PolyLetter

The Newsletter for PolyMorphic Systems Owners and Users

Editorial

With this issue PolyLetter is back on schedule. The JAN/FEB 1987 issue is actually being published within the JAN/FEB 1987 time slot!

Readers have expressed interest in a variety of subjects. A number of readers have responded to say that they are using a clone along with their Poly, but still like the Poly better. I know the feeling. I am using an XT clone but still prefer the Poly. I know how to make the Poly do what I want to; with the clone it's a fight. Readers have asked for more information about communicating between the Poly and clones and between the Poly and a Mac. At least one reader has told me on the phone that the one computer that finally measures up to the Poly is an AT. Unfortunately, there is still not a good set of system software comparable to Poly's. Imagine that! The Poly's ten year old System 88 software design is so good that it takes an AT with an 8 MHz 80286 cpu with ten times the memory to equal a lowly 8080 cpu running at 1.8432 MHz. Just imagine what could be done if the software engineering and inovation that went into the Poly over 10 years ago were put into the computing power available today!

Oh well, back to reality. How many of our beloved Poly users would like PolyLetter to include some items about clones in our sacred pages? I got a call from one reader who practically begged me to move in that direction. In a past editorial I urged Poly to assemble and sell clones to Poly Users who needed more sheer computing power. We must face the fact that there is a limit to Poly's computing power.

In education there is a distinction between potential and achievement. A person's achievement is compared to their potential, such as is measured by IQ and other tests. The normal result is to have achievement roughly match potential. However, there are two groups which do not follow this pattern. Those whose achievments seem far ahead of their potential are called over-achievers. Those whose achievements seem far behind their potential are called learning-disabled.

If we apply this distinction to computers, we see that Z-80 CP/M systems are about normal, but the Poly is clearly an over-achiever it gets a LOT out of its limited 8080 potential. The clones are probably functioning below their potential and could be classified as learning-disabled. The point of this discussion is that Poly has achieved a near maximum realization of its potential. It just doesn't have the hardware to go much further, while the clones, with their cludgy software has enough hardware to support a great deal of potential growth. That doesn't mean that there is no room for Poly to grow, and it doesn't mean that the Poly is no good. On the contrary, the Poly can continue to do what it has done just as well as it has. Why, I have even written two MS-DOS software look-alike programs for the Poly. One is VOL.GO, which reads and displays the disk (volume) name just like MS-DOS's internal VOL command. I usually leave my disks in the drive when I shut off my system and tired of listing each drive to see what I have in it when I boot up. I added VOL 1, VOL 2, and VOL 3 to my INITIAL file and it shows me the names the disks on line when I boot up. The other program is SORT.GO which reads an input file of lines into memory sorts them, and writes out the sorted list to the output file. As in MS-DOS, you can specify switches to reverse the order [/R] or to select the column to sort by [/+ n]. SORT.GO was written to produce the annual index published in the last issue of PL, but it could be used to alphabetize any file. (Someone once wanted to alphabetize a list of quotations, but I don't remember who.)

Poly Problems

by Bob Bybee

Ever had one of those months when your system just wouldn't behave? A few weeks ago I started seeing a "glitch" in the video from my Poly. Thinking it was the video board's fault, I opened up the system. I wiggled the video cable, checked for loose connections, and so on. While I was doing this, the Poly's power was off, but I had left my video monitor turned on. And a short time later, smoke was rolling out of my trusty Leedex (now Amdek) 12" Video-100 monitor!

Well, good. At least it's not the Poly. I went to the closet to find the 9" monitor that came with the system. Haven't used it in a while, but it always served in a pinch. Oops... all the video is smashed into one vertical line! Scratch two monitors.

So I found a cheap Samsung green-screen monitor, mail-order, for about $65. Rushed it here by UPS Blue. Hooked it up, and it worked fine, except that the characters were too wide for the screen. A little adjustment of the monitor's controls, and the two controls on the Poly video board, solved that problem. So the Poly's back in operation.

But then, disk drive problems struck. I started getting more and more errors from my #1 floppy drive. Replaced drive 1, and it's no better. Exchanged drives 1 and 2, and still drive 1 doesn't work reliably. So I started suspecting the power supply.

Measured the voltages feeding the drives... aha! The +5 supply is low feeding both drives, and drive 1 is the lower of the two.

So I spent a couple of days locating parts, removing the power regulators from the system, and replacing them. After all this, the +5 volt supplies measured 4.85 and 4.95 on the two drives, well within tolerances. Run the confidence disks, and now the drives both read with no errors.

Whew! Glad that's over. Button up the system, replace the cover, put the brand new Samsung monitor back on top of the Poly, and... holy bits, Batman, the disk drives are producing errors again!

Now I'm ready to kick myself. The disk drive problems started just after I bought the new Samsung video monitor. I didn't make the connection before, but now it makes sense. The new monitor must be generating a stronger magnetic field than the old one, and it's interfering with the data being read from the magnetic diskettes. Sure enough, moving the monitor off to the side of the Poly corrects the problem.

I'm going to keep the Samsung monitor, but plan to put it on a stand that keeps it away from the disk drives. And if the field is that strong, I need to keep my diskettes away from the monitor as well. But I've always tried to do that anyway.

Is there a moral to the story? No, unless "phooey" counts as a moral.

Letters

Dear Ralph, January 13, 1987

First, I would like to give you some good news. I have one of my Polys up. (By the time you get this I should have two up.)

I have several things that I would like to do to make my Poly more efficient. When I power up my computer does not always give me FFFF. This is because of old memory chips that do not always make contact. As my machine gets hot [when it] is on for several hours the problem seems to get worse. For this reason I would like to convert a 16K memory board to a 64K board. Is there a way a person can get their hands on the information without paying $125.00?

Since I have more than one Poly, I would like to find out how to make a Twin system. It is my assumption that you can get more than 64K with a Poly. (Am I right or wrong?) Do you or anybody know how I can do this? --- Chris Bagley, Tuscon, AZ.

[Glad to hear you have a Poly working.

In regard to the sporadic TOP of RAM: Try rocking each chip in its socket (press down on one end and then press down on the other end); the old anti-static foam was corrosive and tended to make the chip legs form a film. Also, I suggest cleaning the S-100 fingers of the memory card with a soft pink eraser (gently!) to rub off any film. Do not touch the cleaned fingers with your hands, as the skin oil and acids starts the corrosion process again.

In regard to the heat problem: I covered all the openings on the back of the computer so as to force the air to be drawn between the boards. The flow is from side to side instead of from the back to the side. Space the boards so that any 8K static RAM cards are not all together. I also ran the machine with the cover off. (I had one Poly that worked fine until I bolted the cover on -- then it went flakey!) As a matter of fact, the 16K memory board is dynamic RAM and doesn't generate near as much heat as one of the 8K static RAM cards.

Making a Twin system is a hellofa lot of work. There are 20-30 modifications on each CPU and Video card. Each Twin system requires 2 modified Poly 48K memory cards (one for each user) and one 8K memory card. Besides, a twin works slower and requires special system disks. (The CPU runs at the same speed, but is now working for two users, each about 1/2 the time, and the system software must all be written to use that time-sharing.)

You can't get more than 64K (actually 56K) in a Poly because the 8080 has only a 64K address space. If you put in bank-selectable memory, you could have part of the user memory area set to exchange with banks. This is of no use to any existing software that I know of. You could put in a RAM-disk, but it would need a driver program to interface it and it would look like either a disk drive, or a peripheral device, rather than more memory.

As for the 16K to 64K modification. One reader has phoned in to say his son, who is studying EE converted a board for him. I have three boards which have been modified, each in a different way! The $125 you quote is Poly's charge for the labor to do the work. I do not know if Poly has released their version of the modification to their dealers. Next time I talk to Poly, I'll ask if they will release their version. --- Ed.]

Dear Mr. Kenyon 5 Nov 1986

I was very pleased to receive your letter and the copies of PolyLetter that you sent me. . . . I appreciate the problems of editorial handover that has occurred. . . .

The contents of the 1984 issues looks very good, and if any of the copies with data on Arise, the spares kit, diagnostics, etc., are available they would be very welcome.

As far as the disk of mine that you have is concerned, I sent it in as an exchange because Charles [the previous editor] said that he had a printer driver that would solve a problem that I have when using my Epsom RX80 printer (bit 8 is set high on some of the characters so that they come out in italics - copy enclosed - do you know the answer to this one?) However, if you would like to put the programs in the public domain please do so. I will send the documentation to anyone who is interested. The disk has a suite of programs that are used for stereological analysis of light and electron micrographs, useful for any biologist/geologist/materials scientist wanting to get quantatative data from pictures (not image analysis). We are using these constantly in our research work. If the disk is suitable for inclusion I would like to receive a copy of PolyGlot Volume 6 in exchange. I also have a bitpad input/saving routine which runs serial ports at both 1 and 0 (before Poly did it) which you might find useful too.

The latest PolyLetter contains some very interesting points and I was particularly

glad to read the articles on CP/M; I have two CP/M machines here in the department and use them a lot of the time. It would be a great advance to run Poly disks on an IBM clone. If a board becomes available I would be very interested in knowing about it.

I originally got my 8813 in 1979 (after starting with a Poly 88), but the distributor soon folded and I've been on my own ever since. I think that I have the only one in the U.K. [United Kingdom] I had the original Poly 88 construction manuals and with these and a good deal of self-help I've been able to get over the (few) breakdowns that I have had so far. Does Poly produce any field service data or repair manuals (apart from Confidence disks. I have these)?

My main problem is in getting documentation. When Poly sold me the Exec/96 they only sent me update notes from the previous version; my manual is for Exec/72 so there is a big gap on which I have no data; I have nothing on WordMaster, and Arise is just a name in the directory to me! While Poly was very helpful at first, they didn't answer any more and so it was a tremendous thing for me to find that PolyLetter existed. I gather that Poly is still in business, but what do they sell? I never see a single ad or reference to them; it's a shame that the 8813 was 5 years ahead of its time.

I wish you every success with PL; it really is a lifeline and I read and re-read every word of the copies that I have. I will try to let you have a contribution soon. Could you please let know the contents of the various disk of the month series volumes so that I can order some?

Thanks again for your response to my letter, I look forward to hearing from you again soon. --- Dr. L. G. Briarty, Nottingham, Great Britian

[Some of the items in this letter have been covered in recent issues of PL. The rest I will address here, as there may be some other readers with similar concerns.

The Poly's printer driver routine only sends 7 data bits for each character. The 80H high bit is reset by the software before it is put into the 8251. Also, the 8251 is programmed for ODD parity. This means that 8 bits are sent, and the 8th bit is the parity bit. If you look at the letters in the words "Disk SYSPROG" you will notice that the letters are italic on exactly those characters which have the parity bit set.

Italic	Char	Hex	7 bit Binary	Parity	Received
y	D	44	100 0100	1	1100 0100
y	i	69	110 1001	1	1110 1001
n	s	73	111 0011	0	0111 0011
n	k	6B	110 1011	0	0110 1011
y	S	53	101 0011	1	1101 0011
y	Y	59	101 1001	1	1101 1001
y	P	50	101 0000	1	1101 0000
n	R	52	101 0010	0	0101 0010
n	O	4F	100 1111	0	0100 1111
y	G	47	100 0111	1	1100 0111

When your printer is set to 8 data bits, no parity, it interprets the Parity bit as an 80H bit, and does italics.

When your printer is set to 7 data bits, no parity, there is a definite framing problem and you get garbage printed. To solve the problem, you need to set your printer to 7 data bits, odd parity, 2 stop bits. Actually, the stop bits won't matter, since, in asynchronous mode, it will just be waiting for the next start bit anyway and will ignore extra stop bits. If you cannot set the parity arangement on your printer, then you can change the Poly's printer driver setup routine. I am discussing the setup for your printer driver, but it applies to other drivers as well, but the addresses may be different.

Printer/30 makes a call to SETUP in the Proms. SETUP takes immediate data. The first byte is the device select bit and the baud rate nibble. The remaining bytes are for setting up the USART and are outputted to the usart control port. bit 4 (= 10H) selects device 1 or 0 as is strapped on the serial mini-card. Bits 0 thru 3 select the baud rate.

Baud Rate Table
(Multiplier set at X16)

0	(0000)	=	INVALID
1	(0001)	=	50
2	(0010)	=	75
3	(0011)	=	110
4	(0100)	=	134.5
5	(0101)	=	150
6	(0110)	=	300
7	(0111)	=	600
8	(1000)	=	900
9	(1001)	=	1200
A	(1010)	=	1800
B	(1011)	=	2400
C	(1100)	=	3600
D	(1101)	=	4800
E	(1110)	=	7200
F	(1111)	=	9600

The code in Printer/30 on Exec/76 looks like this:

```
        SETUP   EQU     002ADH
301B            LDA Pspeed      ;Get the Printer speed byte
301E            STA L003        ;Store it here for SETUP
3021            CALL SETUP      ;Setup the 8251 USART chip
3024    L003    DS 1            ;Baud rate + device select
3025            DB 0AAH         ;Dummy control instruction
3026            DB 40H          ;Reset to programming mode
3027            DB 0DAH         ;DA = 11 0 1 10 10
                                ;Program = 2 stop bits
                                ;Odd parity enabled
                                ;Word length 7 data bits
                                ;Multiplier = X16
3028            DB 0            ;End of programming data
```

The programming instruction has the format SSPpLLFF.

```
SS=             Stop bits
11  2 stop bits
10  1 1/2 stop bits
01  1 stop bit
00              invalid

P   Parity select
1   EVEN
0   ODD

p   Parity control
1   ENABLE
0   NO PARITY

LL  WORD LENGTH
00  5 bits
01  6 bits
```

10 7 bits
11 8 bits

FF Multiplier
00 SYNC MODE
01 times 1
10 times 16
11 times 64

To prevent trouble you must set up your printer to agree with the Poly. If the printer cannot be changed, then we must change the programming byte in Poly's call to SETUP so that it programs the USART with something the printer likes.

You can use Szap to change the byte, or you can GET Printer, use the front panel to change the byte, and then SAVE a new copy of printer with the changes made.

Many people have added a disk controler and external drives to convert an 88 into a 'home brew' 8813 system. I can sell you a set of ASROM proms (better than Poly's) for $35 (+5$ shipping). You would need to get an extra Disk Controler card and an external enclosure and power supply for drives. You can probably get the enclosure and drives cheaper in England, but you will probably have to buy the disk controler board. PolyMorphic Systems has had them for $149.00, but I don't know what their current stock level is. May I suggest that you look through the ads for used Polys in future issues of PolyLetter with the eye to buying another 8813, and save the boards in your 88 as spare parts for the other system(s). It may be cheaper than upgrading the 88, and you'd have spare parts that way.

ARISE.GO undeletes a single file. If there is more than one deleted file with the same name, specify the desired copy after the name of the file, for example "ARISE FILE.TX 3" undeletes the third deleted copy of FILE.TX. DLIST.GO lists the deleted files. (See HELP PROGRAM ARISE in PL 8605).

Please send a copy of the documentation for the programs you submitted to PolyLetter. A copy of the documentation on disk would be appreciated if available.

See the adds in the PolyLetter for documentation on the Poly Manuals from PolyMorphic Systems. Note their new address.

I can also supply the information necessary to modify the later printer versions (such as is on Exec/83 with PCL-Vol-6) if you cannot set the parity on your printer. --- Ed.]

PolyLetter, January 14, 1986

Received my copy of 8605 a couple of days ago. When I got around to reading it I really got interested in the article on Device Driver Direct Access. As soon as I could get to my Poly, I tried it out.

I have my 8813 driving a TRS-80 DWP-II. The Radio-Shack DWP-II adds an automatic line-feed to each carriage return. I had recently purchased the latest (at that time) version of System Discs (Exec95 - BasicCO3 - Wrdmstr) from Polymorphic. Since I could not find out from Radio-Shack how to disable the AutoLF in the printer (the ESC sequence from the printer manual didn't work) I called PolySystems. This was about 1980-81.

I don't remember which technician I wound up with but he gave me the address to poke in order to disable Poly's auto LF from the printer driver.

In Enabled mode, CTRL-Z gives me the front panel display. L2F4A gives me the 12106 (decimal) address which shows C2. Changing that to C3 disables the autoLF.

From BASIC I always add \POKE 12106,195\ to disable the autoLF. If I want to PRINT to the screen (to test a printout) I have to \POKE 12106,194\ changing the C3 back to a C2.

I compared my front panel display to the sectors shown on page 7. Each byte is identical in sequence to the ones shown. Where the article shows to change the *CD* byte, I am changing the C2 byte - the fourth byte? I don't have Szap.GO so I can't permanently change that byte. Also I am not programmer enough to do it with Assembly Language or anything else.

I would prefer changing the DWP-II printer. I have tried to find the DIP switches which some have told me would be there someplace. Did not have the guts to disassemble any more than I had, so I backed off.

My ONLY other preference would be to fix things so that when I invoke "Printer DWP-II" the AutoLF is disabled and when I invoke "Printer Screen" it is enabled. I also have "Printer 3510" which feeds text with "typesetting codes" directly into my A/M Comp/Set 3510 typesetter through a special interface modem I purchased.

Now that I have responded to the article in 8605, a little about me. I'm an artist/adman/printer. Use my 3-SSSD-drive 8813 w/64K to maintain a 20,000 name address list for a client. We print out the addresses on envelopes with the TRS-80 envelope feeder. Did all my own programming in Poly's extended BASIC. Having problems merging "new" names into the old list which resides on about 30 5" SSSD disks.

On THIS disk BEGIN is a list maintenance program I wrote. Anyone with some understanding of BASIC can see what to change so it would handle any list with fixed length records. If you're interested I would gladly add comments.

The record editor section of the program took several weekends to evolve. I was proud of myself. I suppose it would have been better if I had been able to do it in Assembly Lang. I got Poly's Assembly Language Manual, but I have not done any thing with Assembly Lang. No time. Since I now have an Equity I (MS.DOS 2.1) IBM-PC clone, and have acquired PASCAL with its assembler I will probably go more deeply into that. I really like the Poly Exec/Editor etc. Don't care for FORMAT. So I wrote my own FORMAT to give me justified columns. It's also on this disk. Wish I could take advantage of DWP-II proportional spacing with Poly, but I guess that will come with my Volkswriter-3 program in Equity-I when my eventual conversion to PC clones evolves.

Also is a program I call "SHUFFLER". When you only have 2 drives (which I once had) it would sometimes help to have your list in zip code or alpha order. Adding names to a list is often most easily done in random order (names gotten from reply cards). Even with the "mat array sort" in the first part of SHUFFLER, printing out a sorted list from a random file is slow.

The DWP-II would wait 15 or 20 seconds sometimes while Poly was going to a "distant" record. So I wrote SHUFFLER to use the sorted array to move records into their proper position. In other words: take #40 to pos#1; moving #1 to pos#21; moving #21 to pos#33... etc. In effect, reshuffling the records into their correct positions.

Some Tuesday or Wednesday evening in February I'll call your number to see what your reaction is. As far as I'm concerned these programs can go into the public domain. I doubt anyone would want to take the time to convert them into a non-Poly BASIC. You may enjoy the Cryptoquote Game - there are some puzzles already loaded. The program makes it a little easier to work them and gives you your time. You can put in new puzzles from the newspaper, or make up your own puzzles. I also made a program to print BIG letters which you can run. Don't know what good that would be, although I made it because someone once said in PolyLetter that they wanted something like that - and that's why I did it.

Kindest regards... and more power to you. --- Bob Jones, Columbus, OH

[Bob was kind enough to submit this letter on disk along with the programs he has described here. I have included those programs in the next PolyGlot Library Volume of BASIC programs.

I had never tried to use Printer Screen on a disk in which the driver had been modified for an automatic line-feed printer and was surprised when I tried it. There weren't any carriage returns! Everything was run together. I spent a little more time with the system software and discovered that Poly's designers made a trade off when they chose not to put line-feeds in text files. The serial device driver inserts a line-feed after every carriage return. But, that's not all. The Printer Screen driver routine converts a line feed into a carriage return but ignores carriage returns. It depends upon the wormhole driver to insert a line-feed, uses that line feed to advance the display, but ignores the carriage returns. I was able to make a device driver which does what Bob wants. When selected it disables the automatic line-feed function; when it is not selected the automatic line-feed functions normally, permitting Printer Screen to work properly. The device driver is the same as Poly's Sio.PS, but has one added initialization routine - the automatic line-feed is bypassed. I have called this driver SIO.PS, and it is connected to the system using Setup.GO by selecting the CUSTOM command. One answers that the driver name is SIO, and then to use the standard dialogue.

<A><C><T> REPORT

By Al Levy

Old Spanish Proverb: "The Man Who Doesn't Know Heaven, Doesn't Mind Hell."

Although the proverb is somewhat overstated it makes a point that is often overlooked when one is making comparisons. I suspect that many LICA members, (or most computer users), do not know what S/100 means. Rather than expound on this subject, I will come back to it, and the proverb, later.

The <A><C><T> group was privileged to have as their guest speaker Mr. Richard Lomas of Lomas Data Products. Lomas Data Products is one of the two leading manufacturers of S/100 systems, support components and boards.

Submitted for your approval are some of the specs for the projected S/100 80386 board.

The 80386

Four Megabyte of Dynamic RAM with 0 wait-state read cycles and one wait-state write cycles. The ram will include parity checking and be arranged as a 32 bit wide memory. The initial goal is for 8Mbytes of memory.

The board will run at 16Mhz rate and be suitable as either a slave in a system with a host processor acting as a front end processor or as a master doing it's own I/O processing.

When accessing S/100 bus devices, the interface will be limited to 16 bits wide with a basic clock rate of 8Mhz and either a 3 or 4 clock bus cycle. The board will assume that if a 16 bit request is being made of a bus device that it is capable of a 16 bit transfer and will not break 16 bit transfers into two 8 bit transfers.

SOFTWARE SUPPORT

Use the protected mode of the 386 to provide a large linear address space when used as a slave in a standard CC-DOS system.

Provide a CC-DOS capable of using the protected mode to provide each of many different users, 1 Mbyte of program space running standard 8086 programs.

Initial support will be in real address mode, limited to 1 Mbyte of address space running either Concurrent-DOS, MS-DOS or CP/M-86.

A catalog of available and projected products is available along with a price list from: Lomas Data Products, 182 Cedar Hill Street, Marlboro, MA 01752, (617) 460-0333.

At one time I owned both a 1961 VolksWagon & a 1974 Olds-98. I preferred the VW and drove it for close to twenty years.

I would like to state for the record that I truly respect and admire Richard Lomas for his efforts and accomplishments. There are too few people walking this earth who could boast of one quarter of what this man has done. It would fill my lifetime just trying to understand everything he takes for granted. I was prompted to write this article for two reasons.

First: I am always taken back when a speaker feels obliged to constantly compare his product to that of another company.

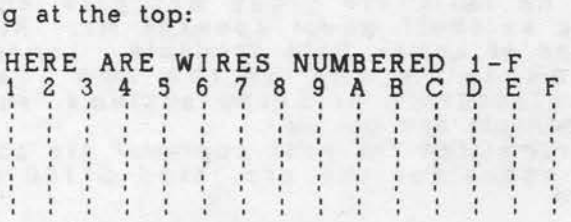
Second: I have heard too many cliches about this business. In the past two years I have heard "S/100 is Dead" and "We Are Not Competing With IBM" too many times.

There is room for everyone and there is a place for every machine. A concept of NEGATIVE COMPENSATING FACTORS is ever present.

Let's talk about S/100: S/100 is a hardware standard set by the IEEE committee. In days gone by, 1975 and up, some manufacturers built boards, components

for boards and even entire systems based upon the standards set up by the IEEE committee.

Starting at the top:



Imagine these wires as being slots. The slots now form a mother board into which you will place computer boards. Each wire or slot carries an electrical signal or impulse. Each board that is placed into the mother board must recognize & act in accordance with the wiring on the mother board.

If we have one hundred different signals, & each of the signals has a specific meaning (as defined by the IEEE), we are using the S/100 bus.

IBM, Apple, Commodore, TI, Heath and Tandy Corp (for example), have propriatary bus structures. The intent of a proprietry structure is to lock in the consumer. When a company owns all of the patents, copyrights etc., they want you to buy "original equipment parts" only.

The history of Main-Frames left a trail of LEASED programs, $700 cables, $4000 disk drives and price lists that would have you pay more for support than for a fine suburban home.

Until recent years, the micro companies tried to emulate the MAINFRAME business, and with some success. The price of a new DS/DD 5.4 inch drive for an APPLE is about $500. A similar drive for other machines is $85 - $125.

Clone makers devised methods of skooting around bus structures. The Tandy-1000 for instance (IBM-COMPATIBLE) uses a mirror image of the IBM mother board. In addition, they left the DMA line out of the system. If you want to upgrade, you must go to Radio Shack. Clone boards don't work!

S/100 was an attempt at hardware compatibilty. If you owned and IMSAI, an ALTAIR, a NorthStar or any of the boxes that conformed to the S/100 standard it was possible to buy memory boards, CPU's, disk controllers, or any other S/100 product from a wide variety of manufacturers. CP/M was the software attempt at compatibility.

Any member of LICA with an S/100 system could trade boards with any other member. Any member using standard CP/M can trade disks.

WHA HAPPENED?

Big Blue introduced it's PC and the public at large accepted computers as a way of life. PC-DOS and MS-DOS became the new standards. To me (personal feeling), MS-DOS is a nice superset of CP/M. It retains many of the features that I still find objectionable. In fact it lacks many features that I have on my twelve year old S/100 system.

THE GOOD, THE BAD, THE UGLY and the pretty

I mentioned NEGATIVE COMPENSATING FACTORS earlier. Let's take a look at some of the data that helps us to make decisions.

It was Dr. William Godbout from whom I first heard the phrase "PRETTY-FACE" used to describe the new varieties of computers. (New means 1984 and later).

THE GOOD and BAD

Today's computers are lightweight. You could develop a hernia lifting my S/100 system (without the eight inch disk drive cabinet). I can tuck the XT-clone under my arm and carry it without too much trouble. The clone fits on almost any desk. The S-100 system needs space, and more space, maybe even rack mounting.

The Chinese and others have made parts cheap, and well within the reach of the mass market. Cost for 640K for an MS-DOS machine is now about $80.00 PolyMorphic Systems (an S/100 company) is asking $700 for a 64K RAM BOARD. That's sixty four not Six Hundred Forty!

A complete XT-clone with a twenty meg hard drive can be purchased within the range of $1300 to $2000 depending on configurations. A new S/100 system has to cost at least $5000.00 and probably more like $7000.00.

Outside companies, American and foreign, are now making upgrade boards for IBM-PCs like there is no tomorrow. For the consumer this means you are no longer locked in and in addition, competition drives prices down. It was this factor that made me considered a clone. I have reconfigured my MS-DOS system at least eight times in the past year.

So, the original reasons for buying an S/100 system (compatibility, availability of parts and the choice of buying from many sources) is no longer valid. This is especially true since I can buy at least two machines of some other type instead of one S/100 system.

The decided advantages of an S/100 are reliability, speed, flexibility and the ability to upgrade ad-infinitum. Although I can buy boards for an XT machine, there is eno way I could ever change it to an AT type machine. With an S/100 system it is possible to swap boards including the CPU. I have also omitted the most important data. Let's get to it.

MS-DOS and PC-DOS are decidely not MULTI-USER. Networks are tricky and I have seen and heard of more problems than successes. S/100 to the rescue! Using concurrent DOS and/or TurboDos multi user is a natural way to go. MS-DOS can be implemented (and indeed it is) as a subsystem. Taking seven users into consideration, $7000 is not a lot of money.

I am somewhat involved in both graphics and music. I am aware of the GOBS of memory and the need for real-time speed in both endeavors. I am sure that professional sound studios would leap to buy a computer that would give them 7 Megabyte of RAM, provided it was reliable and the needed software was available. I have heard CAD-CAM people complain about the speed of AT-software.

Professional Sound Studios are eagerly awaiting good MIDI systems. This is a brand new area and should earnestly be studied by all computer manufacturers, board designers and software houses.

People in the medical profession are now using computers for more than billing. What an ideal tool for X-RAY analysis,

Thermographic analysis, and on it goes.....

I will not presume to teach anyone their business. I do know that as I am exiting the Poly Editor I am typing (ahead) a whole set of commands and when I look up, the machine has already executed at least three of them. (This is ten year old technology!)

If the people in the S/100 camp just look for their market in the right places, (where speed, reliability, gobs of memory and multi-user systems are sorely needed), they should have no reason to view Big Blue, Amiga, Commodore or MacIntosh as competition.

[The above article first appeared in the October 1986 issue of The Stack, the newsletter of the Long Island Computer Association (L.I.C.A.). PolyLetter gratefully acknowledges the kind permission of the editor to reprint this article here.]

Sticking Keys

by Ralph Kenyon

Do some of your keys stick and you haven't spilled soda on the keyboard? Believe it or not, the Poly Keyboard II can wear out! I had the opportunity to examine some sticking keys the other day, and I figured out what made them stick. On Keyboard II the keys have a cap, a hollow square post and a spring. Two small brass contacts stick up in the center of the key.

WARNING

In the last issue I suggested gently prying off key-caps to clean out the keys. If the caps are not pulled straight up the key can be damaged. To avoid damaging the keys I suggest making a key-cap puller. I tried to use and IC removal tool, but it was too awkward and wouldn't fit between the keys.

To make a key-cap puller take a medium sized paper clip and straighten it out. Then bend it in half so that the two ends are the same length. With a pair of pliers make a small hook (facing inward) on each end about 1/8 inch wide. Separate the two hooks until they are about a key-width apart. With this device you can insert the hooks between the keys and slide them around the key-cap to be removed. Make sure the hooks are positioned in the center of the side of the key-cap before pulling straight up.

When the key cap comes out, it can come out in two ways, with the square column attached or without it. The key cap fits in the square column snugly and is only held in place by a friction fit. The square column is thin, and can be cracked if the key is pried toward any one of the four sides rather than straight up. I found cracks in the corners of the square column on sticking keys.

The key doesn't stick when I push it down without the key cap, but when I put the key cap back on it sticks. The reason is that the column is pushed apart at the crack when the cap is inserted. This makes this part wider and it sticks inside the base of the key-pad when pushed down. I would guess that, in an emergency, one could cut back or file down the base of the key (not the cap) about 1/8th or 3/16th of an inch so that the top, cracked part of the square column won't get pushed all the way down into the base of the key-pad. I haven't tried it.

Improving the Puller

The times I have used my key-cap puller, it took quite a bit of pull before the key cap let go. Some kind of leverage device would make the job much easier. I took piece of stff wire about 6 inches long and bent the paper clip around the wire. I also bent small round rings in the end of the wire so there wouldn't be any sharp ends. The paper clip now looks like a pair of old fashioned ice tongs. I slip the hooks around the side of the key cap, slide the stiff wire through the bent paper-clip until one end is on the next key (or the case) and then lift up on the other end of the wire. The key cap comes straight and smoothly up.

Be careful when putting the key-cap back on, too. It must be placed on straight or the square column can be cracked. When it is oriented right, it will slide part way on by itself. Simply depressing the key will push the cap the rest of the way on.

If someone has a dead Keyboard II perhaps they would be willing to donate it as a supply of replacement square posts.

I don't know if Keyboard III has a sticking problem. Anyone had a problem with it?

BugNotes

Abstract Systems BugNote 010.0 **December 1, 1982**

Edit 3.3 (6/10/81)

Edit 3.3 has a bug in the exit routine. If the output directory is full, the Edit asks for a new output file name. If there is no subdirectory in which to enter the output file name, there is no room for another subdirectory either. Edit will not let the output file name be on another disk (presumably, the data has been written to the output disk.), and will not accept a RETURN (to exit the editor without entering the file name in the directory). Exiting without entering the file name would be a much more "user-friendly" abort that pushing reset (or using the front panel, if enabled, to warmstart Exec).

HELP!

In this section I share with you the help system files I have built up over the last few years. (The entire system is included with Abstract Systems Exec.)

```
HELP COMMAND ENABLE

        HELP file for system command "ENABLE"

The "ENABLE" command activates the CTRL-Z front panel,
allows access to powerful system commands, and increases
the information displayed by LIST and DIRECTORY.
ENABLE also changes the functioning of the START command

Syntax: "ENABLE" (RETURN)       (see DISABLE)

The following additional commands are available in ENABLE mode:

DNAME   INIT   IMAGE   DISABLE   SetSys   Sniff   UnSys

Minimum size: "EN"
```

Public Domain

We have a bonanza this issue. There are 7 new disks to choose from. PGL-V-10 has miscellaneous BASIC programs submitted by various persons at various times. PGL-V-11 has Ron Cain's SMALL-C compiler. PGL-V-12 has a terminal program for modems and an absolute machine language debugger submitted by Stanley Reifel. The debugger is very much like RDB which comes on Poly's System Programmers Disk. The source listings for both these programs are included. PGL-V-13 & PGL-V-14 contains the source files for an 8048 Cross-Assembler submitted by Stanley Reifel. PGL-V-15 & PGL-V-16 contains the source files for a Z-80 Cross-Assembler submitted by Stanley Reifel. These disks are all $6 each.

Disk PGL-V-10 has 33 files on it, 16 free entries.
350 sectors in use, 0 sectors deleted, 0 sectors free.

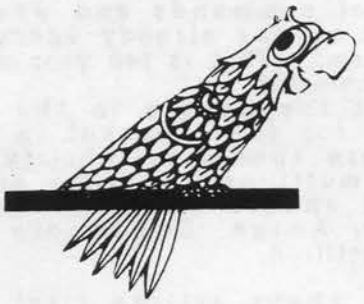
Size	Name
22	RETIRED-PAY-FEDERAL.BS
13	LIFE-CYCLE-COSTS.BS
17	Sorts.BS
15	CAI-B08.BS
4	ADDITION.BS
4	BASIC-USER-FUNCTIONS-1.BS
8	SORT-CREATIVE-COMPUTING.BS
9	COPY-SUB-DIR-1.BS
7	FILESORT-0.BS
3	TOWERS-OF-HANOI.BS
2	WONDEROUS-NUMBERS.BS
12	REVERSE.BS
9	TOWERS-OF-HANOI-GRAPHICS.BS
3	PRINTER-COMMANDS.BS
32	CRYPTOGRAMS.DT
9	CRYPTOGAME.BS
20	BIG-LETTERS.BS
6	SHUFFLER.BS
13	FORMAT.BS
3	PROOF.BS
25	ADDRESS-LISTS.BS
2	ADDRESS-LISTS.DC
15	SAUCERS.BS
9	ASTEROIDS.BS
25	LUNA-LANDER.BS
27	AdrList.BS
6	Month.BS
6	TICKLER.BS
3	MORTGAGE-COMPARE.BS
2	ROSES.BS
10	SNOOPY.BS
2	POLYGRAPH.BS
3	FLASH.BS

SMALL-C

I have no information concerning exactly what subset of C the compiler supports. I suspect the information is covered in the May and September 1980 issues of Dr. Dobb's Journal. If you are a C programmer, you should be able to find out by reading the compiler source code. While I am not (yet) a C programmer, I have managed to use the originally supplied material to condense it down to one disk. However, for compiling most C programs (smaller than the compiler), the contents of this disk are adequate. You will need to use Poly's Asmb.GO and SYSTEM.SY files to complete compiling a C program. I have taken some liberties with the compiler to shrink its disk size; I have put data areas at the end and chopped off those sectors of 00 bytes (cutting it down from 116 to 81 sectors in the process).

Disk PGL-V-11 has 16 files on it, 46 free entries.
349 sectors in use, 0 sectors deleted, 1 sectors free.

Size	Name
12	ccglobals.CS
28	cc1.CS
28	cc2.CS
17	cc3.CS
12	cc5.CS
12	cc6.CS
12	cc7.CS
22	cc8.CS
14	cc4.CS
5	ccio.CS
63	CCLIB.AS
1	SETUP.AS
81	cc.GO
12	Introduction.DC
21	CCIO.AS
5	READ-THIS.TX



Disk PGL-V-12 has 6 files on it, 55 free entries.
275 sectors in use, 0 sectors deleted, 75 sectors free.

Size	Name
102	TERMINAL-1p2.AS
126	ADB-4p3.AS
10	TERM.GO
14	ADB.GO
1	TERM.DC
18	ADB.DC

Disk PGL-V-13 has 7 files on it, 53 free entries.
274 sectors in use, 0 sectors deleted, 76 sectors free.

Size	Name
40	SYMBOL.TX
87	SYSTEMIO.TX
19	CLOCK.TX
75	FUNCTIONS.TX
14	STORAGE.TX
34	PARSETABLE.TX
1	8048_Cross_Assembler.TX

Disk PGL-V-14 has 11 files on it, 49 free entries.
290 sectors in use, 0 sectors deleted, 60 sectors free.

Size	Name
87	EXPRESSION.TX
25	8048-TEST.TX
11	MAIN.TX
30	PSEUDO.TX
63	PARSE.TX
16	CASM-DOC.TX
4	TODO.TX
2	ASMC.TX
8	FRONT.TX
39	casm.GO
1	8048_Cross_Assembler.TX

Disk PGL-V-15 has 11 files on it, 49 free entries.
348 sectors in use, 0 sectors deleted, 2 sectors free.

Size	Name
40	SYMBOL.TX
77	FUNCTIONS.TX
87	SYSTEMIO.TX
9	MAIN.TX
7	FRONT.TX
14	STORAGE.TX
37	PARSE-FUNC.TX
41	PARSETABLE.TX
29	PSEUDO.TX
2	ASMC.TX
1	Z-80_Cross_Assembler.TX

Disk PGL-V-16 has 7 files on it, 53 free entries.
327 sectors in use, 0 sectors deleted, 23 sectors free.

Size	Name
86	EXPRESSION.TX
19	CLOCK.TX
113	PARSE.TX
44	casm.GO
45	CASMZ.GO
16	CASM-DOC.TX

1 Z-80_Cross_Assembler.TX

ADS

From Abstract Systems, etc.
191 White Oaks Road
Williamstown, MA 01267
(413) 458-8421

DISKS -- DRIVES -- MODEM -- PROMS -- SOFTWARE -- SPELL

1. MAXALL diskettes -- $13 per box of 10.
2. Two drive external box and power supply $75.
3. Hayes Micromodem 100 for only $40.
   (300 baud in bus direct connect modem. limited quantity)
4. HayesSys modem software (for the Micromodem 100) $35.
5. (AI'S) Spell, a good spelling checker for $35.
6. Abstract Systems Exec (Enhancements & bugs corrected) $35.
7. Abstract Systems Proms (Enhancements & bugs corrected) $35.
8. PolyGlot Library Volumes 1 thru 9, $6 each.

(Send $1.00 for a complete catalog--[free with any order].)
(Make checks payable to Ralph Kenyon.)

From PolyMorphic Systems
7334-H Hollister Avenue,
Santa Barbara, CA 93117
(805) 685-6238

Manuals	
1 Field Service	$35.00
2 Aligning 88 disk drives	15.00
3 Printer Interface	15.00
4 Adding a SSSD or DSDD drive	15.00
5 Keyboard II & III	15.00
6 Testing & Maintaining 88xx	15.00
7 88/MS user's manual	25.00
8 Confidence	25.00
9 Hard Disk	15.00
10 Exec 96 Addendum	15.00
11 Twin System	15.00
12 Twin System Confidence	25.00
13 Twin System Diagnostics	25.00
14 Plan	35.00
15 Mailist	35.00
16 Assembler	25.00
17 Basic	40.00
18 WordMaster II	40.00
19 User's Manual	40.00
20 System Programmer's Guide	50.00

Theory of operation manuals for the following boards (including schematics):

1 5" DSDD Controller	$20.00
2 8" Controller	20.00
3 SSSD Controller	15.00
4 Video Board	20.00
5 CPU Board	20.00
6 4.0 Monitor ROM	20.00
7 48K & 16K RAM	15.00

Add $5.00 for shipping and handling.

CP/M hardware conversion: $100 plus parts. (CP/M license, manuals, and software: $200)

16K to 64K memory card conversion $125.00 plus parts. (The 16K board has to be a Poly board and in good working condition.)

Eight inch MAXALL 32 hard sectored diskettes for your MS. $15.00 per box or $ 115.00 per ten boxes. Al Levy, Post Office Box 71, Hicksville, NY 11802, (516) 293-8368

For Sale: Multiple 8813 systems - each with 3 drives, 64K, Monitor, and Keyboard - Make offer. Robert L. Schwartz, 906 Main Street, Cincinnati, OH, 45202, (513) 241-3447.

For Sale: 64K 8813 with 3 drives. Make offer. Vince Greenen, 445 Buckeye, Naperville, IL, 60540, (312) 961-2511.

For Sale: 8813 with 3 SSSD drives, 20 Meg hard disk. Make offer. Bruce Buckley, McCormic Equipment Co., Inc., 11591 Grooms Road, Cincinnati, OH, 45242, (513) 489-0100.

For Sale: Assortment of Poly items including a System 88, keyboards, interfaces, CPU, memory, etc. List available on request. Rusty Callihan, 9708 Chatham Oaks Trail, Charlotte, NC, 28210, (704) 541-1604 or 542-8174.

For Sale: 8813 Twin system with MS, 1 5" drive. Best offer. Larry Isaacson, P. O. Box 93887, Atlanta, GA, 30377, (404) 351-3652 (9-5 EST).

For Sale: Video Board - $95, 8" Disk Controler - $150, Printer Interface - $50, Poly CPU - $125, Priam Hard Disk with Poly Interface card and Power Supply - $400, Poly Keyboard/Screen enclosure - $175. Charles Trayser, 415-651-5931

Bit Bucket

The computer store (long gone now) where I got my Poly was giving out bumper stickers which read:

BYTE MY ASCII

I had one on the side of my Poly for years, but it's gone now.

How much wood would a woodchuck chuck...
When is 64K 56K? In the Poly, the usable memory starts at 2000H and goes up to FFFFH; this amounts to 56K of usable RAM. In CP/M machines, where RAM starts at 0000, it is common to equate the highest usable memory location with that amount of RAM. 0000 to FFFF is 64K, so FFFF is 64K. In the Poly, 0000 to 1FFFH is not usable, so this lower 8K must be subtracted. The standard Poly has one 48K memory card addressed at 2000H which give a TOP of RAM at DFFF. If you think that's confusing then try this. In a Poly modified to run CP/M which has memory out to FFFF there is 64K, but the Poly's version of CP/M only 'knows about' memory up to DFFF (a 48K Poly), so only operates as a 56K CP/M system. Poly's 48K CP/M is really 56K. Confused? I am.

4 Bits
Ronald Moffatt of Rochester, NY, writes "Have you had a nibble on your 4 bits question yet? (SEP/OCT)" Congratulations, Ron. You got it! 4 bits is half a byte,

or a nibble. (Apple tried to make us spell it 'nybble' at one time, but I don't think that caught on.) Anyway, Ron, you have just earned yourself a free public domain disk. Just let me know which one you want and I'll send it your way.

K-9

How many of you remember the computerized mechanical dog, K-9, from the British Doctor Who television series (currently running on the PBS)? The next question is, "What do you feed K-9?"

Readers' Responses

Best article: Frank Stearns "Confessions". Impressive batch of issues you've cranked out! Re: Bagley letter (PL 8605 P3). It should be taking the Parrot by the beak or by the feathers ... For Jim Purvis & Others - I can copy from 5" SSSD to 8" SSDD. --- Russ Nobbs, Spokane, WA

We have 2 Twin systems + 4 single users + 2 8813 singles cannibalized for parts. All still running like a charm - a real workhorse 24-hrs a day. --- Posnett Lynas, Newport Beach, CA

Best article: Device Driver Direct Access. More articles on languages. Tell us about relocatable files. I have a relocator program for 8080 from BYTE a few years back, but haven't had much use. What does the .RL extension do?. --- Allen Daubendiek, Palm Bay, FL

More articles on BASIC programming. I'd like to see programs for sorting - quicksort algorithm. I have written a program which removes the spaces and un-numbered remarks from a [BASIC] program and would be willing to put it in the public domain if you're interested. --- George Mack, Fort Wayne, IN

In This Issue

Coming Soon

Asmb.GO Housekeeping Requirements, RS-232 Cables and Jumper Plugs, Modems and Communications software, More BASIC for Beginners, How to UNSAVEP protected Programs, More System Programmers Notes, Making your PC work like a Poly, More Help, BugNotes, Public Domain Software, etc.

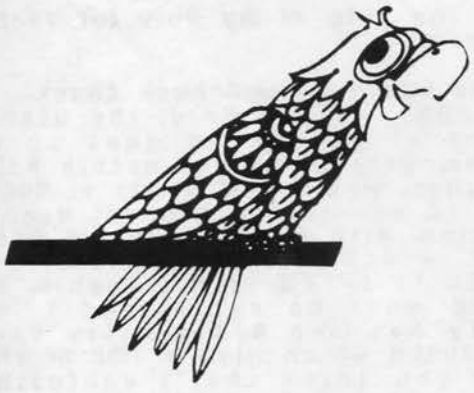
Questions

Can you find and answer the questions asked in this issue? Send your answers and requests in.

PolyLetter
191 White Oaks Road
Williamstown, MA 01267
(413) 458-8421

Address Correction Requested

FIRST CLASS MAIL



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PolyLetter

The Newsletter for PolyMorphic Systems Owners and Users

Editorial

This issue is chock full of letters. The response has been very gratifying. We heard from one of the original design team members, Glenn McComb! [See his letter.] (But don't let that stop YOU from writing. Let's hear from everyone; the more we share the better off we all are.)

The next issue is due off the press by the end of May, so there will be more time for responses to recent issues to be received. I hope the return to a normal schedule doesn't disappoint those who have gotten used to getting a fresh PolyLetter every month. Playing "catch up" has taken some of my time and energy, but it seems to have been worth it.

Last time I tried a small change in the format. A couple of readers have complained that the condensed mode print, such as is used in the HELP column and in the Public Domain listings, is hard to read. My printer gives a little bit too much fill-in when in both letter quality and condensed mode, so I tried shifting to correspondence quality for those sections. The result was a bit on the light side, but it seemed more readable.

Al Levy's complaint that the words are too spread out and the lines too close together pose another problem. I am trying out a new format to satisfy that complaint. With this issue I have shifted from 10 pitch to 12 pitch for the text, and have changed the lines per inch from 8 to 7. This actually allows packing in more information. I used 43 characters per line at 82 lines per page which gave 7053 characters per page in the old format. The new format gives 55 characters at 71 lines for 7810 characters per page for a 10 percent increase in content. (Al is the editor of The Stack, the monthly newsletter of the Long Island Computer Association.)

Since there are so many letters in this issue, I'll keep this short to save room for other stuff.

Poly Letters

I used my Poly for data aquisition and analysis. I still have it but use it very little. We are mostly using IBM PC-XT & AT's now. I would sell the system if there is any market for them now but have never actively tried to. --- C. Barkley Gilpin, Costa Mesa, CA [See Ads. -- Ed.]

I love my Poly, but it's been sick for a long time. The last time I got it fixed they took me for a ride. They are out of business now. Is PolyMorphic Systems still in business? Maybe they can fix it. --- Jose G. Lipana. Long Beach, CA.

[Jose, Poly is still in business - see their ad elsewhere in this issue. I hope your Poly is soon well again. The few times my Poly got sick, I was extremely frustrated. Since then I have picked up a spare one from a prior owner. See the Ads. -- Ed.]

Thanks for picking up the publication. I use my Poly most for my Dental practice. Do you know of someone in the Atlanta area who can service a Poly? The turn-around time for shipping repairs to PolyMorphic Systems in California is too long for my needs. --- Mitchell S. Lippman, Marietta, GA.

[Mitch, I know the feeling. You might try talking with Bob Bybee; he's pretty savvy about hardware. See his address in another letter. -- Ed.]

Dear Ralph, January 6, 1987

Enclosed is my renewal check for PolyLetter, although I'm no longer using my Poly equipment. I purchased a Leading Edge that 's IBM-PC compatible.

My Poly equipment is being used by my church for bookkeeping and mailing list. It is the 3-drive 8813 with 18-megabyte Poly hard disk. I also have another 8813 (3-drive) and MS than are not in use and are available for sale if anyone is interested. I do think they need a little work to get going again.

Someone asked about an inventory program. I have one with the Poly equipment back in Minnesota. (I'm spending the winter in Arizona). It is on an 8-inch disk for the MS. I bought it from a computer firm here in Phoenix that has since gone out of business. The owners were Mark and David Freeman, who were Poly dealers.

I'm glad to see PolyLetter back on a regular basis. . . . I Enjoyed Frank Stearns' letter in the latest issue [8605]. I was very happy with his programs on checking account, spelling corrections and time billing. Also had a circulation and mailing program out of Idaho for newspapers.

I'm retired now, spending about half the year in Minnesota and half in Arizona. . . . Keep up the good work with PolyLetter. I enjoy it even if I'm not using my Poly equipment. Best Regards, --- Bob Johnson, Scottsdale, AZ (Wadena, MN)

Dear Ralph, January 7, 1987

It is delightful to see the frequent issues of PolyLetter even though half of the things are difficult to understand.

I am probably one of the most avid PolyMorphic fans and customers. I was one of the first, I think, to obtain a Poly 88 and graduated with its use until I finally accumulated no less than six (6) such machines consisting of five (5) 8813's, each with three (3) drives and 64K, and one 8810 with 64K, and which by its nature has only one drive.

I have been using the old Word Processing System, not the new one, for perhaps ten years or more, and I have been so satisfied with it I would find it difficult to prepare a Will or a Corporation Agreement without its use.

I have some specific programs that in my law practice I find invaluable. I programmed it myself so that if I enter the name of a client, the date of their accident and a few other items, it pops out letters to the police department for an accident report, to the doctors requesting medical reports, to the hospitals for records and financial information, and of course, writes the client and tells him how to make sure that he takes care of himself for not only the benefit of his doctors but for the benefit of his lawsuit.

I don't think I will ever be able to change the remarkable billing system that I have aquired with Poly. Indeed, while Poly may have misguessed the trend of the market in its early stages, there were many guesses that it made that were right, useful, logical, and appropriate. While at times I wish that I did not have to see the short screen with wrap-around characters to the next line, I have learned to live with it.

I have finally concluded for my own purposes that I don't need five (5) machines. I have recently purchased four (4) clones. I need to sell some of the unused Poly machines. I have got them piled in my conference room and with all the monitors it looks like Cape Kennedy. [see Ad.] . . .

I have loads of disks and all the software that ever existed, including some that no one has ever heard about. Please let me know if you are interested. I won't ever stop using Poly, I just don't need so many of them anymore. Thank you for this opportunity and keep up the good work. Very Truly Yours, --- Robert L. Schwartz, Cincinnati, OH.

[Edit 4.1, on Exec/96 has a side-ways scrolling feature. Edit boots up with the default set to wrap-around. To activate the sideways scrolling feature, use the sequence ESC, CTRL-N, S. To turn side-ways scrolling off use the sequence ESC, CTRL-N, W. This version of Edit also has a cursor centering feature. When selecting this feature, the cursor always stays on the center line. To activate this feature use the sequence ESC, CTRL-N, C. A variation on this is the page-centering feature. The cursor moves down or up away from the center until it hits the top or the bottom of the screen. It then suddenly jumps to the center of the screen. To activate this feature use the sequence ESC, CTRL-N, P. To return to the normal or free floating cursor mode use the sequence ESC, CTRL-N, F. The memnonic values of these sequences are simple. CTRL-N stands for "New" feature, "S" for "Scroll", "W" for "Wrap", "C" for "Center", "P" for "Page floating" and "F" for "Free floating".

I also have a clone here, and have transferred files back and forth from the Poly to the clone. I am running the public domain software package called Procomm on the clone. I just connected a cable between the Poly's printer port and the clone's serial port. I made an 8 conductor cable connecting pins 1 through 7 and 20 straight through. The Poly header is the same one I use for all my printers -- 1-15, 2-16, 3-13, 4-14, 5-11, 6-12, and 9-10. On the Poly I defined a printer with Setup, which I called "pc", in which I set the baud rate to 1200, and set the lines per page and characters per line both to 255. I tell Procomm to use 1200 baud, Odd parity, 7 data bits, 2 stop bits, and then use ASCII file transfer protocol. To send from the Poly, I just PRINT the file. To send to the Poly I run my DownLoad program. I used 1200 baud because that's the fastest I could go without getting a lot of garble. -- Ed.]

Dear Ralph, January 14, 1987

I am enclosing the 8810, which I donate to you for your work with PolyLetter, It includes the basic unit and a keyboard, both of which I think need some help. There is nothing wrong in using it for parts if there is nothing else left to do with it. I have a monitor that I will be sending you as soon as I have a crate suitable for sending it. Thank you for your help. --- Robert L. Schwartz, Cincinnati, OH.

[Dear Robert, -- Thanks very much for the 8810. It will be put to good use here at PolyLetter. The Keyboard has some of those sticking keys I wrote about in the last issue, so it can serve as a supply of parts for the sticking keys of our readers. (Keyboard II only.) Also, see my article entitled "Smoke Test" coming in a future issue. Now that I have located the basic problems in the system, I can convert it to a 96 tpi system which I can take with me when I go to visit other Poly Users. It'll be a lot easier to handle than an 8813. Thanks again, Ralph]

Dear Ralph, January 12, 1987

I received the copy of PolyLetter in November. Thanks for thinking of me. I had dropped my subscription because of my frustration with Poly, the lack of software, and the overpowering sense of doom that I feel about my Poly system dying just when I need it the most -- with no one around to fix it, and no spares parts available. I went through Hell trying to get our system at work repaired. . . . I thought I was going to lose my mind, being without "old faithful" for about six months. Well I did end up losing my job this past October, but not due to the computer. The new company president decided that all the work I was doing should be done by Engineering (the fact that they can't get their own work done notwithstanding).

Now I am relying on my Poly to produce my resumes and cover letters. But I want the printout to be from this Royal typewriter rather than my Prism 80. Royal has an interface which I have ordered ($170) that they claim will connect any serial or parallel computer to the typewriter (model 700D), contains 4K of RAM as a buffer and is compatible with a Diablo 630 standard (whatever than is).

Any way - since I won't be buying a new computer in the near future, I have decided to subscribe to PolyLetter again. Enclosed is my check for $15. I enjoy every issue of this newsletter, though I know nothing about assembly language and have decided that that's the way I like it. I'm an experienced BASIC programmer. I do like Exec, and almost dread having to eventually learn a new DOS. Well, I'll be waiting for my next issue of PolyLetter. Thanks again. Sincerely yours, -- Norman E. Shimmel, Butler, PA.

[Welcome back to the fold, Norm, and good luck with finding your next job. I'm sure the Poly will help there. I have picked up a second hand Poly to use for spare parts. But, I didn't have the heart to cannibalize it, so I set my nephew up with it to use with his school work until the day, if ever, mine needs parts. Since there aren't many local Poly repair shops, it behoves us all to acquire a rudimentary hardware savvy; to help this along, I think we should all share any hardware experiences we have had. I shall encourage our readers to send in their experiences. Also, if anyone knows of a service facility which handles Poly's lets share that info too. We do have some "hardware hackers" among our readers who could be called in times of emergency. Thanks again for rewewing your subscription. -- Ed.]

Dear Ralph: January 20, 1987

To me you're another James A. Michiner. He can research and write meaningful novels faster than I can read them.

Have been accumulating a number of items -- ACCOLADES - You're doing a really magnificent job, and this is especially notable with so little response as you appear to be getting. I think more than let on appreciate what you and your predecessors are doing. I hope this will encourage you to continue as you have been.

PolyLetter ARTICLES - This is really difficult to address and especially on a post card/ First of all, let's categorize the Poly owners by:

1.. Non-EDP type businesses using software packages;

2.. Non-EDP professionals using WORDMASTER, EDIT files structures for data management, and some limited amounts of software either contracted or simple user designed;

3.. Non-EDP professionals using WORDMASTER and EDIT along with user-written BASIC programs;

4.. EDP professionals using Polys in his business;

5.. EDP professionals engaged in the sale of Polys or Poly support soft/firm/hardware.

I can only get a feel for this from the tone of your PolyLetters, but would offer a guess that the percentages of initial Poly owners fall into the categories of 1..50%, 2..25%, 3..10%, 4..10%, 5..5%. I don't know the numbers, but at say 3,000 Polys out there originally, there are now fewer than 750 in Catagory 1, 500 in 2, 200 in 3, 150 in 4, and 75 in 5. Unfortunately for PolyLetter, no one in Category 1 is interested in subscribing and not many in 2. The main interest would come from the category 3-5 Users - - a potential market of some 425 maximum.

The type of articles you're offering would seem to perfectly satisfy this market. Somehow, the Category 3 guys have got to become more involved by asking stupid questions. I would classify myself as a Category 3 even though I earned a CDP back in '76. I don't understand an awful lot of what you all are talking about. That's OK though because it shows me some of what I don't but ought to know. I'll work on it (like how can I have a SSDD MS when it came with and runs SSSD 8" disks?)

Also, some background in missing back issues should help clear things up. The 86/01 issue had a very appropriate article on cabling printers. I'd like to get in touch with the author. . . .

OLD BUSINESS - Haven't had a chance to hook up your HAYES modems, yet. Every bit of available time has been consumed with swapping ROMs 26-28 on different CPU boards and with various system disks and serial headers and cables. I'm getting very inconsistent printer characteristics with different combinations. I'll try to prepare a report on all this after I work out as many of the wrinkles as possible. I'm getting lots of good use out of the SA-400 drives, though, but still haven't found anyone to re-align the old ones for under $35.

FINANCIAL AND INVENTORY PROGRAMS - I've had frequent occasions to write special purpose, almost one-shot programs to compute yields and amortize investments and compute present worth. I'd be glad to mark up a listing on some of these programs, or perhaps put together something that would satisfy others' needs if they will contact - - ditto for inventory. I maintain a retail furniture inventory system that assigns a stock code to every component delivered, the delivery code, actual cost including freight, current list price, current location (invoice number when sold), manufacturer, manufacturer code, color, material, same-as codes, product category code, condition code for damage or replenishment, etc. all in 93 character fixed-length records. Records can be retrieved randomly by stock code or by any other feature with a sequential search. The business has limited floor space and tries to offer a wide range of products either from storage or through catalog sales. Current, accurate, and easily maintained inventory records are provided by this system on some 5,000 components.

FOOTBALL FORECASTING MODEL - last Fall I loaded in the schedules of 100 major college football teams and then most Sundays would enter the scores. I ran a regression of sorts on these each week, weighting more recent games and identifying home games. This resulted in a team rating scheme of from roughly 70-145. If the 145 team played the 70 team on a neutral site the 145 team would win by 75 points. The rating scheme beat the Harrod's predictions, from mid-season on, by some 60%. I plan to set it up again next Fall, possibly incorporating 1986 results in the individual game predictions, and make it available to any who might be interested. There's probably a lot of potential with such a service, especially via telecommunications.

TRIVIA -- My review on the OKIDATA printers is prompted by a recent printhead failure of my model 193, purchased August 1985 from a Local vendor for some $865.92 (incl. sales tax). The vertical slot through which the pins hit the ribbon had worn wider and the pins were slipping about beside each other and making a fuzzy impression. My bumbling attempt to fabricate a collar resulted in half the pins breaking off. Even though the pin guide block appeared initiallly to be the only problem, the smallest component I could find available was the entire printhead unit through an OKIDATA-XEROX service chain for $90 plus freight.

In the meantime, I saw an SnW Distributors ad in COMPUTER SHOPPER for my same (or so I thought) 193 printer for about $500 and a 192 8-1/2" for $289. I called them on December 22 and they said those prices in the January issue were no longer available and that the 192 PLUS price was now $209 plus shipping and it would go out the same day or by the

next day latest. After giving them my VISA number and getting their assurances that they'd get it off as soon as my order cleared CREDIT, and then after a couple more phone calls in early January, it finally arrived January 13. The purchase was entered against my VISA on December 22.

The next unpleasant surprize was that the OKIDATA was marked "IBM Compatible" and lacked the serial RS232 interface board. The OKIDATA manual listed the board as an option, the distributor didn't know the part number, I couldn't get a call through to OKIDATA services, their Chicago office gave me the number and price at $79 but said they were just then out of stock, and finally SnW who had sold me the printer said they'd ship me the interface for $79 plus shipping ($84.03) COD within 3 days. It arrived UPS within 9 days. Despite all this, I'm still very pleased with everything about OKIDATA except the earlier than expected printhead failure. I wonder if I might have better cleaned or lubricated it? It was poorly protected from household dust, I left the cover off practically all the time. I also wonder if the pins might have snagged on bi-drectional while accidentally printing off the edge of 8-1/2" paper.

Again, I welcome your comments. -- Sincerely, Earl Gilbreadth, Savannah, GA

p.s. (1/24) Had not weighed this for mailing yet, and just received your 8606. I especially like Zits, key-bounce, Front Panel, SAVEF, Printer Interface Test, and "BASIC filename" Pleas do not feel obligated to publish any of this without severe editing!

[Most SSSD disks will do ok on DD and on DS, but they are not 'certified' by the manufacturer to do so. All are manufactured using the same process.

See the article "The Straight Wire" elsewhere in this issue for more on RS-232 cabling. Thanks for writing. Ed.]

PolyLetter, January 20, 1987

I rather like the idea of no "GOTO" story jumps. It was frequently confusing.

One negative comment, though, about the typography. If it's possible for you to have the same size type but without all that space between characters, it would certainly be more pleasing to the eye and easier to read. I think you're using proportional type, but with all that excess space between characters, it's hard to tell. Were you to take out some of the space between characters, you could afford to use 7 lines per inch instead of 8, this would also improve readability.

Further on the typography, the smaller typeface (see page 7, Issue 8602, Mar/Apr 86) is even more difficult to read, especially with the fresh ribbon.

And, finally, a blank line between paragraphs is a tremendous aid to readability -- even a half-line is a great improvement over no space at all.

I found most interesting Bob Bybee's comments about his conversation with current PolyMorphic owner Sirous Parsei. The attitudes expressed by Mr. Parsei are directly descended from the attitudes which kept PolyMorphic, instead of IBM, from being the "industry standard" microcomputer. I've run across this attitude many times. In its early days, PolyMorphic was light years ahead of its competition on the technical side, but the inability to understand marketing reality kept PolyMorphic from success. Mr. Parsei's attitude has always been "PolyMorphic owns the PolyMorphic owners, and anyone who tries to sell anything to these people is an enemy of PolyMorphic". Baloney. Had PolyMorphic encouraged others to adopt its operating system, provide peripherals, and write software, it would be alive today, . . .

I made a trip to Goleta (Santa Barbara) in 1982 to try to encourage some sort of activity on the part of PolyMorphic (and Mr. Parsei) to generate more interest in Poly and to try to keep as many Polys in use as possible. He was polite, but obviously wanted me to go away, which I did. Those of us who've had software to sell (and most Poly owners professed to want more software availability) had to try to sell it without any help from PolyMorphic. Several of us have compiled user/owner lists and offered the lists to PolyMorphic, but there apparently was no interest.

It's ironic that Sirous is distrustful of and unhappy with Bob Bybee. I know of several Poly owners, including me, who are probably still using our machines solely because of the work of Bob Bybee. I'm no great computer expert, but I know that with my pamphlets and articles on Poly operation, I've helped a number of Poly owners understand and operate their computers, and I'm on Sirous's list, too. I just don't understand the attitude -- never have, never will.

Keep up the good work, Ralph. We need PolyLetter and the input from you, Bob, and the others who are still trying to keep the PolyMorphic computer alive! -- Best regards. -- Chuck Thompson, Dallas, TX

[7 lines per inch was also suggested by Al Levy. I am trying it in this very issue. I've also gone to 12 cpi to decrease the intercharacter spacing. It looks better to me, but I'm only the editor. What do you think?

It's true that PolyMorphic Systems has moved to smaller quarters twice in the last few years, and their operations are shrinking, but they are still operating. We can't cry over spilt milk (even if it is a damn shame). Let's share what we have left with whoever's left. I'll make available my mailing list, including the non-subscribers, to anyone who wants to send me a self-addressed stamped envelope. (For $5.00 you can have it on SSSD disk.)

There is still room for the Poly to grow. I have updated SD proms and an improved Exec. I also run 96 tpi drives. I have ASROM prom versions for 40 track drives and for drives with fast step times. Chuck has a set of my fast 40 track ASROMS running on double sided TEAC drives; he gets 800 sectors per drive! And, the disk access only takes one seventh (1/7th) as much time. I run fast 80 track ASROMS on double sided drives and get 1600 sectors per drive (1.2 Megabytes in a single 8813). I do have a 30 Megabyte XT clone. It rarely gets used, but I hope eventually to put the Poly operating system on it. It would be great if I could get it to run the Poly Software, then I could have the best of both worlds. --- Ed.]

Dear Ralph, January 25, 1987

Glad you are still around. We use a Poly 8813 with 2-8" drives every day at Sloan Brothers for order entry and invoicing. It's a good ol'

work-horse. A second 8813 sets idle. We'd like to sell it.

Also in the family we have 1 apple II, 3 Osborne's, and a new IBM convertible (Don't buy one; it stinks!).

The second Poly 8813 might get used if we could run CP/M. We are in love with Wordstar & DBASE II having used them for 3-4 years in business mail lists, quotations, etc.

I still use your little known booklet about "Little Known Poly Commands" - Keep up the good work. What's new by Poly? - We'll buy it. -- John A. Sloan, Oakmont, PA.

[John, Poly has an upgrade which allows running CP/M. (See their ad elsewhere in this issue.) Unfortunately, the only other disk format that the Poly CP/M system can read is North Star Single Density. I have had my CP/M conversion running for years, although I seldom use it. I have purchased the Nevada series of FORTRAN, COBAL, and PILOT all on North Star Single density. Once the contents were PIPed over to the Poly drives I had no trouble running the software. I also bought a Lisp system on an Osborn format and had a friend copy the files over to a Poly using the serial ports and transfer software. It ran fine.

Poly is limited to a 64x16 screen and many CP/M programs want an 80x25 screen. The person I know who has the most experience with CP/M programs on the Poly is Al Levy. He has copied most of the Public Domain programs over into Poly disk format. If you know how to set up Wordstar for a 64x16 screen, it might run on the Poly under CP/M.

I'm afraid I don't remember the booklet you speak of, but I now have my own version of Exec which ads several commands, corrects many bugs, and has a HELP system with help files on every command.

Exec/{A|S} is available from Ralph Kenyon for $35. -- Ed.]

Dear Ralph, February 1, 1987

I see you've about caught up on the lost issues of PL! Congratulations, that took a lot of effort.

For several issues now, you've been noting that I have an upcoming article on "hardware problems". If you've been holding out because you're missing the article, please let me know and I'll forward you another copy. Otherwise, I'll hope to see it in print soon. I believe that's the last one I've written for PL, so after it appears, I'll work on some new ones... your suggestions?

My latest version of PCALC (the Poly spreadsheet program), version 1.1 has just been released. Updates are being sent automatically to purchasers of version 1.0 who have let me know they're using the program. Any users who haven't contacted me, please do so to be sure you receive your free update. For new users, PCALC is available on 5" SSSD diskette for $150. For more details on PCALC, see ads in previous issues of PL, or call me for more information.

I'm slowly moving to the PC world. Got a 20 meg hard drive on my IBM now, and I'm using the shareware program "PROCOMM" for terminal emulation on the PC. It's fairly easy to transfer files from the Poly to the PC., and I've done this for several Poly users. Converting BASIC programs so that they run on the PC is a little more time-consuming, but mostly possible.

I'm still looking for Poly-related projects, both hardware and software, to help Poly owners keep their machines useful. Please encourage readers to get in touch with me when they have a need for such services. -- Best regards, Bob Bybee, Stone Mountain, GA.

[Bob, its always good to hear from a past PolyLetter editor. You know from first hand experience about the problem of getting things into the PolyLetter. Your hardware problems article went into the last issue (8701), so you can start working on another at any time. I'll tell our readers that they can reach you at 5011 Brougham Court, Stone Mountain, GA, 30087, or phone you at (404) 498-3556. -- Ed.]

Dear Ralph, March 16, 1987

I am one of the original members of the Poly 88/8813 development team, having been the original author of the Editor and Printed Driver modules, as well as other DOS internals. I have a 3-drive 8813 system available for sale with 56K, keyboard, and 9" monitor, as well as an 8810 single-dive system.

Although these systems appear to be not much more than a curiosity in this age of mega '386 machines, I offer these machines for sale to anyone who might have a use for them.

Please mention this in your PolyLetter, and add my name to your mailing list. I am in contact with Lennie Araki and Mark MacLin, two of the 'early days' Poly people who stuck it out to the bitter end. Between us, we have full access to system source code to the Poly machines and can answer written questions, etc.

Also, please DO NOT publish my phone number. Written queries are all that we are able to handle. -- Sincerely, Glenn Andre McComb, McComb Research Laboratories, Post Office Drawer 90609, Santa Barbara, CA, 93190-0609.

[Glen, there are probably a half a dozen 'hackers' who might be interested in the source code. Sirous has been approached, but so far has asked too high a price for the few of us who may be interested. I would like to correct some of the bugs I have found. (Most of the software I use now is upgrades I have done myself.) There are also some minor enhancements I would like to make. It would also be useful to have the source code if I ever get around to writing an emulator for MSDOS. But mostly, I would just like to see "how they did that" about everything.

When we talked, you spoke about hardware possibilities such as a single ROM/RAM board with the operating system in ROM, etc. Perhaps you could take the time to briefly outline the possibilities you see for our readers; there may be some interest. Since you have been with the Poly since 'Day One', perhaps you have some software which you would be willing to contribute to our public domain library. I'm sure there were 'demo' disks put together at various times; I've seen one with some snappy graphics, but there aren't any in the PolyGlot Library yet. I hope you decide to keep at least one Poly for a while, and stick it out with the rest of us.

I hereby raise and lead three cheers for you as the author of the Editor, which I am sure most all

of our readers will join in. -- Hip, hip, Hurrah! -- Hip, hip, Hurrah! -- Hip, hip, Hurrah! -- The editor is the single most endearing feature of the entire Poly and virtually every owner I have talked to has nothing but accolades for it. In my opinion it has a fine balance between simplicity (ease of use) and sophisticated features. I've not seen anything like the ESC libraries and the "ESC :" feature, but then again, I haven't looked at too many other editors. (You'll not catch me straying from the fold.) Have you given any thought to adapting a version for MS-DOS? I heard that Lennie had done some work in that direction; Sirous says they haven't decided how far to go with it. I'd love to 'beta test' a copy of it. Do write us and tell about the things that might yet be. --- Ed.)

The Straight Wire

by Ralph Kenyon

There seems to have been a lot of confusion about connecting serial cables from Polys to printers, etc. The Poly has a nice little patch plug right on the serial mini-card. Most other computers do not have any such plug, so one must make up a special cable for each device on each computer. However, Poly's flexibility has lead to some confusion.

If you cross the lines in the cable, then the plug must be straight through, and if the cable is straight through, then you must cross at the plug.

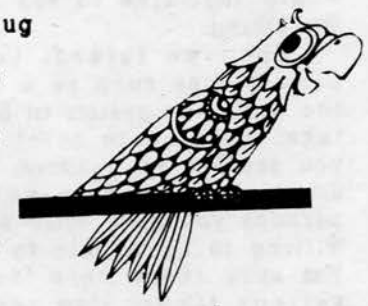
To clear up the confusion I recommend the following solution. Use the Poly's flexibility; make the cable straight through whenever possible and put any cross jumpers on the plug on the serial mini-card. The header published in Poly's printer upgrade (Printer/40) only works when there are some crosses in the cable.

The necessary lines in the RS-232 interface are defined as follows:

1 - Ground
2 - TxD - Transmit Data
3 - RxD - Receive Data
4 - RTS - Request To Send
5 - CTS - Clear To Send
6 - DSR - Data Set Ready
7 - Ground
8 - DCD
20 - DTR - Data Terminal Ready

These lines connect to the Poly's plug as follows.

Name	RS232		Plug
Ground	1		-
TxD	2		2
RxD	3		1
RTS	4		4
CTS	5		3
DSR	6	cc	5
Ground	7		-
DCD	8	cf	5
DTR	20		6



On the Poly's side of the plug we have

16 - RxD (input)
15 - TxD (output)
14 - CTS (input)
13 - RTS (output)
12 - DSR (input)
11 - DTR (output)
10 - RxC (input)
9 - TxC (output)

TxC is the Transmit Clock pulse, and RxC is the Receive Clock Pulse. These are used for clocking the bits out of the 8251 USART chip. In almost every case we just feed the Poly's output clock pulse back to itself by connecting pins 9 and 10. In essence, Poly is telling itself to go ahead and process the bits.

After this it gets slightly more complicated. But, things are much simpler if we know that we have decided to make the cable straight through whenever possible. First, the data line. When we connect a printer or some other device to which we send data we must be able to get the data to it. This involves connecting Poly's TxD (output) line, which is available at the Plug pin 15, to the RS-232 RxD (input) line, which is available at the Plug pin 1. (Remember, we are making the cable straight through.) It may be that our device will be able to send data back to the Poly. So, we need to connect the RS-232 TxD (output) line to Poly's RxD (input) line - Plug pins 2 to 16.

From here on in, we will be dealing with the hand-shaking problem. The Poly has the Clear To Send (CTS) line going right to the 8251 USART serial chip. The USART does nothing until this line is raised. There are two ways to get this signal. One is to get it from the external device by connecting RTS. The other is to get it from the Poly itself. The former case is true hardware handshaking but the latter is fakery. The Poly is telling itself that it is ok to send. If the external device does not have a RTS line by which it signals that it wants to send data, then we must connect the Poly's own RTS line. For true hardware handshaking we connect Plug pin 4 to Plug pin 14. For fakery we connect Plug pin 13 to Plug pin 14. Now, the external device is just like the Poly, and needs to be told that it can send data. It looks at the RS-232 CTS line to determine if it is okay to send data. We must provide that signal. We do so by connecting Poly's RTS line. So, we connect Plug pin 3 to Plug pin 13.

Now, there is another set of such signals and the Poly looks at these signals too. These are the DSR/DTR pair. Exactly the same reasoning involving CTS/RTS applies to DSR/DTR. We must connect Plug pin 6 to Plug pin 12 for true handshaking. For fakery we connect Plug pin 11 to Plug pin 12. Similarly we connect Poly's DTR signal to the RS-232 DSR signal by connecting Plug pin 5 to Plug pin 11.

In most cases connecting 1-15, 2-16, 3-13, 4-14, 5-11, 6-12, and 9-10 will do the job.

If your printer only provides one of the two signals RTS or DTR, then they must be connected together on the Poly plug. This will allow the Poly to see both signals when the printer only provides one. Connect Plug pin 4 to Plug pin 6 in addition to the connections just mentioned.

If your printer does not provide either of these signals, then "fakery" must be used as discussed above. In this case, since the Poly is only held back by itself, the baud rate must be limited to prevent the Poly from over-running the printer, usually no more than 300 baud.

There will be exceptions. My printers provide a

"Fault line" on RS-232 pin 25, but no RTS line, so my cable has pin 25 at the printer end connected to pin 4 at the Poly end. This gets connected to Poly's CTS at the plug, and the Poly stops sending whenever the printer drops the fault line.

OKIDATA 192 PRINTER

by Earl Gilbreadth

I think my OKIDATA printer is another computer in itself, and in fact it is! To wit, this analysis of the OKIDATA 092 (same as 193 wide carriage) was composed on my POLY using EDIT, and then printed with the OKIDATA under direction of a general purpose program I wrote in BASIC. [Sorry, but this article is not printed here with the OKIDATA, but the sample Earl sent did look good. Ed.] Note that the print is not only proportionally spaced for different letters (iiii wwww) but can also be space controlled between each letter to generate a straight right margin. Spacing, print mode, etc. can all be regulated by BASIC within each line. There also is a special feature which permits the design and storage of some 160 special 7x11 matrix characters. It has an 8K buffer.

There also are NO IMBEDDED PRINTER signals within the text file. I can print any conventional text file with <90 characters between CRs. I've got POLY WORDMASTER but have not used it enough to really make a comparison.

I have had the 192 (actually a 193 wide carriage) for about a year and recently ordered a 192 PLUS. The salesman on the phone assured me there was no difference between the PLUS and its predecessor, that the PLUS was improved somehow. Well, it is faster, up from 160 to 200 cps maximum rate. However, the various controls structure has also been expanded and all the BASIC control signals were changed too. The revised signalling structure makes a straight translation of my original BASIC signals somewhat complex but still not impossible. This revised letter was done on the new 192+ after less than 5 minutes modification of my BASIC printer program.

The OKIDATA 192+ with serial interface option costs roughly $400 delivered. When ordering through COMPUTER SHOPPER be sure to specify that you want the serial RS232 interface, otherwise you'll probably get the parallel "IBM Compatible" model for $80 less. Can anyone suggest how to hook up this printer to a POLY in parallel without installing an additional S-100 board?

There are three (3) methods for specifying cpi, print style, lpi, etc. on the OKIDATA: they are dip-switching on the printer's RS232 interface, with BASIC instructions, or calling up the printer ROM driven Menu that prints various options in response to operator on/off activations of various printer controls. The Menu offers LPI, CPI, baud rate, various print modes (DP, italics, "quality"), emphasis and enhancements, different language sets, proportional spacing and some dozen other features. When the printer is powered on, it defaults to the last previous Menu entries. I have a special BASIC program on the POLY systems disk that allows me to make printer changes on the POLY keyboard rather than switching to the printer Menu and wasting paper. The OKIDATA PLUS advances several lines of paper following each response in order to provide better viewing, as opposed to the previous model requiring an advance in order to get a better view of those lines upon which reaction is called for.

Tractor sprockets come on the platen roller for fan fold paper, or pressure rollers against the platen permit single sleet feed from the top-rear. Print head replacement can be expensive ($90) and difficult to order, so be careful and keep it clean. The original OKIDATA manuals are what first attracted me to this machine - - they are far superior to any other EDP manuals I've ever seen. Unfortunately, they don't offer much help in cabling to a POLY. The more recent PLUS manuals for the IBM compatibles are more brief, but OKI sends an instructions disk (IBM of course) to cover more advanced programming situations. I have no idea what's on this disk.

OKIDATA has a toll-free telephone line for technical service which I have used with no difficulty; recently, however, I had to give up after some 40 attempts over a week's time. They are tied in with XEROX on their service centers and use a separate distributor for replacement parts ($$$).

I still use a couple of old INTEGRAL DATA 440 Tigers, and have the OKIDATA set up similarly:

POLY SERIAL HEADER	OKIDATA to POLY CABLE
16 to 02	03 to 03
15 to 01	05 to 20
14 to 03	
13 to 04	
10 to 09	07 to 07

Pre 40s version POLY "Setup.GO"

Oh, by the way. I have designed a character set using a portion of the 160 special characters which permits me to print unlimited length lines from top to bottom of page(s) rather than across. This is still in the shake-down and refinement stage, so I doubt if I will install a right-aligned margin feature any time soon. This program places text into a memory grid with lines loaded in columns but printed in rows. All of this and the right margin programs are in BASIC and VERY slow. I plan eventually to translate portions of these into machine code but will probably need some assistance.

I welcome questions and assistance.

Earl, (912) 355-4415

Public Domain

PGL-V-17 contains an updated version of the PolyMorphic Inventory Control System. This Inventory System has been placed in the Public Domain by PolyMorphic Systems. The programs originally ran on BASIC C00 on Exec/79, but should run on any later versions as well. I have taken the programs off the original system disk and placed them on a disk with the complete documentation. To print out a clean copy of the documentation you need a copy of the FORMAT program from WordMaster 1. Contents:

```
Disk PGL-V-17 has 19 files on it, 330 sectors in use.
   8 FILECREATE.BS      8 INITIAL.BS      27 ROOT.BS
  21 POST.BS            7 ENTER.BS        10 STATUS.BS
  11 CREATE-INDEX.BS    1 DAT.DT          17 DESCRIPTION.TX
   1 HEADER.TX         22 CHAPTER1.TX     46 CHAPTER2.TX
  12 CHAPTER3.TX       62 CHAPTER4.TX     57 INTRODUCTION.TX
```

```
 10 TITLE.TX          2 SETUP.TX       1 PRINT-MANUAL.TX
```

PGL-V-18 and PGL-V-19 have an OLD demo system on Exec/6E, but there are some flashy graphics on it. PGL-V-18 may be booted to on drive 1, but cannot be booted to on other drives, as this early Exec doesn't know about SYSRES. Contents:

```
Disk PGL-V-18 has 47 files on it, 308 sectors in use.
  3 Copysys.TX          1 Unsys.GO      14 FILMS.GO
  2 Graf.OV             1 I/O.BS         5 PLOTTER.BS
  9 Basic.SY            1 Sexy.OV        9 FRED.BS
  3 TEXT.DT            15 EDIT.TX        1 STAN.BS
  1 DRAW.BS             2 SQUARE.BS      4 SHATAS.BS
  3 POLY.BS             3 8813.BS       11 Initial.BS
 13 Printer.GO          4 POLYDEMO.BS    3 STUFF.BS
 11 fred.BS             1 i/o.BS         6 plotter.BS
  3 poly.BS             4 8813.TX        9 INITIAL.BS

Disk PGL-V-19 has 17 files on it, 315 sectors in use.
260 ROSE-DATA.DT        1 PLOT-DATA.DT   3 TEXT.DT
  1 Sexy.OV             2 How-to-use-the-Demo-program.TX
  2 INITIAL.TX          9 INITIAL.BS     1 GARBAGE.DT
  4 TEXT.DT             3 CTEXT.DT
```

PGL-V-20 has two groups of programs. The first group is for stereological image analysis. The second group are for use in chemistry calculations. Contents:

```
Disk PGL-V-20 has 24 files on it, 350 sectors in use.
 58 IMPS52.BS          58 IMPS52/1.BS   62 IMPS52/2.BS
 28 IMPS52/3.BS        14 STEROT6.BS     2 CENTIGRADE.BS
  5 KELEK.BS            7 EH-PH.BS      12 MOLWT.BS
  8 SPECT1.BS           2 ARRHENIUS.BS   4 XLENGTH.BS
  5 POLAROGRAPHY.BS     4 Eyring.BS      3 Arrhenius.BS
  3 GUGGENHEIM.BS      25 LLSQPLOT.BS    7 PKA.BS
  9 CVK.BS              3 KINCHANGE.BS   2 DISTANCE.BS
  3 RCALK.BS           11 SPECTRAL-ANALYSIS.BS
```

Interactive Microcomputer Program for Stereology (IMPS) is a suite of programs which can be used to collect data and to process it for a wide range of stereological applications. The RAM requirement depends upon the size of arrays dimensioned in the experiment being run; a fairly large experiment (for each group: 5 objects x 5 samples x 3 pictures x 12 counting variables x 27 parameters) can be run in 25K bytes of free memory without encountering difficulties. (A full Poly has 38K free bytes.) IMPS was described in "A General-purpose Microcomputer Program for Stereological Data Collection and Processing", which was published in the "Journal of Microscopy", number 124, p. 219, Nov. 1981. The authors were L. G. Briarty, L.G. and P. J. Fischer. A 56 page handbook is available; the reproduction and mailing cost is $6.00 each copy. **IMPS** and **STEROT6** were submitted by Dr. L. G. Briarity, Botany Department, Nottingham Uiniversity, Nottingham, NG7 2RD, Great Britain.

The remainder were submitted by Dr. Michael Clarke, Chemistry Department, Boston College, Chestnut Hill, Massachusetts, 02167.

KELEK.BS calculates homogeneous rate constants from CV currents. **CVK.BS** uses data from disk files.

EH-PH.BS calculates Eh values as a function of pH when the oxidized and reduced forms engage in single proton equilibria.

MOLWT.BS calculates % Elemental analysis for compounds with up to 25 different elements.

ARRHENIUS.BS calculates rate constants given the temperature and Arrhenius activation energy.

XLENGTH.BS calculates molecular bond lengths and bond angles.

POLAROGRAPHY.BS calculates Log((id-i)/i) (Base 10) and Voltage. Current and voltage input can be in arbitrary units.

LLSQPLOT.BS performs a linear regression analysis on data. The data is read into two one-dimensional arrays, X and Y. The data can be inserted into these arrays in three ways:

1) From a one-dimensional array in a data file of spectrophotometric absorbance data,

2) From a two dimensional data array, and

3) From the keyboard.

The total number of points is limited by memory to 275. For a concise discussion of linear-least squares analyses see, "Statistical Methods for Chemists", by W.L. Gore, Interscience, NY (1952). LLSQPLOT.BS CHAINS to GUGGENHEIM, Arrhenius or Eyring.

PKA.BS calculates pKa values from absorbance and pH.

KINCHANGE.BS takes an x,y data set given in Temp(C) and a rate constant and converts it to ln(k) and 1/T(K). The new data set is then read out onto a disk file. The new data set can then be used in LLSQPLOT to get the activation parameters.

DISTANCE.BS calculates the distance between two atoms bonded to a third.

RCALK.BS calculates the product ratio for complex branching and sequential reactions.

SPECTRAL-ANALYSIS.BS plots spectral analysis data.

Windows for the Poly!!

PGL-V-21 has Norm Shimmel's General Programming Functions which include the tools necessary to put WINDOWS in your BASIC Poly Programs.

Superman!

Start with INTRO, and then get INSTRUCTIONS. You will end up in SUPERMAN, a game submitted by Al Levy. Superman has some fancy graphics in the introduction.

PRIME.BS computes the prime factors of a number and was submitted by James Goodall.

```
Disk PGL-V-21 has 10 files on it, 346 sectors in use.
  0 WINDOWS FOR THE POLY!              8 HELLO.TX
111 DOCUMENTATION.TX    75 DEMO.BS
 50 General-Programming-Functions.BS   2 BSdef.ED
 10 INTRO.BS           23 INSTRUCTIONS.BS
 52 SUPERMAN.BS         9 PRIME.BS
```

PGL-V-22 has more financial programs. Contents:

```
Disk PGL-V-22 has 8 files on it, 350 sectors in use.
131 YPS-42.BS          40 AS-DATE.BS
 24 AS-DATE-OMNI.BS    60 CASHFLOW.BS   65 CREATE/BANK.BS
 13 MORT2.BS           9 FIFO-LIFO-INVENTORY-COMPARISON.BS
```

YPS-42.BS is a nesting of ten programs whose purpose is to supply information on any loan as to number of payments, interest rate, regular payments, principal balance, yield, price, balloon payment, balance remaining, total interest paid, days between dates, and percentage of discount.

AS-DATE.BS and **AS-DATE-OMNI.BS** print Loan Amortization Schedules. The above programs were

written and submitted by James J. Trahan PO Box 217, Oxnard, CA 93032.

CASHFLOW.BS by PolyMorphic Systems, is also included on this disk. It was submitted by Joe Toman. PolyLetter has a 32 page manual for CASHFLOW which includes 15 pages of documentation and 14 pages of program listings. The copy and mail cost for this manual is $3.50.

CREATE/BANK.BS is a Deposit Slip/Check Entry - File Maker submitted by Al Levy. It's got some interesting messages in it.

MORT2.BS and **FIFO-LIFO-INVENTORY-COMPARISON.BS** were submitted by James Goodall.

Abstract Systems, etc.
191 White Oaks Road
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(413) 458-8421

DISKS --- MODEMS --- PROMS --- SOFTWARE --- SPELL

1. MAXALL diskettes: 5" 10 hard sector -- $13 per box of 10.
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3. HayesSys modem software (for the Micromodem 100) $35.
4. (AIS) Spell, a good spelling checker for $35.
5. Abstract Systems Exec (Enhancements & bugs corrected) $35.
6. Abstract Systems Proms (Enhancements & bugs corrected) $35.
7. PolyGlot Library Volumes 1 thru 22, $6 each.

(Send $1.00 for a complete catalog--(free with any order).)
(Make checks payable to Ralph Kenyon.)

PolyMorphic Systems
7334-H Hollister Avenue,
Santa Barbara, CA 93117
(805) 685-6238

Users Manuals and Theory of Operation Manuals.

CP/M hardware conversion: $100 plus parts. (CP/M license, manuals, and software: $200)

16K to 64K memory card conversion $125.00 plus parts. (The 16K board has to be a Poly board and in good working condition.)

Eight inch **MAXALL** 32 hard sectored diskettes for your MS. $15.00 per box or $ 115.00 per ten boxes. Al Levy, Post Office Box 71, Hicksville, NY 11802, (516) 293-8368

For Sale: Multiple 8813 systems - each with 3 drives, 64K, Monitor, and Keyboard - Make offer. Robert L. Schwartz, 906 Main Street, Cincinnati, OH, 45202, (513) 241-3447.

For Sale: 64K 8813 with 3 drives. Make offer. Vince Greenen, 445 Buckeye, Naperville, IL, 60540, (312) 961-2511.

For Sale: 8813 with 3 SSSD drives, 20 Meg hard disk. Make offer. Bruce Buckley, McCormic Equipment Co., Inc., 11591 Grooms Road, Cincinnati, OH, 45242, (513) 489-0100.

For Sale: 8813 Twin system with MS, 1 5" drive. Best offer. Larry Isaacson, P. O. Box 93887, Atlanta, GA, 30377, (404) 351-3652 (9-5 EST).

For Sale: Video Board - $95, 8" Disk Controler - $150, Printer Interface - $50, Poly CPU - $125, Priam Hard Disk with Poly Interface card and Power Supply - $400, Poly Keyboard/Screen enclosure - $175. Charles Trayser, 415-651-5931.

For Sale: 8813 System. Karen Klysz, 4050 Hearthstone Court, Cincinnati, OH, 45245, (513) 752-7186.

Poly for sale: C. Barclay Gilpin, 407 Lenwood Drive, Costa Mesa, CA, 92627 (714) 642-0390.

FOR SALE: Two 5" SSSD SA400 drives, $36 each. - Ken Lowe, 5936 W. Zina Circle, West Valley City, UT, 84120 (801) 969-7736.

Charles A. Thompson
PolyCom Associates
2909 Rosedale Avenue,
Dallas, Texas 75205-1532
Phone: (214)-368-8223

PolyCom General Ledger $125

The PolyCom General Ledger has gone through several revisions and is an excellent way to keep books on your Poly. It sold for $750 in 1983, and is much improved since that time. There are two versions. Version 4 is the original form, where you keep each separate set of books on separate diskettes. Version 5 is menu driven and allows you to keep a number of different sets of books on-line. (Version 5 requires a hard disk, preferably, or at least DSDD floppies). Either version is $125.00, including the operations manual. Both versions have been extensively used (I use Version 5 constantly) and there are no known bugs (though only a fool would guarantee a bug-free computer program!).

DEMISE OF THE TAX PROGRAM

The PolyCom 1040 Federal Income Tax Program will not be offered this year. There was insufficient interest to justify the many hours a formal revision takes. I may do a crude revision for my own use, and if you would be interested in that, let me know. Price would be $20 and your blank diskette sent to me. Drop me a note if you're interested, and I'll let you know when (and if).

FOR SALE: Several Poly 8810 boxes, complete with power supply and 5-slot S-100 mother board, but no plug-in boards. These would be great for converting to Ralph Kenyon's enhanced operating system with half-hight drives. $50, plus cost of shipping.

Bit Bucket

How often have you made a copy of a disk and then realized that you had used an un-initialized disk? So, you get out another disk, INItialize it, then IMAGe from the disk to the newly INITialized disk, and finally INITialize the offending disk. Want an easier way? First, set # to the drive number which has the offending disk. Then try this BASIC program: (CLEAN-TAIL.BS)

```
10 DIM A$(1:256) \A$=CHR$(0) \FOR I=1 TO 8 \A$=A$+A$ \NEXT
20 FILE:4,OPEN,"(#(CLEAN.TX",OUT \ON ERROR GOTO 40
30 PRINT:4,A$, \GOTO 30
40 IF ERR()1285 THEN Z=CALL("Berr",5,0,ERR,0) \PRINT
50 Z=CALL(1027)
```

The program starts writing sectors of 00 bytes on the un-used tail portion of the disk and continues until the end of the disk is reached. (I don't know if this works on DD 5" systems or on 8" systems, but it sure works for SD 5" systems.) It is a bit on the slow side, though.

Quick Reference Card

PolyLetter has just received a supply of PolyMorphic Systems Quick Reference cards. Just mention that you want one with any order or renewal, or send in a Self Addressed Stamped Envelope.

K-9

K-9 is getting hungry; no one has figured out what to feed him! (I'll give you a hint; he eats them one byte at a time.)

In This Issue

Coming Soon

Assembly Language Housekeeping, Smoke Test, Modems and Communications software, More BASIC for Beginners, How to UNSAVEP protected Programs, More System Programmers Notes, Making your PC work like a Poly, More Help, BugNotes, Public Domain Software, etc.

Questions

Can you find and answer the questions asked in this issue? Send your answers and requests in.

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Williamstown, MA 01267
(413) 458-8421

Address Correction Requested

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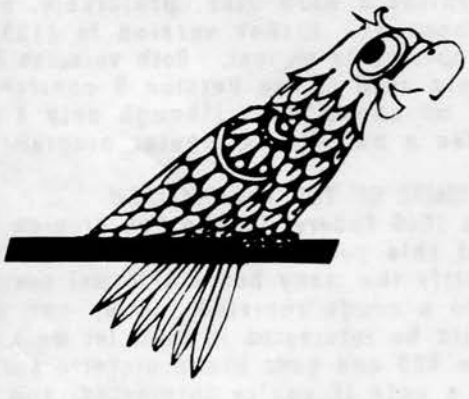

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PolyLetter

The Newsletter for PolyMorphic Systems Owners and Users

Editorial

Well, I must apologize for being later that I expected. I am presently in the middle of re-writing and polishing my masters thesis in philosophy. I'll be glad when that chore is done. With any luck it'll be done before the next issue.

East Coast Service

Davis McCarn of DMCC in Arlington Virginia, 22201, tells me that he still can service Polys. Contact him at 3465 North Fairfax Drive, Phone (703)-243-5730.

SPELL

Some time ago I got Frank Stearns Spelling Checker from Frank. I was not at all satisfied with it and wrote my own, which I have been using for some time. Now that Frank is no longer in the Poly business, I am offering my version of Spell at the incredibly low introductory price of $35.

Frank's dictionaries had lots of incorrect spellings in the form of double letter endings. I decided that the dictionary files should only have correctly spelled words in them. I added large files of prefixes and suffixes. Spell.GO looks for prefixes and suffixes to chop off if it cannot find the word. By having larger files of prefixes and suffixes smaller dictionary files of root words can cover many more words. There is also a file of misspelled words which could otherwise get by the spelling checker. To give an example, the prefix "PRE" and the word "MICE" combine to form "PREMICE" which is an incorrect spelling of "PREMISE", so "PREMICE" goes in the MISPELL file.

To make the system more flexible, I have placed the names of the main dictionaries in a file called DICTIONARIES. Spell.GO looks in this file to get the names of dictionary files to use. A user can customize his version by adding new dictionaries, for example, a dictionary of medical terms, to the list of names in DICTIONARIES.

To use Spell one types in the program name followed by the input file names and the output file name. For example: "Spell Input-file(,input-files) (output-file)." If no output file is specified, the first input-file name with a question mark appended is used. Input file names must be separated by commas; the output file name is set off by a space.

Spell can be run on a system with only 2 small drives. It saves a copy of the checkbyte on the output file disk and checks to make sure this disk is in place on the proper drive before each verification cycle. If it cannot find the correct dictionary file, it asks for the proper disk. This way, you can continually swap dictionary disks and output file disks on the same drive if necessary.

Spell comes on a flippy with the programs and some dictionaries on one side and the remaining dictionaries on the other side. To order Spell, send me check or money order for $35 payable to Ralph Kenyon.

Letters

Dear Ralph, February 2, 1987

How happy I am to hear from you. It has been quite some time since we have used our unit as it seems that the users, and support for PolyMorphic in the DFW area fell into the cracks. Being users, and not programmers, we could really use some help in getting our unit back on line to do some task, ever so small.

Please advise if you can be of help of get us in contact with some people in the Dallas area. Dick Brown, Richardson, TX.

[Dick, I'm sending you a printout listing everyone I know in Texas who had or has a Poly. There should be a few people in the list who will be willing to help you. The list includes the people whose subscriptions to PolyLetter have expired; if you discover that any of these people have gotten rid of their Poly, please let me know. Try contacting Charles Thompson, who has often been a contributor to PolyLetter. -- Ed.]

Dear Ralph: March 3, 1987

First off I would like to say that I think you are doing one fine job in bringing a lot of Poly lovers together. The PolyLetter lives again!!!

About 5 inch drives in the Poly - When I purchased my first Poly the dealer managed to pawn off two used Shugart SA400 drives and before long I began my education. A letter to Shugart resulted in a OEM and Service Manual for free, along with about ten new head load buttons. With complete servicing information my future drive troubles were short lived. Later, after purchasing a Shugart SA400L drive I got a free Service Manual for it. Shugart address was - SHUGART ASSOCIATES, 1503 South Coast Drive - Suite 310, Costa Mesa, CA 92626 and the main office was - SHUGART ASSOCIATES 435 Oakmead Parkway, Sunnyvale, CA 94806. Seems there has been news of their selling out to someone. If someone is interested in adjusting or repairing a drive the manuals are invaluable plus easy to understand. I could go into a lot of detail about adjusting and cleaning for whatever it is worth. Head alignment, disk speed, zero track and head load bail adjustment but access to the manual would accomplish more toward solving a problem than an essay. One

important item is to not lubricate the rails that the head travels on. Clean those with denatured alcohol and leave dry and mechanically free. Frank Stearns wrote a program to exercise a disk - called it ALIGN and was kind enought to send me a copy. That along with a SHUGART ASSOCIATES SA124 ALIGNMENT diskette you're off to the races.

Keeping two Polys operating over the years has been an interesting experience. Being able to substitute between the two was no small advantage. With the "modern" systems today (have two IBM PC's that do nothing but run) the newcomer will miss out on a lot of "down-time" fun. The real fun was the TRS-80 Model 1. Now there was a chance for real experience.

While I have had to replace a few defective chips over the years the main cause of problems is poor contacts due to whatever they do to bend pins and coat them with excellent dielectric material. I found that denatured alcohol (190 proof), obtainable from "behind the counter" at your favorite drug counter, is the best contact cleaning agent. It will take the hide right off on liberal skin contact and is flammable. Used with a cotton tipped swab (Q-Tip) and soft cotton cloth all board contacts can be cleaned easily. To give a board a good treatment I liberally swab the pin row with alcohol and then "rock" the chips while they're swimming in alcohol. I have found nothing that the alcohol bothers. Do recommend that the board be allowed to dry for a few minutes before firing up to avoid a meltdown.

For detecting bad memory chips - the first two minutes of the "Extensive Memory Test" will generally disclose a problem. It is better and faster than running through the regular confidence test. Running the whole Extensive test gives chips the acid test but most generally if you don't get a problem by the time it starts the Galpat routine, you don't have a problem.

Intermittent problems - may I be delivered from such. I had a CPU board that was infected by the devil - I swapped it with PolyMorphic - I got rid of the board but not the devil - does PolyMorphic know something I don't! The board I got back is intermittent!! It knows just when to go Alpha Sierra.

A lockup with front panel or otherwise can be a problem. If all else fails and you're in Edit or Basic - don't shut off the computer. After rebooting GET EDIT or BASIC and generally the text in edit or the program is in basic can be found intact. Loosing run-time is a small price to pay. Rebooting does not zap RAM. That was explained in a much prior issue of PL.

Bob Bybee wrote and sells a good communication program (SM.GO) for the Poly. I have used it to transfer (at 1200 Baud) Poly to IBM or vice versa. Need two modems to do it but it works fine. I have also used it to contact Bulletin Boards. It has it's limits but it works.

I have one setup where I operate a Diablo 1620 printer with both a serial and parallel port. Poly goes serial and IBM goes parallel. The Printer Works in Hayward, California sells a board that fits into the empty slot on the Diablo 1620 and accepts both serial and parallel input with a 64K buffer to sweeten the deal. Input from either computer can be stacked in the buffer serially but not fed at the same time, otherwise you've invented a new script! For professional work a daisy wheel is the only way to go. I have an Epson FX-100 for other than professional presentation and it makes good draft copy.

Back when printers cost as much as a new automobile I bought a Diablo 1620 and 1640. They have served me well. Have never needed a repair. All they do is run and eat up multistrike ribbons like spaghetti. I doubt if there is a printer on the market today that can beat them for endurance and quality performance. They are still available. A 1640 rebuilt by Diablo sells for $600.00 plus shipping. I bought one recently for my son and it's really a new printer that refuses to wear out. The Printer Works in Hayward also specializes in DIABLO printers and are knowledgable.

I'm trying to find time to get a few programs together and include on this disk. Someone was wanting financial programs. Maybe what I can offer will be of some help. Don't know if they're "crude" but they serve the purpose.

These are some ramblings about my love affair with my Polys'. When they reach retirement age I plan to let them out to pasture. They are old friends now and have served me well. Without them it would have been a different story. He who hasn't talked to a computer at some time or other has missed something. Saw an interview on TV with children concerning computers and one young lad when asked what he liked about computers, said that a computer was BETTER than a friend. Asked why, he said, "A computer will WAIT for you." By now you can guess which side of 30 that I am on. Computers are a quantum leap for man - they are the essence of man and his quest. A natural evolution of his creativity. They wait, and who can deny that they who wait also serve.

The following is why I have a facination for computers in general and Poly's in particular.

Turn the clock well back.

I never had my hands on a typewriter until I was over eighteen years old such, was the environment 1937. As a result I have a profound appreciation for any of the mechanical contrivances that provide capabilities sometime beyond our comprehension. Retiring from the Navy in 1957 I ventured into general real estate and loan business. This brought on the need to compute as a large part of the business was making or purchasing and selling at discounts loans of various configurations. The handiest thing at that time was a book of annuity tables and later a book of yield graphs requiring a lot of interpolation. Then came the Olivetti Divasumma 24 - a mechanical monster costing $625.00 and noisy but it could do - + / & * plus it did have a memory. I wore two of them out before Hewlett Packard came out with the HP-80 (also the HP-55, HP-67 and HP-97) - a shirt pocket financial calculator that cost $395.00 but it has the bond formula hard wired into it. With it we declared our independence from the two Mathematical PhD's at Delphi Science Services in Santa Monica and the UCLA computer. That was when Regulation Z went into effect and such things as APR's and Disclosure Statements became part of the loan business. Also, loans became a bit more sophisticated due to the

fact that the other guy had the same "weapons" with which to flimflam the public. Along came the TRS-80 Model 1 from Radio Shack with a cassette storage (that had a habit of losing everything spontaneously and maliciously).

Now we come to the good part.

I spotted a Poly at a computer show in Los Angeles and I guess the attractive thing about it was the beautiful wood cabinet. How many computers have you ever seen with a natural wood cabinet? Poly had it all, a dependable storage (I have never lost one item in all the years of punching keys), attractive cabinet and it was about as bug free as you could want. With it my business prospered and I was hooked enough to buy another to keep at home and write programs for business and recreation. Eventually I bought a third one for parts. Over the years that I have the Poly's I also bought two Apples, one Kaypro and three IBM PC's. All are dependable machines but the sweetest sound is a booted Poly and the second is a Shugart SA400 drive trying to find tract 0. Watching it run a loan collection program doing batch processing using all three drives makes my heart soar like an eagle. Also, with other computers you don't get to know nice guys such as Frank Stearns, Bob Bybee and Ralph Kenyon.

The PolyMorphic computer is a Classic.

Life goes on and more speed, capacity and versatility are needed so gradually the Poly's are being relieved of some of the larger tasks and being allowed to rest while the younger IBM guys take over. It would hardly be an office though without my faithful 8813's standing by to lend a hand whenever they are needed.

Thanks for listening - JIM TRAHAN

Ralph, April 4, 1987

I couldn't decide which public domain disk to claim as my prize, especially after reading the JAN/FEB PolyLetter. So, enclosed is a check for $30 - please send PGL-V-11 thru PGL-V-16 and I'll consider the free one as any one of those 6. My thanks to Stan Reifel for submitting his cross assemblers to PolyLetter.

As we discussed on the phone awhile back (thanks for the call) I have been toying with the idea of a ROM or RAM disk for the Poly system drive. Surveying the available S-100 cards it appears that the best solution is to wire wrap a custom circuit. Are there other hardware hackers reading PolyLetter that would be interested in a device of this type? If so, I would be glad to submit schematics and construction details as work progresses.

Keep up the good work. --- Ron Moffatt.

[Thanks for the order. Do you know what to feed K-9? (See Bit Bucket).

Ron, I bought the documentation for Semi-Disk to see if it could be used as a RAM-disk. It seems like there is no real difficulty in implementing it, but it is still somewhat costly (over $250). With the volume manager software, the Semi disk could be connected as a special device. Once booting from a regular disk, and imaging to the Semi-Disk, it would operate as a (very) fast disk drive. When I spoke to Glenn McComb he talked of a similar device. You might touch base with him as well. If you want speed, I have ASROM proms with a fast step time version (fast drives required).

There is a project which you could look into that some of our readers would be interested in. How could the Serial port on the Poly CPU be converted into a Parallel port? It seems to me that the 8251 and the BRG chips could be removed and plugs connected in such a way that a parallel port results. Of course the best implementation would have to be software invisible to the existing serial port usage. Can it be done? Are there other hardware hackers out there who can say what would be required? There are users who would like to have a parallel port instead of a serial one. --- Ed.]

Ralph, April 7, 1987

I have a '76 Poly 88 which I was planning to replace its entire innards with a Teletek SPC-1 (actually as systemaster). Do you know (a) if anyone would like the old boards for spares, or (b) if anyone is running CP/M with the original Poly boards? I'd actually like to keep the Poly boards, but with a CMOS RAM board & FDC rather than the Teletek (a board of dubious reliability, whereas the Poly itself is rock-solid). I'd appreciate any info you can share. --- Richard Rodman, Falls Church, VA. [Richard, PolyLetter is published every two months. It has been primarily oriented toward Poly Disk system users. (8813, 8810 and Poly-88 with add on Poly Disk Systems.) It was unclear from your letter whether you have a disk system or the old tape system.

For Poly disk system users there is a hardware modification which allows running CP/M. (See Poly's ad in the sample PolyLetter.) You could put in a set of PROMS for some other CP/M system, but that would require disabling the single-step interrupt logic on the CPU card, and might require other modifications as well. You would simply be converting the Poly CPU into a generic 8080 CPU card. The VTI is memory mapped, so would require a BIOS which could take advantage of that. --- Ed.]

Hi Ralph,

I got the diskette (PGL-V-09) and your note. . . . The disk you sent is really good. I had to rewrite most as my BASIC would not accept some of the commands. My BASIC is B08C and Exec/76. It would not accept the command PAGE or FNEND?

How many BASIC versions are there? I see that there are two other versions, A01 and C02. How do I get these and how much?

The disk I got has convinced my wife that I didn't buy a pile of junk!

How large of big can the Poly be expanded? I now have 32K and George Little has let me two 8K boards, but I have not been able to get them to work. When I have some time & get together with him we'll fix them. --- Len Thomsen, Delta, BC, Canada.

[In answer to your questions, "PAGE" works on BASIC C04 and has the same effect as "PRINT CHR$(12),". "PRINT CHR$(12)," will work in earlier versions of BASIC. "FNEND" or "FN END" should work, even on B08C; the error may be on the line before "FN END".

DEC81DOM has Exec/83 with BASIC C01L. (Later than yours.) Exec/83 supports sub-directories. Sub

directories are created with the COPY or EDIT commands by using the "<" character. For example, "EDIT SUB<NAME.EX" will open file NAME.EX in sub-directory SUB.DX; to see what's in a sub-directory, use "LIST SUB". Sub-directories were not implemented before Exec/80.

PGL-V-01 has Exec/4D with BASIC A01. (Earlier than yours.)

BASICS run A00 on cassette, A01 with Exec/4D, B08 and B14 with Exec/73, B08C with Exec/76, C00 and C00L with Exec/78 and Exec/80, C01 and C01L with Exec/80 and Exec/83, C02 with Exec/90, C03 with Exec/94 and Exec/95 and C04 with Exec/96 (the latest).

The latest version of Exec (96, which comes with BASIC C04) is available from Poly. Price ???. Earlier versions come on various public domain or commercial disks. I'd have to check which is where, but I think Exec/83 is the common one.

I offer my Exec/(A;S) with HELP systems for $35 (BASIC not included) which is better than Poly's latest.

Exec/(A;S) is the complete set of modifications to System-88, the operating system, and includes modified commands. Included are Dfn1.OV, Dfn2.OV, Dfn3.OV, Exec.OV, Gfid.OV, Prnt.OV, and Setup.GO. All Exec errors reported in BugNotes have been corrected in this version, and new commands (HELP, UnSys, WRITE, and ReStart) have been added. Also, DONT & SQUEAL have been restored and DLIST is recursive for sub-directories.

LIST and TYPE have been modified to prevent scrolling past protected portions of screen. LIST also shows the number of free directory entries, so the program Space.GO is no longer needed. Also, in ENABLEd mode the flags for each file directory entry are shown (D for deleted, S for system, and N for new). With the flags, you can see just which files to use CLEARNEW or SETNEW on before using BACKUP. TYPE does not scroll past long lines (more than 64 characters long). With both LIST and TYPE a ':' is used instead of a '.', and typing ESC will exit from either (no need for CTRL-Y).

Sniff shows the current sector being tested. It erases the sector number if the sector was ok. It also leaves the last sector number tested on the screen if you exit with a CTRL-Y. Also, you can tell Sniff what sector to start with. If the starting sector is larger than the size of the disk, Sniff checks the entire disk. It defaults to the used sectors. "Sniff <d> <ssss>" will start checking with sector ssss on drive d. With this enhancement, the program SNIFFALL.GO is no longer needed.

The "UnSys" command allows one to designate all files in a directory as 'non-system' files. Like "SetSys", it prompts for the directory name, which may be a drive number. "UnSys" then clears the system bit on all files in the specified directory. The system must be in the ENABLEd mode.

The ReStart command re-starts a command file which has been interrupted or aborted. In restores the command file mode flag and allows continuing the command file with the next command. (ReStart cannot restore programs which take control of the CTRL-Y interrupt.)

WRITE sends text direct to the printer. This command affects only the printer which is selected. "WRITE [text]" prints [text] and a carriage return on the selected printer.

SQUEAL sets a flag which tells Exec to report single density 5 inch disk errors. Whenever Exec is invoked, any previously unreported disk errors are displayed:

Error 102: 0002
Error 103: 0004
Error 104: 0001

DONT resets a flag which tell Exec not to display disk errors. "DONT" cancels the action of "SQUEAL".

HELP searches for a text file of help information and displays it on the screen. The help files may be on any drive. "HELP [name]" displays the help file information in file "<?<HF<name.HF". - Example: HELP COMMANDS. - (DEFPATH is not changed by HELP.) "HELP [dir] [name]" displays the help file information in the file "<?<HF<dir<name.HF" - Example: HELP COMMAND LIST - Custom help files can be added by the user.

Setup.GO shows which printer is the default device. It includes selection of two printer mini-cards, device 1 and device 0, as a normal option in the questions. (With two printer mini-cards, you can switch between two printers without unplugging them.) This version also corrects for the bug in Poly's DELETE routine. Other nice features include showing the driver name, and showing the printer name with the default parameters. These extra features have been added without using more costly disk space; it is the same size as Poly's version (11 sectors).

Poly Hardware Expansion:

The CPU type and speed cannot be expanded. The Screen cannot be expanded. Memory: to 56K (FFFF) the lowest 8K being unusable; one 64K board does the trick. Configuration: CP/M hardware upgrade by Poly. Drives: up to three 5.25 inch drives (any combination of single sided single density with 350 sectors each and double sided double density drives with 1400 sectors each), up to four 8 inch drives with 2464 (0.6M) sectors Single Sided or 4928 (1.2M) sectors Double Sided, up to 3 hard disks. I have three double sided single density 96tpi drives with 1600 sectors each. The volume manager allows up to 7 volumes on line at once. I have also had a Music Synthesizer board running in my Poly. Ram disks or extra memory could be installed but software would have to be written to utilize it. Many other S-100 cards should be installable. --- Ed.]

Dear Ralph, April 14, 1987

I can only repeat the plaudits the other writers to PolyLetter have given you. It certainly is great to get helpful information when you are left out in the wilderness alone, without any local computer store.

Bob Bybee has helped me out on the few problems I have had with the Poly (an 8813). I have his PCalc 1.1 and have found it very useful.

The reason for writing: I have a Diablo 620 printer; I get along fine until I try to print out a

long program, then start getting garbage. I presume the computer is sending more information than the printer can accept. I read your article in the last issue of PolyLetter and thought perhaps you could help me. Would you send me a wiring diagram for the header that possibly would correct this.

Keep up the good work. --- Gary Sterling, Hendrick, IO.

[It sounds like your Poly is not honoring the printers handshaking signal. My earliest printer had only three lines in the cable. They were the Data line, CTS (Clear to send), and a ground. These lines were connected to RS-232 cable pins 3, 5, & 7. On the Poly header plug on the Printer mini card, I connected pins 1 to 15, 3 to 14 and 3 to 12, and pins 9 to 10. This allows the CTS signal on pin 3, which was generated by the printer, to drive both the CTS signal line on pin 14 and the DSR line on pin 12. If the printer does not provide a CTS, or DSR signal, then the baud rate must be adjusted so that the computer does not over-run the printer buffer. Lowering the baud rate to 300 may help. If you send me a copy of the documentation on the RS-232 interface for the Diablo, I can better tell what you should have. --- Ed.]

Dear Ralph, April 1987

This is supposed to be an order, but I found some time to think about desirable hardware upgrades to the old Poly and thought I'd share the daydreams with you.

An obvious one, which we discussed on the 'phone, would be a Centronics compatible parallel printer port. There are many parallel I/O S-100 boards on the market; the question is how to get the Poly to talk to them. As I understand it, the Poly is not geared to recognize anything but the CPU-board USART and the parallel keyboard port as its interface to the outside world. What, if anything, can be done to make it talk to a PIO board running on the bus?

I'm not sure you'll consider this an upgrade exactly, but I would welcome a means of storing archival files on audio cassette. The medium is cheaper and far more robust than diskettes. It galls me to see the money and valuable storage space I have tied up in things like back issues of newsletters, which must be preserved in machine readable form "just in case" but are consulted at most once a year. Ideally, the cassette interface I have in mind would use Poly hardware and special software that would move files from diskette (or hard disc) to tape in "disc image" format...and the reverse, of course. Any ideas?

Another upgrade that I was considering was a different keyboard. I bought one ages ago but did not know how to get the right voltages out to make it run. While looking up some poop on the VTI board I happened to run into the info needed to get +5 and -12 volts for the keyboard...but I'm comfortable with the Poly keyboard now and probably won't make the change even though my "new" keyboard has a numeric pad. Thanks, incidentally, for publishing the info on the ESCAPE and CONTROL sequence equivalents of the Keyboard III function keys. It took your efforts to get me to subscribe to Polyletter and as long as you are willing to carry the ball you can count on my renewals.

How about a modification to the 8" disk controller to allow reading standard CP/M (IBM format) disks. That, plus a switch to port-mapped video (allowing a 24 x 80 screen), would make the Poly a usable CP/M machine, since for practical purposes North Star single-density doesn't exist any more.

And speaking of disk drives: your other readers might be as interested as I am in your trick for using 96 tpi drives with the 5" SD controller, reading both single and double density. A list of compatible drives would be helpful.

Reading Bob Bybee's report on his bid to acquire the source code for the Poly Exec set me thinking. If Poly will even consider selling something that will retain commercial value as long as there is a single working Poly, would they consider selling rights and info on projects that they've abandoned? I'd sure like to see their 16-bit single-board computer,their abandoned Z800 project, their 16-bit Exec... [So would we all ... about 5 years ago! -- Ed.]

In contrast to several of your correspondents, I have no intention of deserting my Poly anytime soon; it's still serving the purpose for which I originally purchased it three years ago: learning how computers work. I also have an instinctive distaste for conformity, and the more companies join the indecent, disgusting rush to produce IBM look-alikes, the less attracted I am to the current generation of microcomputers. I like the S-100 bus because of the sheer diversity of systems that can use the same sturdy support hardware. When I do drop the Poly, I will almost certainly plug another S-100 board set into that bulletproof backplane and power supply. Which reminds me: I am looking for all the info I can get on S-100 hardware so that I can shop intelligently on the used market and at swap meets. Schematics, specs, service info..even sales literature. I'll pay repro costs and postage and offer reprints of material I have that the manufacturer no longer offers. Info on other "obsolete" micro, mini and mainframe hardware is also of interest. Please publish my address and 'phone. Oh yes: I need service manuals for the DECwriter II KSR terminal and I'm in the market for used Poly Wordmaster, 5"DD controller and 8" controller manuals. I see lots of Poly hardware advertised, but no docs!

. . .Also: The year end issue of PL for 1980 mentions a November "Disk of the bi-month" with some interesting stuff on it; is it available? How much are you charging for PolyLetter back issues? Is Don Moe's FORM.OV in the public domain?

Enough! Keep up the excellent work. Best regards, -- Marc de Piolenc, PO Box 1549,La Jolla, CA 92038-1549, (619) 272-1725

[Any S-100 compatible board with a serial or a parallel port should be made to work on the Poly, provided software was written to drive it, and the board was addressed so as not to interfere with the Poly's system calls. I wrote a parallel interface driver for the WW-Components VIO-X2 board. It's easy to interface the driver to the Poly system by making it a custom driver.

Poly's program FILMS.GO will read and write to the Poly Cassette interface card. The capability you desire is old and exists. All you need to get is a cassette interface card and a copy of the

program FILMS.GO. I was testing one out last month and read an original poly file with FILMS. The one drawback is that the transfer takes place at 2400 baud in the PolyPhase format and there is no way to validate that the transfer was error free except by re-reading the entire tape.

The Poly VTI card has the provision to provide unregulated 8 Volts or Regulated 5 Volts for the keyboard. As you say, there are provisions on the board to allow putting in another voltage. There are three ground lines, so two additional voltages could be provided. The VTI board also has the provision for a negative as well as a positive strobe line. With the proper cable configuration and a little work on the VTI card, almost any parallel keyboard could be used.

Lennie Araki worked for a long time getting the MS controller to read standard CP/M disks (all in software). It wasn't fully reliable. It would be better to get yourself a cheap (flea market) disk controler which does not use DMA and write a driver for it.

Switching to port-mapped video is simply a matter of installing the hardware and redirecting the WH1 output to the appropriate code. I did it with the WW Components VIO-X2 board for test purposes. (The board was used as an auxiliary display by a custom software client.)

My 96 tpi drives do not read double density. They read both 96 tpi and 48 tpi in single density format. The 48 tpi trick is accomplished by skipping every other track. So far I have used SHUGART SA-460's, World Storage Technology FDD 221-5, MPI 92, and the SHUGART SA-465 (Half height). The electrical interface requirements differ slightly from drive to drive. (96tpi PROMS : $35. Conversion Software which Reads 35 or 40 track, SS or DS : $35).

See PolyMorphic Systems Ad in previous issues for documents.

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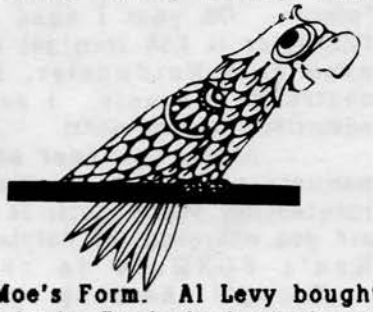

I'm not sure about Don Moe's Form. Al Levy bought the computer which used to be Don's lock stock and barrel along with much software originally owned by Logic, Inc. Al has submitted much of that software for inclusion in the public domain (see PolyGlot Library Volume 8), but Form.OV was not among them. I can ask Al if he has more to submit. -- Ed.]

Ralph, May 3, 1987

I enjoyed the note from Glen McComb. Perhaps he or one of he other design team members could write an article (or a series) for us on the Poly design history, goals, etc. They were certainly far ahead of anyone else! When I got my Poly, others were pushing front-panel paddle switchess. In spite of this design brilliance, the company faded - what went wrong and could it have been avoided?

I'd like to read this story - what do you think? --- Bob Johnson, Roanoak, VA

p.s. My daughter is using my Poly as a word processor after her much newer Kaypro broke down!

[Bob, have you read the book "The Peter Principle"? The author claims that (for the purpose of promotion) "supercompetence is incompetence". -- If your boss doesn't understand what you are doing, he won't think it's good and your promotion chances go down. I think that's one thing that happened to the Poly. They were so far ahead of their time no one could believe what they saw. Poly looked different. The sales claims were un-believable. Everyone else had a "DOS" Poly had an "Operating System". Poly had overlays, (whatever THEY were.) Poly (8813) was also much more expensive. I paid $3100 for a 16K system with 2 drives in 1979, and that was marked down by the dealer who wanted to get out of the Poly business. It wouldn't run CP/M either. (I bought the CP/M mod later). At the time the industry also had a bad reputation for promising the moon and developing the advertised product with the up-front sales income. Poly, with its super claims sure must have seemed like another one of those fly-by-night companies which was promising un-developed products. It was my hands-on use of the editor on last dealer demo model that sold me. Edit and PRINT were all I needed at the time. Poly beat hell out of North Star, Vector Graphics, Apple, Sol, and even the Alpha Micro at the time. The simple addition of file size in the directory list impressed me as more meaningful than the various CP/M system DIR listings. But... I ramble. The Poly wasn't marketed; the owners were engineers. -- ED.]

Dear Ralph, May 6, 1987

I received the issue of PolyLetter with my last letter in it. I appreciate your intent to do a good job for everyone involved in the preservation of the Poly systems, yet I was disturbed by your comments following the letter and their implications.

We do not have the legal right to provide the Poly's source code. As I indicated in my last letter, we can only (perhaps) answer written questions from your readers, based upon the knowledge of the code contained in the Poly System.

I hadn't yet received my copy of the PolyLetter when I got a phone call from Sirous pointing out your comments in the letter.

Please set everyone straight. Sincerely, --- Glenn Andre McComb, P.O. Drawer 90609, Santa Barbara, CA, 93190-0609

[Sirous tells me that he is negotiating to license the source code to one person who would NOT be permitted to distribute it. He said, however, that if enough people came forward, with a little more cash, he might be willing to consider a less restrictive licensing arrangement. Anyone interested should contact Sirous at PolyMorphic Systems. -- Ed.]

Asmb.GO Housekeeping

PolyLetter has received requests for 'beginning' articles on Assembly Language Programming. Let me begin by discussing some of the house keeping

requirements for Asmb.

Assembly language programs require a certain amount of 'housekeeping' for the assembler. In Poly's assembler this housekeeping is an absolute minimum. We must tell the assembler where the program is to be loaded into memory and where the loader is to start the program. We must also tell Asmb where the end of the program is. There is one other thing all assemblers must be told -- where the program starts generating code for.

Normally the assembler expects each line to contain a label (optional), an opcode, its arguments (if any) and a comment (also optional). To fit the housekeeping into this format certain instructions to the assembler are placed in the opcode field, and are called pseudo-opcodes (POPs). The POP which tells Asmb where the program is to be loaded and started is "IDNT". This POP takes two arguments; the first is the load address and the second is the start address. For most programs that will be the start of user memory which is 3200H or the label USER. The code would appear thus:

```
IDNT 3200H,3200H
```

The POP which tells Asmb where to start generating code for is ORG, which takes one argument. ORG sets the value of the program counter. Most programs start out with:

```
ORG 3200H
IDNT $,$
```

$ is a special assembler variable - the current value of the instruction pointer. In this example ORG just set the program counter and IDNT takes that value for the load and start addresses.

The last thing the assembler must see is the END POP.

```
END
```

To make things easier, Poly has a library of system labels in the file called SYSTEM.SY. There are two POPs which allow us to use the contents of SYSTEM.SY. The POP "REFS" opens the file for the assembler. The POP "REF" reads an item from the file. As an example, let us get the system label USER using these POPs. The following would appear in your program:

```
REFS (?)SYSTEM.SY       ;Open the library file
REF USER                ;Get the label for user memory.
```

The System Programmers Guide contains a list of these labels (and macros) and a description of each one.

This housekeeping is summarized in the following example:

```
REFS (?)SYSTEM.SY       ;Open the library file
REF USER                ;Get the label for user memory.

ORG USER                ;Where we live
IDNT $,$                ;Load & Start addresses

;Our program goes here
END                     ;Tell Asmb we're done
```

Complete discriptions of all POPs are included in the MACRO 88 Assembler User's Guide from PolyMorphic Systems.

Smoke Test

by Ralph Kenyon

I received an 8810 the other day which was given to me. The donor said it didn't work, and I could have it.

Well, I had to go poking around in it to see if I could make it work. I re-seated all the boards (they had come lose in shipping) and checked for any obvious faults. Nothing was evident, so I plugged it in and turned on the power. The drive light came on and stayed on. The video screen filled with garbage - the kind the video interface manual describes as a "stable but useless display" - the kind which indicates that the CPU clock is not running. Ok, I pulls out me spare CPU and plugs it in - same difference. Hmmm. I get out my trusty field service manual and my pocket multimeter and start checking the voltages - no negative 16 volts on the backplane.

Ok, sez me, lets test these boards in my other 8810. I lug my other 8810 out from the other room and remove the top cover and the left side. After standing the machine up on its side, I start plugging boards in from the dead 8810. Video works fine. Likewise the memory boards. Similarly the disk controller card.

By now, I am suspecting that the problem is in the dead 8810's backplane and confidently plug in the CPU card from the dead 8810. Oops! Smoke pours out of the backplane of my good 8810 and I get this sinking feeling in the pit of my stomach. The power available light goes out too. So that's why they call it a "smoke test". I look at the fuse and find that its smokey black. Nothing is left of the wire. Hoping the dammage is nothing permanent, I quickly replace the CPU with my good one and put in another fuse. Nope, the video display is "stable but useless". Holy cow! More smoke and the lights go out again. Sure enough, the fuse is fried again.

Okay, I remove all the cards, pull the power supply plug, and replace the fuse. I start searching for any scorching on the power supply end of the back plane. The resistors all look fine. I test the capacitors to see if they are shorted - nope. That leaves the diodes. They don't look damaged, so I try my multimeter on the diodes and find that they seem to show a low resistance both ways - which just ain't right. It's supposed to be low one way and high the other.

Okay, sez me, maybe we can't test it in the circuit and I gets out me soldering iron to unstick one end; that way I can get

a true reading. The first one is fine, but the second one comes apart while undoing it. Ah ha! I check and find that this diode is one in the -16V supply. Sure enough, the other one is dead too. Luckily I have some of these diodes around. I solder the two replacements in place and plug the board back in. Lo! The power is back. I plug in my good CPU and yea verily, everything works fine. Whew! That was a close one. I thought I had lost my lugable 8810 for good.

Ok, lets look at that bad CPU. I check the resistance between the -16V line and ground -- its a big fat zero, a dead short! It's no wonder the power supply gave up the ghost. I look over the circuit and see that it goes to the regulator and to a tantalum capacitor. Well, something is shorted, maybe the capacitor? I'll check it out later. Let's see if that other 8810 has the same problem. My first check of the diodes says they're okay. Okay, what gives? Plug the power supply back in, and measure voltages at the source. Hey! They're okay! Wait a minute! I just measured 0 voltes on the backplane.

Okay, let's check it out again. Let's see, I'll follow the circuit up to the S-100 plug. It's ok there. So I check the power supply on the other S-100 plugs. Nothing there. That's fishy. We should have the same voltage everywhere on the back-plane. Okay, I disconnect the power supply and start measuring resistances between the different S-100 plugs at the -16V line. Whoops, there's an open circuit. In fact, a quick test shows that 3 of the 5 plugs are open.

That short on the CPU must have burned out the trace where the plug connect to it, and it must have happened in three different slots. The one getting power and the ones on either side of it. Soo the trace burned out before the diodes and before the fuse. No wonder, the fuse was a 5 amp instead of the 2 amp fuse which was recommended. Okay, to fix this, I solder a jumper wire from plug to plug on the back of the back-plane. Now, I put all the boards back in except the CPU. This time I put in my spare CPU card. Horay, the system works! Okay, I'll check out that CPU card later.

BugNotes

Abstract Systems BugNote 811.0 December 21, 1982

RDB 4.3 has a bug in its exit routine. The vector in SRA7 is not restored on exiting from RDB with the "Q" command. This results in jumping (PCHL) to the location of the RDB single step handler when some spurious interupts occure. Normally, the front panel would be entered under these conditions, but the address of the routine for the interupt has been reset by RDB to point at its own single step handler. If memory has been ZAPed, this interupt will "coast thru" the NOP's to reboot (IF you have memory thru 0FFFFH). If the top of memory is less than 0FFFFH, (and there is no protected program there), an infinite loop (NOP's thru to FF), blowing the stack, and rebooting will result. If the editor, BASIC, or some other program has placed data in memory, the results will be unpredictable.

To restore the integrity of the system after using RDB, it is best to reboot the system with the reset button. The "boot" command is not sufficient, since the INITER vector table is only restored when the program counter starts from 0000. boot doesn't go back that far.

Public Domain

PolyLetter has just received the disks of user programs which were in the old Poly-88 user group. I haven't had time to catalog them and incorporate them into the PolyGlot Library, but you can look forward to that being done in future issues. Lets give Roger Lewis a vote of thanks for submitting them.

The Other Guys

Well, I've spent more time being frustrated with my XT clone these last two months. I recently found out that CTRL-U on the clone does what CTRL-X does on the Poly. I thought of using the ANSI.SYS driver to map CTRL-X to CTRL-U, but did not do it. I absolutely hate having to shift to get the colon on the clone, so I switched the colon and the semi-colon using the ANSI.SYS driver. Of course, it is bypassed in most applications, so I have to remember when the mapping works and when it doesn't. Of course, to make the clone keyboard like the poly's, more keys need to be moved and that includes some control keys. If anyone wants to know how to do it, give me a call and I'll provide the details. I finally got GW-BASIC for the clone. It doesn't have MAT! And the file handling is so complicated. Poly BASIC knows about fixed length records from the directory information. GW-BASIC has to be told in the program. I converted my TICKLER.BS program over to GW-BASIC. If anyone is interested I'll share the learning experience here.

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For Sale: Multiple 8813 systems - each with 3 drives, 64K, Monitor, and Keyboard - Make offer. Robert L. Schwartz, 906 Main Street, Cincinnati, OH, 45202, (513) 241-3447.

For Sale: 64K 8813 with 3 drives. Make offer. Vince Greenen, 445 Buckeye, Naperville, IL, 60540, (312) 420-8813 days, (312) 961-2511 evenings.

For Sale: Video Board - $95, 8" Disk Controler - $150, Printer Interface - $50, Poly CPU - $125, Priam Hard Disk with Poly Interface card and Power Supply - $400, Poly Keyboard/Screen enclosure - $175. Charles Trayser, 415-651-5931.

For Sale: 8813 System with Decwriter printer. Make offer. - Karen Klysz, 4050 Hearthstone Court, Cincinnati, OH, 45245, (513) 752-7186.

Poly for sale: C. Barclay Gilpin, 407 Lenwood Drive, Costa Mesa, CA, 92627 (714) 642-0390.

FOR SALE: Two 5" SSSD SA400 drives, $36 each. - Ken Lowe, 5936 W. Zina Circle, West Valley City, UT, 84120 (801) 969-7736.

Charles A. Thompson
PolyCom Associates
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Dallas, Texas 75205-1532
Phone: (214)-368-8223

PolyCom General Ledger $125

Version 4 is the original form, where you keep each separate set of books on separate diskettes. Version 5 is menu driven and allows you to keep a number of different sets of books on-line. (Version 5 requires a hard disk, preferably, or at least DSDD floppies). Either version is $125.00, including the operations manual.

FOR SALE: Poly 8810 box with power supply and mother board. $50 plus shipping.

Readers Responses

The type is too dense and hard to read. Good articles, however. Still got both Polys and a PC "clone" now. Trying to get rid of my 8813 3 drives 56K, extra keyboard, etc. If you know anybody. Bob Tripi, Westboro, MA.

I'd like to hear more about running Poly on the PC. I've thought of building a V20 based machine and downloading the Poly ROMS to the RAM, but I'm not too sure of how to convert the Poly disk routines. Art Norton, Fort Worth, TX

Ralph - My Poly has pretty much been superseded by a 4 MHz CP/M machine with 30 Meg of Hard Disk and a generic MS-DOS Clone. It is still operational, though, and I do have an occasional piece of work for it. Let's face it... The Poly is pretty much dead - not too much more is going to happen with it. I plan to install a Z80 in mine - will write an article when I do. This will open up additional CP/M software. John Warkentin, Citrus Heights, CA

Keep up the good work. I've seen more reader input in the past six issues than ever before. Jim Trahan, Oxnard, CA.

Would love to see a disassembly and explanation of any recent printer driver - how to kill special handling of printer control codes (backspace, LF, CR, etc.). John McNally, Goleta, CA.

I have written a program which removes the spaces & un-numbered remarks from a program and would be willing to put it in the public domain if you're interested. George Mack, Fort Wayne, IN

Have 2 88's. Enjoy PolyLetter very much. --- August Flassig, Portage, IN

More information on hardware function & repair perhaps fault tracing. I am very pleased with the content & look forward to receiving [PolyLetter] regularly. Keep up the good work. --- Dr. Briarity, Nottingham, Great Britain.

I haven't had much time, but I did glance at the last page of PolyLetter. [8702] Please send me the PolyMorphic Systems Quick Reference Card. --- 'Cap', San Francisco, CA.

The changes are great. I anticipate the PC-Poly disk info. You are doing a wonderful job. --- Richard Wagner, Dallas, TX.

Ways of talking to PC's. I will probably phase out the Poly this year after 9.5 years of use. It is a shame. I prefer the Poly Editor to write programs

but the lack of a file management program dooms it. --- Jack Hill, White Rock, New Mexico.

Keep up the good work. --- Percy Roy, Edmonton, Alberta, Canada.

Darn hard to improve it - keep up the great work. --- Robert Johnson, Roanoke, VA.

Thanks for PolyLetter. Very informative. Margot Palmer-Poroner, NY, NY.

Bit Bucket

K-9 is getting weak. Can't anyone come up with what he is to be fed? It's worth a free public domain disk if you are the first one with the correct answer.

'Zeroth' generation computers were simple electro-mechanical control circuits. First generation computers were made with vacuum tubes. Second generation computers were made with transistors. The third generation uses integrated circuits and the fourth generation uses large scale integrated circuits (LSI). The Japanese hope to combine very large scale integrated circuits (VLSI) with integrated software design (at the chip level) to be the first to bring the fifth generation to market.

WORM = Write Once, Read Many times.

In This Issue

Coming Soon

Modems and Communications software, More BASIC for Beginners, How to UNSAVEP protected Programs, More System Programmers Notes, Making your PC work like a Poly, More Help, BugNotes, Public Domain Software, etc.

Questions

Can you find and answer the questions asked in this issue? Send your answers and requests in.

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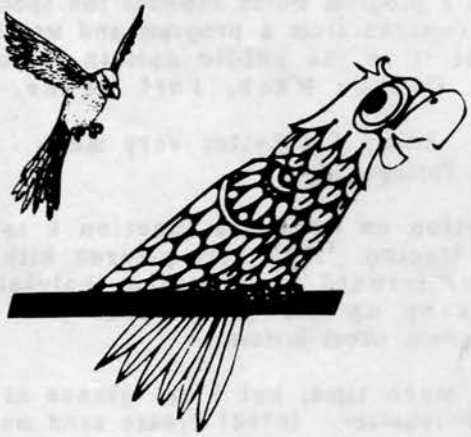

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PolyLetter

The Newsletter for PolyMorphic Systems Owners and Users

Editorial

Well, I must apologize for being later that I expected. This time, I am happy to report that I have successfully completed my masters thesis in philosophy. All the rewriting is finally done. I have also passed my oral exam and will be awarded my Master of Arts in Philosophy on September first. Well, enough of blowing my own horn.

I am taking to heart the many complaints that have asked me to use blank lines between paragraphs. Even though that reduces the information content of an issue, it does improve readability. Speaking of readability, I have been looking at laser printers and drooling. However, the high cost keeps me from making a move. PolyLetter cannot afford to buy one; at its present income rate it would take three years to pay for it if I let everything else go. Maybe Ralph Kenyon, or Abstract Systems, will be able to justify one, and then PolyLetter will benefit.

I also attended the American Association for Artificial Intelligence conference in Seattle Washington last month. The things they can make computers do (and the things they still can't make them do) continue to be amazing. Of course, nobody has anything like the Poly yet (anymore). The VMACS™ graphics editor, which runs on a Symbolics 3645, a $50,000.00 machine, seems to do for graphics editing what the Poly does for text editing.

While in Seattle, I found out where the term 'skid row' came from. It seems they had a road that was used for skidding logs down the hill and it was called skid road. Later, after the logging industry in that area went under, derelicts congregated among the defunct buildings along the road, and were called 'skid-road bums'. In the manner that our language evolves, after years the final 'd' was dropped and we get today's spelling and pronunciation. (That's just a bit of local color.)

Well, my 11 year old Poly is finally becoming cranky. Sometimes I have to boot it twice to get a clean start -- but, once it is running, it still is trouble free.

SORT.GO

SORT.GO is a general line sorting utility that operates much like the MS-DOS external command SORT. It takes input from a file, sorts the lines, and writes the sorted output to another file. Sorting can be in reverse order, or by any specified column. The maximum line length is 254 characters and the maximum size file that can be sorted is what will fit in memory, somewhere above 40K (for a full box). Sort places lines shorter than the specified sorting column at the beginning (end if reverse order is selected) and included lower case letters with the upper case. This is especially useful in preparing a cross reference list sorted by various columns, or in preparing a sorted list of quotations, etc. To order SORT, send me a check or money order for $10.00 payable to Ralph Kenyon.

Letters

Dear Mr. Kenyon May 28, 1987

Originally, PolyMorphic addressed its advertising to the law office. Remember those early advertisements of the Poly 88, and the ultimate Poly 8813, that sat on the lawyer's conference table with law books in the background?

I bought no less than six (6) PolyMorphic systems. .All of them filled to the max with memory, up and running. I invented programs for my bills, for collections, for accident cases, and I even had a program for throwing computer salesmen out of the office. I would type their name and address and Poly would immediately write a letter to their employer advising them that they performed a wonderful demonstration. It would explain that their system did not surpass the PolyMorphic system that I had been using for years. The salesman would walk out of the office in bewilderment, wondering how it could know that they came there and could write a letter all by itself and be so specific. Of course, it was all done in Basic.

Our Poly became a closed club for elite users who were way ahead of the rest of the world. Poly knew Serial was better than Parallel, that Sixty Four (64) characters across were more visible and practical than Eighty (80) and that Editing was a science and skill with depth limited only to the desire of the user.

Being the first on the block with new toys is really fun for a while, but ten you find that it is a habit you can't break. Those of you who subscribe to this letter are probably more gadgeteers than computer enthusiasts. We are the ones who struggled through the early marketing who purchased cords for their units that did not always work and that sometimes had little wires on them correcting mistakes on the printed circuit. We knew the glitches, and the bugs and we learned to work around them, like don't ever be full of electrical static when you sit down to your computer and how to open the unit to check for bad contacts before we ship it

back to California.

Do people laugh at you and say "PolyWhat?". Do you spend a lot of time explaining why you are proud to use a Poly? Have you succumbed to the IBM P.C.?

Enter the IBM Clone which surrounds us with merchandise to the point of selling disks in the drug stores and software in every bookstore. I held out as long as I could. I was not the first on the block with clones. The transition was difficult. It was like unlearning a language and learning a new language that is missing a lot of words. We always knew where that delete key was. Now there are two, in places where you would not expect them to be. The cursor and text movement are now strange animals. All those function keys do things that our preprogrammers told them to do instead of what we tell them to do, and every program is a little different. How do you exit with WordPerfect or from a Modem or from BASIC? Where is that confidence-building sound that comes from the clicking of disk drives? We had it down. We were the leaders. We were in charge of that Poly, but now the personal computer is in charge of us.

It is hard to ignore the new standards, color monitors, plentiful new programs and the public domain software that are so pretty, fast and so perfect in their ways. It is hard to give up our own brain child special programs that we could fix ourselves. We just had exactly what we needed and knew just how to use it.

So much for the game and the fun. Now it is just a thing everyone uses wit no special pride. We may have been the first on the block, probably not just with the home computer, we are probably the ones that also were the first with the VCR and the self-focusing camera and the telephone answering device. We are the last survivors of the gadgeteers. We know that, but nobody eles dose, and nobody else cares, so let's hang in there, Brother Users, lets promote the PolyLetter, and let's have a good time with that old equipment, notwithstanding the fact that we probably all, one day, will be clone operators and only we chosen few shall know we are "PolyPeople" at heart. -- Very truly yours, -- Robert L. Schwarts, Cincinnati, Ohio.

[Amen. Ed.]

Dear Ralph: July 6, 1987

[You've gone and pissed me off and I hope you'll publish the following rebuttal to your first-page editorial about SPELL which appeared in the May/June 1987 PolyLetter. This letter is also on the enclosed DOS diskette, formatted for handling by the Poly editor.]

I'm miffed that after I gave you source for SPELL (and the dictionaries) you would belittle my original SPELL product. While it borders on ridiculous that I need to defend a product that is nearly five years old, I owe such a defense to those many (and quite satisfied) customers who own SPELL 3.0 and who are still using it.

First: do you remember the gentlemen's agreement we made when I released source to you? You would rewrite SPELL to suite your tastes and not sell it to the general public without permission. You said you'd go ahead and disassemble the code anyway if I didn't send you the source. Perhaps the program wasn't so horrible after all if you were that eager for the source.

Second: fitting a comprehensive SPELL program into the hardware limits of Poly was a feat in and of itself. In my version of SPELL, many tricks in dictionary breakdowns, built-in suffixes and prefixes, intentional special spellings of less than a dozen words in the dictionary, and so on, were all done to live (and live reasonably) within the confines of the Poly hardware. The hierarchical content editing of the dictionaries -- done to accommodate limited Poly memory -- is itself worth a considerable amount of money.

Many of the "fixes" you cite are those that I abandoned from the standpoint of a professional writer. By the time I'd settled on the general design of SPELL (the 1.x and early 2.x versions never saw daylight), I'd written over 2 million words and had edited some 15 million words. I had (and still do have) a good idea of the kinds of spelling errors we frail humans are inclined to make. Your "large prefix and suffix" dictionary, which demands a MISSPELL file, would require the user to be adding to it for a long time and in the meantime pass many improperly spelled words. On the other hand, my approach was to set practical and known limits to what the program would and would not pass. A "large prefix and suffix" dictionary scares me, MISSPELL file or not. I remember the development stages of SPELL whenI had numerous prefixes and suffixes. Many of these were not really suffixes or prefixes, but rather convenient groupings of letters. The error rate was unacceptable (as you've apparently discovered -- hence your MISSPELL file). That's when I said, "Hold it! Let's limit entries in the suffix and prefix dictionary to the genuine item, and keep them safely inside the code where no indiscriminate additions can be made..."

The best way to avoid this whole mess is to eliminate suffixes and prefixes from the algorithm. That is, all proper forms of a word are in the dictionaries as discrete entries. That's what most of the DOS spellers do that are nearly 100% accurate. (On a 80286 DOS machine there's adequate RAM and convenient disk space for just such a huge dictionary.) This approach is difficult on Poly because of the hardware -- that's why I used suffixes and prefixes.

It would appear that you've used some of the hard-won tricks I developed in order to make a comprehensive speller fly on standard Poly floppies and 56K of RAM. If you're not going to pay for those tricks, at least credit me with them -- or tell me how you've done it differently.

Do you remember how proud you were that you changed my I/O buffering? (My scheme was designed to go easy on the hardware.) Do you remember my

comments that your I/O buffer approach (while theoretically more streamlined) made the floppy drives sound like woodpeckers, and that the hard disk spent more time seeking then loading?

You also thought it strange that I limited the suffix/prefix recursion to two levels. "I've made the recursion go as deep as it wants," you said. Later, I remember a conversation where you'd put the recursion back to two levels so that "just any old thing wouldn't eventually pass."

The point is, Ralph, please don't directly or indirectly put down a product to which you were given source and assistance free of charge; and don't discount the subtleties of the design based on usage, rather than theory. Also, don't discount those many buyers of the original Frank Stearns Associates SPELL who found the product extremely useful. My product was available in 1982; yours -- apparently based in part on mine -- is here in 1987.

And, oops, did you run your version of SPELL on the May/June issue of PolyLetter? Note the series of letters "Dammage" on page 7, second column, 5th paragraph of the article. You (SPELL?) meant "DAMAGE". I don't suppose you've got the non-suffix "mage" in your suffix dictionary... --- Sincerely, Frank Stearns.

[Dear Frank, August 3, 1987

I am in receipt of your letter of July 6, 1987, and I must say that I am quite disappointed with your response. Far from belittling your version of Spell, I merly stated that I was not at all satisfied with it and that your dictionaries contained misspelling in the form of double letter endings.

I was dissatisfied for exactly the same reason that others were -- Spell 3.0 does not preserve the letter case structure of the misspelled word. This user unfriendlyness makes it difficult to find the misspelled words in the original text. I was not the only one who suggested this change. Others have told me that they recommended this change to you as well.

You did not 'give' me Spell 3.0. You exchanged Spell for some of my software, including AutoPath, which was written especially to your specifications.

As far as a the 'gentleman's agreement' is concerned, I agreed not to distribute your source list or the modified version of your Spell. However, you seem to have forgotten that I stated that I was unable to modify it and that I would write my own version. I even sent you some suggestions for improvements. This took place back in 1984. I was even kind enough to not tell you why I couldn't modify your program. You failed to conform to structured programming techniques, making your program extremely difficult to follow (even with the documentation), let alone prove it correct. I also sent you an early copy of my own version. Had you taken a moment to look over that source list you would have see that there was no similarity to yours at all. I did try to make mine operate like yours in its user interface and display, but there the similarities ended. I never used any of your code; however, I refrained from competing with you as a professional courtesy out of consideration for your providing me with your source list.

My early version of Spell did allow true recursion on the prefix and suffix files, but I soon found out that many illegal combinations resulted. I even tried limiting recursion to a fixed number of levels, at first trying three, and then two levels. However, instead of staying with recursion to two levels, I finally opted to put combined prefixes and suffixes into the appropriate files. I eliminated recursion entirely. -- Obviously, I have undergone the same kind of developmental process you did, which is further testimony to my having written my version separately. -- I encode the usual suffix spelling rule transformations into the routine which strips a suffix off. For example, if the suffix begins with 'I', and a match fails, the routine changes the 'I' to a 'Y' and tries again. It also looks for double consonants, stripping one. Other rules in my english grammar book have also been incorporated, but not all are fool-proof, hence the MISSPELL file. Since double keying is a common problem with Poly keyboards, having double consonant endings in the dictionary is undesirable (to my way of thinking). Hundreds of such words were in your dictionaries.

The concept of loading as much of the dictionary into memory as possible and then doing a serial comparison with the data file was covered in a course I took back in 1979 as part of my Masters in computer science. As for the other 'main' tricks, I simply used a highly optimized search routine which combines both hashing and binary search techniques. The search routine is EXTREMELY fast and efficiently uses registers only. It is hand optimized for speed. Although my dictionaries are arranged in word size order, I hope to eventually put them in frequency order by using the Brown Corpus (If I use the Poly that long). Unfortunately my disk i/o routines do only one sector at a time, and could be enhanced to reduce the clickity-clack. I just haven't gotten around to implementing a larger block size. I should think a whole track (10 sectors) would be ideal, but that correspondingly shrinks the maximum allowable dictionary size.

As you point out, 'dammage' result from the suffix 'age' and the word 'dam' with the double consonant elimination rule, and needs to be added to the misspell file.

Moreover, my release of my version of Spell is to fill the vacancy you left when you got out of the Poly business, not to denigrate those who already have your version. After all, your version is no longer available.

The point is, Frank, there are major differences between our versions of Spell, with advantages and disadvantages to each. Mine is not a modification of yours, although it is designed to have a similar user interface. The biggest difference right now is that yours is unavailable and un-supported while mine is both available and supported. (Unless

you've got a copy left around and would like to put it into the public domain library?) Sincerly, -- Ed.]

Hello Ralph, July 12, 1987

Is it poetic justice when a misspelled word appears in the description of a spelling checker? (Last paragraph - flippy)

I've had a chance to try out the Z-80 cross assembler. What is the difference between casm.GO and CASMZ.GO? I couldn't either one to run. Apparently they expect to see a system clock of some sort. Not having one, (Do you have any details on what it would be?) it was necessary to edit FRONT.AS and change a MACRO from:

CLOCK EQU on

to

CLOCK EQU off

The entire file must be re-assembled. I modified the command file "ASMC" to give the code a new name. Anyone with a 2 drive system is up the creek. Maybe you could offer the de-clocked version on a PGL disk.

The documentation on this disk (Z80) refers to the 8048 assembler. I haven't tried that one yet, but I suspect the clock will also need to be disabled. Should there be different documentation? The format & commands seem to work the same.

On your musings of removing the serial I/O chip and replacing it with a parallel device:

Don't do it!

First, there is no pin for pin compatible device and second, you would lose communications with an external modem. My suggestion is to do some detective work on the printer driver (we already know it talks through WH6 & 7).

By locating the processor 'in' and 'out' instructions in these wormholes we can modify the code to talk to an auxiliary S-100 parallel board. Two programs could be created, one for the parallel card and one to revert back to standard Poly. They would be minor compared to writing a complete driver with the same features as we've grown accustomed to.

Sorry, but no good guesses on K-9's food. Not having owned a dog, I'm not up on all the brand names of food, but isn't there one called K(n)ibbles & Bits? I think it's a byte size serial.

Keep up the good work. --- Ron Moffatt, Rochester, NY.

[Ron, a flippy is a floppy which has holes punched in both sides so that it can be turned over and the other side used; however no less than Frank Sterns found the word damage spelled wrong (dammage) in another area. See his letter and my reply about Spell.

I don't know anything about the Z-80 and 8048 cross assemblers. They are identical to the software submitted for inclusion except that I have changed the extensions to AS to conform to (PolyLetter) standard extensions for assembly language files.

In regard to the serial / parallel processor idea. I had in mind finding out what chips, including the 8251, needed to be removed and designing a piggy-back card which plugs into those (more than one?) chip sockets and which will give a parallel interface without changing the serial driver software. I have already written a parallel device driver which interfaces with the system as a custom device driver. This runs the WW-Components VIO-X2 video board in a two-way mode. It connects as a custom printer to the existing software. I could easily modify my driver for other S-100 parallel interface cards, but had thought about the person who has no need for the serial interface at all -- perhaps they have an in-bus modem, or no modem at all.

Congratulations for submitting the second correct response to K-9's food. You get extra credit for identifying the food as a "Byte sized serial" as well. -- See "Bit Bucket". -- Ed.]

Hi Ralph, August 3, 1987

I really appreciate the service you have developed for the Poly people. When I originally started using this machine, I thought she was a "1 of a kind" machine. This one may be. This PolyMorphic is housed is a roll-a-way type cabinet, with built in printer (serial) & 9" B&W monitor. This package was assembled (I believe) by GST Laboratories and was used as a video/data logger with a mammogram machine. The A/D converter is still installed.

I doubt the printer will last much longer, so I would like to find a parallel port. Maybe there will be one listed in PolyLetter.

Anyway, Thanks. I will probably call you again with another order soon. -- Sincerely, --- Wayne Dewey, Oceanside, CA.

Hi, July 16, 1987

I saw your ad in Computer Shopper. I am interested in a Poly88 mainframe, cpu card, and cassette interface card. I have a Poly VTI card and manual, and several cassettes (asm, BASIC, sample programs, and BASIC/5) with manuals.

I was in college when the Altair, IMSAI, and Poly88 came out. I even built an Altair 8800 for one of my professors. I wanted a Poly88, but I never got one. I eventually got a Vector Graphics mainframe, Ithica Audio cpu card, Tarbell disk interface, and Poly VTI card. I used that for a couple of years, then I got an Atari 800; now I mostly use my Macintosh. But I stall want a Poly88; it was a remarkable system at the time.

I've sometimes thought of building and selling a system similar to the Poly88. A 5-slot toaster-size

mainframe (heck, how many slots do you need), 68010 cpu card (with serial and parallel I/O, floppy disk interface, and 512K memory), 2Meg memory card, video card (hi-res monochrome graphics), and hard disk interface card. Need more slots? Plug in another mainframe. Need a clever name though, could I use Poly68? Oh well, there's no market for it anyway (well, maybe a small market).

Well, enough of that. Please tell me more about your user group and newsletter, and let me know what equipment is for sale. I've enclosed as SASE for your convenience. -- Thank you, Dana Gould, Boxford, MA.

[Dana, See the ads for equipment for sale. Also, you'll have to ask Sirous at PolyMorphic Systems whether you can use Poly-68 as a name, but be prepared to pay for the privilege. He'd probably be willing to sell you Poly-88's for the purpose. -- Ed.]

CRASH!

by Ralph Kenyon

I use a modified version of Poly's PLAN for my spreadsheets. I had just spent 3 painful hours entering all the changes to the data in my household budget spreadsheet. What a job. Thank Poly I don't have to enter that again. Ok, now to save it to disk. Oh no! It's a !*$#% disk crash! I am suddenly looking at "(Error 0106)". Horrors! The drive didn't start.

Well, you dummy, you've been asking for trouble by using that flakey drive when you have two perfectly good new ones to put in. Murphy's law says that it'll happen when it's the worst possible time. Okay, okay, now what do I do? Do I really have to enter that data again? Fortunately, I run with my system enabled, so maybe I'm not dead yet.

I bring up the front panel and load 2D92, the address of SYSRES, poke a 3 in there, and move the system disk from drive 1 to drive 3. Ok, let's try CTRL-Y... nothing. ?? Oh, yeh, (chagrin) BASIC takes over the CTRL-Y. Oops.. better not do that anyway; this program has an ON ESCAPE which will erase all the data anyway. What luck. Ok, let's see, when we get to REE it starts at 3203, but that wipes out the run-time environment. Let's examine where 3203 goes. Ok, go indirect to the JMP address... It looks like it's putting a value in the accumulator. MVI A,1. Then it does a LXI H,data. Ok, continue. Another LXI H,data? Oh ya, this is one of those strange skip routines... Ok, follow it to the end. It calls an overlay. Ok, let's do it. Set the program counter and go. Hey, that looks like a cross-ref list and I'm back to Exec. Try CONTINUE ... nothing still in Exec. It must have been a subroutine rather than the run loop. Better be careful, the wrong overlay call might clear the run-time environment.

Ok, let's save this stuff before we lose anything. Put a scratch disk in drive 2 and use SAVE to store a copy of the memory content on disk. First do a DISPLAY and get the top of memory. It's FD90. Ok, the start of the last sector is FC91. Let's subtract 7F sectors; that gives 7D91 as the start.

So, we SAVE from address 7D91, Starting at 0403, Loading at 7D91, 7F sectors in file <2<TOP. Now, 7D91 - 3200 is 4B91 bytes, or 4C sectors. So, SAVE from address 3200, Starting at 0403, Loading at 3200, 4C sectors in file <2<BOT. There'll be some overlap, but that's better than missing some.

Ok, this saves everything in memory to disk. Now, how do we get it back into a live BASIC program? Well, I'll try starting the program, exiting with EXEC, restoring memory and then resuming with CONTINUE. Let's try it. First I load the program and go to where I was when the crash occurred. Now I try CTRL-Y. Oops, CTRL-Y dumps me back to the initialize routine. Another one puts me back in Exec and kills the run-time environment. Ok, REENTER, and LIST the program, looking for those offending ON ESCAPE statements. Ah ha! there's one.

So as not to change the storage used in memory, I carefully retype in the entire line replacing the ON ERROR with a REM; everything else is the same. Ok, there's another. Now, I try RUN, and get back to where I was. This time a CTRL-Y gives the familiar "Interrupted in line ..." and the ">>" prompt. Ok, EXEC. Now I type in "<2<TOP" and get Exec/(A:S). Then I type in "<2<BOT" and get Exec again. Cross your fingers; here goes nothing; I type CONTINUE, expecting to be back at the ">>" in BASIC. Hey! I get Exec back. What gives. Of course, dummy, you gave 0403 for the start address. It warm started Exec and destroyed the interrupt environment. We can't use 0403 as the start address.

What we need is the address of a return instruction. We know just where one is. Ioret starts at 0064H and consist of POP H at 0064, POP D at 0065, POP B at 0066, POP PSW at 0067, EI at 0068, and RET at 0069. Okay, I could go through the process of loading memory and re-SAVEing it using 69 instead of 403, but it'll be faster if I simply change the start addresses in the directory using Superzap.

Ok, let's try this again... First load the program, Change the ON ESCAPE lines, RUN, get to where we were, CTRL-Y, and EXEC. (It's faster the second time.) Now, load TOP again... We get a $$. So far so good... Now load BOT and get the $$ again. Ok, type CONTINUE, expecting to get the ">>" prompt. Something's wrong, I got the ">" prompt instead. Oh, well, try CON anyway... "Can't continue!". Okay, LIST the program and find the sub-menu where we were. RUN 1100 and see. Dimension error? That means the run-time environment went away. Well, we're still not licked yet. Let's try something else.

BYE and go back to Exec. We'll see where the variables start. and only load the top data area. To find this I start BASIC cleanly with no program. Then I use the following to find the hexadecimal start of the variables. Z=CALL(977,0,0,MEM(Z)) rewards me with 6AF2. (977 is the decimal address of DEOUT.) Ok, bring up the front panel and see

what's there. Hmm, 6AF2 is 00, but that's ok, since Z was zero to begin with. Backing up to 6A28H, the flag byte for the variable Z. I find 0F. But, I also notice that there is a 28 68 at 6A24, which is a byte reversed pointer to the flag byte of variable Z. Everything else around there is 00 bytes. 6A00 seems like a convenient value since it is the start of a page of memory and there are nothing but zeros there.

Ok, this time I load TOP and BOT and then use SAVE from 6A00, starting at 69, loading at 6A00, 7F sectors in file <2<MID. Now... let's try this out. Load BASIC, list the program and find those ON ESCAPE lines (by now I know that there are two of them in this program and which lines they are.) After replacing ON ESCAPE with REM, I RUN the program, get to where I was when the crash occurred, use CTRL-Y and get the ">>" prompt. Next it's EXEC, TOP, MID, and REE. (Whee..., we're really flying now...)

Here's where the TV people would insert a commercial, or worse yet, say "to be continued...", but I'm not going to make you wait. So, back to our story...

Hurrah!! I got the ">>" back. Now I try CONTINUE and select the display mode. Sure enough, the figures show what I had previously entered. Now, first thing, I select the save option and write it out to disk.

Just for drill, I try listing the offending drive 1. Would you believe it? Now it works. I've traced the intermittent... but that's another story for another time.

How to Fix a Dead Bird
or
The Essence of VaporWear

by Charles Steinhauser

Now I know some of you at one time or the other has turned on your poly and the thing just rolled over toes up. This always happens at just the worst possible moment. The final inspector for your machine has a last name of **Murphy**. Isn't that nice? Well this article is written for you out there that has need to know how to get a dead bird back on it's beak uh feet.

First we must assume that you have at least some bare assortment of tools and your thinking hat close by. Secondly you must have the confidence to attempt repair or the deal is off. Here are a few fast tips to get your confidence up and show you just how easy it is to trouble shoot that silicon unit.

You turn on the system and there is nothing. Lets check the obvious, did you pay the electric company or maybe your wife spray painted the screen black, this a popular one of my girlfriend. The first time she did it I tore the computer apart and looked for two days before I noticed the overspray on the bezel. She now uses a little stencil to mask the bezel and got the time down to one day now on suspected painted screens! So can you with a few tips you'll find here.

Next you turn on the system and there is this terrible noise and it gets louder and louder. First check to see if you have closed the disk drive door on one of the children's hands, no children? then proceed to check for cats tail in fan; you would swear that sound is the horizontal oscillator whine it is so high, but no we have to look further and sure enough its a transformer rod knocking. You haven't serviced it in five years, but I don't blame you, you didn't get any documentation with the system and didn't know where the dipstick was at. Have no fear, any small engine shop can repair it for a nominal fee. Unless they have to long block the thing.

Next is the intermittent trouble, these are one of hardest to find. Here you will need to use straight forward logic, process of elimination, knowledge of the theory of Murphys Laws, ability to use the phone for assistance from someone you have never talked to before, an extreme amount of patience coupled with last but not least LUCK.

The first thing to do with an intermittent problem is to note when the problem occurs, there could be outside forces at work. Not the computer but something else. For instance: system won't boot every time, those chocolate diskettes your son stuck in your drive are worn out, (bad oxide), you find yourself in the front panel, your power company thought you ordered 440 three-phase for home service (whoops) this could have caused that transformer rod to go, they may be responsible so I would check with them. Or fragmented data or loss of is another problem. First suspect the electron pump. They are only good for about 2 billion bits, so when you get lousy data the impeller is generally shot, unless the seal is leaking then the bits leak out into the bit bucket. You will need to replace the bit generator (its next to the baud rate generator) call Polymorphic for further details and pricing.

The most drastic problem encountered is smoke. After you see the smoke its too late. Even if you rip the computer apart and find the cause, it is to no avail. Once the smoke leaks out of an IC it can't be fixed it has to be replaced. Now if you have this problem of a bad IC you will have to replace it. This is where the few tools I mentioned will come in handy. Replacing an IC is really very easy. After locating the defective unit it is good idea to determine why it went bad or you will be in the same boat again shortly after replacement. Its a good idea to make sure all cards are properly seated. I suggest a four lb. ballpeen using only a half backswing, these cards are a little delicate.

So lets say you found a defective voltage regulator, its fried and you found the cause (you loaned the computer to your neighbor and being the genius he is, used the 12 volt regulated supply to do some light welding on his motorcycle) you will now set forth to replace it. Here is a typical scenario that should yield favorable results assuming you already have the replacement in hand. We start by removing the cover, this is accomplished

very easily, facing the computer reach under the table and remove the four screws securing the rear. I replaced the straight headed screws with phillips head because it is easier to guide the screwdriver blind into a phillips head screw. Now remove the front four screws and off comes the cover! Locate the card CPU card, it should be the second card from the front. Carefully remove it by pulling with even force on each side while rocking side to side. Oh the cable you just destroyed, as the card came out was the printer interface. We will fix it later. Now locate the bad regulator, it looks like the only part that was at ground zero at President Reagan's last nuclear barbecue party. Nancy pass the U-235 and a bun. Continued next issue.

[Charles Steinhauser is a former endeared editor of PolyLetter and part-time churl. -- Ed.]

Public Domain

PGL-V-23 is the first disk I have put together with programs from the Poly-88 users group. There are still several disks to go which will appear in future issues of PolyLetter. The current disk is entirly interactive games. There are many programs which run on the old A01 version of BASIC which need to be converted to run under current BASICS. This project will be ongoing, and I will release disks as I get the conversions completed. If anyone is interested in the unconverted programs send me a self-addressed envelope for a listing of the programs.

Disk PGL-V-23 has 17 files on it, 43 free entries.
342 sectors in use, 0 sectors deleted, 8 sectors free.

Size	Name
22	OTHELLO.BS
1	STARS.DC
27	STARS.BS
9	ACEY-DEUCY.BS
11	CANNON.BS
14	CHASE.BS
3	RUSSIAN-ROULETTE.BS
67	SUNWAR.BS
14	TIMEBOMB.BS
9	TANKS.BS
16	SLOTS.BS
66	OREGON.BS
9	BAGELS.BS
9	AUTORACE.BS
12	POUNCE.BS
32	REBEL.BS
17	BOXING.BS

OTHELLO is played on an 8 X 8 checkerboard. The object of a play is to capture one's opponents pieces by outflanking them to create a horizontal, vertical, or diagonal run of pieces bounded at each end by at least one piece of one's own. This will 'flip' the flanked pieces, turning them all into one's own. The one who has the most pieces when no more moves are possible is the winner.

STARS is a composite program containing five games converted from 101 BASIC GAMES and People's Computer Company for POLY-88 BASIC by David Larry Johnson, 4106 Montreal Ave., Prince George, VA 23875, November 1977

Game 1. -- Guess a number from 1 to 100. You have six tries to guess the number.
Game 2. -- Catch the jumping number. This time the number changes systematically each time, but you get hints to help you out.
Game 3. -- * STARS *, a number guess game. This version prints more or less stars depending upon how close you are.
Game 4. -- Slot machine. An inexpensive way to bet.
Game 5. -- Acey-Ducey, a card game. The dealer (computer) deals two cards face up. You can bet or not bet depending on whether or not you feel the next card will be between the first two.

CANNON simulates the firing of a field artillery weapon. Copied from Algorithm 1977, J.G.Lipana, 3445 Lama Ave., Long Beach, CA. 90808.

CHASE puts you in a high voltage maze pursued by 5 enemies. It was adapted by the late Pat Lewis & Joe Lake, AAAA Computer How's, 1477 Barrington Suite 17, L.A., CA 90025.

RUSSIAN-ROULETTE - was coded by Joe Lake.

SUNWAR by Kevin Daly, 5438 N. Granite Reef, Scottsdale, AZ, 85253. You are captain of a starship patroling near the edge of human occupied space. Your mission is to prevent alien intrusion. Your ship is equipped with lasers, ballistic torpedoes and electronic deflectors. Your ship is capable of speeds from warp 0 to warp 12. The screen continually updates its display of your sector.

TIMEBOMB coded by J.Lake, based on Kilobaud, August 1977, allows you 10 seconds to defuse a time bomb. Very unnerving.

TANKS is a war game between two tanks.

SLOTS is a 50 cent slot machine. Win or lose til you quit.

OREGON simulates a trip over the oregon trail from Independence, Missouri to Oregon City, Oregon in the year 1847, and is from Creative Computing, May 1978. Your family of five will cover the 2040 mile Oregon Trail in 5 to 6 months --- if you make it alive!!!

BAGELS is another number guessing game from 101 Basic Games, Converted for POLY-88 26 FEB 78 by David Larry Johnson, 4106 Montreal Ave., Prince George, VA 23875 You must guess a number. Clues will be given as follows. PICO means one digit is correct but in wrong place. FERMI means one digit is correct in the right place. BAGELS means none of the digits are correct.

AUTORACE is an original program by Tom S. Weaver, 2716 Pinewood Drive, Waldorf, MD 20601

POUNCE is a game of tag between a cat and a mouse. The cat tries to catch the mouse by jumping to exactly where the mouse is sitting. Sometimes the cat catches the mouse and then the cat is the winner. But sometimes the mouse runs into his hole and then the mouse is the winner. From People's Computers - Nov-Dec 77 - By Mac Oglesby - Converted

for POLY-88 and 'animation' added by David Larry Johnson - 25 Feb 78

REBEL is a Civil War simulation played from the Confederate point of view; it was adapted from 101 Games by Tom de Felice, Box 701, Leominster, MA. You will take part in a series of battles. Facts and figures used are based on the actual occurances. Most battles tend to result as they did in the Civil War, but it all depends on you! You could change history!

BOXING allows you to go twelve rounds of championship boxing. and was re-written for the Poly 88 by Tom de Felice, Leominster, MA.

HELP!

In this section I share with you the help system files I have built up over the last few years. (The entire system is included with Abstract Systems Exec.)

$HELP COMMAND COPY

HELP file for system command "COPY"

The "COPY" command copies one existing file to a new file.

Syntax:
"COPY [<n<path1<old-file.TX] [<m<path2<new-file.TX]" (RETURN)

'n' & 'm' are drive numbers, 'path1' and 'path2' are subdirectory paths, old-file is the file to be copied, and new-file is the new file name. new-file will be an exact copy of old-file. COPY may be combined with ZAP yielding ZCOPY. ZCOPY works faster for copying larger files.

Minimum size: "COP" or "ZC" Example: "COP Dick <2<LETTERS<DICK"

For Sale: 8813 System with Decwriter printer. Make offer. - Karen Klysz, 4050 Hearthstone Court, Cincinnati, OH, 45245, (513) 752-7186.

Poly for sale: C. Barclay Gilpin, 407 Lenwood Drive, Costa Mesa, CA, 92627 (714) 642-0390.

Eight inch MAXALL 32 hard sectored diskettes for your MS. $15.00 per box or $ 115.00 per ten boxes. Also, many used boards, parts and systems - CALL. Al Levy, Post Office Box 71, Hicksville, NY 11802, (516) 293-8368

---

1. System Software: Exec/96, WordMaster II, & BASIC, disks + addendum (w/o manuals) - Normally $150, Special $95.
2. Manuals: User, WordMaster, & BASIC - Normally $150, Special $95
3. Other Manuals and Theory of Operation Manuals. CALL
4. CP/M hardware conversion: $100 plus parts. (CP/M license, manuals, and software: $200)
5. 16K to 64K memory card conversion $125.00 plus parts. (The 16K board has to be a Poly board and in good working condition.)
6. Serial mini-cards: Reconditioned - $75, Bare board - $30.
7. SD controller $95.

For Sale: Multiple 8813 systems - each with 3 drives, 64K, Monitor, and Keyboard - Make offer. Robert L. Schwartz, 906 Main Street, Cincinnati, OH, 45202, (513) 241-3447.

For Sale: 64K 8813 with 3 drives. Make offer. Vince Greenen, 445 Buckeye, Naperville, IL, 60540, (312) 420-8813 days, (312) 961-2511 evenings.

For Sale: Video Board - $95, 8" Disk Controler - $150, Printer Interface - $50, Poly CPU - $125, Priam Hard Disk with Poly Interface card and Power Supply - $400, Poly Keyboard/Screen enclosure - $175. Charles Trayser, 415-651-5931.

FOR SALE: Two 5" SSSD SA400 drives, $25 each. - Ken Lowe, 5936 W. Zina Circle, West Valley City, UT, 84120 (801) 969-7736.

PolyCom General Ledger $125

Version 4 is the original form, where you keep each separate set of books on separate diskettes. Version 5 is menu driven and allows you to keep a number of different sets of books on-line. (Version 5 requires a hard disk, preferably, or at least DSDD floppies). Either version is $125.00, including the operations manual.

FOR SALE. Poly 8810 box with power supply and mother

board. $50 plus shipping.

For Sale: Poly 8813, 2 DSDD drives, 48K, Keyboard III, monitor. Merrill Cottington, 814 Story St. Boone, IA 50036, (515) 432-8743.

For Sale: 8813 with 2 SSSD & 1 DSDD 5" drives, Keyboard II; 8813 with 3 SSSD 5" & 88 MS, Keyboard II. Make Offer to Doug Reaser (205) 277-3167.

Three 8813's for sale, two with 3 drives, one with two. All have 64K memory, Keyboard II, and Koyo monitor. $200 each, $500 takes all three. Also about 100 usable diskettes. Steve Chip Brown, Pensionalysis, Inc., 2116 Union St., San Francisco, CA, 94123. Call (415) 567-0125 weekdays.

What to do with a New Disk

by Al Levy

When receiving a disk from another user or software house, there are some unwritten conventions.

1: Write protect the original.

2: Place the disk in any drive but the System Resident drive.

3: Image the disk.

4: Put the original away in a safe place. If you are as neurotic as I am, image the copy and keep one as a backup.

5: ENABLE your system. -- If there are "SYSTEM" files it is best to know what they are.

6: LIST the directory.

```
                Look for
   .DC extension  ---> Documentation File
   .TX extension  ---> Documentation File

   .TX extension  ---> Text File
   .TX extension  ---> Command File

INSTALL.TX  ---------------> Command File

   .BS extensions ---> BASIC programs
   .GO extensions ---> Machine language files
   .AS extensions ---> Disassembled
        or Source code for .GO or .OV files
```

A source code for a .GO file could have .TX extension The clue would be the name. For example

```
   MOVE.GO        ---> Program
   MOVE.TX        ---> Source
```

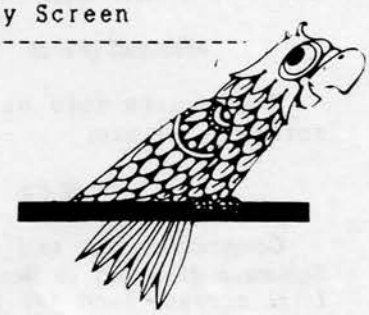
Other extensions to look for:

```
   .DT extensions ---> Data files
   .OV extensions ---> Overlays
   .DX extensions ---> Directories
   .IN extensions ---> Formating Files
   .RL extensions ---> Relocating (.GO) files
   .ED extensions ---> EDIT libraries
   .SY extensions ---> SYSTEM libraries
```

7: Should you discover any DX extensions (Directories), you should list them. Assuming the directory name is "DATA.DX" and the disk is on drive 2, the system command you would use is LIST <2<DATA.

alternatives
Poly Screen

```
$ L 2<DATA
$
$ L ?<DATA
$
$ # 2<DATA
$
$ l #
$
$ L #
```



One of the best ways of knowing everything on the disk, and having hard copy to three hole punch etc.

1) Connect your printer.
2) Use a system disk that has the program CHECKSUM.
3) Type CHECKSUM 2

8: Either TYPE or PRINT any .DC file. If non exists try this with all of the TEXT files.

If there is any documentation (explanations), they should be contained in one these files.

A CP/M convention that I have imitated is to use a "READ.ME" file. Often, I use a "HELP.DC"

Watch out for fellas like KENYON who enjoy lower case. You are liable to see Help.dc

Command files are easy to spot. They have system commands like COPY or DELETE. These make installation easier. Commands preceded with a question mark (?COP) prevent the system from aborting a command file.

Try to get the intention of the author from the command and/or documentation. Follow instructions and take it from there.

It is not a good idea to run programs without knowing what they do or what they expect.

It is not a good idea to start editing the documentation. It is suggested that you print the instructions or documentation. Put it in a loose leaf book. (You still have the original on the original disk)

You are then free to erase them from the disk.

Note:
If you have the utility program SDIR (Super Directory) it will list all directories and sub directories in one shot. (Use continuous form for this one)

BUGNOTES

Abstract Systems BugNote 012.0 December 26, 1982

boot

Exec/95 Dfn2 has a bug in the "boot" function. The boot command checks to insure the destination drive has a disk in it, but does NOT check to see if that disk is a system disk.

Readers Responses

Would like info on graphics programming for screen & printer. --- Jim Clay, Los Gatos, CA

Bit Bucket

Congratulations and a free disk of Public Domain Software goes out to Norm Shimmel who submitted the first correct food for K-9. Norm called me up on July fifth to say that I should feed K-9 some *nibbles and bits*, one byte at a time, before he gets any weaker. Let us know which free disk you want, Norm.

Extra credit goes to Ron Moffatt who submitted the second correct entry. Ron, however went one step further and identified the food as a "Byte Sized Serial". For that extra effort, you get a free disk too. Let us know which one you want.

Now then, for our next contest, what kind of soup does a computer eat?

In This Issue

Coming Soon

Modems and Communications software, More BASIC for Beginners, Serial Device Driver Explained, How to UNSAVEP protected Programs, More System Programmers Notes, Making your PC work like a Poly, More Help, BugNotes, Public Domain Software, etc.

Questions

Can you find and answer the questions asked in this issue? Send your answers and requests in.

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Address Correction Requested

FIRST CLASS MAIL

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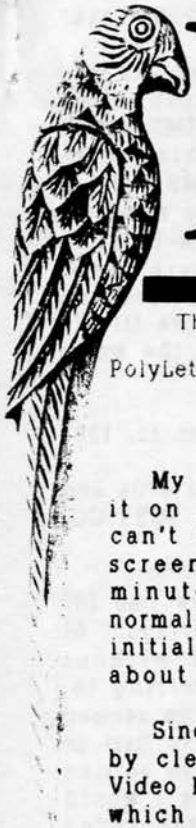

PolyLetter

The Newsletter for PolyMorphic Systems Owners and Users

Editorial

My computer is getting cranky. When I first turn it on it does strange things, like telling me it can't find that file, and putting garbage on the screen, and other strange things. After a few minutes, however, it settles down to operate normally. The confidence package bombs during this initial few minutes. Does anyone have any ideas about what may be causing these symptoms?

Since writing this, I have eliminated the problem by cleaning the contacts of several chips on the Video board. Some were coated with a black material which changed the conductivity of the connection. The old antistatic foam was corrosive and caused problems with the chips which had been stored in it. I used a soft eraser and stuck the legs of the IC's into it to rub off the black film. So far so good.

The problem came back, but cleaning chips on the CPU card seems to have taken care of it.

I had a rude awaking the last time I went to have PolyLetter printed. The printing costs has gone up by 40 percent! Now, PolyLetter has not raised its subscription rate since 1980, but we can't keep this up if the costs keep going up. PolyLetter is contemplating a subscription price increase starting in 1988. The new rate will be $18.00 per year, and will go into effect January 1988. If you wish to beat this rise, you may extend your subscription now for a year at the current rate. Please make checks payable to "Ralph Kenyon".

Well, by popular demand, commercial advertising space will be available again. Noncommercial ads by subscribers continue to be free. The rates for commercial ads are $50 for a full page, $25 for a half page, and $15 for a quarter page. Anything smaller is $3.00 per column inch. A column is 3-3/4 inches wide by 10 inches tall. A full page is 7-5/8 inches wide.

PolyLetter Gets New Phone

I have had to share my phone with teenage girls. You know what that means ... no calls for me! Well, I have finally broken down and sprung for a phone of my own. The new number is (413) 458-3597. You should be able to get through on this line now.

edit.GO

This program is a special command line editor which allows editing and executing any line which is already on the screen. It is a memory resident, "hot key" program which comes up whenever the CTRL-DELETE key is pressed. It can be used in conjunction with BASIC program development, or simply to make re-entering or correcting commands easier.

Once you hit CTRL-DELETE, edit jumps to the line above the cursor and is then ready to edit that line. It supports CTRL-X which deletes the line to the left, CTRL-W which deletes the word to the left, DELETE, and insert. The left and right arrow keys work as expected, the up and down arrow keys move to the beginning or end of the line being edited. ESC, up-arrow moves up to the previous line, while ESC down-arrow moves down to the next line. ESC, right and left arrows move one word right and left respectively.

You can order edit.GO by sending me a check for $15 payable to "Ralph Kenyon".

Letters

Ralph, July 9, 1987

Just read the latest PolyLetter which arrived some time back but I only scanned. Here are some comments on a couple of things mentioned there.

1. Re: Problems with using Diablo 620 printer.

There's a very simple solution to the problem if the "handshake" arrangement doesn't work (or he doesn't want to fool with it). The Diablo 630, 1610/20, 1640/50, and probably most others are capable of handling the ETX/ACK protocol. The standard PolyMorphic printer driver is easy to use with ETX/ACK.

To use the ETX/ACK protocol, use Setup.GO and:

(1) Answer "Yes" to "Is this printer similar to a Diablo?"
(1) Answer "Yes" to "Is this a blocking device?"
(2) Select 255 as the block or buffer size
(255 is the biggest Poly can handle, though most Diablos could handle larger blocks).
(3) The printer does NOT need a start character (no).
(4) The END character is 3 (ETX).
(5) The ACKNOWLEDGE character is 6 (ACK).

By using the ETX/ACK protocol, you can use ANY baud rate the printer is capable of accepting.

The way this works is that the Poly sends a block of 255 characters followed by the control code ETX (end of text) and then stops and waits. The printer processes the 255 characters and when it reaches the

ETX, it sends ACK (acknowledge) back to the Poly. The Poly then sends another block of 255, etc. The only disadvantage to this method (which I used for years until I switched to "hardware handshaking") is that you cannot take advantage of the larger memory buffer often available on printers. My Diablo 1650, for example, has a 2,000 byte memory, and often small printing jobs can be completely dumped to my printer and I can get the computer back while the printer is still plugging away.

All Diablo printers I've ever worked with will work with the ETX/ACK protocol, usually without having to do anything (though it's possible a switch will have to be set). Most, if not all, Diablos will also handle the DC1/DC3 (Xon/Xoff) protocol, but the Poly printer driver will NOT handle DC1/DC3.

Incidentally, the older versions of Poly Exec (prior to Exec/83) have the ETX/ACK protocol but "hardware handshaking" capability wasn't available until Exec/83. [Not true. Poly has used CTS for hardware handshaking from day 1. -- Ed.]

2. Re: Use of a cassette tape for mass storage.

I have a cassette setup, but I can't imagine anyone really fooling with it except to play. The "PolyPhase" system at 1200 baud is reasonably fast (especially when compared to the "Kansas City Standard" 300 baud format) but it has its problems, too.

One of the significant problems is that a fairly high grade cassette recorder is required. PolyMorphic always recommended the SuperScope Model C103 as it was one of the few which worked consistently in PolyPhase. Another problem is that a tape recorded on one recorder may not play back on another.

The most serious problem, though, is that if the computer has the "Version 81" Poly ROMS installed, the cassette handling routines aren't there. FILMS.GO calls these ROM routines and, without them, you're out of luck. (On the other hand, I don't know how many PolyOwners converted to the Version 81 ROMS. You can find out which ROMs you have by going into the front panel (CONTROL Z in enabled mode) and entering L0439. This is VERLOC (VERsion LOCation) and the number displayed after the arrow is the version of the installed ROMs.)

Another way of using cassette tapes is to use BASIC A01 and Exec/4D instead of FILMS.GO. There are built-in cassette routines available there. I believe you still have to have ROMs previous to Version 81.

3. Re: Readability of *PolyLetter*.

The last issue was fairly readable (though I admit to being an unreconstructed "letter quality only" freak). My main suggestion for improvement of readability is that you put a blank line between <u>every</u> paragraph. This reduces the amount of material which can be published but what's there is <u>much</u> more readable. Best regards, -- Chuck Thompson, Dallas, TX.

[I just checked out FILMS/3E with DisAsmb.GO. FILMS/3E does NOT call the cassette routines in the ROMS. The whole purpose of the program FILMS was to provide the tape handling routines which were originally in the 4.0 monitor (part of PROMS version 75) but removed from later PROMS to make room for the MS Dio code. FILMS does use a system location which is called by the Dio code, so there might possibly be a conflict, although I didn't have any trouble reading a short tape and saving the file to disk. The slow speed is, in my opinion, the worst disadvantage. -- Ed.]

Dear Ralph September 11, 1987

Just finished looking through PolyLetter 8704 and am respondring to your offer of $10 for SORT.GO, check enclosed.

I note that the {A!S} price list offers two (2) sort programs, Qsrt and Hsrt that are overlays. Al Levy, in a recent conversation, and without distinguishing which program he was referring to, commented on "Ralph Kenyon's fast sort". He seemed to be impressed. How does SORT.GO relate to Qsrt or Hsrt in speed or concept? I assume that in sorting large files with long fixed-length records I would have to create a special file of shorter index records, imbed the record number at the tail end, use SORT to resequence the index records, and then use the imbedded record numbers in the resequencing index records to randomly access and copy the host file records. Do you have any timing comparisons on the three programs for, or would you estimate the timess for, say, (500) 50-character records; under two conditions; first, of the host file being fully random, versus; two, having only 2% randomly out-of-sequence?

In the latest PolyLetter, I especially appreciated your article "CRASH!". Regarding the exchange of views on SPELL, I am impressed with the candid and objective manner in which you (and your predecessor Bob Bybee) tell it like it is - - or at least as you see it. This is a healthy and helpful environment for everybody when and if issues can be freely discussed and aired, in full context, without insult. I appreciate it.

Ralph, can you help me with 8" replacement SSDD drives? How about pressure pads, especially for 8". Do you have 8" disks available for sale? [See Doug Reaser's ad. -- Ed]

My latest problem: the 8" drive-2 will not respond to any call for a directory update - - not from EDIT, COPY, or PACK. The screw drive will not reverse. I restore operations by manually turning back the screw. From then on it operates properly with LIST, TYPE, PRINT, READ, etc., so long as I don't mess with the directory. I have yet to commence diagnosing by swapping units and cables and boards. Thank God for the extra MS unit that Al Levy recently provided me. -- Sincerely, -- J. Earl Gilbreath, Jr., Savannah, GA.

[Earl, SORT.GO is different from Hsrt.OV and Qsrt.OV. SORT.GO reads variable length lines of text from a text file and writes them out in sorted

order. It doesn't actually sort because it reads one line at a time and inserts a pointer in its proper place. This way the data in memory is kept sorted from the beginning and when it writes the data out, it is already sorted. It works with lines of text. Even so, it takes 25 seconds to do 500 lines of text that are 50 characters long each. It takes about another 44 seconds to write out the sorted output file.

Hsrt.OV and Qsrt.OV, on the other hand, assume that the data to be sorted is already read into a BASIC string array. Hsrt.OV and Qsrt.OV are both passed the address of the first element in the array. They know how to find out how big the array is, and how many elements in it. Once called, these overlays actually sort the contents of the BASIC string array in memory. The performance difference is in the fact that the heap-sort algorithm gives a fairly constant result regardless of the degree to which the file is already sorted. Quick-sort, on the other hand, does well with random data, but poorly with data that is nearly sorted. A comparison between them on the data you suggested (a file of 500 random 50 character records, and the same file only 2% out of order) yields the following comparison.

	Qsrt.OV	Hsrt.OV
Random	6.7	11.9
2%	22.2	12.6

I have a program which is capable of sorting a data file too big to put in memory and having sort keys which are also too big to fit in memory. While there are still blocks of keys to be sorted, it merges the most recently sorted block with the sorted keys, transferring back and forth between two key-files. Then it copies the records in sorted order into a tempory file, and finally copies them back to the main data file (now in sorted order).

For most applications I don't actually sort the file. I usually read in the keys, add record pointers, and sort the keys. Then I access the records in sorted order for printing a label, etc.

Regarding the drives. The problem is complicated by the cache maintained by the 8" controler. It keeps the most recently read sectors so that the disk doesn't actually have to be read again if there wasn't a write. To bypass this boot on a disk which does NOT have the Cache.ZO file on it. You will get a truer response from the drive then.

My guess is that the direction select bit input from the controler to the drive is not being processed. It could be a bad connection or a bad driver IC. It could also be a fault in the stepping motor. Each of what you said it does successfully involves moving the stepper motor in only one direction. I don't have any 8" drives at all. Al Levy can probably get you some. But since you are in Georgia, try Bob Bybee. Also, you may find some drives listed in Computer Shopper. -- Ed.]

Dear Ralph, September 15, 1987

My Poly 88 is as good or better than my Pong Game. Isn't it a shame the Beatles broke up? -- Very truly yours, -- Michael S. Schwartz, Cincinnati, OH.

[Michael Schwartz and Robert Schwartz are both of Schwartz & Schwartz, Attorneys and Counselors at Law, in Cincinnati. -- Ed.]

Hi Ralph, September 16, 1987

Well, I moved and forget to send you a change of address. When I looked at my last PolyLetter, I see my subscription expired in June 87. I am enclosing a check for another year. Thanks for PolyLetter.

Ralph, I have one question that you may be able to help me with. I now have a Radio Shack DWP 230 printer and need to know what printer cable connections I need to get it to work with my Poly 8813, 3D SSSD, 5-1/4.

I hope I can get the issue I have missed. -- Thanks -- Chuck Gross, Mariette, GA.

[Chuck, I have spoken with Trevor Young at Radio Shack here in Pittsfield, MA. He says that Radio Shack has a printer cable for that printer, part number 26-1361. That cable connects to the 4-pin din connector on the printer. The cable has pins 1, 3, 7, and 20 connected. 1 and 7 are grounds, 3 is the data line, and 20 is the status (handshaking) line.

The 4 Pin connector on the DWP 230 is configured as follows: 1 is not connected, 2 is the status line, 3 is the ground line, 4 is the data line. If you make up a cable for this printer you should connect it as follows:

CABLE			POLY HEADER		
DWP 230		RS-232	RS-232		CPU
1	-	1	1	-	15
2	-	20	6	-	12
3	-	7	12	-	14
4	-	3	9	-	10

For more information on the RS-232 interface see the article "The Straight Wire" in PolyLetter 8702.

By now you should have gotten the missing issue. If not, let me know and I'll fire off another copy. The 8706 is the issue number vice month, so you're good through 1988 now. -- Ed.]

Dear Ralph: September 23, 1987

I'm disappointed in your response to my letter. Let's look at your points one by one.

"Dissatisfaction" has several synonyms, none of which apply to the original Frank Stearns Associates SPELL 3.0 software. Nearly all those users who purchased the program -- at its timely availability, price, and functionality -- would agree.

Two users suggested case preservation, but were happy to use SPELL 3.0 without it. Case preservation, along with numerous other goodies (including a comprehensive interactive mode), were

planned for Version 4.0, but I had to be realistic. Nearly 600 hours had gone into the development of SPELL 3.0 up to that point. In lieu of the declining market, spending additional time on the program was not feasible. Keep in mind that SPELL 3.0 offered standard features still not seen in even the "best" spelling checkers, such as parentheses and quote balance checking.

To most people, the word "dissatisfied" means that a product does not work as advertised or does work at all. SPELL 3.0 fulfills every advertising claim made, and in many instances goes far beyond. You might have acknowledged this, and said simply that your version incorporated additional or new features.

You were excited about my concept of an AUTOPATH program and thanked me for the idea, and invited me to tell you of any other ideas I might have had. You were free to sell AUTOPATH to anyone (wasn't it on an Abstract Systems price list at one time?), with no royalty to me for the idea. The amount of code in AUTOPATH was quite small, probably less than 5% of the number of lines in SPELL 3.0. Beyond that, however, your particular rendering of my AUTOPATH idea had a fatal flaw which you shrugged off, though perhaps you've fixed it by now: the AUTOPATH you sent me did not "understand" how overlays and system files were needed by applications such as the editor or BASIC. Thus, if one edited a file down a path set by AUTOPATH, the editor crashed because it attempted to find its .OV files in the subdirectory set by AUTOPATH. TYPE, and other monitor-resident Exec commands that did not require overlays, worked with AUTOPATH but that was about it. Because of these factors, I'd call AUTOPATH a "null trade" for the source to SPELL 3.0.

I noted your comment: "[I did not] compete [with you]...as a professional courtesy out of consideration for your providing me with your source list [to SPELL 3.0]..." This underscores my point that AUTOPATH and SPELL 3.0 were never intended as an even trade.

The source code of SPELL 3.0 follows conventions that to this day make the code easy for me, the author, to follow. Labels are for the most part mnemonic; chunks of code are ordered for my best understanding. You must realize that the code was never intended as an academic model of structured programming. The code is, however, a crystal clear representation of SPELL 3.0 for my use. You, of all people, should be the first to acknowledge that coding styles, regardless of the language used, are nearly as individual as preferences in interior decorating. You might not like the color of my living room walls; I may not like yours.

The only published external documentation for SPELL 3.0 was the user's manual, which you (and nearly everyone else) praised highly. (Just as a point of interest, I had outlined an "OEM" manual for SPELL 3.0, thinking that someday I might sell or license the source. I did write a chapter of that document. As a programming and writing sample, the strength of that unfinished manuscript clinched a major technical writing contract that was pivotal to my success in that profession.)

As far as the "gentleman's agreement", I stand by the statement made in my first letter, and note your statement: "...I did try to make mine [{A:S} Spell] operate like yours [SPELL 3.0] in its user interface and display, but there the similarities ended..." You might want to review the case of Apple Computer vs. Digital Research. DRI got in big trouble because the GEM DESKTOP operating system and its applications "looked" a little too much like the MacIntosh/Lisa operating system and applications. At least at the lowest level the code was completely different, because the Mac and Lisa machines use the Motorola 680XX family of processors and DRI's GEM runs on DOS machines, which use the Intel 8086/8 and 80286 machines. DRI, as far as I know, had to change the appearance of GEM. This is mirrored in my clients' versions of GEM DRAW. The early GEM DRAW looked exactly like MAC DRAW; the latest GEM DRAW looks a lot different (and is a little harder to use).

I'm not about start litigation against Abstract Systems, but your point is an amusing one.

Your computer science course sounds interesting, but what you describe is NOT the way SPELL 3.0 works. My algorithm was ingenious and, as far as I know, unique. On the first pass through a target text file, a COMPLETE subset dictionary is loaded into memory. This first dictionary contains the most "common" words one might expect to find. Words not found in a very fast binary search are passed to the unknown word file. Each successive pass loads the next complete dictionary tier, which contains less and less frequently-used words. The words left over in the unknown file from the previous pass are checked against the current tier. Any unknown words left over are considered misspellings. One of the dictionary tiers is a "user" dictionary.

In building the dictionaries for this system, I considered each word in the original dictionary, and decided into which one of five tiers each word would be placed. This incredibly painstaking dictionary editing process required nearly one hundred hours to complete. Forget the program -- if you're using the bulk of those dictionaries, Ralph, maybe we ought to duke this out in court!

Regarding some words ending in double letters: there are certainly not hundreds, and this solution, while not perfect, does have its benefits. Where, for example, do you put the MISSPELL file when running two SSSD drives in 48K of RAM? I know that you have high-density floppies; and eventually I bought a hard disk for my Poly. Nonetheless, SPELL 3.0 runs on a standard two SSSD drive system, with as little as 48K of RAM. Those are (were) the hardware constraints of more than a third of the SPELL 3.0 users. Can {A:S} Spell be used on those systems? What happens when the MISSPELL file gets a little rotund?

As far as some Poly keyboards having a problem with double letters (bouncing keys) you're right. But I called Mark Maclin at Poly in 1982. He came up with a simple solution. I can't remember now,

but I'm reasonably sure that I did an article on that fix for PL. (One only needed to cut two traces and add two jumpers to the keyboard PCB to stop key bounces.)

Regarding SPELL 3.0 input buffering: 10 sectors is not ideal -- you're looking at the problem superficially. The idea is to keep the drives spinning and the head pad loaded. This is far better than stopping and starting the floppy drives, loading and unloading the heads, or doing a lot of seeking on a hard disk. I tried 10 sectors and several other buffer sizes. Eight sectors for the input buffer and one sector for the output buffer proved optimal over many years of use. While perhaps not the most efficient or elegant method from a software perspective, I'd settle for this "ugly duckling" approach long before placing excessive wear on the customer's disk drives. By the way, the governing factor in the total dictionary size is really the available disk space, not the RAM size. As noted, SPELL 3.0 supports SSSD users, and the dictionaries fit on a single flippy.

I commend you for having spelling software available for the Poly now and actively supporting it. What I did not and do not like was having SPELL 3.0 -- a widely used and praised program -- acknowledged in such a negative light.

You really owe me an apology, Ralph. -- Sincerely, Frank Stearns, Vancouver, WA

P.S.: More items for the MISSPELL file in the July/August issue of PL: Page 2, third paragraph "whenI". In my file it's two words, "when" followed by " I". Perhaps the "whenI" is a printer goof but that seems unlikely because you're right-justifying. If the printer had missed a space, the right margin should also be indented by the amount of the missing space.

Page 3, paragraph 6: "unfriendlyness": That spelling caught my editor's eye but I wasn't sure. For fun I typed "unfriendlyness" on my 286 DOS machine, and then pressed ALT-F10. The Borland Turbo Lightning speller window popped up, indicated that this was not a correct spelling, and offered "unfriendliness" at the top of its list of suggested words. The correct spelling was swapped in merely by pressing RETURN. (When proofing this letter, the Microsoft WORD speller also threw up on "unfriendlyness". It too offered "unfriendliness" as the correct spelling.)

Of course, "whenI" would be caught immediately by the spellers on my DOS machine. Because of the tight suffix and prefix definitions, SPELL 3.0 would also have caught "whenI", but I see how {A!S} Spell might not. Alas, SPELL 3.0, like {A!S} Spell, would have erroneously passed "unfriendlyness". As you say, some things just get through. That's why I'm glad now, in a melancholy sort of way, that I'm on a DOS machine. They're okay once you define a half-dozen operating system commands and a dozen editing commands that make the thing similar to a Poly. There's still the question of DOS machine hardware reliability, but you can now get a set of basic AT (80286) boards for less than $700, and a whole AT system for under $1200. Spares are easy to keep on hand.

[Frank, I couldn't find your definitions for "dissatisfied" in any of my dictionaries, including Websters unabridged and the Oxford English. According to the Oxford English Dictionary, 'dissatisfy' means "...to fail to satisfy or fulfill the wishes of...". I never claimed, nor intended to claim that SPELL 3.0 failed to meet any of your advertised claims. I did, however, claim that it did not do something that I wished that it had done.

As I understand "dissatisfaction" to mean, SPELL 3.0 did not fulfill my wishes or desires. In short it didn't do what I would have liked it to. You were dissatisfied with Autopath for exactly the same reason. Although it did exactly what you SAID it should do, what you SAID it should do turned out not be what you WISHED it to do. You really wished it to change the default path selectively rather than with every lookup as you said. However, since meaning is not in words, but in persons, and "the customer is always right", I defer to your "professional editorial" experience. I profusely apologize to you for saying anything that might have been misconstrued to mean what I had not intended.

It seems that your idea of what an algorithm is differs from that which I learned while aquiring my M.S. in Computer Science. An algorithm is simply an effective procedure. A procedure is effective only if it is guaranteed to terminate. No efficiency criteria is included in the definition. The arrangement of data, however, will affect the efficiency of any particular algorithm. For example, in sorting data, the quick-sort algorithm sorts random data much faster than it sorts nearly sorted data, while the heap-sort algorithm takes about the same time regardless of the arangement of the data.

A simple spell checking algorithm is nothing more than computing the set difference between the dictionary file(s) and the document file(s). Expressed logically:
Output file := Document files - Dictionary files

One of the first problems we dealt with in the first graduate computer science course I took (CS-655) was determining the most efficient method for implementing a procedure to compute the 'join', 'intersection', and 'set difference' between two files. To insure that the process is completed correctly, one must read in as much of one file as will fit in memory and still allow some working space, and then process the entire other file, one record at a time, with subsequent passes for the remaining sections of the first file. 'Join' and 'intersection' process the original file again each pass, while 'set difference' processes the output file each pass. A spelling checker is simply an application of this basic construct.

Theory: C := A - B;
Application: MISSPELL := DOCUMENTS - DICTIONARIES;

We even discussed this particular application in the course. Expressing the algorithm so as to make

explicit the memory limitation yields:

```
FILES A,B,C;
FLAG = 0;
WHILE NOT END OF FILE [A]
  READ [BLOCK];
  CASE FLAG OF
    WHEN 0 => C = B - BLOCK;
              FLAG := 1;
    WHEN 1 => C = C - BLOCK;
  END CASE;
END WHILE;
```

Of course, each block must be sorted, and a binary lookup used to insure speed. Since the blocks are used again and again, it is better to have each block presorted. Disk storage limitations determine how many blocks to a file, the simplest arrangement being one block per file.

While it is commendable that you 'hit upon' the idea on your own accord, you were re-inventing the wheel and cannot claim any rights to such a public idea.

The arrangement of words in your dictionaries, as you say, based on your frequency experience, would affect the speed of any such algorithm. Since your dictionaries are arranged in your frequency experience order, {A:S} Spell would probably run faster if it did use the SPELL 3.0 dictionaries. However, {A:S} Spell uses different dictionaries. Its dictionaries are not presently arranged in frequency order. They are arranged by word size only. I am also sympathetic to your 100 hours editing dictionaries. I too, over the period since 1984, have spent a hundred or more hours editing dictionaries. I, however failed to incorporate frequency experience, BUT, I have ordered the Brown Standard Corpus, which contains standards of English text. I refer you to "Computational Analysis of Present-Day American English", by Kucera and Francis, Brown University Press, Providence, 1967. I will subject the corpus to a frequency analysis and issue revised dictionaries which do take frequency into account. {A:S} Spell does works on SSSD systems with 48K. What's more, if anyone comes up with a configuration where it doesn't work, I'll fix it for them.

Well, Frank, publishing your letters here has given SPELL 3.0 more exposure and positive praise than it ever had before. I am sure that many people out there would like to get a copy. However, since you sold your Poly, lock stock and barrel, software included, to Percy Roy, Perhaps it is Percy that I should be asking to put SPELL 3.0 in the Public domain. I went back to my old 48 tpi disk archive and found the original SPELL 3.0 that you sent me. How about letting me put it in the PolyGlot Public Domain Library? Or, do I have to ask Percy Roy, as the new owner of the rights to it?

As part of my Masters in Human Resources Management, I was taught to seek the "win-win" solution to controversies. Also, Gerald Neirenberg says that the object of negotiation is not a dead competitor, but a solution both can live with. Let us put this controversy behind us by putting SPELL 3.0 in the public domain.

By the way, Frank, months ago you promised me an article on the tricks you employed to make a PC (clone) act similar to the Poly. As you saw yourself, your earlier article on transitioning to a DOS machine got considerable response. We have people out there who have both Poly's and DOS machines, and who would like to have help making it easier to use the DOS machine in light of their Poly experience. How about it Frank, does PolyLetter get another article describing the "half dozen operating system commands and a dozen editing commands that make the thing similar to a Poly."?

I have looked through all the PolyLetters that you edited and have not found any item on eliminating key-bounce. Would you be so good as to let me know which issue you think it was in? -- Ralph.

P.S. The "whenI" you spoke of is actually in paragraph 9. PolyLetter is spell checked, formatted to a file, edited for page headings, and printed in one pass. I checked and "whenI" is NOT in the original file which {A:S} Spell checked. Just for drill, I ran a test and {A:S} Spell does catch "whenI". The "whenI" WAS in the formatted output file, so it apears that either format goofed or fil.PS goofed, or most likely, I goofed during the post formatting editing when I delete alternate page form-feeds. Since the printer does the right justification no space would be expected.

"Unfriendlyness" came about because I had failed to remove "friendly" when I added the LY suffix. Removing Friendly from DIC6-8 solves this particular problem, since the combined suffix LINESS is in SUFFIX. -- Ed.]

Dear Ralph: September 27, 1987

I have been wanting to write and thank you for yet another great issue (#8704) of PolyLetter.

It's fun reading the "nostalgia" articles. I still remember my own first encounter with the Poly - back around '76 in a little corner-store in Santa Barbara, CA called the "Byte Shop". Nothing like today's lavish computer stores. Just 1-2 people hanging around, an IMSAI or two, a couple of Diablo & Teletype printers - and ... than beautiful wooden box with three disk drives in it ... sitting next to the little orange #88. I was mesmerized. An actual computer, a real one, that could do things that only the big IBM 650's were supposed to be able to do! I saved my pennies and got one of the first #8813's shipped by Poly - with minimum RAM and only one drive. [Over the next few years I laboriously upgraded, ROM by ROM, board by board, to a "full house" #8813. And what great people I met along the way - in basements, garages, and studies overflowing with Frankenstein-lab gear. You could always tell a Poly freak, as he always had the #8813 going with the wooden cover off so he could mess with it.

O.K., so the real point of this letter is to give you a good report on the software and hardware combination Bob Bybee put together for me. You'll

recall that I spoke with you a bit about my desire to get my Macintosh Plus to talk to the Poly. You had a software package, but no hardware. Bybee had a communications software package for the Poly, and offered to make me the necessary cables too.

I thought the entire package was extremely reasonably priced [would rather other clients get prices directly rather than my stating it here]. It arrived very quickly, carefully packaged, and with complete and readable documentation. I should add that I am **not** a "tech" person, and that the non-tech language of the documentation was thus important to me.

The result was a Poly-to-Mac cable connection that worked perfectly the first time. Using Bybee's Poly communications software and MicroPhone software on the Macintosh, I was able to move everything I wanted across to the Mac, error-free, at 3600 baud. [Theoreticaly both machines could go at bauds up to 9600, but I began to get errors over 3600. This could have been me and not the soft/hardware too.]

Bybee's Poly-to-modem cable, hooked up to the printer port, also worked perfectly with a Hayes-compatible modem the first time. I use CompuServe and MCI-Mail regularly, and the #8813 zipped smoothly into both of them.

So for PolyLetter readers who are crying about things the #8813 can't do, or shouldn't be relied on to do because of its age:

(1) it makes a superb computer-communications terminal. It's big, beautiful CRT type makes data services & BBS's appear at their best, and the results can be saved to disk and pulled right up in WordMaster II for easy editing, formatting, & printing.

(2) Since the Poly and the Mac can trade text files zip/zip, all you Mac freaks out there can use the Poly when you want, the Mac when you want, and move files back and forth as easily as attaching one cable between the two cases. No more fears that any work done on the Poly will be "stuck to" than system forever.

All for the moment - Keep publishing! -- Sincerely, -- Michael Aquino, St. Louis, MO.

[Mike, Thanks for sharing your MacPoly experiences with us. Al Levy has been transferring files between the Poly and other machines during his tenure as editor of The Stack, the organ of the Long Island Computer Association (LICA). He started 8 years ago swapping files to a Commodore Pet, and has since swapped with a host of different CP/M machines, the Apple, and IBM PC (clone) machines as well as the Macintosh. Al regularly transfers files from a PC (clone) to the Poly for EDiting and then transfers them back. I usually send Clone files to the Poly for editing and printing rather than using the Clone directly. As you say, the secret is having the correct cable connections and appropriate software on both ends. -- Ed.]

Hi Ralph, October 10, 1987

I still have not got my Poly to interface to a printer. I think that my interface in the Poly is not working. How can I test it? If I was to send it to you, can you test it? I'm using a VIC-20 to print this letter.

I also have 2 8K RAMs that I can't get to work. My top of memory is 9FFF. The settings for these RAM's were wrong. Would you know the settings for these boards? Here is the info from the boards:

Copyright 1977 G.Morrow
Synchrofresh TM VIII
ECONORAM TM II from Thinker Toys
2F 01-78

I have two of these boards and if you know the settings I would be very grateful for the info.

Enclosed is $6.00 for PGL-V-10

What is the market value for a Poly now? As I am considering selling or trading my Poly unless I am able to get a printer to interface as I have started a business and need the printer badly. -- Len Thomsen, Delta, British Columbia, Canada

[Hi Len, *PolyLetter* 8606 (NOV/DEC 87) contained an article on testing the printer interface using the confidence test. Make a RS-232 plug which connect pin 2 to pin 3, pin 4 to pin 5, pin 6 to pin 20, and pin 17 to pin 24. Make a Poly printer card header plug connecting 1 to 15, 2 to 16, 3 to 13, 4 to 14, 5 to 11, 6 to 12, and 9 to 10. Run the confidence disk, press CTRL-S and select the Serial interface test. This will tell you if you have problems anywhere between the CPU and the serial card.

PolyLetter 8702 (MAR/APR 87) contained an article on hooking up printers to the Poly serial interface

I can test your printer interface card if you send it to me.

I do not have any info on those particular RAM cards, but they should be addressable on any 8K boundary. You can set the boards by trial and error using the confidence test. Make up a setting on one of the boards. Put it in. Boot on the confidence test package. Look to see where it shows RAM. If you don't see any extra RAM, assume the board is addressed somewhere where you already have ram, and try another setting. Usually you will have 3 switches which will be set in binary. The board may have from 3 to 8 switches which may give memory protect as well as wait states or phantom. Sometimes you will have one switch for each of the 8 possible locations and must turn on only one. I could probably find the combination, (assuming the boards are good).

The top price paid for a Poly in the last year was 500.00. The bottom price paid was 0. The most common price paid was $100 (to the best of my knowledge).

You should be able to get your printer interface working with any serial printer.

Feel free to call me at area code 413-458-3597 for additional info. -- Ed.]

Public Domain

Disk PGL-V-24 has 27 files on it, 27 free entries.
338 sectors in use, 0 sectors deleted, 12 sectors free.

Size	Name	Size	Name
31	MDIR.BS	3	MDIR.DC
27	RPN-CALCULATOR.BS	11	RPN-CALCULATOR.DC
32	PAYROLL.BS	12	LINEAR.BS
10	LREGRS.BS	8	PEEKER.BS
6	T-TEST.BS	3	OBV-ADDER.BS
6	OBV/VPT/MA-CORRECTOR.BS		
8	8THS/MA-CORRECTOR.BS		
24	TELED-11-13.DT	45	STOCKS49.BS
5	STOCKS49.DC	36	GOLD6.BS
3	GTEST.DT	1	GOLDSPOTS.TX
2	DISK.TX	9	COMPRESS.BS
19	EXPAND.BS	5	COMP-EXP-EXAMPLE.TX
6	FRACTION-METRIC-CONV.BS		
7	BASE.BS	6	COMPARE/TWO.BS
5	REMS/LINES/OUT.BS	4	HOURS/DEMO.BS

MDIR.BS generates a sorted listing of file names and disk names. The output from the program may be put into a new file or listed directly to the printer. The output also includes disk names, the number of programs, and the number of sectors in use.

RPN-CALCULATOR.BS was Written by Scott A. Loomer of, Ft. Belvoir, VA, and simulates a Reverse Polish Notation calculator, such as many Hewlett-Packard models.

PAYROLL.BS is an early, and rather simple, program to perform some simple payroll functions, including: print paychecks, tabulate payroll record, list employee records, and summarize employer tax record.

LINEAR.BS solves simultaneous linear equasions numerically.

LREGRS.BS does multiple linear regression.

PEEKER.BS is a memory examining program by David Larry Johnson, Prince George, VA. It dumps memory to the screen.

T-TEST.BS does a T-test for two independent random samples.

STOCKS49 came with the Poly-88 user group programs, but no authorship is contained in it, nor is there any documentations. OBV-ADDER.BS, OBV/VPT/MA-CORRECTOR.BS, and 8THS/MA-CORRECTOR.BS appear to work with STOCKS49. I don't know how this program works, but here's what its menus look like. If you are into stock market analysis, it may provide some useful information.

STOCK MARKET FUNCTION MENU

1. Initiate data record and calculate indicators.
2. Update data record and calculate indicators.
3. Print data and indicators.
4. Graph data and indicators.
5. Terminate Processing.

GRAPH MENU

1. Price Bar Graph
2. Price Bar Graph with Moving Average
3. Closing Price and Moving Average 'Line' Graph
4. Closing Price Point and Figure
5. OBV Point and Figure
6. VPT Point and Figure
7. Return to Main Menu

Some of these options print some snazzy graphs using the sample data file (TELED-11-13.DT).

GOLD6.BS, GTEST.DT, and GOLDSPOTS.TX appear to be for tracking Gold prices on the stock markets.

DISK.TX is a command file to test disks.

COMPRESS.BS is a utility program to compress a BASIC program by removing spaces and REM's. EXPAND.BS puts the spaces (but not the REM's) back in, and COMP-EXP-EXAMPLE.TX is an example of their work.

FRACTION-METRIC-CONV.BS converts back and forth between fractions in inches and metric decimal equivalents.

BASE.BS converts numbers among Decimal, Hexadecimal, and Binary representations.

COMPARE/TWO.BS compares two BASIC programs.

REMS/LINES/OUT.BS removes the line numbers from REM lines.

HOURS/DEMO.BS converts minutes into hours and minutes.

Al Levy
Box 71
Hicksville NY 11802
(516) 293-8368

Stuff For Sale Or Trade

Best Offer

- Poly CPU Board
- Poly Video Card
- Poly SS/SD Disk Controller
- Poly Serial i/o cards
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- Poly 48k Memory Cards
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Note: **16k cards can be converted to 64k cards**

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- Field Service
- MaiList
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- System Programmers Guide (2)
- 5.25 inch diskettes for Poly SS/SD$10.00 box
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- **Disk Conversions**- to/from 300 different disk formats including IBM, Apple, Macintosh,NorthStar, CP/M, 5.25 or 8 inch

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I also sell XT - AT Clones, Printers & supplies for all computers. +
Software for IBM

For Sale: Multiple 8813 systems - each with 3 drives, 64K, Monitor, and Keyboard - Make offer. Robert L. Schwartz, 906 Main Street, Cincinnati, OH, 45202, (513) 241-3447.

For Sale: Video Board - $95, 8" Disk Controler - $150, Printer Interface - $50, Poly CPU - $125, Priam Hard Disk with Poly Interface card and Power Supply - $400, Poly Keyboard/Screen enclosure - $175. Charles Trayser, 415-651-5931.

FOR SALE: Two 5" SSSD SA400 drives, $25 each. - Ken Lowe, 5936 W. Zina Circle, West Valley City, UT, 84120 (801) 969-7736.

Charles A. Thompson
PolyCom Associates
2909 Rosedale Avenue,
Dallas, Texas 75205-1532
Phone: (214)-368-8223

PolyCom General Ledger $125

Version 4 is the original form, where you keep each separate set of books on separate diskettes. Version 5 is menu driven and allows you to keep a number of different sets of books on-line. (Version 5 requires a hard disk, preferably, or at least DSDD floppies). Either version is $125.00, including the operations manual.
FOR SALE Poly 8810 box with power supply and mother board. $50 plus shipping.

Non-Poly equipment for sale: 2 Digital LA-180 printers w/parallel I'face, $70 each. 3 Durango computers model F85 for parts - make offer. ADDS Viewpoint model 60 dump terminal, $60. SDSystems model 700 computer w/512K, 2SSSD 8", 8 serial ports, MPI 9448 Phoenix 96MB disk, and Oasis multiuser OS, make offer. Corvus 20MB and H_MUX, hardly used, make offer. 3 TRS-80 model II's, make offer. TI-810 with bad print head, $125. 2 Soroc IQ-120 terminals for parts, $20. 2 Shugart SA800-2, Memorex model 651 8", $30 each. Pertec 9 track tape drive model T8640-9, 800/1600 bpi, with Wespercorp model TC-113 controller for DEC Unibus, manuals for both, like new, $300. Doug Reaser (205) 277-3167.

One of a Kind

I have acquired a unique item. Would you believe a wooden keyboard? This keyboard... well, ya gotta see it to believe it. It's beautiful. A nice hardwood finish that matches the Poly.

The keyboard is not a Poly keyboard, but it works with the Poly PROVIDED, the jumper on the Poly VTI card is switched from the raw 8 volt to the regulated 5 volt supply. It has extra function keys that the Poly doesn't use and a separate numeric pad, but lacks the cursor control keys on Poly keyboards II and III. It would be easy to add a memory resident keyboard filter program which converted the function key inputs to the Poly

Keyboard III function key and cursor control key inputs.

This is the perfect keyboard for that Polished Display Poly in your Den, which some of our more nostalgic letter writers have spoken of. I am auctioning this keyboard off to the highest bidder subject to a minimum bid requirement of $35.00. Send in your bids postmarked no later than December 31, 1987.

Readers Requests

Readers have asked for articles about the following: Assembly language article governing the use of WH0, WH1, Ckdr, Msg, etc. What happens when a BASIC program is saved with SAVEF, or SAVEP. How to UNSAVEP. How would CP/M be of use. An explanation of the Front Panel. How does CP/M work. Where to get Drive Service, Keyboard Service, etc. Hardware update recommendations, Sorce lists, Communication software articles, File transfer to other computers. More on PClones. More articles on Hardware (Boards, etc.) More articles on languages. An explanation of relocatable files.

As time and space permits, I will try to answer all these questions. However, our readers are encouraged to submit their own articles on these and any subjects. Articles should be submitted on Poly 5" SSSD disk. PC disk format is also acceptable.

Bit Bucket

How many kinds of bits can you think of? I thought of little, tid, part, and 'o'honey. Send in your thoughts.

Remember, our current contest asks: what kind of soup does a computer eat?

In This Issue

Coming Soon

A Parallel 8251 UART by John Warkentin, Modems and Communications software, More BASIC for Beginners, Serial Device Driver Explained, How to UNSAVEP protected Programs, More System Programmers Notes, Making your PC work like a Poly, More Help, BugNotes, Public Domain Software, etc.

Questions

Can you find and answer the questions asked in this issue? Send your answers and requests in.

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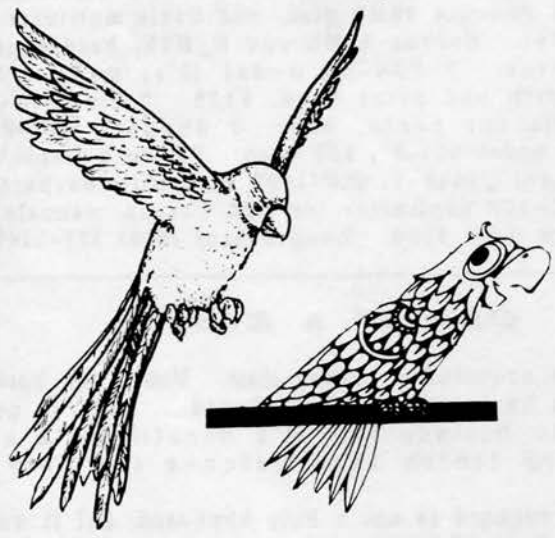
Address Correction Requested



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PolyLetter

Editorial

Last issue I lamented the increasing cost of publishing PolyLetter and reported that the price of PolyLetter is being increased to $18 per year, which is far less than the cost of living increase over the previous price period. As an additional cost saving measure, there will be no more free rides. For those of you who have enjoyed free subscriptions as the perogative of past editors, this is your last issue. You will find a renewal card enclosed.

Poly's Best Kept Secret

During the last couple of months a chain of events has lead to the uncovery of one of Poly's best kept secrets. Gnomus. I spoke with Sirous at PolyMorphic Systems on November 23, and he has agreed to put Gnomus in the public domain. This includes the source code as well as the machine language routine. Gnomus is on PGL-V-25.

Now, then, what's all the hullabaloo about? First, some background. Gnomus was written by Bob Martin in 1977, aparently, exclusively for Poly's in-house use. It is a memory-resident, hot-key program for creating storing, and retrieving macro routines. It has the capability of defining and executing macros, as well as saving them to a file, or reading a file of such macros.

"Ho hum;" you say, "we've had that in the editor since way back?" True, BUT, how would you like to be able to do some of those ESCAPE library routines from Exec, or in BASIC? When I am developing a program, I often execute the same sequence of commands many times. It sure would be nice to be able to do that with one (well, two really) key stroke. For example, in revising my PramKey program I went thru the following sequence several times.

```
DE PK.RL
Asmb <3>pk.AS PK.RL
N
N
N
TEST.CD
```

With Gnomus, I only needed to define the sequence just like from within the editor. ESC,=,G followed by the exact sequence above, followed by ESC, ESC, RETURN. Now, the entire sequence could be executed with the two key sequence: ESC, G.

Hot-key, memory-resident programs became popular with the IBM-PC and its clones. I never heard of such a program for CP/M, has anyone else? Poly had the capability in 1977! How come it was never released? Could it have made the difference in market share? Of course, Poly couldn't have called it Gnomus and still marketed it. They'd have to have called it the Poly Commander, or something like that. But no, they had to keep it a secret all to themselves.

I have completely revamped mine to be relocatable and to use minimum disk space, as well as making several other changes to suite myself. I use the BACK-SPACE key (since no-one else uses that key) to prevent conflict with the Editor's built in Gnome (as Poly referred to it), and I have added my memory-management conventions for relocatable files. If anyone is interested in my enhancements rather than in the public domain Poly original, give me a call at 413-458-3597.

More on edit

Since I 'bit the bullet' and wrote edit, I don't know how I got along without it! I type a file of remarks with commands imbedded, call up edit and move up to the desired command and hit return. Zowie! I sure get a lot of use out of the CTRL, DELETE, ESC, and arrow keys.

PramKey

How many times have you put a favorite program in a command file and then realized that you had to put the answers to the program's questions in the command file too? How often have you wished to be able to give the answers the program wants and then resume the command file?

Well, it's easy enough to do from a BASIC program by using the following codes.

```
Z=PEEK(11656) \REM Save command file flag
POKE 11656,0 \REM turn off command file
      \       \
  insert parameter input routine here.
      \       \
POKE 11656,Z \REM restore command file flag.
```

From an assembly language program the following code works.

```
    LDA CMDF    ;Get command file flag
    PUSH PSW    ;Stash it on the stack
    XRA A
    STA CMDF    ;Turn command file mode off
     \       \
insert parameter routine here
     \       \
```

```
POP PSW     ;Get flag from stack
STA CMDF    ;Put it back
;(It might have been zero.)
```

The latest version of my Clock and date programs both work this way. I wanted to have these inputs when my system booted up, but didn't want to terminate command file mode.

But, what about programs which are already written? How can we make these programs work in the same way?

I find it hard to do anything in the exact same way twice, and remembering all the same things to do at boot up time would be too much for me. So, I made the computer do it for me by having a very long INITIAL file.

Well, during the latest work on edit.GO (see PL 8705), I wanted to edit a line during the command file. Unfortunately, edit puts its result in the command buffer, and Poly never sees that stuff until the command file is done executing. You read about Gnomus? Well, I wanted to define ESC, d as a macro to produce the current date for Gnomus, but I didn't want to have to enter the date twice. So, I figured that I could go into my INITIAL command file and put edit's invoking character right after TYPEing the date on the screen. Then, I would invoke Gnomus's define a macro facility and let edit feed Gnomus the date. Didn't work. I had to put the command last in the command file so that the keyboard buffer was read after the command file was finished.

Not being one to let this stop me, I figured that what I needed was something which would turn command file mode off long enough to get the info from the keyboard buffer. Those of you who have played with or actually used CP/M remember the SUBMIT utility which acts something like Poly's command file mode, but gets the parameters from the command line, or from the keyboard buffer. Well, I decided that I needed a program which would watch the stream of input characters and turn command file mode off long enough to get the info from the keyboard buffer and back on again after getting a parameter. I took a good look at the special characters and decided that the percent character, "%", which happens to be used in the IBM-PC (as well as in CP/M?), is the appropriate character to use. Since a parameter is gotten from the keyboard, I decided to call the program PramKey.

The program turns out to be quite simple. It just watches for its flag (the percent character). When it sees that character, it looks at the next character to see if it is also a percent character. If it is, it gives back one percent character, but if it is not, it throws the character away and starts getting characters from the keyboard buffer until a RETURN is processed. Then it turns command file mode back on. It also checks to see if command file mode is off, and disconnects itself if so. I mean, it's sole purpose is to provide keyboard parameters as input during command file mode, so when command file mode is done it's not needed anymore. (We don't want to waste valuable memory with an inactive resident program.) I put PramKey in the command file just before the first program which requires input. (It has to go in any command file only once.)

Now, back to my INITIAL file. Remember, I wanted to used edit to feed the date to Gnomus in a definition. So I insert the sequence of commands which does the following. I TYPE the date, invoke edit, add the commands to invoke Gnomus's definition facility and the termination sequence (ESC), and then the next character, which is a RETURN, completes edit. The very next characters in my command file are "% ", which allows the character sequence just put into the command buffer to be input and executed. So, it's TYPE Date followed by a CTRL-DELETE character and a space, followed by an ESCAPE and the up arrow character (to get to the beginning of the line) [See Bit Bucket, 8603 MAY/JUN 1986 for the details of how to get CTRL characters into Edit.] Now, I insert ^[since edit.GO knows to convert a character preceded by a carrot to a control character and CTRL-[is an ESCAPE. This is followed by the equal character, "=", and the character "d", since I am defining the ESC, d sequence for Gnomus to be the date. Next, I insert an ESCAPE and the down arrow character to send the cursor to the end of the line. This is followed by "^[^[". Ya, dat's right, two ESCAPEs. Gnomus thinks the first one is for it, and we want an actual ESCAPE character as input. (Gnomus converts two ESCAPE characters into one). Ok, the next character is a RETURN. This will terminate the editing process, and cause the sequence: ESCAPE, =, d, ‹the date on the screen›, ESCAPE, ESCAPE, and RETURN to be put into the keyboard buffer. Ok, now that the stuff is in the keyboard buffer it will be taken when the command file mode is turned off. That's where PramKey comes in. It has been watching for "%". Well it's the next character in the file, so the sequence in the command buffer gets input and executed. First, the ESCAPE turns Gnomus on. Second the "=" sets Gnomus up for a new definition. Third, "d" tells Gnomus what's being defined. Forth, the date is fed to Gnomus as the definition. Fith the first ESCAPE turns Gnomus on again. Sixth, the second ESCAPE tells Gnomus that we want an actual ESCAPE character (Gnomus ate one ESCAPE.) which goes to mark the end of the definition. Seventh, and finally, the RETURN tells Gnomus that the definition is finished. It also tells PramKey to resume command file mode, so the next characters come from the command file again.

Well, there you have it. edit was used to feed the command buffer with a definition sequence for Gnomus, and PramKey was used to feed the definition sequence from the command buffer to Gnomus, all because I was too lazy to type the date twice. And, whenever I need to type the date I simply type ESC, d and Gnomus feeds the date back for me.

PramKey is the spin-off which can be used to input parameters from the keyboard while command file mode is effective. To obtain a copy of PramKey send $15 to Ralph Kenyon. edit is also $15, but $25 gets you both. Next issue I'll tell you about my new Submit.RL program for starting a command file with answers as input parameters on the command line.

Letters

Dear Ralph November 23, 1987

I noted in a previous issue, 8704, that my atrocious puns have won me a PGL disk. I would like PGL-V-17. Never able to resist a challenge, I submit my answer to your current question: "Alphabit soup." No additional puns come to mind at the moment -- maybe I'm cured! -- Ron Moffatt, Rochester, NY

[Right again, Ron; see the Bit Bucket. -- Ed.]

Dear Ralph: November 18, 1987

Jimmy Carter told us he had "lusted in his heart," but that was okay because he hadn't done anything wrong. Richard Nixon told us he was not a crook, but the judgment of history was otherwise. Clearly there are different interpretations of right and wrong, and since you are a person who has studied philosophy and knowledge, I would expect you to agree that the grey areas are often larger than the black and white endpoints.

In our small community of Poly users, we have all learned a great deal from each other. Our tricks, procedures, methods, and shared ideas have formed the basis for eight years of PolyLetter, and have enabled us to continue using our systems even to this day. But where does one draw the line between sharing an idea, and stealing intellectual property? The issue of Frank Stearns' SPELL program has provided some food for thought. I would like to add my views to the forum by citing some more examples.

In the very early days of PolyLetter (April 1980), you offered a "disassembler" program written in BASIC. It was extremely popular, and was widely used by Poly owners with an interest in machine language programming, including myself. I learned much about programming, and about the internals of the Poly, from using your DisAsmb.BS program. But it was a slow program, running in BASIC with lots of disk file accesses, and I wanted something faster that would allow me to disassemble large programs like the ROMs. I studied your program to try and find a way to speed it up, but failed. Instead I decided to write my own, in assembly language. This program was called DIS80, and offered in the July 1983 Disk-Of-The-Month. You quickly generated your own version of a fast disassembler written in assembly, which I declined to advertise in PL.

Soon after I learned (from you) about the "relocatable" features of the Poly assembler, I wrote and sold a program which would load and relocate a program in high RAM. The program was called MAKEREL (for Make Relocatable), and was advertised in the November 1982 PolyLetter. In the January 1983 issue, you offered a program of your own called MakeRel, which performed the same function.

Ralph, you and I have disagreed for years about intellectual property rights, and I see that we continue to disagree. When you disassembled the Poly ROMs and created your own version (the so-called ASroms), you claimed to have fixed several bugs and added features to the ROMs. You asked me to advertise these in PolyLetter. I declined to do so, because I felt that the code in the ROMs was the property of PolyMorphic, not of Abstract Systems. No matter how many minor changes you made to their code, you did not rewrite the majority of it, and so you would be profiting from their development work if you sold it. IBM sued several "clone" makers over this issue, citing that the clones had substantially copied the ROMs in the IBM-PC. IBM won. Most clones now use a set of ROMs (a BIOS) written by an independent, bonded organization which developed the code from an external description of the entry/exit points, without any knowledge of the internals of the IBM ROMs, and without ever having seen the listing. The "Phoenix BIOS" is one example of this.

You also disassembled and enhanced Exec.OV and other parts of the operating system, offering them for sale as Exec/{A|S}. Your sales literature contains a disclaimer that reads something like "Abstract Systems produces upgrades for the 8813 because PolyMorphic Systems chooses not to do so, and we feel it's needed." That statement may be true, and may ease your conscience, but doesn't change my feelings about who owns the rights to these items.

Now, in the latest PolyLetter (September 1987), I find that you are selling a program called edit.GO. This program looks surprisingly like the "BASIC Editor" which I wrote and sold in the July 1982 PolyLetter. Did you use my code? I don't really care, since I know you have the ability to write such a program without ever having seen mine. But as a reader of PolyLetter, you were certainly aware of my program, and might have at least acknowledged it. Incidentally, I wrote the BASIC Editor after seeing the "last-line-recall" feature built into a Chromatics color graphics computer. If memory serves, you also incorporated this feature into the ASroms.

So now we have returned to the present, and to the issue of the SPELL programs. I've used Frank's for years, and without seeing yours I wouldn't even guess whether yours has the "look and feel" of Frank's, or contains any of his code or algorithms. I do know that Frank's worked well, and quickly. I used it for many years to help proofread PolyLetter. But no spell-checker can find everything, especially misspelled words which happen to form other valid words: "I new he was coming."

I would like to ask where you got your dictionary file from. Is it derived from Frank's files? Or perhaps from another spell-checker's file, like an IBM-PC speller?

We have all learned and borrowed from each other over the years. We improve on each other's ideas. And we each have a set of principles which we follow, in determining our actions. Ralph, your readers must decide if they think a product is a "rip-off" of another product, and they can demonstrate their decision by boycotting any product which does not conform to their standards of ethics.

I encourage them to do so, and to keep this dialog going. -- Bob Bybee, Stone Mountain, GA

[Bob, some of your recollections do not agree with the facts.

1. My DisAsmb.GO was released in June 83, and was sold by direct mail promotion PRIOR to DIS80's July 83 appearance. By the time DIS80 was announced, DisAsmb.GO had already sold several copies.

2. I furnished you with the relocatable file bit-map code during mid 1981, well PRIOR to DIS80, and not subsequent to it as you just claimed.

3. I sent you a copy of MakeRel and LoadRel on November 18, 1982. My copy of the NOV/DEC 82 PolyLetter announcing MAKEREL was postmarked November 20. 1982. LoadRel and MakeRel were also direct mail promoted prior to this date.

In all three cases you have reversed the order of events.

I happen to know that a review comparing DIS80 with DisAsmb was submitted to Frank Stearns and never published. I can understand your loyalty to Frank and your use of SPELL.GO, but that does not justify misrepresenting the facts. You should have, at the very least, referred to the records and gotten your facts straight.

However, let us be a little more thorough in examining the historical record.

Bob, we had a couple of phone conversations about the relocatable loader during the spring of 1981, and knew we were both working independently on the same item, both of which came from a analyzing the disassembly of the WPS.GO loader of Poly's. I cracked the bitmap code first and explained it to you. This was while I was still in Virginia Beach, which was up until June 1981.

Subsequently we both wrote loader programs using the information I gave you and our own independent disassembly of WPS.GO. On December 21, 1981 you sent me a copy of your relocatable loader program which used the info I gave to you. The copy you furnished me was called LOAD. Subsequent to that, I began adapting the Poly to use 96 tpi drives and wrote my program LoadRel and MakeRel to support the new disk driver routines. Both were written without benefit of your LOAD program, but used the knowledge gained from understanding how WPS.GO worked.

On September 19, 1982 you sent me copies of your disassembly source codes for the ROMS, along with the comment:

"I'm sending you these files for a couple of reasons. First, to thank you for the assistance you've given me on numerous occasions. And second, because if I didn't send them to you, I know you could get them anyway from somewhere else."

I thought your comment a bit strange, but I sent you a copy of my own disassembly source code in exchange.

On November 18, 1982, I sent you a copy of MakeRel and LoadRel. My copy of the NOV/DEC 82 PolyLetter, in which your MAKEREL.GO was released, was postmarked November 20. Obviously they crossed in the mail. LoadRel.GO and MakeRel.GO were also promoted by direct mail in advance of this submission to you, and I had told you on the phone about both of them Prior to this. At the time I felt mildly annoyed that you had released and promoted your own in PolyLetter, but chalked it up to 'competition'.

This irritation was my motivation when I later beat you to the punch with DisAsmb.GO by a matter of a month.

I had been planning to convert DisAsmb.BS into DisAsmb.GO for quite some time, but finally got around to completing the job in May, 83. After having been 'stung' by you're having advertised your MAKEREL program even though my MakeRel was first, I decided to move more quickly on DisAsmb.GO. I sent out a direct mail promotion in early June, and had sold several copies by the time the Jul/Aug PolyLetter announcing DIS80 hit the streets.

While we're on the subject of relocatable loaders, I have come across a 'third party' version which has the original Poly WPS loader messages still in it. Now that is neither reverse engineering nor independent development. It is clearly piracy. What you and I did with WPS.GO was akin to reverse engineering. We learned enough about how it worked to write our own. Now, I have never seen your MAKEREL program in any form, but I did see your LOAD program after I gave you the code for the relocation bitmap.

In regard to Ethics, you appear to be guilty of 50-50 (not 20-20) hindsight. You must remember that those times were before ROMABLE code was established as subject to copywrite. I quote from my letter to you at the time:

"As for selling custom PROMS, I won't be the first one to do so. I know of three others, and none caused any heartburn with Poly. It's not as if I'm taking away their market, I'm not. I have also made the source of my custom proms available to Poly for inclusion (or not) in their next version (who knows when...). Ken Gudis was most pleasant and responsive the last time I talked to him. (Nov 82).

As far as copywrite laws, ROMable is (maybe) protected from unauthorized duplication and sale, which I am not doing. I think my Policy statement "Cleared the air" on the question of possible "Pirating".

As I understood you from our past conversations, your point of view seemed to me to be expressible as: "what is not (expressly) permitted is prohibited".

Since you mentioned my study of Ethics, consider the following. Article IX of the Bill of Rights states: "The enumeration in the Constitution of certain rights shall not be construed to deny or disparage others retained by the people." Further,

article X states: "The powers not delegated to the United States by the Constitution, nor prohibited by it to the States, are reserved to the States respectively, or to the people." These amendments, along with our legal history, is understood by ethical scholars to mean that "what is not prohibited is permitted". As a military Intelligence Analyst, I learned that the fundamental point of view in the Soviet Union, despite its wonderful constitution, was primarily that "what is not permitted is prohibited" (at least prior to Glasnost). It should be noted that it is not the political ideology that produces such an attitude; conservativism and a tendency to authoritarianism produces it. My military experience gives testimony to the value of discipline. But, even such a good thing has its limits. Rules change.

The "LAW" is in a continuous process of evolving through the mechanisms of legislation and cases. The concepts of law change as well as the application of those concepts. In a rapidly changing technological environment, the "LAW" also undergoes rapid change. What was not prohibited a few short years ago may become so. That is to say, the standards for judging whether some action is permitted can change quickly from a time in which the actions were not prohibited to a time in which they are.

Article I, Section 9, paragraph 3 of the Constitution states: "No bill or attainder or ex post facto law shall be passed." This is the so-called "Grand-father clause" which means that a law cannot be applied to events prior to its passage. The corresponding ethical principle is that we do not judge acts of yesterday by the standards in effect today; we must go back to the standards in force at the time.

The major cases and legislation affecting software all took place in the intervening years. [In that time it has been established that ROM code is subject to copywrite protection.] If we had had the clear(er) guidelines then that are available now, perhaps neither one of us would have taken the course we did. On the other hand, we both have a strong claim that we did not violated today's standards even back then.

Be that as it may, there is still room for our interpretations to disagree. I admit to being a liberal.

Incidentally, I was called by lawyers in a piracy suite to discuss a case in which the competitors ROMS were byte-for-byte identical. The defense produced commented source code and claimed independent parallel development, which the prosecution needed to discredit. I told the prosecution what elements would be necessary to prove such a source was produced from disassembly, and what elements would suggest that it was but not prove it, and what could not prove it. I never got the final result of the case, but this seems a much closer case. Try calling that one! (It was probably settled out of court, which would leave the state of the "LAW" un-clear).

For the record, here is the full text of my so-called 'disclaimer' regarding custom modifications.

ABSTRACT SYSTEMS POLICY

Abstract Systems, etc. attempts to fill a felt need for low level software support for PolyMorphic Systems System 8813 and System 8810 microcomputers. Our goal is to provide software and consulting at low prices.

As with any product and company, PolyMorphic Systems decides to implement some and not to implement other new desirable features for System 88. Also, with each new release, System 88 is "frozen" for an indeterminate period of time. The availability of desirable new features is conditional on the implementation policy and time. Abstract Systems will attempt to implement new features on a CUSTOM basis. Those ALREADY IMPLEMENTED will be made available for a NOMINAL fee. To preclude "giving away" software available from PolyMorphic Systems (Note 1), system enhancements which must be "installed" will not be furnished unless a system disk is provided on which to install it.

Note 1. Abstract Systems does not furnish software which is available from PolyMorphic Systems. Requests or inquiries for PolyMorphic Systems Software and Documentation are referred to PolyMorphic Systems as the appropriate source. Products which require a system disk will be furnished with a previous release of System 88. (The current version of System 88 is available for sale from PolyMorphic Systems, 7334-H Hollister Avenue, Santa Barbara, CA 93117, Phone: (805) 685-6238.) [Abstract Systems is not affiliated with PolyMorphic Systems.]"

Exec/{A|S} is the complete collection of all custom and general operating system enhancements which were previously available as individually installable items. So many individual enhancements and bug corrections were made that it made sense to put them all together in one package. It comes as a 'bare bones' disk onto which the rest of Poly's software must be copied to make a complete system. To make a 'whole' system, Edit.GO, Asmb.GO, BASIC.GO and their associated overlays must all be added. All the enhancments had been offered to Poly at one time or another, and Poly has been furnished with a copy of the current version. All the bugs I have reported to Poly have been corrected, and all the custom enhancements I have made for myself as well as at others suggestions have been incorporated and have resulted in significant differences to every system overlay except Pack.

Comparing B-EDIT.GO with edit.GO is like comparing an apple to the cornucopia. edit.GO does what B-EDIT.GO does and much more. However, my reason for developing it was that I was dissatisfied with using only the GetBack feature of the ASROM proms. (Which Lennie araki told me he implemented at Poly right after I submitted the source code to Poly.) I had originally implemented it as a CTRL-DELETE feature, but Lennie changed it to CTRL-U

to agree with Edit.GO. To maintain consistency, this forced me to change mine to CTRL-U also. A B-EDIT user discribed its capabilities and limitations to me over the telephone. It only does one line, and doesn't understand TABS. (Try editing a BASIC program line which has a TAB character in it; he said it stopped before the tab.) Anyway, I wanted to be able to edit other lines than the last one typed. The fact of the matter is that I wrote my own version, BEDIT, sometime after reading about yours, but had used it only occasionally. I was doing a lot of custom work in BASIC, and finally had the need for it. In writing edit.GO, I started with that code, so it is true to say that your product served as the stimulus for mine. My first version used UCHR and UVEC, and was modeled on a screen dump to printer program. However, I was leery of all this editing being done at the interrupt level, and I wanted to invoke edit from a command file, where UCHR has no effect. So, I changed it to a gnome which eye's WH0. edit.GO can be invoked in command files, and can input and convert CTRL characters. With this capability, I can type in two or three Exec commands on one line separated by ^M's and execute them all in one stroke. Furthermore, edit knows how to find and copy a marked block from anywhere on the screen to the cursor location.

With all this information, I am sure you could upgrade B-EDIT to include the additional features I have mentioned. After all, we're both competent programmers with considerable experience in the Poly environment. Competetion is, after all, competition. In my opinion, it was monopolizing and secrecy which killed Poly's chance for a good market share. Had we healthy competition, low prices, and lots of sharing... but that's off to never-never land again with the rest of the nostalgia.

Incidentally, ISS advertized a spelling checker with a mere 3,000 words (SISS.RL) for $350 well before Frank's SPELL, advertised as having 20,000 words, appeared. (A!S) Spell has about 12,000 words. -- Ralph.]

A PARALLEL 8251 UART

by John J. Warkentin

The Editor of POLYLETTER has voiced a desire for a 'black board' that could be plugged into an integrated circuit socket that normally is occupied by an 8251 Universal Asynchronous Receiver Transmitter (UART), and provide support for a parallel printer port.

Although such a project is only slightly less complicated than a full-blown parallel printer port, there are certain instances where such a hardware device would be most useful. It certainly minimizes the software modifications required to support a change in printers.

Before I begin the discussion of this project let me make one thing perfectly clear: I have NOT built this device; to the best of my knowledge it SHOULD work, but I cannot guarantee that it WILL work. If anyone does build it and discover that it does work, please let me know via a letter to POLYLETTER.

THEORY

Let's begin with a brief discussion of the 8251 UART. The 8251 is basically a serial-to-parallel converter, and vice verse. We do not need to concern ourselves with the serial side of this I.C. to understand what is going on with this project. The parallel side of the 8251, however, is important to understand, as this is what we have to emulate.

The parallel side of the UART is connected to the computer's internal data, address, and control bus. (In the Poly these are contained on the CPU card; buffers drive the S-100 bus.) The 8251 has 8 bi-directional data lines, 4 interrupt lines, 4 control lines, and of course a +5 volt line and a ground line. (There are additional lines, particularly for voltages, that we need not concern ourselves with here.)

Internally, the 8251 has a data-output register, a data-input register, a control register, a status register, and an interrupt facility. Our parallel printer port must emulate these registers and functions if we are to fool the software into thinking it is still working with a serial port.

Let's take a look at the control logic of our 'black board' at this point. Four control lines are used to control the 8251 (or our 'black board'.) A brief aside: Signal names preceded by a '-' are low-true, and those preceded with a '+' are high-true. The 4 signals are -WR, -RD, +C/-D, and -CS. -WR goes true when the computer wishes to write, or output to the 8251. -RD goes true when the computer wishes to read, or input from the 8251. +C/-D goes high when the computer wishes to output to the command port, and low when the computer wishes to input from the status port. +C/-D is driven by the address bit 0 line. The remaining address lines are decoded and used to select the 8251 via the -CS (-Chip Select) line. A 74LS138 (U1) is used to decode the 4 control lines and generate strobes used to control the remainder of our project.

We do not need to worry about data INPUT, but we do need to support data output. the -DATA OUT strobe is used to load data into the 74LS374 (U2), which has 8 internal latches, one for each data bit. At the same time the strobe is passed to the printer to let it know that there is data being presented to it.

The status byte from the 8251 has to be emulated quite exactly. The +Printer Busy signal can be inverted and presented as status bit 0, Transmit Buffer Empty. Whenever this bit is HIGH the software knows that the 8251 is ready to output another byte. We can use the inverted +Printer Error line to emulate Data Set Ready on status bit 7. This bit should be HIGH to permit output. Bit 0 should be tied to bit 2, and bits 1, 3, 4, 5, and 6 should be tied low. A 74LS244 (U3) is used to gate the status byte to computer when the -STATUS strobe goes low.

Now let's provide a means for executing a

software initiated reset of the printer. We do this with another 74LS138 (U4) which is connected to the data bus and enabled by the -CONTROL strobe. Not all the bits are decoded, but enough to recognize when 0CEH is output to the 8251 control port.

The final portion of the 'black board' we need to implement is some sort of an interrupt circuit. The signal -ACK is used to set a flip-flop (U5A-U5B) whose output is called TxRdy. When the status port is read the flip-flop is reset.

That takes care of emulating the 8251. Now for a discussion of the printer port connections. I chose to build the printer interface to follow the IBM parallel printer convention. The pinouts in the schematic are for such a convention. Use a DB25S connector. Certain other signals need to be satisfied; this is done with the pull-up resistor.

SOFTWARE

The Poly uses interrupts, which is why the HALT light is on much of the time even while outputting data to the printer. Output data is placed in a buffer. The interrupt handler removes data from the buffer and outputs it to the printer port each time there is an interrupt due to the transmitter buffer in the 8251 goes empty. This means that the software does not merely execute a tight loop checking the status of the printer. It could, but the Poly's designers were more far-sighted than that. Their use of interrupts permits the Poly's internal Real-Time-Clock to interrupt the printer software (and other parts of the system software). This makes the software a little more complicated, but provides a higher level of sophistication. This also explains why we needed to implement an interrupt facility in our 'black board.'

CONSTRUCTION

Obviously this circuit will not fit into the 8251 socket, so it needs to be constructed on a small piece of perf-board. If a DB25S with right-angle solder pins is used, the perf-board can be mounted to the connecter, like the Poly Printer Adapter Card. Use a 28-pin D.I.P. header to plug into the 8251 socket.

Connect the appropriate pins to the conductors in a flat cable of sufficient length to reach the 'black board'. Although not shown, 0.1 uf capacitors would be connected between ground and +5 volts at each I.C. I generally use sockets designed to be soldered in place, and connect the desired pins with 30-gauge wire-wrap wire. Do not "daisy-chain" the power and ground connections; instead, run a separate wire from each socket to the power distribution point.

HYPERBOLE

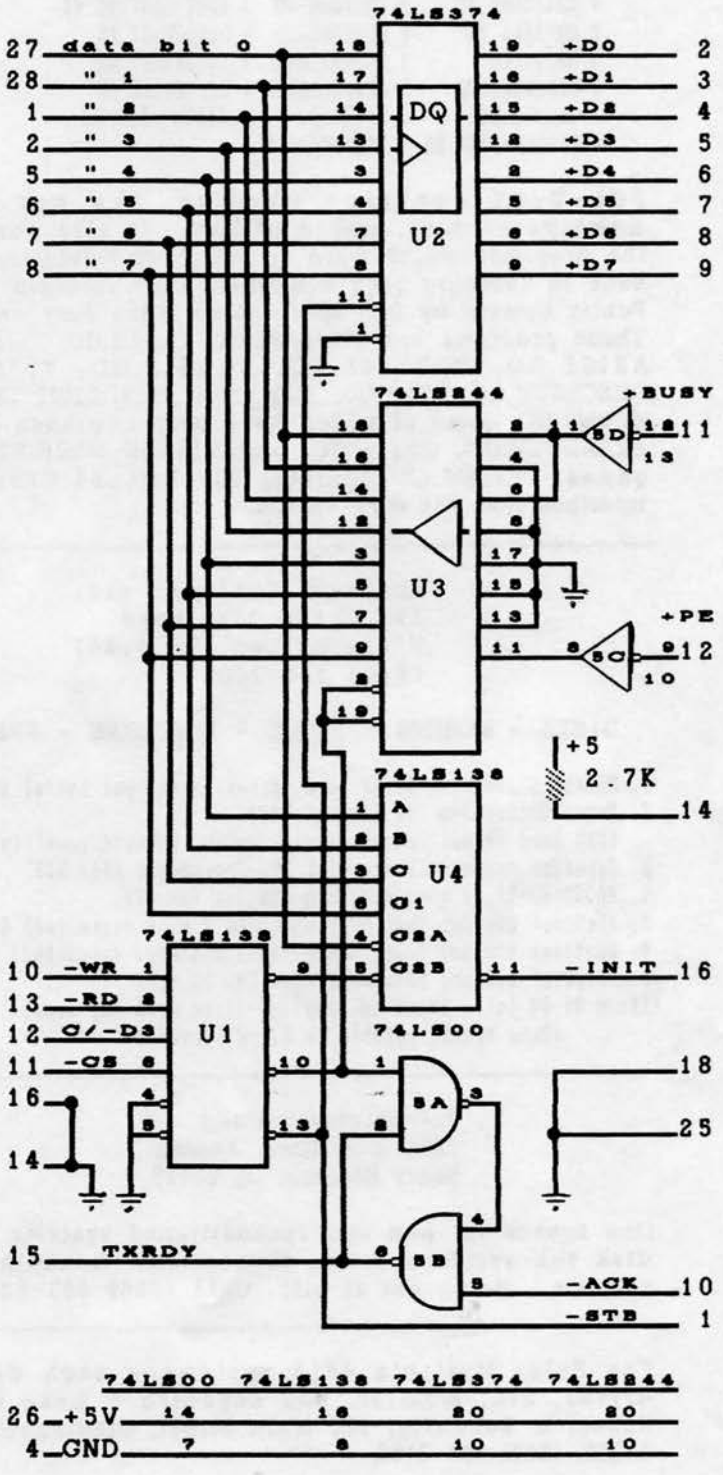
With a relatively minor modification the parallel printer and serial printer functions can be made switch-selectable. Place a socket for the 8251 on the 'black board' board and extend all 28 lines from the socket on the CPU card. Place a double-throw-single-pole switch in line 11, so that the signal is routed to either the 8251 on the 'black board' or else to our circuit. Tie each of the 2 lines to +5 volts through a 2.7K resistor (one resistor for the 8251, one for the 'black board').

CONCLUSION

It IS possible to build a circuit that emulates the computer interface of the 8251. It is not overly complicated; all that is needed is the motivation.

Schematic

8251 Socket Printer Cable



Public Domain

Disk PGL-V-25 has 48 files on it, 9 free entries.
348 sectors in use, 0 sectors deleted, 2 sectors free.

Size	Name.	Size	Name.	Size	Name.
7	BREAKOUT.GO	10	Chase.GO	2	NULIFE.DC
3	NULIFE.GO	2	TWEAK.DC	1	TWEAK.GO
2	SYSMOV.DC	1	SYSMOV.GO	3	SEARCH.DC
2	SEARCH.GO	2	XDUMP.GO	2	compare.GO
7	FORMAT.DC	16	FORMAT.GO	1	compare.DC
8	TBASIC.GO	5	Tbfn.OV	2	XDUMP.DC
10	Gnomus.GO	57	Gnomus.AS	10	Gnomus.DC
1	BIT.GO	1	SCREEN.GO	2	ARISE.GO
2	DLIST.GO	15	FILMS.GO	2	CLEAN.GO
8	CHECKSUM.GO	8	SZAP.GO	4	DUMP.GO
1	USING-DUMP.TX	3	WORMS.GO	9	CONVERTER.BS
7	CALENDAR.BS	5	COMPARE.GO	3	SORT-ROUTINE.BS
8	COPYALL.BS	5	COMPARE.GO	4	DIRECTORY.BS
1	Enter.GO	1	Screen.GO	1	ScreenOff.GO
1	ClockOff.GO	2	Clock.GO	1	KillEnter.GO
5	Screen.DC	3	Clock.DC	2	ASROM-DEMO.GO
88	MIRROR-MAZE.BS	3	READ-THIS.TX		

PGL-V-25 contains Gnomus, the hot-key, memory-resident, macro utility. It also contains the programs which were on the first PolyLetter Disk back in February 1980 and which were released to the Public Domain by Bob Martin back when Poly was hot. Those programs are COMPARE.GO, CLEAN.GO, DLIST.GO, ARISE.GO, COPYALL.GO, TBASIC.GO, Tbfn.OV, CHECKSUM.GO, SZAP.GO, DUMP.GO, USINGDUMP.TX, and WORMS.GO, some of which have been upgraded since. BREAKOUT.GO, Chase.GO, and MIRROR-MAZE.BS are games. FILMS.GO operates the Poly-88 CASSETTE interface from the disk system.

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Readers Requests

HELP! I have double sided REMEX 8" drives for my MS, but I don't know how to strap the shunts. Anyone who knows how to configure these drives for the Poly MS please write Karl Thomas, 145 Bond

Street, Elk Grove, IL, 60007-1218

Other readers have asked for articles about the following: Assembly language article governing the use of WH0, WH1, Ckdr, Msg, etc. What happens when a BASIC program is saved with SAVEF, or SAVEP. How to UNSAVEP. How would CP/M be of use. An explanation of the Front Panel. How does CP/M work. Where to get Drive Service, Keyboard Service, etc. Hardware update recommendations, Source lists, Communication software articles, File transfer to other computers. More on PClones. More articles on Hardware (Boards, etc.) More articles on languages. An explanation of relocatable files.

As time and space permits, I will try to answer all these questions. However, our readers are encouraged to submit their own articles on these and any subjects. Articles should be submitted on Poly 5" SSSD disk. PC disk format is also acceptable.

Bit Bucket

Congratulations to Ron Moffatt for coming up with the correct answer. Question: "What kind of soup does a computer eat?" Answer: "Alphabit soup." Ron, you've been a regular winner, How about coming up with a new contest for us?

How many kinds of bits can you think of? I thought of little, tid, part, and 'o'honey. Send in your thoughts.

No Confidence

When doesn't the confidence test work right? When the printer minicard fails in the on position. When clear to send is set permanently on.

In This Issue

Coming Soon

Modems and Communications software, More BASIC for Beginners, Serial Device Driver Explained, How to UNSAVEP protected Programs, More System Programmers Notes, Making your PC work like a Poly, More Help, BugNotes, Public Domain Software, etc.

Questions

Can you find and answer the questions asked in this issue? Send your answers and requests in.

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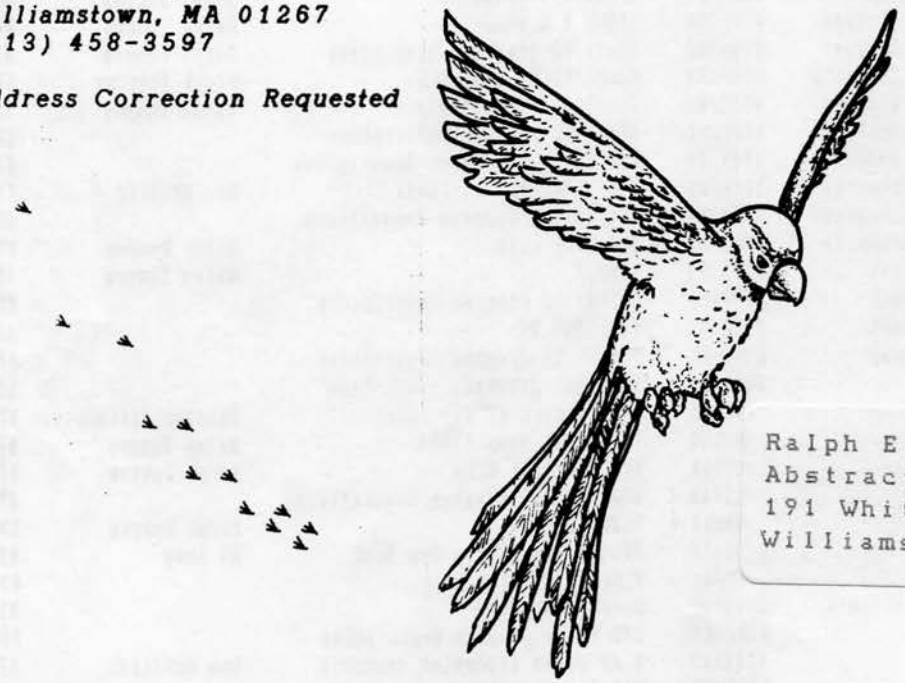

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