

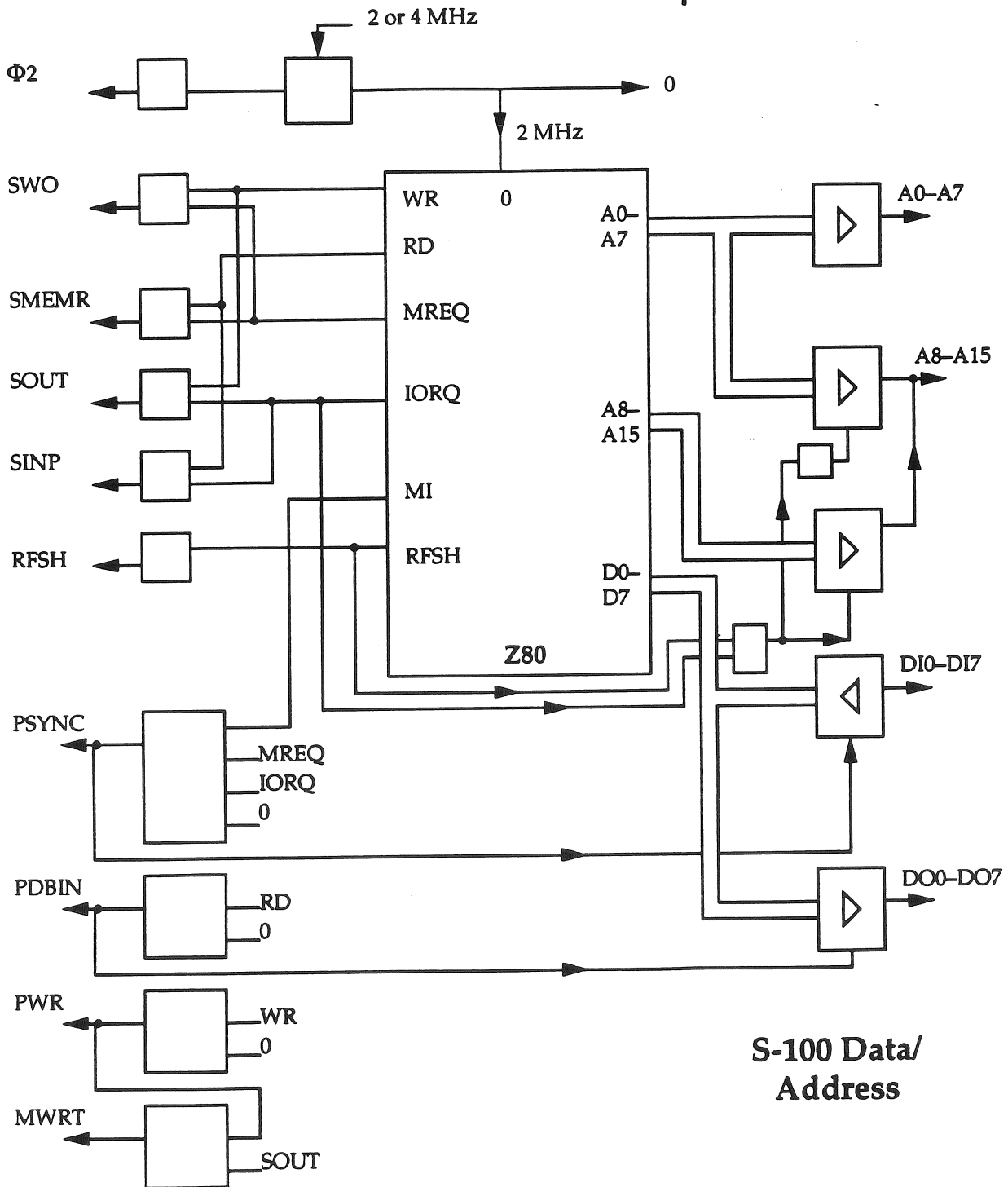
The Z-Letter

Newsletter of the CP/M and Z-System community

Number 13

June 1991

Simplified ZPU Schematic



S-100 Signals

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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 95112-5820, 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

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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.

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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 6-8 appears soon! Honest!

THE STATE OF THE ART

New Z-System computer debuts at Trenton

The 16th annual Trenton Computer Faire was held in April; unfortunately, I could not attend. The most exciting news I've heard from TCF91 was the "dog and pony show", as he calls it, that Ian Cottrell gave. Ian was showing the YASBEC (Yet Another Single-Board Eight-Bit Computer), a *new* Z-System computer!

According to Lee Bradley, this is a single-board computer like the Micromint SB180. The YASBEC's CPU is the Zilog Z180, which is the same chip as the Hitachi HD64180 used in the SB180 (Hitachi and Zilog co-developed the chip). The YASBEC CPU is a 9-MHz Z180, but a 16-MHz Z180 is in the works, and the YASBEC is designed to work at the higher speed.

The YASBEC has 64K to 1M of static RAM, which sounds like it doesn't tie up an address line to switch the ROM. Micromint did that with the SB180, which limited the onboard memory to 512K. Ian Cottrell, when contacted, was unable to confirm this, as his YASBEC has only 64K on it.

Hal Bower, who obtained the rights to XBIOS when Malcolm Kemp gave them up, is said to have already developed a banked BIOS for the YASBEC. If that banked BIOS is based on XBIOS for the SB180, this speed is understandable, but again, I have not yet confirmed this.

The YASBEC also has two serial ports, a Centronics parallel port, a floppy-disk controller that will support up to four 5¼" drives, and a SCSI port, according to Lee Bradley. It comes with a bootable Z-System disk with an unbanked BIOS, ZCPR33, and NovaDOS. If NovaDOS seems an odd choice, recall that ZCPR33 and NovaDOS are public domain; ZRDOS, ZSDOS, and ZDDOS are proprietary. I do not doubt that other DOSes and command interpreters will be available for the YASBEC.

Before you reach for your checkbooks, here is the bad news: YASBEC is not yet available in quantity. A controller manufacturer in Canada,

whose name I have not yet permission to publish, made ten of them and sold them to certain individuals, such as Ian Cottrell. The manufacturer has no interest in getting into the personal computer market and is looking for a U.S. firm to manufacture and sell the YASBEC and pay him royalties. I will keep on top of this (I want one, too!) and let you know what happens.

FOG changes officers, moves

Gale Rhoades, for the last almost ten years the backbone of FOG, has resigned her position as Executive Director effective May 31, 1991. Ms. Rhoades will pursue her own career as a computer consultant; she can be reached for consulting jobs at Gale Rhoades Consulting, P.O. Box 3051, Daly City CA 94015.

FOG's Board of Directors has hired Mike Kaufman as the new Executive Director. As part of the transition, FOG has moved. The new address is P.O. box 1030, Dixon CA 95620. No phone number or street address was yet available in issue 247 of *Foghorn*, the source of this news.

LaserScript LX fails the HP test

Everex, a company well known for its PCs and printers, recently introduced the Abaton LaserScript LX laser printer (Abaton is a company that Everex bought). An ad in the *May 7 Computer Currents* by a store called Uncle Ralph's advertised this printer for \$1599, or \$85 per month if bought on the installment plan. The ad said that the printer "Automatically switches between Postscript (sic) and HP emulations, and automatically switches between parallel, serial and AppleTalk interfaces. With 25 Mb RAM . . ."

I bought one and tried it. Had it worked as promised, last issue would have been produced on it, instead of the HP LaserJet+ I've been using. As it is, I have returned the printer to Uncle Ralph's and gotten my money back.

The advantages of the printer are that it is

lighter and smaller than my LaserJet+; its paper tray holds 150 sheets instead of the 100 standard on the older LaserJet models; and it has a normal plug instead of the special industrial plug on the LaserJet+, so it can be plugged into a power strip or power console. The LaserScript LX has two serial ports, a parallel port, and an Appletalk port. Jobs can be sent to all ports at once, and will be printed in order according to priority settings that the purchaser can set up as he wishes. Any port can default to either the HP emulation or the PostScript emulation, as determined by the user; if it's in HP emulation and a PostScript job is sent, the port switches to PostScript emulation automatically.

Disadvantages are relatively minor, with one exception. The 150-page paper tray is better than the old HP standard of 100, but most laser printers have 250-sheet trays these days. The printer has HP and PostScript emulations, not real PCL or real PostScript. The ability to use HP font cartridges is optional and must be factory installed. The engine that moves the paper is very noisy for a laser printer (though still quieter than a dot-matrix or daisy-wheel printer).

However, there is a major bug in the HP emulation, which neither Uncle Ralph's nor Everex could explain. When I downloaded SoftFonts to the printer and used them, rather than the fonts built into the HP emulation, to print things, they would evaporate unpredictably. Sometimes they would last for pages and pages. Sometimes they would go away as soon as the text being printed ejected a page or switched from regular text to two-column text. Whatever the exact cause, the same software, cable, fonts, and file that printed correctly on the LaserJet+ did not print correctly on the LaserScript LX. As a LaserJet clone, it is a failure.

Uniform-PC 3.00 Beta release

Micro Solutions has sent a Beta release of Uniform-PC version 3.00 to purchasers of its CompatiCard IV board. The CompatiCard IV is a floppy-disk controller that enables PCs to run

up to four 3½", 5¼", or 8" drives in any combination, in single density as well as double density for types of disks to which that is a relevant consideration. The new release of Uniform-PC specifically upgrades Uniform to take advantage of this new hardware. There will be more on this in a future issue, after I know better what this means to people using PCs to translate between CP/M and Z-System formats.

SVCS May meeting

A very strange thing happened at the May meeting of the Silicon Valley Computer Society. Before the meeting, ballots were passed out for members to fill in. When the actual time came for nominations, it was moved from the floor that the slate of candidates be approved "by acclamation". A clear majority raised their hands in favor, and no ballots were collected, or votes counted. I hope this procedure is legal. It sure was the strangest thing I ever saw. Officers so elected were Mark Gerow, Maureen Hannah, Siri Liddell, Richard Meyers, Bert Stephens, Stuart Stevens, Walter Varner, Richard Verna, and Henry Viveiros.

A presentation by a representative of the Technology Center of Silicon Valley, called "the Garage", came next. The Garage has been represented as a computer museum. The talk made it clear it is nothing of the sort. Rather, it is a kind of museum of technology in general, with exhibits on the bicycle, the computer chip (the Intel 80486), the Hubble Telescope, materials, robotics, and biotechnology. When the permanent building is finished it will have meeting rooms, in addition to the store, special hands-on labs, etc. that it has now; SVCS was offered the use of them for meetings when they are completed.

Anyone living in the area who wants to work as a volunteer should contact Julie Rose, Manager of Volunteer Services, (408) 279-7175. The Center uses volunteers as exhibit explainers, special labs assistants, exhibits- and equipment-maintenance assistants, store assistants, and admissions and information assistants.

Lambda Software Publishing

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Regular products – quantities not limited

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- 2. CP/M** Version 2.2 \$15
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- 3. MagicIndex** Version 3.00 \$100
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- 4. 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. (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 our newsletter for the CP/M and Z-System world. (Lambda)
- 7. The Z-Letter (subscription)** \$15/year (US), \$18/year (Canada & Mexico), \$45/year (all other)
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- 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)

Opportunity products – limited to quantity in stock

- A. CBASIC Reference Manual** **\$15**
 CBASIC comes with CP/M as CBAS2.COM, CRUN2.COM, and XREF.COM. However, the manual for the language was rarely included and is hard to find. Get your copy while you can. (DRI)
- B. The CP/M Handbook with MP/M** **\$15**
 A good introduction to CP/M by Dr. Rodney Zaks. It assumes no prior knowledge of computers. This or another book like it is a must for a novice handed a CP/M computer and told "You're on your own." (SYBEX)
- C. Nevada COBOL** **\$15**
 This is an excellent COBOL which I've used myself for years. It's the only one I know of that ever sold for less than \$700. Packaged for the Commodore 64, but will run on any CP/M computer. (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.

Disk copying – \$10 per disk

I can copy most soft-sector double-density 5¼" CP/M formats, including Northstar and Apple II CP/M. Sorry, no hard-sector formats, no single-density formats, no 3½" or 8" formats, and no Commodore CP/M formats yet; some of this will change in the future. 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.

Please note that this is a service provided to the CP/M and Z-System community. I assume that you are honest, and that you are the legal owner of material you ask me to copy. I refuse to accept any responsibility should this turn out not to be the case.

Note also that the price quoted above is for software you purchase elsewhere, or data diskettes you own. **There is no charge for copying software you buy from me in the format of your choice!** Software bought from Lambda will be sent to you in the disk format you request at no cost but the price listed for the software, so don't order Spellbinder and send me extra money for disk copying.

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WHAT IS S-100 TO ME?

The CPU and the Bus
by Herbert R. Johnson
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I've noticed a trend in some computing journals where the author begins an article with some breezy story about their dog, spouse, or the days of their youth. I would rather presume the reader wants information over biography.

In the April issue of *The Z-Letter* I introduced the S-100 bus as sets of signals on a common bus or backplane. In this second article, I'll discuss the features and functions of a popular and typical Z80 processor board for the (IMSAI/Altair) S-100 bus, namely the Cromemco ZPU card. You'll learn how clock cycles become instruction cycles and board-to-board operation. You'll also learn the differences between the Z80 and the Intel 8080, and between I/O operations and memory operations, and how a Z80 refreshes memory. If interest warrants, I'll continue the series with interrupt and power-up descriptions. As for biographical comments, I'll only say that this article was harder for me to write than it will be for you to read, I hope.

My approach here is not to give you detailed timing diagrams or schematics. Your board is likely to be different from the ZPU; but it probably operates in a similar way, particularly at the bus interface. Refer to your own documentation for further details, or nag me into writing more details, or contact me or the references at the end of the article for the actual documentation. Figures 1 through 3 provide general timing diagrams for Z80/ZPU functions, and the cover illustration is a general schematic of the ZPU.

Definitions, terms, and distinctions

When I say *Z80 processor*, I mean signals that come directly from the Z80's 40 pins. When I say *ZPU card*, I mean the logic on the Cromemco ZPU. Finally, *S-100* means the signals on the 100 bus lines. With the editor's indulgence, S-100 signals will be shown in boldface, and Z80 signals in *bold italics*. Again, I will not give specific signal timings beyond *T-*

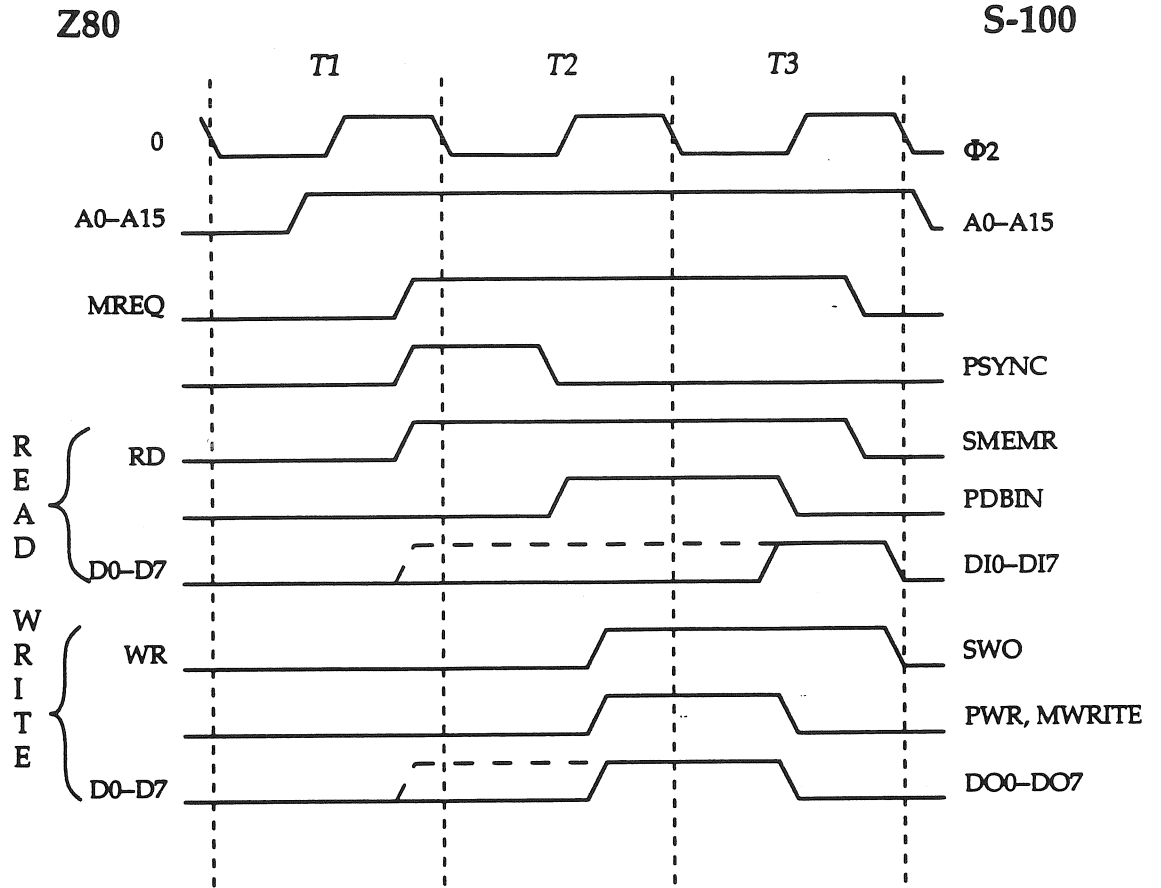
states (defined shortly), or whether a signal is active *high* (logic 1) or *low* (logic 0). The timing diagrams will show all signals as active high; refer to last month's article and your computer's documentation for actual active levels.

The phrase *T-states* refers to the fact that all Z80 processor operations occur during clocked cycles relative to the clock signal that drives the Z80 processor. This same clock signal eventually becomes the S-100 bus signals $\Phi 1$ or $\Phi 2$ (pronounced "phi-1" and "phi-2"). Thus, each T-state is one clock cycle: for a 2MHz clock, that's 500 nanoseconds (ns). Each time the Z80 executes an instruction, it goes through a cycle of T-states where specific events occur. They are typically enumerated: T1, T2, T3. Events (Z80 signals) can occur early or late within the T-state. I'll describe how these events drive (or are driven by) the S-100 bus.

An important distinction, and a potential source of confusion, is the presence on the S-100 bus of both status signals and control signals. Status signals usually start with an S (SMEMR, SWO, etc.) and provide timing for operations like read, write, interrupt, halt. Control signals usually start with a P (PSYNC, PDBIN, PWR, etc.) and provide timing for *bus events* like "data out lines good" or "wait state". Some of these control signals are *synchronized*, which is my way of saying they have particular timing relationships with both the master bus clock signal $\Phi 2$ and the bus timing-control signal PSYNC, which occurs at the beginning of each bus operation, like memory read, I/O write, etc.

WARNING! The original S-100 bus is not a minimal bus, I'm afraid, nor are its signals used consistently. Tradition eventually defined most operations, and a given manufacturer's use was generally consistent within their product line. The revised S-100 bus, the IEEE-696, cleans up the confusion of the older bus, and adds more features as well.

Memory Read, Write



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Memory reads and writes (Figure 1)

The Z80 processor uses *MREQ* to signal a memory operation like read or write, combined with *RD* for read and *WR* for write. The ZPU card combines *MREQ* and *RD* to produce the S-100 status signal *SMEMR*, and *MREQ* and *WR* for status signal *SWO*. In addition, the ZPU combines a synchronized version of *WR*, the bus signal *PWR*, with another bus signal for I/O writes, *SOUT*, to create *MWRT* as a write but not I/O output signal for memory writes. Meanwhile, *SMEMR* is used for memory reads.

To read a byte from memory, the Z80 enters T-state T1, activates the address lines *A0* through *A15*, and signals *MREQ* and *RD*, which become *A0* through *A15* and *SMEMR* on the bus. The memory card to be read has one T-state, T2, to prepare its data to be read on bus lines *DI0* through *DI7*. At state T3, the Z80 processor reads the corresponding lines *D0* through *D7* with *SMEMR* and then deactivates *MREQ*, *RD*, and the address lines (*SMEMR* and *A0-A15* on the bus). At the end of T3 all signals and lines become inactive.

To write a byte to memory, the Z80 enters T-state T1, activates the address lines *A0* through *A15* and, slightly later, the Z80 data lines *D0* through *D7* with output data. These become *A0* through *A15*, and *DO0* through *DO7* respectively. However, the ZPU does not activate the bus data lines until state T2, after *PSYNC* is inactive. Later in state T2 *WR* becomes active and then bus signal *MWRT* becomes active. During state T3, the memory card to be written to senses the *MWRT* signal and reads the address and output data lines. At the end of T3 all signals and lines become inactive.

Actually, memory operations can be a little more complicated than this. I did not describe the operation occurring on the data bus lines in detail, nor the use of additional control signals for timing read and write operations. Nonetheless, many memory boards use only the signals described. For a further description of bus and ZPU data timing, read the section on I/O operations.

Instruction fetch and refresh (Figure 2)

The Z80 and the S-100 bus follow a similar sequence for the *instruction fetch* operation of reading an instruction byte from memory. However, the processor signal *RD* (bus signal *SMEMR*) becomes inactive at the beginning of state T3, at which time the data (instruction) is read from the bus data lines into the processor. Note that an instruction fetch from memory occurs in 2 T-states; while a memory data fetch occurs in 3 T-states. The Z80 reads instructions faster than it reads data!

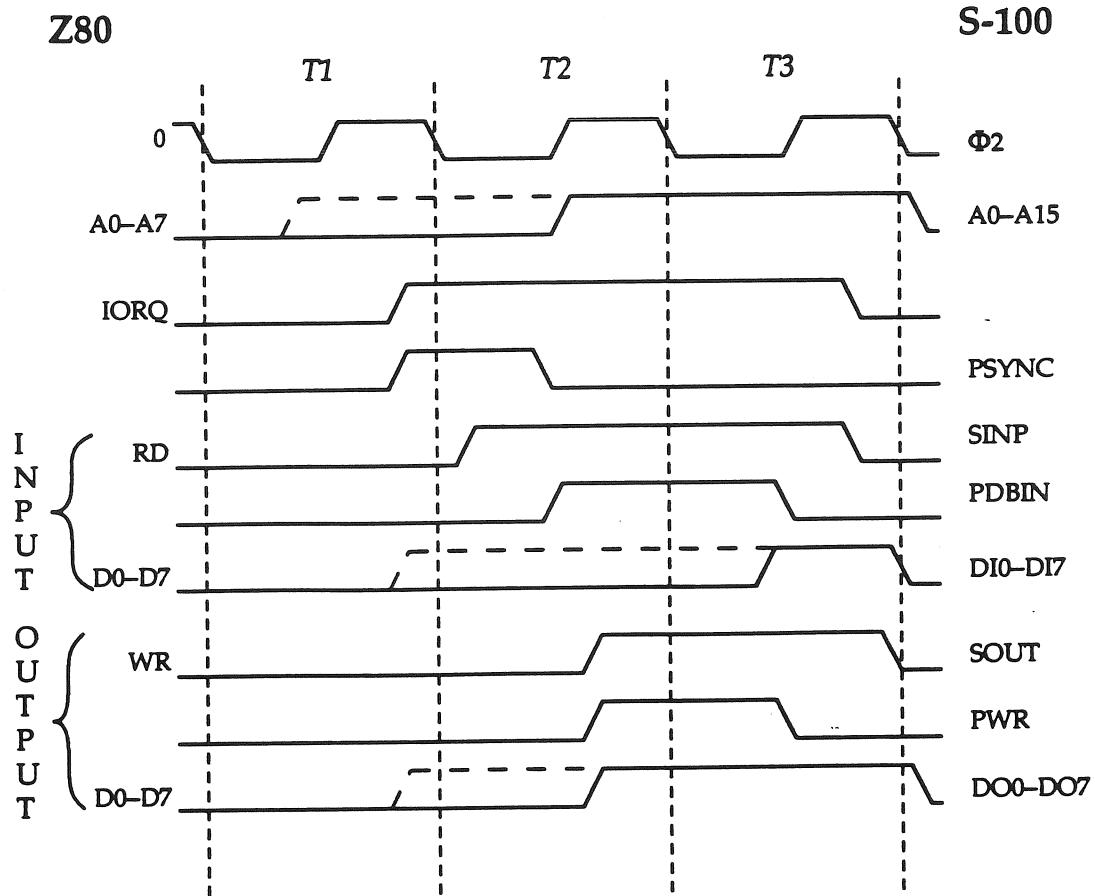
MREQ becomes inactive briefly during T3, then is active again in T3 and T4 with the processor signal *RFSH* (bus signal *RFSH*). Since neither *RD* nor *WR* are reactivated, the bus does not see this second action of *MREQ*. Meanwhile, processor address lines *A0* through *A6* (and also mirrored by the ZPU onto *A7* through *A14*, as described later) contain the contents of the Z80 refresh counter/register, which is incremented with each instruction fetch.

Why all this fuss? So that a bus device that examines the *RFSH* signal can use these address lines to refresh its dynamic RAMs with a read operation while the processor is processing the instruction just fetched. Modern memory designs generally do this refresh with special circuitry or in software (Guess what the IBM PC does!). Dynamic RAM boards on the S-100 bus were often flaky in the old days, which made static RAM boards popular despite their additional expense.

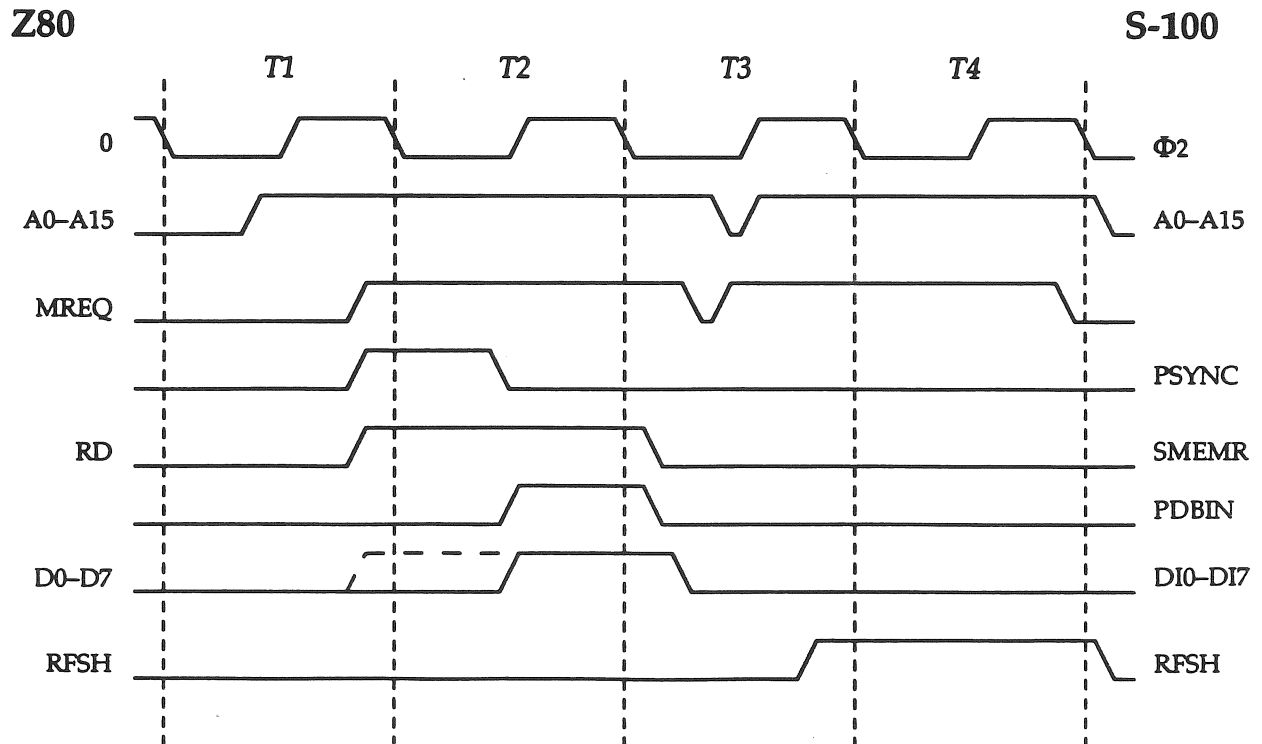
I/O reads and writes (Figure 3)

The Z80 processor uses *IORQ* to indicate an I/O operation. Combined with *RD*, the ZPU creates the bus signal *SINP*; combined with *WR*, it creates *SOUT*. While the timing of these signals from the Z80 is sufficient to perform the I/O operations on the address and status lines, the data-line timing of the S-100 bus requires the additional use of *PDBIN* and *PWR* respectively for data bus reads and writes (but your I/O boards may not!). *PDBIN* is the result of a synchronized *RD* processor signal; while *PWR* is a similarly synchronized *WR* signal.

I/O Input, Output



Instruction Fetch, Refresh



Not only are these data bus control signals important during I/O reads and writes; they actually arbitrate traffic to the Z80 data lines for all data reads and writes. While the S-100 bus has separate lines for data in or data out, the Z80 has 8 bidirectional data lines. PDBIN is used to route incoming bus data to the Z80, while PSYNC is used to route outgoing Z80 data to the bus.

To address an I/O location for either read (input) or write (output), the Z80 enters T-state T1 and activates the address lines A0 through A7; but not A8 through A15. Why? Because Intel's 8080 only defined 256 I/O addresses, which is 8 bits, and placed the appropriate value on the first 8 processor address lines. However, it mirrored or duplicated their contents on the next 8 processor address lines. (Remember, the S-100 bus was defined by the original 8080 processor's features!) The ZPU card anticipates this by (optionally) using IORQ to read the lower address lines and write them to the upper address lines, because the Z80 does not mirror its I/O addresses. Therefore, when IORQ is available at the beginning of state T2, the S-100 bus lines A0 through A15 contain an appropriate address. As suggested earlier, this same mirror occurs for the refresh cycle, when RFSH also provides the low byte of the processor address lines to the high byte of the bus address lines.

To read a byte from an I/O address, the Z80 begins state T1 with address information on line A0 through A7. Early in state T2, the bus signal SINP becomes active and should be sensed by the I/O card on the bus. By processor state T2 the Z80 and ZPU activate S-100 bus address lines A0 through A15 as described above. During state T3, the bus signal PDBIN becomes active; the I/O card should now be prepared to put its data onto the bus data lines DI0 through DI7, and to leave it there until PDBIN becomes inactive at the end of state T3. PDBIN is also used on the ZPU to route the data from the input data bus to Z80 processor lines D0 through D7.

To write a byte to an I/O address, the Z80 begins state T1 with address and data information on lines A0 through A7 and D0

through D7. By processor state T2 the Z80 and ZPU activate S-100 bus address lines A0 through A15 and bus data lines DO0 through DO7. The bus signals SOUT and PWR are also active and should be sensed by the I/O card on the bus. During state T3, the bus signal PWR becomes inactive and the I/O should then read data from the bus data lines. SOUT becomes inactive at the end of state T3, as do the address and data out lines.

Conclusion

Whew! After all this, I can appreciate the simplicity of single-board computers! The cost of a flexible bus is that it is more complicated than a dedicated interconnection scheme. However, the S-100 design stands as the first major computer hobby bus, with a decade of use by many vendors with many flavors of processors, memory and I/O cards. Its successor, the IEEE-696 design established in 1983, is still in use today with 80x86 and 680x0 CPUs. Meanwhile, these old systems keep working and people keep using, buying, and repairing them. I'll continue this series next month with a description of interrupts and power-up "bootstrap" operations.

References

The S-100 Bus Handbook by Dave Bursky, Hayden Book Co., 1980.

The Z-80 Microcomputer Handbook by William Barden, Jr., Howard W Sams, 1978. Or, any other hardware reference to the Z80 which includes timing diagrams. You can obtain documentation either from the library, from a friendly engineer or technician, or via a manufacturer or vendor. The latter two sources get reference books free, and should be able to pass them on at no charge.

Standard Specification for S-100 Bus Interface Devices; a reprint from *IEEE Computer Magazine*, July 1979. This describes the newer IEEE-696 bus, but it is a good reference for looking back to the original S-100 bus. I don't know the cost.

ANSI/IEEE Standard 696-1983; both the American

National Standards Institute and the IEEE offer this final version of the IEEE-696 standard. It will cost about \$30.

Cromemco ZPU Instruction Manual, April 1979; Cromemco/Dynatech Computer Systems,

Mountain View CA 94039, (415) 964-7400 (I think). They may be puzzled by a request for a 13-year old manual; contact me for details.

Check your local bookstore or library for information on contacting these publishers.

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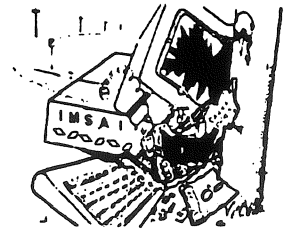
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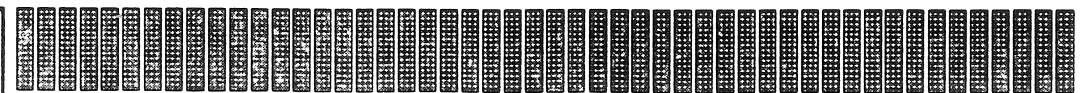
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SCRIPT OF THE MONTH CLUB

An alias is just another name
by Jay Sage

You should not get the idea that aliases always do something fancy or complex. I have lots of ARUNZ aliases that just give me alternative names for commands. This month I am going to share some examples.

In the days before ARUNZ, each alias took up a full block on a disk, typically 1K on low-capacity floppies, 2K on high-capacity floppies, and 4K or even 8K on a hard disk. One was much more reluctant to create dozens of aliases just to make typing easier. With ARUNZ, the disk space required for each additional alias is generally negligible, and you can indulge yourself. That's one of the things the Z-System is for!

Now that I use an MS-DOS machine at work, I have gotten used to certain MS-DOS variants of common commands. On my MS-DOS machine, I run PCED, the Professional Command-line Editor, which has an alias facility with much of the power of ARUNZ (see my recent article in *The Computer Journal*). I have aliases on the MS-DOS machine to allow me to use the names of the CP/M commands, but it is still handy to be able to use all the alternatives. Here are two.

```
DEL      era $*
CHKDSK  b0: chkdir $*
```

The first one is an alias for a resident command in my RCP. The second invokes Gene Pizzetta's lovely CHKDIR program, which scrutinizes a disk's directory for all sorts of problems (of course, unlike the MS-DOS CHKDSK, which very often finds lost clusters, CHKDIR rarely finds any real defects in the much more robust CP/M file system).

I have a whole bunch of aliases to help me with programs whose names I have changed for any of a number of reasons. Sometimes new programs appear with functions similar or identical to older programs whose names I am accustomed to. For example, Hal Bower's MYLOAD is a Z-System improvement on Ron

Fowler's original MLOAD. I still use the old name.

```
MLOAD  asm: myload $*
```

In some cases, I rename the new program to the old familiar name. I renamed the ZDOS COPY command to the name of Richard Conn's original MCOPY, on which it was based. I also got into the habit of renaming the superior LBREXT to LGET. Just in case I try running these programs under their real names, I have aliases to cover me:

```
COPY    b0: mcopy $*
LBREXT  b0: lget $*
```

Sometimes I habitually get confused as to what the correct name is. For example, archive files under CP/M traditionally have the extension ARK to distinguish them from MS-DOS ARC files. (The file structures are the same; the different extensions are used only to distinguish the contents.) So, what is the name of Bob Freed's utility for extracting members: UNARK or UNARC? Well, with an alias, either can be used:

```
UNARK  b0: unarc $*
```

I regularly use the awesome Dynamic Screen Debugger (now only \$50 instead of the original \$130, by the way). The version for Zilog mnemonics was called DSDZ. When I got to the point where I never used Intel mnemonics any longer and brought up a new release of the program, I called it DSD instead. Now I can never remember which name to use. With an alias, I don't have to worry about it; either DSD or DSDZ will work:

```
DSD,Z  asm: dsd $*
```

Often, I just want to save typing, but I don't like renaming the actual COM files to short, cryptic, UNIX-like names. When I display the directory of the disk, I like to be able to

recognize what the programs are for, so I limit the cryptic abbreviations to alias scripts. Here are two:

```
CFG          b0: zcnfg $*
ZP,ATCH     b0: zpatch $*
```

For some reason, I find ZCNFG (the name of Al Hawley's generalized program configuration utility) very hard to type. CFG is the file type of the configuration files used by ZCNFG, so that was a natural abbreviation. With ZPATCH, Steve Cohen's disk-file patcher, I usually enter just ZP.

I didn't want to have only trivial aliases (however useful they might be) in this month's column, so I am going to end with one that does a little more. On a typical, heavily aliased Z-System, doing DIR *.COM shows you very few of the commands that are actually available. Greg Miner wrote a lovely little utility called ADIR, which shows the names of alias commands defined in an ALIAS.CMD file. Unfortunately, from my point of view, it does not use the same kind of syntax that normal directory display programs do. Here is the syntax shown in its built-in usage message:

```
ADIR [dir:] [filename.typ] [=mask] [/o]
```

Notice that the mask for restricting the class of names to be shown must be preceded by an equal sign. A filespec entered directly is taken as the name of the alias definition file to be examined.

I replaced ADIR by an alias as follows:

```
ADIR b0: adir =*$
```

This would simply stick an equal sign in front of anything the user entered. Thus

```
ADIR A*
```

would be turned into

```
ADIR =A*
```

which displays all aliases whose names start with A. (Actually, the asterisk is not needed, because ADIR automatically adds one.)

This alias will fail, however, if one tries to get the built-in help screen in the standard way for Z-System programs by entering

```
ADIR //
```

I actually use the more complicated form below to allow for this case.

```
ADIR    if eq $1 //;
        b0: adir //;
        else;
        b0: adir =*$;
        fi
```

I hope this month's column has given you some good ideas and that by next month you will all have added several dozen simple, convenient aliases to your ALIAS.CMD files.

A PROGRAMMER CORNERED

Two programs are sometimes better than one

The customer file to which I added a key last issue was based on the subscriber data base I got from Joe Wright when I assumed full responsibility for *The Z-Letter*. Joe had set it up in dBase II with a separate field for first name, last name, company, street address, city, state, zip, country, phone, and date. I transferred the data to a SELECTOR V data base without change. The way Joe had set it up allowed a

record to be sorted by any of these categories, since each had its own field. To sort by zip code, for instance, all I would have to do is change the definition of zip code to a key field, and then run the SELECTOR module to generate the keys.

In practice, however, I have only used this information to generate the mailing labels for

The Z-Letter. This application requires no keys, though it is useful if the labels are sorted first by country (since foreign postage is more expensive), and then by last name and first name (which we accomplished by the addition of a key based on the last name and first name, last issue). Collapsing fields that don't need to remain separate reduces the space used up by the data, just as combining files in a library file reduces the space used up by all the files.

Resolving to do so is one thing, doing it another. I wanted to combine the first name and last name fields, so that two fields became a simple name field; and combine city, state, and zip fields into one field, also. The question was, how to do this?

No one tool seemed well suited. Pascal or COBOL could have done it, by counting the characters actually used in each field and concatenating the data with a space in between, but it would have been fairly clunky. Pascal, which handles strings readily, is not really good at going through a file one record at a time, making a new record, and writing it to a new file. COBOL, which is very well suited for exactly that, handles variable-length strings only with difficulty. TACL, a macro language

used at Tandem, can do both easily, but I wanted a solution that would run on a CP/M machine and serve as an example for this column. TACL runs only on Tandem minis and mainframes using the Guardian operating system, so that was out.

SELECTOR's formatted-report writer seemed ideal, except that it writes only to a printer, not to a file. This is not an insuperable problem; the ability to intercept terminal and printer data and put it into a file, using Joe Wright's RECORD IOP, is what got me interested in the Z-System in the first place. Unfortunately, when I tried it, I found that strings concatenated by the report writer do not have a space between them. After trying several ways to force the introduction of a space, I gave up on that means.

Eventually it occurred to me that two different methods could be combined to accomplish what was difficult for either to do on its own. I converted the customer file by using Nevada COBOL to concatenate the fields with no truncation, then used a Spellbinder macro to reduce the spaces between the concatenated fields to a single space. Here is the COBOL program for the first half of this procedure:

```
0010 IDENTIFICATION DIVISION.
0020*
0030 PROGRAM-ID.
0040   MAKECUST.
0050*
0051 AUTHOR.
0052   DAVID ANTHONY JOSEPH MCGLONE.
0053*
0054 DATE-WRITTEN.
0055   30 MAY 1991.
0056*
0057 DATE-COMPILED.
0058   30 MAY 1991.
0059*
0060* This program converts the SELECTOR data file
0070* ZLTRCUST.DAT to a new file NEWCUST.DAT. The
0080* new data file has the same structure as the
0090* old, except that the FIRSTNAME and LASTNAME
0100* fields of the old file have been concatenated,
0110* and the CITY, STATE, and ZIP fields also.
0310*
0330 ENVIRONMENT DIVISION.
```


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

Flat rate repair for any serviceable Little Board	75.00
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0340*
 0350 CONFIGURATION SECTION.
 0360*
 0370 SOURCE-COMPUTER.
 0380 8080-CPU.
 0390 OBJECT-COMPUTER.
 0400 8080-CPU.
 0410*
 0420 INPUT-OUTPUT SECTION.
 0430*
 0440 FILE-CONTROL.
 0450*
 0460 SELECT INPUT-FILE ASSIGN TO DISK
 0470 ORGANIZATION IS SEQUENTIAL
 0480 ACCESS MODE IS SEQUENTIAL
 0490 RECORD DELIMITER IS STANDARD.
 0500*
 0560 SELECT OUTPUT-FILE ASSIGN TO DISK
 0570 ORGANIZATION IS SEQUENTIAL
 0580 ACCESS MODE IS SEQUENTIAL
 0590 RECORD DELIMITER IS STANDARD.
 0600*
 0610*
 0620 DATA DIVISION.
 0630*
 0640 FILE SECTION.
 0650*
 0660 FD INPUT-FILE
 0670 LABEL RECORDS ARE STANDARD
 0680 VALUE OF FILE-ID IS "A:ZLTRCUST.DAT".
 0690 01 INPUT-RECORD.
 0700 05 IR-CUSTID PIC X(14).
 0710 05 IR-FIRSTNAME PIC X(20).
 0720 05 IR-LASTNAME PIC X(20).
 0730 05 IR-COMPANY PIC X(40).
 0740 05 IR-STREET PIC X(40).
 0750 05 IR-CITY PIC X(30).
 0760 05 IR-STATE PIC X(20).
 0770 05 IR-ZIP PIC X(10).
 0780 05 IR-COUNTRY PIC X(20).
 0790 05 IR-PHONE PIC X(20).
 0800 05 IR-DATE PIC X(08).
 0900*
 0910 FD OUTPUT-FILE
 0920 LABEL RECORDS ARE STANDARD
 0930 VALUE OF FILE-ID IS "A:NEWCUST.DAT".
 0940 01 OUTPUT-RECORD PIC X(64).
 1130*
 1140 WORKING-STORAGE SECTION.
 1150*
 1160 01 WS-MORE-INPUT PIC X(03) VALUE SPACES.
 1170*

1180 01	WORK-RECORD	PIC X(64).	
1190*			
1200 01	WORK-NAME.		
1210	05 WN-FIRSTNAME	PIC X(20).	
1215	05 FILLER	PIC X(02)	VALUE " \$".
1220	05 WN-LASTNAME	PIC X(20).	
1230*			
1240 01	WORK-CITY-STATE-ZIP.		
1250	05 WC-CITY	PIC X(30).	
1255	05 FILLER	PIC X(02)	VALUE " \$".
1260	05 WC-STATE	PIC X(20).	
1265	05 FILLER	PIC X(02)	VALUE " \$".
1270	05 WC-ZIP	PIC X(10).	
3210*			
3220*			
3230	PROCEDURE DIVISION.		
3240*			
3250	0100-MAINLINE.		
3255	OPEN INPUT INPUT-FILE.		
3265	OPEN OUTPUT OUTPUT-FILE.		
3270	READ INPUT-FILE		
3271	AT END MOVE HIGH-VALUES TO WS-MORE-INPUT.		
3280	PERFORM 0200-CONVERT-INPUT-FILE		
3281	UNTIL WS-MORE-INPUT IS EQUAL TO HIGH-VALUES.		
3340	CLOSE INPUT-FILE.		
3350	CLOSE OUTPUT-FILE.		
3360	STOP RUN.		
3370*			
3380	0200-CONVERT-INPUT-FILE.		
3700	MOVE IR-CUSTID	TO OUTPUT-RECORD.	
3701	WRITE OUTPUT-RECORD.		
3702*			
3710	MOVE IR-FIRSTNAME	TO WN-FIRSTNAME.	
3720	MOVE IR-LASTNAME	TO WN-LASTNAME.	
3723	MOVE WORK-NAME	TO OUTPUT-RECORD.	
3724	WRITE OUTPUT-RECORD.		
3725*			
3730	MOVE IR-COMPANY	TO OUTPUT-RECORD.	
3731	WRITE OUTPUT-RECORD.		
3740	MOVE IR-STREET	TO OUTPUT-RECORD.	
3741	WRITE OUTPUT-RECORD.		
3742*			
3750	MOVE IR-CITY	TO WC-CITY.	
3760	MOVE IR-STATE	TO WC-STATE.	
3770	MOVE IR-ZIP	TO WC-ZIP.	
3773	MOVE WORK-CITY-STATE-ZIP	TO OUTPUT-RECORD.	
3774	WRITE OUTPUT-RECORD.		
3775*			
3780	MOVE IR-COUNTRY	TO OUTPUT-RECORD.	
3781	WRITE OUTPUT-RECORD.		
3790	MOVE IR-PHONE	TO OUTPUT-RECORD.	
3791	WRITE OUTPUT-RECORD.		

```

3800  MOVE IR-DATE                TO OUTPUT-RECORD.
3801  WRITE OUTPUT-RECORD.
3802*
3900  READ INPUT-FILE
3910      AT END MOVE HIGH-VALUES TO WS-MORE-INPUT.
9997*
9998  END PROGRAM MAKECUST.

```

Like the program in last month's column, this one is very simple. Most fields are copied directly to OUTPUT-RECORD, and then OUTPUT-RECORD is written to the output file. This gives us a Spellbinder list where each field is on a different line. The FIRSTNAME and LASTNAME fields of the input records are copied to fields of a working-storage variable called WORK-NAME, which has a filler between them, composed of a space followed by a dollar sign. This puts the data on a single line (that is, in a single field), in the right order, separated by at least one space and a dollar sign. WORK-NAME is then written to the output file. CITY, STATE, and ZIP are concatenated the same way.

Once COBOL has concatenated the data and written the output to a Spellbinder list, we can use a Spellbinder macro to chop the extra spaces between first and last name, and between city, state, and zip, down to a single space. The largest possible such string of extra spaces occurs between city and state. In the original file, CITY is 30 characters. If the name of the city in a particular record is only one character long, there will be 30 spaces and a dollar sign between CITY and STATE in that record. A rather simple-minded macro can search for 30 spaces and a dollar sign and reduce them to a single space, then search for 29 spaces and a dollar sign and reduce them to a

single space, etc. It's moronic, but quick, and we only need to do this once.

Here are the last 8 lines of the macro I used. To show the spaces more clearly, I have here represented them by `<`. `<` stands for a carriage return in a Spellbinder search command; one of the powerful features of Spellbinder is that it can search for carriage returns, and unspecified numbers, as well as ordinary ASCII characters.

```

t
sa/<<<<$/<$/
t
sa/<<$/<$/
t
sa/<$/</
t
sa/<<<<

```

Once all the extra spaces are gone, the new file serves as the data for a new SELECTOR V data base. SELECTOR can import data from files whose records end with a given character, or (like dBase II) are surrounded by quotation marks and separated by commas.

Next issue I will describe the actual structure of the data base, show how SELECTOR V manages it, and present a program to generate mailing labels from the data base.

LETTERS

May 26, 1990

Dear David:

I have been planning to write to you for months, but as I am the world's greatest procrastinator I am just now getting around to it. First I'd like to tell you how much I am enjoying *The Z-Letter*. I devour each issue as

soon as I receive it. The news, articles and ads are all great.

Next, I'd like to thank you for your editorial "What the World Needs Now" in issue #7. You stimulated me to define myself in relation to computers. I am not a hacker, though perhaps I hack some. I'm not so much a user, though I do

Socrates

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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!

MAGAZINES AND NEWSLETTERS

If you want 300 slick pages of full page advertising and press releases disguised as product reviews, you will be disappointed. Our publications reflect the tradition of user involvement in CP/M. You may even find yourself asked to write an article on something you've learned! Some publications to look at:

THE COMPUTER JOURNAL is the top-of-the-line in CP/M periodicals. Topics range from tutorials to advanced work in the operating system. Heavy emphasis on Z-System. Published six times a year. Subscriptions are \$18 per year. *The Computer Journal*, 190 Sullivan Crossroads, Columbia Falls MT 59912.

PIECES OF EIGHT is published by the *Connecticut CP/M Users Group*. Great degree of user involvement reflects the diverse interests of the members. Recent articles include making Basic 'Z-Smart', and installing a RAM disk. Membership including newsletter is \$15 per year. *CCP/M*, c/o Tom Veile, 26 Slater Avenue, Norwich CT 06360.

SLKUG NEWS is the newsletter of the *St. Louis Kaypro Users Group*. Don't let their name fool you — they support all kinds of CP/M machines. Articles include reviews of new products, offers for group purchases and tips on using applications. Membership including newsletter is \$18 per year. *SLKUG News*, 5095 Waterman Avenue, St. Louis MO 63108.

By the way, we are compiling a listing of all CP/M newsletters and periodicals. If you know of one that you feel is of value, let us know! A sample copy would be most appreciated.

CAN WE HELP?

One last avenue of support is *Socrates Z-Node 32*. We will copy any files you want from our system or extensive off-line archives for \$6 per disk (\$10 for foreign orders). Send \$2 for a listing of available files. Please make checks out to Chris McEwen, Sysop, and tell us what format you need. Proceeds go to the support of Z-Node 32.

Chris McEwen

Try one of these Remote Access Systems for support via modem:

Z-Node Central, Los Angeles	CA 213-670-9465	Z-Node 36, Pasadena	CA 818-799-1632
Z-Node 3, Newton Centre	MA 617-965-7259	Z-Node 45, Houston	TX 713-937-8886
Z-Node 4, Salem	OR 503-370-7655	Z-Node 50, Alice Springs, N.T.	
Z-Node 5, Montreal QC CANADA	514-324-9031		AUSTRALIA 5750 61-089-528-852
Z-Node 6, Drexel Hill	PA 215-623-4040	Z-Node 58, Oklahoma City	OK 405-943-8638
Z-Node 9, San Diego	CA 619-270-3148	Z-Node 62, Perth,	
Z-Node 10, Mill Creek	WA 206-481-1371		Western AUSTRALIA 61-9-450-0200
Z-Node 11, Chicago	IL 312-764-5162	Z-Node 65, Cheyenne	WY 307-638-1917
Z-Node 12, Newington	CT 203-665-1100	Z-Node 66, Costa Mesa	CA 714-546-5407
Z-Node 15, Manhattan	NY 212-489-7370	Z-Node 73, Ballwin	MO 314-821-1078
Z-Node 20, Burnaby, BC CANADA	604-299-0935	Z-Node 77, Austin	TX 512-444-8691
Z-Node 21, S Plainfield	NJ 201-757-1491	Z-Node 78, Olympia	WA 206-943-4842
Z-Node 32, S Plainfield	NJ 201-754-9067	Z-Node 81, Lancaster	CA 805/949-6404
Z-Node 33, Enid	OK 405-237-9282		

use some. And I'm not a programmer, though I do sometimes try a bit of assembly, especially in trying to install or modify programs to fit my hardware. When I read your editorial, I thought to myself, "Aha, that's me. I am a Collector." On further reflection, although I collect CP/M computers and stuff, Hoarder probably is a more accurate label.

I've been fussing with computers since since late 1981. Perhaps you or your readers have some interest in "where I've been". Though my wife claims I have spent a fortune on my stuff I counter with "I got a great deal on a discount!" and "I got it for next to nothing at Zero G, or at Wacky Willie's." My wife says that's a lie.

Zero G is my favorite electronics store in Corvallis, Oregon. Chuck, the owner, collects lots of good salvage as well as having cable and connectors and stuff. Wacky Willie's is a fabulous salvage store in Portland, actually two stores. I have found bargains in disk drives, cabinets, terminals, keyboards and all manner of other things there.

Following is a more or less chronological account of my acquisitions over the years since my first purchase in 1982.

Computers

Actually I have 5 CP/M machines here at home. All are working and all have ZCPR v3.4, mostly with ZDDOS. My first computer is a California Computer Systems S-100 machine. It weighs 170 pounds and has dual 8" drives. Recently I found a SemiDisk 1-meg RAM disk, which greatly speeds up the action. I use a Wyse 60 terminal but also have a Falco TS-1 and a Televideo 970.

My Kaypro II (serial # 9838) was acquired in the fall of 1982. It is my favorite machine, and is much modified. A Micro Cornucopia Pro-8 ROM is installed, clock modified to 5 MHz, Kenmore Z-Time clock, modification for DSDD 5¼" disks, DSQD 5¼" disks, and 8" disks. So it will read and write Kaypro II, 4 and 8 disks, and IBM 3740 8" disks. There is also a Microsphere 1-meg RAM drive. The RAM drive, one TEAC SSDD drive, and two TEAC

quad-density drives are all mounted in the box. There is also a Microsphere composite video output which I don't use. Of course I have installed a hefty power supply, and a battery and charger which keeps the RAM disk for up to 5 hours in case of power failure or if I want to move the machine.

The latest addition is a Corvatek KEY-UP interface which allows me to use any serial keyboard (AT or XT type). This is great. Currently an Omnikey Ultra keyboard (Northgate Computer Systems) is installed. The keyboard is very versatile and even converts to Dvorak as well as QWERTY key layout. The KEY-UP interface is also extremely versatile. It allows all keys on the keyboard to be programmed at will. So keys can be reassigned, or macros can be defined. This works much better than a software key changer because it doesn't use up computer memory. [See the Corvatek ad elsewhere in this issue for more information. DAJM]

In 1985 Southern Pacific Limited, a Japanese concern, marketed Z-80 and HD 64180 single-board computers. I assembled their LAT-1, an HD 64180 machine using CP/M 3.0. It includes a built-in 384K RAM drive, 6.1 MHz clock, serial and parallel I/O, and other features more sophisticated than I am. All this is housed in an Integrand case with one SSDD 5¼" drive, two 12-meg HD 5¼" drives, and a 20-meg hard disk. The BIOS is written to read and write almost any 3½", 5¼", or 8" drive. This is running Z3PLUS.

The next acquisition was a Bondwell 2. That's a portable Z-80 machine with LCD screen and one SSQD 3½" drive, and a 512K RAM disk. It has a Kenmore Z-Time clock but no other modification. It also is running ZCPR 3.4 and ZDDOS.

Last summer I acquired a couple of Kaypro II mother boards. After finding and replacing a bad chip or two on the boards, I installed each in an Ampex monitor with a single 5¼" quad-density drive. Also, the boards were upgraded with Micro Cornucopia ROMs and the 256K memory upgrade which produced a 191K RAM drive. So my daughter and wife each has their

own word-processing computer.

Along the way I assembled an Ampro Little Board Plus. It is in a small Intergrand case with two 5¼" quad drives. My wife uses it in her (physicians) office for word processing.

Printers

First came an Okidata 83, which is built like a tank. It is still in operation at my daughter's house. It is modified with a Rainbow ROM which makes it like an Okidata 93. Next, I acquired an IDS Prism 132. That was used in my office for several years for word processing. Neither of these has ever required maintenance except for occasional cleaning and ribbon change. My son has the Mannesman Talley Spirit printer. It works fairly well but it doesn't appear as stout as the Okidata or Prism.

Most have probably never heard of Epson's HS-80 Letterjet. It is a small (3"x5"x14") very portable, battery operated, inkjet printer I found once on sale. Print quality is only fair, it's slow, and it can only use single sheet paper.

Last year a Hewlett-Packard Deskjet 500 joined the fold. Now there is a printer! It is fast, very quiet, and has outstanding print quality. It is by far my favorite for quality printing.

I have recently adopted a Panasonic KX-P1124 24-pin dot-matrix printer. If I could have only one printer, that would be it. Although its print quality is not quite as good as the H-P, and it's noisier, it is very easy to use, print quality is very good, and it's very versatile, with many fonts and pitches available from the control panel on the front. Also, it costs less than half what the Deskjet cost.

Miscellaneous

Other hardware includes modems, keyboards, drives, isolation transformers, printed circuit boards (including some S-100 stuff) and lots of assorted parts. I hope I don't have to move soon.

Documentation

Most books published about CP/M are in my library, including (I think) all of Cortesi's, Barbier's, and Miller's books, and many on CP/M assembly-language programming.

Journals in my library include: *Computer Smyth* (complete), *CP/M Review* (complete), *Dr. Dobb's Journal* (until they abandoned CP/M), *Kuigram* (complete), *Lifelines* (many), *Microsystems* (1983-), *Micro/Systems Journal* (all), *Micro Cornucopia* (all), *Profiles* (all), *S-100* (all), *Supermicro* (all), and *User's Guide* (all). I don't wish to part with any of them but would be willing to give information out of them.

Software

Too numerous to mention. This is being typed on the LAT-1 using ZDE v1.3. Thanks to Eric Meyer and Carson Wilson. The address label and envelope are being typed on the Panasonic KX-P1124 using ZDB13, thanks to Joe Mortensen.

Yours Sincerely,

A. A. Straumfjord
31618 Bryant Way
Albany OR 97321

Thanks for sharing all that information with us, Al. Maybe it just seems interesting to me because I'm a collector, too. I contacted Corvatek and found they still have some of the KEY-UP interfaces; an ad for them appears elsewhere in this issue. Personally I wouldn't want to use a PC-style keyboard, as I dislike trying to type on them, but anything that expands our options is worth knowing. Certainly it's easier to get a Keytronics keyboard than a replacement keyboard for many old CP/M computers.

Thanks also for sending your letter on a disk, so I didn't have to retype it for publication. I always appreciate that.

June 2, 1991

Dear Dave,

Sorry to be such a bother . . . however, I am so fascinated with Spellbinder that I have spent

THE KEYBOARD INTERFACE

USE AN IBM STYLE KEYBOARD ON ANY* COMPUTER!

Plug an IBM style keyboard into **CORVATEK'S** KEY-UP interface, plug the interface into your computer, and you are ready to type.

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- Dvorak Option** Switch selectable option that changes character key positions to Dvorak.
- Key Click** Switch selectable option activates key click when any key is pressed.

POWER REQUIREMENTS

- KEYUP and keyboard together draw 700 ma. of current from the host computer. Switch selectable external power jack.

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- Size** 7.25" L. x 4.6" W. x 1.25" D. Beige metal box.

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| <input type="checkbox"/> DM-5 ASCII Universal | \$129.00 |
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NOTE: KEYUP is available for computers other than those listed. We also do custom key definitions and applications. Call for more information. Serial models available.

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| <input type="checkbox"/> KB 5150 (Dvorak) | \$112.00 |
| <input type="checkbox"/> KB 5151 (Dvorak) | \$164.00 |
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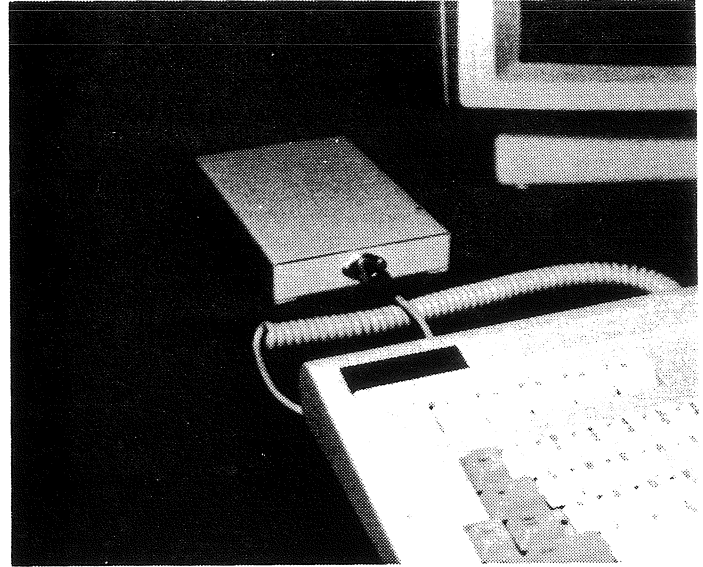
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* KEY-UP is used on any computer with a parallel or serial ASCII keyboard port.
 ‡ Same key placement as IBM keyboard.
 § Familiar typewriter key placement with separate cursor pad.
 † The UNIVERSAL has all of the signals necessary for the user to adapt to any ASCII keyboard port. TTL signals on a DB-25 connector. Requires the user to build his own cable.

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MODELS

DM-1 FOR BIGBOARD

- Cable ready to plug directly into Bigboard's Keyboard connector.
- Bell, Reset-in, Reset-out, and Type Ahead Buffer options available with hardware jumpers on host PC board.

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 jumperson Apple II PC board.

the better part of the last month (whenever I had some time) installing my Wyse 60 terminal and my Epson LX-80 printer.

I could have installed the MX-80 from the listing in the CONFIGSB program. However, I find it quite useful to renew my knowledge of my printer by going through the tedious exercises of installing it directly. This is quite a rewarding adventure; I recall characteristics of the printer I had forgotten about, and discover some I had not been aware of.

Thus far, the printer installation seems to be working quite well. There are a few little things I need to work on, like making sure, for example, that the currently used font is turned off and the printer returned to initial state when changing fonts. These are minor irritants which can be solved in numerous ways; e.g., by turning the printer on and off when a different font is to be used. *[Or by including the printer-reset code in the definition of the inline code which tells the printer to change fonts. DAJM]*

The one problem I am struggling with at the moment is getting the terminal to show the enhanced material in black letters against a dim background. (I suppose you call this "half intensity"; the Wyse manual calls it "dim display attribute".) What I am getting on the screen is a series of slashes which completely replace the enhanced material. However, when the text is displayed using the Spellbinder VIEW command, the enhanced material is displayed exactly as I coded the various SPECIAL CHARACTERS in the Y table. For example, I have coded "emphasized print" to be represented in VIEW by a combination of the Wyse's DIM and REVERSE attributes. This is exactly what I get. The same is true for all the other representations.

My only guess concerning what is happening is that, somehow, the primary enhanced code is embedded somewhere in the program and cannot be dislodged by the material in Table &1. In the example table, the codes shown are (and). These are taken from the Televideo 950 terminal. The Wyse 60 uses these codes to generate write protection. Could it be that these codes are hard-coded into Spellbinder and

cannot be dislodged, and are thus conflicting somehow with the codes I have tried to use?

By the way, the Wyse 60 is a flexible beauty to behold. It can be run in native mode, Wyse 50, 50+, or 100 modes, or various Televideo modes, including the 950. The comments I made above about installing my printer to renew my knowledge of its capabilities apply also to my terminal. I always run it in native mode and always go through the tedious installation procedures.

Look at this problem at your leisure and let me know if you have any suggestions. It is not a tragic situation; I can get around it in many ways. However, if I can resolve this one, it gives me more confidence in understanding how Spellbinder operates "under the hood".

As I mentioned on the phone, at some point I will send you a sort of critical review of Spellbinder. Thus far, it appears to be a lot more powerful than WordStar; not only easier to learn and use, but does quite a bit more tasks necessary for preparing manuscripts and other documents.

One immediate gripe which I thought inherent in Spellbinder was not listing at the top of the screen the name of the file being edited. I quickly learned, however, to get around this by using the .r command followed by the name of the file. This way, I can always go to the top of the file and remind myself of the file being edited. I am sure there must be better ways, but I have only gone through the middle of Chapter 4 thus far. I will be leaving in the next two days for the rest of June and will not have an opportunity to continue my practice sessions. However, I will try to do as much as I can to complete through Chapter 8 in the next two days. I will also take the manual with me and study it while I am away, every chance I get.

Incidentally, the laser printer that was advertised by DAK is an Office Automation Systems "Laserpro Silver Express". It runs at 8 ppm, emulates LaserJet+, Epson FX-80, Diablo 630, IBM Proprinter, Qume Sprint, and NEC Spinwriter. It comes with 33 built-in typefaces,

four of which are scalable fonts similar to Helvetica, Times Roman, Avant Garde, and Optima. It presumably lists for \$2800; DAK's price is \$900, which includes 15M RAM and a fistful of MS-DOS software.

Have a good summer. Keep up the good work with *The Z-Letter*, and get back to me at your own convenience. I appreciate folks like you who are doing a hell of a lot for the 8-bit community.

Brotherly,

Lloyd Hogan
211 N. Dyer Street
Elizabeth City NC 27909

Lloyd, I will look at the terminal-customization tables you sent me after I get this issue out, and see whether I can find anything wrong with them. Since I use Spellbinder as my editor, and do the actual printing on a LaserJet+ controlled by MagicIndex, I have not tried the kind of elaborate terminal customization that you're getting into. Most of the effects you describe I do on a laser by changing downloaded fonts. I'm glad to see that you're having a lot of fun exploring the vast potential of Spellbinder.

Spellbinder does not have a built-in function for the name of the input or output files. This is a philosophical question in the design as much as anything else; word processors that work on the file on disk should, I agree, tell you what file you're altering. When you use Spellbinder, you are not altering a file on disk; you've opened such a file, copied all or part of it to memory, and you're altering the copy in memory. If you save the file to the same name, or do other operations, you may then, and only then, alter the file on disk. If you save it under a different name, you have a different file.

There are several ways to display the file name. Consider the following macro, which I wrote and tested just now:

```
:%1 = $3
:%2 = $2
t
:%A = !
:%B = !
```

```
b0
f%1-1
:mc%2
:pr "#0/This file is named %B."
:in
```

This macro is based on the SAVE macro by B.V. Deltour, which was published in the October 1989 issue of the Eagle Computer Users Group newsletter. That macro, in turn, derives from the example on returning to your original starting point on pages 4-5 and 4-6 of the Spellbinder Macro Manual.

This NAMEIS macro assumes that your file begins with a remark giving the name of the file, such as

r SIS9106.LTR is the name of this file.

It also assumes that your file is small enough to fit into memory all at once, since otherwise this remark won't be in the edit buffer. Anyway, the first two lines save the line and column, respectively, where the cursor was when you invoked the macro. The T command then moves the cursor to the top of the edit buffer, where your remark is. :%A = ! stores the first token of your remark (the .r) in a text variable. The next line stores the second token, the file name, in text variable %B. The next three statements move the cursor to column 1, then moves the cursor forward and down from there to restore it to where it was before it went off to read the file name. The statement :pr "#0/This file is named %B." displays a message like

This file is named SIS9016.LTR.

at the top left of your screen, and the :in command makes Spellbinder wait until you hit any key before erasing the message and resuming normal operation. Del's SAVE macro works similarly, except that it automatically writes the file to disk with the name in the remark:

```
:%1 = $3
:%2 = $2
t
:%A = !
:%B = !
b0
wo/%B
w/wd
f%1-1
```

THE STAUNCH 8/89'er
--> Generic CP/M Software <--

ACANAL (By Gary Appel) \$6
An electronic analysis program to perform AC nodal analysis on an electronic network. Element types may be: resistor; capacitor; inductor; transconductance; transmission line, open line stub, and shorted line stub; coupled inductors (transformer); quartz or ceramic resonator; two-pole monolithic resonator; and transistor (hybrid PI model). Various input/output and gain parameters permitted. Calculations are single-precision.

dBASE II PROGRAMMER'S NOTEBOOK (By Steven G. Meyerson) \$6
Originally published as a booklet in '83 and '84, this is a collection of tips and routines for using dBASE II and writing applications in its command language. Included are hints for using FIND, DO CASE, QUIT TO, semicolons, justification, report column headings, the STR and TRIM functions, terminal and printer commands, sorting, debugging, displaying logical fields, linking database files, two-column printing, menus, error checking, and even a flashing display using H/Z-19/89 terminal codes. As a bonus, it also includes S-MAIL, a mailing list package for dBASE II that features menu-driven operation; adding, listing, deleting, reviewing and altering records; printing labels; and archiving deleted records.

FILEBASE (By Tom Markowitz, EWDP Software) \$6
A "variable-length field" database manager which EWDP is releasing as shareware. Fields are in "comma-delimited ASCII" format, such as those created by BASIC and other higher-level languages or WordStar's MAILMERGE add-on. Defining field length or type (character or numeric) are therefore **not** required when setting up a database. Functions include adding fields, appending records, calculations, indexing, joining existing fields, restructuring the file layout, sorting, and printing reports and/or labels. Registration information for support and a printed manual is embedded in the program. But the package is menu- and prompt-driven, so you may never need the manual.

LUCIDATA PASCAL (By D.Gibby and L.Reeve) Version 3.8 \$25
A substantial subset of the Pascal language, the compiler translates your ASCII source code into a file of p-code ("pseudo"-code). That file is then interpreted by a run-time system (PRUN or RUNCOM). This results in a language package that is faster executing than conventional interpreters, yet the p-code file is generally smaller than equivalent code produced by a conventional assembler. If independence from the run-time system is desired, a command-line pragmat can combine the run-time system with your p-code file. If execution speed is critical, a p-code program included with the package will translate p-code files to source code for Microsoft's M80 assembler and linker. Not as extended as Borland's Turbo, nor as fast during compile. Includes a 100-page hardcopy manual.

MAGIC WAND/PEACHTEXT HELP (By Kirk Thompson, Randall Stokes, and Hank Lotz) \$6
This package for Magic Wand, PeachText 9, and PeachText 5000 word processors has three parts. One is menu-driven online HELP set up as an include file. This is a command reference to both EDIT and PRINT. Another is PROCESS, a print preprocessor. This program lets you directly support the custom features of your dot-matrix printer (such as underlining and italics). The program, as supplied, supports Gemini printers. Instructions are included for editing the ASM file and assembling a custom version for your own printer. The third part of this package is SALVAGE, a utility for recovering a MW/PT file from memory after an abort, BDOS error, or system reset.

MCOLS (By Hank Lotz) \$6
A utility that creates multiple-column listings from a single-column input file. The user specifies the number of columns (2 to 13), space between them, effective page width and length and horizontal pitch, and the record to start at. It also lets you direct the output to a disk file as well as console or printer.

The Staunch 8/89'er General Software Catalog \$6
Staunch's holdings are too extensive to list here. An on-disk catalog of software for CP/M and HDOS is available. Much of the software has been released to Staunch by various vendors or Staunch subscribers.

Note: 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, Televideo, or Xerox); and PC-XT.

Kirk L. Thompson
Editor, **The Staunch 8/89'er**
P.O. Box 548, West Branch, IA 52358
Voice: 319-643-7136 (eves and weekends)

.mc%2

To use either of these macros, type them exactly as shown, then save them to disk as files NAMEIS.WPM and SAVE.WPM. To run them, load them by hitting the LOAD key on your Eagle, or typing AD in command mode if you have some other computer. They will execute when loaded. Once loaded, they can be executed again whenever you wish by typing A in command mode, or

continue in edit mode (continue is the vertical ENTER key at the far right of the keyboard on an Eagle; for any other machine, continue is control-A).

If the file is too big to fit in memory all at once, these simple macros will not work. The macros that will work are too elaborate to present in the Letters column; I hope to find the time to write them up in a future issue.

PERSONAL ADS

H89 for sale

Working H89 with Magnolia disk controller running three half-height soft-sector floppy-disk drives in an external box. The original full-height hard-sector floppy-disk drive is still in the case. Full documentation, software. \$50 or best offer. Call Floyd Knapp, (408) 996-1444.

Communications program wanted

Looking for any telecommunications program that runs under the CP/M-86 operating system. Please call Jimmy Childers in Charlotte NC at (704) 399-8404 extension 17 during business hours East Coast time if you have one. [Note: this is 16-bit CP/M and will not run CP/M or MS-DOS programs! – DAJM]

Disk drives for sale

Two Eagle IIE SSDD 96-tpi drives in working condition (machine converted to double-sided drives). \$50 each or best offer. Call (415) 455-8022; ask for Don or Jacquie.

Geneva parts for sale

Epson PC-8 (Epson Geneva, a CP/M laptop) mother board and keyboard, \$50. Contact Lowell Schneider, P.O. Box 680693, Houston TX 77268, or phone (713) 288-5113.

S-100 book available

Herb Johnson has *Interfacing to S-100/IEEE-696 Microcomputers*, by Sol Libes and Mark Garrett, for \$19.95 plus shipping (list price is \$24.95). Call him at (719) 578-0997.

MAGAZINE ARTICLES

The following magazines were received in approximately the last month. 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.

Circuit Cellar INK, issue 20, April/May 1991. No relevant articles this issue. Hardware journal. Circuit Cellar INK Subscriptions, P.O. Box 3050-C, Southeastern PA 19398; \$17.95 per year (6 issues).

COG Wheels, Vol. 9 No. 8, 5/11/91. No articles

as such, but whole contents of interest to Osborne and Kaypro users. Cincinnati Osborne Group, c/o David Haldeman, 2063 Beechmont Ave., Cincinnati OH 45230; \$20 per year.

The Computer Journal, #49, March/April 1991. *Computer Network Power Protection*, by Wendell H. Laidley. *Controlling Home Heating and Lighting*, by Jay Sage. *Getting Started in Assembly Language*, by A. E. Hawley. *The Z-System Corner: Putting the NZCOM Virtual BIOS to Work*, by Jay Sage. *PMATE/ZMATE Macros: 2. Terminology and Utility Subroutines*, by Clif Kinne. *Z-Best Software: Birth of a New Program*, by Bill Tishey. Main Z-System magazine. See the ad elsewhere in this issue for subscription

information.

Computer Monthly, June 1991. *WordStar's Page Control Dot Commands*, by Benjamin H. Cohen. *Novice Notes On WordStar 4*, by Thomas McEnroe. *SuperCalc On the Osborne 1 Wide Screen*, by Donald A. Baumann. An official outlet for FOG news. Regular columns for Coleco Adam, TI-99, Commodore 64 and 128, Timex/Sinclair, Apple II, TRS-80, as well as PC, Mac, Amiga, and other incompatible computers. Listings of bulletin boards and user groups every issue. Lots of ads, some for our computers. \$15.95 per year from Computer Monthly Subscriptions, P.O. Box 7062, Atlanta GA 30357-0062.

8 Bits and Change!, Vol. 1 No. 5, June/July 1991. *Trenton '91*, by Lee Bradley. *NZCOM and Trantor*, by Daryl D. Gehlbach. *A Z'ified PacPerson*, by Bruce Morgen. Lots of humor every issue, too. See ad for subscription information.

PC Publishing and Presentations, April-May 1991. *Fonts for the Forgotten*, by Daniel Will-Harris, lists sources of scalable typefaces for

the LaserJet III. June-July 1991. *Experiment With Type*, by Daniel Will-Harris. *Tracing & Tracking*, by Ross Smith. Of interest to publishers. Regular PostScript and typeface columns. Assumes you have the latest model PC and don't care about the price tag on printers. \$18 per year from PC Publishing and Presentations, P.O. Box 941909, Atlanta GA 30341-9958.

Publish, May 1991 and July 1991.

Silicon Valley Computer Society Journal, May 1991, June 1991.

The Staunch 8/89'er, issue 22/23 (Jan-Apr 1991). Many short articles, pretty specific to Heath/Zenith computers running either HDOS, CP/M, or the Z-System. Invaluable for Heath/Zenith owners. See the ad elsewhere for subscription information.

VMEbus Systems, June 1991. Not usually relevant to our community, but this issue has *Debugging your C language programs*, by Terry Shankland and John Black.

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. There is once again a guard, at the side lobby. He can see you on the security cameras, but it may take him a minute to come to the front

door and let you in. Sign in on the ECUG sign-in sheet; the guard will tell you which room we're meeting in.

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

June 8 meeting

Our June meeting was attended by David McGlone, Bill Bradley, Bob Vinisky, Bill Josephson, Bob Kowerski, Dick Dethlefsen, Dave Gauch, Shirley Welch, Dave Honkala, Jack Morse, Jerry Davis, and Rudy Stefenel. Repeated electronic mail messages to Tandem security were never acknowledged, but must have been received, because a guard was present. Since he hadn't been told *why* he was working there that morning, I told him about

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- Plu*Perfect Systems
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 - 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, extremely flexible regular-expression text file scanner (\$50)
- ZMATE: macro text editor and customizable wordprocessor (\$50)
- BDS C — including special Z-System version (\$90)
- 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)
- NightOwl (advanced telecommunications, CP/M and MS-DOS versions)
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our group, and when we met. With only one guard, he must sit in the side lobby, where all the monitors for the security cameras are, rather than the front lobby, so people arriving at odd times may not be seen immediately. Please be patient if he does not come let you in right away.

At the Foothill Flea Market, before the meeting, I got an enclosure with two disk drives, a Xebec S1410 manual, and a NEC Starlet with manuals. The Xebec S1410 is the hard-disk controller in the Eagle IV, Eagle V, File 10, and File 40. I made 8½x11 copies of it for myself, Jerry Davis, Bob Vinisky, and Rudy Stefenel; these will be delivered at our next meeting. The NEC Starlet is a CP/M laptop; I had never set eyes on one before, though I had heard of them.

Jerry Davis spoke on installing the Micro Solutions MatchPoint and CompatiCard IV in my Tandem 6AX (more on this in an article in the near future). He also recommended a powerful but relatively inexpensive desktop-publishing package called Textra, \$95 plus \$4 shipping and handling, Ann Arbor Software, 345 S. Division, Ann Arbor MI 48104, phone (313) 769-9088.

June 15 gathering of vultures

Through Rudy Stefenel we learned that Lowell Schneider, who has run a computer, TV and VCR sales and repair business, was closing it and moving to Texas. Rudy, a friend of his whose repairs VCRs, Bob Vinisky, and myself got together the Saturday after the regular meeting to pick over what Lowell didn't consider worth moving. Everyone bought scads of junk with interesting potential. I came away with three Wyse 100 terminals (one that's supposed to be in working condition, one that may be, and one that definitely isn't), a whole box of Wyse 100 keyboards, an Epson Geneva carrying case, two TRS-80s (one that's supposed to work, and one that doesn't have drives or a drive controller), and a huge pile of manuals for various computers and terminals.

July 13 meeting and potluck

9:00 Meeting begins.

9:30 Bob Vinisky will demonstrate ZREMOTE by running his Eagle IV from Televideo 950 and Wyse 100 terminals.

12:00 ECUG meetings ends.

2:00 Potluck get-together at the home of Bill Bradley, 574 Belfast Court, Sunnyvale CA 94087, phone (408) 737-1171.

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.

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.

No PC software was received this month.

EAGLE HARDWARE BULLETIN

Eagle BIOS EPROMs as of June 17, 1985

Editor's note: Back when Eagle Computer was still in business, they maintained a tech support bulletin board, on which were posted a number of Eagle hardware bulletins such as this one. I print them here as a service to ECUG members with Eagle 1600s and Eagle PCs. We will print the others in months to come, thanks to David Banoff, who gave them to me on disk.

Machine	Part Number	Rev	Version	Socket	Date	Cksm	Desc
E-1600	62-2732-001	A	v. 1.01	u403 e	2/18/83	C8DC	BIOS
E-1600	62-2732-002	A	v. 1.01	u404 o	2/18/83	F862	BIOS
E-1600	62-2732-001	B	v. 1.03	u403 e	4/13/83		BIOS
E-1600	62-2732-002	B	v. 1.03	u404 o	4/13/83		BIOS
E-1600	62-2732-001	C	v. 1.03	u403 e	4/15/83		BIOS
E-1600	62-2732-002	C	v. 1.03	u404 o	4/15/83		BIOS
E-1600	62-2732-001	D	v. 1.04	u403 e	5/18/83	0681	BIOS
E-1600	62-2732-002	D	v. 1.04	u404 o	5/18/83	EA98	BIOS
E-1600	62-2732-001	E	v. 2.2	u403 e	7/13/84	7AC4	BIOS
E-1600	62-2732-002	E	v. 2.2	u404 o	7/13/84	1907	BIOS
E-PC	62-2764-001	A	v. 1.03	u1101	4/13/83	F894	BIOS
E-PC	62-2764-001	B	v. 1.04	u1101	4/22/83	02FC	BIOS
E-PC	62-2764-001	C	v. 1.2	u1101	8/31/83	FA3F	BIOS
E-PC	62-2764-001	D	v. 2.2	u1101	8/15/84	92BE	BIOS
E-PC	62-2764-001	E	v. 2.5	u1101	5/24/85	8C00	BIOS
E-PC	62-2764-002			u1103		9200	T-Test
Spirit/PC+	62-2764-003	A		u1101	11/3/83		BIOS
Spirit/PC+	62-2764-003	B		u1101	11/8/83		BIOS
Spirit/PC+	62-2764-003	C	v. 1.9	u1101	11/29/83	8C00	BIOS
Spirit/PC+	62-2764-003	D	v. 2.0	u1101	2/15/84	9E00	BIOS
Spirit/PC+	62-2764-003	E	v. 2.4	u1101	5/2/85	8A00	BIOS
Spirit/PC+	62-2764-004			u1103		9200	T-Test
Turbo	62-2764-007	A	v. 2.0	u706 e	3/19/84	3AB1	BIOS
Turbo	62-2764-008	A	v. 2.0	u506 o	3/19/84	434F	BIOS
Turbo	62-2764-007	B	v. 2.1	u706 e	4/3/84	43F7	BIOS
Turbo	62-2764-008	B	v. 2.1	u506 o	4/3/84	3B09	BIOS
Turbo GT	62-2764-007	C	v. 2.3	u706 e	1/9/85	0A3A	BIOS
Turbo GT	62-2764-008	C	v. 2.3	u506 o	1/9/85	60C6	BIOS
Turbo	62-2764-007	D	v. 2.4	u705 e	5/2/85	4207	BIOS
Turbo	62-2764-008	D	v. 2.4	u506 e	5/2/85	27F9	BIOS

Art Credits

The schematic of the ZPU card on our cover, and the timing diagrams on pages 9 and 11, were sketched by Herbert R. Johnson. Deborah Snaveley prepared the originals for printing in this issue on her Macintosh IIsi.

The Computer Journal

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- Programming the 8051, F68FC11, RTX and other specialized CPUs
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What You Write —

The Computer Journal is just that—a journal. Our readers provide many of the articles. If you have a paper on a significant aspect of micro-computers or embedded controllers, algorithms or programming, submit it for consideration. The spirit of the individual made the computer industry. At *TCJ*, we have never forgotten that.

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