REMark®

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P/N 885-2096 Issue 96

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Computers, Music And MIDI
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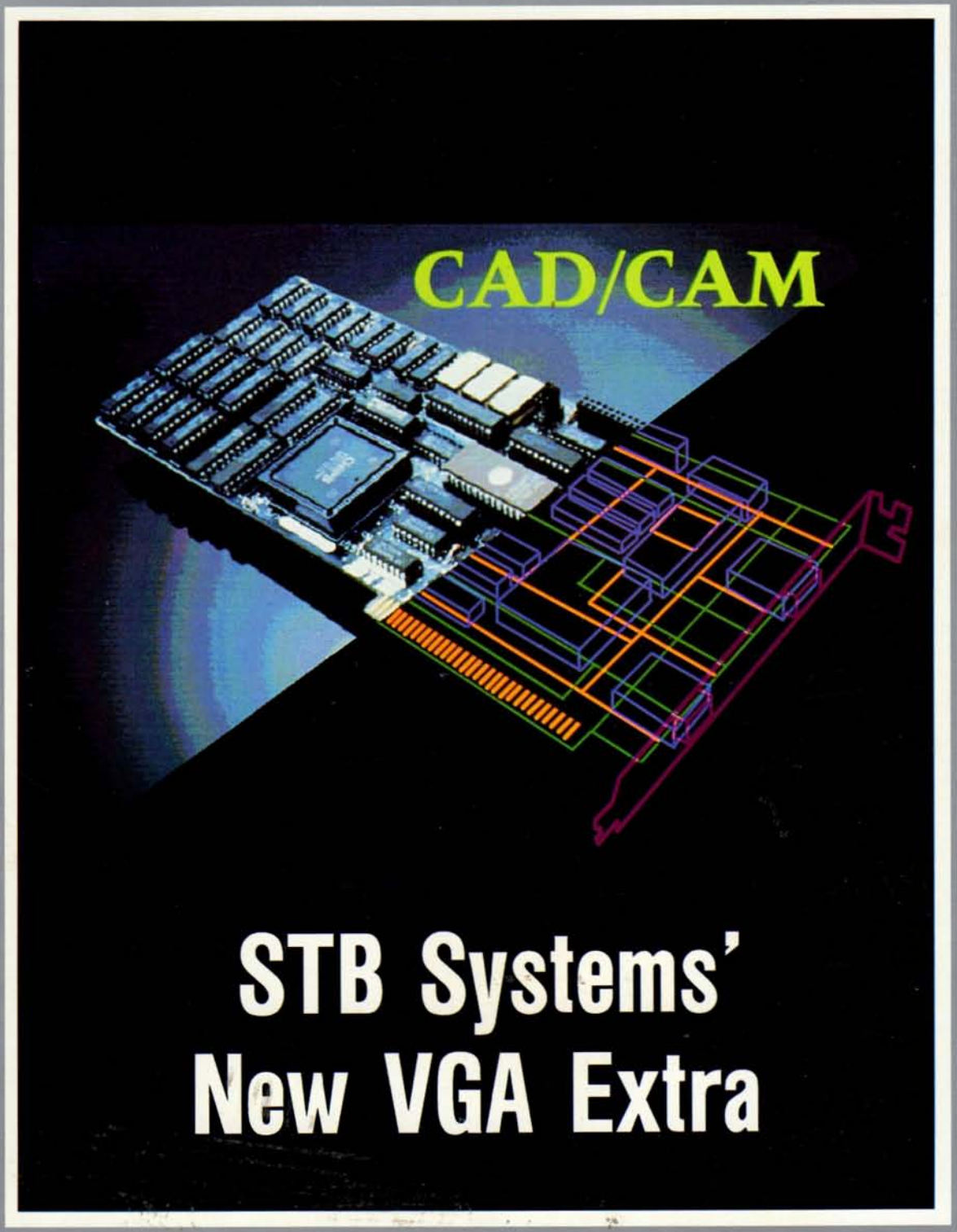

STB Systems' New VGA Extra

A Publication of Heath/Zenith

"Why Haven't You Called?"

"I've stayed up 24 hours a day waiting to hear from you. I know that for most of you, this may be your first time, but I promise, I'm very gentle! If you're still unsure, let me tell you what I have to offer. First, there's my message base. Here's where my users exchange ideas, receive assistance, and sell things. Next, is my database. Most of my users will tell you, it's second to none! With over 30 megabytes of hand-picked software it caters to all Heath/Zenith computers, but mostly PC compatibles. Finally, I have something new for you, my 'Bargain Centre'. Here you can buy surplus software and hardware, at unheard of prices. Interested? I hope so! Set your modem to either 300, 1200, or 2400 baud, and call me right now at (616) 982-3956, and register today. If you're still a bit shy, you can still call my human at (616) 982-3837 and register with him. Although he talks at 150 baud, he's gentle, too!"

RAM TECHNOLOGY

All RAM Technology products include Hardware, Installation Instructions, and One Year Warranty. No soldering is required.

Z-100 1.2 MB External Floppy System: Utilize your Z-100's built-in 8" controller for high capacity storage and back-up. System includes drive(s), cables, external power supply and cabinet.

DRSZ112-1: One 5¼" 1.2 MB High Density Floppy Disk Drive system ..... $ 249.00

DRSZ112-2: Two 5¼" 1.2 MB High Density Floppy Disk Drive system ..... $ 439.00

Z-MAX 100: 768K Memory Upgrade for new motherboard Z-100's; #181-4918 or greater; simple plug-in installation ..... $ 59.95

Z-MAX 148: 704K Memory Upgrade for the H/Z 148 computer ..... $ 19.95

Z-MAX 150: 640/704K Memory Upgrade for H/Z 150/160 series computer. Installs on your existing memory board. ..... $ 24.95

Z-MEG 150: 1.2 MB. Memory Upgrade for H/Z 150/160 series computer. Up to 704K of addressable memory and 512K RAM DISK can be installed on your existing memory board. Please specify 640K EGA compatible or 704K Version when ordering. RAM-DSK software included ..... $ 49.95

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Z-181 External 5¼" Disk Drive: 360K DS/DD 48 TPI Disk Drive mounted in half height enclosure. Interface Cable included.

DRSZ181-1: For the ZFL-181-92 ..... $ 249.00

DRSZ181-2: For the ZFL-181-93 and ZWL-183-92 ..... $ 249.00

3½" Disk Drive Upgrade: For PC's and Compatibles including all Z-100PC and Z-200 PC series computers. Maintain compatibility with the new PS/2 and Portable software formats and increase storage capacity to 720K per diskette utilizing your existing floppy disk controller. Includes mounting hardware for 5¼" enclosures. Requires MS-DOS 3.2 or greater $169.00

PC COMPATIBLE UPGRADE ACCESSORIES

Just because you don't see it doesn't mean we don't carry it. Call Toll Free for pricing and availability on the accessory of your dreams!

LIM/EMS 2 MB. Memory Card: Fully populated. One year warranty. ..... $ 395.00

PTZ148X: Premier Technology's 1½ slot daughter board for Z148. Includes clock/cal. software ..... $ 149.00

SMARTWATCH: No Slot Clock/Calendar, 10-year lithium battery. Easy plug-in installation. Includes installation instructions, and software with source code. One year warranty. ..... $ 39.95

MICROSPEED FAST 88: Speed upgrade for PC's and Compatibles. Guaranteed to work in your H/Z 150/160 or PC, PC/XT series computer or your money back! Increases CPU speed up to 7.6 MHz. Speed is switch-able via software or external speed switch module. Includes Installation Manual, software, and hard ware. One Year Warranty.

OFAST88-1: No Processor included ..... $ 125.00

FAST88-2: With Optional 8088-2 8 MHz. Processor ..... $ 130.00

FAST88-3: With Optional NEC V20 8 MHz. Processor ..... $ 135.00

HARD DISK DRIVES & CONTROLLERS

All Hard Disk Drives come with Installation Instructions and a **ONE YEAR REPLACEMENT WARRANTY.** System Orders (hard disk & controller) come with Cables and Hardware. All controllers capable of handling two drives unless otherwise specified.

PC COMPATIBLE HARD DISK SYSTEMS

ST-225PC: 20 MB. Hard Disk with Controller* ..... $ 329.00

ST-238RC: 30 MB. Hard Disk with RLL Controller* ..... $ 379.00

ST-251PC: 40 MB. Hard Disk with Controller* ..... $ 529.00

ST-251RC: 44 MB. Hard Disk with RLL Controller* ..... $ 545.00

ST-277RC: 65 MB. Hard Disk with RLL Controller* ..... $ 610.00

* Your Choice of Seagate, OMTI, or Western Digital Controller.

AT COMPATIBLE HARD DISK SYSTEMS

ST-225AT: 20 MB., 65 ms., Half Height ..... $ 299.00

ST-251AT: 40 MB., 40 m., Half Height ..... $ 458.00

ST-251RT: 44 MB. Hard Disk with AT RLL Floppy/HD Controller ..... $ 699.00

ST-277RT: 65 MB. Hard Disk with AT RLL Floppy/HD Controller ..... $ 769.00

ST-4038: 30 MB., 40 ms., Full Height ..... $ 605.00

ST-4053: 45 MB., 28 ms., Full Height ..... $ 715.00

ST-4096: 80 MB., 28 ms., Full Height ..... $ 995.00

MS-3650: 30 MB., 28 ms., Half Height ..... $ 480.00

MS-6085: 80MB., 28 ms., Full Height ..... $ 990.00

RAM TECHNOLOGY HARD CARDS

OLHC-20: 20 MB. Hard Card featuring AUTO-START and AUTO-PARK heads, 65 ms. ..... $ 399.00

OLHC-30: 30 MB. Hard Card featuring AUTO-START and AUTO-PARK heads, 65 ms. ..... $ 450.00

Z-100 UPGRADE ACCESSORIES

RAM Technology carries a complete selection of upgrades and accessories for your Z-100 computer. Call Toll Free for pricing and availability.

C.D.R. ZS-100: Speed Upgrade for 4.7 MHz. Z-100's. Easily installed, no soldering required ..... $ 44.95

FBE RESEARCH ZMF-100A: 768K Memory Upgrade for Z-100's with old motherboards #181-4917 or lower; no soldering required ..... $ 59.95

UCI EASYRAM: Memory Expansion Board for Z-100 S-100 Buss. Expands memory up to 2 MB. using 256K DRAM. For systems with 192-768K main memory.

UCI-ER-0: 0 Kb. RAM ..... $ 335.00

UCI-ER-S: RAMDRIVE Software ..... $ 45.00

UCI EASY 87: Math Co-Processor Board for Z-100 ..... $ 85.00

Z-MAX 100: 768K Memory Upgrade for new motherboard Z-100s; #181-4918or greater; simple plug-in installation ..... $ 59.95

SMARTWATCH: No Slot Clock/Calendar with spacers, 10-year lithium battery. Easy plug-in installation. Includes Installation instructions, and software with source code. One Year Warranty ..... $ 42.00

20MB. Internal Hard Disk w/CDR Controller ..... $ 750.00
w/UCI EASYWIN Controller ..... $ 625.00

40 MB. Internal Hard Disk Drive w/ CDR Controller ..... $ 925.00
w/UCI EASYWIN Controller ..... $ 825.00

65 MB. Internal Hard Disk Drive w/CDR Controller $1075.00
w/UCI EASYWIN Controller ..... $ 975.00

DYNAMIC RAM MEMORY

Includes Installation Instructions. One Year Warranty. Prices current 11/87 and subject to change; call Toll Free for current prices.

Quantity Pricing Available On Request.

4164-150 : 64K 150 ns. DRAM ..... $ 2.25

41256-150: 256K 150 ns. DRAM ..... $ 4.20

41256-150: 256K 120 ns. DRAM ..... $ 4.60

41256-100: 256K 100 ns. DRAM ..... $ 5.25

PROCESSORS

Intel processors include Installation Instructions, and a Five Year Warranty. Prices current 11/87 and subject to change; Call Toll Free for current pricing.

Quantity Prices Available On Request.

8088-2 : 8 MHz. Processor ..... $ 8.95

8087-3 : 5MHz. Math Co-Processor ..... $ 119.00

8087-2 : 8 MHz. Math Co-Processor ..... $ 169.00

8087-1 : 10 MHz. Math Co-Processor ..... $ 225.00

80287-6ot 6 MHz. Math Co-Processor ..... $ 195.00

80287-8 : 8 MHz. Math Co-Processor ..... $ 269.00

80287-10: 10 MHz. Math Co-Processor ..... $ 325.00

80387-16: 116 MHz. Math Co-Processor ..... $ 595.00

NEC V20: 8 MHz. 8088 replacement microprocessor. Increases CPU efficiency 10-30%. Includes Installation Instructions. One Year Warranty ..... $ 14.95

TERMS

Prices and specifications subject to change without notice. Personal checks held 10 working days; money orders accepted as cash. Please add 2% (minimum $2.50) for shipping. COD orders accepted; cash or cashier's check only. VISA/MC accepted. Purchase orders accepted from qualified businesses, government agencies, and educational institutions.

RAM TECHNOLOGY

427-3 AMHERST STREET, SUITE 265
NASHUA, NEW HAMPSHIRE 03063

1 800 662-0070 • 603 889-0633

MasterCard VISA

HOURS OF OPERATION: Monday-Friday, 9:00 A.M. -5:00 P.M. EST

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Renewal	$19.95	$32.95*

* U.S. Funds

Limited back issues are available at $2.50, plus 10% shipping and handling — minimum $1.00 charge. Check HUG Product List for availability of bound volumes of past issues. Requests for magazines mailed to foreign countries should specify mailing method and appropriate added cost.

Send Payment to: Heath/Zenith Users' Group
P.O. Box 217
Benton Harbor, MI 49022
(616) 982-3838

Official magazine for users of HEATH ZENITH computer equipment.

Volume 9, Issue 1 • January 1988

Index of Advertisers

This index is provided as an additional service. The publisher does not assume any liability for errors or omissions.

On The Cover: *A composite picture of STB Systems' new VGA Extra Card featuring reliability through state-of-the-art design. See Joe Katz' Review of this fabulous new piece of hardware on Page 61.*

SPEED MODS - **Assembled and Tested** - $34.95
- H/Z 150/160 Software Select 6.67 or 4.77 MHz Hardware Reset included. Satisfaction Guaranteed
- H/Z 89 Software Select 2 or 4 MHz. No Trace Cuts Z80A, CP/M and HDOS Software included.

H/Z 89 20 Meg Hard Disk **only $495!**
Boots from Hard Disk. Supports CDR and Magnolia. All Software and Hardware except Hard Disk $175

H/Z 150/160 Hardware: Smart Watch $ 39
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VERSION UPDATE

HOME FINANCE SYSTEM VERSION 3

—**HFS-III** keeps track of multiple checking accounts, asset accounts, (cash, savings, IRAs, CDs) and regular bill payments. Prints checks, including payee address, on **any** business-sized check.
—Define up to 100 expense codes. Separate tax flag.
—Fast. Written in 100% assembly language.
—Pop-up menus and help windows at a keystroke.
—Frequently used transactions stored for easy use.
—Accepts HFS-II data.

Hardware: HZ-100, all Heath/Zenith PCs or any other PC/XT/AT compatible computer (256K), 2 disk drives. Any printer.
Software: MS-DOS 2 or higher.
Price: $99.00 (includes shipping).
MasterCard/Visa accepted, please include phone number.

Available in December

Jay Gold Software
Box 2024, Des Moines, IA 50310
(515) 279-9821

UP YOUR RAM

AND OTHER H/Z DISCOUNT ENHANCEMENTS

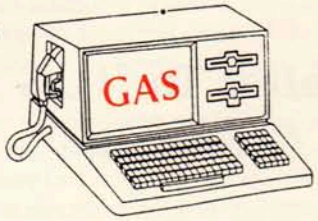
256K D-RAMS, 150ns: 9/$31, or package priced as shown 120ns for Z240 - 9/$34, 100ns for Z248 - 9/$40
Z-100 Motherboard kit to maximize memory to 768K, Z-MAX only $49, with 27 256K RAM's for $139.
ZMF100a by FBE, old Z-100 NO WIRE kit, $59, $149 w/27
Z-100 RAMBOARD by UCI, new version for 192K or 768K, 8mhz, RAMDISK software, .5MB/$399, 2MB/$579.
Z205 Upgrade Kit to use 256K's creating 1MB RAMDISK, wiring required, $44, $134 w/27 RAM, $164 w/36 RAM
Z-150/160 640/704K Upgrade using PAL chip for $19, with 18-256K DRAMS, $79
1.2MB using PAL & 5 banks 256K with RAMDISK software as reviewed by REMark 8/86, $194, $134 w/3 banks 256K's, $44 w/no RAM, specify system memory of 640 or 704K.
Z-148 PAL to utilize 704K instead of 640K, $19, $79 w/18
Z-200 Memory Board, 1.5MB/2 serial/parallel/game, bare $159, w/120ns $359, w/100ns $399, 3MB option

EASY PC - UCI's three board set for complete IBM hardware/software compatability, $459.
ZVM135 cable with intensity control for 16 IBM colors, $22
Utility disk with drivers, communications, diagnostics, $39
I/O board with single IBM COM port, $89, with 2 COM ports, game port & clock, $119
NEW UCI PRODUCTS - check on availability of the following: EasyMATE 8" & cross partition drivers, LANlink network software & hardware, Expansion chasis for PC, Z148, Z100, improved RAMSAVER, etc.
MATH CO-PROCESSOR SUPPORT, UCI daughter board for use with Easy PC or plain Z-100 motherboard. $75
8087-2 math chip, 8mhz, $155. UCI board & chip, $225.
80287-3, Math chip for Z-200, 6mhz, $169, 8mhz, $239

HARD DISK UPGRADES for Z-100 - CDR's 317 SCSI interface card, $329, with SCSI 20MB drive, $699 40MB, $899
UCI's EasyWIN interface card $239, with WD/20MB $549, WD-RLL/30MB $599, WD-RLL/60MB/40ms $849
HIGH DENSITY CONTROLLER RLL card for PC clones, $109 packaged with 30MB hard disk for $349, with 60MB, 40ms access, half high by Seagate for $599

OTHER PRODUCTS:
V-20 by NEC for faster 8088 execution, 8mhz version, $12.
Z-100 speed-up kit, 7.5mhz by CDR, $39
8mhz by UCI, 2 daughter boards, switch, many upgrade chips, specify old or new motherboard, $135
CLOCKS - SMARTWATCH ROM socket plug-in for Z-100 & PC's, $35, add $2 for Z-100 spacers.
1.2MB 5-1/4" floppy drive, $129, cable for Z-100, $29
2400 baud US Robotics PC internal modem, $199
2400 baud Anchor Lightning ext. modem, "HAYES", $229
1200 baud no frills internal or external Weltec modem, $79
DOTS PERFECT-ROM Upgrade for Epson MX,FX,JX, $59
GAME PORT CARD for PC Clones $25,
Z150 Video Board removal kit-call

We specialize in the unusual, state of the art upgrades. Our prices reflect the current market as of 12/1/87, but they are subject to change up or down, especially the RAM prices. Quantity Discounts available. P.O.'s accepted from government, schools, and large corporations. Shipping and handling charges are $5 for small chip kits, $10 for large board sets, etc. add extra $5 for P.O.'s, COD's, & A.P.O.'s.



GRAYMATTER APPLICATION SOFTWARE
1601 TOWNSHIP LINE ROAD
NORRISTOWN, PA 19401-1146
(215) 279-4460
BOB GRAY

WE VISIT MOST MAJOR HUG CONFERENCES

Welcome To The Heath/Zenith Users' Group

Yes, you are holding a copy of REMark! I'll bet you had to look twice to make sure. We made two very obvious changes. First, the cover; we've gone away from the heavy cardboard-like stock to a 100# stock, UV coated on both the back and the front. This newer stock will allow for full color advertisements on the back and inside of both covers. The next change we've made is to the pages themselves. Although the paper weight did not change, the weave is somewhat tighter, making each page just a bit thinner. We've also gone to what I'd call a semi-gloss finish on this paper. I hope you like what you see, and we here at HUG would like to wish you a happy and prosperous New Year!

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

For The New Member

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

For The "Oldtimer"

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

General Heath/Zenith Users' Group Information

Membership Eligibility

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

As a member, you will receive:

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

***Note:** Requires CompuServe membership available from the Heath/Zenith Users' Group.

These benefits are described in the following paragraphs.

HUG Membership Rates

The following rate schedule applies as of January 1988 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

The intial membership package includes the HUG Software Catalog, Software Catalog Update, a Heath Parts Order Form, and a copy of the January issue of REMark.

New For 1988 . . .

You may now order new memberships or renew your membership using the toll free line normally used to order products from Heath Company. Call 1-800-253-0570 Monday through Friday, 8 A.M. to 5 P.M. Eastern Time. In Alaska and Michigan, call (616) 982-3411 or (616) 982-3463.

Identification Card

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

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

HUG Discount Rules And Regulations

1. You must be a member of the Heath/Zenith Users' Group to participate in the discount program.

2. Your ID card can only be used at your local Heath/Zenith Computers & Electronics Centers or through mail order purchases placed with Heath Company. **Telephone orders will not be accepted.**

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

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

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

6. You cannot make a purchase at the discounted rates without your HUG ID card. You must present your ID when placing your order for any item.

7. Your HUG ID cannot be used to purchase individual parts or HUG software products under the discount program from the Heath/Zenith Computers & Electronics Centers or from Heath Company. **HUG products are considered parts.**

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

9. The ID card can be used for a 20% discount on Zenith Data Systems (assembled) computer related items only.

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

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

12. Heath or Zenith Data Systems software is considered a finished or assembled item and, therefore, can be purchased at the 20% discount. Since HUG software is considered a part, it is not included in either program.

13. Multiple discounts do not apply. You can use either "special prices" or your HUG discount, whichever is greater. The HUG ID may not be used with any promotional certificates offered by Heath Company or the Heath/Zenith Computers & Electronics Centers.

14. **Heathkit Mail Order Catalog purchases must be accompanied by your HUG ID card and a SELF-ADDRESSED, STAMPED ENVELOPE for return of your ID once the order has been processed.**

15. If you lose your ID card, you can only receive a replacement by purchasing a new membership to HUG at the current renewal rate.

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

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

Publications

REMark, the official magazine for users of Heath/Zenith computer products, is sent to each member 12 times a year. Individual back issues may be obtained during the current year. However, at the end of the year, all twelve issues become a shrink-wrapped volume which may be purchased as a separate item. There are currently seven REMark volumes available. The second volume is no longer 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.

New Major Article Program!

Announced in last May's issue of REMark, we are now offering **bigger incentives** for authors who wish to contribute major articles to REMark.

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

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

For those of you just joining us, HUG BUCKs are certificates good toward the

purchase of **any** product in the Heath mail order catalog. HUG BUCKs can be collected to completely or partially purchase the product of your choice. Specifics regarding the use of the HUG BUCK accompany the award itself.

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

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

How To Submit Articles To REMark

What Subject?

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

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

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

The following is only a sample list of possible subjects:

Software:

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

Hardware:

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

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

How Big?

To qualify for the *"Major Article Program,"* your manuscript must be 2,000 words or more. Articles in excess of 5,000 words generally need to be broken into installments for separate publication.

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

How About Photos?

If a photograph will help explain, include it. Clear, sharply focused, black and white photos reproduce best, but color photos can be used. Include a caption with each photo to help with the explanation. Any photographs become the property of REMark and cannot be returned.

What About Drawings?

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

Is Hardcopy Necessary?

Yes! We request that any submittal include a printout of all files. Also, we would like to know what you feel your article should look like in print. In some cases, we do not have the processor the author used to duplicate text provided on disk.

Is A Disk Copy Needed?

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

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

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

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

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

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

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

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

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

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

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

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

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

Rewards For Program Contributions

Public Domain Software Library

You will receive any HUG software package free once your program has been added to the public domain library. Your package will be made available through the HUG Bulletin Board System (616) 982-3956.

HUG Software Library

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

Royalty Software Library

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

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

Notes On Software Submittals

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

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

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

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

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

After we have made basic operational tests, we begin looking for undocumented "bugs" in the program itself. If a program defect is detected, the review process is ended. Any program fault that we find could be a reason for rejection of your program. Be sure to document operational peculiarities both for the reviewer and the end user. An example of one common program fault would be the lack of testing for both upper and lower case keys (e.g., "Y" or "y" for YES). There is nothing wrong with a program that only responds to upper case, as long as the user is informed that the CAPS LOCK key should be down when operating the software. A good test for your program is to have another user in your area, who is unfamiliar with your product, attempt to operate it.

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

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

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

Ordering Information

When ordering HUG Software Products, include with your payment the following information:

1. The part number (p/n), quantity, and description of the product to be ordered.

2. Your name, address and HUG ID number.

3. 10% postage and handling, up to a maximum of $5.00, minimum of $1.00.

4. VISA and MasterCard also accepted, minimum $10.00 order.

Send the order to:

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

For VISA and MasterCard phone orders, telephone the Heath/Zenith Users' Group at (616) 982-3838. Have the part number (p/n), description, and quantity ready for quick processing.

Note: HUG currently offers formats for CP/M, HDOS, ZDOS, MSDOS and CP/M-86 5-1/4 inch disks:

SS, SD, hard-sectored
SS, SD, soft-sectored
ZDOS DS
MSDOS DS
CP/M-86 DS

To order soft-sectored, add a "-37" to the part number (p/n) of the product (e.g., 885-1207-37). Your order is processed by part number (p/n), not by description, so please be sure to include the "-37" when ordering soft-sectored.

For additional information concerning any of the HUG software products, contact the Heath/Zenith Users' Group at (616) 982-3463.

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

Change of Address

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

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

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

HUG Bulletin Board Via MicroNET

MicroNET is a time-share system of CompuServe Inc., which most anyone, located near a major city, can access through a telephone link. The National HUG Bulletin Board or SIG (Special Interest Group) on MicroNET provides a way of sharing ideas, questions, and information with over 3,000 other members by simply dialing a number and leaving a message.

MicroNET membership applications are available through the HUG Library or through any Heath/Zenith Computers & Electronics Centers. The package includes free modem software, as well as the necessary information about CompuServe and one hour of free time on the system (see HUG Price List for further details). This membership is separate from the HUG membership application. For further information about CompuServe, contact the Heath/Zenith Users' Group, or CompuServe Inc., 5000 Arlington Centre Boulevard, Columbus, OH 43220, (614) 457-8600.

HUGPBBS System — National HUG Bulletin Board System

The Heath/Zenith Users' Group has opened a public domain bulletin board system for those programs submitted to the Public Domain Library (See Program Submittals). You may obtain public domain packages by signing up for access to the bulletin board system available at (616) 982-3956. You may become a member of the system simply by supplying the following information:

Your Name
Your HUG ID Number
Your Choice Of Password
(Up to sixteen characters)

Leave the above information as a private message to the SYSOP on the system or drop us a postcard requesting access to the HUGPBBS. Over 30 megabytes of programs are available under HDOS, CP/M, ZDOS and MSDOS in convenient catalog areas.

Also available on HUGPBBS is the Heath Users' Group Bargain Centre. Here, registered users can find all types of items for sale at un-heard-of prices! Discontinued products, new products, customer returns, parts, and one-of-a-kind items are a few of the different things you'll find in the HUG Bargain Centre.

Special Interest And Local HUG Groups

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

Heath/Zenith Related Publications

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

Three excellent independent publications are listed here:

BUSS Newsletter
Charles Floto, Editor
716 E Street SE
Washington, DC 20003
(202) 544-0900
20 Issues/year
U.S. $28.00
Others $40.00

H-Scoop
Henry Fale, Editor
2618 Penn Circle
Sheboygan, WI 53081
(414) 452-4172
$24.00/year ($32.00 overseas)

Sextant
Charles Floto, Editor
716 E Street SE
Washington, DC 20003
(202) 544-0900
6 Issues/year
U.S. $14.97
Can. & Mex. $17.25
Other $21.00

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Heath/Zenith Users' Group

PROGRAM SUBMITTAL and AGREEMENT FORM

Programmer: _____

Address: _____ City-State _____ Zip _____

Company (if any): _____

Telephone: _____

Program Name: _____

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

Suggested Outline:

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

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

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

Prepared on/for computer model: _____

Special hardware/software configurations, if any: _____

_____

Program requires: _____ **bytes of memory**

Language: _____ **Version:** _____

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

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

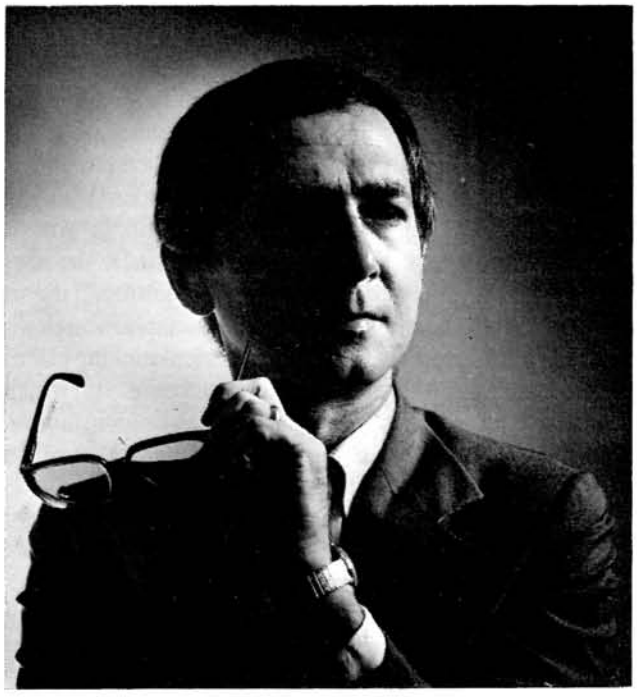
I understand and agree that HUG may distribute it at nominal cost to HUG members.

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

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

Date: _____ **Signed:** _____

P/N 885-6



Mainstream Computing

by Joseph Katz

What you see here is a glimpse of what you can get from Aldus's PageMaker, desktop publishing software that's a dream come true for preparing page oriented publications on your Heath or Zenith computer. I did this column on my Z-248.

Our friend Meredith Fisher just reminded me of a mildly amusing story that took place about eleven years ago. She's now the Art Director for Chernoff/Silver and Associates, an advertising and marketing agency, but in 1976 she was working for me part time, setting type on a dedicated minicomputer that did nothing except set type. It was dumb. Meredith, however, wasn't.

One afternoon I left the office and said, "I'm going window shopping for computer at The Byte Shop."

"What?" she said, looking up from the keyboard.

"It's a microcomputer, Meredith, a junior version of the thing you're using right now. They're a new invention and they don't do much right now but some day they'll do amazing things. Some day they'll be able to do everything our expensive typesetting machine does and more—and faster and cheaper and in much less space. Some day an author in one city will be able to write a book on one of those little computers, store the text on a cassette or floppy disk, and send it to a publisher in another city. Some day an artist in yet another city will be able to illustrate that book on one of those little computers, store the graphics on another cassette or disk, and send it to the publisher. Some day the publisher will be able to pull the text and graphics together on one of those little computers, merge them into finished pages for the complete books, and send those pages off as camera ready copy to the printer. And on that day, Meredith, I will bore people with tales of how it used to be in 'the old days'—by which I will mean today—when it cost staggering amounts of money for even the simplest typesetting equipment. And so I am going off right now to look at computers at The Byte Shop."

"No," she said, patiently, "that's not what I asked. What I wanted to know is, 'What's a "byte?"'," and back she went to work. I wandered off wondering who had been taken.

"Some day" is here now. Now we can do all the things I dreamed of in 1976. And a big part of the credit goes to Aldus Corporation, whose PageMaker software has realized the possibilities for putting books and other printed matter together on microcomputers.

When Aldus introduced PageMaker for Apple's Macintosh in July, 1985, it was such a' radically different kind of software from anything else available then that there was no way to classify it. PageMaker burst on the scene as an exciting new use for microcomputers, an addition to the standard trinity of word processor, database manager, and spreadsheet. So Paul Brainerd, Aldus's president, coined the term "desktop publishing" for this fourth major kind of application. Although Brainerd's term caught on and obviously will stick, desktop publishing software like PageMaker isn't used in the *publication* (literally its "release to the public") of printed matter. The kind of program it defines is used instead in its *production* (literally its "manufacture") especially in those early stages that involve typesetting, illustration, and page makeup.

Take the name literally: PageMaker makes pages. Those pages serve as "camera ready" copy, as perfect pages that will be photographed to make the plates used by the printer, and most decent camera ready copy has a long history. PageMaker fits into that history at the point at which a graphic designer like my wife Janet or our

Please address all correspondence to me at 103 South Edisto Avenue, Columbia SC 29205. I'll try to answer letters accompanied by a self-addressed stamped envelope, but my volume of mail is too heavy for me to promise. Unless it specifically says otherwise, I'll assume the right to publish your letter (edited, if I think that appropriate).

friend Meredith "lays out" how the finished piece should fit together. It's work like an architect's when planning a building. For "page oriented" designs such as advertisements, brochures, and magazines, which are based on units of either a single page or a "spread" of two facing pages, the artist rules the "master" layout, page by page, with a nonreproducible pencil onto sheets of art board. Those rules define all the architectural elements—such things as margins and columns—of the finished page or spread. On that master (or on copies of it if the job is standard enough to make copies worth making), bits of type are fitted together with bits of photographs. The artist works like a jigsaw puzzle addict on some scrambled abstract artwork that has only its perimeter as a guide to the final product. Perhaps the major difference is that the artist use adhesive to fix the pieces onto the layout. The artist's ideal is to fit those atoms of text and graphics into a unified piece of printed matter that looks right, reads right, accomplishes its purposes, and is so professionally executed that it seems to have been created without effort.

Of course the illusion of effortlessness actually takes a great deal of effort. It also takes time, knowledge, experience, and talent. What PageMaker does is reduce the labor and cut down on the expense of making mistakes. It's a graphic designer's dream. One needs little more equipment than PageMaker, a suite of collateral software, a microcomputer, and a laser printer to be in business. PageMaker therefore sells a great many Macintosh computers and LaserWriter printers—so many, in fact, that PageMaker is credited with the very existence of Apple's Desktop Publishing System.

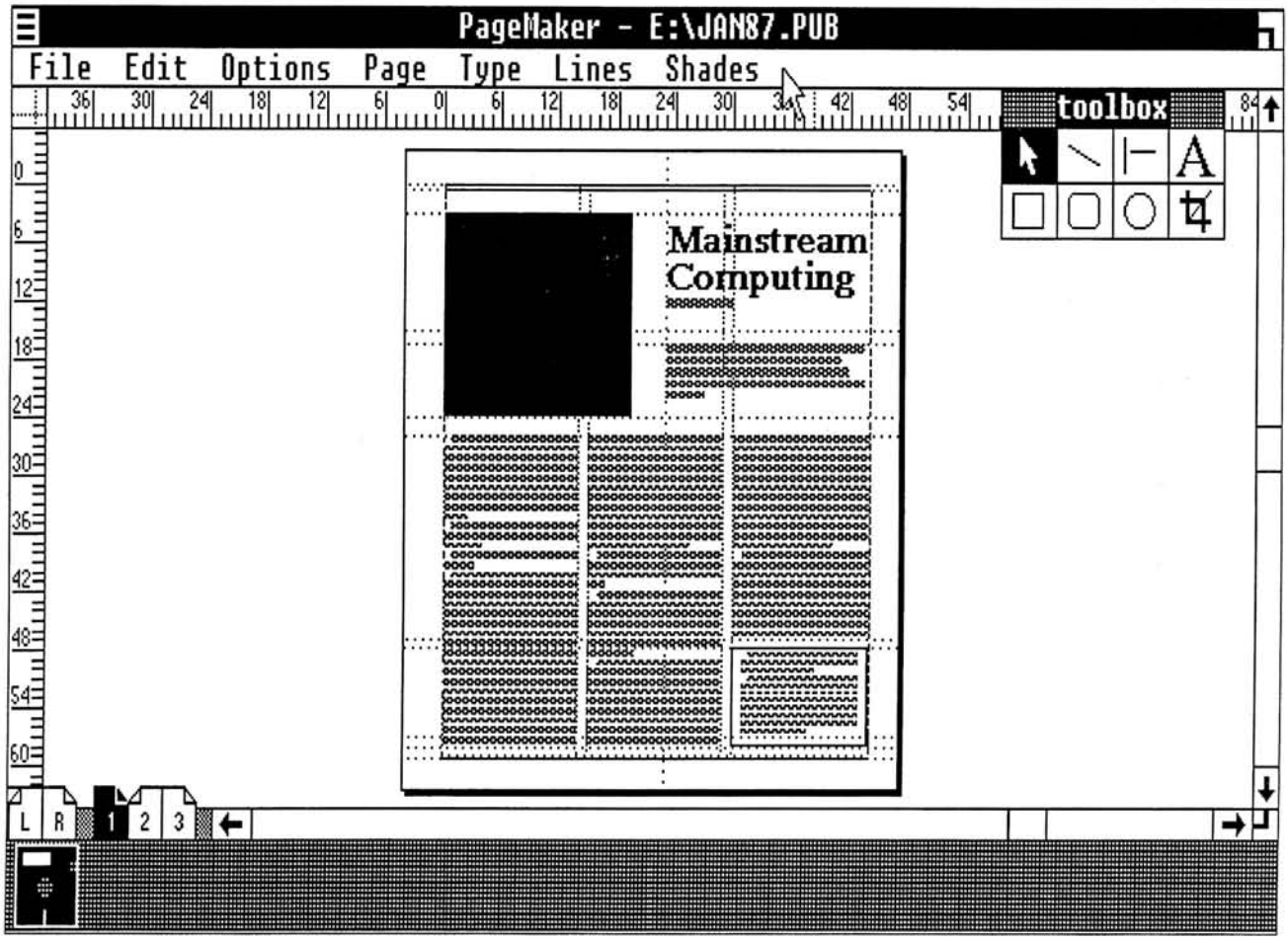
PageMaker for MSDOS computers was introduced in February, 1987, and is selling a great many of those machines and laser printers too. Partly because PageMaker runs under Microsoft Windows, which shares ancestry with the Macintosh environment, "PageMaker/PC" has the look and feel of "PageMaker/Mac." That means you can move from one version to the other and back again with very little sense of disorientation. Even better than that, Version 1.0A of PageMaker/PC and Version 2.0 of PageMaker/Mac can exchange publications files. That means you have the possibility for an ideal situation in which you can take advantage of what each kind of machine does better. You're therefore really not locked in to either the PC world or the Macintosh world. There are restrictions on such transfers (for example you can't transfer object-oriented files produced with draw programs such as MacDraw or Micrografx In*A*Vision) and you'll have to pay careful attention to details (making sure you transfer all the files needed to recreate the publication). But you can do it. Best of all, PageMaker takes excellent advantage of its own environment, Microsoft Windows. Because you usually can "Cut" (which means "delete") or "Copy" text or graphics from another Windows application and "Paste" it into PageMaker while the two are in memory together, each program you add to Windows becomes an adjunct of PageMaker too. That means you can draw from an increasing number of Windows applications to tailor your own array of publishing tools. You can, for example, pop an elaborate pie chart from Micrografx Windows Graph into In*A*Vision for even more elaboration, then snatch the result into PageMaker to illustrate an annual report. You therefore can do wondrous things with PageMaker right now and will be able to do even more wondrous things with it in the future. Almost every application program you add to Windows is also a potential PageMaker resource.

Anyone with even a little experience in graphic design will take to PageMaker right away. It is completely intuitive. All you must know is that its central metaphor is the top of a graphic designer's layout desk. Think about that metaphor long and hard enough to follow the implications, and you might not need even need Aldus's excellent (but far too many) manuals or the excellent tutorial you get with the package. You should work through them, though, because one of PageMaker's real strengths is its excellent use of function keys and control keys that shortcut the pulldown menus once you know what you're doing in the program. In fact PageMaker is superb in its treatment of such details, the ones that allow an experienced user to pick up speed from apparently little touches like the use of the right button on a two- or three-button mouse to quickly change views on the page. You therefore really ought to go through the tutorial and spend time playing with the program—which is easy to do because PageMaker is so inviting.

But always keep in mind the central metaphor. At the top and left-hand side of the metaphorical desktop is a metaphorical drafting machine that can be swung down for accurate ruling and trimming, or swung up out of the way. Centered on the desk is a metaphorical sheet of art board trimmed to the size of the publication's printed page, the printing area outlined with a nonreproducible frame. Visible around the art board is the rest of the metaphorical desktop, for use as metaphorical sticking places (Aldus calls it the "Pasteboard") on which scraps of type and text can be hung temporarily as you turn from one sheet of art board to the next.

You even can get as messy as you might in a real graphic design studio. But since even the mess is metaphorical in PageMaker, you don't incur the penalties that you might in the real world. PageMaker keeps track of what you're doing. It housekeeps for you, and lets you change your mind as often as you'd like with no loss of anything except maybe a little time. There's even an intelligent "Undo" capability to let you revoke the very last change you made. You therefore can lovingly massage each page into perfection, or just experiment, take risks, and learn the craft.

The central metaphor continues. Directly above the desktop are seven pulldown menus. They provide access to metaphorical services, including the "delivery" of type and graphics from sources outside PageMaker itself. PageMaker can import files from most major word processing and graphics programs, and from a variety of optical scanners. Set temporarily (you can move it) at the upper-right-hand corner of the desktop is a representation of that plastic toolholder into which graphic designers toss such essentials as presstype, line tape, X-Acto knives, and proportional scales. You can draw lines, boxes, frames, and borders, and crop or scale graphics imported from other programs. Beneath the lower-left-hand corner of the desktop are page selectors, for each individual page and for master left- and right-hand pages ("versos" and "rectos") containing the basic layout. Just as in real life, but with infinitely more ease, you can follow that layout rigidly on every page or use it only as the guiding theme you'll vary from page to page. You choose, and there's no sub-



stantial penalty for a mistake. If you decide to insert pages, just do it: PageMaker will put them anywhere you want. It's a nice way to work.

The way you start work is with text files produced with word processing software and graphics files produced with paint or draw programs. PageMaker itself allows you to type words and draw objects, but those capabilities are more for producing titles, captions, borders, and ornamentation—the kinds of things for which the well-equipped designer buys a headline machine or press type and collects specialized drawing pens. In the real world you'd go bankrupt or crazy if you tried composing a magazine's text on a slow-moving headliner while illustrating it with detailed ink drawings at the same time you worked to create the camera-ready pasteup. Sure, you could do it, and some people do. But it's much better to use specialized tools for each specialized part of the work. It's the same with PageMaker: you use it to do an electronic pasteup of text and graphics imported from specialized software. And PageMaker recognizes files from a wide range of such software.

You can import text files formatted in Microsoft Word (version 3.0), Windows Write (version 1.0), XyWrite II, MultiMate (version 3.31), WordPerfect (version 4.1), WordStar (version 3.3), DisplayWrite 3 (version 1.10), Samna Word III, Volkswriter 3 (version 1.0), and WordStar 2000 (version 2.0). (Don't take those version numbers too seriously as limitations and run out to buy a replacement for another version you may already own: these specific version numbers evidently are only identifications of the specific versions tested by Aldus. PageMaker does recognize other versions: I've used XyWrite III Plus here, for example. Try what you have.) As you should expect from so individualistic a group of word processing programs, however, PageMaker can't reproduce all formatting features of each. You therefore should not expect to transport features like typefaces and page layout from a word processing program into PageMaker. There is just as big a difference between typesetting and word processing as there is between typesetting and typewriting, and PageMaker is oriented towards typesetting. If you're assembling text from diverse writers, each of whom inevitably has different quirks and word processing software, you'll probably be better off asking for plain ASCII files and a printout of the text than you'll be with files heavily laden with the word processing programs' native format codes. Chances are you'll grow tired anyway of having to adjust each file to the style you've determined for the finished piece. That will be a particularly onerous job because PageMaker does not transfer to the original file any changes you make after importing it. What PageMaker does when importing text files is copy the text itself, and from then on the copy and the original are independent of one another. Be careful, therefore, either to make all necessary editorial changes in the original

before it's imported, or to retype into the original all the changes you make in the PageMaker text. Otherwise you'll have one version in PageMaker and another in the original, and there will be all the editing to do all over again should you want to begin anew with the word processing file.

The situation is far different in the case of files imported from graphics programs. Although PageMaker copies those too when they're imported, the copies are only for you to see on the computer's monitor. (What you see is a lower resolution image that mimics the high resolution original. Mimicry saves time when the screen is refreshed, and you couldn't see the detail of the original anyway on most computer monitors. PageMaker's onscreen imitation is so good that even experienced users don't realize that they're seeing a copy and not the original.) When the time comes to print the piece, PageMaker uses the original graphics file and not the screen representation. Be aware of some important implications of this approach to graphics. It means, for example, that you can't delete the original file after you import the illustration into PageMaker: the program will scream "foul" and won't print the graphic until you return the original to whichever directory you had it in when you made the importation.

That's important in understanding what you can and can't do to illustrations from within PageMaker. For reasons having to do with the way PageMaker handles graphics file, your ability to "edit" graphics is relatively limited within the program. You can "crop" the images, cutting out unwanted material from their four sides, but you can't alter the image itself. It's nearly the same limitation you'd confront when faced with a snapshot of yourself with your arm draped around a former sweetheart: you can't transform her features into those of your current flame, but you might be able to chop off your arm and its incriminating armrest. You therefore must make absolutely sure to get any illustrations you use absolutely right before you import them into PageMaker from the paint or draw programs with which they were created. You also can "scale" the images—change their size to fit into a space—in PageMaker, but of course you will have more success scaling object-oriented files from drawing programs than you will with bitmapped files from paint programs. (Individual bits become obtrusive and ruin the illusion when they're enlarged.) A nice feature in PageMaker is its proportional-scaling capability, which allows you to shrink or enlarge an image without distortion. (All you do is hold down the Shift key while you do the scaling.) But, again, you'll be more successful scaling object-oriented images from a drawing program than you will be scaling bitmapped images from a paint program. Scale the latter before you import them into PageMaker.

PageMaker recognizes bitmapped images produced on IBM compatible microcomputers with Windows Paint, PC Paint, and the PC Paintbrush series of programs. The latter's "PCC" and "PCX" files are as much the lingua franca of MSDOS paint programs as MacPaint files are on the Macintosh, so PageMaker has much broader coverage of paint formats than you might think from so short a list of supported programs. You're also supposed to be able to import MacPaint files—an important capability because of the Macintosh's relatively long history in desktop publishing and graphics—but I haven't been able to get this import to work. Fortunately there are good public domain programs and even better commercial programs (such as PC Qwik-Art's The Graphics Link) to convert MacPaint images into one of the formats PageMaker really does recognize. As for object-oriented images, PageMaker accepts those from Micrografx' Windows Draw!, In*a*Vision, and Graph, as well as from AutoCAD, Lotus 1-2-3, and Symphony. PageMaker also recognizes bitmapped and object-oriented images produced in formats peculiar to desktop publishing and its peripheral areas: TIFF ("Tag Image File Format") developed by a consortium, including Aldus Corporation, primarily for optical scanners but also a medium of exchange among any programs (like Hewlett-Packard's Drawing Gallery and Charting Gallery) that support it; and EPSF ("Encapsulated PostScript Format"), developed for the Macintosh and Apple LaserWriter by Altsys Corporation but rapidly being adopted as a way to exchange images for printing on the increasing number of PostScript laser printers. The most glaring omissions from the list of image formats supported by PageMaker are Digital Research's GEM and Ventura Publisher's IMG, omitted perhaps because of unseemly agoraphobia.

Intelligent use of PageMaker really begins before those text and graphics files for a printed piece are imported. By then you should have designed the piece in as great detail as possible. Here there is no true digital substitute for talent, knowledge, experience, and taste in graphic design. Absent those qualifications, you should get guidance to avoid producing some costly monstrosity. Aldus supplies some guidance. Right now it sends all registered PageMaker owners a sixty-eight page paperback Aldus Guide to Basic Design by Roger C. Parker. This little book offers good, solid advice illustrated with a variety of sample pages. It presents the very least one ought to know about graphic design. I understand too that Aldus has released a series of PageMaker templates starting with some for newsletters. I haven't seen any, but the idea seems reasonable.

Working with PageMaker on your own new file is a simple matter of pursuing the central metaphor—the top of a graphic designer's desk—to the horizon. When you open a file for your new "publication" (PageMaker's designation for your piece), you provide information about basic matters such as paper size, orientation (landscape or portrait) of the printed image on the paper, margins that determine the print area on the paper, and number of pages. You'll find it easy to start with the smallest unit (a page or double-page spread) appropriate to your piece, then insert pages as you need more. Each PageMaker file handles up to 128 pages, but of course you can put together a long printed piece composed of several files. What you do is tell PageMaker the opening page number for each file. You also have to tell PageMaker the printer on which the piece will be printed. Aldus adds new printer drivers so frequently that even an attempt at a current list is futile: ask a good dealer if PageMaker handles the printer you own or contemplate buying. What's important is that PageMaker supports most major kinds of laser printers and is especially good on PostScript printers such as the Apple LaserWriters. PostScript is especially important in desktop publishing because it lets you can use relatively-inexpensive laser printers two ways: for camera-ready copy of jobs in which 300 DPI ("Dots Per Inch") resolution is good enough; for proofing higher quality jobs that then can be sent to

a service bureau to print 1240 or even 2400 DPI camera-ready copy on more sophisticated (and more expensive) PostScript laser printers. There are some traps, and some tricks for avoiding the traps should you go in the latter direction, and the route is still not yet travelled well enough to be safe or easy. You have to make sure, for example, that exactly the same type fonts are available on the service bureau's equipment as on yours, and that they behave exactly the same way. Don't take it for granted, and don't trust what you are told: verify every assurance with a sample test page before you wind up sinking a great deal of time and money into designing a piece you can't produce because the service bureau's Old English doesn't match yours. Don't trust anyone. Except me. PageMaker supports some dot matrix printers too, but you might not see the sense in using one for desktop publishing at this program's level of elegance. I don't. Dot matrix printers don't give good enough quality for near-typeset camera-ready copy, and their output is all wrong for proofing a job's final appearance. Professional desktop publishing on microcomputers really does require professional equipment, including at least a good laser printer. It's not a poor man's sport.

Next you lay down non-reproducible guidelines for the pages, putting them on master verso and recto pages if the job is complex. The master pages don't themselves print, but their contents—those that print as well as those that don't—are replicated on the individual versos and rectos. PageMaker therefore provides no-cost equivalents of the slicks that graphic designers pay to have printed in quantity as a labor-saving aid on big jobs. It's also an easy way to include repeating elements such as rules, borders, and page numbers that will print. (Of course PageMaker can maintain the pagination for you as you add or delete pages.) The non-reproducible guidelines can be either horizontal or vertical, so it's easy to design by laying down grids in which to fit text and graphics. It's especially easy because PageMaker can automatically divide the pages into columns (up to twenty per page) that can be hidden or made visible at will. Those of us with less than admirable dexterity will worship PageMaker for allowing automatic precise alignment of text and graphics with the guidelines. Or you can turn off the "snap to guide" feature to do special positioning that violates your general rules, then toggle it back on when needed.

PageMaker has several features that make it easy to lay down accurate guidelines. One is that metaphorical drafting machine with both horizontal and vertical scales. You can set the zero point on each scale to anywhere on the page, and lock it in place or shift it again. The scales can be set in picas and points, inches, or metric units, and their graduation shifts in fineness as you shift your "view" of the art board. For "view" read "magnification": you can fit the entire board into the display screen or see the board at 100% (actual) size, 50% (half the board is displayed), 75% (three-quarters of the board is displayed), or 200% (twenty-five percent of the board is displayed). When you view the entire board, the type is "greeked" (faked with graphics characters) to save time when the program refreshes the screen display, as it must whenever you make a change. To continue our explicit pursuit of PageMaker's metaphor, those five possible views emulate the motion of a graphic designer at a real desktop. You roughly position an element, then move close as possible for fine adjustments, then step back to eyeball the general effect. PageMaker lets you do it from several positions by varying the views with a few keystrokes or a mouse click.

You import elements by telling PageMaker to "place" them, one at a time. Life is easier if you give files the extensions PageMaker expects: FILENAME.XYW if it's a XyWrite III file, for example, or FILENAME.MSP for a Microsoft Paint file. Then PageMaker automatically knows what to do with the file. If the extension is non-standard or wrong, PageMaker explains the problem and give you the opportunity to type in the file format. When you and PageMaker both agree, the cursor turns into a symbol for that format. You position the cursor where you want the file placed, then click the mouse to make the text or image pour out. You'll be able to reposition the file or manipulate it according to PageMaker's rules for that kind of file. If it's a text file, for example, you can do any of the things appropriate to type: specify font (typeface, size, and style, as supported by your printer), alignment (justified, ragged left, ragged right, or centered), leading (the spacing between lines of type), indention, and everything else. You're not nailed to your choices at any time, because you can respecify them whenever you'd like. PageMaker will automatically flow the type from column to column and page to page as needed to compensate for the effects of your choice, so long as you have properly marked the blocks of type you want reformatted. It's hand work, though.

PageMaker, at least at this stage in its development, does not remove all sweat from the process of making up pages for camera ready copy. Because it's page oriented instead of document oriented, I'd hate to use PageMaker for pasting up a novel or any other big book of straight text. A few hundred pages that must be given individual treatment (pour text that fits onto the current page, then click to the next page, pour again, click again, and so on) willy nilly would drive me to distraction. And because PageMaker does not use "style sheets" (a way to specify macros for handling user-specified design elements such as body type, major headlines, subheads, and captions), you have to reformat each page by hand if you decide to print the publication in more than one format. And because PageMaker does not have a way to flow text automatically around a graphic element—or any other—you have to cut and paste if you want to do such "wraparounds."

But when a job is one of those kinds in which every page really deserves individual craftsmanship, PageMaker is a marvel. Features such as automatic hyphenation (selectable by degrees, no less) and kerning (also selectable by degrees) make it easy to polish each page. PageMaker is a professional tool and it works wonderfully well on Zenith's mainstream computers. Don't be a crazy, though. Be sane, realistic, and—above all—reasonable. For example you won't live happily, or very long, if you expect to run PageMaker on an XT compatible with two floppy disk drives. Desktop publishing on the level offered by PageMaker requires investments. You'll want an AT-compatible Z-241 or Z-248, at least the full 640 KB of base RAM in it, as much Expanded Memory as you can afford to use for a big RAM disk that will boost the speed of every operation, the biggest possible hard disk drive you can afford to use for storing files as well as programs and (possibly)

extra fonts that can be downloaded to your laser printer, a PostScript printer (like the Apple LaserWriter) for the best possible printing quality and flexibility, and at the very least an EGA display. A VGA display is better. A color monitor is not, to my mind right now at least, really essential. Don't even think about using PageMaker with a CGA display: what you want is the best possible resolution you can afford. There is no such thing as a "free" lunch, especially not in real, high quality desktop publishing. If you appreciate the difference between a nosh at Max's and dinner at Maxim's, you're eligible to contemplate PageMaker and almost certainly will become infatuated with it.

I've talked quite often here about PageMaker in the past and I intend keeping up with it here in the future. It's one of those software packages that by itself justifies the purchase of a microcomputer. Of course you can see that for yourself: camera ready copy for this column was prepared with PageMaker from text I wrote with XyWrite III Plus.

Product Information

PageMaker (Version 1.0A). $695.
411 First Avenue South
Suite 200
Seattle, WA 98104
206/622-5500

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On The Leading Edge

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WILD INTERRUPT, DSBACKUP+ On The Z-100, OS/2 And Multitasking, Troubleshooting Software

As we begin a new year, I suppose that it is appropriate to speculate on what the latest fad will be in the next twelve months. In an attempt to see what the latest announcements were at Comdex in Las Vegas, I even held this article a few days beyond the normal deadline so that I could have some current information. It appears there are several possibilities, but perhaps the most obvious is the OS/2 operating system.

Will OS/2 Make It?

That is an interesting question. On the front page of the November 9, 1987 InfoWorld, one article is titled as "OS/2's Arrival Marks the Dawn of a New Era". Another front page article notes that IBM is planning to ship their OS/2 Extended Version in July 1988, and the Standard Version was supposedly shipped on December 4, 1987. Because of the lead time in these articles, you may already know whether IBM made that date or not. And Zenith announced some time ago that they would ship their standard version of OS/2 by the end of last year. I suspect that, by the time you read this, both the Zenith and IBM standard versions of OS/2 will be available.

So much for the press stuff; the real question is whether or not OS/2 will make it. I think that depends on price to some extent. Apparently, IBM is planning to sell the Extended Edition of OS/2 for $795 — a pretty steep investment for a microcomputer operating system in my opinion. Is this the stuff of which "new eras" are made? I have considerable doubts about that. Based on other announcements I have read, it looks like the Standard Edition will still sell for something on the order of $300 plus. And it is reasonable to assume that Zenith will also sell their versions of OS/2 for similar prices. What do you think? Would you be willing to spend that kind of money for an operating system? Let's take a look at some other features of OS/2 that have already been announced at the time of this writing.

Perhaps the biggest single advantage of OS/2 is that it is supposed to be a true multitasking operating system. Multitasking allows you to send a file to a friend in Columbia, South Carolina with your telecommunications package, while you are also writing the next article for REMark. In short, it really allows your computer to do several things at the same time. There is nothing more boring than formatting a box of disks. With OS/2, you should be able to FORMAT the disks while you are working with your word processor, spreadsheet or database. I agree with Larry Niven when he talks about TANSTAAFL — There ain't no such thing as a free lunch. And multitasking isn't free either, aside from the initial cost of the software.

Current DOS versions are single-task systems that allow you (and your computer) to do one "task" at a time. Regardless of what task you are doing, the computer is dedicated to that single task whether it's formatting a disk or running a word processor.

In general, multitasking is a technique that "divides" the power of the computer. Let's say you have an 80286 CPU chip in a Z-248 computer. The real power of that CPU is then divided into more or less equal time chunks for each task. If you have a telecommunications program and a database running, then the CPU will process one task (say the telecommunications program) for a short time. Then, it will stop that task and begin the second (e.g., the database) task which might be something like sorting the database for a short time. Then, it will return to the first task for a short time, and back to the second task for a short time. In essence, multitasking alternates between tasks until each is complete. If you have followed this discussion so far, you probably have noticed the end result is that both tasks will actually take more

elapsed time to complete, since both are competing for the single CPU resource.

The real point is that multitasking is NOT the same as simultaneous processing. That's why, all things being equal (i.e., the same CPU), a given task on a multitasking system can actually take longer than it might in a single task system, like DOS. How much longer is partly determined by how many tasks are currently executing in the system. Of course, a multitasking system can generally process a single task almost as efficiently as a single-task system.

In the description of multitasking, I have ignored all kinds of other considerations. For example, the operating system is a task too, and I conveniently ignored that in the above example. For those who are computer purists, I also ignored a discussion of priorities and time slices, since a more detailed look at multitasking will be the subject of future articles. If you thought you could generally get away from knowing some of the technical details of your operating system, do not plan on buying a multitasking operating system.

I think that the biggest single advantage of OS/2 is probably its multitasking, which is the reason for the explanation. There are other advantages, of course, and perhaps a close runner-up is that OS/2 is supposed to provide a standard operating environment which I think will primarily benefit software developers. Whether or not it benefits us as users is something I won't speculate on at this point. By the way, the current versions of OS/2 are supposed to have DOS compatibility, so you won't have to start buying OS/2-specific software right away. How long that will last is anyone's guess.

As a matter of curiosity, I would like to know what you think about OS/2. Does the price sound so out of line that you would not consider it? Or does it depend on what kinds of applications will be available for it? Is the addition of the multitasking capability enough to warrant that kind of investment to you? Or do you think that something like DoubleDOS that gives you similar capabilities under DOS is a better deal for around $50?

It is reasonable to assume that you should be able to run standard DOS-compatible programs under OS/2, but don't plan on running a lot of copy-protected software just yet. It isn't really clear whether OS/2 (and some of IBM's new PS/2 hardware) will support copy-protected software in its current form.

I am particularly interested in your opinions about the price and advantages that you might see in OS/2. What specific applications do you have in mind that would make OS/2 a good investment for your system? If I get enough letters from you on OS/2 opinions to develop a trend, I will report the results in this column.

In The Mail

I guess that every writer gets a letter like the following once in a while:

Dear Bill,

You stated in your October [1987] article that you use DSBACKUP+ to backup the Tulin hard disk on the Z-100. Wrong, Wrong, Wrong! I ordered a copy as you recommended, and my Z-100 went into the famous Wild Interrupt even though I added the ANSI.SYS device driver to CONFIG.SYS. I wish you would actually try the software before you recommend it in your column.

Would you please tell me what I am doing wrong?

I admit that I find it more than a little difficult to answer this kind of letter gracefully. In fact, this particular letter did not get an answer at all because there was no self-addressed stamped envelope included as I have asked when a personal reply is requested. But the writer has raised some interesting questions, and I'll talk about each one.

WILD INTERRUPT

When the original Z/H MS-DOS book was published for version 2, several people suggested that the BIOS error messages should be added, since these errors were difficult (or impossible) to find in the Zenith documentation. I thought that was such a good idea that I added the "BIOS Error Messages" (page 72) under the COMMAND command in the new MS-DOS FlipFast book, since that seemed to be the only reasonable place to document them. Even if you don't want to look through every page, it is also listed in the 23-page Error Message Cross Reference at the end of the book.

The WILD INTERRUPT error message is documented on page 74, and if you have a copy, you might want to read along. I guess I can quote my own writing without any copyright problems, and the WILD INTERRUPT (on page 74) means:

"The DOS has received an undefined software interrupt which cannot be processed. This error normally occurs when you have attempted to execute a program intended for the IBM PC (or compatibles) on an incompatible computer system (e.g., the Z-100). This error may also occur due to a software problem. Contact your dealer from whom you purchased the software for advice, since it is unlikely that a program which causes this error will run on your system."

In short, the message nearly always means that you tried to run a PC-type program on the Z-100. If you wrote your own program, you tried to use an invalid interrupt (INT) function on the Z-100. I spent considerable time testing this particular error message, and these were the two ways that I could get it to fail.

But aside from my new FlipFast book, where do you find that error message? As I recall, I originally dug that out of the Z-100 ROM listing that I think was part of the Z-100 Technical Manual set. Of course, the ROM listing is all in assembler, and it is not a usual choice for an evening of light reading. So, I have spent a lot of evenings with some not-so-light reading, and that's how I learned most of the stuff that I write about. I also spend a lot of time testing things because there are all kinds of interesting tests one can do based on the way programs are "supposed" to work. In short, I guess that the only way you will know what the WILD INTERRUPT message means is to read about it somewhere, unless you want to spend a couple of weeks reading ROM listings.

The Z-100 And ANSI

For whatever technical reason, the ANSI device driver was implemented on the Z-100 in a really strange way. Unfortunately, the Zenith manuals did not explain how to implement the ANSI device driver, so you were pretty much left to your own devices. The author of the letter that I mentioned earlier clearly did not understand how to implement it either. But let's take a look at what the ANSI device driver does, in general, and then we'll look at how it is turned on.

First of all, the ANSI device driver is hardware specific. That is, the Z-100 version

will NOT work on the Z-150/200 or any of the PC compatibles and vice-versa. I have also seen some indication that the ANSI device driver may also be dependent on the BIOS version which means that you should always use the one furnished on the distribution disks when you change versions of MS-DOS or PC-DOS.

Second, the ANSI device driver acts as a "translator" between some standard ANSI Escape Sequences used for screen control and your computer. For example, the "ESC [2 J" sequence will clear the screen on any DOS computer, assuming that the ANSI device driver is implemented correctly. All of the Escape sequences that can be used with the ANSI device driver are documented under ANSI.SYS on page 477 in my new FlipFast book. In the case of the Z-100, the "ESC [2 J" is translated to the normal "ESC E" clear screen function as shown on page 469. It's a whole different ball game on the PC-type computers.

In any case, the first thing you must do on the Z-100 is get the correct name of the device driver. I checked several Zenith distribution disks, and I always found that it was called "ANSICON.DVD" on every one. Therefore, the following line MUST be added to the CONFIG.SYS file:

```
DEVICE=ANSICON.DVD
```

Remember that the CONFIG.SYS file must be in the root directory on the boot disk or the driver (and all of CONFIG.SYS) will not be installed. You can, of course, include an optional drive letter and/or path in the DEVICE= command, but I recommend that you keep the Configuration File stuff in the root directory (it's a little faster). That's the first step in implementing the ANSI device driver on the Z-100.

The second step is even more tricky because it's one of those things you have to "know", since it is not documented very well in the MS-DOS manual. On the Z-100, it is not enough to set up the CONFIG.SYS file; you must activate the device driver with the CTTY command as follows:

```
CTTY ANSI
```

No, that is not a mistake. The command is really as shown; it is NOT valid to use "CTTY ANSICON" as you might expect. If you try it, my testing of the CTTY command indicates that the error message "Invalid device" will be displayed. Now that the ANSI device driver is installed, let's continue with the installation of DSBACKUP+.

DSBACKUP+ On The Z-100

The most important thing about running DSBACKUP+ on the Z-100 is to get the correct version in the first place. When you place your order, be SURE to specify the MS-DOS ANSI version, and it probably wouldn't hurt to mention that you will be running it on a Z-100. If you try to implement the PC version on the Z-100, I promise that you will see the WILD INTERRUPT message. Oddly enough, I was not able to duplicate that using the ANSI version as that writer did. My distribution disk has a specific listing showing "Format: IBM/ANSI", so it is difficult to make a mistake on that.

We have the device driver implemented, and the correct version has been verified, so now it's time to fire up DSBACKUP+. If you took a look at the "README" file on the distribution disk, you will find that the "DSBACKUP NOGRAPH" command is used for those computer systems that do not have IBM graphics characters, like the Z-100. When the "NOGRAPH" option is used, the borders of the menu screen are displayed with hyphens (-) and other standard ASCII characters; otherwise, you will see that the horizontal lines are a string of D's. The program will still work fine, but the screen will look a little strange.

Everything else works in the same way that the DSBACKUP+ manual describes, except that SPEEDBAK is not included in the ANSI version, because it uses some unique hardware features of the PC disk controller. I've used the ANSI version of DSBACKUP+ on my Z-100 for about a year, and I have checked it with both my 48 TPI drives, as well as the 8" drives. I regularly use DSBACKUP+ to backup my hard disk to the 8" drives, and it works just fine.

Software Problems

When you have a problem with software, I recommend that you always check with the vendor first. In most cases, you will find that the vendor is quite interested in helping you fix whatever problem there is. When I look at a software or hardware product, I also try to check out the technical support. That is usually somewhat difficult because most of the time, the technical support people know that I am reviewing the product.

My impression is that Design Software has an excellent group of support folks. They have demonstrated a considerable amount of knowledge about their products, and I have found that all of them are very pleasant to talk to. In particular, I happen to know that the Design Software Technical Support folks are aware of the strange Z-100 ANSI problem, because I was the one who originally told them how it worked a long time ago. If that letter writer had contacted Design Software, I feel confident that they could have correctly diagnosed the problem as being one of the incorrect DSBACKUP+ versions because of the wild interrupt. The other alternative was, of course, to ask me in a reasonable kind of way and include a self-addressed envelope for a reply.

In case you are contemplating using DSBACKUP+ on the Z-100, I have included a summary of how I do it as Figure 1.

That's all there is to implementing DSBACKUP+ on the Z-100. One interesting note is I found that the ANSI version works fine on my Z-200, too. But I use the standard PC version, because one of the "hazards" of using the ANSI device driver is that screen displays are MUCH slower. I particularly like DSBACKUP+, because I can use it on both systems, and I don't have to learn a different program for each one. And it is not copy-protected like some other software I can think of. All in all, DSBACKUP+ continues to be a highly recommended program for both the Z-100, as well as the PC compatibles.

Troubleshooting Software

There are any number of problems that you can have with software. It can be something as simple as a typo on the command line or it can be one of those really neat "undocumented features" that ends up being a program bug. Or it can simply be something like the Z-100 ANSI thing that isn't documented very well in the manual. How do you know what to do?

The first thing you should do is check the last command (or command line) for some kind of syntax error that is usually the result of a typo. If the problem isn't obvious, the next step should be.

CONFIG.SYS (in the root directory on the boot drive) must contain:

```
DEVICE=ANSICON.DVD
```

Note: The above command assumes that ANSICON.DVD is also in the root directory on the boot drive.

BACKIT.BAT (in XDSBACKUP directory on drive E)

```
ECHO OFF
REM Use SET command on page 4 of documentation
REM Be sure PATH command includes this directory
SET DSBACKUP = E:XDSBACKUP
REM Load ANSI device driver (Check CONFIG.SYS)
CTTY ANSI
REM Load DSBACKUP with no IBM graphics
DSBACKUP NOGRAPH
ECHO OFF
```

Figure 1
DSBACKUP+ on the Z-100

When In Doubt . . .

Read the documentation. It is sometimes difficult to follow that advice, and I recently had a problem because of that. I hadn't connected my modem to the Z-200 until the last few days, and I tried to bring up the PC version of HyperACCESS that is my favorite communications program, as you know. I figured that because I have tested all versions on the Z-100, I would just copy the files to my Z-200 hard disk, and fire away. So I did. And I stupidly skipped reading the documentation again, since I "knew" how to run HyperACCESS on the Z-100 in its native version and with the Gemini card for the PC version. I began checking the modem cable and all kinds of other things.

In desperation, I called Hilgraeve to ask for help, and Matt Gray was kind enough to help a stupid user. Matt asked me the obvious questions about the cable and switches on the modem. Yes, everything is set as recommended in the manual. Then, Matt asked me if I ran "HA STARTUP", and of course, I had not.

When I did that, all of my problems disappeared, and HyperACCESS ran perfectly, as usual. I guess we all have to learn that lesson once a year in order to remember it. The problem was that I use HyperACCESS so often that I assumed that I did not have to read the installation instructions again. The fact that the last installation was done a long time ago was beside the point. Dumb. And embarrassing. That notwithstanding, there are times when it appears that everything is okay, but the problem still occurs. What next?

Get Back To Basics

When programs seem to generate odd error messages at strange times, it's time to get back to basics. For example, memory-resident programs, in particular, can cause all kinds of strange problems. Memory-resident programs are also called TSR programs, because they use the DOS Terminate-and-Stay-Resident function. Despite what you may have been told, TSR programs are probably the most common cause of weird problems. They can be kind of tricky to find, because they are usually installed in an AUTOEXEC.BAT file, especially when you forget about them, because the ECHO OFF command was included in the batch file.

Even more obscure and trickier to find are the problems caused by various device drivers that are implemented in CONFIG .SYS. I spent hours one time trying to find a problem that was caused by a conflict with the Microsoft Mouse device driver (MOUSE.SYS) that I had installed in CONFIG.SYS. The point is that you should never assume that anything works right with anything when you are trying to troubleshoot one of these "weirdos".

So, the trick is to get rid of everything at once to see if the software does work in a "vanilla" system. My procedure is to RENAME AUTOEXEC.BAT to AUTOEXEC .SAV, and RENAME CONFIG.SYS to CONFIG.SAV. Then, reboot the system and check the software to see if the problem still occurs. In all cases where I have had strange software problems, the problem has disappeared when those files were "invisible" to the system. Since I've found it to be easiest, I usually try the CONFIG.SYS file first, since that is just a simple rename. And I reboot the system (required for CONFIG.SYS changes) and check the software problem again. It usually does not occur. Time to check out the AUTOEXEC.BAT file.

At this point, it's time to rename the AUTOEXEC.BAT file and edit it. The basic objective is to "comment out" (using the REM command) all of the commands, except the first one in the file. That is, insert a REM command before each command in the AUTOEXEC.BAT file. Then reboot the system, and try the problem software again. If it still works okay, then edit the AUTOEXEC.BAT file again, and remove the REM that precedes the next command in the file. Reboot, and check the software again. Keep doing that until you find which command in the AUTOEXEC.BAT file causes the problem. Now that you know where the conflict is, you can make some kind of decision as to how to handle it. This can sometimes be a laborious and boring task, but you will usually find the problem. It will probably be some kind of conflict with a TSR program like SideKick, SuperKey or a thesaurus (e.g., WordStar 4.0 has one). If you don't, there is at least one not at all obvious possibility.

You may not know that some DOS programs are memory-resident. Take a look at the MODE command, for instance. Or GRAPHICS. Or GRAFTABL. Or the KEYBxxxx series. Or ZSPOOL. Would you believe the PRINT command? I once found a strange conflict that involved the PRINT command, but I don't recall what it was. All of these programs have some kind of TSR "hook", so you need to check (remember?) if you used one of these programs, too.

You also need to check the possibilities for any program that diddles with disk drives and/or subdirectory names. ASSIGN, JOIN, and SUBST come immediately to mind. Perhaps the problem software has some kind of "hook" that conflicts with these DOS commands.

Last, but not least, you may have actually found a program bug. I admit, that in the heat of battle, it is difficult to remain calm and reasonable when the problem is "clearly" the result of a Zenith error in everything. Despite rumors to the contrary, the holes in my study wall are NOT the result of beating my head against it. And those long vertical marks on the walls that look suspiciously like they were

made by my fingernails were obviously made by my female miniature dachshund (Bambi), despite the fact that the marks begin about a foot or so from the ceiling. I have NOT been climbing the walls regardless of what you may have heard.

Powering Down

All in all, I think there will be a number of interesting things happening this year. As a matter of fact, I have some ideas for articles that even suggests that there are still a few new things for the Z-100. More on that in the future.

From what I can tell, there seems to be a lot of interest in hardware for your systems. I have some ideas on that too, but if you have anything you have seen that might be of interest, be sure to let me know. In the meantime, I still appreciate your letting me know about your questions and interests — keep those cards and letters coming.

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. Happy New Year!

Products Discussed

DSBACKUP+ $79.95
Design Software
1275 W. Roosevelt Road
Chicago, IL 60185
(800) 231-3088 (Orders only)

FlipFast Guide to
Z/H GW-BASIC $21.95
FliPFast Guide to Z/H MS-DOS 24.95
S-A Design Books
515 W. Lambert, Building E
Brea, CA 92621-3991
(714) 529-7999

HyperACCESS (PC only)
(PM-160) $149.00
Heath/Zenith Computer Centers
Heath Company Parts Department
Hilltop Road
St. Joseph, MI 49085
(800) 253-0570
(Heath Catalog orders only)

*

$100 Trade-In for any A/B Switch Box (See Catalog Information below for details)

EasyPRINT—New *Easy* Solutions to Printer Sharing from $79.98 to $149.98 per PC.

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The *EasyPRINT* catalog reviews five configurations ranging from 2 and 3 PC starter kits that let you share up to four printers, to 7 and 8 PC configurations sharing up to 32 printers. Using the chaining capability of our new advanced CrossPOINT™ switch, up to 25 PCs can share up to four printers.

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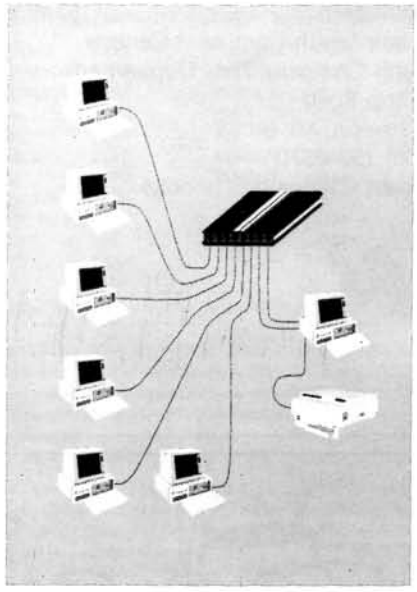
PC Magazine in 1985 profiled the ideal printer sharing system. We compared their wish-list against *EasyPRINT,* and here's how we stack up:

PC Magazine Profile	*EasyPRINT*
■ Hook up any number of PCs to a printer.	Yes
■ Support your choice of:	
Letter Quality	Yes
Dot Matrix	Yes
Laser	Yes
Plotter	Yes
■ Large segmented print buffer.	Yes
■ Accept all incoming print jobs no matter if the printer is busy.	Yes
■ Support mixed serial and parallel devices.	Yes
■ Any 3–4 users should be able to justify a joint purchase of all three printer types.	Yes

Highlights

- Expandable—from 2–25 PCs
- Supports serial and/or parallel printers in any combination
- Totally automatic
- Spooled printer services
- Cable lengths to 500 feet.
- Economical—configurations start at $79.98 per PC.

"Best bargain."
***—PC Magazine,* April 28, 1987**



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- Advanced Forms Support solves the paper changing problem on a shared printer. Now PC users can print regardless of the type of paper mounted on the printer.
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Sunnyvale, CA 94086, Telex 5106003481

Order Form

Item	Description	Price	Qty	Amount
EP-200	*EasyPRINT* Starter Kit 2-PCs. With *EasyPRINT* software.	$ 159.95	___	$ ___
EP-300	*EasyPRINT* Starter Kit 3-PCs. With COM2 serial port and *EasyPRINT* software.	$ 349.95	___	$ ___
EP-700	*EasyPRINT* for 7-PCs. With CrossPOINT switch and *EasyPRINT* software.	$ 899.95	___	$ ___
EP-750	*EasyPRINT* for 7-PCs. With CrossPOINT Switch and Print-Q® software.	$ 999.95	___	$ ___
EP-800	*EasyPRINT* for 8-PCs. With CrossPOINT Switch and special *EasyLAN* software.	$1199.95	___	$ ___

California Residents add state tax $ ___
Shipping Charge $ ___
Total Order Amount $ ___

SPREADSHEET/DATABASE Corner IV

H. W. Bauman
493 Calle Amigo
San Clemente, CA 92672

Easy Network Review

This month I will explore additional dBASE commands for use with a database file. The readers can use the same database from the earlier articles of this series. Maybe the readers would like to use their application database. These commands will be useful with any database.

First, obtain a printout of the current database. Do you remember how to do this? I explained this in earlier articles.

Type — USE A:CLIENTS and press Enter
Type — SET PRINTER ON and press Enter (turn printer ON)
Type — LIST and press Enter — Label this printout #1
Type — SET PRINTER OFF and press Enter

Now, the EDIT command can be used. Editing is a simple task if the database is small. The user must remember the Record Number that needs editing. Check this Record to find out if it is the right one with this command:

```
LIST FOR LNAME = "BAUMAN" .AND. FNAME =
                 "HAROLD" & Enter
```

The following display should be on the screen:

```
1 BAUMAN  HAROLD  493 CALLE AMIGO
                  SAN CLEMENTE CA 92672
```

dBASE shows that this database has only one Record with the desired name. It is Record No. 1. Type EDIT 1 and press Enter.

dBASE provides a form on the screen for user editing. This form provides the record fields for editing:

```
Record No.        1
LNAME            :BAUMAN
FNAME            :HAROLD
ADDRESS          :493 CALLE AMIGO
CITY             :SAN CLEMENTE
STATE            :CA
ZIP              :92672
```

Note that the cursor is under the 'B' in BAUMAN. Use the arrow keys and the cursor control keys to move the cursor to the field to make the change (EDIT). These cursor keys are:

up-arrow — moves cursor up one line
down-arrow — moves cursor down one line
left-arrow — moves cursor one space left
right-arrow — moves cursor one space right
backspace — moves cursor 1 space left & erases the space
delete — deletes the space over the cursor
insert — turns on insert mode
PageUp — moves back one record
PageDown — moves foreward one Record
Escape — abandons changes and returns to dot prompt

To edit the ADDRESS field from 493 to 439, press the down-arrow key twice, moving the cursor down two lines to the ADDRESS field. Press the right-arrow key twice, press delete key two times, and type 3 and 9. To SAVE the edited Record, press Control-W. This will bring the dot prompt. Type LIST and press Enter to check the results. PRACTICE using the EDIT command with other changes. Do another printout and label it #2.

The BROWSE command allows scrolling through the database, both horizontally and vertically, to edit records. dBASE will show as much data as will fill the screen. The user can move the cursor with the cursor keys to the field to be changed. Type in the command:

```
BROWSE
```

and press Enter. dBASE will display the following: (I am showing only one record.)

```
Record No.     1          CLIENTS
LNAME  FNAME  ADDRESS          CITY          STATE  ZIP
BAUMAN HAROLD 439 CALLE AMIGO  SAN CLEMENTE CA     92672
```

Use the cursor control keys to position the cursor at the field the user will change. Type in the NEW data on TOP of the OLD data. SAVE the change as before. Do a printout and label it #3.

Next, try 'global editing', which allows the reader to make the same change to numerous records in the database. If the user wants to change the ZIP code for all records for San Clemente, the dBASE would scan the database for the CITY:

```
CHANGE FIELD ZIP FOR CITY = "SAN CLEMENTE"
                                and Enter
```

dBASE would display the records for San Clemente and the user can change the ZIP code from 92672 to 92677 for each displayed record. Using CHANGE is a slow, but safe, means of doing a global edit!

The REPLACE command will do global edits faster. It is similar to the CHANGE command. It can change the contents of a selected field in a record. However, the REPLACE command makes changes without asking confirming questions. It is usually used in the form: REPLACE ALL!

```
REPLACE ALL CITY WITH "SAN DIEGO" FOR
                  CITY = "S.D." and Enter
```

This one command tells dBASE "Anyplace where the scan finds S.D. as the CITY, REPLACE it with San Diego". The user must use the REPLACE ALL for a global edit carefully. The slightest error will ruin the database file! What if the reader typed the following?

```
REPLACE ALL CITY WITH "San Diego" and
                          pressed Enter
```

Type LIST! Every record in the database will have CITY as San Diego! Look back and find that FOR CITY = 'S.D.' is necessary so that only the S.D. records are changed. A small change in the instructions could be very useful so that dBASE will step through the database for the edits:

```
CHANGE FIELD ZIP FOR ZIP < "80000" and
                                Enter
```

Each record with a zip code less than 80000 will be displayed. Each record can be changed. This is a safe method. I would suggest practice using the REPLACE ALL command on a backed-up database rather than using the original database. Let's do a printout and label it #5. Examine the listing for errors before starting the next command.

Sometimes editing requires removing a record out of the database. The DELETE command can be used to 'mark' records for deletion. The PACK command will permanently delete the record. I will use the Harold Bauman record as an example. I do not need this record in the database. Do you remember how to find this record?

```
LIST FOR LNAME = "BAUMAN" .AND. FNAME =
                          "HAROLD" and Enter
```

The display should look like this:

```
1  BAUMAN   HAROLD   439 CALLE AMIGO  SAN CLEMENTE  CA  92672
```

Use the cursor control keys to eliminate this record, but that is the hard, slow way. The best way would be to ask dBASE:

```
DELETE RECORD 1
```

and press Enter. dBASE will display:

```
1 record deleted
```

Type LIST and the following should be displayed:

```
1* BAUMAN   HAROLD   439 CALLE AMIGO  SAN CLEMENTE  CA  92672
```

The BAUMAN record is still there! NOTE the asterisk. Now the DELETE can be completed with the removal of the BAUMAN record with this command:

```
PACK
```

and press Enter. dBASE will display:

```
1 record copied
```

Now type LIST. The BAUMAN record is not in the database file! Also notice that the BAUMAN space is filled with the record that was below the BAUMAN record. It was record 2. This record is now record 1. All the following records have been moved up one record space and have a new record number. Remember, that when PACK has been used, the record is completely gone! Prior to using PACK, the BAUMAN record can be reclaimed. dBASE has a RECALL command that eliminates the 'mark' (asterisk). I will leave this command for the reader to try. Be sure to know how to use this command. It COULD be important when creating a database file.

dBASE has another global edit method. DELETE ALL FOR (some condition) — is a global deletion. Remove all the San Diego records from the database by simply typing:

```
DELETE ALL FOR CITY = "San Diego" and
                                press Enter
```

dBASE will display records deleted. Use LIST to prove this by looking for the 'marked' (asterisk) records for deletion. We find that all of the records with the CITY field San Diego are 'marked'. Do not use PACK now! In place of PACK, type:

```
RECALL ALL
```

and press Enter. Now, type PACK. What happened? Nothing! Try LIST to prove this. Do a printout and label it #6. Use this to check the command results.

One obvious command 'ERASE' should be tried. The user should have one TEMP.DBF file on the database file drive. ERASE the TEMP file by typing:

```
ERASE A:TEMP.DBF
```

and press Enter. dBASE will display:

```
File has been deleted. (The TEMP file was
                created from the SORT com
                mand that was used earlier.)
```

If ever the user should ERASE a file that is still needed, there are several utilities that will recover the file. I will discuss these utilities in a later review. How many readers already know how to use these utilities?

What is another word for EDIT? dBASE uses MODIFY. Adding telephone numbers to the database 'CLIENTS' would change the database 'structure' to include a FIELD for phone numbers. The full command is MODIFY STRUCTURE. Remember, if the database is not active to type:

```
USE A:CLIENTS
```

and press Enter. Now type:

```
MODIFY STRUCTURE
```

and press Enter. dBASE will display the current database structure:

```
A:CLIENTS

   field name     type      width     decimal
-----------------------------------------------------
1  LNAME       char/text    15
2  FNAME       char/text    10
3  ADDRESS     char/text    25
4  CITY        char/text    15
5  STATE       char/text     2
6  ZIP         char/text     9   (Zip can now have 9 digits)
7              char/text
```

Next, add the new FIELD to the database structure on line #7:

```
7  PHONE       char/text   10
```

SAVE the new structure by typing Control-End. dBASE will display the following message:

```
Database records will be APPENDED from backup fields of the same name
only!  Hit RETURN to  onfirm or any other key to resume.
```

This is hard to understand. When the user asks dBASE to MODIFY STRUCTURE, it first copies all records to a backup file. Now, dBASE deletes all records in the current database to permit the user to modify the structure. When the user completes the modification, all the records are read from the backup file back into the current database. If the field is added or changed, dBASE will not read data into the new field. In the above example, I didn't change any field name; but I added a field name. The user can proceed by pressing Return to complete the modification of the current database. There is no command that automatically puts the phone numbers into the new fields. The only way is one record at a time. To add the phone number, use EDIT'n', where 'n' is the record number until all records have been edited with a new phone number. For example:

```
EDIT 1
```

and press Enter. The data for record 1 will be displayed. Note, that the new field is at the bottom of the display where the phone number can be added:

```
PHONE:
```

Type in the phone number:

```
PHONE: 7144567890
```

SAVE the data using Control-End. Practice MODIFY STRUCTURE command. When the user creates the dirst database file, it may require many modifications! This article has covered many important commands and the user should start thinking about creating a database file that has a practical application. The needed commands have been demonstrated.

The REPORT FORM command will be the next subject. This is the main difference between DATABASE PROGRAMS. I have many SOFTWARE packages. I will be discussing the report utility for a number of these programs. If the READER would like to have me cover a certain program's Report Form, write me a letter with the name of the software package. If I have this program, I will try to discuss it!

I am in the process of testing many 18- and 24-pin Dot Matrix Printers with/without color. I want to report to the readers which printer will work with the various high resolution EGA PLUS boards and monitors. The reason for doing this is based on what I believe the future computers and programs will be. This testing involves different combinations of the boards and monitors with many new software packages. I needed some method of saving time and effort. My search led me to use a software/firmware peripheral-sharing device/system. Of course, the first thing I considered was a Local Area Network (LAN). My inquiries showed these systems cost $500 and up! This was not in the budget. Further searching found lower cost alternatives that would be easy to install and maintain.

First, I could use an A-B switching box. This would permit one computer to access more than one printer. The main problem with these 'dumb' boxes is that they require the user to physically switch the box every time you need to access the other printer. This brings on two larger problems: (1) There is a chance for a costly error if someone changed the switch position in the middle of a print job. This results in possible serious loss of data. (2) An even more serious problem is when the 'mechanical switch' is operated with the equipment "ON". A SURGE could reach the printer or computer through the connecting cables and 'blow' the printer's buffer memory or some component in the computer. This could also cause a 'crash' of a laser printer control board. H-P LaserJet owners have been warned about this costly problem. (I do not have a laser printer, but I ruled out this switch box idea!)

My conclusion was peripheral-sharing. Short of a LAN, it would be a 'smart' electronic switching system. In order for an electronic switch to know when to switch, a peripheral-sharing device MUST have at least minimal processing abilities! Now, I needed to decide what peripherals I would want to share. Printer sharing would be my present reason for a switching system. However, I can think of a large hard disk, plotters, Modems, etc. for starters. The economic/time saving benefits realized by sharing printers are worthwhile. My immediate problem, the time required to set up a printer, change the paper from letter size to wide, black ribbon to color, text to graphics, 18- to 24-pin print heads, etc., would be substantial. I do not think I should limit my installation to just printer testing. The system should be helpful for testing various software packages, firmware devices, computer upgrade devices, and data files! How would this system pay for itself? I need to know this to have a feel for how much money should be spent. I have to keep in mind that the readers needs could be different than mine. The main benefits of a peripheral-sharing system would be:

1. Save floor space. (I am wall-to-wall in computer equipment under test.)
2. Save on supplies and maintenance.
3. Printers could be set up for different features. (Black ribbon vs color, Wide vs Letter size paper, and Text vs Graphics.)
4. Users may find computers and peripherals are standing around unused. This could make 'on-line' look practical.

Except for the case of multi-users, most users will find that a peripheral-sharing device will meet their needs. When the

SAMPLE CONFIGURATIONS

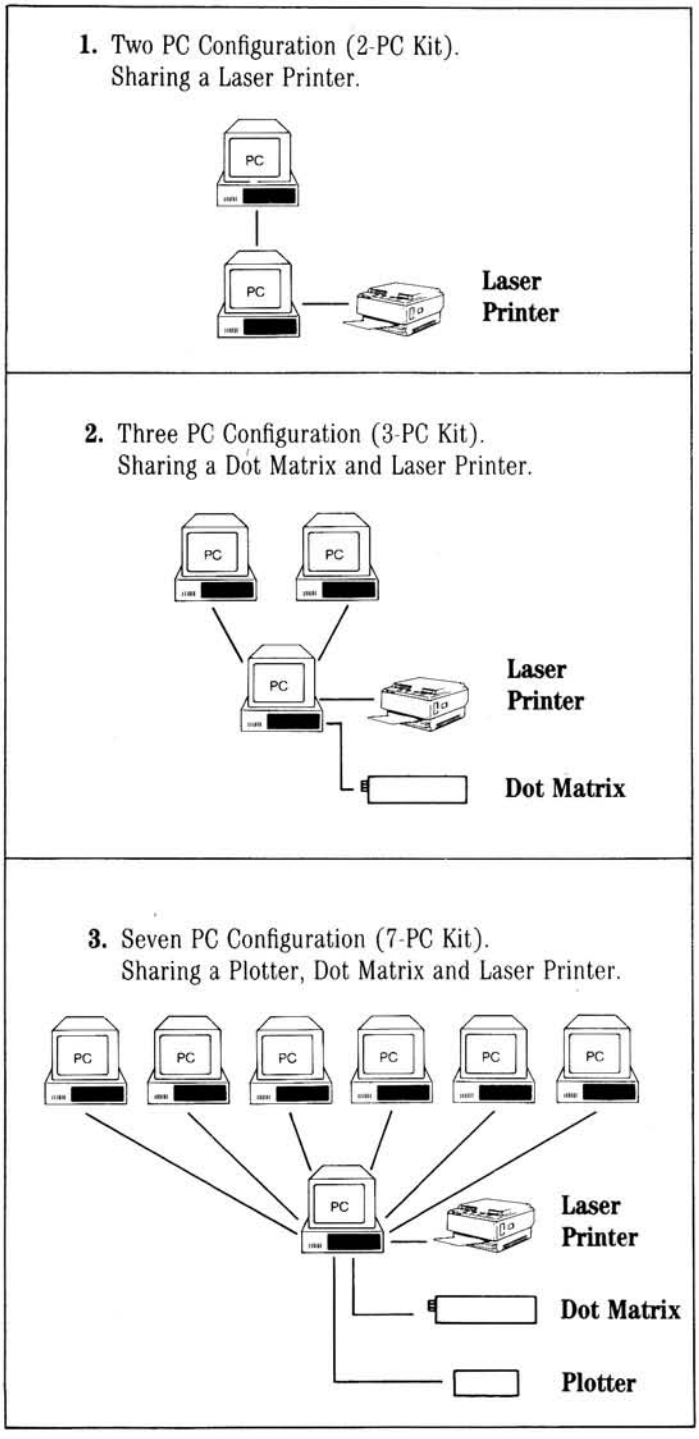


Figure 1

'users' need simultaneous access to share data or application programs, the LAN system is needed! The readers might be interested to know that most LAN systems are also peripheral-sharing systems. The LAN systems would be needed for installations where multi-users are necessary. The biggest problem with the LAN system, as a general rule, is that one computer must serve as the shared server. This means that ONE computer limits how many devices could be shared by the number of ports available. The server user will find that the CPU time is being shared by more users which could slow the user's output. (This is not a serious problem in most cases, because the server uses only a small portion of the possible throughput. The user could choose a faster computer, hard disk drive, Modems, or printers.)

My search led me to a company that specializes in low, easy to install systems. They had the following:

1. EasyPRINT — Low-cost, high function product for printer sharing.
2. EasyLAN — Local Area Network for less than $120 per computer.

My decision was to try both. I was limited by two computers (H/Z-248 and H/Z-241). This would be adequate to prove which system would work best for a particular application.

I obtained the EasyPRINT (EP-200) for two computers with EasyPRINT software, cables, and cable adapters (no internal board required) at a cost of about $80 per computer. (Refer to Figure 1 for sample configurations.) I proceeded to install the system, but I soon found my first limitation. I needed more than one each of the serial and parallel ports on my 'HUB' computer. I chose the H-248 as the HUB computer, because it was the fastest and it had one serial port and one parallel port. Fortunately, I had a CHEETAH 'TriCom-Plus' board for evaluation! This adapter board provides two serial ports on the mounting bracket and a plug-in cable to the board with one serial and one parallel port on a second mounting bracket. This 'TriComPlus' board requires one 8-bit slot in the computer and an open second slot for the other bracket. I had the two open slots. DOS limits the user to two serial ports and three parallel ports without special software to change DOS. If the reader does not have a 'slot' and a 'bracket' space open, I am also testing a CHEETAH COMBO RAM board that provides one serial and one parallel port, along with 1.5MB of RAM using one 16-bit slot. I am testing several other memory boards that will operate at 8Mhz 0 wait states for a future review article.

Now, the installation is easy. Server Technology advertises that EasyPRINT can be installed in less time than a coffee break. I did not get it done that fast, because I had to relocate some equipment and the extra work of installing the extra ports. However, it was EASY and if one had everything in place, I believe it could be done! ALSO! It WORKED the FIRST time! This does not happen very often when using

serial ports. EasyPRINT includes a menu driven software program that takes the user through the installation process and redefines the configuration as printing requirements change. A 'TEST' program is provided to find out if the system is installed correctly. The EP-200 can support two computers, 1 to 3 printers, and a MIX of parallel and serial printers (only low-cost package that can support mixed printers). The HUB unit provides hard disk automatic spooling, a large disk buffer that supports graphics and desktop publishing, supports printing from within an application (w/o modifying document or code), etc. EasyPRINT can be expanded to meet the user's growing requirements, one at a time, up to 14 computers. Each satellite computer requires a serial port, a licensed copy of the EasyPRINT software, and requires 20K of memory. The company also sells a COM2 — two serial ports board, a COM6 — six serial ports board, bulk Easy cable kit for building specialized systems. All PC type computers using MS-DOS/PC-DOS 2.0 or higher are supported. The kit comes with two reference manuals, two EasyPRINT diskettes, and two pairs of two types of port adapters. The system operates in the background and it is transparent to the HUB user.

Next, I tried the EasyLAN Kit for two computers (EL 02) with 30 feet of cable, two diskettes, two manuals, and two port adapters. EasyLAN also provides printer-sharing and shared hard disk drives between the computers. EasyLAN could pay for itself by eliminating duplicate peripheral equipment. The cost per computer is less than $120. Again, the HUB computer MUST have a serial port for each local computer and 20K of memory. A PC clone can run up to 19,200 baud and an AT clone can run up to 56,000 baud. The cable length can go up to about 500 feet. MS-DOS/PC-DOS 2.0 or higher must be used. The new Version 3.0 EasyLAN NETBIOS requires 50K of memory. Who needs EasyLAN? Users who have two or more computers! These users can avoid expensive duplicate peripherals. EasyLAN will justify large, fast hard disk drives and expensive printers including laser printers. The operations perform concurrently in the background. Communications, file transfers, and printer operations can all take place while each computer simultaneously performs normal DOS applications, like Lotus 1-2-3, dBASE, WordStar, etc. A ten-page document can move between the two computers, in the background, in about one minute. EasyLAN can be installed automatically at boot time (use Autoexec.bat), and manage the computer's serial and parallel ports for communications and printing. All operations can be started from any connected computer. Printer-sharing operates transparently with other existing programs. Print files are automatically written to disk

SAMPLE CONFIGURATIONS

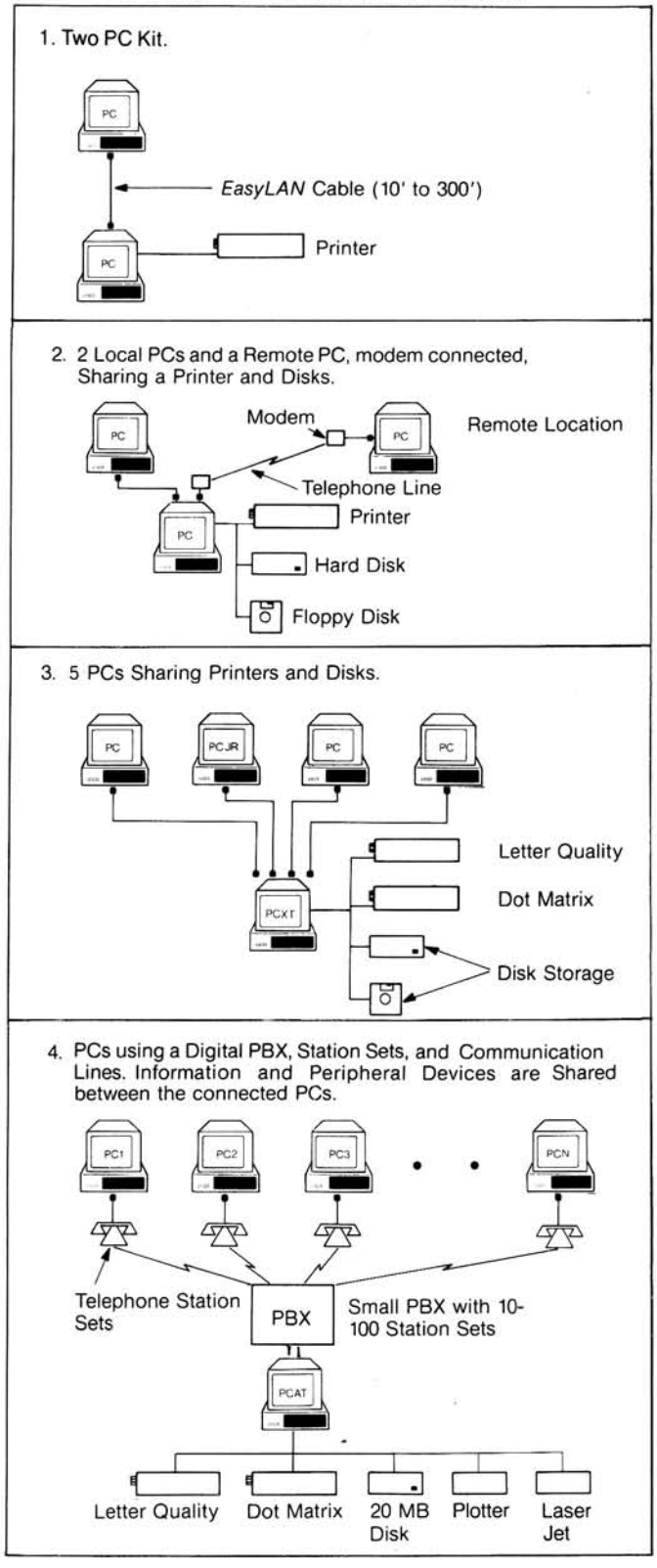


Figure 2

or selected printer. Multiple printers per computer may be designated for specific tasks. For example: one computer can interface with Printer #1 for general printing, with Printer #2 for continuous-form letter head, and with Printer #3 for continuous-form invoices. Disk sharing uses EasyLAN's EZCOPY command to move files to and from connected computers. All operations can be protected by optional passwords and disk drive restrictions.

See Figure 2 for sample EasyLAN configurations! OH! I almost forgot to tell the readers that all cables are shielded to eliminate noise radiation. EasyLAN is as easy to set up as EasyPRINT. Plug in the EasyLAN's adapters and cables using the serial ports. The interactive Install software program provides the easy step-by-step procedures. EasyLAN kits are available to add more computers at any time the user's needs require system expansion at a cost of about $120 each.

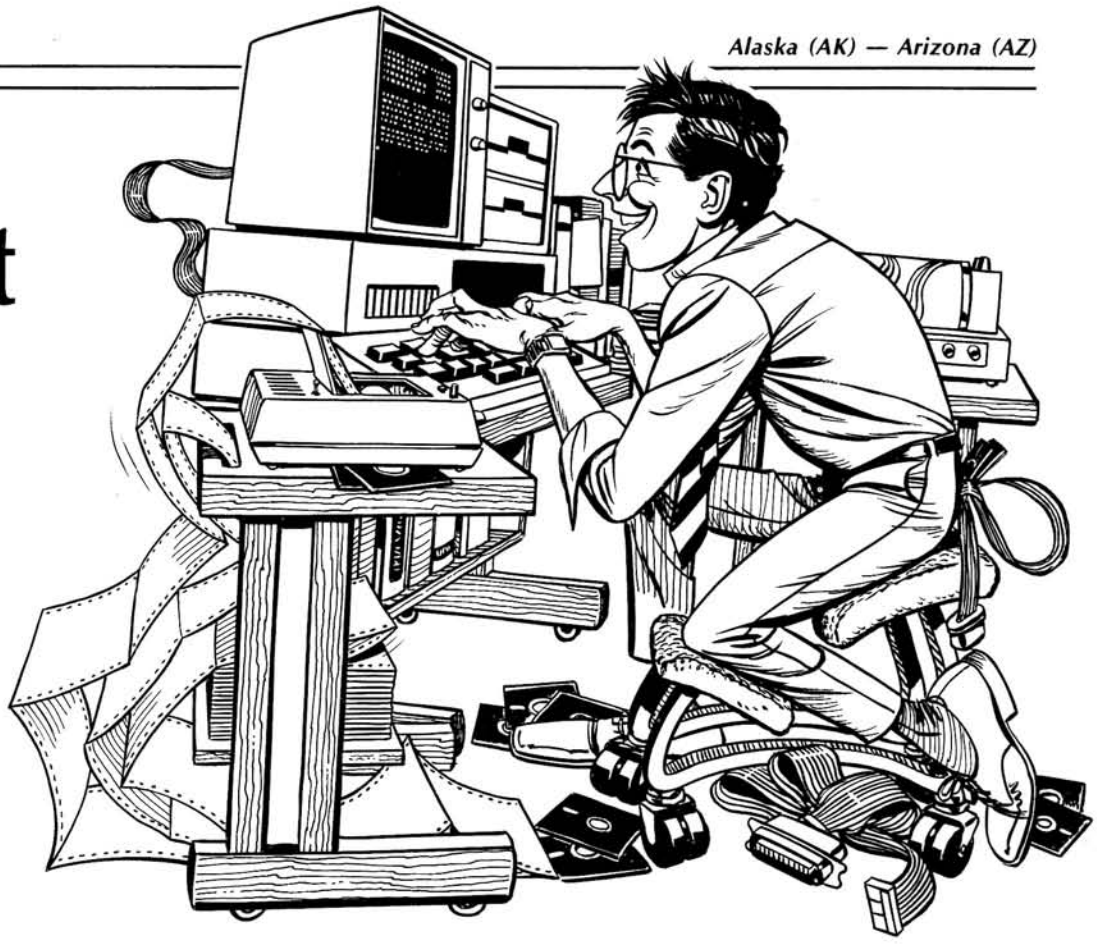
Either of these two systems are easy and low cost. I highly recommend them. For more information, call the following phone numbers. Purchases can be made just as easy.

Server Technology
140 Kifer Court
Sunnyvale, CA 94086
(800) 835-1515 OR (800) 232-7729
In California: (408) 738-8377
EasyPRINT EP-200 ..... $159.95
EasyLAN EL 02 ..... 219.95

CHEETAH International, Inc.
107 Community Boulevard., Suite 5
Longview, TX 75602
(800) 243-3824
In Texas: (214) 757-3001
TriComPlus I/O Board — PC, XT, or AT compatibles
CHEETAH Combo Memory Board — AT compatibles

*

Current Local HUG Clubs



As Of November 1987

ALASKA

AK, Eagle River
Alaska HUG
P.O. Box 770951
Eagle River, AK 99577
(907) 276-5917
(907) 279-7754 Group Size: 15
Contact: Roger Pickels or
Ben Sevier
Meet 3rd Mon 7:00pm Horizon Recovery Center (1650 S. Bragaw). RBBS 9pm-9am Pac Time (907) 276-5917

AK, Ft. Greely
Club no longer in existence.

ALABAMA

AL, Birmingham
BEARHUG (Birmingham HUG)
c/o Jack Goertz
Rte. 19, Box 248
Birmingham, AL 35244
(205) 991-5519 Group Size: 20
Contact: Jack Goertz
Meeting time and place varies.

AL, Huntsville
Club no longer in existence.

AL, Mobile
MOBHUG (Mobile HUG)
6204 Pine Needle Drive S.
Mobile, AL 36609
(205) 675-9742 Group Size: 25
Contact: Gordon Marsh
Meeting time and place varies.

AL, Montgomery
HUG of Montgomery
2948 Willow Lane Drive
Montgomery, AL 36109
(205) 272-6964 Group Size: 50+
Contact: Ronald Travis
Meet 1st Tues 7:30 pm at AF Logs Mgt Ctr.

ARKANSAS

AR, Bella Vista
NW Arkansas Microcomputer User Group (NWA-MUG)
c/o Dr. Kermit Baker
14 Carroll Drive
Bella Vista, AR 72714-3219
(501) 521-2292 Group Size: 30+
Contact: Kermit Baker
Meet 3rd Sat 1pm at NW Voc-Tech School in Springdale.

AR, Little Rock
Club no longer in existence.

ARIZONA

AZ, Phoenix
PHUG (Phoenix HUG)
c/o Tom Luikens
P.O. Box 37783
Phoenix, AZ 85069
Group Size: 60
Contact: Tom Luikens, President
2nd Tues at 7:00 pm at Phoenix HEC
Membership $5 initiation $12/year

AZ, Sierra Vista
HuacHUGa
c/o Gerald King
1964 Viola Drive
Sierra Vista, AZ 85635
(602) 459-2119 Group Size: 30

Contact: Gerald King
Meet monthly at homes of members.

AZ, Sun City
Sun Cities HUG
12739 Mesa Verde Drive
Sun City West, AZ 85375
(602) 584-9181 Group Size: 12+
Contact: Andrew Weilkeiwicz
Meet 3rd Sun at 1:00 pm At HEC

AZ, Tucson
SUNHUG (Tucson HUG)
7109 E Broadway
Tucson, AZ 85710
(602) 325-0096 Group Size: 40
Contact: Allan Anderson
Meet third Sunday 2:00 pm Tucson HEC
BBS (602) 745-0913 300/1200/2400
6pm-9am Mon-Sat, All day Sun

CALIFORNIA

CA, Anaheim
Anaheim Chptr Wstrn Rgnl HUG
330 E. Ball Road
Anaheim, CA 92805
(714) 529-7535 Group Size: 103
Contact: Al Solomon, President
3rd Thursday 7:30 PM at HEC
BB (714) 774-7860

CA, Campbell
San Jose HUG
2350 S Bascom Avenue
Campbell, CA 95008
(408) 377-8472 Group Size: 70
Contact: Gerlene York, Sec.
Meet 1st Wed from 7-8pm at the Campbell HEC.

CA, El Cerrito
ECHUG (El Cerrito HUG)
6000 Potrero Avenue
El Cerrito, CA 94530
(415) 236-8870
Contact: Alan Biocca
Meet 4th Tues

CA, El Monte
ETUG (ET/ETA 3400 Users Group)
Club reorganizing as of 9/85.

CA, Fresno
FresHUG (Fresno HUG)
4833 East Santa Ana
Fresno, CA 93726
(209) 291-6258 Group Size: 12
Contact: Harlen Collins

CA, Glendora
Southern CA H11 Users Group
430 W. Highland Avenue
Redlands, CA 92373
(714) 886-4766 Group Size: 40
Contact: Dr. M.J. Di Girolamo
Meets at 625 E. Palm, Glendora, CA.

CA, Lancaster
AVZUG (Antelope Valley ZUG)
P.O. Box 4529
Lancaster, CA 93535
(805) 942-7576 Group Size: 25
Contact: Jerry Jones
Meet 2nd Thurs at 7:30 pm at members homes.

CA, Los Angeles
Los Angeles HUG
c/o Jim Price
12849 Millbank Street
Studio City, CA 91604-1354
(213) 675-4920 Group Size: 90
Contact: Doug Biddle, President
1st Thursday 7:00 PM at HEC

CA, Los Angeles
LAETUG (Los Angeles ET3400 GP)
2309 S Flower
Los Angeles, CA 90007
(213) 749-026
Contact: Gilbert Murillo
Other contact: Charlie (213) 443-2237
Contact for meeting time and place.

CA, Monterey
Naval Pstgrd Sch Hobby Com Clb
c/o Dave Smith
376 Bergin Dr #F
Monterey, CA 93940
(408) 373-4202 Group Size: 175
Contact: Dave Smith, President

CA, Pomona
Pomona Chptr Wstrn Rgnl HUG
1555 N Orange Grove Avenue
Pomona, CA 91767
(714) 985-5303 Group Size: 102
Contact: Herb Friedman, President
Meet 4th Thursday each month at 7:30 pm at HEC. BB (714) 624-5191.

CA, Redding
Redding Heath Users' Group
22526 Bridlewood Lane
P.O. Box 370
Palo Cedro, CA 96073
(916) 547-3461 Group Size: 6
Contact: Dave Ballard
Meet monthly various locations.

CA, Redwood City
BAHUG Bay Area HUG
2001 Middlefield Road
Redwood City, CA 94063-2890
(415) 365-8155 Group Size: 60+
Contact: Bob Bance, Sec.
Meet 4th Tues 7:00 pm at HEC. BB (415) 365-7836.

CA, Riverside
Club No Longer In Existence.

CA, Sacramento
SHUG (Sacramento HUG)
7607 Maran Avenue
Sacramento, CA 95820
(916) 739-8074 Group Size: 55
Contact: Delven Hamric, President
Meet 2nd Wed 7:30pm at Sacramento HEC. Send mail ATTN: Delven Hamric.

CA, San Diego
San Diego HUG
P.O. Box 33046
San Diego, CA 92103-0340
(619) 484-5120 Group Size: 106
Contact: Clem Pepper
Meet 1st Wed 7:30pm at Kearny-Mesa Rec. Ctr. Monthly guest speakers, Newsletter.

CA, San Diego
San Diego Comp Soc H/Z SIG
P.O. Box 81444
San Diego, CA 92138
(619) 698-2945 Group Size: 176+
Contact: Jon Melby, Chairperson
Meet 1st Sat 10:00 am at La Mesa HEC. 24hr. RC System (619) 461-5117.

CA, San Rafael
Bay Area Zenith Users' Group
4 G Street
San Rafael, CA 94901
(415) 454-2445 Group Size: 25+
Meet 3rd Thurs 7:30 pm at above address.
BB (415) 454-2446.

CA, Santa Maria
4168 Glenview Drive
Santa Maria, CA 93455
(805) 937-6938 Group Size: 24
Contact: Raymond S. Isenson
Meet 1st Mon 7:00 pm at Vandenburg Air Force Base. Meet in Base Library.

CA, Santee
WCHUG (West Coast HUG)
c/o Van Christopher
10784 Magnolia Avenue 2H
Santee, CA 92071
(619) 449-7298
Contact: Van Christopher
Monthly Newsletter - 12 issues/$15.00.
Software Lib ZDS Bulletin Bd Notebk.

CA, Visalia
Visalia HUG

5230 San Joaquin Avenue
Visalia, CA 93277
(209) 739-7228 Group Size: 3
Contact: Peter Shkabara
Meeting time and place not on regular schedule.

CA, Woodland Hills
LUVAHUG
22504 Ventura Boulevard
Woodland Hills, CA 91364
(818) 906-7425 Group Size: 80
Contact: Rick Gaitley
Meet 2nd Thurs. 7:00 pm at HEC.

COLORADO

CO, Colorado Springs
CSHUG (Colorado Springs HUG)
c/o Innovative Computer Service
125 E Arvada Street
Colorado Springs, CO 80906
(303) 632-3019
Contact: Richard Evers
Group is reforming - meeting times not set. 24hr BB (303) 598-4662.

CO, Denver
DENHUG (Denver HUG)
c/o Rob Chapman
P.O. BOX 20023
Denver, CO 80220-0023
(303) 377-3228 Group Size: 86
Contact: Rob Chapman Sec/Tres
BB (303) 331-0982 Support newsltr exchange. Call for meeting time and place.

CO, Denver
Zenith Users' Group
Club no longer in existence.

CO, Ft. Collins
FT.HUG (Fort Collins HUG)
3317 Buckskin Trail
Laporte, CO 80535
(303) 493-2987 Group Size: 30+
Contact: Charles McJilton
Meet 3rd Tue 7:00 pm at members homes. $6.00 dues, Newsletter.

CONNECTICUT

CT, Avon
CONNHUG (Connecticut HUG)
c/o Bob Conlon
1677 Farmington Avenue
Farmington, CT 06085
(203) 589-3824 Group Size: 50+
Contact: Bob Conlon, President
Meet at Greater Hartford Chapter Amer. Red Cross. Meet 1st Wed at 7:00 pm.

CT, Mystic
Mystic ZDS/HUG
P.O. Box 279
Mystic, CT 06355
(203) 536-6953 Group Size: 45
Contact: Larry Moxon
Meet last Thurs 7:00pm at 11 Allen Street, Mystic, CT.

FLORIDA

FL, Cocoa Beach
Brevard Heath Users' Group
Club no longer in existence.

FL, Fort Myers
SWFHUG (Southwest Florida HUG)
P.O. Box 05-0037
Tice, FL 33905
(813) 334-6190 Group Size: 30
Contact: Robert Sloat
Meet 2nd Wed 8:00 pm. Meet at J. Hamilton Welch Academy.

FL, Fort Walton
NWFHUG (NorthWest Florida HUG)
P.O. Box 3275
Ft. Walton Beach, FL 32548
(904) 682-6013 Group Size: 45
Contact: Allan White, President
Meetings 2nd Wed at DATATEC Inc. 7 PM.

FL, Jacksonville
Jacksonville Users Group Inc.
P.O. Box 17547
Jacksonville, FL 32245-7457
(904) 264-9763 Group Size: 150
Contact: Harry Walker
Meet 1st Wed at 7:30 pm at Englewood HS Library. BB (904) 725-4995 24 hrs.

FL, Miami
Miami Amateur Computer Club
c/o Heathkit Electronics Center
4705 W 16th Avenue
Hialeah, FL 33012
(305) 823-2280 Group Size: 85
Contact: Charlie Robertson, Secretary
Meet 2nd Thurs each month 7:00 pm at HEC. BB (305) 823-2281.

FL, Orlando
HUG of Central FL Computer Sc.
P.O. Box 308
Goldenrod, FL 32733-0308
(305) 657-8904 Group Size: 20
Contact: David Chun, Chairperson
Meet 4th Tues each month 7:00pm at Seminole County Library. Corner Rts 17/92 & 436, Casselberry.

FL, Pensacola
PENSAHUG
221 E. Government
Pensacola, FL 32501
(904) 438-7805 Group Size: 15
Contact: Gerry Harris
Meet 2nd Sun each month 2:00 pm at above address. Meet at Professional Business Sys.

FL, Plantation
PHUG (Plantation HUG)
7173 W Broward Boulevard
Plantation, FL 33317
(305) 791-7300 Group Size: 60
Contact: Warren Reeves
Meet 2nd Tues from 7-9 pm at H/Z C&E Ctr. BB (305) 791-7302 24 hrs on Z-150.

FL, Tallahassee
Tally HUG
c/o LPLC
P.O. Box 4276
Tallahassee, FL 32315-4276
(904) 562-1412 Group Size: 10
Contact: Bill Hill
Meet 3rd Tues at Leon Co. Resource Center. In the lower level Northwood Mall.

FL, Tampa
Al Lynch HUG
Tampa, FL 33684-1762
(813) 885-1923 Group Size: 80
Contact: Jim Cottingham, Secretary
Meet 1st and 3rd Wed 7:30 pm at Tampa HEC. Dues $10.00 year.

FL, Winter Park
Martin Marietta Computer Club
1730 Shiloh Lane
Winter Park, FL 32789-5847
(305) 356-3782 Group Size: 300
Contact: George McClure
Meeting time and place varies. Newsletter; BB being established. Evening Phone number (305) 647-5092.

GEORGIA

GA, Atlanta
HUG-GA (Georgia HUG)
c/o HEC 5285 Roswell Road
Atlanta, GA 30342
(404) 449-3328 Group Size: 30
Contact: Tom Campbell
Meet 2nd Mon at 7:00 pm at HEC. BB (404) 252-4345 24 hrs.

GA, Augusta
CSRA Computer Club
P.O. Box 284
Augusta, GA 30903
(803) 648-3603 Group Size: 10
Contact: Dave Howard
Meet 4th Wed-location rotates. BB (803) 279-5392.

GA, Warner Robins
MGHUG Middle Georgia H/ZUG
P.O. Box 1989
Warner Robins, GA 31099-1989
(912) 923-1353 Group Size: 30
Contact: Gary H. Arnett, President
Meet 3rd Tues at Nola Brantley Public Library.

HAWAII

HI, Hilo
BIHUG (Big Island HUG)
P.O. Box 4271
Hilo, HI 96720
(808) 959-8985 Group Size: 20
Contact: R.A. Curtis
Meet 1st Thurs 7:00 pm at HELCO Conference Room. BB (808) 961-4818.

HI, Honolulu
HUGH (HUG Hawaii)
98-878 Olena Street
Aiea, HI 96701
(808) 488-0213 Group Size: 20
Contact: Ted Gladkowski
Meet 3rd Wed 7:00 pm at Pearl City HEC. BB (808) 487-8755.

IOWA

IA, Ames
Ames HUG
c/o George Covert
5006 Todd Drive
Ames, IA 50010
(515) 292-1231 Group Size: 40+
Contact: George F. Covert
Meet 1st Wed 7:00pm Will exchange Newsletters. Meet in room 204 Eng Anx Bldg at ISU.

IA, Des Moines
DMA HUG (Des Moines Area HUG)
10275 NE 23rd Avenue
Mitchellville, IA 50169
(515) 967-6042 Group Size: 21
Contact: Harold Dykens
Meet third Mon each month 7:00 pm.

ILLINOIS

IL, Champaign
CCCC Champaign County Cmp Club
1004 Kinch
Urbana, IL 61801
(217) 344-2178 Group Size: 150
Contact: Jim Mullen
Meet 1st Wed 7:30 pm at Urbana Civic Center. 24hr Public Service BB (217) 359-9090.

IL, Chicago
CHI-HUG (Chicago HUG)
c/o Heathkit Electronics Center
3466 W Devon
Chicago, IL 60645
(312) 674-2491 Group Size: 20
Contact: Hank LaBarbara, President
Meet 2nd Thurs 7:30pm at Chicago HEC. BB (312) 679-8980 after store hours.

IL, Davis
NI-HUG Northern IL HUG
Club no longer in existence.

IL, Downers Grove
I-HUG (Illinois HUG)
6116 Lane
Downers Grove, IL 60516
(312) 971-1660 Group Size: 15
Contact: Len Bateman
3rd Wednesday at various locations.

IL, Downers Grove
HUG Metro (Local Chicago)
124 Arlington Road
Barrington, IL 60010
(312) 358-6293 Group Size: 40
Contact: Marvin Gino, Secretary
Meet 2nd Monday of each Month 7:30 pm at HEC.

IL, Peoria
CIHUG (Central Illinois HUG)
2422 Willow
Pekin, IL 61554
(309) 347-3366 Group Size: 18
Contact: John Cole, Jr.
3rd Sunday at 3 PM (Jan, Mar, May, Jul, etc.)

IL, Springfield
Springfield HUG
2621 S. College
Springfield, IL 62704
(217) 525-1878 Group Size: 12
Contact: Jim or Bobbie Suttie
Club just forming.

INDIANA

IN, Indianapolis
Indiana HUG (IHUG)
7610 Home Drive
Noblesville, IN 46060
(317) 841-0576 Group Size: 75+
Contact: Mark Siminski
Meet 2nd Wed 7:30pm at HEC.

IN, South Bend
MIHUG (Michiana HUG)
620 S. Logan Street
Mishawaka, IN 46544-4834
(219) 255-3923 Group Size: 6
Contact: Mark L. Meidel
Meet 3rd Monday 7:30 pm. Meeting location varies-call first. 24 hr BB (219) 255-4980.

KANSAS

KS, Ellinwood
Library Users' Group-Zenith
Ellinwood School-Community Library
210 N. Schiller
Ellinwood, KS 67526
(316) 564-2306
Contact: Scott B. Mitchum
Meet semi-monthly at different sites around the state. Yearly membership $10.00. Other contact: Elaine den Hoed (316) 225-4171.

KS, Mission
MUG (Micro-Computer Users' Group)
P.O. Box 2093
Mission, KS 66202
(816) 436-3046 Group Size: 50
Contact: Albert Keeler
Meet last Sun of the month 2:00pm at Mission HEC. BB (913) 362-9583 and Newsletter.

KS, Wichita
Wichita HUG
c/o Joe Cross
1029 Burrus
Wichita, KS 67207
(316) 794-2698 Group Size: 30
Contact: Don Robinson
Meet 2nd Thurs at 7:00 pm at Wichita St Univ. Meet in Clinton Hall Room 326.

KENTUCKY

KY, Louisville
Louisville HUG
Club no longer in existence.

LOUISIANA

LA, Baton Rouge
LSU H/Z Users' Group
Dept of Chem Eng LA State Univ
Baton Rouge, LA 70803
(504) 388-1426 Group Size: 40
Contact: Danny Reible, President
Meet 2nd Wed at 4:00pm Ctr for Eng & Bus Admin. $5.00 dues/yr.

LA, Lafayette
ZUG (Zenith Users' Group)
Club no longer in existence.

LA, New Orleans
NOHUG
5305 Janice Avenue

Kenner, LA 70062
(504) 455-3583 Group Size: 60+
Contact: Don Berkowicz
Meet 2nd Thurs.at 7:30 pm at HEC. 24hr BBS (504) 467-9896, Newsletter.

LA, Shreveport
SHRUG Shreveport
Heath Regional Users' Group
c/o Colvin L. Sammons
P.O. Box 752
Barksdale AFB, LA 71110
(318) 742-8552 Group Size: 31
Contact: Colvin L. Sammons
Meet 3rd Wed 7:00 pm at Shreveport-Bossier Votech.

MASSACHUSETTS

MA, Northampton
Hampshire Computer Club
37 Drewson Drive
Northampton, MA 01060
(617) 584-6227 Group Size: 80
Contact: George Scheurer
2nd Tuesday 7 PM at McConnel Hall Smith College. Beginners Group 1st Tuesday.

MA, Peabody
HUG North Shore
12 Stanley Road
Lynnfield, MA 01940
(617) 334-5128 Group Size: 60
Contact: Ernest Bay, President
Meet 2nd Wed at Peabody Heathkit Center. Meet 1st Wed in December. BB (617) 531-9332 24hrs.

MA, Pittsfield
BerCHUG (Berkshire County HUG)
Club no longer in existence.

MA, Wellesley
HUG'EM
165 Worcester Ave
Wellesley, MA 02181
(617) 237-1510 Group Size: 200
Contact: Malcolm Partridge, Director
3rd Wed 7:00 p.m. at HEC. BB (617) 237-1511 24hrs.

MARYLAND

MD, Baltimore
Baltimore HUG
c/o Heathkit Electronics Center
1713 E Joppa Road
Baltimore, MD 21234
Group Size: 50
Contact: James Kratzer
2nd Mon 7:00 pm at Park School - Old Court Road. May also meet at the Heathkit Center.

MD, Rockville
MD Z100 Special Interest Group
c/o HEC
5542 Nicholson Lane
Rockville, MD 20852
(301) 384-1040
Contact: Jerry Horwitz
Meet 1st Mon at 7:30pm at Rockville HEC. This club is a sub-unit of CHUG.

MICHIGAN

MI, Ann Arbor
A SQR HUG
Club no longer in existence.
Contact Len Geisler at (313) 769-6052 for information regarding the Society of Eight Bit Heath Computerists Journal.

MI, Detroit
Metro Detroit Area HUG
35681 Hees
Livonia, MI 48150
(313) 427-3905 Group Size: 65+
Contact: Neil Coffin-Sec, Tres, Librn
Meet 2nd Sat of alternate months at the 2 HECs. Club meets in the evening.

MI, Kalamazoo
SMHUG (Southwest Michigan HUG)
Club no longer in existence 12/85.

MI, Okemos
H/Z SIG a part of M3G
2283 Knob Hill Drive #12
Okemos, MI 48864
(517) 349-9657 Group Size: 10+
Contact: Bill Goodwin
Meet 2nd Wed at 7:30pm. Meet at All Saints Episcopal Church.

MI, St. Joseph
BLHUG (Blossomland HUG)
P.O. Box 414
Saint Joseph, MI 49085
(616) 982-3626 Group Size: 50
Contact: Bill Wilkinson
1st Tues 7:00 pm at St Joe High Sch Cmptr Classrm. $15.00 dues/yr Monthly Newsletter. 24 hour BB (616) 982-3682.

MINNESOTA

MN, St. Paul-Minneapolis
SMUGH
H/Z Computers & Electronics
101 Shady Oak Road
Hopkins, MN 55434
(612) 824-8822 Group Size: 230+
Contact: Jack Lindeman, President
Meet last Sun 2:00 pm at Falcon Hgts Comm Ctr. BB (612) 778-1213 24 hrs.

MISSOURI

MO, St. Louis
SLHUG (St. Louis HUG)
3794 McKelvey Road
Bridgeton, MO 63044
(618) 259-8113 Group Size: 140
Contact: Brad Pulaski, Treasurer
Meet 2nd Thurs 7:00 pm at HEC. 24hr BBS (314) 291-8653.

MS, Starkville
Mississippi St University HUG
PO Box 6269
Mississippi State, MS 39762
(601) 325-3050 Group Size: 30
Contact: Dr. Harry Cole
Do not meet on a regular basis.

NORTH CAROLINA

NC, Charlotte
HUG Charlotte
4415 Emory Lane
Charlotte, NC 28211
(704) 364-9667 Group Size: 25
Contact: Mike Lafleur
Meet 1st Tues at 7:30 pm.

NC, Fayetteville
Club no longer in existence.

NC, Glen Alpine
Western Piedmont HUG
Rt 2, Box 371
Morganton, NC 28655
(704) 584-3684 Group Size: 10
Contact: Bill Poteat
Meeting time and place varies. Will have BB.

NC, Greensboro
Carolina HUG
2711 Azalea Drive
Greensboro, NC 27407
(919) 855-5188 Group Size: 40
Contact: Graham Andrews
Meet 3rd Thurs at 7:30 pm at Greensboro HEC. BB (919) 292-5392 after hours.

NC, Hillsborough
HUG-RTP
Club no longer in existence.

NORTH DAKOTA

ND, Grand Forks
GFHUG (Grand Forks HUG)
19 Vail Circle
Grand Forks, ND 58201
(701) 772-3033
Group Size: 3
Contact: Charlie Robertson
Meeting time and place varies.

NEBRASKA

NE, Omaha
OMAHUG (Omaha HUG)
P.O. Box 777
Bellevue, NE 68005
(402) 291-8402 Group Size: 80
Contact: Mark Frederick, President
Meet 4th Sun at 7:00 pm in Humanities Bldg at Bellevue College. O.N.E.D. BBS, 300/1200 Baud, 24 hours (402) 291-6272.

NEW HAMPSHIRE

NH, Amherst
HUG of New Hampshire
61 Stearns Road
Amherst, NH 03031
(603) 673-6040 Group Size: 23
Contact: Dean Hayden-Macy
Meet 2nd Mon 7:30 pm at APR International, Harris Pond, Merimack, NH. BB (603) 673-7366 also (603) 465-2280.

NEW JERSEY

NJ, Fairlawn
HUGNJ (HUG of New Jersey)
c/o AMBI-TECH
319 Knickerbocker
Hillsdale, NJ 07642
(201) 666-0504 Group Size: 155
Contact: Matt Baum
BB (201) 791-6936 evenings. 3rd Monday 8:00pm at HEC.

NJ, Ocean
SHUG (Shore HUG)
1013 State Hwy 35
Ocean, NJ 07712
(201) 775-1231 Group Size: 71
Contact: James J Jones Jr. (Sec)
Meet 1st Wed 7:30 p.m. at Ocean HEC. BB (201) 775-8705 24hrs.

NEW MEXICO

NM, Albuquerque
Albuquerque HUG
1200 Madeira Drive, SE #126
Albuquerque, NM 87108
(505) 266-0677 Group Size: 25+
Contact: Jim Pattee, President
Meet 3rd Sun at Que Pasa Recreational Ctr, Kirkland AFB. Newsletter, 24hr BB (505) 292-6770.

NEW YORK

NY, APO New York
BWHUG (Bentwaters HUG)
PSC Box 3703 RAF Bentwaters
APO New York, NY 09755
Group Size: 6
Contact: TSGT Rodney Jones
Phone Autouon 225-2161 or Saxmundham 3519.

NY, APO New York
BAHUG (Bad Aibling HUG)
UNIT AA Box 561
APO New York, NY 09098
Group Size: 10
Contact: Louis J. DeMichele
Phone 08061-4519/6340 West Germany

NY, Buffalo
BUG (Buffalo Users Group)
c/o Heath/Zenith Computers & Electronics Center
3476 Sheridan Drive
Amherst, NY 14226
(716) 892-9389 Group Size: 75
Contact: Frank Jager
Meet 3rd Tues 7:30 pm at Amherst HEC. Club doesn't meet July, Aug or Dec. BB 24 hr (716) 835-0443.

NY, Long Island
Jeri-HUG (Jericho HUG)
5 Helen Place
Glen Cove, NY 11542
(516) 676-5616 Group Size: 75
Contact: Alan Scott Dodge, Sec./Tres.
Meet 2nd Thurs at 8:00 pm at the Jericho HEC. Newsletter, Software library, BB.

NY, North White Plains
North White Plains HUG
c/o HEC
7 Reservoir Road
North White Plains, NY 10603
(914) 761-7690 Group Size: 50
Contact: Ed Koch
Meet 2nd Tues. ea mo 7:30 pm at HEC.

NY, Potsdam
CUHUG (Clarkson University)
Attention: Educational Computing
Clarkson University
Potsdam, NY 13676
(315) 268-6455 Group Size: 60
Contact: William Kaster
Meet monthly-call for date, time and place. Alternate Contact Person: Donna Lee.

NY, Rochester
RH/ZUG (Rochester H/ZUG)
937 Jefferson Road
Rochester, NY 14623
(716) 424-2560 Group Size: 55
Contact: RHUG Editor, Blanche Nail
Meet last Tuesday each month 7:30 pm at HEC. BB (716) 424-2576.

NY, Schenectady
Schenectady HUG
c/o T. Budge
715 Sanders Avenue
Scotia, NY 12302
(518) 377-4273 Group Size: 20
Contact: Walter Whipple
Meet 3rd Wed 7:30 pm at above address.

NY, Syracuse
SYRHUG (Syracuse HUG)
c/o Garrett Voss
Box 6
Oran, NY 13125
(315) 682-5113 Group Size: 18
Contact: Garrett Voss
Meet 1st Wed at 7:00 pm. 24 hr BB (315) 682-6912.

OHIO

OH, Cincinnati
Cincinnati HUG
10133 Springfield Pike
Woodlawn, OH 45215
(513) 771-8850 Group Size: 90
Contact: President
2nd Tuesday 7:00 pm at HEC, $10.00 dues/year. Newsletter, 24hr BB (513) 772-6190.

OH, Cleveland
NOHUG (Northeastern Ohio HUG)
7838 Valley Villas Dr.
Parma, OH 44130
(216) 845-6752 Group Size: 54
Contact: Don Danko, Sec.
Meet 2nd & 4th Thurs 7pm at St. Gregorys Church.

OH, Cleveland
Cleveland HUG
28100 Chagrin Boulevard
Cleveland, OH 44122
(216) 291-0698 Group Size: 30
Contact: Kent Currie
First Thurs 7:00 p.m. at HEC. BB (216) 292-7554 Non-store hrs only.

OH, Columbus
Columbus HUG
2095 Milden Road
Columbus, OH 43221
(614) 457-0419 Group Size: 40
Contact: Jay Eikes
Meet 2nd Tues at HEC. BB (614) 475-7201 after store hours.

OH, Dayton
Dayton HUG
c/o Mark Roth
P.O. Box 33070
Dayton, OH 45433
(513) 667-8155 Group Size: 179

Contact: Mark Roth
Meet 3rd Thurs at 4:15 at Flt Dyn Lab, Bldg 146, Rm 203E.

OH, Toledo
THUG (Toledo HUG)
c/o Jack Westbrook
526 Cambridge Park South
Maumee, OH 43537
(419) 891-5446
Contact: Jack Westbrook
Club reorganizing. BB (419) 474-1175.

OH, Youngstown
YOU-HUG
c/o Medesa Computer Systems
1847 Woodland Trail
Youngstown, OH 44515-4821
(216) 799-5028 Group Size: 12
Contact: Mario DeSantis
Club just getting started.

OKLAHOMA

OK, Oklahoma City
OKC TUGS
c/o Bill Cadwallader
P.O. Box 1171
Lawton, OK 73502
(405) 848-7593 Group Size: 40
Contact: Bill Cadwallader
Meet 3rd Thurs 7:30 pm at HEC. BBS (405) 848-9329 24 hours.

OK, Tulsa
Tulsa HUG
23 Glenwood Estates
Claremore, OK 74017
Group Size: 5
Contact: Christian Kessler
Meet 2nd Tues at members homes. Club just starting - No dues.

OREGON

OR, Salem
SHUG Salem Heath Users' Group
P.O. Box 13434
Salem, OR 97309
(503) 393-0786 Group Size: 21
Contact: Ken Hiigel
Meet 2nd Tues each month. Contact Ken Hiigel for location.

PENNSYLVANIA

PA, Allentown
Lehigh Valley HUG
c/o Bob Kendi
Cpt Ctr Lehigh Un
Mart Library 8-B
Bethlehem, PA 18015
(215) 770-5993 Group Size: 30
Contact: James Batug
2nd contact Bob Kendi (215) 861-3992.
Meet 2nd Sat at Lehigh University.

PA, Frazer
FUG (Frazer Users Group)
4631 Pine St G-101
Hiladelphia, PA 19143
(215) 387-5572 Group Size: 80
Contact: Colin McGowan, President
Meet 1st Wed 7:00 pm at Frazer H/Z C&E Ctr. BB (215) 644-7661.

PA, Harrisburg
CPaHUG (Cent Pennsylvania HUG)
c/o Ernest Asper
7540 Mourningstar Drive
Harrisburg, PA 17112
(717) 545-2764 Group Size: 7
Contact: Ernest E. Asper
Meeting time & place varies. Club just getting started.

PA, Philadelphia
Philadelphia Heath Users'Group
P.O. Box 8184
Philadelphia, PA 19101-8184
(215) 387-5572 Group Size: 58
Contact: Colin C. McGowan
Meet 2nd Wed each month 7:30 pm at HEC. RBBS (215) 288-0262.

PA, Pittsburgh
Pittsburgh HUG
3482 William Penn Highway
Pittsburgh, PA 15235
(412) 882-5932 Group Size: 53
Contact: Bill Pridemore, President
Meet 3rd Tues at 7:00 pm at HEC. Newsletter.

RHODE ISLAND

RI, Warwick
HUG-'RI' (HUG of Rhode Island)
558 Greenwich Avenue
Warwick, RI 02886
(401) 738-5150 Group Size: 150
Contact: Dave Haskell or Bill Rothman
2nd Wed 8:00 pm at HEC.

SOUTH CAROLINA

SC, Anderson
Anderson HUG
Regency Park
401 Tiffany Drive
Anderson, SC 29621
(803) 225-0084 Group Size: 8
Contact: John R. Miller
Meet time and place varies. Club just starting.

SOUTH DAKOTA

SD, Sioux Falls
Sioux Falls Area HUG
2001 S Spring Avenue
Sioux Falls, SD 57105-2820
(605) 336-8629 Group Size: 20
Contact: Lorin Dobson
Meet once a month on Sat-time and place varies. BB (605) 336-3935 24 hrs.

TENNESSEE

TN, Knoxville
ETCHUG East Tenn Central HUG
1304 Witthollow Road
Sevierville, TN 37862

(615) 428-2057 Group Size: 20
Contact: G.R. Stradley
Meet 3rd Thurs 7:30 pm. Meet at John XXIII Center.

TN, Memphis
Memphis HUG
Club inactive as of Jan 1986.

TN, Nashville
Mi Te HUG (Middle Tenn HUG)
c/o Radio Ser Ctr
116 17th Avenue S
Nashville, TN 37203
(615) 242-0556
Contact: Charlie Wolf
Meet 2nd Monday 6:30 pm at Radio Service Center.

TEXAS

TX, Austin
AHUG Austin Heath Users Group
4206 Tamarack Trail
Austin, TX 78727
(512) 255-0376 Group Size: 60
Contact: George Koehler
Meet 1st Thurs 8:00pm Univ. of TX $10.00/yr dues. Meet at Robert Lee Moore Hall.

TX, Dallas
Dallas Personal Robotics Group
814 Mockingbird Circle
Lewisville, TX 75067
(214) 690-1575 (between 6-10 pm)
Contact: Joe Rowe, President
Meet the third Sat 3:00 pm at the Dallas H/Z Computer Center. Have Newsletter, annual dues of $10.00.

TX, Dallas
Dallas-Fort Worth (DFW HUG)
c/o Heath/Zenith Computers &
Electronics Center
12022-C Garland Road
Dallas, TX 75228
(214) 327-4835 Group Size: 70
Contact: Phil Hanus, President
Meet 1st Tues 7:30 pm at HEC. Meet 3rd Wed at 7:30 pm at Tex-Matics Computer Store. BB (214) 742-1380.

TX, El Paso
EPHUG
5436 Van Horn
El Paso, TX 79904
(915) 821-3488 Group Size: 30+
Contact: Rick Peterson
Meet 3rd Wed. 7:00 pm 444 Executive Ctr Blvd. Suite 100 24hr BB (915) 821-3638.

TX, Ft. Worth
FWHUG
6825A Greenoakes Road
Ft. Worth, TX 76116
(817) 737-8822 Group Size: 60
Contact: Kent Young
Meet 4th Thurs 7:30 pm at HEC.

TX, Houston
HUG-H
7798 Braniff
Houston, TX 77061
(713) 644-5689 Group Size: 75
Contact: Tom McCormick, President

TX, Houston
NHHUG (North Houston HUG)
20207 Cotton Glade
Humble, TX 77338
Group Size: 50+
Contact: Barbara Gabner, Secretary
Meet 3rd Tues 7:30 at HEC. 24 hour BB (713) 583-1287.

TX, San Antonio
San Antonio (SAHUG)
7111 Blanco Road
San Antonio, TX 78216
(512) 341-8876 Group Size: 65
Contact: Tom Schneider
First Tuesday at HEC, 7:30 PM.

TX, Wichita Falls
NORTEX HUG (N. Texas S. Okla)
4510 Allendale Road
Wichita Falls, TX 76310-2102
(817) 691-0814 Group Size: 42
Contact: Alan D. Martin
Meet 3rd Sat 9am at MicroEducation Institute. Meet at 4550 Seymour Hwy.

UTAH

UT, Castle Dale
Castle Mesa Computer Group
670 N 90 E Box 587
Castle Dale, UT 84513
(801) 381-5173 Group Size: 10
Contact: Doug Sorensen
Meet 2nd Mon 5:30 pm at above address.

UT, Midvale
UHUG (Utah HUG)
58 E. 7200 South
Midvale, UT 84047
(801) 262-8810 Group Size: 130
Contact: Wayne Newland
2nd Wednesday 7:00 PM at HEC. BB (801) 566-4551.

VIRGINIA

VA, Arlington
CHUG (Capital HUG)
P.O. Box 16406
Arlington, VA 22215-1406
(703) 339-7330 Group Size: 1000
Contact: Dick Heintze
Meet 3rd Mon 7:00 pm at Fairfax High School. (703) 339-9857 for Club info recording. Large Software Library (150+ disks). CHUG FIDO (703) 339-9856.

VA, Christiansburg
New River Valley HUG
c/o CCS Data Sta.
8 Roanoke Street
Christiansburg, VA 24073
(703) 382-4234 Group Size: 42
Contact: Ted Fleshman
Meet 1st Thurs 7:30 pm Christiansburg High School.

VA, Hampton
PENHUG (Peninsula HUG)
500 Carters Grove Court
Hampton, VA 23663
(804) 851-0974 Group Size: 20+
Contact: Doug Church
Meet 2nd Tues 7:30 pm at NASA Langley Building 1194A.

VA, Richmond
RHUG (Richmond HUG)
4302 Smithdeal Avenue
Richmond, VA 23225
(804) 231-6759 Group Size: 20+
Contact: Carlos Chafin
Meet 3rd Mon 7:30 pm. Meet at Alpha Audio 2049 W Broad.

VA, Virginia Beach
THUG (Tidewater HUG)
1055 Independence Blvd.
Virginia Beach, VA 23455
(804) 467-4783 Group Size: 90
Contact: Hank Rogerson
Meet 1st & 3rd Thurs. 7:30 pm at H/Z C&E.

WASHINGTON

WA, Bellevue
PNHUG (Pacific Northwest HUG)
54 Glacier Key
Bellevue, WA 98006
(206) 747-2322 Group Size: 250
Contact: Dave Banks
Meet 2nd Thurs odd months Federal Way HEC (both 7:00). Meet 2nd Thurs even months Seattle HEC.

WA, Kennewick
Tri-Cities HUG/ZUG
2714 W. John Day
Kennewick, WA 99336
(509) 735-7008 Group Size: 20+
Contact: Pete Roberson

Meet 4th Tues 8:00 pm - location varies. 2nd Contact John Nelson (509) 375-0300.

WA, Spokane
SPOHUG (Spokane HUG)
S. 3810 Havana
Spokane, WA 99204
(509) 448-9727 Group Size: 25
Contact: Charles Ballinger/Ron Hodges
Meet last Thurs 7-9pm at Acme Business Computers. Alternate phone (509) 448-5009.

WA, Vancouver
Portland-Vancouver HUG
516 SE Chkalov Drive
Vancouver, WA 98663
(206) 254-4441 Group Size: 46+
Contact: Dan Heims
1st Thursday at 7:30 PM at HEC. Portland OR and Vancouver Area. BBS (503) 648-5591 (special section for ZPC users).

WA, Walla Walla
HUG/ZUG of Walla Walla
112 N. Division
Walla Walla, WA 99362
(509) 525-8404 Group Size: 8+
Contact: Pat Hanna
Meet 2nd & 4th Tues 8pm at 112 N Division. 2nd cont Pete Parcells (509) 527-5267.

WISCONSIN

WI, Madison
Madison Area HUG
3519 Tally Ho Lane
Shorewood Hills, WI 53705
(608) 233-4588 Group Size: 25
Contact: Thomas Gans
Meet 1st Wed 7:30pm at Wisconsin Union South.

WI, Madison
UWHUG (Univ of Wisconsin HUG)
109 N Few
Madison, WI 53703
(608) 257-0373 Group Size: 30
Contact: Walter Burt
Meet 1st Wed 7:30pm at Univ WI Union South. Club newly formed 12/83.

WI, Milwaukee
MHUG Milwaukee Heath Users' Gp
9040 N. Lake Drive
Milwaukee, WI 53217
(414) 352-3346 Group Size: 80
Contact: Marvin Olson, Tres.
Meet 3rd Sat 2:00pm at Milw Sch of Eng Rm L-100.

WI, Mosinee
CWHUG-Central Wisconsin HUG
Club no longer in existence.

BELGIUM
27, Avenue des Marguerites
B-1970 Wezembeek-OPPEM BELGIUM
Group Size: 4+
Contact: Will Degeest
Meet 1st Tues 8:00 pm at Cafe "Alice's". Cafe is in Brussells, BELGIUM.

CANADA, Calgary, ALBERTA
Heath Users of Calgary
#101-5809 Macleod Trail South
Calgary, Alberta T2H 0J9 CANADA
(403) 252-2688 Group Size: 20
Contact: Bill Jones
Meet 1st Tues at 7:00pm at Calgary HEC. Club reorganized March 1985.

CANADA, Edmonton, Alberta
HUGOE (H/Z Users' of Edmonton)
17314 106 Avenue
Edmonton, Alberta CANADA T5S 1H9
(403) 482-4656 Group Size: 12
Contact: Edward Hrdlicka
Meet 1st Wed at 7:30pm Meeting place varies. BB (403) 454-6093.

CANADA, Ottawa, ONTARIO
HUG 'O' (HUG Ottawa)
866 Merivale Road
Ottawa, ONTARIO K1Z 5Z6 CANADA
(613) 728-3731 Group Size: 30
Contact: Brian Fultz, President
2nd Wednesday 8:00 PM at HEC.

CANADA, Toronto, ONTARIO
THUG (Toronto and area HUG)
54 Camrose Crescent
Scarborough, Ont. CANADA M1L 2B7
(416) 755-0853 Group Size: 20
Contact: Stephen Dugas, President
Meet 2nd Thurs 7:30pm - meeting place varies. BB (416) 755-8823.

CANADA, Vancouver BC
VANHUG (Vancouver HUG)
3058 Kingsway
Attn: Robert Hudak
Vancouver BC, CANADA V5R 5I7
(604) 437-7626 Group Size: 50+
Contact: Robert J Hudak
Meet last Tues 7:30 pm at HEC.

CANADA, Vancouver, BC
Vancouver Island HUG
Suite 304, 560 Johnson St
Victoria, BC CANADA V8W 3C6
(604) 384-3134 Group Size: 9
Contact: Greg Greene, President
Meet 2nd Wed 7:30 pm at Dogwood Software.

ENGLAND, Gloucester
United Kingdom Users' Group
ZDS Limited Bristol Road
Gloucester,GL2 6EE, ENGLAND
0452-29451 Group Size: 80
Contact: Philip Meek
Group does not hold regular meetings.

FRANCE, Paris
GUFI (French HUG)
37 Boulevard Saint-Jacques
75014 Paris, FRANCE
1 565 10 11 Group Size: 350
Contact: Dr. Bernard Pidoux
Meet every WED at 7:00 pm at club address. CBBS +33 (1) 45 65 10 09.

HOLLAND, Apeldorn
See NETHERLANDS club listing.

HONG KONG
Compudragon
273 Prince Edward Road
11/C Kowloon, HONG KONG
3-711-8904
Contact: K.T. Lee
Club just organizing.

KOREA, Yongsan, Seoul
K-HUG
HHC 1st SIG BDE c/o LTC Dismukes
APO San Fran, CA 96301
293-4132 Group Size: 6
Contact: LTC William Dismukes
Just started-monthly meetings not established.

NETHERLANDS
Dutch Heath Users' Group
NIEUWE KERKHOF 16
9712 PV Groningen, NETHERLANDS
050-180203 Group Size: 120
Contact: Evert Jan Stokking
Meet quarterly at Amersfoort.

NEW ZEALAND
HUG New Zealand
94 Dowse Dr
Maungaraki, Lower Hutt, NEW ZEALAND
695-924 Group Size: 1
Contact: Mr. R. Siebers
Would appreciate New ZInd REMark readers contact. Eager to expand group.

OKINAWA
OKIHUG (Okinawa Users Group)
c/o American Computer Services
P.O. Box 443
Okinawa, JAPAN 904-99
09893-6-4321 Group Size: 22
Contact: American Computer Services
Meet 2nd Fri at 7:00 pm at American Computer Service< Classroom.

PANAMA CANAL
Club no longer in existence.

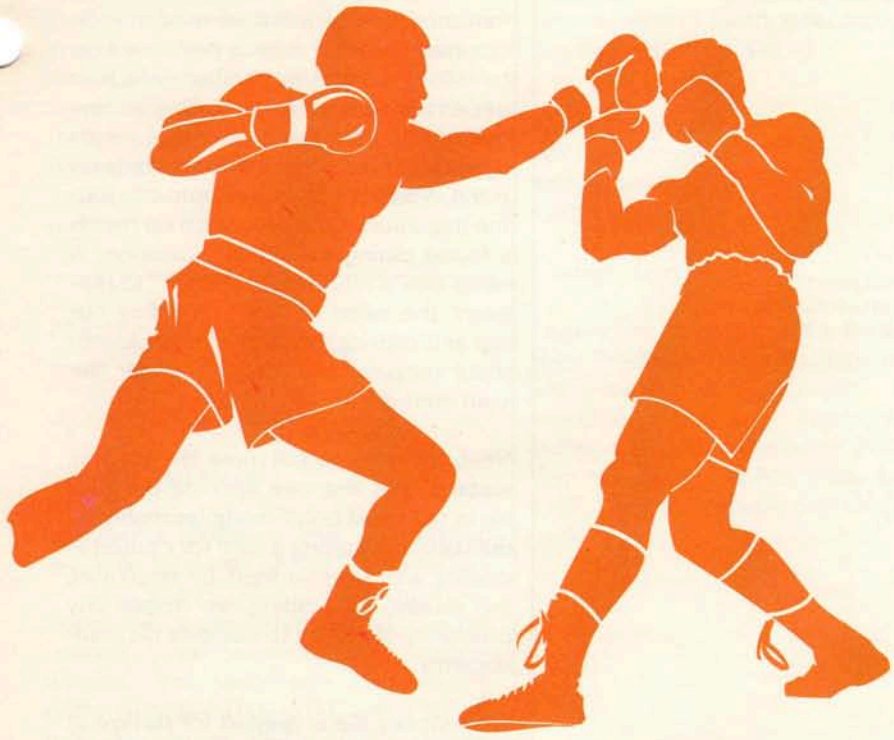
PUERTO RICO, Rosario
PRHUG (Puerto Rico HUG)
Calle La Paz #706, Miramar
Santurce, PR 00907
(809) 722-1612 Group Size: 30
Contact: Joseph Gonzalez
Meet 2nd Sunday of odd numbered months.

SCOTLAND, EDZELL
EDZELL HUG
Box 517 NSGA EDZELL
FPO New York, NY 09518
EDZELL-7254 Group Size: 3
Contact: Lt. Dave Smith
Club very interested in expanding.

SPAIN, Zaragoza Air Base
Small Computers Users' Group
1986 ISS/DOA
APO NY 09286-6346
Contact: MSGT John E. Johnson, Jr.
Formalized group in March 1986.

WEST GERMANY
North Baden Computer Users Group
Amselweg 9
D-7500 Karlsruhe 31, FRG
WEST GERMANY
0721-704452 Group Size: 120
Contact: Peter H. Breitfeld
Contact maintained via RBBS and mail. RBBS:(HUGPBBS) CCITT standard (V21) 300/8/N/1. Data line: 0721-709871. German-American Public Domain Data Bank for CP/M and MSDOS.

*



C_Power Part 9

John P. Lewis
6 Sexton Cove Road
Key Largo, FL 33037

The last C_Power article, part eight of this series, dealt essentially with an evaluation of Turbo C. My enthusiasm for "C", in general, and Borland's excellent product, in particular, may not be legend, but is certainly self evident by now. That first impression has been reinforced through the creation of a calendar program, something I had been wanting to do for some time. The algorithm itself is not terribly sophisticated or large. It merely displays the typical six row, seven column alpha/numeric/graphics representation of any month of any year (user specified), making adjustments for leap year, if needed. The point to my little discourse is that this is the kind of program many users will be generating with Turbo C. I found it to be a real asset in aiding the development of "CALENDAR.EXE". The high speed execution of this little gem can also be attributed, in large part, to my favorite compiler.

For those of you who just climbed aboard for a voyage into the realm of C_Power, let me clarify our course and destination. The hardware employed will be IBM PC compatible. Any version of MS-DOS, starting with 2.0, should be ok. The code included in this article, as well as succeeding articles is/will be written for Borland's Turbo C compiler. Our destination: A tutorial on the "C" language, beginning with a database program featuring a versatile, high speed retrieval system. Those of you who already own a "C" compiler and don't care to invest in another one will find some changes must be made in the code before successful program EXECUTION can occur. Most of these changes are quite minor and will be in the area of disk I/O.

My own hardware, for interested parties, is a Heath HS-148 computer with one floppy, a 20 meg hard disk, 640 K of Ram, and a Paradise hi res board working with a high resolution monitor (Zenith monochrome). Since I'm on the go a lot, I also use a Zenith Z-181 for both program creation and writing. The portable is equipped with 640 K of Ram, as well. Two 3-1/2" drives are standard equipment. I use a communications program and a null modem cable to transfer files back and forth between the two machines.

Ok, enough about hardware. We have a lot of ground to cover in just one article, so let's get started. C_Power veterans will recognize the attached program listing as the same source code used for the first six parts of this series, modified for compilation under Turbo C (some areas have been streamlined a bit, as well). We will peruse the listing in a top down manner as before. Additionally, please note that I have elaborated on the original commenting, an effort to provide more continuity to the reader. Anyone desiring more detail should obtain the back issues of REMark containing the previous C_Power articles (March 87 through August 87).

Looking at the top of the source code printout (below my credit line), you will see a listing of the include files. Pclib.c is, of course, the library file provided in Part 8 of this series. A couple more items of interest here are some strange sounding file names unique to Turbo C, namely stat.h and fnctl.h. Both of these files are provided to complement the disk I/O. Nothing unusual about the rest of the include files or, for that matter, the definitions that follow.

I'm guilty of bending one of the rules governing global variables in "C". I make rather extensive use of them in most of my programs and this one is no exception. You will notice a rather lengthy list immediately below the definitions. The value of a global variable is that when it is changed within a function or elsewhere, it is changed throughout the program. Exactly the opposite to declaring a variable within a function. This action has its drawbacks, but can reduce the parameter passing needed by the program.

Listing 1

```
/* PCLIB.C screen and string function library for the PC. Written */
/* to compile and run under Turbo C., using MS-DOS 2.0 or later */
/* ************ by John P. Lewis ********** */
#include <dos.h>
#include <stdio.h>
#define VIDEO 0x10

void locate(x,y)
int x,y;
{
  union REGS regs;
  x-=1;y-=1;                        /* enable first = 1 */
  regs.x.ax=(2 << 8) + 00;            /* set cursor position */
  regs.x.dx=(x << 8) + y;           /* this routine locates the cursor */
  regs.h.bh=0; /* video page = 0 */    /* at row x and col y */
  int86(VIDEO, &regs, &regs);
  }

void cls()
{
  union REGS regs;
  regs.h.ah=7;                  /* clear screen function */
  regs.x.cx=(00 << 8) + 00;     /* top left of screen */
  regs.x.dx=(23 << 8) + 79;     /* bottom right */
  regs.x.bx=(15 << 8) + 00;
  regs.h.al=0;
  int86(VIDEO, &regs, &regs);
  locate(1,1);                  /* locate cursor row 1, col 1 */
}

void clr_dn(row1,row2)
int row1, row2;
{
  union REGS regs;
  row1-=1;row2-=1;            /* enable usage first row = 1 */
  regs.h.ah=7;                /* clears the screen between and including */
  regs.x.cx=(row1 << 8) + 0;  /* row one, and row two */
  regs.x.dx=(row2 << 8) + 79;
  regs.x.bx=(15 << 8) + 00;
  regs.h.al=0;
  int86(VIDEO, &regs, &regs);
}

gofor(c,i)
int i;                      /* retrieves a string of maxnumchars */
char c[];
{
int j;
for(j=0; j <= i && c[j-1] != 13 ; ++j)
}
c[j]=getch();printf("%c",c[j]);
if ( c[j]==8)
  {
  printf(" %c",8);j-=2;
  }
}
puts("");c[j-1]=;\0;;
}
```

Next we come to the program functions, starting with a pair of routines to open the data file. The first order of business is to determine if the file already exists. "Stat" returns a 0 if it finds the file name specified. If the value returned is other than zero, the file is created under the write mode, otherwise, it is opened under the update mode, as shown. While you are examining this code, notice that Turbo C uses a "handle", as well as a "stream". This syntax was new to me when I began recoding this program, and I spent quite a bit of time in getting it to work the way I wanted it to. You may experiment with these routines until your computer runs out of electrons or whatever, but I don't think you will find a more expedient way to do the job.

Moving on down, we encounter a trio of routines that work hand in hand. The first, "search" reads the company and name fields into the search area delineated in "string[SIZE]". Each record is read, written into its location within "string", and then its neighbor is treated the same way until the entire file has been parsed. Next, "srch2" is employed to retrieve a string from the user which is then used to look for a match. A little math is performed on the value returned by "jindex" which in turn is handed back to the calling routine (option one from the main menu) resulting in an "offset" to be used in records retrieval. A trap has been built into this routine that informs the user when no match is found during the search operation. A minus one is returned by "jindex" to represent the value of "loc", enabling our trap and causing the display of an appropriate message (see case '1' under the main menu).

Next, we come to still more file handling routines, the first one opening our data file in the "read only" mode (probably redundant, but casting a vote for caution in dealing with random files). By employing this routine for reading, we negate any possibility of writing to our data file inadvertently.

A temporary file is needed for storage of our sorted data; hence, we create one much as we did before, but without checking for the existence of the same. The need for checking is obviated by the procedure we must follow. Destruction of any file on disk named "temp" is predicated by this operation, since first, we create the above named file, store our sorted data in it, erase the original file, and finally, rename the temporary file to that of the original. Need I mention what would happen to any file named "temp" on our disk prior to the invoking of the sort routine?

Perusing further, we find yet another file opening routine; however, the "file", in this instance, is actually the printer. We are merely following a "C" convention which dictates that we treat peripheral devices as files.

I borrowed some terminology from BASIC for the next function.

Lprint seemed to be a good name for a routine which sent data to the printer. This algorithm retrieves an entire record a character at a time, sends the appropriate number of characters for each field to the printer, follows each field with a carriage return/line feed combination, and then returns to the calling code segment. A provision is also made for multiple copies when only one record is accessed.

OK, we have arrived at the last group of functions, all of which are devoted to do-

ing just one job — sorting the database. A number of tasks must be accomplished before the records can be put in order. We must first choose an element of each record for comparison, determine if the elements are in order and swap them if not, meanwhile maintaining a reference to their location on disk. Then determine when the records are in the desired order, retrieve the records from disk in their new order, and finally, write them back to disk in sequence. This might sound like a tall order, but turns out to be a "piece of cake" when each job is approached individually.

The user chooses to sort by name or zip (menu option five), thereby assigning a value to "pad". Pad is then used by function prepared to select a group of characters from the record to parse — backwards. An unusual method of string retrieval, you say? I have to agree, but necessitated by the relative position of the desired field within the record. After obtaining our back to front representation of the selected character string, we turn it around again; this time in its correct orientation. The ascii equivalent of the record number is appended and then our new creation is written into memory, an operation which is repeated for each record in the database.

The last name (or zip code, along with its record number) for each record in the database can now be found residing in "string[SIZE]". Each record is represented by a ten character string that is appended to its successor; thereby creating a rather long string. A possible candidate for the Guinness Book of World Records? Not to worry, we made room for over two thousand elements.

Before the fragmented strings can be sorted, they must first be selected through the use of a suitable algorithm. "Sort(gap)" is a modified version of the "Shell Sort". Actually it only produces the integers used by "get(i,j)" to generate a corresponding array subscript used for string retrieval. If i and j are multiplied by ten, the result will provide us with the numbers we seek. These two integers are then employed as pointers to the strings to be retrieved. Subsequently, it is a simple matter to compare the strings and swap them, if necessary, continuing until all the elements are in order.

So far, a lot of string manipulation has taken place, but the database remains as we found it, in random order. The next function, "writerec" will take care of that problem. If we parse the old familiar string-[SIZE] ten characters at a time and scrap all but the record numbers, we will have a numerical sequence that, if employed to retrieve the database records, will produce a sorted file. The only job remaining is to write the records back to a temporary file in the order in which they were read, erase the original file and rename the temporary file. See, that wasn't difficult at all — was it?

Our examination of the program has brought us to the "main" function. From here, we will call the functions just described, as well as execute some "straight line" code. The first order of business is to declare the variables used within main. The Program "menu" follows with the options available to the user. A "switch case" function is used to enable the routine selected by the user.

Case One: "Search for a record" utilizes search and srch2 to scan the area where we have written a concatenated memory image of the first two fields of all the records in the database. If a match is found for the user's input, the corresponding record is displayed. The display routine does not convert the record fields into individual variables, rather it displays a fragmented record in such a manner as to provide the user with the desired information without conversion. A submenu is then provided to allow printing, editing, return to menu or continuation of the search. When the desired record is not the one displayed (in cases of ambiguity), the user may choose continue from the submenu.

The "Continue" option allows selection of the desired record even when the user is searching for a "Smith" in the presence of fifteen such names. What happens is this: the value of loc is divided by fifty, reducing it to a record number, one is added, resulting in bumping the pointer past the existing record. By multiplying our new variable by fifty and passing it to "jindex", we will obtain the next location reference. Then we do some creative arithmetic on the new value resulting in "offset", which subsequently will be used in record retrieval.

Case Two: "Review existing record names" is a routine allowing the user to view the company or name fields of all the records in the database. The company name may be "hidden" by preceding it with a space when the record is entered, thereby preventing the display of a blank field when no company name is present. The actual display is accomplished in a manner very similar to that employed in case one.

Case Three: "Create new record(s)" first displays a data entry form which aids the user through automatic cursor positioning and the display of field length. The "filelength" library function provided with Turbo C proved to be an asset when revising this program for MS-DOS. Also, please note the extensive use of the pclib.c functions: gofor and locate, which were used in this routine to facilitate user input.

Case Four: "Print entire mailing list (to printer)" employs the "lprint" function described earlier to send each record to the line printer. Offset is initially set to zero, incremented by "RECORD" after each iteration and compared with "filelength" before starting the next cycle.

Case Five: "Sort list (on specified field)". We covered this routine pretty well when describing the associated functions, but let me add a word of caution. Please remember that when the sort routine is invoked; there must be enough room on disk for two data files simultaneously. For example: Your data file takes 32 Kilobytes of space, your disk has 28 K of room remaining. An attempt at sorting the data is doomed to failure, since insufficient room remains for an additional data file.

Case Six: "Exit to operating system" provides a graceful exit from the "do while" menu loop to MS-DOS.

The entire program is easy to use and, for the most part, intuitive. The feature which might cause some confusion is the search routine. This can take many forms, from entering an entire name, when prompted for a search "key", to the entering of a single character. If the user enters a unique search string, there will be only one match. But if a space is entered, equality will be found in every record in the database — useful for accessing each record in a serial manner. The quickest method is to enter enough characters in the search string to assure a match with only one record.

There you have it. A very useful program with the source code included, so you can make changes and adapt it to your needs. Those of you who lack the time and/or patience to enter the included listing may acquire the source code and a

compiled version of this program by sending me a blank, formatted disk and five dollars to cover shipping and handling.

This issue marks a turning point in this series, since the next article will deal with linked lists and dynamic data creation. The eventual target of the next part of C_Power will be a word processor. Not fancy, but one that can be used "as is" or modified to suit your requirements, and small enough to be included in a larger program.

Listing 2

```
 /* --- "CPOWER" by John P. Lewis --- */
  /* version modified to run under Turbo.c - 9/8/87 */
#include <stdio.h>
#include <pclib.c> /* PC screen handling routines */
#include <c:\sys\stat.h> /* file i/o include module, adjust drive */
#include <fcntl.h>        /* designation to suit your configuration */
#define SIZE 20480 /* size of "search" area */
#define LEN1 25    /* length of field for compny & name fields */
#define LEN2 25
#define RECORD 128 /* record size */
#define SPACE 32  /* space char used for fill */
#define LEN 7   /* length of comparison string */
#define NUMREC 360  /* number of records */
#define ZIP 115      /* number of bytes to add for sort by zip */
#define FNAME "CPDATA"  /* data file name */

/* *************** GLOBAL VARIABLES ************** */

long offset, offset2;  /* added for msdos */
long loc, q, posit, numbr; /* global variables to be used */

FILE *f1, *fd, *f2, *temp;
int init, pad, flag, flagl, handle, handle2, ret;
char ptr[LEN1], string[SIZE], c[RECORD], dummy[2], men[2],holdit[2048],tst[11];

 o_pen()
{
int stat;
stat=access(FNAME,0);
if (stat!=0)
  {
   handle = open(FNAME,O_CREAT,S_IWRITE);  /* if file does not exist */
   fd=fdopen(handle,"w");                  /* open in write mode */
  if(fd==NULL)
  printf("fdopen failed");
  }
  if (stat==0)
  {
  handle=open(FNAME,O_RDWR,O_TEXT);  /* if file does exist, open in */
  fd=fdopen(handle,"r+");            /* update mode */
  }
}

search ()
{
int i, k;
k=0;offset=0;
if (init != 1)
  {
  printf("Please stand by, I;m initializing \n");
   while ( offset < filelength(handle))
   {
  fseek(fd,offset,0);
  for ( i=0; i < LEN1+LEN2 ; ++i,++k)     /* read first two fields of all */
    string[k] = getc(fd);                 /* records into search area */
    offset+=RECORD;
     }
init =1;q=k;offset=0;
  }
}
srch2 ()
{
printf("Please enter the search ;Key; ");
gofor(ptr,LEN1);                /* look for a match between */
loc=jindex(ptr,0L);               /* input string and any part of */
offset = (loc/(LEN1+LEN2))*RECORD; /* first two fields in any record */
numbr=offset/RECORD;
```

```
}
jindex (t,p)    /* This routine utilizes a "floating" reference (p) */
char t[];      /* when comparisons are made */
long p;
{
int i, j, k;
if( p >= q )
return (-1);   /* abandon search if we have run out of search area */

for ( i=p; i <= q ; i++)
   {
   for ( j=i, k=0; t[k] != ;\0; && string[j] == t[k] ; j++, k++);
   if (t[k] ==;\0; )
     {
     return (i); /* i=pointer if match is found */
     }
   }
return (-1);   /* no match */
}

opnforrd ()
   {
   handle=open(FNAME,0_RDONLY);
   fd=fdopen(handle,"r");  /* open "data" file in read mode */
   if ( fd == NULL )
     {
     cls();locate(12,12);printf("Sorry, no data file exists.");
     locate(14,12);printf("Press Return to continue ");gofor(dummy,2);
     ret=1;     /* provide a means of escape to menu */
    }
   }

open_t()
   {
   handle2=open("temp",0_CREAT,S_IWRITE);
   f2=fdopen(handle2,"w");  /* open destination sort file */
   if(f2==NULL)
   {
   printf("Sorry, unable to open file for sorting, press return to comtinue ");
   gofor(dummy,2);
   }
   }

open_p()
   {
   f2 = fopen("prn","w"); /* "open" printer */
   }

lprint ()
  {
  int i;
  char ch;
 /* putc(27,f2);putc(21,f2); */   /* Tandy printer line feed defeat */
  fseek(fd,offset,SEEK_SET);
  for ( i=0; i <= 116; i++)
    c[i]=getc(fd);
  putc(;\n;,f2);
 for ( i=0; i <= 24; i++)
  {
  putc(c[i],f2);
  }
  putc(;\n;,f2);
  for (i=25; i <=49; i++)
    {
    putc(c[i],f2);
    }
  putc(;\n;,f2);
  for ( i=50; i <=84; i++)   /* output to printer */
    {
    putc(c[i],f2);
    }
  putc(;\n;,f2);
  for ( i=85; i <=115; i++)
    {
    putc(c[i],f2);
    }
  putc(;\n;,f2);putc(;\n;,f2);
  fflush(f2);
   if (men[0] != ;4;)
    {
    printf("\n\tCopy (y/n) ");
    gofor(dummy,1);ch=dummy[0];
    ch = toupper(ch);
    if (ch == ;Y;)
    lprint ();
    }
  }

preparec(gap)
   int gap;    /* this function retrieves a record & parses */
   {   /* the field to be compared, stores last string(in field) */
   char recnum[7]; /* & record number in memory for future sort */
   int i, k, j, rnum, len, gp;gp=gap;k=0;offset=0;opnforrd();
   i=j=len=0;
   while ( gp > 0 )
     {
     fseek(fd,offset,SEEK_SET);j=0;len=0;
       for( i=0 ; i < pad-1; i++)
       c[i]=getc(fd);    /* retrieve name or zip field */
       i-=1; /* bump past end */
       for( ; c[i] == SPACE ; --i );   /* parse for spaces */
       for( ; c[i] != SPACE ; --i,++len ); /* look for non space char */
       i+=1;gp-=1;
       for( j=0; j < len && j < 7 ; ++j,++i )/*new string from name/zip */
       ptr[j]=c[i];
       for(i=j ; i <= 6 ; ++i )
       ptr[i]=SPACE;   /* pad ptr with spaces if less than 7 char */
       rnum=(int)offset/RECORD;  /* derive record number */
       itoa(rnum,recnum,10);len=strlen(recnum);  /* convert record number */
       for( i=0 ; i < LEN ; ++i, ++k )  /* to ascii & get length */
       string[k]=ptr[i];
       for( i=0 ; i < len ; ++i, ++k )  /* store appended string in mem */
       string[k]=recnum[i];  /* at string[k] */
       for( i=7+len ; i < 10 ; ++i,++k )
       string[k]=SPACE;    /* pad string to length = 10 */
       offset+=RECORD;
       /* continue until all records have been read into mem */
       }
```

```
    offset=0;sort(gap); /* call sort function */
 }

sort (gap)
   int gap;  /* gap = num of records */
   {
   unsigned i, j;q=gap;
   while ( gap >0 )
  {
  gap=(gap/2);      /* this is a modified shell sort */
  if( gap == 0 )
  break;
  for( j=gap; j < q; ++j,--flag )
  {
  i=j-gap;    /* i & j are incremented each iteration */
  get(i,j);
  }
      if ( flag > 0 && gap < 2 )
  {
  gap+=1;continue;  /* if swap was performed during last iteration */
  }   /* increment gap and do it again */
      }
   }

get(i,j)
    int i, j;
    {
    int cmp;
    unsigned k, temp, posl, pos2;
    char strngl[11], strng2[11];
    pos2=10*j;posl=10*i;  /* i & j become locations in string[i] */
    i=posl;j=pos2;       /* for conversion back into strings for */
    cmp=0;
    for( k=0; k < 10 ; ++k,++i )     /* comparison */
    strngl[k]=string[i];
    for( k=0; k < 10 ; ++k,++j )
    strng2[k]=string[j];
    cmp=strcmp(strngl,strng2);
    if ( cmp > 0 )
      {
      swap(strngl,strng2,posl,pos2);flag=q;  /* swap if field 1 is > */
      }    /* than field 2, reflect swap in flag */
    }

swap(strngl,strng2,posl,pos2)
   char strngl[], strng2[];  /* this function swaps strings in memory only */
   int posl,pos2;  /* used for computation of new offset */
    {
    char temp[11];
    int i, j;j=0;
    for ( i=0; i < 10 ; ++i)  /* strng one is read into strng temp */
    temp[i]=strngl[i];
    for( i=0; i < 10 ; ++i)
    strngl[i]=strng2[i];     /* strng two is read into strng one */
    for( i=posl; i < posl+10; ++i,++j)
    string[i]=strngl[j];j=0;  /* i = offset within string[ ], read strngl*/
    for( i=pos2; i < pos2+10; ++i,++j) /* into new location, likewise */
    string[i]=temp[j]; /* strng2, swap is now completed */
    }
```

```
writerec(no)
   int no;
   {
   int recnum[NUMREC], i, j, k, temp, last, *ptr, siz;
   char retrieve[3], dump[7];
   temp=no;j=0;k=0;offset2=0;
   fclose(fd);open_t();      /* open temp file, close data */
   while ( no > 0 )
     {
     for ( i=0; i < 7 ; ++i, ++k ) /* retrieve & dump string[k] */
     dump[i]=string[k];
     for ( i=0; i < 3 ; ++i,++k ) /* retrieve ascii representation of */
     retrieve[i]=string[k];--no;retrieve[i]=;\0;; /* record number */
     recnum[j]=atoi(retrieve);++j;  /* convert it to numeric val */
    }    /* store in subscripted recnum */
     no=temp;j=0;i=temp=0;offset2=0;
     while ( no > 0 )
     {
     opnforrd();k=0;
     for( i=temp; i <= temp+3 && no > 0 ; ++i,--no)
       {
       offset=recnum[i]*128;   /* convert recnum[i] into offset */
        fseek(fd,offset,SEEK_SET);  /* retrive records in sorted order */
        for ( j=0; j <= 127 ; ++j,++k)  /* store 4 in holdit buffer */
        holdit[k]=getc(fd);
        }
        siz=k;k=0;temp+=4;fclose(fd);/* write sorted records to temp file */
        fseek(f2,offset2,SEEK_SET);
        switch (siz)
        {
        case 128: holdit[128]=;\0;;fprintf(f2,"%-128s",holdit);break;
        case 256: holdit[256]=;\0;;fprintf(f2,"%-256s",holdit);break;
        case 384: holdit[384]=;\0;;fprintf(f2,"%-384s",holdit);break;
        case 512: holdit[512]=;\0;;fprintf(f2,"%-512s",holdit);break;
        }
        offset2+=512;
      }
   fseek(f2,0L,SEEK_END);fclose(f2);k=0;
   }

main ()
 {
   int i, k, j;
   char  compny[LEN1], name[LEN2], street[35], city[33];
   char phone[11], ch, ff1[3], string[SIZE];

   do
   {
   cls ();locate (4,5);
   printf("************************************");
   printf("************************************");
   locate(6,8);
   printf("       Please ....");
   locate(8,18);printf("1. Search for a record.");
   locate(10,18);printf("2. Review existing record names.");
   locate(12,18);printf("3. Create new record(s).");
   locate(14,18);printf("4. Print entire mailing list (to printer).");
   locate(16,18);printf("5. Sort list (on specified field).");
   locate(18,18);printf("6. Exit to operating system.");
```

```
 locate(21,14);printf("Enter the number corresponding to your choice ");
 gofor(men,1);
 switch (men[0])
  {
case ;1;:
  cls();locate (4,10);offset=0;ret=0;opnforrd();
    if( ret == 1)
    break;
    if (init != 1) /*   if search area has not been updated */
    search ();       /* read partial records into search area */
    locate (8,8);
    srch2 ();
    label:
    if (loc == -1 )
 {
cls ();locate (6,4);
printf("No match found, press return for menu ");
gofor(men,1);break; /* force return to menu */
}
fseek(fd,offset,SEEK_SET);
for ( i=0; i < RECORD ; ++i) /* get a record, a char at a time */
c[i] = getc(fd);
  cls();locate (2,6);printf("Data for record no. %ld",offset/128+1);
  locate (4,8);
  printf("Company: ");locate (6,8);  /* print headings to screen */
  printf("Name: ");
  locate(8,8);printf("Street: ");
  locate(10,8);printf("City, State, Zip: ");
  locate (12,8);printf("Phone: ");
  locate (4,18);
  for (i=0; i <=24; ++i)  /* insert data under correct heading */
  putchar(c[i]);putchar(;\0;);
  locate (6,15);
  for ( i=25; i <= 49; ++i)
  putchar(c[i]);putchar(;\0;);
  locate (8,17);
  for ( i=50; i <= 84; ++i)
  putchar(c[i]);putchar(;\0;);
  locate (10,27);
  for ( i=85; i <= 117; ++i)
  putchar(c[i]);putchar(;\0;);
  locate (12,16);
  for ( i=118; i <= 127; ++i)
  putchar(c[i]);
  do
  {
   clr_dn(16,24);locate(16,4);
  printf("You may (E)dit, (R)eplace, (P)rint, (C)ontinue or (M)enu ");
  gofor(men,2);ch=men[0];ch=toupper(ch); /* allow for either */
  switch(ch)     /* upper or lower case entry */
  {
  case ;P;:
  open_p();lprint (); /* open printer, print one record */
  fclose(f2);fclose(fd);
  break;
  case ;C;:
  if(init==0) { locate(20,4);printf(";Sorry, I can;t continue ");
  printf("after editing, press return for menu ");gofor(dummy,1);
  ch=;M;;break; }
  loc /= 50L;loc +=1L;loc *= 50L;loc=jindex(ptr,loc);
  offset=loc/(LEN1+LEN2)*RECORD; /* bump pointer */
  goto label;   /* and establish new offset */

  case ;R;:
  men[0]=;3;;
  break;
  case ;E;:
  clr_dn(16,23);fclose(fd);o_pen();
  locate(16,4);printf("Please indicate the field you wish to edit");
  locate(18,1);
   printf\
  ("(1) Company (2) Name (3) Street (4) City-St-Zp (5) Phone ");
  gofor(men,1);
 switch(men[0])
{
case ;1;:
locate(20,4);printf("Company: _____¦");
locate(20,13);gofor(compny,LEN1-1);fseek(fd,offset,SEEK_SET);
fprintf(fd,"%-25s",compny);init=0;
goto done;
case ;2;:
locate(20,4);printf("Name: _____¦");
locate(20,10);gofor(name,LEN2-1);fseek(fd,offset+25,SEEK_SET);
fprintf(fd,"%-25s",name);init=0;
goto done;
case ;3;:
locate(20,4);printf("Street: _____¦");
locate(20,12);gofor(street,34);fseek(fd,offset+50,SEEK_SET);
fprintf(fd,"%-35s",street);
goto done;
case ;4;:
locate(20,4);
printf("City, State, Zip: _____¦");
locate(20,22);gofor(city,32);fseek(fd,offset+85,SEEK_SET);
fprintf(fd,"%-33s",city);
goto done;
case ;5;:
locate(20,4);printf("Phone: _____¦");
locate(20,11);gofor(phone,10);fseek(fd,offset+118,SEEK_SET);
fprintf(fd,"%-10s",phone);
     done:
     fseek(fd,0L,SEEK_END);fclose(fd);c[0]=;\0;;break;
 } /* end of edit switch */
} /* end of menu switch */
} /* end of do-while switch */
while (ch != ;M; && ch != ;R;);
fclose(fd);cls();
if(men[0]==;3;) goto replace;
break;

 case ;2;:
   cls ();locate (4,1);j=1;ret=0;
   opnforrd ();offset=0;
   if( ret == 1)
   break;
  while ( offset <= filelength(handle))
   {
   fseek (fd,offset,SEEK_SET);
```

```
   for ( i=0; i<=LEN1+LEN2-1 ; i++)
 c[i] = getc(fd);
if ( c[0] > ; ; )      /* display one field of each record */
{
for ( i=0 ; i <= LEN1-1 ; ++i) /* allow "hiding" of first field */
 putchar(c[i]);j+=25;       /* by preceeding data with a space */
}                     /* causing display of second field */
else
{
for ( i=LEN1-1 ; i <= LEN1+LEN2-3 ; ++i)
putchar(c[i]);j+=25;
}
 if (j > 75 )
   {
   printf("\n");j=1;
   }
offset += RECORD;
if (j > 24 && offset <= filelength(handle))
{
putchar(;,;);putchar(; ;);
}
    } /* end of while loop */
    printf("\n\tEnd of records\n");
   printf("\n\n\tPress <RETURN> to return to menu ");
   gofor(dummy,1);cls();
   fclose(fd);offset=0; /* reset offset */
   break;
case ;3;:
   cls();
   o_pen();offset=filelength(handle);
   replace:if (ch==;R;) o_pen();
   for ( ; ; )
    {
cls ();locate (4,10);printf("Mailing List\n");locate(6,6);
printf("Enter Company _____¦");
locate(8,6);
printf("Enter name _____¦");
locate(10,6);
printf("Enter Street _____¦");
locate(12,6);
printf("Enter City, State, Zip _____¦");
locate(14,6);
printf("Enter Phone _____¦");
locate (6,20);gofor(compny,LEN1-1);locate(8,17);gofor(name,LEN2-1);
locate(10,19);gofor(street,34);locate(12,29);gofor(city,31);
locate(14,18);gofor(phone,10);fseek(fd,offset,SEEK_SET);
fprintf(fd,"%-25s%-25s%-35s%-33s%-10s",compny,name,street,city,phone);
if ( ch == ;R; )
 goto skip;
offset+=RECORD;
      locate (18,4);
printf("Enter 0 to exit, any other character to continue ");
gofor(men,1);
      skip:        /* jump here after replace function, force init */
if ( men[0] == ;0;¦¦ ch == ;R;) /* test for more input activity */
      { init=0;ch=; ;;cls();break;}
    }      /* end of for loop */
   fseek(fd,0L,SEEK_END);fclose(fd);
```

```
   break;  /* two "break" statements necessary here, one for "for" loop
    and one to delimit the "case" */

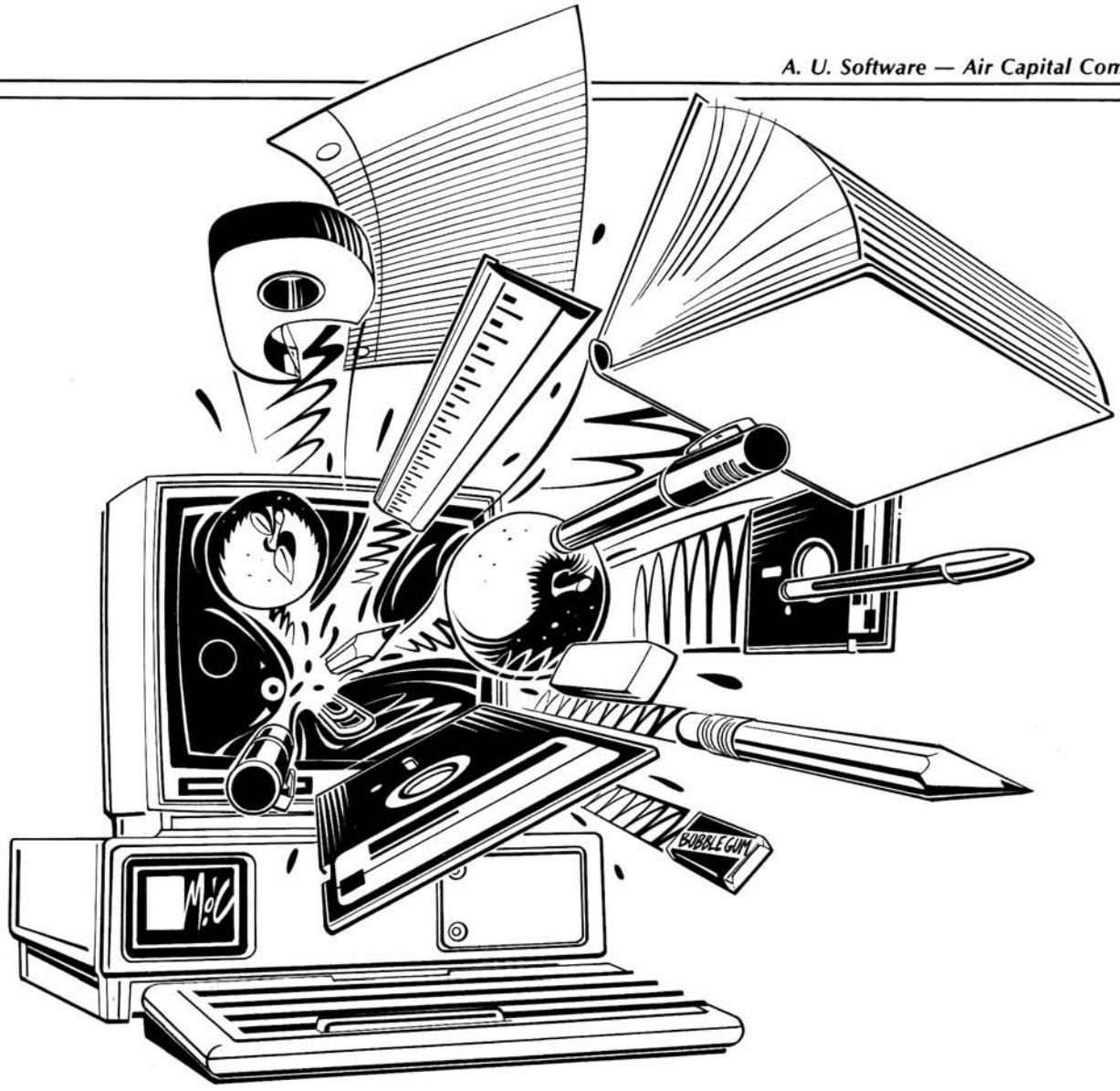
   case ;4;:

opnforrd();open_p();
offset=0;
while ( offset <= filelength(handle))
{
fseek(fd,offset,SEEK_SET);
lprint ();offset+=RECORD;
}
fclose(f2);      /* close file */
break;

 case ;5;:

opnforrd();init=0;c[0]=;\0;;
q = filelength(handle)/128;
cls();
locate(6,1);fclose(fd);
printf("Please indicate the field to be used for sort function\n");
printf("N(ame) or Z(ip) ");gofor(dummy,1);dummy[0]=toupper(dummy[0]);
switch (dummy[0])
{
case ;N;:
  pad=LEN1+LEN2-1;break;
case ;Z;:
  pad=ZIP;break;
default: pad=ZIP;break;
 }
preparec(q);
locate(10,1);printf("Stand by, I;m writing the sorted file to disk");
writerec(q);
      unlink(FNAME);rename("temp",FNAME);/* erase data file, rename */
break;    /* temp file to data */
    } /* end of switch loop */
  } /* end of menu do - while loop */
  while ( men[0] != ;6;);
}   /* end of main */
```

*



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Chambersburg, PA 17201
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Contact: Terry Pratt

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(805) 466-1589

Contact: Peter Shkabara

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324 North Orlando Avenue
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(305) 629-0753

Contact: Robert S. Dee

Comments: Software and consultation available. Products: Excalibur Business System — The Excalibur Plus is a multi-user, multi-tasking business system designed for the small to medium size businesses. This management system fulfills the extensive accounting and management reporting needs with 12 fully integrated modules including: General Ledger, Inventory Control, Billing, Point-of-Sale, Purchase Orders, Order Entry, Payroll, Job Cost, Import Data, Accounts Receivable, Accounts Payable, and Customer Information/Database Management. Special Notes: The Excalibur Plus is compatible with most of today's hard disk microcomputers, including IBM, PC-DOS, MS-DOS, and XENIX.

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Contact: Mike Forrester

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(800) 525-9966

Contact: Kathy Krumweide

Comments: Consultation available. Products: Manufacturer of ribbons for computer printers, word processors, typewriters. Also, manufacturer of replacement laser toner cartridges.

Autodesk, Inc.
2320 Marinship Way
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(415) 332-2344

Contact: Keven Seaver

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BV Engineering
2200 Business Way #207
Riverside, CA 92501
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Contact: Wilda Daggett

Comments: Software available. Products: Circuit Analysis, Root Locus, Thermal Analysis, Plotter Drivers, Engineering Graphics, Signal Processing, Active/Passive Filter Design, Transfer Function/FFT Analysis, Logic Simulation, Microstrip Design. Special Notes: Call or write for a free Applications Guide and Catalog.

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Contact: Bob Beasley

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Contact: Dante Bencivengo

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(305) 652-5828

Contact: Ralph Boyd

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Contact: Evelyn Kennedy

Offers ribbons, printwheels and thimbles for letter-quality printers and electronic typewriters. Ribbons for computer printers. Laser printer supplies. Printwheel/thimble modification service. Special Notes: Free 36-page catalog has ribbons and samples of printwheel/thimble typestyles.

C & C Engineering
Route 4, Box 3986
Lexington, NC 27292
(704) 787-4131

Contact: Carol Bernhardt

Comments: Hardware, software and consultation available. Products: Plotter Scribe: Allows plotters to print fancy text, any size/direction. Attorney's Deed Check: Checks closure and plots deed on printer/plotter. Pro-Surv3: Complete Land Surveying Computation. Interfaces to AUZ Mapping or AutoCAD. Earth 3: Complete Earthwork computations. Completely self-contained program. Printer/plotter output. AUZ Mapping: Comprehensive computer mapping and design system using interactive screen graphics. Special Notes: Programs available for Z-100 under ZPC and Zenith PC series (XT, AT) computers.

Cambridge Computer Corporation
80 Mt. Sanford Road
Mt. Carmel, CT 06518-1210
(203) 288-6004

Comments: Software and consultation available. Products: Micro to Honeywell Mainframe software products. PC77/78 — Emulates Honeywell VIP7700/VIP7800 series terminals. PC73/78 — Emulates Honeywell VIP7200/VIP7300/VIP7800 series async. terminals.

Chi Corporation
26055 Emery Road
Cleveland, OH 44128
(216) 831-2622

Contact: L. F. Somogyi

Comments: Hardware, software and consultation available. Products: Chi's emulator products include Sperry/UTS (UTS20, 30, 40, 60 and 400; Uniscope 100 and 200; and SVT-1120), IBM/3270 BSC, Honeywell VIP 77xx/78xx and DEC VT (52, 100, 102 and 220) emulation. Chi's gateway products include versions of ChiLAN CS-1, the Chi UTS LAN Gateway, for 8, 16 or 32 workstations for NetBIOS and IPX compatible LANs. Chi manufactures these and other communications products, including our NineTrack — 9 track tape system for PCs.

Church-Related Computer Programming
P.O. Box 5395
Oregon City, OR 97045
(503) 657-5026

Contact: Larry Monk

Comments: Software and consultation available. Products: Church administration software for congregations under 350 members: Treasurer, Contributions, Membership data. H/Z-89, H/Z-100, IBM-PC, Apply II+. Needs 64k, MBASIC, and a printer. Special Notes: Quality user-customized software at affordable prices.

COMMSOFT, Inc.
2257 Old Middlefield Way
Mountain View, CA 94043
(415) 967-1900
(800) 32-ROOTS
(800) 53-ROOTS (CA)

Contact: Wendy Whipp

Comments: Software and consultation available. Products: COMMSOFT produces ROOTS II, sophisticated genealogy software for the Z-100 and IBM-compatible computers. Store, retrieve and display 1000's of family facts and print family books. Special Notes: COMMSOFT BBS, connected to the National Genealogy conference (415) 967-6730.

Computer Ad Designs, Inc.
#10 Cherokee Drive
St. Peters, MO 63376-3926
(314) 447-2223

Contact: Sue Spencer-Evans

Comments: Consultation available. Products: CAD is an advertising agency specializing in computer products and publications. Ad costs are held down via use of desktop publishing systems. Special Notes: Performs work nationwide. Call for prices on your ad requirements.

Computer Associates
1770 Burrard Street, 3rd Floor
Vancouver, B.C. V6J3G7
(604) 733-2343

Comments: Software and consultation available. Products: Computer Associates Canada, Ltd., Micro Products Division (CA) is the largest publisher of micro-based financial software. CA is primarily known for its complete line of integrated accounting and financial management software packages, such as ACCPAC which has gained more than 80% of the market for full-function micro accounting products in Canada, SuperCalc4 (designated 1986 "Spreadsheet Product of the Year" by InfoWorld), The Spreadsheet Auditor, SuperProject Plus, EasyWriter II (Word Processor), and EasyPlus Windowing and Network Manager. Special Notes: Our ACCPAC accounting products are marketed outside of Canada under the name EasyBusiness Systems.

Computer Shopper
5211 S. Washington Avenue
Titusville, FL 32780
(305) 269-3211

Contact: Stan Veit

Comments: Hardware and software available.

Condor Computer Corporation
1490 Eisenhower Place
Ann Arbor, MI 48108
(313) 971-8880

Contact: Howard Pikstein

Comments: Software available. Products: Condor Manufactures an easy to learn, fully relational database management system designed to be used by both novice and experienced users.

C.D.R. Systems, Inc.
7171 Ronson Road
San Diego, CA 92111
(619) 560-1272

Contact: Marc D. Brooks

Comments: Hardware and consultation available. Products: For Z-100/120: ZS100 7.5MHz module. CDR317-IIB hard disk controller. It looks like the Z-217 controller to the Z-100, but has added features. Special Notes: C.D.R. Systems has manufactured quality products for the Heath/Zenith community for many years.

Custom Software Services Inc.
513 Gunter Avenue
P.O. Box 65
Guntersville, AL 35976
(205) 582-4168

Contact: Tyrus Dorman

Comments: Software and consultation available. Products: The Sandman Medical Billing Program provides the user with a full range of medical billing and insurance form preparation. Special Notes: Written in dBASEIII+, source code provided. Costs $1000.

D-G Electronic Developments Company, Inc.
700 South Armstrong
Denison, TX 75020
(214) 465-7805

Contact: Bruce Denton

Comments: Hardware and consultation available. Products: DoubleCOM — Integrated serial port/software controlled electronic "A/B" switch for IBM and Zenith PC compatible computers. PCS-110 — PC compatible Analog game port/Realtime clock. Special Notes: Company provides custom design and consulting services for dedicated controller or computer system expansion applications.

Data Transforms
616 Washington Street
Denver, CO 80203
(303) 832-1501

Contact: Glenn Searfoss

Comments: Software available. Products: IBM Fontrix is a graphics creation and single page typesetting package. IBM Printrix is a print utility for typesetting and batch processing word processor text files. Special Notes: Printrix can utilize Fontrix graphics. Both packages share a library of over 200 fonts.

Delta Technology International, Inc.
1621 Westgate Road
Eau Claire, WI 54703
(715) 832-7575

Contact: Linda Thomson

Comments: Software and consultation available. Products: EXTRA is a remarkable memory resident program manager that provides complete control of all memory resident programs. Direct Net is a powerful menu system for local area networks that presents workstation users with menus in plain English, eliminating the costly and lengthy training usually associated with network implementation. Direct Access is a professional menu system that organizes software programs into a user-defined menu system. Software programs can be executed with just one keystroke.

Dimensional Business Systems, Inc.
250 N.W. 4th Diagonal
Boca Raton, FL 33432
(305) 368-0270

Contact: Ralph Avery

Comments: Software and consultation available. Products: A totally interactive insurance agency/broker accounting/management system designed on Zenith/Heath equipment for use on PC-DOS compatible equipment. Special Notes: Office also located in Toronto, Ontario, CANADA.

Domino Computer Service
108 N. Hickory
Arlington Heights, IL 60004
(312) 870-8707

Contact: Brian

Comments: Hardware, software and consultation available. Products: The widest selection of Z-89/90 software on the Planet Earth. Original Heath packaging. We have hardware and repair service also. Special Notes: If it's not in stock, we'll get it.

Harold Dykens
10275 NE 23rd Avenue
Mitchellville, IA 50169
(515) 967-6042

Comments: Software and consultation available. Products: Set of programs to aid real estate agents in more professionally qualifying their clients. Special Notes: Rent vs Buy; Amortization Schedules; Wrap-Loan; Depreciation; Seller's Proceeds; Buyer's Cost; Buyer Qualification; etc.

Dynacomp, Inc.
The Dynacomp Office Building
178 Phillips Road
Webster, NY 14580
(716) 671-6160

Contact: F. Ruekdeschel

Comments: Software and consultation available. Products: Dynacomp's catalog contains the largest collection of mathematical, scientific, engineering, business, and educational software available for MS-DOS systems. Available on written request. Special Notes: Dynacomp specializes in engineering and scientific software with many offerings in electrical and mechanical engineering.

Ecosoft, Inc.
6413 North College Avenue
Indianapolis, IN 46220
(317) 255-6476

Contact: Emma Alkire

Comments: Software available. Products: Eco-C88 Compiler has four memory models to choose from. They are small, compact, medium and large; up to 1Meg code and 1Meg data. It has over 200 standard library functions.

Elektrokonsult A/S
P.O. Box 846,
N-3002 Drammen, NORWAY
+47 3 83 15 00

Contact: Terje Bolstad

Comments: Software and consultation available. Products: "File Mover" facilitates file transfer between Zenith CP/M and MS-DOS computers. $99.00 for *two* computers. "Disk Utility Package" for CP/M. Works with any diskette format — $99.00. Special Notes: Specify diskette format and o/s. VISA accepted.

Emerging Technology Consultants, Inc.
4760 Walnut Street
Boulder, CO 80301
(303) 447-9495

Contact: Jennifer Schoeninger

Comments: Software and consultation available. Products: EDIX — A full screen text editor. The Professional Writers Package — A document processing system.

ETTS, Incorporated
19224 S.E. 164th
Renton, WA 98058
(206) 226-3916

Contact: Eric Therkelsen

Comments: Software and consultation available. Products: ZDRAFT creates technical illustrations and drawings whose size is only limited by RAM. Version 2.0 adds

plotter-like commands and off-line mode. Special Notes: For Z-100 under MS-DOS; price is $139.00 or $25.00 for demo with complete demonstration.

EWDP Software, Inc.
P.O. Box 40283
Indianapolis, IN 46240
(317) 872-8799

Contact: Barb Markowitz

Comments: Software available. Products: FILEBASE — Variable length fields data manager. Comma delimited format for letter-merge programs, such as Mailmerge, Multimate, Displaywrite and others. Built-in computation and report generation. Also functions as files processor. Special Notes: CP/M, MS-DOS, and PC-DOS versions.

EZWare Corporation
29 Bala Avenue, Suite 206
Bala Cynwyd, PA 19004
(800) 543-1040
(215) 667-4064 (PA)

Contact: Joyce Gerritsen

Comments: Software and consultation available. Products: Tax preparation and planning for users of Lotus 1-2-3, Symphony or Multiplan. 1040 Individual preparation, 1065 Partnership preparation, Personal and Corporate planning. Special Notes: Requires user have Lotus 1-2-3, Multiplan or Symphony 1.2 spreadsheet.

FBE Research Company, Inc.
P.O. Box 68234
Seattle, WA 98168
(206) 246-9815

Contact: Dave

Comments: Hardware and software available. Products: Enhancements for H/Z-150/160 (LIM-150, MEGARAM-150, ZP640+, COM3), Z-171 (MEGARAM-171), H/Z-100 (ZMF100A, ZRAM-205), and H/Z-89 (H-89 PIP, SPOOL DISK-89, SLOT4). Smartwatch No-slot calendar/clock module. Special Notes: Call or write for latest information. Thank you for your support!

FINA Software
16144 Sunset Blvd. #3
Pacific Palisades, CA 90272
(213) 454-6393

Contact: Larry Fina

Comments: Hardware and consultation available. Products: H/Z-25 Super Chip Set ROM Enhancements: 4 Chips, Dot Graphics, MS-DOS Character Set, Italics, Double Strike, Underline, Super/Subs, Hex Dump, and Key Pad Augmentation. Special Notes: Operating System Independent, Easy Installation, detailed documentation and no soldering required.

First Capitol Computer
16 Algana Drive
St. Peters, MO 63376-3930
(314) 447-8697

Contact: Tom Jorgenson

Comments: Hardware, software and consultation available. Products: High volume reseller and VAR of Zenith Data Systems' equipment. We specialize in custom systems at prices below shelf/terms from MDST dealers. Special Notes: Call 1-800-TO-BUY-IT for free price quotes.

Friendlysoft, Inc.
3638 W. Pioneer Parkway
Arlington, TX 76013
(817) 277-9378

Contact: Andrea Vanchura

Comments: Software available. Products: FriendlyWriter with FriendlySpeller is the only word processing package on the market today that has over 30 continuous specific help screens, as well as a 70,000 word spell checker included — for under $100. FriendlyWare PC Arcade, voted by PC World Magazine readers as one of the top five entertainment packages in their World Class PC Contest, gives you ten great arcade games on one diskette for only $29.95. FriendlyWare PC Introductory Set, which was first released in 1982, has become one of the most effective programs in helping new computer users learn and be comfortable with their computers — suggested retail price is only $29.95.

Generic Computer Products, Inc.
P.O. Box 790, Dept. HD18
Marquette, MI 49855
(906) 249-9801

Contact: Irma Woodard

Comments: Hardware, software and consultation available. Products: Computer software developer/publisher with a program line including: entertainment, financial, utilities, graphics and CAD products. Also carries a full line of PC-compatible hardware products. Special Notes: Priding ourselves on full end-user support. Call or write for a FREE CATALOG.

Golden Software
807 14th Street
Golden, CO 80401
(303) 279-1021

Comments: Software available. Products: SURFER® — Three dimensional plotting package — surface plots, contour plots — up to 10,000 random data points/plots functions — output to over 80 devices. GRAPHER™ — Scientific XY plotting with error bars, best fit lines. Special Notes: Hardware requirements: 256K memory; graphics board and math chip recommended.

Graymatter Application Software
1601 Township Line Road
Norristown, PA 19401
(215) 279-4460

Contact: Bob Gray

Comments: Hardware, software and consultation available. Products: H/Z-100 & H/Z-PC discount upgrade products including board level RAM upgrades, RAM chips, UCI, CDR, FBE products, hard disks, high density floppies, clocks, and other specialty items. Special Notes: Home brew operation; no mail order VISA/MC, but will take personal checks with no waiting period.

H-SCOOP
P.O. Box 1242
Sheboygan, WI 53082-1242
2618 Penn Circle
Sheboygan, WI 53081-4250
(414) 452-4172

Contact: Subscription Department

Products: H-SCOOP, the #1 rated independent newsletter for H/Z computer support is mailed monthly via first class mail (AIR MAIL foreign). Contains general information on all H/Z computers (except for H-11 series), covering general information, new product news, technical information, good and bad vendors to deal with, tips and ideas, feedback, who's doing what with their systems, requests for help, classifieds, reports and reviews, etc. $24 for a 12 issue year USA and Canada,

$32 foreign. Average 8 page quad density issue. Back issues and package deals available. VISA/MC accepted.

Hand Tool Industries, Inc.
1933 Lake Street
Kent, OH 44240
(216) 678-8787

Contact: G. Martin

Comments: Hardware and consultation available. Products: Professional tool kits; standard and special hand tools. Special Notes: Complete customer tool kit and tool service available.

Paul F. Herman, Inc.
3620 Amazon Drive
New Port Richey, FL 34655
(813) 376-5457

Contact: Paul Herman

Comments: Hardware and software available. Products: DOODLER Graphics Package, Mouse Pack Mouse Driver, Screenpro, and other programs for the Z-100 and PC compatibles. Our special interest is computer graphics. Special Notes: We would like to have you on our mailing list. Call or write today!

Hersey Micro Consulting, Inc.
P.O. Box 8276
Ann Arbor, MI 48107
(313) 994-3259

Contact: Mark Hersey

Comments: Software and consultation available. Products: FANSI-CONSOLE — An integrated console utility, speeds up screen writing and adds zip to cursor keys! REVISE! — The convenient file revision utility. MODEM 86 — MS-DOS and CP/M-86 communications program.

Hilgraeve, Inc.
P.O. Box 941
Monroe, MI 48161
(313) 243-0576 (MI)
(800) 826-2760

Contact: Matt Gray

Comments: Software and consultation available. Products: HyperACCESS Communications software links a PC or Z-100 to remote systems or utilities. Provides fast file transfer protocols and script language. Has an unattended password- protected host mode for remote-control operation. Special Notes: Owners of ACCESS upgrade to HyperACCESS for special reduced cost. Contact Hilgraeve, Inc. for details.

Hogware Company
470 Belleview
St. Louis, MO 63119
(314) 962-7833

Contact: Janet Hirsch

Comments: Hardware, software and consultation available. Products: SHOWOFF — High resolution graphic editor *for the Z-100*, 640 x 480, 92 colors, 92 patterns, and professional quality text. Compatible with PC, Macintosh, and all Z-100 software. LOGITECH — We carry all Logitech products: mouse, software, video boards and monitors.

Innovative Software, Inc.
9875 Widmer Road
Lenexa, KS 66215
(913) 492-2086

Comments: Software available. Products: A network ready, integrated software package which includes a Database Manager, Spreadsheet, and Word Processor. Available for DOS, UNIX, and XENIX environments. Special Notes: For sales information, call 1-800-GET-SMART.

James River Group, Inc.
125 N. First Street
Minneapolis, MN 55401
(612) 339-2521

Contact: Sales

Comments: Software available. Products: Accounting software: general ledger, accounts receivable, accounts payable, payroll, etc. $125 per module. Runs on all Zenith computers (CP/M & MS-DOS), including the Z-100.

KEA Systems Ltd.
#412 - 2150 West Broadway
Vancouver, B.C.
CANADA V6K 4L9
(604) 732-7411

Contact: Anne Lee

Comments: Hardware, software and consultation available. Products: Complete, fast, DEC emulation packages: VT100, VT220, VT241, and Tektronix 4014, which run on PCs, ATs, PS/2s, Zenith PCs, and Zenith ATs. Softkeys, DOS calls, file transfers. Special Notes: Some packages carried by Zenith Data Systems. All software and PowerStation200 keyboard available from KEA.

C. Kingston
P.O. Box 564
Elmsford, NY 10523
(914) 949-7870

Contact: C. Kingston

Comments: Software and consultation available. Everyone's File Management System (EFMS): A simple, fast, and easy to use file manager for PC compatible computers, for only $69.95. Special Notes: Report functions are built-in.

Laclede Printing Company
10702 Manchester Road
St. Louis, MO 63122
(314) 821-3313

Contact: Tom Simon

Comments: Consultation available. Products: Custom and stock computer forms; labels, letterheads, envelopes, checks, invoices, statements, etc.

Lindley Systems
21 Hancock Street
Bedford, MA 01730
(617) 275-6821

Contact: William or Robert Lindley
Comments: Software and consultation available. Products: Utility and application programs for all H/Z computers; custom programming. Special Notes: Call or write for free catalog.

Megamicro Computer Center
17 Bellevue Avenue
Penndel, PA 19047
(215) 750-7626

Contact: Maxine Ajala

Comments: Hardware, software and consultation available. Marketers of Public Domain software, Megamicro Company offers over 300 titles of Mega Brand software. Titles include utilities, games, word processors, database managers, and the complete King James version of the Bible. Special Notes: Most programs require a minimum of 256K memory and color graphics card.

Meridian Technical Associates, Inc.
2 Southboro Lane
Glen Rock, NJ 07452
(201) 445-8645

Contact: J. Fitzpatrick

Comments: Software and consultation available. Products: Meta Input Controller (MIC) command file processor for HDOS batch, "submit" functions. Intelligent Modem Program (IMP) for terminal communication to mainframes, minis, other micros (CP/M or HDOS). Special Notes: Business applications, communications and integration into mini and mainframe environments our specialty.

Micro Doc
3108 Jackson Street
Bellevue, NE 68005
(402) 291-0795

Contact: Fred Pospeschil

Comments: Software available. Products: FLEXI-GRAPH: Libraries of graphics routines for Fortran, C, Pascal. Supports Z-100, CGA, and EGA environments. No royalties and not copy protected. MICRO WORLD DATA BANK II: Database of 180,000 points for making maps with computers. Special Notes: FLEXI-GRAPH is $99.00, plus $5.00 shipping and handling. MICRO WORLD DATA BANK is $10.00 (5 disks placed in public domain).

Micro Wizzard Software
199 Buckwood Drive
Hyannis, MA 02601
(617) 778-1430

Contact: Katherine Ellstrom

Comments: Software and consultation available. Products: CAM systems and DOS utilities for text processing, graphics, TSR functions, and NIC programming.

Micronics Technology
449 Barbados Way
Niceville, FL 32578
(904) 897-4257

Contact: Darrell Pelan

Comments: Hardware and software available. Products: H-150/160 SPEED MODs (Norton 2.7 with V20), Memory PALS 704k or 1.2 Meg RAM, H-89 4MHz SPEED MODs and Winchesters, Financial Software for all Computers. Special Notes: Hours: 6-8PM CST Monday-Friday and 9-12 Saturday. BBS (904) 897-4966 24 hours, 240/1200/300 baud.

Mountain View Press
Drawer X
Mountain View, CA 94040
(415) 961-4103

Contact: Roy Martens

Comments: Hardware and software available. Products: FORTH computer language books, manuals, tutorials, software and hardware.

NORCOM
9630 Hayes
Overland Park, KS 66212
(913) 888-6237

Contact: Roger Lembke

Comments: Hardware and consultation available. Products: Replacement character generators for H/Z-89 and H/Z-19. G-Prom improves graphics resolution: $19.95. T-Prom improves text characters: $19.95. GT-Prom provides both functions: $24.95. (Prices include shipping and instructions.) Special Notes: Write NORCOM for full details.

PC Software
11627 Calamar Court
San Diego, CA 92124
(619) 571-0981

Contact: Joseph Juhasz

Comments: Software available. Products: Graphics for business, educational and personal use from $245.00. Games — $34.95 — Blackjack, Backgammon, Concentrate and NFL Trueline, Business Aids-Junior Partner. Special Notes: Quality software written by professionals in the field. Catalog on request — FREE.

Paragon Associates
7813 Port Circle
Centerville, OH 45459
(513) 435-8778

Contact: R.G. Clodfelter

Comments: Software available. A complete property investment analysis program for the assessment of various investment alternatives including commercial, rentals, residential or an individual's personal residence. Special Notes: (IBM, Zenith 100, Commodore 64 — $73.00 for disk and documentation) or request additional information.

The Performance Group, Inc.
4213 Hunters Hill Road
Norman, OK 73072
(405) 360-2179

Contact: Paul Blanchard

Comments: Software and consultation available. Products: Plotting software for HP and HI A and B size plotters. Executable programs make multiple plots/page with up to 99 lines, use multiple data files. Easy to use, but very flexible. Special Notes: Program information free on request. Demo disk $5.00. Requires MS-DOS 2 or higher. Custom programming services.

Pivar Computing Services, Inc.
165 Arlington Heights Road
Buffalo Grove, IL 60089
(312) 459-6010

Contact: Gary Pivar

Comments: Consultation available. Products: Pivar Computing Services, Inc. is a leading conversion services company. Media conversion capabilities include to or from Mag tapes, Mini & Micro Computers, Word Processors and Typesetters.

Polytron Corporation
1815 N.W. 169th Place, Suite 2110
Beaverton, OR 97006
(503) 645-1150

Contact: Lisa Colling

Comments: Software and consultation available. Products: PolyDesk III — memory-resident, dBase III compatible desktop organizer. PolyBoost II — Disk Cache and PC speed-up utilities.

Powerline Systems
131 Jumping Brook Road
Lincroft, NJ 07738
(201) 747-2063

Contact: John W. Preusse

Comments: Software and consultation available. Products: Fed up with difficult database programs? Ask us about JUPITER, the ideal program to manage records about people. It's fast, easy to learn, and helpful in ways you never imagined. And at only $99.95, it won't send you to the poorhouse.

Public Brand Software
P.O. Box 51315
Indianapolis, IN 46251
(800) IBM-DISK

Contact: Terry Ramstetter

Comments: Software available. Products: A complete library of shareware and Public Domain software for MS-DOS computers.

Quest Computing
P.O. Box 1323
Freeport Center, UT 84016

Contact: B. Hellewell

Comments: Software available. Products: A complete accounting software system for CP/M and MS-DOS. Includes general ledger, accounts payable, accounts receivable and payroll modules. The modules can be run stand alone or as an integrated system. Special Notes: The complete system cost is $75.00. Specify operating system and disk format.

QUIKDATA, Inc.
P.O. Box 1242
Sheboygan, WI 53082-1242
2618 Penn Circle
Sheboygan, WI 53081-4250
(414) 452-4172 Orders
(414) 452-6854 Tech. & Questions

Contact: Sales Department

Comments: Hardware, software, and consultation available. Products: Oldest independent H/Z vendor in business — over 10 years serving the H/Z public. High-tech innovative mail order company with complete support and service facilities, handling a wide variety of lowest priced hardware and software products for H/Z computer systems (and PC compatibles), including Zenith computers. Specialize in disk drives and cabinets, winchester drives, memory chips and devices. Printers, monitors, general software, modems, computers, cables and connectors, diskettes and more. VISA and MC accepted. Call or write for a no obligation catalog.

RealData, Inc.
78 North Main Street
South Norwalk, CT 06854
(203) 255-2732

Contact: Dale Palmer

Comments: Software and consultation available. Products: RealData, Inc. specializes in software programs for Real Estate and Financial Professionals. Most programs are spreadsheet templates for analysis. Several "stand-alone" applications are available for appraisal forms-filling, loan amortizations and legal form filling. The *Real Estate Investment Analysis* program is RealData's most popular program having 7000+ users. Special Notes: Tax-sensitive programs are updated for registered users. Call or write for a 30 page, detailed catalog, complete with sample printouts. Call for demonstration disks. Consultation available 9am to 5:30pm — Monday thru Friday.

Realty Software
1926 S. Pacific Coast Highway, #229
Redondo Beach, CA 90277
(213) 372-9419

Contact: Pam Beck

Comments: Software and consultation available. Products: Our systems reflect a combination of state-of-the-art programming and extensive real estate knowledge. We know what you need in property management and real estate analysis and our systems deliver. Plus, we keep you on top of this ever-changing market with yearly updates. All of our products are MS-DOS compatible.

Red Wing Business Systems, Inc.
610 Main Street
P.O. Box 19
Red Wing, MN 55066

Contact: Patricia B. Brown

Comments: Software available. Products: Red Wing Business Systems is one of the leading producers of financial management software. The systems are easy to use and they come complete with instructions on how to use them. Special Notes: Red Wing software includes, General Ledger, Accounts Receivable, Accounts Payable, Payroll and Business Inventory.

Robotronix, Inc
Box 1125
Los Alamos, NM 87544

Comments: Software and consultation available by mail only. Products: Software for Heath Robots. ANDROTEXT language compiler. Personalities: Hero Patrol, Hero Caller, Hero Butler, Hero Pet, Hero Santa. Games: Tic-Tac-Toe, Hop-To-It, Voice Control, Math Quiz.

Ross Custom Electronics
1551 Sandra Drive
Boulder City, NV 89005
(702) 293-7426

Contact: J. D. Ross

Comments: Hardware, software and consultation available. Products: IntelliBurner EPROM, EEPROM, and 87xx Microcontroller Programmer $299.00 (PC Board Set $99.00). Supports EPROMs through 27512/27513, and many EEPROMs. Other RS-232 Serial Programmers from $149.00 — PC Boards from $39.00. Special Notes: Complete software support included — HDOS, CP/M, ZDOS, MS-DOS, and others. UV lights and accessories available.

RYBS Electronics, Inc.
5721 Arapahoe Avenue, Suite A
Boulder, CO 80303
(303) 444-6073

Contact: Mike Rossmann

Comments: Hardware, software and consultation available. Products: A short-slot 256K memory advancement card for IBM PC/XT/AT and compatibles. Extends DOS up to 256K above the 640K limit. Network Drivers, TSR's and E-mail installed above DOS is separate memory block allowing more memory for larger applications. Special Notes: 2 year warranty offered by the Manufacturer and no charge end user technical support.

S & K Technology, Inc.
4610 Spotted Oak Woods
San Antonio, TX 78249

Contact: Kay A. Robbins

Comments: Software and consultation available. Products: WatchWord Version 3 — PC version $129.95, Z-100 version $100.00. Resident Speller — PC version $99.95, Z-100 version $100.00.

St. Benedict's Farm
Box 366
Waelder, TX 78959
(512) 540-4814

Contact: George Gannon

Comments: Software and consultation available. Products: BEEFUP: cow/calf

herd performance data system providing 12 constantly updated types of reports. PEDIGREE: 5 generation annotated pedigrees on any kind of livestock.

Sammamish Data Systems, Inc.
1813-130th Avenue N.E.
Bellevue, WA 98005
(206) 867-1485

Contact: Richard Schweitzer

Comments: Software and consultation available. Products: Computer mapping and Geographic Information Systems for sales and marketing professionals. Used for demographic and business targeting, and sales territory delineation. Special Notes: Zenith '241, '248 or '386.

The Santa Cruz Operation, Inc.
400 Encinal Street
Santa Cruz, CA 95060
(800) 626-UNIX
(408) 425-7222

Contact: Telemarketing

Comments: Software and consultation available. Products: SCO has a wide variety of products for 286 and 386 PCs. Call or write for information on these products. Special Notes: All products require the XENIX Operation System.

Scottie Systems
2667 Cropley Avenue #123
San Jose, CA 95132
(408) 259-6226

Contact: Barbara

Comments: Hardware, software and consultation available. Products: IBM emulation with the Scottie Board and ZPC. IBM clone serial ports and clock available. Hard drives, controllers and printers for Z-100, AT/XT and compatibles. Special Notes: Coming in '88: Scottie Board w/ softnets KAL1000 Network; Z-100 adapter board for OMTI or WD controllers and more.

Secured Computer Systems
12011 Aclare Street
Cerritos, CA 90701
(213) 924-6741

Contact: Ken Halbasch

Comments: Hardware, software and consultation available. Products: Memory card, parallel card, clock card Z-89, Z-90 office productivity and performance monitoring software Z-110, Z-100-PC. Custom hardware Z-100 and Z-100-PC sales and service. Special Notes: We develop custom systems — hardware and software add-ons and request.

Sextant Publishing Company
716 E Street, S.E.
Washington, DC 20003
(202) 544-0900

Contact: Dawn Hayden

Products: *Sextant* magazine, *Buss* newsletter, and *The Buss Directory* are independent publications exclusively for users of Zenith computers. *Sextant* — $17.95/6 issues; *Buss* — $28/20 issues (includes *The Buss Directory*); *The Buss Directory* — $12.50.

SigmaSoft and Systems
17000 Dallas Parkway, #207
Dallas, TX 75248
(214) 380-6187

Contact: Clay D. Montgomery

Comments: Hardware, software and consultation available. Products: Complete Hard Disk Drive systems which include drive, controller, parallel interface, cabinet, power supply, boot ROM, Z-37 compatible floppy disk controller, and very comprehensive CP/M and HDOS support software. Prices are $795 for 10MB, $895 for 20MB, and $1145 for 40MB. Special Notes: SigmaSoft and Systems specializes in supporting H/Z-90 users.

Softnet Communication, Inc.
15 Hillcrest Drive
Great Neck, NY 11021
(516) 829-6536

Contact: Michael Mardklea

Comments: Hardware and consultation available. Products: A high performance local area network for IBM PC/XT/AT, compatibles and the Zenith Z-100 based on a proprietary hardware design and Western Digital's Vianet Lan operating system. Special Notes: Hardware and software per node: $295.00 — IBM PC/XT/AT, $395.00 — Z-100.

Software Applications of Wichita
2204 Winstead Circle
Wichita, KS 67226-1122
(316) 684-0304

Contact: Nat Addleman

Comments: Software and consultation available. Products: TaxAide income tax preparation templates for Lotus 1-2-3. Easy to use, menu driven format. Load and use, does not require worksheet building knowledge. Produces IRS approved forms. Special Notes: Satisfaction guaranteed. Full technical support. Specializing in customing application software.

The Software Group
Northway 10 Executive Park
Ballston Lake, NY 12019
(518) 877-8600

Contact: Sally Devito

Comments: Software and consultation available. Products: The Software Group provides the following software packages: Enable, Enable/LAN, Enable/Learn. Enable is an integrated software package consisting of word processing, spreadsheet, graphics, database and telecommunications. Special Notes: Training and applications development are also offered. Enable is available in seven different languages in 23 countries.

Software Wizardry, Inc.
8 Cherokee Drive
St. Peters, MO 63376-3926
(314) 447-7337

Contact: Dale Wilson

Comments: Hardware, software and consultation available. Products: Manufacturer of enhancement software and hardware products for Heath/Zenith computers. Products include: Wildfire, Rampal, Palette, and many others. Special Notes: Products available direct, Heath/Zenith Electronics Centers, and other Heath/Zenith outlets.

Southwest Accessories Network
1423 Godwin Lane
Duncanville, TX 75116

Contact: Local Heath/Zenith Manager

Comments: Hardware available. Products: Computer cables, standard and custom. Special Notes: Contact your local Heath/Zenith Electronics Center.

Spectre Technologies, Inc.
22458 Ventura Boulevard., Suite E
Woodland Hills, CA 91364
(818) 716-1655

Contact: David Grenewetzki

Comments: Software available. Products: High quality software products for MS-DOS and CP/M computers, including REMBRANDT Business Graphics Toolkit, PRESTO Software Supercharger and LONG & LOUD sideways and banner printing programs. Special Notes: Also distribute the MEDIA Master line of disk-to-disk transfer software for the Z-100 and MS-DOS computers.

Robert J. Stalder
3508 Furey Avenue
Madison, WI 53714
(608) 241-5483

Contact: Bob

Comments: Software and consultation available. Products: Software maps out on your terminal eight lines of information on computer byte or word. Input can be in octal numbers or decimal bit numbers. Special Notes: At $49.95, an aid to H11 or PDP-11 assembler programmers, students and hobbyists.

Studio Computers, Inc.
999 S. Adams
Birmingham, MI 48011
(313) 645-5365

Contact: Ray Massa

Comments: Hardware, software and consultation available. Products: Authorized Zenith Data Systems Dealer, Panasonic printer and MPI service. Retail and mail order of computers and all popular accessory items and desktop publishing systems.

STSC, Inc.
2115 East Jefferson Street
Rockville, MD 20852
(301) 984-5000

Contact: Jerry Turner

Comments: Software and consultation available. Products: STSC provides APL*PLUS software and various applications software packages for mainframe computers/minicomputers/PCs.

Surplus Trading Company
609 Paw Paw Avenue
P.O. Box 1082
Benton Harbor, MI 49022
(616) 926-6391

Contact: Les Turk

Comments: Hardware available. Products: Surplus Zenith computer parts including power supplies, boards for various model computers, disk drives, miscellaneous cables, IC chips, trade-in computers, many other items. Special Notes: Please call for information — we ship UPS COD CASH ONLY. All parts AS IS.

Symbiotics
431 Mishler Road
Mogadore, OH 44260
(216) 699-4978

Contact: Bill Claxton

Comments: Software and consultation available. Products: Bible tools/PKT Bible software in APL. Authorized STSC PLUS*WARE dealer. Custom programming. Weibull analysis of life data. Special Notes: APL Programs for Z-150, IBM-PC, Compatibles.

Taranto & Associates, Inc.
68 MItchell Boulevard, Suite 125
San Rafael, CA 94903
(800) 227-2868
(415) 472-2670 (CA)

Contact: Arlene Schaffer

Comments: Hardware, software and consultation available. Products: GL, AR, AP, IC and Payroll. Integrates with Multiplan and can include POS. Interfaces with WordStar for customer/vendor names and addresses. Links AR with IC. Searches for part number in master file. Displays price and description. Updates inventory.

TEACO, Inc.
2117 Ohio Street
P.O. Box E
Michigan City, IN 46360
(219) 874-6234

Contact: Paula D. LeMay, Sales Coord.

Comments: Hardware and consultation available. Products: FLOPPY DISK DRIVE EXERCISERS for standard 5-1/4" and 8" drives; adaptors for other interfaces. RADIALIGNER and ALIGN-A-FLOPPY alignment aids to accomplish radial alignment of the read-write head without an oscilloscope. CABL-SIMPL-CHEKR tests continuity of ribbon cables. Special Notes: Units available either DC or AC powered and in sizes ranging from hand-held to bench models.

Technical Advisors, Inc.
861 Washington Avenue
Westwood, NJ 07675
(201) 666-0504

Contact: Matt Baum

Comments: Hardware, software, and consultation available. Products: A multi-port Parallel I/O card for use in the Left-Side card slots of the H-89. Very simple interfacing, for hobby or machine control.

Teletek Enterprises, Inc.
4600 Pell Drive
Sacramento, CA 95838
(916) 920-4600

Contact: Tim Noxon

Comments: Hardware, software and consultation available. Products: IBM compatible memory expansion which utilizes the EMS 4.0 enhancement of the previous EMS standard. For XT and AT compatibles.

Kirk L. Thompson
#6 West Branch Mobile Home Village
West Branch, IA 52358
(319) 643-7136

Contact: Kirk Thompson

Comments: Hardware and consultation available. Products: "Generic" keyboard overlays for 8- and 16-bit computers: H-19/89/90, H/Z-100/138/148/158/161, and H/Z-286. Consulting about 8-bit systems.

Barry A. Watzman
Microcomputer Systems & Consulting
560 Sunset Road
Benton Harbor, MI 49022
(616) 925-3136

Contact: Barry Watzman

Comments: Hardware, software and consultation available. Products: Perks Desktop Utility for Z-100 and -PC compatibles; Addresselope envelope addressing program for PC compatibles. PC Clone Hardware Consulting.

WindowDOS
Box 300488
Arlington, TX 76010
(817) 467-4103

Contact: David Thomas

Comments: Software and consultation available. Products: WindowDOS 2.0, a memory-resident DOS utility to perform DOS commands from within another program. Commands include format, move, rename directory, show environment, password lock, and standard DOS file commands. Special Notes: Not copy protected. Supports EGA and Hercules. Requires a 100% IBM compatible computer.

ZPAY Payroll Systems
3516 Ruby Street
Franklin Park, IL 60131
(312) 671-3364

Contact: Paul Mayer

Comments: Software and consultation available. Products: ZPAYII Payroll System — For IBM-PC/XT/AT & Compatible. Complete password-protected payroll system; pays salaried, hourly, commission, and salary plus commission; prints current, MTD, QTD, and YTD reports, tax reports, W-2's, 1099's, checks, and more; handles multiple companies, as well as multiple pay periods, and can be used for a post facto payroll; on-line help windows make data entry simple and smooth; no special accounting knowledge required; database can hold 32,000 employees and locate a record in under two seconds. Price $49.95

Zoom Telephonics
207 South Street
Boston, MA 02111
(800) 631-3116

Contact: Terry Manning

Comments: Hardware and software available. Products: Zoom/Modem PC 1200 and 2400, with Demon Dialing, touchtone decoding, electronic mail buffer, audio ports and more. Zoom/Modem HC 2400 with ProComm retails for $199. TeleDex software provides contact tracking.

*

The other cats get to sing along!

That's because HEPCAT runs ***with*** your other programs, not ***over*** *them. HEPCAT (HUG Engineer's and Programmer's CAlculation Tool) is a powerful pop-up calculator for all Heath/Zenith MS-DOS and Z-DOS based computers. Unlike other pop-up calculators, HEPCAT does not stop the currently running program while it is popped up. That means that you can do calculations while your computer is busy with something else. For example:*

- *While Lotus (tm) is loading a huge spreadsheet, you can check your kid's math homework.*
- *While Dbase (tm) is sorting a large database, you can add up some grocery prices.*
- *While your computer is busy compiling one program, you can work on number base conversions needed for another program.*

HEPCAT is safe to pop-up during just about any running program — even during disk activity. And HEPCAT has other features the other guys can't touch.

HEPCAT gets along with everyone . . .

HEPCAT supports more video configurations than any other pop-up, and always pops up in the current video mode, rather than forcing the screen into a text mode as other pop-ups do. It also works properly with more programs than any other pop-up. You can pop up HEPCAT over Microsoft Windows (tm) and many other programs that other pop-ups can't work with, and even over some other pop-ups.

HEPCAT works harder . . .

*HEPCAT provides a multi-function floating point calculator and a programmer's binary calculator that work together to do more than the basic four (+, -, *, /). The floating point calculator includes the following built-in functions: powers, pi, factorial, square root, sine, arc sine, cosine, arc cosine, tangent, arc tangent, log (natural and base 10), e^X and 10^X. It also includes the following conversions: degrees-radians, radians-degrees, Celsius-Fahrenheit, Fahrenheit-Celsius, centimeters-inches, inches-centimeters, meters-feet, feet-meters, kilometers-miles, miles-kilometers, grams-ounces, ounces-grams, kilograms-pounds, pounds-kilograms, milliliters-fluid ounces, fluid ounces-milliliters, liters-quarts, quarts-liters. The binary calculator works in these number bases: binary, tetral (base 4), octal, split octal, decimal, and hexadecimal; and it supports these operations: MOD, AND, OR, XOR, SHL, SHR.*

The HEPCAT floating point calculator supports 8 significant digits and can display numbers four ways: floating point, fixed point, scientific notation, and engineering notation. Numbers are handled internally in BCD format to eliminate binary round off errors in addition and subtraction.

HEPCAT eats less . . .

HEPCAT uses less than 16k of memory — less than any other pop-up calculator that we know of. It also uses less than 16k of disk space, so you don't have to worry about where to put it on a small system. The HEPCAT window uses less screen space, too. It shows you more real information than other pop-up calculator displays, but it doesn't waste space by showing you a keypad layout. You already know what your keypad looks like! HEPCAT is easier to learn, too, with commands that make sense.

If you are tired of pop-ups that can only sing solo, give HEPCAT a try. HEPCAT is available from HUG as part no. 885-3045-37 for $35.00. It works on any Z-100 PC, Z-200 PC, or Z-100 (not PC) system and any version of MS-DOS or Z-DOS.

STB's VGA Extra for IBM Compatible Computers

by Joseph Katz

With STB Systems' adaptor board you actually get the ability to run more of today's software when you add the capability to use new VGA software. So maybe there is such a thing as a "free" lunch.

When IBM introduced its new generation PS/2 computers it added a new set of letters to the alphabet soup of graphics display standards and something else for you to worry about. Although that new VGA ("Video Graphics Array") display was made available immediately on high end PS/2 computers, it was only a future option for the Model 30 and existing computers. IBM's marketing strategy obviously was to hit the beachhead full blast with the new machines and make the PC, XT, and AT types of computers obsolete. You, therefore, computing happily with your IBM compatible computer, suddenly faced the prospect of sooner or later not being able to use new software. After all, you can't use software your computer can't display, and IBM obviously wasn't going to ease the pressure on you to junk your old system and buy its new ones.

Fortunately STB Systems solved that problem by introducing a VGA display adaptor board for computers with the bus shared by the Model 30, PC, XT, and AT—the generation of computers that seemed to have been made obsolete—and you could breathe a sigh of relief. Now you could upgrade your present computer to use VGA software by installing STB's VGA Extra adaptor and the appropriate monitor. The best thing about the VGA Extra to my way of thinking, however, is not only that it allows your present IBM compatible computer to run software for the new display standard but also that it allows you to run software for most of the past and present display standards too. That broad capability is the "Extra" in the name "VGA Extra" and it, more than the fact that the VGA Extra was the first VGA adaptor for existing computers, is what I find exciting about this board. If you don't yet see why I'm cheering, maybe you don't recognize the problem this board solves.

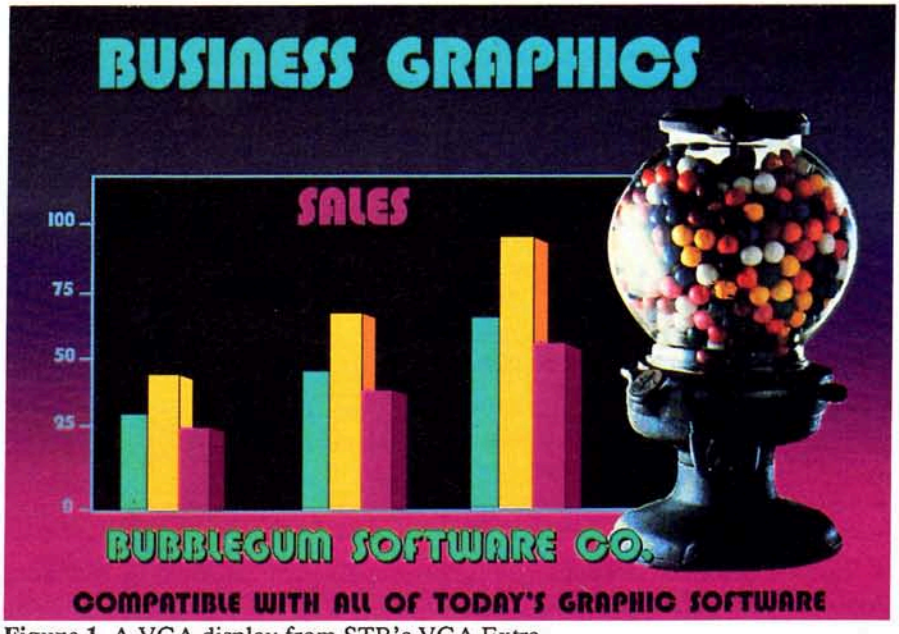


Figure 1. A VGA display from STB's VGA Extra.

So here are the generations represented by that alphabet soup of abbreviations for the various major display standards for graphics—those standards intended to do more than display mere text. In the beginning (August 1981) was CGA ("Color Graphics Adaptor"), which uses a digital monitor to display a maximum graphics resolution of 640 pixels X 200 pixels. If your Heath or Zenith computer is an XT compatible more than about a year or so old, it probably came with a CGA adaptor: Zenith included it with computers such as the 150 and 158. Then (August 1984) came EGA ("Enhanced Graphics Adaptor") with a maximum graphics resolution of 640 X 350 on a digital monitor. If you have a Heath or Zenith AT compatible 241 or 248, it may

well have an EGA adaptor in it: depending on when you got the computer, you either had to pay for a separate adaptor of your choice or had an EGA adaptor included in the computer's price. Simultaneous with EGA was born PGC ("Professional Graphics Controller") with a graphics resolution of 640 X 480 and, for the first time, requiring an analog instead of a digital monitor.

A major element in this succession of display standards is resolution, determined by the number of pixels—dots—with which a shape is represented on the monitor, and you can see that each new standard brought increasingly finer resolution. PGC therefore should have taken the world by storm. One reason it didn't was that PGC cost too much for most people: when you put together the cost of the adaptor board with the cost of the analog monitor it required, you wound up with a bill for $4,500. That's a bit much for anyone but Reginald Van Gleason III to spend on getting just a nicer display for such things as word processing, spreadsheets, or database managers, with maybe a few games and other graphics thrown in. The price of admission defined PGC as a special purpose standard, the special purpose being mainly applications such as CAD (Computer Assisted Design) and CAM (Computer Assisted Manufacturing) where the highest possible resolution was worth the premium it cost. You therefore don't find much software written to the PGC standard outside such specialized areas of computing.

I may be wrong but my sense of where VGA (April 1987) belongs in this continuum is that it's as much a kind of PGC for the masses as it is a refinement of EGA. Like PGC it displays a maximum color graphics resolution of 640 X 480 and uses an analog monitor. Those from IBM are priced much more reasonably than its expensive PGC monitors and there currently are four VGA monitors available from IBM: 12-inch 8503 (monochrome) at $250, 14-inch 8512 (color) at $595, 12-inch 8513 (color) at $685, and 16-inch 8514 (color) at $1,550. VGA therefore may well become *the* new graphics standard and, even so soon after its birth, is becoming *a* standard. That's in large part because IBM built the VGA controller into the system board of its new PS/2 Models 50, 60, and 80. Microsoft is supporting VGA and so are such major manufacturers of graphics software as Z-Soft, which publishes the useful and influential Paintbrush programs for IBM compatible computers. You therefore probably don't have to worry that VGA will suffer the same fate as its predecessor PGC: you'll see a great deal of VGA and, because its cost of implementation can be about the same as EGA, it may eventually supplant EGA.

Although VGA is not so great a leap forward in resolution from EGA as EGA was from CGA, VGA is very nice indeed. The 640 X 480 resolution delivers the same number of pixels-per-inch horizontally and vertically, which should mean you'll be seeing more programs that do more things worth doing. Expect, for example, to see more programs that allow you to rotate views on your screen so you can instantly transform stalagmites into stalactites, convert bar graphs into column graphs, and turn headlines on their sides. I think it's a sure bet, therefore, that you'll find VGA becoming the real most desirable standard for desktop publishing. You'll see why if you spend a few minutes sketching circles as they would appear when displayed by the various standards. CGA (which, as I've said, used to be standard equipment on Zenith computers) and EGA (which, as I've implied, has become standard equipment on some newer Zenith computers) suffer from an

Figure 2. Modes available from the VGA Extra.

These modes, supported on the monitors indicated, may be set using either the Setmode utility program supplied with the VGA Extra or by programming the "set video mode" function of the VGA Extra's BIOS. From the *STB VGA Extra User's Manual*, (Version 1.2), p. 42.

MODE	DESCRIPTION	DIGITAL MONITORS	ANALOG MONITORS
0	40 x 25 Text	RBG, EGA, Multifrequency	Color, Monochrome
1	40 x 25 Text	RBG, EGA, Multifrequency	Color, Monochrome
2	80 x 25 Text	RGB, EGA, Multifrequency	Color, Monochrome
3	80 x 25 Text	RGB, EGA, Multifrequency	Color, Monochrome
4	320 x 200 Graphics	RGB, EGA, Multifrequency	Color, Monochrome
5	320 x 200 Graphics	RGB, EGA, Multifrequency	Color, Monochrome
6	640 x 200 Graphics	RGB, EGA, Multifrequency	Color, Monochrome
7	80 x 25 Text	Monochrome	Color, Monochrome
8	132 x 25 Text	Monochrome	
9	720 x 348 Graphics	Monochrome	Color, Monochrome
10	132 x 44 Text	Monochrome	
11	704 x 519 Graphics	Multifrequency	
13	320 x 200 Graphics	RGB, EGA, Multifrequency	Color, Monochrome
14	640 x 200 Graphics	RGB, EGA, Multifrequency	Color, Monochrome
15	640 x 350 Graphics	Monochrome	Color, Monochrome
16	640 x 350 Graphics	EGA, Multifrequency	Color, Monochrome
17	640 x 400 Graphics	Multifrequency	Color, Monochrome
18	640 x 480 Graphics	Multifrequency	Color, Monochrome
19	320 x 200 Graphics	Multifrequency	Color, Monochrome
34	132 x 44 Text	EGA, Multifrequency	
35	132 x 25 Text	EGA, Multifrequency	

Figure 3. STB's VGA Extra adaptor board.

aspect ratio (the ratio of a pixel's height to its width) that distorts what you see on the monitor. If your computing involves the printing of graphics on a printer with a 1:1 aspect ratio and you create those graphics on a CGA display, you probably suffered some brain damage during the time it took you to figure out that you could get circles on screen or on paper but not on both. That's why some graphics programs allow you to choose between configuring them for your monitor or your printer. And that's a big reason why people whose living comes from computer aided design ran to those now-defunct IBM Product Centers to plunk down about $4,500 for PGC displays with a 640 X 480 resolution. PGC has a 1:1 aspect ratio. So does VGA.

Analog video is another reason why VGA is nice. Your CGA or EGA monitor uses digital video. "Digital" means a signal can be either "on" or "off." CGA has four color signals (red, green, blue, and black), and since each can be in one of those two conditions there is a maximum of sixteen possible colors. EGA has six color signals, and since each can be in one of the two digital conditions there are sixty-four possible colors. Analog video uses only the three primary Red-Green-Blue signals but varies their strength to blend hues and tones. The VGA standard allows a maximum of 64 different signal levels, and since each of the RGB signals can be generated on one of those levels there are 262,144 possible colors. But not, in practice, all at once. The number of colors that can be displayed simultaneously is limited by factors including available video RAM. The practical limit right now is 256 colors displayed simultaneously.

Fantasize about subtly shaded rainbows if you'd like, but when you slide back to earth you'll realize that in computing as in the rest of life you always have to make compromises. There's a tradeoff between resolution and colors. Both eat memory. You know that from experience with CGA: your application software never showed you more than four colors at a time in the so-called "80 column mode"; when you played a game that dazzled you with more colors it likely was programmed to snap into the so-called "40 column mode" and displayed astonishingly crude graphics. The programmer sacrificed four-color 640 X 200 resolution to get sixteen-color 320 X 200 resolution. If you want the 640 X 480 resolution in VGA, learn to like having from two to sixteen colors. If you want the 256 colors, you'd better enjoy 320 X 200 resolution. And be prepared to accept less of each if your most important programs gobble memory for other purposes. Z-Soft's Publisher's Paintbrush, for example, can handle an entire 8-1/2 X 11 inch page of graphics—can display it and print it on a suitable printer—if you have a few megabytes of Expanded or Extended Memory. But not if you use lots of color at a high resolution, and not if you have to do any fancy manipulation of images. Cutting, pasting, and copying all require resources and those resources translate partly into an absolute demand for lots of RAM, which in turn take hefty stacks of dollars to acquire.

And yet even after you come back to earth the VGA display is hard to resist. It's a real blessing if your work involves graphics, including desktop publishing, even if your desktop publishing is only or mostly text. The ideal in that kind of work is still WYSIWYG: pronounced "WizzyWig" and meaning "What you See is What you Get." VGA brings you closer to WYSIWYG than EGA does, and much closer than CGA does.

So STB's VGA Extra card is not only new but also really important. It's even more important for owners of Zenith computers because the VGA Extra board is not only "VGA" but also "Extra." That "Extra" signifies that STB's board supports an incredible number of display modes—some of them standard (CGA

STB's Chauffeur HT: A flexible high resolution monochrome adaptor

It used to be you had to choose between the dubious wonders of color and graphics on the one hand and the real benefits of high resolution on the other. On the right there was CGA while on the left was IBM's other 1981 standard, MDA ("Monochrome Display Adaptor"). You, like Hobson, had to choose whether you wanted high resolution text or medium resolution graphics.

With MDA you sacrificed the ability to play games or do anything else that required real graphics. (MDA programs did use IBM's "Extended ASCII" character set for visual effects, and often quite nicely.) But the gain was less fatigue, fewer blinding headaches, and reduced eyestrain in applications such as word processing and spreadsheeting. The high resolution text modes in VGA and EGA are so good that many people will see no imperative to make Hobson's Choice.

But high resolution monochrome is not dead. If you already own a high resolution monochrome monitor like Zenith's ZVM-1240, consider feeding it from STB's Chauffeur HT adaptor board instead of your dedicated MDA-only adaptor. The Chauffeur HT is much more than a mere replacement for Zenith's own high resolution monochrome adaptor board (which is strictly MDA) or even for a sophisticated Hercules Graphics Card. The Chauffeur HT supports both standards and--like STB's VGA Extra--provides significant added value. For example, the Chauffeur HT allows graphics with a 1056 X 352 resolution that is crisp and really useful in Microsoft Windows. For another example it allows a high-resolution 132 column display that is crisp and really useful with Lotus 1-2-3 spreadsheets. STB supplies the essential drivers for introducing those special features into those specific applications programs when you use the Chauffeur HT.

The Chauffeur HT has the additional advantage of supporting standard RGB monitors (not tested) and Multifrequency monitors like the NEC Multisync (tested). It's really a joy to be able to run software for either high resolution monochrome or color graphics without swapping boards and monitors. And if all that isn't enough, the Chauffeur HT board comes with a parallel printer port and can be ordered with an optional serial port and clock/calendar.

and EGA, for example), some quasi-standard (HGC, "Hercules Graphic Card"), and some contributed by STB itself. Don't snub the latter as a "standard that isn't a standard." The way this board works, that doesn't matter. These benefits come without a curse, at least none that has struck me. STB supplies drivers to get sixteen colors in 640 X 480 resolution with Microsoft Windows and AutoCAD, and 132 columns with Lotus 1-2-3. Exit those programs and you're out of those drivers, free to benefit (or suffer) from the standards used by other programs. The VGA Extra is an "intelligent" board that recognizes the display required by each program and automatically supplies it. Or in many instances you can use a Setmode utility program STB supplies with the VGA Extra to set the mode you want. Look at Figure 2 to see what's possible, depending on the kind of monitor you use.

Of course what you get depends on what you have in your computer or attached to it. No board, not even the VGA Extra, can show you pretty pictures directly. It serves only as intermediary between the software that generates them and the monitor that displays them. Here are the kinds of monitors supported by the VGA Extra: Multifrequency Analog Color (such as the NEC Multisync); Fixed Frequency Analog Color (such as the IBM PS/2 Color Display 8513); Multifrequency Digital Color (such as the NEC Multisync); Enhanced Graphics (such as the Amdek 722); Fixed Frequency Analog Monochrome (such as the IBM PS/2 Monochrome Display 8503); standard RGB Color (such as the Zenith ZVM-135); and standard High Resolution Monochrome (such as the Zenith ZVM-1240). That list seems to cover all the current kinds of computer monitors for microcomputers: there is no practical way to list the individual monitor brands and models supported by the VGA Extra because it supports such a great many of them. If you already own a powerful monitor and want to take advantage of its inherent capabilities, the VGA Extra ought to support the best of which your monitor is capable. If you're not sure what that is, or if you plan on buying a new monitor to take the best possible advantage of the VGA Extra, call STB Systems and ask. I've found their support to be superb.

If you own a multifrequency monitor like the NEC Multisync you ought to be giggling in delighted anticipation of what you can do if you add a VGA Extra adaptor to your system. If you don't own one and wonder why it's treated here as both an analog and a digital monitor, the reason is that it can be either: there's a little bat switch on back of the monitor to toggle between digital (marked "TTL" on the NEC Multisync) and analog. NEC's golden idea was a monitor that supported existing standards and stood a good chance of handling future standards too. That way the Multisync would be an investment instead of an expense. So right after IBM introduced the PS/2 and VGA, NEC announced it would supply a new cable necessary to connect the Multisync to the DB-15 jack on the new computer for analog operation. And NEC did: it costs about $30, you'll probably have to special order it through a NEC dealer, and you may even have to convince your dealer that the cable exists, but it does and you can get it. The STB Extra has that same DB-15 jack for analog operation and, below it, the DB-9 jack required for digital operation. (Mounted on the board are also a light pen connector and a "feature connector.") The board is factory preset for a Fixed Frequency Analog Color Monitor. If that's what you have, just plug the DB-15 male end of your monitor's cable into the DB-15 female plug on the board. Otherwise you set some switches, and maybe move some jumpers, in addition to plugging in the monitor.

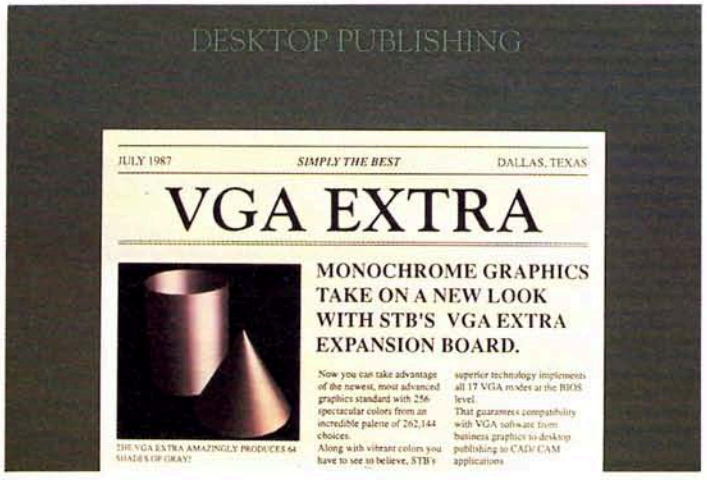
Installation is a snap in a machine like Zenith's Z-248. There's an 8-bit DIP ("Dual Inline Package") on the board's top right corner. (See Figure 3.) You set its eight switches for the characteristics of the monitor you're connecting to the VGA Extra and to specify whether you want the board and monitor used as the primary or secondary display. IBM compatibles can support two different kinds of displays—as, for example, Multifrequency and Monochrome—at once in a single computer. You need an adaptor board for each, which means that you'd need a high resolution monochrome adaptor board such as STB's Chauffeur HT (see the sidebar) if you want a Monochrome display too. Jumpers let you select a 132 column mode and, for special situations where additional hardware requires it, use of the feature connector. Then, in an AT-compatible computer like Zenith's Z-248, you insert the board into any vacant slot (it's an 8-bit board) and use the Setup routine in the ROM BIOS to select an EGA display. At that point you're up and running. Even the preliminary manual that comes with early versions of the board has good, clear installation instructions. The only special attention required to install the board in the Z-241 or Z-248 is that you must set the appropriate switch on the VGA Extra so it does not automatically emulate CGA when you boot the computer. Set that switch to "off." No, you're not losing CGA when you do that: what you're doing, according to STB's engineers, is compensating for what may be a slight conflict having to do with checking for Non Maskable Interrupts on Zenith's computers. The odd result, on my computers, is that warm boots produced a scrolling error message that required me to do a cold boot instead. Setting the appropriate VGA Extra DIP switch to "off" solved the problem without in any way affecting my using any of the large amount of CGA software I own. Don't argue the point: just set the darned switch to "off." If you need support from STB, you should find their technical support staff eager to help and knowledgable enough to do it. I've found their responsiveness right now to be impressive by any standard and, as you may have heard, my standards for such things verge on the unreasonable.

Of course there's a risk when you buy any board other than IBM's during the infancy of VGA. That's the risk you take with any compatible product instead of the one-and-only original: you took it when you bought your Zenith computer instead of one from IBM. STB claims complete BIOS compatibility but only substantial register compatibility with IBM's product. Any genteel, well-behaved program that makes only BIOS calls to produce a display should therefore do nicely with the VGA Extra. It's those lean, mean, and ill-mannered programs, which bypass the BIOS to program the registers directly, that may cause future problems. Of course the only hope right now to avoid such maybe problems is to go with IBM's own board. But get some perspective on the subject. There'll always be the chance of problems with any product from any other manufacturer, and perhaps even from IBM's board once the inevitable revisions start happening. In contrast to the omnipresent gloom of what maybe might happen someday perhaps is the present reality. Publisher's Paintbrush thinks it's running on an IBM PS/2, as does Microsoft Windows installed with Microsoft's own drivers for the PS/2, and so does the VGAGIF program to display graphics in CompuServe's own GIF format. VGAGIF.EXE carries the warning that it writes to the registers and will work only on a PS/2, not on a VGA compatible. But it works nicely on the VGA Extra. So does the VGA Extra itself. There's some roughness when switching between some modes on a NEC Multisync, but it's easily corrected by adjusting the monitor's controls, and it's unlikely to trouble anyone except a bloodthirsty reviewer determined to magnify every freckle into a flaw. Real people, who rely on a few major application programs to do real work, are likely to adjust the monitor once and forget they did it. They might not even notice the freckles. The VGA Extra is in fact not only new but also exciting if you're interested in upgrading your present computer to VGA without leaving your present software behind.

PRODUCT INFORMATION

VGA Extra. $395.
Chauffeur HT. $219.

STB Systems, Inc.
1651 N. Glenville
Suite 210
Richardson, TX 75081
214/234-8750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VGA EXTRA

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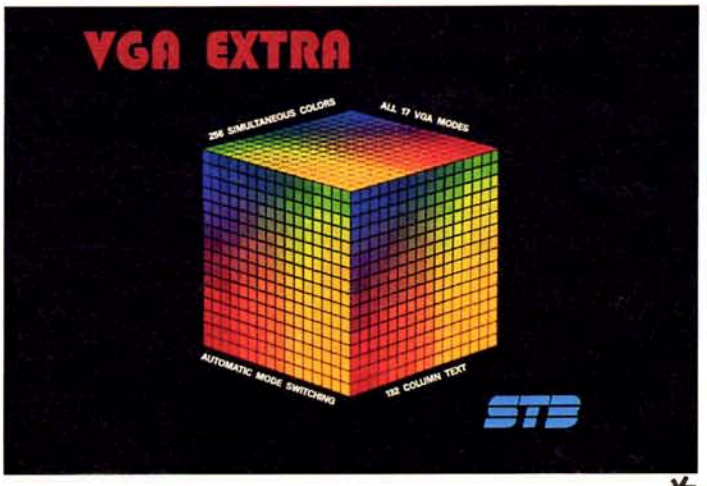


Enable

Part 2

George Elwood
1670 N. Laddie Court
Beavercreek, OH 45432

In the first article in this series on ENABLE, I went through the procedure necessary to install the program on the disk system for your computer, be it dual floppy or hard disk. The procedure actually takes less time to do than it does to read how to do it. Hopefully, everybody has ENABLE installed and is now ready to use this program. Because these articles focus on the Z-100 version of ENABLE, which is version 2.0, some of the features discussed are not available in versions 1.1 or 1.15.

Because ENABLE can do so much, these articles will cover the various modules in groups. This will provide a basic understanding of the word processor, spreadsheet, and database management system in the first set of three articles. The second set of articles will go into greater detail and the third set of three into even greater detail with explanations on the uses of the advanced capabilities of the program. Examples will be used throughout the series to demonstrate each module.

As I have said in the previous article, ENABLE can run on a dual floppy disk system, but after a few minutes of operation you may become discouraged because of the disk changes. Most operations take at least one disk change and normally more. A hard disk system or a system with two high capacity disk drives is highly recommended. The version of ENABLE that is bundled with the DoD Z-184 lapheld computer has been modified to fit on one 760k disk. Some of the modules have been left off the working disk, although they are available on other disks. Unless you have at least 760k, you will be into disk swapping in a big way.

The Word Processor

After using WordStar for over six years, both on the H-89 under CP/M and the Z-100 MSDOS version 3.31, it took me about two weeks to change to ENABLE's word processor. All of the capabilities of WordStar, and more, are available in ENABLE. The learning process took the form of relearning some keystokes (don't use the Z-100 DELETE key, it deletes the line from the cursor to the start of the line) and learning the expert keystokes in ENABLE, a process which is still going on.

To use the word processor, enter ENABLE as described in the first part of this series. At the opening menu, you can either move the highlighted area with the cursor keys or type the first letter of the choice. You will notice that the second menu choices are displayed under the top line. One of the choices under "Use System" is "Word Processing." When you enter ENABLE the "Use System" is highlighted as the default choice. Press <RETURN> or "U" to access the next level of menu items displayed. The "Word Processing" choice is highlighted by default. Again, the next set of choices is displayed. Under word processing, five menu choices are available; Create, Revise, Print, Dictionary, and Mail Merge.

If you press <RETURN> or "W", the default setting is "Create." You must now type in the name of the file you wish to create. You can use directories to indicate where the file is to be stored when saved. You have 25 total spaces to use for this name, including the drive and directory. The actual name can not exceed the DOS limit of eight, plus three in the extension. You can indicate an extension if you wish or ENABLE will assign the ".WPF" extension. ENABLE will then search for this extension when you look for wild card word processing files (WPF). ENABLE will inform you if the name you have selected is in use. If you hit a <RETURN> at the name prompt without an entry, the file will be called "NO-NAME.WPF".

You have entered a name and now are in ENABLE's word processor. The first thing you notice is the initial ruler at the top of the page. This ruler reflects the setting you made during the establishment of your

PROFILE. The "L"eft and "R"ight margins and the "+" center line are displayed along with the "T"abs you selected. You can change these settings at this time by moving the cursor to the location you want the new margins and typing in "R" or "L". You can also make new tab settings by typing "T" or deleting the displayed setting by typing a "-" over the displayed T's. If you type in a "J" on the right side of the margin line, all text entered will be justified. Note that the column count in the bottom right-hand of the screen reflects the location of the cursor. The "+" center of the text marker is displayed automatically depending on the location of the margins. ENABLE displays these instructions on the screen.

I will use the same convention as the ENABLE documentation when describing keystrokes. If the keystrokes are displayed with a "/" between them, the keys are pressed together, .i.e., SHIFT/3. If they are separated, F0 F2, then they are pressed in order, one after another.

After pressing <RETURN>, the next option is the Document Title. You must use the up arrow key to move up into the Document Title area from the text area. This space is used to generate a title page which is printed when the document is printed. This space will grow to whatever size you want. If you do not want a blank title page printed with the document, this can be turned off in the print menu using the "F10" key or in the Print PROFILE.

Before starting the text, note the bottom information line. The 25th line display shows, starting from left to right, the window number, the name of the document, including drive and directory, if you are in draft or final mode, any attributed in effect, and the line and column counters. If you have the EGA driver installed on the PC version, this line is very hard to read as the letters are bright white on a white background. There is no problem with the Z-100 version. You can also turn on a top line help menu that indicates the function of the function keys, both separately and with the F0 (ALT key for the PC). This can be turned on by typing F0 F1 (ALT/F1, for the PC).

ENABLE, like most word processors, has an automatic word wrap at the end of the line. The line will wrap with a rough edge if the top margin is indicated with an "R" or right-justified with spacing between words if the "J" indicates the right margin. You now enter text as with any word processor with a <RETURN> only at the end of a paragraph or for hard line endings. Note that a paragraph marker is placed on the right side of the screen when you use <RETURN> to indicate a break.

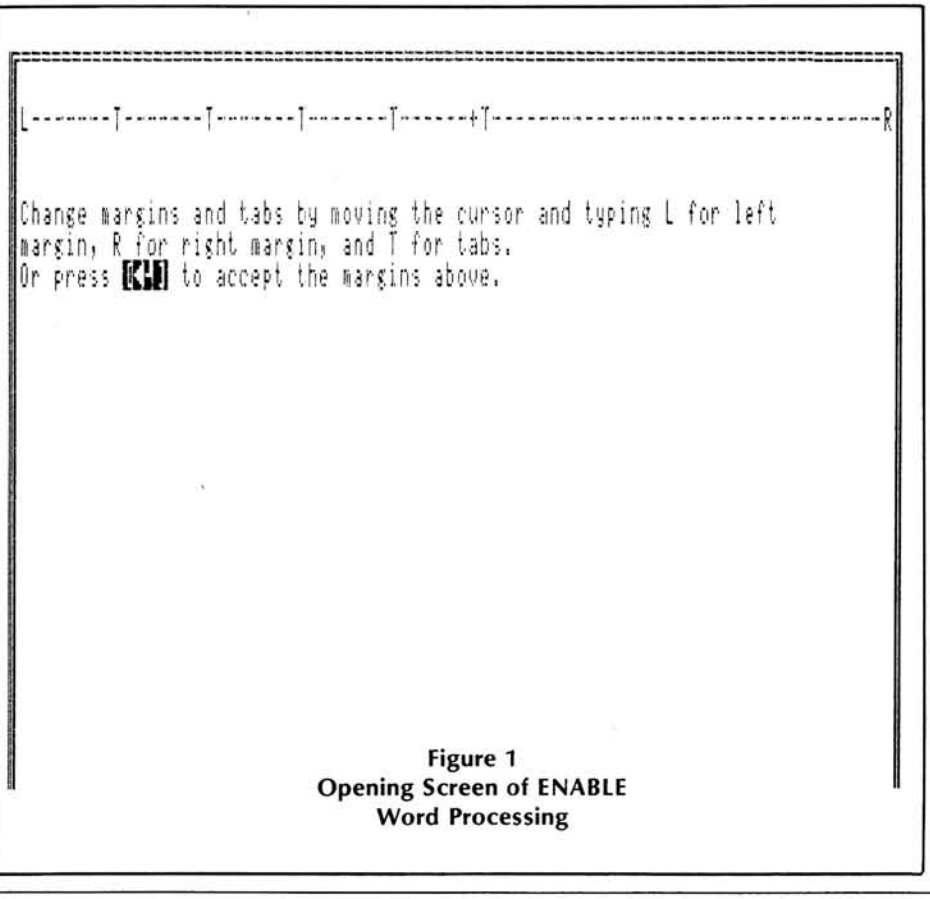


Figure 1
Opening Screen of ENABLE
Word Processing

Hard and soft hyphens can be added to words in documents. The difference between these is that a soft hyphen will be removed if the paragraph is reformatted and the hard hyphen will remain. To use a soft hyphen, press the DASH (-) after typing part of the word. Then press TAB to get to the next line and continue typing the remainder of the word. To get a hard hyphen, press F0/- (ALT/- for the PC) where you want the hyphen. This hyphen will stay in the text.

Editing text is done by moving the cursor over the text and correcting the error. You can add by simply turning the insert on (I CHR for the Z-100 or INS for the PC) and the cursor changes to a block. Anything you type in this mode will push the remaining characters to the right of the cursor to the right. To insert a line, place the cursor below where you want the line and press INS LINE or F3 on the Z-100 or F3 on the PC. To delete a character, place the cursor below the character and press SHIFT/D CHR for the Z-100 or DEL for the PC. To delete a line press SHIFT/DEL LINE or F0 F3 for the Z-100 or ALT/F3 for the PC. You can use the Z-100 DELETE key to delete from the cursor to the beginning of the line. ENABLE also permits deletions of blocks, sentences, cursor to end of text, cursor to beginning of text. A companion to DELETE is the UNDELETE function. I used this frequently during the learning process. It, as all of the DELETE functions, can be used by calling the DELETE window from the top menu by using the F10 key or by using the expert F9 U keystroke.

If there is one key that is important to ENABLE it is the F10 key. This key will bring up a menu with pull down windows for all modules in the program. It is possible to use ENABLE without reading anything by just using the F10 key and using the extensive menus. The expert keys, as they are learned, will speed the use of ENABLE.

Moving about within the document you have created is done with the arrow keys for small movement. Larger moves can be made with the SHIFT/9 (PGUP on the PC) or SHIFT/3 (PGDN) to move a screen 22 lines at a time. Moving a word right or left can be done using the SHIFT/right arrow or SHIFT/left arrow for the Z-100 or CTRL/right arrow or CTRL/left arrow

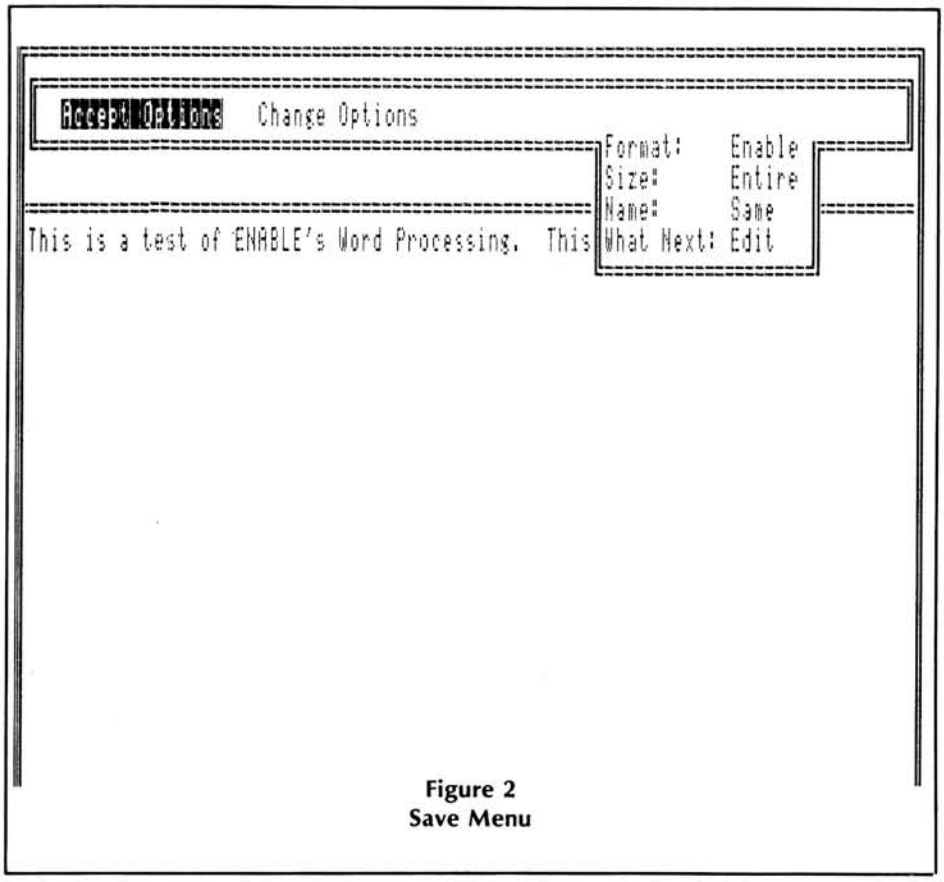


Figure 2
Save Menu

for the PC. Movement to the end or beginning of a line is made using the F2 left or right arrow. Movement to the start of the file is with the keystroke SHIFT/HOME for the Z-100 or CTRL/HOME for the PC. The end of the file can be reached with the strokes SHIFT/F0 SHIFT/1 for the Z-100 or CTRL END for the PC. Moving down (up) [n] pages can be made by using the command F2 [n] SHIFT/3 (9) for the Z-100 or F2 [n] PGDN (PGUP) for the PC. A complete list of the cursor movements are detailed on the plastic overlay.

Now that you have completed some part of the document you were working on, you can save it by pressing F10 to get the top menu and selecting "S"ave. ENABLE will now permit you to accept the options as indicated on the right side of the screen in the pull down block or change the options. If you elect to change the options, more menu choices appear for you. The first choice is the output format. You can output files in ENABLE, ASCII, VOLKSWRITER, EASY, WordStar, Multimate, Peachtext or DCA formats. The ASCII format is helpful for those files like .BAT, BASIC, or Assembly files. If you make ASCII files for .BAT files, make sure you delete all blank lines below the last line of text or you will get results you did not plan on. Use the SHIFT/DEL LINE (ALT/F3 for the PC) to remove these lines. The double line indicating the end of the file should be just below the last line of the text.

The next selection choice is the part of the file you wish to save. The last option permits you to change the name to include the disk drive and directory, if you so desire. If you select a file name that already exists, you will be prompted on your desire to continue. Unlike WordStar, ENABLE does not automatically make a backup file, unless you selected this option during the PROFILE development procedure. After saving the document, you can return and EDIT the same document, Revise another, Create another, Close the Window, or return to DOS. For this exercise, close the window. Note: ENABLE keeps the entire file in memory so movement is rapid between the top and bottom. It would be wise to save the file every so often, because if a power problem occurs, you will not have lost everything.

Now that a document has been created, we can go back and revise it. From the opening menu, select "U"se, "W"ord processing, or "R"evise by either highlighting the options with the cursor or by typing the first letter of the choice. You now have to type the name of the file you wish to revise without the extension, unless you provided an extension during the save or have imported a file from another source. If you do not remember the name of the file, just type in a "?" and a list of all .WPF files on the logged directory will be displayed. You can also use the DOS wild card *.*. Use the cursor to highlight the file you want and a <RETURN> will bring it into the word processor.

If the file is not in ENABLE format, you are prompted for the type format. The same formats are read as written in the save. If you have a file that is not in the ENABLE format without the .WPF extension, it will not be displayed if you use the "?" wild card. If you have a file without an extension, you must put a period after the name or ENABLE will not find it. After opening the file, the cursor will be at the top for your revisions.

The Software Group has made the file extensions meaningful throughout the program. As an example, the word processing files have the extension .WPF. The other extensions used in the word processing module are as follows:

.WPF	Word Processing Files
.WPI	Word Processing Index Files
.WPT	Table of Contents Files
.WPP	Print Files (removed after printing is completed)
.WPM	Word Processing Macro
WP.MNU	Default Word Processor Menu
x.WP	Named Word Processing Menu
.DOC	Extension required for Multimate and PeachText Files

With ENABLE, you can print the file from anyplace in the document. You do not have to save it first as in some other word processors. To print the file, all you have to do is press F0 F2 (ALT/F2 for the PC). You must have enough space on the working disk for a file the same length as the one you are using. ENABLE makes a print file and places the name of the file in the print queue. You can have several files in this queue and they will print in the background without problem. If you have a print buffer, either in the printer or outboard, the disk access will not slow the printing. If you wish to abort the printing in progress press SHIFT/F0 F2 (CTRL/F2 for the PC) and a message will appear on the bottom of the screen that printing will stop when the buffer is empty. Note that if you drop out of ENABLE for any reason before the printing is completed, the file being printed remains in the print

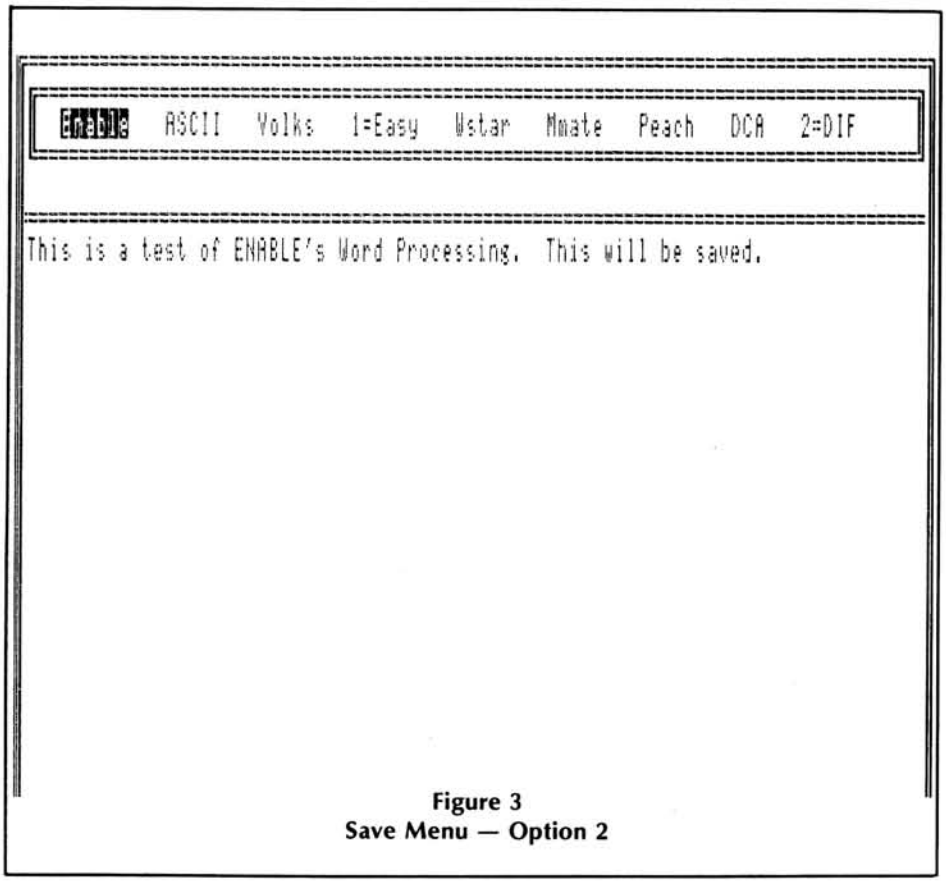


Figure 3
Save Menu — Option 2

queue. You can look at this file with the word processor by typing in the name "PRINTQ.TSG", again an easy name to remember. You can delete the remaining files, if you so desire.

If you start printing using the above procedure, the output will use the default print setting from the selected PROFILE. To change the PROFILE, use the F10 and "P"rint. Five menu selections will permit you to change any of the default selections. On version 2, you can change printers, as long as the drivers were selected during the INSTALL procedure. To name a few of the options, you can select pages to print, the number of copies you wish printed, number the pages, change the date structure, change paper length and width, page offsets, change the pitch, or select letter quality if your printer will print in this mode. You save the print setting with F0 F10 (ALT/F10 for the PC) with the document. With the PC version, you can print different files to different printers. You have to select the printer and port for each file. I have printed on the parallel LPT1 to a letter quality printer and then started another file on LPT2 to a serial printer, with both files printing at the same time. As indicated in the first article, the Z-100 version will not support this feature because of the non-support of the serial ports for output devices.

Now that we have an output, you see the need for a user defined page break in your document. Move the cursor to the location where the page break is needed. Press F10 and the top line menu appears. Select "L"ayout and a pull down menu appears from which you can select "Page Break." Once you become proficient with ENABLE, you can use the expert "F9 INS M P" keystrokes.

As you add more text, you decide to change the margins of a section of text. To do this, add another ruler above where you need the change. Again, press "F10" and select "L"ayout by either moving the cursor to that word or typing the first letter "L". From the pull down menu, select "1" to add a ruler. When the ruler appears, you can move along it with the cursor and place the "L"eft and "R"ight margins or "T"abs, as desired. You can also add the ruler by using the F0 F6 (ALT/F6 for the PC) expert keystrokes.

After saving the file and before quitting, you can look at information on the file. By typing F10 "M"cm "2" Files and the "1" for the file summary. This block provides information as to the total number lines, number of words, date you started the file, date of last revision, and total pages. To get the page count, you must save the file in the FINAL format. Earlier in this article, you added a page break after seeing a need from a hard copy. You can see the document without printing by using EN-

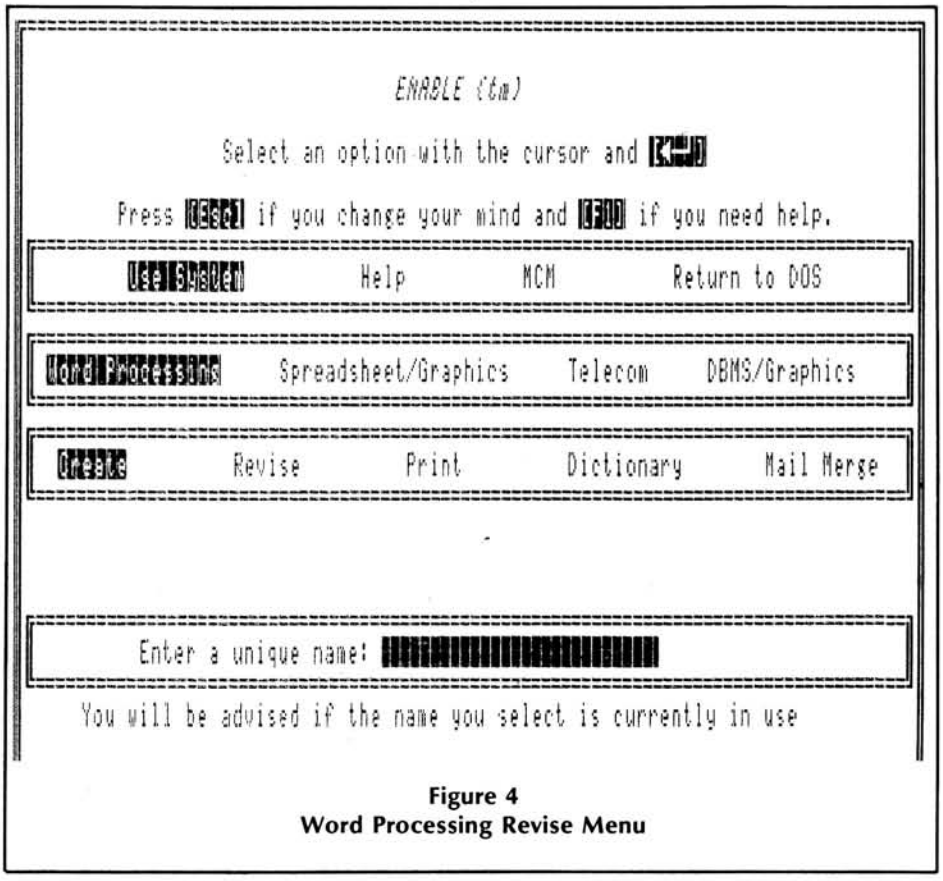


Figure 4
Word Processing Revise Menu

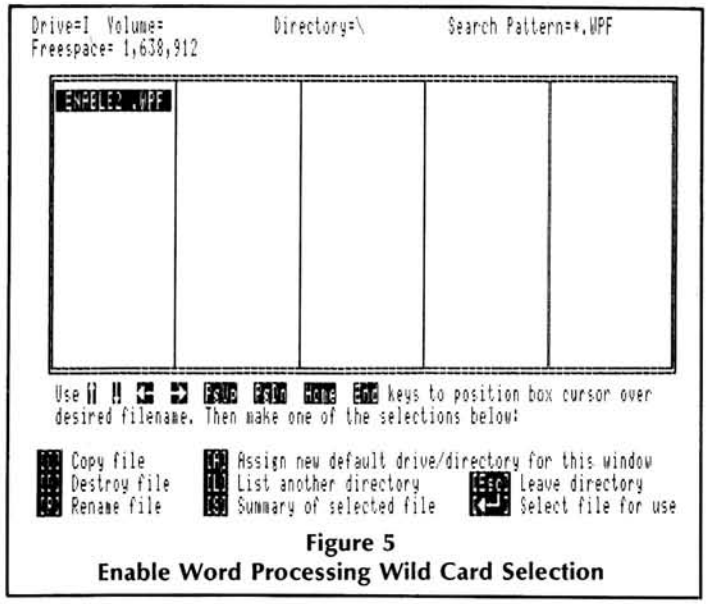


Figure 5
Enable Word Processing Wild Card Selection

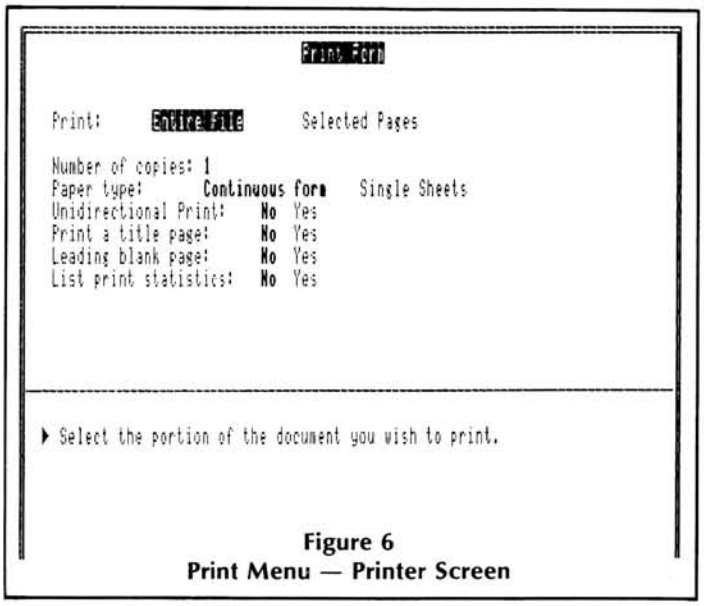


Figure 6
Print Menu — Printer Screen

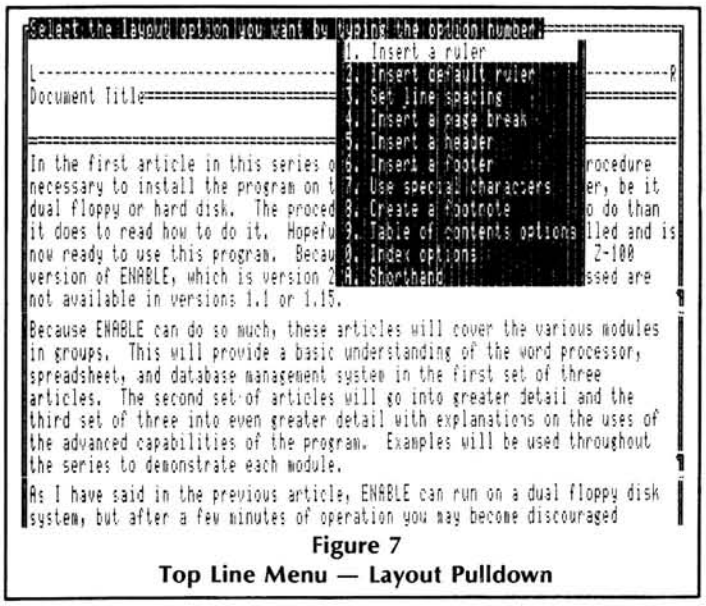


Figure 7
Top Line Menu — Layout Pulldown

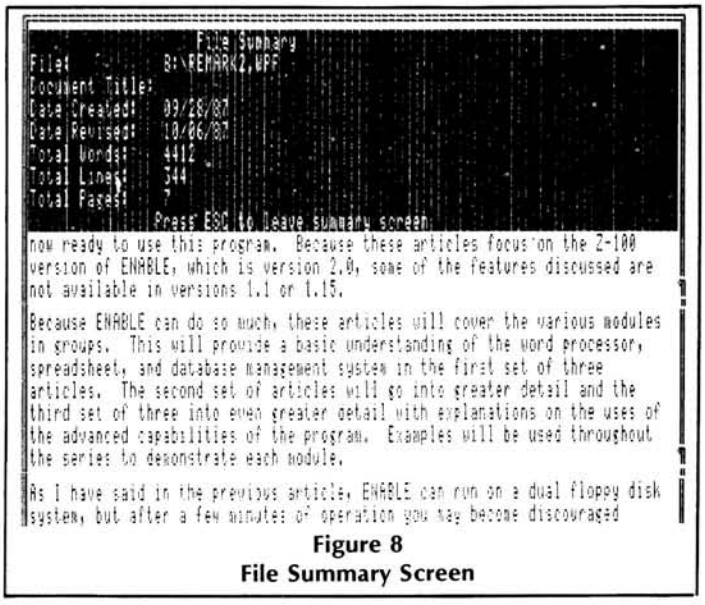


Figure 8
File Summary Screen

ABLE's FINAL option. This can be selected from the top line menu (F10 "E"ditOps "b". Draft/Final) or "F9 O D" expert command strokes. The final mode shows the location of page breaks based on print selections, including the spacing between headers and footers. The x's on the right side of the screen are blank lines during printing. Page breaks are shown with the page number shown on this line. You must save the file in this mode for the total pages to be shown in the summary block.

Headers and Footers can easily be added to word processing documents. Headers and Footers are used to add information to the beginning and ending of pages and to repeat this information until told to stop. To create a Header, position the cursor to the desired location and press F10 "L"ayout "5". Insert header or use the expert "F9 I CHR H" keystrokes. This inserts a page break and header space in the document. Move the cursor inside the two double lines, which mark the header space, and type whatever you wish to appear at the top of the pages that follow. You can use any of the ATTRIBUTES that are available in ENABLE. In one document, I added a ruler and went to compressed print and made 90 character lines for headers, while the remainder of the document was in 12 pitch. You can add as many lines as desired. The date can also be added by typing "%DATE" at the location it is required. The date printed will be in the format selected in the PROFILE or as changed in the print menus. The date format can be Standard (October 1, 1987), Military (1 October 1987), Numerical (10/1/87), or European Numerical (1/10/87).

Footers are added in the same manner as headers. They can be added by using the top line menu or the expert "F9 I CHR F" (F9 INS F for the PC). You can also add automatic page numbering by placing a "#" where you would like the number to appear. The automatic numbering can be modified to reflect new numbers by typing #=[n]. The n can be any number. This is a convenient means to number sections of a document. In the header or footer, you could type in "SECTION - I#=1". Every page after this would reflect the section and the page numbers would increase. Each section would require a new header or footer with the same input, except for the section number.

ENABLE permits you to have alternating headers/footers appearing on alternating pages. To do this, add a header or footer

as desired. Inside of the space provided, type in the first comment which you want to appear on the odd numbered pages. On the next line, type "%ALT" as the first character on the line. On the next line, type in the comment that you want to appear on the even numbered pages.

To center text on a line, either in the document or in header/footers, use the F0 F4 (ALT/F4 for the PC). This will center the text on the line based on the current ruler. ENABLE permits you to change the indicated center point of the ruler by moving the "+". Any text will now center on this new off-center point. You can align text on a line, either on the left or right side, by typing SHIFT/F0 [for the left side or SHIFT/F0] for the right side (CTRL/[or CRTL/] for the PC). Again these commands can be used in any of the areas of the word processor.

One new thing added to ENABLE Version 2.0, is the column capability. With this capability, making multiple column outputs is easy. To start this function, you have to add a ruler. On this ruler, place the "R"ight margin, or "J"ustified right, at the location desired. At the start of the next column, place a "C". You can add columns as desired, within the limits of the line width and your printer. ENABLE will reformat the text with the new right margin when you press <RETURN>. Now if you go to the FINAL Mode (F9 O D), the text will line up in the column indicated. If you go back to draft mode (F9 O D is a toggle), the text will go back to the one long column, but will reflect the end of the column and pages. This is a very handy capability, if you write newsletters.

This completes the introduction to ENABLE's word processor. The next article will cover the spreadsheet and will also be an introduction. Each article is designed to build on the previous material so that using ENABLE will become second nature. ENABLE has tremendous capabilities, and through these articles, I will explain them to the readers of REMark. I recommend that those of you who own a Z-100 purchase ENABLE. For the $195 price, you can not buy three programs that will do everything that ENABLE can do. Support, in the form of purchase, will permit The Software Group to continue developing module capabilities for the Z-100 version. Z-100 ENABLE is also available on the GSA schedule for those who would like to purchase it for military organizations with Z-100s. *

```
displayed. Under word processing,
five menu choices are available;
Create, Revise, Print, Dictionary,
and Mail Merge.

If you press (RETURN) or "W", the
default setting is "Create." You
must now type in the name of the
file you wish to create. You can
use directories to indicate where
the file is to be stored when
saved. You have 25 total spaces to
Page Break==   2 ==========================
Column # 1=================================
use for this name including the
drive and directory. The actual
name can not exceed the DOS limit
of eight plus three in the
extension. You              can
indicate an extension if you wish
or ENABLE will assign the ".WPF"
extension. ENABLE will then search
```

Figure 9
Screen Display

```
into greater detail and the third   the start of the line) and learning
set of three into even greater      the expert key stokes in ENABLE, a
detail with explanations on the     process which is still going on.
uses of the advanced capabilities
of the program. Examples will be    To use the Word Processor, enter
used throughout the series to       ENABLE as described in the first
demonstrate each module.            part of this series. At the
                                    opening menu, you can either move
As I have said in the previous      the highlighted area with the
article, ENABLE can run on a dual   cursor keys or type the first
floppy disk system, but after a few letter of the choice. You will
minutes of operation you may become notice that the second menu choices
discouraged because of the disk     are displayed under the top line.
changes. Most operations take at    One of the choices under "Use
least one disk change and normally  System" is "Word Processing." When
more. A hard disk system or a       you enter ENABLE the "Use System"
system with two high capacity disk  is highlighted as the default
drives is highly recommend. The     choice. Press (RETURN) or "U" to
version of ENABLE that is bundled   access the next level of menu items
with the DoD Z-184 lapheld computer displayed. The "Word Processing"
has been modified to fit on one     choice is highlighted by default.
760k disk. Some of the modules      Again the next set of choices is
```

Figure 10
Printer Output of Dual Column

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.

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

HEPCAT is here! *HEPCAT* is here! *HEPCAT* is here! So what is *HEPCAT*, you may ask? Why it's just another Pat Swayne SUPER-UTILITY. *HEPCAT* is an acronym for *HUG Engineer's and Programmer's CAlculation Tool*. Just what we don't need, another memory resident calculator, right? Wrong! With *HEPCAT*, you can throw away the rest and use the best. *HEPCAT* only uses two partial lines on your screen, and best of all, does NOT cause existing programs to stop executing! That means, while your computer is grinding numbers internally, you can be grinding them externally. Order ***HUG P/N 885-3045-37***.

Can't remember how to use the MS-DOS 'COPY' command? Forget the exact command line format for 'ASGNPART'. Too far to go for the MS-DOS manuals on the shelf on the other side of the room? Why not just type 'HELP' on the keyboard? You say it comes back with "Bad command or file name"? It wouldn't if you had HUG's ***HELP*** program. With *HELP* installed on your hard disk, all you need to do is type 'HELP' for a complete list of MS-DOS commands and transients along with a brief explanation of how each command works, as well as the format for its use. *HELP*, ***HUG P/N 885-8040-37***, works on *ALL* Heath/Zenith computers that run MS-DOS!

HUG Price List

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
ASCRITY	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	20.00
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
MAPLE	885-8005	HDOS	COMMUNICATION	35.00
MAPLE	885-8012-[37]	CPM	COMMUNICATION	35.00
MICRONET CONNECTION	885-1122-[37]	HDOS	COMMUNICATION	20.00
MISCELLANEOUS UTILITIES	885-1089-[37]	HDOS	UTILITY	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
VOLUME I	885-1008	N/A	SOFTWARE LISTINGS	9.00
VOLUME II	885-1013	N/A	SOFTWARE LISTINGS	12.00
VOLUME III	885-1015	N/A	SOFTWARE LISTINGS	9.00
VOLUME IV	885-1037	N/A	SOFTWARE LISTINGS	12.00
WATZMAN ROM SOURCE & DOC	885-1221-[37]	CPM	H19 FIRMWARE	30.00
WATZMAN ROM	885-4600	N/A	H19 FIRMWARE	45.00
WHEW UTILITIES	885-1120-[37]	HDOS	UTILITY	20.00
XMET ROBOT X-ASSEMBLER	885-1229-[37]	CPM	UTILITY	20.00
Z80 ASSEMBLER	885-1078-[37]	HDOS	UTILITY	25.00
Z80 DEBUGGING TOOL (ALDT)	885-1116	HDOS	UTILITY	20.00
H8 — H/Z-89/90 — H/Z-100 (Not PC)				
ADVENTURE	885-1222-[37]	CPM	GAME	10.00
BASIC-E	885-1215-[37]	CPM	LANGUAGE	20.00
CASSINO GAMES	885-1227-[37]	CPM	GAME	20.00
CHEAPCALC	885-1233-[37]	CPM	SPREADSHEET	20.00
CHECKOFF	885-8011-[37]	CPM	CHECKBOOK SOFTWARE	25.00
COPYDOS	885-1235-37	CPM	UTILITY	20.00
DISK DUMP & EDIT UTILITY	885-1225-[37]	CPM	UTILITY	30.00
DOCUMAT & DOCULIST	885-8019-[37]	CPM	TEXT PROCESSOR	20.00
DUNGEONS & DRAGONS	885-1209-[37]	CPM	GAMES	20.00
FAST ACTION GAMES	885-1228-[37]	CPM	GAME	20.00
FAST EDDY & BIG EDDY	885-8018-[37]	CPM	TEXT PROCESSOR	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
RF CAD	885-8020-[37]	CPM	UTILITY	30.00

PRODUCT NAME	PART NUMBER	OPERATING SYSTEM	DESCRIPTION	PRICE
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
X-REFERENCE UTILITIES FOR MBASIC	885-1231-[37]	CPM	UTILITY	20.00
ZTERM	885-3003-[37]	CPM	COMMUNICATION	20.00
H/Z-100 (Not PC) Only				
ACCOUNTING SYSTEM	885-8048-37	MSDOS	BUSINESS	20.00
CALC	885-8043-37	MSDOS	UTILITY	20.00
CARDCAT	885-3021-37	MSDOS	BUSINESS	20.00
CHEAPCALC	885-3006-37	MSDOS	SPREADSHEET	20.00
CHECKBOOK MANAGER	885-3013-37	MSDOS	BUSINESS	20.00
CP/EMULATOR	885-3007-37	MSDOS	CPM EMULATOR	20.00
DBZ	885-8034-37	MSDOS	DBMS	25.00
ETCHDUMP	885-3005-37	MSDOS	UTILITY	20.00
EZPLOT	885-3023-37	MSDOS	PRINTER PLOTTING UTILITY	20.00
FAST EDDY	885-8025-37	CPM	TEXT PROCESSOR	20.00
FAST EDDY	885-8029-37	MSDOS	TEXT PROCESSOR	20.00
GAMES CONTEST PACKAGE	885-3017-37	MSDOS	GAMES	25.00
GAMES PACKAGE II	885-3044-37	MSDOS	GAMES	25.00
GRAPHICS	885-3031-37	MSDOS	ENTERTAINMENT	20.00
HELPSCREEN	885-3039-37	MSDOS	UTILITY	20.00
HUG BACKGROUND PRINT SPOOLER	885-1247-37	CPM	UTILITY	20.00
HUG BACKGROUND PRINT SPOOLER	885-5009-37	CPM86	UTILITY	20.00
HUGPBBS	885-5006-37	CPM86	COMMUNICATION	40.00
HUGPBBS SOURCE LISTING	885-5007-37	CPM86	COMMUNICATION	60.00
ICT 8080 TO 8088 TRANSLATOR & HFM	885-5008-37	CPM86	UTILITY	20.00
KEYMAC	885-3046-37	MSDOS	UTILITY	20.00
KEYMAP	885-3010-37	MSDOS	UTILITY	20.00
KEYMAP	885-5001-37	CPM86	UTILITY	20.00
KEYMAP CPM-85	885-1245-37	CPM	UTILITY	20.00
MAPLE	885-8023-37	CPM	COMMUNICATION	35.00
MATHFLASH	885-8030-37	MSDOS	EDUCATION	20.00
ORBITS	885-8041-37	MSDOS	EDUCATION	25.00
POKER PARTY	885-8042-37	MSDOS	ENTERTAINMENT	20.00
SCICALC	885-8028-37	MSDOS	UTILITY	20.00
SKYVIEWS	885-3015-37	MSDOS	ASTRONOMY UTILITY	20.00
SMALL-C COMPILER	885-3026-37	MSDOS	LANGUAGE	30.00
SPELL5	885-3035-37	MSDOS	SPELLING CHECKER	20.00
SPREADSHEET CONTEST PACKAGE	885-3017-37	MSDOS	VARIOUS SPREADSHEETS	25.00
TERM86 & DSKED	885-5004-37	CPM86	COMMUNICATION & UTILITIES	20.00
TREE-ID	885-3036-37	MSDOS	TREE INDENTIFIER	20.00
USEFUL PROGRAMS I	885-3022-37	MSDOS	UTILITIES	30.00
UTILITIES BY PS	885-5003-37	CPM86	UTILITY	20.00
UTILITIES	885-3008-37	MSDOS	UTILITY	20.00
ZBASIC DUNGEONS & DRAGONS	885-3009-37	MSDOS	GAME	20.00
ZBASIC GRAPHIC GAMES	885-3004-37	MSDOS	GAMES	20.00
ZBASIC GAMES	885-3011-37	MSDOS	GAMES	20.00
ZPC II	885-3037-37	MSDOS	PC EMULATOR	60.00
ZPC UPGRADE DISK	885-3042-37	MSDOS	UTILITY	20.00
H/Z-100 — PC Compatibles				
ADVENTURE	885-3016-37	MSDOS	GAME	10.00
ASSEMBLY LANGUAGE UTILITIES	885-8046-37	MSDOS	UTILITY	20.00
DEBUG SUPPORT UTILITIES	885-3038-37	MSDOS	UTILITY	20.00
DOCUMAT & DOCULIST	885-8035-37	MSDOS	TEXT PROCESSOR	20.00
DPATH	885-8039-37	MSDOS	UTILITY	20.00
HADES	885-3040-37	MSDOS	UTILITY	40.00
HELP	885-8040-37	MSDOS	CAI	20.00
HEPCAT	885-3045-37	MSDOS	UTILITY	35.00
HUG BACKGROUND PRINT SPOOLER	885-3029-37	MSDOS	UTILITY	20.00
HUG EDITOR	885-3012-37	MSDOS	TEXT PROCESSOR	20.00
HUG MENU SYSTEM	885-3020-37	MSDOS	UTILITY	20.00
HUG SOFTWARE CATALOG UPDATE #1	885-4501	VARIOUS	PROD 1983 THRU 1985	9.75
HUGMCP	885-3033-37	MSDOS	COMMUNICATION	40.00
HUGPBBS SOURCE LISTING	885-3028-37	MSDOS	COMMUNICATION	60.00
HUGPBBS	885-3027-37	MSDOS	COMMUNICATION	40.00
ICT 8080 TO 8088 TRANSLATOR	885-3024-37	MSDOS	UTILITY	20.00
MATT	885-8045-37	MSDOS	MATRIX UTILITY	20.00
MISCELLANEOUS UTILITIES	885-3025-37	MSDOS	UTILITIES	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
SCREEN DUMP	885-3043-37	MSDOS	UTILITY	30.00
UTILITIES II	885-3014-37	MSDOS	UTILITY	20.00
PC Compatibles				
ACCOUNTING SYSTEM	885-8049-37	MSDOS	BUSINESS	20.00
CARDCAT	885-6006-37	MSDOS	CATALOGING SYSTEM	20.00
CHEAPCALC	885-6004-37	MSDOS	SPREADSHEET	20.00
CP/EMULATOR II & ZEMULATOR	885-6002-37	MSDOS	CPM & Z100 EMULATORS	20.00
DUNGEONS & DRAGONS	885-6007-37	MSDOS	GAME	20.00
EZPLOT	885-6003-37	MSDOS	PRINTER PLOTTING UTILITY	20.00
FAST EDIT	885-8033-37	MSDOS	TEXT PROCESSOR	20.00
GRADE	885-8037-37	MSDOS	GRADE BOOK	20.00
HAM HELP	885-6010-37	MSDOS	AMATEUR RADIO	20.00
KEYMAP	885-6001-37	MSDOS	UTILITY	20.00
LASERWRITER CONNECTION	885-8050-37	MSDOS	PRINTER UTILITY	40.00
RF CAD	885-8038-37	MSDOS	UTILITY	30.00
SCREEN SAVER PLUS	885-6009-37	MSDOS	UTILITIES	20.00
SKYVIEWS	885-6005-37	MSDOS	ASTRONOMY UTILITY	20.00
TCSPELL	885-8044-37	MSDOS	SPELLING CHECKER	20.00

You've got a screen full of important technical data that would be nearly impossible to memorize, and you already have writer's cramps from the last screen full. With ***SCREENDUMP*** from HUG, you can reproduce a complete video screen on a dot matrix printer, including both text and graphics without having to exit the current program. *SCREENDUMP* supports most of the more popular dot matrix printers, including the newer 24-pin and laser jet models. The latest version of *SCREENDUMP* is ***HUG P/N 885-3043-37***.

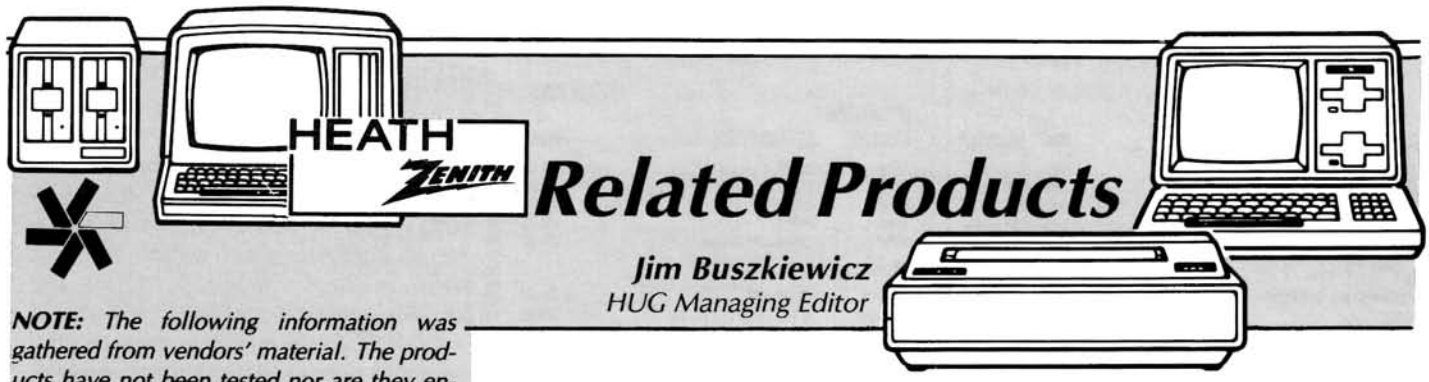
"Thank Heaven for *HADES*!" That's what a lot of MS-DOS users are saying when ***HADES*** rescues a file that just got accidentally erased. Erased file recovery is only a small part of the capabilities of this program. *HADES* is *HUG's Absolute Disk Editing System*. Within the realms of MS-DOS, *HADES* allows you to directly edit any part of any disk. Directories, files, file attributes. FATS: nothing can hide from you when you use *HADES*. *HADES* works on *ANY* computer that can run MS-DOS version 2 or greater. Order ***HUG P/N 885-3040-37*** today!

Want to keep your H/Z-100? Want to run a lot of that good PC compatible software out there? Don't want to buy a PC compatible though? Then get ***ZPC II, HUG P/N 885-3037-37***, and the ***ZPC II upgrade disk, HUG P/N 885-3042-37***.

ORDERING INFORMATION

For VISA and MasterCard phone orders, telephone the Heath Users' Group directly at (616) 982-3838. 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.



Related Products

Jim Buszkiewicz
HUG Managing Editor

NOTE: *The following information was gathered from vendors' material. The products have not been tested nor are they endorsed by HUG. We are not responsible for errors in descriptions or prices.*

Through the joint efforts of **New Orleans General Data Services** and **Micro Doc**, a new version (ver 2.1) of **Flexi-Graph** is now available. Flexi-Graph provides an integrated set of utility procedures and functions which allows the programmer to directly access and manipulate the graphics display memory of the computer from FORTRAN, C, PASCAL, and MASM code. These routines provide high level calls which support line drawing, circle generation, and other graphics operations within the display area. This new version provides full support for the Color Graphics Adapter (CGA), the Enhanced Color Graphics Adapter (EGA), and all video modes of the H/Z-100 series, including the 640 x 480 interlace mode. Flexi-Graph supports five language environments: 1) MS Pascal, 2) MS Fortran, 3) Ecosoft C, 4) MS, DesMet, and Lattice C, and 5) CI86 C. Flexi-Graph is available from New Orleans General Data Services Inc., 7230 Chadbourne Drive, New Orleans, LA 70126, (504) 241-9495, and sells for $99.00 for the first language. Additional language environments are $5.00 each. Questions can be directed to Micro Doc at (402) 291-0795 (7-10 PM Central).

Through the efforts of a number of people, there is now a map database which can be used on most micro computers which can read standard MS-DOS 360k 5" floppy disks. This database was extracted and compressed from the World Data Bank II files which are distributed by the National Technical Information Service (NTIS). This **Micro WDB II** contains some 178,000 points and provides worldwide coverage for coast lines, country boundaries, state boundaries, islands, rivers, and lakes. Each line type is provided at five levels of detail. Because the total database takes a little over one megabyte of disk storage, each line type has been extracted into its own file so that the database can be distributed in the standard MS-DOS 5" floppy disk format. Several basic utilities, with Pascal source code, are provided to assist in customizing the files to individual needs. Permission has been granted to place this database in the public domain, and is available for $10.00 (to help with shipping, and the cost of the 5 disks) from Micro Doc, 3108 Jackson Street, Bellevue, NE 68005. Questions can be directed to Fred Pospeschil at (402) 291-0795 (7-10 PM Central).

Bantam Computer Books has released its 3rd edition of "How To Get The Most Out Of CompuServe". This book is the only hands-on guide to CompuServe, the largest and fastest growing information network available. Whether you're a first-time user or veteran subscriber, authors Bowen and Peyton will help you work (and play) more efficiently and with greater savings. Screen-by-screen instructions provide an easy-to-use comprehensive map of the entire system. This is the only guide fully endorsed by CompuServe. "How To Get The Most Out Of CompuServe" should be available (or at least obtainable) at you local bookstore, and sells for $19.95. Bantam Books Inc., is located at 666 Fifth Avenue, New York, NY 10103.

1986 Software Update

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

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

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

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

Disk A

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

Disk B

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

Disk C

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

Program Authors:

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

Program Content:

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

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

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

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

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

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

TABLE C Rating: (9)

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

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

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

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

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

P/N 885-3033-37 Update

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

Attention HERO 2000 Owners!

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

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

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

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

This disk contains the following files:

README	.DOC	ANSI	.COM
FIXASM	.DOC	ANSISYS	.ASM
PREFIX	.BAT	ASCII	.DEF
REPLY	.COM	Z150ROM	DEF
FIXZPC	.BAT	ANSI	.ASM
FIXZPC1	.DAT	LTSPCH	.BAT
FIXZPC2	.DAT	LTSPCH	.DAT
FIXZPC3	.DAT	DBPCH	.BAT
FIXZPC4	.DAT	DBPCH	.DAT
FIXZPC5	.DAT	DBCPCH	.BAT
FIX3A	.BAT	DBCPCH	.DAT
FIX3A	.DAT	FWPCH	.BAT
DOS3	.BAT	FWPCH	.DAT
DOS3A	.DAT	FW1PCH	.BAT
DOS3B	.DAT	FW1PCH	.DAT
DOS3C	.DAT	FW2PCH	.BAT
DOS3D	.DAT	FW2PCH	.DAT
DOS3E	.DAT	ENABPCH	.BAT
ANSISYS	.COM	ENABPCH	.DAT
MMPCH	.BAT	PALDPCH	.DAT
MMPCH	.DAT	MW1PCH	.BAT
VXPCH	.BAT	MW1PCH	.DAT
VXPCH	.DAT	MW2PCH	.BAT
EDIXPCH	.BAT	MW2PCH	.DAT
EDIXPCH	.DAT	SC3PCH	.BAT
PALPCH	.BAT	SC3PCH	.DAT
PALPCH	.DAT	SC3IPCH	.BAT
PALDPCH	.BAT	SC3IPCH	.DAT

Program Author: Patrick Swayne, HUG Software Engineer

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

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

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

TABLE C Rating: (10)

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

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

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

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

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

Program Author: Ronald Perrella

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

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

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

TABLE C Rating: (10)

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

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

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

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

Disk A

RUN	.BAT	RUNAB	.BAT
RUNI	.BAT	README	.DOC
TREE-ID	.EXE	AMEELM	.PRN
BASSWO	.PRN	BEECH	.PRN
BITHIC	.PRN	BLACHE	.PRN
BLAGUM	.PRN	BLALOC	.PRN
BLAOAK	.PRN	BLAWAL	.PRN
BLAWIL	.PRN	BLUBEE	.PRN
BOXELD	.PRN	BUROAK	.PRN
CHEOAK	.PRN	CHIOAK	.PRN
COFTRE	.PRN	COMCOT	.PRN
FLODOG	.PRN	HACKBE	.PRN
HONLOC	.PRN	IRONWO	.PRN
LARASP	.PRN	OHIBUC	.PRN
OSAORG	.PRN	PERSIM	.PRN
PIGHIC	.PRN	PINOAK	.PRN
REDBUD	.PRN	REDMAP	.PRN
REDMUL	.PRN	REDOAK	.PRN
RIVBIR	.PRN	SASAF	.PRN
SHAHIC	.PRN	SHIOAK	.PRN
SILMAP	.PRN	SLIELM	.PRN
SUGMAP	.PRN	SWAOAK	.PRN
SWEGUM	.PRN	SYCAMO	.PRN
TULIPT	.PRN	WHIASH	.PRN
WHIHIC	.PRN	WHIOAK	.PRN
GLOSSARY	.TXT		

Disk B

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

Author: Ronald B. Berger

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

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

TABLE C Rating: (10)

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

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

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

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

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

The ZPC Version 2 disk contains these files:

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

Author: Patrick Swayne, HUG Software Engineer.

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

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

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

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

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

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

Notes:

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

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

```
A>PC
```

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

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

```
A>Z100
```

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

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

ANSISYS.COM — This program emulates the 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.

FIXC8.COM — This program fixes compiled PC GW-BASIC programs so that they will run with the small memory version of ZPC. Patching is not needed if you have 768k of memory.

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

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

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

DEMO.COM — A program that demonstrates ZPC.

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

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

P/N 885-3038-37 Z-DOS/MS-DOS DEBUG Support Utilities

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

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

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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 that 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 885-3041-37 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 a 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
SCDMPCIT	.100	Z-100 Vers for C. Itoh 8510/1550
SCDMPCIT	.150	Z-150 Vers for C. Itoh 8510/1550
SCDMPCIT	.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
SCDMPCIT	.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
SCDMPGEM	.150	Z-150 Version for Star Micronics Gemini
SCDMPGEM	.ZPC	Z-100 ZPC Vers for Star Micronics Gemini
SCDMPGMX	.100	Z-100 Vers for Star Micronics Gemini 10X
SCDMPGMX	.150	Z-150 Vers for Star Micronics Gemini 10X
SCDMPGMX	.ZPC	Z-100 ZPC Vers for Star Micronics Gemini 10X
SCDMPGEM	.ASM	Source for Star Micronics Gemini Series
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
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
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
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
SCDMP-LR	.SKL	for your unique printer or application
SCDMP	.BAT	Batch file for auto load of SCDMP .COM (rename the appropriate program to SCDMP.COM)
INT5	.BAS	Sample BASIC program to call int-5
INT5	.ASM	Assembly subroutine for above
INT5	.BIN	Assembled subroutine for call from BASIC
CINT5	.BAS	Sample BASIC program for Compiler to call int-5
CINT5	.ASM	Assembly subroutine for above
CINT5	.OBJ	Object file for linking with Compiled BASIC

Program Author: Leslie L. Bordelon

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

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

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

The program also allows multiple density printing. This is accomplished by using a higher dot density in graphics mode if the printer supports such. For those printers that do not, high density is achieved by overprinting each line a second time. Entering 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)

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

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

CP/EMulator II has been improved in the following ways:

- Support of the V20. If you have a V20 processor in your computer, CP/EMulator II will use it to execute the 8-bit code in CP/M programs, which will cause them to run much faster. If you do not have a V20, CP/EMulator II will emulate the 8-bit code itself. It automatically detects the V20 and uses it, if one is installed.
- Faster screen output. Whether you have a V20 or not, CP/EMulator II will be faster than before, because screen output has been speeded up.
- Runs more programs. CP/EMulator II has been improved to run more CP/M programs, including WordStar (all functions), PIP (all switches), and ED.

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

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

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

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

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

P/N 885-6008-37 MSDOS NAVPROG

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

TABLE C Rating: (10)

NAVPROGseven Update

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

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

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

Introduction: This disk contains four MS-DOS utilities for the H/Z-100 PC computer systems: ScreenSaver, DualScreen, ChangeSpeed, and a Print SCreen 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 SCreen utility for Text Modes) is designed to be used in conjunction with a graphic PSC (Print Screen) utility, to allow it to work in the text modes. It allows you to print a duplicate of what is on the screen, including text mode graphic characters and special symbols. It works with any printer for which you have a graphic print screen utility.

TABLE C Rating: (10)

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

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

1. Macros can now be longer than 256 characters.
2. Full MS-DOS path names are now permitted.
3. Proper operation with RAM drives and windowing software.
4. Output from DOCULIST can now be sent to a file.

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

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

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

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

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

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

Program Author: Gary A. Field

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

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

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

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

(1) Low Frequency circuit design
(2) High Frequency circuit design
(3) UHF and Microwave circuit design
(4) Antenna and Transmission line design
(5) Filter design
(6) Space Communications Aids
(7) Miscellaneous conversions
(8) Strays
(9) Help
(10) Return to O/S

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

TABLE C Rating: (10)

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

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

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

The following files are included on this distribution disk:

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

Program Author: Gordon Buchanan

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

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

- Better organized file structure, resulting in fewer files in application directories, and making it easier to find information on a disk.
- More free disk space because copies of programs and associated files are not needed in each application directory.

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

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

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

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

TABLE C Rating: (10)

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

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

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

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

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

The following files are included on this distribution disk:

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

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

Program Author: John F. Stetson

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

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

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

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

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

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

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

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

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

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

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

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

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

TABLE C Rating: (10)

P/N 885-8041-37 ORBITS

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

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

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

Disk A

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

Disk B

AMOR	.ORB	APOLLO	.ORB
DEMO10	.OSY	DEMO3	.OSY
DEMO4	.OSY	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 × 480 interlace mode using Z-GRAPH-100 subroutines, show the contructed 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, pardner!

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

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

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

Author: Robert E. 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 ALTCHAR.SYS be on the boot disk. The other version of MATT is for the PC compatible series using MS-DOS version 2 or above. Color is not required for either version, and only the basic 128k memory is needed.

The following files are included on the disk:

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

The following are Z-100 specific include files:

BOX	.PRO	MYIO	.PRO
PAGESWAP	.PRO		

The following are PC specific include files:

BOX	.PC	MYIO	.PC

The following are included in both versions:

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

Author: Dennis K. Greer

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

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

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

TABLE C Rating: (10)

P/N 885-8046-37
Assembly Language Utilities

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

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

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

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

Author: John F. Stetson

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

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

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

The following files are Z-100 specific.

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

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

DATETIME	.ASM	- Display system day, date, and time
DATETIME	.COM	- Executable version of DATETIME
LOGON	.BAT	- Display last date/time off system at boot time
LOGOFF	.BAT	- Display last date/time on system at exit time
LOGON	.DAT	- Data file used by .BAT files above
LOGOFF	.DAT	- Data file used by .BAT files above

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

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

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

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

BEEP	.ASM	- Generate a tone in .BAT files
BEEP	.COM	- Executable version of BEEP
CMD	.ASM	- Execute COMMAND.COM as a child process
CMD	.COM	- Executable version of CMD.COM
CPU	.ASM	- Determine the speed of the CPU chip
CPU100	.COM	- Z-100 executable version of CPU .COM
CPUPC	.COM	- PC compatible executable version of CPU.COM
CRLF	.ASM	- Send CR and LF to console from a .BAT file
CRLF	.COM	- Executable version of CRLF
FF	.ASM	- Send a form feed character to the printer
FF	.COM	- Executable version of FF
MODEM	.ASM	- "Dumb" terminal modem program
MODEM100	.COM	- Z-100 executable version of MODEM.COM
MODEMPC	.COM	- PC compatible executable version of MODEM.COM
PASSWORD	.ASM	- Password protection for hard disk systems
PASSWORD	.DVD	- Executable version of PASSWORD
RAM	.ASM	- Display total RAM, RAM used, and RAM free
RAM	.COM	- Executable version of RAM
RAMFIT	.ASM	- Display or change RAM allocation strategy
RAMFIT	.COM	- Executable version of RAMFIT
RAMLIM	.ASM	- Limit the amount of system RAM
RAMLIM	.COM	- Executable version of RAMLIM
SD	.ASM	- Sorted directory utility program (V5.2)
SD	.DOC	- Documentation file for SD.COM
SD100	.COM	- Z-100 executable version of SD .COM
SDPC	.COM	- PC compatible executable version of SD.COM
SHELL	.ASM	- Execute COMMAND.COM from within programs
SHELL100	.COM	- Z-100 executable version of SHELL .COM
SHELLPC	.COM	- PC compatible executable version of SHELL.COM
SPEEDUP	.ASM	- Console speed-up utility program
SPEED100	.COM	- Z-100 executable version of SPEEDUP.COM
SPEEDPC	.COM	- PC compatible executable version of SPEEDUP.COM
WAIT	.ASM	- Conditionally pause .BAT file execution
WAIT	.COM	- Executable version of WAIT

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

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

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

TABLE C Rating: (10)

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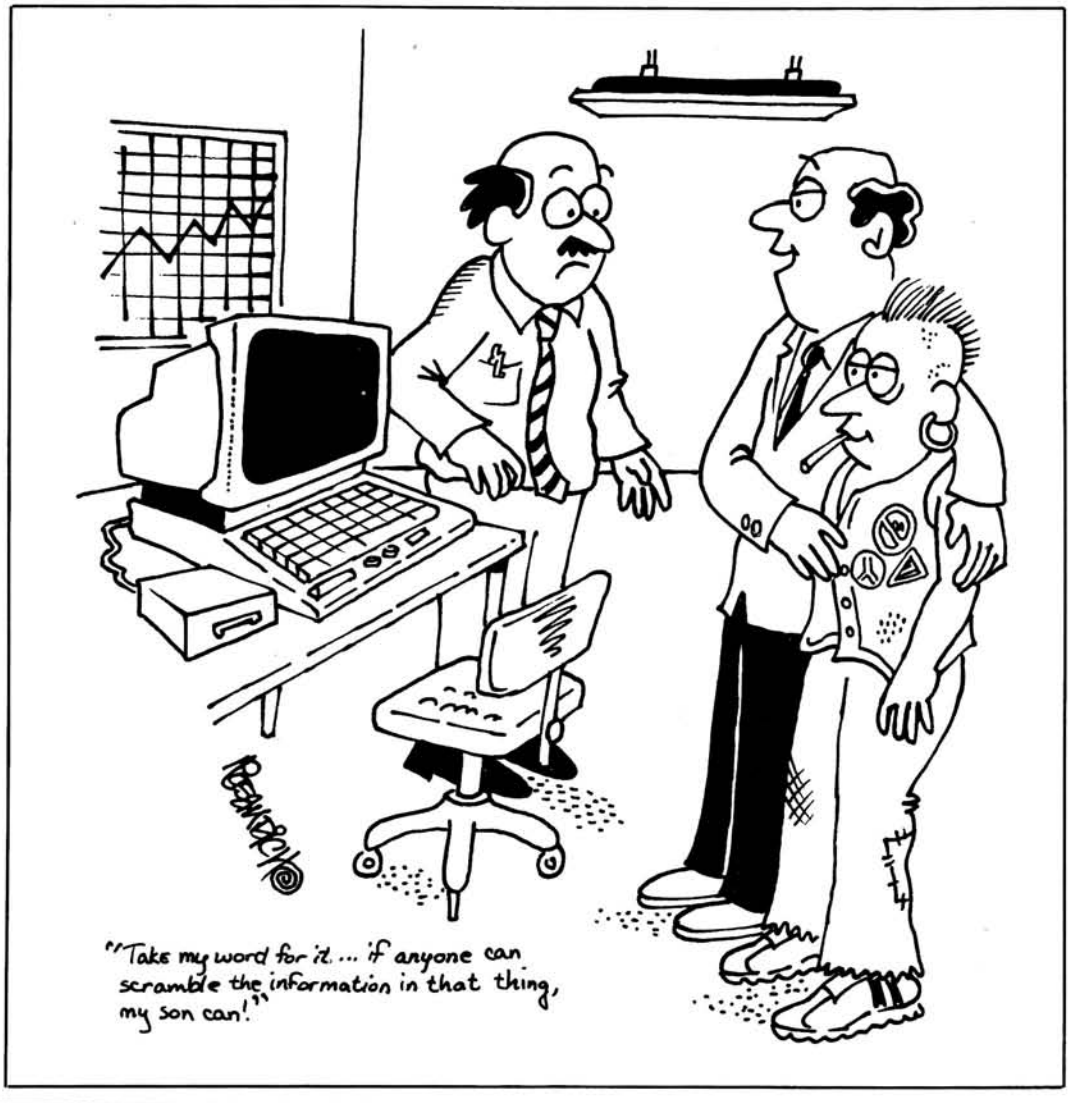


1987 Software Update

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.

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

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

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

UPDATE YOUR COPY TODAY!

P/N 885-3040-37
HADES Update

Murphey's second postulate states: "There's always one more bug." Unfortunately, such WAS the case with HADES, HUG P/N 885-3040-37. The problem corrected, only occurs with a 32-meg hard disk and only in the file mode. If you have version 1.01 or lower, return your original disk to Nancy Strunk, Heath Users' Group, P.O. Box 217, Benton Harbor, MI 49022-0217, and your disk will be updated to version 1.02, FREE!

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

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

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

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

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

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

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

P/N 885-3044-37
Games Package II

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

Requirements: In order to play these games, an H/Z-100 (not PC) system with at least 192k of RAM is needed. MS-DOS version 2.0 or greater must also be used. The two casino games, GOBE-SOU and BLACK-SPOT, require the ZBASIC interpreter; 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)

P/N 885-3045-37
HEPCAT

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

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

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

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

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

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

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

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

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

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

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

The HEPCAT disk contains the following files:

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

Program Author: Pat Swayne, HUG Software Engineer

Here is an explanation of some of the files:

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

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

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

SCRNCLK.POM, SCRNCLK.ZOM — These are improved versions of the screen clock program that has been listed in REMark 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)

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

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

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

Program Author: Patrick Swayne

The KEYMAC disk contains the following files:

README	.DOC	KEYMAC	.DOC
KEYMAC	.COM	MAKEMAC	.COM
WS	.KM	DOS	.KM
BASIC	.KM	NULL	.KM
KEYMAC	.ASM	MAKEMAC	.ASM

Program Content

KEYMAC.DOC — Instructions for using KEYMAC.

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

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

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

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

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

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

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

TABLE C Rating: (2, 3, 10)

KEYMAP To KEYMAC Upgrade

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

P/N 885-6010-37
HAM HELP

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

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

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

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

Program Author: Raymond S. Isenson, (N6UE)

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

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

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

Comments: none

TABLE C Rating: 10

P/N 885-8005 HDOS MAPLE Update

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

P/N 885-8040-37 HELP Update

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

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

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

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

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

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

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

An 80-column printer (tractor-feed recommended) is required for report listings.

For the MS-DOS versions (885-8048 and 885-8049), COBRUN.EXE (which is included) must be present at run time.

The CP/M version requires 64k of memory. The MSDOS versions require at least 94k, exclusive of the operating system. All three versions also come with an extensive users manual.

The following files are included on the various distribution disks:

CP/M Version: HUG P/N 885-8047-37.

ACCOUNT1	.COM	ACCOUNT2	.COM
ACCOUNT3	.COM	README	.DOC

ZDOS/MSDOS Versions: HUG P/N 885-8048-37 and P/N 885-8049-37.

COBRUN	.EXE
ACCOUNT	.EXE
README	.DOC

Program Authors: John A. Liotta and Carl D. Rise

Program Content: During program execution, the following capabilities are available from the main menu:

A = Add New Daily General Journal Entries
B = Print the Monthly Trial Balance
C = Add Monthly Journal Adjusting Entries
D = Print Monthly Adjusted Trial Balance
E = Print Income Statement and Balance Sheet
F = Add Monthly Journal Closing Entries
G = Print the Post-Closing Trial Balance
H = Update the Chart of Account Control File
I = Print your Chart of Account Control File
J = Print an Active Account Recapitulation
K = Print the Daily General Journal Entries
ESC = Return to System

Comments: Excellent low cost small business or personal accounting systems!

TABLE C Rating: (10)

P/N 885-8050-37 The LaserWriter Connection

Introduction: *The LaserWriter Connection* is software and a printed, illustrated instruction manual for using the Apple *LaserWriter* and *LaserWriter Plus* printers with IBM PC-, XT-, AT-, and PS/2-compatible computers. These printers are among the least expensive *PostScript* devices available, which makes them superb for typesetting, desktop publishing, and graphics. Apple, however, supports them almost exclusively for use with its own MacIntosh computers and has no good information on using them with IBM-compatibles. This is the very same package Joseph Katz (columnist for *REMark* and *Sextant*) developed for his own use.

Requirements: Software in *the LaserWriter Connection* provides the interface and basic support for both *LaserWriters* on either COM1 or COM2 of a true IBM-compatible computer with any version of MS-DOS. Of course it supports all Heath and Zenith Z-100 PC and Z-200 PC computers, and Zenith's versions of MS-DOS for them.

Program Author: Joseph Katz

Program Contents: *LaserOne*, the heart of *The LaserWriter Connection*, controls traffic between your computer and the *LaserWriter*. You use one of two programs provided: LAS1.COM is used with the COM1 port; LAS2.COM is used with the COM2 port. It takes over the computer's printer interrupt, installs a software protocol handler, and sets the proper parameters for communication between IBM-compatibles and the *LaserWriter*. These printers require *LaserOne* to operate reliably. With *LaserOne* installed (once each computing session, before you print the first time), you need not use the DOS MODE.COM. You, therefore, can run *LaserOne* from AUTOEXEC.BAT and set up the system for a naive user. An important benefit of *LaserOne* is that it makes the DOS PRINT.COM an excellent printer spooler and *PostScript* dump program for the *LaserWriter*. *LaserOne* has been tested with an extensive body of application software, including Microsoft *Windows*, and has been found completely compatible with everything.

STAT determines the current status of important programmable features of the *LaserWriter*. It makes a printout record

including: fonts (both permanent and temporary) in the printer; version of the *PostScript* ROM; total number of pages printed; and the communications settings for each channel. STAT tells you if your *LaserWriter* supports both hardware and software handshaking (some do), or only software handshaking (some don't).

If your printer supports both hardware and software handshaking, HANDSHAKE lets you set the *LaserWriter* for your choice. You may change handshaking, as appropriate, to the capacity of the *LaserWriter* EEROM.

DELASER.COM "unhooks" *LaserOne* from the computer's printer interrupt in case you want to use a parallel printer instead of the *LaserWriter* in the computing session.

MACHEATH.COM translates ASCII files from the Apple MacIntosh to the format expected by MS-DOS programs.

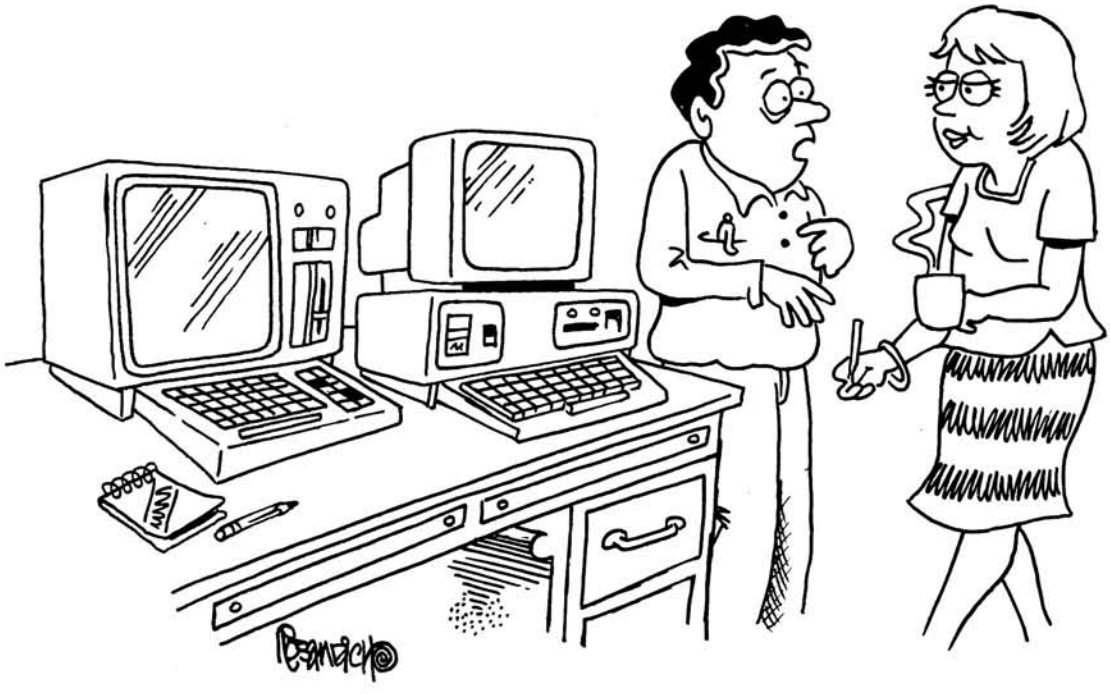
PSPRINT.COM does a simple *PostScript* encoding of an ASCII file so the *LaserWriter* can print it. Although PSPRINT can handle *WordStar* files, it does not reproduce print-formatting features, such as underlining or boldfacing. Its aim is to let you use the *LaserWriter* as a simple line printer for proofing and quick printing of doc files. PSPRINT can print directly to the *LaserWriter* or to any other device, such as a modem. It also can output to a disk file you may edit before printing.

All those programs are easy to use. *LaserOne* has no options. The other programs may be used in either a command mode or a prompt mode. There is extensive error checking and almost no possibility of a fatal error.

In addition to instructions for each program, *The LaserWriter Connection* instruction manual gives detailed instructions on connecting the *LaserWriter* to the IBM-compatible computer. It includes an illustrated explanation of the *LaserWriter* switch settings and writing diagrams for the required cables.

You also may use *LaserOne* as the handler for software handshaking with other serial laser printers, such as the Hewlett-Packard *LaserJet*.

*



"THEY WANT TO GET MARRIED?"

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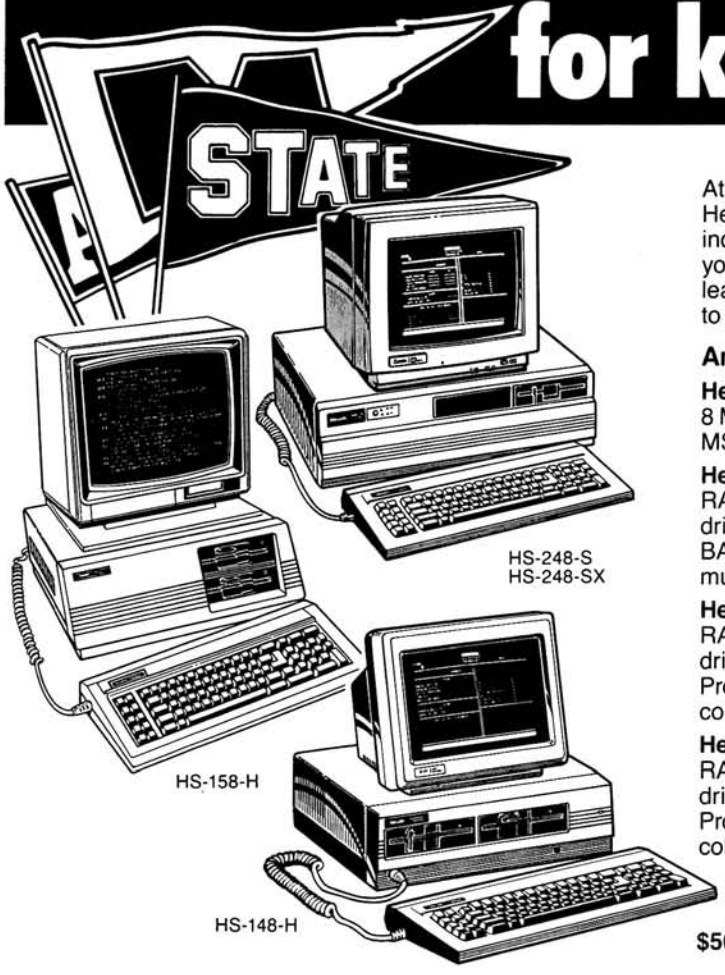

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Letter To HUG

D. C. Shoemaker
5828 5th Avenue, N.W.
Seattle, WA 98107
7 September 1987

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

Dear HUG:

Congratulations on a new decade! I can't believe how fast these last ten years have gone by (probably faster still for you and the staff), and regardless of how trite it may sound, I must go on record as saying that without "REMark" I would have had a great deal less enjoyment from my computer activities. You and the whole staff are to be congratulated on providing an exemplary user-specific magazine.

As I recall back over the years the way the hobby evolved into an industry, with standards instead of just advocates, it's hard to realize just how much things have changed. Most of the recent arrivals have no idea of how things started, and a retrospective might be interesting.

I started with the H8, exactly ten years ago, in the summer of 1977. Radio Shack's and Heath's catalogs arrived the same day, advertising low cost microcomputers that would run BASIC. At the time, I was an MBA grad student at the University of Washington here in Seattle, and I had just seen my first BASIC-speaking computer, an old Hewlett-Packard 2000. The thought of actually owning a personal computer had been with me since that January when the "Wall Street Journal" made me aware that such things existed. The Altairs and IMSAIs were far too expensive and limited, and the TRS-80 and H8 seemed to be the ticket.

A quick check at some local Radio Shack stores turned up the information that RS wouldn't supply demonstration models, that the stores had to buy their own and that the stores weren't interested in laying out that kind of money for a microcomputer. The local Heathkit store, however, had a working H8 and H9, and that decided the matter. I ordered the fourth kit that the store sold in the Seattle area, (what the catalog referred to as the System Two, with the H8, H9, 16K of memory, BASIC on tape, and a tape recorder, all for $1,472.50) and started a ten-year love affair with Heath computers. And yes, the H8 system wound up costing more than the TRS-80, but I got to build it, and that alone was worth it. The H8 always did more than the TRS-80, anyway. (How many fights have started over statements like that . . .)

By 1979, I'd moved up to the H19 terminal and dual floppies, courtesy of Dave Kobets in the Mission, Kansas store. Dave was a wizard at marketing; he made everything available in the store to "try-before-buy," and did we ever! I was already writing articles and reviews, mostly for "Kilobaud," later to become "Microcomputing" and even later to fall by the wayside, like most of Wayne Green's other magazines. I was using the H14 printer, which was and still is the most reliable piece of computer equipment I've ever seen. Naturally, I built everything from kits. The only exception was the H17, which I had to have so badly that I couldn't wait for the kit version to become available; I bought that ready-wired, just having to install the second drive. Dave threw in a copy of Adventure, the original version. This at a time when the only adventure games for other micros were the relatively crude TRS-80 BASIC versions from Scott Adams. We've always been years ahead with our software.

Writing has accounted for an increasingly large share of my computer time over the years. I had no idea when I bought my first H8 (I've bought three over the years, one as a gift for my wife's father and a second "hack" machine) that writing would be the main use, because I loved to program in BASIC. I still do, perhaps being brain-damaged as Edgar Dykstra says, but I fully believe, along with Kemeny and Kurtz, that you can do just as well with BASIC for "quick-and-dirty" programs of less than a thousand lines as you can in any other language, and faster than anything else. One of the best programmers I know, Jim Illman (Vega-Bound I and II, U.S.S Fast Attack, some of the absolute best graphics-based games you can buy for any computer) still uses it in preference to all other languages (and he knows a bunch of them.)

The H8 that I started with has gone through some major modifications, but is still intact, around and operational. My father-in-law has it at the moment, using it to troubleshoot his own H8, which has an ailing power supply. From the initial version, it's been equipped with the Monteith modification (how many readers remember that one?), Pat Swayne's Z80 modification in a neat pc (printed circuit, for all you clone war veterans) version done up in Germany by Steve Tinius, whom many of the older hands will recall. It has a gold-pin buss, since the old steel pins caused too many corrosion problems, and the latest front panel ROM and CP/M 0-origination mod. Still 2 MHZ, 1S1D drives (but three now).

By 1980, I had to add another computer to the family. My wife was competing with me for time on the H8 (again, to write), and Curtis Crowe at the Alexandria, Virginia store found an H-89 kit for me at a very attractive discount price. I don't recall why the low price; I think it may have been a returned kit (remember the days when Heath put their famous note in kits, advising the buyer to look at the parts and reaffirm his or her decision to build the machine themselves?) and he just didn't want to inventory it for parts. We still have that one, too; it's at work, hooked up to a Juki 6100 via McGaffey's parallel printer port. Works great, and still impresses my boss with the ease of electronic correspondence using Video Scribe.

My computer of choice is still the Z-100. I have yet to see anything worth buying to replace it. With the 768K and 8 MHZ, none of the newer PC clones offer enough to be worth the switch. If I were starting fresh, of course, the Z-248 would be my first choice. But I went the '100 route instead of the PC route to take advantage of all the software I already had, and I've never regretted it. There's a rather foolish theory in economics that says, "when you evaluate a decision like that, you should ignore the sunk cost," meaning what you've spent before counts for naught. My boss would fire me if I tried a stunt like that with his money, and I certainly would feel foolish tossing all the stuff that goes back to HDOS that would be difficult or impossible to run today. Oh, I know that the '200-series will run all the older stuff, but that alone isn't a good enough reason to scrap the '100. Besides, there's that wonderful '100 keyboard and screen, both of which still impress my friends and co-workers.

Sadly, nothing is constant in this business, and after starting work as a full-time applications software instructor, I was forced to give in and buy a Z-138 portable PC-clone. It runs all the software I teach, and has all the good features you'd expect from Heath. But it's slower and the screen's not as nice, and the keyboard leaves a lot to be desired, and it's not a Z-100 . . .

I must confess, I originally started writing about my computer in hopes of finding other Heath users in my area. In the old days, Heath users tended to be closet-computerists. They had bought their computers

for specific purposes, and didn't generally advertise their existence. Unlike Apple and TRS-80 owners, who were always ready to show off the newest graphics blandishment, the H8 and H-89 users tended to stick close to home and tend their metaphorical knitting. Writing about Heath computers for "Kilobaud" made me some wonderful friends, who were especially appreciated when they shared some of the software they wrote themselves. And for years, that's about the only software we had. I well recall one fellow who stopped by my apartment in Blacksburg, VA, on his way from the midwest to Washington, DC; he had some of Walt Bilofsky's original software with him. After he showed ZenCalc, MyChess and the first version of the C compiler to me, I couldn't wait to get an order off to Walt, and I still keep a close watch on his catalogs.

Writing Heath-related articles helped me start at least three local users' groups, introduced me to uncounted friends, got me a bit of fame (or notoriety) within the community of Heath users, earned a bit of money, and was tremendously rewarding in that it allowed me to share a little with others, by way of repaying all that has been shared with me by so many of such great talent. If I've encouraged others to try something they would otherwise have passed up, or helped others over a rough spot, or introduced others to the wonderful world of microcomputing, then that's reason enough to do the work.

Worthy of a book is the question of how the Heath/Zenith community has developed and changed. Certainly, gone is the early, close-knit feeling that we shared in the seventies. In a sense, that's just as well, because our horizons needed to expand for the Heath line to remain competitive. Many bemoaned the passing of the H8, then the H-89, then the H-11, and most recently the H-100 series. All enjoyed remarkably long lives, considering the competition, and no one could seriously expect Heath to keep the H8 line open for a few additional sales per year. Even the H-100, good as it was, has been overshadowed by the Z-200 series. Prices have remained about the same, but capabilities have grown almost geometrically. What I paid for my first H8 system would today get a Z-148 with 640K, a 20 megabyte hard disk, and color graphics that would have seemed impossible in 1977. Progress is inevitable, and with progress come changes in the user community.

First of all, is the tremendous influx of PC-clone users. These folks are the ones the computer revolution was really aimed at, the ones who want to use computers as tools, as they use the telephone or the automobile. They neither want nor need to know what goes on "under the hood." They just want to compute, whether for business or pleasure. They're worlds apart from the original Heathkit builder, who was a hacker in the original and truest and best sense of the word. And the revolution was immensely successful. The hackers are a small minority now, not necessarily because their numbers have dwindled, but because the others, the users, have so outnumbered them.

This change in composition accounts for the direction the new machines and the new software has taken. The former are fast, easy to use and dead reliable. The latter are big, expensive, sophisticated, and on the cutting edge of all computing technology. After all, software determines, and limits, the usefulness of any new computer. There are some things a mainframe computer can do better and faster than any micro, but there are many more things that the micros can do that no mainframe can do at all.

Shared or distributed computer power, in the sense that such powers are now in the hands of the individual, not the vast organizations, is as much a revolution today and in the coming decades as the printing press was in the fifteenth century. The hackers of the seventies, including the Heath community, were as important to that movement as Aldus Manutius was to printing. After all, Gutenberg may have invented the technology of printing as we know it; Manutius put the technology to work printing vast numbers of cheaply bound popular books. He was the father of the paperbacks, the popularizer of reading and writing. To all of you early Heath users who were there, congratulations and a happy tenth anniversary.

I apologize if this seems to ramble, but I had fun writing it, and I hope there's something here that you can use. I'll send this along on a disk; you can edit it and print it in any way you see fit. I think that may sum up how I feel about microcomputers: today, we have a larger measure of control over how things will be done. There's no turning back now. Best wishes for the new decade, and continued success with REMark. *

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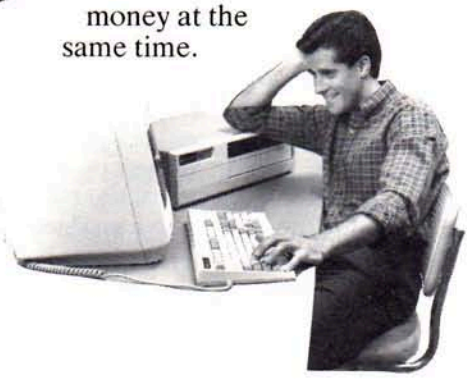

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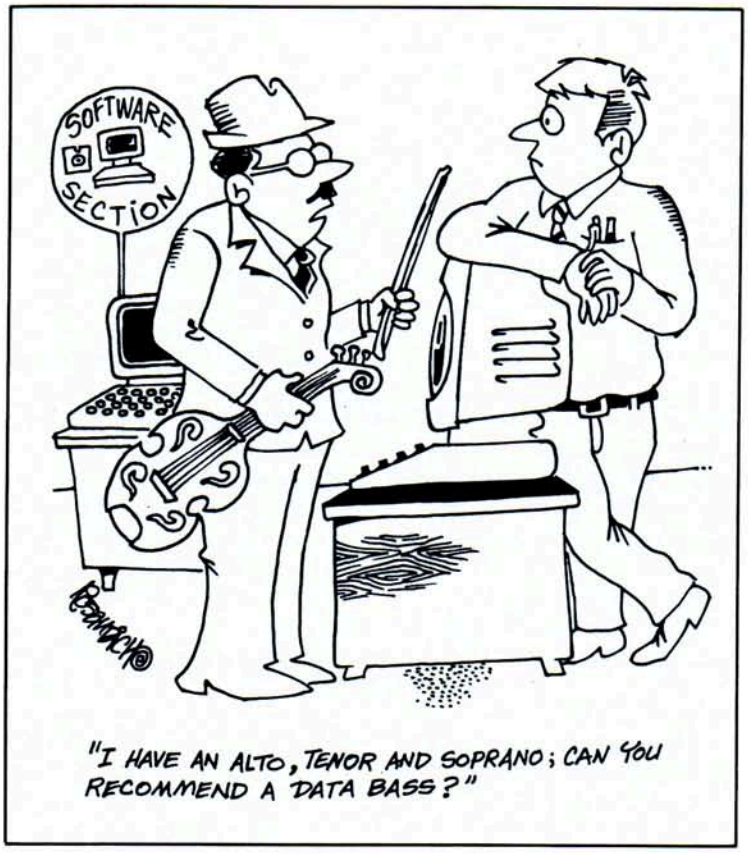

Computers, Music And MIDI

Part 1

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From the earliest bang on the drum or toot of the flute, composing and performing music have been the ambition of many, but the achievement of relatively few. The main stumbling block was the technical limitations of instrument or performer. In the past five years, however, many of these would-be composers have been able to make the music they have been hearing in their heads for so long. Why? The answer is MIDI, the Musical Instrument Digital Interface.

When you hear some of these unleashed compositions you may well wonder what all the fuss is about, but some are good and a few are great. So if you can take the small step to saying "I could do as well as that if I only had the tools", you are ready to go. These articles are about those tools and how to use them.

This is a three part series dealing with computers, music and MIDI. In the first part, this month, we will examine a little musical history and the reasons for the development of MIDI. Then we'll explore how MIDI works, what it can do, what it does not do and what the future holds for further MIDI development.

Next month, I will get into the details of a hardware MIDI interface for an H-89 computer, plus a utility MBASIC diagnostic program for testing the interface. In the final part, I will present two programs in C and one in assembler to drive the interface.

There is considerable industry MIDI support for Commodore, Macintosh, Atari and generic MS-DOS computers, but none that I know of for H8, H-89, or for that matter, H/Z-100 computers. The hardware details are specifically for the H-89, but they are adaptable to the H8 or the H-100. The C software is useable on any of the three machines with minor changes, but the assembler portions work only on an H-89 or an H8 equipped with a Z80 processor. Even there, though, the modifications should not be extensive to make the code work on the 8085 in the H/Z-100 series.

History

For the first few civilized millenia, music was the result of hitting, scraping or blowing naturally occurring objects. But recently(!), we have been making instruments that are increasingly sophisticated to help us realize our creative instincts.

The first manufactured instruments were really only slight improvements on the found objects. But as we progressed, they became more and more complicated and capable. The users of these instruments required higher and higher levels of training to meet the requirements of the music, which was also expanding to use all the capabilities in the new instruments. Even so, there were those who could hear sounds in their minds that they could not produce using the available instruments and techniques. They turned to the new science of electronics.

In the 1920s, several researchers throughout the world developed the first electronic musical instruments. These were crude, as were the first non-electronic instruments, but they were certainly capa-

PC Compatible Owners Take Note: *Even though the original computer used for the completion of this article was a Heath H-89, the Asynchronous Communications Element (8250 ACE) is the same device used for the 'COM' serial port in all PC compatibles. Further, a good portion of the support software is written in a higher level language, making it easily transportable. The Z-80 assembly language code could easily be hand translated to 8088/86 code.* -ed.

ble of producing sounds that could be recognized as music by almost anyone.

One early worker was Hugh LeCaine at Queens University in Kingston, Canada and later at the Canadian National Research Council. His first instrument was completed in 1937 and the device he built by 1945, the Sackbut, was striking even by today's standards (1). It was about this time that the process of producing the desired sounds electronically was referred to as "sound synthesis" and the instruments were called synthesizers.

LeCaine's work was known to only the very few people directly involved in the research. The first time the concept really came to the notice of the general public was with the work of Robert Moog (rhymes with rogue) in the early 1960s. The phrase "the Moog Synthesizer" is still used by many as a generic term to describe anything that makes "electronic noises". The 1968 recording "Switched On Bach" (2) by Walter Carlos was a landmark and was all done on a Moog Synthesizer.

These early synthesizers were analog instruments with separate oscillators, amplifiers, filters, modulators and controllers interconnected manually using a patch panel with plugs and cables to generate the desired sounds. If the sound was to be used again, the set of cable connections and control settings were recorded using pencil and paper, but even so, the specific sound was rarely precisely repeatable.

As the electronic instruments were being developed in one lab, the lab next door was often the scene of intense work on the development of electronic calculating machines. The first practical computers and synthesizers appeared at about the same time, and ever since, the two fields have been gradually merging to the point where modern popular music would not be possible in its current form without the use of a large amount of computing power.

I first heard computer generated music in 1964 at the University of Waterloo in Waterloo, Canada. I was on a high school student tour of the computing facility that was treated to a recognizable version of "Anchors A-Weigh" played on the IBM 1401 line printer. Careful selection of the printed character sequence resulted in changes in the frequency of hammer impacts on the paper, and thus, different notes! By the time I went to the university myself, the IBM 1620 (the original student hacker's machine at Waterloo) was generating music(?) by modulating the noise transmitted to a portable radio placed on top of the cabinet. Such progress!

Enter personal computers. Virtually every one made, from the early Apples and Commodore PETs to the modern machines, has been used to generate music in some fashion. This is probably due to the basic tendency of people everywhere to make music on any available instrument. HUG still has available a disk of software and data files to play music on an H8 or a modified H-89 by toggling a single output bit on and off periodically (885-1031). This technique can generate some remarkable results, but I don't believe we'll ever hear a hit record produced this way. The New Orleans Graphics cards for the H8 and the H-89 included a General Instruments sound chip that was capable of generating multiple voices at once and took a considerable load off the main processor. This was an improvement, but still the quality left a lot to be desired.

The original IBM PC was (and still is) not much better than the 885-1031 disk capabilities. Some computers, notably the Radio Shack Color Computer, included a digital to analog converter in the basic hardware that was used for more sophisticated sound generation techniques, and the Apple IIGS has a real synthesizer sound chip built in, which can produce really spectacular music and effects. These are improvements, but they have been used generally by computer enthusiasts rather than by professional musicians. The musicians were having fun with their own toys.

As one would expect, the synthesizers available to the music industry have been improving along with computer technology. I own two synthesizers and each has at its heart as much computing power as my H-89. Each has a Z80A complete with RAM, ROM, a serial port and parallel ports. The latest synthesizers have virtually no analog circuitry; the sound generation is done digitally with no patch panels or cables and with instant recall of old set-ups. The set-ups are still called "patches" though.

The ultimate goal of the electronic musician is to control the entire orchestra at one time from a single keyboard. Until recently, however, it has been impossible to play more than a single sound, or in many cases, a single note at one time. This was the last major obstacle to overcome to bring out the full capabilities of the new powers of electronic sound synthesis.

In 1981/82, a large and unusually cooperative industry effort produced a standard for the interconnection of electronic musical instruments called MIDI — the Musical Instrument Digital Interface Version 1.0 dated January 1983. This standard defined for the first time a method of interconnecting several synthesizers for control by one keyboard. As we shall see, MIDI was designed to be as open-ended as possible to allow for future growth, and in fact, is now being used for many things that go far beyond anything the writers imagined. Among other things, MIDI allows for the connection of a computer in place of a keyboard, adding a whole new dimension. Finally, the computer and the musical instrument have come together.

MIDI

What is MIDI and why do we need it? To answer the second question first: MIDI was developed specifically to enable a musician in a studio to interconnect several synthesizers, regardless of manufacture, and to play them all using only one keyboard. This has been a design goal for several years and other attempts have been made ranging from a fat cable with a wire pair for every key to an analog interface that sent down a direct current control voltage scaled at 1 volt per octave. The analog interface was widely used between analog synthesizers, but was limited to the control of one note at a time. Chords were not possible.

Now for the first question: what is MIDI? MIDI is a definition of a hardware interface standard and a message protocol of an adequate speed and sufficient capabilities to meet the needs of the studio musicians. It serves much the same purpose as the RS232 serial printer interface standard with the one major difference that everyone in the music industry adheres to the MIDI standard. Voltage level, connector type and transmission speed are defined. The character set is defined and many control code functions are defined. There is even room for manufacturer specific control functions, as well.

I'll use an analogy here to try to explain what sort of information is sent over a MIDI link. Imagine that we have an or-

chestra set up in a concert hall without their music sheets and without a conductor. The conductor is locked in the dressing room with the music, the key cannot be found and the show must go on. What can we do? The conductor calls for a runner and passes him messages on slips of paper pushed under the door. Each message is delivered to the orchestra on stage in turn. The first slip of paper says "violins are number 1", the second: "violas are number 2", and so on, until each instrument has been assigned a channel number. This is a small orchestra with only 16 instrument groups to worry about.

Once the channels are assigned, the music can start. The messages will come from the dressing room as follows:

all channels, tune up now
number 1, play a middle C
number 2, play a middle C
number 5, play an F above middle C
  wait for a quarter note time period
number 5, stop playing that F
  wait for a quarter note time period
number 2, stop playing that middle C
number 1, stop playing that middle C
etc.

In theory, if the runner were fast enough, the conductor could send enough specific commands to every instrument about exactly what was to happen next and when it was to happen to make the concert a success after all. The commands would go only to the correct destination, despite all messages using the same transmission medium, as each instrument is listening only for its assigned channel number. The technique has obvious limitations, but theoretically, it should work. Once the humans are taken out of the loop, though, and are replaced by electronics, it does work.

What isn't MIDI and what can it not do? First, MIDI does not transmit any actual sounds itself. The instruments make their own sounds and changing the tone of the entire concert by reassigning channel 1 to the trumpets instead of the violins is quite possible. The MIDI command sequences can be recorded in real time or incrementally, a note at a time, and can even be edited later to correct performance errors. Remember, though, that it is the commands that are stored, not the sounds. A MIDI recorder (called a sequencer) is not a tape recorder.

Second, MIDI was designed for keyboard operated synthesizers originally, but is not now restricted to them. Almost any instrument can and has been adapted to operate in a MIDI environment. Next month, I'll have a few words to say about what is available, what types of instruments to avoid and what are most useful.

Third, MIDI won't peel potatoes, at least not yet.

Basic Details — Hardware

The MIDI standard details that follow are taken from the MIDI Standard V1.0 as published by the International MIDI Association (3). A complete copy of the standard can be obtained from the address at the end of this article and is indispensible for any really serious experimenting with MIDI. Manufacturer's manuals often contain an adequate description, at least as far as it applies to their equipment.

The basic hardware interface specifications are:

- Serial interface — 1 start bit, 8 data bits, 1 stop bit, no parity
- Data rate — 31.25 kbaud
- Signal transmission — 5 ma. current loop, opto-isolator coupled
- Connectors
  - 5-pin DIN as used on many audio components
  - 2 pins for signal twisted pair
  - 1 pin for shield is connected at both ends of the cable
  - Shield pin is only connected at MIDI out chassis connectors to avoid ground loops
- Connector quantity — 3 — MIDI IN, MIDI OUT, MIDI THRU
- Maximum cable length — 50 feet

These specs have several implications. For example, the baud rate happens to be a x16 sub-multiple of 500KHz, often an easy frequency to find in a microprocessor driven synthesizer or personal computer. This data rate is equivalent to about 3000 bytes per second. Consider-

Glossary For Computers, Music And MIDI

MIDI — Musical Instruments Digital Interface.

MIDI Channel — There are 16 channels on a MIDI network. Different synthesizers or different voices within one synthesizer can be addressed individually on the same MIDI link.

Mode — Omni, Poly and Mono MIDI modes describe the different possible relations between MIDI channels and synthesizer voices. See the MIDI spec for details.

Multi-timbral — A multi-timbral synthesizer can play any combination of different patches at one time up to the maximum number of voices available, commonly 6 or 8.

Patch — A collection of parameters unique to a particular brand of synthesizer that describes all details of the sound the synthesizer will make. A patch can be sent to a similar machine via MIDI, but the parameters are probably meaningless to another manufacturer's equipment.

Poylphonic — A polyphonic synthesizer can play more than one note at a time (as with piano chords), although often the synthesizer is restricted to using only one patch. The older monophonic synthesizers could play only one note at a time.

Sequencer — A device, either stand-alone hardware or software on a computer, that can record and play back a sequence of musical notes or MIDI commands all related to a tempo time base.

Voice — One sound generating channel in a synthesizer whose operating parameters are described by a patch.

ing that a command is usually made of two or three bytes, it is apparent that the data rate should be able to keep up with most playing situations. The MIDI cables are unidirectional and go from MIDI OUT on one synthesizer to MIDI IN on another and vice versa. The MIDI THRU connector is a duplicate of the MIDI IN for daisy-chaining several instruments together. As the circuit is a current loop, it is not possible to parallel MIDI cables as audio cables can be paralleled or divided. Two MIDI data streams can only be mixed using a MIDI data processor to avoid mutual interference.

Basic Details — Message

To explain the MIDI message format, I'll return to the earlier analogy. Those messages to the orchestra each had to identify what should be done and who should do it. MIDI messages do exactly that. Every MIDI message is composed of a status byte followed by a number of data bytes which depends on the status. Status and data bytes are easily distinguished by the most significant bit: for a status byte, it is set to 1 and for a data byte, it is reset to 0. Once a status byte is sent, there is no need to repeat it between sets of related data bytes if there is no change in the status. This facility, known as "running status" can save up to 30% of the available transmission bandwidth when it is most necessary.

A status byte is divided into 2 four bit nibbles, which generally define what is to be done and who is to do it. There are two types of MIDI messages, voice messages and system messages. A typical voice message will turn a note on or off or change a pitch wheel setting or a patch. A typical system message will provide a timing clock, request a synthesizer retune or do a bulk patch parameters dump.

A voice message has a status byte in two halves. The first nibble defines what the command is and the second nibble defines the MIDI channel number being addressed. The available nibble 1 commands are:

nibble 1 (command)
= 0 — note off event
= 1 — note on event
= 2 — total key pressure
= 3 — control change
= 4 — program change
= 5 — individual key pressure
= 6 — pitch wheel change
nibble 2 (channel)
= 0 to 15 — channel # 1-16

Following the status byte is an appropriate number of data bytes. A typical voice message would be as follows:

1sssxxxx — 1sss = status, xxxx = channel number
0nnnnnnn — n..n = note number
0vvvvvvv — v..v = key velocity (0-127)

In such a message, the note to be turned on is in the range from 0 to 127. The range of a piano is from 21 to 109 and middle C is note 60. The key velocity is a measure of how hard the key was struck and can be used to control such parameters as the loudness of the resulting sound. A velocity value of 0 is the same as a note off command which allows the use of interleaved note on and note off commands without changing status (i.e., using running status). Many synthesizers do not send or respond to velocity values other than 0, so for non-velocity equipped keyboards a standard value of 64 is often used. The following is a numerical example.

In hex notation
93 41 56
which means — turn on, using channel 4, note 65 (the F above middle C) with a velocity of 86 (moderately loudly)

The voice message definition did not describe the case of the status byte command nibble=7. This is actually the designation of a system message. In this case, the second nibble specifies which system command is required rather than which channel is being addressed because the system commands are not channel sensitive. Typical system message layout is as follows:

1111cccc - 1111 - command 7 = system status
- cccc - identifies which system command is being called
0ddddddd -ddddddd - data bytes as necessary

The available system commands are:

0 System exclusive	8 Timing clock
1 undefined	9 undefined
2 Song position pointer	A Start
3 Song select	B Continue
4 undefined	C Stop
5 undefined	D undefined
6 Tune request	E Active sensing
7 EOX end of exclusive	F System reset

The system exclusive command can be used to do anything the manufacturer decides. In this case, the second byte is a code that will identify this manufacturer's products and the third byte is often used to identify the specific model number. System exclusive is often used to dump and load patch parameter data, but the specifics are not described in the MIDI specification at all. The manufacturer's manuals must be consulted for the details.

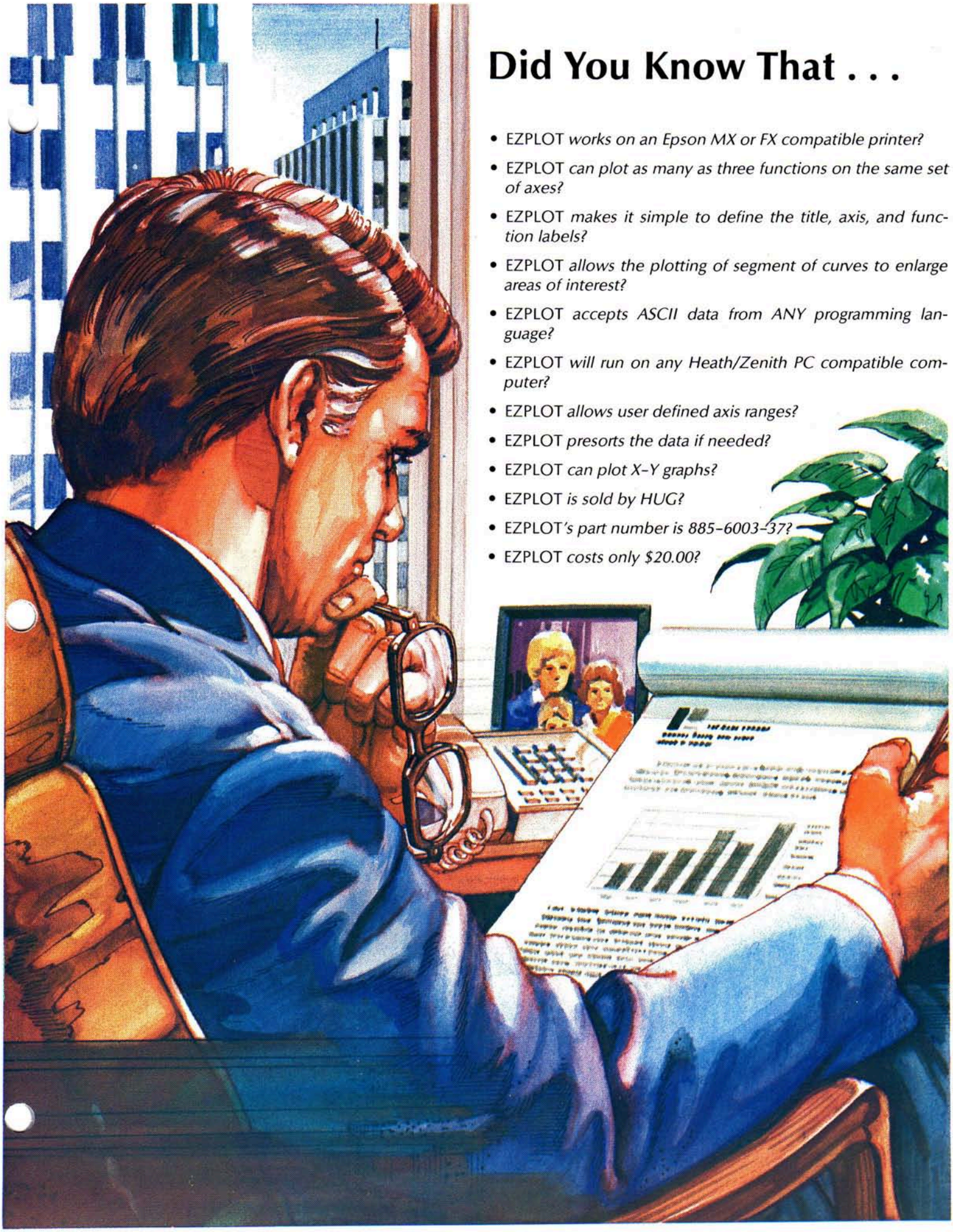
I cannot cover all the details of the MIDI standard here. Copies are available from the references at the end of this article, but it is often possible to get a copy through a local electronic instrument store for the price of the photocopy. The standard is in the public domain and should be available at a nominal cost. Full details of the system and voice commands are given along with hardware and usage information.

If you are going to experiment with MIDI messages, note the fact that the MIDI bytes cover the full range of possible ASCII characters from 0 to 255 (or from x00 to xFF) so any routines to send or receive MIDI data must be transparent to the content to avoid problems with the operating system Input and Output routines. Note also that the baud rate specified (32.5 kbaud) is very fast for most computer systems. Programs written in BASIC generally cannot cope with data input at that speed, but data output is possible for experimentation purposes.

Next month, we will cover the hardware details of making this work on an H-89. Until then, have fun exploring your local music stores and their electronic instrument stocks. Five years ago, I had to persist in my search for an electronic piano rather than a "fine piece of furniture" for $5000 and up. Today, it is becoming hard to find a piano made of wood and steel. I will have a few words of advice next month on the features to look for when trying to select an electronic instrument for use in a home studio from the vast range of available equipment.

References

(1) Keyboard Magazine, February 1985
(2) Switched-On Bach, Walter Carlos and Benjamin Folkman, Columbia Records MS7194
(3) MIDI spec (Complete) $35
International MIDI Association
12439 Magnolia Boulevard, #104
North Hollywood, CA 91607 *



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