with all major brands of microcomputers and software, as well as a number of Local Area Networks (LANs) and Wide Area Networks (WANs). This has given me the opportunity to use and compare a lot of computer systems from major manufacturers (including Zenith, IBM, Compaq, and Tandy), add-on boards, and a wide array of word processing, spreadsheet, and data base software. Regardless of what hardware I have used, I still think that the Heath/Zenith systems are the best, and those are the ones that I personally chose to buy and write about.

As you will see on the masthead, I am a Contributing Editor and have been writing this column for *REMark* since 1983. I have been a HUG member since 1982. During this time, I have seen a major shift in the HUG membership from primarily hobbyist-oriented interests to the business-related use of computers. Many new HUG members are not necessarily interested in all of the technical details of their computers, but at least some knowledge is required to successfully operate and use these systems. You can find nearly all of the information you will need to begin using your computer in the documentation provided with your computer and the *Powering Up* books available from HUG.

What's the Purpose of HUG?

The Heath/Zenith User's Group, usually called HUG, was established over 11

years ago. As published in each and every *REMark*, HUG is provided as a service to its members for the purpose of fostering the exchange of ideas to enhance their use of Heath/Zenith equipment. In other words, the whole concept of HUG is to help members exchange ideas on the use of Heath and Zenith computers. And the whole idea of *REMark* is to provide a medium where members can write about and exchange information on various topics that can help other HUG members.

Articles published in *REMark* are written by HUG members for HUG members. If a HUG member (including the HUG staff) does not write about it, then there is no way you will see it in this magazine. If you have a specific question or suggestion for a topic that you need additional information on, I suggest you write to HUG or directly to me with that idea. Most of the topics I write about, such as the "How to Use EMM.SYS" article in this issue, are a direct result of questions or suggestions in the letters I receive. Or, if you have an idea for an article that would be of interest to other HUG members, consider the idea of writing about it yourself. Information about compensation for published articles is included elsewhere in this issue.

There are occasional suggestions that articles in *REMark* should have more of "this" and less of "that". For example, I received one letter that suggested that information about all ROM releases for ALL Heath and Zenith computers should be published in this magazine. On the surface, that sounds like a good idea. In fact, it is such a good idea that I checked it out several years ago with the idea of writing about it. Unfortunately, there is no one person that knows everything about all ROMs for all Zenith computers (including discontinued models). And wading through hundreds of pages of technical information to get one little tidbit of important information is not really my idea

of a good time. Besides, the real answer to this suggestion is that NO major manufacturer — not Zenith, not IBM, and not Compaq — is willing to generally release this kind of highly confidential and proprietary information about changes made in each ROM release. For HUG members, there is another way to find out about this information.

The Purpose of this Column

Since it began, the purpose of this column has always been to help HUG members keep "On the Leading Edge" for information about Heath and Zenith computers. That includes various topics, such as new Zenith or Heath hardware, operating systems, and third-party products which can be used on these systems. When I find out about new items of general interest, such as ROM changes that may be required to use new software, that information has been and will be published here. When a new release of Zenith MS-DOS is available, I include general information about it to help you decide if you should upgrade or not. Sometimes it takes a little time for me to explore new features so that I can provide you with ideas on how to intelligently use them. In other cases, I may not use a new feature on a regular basis, and I may not write about it unless I receive a letter which indicates that the subject may be of general interest to all HUG members. The EMM.SYS article in this issue is an example of that.

Some members have suggested a continuing series of articles that includes specific information about Heath/Zenith computers and MS-DOS. In short, the purpose of this column is exactly that. Now let's move on to some other topics of particular interest to new HUG members.

Compatibility

The most common question that we receive at HUG has to do with the various model numbers of Heath and Zenith PC compatible computers. Perhaps the most common question of all is something like: "Why don't you have any articles about MY computer?" That kind of question is either preceded or followed by a statement about which model that user has. Sometimes the question is phrased in such a way that it is clear the user does not know what the general "type" (e.g., PC compatible) category the system falls into. And HUG has even been criticized for including a list of the PC Compatibles as part of the Table of Contents page because of a statement I made in a previous article that the model numbers were not particularly important. Actually, Jim Buszkiewicz and I came up with the idea of listing some of the PC compatible series numbers in an attempt to help users identify what kind of system they have.

One of the hazards of providing that kind of list is that at least one system will not be listed (e.g., the eaZy PC), and someone will be offended by that. Before we get into specific model and series numbers, it is important to define what we are talking about when the term "PC Compatible" is used.

IBM Compatibility

What the term "PC Compatible" means is really determined by the context in which it is used. As used by HUG and in REMark, the term "PC Compatible" refers to SOFTWARE compatibility. That is, software generally listed as "PC Compatible" will run on Heath and Zenith computers, as well as other compatibles, such as IBM, Compaq, etc. In other words, it is generally safe to assume that any software which will run on an IBM PC (where PC compatibility is essentially defined) will also run on a Zenith or Heath PC compatible computer. For purposes of HUG software, the term "PC Compatible" means that the software will run on any Heath/Zenith PC compatible computer, and most other compatible systems too. If you read this paragraph carefully, you will note that I said "generally safe to assume", which of course means that there are some exceptions. To understand why that is true, it is necessary to review a brief bit of history on the development and "compatibility" of IBM computers.

The first IBM microcomputer was called the IBM Personal Computer, or IBM PC for short. The original IBM PC featured a whopping 64 kilobytes of memory (later increased to 128K), SINGLE-sided/double-density 5.25-inch disk drives (180K) that were later changed to double-sided/double-density (360K), a cassette tape interface, a single parallel port for a printer (a serial port was optional at extra cost), an 8088 MPU running at 4.77 MHz, and a 65-watt power supply. Most early PCs were equipped with a CGA video card and monitor. In the hardware sense, true PC compatibility was essentially defined as this kind of configuration. Because of several interesting problems with this specific configuration, IBM introduced the IBM XT computer.

The XT (eXtended Technology) was essentially a "reworked" PC with one very important difference: it had a larger power supply. As I recall, it was rated at something around 90 watts or so. A beefed-up power supply was required because the other significant difference in the XT was that it included a hard drive, usually on the order of 5-10 MB. In other words, the PC was so underpowered that it did not have a big enough power supply to support internal electronics (including memory), two floppy drives, AND a hard drive; otherwise, the technical specifications were about the same, including the 8088 MPU and the 4.77 MHz clock speed.

Through the normal development process, IBM introduced the AT.

The original AT (Advanced Technology) contained an 80286 MPU and ran at a screaming 6 MHz clock speed with one wait state. This AT came equipped with a whopping 512 KB of system memory and a 5.25-inch high density (1.2 MB) floppy disk drive. This was the "standard" configuration, but most ATs were also equipped with a hard drive. Later, another AT was released, and it had a clock speed of 8 MHz with one wait state. These two computers essentially defined what "AT compatible" meant; however, advances in this technology caused all kinds of problems. And general software and hardware compatibility with other manufacturer's systems were the biggest.

Copy Protection and Compatibility

In the early days of computer software, many paranoid software manufacturers developed software with a copy-protection feature. At least one form of copy protection checked a computer's clock speed, and many irate users found out the hard way that true PC compatible software would not run on their new AT systems because of the increased clock speed. In particular, many games checked to see if the computer was running at 4.77 MHz, and if it wasn't, the game program would not run. Many users viewed this approach as a rather shabby marketing technique to force them to buy new software. And many software manufacturers at the time would not even give a legally registered software user a discount for an update to a new version. This particular problem is one reason that Zenith introduced the dual-speed (4.77 MHz and 8 MHz) Z-158 computer system.

Although some copy-protected software still exists today, most enlightened software manufacturers have removed it. Lest you believe they did that because of a user rebellion against it (which may be a small part of the reason), most manufacturers dropped copy protection for the very good business reason that it was causing incredible problems (especially installation) for their technical support groups. In other words, copy protection was causing lots of problems and costing them lots of MONEY — so much so that it was more cost effective to remove copy protection than to support it. Some software manufacturers might have you believe that they removed copy protection for altruistic reasons, but I am more than a little skeptical of those claims.

There are many other forms of copy protection — some of them use one or more "hidden" files (from the DIR command), a few actually change the "format" of a disk, and one form of copy protection actually has a hole punched in a disk (usually by a laser) that prevents it from being copied by DOS. Another form

of copy protection requires a "key disk" that must be inserted in a floppy drive to run a program, even if the software is installed on a hard drive. The latest form of copy protection is in the form of a "hardware key" — called a DONGLE — (yes, that's really the name of it) that plugs into a serial or parallel port and is checked by the software during operation. A dongle looks like, and is about the size of, a gender changer for a serial or parallel port. It usually has a DB-25 connector on both ends, so that you can plug it into the computer and then plug in a peripheral, such as a printer or modem, directly into the dongle. It is claimed that the dongle does not interfere with any peripheral in any way.

Hardware Compatibility

A discussion of hardware compatibility is difficult because it means different things to different people. Unfortunately, many people have the mistaken idea that a "compatible" computer from any manufacturer, including Zenith, is 100% compatible for both hardware and software. That is very often not true, because of some things that hardware and software manufacturers do. Speed-sensitive software that was mentioned earlier is one of those problems, but there are two other common problems.

The second problem is that some software is not compatible with other software, regardless of the general hardware compatibility features of a system. Memory-resident programs, like device drivers and many desktop utility programs (e.g., SideKick), sometimes have conflicts with each other. In many cases, it is at least difficult, if not impossible, to try to predict what software will produce conflicts unless it is actually tested. Some manufacturers still use non-standard programming techniques that are used to improve speed, functionality, or both.

The third problem that is directly related to hardware compatibility is that some manufacturers, including Zenith, have built better systems than IBM. I think the best example of that is when Zenith introduced the AT-compatible 6 MHz Z-241, which could not use some of the memory boards developed for the IBM AT. As it turned out, Zenith used better engineering to produce a computer with zero wait states (memory) which was demonstrably faster than its IBM counterpart. Unfortunately, many of the early memory boards were developed using the IBM "standard" of one wait state, and these memory boards were simply not "fast" enough to keep up with a Zenith computer using a zero-wait-state configuration. If you are interested in knowing more about a computer's memory, the chapter on "Adding More Memory to Your Computer" in *Powering Up* goes into considerably more detail on the informa-

tion you must know before you buy anything.

The issue of hardware compatibility goes even deeper. In the true hardware sense, I don't think Zenith has ever produced a "real" PC compatible desktop computer. The first PC compatible, called the Z-151, was actually an XT compatible because its larger power supply COULD support a hard drive, which is really the major difference in hardware between a PC compatible and an XT compatible. That's why you sometimes see the term "PC/XT compatible."

As time goes on, you will probably continue to see the term "AT compatible" which usually refers to a computer with an 80286 Micro Processor Unit (MPU). Whether or not a system is really AT compatible depends on how the definition is established by a manufacturer. In general, though, "AT compatible" means that SOFTWARE that runs on an IBM AT will run on an 80286-based system, such as the Zenith Z-241, Z-248, Z-286, and SupersPort 286. If you examine most of today's software, you will find that it is clearly labeled as being "PC, XT, and AT compatible." Of course, you must be careful in reading the label because a lot of current software now requires a high-resolution video display (e.g., EGA), so the fact that it is generally compatible with the non-video system hardware is not enough. If you need to know more about your computer's display system, you may find the *Powering Up* chapter on "Understanding Video Hardware" helpful.

Advances in technology have produced the 80386 MPU and the soon-to-be-released 80486 MPU (when Intel gets the bugs out). From a software perspective, Zenith 80386 computers (e.g., the Z-386/16, the Z-386/25, and the Z-386/33) are still AT compatible. From a hardware perspective, the Z-386 systems are generally AT compatible, except for the fact that at least one system (i.e., the Z-386/16) must currently use Zenith 32-bit memory cards for memory expansion because of the proprietary bus.

The whole point of the discussion so far is that you really must have some kind of technical knowledge about your computer system. As you can see, the whole issue of compatibility gets very involved very quickly, and it frequently depends on whether you are talking about hardware or software. Hardware compatibility most often depends on the type of MPU a computer has, the resolution of its video display system, and sometimes its clock speed and number of wait states. In some cases, it also depends on exactly what Heath or Zenith computer model you have in terms of how much built-in expandability the system has. For example, the eaZy PC (all models) hardware configuration cannot be upgraded by using the usual add-on cards, such as mem-

ory or video, because it was designed to be a low-cost system. More on that in a minute.

Heath/Zenith Computer Classes

There are at least two things that all computer users should know about their systems: the MPU, and the type of video display. In some cases, knowing about the system clock speed can also be critical. However, knowledge of the exact MPU used in your computer is becoming more and more critical when selecting software, and the discussion of Heath and Zenith computer models will be based on the type of MPU that each system has. Today, there are three classes of Heath and Zenith computers: the 8088, the 80286, and the 80386. When the 80486 systems are released, there will be four classes of computers, but that will have to wait for a future article. To find out which class of computer you have, all you need to do is look at the "Specifications Page" in your Owner's Manual. Let's begin with the 8088-based computer models which will generally be discussed in the order of release dates.

8088-based Computer Models

The very first compatible computer released by Zenith was called the Z-151 which was basically an XT compatible running at 4.77 MHz. In addition, Zenith also released the Z-161, which was a "portable" (I call it "luggable" because it was heavy) version of the Z-151, except that it had a self-contained CRT.

When a faster 8088 MPU was available, Zenith released the Z-158, which looked the same as the Z-151, except that it contained a switch that allowed a user to choose between the 4.77 MHz and 8 MHz clock speeds. As far as I know, Zenith was the first major manufacturer to release a production system that used the fast clock speed that is now commonly known as a "turbo" system. All of these systems were generally expandable and had at least four slots for add-on cards. A Z-159 was also released, and all of these I have seen have featured a 101-key keyboard and EGA video support. One model that received little attention was the Z-157, which was limited in the way it could be expanded (using a daughter board), and this system was later placed in a different "box" and called the Z-148. All of the Z-15x computers are generally known as the Z-150 series computers, even though the Z-157 was quite different in its internal hardware.

The Z-148 is a low-cost system with very limited expandability. Although it will accept some add-on cards (half size), it requires the purchase of an additional board, called a daughter board, to add a card. The traditional use of this expansion capability was to add a hard drive and controller. There were several different

"versions" of this computer produced (some with floppies only and one with a hard drive), but it is generally referred to as the Z-148 or the Z-140 series.

The Z-138 portable is essentially the Z-148 system hardware in a luggable box, and its expansion capabilities are also limited. This computer is sometimes discussed as the Z-130 series.

The Z-171, sometimes called the Z-170 series, was a "lunchbox-style" computer that was one of the first of the true portables, weighing in at about 15 pounds. It was not really a "laptop", unless your lap just happens to fit its shape.

Zenith has developed a number of high-quality and highly-rated laptops that are generally known as the 180 series. These include the Z-181, Z-183, and Z-184. The model number generally defines what features were available on the system that was primarily related to whether the system had a hard drive. In the model number series, the Z-184 actually refers to the SupersPort computers, and there are two different SupersPort models: the original SupersPort (with an 8088 MPU) and the SupersPort 286 (with an 80286 MPU). This is one example of where the actual series includes two different classes of computers.

Small, light computers are the current rage, but a few people may remember the ZP-150 laptop that was released a number of years ago. Its ROM contained some programs, like word processing (and of course, MS-DOS), but it was not very popular, probably because its display was very difficult to read under most conditions. And of course, the new Zenith MinisPort computer is the latest in the super-small and light laptops. Although I suppose it is inevitable that I will miss one, Figure 1 is intended to include all of the Zenith models. If you have one that I missed, I apologize in advance.

Series	Model Numbers
Z-130	Z-138
Z-140	Z-148
Z-150	Z-151, 157, 158, 159
Z-160	Z-161 (usually included as the Z-150 series)
Z-170	Z-171
Z-180	Z-181, 183, 184 (except Laptop SupersPort 286)
eaZy PC	PC-1, PC-2, PC-3
ZP-150 Laptop	
MinisPort Advanced Laptop	

Figure 1
8088 MPU PC Compatible Systems

Before we go on, it is important to remember that these systems are generally compatible with all software which have a label of "PC or XT Compatible." Depending on the system, the level of hardware compatibility varies as previously discussed. There is one important exception

that is listed in Figure 1, but does not actually have an 8088 MPU.

The eaZy PC

From the letters I receive, the eaZy PC seems to be the most controversial system that Zenith has ever released. The entire eaZy PC series (PC-1, PC-2, and PC-3) was discontinued some time ago. Unfortunately, it does not have the expansion capabilities of the more expensive desktop systems, and many eaZy PC owners have only learned about that AFTER buying one. My guess is that some discount firm must have obtained a rather large inventory of the discontinued eaZy PCs because I get a lot of mail with questions about them. The worst part of this particular unit is that whoever is selling them can't help and support the buyers, probably because the seller doesn't know anything about computers either. If you have an eaZy PC, you might be interested in my comments about it in the "On the Leading Edge" column that was published in the April 1988 REMark. Back issues are generally available from HUG, and I suggest you call to check on availability. But here are some things you must know about the eaZy PC, if you have one.

First, the eaZy PC contains an NEC V20 MPU, which is compatible with the 8088 MPU systems listed in Figure 1. The eaZy PC contains its own monochrome CRT (with 16 shades of gray) which provides CGA-compatible video resolution (640 x 200), but it cannot be upgraded to color because the video circuitry is part of a single board inside the computer.

The eaZy PC is completely limited in its expansion capabilities to those manufactured by Zenith: a 128K Memory Expansion Module (to increase memory to 640K from the original 512K), a Serial Port Module (required to support any serial device, including a printer), and a Modem Module. You may find one or more of these accessories as a single unit, if you are able to find them at all. I recommend that you buy the Memory Module, and the Serial Port Module may be important because the eaZy PC's built-in serial-type port is designed to only support a mouse, not a printer or external modem. Other than that, you cannot expand or add to the eaZy PC in any other way. You cannot add a color monitor, nor can you add ANY disk drives beyond what was included in the original system. Now let's move on to the more advanced systems.

80286-based Computer Models

The Zenith 80286-based systems began life as the Z-200 series, and many people (including me) still refer to any system that contains an 80286 MPU as a Z-200 system. I have already mentioned the 6 MHz Z-241 and 8 MHz Z-248 as AT compatibles, but sometime after these were released, Zenith changed the model

number designations to the point that they are confusing to everyone. Not to be outdone, Heath also came up with some incredibly odd model numbers to describe the same computer available in kit form. I won't even pretend that I know how to decode all of these strange numbers, but there is still an easy way for you to figure out what kind of system you have. As mentioned previously, you need to refer to the "Specifications Page" in your Zenith Owner's Manual to determine the type of MPU in your system.

Sometime around the beginning of 1988, Zenith began introducing several different "packages" containing an 80286 MPU. The first one that I found was the ZW-286-25 which was an 8 MHz 80286 system (Z-286/8) that appeared to use the same cabinet as the Z-150 series. Then, a 10 MHz "Compact AT Compatible" appeared that reminded me of the Z-148 cabinet with a different front plate and a strange model number of ZCF-2326-EY. Heath released the same computer as a kit which, for some reason, was called the HS-40. Depending on when you purchased this computer, it may be called the Z-286 LP (Low Profile) or perhaps the Z-286/10 (10 MHz). All of these systems were somewhat less expensive than the large Z-241/248, and they had fewer expansion capabilities and slots too. Their biggest advantage is that they used SIMMs (Single Inline Memory Modules) for memory expansion, and problems with having to use Zenith memory boards were a thing of the past.

As 12 MHz 80286 chips became available, Zenith and Heath released the "2500 series" which was a large desktop unit. As a Heathkit, it was available as the HS-2526. As an assembled Zenith computer, it was available in various models such as the ZBO-2503-EK, ZBF-2526-EK, and the ZBF-2527-EK. This computer may also be called a Z-286 or a Z-286/12, depending on the documentation. The cabinet is virtually identical to the Z-386 system with four drive bays.

The SupersPort 286 is a popular and well-designed 80286-based laptop that runs at 12 MHz. It has CGA-compatible resolution, but it provides a high-resolution display (640 x 400) when used with its own LCD screen. Figure 2 summarizes the various Zenith and Heath 80286-based systems.

Now for the latest and greatest in the 80386-based systems.

80386-based Computer Models

The original Z-386 was released several years ago and contains an 80386 MPU running at 16 MHz. Because of its zero-wait-state technology, it can still process as fast as other 80386 systems with higher clock speeds — the Compaq 386/20, for example. As more powerful and faster computers are developed, it is be-

Model/Series	Description
Z-241	Large, desktop unit. 6 MHz.
Z-248	Large, desktop unit. 8 MHz.
ZW-286-25	Smaller desktop unit. 8 MHz. (Z-286/8)
ZCF2326-EY	Compact desktop unit. 10 MHz. (Z-286/10 or Z-286 LP) Same as Heathkit HS-40
2500 Series	Large desktop unit. 12 MHz (Z-286 or Z-286/12)
SupersPort	286 Laptop. 12 MHz.

Figure 2
80286 MPU AT (Z-200)
Compatible Systems

coming more important to understand the relationship between the computer's clock speed and the number of memory wait states. When *Byte* magazine reviewed the Z-386 that was featured on the cover, the 16 MHz Z-386 was just a few hundredths of a second slower in processing speed than the Compaq 386 that was running at 20 MHz with one wait state. In short, the processing-speed penalty for using slower (and cheaper) memory chips becomes significant even with adding just one wait state.

About a year ago, Zenith released the 25 MHz Z-386 (Z-386/25), and a 33 MHz system (Z-386-25) is also available. The 25 MHz version is also available as a Heathkit called the HS-3629. And of course, the 12 MHz TurbosPort 386 with the page-white CGA double-scan screen was Zenith's entry into the high-powered laptop market. I have noticed that Zenith has now come out with a 386SX laptop that includes a VGA display, but I was not able to find a model number for that as of the time of this writing. Figure 3 summarizes the Zenith 80386 systems.

Model/Series	Description
Z-386	Large, desktop unit. 16 MHz. (Z-386/16)
Z-386/25	Large, desktop unit. 25 MHz. (Z386/25)
Z-386/33	Large, desktop unit. 33 MHz. (Z-386/33)
TurbosPort	386 Laptop. 12 MHz.
3865S	Laptop. Similar to TurbosPort 386, but with VGA display.
Z-1000	Multiple 80386 MPUs.

Figure 3
80386 MPU Systems

The Z-1000, in its base configuration, contains two 80386s and may be configured to include up to six. As I recall, its base price is somewhere in the \$40,000 range, but I have included it here to be complete. By the time you read this, there will probably be at least one new model that I have not listed here.

Are Model Numbers Important?

Sometimes, but not often, at least in

terms of the articles in *REMark* and most other magazines that cover personal computers. How often have you seen an article about the model 99 or the model 339 computer? How about the model 30 or the model 50, or the model 70? What you do see are articles about the IBM PC, AT or the PS/2 series in general, but very few articles (unless they are hardware comparisons) will refer to the specific model number or even mention a series number. For Heath and Zenith computers, you will occasionally see model-specific articles in *REMark*, such as the ROM installation on my SupersPort 286 (November 1989), but virtually all *REMark* articles are written by people who have done something specific with a Heath or Zenith computer. For IBM computers, the model number usually doesn't matter, so long as the computer can run the software. For Zenith and Heath computers, the model number is also not relevant in many cases because the computers ARE compatible.

I mentioned IBM model numbers specifically because I have noticed that many new HUG members have a preoccupation with computer model numbers for some reason. I suppose that many new members expect to see a specific article about the Z-159, Z-148, eaZy PC or whatever, but I continue to be puzzled by the fact that some computer users spend a wad of money on a computer and apparently don't understand that these are compatible systems. It's true that each model has some unique features, and some have specific limitations (e.g., the eaZy PC), but these systems are still compatible and will still run compatible software. As I mentioned earlier, I think it's unfortunate that many new computer buyers only find out after the purchase that a computer has some kind of limitation, such as the eaZy PC. Perhaps the only good approach is to say that that's the "cost" of education and chalk it up to experience.

In short, the exact Heath or Zenith computer you have is not too important for most articles you will see in this and other similar magazines. The whole idea of buying a Heath/Zenith compatible computer in the first place is to have reasonable assurance that you can use a wide variety of software on it, regardless of the exact model number you have. Computers that cost less, such as the Z-148 and eaZy PC, don't have the hardware flexibility and expansion capability that the more expensive systems have, but that should not be a surprise either. The cost of computers, like cars, is based on the type and number of standard features. A Cadillac costs more than a Chevrolet, but both will still get you from here to there. A Z-159 costs more than an eaZy PC, but both will do about the same job. For the most part, virtually all of these systems will run compatible software, regardless of which MPU

is used. All of the computers listed in this article will run HUG software that is listed under the "PC Compatibles" or "H/Z-100 and PC Compatibles" headings.

Give Your Computer a HUG!

Membership of course. With a HUG membership, you get a discount on Heath and Zenith computer-related products as described elsewhere in this issue, not to mention a year's subscription to *REMark*. Articles include information that is useful to the beginning, as well as the advanced computer user ranging from "how-to" discussions (e.g., the "Getting Started With..." and the "Powering Up series) to programming in various languages. Some articles include specific hints and tips on how to use various application software and utilities. And this "On the Leading Edge" series includes information about new hardware, software (including new releases of Zenith MS-DOS), and other information that is specific to Heath and Zenith computers.

If you have a question about your Heath or Zenith system, I strongly encourage you to write to us. Although the HUG staff does not have every single Heath and Zenith computer model, we can usually help solve a problem because of our experience with these systems, including Zenith MS-DOS. If you do have a question or a problem, be sure to include the information mentioned at the end of this article so that we can provide a specific answer to help you.

If you have found something that you think needs to be shared with other Heath and Zenith computer users, I also encourage you to let us know about it. It may be something that solves a problem, like a new ROM version, or it may be about a software problem or bug. At HUG, we do not use or test every possible software and hardware combination, and there may be some little-used software (especially networking-related software) or hardware that has a conflict with something in a system. When I know about these kinds of things, they usually appear in this column with a credit (by name) to the provider of the information. Now let's move on to one of the new features of Zenith MS-DOS 3.3 Plus.

MS-DOS 3.3 Plus

If you have examined the User's Reference on the ECHO command, perhaps some of you noticed the at-sign (@) that precedes the ECHO OFF command. That is a minor enhancement in MS-DOS 3.3 Plus (and OS/2) which prevents the display of the ECHO OFF command line. I have always wondered why the ECHO OFF command did not turn off the echo for that command line, and this little trick will do it. For additional information, you may want to check pages 3.12-13 in the MS-DOS 3.3 Plus User's Reference under

the ECHO command.

I occasionally receive letters from readers asking where I get all this kind of information. Actually, I read the Zenith manuals and then check out features and enhancements that I think might be useful in my work, as well as my articles.

For example, you may have noticed that the FASTOPEN command is new in this latest version. FASTOPEN is a memory-resident program that basically keeps track of the location of a number of files, including directories, on a hard disk. Although it may help reduce the amount of time required to access frequently-used files on a hard disk, I suggest that you do some extensive testing before using this command on a regular basis. There are reports that if FASTOPEN is used with programs which use direct disk I/O commands — such as the disk utilities programs mentioned earlier — these programs may scramble a hard disk. If you must use the FASTOPEN command, be absolutely sure that you do not run it before using any disk utility programs of any kind. I recommend forgetting about using the FASTOPEN command entirely, and I don't use it at all. By the way, this command is part of all the latest DOS versions, including PC-DOS 4.0.

Adding Color to the SupersPort

Although the SupersPort 286's screen is excellent for a laptop, I had occasion to set mine up the other day with an external CRT because I really did not want to transfer some files to my production Z-386. After checking the SupersPort Owner's Manual to be sure that the pin connections were compatible with my old original NEC MultiSync monitor, I simply plugged the NEC into the SupersPort, and powered everything up. After the computer had booted, I used the FN-F10 key sequence to turn off the LCD and turn on the CRT. Everything worked fine, but I was surprised to see the difference between CGA and the EGA resolution that I am used to on my desktop systems. I am so used to EGA resolution that I had forgotten how "bad" CGA is by comparison.

The reason that the SupersPort 286's screen is better than most other similar laptops is that something called "double-scan" CGA has been implemented on the Liquid Crystal Display (LCD) screen. If you check page 4-13 (Specifications for the hardware) in the Owner's Manual, you'll find that the LCD has a 640 × 400 pixel resolution. One of the advantages of double-scan CGA is that it provides a much better display than the standard LCD that only has a standard CGA resolution of 640 × 200. That's why the SupersPort display is easier to read than many other laptops, like the Toshiba 1200. The SupersPort 286's screen also uses "supertwist" technology and backlighting to make it easier to read.

If you read my *Powering Up* article (February 1989) or book (page 81) about "Understanding Video Hardware," you will probably remember that 640 × 400 is not a "standard" resolution mentioned in that article. Standard CGA resolution is 640 × 200. Since the SupersPort provides an external CGA output, all you need to do is plug in any standard CGA-compatible CRT to the SupersPort, use the FN-F10 key sequence to switch to the external CRT, and you are ready to use a "big screen."

This kind of terminology is an example of the reason I wrote the *Powering Up* series in the first place. The SupersPort Specifications page 4-13, under the "Input/output" heading, mentions that "Composite (monochrome) video and RGB (color) video with intensity signals from a single 9-pin connector" are available. If you read my article (or referred to it), you know that RGB refers to a typical CGA color monitor with the usual 640 × 200 resolution. If you have a monochrome (not TTL) CGA composite monitor, you can make your own special "adapter" that takes the usual phono plug to pin 7 (composite signal) and the shield to pin 1 (ground) on a DB-9 male connector for the SupersPort's CRT connector. If you don't understand some of this, you should check that *Powering Up* article for additional information. By the way, I should probably mention that it is very important to carefully read and understand the Specifications for the SupersPort. For example, the "Display" specification clearly states the 640 × 400 resolution is for the LCD, but the "Input/Output" specification for video states that only RGB (i.e., CGA) and composite signals are available to an external monitor. The double-scan 640 × 400 resolution is only available for the internal LCD, while standard CGA resolution of 640 × 200 is available for an external monitor as described in the specifications.

Although I would like to have higher resolution on an external monitor for the SupersPort, I cannot justify spending over \$1,500 for an Expansion Chassis, an EGA video card (e.g., HVB-550), and a dedicated EGA monitor (e.g., ZCM-1490) to add it. I already have that capability on my desktop systems, and if I need higher resolution, I can always just transfer files from the SupersPort. If you are using the SupersPort as your only computer, you might find it is a good investment to buy this additional equipment for a "desktop" system.

Powering Down

If this particular issue of *REMark* is your first as a new member, welcome to HUG. I think you will find that the articles published here will help you learn about and use your Heath and Zenith computer system more effectively. To help you find

out more about Heath and Zenith computer products, I also suggest that you write to Heath Company at the address shown at the end of this article for a free catalog. This may help you learn more about the different kinds of computer equipment and accessories available for your system. Although it is my usual practice to list the models and prices at the end of each article, they are not included for the general discussion of model numbers because many of the older systems mentioned have been discontinued.

For help in solving specific computer problems, be sure to include the exact model number of your system (from the back of the unit or series from the Owner's Manual), 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 parallel) 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 questions about anything in this column, or about Zenith or Heath systems in general, be sure to include a self-addressed, stamped envelope (business size preferred) if you would like a SupersPort 286 w/40 MB HD ... \$5499.00
SupersPort 286 w/20 MB HD ... 4999.00
SupersPort 286 1 MB Card
(ZA-180-66) 799.00
SupersPort Expansion Chassis
(ZAS-3034-EB) 499.00
Video Card (HVB-550) 599.00
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Getting Started With . . .

ASSEMBLY LANGUAGE

Part 2 More Fundamentals

This series is an attempt to teach simple assembly language programming skills to persons familiar with BASIC. This series is applicable to you if your computer uses the MS-DOS operating system. Those of you who read Part 1 will remember that I said I would discuss the Central Processing Unit and the assembly language instruction set. However, before I get into those topics, there is another topic I should discuss.

Hexadecimal and Binary Numbers

If you have had the opportunity to examine some assembly language programs, you may have noticed that hexadecimal numbers were used in them (numbers made up of the digits 0-9 and the letters A-F). You may also have noticed hexadecimal numbers in BASIC programs, in PEEK or POKE statements. And you may have deduced from your observations that hexadecimal numbers are used to specify memory addresses and port addresses in a computer. But why are hexadecimal numbers used, and not the ordinal decimal numbers that people use? The reason is that, as I stated last time, computers work in binary numbers. It would be fine to use only binary numbers to specify memory addresses, etc., in an assembly language program, but they are difficult to work with. Binary numbers tend to be rather large in terms of the number of digits required to express a given number, and it is difficult to look at one and visualize a count in your mind. It would also be fine to use decimal numbers, but there are times when you need to know what the number is in binary, or at least whether it is above or below a certain binary value. It is very difficult to convert between decimal and binary, and vice versa.

It is very easy to convert between hexadecimal and binary numbers, and hexadecimal numbers are not that difficult to work with. Once you learn some basic relationships between binary, hexadecimal, and decimal numbers, you can work easily with hexadecimal numbers, and feel comfortable with them. Consider the following chart

Decimal	Binary	Hexadecimal
0	0	0
1	1	1
2	10	2
3	11	3
4	100	4
5	101	5
6	110	6
7	111	7
8	1000	8
9	1001	9
10	1010	A
11	1011	B
12	1100	C
13	1101	D
14	1110	E
15	1111	F
16	10000	10

An important relationship between hexadecimal and binary numbers that you should be able to see by looking at the chart is that for every 4 places used in a binary number, one place is used in the equivalent hexadecimal number. You should be able to see, then, that 100 hexadecimal is equivalent to 100000000 binary. In fact, the above chart is all you need to convert any hexadecimal number to binary, and vice versa. Here is another chart that will help you visualize hexadecimal numbers as actual quantities in your mind, which is trained to think in decimal.

Decimal	Hexadecimal	Often expressed as
16	10	One paragraph
256	100	One page
1024	400	One k
4096	1000	4 k
16384	4000	16 k
65536	10000	64 k

You may have heard of computers described as 8-bit, 16-bit, or 32-bit computers. A bit is another name for a binary digit. An 8-bit number is, therefore, a number made up of a maximum of 8 binary digits. The largest number that can be expressed with 8 bits is 11111111 binary, or FF hexadecimal, or 255 decimal. This brings up another important concept you need to know. Suppose you had a group of ping pong balls with numbers on them, numbered from 0 to 255. How many ping pong balls would you have? You would have 256. The highest numbered ball would be 255, but you would have 256 balls. If you had 64k of memory in your computer, the highest memory "address" in your computer would be 65535 decimal, or FFFF hexadecimal, but the number of memory locations would be 65536.

Notice that FFFF is the highest number that can be expressed in 16 bits. If a computer has 16 address bits, then the most memory it can address is 64k. This has nothing to do directly with whether it is a 16-bit computer or not, but it is another concept that you should begin to understand. If a computer can move a number no larger than 8 bits to or from memory at once, it is an 8-bit computer. To move a number larger than 8 bits to memory, it must move it in pieces. Each of these 8-bit pieces is called a "byte". If a computer has 16 address bits and can move data 8 bits at a time, then it can ad-

dress 64k bytes of memory. The actual CPU chip in such a computer might have 16 pins that are used to address memory, and 8 pins that are used to transfer data. So you can see that the number of data bits and the number of address bits in a computer are directly related to the actual computer "hardware".

It is not important to know all of the above information in order to program in assembly, but it is important to know that some computer instructions work with 8-bit numbers, some with 16-bit numbers, and some with 32-bit numbers. You should know that the number of bits limits the size of the numbers you can work with. For example, if you are adding two 8-bit numbers, and the answer is also limited to 8 bits, then it can never be larger than 255 (decimal). So if you add 200 (decimal) to 200, and the answer is limited to 8 bits, the result will be 144. This is easier to see in hexadecimal numbers. 200 in decimal is C8 in hexadecimal, and if you add C8 and C8, you get 190 (hexadecimal). With an 8-bit limit, and the knowledge that there are 4 binary digits for each hexadecimal digit, it is easy to see that the result will be 90, which is 144 in decimal.

If you would like to try adding some hexadecimal numbers in a situation where the numbers are limited to 16 bits, use the H command of the DEBUG program. You will find a description of DEBUG in your MS-DOS manual if you are not familiar with it. If you think you are going to need some help working with hexadecimal numbers and converting between hexadecimal, decimal, and binary, get HEPCAT (HUG part no. 885-3045). It can add, subtract, multiply, and divide these different types of numbers, and it can convert from one type to another.

The Central Processing Unit Registers

The Central Processing Unit, or CPU, is the heart of your computer. While your computer is operating, the CPU is constantly transferring binary numbers from your computer's memory into itself, decoding these numbers into instructions, and performing various other operations based on these instructions. It is not important for you to know everything that goes on inside your CPU, but there are some things you should know, and I will try to present them here.

Inside the CPU are some special memory cells called "registers". Each of these registers is 16 bits wide, but some of them can be combined in various ways to form larger numbers, and some of them can be divided into two 8-bit registers. It is important for the assembly language programmer to know the name of each register and how it is used. Here is a chart that may help you learn them.

Register name	Use
(General purpose registers)	
AX (AH and AL)	Accumulator
BX (BH and BL)	Base Index
CX (CH and CL)	Loop counter
DX (DH and DL)	Data pointer, high order accumulator
(Index registers)	
SI	Source index
DI	Destination index
BP	Base pointer
(Special pointers)	
IP	Instruction pointer
SP	Stack pointer
(Segment registers)	
CS	Code segment
DS	Data segment
ES	Extra segment
SS	Stack segment

The first four registers in the chart are called general purpose registers because they can be used interchangeably for a number of jobs. For example, if you want the processor to add two numbers, you can place the numbers in any two of the general purpose registers, and you can have the result placed in either of those two. Notice that each of the general purpose registers contains two 8-bit registers, which can be used independently.

Each of the general purpose registers also has a specific purpose for some instructions. The AX register is used as an accumulator (it accumulates the result) in multiply and divide operations. The BX register can be used as an index register for pointing to memory. I will discuss this more later. The CX register is used as a counter for certain loop instructions. It is the equivalent of the variable I in this BASIC statement:

```
FOR I= TO 100:NEXT I
```

The DX register is used as the upper half of a double word accumulator. For example, if you multiply two numbers, and the result is more than 16 bits, the lower 16 bits will be in the AX register, and the excess bits will be in the DX register. This register is also used as a data pointer by MS-DOS for many of its functions.

The SI and DI registers can be used as index registers in the same manner as the BX register. They are also used for special string manipulation instructions, such as string compare or string copy. For these instructions, the SI register always points to the source string, and the DI register points to the destination string.

The BP register is a special index register that is used in conjunction with the stack. I will explain the stack in the discussion of the SP register.

The SI, DI, and BP registers can also be used as general purpose registers for some instructions. For example, they can be used for addition or subtraction problems.

The IP register is the Instruction Pointer. It always points to the next instruction in memory that the CPU is about to execute. When that instruction is executed, the IP register is updated to point to the next instruction, etc.

The SP register is the Stack Pointer. The stack is a special area in memory used to hold return addresses for subroutines. Assembly language subroutines work like GOSUBs in BASIC in that, when the subroutine is completed, control returns to the next instruction after the subroutine call (the next instruction after the GOSUB). In order for BASIC to know where to return control after a GOSUB is finished, it must maintain the location of instruction following the GOSUB in a table of some sort. The BASIC programmer is not concerned with where or how this table is maintained, and he cannot access it. In assembly language, however, the table of "return addresses" is pointed to by the SP register, and because the value in the SP register is accessible, the table is also accessible. So the stack is used not only to hold return addresses, but to pass data from one part of a program to another. The stack works like a tray dispenser in a cafeteria. Putting a value "on the stack" is like putting a tray in the dispenser, and this action is called "pushing" data on the stack. Removing a value from the stack is like removing a tray from the dispenser, and the action is called "popping" data from the stack. The Stack Pointer is like the top of the tray dispenser. It points to the last item that was pushed on to the stack. The items are stored such that newer items on the stack are at numerically lower addresses than old items. Each time an item is pushed on to the stack, the SP register automatically decrements to point to that item, and if an item is popped, the SP register increments to point to the next one.

The BP register can be loaded with the value of the SP register and then used as a pointer for examining items on the stack. The concept of a pointer or index

register may be a bit difficult for a BASIC programmer to understand, but perhaps I can make it clearer by comparing it to a singly dimensioned array. Suppose you have an array ALPHA() in a BASIC program. If you wanted to access the fifth item in the array, you could do it with

```
10 INDEX = 5
20 A = ALPHA(INDEX)
```

In this example, INDEX is our index register. Because its value is 5, it points to the fifth item in the array. You could retrieve the sixth item by either incrementing the index register (INDEX = INDEX + 1) or by adding an "offset" to it, as in

```
30 B = ALPHA(INDEX+1)
```

Index registers in assembly language work the same way. You can access a particular item in memory either by putting the address of that item in the index register, or by adding an offset to the current value of the index register, so that the value plus the offset equals the address of the item.

The Segment Registers and Memory Addressing

The last four registers in the register chart are called segment registers. To explain their use, I will first explain a bit about memory addressing. The central processing unit used in the original MS-DOS type computers was the 8088. It is capable of addressing 1 megabyte, or actually 1,048,576 (20~2) bytes of memory, because it has 20 address lines and 8 data lines. (Actually, some of the pins on the 8088 chip are dual purpose, so that there are not 28 separate data and address pins. Newer processors can address even more memory, but in the mode of operation used for MS-DOS, 1 megabyte is still the available memory.) However, as I have already pointed out, all of the registers are 16 bits wide, and the most number of one-byte memory locations that you can point to with a 16-bit register is 65536. So how can the CPU access the whole megabyte of memory? It is done using a process called segmentation.

In processors that were used in personal computers before the 8088 came along, such as the Z80 used in H89 computers, the pointer and index registers were used by themselves to form memory addresses. These processors could not access more than 65536 byte of memory, and so 16-bit registers were enough to point to any place in memory. In the 8088 and its successors, however, the index and pointer registers are not used by themselves. Instead, they are added to a value in one of the segment registers in an unusual way. The segment register is treated like a 20-bit binary number with the lower 4 bits missing. In hexa-

decimal terms, it is like a 5 place hexadecimal number with the lower place missing. To see how this works, suppose a segment register has the value 1010 (hexadecimal), and a pointer register has the value 1234. To get the actual address pointed to by these registers together, you would add them like this:

```
    1234
+1010
-----
11334
```

With this method, it is possible to address the entire megabyte of memory space. The segment registers by themselves and can only point to even "paragraph boundaries" in memory. An index or pointer register can point to any of 65536 locations within each of these boundaries, or segments.

The pointer and index registers are each linked to one of the segment registers. The IP (Instruction Pointer) register is linked to the CS (Code Segment) register. When the CPU "fetches" an instruction from memory, it adds the value of the IP register to the value of the CS register using the method shown above to arrive at the "absolute" address of the instruction to fetch.

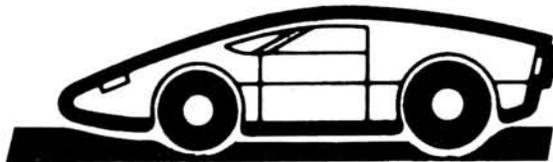
The BX, SI, and DI registers are linked to the DS segment register when they are

used as regular index registers. When the DI register is used in string manipulation instructions, it is linked to the ES register. With the SI register still linked to the DS register, the processor is able to move or compare strings anywhere in the 1-megabyte address space.

The BP register is linked to the SS segment register, since it is designed for indexing into the stack. Special override instructions are available to allow non-default segment registers to be used with most memory access instructions. Nearly all memory access instructions, not just those that use pointer or index registers, use the segment registers for calculating the address. The exceptions are instructions that specify both a segment and an offset as numbers.

I have used up just about all of the time and space I wanted to spend on this month's installment of this series, and I have not introduced the instruction set yet. As you can probably tell, I am not working from a prepared script, so be prepared to expect the unexpected in each installment. If you have any suggestions as to specific areas to cover, please let me know. *

MOVING?



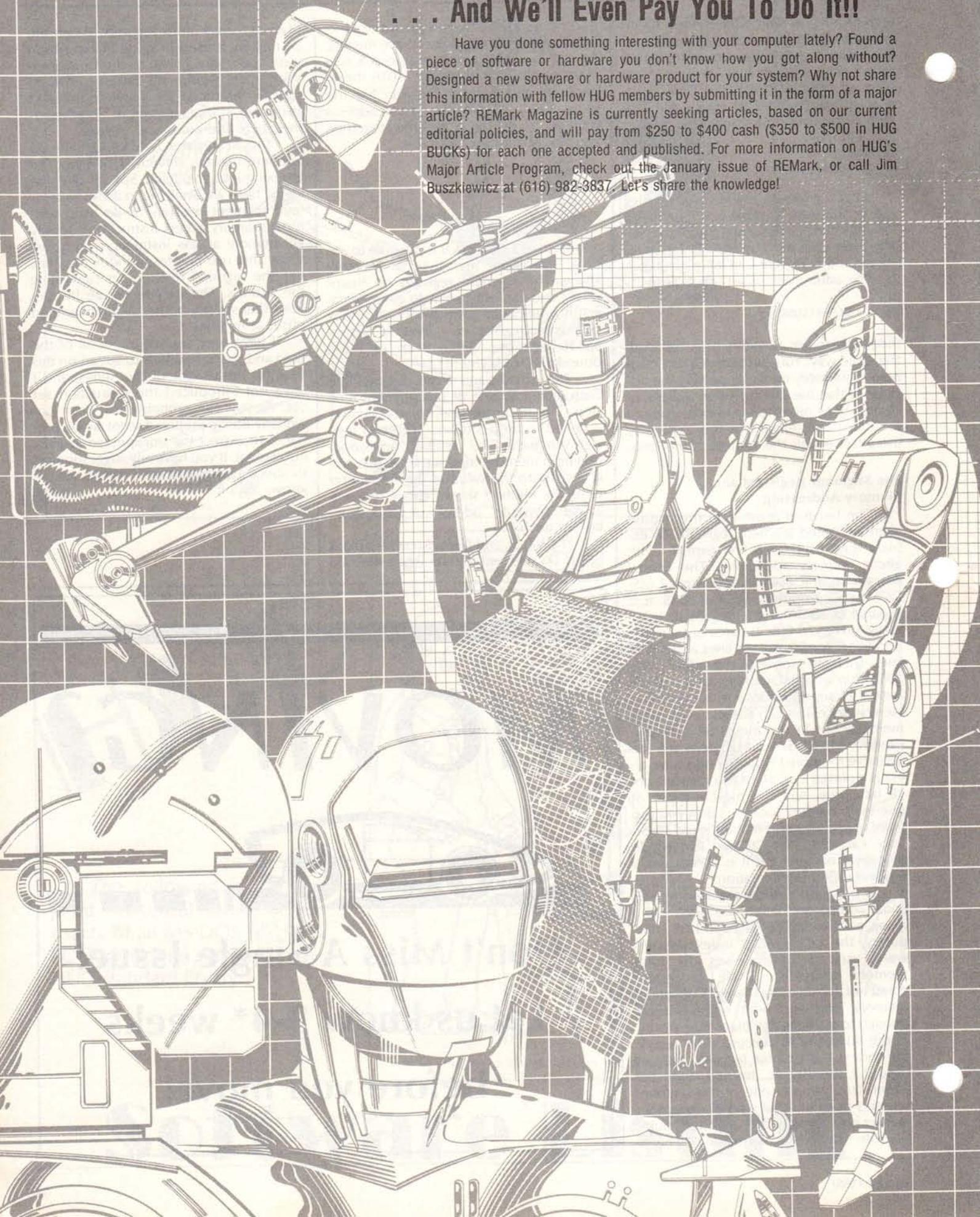
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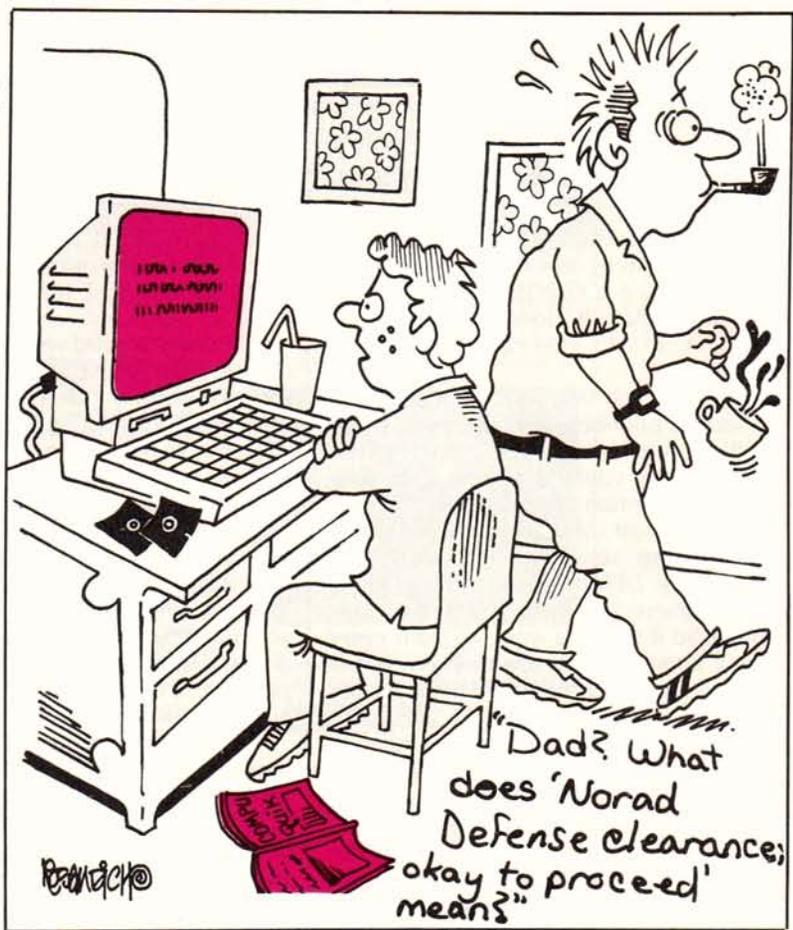
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Z-100 Survival Kit

#10

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Learning How to Patch Programs for ZPC

I guess I'm just going to have to face up to the fact that most of the Z-100 world craves the ability to run PC compatible software. A big percentage of the mail I receive from "Survival Kit" readers is from people who want to know more about how to patch programs to run under ZPC. I've tried to avoid doing this, but . . . the pressure is unrelenting. By popular demand, Survival Kit #10 and #11 will be devoted to teaching you how to become an expert in the art of ZPC patching.

If you will recall, I stated in Survival Kit #1 that I didn't want this column to turn into a "ZPC Update" series. That is still my feeling, but it appears that the only way I can maintain this position is to provide ZPC patch information on the side. The first step in this plan was taken in Survival Kit #9, where I announced a new PATCHIT utility, and gave a detailed format specification for program patch information which is submitted by users. The obvious next step is to teach you all how to develop the patches so that all I will have to do is organize the data and distribute it.

When in Doubt, Read the Instructions

Probably the most frustrating aspect of trying to provide technical support to people who want to develop patches is the fact that most of the information they need is right in the ZPC manual. Pat Swayne has given a very adequate (and

understandable) explanation about the type of things which require patching for operation with ZPC.

Over the course of this, and the next, installment of Z-100 Survival Kit, I will be guiding you by the hand through procedures needed to patch programs. But in the end, most of what we cover will be summarized by pages 11 through 14 of the ZPC manual.

What Seems to Be the Problem?

I am left with the conclusion that there are five factors leading to ignorance about how to make ZPC patches (see the list in Figure 1).

1. Users don't have an understanding of assembly language programming.
2. Users don't know how to use an editor like DEBUG to search for areas to patch.
3. Users don't understand how PC specific programs work, or why patches are required.
4. Users haven't read pages 11 through 14 of their ZPC manual.
5. Users don't have a ZPC manual because they have a 'borrowed' copy of ZPC.

Figure 1

I tried to express number 5 as politely as possible; if this is your excuse, then you really have no excuse. Making unauthorized copies of commercial software (yes, ZPC is a commercial program!) is not only

illegal, but immoral. And stealing it from a users' group is double-dirty. Shame, shame! If you fall into group 1, there may not be any hope for you. At least not for the next several months, while you take a crash course in 8088 assembly language. Yes, most of these patches could be made by a user who doesn't know what he is doing, but as soon as something varies from the game plan which is described, you'll be lost. Much of the code that needs patching can be written in a number of ways, and developing appropriate patches will require at least an elementary understanding of what is taking place in the program.

If number 3 is your problem, it may be because you also fall into category 4. I'll be covering specific patch circumstances in the next installment of Survival Kit. We'll take a detailed look at what types of things PC specific programs do that cause problems, and what patches are required to correct them.

The rest of this column will be devoted to group number 2. I know (based on letters and phone conversations) that many of you are not proficient in using DEBUG. It is absolutely necessary that you understand how to use an editor which allows byte-by-byte editing of a file. This could be DEBUG, or SYMDEB, Norton Utilities, HADES, or any number of other public domain file editor programs which are available. Our discussion will concentrate on the use of DEBUG, mainly because everyone has a copy (it

comes with DOS).

DEBUG — A Short Tutorial

DEBUG.COM is a down-and-dirty file editor that has been included with DOS since day one. There are lots of alternative editors available, but I happen to think that DEBUG is a nice program. It's short. It's quick. And it does everything you need it to do, to develop program patches.

There have been quite a few articles in various publications about how to use DEBUG. And Zenith's version of the MS-DOS manual contains a more than adequate description of how to use the program. But most users aren't willing to take the time to study the documentation thoroughly. DEBUG is one of those kinds of programs that you don't use very much. So it seems a waste to learn every detail about how to use it. The result is that you have to refer to the manual each time you want to use DEBUG, and some of the finer details of its use are neglected. I know, because I still have to refer to the DEBUG manual occasionally when I use it.

For our purpose at hand, which is developing patches for programs to run under ZPC, we don't need to know how to use all of DEBUG's features. In fact, the only DEBUG commands we need to worry about are those shown in Figure 2.

A Assemble 8088 code instructions
D Dump (or Display) contents of memory
E Enter or change memory locations
Q Quit, and return to DOS
R Register contents (display or change)
S Search memory
U Unassemble 8088 code instructions
W Write file to disk

Figure 2

I find that most users have an elementary understanding of these commands. But in order to use DEBUG to find patches (or make patches), there are a few additional tricks of the trade that aren't immediately obvious from reading the manual. We're going to cover each of these commands in detail, paying special attention to details which will be necessary for our goal of patching programs. I'll describe the commands in the order we're likely to use them, not in alphabetical order as they are listed in Figure 2. But first, we need to take a look at how DEBUG is started, and how it loads programs into memory.

Invoking DEBUG

DEBUG may be invoked with the following command:

```
DEBUG filename.ext
```

This command runs the DEBUG program, and tells it to load the named file

into memory. This is pretty simple to understand, but there is a complication; if the program we want to patch is an EXE program, its name must be changed before loading it with DEBUG. If you attempt to write an EXE file back to disk with DEBUG, you will get an error message that says "EXE files cannot be written".

There is a good reason why DEBUG cannot write an EXE file to disk, and why we can't directly patch an EXE program. The DEBUG manual isn't very clear on this situation, so let's take a few paragraphs to find out what's going on.

When you load a program file (.COM or .EXE) with DEBUG, the program is not simply loaded into memory. There's more to it than that. You see, DEBUG is more than just a hex file editor — it also allows you to execute or single-step through programs. Therefore, when DEBUG loads a program, it loads it just as though it was going to run the program.

For COM programs, this means that a program segment prefix (PSP) is built at the first available load address. The PSP is 100h bytes long, and contains information that may be useful to the program, such as the location of the environment strings, address of the control-C handler routine, any command line arguments, etc. Immediately after the 100h byte PSP, the COM program is loaded. This is exactly the way the program would be loaded into memory by DOS, if you were executing it from the DOS prompt. You'll notice, when using DEBUG to investigate a COM program, or other file, that the (D)ump or (U)nassemble commands always begin with address 100h in the current segment. That's where the actual program begins. And whenever a program or file is written back to disk, the default start location for the write operation is 100h.

The way EXE programs are handled is completely different. Every EXE program begins with a header that includes initialization information, as well as relocation (or fixup) addresses. When DEBUG loads an EXE program, it does it just as though it were preparing to run the program. This means that a PSP is built, and information in the file header is used to perform "fixups" to the program code as it is being loaded into memory. Without the address fixups, you wouldn't be able to execute or single-step the program. After the program is loaded, the header information is simply discarded.

Now, there are several reasons why the resulting EXE memory image which has been loaded can't be written back to disk. First of all, the EXE file header (which is at least 512 bytes long, maybe larger) is not stored in memory. It is used to load the EXE file, and then overwritten. If you were allowed to write the program back to disk, it would not contain the required header information. Secondly, since fix-

ups were made to the program code after it was loaded into memory, the code you see with DEBUG is not the same as the code in the program on disk (the jump addresses will be different). In other words, the memory image of the EXE program is different from the disk file image.

Since our main objective is to be able to make patches to a program, and write it back to disk, it is obvious we can't work directly with EXE files. The solution to this problem is, however, very simple. Just rename the EXE program so that it has a different extension. Then DEBUG will think it is working with a non-EXE file. My favorite substitute name is simply the program name without any extension. In other words, rename TEST.EXE to just TEST.

DEBUG Preliminaries

Okay, let's assume that you have invoked DEBUG, and loaded the program you want to patch. If it was an EXE program, you renamed it first. Now what? Try hitting 'r' and then RETURN. You should see something that looks like Figure 3.

This display shows the contents of all of the 8088 CPU registers, along with the current instruction pointed to by the instruction pointer. I'm not going to try to explain everything there is to know about this display of register contents — I'll assume that you have the basic assembly language knowledge it takes to figure most of it out (remember group 1?).

There are, however, a few specific points I would like to make while we are here looking at the register display. First off, note that DEBUG displays numbers (and expects them to be entered) in hexadecimal notation — exclusively. If you don't know the hexadecimal (base 16) numbering system, take time out right here to learn more about it — otherwise, you'll be lost.

Notice that DS, ES, SS, and CS all contain the same value (2044h in our example). This will always be the case for COM programs or plain vanilla files. The actual segment address may (probably will) be different on your system. It will even be different depending on what type of memory-resident utilities or device drivers you have loaded before invoking DEBUG. The address shown in these segment registers is the first available load address. Remember, the PSP is loaded at this segment address, and then the program is loaded. Look at the value for IP (the instruction pointer) in Figure 3. The fact that it says 100h should be no surprise at this point.

There are two other registers which are significant to our patching goal. Registers BX and CX will contain the length of the program which was loaded. The actual length is BX: CX. For programs which are less than 64K (65536) bytes long, BX will be zero. In the example shown in Figure 3, the length of the program we loaded is

0001:2F00h (which is the same as 12F00h). This translates to 77568 decimal bytes. The length of the program will be very important when it comes to searching for patch locations.

Okay, now we're ready to examine the individual DEBUG commands.

R — Register Contents (Display or Change)

This is the command we used above to display the contents of all the CPU registers. You can also use this command to change the register values. Enter 'R' immediately followed by the two letter name of the register you want to change. For example, type 'RCX' if you want to change the CX register. After you hit RETURN, the current register value will be displayed, and you will be allowed to type in a new value.

You probably will not need to change the values of any registers when patching programs. The most important use for the 'R' command, for our purpose here, is to determine how long the program is, and to find the segment load address.

D — Dump (or Display) Contents of Memory

The (D)ump command is used to display the hex values of memory. The syntax is:

```
D[address] [L value]
```

The address you specify is the start memory address for the bytes to display. The address may be composed of a segment and offset, or simply the offset. If just an offset is specified, the current data segment (value in DS) will be used. If no L value is specified, 128 (80h) bytes will be displayed. Here are some examples:

```
D500
```

This command will dump 128 bytes beginning at offset 500h in the current data segment.

```
D3044:2000 L 100
```

This command will dump 100h bytes beginning at segment address 3044h, offset 2000h. Notice that this is offset 2000h into the second 64K of the program, assuming that the initial data segment is 2044h, as shown in Figure 3.

If you simply type 'D' with no arguments, the next 128 bytes (since the last Dump command) will be displayed.

The Dump command will be useful to us for finding particular locations in the file to patch. Sections of the program which contain ascii text may be quickly examined by using the Dump command.

E — Enter or Change Memory Locations

The 'E' (Enter) command is used to view a particular memory location, and to change it. The syntax is:

```
Address
```

where 'address' is the memory location where you want to begin viewing or changing values. DEBUG also allows you to include a list of hex values on the 'E'

command line, but we won't need to worry about that feature. As an example of how the Enter command is used, suppose we want to change several bytes beginning at offset 520h in the program. We would issue the command:

```
E520
```

followed by a return. DEBUG will display the present value of the byte at offset 520 in the data segment, and then allow us to change it. If we decide we just want to skip this byte, we can simply hit the spacebar. After a new value is entered, or the spacebar is struck, the next byte is displayed for our review. This continues until we hit the RETURN key. As with the dump command, the address used with the Enter command may include a segment prefix if the memory address isn't within the first 64K of the program.

The Enter command will be our main tool for patching programs, so you must understand exactly how it works. If doubt still lingers, fire up DEBUG and play with it a bit. The best way to get the hang of it is practice, practice, practice!

S — Search Memory

The Search command is the second-most powerful tool we have in our quest for proper patches. (The most important tool is, or should be, your brain). The proper syntax for the Search command is:

```
Srange list
```

'range' specifies where the search is to begin, and how many bytes to search. This may be done by specifying a start and end address, as in this example:

```
S100 500 50 61 75 6C
```

which will search from offset 100h to 500h for the occurrence of four bytes with the values 50h, 61h, 75h and 6Ch ('Paul'). We could have also used a segment prefix for the start address, like this:

```
S3044:0 FFFF 5A 31 30 30
```

This example would search 65535 bytes beginning at paragraph 3044h for the four specified bytes. Another way of telling DEBUG the search range is by specifying the actual number of bytes to search, instead of the end address. For example:

```
S100 L 400 50 61 75 6C
```

This command tells DEBUG to search 400h bytes beginning at offset 100h. This example has exactly the same results as our first Search example.

One important time-saving feature you'll want to note is that the 'list' of bytes to search for may be given as an ascii string of characters, instead of a list of hex bytes. The ascii search string should be enclosed in single quotes, like this:

```
S3044:0 FFFF 'Z100'
```

This is exactly the same command as our second example above, except it is a lot simpler to enter.

DEBUG's search range is limited to 0FFFFh bytes, so if you have a program which is longer than 64K, you'll need to search it in several steps. For instance,

suppose the program is 192K long, and our registers after starting DEBUG are as shown in Figure 3. In order to search the entire file for the string 'Heath', these three commands would be required . . .

```
S2044:0 FFFF 'Heath'
```

```
S3044:0 FFFF 'Heath'
```

```
S4044:0 FFFF 'Heath'
```

While DEBUG is searching memory, the segment:offset of each match is listed on the screen. Be prepared to use Control-S if you are searching a large range, because the list of match addresses may quickly scroll off the screen.

It doesn't hurt anything if you tell DEBUG to search a range which extends beyond the limits of the currently loaded program. But be sure to check the program length to make sure that any matches you find fall within the program area. Another thing to keep in mind is that DEBUG's searches are case sensitive. This means that searching for 'Heath' will not find an occurrence of 'heath', since the first character is not capitalized. A good practice when searching for words which may be capitalized, is to start the search string with the second letter. For instance, if you are looking for the copyright notice in a program, search for 'opyright'.

A couple of important notes about DEBUG versions . . . Some of the older versions of DEBUG may not allow you to enter your search list as an ascii string. Check your documentation (or just try it) to determine if your version falls into this category. Also, some versions of DEBUG may impose a search limit of 8000h bytes, instead of 0FFFFh. If you have one of these versions, and you need to search an entire 64K block of code, you'll have to do it in two steps.

U — Unassemble 8088 Code Instructions

The Unassemble command allows us to see the CPU instructions that make up the program. Without the 'U' command, the program is nothing but a bunch of hex bytes. We will use the Unassemble command extensively to determine where patches need to be made. The syntax for this command is:

```
U[address] [L value]
```

```
or
```

```
U[range]
```

As with the Search command, 'range' may consist of a start and end address, or a start address and the number of bytes to unassemble. If only the start address is given, 32 bytes will be unassembled beginning at the specified address. Or you can specify the number of bytes to unassemble with the 'L' option. If the 'U' command is given with no arguments, 32 bytes are unassembled beginning at the current position of the instruction pointer. If the instruction pointer (IP) has not been altered since the last 'U' command, then the unassembly will continue from the point last unassembled. Unlike the Dump

```

-r
AX=0000 BX=0001 CX=2F00 DX=0000 SP=FFEE BP=0000 SI=0000 DI=0000
DS=2044 ES=2044 SS=2044 CS=2044 IP=0100 NV UP EI PL NZ NA PO NC
2044:0100 01711F      ADD      [BX+DI+1F],SI

```

Figure 3

and Search commands, the Unassemble command (and Assemble command) use the value of the code segment (CS) if no segment prefix is given. This may all be a bit confusing, so let's have a few examples:

U100 150

This command causes the bytes between 100h and 150h of the current code segment to be unassembled.

U3044:0 L 50

This example will unassemble 50h bytes in paragraph 3044h, beginning with offset 0.

U

If this command (Unassemble with no arguments) were issued immediately after the previous example, it would cause the next 20h bytes to be unassembled.

A — Assemble 8088 Code Instructions

The Assemble command is the counterpart to the Unassemble command. It allows you to enter 8088 mnemonic instructions, and will convert them into byte values. In other words, it allows you to enter assembly language program instructions. The syntax is simple:

A[address]

If an address is specified, assembly of instructions will begin at that address. The address may contain the segment, as well

as offset. If no address is specified, assembly will begin at offset 100h in the current code segment, or at the last address where instructions were assembled.

The Assemble command is another method we have for changing the program code. It may be preferable in some cases to use the Assemble command to patch programs, instead of the Enter command. This is particularly true when we need to change large areas of ascii text, since we can use the Assemble command to enter DB instructions like this:

```
DB 'Z-100 Survival Kit'
```

This is much easier than looking up all the hex values for the ascii characters, and entering them one at a time with the Enter command.

W — Write File to Disk

After we have found our patches, and made our changes, the 'W' command is used to write the file back to disk. The Write command may be used with arguments which will cause it to do all kinds of neat tricks, but for our purposes, all we need to know is 'W', followed by RETURN.

One thing you should take note of, however, is that the actual number of bytes written to disk is controlled by the

BX: CX registers. Remember way back at the beginning, when a program is loaded, that the BX: CX registers contained the program length. DEBUG uses this value to determine how many bytes to write. So make sure that registers BX and CX don't get changed between the time you load your program and the time you write it back to disk.

Q — Quit, and Return to DOS

It doesn't get much simpler than this. Hit 'Q' and RETURN. Your done! DEBUG doesn't give you a second chance on this one, so make sure you have saved your changes by using the Write command.

One tip for the time when you do inadvertently quit without saving your patched program . . . If you invoke DEBUG again, immediately, and without any command line parameters, you'll find that your program is still there, intact. However, the program length will not be properly recorded in the BX: CX registers at this point, so you'll have to be sure and set them to the proper length before issuing the Write command to save your work.

Get Ready for the Good Stuff!

We now have most of the preliminaries out of the way. In the next issue of Survival Kit, we will begin probing deeply into the why's and how's of making ZPC patches. In the mean time, practice using DEBUG until you know these commands we have discussed. Your time will be well spent.

Until then, keep in touch!



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```

/*
 OS/2 Protected mode program to turn off the
 keyboard numlock state.
 Written by Robert A. Metz
*/

#define INCL_SUB
#include <os2.h>
main()
{
 KBDINFO kbstKbdInfo;

 kbstKbdInfo.cb = sizeof(kbstKbdInfo);
 KbdGetStatus(&kbstKbdInfo,0);
 kbstKbdInfo.fsMask |= 0x10;
 kbstKbdInfo.fsState &= 0xffdf;
 KbdSetStatus(&kbstKbdInfo,0);
}

```

Figure 2

```

name doslkoff
title Program to turn off numlock in dos
; Written by Robert A. Metz as a .COM program
; Extended to an .EXE program by Bill Hall

; This program is used as a stub to the OS/2 NUMLKOFF program

dosseg
.model small
.stack

.code

;; main
;
main proc
mov ax,40h
mov ds,ax
and byte ptr ds:[17h],0dfh
mov ax,4c00h ; exit function, 0 error code
int 21h ; ... return to DOS
main endp
end main

```

Figure 3

fault.

We are going to exploit this capability by making a DOS version of NUMLKOFF the stub for an OS/2 version. Both are written in assembler for speed and small size. The resulting program will run in DOS or OS/2 and is about one-sixth the size of the one generated by BIND.

The Assembler Versions

Figure 3 shows the code for turning off the NUM LOCK key in MS-DOS. The code is adapted from the corresponding .COM version given in [1]. You should note particularly the simplified segment

and model directives which make the business of program setup much easier than before. This itself is one reason for upgrading to version 5.1 of MASM.

Figure 4 is the corresponding program for OS/2. Several items are worth noting. The includelib directive eliminates the need to specify that library at link time. The .286 directive is only for code which will run on 80286+ processors. The

KBDINFO structure is just as in the C program. It is used to declare kbddata in the data segment. The extrn directive declares those external functions which will be called to get and set the keyboard state and to exit.

To turn off the NUM LOCK key, it is necessary to retrieve the KBDINFO structure, modify some flags, and write it back. Here are the C declarations for KbdGet-

```

title numlkoff
; Assembler program to turn off the num lock key in OS/2
; William S. Hall
; 3665 Benton Street, #66
; Santa Clara, CA 95051

includelib doscalls.lib ; must link with this library

.286
.model small

; Keyboard information for KbdSetStatus and KbdGetStatus
KBDINFO struc
cb dw ?
fsMask dw ?
chTurnAround dw ?
fsInterim dw ?
fsState dw ?
KBDINFO ends

.stack

.data
kbddata KBDINFO <SIZE KBDINFO,...> ; keyboard data information structure

.code
extrn KbdGetStatus:FAR, KbdSetStatus:FAR, DosExit:FAR

;; entry point
;
main proc
push ds ; push far address of kbddata
push OFFSET kbddata ; push keyboard handle
push 0 ; fill the structure
call KbdGetStatus
or kbddata.fsMask,10h ; alter the mask and state
and kbddata.fsState,0ffdfh ; now set the data
push ds
push OFFSET kbddata
push 0
call KbdSetStatus
dos exit ; terminate all threads
push 1
push 0
call DosExit
main endp
end main

```

Figure 4

```

; Definitions file for Numlkoff
; Note the use of the Dos version as the stub for the OS/2 program

NAME    Numlkoff

STUB    'Doslkoff.exe'

STACKSIZE 1024

```

Figure 5

Status and KbdSetStatus:

```

USHORT APIENTRY KbdSetStatus ( PKBDINFO, HKBD );
USHORT APIENTRY KbdGetStatus ( PKBDINFO, HKBD );

```

Hence, both of these functions require a far pointer to a KBDINFO structure and a keyboard handle and return an unsigned short. The keyword APIENTRY itself is defined as PASCAL FAR. Now a function declared as PASCAL handles its arguments differently than a standard C function. In particular, the arguments are pushed onto the stack from left to right and the callee restores the stack. In standard C, which must deal with functions with a variable number of arguments, arguments are pushed from right to left and the caller pops the stack. So, if you are going to use these functions in assembler, you must use the PASCAL convention. In particular, the far address of kbddata is first pushed, then the keyboard handle (0, in this case) is added to the stack frame before the call is made.

Similarly, the parameters to DOS exit are (1, 0), and they are pushed as shown before the call. In fact, all OS/2 system calls are FAR PASCAL.

The Definitions File

The .DEF file is something new to MS-DOS programmers not yet acquainted with Windows. Containing information about stacksize, heapsize, program name, segment attributes, stub, etc., it is very important in Windows and Presentation Manager. For non-PM OS/2 programs, a definitions file is usually not needed; here we want it so that the DOS version of NUMLKOFF will be the stub for the OS/2 program. Figure 5 shows our .DEF file.

Putting it All Together

Figure 6 is the make file for the assembler version of NUMLKOFF. First, the MS-DOS version is assembled and linked into an .EXE file. Then the OS/2 version is assembled. Finally, the object file just created is linked along with the definitions file to produce the final executable. The bind utility is not needed and the resulting program is only 2K in size.

I hope you have enjoyed this rela-

```

doslkoff.obj : doslkoff.asm
masm doslkoff;

doslkoff.exe : doslkoff.obj
link doslkoff;

os2lkoff.obj : os2lkoff.asm
masm os2lkoff;

numlkoff.exe : os2lkoff.obj numlkoff.def doslkoff.exe
link os2lkoff,numlkoff,NUL,,numlkoff.def

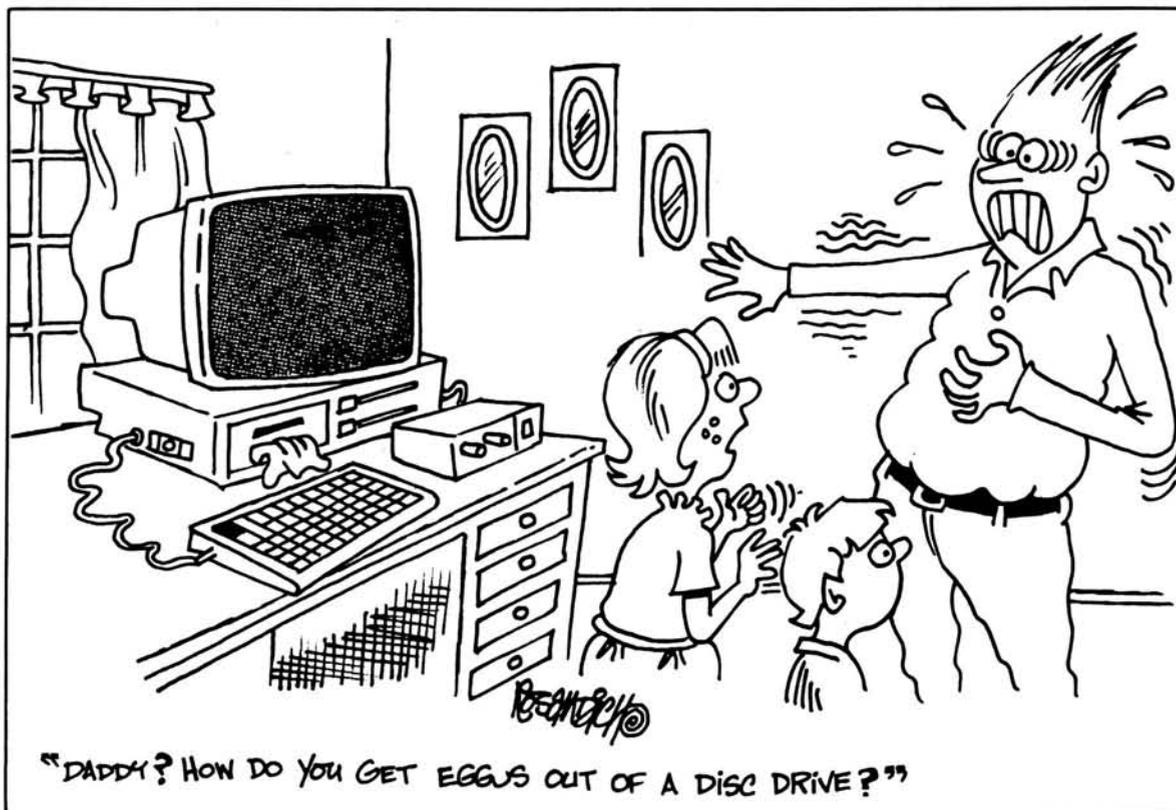
```

Figure 6

tively painless introduction to assembler OS/2 and an interesting use of the stub feature.

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10 Ways You Can Cause A Computer Failure

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Over two dozen actions (or inactions) can directly cause computer failure. How you handle a disk, boot your system, type a document, or secure for the day has a direct impact on how long and how well your computer will perform. This article describes the 10 most common causes for computer system failure.

1. Keyboard Misuse
2. Disk Drive Misuse
3. Tars & Nicotine
4. Cheap Disks
5. Liquid Fry
6. Asphyxiation
7. Interference Wipeout
8. Electrostatic Discharge
9. Improper Installation
10. No or Improper Maintenance

Made of both electronic and mechanical moving parts, the keyboard and the disk drive are the two most common failure items in any computer system. There is a finite limit on how long any electro-mechanical device will operate before some form of housekeeping (e.g., low level reformat, cleaning, adjusting, etc.) is required. You wouldn't operate your automobile for 100,000 miles without a periodic tune-up, and your keyboard and floppy disk drives deserve similar care and attention. The first four failure causes relate to the keyboard and floppy disk drives. The remaining six failure causes apply to the complete computer system. Each cause will be individually described in the paragraphs that follow.

Keyboard Misuse

The keyboard banger is someone who grew up with a mechanical typewriter

and then graduated to a computer keyboard without learning that the electronic keyboard is vastly different from the "push it hard" manual typewriter. Striking the keys hard may make the person think their actions are causing better images on the screen or printer paper, but in reality this action bends an electronic membrane mounted below the keys. As the membrane bends under the banging force, key contact becomes intermittent and, eventually, certain keys fail to operate. This hard failure causes frustration and often colorful words.

Another keyboard abuse is the full cord stretch — extending the coiled keyboard cable to its full limits (and sometimes beyond). Computer keyboards were designed for gentle, firm operation — not for rough handling. Treat your keyboard and cables kindly and they'll serve you long and well.

Disk Drive Misuse

Like the keyboard, your floppy disk drives need gentle, firm handling. The drives and disk media are designed for human interaction, but some users go beyond acceptable handling limits. They treat the drive and the mini- and micro-floppy disks like they do a real or imagined sports car. They jam a disk into a drive and slam the door shut, or bang the eject button to see if they can cause the disk to shoot out like browned bread from a misaligned toaster. Look at your 5.25 inch disks. Check the disk surface near the spindle hole in the center. If you see tiny impressions in the disk, you can be sure that someone tried to slam a disk

drive door shut before the disk was properly seated over the spindle shaft. Closing the drive door causes mechanical components in the drive to clamp the disk over the spindle. If the disk is not all the way in, the clamping action presses tiny indentations into the disk surface. Rough disk insertions can destroy the disk media or misalign the mechanical components in the drive itself. Either result can have a lasting impact on your confidence and the usefulness of your computer.

Tars & Particles

Watch a smoker drag on a cigarette and then exhale through a clean handkerchief. That dark brown stain is a combination of tar and nicotine. Tar and nicotine in cigarette and cigar smoke doesn't only affect the smoker and other humans in the area. The smoke also enters your computer equipment and forms a gummy coating on the surface of the components. This coating prevents normal operating heat from escaping and reduces the system's useful life. It literally gums up the works and can actually eat away the surface of a disk drive read/write head and also scratch disk media passing under the head. Smoke, dirt, dust and other particles that settle on the disk media can damage both the disk media and the disk drive. The data you lose when your disk media fails is usually the most important data you had stored. If you can't avoid smoking near your computer system, then keep the disks stored in boxes and clean your drives often (inside and outside).

Have you ever noticed 5.25 inch floppy disks laying out all around the

computer without their protective storage sleeves? How many times have you noticed computer operators eat crackers, cookies, or other crumb-producing food near disk media? Foreign particles that get inside disk jackets (or cassette housings) can be swept into the drive read/write heads during disk use. These particles can clog the heads causing them to chip, erode or gouge tracks in the disk media surface. To a disk drive read/write head, a tiny hair particle is like a huge log laying across a narrow road. Just touching a disk surface with your finger places oils from your skin on the disk. These oils cause corrosion of the media. If you accidentally touch a disk, immediately copy the data to a new formatted disk and discard the fingered media.

Keyboards are also affected by dirt, particles and residues. Once I noticed a secretary clean and trim her nails over a keyboard. A week later the keyboard began to operate erratically. Disassembling the keyboard and cleaning out the nail clippings and dirt that had fallen beneath the keys restored normal operation. Loss of productive time: one hour, two people. Periodic keyboard cleaning with a brush attached to the end of a vacuum cleaner hose can prevent intermittent operation. Dust covers are also a good investment in preventive maintenance.

Cheap Disks

The shelf life for many floppy disks is about five years. Yet, once placed in use, the operating life of these same disks drops to only 47 days. The way we handle and use our disks can directly affect how long they last. However, sometimes the disks start out with a life expectancy handicap. Contrary to what you may think, all disks are not created equal. Less expensive disk media may have a thinner oxide layer and less glue to bind the magnetic oxide particles on the disk surface. This softer oxide layer rubs off easily, clogging the read/write heads in the drives and producing disk read/write errors. The high-capacity disk media is much less affected by this phenomenon, but data is too important to treat lightly and cheaply. To avoid potential problems, use only name-brand disks.

Liquid Fry

Placing a can, cup or glass of liquid several feet from an energized computer causes little concern, but my heart really begins to pound when I see someone set a container of liquid on the top of a display monitor, external disk drive or on the computer system unit itself. Accidentally spilling liquid into a keyboard, disk drive, or (worse yet) monitor can be devastating. Not only could you place yourself in danger from electrocution (if the spill is into the display unit), but you can short out the printed circuit boards

causing the need for potentially expensive repair.

Asphyxiation

Inexperienced computer users often stack manuals and disk storage boxes next to their computer, covering the ventilation slots that allow hot air to escape from inside. Some heating of electronic components is normal, and these devices are designed to operate in warm environments with minimum wear. However, when the heat is increased beyond a given level, internal deterioration occurs reducing the life of the part.

Computers are designed with cooling fans and chassis vent holes to manage internal temperatures. When you block the ventilation ports on a PC, you cause the inside temperatures to soar. This can cause intermittent memory chip operation. If the ICs get too warm, some chips become heat sensitive. If the temperature gets too hot, disk data transfers can become garbled. It's important to keep all cooling ports open and clear.

Interference Wipeout

Two types of electronic noise interference are important to computer users. Electromagnetic interference (EMI) occurs between one Hertz and 10 Kilohertz. Radio frequency interference (RFI) occurs at frequencies above 10 Kilohertz. Both EMI and RFI can cause static noise in the signals passing around the circuitry of your PC and over cabling. These noise problems come from many sources — large nearby motors, fans, fluorescent lights, switching power supplies, electric discharge, and any digital circuit with clock signals above 10 kHz (all the PCs). The case of your PC is designed to minimize EMI and RFI from entering or escaping, but openings in the case are potential transmission ports for interference. This noise appears as static on nearby TVs or is heard coming from a radio speaker. Noise interference can also appear as garbled characters on your PC screen and in printed output, as wrong data stored on disk media, and as paper jams in the printer. Leaving cover plates off equipment or using unshielded cables can cause RFI and EMI. If your printer cable plug can be clipped or screwed to its socket, do it! Don't just plug the cable in like a temporary fix. You could be introducing your own noise problem.

Electrostatic Discharge

People and objects can accumulate an electrical charge that can cause a mild shock during discharge. An electrical charge always seeks to become neutralized by passing the charge to ground. This electrostatic discharge (ESD) is a particularly severe form of EMI. Just walking over a carpet on a dry day can build up to 25,000 volts of charge on your body.

Then, when you touch a metal object (door knob, lamp, etc.) a discharge occurs that shocks you. The human body passes ESD easily — electronic equipment is different. If you first come in contact with your computer instead of the metal object, the discharge path will be through electronic circuitry. This discharge path can be very damaging to electronic components. ESD is invisible and 500 to 15,000 volts of charge on our body is common. We often can't see or feel the discharge, but each time we zap an IC, its ability to perform properly gets degraded. Finally, the component begins functioning at its operating threshold, and intermittent random glitches occur producing system crashes and flaky response.

Low humidity increases the risk of ESD problems. When the humidity drops below 50 percent, be cautious. Clean your computer and the area around your PC using antistatic cleaner. Spray your screen and keyboard with antistatic spray. And always touch a metal object BEFORE touching your PC.

Improper Installation

Many people remove their new computer and display unit from their shipping boxes, connect them up and turn on power only to discover they failed to properly check the configuration jumpers and switches. If the video board settings are incorrect, a long audible beep followed by three short beep signal becomes a discouraging reminder that installation was improper and board failure has likely occurred.

Others move their computer system and reconnect everything only to discover that their printer no-longer responds to requests from the PC. Most peripheral devices have interface cables with plugs that are keyed to prevent connection to the wrong socket. But not all. Improper installation is a hazard we all take whenever we change our existing system configuration. Be careful! Go slow, and check the settings twice.

No or Improper Maintenance

The "don't fix it until it breaks" cliché is not appropriate in today's world of high performance microcomputers and megabyte floppy disk drives. If you don't establish and follow a preventive maintenance (PM) program to keep your system clean, adjusted, and orderly, you will surely follow a program of expensive repair. You can defer this repair for years by following common sense and a good PM plan. In a future article, I'll describe a recommended PM schedule for your Heath/Zenith PC system.

11 Ways to Extend The Life of Your Disk Media

1. Buy only name brand disks.
2. Never touch the disk surface.
3. Properly insert and remove disks from a drive.
4. Keep unused disks stored in their protective sleeves.
5. Store disks vertically (horizontal stor-

age can cause them to bind inside their dust jacket).

6. Store disks in a cool, clean, dry place.
7. Never write on a disk jacket with a ballpoint pen or pencil. Write on a disk label before attaching the label to the disk jacket.
8. Never set a disk in direct sunlight or in a hot environment such as a closed

car.

9. Never allow smoking near your disk drives and disk media.
10. Never set disks near color displays or printers where their electromagnetic fields could alter the disk data.
11. Never fold or bend a disk.



Continued from Page 8

cartridge. This latter device allows you to use the FX-80 printer driver that most software support and it converts all those features to the Deskjet Plus.

The Deskjet Plus is less wasteful of paper because it uses cut sheet paper like the laser printers. You don't waste a sheet advancing the fan-fold paper to tear off your printout like most dot-matrix printers do. Printing is whisper quiet, HP rates it at 60 decibels. The only drawback to an otherwise great little printer is that the ink on the printout remains water soluble for life. You just have to be careful when handling it not to have damp fingers or spill anything on it. For business use, we get around the problem by photocopying the printout to distribute memos or copy onto letterhead to mail outside the company. This may not be possible for home use.

Computer Speed Tests

Version 4.5 of the Norton Advanced Utilities includes a computer test program that checks your system and tells you all about it including brand of computer, type of CPU, coprocessor presence, DOS version, recognized drives, active ports, memory allocations, Computing speed Index (CI), Disk speed Index (SI) and a mix of the two indexes they call Performance Index (PI). The TurbosPort checked out with an SI of 13.7, a DI of 5.0 and a PI of 10.8. This means the CPU runs 13.7 times that of the original PC/XT and the hard disk drive speed is 5 times as fast, which is very fast. The following compares these results to other computers we have in our department:

Computer Model	CI	DI	PI
TurbosPort 386 (12 MHz, 40 Meg HD)	13.7	5.0	10.8
SupersPort 286 (12 MHz, 20 Meg HD)	13.4	3.5	10.7
Z-241 (6 MHz, 20 Meg HD)	6.9	1.9	5.2
Z-286/12 (12 MHz, 30 Meg HD)	13.1	6.7	10.9
IBM AT with Intel 386 Inboard (16 MHz)	17.6	3.1	12.7
Z-386 (16 MHz, 80 Meg HD, Z-525 Cache)	17.9	3.7	12.9
Compaq 386/20 (20 MHz, 110 Meg HD)	24.2	5.5	17.9
Dell 386/25 (25 MHz, 60 Meg HD)	29.8	4.0	21.2
Z-386/33 (33 MHz, 110 Meg ESDI HD)	40.4*	---	---

* Per June 1989 Personal Computing magazine

Zenith chose to slow down the 80386 clock in the TurbosPort to 12 MHz to prolong battery life. This dropped its computing speed index from 17 to 13 according to the table. Zenith says the zero

wait state and slushware operation give an equivalent operation to 16 MHz computers with one wait state, however. My experience with this unit says that most of the use will be on AC power and they should at least offer three speed options, 6, 12 or 16 MHz. This would allow faster desktop operation, the ability to slow it down for battery use or really slow it down to allow old types of software to work.

External Floppy Options

Your floppy drive needs may differ, however. If so, you could use the Expansion Chassis and CompatiCard with a third party single or dual drive cabinet/power supply, such as are available from QuickData. You could have a 1.2 Meg 5-1/4" and another 3.5" 1.44 Meg drive connected to the TurbosPort 386 if you can afford it. You could get a bit ridiculous and run a second two-drive ribbon cable from the connector on the Compaticard out the cutout in the rear of the Expansion Chassis and into a second two-drive cabinet. The point is, the CompatiCard and its software driver support up to four floppy drives. Combined with the internal floppy, this provides the incredible capability for five floppy drives on the TurbosPort 386.

Summary

I really like the TurbosPort 386 system. The Page White LCD screen has very readable black characters on a white background. The hard drive is fast and very quiet. I think running a fast 40 Meg hard drive on batteries for 4 hours is mind boggling and rumor has it that Zenith will

have a 100+ Meg laptop drive later this year. Choosing a 386 machine means we won't become obsolete any time soon. We can run Windows/386, Desqview 386 or step up to OS/2 for multi-tasking of

software right now. We'll be able to use any future 386 only software that comes along.

I would like to see future TurbosPort 386 models have a VGA color monitor plug-in capability, a faster CPU clock, a more easily removable battery pack, and an external floppy drive connector. I would also like to be able to power it from a vehicle cigarette lighter as you can the SupersPort 286. The high current draw of the TurbosPort apparently prevents this for now.



Back to the Books

Let's face it, sooner or later you're gonna have to try and read those computer USER manuals! But, before you do, read "POWERING UP". This book was written especially for you in a non-technical, easy-to-understand style. Who knows, with "POWERING UP", you may NEVER have to read your user's manuals again! Order HUG P/N 885-4604 today!

Installation of Hard Disk Drive(s) in a Z-386

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Background

I can remember way back when I purchased my H-100 and I thought that two 5-1/4" 360K floppy disk drives were a lot of storage. In fact, the capacity of the above floppies was actually 320K using version 1 of Z-DOS. The capacity was increased with version 2 of the DOS operating system. Then I added two 8" 1.2MB floppy drives. That seemed to be enough and still is. A couple of years later, I purchased a Z-160 with two 360K floppy drives. For years, I used those two machines for development purposes and Beta Testing a number of products for Zenith Data Systems, Borland International, MicroPro, etc. But it was time to move on to bigger and better things.

In the Spring of 1988, I splurged and bought a Z-386 (16 MHZ) that had a 40MB hard disk drive. Now that was a big jump — going from no hard drive on either of my other Heath/Zenith machines to 40MB. However, I had the opportunity to trade in the 40MB drive for a Control Data Wren II 80MB (72MB formatted) for a small difference. So I did that, but it was up to me to remove the 40MB drive and replace it with the Wren II.

Installation of First 80MB Hard Drive

This was not my first experience installing (or in this case, it was replacing) a hard disk drive. I first installed the same Wren II hard drive in a Z-200. This was soon after the Z-200's became available. The problem I had then was that Zenith's version of MS-DOS did not have this particular hard drive in its list of supported hard drives. Fortunately, I was Beta Testing a new version of MS-DOS for Zenith Data Systems at the time (I can't remember the version — but I believe it was MS-DOS V3.21 — sorry), and that had an enhanced setup capability for hard drives, allowing one to specify various parameters, such as landing or shipping zone, start write precompensation cylinder, whether the drive required Servo Track Information or not, etc. This new version of

MS-DOS allowed me to install and configure the Wren II to work with a Z-200.

With my Z-386, I received MS-DOS V3.21 and the Wren II hard disk drive is now included in the list of supported drives (Drive Type 39 — see page 2-23 of the Z-386 "High Performance Workstation Owner's Manual"). This makes the configuring of the Wren II from the software side very easy. Replacing the hardware (physical hard drive itself) was the real task.

Using the instructions and illustrations in the Owner's Manual as a guide, I proceeded to remove the 40MB drive. First, the cables had to be disconnected: the power cable, the command cable (34-conductor ribbon cable), and the data cable (22-conductor ribbon cable).

Next, I removed the existing hard drive. Then I removed the Wren II from its packing and installed it in the mounting bracket, as shown in the Owner's Manual. Then, reconnected the above cables, left the Terminator Pack in since this is the last disk (and only one) on the string, and made no changes to the jumper settings.

Before putting my computer's cover back on, I turned the computer back on, and booted from my MS-DOS V3.21 system floppy. I then went into diagnostic mode via ALT-CTRL-INS. Entered "SETUP" to display my hardware options. Here is where I selected Device Type 39. See page 2-23 of the Owner's Manual.

Since the Wren II was not formatted for a Zenith machine at the factory, MS-DOS was not able to recognize the hard drive. A "low-level" format was required first. This involved running the PREP program as described on pages 4.11 - 4.17 of the Zenith Data Systems' MS-DOS V3.21 Users' Guide and Reference Manual. Incidentally, the parameters that I mentioned above for the Z-200, are covered in this section.

The low-level formatting took about two hours or so. Once PREP was done, I had to run the PART program as described on pages 4.5 through 4.10 of the Users'

Guide and Reference Manual. PART's main task was to partition my 80MB (72MB formatted) into smaller units. Before the release of Zenith Data Systems' MS-DOS V3.3+, MS-DOS had a hard drive limitation of 32MB. So I created 3 partitions; two at 32MB and the third at around 8MB.

The next step involved the "high-level" formatting operation using the MS-DOS FORMAT program. FORMAT needed to be called for each of the three partitions (C, D, and E). The FORMAT call for the first partition (the "C" partition) was run with the "/S" option so that the MS-DOS system programs (IBMIO.COM, IBM-DOS.COM, and COMMAND.COM) were copied to the formatted hard drive partition to make it a "bootable" device. Once this step was done, I could now boot my Z-386 from my newly installed Wren II hard disk.

Before going on, I would like to point out something that looks strange in my last paragraph. If one looked at the hidden files of a PC-DOS system disk, one would see the "IBM" files as shown above. However, one would expect to see these same files by other names for an MS-DOS system. In earlier Zenith MS-DOS versions, these files were indeed known by other names; IO.SYS and MS-DOS.SYS. Why the change at this point in time, I cannot answer that.

Also in earlier MS-DOS releases, Zenith Data Systems took pride and painstaking effort to provide their customers with excellent documentation. Their manuals were far superior to the competition. However, the quality of their manuals in the last couple of releases has slipped considerably in my opinion. Gone are the many, many examples that were included with each MS-DOS command. Yes, there are some today, but not like it was in the past.

Back to my 80MB Wren II hard drive. Now I was in my glory. A full 72MB of formatted disk capacity. I figured it would be a long time before I would need more

space. But as I started to Beta Test newer software application products (which constantly required more and more hard disk capacity) and started to do more development work, I slowly started to fill up my hard drive. Let me give you some examples.

dBASE IV alone takes over 4MB. Then there is Microsoft C, Quick C, Quick Basic, Fortran, MASM, etc. Borland's Turbo C, Pascal, Assembler, and Debugger. Continuing, there is Wordstar V4 and V5, Wordstar 2000 Plus, Word Perfect, Quattro, Lotus 1-2-3, Windows-386, dBASE III+, Sprint, a 20MB hazardous chemicals data base, "tons" of developed code, etc. Before long, 72MB was just not enough anymore. It was time to increase my hard disk capacity.

Installation of Second 80MB Hard Drive

Since the power supply and disk controller that are in the Z-386 will support up to two hard drives, it was just a matter of getting another disk and simply install it as before; so I thought. I did run into a problem that was caused by reading and following the instructions just as they were printed in Chapter 5 ("Adding More") of the Zenith Data Systems' Z-386 Owner's Manual.

About one year to the date of my purchase of the Z-386, I had the opportunity to purchase another Wren II disk at a substantial discount because of an over supply of them. Along with the Wren II, for a small fee, I was able to purchase a special version of Ontrack Computer Systems, Inc.'s Disk Installation and Maintenance Software. The software was a part of an installation kit which also included the data cable that I talked about before. Although I did not actually use their formatting software because Zenith's PREP works just fine, I did find the installation instructions to be useful after I ran into problems (more about that shortly).

Like everyone that has a hard disk, my first disk was full of letters, memos, notes, source code for development projects, etc. In other words, a lot of files that I didn't want to lose. At the suggestion of the technician at the local Heath/Zenith store, I removed my first hard disk with all my important files (they were also backed up as well). I didn't want to lose everything if something went wrong with the installation and formatting of the second hard disk drive.

After removing the first hard drive, I proceeded to install the second drive in the first drive's mounting bracket just as I did before. Connected it as before, but only to find that the disk wasn't working. It was DOA. So I sent it back for a replacement which took about 3 weeks. In the meantime, I had to put the first disk drive back and continue as before.

When I received the replacement, I removed the first hard drive and installed

the new one. Connected it as if it were the first drive, ran the PREP program to perform "low-level" formatting, ran the PART program to partition it into 3 parts, then finally ran the MS-DOS FORMAT program for each of the three partitions. I did not run FORMAT on the first partition with the "/S" as I did with my first installation. I did not want any boot partition on the second hard drive.

After I was satisfied that the new hard drive was working, I removed it. I put it aside while I put the first hard drive back in. Before proceeding with the second drive, I checked to be sure the first one was still working which it was, and all my files were still there which they were. The next step was to follow the instructions on pages 5-18 through 5-22, as well as the illustration on page 5-23 in the Zenith's Z-386 Owner's Manual.

First, I removed the Terminator Pack on the second drive since it would be the first drive on the command cable (34-conductor). Both hard drives share the same command cable in a "daisy-chained" arrangement. Next, the illustration on page 5-18 shows that the Drive Select Jumper is set to the second position (1). The first drive was set to the first position (0).

Put the second hard drive in its mounting bracket. Then proceeded to connect up all three cables as was done before. Before putting the cover back on, I powered up the Z-386 and booted from the first hard drive. Then I went into diagnostic mode via the ALT-CTRL-INS key press. I started SETUP and went on to select the correct Drive Type (39 as before) for the second hard drive. Saved those changes and re-booted.

I tried to use the ASGNPART command to assign the first partition of the second hard drive to logical drive F since I already used C, D, and E for the first hard drive. MS-DOS would not recognize the second hard drive. I called my friendly Heath/Zenith technician and he told me that the instructions for installing a second hard drive in a Z-386 are not entirely correct. He pointed out two things. One, the command cable had a pair of wires twisted. Yes, my cable did indeed have a pair twisted. He then said that the Drive Select Jumper should be in the second position on **both** drives. The twisted cable takes care of which drive is being selected by the system. Remember, the original hard drive had the Drive Select Jumper in the first position (0), and on the second drive I installed, I set the Drive Select Jumper to the second position (1) as per the instructions in the Z-386 Owner's Manual.

Before going through a lot of work, disconnecting the cables to both hard drives and taking them completely out of the Z-386 chassis, I decided to read the documentation that came with the On-Track installation kit. There was a section

on the installation of two hard drives showing with illustrations what the twisted cable looks like, what the Drive Selection Jumpers should be set to on both drives, what connector of the command cable goes to what hard drive, and which one has the Terminator Pack removed. Much better instructions than those in the Z-386 Owner's Manual.

After I went through that documentation and saw that it was exactly what the Heath/Zenith technician told me to do, I went to work disconnecting the cables to both hard drives, and removed them both. I really only needed to change the Device Selection Jumper on the first drive to the second position. But Zenith didn't allow much room for disconnecting (and connecting) cables and removing (installing) hard drives. It was easier to remove the second drive and get it out of the way so I could work on the first drive.

After making the Drive Selection Jumper change and putting the drives back in, and connecting all the cables back, I booted up my system. Then I executed the ASGNPART command assigning the first partition of the second drive to logical drive F. The command executed and I was able to read and write on the first partition. Success!!! However, the surprises were not over yet.

I tried to execute the ASGNPART command for the second and third partitions of the second drive to logical drives G and H but they failed. No obvious reason that I could find. To make a long story short, it turns out that MS-DOS only allows one to access up to four partitions at one time. Even though one can make many partitions using the PART program, only four can be accessed at one time. I could access the other two partitions by rebooting and assigning them in turn to logical drive F, etc.

Alternately, I could install MS-DOS V3.3+ and make larger partitions so I would only have 2 to 4 partitions total. That would allow me to access the entire 72MB of both drives. Running with MS-DOS V3.21 as I am, the maximum disk space that I can access is 128MB spread over 4 partitions of 32MB each (2 on each drive). So I have a number of options including leaving a partition or two hidden for possible OS/2 someday or maybe even a UNIX-based operating system.

- After all my hard work, I am pleased with my results and my Z-386 is just a super machine. I just received my Z-549 VGA video adapter from Zenith and will be installing that shortly. My Z-386 came with a 5-1/4" 360K floppy and a 3-1/2" 1.44MB floppy. Several months ago, I installed a CompatiCard Floppy Disk controller card and added an external 5-1/4" 1.2MB floppy drive. Now I have one of each. What more can I ask for?

I do have one question that no one

Continued on Page 80

Continued from Page 11

times does not always work as you might expect in some DOS versions (notably MS-DOS 3.3 Plus and PC-DOS 4.0), I suggest entering CTRL-P or CTRL-PRTSC as the only entry on a DOS command line and following it with a RETURN. For some reason, these latest DOS versions are quite finicky about when they will accept a printer echo command, depending on when it is typed and what keystrokes have preceded it. Then execute whatever commands you want to echo to the printer, such as DIR. After you finish printing, then turn off the echo with CTRL-N.

The trick of using the printer echo feature to make a DIR listing of the files on a floppy disk has been used by many of us for years. It makes finding files a lot faster because I can think of few things more boring than inserting disks in a drive to see what files are on it. Keeping a printed list of the files on a disk was quite convenient in the "old" days because the printout could be folded and kept in the disk envelope. I still do that to some extent with the plastic "envelopes" that come with the 3.50" disks, but it is not quite as convenient.

Aside from the problem that sometimes occurs with the printer echo feature in the latest DOS versions, there is a much better way to print a list of files on a disk. Most people agree it is much easier to find a specific file in a list if it is sorted in alphabetical order, and you can't do that with the printer echo command. Instead, you need to use command piping and I/O redirection to print an alphabetically sorted directory list.

All you have to do is use a command line like:

```
DIR | SORT > PRN
```

When you use command piping with the SORT command, the file names in the list will be listed in alphabetical order, and I/O redirection sends the usual screen display to the printer (PRN) instead of the CRT. If the directory entries are not sorted, the DIR command will simply list the file names in whatever order they are found in the disk directory. I find it quite useful to use this command on just about any disk to generate a printed listing with file names that are easy to find.

Other General Commands

There are two other general commands that work on nearly all PC compatibles. The first, CTRL-ALT-DEL, is of course used to reboot the computer. Because the computer is already powered on, this command is sometimes called a WARM BOOT, which reloads the operating system, but does not perform the Power On Self Test (POST). You may sometimes see the term COLD BOOT, which usually refers to the automatic booting (sometimes called AUTOBOOT) of the operating system when the com-

puter is powered on. A cold boot includes the POST, as well as the autoboot of the operating system. Figure 4 summarizes the general hardware commands.

Key Sequence	Function
CTRL-ALT-DEL	Reboot computer
ALT-BREAK	Empty type-ahead buffer

Figure 4
General Hardware Commands

ALT-BREAK is one of those little-known, but occasionally needed commands that can help fix a problem. Have you ever typed a series of commands and heard your computer complain about it by beeping? This can happen if you type several commands quickly, especially if you are a touch typist. To understand why your computer is complaining, you need to understand how the system uses something called a type-ahead buffer.

The type-ahead buffer is just a special kind of memory that stores keystrokes as they are entered and before they are processed (e.g., displayed). A simple experiment illustrates how the type-ahead buffer works. First, run the CHKDSK command (press RETURN to execute), and then execute the DIR command (press RETURN) while CHKDSK is running. Note that the DIR command will begin execution immediately after CHKDSK, even though you entered the DIR command while CHKDSK was running. You can fill up the type-ahead buffer by entering the CHKDSK command, and while it is running, repeatedly press F3 (to copy the command) and RETURN (to execute the command). After quickly pressing F3/RETURN several times in succession, you will find that your computer begins to beep, indicating that the type-ahead buffer is filled because you have exhausted its 15-character capacity. You can "clear" or empty the type-ahead buffer by using the ALT-BREAK command.

Two points about the type-head buffer. It is *not* the same as the DOS command line buffer (*Powering Up*, page 38) or the template (page 40). And some memory-resident programs, like Borland's SuperKey, effectively increase the size of the type-ahead buffer, so you may find that the above experiment will not appear to work if you use one of these programs. Both of the commands shown in Figure 4 are available on nearly all PC compatible computers.

At this point, we have looked at all of the general commands that are available on just about any DOS-based computer. Although some older DOS versions may have additional commands, the ones listed here work fine with the current DOS versions. Now let's take a look at the Zenith-specific commands.

Zenith-Specific Hardware Commands

Commands in this part of the article are specific to Heath and Zenith computers and will not work as described on any other brand of computer. In addition, most if not all of these commands will also not work with the Zenith eaZy PC or the portable Zenith Z-171. I was not able to locate a discontinued eaZy PC for testing, but I do know for sure that some of these commands (e.g., CTRL-ALT-INS) do not work on that system.

How to use CTRL-ALT-INS to activate the Zenith ROM Monitor was described in detail in "Using the Zenith ROM Monitor" for *Powering Up — Volume 2* originally published in the October 1989 *REMark*. It is mentioned here because it is unique to Zenith and Heath computers, and you should refer to the previous article for additional details on using this command. Figure 5 is a summary of the Zenith-specific hardware commands.

Key Sequence	Function
CTRL-ALT-INS	Activate Zenith ROM Monitor
CTRL-ALT-RETURN	Activate Zenith ROM Monitor and save registers
ALT-ESC	Keyclick off/on — See also ALT ~
ALT-~	Keyclick off/on — Requires Zenith keyboard
CTRL-ALT-n	Switch to video page n
CTRL-ALT-F	Fill interlace mode
CTRL-ALT-I	Interlace mode with 50 lines
CTRL-ALT-N	No interlace mode (return to normal mode)

Figure 5
Zenith-Specific Hardware Commands

The CTRL-ALT-RETURN key sequence is similar to CTRL-ALT-INS in that it activates the Zenith ROM Monitor, but it also saves the contents of the registers which CTRL-ALT-INS does not. CTRL-ALT-RETURN is designed to be used by programmers to interrupt a program for debugging purposes and is not intended to be run by non-technical users. Despite its intended design and usage, there is one situation where you may see something puzzling and need to know how to "recover" from it. Here's what can happen.

At some point, you may be running a program when, all of a sudden, you see a display that looks something like Figure 6.

```
AX=10C8 BX=5000 CX=000A DX=033D SI=0036
DI=01A9 BP=04C6 SP=04C6
CS=1048 DS=0040 SS=10C8 ES=10C8 IP=0166
FL= NC PE NA ZR PL DI UP NV
1048:0166 8BEC MOV BP,SP
```

Figure 6
ROM Register Display

Figure 6 is basically a register display that can be viewed by using the Register® subcommand available in the Zenith

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ROM Monitor and DEBUG. Sometimes, programs that did some non-standard things would activate the Zenith ROM Monitor, and a display similar to Figure 6 would be the result. In earlier Zenith MS-DOS version 3 releases, Zenith included the NODEBUG command that would effectively turn off the ROM debugging features so that an application program could not activate the debugger. I suspect that at least one user has lost data without knowing the way to recover from this display is simply to type G (the Go command) and press RETURN. Depending on the application (e.g., a word processor), the register display may still remain on the screen, but you can usually get rid of it by pressing one of the page keys on the keypad. The NODEBUG program is not included with MS-DOS 3.3 Plus because some changes have been made so that the debugger cannot be inadvertently activated by an application program. There is a new twist to this problem however.

Microsoft continues to use non-standard key sequences in the Word program, and Word version 5.0 is no exception. In this context, I am using the term "non-standard" to mean that a defined key sequence does not have a unique keyboard scan code. For example, Word has used the ALT-SPACEBAR command for years, but CTRL-ALT-RETURN is used in Word 5.0 to activate a column break (like a page break). Interestingly enough, I found that Word's CTRL-ALT-RETURN does indeed perform a column break as documented, and it does not activate the ROM debugger on my Z-386/16 (ROM version 2.6E) running MS-DOS 3.3 Plus. It is obvious that Zenith has already recognized this problem with Word 5.0 and has taken steps to avoid it.

The CTRL-ALT-RETURN command is one of those things that you may want to experiment with, just in case you ever see the register display. There is no need to lose data if you know how to get back to where you were, and the G subcommand does just that. For programmers, the capability to activate the ROM debugger is a powerful tool because there is no need to spend extra money for a special hardware debugging board — the hardware feature is already built into Zenith and Heath computers. This single feature alone can save several hundred dollars for developers by generally eliminating the requirement for an extra board, although there are some cases where an additional board may still be necessary.

In an attempt to satisfy a number of different requirements, Zenith also included an interesting feature that allows a user to deactivate the "keyclick" sound from a keyboard. Aside from the fact this only works on Zenith and Heath computers, you *must* also have a Zenith or Heath

keyboard for this feature to work — it will not work with any other brand of keyboard. How you control this feature also depends on exactly what ROM version you have in your computer.

For computers with ROMs that are at least two years old, you will probably find that the ALT-ESC command will turn the keyclick on and off. In other words, ALT-ESC is a *toggle* (like a light switch). When your computer is powered on, the default is "keyclick on". You can turn the keyclick off by entering ALT-ESC one time. If you enter ALT-ESC again, the keyclick is toggled back on. Depending on the age of your computer's ROM however, you may find that the ALT-ESC command has no effect.

Newer ROMs, and all Z-386 ROMs, have a different command that controls the keyclick — ALT ~ (tilde). Why did Zenith change the keyclick command? The answer is that another manufacturer decided to use the ALT-ESC command for another function, and even though Zenith has used ALT-ESC for years for keyclick control, there was a command "conflict". To be specific, ALT-ESC is used in the OS/2 operating system to switch between running programs (CTRL-ESC is used to switch to the "program selector"). And that was the conflict. If you were running OS/2 and wanted to switch between programs with ALT-ESC, you also turned off the keyclick at the same time. But there is also a hidden story as to why something like ALT-ESC was necessary for OS/2 in the first place.

The OS/2 operating system was, of course, under development for a LONG time, and there was a known requirement to have a keyboard command for task switching. Because of that, AT-class keyboards included a key which was usually labeled with something like SYS REQ. Unfortunately, IBM had released an AT-class computer with a really odd keyboard that did not have the SYS REQ key or anything like it. This system was called the IBM XT-286. Many people thought that this ill-advised and incredibly unpopular computer was an attempt to use up the remaining XT "boxes" and power supplies because it was released after the IBM AT system. In fact, many people have never heard of this computer because it was so unpopular that it was officially marketed only for a few months. Because the OS/2 operating system can be run on an XT-286 and because that keyboard did not have a SYS REQ key, system developers had to define a keyboard command that would work for that system. And that command happened to be ALT-ESC. That's why you will find that older Zenith ROMs for AT-class computers use ALT-ESC for keyclick control, while newer ROMs use the ALT ~ command.

Zenith Video Commands

The last four commands listed in Figure 5 are related to video control features that are only supported on systems that retain the *original* Zenith video features. That is, you must have a Zenith-brand video card, such as the Z-309, Z-409, Z-329, Z-429 or Z-449 video card; or you must be using the original video display system supplied with some computer models, such as the Z-138, Z-148 or Z-150 series. All bets are off if the original video display system has been modified using a non-Zenith hardware modification, such as various video card eliminators, and this is one of the few cases where I suggest that you *NOT* experiment if you don't understand this discussion. Also, I haven't tried any of these commands on anything other than a "pure" Heath or Zenith system, and I am not sure what might happen. There is a remote possibility that at least one of these commands could damage something in a non-Zenith display system, depending on exactly how a modification was implemented.

Before we get into these commands, it's also important to note that using one of these commands must also make sense in your current display system. For example, it's kind of stupid to attempt to activate a CGA interlace mode if you have an EGA display system. Don't try it.

Unlike the other commands, the first — CTRL-ALT-*n* — (where *n* is a number) is not likely to damage any display system and is perhaps the most interesting of all. CTRL-ALT-*n* allows you to switch to video page *n-1*. For the usual 80 column text (not graphics) modes, four video pages are supported, and *n* can be in the range 1-4 for pages 0-3. For 40 column text modes, eight video pages are supported, and *n* can be in the 1-8 range for pages 0-7. In both cases, the display default is set to the text (not graphics) mode with video page zero (0) when the computer is booted (i.e., CTRL-ALT-1). The CTRL-ALT-*n* command is interesting because it can be used to have more than one display "available" in an almost simultaneous switch, thus giving an impression of being able to perform more than one task at a time. Of course, this is NOT — by any stretch of the imagination — multitasking because you cannot run a batch file in one video page and do something else on another video page (e.g., word processing), even though it may LOOK like it can. Because software can also use commands to switch video pages and modes, all video pages will be cleared (erased) if a program executes a command to set a mode.

CTRL-ALT-F activates an interlace mode that can appear to improve resolution on a CGA (640 × 200) display by "seeming" to fill in the scan lines (called interlacing) on the display. What actually happens is that the scan lines are slightly

offset from their previous position each time the screen is "refreshed" (normally 60 times per second). If you are not using a CRT that has a long-persistence phosphor (e.g., Zenith ZVM-136), the display will appear to flicker because the refresh rate is not fast enough (effectively 30 times per second for interlacing) to cause the lines to appear stable. I have tried this with a C. Itoh CGA color monitor (short-persistence phosphor), and the flickering effect is unpleasant to say the least. This command is not intended to be used on a system that already has a high-resolution display system (i.e., card and CRT), such as EGA.

CTRL-ALT-I activates a 50-line (text lines) interlace mode and only works in an 80-column text mode. Virtually all standard video features, except for video pages, are supported, but you will need to correctly configure an application program (e.g., WordStar) if you intend to use this feature.

The CTRL-ALT-N command returns the video system to normal (i.e., No interlace) after using either interlace mode activated with CTRL-ALT-F or CTRL-ALT-I.

In summary, the video commands are interesting, and you will probably find the CTRL-ALT-*n* command is the most useful. Commands that activate an interlace mode are only appropriate for a CGA system and are essentially meaningless on

a display system that already has high-resolution capabilities.

Powering Down

This article was written to document various keyboard commands that can be used with Zenith MS-DOS version 3.3 Plus and most Heath and Zenith computers. Commands listed in Figures 1, 2, 3, and 4 should work on virtually all PC compatibles and DOS versions. Some earlier DOS versions, such as 2.1, may have additional commands that are not listed here because they have been "discontinued" and are not available in the latest DOS versions from any manufacturer. The Zenith-specific hardware commands listed in Figure 5 will work only with Zenith and Heath computers with the exception of the eaZy PC and the Z-171 portable.

With the exception of the video commands that are not appropriate for today's high resolution systems, I encourage you to experiment with these commands to learn what they can do to help you manage and use your system. It is one thing to read an article explaining what the commands do, but you can really use these commands only if you become familiar with them through some experimenting.

The next article discusses "How Disks and DOS Work Together" and it explains the relationship between the ROM,

the four parts of DOS, and how a disk is organized. You will also see why a file deleted with the DEL command is not really "erased" from a disk, which will help explain how various programs can actually "undelete" a file. This article also includes some interesting facts I have discovered about disks and DOS which I believe you will find helpful, especially when something goes wrong.

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.

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Continued from Page 76

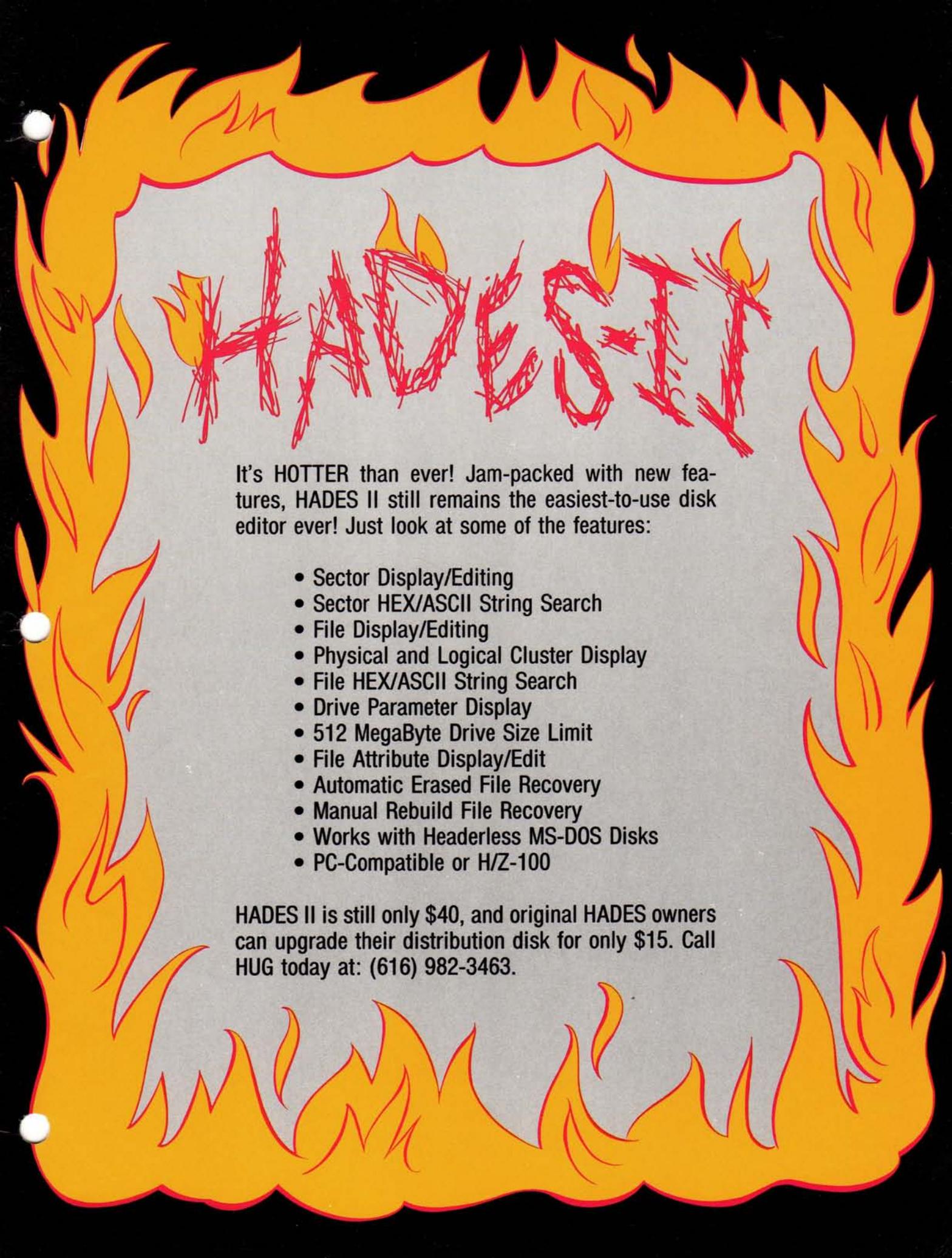
can seem to answer for me. Hopefully one of you can help me. It concerns Zenith's SHIP program that positions the read/write head of the hard drive to a "safe" cylinder so the computer can be moved safely. Does SHIP only work with the main hard drive? Does it sense that there are two hard drives and park both heads? Is there a way to specify a hard drive when calling SHIP? If the answer to all the questions above is NO, then does anyone know of a utility that will allow me to park both heads before I move my Z-386? Appreciate any information that will help me. Thanks.

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