REMark®

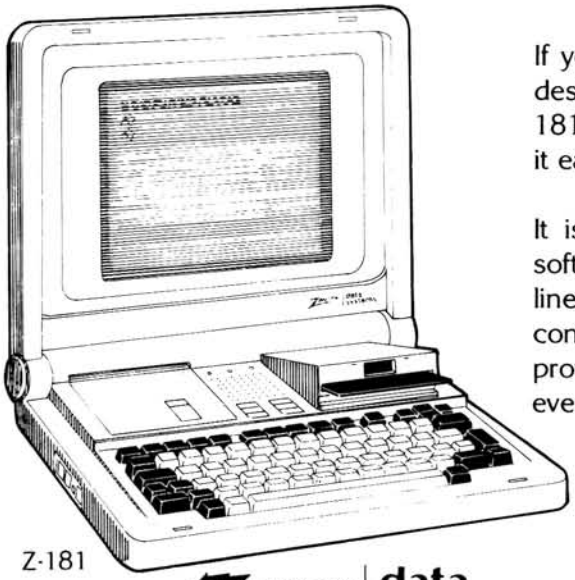
Volume 8, Issue 7 • July 1987
P/N 885-2090 Issue 90

Official magazine for users of HEATH ZENITH computer equipment.

HUGCON 87 Information
See Page 7

$2.50

Portable Computing from Zenith and FCC



Z-181

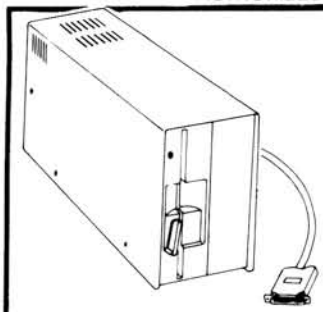
ZENITH | data systems

AUTHORIZED SALES AND SERVICE

If you're a person on the go, you'll never find a more desirable portable computer to take with you than the Z-181! This computer weighs less than 12 pounds, making it easy to carry.

It is a **true** PC-compatible, and runs virtually all PC software. It has a special supertwisted LCD display with 25 lines of 80 columns each, a 60 degree viewing angle and a contrast ratio higher than 8! A built-in illumination tube is provided which lights the display from the rear, for use even in dark rooms.

Standard features are 1 serial port, 1 parallel port, a rechargeable battery with built-in recharger, and an external RGB monitor card. The standard unit comes with 2 built-in 3.5" floppy drives (720k per drive) plus an external floppy expansion port suitable for connecting our FCC external 5" floppy drive.

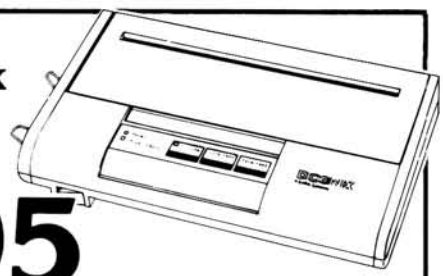


FCC External 5" Drive

$250

Since the Z-181 computer comes with a 3.5" drive, and 5" drives are more common, First Capitol built an add-on 5" drive. Our drive is enclosed in an external cabinet with 110VAC power supply and a shielded cable to attach to the Z-181 itself! (Does not use a battery).

Diconyx Printer



$395

The Diconyx printer is a **portable** inkjet that runs off its own internal rechargeable battery. The carriage is 9" wide, and able to accommodate both friction and tractor feed paper without buying any options.

Ruggedized Carrying Case

$295

To make portable computing even more convenient, we offer a sturdy carrying case. This hardside case has a foam interior to protect the Z-181, Diconyx printer, and power packs. What an easy way to transport your portable computer system!

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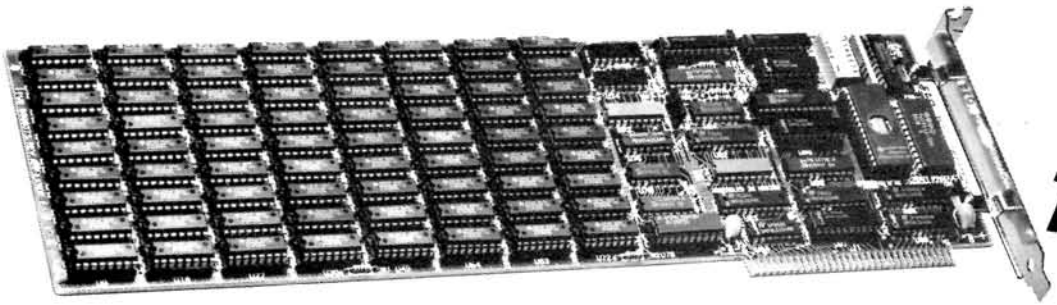
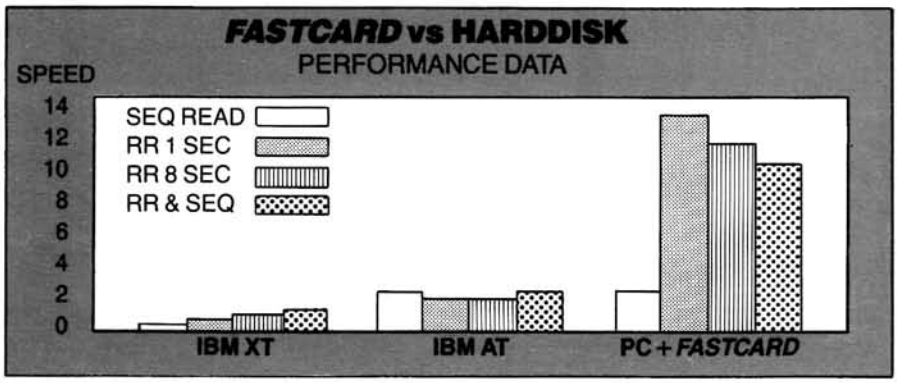
FASTCARD®

fully loaded with 2 *MBYTES* for just $395*



10 DAY FREE TRIAL!

FASTCARD speeds disk I/O by as much as tenfold, *as shown in the following chart.*



This graph shows benchmark test results of a PC equipped with *FASTCARD* versus a PC-XT and PC-AT. These tests were run by a major independent testing laboratory using their standard disk performance benchmark tests.

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- Print Buffering
- Built-in Diagnostics and Automatic Fault Tolerance

*Each *FASTCARD III* comes with 2 MBytes of memory for $395. *FASTCARD IV*, available with 1 MByte, includes serial/parallel ports and a clock calendar for $299. *FASTCARD III* without memory is $140 and *FASTCARD IV* without memory is $169.

For additional information, call: PMi PERIPHERAL MARKETING, INC. **(602) 483-7983**
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★★★ UPGRADE ACCESSORIES FOR Z-100 ★★★ SERIES COMPUTERS

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Zenith packages with software, manuals and registration cards for the original Z-100 computer series (not for the IBM compatibles).

PART NUMBER	DESCRIPTION	LIST PRICE	SALE PRICE
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OS-63-4	Z-DOS	$150.00	$35.00
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MEMORY KIT #150-256-18. Includes a ZPAL chip which allows use of 256K RAM chips included (18 pieces 256K 150 ns RAM chips). Kit increases 128k memory to 640K or 256K memory to 704K. All chips plug into your existing Zenith Memory Board. Unbelievable but true $87.00

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PTZ-148 Expansion Card for Z-148. Includes 2 expansion slots plus a clock/calendar. $129.00

EVERCOM INTERNAL MODEM. Fully Hayes compatible 1200/300 baud with powerful BitCom software included $128.00

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LEXISOFT	Desktop Publisher	$695.00	$445.00
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SR-B410	DS BACKUP (hard disk)	$70.00	$62.50
SR-4500	Norton Utilities 4.0	$99.00	$69.00
SR-3950	dBase III plus	$695.00	$479.00
SR-4100	DAC EASY Accounting	$69.00	$62.00
SR-3090	LOTUS 123	$499.00	$389.00

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INTERNAL DUAL DRIVE SETUPS. Includes two half height double sided disk drives and all hardware and connectors required to mount inside your H-89. Steel mounting shield/case included.
MITSUBISHI MF501 Setup, 48 TPI, 6 MS seek, 320K $262.00
MITSUBISHI M4853 Setup, 96 TPI, 3 MS seek, 640K disks ..$269.00

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The Sixth International Heath/Zenith Users' Group Conference

Jim Buszkiewicz
HUG Managing Editor

Tenth Anniversary Celebration!

Can you believe it? It will have been 10 years ago, this fall, when the first H-8s, H-11s, and ET-3400s, rolled off Heath Company's assembly line, and The Heath Users' Group (HUG) was born. Robert Furtow was manager of HUG, and Lou Frenzel was Director of Computer Products. If your H-8 had 32k of memory, you were considered one of the elite few. REMark was a full 28 pages, and came out quarterly (hopefully). I was playing with S-100 machines, and there were other computer related periodicals being published like: Creative Computing, Interface Age, ROM, Kilobaud, Personal Computing, and others. Most of these have long since gone by the wayside, yet, HUG and REMark live on. You must admit that it takes a special kind of person with a burning desire, who wants the most from his or her computer investment, to be a HUGgie!

This year's magic dates are August 21, 22, and 23, and the magic location is the Hyatt Regency O'Hare in Rosemont, Illinois. Once again, Huggies from all over the world will meet, share ideas, learn, and generally have a good time. This year's conference format will only stray slightly from that of the past, in that, this year we plan to have professional entertainment after dinner, Saturday evening.

Manufacturers from all over the country will be represented this year at the exhibit area. Once again, we've reserved the entire lower level of the hotel for exhibitors, and have over 60 exhibit spaces available. You'll probably recognize many of the exhibitors from previous conferences, and from their advertisements in REMark. You'll also see some new faces and products as we welcome new vendors to the world of Heath/Zenith computing.

The Heath/Zenith Computer and Electronics Center will be there with literally truckloads of bargains. Those of you who have attended previous HUG Conferences will remember the great prices that these people offer. In fact, rumor has it that the computer prices will be so low, you'll be able to afford a 'spare'! For the newcomer, bring your paper or plastic. Prices like these only happen once a year at HUGCON.

The Exhibit Area will have the traditional (non-electronic) bulletin boards available so that you can post messages to fellow users. As in the past, the boards will have the following categories:

WANTED/TRADE — This bulletin board will be available for those of you wishing to purchase or trade items.

FOR SALE — This bulletin board will be available for those of you wishing to sell computer related items. (I used this board last year, and guess what, it really works!)

MESSAGES — This bulletin board will be available for general messages of any nature.

These bulletin boards are made available for Heath Users' Group members. Special forms will be available for these boards. We ask that all ads placed on these boards be removed only by the individual that placed the information. Also, commercial ads are not to be posted on the bulletin boards. Space is provided for commercial advertising elsewhere in the Exhibit Area. If you have a commercial ad you would like to distribute, please contact either Margaret Bacon, or myself at (616) 982-3463, or write to Heath/Zenith Users' Group, Hilltop Road, St. Joseph, MI 49085 for further information.

Friday, August 21st, is the first day of the conference, and early arrivers will see Margaret Bacon and her crew of hard working HUGgies manning the HUG Registration Booth just to the left of the main entrance. Be sure to check in with Margaret! She has some conference information for you that will make life a lot easier during the busy weekend. Margaret's area will also prove to be quite useful when it comes to contacting the proper people should you have any questions regarding the hotel facilities. Although the Registration Booth opens at 2:00 pm, the Exhibit Area doesn't open until 3:00 pm. This extra hour can be spent looking over all the information you received from Margaret when you registered.

When the doors are first opened at 3:00 pm, it's like a 'going out of business' sale at Fort Knox, everyone heads for the Heath/Zenith Computer and Electronics Center. Don't worry! There are plenty of bargains for everyone, not only at the Heath/Zenith Center, but at a majority of the other exhibitors also! This on-rush of madness continues up until 8:00 pm, and possibly even later this year, since there are no opening talks or ceremonies afterwards.

The next day, Saturday, is going to prove to be very busy. Margaret and her crew will be available at the Registration Booth at a bright and early 7:30 am. A short time later, 9:00 am, the exhibits will open for a full day of business. Now comes the hard part. (**Hint:** Make this decision the night before!) Should you visit the exhibits one more time and try and pick up on something you may have missed the night before, or should you attend one of the many interesting discussion groups which start at the same time the exhibits open?

Each year we try to arrange a series of discussion groups for HUGCON, so that there is a great variety of subject matter. This year is no different, and in fact, may be the best. Scan the list! Talks for the beginner, graphics, operating systems, hardware and software workshops are only a few from a large complement of subjects available to you. The Discussion Group Schedule is arranged to repeat some of the popular sessions up to three times during the weekend. Be sure to carefully review the Conference Program to select those topics you are most interested in. Hopefully, there will be something for everyone.

The Exhibit Area will close late Saturday afternoon at 5:00 pm, and then shortly afterwards, the Registration Booth will also close (5:30 pm). This is so we all can get ready for the evening's exciting schedule. At 7:00 pm you're all invited to get a couple of drinks at the Dinner Warm-up. Then at 8:00 pm, grab the nearest seat for a great meal served by the Hyatt. Following dinner, sit back and relax, and get ready to laugh as you've never laughed before. Star of the Golden Horseshoe Review in Disneyland, Dick Hardwick will use both hands to tickle your funny bone. Then, comes the prize drawings. The only clues I can give you for the prizes this year are actual quotes from those people who donated them: "worth lotsa bucks", "juicy", "kit", "lotsa computing power", and "communications". No, "Monty" and "Don" won't be there this year, so we'll probably have some 'unknown' giving these prizes away this year, and you must be present to win.

If you survived the schedule of the night before, Sunday morning starts off bright and early with the Registration Booth opening at 7:30 am, and the Exhibit Area and Discussion Groups starting at 9:00 am. Now is the time to pick up on some last minute shopping and questions in the Exhibit Area, and possibly one or two talks you may have wanted to attend Saturday, but were unable to. The Sixth International Heath Users' Group Conference will close at 2:00 pm.

In addition to the major prizes given away at the dinner on Saturday night, each year, most of our exhibitors donate a number door prizes to be given away during the conference activities. No exception this year! Prizes donated by the exhibitors will be selected at random for a special prize drawing each hour the Exhibit Area is open. Numbers of the winners will be displayed at the HUG Booth for the duration of the conference. The prize and the name of the winner will be announced as each winner collects the prize.

HUGCON87 International

Sixth International Heath/Zenith Users' Group Conference

Schedule of Events

Friday, August 21, 1987

2:00 pm ..... Registration Booth Opens
3:00 pm ..... Exhibit Area Opens
8:00 pm ..... Exhibit Area Closes
8:00 pm ..... Registration Booth Closes

Saturday, August 22, 1987

7:30 am ..... Registration Booth Opens
9:00 am ..... Exhibit Area Opens

Morning Discussion Groups Start Times

9:00 am 10:30 am

Afternoon Discussion Groups Start Times

12:00 pm 1:30 pm
3:00 pm 4:30 pm

5:00 pm ..... Exhibit Area Closes
5:30 pm ..... Registration Booth Closes
7:00 pm ..... Dinner Warm-up Open (Rosemont)
8:00 pm ..... Dinner, Entertainment, Awards and Prizes (Rosemont)

Sunday, August 23, 1987

7:30 am ..... Registration Booth Opens
9:00 am ..... Exhibit Area Opens

Discussion Groups Start Times

9:00 am 10:30 am

12:00 pm ..... Registration Booth Closes
2:00 pm ..... Close of Sixth International HUG Conference

August 21-23, 1987 promises to be a busy exciting weekend. The staff of the Heath/Zenith Users' Group is working hard to insure a great time for all that choose to join with fellow users at the Tenth Anniversary Celebration. The Hyatt Regency O'Hare provides an excellent atmosphere for an exciting, yet relaxing weekend. If you have not attended previous HUG Conferences, this is a good time to get into the swing of what the Heath/Zenith Users' Group is all about. The "old pro" at HUGCONs will find many new items of interest, along with some new topics at the Discussion Groups currently scheduled.

Note: The schedules, exhibitors and activities of the Sixth International Heath/Zenith Users' Group Conference are subject to change. A final program of events will be available at the HUG Registration Booth on the days of the Conference. Changes that occur during the Conference will be announced within the Exhibit Area during normal hours. Tickets for those of you who have pre-registered are now being mailed every two weeks. If you have not received your tickets, please contact Margaret Bacon, HUG Secretary, at (616) 982-3463. If you are planning to attend for one day only, you may purchase tickets at the HUG Registration Booth. One-day tickets may be used for Discussion Groups and access to the Exhibit Area, however, one-day ticket holders will not be eligible for door prizes selected in the Exhibit Area or at the HUG Dinner Party. The $27.00 regular ticket entitles the holder to attend all activities of the Sixth International Heath/Zenith Users' Group Conference (you must be present to win prizes at the HUG Dinner Party on Saturday night). We cannot guarantee seating space for all attendees to each Discussion Group. Seating will be available on a first-come, first-serve basis.

Special Note: Dates furnished on the Hyatt Regency Room Registration Cards have the Conference listed from August 20-23, 1987. Be sure you fill in the dates that you will be staying at the Hyatt so there is no mistake about your reservations and room requirements. Remember, actual Conference dates are from August 21-23, 1987.

A Look At Our Speakers

This year's line-up of discussion groups should prove to be more interesting than ever. Rather than give you the actual schedule ('cause I ain't made it up yet), I thought I'd list each of the topics and speakers, along with a short description of each. The actual speaker schedule will appear in the packet of information Margaret Bacon will give to you when you register at the conference. Here's how our line-up looks:

Programming In 'C' For Efficiency — Once again we're fortunate to have Jack Purdam from EcoSoft speaking. Jack is the author of several books on the subject, as well as the creator of the EcoSoft 'C' Compiler.

What's New In Three Two (MS-DOS 3.2) — Bill Adney will be speaking about his favorite subject, MS-DOS version 3.2. Bill as you know is one of REMarks Contributing Editors.

Writing Programs For Microsoft Windows — Will be Bill Rothman's subject this year. Bill is an accomplished Assembly language programmer as shown by several of his articles in REMark.

Writing Terminate And Stay Resident Programs — Prompted by his famous HEPCAT program, Pat Swayne will show you 'how it's done'.

Using RS-232 Ports (Without Fear) — A long time Computer Hardware Consultant for Heath Company, Bob Harris will address RS-232 ports, in general. His talk will be general in nature, and not address any specific machine.

Multi-User, Multi-Tasking Operating Systems (Xenix) — John Guenther, a long time user and employee of Zenith Computer Systems, will address the use and advantages of the Xenix Operating System.

Computers For Beginners — As in previous HUGCONs, Ron Hackney, an engineer from Heath Company will give his popular talk on computers for the beginning user. This discussion has always been well received by conference attendees.

Software Workshop — Back for another return engagement is Bill Parrott with his software workshop. Here is where you can get those unanswered software questions, answered. With your registration pack (from Margaret Bacon), you will receive a small card upon which you can write your questions you would like Bill to answer. These cards are to be given to Bill before his talk begins.

Where We Are, And Where We're Going — This discussion group actually consists of the 5 Product Line Managers from Heath Company! Each manager will talk for 15 minutes about his product line. Wayne Wilson will be talking about New Products in the Weather, TV, and Amateur Radio field. Denton Bramwell's talk is entitled: *"Truth, Beauty And The Art of Computer Construction"* (this should be interesting). Jim Wilson will address New Products in Education. Mark Witsaman will be talking about our computer based instruments line. Finally, Jim Bungard will be telling us about the new products Heath carries which are manufactured by other vendors (buy-sell). Have your questions ready, because each PLM will open up the floor for them.

Z-LAN — Networking is here, and here to tell us about Zenith's exciting entry into this field will be Gordon Reichard, an engineer from Zenith's Communications Group. If you're at all into networking, you won't want to miss this one.

Desktop Publishing — John Roach is back this year with another very popular topic. Complete, professional magazines are already being prepared using this form of publishing, and I'm sure it won't be long before the days of 'laying out by hand' are a thing of the past.

Bull Session For Old And New Computer Users — Another very popular discussion group is Bruce Denton's hardware workshop. Once again, small cards will come with your registration pack, which you can use to write your hardware related questions on, and then give them to Bruce before his talk begins. Bruce is the Owner of DG Electronics, and quite familiar with literally EVERY computer made by Heath/Zenith.

Public Domain Software — With the advent of PC 'Shareware', who would know better about the subject than Bob Todd. Bob is the keeper of more public domain software than I or anyone can possibly imagine.

ENABLE For The H/Z-100 — Yes, ENABLE has been ported over to the H/Z-100. Now get the full details from Mary Pelagalli, from the Software Group, about the new exciting product. All you H/Z-100 owners won't want to miss this one!

A 2-D Graphics Editor Using A Mouse Input Device — David Powers, a professor at Northern Michigan University will be speaking about this amazing software.

Hi-Res Graphics Using SHOWOFF On The H/Z-100 — Janet Hirsch from Smart Graphics, will be talking about their version of SHOWOFF for the H/Z-100 computers. This is another talk H/Z-100 owners won't want to miss.

Databases And Their Applications In Business — Esther Czekalski, from the

Zenith Software Consultation department, will be on hand to discuss business software applications. Esther has a Masters Degree in Business, and has written some applications programs for her department.

OS-2 — No, it does not stand for "Ohio Scientific"! What it does stand for though, is MicroSoft's latest and greatest operating system, and to give us a first hand look at the generic version will be Rachel Klau, one of Zenith's Software Engineers.

Z-386 — This is the system everyone WOULD like to have, and to tell you all about it's features and capabilities will be Jim Kelly, one of Zenith's engineering staff.

Multi-User Applications Software For Local Area Networks — This talk will be given by Steve Hesterman from ZeduCorp. Steve will discuss the different types of software, and problems one can encounter with that software while using it with local area networks (LANS).

Bionics — Last, but definitely not least on the list, is Steve Greelish with his seminar on bionics. No, this is not another robotics discussion. This is the real thing. Steve will be discussing his work with human limb replacement using myoelectricity (muscle impulses) and perhaps show us some first 'hand' examples. Move aside Steve Austin, this is no longer fiction. Definitely standing room only!

The Vendor Area At A Glance

How does that saying go... "something old something new..."? I guess the same can be said about our vendor area. Many of the vendors from past conferences will be there, as well as many welcome new faces. Just to name a few, the following companies will be represented at HUGCON VI this year:

Hogware Company will be displaying their popular SHOWOFF for the H/Z-100, as well as PC PAINT, GENERIC CADD, and more.

Barry A. Watzman will have his latest versions of PERKS for the PC and H/Z-100 machines in addition to other hardware and software products.

D-G Electronics is hopefully going to have a surprise or two to show us.

Sextant Publishing Company will be on hand with plenty of reference material, newsletters, magazines, etc.; all for the Heath/Zenith community.

Powerline Systems is going to be displaying their records management system, JUPITER, and their grocery coupon management system, COUPON. Now there's one for you shoppers!

Graymatter Application Software will have many H/Z-100 and PC Compatible upgrade products to show, as well as PC-Blue and SIG/M Public Domain Software.

Al Davis will be there for all you tinkerers, with his stock of Heath/Zenith surplus salvage parts.

New Orleans General Data will be on hand with their graphics software, and right beside them will be **Ecosoft** with their fabulous C Compiler.

WindowDOS Associates is another newcomer to HUGCON, and will have a DOS shell program you'll just have to see to believe.

Heath Company plans on showing off a good portion of their new, as well as more popular kits.

Generic Computer Products plans to have their graphics and CAD products available for your evaluation. **Jay Gold Software** will also be available in this booth.

Software Wizardry is rumored to have just about any type of software application package available for any Heath/Zenith computer system, in addition to a potpourri of hardware related products. You can bet there'll be some special prices from Tom!

Micronics Technology is known for their variety of popular products, including speed mods for the H-89 and H/Z-150/160, software for all H/Z machines, and winchester disk drives at very reasonable prices.

U.C.I. Corporation will be showing H/Z-100 owners how 'easy' it is to convert their computers to full PC compatibility with the U.C.I. 'EasyPC'.

The Software Group will be there with their new version of ENABLE available for H/Z-100 owners to examine. This software package should bring new life to an old friend!

Newline Software is another magical software vendor that can come up with just about any type of application software you may need for your 16-bit computer, and at reasonable prices.

Hilgraeve, Inc. is the originator of the HyperACCESS communications package, and will no doubt have it available for your examination.

Diskmovers will be doing exactly that, moving boxes of disks, as well as different types of disk boxes, at incredible savings!

Graphnet Systems is run by Bob Todd (one of our speakers), and he will have available various Zenith computers, CAD Systems, Network Software, and public domain software.

Bea-Soft Computers, a dealer for hard disk drives, cabinets, and subsystems, will be on hand to answer any questions you may have regarding this hardware.

From this partial list, I think you get the picture. Software, hardware, and everything in between will be represented by our vendors this year at HUGCON. Come help us celebrate our 10 year anniversary at The Sixth International Heath/Zenith Users' Group Conference. ✱

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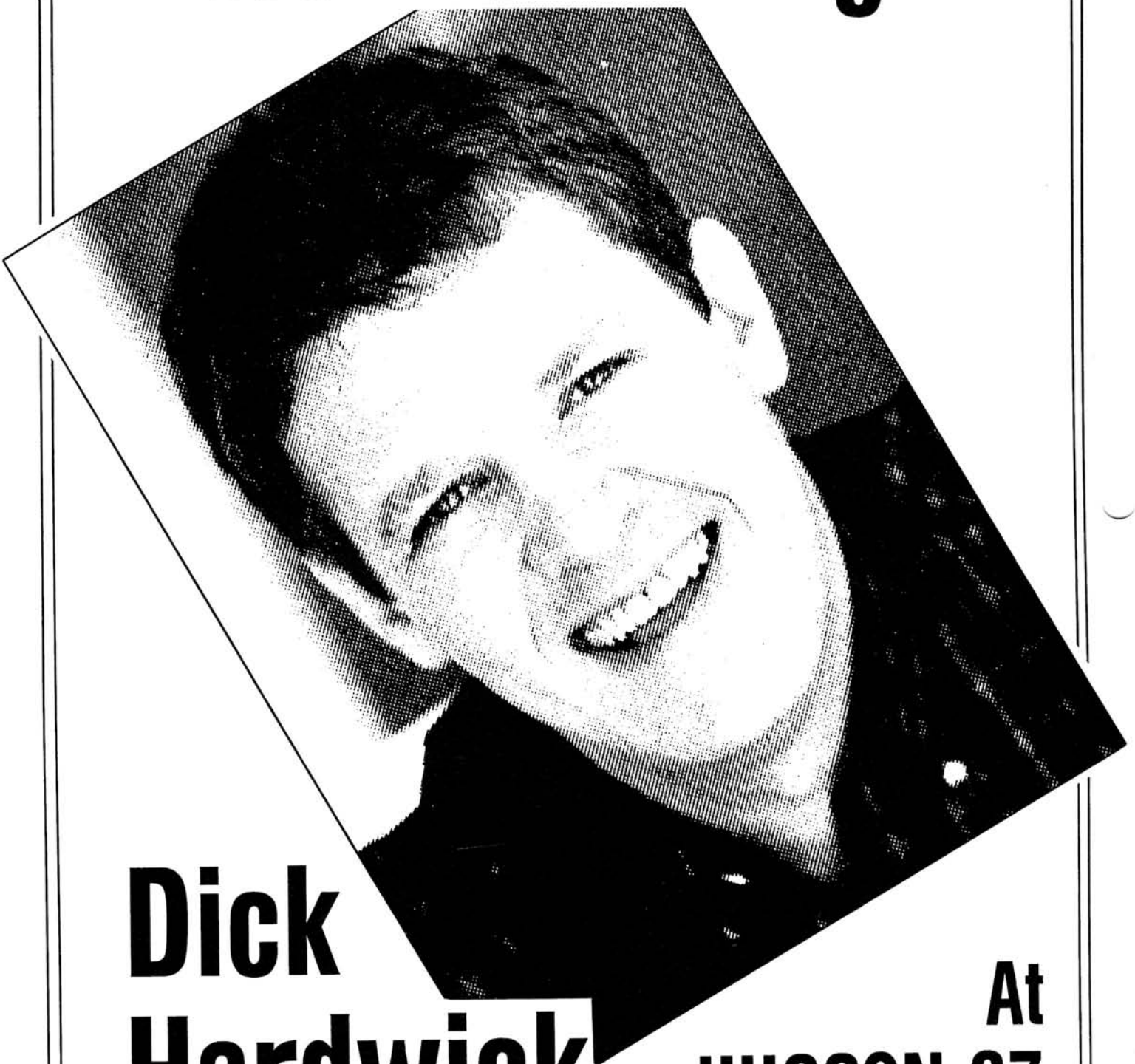


Dick Hardwick

At HUGCON 87

LIFESPAN.BAS

Paul M. Spannbauer
One Brockley Drive
Delmar, NY 12054

Everyone is interested in prolonging their lifespan nowadays. One way to estimate your current lifespan is to try this GW-BASIC program. You can run it on any Zenith IBM compatible (148, 158, etc.), or you can modify it to run on computers that run other versions of BASIC. The program occupies only 6K bytes of RAM.

The questions in the program are used by physicians, hospitals, and insurance companies to estimate longevity. The program will actually give you a better estimate of longevity than actuarial tables, because it measures risk in terms of environment, stress, and general behavior.

You begin the program with a basic lifespan of 72 years. The program will then add or subtract years from your lifespan based on your answers to questions about your personal habits and lifestyle. For example, you will take an estimated eight years off of your lifespan by smoking more than two packs of cigarettes per day. The computer will ring its bell each time a response subtracts years from your life.

After running the program, see how you compare with the current national average lifespans: 70.5 years for white males, 65.3 years for all other males; 78.1 years for white females, 74 years for all other females.

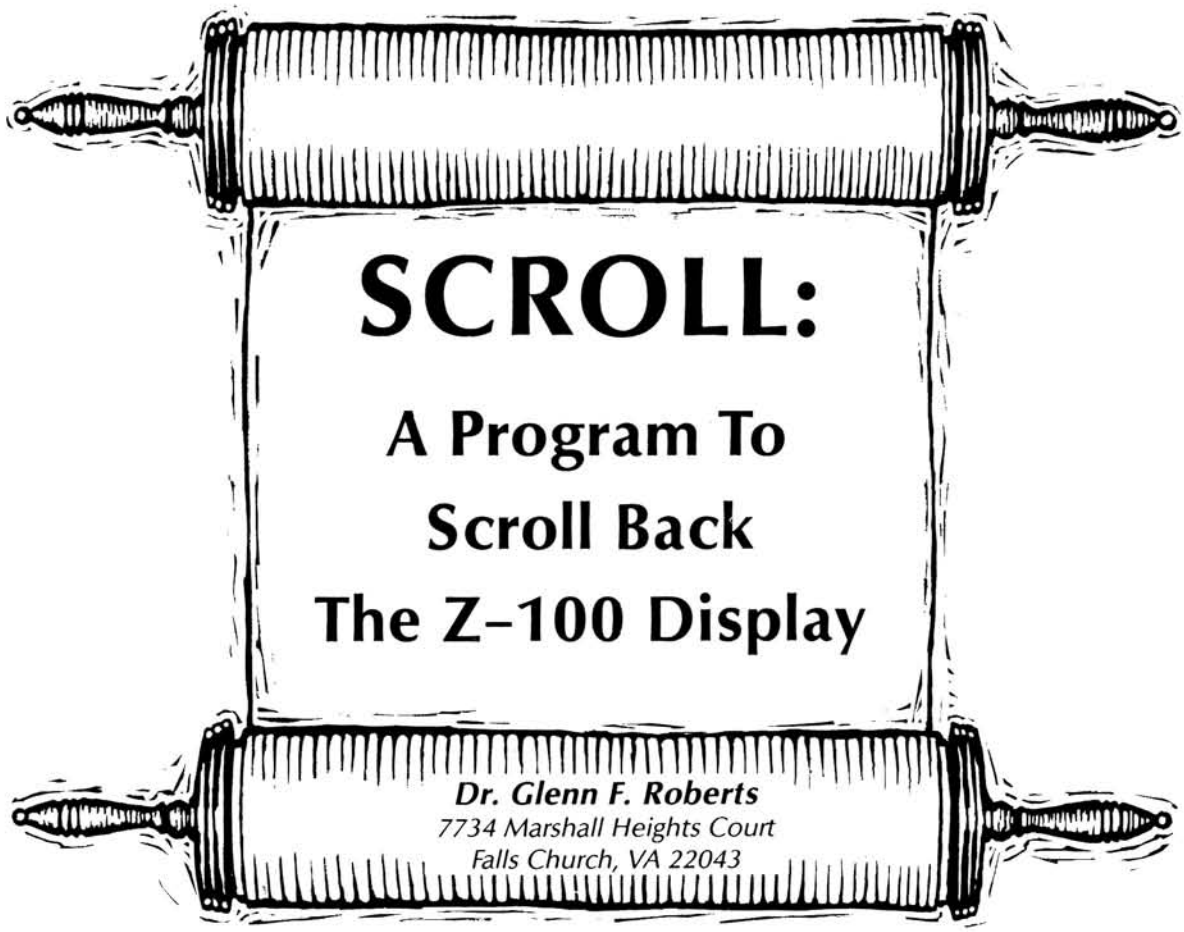
HUG Software Engineer's Note: To run this program under MBASIC on an H/Z-89/90 or H-8, replace all CLS commands with PRINT CHR$(27)"E"; (include the semicolon), and all BEEP commands with PRINT CHR$(7);.

Reference

Allen, R. F. and S. Linde, *Lifegain: The Exciting New Program That Will Change Your Health — & Your Life*, Appleton Consumer Health Guides, 1981 (288p).

```
10 CLS
20 PRINT:PRINT"LIFESPAN"
30 PRINT:PRINT"by Paul M. Spannbauer, Ph.D."
40 PRINT:PRINT"This program will estimate your lifespan by evaluating your"
50 PRINT"personal habits and lifestyle."
60 PRINT:PRINT"The computer will ring its bell for each response that takes"
70 PRINT"years off of your lifespan."
80 PRINT:PRINT"Make sure that all of your responses are entered in CAPITAL"
90 PRINT"letters by pressing the CAPS LOCK key on your keyboard."
100 PRINT:PRINT"Press any key to continue...",INPUT$(1)
110 CLS
120 A=72
130 PRINT:PRINT"Are you:"
140 PRINT:PRINT TAB(5);"1-- Male?"
150 PRINT TAB(5);"2-- Female?"
160 PRINT:PRINT"Type 1 or 2 and then RETURN:"
170 INPUT SEX%
180 IF SEX% = 1 THEN A=A-3:BEEP
190 IF SEX% = 2 THEN A=A+4
200 PRINT:PRINT"Do you live in a:"
210 PRINT:PRINT TAB(5);"1-- City?"
220 PRINT TAB(5);"2-- Small Town?"
230 PRINT:PRINT"Type 1 or 2 and then RETURN:"
240 INPUT CITY%
250 IF CITY% = 1 THEN A=A-2:BEEP
260 IF CITY% = 2 THEN A=A+2
270 PRINT:PRINT"Do you have a grandparent that lived to age 85?"
280 PRINT:PRINT"Type Y or N and then RETURN:"
290 INPUT GRAND$
300 IF GRAND$ = "Y" THEN A=A+2
310 PRINT:PRINT"Have all four of your grandparents lived to age 80?"
320 PRINT:PRINT"Type Y or N and then RETURN:"
330 INPUT OLD$
340 IF OLD$ = "Y" THEN A=A+6
350 PRINT:PRINT"Has one of your parents died of a stroke or heart attack"
360 PRINT"before age 50?"
370 PRINT:PRINT"Type Y or N and then RETURN:"
380 INPUT PARENT$
390 IF PARENT$ = "Y" THEN A=A-4:BEEP
400 PRINT:PRINT"Do you have a parent, brother, or sister under 50 who has had"
410 PRINT"cancer, a heart condition, or has had diabetes since childhood?"
420 PRINT:PRINT"Type Y or N and then RETURN:"
430 INPUT CAN$
440 IF CAN$ = "Y" THEN A=A-3:BEEP
450 PRINT:PRINT"Do you earn over $50,000 a year?"
460 PRINT:PRINT"Type Y or N and then RETURN:"
470 INPUT SAL$
480 IF SAL$ = "Y" THEN A=A-2:BEEP
490 PRINT:PRINT"Have you graduated from college?"
500 PRINT:PRINT"Type Y or N and then RETURN:"
510 INPUT GRAD$
520 IF GRAD$ = "Y" THEN A=A+1
530 IF GRAD$ = "N" GOTO 580
540 PRINT:PRINT"Do you have a professional or advanced degree?"
550 PRINT:PRINT"Type Y or N and then RETURN:"
```

```
560 INPUT DEG$
570 IF DEG$ = "Y" THEN A=A+2
580 PRINT:PRINT"Are you 65 years or older and still working?"
590 PRINT:PRINT"Type Y or N and then RETURN:"
600 INPUT WORK$
610 IF WORK$ = "Y" THEN A=A+3
620 PRINT:PRINT"Type in the NUMBER of your age category:"
630 PRINT:PRINT TAB(5);"1-- Under 30"
640 PRINT TAB(5);"2-- Age 30-39"
650 PRINT TAB(5);"3-- Age 40-49"
660 PRINT TAB(5);"4-- Age 50-70"
670 PRINT TAB(5);"5-- Over 70"
680 INPUT AGE%
690 IF AGE% = 2 THEN A=A+2
700 IF AGE% = 3 THEN A=A+3
710 IF AGE% = 4 THEN A=A+4
720 IF AGE% = 5 THEN A=A+5
730 PRINT:PRINT"Do you live with a spouse, friend, or relative?"
740 PRINT:PRINT"Type Y or N and then RETURN:"
750 INPUT MAR$
760 IF MAR$ = "Y" THEN A=A+5
770 IF MAR$ = "N" THEN A=A-1:BEEP
780 PRINT:PRINT"Do you work behind a desk?"
790 PRINT:PRINT"Type Y or N and then RETURN:"
800 INPUT DESK$
810 IF DESK$ = "Y" THEN A=A-3:BEEP
820 PRINT:PRINT"Does your work involve heavy physical labor?"
830 PRINT:PRINT"Type Y or N and then RETURN:"
840 INPUT LABOR$
850 IF LABOR$ = "Y" THEN A=A+3
860 PRINT:PRINT"Type in the NUMBER of the exercise category that applies"
870 PRINT"to you:"
880 PRINT:PRINT TAB(5);"1-- No exercise performed"
890 PRINT TAB(5);"2-- Strenuous exercise once a week"
900 PRINT TAB(5);"3-- Strenuous exercise 2-3 times a week"
910 PRINT TAB(5);"4-- Strenuous exercise 4-5 times a week"
920 INPUT EX%
930 IF EX% = 3 THEN A=A+2
940 IF EX% = 4 THEN A=A+4
950 PRINT:PRINT"Do you sleep more than 10 hours each night?"
960 PRINT:PRINT"Type Y or N and then RETURN:"
970 INPUT SLEEP$
980 IF SLEEP$ = "Y" THEN A=A-4:BEEP
990 PRINT:PRINT"Are you:"
1000 PRINT:PRINT TAB(5);"1-- Intense, aggressive, and angry?"
1010 PRINT TAB(5);"2-- Easygoing and relaxed?"
1020 PRINT:PRINT"Type 1 or 2 and then RETURN:"
1030 INPUT ANGER%
1040 IF ANGER% = 1 THEN A=A-3:BEEP
1050 IF ANGER% = 2 THEN A=A+3
1060 PRINT:PRINT"Are you:"
1070 PRINT:PRINT TAB(5);"1-- Happy?"
1080 PRINT TAB(5);"2-- Unhappy?"
1090 PRINT:PRINT"Type 1 or 2 and then RETURN:"
1100 INPUT HAPPY%
1110 IF HAPPY% = 1 THEN A=A+1
1120 IF HAPPY% = 2 THEN A=A-2:BEEP
1130 PRINT:PRINT"Have you had a speeding ticket in the last year?"
1140 PRINT:PRINT"Type Y or N and then RETURN:"
1150 INPUT TICK$
1160 IF TICK$ = "Y" THEN A=A-1:BEEP
1170 PRINT:PRINT"Type in the NUMBER for your smoking habits:"
1180 PRINT:PRINT TAB(5);"1-- Non-smoker"
1190 PRINT TAB(5);"2-- 1/2 to 1 pack a day"
1200 PRINT TAB(5);"3-- 1 to 2 packs a day"
1210 PRINT TAB(5);"4-- More than 2 packs a day"
1220 INPUT PACK%
1230 IF PACK% = 2 THEN A=A-3:BEEP
1240 IF PACK% = 3 THEN A=A-6:BEEP
1250 IF PACK% = 4 THEN A=A-8:BEEP
1260 PRINT:PRINT"Do you drink 1.5 ounces of liquor per day?"
1270 PRINT:PRINT"Type Y or N and then RETURN:"
1280 INPUT DRINK$
1290 IF DRINK$ = "Y" THEN A=A-1:BEEP
1300 PRINT:PRINT"Type in the NUMBER for your weight category:"
1310 PRINT:PRINT TAB(5);"1-- Normal weight"
1320 PRINT TAB(5);"2-- 10-30 pounds overweight"
1330 PRINT TAB(5);"3-- 30-50 pounds overweight"
1340 PRINT TAB(5);"4-- More than 50 pounds overweight"
1350 INPUT WT%
1360 IF WT% = 2 THEN A=A-2:BEEP
1370 IF WT% = 3 THEN A=A-4:BEEP
1380 IF WT% = 4 THEN A=A-8:BEEP
1390 PRINT:PRINT"Are you a man over 40 who has annual physical checkups?"
1400 PRINT:PRINT"Type Y or N and then RETURN:"
1410 INPUT MANCHK$
1420 IF MANCHK$ = "Y" THEN A=A+2
1430 PRINT:PRINT"Are you a woman who sees a gynecologist at least once"
1440 PRINT"a year?"
1450 PRINT:PRINT"Type Y or N and then RETURN:"
1460 INPUT WOMCHK$
1470 IF WOMCHK$ = "Y" THEN A=A+2
1480 CLS
1490 PRINT:PRINT:PRINT:PRINT:PRINT:PRINT:PRINT:PRINT:PRINT:PRINT
1500 PRINT"YOUR ESTIMATED LIFESPAN IS",A"  YEARS!":BEEP
1510 PRINT:PRINT:PRINT"Would someone else like to try?"
1520 PRINT:PRINT"Type Y or N and then RETURN:"
1530 INPUT LOOP$
1540 IF LOOP$ = "Y" GOTO 10
1550 END
```



SCROLL:

A Program To Scroll Back The Z-100 Display

Dr. Glenn F. Roberts
7734 Marshall Heights Court
Falls Church, VA 22043

How many times have you found yourself in this position: You're watching some data being displayed on your computer screen, perhaps you're typing out a "README.DOC" file or doing a long directory listing, and you spot something of interest, but you aren't quite quick enough to hit the Control-S key and it scrolls off the top of the screen? You wish you could just scroll it back down, but instead, you must reissue the command and try to be more careful the second time.

You may not know it, but if you have a Z-100, then more than a full screen's worth of these lines are still available in your computer's video memory, and all you have to do to look at them is have a simple utility, like the one I describe here, to let you scroll them back down onto the screen.

In this article, I describe a program called SCROLL which allows you to scroll the screen backward to see information that has disappeared off the top of the screen. When you run SCROLL, the program installs a portion of itself permanently in memory. From then on, whenever you hold down the Shift key and depress the Up-Arrow key, the screen will scroll backwards up to 27 lines!

These 27 "hidden" lines, combined with the 24 lines normally displayed on the Z-100's screen, form a total of 51 lines in this "virtual" display area. Using the Shift-Up-Arrow and Shift-Down-Arrow combinations you can scroll through this area, in effect using the screen as a 24-line "window" into this 51-line region. As soon as you hit any key, other than Shift-Up-Arrow or Shift-Down-Arrow, the screen reverts to its previous state and the depressed key is processed.

How It Works

The SCROLL program requires that your Z-100 have the 64K RAM chips on your video board. It is these 64K chips which allow slightly better than one full screen to be saved even after the information has scrolled off the top of the screen. This saving of text and graphics is done automatically as a built-in side effect of the way the Z-100 does scrolling.

The Z-100 scrolls the screen by moving a 24 line "window" down one line for each line to be scrolled up. Although we see the text and graphics move up on the screen, the text and graphics are really not moved, rather the "window" is moved down. All the SCROLL utility does is move this screen "window" back up. Since the 64K VRAM chips can store a total of only a little more than two screen's worth of information, the screen can only be moved back about 27 lines before "wrapping around" back to the original screen. SCROLL avoids this wrap around by only allowing the user to scroll back 27 lines or less.

SCROLL looks for the Shift-Up-Arrow and Shift-Down-Arrow keys by installing a new keyboard interrupt handler. This new interrupt handler looks for the hexadecimal scan codes E5 and E6, which correspond to the Shift-Up-Arrow and Shift-Down-Arrow, respectively. These can be changed to other values by substituting the appropriate scan code for the desired key combination, as specified in the Key Code Chart in Chapter 10 of the Z-100 Hardware Technical Reference. To change these values in the source code, change the equate values for FORWARD_KEY and BACKWARD_KEY.

Since SCROLL does nothing special with the operating system, it works with either Z-DOS or MS-DOS 2, and should work fine with MS-DOS 3. You should be able to assemble the source code with any version of the Microsoft Macro Assembler (MASM). Since SCROLL relies on certain hardware characteristics of the Z-100 video board, it works only on the Z-100, and cannot be adapted for use with the newer (IBM PC compatible) Z-100 PC models.

Installing And Using SCROLL

SCROLL is designed to be assembled into a ".COM" file. To create the file, execute the following:

```
MASM SCROLL;
LINK SCROLL;
DEL SCROLL.OBJ
EXE2BIN SCROLL SCROLL.COM
DEL SCROLL.EXE
```

The SCROLL program is designed to install itself and remain resident in your computer. You must run the program once to install the resident portion (typically by placing the SCROLL command in your AUTOEXEC.BAT file), and thereafter, whenever you press the Shift-Up-Arrow, the screen will scroll back one or more lines. You can configure the amount which it scrolls by appending "/n" to the command line, where n is the number of lines to scroll for each Shift-Up or Shift-Down arrow key hit. As an example, the command

```
SCROLL /24
```

sets SCROLL to scroll back one full screen when the Shift-Up-Arrow is pressed.

SCROLL works properly in conjunction with Control-S. This means that you may stop the screen with a Control-S, use the Shift-Up-Arrow and Shift-Down-Arrow keys to scroll through the previous 51 lines of output, then hit any other key to resume output.

SCROLL should not interfere with the operation of most Z-100 software. It has not been tested with resident programs, such as Barry Watzman's *Perks(tm) Desktop Utility*, which are the most likely types of programs to give it a problem. Lotus 1-2-3 reassigns the Shift-Up-Arrow and Shift-Down-Arrow for use as Page-Up and Page-Down, however, SCROLL operation is properly reinstated when the user leaves Lotus.

In the August 1986 issue of *>CHUG*, the newsletter of the Capital Heath Users' Group, Tom Walker describes a fascinating hardware modification to the Z-100, which allows 256K RAM chips to be installed on the video board. It would be very interesting to see an adaptation of SCROLL for use with this enhancement. It would seem to be possible to scroll back by over 200 lines with this combination of hardware and software!

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```
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COMMENT $
=====================================================
SCROLL -- Program to scroll the Z-100's screen backward

        Glenn F. Roberts        11/05/86
        Version 1.21

Description:  When run, this program installs a new
        keyboard interrupt handler which allows you to
        scroll back the Z-100's screen by up to 27
        lines.  Scrolling is performed using the
        shift key in conjunction with the up and down
        arrow keys.  Shift-up scrolls back, shift-down
        scrolls forward.  When any other key is pressed
        the screen is restored to its former state and
        the key is processed normally.

Usage:  SCROLL [/n]
        where n is an optional numeric value which is
        the number of lines by which the screen is
        to be scrolled each time the shift-arrow key
        is pressed.  If no parameter is supplied a
        default value of DEFAULT_LINES is used.

Requirements:
        Z-100 using Z-DOS or MS-DOS
        64K video RAM

Creation of SCROLL.COM:
        Create source file (SCROLL.ASM)
        MASM SCROLL;
        LINK SCROLL;
        DEL SCROLL.OBJ
        EXE2BIN SCROLL SCROLL.COM
        DEL SCROLL.EXE

=====================================================
$
;       Equates and definitions
;

FORWARD_KEY     EQU     0E6H            ; Shift down arrow scrolls fwd
BACKWARD_KEY    EQU     0E5H            ; Shift up arrow scrolls back
MAXIMUM_LINES   EQU     27              ; Maximum to go back
DEFAULT_LINES   EQU     1               ; Default lines to move
INT_UKBA        EQU     50H             ; User keyboard interrupt
PHD_DIOA        EQU     080H            ; Command line info.

ZCRTC           EQU     0DCH            ; Video 6845 CRT-C port
  CRTREG        EQU     0               ; CRT-C register select
  CRTDAT        EQU     1               ; CRT-C data
  CRTSAH        EQU     12              ; Set CRT-C High reg.
  CRTSAL        EQU     13              ; Set CRT-C Low reg.
```

```
DOSI_FUNC       EQU     21H             ; DOS function interrupt
  DOSF_DRCINE   EQU     08H             ; Console input (no echo)
  DOSF_OUTSTR   EQU     09H             ; String output function
  DOSF_SIVEC    EQU     25H             ; Set interrupt vector function
DOSI_TERM       EQU     20H             ; Normal terminate interrupt
DOSI_TERMR      EQU     27H             ; Terminate & stay resident

CR              EQU     0DH             ; ASCII Carriage Return
LF              EQU     0AH             ; ASCII Line Feed
TAB             EQU     09H             ; ASCII Horizontal Tab
ESC             EQU     1BH             ; ASCII Escape character

FALSE           EQU     0
TRUE            EQU     NOT FALSE

; =-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=
;
;       Macro Definitions
;
SETDS   MACRO
        PUSH    DS                      ; Set Data Segment
        MOV     AX,CS                   ; to be same as
        MOV     DS,AX                   ; Code segment
        ENDM
;
;
JMPF    MACRO
        DB      0EAH                    ; Simulate a FAR jump
        ENDM
;
;
READ_KBD MACRO                          ; Read a single character
        MOV     AH,DOSF_DRCINE          ; from the keyboard
        INT     DOSI_FUNC               ; (without echo)
        ENDM
;
;
DISPLAY MACRO   STRING                  ; Display a string of
        MOV     DX,OFFSET STRING        ; characters terminated by
        MOV     AH,DOSF_OUTSTR          ; a '$'
        INT     DOSI_FUNC
        ENDM

; =-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=
;
;       Code begins here
;
CODE    SEGMENT BYTE PUBLIC 'CODE'
        ASSUME  CS:CODE,DS:CODE

        ORG     0100H

BEGIN:  JMP     INSTALL                 ; Install the handler

; =-=-=
;       User key interrupt handler -- This code is executed
;               each time a keyboard interrupt occurs.
;
```

```
KEY_INT PROC NEAR
        CMP     AH,0                    ; Has someone already
        JNE     K_EXIT                  ; handled ? if so exit
        CMP     AL,FORWARD_KEY          ; is this a scroll fwd ?
        JNE     K_INT1                  ; no, keep trying
        JMP     SCROLL_FWD              ; yes, jump to routine
K_INT1: CMP     AL,BACKWARD_KEY         ; is this a scroll back ?
        JE      SCROLL_BACK             ; yes, jump to routine
        CMP     CS:HAVE_MOVED,TRUE      ; no, is screen messed up ?
        JNE     K_EXIT                  ; no, just exit.
;
;       Restore messed up screen before handling character.
;
        PUSH    AX                      ; save the character
        SETDS                           ; set up DS register
                                        ;
        MOV     AX,DISPLAY_SAVE         ; get saved display state
        CALL    PUT_START               ; and restore it.
        MOV     HAVE_MOVED,FALSE        ; Turn off "messy" flag
        MOV     LINES_MOVED,0           ; and zero line count
                                        ;
        POP     DS                      ; restore DS
        POP     AX                      ; get back the character
;
;       Exit from handler
;
K_EXIT:
        JMPF                            ; do FAR jump back
KEYVEC  DW      ?                       ; (vector and segment
KEYSEG  DW      ?                       ; filled in by INSTALL)

; =-=-=
;       Scroll display back by LINES_TO_MOVE lines
;
SCROLL_BACK:
        SETDS                           ; set up data segment
                                        ;
        MOV     AX,MAXIMUM_LINES*80     ; Compute how much room
        SUB     AX,LINES_MOVED          ; is left to scroll
        CMP     AX,LINES_TO_MOVE        ; and compare with request
        JB      SC_B2                   ; if less, don't scroll
                                        ;
        CALL    GET_START               ; get display address
        CMP     HAVE_MOVED,FALSE        ; is this first move ?
        JNE     SC_B1                   ; no, jump
;
;       First time through, save display state
;
      MOV     DISPLAY_SAVE,AX           ; save display state

SC_B1:  SUB     AX,LINES_TO_MOVE        ; scrolling backward
        CALL    PUT_START               ; update the display
        MOV     HAVE_MOVED,TRUE         ; note screen is messy
        MOV     AX,LINES_TO_MOVE        ; note how far the
        ADD     LINES_MOVED,AX          ; screen was scrolled
                                        ;
SC_B2:  MOV     AH,TRUE                 ; tell BIOS we've handled
        POP     DS                      ; restore DS
        JMP     K_EXIT                  ; and exit ...
```

```
; =-=-=
;       Scroll display forward by LINES_TO_MOVE lines
;
SCROLL_FWD:
        SETDS                           ; Set DS register
        CMP     LINES_MOVED,0           ; check how far back
        JE      GO_F1                   ; we are, if zero then done
                                        ;
        CALL    GET_START               ; get display address
        ADD     AX,LINES_TO_MOVE        ; scroll down
        CALL    PUT_START               ; and update display
        MOV     HAVE_MOVED,TRUE         ; note screen is messy
        MOV     AX,LINES_TO_MOVE        ; note how far the
        SUB     LINES_MOVED,AX          ; screen was scrolled
                                        ;
GO_F1:  MOV     AH,TRUE                 ; tell BIOS we've handled
        POP     DS                      ; restore DS
        JMP     K_EXIT                  ; and exit ...
KEY_INT ENDP

; =-=-=
;       Working storage
;
LINES_TO_MOVE   DW      80*DEFAULT_LINES ; Lines to scroll * 80
LINES_MOVED     DW      0               ; How far back we've gone
HAVE_MOVED      DW      FALSE           ; Flags screen as messy
DISPLAY_SAVE    DW      ?               ; save area for display

; =-=-=
;       GET_START - get display starting address
;
GET_START PROC NEAR
        PUSH    BX                      ; save BX
        CLI                             ; turn off interrupts
        MOV     AL,CRTSAH               ; Request high byte
        OUT     ZCRTC+CRTREG,AL         ; of address
        IN      AL,ZCRTC+CRTDAT         ; read high byte
        MOV     BL,AL                   ; save it
        MOV     AL,CRTSAL               ; request low byte
        OUT     ZCRTC+CRTREG,AL         ; of address
        IN      AL,ZCRTC+CRTDAT         ; read low byte
        MOV     AH,BL                   ; put hi byte in AH
        STI                             ; restore interrupts
       POP      BX                     ; restore saved BX
        RET                             ; and return
GET_START ENDP

; =-=-=
;       PUT_START - install display starting address
;
PUT_START PROC NEAR
        PUSH    BX                      ; save BX
        MOV     BX,AX                   ; BX = new address
        CLI                             ; turn off interrupts
        MOV     AL,CRTSAH               ; Request to set high
        OUT     ZCRTC+CRTREG,AL         ; address byte
        MOV     AL,BH                   ; get high byte
        OUT     ZCRTC+CRTDAT,AL         ; and output it
        MOV     AL,CRTSAL               ; request to set
        OUT     ZCRTC+CRTREG,AL         ; low address byte
        MOV     AL,BL                   ; get low byte
        OUT     ZCRTC+CRTDAT,AL         ; and output it
        STI                             ; restore interrupts
        POP     BX                      ; restore saved BX
        RET                             ; and return
PUT_START ENDP

ENDRES LABEL NEAR                       ; End of resident code

; =-=-=
;       This code installs the resident interrupt handler
;
INSTALL PROC NEAR
;
;       Check for 64K VRAM components
;
        DISPLAY ITT_MSG                 ; Request identify terminal
        REPT 5                          ; read five-byte response
          READ_KBD                      ; the fifth byte will be
        ENDM                            ; 'A' for 32K VRAMs and
                                        ; 'B' for 64K VRAMs
        CMP     AL,'B'                  ; have 64K VRAMs ?
        JNE     BAD_VRAM                ; if not, then abort
;
;       Main handler installation code
;
        MOV     AX,CS                   ; Make DS = CS
        MOV     DS,AX                   ;
;
;       Check for numerical "switch" value
;
        CALL    CHECK_SW                ; Check if numeric switch
        JZ      DO_HANDLER              ; if none, then jump
        CMP     AX,MAXIMUM_LINES        ; else compare value to max
        JBE     DO_VAL                  ; if below or equal OK
        MOV     AX,MAXIMUM_LINES        ; else use the maximum
DO_VAL: MOV     DX,80                   ; now multiply the value
        MUL     DX                      ; by 80 bytes/line
       MOV     LINES_TO_MOVE,AX         ; and save it.
;
;       Install handler interrupt vector
;
DO_HANDLER:
;
;       Set up far jump back from keyboard handler
;
        MOV     AX,0                    ; AX = interrupt page
        MOV     ES,AX                   ; ES = interrupt page
        MOV     BX,INT_UKBA*4           ; ES:BX = kbd interrupt
        LES     BX,DWORD PTR ES:[BX]    ; load the old vector
        MOV     WORD PTR KEYSEG,ES      ; and save segment and
        MOV     WORD PTR KEYVEC,BX      ; offset for FAR jump
;
;       Set up new key handler entry
;
        MOV     DX,OFFSET KEY_INT       ; DX = new handler addr.
        MOV     AH,DOSF_SIVEC           ; request set int. vector
        MOV     AL,INT_UKBA             ; for user keyboard
        INT     DOSI_FUNC               ; via DOS
```

```
                                        ;
        DISPLAY OKMSG                   ; report handler installed
        MOV     DX,OFFSET ENDRES        ; point to end of resident
        INT     DOSI_TERMR              ; code and terminate

BAD_VRAM:
        DISPLAY RAMMSG                  ; report wrong VRAM type
        INT     DOSI_TERM               ; and abort
INSTALL ENDP

; =-=-=
;       CHECK_SW - Check for numeric switch
;
;       'Z' flag set if zero or no switch
;
CHECK_SW PROC NEAR
        MOV     SI,PHD_DIOA+1           ; Point to command line data
SKIPBL: CMP     BYTE PTR [SI],' '       ; and skip over any
        JNZ     NOTBL                   ; blanks after program
        INC     SI                      ; name
        JMP     SKIPBL                  ;
NOTBL:  CMP     BYTE PTR [SI],CR        ; First non-blank = CR ?
        JZ      NOSW                    ; yes, no switch
        CMP     BYTE PTR [SI],'/'       ; First non-blank = '/' ?
        JNZ     NOSW                    ; no, not a switch
;
;       Process switch value
;
        MOV     AX,0                    ; Init result to 0
        MOV     CX,10                   ; use base 10 conversion
DIGIT:  INC     SI                      ; point to next byte
        MOV     BL,BYTE PTR [SI]        ; get a character
        SUB     BL,'0'                  ; convert from ASCII
        JC      ENDSW                   ; not a digit ? then quit
       CMP     BL,10                   ; check if too high
        JNC     ENDSW                   ; if so then quit
        MOV     BH,0                    ; zero out high byte
        MUL     CX                      ; multiply by base
        ADD     AX,BX                   ; add this value in
        JMP     DIGIT                   ; then loop for more
;
NOSW:   MOV     AX,0                    ; 0 flags bad switch
ENDSW:  OR      AX,AX                   ; set/clear 'Z' flag
        RET                             ; and return.
CHECK_SW ENDP

; =-=-=
;       Text messages
;
OKMSG   DB      CR,LF,TAB,'SCROLL utility installed !'
        DB      CR,LF,'$'

ITT_MSG DB      ESC,'i0','$'            ; Identify Terminal Type
;
;       NOTE:  The 0 above in ITT_MSG is a zero, not the letter O
;
RAMMSG  DB      CR,LF,TAB,'Machine needs 64K of VRAM to use SCROLL !'
        DB      CR,LF,'$'

CODE    ENDS
        END     BEGIN
```

*

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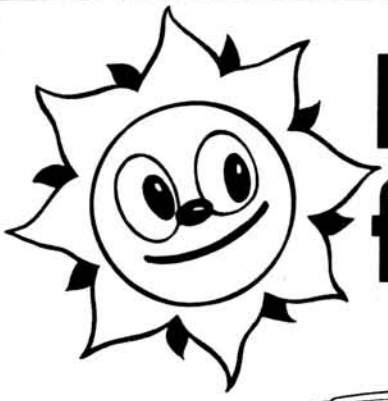

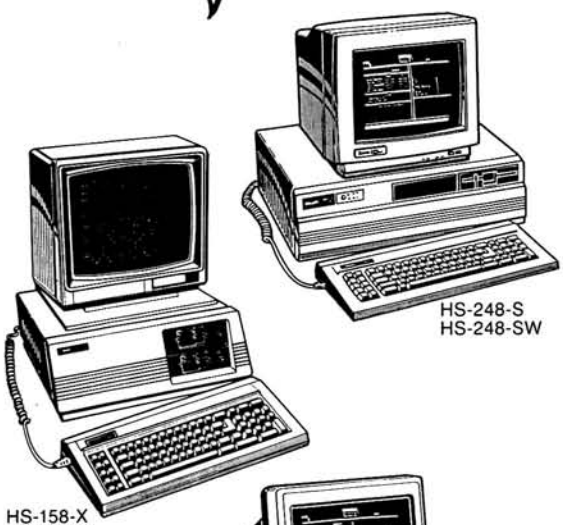

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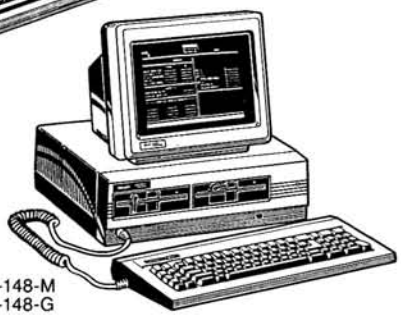

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HERO Speaks

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I would have to be the first to admit it. Yes, when I first encountered our HERO 1 ET-18 Robot during robotics class I was intrigued by HERO's speech. Even "Ready" was mildly amusing and the canned sentences stored in ROM added character to the little fellow. He was kind of cute standing up at the front of the class spewing simple sentences. But that was the first day of class. "Beep, I can talk like this" just didn't cut it after that. I can't imagine that I'm the only one who's gotten bored with HERO's limited vocabulary. I bet alot of you who use one to amuse the children (while amusing yourself) have lost their interest for the same reason. It must go something like this: "Daddy, is that all he can say?". "No dear, but I have to type in a long program to make him say more, and I just don't have time. Run along now." And so it goes, the kids have lost interest, your wife wonders why something that expensive can't say more, and the dog thinks his name is "Ready". Maybe the enclosed program can help you out.

What It Does

"Robot Speak", as I like to call it, is a Pascal program that converts a text file into a Wintek BASIC program by way of a dictionary. Instead of having to create an entire document yourself, one BASIC line at a time, you can enter it with your word processor, execute "Robot Speak" on it, use a utility to convert it to S1S9, and download it to your HERO with any communications package. Bingo, instead of "I can talk like this", HERO can be reading bedtime stories to the kids. That should spark some interest! What could be better for encouraging them to learn more. After all, the best way to get young children accustomed to computers is friendly interaction. Not only that, but maybe old Ready (formerly Rover) can learn something from your HERO. Just write up a list of his tricks and impress your friends by having the robot tell the dog to roll over.

How It Works

The "Robot Speak" program is very simple and a quick glance over the code gives a pretty good idea of what it does. It first takes the "dictionary" of HERO's known vocabulary (created by you) and puts it into memory. I have chosen a tree type data structure for this as it allows the disk file of the dictionary to be in any order and makes the location of words very fast. The program then asks for your input file and goes to work parsing it. After each word is separated from the text, the dictionary tree is searched for a matching word. If the word is found in the "dictionary", the corresponding phonetical equivalent is combined with the proper Wintek Syntax and output to the file being formed. If the word is not found in the "dictionary", it is output to the file being formed as it is, leaving your HERO to say it as best it can. Words not found are also noted in another file and you are provided with a list after the program has completed.

The Necessary Files

You're probably a bit skeptical as you already know that the dictionary is not provided and that, of course, means you have to type one in. It's not too bad, actually, and a good place to start is the book of vocabulary provided with HERO's documentation. This provides 750 or so words and their HERO phonetical equivalent. In an hour, you can have a dictionary that will handle just about any "Dick and Jane" reader. For more complex words, you will have to build your own phonetical equals, but again the HERO's vocabulary book provides most of the sounds you will need.

The dictionary file itself is quite simple to create and maintain as its format is unsorted ASCII text. Any word processor will suffice to create it. The only rules for the file are:

1. Use upper case letters as the program will convert all words in the text being read to capitals. That way, "The" and "the" do not have to be entered into the dictionary separately.
2. Alternating lines should have the word as it will appear in the document interleaved with phonetical equivalents. That is, odd lines contain the word, even lines the equivalent.

For example: WORK
WERRK
SPRING
SPRI1I3NG
TWO
TIUU1U1
etc. . .

3. All words should begin in column 1.
4. No blank lines as this will set off the order and the tree will not match words with HERO's necessary phonetics.
5. If you want periods and commas to create pauses in HERO's speech, include them as words. I equated a period (.) with PA1 and a comma (,) with PA0.
6. Remember, don't bother to sort the words in the file as the Robot Speak code will take care of it. This means that when adding to the dictionary, simply append new words to the end.
7. Last, name the dictionary *dctnary.txt*.

The file you are submitting as an input document can have any name and any number of words per line. Very few restrictions apply here, but complex punctuation may be better left out as it will be ignored anyway. "Robot Speak" does recognize periods, commas, and single quotes. Note, however, that periods and commas must be defined in the dictionary and they must be separated by a space from words so as not to be added to the end of the previous word.

The other two files, "missing.txt" and "outspk.bsc" are created automatically by "Robot Speak" and contain words not found in the dictionary and the Wintek BASIC code, respectively. Be aware that both are recreated each time the program is run, so if the information within them is of value, rename the files or move them to another disk.

Best of luck with "Robot Speak", and I sincerely hope it raises your HERO's standing among your family members. Oh, and if you're wondering, for me it just fills a requirement for "Advanced Topics in Computer Science" at Carroll College, Waukesha, WI 53186. I enjoyed writing the program and further enjoyed listening to our HERO say something meaningful! You can continue to listen to "I can talk like this" if you like, but it's no longer necessary.

```
A:\>c:

C:\>Program RobotSpeak;     { Program to convert a text file into}
                            { BASIC code that can be loaded into }
                            { the robot and run so as to make it }
                            { appear as if the robot is reading the }
                            { text file. }

type
  LineFormat=string[81];
  WordFormat=string[20];
  NodePointer=^NodeRecord;  { NodePointer is a pointer to a record }
  NodeRecord=record         { which is placed on a tree and makes up }
               Word:WordFormat;  { dictionary of phononims }
               Phonix:WordFormat;
               Left:NodePointer;
               Right:NodePointer;
             end;

var
   Root,Cur,Pre:NodePointer;
   InFile,OutFile,Missing:Text;
   Line,OutLine:LineFormat;
   Word:WordFormat;
   LineNum,B,E,T,X,Y,Cnt:integer;
   FileName:string[12];
   LineEndReached,Fnd,OK:boolean;
   LineNumStr:String[4];


Procedure TreeSearch(SearchWord:WordFormat;Var Current,Previous:NodePointer;
                     Root:NodePointer;Var Found:boolean);

  Var
    NotFound:boolean;          { Procedure to search tree for }
                               { SearchWord and return pointer to }
  Begin                        { it if found and boolean indicating }
    Previous:=nil;             { if found or not }
    Current:=Root;
    NotFound:=true;
    While NotFound and (Current <> nil) do
      With current^ do
        if SearchWord <> Word then
          Begin
            Previous:=Current;
            if Word>SearchWord then
              Current:=Left
            else
              Current:=Right
          End
        else
          NotFound:=False;
    found:=not NotFound;
  End;


Procedure TreeInsert (NewWord,NewPhonix:WordFormat;Var Root:NodePointer);

  Var
    Current,Previous,NewNode:NodePointer;   { Procedure to insert new word }
    Found:boolean;                          { into the tree }

  Begin
    TreeSearch(NewWord,Current,Previous,Root,Found);
    if not (found) then
     Begin
       new(NewNode);
       with NewNode^ do
         Begin
           Word:=NewWord;
           Phonix:=NewPhonix;
           Left:=nil;
           Right:=nil;
         End;
       if Root<>nil then
         with Previous^ do
           if Word>NewWord then
             Left:=NewNode
```

```
          else
            Right:=NewNode
        else
          Root:=NewNode
      end;
  End;


Procedure BuildTree(Var Root:NodePointer);  { Procedure to build dictionary }
                                            { tree from file dctnary.txt }
  var
    Dictionary:Text;
    NewWord,
    NewPhonix:WordFormat;

  Begin
    assign(Dictionary,'Dctnary.txt');
    reset(Dictionary);
    while not eof(dictionary) do
    Begin
      Readln(Dictionary,NewWord);
      Readln(Dictionary,NewPhonix);
      TreeInsert(NewWord,NewPhonix,Root);
      NewWord:='';
      NewPhonix:='';
    End;
    Close(Dictionary);
  End;


Functions Isletter(ch:char):boolean; { checks to see if ch is a character }
  Begin                              { and returns boolean. }
    Isletter:=(ch>='a')and (ch<='z') or (ch>='A')and (ch<='Z') or
              (ch='.') or (ch=',') or (ch='''')
  End;


Procedure NextWordBegin(Var Buffer:LineFormat; Var B,E:Integer;
                        Var LineEndReached:boolean);
                       {Finds the beginning of the next word in the text}
                       {file being parsed}
  Begin
    B:=E;
    While not isletter(Buffer[B]) and (B<=81) do
      B:=B+1;
    If B>80 Then LineEndReached:=true;
  End;


Procedure EndOfWord(Var Buffer:LineFormat;Var B,E:Integer);
                    {Finds the end of the current word in the text file}
                    {being parsed}
  Begin
    E:=B+1;
    While Isletter(Buffer[E])
      E:=E+1;
  End;
```

```
BEGIN
   Root:=nil;
   LineNum:=10;
   BuildTree(Root);          {build dictionary tree}
  { TextColor(14);}          {set input screen}
  { TextBackGround(1); }
   ClrScr;
   GoToXY(16,3);
   Write('Robot Speak Text to Phonix Conversion Program');
   GoToXY(14,8);
   Write('Enter Name of File to be Converted to Basic:');
   Repeat
     Readln(FileName);
     Assign(InFile,FileName);   {get input file until accepted file}
     {$I-} Reset(InFile) {$I+}; {is entered}
     OK := (IOresult=0);
     if not OK then
     Begin
       GoToXY(50,10);
       Writeln('Cannot find file ',FileName);
       GoToXY(58,8);
       Writeln('                    ');
       GoToXY(58,8);
     End;
   Until OK;
   Assign(OutFile,'OutSpk.BSC');
   Assign(Missing,'Missing.TXT');
   Rewrite(OutFile);
   Rewrite(Missing);
   Reset(InFile);
   While not eof(Infile) do   {While not end of text file being parsed}
   Begin
     Readln(InFile,Line);
     For Cnt := 1 to length(Line) do   {Change Line to all upper case}
       Line[Cnt] := UpCase(Line[Cnt]);
     B:=E:=1;LineEndReached:=false;
     While not LineEndReached    {While still words on line}
     Begin
       NextWordBegin(Line,B,E,LineEndReached); {Find beginning of word}
       if not LineEndReached then   {If last word not reached}
       Begin
         NextWordBegin(Line,B,E,LineEndReached); {Find beginning of word}
         if not LineEndReached then   {If last word not reached}
         Begin
           EndOfWord(Line,B,E);  {Find end of word}
           T:=E-B;
           Word:=copy(Line,B,T); {Copy word from line to Word}
           Fnd:=false;
           TreeSearch(Word,Cur,Pre,Root,Fnd); {See if word in dictioanry}
           If Fnd Then
           Begin    {if found, get phononim and create line of BASIC}
             Str(LineNum,LineNumStr);
             OutLine:=LineNumStr+'   SPEAK  "'+Cur^.Phonix+'"';
             Writeln(OutFile,OutLine); {Write to output file}
             OutLine:='';
             LineNumStr:='';
             LineNum:=LineNum+10;
```

Continued on Page 28

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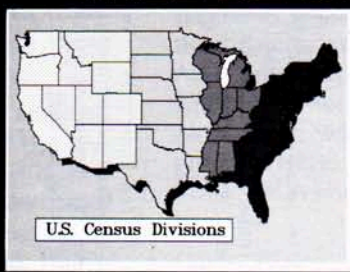

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ZPC Update #18

Pat Swayne
HUG Software Engineer

This is the eighteenth in a series of articles in support of ZPC, a program that allows you to run IBM PC software in H/Z-100 (dual processor) computers. ZPC is available from HUG as part no. 885-3037-37. An upgrade disk for ZPC is also available as part no. 885-3042-37.

In this installment of ZPC Update, I am going to concentrate for most of the article on only one program that was a bit of a tough nut to crack to get it to run under ZPC. The program is Lotus Freelance Plus version 2.0.

At the end of this article, I will present a patch for Sublogic Jet (a flight simulator) for ZPC that was sent in by a user.

Lotus Freelance Plus

As indicated in the ZPC instruction manual, some programs access the graphic mode character table directly. On a real PC-compatible computer, this table is at address F000:FA6E (hex), but in ZPC it is at B000:0. Programs that access the table must be patched before they will work correctly under ZPC, and Lotus Freelance Plus is such a program. What I did not realize when I started to work on Freelance is that a program can use different ways to point to the same address. Freelance accesses the table by point to F800:7A6E, which is the same point in memory as F000:FA6E. The code that contains these pointers looks like this (all code shown is from the module GCISD.EXE, which is the screen driver for Freelance):

```
2E75:2F56 8B46F6      MOV     AX,[BP-0A]
2E75:2F59 D1E0        SHL     AX,1
2E75:2F5B D1E0        SHL     AX,1
2E75:2F5D D1E0        SHL     AX,1
2E75:2F5F 056E7A      ADD     AX,7A6E
2E75:2F62 50          PUSH    AX
2E75:2F63 B800F8      MOV     AX,F800
2E75:2F66 50          PUSH    AX
```

When I patched the 7A6E to 0, and the F800 to B000, Freelance accessed the ZPC table correctly, but another problem showed up. Freelance uses the ROM BIOS scroll routine to clear portions of the screen during operation, but puts characters on the screen by writing directly to memory. This combination does not work correctly in ZPC while a graphic mode is active. So I had to patch in a routine that caused the areas to be cleared by filling them with spaces. The original code that called the BIOS scroll routine looks like this:

```
2E75:48F9 55          PUSH    BP
2E75:48FA 8BEC        MOV     BP,SP
2E75:48FC 8B4604      MOV     AX,[BP+04]
2E75:48FF 8B5E06      MOV     BX,[BP+06]
2E75:4902 8B4E08      MOV     CX,[BP+08]
2E75:4905 8B560A      MOV     DX,[BP+0A]
2E75:4908 CD10        INT     10
2E75:490A 5D          POP     BP
2E75:490B C3          RET
```

I patched in a jump to an area of the screen driver that is not used for the type of display that ZPC emulates. After the jump is patched in, the code looks like this:

```
2E75:48F9 55          PUSH    BP
2E75:48FA 8BEC        MOV     BP,SP
2E75:48FC 8B4604      MOV     AX,[BP+04]
2E75:48FF 8B5E06      MOV     BX,[BP+06]
2E75:4902 8B4E08      MOV     CX,[BP+08]
2E75:4905 8B560A      MOV     DX,[BP+0A]
2E75:4908 E921E6      JMP     2F2C
2E75:490B C3          RET
```

The unused portion of code where the patch was placed looks like this before patching:

```
2E75:2F2C 8B46F6      MOV     AX,[BP-0A]
2E75:2F2F 0580FF      ADD     AX,FF80
2E75:2F32 D1E0        SHL     AX,1
2E75:2F34 D1E0        SHL     AX,1
2E75:2F36 D1E0        SHL     AX,1
2E75:2F38 0306CC02    ADD     AX,[02CC]
2E75:2F3C 50          PUSH    AX
2E75:2F3D FF36CA02    PUSH    [02CA]
2E75:2F41 FF7608      PUSH    [BP+08]
2E75:2F44 8B4606      MOV     AX,[BP+06]
2E75:2F47 FF4606      INC     WORD PTR
                              [BP+06]
```

The patch that I inserted here looks like this:

```
2E75:2F2C 38F5        CMP     CH,DH
2E75:2F2E 7515        JNZ     2F45
2E75:2F30 52          PUSH    DX
2E75:2F31 89CA        MOV     DX,CX
2E75:2F33 B700        MOV     BH,00
2E75:2F35 B402        MOV     AH,02
2E75:2F37 CD10        INT     10
2E75:2F39 5A          POP     DX
2E75:2F3A 28CA        SUB     DL,CL
2E75:2F3C FEC2        INC     DL
2E75:2F3E 88D1        MOV     CL,DL
2E75:2F40 30ED        XOR     CH,CH
2E75:2F42 B8200A      MOV     AX,0A20
2E75:2F45 CD10        INT     10
```

```
2E75:2F47 5D          POP     BP
B2E75:2F48 C3          RET
```

I have shown all of this code in the hope that those of you who have a version of Freelance Plus that is different from the version I patched can figure out the patches for your version. If you have version 2.0, you can add the following to your PATCHER.DAT file, and use PATCHER to make the patch.

```
LOTUS FREELANCE PLUS v 2.0
Insert the disk containing GCISD.EXE.
GCISD.EXE
2E2C,38,F5,75,15
2E30,52,89,CA,B7,0,B4,02,CD
2E38,10,5A,28,CA,FE,C2,88,D1
2E40,30,ED,B8,20,A,CD,10,5D,C3
2E60,0,0
2E65,B0
4808,E9,21,E6
z
```

The disk that contains GCISD.EXE is the one labeled Program 2. Follow the instructions in your ZPC manual for using PATCHER to make the patch.

Sublogic Jet

ZPC user David Gan submitted a patch for Sublogic Jet that will allow it to run under ZPC. The copy protection on the program must first be removed using a public domain program called DEJET. Here is a PATCHER version of David's patch.

```
SUBLOGIC JET
Insert the disk containing JET.EXE.
JET.EXE
B4C,CD,91
B76,CD,91
B8B,CD,91
265F,CD,90
2662,CD,91,58,3C,AA,75,6,24,7F,90,90,
   90,90
z
```

David states that you must put ZPC into the graphic mode you wish to use (PC 6 for monochrome, or PC 4 for color) before you run the game, but that is not necessary if you have a ZHS board (Dec. 1986 version) or Scottie board. If you have the board, the game will run in the monochrome mode if you select "composite" as your display type. It will run in the color mode if you select "4 color RGB" as your display type. For best results, you should run the program in monochrome. Whether you have the ZHS board or not, you must perform the video board modification that is mentioned in the original ZHS board article supplied with ZPC.

David said that he also has patches for other games. For more information, including how to get DEJET, contact him at this address:

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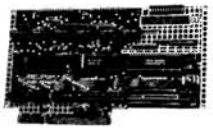

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WH-8-64 Memory Replacement With 64K Chips

Ed Rockwood
7034 NE Hassalo
Portland, OR 97213

Some time ago, I upgraded my H-100 to 8 MHz and 768K of memory, and in so doing acquired a sackful of extra ICs (Integrated Circuits). Among these were 27-4164 150ns chips which, along with the 10 extra 4164s that I bought when I brought my 128K '100 up to full capacity (192K), gave me enough chips to fully populate the sockets of my H-8's memory board with 64K chips. I hadn't seen it done before, so I decided to see if I could come up with a quick, easy, and neat modification myself.

If you have a Heath 64K board in your H-8, its capacity can easily and cheaply be quadrupled. Because of the relative simplicity of this modification, one would almost think that the engineers had the 4164 chip in mind when they designed the WH-8-64 64K Dynamic RAM board.

The 4164 (MCM6665) is a pin-for-pin replacement for the MCM4517. In addition, it uses pin 9, accessed by the two Most Significant Bits on the address buss. Pin 9 of the MCM4517 is NC (Not Connected). Each 4164 contains 64K (65,536) bits of memory, so at eight bits per byte, we use eight 4164 chips for a 64K-byte memory. The sixteen line address buss can access 65,536 (the sixteenth power of two) locations.

Removal of all 16K MCM4517 chips and fully populating the board with thirty-two 64K 4164 chips results, after the operations described in this article, in a board containing 256-bytes of dynamic RAM, in four 64K-byte banks. Of course, all that memory is only usable when controlled by a device such as the Trionyx Electronics X/2-H8 Bank Select Card (which I have). Also, your H-8 must originate its RAM (i.e., Read/Write Memory) at ZERO (ORG 0), to utilize this modification, as there is no way to deselect the first 8K to clear a place for non-switchable ROM.

The bank select switches are still used, much in the same manner as with the original configuration, and with the same stipulations, especially the avoidance of overlapping banks. Paired slides on each switch must be used, as 1-2, 3-4, 5-6, and 7-8 (and NOT any other combinations).

In modifying this board, a wee bit of delicate soldering and trace cutting on the back side of the board (not the component side) is required. Use of a 25-watt pencil iron with a 1/8" chisel tip, and an X-Acto knife, is recommended (along with courage and determination).

First, remove all the memory chips, U1 through U32, and two other chips, U48 (74LS145) and U65 (74LS75). U48 and U65 will not be used, and their sockets must remain empty.

Seven traces must be cut on the back of the board. It is very important to be sure that you are cutting the right traces, so don't hesitate to orient yourself more than once to the correct socket locations, as they are marked on the front and the cutting must be done on the back. Be sure tyou know which pins are which, too. Cut the trace between U54 pin 7 and U62 pin 7, the trace between U54 pin 8 and U62 pin 9, the trace between U54 pin 13 and U62 pin 12, the trace between U54 pin 14 and U62 pin 14, the trace between U54 pin 17 and U62 pin 16, and the trace between U54 pin 18 and U62 pin 18. Finally, cut the trace between U54 pin 4 and U63 pin 9. Be sure the traces are completely cut.

Nine short jumpers must be soldered in place on the back of the board. Using small-gauge solid wire (leave as much insulation on as possible), jumper together: U54 pin3 and U62 pin 3, U54 pin 7 and U62 pin 5, U54 pin 8 and U62 pin 7, U54 pin 13 and U62 pin 9, U54 pin 14, and U62 pin 12, U54 pin 4 and U62 pin 18. Then, jumper U55 pin 3 to U63 pin 9. Finally, be sure that U54 pin 2 and U55 pin 2 are still accessible for one more jumper, to be installed later. Check for shorts, bridges, and good soldering.

Next, 'buss' together pins 9 of sockets U1 through U32. The left end of the board, when viewed from the back, is the motherboard connector end. I used four small-gauge insulated solid wires, running vertically from bottom to top, plus an inch or so,

for each bank, leaving insulation between socket pins. The four vertical runs are then connected to a horizontal wire of slightly larger gauge (leave an inch or so of extra length on the left end), lying just below the top edge of the board, again leaving insulation between the connecting points. The left end of this heavier wire is connected to a 1/2 watt, 33 ohm resistor lying horizontally (the open end of this resistor should be pointing towards the left, or connector, end of the board). I secured the resistor to the board with a small piece of thin, double-sided foam tape.

Now, U54 pin 2, U55 pin2, and the open end of the 33 ohm resistor must be jumpered together.

To connect the Bank Select Card, I set the bank select switches as follows: Bank 0 (Switch 4), 1-2 on; Bank 1 (Switch 3), 3-4; Bank 2 (Switch 2), 5-6 on; Bank 3 (Switch 1), 7-8 on. All other slides should be off. Providing a low (or ground) at (empty) U48 socket pin 1 will select Bank 0, at pin 3 will select Bank 1, at pin 5 will select Bank 2, and at pin 7 will select Bank 3. These are the four points that I used to connect the negative-going control signals from the four outputs on the Bank Select Card. The heavy horizontal trace just below the top edge on the front of the memory board provided an excellent ground to reference to.

Assuming a fully-populated board (and why not? 64K chips are a LOT cheaper than the 16K chips), this inexpensive modification gives you a fast 64K of main memory and 192K for cache or memory-disk operation. I am very pleased with the speed and convenience provided by the Trionyx X/2-H8 Bank Select Card and software, and 256K of memory. *

Continued from Page 23

```
          Str(LineNum,LineNumStr);
          OutLine:=LineNumStr+'  SPEAK  "PA0"';{create pause between words}
          Writeln(OutFile,OutLine);
          OutLine:='';
          LineNumStr:='';
          LineNum:=LineNum+10;
        End
        Else    {Else if word not found, Write to Missing file}
        if length(word)>0 then
        Begin
          Writeln(Missing,Word);
          Str(LineNum,LineNumStr);
          OutLine:=LineNumStr+'   SPEAK  "'+Word+'"';
          Writeln(OutFile,OutLine);
          OutLine:='';
          LineNumStr:='';
          LineNum:=LineNum+10;
          Str(LineNum,LineNumStr);
          OutLine:=LineNumStr+'  SPEAK  "PA0"';{create pause between words}
          Writeln(OutFile,OutLine);
          OutLine:='';
          LineNumStr:='';
          LineNum:=LineNum+10;
        End;
      End;
    End;
  End;
  Str(LineNum,LineNumStr);
  OutLine:=LineNumStr+'   END';
  Writeln(OutFile,OutLine);
GoToXY(11,12);
Write('*** Conversion Successful, Basic Code in OutSpk.BSC ***');
GoToXY(4,16);
Write('The Following Words Were Not in the Dictionary:');
X:=4;Y:=18;
Reset(Missing);
While not Eof(Missing) do   {Report all missing words}
Begin
  Readln(Missing,Word);
  GoToXY(X,Y);
  Write(Word);
  Y:=Y+1;
  If Y>21 then
  Begin
    Y:=18;
    X:=X+15
  End;
End;
If (Y=18) and (X=4) then
Begin
  GoToXY(X,Y);
  Write('** none **');
End;
  Close(InFile);
  Close(OutFile);
  Close(Missing);
END.
```

*

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Small-C For The Mainstream

David A. Wallace
146 Westford Street
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My Small-C Compiler for MS-DOS [H.U.G. P/N 885-3026-37] has been in the Heath Users' Group library since May of 1985. Just recently, I added an accessory package consisting of library routines and utility programs which has been issued as an upgrade. In the course of submitting this extra diskette, Jim Buszkiewicz and I got to talking about a minor defect in the Small-C Compiler: it won't clear the screen on a PC-compatible machine. Because of this defect, H.U.G. advertises the Small-C package for the Z-100 machines only.

But the screen clear "bug" is the only reason that the compiler is not categorized as universal, as several people have been told when they called H.U.G. to inquire about running Small-C on a Z-150 or Z-200 series machine. This article will explain why the compiler has trouble with clearing the screen on a PC-type machine and how to fix the problem. If you don't want to perform the operations outlined below, remember that the compiler is still usable on any MS-DOS (version 2.0 or higher) machine; it just won't look as pretty when it signs on.

First, let me explain why the Small-C Compiler prints out a left-arrow and capital E on a PC-type machine when it signs on. As most of you probably know, the Z-100 machines (Z-110, Z-120, Z-1108 and Z-1208) emulate the venerable H-19 terminal when displaying text. This emulation was one of the reasons I bought my H-100 in the first place. My Heath kit computing days started with an H-8 computer and an H-19 terminal. I like that H-19 terminal! Not only does it produce a more readable character display (font) than the pseudo-typewriter characters of the PC-type machines, but it also understands simple character sequences (each beginning with the ASCII escape character, '\033') that do special things to the display, such as turning on reverse video or moving the cursor around.

Unfortunately, one terminal's command sequence is another's garbage character string. The "clear screen" command for the H-19 terminal (and hence, for the Z-100) is escape followed by capital E. A PC-type machine does not understand this sequence as anything special, so it merely attempts to display the characters it receives. As luck would have it, the escape character is defined as the graphical symbol "left arrow". So the Z-100's clear screen command is printed out on a PC-type machine as left-arrow and capital E. [Q.E.D.] The explanation was simple, wasn't it? Correcting the problem is less so.

The ideal "fix" would be for the compiler to discover what kind of machine it was being run on. While there are possibly some ways that this could be done, oddball hardware add-ons on PC-machines or PC emulators on Z-100s might confuse the compiler. A safer way would be to re-compile Small-C with some code changed so that it works correctly on a PC-type machine. This new version of the compiler would only run on a PC-type machine. Unfortunately, the Z-100 will "crash" if fed the interrupt-10 instructions which implement the PC-type screen clear. It turns out that the amount of code which must be changed in order to build a PC-only version of Small-C is not very big — about fifteen lines out of the 4,000 or so lines of code that constitute the compiler are responsible for all of the trouble! Furthermore, only one module, C88A3.C, is affected. The remainder of this article describes the changes required to this source code file and the necessary steps to construct a PC-version Small-C Compiler.

The first thing you must do is to establish the ability to run the compiler as supplied to you. Remember, this compiler is completely at home on your PC-type machine, except for printing out two funny characters as it identifies itself. Follow the instructions given in the documentation file C88USE.DOC contained on Disk A of the compiler package. (I'm assuming that your machine has two floppy disks — a hard-disk user will have to work out his own methods, I'm afraid, as there are altogether too many ways of arranging a hard disk.) Once your disk Alpha (the one containing

the compiler and its library files) has been constructed, copy the file C88A3.C from the Compiler sub-directory of Disk B of the compiler package onto your work disk (Disk Beta).

Using your text editor (You did remember to copy it onto Disk Alpha, didn't you?), locate the function "clrscr" in the C88A3.C file. This function is about 270 lines down the file. Replace the text of this function with the code of Listing 1. This code is the clear-screen routine for a PC-type machine. Be careful not to change anything else in C88A3.C. The remainder of the compiler is not sensitive to the type of MS-DOS machine you use.

Listing 1

```
clrscr()
{
#asm
        MOV     AX,0600H
        MOV     BX,0700H
        MOV     CX,0
        MOV     DX,0184FH
        INT     010H
        MOV     AX,0200H
        MOV     BX,0
        MOV     DX,0
        INT     010H
#endasm
    return;
}
```

Write this edited version of C88A3.C back to Disk Beta as C88A3PC.C, so you can tell the "new" version from the "old". Now compile C88A3PC.C using the command:

```
C88 B:C88A3PC
```

Assemble the generated assembly-language file by using the command:

```
MASM B:C88A3PC;
```

This will create the file C88A3PC.OBJ, which we will need in the next step. We cannot use the CMAKE batch file to perform these operations, because we are compiling only one part of a program and CMAKE assumes that we want to compile a complete program instead. So, this piecemeal technique must be used.

Having created the object file which reflects the PC screen-clear change, we must now combine it with the object files of the other modules for the compiler in an operation called "linking". To do this, we must copy all of the object files from the Compiler subdirectory of Disk B.

You should know how to do this, but in case you've forgotten, the sequence goes like this:

1. Remove Disk Alpha from drive A: and replace it with the Small-C Disk B.
2. Issue the command

```
COPY A:\COMPILER\*.OBJ B:
```

3. Replace Disk Alpha in drive A:.

You may now delete the file C88A3.OBJ which was just copied; it will not be needed.

We are now ready to perform the link operation. Issue the command:

```
LINK
```

LINK will ask several questions (which I have printed in italic type), answer them exactly as indicated below:

```
Object Modules [.OBJ]: CRUN+B:C88A1+B:C88A2+B:C88A3PC+
Object Modules [.OBJ]: B:C88B1+B:C88B2+B:C88C1+B:C88D1+
Object Modules [.OBJ]: B:C88E1+B:C88F1+B:C88G1+
Object Modules [.OBJ]: B:C88H1+B:C88H2+C88I1
Run File [CRUN.EXE]: B:C88PC
List File [NUL.MAP]: B:C88PC
Libraries [.LIB]: SMALLC88
```

If you have followed the above instructions properly, LINK will create the file C88PC .EXE and issue only a warning message about the non-existence of a stack segment. The warning may be ignored; any other messages indicate that you have made a mistake. If that happens, re-try the LINK command.

One more step remains: converting the .EXE file to a .COM file. This is done with the command:

```
EXE2BIN B:C88PC.EXE C88PC.COM
```

When this command has been executed, the file C88PC.COM will have been created. C88PC.COM is the PC-compatible version of the Small-C Compiler. You may copy C88PC.COM to your Disk Alpha (presently in drive A:) as C88.COM and use this disk for future compilations. You should immediately notice that the screen clears normally now.

There remains two programs which are incompatible with the PC-type machines: SEE.C from the example programs on Disk A and LOOK.C from the accessory package. These programs make extensive use of H-19 escape sequences. While converting these programs for use on PC-type machines can be done, the conversion is complicated, and I'm afraid, too lengthy to explain in this short article. Perhaps I will return to these pages at some future date with information about this fix-up; better yet, perhaps someone now reading this issue will figure out how to replace the critical code areas and will kindly pass along the fruits of his labors. After all, this is how Small-C got started in the first place!

*

Please let us know 8 weeks in advance so you won't miss a single issue of REMark!

The New FINA ROM Chip Set

Laszlo M. Vesei
420 Philip Road
Niles, MI 49120

There is a dark corner in most homes, where diverse household devices, having overlived their usefulness, find their final resting place. Mine contained, among other things of the past, a genuine Heathkit H-25 printer, along with an H-89A. Now, for sentimental reasons alone, I could not allow these to spend the remainder of their days as fancy doorstops. On the other hand, they are no longer the pinnacle of the electronic arts and there are now more modern machines in my den.

These and similar thoughts crossed my mind every time I happened across these relics of the not-too-distant past. Then, in one of the magazines an ad hit my eye. Someone was offering a ROM chip set to rejuvenate the H-25. I called the number on the phone and having ascertained that the price would not get me a lodging in the debtor's prison, ordered the set.

In due time, a small package arrived containing four ROM chips and a VERY detailed set of instructions as to how to install these on the logic board of the H-25. It also listed the various escape codes to bring the features of the new character ROMs to action. No soldering was involved in the installation. The new features were very nice, although frankly, a little more was expected. (See Jim Buszkiewicz's article in Volume 7, Issue 3 of REMark.)

That was last year. Now, the other day, I received a letter offering a new, improved ROM set. It is supposed to contain the entire 256 MS-DOS character set! So, I ordered it the same day. As soon as it arrived, I became an electronic brain surgeon (or is chip-butcher a better word?).

Again, no soldering was involved, just replacing four ROM chips. This time it was a bit trickier, as some jumpers had to be moved to different locations and one of the chips had a "tail" with a plug attached to it and that had to be plugged in at one of the jumper posts, also. The instructions and the pictorial were the paragons of clarity. Even I could do it easily. There were also some changes to be made on the rear DIP switches of the printer.

Trying out the printer was not without difficulties. Since my usual machine is now an H-161 with a parallel-connected printer, the order of the day was to map the parallel port to the serial one. There are several dozen options to choose from and neither seemed to work. I had to construct — on the advice of a friend — a null-modem (behind that terminus technicus you will find two RS-232 25-pin connectors wired back-to-back, with some wires crossed).

Two days of experimentation showed that the H-25 option of the configur-list did not work. The new chip set did not seem to work faster than 2400 baud, while the old H-25 standard is 4800. The very first option on the list is the right one. (I also had to change the baud rate of the old H-89A — a software change — and now it works also. With the proper use of the OUT-code, even the old Magic Wand can be reused.)

I have put the new FINA chip set through all its paces and am happy to report that the results are highly satisfactory. I was particularly impressed with the speed of the "letter quality" printing. To be sure, it is only "semi-letter-quality" (see sample), but oh boy, is it fast!

The graphic symbols are handy for charts and ladder logic diagrams. Since I am doing some foreign correspondence and also mathematical work, the foreign letter set (French, German, Spanish, Greek, also math symbols) is a very useful feature.

I would be remiss in this report if I did not mention that this improvement also allows dot addressable graphics with a very fine resolution. It will handle the EPSON-coded stuff, but the proportions will be somewhat different, as the pitch of the horizontal and vertical stepper motors differs from that of the Epson machines.

Finally, here is a short program in GW-BASIC that will generate a page showing all the characters contained in this chip set. I have one framed and hanging on the wall near my keyboard. (Careful, this program will NOT work without changes on any other printer! Also, a program resulting in

the same sample page in MBASIC on the H-89 differs considerably from this one.)

```
10 LPRINT CHR$(27)+"G"
20 LPRINT:LPRINT TAB(25)
"The FINA character set code (decimal)
30 'Written by L.M.Vesei--
   May gremlins infest your ICs
40 "if you omit the name of the author!
50 LPRINT TAB(3) STRING$(80,"=")
60 LPRINT :LPRINT
70 FOR Y=0 TO 25
80 FOR X=0 TO 9
90 U=10*Y:U=U+X
100 IF U<2 OR U=27 OR U=3 THEN 240
110 IF U>6 AND U<16 THEN 240
120 IF U=20 OR U=32 OR U=127 THEN 240
130 IF U=256 THEN 270
140 T=8*X:D=U-26
150 IF U>3 AND U<7 THEN T=T+3-X
160 IF U>16 AND U<20 THEN T=T+6-X
170 IF U>21 AND U<27 THEN T=T-D-5
180 IF U=28 THEN T=T-6
190 IF U=29 THEN T=T-7
200 IF U=31 THEN T=T+1
210 IF U=>31 AND U<40 THEN T=T-2
220 T=T+3:LPRINT TAB(T)USING "###";U;
230 LPRINT TAB(T+4)CHR$(U)Z$;
240 NEXT X
250 LPRINT:LPRINT
260 NEXT Y
270 LPRINT CHR$(12):LPRINT CHR$(27)+"G"
    :END
```

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Sample printing

Draft quality print:

This is the time for all good men to go to the aid of their country!

Letter quality:

The quick brown fox jumped over the lazy dogs.

Italics:

In the mid*dle of one* Word if so desired

Super- and subscript:

$$H_2SO_4,\ y=\tfrac{1}{2}\ mv^2$$

Foreign text:

Hôtel de Dieu, mon père, Garçon, die Schönste von Wörthersee,

Ångström-unit,Rózsavölgyi: Kesergö, più bella, omertà, égalité

$$C_1 = \frac{6}{\pi * \ln(a)} * \left[\frac{(A-1)}{2} - 1 \right] - - - - - - - - - - -(23)$$

$$V = 4 * \int_a^b x^2 \ . \ dn \quad - - - - - - - - - - - - (47)$$

The FINA character set code (decimal)

				2	☺			4	♦	5	♣	6	♠							
												16	▶	17	◀	18	↕	19	‼	
		21	§	22	▬	23	↨	24	↑	25	↓	26	→			28	∟	29	↔	
30	▲	31	▼			33	!	34	"	35	#	36	$	37	%	38	&	39	'	
40	(	41	)	42	*	43	+	44	,	45	-	46	.	47	/	48	0	49	1	
50	2	51	3	52	4	53	5	54	6	55	7	56	8	57	9	58	:	59	;	
60	<	61	=	62	>	63	?	64	@	65	A	66	B	67	C	68	D	69	E	
70	F	71	G	72	H	73	I	74	J	75	K	76	L	77	M	78	N	79	O	
80	P	81	Q	82	R	83	S	84	T	85	U	86	V	87	W	88	X	89	Y	
90	Z	91	[	92	\	93	]	94	^	95	_	96	`	97	a	98	b	99	c	
100	d	101	e	102	f	103	g	104	h	105	i	106	j	107	k	108	l	109	m	
110	n	111	o	112	p	113	q	114	r	115	s	116	t	117	u	118	v	119	w	
120	x	121	y	122	z	123	{	124	¦	125	}	126	~	127		128	Ç	129	ü	
130	é	131	â	132	ä	133	à	134	å	135	ç	136	ê	137	ë	138	è	139	ï	
140	î	141	ì	142	Ä	143	Å	144	É	145	æ	146	Æ	147	ô	148	ö	149	ò	
150	û	151	ù	152	ÿ	153	Ö	154	Ü	155	¢	156	£	157	¥	158	₧	159	ƒ	
160	á	161	í	162	ó	163	ú	164	ñ	165	Ñ	166	ª	167	º	168	¿	169	⌐	
170	¬	171	½	172	¼	173	¡	174	«	175	»	176	░	177	▒	178	▓	179	|	
180	┤	181	╡	182	╢	183	╖	184	╕	185	╣	186	║	187	╗	188	╝	189	╜	
190	╛	191	┐	192	└	193	┴	194	┬	195	├	196	─	197	┼	198	╞	199	╟	
200	╚	201	╔	202	╩	203	╦	204	╠	205	═	206	╬	207	╧	208	╨	209	╤	
210	╥	211	╙	212	╘	213	╒	214	╓	215	╫	216	╪	217	┘	218	┌	219	▉	
220	▄	221	▌	222	▐	223	▀	224	α	225	ß	226	Γ	227	π	228	Σ	229	σ	
230	µ	231	τ	232	Φ	233	Θ	234	Ω	235	δ	236	∞	237	ø	238	∈	239	∩	
240	≡	241	±	242	≥	243	≤	244	⌠	245	⌡	246	÷	247	≈	248	°	249	•	
250	•	251	√	252	ⁿ	253	²	254	■	255										

*

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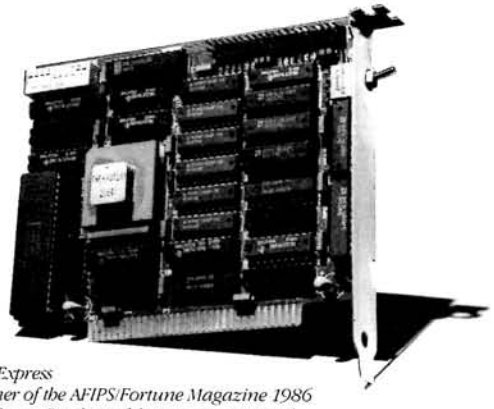

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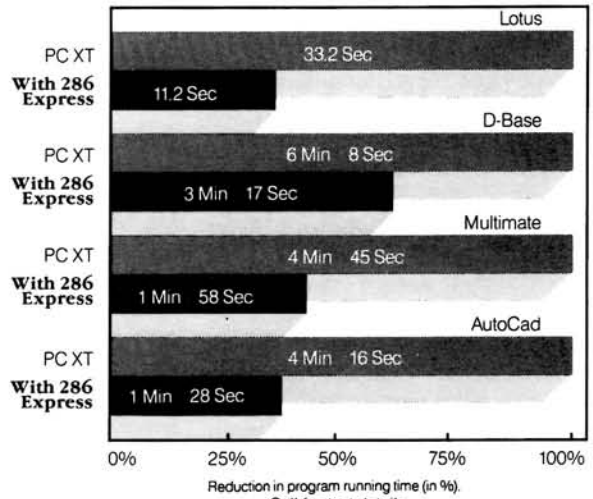

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On The Leading Edge

Gremlins, Hard Disks, New IBM Computers, '241 Upgrade

William M. Adney
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Grand Prairie, TX 75053-1655

Gremlins are the bane of all computer users and technical writers as I mentioned in the January article. In retrospect, it appears that they were more active than ever while I was writing that particular article, and they even managed to change some things that were originally correct.

You will recall that I criticized the new Heathkit catalog format with particular emphasis on the omission of the product specification blocks. Since I did not have the specifications for all of the computers, Bill Stewart of Heath Company was kind enough to assist me in providing the ZDS data sheets on the entire product line. In an attempt to acknowledge Bill's assistance in providing the information, his last name was spelled incorrectly as "Steward" instead of "Stewart". It is always poor form to misspell someone's name, and it is especially tacky to do so when you are trying to express thanks for their help. My apologies to Bill Stewart for that error.

Sneaky Little Devils

Gremlins are sneaky little devils. In some cases, they do not even wait until night when you are not using your computer — they will sneak in as you are typing. That is the only possible explanation for losing all of your batch files as you observe that your computer display says "ERASE *.BAT" when you absolutely KNOW that you typed "ERASE *.BAK".

I received several letters from computer owners noting that some of the power specifications listed in the article were incorrect. As it turns out, the figures were correctly copied from the ZDS data sheets (when they were listed).

Unfortunately, it is not always possible to blame technical errors on gremlins. Sometimes, during the writing of a technical item, it is altogether too easy to get involved in trying to make a point and include a statement that is not quite technically accurate. Virtually all writers do this at some time or another.

Perhaps the worst part of this is that sometimes it is difficult to separate what is what. In some cases, I suspect that we think that the reader is telepathic and KNOWS what we mean. In others, it is just a technical error or perhaps we assume too much.

One of the best examples of this is the so-called 640K DOS limit. I mention this specifically since I have been guilty of this on a couple of occasions. This "fact" has also been incorrectly published in a number of PC-related magazines by a number of writers. After seeing this a couple of times, it is usual to assume that it must be true even though it is not.

If you think about it, a "640K DOS limit" is a rather ridiculous statement to make. Anyone who has a Z-100 knows that is not true, since you can have a maximum of 768K of Z-100 system Random Access Memory (RAM) which can be used by MS-DOS. You might assume that Zenith modified MS-DOS to use more that the "allowed" 640K of memory, but that is not true either.

In order to set the record straight on this, let's review a couple of facts. First and foremost, the 8088 CPU can address a maximum of one megabyte (1,048,576 bytes) of memory. That is an absolute hardware limitation of the 8088 that cannot be changed. That includes system RAM, video memory, and Read Only Memory (ROM).

For the Z-100, the one megabyte (1,024 KB) is allocated as 768 KB for system RAM, three banks (red, green, blue) of 64 KB each for a total of 192 KB video memory, and the rest for all ROMs (64 KB). Memory allocation is not quite as simple for the IBM PC.

Simply stated, the 640 KB memory limit is actually a hardware design limitation in the IBM PC. It appears that IBM decided to reserve all memory above 640 KB for various purposes including video memory, hard disk ROM, BASIC ROM, and ROM BIOS. In practice, the memory between 640 KB and 704 KB has generally not been used, but that may change with the new IBM announcements. We will look at that in a minute.

Without going into all of the gory technical details, suffice it to say that all of this

memory allocation is sort of controlled by a Programmable Array Logic (PAL) chip inside the computer. If you changed from 64 Kb to 256 Kb memory chips for your system RAM, you also had to install a new PAL chip. That applies to the Z-100 where the new PAL was part of the HA-108 upgrade, and also to the Z-151.

One More Time . . .

I received a letter about the statement in my November 1986 article: "It is a fact that the Z-100 computer will support a maximum of two 5.25" drives, two 8" drives, and four hard disk partitions." Although the letter correctly pointed out that this is a software limitation, there was a specific reason why I made that particular statement.

Unless specifically mentioned, I do not generally write about things that are not officially supported by Zenith. To be specific, the Z-207 floppy disk controller will support a maximum of four 5.25" drives and four 8" drives according to the documentation. Even though that may be true, you are taking a risk by changing the BIOS to add additional drives. Due to some rather odd programming techniques used by some vendors, software that works with the standard ZDS MS-DOS may not work when the BIOS is changed to add additional disk drives. In addition, changing the BIOS to add additional disk drives is not as simple as it looks. Although you can find a few of these BIOS modifications on some bulletin boards, I have seen at least one that I know to be incorrect.

This same letter goes on to mention that this user had to modify the BIOS again so that it would work with the Condor database software that refused to recognize any drive beyond H. He also had problems with Windows trying to read drive N (of all things!). Those problems are precisely the reason that I do not recommend any changes to the ZDS BIOS. Aside from the fact that it is not supported by Zenith, some vendors have strange "hooks" in their software that looks for specific things at certain memory locations. It does not matter that this is poor programming practice, since a few vendors do it anyway.

This kind of vendor idiocy was evident in PeachText 5000, since it always seemed to try to find something in drive A no matter what I did with my "standard" hard disk system. That is the reason that I retired PeachText to my library without any further attempt to use it. Even Microsoft has managed to perpetuate this kind of stupidity. I have been using Word 3.1, and it always tries to read drive A when you ask for the tutorial despite the fact that I have the tutorial files on my hard disk.

Although we have strayed from the point of changing the BIOS, there is an obvious solution to the problem. Use a device driver. If you know enough to be able to change the BIOS, I would assume that you know how to write a simple device driver to add a disk drive. That allows the original BIOS to remain intact so that you can add whatever devices you want. Indeed, that was the concept behind the device driver in the first place. Some hard disk manufacturers even implement their system using device drivers even though that is a rather clumsy way to add a major device like that. The problem with implementing a hard disk that way is that you simply cannot boot the system from it. I have not quite figured out why Tandy did that with one of their 3000 systems.

By the way, if any of you have written a device driver to add a third 5.25" or 8" floppy disk drive to the Z-100, I would suggest that you write an article about it. I would find that article interesting, since I have not had the time to experiment with that aside from the fact that I already have four drives on my Z-100.

By the way, the Z-217 hard disk controller will support a maximum of two physical hard disk drives according to the documentation, but I am not sure that I believe that. There are a couple of rather serious technical errors on the specification page of the 217 controller documentation. In particular, the documentation states that the controller can handle a maximum of two physical drives of 65 megabytes each. Here is some information that I have confirmed, as well as some speculation.

More On Z-100 Hard Disks

All of the information on the Z-100 hard disk upgrade was originally part of several questions that Huggie Richard Hanson asked me in a recent letter.

Despite the Z-217 Controller Manual, I have some reliable information that the "65 MB" limit is software, not hardware (or controller) related. The actual limit is 64 megabytes, but since that is really 65,536,000 bytes, it is clear that the manual was written by someone who did not know that a "K" in a computer is 1024, not 1000. For those of you interested in such things, this information can be found on page 5 of the Z-217-1 Technical Manual.

On the same page, you will find that the controller supports both 512 and 1024 byte sector sizes, as well as two physical hard disks. That information is misleading, since it is not clear exactly what the specifications are.

What these specifications really mean is that you can use a 32 MB hard disk with 512 byte "standard" sectors (the default) or a 64 MB hard disk with 1024 byte sectors. Unlike the PC series MS-DOS, the Z-100 MS-DOS has a feature in PREP (/K switch) that allows you to change the sector size.

On the Z-100, therefore, you can use up to a 32 MB hard disk (or a 64 MB hard disk with 1K sectors). The 1K sector size is absolutely NOT recommended, since it is not compatible with some software, not to mention some hardware problems. The biggest single problem is that you cannot use the 1K sector size with PC emulation (e.g., the Gemini board), since that is not the standard sector size. Since the sector size is specified with Z-100 PREP, there is no telling what that might do to the Easy PC. I doubt that either Gemini Technology or UCI has considered the possibility of 1K sectors, since that is NOT compatible with the IBM PC, so you would certainly be asking for trouble if you expected that.

The 32 megabyte hard disk maximum has been "standard" in MS-DOS and PC-DOS since hard disk support was provided in the DOS. If you are interested in the technical reasons for that, you might want to refer to my October 1986 column for additional information. This was a Microsoft limitation that has applied to all "standard" DOS releases. Zenith changed this in late releases of the PC MS-DOS 3.10 (with BIOS 3.04 and later) as I mentioned in October. It appears that other major computer manufacturers, including IBM, are now modifying DOS to conform to the "Zenith standard" of 32 megabyte partitions and providing software support of larger hard disks. I should note that the Z-100 MS-DOS has NOT been changed to allow larger hard disks other than the 32/64 megabyte limitations based on sector sizes.

Some late information that I received indicates that there is no known technical reason why a high speed hard disk (e.g. 30 ms) should not work on the Z-100. Unfortunately, I do not know anyone who has tried one of the newer hard disks, so I cannot say for sure. If anyone has tried one of the new hard disks, let me know so I can provide that information to all Huggies. There are still quite a few of us with the Z-100.

Hard Disks On The PC With Zenith MS-DOS

Sandi Keyser sent me an article from PC Magazine about cluster sizes on PC type computers. While that may sound too technical for some of you, if you have a hard disk, this is something that you really should know.

For those of you who tuned in late, disk space is allocated in "blocks" of sectors. In DOS, these blocks are called clusters. In a standard 5.25", 9 sector, 360 KB floppy disk, there are two sectors (1024 bytes) per cluster. The bottom line is that, for any file less than 1024 bytes (in this specific format), the file still requires the two sectors which can "waste" a considerable amount of disk space. For example, you may have a small AUTOEXEC.BAT file that contains 30 bytes or so as indicated by the DIR command. That 30 byte file still "uses" two sectors of disk space so that 994 bytes of space are unused. Similarly, a file that exceeds 1024 bytes, like 1025 bytes, requires another cluster to store the file even though only one byte of the cluster may be used.

To make matters even more difficult, a hard disk has a variable cluster size that depends specifically on the size of the partition defined in the Zenith PART command. If you want to know what the various cluster sizes are for disk formats, they can generally be found in the the Programmer's Utility Pack documentation. The point is that you can adjust the cluster size by simply changing the partition size with the PART command. Unfortunately, you will probably need to have some software like the MACE+ utilities that I mentioned in the December issue to display the current cluster size. You may be able to figure it out in several other ways, but you really should have the MACE+ utilities anyway as I mentioned.

Since the cluster size is strictly dependent on the size of the partition, you will need to play with the PART command to get an "ideal" cluster size. Unlike the Z-100 PART command, the PC MS-DOS requires that you enter partition sizes in number of cylinders. That's why you have to experiment with PART to get an ideal cluster size.

The table listed in Figure 1 shows a good starting point for cluster definitions based on partition size.

Figure 1
Cluster Sizes For PC Series MS-DOS Version 3

Partition Size	Sectors/Cluster
32K - 256K	1
256.5K - 1024K	2
1024.5K - 4096K	4
4096.5K - 16340K	8
16340.5K - 32768K	4

The basic information for the above table was obtained from the Version 3 Programmer's Utility Pack, although I found a few errors in that documentation. I had to recalculate the partition size, since it was apparent that whoever calculated the partition size in the PUP was again using the K = 1000 factor instead of the correct K = 1024 factor. Fortunately, the PUP also listed the number of sectors in the partition, so the above calculation was easy. Please note that the information in Figure 1 applies to the PC series computers only, not the Z-100.

If you examine the above table closely, you will see that the cluster size drops from 8 sectors per cluster (4096 bytes) to 4 sectors per cluster (2048 bytes) when the partition size is just over 16340 KB. In my '241 40 MB hard disk, I have two partitions that are defined at just over 16 megabytes so that I could reduce the cluster sizes. For best efficiency, you should not define partition sizes between 4 and 16 megabytes, since that requires eight sectors per cluster.

If you have a 10 megabyte hard disk, you can also see from the table that just under a 4 megabyte partition will also allow you to have better efficiency. My suggestion is to define two 4 MB partitions and one 2 MB partition for a 10 MB hard disk. That will give you drives C, D, and E. Be sure to run the CONFIGUR command to use "Manual Partition Assignment" before you assign the partitions with the ASGNPART command. This particular description assumes that you are using version 3 of the Zenith MS-DOS for the PC series.

Since PART only adjusts partition sizes in whole cylinders, it will take some experimentation to determine the exact cylinder number that is just under 4 megabytes. After running PART, you will, of course, have to FORMAT the new partition before you can check the cluster size. Be sure that you backup everything on the hard disk before you try any of this, since the PART/FORMAT combination will destroy all data on the hard disk.

New IBM Computers

Since IBM has announced their new PS/2 series of computers, there has been considerable speculation about various hardware and software implications. About the only thing that everyone seems to agree on is the fact that their new Micro Channel bus is not compatible with any of the existing hardware add-ons, so that should spur a whole new series of upgrades of one kind or another.

The video upgrade inherent in the top three computers appears to be of great interest, since there is a considerable increase in the resolution. More on that in the future as I find out more details.

Upgrading The '241

Things have been more or less normal here at Disaster Central. In fact, I have done at least one thing that really invites disaster, but I have had no problems as yet.

For various reasons, I decided to "upgrade" my '241 to a '248 configuration. That involves replacing the CPU and the I/O boards with a little surgery on the I/O board required. The good news is that everything seems to work just fine for the time being. That bad news is that it is quite expensive to purchase those boards.

You will need to order part number 181-6115 and 181-6516. But you will need a wad of money to do so. The 6115 board costs $470 and the 6516 board costs $777, so you will need about $1250 if you plan to change your system. Even though Zenith has never been known for inexpensive parts, I think those prices are ridiculous. Such is the price of progress I suppose.

In order to do the upgrade, you must know one trick. The socket for the new I/O board is polarized and only allows the plug from the key switch/speaker to fit one way . . . the wrong way. You must remove the "lip" from the socket so that the plug is installed in exactly the same way as the standard '241 I/O board. That is, the black wire must still be toward the back of the computer when the '248 I/O board is installed. It did not seem to cause any real problem when I originally installed the plug backwards, except there was no green power on light and the speaker did not work. Cutting off

the socket lip and reversing the plug fixed everything. I suppose that the key switch/speaker assembly has a different plug arrangement on the "real" '248 so that everything fits together correctly.

I guess another bit of bad news is that my Z-405 memory expansion board does NOT work in the '248. If you are so inclined, you will need to spend another $400 or so for a new Z-445 memory board that does work in the '248, but there is another option.

You may have seen some advertisements in this magazine by a company called Peripheral Marketing Incorporated (PMI). They have a neat set of memory expansion cards called the FASTCARD which is equipped with two megabytes of memory. The FASTCARD III works just fine in the '241 and sells for $395. By comparison, the Z-445 card for the '248 includes 512 KB of memory. The first 128K of RAM is used to complete the '241 system memory to 640K, and the balance is used as extended memory. That sounds fine until you try to add the remaining 512K (on the first card) so that you have one megabyte. Then Zenith socks it to you for the Z-405-1 256K memory set for $240 each (hint: you need two sets). That is totally ridiculous, since you can find 256K RAM just about anywhere for $4 each or less.

In any case, it looks like PMI has come to our rescue with the FASTCARD series. I just received a FASTCARD III (for the '150 series and the '241) and a FASTCARD V (for the '248). If you are considering adding memory to any Z-200 computer, you might want to wait until I have had a chance to look at these boards. It looks like PMI has really developed something of considerable interest to Heath and Zenith computer users. Special thanks to Huggie Tom Pearson for calling the PMI memory boards to my attention.

In The Future

I will be mentioning more ideas based on your questions, since there are a number of excellent suggestions that I have already received. Only a few are mentioned in this article, but more are on the way.

As usual, 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. And don't be too surprised if you see your name as we take a look at your suggestion or article idea.

Products Discussed

Software

MS-DOS Version 3	
PC only (OS-63-31)	$ 150.00
Z-100 only (OS-63-30)	150.00
Programmer's Utility Pack (CB-3163-30)	225.00

Hardware

Advanced Personal Computer (HS-248)	$2499.00
Monochrome/Color Video Card (Z-409)	239.00
High Resolution Video Card (Z-329)	200.00
High Resolution Video Card Kit (H-329)	159.95
20MB Winchester (ZD-200)	1199.00
40MB Winchester (ZD-400)	1699.00
Winchester Cable (Z-417-1)	20.00
181-6115 board for '248	470.00
181-6516 board for '248	777.00

Heath/Zenith Computer Centers
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C__Power

Part 5

John P. Lewis
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This month we are going to look at the code which will provide a "window" into the database. More specifically, menu option "2. Review existing record names". This routine displays the company or name fields, giving priority to the company field; thus providing the user with a way to determine the best "key" to use for data retrieval and also confirm the existence (or absence) of a particular record. The (P)rint (hard copy) option from the submenu will be implemented, as well as option four from the menu, "4. Print entire mailing list". The (R)eplace option from the submenu will also be implemented at this time. When done, we will have a complete program, excluding the sort option. This issue will also touch on string handling in "C", elaborating on the writing of random records using strings as the data source.

Let me digress for a moment and give you a bit of my philosophy as it pertains to programming, whether in "C" or any other language.

One of the most intriguing aspects of programming is the capacity to try different ways of doing things with the only investment required being time. I think that this is the fascination that keeps many of us in front of the computer for hours on end, while another facet of this personality aberation is the inability to resist a challenge. The only motive required for experimentation is not the need, only the inclination. The only precaution to be observed; make back up copies before proceeding. Now, before I climb down off my soap box, let me add one more thing that is probably self evident but bears emphasizing. The source code of any program is just a reflection of the author's method of accomplishing a particular job, your way may be better. The bottom line here is that, with a little patience and fortitude, you can modify and improve this program to suit yourself.

For those of you who are new to programming in general and "C" in particular, let me pass along a lesson learned from experience. One of the best ways to learn a new language is to rewrite, in the new language, an existing program or algorithm that you fully understand. Also, when testing a new routine, writing a short program as a test vehicle for the algorithm you are creating can sometimes save hours of frustration, and often lead to a better understanding of the concepts involved.

OK, let's get on with the job at hand. The included listing will show the code to be inserted in your existing program skeleton, gleaned from C__Power — Parts 1 through 4. As before, any redundant code fragments are included for clarity only. Do not insert or add them to the new version of "C__Power".

Looking over the listing, from the top down as before, you will see that the code fragment declaring global unsigned (integers) has been appended with the file descriptor "f2". We have also moved men[2] to the global character declarations. Be sure that this variable (men[2]) is deleted from main before continuing.

Back already? Great, let's look at the two new functions. The first one, "open__p" is very short, only one line, but remember, the only motive needed for the creation of a function is the saving of code (memory space and/or programming effort). For instance; this routine is called from the (P)rint subroutine under case '1': as well as the option "4. Print entire mailing list", hence, the motive for inclusion within a function. This bit of code also points up a rather unusual aspect of the "C" language. It treats all peripheral devices much the same. Accordingly, we have the reason for needing to "open" the printer. The program is getting the computer ready to send characters to a file descriptor (f2), which in this case is the LST device under CP/M protocol.

Now that we have the printer ready to work with the computer, let's see how we retrieve the data and send it to the LST.

Notice that I borrowed some terminology from BASIC again. LPRINT is, of course, the BASIC command for sending a string of characters to the printer. I used the word to name a function in "C" which does much

the same thing. The first action here is the declaring of variables within a function, something we have already covered so I won't repeat myself. Next, you will notice a line of code that has been "commented" out. The need for this line of code is the peculiar way in which Tandy (Radio Shack) printers treat carriage return characters, automatically supplying a line feed. This leads to double spaced lines when using a Tandy printer with another brand of computer which sends a carriage return, line feed sequence (Heath, most other brands). Sending the escape sequence shown here to the printer (Radio Shack) will defeat the extra line feed. You have probably already figured out that I use a Tandy printer, nice detective work! If you are using a Radio Shack printer with this program, remove the comment delimiters from around the escape sequence. The rest of you can leave them in.

When this LPRINT function is called from option "4. Print the entire mailing list", the offset is initially set to zero and incremented by one record (128 bytes) each time it prints a record. If called from the submenu using the (P)rint command within option "1. Search for record", the offset is determined by the record being displayed. In either case, we have already opened the file for reading and now the read/write head is positioned to retrieve data from the disk. The program utilizes "getc" to retrieve the first 117 characters of the record and stores them in string c[i]. After sending a newline character to the printer, we use the same technique employed earlier to print fragments of this string on the appropriate line. For instance, the first twenty-five characters of the string, c[i], will represent the company field (compny[LEN1]) and this string segment will be sent to the printer followed by a newline. Incidentally, this field will be composed of twenty-five spaces if a return is entered by the user when asked to input the company field, providing the correct format in the event this record is that of an individual. The same sequence is repeated for the entire record excepting the "phone" field, giving us a printed record which we may use for a mailing label(s), if desired.

Near the bottom of this function, you will find a code fragment which tests men[0] for the ASCII character '4'. If men[0] contains '4', a return to the calling routine is executed (menu option 4). Otherwise, the user is asked if he or she wishes a copy, and a reply in the affirmative will cause the function to call itself, effectively entering a loop. Any other response will cause a return to the calling function, which in this case would be the (P)rint routine from the submenu which, in turn, will enable a return to the menu.

Notice that the two remaining routines so far unimplemented under menu option 1 are now complete. Submenu option (P)rint calls our new open_p function to "open" the printer, calls the LPRINT function to print one record (the function gives the user the option of additional copies of an individual record), and then closes the printer before returning to the menu. Option (R)eplace (from submenu) is even simpler. All it does is cause a jump to the "replace" label in the code for menu option "3. Create a new record". This label is just above the FOR (; ;) loop used for record input and just after the code resetting offset. Make sure the label is placed precisely where shown in the listing or problems will result. What we are doing here is arriving at the correct offset through the search option and then writing over the existing data with the new, thus replacing the data for the individual record found earlier using the search option.

Before we leave this routine, please note two "adjustments" I made to the values under case '4' and case '5' within submenu option (E)dit. The first change defines the size of the string written to the disk. The new code should read: fprintf(fd,"%-33s", city);. The old value was 32. The next change is associated with case '5' and changes the amount added to offset. The new code should read: seek(fd,offset+118,0);. The old value was 117.

Menu option two is designed to provide a look at the name or company field within each record in the database. The need for this routine is emphasized when trouble is encountered in retrieving a record. Occasionally, the user will enter a name using all caps or fail to capitalize the first letter in a name, thus causing a mismatch condition when a match is expected while a search is being executed. This window into the database will allow the user to view the name fields and discover any discrepancies.

This routine clears the screen, locates the cursor on the fourth row, opens the data file for reading and resets the offset to 0 before entering a loop where the first fifty characters of a record are retrieved and a test is made on the first character for DEL. Assuming that c[0] is not equal to DEL, we make another test for the value of c[0] to determine whether or not it is a space. If it is not a space, the company field is printed to the screen, a comma followed by a space is printed, offset is incremented and the process is repeated. If the test on c[0] reveals a space, i is incremented by twenty-five (i=LEN1) and the name field is printed to the screen. While we are printing partial records to the screen, we are also incrementing the character counter j and a test is made for the value of j after each field is processed. When j is equal to 76 (at the end of every third record), a newline is printed and j is reset to one. Thus, we march across the screen printing three fields in a row, inserting a delimiter after each one and moving down to the next row after each third record. When the test performed on c[0] reveals the DEL character, the program will exit the loop, inform the user that the end of records has been reached and enable a return to menu, closing the file, resetting offset, and purging c[0] before doing so. Not a terribly sophisticated routine, but a very handy one for the user.

We have already covered the addition to the routine under case '3', so I will skip down to the next addition after I reveal the fact that I committed a no-no when using the goto instruction to jump from the (R)eplace routine to the replace label found in the data input module. Using goto instructions (in "C") is frowned upon by most programmers and I try to keep them to a minimum, but in this case, it provided the most expedient way to retain the offset we worked so hard to get, and use it to enable the replacement of one record with another.

Next, we encounter case '4' from the menu, giving access to: "4. Print entire mailing list (to printer)". This is a rather short routine, its main purpose in life is to call the LPRINT function after opening the data file and the printer, then positioning the read/write head using the seek function. The offset is incremented by RECORD after each label is printed. We compare c[0] after each iteration to ascertain when the last label has been printed and fall out of the "while" loop when DEL is detected, causing a return to the menu after closing the data file and purging c[0]. You might wonder why c[0] is purged each time DEL is detected as its contents. This is to avoid aborting a function when it is first entered, since c[0] is our position of choice and DEL is the delimiter we are using to indicate the end of file.

When this listing has been inserted where appropriate and tested, you will find that you have a very nice directory/mail list program that is a pleasure to use, missing only the sort function to make it a full blown version. We'll tackle that job next issue, but before I leave you for this issue, let me pass

Continued on Page 45

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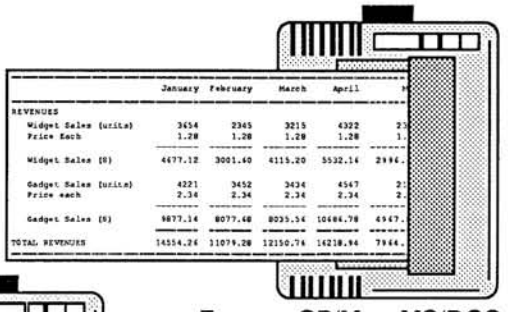

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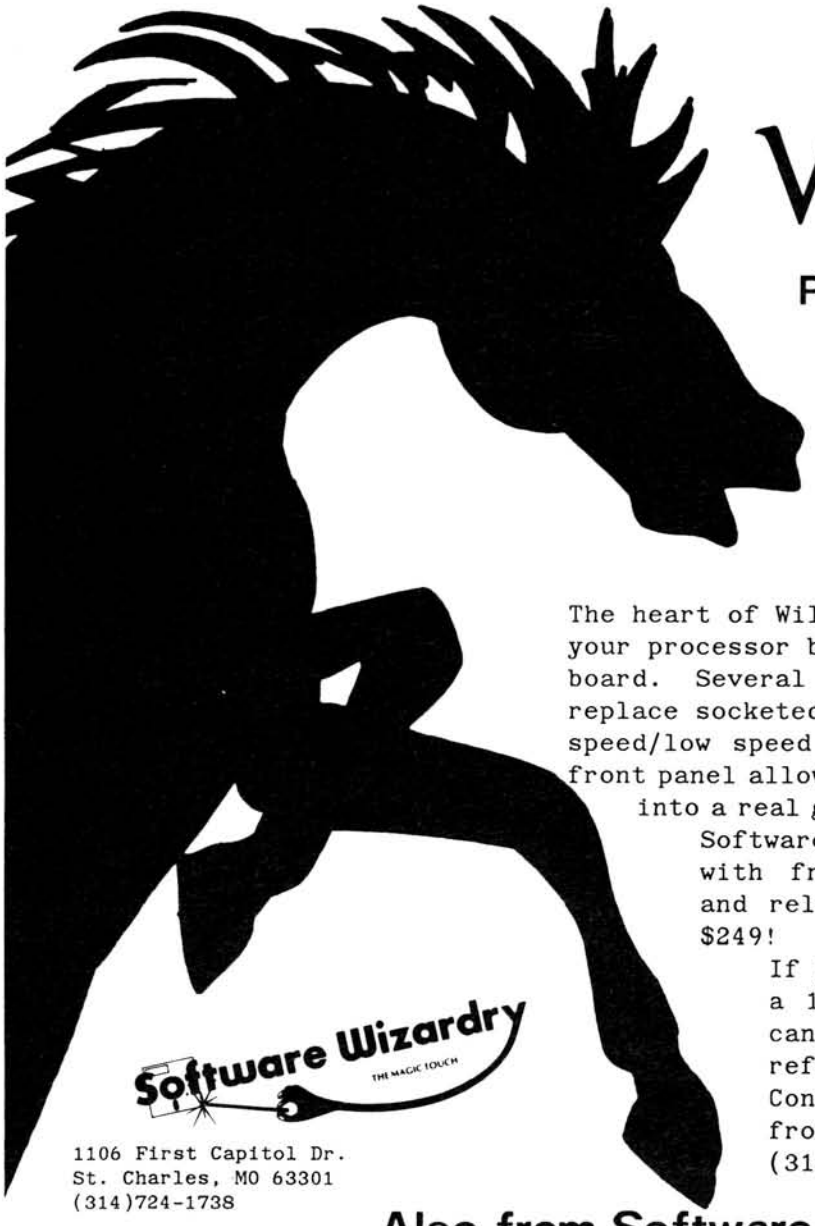

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Continued from Page 40

along something which should have been painfully obvious, but eluded me for some time.

When declaring variables of type char; the number of characters in a string are indicated by the number in the closed brackets following the variable. For instance: char str[10]; declares a variable named str, type char, containing ten characters. All quite elementary, dear Watson, or so it would seem. Actually, it is quite straight-forward. The only problem is when you input a string to fit within the parameters you have outlined with your declaration. If you use the "gofor" function as in gofor(phone, 10);, the computer will attempt to store a string containing eleven characters in a space large enough for ten. The result will be largely unpredictable, but I can predict one thing; you won't like the result! What is happening here is that ALL strings input in "C" MUST be terminated with a '\0' character, which takes up the space that would be occupied by a character. The bottom line is that you must leave room for this string terminator when declaring strings and when inputting same. The above code fragment would work fine if the declaration were expanded to eleven characters or the number input was reduced to nine, using the declaration as is. This is probably elementary to most of you, but Murphy (of Murphy's Law fame) had to teach me in a very emphatic way.

One aspect of this phenomenon that tends to cause a bit of consternation, is when the above string is written to the disk using random records protocol, the string terminator is not included. As an exercise in validating this little dissertation; write a couple of records to a random data file using your new directory/mail list program and then examine the data using DDT. For those of you who are not familiar with some of the utilities provided with CP/M, you may invoke DDT with: A>"DDT DATA" assuming a data file named "data" and DDT.COM are on your default disk. The A> prompt is, of course, provided by CP/M to inform you that drive A is the default and the DOS is ready to carry out your commands. Next, enter D100 at the DDT prompt ("-"). This will cause DDT to display the contents of the computer's memory starting at location 100 (hex) where the file data was loaded. I hope that this little exercise will add to your education as it did mine.

I hope that you have been able to follow along through the preceeding parts of this series and now have a viable program with no "bugs", but if you have not, for whatever reason, I will transfer the source code of this program to your formatted disk, H-89 (hard sector) or H-100 soft sectored double-sided, double-density only. Please remember that this program, as it is written, will run under CP/M only. Also, keep in mind that we still have the sort routine to add to this program, and we are going to furnish the source code for "Hexout" (mentioned in C_Power — Part 1) to aid in troubleshooting this or any other program written in "C". If you do send for the disk, please enclose $5.00 (check or money order) to cover shipping and handling.

If you have any difficulty with this program that you are unable to resolve, feel free to write me with a description of your problem and I will TRY to help. Please enclose a SASE if you wish a reply. If you have any ideas for incorporation in this series or another I would like to hear from you. Please address all correspondence regarding this series to the above address.

"C" you in "C_Power — Part 6".

Listing

```
/* --- "CPOWER" by John P. Lewis --- */
/* *** source code for part five *** */
#include "printf.c"
#include "funclib.c" /* routines cls, locate, fetchc and gofor
     from "CPOWER" */
#include "seek.c"  /* one of random access library files */
#define DEL 127  /* this char used for an "end of records" delimiter */
#define SIZE 2048  /* size of future "search" area */
#define DELAY 10000   /* number of iterations in delay loop */
#define LEN1 25     /* length of field for compny & name fields */
#define LEN2 25
#define RECORD 128   /* record size  */

unsigned fd, offset, loc, q, f2;  /*global variables to be used
 by functions and main */
int init;
char ptr[LEN1], string[SIZE], c[RECORD], dummy[2], men[2];

search ()
{
int i, k;k=0;
opnforrd ();seek(fd,offset,0);
if (init != 1)
  {
   printf("Please stand by, I'm initializing \n");
    while ( c[0] != DEL )
     {
     seek(fd,offset,0);
     for ( i=0; i < LEN1+LEN2 ; ++i,++k)
       {
        c[i] = string[k] = getc(fd);
       }
      offset+=RECORD;
     }
init =1;q=k-(LEN1+LEN2);offset=0;
  }
}
srch2 ()
{
printf("Please enter the search 'Key' ");
gofor(ptr,LEN1);
loc=jindex(string,ptr,offset);offset = (loc/(LEN1+LEN2))*RECORD;
}
jindex (s,t,p)
char s[],t[];
unsigned p;
{
int i, j, k;
for ( i=p; i <= q ; i++)
   {
    for ( j=i, k=0; t[k] != '\0' && s[j] == t[k] ; j++, k++);
    if (t[k] =='\0' )
      return (i); /* i=pointer if match is found */
   }
return (-1);   /* no match */
}
```

```
opnforrd ()
   {
   fd=fopen("data","r");  /* open "data" file in read mode */
   if ( fd == 0 )
     {
     fd=fopen("data","w");seek(fd,0,0); /* if file does not exist, create */
     fprintf(fd,"%c%c",DEL,EOF);seek(fd,0,2);fclose(fd);/* one & insert */
     fd=fopen("data","r");  /* delimiter */
     }
   }


o_pen()
   {
   fd=fopen("data","u");  /* open file in "u" (update) mode */
   }
open_p()
   {
   f2 = fopen("lst:","w");   /* "open" printer */
   }
lprint ()
  {
  int i;
  char ch;
/*  putc(27,f2);putc(21,f2);*/ /* Tandy printer line feed defeat */
  seek(fd,offset,0);
  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 <=116; i++)
     {
     putc(c[i],f2);
     }
  putc('\n',f2);putc('\n',f2);
   if (men[0] != '4')
     {
     printf("\n\tCopy (y/n) ");
     gofor(dummy,1);ch=dummy[0];
     ch = toupper(ch);
     if (ch == 'Y')
     lprint ();
     }
   }
```

```
main ()
  {
    int i, k, on, j;
    char  compny[LEN1], name[LEN2], street[35], city[33];
    char phone[11], ch; /* char men[2] deleted & moved to global */

    do
    {
    cls ();putchar(27);putchar(70);locate (4,5);  /* enter graphics mode */
    printf("pppppppppppppppppppppppppppppppppppppp");
    printf("pppppppppppppppppppppppppppppppppppppp");
    putchar(27);putchar(71);  /* exit graphics mode */
    printf("\n\n\t         Please ....");
    printf("\n\n\t              1. Search for record.");
    printf("\n\t              2. Review existing record names.");
    printf("\n\t              3. Create new record(s).");
    printf("\n\t              4. Print entire mailing list (to printer).");
    printf("\n\t              5. Sort list (on specified field).");
    printf("\n\t              6. Exit to operating system.");
    printf("\n\n\n\t   Enter the number corresponding to your choice ");
    gofor(men,1);
    switch (men[0])
     {
  case '1':
     cls();locate (4,10);offset=0;
     if (init != 1)
       search ();
       locate (8,8);
       srch2 ();on=0;
       label:
       if (loc == -1 )
{
cls ();locate (6,4);
printf("No match found, press return for menu ");
gofor(men,1);break; /* force return to menu */
}
       seek(fd,offset,0);
 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. %d",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]);
       locate (6,15);
       for ( i=25; i <= 49; ++i)
  putchar(c[i]);
locate (8,17);
       for ( i=50; i <= 84; ++i)
  putchar(c[i]);
locate (10,27);
for ( i=85; i <= 116; ++i)
  putchar(c[i]);
```

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```
locate (12,16);
for ( i=117; i <= 127; ++i)
putchar(c[i]);
do
{
locate(16,1);putchar(27);putchar(74);locate(16,4);
printf("You may (E)dit, (R)eplace, (P)rint, (C)ontinue\
 or (M)enu ");
gofor(men,1);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); /* close printer */
break;
case 'C':
loc /= 50;loc +=1;loc *= 50;loc = jindex(string,ptr,loc);
offset=loc/(LEN1+LEN2)*RECORD; /* bump pointer */
goto label; /* and establish new offset */
break;
case 'R':
goto replace;
break;
case 'E': init=0;
locate(14,1);putchar(27);putchar(74);fclose(fd);fd=fopen("data","u");
locate(16,4);printf("Please indicate the field you wish to edit\n");
printf("\n(1) Company, (2) Name, (3) Street, (4) City-State-Zip, (5) Phone ");
gofor(men,1);
  switch(men[0])
  {
  case '1':
  locate(20,4);printf("Company: _____¦");
  locate(20,13);gofor(compny,LEN1-1);seek(fd,offset,0);
  fprintf(fd,"%-25s",compny);
  goto done;
  case '2':
  locate(20,4);printf("Name: _____¦");
  locate(20,10);gofor(name,LEN2-1);seek(fd,offset+25,0);
  fprintf(fd,"%-25s",name);
  goto done;
  case '3':
  locate(20,4);printf("Street: _____¦");
  locate(20,12);gofor(street,34);seek(fd,offset+50,0);
  fprintf(fd,"%-35s",street);
  goto done;
  case '4':
  locate(20,4);
  printf("City, State, Zip: _____¦");
  locate(20,22);gofor(city,32);seek(fd,offset+85,0);
  fprintf(fd,"%-33s",city);  /* fix */
  goto done;
  case '5':
  locate(20,4);printf("Phone: _____¦");
  locate(20,11);gofor(phone,10);seek(fd,offset+118,0); /* fix */
  fprintf(fd,"%-10s",phone);
  done: seek(fd,0,2);fclose(fd);break;
  } /* end of edit switch */
 } /* end of menu switch */
} /* end of do-while switch */
while (ch != 'M');
break;

  case '2':
     cls ();locate (4,1);j=1;
     opnforrd ();offset=0;
   while ( c[0] != DEL )
      {
      seek (fd,offset,0);
     for ( i=0; i<=LEN1+LEN2-1 ; ++i)
  c[i] = getc(fd);
if ( c[0] > ' ' )
{
for ( i=0 ; i <= LEN1-1 ; ++i, ++j )
  putchar(c[i]);
}
else
{
for ( i=LEN1 ; i <= LEN1+LEN2-1 ; ++i,++j )
putchar(c[i]);
}
  if (j == 76 )
     {
    printf("\n");j=1;
     }
offset += RECORD;
if (j > 24 && c[0] != DEL )
{
putchar(',');putchar(' ');
}
       }  /* end of while loop */
       printf("\n\tEnd of records\n");
      printf("\n\n\tPress <RETURN> to return to menu ");
      gofor(dummy,1);
      fclose(fd);offset=0;c[0]='\0'; /* reset offset, purge c[0] */
      break;
 case '3':
fclose(fd);  /* close file if open */
cls();locate(6,6);printf("Please be patient, I'm looking for the");
locate(8,6);printf("the end of this file ");init=0;
for( i=0; i <= DELAY ; ++i );
     opnforrd();offset=0;
     seek(fd,offset,0);
     while ( string[0] != DEL )
{
for (i=0; i <=127; ++i)
   {
      string[i]=getc(fd);
   }
offset +=128;seek(fd,offset,0);
}
     offset -= 128;fclose(fd);string[0]='0'; /* Purge string[0] */
/**/ replace:
   for ( ; ; )
      {
cls ();locate (4,10);printf("Mail List\n");o_pen ();locate(6,6);
printf("Enter Company (if applicable) _____¦");
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 (6,36);gofor(compny,LEN1-1);locate(8,17);gofor(name,LEN2-1);
locate(10,19);gofor(street,34);locate(12,29);gofor(city,32);
locate(14,18);gofor(phone,10);
seek(fd,offset,0);
fprintf(fd,"%-25s%-25s%-35s%-33s%-10s",compny,name,street,city,phone);
if ( ch == 'R' )
  goto skip;
seek(fd,offset+128,0);
fprintf(fd,"%c%c",DEL,EOF); /* insert delimiter & end of file marker */
skip:init=0; /* jump here after replace function, force init */
seek(fd,0,2);fclose(fd);locate (16,4);
printf("Enter 0 to exit, any other character to continue ");
gofor(men,1);
offset +=128;
if ( men[0] == '0') /* test for more input activity */
break;
      }      /* end of for loop */
     break;   /* two "break" statements necessary here, one for "for" loop
      and one to delimit the "case" */
    case '4':
opnforrd();open_p();
offset=0;
while ( c[0] != DEL )
{
seek(fd,offset,0);
lprint ();offset+=RECORD;
}
fclose(f2);c[0]='\0'; /* close file, purge c[0] */
break;
   case '5':
     cls();locate(4,1);
     printf("You have selected the 'Sort' option which has not yet\n");
     printf("been implemented. Press RETURN for menu ");
     gofor(men,1);
     break;
      }  /* end of switch loop */
   } /* end of menu do - while loop */
   while ( men[0] != '6');
}   /* end of main */
#include "stdlib.c"
```

Listing

```
 /* --- "CPOWER" by John P. Lewis --- */
 /* *** source code for CPOWER, PART 5 */

unsigned fd, offset, loc, q, f2;  /*global variables to be used
by functions and main, f2 and men[2] appended */
int init;
char ptr[LEN1], string[SIZE], c[RECORD], dummy[2], men[2];
```

```
open_p()
   {
   f2 = fopen("lst:","w");   /* "open" printer */
   }
lprint ()
  {
  int i;
  char ch;
/* putc(27,f2);putc(21,f2); */ /* Tandy printer line feed defeat */
  seek(fd,offset,0);
  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 <=116; i++)
     {
     putc(c[i],f2);
     }
  putc('\n',f2);putc('\n',f2);
   if (men[0] != '4')
     {
     printf("\n\tCopy (y/n) ");
     gofor(dummy,1);ch=dummy[0];
     ch = toupper(ch);
     if (ch == 'Y')
     lprint ();
     }
  }

main ()
  {
/* code deleted */

  case '1':

/* code for menu option 1 deleted down to submenu */

printf("You may (E)dit, (R)eplace, (P)rint, (C)ontinue\
 or (M)enu ");
gofor(men,1);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); /* close printer */
```

```
break;
    /*case 'C':  deleted */
case 'R':
goto replace;
break;
     /* edit code deleted down to case '4' */

  case '4':
  locate(20,4);
  printf("City, State, Zip: _____!");
  locate(20,22);gofor(city,32);seek(fd,offset+85,0);
  fprintf(fd,"%-33s",city);  /* fix */
  goto done; /*  ^ note adjusted constant here */
  case '5':
  locate(20,4);printf("Phone: _____!");
    locate(20,11);gofor(phone,10);seek(fd,offset+118,0); /* fix */
    fprintf(fd,"%-10s",phone);       /*    ^ note adjustment */
/* code deleted */
  case '2':
     cls ();locate (4,1);j=1;
     opnforrd ();offset=0;
   while ( c[0] != DEL )
      {
      seek (fd,offset,0);
     for ( i=0; i<=LEN1+LEN2-1 ; ++i)
  c[i] = getc(fd);
if ( c[0] > ' ' )
{
for ( i=0 ; i <= LEN1-1 ; ++i, ++j )
  putchar(c[i]);
}
else
{
for ( i=LEN1 ; i <= LEN1+LEN2-1 ; ++i,++j )
putchar(c[i]);
}
  if (j == 76 )
     {
    printf("\n");j=1;
     }
offset += RECORD;
if (j > 24 && c[0] != DEL )
{
putchar(',');putchar(' ');
}
       }  /* end of while loop */
       printf("\n\tEnd of records\n");
      printf("\n\n\tPress <RETURN> to return to menu ");
      gofor(dummy,1);
      fclose(fd);offset=0;c[0]='\0'; /* reset offset, purge c[0] */
      break;
 case '3':
    /* code deleted */

     offset -= 128;fclose(fd);string[0]='0'; /* Purge string[0] */
/**/ replace:
   for ( ; ; )
    /* input module code deleted */
```

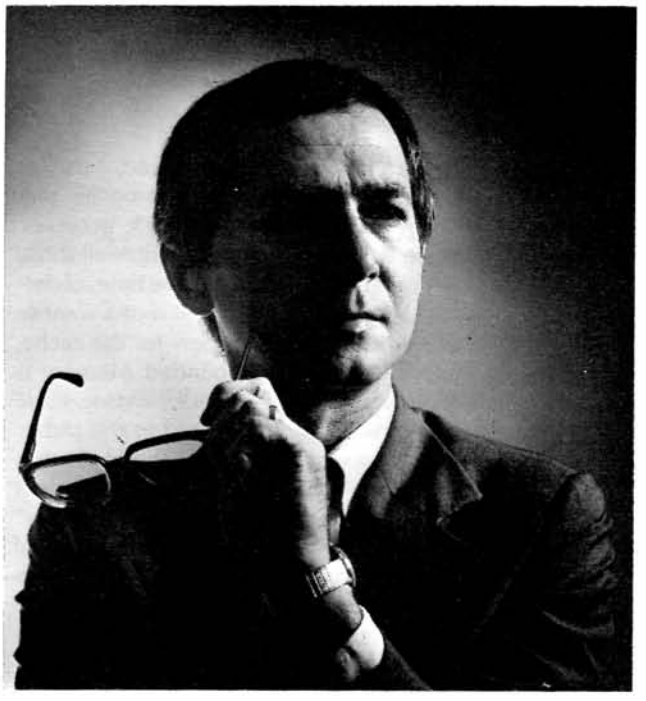


```
    case '4':
opnforrd();open_p();
offset=0;
while ( c[0] != DEL )
{
seek(fd,offset,0);
lprint ();offset+=RECORD;
}
fclose(f2);c[0]='\0'; /* close file, purge c[0] */
break;
   case '5':
/* not yet implemented */
     break;
      }  /* end of switch loop */
   } /* end of menu do - while loop */
   while ( men[0] != '6');
}   /* end of main */
#include "stdlib.c"
```

*

MOVING?

Please let us know 8 weeks in advance so you won't miss a single issue of REMark!



Mainstream Computing

Joseph Katz
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Columbia, SC 29205
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Oh sure, by the time I get this issue of the magazine it will be July and I'll have caught up with most of the things I was supposed to do in May. Right now, though, it's the middle of May and I'm still working on the last few of my March deadlines. I once conceived the idea of "Amnesty Day," when the calendar would be rolled back about ninety days. At 11:59 P.M. last night, for example, I'd be calmly sipping tea as Friday, 15 May, clicked into Monday, 23 February. Writers of the world would canonize me as their patron saint and academics speak of me with similar reverence. I can't imagine what programmers or editors might think because the former babble in strange tongues and the latter always rave hysterically over the phone. At least such is my experience with those I know. I'll probably never find out how the world will honor me for Amnesty Day, because I haven't yet gotten around to putting the details on paper. It's all clear in my mind, though. Right now, I'm in a bit of a hurry to catch up on what I was supposed to do last deadline and a few others besides.

A Backwards Glance At Microsoft *Windows*

You may recall my talking, when we met, about my infatuation with the idea of Microsoft *Windows* and my disappointment at the actual meeting. My chief lament was that *Windows* took so long to do so little. All I had then, of course, was the first version of *Windows*, its included applications, such as *Write* and *Paint*, and an XT-compatible Z-152 on which to run them. Yawn.

So when Microsoft sent me version 1.03 of *Windows*, I gave it a place on the biggest shelf in my office: where I store all the stuff I'll do just as soon as I get caught up on my current deadlines, right next to a nearly-complete letter I am writing President Eisenhower to complain about Vice-President Nixon. (It's a scorcher.) I masterfully restrained my feverish excitement about the new version of *Windows* and went on with my daily life.

Aldus' *PageMaker*

Then my Apple *LaserWriter* came and so did Aldus' *PageMaker* for the IBM PC. Ah, with what deceptive calmness I say that. In fact I was burning, yearning, hungering — even lusting — after *PageMaker*. It was why Messrs. Heath and Zenith, with remarkable prescience, invented microcomputers for me. I'm writing a longish essay on *PageMaker*, so I'll keep the details for it. But here's the punch line: If you're really interested in producing a "page-oriented" publication (such as an advertisement or magazine or manual) on an IBM-compatible computer, you absolutely need *PageMaker*. It's a page-makeup tool, on the analogy of a graphic designer's pasteup desk, that lets you build your publication page by page from the output of various word-processing and graphics programs. *PageMaker* works such wondrous magic that, since it appeared for our computers a couple of months ago, I've been spending every free moment working with it. That's a big reason why I'm behind on everything else right now.

PageMaker runs under Microsoft *Windows*: it's a *Windows* application. "Argh," I thought, when I got the first announcement last fall, "I was afraid of that." *PageMaker* was introduced first for Apple's Macintosh in 1985 and — or so think one-third of us in this typical American household — was the only reason to buy that computer then. The Macintosh operating system has an object-oriented graphics interface, instead of our laconic A> prompt, to programs that access interchangeable data. So a MacMoron can mouse around the same file doing text and graphics operations on it without shedding a drop of perspiration or expending an erg of thought. It's not a data-processing approach to computing. At this very moment, I'm hunched over this keyboard working, Janet is off at the University fooling around with *MacPaint* and *MacWrite* to do some stuff in *PageMaker* on the Mac. IBM-compatible computers, these last generations at least, are oriented to data-processing: remember, it's "International Business Machines." So *Windows* is a way to

superimpose the Macintosh environment as a layer on quite a different one. *Windows* is really kind of an "emulator," like those that allow you to run CP/M programs on MSDOS: a program runs under *Windows*, which in turn runs under MSDOS. Slow. All that negotiation takes time.

But I had spent years in something like unsatisfied pubescence, mooning over midnight fantasies of something like *PageMaker*. When the box arrived all my pent up energy erupted. I opened the new Windows and determined to find ways to make it hustle. I found them. Windows and all the applications that run under it move at a speed that dazzles onlookers. Really.

A Glance Through *Windows* Today

I don't know the difference between *Windows 1.03* and the earlier version that bored me, but I confess I don't really care right now. Right now, I have *Windows* on my AT-compatible Heath H-241 running at 6MHz, and — as some of my less articulate students say — you oughta see that sucker move!

One of the great moments in my life this Spring was when Janet elbowed me away from the '241 because *PageMaker* ran so much faster on it than on the Mac that she wanted to play. Bill Crowe, a Hewlett-Packard programmer, had reminded me most gently a few hours earlier that Windows knew how to use Expanded Memory. "Gadzooks!" I exclaimed, "Methinks I remember now." So I had at it.

The "it" I "had at" was 2 MB of Expanded Memory over and above the 640 KB of base memory MS-DOS can address, thanks to Boca Research's inexpensive memory boards that work so well in the H/Z-241. Boca's *TophAT* fills in the 512 KB base memory IBM, Heath, and Zenith supply on the motherboard of a standard AT-compatible, bringing it up to the 640 KB it should have had in the first place. Boca's *Bocaram* board adds 1 MB of Expanded Memory, and a 1 MB *Bocaram* daughter board that snaps into the first board brings the Expanded Memory to a total of 2 MB. Oh my, how nicely *Windows* uses that Expanded Memory. Thank you, Bill. But you have to tell *Windows* to use the Expanded Memory, and how. Indeed one of the *Windows* manuals mumbles something about a RAM disk program (RAMDISK.SYS) supplied on the distribution disk for Intel's *Above Board*. Who reads manuals from cover to cover? You don't, and I wouldn't believe you if you said you did. From cover to cover? Nah, I don't believe that. At any rate, you don't want to move the *Windows* programs to the RAM disk — which is usually the way to employ memory that emulates a disk drive.

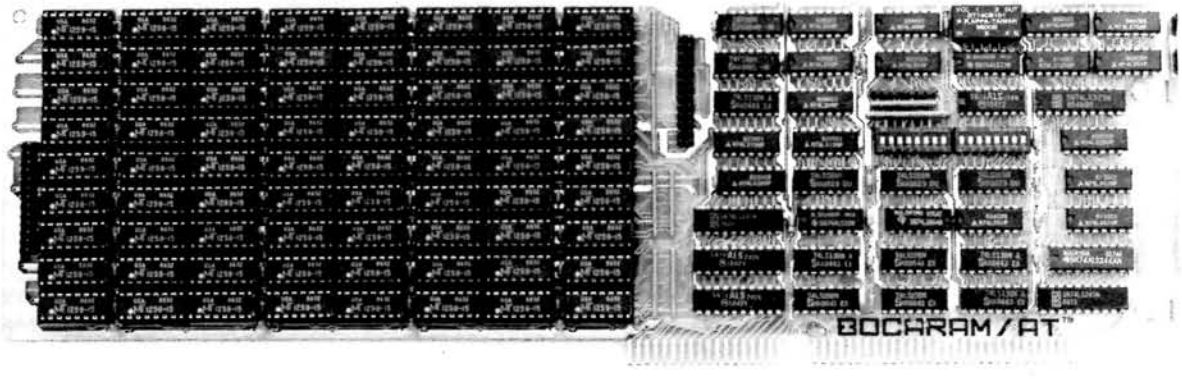
What you want to do first is tell *Windows* to write its temporary files to a section of Expanded Memory you reserve as the RAM disk. That use of electronic disk emulation absolutely supercharges *Windows*, because it has to do so much memory-intensive stuff that it writes several temporary files and continuously updates the whole series of them whenever you do anything at all in a *Windows* application program. Move the cursor even a tad (a "tad" is the basic increment of everything in computing) in *Windows Paint*, for example, and watch the access light on your hard disk flick on and off like the tail lights of a jalopy jiggling along an unpaved road. Those flickers are the visible signal that *Windows* is reading and writing files. So the trick is to point *Windows* to write those files on a RAM disk. But since *Windows* and its applications themselves require a great deal of RAM, you want the RAM disk in Expanded Memory.

I haven't had the time to determine an optimum size for that Expanded Memory RAM disk yet, so I arbitrarily decided on 1MB. It's Drive E on my H-241, which has two hard disk drives as Drive C and Drive D at the moment. Before I run *Windows* the first time in any computing session, therefore, I give MSDOS this command:

```
SET TEMP=E:\
```

Zoom!

To pick up a little more speed, I use an Expanded Memory cache program that keeps track of frequent disk accesses. Since *Windows* reads and writes all those temporary files virtually all the time, cacheing saves time. Of course, I didn't want to use precious base memory for the cache, and all I have for Expanded Memory is Professor Frank Lozier's *EMMCACHE .COM*, which he dedicated to the public domain. It worked well with the 2 MB setup I've described. Then, Boca Research sent me its new and exciting "Swiss Army knife" *Bocaram/AT* memory board with 1MB of RAM, and I was eager to see how *Windows* would work on the H-241 with 3 MB of Expanded Memory, so I did a quick installation of the *Bocaram/AT*. (I call the *Bocaram/AT* a "Swiss Army Knife" because it can have 2 MB on the main board, 2 MB on a plug-in daughter board, and you can assign any part of that memory to any of the following types by selecting switches on the board: Lotus/Intel/Microsoft *EMS 3.2* Expanded Memory (Intel's *Above Board* type); Extended Memory as required by Xenix; base RAM backfill without the need for a memory topper like the *TophAT*. It's incredible. I like the Boca Research products I'm using.) Immediately, I lost my memory: Professor Lozier's *Emmcache* departed for Tijuana with it. I subjected the problem to careful scrutiny and finally decided that something was wrong. I haven't had time to figure out what yet. If you know the makers of any Expanded Memory disk cache programs, you'd be doing all of us a favor by pointing them at me. With the 2 MB setup, though, the cache program used



Boca Research's new *BocaRAM AT* — The "Swiss Army Knife" memory board.

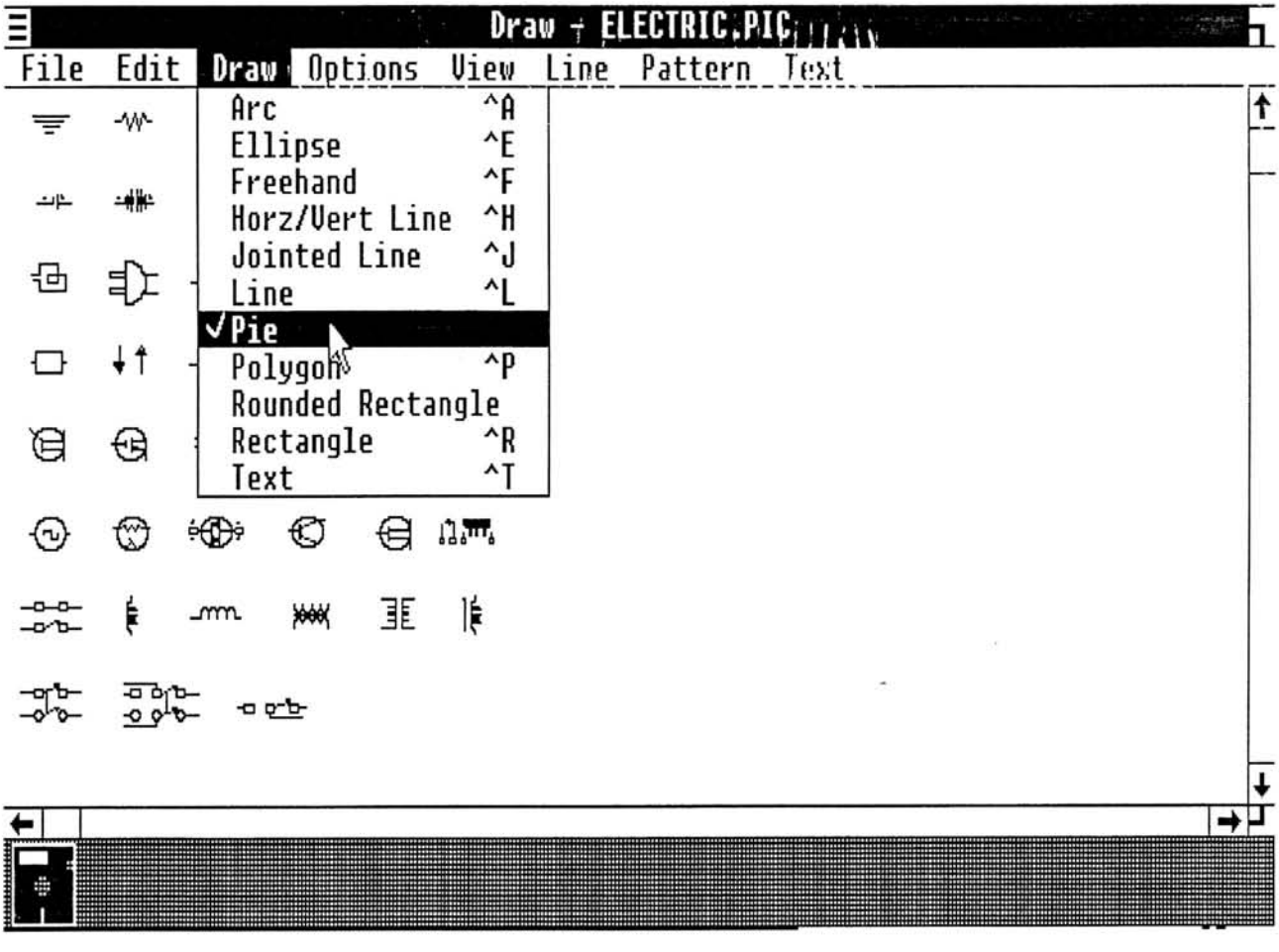
together with the RAM disk made *Windows* go Zooom!

This was the stage at which Janet became a tad (the "tad" is the smallest increment in marriage too) confused and mistook my *PageMaker* running on my H-241 as somehow having become her *PageMaker* running on what had transformed itself magically into her H-241. I gave up and watched television until she went to bed. Then I continued the job of fine tuning my H-241 for *Windows* and *PageMaker*.

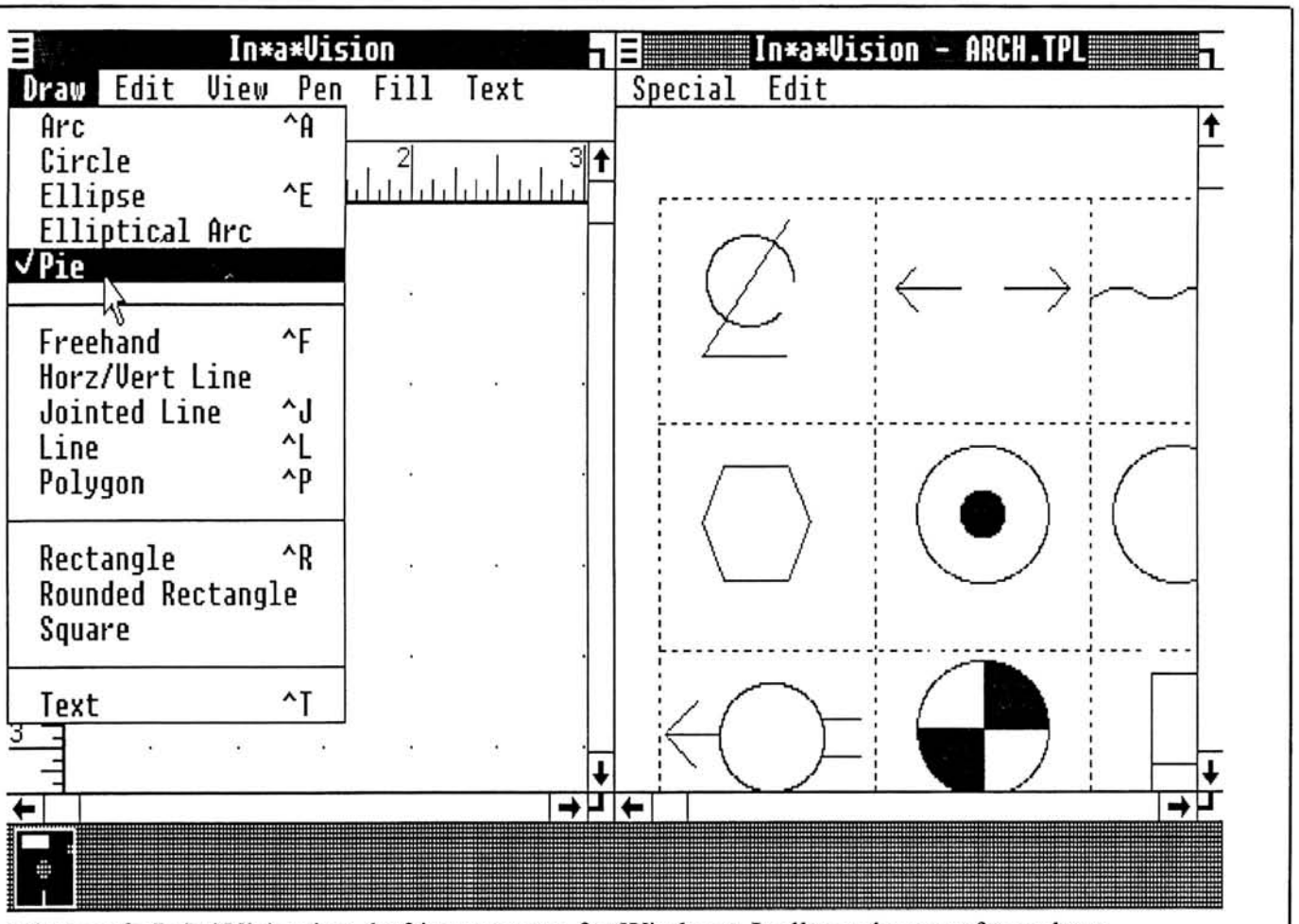
It involved running a screen speedup program. In case you've lived only under the shelter of Heath and Zenith, you may not be aware that IBM's color displays are a tad (the smallest increment for measuring blunders too) buggy. They flicker — some describe it as "snow" — whenever the screen is rewritten, as it must be when you do anything at all that affects what you see. Programmers who write for IBM's own computers, therefore, intentionally slow down screen output. The need to deal with such craziness probably has something to do with the reason why programmers babble, often — it seems to me — in a voice like Kermit, the Frog's. Other programmers, therefore, write utility programs to undo the intentional slowdowns introduced by the first set of programmers, because it's not needed on IBM-compatible computers produced by manufacturers with some experience in video and who have their heads screwed on the right way most times. I do not know if those programmers who undo the work of those other programmers sound more or less like Kermit when they speak. My guess is that many of them are really the first set of programmers, moonlighting to set things right. If so, they are probably so exhausted that it's probably not worth while encouraging them to speak. I've tried *FASTSCR .COM* and *ZENO.COM*, two public domain programs, and both work nicely with my Zenith EGA board and NEC Multisync monitor. Since *Windows* spends an awful lot of time rewriting the screen (graphics, remember?), a program like this helps make it Zoooom!

A few days after I dug into *PageMaker*, when I came up to catch my breath, a realization struck like a bolt of lightning. I hadn't understood what *Windows* was really about until I began using *PageMaker*. *PageMaker* is the first ***real*** *Windows* application.

I don't want to upset anyone by that statement, so I'll explain a little about ***one*** thing I mean. A few minutes ago, in describing the different orientations of Macintosh and IBM-compatible computers, I mentioned the interchangeability of data among programs and spoke about Janet using *MacPaint* (a graphics program) and *MacWrite* (a text program) on the same file. She could use other programs on that file too: there are datafile standards for Mac programs. There aren't for MS-DOS programs. Every programmer is free to invent his own, and of course every programmer knows The Right Way to do it, which is why you can't pop native word processing files from *WordPerfect* into *WordStar*. Files produced by graphics programs are subject to even greater variety, which is why you can't touch up a *PC Paintbrush* picture with Microsoft *Paint*. *PageMaker* accepts documents and graphics from most major pro-



Micrografx Windows Draw is a full-featured drawing program that runs under Microsoft Windows.



Micrografx In*a*Vision is a drafting program for Windows. It allows the use of templates.

grams. It integrates them all into any publication — seamlessly and effortlessly. That's the way *Windows* applications should perform. The concept, incidentally, has been made formal under *Windows* as "Dynamic Data Exchange." You'll probably be seeing that term in other magazines.

Micrografx *Windows Draw* And *In*A*Vision*

Micrografx's *In*A*Vision* was the first application program to run under Microsoft *Windows*. Since Micrografx had *Windows In*A*Vision* available before Microsoft released *Windows* itself (it's shipped with a runtime version of *Windows* on which you can run only *In*A*Vision*), I suppose a troublemaker might say Microsoft brought out *Windows* after Micrografx paved the way with *In*A*Vision*. No intelligent computer writer would say such a thing publicly. I certainly won't, and don't you say I did.

*In*A*Vision* and *Windows Draw* both are "object oriented" graphics programs. You build the finished graphic by combining objects: basic forms such as lines, arcs, boxes, and circles you can stretch, squeeze, move, copy, and otherwise manipulate. In contrast, "paint" programs anipulate individual bits, the way a ***pointiliste*** painter like Seurat laid down one dot of color next to another to render an impression of a scene. You get fine control with a paint program, but it's a hellish way to do a floor plan. Draw programs like *In*A*Vision* and *Windows Draw* are much better for such purposes.

*In*a*Vision* is a CAD ("Computer Assisted Design") program. I don't know how it stacks up against *AutoCad* (not a *Windows* application) or other high end CAD programs. *In*A*Vision* is certainly powerful enough to treat as child's play all the things I do with a CAD program: mostly technical drawings to illustrate articles and manuals, and basic floor plans. Certainly, too, *In*A*Vision* is much more powerful than the demands I place on it. Even so, I won't give it up willingly because — to be absolutely blunt about a point you already have surmised — *In*A*Vision* makes me look good. I don't know how to draw. *In*A*Vision* lets me turn out illustrations that look as if I do. A trick I've learned is to break my drawings into component parts, build them individually, and save them as *In*A*Vision* "templates." For *The LaserWriter Connection* manual, for example, I did templates of hood shapes, connectors, and pinouts you'll see illustrating this column from time to time in the future. *In*A*Vision* allows me to call a template window from the major drawing, copy one of the templates from a sheet of them, and paste it into the major drawing for further manipulation. Very nice.

I've heard someone describe *Windows Draw* as a scaled-down version of *In*A*Vision*, but he was absolutely wrong. It's the same basic concept tailored for general business purposes instead of a draftsman's needs. The custom fit of *Windows Draw* makes it much easier to handle for general drawing use. In addition, *Windows Draw* imports *1-2-3* and *Symphony* graphs from Lotus's PIC files. You can massage those childish picts into graphics suitable for public view, including — if you own *PageMaker* — into forms suitable for something like an annual report.

In that connection, Micrografx has announced *Windows Graph*, of which I've just seen a pre-release copy, and I think you should keep your eyes open for it if

you want really sophisticated business graphing in the *Windows* environment — which, I blush to say now, turns out to be a grand place to have it.

Micrografx *In*A*Vision* and *Windows Draw* are grand programs with grand features. I won't advocate that you run out and buy *In*A*Vision* unless you need that kind of full-featured CAD program. (I find it handy.) I most certainly do advocate that you run out and buy *Windows Draw* if you need a first-rate drawing program, even if you don't own Microsoft *Windows*. (Remember it comes with a runtime version of *Windows* so you don't need the complete version.) I have a shelf full of inexpensive draw programs, modestly priced and worth less. *Windows Draw* is a tool that I think is worth more than the price. If you're really interested in desktop publishing, consider *Windows Draw* one of your essential tools.

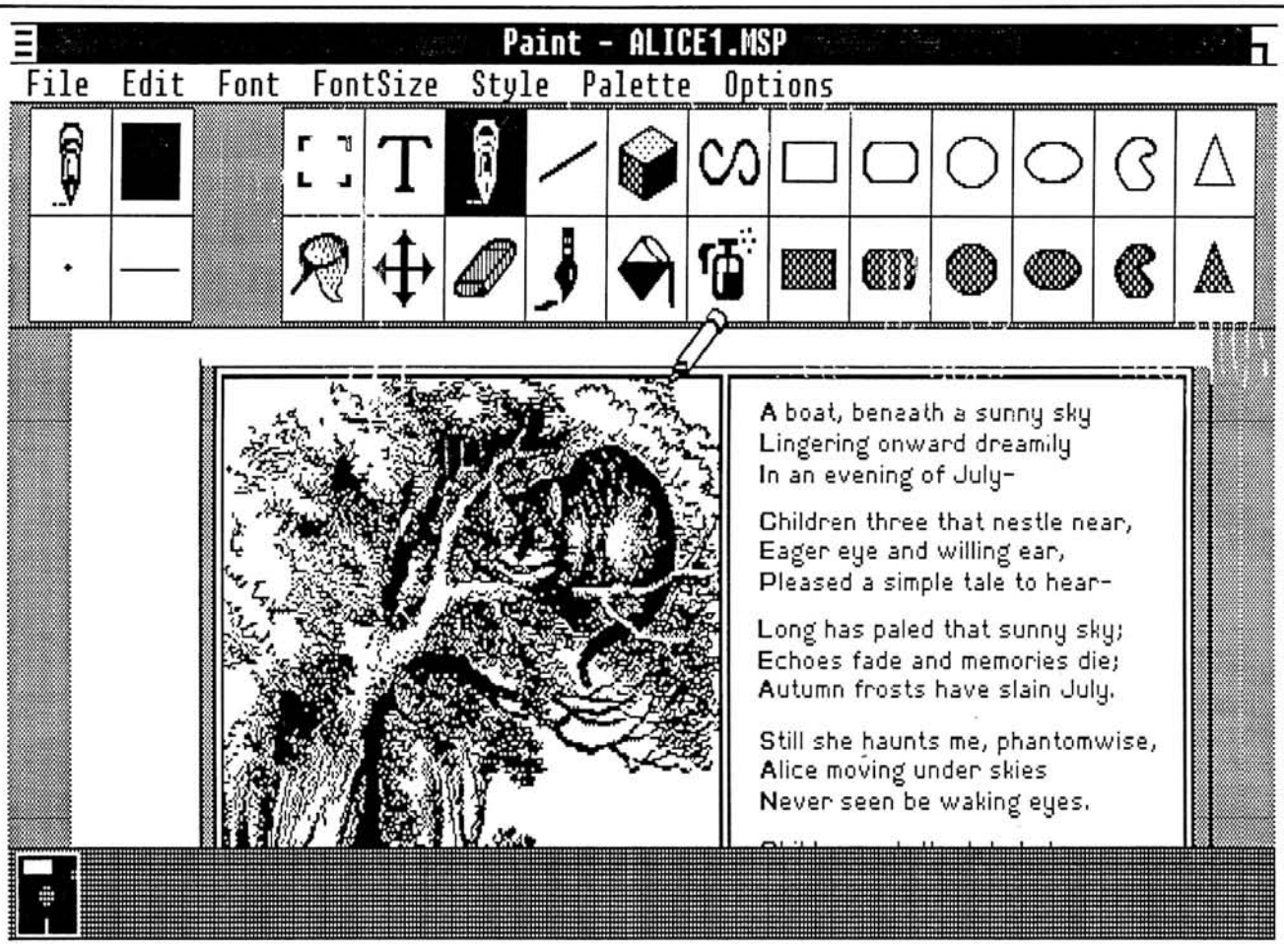
Micrografx supports its products well. They don't throw their software on the table with a take-it-or-leave-it attitude. Whether or not you can draw, for example, you'll probably appreciate the Micrografx clip art packages. There are two right now: one of general subjects you can use in either *Windows Draw* or *In*A*Vision*, and one of CAD templates more appropriate to *In*A* Vision*. I can't draw, so I want all they produce. If you need compatibility with *AutoCad*, you'll be interested in knowing about *Windows Convert*, a conversion program that is supposed to convert *AutoCad* files for use with *In*A*Vision*. I don't have access to *AutoCad* so I haven't had the occasion to try *Windows Convert*.

Owners of the full Microsoft *Windows* system should be careful when installing *In*A*Vision* and *Windows Draw*. Don't overwrite the full system with the runtime *Windows* that accompanies these two programs: they're for use only if you don't have the full system. You can't run other *Windows* applications with that runtime system.

Be careful, too, that you understand the difference between "Clear" and "Delete" in these programs. "Delete" removes the one object you've selected for an operation. "Clear" zaps the entire drawing, preliminary to starting a new one. Yes, the manual explains the difference well; yes, there is good warning before the drawing is zapped by a Clear; and yes, you have to confirm the Clear. But the term "Clear" is used by other programs, like *PageMaker*, for the less destructive action that is "Delete" in the Micrografx programs. I know one person who zapped an entire *In*A* *Vision* drawing thinking he was deleting a single object in it. There's always some fool big enough to defeat the foolproofing of any computer program.

If you own an Apple *LaserWriter* or other *PostScript* laser printer, you get a nice bonus with *In*A*Vision*. Its *PostScript* driver is more efficient than the one currently supplied by Microsoft with *Windows* Version 1.03, so use the Micrografx driver instead of Microsoft's for all your *Windows* printing.

No matter what printing device you use,



A Macintosh MacPaint file converted to Microsoft Windows Paint with PC-Quik Art's The Graphics Link. No wonder Alice thinks she's in wonderland. She is.

reflect on the implications of something I said earlier about Microsoft *Windows* being an environment superimposed on MS-DOS. *Windows* applications, therefore, do all I/O ("input/output") through *Windows*, and *Windows* uses drivers that you can install, uninstall, and choose amongst. So if Microsoft *Windows* supports your printer, plotter, or whatever, any *Windows* application supports it too. That's why I use Micrografx's *PostScript* driver instead of the one supplied with *Windows* Version 1.03: ***all*** my *Windows* applications benefit from it. Micrografx generally supplies excellent drivers with these two programs. If you own a program with a better *Windows* driver for your equipment, however, use it instead. That's nice.

PC Quik-Art's *The Graphics Link*

I have many different paint programs and every single one of them uses a different file format and that drives me nuts, because none of those files can be imported into any other paint program.

Why do I care as long as *PageMaker* can import files from the major paint programs? It can, but since paint files are bit-oriented instead of object-oriented, you need the paint program to touch up the file. You can crop a paint graphic after it's imported into *PageMaker*, but that's about all. The limitation is not *PageMaker*'s: if you didn't have Seurat or his palette, what could you do to change a Seurat painting, except maybe trim it?

So if I'm putting together a publication with graphics from several different paint programs, I sigh and make sure I have all of them on my hard disk. They consume a lot of hard disk space. When I have a paint file produced by a paint program I don't own, even a sigh won't help. If the graphic needs anything more than cropping, I have to discard it. I can't use it unless I get the paint program that produced it.

A new company, PC Quik-Art, has released or is about to release *The Graphics Link*, a program that converts files from any of these major paint formats to any of the others:

Microsoft *Windows Paint*
Microsoft *Paintbrush/PC Paintbrush*
Macintosh *MacPaint*
BASIC BLOAD/BSAVE
PC Paintbrush Plus
EGA *Paint*
PC Paint Plus
Dr. Halo DPE

I've worked out with the first four formats during the few days since *The Graphics Link* arrived. I don't own either the programs to produce or any files produced from the last four. Of the first four, the only one I can't get to work is the BASIC BLOAD/BSAVE conversion: my fault, probably. PC Quik-Art has toll-free support, which I called for help. I was given good attention and good advice, but to no avail. As I say, it's probably something I'm doing wrong or haven't thought to avoid. The first four conversions work like a charm: fast, accurate, and easy to do.

The program shows a list of the above formats, from which you choose the one for the source file. Then you get another list, from which you choose the format you want for the target file. *The Graphics Link* then shows you a list of files in the current directory with the extension it recognizes for that format. You tag the files you want to convert: press "T" to tag it for positive conversion (for example blacks in the source are blacks in the target), press "R" for negative conversion (so blacks in the source are whites in the target). If you press the ENTER key at this point, the conversions are done batch mode, one after the other. With a Color Graphics Adaptor (or an EGA display), you have the option to view each file first: you see it displayed as it will be converted. Viewing is a useful option for seeing which files need negative conversion. Macintosh files seem to need them. Oh sure, *The Graphics Link* converts from or to *MacPaint* files. Take a look at the Alice illustration. It was scanned by someone into *MacPaint*, I downloaded it from somewhere, converted it with *The Graphics Link* to a Microsoft *Windows Paint* file, and popped it into *Windows Paint*. I have a couple of public domain programs that convert from *MacPaint* to *Windows Paint*, but none of them go the other way.

Logitech's *Logimouse C-7*

Of course, you don't absolutely need a mouse with Microsoft *Windows*: you can train yourself to use the keyboard instead. Of course, you probably could also train yourself to pound nails into a board with your head, instead of using a hammer. Don't ask me which is the more painful make-do: I'd have to think carefully.

One thing I've been feeling guilty about a long time is using Logitech's *Logimouse C-7* and only making casual reference to it from time to time. Part of the reason is I don't know what to say about a mouse. I've used others — given them a good try — but they don't feel right to me. They don't fit my hand, or they require an external power supply, or something. So I figure that I'm just not a mouse person, put them away for a while, and reconnect the *Logimouse C-7*. It works for me.

If a program has its own mouse driver with an option to install the *Logimouse C-7*, I choose that option: Microsoft *Windows* has it. If the only option is to install a Microsoft *Mouse*, I choose that instead. Either way, the *Logimouse C-7* works nicely. If there's a program that can benefit from a mouse but doesn't have its own mouse driver (John Friend's great shareware program *PC Outline* is one of those), I write a mouse menu with my word processing program according to the instructions in Logitech's manual, compile that source code with the software accompanying the mouse, run the *MOUSE.COM* driver, and use my *Logimouse C-7*. If I get a mouse menu for the Microsoft *Mouse*, I use it with *MOUSE.COM* instead. It all works nicely and unobtrusively and what else can I say?

I have two gripes. The mouse cable comes out the head of the mouse (the wrong place, I think) instead of the back (the right place, I think). The cable is too short for my cluttered work area, so I made an extension for it.

It would be absurd for me to make much of those gripes, because I have treated the *Logimouse C-7* so badly I half expect Logitech or the ASPCA to accuse me of mouse abuse. I drop it a couple of times whenever I use it; much of the time I have to pull it by its cable out from a stack of stuff under which it has burrowed; I roll it over tacky coffee goop mixed with spilled cigarette ash; I've only cleaned it once, a few days ago when Janet said it was just too filthy to be seen by visitors, and all I did then was clean the housing with Fantastik spray and wash its little rubber ball with soap and water. My Macintosh friends lament the time they spend cleaning the monorchid creature packed with their computers and lecture each other on its need for a fastidious environment. I sort of slink away. My *Logimouse C-7* seems to thrive on coffee and cigarettes. It always works.

I've heard through the grapevine that Logitech soon will introduce a new breed of mouse. What impelled me to write about my *Logimouse C-7* now is that I wonder about its descendant. Will it be even heartier? If this new Logitech mouse has a long cable emerging from the proper end, I want it. But if what they mean by a new breed is something stronger and more powerful than my *Logimouse C-7*, I'm going to have a couple of friends around for protection when I open the box. What if

this mouse demands martinis and discovers I don't drink? What then?

The LaserWriter Connection

If you want to do serious desktop publishing right now, you need a good laser printer. The best ones I've found, as you know, are the Apple *LaserWriter* and Apple *LaserWriter Plus* laser printers. They're *PostScript* printers and they're about the least expensive *PostScript* printers available. You have special reason — because I've been saying so here for months — to know that the *LaserWriters* work marvellously well on IBM-compatible computers. Smile knowingly at people who say they don't, or that you'll have to go through hell to get one of the LaserWriters to work with an MS-DOS computer.

The LaserWriter Connection is a $40 software package, including a well-written instruction manual, that makes connecting a *LaserWriter* or *LaserWriter Plus* to any IBM-compatible computer easy as pie. Sometimes I think it's worth buying a *LaserWriter* just so you can have the pleasure of experiencing *The LaserWriter Connection*. I wouldn't think of being without it, and I feel sad when I think about the billions of people who have not yet bought it. I can't understand how William Shakespeare managed to get a line in print without *The LaserWriter Connection*.

If you think I'm being a bit obvious, I'll try to tone things down next time. Take a look at the ad in this issue of *REMark* though. Pretty, isn't it? It was printed on an Apple *LaserWriter* connected to an H-241 with *The LaserWriter Connection*!

Whoops. Sorry. It sneaked out before I could stop it.

Products Discussed

Microsoft *Windows* (Version 1.03) Microsoft Corporation 16011 NE 36th Way Box 97017 Redmond, WA 98073 (800) 426-9400	$ 99.00
Bocaram/AT 2 MB board with 1 MB RAM Boca Research 6401 Congress Avenue Boca Raton, FL 33431 (305) 997-6227	$395.00
Windows Draw	$199.00
*In*A*Vision*	$499.00
CAD *ClipArt*	$ 99.95
Windows ClipArt	$ 99.95
Windows Convert Micrografx, Inc. 1820 N. Greenville Avenue Richardson, TX 75081 (800) 272-DRAW	$ 99.95
Logitech *Logimouse C-7* Logitech, Inc. 805 Veterans Boulevard Redwood City, CA 94063 (415) 365-9852	$ 99.00
The Graphics Link (Version 1.0) PC Quik-Art 394 S. Milledge Avenue Athens, GA 30606 (800) 523-1796	$ 99.00
Joseph Katz's *The LaserWriter Connection* (Version 1.0) (HUG P/N 885-8050-37) Heath Company Parts Department Hilltop Road St. Joseph, MI 49085 (616) 982-357	$ 40.00

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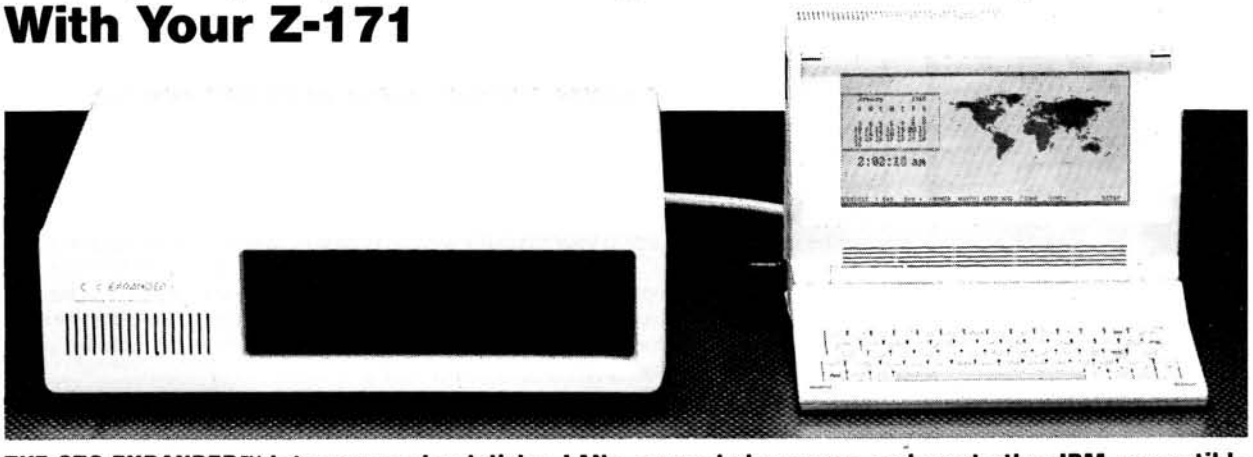

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MASTERKEY
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Jim Buszkiewicz
HUG Managing Editor

Much like the ability of the old skeleton key to open just about any door that had a skeleton key keyhole, TranSec's MasterKey program will enable you to 'unlock' just about anybody's diskcopy protection scheme. While no copy-busting program can defeat EVERY method of copy protection (with all the different schemes available), MasterKey comes close!

Unlike most other disk copying programs, MasterKey actually removes the copy-guard scheme, and makes a version of the program which can be copied by normal means (such as the MS-DOS 'COPY' command)! MasterKey was written to specifically defeat the SuperLok (tm) and ProLok (tm) copy protection schemes. These two methods of copy protection are used by the manufacturers of most higher priced and professional pieces of software, such as Dbase, Lotus, Diagraph, etc. (see the list at the end of this article). MasterKey comes packaged in an attractive, clear plastic box. To the unknowing individual (such as myself), this box can be deadly! Incorporated within this container is a locking system called SOFTLOCK (tm). Upon opening the box, the first inclination is to remove the manual which appears to be setting on top of the disk. Don't! If you tug too hard, you'll tear the back cover which is securely locked (along with the disk) in place by another plastic flap. Well, I didn't tear the back cover (at least too bad), but "how DO you unlock this blasted thing?". After a minute of prying, tugging, and pulling, a sheet of paper fell out (from where I don't know). Yes, it was the key (instructions) to SOFTLOCK (tm). You simply pry up on the plastic flap (breaking the locking tabs), and remove the disk. Apparently, the manual was meant to remain in the box, for if you remove it, the back cover turns out to be much larger than the rest of the manual. Aesthetically pleasing in the box, but unfortunately, functionally useless. I wound up throwing away the front and rear manual covers. Fortunately, use of the software itself involves a lot less hassle! I would suggest, however, that TranSec Systems (tm) consider other means of packaging.

After an initial title page, and disclaimer, MasterKey signs on with its first of twelve menus! Basically, these menus consist of the names of roughly 80 different programs MasterKey will unlock. In addition to specific programs, MasterKey also has selections to unlock programs which are not listed. These 'generic' unlock selections work only on the SuperLok (tm) and ProLok (tm) copy protected disks.

TranSec has included in MasterKey, two analyzer selections which will identify whether or not a disk is protected by SuperLok (tm) or ProLok (tm). In addition, MasterKey has the capability of rebuilding the 'EXE' file header when the copy protection scheme destroys them.

When analyzing a disk for the ProLok (tm) protection scheme, you must specify the loader 'EXE' file to examine. This information isn't always handy, and as a convenience, one of MasterKey's command selections allows you to list all the files on a disk, including all the attribute bits, number of clusters used, and the number of bytes used in the last cluster, for each file.

MasterKey itself is NOT copy protected. However, when it is copied from the distribution disk using the standard DOS 'COPY' command, the serial numbers it signs on with, are changed! So, if you ever need to call TranSec Systems for help (which you normally wouldn't) with MasterKey, have your original serial numbers handy! I have discovered that using full disk duplicating programs, such as COPYIIPC left the serial numbers in place. This method is quite useless, however, when copying MasterKey to your hard disk.

As mentioned earlier, MasterKey is NOT a disk duplicator, such as COPYWRITE or COPYIIPC. MasterKey actually performs 'surgery' on the files that are copy protected, and makes them executable and copyable in a normal fashion. Besides

MasterKey's generic ability to remove copy protection from SuperLoc (tm) and ProLok (tm) disks, currently, there are roughly an additional 80 major programs in MasterKey's unlocking menu. The following list includes some of those programs:

1-2-3, 1-2-3 Reprwriter, Autocad, Cap, Chartmaster, Cupper, Courttrack, Cp2a, Data Base Manager II, Dbase III, Dbase III +, Diagraph, Discovery Litigation Support, Disk Optimizer, Dollars & Sense, Double Dos, Erunacad, Fastback, Financial Analysis For Farmers, Financial Profiles, Framework, Framework II, Fund Master-TC, Graphwriter, GSS Arab Word, Harmony, Harvard Total Project Manager, IBM Filing Assistant, IBM Reporting Assistant, IBM Writing Assistant, Insearch, Interceptor IV, Intercom 102, Managing Your Money, Mapmaster, Microsoft Word, Minitab, Multilink Advanced, PBS, PCFocus, PCInformation System, PCLink, PFS Access, PFS File, PFS Graph, PFS-Plan, PFS Report, PFS Write, Picture Perfect, Pluto, Print Master, Quicken, Realia Cobol, Real CICS, Redboard, Screenio For Cobol, Sign Master, Smartwork, Softbol II Runtime System, Softbridge Financial Planner, Spectra Business Systems, SPSS, Star Trek: The Kobayashi Alternative, Symphony, Thinktank II, T-Bond Trading System, Taotex, Versatile Report System, What's Best, and many more.

To quote TranSec Systems, "Frankly, this program isn't for everyone. It is intended for users with an extensive library of copy protected programs who wants the best and most comprehensive copy-busting program available". For more information, contact TranSec systems Inc., 220 Congress Park Drive STE 200, Delray Beach, FL 33345, or call (800) 423-0772. Florida residents can call (305) 276-1500. *

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Beehive Tpr	IBM CP/M86	Otrona	TRS80-4 CP/M
CDR Systems	IMS 5000	PMC MicroMate	Xerox 820
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Turbo Toolbox $45
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SPREADSHEET Corner

Review #1

H.W. Bauman
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As I was planning the new projects for the "SPREADSHEET Corner" readers, I found that many of the projects required more memory than I had (640K RAM). So, I started thinking about getting an AT compatible computer, such as the Z-241. After considering the cost, I decided it made more sense to upgrade my PC compatible Z-151. Once I started to look into what could be done, I found that the recent changes in the fields of spreadsheet and database software had changed to where one might call it a whole new generation of software. The new updates of this software were designed to use the new EMS boards (Expanded Memory System). This EMS would take DOS pass the 640K RAM barrier. This same technique would be required with the AT type computers to get around the DOS 640K problem at this time. The Z-241 would be somewhat faster, but this could be overcome quite easily with some new techniques using RAMdrives. So, I concluded that this updated Z-151-PC path was the way I would go.

I think that the readers of "SPREADSHEET Corner" will find the results of my search interesting. I will spend the next few articles writing about what can be done, what I consider the best changes to make, and some idea of the time/cost vs benefits that would result. I will divide the discussion into three groups:

I. How the new memory expansion boards give the PC compatible computers the ability to push past the 640K RAM limit. There are two slightly different techniques (EMS and EEMS) that I will discuss.

II. New software that will no longer be limited by the 640K memory barrier by working with the new memory boards using this EMS technique. Some of the software that was available to discuss follows:

   A. LOTUS 1-2-3 Release 2 Upgrade.
   B. LOTUS Symphony Version 1.1.
   C. Ashton-Tate Framework II.
   D. Computer Associates SuperCalc3 Release 2.1.
   E. Ashton-Tate dBASEIII Plus.
   F. Quarterdeck Office Systems DESQview.
   G. Microsoft Windows Version 1.01.

III. Other hardware

   A. Enhanced Graphics Adaptor Board. (EGA)
   B. 8087/80287 number cruncher chips.
   C. Harddisk and RAMdisk memory techniques (not hardware as such but act as hardware).
   D. Enhanced Graphics Color Monitors.

All of the above items will be discussed in some detail in this and following articles. I will not be able to go into enough detail in one article; but, if you are planning on adding new software, hardware or a computer to your system, I would suggest that you wait until you have read these reviews! I will attempt to keep them short, while still covering the main advantages and disadvantages. At the conclusion of the series, if enough readers would like to have me expand on any of the material, I will be glad to do so.

I will start with one software package and one hardware item in this article. I have always been negative on what I called an Integrated Software Package, but Framework II has changed my mind! It is not for everyone, but it will do nearly everything one would want in an integrated package. The first generation of Framework was BAD!! It used up a lot of memory and required learning new commands for each of the various modules. It just was not worth the effort. I was sold on the LOTUS 1-2-3 Version 1A used along with a separate word processor and a communication/MODEM package.

I am going to write this article using the Framework II word processing module. I will start out using the OUTLINE program:

1 Introduction
  1.1 Expanded memory boards
  1.2 Upgraded software
  1.3 Other hardware
2 Framework II
  2.1 New features
  2.2 Advantages
  2.3 Disadvantages
3 EMS Boards
  3.1 AST EEMS & EMS
  3.2 Above Board EMS
  3.3 JRAM-3 EMS Board
4 Closing

Ashton-Tate's Framework II is the largest improvement step that I have seen in software since the LOTUS 1-2-3 Spreadsheet program. Ashton-Tate listened to the users' negative remarks about the early Framework integrated program and they have come out with a really workable integrated software program for the PC compatible computers. Most software companies make small changes a step at a time, but not Ashton-Tate. They took the bull by the horns and corrected nearly all of the problem areas. These changes were made possible by the EMS (expanded memory) boards as you will see as we discuss the package further. Framework II provides the following:

1. A truly professional word processing capability with a good spelling checker/corrector, a Built-in Mail-Merge, Label Printing, etc. When I learned WordStar (which is not easy, if you haven't tried it), I swore I would never try learning a new word processor. I would remain with WordStar! Well I changed my mind! I am writing this article with Framework II. Writing for magazines does not require or is it desired to have fancy print formatting, but being able to Cut and Paste is a must! Also being able to move blocks of text around is a must! These are all easy to do with FW2.
2. A spreadsheet with 32,000 rows by 32,000 columns. Do not laugh! The new expanded/extended memory boards take you passed the 640K RAM barrier and thus allow the user to make use of really large spreadsheets. Also, I have found that Framework II makes better use of this added memory than most of the upgraded programs. It is fast and supports the 8087 co-processor which can speed up the recalculation even more, depending upon what functions are used in the spreadsheet!
3. Database management module provides Views of a Table of Records, user-specified forms, or dBASE-type views. The Sort is very fast, and date/time arithmetic is available. Of course, being an Ashton-Tate product, it can read-in and manipulate dBASEII, dBASEIII and dBASEIII Plus files directly using the Application feature. Again, the EMS memory makes it feasible to have the dBASE program loaded in RAM for direct use!
4. Graphics are excellent and can be linked to database or spreadsheets without leaving Framework II for fast, automatic updating whenever values are changed. This is what I call really having a "WHAT-IF" ability! The graphs are easily printed (in color if you wish and have the proper printer). The graphs can be "integrated" right into your text documents. This makes a report with text, graphs, and spreadsheets possible in an all-in-one document without cutting and pasting or making extra pages for them. They can be put right in the portion of text where everything can be explained to the reader. That makes a report professional!
5. Telecommunications is now a fully integrated module and menu-driven into the software package using the same type of commands and pull-down menus as the rest of the modules.
6. OUTLINING (I put this in caps because this should be included in every word processing package.) provides a flexible "idea producer" and brainstorming tool. As the "SPREADSHEET Corner" readers know, this is the type of tool that I have always asked the readers to use before starting a project! This is true for writing as well. I am using the Outliner for putting this article together. The Outliner will provide a tool to organize the word processing, spreadsheets, databases, graphs and telecommunications features into an integrated project. ALL! Computer projects require this preliminary, but necessary planning step for an efficient, working of the first time project! THIS IS THE IMPORTANT FEATURE OF Framework II, but not the only one!
7. Last, but not least, is "FRED"! FRED provides the power of a general-purpose language, like BASIC or PASCAL, combined with the sophisticated and easy-to-use environment of Framework II. I will explain how the name "FRED" was arrived at later. I want to hold your interest about this built-in language!

The minimum computer requirements needed to run Framework II is as follows:

1. PC computer, such as the H/Z-150, H/Z-158, H/Z-148, H/Z-241, etc.
2. A minimum of 384K RAM, but I wouldn't advise less than 640K; and I am sure you will find that you will want to have at least 1 megabyte by using an EMS board.
3. Two 360K floppy drives, but again I would recommend one floppy and a 10 or 20 megabyte hard disk drive.
4. A graphic/monochrome monitor, but I would recommend a color/graphics monitor.
5. MS-DOS 2.xx or higher. I am using MS-DOS 3.1.
6. Graphics video is a must to really get the most from Framework II!
7. A dot matrix printer with graphics and software code control. I use an Epson F85 for monochrome and an IDS-132C (same as Data Products 8050C) for graphics, text and color. A plotter would be nice to have, but they are not of help if you want to combine text, databases, spreadsheets and graphics into the same document which I believe is a must for an integrated software package output.

Now, let's discuss how Framework II can supply this integration! The program consists of modules using what are called "FRAMES". These could be thought of as windows, only better. All modules are started from pull-down menus, which means that the user can learn Framework easily. An excellent disk Tutorial, where each type of module is explained with three levels of skills, is provided along with an excellent set of manuals. Also, Help screens, that are always available by pressing F1, are complete and easy to understand.

When I obtained my Framework II package, I installed it in my computer with the step-by-step procedure that is explained in a separate manual. It was an easy, prompt type procedure. I was very careful because it is Copy Protected, my major dislike about Framework II. I was worried about the hard disk installation, but the instructions were clear and easy.

I could hardly wait to get started. I went to "TUTORIAL" and about six hours later, I pretty well knew my way around Framework II. This did not mean that I was through learning. In fact, the more I use Framework II, the more I find what I can do with it. In two months, I can produce nearly everything I have been doing with computers for years; BUT, with the FRED programming language and the easy way to com-

bine dBASEIII PLUS, there is a lot more that can be done!

Did I hear someone say it sounds great, but who can afford it? It sells for $695, but if you add up each of the programming modules and purchased them separately, you will find that the price is not out of reach. Especially, when the separate software could not produce the integrated work that Framework II can. Also, think about the ease of learning Framework II. All modules use the same type of pull-down menus and commands. You do not have to learn a new set of commands FOR EACH TYPE OF MODULE! This is important to me, because to write these reviews for "SPREADSHEET Corner" readers, I have spent most of the last four months learning the many software and hardware systems I discussed at the start of this article.

Two keystrokes will create an "empty frame" on the screen, which is the starting point for any project using Framework II. The empty frame is a unique window that is assigned a name by the user for use as a word processor, spreadsheet, database, etc. Coupling the OUTLINE, which is what should be the first window, is the method provided by Framework II so that the user can plan and build their project. This linking of frames can handle the project from conception right down to the combined result, which could be a printed report, spreadsheet, database, etc.

The disadvantages of the early Framework I program was its poor memory management, the lack of a true, complete word processor, a tacked on telecommunications module, and a few dozen other little quirks. As you can see, ASHTON-TATE has solved these!

LOTUS Symphony also had and still has many disadvantages; BUT, Ashton-Tate came to Frameworks rescue, like I have never seen before, with a completely updated, in all areas, Framework II! Almost every problem that plagued the first program has been confronted. The Word Processor has come from an also-ran module to a truly professional program that adds powerful integrating features that can't be found in others; plus ways to exchange data with the outside world. This is especially true of databases! The telecommunications module has now been thoroughly integrated into Framework II!

The original Framework I was a memory "HOG"! On a 256K RAM system, spreadsheets were limited to a couple of hundred cells and databases hit a "Full Memory" warning with only a few hundred records at best. Ashton-Tate has taken full advantage of the new expanded memory boards to get past the 640K limit made practical with the low cost of RAM; but, they first made better use of existing memory by rewriting the package using tighter coding. This increased its capability by a factor of two to five times along with faster operations. Next, they adopted the sparse matrix memory management that can increase usable memory by approximately 300%; thus, eliminating the waste of valuable memory tracking blank cells. The new code that adds true integration to the package added code to the product. It now needs about 380K of RAM to load into memory.

The company adopted the EMS (more about this later) board. With these boards, Framework II can address up to eight megabytes of memory. I would not suggest thinking about over two megabytes because these large programs are nearly impossible to debug and they take "forever" to run!

The early problem of integration of Framework's modules has been solved! Blocks (frames) of data from different applications could not be brought together and printed on the same printed report without resorting to separate report pages. NOW, the Outliner provides the means to bring frames, whether they contain text, graphs, spreadsheets, or database reports together. The user can transfer text, functions and values between frames providing immediate recalculated results. Also, numbers in parentheses (representing a negative number) are calculated as negative numbers without further formatting. This is only touching a few of the possibilities on how data can be moved between frames. This represents an integrated program! (LOTUS Symphony still needs some form of true integration which I will discuss in a later article.)

I cannot cover all the modules with their commands and features in this review, but I would like to discuss a few that I was impressed with. An excellent UNDO command from the pull-down menu works with most modules in similar ways including one you might not think of. The UNDO will work on frame labels (I know that you do not know much about these now.); but this is some feat when you consider labels can be up to 64K in length! The command works in word processing, spreadsheets, databases, etc.

Moving between menus is very easy to do and Framework II incorporates similar keyboard commands throughout all the modules. This means learning one set and you are ready to go with all modules. An example would be the GOTO command. This GOTO command can be used to find a cell in a spreadsheet or to navigate from a location in one module to a destination in another module.

There is a new "APPS" menu added that allows the user to integrate other software into Framework II. dBASEIII has already been added. (Not unexpected when you remember Ashton-Tate furnishes both.) The user can add to this or replace it with any other, such as dBASEIII PLUS. It also provides for the addition of two more applications of the users choosing. This is only limited by memory.

The menu driven SETUP program is very convenient for installing Framework II to your computer. It is external to the main program modules and that enables the user to choose the appropriate setup at the initial installation; plus, the convenience of easily reusing SETUP whenever you make changes to the computer system or add applications. Before I forget, the user can SAVE their work at any time to disk by pressing Control and Return keys, so there is no reason not to save your work often. Also, there is a Word Counter that I have just used and found that I have reached nearly 2500 words and I have not reached the discussion about EMS boards. I will not discuss the Database module in detail as I am short of space and you would know that Ashton-Tate would do a good job in that regard!

I must write some about the documentation which is a great improvement over the earlier Framework. It is organized in booklets by levels of difficulty, progressing from a "Getting Started" thru an extensive tutorial level. These are followed by one called "Using Framework" and one called "Advanced Topics". My negative reaction to the booklets is that they are paper covered, spiral bound and look plain "cheap"! (However, if you look at LOTUS 1-2-3 Release 2 or Symphony Version 1.1 manuals, which are plain old paper backs that will not lay flat, Framework II booklets are great!) It seems that as the software companies become successful, have higher prices and profits that they forget about IMAGE to the user and ease of usefulness! I just feel strong about how nice the loose leaf ringed manuals in the slip case were in comparison. If the prices were down to say $100, I could understand. If they need to make small changes it is not as easy as sending out replacement pages! IMAGE IS WORTH MONEY! Enough said.

Perhaps the new user's experience of getting use to frames and keeping track of the relationship between frames is the biggest difficulty in the "Learning Experience" for Framework II. But, the tutorials and Help pull down screens help solve the problem. Ashton-Tate uses family relationships as metaphors. Sub-frames are called "children" of the frames that contain them, while these containing frames are referred to as "parents" or "ancestors". Two frames on the same level within the one containing frame are "siblings" and if they are in separate frames they are "cousins". The documentation uses the concepts of "inheritance" and "scope" to advantage. Thus, unless the user makes deliberate changes, all sub-frame attributes (print format as an example) are "inherited" from "parent" frames. "Scope" refers to what commands do when issued within the parent frame to all of the children frames, but NOT to its cousins or siblings. This is best learned by doing and if the user uses the Outline feature it is not difficult to learn.

Other analogies are: (1) Screen is called "desktop", (2) Disk drives are referred to as "filing cabinets" and, (3) Active files are "trays". Oh yes, I should also mention "library" where the macros are stored and they are automatically loaded into memory when Framework II is loaded. I know that all of the above might sound difficult, but by the time you spend a few hours with the tutorials, this all becomes old hat!

I must say a little about "FRED" (an acronym for frame editor). FRED is a full-featured, procedural programming language. It is easy to learn and use, as it is well supported by menus and Help screens. It would take an article by itself to discuss it fully. Maybe in a later article if enough readers tell me they are interested. This is the area where I believe you could keep learning more things that Framework II can do for months and months. It would challenge the most experienced user.

In closing my review of Framework II, I must point out that Ashton-Tate is an unusual company when responding to customer's criticism like they have. Most companies will not admit that their product has many faults and they release their updates in bits and pieces that fall way short of solving the problems. Framework II is a meaningful overhaul! The complete software overall performance, integration, and memory management have been greatly improved. It provides extensive import and export facilities that are the best that I have found. Framework II is the INTEGRATED SOFTWARE PACKAGE of the year in my book. It is well worth your consideration if your needs require a fully integrated program.

This is not part of the review, but I must thank everyone at Ashton-Tate — 20101 Hamilton Avenue, Torrance, CA 90502 — for their help and cooperation — Customer Service, Technical Service and Ashton-Tate Publishing Group (their books "Framework II: An Introduction" and "Framework II: For Writers" saved me a lot of time). They have a phone setup where if you get a no-answer or a busy signal, a recording system takes your call. What is more they DO call you back, and if they cannot answer your question, they find the person that can! Again, this is a first for me and it is worth the price of the software alone in these days when Customer Service cannot be reached for days, and then they do not give a worthwhile answer. The word counter tells me I am now over 3000 words!

After spending so much of this article about Framework II, I will have to discuss the new expanded memory boards briefly and continue in the following articles. In the new generation of software, not only Framework II, uses this MAJOR improvement for owners of PC type computers. The 8088 CPU can address one megabyte of memory, but the computer BIOS ROM, video ROM, floppy and hard disk controllers, etc. all take a portion of this memory. At the time DOS was introduced, 64K RAM was a large memory! Do you remember? A glance at a memory map for the PC computer will show you that a block of 640K was available. This is what Microsoft DOS was designed to use. At the time, everyone thought that this would handle the future requirements. It did not last long. This shows how fast this industry is moving. Practically, an AT computer with the 80286 CPU can address 16 megabytes, if I remember right; but, it is still limited to the 640K RAM that DOS was designed for to provide compatibility between all PC family computers. There are not enough AT computers to support new software packages at this time and users do not want to obsolete their software programs and data that they have accumulated. So, again we have the 640K memory limit.

A technique that has been around for some time was used again to solve this 640K barrier. It is called "bank switching", among other names. There was a 64K block of RAM that was reserved for some other purpose, but not being used; so, LOTUS, INTEL and Microsoft eventually got together and set a pseudo standard for expanded memory addressing. This 64K is broken into small addresses to handle 16K pages of expanded memory. There are two essential methods that were developed, one by AST Research called EEMS (Enhanced Extended Memory Specification) supported by AST, Ashton-Tate, Quadram and others. Both methods are worked out so that they will handle EMS! Any programs written for EMS will work equally well with EEMS. I think the name "life-cycle extender" would be a good one for PC computer equipped with an EEMS/EMS board!

Neither of these methods are dominant in the market as I am writing this article, but I believe that the EMS will prevail. I am using the AST Research RAMpage with two megabytes of RAM installed in my computer at this time. I have tried the INTEL Above Board and the Tall Tree JRAM-3 in my Z-151 each with two megabytes of RAM chips installed. My order of choice goes as follows — First: RAMpage, SECOND: JRAM-3 and THIRD: Above Board. These three represent a cross section of what is out in the marketplace at this time and they all work well. The software that is furnished with them puts one in front of the other. I will discuss some of the software in a future article.

Microsoft has stated in publications that a future release of MS-DOS will make it easier for programs to make use of expanded memory. At the present time, each board comes with varying software to provide for operation with EMS. Some of the software provides for 8 mbytes and others will use 2 to 6 mbytes. I can't see where this is important at this time. With the 256K chips the boards usually go to 2 mbytes. By the end of 1986, one megabyte chips will be popular and 8 mbytes on a board will be possible.

Besides supporting the large integrated software packages, there are many other memory resident programs that many users like. Just think what a large Ramdisk could do. AST Research supplies DESQview with their board and this program is worth more discussion space than what I have this time so I will discuss it in a later article. How about Microsoft's Windows program? That program really can use a lot of RAM and it does not have a lot of value with the present day software programs. Have you tried these? Right now there seems to be a problem with too many programs loaded into memory interfering with each other. I have found some of the problem areas and I will tell you about them in later articles.

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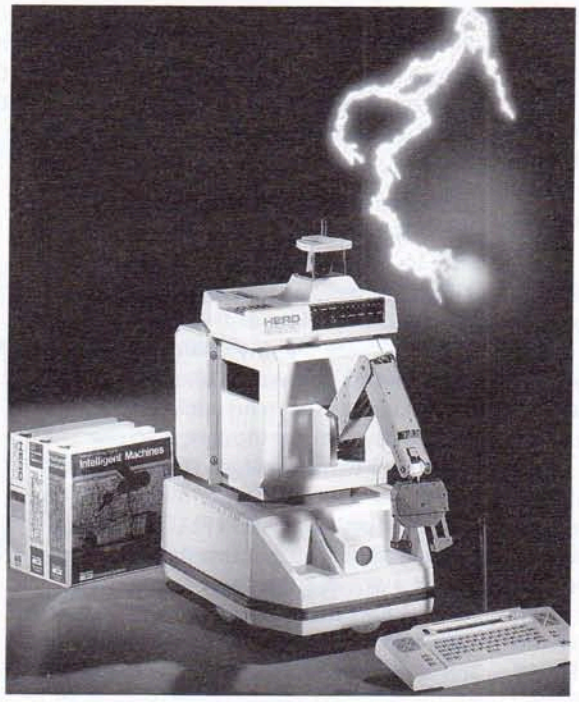

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I would also like to thank AST Research Inc., 2121 Alton Avenue, Irvine, CA 92714 for their cooperation and help. Their Customer Service is available and they HAVE the answers. The RAMpage! board is among the easiest to install with their software. This is important! JRAM-3 documentation is poor, and Above Board's was really bad. Their installation program can wipe out your Autoexec and Config files if you are not aware of such things. There are no warnings to tell you about this in their documentation!

I would like the readers of "SPREADSHEET Corner" to keep me informed as to their reaction to these articles. Are they of interest to you? Which product, if any, would you like to have me expand on? Be sure to let me know if I am in error anyplace. I will pass on your corrections to the other readers. If you do write to me, remember to enclose a stamped, self-addressed envelope (business size) if you would like an answer back. I will answer all letters in person and if the subject is broad enough to interest many readers I will cover the subject in an article. I get too many letters to pay for the postage, but my time comes free.

I must ask one question. Did you notice if I stuck pretty close to the OUTLINE? Could you see where the article changed levels in the OUTLINE? Can you see an advantage to the OUTLINE ability? If you learn to plan all computer projects, OUTLINE will really help you get things right or close to right the first time. Now, if they would tell me how to put in commas and such I would be all set.

I plan on spending a few articles on reviews, like this article, and then I will get back to the main function of "SPREADSHEET Corner", writing how-to articles. I will ask the readers at the end of these articles if there are any changes in which software and hardware I should use. SO! Please keep this in mind while reading the articles! My present thought is to use LOTUS 1-2-3 (which release ?) and dBASEIII (or do you want dBASEII or dBASEIII PLUS — I would prefer dBASEIII PLUS)! If enough readers were to get interested in Framework II, I would enjoy using that software. I have picked these because most readers have told me this is what they are using. This is not a final decision, because your letters from this series could change it! I have been receiving a lot of letters asking why "SPREADSHEET Corner" has been published in a haphazard fashion. I usually have a number of articles in the hands of the REMark staff, so this is as far as I can control the publication schedule. The rest is up to the REMark staff, so I would suggest that you direct that type of question to them. Happy Spreadsheeting! *

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An Introduction To Disk I/O For The Heath Macro 86 Assembly Language Course

Part 1

Robert Brownlee
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Sedalia, MO 65301

I have purchased a number of Heath educational products the past 6 years. The first one was the microprocessors course EE-3401-A, which got me hooked on computers. When I purchased my Z-100 and started to look over some of the Assembly language programs, I had a problem. I had owned an H-8 and was familiar with the 8080 code, but when going over the 8088 code I found some similarities, but a great number of differences. New words like offset, segment, [BX], showed up in the code. I knew it was time get some help. The Macro 86 Assembly Language course from Heath Company (part number EC-1201) sells for $59.95. It also requires a Z-100 or a PC compatible computer, an operating system, and a MACRO-86 Assembler for full use of the course.

The Macro 86 course has 9 chapters, starting with the most simple fundamentals and ending with the advanced concepts of the assembler. The following is a breakdown of the 9 chapters.

Chapter 1: Basic 8088 architecture, segment memory concepts.

Chapter 2: Basic Assembly language concepts, use of assembler directives and operators, the 4 steps in creating a COM program.

Chapter 3: Unconditional and conditional jumps, understanding the use of the flag registers, the LOOP instruction.

Chapter 4: The CALL and RET instructions, stack instructions, the INCLUDE directive.

Chapter 5: Data storage, use of structures and records, indirect addressing, and index addressing.

Chapter 6: Arithmetic instructions, data transfer instructions, and bit manipulation instructions.

Chapter 7: EXE program concepts, understanding the different types and class of a segment, intersegment JMP, CALL and RET instructions, IN and OUT instructions, new concepts of the linker.

Chapter 8: Interrupts concepts both software and hardware, how to make an interrupt service program, and the string instructions.

Chapter 9: Procedures, macros, conditional directives, listing directives.

By the time you complete Chapter 6, you will have the knowledge to understand and create 8088 Assembly language programs. Chapters 7, 8 and 9 deal with advanced concepts. Each chapter has an experiment session for hands-on training. The experiments make use of the debugger to single-step through programs to show how and why the program works. The experiments make extensive use of the MS-DOS INT 21 function for console input and output. The quirks of the different versions of the assemblers and linkers are covered in the experiments, and the differences in programming for the Z-100 and PC are also covered. At the end of the course, you can take the optional final exam which is worth 5 C.E.U.'s, if you pass the test. For a home study course, it gets an "A" for teaching Assembly language, but an INCOMPLETE in teaching disk I/O. This area, as with most Heath educational courses, does not cover the topic of disk I/O. It took me nearly a month of reading and a number of trial and error programs to make a simple disk read and write program. I now give you the missing chapter to this course.

Chapter 10: Sequential Disk Input And Output

MSDOS has a number of options of dealing with disk I/O. INT 25 and INT 26 are absolute disk read and write functions. The drawback of using these functions is you have to know in advance the size of the file and the number of sectors to read or write. The MSDOS INT 21 function request has provisions for both sequential and random disk operations which are CP/M compatible. MSDOS version 2 and higher also support the XENIX file/device I/O handles for tree-structured directories. The XENIX functions are more commonly used than the other disk I/O functions, but are not CP/M compatible. I will only cover sequential operations in this article. I will cover the XENIX functions in a following

article. First, there are some words to learn. The first word is FCB, which is short for File Control Block. It is a buffer 37 bytes long, which contains vital information of the disk file. The following is a breakdown of the FCB.

Field	Length in Bytes	Offset in Hexadecimal
	Standard FCB	
Drive number	**1**	**00H**
Primary file name	**8**	**01-08H**
File name extension	**3**	**09-0BH**
Current block	**2**	**0CH,0DH**
Record size	**2**	**0EH,0FH**
File size in bytes	**4**	**10-13H**
Date of last write	**2**	**14H,15H**
Time of last write	**2**	**16H,17H**
Reserved	**8**	**18-1FH**
Current record	**1**	**20H**
Random record	**4**	**21-24H**

To read or write a sequential disk file, the following fields must be set up. Drive number field specifies the disk drive where 1=A:, 2=B:, etc. The primary file name field holds up to 8 valid file name characters. If a name is less than 8 characters, the extra bytes must be padded with a space. The file name extension field holds 3 valid characters. If less than 3 characters, the extra bytes must be padded with a space. The record size field determines how many bytes will be read or written per each disk operation, the default is 80H or 128 bytes. The current record field points to the record to be read or written, in most sequential operations you start with record 0. After the current record is set up, the DOS will automatically point to the next record. The following is a sample FCB.

```
FCB   DB    37 DUP(?)
      MOV   FCB+0,1
      MOV   FCB+1,'TEST
      MOV   FCB+9,'DAT'
      MOV   WORD PTR (FCB+0EH),82
      MOV   FCB+20H,0
```

The above FCB will point to file A:TEST .DAT, with a record size of 82 bytes starting with record 0. For more information on the other fields, refer to the MS-DOS Programmer's Utility Pack book. The next word to learn is DTA. DTA stands for Disk Transfer Address, it is a block of memory the same size as the record. When a disk is being read, the information is stored on the DTA. When a disk is being written to, the information on the DTA is written to the disk. The following are the basic steps in making a disk read or write program.

Disk Read	Disk Write
Set up FCB	Set up FCB
Open file	Create file
Set DTA	Set DTA
Read sequential	Write sequential
Check for EOF	Continue writing
Close when EOF found	Close file when finished
Continue reading	

The first program will input a line up to 80 characters and write them to a disk file until a CTRL-Z is entered. The second program will read a text file and display the contents on the screen, this program is similar to the TYPE command. These programs were written for the Z-100, if you intend to use them on a PC, you will have to redo the section that clears the screen.

```
TITLE --DISK WRITE
COM     SEGMENT
        ASSUME  CS:COM,DS:COM,SS:COM,ES:COM
        INCLUDE DOS.DEF
        ORG     100H
START:  JMP     DO                              ;avoid forward references
;
CLR_SC  DB      1BH,'E',1BH,'H','$'             ;clear screen, home cursor
MSG1    DB      'This program will input a line up to 80 characters .'
        DB      CC_CR,CC_LF,'The lines will be stored on a disk file.'
        DB      CC_CR,CC_LF,'Enter a CTRL-Z and CR to end program $'
MSG2    DB      CC_CR,CC_LF,'Proceed to enter lines of characters $'
N_LINE  DB      CC_CR,CC_LF,'$'
DTA_0   DB      82 DUP (?)
FCB_0   DB      FCB_SIZE DUP(?)
STR     DB      81
STR_CNT DB      ?
STR_BUF DB      81 DUP (' ')
SUB_FL  DB      0
;
F_NAME  DB      13
F_CNT   DB      ?
F_BUF   DB      13 DUP(' ')
DR_MSG  DB      CC_CR,CC_LF,'Enter the drive letter using A-I $'
F_MSG   DB      CC_CR,CC_LF,'Enter the file name using the NAME.EXT format $'
DR_ERR  DB      CC_CR,CC_LF,'INVALID DRIVE NAME, TRY AGAIN $'
;
FO_OPEN DB      0
CR_ERR_MSG      DB      CC_CR,CC_LF,'DISK DIRECTORY FULL, OR ILLEGAL'
                DB      'CHARACTER ON FILE NAME OR EXTENSION $'
WR_ERR_MSG      DB      CC_CR,CC_LF,'ERROR ON DISK WRITE $'
CL_MSG  DB      CC_CR,CC_LF,' DISK FILE NOW BEING CLOSED $'
;
DO:     MOV     DX,OFFSET CLR_SC
        CALL    DISPLAY
        MOV     DX,OFFSET MSG1
        CALL    DISPLAY                         ;display prompt message
        MOV     DX,OFFSET N_LINE
        CALL    DISPLAY
        MOV     DX,OFFSET FCB_0
        CALL    FILE_NAME                       ;get output file name
        MOV     DX,OFFSET MSG2
        CALL    DISPLAY
LOOPA:  MOV     DX,OFFSET N_LINE
        CALL    DISPLAY
        MOV     DX,OFFSET STR
        CALL    IN_STR                          ;get input string
        LEA     BP,STR_BUF                      ;use BP for input string
```

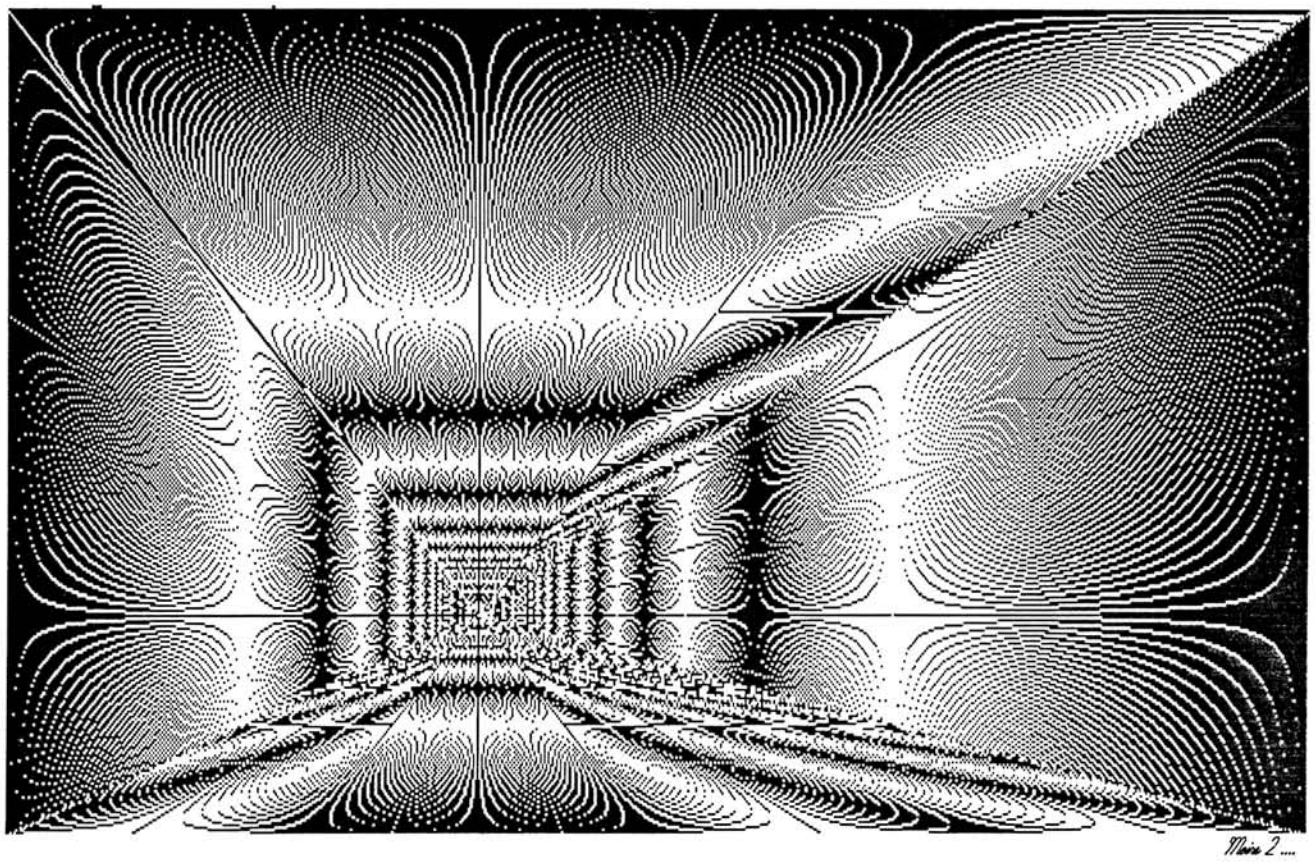
```
        LEA     BX,DTA_0                        ;use BX for DTA buffer
        MOV     CX,80                           ;set loop for 80 characters
LOOPB:  MOV     AL,[BP]
        CMP     AL,CC_SUB
        JZ      WR_CL                           ;check for CTRL-Z
        CMP     AL,CC_CR
        JZ      STR_OK                          ;check for CR
        MOV     [BX],AL                         ;store character in DTA
        INC     BP
        INC     BX
        LOOP    LOOPB
        JMP     PAD1                            ;full line
WR_CL:  MOV     SUB_FL,1                        ;set CTRL-Z flag
        MOV     [BX],AL                         ;put SUB in disk file
        JMP     WRITE
STR_OK: MOV     SUB_FL,0
PAD:    MOV     AL,' '                          ;fill rest of DTA with spaces
        MOV     [BX],AL
        INC     BX
        LOOP    PAD                             ;fill out rest of line
PAD1:   MOV     BYTE PTR [BX],CC_CR
        INC     BX
        MOV     BYTE PTR [BX],CC_LF
WRITE:  MOV     DX,OFFSET FCB_0
        MOV     BX,OFFSET DTA_0
        CALL    FILE_OUT                        ;write the disk file
        CMP     SUB_FL,0                        ;continue if no CTRL-Z
        JZ      LOOPA
        MOV     DX,OFFSET FCB_0
        CALL    FILE_CL                         ;close the file
        INT     DOSI_TERM                       ;end program
        INCLUDE SUB.ASM                         ;get subroutines
;
COM     ENDS
        END     START



TITLE --DISK INPUT
COM     SEGMENT
        ASSUME  CS:COM,DS:COM,SS:COM,ES:COM
        INCLUDE DOS.DEF
        ORG     100H
START:  JMP     DO                              ;avoid forward references
;
CLR_SC  DB      1BH,'E',1BH,'H','$'             ;clear screen, home cursor
MSG     DB      'THIS PROGRAM WILL ASK FOR A FILE THAT WILL BE DISPLAYED'
        DB      ' ON THE SCREEN',CC_CR,CC_LF,'$'
RD_MSG  DB      CC_CR,CC_LF,'READ ERROR , PROGRAM TERMINATED $'
;
FCB_IN  DB      FCB_SIZE DUP(?)
DTA_IN  DB      82 DUP (?),'$'
;
F_NAME  DB      13
F_CNT   DB      ?
F_BUF   DB      13 DUP(' ')
DR_MSG  DB      CC_CR,CC_LF,'Enter the drive letter using A-I $'
F_MSG   DB      CC_CR,CC_LF,'Enter the file name using the NAME.EXT format $'
DR_ERR  DB      CC_CR,CC_LF,'INVALID DRIVE NAME, TRY AGAIN $'
R_ERR_MSG       DB      CC_CR,CC_LF,'CANNOT OPEN FILE, PROGRAM TERMINATED $'
FI_OPEN         DB      0
;
DO:     MOV     DX,OFFSET CLR_SC
        CALL    DISPLAY
        MOV     DX,OFFSET MSG
        CALL    DISPLAY                         ;display prompt message
        MOV     DX,OFFSET FCB_IN
        CALL    FILE_NAME                       ;get file name
READ:   MOV     DX,OFFSET FCB_IN
        MOV     BX,OFFSET DTA_IN
        CALL    FILE_IN
        CMP     AL,1
        JZ      R_DONE                          ;EOF
        CMP     AL,2
        JZ      R_ERR                           ;read error
        CMP     AL,3
        JZ      P_REC                           ;partial record with EOF
        MOV     DX,OFFSET DTA_IN
        CALL    DISPLAY                         ;display buffer
        JMP     READ
P_REC:  SUB     SI,SI                           ;zero index
F_EOF:  CMP     DTA_IN[SI],CC_SUB               ;is character CTRL-Z ?
        JZ      R_DONE
        MOV     DL,BYTE PTR DTA_IN[SI]
        MOV     AH,DOSF_CONOUT
        INT     DOSI_FUNC                       ;display character
        INC     SI
        JMP     F_EOF                           ;next character
R_ERR:  MOV     DX,OFFSET RD_MSG
        CALL    DISPLAY
R_DONE: MOV     DX,OFFSET FCB_IN
        CALL    FILE_CL
        INT     DOSI_TERM                       ;end of program
        INCLUDE SUB.ASM                         ;get subroutines
;
COM     ENDS
        END     START

FILE SUB.ASM , SERVICE SUBROUTINES FOR THE ABOVE PROGRAMS

;Subroutine DISPLAY
;This subroutine will output a string of characters terminated by a $
;INPUT DX contains offset of string
;OUTPUT console
;FLAGS returned none
;Other registers affected none
DISPLAY:
        PUSH    AX
        MOV     AH,DOSF_OUTSTR
        INT     DOSI_FUNC
        POP     AX
        RET
;
;SUBROUTINE IN_STR
;This subroutine will input a string up to 80 characters
;INPUT DX contains offset of string buffer that has been set up
;OUTPUT string buffer
;FLAGS returned none
;Other registers affected none
```



The LaserWriter Connection

by

Joseph Katz

Of course there's light at the end of the tunnel. At both ends. It's a matter of perspective.

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The LaserWriter Connection costs $40. Order Part Number 885-8050-37 from Heath Company (Parts Department), Hilltop Road, St. Joseph, MI 49085. Telephone 616/982-3571. Visa and MasterCard accepted.

See the light?

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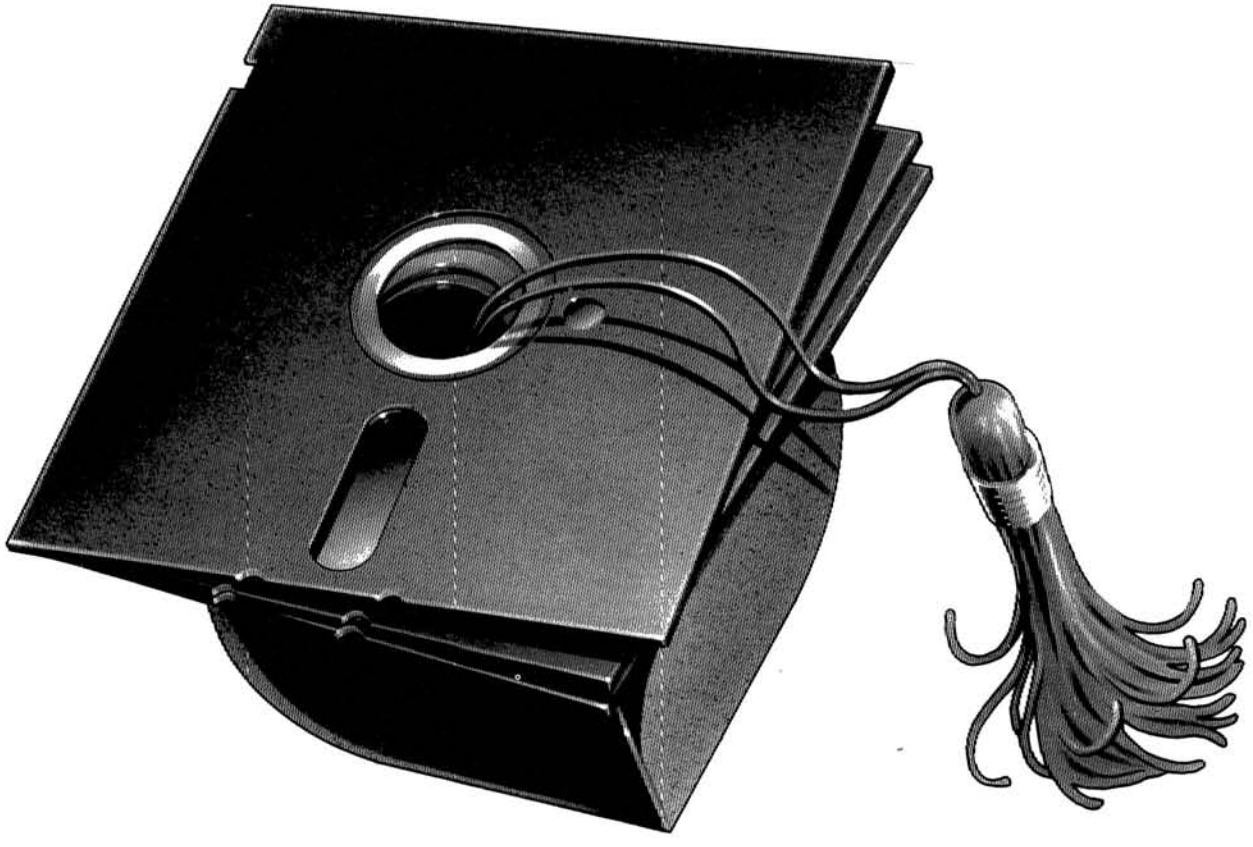
```
IN_STR:
        PUSH    AX
        MOV     AH,DOSF_INSTR
        INT     DOSI_FUNC
        POP     AX
        RET
;
;Subroutine FILE_NAME
;this subroutine will ask the user for disk drive,filename and extension
;requires DISPLAY and IN_STR subroutines
;INPUT DX contains offset of file FCB buffer
;OUTPUT FCB buffer
;FLAGS returned none
;Other registers affected none
;
FILE_NAME:
;
        PUSH    AX
        PUSH    BX
        PUSH    CX
        PUSH    BP
        PUSHF
        XCHG    BP,DX
DRIVE:  MOV     DX,OFFSET DR_MSG        ;prompt user for drive letter
        CALL    DISPLAY
        MOV     AH,DOSF_CONIN
        INT     DOSI_FUNC
        CMP     AL,'A'                  ;check for valid name
        JL      INVALID
        CMP     AL,'I'
        JLE     DR_OK
        SUB     AL,'a'-'A'              ;check for lower case letter
        CMP     AL,'A'
        JL      INVALID
        CMP     AL,'I'
        JLE     DR_OK
INVALID:MOV     DX,OFFSET DR_ERR
        CALL    DISPLAY
        JMP     DRIVE
DR_OK:  SUB     AL,40H                  ;Convert to FCB number
        MOV     [BP],AL       '         ;Store number in FCB
        MOV     DX,OFFSET F_MSG         ;prompt user for file name
        CALL    DISPLAY
        MOV     DX,OFFSET F_NAME
        CALL    IN_STR                  ;get filename and ext
        MOV     CX,8
        INC     BP                      ;Point to file name area
        LEA     BX,F_BUF
N_LOOP: MOV     AL,[BX]
       CMP     AL,'.'                  ;found period
        JZ      EXT
        CMP     AL,CC_CR                ;found CR
        JZ      EXT0
        MOV     [BP],AL                 ;store character in FCB
        INC     BX
        INC     BP
        LOOP    N_LOOP
        JMP     NINTH                   ;full name
EXT0:   STC                             ;set CF to indicate no extension
        JMP     EXT1
```

```
EXT:    CLC                             ;period indicates extension
EXT1:   MOV     AL,' '                  ;pad name with spaces
        MOV     [BP],AL
        INC     BP
        LOOP    EXT1                    ;go to extension of FCB
        JC      NO_EXT                  ;fill extension with spaces
        JMP     EXT_OK
NINTH:
        MOV     AL,[BX]
        CMP     AL,'.'                  ;Is 9th character a
        JNZ     NO_EXT                  ;no extension
EXT_OK: INC     BX                      ;skip period
        MOV     CX,3
EXT_L:  MOV     AL,[BX]
        CMP     AL,CC_CR                ;carriage return ?
        JZ      C_EXT                   ;if so pad extension with spaces
        MOV     [BP],AL
        INC     BX
        INC     BP
        LOOP    EXT_L
EXT_D:  POPF
        POP     BP
        POP     CX
        POP     BX
        POP     AX
        RET
NO_EXT: MOV     CX,3
C_EXT:  MOV     AL,' '                  ;Pad extension with spaces
        MOV     [BP],AL
        INC     BP
        LOOP    C_EXT
        JMP     EXT_D
;
;F_NAME DB       13                      ;8+'.'+3+cr
;F_CNT  DB       ?                       ;characters typed
;F_BUF  DB       13 DUP(' ')             ;buffer
;
;DR_MSG DB       CC_CR,CC_LF,'Enter the drive letter A-I $'
;F_MSG  DB       CC_CR,CC_LF,'Enter the file name using a NAME.EXT format $'
;DR_ERR DB       CC_CR,CC_LF,'INVALID DRIVE NAME , TRY AGAIN $'
;
;SUBROUTINE FILE_OUT, this subroutine will output a string up to 80 characters
;a CR and a LF to a disk file
;NOTE a valid FCB buffer must be already set up
;INPUT, BX contains offset of the string,DX contains offset of FCB
;OUTPUT, disk file
;FLAGS returned, none
;Other registers affected, none
;
FILE_OUT:
        PUSH    AX
        PUSH    BP
        CMP     FO_OPEN,0                       ;is file open
        JNZ     F_OUT                           ;if not create file
        MOV     AH,DOSF_CRFILE
        INT     DOSI_FUNC
        CMP     AL,0
        JNZ     CR_ERR                          ;cannot create file
        MOV     FO_OPEN,1                       ;set flag to open
        XCHG    DX,BP
```

```
        MOV     WORD PTR [BP]+FCB_RECSZ,82      ;set record size to 82
        MOV     BYTE PTR [BP]+FCB_CURREC,0      ;start at record 0
        XCHG    DX,BP
F_OUT:  XCHG    DX,BX
        MOV     AH,DOSF_SDIOA
        INT     DOSI_FUNC
        XCHG    DX,BX
        MOV     AH,DOSF_SEQWRITE
        INT     DOSI_FUNC
        CMP     AL,0
        JNZ     WR_ERR                          ;write error
        POP     BP
        POP     AX
        RET
CR_ERR: MOV     DX,OFFSET CR_ERR_MSG            ;cannot create file
        CALL    DISPLAY
        INT     DOSI_TERM                       ;END PROGRAM
WR_ERR: PUSH    DX                              ;save FCB offset
        MOV     DX,OFFSET WR_ERR_MSG            ;display error message
        CALL    DISPLAY
        MOV     DX,OFFSET CL_MSG                ;display close message
        CALL    DISPLAY
        POP     DX                              ;get FCB back to DX
        MOV     AH,DOSF_CLFILE                  ;close the file
        INT     DOSI_FUNC
        MOV     FO_OPEN,0                       ;reset open flag
        POP     BP
        POP     AX
        RET
;Put the following bytes in front of the program to avoid phase errors
;FO_OPEN        DB      0                               ;file open flag
;CR_ERR_MSG     DB      CC_CR,CC_LF,'DIR FULL OR ILLEGAL CHAR ON FILE NAME $'
;WR_ERR_MSG     DB      CC_CR,CC_LF,'ERROR ON DISK WRITE $'
;CL_MSG DB      CC_CR,CC_LF,' DISK FILE NOW BEING CLOSED $'
;
;SUBROUTINE FILE_IN, this subroutine will input a string up to 80 characters
;a CR and a LF to a buffer space of 82 bytes
;INPUT, BX contains offset of buffer, DX contains offset of FCB
;OUTPUT, buffer
;FLAGS returned, none
;Other registers affected, AL, returns EOF status or read error
;
FILE_IN:
        PUSH    BP
        CMP     FI_OPEN                         ;is file open
        JNZ     F_IN                            ;if not open file
        MOV     AH,DOSF_OPFILE
        INT     DOSI_FUNC                       ;open file
        CMP     AL,0
        JNZ     OP_ERR                          ;cannot open file
        XCHG    DX,BP                           ;save FCB
        MOV     WORD PTR [BP]+FCB_RECSZ,82      ;set record size to 82 bytes
        MOV     BYTE PTR [BP]+FCB_CURREC,0      ;start at record 0
        MOV     FI_OPEN,1                       ;set open flag
        XCHG    DX,BP
F_IN:   XCHG    DX,BX
        MOV     AH,DOSF_SDIOA                   ;set DTA
        INT     DOSI_FUNC
        XCHG    DX,BX
        MOV     AH,DOSF_SEQREAD
        INT     DOSI_FUNC                       ;read file
        POP     BP
        RET
OP_ERR: MOV     DX,OFFSET R_ERR_MSG
        CALL    DISPLAY
        INT     DOSI_TERM
;Put the following byte in front of the program to avoid phase errors
;R_ERR_MSG      DB      CC_CR,CC_LF,'CANNOT OPEN FILE, PROGRAM TERMINATED $'
;FI_OPEN        DB      0
;
;SUBROUTINE FILE_CL, this subroutine will close a file
;INPUT, DX contains offset of FCB
;OUTPUT, file closed
;FLAGS returned, none
;Other registers affected,none
;
FILE_CL:
        PUSH    AX
        MOV     AH,DOSF_CLFILE
        INT     DOSI_FUNC
        POP     AX
        RET

FILE  DOS.DEF, COMMONLY USED DEFINITIONS IN MSDOS PROGRAMS.
 .XLIST
DOSI_TERM       EQU 20H         ; Program terminate
DOSI_FUNC       EQU 21H         ; Perform a function
DOSF_CONIN      EQU  1          ; Console input
DOSF_CONOUT     EQU  2          ; Console output
DOSF_PRINTOUT   EQU  5          ; Printer output
DOSF_DRCIO      EQU  6          ; Direct console I/O
DOSF_DRCI       EQU  7          ; Direct console input
DOSF_OUTSTR     EQU  9          ; Output string
DOSF_INSTR      EQU 10          ; Input string
DOSF_STCON     EQU 11          ; Status of console
DOSF_OPFILE     EQU 15          ; Open file
DOSF_CLFILE     EQU 16          ; Close file
DOSF_SEQREAD    EQU 20          ; Sequential read
DOSF_SEQWRITE   EQU 21          ; Sequential write
DOSF_CRFILE     EQU 22          ; Create file
DOSF_SDIOA      EQU 26          ; Set disk I/O address
FCB_DRIVE       EQU 0                   ; Drive number
FCB_FNAME       EQU FCB_DRIVE+1         ; File name
FCB_EXT         EQU FCB_FNAME+8         ; Extension to file name
FCB_CURBLK      EQU FCB_EXT+3           ; Current block
FCB_RECSZ       EQU FCB_CURBLK+2        ; Record size
FCB_FILSZ       EQU FCB_RECSZ+2         ; File size
FCB_DATE        EQU FCB_FILSZ+4         ; Date file modified
FCB_TIME        EQU FCB_DATE+2          ; Time file modified
FCB_CURREC      EQU FCB_TIME+10         ; Current record(in block)
FCB_RANREC      EQU FCB_CURREC+1        ; Random record number
FCB_SIZE        EQU FCB_RANREC+4        ; Size of a FCB
CC_LF           EQU  10
CC_CR           EQU  13
CC_SUB          EQU  26
 .LIST
```

Although these programs are not bullet proof, they should give you the basic building blocks for making your own disk I/O programs. *



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BUGGIN' HUG

Difficulty Executing COM Files

Dear HUG:

I have a Zenith 151 with MS-DOS 2.11 and MFM 2.0. I have just installed a Plus Development 20 Meg HardCard. I am having difficulty executing COM files outside of a particular directory. For example, I have a subdirectory, WORD, the root directory is C:\. I would like to activate the German keyboard by executing the MS-DOS command KEYBGR from the WORD directory. From the WORD directory neither \KEYBGR nor C:\KEYBGR nor \C:\KEYBGR has any effect. As soon as I go back to the root directory where KEYBGR.COM exists, the command KEYBGR works perfectly. Any help? Could it be that I need to upgrade my BIOS? Is there any way I can tell which version of BIOS I have on board?

I have another unrelated problem. I want to use redirection to "run" some COM files. As a trial I have created the following simple Pascal program:

```
program TRIAL( input, output );
   var   Ch: char;
   begin
      read( kbd, Ch );
      writeln( Ch )
   end;
```

I also have a text file, DATA.TEXT, which simply contains the character 'x'. I compile the program into a file, TRIAL.COM. When I enter TRIAL and press 'x', it echos 'x'. However, when I enter:

```
TRIAL < DATA.TEXT
```

nothing happens. Have I misunderstood something here?

Is there anyone out there who can give me some help? Thanks in advance.

Sincerely,

Marion Deckert
Box 475
North Newton, KS 67117

MS-DOS 2 Versus MS-DOS 1

Dear HUG:

I would like to offer the following information for any users who might benefit from it. I own a Z-100 with 96 TPI (track per inch) disk drives. Zenith does not guarantee support for these drives, but they generally try to accommodate them as well as they can. I used Z-DOS (MS-DOS 1) for a long time and developed a considerable pile of files on my 96 TPI disks. Quite some time ago, I purchased MS-DOS 2 and found that this operating system would not work properly with disks which were formatted under Z-DOS. Disgusted, I simply did not use MS-DOS 2 because my files could not be copied (however, the directory worked just fine). Recently, I decided to find out just why MS-DOS 2 would not read these disks correctly. Finally, I found the source of the problem.

As you may know, each disk is divided into sectors (like slices of a pie). With MS-DOS 2, a disk can have either 8 or 9 sectors, but Z-DOS (and MS-DOS 1) only allowed for 8 sectors. Of course, a disk can be either single-sided or double-sided. Under MS-DOS 1, all disks were to be 48 TPI. Z-DOS, however, allowed for 96 TPI. MS-DOS 2 (for the Z-100) also allows for 96 TPI drives. Putting all of this together, we can create the following table.

Version	Possible Formats	ID Code
MS-DOS 1	48 TPI 8 sector SS	FF
	48 TPI 8 sector DS	FE
Z-DOS	48 TPI 8 sector SS	FF
	48 TPI 8 sector DS	FE
	96 TPI 8 sector DS	FD
MS-DOS 2	48 TPI 8 sector SS	FF
	48 TPI 8 sector DS	FE
	48 TPI 9 sector DS	FD
	48 TPI 9 sector SS	FC
(for Z-100)	96 TPI 8 sector DS	FB
	96 TPI 9 sector DS	F9

Since Zenith was supporting a device which Microsoft was not supporting, Zenith had to pick a disk ID code for 96 TPI drives in Z-DOS and they chose FD. Unfortunately, when Microsoft wrote version 2 of their operating system and increased the kinds of disk formats available, they chose to use FD for something completely different from what Zenith had used it for. Consequently, Zenith had to abandon the code used in Z-DOS and use a different code in MS-DOS 2 for 96 TPI drives. This is the sort of problem which is beyond Zenith's control and why they are forced to publicly state that they do not guarantee support for 96 TPI drives.

The result of all this is that when MS-DOS 2 tries to copy a file from a Z-DOS disk formatted with 96 TPI, it sees the code FD and assumes that the disk is 48 TPI with 9 sectors. Naturally, it is unable to accurately read the disk. The solution then, is to change the ID code on the disk. The ID code on every MS-DOS disk is located at the very first byte location on the second sector of the first track (the first sector is the disk boot routine). You can use the DEBUG.COM program to change the ID code. I would suggest the following procedure:

1. Invoke DEBUG from Z-DOS in drive A.
2. Give the commands:
   L 0,0,1,1
   E 0, FB
   W 0,0,1,1
   This will read one sector from the A drive beginning with sector 1 (numbered beginning at 0) and stores the disk contents at memory location 0. Then the first byte is changed to the new ID code. Then, the information is written back to the disk.
3. Reboot the computer with an MS-DOS 2 disk.
4. Simply copy the files from the modified Z-DOS disk. Note: Avoid copying COMMAND.COM.
5. If you wish to reuse the modified disk with Z-DOS, you should use a similar procedure to change the ID code back to its original value (FD).

Now that I have changed all of my files to MS-DOS 2, I can start thinking about getting MS-DOS 3. Who knows what mysteries might lie ahead! If any of you have encountered any little problem like this with any aspect of your Zenith computer, I encourage you to write a letter to REMark. The exchange of information is what makes a users' group useful.

Happy computing,

James J. Hughes
5454 Braesvalley #268
Houston, TX 77096

ZCLK And The Emulator Boards

Dear HUG:

In the October '86 issue of REMark, I read with disbelief a letter from a company offering a $185 solution to the clock/calendar problem that apparently exists between ZCLK and the Gemini and EasyPC emulator boards. I would like to offer a considerably cheaper solution to this problem.

When I received my EasyPC board from Heath, I first noticed the claim that it would not be compatible with ZCLK. "Oh no!" I thought. "How am I going to live without ZCLK? Well, let's not panic," I told myself. After examining the EasyPC board, there appeared to be a solution. The only problem was the two boards could not physi-

cally co-exist as they were originally designed. However, the ZCLK board could be moved. I went to a local electronics parts supply house and purchased a 40-pin dual-in-line plug/cable assembly and a 40-pin DIP socket. I soldered the ends of the cable from the 40-pin plug to the solder tails of the 40-pin socket. This cable assembly allowed me to move ZCLK away from the motherboard and the EasyPC board. ZCLK is now mounted to the outside of my S-100 cage, yet plugged into the PIA socket through my fabricated remote cable assembly. It works great! In fact, it even works when the computer is in the PC mode of operation.

Will my solution work for the Gemini board? Well, the answer is, partially. It solves the physical problems and it works fine in the Z-100 mode. However, ZCLK cannot be accessed in the PC mode on the Gemini system. Perhaps Gemini Technology could offer a solution to this shortcoming.

Oh, I almost forgot. My solution costs less than $10.00. I guess now I have an extra $175.00 that I can spend on other computer goodies. If I could only convince my wife of that!

Tom L. Riggs, Jr., Ph.D.
3830 Cloud Drive
Colorado Springs, CO 80918

ZPC Bug Correction

Dear HUG:

I would like to bring to your attention a correction to a bug in ZPC, that makes it hang up when writing to the COM1 port. It also enables one to work around an annoying bug (that I haven't located) when using ZPC to run Microsoft WORD; this results in spurious 'Printer not ready' messages.

One instruction is missing from the PRINTER.ACM source file. Since the correction involves adding an instruction, I do not see a simple way of patching just the ZPC.COM file. The instructions around label INT14PG should read:

```
     MOV    AH,80H          ;SIGNAL ERROR
     JMP    INT14X
INT14PG:
     POP    CX              ; JCC correction
     XOR    AH,AH
     JMP    INT14X
```

A corrected ZPC program can then be made by reassembly, etc. in the usual way.

I discovered this bug when trying to run Microsoft WORD (version 3.0) under ZPC. WORD works fine, except that when printing to LPT1:, WORD complains that the printer is not ready (except the first time in a session). This problem does not occur if WORD is told to use COM1:, which is equivalent to LPT1: when using ZPC, but unfortunately, the bug described above prevented use of this port.

Yours sincerely,

John Collins
5406 S. 73 Court
Summit, IL 60501

Installing A Bar In Your H/Z-100

Dear HUG:

Using the DOS PROMPT command, I have installed a reverse-video bar containing the current directory, time and date at the top of the screen of my H-100. Updating occurs each time RETURN is pressed.

In my AUTOEXEC.BAT file is the command (with periods = spaces):

```
PROMPT.$ej$eH$eK$ep$p.....$t$h$h$h.....
$d...$eq$ek$p$g
```

This command is a modification of a similar procedure given by Mark Aramli in PC World, March 1987, page 329.

To remove the bar, I use PROM1.BAT which contains the line PROMPT pg giving the current directory at the prompt.

To reinstate the bar, I use PROM2.BAT which contains the same PROMPT line as in AUTOEXEC.BAT.

Variations of PROMPT capabilities can be found in the MS-DOS manual and the required escape codes in Appendix B of the Z-100 Users' Manual.

Sincerely,

Ken Hooten
13021 South 42nd Street
Phoenix, AZ 85044

Don't Remove The Holes!

Dear Jim:

I read with interest your article on "Big Changes And Bigger Bucks" in the May 1987 issue of REMark. I have just one condescending note to input at this time. I can partially understand HUG's stopping the sale of the HUG binders. I cannot, however, see how this is sufficient to warrant the stopping of the three "'unprofessional' .25 caliber holes someone's been shooting in each issue of REMark."

In the first place, I do not see these holes as being 'unprofessional'. I subscribe to several highly rated magazines in the literary and psychology fields, and I wish that these magazines had the foresight to be so 'unprofessional'. I have been placing my REMark magazines in privately purchased three-hole binders (one binder per year) since I became a member. The ease this allows in finding a particular magazine or article is unsurpassed in others of my magazines which sit in boxes, on shelves, and in drawers in some sort of order or another.

I would ask that you reconsider the decision to eliminate the holes. Something this simple might not seem like much, but it can be a great help to the user. REMark is not the type of magazine that gets read and stored away in a box. There is always a need to refer back to some article for a piece of information. The holes make this referral both easy and possible.

Sincerely,

John A Liotta
Secretary, Omaha Heath Users' Group
1803 Madison Street
Bellevue, NE 68005-3356

About HUGCON

Dear Jim:

I like the new REMark look. Three columns are easier to read. You are a genius the way you redesigned the HUG disk lists. Great! Very clear!

In responding to your intro column for suggestions for the August HUGCON, thanks for asking for input! I strongly hope you'll have Bill Parrott do at least one session on the new HDOS 3.0 (which I have and am using daily). He should explain its new features over 2.0, tell of undocumented features (of which there are many!), and especially open up to questions.

I've also enjoyed Bruce Denton's past rap-sessions on H-8 and H-89 Hardware and would hope you have him back for more of the same.

Appreciate the great job you are doing. See you at HUGCON.

Terry Hall
516 East Wakeman
Wheaton, IL 60187

Keep The Holes!

Dear Jim:

After reading your editorial comments in the May 1987 issue of REMark, I felt compelled to express my opinion regarding what may be (to you) a very minor issue,

specifically the matter of the elimination of "the three 'unprofessional' .25 caliber holes someone's been shooting in each issue of REMark."

I value the presence of these holes nearly as much as I value the publication itself. They make it possible to file each issue in an organized fashion in a three-ring binder, so that they may be readily located for reference at any time. I only wish that publishers of all periodicals would provide these 'unprofessional' holes.

Further, since I have chosen to file my REMarks in three-ring binders, I will continue to do so even if you do not continue to provide me with professionally 'shot' holes. Believe me, holes gnawed through with a drill bit look considerably less professional than those you provide.

Keep the holes.

Sincerely,

Mike Clayton
Century Electronics
18044 Wallingford North
Seattle, WA 98133

A Note From The Firing Range

Dear HUGgers:

Ok, Ok! Stop with complaints already! We've reloaded our .25 caliber pistol, gave our sharp-shooter a raise and a new pair of glasses. For the time being, we'll keep the holes in REMark, but eventually, you'll have to find your own binders.

-Jim
Managing Editor

Condensed CPM/DOS Package

Dear HUG:

After nearly a year of effort (in my "spare" time), I have completed a package of programs that provide some of the MS-DOS capabilities that are needed to enrich a conventional CP/M environment in a simple and straightforward way without any changes to the original system. The package which is written in assembly language is very small and compact (6K bytes on disk). It was programmed and tested on an H-89, but it adheres completely to CPM/8080 conventions, so the Condensed CPM/DOS package of programs should run in any CP/M environment that is compatible with Version 2.2 of CP/M.

The package is comprised of the four programs: SUB, SD, CMP, COPY. Each provides a distinct capability in a form that is appropriate for, but not limited to, small machines with limited disk capacity; and all execute at speeds very close to the optimum.

SUB replaces the SUBMIT facility. It emulates SUBMIT for SUB files, but it also allows several SUB files to be packed into and invoked directly or listed from a single master file named SUB.BAT. In the interactive mode, SUB behaves much like the DOS command structure, since it accepts CCP, COM, SUBMIT, or SUB.BAT commands without any qualification. SUB normally accepts multiple commands per line, but this and other environment features, such as allowing lower case files, can be enabled and disabled with special configuration commands.

SD replaces the STAT utility. It produces a list of files, or a subset of the files on a disk. For each file listed, it tells its size and the number of unused sectors at the end of the file. A summary of the space used by the files follows the list. Directives allow listing four or less files per line in alphabetic or directory order by name or by extension. A user summary directive, as well as directives for changing the status of a file are also provided.

CMP compares the respective bytes of two indicated files up to the end of the shorter of the files. It lists the first 30 (or more if indicated) differences in ASCII or hexadecimal. Directives allow comparisons in a binary mode, and the specification of a pattern byte to search for in the file (or in a file compared to itself). The number of bytes compared, differences found, and the line number of the first difference are reported when the comparison is finished.

COPY converts a DOS copy command line to a PIP command line and transfers control to PIP. It does not really provide any capability beyond the normal PIP command, but it accepts the more natural DOS copy command sequence. A directive exists to tell COPY to delete a file with the same name as the destination file to make more disk space available before copying the file.

The Condensed CPM/DOS Package of programs and its documentation is available for only $12.00 (this includes postage in the U.S.) in any standard H-89 hard or soft sectored 48, TPI CP/M format. It is also available in the standard 48 TPI CP/M formats of most other machines. Those interested should send me their preference of a disk format.

W. S. Derby
P.O. Box 2041
Livermore, CA 94550

Where Are There Any MPI-99 Printer Ribbons?

Dear HUG:

I really enjoy reading REMark, especially the articles on the H-100 and graphics. I was wondering if you or your readers could help me with the following problem.

A year or so ago, I purchased, from Heath Company, an MPI-99 printer. I called Heath for a replacement ribbon, and was told that they (Heath) no longer carry the MPI-99 printer, and therefore, do not stock any ribbons. I even called MPI directly and was told that they have a $30 minimum for an order. Also, I checked several mail order companies, but they do not even list MPI in their cross-reference ribbon files. Any help in finding a supplier for MPI-99 printer ribbons will be greatly appreciated.

Anthony G. Placzek
30 Robinson Street
Webster, MA 01570

Printer Ribbon Rewinds

Dear HUG:

Those of us who spend our hard earned money buying printer ribbons may be interested in considering "rewinds". When a ribbon is beyond further use, save it and set it aside. When three or more are accumulated, box them and send them out to have the cartridge opened, the badly worn ribbon removed and replaced with a fresh, new one. These "rewinds" are both bagged, sealed and boxed before being returned to you. I find that I can have three or four "rewinds" done for the cost of a single, new ribbon. And, as an added plus, I find the ribbons used in the "rewinds" are longer lasting than a complete cartridge, which may have been on the shelf for a long time. This may be a useful cost savings opportunity for some organizations to consider. For further information contact:

Tammy Hardin
DURA-LINE PRODUCTS
Route 2 — Box 39A
Flat Rock, NC 28731

Cordially,

John R. Miller
401 Tiffany Drive
Regency Park
Anderson, SC 29621

Does Desqview Work On The '100?

Dear HUG:

I saw a review of "EasyTax" by Valley Management, 3939 Bradford Road, Huntingdon Valley, PA 19006 in LOTUS magazine. I wrote asking if EasyTax would run on the H/Z-100 (not PC) computers and they sent me a demo disk. Since it uses Lotus 123, it is not hardware dependent and ran on my H/Z-100 without a hitch. I have not reviewed other tax software, and therefore, cannot give a comparison. However, it does have numerous features which I have not seen advertised by other software and the price is very reasonable.

I have heard several good items concerning "Desqview" from Quarterdeck Office Systems. I wrote them a letter and received an information packet. However, I cannot determine from the information if it will run on the H/Z-100 computers. I suspect that it will not. I, for one, would certainly be a buyer of this type of program if it would run on the '100s. Is there anyone out there who has tried this program? Is there a comparable program for the H/Z-100?

Sincerely,

Emory Howell
Rt. 11 Box 494A
Tyler, TX 75709

Of Mice And Men

Dear HUG:

Several people have called or written wanting specific information about the hard disk I described installing in the February issue of REMark. The following information may be of general interest.

I purchased my hard disk from Qubie', 507 Calle San Pablo, Camarillo, CA 93010 about a year ago. Telephone number: (800) 821-4479. At that time, they furnished a Tandon drive. They may be able to tell you in advance what make of drive will be furnished. I believe the controller was made by BTI (with the main chip by Western Digital). One reason I purchased from Qubie' is they have a 30-day, money back guarantee and stated the drive was compatible with the Z-150. Just in case it did not work!

As long as the drive door is open, it boots from the hard disk. Close the door with a non-system disk in A: and you get the standard error message of non-system disk. But, so does the genuine IBM XT at work when a non-system disk is in A: and the door is shut. In this respect, the performance of the two machines is identical. From Adney's article, also in the February REMark, apparently the Zenith should boot from the hard disk even with a non-system disk in A:. At any rate, it has caused me no problems in the year or so I've been using the drive.

The installation of a Seagate ST-225 will require some modifications to the plastic clips that hold the lower floppy, and drilling out the mounting holes in the third (lower slot) to match the drive. I understand that an OMTI controller will also work.

If anyone has an idea of what is causing some power supply problems I am having, I'd like to hear from them. Over the last few weeks, my Z-150 has shut itself down three times. Each time, it has "healed" and gone back to work. After the first incident, I cleaned out all the grime (not much, really) and reversed the fan. The third failure lasted long enough to determine that the +12 volt supply line was not coming up.

Heath/Zenith wants about $250 for a replacement; the $60 clone supplies are too large, physically, to fit. Any suggestions would be appreciated.

Sincerely,

Jack W. Bazhaw
900 — 13 Street
Bellingham, WA 98225

A Patch For HDOS MBASIC And More

Dear HUG:

I finally decided to write you for the first time after seeing how other people have done some of the things I had already done and not said anything about up to this point, so here it is.

A patch for HDOS MBASIC ver 4.82 to enable the use of the underline character. Following is a short program to test it out.

```
>PATCH <RETURN>

Patch Issue #50.06.00.

File name? MBASIC

Address? 144256
144256 312/000
144257 124/000
144260 144/000
144261 376/^D

Address? ^D

File name? ^D
```

If you want to change the version number, then patch the following address as shown; changes version number to 4.86.

```
161150 062/066
161151 xxx/^D
```

This little program will test the modification:

```
10 PRINT "_"
20 PRINT STRING$(40,"_")
30 END
```

If the program will list and run, the patch was successful.

I also use Magnolia's CP/M. As to the little program that was done in REMark #81, I am using Pat Swayne's 4 mhz mod in my old trusty H-88/90 with the 128k board from MMS. I ended up changing from pin 6 on U552 to pin 9. It seems that MMS decided to use pin 6 to enable/disable the RAM board. I just changed the appropriate addresses in the programs in REMark to use pin 9. It works for both the Z-37 and the CORVUS.

If anyone is interested, I also have a patch to enable 1200 baud for the printer under UCSD Pascal. I can be reached at the address below. The H-88/90 is not yet DEAD!!

Enjoy it,

Joe Smith
4454D Gaffey Heights
Ft. Knox, KY 40121

Particularly Pleasant Mail Order

Dear HUG:

This is to inform the members of a recent, particularly pleasant, mail order experience and to bring to their attention some excellent software from what I believe to be an unexpected source. Responding to an advertisement of a CP/M capable, "C" compiler in "Dr. Dobb's Journal", I wrote inquiring whether a version was available for my H-89. MIX Software (2116 E. Arapahoe, Richardson, TX 75081) replied by return mail advising that they had such and asking me to specify the desired soft sectored disk format. I ordered the program in a DSDD format and sent a check.

Within ten days, UPS delivered a package containing a very polished, 8-1/2" × 11", 450 page intermediate level tutorial for the C programming language, and a C compiler advertised as "a complete implementation of C as defined by Kernighan and Ritchie". A quick "thumb through" of the manual convinced me that even I should be able to understand it. Unfortunately, "Murphy's Law" obtained.

The software was for the H-89, OK — so long as it was running Magnolia(tm) CP/M

— which, although I'd be pleased to have, I don't! A letter to the vendor, mailed on Saturday, brought a response the following Friday; new disks with a Heath(tm) H37 version and a letter offering to try again if the SSDD formatted disks were not adequate.

I guess my points are: This is one fine vendor and he's offering a complete implementation of C in either Heath or Magnolia format for the H-89/90 (and obviously, for the 8085 Z-100), as well as for the PC compatibles running MS-DOS. I've just begun to work with it, so can't offer any judgements as to overall quality. But, based on my experience so far, I'll wager that the MIX compiler will satisfy me and that I'll be able to refer problems to the source should any arise. Wish that I'd had anywhere near this level of cooperation from other mail order sources.

Sincerely,

Ray Isenson
Santa Maria-Lompoc HUG
4168 Glenview Drive
Santa Maria, CA 93455

To The Defense Of William Adney

Dear HUG:

In the November issue of REMark, you published a long letter from Mr. Charles E. Wiley who took columnist William Adney to task for a critical review of the UCI EasyPC. I wish to come to the defense of Mr. Adney who said it like it is.

I am very glad that Mr. Wiley had no problems installing his EasyPC. I, unfortunately, experienced all of the installation problems mentioned by Mr. Adney (except the hard disk failure) and a few to boot, including a broken pin on the CPU. Now then, I resent Mr. Wiley's implication that this was because I was careless or failed to follow the instructions. As a long-time Heathkit builder, I am aware of Heath's usually flawless instructions and the value (necessity) of following them to the letter. I did follow the instructions and I was **NOT** careless. This was the first case I know of a failing in a Heathkit due to lack of foresight on Heath's part. An inexpensive IC removal tool for the CPU should have been included because of the possibility that older machines may have stuck IC sockets, as mine apparently had. A screwdriver is good only for screwing something in, out, or up.

Mr. Wiley is simply wrong when he says that all the EasyPC's pins are visible. He must not have had to see them all. My sockets, which were reluctant to give up the old ICs, were just as reluctant to accept the new ones. Therefore, I *HAD* to see what was going on. I couldn't. To repeat; despite Mr. Wiley's claim to the contrary, all of the EasyPC's pins are not visible when installing them on the Z-100 motherboard, unless you remove the motherboard, which is not called for in the instructions.

I share Mr. Wiley's feelings about the performance of the EasyPC once installed. It ran every PC program I could find without a hitch, and usually better than an IBM PC. However, it failed to return my Z-100 to a Z-100 when I wanted to run some of my '100 programs! I had long ago installed the Programmable Sound, Speech, and Time (PSST) card from Software Wizardry and the EasyPC is incompatible with this card without extensive software revision. Heath, UCI and Software Wizardry all knew about this before I bought my EasyPC, but nothing was ever said. Heath didn't know how to fix it. UCI did, but would only *sell* me the instructions for $14.00. Software Wizardry sent me the instructions gratis. What does this say about these companies?

Anyway, the instructions required me to revise over two dozen programs and I was unwilling to do this, so I asked Heath to remove the EasyPC, which to their credit they did at their expense. In conclusion, then, let me state my opinion that the best way to achieve PC compatibility is to spring for the extra couple of hundred dollars and buy a Zenith PC. Nuts to dicking around with a superior machine trying to degrade its performance, for that is surely just what you will end up doing.

Yours truly,

William G. Nabor
27172 Huerta Street
Mission Viejo, CA 92692

It's Allocating Space In 16 Sector Clusters; Wants 4 Or 8.

Dear HUG:

I have a Seagate ST-225 20 MB hard disk with an OMTI controller installed in an H-151. The kit was packaged by Media Winchester LTD. The disk works just fine, except for one problem — MS-DOS is allocating space in 16 sector clusters, i.e., 8k bytes at a crack. Various articles I've read, in REMark and other publications, suggest that this should be more like 4 or 8 sector clusters. The disk was originally formatted using MS-DOS 3.1 by my dealer after I had some problems with the installation (the original disk was bad). In attempting to cure the problem, I have rerun the installation programs and reformatted the disk using MS-DOS 2.11, to no avail. Any suggestion?

It's very enlightening to read Messrs Adney and Katz each month, since they usually cover different ground, but both provide insight into the Zenith-compatible world. It is even more so when they happen to intersect. In the August through October issues, Mr. Adney pretty clearly says that some user(s) have had problems with hard disks that were entirely caused by operator error, rather than by problems with any Zenith software or documentation. Indisputably, anyone smart enough to put files on a disk should also be smart (or trained) enough to have backup copies of those disks, hard and floppy alike. However, in the September issue, on page 58, Mr. Katz says:

"I have been done in by the MS-DOS BACKUP and RESTORE utilities often enough so I don't trust them. (There's a bug in the DOS *(context indicates MS-DOS, not PC-DOS - my italics)* 3.1 BACKUP, by the way, which affects files that span backup disks.)"

Given the critical nature of backups, knowing which of your contributing editors is correct is of more than passing interest. Would someone at HUG care to referee this matter? Also, perhaps an article on how to avoid being "done in" using BACKUP and RESTORE and/or alternative ways of doing saves.

Sincerely,

Michael Hansen
103B Worthington Avenue
Hickam AFB, HI 96818

*

Local HUG Club Information

There have been quite a few changes in the local HUG clubs since the January REMark listing. Even though I've received and read about these changes, I would imagine there are more clubs out there that need to send us updated information. Also, there are a few clubs that just seemed to have disappeared. Can someone let the National HUG know what happened to the following clubs:

Little Rock H/ZUG — Little Rock, AR
Northern Illinois HUG — Davis, IL
Zenith Users' Group — Lafayette, LA
Berkshire County HUG — Pittsfield, MA
HUG-RTP — Hillsborough, NC
Central Wisconsin HUG — Mosinee, WI

Updated Information

TRY-STATE HUG Fayetteville, Arkansas is now known as **Northwest Arkansas Micro Computer Users' Group (NWA-MCUG)**. Address: c/o Ronald Koelling, 14 Carroll Drive, Bella Vista, AR 72714-3219. They meet at the same time and place. Contact person is Ronald Koelling at (501) 855-3669.

SUNHUG Tucson, Arizona meets the third Sunday of each month at 2:00pm at the Tucson Heath/Zenith Computers & Electronics Center.

DENHUG Denver, Colorado meets the first Friday each month at 7:00pm at the Software City Building.

New address for **CONNHUG** Avon, Connecticut — c/o Bob Conlon, 1677 Farmington Avenue, Farmington, CT 06085.

Al Lynch HUG Tampa, Florida — New information will appear in a future issue of REMark.

The **Louisville, Kentucky HUG** has disbanded.

A-SQR-HUG Ann Arbor, Michigan has also disbanded.

New contact person for **Blossomland HUG** St. Joseph, Michigan is Bill Wilkinson. He may be reached at (616) 982-3626. Also have 24 hour BB at (616) 982-3682.

New contact person/president for **SMUGH** St. Paul-Minneapolis, Minnesota is Jack Lindeman. He may be reached at (612) 824-8822. They have a membership of 230+.

OMAHUG Omaha, Nebraska now meets the fourth Sunday each month at 7:00pm in the Humanities Building at Bellevue College. New contact person/president is Mark Frederick at (402) 291-8402. They have a 24 hour BB 300/1200 Baud at (402) 291-6272 and their membership totals 80.

Buffalo Users' Group, New York address is now c/o Heath/Zenith Computers & Electronics Center, 3476 Sheridan Drive, Amherst, NY 14226. New contact person is Frank Jager at (716) 892-9389.

New contact person for the **Dayton, Ohio HUG** is Bill Bolyard at (513) 426-1923. New address: c/o Bill Bolyard, P.O. Box 33070, Dayton, OH 45433.

Toledo, Ohio HUG now has only one bulletin board and the new number is (419) 474-1175. They are also revitalizing their club and would like some ideas/input from

FBE Products

For the H/Z-150, 160 Series

MegaRAM-150 — Modification kit allows memory board to be filled with 256K RAM chips (1.2 MByte). No soldering. Supplied with RAM disk software. ***$49.95***

ZP640 PLUS — Replacement PAL for standard memory board allows up to 2 banks of 256K and 2 or 3 banks of RAM chips to be installed for 640K or 704K maximum memory. ***$24.95***

COM3 — Replacement PAL allows installation of three serial ports (one an internal modem). Supplied with printer driver software for 3rd port. ***$39.95***

FBE Smartwatch

Calendar/Clock using Dallas Semiconductor's DS1216E SmartWatch module. Works with H/Z-110/120, 138/148, 150/158. Package includes SmartWatch with our software and documentation. Spacer kit ($2) required for Z-100. ***$44.95***

For the H/Z-100 Series

ZMF100a — Modification package allows installation of 256K RAM chips in older Z-100 without soldering. Works only with old-style motherboard. ***$65***

ZRAM-205 — Kit allows 256K RAM chips to be put on Z-205 memory board to make 256K memory plus 768K RAM disk. Requires soldering. PAL ($8) required for new motherboard. ***$49***

For the H/Z-89, 90 Series

SPOOLDISK 89 — 128K byte electronic disk and printer interface/spooler card. ***$195***

H89PIP — Dual port parallel interface card. Use as printer interface. Driver software included. ***$50*** Cable ***$24***

SLOT4 — Extender card adds 4th I/O expansion slot to right side bus. ***$47.50***

FBE

FBE Research Company, Inc.
P.O. Box 68234, Seattle, WA 98168
(206) 246-9815, M-F 9-5

UPS/APO/FPO Shipping Included.
VISA or MasterCard Accepted.

their membership. New members welcome!

The new address for **DFW HUG**, Dallas-Fort Worth, Texas is c/o Heath/Zenith Computers & Electronics Center, 12022-C Garland Road, Dallas, TX 75228. Contact person/president is Phil Hanus at (214) 327-4835. They meet the first Tuesday of each month at 7:30pm at the Heath/Zenith Computers & Electronics Center and the third Wednesday at 7:30pm at Tex-Matics Computer Store.

The contact person for **Capital HUG** Arlington, Virginia is Dick Heintze at (703) 339-7330. The number (703) 339-9857 is a recorded message giving CHUG news and meeting times.

CHUGCON '87

Capital Heath Users' Group
International Conference
October 24 and 25, 1987

Sheraton Hotel, Tysons Corner, Virginia

This two day conference for Heath/Zenith compatible people is open to the public. A nominal registration fee will be charged and Sunday night banquet tickets will be available only by pre-registration. Be sure to mention CHUGCON when making your hotel reservations with the Sheraton as the hotel is holding a block of rooms at special conference rates. Space allocation for vendors is on a first come, first serve basis.

The display area will provide users an opportunity to benefit from very attractive vendor "special conference" pricing schemes. Tutorials and demonstrations will be conducted by CHUG members, vendors and other recognized experts in their respective fields. One of this year's most interesting topics is sure to be the 386 machines.

For More Information Contact

CHUGCON '87
P.O. Box 16406
Arlington, VA 22215-1406

>CHUG FIDO BBS
(703) 797-7236
(modem)

CHUGCON VOICE
(703) 339-7330
(voice)

*

Did you know that HUG has a small business accounting package? Its unique name is ***Accounting System***. As with most HUG software, it is user-friendly, double entry, can handle up to 999 separate accounts during any calendar year, and is available for ANY Heath/Zenith computer with a double density disk drive. The different versions available are as follows: ***CP/M — P/N 885-8047-37, Z-DOS/MS-DOS — P/N 885-8048-37, MS-DOS — P/N 885-8049-37.***

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All the features of ZSTEMpc-VT100 plus 8-bit mode, downloadable fonts, user defined keys, full national/multi-national modes. Extended macros/script language. True 132 columns on enhanced EGAs and on most standard EGA's using the EGAmate option. 43 line support on EGA's. Enhanced keyboard support.

EGAmate™ daughterboard option for 132 columns on most standard EGA adaptors. **$39.00**

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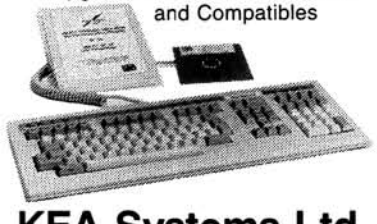

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If You Don't Have WindowDOS 2.0, You're Wasting Time!!

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—Patrick Marshall, WindowDOS 2.0 Product Review, PC World, May, 1987

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- Display Wordstar files in readable format
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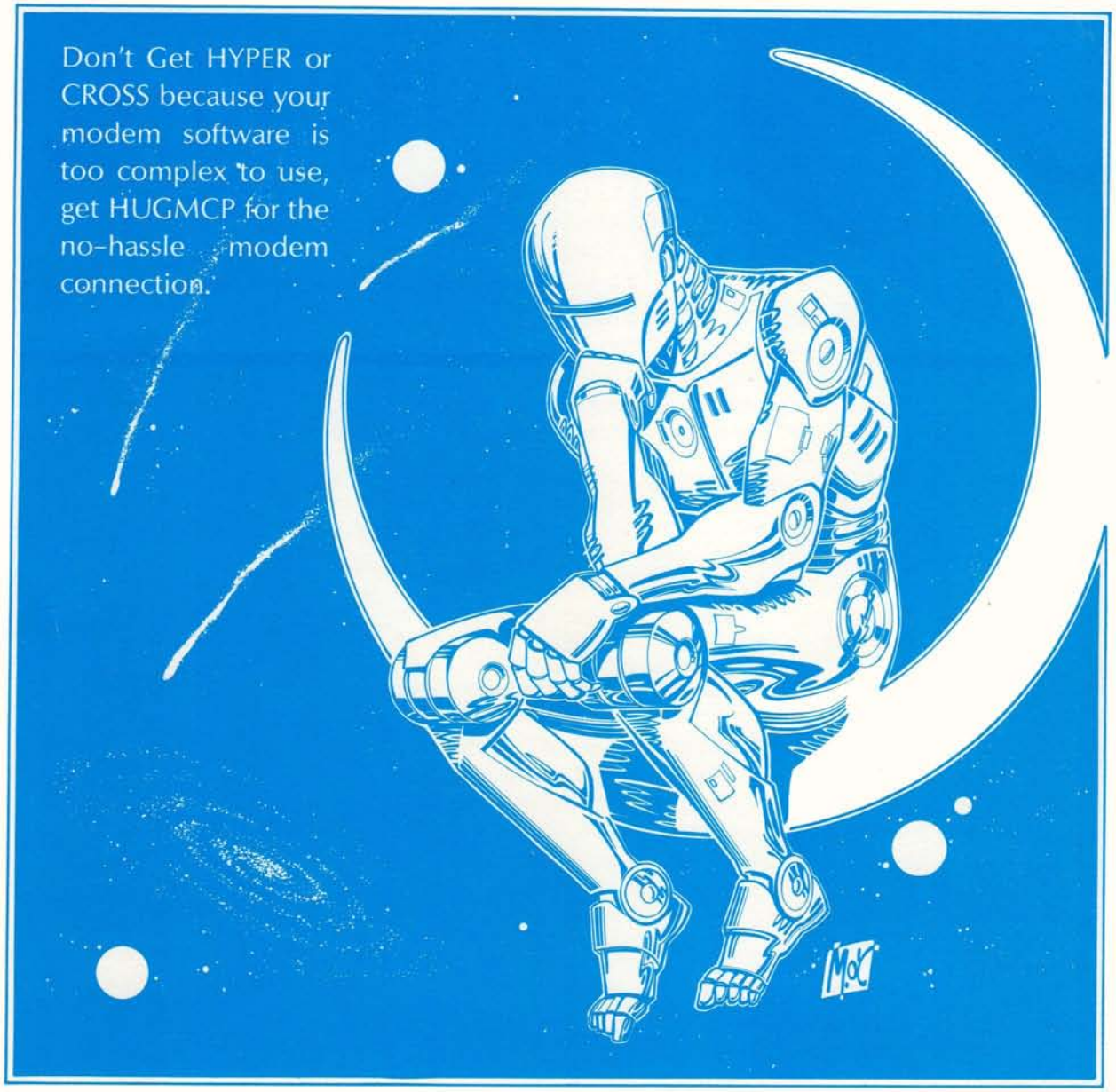

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