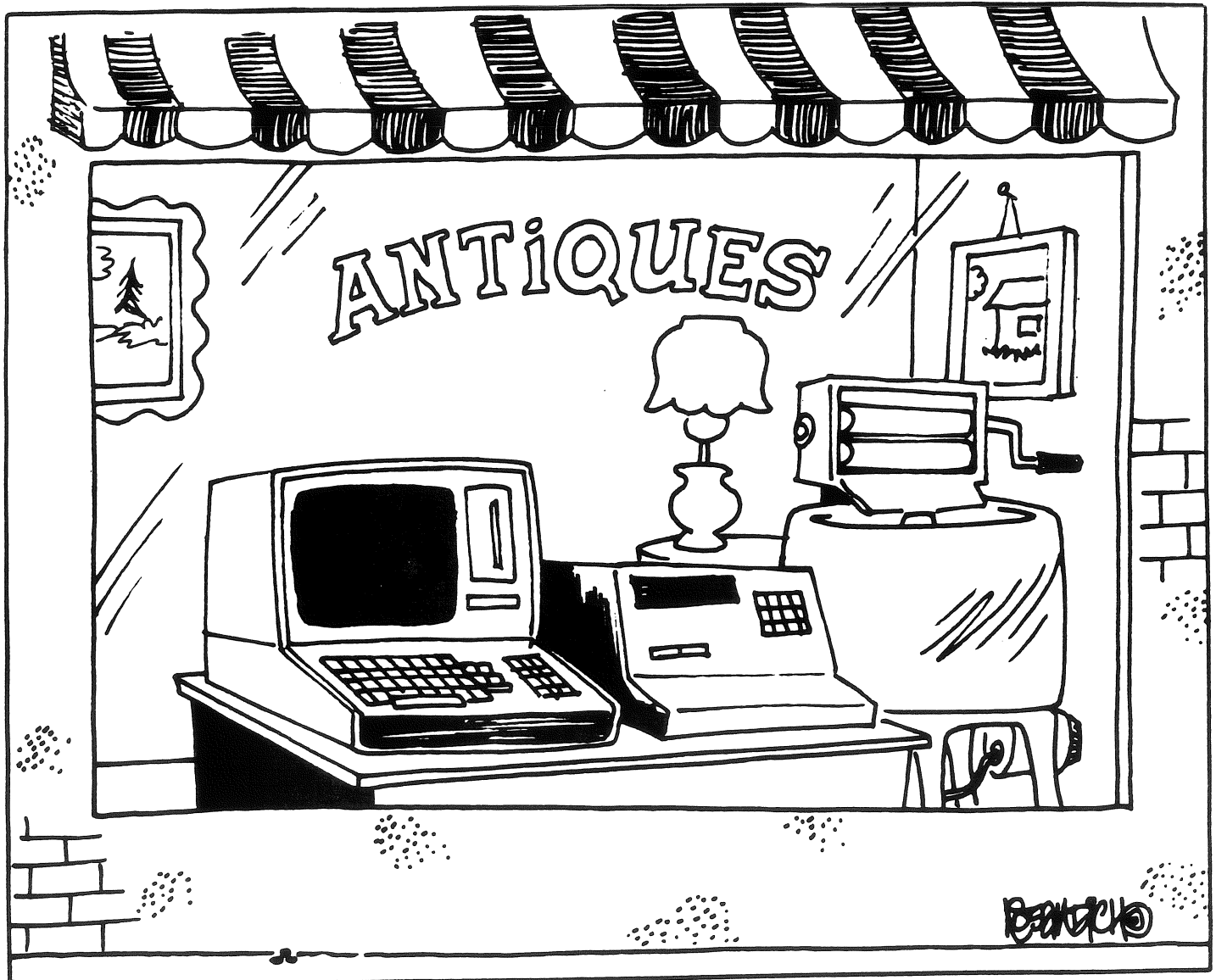


# The Z-Letter

Number 9

February 1991



The H89 and Its Kin, by Lee Hart

Two Alternatives to 96-tpi Drives, by Jerry Davis

Script of the Month by Jay Sage

Conclusion of the Eagle IVx2

# TABLE OF CONTENTS

## ABOUT THIS NEWSLETTER

Submitting material for publication .....	3
Letter policy .....	3
Subscriptions .....	3
How to read your mailing label .....	3
Advertisements .....	3
Trademarks .....	3
Index available .....	3

## THE STATE OF THE ART *News of our community*

Next two BUSCON dates .....	5
Lambda to offer MagicSeries .....	5
KaftorWare drops CP/M software .....	5
Postal-rate increase changes prices .....	5
Local computer stores carry <i>The Z-Letter</i> .....	5
Free subscriptions .....	5

## Two Alternatives to 96-tpi Drives

<i>by Jerry Davis (Morgan, Thielmann &amp; Associates)</i> .....	6
--	---

## COMPUTER CURRENTS: The H89 and Its Kin

<i>by Lee Hart (TMSI)</i> .....	8
---------------------------------	---

## SCRIPT OF THE MONTH CLUB

<i>by Jay Sage</i> .....	17
--------------------------	----

LETTERS .....	18
---------------	----

PERSONAL ADS .....	22
--------------------	----

MAGAZINE ARTICLES .....	23
-------------------------	----

## EAGLE COMPUTER USERS GROUP

Meeting place .....	24
March 9 meeting .....	26
ECUG library .....	26
ECUG software libraries .....	26
The Eagle IVx2, an experiment in hardware (Conclusion) .....	27

Z-SYSTEM USERS GROUP .....	31
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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 © 1991 by the editor: David A.J. McGlone, Lambda Software Publishing, 720 S. Second Street, San Jose, California 95112, 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: 12*. 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.

### Advertisements

There is no charge for either business or personal ads. Business ads are carried as a public service to the community. If you sell a product or provide a service to the community, please send us ad copy, either camera-ready or on disk. If you stop doing business in our community, please let us know so that we can drop your ad. Readers who find a product or service unsatisfactory, or discover that a vendor has gone out of business, are requested to inform us.

Subscribers may place personal ads at any time. Each ad will be run three times automatically. If the ad doesn't achieve its end in that time, it can be reinstated after a lapse of one issue. If the ad succeeds before it has run three times, please inform us so we can drop it at once.

### Trademarks

All trademarks used herein are acknowledged to be the property of their owners.

### Index available

*The Z-Letter* is indexed annually. The index for issues 1-5 appeared in issue 5. The index for issues 6-8 will be done Real Soon Now.

## Lambda Software Publishing

720 South Second Street, San Jose, CA 95112, phone (408) 293-5176

Products for sale, February 1991

- 1. Spellbinder** Version 53H \$60  
 The Rolls Royce of word processors. This includes the software, the User's Guide which always came with the software, the Technical Manual and Macro Manual (which always cost extra), and a new Introduction. All four manuals come a 2" binder in 8½ X 11" format. Both generic and Eagle versions are available. (Ltek)
- 2. CP/M** Version 2.2 \$15  
 Bought the hardware, and don't have the operating system? I can sell you the license and the manuals, making the copy you get from your user group legal. For many brands of computers, I can even send you the actual operating system with the BIOS for your machine. (DRI)
- 3. Various computer manuals** Each \$15  
 Complete manuals now available for: Eagle CP/M, Eagle 1600, Eagle PC Plus and Spirit, Otrona Attache, and Pied Piper.
- 4. 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.
- 5. The Z-Letter (back issues)** \$2 per issue  
 Past issues of our newsletter for the CP/M and Z-System world.
- 6. The Z-Letter (subscription)** \$15/year (US), \$18/year (Canada & Mexico), \$45/year (all other)  
 Published monthly.
- 7. Z-Fonts catalog** \$2  
 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.
- 8. Z-Fonts** \$2 per font plus \$2 per disk  
 Once you've perused our catalog, you can order the fonts you want very cheaply.

*Please circle each item desired, and write the quantity desired in the margin next to the listing for the item. For item 5, list which issues you want. For item 8, use the order form from a copy of the catalogue.*

Name:

Company:

Address:

City, State, Zip:

Home Phone (    )

Business Phone (    )

Computer format in which software should be supplied:

Total money enclosed:

## THE STATE OF THE ART

### Next two BUSCON dates

Information promised by various vendors at BUSCON/91-WEST is still trickling in, so the report on the convention will be in our next issue. Meanwhile, here are the dates and locations of the next two:

BUSCON/91-EAST, September 11-13, 1991, Omni Shoreham Hotel, Washington DC.

BUSCON/92-WEST, February 4-6, 1992, Long Beach Convention Center, Long Beach CA.

For more information on these events, write to Conference Management Corp., 200 Connecticut Avenue, Norwalk CT 06856, phone (203) 852-0500.

### Lambda to offer MagicSeries

Bill Roch of Elliam Associates has been offering the MagicSeries, the print formatter and laser-control software used to produce this and many other newsletters, at list. Computer EdiType Systems, the owner and author of the MagicSeries, sells single copies of MagicPrint for \$150, MagicBind (which includes MagicPrint) for \$195, and MagicIndex (which includes MagicPrint and MagicBind) for \$245. CES charges the same price for all versions of MagicSeries, including the MS-DOS versions.

I learned that Elliam was dropping MagicSeries from its catalog when I began negotiating with CES about adding it to my catalog. Lambda will be offering MagicSeries in four versions: CP/M-Spellbinder-Diablo, CP/M-Spellbinder-LaserJet, CP/M-WordStar-Diablo, and CP/M-WordStar-LaserJet.

Details are not yet final. We may end up carrying MagicPrint, MagicBind, and MagicIndex for those combinations of operating system, word processor, and printer, or just the entire MagicSeries. If the former, the proposed price for MagicPrint will be \$60, MagicBind \$80, and MagicIndex \$100, with the charge of \$35 to get MagicBind if you already have MagicPrint, or MagicIndex if you already have MagicBind.

If the latter, the price for the whole package will probably be \$100.

### KaftorWare drops CP/M software

Ben Cohen (KaftorWare Associates) no longer sells CP/M software. PC-File 80, KaftorWare's data-base manager, remains available through Elliam (see the ad in this issue).

### Postal-rate increase changes prices

U.S. postage increased this month. As most of our products' prices are set just a little over the cost of royalties and postage, this forces an increase on us. Computer manuals will be \$15 instead of \$10.

A years' subscription to *The Z-Letter* will be \$15 to U.S. addresses, \$18 in Canada or Mexico, and \$45 for all other countries. The good news is that Canadian and Mexican subscribers will pay \$6 less in future. Unfortunately, those in Germany, Australia, etc., are really getting clobbered. I wish I had an alternative.

As long as prices are changing anyway, this seems a good time to *reduce* the price on Spellbinder, which is not selling as well as it should, given its excellence and all the manuals being included with it. Spellbinder will henceforth be \$60. Expect no further reductions in that price.

### Local computer stores carry *The Z-Letter*

Computer Literacy bookstore, 2590 North First Street, San Jose, has agreed to display *The Z-Letter* in a rack near the front door. These copies will be free, to introduce *The Z-Letter* to people who might otherwise never hear of it.

Weird Stuff, a local computer-surplus store, also carries *The Z-Letter* for free distribution.

### Free subscriptions

If you publish the newsletter of a local CP/M user group, you can get *The Z-Letter* free. Simply send me every issue of your newsletter

from now on, with a cover letter on the first one telling me that you are willing to exchange newsletters. I will be more than happy to reciprocate. Sending me a copy of every back issue you have on hand would be a nice gesture, too. I would be glad to pay the postage for such a package.

### Watch this space!

I am not going to offer excuses for the lateness of this issue. Anything you don't see here that you expected, will be in our March issue, out in two or three weeks.

## TWO ALTERNATIVES TO 96-TPI DRIVES

by Jerry Davis  
Morgan, Thielmann & Associates

Most CP/M computers used 48-tpi 5¼" floppy drives, also known as 40-track drives. These computers are almost all orphans, and were never the most popular models, despite their great disk capacity (784K each, or 3/4 of a megabyte, on the double-sided double-density 96-tpi drives used in an Eagle III, for instance). To make matters worse, early PCs also used 48-tpi floppy drives. Today, finding 96-tpi drives is very difficult. Fortunately, there are alternatives.

### Substituting a high-density drive

It is now possible to replace or upgrade from the older full-height floppy drives to a new, readily available, half-height floppy drive. Here's what's needed and how it's done.

**Parts:** A Samsung model #SFD-560k half-height floppy drive, possibly better known as an IBM AT-style floppy drive. This drive was selected from several other brands primarily because of how easily its jumpers can be reconfigured, and its relatively low cost.

**Jumper changes:** Most of the jumpers on the drive will be left as they were set at the factory. A few will be changed, depending on whether you want to use the drive as drive A or drive B. For the jumper names in the following, refer to the manual that you get with the drive.

For drive A, (1) move DS1 to DS0, (2) move MA to MB, (3) move AT to XT. For drive B, (1) leave DS1 alone (factory configuration), (2) move MA to MB, (3) move AT to XT. In both cases, leave all other jumpers alone.

**Diskettes:** We tested different brands and types of diskettes on several different brands of this new floppy drive for the Eagle IIE series of computers. The high-density (AT-type) diskettes did not perform properly and are *not* recommended for the new style drives, even though they are the only diskettes that should be used in an IBM AT-type computer system. We found that a *good quality* DSDD 48-tpi diskettes performed the best. The brand of disk that turned out the best results during the testing was the Maxell MD2-d. Fuji, Verbatim, and Dysan disks also did well; 3M diskettes did very badly. Please keep in mind that these drives are formatting the disks for twice their stated capacity. Backups are recommended.

### Substituting a 3½" drive

3½" floppy drives can also be substituted for 96-tpi drives. These drives come in two kinds. The older 3½" drives format at 720K on a PC; these drives will act in an Eagle or other CP/M machine with a 96-tpi drive just like a 96-tpi drive. The actual diskette used will be 3½" instead of 5¼", but the machine won't care, as long as it has the right hardware (floppy drive) it will treat a 3½" diskette in a 3½" drive the same as it would a 5¼" diskette in a 5¼" drive.

Newer 3½" drives can write either the 720K format of the older drives, or a larger 144 Mb format of their own. CP/M machines with 96-tpi formats will not be able to use this format, chiefly because the drives spin at a faster rate (but machines with 8" formats can substitute these drives for the 8" drives, which also spin at the faster rate).

# Socrates

Z - N O D E 3 2

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modem: (201) 754-9067 24 hours daily

*Serving Today's CP/M and ZCPR Users*

*With the best in 8-bit computing*

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## CP/M Support

You have been told that CP/M is dead. Don't you believe it. To paraphrase a famous quote, reports of our demise are premature. We haven't died; we have transformed!

Since the earliest days, CP/M has attracted the best in programming talent. Some sold their work commercially but many more donated their efforts to the public domain. Today, most commercial programmers have moved on. But the others remain, as active as ever. This presents you with an interesting dilemma: Most of the new programs are free or nearly so, but stores won't carry them! How can you get support?

There are four avenues of support for today's CP/M user:

- Remote Access Systems (BBS's)
- User Groups
- Mail Order Companies
- Magazines and Newsletters

### REMOTE ACCESS SYSTEMS

Remote Access Systems (RAS or sometimes called Bulletin Boards), are computers set to automatically answer the telephone. You can send and receive messages, programs and files on a RAS. You need a modem and a communications program.

There are literally hundreds of systems that support CP/M. Most are free to the caller. *Socrates Z-Node 32* is such a system. Some of the most active are listed at the end of this paper. Find one that appeals to you and call. You should be able to find the North American listing of remote CP/M systems on any of these. Ask the sysop if you need help.

One problem with getting support by modem is the cost of the calls. Galaxy Starlink offers an "after hours" service through Tymnet that allows you to make modem calls to some 200 cities for as little as \$1.50 per hour plus \$10.00 per month. Call 1-505-881-6988 for more information.

### USER GROUPS

User groups are excellent sources of help. A comprehensive list of groups is printed in the back of *The Computer Shopper* each month. Groups vary considerably based on their size and the relative experience of their members, so check out the group before you join. Since a group is only as good as its members, you should plan to take on some responsibilities. You will find your efforts amply repaid.

### MAIL ORDER COMPANIES

There are many companies that continue to specialize in CP/M. *Chicago's First Osborne Group* publishes a file named CPMSRC-I.LZT which lists most such firms. You can get this list from your user group or on a RAS. Or write to CFUG at Box 1678, Chicago IL 60690. Enclose a couple dollars to pay expenses.

Special mention should be made of the *Z-System Software Update Service*. Users of ZCPR can subscribe for regular updates of the best Z-System programs. Special editions are also available. For example, there is a collection of some 360 command files in a set of six disks for just \$36, or over a full megabyte of help files for \$20. Send \$2 to *Sage Microsystems East*, 1435 Centre Street, Newton Centre MA 02159-2469 to receive a catalog disk. Be sure to tell them what format you have!

In sum, CP/M computers with 96-tpi formats may use either the older 3½" drives, which are only capable of the smaller format, or the newer drives, which can write either format. However, when substituting for a 96-tpi 5¼" drive, only the smaller format may be used, no matter what model of drive. If you buy the newer 3½" diskettes which can be used for either format, be sure to set the diskette to the smaller format. These diskettes, besides having a window in the case for write-protection, also have one for format selection.

### Replacing the old drives

The quickest way to replace an old full-height floppy drive with a half-height floppy drive is to remove the old full-height drive and install the new drive using the original mounting holes left by the old drive.

For those folks who want two half-height drives in one full-height slot, the recommended installation is to have both drives in the bottom of the drive cage. New mounting holes will have to be drilled in the sides of the cage to secure the new drives properly. The other reason to mount two half-height drives in the lower portion of the drive cage is to make sure that the I/O and power cables will reach both drives.

Anyone who wants to purchase these drives already configured and ready to install can purchase them from Morgan, Thielmann & Associates (5141 Pharlap Avenue, San Jose CA 95111, (408) 972-1965) for \$70.00 each. You can take them to your local service facility for installation, or we can do the work for you. We need to know whether you want 5¼" or 3½" drives, and whether the drive is to replace drive A (top) or B (bottom).

## COMPUTER CLASSICS: The H89 and Its Kin

by Lee Hart, TMSI

Dear David,

You had asked for information on various classic CP/M machines. It sounds like a great idea! I am hereby submitting information on my favorite machine, the Heath H89.

My hope is that a catalog listing the capabilities and limitations of the many CP/M computers could be compiled. I personally have over a dozen machines, and have had to learn the hard way for each.

Suppose someone donates an unfamiliar computer to your school or church group, or you see an incredible bargain at a garage sale on a computer that you know little about. Typically, some minor but vital parts are missing (manuals, boot disks, cables, etc.). Where do you turn for help?

A listing of the basic characteristics of the machine, its strengths and weaknesses, and what user groups exist would be invaluable at separating gold from grot.

If you're collecting CP/M machines, \$50 will get you a hard-sectored machine, but you should really hold out for one with a soft-sector controller. They usually sell for around \$100, but can sometimes be acquired for less if the seller doesn't know what he's doing.

On CP/M being obsolete: My definition of obsolete is "cheap, simple, reliable, available, easy to use, and thoroughly tested." By that definition, CP/M certainly qualifies.

### 1. Name of machine:

H19, WH19, or Z19: smart Z80-based terminal

H88, WH88: computer with no disk drives

H89, WH89, or Z89: computer with one hard-sector 5¼" drive

H90, WH90, or Z90: computer with one soft-sector 5¼" drive

"H89" is the generic name for a family of very similar computers. "H-" versions were kits sold by Heath; "WH-" versions



were assembled by Heath, and "Z-" versions were assembled versions sold by Zenith after they bought Heath Company. The later "-A" versions have extra shielding to meet FCC class-B noise-emission guidelines.

Other models exist; H89s were customized for large buyers, and sold with the customer's nameplates. Unmarked H89 kits were also sold as part of electronic correspondence courses.

## 2. General description:

The H89 is an all-in-one computer; logic boards, keyboard, monitor, disk drive, and power supply are all housed in a thick gray plastic case measuring 17" wide X 13" high X 20" deep. It weighs 40-55 lbs, depending on options.

An H19 terminal has a single 10 X 11" terminal logic board (TLB) with a Z80, RAM, ROM, keyboard, video, and RS-232 serial port. The power transformer is smaller, and there is no fan.

An H89 is an H19 terminal with a second 10 X 11" single-board computer (CPU) board, with Z80, RAM, ROM, RS-232 serial port, and 6 expansion slots (3 for memory, 3 for I/O). The power transformer is larger, and a fan is added. The TLB and CPU board's RS-232 ports are connected, so disk drives and external serial and parallel I/O require plug-in boards.

## 3. CPU and speed: TLB and CPU are both 2 MHz Z80

Non -A models have jumper-selectable clock speeds from 1 to 4 MHz, but memory chips, the H88-1 disk controller, and certain programs must be changed for speeds other than 2 MHz. Speed-up kits from Magnolia, Kres, Micronics, and Anapro supply the necessary parts and software.

The optional DG Super-89 CPU board has a 4-MHz Z80 and 256K of RAM. The TMSI H-1000 CPU board has Z80 and 8086

CPUs running at 2, 4, or 8 MHz, and 1 meg of RAM; it runs PC-DOS as well as CP/M.

## 4. Memory

TLB RAM: 2K for screen, 256 bytes for stack. Expandable to 4K with Ultra-ROM Page 2, or TMSI Superclock.

ROM: 4K program ROM, emulates VT-52 in normal or ANSI modes. ROM options: HUG/Watzman, UltraROM, Super19, or TMSI Superset.

2K character generator, VT-52 text and Heath graphics. Options include NORCOM GT-PROM, Font-19, TMSI Superfont.

2K keyboard-mapping ROM, for VT-52 plus extra function keys. Options: VT-100, Dvorak, TMSI Superkey.

CPU RAM: 48K dynamic RAM on CPU board. 16K, 128K, and 512K expansion cards available from Heath, Magnolia, CDR, and FBE Research.

2K static RAM, rarely used; only 1K is usually installed.

ROM: 4K monitor ROM (MTR-88, MTR-89, MTR-90 standard) to examine, change, or test memory or I/O, or boot from any disk. Options: CDR, Kres, Magnolia, TMSI, Sigmasoft, Ultimeth.

## 5. Monitor

12" diagonal, black-and-white, with white, green, or amber phosphor. 80 characters by 25 lines. 128 displayable characters (95 text, 33 graphic) in 8 X 10 pixel cells.

### 5a. Keyboard

84 keys, including 8 function keys and 12-key numeric keypad. Cursor keys shared with numeric keypad. Can send every ASCII code, including NULL and BREAK. REPEAT key to repeat any other key held

down.

OFF-LINE key separates TLB and CPU boards, and sends keys directly to screen. Useful to set console modes, but confusing to novices if they don't notice the OFF-LINE key is down.

RESET plus right SHIFT keys reset both TLB and CPU boards. CTRL-T-Y-BACKSPACE (all at once) resets just the TLB board.

#### 6. Display Attributes:

Reverse video is the only stock attribute. Optional TLB program ROMs: HUG/Watzman adds 38400 baud, on-screen clock, interlace, some VT-100 functions. UltraROM add these plus programmable function keys, 2nd page of screen RAM, but deletes ANSI mode. Super-19 adds this plus calendar and more VT-100 functions. TMSI Superset/clock/font/key adds these plus blink, bright, dim, superscript, and subscript attributes, 8 fonts, white screen, menus, windows, and sprites.

Optional TLB boards: Cleveland Codonics "Imaginator" adds 504x247 graphics. Sigmasoft adds 3 pages of 640x500 graphics. Northwest Digital GP-19 adds VT-100, 132x50 char text, 512x250 graphics. Northwest Digital GP-29 adds VT220, 160x77 text, and 1024x500 graphics with 4-level gray scale.

#### 7. Disk drives:

Internal: One full-height or two half-height 5¼" drives. Heath always used full-height; two half-height drives require drilling two holes and adding a power and data connector. Standard drives were single-sided 48-tpi.

External: The Heath H17 held two or three full-height single-sided 48-tpi 5¼" drives. The H/Z77 held two full-height 5¼" drives (48-tpi single-sided, or 96-tpi double-sided). The H/Z47 had two full-

height double-sided 8" drives. The Z67 is a 10-megabyte Winchester and full-height double-sided 8" drive.

Options: Almost any disk drives can be used. The H89 uses standard PC-type 8", 5¼", or 3½" drives (not Apple or 144 meg). Depending on disk controller, the H89 supports 8 drives, single or double sided, single or double density, 48-tpi or 96-tpi, hard or soft sector, and 3 to 30-mSec step rates. External drives need just a box and a power supply.

#### 8. Disk formats:

The disk controller is a plug-in card, so there is no standard format. The H89 can have up to two disk controller boards, with up to 4 drives each. Seven basic disk controllers were available (most common first):

**Heath H88-1.** H17 format 5¼" hard-sector single-density controller. Stores 90-390K per disk. Requires special 10-sector disks (like Northstar). Controls up to 3 drives. It needs BIOS-80 software to use double-sided and/or 96-tpi drives.

**Heath Z89-37.** H37 format 5¼" soft-sector controller. Single or double density, single or double sided, 48-tpi or 96-tpi. Standard PC-type disks. Controls 3 drives 5¼" (or 3½" to 720K), with 90-782K per disk. Anapro's EMULATE software uses it to read, write, and format disks for most other CP/M machines and PCs. Sigmasoft and TMSI sell "clones" of this board.

**Magnolia 77316** soft-sector controller. Single or double density, single or double sided, 48-tpi or 96-tpi. Standard PC-type disks. Runs four 3½", 5¼" or 8" drives (not 3½" 144 meg). Stores 90-1208K per disk.

**CDR FDC-880H** soft-sector controller. Single or double density, single or double sided, 48-tpi or 96-tpi. Standard PC-type disks. Runs four 3½", 5¼" or 8" drives (not 3½" 144 meg). 90-1208K per disk. Comes with MODIFY software to read and write



# ELLIAM ASSOCIATES

(805) 466-8440

January 15, 1991

P.O. Box 2664  
Atascadero, CA 93423

David McGlone  
720 South Second  
San Jose, CA 95112

Dear Dave:

Thanks for the opportunity to make a pitch for CP/M and for Elliam Associates. Here is the ad.

I have included our latest CP/M catalog and also our latest Amstrad PCW catalog. When IBM dove into the PC market the CP/M folks here in the U.S. went into panic and folded away and let DOS take over the computer industry. This did not happen in England and most of the rest of the world. Around 1985 Sears bought a boatload of Amstrad PCW "word processors" and dumped them all over the country.

They were really a CP/M 3.0 computer. They came with a powerful easy to use word processor called LocoScript and Mallard Basic (no manual). Mallard Basic is like MBasic but has a couple of extra features like built in indexing (b-tree) and the ability to handle users. You specify the user along with the drive.

To keep the price down Amstrad took some shortcuts - no serial or parallel ports. The Epson type 9 pin printer plugged directly into the computer. They used one 3" ss/dd disk drive and 110K ram drive. The 3" disks are floppy holding 173K per side. The screen is 90 by 31 and handles graphics. The keyboard is designed for the word processor with special titles on some keys. Two goof's - they named the control key as ALT and the escape key as EXIT.

That's the bare machine to which can be added a 720 K B drive which may be 3", 3-1/2" or 5-1/4". There is software that can be used to read a number of CP/M formats as well as DOS. You can add a serial/parrallel interface - have had mine hooked up to my HP laser. There is also a RAMPACK that lets you get up to a Meg of memory. A hard disk is available but still too expensive.

Remember CP/M is dead - right. The folks don't know it in England as it is still going strong. They are still updating the word processor. In 1989 a desk top publishing package was issued and updated last year. Imagine running a 64K CP/M machine and doing graphics and scalable fonts. I have a mouse for this DTP program - yes a mouse on a CP/M machine. A scanner is now available.

They have a program called Flipper that is like BackGrounder. When you are using a big M drive it does a nice job. Have not run into anyone who seems to have a real handle on the machine and have not had one Amstrad owner mention ZCPR. If some one has a bit of time and talent they could sure have a ball with this machine.

Sincerely,

Bill Roch

disks for most other CP/M machines.

**Heath H/Z67.** SCSI host adapter, driving a DTC100 controller in the external box. 10 Mbyte Winchester. 8" single or double sided single or double density floppy stores 241-988K. Sigmasoft, Quikdata, Micronics, and Magnolia make H/Z67 clones with newer drives and controllers.

**Heath H/Z47.** H47 format 8" controller. Really a SCSI host adapter, running a Remex intelligent drive and slave drive in the external box. Controls 2 drives, single or double density, single or double sided, capacity 241K-1208K per disk.

**LLL FDC-8.** 8" soft-sector single-density single- or double-sided controller. Controls 2 drives, 241-488K per disk.

Heath disk formats are unique, except 8" single-sided single-density, which is IBM-3740 compatible. Heath formats are supported by Media-Master type programs on other machines. Magnolia and CDR controllers use incompatible formats, but they can read, write, or format Heath disks.

#### 9. Hard Disks:

The H/Z67 (and its clones) allow 16 bootable partitions. H/Z67 backup and restore takes 10 disks; clones require a second disk controller and drives for backup. Hard disk sizes range from 10-40 megabytes.

#### 10. Other peripherals:

The H89's open architecture and hobbyist orientation spawned dozens of specialized

## CP/M Software

*For most CP/M computers  
including the Amstrad PCW*

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boards and interfaces, such as real-time clocks, RAM disks, analog I/O, EPROM programmers, color graphics, voice synthesis, speech recognition, math coprocessors, the "Hero" robot remote control, security systems, ham radio controls, model railroad controllers, and the X-10 interface (which controls household appliances via power line).

#### 11. Serial Ports:

H88-3 "3-port" board is most common. It has three 8250 asynchronous RS-323 ports (1 DTE, 2 DCE). Chips were often removed from one DCE ports on low-end systems.

#### 12. Parallel ports:

None standard. The optional Z89-11 "Multi-Function I/O" board has one 8255 parallel port, one 8250 asynchronous RS-232 serial port, and one 2661 universal serial port (async or sync, HDLC or SDLC, etc.). The parallel port has a DB25 connector for a Centronics-type parallel printer, but the pinouts are different from an IBM PC.

#### 13. Other ports:

Back panel connectors: three DB-25 connectors (serial and/or parallel I/O), two external drive connectors, cassette (rarely used), and IEEE-688 (never used).

#### 14. Operating systems:

CP/M (1.4, 2.2, 3.0): Heath started with org-2000h CP/M 1.4; then normal 0-org CP/M 2.2. Version 2.202 supports H17 and H47 disk controllers and serial I/O; 2.203 supports H17/37/47/67 disk controllers and serial I/O; latest version 2.204 adds parallel I/O, and automatically builds a BIOS to suit your system. Magnolia and CDR provide their own CP/M implementations with their disk controllers. Magnolia has CP/M 2.2 and 3.0 (CP/M Plus). CDR and LLL's BIOS-80 provide ZCPR1 for CP/M 2.2. Anapro has Z-System.

HDOS (1.0, 1.4, 2.0, 3.0): HDOS is Heath's own disk operating system. Version 1 is reminiscent of the DEC PDP-11; version 2 is a precursor of MS-DOS (its author, J.G. Letwin, is also the author of MS-DOS 2.0); version 3 can best be described as a hacker's MS-DOS for the Z80.

UCSD P-System: I know it was sold for the H89 by Heath, but know no more about it.

#### 15. Special features:

A. Very thorough manuals. 700+ pages of documentation, full schematics, parts lists, theory of operation, IC data sheets, and source code (printed and on disk). Heath and correspondence schools (CIE, NRI, etc.) offered training courses in programming and electronics based on the H89.

B. Easy to maintain: Flip-top case, all ICs socketed. Hardware designed to be built and maintained with simple tools. Built-in RAM and disk tests, plus diagnostic software on disk.

C. ROM monitor on power-up: Can examine or change memory or I/O, run diagnostics, or boot from any drive, any partition. Power-up displays H: prompt. Type B to boot from 1st disk controller (then S for 2nd), then drive number 0-3 (default is 0), then RETURN.

D. Well designed BIOS supports almost any printer or disk drive. Disk errors never "hang" or crash the system (bad sector, door open, wrong format, etc.). Keyboard and screen buffers so console works during disk access. BIOS is a normal CP/M file (BIOS.SYS), relocatable so it need not be reassembled to change memory size. Boot tracks contain only the BDOS, CCP, and a tiny BIOS.SYS loader.

- E. Heath User's Group (HUG) is subsidized by Heath: It has a monthly magazine *REMark*, bulletin board, and extensive software library.
- F. Publications devoted to H89 (and the earlier H8): *SEBHC Journal*, a monthly newsletter. *Staunch 8/89er*, a bimonthly newsletter.  
  
Publications for all H/Z computers (back issues are best; recent ones are 90% PC-clones): *REMark*, the Heath User Group's monthly magazine. *H-Scoop*, a monthly newsletter. *Buss*, a monthly newsletter, and *Sextant*, a bimonthly magazine, both ceased publication in 1989.
- G. Most worthwhile accessories: 4MHz mod and soft-sector controller.
- H. Most common failure: Power supply overheats, killing bridge rectifier BR1 or connector P101. Don't block air vents on top cover, be sure fan blows down, and don't block air flow over heat sink with cables, etc. If P101 shows any discoloration, solder its yellow wires directly to the orange wires of BR1.
- I. Does not ship well! Loose screws fall out, and I/O boards tend to unplug themselves, then rattle around until they break something. Be *sure* screws are tight, I/O boards are retained by their brackets, and use *at least 2"* of padding on all sides of box.

16. Utilities and unaltered application programs:

These vary between versions. CP/M 2.204 comes with ASM, DDT, DUMP, DUMP.ASM, ED, LOAD, SUBMIT, SYSGEN, PIP, STAT, and XSUB.

17. Utilities altered or written specifically for the H89:

- A. SETUP, BIOS.ASM, MAKEBIOS,

MAKEBIOS.SUB, and PREL make up a menu-driven system to build a CP/M BIOS for your hardware.

- B. ASSIGN, BRS assign partitions, back up, and restore the H/Z 67 Winchester.
- C. CONFIGUR, SETLP configure serial ports, console, printer, disk drives, and other system parameters to suit your hardware.
- D. BSYSGEN, MOVCPM17, MOVCPM37, MOVCPM47, MOVCPM67 make bootable hard or floppy disks.
- E. DUP makes exact copies of disks.
- F. FORMAT formats disks.
- G. LIST prints disk files in various formats (headings, page numbers, multiple copies, etc.).

18. Manufacturers and suppliers:

**Heath Company**, Hilltop Road, Benton Harbor MI 49022, phone (800) 253-0570. Though no longer in production, Heath is still in business and usually provides manuals, parts, and service on its products forever (though slow and costly).

**Heath User's Group**, Box 217, Benton Harbor MI 49022, phone (616) 982-3463. Monthly *REMark* magazine, bulletin board, software, discounts on Heath products. Now PC-oriented, but still lots of good software. \$22.95/year.

**ANAPRO**, Box 1987, Blythe CA 92226, phone (619) 922-3919. 4MHz and 6MHz speedup kits, CPC and EMULATE programs to read, write, or format disks for PCs and other CP/M machines. Z-System for H89.

**CDR Systems Inc.**, 7210 Clairemont Mesa, San Diego CA 92111, phone (619) 560-1272. FDC-880H floppy disk controller,

Winchester system, SuperRAM RAM disk (no longer built, but parts and service are still available).

**DG Electronics**, 700 S. Armstrong, Denison TX 75020, phone (214) 465-7805. Super-89 CPU board, with 4MHz Z80, 256K RAM, 9511 math coprocessor, real-time clock, etc., no longer built, parts and service available.

**Extended Technology** (out of business). Super-19 and Font-19 ROMs for TLB.

**FBE Research Co.**, 11648 S. Military Road, Seattle WA 98168, phone (206) 246-9815. SpoolDisk-89 print spooler and 128K RAM. H89PIP two parallel port I/O card. Slot-4 I/O slot expander.

**H & H Computer** (out of business). 2 serial plus 3 parallel port I/O board.

**Kres Engineering**, (out of business). DSM-240 4MHz speedup. KMR-100 monitor ROM. 7IO 7-slot I/O and 16K RAM expansion board.

**Magnolia Microsystems**, 2806 W. 22nd St., Seattle WA 98199, phone (206) 285-7266. CP/M 3.0, 4MHz kits, 77316 floppy controller, 77311 16K and 77318 128K RAM expansion, 77320 3-port serial plus SCSI host adapter, much more (poor availability, weak support).

**Micronics Technology**, 54 Dalraida, Suite 159, Montgomery AL 36109, phone (205) 244-1597. 4MHz speedup kits, WIN89 hard disk systems.

**Quikdata**, 2618 Penn Circle, Sheboygan WI 53081, (414) 452-4172. Parts, manuals, boards, software, service, and accessories for all H/Z computers. Publishes *H-Scoop* monthly newsletter, Henry Fale editor, subscriptions \$28/year.

**Sigmasoft and Systems**, 17000 Dallas Pkwy #207, Dallas TX 75248, phone (214) 380-6187. Z89-37 clone, Winchester

system, IGC graphics controller, graphics software. (IGC no longer built, but parts and service are available).

**Staunch 8/89'er**, P.O. Box 548, West Branch IA 52358, phone (319) 643-7136. Bimonthly H8/H89 newsletter, \$12/year. Kirk Thompson, editor.

**TMSI**, 323 W. 19th St., Holland MI 49423, phone (616) 396-5085. Superset, Superfont, Superclock, and Superkey upgrade ROMs for TLB. Z89-37 disk controller. H-1000 Z80/8086 CPU board. Parts, boards, service, and software.

**Ultimeth**, (out of business). MTR-OCT, MTR-HEX monitor ROMs, Winchester boot code (used by Quikdata's hard-disk systems).

**SEBHC Journal**, 895 Starwick Drive, Ann Arbor MI 48105, phone (313) 662-0750. Monthly H8/H89 newsletter, \$24/year. Lenny Geisler, editor.

**Al Davis**, M31S at Long Lake Road, Berrien Springs MI 49103, phone (616) 471-1792. H/Z computer "junkyard", with many H89 parts. Cheap, but you get what you pay for!

**Surplus Trading Co.**, P.O. Box 1082, Benton Harbor MI 49022, phone (616) 849-2995. Another computer "junkyard", that buys Heath scrap and sells it as is. *Caveat emptor!*

19. Manufacturers still in business? Yes, except as noted above.
20. Is the H89 still being manufactured? No.
21. Production: Approximately 50,000 units. H/Z19: 1978-85. H/Z88: 1979-81. H/Z89: 1979-84. H/Z90: 1981-85.
22. Submitted 1/20/91 by: Lee A. Hart, 323 West 19th Street, Holland MI 49423, phone 616-396-5085

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## SCRIPT OF THE MONTH CLUB

A new column by Jay Sage

I would like to announce a spectacular new service of *The Z-Letter*, called the Script of the Month Club. Here's how this sensational plan works. Every month we will mail you a brand new script – perhaps for ARUNZ, perhaps for ZEX, perhaps stand-alone. You examine the script in the privacy of your own home, on your own computer, for two weeks. Try it out; put it through its paces; use it as much as you want.

Then, if you are not completely satisfied with the quality of this superb script, just return it with no obligation whatsoever. On the other hand, if you find it, as we are sure you will, to be one of the finest scripts you have ever laid eyes on, it's yours to keep, to use, even to modify to your heart's content.

For a limited time only, the \$100-per-year membership fee that others have to pay to join the Script of the Month Club will be waived for paid subscribers to *The Z-Letter*, and you will not be obligated to accept any minimum number of scripts during your membership period. How can you go wrong with a fabulous offer like this? As an extra special bonus, in some months (like this one) you will even get two scripts for the same low price as one.

### February's script

The Wyse 50 terminal that I use with my SB180 computer has two special status lines, one at the top of the screen and one at the bottom. There are escape sequences that allow one to program the text that is to appear in these areas. After suffering the annoyance of trying to look up these sequences in the Wyse manual (and that was after the annoyance of trying to *find* the Wyse manual), I made the following two ARUNZ script definitions.

```
MSGTOP=MSG=TOP echo ^[f$*
MSGBOT=BOT,TOM echo ^[%>f%<$*
```

Both scripts use the ECHO command to send a character sequence to the screen. (ECHO is

available either as a transient, ECHO.COM, or as an RCP – resident command package – command.)

The escape sequence for putting a message into the status area at the top of the screen is ESC F followed by the message text. The first script will be recognized by any of three names: MSGTOP, MSG, or TOP. In the argument to the ECHO command, the caret followed by [ will be interpreted by ARUNZ as a control-[ , which is the ASCII escape character. Then comes the F. Remember that Z-System, like CP/M, always capitalizes command lines. Finally, we have the ARUNZ parameter \$\*, which ARUNZ replaces by the command tail, i.e., whatever the user typed after the command name.

The second script has some important subtleties. One is the use of a comma in the script name **BOT,TOM**. The script will respond to commands BOT or BOTTOM or anything in between, such as BOTT. This is how ARUNZ supports command abbreviation. The part before the comma must be typed; the part after is optional.

The escape sequence for putting a message into the bottom status line is ESC f followed by the message. How can we generate the lower-case f? The ECHO command recognizes the special character sequences %> and %< to mean “start translating to lower case” and “resume upper case”, respectively. Thus, the command

```
A0:RAM>bot this is my message
```

will produce **THIS IS MY MESSAGE** in the lower status line. If you want lower-case letters in the message, you can use your own %> and %< commands in the text to control case. Thus

```
A0:RAM>top t%>his is my %<message
```

will produce **This is my MESSAGE** in the upper status line.

The technique illustrated in these two scripts can be applied to other terminal functions, such as programming function keys. It can also be used to program printer setup by sending the character stream to the printer (using the

ECHO switch %P) instead of the screen. The main purpose of such scripts is to relieve you of the burden of having to remember the character sequences required. There are lots of possibilities – have fun!

## LETTERS

15 December 1990

Dear David:

I like the new combined Z-LETTER and feel the expanded size and readership will allow for a broader range of subjects than the ECUG newsletter. My only concern is that ECUG might get lost in the shuffle. I would hate to see the newsletter get so generic that Eagle owners could not get specific help.

One addition to the newsletter I would really like to see is a humor/notes column. ECUG was so intent about answering questions and providing information, the reader came away with the feeling that the newsletter was put out by a very somber crew indeed.

This type of column might entice those members who feel they are not up to sending in technical articles to submit humor pieces, jokes, clippings or what have you. Getting members involved is the thing that keeps any club going.

You will find my check for a subscription renewal, and a note written in longhand that you probably can't decipher, which merely says that the Printmaster disks have been sent to Ken Thomson, and if you would like a set, let me know and I will forward same.

Sincerely,  
Ernie Shields  
127 Lafayette Street  
Ionia MI 48846

*By now, Ernie, you should see that ECUG is not being slighted in The Z-Letter. On humor, you do realize that the same people (or person!) is doing The Z-Letter that was doing the ECUG newsletter, don't you? Funny, when we were exchanging newsletters with Chet Pryor of the Washington Area Eagle*

*Users Group, he thought our newsletter was "chatty"; you find it "somber"! But we'll see what we can do. Try Jay Sage's tongue-in-cheek introduction to his alias column.*

*Ken got the Printmaster disks and I expect to work your documentation into the next issue or so as an article. If I need more information than I got from Ken, I'll let you know.*

21 January 1991

Dear Sir:

Just got back from visiting Lee Bradley (Z-Node 12) and Lee showed me Z-Letter #7. I understand that you use a laser printer to generate the Z-Letter.

I assume you use the Z-Fonts to generate the newsletter.

I use WordStar 4.0 and an HP IIP with my C-128 for word processing. I am interested in augmenting the internal fonts with either downloaded fonts or a font cartridge.

Is your product compatible with the LaserJet IIP?

What exactly is your product? In addition to the fonts themselves, are there additional software utilities required?

How does one download the fonts into the LaserJet? Can you just use PIP?

What other things do I have to do to use the fonts? I assume that mixing fonts requires some adjustments of margins and vertical spacing. How do I accomplish this?

Sigurd E. Kimpel  
62 Rockland Drive

Pittsfield MA 01201  
(413) 443-4397

*Sigurd: Permit me to explain how I produce The Z-Letter, as it may be the simplest way to answer your questions.*

*I use a Micromint SB180FX as my primary computer. This is a Z-System machine with a HD64180 CPU. This operating system is an improved CP/M, and the chip is an improved Z80. Hence I run CP/M applications like Spellbinder and the MagicSeries on my machine. My printer is an HP LaserJet Plus. In case you are not familiar with the development of the LaserJet line, the sequence is: LaserJet, LaserJet Plus, LaserJet 500 Plus, LaserJet II, LaserJet IID, LaserJet IIP, LaserJet III, LaserJet IIID. All of these HP laser printers use the same downloadable SoftFonts, except that the original LaserJet could only use cartridge and built-in fonts, and the III and IIID can also use the new scalable typefaces.*

*My Z-Fonts are standard fonts which conform to the HP SoftFont definition and can be used in any HP LaserJet model except the original LaserJets. If you have heard of the typeface company Digi-Fonts, it may mean something when I tell you that the Z-Fonts are fonts generated from the Digi-Fonts typefaces and sold under a royalty arrangement with them.*

*To use the Z-Fonts (or any other SoftFonts), you must first download them to the laser printer and assign them font numbers. You can then send to the printer standard escape sequences defined in your printer manual to select the fonts. Anything printed on the laser will be in that font until you select another font.*

*To download a SoftFont, you can indeed use PIP, or any other copy utility, by copying the font file to the printer device. If you use PIP, or some other copying program which does not verify the copy is good unless you tell it to do so, make sure you do tell it! To select fonts, draw boxes, fill in areas with grey shading, adjust the margins, adjust the vertical spacing, or any other thing the LaserJet can do, you send it escape sequences. If your word processor allows it, you can insert these escape sequences directly into your text. If your word processor is even more versatile, you can define macros for the*

*various commands, and put these macros in your text.*

*Spellbinder, the word processor I use and sell, allows all of this, but was not designed for laser printers. It was designed for dot-matrix printers that have large, but limited, selections of fonts. To get the full benefit of my laser printer, with minimum effort, I use Spellbinder as my editor to write text such as The Z-Letter. This gives me the full power of Spellbinder's macros and search commands and the other features I'm used to. To print the text, I exit Spellbinder and use the MagicSeries to send the text to the printer. MagicSeries' commands, which I put right in the text when I typed it in Spellbinder, include commands for downloading a SoftFont and assigning it an ID number, selecting and switching between fonts, drawing boxes, drawing lines, shading areas, etc. While I occasionally use the fonts built into the laser printer, or a font bought from another company, the fonts in what I write are almost always Z-Fonts.*

*You can purchase Spellbinder, the MagicSeries, and the Z-Fonts from me. Making these products available to the CP/M and Z-System community is why I founded Lambda, and the reason for the "Software" in the company name Lambda Software Publishing. If you prefer to stay with WordStar (for whatever arcane reason), there is a version of the MagicSeries that works with WordStar instead of Spellbinder.*

January 25, 1991

Dear David:

*The story of my letter writer isn't that long. I've had one up and running since 1983, am writing this letter with it. [Note: Gene is continuing a "conversation" from last issue - DAJM]*

*When I first bought the Great Slaving Beast [his Eagle computer - DAJM] it took me about two minutes to realize one of its uses was writing letters. Since then, I've learned that over 90% of all word processors are used part of the time to write letters.*

*All letter writing, whether on imprinted letterheads or used toilet paper, requires drudge work that is done the same way with the same data, using the same format. Addressing the*

# SPECIFICATIONS

## Ampro Z80 Little Board/PLUS

### CPU:

4 MHz Z80A, 8 bit-microprocessor

### MEMORY:

64 kilobytes of dynamic RAM  
4-32 kilobytes of EPROM

### TIMER:

Z80A CTC (4 channels)  
2 channels not used by Ampro software

### SERIAL I/O:

Z80A SIO/0  
Two RS-232C compatible ports  
Software controlled baud rates  
Channel A - 75 to 38,400 baud  
Channel B - 75 to 9600 baud  
Four standard RS-232C signals per port  
Data Out  
Data In  
Handshake Out  
Handshake In  
Two ground pins

### PARALLEL I/O:

Centronics-compatible printer port  
Ten signals supported  
Data Bits 1-8 - Output  
Data Strobe - Output  
Printer Busy - Input  
12 ground pins

### DISK I/O:

Drives supported: 1 - 4  
Disk Controller: WD1772  
Data Rate: 250k bps (MFM),  
125K bps (FM)  
Sector Size: 128, 256, 512, or  
1024 bytes  
Phase locked loop: digital (8 MHz)  
Write precompensation: Software enabled  
Drive capacity (formatted):  
Type 1 (40 track, 1 side) - 200K bytes  
Type 2 (40 track, 2 sides) - 400K bytes  
Type 3 (80 track, 1 side) - 400K bytes  
Type 4 (80 track, 2 sides) - 800K bytes

### SCSI/PLUS BUS INTERFACE:

SASI Compatible  
ANSI X3T9.2 (SCSI compatible)  
SCSI/PLUS Initiator compatible  
Uses NCR 5380 SCSI bus controller

### POWER:

Same power connector and voltages as 5¼" disk drives.  
+5VDC at 0.95A  
+9 to +12VDC at 0.05A

### ENVIRONMENT:

Temperature: 0 to 32° C, operating  
Humidity: 5 to 95%, noncondensing  
Altitude: 0 - 10,000 feet

### SIZE:

7.75" x 5.75" x 0.75"

### SOFTWARE:

Boot program in 2732 EPROM (standard)  
Options (see price list for details)  
CP/M 2.2 with ZCPR3 enhancements  
Little Board/Plus system utilities  
BIOS and utilities source code

### DOCUMENTATION: (Optional)

Little Board/Plus Technical Manual  
Little Board Plus Software Manual

### EXPANSION MODULE:

The Ampro Z80 project board is available for special purpose I/O. The board stacks on top of the Little Board and plugs into the CPU socket and provides breadboard space for wire-wrap applications.

Exclusive manufacturing rights for the Ampro Z80 Little Board have been purchased from Ampro by Davidge Corporation. Technical support and repair service is available directly from Davidge. Ampro no longer supports the product.

# 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

Flat rate repair for any serviceable Little Board	75.00
---	-------

### VOLUME DISCOUNTS

10-24 units - 5%; 25-49 - 10%; 50-99 - 15%; 100+ - 20%

Prices are in US dollars. All products shipped FOB Buellton, CA. Prices effective 10-1-90 and subject to change without notice. All orders are shipped UPS Blue, C.O.D. unless other arrangements made at time of order.

envelope, data, salutation, and signature line in all cases, city, date, and, in my case, the full header that takes the place of imprint. It takes time. When done on a keyboard, it's error prone. Why not a program to do the drudge work, leaving me with only the text to type?

I wrote a set of Spellbinder macros that manage the files, and do the drudge work from file data. The key element is search control. The program examines the order and configures itself without operator commands to search by last name, full name, sort code, file segment, telephone number, zip, or city and state. All I do is type the order and hit ENTER, wait for a file item to come up, address the envelope with a single keystroke, jump to text mode with another keystroke, type the text, hit ENTER again and type the letter with one more keystroke – without worrying about my lousy typing sending it to Afghanistan instead of Arkansas. It does form letters, too.

The macros are slow, cumbersome, and work the drives to a frazzle. Plus you can't do backwards searches, proper displays, or a dozen other things with Spellbinder 5.3 macros.

I examined other letter writers and found them all pain and no gain. I tried it with CBASIC. Better, but fell short.

I'm rewriting it in assembly. Since my poor, crude macros cut my letter-writing time in half, I'm not pushing. Work a couple of hours, chase Mama around the bed, then when she outruns me, take a nap and try it again next week.

So far, I'm able to do everything I want. Just finished testing the search configuration module, which is the hard part. Now it's a

matter of getting off my duff and working at it. (I finally figured out how ANDs and ORs work. I'm having a ball writing everything from switches to nibbles. Eliminated half a dozen control bytes and the thing runs faster.)

You talk about manuals. How about the Eagle monitor? Motorola doesn't support it. SAMS won't even answer my letters. There are unused capabilities in these things and at least two or three character sets I can reach with assembly. I want 'em, but can't find a manual that tells what does what.

Incidentally, I wonder whether anybody would like a Dvorak keyboard in the CP/M Eagle? If so, I can write a program that changes the keyboard to Dvorak without disturbing the BIOS. I do the programming part in my letter writer. All I would have to do is write a Dvorak table for that section of this program. All I would need is the Eagle model and a formatted (DSDD, 96 tpi) disk. The keyboard is available in the local library.

Eugene Austin  
P.O. Box 115  
Tilden NE 68781  
No telephone

*If anyone has a manual for a Motorola monochrome monitor, please send Gene a copy! Or you could donate the manual to the ECUG library, and I'll make a copy for him.*

*Gene: more detail, please. What do your Spellbinder macros look like, and in what ways are they inadequate? I'd like to get them, and your assembly source, and your comments on both. The Dvorak keyboard for the Eagle sounds like a good article for The Z-Letter, too.*

## PERSONAL ADS

### Old magazines wanted!

I collect magazines and books about CP/M. I encourage you to do the same, because they are getting harder and harder to find. But if you're going to get rid of some, send me a self-addressed stamped envelope for my list of

magazines. I will buy any you have that I don't. David A.J. McGlone, 720 South Second Street, San Jose CA 95112.

### Eagle II for sale

Purchased in 1983 and no longer used. Drive A

needs repair. Comes with manual, Spellbinder, Ultracalc, other software. \$50 plus shipping. Jeff Golden, Ashland, Oregon, (503) 482-9843.

**Eagle PC manuals and software for sale**  
MS-DOS manual, GWBASIC manual, and CP/M-86 manual that came with an Eagle PC. Software included. \$10 or best offer. Call Burt Sukhov at (408) 269-8420 before 9:30 A.M. or after 3 P.M. Pacific time.

**Nevada COBOL for sale**  
I have stumbled across 8 copies of Nevada COBOL, an excellent microcomputer COBOL that I've used myself for many years. \$15 apiece while they last! Packaged originally for CP/M on the Commodore 64, but it will run on any CP/M computer. Specify your make and I'll copy it to your format. Just ignore the Commodore hype in the manual. David A.J. McGlone, Lambda Software Publishing, 720

South Second Street, San Jose CA 95112-5820, or call (408) 293-5176.

**Osborne Executive for sale**  
Like new, with two floppy-disk drives, 128K RAM, 80-column screen, Epson RX80 printer, CP/M 3.0 operating system, WordStar, Supercalc, Personal Pearl, MBASIC, CBASIC, P-System, and back issues of the *Osborne Companion* and *Foghorn*. \$250 takes it all. Call John Coppini at (415) 352-4533 after 7 P.M.

**Pied Piper for sale**  
Pied Piper portable CP/M computer with modem card, manuals, and bundled software. Currently working, but the two half-height 96-tpi drives will be removed (I'm keeping them) before shipping. Well worth \$55 (plus postage and handling) as a rare parts car. Contact Ken Thomson, 71 Rosekranz, San Francisco CA 94110, (415) 648-7550.

## MAGAZINE ARTICLES

### Ohio readers, take note

Readers who own Kaypro or Osborne computers and who live in Ohio, especially around Cincinnati, may be interested in *COG Wheels*, the newsletter of the Cincinnati Osborne Group and the Cincinnati Kaypro Users' Group. The latter used to have a newsletter called *One Kay*, but *COG Wheels* now includes material for both groups, who meet together on the second Tuesday of each month at 7:30 PM in the Campbell County Public Library. Dues are \$20 per year, payable to COG, c/o David Haldeman, 2063 Beechmont Avenue, Cincinnati OH 45230.

### TCJ continues to stir the imagination

Issue 48 (January/February 1991) of *The Computer Journal* came out since our own last issue, making me realize that I had missed issue 47 (November/December 1990). As usual, both were excellent. *TCJ* is really the foremost magazine of the CP/M and Z-System community, pleased as I am that some people have compared my own efforts favorably. They address a much more knowledgeable

audience than I aim for.

In #47, Jay Sage's regular Z-System column described macro commands in ZMATE, the Z-System version of PMATE or MATE. David L. Clarke's *ZCPR3 and Modula Too* describes how programs in FTL Modula-2 can address the environment of the Z-System.

Issue 48 had more articles on the Z-System. (With this issue, Chris McEwen took over as editor from *TCJ* founder Art Carlson, whose health demanded he take a break.) David L. Clarke continued his writing on connecting the Z-System and FTL Modula with *Modula 2 and the TCAP*. Jay Sage's column covers *Patching MEX-Plus and The Word - Using ZEX*. Wayne Sung made my mouth water with his article *Adding a Bernoulli Drive to a CP/M Computer*. Bill Tishey begins a public service with a column called "Z Best Software", in which he describes great Z-System software and tells how to use it. In this first column, Bill gives one-paragraph bios of contributors like Joe Wright, Al Hawley, and Cameron Cottrill, then describes CHKDIR and SAP-Z by Gene Pizzetta and Howard Goldstein's LBREXT. Carson Wilson reviewed

BDS Z, the Z-System version of the venerable BDS C. Finally, Clif Kinne wrote the first of a new column on PMATE/ZMATE macros.

### Case of the disappearing Vulcan

With the January 1991 issue, *Vulcan's Computer Monthly* has apparently dropped the "Vulcan's" from its name. The word can no longer be found on the cover, contents page, or anywhere in the magazine.

The January issue has no articles of interest to the CP/M community, "merely" the usual user-group listings from Fog International, specialized columns on the Coleco Adam, TRS-80, TI-99, and other computers, and great ads such as LaserJets, Northstar computers, and Pickles & Trout CP/M for Radio Shack computers. *Computer Monthly* can be found in most computer stores. It's the same large size as *Computer Shopper*, only not as thick, and costs \$1.95 per issue.

### Do you know where your Lifeboat is?

Volume VII, issue 6 of *The Epson Lifeboat* (Dec. 1990-Jan. 1991) had very little CP/M stuff. But the list of QX-10 repair centers on page 248 and phone resources on page 293 should be noted for reference. Leslie Clark also described a problem he had with his SemiDisk (a RAM disk available for QX-10s) and how he fixed it. Owners of Epson computers can get the *Lifeboat* by joining the National Epson Users Group, \$26 annually to U.S. addresses (and other rates), Box 1076, Lemont PA 16851.

### Getting the most from your toys

I never cease to be glad that printers are external devices that don't care what's at the other end of their input cables. If this were not so, I would be unable to use my HP LaserJet Plus unless I had a PC, and *The Z-Letter* would be published, probably, on a dot-matrix printer.

Since it is so, however, there is often quite a bit of useful stuff in magazines that assume you're using MS-DOS programs on PCs attached to laser printers. The February 1991 issue of *PC Publishing* is a good example of this. I read Michael Angelo's (is this a pseudonym?) article on *Low-Cost PostScript Printing Options* with much interest. Unfortunately, *PC Publishing* is going out of business; this is its last issue. A lot of the same product information and ads appear in *Publish*, but that magazine is heavily Mac-oriented and often has no articles of interest.

### Lots of staunch CP/Mers

Kirk Thompson sent me issue #20/21 (Sep-Dec 1990) of *The Staunch 8/89'er*, which he edits. If you've already read Lee Hart's article on the H89 computer and are drooling at all the stuff available for it, I advise you to write to *Staunch* and the other newsletters Lee listed. Lots of interesting articles, lots of H89 news, and lots of H89s for sale and accessories for them, too! Send \$2 for a sample issue to Kirk L. Thompson, P.O. Box 548, West Branch IA 52358, and when (not if) you're impressed, subscribe! Even if you don't have an H89, you will find useful stuff here.

## 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, P.O. Box 3381, Saratoga CA 95070, phone (408) 972-1965.

### Meeting place

ECUG meetings are held at Tandem Computers Incorporated, 10435 North Tantau Avenue, Cupertino. To get there, take 280 to the Wolfe Road exit; turn left at Vallco Parkway; turn left at Tantau; go over the bridge; and turn in where it says "Tandem Computers" on the left. Sign in with the guard at the lobby. He will know what room the meeting is in.



**Herbert  
R.  
Johnson**

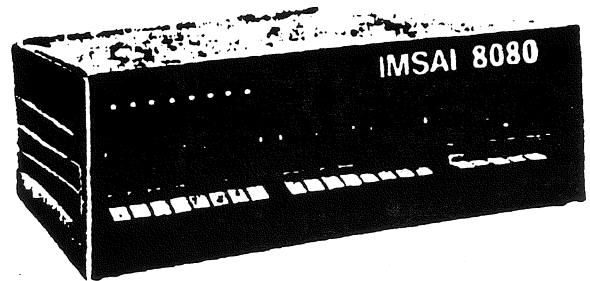
## **Great Buys on Used Computer Equipment**

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**Herbert R. Johnson  
1519 Mount Everett St.  
Colorado Springs, CO 80909  
(719) 578-0997**

Meetings are the second Saturday of every month, from 9 A.M. to Noon. The remaining 1991 meetings will occur on Mar. 9, Apr. 13, May 11, June 8, July 13, Aug. 10, Sep. 14, Oct. 12, Nov. 9, and Dec. 14.

### March 9 meeting

9:00 Meeting begins. No presentation is scheduled for this meeting.

12:00 ECUG meetings ends.

12:30 ZSUG (Z-System Users Group) meeting begins.

### ECUG library

The contents of the ECUG Library reside at the editor's house. Members may borrow them between one meeting and the next. Either call me evenings at (408) 293-5176 and ask me to bring them to a meeting, or phone to arrange a time to come over and borrow them.

*CD-ROM Product Guide*, Bureau of Electronic Publishing, Inc. Fall 1990 issue. Donated by the publisher.

*The Eagle 1600: A Powerful Bird Takes Flight*, from *Interface Age*, October 1983. Donated by Jack Morse.

*New Wings for Old Eagles*, from *PC Resource*, August 1987. Donated by Jack Morse.

*PC Software & Supply*, MS-DOS shareware catalog number 82, donated by the publisher.

*README.DOC*, Journal of the Orange Coast IBM PC User Group. December 1990 and January 1991 issues, Vol. 6 No. 12 and Vol. 7 No. 1. Donated by David Banoff.

The *Eagle PC Plus and Spirit Service Manual* and *Eagle PC Spirit User's Guide* furnished by Jerry Davis have been copied. In addition, Jack Morse has donated the *Eagle Computer EPROM Installation Guide*, which will be incorporated into our copies of the Eagle PC manuals. Finally, Dave Banoff has donated a camera-ready copy of the *Eagle 1600 User's Guide*. Each of these is available as a single 8½ X 11" looseleaf manual; the cost is \$15 apiece. See the Lambda

order form elsewhere in this issue.

Our library has two extra copies of the *MS-DOS 2.0 Operating System Manual* and two extra copies of the *CP/M-86 Operating System Manual* that came with Eagle PCs. Anyone who wants to come to my house or arrange by phone to pick them up at an ECUG meeting can have them free. If I have to package and mail them they will cost you \$10 each.

In a similar vein, or CP/M software librarian, Ken Thomson (address below), has picked up 6 copies of *IBM PC 3270 Emulation Program Entry Level v. 1.21*, I believe with software. If you want them, he will gladly give them to you free. Act quickly before he throws them away.

### 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.

Please note that, as ECUG is no longer a corporation, the officers of the club do not wish to handle money (except those, like Shirley Welch and myself, who have businesses and do so as part of the business). Therefore, when you request disks from Ken or Jack, send them the floppy disks and the postage to mail them. 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.

PC software received (donated by the author or company):

*Online Bible*, version 5.03, copyright 1991 Woodside Bible Fellowship, Ontario. Available free from anyone who has it already, or send \$1.50 per disk copying charge to Rockware Computer Bibles, P.O. Box 21, Bronson MI 49208, phone (800) 243-7124. Requires between 3 and 10Mb of hard-disk space. Telephone help and a printed manual are available from (517) 369-6035.

*TutorialWriter*, described as "an authoring system for computer assisted instruction or computer based training." M.G. Wight (Compuserve ID 70441,2746) is the author, and

the president of Intelligent Educational Software, P.O. Box 189, Houston TX 77244. Shareware.

## THE EAGLE IVx2, AN EXPERIMENT IN HARDWARE

### Conclusion

In this installment I will describe how to install the extra boards to turn an Eagle IV into a machine with two 10Mb hard disks instead of one. I will also explain why it is a poor solution to the desire to upgrade the capacity of the Eagle.

Remember to unplug the machine and turn it off before opening it up. Some terms and procedures mentioned in this section were defined or described in detail last issue. If, after reading all of this, you decide to go ahead, you should change the floppy-disk drives (as described last issue) and install the additional boards and hard disk (described below) all at the same time, to minimize how many times you open your machine and expose it to potential damage.

#### Adding the new hard disk and boards

Eagle made an external 10Mb hard-disk unit, called a File 10, which could be plugged into the back of the CP/M models. With the installation of the proper software, this made it easy to turn an Eagle III, for instance, into a machine like an Eagle IV, except that the Eagle III plus File 10 had two full-height floppy-disk drives instead of the Eagle IV's one, and the hard disk would be outside the Eagle case in a separate box. The Eagle IVx2 we've been discussing is a very conservative approach to upgrading an Eagle. We are not contemplating here new software, which would allow newer hard disks such as 60 or 80Mb models to be used. We're simply taking the boards and hard disk that would have been in a File 10, and putting them directly into the Eagle IV instead. To make this modification you will need the SASI board from a File 10, a Xebec controller, and a second 10Mb hard disk besides the one that's already in your Eagle IV.

If you are modifying an Eagle I, II, or III, you

will need two SCSI boards, two Xebec controllers, two 10Mb hard disks, and another power supply like the one already in your Eagle. It can be done, but the SASI boards were made by Eagle and are hard to find these days. Xebec controllers and this make of power supply are no longer common, either.

1. **Open the clamshell.** See last issue, where I defined what I meant by the clamshell, and gave instructions for opening it.
2. **Install the SASI board.** In all but the very oldest Eagles, the mother board is 13½" wide by 9¼" deep. In an Eagle I, II, or III (IIE-1, IIE-2, or IIE-3), this board is fastened directly to the bottom of the clamshell by six screws, one in each corner, one in the middle of the back edge, and one in the front middle of the board. In an Eagle IV or V (IIE-4 or IIE-5), one-inch standoffs elevate the main board from the bottom of the clamshell. Under the mother board, a Xebec controller occupies the right half of the space thus created; the SASI master card occupies the left half.

Undo all the screws, saving them and their washers carefully. Lift the mother board up and out of the way. If you remove it from the Eagle entirely, as you may choose to do to make your work easier, be sure you write down what cables go to what connectors on the board.

The Eagle case is made of a non-conductive plastic, so it doesn't matter if components on the boards touch it, but there must be no accidental contact between elements on different boards. For these two reasons, the Xebec controller is mounted in the bottom of the clamshell upside down. This keeps devices on what would normally be its top

side from touching traces on the underside of the mother board, which would cause a short circuit. The SASI master card is right side up, because the elements that stick up the farthest are the connectors on its left and right side. The one on the left connects by a ribbon cable to a connector at the rear of the mother board. Data going from the computer to the hard disk (drives A and B) and *vice versa* move along this cable.

The connector on the right of the SASI master card has two cables coming from it. One cable goes to the Xebec controller on the SASI card's right. Data going from the computer to drives A and B, after being buffered on the SASI card, continue along this cable to the Xebec controller, then along the cable from the rear of the Xebec controller to the hard disk that comes with the Eagle IV.

The other cable attached to the connector on the right of the SASI master card bends and goes to the rear of the Eagle, where it ends in an external port labeled "system interface". If a File 10 were attached to this port and properly configured, data going from the computer to the hard disk in the File 10 (drives C and D) would go from the connector on the back of the mother board to the connector on the left side of the SASI master card, then from the connector on the right side of the SASI master card to the port in the rear of the Eagle, then over a cable to the File 10. In the File 10, a cable from the port on the outside would go a connector on the SASI slave card, then from another connector on that card to a Xebec controller in the File 10, then from that Xebec controller to the hard disk in the File 10.

We're putting the SASI slave card in the Eagle itself, underneath the mother board, in front of the SASI master card. Place the SASI slave card directly on the bottom of the clamshell, about half an inch in front of the SASI master card. Use a marker of some kind to mark where the rear two holes on the slave card fall. Drill two holes through the bottom of the clamshell at

those points. The diameter of the holes should be the same as the holes in the corners of the SASI slave card. Fasten the SASI slave card to the clamshell with bolt and nut. Because the front of the card will rest on a ridge running across the bottom of the clamshell, you will want to support the rear of the card by threading the nuts that fasten it down through 3/8" standoffs. Connect one of the unused power connectors on the power supply to the left of the two SASI boards to the SASI slave card. Standard connectors should be used, similar to the ones already in use in the Eagle (and all other computers).

Next, unscrew the "system interface" port at the back of the Eagle. The ribbon cable that is folded to run from the righthand connector of the SASI master card to the "system interface" port should be refolded so that it runs forward to the SASI slave card instead, and connects to the port on the SASI slave card labeled "J1". You will also have to change the connector on the end of this cable, as the "system interface" port and "J1" are opposite genders. You will need to add another ribbon cable to go from connector "J2" on the card to the opening at the right rear of the clamshell; this cable will be connected to the second hard disk later.

Finally, there are two switches "S1" and "S2" on the SASI slave card. On a File 10 these switches are on the outside rear of the box. Though the positions are unlabeled, the down position of "S1" is "S" for "system interface", up is "P" for "parallel". The down position of "S2" is device 1, up is device 0. Set "S1" in the down position, "S2" in the up position.

3. **Detach the disk frame.** Since we'll be changing the hard disk, remove the screws in the top of the clamshell that holds the frame for the floppy-disk drive and hard disk. This was described last issue.
4. **Open the monitor box.** Again, last issue explained how to open the top part of the Eagle case.

5. Remove the disk frame. You guessed it! See last issue.
6. Add the second hard disk. Last issue I described how to remove the single full-height floppy-disk drive and replace it with two half-height floppy-disk drives. Removing the single full-height hard disk and replacing it with two half-height hard disks is very similar. You will need to format the two replacement disks; the software to do so is not normally available to the end user, but the Eagle Computer Users Group has it and will send it on request. The two hard disks are not daisy-chained, as the floppy-disk drives are; each drive has its own SASI board and Xebec controller. Choose one hard disk to be drives A and B and hook it up with the power cables of the original hard disk and the data cables coming from the original Xebec controller, the one under the Eagle mother board.

An Eagle IV or V has a second power supply in the top of the case, normally used

only to supply power for the hard disk. In the IVx2, this power supply provides power for both hard disks, the second Xebec controller, and the second floppy-disk drive.

7. Install the Xebec controller. The only place we could find for the second Xebec controller was the inside right side of the case, in the space beside the aluminum box holding the disk drives. With the disk frame removed, place the controller on its long side against the inside right of the bottom half of the monitor box, so that the power connector in one corner is at the top rear. Mark the locations of the bottom two holes in the corners of the controllers, then drill these holes through the Eagle case. Attach the controller to the side using nuts and bolts. The power connector can be two types; one kind has its connections straight up from the board, the other bends so that the power connector is flat to the board. The first kind won't fit because it sticks into the disk frame, the second kind won't fit into the rounded rear corner of the

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February 2, 1991

Enclosed is a list of computer hardware and software that I need to sell, as I will be moving soon. I would appreciate it if you would make this list available to your organization's members. I know that some of the items may not be specific to your organization's area of interest, however, I hope that some of your members may know someone who would like to own any (or all!) of these items. I will consider any reasonable offer on anything on this list; additionally I have some broadcast and ham equipment, and some electronic test gear and tubes that I will sell very reasonably. I need to sell these items as soon as possible!

Thank you,  
Kenneth W Hart,  
R D 3 Box 1414  
Mifflintown, PA 17059  
(717) 436-9089

# Computer Hardware/Software For Sale

The following computer hardware and software is offered for sale. Everything is priced at "Best Offer" and "First come, first served". I also have a selection of broadcast, ham, and electronic test gear and receiving/transmitting tubes for sale. For a complete list, or to make an offer, contact Ken Hart, R. D. 3 Box 1414, Mifflintown, PA 17059 or call (717) 436-9089.

**TRS-80 Model 4** with 48K ram, RS-232 port, one full size double sided 360K drive and two half height 360K double sided drives internal, one full size 360K doubled sided drive external. Unit is in good condition, in original shipping carton.

**Radio Shack DMP-100** Dot matrix printer. Nine inch width, adjustable tractors. In good condition, in original shipping carton.

**Radio Shack Model 100** Portable computer with 32K ram, AC adaptor, owner's manual, briefcase style hard carrying case. Built-in RS-232, modem, software for text, telecom, BASIC. In good condition.

**Texas Instruments TI-99/4A** computer with AC power supply, cassette cable, extension cable for power and RF, extra keyboard assembly. In nearly unused condition, in original packaging.

## Available software

<b>Assembly Language Tutor Disk</b>	<b>26-2018</b>
<b>Profile (model I, III)</b>	<b>26-1562</b>
<b>Pascal (model I, III)</b>	<b>26-2211</b>
<b>LDOS (model III)</b>	<b>26-2214</b>
<b>Series I Editor Assembler (model I, III)</b>	<b>26-2013</b>
<b>Model 4 Technical Reference Manual</b>	<b>26-2110</b>
<b>Level II BASIC Reference Manual</b>	<b>26-2102</b>
<b>Getting Started With TRS-80 BASIC</b>	<b>26-2107</b>
<b>Model III Disk Owners Manual</b>	<b>26-2111</b>
<b>Model 4 Disk Owners Manual</b>	<b>26-2112</b>
<b>"How To Do It On The TRS-80" by William Barden Jr</b>	
<b>Spectaculator (Model III cassette)</b>	<b>26-1513</b>
<b>Dow Jones Market Analyzer</b>	<b>26-1606</b>
<b>PFS: File (model 4)</b>	<b>26-1518</b>
<b>TK! Solver (model 4)</b>	<b>26-1630</b>
<b>"Model 4 by Jack" by Jack Klein</b>	
<b>"TRS-80 Graphics" by Don Inman</b>	<b>62-2063</b>
<b>TRS-80 Assembly Language</b>	<b>62-2006</b>
<b>TRS-80 Programs</b>	<b>62-2064</b>
<b>More TRS-80 Assembly Language</b>	<b>62-2075</b>
<b>TRS-80 Data File Programming</b>	<b>62-2085</b>
<b>Advanced Level II BASIC</b>	<b>62-2072</b>
<b>"TRS-80 Assembly Language Made Simple" by Earles McCaul</b>	

Eagle top. You will have to desolder the power connector on the controller and solder the wire from the power supply directly into the controller board, to make it fit.

There are up to 4 connectors on the Xebec controller for the ribbon cables carrying the data to and from the second hard disk. The one on the front of the controller, on the opposite end from the power connection and the other data connectors, receives the data from the SASI card. The connector on the end of the cable leading up from the SASI board you installed in the clamshell goes here. The connectors on the rear of the controller are for the cables that go to the second hard disk.

8. **Put everything back.** Screw the disk frame back in, screw the top of the monitor box back on, lower the monitor box back onto the clamshell, replace the glare protector and the bezel, and screw the clamshell shut.

#### Is it worth it?

The completed IVx2 has two half-height floppy-disk drives instead of the single full-height floppy-disk drive it had before, and two half-height 10Mb hard disks instead of the single full-height 10Mb hard disk it had before. Where it had drives A (8 Mb), B (2 Mb), E (784K), and I (382K) before, now it has additional drives C, D, F, and J, with the same respective capacities. If

20Mb hard disks were used, B and D could even be 8Mb each. Despite the additional hardware, the IVx2 weighs less and draws less power than an Eagle IV.

Nevertheless, there are serious problems with this approach. Xebec controllers are hard to find, and the Eagle SASI cards almost impossible. Yet here we are using two of each in a single computer, just to double its storage capacity. With the same hardware, we could have converted a floppy-only Eagle (models I, II, or III) into an Eagle IV.

Even worse, the Eagle hard-disk formatting software only works with a few models of hard disks with specific numbers of heads, numbers of cylinders, etc. And the Xebec controller, while faster and better than having no hard disk at all, is very slow compared with today's controllers.

All in all, then, the Eagle IVx2 must be ranked as a successful experiment. It proved that an Eagle IV *can* be upgraded to more storage capacity. The same effort, however, is better spent in devising a modern upgraded BIOS that would allow the use of today's SCSI hard disks with built-in controllers. Such an "Eagle VI" would not only allow larger capacities of 30, 40, or 60Mb, but would be faster. Also, since it wouldn't need the two SASI boards, the two Xebec controllers, and the two hard disks, it would be lots lighter and draw lots less power than the IVx2, much less a standard IV or V.

## Z-SYSTEM USERS GROUP

We are still trying to start a Z-System user group in the San Jose, California area. There are no active CP/M or Z-System user groups in the area. The purpose of the group would be to help new owners of CP/M or Z-System machines learn how to use them, pool resources for projects like a West Coast convention, help each other install hard disks, modify BIOS, *et cetera*.

Currently, the afternoons of the second

Saturday of every month are reserved at Tandem Computers, 10435 North Tantau Avenue, Cupertino. The next two scheduled meetings are March 9 and April 13. If you can't come Saturday afternoons, but some other time is better, please contact me. If there are a lot of requests for Monday evening, for instance, Monday evening it will be, as soon as I can arrange it. Suggestions for other places to meet, in the event of a different meeting time, are also requested.

# SAGE MICROSYSTEMS EAST

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  - NZCOM: Z-System for CP/M-2.2 computers (\$70)
  - ZCPR34 Source Code: if you need to customize (\$50)
- 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 (\$75)
  - ZSDOS/ZDDOS: date-stamping DOS (\$75, \$60 for ZRDOS owners)
  - ZSDOS Programmer's Manual (\$10)
  - DosDisk: MS-DOS disk-format emulator, supports subdirectories and date stamps (\$30 standard, \$35 XBIOS BSX, \$45 kit)
  - JetFind: super fast, extremely flexible text file scanner (\$50)
- ZMATE: macro text editor / customizable wordprocessor (\$50)
- PCED — the closest thing to ARUNZ and LSH (and more) for MS-DOS (\$50)
- BDS C — including special Z-System version (\$90)
- Turbo Pascal — with new loose-leaf manual (\$60)
- SLR Systems (The Ultimate Assembly Language Tools)
  - Z80 assemblers using Zilog (Z80ASM), Hitachi (SLR180), or Intel (SLRMAC) mnemonics
  - linker: SLRNK
  - TPA-based (\$50 each) or virtual-memory (special: \$160 each)
- ZMAC — Al Hawley's Z-System macro assembler with linker and librarian (\$50 disk, \$70 with printed manual)
- NightOwl (advanced telecommunications, CP/M and MS-DOS versions)
  - MEX-Plus: automated modem operation with scripts (\$60)
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