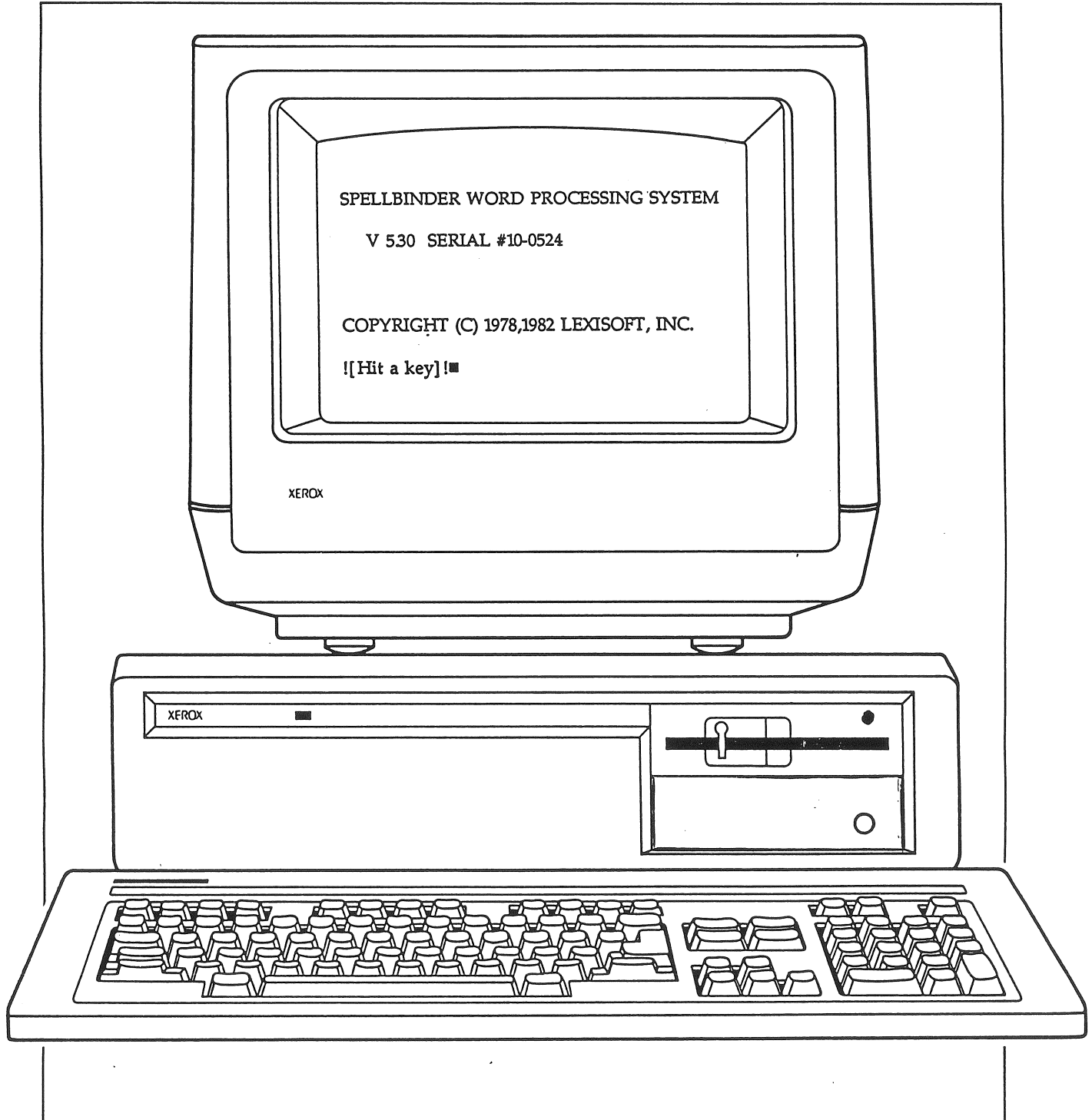


The Z-Letter

Newsletter of the CP/M and Z-System community

Number 27

September/October 1993



The Xerox 16/8

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Welcome to *The Z-Letter*, a newsletter for the community of CP/M and Z-System users. Everything in this issue is copyright © 1993 by David A.J. McGlone, Lambda Software Publishing, 149 West Hilliard Lane, Eugene, Oregon 97404-3057, phone (503) 688-3563.

The purpose of this magazine is to spread the news about new developments in the community, and to help newcomers get the most out of their machines. So send us the news about your new software or hardware, your opinion of someone else's product, that article you've been meaning to write, your praise, gripes, or just plain questions! This is the place.

Please submit material on 5¼" or 8" diskette in almost any format, or printed or typewritten on clean white unlined paper. We cannot pay for articles, but the author of any article we publish will receive that issue of *The Z-Letter* free. If the author has a subscription, the subscription will be extended for one issue.

The Z-Letter reserves the right to edit for publication letters received. If you're not willing to have your letter printed, or edited before

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The Z-Letter is indexed as time permits. The index for issues 1-5 appeared in issue 5. The index for issues 1-24 is being prepared; the contents section has been finished.

This issue was printed by Alan Bard Newcomer's Hypatia Press, 360 West First, Eugene OR 97401, phone (503) 485-0947, and mailed by the Press' bulk-mail permit.

RANDOM ACCESS

Fifth anniversary of *The Z-Letter*

This issue marks the fifth anniversary of *TZL*. Joe Wright and I produced the first issue in September 1988, while I was on the first of my two sabbaticals from Tandem Computers. The first issue was 5½" X 8½", because Joe preferred that size, and the magazine stayed that size until I founded Lambda and began publishing *TZL* on my own, with Joe's blessing. News in the first issue included the passing of Echelon, the completion of ZCPR 3.4 and ZRDOs 1.9, and their incorporation in two new products, NZ-COM and Z3Plus.

Progress on the *TZL* index

I have decided to make the index to *The Z-Letter* a separate publication, because I've gotten so far behind that it would take all of two regular issues, or half of four of them, to print it all. Substantial progress has been made on the index; the Contents section has been completed. In the process, I learned a simpler way to do Tables of Contents in MagicIndex. The one in this issue, for instance, looks like any previous one, but takes many fewer commands to produce.

When the Titles section, the Authors section, and the Subjects section are done, I will announce the completion of the Index in these pages. The price will depend on its size.

Lambda adopts a logo

The shield on our front cover is Lambda's new logo. When reproduced in color, the white sections stay white, but the black sections should be blue. For students of heraldry, the blazon is "*Per pale Argent and Azure, a capital letter Lambda counterchanged.*"

CP/M calendar canceled

Having received no response at all to what I thought was a great idea, I hereby announce that there will be no CP/M Calendar after all. Too bad, guys.

Using 22DISK and Uniform-PC together!

Every now and then I get a fairly big disk-copying order. Most are fairly simple, like the Apple II CP/M disks that a college music department wants copied to 3½" PC disks. Some are tedious; to copy a diocese's records from Vector III to PC disks required

us to run a serial cable from the Vector to the PC, and transmit the files using a modem program, because Vectors are both hard-sectored and 100 tpi.

Perhaps the most complex disk-copying job involved a single disk in NorthStar format. The writer who sent it to me wanted the WordStar files on the NorthStar disk turned into ASCII files on a Macintosh disk. This required a number of steps:

1. Using Uniform-PC, copy the files from the NorthStar disk to my Tandem 6AX's hard disk.
2. Using 22DISK, copy the files from the hard disk to a floppy in SB180FX format.
3. On my SB180FX, use FILT to take all the WordStar junk out of the files.
4. Back on the Tandem PC, use 22DISK to copy the files to a PC 3½" floppy disk.
5. On a Macintosh with System 7, use Apple File Exchange to copy the files from the PC disk to the Mac's hard disk.
6. Copy the files from the Mac's hard disk to a Macintosh floppy.

As I started this, I was struck by a sudden thought. 22DISK and Uniform-PC work in two very different ways. 22DISK has its own commands, which you can use on any drive, specifying in each command what format the disk in the drive has. In each command, one drive has a CP/M disk in it, in the specified format; the other drive is a PC drive. Uniform-PC, on the other hand, patches the PC's operating system so that the specified drive knows only the specified format, until you clear it using Uniform-PC or by resetting the system. But you use the regular MS-DOS commands on that drive.

It occurred to me to wonder, then: once I set up the 48-tpi drive as NorthStar, using Uniform-PC, could I then use 22DISK to copy directly from that disk to an SB180FX disk in the 96-tpi drive, specifying the Uniform drive as the PC drive? Or, to put it another way, could I use the fact that 22DISK and Uniform work differently to use them together, making a CP/M-to-CP/M copy on the PC, and collapse steps 1 and 2 into one step?

Amazingly, the answer is yes. Apparently, 22DISK is well-behaved and accesses the PC drive through the BIOS, rather than manipulating it directly. So the data is read off the NorthStar diskette, using the NorthStar information patched into the BIOS by Uniform-PC, and placed on the SB180FX diskette just as though it came off a PC disk.

This technique can be used in other

circumstances where a CP/M-to-CP/M operation is desired. The chief limitation of it is that Uniform-PC knows so few formats, compared by 22DISK. If the CP/M format desired is not one included in Uniform-PC, I still have to use 22DISK to copy from one CP/M disk to the PC's hard disk, then from the hard disk to the other CP/M disk.

For the record, AnaDisk works directly with the hardware, of necessity, and cannot be combined with Uniform-PC (I tried). So it still takes a NorthStar or an Apple II to make a NorthStar or Apple II boot disk.

Durango format available

Add the Durango 100-tpi format to the list of odd formats I can now copy to or from. Like the Vector, it requires a cable between the Durango and a PC, and modem programs on both machines.

Spellbinder manual revised

The Introduction to Spellbinder manual, which I wrote, had gotten pretty out of date. It was full of references to companies which no longer sell Spellbinder, as well as addresses of other companies selling other software packages for CP/M, who no longer do so. The second edition, just completed, replaces all of these references with statements like *"This program is now available from Lambda. See The Z-Letter for price and availability."*

Critter Crunch

Attention Robotists! The Mad Scientist Club of Denver is pleased to announce and invite fellow Tinkers, Gadget Mongers, and Workshop Wizards to the Robotics Competition known as: **Mile-Hi-Con's Critter Crunch**, October 23 and 24 at the Sheraton Denver West, 360 Union Blvd., Denver Colorado.

Note that your vehicle may, during the course of competition, be severely damaged, or even destroyed. Past competitions have seen vehicles equipped with pneumatic cylinders, spear-throwing cannons, and flame throwers. Developing an emotional attachment to your vehicle is not recommended.

For the faint of heart, therefore, there is also a non-combative Critter Crawl, with awards for function, workmanship, and popular appeal.

It will probably be too late to consider entering when you get this, but everyone is encouraged to write the committee and obtain a copy of the rules for this event, anyway. They are hilarious! I particularly like the phony heraldic device of the Mad Scientist Club, and their motto, "Sumus scientes, noli hic domi temptare," which is correct Latin for "We are scientists, don't try this at home."

For information about Mile-Hi-Con, call (303) 426-0806. For more information about the Critter Crunch or Critter Crawl, call (719) 687-1449.

SCRIPT OF THE MONTH CLUB

Scripts With Variable Numbers of Arguments by Jay Sage

Before doing anything else, I would like to apologize for missing last month; I was just too busy. However, one of the things I was busy with relates to this column. To make up for my absence last month, I am going to show you an ARUNZ script that is brand new — because it is based on a new parameter that I just added to the code! This was the first time I had done any code writing in quite a while, but I really wanted to have that parameter.

For those who might be interested, I also decided that it high time that the source code to ARUNZ got into the hands of others who might make improvements. Howard Goldstein had done a lot of work cleaning and fixing things up for an unreleased version. I added my new parameter, and the code is posted on Z-Nodes as ARUNZ10LBR.

The new parameter is \$#, and it returns an ASCII numerical string representing the number of arguments passed on the command tail. I had wished for such a parameter before but always relied on work-arounds; this time I decided enough was enough. Here's what I was trying to do. I had a whole bunch of used diskettes that I wanted to recycle. They were already formatted DSQD for my Ampro and SB180, and it was much faster to erase the files on the disks instead of reformatting them.

Files were stored in various user areas, however. I would run the command SD /AS to display those user areas that had files (including SYS files), and then wanted to run the ERA command on each of those areas using an alias of the form CLEAN # # # . . . where each # represents a user area with files. The

difficulty was that the number of such user areas varied from disk to disk.

I planned to use Terry Hazen's ERAZ utility, which allows one to include multiple file specifications in a single command. One might write the following script to deal with this situation for up to five user numbers:

```
if nu $2
  eraz f$1.* /ra
else
  if nu $3
    eraz f$1.* f$2.* /ra
  else
    if nu $4
      eraz f$1.* f$2.* f$3.* /ra
    else
      if nu $5
        eraz f$1.* f$2.* f$3.* f$4.* /ra
      else
        eraz f$1.* f$2.* f$3.* f$4.* f$5.* /ra
      fi
    fi
  fi
fi
```

The trouble with an alias like this is that the multiple command line buffer overflows because of all the command lines, each with the whole command tail, that will never be run. Indeed, in any particular case, only one of the possible command lines will actually be used. A ZEX script could have been used, since it provides a virtual command line buffer of whatever length is needed, but I did not like that approach.

What I wanted to do was to run a master alias that would invoke the appropriate secondary alias depending on the number of user areas specified in the command tail. The master script, using the new

\$# parameter, would look like this:

```
CL,EAN /xcd$# $*
```

Simple enough, right? The master alias invokes a secondary alias whose name is automatically modified depending on the number of arguments to process, and the command tail gets passed to it for processing. Now we just need the following additional alias scripts:

```
XCL0 echo S%>yntax: %<CL%>ean user1
      [user2 [user3 [ . . ]]]
XCL1 eraz f$1.* /ra
XCL2 eraz f$1.* f$2.* /ra
XCL3 eraz f$1.* f$2.* f$3.* /ra
XCL4 eraz f$1.* f$2.* f$3.* f$4.* /ra
XCL5 eraz f$1.* f$2.* f$3.* f$4.* f$5.* /ra
```

Now I can even provide a syntax message when no command line argument is given. If we really wanted to be rigorous, we could modify the master alias as follows:

```
CL,EAN if gt $# 5
      xclderr
      else
        xcd$# $*
      fi
```

Then we would add another secondary alias, XCLERR, to echo an appropriate error message to the screen. This script is still plenty short enough to fit in the command line buffer.

I can't remember just now what the other situations were that begged for the \$# parameter. I hope that you readers can think of some. If so, I'd love to hear from you.

COMPUTER CLASSICS

The Xerox 820, 820-II, and 16/8 computers

One of the earliest manufacturers of complete single-board computers, as opposed to S-100 boards, was Digital Research Computers of Garland, Texas. Xerox Corporation is also a Texas corporation, which may explain why they began producing computers when they did, and why they used DRC's Big Board as the core of their systems.

Xerox's computer line went through four distinct phases. First came the Xerox 820, then the 820-II.

Next came the dual-processor 16/8, followed almost immediately by the 16/8 with Spellbinder function keys and a special version of Spellbinder. One of these latter, fitted with a 5¼" floppy-disk drive and 10-Mb hard disk, is our cover this month.

The Xerox 820 could be upgraded in the field to the 820-II model, and the 820-II could be upgraded to a 16/8. Upgrade-kit instructions spelled out, step by step, how to install the necessary hardware.

The Xerox 820

The earliest Xerox computers come in three big pieces. The main unit, roughly 15" W x 13" H x 13" D, contains the CRT and the main board. It is similar to the main units of the other models in appearance, but not identical. Unfortunately, I don't have a picture of this model to reproduce. The one I have has a power-switch toggle and screen-brightness knob on the front. On the back has a standard power-cable plug, fuse, screen-contrast knob, keyboard connector, serial port, and a switch to select 230 or 115 volts.

The keyboard unit is a large 19½" W x 3" H x 8½" D. Despite the size, it's a very simple keyboard. There are no function keys. The left portion is a

simple typewriter keyboard; the right side combines arrow keys and a number pad (see Figure 1).

The third unit of a Xerox 820 is the drive box. This measures 14" W x 10½" H x 17" D. It has its own power switch on the side, and power plug on the back. It can contain either two 8" floppy-disk drives, or one 8" floppy-disk drive and one 8" hard disk (see Figure 2). The hard disk is very rare in 820s. The floppy-disk drives are single-sided.

All in all, the Xerox 820 is nothing to get excited about. It's a fairly standard CP/M computer. If anything about it is unusual, it's the minuses; the size, the 8" floppy-disk drives, and the fact that the disk format is the standard, small capacity.



Figure 1. The Xerox 820 and 820-II keyboard.

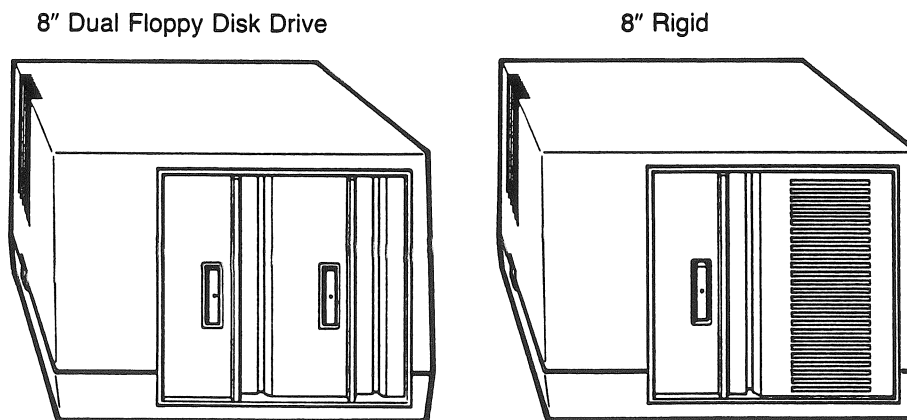


Figure 2. Disk-drive options of the Xerox 820.

The Xerox 820-II

Having described the 820 very briefly, I will go into the 820-II in more detail. Not only do I have a couple, but I have the manuals, which supply a wealth of detail.

The main unit of the 820-II is almost identical to the 16/8, except that it lacks the glare screen (see Figure

3). It measures 14" W x 12" H x 14" D. The power switch is a rocker switch under the right front (as you face the screen). Screen brightness is set by a lever under the left front. Little round feet lift the main body of the unit a good inch and a half off whatever it sits on, so the location of these switches is not a problem. The back of the unit features a reset switch, a 37-pin disk-drive connector, a keyboard connector, a

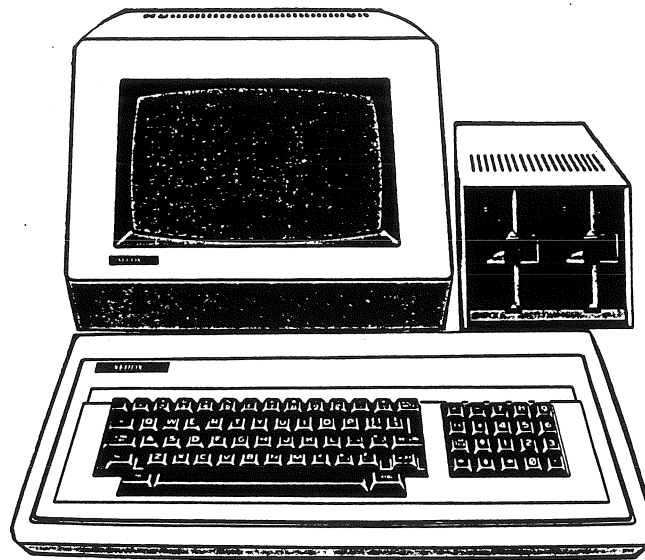


Figure 3. The Xerox 820-II system.

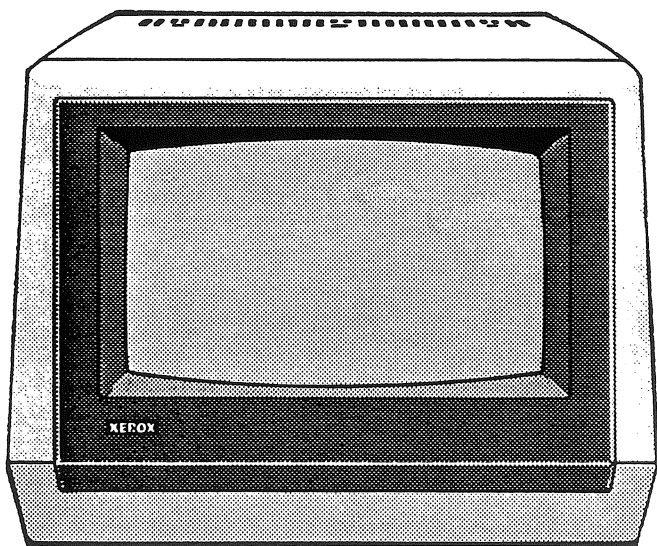
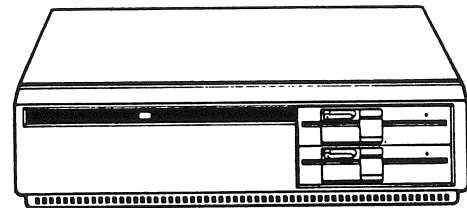
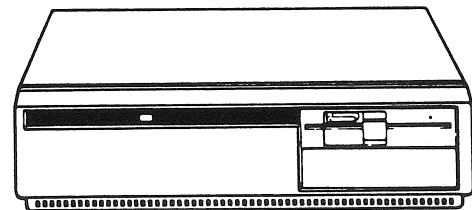


Figure 4. The Xerox 16/8 main unit.



5 1/4" Dual Floppy Disk Expansion Module



5 1/4" Rigid Disk Expansion Module

Figure 5. The 16/8 Disk Expansion Module.

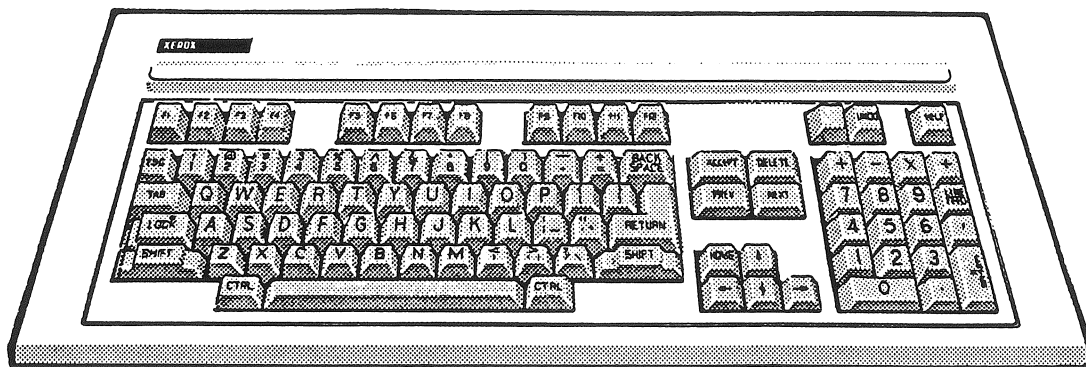


Figure 6. The Xerox 16/8 keyboard.

printer port, and a comm port. All the connectors and ports are female. The power cord is built in, rather than plugging in.

The 820-II meets all the CP/M standards. The screen is 24 lines by 80 characters. The CPU is a 4-MHz Z80A, and the system has 64K of RAM. The keyboard unit is identical to the Xerox 820.

The 820-II has a variety of disk-drive options. In a drive case identical to that of the 820 you can put two 8" floppy-disk drives. These drives can be SSSD (241K), SSDD (482K), DSSD (490K), or DSDD (980K). Another option was a DSDD 8" floppy-disk drive, and an 8-Mb 8" hard disk. If the customer wanted 5¼" floppy disks, he could get two of them in a small case like the one shown in Figure 3. These drives can be SSSD (81K), SSDD (155K), DSSD (172K), or DSDD (322K).

The Xerox 16/8

The main unit of the 16/8 is identical to the 820-II, except for the addition of a distinctive black frame on the front (*see Figure 4*), which holds the glare screen. Like the 820-II, it's a 4-MHz Z80A, with 64K RAM. Some minor details differ, such as the 16/8 have a larger ROM, but there are no differences the average user would notice.

8" floppy-disk drives and hard disks were available for the 16/8 in exactly the same variety, and in the same case, as for the 820-II. Most 16/8s, however, were sold with the Disk Expansion Module (*see Figure 5*). The DEM measures 18" W x 6" H x 17" D, and contains two 5¼" drives, either two DSDD (328K) floppy-disk drives, or a single floppy-disk drive and a 10-Mb hard disk.

In the DEM model, the main unit plugs into the DEM, rather than into the wall. A second plug allows a standard power cord to be used. The system power switch and fuse are also on the back of the DEM. Finally, on the DEM model the disk-drive port on the main unit is not used. Instead, two black cables come directly out of the main unit and plug into female connectors on the back of the DEM.

The DEM also contains the cage and bus for the 8086 board which justifies the name 16/8. This board contains 128K RAM, and there was a second board available with another 128K. But the 8086 only ran at 4.772 MHz, was not fully PC-compatible, and its memory couldn't even be accessed by the Z80 as a RAM disk, so that's all I'm going to say about it.

The 16/8 keyboard is 20" W x 2½" H (with its feet extended) x 8" D, considerably smaller than the bulky 820 and 820-II keyboards. (But not lighter. The 16/8's components are in metal cases, which makes them heavier than their predecessors.) This keyboard separates the arrow keys from a full adding-machine keypad, both to the right of the typewriter keyboard, and adds 12 programmable function keys (*see Figure 6*).

In the Spellbinder 16/8, many of the keys are labeled with the Spellbinder function those keys perform while the user is running Spellbinder. The changed keys on that keyboard are:

F1	INDENT
F2	CLEAR INDENT
F3	ABSOLUTE TAB
F4	DECIMAL TAB
F5	MARK
F6	HOLD MODE
F7	UNHOLD
F8	ENHANCE MODE
F9	FORWARD MODE
F10	BACK MODE
F11	DELETE MODE
F12	MODE
ACCEPT	EDIT/COMMAND
PREV	INSERT
NEXT	ENTER ENHANCE
HOME	SCAN
UNDO	NEXT SCREEN

The unmarked key to the left of UNDO, on the Spellbinder keyboard, is marked PREVIOUS SCREEN. DELETE and HELP are unchanged. The 16/8, like the Eagle, has a set of help messages included in its own version of Spellbinder, called up when the HELP key is pressed.

Indeed, the 16/8 with Spellbinder is very comparable with an Eagle for word processing. The two-floppy model compares well with an Eagle II, the model with the hard disk somewhat less favorably with an Eagle IV. In the Eagle's favor is the greater disk capacity (the Eagle III, IV, and V use 96-tpi 784K floppy-disk drives) and its lighter weight (Eagles have plastic cases). The Eagle V also has a 32-Mb hard disk, but these are rarely found. In the Xerox's favor is its separate modules; the keyboard can be placed at correct typing height, the CRT at correct eye height, and the drives in a convenient place – within the limits of the connecting cables.

Hard disks on Xerox systems

The Xerox 820s and 820-IIs with hard disks, I am told, boot from floppies. (I haven't seen any of these myself, so cannot confirm this.) This makes for great flexibility in the operating system, but it also makes it possible to have a perfectly good computer with a hard disk that you can't run, because someone has lost the boot disk!

The 16/8, when turned on, presents a ROM menu that allows you to boot from the drive of your choice. This can be the floppy-disk drive, drive A, or one of the hard-disk partitions. The 16/8 comes originally with the hard disk divided into four partitions E (4 Mb), F (2 Mb), G (2 Mb), and H (1 Mb); however, the CONFIGUR program allows you to change the number and size of the partitions!

When you boot the 16/8, the partition from which you boot swaps its drive letter with the floppy-disk drive. If you boot from E, that hard-disk partition becomes A, and the floppy-disk drive becomes drive E. The other partitions are not changed.

Disks that come with the 16/8

The 16/8, for greatest flexibility, comes with not one but several boot disks. They are labeled (1) CP/M-80 Operating System and CP/M-86 Operating System, (2) CP/M-80 Operating System and CP/M-86 Operating System-Development Disk, (3) MS-DOS Operating System, and (4) MS-DOS Operating System-Development Disk. There is also (5) a Spellbinder disk, and (6) an Electric Webster disk.

The amount of TPA available to the various operating systems depends on whether you choose the concurrent processing option, under which the Z80 and 8086 could operate simultaneously and even exchange information. Of course, there is no software written to take advantage of this option, so it's rather beside the point. Standalone CP/M (no concurrent processing) provides 54K of TPA. CP/M-86

provides a minimum of 110K TPA, which can be increased to 238K with the addition of the 128K expansion memory board. MS-DOS provides 100K TPA, increasable to 228K the same way.

Xerox 16/8 manuals

The 16/8 also comes with a huge stack of manuals. There is a 16/8 Operation Manual; reference guides and programmer's guide for CP/M, CP/M-86, and MS-DOS; several Spellbinder manuals; and several handbooks for the Disk Expansion Module, for dual floppy or floppy and hard disk, and the various operating systems. The total manual set takes up two feet of shelf space.

Conclusion

Today Xerox no longer makes personal computers. Their involvement in the field, however, is nothing to be ashamed of. Their first effort, the 820, compares well with other freshman computers such as the Kaypro II, Osborne 1, Morrow Micro Decision 2, and Eagle II. Their sophomore work, the 820-II, addresses the perceived inadequacies of the 820, and is a very standard CP/M computer, with a wide range of drive options. Only a 5¼" hard disk is lacking.

With the 16/8, Xerox produced one of the finest CP/M machines. They erred on the side of extra features by trying to cover all the operating-system bases. This led to a machine that cost more than it would have otherwise, and the metal case made it heavier than it should have been. No doubt the huge stack of manuals intimidated ordinary users. I can also testify from answering questions that the average user is completely at sea over the flexibility of the machine.

But the 16/8's full name, in the manuals, is the Xerox 16/8 Professional Computer. The long-time computer user will find the 16/8 a powerful and versatile computer; while the professional word processor will enjoy the combination of this hardware and the Spellbinder software.

If the computer is turning the world into a global village, and I can't figure out how to use the thing, does that make me a global village idiot?

— From the comic strip *Shoe*, 2 July 1993

LETTERS

Computer History Association

July 29, 1993

Dear Mr. McGlone,

Thank you very much for your kind letter and copy of your magazine. Your publication should be an example to us all; so should your obvious energy.

Your magazine brings back many fond reminiscences, primarily of my first computer, an IMS 5000IS which I brought in April 1983. With 128K RAM, one 770K floppy-disk drive, and a 12Mb Rodime hard disk, it cost me \$4500 wholesale — but was still far cheaper, quicker, and more capable than the competing IBM PC XT, which was then just being introduced. This machine runs TurboDOS, by the way, and I still have it. Since I was the last of the big spenders I also picked up a reconditioned Diablo 620 printer and a new VenTel 1200-baud modem with no autoanswer. You may imagine that I find your accomplishments, as a collector, historian, and technician, inspiring.

We would be interested in knowing what duplicate machines you have that were *developed or produced in California*, since that is necessarily our emphasis. I can hardly imagine returning the favor with a CP/M machine “not represented in [a] collection . . . of 100-200,” but I will let you know about anything I stumble over. Your reference to “extra copies of computer . . . periodicals, etc.,” is also enticing since we need — to take only two examples — any and all newsletters of the People’s Computer Company written by Bob Albrecht; also any newsletters, flyers, posters, or anything else related to the Homebrew Computer Club.

Our newsletter, *The Analytical Engine*, published its first issue on July 1, and I enclose a copy. It ain’t so pretty since it’s distributed almost solely as an ASCII file, to bulletin boards and over the Internet, but it’s aroused a startling amount of interest. Less than a month later we already have enough articles and copy in hand to present a decent-sized October issue. We would be glad to exchange a subscription to the *Engine* for a subscription to *The Z-Letter*. With your permission, we will also mention *The Z-Letter* in the October *Engine* as a corresponding publication.

As for “any help [we] could give . . . in incorporating . . . as a non-profit, tax-exempt organization . . .” I’m afraid that whole process

is something that our two organizations will go through quite step for step. After setting up CHAC by corresponding through netmail, file transfer, and fax, literally at the speed of a T3 backbone, if not quite of light, it’s devastating to make contact with banks and government agencies and be instantly returned to that paper-shuffling, hidebound, glutinous, litigious environment, where everything takes three weeks. CHAC is an irrefutable fact on the ground, but it is barely a legally constituted entity, and it may not be one for quite some time. However, again, we will be glad to pass along whatever we find out during the process.

Thank you once more for your letter, and I look forward to cooperation between our respective museum/archives. Incidentally, do you have an Internet address?

Sincerely,
Kip Crosby
Director

Computer History Association of California
1001 Elm Court
El Cerrito CA 94530-2602

Voice: (510) 527-7355

Fax: (510) 528-5138

CIS: 72341,2763

Internet: kcrosby@crayola.win.net

Kip, I have added you and CHAC to my data base for a complimentary subscription in expectation of exchanging our newsletters. Please keep me informed of your progress. Most of my spare computers at the moment are Eagles, Morrows, and NorthStars, all of which were manufactured in California. I also have many extra copies of computer magazines published in California; send me your list, and I’ll send you mine. Good luck to us both.
—DAJM

Looking at laptops

July 31, 1993

To: Lee Hart and David McGlone

I just spotted something that will change our interest in a laptop with printer. Canon is on the market with a laptop that is a 486 computer with high-resolution graphics printer in the box. 4+ Mb expandable RAM, 50-Mb hard disk, MS-DOS 6.0, Windows, the whole nine yards.

Expensive beast, just over \$2000 without Spellbinder or programming tools. I figure the

aggregate total \$3000 to \$3500.

I saw a Windows program that comes up A> when you turn it on. You have to type a couple of letters to start it. As I understand, there's a switch you set on installation that opens A>, rather than starting Windows directly. I assume it doesn't use RAM unless it's pulled up. I hope! I've been told that it's easy to bypass the MS-DOS garbage at startup, although all that trash remains in RAM.

That opens the door to simple commands with my own programs.

My plans are for airline travel, so I gotta look close at shielding, modem, what kind of box it'll need to make it into a portable office with pockets for paper, envelopes and disks, battery life on one charge, all kinds of little goodies. (It's my damn money, I will get answers or spend it elsewhere!)

If Ltek still sells Spellbinder 6.0 or newer, I'll use it for word processor. My daughter will pick the spreadsheet.

This *does not* mean I'll drop out of *The Z-Letter*. I've picked off too many good tips for that.

Can you confirm that Ltek still sells Spellbinder and whether it is as easy to bypass MS-DOS and Windows as I think?

Sincerely,
Eugene Austin
P.O. Box 115
Tilden NE 68781

\$3000 to \$3500? Forget it! Before I'll spend that kind of money on a travelling computer, I'll lug around a Kaypro 10, or put a hard disk in a Bondwell or Zorba and use that. I don't need to type right on the plane, and I certainly don't have that kind of money.

Nor am I interested in a laptop with a built-in printer. I am perfectly happy to have a separate printer hooked up with a parallel cable.

Ltek no longer sells any MS-DOS version of Spellbinder. In fact, I believe I am now the only legal source of Spellbinder. I can supply the Eagle version, the Xerox version, the Hewlett-Packard version, or the generic version, but only for CP/M. -DAJM

More Model 100 info

August 7, 1993

Dear David,

No sooner did I mail the last letter than a missive from Eugene Austin arrived. Here is my reply to him, plus some info on a new

accessory I bought for my Model 100.

Reply to Eugene Austin

Keep in mind that speed, power, memory, size, failure rate, and cost are all *directly* related. They all tend to go up (or down) together. A 486 is faster than a Z80. So it inevitably needs more power to do the same job. It will need more memory, because people have greatly increased expectations for a slightly better processor. All of this increases the number of parts needed, which raises cost and lowers the reliability of the machine.

The Radio Shack Model 100, with an 8085 CPU and 64K of memory, has 36 integrated circuits. It runs at 2.5 MHz, weighs 3 pounds, and runs 24 hours on four AA batteries. It is fully capable of running CP/M, Spellbinder, etc., though Radio Shack chose to saddle it with their own peculiar operating system; a marketing problem, not a machine limitation.

A 25-MHz 486SX PC portable has about 100 ICs. Packing three times the parts into the same size box makes it more expensive to build, flimsier mechanically, and so less reliable. While it is 10 times faster, its programs are 10 times longer, so it takes just about as long to do the same task. But the 10x higher clock speed and 3x more parts means it needs 30 times the power. The batteries grow from ounces to pounds, and still only last a few hours. There are no miracle breakthroughs; these are the laws of physics.

My point is, suppose we built a 1984-vintage 8-bit computer with *today's* parts and technology. We could build a Model 100 with 6 chips. Fewer parts means smaller size, less power, and greater reliability. Or, if we kept the number of chips the same, we could add a couple dozen memory chips (several megabytes worth, nowadays), or other new features. All without giving up power consumption, ease of assembly, or reliability. This would make a far more usable portable than any bloated PC clone.

The Atari Folio, Poqet, and HP Pocket PC are all examples that show just how simple, small, and low-power such a computer can be. But for marketing reasons, they all compromised on keyboard and screen size, and tried to run MS-DOS like a full-size machine. The closest example of what I'm talking about is the Sharp Wizard OZ-9600; it has a Z80 with 512K of memory. Alas, they also skimped on keyboard and screen sizes, and like Radio Shack,

chose to run a proprietary operating system.

I got a fair amount of interest in building our own portable from readers of *The Z-Letter*, etc. But the comments all ran like, "Sounds great, but I won't help, and wouldn't buy one unless it's cheaper than a used Kaypro from the flea market." Personally, I just modified my Model 100 to add memory, a faster CPU, and bigger screen. All those pissers and moaners can keep buying overpriced, unreliable toys from fly-by-night pirates.

Note that you don't have to run MS-DOS and Windows on a PC. Many early PCs use NEC V20 or V30 CPU chips, which have both 8088 and 8080 instruction sets. The 8080 side is normally ignored. But nothing stops you from writing a CP/M BIOS for it. This would give you a *true* high-speed CP/M machine, not a slow, awkward emulation like MYZ80.

The Heath/Zenith Z-100 computers were such a dual-CPU architecture; you simply booted from a CP/M or MS-DOS boot disk as desired. In typical Heath fashion, they supplied full documentation and source code on disk. Thus it provides a well-documented example of such a machine.

Eugene, if you are really infatuated with 486s, Windows, etc., then by all means, borrow or rent a machine to try for a few trips. I used to carry my employer's 386 portable. I gave up; it was less productive. I went back to my old portable office (Model 100, Diconix printer, cables, supplies, carrying case, etc.). It's easier to use, more capable, and weighs less than the MS-DOS machine alone. My boss tried the 100; now *he* borrows it for trips, too!

Windows is just a shell that runs on top of MS-DOS. Your computer will run lots faster and have more disk and memory space if you dump Windows. It's easy to exit Windows; double-click the top left corner, then select **exit**. If your machine automatically enters Windows on boot-up, somebody put a **win** command somewhere in your **AUTOEXEC.BAT** file. Remove it, and Windows will only run when you type **win** at the MS-DOS prompt.

EME Systems

I use a Radio Shack Model 100 portable computer when I travel. It's small, rugged, lightweight, and gets excellent battery life, but only has 32K of RAM. This gets a little cramped on a long trip.

EME Systems sells accessories for the Model

100. Their products are literally "out standing in the field;" they build agricultural data loggers and monitoring systems. The Model 100 sits out in a farmer's field, recording temperature, humidity, sunlight, and rainfall conditions. EME's software can then advise on irrigation requirements, and when conditions are right for various insect pests, mold, or fungus invasions. This is a tremendous aid in minimizing water, pesticide, and chemical usage.

Tracy Allen, design engineer for EME Systems, says 8-bit systems like the Model 100 are ideal for their work. Speed means nothing, and long battery life is vital. 8-bit simplicity means high reliability, and eases interface to the various special sensors. He dreads the day when the Model 100 is no longer available; they'll be forced to use PC portables, or build their own computer from scratch.

My interest in EME was with their ExtRAM, a memory expansion for the Model 100. It adds 128K of RAM, organized as 4 banks of 32K ROM (yes, ROM!).

A few words on the Model 100's memory map might be in order. The memory in most CP/M and MS-DOS computers is almost all RAM. There is a tiny ROM (2k to 8K bytes) that contains some simple diagnostics, a machine-code monitor, and just enough software to boot a disk. The balance of memory is all RAM. To do any task (say, text editing), you first boot (load) the operating system from disk into RAM, then the program from disk into RAM, then the data from disk into RAM. You need enough RAM to hold the operating system, program, and data all at the same time. The RAM is volatile; if power fails, everything in RAM is lost.

The Model 100 takes a different tack. It has a huge ROM (32K), that contains every program they thought the typical user would ever need: operating system, editor, BASIC, etc. They don't need to be loaded from disk, and don't take any RAM. So when you turn on the power, the system is instantly ready.

Since 8-bit machines have a 64K memory map, a 32K ROM only left 32K for RAM. But that RAM is entirely available for data, and is non-volatile (keeps its contents even with power off). So if you turn the 100 off while in the middle of a program, when you turn it back on your data is exactly as you left it. It's as if the system had never been turned off.

If you want to add programs, there is an expansion ROM socket. In my case, I have

added a word processor, spreadsheet, data-base manager, and thought outliner. The operating system can bank-switch to the expansion ROM, so programs in it behave exactly like those in the main ROM. In effect, the main ROM leaps out of its socket, and the expansion ROM jumps into its place.

Most memory expansions for the Model 100 extend the amount of RAM. Some simulate a disk drive; you load/save data to an I/O device with a name like A: just like a conventional computer. Others bank switch the 32K RAM; in effect, they "blow up the world" and replace everything in RAM with the contents of another bank (like rebooting your system with a new boot disk). Since the Model 100 uses RAM for data, such expansions work best for text or BASIC programs (which are actually text files anyway).

EME's ExtRAM XR4 is a tiny PC board the size of a 28-pin EPROM. It plugs into the expansion ROM socket. Three little wires plug into the bus expansion connector to gain access to the write line, battery backup supply, and an I/O port. On the board is a 128K static RAM, and a 4-bit latch. Two bits select one of four 32K banks (0-3), and one is a write-protect line. The remaining bit supports future ExtRAMs, with even bigger RAMs. EME provides software to write as well as read to this chip in a ROM socket.

Program storage is a natural with this setup. Programs are simply switched into the CPU's memory map and executed in place. But you can also use XR4 banks to store data and BASIC programs. Software is provided to simulate both methods of RAM expansion; you can transfer files between ExtRAM and main RAM individually, or do a complete RAM swap.

Clearing the write-protect bit makes the expansion ROM become read/write RAM. This finally gives the 100 an all-RAM memory map, so it can run CP/M and standard software. The keyboard and screen emulate a VT-52 terminal, the serial and parallel ports are standard, and the TPDD (Tandy Portable Disk Drive) provides 3½" floppy-disk support. Anybody else interested in helping me write a BIOS?

The ExtRAM technique is highly applicable to other 8-bit systems. The system ROM could be replaced with an ExtRAM. You could then switch between the stock ROM (for booting), and put CP/M and other frequently used programs in the other banks. It would be a great tool for developing new boot ROMs. But I

think most people would use the ExtRAM as the A: disk; it gets used the most frequently, and configuring it as a disk would automatically be compatible with existing software.

What do others think? Would you like to have some extra RAM in your system? How would you like to be at the A: prompt instantly upon power-up or reset? What if all accesses to the A: drive took zero time?

The ExtRAM costs \$169 from EME Systems, 2229 5th Street, Berkeley CA 94710, phone (510) 848-5725. Hardware and software modifications need to be worked out for non-100 applications, but they should be quite simple (we're only dealing with one chip and three wires).

Yours truly,

Lee A. Hart

TMSI

323 West 19th Street

Holland MI 49423

(616) 396-5085

Lee, would you be willing to fix up my Model 100 the same way you did yours, with the extra memory, faster CPU, and bigger screen? How much would it cost? I'm still looking for a portable CP/M machine, and the best practical solution I've found so far (meaning, not costing a fortune, and technically feasible) is adding a hard disk to a Zorba or a Bondwell. But a laptop would be even better, as long as it had enough memory to store stuff I write on trips, so I could download it to my regular machine when I got home.

I would want the modified 100 to run Spellbinder and the Z-System. Could this be implemented via the ROMs you mention, or would I need to buy the ExtRAM card? As you can see, I know very little about the Model 100. I bought it from Herb Johnson, and I have no documentation.

Are you serious about writing a BIOS for a standard CP/M with the ExtRAM? I'm not a system programmer, but I would certainly buy a copy, and I'd be glad to produce the manual. There are several people around here who could help with the programming, if you mean it. -DAJM

Former Sound Potentials checks in

August 17, 1993

Dear David,

Glad you received the magazines and manuals, and thanks for reimbursing the shipping charges. Also glad you did not have a copy of COMPAT before.

I am having lots of fun with MYZ80. I

currently run MYZ80 v. 1.11, registered with the author, Simeon Cran of Australia. Under it I have a full-up Z-System running NZCOM and ZSDOS, which is a snap to install. Steven Hirsch has written a clock driver for MYZ80, which can be found in MYZ80CLKLBR on Z-Nodes. With this I also have full time/date stamping. A feature of MYZ80 that is really nice is the ability to remap the IBM keyboard any way you like. There are two levels of definition, a default level and a transient level. I program the default level with WordStar control keys that Z-System software often uses, and then have separate transient key definitions (stored in files) for applications such as Spellbinder. Z-System aliases make it easy to automate the loading and unloading of key definitions along with their associated applications. MYZ80 provides three virtual CP/M hard disks, A: B: C:, each 8 Megabytes maximum. These exist as MS-DOS files which grow automatically (and shrink by command). If your PC has the memory, MYZ80 will give your CP/M system a 1-Megabyte RAM disk, drive D:. One drawback to MYZ80 is that the PC's floppy-disk drives are not accessible from CP/M, using CP/M disk formats. You can access the MS-DOS floppies if you want to import files to CP/M that are on MS-DOS format diskettes. I generally use 22DISK by Sydex to copy files from CP/M format diskettes over to a holding directory on the PC, and then import them into CP/M after running MYZ80.

On my 40-Mhz 386DX clone MYZ80 really flies. I get much better performance than with my 4-Mhz Kaypro with Advent TurboROM and its 1-Megabyte RAM disk. About the only trouble I have had is some minor problems with screen control under MYZ80. The MYZ80 terminal emulator is quite good, and is supposed to imitate a number of CP/M terminals. It can be configured, too. I set it to emulate a Kaypro terminal (except for the graphics), and almost everything works fine. In some word-processing software that I have not yet explicitly installed for MYZ80 (notably ZDE v1.6 and WordStar v3.3) there is a problem with line insert and delete, especially at the bottom of the screen. The Z-System version of QL v4.1 also did not work until I reassembled it for the MYZ80 terminal.

I have been using the CP/M system under MS-DOS and MYZ80 mainly for word processing. Spellbinder is now my main word-processing program. For quality output with

my Epson LX-810 dot-matrix printer I have Spellbinder print to disk a file for ImagePrint to print. I am also using dBase II, Epson Print, MagicSeries and other CP/M software with great success. With MagicSeries laser version combined with a commercial MS-DOS product called LASER TWIN that emulates an HP LaserJet III printer, I can produce laser-printer images under CP/M with the printer output captured by LASER TWIN running over MYZ80 as a TSR. I then return to MS-DOS and with LASER TWIN view them on screen or print an emulation on the LX-810. It is really neat. The latest addition to my word-processing software is the Z-Mate text editor, which I am now learning to use.

There is an API (application programming interface) for MYZ80 with access to many extended BIOS calls, such as for redefining keys. I have not yet spent much time studying the API. Most of my time recently has been devoted to finishing up a B.S. degree in Computer Information Systems. I am now finished with all the courses, and I'm awaiting the degree to be conferred. I have been sending resumes to the Raleigh, NC area, and may very well move there. In the meantime I will spend more time with my own computer system. I am working on mastery of the C++ language using Borland's Turbo C++ package. C++ is a very powerful object-oriented language. In the right hands I think it can be useful, but like most programming languages C++ can lend itself to some really bad programming practices. In my opinion no compiler design will ever force a programmer to write good code; programming will remain an art form, and for the simple reason that programming itself is not algorithmic. That is, no computer will ever be able to program itself (no matter what those goofy AI people say).

Looking forward to more of *The Z-Letter*, David. Hope you can keep up publication.

Very truly yours,
Richard E. Brewster
31 Laurel Ave.
Binghamton NY 13905
(607) 771-6472

Glad you're enjoying yourself, Richard. Thanks for sending me your letter on disk. It's nice not to have to type one, more so when it's written in Spellbinder and I don't even have to run FILT on it first. Good luck on your job search. —DAJM

PERSONAL ADS

Computers for sale or trade

Six **Morrow MD2** computers, each \$50 plus shipping; terminals not included. Five **Eagle III** computers, each \$70 plus shipping. Three **Eagle File 10** external hard-disk units, \$100, plus shipping. Two **TRS-80 Model 3** computers, one with 16K, one with 32K, condition unknown, \$20 each plus shipping. Five **NorthStar Horizon** computers, condition unknown, \$20 plus shipping; wood and steel covers available. Two **Xerox 820** computers, one **Xerox 820-II** computer, all working, dual 8" floppy disk drives, each \$50 plus shipping. Other computers come and go all the time; let me know what you're looking for. Will trade for comparable computers not represented in my collection. Contact David McGlone, phone (503) 688-3563.

Software and manuals wanted

Wanted: Turbo Pascal Toolbox software, and manuals for CP/M and FTL Modula-2. Apple CP/M disk format preferred. Contact Norman Leet, 840 Hunter Road, Apt. L, Enon OH 45323, phone (513) 864-2261, GENIE NLEET1, Compuserve ID 70200,144.

Available for cost of shipping

Currently I have nine Kaypro computers (seven I would recommend only for parts), one Osborne 1 (likewise), two SWP 8088 boards for Kaypros, and various and sundry manuals and software. I am willing to part with most of this, with the exception of perhaps one copy of the manuals, for reimbursement of the shipping cost. Contact Marion Wilde, 3131 Candelaria NE #179, Albuquerque NM 87107, phone (505) 243-4209.

MAGAZINE ARTICLES

The following magazines were received since last issue. Articles relevant to the CP/M and Z-System community, if any, are listed for each magazine. Where the address and subscription rate are not listed, see the listing for the magazine in the RESOURCES section.

ADAM newsletters are very difficult to cover adequately. There are a lot of them, and most are full of little articles and product reviews, that would take too much space to list individually. At the same time, they all reprint each other's articles. While this is undoubtedly a great service to their local readers, I have no space for listing an article five times when it appears in five newsletters. Suffice it to say, if you have a Coleco ADAM, you should probably get at least a sample issue of all the ADAM newsletters. Ones received since last issue include:

AIM, #94, September 1993. AIM stands for Adam International Media, and is the house publication of Adam's House, a company that supports Adam users. The editor/proprietor is Terry R. Fowler. For information write ADAM's HOUSE, Route 2, box 2756, 1829-1 County Road 130, Pearland TX 77581-9503, or call (713) 482-5040.

AUGER, September and October 1993. AUGER (ADAM Users Group Educational Report) is the newsletter of ECAUG, the Emerald Coast

ADAM Users Group. ECAUG has evolved from a local to a national ADAM users' group, and AUGER has regular short articles on CP/M and T-DOS. Membership in ECAUG is \$15 per family per year. A 36-page list of the disks in the group's public-domain library, plus the year's issues of AUGER, come with the membership. Send the money to Norman J. Deere, Treasurer and Editor, at P.O. Box 4934, Fort Walton Beach FL 32549-4934, phone (904) 244-1516. All back issues of AUGER are available; see the ad in any issue.

Metro Orlando Adam Users Group newsletter, September 1993. A subscription to the newsletter comes with membership in MOAUG, which is \$20 per year. Write to James Poulin, 1146 Manatee Drive, Rockledge FL 32955, phone (407) 631-0958.

MTAG Express, #42 (August 1993), edited by Neil Wick. This is published six times a year by the Metro Toronto Adam Group, Box 165, 260 Adelaide Street East, Toronto, Ontario M5A 1N0, Canada. For information on MTAG membership and/or subscription rates, call the club's number, (416) 424-1352.

Omaha ADAM Users Club newsletter, #55 (August/September 1993), bills itself as the oldest active ADAM newsletter in the USA,

and says it was established 11 July 1984 by Norman R. Castro, who is still the editor. Subscriptions are \$5, \$7, or \$10 per year (6 issues) for U.S., Canadian, and other foreign subscribers, respectively, from Norman R. Castro, 809 W. 33rd Avenue, Bellevue NE 68005, phone (402) 291-4405.

The Analytical Engine, #1 (July 1993). Distributed over computer nets as an ASCII file, this newsletter of the Computer History Association of California is not printed fancy, but very interesting. The editorial in the first issue describes the crying need to preserve the physical material of computer history, a theme which should be familiar to TZL readers. Also included is *Programming the 1401: An Interview with Leo Damardas*, by Roger Louis Sinasohn, and *I Played the ORIGINAL Video Game!*, by Scott Robinson. I look forward to future issues of the *Engine*. See this issue's LETTERS for the address and phone numbers of Kip Crosby, the editor.

Communications of the ACM is the magazine of the Association of Computing Machinery, the main professional organization for computer scientists. Volume 36, Number 8 (August 1993) contains *FidoNet: Technology, Tools, and History* by Randy Bush. Thanks are due Neil Wick of MTAG Express who included the article with his newsletter, thus bringing it to my attention.

The Computer Journal, #63, September/October 1993. J.W. Weaver lists some interesting addresses, though some of them I know to be extinct

companies. Jay Sage's column is about PCs and PC software this month, except for a couple of items at the end. Herb Johnson gives a tutorial on disk drives that is very interesting. Rick Rodman writes about calling conventions that are language independent. Chuck Stafford provides some good tips and tells the Kaypro owner how to upgrade the power supply. The Center Fold this issue is another Xerox 820 schematic. Tilmann Reh finally delivers part 2 of Connecting IDE Drives, on IDE basics. Terry Hazen provides part 2 on a SCSI EPROM programmer.

See our RESOURCES section for address, phone number, and subscription prices for TCJ. And then subscribe!

Smaller is Better, September 1993. This is the newsletter of the Connecticut CP/M Users Group, affectionately called CCP/M. CCP/M is a long-standing group that has much to its credit, not least of which is the East Coast Z-Fests. For dues and/or subscription information, write Stephen Griswold, P.O. Box 74, Canton CT 06019-0074, or call the Mouse House BBS at (203) 665-1100.

Z-100 LifeLine, #27 (August 1993). This magazine is extremely well written, and the editor writes long articles on all the ins and outs of the Z-100. Unfortunately nearly all of every issue is devoted to PC subjects. There are three more issues left, and then Paul Herman (the editor) will be doing his new magazine, *PC LifeLine*, exclusively. See RESOURCES for the address of *Z-100 Lifeline*. Now is the time to get back issues.

RESOURCES

Lee Bradley sells public-domain CP/M packages, \$15 each for the game disk, word-processing disk, dot-matrix printer disk, time-manager disk, SIL compiler disk, NPS COBOL compiler disk, mailing-list disk, spreadsheet disk. NZCOM, Z3PLUS, ZSDOS, BDS C, ZMAC also available. He also carries the MYZ80 Z80 emulator for PCs, plus a large set of Z-System utilities, as a package called Z-4-AT, at \$10 per disk; there are currently two disks. CP/M computer training, \$15/hour. Contract programming service available. Computers, printers for sale. Write Lee Bradley, 24 East Cedar Street, Newington CT 06111, or call (voice) (203) 666-3139 or (data) (203) 665-1100.

Paul Chidley is the co-inventor of the YASBEC

computer. The YASBEC board is \$100 Canadian, the YASMEM memory-expansion board is \$30 Canadian, the EuroCard backplane is \$25 Canadian, and the ZVID video board is \$35 Canadian with PALs, \$25 Canadian if you wish to provide your own PALs from the logic in the documentation. Contact Paul Chidley, 627 Hunterfield Place N.W., Calgary Alberta, Canada T2K 4L5.

The Computer Journal is the foremost magazine in today's CP/M community. Published 6 times a year. Free sample issue available. Subscription is \$24/year surface, \$34 air, \$44/2 years surface, \$64 air, in the US. In Canada and Mexico, \$32, \$34, \$60, \$64 respectively. Elsewhere \$34, \$44, \$64, \$84 respectively. *The Computer Journal*, P.O. Box 535,

Lincoln CA 95648-0535, phone (800) 424-8825.

Corvatek sells KEY-UP, a keyboard interface for IBM-style keyboards. The DM-1 for Big Boards, DM-2 for Xerox 820, DM-3 for Kaypro, DM-4 for Franklin, DM-5 for ASCII Universal, DM-6 for Apple II are each \$129. Inquire for other models and custom key definitions and applications. They also sell Keytronic keyboards in QWERTY or Dvorak; the KB5150 is \$112, KB5151 is \$164; shipping and handling extra. Corvatek, 561 N.W. Van Buren St., Corvallis OR 97330, phone (503) 752-4833.

Davidge Corporation makes and sells the Ampro Z80 Little Board, one of the CP/M computers still made. This is a 4-Mhz Z80 single-board computer with 64K RAM. The Little Board without SCSI is \$240, the Series 1B Little Board Plus is \$250. Software, BIOS source, manuals, and repair service are also available. Volume discounts available. Write to Davidge Corporation, 94 Commerce Drive, P.O. Box 1869, Buellton CA 93427, phone (805) 688-9598.

Elliam Associates sells disks of public-domain software and commercial software for most CP/M computers, including the Amstrad PCW. For a 100+ page catalog, send \$8.50 plus \$2.00 shipping and handling to Elliam Associates, P.O. Box 2664, Atascadero CA 93423, or phone (805) 466-8440.

Herbert R. Johnson is "Dr. S-100". He supports S-100 bus computers, including NorthStar, Compupro, Cromemco, IMSAI, and Vector. He can sell you S-100 boards, manuals, books, etc. Write to him at P.O. Box CN-5256 #105, Princeton NJ 08543, or phone (609) 771-1503.

Lambda Software Publishing publishes this magazine and sells CP/M and Z-System software, manuals, laser fonts, books. See the ad at the back of this magazine.

Microcomputer Mail-Order Library of books, manuals, and periodicals relating to microcomputers in general, and Heath/Zenith systems in particular, will loan you any item for 4 weeks for a handling fee plus postage. Send the deposit plus enough for postage, and the requested items will be sent you by first class priority mail. When you return them, the deposit and any left-over postage, minus the handling fee, will be refunded. For periodicals, the deposit is \$1 per issue, \$0.25 handling; books and hardware manuals are \$5 deposit, \$2 handling fee; software manuals are \$10 deposit, \$5 handling fee. The price is deliberately low to encourage people to

learn more about their computers. Inevitably, some items will be lost in the mail or not returned. Donations of printed material would therefore be greatly appreciated! To obtain a list of available items, or to borrow material, write to Library c/o Hart, 323 West 19th Street, Holland MI 49423.

Micromint makes and sells the SB180 and SB180LO computers. These are 9-MHz HD64180/Z180 single-board computers with 256K RAM. The SB180 is the size of a 3½" disk drive, costs \$299 (\$195 each 100 quantity), or \$399 with ZCPR, ZRDOS, BIOS and ROM sources. The SB180LO is the size of a 5¼" disk drive, has SCSI, costs \$400 (\$320 each 100 quantity), or \$490 with ZCPR, ZRDOS, BIOS and ROM sources, Z-System utilities. The SB180FXMME 2-Mb memory-expansion board, populated with 256K, costs \$319. Micromint, Inc., 4 Park Street, Vernon CT 06066. Technical Assistance, (203) 871-6170. To order, 1 (800) 635-3355.

MicroSolutions makes several products of interest to our community. Uniform format-translation software costs more and knows fewer formats than 22DISK (see Sydex, below), but 22DISK only runs on PCs. Versions of Uniform are available for CP/M machines: Actrix, Bondwell (12 and 14), Epson QX-10, Kaypro (all models except Robie), Micromint SB180, Morrow Micro Decision (2, 3, 5, 11, 16, and 34), NEC PC-8801, Osborne 1 (double density), TeleVideo (801, 802, 803, and TPC-1), Toshiba T100, Xerox 820-II, and Zenith Z-100. All versions of Uniform, including Uniform-PC, cost \$69.95. MicroSolutions also sells UniDOS, a Z80 card for PCs, for \$175; and their CompatiCard IV lets a PC use 4 floppy-disk drives, including 8" drives, for \$95. MicroSolutions Computer Products, 132 W. Lincoln Hwy, DeKalb IL 60115, phone (815) 756-3411.

Morgan, Thielmann & Associates sells and services computers, not only the latest 386 and 486 systems with DR DOS or Unix, but also Eagle computers, all models, and other CP/M computers. Call them at (408) 972-1965 for prices and information.

Paul F. Herman Inc. publishes *Z-100 LifeLine*, a bimonthly journal dedicated to the Zenith Z-100 dual 8088-8085 computer. A one-year subscription is \$24 per year to any U.S. zip code, \$28 to Canada or Mexico, and \$28 to any other company by surface mail, \$36 by air mail. Back issues are available for \$5 each (\$2 each is you're a *Z-100 LifeLine* subscriber); some early issues are getting low. An index disk to Z-100 articles in various magazines is available to

subscribers for \$19, and an update can be purchased any time after that for \$5. Contact Paul F. Herman Inc., 9317 Amazon Drive, New Port Richey FL 34655, or call (800) 346-2152.

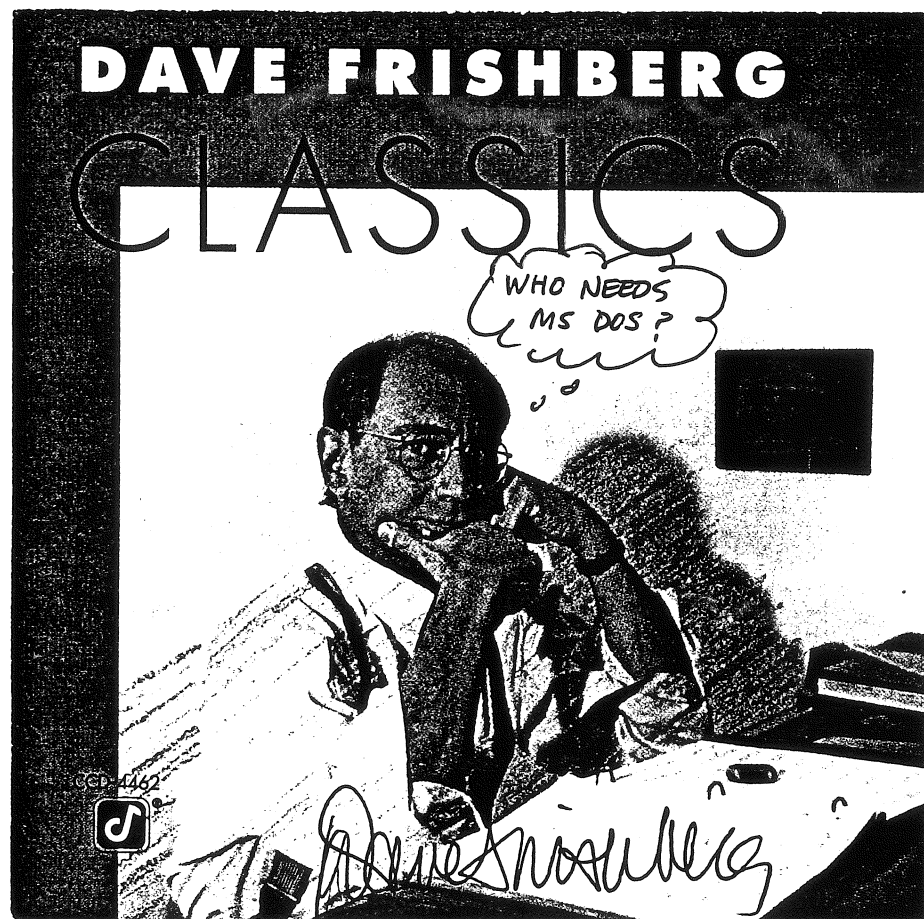
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Chuck Stafford sells important products for Kaypro computers. The Advent TurboROM allows flexible configuration of your entire system, reading and writing additional formats, and more; \$35. The hard-disk conversion kit includes everything needed to add a hard disk except the hard disk itself; the interface, controller, TurboROM, software and

manual. \$175 without clock, \$200 with clock; very few are left, so order now. Orders receive a free copy of the schematic for the Personality Decoder Board which lets you run more than two drives, and use 96-tpi drives (when combined with the TurboROM); unfortunately there are no more of the actual boards left. Write him at 4000 Norris Avenue, Sacramento CA 95821, or phone (916) 483-0312 evenings or weekends.

The Staunch 8/89'er is a magazine for users of Heath/Zenith H-8 and H-89 computers; \$15 per year U.S. and Canada, \$19 overseas. Kirk L. Thompson, the editor, also sells CP/M and HDOS software, in all H/Z formats, including hard-sector. Write him at P.O. Box 548, West Branch IA 52358, or phone (319) 643-7136 (evenings and weekends).

Sydex sells PC software useful for copying CP/M files and handling CP/M disk formats (22DISK), running CP/M programs on a PC (22NICE), and copying CP/M boot disks without having the original machine (AnaDisk). \$25 each plus \$2.50 shipping and handling per order. Free sampler disks with the limited shareware versions are available. Talk to Chuck or Miriam at Sydex, P.O. Box 5700, Eugene OR 97405, phone (503) 683-6033.



Jazz artist Dave Frishberg loves his Eagle Computer and the Spellbinder word processor that comes with it. Recently, in appreciation of the support I've given him over the years, he sent me two of his CDs, one of which is shown here. The other one, his *Where you at?* album, is also signed, and inscribed "To David A.J. McGlone, my Spellbinder connection." Appreciation like this makes running Lambda worthwhile. Thanks, Dave.

Lambda Software Publishing

149 West Hilliard Lane, Eugene, OR 97404-3057
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Operating system

CP/M (version 2.2), \$25. A lot of my customers have picked up a computer without a disk to operate it. I can sell you the disk to run your computer. (DRI)

Manuals and newsletters

Computer manuals, \$15 each. Manuals for many different makes and models of CP/M computers are available, too many to list here; please inquire. (Various companies)

Software manuals, \$15 each. *CBASIC Reference Manual*, (DRI); *MBASIC Reference Manual*, (Microsoft); *Perfect Calc User's Guide*, *Perfect Filer User's Guide*, *Perfect Writer/Speller User's Guide*, (Perfect Software, Inc.); *The CP/M Handbook with MP/M*, by Dr. Rodney Zaks (SYBEX); *Personal Pearl Manual* (Pearlsoft). Other manuals available; please inquire.

The Z-Letter, back issues: \$3/issue (US, Canada, Mexico), \$5/issue (elsewhere).

The Z-Letter, subscription: \$18/12 issues (US), \$22/12 issues (Canada & Mexico), \$36/12 issues (all other). Now published bi-monthly.

The Z-Letter, back-issue/subscription package. Get all back issues of TZL plus a current subscription for less than the cost of the individual back issues. Send the money for a 36-issue subscription (\$54 in the U.S., \$66 Canada and Mexico, \$108 elsewhere), and indicate that you want your subscription to start with issue 1. You will receive all the back issues immediately, and the remainder of your subscription as it is published.

Eagle Computer Users Group newsletter, \$15. All issues from July 1987 to October 1990.

Word processing

Spellbinder (version 5.3H), \$60. The best CP/M word processor. Includes all four manuals and full support. (Ltek)

MagicIndex (version 3.00), \$100. Text formatter

used to produce this newsletter. Versions available for standard word processor or WordStar, LaserJet or Diablo 630. Please specify your word processor and printer when ordering. (CES)

Z-Fonts catalog, \$3 (US, Canada, Mexico), \$5 (elsewhere). Samples of all the fonts available from Lambda for HP LaserJet printers, with instructions on how to choose what size, orientation, etc. you wish.

Z-Fonts, \$8 per font. (Digi-Fonts)

SuperCalc 2

The standard CP/M spread sheet (version 2.0), \$30. (Sorcim)

Move up to the Z-System!

NZ-COM (version 1.2d), \$20. Upgrades your CP/M 2.2 system with no hardware change, yet you can still run your CP/M programs like Spellbinder and SuperCalc. Includes a manual and a large set of Z-System utilities. (Alpha)

ZCPR 3.4 source code, \$15, \$10 if purchased with NZ-COM. (Alpha)

I/OR, \$25. Saves the screen in a file, saves printer text in another file. 1.5K IOP segment, ZRDOS required. (Alpha)

B/Printer, \$25. Deluxe background single-file printing. 1.5K IOP segment, ZRDOS required. (Alpha)

NuKey (version 2.03), \$25. Advanced function-key generator. 1.5K IOP segment, ZRDOS required. (Alpha)

All three IOP segments, \$60. (Alpha)

Customizable diskette carriers

Each protects up to three 5¼" diskettes from harm in briefcase, etc. Perfect for traveling or just between home and office. \$3 each.

(Ad continued on next page)

Boot disks wanted!

I am building a library of CP/M boot disks so that I can supply working CP/M disks for all makes of machines. The disk should contain the CP/M utilities, the formatting and other utilities that are specific to the machine, and have the operating system on the boot tracks. I will pay you \$5 for each one I don't have already, or deduct \$5 from any products you buy from me.

Disk copying – \$10 per disk

I can copy most soft-sector (both single- and double-density) 5¼" CP/M formats, including Apple II CP/M and Commodore CP/M. (Sorry, no hard-sector formats except Northstar, Heath/Zenith, and Vector.) I can also copy 8" disks and 3½" formats. Copies can be CP/M <-> CP/M, CP/M <-> MS-DOS, CP/M <-> Mac, or Mac <-> MS-DOS; specify the format of your originals, and the format desired for the copies. Both originals and copies will be returned. *The responsibility is yours to ensure that you are the legal owner of material you ask me to copy.* Software you buy from Lambda will be sent to you in the disk format you request at no extra cost.

Sound Potentials public-domain software

The Sound Potentials collection of public-domain and shareware software for CP/M systems is now available from Lambda, and the name Sound Potentials is now a Lambda trademark. To receive a catalog of Sound Potentials software on disk, send \$10. If you have a earlier printed catalog, you may use it to order software from me. To order, add up the sizes of

the software you are ordering, divide by the size of your disk format, and round up to get the number of disks required to hold it. The price has gone down to \$10 per disk, same as I charge for copying disks. Obviously, then, the larger your disk format, the more software you can get for the same amount of money. As with all things I sell, there is no separate charge for shipping and handling.

Before investing major sums in public-domain software from any vendor, consider purchasing a package designed to achieve your end. For instance, if you are going to order a lot of utilities, consider upgrading to the Z-System via NZCOM, which will not only give you a later version of ZCPR than the public-domain version 2, but includes a huge set of utilities tailored for the Z-System. Before purchasing lots of patches for your copy of WordStar, investigate Spellbinder, ZMATE, VEdit, and other superior word processors. If you desire superior formatting abilities, MagicIndex may be just what you're looking for.

On the other hand, if you're almost perfectly satisfied with your present system and just need a few utilities to round out the corners of your happiness, the public domain may have just what you desire.

Ordering

Make sure you tell me your name, company name if any, address, home and business phone, and the computer format in which software should be supplied. For back issues, list which issues you want. For fonts, use the order form from a copy of the catalogue. For Sound Potentials software, list the programs you want. Your check for the total should be in U.S. funds in an international money order, or the equivalent in your country's currency. There is no sales tax in Oregon. I do not charge separately for shipping and handling.

Hoo-boy! My computer and I became obsolete on the same day!

– *From the small society by Bill Yates*

Ah, yes, the most oxymoronic achievement of the computer age . . . the personalized form letter.

– *From the comic strip Duffy, 6 February 1993.*

I hit 'delete', and the computer disappeared!

– *From Laugh Parade by Bunny Hoest and John Reiner, 8 August 1993.*