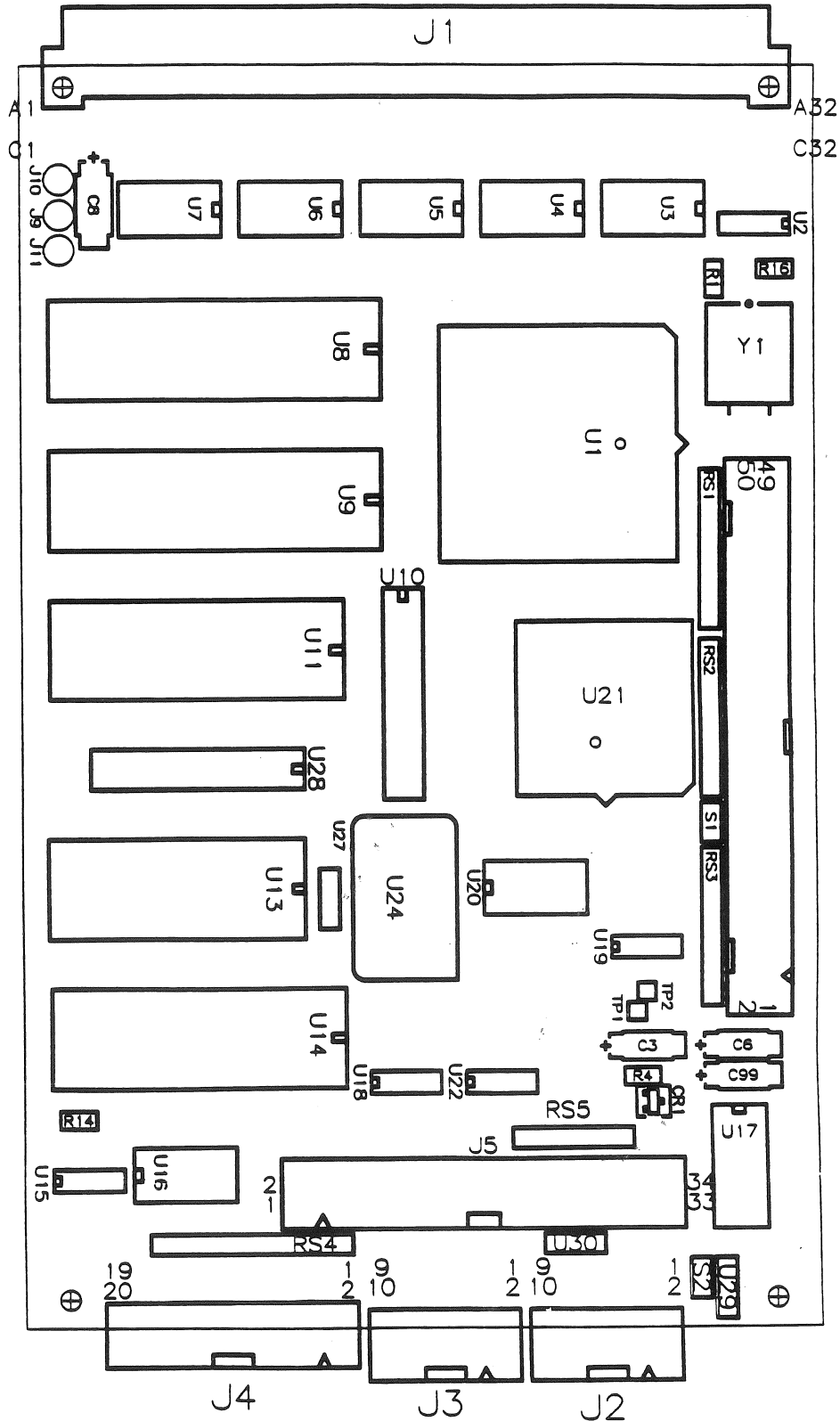


# The Z-Letter

Newsletter of the CP/M and Z-System community

Number 15

September 1991



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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

*The Z-Letter* is a monthly publication, and subscriptions will be accepted for 1 or 2 years. A subscription starts with the first issue after the subscription payment is received. The cost is \$15 per year for subscriptions mailed to U.S., FPO, or APO addresses. Canadian and Mexican

subscriptions cost \$18 per year. Other foreign subscriptions cost \$45 per year. Subscriptions should be paid by check or international money order in U.S. dollars, mailed to Lambda Software Publishing. Back issues cost \$2 apiece; every back issue is kept in print.

### How to read your mailing label

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

### Advertisements

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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 appears soon! Honest!

## BUILDING THE YASBEC COMPUTER

### I: Schematics and parts list

On July 23, 1991, Paul Chidley announced a new Z-System computer, the YASBEC, which stands for Yet Another Single-Board Eight-bit Computer. The YASBEC is a single-board computer, like the Micromint SB180, and uses the Zilog Z180 as its CPU (same as the Hitachi HD64180 used by the SB180). Its advantages over the SB180 are two. First, the YASBEC does not tie up a CPU address line to switch the ROM in and out, so it can directly address twice as much memory as the SB180. Secondly, Zilog is rumored to be working on an 18-MHz Z180, to be announced in the last quarter of this year. The chips chosen for the YASBEC are fast enough to run at this speed. So the YASBEC is potentially twice as fast as the 9-MHz SB180, and can address twice as much memory.

The YASBEC's big disadvantage is that it isn't being sold by an established company, with support, bundled software, already assembled and tested. The YASBEC is a kit, requiring some hardware expertise on the part of the purchaser (or a friend of the purchaser, in my case Jerry Davis) to buy the parts, solder them, test the assembled board, etc. Software is provided by third parties. No complete, assembled YASBEC system is available, while the SB180 can be purchased from Micromint fully-assembled in a case, with power, hard disk, and floppy-disk drives attached and working.

I estimate that the cost of a complete YASBEC system would be:

Basic YASBEC kit	\$95
Chips and other parts	\$120
Enclosure with power supply	\$100
Two floppy-disk drives	\$60
32-Mb hard-disk drive	\$150
Terminal console device	\$125
 Total estimated cost	 \$650

Remember, this is only an estimate. The \$95 U.S. is firm; Paul is charging \$110 Canadian for the YASBEC. The other figures should

probably be regarded as maximum figures, as you can probably find these items for less. A Televideo 801 case, for example, would make a perfectly good enclosure, and they can be found in this area of around \$20. I have seen working floppy-disk drives at flea markets for \$10. Terminals can sometimes be found for as little as \$20, though the \$125 seems to be the going rate. Weird Stuff, in my area, has several Televideo 970 terminals for \$99 each.

I have ordered and received my YASBEC, and as the project progresses, I will report in *The Z-Letter* what Jerry and I do, and how much each part costs. I urge you not to wait until the series is done, but to order a YASBEC from Paul and proceed on your own. I would be glad to hear from other YASBEC purchasers, and the community will be richer for having the experience of many builders published. The address is Paul Chidley, 162 Hunterhorn Drive NE, Calgary, Alberta, Canada T2K 6H5, phone (403) 274-8891.

When my YASBEC arrived, I opened it eagerly. The very small package contained the printed circuit board, which had certain components already attached by a process known as surface mounting. Most of the components are not attached; they have to be bought and soldered on. The CPU, particularly, should be inserted into a socket, rather than soldered onto the YASBEC board directly, so that it can be replaced easily when the 18-MHz Z180 becomes available.

Besides the circuit board, the YASIO-1 I/O logic and 128MEM2 memory logic PALs were included, along with complete schematics and parts list for the YASBEC. The EPROM was not included because Paul is still working on it; I choose to go ahead, trusting that the EPROM will be ready and sent to me before I need it.

Our cover this issue shows the layout of the chips and connectors on a YASBEC that's been fully-assembled. The other schematics, reduced in some cases to fit our 8½ x 11" page format,

appear on the following pages, as do the parts lists and suggested sources. Paul has given me full permission to print the whole thing, and I have made no alterations except some photoreduction.

The next installment of *Building the YASBEC* will describe where I found the various chips, and how much they cost there. If possible, single and multiple-unit prices will be given. A user's group could reduce the cost of each member's YASBEC by buying the chips in quantity. Often, buying even 10 chips instead of 1 reduces the cost of each chip significantly.

The YASBEC offers two significant opportunities for anyone who wants to make a

little money and help our community. First, Paul is willing to sell the board at little more than cost to anyone who wanted to sell assembled and tested boards, or even complete systems. Someone with the necessary skills and a little front money could probably make some money selling complete systems at \$900, or even less (buying parts in quantity). Second, the chips in the list are CMOS. This low-power, high-speed arrangement cries out for someone to put a YASBEC in a laptop case and give us the first Z-System laptop with a full screen and a decent keyboard. If anyone does so, I would be *delighted* to print his or her how-to article. I believe that someone who combined these two ideas would find a large, untapped market for powerful laptops that run CP/M applications.

**Advertisers this issue**  
Alphabetical by advertiser

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For: CP/M Users with a sense of humor
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Mr Bradley
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Address: 24 East Cedar Street Newington, CT 06111
<input type="checkbox"/> called for you <input checked="" type="checkbox"/> stopped by <input checked="" type="checkbox"/> wants to hear from you
<b>Message:</b> Remember Pieces of 8? It's back, better than ever as <u>Eight Bits &amp; Change</u> , a bimonthly newsletter filled with humor, tutorials, graphics and fine technical articles. Only \$15 per year in the U.S. (\$18 in Canada and \$21 foreign.) Subscribe today! Satisfaction guaranteed!

**YASBEC BILL OF MATERIALS - Rev. 1.0 Aug 22, 1991**

Ref#	Item#	Part#	Description	Geometry
------	-------	-------	-------------	----------

**Circuit Board and Custom Parts:**

		YASBEC-E	printed circuit board	
U11	24	Act# 4E198	Eprom 27C256	dip28
U28	31	YASIO-1	PAL16L8BCN	dip20
U10	31	128MEM1	PAL16L8BCN	dip20

**Surface Mounted Components:**

C1	30	cap1	10 pf capacitor	805
C2	30	cap1	10 pf capacitor	805
C3	3	Act# 2T101	10 uf tant capacitor	smd_ta_c
C4	29	cap	0.1 uf capacitor	1206
C5	29	cap	0.1 uf capacitor	1206
C6	1	475K10BH	4.7 uf tant capacitor	smd_ta_c
C8	2	Act# 2T102	33 uf tant capacitor	smd_ta_d
C9	29	cap	0.1 uf capacitor	1206
C10	29	cap	0.1 uf capacitor	1206
C11	29	cap	0.1 uf capacitor	1206
C12	30	cap1	1500 pf capacitor	805
C99	3	Act# 2T101	10 uf tant capacitor	smd_ta_c
CR1	14	MBAV99T1	bav99	sot23
R1	36	res2	4k7 ohm	805
R2	36	res2	470k ohm	805
R4	36	res2	470k ohm	805
R5	36	res2	4k7 ohm	805
R6	36	res2	4k7 ohm	805
R7	36	res2	4k7 ohm	805
R8	36	res2	4k7 ohm	805
R9	13	res2	0 ohm resistor (jumper)	805
R10	13	res2	0 ohm resistor (jumper)	805
R11	13	res2	0 ohm resistor (jumper)	805
R12	13	res2	0 ohm resistor (jumper)	805
R13	36	res2	100 ohm	805
R14	36	res2	4k7 ohm	805
R16	35	res	4k7 ohm	1206
U2	11	MM74HC08M	74HC08	soic14
U3	15	MM74HCT245WM	74HCT245	soic20
U4	15	MM74HCT245WM	74HCT245	soic20
U5	15	MM74HCT245WM	74HCT245	soic20
U6	15	MM74HCT245WM	74HCT245	soic20
U7	15	MM74HCT245WM	74HCT245	soic20
U15	10	MM74HC74AM	74HC74	soic14
U16	17	MM74HC374WM	74HC374	soic20
U17	25	MAX239CWG	MAX239	soic24
U18	20	74ACT00SC	74ACT00	soic14
U19	19	MM74HC14M	74HC14	soic14
U20	16	MM74HC273WM	74HC273	soic20

**YASBEC BILL OF MATERIALS - Rev. 1.0 Aug 22, 1991**

Ref#	Item#	Part#	Description	Geometry
U22	18	74ACT04SC	74ACT04	soic14
U23	10	MM74HC74AM	74HC74	soic14

Misc. Components

RS1	34	Act# 4A239	220/330 ohm terminator sip	1 x 8
RS2	34	Act# 4A239	220/330 ohm terminator sip	1 x 8
RS3	34	Act# 4A239	220/330 ohm terminator sip	1 x 8
RS4	12	Act# 4A315	4k7 ohm 9 res. bussed sip	1 x 10
RS5	33	Act# 4A321	330 ohm 5 res. bussed sip	1 x 6
S1	8	n/a	jumper pins	1 x 2
S2	8	n/a	jumper pins	1 x 2
U24	4	Act# 68105	8 MHz Oscillator Module	osc14
Y1	39	Act# 68005	crystal 18.432 MHz	xtal_flat
U27	5	n/a	link_2way	3x1
U29	5	n/a	link_2way	3x1
U30	5	n/a	link_2way	3x1

Standard Socketed Components:

U1	27	Z8018010VSC	Z180	plcc68
U8	28	TC551001PL-10	Static Ram	dip32
U9	28	TC551001PL-10	Static Ram	dip32
U13	22	9511A / 8231A	Arith. Math Processor	dip24w
U14	26	WD-1772-02	Floppy controller	dip28
U21	23	DP5380V	SCSI controller	plcc44

Connectors:

J1	32	Act# 20300	din-64 rows a & c	2 x 32
J2	6	IDH-10LP-SR3-TG	10 pin header, right angle	2 x 10
J3	6	IDH-10LP-SR3-TG	10 pin header, right angle	2 x 10
J4	37	Act# 58315	20 pin header, right angle	2 x 20
J5	7	Act# 58318	34 pin header	2 x 17
J9	9	n/a	push pin	1 x 1
J10	9	n/a	push pin	1 x 1
J11	9	n/a	push pin	1 x 1
U32	21	Act# 58322	50 pin ide ribbon connector	50x2

Sockets:

Act# 5308	leaded 68 pin plcc	plcc68
Act# 5306	leaded 44 pin plcc	plcc44
Act# 23027	600mil dip, 32 pin	dip32
Act# 23027	600mil dip, 32 pin	dip32
Act# 23024	300mil dip, 20 pin	dip20
Act# 23024	300mil dip, 20 pin	dip20
Act# 23040	600mil dip, 28 pin	dip28
Act# 23040	600mil dip, 28 pin	dip28
Act# 23010	600mil dip, 24 pin	dip24w

**YASPARTS - BILL OF MATERIALS NOT INCLUDED IN PCB KIT.**

Ref#	Notes:	Vendor	Vendor#	Manufacturer	Manu. Part#	Description	Geometry
<b>Misc. Components</b>							
RS1	-	Newark	46F4372	Bourns Inc.	4308R-104-221/331	220/330 ohm terminator sip	1 x 8
RS2	-	Newark	46F4372	Bourns Inc.	4308R-104-221/331	220/330 ohm terminator sip	1 x 8
RS3	-	Newark	46F4372	Bourns Inc.	4308R-104-221/331	220/330 ohm terminator sip	1 x 8
RS4	-	Newark	81F9208	Bourns Inc.	4610X-102-472	4k7 ohm 9 res. bussed sip	1 x 10
RS5	-	Newark	81F9206	Bourns Inc.	4606X-102-331	330 ohm 5 res. bussed sip	1 x 6
U24	-	Newark	44F4208	Dale	XO-43B 8.0	8 MHz Oscillator Module	osc14
Y1	-	Newark	81N2541	SPC	MPC-18-1843	crystal 18.432 MHz	xial_flat
S1	1				n/a	jumper pins	1 x 2
S2	1				n/a	jumper pins	1 x 2
U27	1				n/a	link_2way	3x1
U29	1				n/a	link_2way	3x1
U30	1				n/a	link_2way	3x1
Note 1:	Use ;	Newark	90F6625	Robinson Nugent	NSH-36SB-S2-T	break to appropriate lengths	1 x 36
Note 1:	Use ;	Newark	90F6349	Robinson Nugent	HPS-02-G	Header Shunts, 3 needed.	

**Standard Socketed Components:**

U1	2	Newark	??	Zilog	Z8018010VSC	Z180, 10MHz	plcc68
U8	3		28	Toshiba	TC551001PL-10	128k x 8 Static Ram, 100nS	dip32
U9	3		28	Toshiba	TC551001PL-10	128k x 8 Static Ram, 100nS	dip32
U14	4	EasyTech	26	Western Digital	WD-1772-PH02	Floppy controller	dip28
U21	5		23	National Semi	DP5380V	SCSI controller	plcc44
U13	6	Active	22	AMD	9511A	Arith. Math Processor	dip24w

Note 2: Zilog part available from Newark and Active Components. Sub; 12 MHz or Hitachi 64180Z

Note 3: Any make 128K x 8 full cmos static ram, 32pin 600mil dip. Pseudo statics cheaper but use more power.

Sources; Microprocessors Unlimited, B.G. Micro, Active, EasyTech, etc.

Note 4: Sub; VL-1772-02PC from VTI (VLSI Technology, Inc).

Note 5: Sub; DP8490V or ANY 5380 chip in a 44 pin plcc package. Check IC Master, many makes.

Note 6: Sub; Intel 8231A Optional, only needed for applications specifically written to use it.



**YASPARTS - BILL OF MATERIALS NOT INCLUDED IN PCB KIT.**

Ref#	Notes:	Vendor	Vendor#	Manufacturer	Manu. Part#	Description	Geometry
<b>Connectors:</b>							
J1	7	Newark	90F6341	Robinson Nugent	DIN-64CPB-SR1-TR	din-64 plug rows a & c, right angle	2 x 32
J2	8	Newark	90F6623	Robinson Nugent	IDH-10LP-SR3-TG	10 pin header, right angle	2 x 10
J3	8	Newark	90F6623	Robinson Nugent	IDH-10LP-SR3-TG	10 pin header, right angle	2 x 10
J4	8	Newark	90F6459	Robinson Nugent	IDH-20LP-SR3-TG	20 pin header, right angle	2 x 20
J5	8	Newark	90F6466	Robinson Nugent	IDH-34LP-S3-TG	34 pin header	2 x 17
U32	8	Newark	90F6474	Robinson Nugent	IDH-50LP-S3-TG	50 pin ide ribbon connector	50x2
J9	9				n/a	push pin	1 x 1
J10	9				n/a	push pin	1 x 1
J11	9				n/a	push pin	1 x 1

Note 7: Only needed to plug board into a backplane. Power comes from here or push pins.

Note 8: Break apart headers will work but shrouded parts recommended. Many subs available.

Note 9: Both pins and mates provided with the Yasbec.

**Sockets:**

n/a	10	Newark	87F6315	AMP	821574-1	plcc68	plcc68
n/a	10	Newark	87F6317	AMP	821575-1	plcc44	plcc44
n/a	11	Newark	14F3311	AMP	532-AG 12D	dip32	dip32
n/a	11	Newark	14F3311	AMP	532-AG 12D	dip32	dip32
n/a	12	Newark	44F7966	AMP	2-640464-1	dip20	dip20
n/a	12	Newark	44F7966	AMP	2-640464-1	dip20	dip20
n/a	13	Newark	44F7969	AMP	2-640362-1	dip28	dip28
n/a	13	Newark	44F7969	AMP	2-640362-1	dip28	dip28
n/a	14	Newark	44F7968	AMP	2-640361-1	dip24w	dip28
n/a	15	Newark	DS1216E	Dallas Semi	DS1216E	dip28	dip24w

Note 10: Sub any 'lead' 68 or 44 pin plcc socket.

Note 11: Sub any 32 pin, 600mil dip socket.. Machined easier to find than dual lead.

Note 12: Sub any 20 pin, 300mil dip socket..

Note 13: Sub any 28 pin, 600mil dip socket..

Note 14: Sub any 24 pin, 600mil dip socket..

Note 15: Optional SmartWatch socket, fits under 27C256 monitor rom.

Can be soldered in as socket for eeprom or plugged into regular eeprom socket.

**YASPARTS - BILL OF MATERIALS NOT INCLUDED IN PCB KIT.**

Ref#	Notes	Vendor	Vendor#	Manufacturer	Manu. Part#	Description	Geometry
------	-------	--------	---------	--------------	-------------	-------------	----------

Suggested sources: Vendor and vendor part numbers are provided only as a convenience to users. No recommendation of one vendor over another is intended or implied. Users are encouraged to heap praise or criticism on vendors via the CPM area of GENIE or their local CPM BBS to aid other users.

**Vendors:**

**NewArk Electronics** (Administrative Office, ask for the office nearest you and catalog)  
 4801 North Ravenswood Ave.  
 Chicago, IL 60640-4496  
 (312) 784-5100

**Active Components** (Administrative Office, ask for the office nearest you and catalog)  
**Telemarketing:** In the U.S.A. 1-800-677-8899  
 In the Canada 1-800-363-7601

**EasyTech** (Ask for catalog)  
 2917 Bayview Drive  
 Fremont, CA 94538  
 Order Direct: 1-800-582-4044  
 Fax Direct: 1-800-582-1255  
 Local: 415-770-2345

A Description of the YASIO-1 pal.

PAL16L8

;----- PIN Declarations -----

PIN 1	A7	COMBINATORIAL ; INPUT
PIN 2	A6	COMBINATORIAL ; INPUT
PIN 3	A5	COMBINATORIAL ; INPUT
PIN 4	A4	COMBINATORIAL ; INPUT
PIN 5	A3	COMBINATORIAL ; INPUT
PIN 6	A2	COMBINATORIAL ; INPUT
PIN 7	A1	COMBINATORIAL ; INPUT
PIN 8	A0	COMBINATORIAL ; INPUT
PIN 9	RD	COMBINATORIAL ; INPUT
PIN 10	GND	; INPUT
PIN 11	WR	COMBINATORIAL ; INPUT
PIN 12	IO_A7	COMBINATORIAL ; OUTPUT
PIN 13	IORQ	COMBINATORIAL ; INPUT
PIN 14	FPPCS	COMBINATORIAL ; OUTPUT
PIN 15	NCRCS	COMBINATORIAL ; OUTPUT
PIN 16	NCRDACK	COMBINATORIAL ; OUTPUT
PIN 17	FDCCS	COMBINATORIAL ; OUTPUT
PIN 18	PRINTERSTROBE	COMBINATORIAL ; OUTPUT
PIN 19	CREQCS	COMBINATORIAL ; OUTPUT
PIN 20	VCC	; INPUT

;----- Boolean Equation Segment -----

EQUATIONS

```

/CREQCS = /IORQ * /WR * /A7 * A6 * /A5 * /A4 * /A3 * /A2 * /A1 * /A0
/PRINTERSTROBE = /IORQ * /WR * /A7 * A6 * /A5 * /A4 * /A3 * /A2 * A1
/FPPCS = /A7 * A6 * /A5 * A4 * /A3 * /A2 * /A1
/NCRCS = /IORQ * /A7 * A6 * /A5 * A4 * A3
/NCRDACK = /IORQ * /A7 * A6 * A5 * /A4 * /A3 * /A2 * /A1 * /A0
/FDCCS = /IORQ * /WR * /A7 * A6 * A5 * /A4 * A3
        + /IORQ * /RD * /A7 * A6 * A5 * /A4 * A3
/IO_A7 = /A7

```

;-----

```

;
;          $00 - $3F // Z180 Internal I/O
;          /CREQCS = $40 // Control Register (74hc273)
;          /PRINTERSTROBE = $42 - $43 // Printer Strobe
;          /FPPCS = $50 - $51 // Floating Point Processor
;          /NCRCS = $58 - $5F // SCSI
;          /NCRDACK = $60 // SCSI DACK
;          /FDCCS = $68 - $6F // Floppy Disk Controller
;          $70 - $7F // Not Used
;          $80 - $FF // Off board I/O

```

A Description of the 32KMEM1 pal.

PAL16L8

```

;----- PIN Declarations -----
PIN 1          A19          COMBINATORIAL      ; INPUT
PIN 2          A18          COMBINATORIAL      ; INPUT
PIN 3          A17          COMBINATORIAL      ; INPUT
PIN 4          A16          COMBINATORIAL      ; INPUT
PIN 5          A15          COMBINATORIAL      ; INPUT
PIN 6          RD           COMBINATORIAL      ; INPUT
PIN 7          WR           COMBINATORIAL      ; INPUT
PIN 8          MREQ         COMBINATORIAL      ; INPUT
PIN 9          IORQ         COMBINATORIAL      ; INPUT
PIN 10         GND          ;
PIN 11         IO_A7        COMBINATORIAL      ; INPUT
PIN 12         EPROMCS      COMBINATORIAL      ; OUTPUT
PIN 13         SRAM1CS      COMBINATORIAL      ; OUTPUT
PIN 14         SRAM2CS      COMBINATORIAL      ; OUTPUT
PIN 15         MEMRD        COMBINATORIAL      ; OUTPUT
PIN 16         MEMWR        COMBINATORIAL      ; OUTPUT
PIN 17         IORD         COMBINATORIAL      ; OUTPUT
PIN 18         IOWR        COMBINATORIAL      ; OUTPUT
PIN 19         BUS_DIR      COMBINATORIAL      ; OUTPUT
PIN 20         VCC          ;

```

```

;----- Boolean Equation Segment -----

```

EQUATIONS

```

/EPROMCS = /MREQ * /A19 * /A18 * /A17 * /A16 * /A15
/SRAM1CS = /A19 * /A18 * A17 * /A16 * /A15
/SRAM2CS = /A19 * /A18 * A17 * /A16 * A15
/MEMRD = /RD * /MREQ
/MEMWR = /WR * /MREQ
/IORD = /RD * /IORQ
/IOWR = /WR * /IORQ
/BUS_DIR = /( A19 * /MREQ * /RD + IO_A7 * /IORQ * /RD )

```

```

;-----
;
; /EPROMCS = $0:0000 - $0:7FFF 32k x 8 Eprom (27C256)
; /SRAM1CS = $2:0000 - $2:7FFF 32k x 8 Static Ram
; /SRAM2CS = $2:8000 - $2:FFFF 32k x 8 Static Ram
; /BUS_DIR = Reverse data bus buffer for a
;             memory read from $8:0000 - $F:FFFF
;             or an i/o read from $80 - $FF
;

```

A Description of the 128MEM1 pal.

PAL16L8

----- PIN Declarations -----

PIN 1	A19	COMBINATORIAL	; INPUT
PIN 2	A18	COMBINATORIAL	; INPUT
PIN 3	A17	COMBINATORIAL	; INPUT
PIN 4	A16	COMBINATORIAL	; INPUT
PIN 5	A15	COMBINATORIAL	; INPUT
PIN 6	RD	COMBINATORIAL	; INPUT
PIN 7	WR	COMBINATORIAL	; INPUT
PIN 8	MREQ	COMBINATORIAL	; INPUT
PIN 9	IORQ	COMBINATORIAL	; INPUT
PIN 10	GND		;
PIN 11	IO_A7	COMBINATORIAL	; INPUT
PIN 12	EPROMCS	COMBINATORIAL	; OUTPUT
PIN 13	SRAM1CS	COMBINATORIAL	; OUTPUT
PIN 14	SRAM2CS	COMBINATORIAL	; OUTPUT
PIN 15	MEMRD	COMBINATORIAL	; OUTPUT
PIN 16	MEMWR	COMBINATORIAL	; OUTPUT
PIN 17	IORD	COMBINATORIAL	; OUTPUT
PIN 18	IOWR	COMBINATORIAL	; OUTPUT
PIN 19	BUS_DIR	COMBINATORIAL	; OUTPUT
PIN 20	VCC		;

----- Boolean Equation Segment -----

EQUATIONS

```

/EPROMCS = /MREQ * /A19 * /A18 * /A17 * /A16 * /A15
/SRAM1CS = /A19 * /A18 * A17
/SRAM2CS = /A19 * A18 * /A17
/MEMRD = /RD * /MREQ
/MEMWR = /WR * /MREQ
/IORD = /RD * /IORQ
/IOWR = /WR * /IORQ
/BUS_DIR = /( A19 * /MREQ * /RD + IO_A7 * /IORQ * /RD )

```

-----

```

;
; /EPROMCS = $0:0000 - $0:7FFF 32k x 8 Eprom (27C256)
; /SRAM1CS = $2:0000 - $3:FFFF 128k x 8 Static Ram
; /SRAM2CS = $4:0000 - $5:FFFF 128k x 8 Static Ram
; /BUS_DIR = Reverse data bus buffer for a
;           memory read from $8:0000 - $F:FFFF
;           or an i/o read from $80 - $FF
;

```

A Description of the 128MEM2 pal.

PAL16L8

```
;----- PIN Declarations -----
PIN 1          A19          COMBINATORIAL      ; INPUT
PIN 2          A18          COMBINATORIAL      ; INPUT
PIN 3          A17          COMBINATORIAL      ; INPUT
PIN 4          A16          COMBINATORIAL      ; INPUT
PIN 5          A15          COMBINATORIAL      ; INPUT
PIN 6          RD           COMBINATORIAL      ; INPUT
PIN 7          WR           COMBINATORIAL      ; INPUT
PIN 8          MREQ         COMBINATORIAL      ; INPUT
PIN 9          IORQ        COMBINATORIAL      ; INPUT
PIN 10         GND         ;
PIN 11         IO_A7       COMBINATORIAL      ; INPUT
PIN 12         EPROMCS     COMBINATORIAL      ; OUTPUT
PIN 13         SRAM1CS     COMBINATORIAL      ; OUTPUT
PIN 14         SRAM2CS     COMBINATORIAL      ; OUTPUT
PIN 15         MEMRD       COMBINATORIAL      ; OUTPUT
PIN 16         MEMWR       COMBINATORIAL      ; OUTPUT
PIN 17         IORD        COMBINATORIAL      ; OUTPUT
PIN 18         IOWR        COMBINATORIAL      ; OUTPUT
PIN 19         BUS_DIR     COMBINATORIAL      ; OUTPUT
PIN 20         VCC         ;
```

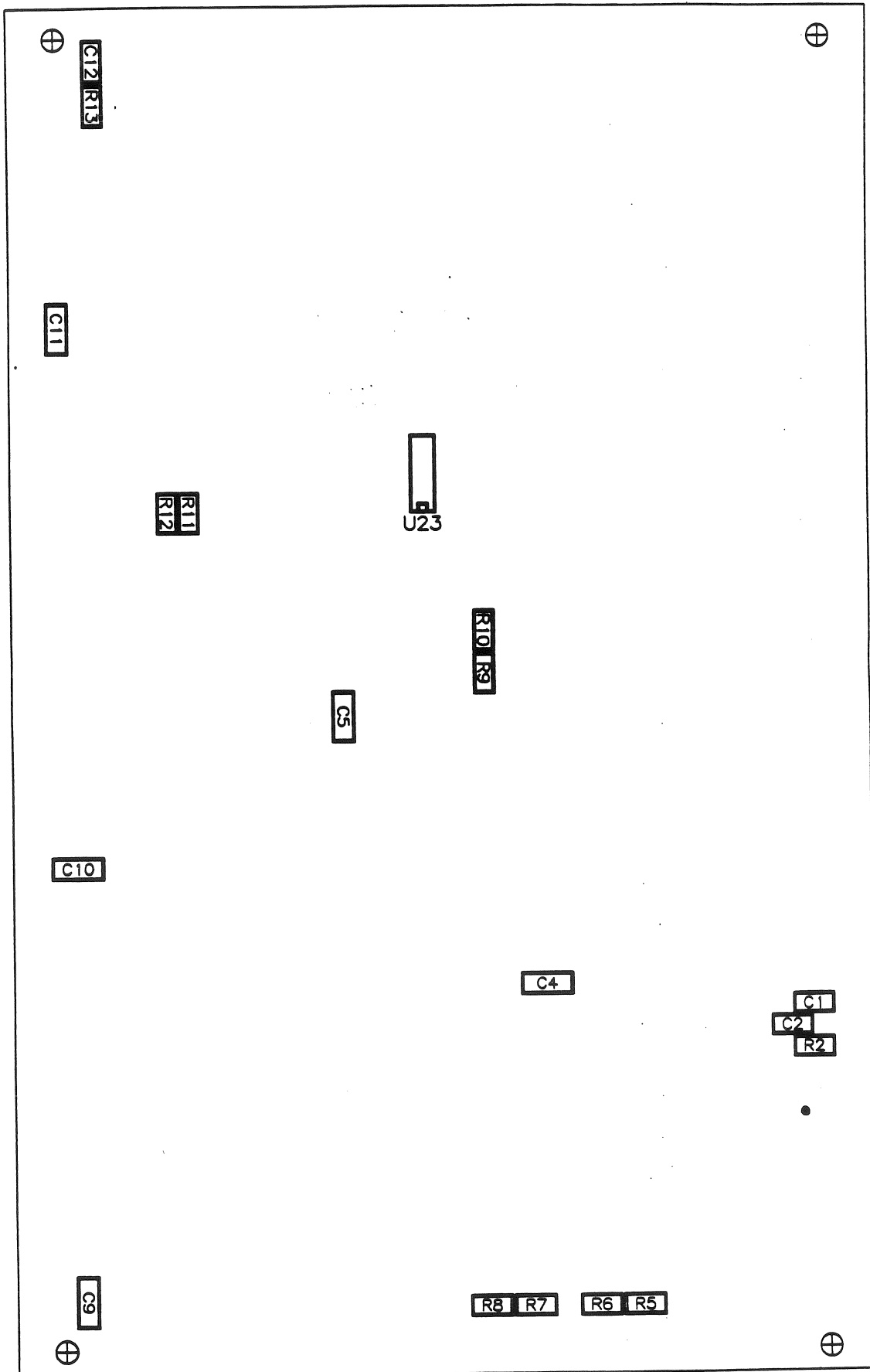
```
;----- Boolean Equation Segment -----
```

EQUATIONS

```
/EPROMCS = /MREQ * /A19 * /A18 * /A17 * /A16 * /A15
/SRAM1CS = /A19 * /A18 * A17
/SRAM2CS = /A19 * A18 * /A17
/MEMRD = /RD * /MREQ
/MEMWR = /WR * /MREQ
/IORD = /RD * /IORQ
/IOWR = /WR * /IORQ
/BUS_DIR =
/( A19 * /MREQ * /RD + A18 * A17 * /MREQ * /RD + IO_A7 * /IORQ * /RD )
```

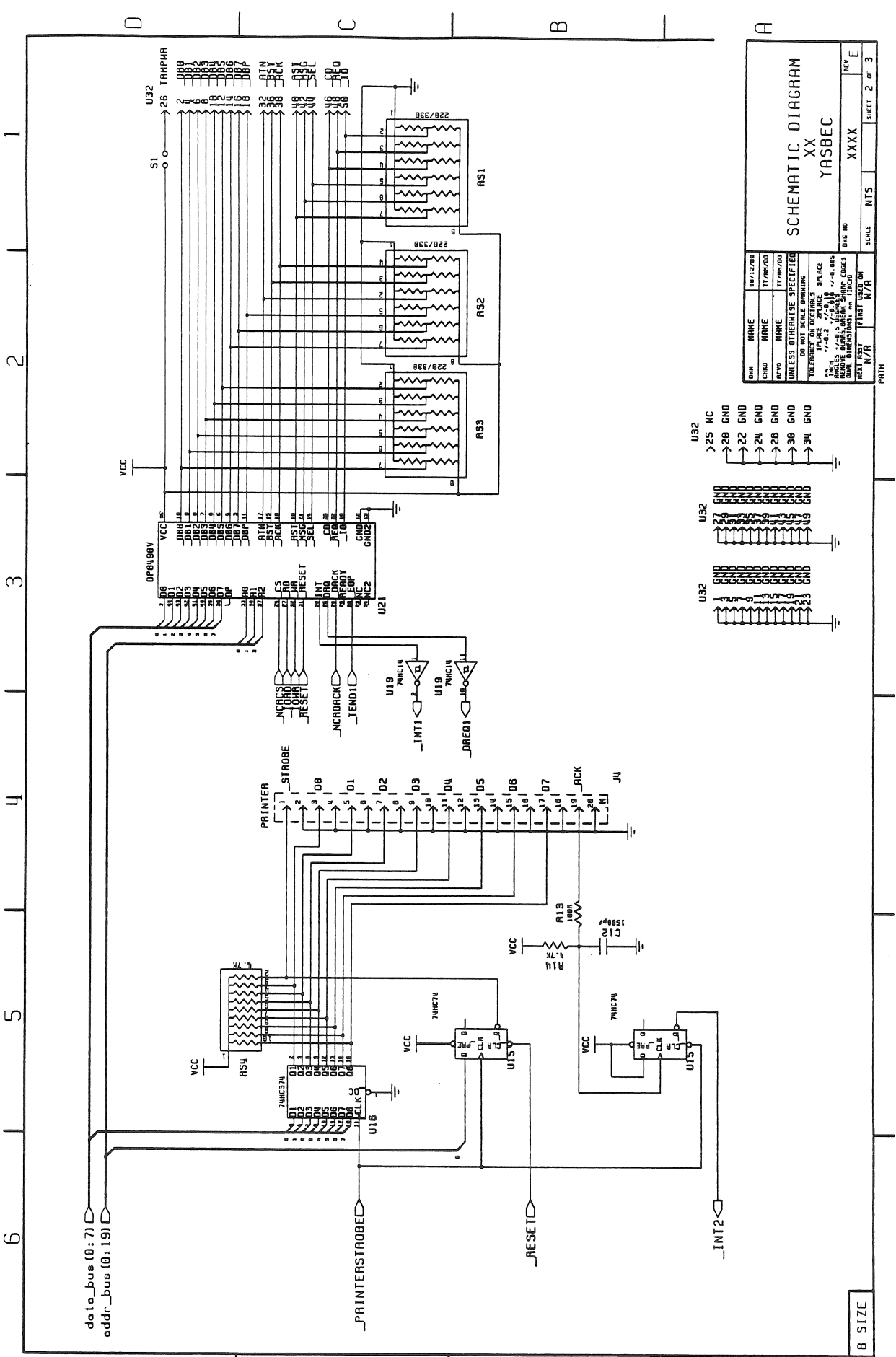
```
;rev 2: external ram now $6:0000 and up instead of $8:0000
```

```
;-----
;
; /EPROMCS = $0:0000 - $0:7FFF 32k x 8 Eprom (27C256)
; /SRAM1CS = $2:0000 - $3:FFFF 128k x 8 Static Ram
; /SRAM2CS = $4:0000 - $5:FFFF 128k x 8 Static Ram
; /BUS_DIR = Reverse data bus buffer for a
;             memory read from $6:0000 - $F:FFFF
;             or an i/o read from $80 - $FF
```









DATE	NAME	BY/DATE	REV
UNLESS OTHERWISE SPECIFIED			
DO NOT SCALE DIMENSIONS			
TOLERANCES ON DIMENSIONS			
FRACTIONS 1/16" 3/32" 1/8" 3/16"			
DECIMALS 0.03125 0.0625 0.125 0.25 0.5 1.0 2.0 3.0 5.0 10.0			
DIMENSIONS UNLESS OTHERWISE SPECIFIED			
HEAT SINK	N/A	FASTENING	N/A
SCALE			SHEET 2 OF 3
TITLE			REV
XXX			E

SCHMATIC DIAGRAM  
XX  
YASBEC

B SIZE



## 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)
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 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. Issues 1-6 are available both in the original 5½ X 8½" format, and enlarged to the 8½ X 11" format of issues 7-present, until copies of the older format run out. (Lambda)
- 7. The Z-Letter (subscription)** \$15/year (US), \$18/year (Canada & Mexico), \$45/year (all other)  
 Published monthly. (Lambda)
- 8. Z-Fonts catalog** \$3 (US, Canada, Mexico), \$5 (elsewhere)  
 Shows samples of all the fonts available from Lambda for HP LaserJet printers, with instructions on how to choose what size, orientation, etc. you wish. (Lambda)
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 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  
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I can copy most soft-sector double-density 5¼" CP/M formats, including Apple II CP/M. Sorry, no hard-sector formats except Northstar, 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.

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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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## SCRIPT OF THE MONTH CLUB

### Changing the maximum user area allowed by Jay Sage

For the past two months I have presented fairly large collections of relatively simple macros, even though the terms and conditions of the Script of the Month Club stipulate clearly that only one macro need be provided each month. Just so you don't get totally spoiled, this month you are going to get only what you paid for!

Just so the let-down won't be too great, however, this macro will illustrate some principles we have not covered before. It will use another of the more exotic ARUNZ parameter expressions, and it will illustrate a simple form of recursion.

Since I do a fair amount of operating-system development work, I often want to test features that I would seldom use on my personal system. One of these features is security. For example, I might want to test password-protected named directories, or the ability of a program to refuse to operate with user numbers bigger than the largest value specified in the environment.

Beginning with ZCPR33, if access to a named directory by drive and user number would be allowed, then any password associated with that directory is ignored. Thus, in order to test password-protected named directories, I have to set the maximum user number to something less than that of the protected directory.

To make it convenient to see what the current maxuser value is, and to set it to a new value, I developed the script called MAXUSER shown below (only the first four characters are required). When used with no parameter on the command line, it simply displays the current maxuser setting in both hexadecimal and decimal. When invoked with a value on the command line, as in

```
maxuser 8
```

the old value is shown, the new value is established, and finally the new value is displayed. (It is nice to be reminded of how

things were before and to have confirmation that the intended change was actually made, and made correctly.) Here is the script:

```
MAXUSER
  ECHO max user = @$h+e002d ($@f+e002d
decimal);
  IF ~NU $1;
    POKE $+e002d $1;
    /maxu;
  FI
```

The first command echoes the current value in both hex and decimal forms. Here we use the parameter `$@`. This parameter is like the `$a` and `$+` parameters we saw last time. But, instead of returning the specified memory address, it returns the value of the byte stored at that address, converted according to the format specified by the next character: `h` for hexadecimal, `d` for three decimal digits, `t` for two decimal digits, `o` for one decimal digit, `f` for a floating decimal (however many digits are needed for that value), or `a` for the equivalent ASCII character.

In the expression `@$h+e002d`, the `e` indicates the ENV module and the `+` indicates an offset address, with the offset given as `002d`. That is the offset into the ENV where the maxuser value is stored. This parameter expression uses hexadecimal conversion. The alternative form in parentheses is the same except for the `f` format for a floating decimal display.

The remaining commands are conditional and are carried out only if an argument is given on the command line. First the argument is poked into the maxuser address. Note that the value must be given in hexadecimal, as required by the POKE command. That is why I display the value mainly in hex, with the decimal value only in parentheses. It is also why I always echo the value. If I try to set the maxuser to ten using the command

```
maxuser 10
```

I will immediately see that the new value is 16 decimal instead of what I intended.

You could use flow-control commands such as

```
IF VALUE $1H > 1FH
```

or

```
IF VA $1H > 31D
```

to trap arguments that would be interpreted as a user number higher than the maximum value allowed (1FH = 31 for CP/M-2.2 systems and 0FH = 15 for CP/M-Plus systems). I figure that if I am going to poke around in the system like this, I will take responsibility for what I do; therefore, I omit this kind of value checking.

Note how the new value is displayed! The script itself is invoked in line 4, but with no command-line parameter. This is the simple use of recursion that I promised. The leading slash

is used to tell the ZCPR33 or ZCPR34 command processor to invoke CMDRUN.COM immediately without wasting its time (and possibly doing something wrong) looking for a resident or transient command called MAXU.

Duplicating here the display command in line 1 would not work, by the way. One must remember that all parameter values are expanded *at the time a script is invoked*, before any of the commands is actually executed, *not at the time that each component command is run*. If, instead of reinvoking the script, the echo command were repeated here, one would see an identical display and would think that the maxuser value had not been changed. This is a point that is very easy to forget. In fact, to be honest, I forgot it myself and had written something very different here (and very wrong), which I had to erase.

---

### SOUND POTENTIALS CP/M PUBLIC-DOMAIN SOFTWARE CATALOG

We publish a catalog that lists the titles of 720 CP/M library files from which you can pick and choose. The titles are current up to 1990. The catalog lists each title, author, date, size of library, and a description. We charge you a copying fee of only five cents per 1K of library file copied. We can format for over 180 5¼" disk formats, both 48- and 96-tpi, and we charge you no extra for your format. We offer discounts for large orders if your disk format holds over 300K. You receive your selections plus our catalog on disk and a library utility to remove the files.

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As a special introduction to the public domain of CP/M, we have put together a Sampler of some of the best utilities and word processing programs. This large collection is available on your disk format for \$10.00 plus \$4.00 shipping and handling. We throw in the printed catalog for \$1.00 more (\$15.00 total). If you just want the printed catalog and other info, send \$2.00.

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**Alpha Systems Corporation**  
 711 Chatsworth Place, San Jose, CA 95128, phone (408) 297-5994

1. **TURBO Pascal** Version 3.0 \$60  
 This is the CP/M version of the compiler that changed the standard for Pascal. No longer available from Borland directly. Comes with loose-leaf Reference Manual for insertion into a 5½ x 8½" binder.
2. **NZ-COM** Version 1.2d \$70  
 Once the only way to upgrade your CP/M 2.2 computer to the Z-System was to download the assembly-language source files from a BBS, edit them, and assemble them to a binary file. NZ-COM spares you this. The MKZCM program included combines the BIOS of your CP/M system with ZRDOS 1.9 and ZCPR 3.4 to make a dynamic Z-System for you automatically. Then you type NZCOM to run your new system. Comes with a large suite of Z-System utilities, and a manual by Jay Sage and Bridger Mitchell that takes you through the process step by step and introduces you to the Z-System. If you're running CP/M 2.2 or a static Z-System, you need this.
3. **ZCPR 3.4 (Source)** \$50  
 The assembly-language source code for the latest version of the Z-System command interpreter is available for anyone who wants to customize his system the old way, or customize the command interpreter itself.
4. **I/OR** \$40  
 Our input/output recorder redirects output that would otherwise go to the console or the printer to the files CONSOLE.FIL and PRINTER.FIL, respectively. This allows you to send the console or printer output to a file, even if it's a CP/M program that doesn't have that option. The console and printer functions are turned on and off separately. 15K IOP segment, ZRDOS required.
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## SPEEDING UP ARUNZ ON FLOPPIES (AND KEEPING IT THAT WAY)

by Bob Vinisky

This was not supposed to be a problem, but a solution. The series of application notes Jay Sage wrote for ZCPR33 contained an intriguing little aside about enhancing performance on a floppy-disk based system using ARUNZ as the extended command processor. It involves placing ARUNZ (renamed to CMDRUN.COM) and ALIAS.COM near the beginning of the disk directory. Start with a freshly formatted disk, then copy CMDRUN.COM and ALIAS.COM to the disk first. Your aliases will now run very quickly, especially when you use a leading space (or slash) on the command line.

The problem surfaces when you want to add an alias or two, or edit an alias. Call up ZDE to edit ALIAS.COM, save the work, then exit. Now, what have we done? First ZDE (as will most tools modifying a text file) renames ALIAS.COM to ALIAS.BAK, then creates a new ALIAS.COM file! Look at the first part of your disk directory with ZP or DU and you will see ALIAS.BAK where ALIAS.COM used to be and ALIAS.COM – who knows? All that work getting the files in the correct place is wasted the first time you edit the file.

Moving ALIAS.COM somewhere, deleting ALIAS.BAK, then moving ALIAS.COM into ALIAS.BAK's place is inefficient and creating a new ZDE (configuring it to NOT make a BAK file) under another name wastes disk space. So I poked around a little in ZDE.COM and found the flag that control production of .BAK files, and, while I was at it, the flag for alternate video in the header. Using the venerable poke-and-go technique I now have an alias script that takes care of the problem. You need ZCPR3.4 and version 0.9U of ARUNZ for this script: ZCPR3.4 can accept a command like PROG.Z80 and pass it to the extended command processor (ARUNZ, here), where earlier versions would reject the command because PROG.Z80 is not a .COM file. You need an alias definition like

```
>Z80          zmac $tn0
```

The > tells ARUNZ that any Z80 file used as a command, rather than as a parameter of a .COM command, should be interpreted as a command to run ZMAC with the Z80 file as its parameter. The Z80 file is represented by the ARUNZ parameter \$tn0, which stands for the simple file name of the original command, the PROG in PROG.Z80.

I keep three .CMD files (ALIAS.COM, ZFILER.COM and LSH.COM) in A0:, and want them kept in their place on the disk directory. This script works fine for all of them:

```
>CMD
a0;
GET 100 zde.com;
POKE 140 00;
POKE 160 ff;
GO $t0;
$hb:
```

To edit one of these .CMD files, just type its name (let's say ALIAS.COM). First the script logs into A0:, then loads ZDE.COM with ZCPR's GET command, pokes the appropriate places, then runs the altered ZDE with Go \$t0 (the parameter \$t0 returns the entire command line you typed). As a little reminder that this ZDE is modified, I use alternate video in the header. Then after leaving ZDE, we log back into our original directory.

This same idea can be used over and over in various ways. Another use I have found for the ARUNZ >??? alias is XFOR. This tool, developed mainly for BBSs to list the FOR files for users, has many options begging to be used. One I have found is for displaying Z-Node messages. I edit them to remove extraneous material, group them by month, and rename to ZND. Then, using a >ZND alias with ARUNZ, they are paged out nicely, special header and all. Ain't Z grand!



# Socrates

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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!

## 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:

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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.	
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## THE COLLECTOR'S CORNER

### The importance of keeping lists

In collecting anything, whether it's computers, comic books, CDs, or rare old books, it's important that you keep an up-to-date list of what you have. Professional librarians call this an *accession list* and use a printed form with the accession number, donor, donor's address, date of donation, description, and other information about each item. This is in addition to the catalog, which lists material by title, author, and subject, so that users of the library can find things. The accession list keeps track of what the library has and where it came from, and there is a separate entry for each copy of a book, though the catalog entries for the first copy covers them all.

Even the casual collector haunting the flea markets and special shows of his field needs a list of what he has. When collecting things like magazines and records, you can't rely on your memory to tell you whether you have a given item. You may have heard every record by a particular favorite group so many times that you have no idea which ones you actually own. On the flip side, if you're collecting something like *National Geographic* solely to have it as a reference, you may have not read any of the old issues, so that they're all "new" to you. The collector who can remember everything he has is either monomaniacal, or has a very small collection that changes very rarely.

Having stressed the importance of lists, here is the list of the computer magazines I have. If you have issues I don't, and you're willing to sell them or donate them to the cause, please write and let me know. You may think that your local user-group newsletter is unwanted outside your group, but I want those just as much as I want professional magazines like *Profiles*. In future issues I'll print lists of the computers, manuals, and software I have, to spur you to sell me your spares of them, too.

I want to thank Joe Wright, Ben Cohen, and Naj Najarian for the magazines they have given me. They really fleshed out my collection.

*The 180 File* 1/1-1/12, 2/1-2/6

*80 Microcomputing*

Oct 80

Apr, May, Aug, Sep, Dec. 81

Jan, Feb 82

Jan, Feb 83

*Ashton-Tate Quarterly*

Jan 85, July 85, Jan 86

*Ashton-Tate Tech Notes* Feb 86

*Attache Users Newsletter*

I/7-11, II/1-12 (all), III/1,2,4,5

*BAKUP News*

85: May, Jul, Aug, Oct, Nov

86: Mar, Nov

87: Jan, Feb

*BAMDUA/BAKUP News*

88: Jan/Feb, Mar/Apr

*Boston KUGEL* 3/4, 5/2, 5/3

*BUSS*

Have 64-68, 70-100, 102-113, 115-116, 118-121,  
123-124

BUSS Directory 7, 9

*Byte* All though Mar 89

*CCP/M magazines*

"Greatest Hits 1986-1989"

Pieces of 8

89: Aug, Oct, Nov, Dec

90: Jan-May, Jul, Aug/Sep

Smaller Is Better!

Apr 90, Oct? 90

*Circuit Cellar Ink*

Have 1-11, 15, 16, 19, 21

*COG Wheels*

Have 8/9, 8/12, 9/2, 9/4-9/7, 9/9-9/12

**Computer Currents**

1/1 through 5/21 (last CP/M column)

**The Computer Journal**

Have 1-4, 6, 8, 16, 18-51

**Computer Monthly**

90: Nov, Dec

91: Jan, Mar-Sep

**Computer Shopper**

Have Jun-Dec 88, all 89, Jan-May 90

**Computers 82***(Mechanix Illustrated Home Service Series, #3)***Computers & Electronics** Jan 84**CP/M Review**

Have 2/1-3/1 (Jan/Feb 83 thru Jan/Feb 84)

**C-PRO** Have 1/7 (Oct 84)**Creative Computing**

76: J/F, S/O, N/D

77: J/F, M/A

79: Feb, Apr, May, Aug, Oct, Nov, Dec

80: Jan-July, Sep-Dec

81: Jan-Aug

**Data Based Advisor**

Have 1/1-3, 2/1-7,9-11, 3/1-12, 4/2-6,8,11

**Desktop Communications**

91: Mar/Apr, May/June, July/Aug

**dNews** Have 2(?), 5-16, 18, 19**dNotes** Have 1 and 2**Dr. Dobb's Journal**

Have 1-122 (All 1976-1986)

**Eagle Computer Users Group newsletter**Have 84/1 through 90/10 (last)  
except 86/7**Eight Bits & Change!**

1/1, 1/5, 1/6 (Back issues ordered)

**Epson Lifeboat** Have 7/1-6, 8/1-2**The File Letter** 1/1 (Dec 89) (only?)**Foghorn**

May 87

Jul-Nov 88

Apr-Jul 89

**Foglight**

88: June

89: Jan-Mar, May, June, Aug

**Heath Bits & Bytes**

March 84, Summer 84, Jan 85

**Infoworld**

2/1

5/35A, 44, 45, 48A, 49, 52 (last)

6/1, 5, 8, 12, 15, 18, 20, 24, 28, 28A,  
29, 30, 41, 46-48**Interface Age**

75: Dec (1/1)

76: Jan-July (1/2-1/8)

Oct (1/11)

Dec (2/1)

77: Apr, May (2/5, 2/6)

Jul-Sep (2/8-2/10)

78: Jan, Feb (3/1, 3/2)

Oct (3/10)

80: July

82: Jan, Mar

83: May (8/5)

**Kilobaud (later Microcomputing)**

77: Jan-Apr (1-4)

79: Aug-Dec

81: Mar

82: Jan

**KuGRAM** 3/1, 3/3, 3/4**KuTE NEWS** 36 (Apr/May 87)**Lifelines**

( ) = photocopy, not original

80: Sep, Oct, Nov, (Dec)

81: (Jan-Nov)

82: (Jan), (Mar), (May), June, Aug-Nov

83: Jan-Dec (all 83)

84: Jan-Oct

# SAGE MICROSYSTEMS EAST

## Selling & Supporting the Best in 8-Bit Software

- Automatic, Dynamic, Universal Z-Systems: Z3PLUS for CP/M-Plus computers, NZCOM for CP/M-2.2 computers (\$70 each)
- XBIOS: the banked-BIOS Z-System for SB180 computers at a new, lower price (\$50)
- PCED — the closest thing to Z-System ARUNZ, and LSH under MS-DOS (\$50)
- DSD: Dynamic Screen Debugger, the fabulous full-screen debugger and simulator, at an incredible new price, down from \$130 (\$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, \$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)
  - MEX-Plus: automated modem operation with scripts (\$60)
  - MEX-Pack: remote operation, terminal emulation (\$100)

Next-day shipping of most products with modem download and support available. Order by phone, mail, or modem. Shipping and handling \$3 per order (USA). Check, VISA, or MasterCard. Specify exact disk format.

### Sage Microsystems East

1435 Centre St., Newton Centre, MA 02159-2469

Voice: 617-965-3552 (9:00am - 11:30pm)

Modem: 617-965-7259 (pw=DDT) (MABOS on PC-Pursuit)

*Micro Cornucopia*

Have 1-7, 9, 12-15, 17-26, 28-32, 38-53

*Microsystems*

4/2-4/12, 5/1-5/5, 5/7-5/9

*Microtrek*

Aug 76 (first)

Jan/Feb 77 (last)

(Merged with Personal Computing)

*Morrow Owners' Review* 1/1-1/5, 2/1-2/2*MTDog-Bytes Newsletter* 1/2*Online Today* 9/86, 1/87, 11/87, 4/88*Orange Bytes*

90: Nov, Dec

*PC Publishing*

90: May-Dec

91: Jan, Feb, Apr/May, Jun/Jul, Aug/Sep

*People's Computers* Mar-Apr 78 (6/5)*Personal Computing*

77: Jul/Aug, Nov/Dec

78: Jan-Mar, Jun, July

80: Jan

81: Sep-Dec

82: Jan-Apr, Dec

83: Jul, Aug, Oct, Nov

84: Jan, Mar, Apr, Aug

85: Jun-Sep

86: Mar, Apr

87: Aug-Dec

88: Jan-May

*Personal Publishing* May 90*Pico News* 4/2-4/4, 5/1-5/4*Pieces of Eight* See CCP/M*Popular Computing*

82: Jan, May

83: Sep, Oct

84: May, Jul, Aug, Dec

85: Jan

*Postscript Language Journal* 2/1-3*Profiles*

84:

85: June

86: Feb-Sep

87: Mar-Dec

88: Jan-Oct/Nov

*REMark*

85: Feb, Jun-Sep

*RUN* 32-48, Special #3*S-100 Journal* Have 1-7 (all)*SCCS Interface* See *Interface Age**Sextant* Have 15, 17-21, 37-40*Smaller Is Better* See CCP/M*The Staunch 8/89'er* 1-5, 7-24*Supermicro* Have 1-6*SVCS Journal*

91: Apr, June-Sep

*The Users' Guide* Have 1-17 (all)*Vulcan's Computer Monthly*See *Computer Monthly**The Z-Letter* Have all*Z-News*

Numbering is 001-009, 101-109, 201-209, etc.

Have 001-809 (all?),

Z-Index (covers 001-508)

## ERRATUM

On page 22 of issue 14, in item 4 on that page, the word squeeze was typed as squeeae. I apologize for this mistake.

# 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 (5½", 40 track disks)	65.00
A60101-2	CP/M and ZCPR3 (5½", 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.



## LETTERS

5 September 1991

Dear Dave:

I note with excitement that you, too, are a Selector V user. One of Sage MicroSystem East's first offerings was Selector V, but eventually we had to drop it because we could not get any response from Micro Ap. I sent them letters and called and left messages on their answering machine, but I never heard anything back. Do you, by chance, know what has become of them? Whenever I was in the Bay Area to visit my parents or brother, I would drive down to visit the people at Micro Ap (it's been so long I can't remember their names anymore).

I use Selector under both CP/M and MS-DOS. As with PMATE and MEX, I really like the fact that I can move between the two machines and still have the identical application. I also especially like the fact that Selector uses only pure ASCII files, and very often I go in and do things using PMATE. Making simple changes to procedures, for example, is much easier that way. I often also look directly at data files when I need just one piece of information, such as a phone number, in a hurry. This is impossible with dBase. In fact, I have thought about writing some compilers (in PMATE macro language) for generating procedure sections for batch postings and report generators.

Jay Sage  
sage@ll.mit.edu

*I bought Selector at half price at a West Coast Computer Faire many years ago. I was indexing magazines, which requires separate files for authors, articles, subjects, book reviews, and magazines, all tied together into a relational data base. dBase II can only keep 2 files open at a time, so it was ruled out. FMS-80 and Condor were hard to program. That left Selector.*

*Selector also led to my interest in the Z-System. Selector has two report writers: a very simple one that writes to files, and a very elaborate one that only writes to the printer. Hoping to be able to save the*

*reports generated by the latter to a file, using the RECORD IOP to intercept it on its way to the printer, was the earliest thing about the Z-System to interest me. Nowadays I tend to use Selector to enter the data and manage it, and then use Nevada COBOL to extract the information into a form that I can print with Spellbinder and/or MagicIndex.*

*I agree, it's useful that Selector files are plain ASCII. Sometimes I modify them using Spellbinder, and sometimes I use the file-translation module to produce a file where each field is a separate line, with the same number of lines in each record. Then I modify this file in Spellbinder, and translate it back. Mark and Mary Robinson, who wrote the Selector manual using Spellbinder, are long-time Spellbinder users and distributors. I don't believe it's a coincidence that it's so easy to translate Selector data files to Spellbinder data lists, and vice versa.*

*One problem with using Selector on my SB180FX is that it runs slower under XBIOS than it did on my CP/M Eagle. I believe this is a bug in XBIOS rather than a bug in Selector, as Accounting Plus, another program written in compiled CBASIC, behaves the same way. Nevertheless, the slowness remains.*

*There are features of Selector that I've never used and don't fully understand, so I decided long ago not to sell it because I couldn't fully support it. But I will try to get back in touch with Micro Ap and put them back in touch with you.*

27 August, 1991

Dear Dave:

I read in #14 with considerable interest your discussion of "becoming an authorized distributor of new CP/M licenses." There is certainly a need for such a distributor. In my own niche, the Heath/Zenith '89, both of the two implementations that were readily available as little as five years ago are now extremely hard to find. I recently also approached Heath Co. about releasing to the public domain those proprietary portions of the system that it wrote for its versions 2.2.03 and/or 2.2.04, as it released its wholly-proprietary HDOS 2.0 (source code, object code, and documentation) some three years ago. Regrettably, the main stumbling

block is the restrictive license it has with DRI. I'll be reporting on that in an upcoming issue of *The Staunch 8/89'er*.

However, there's another issue I think you should give some consideration to. This is the release for your distribution, *by the licensees*, of their custom code (BIOS included) for their implementations. Based on past experience, I suspect Heath may be willing to do that *if* DRI is willing. What the other vendors may do, however, is another story, and you may have trouble tracking down representatives of now-defunct companies to obtain such a release.

If, on the other hand, you are able to pull it off – and I hope you are – I would be happy to provide you with bootable media for the '89/90 on soft-sector disks. I would also be happy to perform media and system conversion for any of your customers who need the system on Heath's hard-sector disks. Perhaps I could even serve as a wholesaler of the latter, if you discover there's a sufficient market. I have a couple of whole-disk copiers, and, though they run under HDOS, they do a nice job replicating CP/M disks.

I also concur with your disgust with the "revisionist" computer history so widely touted these days. And despite the power of Big Blue, Apple, and the agreement between those two, I'm wondering if what we're actually seeing is an industry fragmentation similar to what we saw before IBM laid its "golden" egg. Perhaps those who aren't aware of their history are truly doomed to repeat it!

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

*The negotiations with DRI are going very well. They seem astonished that anyone still wants CP/M, but only too glad to earn some more money from it. The sales manager I've been talking to even appreciates that old CP/M computers go for around \$50, and that asking that or more for the operating-system software would be to guarantee poor sales. The contract we're working on is a non-exclusive*

*one, so I may be opening the door for other CP/M vendors to sell DRI licenses. That would not distress me one bit; just wait until I announce the completed contract before jumping in, OK? Then, once my own supply is assured, I can give others tips on who to talk to, what the terms of my contract are, etc.*

*In fact, since DRI is used to dealing with OEMs, they are actually better set up to deal with someone who wants to get CP/M licenses for his own brand of computer. They expect a single licensee to sell CP/M with a single kind of computer.*

*The issue of getting permission from the computer manufacturer for his BIOS and utilities is a real one, and I'm glad you brought it up. Basically, companies that sold CP/M computers fall into three categories: (1) The company is out of business now, (2) the company is still in business, but they don't make that computer any more, and (3) the company is still in business and still making and selling the computer. Let's look at these cases individually.*

*Eagle and Intertec are examples of companies that no longer exist. In the case of many of these companies, they stopped making CP/M computers and switched to making clones even before they went under. I'm not sure there's any point in worrying about getting permission from these companies for their BIOS and utilities. A lawyer might say there's some liability, but realistically, who owns the rights to the Eagle or SuperBrain product lines, and how do you find them? Life's too short. If contention arises, it's easy enough (for some of us) to write a new BIOS and utilities, thus avoiding the whole issue. There's also the point that the person who purchased the computer is entitled to an operating system for it, or else it's just a very large paper weight. This argument does not void the real rights of companies like DRI that have hung in there right to the present day, but I think it's stronger than the rights of a corporate entity that no longer exists. Of course, that's just my opinion.*

*Many companies that used to make CP/M systems survived IBM's entry into the personal-computer market, even if their computers didn't. Televideo, Epson, and Xerox come to mind as examples. And you're right, these companies should definitely be asked permission.*

*The last category is a trivial one. If the company still exists and still sells the computer, purchasers of*

their machines should get the system disks from them! Of course, this is only a handful of companies: Davidge, Micromint, Laser, and Amstrad (any others?). And it should be noted that all the most recent computers of our type, except the Laser, run the Z-System rather than CP/M, so the owners of the proprietary parts of the code are not DRI anyway.

On the other subject you raised, the personal-computer industry does indeed seem to have stalled out. The IBM-Apple pact is a glaring example of how desperate IBM is to retain market share, and Apple is to get it. It's also very foolish on Apple's part, since their whole market depends on their being unique and making the PC manufacturers play catch up with Windows. I don't think it's a coincidence that Apple survived *The Great Leap Sideways* (the introduction of the IBM PC) by continuing to make and sell the Apple IIe, while most other small-

computer manufacturers switched to making PCs, and then folded. Doomed to repeat history, indeed!

See also the article that appeared in the *Dow Jones News* on 9/5/91, titled **Computer Becomes Commodity; Industry Will Never Be Same**. The article bemoans that computers, except for the big mainframes, are all alike, and customers are buying them as cheaply as possible. This forces the manufacturers to cut the prices and continually develop new chips, faster memory, etc., and sell them at less and less profit margin. This leads to closed plants, fired workers, excess manufacturing capacity, and business maneuvers such as mergers and joint efforts to cut competition and share development costs. Even IBM, who started the whole vicious cycle and who's traditionally immune to such things because of the income from their mainframes, has had to cut prices; Tandem and various UNIX systems have been taking mainframe sales away from them.

## PERSONAL ADS

### 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 Jacque.

### 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.

### Otrona Attaches for sale

Two working Otrona Attache portable computers, as described in issue 5 of *The Z-Letter*, except these each have only one floppy currently installed. \$100 includes a legal boot disk and good copies of the manuals. Will consider barter for CP/M computers, books,

magazines, user-group newsletters, or software that I don't have. Also seeking terminal documentation, especially Zentec Zephyr and Onyx OT-80. Call David A.J. McGlone at (408) 293-5176, or write to Lambda Software Publishing, 720 South Second St., San Jose CA 95112-5820.

### Eagles for sale

I would like to sell two of my computers and a hard disk as follows: (1) One Eagle II computer, (2) one Eagle III computer, (2) one Eagle File 40 external hard-disk unit. \$350 for all three items. Contact Donald C. Calvillo, (408) 947-8117 (daytime) or (408) 377-7129 (evenings).

### Eagle PC+ XL for sale

Late-model Eagle PC includes 640K RAM, turbo speedup kit. Best offer. Call Pat Pacholski, (510) 449-1377.

### Eagle IV for sale

Make offer to Bob Serrano, (415) 586-5000 (days) or (415) 469-9666 (evenings), or write to 6029 Mission Street, Daly City CA 94014.

# Corvatek Presents:

# KEY-UP

## 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.

#### STANDARD FEATURES

COMMON TO ALL MODELS OF KEYUP

- Reprogrammable Keys** Redefine keys on the keyboard to any character or string of characters. 250 bytes of memory are available. Minimum of five bytes used per definition. Maximum number of definitions is 50. Definitions are permanently stored in memory until erased or changed.
- 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.

#### MECHANICAL

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

#### PRICES

- |   |          |
|---|----------|
| <input type="checkbox"/> DM-1 for Bigboards                             | \$129.00 |
| <input type="checkbox"/> DM-2 for Xerox 820                             | \$129.00 |
| <input type="checkbox"/> DM-3 for Kaypro                                | \$132.00 |
| <input type="checkbox"/> DM-4 for Franklin                              | \$129.00 |
| <input type="checkbox"/> DM-5 ASCII Universal                           | \$129.00 |
| <input type="checkbox"/> DM-6 for Apple II                              | \$129.00 |
| <input type="checkbox"/> Optional AC power adapter<br>(9v d.c. 700 ma.) | \$7.50   |

90 day parts and labor warranty

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.

#### KEYTRONICS KEYBOARDS

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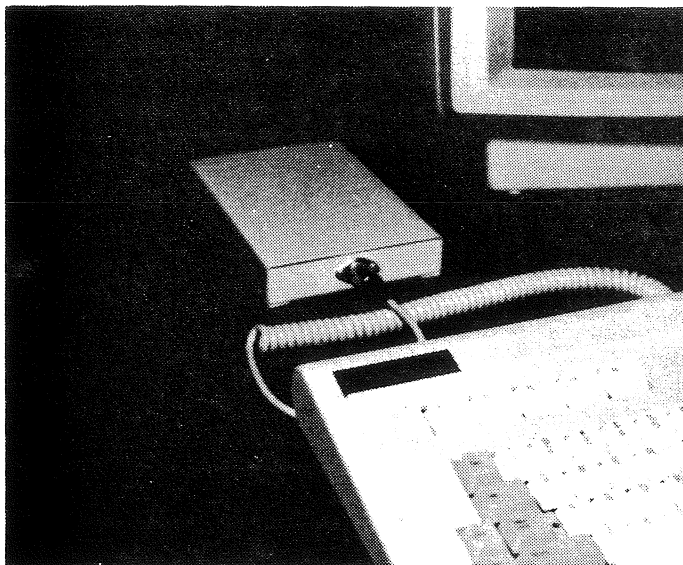
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\* KEY-UP is used on any computer with a parallel or serial ASCII keyboard port.  
‡ Same key placement as IBM keyboard.  
§ Familiar typewriter key placement with separate cursor pad.  
† The UNIVERSAL has all of the signals necessary for the user 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.

## 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.

*COG Wheels*, Vol. 9 No. 11 (8/10/91): July COG meeting, a WordStar tip, getting started with computers, and long-distance echo mail through GT POWER. Vol. 9 no. 12 (9/8/91): August COG meeting, what do do with unneeded software, why have a computer?, and odd bits from other newsletters. Contents of interest to Osborne and Kaypro users. Cincinnati Osborne Group, c/o David Haldeman, 2063 Beechmont Avenue, Cincinnati OH 45230; \$20 per year.

*Computer Monthly*, September 1991. FOG's back, with articles *CP/M Assembly Language Part I: Assembler Basics* by Eric Meyer, *File . . . Exists - Overwrite? (Y/N)*: by John Fulton Woodford, *ACTRIX Help Available* by Bob Forsberg. Regular columns for Coleco Adam, Commodore 64 and 128, Apple II, TRS-80, Timex/Sinclair are still present; these machines either run CP/M or can run CP/M in addition to a proprietary operating system of their own. Bulletin-board listings and ads are also of interest. \$15.95 per year from Computer Monthly Subscriptions, P.O. 7062, Atlanta GA 30357-0062.

*The Epson Lifeboat*, Vol. VIII Issue #2. This is the newsletter of the National Epson Users Group, although they emphasize that they support all CP/M and MS-DOS computers. This issue actually backs up that claim somewhat, having more CP/M stuff than many recent issues. It has *Need a*

*WORKHORSE for your office?* on a dBase II office-management program, *How to Run Those Public-Domain (PD) Disks* by Phil Parish, and *Using Copyright Notice* by Henry Abelman. William C. Colley, Jr. has several articles listing programs written in something called RSI Basic (Rising Star Graphics Basic) on the QX-10: *RSI BASIC Menu Generator Function*, *FX-86e Printer Setup Utility in RSI BASIC*, *Submitting Batch Jobs from RSI BASIC*, and *A String Editor Function in RSI BASIC*. Also: Geneva tips (some by Jim Wiley), where to get Titan products now that they're bankrupt, an editorial on the good old QX-10 by Cliff Johnson, phone numbers of people who've volunteered to help others in their specialties, and software and hardware available from the NEUG Co-op. NEUG dues are \$26 in the U.S., \$40 U.S. for Canadian addresses, \$45 U.S. for overseas addresses. There's also a college-student rate of \$22 and a lifetime membership of \$180. The address is Box 1076, Lemont PA 16851.

*PC Publishing and Presentations*, August-September 1991. *Fonts You Can Bank On* and *Efficient, Ecological, Elucidating E-Mail*, both by Daniel Will-Harris.

*Silicon Valley Computer Society Journal*, September 1991.

*The Staunch 8/89'er*, Issue 24 (May-June 1991). *Numbers* by Gerry Kabelman is a BASIC program to teach arithmetic. *Square One for Computerphiles, Part 3 - H-89 Terminal Configuration*, by Hank Lotz. *Troubleshooting the '89, Part 1: Introduction*, by Kirk L. Thompson with Daniel N. Jerome. *A Patch for WordStar 3.0 and the Heath 89 Numeric Keypad*, by Joseph Mendez. Also letters, personal ads, and a question-and-answer column by Peter Shkabara. See the ad elsewhere in this issue for subscription rates and address.

**The Computer Journal**  
Applications — Programming — User Support

# Sh... Quiet! ...They Don't Know We're Here!

They search for ever more RAM, we build custom interfaces. They add \$300 coprocessors to compensate for bad programming, we automate our homes with \$50 controllers. They write macros to add a column of numbers, we write operating systems. Their magazines carry endless reviews of computers only a corporation can afford. Our journal publishes schematics and source code.

There are whole other worlds of computing beyond Windows 3 and DOS, but they don't know about it. Maybe you do. If S100, CP/M, Forth, embedded controllers or robotics mean anything to you, then you need to know about *The Computer Journal*.

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*TCJ* is written and read by people who remember where all this started. Our articles teach the principles behind digital control. You will see real-life applications and be given the tools to do it yourself. Topics include Assembly Programming for the High Level Language Programmer, writing and using IOPs, and more. We discuss computer languages: Modula-2, C, Forth, Pascal. You will read award winning articles, such as the first place winner of the Harris RTX Design Contest.

- Embedded controller concepts, applications
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- Use of logarithms in controllers
- Lazy evaluation
- Operating system design, modification
- Encryption techniques
- System design, interfacing
- Plus monthly columns: Jay Sage, author of ZCPR 3.4, telling you how to get the best from Z-System; Richard Rodman on Minix and National Semiconductor cpu's; Matt Mercaldo with the F68HC11; Wayne Sung on LANs. Bill Kibler keeps an eye on the future of the industry.
- Programming the 8051, F68FC11, RTX and other specialized CPUs
- Programming in Forth, Modula-2, C, Assembler
- Hardware projects ranging from interfacing a Bernoulli removable hard disk to a CP/M computer to dedicated embedded controllers
- Modifying and repairing printed circuits
- T1, X.25, related communications topics

### 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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## EAGLE COMPUTER USERS GROUP

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

### Meeting place

ECUG 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. Try to arrive on time, so that I can let everyone in at once, on months when Tandem has not arranged for a guard.

Meetings are the second Saturday of every month, from 9 A.M. to Noon. The remaining 1991 meetings will occur on October 12, November 9, and December 14.

### Potluck/picnic final notice

Don't forget our potluck on October 12. It's at Bill Bradley's place, 574 Belfast Court, Sunnyvale CA 94087, phone (408) 737-1171.

### September 14 meeting

There is a rumor going around that the Foothill flea markets may be ended because of the budget crisis at De Anza and Foothill colleges. Perhaps this rumor accounted for the strangeness of the September 14 flea market. Each market is different, but there were things I'd never seen before: a Unix system using the same hardware as an Excelan Nutcracker, Zentec 8001 terminals, a Morrow MD-3 portable, and an S-100 Z80 system with the Oasis operating system. There was also a Rothenberg

CP/M multi-user system, which consisted of a coffee-table-sized main unit, 4 Rothenberg terminals (Televideo 950 terminals with the Rothenberg label), the cables to connect them, boxes and boxes of CP/M software on 8" disks (including at least two copies of MagicPrint), for \$200 for the whole thing. If I'd had both the \$200 and the room, I'd have bought it.

It also seemed to be Televideo month at the flea market. I saw Televideo 912, 925, 950, and 970 terminals, and Tele-PC, 802, and 804 computers, as well as a Televideo "Personal Terminal" (which, despite the name, is a PC monitor, not a terminal). I came away from the flea market with the two Zentec terminals, the Televideo 802 computer, and 5 half-height 96-tpi floppy-disk drives. Expect articles in the future on the Z-System TCAP and how to make one for an unusual terminal, and one on customizing Spellbinder for the Zentec 8000 terminal.

Attendance at the ECUG meeting was fairly small, several regular members being unable to attend. Present were Bob Vinisky, Bob Kowerski, Dick Dethlefsen, David Banoff, Bill Josephson, Ken Thomson, Shirley Welch, and Jack Morse (listed in the order in which they signed in), and David McGlone. The recent lack of new members may be caused by FOG's dropping us from the user-group listings they send *Computer Currents*, *MicroTimes*, and *Computer Monthly*. I have sent them a letter asking them to put us back in, and have added them to my subscriber data base, so this may improve.

Bob Vinisky has produced a disk which demonstrates the features of the Z-System on an Eagle computer, using a menu-driven tutorial written with the Z-System menu shells, and he showed some of it to Ken Thomson, who took it home to play with until the next meeting.

By the time you get this in your mailbox, Bob Vinisky will have moved to a suburb of Portland, Oregon to be with his family. Bob assures us that he will try to get down this way fairly regularly, if only to hit up Halted and

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Weird Stuff from time to time. In the approximately two years that Bob has been in the group, he has gone from a novice with no CP/M experience to a sophisticated user who runs NZ-COM on his Eagle, complete with all the latest utilities that he's downloaded from the bulletin boards. Bob is nearly done with the disassembly of the Eagle IV BIOS, a task he has done single-handed with only a little instruction from Joe Wright. Bob hopes to fix the slow disk-access setting in the current BIOS, which causes Eagle floppy-disk drives to be so noisy, and which will also make them run twice as fast. Other tasks in the works include a modern SCSI hard disk for Eagles (to replace the SASI interface and old hard disks used in IVs and V, and File 10s and 40s), a Uniform-like program that would enable Eagles to read other CP/M formats, and translating the Spellbinder source code into a form that can be assembled by standard assemblers, so that I can add some of the features Spellbinder lacks.

After the ECUG meeting, Bob and I went to Weird Stuff, where I found and bought a Monroe computer. You heard right, I said Monroe, not Morrow. I knew Monroes existed, and that they used 96-tpi drives, but I had never seen one before.

#### October 12 meeting

9:00 Meeting begins.

9:30 Dave Banoff will compare Lotus 1-2-3 for Windows with other PC spreadsheets.

12:00 ECUG meetings ends.

#### ECUG library

The Eagle Computer Users Group has a library of printed material, including Eagle PC and Eagle 1600 manuals, magazines, and books. Most of it was donated by members, the rest is

stuff kept from what shows up in our P.O. box every month. This resource has been used perhaps three times in the years I've been maintaining it. I am considering breaking up this collection; if I did so, I would list the contents, so that people could request anything they wanted, and then throw away the remainder. If you feel strongly about this, write and let me know.

#### 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 this month:

Assorted shareware programs for PCs, from TypeRight Corp., 336 Swain Blvd., Lake Worth FL 33463-3342, phone (407) 969-3643.

*Micro Moonlighter Newsletter*, ISSN 1057-154X, volume 1, number 1. Copyright 1991 by The Technical Group, Inc. A newsletter on starting "your own at-home enterprise with your computer as its focus. Contains the complete issue of the newsletter plus an extensive catalog of resource materials."

## DIGITAL RESEARCH ANNOUNCES DR DOS 6.0

For the benefit of Eagle PC and Eagle 1600 users, we present the two most interesting pages from Digital Research's announcement of DR DOS 6.0, comparing it with Microsoft's MS-DOS version 5.0. We will resume printing Eagle technical bulletins next issue.

# DR DOS™ 6.0 vs. MS-DOS® 5 Upgrade

DR DOS 6.0 is everything you need to run your DOS, Windows, and networking applications faster. To maximize the capacity and speed of your hard disk. To maintain reliable system security. And to make using your PC easier and more convenient than ever.

## Why should I switch to DR DOS 6.0?

- Full compatibility with all your DOS, Windows 3.X, and networking software.
- More memory for your applications on more types of 8086/8088, 80286, i386 and i486-based systems.
- Optional file compression that can double the storage capacity of the typical hard disk.
- High performance read and write disk cache for dramatic improvements in the performance of DOS and Windows applications.
- Disk defragmentation for faster data access.
- Full range of password security features to protect your system, programs, and data.
- Comprehensive on-line help and documentation that eliminate the need to keep a manual on hand.
- "Undelete" that recovers accidentally erased files where other undeletes may fail.
- Additional utilities for portables and laptops, including cursor control, PC-to-PC serial file transfer, and on-line help.
- Interactive customization of CONFIG.SYS and AUTOEXEC.BAT files.
- Complete, fully bootable DOS - not just an upgrade.

### Key Features:

### DR DOS 6.0

### MS-DOS 5

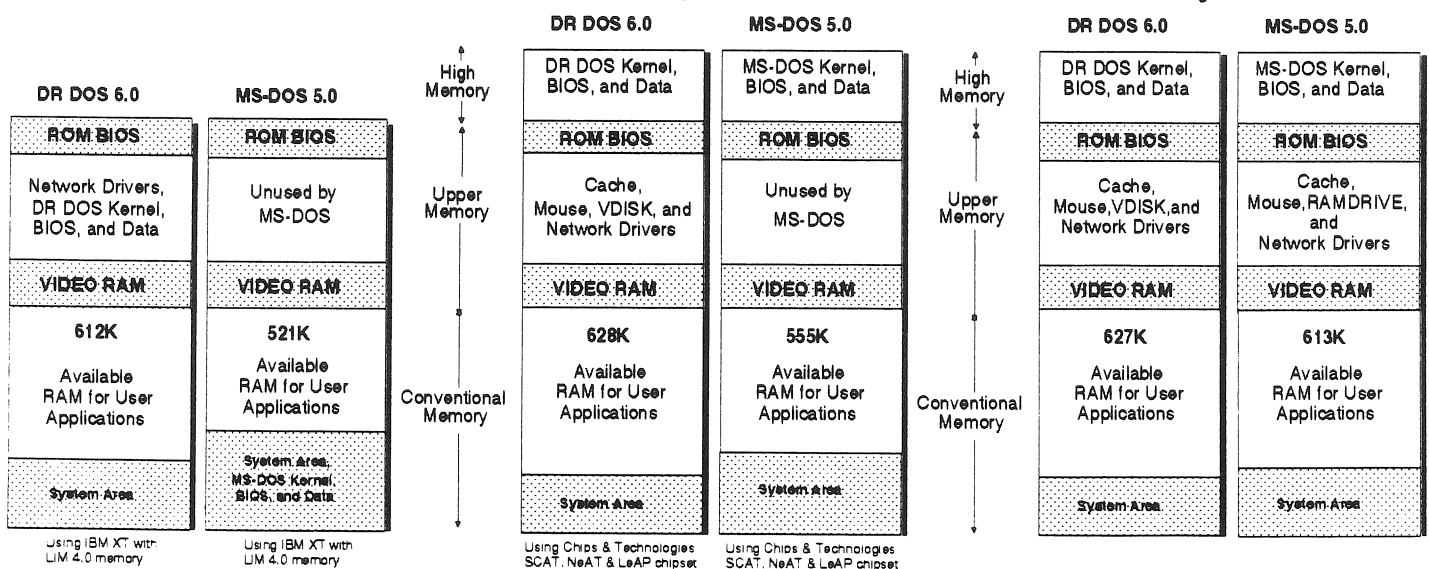
Use of High Memory	Loads kernel, BIOS, disk buffers high	Loads kernel, BIOS, disk buffers high
Use of Upper Memory on i386 & i486-based systems	Loads kernel, BIOS, drivers, and TSRs into upper memory	Loads drivers & TSRs into upper memory
Support for 8088, 80286 with LIM 4.0 memory	YES - Loads TSRs, drivers, kernel, BIOS, and buffers into upper memory	NO
Support for 80286 using NeAT, LeAP, or SCAT chipsets	YES - Allows TSRs, drivers, kernel, BIOS, and buffers to load into upper memory	NO
Disk Compression	YES - Transparent compression/decompression. Up to double disk's data capacity	NO
Disk Defragmentation	YES - Defragments disk to increase application performance	NO
Disk Caching	YES - High performance cache dramatically improves application and Windows 3 performance	YES
Undelete	YES - Succeeds even after intensive disk use	YES - May fail if not used immediately after delete
Task Switching from Command Line or Third Party DOS Shell	YES - Minimizes impact on RAM (as little as 0K of conventional memory)	NO - Only runs from Microsoft shell, consuming 35-40k of task's address space
On-line documentation	YES - Thorough comprehensive on-line documentation allows quick location of information via "hypertext" links	NO

## More Memory Using DR DOS 6.0

Running on an 8088

Running on an 80286

Running on an 80386



## DR DOS 6.0

## MS-DOS 5

Task Switching to Memory	YES - Swaps to extended, expanded, virtual disk, or disk	NO - Swaps only to disk or virtual disk
Cut and Paste across Switched Applications	YES - ASCII, text, and numeric data	NO
Preload Task List	YES - Up to 20 tasks at a time	NO
Full Task Switching capability from DOS Command Line, Active Application, and Graphical Shell	YES	YES - From Graphical Shell and application only
Enhanced CONFIG.SYS and AUTOEXEC.BAT	YES - User selectable configurations at boot time via simple control language	NO
Installation	Interactive and optional configurations; installs all integrated options with on-line help available	Automated installation. Assumes configuration and refers user to manual for post-installation configuration instructions
Password Files and Subdirectories	YES - Consistent protection from command line and shell	YES - But only from shell (not available from command line)
Read/Write/Delete Protection	YES - file attribute, password protection	NO
Secure Disk Partitions	YES - Prevents circumvention of security	NO
"Walk Away" Keyboard Locking	YES	NO
Password Sign-on	YES - With master key feature for system administrators	NO
Support for 80286	Loads kernel, BIOS, and disk buffers into high memory	Loads kernel into high memory
Memory Managers	Optionally loads into upper memory	Uses 8.2K of conventional memory
MEM Command	Provides 7 options to view memory usage; multiple options available	Provides 3 options to view memory usage; no multiple options available
Graphical Memory Map	YES	NO
Use of Graphical Video Memory	YES - For text based applications, provides up to 727K free memory	NO
Command Line History	YES - Built-in (uses 0K extra memory)	YES - TSR (uses 4K extra memory)
Command Line HELP	YES	YES
Wildcard Support	Appropriate utilities support wildcards and '@filelist'	Minimal support, requires entry of multiple filenames
Quick Reference Card	YES	NO
DOS Shell	YES - Graphical CUA-compliant with a selection of application and data icons	YES* - CUA-compliant
Full Screen Editor	YES	YES
CURSOR Utility	YES - (improved LCD legibility, change size, and speed)	NO
Postscript Printer Support	YES	NO
Single Insertion Disk Copy/Compare	YES - Uses extended and expanded memory, and disk	NO
Tree Command	Provides file attributes, size, date, time, and path in text or graphical display; option to pause after each page	Limited to graphical display with no option to pause at the end of each page
TOUCH Command	YES - Updates file date/time stamp	NO
File Transfer Capability	YES - Includes FILELINK™	NO
Unformat/Quick format	YES	YES
Uninstall	YES	YES
Fully Bootable	YES	NO
Support Policy	Free product lifetime support	Free for 90 days, 900 number thereafter (\$2.00/minute)
Suggested List Price	\$99	\$99
Site License Program	YES - Minimum 100-unit license	YES - Required on 100% of company's DOS systems

\*MS-DOS Shell uses 35K of conventional memory (of each active task's program space).

Charts are based on tests performed by Digital Research; test results may vary depending on system configuration; details on the tests are available from Digital Research upon request.

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**THE STAUNCH 8/89'er**  
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**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.

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