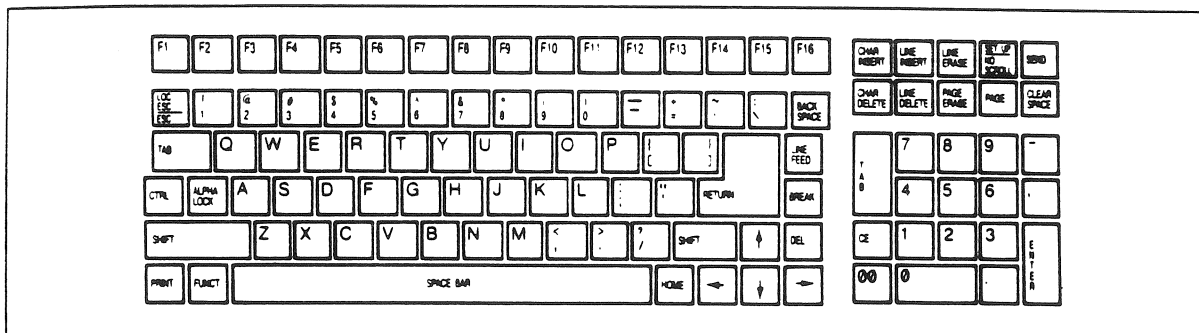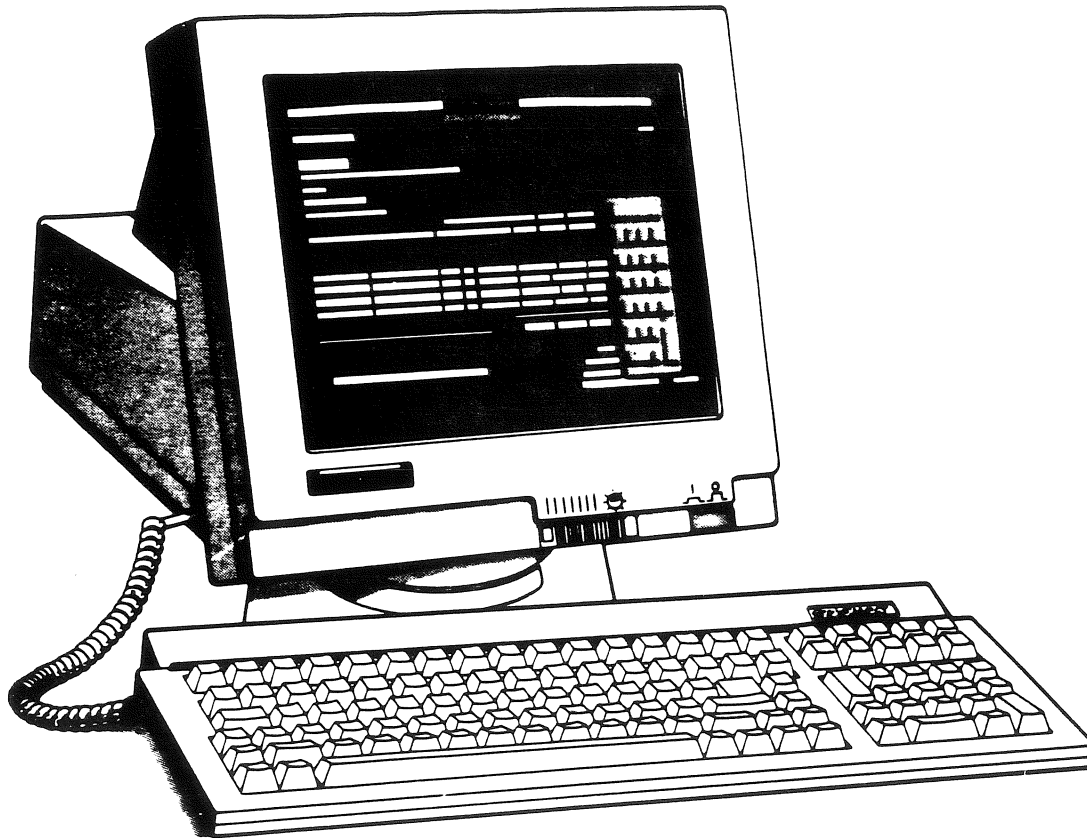# The Z-Letter

Newsletter of the CP/M and Z-System community

Number 19 March 1992

The TeleVideo 965 terminal

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ABOUT THIS NEWSLETTER

Welcome to *The Z-Letter*, a newsletter for the community of CP/M and Z-system users. Everything in this issue is copyright © 1992 by the editor: David A.J. McGlone, Lambda Software Publishing, 720 S. Second Street, San Jose, California 95112-5820, phone (408) 293-5176.

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.

Submitting material for publication

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

Letter policy

The Z-Letter reserves the right to edit letters received to conform to standards of taste, decency, and language. We will NOT distort the meaning of any letter; we'll simply not print it first. If you are not willing to have any letter you send printed, or edited before printing, please say so in the letter. All other letters will be assumed to be for publication and become the property of Lambda Software Publishing upon receipt.

Subscriptions

The Z-Letter is a monthly publication, and subscriptions will be accepted for 1 or 2 years. A subscription starts with the first issue after the subscription payment is received. The cost is $15 per year for subscriptions mailed to U.S., FPO, or APO addresses. Canadian and Mexican subscriptions cost $18 per year. Other foreign subscriptions cost $45 per year. Subscriptions should be paid by check or international money order in U.S. dollars, mailed to Lambda Software Publishing. Back issues cost $2 apiece; every back issue is kept in print.

How to read your mailing label

If you are a subscriber, your address label lists when your subscription expires, for example, *Your last issue: 20*. If we have sent you a single issue in hopes that you will subscribe, it will be marked *Sample copy*. *Complimentary* copies go to people we expect to spread the word of the newsletter's existence, and perhaps contribute information or articles.

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Index available

The Z-Letter is indexed annually. The index for issues 1-5 appeared in issue 5. The index for issues 1-18 is being prepared.

RANDOM ACCESS

Editorial mumblings about this and that

Breaking up is hard to do

My layoff from Tandem is affecting things I never thought of. With the need to deal with the separation cutting into my sabbatical, some projects such as the index to this magazine have not been completed (although that one, at least, has been started), and the new Z-Fonts catalog hasn't made any progress at all. All I can say is, they will get done, and I'll let you know in *The Z-Letter* as soon as they're finished.

The Z-Letter is the thing most affected by the layoffs. Tandem's community-relations department was allowing me to use photocopy machines at Tandem to print it, just as they were allowing the Eagle Computer Users Group to meet at Tandem facilities. With Tandem no longer willing to subsidize *The Z-Letter*, it no longer pays for itself (everything else that Lambda sells makes a profit, however small). The current subscription rate pays for envelopes, labels, and mailing, and nothing else. This leaves me with several choices: discontinue *The Z-Letter*, find another sponsor for it (or perhaps several sponsors), make it smaller, or publish it less often, or raise the subscription price to cover printing.

Discontinuing the magazine is definitely a last resort. I believe, and your letters tell me you agree, that *The Z-Letter* fills a need in our community. There would be a hole left behind that even *The Computer Journal*, *Eight Bits and Change!*, and the more specialized magazines and user-group newsletters all together could not fill. *TZL* falls in between everything else; it's less technical than *TCJ*, perhaps a little more technical than *EB&C*, less specialized than *Staunch*. It's also the only place where Eagle computers and Spellbinder are covered regularly, so I guess in some ways it's pretty specialized, too.

I don't want to publish it less often, because it's already the only monthly magazine in our community (as opposed to user-group newsletters). Raising the price wouldn't help

unless I raised it *a lot;* one printer estimated $600 to print a normal run, which would mean the subscription price would have to quadruple! That would drive away subscribers in droves.

What does that leave? Well, I think that if I cut the size of each issue in half, and raise the price a little bit, it can still come out monthly and pay for itself. I will investigate with more printers and some careful calculation and let you know for sure next issue. Subscriptions received at the current rate before I announce the new price will be honored for the full number of issues paid for, so if you've been reading someone else's copy, this is the time to send me a check for your own subscription.

So that's what a Zorba looks like

I had more things listed to do on my recent sabbatical than I could have done in six months, let alone six weeks. Several things got well started (but not, alas, finished), such as some COBOL programs I've been wanting to write, and the index to *The Z-Letter*. A few things even got done, such as installing my new TeleVideo 965 terminal; see the article this issue.

Another thing that got done was my trip to Denver to buy stuff from Herb Johnson, and not incidentally to visit with my college roommate, David Samson, and his family. I was there about three days. We went to a gun show, the Mile High Flea Market (where I saw no computers worth mentioning, but picked up a beautiful Finnish junki in the Estonian style – that's an ethnic knife, folks – for my collection), and numerous computer stores. I bought a lot of stuff from Herb, including a NorthStar Horizon, another Epson Geneva, another NEC Starlet (both the Geneva and the Starlet are CP/M laptops), a hard disk, a Corvus hard-disk box, lots and lots of CP/M magazines, lots of NorthStar and Vector documentation, and a Zorba. We met Herb's charming lady, went out to dinner several times, and met the folks at Alpha Center, a computer store that used to be a Kaypro dealership, where Dave bought a

Kaypro 10 to replace the Zorba, which he's been using. I also got the number of Gordon Ulrichson, who's well into the process of turning his collection of over 200 computers into a CP/M museum in Denver, and got some tips from him.

The Zorba is an interesting computer. Overall the impression it gives is the mutant offspring of a Kaypro and an Osborne. The setup is generally like a Kaypro, but the case is high-impact plastic and rounded, so it looks a lot like an Osborne, too. It has a full-size screen (80x24) and two floppy-disk drives of a make I've never seen except on dedicated word processors; when they're closed, they're completely closed, as the latches are full-cover lids over the slot into which the floppy disk goes. The keyboard has 19 (!) function keys, fully programmable. To complete the weatherproofing, the ports in back are covered when not in use with a plastic strip that seals them off, and this strip is attached to the case with a chain to keep it from being lost. I don't know what market Zorba was aiming for, but it's intended for outdoor conditions with electrical power available. The Army? Geologists? Who knows?

The Eagle V and the Kaypro 22

One thing I learned in Denver, that I hadn't known before, is that the Kaypro 10 is a Kaypro with a 10-Mb hard disk. If it seems late for me to be learning this, remember that my main computer was an Eagle III, then an Eagle IV, then a Micromint SB180, and now a Micromint SB180FX. I didn't even own any Kaypros until I started collecting computers for my museum.

I have, however, been wanting a portable computer with a hard disk to take on trips. Even the new, lighter box my computer's in, and the lighter TeleVideo 965 I'm using now instead of a 950, is not really portable unless I'm going somewhere by car. While I have many portables, none of them have a hard disk.

Until now, that is. One of the things Joe Wright gave me when we were clearing out his garage was a Kaypro 10, which was now sitting in *my* garage. When I got back from Denver, I brought it in, cleaned off the dust and cigarette smoke, and fired it up.

Then I fell off my chair, because this beast isn't a Kaypro 10 any more! Joe had replaced the 10-Mb hard disk with 22 Mbs, replaced the 48-tpi floppy-disk drive with a 96-tpi drive, and installed an Advent Turbo ROM!

After recovering from the shock, I discovered that the hard disk is partitioned into a large number of logical disk drives. The drives and their sizes are:

A	6 Mb
B	6 Mb
C	3 Mb
D	2 Mb
E	2 Mb
F	2 Mb
G	872 Kb
H	782 Kb (the floppy)

Before copying everything but the Z-Fonts from my regular hard disk, installing NZCOM, and configuring Spellbinder, I want to repartition the hard disk in the Kaypro 22 (as I've taken to calling it) into three partitions (A = 8 Mb, B = 8 Mb, C = 6 Mb). Fortunately, the Advent Turbo ROM is still supported. Chuck Stafford, who advertises in *The Computer Journal*, makes and sells the Turbo ROM for $35. He also has a separate product, Turbo ROM hard-disk formatting software, for $25. Chuck charges $5 shipping and handling per order; I sent him $30 and received ADVFMT 2.3 within a week. I hope to have the Kaypro 22 ready to take with me to Trenton in a couple of weeks. If you want to upgrade your Kaypro, Chuck's address is 4000 Norris Avenue, Sacramento CA 95821. Or call him evenings or weekends at (916) 483-0312.

Another stroke of good luck I had recently was finding what I thought at first was an Eagle PC at the flea market, and buying it, along with a spare CPU box, spare keyboard, and lots of manuals, for $50. What I was buying was the 40-Mb hard disk. But the machines are not Eagle PCs, but Eagle 1630s. What's the difference? The Eagle 1600 series came out before the Eagle PC series, and was less

compatible with IBM PCs. Eagle also economized by using *the same hard-disk setup used in an Eagle V.*

Big deal, you say. But consider. There was so little demand for a CP/M machine with a 32-Mb hard disk that I, personally, have never laid eyes on an Eagle V. Neither have most other members of our Eagle Computer Users Group. The Eagles commonly found are IIs and IIIs, computers with two single-sided and and two double-sided 96-tpi floppy-disk drives, respectively. Even the Eagle IV, with one DSDD 96-tpi floppy and a 10-Mb hard disk, is relatively rare.

The bottom line is this. I took out and kept the DSDD 96-tpi floppy, the 40-Mb hard disk, and the Xebec controller. The rest I gave to Jerry Davis, as I have no interest in or use for PCs of any stripe. By replacing the 10-Mb hard disk in my Eagle IV with this 40-Mb hard disk, replacing the Xebec controller in the Eagle IV with this Xebec controller, and running the Eagle hard-disk formatting software, I should have a working Eagle V! If I also put the floppy in, so that it becomes a V+ (a V with two floppies instead of one), every bit of potential in the Eagle hard-disk BIOS will finally be realized. Even the Eagle IVx2 which Jerry and I put together had drives B and D limited to the 2 Mb left over when A and C were subtracted from two 10-Mb hard disks. On an Eagle V, hard-disk partitions A, B, C, and D are all 8 Mb.

I'll let you know how this project goes. Watch this space!

THE STATE OF THE ART

Trenton Computer Festival, April 11/12

Don't forget Trenton this year, and the separate get-together that East-Coast Z enthusiasts have organized at the Stage Depot Motel in Pennington, New Jersey nearby. The details are in last month's issue of *The Z-Letter* and the current issue of *Eight Bits and Change!*, but I thought I'd remind you one last time before the actual events. I know from talking to Terry Hazen that he and Al Hawley are flying out from southern California, and Jay Sage tells me that over 30 people have taken rooms under the Z-Fest package deal. This should be quite a wingding! See you there, I hope?

Flea Market returns to Foothill College

The Computer and Electronics Flea Market regularly returns to Foothill College in March, not unlike the swallows coming back to Capistrano (what kind of bird collects computers? "Look, Martha, it's a four-eyed, RAM-craving, pocket-protectored nerd!")

This year, however, no return was expected. The flea market had lost its sponsor when the campus electronics museum closed, and Foothill wouldn't let it continue because of the potential insurance liability. A local electronics and computer store, Haltec, took to holding the flea market in its parking lot instead.

On March 14, however, there was the Flea Market at Foothill, just as though nothing had happened. Haltec will continue to hold its own flea market, but Haltec is also attending the Foothill one, and has moved the store hours and the hours of its own flea market back so they don't open until 9 AM.

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1. Spellbinder   Version 5.3H $60
The best CP/M word processor. Includes all four manuals, in one binder. (Ltek)

2. CP/M   Version 2.2 $25
Got the computer, but not the operating system? I can sell you a legal copy. (DRI)

3. MagicIndex   Version 3.00 $100
Extends even Spellbinder's control of printers, and what it does to WordStar has to be seen, and then you still won't believe it! Used by us to produce this newsletter. Versions available are: SL (for Spellbinder or other ASCII word processor plus HP LaserJet or laser with HP emulation), SD (for standard word processors, Diablo 630 and similar daisy-wheel printers), WL (WordStar or WordStar clone plus laser), and WD (WordStar and Diablo). Please specify your word processor and printer when ordering. (CES)

4. Computer manuals   Each $15
Complete manuals now available for: Eagle CP/M, Eagle 1600, Eagle PC Plus and Spirit, Otrona Attache, and Pied Piper. Inquire about others. (Various companies)

5. Eagle Computer Users Group newsletter   July 87 to October 90 $15
All the issues done by the present editor of the only Eagle user group left. (Lambda)

6. *The Z-Letter* (back issues) $3/issue (US, Canada, Mexico), $5/issue (elsewhere)
Past issues of this newsletter. Issues 1-6 are available both in the original 5½ X 8½" format, and enlarged to the 8½ X 11" format of issues 7-present, until copies of the older format run out. (Lambda)

7. *The Z-Letter* (subscription) $15/year (US), $18/year (Canada & Mexico), $45/year (all other)
Subscription price for this newsletters, which is published monthly. (Lambda)

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

9. Z-Fonts $2 per font plus $2 per disk
Once you've perused our catalog, you can order the fonts you want very cheaply. (Digi-Fonts)

10. NZ-COM   Version 1.2d $50
Combines the BIOS of your CP/M system with ZRDOS 1.9 and ZCPR 3.4 to make a dynamic Z-System for you automatically. Make your CP/M system work for you. (Alpha)

11. ZCPR 3.4 $35
The assembly-language source code, for anyone who wants to customize his system the old way, or customize the command interpreter itself. (Alpha)

12. I/OR $25
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13. B/Printer $25

Deluxe background single-file printing. 1.5K IOP segment, ZRDOS required. (Alpha)

14. NuKey   Version 2.03 $25

This advanced function-key generator redefines the output from your keyboard, using key definitions you create very simply. Different sets of key definitions may be saved as files and loaded for use with different programs and different terminals, letting you customize even programs have no customization procedures, and terminals whose keys are not programmable. Even multi-character function keys may be redefined. 1.5K IOP segment, ZRDOS required. (Alpha)

15. I/OR, B/Printer, NuKey combined IOP package $60

Sales of the following products are limited to quantity in stock:

A. *CBASIC Reference Manual* $15

CBASIC comes with CP/M as CBAS2.COM, CRUN2.COM, and XREF.COM. (DRI)

B. *The CP/M Handbook with MP/M* by Dr. Rodnay Zaks $15

This good introduction to CP/M assumes no prior knowledge of computers. (SYBEX)

C. Nevada COBOL $15

This is an excellent COBOL which I've used myself for years. (Ellis)

D. Customizable diskette carriers $3

These sturdy little carriers hold up to three 5¼" diskettes safe from harm. Ideal to carry diskettes in a briefcase and protect them from your lunch, heavy books, etc. Front and back covers are clear pockets that will hold covers of your design, allowing you to customize these diskettes as you would a binder.

E. SuperCalc   Version 2.0 $30

The standard CP/M spread sheet. (Sorcim)

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I can copy most soft-sector (both single- and double-density) 5¼" CP/M formats, including Apple II CP/M and Commodore CP/M. I can also copy 8" disks. (Sorry, no hard-sector formats except Northstar, and no 3½" formats yet. Copies can be CP/M to CP/M, CP/M to MS-DOS, or MS-DOS to CP/M; specify the format of the disks you send, and the format in which you want 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.* This does not apply to software you buy from Lambda, which will be sent to you in the disk format you request at no extra cost.

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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. List the number from this list of each item desired, and how many of each item you want. For item 6, list which issues you want. For fonts, use the order form from a copy of the catalogue. Your check for the total should be in U.S. funds, or the equivalent in your country's currency.

SCRIPT OF THE MONTH CLUB

ZEX5 scripts with flow control
by Jay Sage

Last month we had a change of pace and looked at a script for ZEX5, the incredibly powerful Z-System batch-processing facility. That script made use of (1) ZEX's ability to feed preplanned interactive keyboard input to a program, and (2) its ability to write directly to the screen for the display of messages. This time we will look at another of its capabilities: ZEX flow control. For this purpose we will use a script I have called DEMO.ZEX. It does not actually do anything, but it provides the framework for scripts you can write yourself.

The basic function of DEMO.ZEX is to determine whether or not an argument was given on the command line. If not, it displays a syntax and usage help screen. Otherwise, it runs the commands that implement the desired actions. In DEMO.ZEX there are no actions implemented; the script simply displays a message saying that it would have done something.

DEMO.ZEX tests for the presence of a command-line token using the flow-control command command if null $1. Recall that the ZCPR3 command processor has a flow-control facility that responds to a set of special commands, such as IF, ELSE, and FI (end if). You have seen these often in the command aliases I have presented in past columns. The command flow state takes on either of two values at any given time: true or false. When the flow state is true, commands are executed. When the flow state is false, regular commands are ignored; only flow-control commands are executed.

With command aliases, messages have to be generated by a series of ECHO command lines or, I suppose, by a special program written just to display the desired message. ZEX, however, makes things much easier because of its ability to provide direct screen output via the | SAY | directive. As we shall see, however, we have to have a way to control when the information is displayed and when it is suppressed.

Suppose we had the following simple ZEX script:

```
if < some test >
| SAY | Result of test is true | END SAY
else
| " | Result of test is false | "
fi
```

Just for fun and to refresh your memory from the last column, in the line after the ELSE command we have used the special shorthand SAY directive, | " | , which toggles the SAY state. At first glance this looks as though it would tell us what the result of the test was. On further thought, however, you should realize that in fact both messages will be displayed in all cases. Remember, the | SAY | blocks are not command lines; they are processed directly by ZEX. To handle this kind of situation ZEX needs (and provides) additional ZEX-specific flow control facilities.

ZEX maintains a single-level, three-valued flow-state flag. When this flag is in its neutral state, all characters in the script are processed. When it is in its true state, characters are processed only if the current Z-System flow state is true. When the ZEX flow-state flag is in its false state, characters in the script are processed only if the current Z-System flow state is false.

The ZEX flow state is controlled by four basic directives: | IF TRUE | , | IF FALSE | , | ELSE | , and | END IF | . The first two set the ZEX flow state to true and false, respectively. The third one toggles the flow state between true and false. The last one returns the ZEX flow state to its neutral condition. Now we see that we could implement the above script properly as follows:

```
if < some test >
| IF TRUE |
| SAY | Result of test is true | END SAY |
| END IF
else
| ' | Result of test is false | '
```

fi

Here we have introduced the special shorthand directive | '. It is like | " in that it toggles the SAY state, but it also toggles the ZEX flow state. Thus its first occurrence above is equivalent to | IF TRUE | | SAY | , and its second occurrence to | END SAY | | END IF. As you can see, it saves a lot of typing. Before we go on, note that we could have let ZEX do more of the work and implemented the script very compactly as:

```
if < some test >
| SAY | Result of test is
| IF TRUE | true
| ELSE | false
| END IF | | END SAY
fi
```

Here the flow control is within the domain of a SAY block. The string *Result of test is* is always sent to the screen. The ZEX flow-control directives then determine whether the string *true* or the string *false* is added.

The script DEMO.ZEX is printed below. You can modify the help message, take out the message about running the commands (or make it say something appropriate), and fill in whatever commands you want this script to run. Although it is natural to put those commands after the | END IF | directive, you should note that they could just as well be placed immediately after the if null command (and before the | IF FALSE | directive). Also, the order of the messages could have been reversed and the | IF FALSE | directive replaced by | IF TRUE | .

There is one very important caution that I appreciated only as I was experimenting with scripts for this column. One should never have ZCPR3 flow control commands in a part of a ZEX script in which the ZEX flow-control flag is not in a neutral state (i.e., between an | IF TRUE | or | IF FALSE | directive and the terminating | END IF | directive). Otherwise, once a ZCPR3 flow control command changes the flow state to the one in which ZEX ignores the script contents, other flow-control commands will not be passed to the command processor. The script will malfunction, and the script will end with the flow state garbled. In particular, the flow state might be left in a false state, and commands that you type at the system prompt will not run. You will think that your system has crashed in some way. You can get out of this situation and clean up the flow state by entering the command ZIF (zero out if state). Also, you can run the IFQ (IF Query) command to see what flow state you are in at any time.

```
{
     ZEX SCRIPT:        DEMO.ZEX
     AUTHOR:            Jay Sage
     DATE:              January 8, 1992

     This script is a demonstration script that illustrates how ZEX flow control can be used to provide a
     built-in syntax and usage message.
}

if ~null $1              ;; Set flow state true if an argument is present

;; Now we begin a block of the script that is controlled by the ZEX
;; flow state.

| IF FALSE |             ;; This part is processed only if no argument is present

| SAY |
```

This program carries out whatever function the author wishes
    to describe here. The syntax is:

        $0 arg1 [arg2 etc.]

The help screen can continue further.

| END SAY |

| ELSE | ;; This part is processed only if an argument is present

;; For this demo we only put out a screen message.

| SAY |

    The script $0 is now doing its real work by running the script
    with the command tail: $1 $2 $3

| END SAY |

| END IF |

;; Here we would have the commands that do the real work.

fi

A PROGRAMMER CORNERED

Programming the TeleVideo 965 terminal

Recently I acquired a TeleVideo 965 terminal from Joe Wright. The terminal was broken, and Joe was in no position to get it fixed. I took it to TeleVideo, and paid $150 to get it fixed. I also bought a manual for $20 (the illustration of the terminal and keyboard come from this manual). These prices seemed reasonable to me. TeleVideo makes such good equipment that ten-year-old TeleVideo 950 terminals, such as the one I've been using for years, regularly cost over $100 in computer stores. The 965 is a generation newer than the 950 and 970 terminals. TeleVideo still makes and sells them; they can be bought new with either a green, white, or amber screen, for $375 without the keyboard. The keyboards available are an ASCII model, an ANSI/VT220 model, and an enhanced PC model, any of which costs $124. So for $170 I got a working $499 terminal, with manual.

The 965 is a truly amazing device. Any feature you've ever seen on a TeleVideo terminal is present in this one. The screen is larger (13" visible area) than that of a 950 or 970, and much flatter. The whole terminal is much lighter (19 pounds) than a 950 or 970 (35 pounds or more), and draws less power.

Other nice features of the 965 include the full tilt and swivel built in, the placement of the brightness and power switches on the front instead of the back, and the fact that the keyboard plugs near the front of the left side. This is reminiscent of the 970, whose keyboard plugged into the front; on the 950, as with most PCs even today, the keyboard plugged into the rear of the machine.

The keyboard itself is thinner and lighter than the 950's keyboard. The layout of the keys is similar to those on the 970, with some slight

changes. The editing keypad, ten keys arranged in two rows of five, have been separated from the numeric keypad by moving the numeric keypad down. The cursor keys are arranged in an inverted T, with the up arrow placed above the down arrow, which is placed between the left arrow and right arrow. While not quite as good an arrangement as a true cross arrangement (where the HOME key is in the middle and the four arrow keys are place above, below, left, and right of it) such as found on a Zentec keyboard, the inverted T is a great improvement over the earlier TeleVideo models, which had the keys arranged, from left to right, in the order down, up, left, and right.

The keyboard can be described as intensely programmable. It has 16 function keys arranged across the top, and each function key can be programmed eight times. That is, not only can you put in a separate function for each key shifted or unshifted; once you've done so, you can switch to another function key set and do it again, up to four times. As you will see below, I'm using one set for HSH, one for Spellbinder, one for Selector, and have no use, at present, for the fourth set.

Besides the function keys, the edit keys are programmable; all the keys on the numeric keypad are programmable; and the cursor keys, HOME, DEL, BREAK, LINE FEED, BACK SPACE, and TAB keys are programmable! There are *two* separate, programmable status lines, top and bottom; a WordStar mode, for those interested; and most programming can be done in the setup mode as well as by sending commands to the terminal. Emulations include most TeleVideo terminals, Wyse 50, 50+, and 60, DEC VT100, Data General DG200, ADDS VP A2 and 60, ADM 3A, 5, and 31, Hazeltine 1500, PC terminal, IBM 3101-1X/2X and 3161-V. New characters and character sets can be designed and downloaded to the terminal. Up to eight pages of memory can be installed. The terminal can be set for 80 or 132 columns per line, and 24, 25, 42, 43, 48, or 49 lines per display page. There are many other things which may be set or changed, but that's enough to give you the idea. Our Z-System operating system is so diverse that you may choose what you want, and then customize it to suit yourself; in this

terminal we have hardware to match.

In fact, the only complaint I have about this terminal is the fact that I can't put the keyboard up on top when I want to clear my desk for writing or reading. I could do this with the 950, with its flat top. With the 965, I put a stack of in baskets to organize stuff for *The Z-Letter*, and I put the keyboard on top of the uppermost basket.

One final feature that I have to mention is the VideoDesk Accessories built into the terminal. All TeleVideo terminals have a FUNCT key located left of the space bar. When FUNCT is held down and a key is struck, the keyboard emits the sequence Ctrl-A, the contents of the key, Carriage-Return. On the 965, FUNCT-F1 gives you a clock in which you can set the current time, date, and an event for it to remind you of by sounding the bell and flashing the message in one of the status lines; this clock keeps time as long as the terminal is not turned off (the terminal, of course, has a screen saver, which is, of course, programmable). FUNCT-F2 is a perpetual calendar, which normally shows the month and year set in the clock but you can go forward and back by month and by year, rendering a calendar on the wall unnecessary. FUNCT-F3 is a full-function calculator, whose results can be sent to the terminal at the location of the cursor. FUNCT-F4 is an ASCII chart. You escape from any of these accessories by hitting ESCAPE. Once you're in any of them, you can switch between them by hitting F1, etc., without hitting FUNCT again. And you can use the cursor keys to move the windows for the individual accessories around; they are true windows, which you can call up in the middle of applications without disturbing the applications.

Down to work

Members of the Eagle Computer Users Group who have the May, 1988 issue of the ECUG newsletter, or customers who have bought Spellbinder from Lambda, and thus have my Introduction to Spellbinder manual, have read how I customized a TeleVideo 950 terminal for Spellbinder and Selector V. Basically, I

programmed the eleven programmable function keys on the 950 to emit a series of control codes. Then I configured Selector to assign these codes to Selector functions. Spellbinder was further customized to accept the 950's down-arrow key as such (the 950's key emits Ctrl-V instead of Ctrl-J as Spellbinder expects), to substitute command-mode commands for the non-programmable function keys to the right of F11, and to substitute escape sequences for certain control codes emitted by some of the function keys.

The 965 was programmed in a similar way, with some nice differences due to the greater flexibility of the newer terminal. As before, a DPROG script was written and DPROG is used to send it to the terminal, thus programming it. On the 950, this was done by the START alias whenever the computer was turned on, as the values were not retained by the terminal when it was turned off. Once I was satisfied with the programming of the 965, however, another command sent to it told it to keep this programming permanently, which shortens startup. Once the terminal was programmed, Selector was configured and Spellbinder customized. The configuration of Selector was very slight; since the terminal has four sets of function-key programs possible, the Selector set was largely the default set that Selector comes with. The DPROG script used to program the 965 follows.

```
;Desc:This file programs the TVI 965 keyboard.
;Date:920223
;By:DAJM
;:
;
;
;          PROGRAMMING THE TELEVIDEO 965
;          FUNCTION AND EDITING KEYS
;
; Reference: TeleVideo 965 Operator's Manual,
; TeleVideo Document 133008-00-C,
; January 1989.
;
;
; The first part of the string for programming
; the function keys on a Televideo 965 is the
; prefix "ESC 1'. The prefix for programming
```

```
; the editing keys is "ESC 0". We also define
; certain useful constants here.
;
-esc "\e"
-prefix esc "1'
-eprefix esc "0"
-tab "\t"
-return "\r"
-nul " ^ @"
-ctrlb " ^ B"
;
; The second part of the string is an element
; p1 that tells the terminal what function key,
; shifted or unshifted, is being programmed.
;
-f1 "1"
-f2 "2"
-f3 "3"
-f4 "4"
-f5 "5"
-f6 "6"
-f7 "7"
-f8 "8"
-f9 "9"
-f10 ":"
-f11 ";"
-f12 "
-f13 "='
-f14 "
-f15 "?"
-f16 "@"
-sf1 "A"
-sf2 "B"
-sf3 "C"
-sf4 "D"
-sf5 "E"
-sf6 "F"
-sf7 "G"
-sf8 "H"
-sf9 "I"
-sf10 "J"
-sf11 "K"
-sf12 "L"
-sf13 "M"
-sf14 "N"
-sf15 "O"
-sf16 "P"
;
; The second part of the string that reprograms
; the edit keys identifies which editing key is
; to be programmed.
;
```

```
;    Unshifted editing keys:
;
 -ek_home        "@"    ; HOME key
 -ek_down        "A"    ; DOWN ARROW key
 -ek_up          "B"    ; UP ARROW key
 -ek_left        "C"    ; LEFT ARROW key
 -ek_right       "D"    ; RIGHT ARROW key
 -ek_maintab     "E"    ; main TAB key
 -ek_backsp      "F"    ; BACK SPACE key
 -ek_clearsp     "G"    ; CLEAR SPACE key
 -ek_print       "H"    ; PRINT key
 -ek_charins     "I"    ; CHAR INSERT key
 -ek_chardel     "J"    ; CHAR DELETE key
 -ek_lineins     "K"    ; LINE INSERT key
 -ek_linedel     "L"    ; LINE DELETE key
 -ek_lineera     "M"    ; LINE ERASE key
 -ek_pageera     "N"    ; PAGE ERASE key
 -ek_page        "O"    ; PREV PAGE/NEXT
 -ek_send        "P"    ; SEND key
 -ek_numtab      "Q"    ; TAB, number pad
 -ek_ce          "R"    ; CE key, number pad
 -ek_enter       "S"    ; ENTER, number pad
 -ek_return      "T"    ; RETURN key
 -ek_linefeed    "U"    ; LINE FEED key
 -ek_esc         "V"    ; ESC/LOC ESC key
 -ek_del         "W"    ; DELETE key
;
;    Shifted editing keys:
;
 -sk_home        " ' "  ; HOME key
 -sk_down        "a"    ; DOWN ARROW key
 -sk_up          "b"    ; UP ARROW key
 -sk_left        "c"    ; LEFT ARROW key
 -sk_right       "d"    ; RIGHT ARROW key
 -sk_maintab     "e"    ; main TAB key
 -sk_backsp      "f"    ; BACK SPACE key
 -sk_clearsp     "g"    ; CLEAR SPACE key
 -sk_print       "h"    ; PRINT key
 -sk_charins     "i"    ; CHAR INSERT key
 -sk_chardel     "j"    ; CHAR DELETE key
 -sk_lineins     "k"    ; LINE INSERT key
 -sk_linedel     "l"    ; LINE DELETE key
 -sk_lineera     "m"    ; LINE ERASE key
 -sk_pageera     "n"    ; PAGE ERASE key
 -sk_page        "o"    ; PREV PAGE/NEXT
 -sk_send        "p"    ; SEND key
 -sk_numtab      "q"    ; TAB, number pad
 -sk_ce          "r"    ; CE key, number pad
 -sk_enter       "s"    ; ENTER, number pad
 -sk_return      "t"    ; RETURN key
 -sk_linefeed    "u"    ; LINE FEED key
 -sk_esc         "v"    ; ESC/LOC ESC key
```

```
 -sk_del         "w"    ; DELETE key
;
; NOTE: On the TeleVideo 965, you can ALSO
; reprogram the rest of the number pad.
; I can't conceive of a reason to do so,
; so I'm not going to bother to define key
; names for these keys.
;
; The third element p2 tells the terminal
; whether the string to be emitted by the
; function key is to be sent to the
; computer only (full duplex), to the
; terminal screen only (local), to both
; the computer and the terminal screen
; (half duplex), or to a printer attached
; to the terminal.
;
 -fdx   "1"
 -local "2"
 -hdx   "3"
 -ptr   "4"
;
; The fourth element of the programming
; string is the actual text to be emitted
; by the function key. The fifth and
; last element is a " ^ Y", marking the
; end of the string for the terminal.
;
 -ctrly " ^ Y"
;
; It's easier on the eyes if the terminal
; screen is turned off until the keys
; are programmed . . .
;
 -screen_off esc "o"
 -screen_on  esc "n"
;
; On the TeleVideo 965, the function keys
; may be programmed with up to four
; distinct sets of commands. To select
; a given set . . .
;
 -command_set_1 esc ";0v"
 -command_set_2 esc ";1v"
 -command_set_3 esc ";2v"
 -command_set_4 esc ";3v"
;
; Time now to send the actual programming
; instructions to the terminal. The
; previous sections simply defined words
; for us to use.
;
```

```
screen_off
;
;   EDITING KEYS – We will now reprogram
;   those edit keys whose output conflicts
;   with Spellbinder, or does not have the
;   value we want them to have.
;
;   Define HOME key as Spellbinder SCAN
eprefix ek_home  " ˆ S"  nul nul nul nul
;     Same as above, when shifted
eprefix sk_home  " ˆ S"  nul nul nul nul
;   Define down arrow to SB down arrow
eprefix ek_down  " ˆ J"  nul nul nul nul
;     When shifted, too
eprefix sk_down  " ˆ J"  nul nul nul nul
;   The editing keypad is set to a set of
;   values that do not conflict with
;   Spellbinder's control and escape keys,
;   nor the terminal's FUNCT keys.
eprefix ek_chardel  ctrlb "1"  return nul nul
eprefix ek_linedel  ctrlb "2"  return nul nul
eprefix ek_pageera  ctrlb "3"  return nul nul
eprefix ek_page     ctrlb "4"  return nul nul
eprefix ek_clearsp  ctrlb "5"  return nul nul
eprefix ek_charins  ctrlb "6"  return nul nul
eprefix ek_lineins  ctrlb "7"  return nul nul
eprefix ek_lineera  ctrlb "8"  return nul nul
eprefix ek_send     ctrlb "9"  return nul nul
eprefix sk_chardel  ctrlb "A"  return nul nul
eprefix sk_linedel  ctrlb "B"  return nul nul
eprefix sk_pageera  ctrlb "C"  return nul nul
eprefix sk_page     ctrlb "D"  return nul nul
eprefix sk_clearsp  ctrlb "E"  return nul nul
eprefix sk_charins  ctrlb "F"  return nul nul
eprefix sk_lineins  ctrlb "G"  return nul nul
eprefix sk_lineera  ctrlb "H"  return nul nul
eprefix sk_send     ctrlb "I"  return nul nul
;
;  FUNCTION KEYS SET 1
;    Z-System command line, including
;    HSH commands.
;
command_set_1
;  Toggle insert on/off
prefix  f1  fdx " ˆ V"         ctrly
;  Recall next command
prefix  f2  fdx " ˆ X"         ctrly
;  Recall previous matching command
prefix  f3  fdx " ˆ L"         ctrly
;  Recall previous command
prefix  f4  fdx " ˆ E"         ctrly
;  Cursor back one character

prefix  f5  fdx " ˆ S"         ctrly
;  Cursor forward one character
prefix  f6  fdx " ˆ D"         ctrly
;  Cursor back one word
prefix  f7  fdx " ˆ A"         ctrly
;  Cursor forward one word
prefix  f8  fdx " ˆ F"         ctrly
;  Cursor to beginning of command
prefix  f9  fdx " ˆ Q"         ctrly
;  Cursor to end of command
prefix  f10 fdx " ˆ R"         ctrly
;  Delete char to left of cursor
prefix  f11 fdx "\B"           ctrly
;  Delete char under/to right of cursor
prefix  f12 fdx " ˆ G"         ctrly
;  Delete word to left of cursor
prefix  f13 fdx " ˆ W"         ctrly
;  Delete word under/to right of cursor
prefix  f14 fdx " ˆ T"         ctrly
;  Delete whole command
prefix  f15 fdx " ˆ P" " ˆ Y"  ctrly
;  Display chart of HSH commands
prefix  f16 fdx " ˆ J"         ctrly
prefix  sf1  fdx nul ctrly  ;   undefined
prefix  sf2  fdx nul ctrly  ;   undefined
prefix  sf3  fdx nul ctrly  ;   undefined
prefix  sf4  fdx nul ctrly  ;   undefined
prefix  sf5  fdx nul ctrly  ;   undefined
prefix  sf6  fdx nul ctrly  ;   undefined
prefix  sf7  fdx nul ctrly  ;   undefined
prefix  sf8  fdx nul ctrly  ;   undefined
prefix  sf9  fdx nul ctrly  ;   undefined
prefix  sf10 fdx nul ctrly  ;   undefined
prefix  sf11 fdx nul ctrly  ;   undefined
prefix  sf12 fdx nul ctrly  ;   undefined
prefix  sf13 fdx nul ctrly  ;   undefined
prefix  sf14 fdx nul ctrly  ;   undefined
prefix  sf15 fdx nul ctrly  ;   undefined
prefix  sf16 fdx nul ctrly  ;   undefined
;
;  FUNCTION KEYS SET 2
;    Spellbinder edit-mode function keys.
;      Command-mode functions are handled by
;      redefining the terminal's "editing"
;      keys inside Spellbinder.
;
command_set_2
;  Toggle between edit and command mode
prefix  f1  fdx " ˆ Q"    ctrly
prefix  f2  fdx " ˆ G"    ctrly ; previous page
prefix  f3  fdx " ˆ V"    ctrly ; next page
prefix  f4  fdx " ˆ E"    ctrly ; insert
```

```
prefix  f5  fdx " ˆ B"      ctrly  ; mode back
prefix  f6  fdx " ˆ F"      ctrly  ; mode forward
prefix  f7  fdx " ˆ O"      ctrly  ; cursor mode
prefix  f8  fdx " ˆ T"      ctrly  ; line top
prefix  f9  fdx esc "h"     ctrly  ; hold (cut)
prefix  f10 fdx esc "u"     ctrly  ; unhold (paste)
prefix  f11 fdx esc "b"     ctrly  ; back (to) mark
prefix  f12 fdx esc "f"     ctrly  ; fwd (to) mark
prefix  f13 fdx " ˆ W"      ctrly  ; enter enhance
prefix  f14 fdx " ˆ U"      ctrly  ; mode enhance
prefix  f15 fdx esc "t"     ctrly  ; cursor (to) top
prefix  f16 fdx esc "e"     ctrly  ; cursor (to) end
prefix  sf1 fdx " ˆ Z"      ctrly  ; decimal tab
prefix  sf2 fdx " ˆ P" " ˆ Y" ctrly ; indent
prefix  sf3 fdx esc "i"     ctrly  ; clear indent
prefix  sf4 fdx " ˆ C"      ctrly  ; clear (join)
prefix  sf5 fdx nul         ctrly  ;    undefined
prefix  sf6 fdx " ˆ S"      ctrly  ; scan
prefix  sf7 fdx nul         ctrly  ;    undefined
prefix  sf8 fdx esc "c"     ctrly  ; line center
prefix  sf9 fdx nul         ctrly  ;    undefined
prefix  sf10 fdx " ˆ A"     ctrly  ; continue
prefix  sf11 fdx nul        ctrly  ;    undefined
prefix  sf12 fdx " ˆ D"     ctrly  ; mode delete
prefix  sf13 fdx esc tab    ctrly  ; absolute tab
prefix  sf14 fdx esc esc    ctrly  ; line/column
prefix  sf15 fdx " ˆ X"     ctrly  ; mark
prefix  sf16 fdx " ˆ N"     ctrly  ; soft hyphen
;
; FUNCTION KEYS SET 3
;    SELECTOR V function keys.
;
command_set_3
; Exit SELECTOR or quit a module
prefix  f1  fdx " ˆ Q"      ctrly
; write a record
prefix  f2  fdx " ˆ W"      ctrly
; character line/box
prefix  f3  fdx " ˆ O"      ctrly
; insert mode
prefix  f4  fdx " ˆ E"      ctrly
; word left
prefix  f5  fdx " ˆ A"      ctrly
; word right/next field
prefix  f6  fdx " ˆ F"      ctrly
; screen left
prefix  f7  fdx " ˆ B"      ctrly
; screen right
prefix  f8  fdx " ˆ N"      ctrly
; insert line
prefix  f9  fdx " ˆ I"      ctrly
; kill (delete) line
```

```
prefix  f10 fdx " ˆ D"         ctrly
; clear a line to spaces
prefix  f11 fdx " ˆ S"         ctrly
; center the line
prefix  f12 fdx " ˆ R"         ctrly
; help
prefix  f13 fdx " ˆ P" " ˆ Y" ctrly
; clear screen
prefix  f14 fdx " ˆ C"         ctrly
prefix  f15 fdx nul ctrly ;    undefined
prefix  f16 fdx nul ctrly ;    undefined
prefix  sf1 fdx nul ctrly ;    undefined
prefix  sf2 fdx nul ctrly ;    undefined
prefix  sf3 fdx nul ctrly ;    undefined
prefix  sf4 fdx nul ctrly ;    undefined
prefix  sf5 fdx nul ctrly ;    undefined
prefix  sf6 fdx nul ctrly ;    undefined
prefix  sf7 fdx nul ctrly ;    undefined
prefix  sf8 fdx nul ctrly ;    undefined
prefix  sf9 fdx nul ctrly ;    undefined
prefix  sf10 fdx nul ctrly ;   undefined
prefix  sf11 fdx nul ctrly ;   undefined
prefix  sf12 fdx nul ctrly ;   undefined
prefix  sf13 fdx nul ctrly ;   undefined
prefix  sf14 fdx nul ctrly ;   undefined
prefix  sf15 fdx nul ctrly ;   undefined
prefix  sf16 fdx nul ctrly ;   undefined
;
; FUNCTION KEYS SET 4
;   (I have no use right now for a fourth
;    set of function keys.)
;
command_set_4
prefix  f1  fdx nul ctrly ;    undefined
prefix  f2  fdx nul ctrly ;    undefined
prefix  f3  fdx nul ctrly ;    undefined
prefix  f4  fdx nul ctrly ;    undefined
prefix  f5  fdx nul ctrly ;    undefined
prefix  f6  fdx nul ctrly ;    undefined
prefix  f7  fdx nul ctrly ;    undefined
prefix  f8  fdx nul ctrly ;    undefined
prefix  f9  fdx nul ctrly ;    undefined
prefix  f10 fdx nul ctrly ;    undefined
prefix  f11 fdx nul ctrly ;    undefined
prefix  f12 fdx nul ctrly ;    undefined
prefix  f13 fdx nul ctrly ;    undefined
prefix  f14 fdx nul ctrly ;    undefined
prefix  f15 fdx nul ctrly ;    undefined
prefix  f16 fdx nul ctrly ;    undefined
prefix  sf1 fdx nul ctrly ;    undefined
prefix  sf2 fdx nul ctrly ;    undefined
prefix  sf3 fdx nul ctrly ;    undefined
```

```
prefix sf4  fdx nul ctrly  ;    undefined
prefix sf5  fdx nul ctrly  ;    undefined
prefix sf6  fdx nul ctrly  ;    undefined
prefix sf7  fdx nul ctrly  ;    undefined
prefix sf8  fdx nul ctrly  ;    undefined
prefix sf9  fdx nul ctrly  ;    undefined
prefix sf10 fdx nul ctrly  ;    undefined
prefix sf11 fdx nul ctrly  ;    undefined
prefix sf12 fdx nul ctrly  ;    undefined
prefix sf13 fdx nul ctrly  ;    undefined
prefix sf14 fdx nul ctrly  ;    undefined
prefix sf15 fdx nul ctrly  ;    undefined
prefix sf16 fdx nul ctrly  ;    undefined
;
screen_on
"\L"
"Keyboard has been programmed."
command_set_1
```

The script following is the Spellbinder table which is installed to tell Spellbinder how to interpret the codes now emitted by the edit keypad, and certain FUNCT key combinations. For my own convenience, all the inline MagicIndex commands which change to the fonts downloaded whenever I print *The Z-Letter* have been assigned to keys on the top of the typewriter section of the keyboard. To switch to italic print, for instance, I no longer type by hand ~=003~; instead I just hold down the FUNCT key and tap the 3 key on the typewriter keyboard. I could have done this, by the way, on the 950, but never got around to it.

The second part of the table redefines the Ctrl-B sequences that we've programmed into the edit keypad into Spellbinder command-mode commands. And that's it! We don't need to interpret the down arrow, because we programmed it to be Ctrl-J just as Spellbinder expects. Nor do we have to redefine any function keys; freed both of conflicts with the edit keypad, and with no need to compromise with Selector's limited configuration space by eliminating escape sequences, the function keys are programmed with Spellbinder editing commands, whether control codes or escape sequences. That is to say, Spellbinder doesn't have to interpret the function keys because the function keys match Spellbinder's editing commands already.

```
&7
001   ; MULTI-KEY LEAD-IN 1 is the ASCII value for control-A.
013   ; TERMINATOR 1 is the ASCII value for carriage return.
003   ; KEY COUNT 1 equals 3. Each key sends a 3-character sequence.
000   ; SHIFT FLAG 1 equals 1. Ignore upper/lower case.
016   ; DELAY is set to 16.
002   ; MULTI-KEY LEAD-IN 1 is the ASCII value for control-B.
013   ; TERMINATOR 1 is the ASCII value for carriage return.
003   ; KEY COUNT 1 equals 3. Each key sends a 3-character sequence.
000   ; SHIFT FLAG 1 equals 1. Ignore upper/lower case.
016   ; DELAY is set to 16.
;
001   ; This byte indicates beginning of first multi-key lead-in block.
      ; All strings following are for keys with a lead-in of CTRL-A and
      ; terminated with carriage return. These values are generated by
      ; holding down the FUNCT key and striking the key indicated. Any
      ; such combinations not included in this table will be ignored by
      ; Spellbinder.                    KEY  CODE     FUNCTION
045 126 061 057 051 057 126 255   ; "-"  ~=939~   18-point titles
048 126 061 048 049 048 126 255   ; "0"  ~=010~   MagicSymbol
049 126 061 048 048 049 126 255   ; "1"  ~=001~   Normal text
050 126 061 048 048 050 126 255   ; "2"  ~=002~   Bold test
051 126 061 048 048 051 126 255   ; "3"  ~=003~   Italic text
052 126 061 048 048 052 126 255   ; "4"  ~=004~   Bold italic text
```

```
053 126 061 048 048 053 126 255      ; "5"  ~=005~   Special symbols
054 126 061 048 056 051 126 255      ; "6"  ~=083~   Math symbols
055 126 061 055 048 049 126 255      ; "7"  ~=701~   14-point titles
056 126 061 049 056 052 126 255      ; "8"  ~=184~   Bold Greek
057 126 061 051 050 051 126 255      ; "9"  ~=323~   Italic Greek
255              ; Block Terminator
;
002    ; This byte indicates beginning of second multi-key lead-in block.
         ; All strings following are for keys with a lead-in of CTRL-B and
         ; terminated with carriage return.
```

		KEY	FUNCTION	NEW CODE	TVI 965 KEY
049 082 073 013 255		; "1"	Read	RI cr	char delete
050 084 047 087 047 087 068 013 255		; "2"	Save	T/W/WD cr	line delete
051 084 047 083 065 013 255		; "3"	Search	T/SA cr	page erase
052 068 065 013 255		; "4"	Clear	DA cr	prev page
053 065 068 013 255		; "5"	Load	AD cr	clear space
054 084 047 086 065 013 255		; "6"	View	T/VA cr	char insert
055 084 047 080 065 013 255		; "7"	Print	T/PA cr	line insert
056 083 084 013 255		; "8"	Status	ST cr	line erase
057 077 013 255		; "9"	Memory	M cr	send
065 090 013 255		; "A"	Tabs	Z cr	CHAR DELETE
066 067 047 068 032 255		; "B"	Files	C/D sp	LINE DELETE
067 084 013 255		; "C"	Top	T cr	PAGE ERASE
068 089 013 255		; "D"	Y Format	Y cr	PREV PAGE
069 089 084 013 255		; "E"	YT Format	YT cr	CLEAR SPACE
070 088 013 255		; "F"	Exit	X cr	CHAR INSERT
071 070 070 013 255		; "G"	Form Feed	FF cr	LINE INSERT
072 069 013 255		; "H"	End	E cr	LINE ERASE
073 065 013 255		; "I"	Continue	A cr	SEND

```
255         ; Block Terminator
;
255         ; END OF TABLES
```

The final step in all this is adding to my ARUNZ aliases for Spellbinder and SELECTOR two invocations of DPROG in each, to switch to the appropriate function-key set when going into the application, and back to the HSH set when leaving the application. In this way, I have HSH function keys at the ZCPR prompt, Spellbinder function keys when in Spellbinder, and SELECTOR function keys when I'm in SELECTOR.

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LETTERS

David,

As I mentioned at today's meeting, Classic Components (2121 Old Oakland Road, San Jose CA 95131, phone (408) 434-1600; ask for Leanne) has the CRT 5037 chip (40 pin) in stock for $10.45 each (minimum order 5), and the CRT 8002 chip (28 pin) for $10.10 each (minimum might be higher due to more chips in tube).

However, she called me back an hour later and told me they couldn't find the CRT 8002 even though they had done a physical inventory in January and their computer inventory showed 800 available.

Also, I thought you'd like to know that Kaypro has discontinued its 800 number, and that they no longer support any Kaypros. I talked to them via the parent company, Non-Linear Systems near San Diego, (619) 535-2155 and 535-2161. They told me that the whole of their parts inventory has been turned over to Mr. Alan Franklyn, c/o Drive Masters, 6275 Canterbury Drive, Culver City CA 90230. Mr. Franklyn is tough to reach at (310) 645-2563, and the best time to try is between 1 PM and 6 PM PST time. He monitors his calls, so give him time to pick up, or leave your number and he will call you back collect.

Cordially,
Kenneth D. Thomson
71 Rosenkranz St.
San Francisco CA 94110

Thanks for the information, Ken. As you know, those chips you mentioned that Classic Components may have are the most frequent part to fail in old Eagle computers. Jerry Davis has been looking for a source of them for a long time. I phoned him with this news and found that he already knew it, and in fact has placed an order with them. He says they have 80 8002s, not 800.

On another note, I've known for some time that Kaypro was out of business, but Kaypro owners will be glad to learn who has their parts inventory, if they don't know already.

Dear Dave:

Just got your February issue (#18) and would like to make a minor correction to your survey of magazine contents. Paul Flexman's article on printer graphics used a much-reduced dialect of Pascal (HDOS Tiny Pascal) to create the printout. I suspect all those PRINT statements in the code listing threw you! I might also note that *Staunch* will shortly be adding a column similar to your Magazine Articles section. I've had a number of people coming to me for assistance who were running CP/M machines other than the two I specialize in, the Heathkit H-8 and Heath/Zenigh '89/90. Furnishing information on other 8-bit publications will demonstrate to my readership that, at minimum, all is certainly not lost! My tentative name for the column is **R/O Media**.

Enclosed is replacement copy for the ad you're presently running. All the items listed here were released to me last December by Dave Powers of Generic Computer Products of Marquette, MI. However, I'm looking for other items Dave wrote and sold when he was Generic Software in Troy, MI. Some of this latter material was for CP/M, but even most of the packages I'm listing in the ad had their HDOS permutations and Dave no longer has copies. Source code is available for some of these, as you'll note, but not enough to move everything to the alternate operating system I support.

I've tracked down Norman Worthington of defunct Spite Software. He's working for The Software Toolworks and I've written to see whether he is willing to release the software he wrote while operating out of Portland, OR. I'm also looking for information on some other, now-defunct vendors. They are:

Brookfield Software Co.
P.O. Box 241083
Memphis TN 38124

George E. Tylutki
100% Cotton Software
P.O. Box 73

La Plume PA 18440

Pro/Tem Software
2363 Boulevard Circle
Walnut Creek CA 94595

If you or your resources should have more recent addresses, I would appreciate if you could supply them to me. Enquiries to those given above have been returned for no forwarding address or forwarding expired. My interest is in acquiring a software-distribution agreement.

Finally, you asked about sources for bootable CP/M disks. Of course, I can supply version 2.2.03 for the H-8 and H/Z-90. This would be a two-disk 5¼" soft-sector set; there are so many configurations permitted by Heath/Zenith's implementation that the least exotic, that is, SSDD 48 tpi, is the best way to go. If someone needs H/Z hard sector, I can also supply that to you as a three-disk set. These would include *all* utilities, including the BIOS source code, as distributed on my originals.

Sincerely,
Kirk L. Thompson
Editor, *The Staunch 8/89'er*
P.O. Box 548
West Branch IA 52358

It still looks like BASIC on first glance, Kirk, but looking more closely, I see the Pascal procedure structure, variable definitions, etc. Since there are also a few WRITE statements in the main procedure, I take it that PRINT is a Tiny Pascal statement for sending decimal ASCII characters to the terminal? At least that's what it's being used for.

I combined your two letters into one for clarity. I will write to you soon about getting the H-9 and H/Z-89/90 diskettes from you, and thanks. Maybe we can even work out some arrangement where I sublet orders for hard-sector disks to you.

February 26, 1992
Dear Mr. McGlone,

I have enclosed a disk in Kaypro 4 format that contains this letter, an article you may publish in *The Z-Letter* if you like, and a list of some commercial software that I want to sell.

I am afraid that SOUND POTENTIALS will be slipping into history some time in 1992. I plan to move soon, even to spend a period of time out of the United States, and so I will not be around to operate SOUND POTENTIALS copying service for CP/M public-domain software. You may run the ad for SOUND POTENTIALS in *The Z-Letter* up through June of this year, but please discontinue it after June. Many thanks for running it so many times for free. If anyone is interested in acquiring my collection of CP/M public-domain software in its entirety, please write. The collection totals about 20.5 megabytes of LBR files.

The article for *The Z-Letter* is a piece on installing ZCPR v3.3. I had some difficulty figuring out how to do this, and I thought the method I came up with for initializing the Z-System memory buffers and segments might be of interest to others.

I have a question regarding the use of a modem with the Kaypro that might interest other Kaypro users. I use a ZOOM model MX2400R modem with my Kaypro 4. It is a Hayes-compatible, 2400-bps modem. The problem I have had is that all of the public-domain modem programs I have tried – MDM740, IMP245, SMODEM53, ZMP14, MEX114, and QTERM43F – drop characters when receiving text from the modem and displaying to the screen at 2400 bps. I have to use an ancient commercial program, MITE, to do all my tele-computing. I do not like MITE very much, because it lacks the sophistication of programs like MEX and QTERM. I have also found MITE to hang the system occasionally. But MITE does not lose any characters. How come? I do not have the source code to MITE's overlay for the Kaypro, so I cannot compare it with those for the Public Domain modem programs. The Kaypro is capable of being programmed for interrupted I/O using the serial port and Z80 interrupt mode 2. I guess that interrupt-driven I/O for the serial port would be less likely to miss incoming characters than would a polling method like that used by most of the programs mentioned. I do not even know whether MITE is using an interrupt scheme. I did try to write

an interrupt-driven overlay to use with QTERM, but I could not get it to work. Interrupts are very tricky to implement. You have to know all the other interrupts that are in use on your system, and I don't know whether the Advent / Plu*Perfect Systems TurboROM uses interrupts to take input from the keyboard. I do not use the interrupt-driven option for disk drive de-selection under the TurboBIOS. Anyway, it's always been a mystery to me why MITE should work and all the other programs will not. At 300 bps, they all are able to receive without character loss. Some chars start to be missed at 1200 baud, and more at 2400. Does anyone have a suggestion?

I really appreciate *The Z-Letter*, especially the ads. One of the most important things to know if you are trying to keep an older computer running is where you can buy software, and even hardware for it. Keeping up on the recent developments for hardware and software for CP/M is not easy these days. I am very interested in YASBEC and the SBC280. I plan to one day build a high-power CP/M system and may very well use one of these boards or the SB180. I'll keep current by reading *The Z-Letter*.

Sincerely,
Richard E. Brewster
SOUND POTENTIALS
R.D. 1, Box 46
Brackney, PA 18812

FEBRUARY 1992 SOFTWARE SALE

This sale will end June, 1992. Do not send orders after June.

I have ONE copy of each commercial program listed here to sell, first come, first served, all sales final. Each package includes the original release diskette(s) plus the original printed manual(s). At your request I will supply one additional copy of the software on any 5 1/4" CP/M disk format of your choice (or IBM 360K format) for $5.00 additional charge per program package. Prices include shipping – some manuals are heavy. Send orders to me at the address above and include a **separate check or money order for each individual program**

package you order. That way I can just return your check for any program that has been sold already.

WordStar 3.3 (MicroPro International) Kaypro DSDD $30.00
Included are WordStar v3.3 with MailMerge, and The WORD PLUS spelling checker. Four large manuals too.

Printerizer and Hexprintr (C.I. Software) Kaypro SSDD $10.00
These two programs autoinstall to become an integral part of WordStar v2.26, v3.0, v3.3 to allow total control of Epson FX-80 compatible printers.

Express 2.0 (TCI) Kaypro DSDD $15.00
Express is a full screen editor for ASCII files. Advanced features include word wrap, block commands, system commands, macro key commands. Editing commands fully configurable.

Writer's Aide (Spite Software) Kaypro SSDD $10.00
Writer's Aide is a collection of word-processing utilities for transforming ASCII to WS files and vice versa, concatenating files, encrypting files, checking for matched control characters, word counting and word frequency, and line numbering.

ShadowPrint (Common Sense Systems) Kaypro SSDD $10.00
ShadowPrint is a background print spooler for CP/M.

Thoughtline 2.11 (Spite Software) Kaypro SSDD $15.00
Thoughtline is an outline processor that uses the WordStar command set. Terminal must support clear screen, position cursor, delete/insert line, clear to end of line.

BASIC-80 5.21 (MicroSoft) Kaypro DSDD $30.00
This is MBASIC for CP/M, the original full-featured disk BASIC interpreter. Comes with a set of GAME software.

CBASIC (Digital Research) and Microplan

(Chang Laboratories) Kaypro DSDD $30.00
CBASIC is a complete BASIC language compiler. Microplan is a spreadsheet program with financial formulas.

Mix C 1.0 (Mix Software) Kaypro SSDD $15.00
Mix C is a full K&R standard C compiler. The package includes a really great manual and tutorial for the C language. Mix C works on CP/M 2.2 or 3.0 (CP/M+).

Pascal 80 (New Classics Software) Kaypro SSDD $15.00
Pascal 80 by Phelps Gates and Richard Koch includes the in-memory editor/compiler program, plus a manual in loose leaf binder.

Personal Pearl 1.06 (PearlSoft) Osborne SSDD $20.00
Pearl is a menu-driven data-base program that is quite easy to use. Pearl can report information from multiple data bases.

Compat 3.2 (Mycroft Labs) Kaypro SSDD $15.00
Compat is a multiple-disk-format utility for use on the Kaypro model 4-84 only. It allows the Kaypro to format diskettes in foreign CP/M disk formats and to transfer files.

Xtrakey 2.1 (Xpert Software) Kaypro SSDD $15.00
Xtrakey is a keyboard redefinition program, i.e., a keyboard macro program, that is loaded with features. Included are a generic version for any CP/M computer, and an enhanced version for Kaypro 2/4/10 computers.

NFL Forecaster (100% Cotton Software) Kaypro SSDD $10.00
NFL Forecaster predicts football winners by using scores to rank teams. Also maintains team statistics, and makes various reports.

Richard, thanks for the kind words about The Z-Letter, and especially thanks for sending all this on disk, instead of making me retype it. That's really appreciated! There's no room this issue for the article, but it will be in the next issue (20).

I'll be sorry to see SOUND POTENTIALS go away

in June, and so will everyone else, if not now, then after June when they go looking for something no one else has. I regret that I'm out of work at the moment, otherwise I'd send you the money to get almost everything in your sale, except perhaps the NFL Forecaster and the WordStar. I also don't deal in CP/M public-domain software. Perhaps Ken Thomson will acquire your collection of public-domain CP/M software for the Eagle Computer Users Group. Drop us a line now and then, Richard, and let us know how and what you're doing.

Dear David:

I must disagree about where to put monitors. All the recommendations that I see say 15-20% below eye level! Just take a look at where you hold a book or newspaper when you read it. Do you hold it up vertically to eye level? No.

> Ben Cohen, Executive Editor
> *Law Office Technology Review*
> P.O. Box 1674
> Chicago IL 60690

You're right, Ben. I tried putting my new terminal up at eye level by adding my CD player to the stack, and immediately began getting neck strain. The comfortable position is, as you say, with the top of the screen a little below eye level, and slanting up towards me.

March 17, 1992

Dear Mr. McGlone:

Enclosed is a letter that we are distributing to our customers. I believe that Jeff mentioned to you on the phone our plans to discontinue sales and support of the Spellbinder products. I wanted to assure you that this current step will not affect our relationship with you. If you have any questions, please do not hesitate to contact us.

> Sincerely,
> Gayle Dyer

March 9, 1992

Dear Ltek Customer:

About four years ago, Ltek acquired the

Spellbinder product line. Lexisoft, the former owner, was going out of business and subsequently discontinuing sales and support. As a small software developer, we believed that the Spellbinder technology would enhance our existing software technology base. Because we believed in the products, we decided to continue selling the products and supporting the existing users.

As a small company we have battled increased competition, higher costs of doing business, and lack of resources. Although we do so with great regret, we must now discontinue our direct sales and support and focus our attention on our original goal, developing new software products.

The Next Step

Ltek will discontinue all direct sales of its products on April 6, 1992, and discontinue customer support on April 30, 1992. We will continue to develop our current products as well as develop new technologies. We are hoping to find publishers interested in Ltek Print and Spellbinder Word Processor. We believe that this step is in the best interest of our customers. Although we stand behind our products 100 percent, Ltek can not afford to market the products in the current highly competitive software marketplace.

If you are interested in purchasing Spellbinder Word Processor 6.1 or Ltek Print 1.01 for the HP LaserJet II before April 6th, you can contact us on our information request line (408-496-9554) or fax (415-948-1377).

Sincerely,
Gayle Dyer
General Manager

Ltek, Inc.
4546 B10 El Camino Real
Los Altos, CA 94022

Before everyone panics, realize that Lambda will continue to sell and support the CP/M version of Spellbinder. This announcement does not mean that you can't get Spellbinder for our machines. It means that PC users won't be able to get Spellbinder or Ltek

Print for their machines until and unless some company that sells and supports software contacts Ltek and becomes a distributor for those versions. I only print this letter here because some subscribers to The Z-Letter use PCs as well as CP/M machines, and use Spellbinder on their PCs. For instance, see the following letter.

Dear Dave,

You've helped me in the past, very generously, when I've been stuck with arcane Spellbinder problems. I've had a 14-year-long standing commitment to 8-bit machines in general, and CP/M (and its surrogates) in particular. So you may appreciate the significance with which I now decline to renew my subscription to *The Z-Letter*. But let me explain, since the contrasts involved in this decision may be useful to others.

I had *six* SOL-20 machines, possibly the largest collection extant in non-commercial hands. Two of these had been converted to Z80, 24x80 display, 6-12MHz clock speed, disk storage, and **lots** more. Two were semi-vanilla but disk-based, and the remaining two were totally plain vanilla (for old times' sake). All worked; two were always on line.

I loved those SOLs; knew them inside and out, had upgraded and repaired them, reveled in my independence from computer stores ... One of the Z80 conversions was my main machine. For very good reason: on every benchmark I could find, *it outperformed my seventh machine*, a Leading Edge IBM XT compatible, also always on line.

And software ... Boy! Did I have software! A 14-year collection of *all* the best commercial and public domain. Seven thousand disk files, 14 feet of binders full of code (mostly assembler, but also BASIC, FOCAL, Pilot, COBOL, ALGOL, Forth, C, etc., etc.). And the necessary books, journal clippings, et al., running to over 20 linear feet.

So why?

I was burned out in the October 20 Oakland fire. To the ground. Twenty minute warning

(no, not the cops. We providentially saw the smoke and flame only two blocks away). Got out with our skins, the clothes covering us, and our vital files. I had limited choices: the SOLs and associated disks and documentation (forget that; no time), or four small disk tubs with our critical records (all backup copies onto IBM-compatible disks). Right! We grabbed the IBM tubs.

Faced with all this, and needing super-rapid recovery from what most observers agree was a super-disaster, we bought an IBM clone (IBM disks, remember?) to assist us in recovery. It's no super machine, but it does do a badly needed job. We're not rich, so this is our machine, by default, for the present. The present looks like two years. Post fire, I've zero time for personal programming; and insurance doesn't cover everything. My wife and I were making do with computers at work, all IBM types. So choices of computers to buy were severely constrained.

Actually, I'd often dreamed of a Mac, maybe an Atari, who knows – a Next? I really don't like IBM. Repeat: I *really* don't like IBM! The reasons aren't germaine here.

Sadly, neither these nor any eight-bit machines are in my immediate future. The dice are cast, but I didn't throw them. Maybe, two or three years from now, I can return to the really fun, totally controllable 8-bit machines.

And *that* is why I'm not renewing.

Keep up the good work, fight the good fight. There *is* a future for 8-bit machines. That from one who *very* regretfully is leaving them – for a while.

<div align="center">

Sincerely,
William D. Loughman
</div>

P.S. But I still use Spellbinder, and wouldn't do with anything else (I've tried almost all the others)! A marvelous port to IBM is available from Ltek, Inc., 4546 B10 El Camino Real, Los Altos CA 94022.

P.P.S. If you haven't got Guaranteed Total

Replacement (HO-5) as a Homeowner/Rental insurance policy, **GET IT! NOW!** We had it; we're OK. Our neighbors didn't; they're not OK. 'Nuff said?

I've read this letter over and over, and I still don't understand the logic involved. Here is someone who really liked CP/M machines, and who had put considerable time and learning into them. So why did he spend a lot of money, after the fire, on a PC, PC software, etc., when he could have gotten another CP/M machine, CP/M software, and even a registered copy of 22DISK to run on one of the PCs at work? He's been a subscriber since the first issue, so he knows about 22DISK, and has the addresses of companies that sell CP/M software. So why? Why back up files from your CP/M machines onto PC format? And why let that lead to a PC, instead of admitting your mistake and copying them to the format of your replacement CP/M machine? I just don't get it.

<div align="right">

February 11, 1992
</div>

Yo dude:

Send me all the back issues of *The Z-Letter*, as discussed on the phone, plus the current one (and future ones obviously).

If you are interested in the CPU280 (or know other people who are), give me a call at (408) 335-4347 (home, 8 PM to midnight), (415) 926-2701 (work, 10 AM to 7 PM), or send mail to RALPH@SLACUM.SLAC.STANFORD.EDU.

I think the cost of the parts for the CPU280 will be about:

$56	Z280
$35	real time clock
$15	UART and RS232 driver
$40,80,160	for 1 Mb/2 Mb/4 Mb RAM
$19	floppy controller
$20	random TTLs
$30-40	sockets, connectors
$8	crystals (4)
$3	capacitors

$230, add 10% for screwups and incurable optimism, plus PC board (I guess about $100)

$350-$400

Ralph Becker-Szendy
6471 Ashley St.
Felton CA 95018

Ralph has moved here from Europe and is acclimating, if anything, too quickly. Dude, indeed! Thanks for the information on the CPU280, Ralph. The deal on back issues he mentions is one I've offered and several people have accepted. If you want all the back issues of The Z-Letter, *the cheapest and most convenient way to get them, for both me and you, is to send me a check for two years' subscription and specify that you want your subscription to start with issue 1. I will then send you all the back issues at once, plus future issues through issue 24.*

PERSONAL ADS

SB180 computer for sale

9-MHz Micromint SB180 board, 256K ram, SCSI card, cable, manuals, some disks of Z-System software. BEST OFFER. Contact Lloyd Hogan at (919) 335-1089.

Terminals for sale

VT-100 and VT-101 terminals, $45 each. TeleVideo TVI 910 terminals, $35 each. All verified in working condition. Shipping extra. Call Herb Johnson, (719) 578-0997.

Boot disks wanted!

I am a licensed CP/M distributor who will pay $5 for a copy of the boot disk for *your* computer. I wish to build a library of such 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. Send me a post card listing which makes and models of CP/M machines you have the system disks for, and I will send you $5 for each one I don't have already. David A.J. McGlone, (408) 293-5176, 720 South Second Street, San Jose CA 95112-5820.

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 a magazine is generally of interest to our community, its subscription address is listed, along with the U.S. subscription rate, whether there was a relevant article this issue or not.

The Computer Journal, #54, January/February 1992. *Ten Years of ZCPR,* by Jay Sage (ZCPR was first released 2 February 1982); *I/O Redirection in CP/M Plus,* by Bridger Mitchell; *ZCPR on a 16-Bit Intel Platform,* by Brian Moore; *Interrupts and the Z80,* by David Goodenough; *8 MHz on an Ampro,* by George Warner; *Dallas Smartwatch and Data Books,* by Paul Chidley; *The Development of TDOS,* by Guy Cousineau. You should subscribe to *TCJ.* See the ad elsewhere in this issue for subscription information.

Computer Monthly, January 1992. CM has a beginning computing column, called "Fearless Computing", by Nancy A. Black; emphasis is on the Commodore 64 and 128, with fairly regular discussion of CP/M on those computers. This month she talks about word processors, especially WordStar 4 for CP/M on the Commodore. Regular columns for Coleco Adam by Faye Deere, Commodore 64 and 128 by Gary A. Edwards, and TRS-80 by Dr. Michael W. Ecker are still present; these machines either run CP/M or can run CP/M in addition to a proprietary operating system of their own. Bulletin-board listings and ads are also of interest. $15.95 per year from Computer Monthly Subscriptions, P.O. 7062, Atlanta GA 30357-0062.

Eight Bits and Change! Volume 2, Number 3, February/March 1992. *Mandelbrot Update* by Chip Bradley and Larry Schnitger; yes, Virginia, you can do Mandelbrot calculations

and displays in CP/M. *The Hardhacker Chronicles: BLASTDOS.COM* is the first installment from new humor columnist Tom Veile. Lee Bradley reports on ZSIM, a PC program by Jurgen G. Weber; this is not a CP/M emulator, but a Z80 emulator. Lee got NZCOM running under ZSIM on a PC XT. Right now it only enables the PC to be used as a two-floppy system, but I'll be watching further developments with great interest. Give it access to the PC hard disk, or to a second hard disk formatted with CP/M directory structure, guys. A YASBEC update reports some of the things people have been doing with this new computer. Cam Cotrill has an unbanked boot disk available in either 3½" or 5¼" format. Other items: a patch for STAT, a new ZDB, KEYIN/KEYBIOS, windows for CP/M, and a new TCSELECT.

The Epson Lifeboat Volume VIII, Issue #4, February 1992. *"CPM" Floppy Drives* by Ted Temkin illustrates just how ignorant PC users are; the author "managed" to use the 48-tpi drive from a non-working Morrow computer as a 360K drive in a PC, and was amazed that the drive cables and screw holes were compatible. Along the way a friend of his, apparently an "expert," advised him that CP/M floppy drives wouldn't work in PCs. Since Ted is pretty smart and not afraid to try things, he succeeded at last in what should have been a trivial task that any experienced computer user can do. How soon (and how thoroughly) they do forget!

Humor articles in this *Lifeboat* include *The Tragedy of an Online Addiction* by Steve King, and a truly spine-chilling *Care of Diskettes and Drives* by Gail Hodgson. Whatever you do, don't do as she says! I'm sure it's humor, but it isn't labeled as such, and I'd never dare print it myself!

Other information: Hard disk tips for the QX-16 by Bill Lafitte (page 216), Geneva programs and custom ROMs (page 220), SemiDisk tips

from Bill Lafitte (page 222). Everything else in *Lifeboat,* as usual, was MS-DOS, with a tiny sprinkling of Valdocs. If you wish to subscribe anyway, it's $26/$40/$45 per year (for US, Canadian, and overseas addresses, respectively), National Epson Users' Group, Box 1076, Lemont PA 16851. But they're starting to talk about dropping their Epson affiliation and becoming the National PC Users' Group. You have been warned.

The Staunch 8/89'er #28, Jan-Feb 1992. Daniel N. Jerome has a big article on *Troubleshooting the '89: The H-89 Keyboard Module.* Another particularly interesting experiment is reported under *Attack of the Mutant Viruses.* Kirk Thompson deliberately ran some PC viruses on his H-89, confirming what we were always pretty certain of anyway, that they can do no damage on CP/M machines. Why? Well, the 80x86 opcodes are totally incompatible; that alone means that PC programs are meaningless to the 8080 and Zx80 CPUs in our machines. As further protection, the BIOS calls are completely different, the directory structure is completely different (unless you're using DosDisk), and (in at least some CP/M machines) the directory is located on a different track. Nice, though, to see someone confirm by experiment what we always believed.

As always, this issue of *Staunch* is full of news and contacts for owners of Heath/Zenith CP/M machines, with regular contributions by Kirk L. Thompson (the editor), Pete Shkabara, and Hank Lotz (the founder). See the ad elsewhere in this issue for *Staunch's* address. The subscription price is $15 per year.

Kirk has been a vigorous proponent of proprietary products being released to the public domain when the original authors no longer sell or support them. In this issue quite a bit of CP/M and HDOS software becomes available this way; the CP/M stuff is listed in his ad in this issue.

EAGLE COMPUTER USERS GROUP

The Eagle Computer Users Group is one of the few remaining support groups for users of Eagle computers, both the CP/M line and the later 1600 and PC models. Because Spellbinder was bundled with Eagle computers, ECUG is also a Spellbinder users group. Anyone who acquires an Eagle computer is urged to get in touch with ECUG by writing Lambda Software Publishing, 720 South Second Street, San Jose CA 95112-5820, or phone Morgan Thielmann and Associates, (408) 972-1965. Do not use the old P.O. box, which will soon expire and not be renewed.

Meeting place

ECUG no longer meets at Tandem Computers! I was the only Tandem employee in the club, and I've been laid off. Becky Deanda, when queried whether we could still meet at Tandem without a Tandem sponsor, said that even a Tandem sponsor is no longer enough; by her interpretation of Tandem policy, most of our members should be Tandem employees to use Tandem facilities.

Meetings are the second Saturday of every month, from 9 A.M. to Noon. The remaining 1992 meetings are April 11, May 9, June 13, July 11, August 8, September 12, October 10, November 14, and December 12.

If you need to find out where a meeting will be held, call David McGlone at (408) 293-5176, Jerry Davis at (408) 972-1965, or one of the software librarians listed below, no later than the evening before the meeting.

March 14 meeting

Our March meeting was the last one at Tandem Computers. Present were Dave Banoff, Dick Dethlefsen, Ken Thomson, Bob Kowerski, Bill Josephson, Jack Morse, Dave Honkala, Roy Johnson, and me. Ken brought his Eagle; I brought my SB180FX in its new case and with its new terminal, and the Kaypro "22" that Joe Wright gave me. These were shown off to those interested.

Dave Honkala and Roy Johnson came in late, and told everyone how Dave had picked up a Kaypro 10 for $25 (including disks and manuals) at the Foothill Flea Market. On learning that the Foothill Flea Market is back, Ken and I excused ourselves for about an hour and made a quick examination of those vendors who were still there despite the rain. I picked up an Eagle 1630, along with spare CPU box and keyboard and manuals, for the sake of its hard disk.

Where to meet in future was discussed. No other Tandem employee responded to my plea, and TeleVideo never replied. No one else present admitted to looking for a place, and the same possibilities that had been talked about at the February meeting were repeated, fruitlessly. Bill Josephson said we could meet in April at his place.

April 11 meeting

Our April meeting will be at the home of Bill Josephson, 1681 Samedra Street, Sunnyvale, California.

How to get there: Going west on Homestead Road, you come to Mary Avenue, which dead ends at the High School. Turn right. One short block farther on is Samedra Street. Bill's house is white; it's the third house on the left. If you get lost, you can call Bill at (408) 245-0318.

Our regular meeting hours (9 to Noon) will be observed. No program is scheduled, because the thing we most need at this point is to decide where we're meeting from now on. If Bill is willing and his place is large enough and convenient enough, perhaps it will be at Bill's place. Someone needs to take notes at the meeting, because I will be at Trenton that weekend.

NZCOM improves Eagle disk performance!

I noticed the other day that running NZCOM on an Eagle seems to improve the behavior of the disks! This unexpected result suggests an answer to a riddle that has puzzled the community of Eagle users for a long time.

The 96-tpi floppy-disk drives used in Eagles are notorious for the loud grinding noises they make when operating, and the slowness with which they copy files to disk. It was known that both of these symptoms were caused by a wrong disk-access time. We discovered this because the 96-tpi drives in my SB180FX system behaved the same way. On the SB180FX, however, the disk-access time can be changed easily (at least under XBIOS). When I reduced the disk-access time, at the suggestion of Joe Wright, George Warner, and Terry Hazen, the drives became very quiet and twice as fast.

Obviously, then, some such change would be very desirable on Eagles as well. The problem is, we've always had the source code for the Eagle BIOSes, and nowhere in them in the disk-access time set. Even when Bob Vinisky disassembled the actual operating system, we couldn't find any place where the disk-access time is set to a wrong value, so that we could change it and assemble a new system.

The improvement under NZCOM suggests that the disk-access time is not set in the Eagle BIOS at all! Recall that when you run MKZCM, it links your CP/M BIOS with ZRDOS and ZCPR. This means that the improved behavior is occurring in an operating system whose BIOS is the same as the one in the ordinary CP/M system. One hypothesis that would explain the behavior observed goes like this: Suppose that if the disk-access time is set in the BIOS, that is the value used; but if it isn't set, the DOS selects a default value instead. If the CP/M BDOS, which is older, selects a slow disk-access speed needed by the slow floppy-disk drives of yesteryear, but the much newer ZRDOS 1.9 selects a faster speed consistent with today's drives, the result would be exactly what we observe. Can any reader confirm that this is the way disk-access speed is selected under CP/M and compatible operating systems, or suggest another hypothesis consistent with the observations? If so, please write.

ECUG software libraries

ECUG has two software librarians. Anyone seeking CP/M or Z-System software should contact Ken Thomson, 71 Rosenkranz Street, San Francisco CA 94110, phone (415) 648-7550. For PC (MS-DOS) software, our librarian is Jack Morse, 7390 Rainbow Drive, #1, Cupertino CA 95014, phone (408) 252-6103.

When you request software from Ken or Jack, send them floppy disks, not money, and the postage to mail the disks. They will copy the software you request onto your disks and mail them back to you. That way no money changes hands, as would be the case if they continued to charge a fee per disk.

No software received since last issue.

Notes from Jerry's desk

The famous **FastPak Mail** system program for PCs was recently released and then recalled to clean up some program features. The new release is version 5.0. It has way more features and versatility than the early versions. One of the most impressive additions is the ability to print the postal bar code on your envelope or label. With bar codes on your envelopes delivery times are greatly reduced. Version 5.0 can also handle mail lists of any size. The recommended system configuration is 12 or 16 MHz or faster and color EGA/VGA.

Your **Post Office** has a new service for small business people that do regular mailings. This service will check and correct addresses in your mail list. You must provide the list on diskette in a ASCII format that they can use and they run your list against a current address list from CD ROM. The corrected list will also include the updated 9-digit ZIP. The best part of the service is it's *free*. Contact your local Post Office Small Business Services Department.

PM9109ZLT

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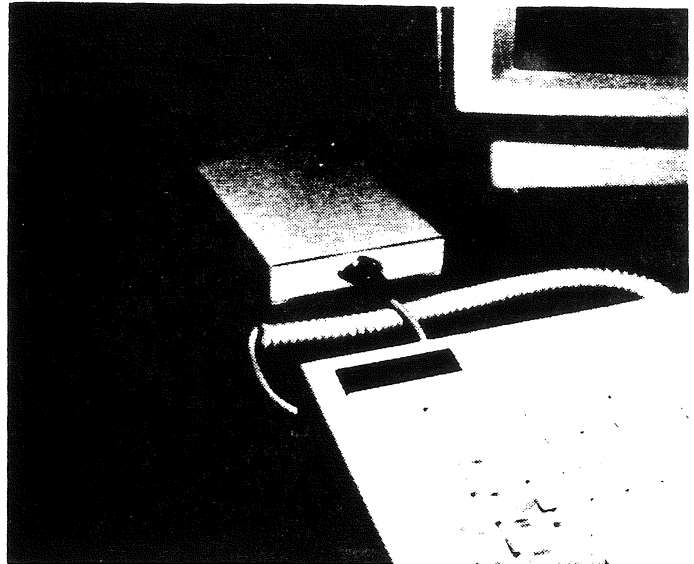|	
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DM-2 FOR XEROX 820
Cable ready to plug directly into Xerox 820 Keyboard connector
Bell. Reset-in. Reset-out. and Type Ahead Buffer options available with hardware jumpers on host PC board.

DM-3 FOR KAYPRO
Cable ready to plug directly into Kaypro's Keyboard connector
AC power adapter included.

DM-4 FOR FRANKLIN ACE 1000‡
Cable ready to plug directly into Franklin Ace 1000 Keyboard connector.
Reset-out. and Type Ahead Buffer.

DM-5 UNIVERSAL†
ASCII parallel or serial data is presented on a DB-25P connector
The KEYUP interface can be adapted to a variety of computers simply by constructing the proper cable.
Usable functions:
- **Reset-in** Host reset of KEYUP and keyboard.
- **Reset-out** KEYUP reset of host computer using (Alt-Cnt Del).
- **Bell** KEYUP bell driven by host computer.
- **Type Ahead Buffer** Requires ACK signal from host computer.
- **Serial Data** KEYUP can transfer serial data to host computer at 300. 1200. 4800. and 9600 baud. TTL signal level.

The above functions are activated in neg. or pos. TTL logic on the DB-25P connector.

DM-6 FOR APPLE II
Cable ready to plug directly into Apple II Keyboard connector
Reset-out.
Type Ahead Buffer options available with hardware jumpers on Apple II PC board.

Ampro Z80 Little Board/PLUS
by Davidge

FEATURES

Little Board/PLUS is a complete 8-bit, Z80-based single board microcomputer. It includes all the circuitry, software, and firmware necessary to construct a functional CP/M-based computer system. Some of the main features are:

- 4MHz Z80A 8-bit microprocessor
- 64K bytes dynamic RAM, 4K-32K EPROM
- Two spare counter/timer channels
- Floppy controller capable of controlling from one to four single- or double-sided, single- or double-density, 40- or 80-track mini or micro floppy drives.
- Two RS232C serial ports
- One Centronics printer port
- SCSI/PLUS multi-master I/O expansion bus:
  - SASI Disk/Tape controller compatible
  - ANSC X3T9.2 (SCSI) compatible
  - Multiple Little Board networking
  - Simple bi-directional I/O (17 lines)
- Mounts directly to a 5¼" disk drive
- Minimum external components
- Power connector and voltages compatible with 5¼" disk drive.

FUNCTIONAL DESCRIPTION

CPU, Memory and Timing
The heart of the Little Board/PLUS is a Z80A 8-bit microprocessor operating at 4 MHz. All system functions are based on a single 16 MHz master clock. System RESET is provided in two ways: upon power-up and via an external RESET switch.

Two types of memory are present: EPROM and RAM. A 28-pin EPROM socket provides from 4K to 32K bytes of firmware space. Jumpers are used to program the socket for a 2732, 2764, 27128, or 27256 type EPROM. The EPROM can be enabled and disabled by software.

System RAM consists of eight 64K x 1 bit dynamic RAM devices. Control circuitry for the RAM is entirely digital (no one-shots or R-C components) and provides a high degree of reliability.

A Z80 Counter Timer Circuit (CTC) provides four programmable counter or timer channels. Two of the CTC channels provide the baud rate used by the two serial I/O ports. The other two CTC channels are available for use as programmable timers in applications programs, for real-time clock functions, etc.

Serial Ports
A Z80 Serial Input/Output Controller (SIO/0) provides two fully programmable, asynchronous serial ports. Each channel has four of the standard RS-232C signals: TxD, RxD, RTS, and CTS. These signals are sufficient for interfacing most serial printers, modems and terminals.

In those cases where other signals are required for one of the serial ports, handshaking signals can be borrowed from the second port (if not needed by that port). Polarity and use of the handshaking signals is defined by the software.

Programmable baud rate clocks are supplied by the CTC for baud rates up to 9600 baud. Additional circuitry provides baud rates of 19.2K and 38.4K baud, for Port A only. Since the two serial ports are otherwise identical, either can be programmed as a terminal, modem, serial printer, or other RS-232C interface.

Parallel Printer Port
The parallel port provides the 10 essential signals of a Centronics-type printer interface: Data Bits 1-8, Data Strobe, and Busy. Both the Data Strobe (output) and Busy (input) handshake protocols are defined by software.

Floppy Disk Controller
A Western Digital 1772 floppy disk controller device provides all the functions required to interface with standard 5¼" "mini" - and most 3½" "micro" - floppy disk drives. The 1772 includes the following capabilities within a single LSI device:

- Digital phase locked loop
- Digital write precompensation
- Motor on start/stop delay
- Software controlled step rates

Timing for the floppy disk interface is derived directly from the 8 MHz system clock, without delay lines, R-C time constants, or one-shots. This again results in a very high degree of system reliability.

SCSI/PLUS Multi-Master Bus
A 50-pin "ribbon cable bus" interface which meets the specifications for the popular Small Computer System Interface (SCSI) - formerly called "SASI" - provides a general purpose multi-master I/O expansion bus. All SCSI Initiator and Target functions are fully supported, including bus arbitration and disconnect/reselect.

In addition, Little Board/PLUS supports the initiator function of AMPRO's innovative SCSI/PLUS extension to SCSI. This allows connection to up to 64 SCSI/PLUS Target devices, rather than the usual eight device limit of SCSI.

Applications include both direct and shared use of a wide variety of controllers and devices, as well as tightly coupled Little Board networks. For example, one or more Little Boards, a SCSI Winchester controller, and modules providing calendar/clock, serial port expansion, RAM disk, etc. might all coexist on the same SCSI/PLUS bus.

The 17 bidirectional I/O signals of the SCSI/PLUS interface may also be used as general purpose, software controlled digital I/O lines, without SCSI compatibility. In this case, the boards's 8-bit SCSI bus ID input register can serve as an additional 8 bit input port.

OEM PRICE LIST
AMPRO Z80 LITTLE BOARD
Manufactured under license by Davidge

HARDWARE

A60060-2	Ampro Series 1B Little Board Plus Computer	250.00
A60060-3	Ampro Little Board without SCSI	240.00
A60156	Project Board/80	75.00

SOFTWARE

A60101-1	CP/M and ZCPR3 (5¼", 40 track disks)	65.00
A60101-2	CP/M and ZCPR3 (5¼", 80 track disk)	65.00
A60101-3	CP/M and ZCPR3 (3½" disk)	75.00
A60103-1	CP/M, ZCPR3, BIOS Source (40 track disks)	100.00
A60103-2	CP/M, ZCPR3, BIOS Source (80 track disks)	100.00
A60103-3	CP/M, ZCPR3, BIOS Source (3½" disk)	110.00

LITERATURE

A74010	Little Board/Plus Technical Manual	15.00
A74025	Project Board/80 Technical Manual	10.00
A74006	Z80 System Software User's Manual	15.00
A74015	Z80 Hard Disk Software User's Manual	15.00
A74022	Z80 Hard Disk Backup Software Technical Manual	10.00
A74011	CP/M 2.2 Manual	15.00

REPAIR SERVICE

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When applications demand high-volume data storage, complex software, low power consumption, and compact size, they demand the best—**SB180**. Micromint's powerful **SB180** is the heart of hundreds of demanding applications, providing the programmable power and I/O flexibility to meet the most critical requirements.

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Technical Assistance
(203) 871-6170

Features

- 9.216-MHz HD64180 CPU (Z80 instruction superset), 256K RAM, 8K monitor ROM with device test, disk format, read/write
- Floppy controller (1–4 drives, single/double density, 1–2 sided, 40/80 track 3.5" and 5.25" drives)
- Measures 4" x 7.5", with mounting holes
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- Multiple disk formats supported
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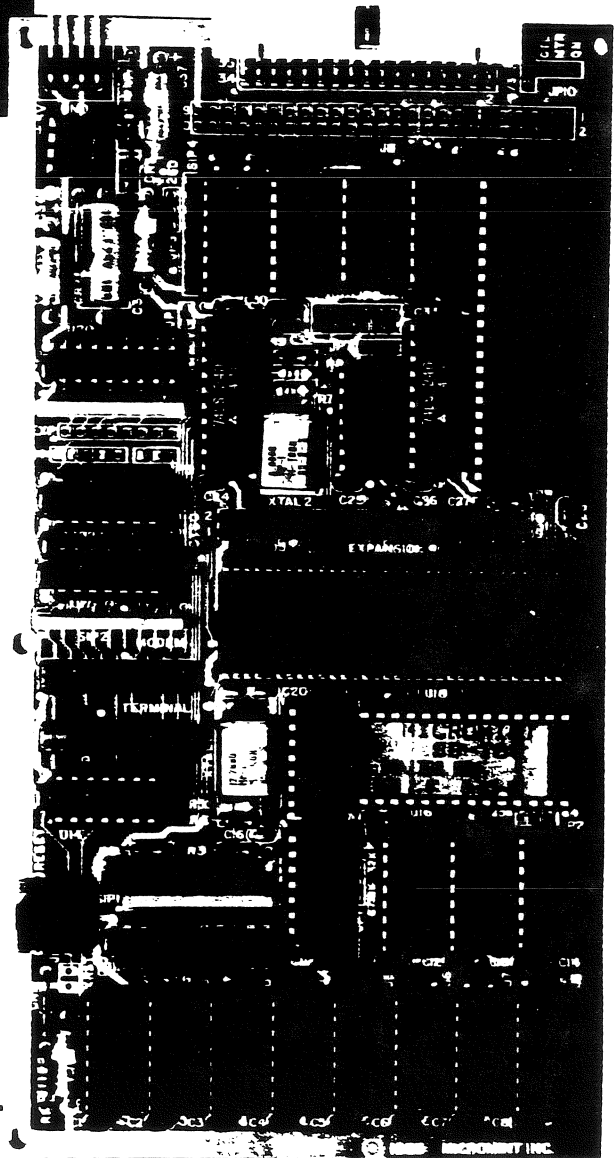
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SB180-1 — 9.216-MHz SB180 w/256K bytes RAM and ROM monitor	$299.00	$195.00
SB180-1-20 — Same as above w/ZCPR3, ZRDOS, BIOS and ROM sources	$399.00	

SB180LO
Single-Board Computer

Micromint, Inc.
4 Park Street
Vernon, CT 06066

If your embedded control applications call for maximum capabilities from a controller, look to the **SB180LO** to power your solutions. Based on the rock-solid SB180, the **SB180LO** adds up to 4 Mbytes of RAM, more parallel ports, and an industry-standard SCSI port for hard disk or high-performance peripheral expansion.

For maximum programmability, flexibility, and reliability, the field-proven **SB180LO** is your most powerful choice in single-board applications engines.

Technical Specifications

Processor
- Hitachi HD64180, an 8-bit CPU in a 68-pin PLCC package
- Superset of Z80 instruction set, including hardware multiply
- Integrated Memory Management Unit
- Dynamic RAM refresh
- Wait state generator
- Clocked serial I/O port
- 2-channel Direct Memory Access Controller
- 2-channel Asynchronous Serial Communication
- 2-channel 16-bit Programmable Reload Timer
- 12 interrupts
- Dual bus interface to 68xx and 80xx support chips
- 9.216-MHz system operation

Memory
- 256K bytes dynamic RAM on board
- Memory externally expandable to 4 Mbytes RAM
- Either an 8K 2764, 16K 27128, or 32K 27256 EPROM usable
- Full-function 9K ROM-resident monitor

Input/Output
- Console RS-232 serial port with auto data rate select to 38,400 bps
- Peripheral RS-232 serial port, full handshaking, 150–38,400 bps
- Line printer parallel I/O port
- 24 bits bidirectional parallel I/O
- 19-bit address decoding, I/O port decoding, and dual bus interface brought out to expansion bus connector
- Can be directly attached to GT180 640 x 480 color graphics adapter
- Fully implemented SCSI hard disk and communications bus interface

Floppy/Hard Disk Interface
- Uses Standard Microsystems 9266 disk controller
- Compatible with NEC 765A controller
- On-chip digital data separator
- Can control 3.5" and 5.25" floppy disk drives
- Handles both FM-encoded (single-density) and MFM-encoded (double-density) data
- NCR 53C80 SCSI bus controller for hard disk or network communication (optional)

	Single Qty.	100 Qty.
SB180LO-1 — 9.216-MHz board populated w/256K bytes RAM, 9K byte ROM monitor, without SCSI chip	$400.00	$320.00
SB180LO-1-30 — Same as above with Z-System software including ZRDOS, ZCPR3, editor, utilities, ZAS assembler, ZDM debugger, BIOS and ROM monitor sources, and BIOS for SCSI hard disk. Supplied on five 5.25" SB180-format DSDD disks	$490.00	
SB180FXMME — 2 Meg. memory expansion board populated with 256K	$319.00	

386-33Mhz Tower system w/128k cache & 1024 x 768 SVGA $1995.00

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- 8 expansion slots
- 2 Serial/ 1 Parallel ports
- DR-DOS 6.0
- 1meg SVGA adapter

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- 120 MB, 17ms hard disk drive
- 1.2 MB & 1.44MB floppy disks
- 101 key enhanced keyboard
- 14" SVGA 1024 x 768, .28 (M-V4E)

486-33Mhz Tower system w/64k cache & 1024 x 768 SVGA $2495.00

- 4 Meg memory
- 8 expansion slots
- 2 Serial/ 1 Parallel ports
- DR-DOS 6.0
- 1meg SVGA adapter

- IDE HDD/FDD controller
- 120 MB, 17ms hard disk drive
- 1.2 MB & 1.44MB floppy disks
- 101 key enhanced keyboard
- 14" SVGA 1024 x 768, .28 (M-V4E)

486-33Mhz Tower system w/64k cache & 1024 x 768 SVGA ultra $3345.00

- 8 Meg memory
- 8 expansion slots
- 2 Serial/ 1 Parallel ports
- DR-DOS 6.0
- 1meg SVGA adapter (1280°)

- IDE HDD/FDD controller
- 212 MB, 15ms hard disk drive
- 1.2 MB & 1.44MB floppy disks
- 101 key enhanced keyboard
- 14" SVGA 1024 x 768, .25 (M-V5+)

Add $170.00 for **NEC 3FGx**, 15", flat screen, 1024x768, .28 pitch, Low Emissions monitor in place of the (M-V5+).

————————————386/486 Special Notes————

The 486 above have Made in USA main boards.

The 486 has 8k of internal cache and its own cache controller plus a math co-processor built-in. The 486 handles 32 bit software 45% faster than the 386. 32 bit operating systems are represented in Novel NetWare 3.11, Windows NT, OS/2 ver 2.0, Solaris, SCO UNIX, and others will be coming available in the future.

————————————Warranty————

The 386-33 comes with a 1 year warranty on all parts.

The 486-33 has a 24 month warranty on the main board and a 1 year warranty on the rest of the system.

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- ZSUS: Z-System Software Update Service, public-domain software distribution service (write for a flyer with full information)

- Plu*Perfect Systems

    - Backgrounder ii: CP/M-2.2 multitasker (now only $49)
    - ZSDOS/ZDDOS: date-stamping DOS ($75, $60 for ZRDOS owners, $10 for Programmer's Manual)
    - DosDisk: MS-DOS disk-format emulator, supports subdirectories and date stamps ($30 standard, $35 XBIOS BSX, $45 kit)
    - JetFind: super fast, extemely flexible regular-expression text file scanner (now only $25)

- ZMATE: macro text editor and customizable wordprocessor ($50)

- BDS C — complete pkg including special Z-System version (now only $60)

- Turbo Pascal — with new loose-leaf manual ($60)

- ZMAC — Al Hawley's Z-System macro assembler with linker and librarian ($50 with documentation on disk, $70 with printed manual)

- SLR Systems (The Ultimate Assembly Language Tools)

    - Z80 assemblers using Zilog (Z80ASM), Hitachi (SLR180), or Intel (SLRMAC) mnemonics, and general-purpose linker SLRNK
    - TPA-based ($50 *each* tool) or virtual-memory ($160 *each* tool)

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CP/M Wordprocessing Disk: $15: ZDE (Z System Display Editor,) installation
program, documentation files, key compiler, help files. Hardcopy of a
simplified manual on how to use this WordStar compatible full screen
editor. Indexing utility. Spell Checker.

Printer Specialty Disk: $15: Contains BRADFORD, MXPLOT, GOTHIC, RLEPRT and
more. Most programs require Epson compatible dot matrix printer with dot
graphics.

Time Manager Disk: $15: Contains classic HANDYSYS, the CP/M answer to
"Sidekick." To Do Notepad, Calendar, Phone List, Appointments and more.

SIL Compiler Disk: $15: Contains a powerful subset of the C programming
language. Compiler, documentation, assembler, linker, sample programs. CP/M
hooks. Discussed in back issue of Eight Bits And Change.

NPS Cobol Compiler Disk: $15: Contains compiler, runtime system,
documentation, sample programs.

Mailing List Disk: $15: ZDB (Z System Database.) NOTE: Requires Z System.
Fast, easy to use. Generates mailing labels. Keeps track of clients.
Generates selective listings and more. Understands time if ZSDOS installed.
See Z System below.

Spreadsheet Disk: $15: MC (MicroCalc.) Minimal, one sheet spreadsheet, but
adequate for monthly records for small business.

Telecommunications Hardware/Software Package

New, 1200 baud Hayes compatible modem, cable, software and easy to
understand hardcopy User's Guide on how to call BBS's, RCP/M's, Z Nodes,
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and text. Cost: $90. A computer without a modem is like a home without a phone.

Eight Bits And Change

A bi–monthly computer and humor 'zine (which, we trust, you are, at this
very moment, enjoying ...) Cost: $15 per year ($18 Canada, $21 foreign.)
Contains technical articles on CP/M and Z System, humor pieces, graphics, 8
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Office Master 2000 letter quality printer with manual, cable. Almost new.
In perfect working condition. 35 cps. Letter quality. Daisy wheel. Cost:
$150 plus shipping. Call.

Single drive (300k) Royal alphaTronic computer, monitor, manual, cables and
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Disk. Cost $200 plus shipping. Starter/Sampler Disk alone costs $15.

Kaypro II. 3 drives. Many extras. Software. Call for details. $275 plus
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Epson RX–80 FT Dot Matrix Printer. Call for details. $225 plus shipping.

Z System

Small Computer Support is a Z System distributor. Z System is an extremely
powerful CP/M replacement. NZCOM (for CP/M 2.2 machines) and Z3PLUS (for
CP/M 3.0 machines) costs $75. You get manual, disks. Easy to install. Join
the community of Z System users. In our (admittedly biased) opinion, it's
the best operating system ever written. ZSDOS, BDS Z, ZMAC also available.
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Small Computer Support will teach you how to use your CP/M computer. Over
the phone, at our office. $15 per hour. You might be surprised by what your
"obsolete" CP/M computer can do! Give us a call!

Contract Programming

Have a computer program you need written? Call with the specifics and we'll
see what we can do for you.

CATALOG-MASTER (by GCPI) $6
CATALOG-MASTER is a utility for creating and maintaining a master file directory for multiple disk volumes. Any type of disk volume can be processed. The program provides: its own file description editor, master file directories with file selection options and sorting, merging of previously created description files into the master catalog output, and output can be directed to screen, printer, or disk file. The package requires 64K. Three terminal configuration files are supplied: Epson QX, Heath H-19, and Kaypro. However, these files may be edited with a text editor for custom use with other systems; instructions are included.

FOOTBALL (by Thomas Llanso) $6
FOOTBALL is a fast-action game of skill for one or two players and challenges your skill against a computer-controlled defense. This game allows runs, passes, or punts and even field goals! It has nine skill levels. The game requires a 80x24 terminal with direct cursor addressing, 48K, and comes configured for the Heath H-19 terminal. However, BASIC-80 source code is included with the compiled game, so you may customize it to your hardware.

FOOTBALL PICKS (by John S. Mays) $6
FOOTBALL PICKS allows the user to make predictions for office pools, etc. This package uses information easily found in most daily newspapers, and, unlike some other prediction programs, does not require the user to predict each and every game of the entire season in order to keep the database current and the predictions viable. The program requires one disk drive and 48K.*

INVESTMENT-MASTER (By David J. Powers) $6
INVESTMENT-MASTER is a program used for lump sum and annuity investment calculations. It is able to solve for any unknown investment parameter. The program can handle both a deposit or withdrawal annuity and provides an investment summary which lists all the input and calculated parameters for the investment. Investment summaries can be output to screen, printer, or disk file. It requires 48K, one disk drive, and an 80x24 display terminal with direct cursor addressing.*

LOAN-MASTER (By David J. Powers) $6
LOAN-MASTER is a program used to generate amortization schedules for any type of fixed-rate loan. The program is able to solve for any unknown loan parameter by using sophisticated iteration techniques. Zero-interest loans and "balloon" contracts can also be handled. LOAN-MASTER can output either a periodic or annual amortization schedule. Schedules and loan

summaries can be output to screen, printer, or disk file. LOAN-MASTER requires: 48K, one disk drive, and an 80x24 display terminal with direct cursor addressing.*

FORMS-LIB for BASIC or Pascal (By David Powers) $6
FORMS-LIB is a set of high-level source routines which can be included with your application program to control the input of information from your display screen. FORMS-LIB libraries require the following system software and language support: a text editor or the included Forms EDitor (FED) to create the data entry screen forms used by FORMS-LIB and either Borland's TURBO PASCAL or Microsoft's BASIC-80 interpreter or compiler. The FED program requires: 48K, one disk drive, and an 80x24 display terminal with direct cursor addressing. It comes configured for the Heath/Zenith H-19 terminal. However, the terminal parameter file is ASCII, so may be edited for your system. The BASIC and Pascal versions of this package are **separate** products.

STOCK-MASTER (By GCPI) $6
STOCK-MASTER is a stock market investment aid which is especially useful for the management of stocks and mutual funds. The program provides for: checking the status of any active stock fund, adding a buy/sell transaction to any stock fund, or obtaining a listing of the transaction log for any fund. Transaction log listings may be directed to console, line printer, or a disk file. The program requires: 48K RAM and a printer. This package includes compiled versions for Heath and Epson QX-10 systems **with** MBASIC source code and compiled versions (only) for ASCII, Kaypro, and Televideo terminals.

TCOUNT/TPRINT (By U-WARE) $6
TPRINT is a text file printing program which allows selected portions to be listed and provides for multiple copies and single-sheet feeding. TCOUNT is a text file summary statistics program providing character, word, line, and page counts. TPRINT and TCOUNT require 32K of RAM. TPRINT will work with any printer.

* **Note:** A terminal installation program for these packages supports the following models: ADDS 25, ADM-20 and -31, Beehive 150, DEC VT-52/Heath H-19, Epson QX-10, Hazeltine 1500, IBM-PC/TI-PROF, Kaypro II/4/10, Xerox 820, Osborne 1, Televideo 912/920, and Zenith Z-100. If you have another make, you will have to manually install terminal codes and data-entry functions with TCONFIG.
   Prices include first class shipping in the continental U.S. Supported disk formats are Heath/-Zenith soft-sector (H-37) and 10-hard-sector (H-17); most 40-track, single- or double-sided, soft-sector CP/M (such as AMPRO, Cromemco, Kaypro, Osborne, or Xerox); and PC-XT.