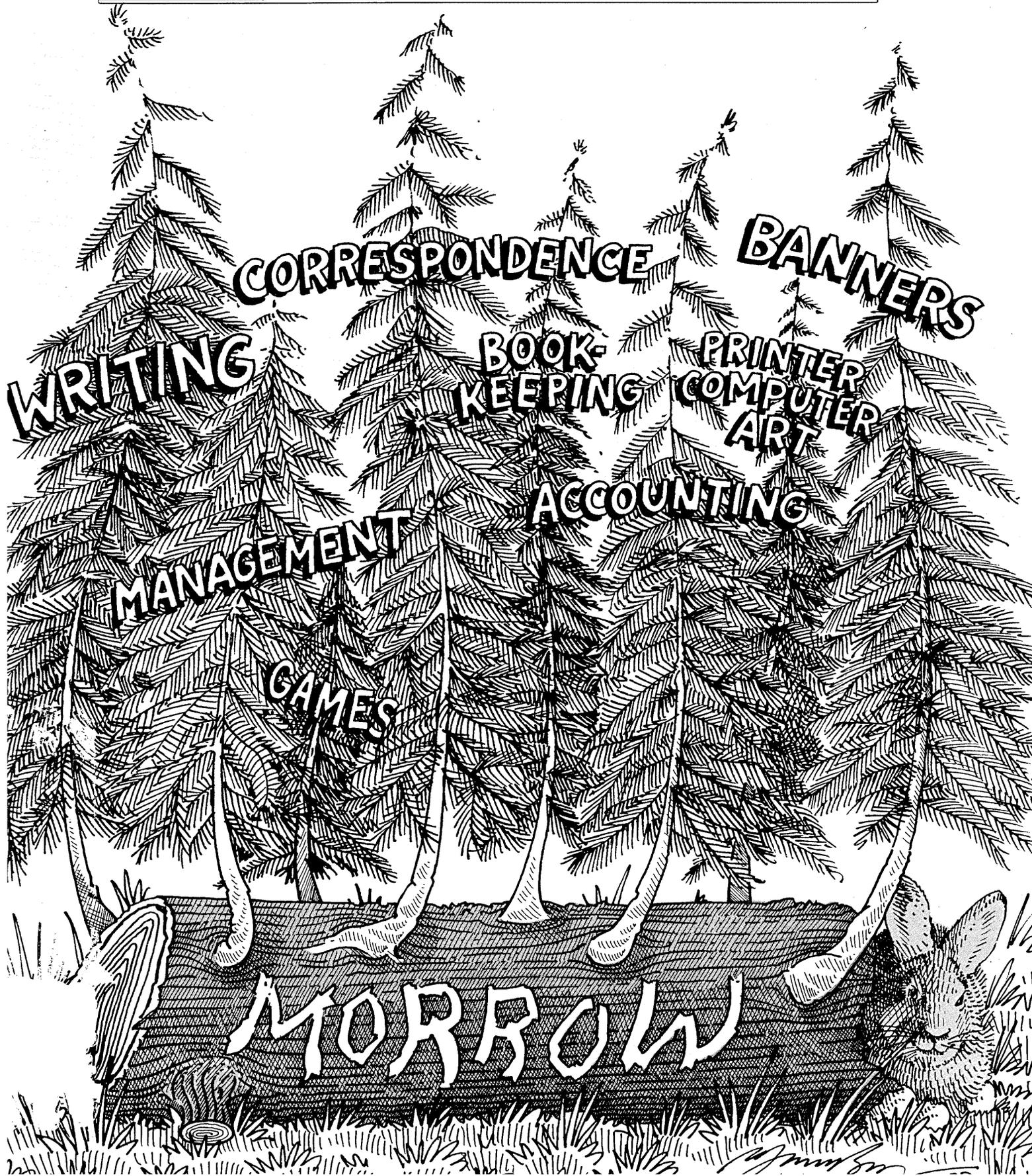


# MORROW OWNERS' REVIEW

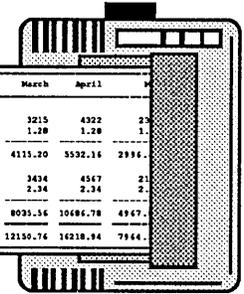
The International Magazine for Users of Morrow and Other CPM Computers



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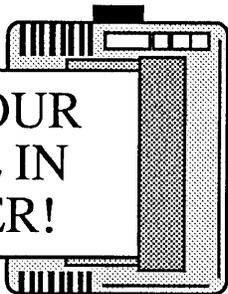
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# Editorial

## MOR'S THIRD BIRTHDAY

With this issue MOR is three years old. If you can remember what the first issue looked like, you can see how far we have come. And by "we" I mean all of us, from letter-writing readers to our volunteer authors to the MOR staff. We are starting our fourth year in reasonable financial health, with an expanding mailorder service and a helpful and ever more knowledgeable crew in the office.

In February 1984, Ed Niehaus, then Director of Marketing at Morrow Designs, helped me start MOR as a national users' magazine. I went part-time on my job and produced our first issue with my administrative assistant, Dana Gaskin -- just the two of us -- out of a back room in my house.

In those early days I spent almost all my time developing the now disbanded MOR Editorial Council and nurturing a growing cadre of volunteer authors. To this day nearly every article and column in MOR is written by these enthusiastic writers. Never have we experienced a lack of articles, a true indicator of the creative strength in our MOR community. Of the 75 authors MOR has enjoyed working with, about 25 are regulars. Of these, our most regular contributors today are MOR columnists Mike Allen, Rick Charnes, Ken Grymala and Bill Steele, all truly dedicated communicators, as you well know.

What will you find in this issue? Ted Silveira, a former MOR editorial councilor, writes about the ON! computer, a new CP/M machine which is fast, powerful and silent. First published as a series of three columns in the Bay Area bi-weekly tabloid Computer Currents, this article

created widespread excitement among CP/M aficionados.

MicroPro's acquisition of NewStar (makers of NewWord) and the prospect of a brand new WordStar 4.0 for CP/M by the end of 1987 has also received a lot of computer-media attention. MOR Managing Editor Serge Timacheff interviewed the main players in this drama and tells about it in "The New WordStar." In another article, Jon Koerner spins an honest and excruciating tale of doom and glory relating his experiences with a crashed MD11 disk. His story may strike a chord of memory for some. All of us can learn from that old adage: Back up, or be sorry.

## HARD TIMES FOR MUGS

On the whole, Morrow Users' Groups (MUGs) are in decline. Of the nearly 30 groups in existence at the peak of Morrow, Inc.'s MD production, about half have folded and many are cutting back activities as their membership shrinks. The downhill slide is understandable since the groups are organized around a machine that has not been produced for over a year. Bucking the trend are a few groups that continue in full swing even with fewer members. These clubs conduct meetings, publish newsletters, and sometimes even operate lively electronic bulletin boards (BBSs).

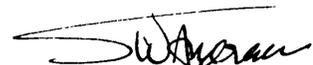
One example of a large users' group that is maintaining its range of functions even while engaged in necessary retrenching is the Bay Area Micro Decision Users' Group (BAMDUA) in the San Francisco area. Its membership peaked at nearly 900 at the end of 1984, dropped to 600 in 1985, and is now hovering around 400. Between 15 and 30 people attend

BAMDUA's monthly meetings, and, for four years, the club has published a monthly newsletter. For almost two years, we at MOR headquarters have shared office space and a staff person -- most recently, Greg Smith -- with the club.

Because of declining membership, BAMDUA can no longer support such uncommon luxuries among users' groups as staff and office. At a recent board meeting, the club's directors acted decisively to pull BAMDUA out of a financial nosedive that would have otherwise bankrupted it this month. The board eliminated the office rental and the five-hour-a-week staff position and reduced the newsletter publishing schedule from monthly to every other month. Administrative duties -- mainly answering the phone and the mail -- will now be handled by board members, as they are in most groups.

One bright spot for BAMDUA is its electronic bulletin board. The BAMDUA BBS has developed into an exceptionally helpful and well-used resource for over one hundred regular callers, about half which are from outside the Bay Area. It enjoys a lively exchange of messages on various Morrow-related and other topics and carries some 20 megabytes of public domain software on board.

In our next issue, we plan to bring you up to date on the most active users' groups, explore the ways they are adapting to their new situations, and tell how you, as users, can both gain from and contribute to these useful grassroots associations.



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# Letters to the Editor

## THREE CHEERS FOR ZCPR3

Dear Editor:

I would like to thank you for your work with Echelon on the Morrow-specific ZCPR3/Z-System and with Advanced Concepts on their Mini-Winnie. For those of us who see no advantage in trading "up" to a Big Blue-compatible machine, these enhancements will be a gift from the gods.

On this subject, I would like to take issue with the reader Tim Evans ("Enhance Your Morrow or Go Blue," Volume 3 #6). I'll agree with him that loyalty is one thing and foolishness is another. However, for that \$995 that Mr. Evans would be spending on the WestWind products, he would be hard-pressed to buy a decently documented clone system and the software equivalent to that originally bundled with the Morrow. Most of the software bundled with the low-end (\$500-\$1200) clones is a joke—and I speak from experience. The documentation, both hardware and software, is little better. Sometimes the hardware is a joke, too. Additionally, a Westwind-equipped Morrow such as Mr. Evans alludes to would outperform any clone in his quoted price range, and a lot out of it.

*William J. Seward II  
High Point, NC*

Dear Editor:

I am happy to donate the enclosed MD2 board and disk drives to MOR. I'm equally happy that you can use the computer parts to help design the Z-system for MD2 owners.

ZCPR3 has given a tremendous shot in the arm to 8-bit computing, and MD2 users should have the opportunity to enjoy it productively. From my experience, Echelon has done a good job of supporting it's customers while developing excellent Z-related products. The one Echelon failing, as far as Morrow owners are concerned, appears to be the company's inability to write clear documentation for the novice user. (The Users' Guide helps, but still lacks clarity and completeness.) I hope this is where MOR can help with its new Z column. If I can ever add anything from my experiences as a novice, but enthusiastic, "Z-er," let me know.

*James E. Bottom  
Salem, OR*

*[Echelon, who made the MD3 bootable Z system for MOR, is unable to make the MD2 version. However, MOR has found someone to work on the MD2 Z system and, hopefully, MOR will make it available by June. -EDJ]*

Dear Editor:

I really enjoy the Z-system, which I recently purchased from MOR. It's a great deal of fun. But I don't think that it is only for those who are interested in "process." Z has many great features which make it a much easier system for people without any technical knowledge of computers or computer systems. The archive, alias, vtype, print utilities are all excellent and can be used by almost anyone to great benefit. The vtype especially is a godsend for a floppy disk system, permitting the user to go to the top and bottom of a very large file in two seconds, with a find command to boot. I think it would be wise for MOR not only to "push" Z for all levels of users, but especially for beginners. The Z-newsletter is often too technical or assumes too much knowledge to be immediately helpful. I would like to add, however, that even in the last issue of MOR, Rick Charnes discussed two Z programs which were not bundled with the Morrow version of the system. He discussed a later version of vfiler.com which permits letter commands after striking the escape key, and HSH utility, which also was not bundled. Will they be bundled in the next installment of the MOR Z-system? And will the I/O facilities become available for Morrow computers?

*Gary Rosenshield  
Madison, WI*

[Look at the MOR Product pages. Already we have included more Z-system material than we had planned. Before you order better first obtain ZCPR3.DIR, a directory of Z-system files available from MOR. A SASE to the MOR office will get you one fast.—Ed.]

## UPGRADE INSTRUCTIONS INCOMPLETE

Dear Editor:

Having just installed the ROM 3.1 upgrade in my parents' MD3 I wanted to pass on a couple of observations that might help someone ready to tackle the project.

The READ.ME and MOR.NOT files which accompany the MD3 ROM upgrade kit have been enhanced by Maxwell Syndstrom's article in the June/July 1986 issue of MOR and the author's instructions were quite helpful. However, the connection between the instructions given in the article and those in the upgrade kit is not always clear. It is not always obvious which of the two upgrade disks is needed for a particular step in the process. Mr. Syndstrom's article doesn't mention that you must choose and rename a CBIOSxx.HEX file before that file is copied to your new working system disk. Even with these discrepancies, including a reprint of the article with the upgrade kit might assist future upgrades.

Physically replacing the new ROM chip in the MD3 is another matter. Finding the cover screws and removing the cover is easy. What neither the Morrow Decision Manual, the upgrade instruction files, nor Mr. Syndstrom's article mention is that the chip to be replaced is located underneath the bracket of the computer casing. Replacing the chip requires that you release the four screws which secure the printed circuit board to the bottom of the casing. You must then release the rear plate from the casing enabling the entire PC board to slide out the back of the unit. There are some connecting cables which need to be carefully bent out of the way in order

for the board to slide out.

David Hebert  
San Francisco, CA

[Thanks for your additional instructions. After we discovered the enormous proliferation of BIOS versions used by Morrow and the myriad difficulties it caused in upgrading to an MD3, we have changed our policy and are now sending a new CP/M distribution disk with the appropriate version number in exchange for the original from the user. The installation is then very simple: the same as when the user first got the machine.

As for the casing bracket: Normally the MD3 ROM is easily accessible. But a small number of MD3's were built with casings designed for the MD11 and related machines. These casings had an extra bracket to support the hard disk assembly. This bracket indeed covers the ROM of the MD3 PC board. Your parents' MD3 must have been built with such a casing.—Ed.]

## MOR SURVIVAL SUPPORT

Dear Editor:

Today I received from MOR my copy of the "latest edition" Morrow manual for the MD11 (also MD5, MD16 & MD34), titled *Hard Disk Micro Decision User's Guide*, copyrighted 1985. I have only begun to examine it, but I want to confirm and reinforce the comments of Douglas Baker in his letter to the editor (MOR, 3, #6, p.3). This manual contains substantive useful information which is not contained in the older manual, *MD11 User's Guide* which came with my computer (purchased December, 1984).

I wish that I had known about and owned this newer edition manual two years ago. It would have facilitated my computer use and prevented several frustrations and headaches. Every reader with a hard disk Morrow (or a friend with one) should order this manual — particularly those who are upgrading

their machine with the "latest edition" ROM chip and software. I wish, too, that I had been able to upgrade my MD11 two years ago. Thanks to MOR, I now have a "top-of-the-line" computer, a good fan to keep it running cool, good (reviewed) additional software, and the knowledge, confidence and crisis hand-holding (via the MOR BBS) to keep it going when things go wrong. Thanks to MOR, my initial investment in a Morrow computer continues to prove itself an intelligent one, one that promises to keep paying for itself for many years to come.

Hurrah for MOR! You are providing the support that Morrow never did. I hope that MOR survives and thrives, because without you, our survival (as individual Morrow users) will be threatened. Well, at least our "quality of life" will be severely diminished. I was as saddened as anyone to see the demise of Morrow, Inc., but I would rather have a MOR with no Morrow than a Morrow with no MOR.

Jon Koerner  
Minneapolis, MN

## THE SAFARI CONNECTION

Dear Editor:

Let me tell you how I learned of MOR. On the first bush day of a safari in Kenya, I climbed into a van and sat next to another middle-aged male. I said, "Different way to start a day." He said, "Well, it gets me away from my computer." I said, "Me too." He said, "What do you have?" I said, "You never heard of it." He said, "I have a Morrow MD-3." I said, "Me too!"

I bought from a small shop that never had a Morrow franchise. Once I bought, it folded. I had no contact with Morrow or with Morrow users until I met Nels Hanson in Africa and learned of MOR. MOR has been almost as exciting as the safari.

James X. Corgan  
Clarksville, TN



# Tools for Tyros

by Mike Allen

Well, friends, it seems that I've erred yet again. Phil Hess wrote me a very nice, learned letter about my statement that direct BIOS calls should never be used. Phil pointed out that there are several limitations to the use of BDOS calls for console I/O, not the least of which is speed. He further points out that almost all of the commercial software use direct BIOS calls. NewWord and WordStar are two prime examples. I will still stand by my statement for casual programmers like me. It takes a very extensive understanding of CP/M to use direct BIOS calls and be able to avoid pitfalls.

I truly appreciate Phil's letter. People who are just learning their way around a computer don't need to be given bad information. People like Phil keep me on my toes and help me

---

*Send your questions and comments to Mike Allen at 400J Summer Wind Way, Glen Burnie, MD 21061.*

to learn, too. Thanks, Phil.

Glancing back over my previous columns I find that I have totally ignored the concept of user areas. Back in one of my early columns when I was talking about resident commands I mentioned the USER command and then completely ignored it. Most of us with floppy MDs will probably never need it, but it becomes extremely important of hard-disk machines. With people upgrading their floppy MDs with the Minnie-Winnie and with the availability of cheap MD-HDs from Silicon Valley Surplus the time has come to explain what is meant by user areas.

A good way to look at a disk is like a file drawer in a cabinet. Double sided disks would have twice as long a drawer as a single sided disk. A hard disk would be many times as long as a floppy disk. No matter what size disk you have, each one can hold only so much information. The drawer has a finite length and can only hold so

many folders. A folder is a good analogy to a disk file.

Now if you have a large number of small file drawers you could devote an entire drawer to a given subject and all the folders in that drawer would be on that subject. However if you have a limited number of drawers you might want to subdivide a drawer into several different subject areas. Each area could hold file folders that contain information about that subject. You still haven't changed the amount of information that you can store in the drawer, but you have organized it. The nice thing about this system is that there is really no limit to the number of file folders you can put in an individual subdivision as long as everything fits in the drawer.

User areas on a disk correspond to these subdivisions. Under CP/M, 16 user areas are supported on each disk. (Some software makes use of the expansion possibilities that exist in CP/M and can access 32 user areas.

NewWord is a good example.) These areas are numbers 0 through 15. You change user areas by typing "user n<cr>" from the CP/M prompt where "n" is the user area you want to use. If you are using a floppy machine with vanilla CP/M 2.2 you are probably doing most, if not all, of your operations in user 0. The reason I said "vanilla" CP/M 2.2 is that there are serious restrictions about using multiple user areas with CP/M 2.2 as supplied by Digital Research.

First off it is almost impossible to copy a file into another user area with the utilities supplied by DRI. Since the command being executed must either be resident or in the user area that you are logged into you must have your transient commands in the user area. The program that DRI supplies to copy files is PIP. PIP allows you to copy a file from another user area into the area where PIP resides but not to any other area. That means that to copy files into an area you must first get PIP into that area and you can't do that using PIP or any other utility that is supplied by DRI. This makes things rather difficult.

The second problem was already mentioned in the previous paragraph. For a program to execute, it must reside in the area that you are logged into. That would mean, for instance, that you would have to have a copy of LogiCalc in every area from which you wished to use LogiCalc. This can use up disk space in a hurry.

A third minor, but irritating, problem is that you don't know what user area you are in. The prompt tells you which disk drive you are using, but the user area is up to your memory.

All is not lost if you wish to utilize the user areas under CP/M 2.2. There are several enhancements that can be used to overcome these shortfalls. The quickest and easiest is ZCPR1. This is a replacement for the CCP in CP/M 2.2. It is public domain and is on BAMDUA BBS (and I hope on the MOR BBS soon. I didn't see it there the last time I looked) in a version that was tailored for the MDs and is just about self-installing. It is what I use and I find more than sufficient for me.

What does it buy you? The most obvious thing is the prompt. You will find a number following the disk letter. This tells you what user area you are in. The normal user 0 prompt would look like "A0>" which makes things rather obvious. This takes care of the third problem mentioned above.

The first and second problems are handled by a little gimmick called a "search path." What this means is that if you are logged into a user area and try to execute a transient command it will first look in the logged area and if it doesn't find the command there it will look somewhere else. Somewhere else in ZCPR1 is user 0 of the logged drive. This means that you can keep all your utilities on user 0 and access them from any user. Therefore if you want to copy a file to user 7 you log into user 7 and then execute PIP which is residing in user 0. You have to give PIP the "gn" option where n is the user area the file to be copied resides. (pip a:=a:junque.txt[g0] to copy the file junque.txt from user area 0 to the logged user area where both the user areas are on drive a.) A word of warning. Some programs that use overlays will not work except in user 0. This is because ZCPR1 only looks for COM files on the search path and not the OVR files. WordStar is like this. NewWord, however, knows where to look for its OVR files and runs fine.

There are a few other extras like one of my favorites; the ERA command tells you what files you have erased. This is nice in case you gave a wildcard erase command and discovered you erased a file you didn't want to. There are several "unerase" utilities that will allow you to recover an accidentally erased file, but most of them require that you unerase the file before any write actions have taken place on the disk. This way you know that you goofed as soon as the erase executes and not some time later when you discover that that very important file has disappeared.

This is a Yugo version of ZCPR. If you want the Porsche, go with ZCPR3. It does all sorts of wonderful things (right Rick?) and is almost indispensable if you are running CP/M

2.2 with a hard disk. A ready-to-fly version of ZCPR3 is available from MOR.

Thankfully for the MD-HD users, CP/M 3.0 takes care of these deficiencies in CP/M 2.2. The prompt shows the user area (2A> - backwards from ZCPR), you can set a search path and any file declared a system file on user 0 (set junque.com [sys]<cr>) is accessible from any other user. Please note that files accessed this way outside of user 0 are automatically treated as read-only.

In a lot of respects CP/M 2.2 with ZCPR3 is a more mature operating system than MSDOS. Keep an eye on Rick Charnes' column for an idea of what ZCPR3 can do. There is a ZCPRish CCP replacement out for CP/M 3.0 called CCP105+. Its not ZCPR3 by a bunch, but it is getting there.

I snuck in a new term; "wildcard." A lot of CP/M utilities allow you to substitute a "?" for a character in a file name. The "?" means "any character here" to the utility. For example if you went "dir junque.ba?<cr>" both junque.bas and junque.bak would show up. (If there were a file junque.ba it too would show up.) A second wildcard character is the "\*" which means "anything from here to the end of this part of the file name." If I went "dir nw\*.com<cr>" nw.com, nwu.com and nwinstal.com would all show up. You can find out and do all sorts of things using wildcards. Just be careful using the ERA command.

A little aside to end this column. There is a wonderful utility in the public domain called New Sweep. (The program is actually NSWP.COM.) The latest WORKING version is 2.07. It combines PIP, ERA, REN as well as squeeze and unsqueeze into a single program. It will copy from and to different user areas under vanilla CP/M 2.2. It took me a long time to try it. Now I don't know how I ever did without it. Its available on a FLOB as well as probably every CP/M BBS around the country. If you were only to have one piece of software other than that which came with your system, this should be it. See you in a couple of months. ■



## CP/M Alive!

by Ken Grymala

Over the past couple of weeks I have received a number of similar inquiries about modems and modem software. Hopefully, my experiences can be of some help to you.

MOR reader Bernie Ghiselin wrote and asked "... 1200 baud modems are priced around \$105 without software and I wonder, what's wrong with them?" He then referred to two specific brands, one of them being the Avatex 1200.

For the past year I've been using an Avatex 1200, and I couldn't ask for more for my money. When I first ordered mine, I too had to question the performance and price. A year ago it was almost impossible to find any "Hayes compatible" 1200 baud "smart modem" for under about \$350. Yet, I got together with five other friends, and we were able to get Avatex 1200s from a local wholesaler for under \$100 each.

The Avatex 1200 came with a 1 year full replacement guarantee. That is, if it failed in the first year I could send it in for a new one (Avatex is in San Jose, CA). All together, about 12 friends ended up buying Avatex 1200s, and to my knowledge, none of us has had any problems.

For reference, I have also installed a number of Hayes 300/1200 baud smart modems for my clients in the past

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*Send your questions and comments to Ken Grymala at P.O. Box 2540, Manassas, VA 22110.*

three years. The Avatex is electrically identical, but to me, is easier to set up than the Hayes. The Avatex has a built in test function that is really helpful when you are first connecting and testing the modem. It also has a user's guide that, in my opinion, is far superior to the Hayes manual.

### MODEM SOFTWARE

As for communications software, I've tried too many commercial modem software packages to mention -- and most of them not even worth mentioning!

I use public domain packages. On my Morrows I use XMODEM, and on my MS-DOS machines I use an XMODEM compatible program called QMODEM. Other good public domain CP/M and MS-DOS packages are MEX and KERMIT. As far as I know, XMODEM, MEX, and KERMIT are available for Morrow computers on MOR's public domain disks and bulletin board.

I use XMODEM because that is

what I started with quite a few years ago. It is a little difficult to use if you have never used a modem program before, but it does everything I need, plus it works flawlessly. (QMODEM for the MS-DOS machines is almost the same as XMODEM, but is easier to use and is every bit as good and flashy as any high quality commercial software package.)

If you have not used a modem before I have three very important suggestions if you want to successfully get your modem working:

1. Get a modem software package that is already installed and set up for your particular model of computer. Unless you can be absolutely assured that the package you are going to be using is set up for your particular computer, then get one of the public domain programs from MOR or your local Morrow Users Group that is installed for your MD-2, -3, -5, -11, etc. If you don't, then find a computer enthusiast who is willing to spend some time with you, your computer, and your new modem.

2. Buy or build a "null modem" cable or adapter. These are widely available at computer stores, including Radio Shack. A null modem converts an RS-232 communications port from looking like a "Data Terminal Equipment" (DTE) port to a "Data Communications Equipment (DCE) port, or vice versa. The RS-232 communications ports on your Morrows were set up at the factory as to communicate with printers. Your

new modem wants to see equipment that is set up just the opposite, which is what the null modem will do for you. You can build a null modem for about \$5, and you can find plans in most computer books, and in some of the books that were shipped with the later Morrow computers.

3. Find a friend who knows a little or a lot about modem communications.

I don't want to scare you, but be prepared for the worst when you set up your modem. Computer communications shouldn't be difficult, but everytime I have to talk to, or with, a new type of computer I have problems -- and I supposedly know what I'm doing. If you heed suggestion #3 above, and your friend happens to have a "breakout box," and knows how to use it, treat this friend like royalty. The "breakout box" is a piece of test equipment that connects between your computer and your modem. It is used to tell you exactly what signals are where, and how they are to be connected.

### RS-232 PROTECTORS -- MORE (MOR??) INSURANCE

As some of you may recall, my MD-2 and my Okidata 92 met with disaster two summers ago when the house two doors away was struck by lightning.

Neither the MD-2 nor the Okidata were even plugged in at the time. But they were connected together through a long RS-232 cable. The RS-232 cable acted as an antenna, picked up the lightning charge, and blew out the RS-232C driver integrated circuits in the MD-2 and Okidata.

Until recently, surge protectors for RS-232 lines were quite expensive. After the disaster, I made my own protective kludges, but even they cost me about \$15.00 a piece.

There are now a number of companies selling RS-232 surge protectors for between \$7 and \$15 a piece.

Do I recommend RS-232 line protectors? Absolutely!

If you are using the serial ports on your computer, and you must be, if

you have an MD-2. If you have a modem, or any serial/RS-232 printer, you should have surge protectors in these lines also. It is cheap insurance.

If you should decide that you are going to install RS-232 surge protectors in your system, you really need one at each end of the cable if the cable is much more than about two feet long.

The surge protectors are now available at many computer stores. If you can't seem to find one at a local computer store, they are available from quite a few mail order houses.

### CHEAP COMPUTERS

If you are in the market for an additional computer for the office or home, and you would like it to be (almost) fully compatible with your Morrow, then you should look at some of the surplus CP/M computers. They have really gotten cheap.

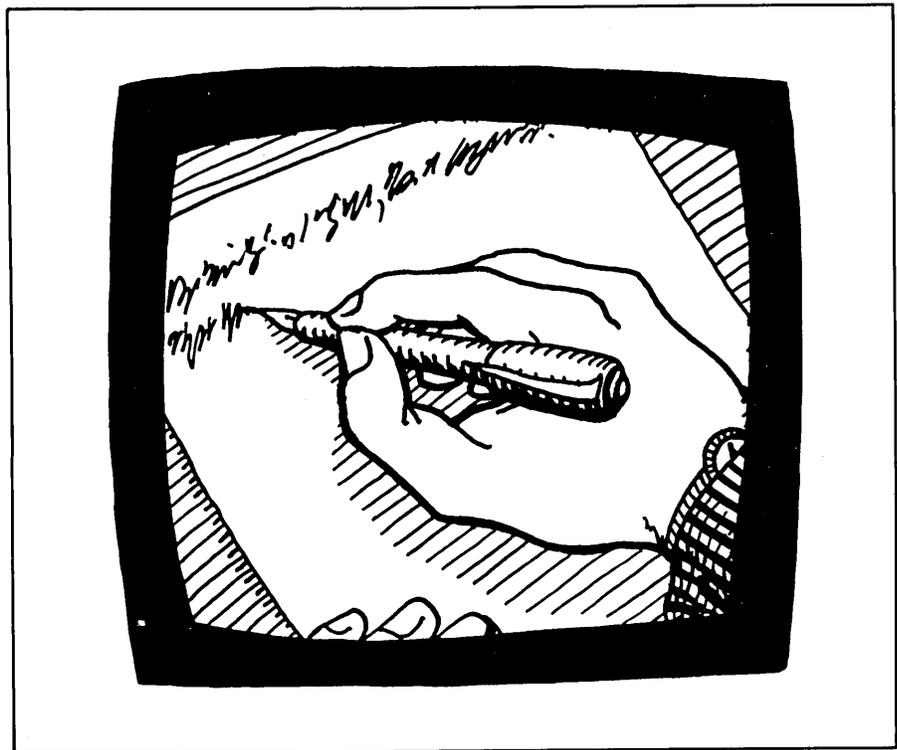
I have recently seen ads for Televideo and Xerox CP/M systems that are roughly equal to MD-3s for \$200-300 -- brand new! Also available are Televideo computers with hard disks. These machines are basically

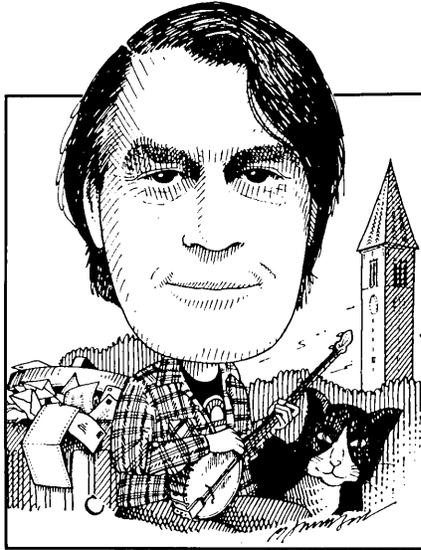
equivalent to the MD-11s, and are only \$350 to \$450. In many cases, these computers even come bundled with software.

The Televideo TS-800 series CP/M computers are extremely well built computers. The TS-801 and TS-802 are one-piece computers that have 11 inch screens and two disk drives.

My favorite are the TS-803 and TS-803H. These are also one piece computers, but they have 14" tilting screens. They look similar to the Morrow MDT-70 terminal, but they have a column mounted to the left of the display that holds two disk drives. The TS-803 has two 5-1/4" drives. The 803H has a built in 10 mbyte hard disk.

Both the Televideo and the Xerox CP/M computers were extremely popular business computers in the early- to mid-80's. Televideo is still a major manufacturer of computers, and service and parts are extensively available. Service and parts are also widely available for the Xerox computers. Both are served by numerous user groups throughout the country. Look for ads in various computer and electronics magazines. ■





Here's what may be the last tip ever to come out of the NewStar shop. You may have noticed that NewWord won't do a search for any string containing a ^J, or linefeed character. Since a carriage return in a NW or WS file actually consists of a carriage return followed by a linefeed (i.e., ^M^J), you can't use search and replace for such things as changing double carriage returns between paragraphs to single. Search and replace will replace linefeeds, but won't find them. (WordStar is even worse: it finds the "soft" carriage returns at the end of every line, as well as the "hard" ones at the ends of paragraphs.) Solution: save the file and reopen it in non-document mode, where NW will find the ^J's.

One mystery deepens. In our last episode, you may recall that **John William Johnson** couldn't get the CORRECT-IT master dictionary to update and we had discovered that AUXDICT.TXT contained words with the last letter missing, e.g., "dictionar" or "updat." Now **Nina Seco of Seattle, WA** reports that her CORRECT-IT does the same thing, and that WordStar files contain truncated words when viewed by other

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*We're more on our own than ever, so if you know a solution to a problem, don't assume someone else will write in; there are not so many of us that you can count on that. Whether you have questions or answers, keep them coming: Bill Steele, P.O. Box 782, Ithaca, NY 14851, 607/273-2132; MCI: WSTEELE, 254-5833.*

## From the Mailbox

by Bill Steele

programs, although they print out OK under WS. This seems to happen only on her *Morrow*, she adds, not on her *Osborne*. In the same letter, she asks if there is anything strange about UNIFORM in Osborne format on the *Morrow*. "I seem to have problems at times with being unceremoniously dumped out of the file to the prompt, after having configured the B drive to Osborne format and working for a bit. Finally, she warns that James River Group's Inventory and Accounts Receivable would not run on the Osborne with a Drive C ramdisk. Anyone have this trouble on an MD?

**Dick Schad of Buffalo, NY** is trying to write an execute file in SuperCalc that will include instructions to his Okidata 82 printer to change pitch; he finds these instructions work from the SuperCalc command line but not from the execute file. For instance, he says a line like "/ODA1:E1,SS^P^J^M" doesn't work, whether he prepares the file in the SuperCalc mode or in WordStar. The solution probably isn't this simple,

but if you're printing under WordStar you can't pass control codes to the printer by entering them in the file. WS's printer driver sorts out all control codes and interprets them its own way. It might be that SC does the same. The best bet would be to print your SC file to disk, edit in the printer commands, then print out under WS. Patch the pitch control commands either into WS's alternate pitch commands, ^A, ^N, or the Custom Print Controls, ^Q, ^W, ^E, ^R, using the patcher or DDT. See page F-8 in the WS manual for the patch addresses. Or, set up the printer before loading SC, by one of the methods described in this column in MOR Vol. 3, #3, June/July 1986.

**Gordon Northrup of Lee, MA** ran into trouble and big long-distance phone bills trying to upload an article to the BAMDUA bulletin board with MITE and an MM300 modem. "It just printed out the first line and hung up; earlier it had worked OK to upload a message. Should I have used one of the filter programs on the MOR Writer's FLOB? What do they do, make the high bits zero?" I had the same problem the first time I tried to upload an article to a BBS. I suspect that, like me, you tried to upload by sending straight text, as you would to a service like MCI mail or CompuServe. Because of noisy phone lines, most BBS's are set up to receive long files via XMODEM protocol, which includes error checking, although they accept straight text for short messages. When you send under the wrong protocol, MITE gets hung up as soon as the error-checking

signals come back. To send a long file with MITE, use the Binary File Transfer menu, rather than the Text File Upload menu. For most boards, including MOR's, you must set the CRC Option to ON; MITE's default is OFF. (You can then save this setting to a parameter file and not have to mess with it the next time.) You can usually send WS/NW files unchanged, though I always take the precaution of changing ^S's to something else, since some systems treat them as a signal to stop. To send straight text through MCI mail and other services you prepare it in the non-document mode or use a filter program like HARDSOFT, which indeed resets the "high" bits that the word processor has changed, and puts a "hard" carriage return at the end of each line. Without that, the text would come out at the other end as one long, long line. If you don't have a filter program, copying with PIP and the Z option, i.e., "PIP FILENAME.HRD=FILENAME.SFT[Z]" will "harden" a file in exactly the same way. HARDSOFT is just a whole lot faster, and also can be used to convert back to a WS/NW file. Incidentally, MITE tends to crash whenever something goes wrong with a file transfer. When it does, the only thing you can do is hit reset and start over. Don't just walk away, because your modem is still online, and you're paying for the long distance call. When you get MITE reloaded, hit G, for "Start Communications," and you'll see "Now resuming previous call." But you won't see anything else. At this point, you'll have to remember what command the remote system expects as a signal to stop whatever it was doing and give you a new prompt. Without that, you might as well hang up and call back. To hang up without reloading MITE, unplug the modular phone cord from the modem for a second or two, or just turn off the computer, which powers down the MM300.

**Hilary Powers of Oakland, CA** writes "Gordon Northrup's article on function keys (MOR Vol. 4, #1, Feb./Mar. '87) reminded me of one of my pet peeves--the plus sign on the

number pad, which wouldn't do anything but enter a RETURN. The 'TERM \_ESC[' line he suggested for the KEY file looked like it might do the trick, but it only made the whole file unusable on my MT70." In the process she discovered something a lot of us knew, but it's worth passing on the reminder: the keys on the MT 70 (and MDT60) numeric pad can also be programmed by KEY.COM when the pad is put in function key mode by entering ESC [ at the A> prompt, or by one of the other methods mentioned in MOR Vol. 3, #3. That's also what the 'TERM \_ESC[' line is supposed to do; anybody know why it didn't? Like the other function keys, the numeric pad keys can be programmed in three modes--regular, shifted and control, for a total of 42 more functions. However, Ms. Powers points out, "If you define any keys on the pad, you have to define them all, [and] the KEY file has a maximum length, and might overflow if you're using a lot of boiler-plate text." Anybody know precisely what that maximum length is? Finally, she asks, "Any suggestions for disabling the LINE FEED key so it doesn't drop me into the help menu if I miss the SHIFT?" You might use Smartkey to redefine the line feed (^J) to something else, perhaps ^M (shift), but then you'll want to redefine a function key to send ^J so you can get it when you need it. While we're on that, a note to you cautious types: when you've learned all the NW/WS commands, patch your program to come up in help level 0, and you'll find everything runs faster; deletes are carried out without the Y/N question, and you don't have to delay typing in filenames until directories come up. I've patched a function key with "^J ^J 2 ^M" to get into help level 2 when I want to know what page I'm on or see a directory after a read-in command, and another key to get back.

This month's cautionary tale comes from **Bill Welch in Houston, TX**: "Danger signals appeared at least six months before my MD11 crashed. Files wouldn't read, Pearl wouldn't sort. And one day the hard disk refused to do anything. Not to worry. I had

three full backups, so I just reformatted and tried to run RESTORE. Alas, none of them worked; all I could get was the fatal error message, 'First backup disk has inconsistent parameters.' Same thing with each backup set. SELECT says I should be running SELECTS, which does not exist within my software. Is there hope for restoring any of these files?" The "inconsistent parameters" message is supposed to mean that something else has overwritten the backup files; you shouldn't put anything else on backup floppies, not even PIP or a directory program. SELECTS (sometimes SELECTL) is an alternate version of SELECT, but Morrow quit shipping it, and the manual says "You should never get this message." Thanks a lot. No guarantee it would help Mr. Welch, but does anybody have copies of these programs? Morals: heed warning signs by having your equipment checked, and make additional backups of important files the old fashioned way, by copying with PIP, if they are small enough to fit on a single floppy.

**C. M. Deasy of San Luis Obispo, CA** wonders if there's any way to stop his MD3 from interfering with his wife's TV programs. MD's meet FCC radio frequency radiation standards for commercial use, which are not as stringent as those for "home" computers. My own experience is that you can do a lot by shielding the input to the TV set. Replace twinlead from the antenna with coaxial cable, and keep the lines as short as possible. In desperate cases, try a signal amplifier at the antenna to boost the TV signal so it overpowers radiation from the computer. I had some trouble with our cable TV signal (it was also picking up the local police) until I asked the cable company to reinstall with a new, tighter line from the street and that cured it. Try to keep the cables connecting the computer with the terminal and printer away from the power cords; wrapping those cables with aluminum foil might also help. A line filter that plugs into the wall receptacle will help keep RF from traveling through house

wiring; try using one at the TV set and another at the computer.

**James E. Bottom of Salem, OR** sends along some more information on the specs for Morrow printers: the MP100, 200 and 300 run at a maximum 14, 17 and 31 characters per second, respectively (at 12 pitch); the 100 and 300 have parallel interfaces while the 200 is serial; the 200 and 300 have an autoloader function for single sheets, and optional tractor feed. Silicon Valley Surplus, he tells us, has all three (in refurbished form) and a lot of parts.

Responding to one of Mr. Bottom's

other questions, **Phil Hess of Lafayette, IN** says that Part VIII of his series of articles on "Reinventing Your Morrow Micro Decision" in the BAMDUA newsletter deals with upgrading to a Rev. 2 motherboard. Mr. Hess also corrects my statement about accessing the MT70's graphics characters: "Sending an extended ASCII code doesn't work as the MT70 ignores the eighth bit; however, there is an escape code (ESC !) which causes the next character received to be displayed from the alternate set. Hence, to print a series of characters from the alternate set it's necessary to precede

each character with this escape code. I know the table in the MT70 manual would seem to suggest otherwise but that's just not the case." The manual does document this, on page 3-3. It also says ESC \$ will put the terminal into graphics mode for a series of characters, and ESC % will take it out; I don't have an MT70 to play with, so I don't know if this will work with characters sent by a program, or just from the keyboard. The character you get this way is found by adding 80 hex to the ASCII value of the character you type, or by counting down eight rows in the table on page 1-4. ■



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## Forever Z

By Rick Charnes

By now many of you are well on the way toward creating elegant command scripts for your menus and exploring the many ways to make beautiful screen displays. The menu utilities (VFILER, VMENU, MENU) are interesting: while many of us were running CP/M we denigrated programs that relied heavily on menus. "Menus are for beginners!" we insisted. But in Z-System the more you use them the more you see how helpful they are, how much time and energy they save in doing repetitious tasks. The difference between CP/M programs that display menus and Z-System menus you create yourself is the latter's ability to run detailed 200-character command lines at the touch of a key. Most CP/M menus execute but a single command in this manner.

I would like to mention a few other sources of Z-System information that I have found immeasurably helpful in my own education. First and foremost are

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*Rick Charnes bought his MD-2 many years ago when he thought of himself primarily as a writer. Now a self-admitted fledgling technical type, his computer has turned from tool to toy. His immense love affair with ZCPR3 leaves some occasional time for mundane things like work. He is president of BAMDUA.*

products from Echelon, Inc. at 885 N. San Antonio Road, Los Altos, CA 94022. I urge all users of Z to subscribe to their stylish and lively fortnightly Z-News containing much information about new CP/M-compatible hardware (and don't think it doesn't exist!), Z-System tips, announcements and discussion of new programs, letters from readers, philosophical ruminations, etc. It's the essential way to keep up with the latest developments in our Z-System world. I recommend it to every user without exception. Echelon's new catalog is also out, which discusses each of their products from a personalized point of view. It's beautifully done and presents Z-System from a broad historical perspective. Lastly, the invaluable accompaniment to the Z-System User's Guide which most of you have is ZCPR3: The Manual, available from MOR for \$20. This is a reference manual rather than a guide, and describes each utility in painstaking detail, picking up where The User's Guide leaves off.

Now to HSH.COM, the amazing command recall and editing program. "HSH.COM" stands for "History

SHell," and that's exactly what it is. It remembers the "history" of all the commands you've entered and stores them in a file. It's a "shell" because it envelopes all your other operations, remaining in the background until you need it, with no functional reduction in TPA. Who among us has never typed a line such as: "NW LOBELTR.TXT" only to realize that the "B" was supposed to have been a "V"? In CP/M all the letters after the "B" are lost. You have no choice but to backspace and erase until you get to the "B", this time enter "V", and retype the rest. If, however, in your STARTUP alias you loaded HSH, you can cursor to the left with ^S or ^A to move to the offending letter, delete it with ^G and replace it with "V", and return. This feature is especially valuable in Z-System where we are allowed command lines of up to 200 characters in both a menu script and directly from the command line.

This isn't the half of it. I've found its most useful feature to be command line recall. When we are doing work from the command line that entails frequent repetition of filenames and commands, we are able to "recall" previously issued commands. They can then either be reissued as is or edited and then run. The author has kindly relied on the Wordstar/NewWord cursor movement commands with which we're

familiar. To recall a previous command we type ^E until we get to the command we desire. To move forward in our command "history" we type ^X. When we find the command we want, <CR> will send it to the operating system, or we can edit it and send it out again.

I keep HSH in operation at all times. It is available on our MOR BBS (415/654-3798) or Z-Nodes everywhere free of charge, courtesy of its author Michael Rubenstein. It is a brilliant piece of work and adds an additional level of elegance to our computing.

Another superb program which I wanted to cover, just released in 1987, is ZPATCH. This is a patching utility that leaves ZAP, the program many of us previously used, in the dust. It is also a shell, which has a special meaning in this context. Remember, a shell sets itself up below your normal operations. Any time you choose to exit another program, you are always returned to the shell. Because of this feature ZPATCH has a power and flexibility that no comparable CP/M program such as ZAP or EDFILE can match.

Suppose you have found a certain patch you want to make to VFILER.COM, for instance to allow for immediate execution of macros 0-9 without hitting the "macro" lead-in character. You know the patch address for this byte is 011Ah. From the Z-System command line enter "ZPATCH VFILER". Once you are inside ZPATCH the actual commands for patching are very similar to any of the CP/M programs such as the two mentioned above. But here's the rub. Once you have made the patch and saved to disk, hit "X" to eXecute. Voila! The program VFILER is automatically run, with your new values in effect. You can of course test it now to make sure the changes you have made work as you wish. Now: when you are finished testing, exit VFILER the way you would normally. ZPATCH once again takes over. You see its "strike any key" message and when you do so you find yourself back in ZPATCH. If you wish to correct the changes you made

the first time or to patch new locations you may do so all without leaving this wonderful shell we have created. You can loop back and forth between patching and running as many times as you like until you have your program exactly as you like it. No commands need be typed on your part; the entire routine is held "on the shell stack" and is taken care of by the operating system. This user as opposed to programmer use of the shell stack is one of the superior elements of Z-System over CP/M.

But that's not the end of ZPATCH's shell nature. Suppose in the middle of patching you realize you're not sure of the right addresses to change. You remember they're all explained in the HELP file for VFILER, VFILER.HLP. But what a shame it would be to have to leave ZPATCH. Simply hit "Z". This will return you to the Z-System command line but still from within the ZPATCH shell (a similar feature is available by typing "Z" in VFILER as well.) You may then enter "HELP VFILER" (or any other Z-System command line) as if you were at your regular operating system prompt. HELP.COM will load your help file; you may read it, note the patching address, and exit. Here, rather than returning to your Z-System command line as you would normally, you will be presented with ZPATCH's familiar "strike any key." You do so and you're immediately back to the precise location and screen in ZPATCH from which you left off.

ZPATCH is quite an extraordinary program and is available through all the usual channels. By the way, for keeping up with the latest programs I must emphasize here the importance of having and using a modem for any serious work in Z-System.

I'd like to delve into a topic which is covered only in the most cursory manner in the Z-System User's Guide, Extended Command Processing (ECP), which is especially important on floppy disk systems. This feature has no parallel in CP/M. Suppose you issue a command "COPY LETTER1 C:LETTER2"

while logged on to B0:. In CP/M, if you have no program called COPY.COM that's the end of it. But not in Z-System; this is where the ECP comes into play. The ECP then looks for a file called CMDRUN.COM. This file can be any executable program, renamed to CMDRUN.COM. Whatever this file may be, it then is executed. Most people use a program called ARUNZ.COM. ARUNZ stands for Alias RUN Z-System (run an alias) and is a real star in our repertoire. It provides us a way to put all our aliases into a single supplementary file which we create, called ALIAS.CMD.

What is the advantage of this? On a floppy disk system a single alias existing as its own COM file occupies a minimum of 2k in disk space and 4k on a hard disk. This is an inefficient use of space considering that the maximum length of an alias is 200 characters. With your word processor you create a file which you name ALIAS.CMD. Into this file you then put as many aliases as you like, each horizontal entry representing one alias. Each should occupy one physical line only and the individual commands within an alias must be separated by semicolons, just as within a menu command script. The lines themselves may extend to a right margin of 200, and should begin with the name of the alias.

Suppose you wanted to put the COPY alias that I described last time into your ALIAS.CMD rather than as a "free-standing" COM file taking up disk space. Your entry in ALIAS.CMD would read:

```
COPY CP $1=$2
```

Then when you issued your command "COPY LETTER1 C:LETTER2" your CCP would first look for a regular program named COPY.COM and not finding one would surrender control to the ECP which is here ARUNZ.COM. It in turn then passes control, complete with your parameters, to its auxiliary file ALIAS.CMD, and finding your entry will successfully execute the copy. This entire process

takes place very quickly, occupying just a very slight amount of time greater than it would with a single program called COPY.COM.

The possibilities are endless. You can put as many of your aliases as you wish into your ALIAS.CMD and save an amazing amount of space, especially crucial on a floppy disk. A nice variation would be:

```
COPY ECHO COPYING FILE
"$1" TO "2"...;CP $1=$2
```

to give yourself some friendly "status reporting."

Don't forget about our memory resident flow control, always crucial with aliases and menu scripts. Remember how "if", "else" and "fi" (endif) work together. The following is typical:

```
IF condition x exists
(do such and such command)
ELSE ;or else if condition x does NOT
exist
(do such and such OTHER command)
FI ;it must be terminated in this manner
```

A good example here, building on

our alias above, would be to first check to see if our file existed at all. This is done with the EXIST option of IF (a resident command). The following would be our ALIAS.CMD entry:

```
COPY IF EXIST $1;ECHO COPYING
FILE "$1" TO $2...;CP $2=$1; >>
ELSE;ECHO FILE "$1" DOES NOT
EXIST
```

Each entry is separated by semicolons. If the file does not exist, we are told so by means of an ECHO'ed message.

In closing, I must mention something in our Morrow Z-System world that is most exciting. Many of you have been hearing about the new Hitachi HD64180 chip, an 8-bit CP/M compatible microprocessor capable of addressing 512k bytes of memory. All our familiar CP/M and Z-System programs can run on this chip at approximately twice the speed. Several machines are now being manufactured that use this chip such as the Micromint SB180 and the Deep Thought DT42. We in the Morrow community may soon have the opportunity to install an HD64180

to our existing computer by means of an add-on board made by a company called M.A.N. Systems. An operating system capable of multi-tasking and taking full advantage of the 64180 is still under development at Echelon, but until then we would be able to use the extra memory primarily as a RAMdisk.

There is one hitch, however: M.A.N. Systems has requested that we do the necessary revisions to the Morrow BIOS. We are looking for assembly language programmers willing to tackle the task. Interested parties should contact me through the MOR office.

Lastly, don't forget the Morrow auto-install Z-System disk packages are now available and shipping from MOR in both floppy and hard disk versions, as well as the group discount for the Mini-Winnie hard disk. Running Z-System on a hard disk is a sight to behold... By the way, with purchases of these disks MOR is now including my home phone number as a reference, and please feel free to call if you have any questions.

Learn, experiment, and be amazed. Z see you next time... ■

## ZCPR3 Notes

### ONLY MD3 ROM 3.1 WILL WORK

We have printed it before and we will print it again: The current MOR bootable ZCPR3 kit will only work properly on an MD3 with a Rev. 2.0 PC board with ROM Rev. 3.1 and a CP/M 2.2 Rev. 3.1. Even then you may have troubles, in which case you should call the MOR office.

There are many other MD3's around with ROM Rev. 2.3 or 2.5, or even with a Rev. 1.1 PC board. To make the MOR ZCPR3 work with them you have to upgrade first.

### MOR ZCPR3 FOR THE MD2

Most MD2's have Rev.1.1 PC boards, and most MD3's have Rev. 2.0 boards. Those MD3 owners can run ZCPR3 if they have a ROM 3.1, but so far MD2 owners are out of luck. However, MOR has permission from Echelon to arrange for someone to create an MD2 ZCPR3 system, which enables MD2 owners to add a discounted Mini Winnie hard disk. **If you are interested, write MOR right away, to the attention of Sytko Andreae.** We are hoping for a June delivery.

### MOR ZCPR3 PRODUCT CHANGES

MOR received from Echelon a different set of ZCPR3 source files than we had expected. This has caused some changes and additions in MOR's Z-products.

**Prod 803, \$35:** Five floppies with ZCPR3 utility sources.

**Prod 806, \$25:** Four floppies with ZCPR3 source files (except ZRDOS); includes BIOS for normal MD3 and MD3 with Mini Winnie.

**Prod 807, \$40:** Assembled ZRDOS without ZCPR3. Get ZCPR3.DIR and some advice before you order.

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# ON!

## *A New CP/M Computer with Great Promise*

By Ted Silveira

Is it possible for someone to successfully introduce a new CP/M-compatible computer? Not a hardware *aficionado* computer, like Ciarcia's SB180 or Deep Thought, but a computer aimed squarely at the business market? And at a time when people are beginning to consider the standard 8088-based PC clone to be obsolete? Can these people be anything but crazy?

Well, in fact, they may be crazy, and it may be impossible to break into the business market with an 8-bit computer. But after working with Oneac's ON! computer for a while, I can tell you two things for sure. First, if any 8-bit computer can crack this market, the ON! is it. And second, some day the features that make the ON! computer special will be standard equipment on *all* computers, no matter which chips or operating systems they use.

### **A Dream Come to Life**

Some time back, I described my dream computer--something fast, silent, spacious, and immune to power problems. The ON! is that computer come to life.

The ON! is made by ON! Systems, a subsidiary of the Oneac Corporation of Illinois. It consists of a smaller than average system unit (roughly 13 inches square), a single 800K floppy disk drive, and a Televideo 955 terminal, with both the system unit and the disk drive done up in a smart looking dark gray with a red stripe (nice to see something other than beige). The ON! uses a Z80 processor running at 4 MHz (why not 8 MHz, I wonder?), just like the typical Morrow or Osborne or the 84-model Kaypros, and it has a built-in 2 megabyte (2048K) RAM disk and complete

power protection, also built-in. For its operating system, the ON! uses the Z-System, an advanced CP/M-compatible operating system I've covered here previously. It also comes with NewWord (the WordStar clone), V-Spell (an excellent spelling checker), SuperCalc2, and a communications program, as well as the Z-System utilities, including custom menus.

There are four things in this package that really make the ON! unique:

**The RAM Disk** Though the ON!'s 800K floppy disk drive is fast as floppy disk drives go, it's only meant to be used for backup purposes. The 2 megabyte RAM disk (4 megabytes available soon) is the ON!'s drive A and is designed to be the computer's main storage. On it are kept all the programs and working data files, stored in different user areas (A0:, A1:, A2:, etc.).

Needless to say, the ON!'s RAM disk is fast. Most complex programs like NewWord (or WordStar) and dBase II are disk-bound--they read from and write to the disk so often that their overall performance is limited by the speed of a computer's disk drives. And you know how tedious it is to sit twiddling your thumbs while a program grinds away at your disk. Well, on this computer, NewWord, dBase II, and other disk-intensive programs absolutely fly (I'll give you some performance figures later).

Almost as important to some people (including me), the RAM disk is utterly silent. And since the ON! has no fan to whirr and no disk to grind, it, too, is utterly silent. It's easy to overlook the importance of this, but after I've worked in my quiet office with a typically noisy PC clone (fan and hard disk noise), I'm tense. And after a day's work on a machine like that, I'm exhausted. But even in the quietest room, the ON! adds no noise--no distraction to get between me and my work.

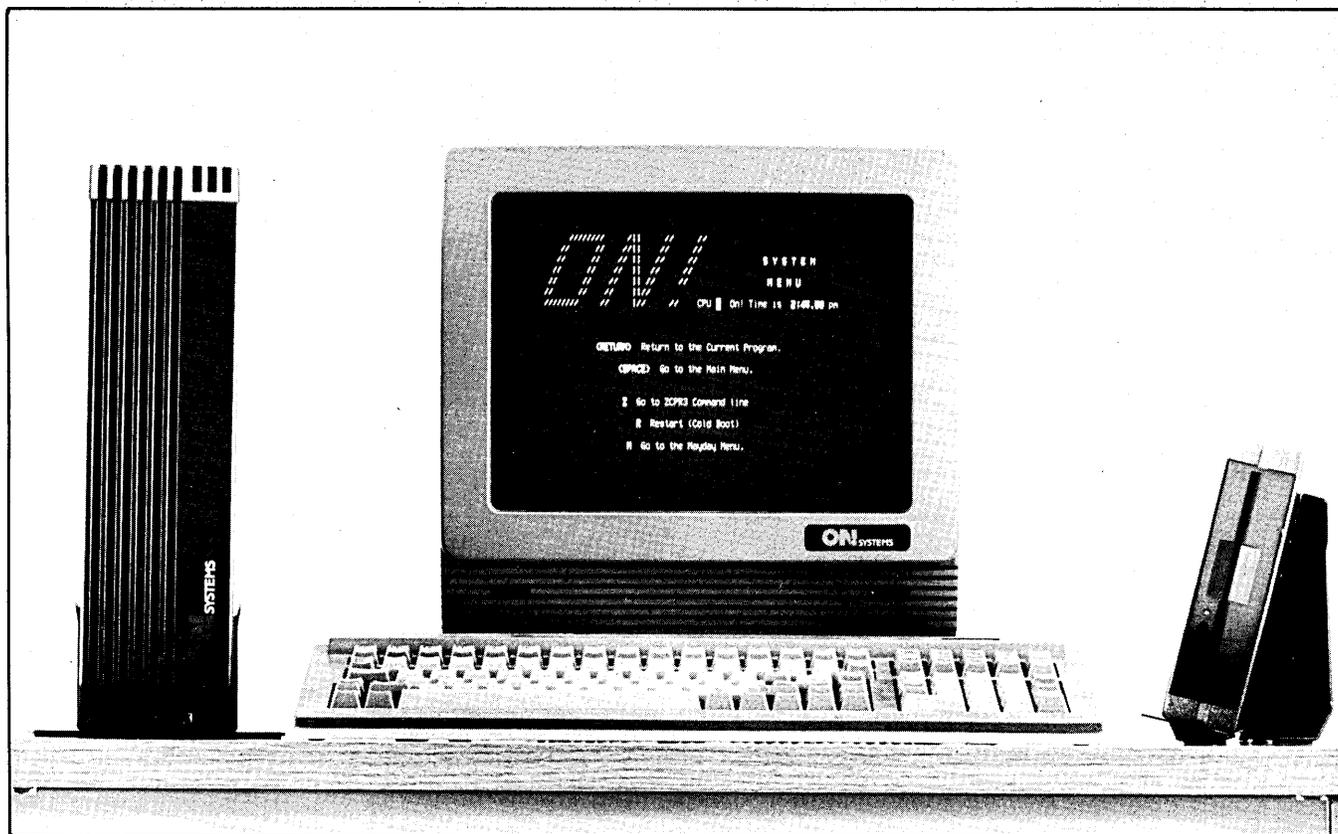
And because it's a solid state device (made of integrated circuit chips), the RAM disk is inherently more reliable than either a hard disk or a floppy disk, both of which have moving parts that can wear out and magnetic media that can develop flaws.

**Power Protection** The ON!'s second unique feature is

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*This article originally appeared in the San Francisco Bay Area tabloid Computer Currents.*



its built-in power protection, which has two stages. First, the ON! has all the protection from spikes, dips, and electrical noise you could want built in--well beyond that supplied by most surge suppressors and other add-on devices. The ON! also has filtered power outlets on its back panel so that you can plug in the terminal and other electrical equipment to take advantage of the ON!'s protection.

Second, all the RAM in this computer is protected, so the ON! can survive a complete power outage of up to 14 hours without losing any of the data stored on its RAM disk or in its 64K working memory. In other words, if your four-year-old niece or nephew playfully pulls the plug on your computer while you're working on an important file, all you have to do is shoo the kid gently out of the room, plug the computer back in, and return to work. You can pick up right where you left off, even in the middle of a program.

To test this, I just pulled the plug in the middle of writing the last sentence in NewWord. I plugged it back in, hit a couple of carriage returns to restore the ON!, and finished the sentence. Try that with your garden-variety computer.

In short, for anything less than a 14 hour total power blackout, your data is safer in the ON!'s memory than it is on any floppy disk, hard disk, or tape.

**The Missing Switch** The ON! computer has no

on/off switch--once you plug it in, it's ready to work. When you're not using it, you simply leave it on. Because it's all solid state, the computer itself draws very little power, and the Televideo 955 terminal automatically blanks its screen after a few minutes of non-use to prevent burnout (pressing any key restores the screen). So the ON! is always ready for you, instantly--no power-on sequence, no cold boot, no warm up, just sit down and go to work. When you're done, walk away.

Most computer hardware demands your attention at regular intervals, with dire consequences if you don't heed. The ON! is about as demanding as a pencil and scratchpad.

**The Z-System** The perfect mate for the ON!'s wonderful hardware is the Z-System software. The Z-System is unique among microcomputer operating systems in the power it gives the user to custom-tailor his or her working environment through menus, multiple commands, aliases, and special utility programs. The Z-System extends the ON!'s philosophy of staying out of your way so that you can concentrate on your work by allowing you to modify your environment to suit your own habits and to automate common tasks with the touch of a key. The speed and silence of the ON!'s RAM disk take the Z-System to new heights by making menus appear almost instantaneously and complex command strings run as if they were built in. It's a sweet combination.

The ON! computer is quiet and stylish, both nice features in a world of noisy beige clones. And because of its two

megabyte RAM disk, the ON! is also fast.

To find out how fast, I set up a few simple tests designed to match the ON!'s RAM disk against typical CP/M hard disk and floppy disk computers. These tests weren't very scientific. I didn't, for example, try to control the fragmenting of the test files on the various disks I used (but the ON! files were probably the most fragmented, since it's been the most heavily used for the last month). I did, however, try to choose tests that reflect the way people actually use computers.

These tests were run on the ON! and on two Morrow MD3 CP/M computers, one with a 20 megabyte hard disk and one with two double-sided floppy disks only. The Morrow is a typical 8-bit CP/M computer, with its Z80 processor running at 4MHz (the same as the ON!). The Morrow is somewhat faster than normal at reading from and writing to its floppy disk drives--definitely faster than a Kaypro, not quite as fast as an Ampro. All three computers were using the Z-System CP/M-compatible operating system.

For the first set of tests, I used a 100K text file (85 double-spaced pages) and an unmodified copy of WordStar (no patches of any kind). I collected times for loading WordStar and the text file, for jumping directly from the beginning of the file to the end (^Q^C), for saving the text file while positioned at its end, and for saving the text file while positioned at its beginning.

The results, shown in Table 1, were impressive. The ON! was consistently two to three times faster than the hard disk Morrow and three to four times faster than the floppy disk Morrow. (If you're wondering why it takes so much longer to save a file from its beginning than from its end, it has to do with the temporary work files WordStar creates while you're editing or scrolling through a document.)

For the second set of tests, I used dBase II (version 2.43) with an 80K data file containing 392 records (each record consisting of 204 characters in 9 fields). Here I collected times for sorting the data file on a new field, for indexing the data file on a new field, and for displaying the last record in the file (using the command [DISPLAY FOR AUTHOR =]).

Again, the results (shown in Table 2) were impressive, especially in sorting and indexing. With the ON!, sorting a large dBase II file is no longer an excuse to step out for coffee.

All three computers tested use the same chip (Z80) running at the same speed (4 MHz), so the ON!'s spectacular performance is mainly due to the differences in disk read/write speed between the RAM disk, hard disk, and floppy disk drives. Because CP/M and CP/M-compatible computers like the ON! and the Morrow have only a 64K memory to work in, the programs that run on them use the disk drive a lot, swapping program overlays and parts of files in and out. As a result, the performance of most CP/M programs is limited by the speed of the disk drives. And because the ON!'s RAM disk is so much faster than either a hard disk or floppy disk drive, most programs run like lightning on it.

This increase in performance has one obvious effect--you get more work done in less time. Word processors, data base programs, accounting programs, mailing list programs--all become faster and more responsive. On the floppy disk Morrow, WordStar gets very sluggish when working with files of 30K or more. On the ON!, a 30K file is no strain at all.

The performance increase also has two not-so-obvious effects. First, it reduces frustration and improves your outlook on life because you spend less time waiting for your computer to do something and more time actually working. At the end of a long day, the extra two minutes you have to wait while your floppy disk computer indexes your database can make even the best-tempered person grouchy.

Second, the speed and responsiveness of the ON! lead you to do things that you would avoid doing on any other computer because they take too long. For example, when I'm editing a long file with WordStar and find I could use some information that's in another file, I'm often tempted to recreate it from memory (treacherous), leave a blank to be filled in later (clumsy), or work around it (very unsatisfactory)--all because it takes so much time to exit one file, open another, find the information I need, and so forth, especially if finding the information requires running a second program, such as dBase II. But with the ON!, I can get out of one file or program and into another so quickly that I do it without hesitating.

Of course, you can add a RAM disk to almost any computer and increase its performance. What makes the ON! different is that the RAM disk is an integral part of the computer, not an afterthought. Most important, your data is well-protected on the ON! RAM disk, safe from power line disturbances or even complete blackouts of up to 14 hours. Most add-on RAM disks get total amnesia at the first sign of an electrical disturbance, so you either buy a battery backup system (expensive), keep only programs on the RAM disk and not data files (which costs you performance), or trust to your luck and the electric company.

**Table 1**

WordStar and 100K Text File (all times in seconds)

	ON!	Morrow w/	
		Hard Disk	Floppy Disk
Load File	4	8	12
Jump to End	15	38	52
Save from End	3	6	14
Save from Beginning	16	43	57

**Table 2**

dBase II and 80K Data File (all times in seconds)

	ON!	Morrow w/	
		Hard Disk	Floppy Disk
Sort File	95	255	375
Index File	27	44	182
Display Last Record	6	10	12

---

More on the marvelous ON! computer. I have learned some new things about the ON!, which answered some of the objections I had developed. (I also got the chance to talk to Nick DeWolf, the ON!'s designer, who's an interesting guy, to say the least.)

**Problem** The ON! I've been using has only a 2 megabyte RAM disk for its main storage. Now, 2 megabytes seemed like a lot to me when I started using the machine, but it doesn't any more. First of all, the ON! uses the Z-System, a CP/M compatible operating system, and the Z-System utilities take up a lot of space (there are over 70 of them). You don't have to use them all, but people tend to accumulate them anyway.

Second, I want to have all my important files and programs on-line all the time, and 2 megabytes isn't nearly enough. The original idea seems to have been that you would shuffle files onto and off of the RAM disk by means of the 800K floppy disks. Unfortunately, that plan is inconvenient and very irritating--especially because the rest of the ON!'s operation is so fast and silent. The tedious disk shuffling and grinding seems even more of a burden than on a normal computer.

In short, to me, the 2 megabyte limit on the RAM disk worked against some of the ON!'s outstanding features and made it seem more like a typical computer.

**Solution** The ON! will have a 4 megabyte RAM disk, with the option of adding 4 more, for a total of 8 megabytes. Nick DeWolf doesn't think most people will be interested in paying the extra money for 8 megabytes. I'm willing to bet he's wrong--having lots of fast storage substantially changes the way you use your computer. And it's very important in text-based applications, which take up a lot of space and which, coincidentally, the ON! is very good at.

**Problem** The ON! that I have came equipped with a single 800K (96 tracks-per-inch) floppy disk drive for shuffling programs on and off the RAM disk. Most common CP/M and MS-DOS disk formats, however, are for 48 tpi disk drives. While my ON!'s disk drive (and its associated software) can *read* disks written in most of these formats, it can't *write* properly to them--because the narrower read/write heads on the 96 tpi drive don't match the wider tracks on the 48 tpi disks, creating a hopeless mess if you do try to write to the disk.

As a result, it's easy to get information into the ON!'s system but hard to get it out to a different system. I can take disks from my Morrow or Kaypro, put them in the ON!'s disk drive, and simply copy the information over, but I can't do the reverse. To get information from the ON! to a Morrow or Kaypro disk, I have to hook the two computers together with a null modem cable and use a communications program on each end to transmit the information. (And can't you imagine how frustrating that is when I need to transfer an article from the ON! to an MS-DOS disk with my deadline ticking down?)

**Solution** New versions of the ON! will be shipped with 48 tpi drives standard (with a 96 tpi drive available as

an option). In addition, the ON! will be able to read and write MS-DOS disks as one of its *native* formats.

The ON! already includes a disk conversion program that can handle many different CP/M disk formats. But it also can handle certain popular formats directly through its operating system, without the need for a disk conversion program. The ON! recognizes these native formats immediately, so I can, for example, insert a Kaypro disk (one of the native formats) in the drive at any time, and the ON! will read it successfully, even if the drive was set to some other format (like Osborne or Morrow) when I put the disk in. In an increasingly MS-DOS world, it will be a bonus to have the MS-DOS disk format installed as a native format.

**Problem** ON! Systems has used the Z-System menu programs to create its own special set of menus for running the ON! computer. That's not a problem in itself--I use the Z-System menus on all my CP/M-compatible computers, and I love them. But the menus themselves have not been well thought out, with the result that they're both too simple and too complex.

The menus are too complex in the sense that there are too many of them and the connections between them are a bit too labyrinthine. I'm generally not easily confused by such things, but I got myself turned around more than once in my early encounters.

On the other hand, the menus are too simple because they don't anything extra for you--they just run programs as you would yourself from the A> prompt. In fact, these menus are afflicted with the same disease most menu systems are--they're focused on the programs and the directories in which the programs reside rather than on the data files and the *work* people want to do on the data.

Like many menus, this system seems to be aimed at computer klutzes, but it doesn't really give them much help. They'd be much better off spending a few days struggling with A>.

**Solution** The Z-System menu system doesn't have to be used this way. In fact, it's one of the few menu systems in either the CP/M or MS-DOS world that offers you real "point-and-shoot"--the kind of menu in which you simply point to a data file and then press a key to take action directly on the file (i.e., I point to a text file, press the S key, and the system runs a spelling check on that text file). So the solution is for ON! Systems to rethink what they want their menus to do and then redesign them, using *all* the capabilities of the Z-System to make them something special.

I've been told that the menu system now being shipped has been reworked, but I've also been told that it still follows the pattern laid out in the original.

In my own case, I simply removed the ON! menus after a few days of frustration and replaced them with a slightly modified version of the Z-System menus I use on my other computers. The whole operation took about 10 minutes, but while it's not a difficult or technical job at all, it's also

not the sort of thing you can expect inexperienced users (the kind of people menus are usually written for) to do on their own.

## More ON! News

In the last two weeks, I also got some updated software for the ON!, which brought to life yet another nifty feature of this computer.

On the back panel of the ON! are four power outlets, all of which have the same super power protection the ON! itself does. One of these outlets is for the ON!'s terminal. The other three are for your peripherals, and they can be turned on and off with the ON!'s software.

So what's the big deal? Let me tell you: You plug the power cord from your printer into one of the ON!'s power outlets and turn the printer's power switch on. Now you can turn your printer on and off from your keyboard instead of having to walk across the room. Still not impressed? Well, if you go to print a file and forget to turn the printer on, *the computer will automatically turn the printer on for you.* Now that's exactly the kind of mindless detail that computers should take care of. Don't bother me with your beeps and your cryptic error messages--just turn the thing on and get back to work.

I also learned that the new version of the ON!, which should be available before summer, will come in a new, somewhat larger case and that the disk drives will be installed in the main case instead of being separate as they are now. On the one hand, I think including the drives in the main case is a good idea--it helps fight the kind of cable proliferation that computers are prone to. On the other hand, I really like the design of the current box and only hope the new one is equally stylish.

## Protecting Your Data

Though I've frequently mentioned the ON!'s speed and silence, I haven't paid as much attention as I should have to another important factor--data integrity. To Nick DeWolf, the ON!'s designer, protecting data goes beyond supplying built-in power filters and backup power that lasts for hours instead of minutes. All the computer's chips and other parts, for example, are easily available--no single-source rarities here--so that even if ON! Systems bites the dust, you'll be able to get your computer fixed at any competent repair shop. The RAM disk, instead of being stressed to critical limits, loafs along at an easy pace (though it's still blazingly fast compared to any other form of storage). And the computer itself uses no DMA (direct memory access--a trick that lets data be shuffled in and out of memory without using the main processor chip). While DMA moves data very quickly, it puts your data somewhat at risk--a glitch in the middle of DMA transfer can scramble files in a twinkling.

Personal computers--those single-user desktop machines most of us are familiar with--are so new that few manufacturers or users have given much thought to the

future, to what will happen to their current computers and the data that's in them 10 or 15 or even 20 years down the road. Nick DeWolf and ON! Systems have thought about it, though, and they've gone to great lengths to make sure that your data will remain intact, protected, and accessible well into the future.

## Final Thoughts

The ON! is not a cheap computer. It sells for \$2500 (including the \$700 Televideo terminal), a hefty price for a non-MS-DOS computer at a time when MS-DOS clones can be had for under \$1000. And because I'm not a marketing person, I have no idea whether it's possible to survive today selling a \$2500 business computer that can't do graphics and can't run Lotus 1-2-3.

I do know that ON!'s unique features--its data protection, its power conditioning, its absolute silence, its instant readiness--are going to be standard equipment on all computers before long. Once people find out these things are possible, they'll demand them. ■

*For more information, you can contact:*

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# The New WordStar

## *MicroPro Buys NewStar and Promises CP/M Upgrade*

By Serge Timacheff

### **I have returned.**

*... Douglas MacArthur, upon landing on Leyte, October 20, 1944*

It's been three years since the name "Stan Reynolds" meant anything good at MicroPro International. Now it may mean the survival of WordStar. Reynolds left MicroPro in 1984 as part of a "reduction in forces" spurring an effort that hurt WordStar's popularity, namely the creation of NewWord. The product provided former MicroPro fans with a "mock" WordStar, complete with the features they wanted and needed. Reynolds became NewStar's president and has prospered ever since.

On February 23 NewStar closed its doors, having been acquired by MicroPro in a move to save development money and time. "When Leon Williams came to MicroPro back in September, he set up his priorities, the first of which was to upgrade WordStar," said Lee Lensky, MicroPro Public Relations Manager. "The first step in upgrading was to make a 'buy-build analysis.' He of course was aware of the NewWord product line, and he went through an analysis of whether or not from cost, time, and feasibility standpoints it would be better to buy an existing feature set or to build our

own. The analysis came out in favor of purchasing."

One reason WordStar was never properly upgraded is that the code was extremely difficult to decipher, while NewWord code is easier and more popular at MicroPro. "I think in the sense that they know it's a good product and they've tested it to death and will release it soon, it should be a real shot in the arm for MicroPro," said Reynolds. "In that sense, everybody's happy about it."

MicroPro knew that, in a world where every other word processing package lists features that outdo WordStar, an upgrade had to be made. Additionally, the company continued to receive bad marks for poor customer support. NewStar, conversely, served its customers diligently and offered an enhanced WordStar "clone." After considerable negotiations with Reynolds, Williams managed to buy NewWord along with a considerable chunk of the NewStar staff.

Reynolds returns to MicroPro as Vice President of Business Acquisitions. "My job will be to scout about the country for things to bring into MicroPro's 'vault,'" he said. While many of the MicroPro employees joined the company after his departure and have little impression of him, Reynolds is hardly a forgotten character. "I don't know that I am personally in their good graces except with Leon, their president. There was a lot of apprehension at MicroPro when this acquisition took place, because they have to eat an awful lot of crow...these guys they fired three years ago walk off and build a better product. Now they're buying it back!"

MicroPro's Lensky played down any resentment. "I have not seen any evidence whatsoever. As far as I'm concerned, it's 'Welcome home, Stan!' That's really what the attitude's been around here -- extremely cordial." Naturally, losing face isn't so bad when you stand to profit from the deal.

### **The CP/M Factor**

Both MicroPro and NewStar prided themselves in supporting CP/M, even though the progressive MS-DOS crowd chided them for trying to feed a corpse. Both companies have succeeded in profiting from the CP/M following and have served it well while dozens of other software companies chose to forsake the eight-bit users. Lensky continues to research the CP/M marketplace. "We continually hear, without any prompts, from CP/M users that they want an update. About three months ago I mentioned the possibility of doing a CP/M update in the Osborne Users' Group newsletter. Since that time, I've been getting 10 to 20 pieces of mail a day saying 'I'll buy it.' The best estimates I have say that there are at least between 200 and 300 thousand CP/M machines out there. I know that about 40 percent of those use word processing, most of them with WordStar. People have an investment in that -- in both systems and in MicroPro, and we feel a responsibility to get back to fulfilling our obligation to them. It's kind of like a 'better dead than red' philosophy -- I'd rather have them use WordStar than anything else."

MicroPro promises a CP/M WordStar upgrade, Version 4.0, by the

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Former NewStar Execs (L-R) Walter Feigenson, Stan Reynolds and Peter Mierau. Reynolds and Mierau were two of the three NewStar founders, and Feigenson was VP of Sales & Marketing. All three now work for MicroPro.

end of this year. A remake of NewWord code, MicroPro reworked the MS-DOS NewWord more than 70 percent, in order to facilitate all of the desired changes. The CP/M upgrade will take a similar effort. Given the notorious delays in software development, is it reasonable for the public to expect the CP/M upgrade to be ready by the year's end? "I don't want to be quoted, so I'll just keep quiet," Reynolds chuckled. "But I do think it's doable and it's all going to depend upon whether someone's willing to put the energy and resources into it, and on MicroPro's reading of the market and how necessary and desirable that is."

Former NewWord Product Development Vice President Peter Mierau supervises the CP/M upgrade effort, just as he did for MS-DOS. Mierau was the NewWord 3 engineer for both MS-DOS and CP/M, as well as for other NewStar products.

Will this be the last CP/M upgrade? Apparently not, according to Lensky.

"We're committed to keeping this product alive. To rule out any further upgrades at this point would be contrary to what we've been saying. As far as DOS goes, we keep saying we're going to update it. We're going to get this one update out for CP/M and see what the reactions and responses are, too." What will be neglected are CP/M 80 and CP/M 86, which have now been withdrawn from the market. WordStar decided that they could not profit from selling software for these systems, however there are still significant motions being made to get both back into the market.

To a degree, Reynolds agrees with Lensky on CP/M support. "I believe in a *modest* commitment, but I don't want to end up spending a couple of hundred thousand dollars in the process. Let me badmouth the people who were saying that nobody supports CP/M -- They're wrong. They're entirely and completely wrong. What is true is that the CP/M marketplace isn't buying anything. NewStar made

the product and sold it as best they could, but there was a very small market for CP/M with people flocking to the IBM because of its standardization. You can badmouth people for not supporting CP/M, but the answer really is that there's no market there -- nobody's buying anything. And the people that do have CP/M machines are not willing to pay money.

"Nobody understands better than the software companies how hard it is to make and support software and still profit. It's almost impossible to make a \$99 software product unless you sell it by the thousands and don't support it very much."

The upgrade from *any* version of NewWord or WordStar to WordStar 4 will cost \$89 plus \$5 shipping and handling. Brand new, it costs \$495. Lensky also said the CP/M upgrade *may* cost less than the MS-DOS, but no final decision has been made. For the first 15 thousand units sold, MicroPro is offering a \$100 rebate or a

choice of \$300 in software. Again, at this point it is unclear if that rebate will be at all available for CP/M upgraders. The low upgrade price may not always be available, either. "I don't know how long the \$89 price will hold," said Reynolds. "What MicroPro's trying to do is get a big surge of people to buy it and so they're offering the attractive price."

MicroPro hopes that as many as 95 percent of CP/M owners will buy the upgrade, offered to NewWord and WordStar owners alike. What has yet to be decided are the new features for the CP/M upgrade and what systems will be supported. "We want to hear from people and I am doing primary market research in the field right now," said Lensky. He wants to hear from anyone interested in an update as to what they want in the upgrade and what system(s) it should support (see box with "CP/M Update" address).

## New Features

MicroPro has yet to decide on new CP/M features. The parts of NewWord 2.17, the last CP/M version, not found in WordStar are likely to appear in WordStar 4.0. For MS-DOS, the WordStar upgrade contains an undelete command, on-screen boldfacing and underlining, better and more printing support, and MS-DOS subdirectory capabilities. The WordStar spelling corrector and the WordFinder Thesaurus are included in the new version. The NewStar indexing and table of contents generator which, according to Lensky, "is not quite as sophisticated as ours was, but is a hell of a lot easier to work with," is also part of the deal. The program will also offer an auto-patcher and a detailed customization menu to allow users to make installation patches from a menu instead of having to struggle with the actual code.

Reynolds says there may even be some "quasi-graphics" for CP/M. "In some sense, the box- or line-drawn characters that WordStar 4 supports for MS-DOS aren't actually graphics -- we're just using the extended character set. That would be something that could be put into the CP/M version, but it would be very terminal

dependent, of course. Whether you could draw line characters or not depends upon your terminal."

## User Support

A big part of the upgrade effort involves user support. "We've got about a \$300 thousand investment in new data processing support systems in customer service for record and product tracking," says Lensky. "The phone staff has doubled since 1986 and we're continuing with free service. We've also added a premium service, which gives you a toll-free number and unlimited calling with about a two minute response. That costs \$65 for six months and \$90 per year." WordStar also instituted a 90 day warranty policy that, in addition to covering defective media, gives your money back if the product does not perform as MicroPro says it will. During the 90 days, you have access to a priority, free support line that also sports two minute service. Additionally, large corporate support policies are offered. If you don't ask for help soon after purchasing, you only get 45 days of free support instead of the 90, so it's worthwhile to call with any kind of a question to activate the 90 day plan.

Documentation for WordStar 4, actually a crucial part of user support, comes from the NewWord manual. Technical writers attacked the manual at its main points of criticism, namely too many words and too much "backpadding." The MicroPro technical writers made a concerted effort to cut down on verbiage for the new manual, hopefully resulting in a simplified version.

## A Tough Market with Few Competitors

Ironically, the decision to support CP/M places WordStar in a market tough to support with few challengers, but with thousands of customers. Virtually no one else manufactures CP/M word processing software today, meaning WordStar has a monopoly by default. Whether CP/M word processors will continue to be available lies in MicroPro's hands,

unless somebody decides to create a new software package of their own. Other popular and successful CP/M word processing manufacturers of the past, such as Palantir, Inc. in Houston, installed thousands of eight-bit programs until two or three years ago. They now have withdrawn from the market and shy away from possible reentry. Much of the reason for withdrawal has to do with support difficulties and CP/M non-standardization. Still, NewStar, until being bought, and WordStar have successfully worked the CP/M market *for a profit*. Obviously, much remains unclear in this complex situation. If MicroPro feels that *hundreds* of thousands of CP/M users are eager for an update, that means there is still plenty of pie for others to have a slice. Perhaps the software companies' complaint that none of the CP/M users "are buying" is a double-edged sword -- why go shopping when there is so little to buy?

Hopefully by the beginning of 1988, the CP/M community can accurately assess just what the future holds -- whether growth, stability, or decline. In any event, with a little luck, the CP/M WordStar upgrade will be out soon and will fulfill a long overdue promise. ■

## CP/M Upgrade

*Make yourself known! Tell MicroPro what features you want to see in the CP/M WordStar upgrade and what system(s) you want supported. They want to hear from you even if you're just voicing your opinion about the CP/M upgrade in general. Write directly to:*

Lee Lensky  
CP/M Update  
MicroPro International  
33 San Pablo Avenue  
San Rafael, California  
94903

# MOR Products

Original *User's Manuals* published by Morrow.

<i>Prod #</i>	<i>Description</i>	<i>Price</i>
601	Correct-It User's Manual	8.00
602	CP/M 2.2 User's Guide (for MD2 & MD3)	12.00
603	CP/M Plus Guides (for hard disk MDs; 5 books)	35.00
604	MBASIC User's Guide	12.00
605	MD Companion Guide (for everyone who isn't compatible with CP/M)	12.00
606	MD User's Guide (for MD2 & MD3)	12.00
607	MD Hard Disk User's Guide	12.00
608	Morrow Software Sourcebook (1983 edition)	8.00
609	NewWord User's Guide	12.00
610	Pilot User's Guide	12.00
611	SmartKey User's Guide	8.00
612	SuperCalc User's Guide	12.00

*Service Manuals* to help repair or enhance your machine. (Even if you don't do the repair yourself, your repairman probably will need them.)

<i>Prod #</i>	<i>Description</i>	<i>Price</i>
700	Complete manual set (701-710)	80.00
701	Micro Decision Service Guide w/ schematics for Rev. 1.1 & 2.0 (for MD2 & MD3)	25.00
702	Diagnostic II User's Manual (disk sold separately)	25.00
703	Hard Disk MD Service Guide w/ schematics	25.00
704	SA 200 Shugart Mini Floppy Drive Preliminary OEM Manual (for SS drives)	15.00
705	SA 455/465 Shugart Mini Floppy Drive Service Guide w/ schematics (for DS drives)	15.00
706	MDT20 Terminal Reference Guide	10.00

707	MDT20 Service Manual	12.00
708	MDT50 Video Terminal Service Manual	10.00
709	MDT60 Video Terminal Service Manual w/ MT70 Video Terminal Supplement	15.00
710	David Block's original MD Q&A book	6.00

**ZCPR3** is a Morrow-bootable CP/M 2.2 replacement by Echelon for the MD3. Complete with two disks and manual, the ZCPR3 kit provides an operating system superior to CP/M 3.0. This kit currently only available for ROM Rev. 3.1. For more information on any of the **Z Supplement** disks (Prod. 803, 806 & 807) send a SASE to MOR, attn: ZCPR3 Dir.

<i>Prod #</i>	<i>Description</i>	<i>Price</i>
801	ZCPR3—including: Z-System, 85utilities, help disk and <i>The Z-System User's Guide</i>	59.50
802	Diagnostic II disk (\$45.00 price effective 1/1/87)	45.00
803	ZCPR3 Utilities source. Five disks with the source code to some of the latest Z-System utilities.	35.00
804	ZCPR3: The Manual	20.00
805	Out-Think—Outline processor	45.00
806	Z-System source code. Four disks with source code to some of the system segments and BIOS.	25.00
807	ZRDOS. Assembled ZRDOS without ZCPR3 plus HLP files to aid installation.	40.00

**ROM Upgrade Kits** contain instructions, ROM chip and software—everything you need to bring your machine up to date. (Some software that won't run on older machines *will run* with an upgrade.)

<i>Prod #</i>	<i>Description</i>	<i>Price</i>
901	ROM Upgrade Kit for MD3	35.00
902	ROM Upgrade Kit for MD Hard Disks	45.00

# Floppies of the Bimonth

With every issue of *MOR*, we compile floppies that contain public domain programs, short articles and other interesting tidbits. Each **Floppy of the Bimonth (FLOB)** costs \$8.00. Listed here are the **FLOBs** for this issue. A list of all **FLOBs** to date is available upon request.

## A Note on Using FLOBs

Some of the files on **FLOBs** have been compacted to allow us to put more on a **FLOB**. When you receive your **FLOB**, you will need to return these compacted files to their original form.

## Which Files Have Been Compacted?

If a file name ends with "LBR", it is a library. A library is a file that contains a number of related files (e.g., one file might be a program, another file might be the documentation for the program). To use these files you must extract them from the library with a library-management program like NULU, which is available on **FLOB #3301**.

If a file name has a "Q" in the middle of its three-letter extension (e.g., WORDSTAR.DQC), the file has been squeezed. Many programs will unsqueeze files, NSweep is a popular one.

If a file name has a "Z" in the middle of its three-letter extension (e.g., WORDSTAR.DZC), the file has been crunched. CRUNCH and UNCR are available on **FLOB #3605**.

For more information on using **FLOBs**, see *MOR* Vol. 3, #3, p. 55.

NOTE: Disks #1 and #2 contain all the software needed to make a BBS system on either a floppy or hard-disk based Morrow computer.

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## Prod.#4201 — FLOB/APR87 DS Disk #1:

BYE510.LBR      Command Control program for BBS systems

KMD22.LBR      Modem communications program for BBS  
B5MD-1.IQS      Insert for BYE510 for MD floppy machines  
B5MH-5.IQS      Insert for BYE510 for MD HD machines  
FATCHAT.LBR      Chat Program for MBBS BBS System  
MBBS-HQ.DQC      Information on MBBS Headquarters  
MBNOTE01.LBR      Note program for MBBS BBS System  
UNCR.COM      Program to uncrunch files

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## Prod.#4202 — FLOB/APR87 DS Disk #2:

MBBS45A.LBR      Part one of the MBBS BBS System  
MBBS45B.LBR      Part two of the MBBS BBS System  
LUX70.LBR      Program to use libraries on BBS System  
ZCMD29.LBR      CCP Customization for BBS System

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## Prod.#4203 — FLOB/APR87 Disk #3:

CLEAND15.LBR      Directory maintenance program  
EGUTIL51.LBR      Library of small, fast utilities by Eric Gans  
RESTORE2.LBR      Utility to reorganize files on disk

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## Prod.#4204 — FLOB/APR87 Disk #4:

STARFND2.LBR      Star Finder in Dbase II  
VIDLOG20.LBR      Videotape Log in Dbase II  
WALLPAP3.LBR      Random Design-Maker for Dot Matrix Printers

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## Prod.#4205 — FLOB/APR87 Disk #5:

Z-NEWS.7Q1      Latest news on ZCPR3 from Echelon  
Z-NEWS.702      Latest news on ZCPR3 from Echelon  
ZNEWS-V6.LBR      Volume 6 of the ZNEWS library  
ZNEWS01.IDX      Index to ZNEWS by program

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## Prod.#4206 — FLOB/APR87 Disk #6:

ZNEWS-V7.LBR      Volume 7 of the ZNEWS library  
MEMCOM.LBR      Creates a "virtual drive" in memory

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## Prod.#4207 — FLOB/APR87 Disk #7:

PCFILE.LBR      Public Domain Database Program for CP/M  
LM107.BQS      The land mine game reviewed in this issue.

# Back Issues

A resource to help make your Morrow really useful

## Vol. 1, #2, JUN84 (Prod #102)

Concurrent Editing and Printing with WordStar  
☆ Customizing NewWord ☆ Troubleshooting  
Your Micro Decision ☆ Diskettes Deteriorate  
☆ About Serial Communications ☆ Installing  
WordStar for Dot Matrix Printers

## Vol. 1, #3, AUG84 (Prod #103)

Graphics Package for the Morrow ☆ Freindly  
Telecommunications ☆ A Very Simple Modem  
Program ☆ Proportional Spacing with WordStar  
☆ Using BASIC to Control Your Printer ☆  
Patching WordStar for an Epson Printer  
☆ Installing WordStar 3.0 for the MP100

## Vol. 1, #4, OCT84 (Prod #104)

About Surge and Spike Protectors: I Thought It  
Would Never Happen to Me ☆ Public Domain  
Software Made Easy ☆ Programming Your  
Function Keys with NewWord ☆ More Printing  
and Editing Concurrently with WordStar

## Vol. 1, #5, DEC84 (Prod #105)

Speeding Up Your Computer ☆ WordStar  
Emergency Tricks ☆ Customizing WordStar's  
Terminal Defaults ☆ ZCPR3 Makes CP/M 2.2  
Shine ☆ Spool-Away with Printer Buffers  
☆ Notes from a Smartkey User

## Vol. 2, #1, FEB85 (Prod #201)

Trouble-Shooting Your Morrow ☆ Micro  
Justification and Prop. Spacing in WordStar  
☆ Teaching with Pilot ☆ Toward a More Useful  
MD2 (1,876K disk space) ☆ Getting Started  
with TURBO PASCAL

## Vol. 2, #2, APR85 (Prod #202)

Morrow Drive Error Messages ☆ Saving Time in  
SuperCalc with X (eXecute) ☆ The Morrow  
Toolbox ☆ Automatic Formatting with PILOT ☆  
Uniform, A File Transfer Utility ☆ SUBMIT to  
Less Work

## Vol. 2, #3, JUN85 (Prod #203)

Modems: What's All the Fuss About? ☆  
Getting Started with Modem Programs ☆  
Morrow Printer Ribbons ☆ Locked Out of  
LogiCalc? ☆ Short Introduction to FIDONET ☆  
Adding Z-Clock to MD3 ☆ The Smartest Modem  
of All (Visionary) ☆ The CTS MM300 Modem  
with MITE

## Vol. 2, #4, AUG85 (Prod #204)

Upgrading NewWord: Why and How? ☆  
KAMAS, an Outline Processor ☆ EUREKA! A  
CP/M Disk Cataloguer ☆ NSWEEP: A Public  
Domain Jewel ☆ New Tricks for WordStar ☆  
ShadowPrint (SPRINT), a Print Spooler

## Vol. 2, #5, OCT85 (Prod #205)

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An Overview of Personal Pearl ☆ Eliminate  
Sort Disk Swap when Using Pearl

## Vol. 2, #6, DEC85 (Prod #206)

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# Let's Talk Disks

## *BBS Users Rap About Floppy Quality*

The following information about floppy disks was originally presented by Cliff Gray in a message to Frank Bateman in answer to an inquiry about Maxell disks. The message contains comments of general interest and has been preserved because it may well be of educational value to many. Dick Ezzard, Ass't KAY\*FOG Sysop, chimed in with a few comments about the floppy disk mystery, and his messages follow Cliff Gray's original.

Dear Frank,

There is a review on disk quality in *Byte* magazine, I think about June-83, can't find my notes. The disk makes reviewed include Maxell, Dysan, 3M, TDK, Verbatim, Memorex and more, about 12 to 15 in all. They were tested for surface polish, dropout rates, voltage of output, and friction coefficients.

Results range from zero to six dropouts (mostly pinpoint sized), drive speed consistency with the disks from zero to five percent slowdown (from 300 rpm), voltage output and output consistency at different points on the disk, (affected by a slower head speed at the inside track vs outside). About 80 percent showed significant loss of output on the inside track.

Now for the bad news. Maxell rated at the bottom overall and near bottom in every category. One other (?) equaled it. Dysan and some Japanese make tied for first place with Dysan showing no output loss at the inside track. TDK, my favorite audio and video tape, came in about the middle

"acceptable" range. The article contains a lengthy discussion on coatings, manufacturing techniques, etc.

Surface polish seems to be the leading culprit. If disk surfaces are not well polished (shiny), you are more likely to experience excessive head wear, slowed disk R/W speed and dropouts (crashes). Other influencing factors include envelope friction, uneven oxide coating, coatings that have been polished through to the medium, less than optimum oxide formulations (good ones produce consistent output).

I, too, have been curious about the Maxell disks. They have a good reputation for their audio cassettes and the other appeal is they're the cheapest brand name on the market. I have some Maxells that I bought after forgetting my first reading of that article. It's easy to see the lack of surface polish. Try comparing their surface reflection to some other brands. I now use them as little as possible, just for backing up my working disks and exchanging with friends. True, I haven't had a bad experience with them. It's just that I choose not to invite bad omens into my system. These things are unmeasurable by us as individuals, so no one person can say that a disk is reliable without some scientific procedures being employed.

How to choose? The computer magazine industry is the weakest in providing good, accurate and complete reviews of products, compared to even the slickest pulp on audio/visual equipment. We have little to rely on. The best seem to come from *Byte* or *InfoWorld*, at least from the standpoint of honesty.

So *Byte* has provided some empirical evidence on a select group of disks. I have some Sentinel disks, not reviewed by them, but they seem shiny enough and I can't give up the

usefulness of their color jackets. It seems to me a good idea to place your investment in one shown to be reliable, however this, the only article I've seen on the subject, may be long outdated; formulations change.

Hope I've been of some help.

Cliff Gray

*(Following are comments of Dick Ezzard, Ass't Sysop)*

Cliff--

Pardon the butt-in, but your message to Frank Bateman about floppy disk quality was very informative and points out the problems faced by the average user in trying to determine what brands of disk to use, and whether it makes a difference. It sure does make a difference, but there is very little to go on in the marketplace except rumor. And the individual, no matter how industrious, can't build up a statistically significant sampling of what's available sufficient to make a rational decision.

As an example, the worst bunch of disks I ever encountered was a ten-pack of Dysans which I bought in 1981 when I was a brand new user and couldn't tell if the problems were mine, the disks, the computer or what. By the time I could pin the rap squarely on the disks (after much trouble) it was too late to go back to the dealer. Yet the consensus is, and the tech reports seem to bear out, that Dysans are about the best quality disks available. So my individual experience has to be a statistical anomaly, and not significant to others. (But I personally will never buy another Dysan in my life.)

I think many home users stumble through disk purchases by buying what's available at a price, getting tips from friends, using a favorite brand until it goes "sour" and then they have

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*(MOR received this article courtesy of the KAY\*FOG BBS, (415) 285-2687. It was originally published on that BBS under the title "The Quality of Floppies is Not Plain" by Cliff Gray. - Ed.)*

to switch. I have used perhaps 20 different kinds of floppies over the past few years, from no-names to best knowns, and could tell you the kinds I have had trouble with, but could never tell you the ones I haven't had trouble with yet but might have trouble with in the future. It has all been hit or miss, based sometimes on price, availability, or the well-intended suggestions of friends, which is like the blind leading the blind. In fact, the article you cited in your message is the first reference I have seen to anything like a flop-off quality contest. And it seems to have been limited to just a few brands out of the plethora available nowadays.

A couple of years ago I wrote to *Consumer Reports* magazine suggesting they do a floppy quality comparison, and I still think they would be the ideal unbiased tester. They do many projects like this where they get samples of brands purchased (not solicited from the manufacturer) all over the country and then report results of lab tests and practical endurance tests that the average person is not equipped to do. However, they merely acknowledged my suggestion, and nothing has come of it, and I suspect it was put in file 13. *Consumer Reports* is giving more space to computer-related matters lately. For example, their latest issue compared alternatives to the IBM PC, including the Kaypro running old CP/M which was given very favorable comment. So perhaps if enough other disk users who also read *Consumer Reports* troubled to ask about a brand-name determination of floppy quality, such a study might be forthcoming.

You are right that the computer magazine industry has been remiss in not doing the kind of product testing and comparisons on disks that we see with audio/TV and camera magazines. I used to think that they were scared of losing big advertisers but since I have seen many very frank appraisals of equipment such as printers, computers, modems, I don't think that's it. Probably the size of the project required to do an honest and comprehensive survey and test has scared them away. Thanks for an

interesting and informative message.

--Dick Ezzard, Ass't. Sysop

*(Cliff replied that he was going to dig out the disk article and would report more details.)*

Cliff --

Thanks for continuing your floppy research. I await further details with great interest, as do, I am sure, the many eavesdroppers who are probably following this discussion. By coincidence with our musings on floppy disk quality, John C. Dvorak's "Periscope" column in Sunday's (July 21) *San Francisco Examiner* Business section (page D2) had some comments about floppies. It seems the most likely way to screw up a disk is fingerprints. (By extension, I would guess any simple kind of dirt/grease combination.) Dvorak reports success in physically cleansing dirty diskettes - - by cutting a suspect disk out of its jacket, washing with soapy water or isopropyl alcohol! Then slip it back into a clean jacket and see if you can read it. That procedure seems so common-sense that I can hardly wait for my next bad-sector error to give it a try. Have already put aside a salvage jacket.

Of course, this isn't going to work where the damage is magnetic or mechanical. Magnetic error can come about because of wrong reading and writing operations -- disk drive trouble such as a head out of alignment, motor speed off, or external magnetic fields like motors and the ringer in a telephone. Mechanical problems on the disk could be actual flaking of the media, drop-outs, scratches, etc. These seem to occur most often in the most critical part of the disk -- the directory area which gets read every time the disk is accessed, and gets written on every time any new file is saved. The head probably rubs against the directory area more than any other part of the disk, leading to a greater likelihood of damage in that neighborhood. But that's the crucial part you need to get to everything else! Cleanup won't help these kinds of problems (magnetic and physical damage). All you can do is work

around them with utility software which will let you read and write to specified areas of the disk, (such as the public domain DU program).

Sometimes you can fix the directory by hand -- erasing glitched entries and rewriting new directories if you can find out where the current active parts of the file are. Working directly to the disk is so laborious and painstaking a job that I wouldn't wish it on anyone. (One such session will surely lead you to a great and fine appreciation of the operating system which handles disk access automatically.) Still, for important data which is not backed up, you get to save what you can by disk rescue operations. But, boy, is it a pain! I read recently that Poloroid Corporation, as part of promoting their entry into the disk market, offers a service where they will read glitched disks and write salvaged data to a new disk in appropriate format, for a reasonable price. It's about time. If anyone listening has had experience with the Poloroid data recovery service, would appreciate hearing the details.

This brings us to BACKUP, surely the most-preached, most neglected, most common-sense precaution since seat belts. My own experience shows me a cycle where I become a born-again backer-upper about once every six months or so. This is usually after a horrendous life-threatening experience where I almost lose a lot of important stuff which is then painstakingly retrieved from the glitched disk only with the greatest of difficulty. After such a giant "Uh-oh!" (accompanied by tiny beads of sweat on the forehead) the foxhole backer-upper religiously copies everything to newly minted disks ... for about two weeks. In the absence of any untoward experiences, I usually then compromise by continuing to back up everything that is "important." After some months, my old slip-shod ways assert themselves and riotous disk handling again becomes my normal habit. Until the next dreaded Bdos Err disaster when the diligent backup cycle starts again. Nevertheless, do as I say, not as I do. Get that old time religion and BACKUP, BACKUP, BACKUP.

## JAPANESE REV. 2.0 PC BOARDS NOT ALL THE SAME

by Brian Leyton

Not all Rev. 2.0 Japanese (KOHJINSHA) boards are created equal, which is one reason why some of you might have some trouble upgrading to the 3.1 ROM. Last year I decided to build a new MD3 from surplus parts. I purchased the motherboard from Silicon Valley Surplus (SVS), an old Kohjinsha board marked 2.0a. It was fitted with a 3.1 ROM, and also had some thin green patch wires running to and from points in the disk controller circuitry. When I got the stuff home, I decided I would use the 3.1 ROM on my own MD-3, and put my old ROM (2.3a) into the new MD3 which I was going to sell. When I put everything together, it all seemed to work fine until I started getting sporadic disk errors. Rather than being harmless errors they seemed to result in bad sectors on the disk, which would disappear when the disk was reformatted. In addition, it became impossible to format a disk, since it would always result in an "unignorable" error. I was about ready to pull my

hair out, when I remembered that I had had the exact same problems with my MD-3 when I first bought it. And what was the solution back then? An upgrade to ROM revision 2.3a!

When I took a closer look at my old motherboard, I discovered that it was the same board as the new one I had bought, except that it said Rev. 2.0. It also didn't have wiring patches of the new board. I concluded that my old board must have had some problem with the disk controller circuitry which was patched up temporarily in software by the 2.3a ROM, and later corrected with a modification to the motherboard in the 2.0b board. The board I bought at SVS was probably either an engineering prototype, or most likely a board that Morrow patched in the interim until something more elegant could be done. The end result was that switching back to my old 2.3a ROM solved all problems, and my old MD-3 has been running fine ever since.



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# A Mix-C System Setup

*Creating a Fast and Convenient Programming Environment*

By Keith Bale

I wanted a fast and easy environment for C programming such as the one for Turbo Pascal, and it had to fit within my 64K CP/M limits and my budget. Since the only ones fitting the memory and budget requirements were MS-DOS C compilers, I decided to build my own personal programming system using existing commercial or public domain programs.

To meet the speed requirement would require a ramdisk with a 512K storage minimum and a fast editor allowing me to compile and link without ever leaving the editor. The system that I use has met all of these requirements.

- Morrow MD3 with MDT60 Terminal
- 1 Meg Ramdisk from SWP
- Mix C for CP/M
- Mix Editor for CP/M
- Write-Hand-Man desk top utility

---

*Keith Bale, a chemical engineer from Westmont, Illinois, performs computer simulations on micro-computers for a petrochemical company near Chicago and writes as a hobby.*

- Customized function keys using KEY.COM (supplied with the machine)
- Public Domain editor VDE23
- Public Domain file utility program NewSweep, version 2.07

The SWP ramdisk is the Co-Power88+ that has room for one megabyte (meg) of ram using 256K chips. The price of the ramdisk was \$350 for the board with 256K of storage, and I added the remaining memory by installing the chips myself, purchased for \$99 from Elek Tek.

Mix C was chosen for its price (\$39.95), its extensive library of Unix compatible functions as well as CP/M system related functions and its detailed compiler error messages. It has relatively good execution and compilation speed. The Ecosoft C compiler was considered but the price at the time was \$250. They have since reduced their price to \$59. BDS C is \$150 and is not Unix compatible. C/80 does not come with long or floats without buying a separate package that totals \$79. Aztec C is priced at \$200.

The Mix editor was purchased with the compiler for \$15. Sold separately

the price is \$29.95. The editor is a Wordstar/ NewWord compatible split screen editor that allows the editing of two files using two editing windows. The split screen was critical for the desired programming environment.

Write-Hand-Man (WHM) is the SideKick type ram resident program for CP/M. An entire article can be written about its capabilities, but I will only address those used for the programming environment. Write-Hand-Man enables the Compiler and Linker to execute without leaving the editor, and it gives a "Turbo" feel.

The function keys were customized with the Morrow supplied program KEY.COM, which works nicely for my needs because it does not deplete the TPA ... which becomes a scarce commodity after loading WHM and the ramdisk. The TPA stands for the Transient Program Area. It is the memory left over after the operating system has been loaded. Also, I'm not putting 2K of text under the function keys as some writers do. By hitting two function keys I can compile and link my programs, then instantly return back to the editor when finished.

VDE23 is a public domain editor with 90 percent of NewWord's power in 10K of program size. It is a great

program that does word wrap, windowing, find/replace, etc., and could be used if you do not wish to purchase the Mix editor. The windowing in the Mix editor is much more sophisticated. VDE23 also lacks auto indent which is a very useful for writing structured C code.

Ah, NewSweep. What can you say about the most widely used public domain program for CP/M? It's the best and can be executed while in the Mix editor by using WHM.

## SYSTEM SETUP OVERVIEW

*Use a batch submit file for setup.*

1. Execute the SWP ramdisk program that loads the ramdisk driver into high memory.

2. Copy all the C compiler files and subsequent libraries into the ramdisk.

3. Copy the editor and related files into the ramdisk. The editor can either be the Mix editor, VDE, ... even NewWord will fit in the one meg ramdisk.

4. Copy the Write-Hand-Man files into the ramdisk. This whole transfer setup will fit on one or two double sided disks depending on which editor is used.

5. Invoke WHM and execute the editor. The system is ready for text entry, compiling, linking and execution of your C programs.

## SYSTEM COMPONENTS DESCRIPTION

The Co-Power88+ is an enhanced version of the Co-Power88 board that Morrow was selling with the MD3. The board was made by SWP and licensed to Morrow and is actually another computer that uses the Morrow peripherals and is controlled by an Intel 8088, communicating with the outside world through the Z80.

The difference between the 88 and the 88+ is that the 88+ has sockets for one meg of memory using 256K chips

plus the option of adding another board to increase the CP/M ramdisk to two meg. The software has also been improved to include, in addition to the regular CP/M ramdisk and MS-DOS software, an ANSI terminal driver, an eight inch disk driver, a 96TPI disk driver, better disk drive compatibility with PC-DOS, the ability to boot with PC-DOS or MS-DOS, MS-DOS ramdisk software, and the ability to address one meg of memory in MS-DOS (you are not restricted to 640K).

I purchased my MD3 in 1984 with the Co-Power board factory installed and I have used it extensively. I recommend the board to anyone who wishes to have an inexpensive ramdisk for CP/M or wants to do 16 bit programming in MS-DOS or CP/M86. Don't buy it if you intend to run PC-DOS application software such as spreadsheets or word processors. The majority of commercial software has been written to access the bios video interrupts of the IBM PC, which will not work with an RS232 terminal such as the Morrow uses. To purchase MS-DOS software for the Co-Power88 or 88+ make sure the DOS software has an installation program for your terminal (Such as the ADM31, Soroq IQ120, or ADM 3A), uses BDOS function calls, and does not take direct control of the hardware (keyboard-interrupt 16H or video-interrupt 10H). If these three goals are met the software will run on the Co-Power board.

The Co-Power88+ includes the board, 256K ram, ramdisk software, and MS-DOS or CP/M86. The additional memory, from Elek Tek, I installed myself. You should also order the MS-DOS public domain disks that SWP has for the Co-Power88+ that are already tested for generic MS-DOS. So, for \$460 you get a large CP/M ramdisk, the ability to program in MS-DOS or CP/M86, and the option of expanding the CP/M ramdisk to two meg.

Write-Hand-Man (WHM) has to be

one of the most ingenious programs written for CP/M. Efficient programming fit such a powerful program in a small amount of memory, and I will not go into review of this program because that was handled quite well by a review in the Oct/Nov '86 MOR issue by Bruce Gowens. I will simply describe the features I used to make this programming C environment.

WHM is the cornerstone of this system. The swap utility that comes with WHM is the window used to execute the compiler and linker from within the editor. This feature is extremely powerful because CP/M was never designed to allow this type of a program, and you can even execute NewSweep and do disk maintenance without exiting from the editor.

The swap routine takes the contents of what you have in memory and stores it in a file called SWAP.DAT that can either be on a floppy, a hard disk, or a ramdisk. You are then presented with a Console Command Prompt M0>. Enter the name of the program to execute, such as the Mix C compiler (M0>CC WORK.C). When the compiler has terminated execution, the system prompt is presented. Hit escape (ESC) and the WHM menu is displayed. Hit ESC again and you are back in the editor. This swap routine is very fast with a ramdisk and would be acceptable with a hard disk, but too slow for a floppy system.

## Mix C

Mix C is a C compiler for Z80 CP/M2.2 or CP/M3.0 with 55K of ram. It includes several files.

CC.COM	C compiler for full memory (34K)
CC.OVY	Overlay file used by compiler for full memory (20K)
C.COM	C compiler for small memory (24K)
C.OVY	Overlay file used by compiler for small memory (28K)

STDIO Standard I/O header file (2K)  
 STDLIB.H Header file containing miscellaneous definitions (2K)  
 CERRORS.DAT Error message file used by the compiler (4K)  
 LINKER.COM Links object files and creates a com file (18K)  
 RUNTIME.OVY Runtime file used by linker to make an executable program (20K)  
 SMALLCOM.OVY Runtime file without longs and floats (14K)  
 CLIB.MIX C function library (object code for all functions) (36K)  
 STDLIB.C Source code for most of the standard functions (20K)  
 PRINTF.C Source code for printf, sprintf and fprintf (10K)  
 SCANF.C Source code for scanf, sscanf and fscanf (14K)  
 NOSOURCE.MIX Object code for remaining functions (no source) (14K)  
 SHRINK.COM Reduces the size of object files (20K)  
 SPEEDUP.COM Increases the speed of object files (36K)  
 CONVERT.COM Converts object files from binary to ASCII and vice versa (16K)

For the turbo environment, the small memory C compiler (C.COM) must be used because there is insufficient space for the compiler with all of the ram resident programs already in memory. The small memory compiler makes more disk overlay swaps than the large memory compiler (CC.COM). There is no noticeable difference in compiler execution speed using the ramdisk.

The files that are required on the ramdisk are C.COM, C.OVY, STDIO, CERRORS.DAT, LINKER.COM, RUNTIME.OVY AND CLIB.MIX. The other files are either function source code or are infrequently used optimization utilities. The utilities are only required after a function has been thoroughly debugged and tested.

Mix C is not the fastest but it has reasonable speed and a very extensive

CP/M function library. Standard UNIX and K&R functions are included to make very portable programs. A special utility to allow the linking of assembled relocatable object files is also available. It has 16 digit double (double precision reals) and 6 digit float (single precision reals). The price is reasonable at \$39.95, and bundled with the Mix editor the total is \$54.95.

Mix C is for people who want a compiler with which to learn C, do not want to invest a lot of money into a compiler and have a 450 page manual/C textbook that comes with the compiler. Mix C has also kept up with the proposed ANSI C standard and has included the new ANSI features such as functions of type void, returning and passing structs and arrays from functions.

### Mix Editor

The Mix editor is a full feature programming editor that uses a superset of the WordStar editing commands. The editor is fully configurable to run with non-WordStar commands if desired. It is a split screen editor capable of editing two files in two separate windows.

One of the most extensive terminal configuration programs comes with the Mix editor, with three pages of menu selectable predefined terminals. Terminal codes can be entered interactively for an undefined terminal. The editor has its own key definition section to allow you to redefine any key on the keyboard. Detailed macros can be made, and the editor runs in two modes, Wordstar and command line. The Wordstar mode uses the normal commands such as ^KD to save files.

Command line commands are mnemonics of the Wordstar commands. This allows you to run the editor if you are not familiar with Wordstar commands or if you find them too troublesome to learn. Type ^J to enter the command line. The A<> prompt is output at the 24th line

of the terminal screen, at which point you type the desired mnemonic and hit return. For instance, the mnemonic to move the cursor up is the letters u p. The command line is much slower to use because of increased keyboard usage, as evidenced by the five keystrokes used to move the cursor up (^JUP,return).

The editor is a virtual memory editor which means it can edit a file larger than available memory by using temporary files, just as with Newword/WordStar. Left justification, wordwrap and full justification are also possible for writing in English instead of C. There is auto indent for C and Pascal and auto line numbering for BASIC. Its real power is the split screen editing of two files. Looking at the error file alongside the source code file in two vertical windows is a phenomenal debugging system. All of this is on a non-bit mapped terminal for \$30.

### VDE23

VDE version 2.3 is an ASCII text editor written by E. Meyer in the style of VDO and placed in the public domain. It is much more powerful than VDO and works with the swap routine of WHM whereas, VDO locks up using the swap routine. VDE is constantly being improved with new features while VDO remains stagnant.

VDE does almost everything that the Mix editor does, but the split screen, dual file editing of Mix is much more sophisticated. Also, VDE is not a virtual memory editor. All memory not used by VDE is left for text editing. VDE is only 10K and with all of the ram resident files loaded in the system there is still 42K of memory left for editing. VDE also incorporates a compression routine that allows files larger than available memory to be loaded.

Because all of the file being edited is in memory the editor is very fast, especially on search and replace sessions. The commands used are similar to Wordstar. The use of the

*Continued on Page 34*

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*Continued from Page 32*

escape key is used instead of the control K key combination. VDE is a powerful, fast editor that can be used for the turbo C programming system instead of the Mix editor. The one feature I wish VDE offered is auto indent. You become accustomed to having this luxury after using the Mix editor or the Turbo Pascal editor.

## Detailed System Operation

Load all of the necessary files onto the ramdisk. These include all the desired WHM utilities, the Mix C compiler, the C library, the C header, the Mix editor or VDE, the function key file and KEY.COM. Execute Write-Hand-Man from the ramdisk so WHM knows to look for its files on the ramdisk, which ensures that all swapping is done to the ramdisk. Execute the editor and load the file to be compiled or create a new file.

Now hit the hot key which you have installed into WHM. The hot key is a rarely used ASCII character that you type to trigger WHM to take control. On my system the hot key is ^]. Type O for other programs. Type "swap" and hit return. The window will say "swapping out old context." Type in the C compiler's name and the file to be compiled to initiate compilation, such as M0>CC WORK.C. Hit return. The compiler will generate a compiled file and an error file. The Mix C compiler generates a very detailed error file with a duplication of your C code, but with an arrow pointing to where a syntax error has occurred.

The error file by default is sent to the screen but can be redirected to a disk file. Redirection of the error file

will considerably speed up the compilation step and is required for our desired programming environment. Now use the windowing of the Mix split screen editor to edit the redirected error file that I call ERROR.DOC. Split the screen vertically and page down ERROR.DOC until you see the first error or build a macro that will search for the error arrows.

Now go to your source file window, and ^O allows you to jump from one window to the other. At the command line of the editor type "GO" and the line number where the error occurred. The editor will instantly go to that line. Now the error file and your source code file are synchronized line by line. An error message at the bottom of the error file tells what type of code the compiler expects to remove the syntax error.

Make required changes to your source file. Close the error file in the other window before compiling your source code or you will experience an already open file error message when you try to make a new error file.

The same routine is used for the linker except that the linker is executed along with all of the non-library files to be linked. An example is M0>LINKER WORK.MIX. If the linker has an error the Mix linker goes into the interactive mode, which is a menu driven command set explained in the Mix compiler manual. After the linker has completed its job, the newly created program can be executed from the WHM window by typing the executable file name at the WHM window system prompt and hitting return, M0>WORK.

All of this is done without ever leaving the editor. To drop back into the editor when the CP/M prompt is showing, hit the ESC key twice. Depending on your WHM configuration the screen may or may not be refreshed. A refreshed screen uses RAM memory to store what the screen state was before invoking WHM. If the screen is not refreshed just page the screen back and forth (^C and ^R) and it will do so automatically. A version of WHM that does not refresh the screen will use only three K of the TPA whereas the WHM that refreshes the screen will use five K. An extra two K of memory for the editor might be important for your programming situation or needs.

Achieving the total turbo environment also requires using a key definition program, preferably KEY.COM because it does not use up the TPA. All of the key strokes I have described can be put under five key strokes using KEY.COM. I have included a copy of my definitions which are largely a modification of the NewWord definitions established by Morrow.

The keys that are specific to the automated swapping system are F1, control TAB and shift TAB. You can use other keys that suit your purposes. The first key used is F1 which brings up WHM and swaps out the editor. ^TAB is hit to execute the compiler with the error file redirected to the disk file ERROR.DOC. The shift TAB combination executes the linker. This is effectively done because the program I am working on is always called WORK.C, and in this way the redefined keys are always correct. Use



NewSweep to rename the work file when the program is completely debugged, and if you have the work file in ramdisk use it to periodically backup floppies.

### Advantages

The advantages of this system include program development speed, ease of error correction and the reduction of sheer system deadtime while you are either compiling or linking. Error detection and correction is close to that of working with an interpreted language but is still a compiled language. The system is silent, which is nice because the grinding of disk drives during compiling becomes irritating after many hours of work.

The advantage of using Mix C is important also because it is a "one pass compiler" that will fit onto one disk while other compilers must take several passes before the compilation step is complete. After refining your program you can run either the Speedup or Size utility programs to fully optimize your program.

### Disadvantages

Together, the ramdisk, WHM and the C Compiler adds up to quite a cost. A 512K ramdisk is required to handle this type of system. The loss of usable memory from Write-Hand-Man and the Ramdisk drivers also is a problem. This may become significant if you need more heap or stack for your program to execute.

The size of the TPA after WHM, ZRDOS and the Ramdisk are loaded is 43K. The ZRDOS loaded had a resident command package, flow control package and an I/O package. The size of the TPA after WHM and the ramdisk are loaded is 49K. The WHM loaded was the five K screen refresh version. This system does not work with ZRDOS/ZCPR3. There is not enough room for the compiler to work using Write-Hand-Man and ZRDOS, Ramdisk, Mix C and the Mix or VDE editors. The compiler

will say there is insufficient heap for the compiler, but since you never go to the operating system the loss of the Z system is not noticed.

### Conclusion

A ramdisk oriented system works well for single application tasks such as programming. If you expect to be switching from a database, editor, spreadsheet or other utilities frequently it might be best for you to save your money and get a hard disk. For a single task like programming, a large ramdisk based system is the best ... but just remember to periodically save your source code to a floppy or purchase an uninterruptable power supply (UPS).

If you do go to a hard disk you can use the swap facility of WHM with satisfaction, but with floppies the swap system is too slow. The unfortunate fact is that the Z-system does not leave enough room for this turbo programming environment. However, the Z-system allows you to go back to CP/M with a single program (ZCX.COM) which can be put into a batch file to pop back and forth between the Z-system and CP/M. This allows you to set up a turbo programming environment on a system that is normally under ZRDOS.

This turbo programming environment can easily be used for other programming languages such as assembler, dBaseII, compiled Basic and Modula II. The system is flexible and adaptable to your needs and imagination. Try and make your CP/M system do what only MS-DOS systems with 640K of memory can do -- we have very powerful computers that are capable of applications and marvels we have only begun to think of. Think of your CP/M machine as a Haiku poem; small, powerful, frugal and concise. ■

### Product Addresses For Applications Listed

**Mix Software**  
2116 E. Arapaho  
Suite 363  
Richardson, Texas 75081  
1-800-523-9520

**WHM**  
Poor Person Software  
3721 Starr King Circle Dept 221  
Palo Alto, CA 94306  
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# Watch Out for that Landmine!

*Free Time to Kill? Here's The Answer*

By Joe Erhardt

Computer Games provide a welcome escape from the drudgery of keying manuscripts, logging ledger entries, or sorting through spreadsheets. My preference is for "logic" games over "action" games; they permit me to leisurely contemplate my next move or to get up for a cup of coffee or a sandwich while in the middle of a game. In contrast, a space-based shootem-up won't usually even give me the chance to answer the telephone--or my wife!

Move-oriented games, such as Chess and Backgammon, and interactive text games like Adventure (see MOR Vol. 3, #1 Feb/Mar 86) fall into the "logic" game category. So does LANDMINE.

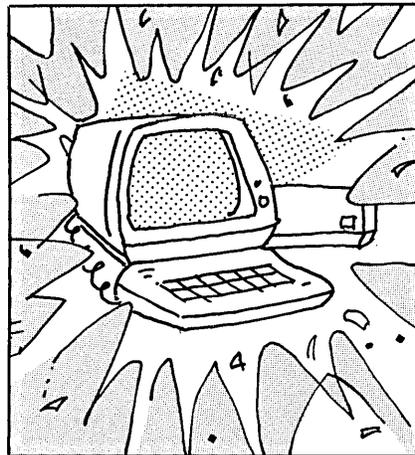
I first discovered LANDMINE, by Larry Ludwick of Tampa, FL, on a disk of IBM PC public domain software. He attributes the inspiration for his game to RLOGIC, a game originated by "Conway, Wayne & Chung." Mr. Ludwick's program was not provided in source form, however,

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*Joe Erhardt is president of a small d.p. consulting firm in Richmond, VA. He has been in data processing since 1971 and is experienced on mainframes, PCs, and his "old but reliable" MD2. Outside interests include reading, music, and the occasional good night's sleep. Currently he suffers from modemophonophilia and a higher than average long-distance bill.*

and I wished to port the game to both a mainframe and a non-graphics PC clone. In the re-engineering of the game, I found that it could easily be made CP/M-compatible, and I took the opportunity to add some other features as well.

In LANDMINE, you are placed in the upper left square of a 14 by 9 grid. The grid symbolizes a minefield, and



your goal is to reach your Field Headquarters (in the lower right square) with an important battle document without stepping on any mines. The mine detector with which you have been provided has become defective, and it will only tell you how many mines are adjacent to where you are standing, and not exactly where the mines are. ("Adjacent" here means all of up, down, left, right, and diagonally from your current position.)

You move from square to square by simply pressing one of the number keys on your numeric keypad. The "5" key represents your current position while the other keys indicate the direction in which you wish to go. For example, pressing the "3" key will move you diagonally down and to the right. If you do not have a numeric keypad, an alternate set of keys in the right-hand area of the keyboard is also provided.

When LANDMINE is first initiated, you have the option of reading the full set of instructions or jumping directly to the game. During the game, the set of instructions can be called up by simply pressing the "H" key (Help).

When a game is started, you can select from 10 to 40 mines to be placed on the playing field. At forty mines, however, luck has so much to do with winning, and logic so little, that as an improvement over Mr. Ludwick's version, a couple of hand grenades are provided to enable you to clear two squares. (The first grenade is provided with 32 mines, the second with 36.)

Additionally, if you can determine without doubt that one or more adjacent squares contain mines or are empty, you can mark the squares by "declaring," much as one would "declare" in Bridge. Declaring is done by pressing the "5" key, which otherwise represents your current position on the grid. But watch out! If you declare incorrectly, you will be penalized points!

Scoring is another enhancement. You score by marking squares as empty or as containing mines. You can expose a mine only by properly declaring; you can clear a square by declaring or by traversing (traveling onto) it. You also, of course, get points by reaching your Field Headquarters, which concludes the game.

LANDMINE seems to provide more fun than even I suspected. Those friends to whom I have given the game seem genuinely addicted, and the mainframe version I created may now only be run during lunch or after business hours!

The fun of playing LANDMINE appears to be centered in the mental satisfaction attained by successfully using deductive reasoning to determine where the mines are located. Let's take a look at an example:

one of which contains a mine. One plus One equals Two, and that means NONE of squares "c," "d," and "e" contains a mine, and that it is safe to move there.

Here is a situation where "declaring" can be used:

X	X	X	I
MIN	YOU	a	I
X	MIN	b	I

Here, YOU indicates your location. X indicates a cleared square, and MIN an exposed mine. "a" and "b" are discussed in the text below.

If the game now tells you EITHER "You are next to 4 mines" OR "You are next to 2 mines" you can declare and have squares "a" and "b" marked for you.

Finally, there will be situations where you will still have to guess. But, not all guesses are alike! Consider the situation below:

Suppose in square "a" you are next to 3 mines. One mine is accounted for, so squares "b," "c" and "d" contain 2 mines. Finding the empty square by guesswork is thus a 33 percent proposition. On the other hand, suppose in your current position you are next to 3 mines also. Since two mines are accounted for, squares "e" and "f" contain just one mine, a full 50 percent chance. If I HAD to guess, I would guess one of "e" or "f."

Technically inclined players will be interested in the routines which verify that each game is winnable and those that provide system and CRT independence. Since the game is provided in BASIC source form, such curiosity is easily satisfied. (If there is enough interest, I will post a discussion of the verification routine on the MOR BBS.)

LANDMINE Deluxe, Version 1.07, is currently on the MOR BBS (415-654-3798) as LM107.BQS in user area A11: (use UNSQ.COM to unsprung), and on FLOB. It does not use any machine dependent cursor positioning, and so should run under MBASIC 5.xx under most CP/M 2.2 or later systems. (It works just fine on my MD2 with MDT20 CRT.) Once you have LM107.BAS on your MBASIC disk, just type

X	X	a	c
MIN	YOU	X	d
X	MIN	b	e

Here, YOU indicates your location. X indicates a cleared square, and MIN an exposed mine. "a," "b," "c," "d" and "e" are squares discussed in the text below.

Suppose in the above situation, the program tells you that you are next to three mines. That means that either square "a" or square "b" contains a mine. Now you press the "6" key to move one square to the right, and the game tells you that you are next to two mines.

By simply looking at the screen, you know you are adjacent to the MIN in the third row above, and that you are still adjacent to squares "a" and "b,"

X	X	X	e
X	X	YOU	f
X	a	MIN	MIN
b	c	d	I

Here, YOU indicates your location. X indicates a cleared square, and MIN an exposed mine. "a," "b," "c," "d," "e" and "f" are discussed in the text below. "a" is assumed cleared also.

A>MBASIC LM107

and you are off! Now to keep the promise made at the beginning of this article; namely, to explain the subtitle "Searching for the 'Work Break' Amidst the Mines":

Shortly after giving the IBM PC version of the game to a friend at one of my client's sites, I dropped by to see him in his office. As it was approaching 2 p.m., he was apparently on an extended lunch; LANDMINE, with its distinctive grid, was in evidence on his PC clone. He looked somewhat sheepishly at me and muttered, "Just one more game, Joe!" I nodded without saying anything and left, for on his screen, LANDMINE was happily asserting, near the bottom right of the display, that "This is Game# 32." ■

# Mingling Morticians

*A Lively Bunch, They Are*

By Ed Niehaus

*(Ed Niehaus, former Director of Sales for Morrow, played an instrumental role in the start of the Morrow Owners Review, and came close to producing the magazine himself. In MOR's early days, he provided moral as well as material support until Sypko Andrae agreed to take on the entire project. Responsible for dealer training and marketing tasks, Niehaus traveled often and came into contact with many unique corners of the computer industry, as his fictional article illustrates. He presently owns a successful public relations agency housed in a converted railroad car in San Francisco. - Ed)*

Several people have asked "how did you like your job as a national manager?" Well, here is a typical trip... I went to Dallas to help one of our OEM's sell computers to morticians at a trade show. It was quite a show. Computers, shrouds, Limos and Hearses (a baby Benz hearse I'd love to have as a ski car...), caskets that last forever, unthinkable chemicals, etc.

There are two kinds of Funeral Directors. There are the old timers, both spry and infirm, and their sons, mostly yuppies and nerds.

The organization is called The National Association of Funeral Directors, NAFD (pronounced "nasty," with an F). They remind me more of a Rotary Club than a trade organization. The election of their President is the biggest event of the year to these folks -- campaign buttons, banners, bumper stickers, even a giant balloon out in the rain with a candidate's name on it.

One candidate from Little Rock, Arkansas, Eldon Jackson, is a cartoon image of a good-old-boy. In smoother times he and Tom Pursley, a well heeled success story from Cincinnati, would give one another a good race. But both men are around 60. This year

a third candidate, a 25 year-old upstart named Steve Wilson, has lined up the votes of all the sons. Nearly every one of the older generation has a son, or a son-in-law, and with the geriatric vote split, it looks shockingly as if Wilson will win.

I put in my day at the show, and figured to spend a quiet evening in my room at the Dallas Hilton, maybe catching up on expense reports. It turns out there is a cocktail party in room 1929. I'm in 1829 and the noise comes through the ceiling so I decide

flips in an ice cube. No soda.

I elbow my way toward a wall to sip at my week's supply of warm bourbon and scope out the crowd. The place suddenly grows silent, and, as the murmur begins to recover, I gather that the young upstart, Steve Wilson, has shown up to crash the party.

The very drunk woman crowded beside me gasps loudly, "What? Let me see," and whirls around sloshing my eight ounces of booze on us both.

Her thin hair is dyed that warm pink old ladies call Champagne, but her face

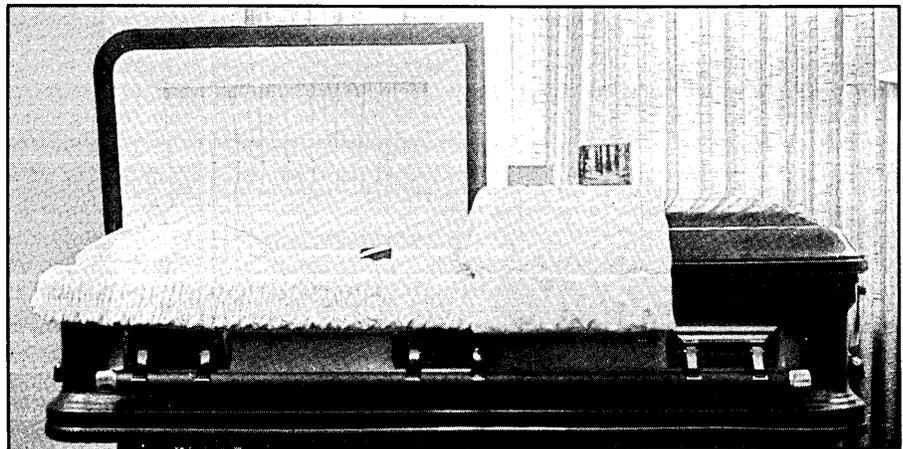


Photo: McNary-Morgan & Engel Funeral Service, By Serge Timacheff

to go up and take a look.

A skinny 6'4" black man wearing a Walkman headset and a Hilton name tag "Jerome" is tending a smokey bar for the Paris Vault Corporation. They are putting on this crowded party to help well heeled old Tom get elected NAFD president. Jerome is pouring strong doses of whatever he feels like for the old boys and their wives, while he nods and sways to music only he can hear. After watching his lip reading act for a while, I scrawl "JACK D. & SODA" on a cocktail napkin and hand it to him and stand a dollar up in his tip cup. He smiles down at me, picks up the right bottle and fills a tall glass to the top and

is streaked with Jack Daniels, showing pale skin underneath the pancake makeup. She is starting to faint so her husband grabs her by the sleeve and aims her at the couch. She lands half in the lap of a skinny old man in a leisure suit, whose cigarette ember is knocked down the back of her dress.

She's not going to faint after all, so I ease away from the commotion, out the door and on down the hall, and into the elevator. I turn around and push the 18 button, and Jerome shows up. "Here," he says as he hands me another highball. The door slides shut on his laughter.

I take a sip. It's just right: bourbon, soda and ice. ■

# Miscellaneous Notes

## ROM UPGRADE KIT INSTRUCTIONS

The installation instructions that MOR enclosed with the MD3 and MD11 ROM upgrade kits turned out to be less than clear for many kit owners. We rewrote them recently, helped by the excellent suggestions from Jim Bottom in Salem, Oregon and Jon Koerner in Minneapolis, Minnesota. Thanks a lot, Jim and Jon.

## CP/M IN EUROPE AND DOWN UNDER

Unbeknownst to many of us in the USA, CP/M is quite strong in Western Europe. We are looking for writers to investigate the European CP/M scene and report on it in a MOR article. Our readers also don't know much about what CP/M's fate is in New Zealand and Australia. Let's hear from down under!

## BAMDUA ACCEPTING TAX DEDUCTABLE GIFTS

BAMDUA, the Bay Area Micro Decision Users Association, is a non-profit, tax exempt corporation. You are invited to give your hand-me-down computers, software or even money to BAMDUA, so that you may relieve your tax pressures somewhat. In return you will receive a splendid receipt on BAMDUA letterhead.

## A BRIGHT NEWWORD HOT TIP

Here is a tip from Ilbert Buttler to make your NW show bright text, but it will only work for NW 2.17 and up (?): Run NWINSTAL, select (H) patch menu 4, enter patch Q and you'll see a string of zeroes. Change the first hex number 00 to FF. That's it! Text in bright, blocks in reverse video, bold in dim.

## Erratum

### Typeset Jumble

(The February/March issue contained an article by Gordon Northrup, MD titled Make Those Function Keys Work!. It contained a "NEWWORD.KEY" program listing that, we felt, was less than legible. For your convenience, we are rerunning the listing in a more orderly fashion. - Ed.)

A NEWWORD.KEY program looks like this shortened sample, and is done as a Non-document with Newword or Wordstar.

```
#_FST          ; "FAST", See KEY.COM NOTES
UP             ^E          ; The up-arrow key is "UP"
^UP           ^Z          ; ^UP means shifted up arrow
^UP           ^R          ; ^UP means control up arrow
               ; "DOWN" and "RIGHT" omitted
LEFT          ^S          ; Type the control character
^LEFT        ^A          ; (the caret (^)) as a
^LEFT        ^QS         ; shifted 6 key.
F1            ^R          ; Up one screenful
^F1          ^C          ; Down one screenful
               ; You can leave out ^F1.
F2            AUXDICT.TXT ; Enter up to 127 characters
^F2          G Northrup_RTN RR 1, Box 698_RTN Lee,
               MA. 01238
               ; _RTN calls for RETURN, _ESC is escape, _TAB is tab
               ; Comments after semicolon anywhere on line.
               ; An empty line is OK.
^TAB         ^OI         ; Et cetera,
^TAB         ^ON         ; et cetera.
HELP         ^J          ; Set numeric keypad applic.
TERM        _ESC        ; Go on to Newword.
CHAIN       NW.COM      ; End with a RETURN.
```

---

# Confessions of a Complete Idiot

## *Surviving a Hard Disk Crash*

By Jon Koerner

Back in the Sixties, Frank Zappa and the Mothers of Invention (a zany California band) recorded a witty little song that probably never made the Top 40, entitled something like "It Can't Happen Here (Kansas, Kansas, Kansas)." I lived in Kansas at the time, and, though my home is now in Minnesota, the song made a lasting impression. In the Eighties, I had often read in computer magazines and books (written by people from California) about the perils of hard disk crashes and the importance of backing up, but to me, safe in my cozy home in the Midwest with my trusty Morrow MD11, their warnings seemed like those for cancer or air pollution -- something that happens in the distant future to "somebody else" living "someplace else." It can't happen here.

What if, at this very instant, your hard disk were to crash? Is it backed up? How long ago? How long would it take you to re-enter your data files? How much data loss would be unrecoverable? Do you go for a month without backing it up? Two months? More? Do you, like I did, switch off the machine at the end of the day, subconsciously telling yourself, "Well, the old Morrow has been running smoothly for months now, I'm not going to spend the five

minutes (or 10, or 15) it would take to back it up. It can't happen here."

In fairness to Zappa, his song was really a parody of the complete idiot, who, fooled by the illusion of security, thinks that the unexpected, the bizarre, cannot happen here. Zappa was right. It can. It did, to me, right here in Minnesota, and this is the confession of a (former) complete idiot. Hear my confession, so that just maybe you will think twice tonight about switching off your machine without first backing it up.

### The Cost of a Crash

My MD11 was not thoroughly backed up when it crashed recently, and I have been suffering the consequences for over a month now, and shall be for some time to come. Fortunately for me, most of my programs, at least, were backed up. ALL of my commercial programs on the hard disk were (of course) backed up. There were a few public domain programs though, downloaded from the BAMDUA BBS (at about a \$60 long-distance expense), that were not, and they are now gone. I will have to pay the long distance charges to obtain these programs once again, and will have to spend the time it took to find and download them (around 10 hours), again.

I also lost about \$100 worth of bibliographic searches, conducted recently on an electronic database for my Ph.D. dissertation. I will have pay for these again, and I'll have to spend the time and effort (around three hours search time and another 10 hours planning, sorting and editing time) to redesign and conduct the searches,

again.

I lost several months' worth of useful information (mostly answers to my many questions about computers) gleaned from electronic acquaintances across the country. When these questions arise again for me, I won't have the answers at hand, and will have to go through the process of writing my questions, posting them on BBSs, waiting for and then downloading the answers, again. This information probably cost me another \$100 in long distance charges, which I will probably in the long run pay for again. Then there is the humiliation of having to ask my friends the same questions they've answered for me before.

I teach various college courses, and recently spent many hours designing and preparing materials for a new course. I lost all my files on this course. Next time I teach this course, I will have to re-enter about 15 pages of syllabi, reading lists, schedules, surveys and various handouts. This will take around three hours, at my typing speed (which is not bad).

I lost two final exams and study guides from courses taught last quarter. I will have to re-enter those 50 pages eventually, which will take around 10 hours.

I lost all of my business and personal correspondence from the last two months. There is no way to re-enter this stuff. When the phone company (and insurance company, etc.) continues to screw up my account, I will be unable to say to them with an air of self-assurance, "As I explained to you twice already in my

---

*Jon Koerner teaches psychology and skeptical inquiry at the University of Minnesota, where he is finishing a Ph.D. with a dissertation on dog (that's right, dog) behavior therapy. Koerner calls himself a "retired hippie."*

letters of December 21 and January 12...."

I lost a file containing personal notes (memos, names, addresses, phone numbers, to-do lists, etc.) for the past two months. I will have to call the doctor and dentist to ask when my next appointments are scheduled. Some recent personal and business acquaintances I simply have lost -- I don't remember their names or how to reach them.

I lost my recently updated curriculum vitae (an academic resume) and had to do that again -- it took a couple of hours.

I lost the outline for a literature review article I am writing. That will take another three to four hours to reconstruct.

I lost one month's worth of my financial records. I will be able to reconstruct some of this, from cancelled checks and receipts (this will take maybe 15 hours), but it will not be nearly as detailed as the original records. My records are rather complex, as I have both wage and self-employment income as well as certain expenses that are shared with housemates, and a single purchase at the hardware store, for example, might include some tax-deductible items, some items chargeable to my housemates, others chargeable to a contract, and others that are purely personal. It will be impossible to reconstruct these breakdowns from the paper receipts, so I will lose maybe \$200 of deductible or chargeable expenses. And there are other receipts that were sent to the garbage dump already, paid for in cash, logged on the computer, and, now, are totally gone. I had created extensive budgets on several new 1987 accounts. They will have to be recreated, at a cost of around 12-15 hours. I had done about 20 hours of work recently organizing my financial records for filing income tax forms -- this will now have to be done all over again.

I had recently spent two or three evenings writing four SuperCalc spreadsheet templates, nifty little things that automatically calculated each housemate's share of utility and phone bills. I now have to spend those

two or three evenings all over again.

What else is gone? I am not sure what I've left out of the above list, but I am relatively certain that there were other things lost which I cannot now even remember. These ghosts will spring up from time to time and haunt me. I will be working on some project and recall a piece of information that I'm "sure" I have somewhere on the computer or on floppies, and spend who knows how much time looking for it before giving up and concluding that this, too, must have been lost in the great hard disk crash of January '87.

In the first eight days following the crash I spent 50-60 hours trying to restore the crashed disk. These efforts didn't ultimately pay off (for reasons detailed below), but I can't blame myself for having tried, given the immensity of the task of reconstructing the lost data. From my brief and incomplete tally above, another 117 hours or so will be required to fully reconstruct the work that can be reconstructed.

The damages sum up to something like this:

\$1700.00 My labor in recovering from the crash (figured at \$10 per hour for 170 hours) -- Note that this may be a low estimate for your labor.

\$210.00 Long-distance BBS and bibliographic database charges

\$200.00 Rough estimate of losses to the IRS, clients, etc. due to missing financial records.

\$107.79 Long distance phone charges for advice on recovering from the crash.

**\$2217.79** Approximate total

This, of course does not include all of the damage, for much of it cannot be given a dollar amount. What about the damage to my social life -- I stayed at home many evenings repairing the damage when I might have been out having fun. And then there are the phone numbers I lost -- one, for example, was for a woman I recently met and had hoped to see again. Now it is doubtful that I will. Then there is the toll in lost sleep, headaches, frayed neurons, etc., etc., etc.

Have I made my point? Don't let this happen to you. Lest the above hasn't shocked you into reforming your backup habits, let me describe some of the gory, experiential details of recovering from a crash like the one I experienced.

### **Some Minor Problems, A Major Solution, and an Even Bigger Catch (or, What Not to Do When Your Hard Disk Crashes)**

A friend was visiting at my house one evening in January. His printer had broken down and he'd brought along some disks for me to print out some of his files as a favor. While he was here I flipped on the MD11, and proceeded to impress him with a demonstration of a program I'd recently obtained. In the course of my demo, I forgot the keystrokes required to exit from the program, but was in a hurry so randomly began pressing a few of the old standbys, things like ^C, ^X, ^Q, Esc-E, etc. *Oops...* No more keyclick. No more cursor movement. No more anything. Oh, well, no problem, just hit the reset button and restart. *Oops...* An error message, the system won't boot. Embarrassing, but no big deal, really. I saw my friend off, then came back to fix things up.

A few more attempts at resetting resulted in strange things. I didn't write down the various error messages, but one I remember, for example, was "Keyboard Not Connected." Hmmmm.....

No problem, probably just glitched the system tracks, so I proceeded to reload them. On the MD11, you simply boot up from the distribution disk in the floppy drive, and give the `command "COPYSYS SYSLDR.COM, B:"` -- wait a second or two and .... Whew! It worked! Great! Now, hit reset to boot up from the hard disk. Oh, No! Another error message! All right, well, maybe it's the rest of CP/M that's not working properly. That's simple enough. Just boot from the floppy again, giving the command `"PIP B:=CPM3.SYS"`. (On the MD11, the CP/M operating

system is loaded onto the disk in two parts, via the two operations described above, rather than with the single SYSGEN command on the MD2 and MD3.)

Didn't work. Tried it again. Nope. And again, to no avail. Oh, boy, now I'm in trouble. I begin to panic. I could not get a directory of the hard disk, I could not get anything from it but error messages. "C'mon, now," I'm pleading with the machine, "it can't be that big of a deal -- everything is still on the hard disk, it must be just some damaged part of CP/M that isn't working..." OK, now, how to get that CPM3.SYS file onto the hard disk?

Ah-Hah! Figured it out! How brilliant of me, I think, as I hastily dig my grave ever deeper. The idea was this: The damage is obviously to the CPM3.SYS file, which is the first file loaded onto the hard disk after formatting and putting the system tracks on, so it must reside right up front, at the beginning tracks on the hard disk. Solution: Reformat just

those first few tracks, then copy the file onto them from the floppy and be back in business in no time. Minor problem: I don't have a program to reformat selected tracks. It would take a long time (maybe a whole day, even) to put together a floppy with a modem program on it, contact the MOR BBS and track down such a program to download.

Bigger problem [or so I thought]: I'm in a hurry to get some work done tonight. Makeshift solution: Well, I'll just start up the trusty FORMAT program, then cut the power to the computer as soon as it begins, so as to erase just the first few tracks. Minor problem: It will probably erase more than just the tracks on which the discombobulated file resides.

Final solution: Oh, big deal! So I lose a few of those CP/M files at the start of the hard disk -- I can easily replace those, once I get the CPM3.SYS file on there and get the thing to boot up.

It worked. The FORMAT program

went about its business pretty fast, must have wiped 18 tracks or so before the monitor faded out. But the CPM3.SYS file loaded now, and the hard disk booted!

The catch: A>DIR, I typed, with smug satisfaction ... "Uh-oh, whad'ya mean, 'NO FILES?'" Try again: A>DIR ... No files. Well, let's try another user area then... A2>DIR ... No files. "Uh-oh. Better get out DU and take a look at the directory..."

The directory now contained only one file, CPM3.SYS. Turns out that the directory resides right up front on the hard disk, in the tracks that I formatted into oblivion. Taking a look around, I found that the hard disk still did actually have lots of data, programs, etc. on it, just no directory.

### California Dreamers

It was at this point that I really began to panic. I could feel my heartbeat pounding at about double its usual velocity, and, as the full force of the realization of what I had done began to sink in, a lump began to well

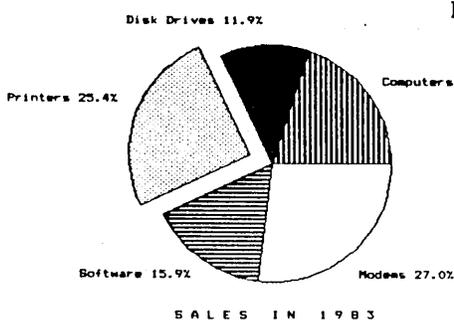
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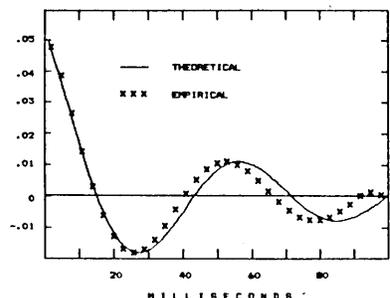
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up in my throat. It was clearly time for drastic measures: I dug out my BAMDUA newsletter and looked for phone numbers. I found one and reached BAMDUA's new president, Rick Charnes. Desperate, I sobbed out my predicament and my plea for help. Rick, in that inimitable northern California hip-cool-Zen manner, immediately took charge of the situation and offered the following advice: "Go run yourself a nice warm bath of water, sprinkle some herbs in it, relax in the tub with some nice music, and when you wake up in the morning call George Borys, our resident expert in this sort of problem."

Incredible! Here I am, in the depths of a mid-life, midnight crisis, I call across the country looking for bits, bytes, hexadecimals, screwdrivers -- whatever it takes to fix this hard disk -- and this flaky Californian is talking herb baths! Well, I humored him for awhile, then, getting off the phone I spent a couple of hours trying to figure out what to do before giving up and heading for the warm bath (no "new age" herbs, bat eyes or newt tongues, thanks -- after all, this is the "Prairie Home" show state, where people are above-average, down-to-earth, and unsuperstitious).

I woke up the next day rested but without having dreamt up a magic solution (perhaps I should've used the herbs?). After talking at some length with George Borys, the MOR staff, and Bill Smith (all very helpful and knowledgeable), I proceeded to methodically approach the task before me, which might properly be called (thank you, Steven Wartofsky):

### Night of the Living Operating System

The job: To recreate the missing directory entries. No problem, just use DU to find the beginning and end of the files, write an entry in the proper place, and presto, it shows up at A>DIR.

Now I began to understand the job of the operating system (at least one job -- file management). Turns out that CP/M, when it writes a file to disk, looks for the first available blank space and writes until it runs into

something occupying space, skips over that and finds the next blank space, writes for awhile, then skips again, etc. So a single file is written in perhaps umpteen different little spots on the disk. Not so easy to find.

However, DU can help with this. It has a "find" command similar to that in Wordstar, where you tell it to search for the occurrence of an ASCII string. If you know some unique word that's in the file you're trying to recover, simply enter the word and wait for DU to find it, then browse around to find the beginning and ending of the material you're interested in saving, note its block location, and write a directory entry for that area of the disk.

This worked fine, except for the fact that DU would not access the entire hard disk, and the ASCII search strings that I sought were not there on the part of the disk that it would access. I still don't know why this is, exactly, but I have a pretty good guess. It would read only one-fourth of the hard disk. Tracks 0-313 (decimal). The disk has four read/write heads. So I believe the problem is that DU only accesses one head. Something in the BIOS tells the machine which head to use, but it doesn't tell DU.

I figured out a way around this -- I could write a directory entry for a file occupying 32K worth of disk space in tracks higher than DU's limit, then examine it's contents with an editor (WordStar), to see if it contained any of the non-backed up missing data. Well, 11 megabytes contains 340 of these 32K files. Do you know how long it takes to look at just one 32K file? I takes a few minutes, under the most optimal circumstances, which I never had the pleasure to encounter.

The less than optimal circumstances are that, if the file contains certain "garbage characters," Wordstar won't be able to read beyond them. These 32K files are very likely to contain such certain "garbage characters," since these are chunks of 32 Kbytes taken sequentially from the hard disk tracks (which is not necessarily how CPM places files on the disk), and each file consists of segments of text or data intermixed with segments of assembled .COM files which look like

garbage to WordStar. So you have to go back into DU and get rid of the "garbage," then back to WordStar to read a bit more, then back to DU, back to WordStar, then back to DU again, etc. Takes a while. Eventually, after 30 or so hours of this, I gave up. I did manage to find a few bits of data and text that otherwise would have been lost, but the cost per recovered item was far too high.

### The Moral of This Story

In the weeks since the crash, I have put in many hours reconstructing the data and text that are capable of reconstruction. I have also painted a room, read a book or two, lost a good bit of sleep, seen a movie, and written this article. In other words, I am finally beginning to feel that my life is returning to normal. I did not seek costly psychotherapy to deal with the loss (although that perhaps may not have been a bad idea).

In retrospect, I can identify a few of the mistakes I made before, during, and after this disaster, which I hope will prevent me (and you, dear reader) from making them again.

Lesson #1: It CAN happen here. Backup that hard disk thoroughly, and keep it backed up, every day. Koerner's Little Aphorism: "A job worth doing is worth not doing all over again." (That is now tacked on the wall above my computer).

Lesson #2: Those Californians aren't necessarily flaky after all. Rick Charnes' advice was actually quite good. The problem was that I sought it too late, after having turned a bad situation into one much worse. The point here is to recognize the symptoms of panic early, stop what you're doing and go take a bath (or a walk, or a coffee break, or whatever). Once you've calmed down a bit, seek assistance (from BAMDUA or MOR, for example) before proceeding. For recognizing the early symptoms of panic, a good clue is when you begin thinking that waiting until tomorrow for help, a *whole day* would be a *long time*. Waiting a *whole day* for a *good idea* isn't nearly as long as the wait entailed in recovering from a *bad idea* gotten *right now*. ■

## Important Announcements

### MOR STAFF CHANGES

Margo DeMello, our former subscription coordinator, left MOR last month to train for a new vocation in the exiting realm of nightlife. She has been with us for nearly two years, and did a fine job taking care of her department. Good luck Margo!

Kirsten Andreae, who joined us in February as a temporary clerical helper is now in charge of the subscription department, which today also includes the MOR mailorder administration. She also helps with the reorganization of our mailorder tracking system.

LeMel Hebert-Williams has been with us several months as a temporary clerk and joined the staff permanently last month. He takes care of FLOB production and supports Kirsten with the mailorders. You'll hear more of him.

Laurie Alden joined us just before we went to press as advertising salesperson. She has a background in advertising and fund raising for horse shows among other things. Welcome aboard, Laurie.

### CALIFORNIA SALES TAX RAISED TO 7%

This is only important to California resident MOR subscribers, but that is nearly half of us: The California sales tax for the county in which MOR resides (Alameda) will go up from 6.5% to 7% beginning April 1, 1987. Please take this in account when you place mailorders, otherwise MOR will have to make up for it, and we know you don't want that to happen.

### THEMES FOR COMING MOR ISSUES

Readers started asking us whatever happened to our MOR issue themes. Here is what's coming:

- JUN 87: MUGs, BBSs and Repair Shops
- AUG 87: Communications
- OCT 87: Word Processing and Desktop Publishing
- DEC 87: Computers in Small Businesses

The deadline for article submission is two months before publication date. Ask for the Writer's Guidelines at the MOR office. Uploading your articles to the MOR BBS is encouraged, but floppies in the mail are fine too. Keep those articles coming.

## Tomorrow

*Growing with ebbs and flows,  
A diverted shoot and altered course,  
Yet the community lives on.*

*Residents come and go,  
Some silent, some prolific, some just there,  
But always loyal to the cause.*

*New things tempt,  
Sometimes acquired and used,  
Seldom replacing.*

*What power drives the spirit?  
Despite setbacks and strangulations,  
The spirit lives on while the body dies.*

*Friendships, creations, and success,  
These three progress,  
While in substance little remains.*

*Life, that mysterious, possessive force,  
Clutching its own like earth to a tree,  
No matter how wind or rain might ravage.*

*Trying to dispel the spirit,  
Man attempts to create his own,  
Merely to find it living once more.*

... Serge Timacheff

### Writers Wanted

MOR is still looking for new writers. If you have an idea for an article you'd like to write, please send a query letter and one or two writing samples (unpublished articles are fine) to Serge Timacheff, Managing Editor, *Morrow Owners' Review*, P.O. Box 5487, Berkeley, CA 94705. Writer's Guidelines and an editorial calendar are available upon request.

# Hot Tip

## By Bruce Gowens

I indent my Turbo Pascal nesting by three spaces. When I make a nesting change SmartKey makes pushing code around easy. My triggered 3 key does:

```
< ^S^S^S^X>
```

Three spaces, return three, down to next line. I can quickly push over even a large block of code. The 6 and 9 keys work similarly. To go the other direction I use the 2 key for:

```
< ^G^G^G^X>
```

The 5 and 8 keys get used the same way for 6 and 9 spaces. Since my 186K disks fill up quickly with lots of ".BAK" files, especially when a program has a lot of include files that I've been going back and forth between, I use the following macro to save the file I've been working on:

```
< ^KDSXNS *.BAK^MEUN><X>
```

The "KDS" saves the file, "X" runs a program, "NS" \*.BAK" calls NSweep for only ".BAK" files, "E" erases "U" untagged files "N" without asking, and then the "X" exits NS. A similar macro for WS:

```
< ^KDRNS *.BAK^MEUN><X >
```

The space after the "X" gets back into WordStar. If you can never seem to remember each SmartKey definition file, make a macro to remind you. On each definition file I use the triggered "?". A short example:

```
< ^N^N^N^NpP-procedure head^M^bB-begin/end^M369-move  
line right^MkK-save, delete.BAK>< ^E^E^E^E^Y^Y^Y^Y^Y>
```

This first makes space for the lines to follow with "N"s, then come the keys used, a dash, and the use followed by a CR (the "M"), etc. After the pause the "E"s take us back to the first line and the "Y"s then delete these lines. Note that one extra "Y" is needed since the cursor is not in column one when these start. With NW, which doesn't have the "N" command, you would replace the "N"s with:

```
< ^M^M^M^M^E^E^E^E ... >
```

**Warning:** always be on a blank line or at least column one when you use this macro, or the first and last "Y"s might erase some of your text or code.

Note, in the reminder example, a procedure head and a begin/end macro. The procedure head asks for the procedure name, then cleans up and drops down to insert the begin and end with some lines between them. This helps you avoid forgetting the "end;". Since some codes are repeated, I'm

going to use "[15]" to indicate that "AY[12]" means that there should be a total of 12 ^Y's, and "%" to mean continue without a line break:

```
< ^N[15]ENTER procedure NAME:>%  
< ;^S^Kk^A^Kb^A^G[6]^X^Xvar^A^X[3]begin%  
{^Kc^F}^A^A^X[6]end; {^Kc^A^Kk^E[5] [3]>
```

(Note: The "%" is used where the line had to be broken for space considerations. -- Ed.)

I indent for the proper nesting before calling this. After the pause (where I insert the procedure name), the name is marked as a block with the "Kk^A^Kb" and the message is chopped to the word "procedure." I use comment braces to identify the procedure begin and end, so after "begin {" the procedure name is copied in with "KC" and the "}" is added. After "end; {" another "KC" puts the name there, and due to a peculiarity of the Turbo editor the end brace comes along with it. "A^A^E^E^E" take me just below the b of begin and three spaces puts me where I'll be writing code. Sticking in the "var" and a couple of lines does save some keystrokes later, even though not all procedures have their own variables. ■

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# Review

## SOFTWARE REVIEW

**Program: Twist & Shout**

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

**Systems:** Most CP/M Systems

**Requires:** Dot Matrix Printer,  
several supported

**Price:** \$34.95

### By Georgia Babladelis

Although the names of these programs might conjure up visions of a sixties dance, you really don't need to exert much effort to get a lot of use and fun with them. In fact, the name of each program is descriptive of what it does. TWIST lets you turn your printout sideways; SHOUT lets you create banners with one or several lines in different fonts.

Installation is clear and simple for both programs. The file which holds the printer overlay for your specific printer is used by both TWIST & SHOUT. The printers currently supported are: Apple Dot-Matrix Printer, Imagewriter, Imagewriter II; BMC Micrographic; C.Itoh 8510, 8610 BPI, 8510 ProWriter, 1550, 8600B; CTI CT-80; DEC LA-50; Epson (all models with Grafrax) and compatibles; Gemini 10X, 15X, 10X-PC, 15X-PC, all SG series; HP ThinkJet; IBM Graphics Printers, ProPrinter and compatibles; IDS Prism 80/132 with Dot-Plot, Microprism and 480; Legend 880, 1385; Mannesmann Tally Spirit 80, MT160, MT180; MPI Sprinter, Printmate 99, Printmate 150; NEC 8023 AC; Okidata 82/83 with Okigraph or PC-Write ROM, 92, 93, 182, 192, 84. Versions of TWIST & SHOUT are available for all MS-DOS and all CP/M computers. The version reviewed here is CP/M, Morrow format.

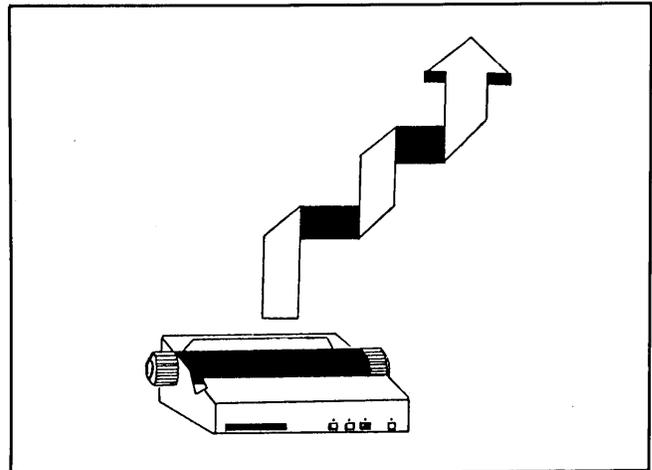
To use TWIST, simply enter that command (assuming, of course, that you have made a working disk copy and have installed the program). A sample file is provided so that

---

*Georgia Babladelis is the editor of the Bay Area Micro Decision Users' Association newsletter and a psychology professor at California State University at Hayward.*

you can test right away to see if everything is working correctly for you. A few troubleshooting guides are presented, as well as a list of error messages describing possible problems and what to do about them. The user can control the way the final printout looks, including the margins, character size and spacing, form size, and print density. A menu of choices is available for you to choose the options desired. The manual explains clearly what the options are; of course, you can try out different ones until you find the combination of size, margins, etc. that pleases you.

My Gemini 10X has a small carriage and on occasion I want to print out a big spreadsheet. I usually do it in two stages, or if time is not pressing, I print out the whole thing on my wide-carriage MP200. Now, with TWIST, I can print out the whole spreadsheet on one 8-1/2 x 11 sheet of paper using small print or across two sheets of paper using large print. I prefer the small print, which gives me a condensed spreadsheet of information. TWIST will work with virtually any text file (ASCII files). Almost every program you might use has a method for generating a compatible text file. In the manual, descriptions for conversion to compatible files are given for: Lotus 1-2-3, Symphony, Multiplan, WordStar, CalcStar, SuperCalc, Perfect Writer, Perfect Calc and MicroPlan. My files were done with SuperCalc. It was simple to convert the files to



the .PRN format in SuperCalc and then to run TWIST and print out the spreadsheet information lengthwise on the paper in condensed print on one page.

SHOUT is similarly easily used. The command (SHOUT) will bring up a menu from which you make choices which will control almost all aspects of the banners you make. There is even a provision for cooling the printhead, if necessary. If you do not want to use one of the three typefaces provided (Times Roman, Olde English, and

Sans Serif), you may opt for a quick output which prints the banner much more quickly using either an asterisk or, if you opt for "auto quick," the equivalent text character (e.g., if you print an A, then A's will be used in the printing of it). Otherwise, (i.e., not using "quick"), the full graphics method of printing is used. Several lines are possible for your banner message, depending on the size of your printer (a chart is provided in the manual for easy reference). For my Gemini 10X, the maximum number of lines is four. The lines may be printed centered (i.e., each line is centered) or left justified, as you wish. The typeface chosen can be different for different lines in the same banner or even mixed within the same line. It is easy to change the text and/or the typeface by making the appropriate menu selection. You can save your choices for future printings, or update them if you change your mind. Finally, you select "print" and the file is immediately twisted and printed out. Printing can be aborted at any time.

Clearly, these are easy to use and fun programs. I am delighted to have the capability for "twisting" the printout of data so that it goes across the page sideways. For my purposes, it is much more convenient to have all the information on one page of a standard size, rather than spread across several pages in segments or printed in one page on a large sized sheet. Personally, I do not make banners very often but I can say that if I want one in a pinch, this certainly is an easy and attractive way to do it. The makers of SHOUT promise even more typefaces in the

future.

*(Since this article was written, Spectre Technologies, Inc. has announced that TWIST & SHOUT now has a new name for the CP/M version due to some new legal agreements. It is now called LONG & LOUD. Spectre says "LONG is the new name of TWIST since it prints files the long long way, and LOUD (the new name for SHOUT) prints your messages loud (and large) on your printer."*

*Also, the installation procedure has been improved - no more file renaming. You choose a printer from a list on the screen. They have also done away with scrolling displays, and during installation you can choose your computer or terminal type from a menu.*

*In LONG, two new character sizes bring the total to four and there is a screen preview function to make sideways printing easier. A foreign character set toggles between US and UK sets, with more promised in the future.*

*LOUD is now disk based, and the fonts no longer have to fit into memory simultaneously, meaning new fonts and features can be added without making the TPA overflow. Full upper and lower case typefaces are included in the five font choice, including script and special symbol fonts for simple graphics on banners.*

*Many new printers have been included on the support list, and Spectre still offers to create a custom printer driver for you free if yours isn't supported in the basic package.*

*Word has it that Spectre also has two other products in the works to be out soon, a business graphics tool kit and a memory resident "software supercharger" somewhat akin to Borland's "Sidekick."*

*It's nice to see a manufacturer supporting the CP/M community with useful, reliable, and creative products. -- Ed.)* ■



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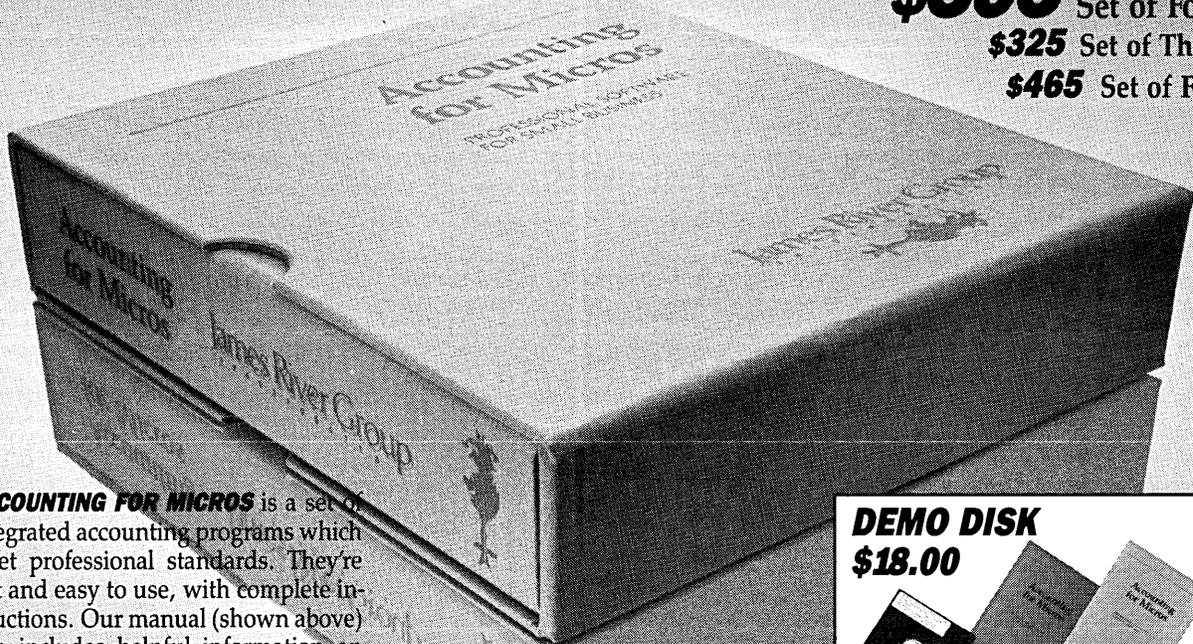
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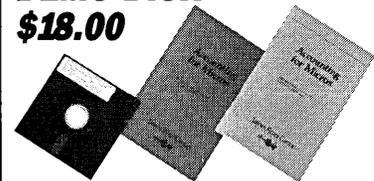
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