

PolyLetter

The Newsletter for PolyMorphic Systems Owners and Users

January/February #8501

Editorial

PL had a strange phone conversation with PolyMorphic Systems recently. It seems that Polymorphic Systems is "upset" with PL for "selling hard disks." PolyMorphic Systems also said that "several people have complained to PolyMorphic Systems about the editorial content of PL..." They also stated that one PL contributor in particular had written half of PolyLetter.

PL would like to set the record straight on these items, one by one.

Hard Disks

PL does not sell hard disk subsystems, nor any other kind of hardware. PL has, however, welcomed the advertising of any hardware vendor—including PolyMorphic systems, which has declined to advertise.

Poly Peripherals (not affiliated with PL or PolyMorphic Systems) has been the only company willing to advertise hard disks and, as far as we know, the only third party producer of fully Poly-compatible hard disks.

In the commercial third-party software arena, there are several producing people: Ralph Kenyon, Abstract Systems; Al Levy; Chuck Thompson, PolyCom Associates; Frank Stearns Associates; and if PL's missed anyone, please forgive us.

PL would like to point out the following: (1) if third parties are producing for any system, this indicates some level of health. Even IBM, who traditionally made it impossible for third party vendors to survive (until the Justice Department got into the act), changed their basic attitude with the PC. This change helped IBM lock in nearly a third of the PC market. (2) Competition is fundamental. It keeps everyone on their toes.

PolyMorphic's Complaints about PL

PL speculates that any negative comments from PL readers reported *through* PolyMorphic Systems are really manifestations of PolyMorphic Systems' unhappiness with the "press" in PL. PL has received only the highest praise from those of you that have taken time to write, and we thank each of you.

But it's equally important to hear from those of you who do take issue with any of PL's content, editorial or otherwise. We are responsive to reader input—as is stated every issue in the masthead: "this is your newsletter." If you don't like something about PL, please come to us directly.

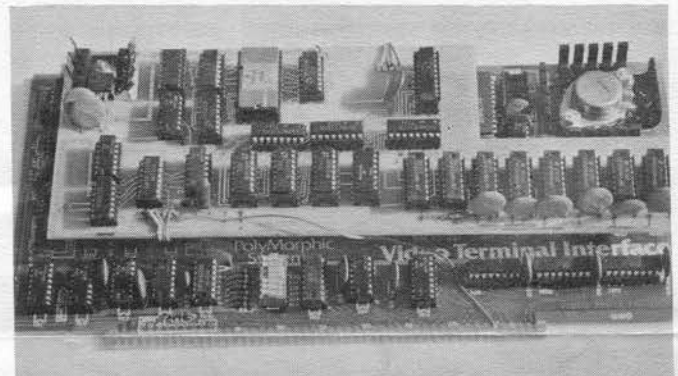
PL's Editorial Comments about Poly's New System

We have been as supportive of PolyMorphic Systems as possible, but have drawn a line at making any more

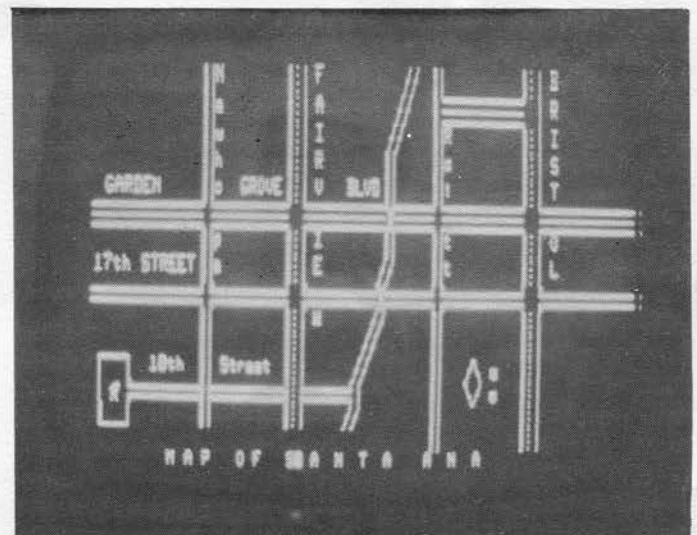
GOTO 5

Poly Graphics

Once upon a time a company called VAMP built the "PolyGrafix" hardware add-on that made the Poly VTI board capable of producing graphics. Ken Lowe, of West Valley City, Utah, wrote to PL about his graphics capability using this hardware. We excerpt portions of Ken's letter here, and reproduce a few of the photos Ken sent to us.



The PolyGrafix board mounted on the VTI. The board provides 8K of screen memory, a programmable character generator, and five different graphics modes including reverse video (black characters on a white background).



A Map Display. Points can plotted anywhere on the screen with a resolution of 240 vertical and 640 horizontal.

Ken had several obstacles to overcome when he retrofitted this card to his system, not the least of which was no software. He had to write his own. One hardware limitation was the inability to read the character RAM. This required a "software mirror" of the character RAM, updated whenever RAM was updated.

GOTO 4

Kind Words

Poly owners still praise their ancient systems. Many speak from experience. The following are excerpts from a letter to PL from Dr. Michael Aquino, San Francisco.

Every once in awhile I seem to detect a touch of "obsoletitus" among Poly people—like they've got some old clunker of a machine while all their friends are driving snazzy new PCs. I've worked with IBM PCs and a variety of Apples including the Macintosh, and wish to point out a few of the Poly's features which keep endearing my 8813 to me: I've yet to see another CRT display with text that is as large, clear, and legible as Poly's. I have yet to tap another keyboard that is as finger-friendly as the Keyboard III. Typing on most PC keyboards is like making hundreds of miniature parachute landings per minute: soft until you hit bedrock. I have yet to see a PC as trouble and maintenance free as the Poly. My 8813 was one from the first batch produced by Poly, and it has been in use ever since. I can do anything I want with WordMaster II, while WordStar and other WP programs do...

...funny things.

Mailist produces addresses that fit perfectly on mailing labels instead of running up or down. Hooking up the HD-18 to the 8813 was like switching from Clark Kent to Superman. I'm up, up and away while the IBMers are listening to their PCs sneeze and snarfle floppies into RAM. (And it seems that Poly floppies are faster than IBM floppies.) Speaking of floppies, once you're used to three, try living with two, or shudder, just one.

All of which is to say Dr. Aquino is not giving up his 8813 until it disintegrates from sheer age. "It's one hell of a machine. PolyMorphic deserves a big pat on the back for making it and developing the higher-generation software that brought it up to Warp Speed."

Supply hints from Dr. Aquino:

Inexpensive diskettes:

Arrow Computer Supply/20-B Timetel Court #10/Novato, CA 94947/415-382-0190

Film or Fabric ribbon users—get old cartridges refilled at a substantial savings over buying new cartridges:

American Ink Products Company/527 Howard Street/San Francisco, CA 94105/415-982-0161.

PL

More Kind Words

Santa Claus was indeed good to Poly this year. Ken Lowe, of West Valley City, Utah, had the following thoughts on his Poly:

"Because the Poly has many superior features when compared with even the most recent micros, it is absurd to be concerned with "compatibility." Being compatible with ill-conceived, unimaginative, and poorly implemented computers would invariably mean the sacrifice of unique Poly capabilities.

"We should instead concentrate on developing additional tools to make programming easier. The BASIC editor could be expanded to include more features of Edit—even a decent line editor with non-destructive cursor movement and insert/delete capability would help...

"An exciting modification for the 8813 would be a RAM disk. Performance could be greatly enhanced by dump-

ing a System disk to RAM and then rebooting Exec from the RAM disk. As little as 128K would be sufficient. This would vastly accelerate overlay swaps and Edit disk accesses, as well as freeing up the system drive for additional online storage... RAM is not that expensive nowadays, and even non-volatile devices have been implemented. An addressable RAM disk could really soup up our Polys!"

Ken has an interesting point. PL has used IBM PCs that use RAM disks, and the increase in through-put is astounding. PL encourages all the Poly hardware and software hackers to think about this one, and see what might be done. PL

A quickie BASIC tip, for those who are upset that they can't stop BASIC's output with something like Ctrl-S: Put this line in the program, anywhere you want to have the option of stopping (by pressing any key).

```
IF INP(0)>0 THEN Z9=INP(1)+INP(1)
```

Press any key to stop, another to resume output.

POLY ADS

FOR SALE: 8813 with 48K memory, two 5-inch SSDD drives, 88/MS with two 8-inch SSDD drive, keyboard, Sanyo VM 4209 monitor, serial card, 300 baud Clear Signal acoustic coupler, Multi Tech 300 baud modem FM 30, Integral Data IP 125 dot-matrix printer with Graphics adaptor card. Software and documentation include the System 88 Programmer's Guide, Operating Systems Version 6.4, 4.2, and 2.0, 5 and 8 inch Confidence Disks, PLAN, WORDMASTER II, and PolyLetter Disks of the Month for 1980 and 1981. *Make an offer.*

Contact Bob Harris/10310 Eby/Overland Park, KS/66212/913-648-0804.

FOR SALE: 8813 with 3 SSSD drives, 56K single card dynamic RAM, Sanyo monitor, standard keyboard, and serial interface card. Two spare 8K static memory boards included. Full documentation including the System Programmer's Guide, Confidence Manual, WordMaster, and WordMaster II. Also includes 31 used and 10 new Verbatim diskettes. \$1200.

Lear Siegler 310 heavy duty printer and manual—180 CPS, 15 inch carriage. \$600.

Contact Erich Koch/632 S. Park Rose Av/Monrovia, CA 91016/818-359-5649.

The IRS rides again! And so does Chuck Thompson's famous Tax program. Once again, Chuck will shortly be releasing his 1984 tax package. This program actually makes tax time fun. \$75 for first-time purchase by individuals, \$150 for first-time purchase by tax preparers. Halve these prices if you've purchased before and just want an 1984 update. For more information contact Chuck Thompson/PolyCom Associates/2909 Rosedale Ave/Dallas, TX 75205/214-368-8223. Source Email: STJ970.

WANTED: Editor/publisher for *PolyLetter*. Send a brief statement of interest to PolyLetter/14307 NE 16th St/Vancouver, WA 98684. (No phone calls, please.)

Communicating at 9600 Baud

9600 baud—nearly a 1000 characters per second—is the fastest serial communications speed possible in the 8813/10s. Even though RS-232 is capable of 19,200 baud, 9600 is also the “top end” for many of today’s new micros.

Working with these high data rates, which in some cases approaches the effective “internal” data handling capability of the Poly, can be “interesting.”

Advantages

This is obvious—speed. Things get in and out of the system faster. But there are some other secondary pluses for high speed. When using high-speed, less real-time is spent by the system in the act of transferring data. Therefore, primary system tasks, such as running the formatter, do not have to be idle quite as long during data transfer. Overall time spent in system overhead is reduced if less time is used to shuttle bits in and out.

Disadvantages

Stated simply, characters can be lost or garbled when things are happening so fast. There are a series of system tasks that must be done periodically, such as updating the screen. At 9600 baud, there is little time to perform such maintenance functions when running the serial port at such high speeds. And this can work both ways—if you’re sending, things may be too fast for the receiving system.

Printers

Sending information to a printer at this high rate seldom causes any problems, simply because the Poly is not concerned with incoming data. If there are problems, you have the option of providing padding strings and flow control through the printer driver dialog.

Terminal Emulation

Now we move on to modems or direct wire links between a Poly and another system. If you are simply typing back and forth, there will be no problem. If files are transferred back and forth, care must be taken not to overrun one system or the other.

Send Throttles

The communications software in each machine should have some method of throttling the rate at which it sends data. Throttling does not imply that the bit rate *per character* is slowed. Instead, the sending system pauses for some brief time between successive characters—but each character is sent at the selected baud rate. Special cases, such as a character which causes the screen to scroll (line feed or carriage return), may require additional delay.

Of course, there is a certain amount of throttling built into the sender. Time is required to get the outgoing character; echo it to the screen if required along with screen maintenance; and then to ship it out to the USART. But only a relatively few instructions are required in most of these maintenance activities, thus the “built in” throttling effect is minimal.

Receiving

On a character-to-character basis, there is little the

receiver can do if the incoming character stream is too fast. However, an excellent way to avoid problems is to “turn off” the Poly screen. This means not to echo incoming characters to the screen, thus eliminating a potential overhead interval of several thousand instructions. (See “How Incoming Characters are Lost”, below.)

If the system is downloading the incoming information to disk, then major losses of the incoming data will occur when the system does a disk write. In the one to two seconds it takes to complete say a 10 sector buffer write, one to two thousand characters can be lost. It’s critical to have some kind of flow control between the two systems. The most common is Xon/Xoff (transmit on, transmit off). When the receiver needs time, it sends an Xoff. The sender recognizes this and stops sending (assuming that the sender and receiver software know about Xon/Xoff). When ready for more, the sender sends an Xon to resume the transmission. The character values are Xon=DC1=11 hex, and Xoff=DC3=13 hex.

An alternate method is Enquiry/Acknowledge (ENQ/ACK). Periodically, say once every 32 characters, the sender ships an enquiry character. It waits for an acknowledge character back from the receiver. The receiver only acknowledges when all is well. (The character values are ENQ=5 and ACK=6.)

Much more sophisticated protocols are used by some systems. These formats use “packet” or block sends and receives, with checksumming. Typically, the data chunk is 128 or 256 characters. If there is an error, the entire block or packet is resent. These formats vary dramatically and can be quite complex. Block formats are rarely used when communicating with a large consumer database service such as The SOURCE or COMPUSERVE. Block formats are usually unnecessary when two systems are connected via direct wire.

If a block format is to be used, you’ll have to get all the specifications and obtain (or create) the software capable of communicating in the chosen block mode.

USART Configuration

The two systems must agree on how the character shall be transmitted and received—word length, parity, and number of stop bits. Failure to match these parameters can cause many garbage characters, even though the transmission appears to be fine otherwise.

How Incoming Characters can be Lost by Poly

The whole video display subsystem of the Poly, including the ROM and operating system software that handles character display, can take just enough system time to cause problems when receiving characters at a high speed (1200 baud and up). The overhead to simply move a character to the screen is no problem, but consider the worst case of screen display: the screen is “full” and another character forces a scrolling action. The ROM routines to scroll the screen are extremely streamlined and take little time. In addition, Poly video is “mapped” making it very fast. Unlike many of the newer systems which use “ported” video, a full-screen scroll on a Poly appears to be instantaneous. Nonetheless, screen updates can take time—a long time if the CPU is also trying to monitor the USART for incoming characters.

Consider what is involved with a full-screen scroll.
GOTO 4

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Ken discovered that in the newer versions of BASIC (versions later than A00 and P01) that the OUT function no longer worked as required by the graphics hardware. "To accomplish high-resolution plots quickly from BASIC, I defined a new graphics character set and tricked PLOT and DRAW into using those new characters instead of the old block graphics characters. Of course, the old graphics set can be installed as half of the 128 programmable characters to maintain compatibility with programs that require them."

Another hurdle was trying to place reverse-video characters on the screen with normal-video characters. "There are many ways to achieve this," says Ken, "but the easiest method is to simply define a set of alphameric characters with a white background and poke them on the screen wherever desired."

Ken keeps his Poly quite busy: "my 8813 is used primarily for education and recreation—mathematical modeling, artificial intelligence, investigations into number theory, CAI, number crunching, plotting, and various animated graphics routines. My current project is writing a Super Scientific Advanced Programmable Electronic Calculator Emulator... It uses split-screen scrolling, multiple help windows, mnemonic memory labels, RPN logic, symbolic manipulation, and infinite precision..."

In these kinds of pursuits, Ken is especially fond of Poly's BASIC and its provisions for programmable precision, MAT statements, n-dimensional arrays, and others. Ken concludes, "It really makes me appreciate Poly."

PL salutes Ken in this extended use of his Poly.

Do you have an unusual Poly application or modification? PL would like to hear about it. Drop us a note at your convenience. PL

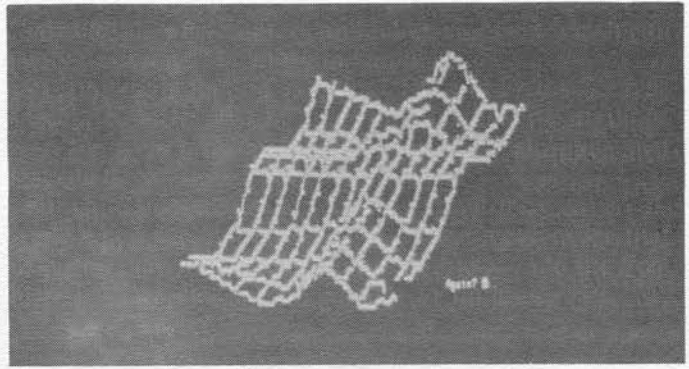
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Each character has to be moved to a new location, typically to the location above. This requires a little bit of arithmetic, because the previous row is offset by 64 locations. A full screen has 1024 characters. Therefore, the processor must execute several thousand instructions to move all those characters.

Ideally, this would be done in the eyeblink between one 9600 baud character and the next. Unfortunately, there isn't enough time. What happens, unless the incoming stream is throttled in certain ways, is that whenever the Poly screen scrolls, two or more (sometimes as many as six) incoming characters are lost—the CPU is busy shuffling characters on screen while characters hop into the USART. And while the USART does provide an interrupt, the screen code takes priority. At certain times during screen updates, interrupts are "shut off"—USART interrupts are ignored.

Several vendors offer communications software, including Bob Bybee, Poly Peripherals; PolyMorphic Systems; Ralph Kenyon, Abstract Systems; and Al Levy. If you're using something of your own design, we'd like to hear about it. (PL uses "hacker" communications software unsuitable at this time for general release.)

PL



Equation-produced Figure: Ken's custom machine-level software can zoom, pan, or rotate figures.

How to Ship Disks

You'll hear a lot about the best way to ship diskettes cross-country or around the world to protect from magnetism, X-ray radiation, and gorilla handlers. PL used to ship master tapes for album production all over the country, and became ultra paranoid about the integrity of that analog information. Is it necessary to carry expensive one-of-kind analog media shipping techniques to floppies? (The techniques included outer and inner wrapping layers (or box), plastic, and aluminum foil.)

When the postage becomes significant for such elaborate measures, we begin to consider a few things about shipping floppies: first, the information should not be one-of-kind. There is no signal quality loss from a copy. So in the event of a catastrophe—a lost or blasted disk—another copy should be available. (This of course assumes we've had the sense to backup anything sent out.) Right away we have a level of confidence not reachable with one-of-a-kind-only analog storage.

Next, the digital signal itself can be severely degraded and still be fully usable on a routine basis. So even in the unlikely event that a disk in the mail comes in proximity with magnetism or radiation, it is rare that any minor signal loss will adversely affect the disk.

Temperature and humidity fluctuations seem to have little impact on disk performance, once the disk has been allowed to "climatize" to the destination environment (this can take as long as a day).

Mechanically, diskettes are virtually shock proof—the shipping envelope and disk envelope seem to provide adequate mechanical shock protection. What the disk cannot stand is severe flexing or in the worst case, creasing. The risk of this kind of damage can be nearly eliminated by backing the disk with a piece of corrugated cardboard in the shipping envelope.

So all you really need is a standard manilla envelope large enough for the diskette (but no larger), backed by a piece of cut corrugated cardboard. That's it! Typically the first class postage for this package is around \$.40. Contrast this with mailers and bulky shippers which can easily cost you \$2 or more in shipping.

Testimonials for the skeptics? PL and Frank Stearns Associates have sent in excess of 100 diskette mailings over the years using the technique (or similar) just described. Not one disk has come back.

So while you should not take a "devil may care" attitude when sending a disk to someone, remember that disks can take more than you might guess—and the Post office is more gentle than you'd ever imagine. PL

POLYLETTER, January/February, 1985

Editor and Publisher: Frank Stearns, PolyServe

Contributing Editors: Michael Aquino, Ken Lowe

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Advertising (camera-ready or PL typesetting): \$2.00/column inch; full column: \$18; full page \$30 (Personal ads are still free of charge.)

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1984 INDEX TO POLYLETTER

The following index is for the 1984 issues of PolyLetter. Back issues are \$3.50 each; all six issues may be purchased for \$17.00, a savings of \$4.00. Prices include shipping and handling.

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statements about new system delivery dates. This side show has been going on for years, and the few phone "complaints" received by PL have been from PL readers saying: "where is the new system? We're tired of hearing about it in PL and yet seeing nothing." PL agrees.

While PolyMorphic Systems refused to give PL any current information about the new system (even after PL expressed interest in buying one) the statement was made that any one *else* can call, state their needs, and PolyMorphic Systems will "take care of them." It would appear that for those of you interested in buying a new Poly system, here is your long-awaited chance. We suggest, however, that you make the payment terms NET 30.

Implied Excesses in Editorial Contributions

Poly complained that Bob Bybee writes half of PL. PL does not understand this statement—PL refers you to the 1984 Author index in this issue. We are all pleased to have timely editorial contributions from Ralph Kenyon, Russ Nobbs, Charles Steinhauser, and John Warkentin. In Bob's case, we are fortunate to have a professional hardware designer explaining to you, the PL reader and Poly owner, various parts of the system—explaining, in fact, how such farsighted design features enable this system to still hold its own after nearly a decade. PolyMorphic Systems is complaining about this form of unsolicited high praise? In particular, we hope the service angle of these articles has proven useful in keeping an aging system running.

We suppose that PolyMorphic Systems is partially upset because a "competitor's" name, Poly Peripherals (Bob's company name), is listed with each article he contributes. Because PL is not in a position to pay its contributors, the least we can do is list the name and company (if any) of the author.

PL openly invites similar contributions from PolyMorphic Systems as well—or anyone else. Previous PL editors Mark Sutherland and Bob Bybee also made this

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offer. PolyMorphic Systems did start a column with the intent of "...letting PolyLetter readers know what is going on...", but this column started and ended with the 1981 September/October issue of PL.

Some Concluding Thoughts

Many of us still stand cheering PolyMorphic Systems for what was done with the 8810/8813 series (witness all of us who have hung on after all these years). We sincerely appreciate the upward compatibility, and the major enhancements made in the operating system, BASIC, and WordMaster.

Based on the past relatively sterling performance of PolyMorphic Systems, many of us gave unqualified support for the new system for a very long time—yet as new system release dates went by (twelve anticipated delivery windows have been published in PL since November of 1981), disappointment and frustration mounted. The reasons for the continued delays dwindled and appeared to make less sense.

In addition, there is one very distressing item: it has been reported to PL that on separate occasions, two Poly owners who were on site at the PolyMorphic Systems Santa Barbara facility did not see any sign of the new system. One recent visitor (according to his account) was actively discouraged by telephone from visiting at all. When he insisted, he was grudgingly allowed only a brief chat in the front office. A facility tour, it seemed, was out of the question. The other visitor was given similar treatment. Security reasons? Busy personnel?

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Certainly understandable if so, but even those explanations were not offered at the time.

It has been this kind of treatment of long-time Poly owners, and the now nearly three and one half year new product delay in the new system, that prompts PL's brief and good-natured gigs at PolyMorphic Systems. C'mon, Poly, lighten up! Tell us your problems. Maybe we'd all be happy to lend a more sympathetic ear if an understandable description of the shape of things was presented.

PL invites PolyMorphic Systems to send any kind of revised information they'd like—via telephone, press release, whatever. We'll print it. PL

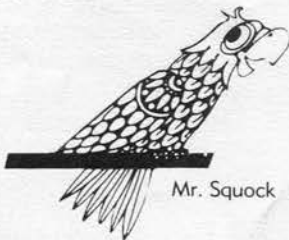
Next Issue: a review of the Anchor Automation Mark XII 300/1200 baud auto-answer modem—a Hayes at half the price. PL

Shame on you, Computer Shopper, for not mentioning PolyMorphic Systems in Stan Veit's Editorial in the February, 1985, issue. Imsai and Altair are gone, but Poly is still with us. PL

PolyLetter is considering publishing a revised subscriber mailing list sometime this year. If you have any objections to your name and address being published, please let us know. PL

PolyLetter

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FIRST CLASS

PolyLetter

The Newsletter for PolyMorphic Systems Owners and Users

March/April #8502

EDITORIAL

One of the reasons PL has been late the past four issues is my professional schedule. Three years ago, I set up shop here in the "Silicon Forest" as a freelance technical writer. The first 12 months yielded starvation, the next 18 months saw gratifying success. In the past six months, the demands for my services have been astounding. I once explained to a PL reader that my time could be booked 24 hours a day. Unspoken was the assumption that no sane person would do that. However, no one ever said freelance writers were sane. Still remembering the sting from the hunger pangs of that first year, a few 24 hour bookings have been made to meet current client demands. In actually doing this, the thought was to appease those clients, old and new, and by doing so finalize long-term client relationships that will leverage this writer back onto a "normal" schedule.

Unfortunately, this state of affairs leaves little time for other activities, such as editing PolyLetter. Please note that my stepping aside has no connection with my or other PL readers' and supporters' disappointments with PolyMorphic Systems. In spite of everything, I think we all shrug and wish PolyMorphic Systems well.

Charles Steinhauser will carry on the PL tradition, and with his known and controllable schedule, will be able to maintain a more timely publication time-table.

PL still needs your contributions! Please welcome Chuck and give him the same wonderful support you've given me.

In other news, response to last issue's editorial was lively. Included is a sampling of your letters to PL. Sadly, we hear nothing from PolyMorphic Systems themselves. (To make room for these letters, the feature articles, and PL's first paid full-page ad, the typesize has been reduced. Let PL know what you think about this. It may be the wave of future PLs in an effort to cut page count and production costs. By the way, for those concerned that the switch to typesetting cost PL a lot of money, this is not the case. PL uses a quality yet inexpensive typesetter. Typesetting charges are offset by the reduction in printed pages required.)

And the torch has passed...

First let me introduce myself. My name is Charles Steinhauser and I am from Dallas, Texas. I am looking forward to assuming the duties as editor of PolyLetter, it will be an enjoyable challenge. A challenge because of the professionalism and readability of the PolyLetter by the past editor, Frank Stearns.

I have several new ideas that I will incorporate into the letter, namely new topics to be explored and several new areas of how-to and programming skills. The letter will remain the same in other areas. I hope to build on the existing framework, that is not to take away what is already there, but to enhance some areas that possibly need attention. I wish to solicit your remarks, articles help, and criticism.

The PolyLetter is the only educational tool we users have aside from the published documentation supplied with the system. We, the owners and readers of PolyLetter, represent

the true experts of the PolyMorphic System. The example is quite unique in that the number of systems still in use is so low (unlike that of IBM or some of the other big PC companies which produce millions of machines annually). We need to give our knowledge to others so that we may utilize the Poly to the fullest.

The Poly uses the 8080 processor, which is the Grandfather of the CPU family. Many people discarded the 8080 for faster and more sophisticated CPUs. However, if you look at the utility, service, and power the 8080-based Poly has, along with a full understanding of how to make applications programs work and how to use the Poly as an aid for learning assembly-level programming, then for most of us the Poly is still a machine with very much life left indeed.

I am looking ahead to the May/June issue with anticipation and hope to have a few surprises that you will enjoy.

LETTERS

PL's editorial in the last issue brought some interesting responses from you, the readers of PL. A few of the letters received appear here.

I was disappointed to read of PolyMorphic's accusations. Are they finally feeling what we all have felt for years? Please, take no offense at their shortsightedness. PL is the last string attaching us to civilization. (I often feel I've been abandoned, then another PL comes in the mail!) After all, it isn't easy being on the trailing edge of technology. In a recent article even *Datamation* wondered where Poly is. I guess they think someone left the cage door open, but we know the old buzzard is still around.

I have been tempted to go with a new machine since many good deals come along from work, but I haven't been impressed. I like the Poly and the people that I have met, in person and by phone, because of it. Ralph Kenyon and Bob Bybee have always been willing and helpful with ideas and solutions. Heck, PolyMorphic owes quite a bit to all the editors of PL. If it wasn't for PL, I'm sure many of us would have quit long ago. Thank you all for the job you are doing.

Douglas R. Schirripa
Eastman-Kodak

Doug also asks if anyone has developed a VT-100 terminal emulator for Poly. Contact him at 716/724-5366, 7AM to 4PM EST.

The latest PolyLetter (Jan/Feb 85) editorial deserves some comment. I, also, would complain about Bob Bybee writing half of PolyLetter. It seems very unreasonable that a very small number of PolyUsers contribute a very large amount of copy for each issue. Why aren't the rest of us represented? Of the dozen or more articles, programs, trix, and hints that I was going to write for PL, why was only one printed? Why such heavy-handed editing? (I can hear Frank now, as he reads this: "But Russ only sent me a couple of things!")

The problem is that most of us haven't sent PL anything to publish. PL ran excerpts from a rambling wish list that I sent. All the other things I promised never got finished and therefore were never sent to PL.

HOW IT WORKS—THE DISK CONTROLLERS

by Bob Bybee

Part 1

The 8813 supports a number of different floppy disk drives: 5 inch single-sided single-density (SSSD), 5 inch double-sided double-density (DSDD), and 8 inch double-density with either single or double-sided drives. In this article, we'll see how the data gets to and from the drives, and talk about each disk controller the Poly uses. Along the way, we'll also discover why Poly disks are incompatible with the rest of the Known Universe.

In PolyLetter issues 8301 and 8302, Frank Stearns discussed the workings of the SA-400 disk drive used in 5 inch SSSD systems. These principles also apply to the 5 inch DSDD drives (Tandon TM-100), and 8 inch drives (Shugart SA801 or 851). For further information on the topic of disk drives, check your old PL files for those articles.

From the programmer's viewpoint, the 8813 writes data on a disk by calling the Dio subroutine. Dio knows how to write to the various types of disk drives, using a different controller for each. To write on the disk, you simply give Dio the memory address, number of 256-byte sectors, the location where these should be written on disk, and the drive number. To read back from the disk, you give Dio the disk address, the number of sectors, and the memory address. Dio magically transfers the data to and from your disks.

To perform these transfers, Dio has to know how to talk to each type of disk drive, through the proper controller. Each disk controller has to perform the same functions:

- Select the proper drive
- Move the drive head to the proper track
- Transfer data to and from the disk

The first two functions are almost trivial. In the disk interface cable, the ribbon cable that goes between the drives and controller, there are wires which select each drive. When a drive is selected, its light comes on and the head "loads," or presses against the disk. There are also signals which step the head "in" toward the center, or "out" toward the edge of the disk. This stepping is a relative operation, so you have to know where you are, and where you want to go, then decide how many steps to make in order to get there. Another signal in the cable tells when the head is on the outermost track (track zero). If the controller doesn't know where the head is, it can always step out until it finds track zero, then go anywhere else.

Most of the disk controller is concerned with moving data to and from the disk. The data is recorded on the disk in units called sectors. Each sector contains some preliminary information called a *preamble*, then the data, then a *checksum*. The preamble lets the disk controller identify where each sector begins, and the checksum indicates whether the data was read back properly.

Each of these items consists of a number of bytes, 8-bit units of information. But on the disk, information can only be stored one bit at a time, in a serial fashion. Part of the disk controller's job is to convert bytes to bits when writing, and convert bits back to bytes when reading. The hardware that performs this function is sometimes called the SERDES, for "serialize/deserialize."

As you know, information is stored on the disk as a series of magnetic fields. The drive writes on the disk by using the head as an electromagnet, and magnetizing the disk surface in one of two directions. (Call them North and South if you like). But, N and S don't correspond directly to recording a "1" or a "0" on the disk. Instead, a reversal of direction corresponds to a one, and a lack of reversal (a constant magnetism) is a zero. This reversal of magnetism is called a *flux change*.

Suppose you tried to store a long series of zeros, followed by a few ones:

0000000000000000000000000000000011

Now, quickly: how many zeros are there? It's hard to tell, and it gets harder as the string of zeros gets longer. The disk controller has the same problem. Since a zero is represented as a constant

magnetic field, the controller loses track of how many zeros have passed under the head. There must be some additional timing information on the disk, along with the data bits. These pieces of timing information are called, appropriately, *clock bits*.

In single-density recording, there is one clock bit between every pair of data bits. This can be represented as follows:

0c0c0c0c0c0c0c0c0c0c0c0c0c0c0c0c1c1c

Since a clock bit is always recorded as a reversal of flux, each "bit cell" of the disk will contain exactly one or two flux changes. If one flux change occurs in a bit cell, that change is the clock bit, and the data bit in that cell is a zero. If two flux changes occur in a cell, the data bit is a one. The disk controller automatically adds these clock bits when data is written to a disk.

Since data and clock bits are each recorded as simple reversals of magnetism, how can you tell one from the other? It's the job of the *data separator* to tell them apart. The data separator is a small circuit, included in every disk controller, that determines what's data and what isn't. Only the data bits are allowed to pass on to the CPU.

Once they're separated from clock bits, the data bits must be assembled into bytes. This is done just as bits are assembled into characters in a serial port. In the 5 inch SSSD controller, a Motorola 6852 chip is used for this task. In the double-density controllers, a similar (but faster) part is used, the 2652. (Both of these chips are designed for high-speed serial communications work, rather than for disk controller use. As we'll see in a moment, that's part of the compatibility problem.)

Finally, the bytes that come from the disk controller are read by the CPU. But there are more than 256 bytes per sector. At the start of each sector is a "preamble," containing the sector and track number of this sector. The preamble is followed by the 256 data bytes, and then the 2-byte checksum. Why store the sector number in the preamble? Disk drives occasionally suffer from "seek errors," where the head ends up on the wrong track. Checking the preamble allows the Poly to detect these errors. Of course, the checksum simply offers additional assurance that your data is being read correctly.

With the SSSD controller, all of the reading and writing functions are performed a byte at a time, by the CPU. Data travels slowly enough that the CPU can handle it on SSSD disks. But on 8 inch drives, or 5 inch DSDD drives, the data moves much faster and the CPU can't handle it. That's why the DSDD and MS controllers are so much more complicated. Each contains a Z80 processor to do the fast shuffling of data to and from the disk. This is an interesting example of the slave processor (a Z80) being more powerful than the main CPU (an 8080).

In these double-density controllers, data is not transferred directly from the disk drive to RAM. Instead, the Z80 takes data from the disk drive and stores it in some RAM on the controller board. Then, the main CPU reads it from the controller and moves it into main memory. Does this take longer than putting it directly in RAM? Yes. Why did Poly do it that way? The Poly CPU was designed without any ability to perform DMA (direct memory access) operations. And without a DMA controller, the Poly CPU can't handle data fast enough to accommodate DSDD disks.

Why are the speed requirements more severe for DSDD disks? Double-density recording packs more data onto a disk, by eliminating some of the clock bits. Using double-density, clock bits are only recorded when there has been no data bit for two consecutive bit cells. This allows us to put data bits closer together, and therefore the data comes out faster. The data rates are roughly 125,000 bits per second for SSSD 5 inch, 250K bits/sec for DSDD 5 inch, and 500K bits/sec for DSDD 8 inch. The 8 inch drives are twice as fast as 5 inch DSDD because the disk rotates faster in the drive.

Poly vs. IBM—guess who lost?

In the early days of microcomputing, disk controllers were complex and expensive. PolyMorphic and North Star were among a few brave souls who began building disk controllers for

S100 systems. Trying to keep them simple and inexpensive, these designers chose to deviate from the standard disk formats that IBM had developed. Since IBM-format disks were only used in 8 inch drives at the time, and Poly was using 5 inch drives for cost and size reasons, there was no pressing need to be IBM-compatible.

Poly, like North Star, built a *hard-sectored* disk controller. With hard-sectored, there are 10 holes around the center of the disk, and each hole marks the start of a sector. The disk controller counts these holes, and begins writing after it sees the correct one. This is a fairly simple method for locating data on the disk. IBM uses a soft-sectored format, which requires the disk controller to look for *address marks* on the disk. Address marks are special bit patterns which signal the start of each sector, but it takes extra hardware to detect them. These marks are written when a disk is initialized in IBM-format systems.

Why did soft-sectored win out? The IC manufacturers began producing disk controller chips that could handle the IBM format. Using these chips, a disk controller could be designed to be cheap *and* IBM-compatible, all at the same time. And it turns out that soft-sectored works more reliably when the disk drive is slightly out of alignment.

Another difference between Poly and IBM format is in the method of error detection. Poly uses a simple checksum, which finds many errors. But the IBM format calls for a cyclic redundancy check, or CRC, which is a much more thorough test. A checksum is done with addition, but a CRC is a division process, and the probability of an undetected error is extremely small. Performing a CRC with discrete hardware would be expensive, but once the IC makers put it on their disk controller chips, the penalty for being IBM-compatible was removed.

Can the Poly disk controllers be modified to use IBM formatting? I think not. The 2652 and 6852 chips have no provision for CRC calculation, nor can they do the address mark generation and detection required for IBM-format disks. About a year ago, Poly was hinting that they had developed a way to read IBM-format 8 inch disks on the 88/MS. But if this ever materialized, it has remained a well-kept secret.

This is a good example of one of the tradeoffs in the fast-moving computer marketplace. If you move too soon, you may build something the rest of the world won't follow. (Like hard-sectored disks.) On the other hand, if you move too late, your product is just another me-too.

Next issue, Bob discusses troubleshooting and talks about the "odds and ends" of the Poly disk systems. PL

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REVIEWS

Anchor Automation "Signalman Mark XII" 300/1200 Baud Modem

Anchor Automation, maker of the "Volksmodem" series of inexpensive, workhorse modems, can be proud of the Mark XII. It performs as advertised, and it performs quite well. As far as PL can tell, the Mark XII is Hayes compatible, and for a great deal less money. The only immediate feature lacking is an audio monitor on the phone line itself. In the Hayes, this monitor lets you hear the modem find a dial tone, dial, and make connection with the remote system. A handy feature in some cases but probably not one worth the extra \$200 to \$300.

The Mark XII has all the rest—LEDs showing high/low speed selection, connection, data transmit/receive, power applied; auto answer; and an internal microprocessor to handle a series of control commands, such as dialing phone numbers and controlling numerous parameters of the modem; and a full two-year warranty. The only useful feature the Mark XII lacks is auto equalization of the analog signal. Such equalization theoretically makes up for varying phone line conditions. However, it hasn't been clear that other popular modems—without getting very pricy (\$1,000 and up)—offer this feature either. It's a safe bet that for local connection points (such as using the common-carrier TELENET) you would never see the need for such phone-line fine-tuning. While a cross-country connection has not yet been tried, I'm confident the Mark XII will have no problem.

But the best feature is the speed, oh my, the speed. 1200 baud makes it practical to send and receive large blocks of text. Just in the past month, I have downloaded over half a megabyte from one of my clients, and shipped out at least that much to typesetters—error free. And the error rate can be a concern, because at 1200 baud the innocuous phone glitches that were never noticed at 300 baud suddenly become hand-grenades. About one or two out of every 10 connections will be over noisy phone lines, causing readily visible errors. This is usually solved by simply hanging up and remaking the connection. The phone system, even on a local basis, is such a huge web that the chance of getting the same noisy line or even the same trunk two calls in a row is small.

Because the modem was needed in a hurry, I did not do my usual careful shopping. Instead, a few calls around town yielded prices ranging from \$265 to \$350 (list is \$399). I have since seen the modem advertised for as low as \$239. Check the mail-order advertisement pages of your favorite computer magazine. (The modem package includes manual, power-supply, and an attached RS-232 cable and connector.)

Based on now almost three months of use, PL rates this modem a "best buy." In regard to software, you're more or less on your own. But in issues past PL has mentioned the communications software that is available from several vendors.

Big Book of Photo Copier Humor

Writer, humorist, physicist, software engineer, and consultant Wayne Norris has collected all those great pearls of wisdom and backroom humor that you've seen around, especially in those places where people congregate to wait for something—such as the local print shop, or in-house copy or data-processing center.

This is a funny book, but be warned that there are sections that some would dub crude, maybe even lewd. But it takes all kinds, and the laughs far outweigh the raised eyebrows of propriety. For more information, refer to the ad in this issue of PL.

NEXT ISSUE: John Warkentin discusses "solid state disks" and your Poly. You may recognize the term "RAM disk" instead. The idea is basically the same (blinding SPEED), but John draws a suitable line in the definition, which he explains in the article. John is in the process of assembling the hardware, and will keep us posted as he goes.

Also look for new editor Charles Steinhauser's surprises. Bob Bybee's article on the Poly disk system concludes.

How 'bout you? Where are all the things that you have learned while keeping your Poly(s) running—while upgrading the software that fits your business better each year? Where are your articles, programs, hints, and tricks?

The time is now, while we still have enough users to support a national user magazine. Share what we have learned!

Have "Several people complained to PolyMorphic Systems about the editorial content of PL"? Why not complain to the editor? Why not submit articles with divergent ideas? Why doesn't Poly use the captive audience of "satisfied users" who read PL to try to sell upgrades and new systems? Perhaps Poly doesn't really understand the marketplace. Perhaps that's why Poly never shipped more than a few thousand machines. No matter how great our Poly computers are, the marketplace demands promotion, advertising, merchandising, user support and a reputation for honest, up-front dealings with both end users and dealers. Poly has had problems in all those areas during the past 7 or 8 years.

The 8813/10 is (was) a grand old system. But the window for introducing a new system is rapidly narrowing. The rapid growth of hardware and software that we saw in '77 through '82 was slowed considerably as most vendors jumped to build clones, add-ons, and enhancements to IBM's entry. Ol' safe & sane Big Blue set R&D back while the industry remade 50 divergent directions into the IBM mold. Yes, standards are important... but at the expense of innovation?

I wish PolyMorphic Systems the best. I'd really like my next "big" system to be a multi-user Poly running 8-bit and 16-bit software. For about the price I paid for my 8813 & MS. But I think the system may be a CompuPro. Unless I wait for 16-bit machines to mature as 32-bit machines appear...

Russ Nobbs
Spokane, WA

(The following letters were received too late for typesetting.)

About a year ago I decided to take the plunge into a hard disk -- solely, I might add, because of Bob Bybee's discussions in PL. I called Bybee on the phone, and he discussed the Poly Peripherals system he was marketing. He also mentioned PolyMorphic's HD-18 -- but, and I think this is important -- entirely favorably. In short, there was no "hard sell", nor was there any effort on his part to bad-mouth PolyMorphic. Rather, he praised the quality of the HD-18.

Consequently I called Ken Gudis at PolyMorphic and asked for HD-18 literature, and ultimately I decided to buy PolyMorphic's HD-18. (This is no reflection on Bybee's product, but derives rather from my relative nearness to Santa Barbara in case of servicing needs.) The point is that PolyMorphic Systems got several thousands of dollars of my business not in spite of Bybee, but in major part because of him. Accordingly, I don't think PolyMorphic Systems should protest Bob Bybee in the least.

My second comment concerns

PolyNotes from Chuck Thompson

Tax Return Package: There still may be time to order the Tax Return package! The programming is now complete, and the system is ready to ship. The price is the same as last year: \$75 to first-time purchasers, \$37.50 for the annual update. (Professional preparers pay \$150 and \$75.) More than 100 1984 returns have been prepared without error using the software here in Dallas at my "beta test site" (professional tax preparer Jim Cook)!

Getting rid of your Poly? If you've finally succumbed to the lure of Big Blue or one of the other shiny new computers, you may have a lonesome Poly sitting around the house or office. If so, you might be interested in donating it to REACT Communications Corporation (a charitable, nonprofit corporation). I am a trustee and secretary/treasurer of RCC. Drop me a line (address below) and I'll give you more information and an estimate of the deduction you might be entitled to. Be sure to include a listing of all software, manuals, and accessories, as well as a description of the Poly.

Addendum to the Poly Manuals: In 1981, I published a 42 page "Addendum" to the Poly manuals which contains a wealth of information about the undocumented features of the Poly operating system, helpful tips on how to use many of the more common utility programs, and so on. I still have a number of these and can easily be persuaded to part with them at \$6.00 each. I also have a set of three publications that supplement the Wordmaster II manual: Table of Contents, Index, and Command Summary. This set of three is also \$6.00. All four can be delivered to your door for just \$10.00. Note that the latest Poly operating system (Exec/96) and BASIC C04 are essentially the same as the Exec and BASIC in use when the *Addendum* was published, so the material is still current.

For more information contact Charles A. Thompson, PolyCom Associates/2909 Rosedale Ave/Dallas, TX 75205/214-368-8223. Source Email: STJ970.

PolyMorphic's attitude towards visitors. I have called them perhaps half a dozen times in the past year or so, and have visited the office 2-3 times (not to buy the HD-18, but for incidental servicing questions and needs). On each visit I was greeted with the utmost courtesy, was helped promptly, and was invited to wander through the premises and look at things. In one workroom I saw the legendary "new system", which was self-testing (in full color on the crt!). Someone was hard at work on its guts, bug-hunting. So the prototype does exist, or at least it did a year ago. I left the premises with very good feelings about PolyMorphic indeed.

As for PL, I think PolyMorphic Systems should be very appreciative of its existence. PL is free advertising for PolyMorphic Systems in the most valuable way: satisfied users who are not being paid to promote PolyMorphic Systems. Personally, I think PolyMorphic Systems should provide every new

THE BIG BOOK OF PHOTOCOPIER HUMOR

by
WAYNE B. NORRIS

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continued from page 4

Poly purchaser with an introductory subscription to PL.

Dr. Michael Aquino
San Francisco, CA

Recently I had an experience where two drives went bad at the same time. I swore it was not the drives. I felt sure that it was something else and wrestled with my Poly for nearly two weeks. Reaching the end of my understanding of the system, I talked with Ken Gudis and Mark Maclin of PolyMorphic Systems. Through their kind assistance, I was able to make swaps and changes, and determine that two drives were in fact bad. While this is probably elementary to many PL readers, it wasn't to me and I was glad to have Poly's help.

Early on in the game, Poly could have easily thrown up its arms in despair and left the market. They haven't. What the future holds for this group I can't tell, but I regard them as old friends, struggling in the rat race that is the computer market place.

I have kicked and scolded my Polys more than once, but when I press the load button and watch the red glow of the LED on the drive I am proud of myself and what I have learned. While it may be my imagination, I think that the machine is smiling at me.

PolyMorphic users are a family, not just a club. We were a bunch of gadgeteers who knew what was cooking in our technological world long before the rest. I am proud to be a participant and don't know that I'll ever give up my Polys. If I ever do get anything else, the Polys will not be replaced.

Robert L. Schwartz, Attorney
Cincinnati, OH

(Bob also suggests a place for Shugart disk drive repair. Call 617/568-1492 for details and a return authorization, then ship the drive prepaid to Shugart East/18 Kane Industrial Drive/Hudson, MA 01749. If you're in the West, call the above number for the west coast office, or contact PolyMorphic Systems.)

PolyLetter

903 B Allegheny Way
Richardson, TX 75080
214/669-2169



Mr. Squock

FOR SALE: 8813 totally reconditioned by PolyMorphic Systems in December, 1984. Two drives, 64K RAM, \$1400. Call Craig Clark at 408/425-1101 or 408/475-1679.

FOR SALE: 8810 with 24K RAM and several disks, \$600. Contact Wayne Norris/1810 Cliff Drive/Santa Barbara, CA 93109-1693. 805-962-7703.

Bill Davis, exotic medical consultant to PL during the extended illness of Mr. Squock, reports that the bird had come down with a severe case of *parrotentitis*. ..



20

FIRST CLASS

PolyLetter

The Newsletter for PolyMorphic Systems Owners and Users

May/June #8503

Editorial

As editorials go, this one seems to have a certain positive ring to it. I hope you will agree.

Many new and positive occurrences have transpired since the last issue. For one, I have had many phone calls from you the subscribers with nothing but support and congrats. I am truly flattered! I had expected some support, but not this much. However I won't pat myself on the back too long, people get bored hearing about it.

Sorry for the slight delay in the first issue, I had a LITTLE problem with the mail-list. As you know, it would be difficult to have all PolyLetters delivered to their proper places without an address affixed. The post office has problems as it is, even with a label and proper zip-code. Some of you out there have recieved an issue and are off the active mailing list... either you have let your subscription expire or no longer have your Poly. If you would like to subscribe please drop me a line, or if you just don't like the letter, please drop me a line, I would like to know what you don't like about it and maybe you could offer some suggestions on how to improve it.

Please let me hear from you regarding the new format (please no letter bombs as my digits can't handle another). But seriously, let me know what you want (articles, product reviews ect.), As it states in the masthead "this is your newsletter".

I have had a lot of fun putting together this first issue, however I need a vacation. By the time you read this I hope to have taken the Mooney 201 and gone to Padre Island. Well I guess we should get down to the business at hand.

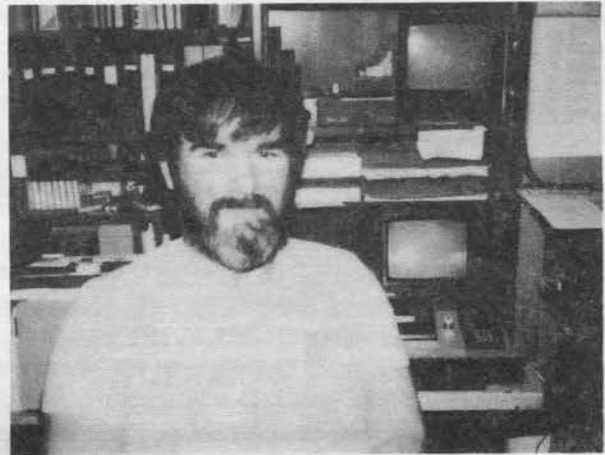
PolyMorphic Systems is willing to release a new Exec if there is enough interest. I think PolyMorphic will work with us on what we need and want. Note the ad this issue. If you have any ideas for a new Exec please forward them and I will compile a list and submit them to PolyMorphic. PL

NEWS FROM POLYMORPHIC

Yes there is a New system! Let's set the rumors straight. This is the context of the conversation PL had with PolyMorphic just last week. The system will definitely NOT be S-100 based. However it will be a multi-user system that uses a central unit with many smart terminals connected.

Goto 2

Glitch of The Issue



This issue, the person shown is a man many of you have talked to but probably not seen. As will be the rest of the photos seen in this feature for future issues. The persons highlighted in this feature will be people that are associated with PolyLetter or PolyMorphic in one way or the other.

The following list is some of his outstanding achievements that are worth mentioning.

Potty trained at age 9.

Graduated from Kindergarden suma cum laude at age 15.

He was the reason RightGuard was invented.

Held indoor track record in Highschool for the 3 meter dash.

Was affectionately called "Missing Link" by his Fraternity.

Popular with Frat bros, made denatured alcohol potable (almost)

Excellent cook, favorite dish is Catfish with Carp sauce.

Favorite drink is Perrier and water.

Favorite implement of destruction is a meat cleaver.

A musician, plays the radio frequently.

Father of machine language as his speech sounds like it.

Around PL we call him 'Pro-Hacker'.

Listed below is his name in cryptic code. For the first one that sends in the correct answer, not just a guess, but who has broken the code will receive a free Disk of the month. Next issue the winner's name will be announced along with our glitch of the issue unknown person's name. This issues' code is: 51 62 6A 72 65 48 47 69 69 5E 69 54 Good Luck!

by Bob Bybee

Part 2

Odds and Ends

These terminals will have a video card and a CPU card, and have a high resolution color capability, unlike the cardboard texture of an IBM-PC color display. It looks like the central unit can handle about ten such terminals. This system will be a network system unlike many other network systems that merely connect several separate computers together. It will tie the terminals together to the central unit. This is a much more cost effective way of having multi-user capabilities without the expense of several computers.

PolyMorphic's reasons for delay in the new system is multi-fold. They had thought to use the Intel 80186 processor, but with the 80286 now being produced in large quantities, they feel that this processor is the one to use. Also there has been much time and energy devoted to software. PL understands that the new system WILL be compatible with IBM PC. But don't fret the editor will remain and several other Poly originals. It is unclear if a Poly operating system will be in the lineup or if it will run a pseudo-PC DOS operating system.

In any event with a new machine with Poly's trademark of utility and power of using the system to do what is wanted, the increased software base that is offered by going IBM-PC compatible, imagine what the Poly is now capable of with a sixteen bit cpu and nearly unlimited memory storage. Have you ever tried to make an IBM do the things a lowly 8080 Poly will do? I have and it is not a pretty sight! But the best of both micro worlds... Awesome! PL

FOR SALE

Amusement Park at lovely Three Mile Island, owner will finance. Great tax shelter and could be used as a nuclear weapons plant in the off season. Amenities include: hot and hot running water, cheap electric bills, 24 hour day-glow lighting, and picnic areas with cooking facilities everywhere. Rides include the gamma blaster: when looking at the person next to you, it is as if they are standing in front of an x-ray machine. Great for getting a free lung x-ray etc... radiology fee extra. Cable car rides over the crippled number two reactor, its like nothing you have ever seen! And last years smash hit, the Meltdown! Imagine, sitting atop the reactor core in special lawn chairs and journey to the center of the earth in a real live Meltdown! A once in a lifetime adventure! For futher details contact the NRC in Washington, D.C. or your local broker.

Next Issue:

The Glitch of the issue is named, two new features will debut, John Markentin's second of the three part article on SSDs, and hopefully an ontime issue.

Here is some miscellaneous information that you may not have known about Poly disk systems.

The 5 inch DSDD drives actually store 512 bytes per physical sector on the disk. As far as the system is concerned, each of these is used to store two logical sectors, which contain 256 bytes each.

On DSDD disks, the system alternates between sides before it changes tracks. So, for example, the first 20 sectors would be on track 0, side 0, and the next 20 sectors would be on track 0, side 1. This allows the controller to read 40 sectors before changing tracks. The system stores data this way because moving the disk head takes time, and should be done as seldom as possible.

Poly SSSD drives are set up to store 350 sectors, as 10 sectors per track, on 35 tracks. Older Shugart SA-400 drives could only step to 35 tracks. Newer ones can go to 40 tracks, but Poly's ROMs were never rewritten to do this, since it would result in 50 sectors that some older Polys wouldn't be able to read.

Troubleshooting

In any system with electrical and mechanical components always expect the mechanical ones to cause trouble first. (Suspect the disk drives, if possible.) Here is a suggested approach to use, when disk problems strike:

If none of the drives work, you may have a loose cable on top of the disk controller card, or a bad controller. The easiest thing to do is swap controller boards, if you have a spare board. If your system has an 88/MS as well as 5 inch drives, try booting from both drive 1 and drive 4. Since they have different controllers, a dead controller would probably only affect one type of drive.

Either type of drive can have power supply problems, so if you know how to use a voltmeter, check the supply voltages. The 5 inch drives use only +12 and +5. The 8 inch drives use +5 and +24 volts, and 110 volts AC for the motors.

If the problem is only associated with one drive, is it a complete failure or a marginal problem?

If the drive light comes on when you access the drive, then the power and data cables are connected properly. If the light doesn't come on at all, check behind the drive and see if one of the cables has come loose.

If the light comes on, but you immediately get a "no disk in drive" error, access one of your working drives and look inside the non-working one. All of the drive motors should be on whenever any drive is in use, and you should see the spindles rotating. If not, check for a broken drive belt between the motor and the spindle, on the side of the drive opposite the circuit board. You could replace this belt with a rubber band, if you had to.

OK, you don't have a complete failure. But one drive is

having trouble reading or writing. Now what?

If a certain disk can't be read, try reading it in other drives. If that doesn't work, re-INIT the disk and try again. Be careful with a disk that has given you trouble once -- it may do it again, when you least expect it. I prefer to throw a disk away if I have any doubts about it.

If the problem persists with other disks, try to isolate it to a certain drive. A drive that can't read or write reliably may have a dirty head. You can try to clean the head, using a commercially available cleaning kit. If one drive's head needs cleaning, don't be lazy -- do them all.

If a disk that was written on one drive can't be read on another, you have an alignment problem. Find your original Poly system disk or Confidence disk, and use this as your reference. Assume this disk was written on a drive that was in good alignment. Any drive that can't read it is out of alignment. You can also simply run the Confidence disk, and see if it shows up any problems.

Disk drives are becoming a commodity item in the personal computer marketplace. If your system absolutely must have all three drives running at all times, buy a spare drive and keep it on the shelf. At about \$200, it's cheap insurance.

When replacing a bad drive, locate the two components in IC sockets on the printed circuit card. One is a set of silver-colored jumpers, and the other is usually a light blue or grey package (only installed in drive 1). The silver jumpers select which drive is which, and the other package is a set of resistors which must be installed in one (and only one) drive of the set, usually drive 1. The other drives will have an empty socket at this location. So when swapping or replacing drives, move these parts from the failed drive to the new drive before installing it in the 8813.

If your spare drive has these components already installed, remove them, or be sure that they are configured exactly like the drive you are replacing. On 8 inch drives, also check for small jumper plugs or switches which may need to be set. If you get these items wrong, you won't blow up the system, but it won't work correctly either.

Choosing a Repair Shop

When calling to see if a shop can handle your disk drive repairs, be sure you know what sort of disk drive you've got (manufacturer and model number, like "Shugart" and "SA-400"). Ask if they repair this sort of drive. Do not ask if they repair PolyMorphic disk drives. Poly doesn't manufacture the disk drives, and the shop will only get upset if you ask them to repair something they've probably never heard of.

When getting a drive aligned, make the repairman aware that the drive comes from a *hard-sectored* system. Many shops won't adjust the "index timing" carefully, since that's not a critical adjustment in soft-sectored systems. But it is critical in hard-sectored machines like the Poly. If the serviceman asks what kind of computer uses hard-sectored in this day and age, tell him it's a PolyMorphic, but also tell him that it's very similar to a North Star. He'll smile with a nostalgic look, like a mechanic working on his favorite '57 Chevy. He might even tell you about his first Altair.

ADDING A SOLID STATE DISK TO A POLY 8813

by
John J. Markentin

First, let's talk about terminology. Two terms are commonly bandied about... Solid State Disk, and Ram Disk. In my mind there is a definite difference between the two. I view a RAM Disk as being composed of banks of memory that are switched in and out of the CPU address space as needed. A Solid State Disk, on the other hand, I view as consisting of a block of memory chips (plus appropriate supporting circuitry) that is accessed via I/O ports. I tend to lean toward the latter configuration, as it does not require retrofitting the computer system to be capable of bank-switching. A Solid State Disk requires only that you choose a block of port addresses that does not interfere with other I/O devices in the computer system.

Some time ago I implemented a Solid State Disk on a friend's S-100 / CP/M system. I was impressed with its performance, but felt that the cost per byte was too high when compared with a hard disk. As I have two computer systems (a Poly 8813 and a home-brew S-100 / CP/M / Z-80), I have to make a sometimes difficult decision as to which machine gets the hardware. I recently installed a 31 megabyte hard disk on the Z-80 machine, and wanted similar performance for my Poly. I could not convince myself to invest in a second hard disk, so I looked further into the possibility of installing a Solid State Disk. I had used a particular one on my friend's system, so have kept an eye on that company's ads over the years. Recently their prices have started to drop to where I just could not resist any longer.

The product I will be writing about is the Light-Speed-100 Solid State Disk, a product of Digital Research Computers, located in Garland, Tx. Their product is a 256K Solid State Disk, priced in the March issue of Byte magazine at \$229.00 for a kit. You can figure an about 4 hours of soldering to complete the kit. The kit also includes an 8" disk with files appropriate to the CP/M operating system. However that won't help us, of course, but I will be making the software I develop available to those interested in installing a Solid State Disk on their system.

Now for some general comments about disks and the Poly. First of all, this project is ROM level dependant. As originally designed, the Poly disk I/O drivers are in ROM, and are accessed with a CALL to a particular ROM address. This makes it extremely difficult to modify a Poly system's disk configuration. In latter versions of the system ROMs, the code has been modified to jump to a location in read/write memory which is initialized with a jump back into the ROM (Poly calls this a wormhole). This allows us to intercept disk I/O, and add a routine to control a hard disk, MS-88, or (you guessed it!) a Solid State Disk. In short, to add any sort of disk I/O to your Poly, you will have to either (A) obtain the latest ROM version set for your machine from PolyMorphic Systems (\$150.00 plus shipping), or (B) modify or find someone to modify your current ROMs to support the detour through R/W memory.

MODERNIZING YOUR POLY
by Bob Bybee, Poly Peripherals
1437 Sugarwood Lane
Norcross, GA 30093
404/925-2480

Take Heart Dear PolyOwner
by
Al Levy

A brief history...

Hardly an issue of PL goes by without a letter from some 8813 user who loves his Poly, but wishes it had some new-fangled feature that "everybody" else's computer seems to have. Here is a list of some such features:

soft-sectored disk controller, for
8" or 5" IBM-PC and CP/M disks

80x24 video display

Z80 CPU with 64K RAM, running
"real" CP/M 2.2

local area networking, to tie Polys
together in an office

RAM disk, with 256K RAM or more
(1000+ lightning-fast sectors)

Just a few years ago, a hard disk would have been on this list as well. PolyMorphic Systems, and my own company, have both responded to the need for hard disks. As a result, hard disks are off the "wish list" and are now available to anyone who needs them.

What about the others? Can we add these features to our Polys, and how much will it cost us? Is it worthwhile? I recently discussed some of these ideas with PolyMorphic Systems. Ken Gudis was polite, but indicated that PolyMorphic had no interest in these projects. "There are a lot of things that can be done with the 8813," Ken noted, "but we don't see enough of a market for them. We're putting our efforts into new systems, which aren't even based on the S100 bus."

That's a mixed blessing for 8813 owners. We should be happy that PolyMorphic is still alive and well, working on new things. But we have to mourn their lack of interest in modernizing the 8813.

As the owner of three Polys, and an avid fan of the system, I have a strong desire to keep my machines running for a long time to come. I would like to add new, modern features to my system, both to enhance my productivity and to keep me from feeling "behind the times." A year ago, I founded Poly Peripherals as a way to provide these features to myself and to other Poly users, at reasonable prices, and maintaining total compatibility with the existing 8813.

I've spent a lot of time considering each of these ideas. They all require hardware and software, which I can provide. In my duties at Chromatics, I have designed and programmed CPUs, disk controllers, memories, and video displays. But for Poly users, the most cost-effective solution won't involve designing any new boards. It's very expensive to design and build new hardware when a limited marketplace is available. I can buy a disk controller for \$200, but it might cost me \$500 each to build ten boards of a new design.

Most of these S100 boards can be purchased off-the-shelf

I was stuck but good with a mini made by ROYAL Typewriter (Litton Industries). I went in search of a better printer for the beast. In my typical manner I haunted all of the "cheap buy" places. I stumbled across a Diablo 1620 about four months old. It was repossessed by a local bank and was up for grabs. The dealer asked \$1000 and I said ok. When I was taking the printer to my car the dealer shouted to me "Don't forget the brown box!" Brown box indeed! This was a Poly 8813 with full memory etc. My attitude was "if I have to throw the computer away, so what?" I immediately called Santa Barbara to ask the name of a local dealer. I had him plug it in and test it. For a year I used the Poly as a typewriter and that was that. One glorious day I decided to write a BASIC program to add up checks. That was the beginning of the beginning.

Somewhere in the user's manual I read MARTY the WIZ's comment on DONALD A KNUTH'S books. I bought these and many other books on programming. I subscribed to some of the popular magazines and copied programs. The BASIC HANDBOOK by David A Lien was a great help with translating from one BASIC to another. Before I knew it, I had written a complete Database Management system to run my business. The only professional program I owned was Poly's MAILIST and much of my programming imitated their model.

I then joined LICA (Long Island Computer Association). My reason for joining was simple. I never heard of PolyMorphic and I wanted reasons to sell the Poly and buy radio shack's computer. (That was the only brand name micro around.)

Well here it is some six or seven years later. I sat in on some 24 sessions a year (12 with LICA and 12 with the smaller S/100 sub group), and we discussed PIP, BIOS, BDOCS, and all of the "GREAT" utilities arising out of the CP/M USER GROUP library. In my ignorance I asked (and still ask) didn't you always have those capabilities? (After all, the Poly did.) Can you believe that reporting TOP OF RAM on boot is a new feature? It takes about two minutes on the IBM. I won't dwell on this subject.

As editor of the newsletter for LICA, (we have 1200 members plus 4000 additional readers), I have to receive and copy disks from and to various formats. I have in house an APPLE IIe, a COMPUPRO S/100, and at least nine Polys. On occasion I have used the IBM, Radio Shack, Kaypro, etc.

I have in my office the entire CP/M and SIG/M libraries. This accounts for about 800 eight inch disks! There may be ten programs that do not duplicate what you, the PolyOwner already have, or have available. Much of the software deals with copying a file in one fashion or another. There is absolutely nothing like the System Programmer's Guide released by you know who.

WordStar is the pits! Supercalc is a toy, dBASE II is a monster, and none of them are compatible! You must buy or "trade" (a polite word for steal) another high priced utility to make any of them work together. We are talking thousands of dollars. By the time you learn to use dBASE

you might as well have learned Poly BASIC. Its easier, more fun, and faster! Don't be snowed by press releases and advertisements. dBASE II is not the answer to your problems. It only creates new problems. You now own the best buy on the market! I have purchased a number of PolyMorphic computers (used) and I am constantly amazed at the lack of knowledge on the part of the previous Poly owners. Despite chip and clock speed - the Poly is FASTER! This is because of the incredible operating system software. I had visits from INTEL. The engineers tried the Poly. Their comment: "WOW! - who thought this up?"

Now let's face it. I bought my machine used. Poly owed me nothing. When I had problems, I placed calls to the persons in the great sun belt. If the proper person was not available I received a return phone call from Poly. On their nickle I got all the help I needed. Try that with APPLE or KAYPRO or TANDY or SANYO or..... (The national distributor for SANYO is a close friend. He won't get on the phone to help his own dealers.)

I assume that you have single sided single density drives. Edit a file. Type in the letter "A". Close the file. You have now used one sector or 255 bytes. Do this on a CP/M machine and you have used 1000 bytes or our four sectors. If you happen to use double density CP/M drives you have used up 2000 BYTES or the equivalent of eight sectors. The new Poly Editor uses about 8K (Check your system disk for Edit) plus 2K (8 sectors) for Emsg.OV and the same 2K for Efun.OV The overlays take no memory away

from your system.

WordStar takes 16K plus a 28K file for the messages plus 34K for the WordStar Overlay. This does not include the INSTALL module nor your files. Can you see why the user's are screaming for more memory and disk space? A block move in WordStar takes

- 1)^m to get the proper menu,
- 2)^k mark the head of the block
- 3)^m
- 4)^k mark the end of the block
- 5)^ something (I forgot) moves the block
- 6)^m
- 7)^ something - remove the block markers

This is neither immediate nor easy. Most screens are not memory mapped (like the Poly) so it is a shock when you see how slow this can be.

I am now the authorized New York dealer for PolyMorphic systems.

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How many of you would like to do programming in Basic but don't know how or just can't seem to get started? Actually it is quite simple and all that is needed is a problem to solve and your Basic manual. Let's use this small program as an example.

```

05 PRINT CHR$(12)
10 PRINT "WONDOUS NUMBER TEST"
20 INPUT "ENTER NUMBER TO BE TESTED  ",N
30 M=N
40 I=0
45 IF M=0 THEN PRINT "GREATER THAN 0 PLEASE!" \ GOTO 20
50 IF M<>1 THEN 80
60 PRINT I," ITERATIONS NEEDED TO MAKE ",N," WONDOUS"
70 GOTO 20
80 IF M/2=INT(M/2) THEN 110
90 I=I+1
100 M=M*3+1
110 I=I+1
120 M=M/2
130 GOTO 50
RUN

```

Let's suppose that you want to take any number, if it's odd multiply it by three and add one. If it then becomes even divide it by two, if then odd multiply by three and add one. You want to continue until the result becomes one and keep a count on the iterations needed to attain a result of one. Now we will examine how the program works.

line 5 this just clears the screen and homes the cursor
line 10 print message
line 20 print prompt and N will be any number we choose
line 30 makes life easy
line 40 initialize our counter to zero
line 45 zero is not a good N, return for another N
line 50 if M<>1 see if it is odd or even and crunch
line 60 this is the program output
line 70 when M equals one then line 60 will be printed and line 70 will jump to line 20 and ask for a new N
line 80 if M is even then increment counter and crunch
line 90 this increments counter for odd M
line 100 if M is odd then multiply by three and add one
line 110 increments counter for even M
line 120 divides even M
line 130 go see if M=1 yet if not go crunch

Now if you have a number cruncher problem to solve, just write down the problem, arrange it in a logical order, check your Basic manual for proper syntax and RUN!

A computers virtues are they don't get bored, don't mind repetitions, they do what they are told and they are very FAST! Try this algorithm with pencil and paper on a number say 27. Don't start late at night or you may see the sunrise!

The highest number of iterations I have found for a number is 411, is there a limit to this number? Are all numbers eventually wondrous? PL

In summary, those interested in pursuing this project should obtain system ROMs supporting the Dio wormhole, and purchase a Solid State Disk. I have purchased the ROMs from Poly, and have ordered a disk from DRC in Garland, Tx.

The mailing address of DRC is:

Digital Research Computers
P.O. Box 461565
Garland, Texas 75046

I will possibly have further news on the outcome and speed by the next issue. PL

(John already has his SSD up and running, and the software is now available). Contact PL for info.

Modern continued

from some vendor. Then, software must be written to integrate the device into the 8813. This should be done with compatibility in mind, not losing any of the Poly's existing features. The software provided by most S100 board vendors will be on an 8" CP/M diskette, and so it can't even be read on a Poly, and certainly won't run.

Each of the ideas listed above can be done on a Poly. I have already sketched out a number of approaches for each one. But I have a problem. The hard disk system I offered through Poly Peripherals was met with lukewarm response (4 sales total), and I can't afford to continue developing new hardware products on the hope that they will sell.

Let me put the question to you, the 8813 users: Would any of these upgrades make your Poly more useful, and encourage you to keep it for several more years?

If so, "put your money where your mouth is!" Do you want a RAM-disk (or a video card, or a chrome-plated whatchacallit) for your system? Then contact me. I will arrange for you to buy one and ship it to me. I will write software, and modify the device if necessary, to make it work on your 8813. You will get the software and hardware for the cost of the hardware alone. I will retain the right to re-sell this product to other Poly users, and the price will be reasonable since I won't have to recover any development expenses.

I think this offer gives us the best of everything. I can develop useful products without a large risk, and you can enhance your Poly at the lowest possible cost. PL

(For more information, please contact Bob at the address listed above.)

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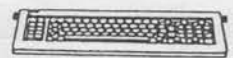
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KEYBOARD ASSEMBLY
New TI keyboard, 48 keys, unencoded output. Terminates to 15 pin connector. Solid frame 4" x9". Grey colored keys.
KEY-48 \$3.50ea or 10/\$19

Astec #UM1381-1 Modulator. can be used with all video sources. Built in A/B switch. Operates on 12vdc. Hook-up diagram included.
MOD-1381 \$3.50ea or 10/\$15

CASSETTE INTERFACE CABLE
Has DB 9 connector on one side to 3 phono jacks on the other.
CIC-93 \$2.50ea or 10/\$15

POWER TRANSFORMER
Dual output: 18vac @ 22va & 7.5vac @ 1va. Heavy duty.
TN-18 \$2.50ea or 10/\$22

FIRST CLASS

Apparently the Parrot is suffering from an identity crisis. He only spoke once when picked up from the airport. He asked for a paper sack, said he was molting and wanted a limo.



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PolyLetter



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PolyLetter

The Newsletter for PolyMorphic Systems Owners and Users

July/August #8504

MODERNIZING YOUR POLY - A FOLLOW-UP

by Bob Bybee, Poly Peripherals

1437 Sugarwood Lane

Norcross, GA 30093

404/925-2480

Last PL I mentioned a number of enhancements that could make a PolyMorphic into a more state-of-the-art computer. Several of you responded to my article, and suggested ideas of your own.

PC Disks

The most popular idea was the IBM-format disk project. This would provide a way to read and write IBM-PC diskettes, so that files can be moved between the Poly and most other PC systems in the world. Several of you have expressed a need for transferring files to and from a PC, and this would be a convenient way to do it. (This drive could not be used for additional storage under the Poly operating system. It would only be a means for transferring files to PC format.)

I investigated several ways to solve this problem. A company called ADPI, in Troy Ohio, offers a self-contained box with an IBM-PC format disk drive, a processor, and a serial port. It could be connected to the Poly serial port, and with suitable software, a file transfer system could be set up using this box. The catch is the price: \$1295 each.

The way I originally proposed this project turns out to be a lot cheaper. My approach would be to use an additional disk controller and drive, along with software to read and write IBM-PC format diskettes. Here is the approximate cost breakdown:

\$100 disk controller	\$275
DSDD disk drive	120
power supply & chassis	100

total (excluding software)	\$495

As I mentioned in my last article: If you want to add this to your Poly, and you are prepared to pay for the hardware, I will give you the software for free. I will develop the software and retain the right to re-sell it, with hardware, to other users. This offer is only good to the person who assists with the initial development of this (or any other) project.

Glitch of The Issue



Yes, we had a winner. The Glitch from the last issue was found. Tom deLellis from Torrance, Ca. successfully decoded the answer, and won a free disk of the month. To break the code, add 1 to the first hex number, subtract 1 from the next, add 2 to the next etc.

The glitch was Mr. Pith Helment himself, Ralph Kenyon. Ralph was a good sport and for his efforts he will receive an official Cracker Jack decoder ring. Thanks Ralph!

O.K., now we have a new glitch to introduce and I know almost everyone has talked to him at one time or the other. Below is some of his outstanding achievements:

Has the worlds largest collection of shirt pocket protectors.

His I.Q. and weight are identical, give or take 10 lbs.

Has all of Elvis's unreleased Shower Tapes.

He gives new meaning to "dual floppies".

Was responsible for the phrase "garbage in gospel out".

Wrote shortest book known "Poly Owners I Met While Yachting".

Wrote and starred in "Revenge of the Nerds".

Around PolyLetter we call him Sir.

Below is the code for his name. The person with the first right answer will receive a free disk of the month.

4631104 50739815000. Good luck. PL

Modern cont.

Stuart Woods, an Atlanta writer who uses a Poly for word processing, offered to donate a disk drive to this project. In return, he would want to use the system occasionally for transferring files. Is anyone interested in sharing the cost with Stuart?

Solid-State Disks

John Markentin is doing a fine series of articles on adding a solid-state disk to a Poly. I won't repeat his information here, but here are a few more points about SS disks.

Bob Kelso suggested a fine application for an SS disk. He has some 8810s that have been modified for two drives. But a three-drive Poly is the most useful, so Bob suggested adding an SS disk as the third drive. This turns out to be an excellent configuration. Look at how it all works:

- The "stock" 8810 has exactly one free card slot, which can hold the SS disk card.

- You must boot from drive 1, as usual, then load in the "device driver" software for the SS disk. Let the SS disk be configured as drive 3.

- Then, copy the System disk into "drive 3" (the SS disk) and boot to it. Now you can use drives 1 and 2 for data and programs, and drive 3 will be the lightning-fast System drive.

- Since the SS disk loses its memory when power is turned off, it makes sense to use it as the System disk. You don't often make changes to your System disk.

- If your 8810 has only one drive, you could let the SS disk be used for both drives 2 and 3. A 256K RAM-disk, the kind used by John Markentin, has 1000 sectors, and could easily be divided (by software) into two 500-sector "drives," each slightly larger than an SSSD 5" diskette.

As John pointed out, the new ROMs do their disk I/O through a "detour" in RAM, and changing the "detour" is the way that new device drivers are added to the system. He also suggested the possibility of modifying old ROMs to add the "detour" capability. I've tried this approach, and don't recommend it. First, the "detour" has to be initialized somehow, and finding a place to put the initialization code is tricky. Second, the "detour" has to be called at ALL points where disk I/O is used, not just at address 0406, the main Dio vector. In short, buy the new ROMs from Poly... it's much easier.

Other Ideas

A few new ideas for modernizing the Poly environment have come to mind since the last issue of PL. Let's reverse our thinking for a moment, and instead of fighting the onrush of IBM-PCs, let's assume that many Poly users will eventually buy a PC. How can a PC-owning Poly lover still enjoy the wonderfulness of the Poly?

It would be possible, but costly, to build an add-on card for the IBM-PC which emulates the Poly. Such a card would contain a Z80, 64K of RAM, and software to duplicate what the Poly ROMs do (like disk I/O). It would use the IBM screen and disk drives. It would no longer be able to read/write Poly diskettes - the opposite of our current

problem!

The benefit from this project would be that you could run your old Poly BASIC programs, and many machine-language programs, without modification. With a little luck, even the Poly editor might work.

There are several companies building Z80 cards and 6502 cards for the IBM, which run CP/M and Apple programs, respectively. So we know the project can be done. It is worth it?...

But that project would be quite complex. A much simpler one would be to write a set of IBM-PC programs that provide the nicest features of the Poly system, like the screen editor. These would run under the IBM operating system, MS-DOS. A set of such programs might give Poly owners the bridge they need to move on to the 16-bit world, without the "culture shock" of jumping into a land without screen editors and Super Zap.

If PolyMorphic had carried through with their original plan, of building a PC-compatible upgrade card for our 8813 systems, all of this speculation would be unnecessary. I, for one, wish that plan had worked out.

On the subject of IBM editors: I was recently given a brief demo of a program called Volkswriter. It seemed to be quite similar to the Poly editor, at least at first glance. If you're considering moving your word-processing to a PC, you might want to investigate Volkswriter.

July 16, 1985

Dear Charles,

After talking to you about your modification to the disk controller card for double sided drives, I looked at the source code for the Dio routine in the ROMS. I was worried about the wrong side being left selected after stepping in or out. As it turns out, the ROM code (both Poly's and ASROM's) select the proper side after all the stepping is done. That allows jumpering the direction select line direct to the side select line on the disk controller. I made the change to mine and it works fine. I don't have to rewrite my ASROMS after all.

Also, Al Levy has found someone who has some 80 track double sided drives for only \$65! (And just after I paid \$89!)

For Adventure Fans

I have found the following treasures: Gold nugget, Diamonds, Silver, Jewelry, Coins, Ming Vase, Pillow, Candy, Magazines, Ring, Rod, Cage, Bird, and fresh batteries for the lamp. I know two magic words. I also know how to get rid of the snake. I have maps of two mazes. Anyone interested? I'd like to hear from anyone who is playing Adventure to compare notes. I must have been killed a dozen times getting the maps of the mazes. I count 8 dead-ends in the 'all the same' maze. Has anyone else found other treasures or hazards?

RALPH KENYON better known as:
(WHOLLY PITH HELMET; Ace, Adv, Dead, Phd., R.I.P.)

Adding A Solid-State Disk to a Poly 88ix

Part 2

by

John J. Markentin

In the previous article I discussed some of the reasons why one might add a Solid-State Disk to one's computer system, as well as the difference in such an item and a RAM-disk. In brief, a RAM-disk is a section of memory that is used to emulate a disk drive, whereas a Solid-State disk is an I/O device, occupying no memory address space. I also stated that I would be using the LS-100, a product of Digital Research Computers of Garland, Texas. Please note that this project requires the system ROMs to be version 81 or later.

The Construction Project

The LS-100 kit is not targeted toward the electronically innocent. You must be able to read resistor and capacitor codes, or know someone who can. The project went together with no problems for me, with the exception of the two LEDs. Those in the kit were rectangular and the documentation thought they should be cylindrical. If you get the rectangular type, the anode is the longer of the two. Other than this minor change the assembly went problem free. The time to build the kit was 2.5 hours (I am experienced at this sort of task and it could take others longer). The toughest part is soldering sockets that contain the memory matrix. The high point is when the LS-100 runs.. error-free the first time!

Theory of Operation of The LS-100

The LS-100 consists of 256K of dynamic read/write memory, with the address lines being driven from latches that are loadable via I/O instructions from the computer. There are four I/O ports: Sector high, Sector low, Byte and Data. Their relative addresses are as follows:

Data	BASE+0
Sector High	BASE+1
Sector Low	BASE+2
Byte	BASE+3

where BASE is the I/O address of the LS-100 board. See figure 1 for a comparison of the bits in the registers to the memory address bits within the LS-100.

The lower 6 bits of BASE+1 are used to set the upper 3 bits of the sector address, and also the board address. This makes it very easy to add additional boards, as the additional board just increases the number of sectors available (all the boards are set to the same BASE address, but the board select switches are set to unique values).

BASE+2 is an 8-bit register that is used to load the lower byte of the sector address.

BASE+3 is a 7-bit register that is used to address the byte within the sector. Since this product was designed for a CP/M environment, it is designed to have 128 bytes per sector. An output to BASE+1 will cause this register to be cleared to 0, the normal desired value. Each DATA I/O

causes BASE+3 to be incremented, thus automatically pointing to the next memory location within the sector. The capability of loading BASE+3 with a value other than 00 is used by the checksum routines within the LS-100 software.

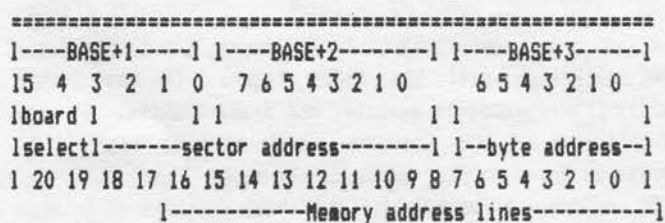


Figure 1.

Software

The software required for support of the LS-100 consists of three modules: LSDISK, LSINIT, and LSDIAG. I will discuss each of these.

LSDISK

LSDISK is the module that supports the LS-100 within the Dio environment. It may be viewed as the driver program for a controller. Its main purpose in life is to translate the parameters passed by the calling program into a sequence of operations at the hardware level which will accomplish the desired result.

For the LS-100, this is fairly simple, as one of the parameters passed to LSDISK is a pointer to the desired sector. This must merely be translated into a pointer into memory on the LS-100. This pointer is treated as a SECTOR NUMBER in the documentation for the LS-100, and for our purposes this is certainly suitable. One minor problem--since the LS-100 is designed for use in a CP/M operating system, it has 128 bytes per sector. Therefore, LSDISK is written to make each disk sector I/O to the LS-100 actually access two physical sectors sequentially, thus transferring the 256 bytes that the Poly operating system expects to be in a sector.

A checksum is generated and checked for each LS-100 sector, and is stored within one of the first 16 sectors, thus the total number of sectors available for data is 2048-16. This translates to 1016 Poly sectors. Of course we must remember that four Poly sectors are needed for the directory, leaving a net availability of 1012 Poly sectors for files.

LSDISK installs itself in memory according to where it is ORGed. It patches into the WH9 vector so that any calls to Dio will first be routed to LSDISK. LSDISK checks to see if the disk unit is itself. If not, control is passed to the resident disk driver code. If the address matches, LSDISK performs the requested function and then returns to the caller.

A note on LS-100 disk unit addresses. Since I have 3 SSSD disk drives in my system, I chose to make the address of the LSDISK unit 4. This may be changed of course, to suit the requirements of your particular system.

Hardware Notes.

Port "0" Serial Card upgrade.

by Ralph Kenyon

I just got a new printer. It's a beaut, the Dataproducts 8050C which they call the Paper Tiger. It has letter quality, correspondence quality, and draft quality. It also has color and all the software which I have written to operate my Prism printer works on the Paper Tiger.

Of course, I wanted to run both printers on my Poly instead of just one, so I got out my spare serial minicard and changed its address jumper to 0 and installed it in the Poly. Using my Setup.60, I defined a new printer called "tiger" which was to be connected to device 0.

Everything seemed to be working out fine, except I had an intermittent problem in which the printer connected to device 1 ate everything printed to it. Poly printed the file and gave me back to Exec, as if to say "I'm done, what's next?" But, the printer said "You never sent me anything at all!" I got out my confidence test package and ran the serial test. It reported errors everywhere! But, it didn't tell me much about what was causing the errors. I says to myself, "We'll see about that.", and broke out my powerfull disassembler. I disassembled SERIAL-TEST.60 and began looking at just what it meant when it said it had an error.

SERIAL-TEST.60 runs through all the baud rates one at a time, sending characters to itself. It counts the number of characters received back in one second and compares that count to a table of minimum and maximum counts for each baud rate. If the count of characters received is less than the minimum or more than the maximum it counts as an error. But, there's more... SERIAL-TEST also asks the USART if it got any parity errors, framing errors, or overflow errors on each pass. If any of these kinds of errors occurred, SERIAL-TEST counts that as an error too.

The count of characters depends upon the real-time clock, which is taken directly from the sixty hertz ac power line, and the CPU clock, which is set by a crystal and a capacitor on the CPU card. If either of these clocks is not running exactly right, the count of characters could be too high or too low. You could get error from counting these things which is not a problem for serial transmission if the 60 hertz power supply is off frequency. More likely is that the CPU clock is a little off.

I was unsatisfied with the kind of information given by SERIAL-TEST, so I changed it to show what the actual count of characters was, to flag whether the count was too high or too low, and to report any framing, parity, or overflow errors. Framing and parity errors are serious and mean something is not right with the electronics.

I also wanted to be able to select which device was to be tested (device 1 or device 0). Afterchanging SERIAL-TEST, my display now looks like this:

```
System 88 Printer Interface Test   Version 1.1 (07/05/85)
                                Device 1
```

```
Passes completed:0001           Total Errors:0003
Baud Rate Lo  Hi  Got  Errors  Baud Rate Lo  Hi  Got
```

Errors

```
                                50   4   4   3  Lo F
P
    75   6   6   7  Hi  P   110  12  12  12   F
P
```

This is much more informative. It tells me about the kinds of errors occurring in the test.

Well, in testing my two cards, I found that I was getting really crazy results. I was getting character counts much higher than the acceptable limit. To find out what was causing the problem I unplugged each card and tested only one at a time. It seemed that the problem was in my Device 0 card. I unplugged each chip and tested it in the device 1 card. I found a 74LS367 chip and replaced it. Everything else worked. Back to Device 0. Hey! the problem is still there! Next I jumpered the card back to device 1 and it worked fine. So, I tried the other card. Same problem. Both cards worked fine addressed as device 1. Both cards gave crazy results when addressed as device 0. What was even crazier, is the fact that the problem only showed up in the confidence test. When I printed to the printer everything looked great. Ok', I says to myself, what's different about the two device selections? Examining the schematic for the Printer interface showed that when device 1 is selected, the select line goes to IC-7, a 74LS04 and is inverted. That inverted signal (active low) is used to enable IC-4, a 74LS367 tri-state buffer for incoming signals and IC-3, a 74LS32 quad 2 input OR gate, which buffers the outgoing signals. But when device 0 is selected, the select line goes direct to these devices without any buffering. I looked back at the CPU schematic to see what kind of device is driving this line and found that it was a 74LS174 flip-flop in IC-30. The signal coming out of the CPU card did not go thru any buffering. I reasoned that when device 0 was selected the load was too much for this flip-flop and that the signal needed to be buffered. I figured out that inverting an inverted signal gives the original signal back, so decided to use one of the unused inverters in IC-7 to do the job. I would have the incoming signal inverted in IC-7 as it is when device 1 is selected, but invert that signal again to select device 0. This way, the select lines to IC-3 and IC-4 would be buffered thru a double inversion in IC-7.

It proved easy to implement this design with only two jumpers and one trace cutting on the Printer card. IC-7 is a HEX inverter but only two of the inverters are used. One is used for current-loop applications and is not used in RS-232 applications.

The output of the inverter goes to a pad marked 1 on the top of the card. This comes from pin 10 of IC-7. I connected this output to the input of the next inverter; I jumpered pin 10 of IC-7 to pin 9 of IC-7 on the back of the board. On the bottom of card a trace runs from pin 9 of the cable to the jumper which connect either to 0 or 1 on the top of the card. I cut this trace and removed a small section close to pin 9 of the cable. I ran a jumper from this trace (the side of the cut away from pin 9 of the cable) to pin 8 of IC-7, which is the output that inverts the input at pin 9.

Now the signal goes from pin 9 of the cable (you cannot see it because it runs on top of the board under the cable

**HOW TO USE MAILLIST
BY
AL LEVY**

I find that most PolyPeople use the Editor or WordMaster exclusively. Next in line is PolyMorphic's Mailist program.

If this is all you use, you are wasting 99.999999% of the Poly's power.

Now don't get me wrong. If that's all you need then enough said. If you want the computer to do more, then the trick is to learn how! I hope to continue writing for PolyLetter (thanks Charles) and run through my experiences thereby help you expand your potential usage and knowledge. I will attempt to write tutorials on the subjects I know best.

PREMISE: You bought a computer to do your work.
PREMISE: You should not be working for the computer.
PREMISE: A computer is redundant, is redundant, is redundant, is redundant, is redundant, is redundant.

Conclusion: If you type it more than once, you are doing the computer's work.

Subject: PolyMorphic's Mailist Program

I don't mean to sound as if I have all the answers, I don't. From speaking to other people using dBase-III or Lotus or Mailist or whatever, I find that many users and programmers use the tried and tested path to set up data bases. Sometimes there is a better way. For Example: Mailist allows you to set up ELEVEN fields. This is a typical setup:

```
1 Title      Mr.
2 First Name Sam
3 Last Name  Smith
4 Address    22-45 East Main Street
5 Address(2)
6 City      Nowhere
7 State     CA
8 Zip       90000-1234
9 Phone     (xxx) xxx-xxxx Ext:0987
10 Phone #2
11 Comments
```

Mailist assumes that you are in some order. You have setup Last Name as the field on which to "sort" the list. The problems arise when you want to print labels or envelopes in zip order. STEP #1

Setup the mailist using this model. The model will allow for foreign mailings, strange address types (4 lines) etc and a few other good things. Notice that we have three fields free. You can use these for anything you wish. If you have nothing in mind, make up field names and sizes. It pays to have room for the unexpected. If you know from experience that you absolutely will not need all the fields use only what you need.

Model 1

```
1 ALFACODE: SMITH SAM (10)
2 ZIPCODE: 90000SMITH (10)
3 SPARE: (30)
4 Name: Mr. Sam Smith (30)
5 Address: 22-45 East Main Street (30)
6 City-Zip: Nowhere, CA 90000-1234 (30)
7 Phone: (xxx) xxx-xxxx Ext:0987 (25)
8 (??)
9 (??)
10 (??)
11 Comments (??)
```

I have set up the next model to reflect the needs of a publication such as PolyLetter.

Model 2

```
1 ALFACODE: SMITH SAM (10) Key
Field
2 ZIPCODE: 90000SMITH (10)
3 SPARE: (30)
4 Name: Mr. Sam Smith (30)
5 Address: 22-45 East Main Street (30)
6 City-Zip: Nowhere, CA 90000-1234 (30)
7 Phone: (xxx) xxx-xxxx Ext:0987 (25)
8 Exp Date: 09/08/86 (8)
9 Source: Shopper (20)
10 Yes/No: Y (1)
11 Comments d1/585 (30)
```

At a glance we can tell that Mr. Smith's subscription will expire in September of 1986. Field #9 tells us that he answered an ad in Computer Shopper. Field #10 tells us that he is currently getting PolyLetter. There is no need to delete his name when the subscription expires. Just change the "Y" in field #10 to a "N". If we want to send renewal notices, send them to all people with "N" in field #10. Field #11 tells us that Mr. Smith purchased the famous Disk Of The Month (#1) in May of 1985.

In model three we are using a four line address. The Label.TX file would look like this:

```
-----
Exp Date: ^8
^3
^4
^5
^6
```

If Field three is blank the resulting label will be:

```
=====
Exp Date: 09/08/86

Mr. Sam Smith
22-45 East Main Street
Nowhere, CA 90000-1234
=====
```

Model 3

```
1 ALFACODE: SMITH SAM (10) Key
```

For Sale

Four SA-400 SSSD disk drives. In working order when replaced. \$40.00 each, contact Ralph Kenyon.

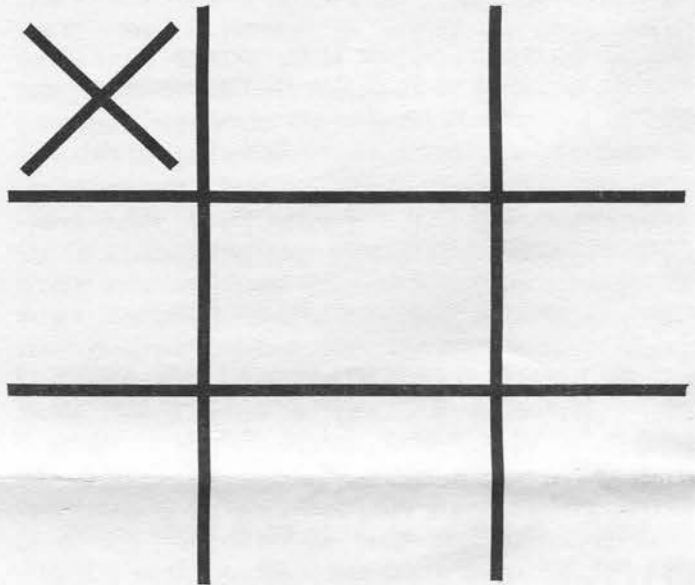
POLYMORPHIC SYSTEMS
5330 Debbie Rd.
Santa Barbara, Ca. 93111
(805)967-0468

Al Levy and the Poly Support Group are making the following items available to PolyLetter subscribers immediately. All items are in limited quantities and are subject unsold.

- <1> Manuals (Latest Releases)
 - a) BASIC \$35
 - b) WORDMASTER II \$35
 - c) User's Manual \$35
 - d) System Programmers Guide \$50
 - e) Maintenance Manual \$50
- <2> Disks Latest releases
 - a) Exec-96 SS/SD \$35
 - b) Exec-96 DS/DD \$35
 - c) WordMaster II \$35
 - d) System Programmer's Guide \$50
 - e) PLAN with manual \$45
 - f) MAILIST with manual \$45
 - g) KISS (BASIC programmers aid) \$35
 - h) Drivers.DD for Hard disk \$35
- <3> ROMS v81 Single or Double \$45
Test Set \$75
- <4> HARDWARE
 - a) Syquest Drive (removable 5 meg) \$650 (NEW)
 - b) Media for above \$ 70 each (NEW)
 - c) Syquest Drive (used) needs work \$200
comes with two hard disks
 - d) SEAGATE 18 Meg drive for Poly system....
needs some work (make offer)
 - e) Diablo 1620 printers. 1200 baud. workhorse
of the industry. Completely refurbished, 90 day
warranty. The Poly was built to work with this
printer. I will include a disk which has
auto-Driver routines to make FORMATTING from Exec
a pleasure! These can be modified by the user to
fit his or her own specs..... \$600 + shipping
 - f) Texas Instrument 810 printer (Make offer)
- <5> MEDIA
 - a) 5 1/4" disks (10 hard sectored)
These are becoming harder to obtain as IBM
takes over! Boxes of 10\$ 12.50
 - b) 32 Hard sectored disks.....call for quotes
- <6> IBM/pc, XT, AT (look alike-100% compatible)
Prices dropping rapidly. Call for quotes.

8813 reconditioned, including: 64K ram, 2 SSSD disk drives
New keyboard III, New 9" monitor Latest ROMs, Exec 96 and
addendum Wood cover \$995.00

Limited stock, so call now for your backup system.



Bit Bucket

Does anyone have a better idea than Mailist? Contact PolyLetter please.

Ralph beware of the dragon!

Chuck Thompson, you haven't sent me your picture yet.

Tom de Lellis wants to know if anybody out there is interested in RBBS for the Poly. He has one that he wrote and PL is going to install it on the system. Try PL around the middle of August for RBBS.

Ken Gudis call PL please.

Ralph has a solution for junk mail. He suggests that the Post Office drill mail slots in the dumpster and cut out 200 million middlemen.

Why won't Adventure let you use Printer LOG or Control-U?

I need Poly keyboards, wood cabinets. Will consider trades.

TONS of "working" software available. I will try to compile a list for the next issue of PolyLetter.

Al Levy
Box 71
Hicksville, New York 11802
(516) 293-8368

SSD cont.

LSINIT

LSINIT should be run after LSDISK is run. LSINIT does check to see if LSDISK has been installed, and does issue an error if it finds that there is no disk drive at the unit number it thinks LSDISK should be at. Note that LSINIT must be told which address is occupied by LSDISK, this is done at assembly time.

LSINIT first tries to read from the first 40 sectors of LS-100. If successful, it quits without disturbing the contents of the disk. This allows us to boot up the system after a catastrophic software boo-boo without having to reload the disk with the desired software.

If the initial read test fails, all sectors are written with zeroes and the proper checksums are generated, and a valid directory is written. A read test of all sectors is performed. Any errors are reported via the console.

LSDIAG

This is a diagnostic program that can be run at anytime. It performs extensive testing of the LS-100 and should not be used while the LS-100 is being used as the sysres device! LSDIAG leaves the contents of the LS-100 directory in an invalid state. It does print a matrix representative of the memory chips, indicating which are good and which failed the diagnostic test. The matrix idea is quite nice; if a chip fails the diagnostic, it is easy to see which one is bad. The test can be left to run for long periods of time.

Let me mention at this point that LSDISK, and LSINIT are of my own creation. LSDIAG was supplied in its original form by Digital Research Computers, and was adapted to the Poly by me.

Well, that about covers this installment. In the next issue I will discuss the use of a Solid-State disk within the context of the PolyMorphics operating system, along with some of what I have learned about the LS-100 so far (yes it is operational!).

Printer cont.

connector) to pin 11 of IC-7, is inverted at pin 10 of IC-7, goes to pin 9 of IC-7, and is inverted again at pin 8 of IC-7, and finally goes to the 0 jumper pad.

It worked! No errors for either card whether connected to device 0 or device 1. My CPU is a vintage early version 0.1, so I don't know if Poly's later CPU's buffer this signal. My solution gave me both printer mini-cards with two different printers and no significant errors. (I still get one character too few at 9600 baud, but without framing or parity errors.)

Abstract Systems, etc.
191 White Oaks Road
Williamstown, MA 01267

Mailist cont.

Field		
2	ZIPCODE:	90000SMITH (10)
3	SPARE:	Mr. Sam Smith (30)
4	Name:	c/o Osgood Corp. (30)
5	Address:	22-45 East Main Street (30)
6	City-Zip:	Nowhere, CA 90000-1234 (30)
7	Phone:	(xxx) xxx-xxxx Ext:0987 (25)
8	Exp Date:	09/08/86 (8)
9	Source:	Shopper (20)
10	Yes/No:	Y (1)
11	Comments	d1/585 (30)

If there is a fourth line to be printed, the label will appear as follows:

=====

Exp Date: 09/08/86

Mr. Sam Smith
c/o Osgood Corp.
22-45 East Main Street
Nowhere, CA 90000-1234

=====

So, we can look Mr. Smith by last name. We can include extra information. We cannot print in zip order without sorting (and who wants to wait three hours?) We are doing "extra typing" for ALFACODE and ZIPCODE! All of this seems to contradict what I stated up front.

Next article:

I'll cover the perplexing contradictions.....

New Disk of the Month

PolyLetter is happy to announce a new disk of the month. The August DOM will feature a help system that was written by our very own Ralph Kenyon. It is very helpful for the new Poly user and veteran alike.

The ease of use and implementation of the file is extremely efficient. The help system resides in a sub-directory HF.DX so the look-up is fast. An example of the syntax is as follows: HELP IMAGE . Here is the actual output:

HELP file for system command "IMAGE"

The "IMAGE" command copies entire disks.

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

"IMAG" prompts:

From Which drive? d1
To Which drive? d2

Minimum size: "IM" (The system must be in ENABLE mode.)
\$\$

The price is as for all DOMs \$15.00. PL

FIRST CLASS MAIL



214/669-2169
Richardson, TX 75080
903 B Allegheny Way

PolyLetter



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PolyLetter

The Newsletter for PolyMorphic Systems Owners and Users

September/October #8505

Letters to the Editor

There has been several letters sent since the last issue and I would like to share some of them with you. Because of the length of some of the letters I will print only the flattering parts.

From Harold Kinne, he writes: Have enjoyed PolyLetter for years... still feel that Poly was years ahead of its time and very poorly marketed. It could, and should, have become the standard personal computer in 1978-1979 and might even have pre-empted IBM's entry into the this marketplace! Poly should be a subject for a case study at Harvard, Stanford, Wharton and other business schools for the next century... it is really a classic marketing goof where they actually did build a better mousetrap and let the world ignore them completely.

Kenneth Lowe writes: I am enjoying PolyLetter, BUT do not like the tone of recent articles on IBM PC compatibility, I realize that some readers may have asked for this, but my opinion is that absolutely no attention be given to this. Constantly reading about IBM's mediocre PC's is very tiresome. IBM cannot "take over" as long as we can keep our machines running and find ways to adapt Poly software to new hardware.

At work I have my own PC AT and use XT's and main frames as well as others. There is no way that I would encourage anyone to trade EXEC for that poorly-concieved PC DOS which has been foisted on computer users by IBM. As an instructor in PC DOS on the job, I can state unequivocally that the DOS used by IBM machines is a frustrating abortion. Many of the commands are really kludges to compensate for the foolish implementation of a very primitive DOS. Since you are a Poly user I need not list the specifics here, so please do not encourage the bastardization of fine equipment like the Poly 8813!

Kenneth continues in saying that we need to adapt the Poly O.S. to new hardware and then have the best of both worlds. Ken says in closing (I've got to get my pat here) your continuing support of PolyMorphic computers is refreshing and welcomed.

Bit Bucket

Has anyone seen Ralph Kenyon? I have tried to reach him several times but to no avail. Rumor has it he is stuck inside one of the Adventure mazes and can't get out.

Chuck Thompson I STILL NEED YOUR PICTURE!!!!

PolyLetter would like to thank all of you readers and recent subscribers, as I say "thanks to you it works".

Please let me hear of anything new that you would like to see in PolyLetter.

Our condolences go out to Bob Bybee, as it looks as if we lost a really fine Poly type person. Rumor has it that he is to marry soon and we know that those late night keyboard jammings are over (sniff). Congratulations Bob, and wish you many years of happiness (the toaster is in the mail Bob).

Glitch of the Issue



Well, I am really disappointed in you readers this time! The Glitch was not found and no one sent in an answer. Moreover the Glitch was quite hurt by not being guessed. Without further delay the Glitch is one of PolyLetter's past editors and regular nice guy..... Bob Bybee! To break the code for Bob's name you have to treat his name as an equation. $4631104 = 50739815000$, now take the square root of each side and this yeilds.... $2152 = 225255$. Now just solve as an alpha-numeric code, 2 is a B, 15 is an O, 2 is a B etc.

We now have yet another poor soul that has sent his picture in for what he thought was a contract with MGM! Unknowing to him PolyLetter was at the bottom of the whole thing and obtained these photos for it's Glitch of the Issue. By the way, you realize if we don't get more pictures then the Glitch series will be history in about three issues. (I suspect that this is what you want!)

Below are all of his outstanding achievements:

Was voted most likely "to" by his Senior Class.

Was class Pres. at the Reform school he attended.

Asked "what was his most difficult obstacle" and replied "I would say third grade".

Opon graduating became a famous Author.

Wrote "Dressing for Success as a Solipsist".

Also wrote for himself "What is Reality".

Below is his name in some sort of code. The first one to send in the correct answer will undoubtedly recieve a free disk of the month. Good luck! 19618111141419205118 PL

How to Use Mailist
by
Al Levy Part 2

Preface

This series deals with setting up a Mailist and writing command files to do most of the maintenance.

The extra files needed will be:

- a) a command file to set up the list using NEWFILE.BS
NF.TX
- b) a disk library file to store command codes
MYdef.ED
- c) a command file to do updating
COMMAND.MY
- d) a file to replace MENU.BS to select different Mailists
- e) a command file to BACKUP your new entries

Notes: Setting up is somewhat more tedious than typing by hand but you only have to set up once!
Errors created by manual entry are lessened when the machine does the work.

Model 3

```

1 ALFACODE: SMITH SAM          (10) Key Field
2 ZIPCODE: 90000SMITH        (10)
3 SPARE: Mr. Sam Smith       (30)
4 Name: c/o Osgood Corp.     (30)
5 Address: 22-45 East Main Street (30)
6 City-Zip: Nowhere, CA 90000-1234 (30)
7 Phone: (xxx) xxx-xxxx Ext:0987 (25)
8 Exp Date: 09/08/86         (8)
9 Source: Shopper            (20)
10 Yes/No: Y                  (1)
11 Comments: d1/585           (30)

```

To continue:

I am editor of a computer club news-letter. LICA (The Long Island Computer Association) has close to 5000 names on the Mailing List.

Problem:

The President and Treasurer of the club each get a report each month. The report is printed in (Last Name) Alfa order.

Problem:

We mail domestic mail using bulk rate. The mail must be in zip order.

Problem:

Sorting the list using Poly's SORTFILE would take a day and a half. (Maybe I'm exaggerating a bit.)

The "ZIP" problem would have been solved had I set up the MailList as in model 4 but then I would have to sort to print the report!

Model 4

```

1 ALFACODE: SMITH SAM          (10)
2 ZIPCODE: 90000SMITH        (10) Key Field
3 SPARE: Mr. Sam Smith       (30)
4 Name: c/o Osgood Corp.     (30)
5 Address: 22-45 East Main Street (30)
6 City-Zip: Nowhere, CA 90000-1234 (30)
7 Phone: (xxx) xxx-xxxx Ext:0987 (25)
8 Exp Date: 09/08/86         (8)
9 Source: Shopper            (20)
10 Yes/No: Y                  (1)
11 Comments: d1/585           (30)

```

Using the natural power of the Poly, I decided to take a new approach.

First, I hate typing data in response to BASIC prompts. Second, I love keeping my keystrokes down to a minimum. Third, the possibility of error in the fields labeled ALFACODE:, ZIPCODE:, Name: and City-Zip are increased

when one types them more than once.

Examples: ALFACODE: could be right but the name typed wrong. (or the reverse)

ZIPCODE: could be right but the CITY-ZIP typed wrong. (or the reverse)

For LICA I use the following field names:

```

ACODE:
ZCODE:
SPARE:
NAME:
ADDRESS:
CITY-ZIP:
PHONE:
EXP DATE:
SUB GROUP:
MAIL EXC:

```

The EXP DATE and MAIL EXC are usually the same. Expiration date is the end of the current year and is entered as 12/31/85.

The Mail Exclusion has to be Y (for yes) or else I would not be entering the name.

The phone usually starts with (516), the area code for Long Island.

NOW FOR THE SOLUTIONS

a) Setting up

First I used NEWFILE and answered all prompts by hand entry. I kept a pad handy and wrote down everything including "NEWFILE". (I deleted the MENU years ago) To tell the truth I typed NF because I renamed NEWFILE to NF to save keystrokes. Talk about lazy.....

My notes appeared as follows. The first column is what I typed. The second column told me what I was doing.

NF	Typed from Exec
ACODE	First Field Name
10	Number of characters
ZCODE	Second Field Name
10	Number of Characters
SPARE	Third Field Name
30	Number of Characters
NAME	Fourth Field Name
30	Number of Characters
ADDRESS	Fifth Field Name
30	Number of Characters
CITY-ZIP	Sixth Field Name
30	Number of Characters
PHONE	Seventh Field Name
13	Number of Characters
EXP DATE	Eighth Field Name
8	Number of Characters
SUB GROUP	Ninth Field Name
2	Number of Characters
MAIL EXC	Tenth Field Name
1	Number of Characters
Y	Key Field Select
Y	<Y>es Its True
ML<NAME	New of Mailist File
4	Drive to store Date file
Y	<Y>es Its True
1336	Number Of Sectors Available
Y	<Y>es Its True

I did not enter the last Y. Instead I used the Poly Editor and typed the first column exactly as shown above. There is a <RETURN> after the last Y.

I typed the name of the EDITED file and the system did the work.

This command file created ML<NAME and ML<NAMEC

Adventure Patches

Why won't Adventure let you use printer log or CONTROL-U?

Adventure loads at 2F00H, which is the address where the worm-hole driver lives. Also 3000H-31FFH is overwritten, and that is where the serial device driver lives in the current operating system. When adventure loads, it clobbers the printer device driver code. But, a call to WH7, which is used in Printer LOG, or CONTROL-U still jumps into those locations. When you set up CONTROL-U and try to use it in Adventure, you make a random jump into the beginning 3 sectors of Adventure. If you are lucky, you eventually get back into the program, because Adventure keeps its own stack pointer, and resets it on each loop. Otherwise, you get hyper-space. This can be prevented by placing a RETURN instruction in WH5, WH6, & WH7. You still won't get any printouts, but you won't end up in hyper-space.

There are three bugs in Adventure that can be fixed. When you are at locations other than the east side of the fissure, waving the rod gives the message "asm.", when it should say "Nothing happens". This bug can be corrected by changing 6 bytes using the front panel.

To make the change, Adventure must first be brought into memory with the system command "GET". After making the changes, the new version is saved with the system command "SAVE". First, enable the system with the ENABLE command. \$ENABLE (The system prompt will be changed to 2 dollar signs.) Second, bring adventure into memory with the GET command. \$\$GET <?<Adventure.GO When the system prompt (\$\$) returns, Adventure will be in memory and you can then proceed. Next, we bring up the front panel by holding down the CTRL key and typing a "Z". (CTL-Z). Once in the front panel, we will locate and change 6 bytes of memory to make the change. First, we need to point the memory modify window at the proper location. To do this type in L4082 and RETURN. After doing this, the lower part of the display will change and show the number "4082" in front of a right arrow and the bytes "CA 8B 40 21 2A 00 C3 94" to the right of the arrow. The display should look like this:

```
PC 05F1 E1 FB 76 E5 3A 8B 2D B7
SP 0FF6 24 F1 05 14 05 3F 00 6F
HL 2D40 30 34 4C 50 72 20 46 69
DE 2771 00 24 24 00 20 2D 20 54
BC 003F 2A 1C 0C E9 D3 08 21 00
AF 2456 Z
```

```
4062 94 31 21 DB 00 E5 FE 2E
406A CA FD 3F FE 51 CA FD 3F
4072 FE 52 CA FD 3F C3 91 31
407A C5 CD 4A 39 C1 79 FE 05
4082 CA 8B 40 21 2A 00 C3 94
408A 31 3A 13 4D B8 C2 94 31
4092 21 78 4A 34 E5 1E 0C CD
409A 9C 35 E1 7E FE 02 C2 97
```

The top part of the display will be different for different operating systems and PRDMS, but the bottom part should be the same as is shown. The change is made by typing in each byte followed by one space. First type in "21" and a space. The display will change and the number in front of the arrow will become 4083; also, the byte at the end of the line above the arrow will now be 21. Continue with the five remaining bytes: 2A (space) 00 (space) CA (space) 8B (space) 40 (space). At this point the display should read as follows:

```
PC 05F1 E1 FB 76 E5 3A 8B 2D B7
SP 0FF6 24 F1 05 14 05 3F 00 6F
HL 2D40 20 31 32 50 72 20 46 69
DE 2771 00 24 24 00 20 2D 20 54
BC 003F 2A 1C 0C E9 D3 08 21 00
AF 2456 Z
```

```
4068 FE 2E CA FD 3F FE 51 CA
4070 FD 3F FE 52 CA FD 3F C3
4078 91 31 C5 CD 4A 39 C1 79
4080 FE 05 21 2A 00 CA 8B 40
4088 C3 94 31 3A 13 4D B8 C2
4090 94 31 21 78 4A 34 E5 1E
```

```
4098 0C CD 9C 35 E1 7E FE 02
40A0 C2 97 31 36 00 C3 97 31
```

Check to insure these two lines appear as follows:

```
4080 FE 05*21 2A 00 CA 8B 40*
4088 C3 94 31 3A 13 4D B8 C2
```

If you make a mistake, start over, since you might have inadvertently changed something else.

The second bug is the fact that the system bombs when you quit. This can be fixed by changing 11 bytes in two locations. First point the memory window at 4FF7 with the command L4FF7 RETURN. Now, type in the following 9 bytes, each followed by a space 21 40 00 22 1A 0C C3 03 04 Then move the memory modify window to 3AE4 with the command L3AE4 RETURN. Now, type in the following 2 bytes, each followed by a space F7 4F

For the third bug, load the memory modify window with the address 47A6 using the command L47A6 (RETURN) At this time insert three 00 bytes by typing 00 space 00 space 00 space. Once the change is correctly made, we have to get out of the front panel and save the changed result. To get out of the front panel, type a single "G" followed by a RETURN. The enable prompt, "\$\$", will appear. Finally we must save the changed copy with "SAVE". "SAVE" will ask questions which you answer as follows:

```
$$SAVE
From address: 2F00
Load address: 2F00
Start address: 2F88
Number of sectors (1-7F): 21
File name: <#<New-Adventure
What do the changes mean? The first change puts the number
of the message for "Nothing happens.", which is 42, into HL
before a conditional jump.
The 'original' code read:
```

```
JZ 408BH ;Wrong location, so go display
message
LXI H,42 ;Nothing happens message
```

With our change, we correct the bug by putting the message into HL first.

```
LXI H,42 ;Nothing happens message
JZ 408BH ;Wrong location, so go display
message
```

The second change is needed to disconnect the clock when you quit. The original code, before I chaged it to "Warm" went to 0, resulting in a cold boot. We add the code at 4FF7 to turn off the clock, and then to warm start Exec.

```
LXI H,10ret
SHLD WAKEUP
JMP Warm
```

And then point the exit jump to this code. The third change corrects for MEMTOP being reset.

The old code, which said
SHLD MEMTOP
is replaced with

```
NOP
NOP
NOP
```

which prevents MEMTOP from being changed.

Also, the READ LISTING command in Adventure bombs out because the operating system was changed in some subtle way. This can be corrected with a Pre-Adventure program which fixes things up. (Assemble it yourself.)

; Pre Adventure program

```
REFS SYSTEM.SY
REF WH1
REF WH5
REF WH7
REF Ovrto
REF Warm
REF USER
```

ORG USER

GOTO 6

HOW PROGRAMS RUN ON THE POLY, THE TWIN, AND OTHER THINGS

by Bob Bybee
Poly Peripherals
1437 Sugarwood Lane
Norcross, GA 30093

When a computer system is designed, the engineers make a number of important hardware and software decisions about how the system will operate. One of the most important decisions is the memory map. It determines how the memory in the machine will be used, how much of it is available for user-written programs, and how much of it is reserved for the operating system. And, there is always an upper limit on how much memory can be installed in the machine.

In the 8813 (and most other small systems), the maximum amount of memory the processor can use is 65536 bytes, or 64K bytes. The Poly designers took a large amount of "low RAM" (lower memory addresses) and dedicated it to the operating system and I/O devices. Addresses 0000 to 0BFF are ROMs, 1800 to 1BFF is the screen memory, and so on. (All addresses in this article are in hexadecimal.) The System Programmer's Guide gives a memory map of the Poly, if you're interested in more details.

There is a small amount of RAM at addresses 0C00 to 0FFF, and a few other chunks between 1000 and 1FFF. But what we normally think of as RAM, a continuous block of memory, starts at address 2000 hex. It continues up to some high memory address, and that address depends on how much RAM is in your system. If your machine says "Top of RAM is FFFF", then you have 56K of RAM between addresses 2000 and FFFF. That's as much as a Poly can hold.

But you don't get all of this RAM for your own programs. The operating system, Exec, reserves all the space from 2000 to 31FF hex. There are areas in this region that hold a copy of a disk directory, a buffer for keyboard input, a serial port buffer and printer driver, and literally hundreds of little variables used by Exec to keep track of what's going on. So your "user area" actually runs from 3200 to the top of RAM. If your top of RAM is FFFF, you have 51.5K bytes of user RAM.

This magic number, 3200 hex, is very important in the Poly. It's the start of the user RAM area, and most programs are written so that they load into memory at this address. Look at any disk directory in ENabled mode, and you'll see that most executable programs have a load address (La) and start address (Sa) of 3200.

CP/M systems have a similar magic number. Their memory map is quite different, so their "user RAM" begins at 100 hex. Using CP/M, the operating system lives in high memory, not in low memory like it does in the Poly.

There's a disadvantage to having all programs run at the same address. Only one program can run at a time! Years ago, this wasn't much of a limitation; but today, users expect their computers to do multiple chores at the same time. It's annoying to have to wait while the formatter prints a hundred-page document, for example. Thus was born the idea of multi-tasking. Large mainframe computers have done multi-tasking for years, so that many users could share the power of a big system. But we've learned that users want a small system to do more than one thing at a time, too.

There are also times when you want a program to remain in memory, so it can be called upon when needed. This is not a true example of multi-tasking, but presents similar problems: if all programs run at address 3200, how do you keep one in memory while running another?

Relocation

Many programs on the Poly are relocatable, meaning they can run at any address, not just at 3200. The word processing system WPS, the popular utilities in KISS.RL, and the Poly hard disk device driver file Driver.DD, are all relocatable programs. These programs will initially load at 3200 and then copy themselves up to a high memory location, adjusting addresses inside the program as they go. This is similar to what happens when you tell BASIC to renumber a program: not only do all the line numbers have to change, but all the references to those numbers must also change, or the first GOTO would blow up.

The Poly is not set up to handle relocatable programs directly. A special "loader" routine is included inside each one of these programs, and the loader is responsible for moving the code and knowing what to change for relocation. The Poly assembler has an undocumented command, RELOC, which assists in writing a relocatable program. But Poly does not provide a loader routine for you to use. Poly Peripherals does offer a relocating loader, and a discussion of RELOC will appear in a future PolyLetter article.

Enter the Twin

True multi-tasking requires more memory. If one user can occupy all 51.5K bytes, and that's all the system has, you obviously can't let two people run big programs simultaneously.

When they devised the TwinSystem 8813, Poly's designers used a technique called "bank switching." One entire 56K bank of memory is turned off, and another bank is turned on, in order to let the system access more than 64K of memory. Each bank contains one user's program, and each user can still only run one program.

The Twin alternates between the two users. It turns on user 1's memory and runs his program for a while, then turns user 1 off and user 2 on, and runs user 2 for a while. This switching happens many times per second, so it's not noticeable to the users. The operating system is also smart enough not to wait around for a user when no program is running on his side. If only one user is trying to do something, he gets almost the full computing power of the system, not just half of it.

So in the Twin, there are two areas of "user RAM", both of which have the same address. Bank switching keeps them out of each other's way. There is also an area of common memory that isn't switched, and is used by the operating system at all times, regardless of which user is running. The Twin allows user programs to run in addresses 2F00 to DFFF. All memory between 2000 and DFFF is bank switched. Memory below 2000, and between E000 and FFFF, is used by Exec and is not switched.

Why did the start of user RAM change from 3200 to 2F00 in the Twin? In a single-user system, the area from 2F00 to 31FF is used by the printer driver software. Since there's only one printer port, it wouldn't make sense to put this software in both users' RAM, so the printer driver was moved up above E000 in the Twin. The extra 3/4 of a K was given to the user. This change from 3200 to 2F00 is one of many important differences between the single and Twin, and is why a program written for one will not run on the other.

More New Ideas

Newer processors, like the 8086, 8088, and 68000, have the ability to access more than 64K bytes. The 68000, used in the Macintosh (Apple) and Amiga (Commodore), can access up to 16 megabytes of memory. The 8088, used in the IBM-PC and its clones, can access up to one megabyte (1024 K); although the PC's memory is not designed to be expanded beyond about 640K.

The 8088 was designed with multi-tasking in mind. With its large memory space, an 8088 can easily have more than one program in memory at the same time. But what about the problem of loading all programs at the same address? Is bank switching needed again?

The 8088 contains a memory management scheme using segment registers. A segment register is a component of the 8088 which allows the operating system to "offset" memory addresses, so that the address seen by a program is not the actual memory address that is used. Every program can think it is loaded at some fixed address (say 100 hex), but in reality, the programs are loaded in different parts of memory.

Suppose programs A and B both want to run at address 100 hex. The operating system loads both of them, but might load A at 1100, and B at 2100. Then, the 8088 processor can run both programs by switching between the two, just as the TwinSystem does. But to keep both programs happy and make them both think they're running at address 100, the 8088 must set its code segment register to 1000 while running program A, and 2000 while running B.

Segment registers make it easy for programs to be relocatable. But they don't offer one program, or one user, any protection from another. Program A can write all over

program B, changing its data or crashing it completely. Program A might do this unintentionally if it wasn't completely debugged.

Larger, multi-user systems can't tolerate this situation. If you were running your payroll program, you wouldn't want another user of the system to be able to change any values in your data or crash your program. True multi-user systems must have complete protection between users, preventing any malicious or accidental interaction between them.

Large systems use a technique called hardware memory management to protect users from each other. When any program tries to read or write memory, the memory management unit (MMU) checks that the requested memory location is valid (belongs to that user). If not, the memory access is trapped, and the program is stopped before it can read or alter someone else's data. Only the operating system can control the MMU and determine what memory areas are valid. User programs are not allowed to read or write to the MMU, since it's in an area of memory that these programs can't access.

The 8086 processor is an upgraded 8086 machine, containing not only segment registers but an MMU as well. This processor is suitable for running a multi-user system. The 80286 is currently being used in the IBM PC-AT. Unfortunately, the '286 suffers from the same drawback as the 8086: neither of these chips can directly address more than 64K of memory without diddling with the segment registers. Programs that want to use arrays larger than 64K will always be slowed down by this fault, which the 68000 doesn't share.

The 68000 processor doesn't have any segment registers like the 8086. But it can be used in connection with an MMU to build a system that's much more powerful than the 8086, and that's the basis for the growing popularity of the 68000. It's being used in computers ranging from the Macintosh to large engineering workstations and graphics displays, like the kind my employer (Chromatics) builds.

So the next time you worry that your Poly contains outdated technology, remember this: The IBM-PC, and the 8088 that powers it, was outdated the day it was introduced. Newer and faster processors like the 68000 (and its turbocharged cousin, the 68020) can run circles around the 8088. But that isn't keeping the PC and friends from holding onto a large share of the market. And the availability of faster systems shouldn't keep you from holding onto your Poly, if it continues to serve your needs.

NEW USES FOR THE POLY

Found a new use for your Poly, but can't figure out how to make it fly?

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EASYLINK SOFTWARE NOW AVAILABLE

Poly Peripherals now offers EASYLINK software. Let your Poly act as your Telex machine, automatically receiving Western Union messages, even when unattended. Messages are automatically stored on disk for later listing or printing. Compose your messages using the Poly text editor and transmit them to Western Union customers anywhere. Works with a standard Poly serial port, using any auto-answer modem. For information about the EASYLINK Western Union Telex service, contact Poly Peripherals or your local Western Union office. EASYLINK software for the Poly is priced at \$200. Poly Peripherals, 1437 Sugarwood Lane, Norcross GA 30093, (404) 925-2480.

For Sale

One 8813, 64k card, 3 SSSD drives, keyboard III, 9" monitor, all documentation, EXEC 96. \$895.00 contact Mark MacLin at PolyMorphic Systems, phone (805)967-0468.

Hard disk from PolyMorphic, this is the HD 18. Includes: 18 meg disk, controller, power supply, chassis, EXEC 96, CPU ROMs, cables, ready to go. Limited supply \$1595.00. Contact PolyMorphic Systems at (805)967-0468.

New from PolyLetter

Are you still running without a full deck? Do you need more memory for a reasonable price? Do you have any 16k memory cards for sale or for conversion? PolyLetter has 4116 chips for sale. These are the ones used in 16k to 64k card conversions. PolyLetter also has 4164 and 41256 chips for sale, and almost every other chip you might need.

Qume 142 DSDD half high, fully compatible with SA-400 and with a ROM change can be run as 800 sector disks... \$69.95 each Samsung 12" amber or green monitors with tilt base. Composite \$84.95, TTL \$94.95. 10 meg hard disk half high...\$325.00, 20 meg\$435.00. These are Shugart drives.

Fortis DM20 printers. These are the printers you have been holding out for! Full size carriage, serial AND parallel interface! Bottom or rear paper feed, fully Epson compatible, and (shudder) IBM compatible (switch select). Tractor AND friction feed. 160 cps on draft, 80 on correspondence and 37 at NLQ setting! This printer is fully programable thru Wdm II and EVEN has proportional spacing (5-20)!! Bit addressable graphics. 110 to 9600 baud, 2k buffer, DTR, Xon/Xoff, ETX/ACK. Fully Epson compatible (Esc n or Esc nn) format, etc. The printer can also be set to print 10,12,16.7,cpi and 1,1.5, or 2 line spacing, or proportional spacing FROM the the external buttons on the printer face. List price is \$900.00 but for a limited time and limited quantity PolyLetter is pleased to offer these fine printers at only \$499.00!! The copy you are reading was printed by this printer. Contact PolyLetter.

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ONE 64k memory board... \$125.00 and exchange for a working 16k Poly card. Contact Ralph Kenyon.

Adding a Solid-State Disk to the PolyMorphics System 881x

by
John J. Warkentin

In the previous two installments I discussed some of the reasons for adding a solid-state disk to the Poly, and the software required to support and use such a peripheral. In this final installment I want to talk about utilizing a solid-state disk to good advantage.

A solid-state disk can be two or more times as fast as a hard disk due to the lack of seek time and rotational latency (waiting for the correct sector to come around). This speed is the primary reason for adding it to a computer system. Since the Poly operating system is so disk-intensive, one becomes acutely aware how slow 5.25" floppies are.

The logical method for merging the solid-state disk into the Poly system is by the use of the INITIAL command. At boot time the Poly operating system looks for a file called INITIAL. If found, it is executed. If INITIAL is a text file, it is treated as if it contains commands typed in at the keyboard. Thus a file can be created that will cause the computer system to automatically copy all files from the boot drive (1, if SSSD), to the solid-state disk. I did this using a program that I wrote. The program stays in memory, permitting a number of files to be copied. This reduces Dio but I found that it took two and a half minutes to copy all the overlays, Asmb, Edit, and BASIC. Is there something faster (dis-satisfaction.... the mother of invention), I wondered. The IMAGE command copies entire disks without referencing the directory. That reduced the time to 45 seconds.... much nicer.

I ended up with a command file that looks like this:

```

ENA                ;Allow use of IMAGE
LSDISK.G0          ;Install disk driver
LSINIT.G0          ;Initialize LS-100
IMAGE              ;Copy system to LS-100
1                 ;From disk
4                 ;To disk, LS-100 is drive 4
SYSRES.G0 4        ;Make LS-100 system drive
DNAME              ;Rename it, avoid confusion
4                 ;Drive number
LS-100            ;New name
DEL LSINIT,LSDISK,LSDIAG ;Delete un-need files
PACK              ;Reclaim space
Printer TOSHIBA    ;Initialize printer
    
```

A couple of additional comments: of course the above comments to the right of the semi-colons are not in the file. The file SYSRES allows reassignment of the system drive, which specifies where the system overlays are to be found. Might as well put that speed to work! SYSRES is something I wrote, which allows one to reassign the system device. The delete action is not really necessary, but I will explain shortly why I reclaim the directory space.

Which additional files you want to put on the LS-100 will depend on what you use your system for. Any file that is used frequently is a candidate for transfer to the LS-100. Just remember that when the power goes away, so does the contents of the LS-100. Remember to copy any modified files to floppy disk before shutting off the power.

The speed of the LS-100 quickly becomes apparent when one is in a tight loop of editing, assembling, testing, back to editing of a program. Again remember to save the final product to floppy before shutting off the power. This last item is the major change in using the computer that has to be learned after the addition of the LS-100. It may be learned the hard way, but nevertheless it will be learned.

A natural result of using IMAGE to copy an entire disk onto the solid-state disk is the setting up of several boot disks, one for each major function for which you might use your computer. In my case I have one disk for WordMaster, another for serious debugging activities and another as a vanilla system.

With the availability of so much disk space it is tempting to load up the LS-100 with lots of files.

Unfortunately the directory space is not correspondingly larger (this is why I delete un-needed files at boot, to reclaim directory space). I generally run out of directory room long before disk space. The solution to this is to learn to use a tree-structured directory. This means the placing of related files within sub-directories. I encourage you to read your System 88 user manual for more information on this subject.

Such projects usually lead to doing some timings, just to impress oneself with the great improvement in speed.

Function	LS-100	SSSD
WordMaster II time to 1st menu	6.0	17.2
sec		
WdM II 1st menu to "hit any key"	5.3	12.0
Execute BASIC	1.3	6.2
BASIC TEST (test residing on SYS)	2.5	12.6
Asmb	1.2	7.0
Szap	1.9	4.4
Sniff 293 sectors	2.6	
Sniff 1016 sectors	8.0	
Sniff 314 sectors		61.0
Total time (not including Sniff)	18.2	59.4

The ratios of the times varies somewhat, and will reflect the location of the files on the floppy disk. One of the nice things about the LS-100 is that the access time is the same, no matter where the file is on the disk. The average ratio of times is 3.3 : 1, which means that the LS-100 is about three times as fast as my old SA-400 disk drives.

The above calculations do not include the times for Sniff, as Sniff reads only the sectors in use, not the entire capacity of the disk. However, we can use the Sniff times to gain some idea about relative transfer rates. The floppy time/sector ratio yields about 5.1 sectors/sec, or about 1,317 bytes/sec effective transfer speed. The LS-100 times yield 112.7 sector/sec (28,581 bytes/sec) and 127 sectors/sec, or 32,512 bytes/sec. An average of the two LS-100 Sniff times is 123.5 sectors/sec, which is 31,613 bytes/sec average transfer rate. We can thus come up with a transfer rate ratio of about 24:1 between the LS-100 and a SSSD floppy.

All the discussion of numbers doesn't really get across how much faster the system SEEMS when the system files reside on the Solid-State Disk. Since the Poly operating system makes so much use of overlays, almost any command given results in disk activity. The Solid-State Disk makes this almost invisible.

This has been a fun project for me, in case you can't tell. Everytime I use my Poly I enjoy the super speed which was the primary goal of my work. It is well worth the expense to add a solid-state disk to your system. PL

Adventure cont.

```

IDNT $,$
JMP Start
JMP Warm

Start LXI H,Null
      MVI A,2
      CALL Ovrto
      DB 'Prnt'
      LHLD WH1+1
      SHLD WH5+1
      SHLD WH7+1

Null  DB 'Null',0DH

      END
    
```

Asmb Pre-Adventure.AS Pre-Adventure.G0

N
N
N

Mailist cont.

The next step was to copy the data files.
If you use 5.25" disks, IMAGE the disk.

The second copy of the data files I RENamed ML<ZIP
and ML<ZIPC.

I then ran SORTFILE (SF). and "sorted" the new ZIP
list. Of course there was nothing to sort but I did
change the key.

Next steps:

- 1) IMAGE either of the data disks
- 2) Put a write protect on the extra copy
- 3) Store the extra copy as a model for the next time

(A small aside)

In case you are getting weary with this.
Even if you never have to go to these extremes,
write down whatever you do when running a program!
If you must type the same things each and every time
you run the program, TYPE IT INTO A TEXT FILE!!!!!!

The text file is now a COMMAND file and it will type
your response from that point on.

(Back to business)

The next step was to write a command file that would
enter the same information into both files and forever
keep my typing at a minimum.

AHA! Poly's Editor, (Bless Its Creator), allows the use
of Escape libraries. You know, when you press
[ESC]i you get . (You didn't know?????)

Why not create a file for the purpose of editing
a command file?

D.K. I edited a fake file called FAKE and started
defining keys. The first one was an obvious need.
I needed the names of the mailist fields. So I played
around a bit. Let's build it together.
TURN ON YOUR POLY AND EDIT A NEW FILE

REM create the field names
Type ESC=1 and what you see in the left column

ACODE:
ZCODE:
SPARE:
NAME:
ADDRESS:
CITY-ZIP:
PHONE:
EXP DATE:
SUB GROUP:
MAIL EXC:
Y
A

<RETURN>
press the up arrow 12 times
type a ctrl/F (don't let the swahili-like
character fool you)
type a colon :
type ^[
Press [ESC]

Just for the fun of it, now press [ESC] then 1.
You can erase the results later.

Now type any last name, a space, a first name and even
a middle initial if you wish.

Example JONES HARRY L

Press the down arrow. You are now at the ZIPCODE field
Type a 5 digit zip code such as 09876

Now for the tricky part. NONE of the commas are to be
typed.
They are here for punctuation only.

REM Fill in LAST NAME in ZIP and NAME fields

REM Dont type returns!

Type ESC=2
Type ^[, an up arrow, a ctrl/f, a colon, ^[, ^[a right
arrow
ctrl/f, a space, AND ^[
Press the left arrow
Type type ^[, a left arrow, ^[
press the down arrow twice
press the left arrow <---- once
type ^[, ctrl/c, ctrl/f, NAME:, ^[, ^[AND ctrl/c
press the [ESC] key

REMOve the arrows

Type ESC=3
type ^[, three up arrows, ctrl/f, a colon, and ^[
press the right arrow once
type a ctrl/d, ctrl/f, a space and ^[
press the left arrow once
type a ctrl/d
press the [ESC] key

REM last name in the NAME: field

Type ESC=4
press the right arrow
type ^[and press right arrow
type ^[and press the down arrow
press the left arrow
type ^[and press the left arrow
type ctrl/f, NAME:, ^[, ^[, ctrl/c and a space
Press the [ESC] key

REMOve the arrows

Type ESC=5
type ^[and the up arrow
press the up arrow, the left arrow
type ctrl/d and press the right arrow
Press the up arrow
type a ctrl/f, a space, and ^[
press the right arrow, ctrl/d, ctrl/f, SS:, ^[
Press the [ESC] key

REM Do all of the above (2-5) in one fell swoop
REM I used the letter "N" for "NAME"
REM Easier for me to remember

type ESC=N
type ^[2^[3^[4^[5, ctrl/f, SS:, ^[
Press the [ESC] key

REM Put the zip code after the address

type ESC=6
type ^[, four up arrows, ctrl/f, a colon, ^[, six right
arrows
type ^[, a left arrow, ctrl/f, DATE:, ^[
Type ^[, Press up arrow, left arrow, type two spaces
Type ^[, ctrl/c
Press the [ESC] key

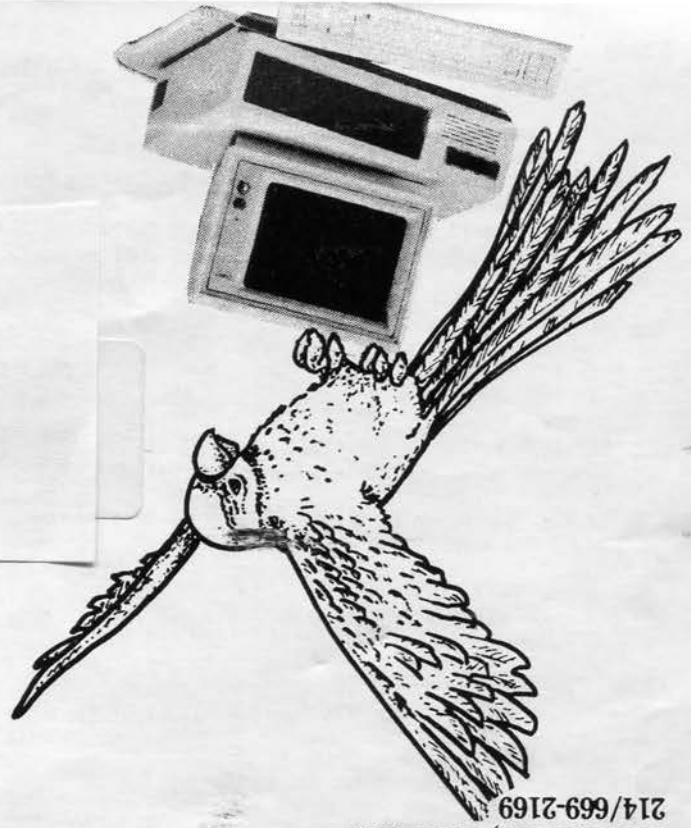
REMOve the arrows

Type ESC=7
Type ^[, four up arrows, ctrl/f, a colon, ^[
Press a right arrow, type ctrl/d, six right arrows,
ctrl/d
Type ctrl/f, PHONE:, ^[, (516), and a space

REM Combine the last two
Type ESC=Z
^[&^[

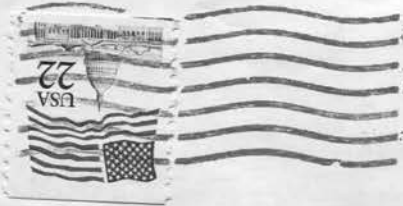
GOTO 8

FIRST CLASS MAIL



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Richardson, TX 75080
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PolyLetter



More About Adventure

Actually, there are several other bugs, and very many things which are not implemented. I have now DisAssembled both VM.VM and Adventure.GO (INITIAL.GO on the DoM), and have been thru it to see what goes on. I have corrected most bugs and added some routines. The Dwarves are supposed to move - fixed. The Dwarves are supposed to block your way sometimes - fixed. The Dragon and the Rug code has been fixed too. Now you have to ask for the rug to get it. I sent in a very nice map of one of the mazes, (maybe Charles will print it.) I don't know how the game is supposed to work when it comes to the ending. There's no code at all for that part of the game. If anyone has information about the game, let me know. I hear it's on the source in almost exactly the same format (no attic though).

Things I still have to do: make dwarves throw knives, fix the get water/get oil code, add the water plant code, add code for seeing the Pirate, fix the pick up things code, figure out how to repair the cave-in's to get to certain blocked areas, etc. If you have any ideas about what it does that you think it isn't supposed to, or doesn't do that you think it should, or any other ideas about it, drop me a line. If you want a copy of my "working version", send \$5

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Lets test this out:
Erase all of what you, but don't leave the Editor!

Press ESC-1
Fill in Last name space and first name such as JONES MARY
Press the down cursor
fill in a 5 digit zip code such 09876
Press ESC-N
Fill in an address
Press the down cursor
Fill in the city and state(no space after state)
Press ESC-Z

- 1) DON'T QUIT THE EDITOR YET
- 2) ERASE THE CONTENTS OF THE FILE (IF ANY)
- 3) TYPE [ESC] 1
- 4) FILL IN LAST NAME AND FIRST NAME
- 5) FILL IN ZIP CODE
- 6) PRESS [ESC] N
- 7) FILL IN ADDRESS
- 8) FILL IN CITY AND STATE
- 9) PRESS [ESC] Z
- 10) FILL IN THE PHONE NUMBER

Press ESC CTRL/W
Answer the prompt "Key Definition Name:" with "MYdef"
Not "MYDEF"
Not "mydef"
USE "MYdef"

ERASE WHAT YOU HAVE. QUIT THE EDITOR

..... to be continued

Questions concerning this series will be answered if you write to me (Al Levy - Box 71 - Hicksville NY 11802) or call (516) 293-8368.

PolyLetter

The Newsletter for PolyMorphic Systems Owners and Users

November/December #8506

Editorial

Something just occurred to me at about 12 pm. the other night. PolyMorphic Systems is the oldest micro system that is still in production. To verify this I called Poly and they indeed acknowledged that they were. Now I know that this opens up the old rumor of where is the new system. The real issue is will PolyMorphic stay in business and will they continue to support our systems. Whether they do indeed release a new system that is not of the "old" style or an IBM type, it doesn't really matter. Are they going to be there to keep our 8813's operational?

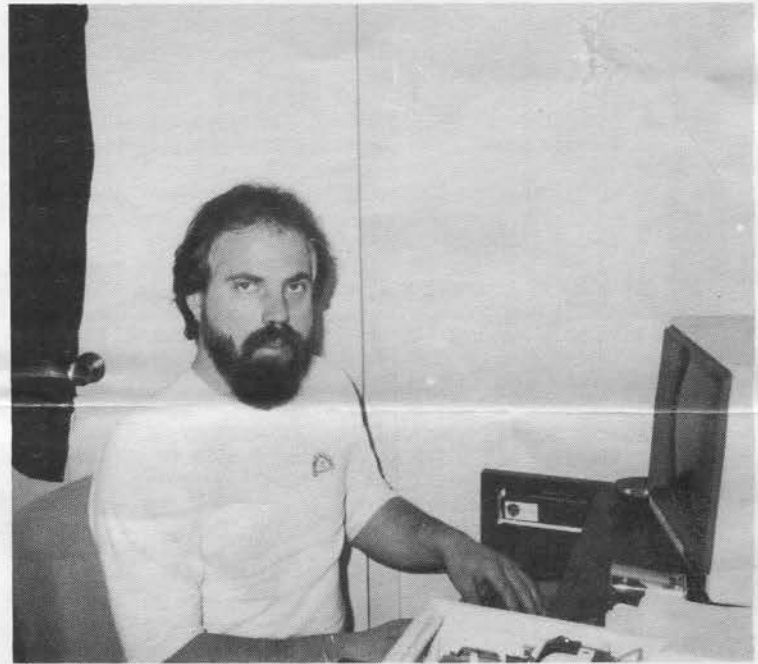
I talked to Poly on 11/25 and they assured me that they are indeed in business and that the 8813 is still in production. I think the biggest problem is the attitude that most of us Poly owners display. We bought the system when most people were not inclined to buy a computer because their next door neighbor had one. We bought one because there was a real need to have one, be it for use in their profession or for their business. These people paid big money for their system and doted on it like it one of their children. Now with rumors of Poly going out of business, sure they get defensive and may lash out at PolyMorphic because they have no intentions of replacing it with something else. The bottom line is that we want to keep our systems and we want to keep them running, they do the job, we know how to use them inside and out and to heck with IBM. So comes the natural end: we don't want an IBM type system replacing our Poly and can't understand why Poly would even think of doing it.

I work building IBM clones (shudder) and when I have to answer questions about our system and people want to know why it can't do this or that I just laugh. Then they ask me what kind of system I have. I tell them a PolyMorphic and they say a Poly what? Yes a PolyMorphic. Well how much memory does it have? Just 64k and then they laugh. However when I explain what the Poly can do and it's utilities they don't laugh. Which leads us to why Poly is going in the direction it is.

There are two reasons. First there is new technology and if you are to survive then you MUST take advantage of it. You can't market an old hat forever, there are aesthetic reasons and there are new enhancements to deal with. When you bought that 1975 model car it was the best, but when the old sled layed down you bought the 1980 model and then promptly threw rocks at the '75. You were in love with all the bells and whistles! The problem is you can't throw rocks at the Poly! Secondly there is the economic side of things. Who is taking the lions share of the market? You guessed it, IBM type machines. You go with the flow unless you have latent suicidal tendencies, or IBM's checkbook.

Now if PolyMorphic systems goes to an IBM type machine in as far as the added memory, hard disks, faster clock speeds, increased instruction sets with the true sixteen bit CPUs, and KEEPS the Poly DOS and the other ideas that made the Poly what it really is, then more power to them! Who else can tout ten years in the micro business? Happy tenth, PolyMorphic. PL

Glitch of the Issue



Well, the glitch was not found! Are you surprised? Of course not. The code was not hard to break, just solve as a alpha-numeric code! The glitch is one of Poly's regular smart guys and the past editor of PolyLetter. So lets introduce the one and only Frank Stearns. Give Frank a big hand for being such a good sport (I haven't heard from him for a while, maybe that is part of being a writer).

At any rate we have yet another person to crucify in this series. This glitch is so naive that he sent an entire portfolio! Listed below is his claim to fame.

Thought a phallic symbol was used in Assembly code.

Discovered a cereal port in Battle Creek Michigan.

Studied all night and nearly failed his blood test.

Took his IQ test twice, they couldn't believe that anyone could score that low and still read.

Calls his Rolex a "Texas Timex".

Undoubtly is a legend in his own mind.

Below is his name in some sort of code. The first person to break the code will receive a free disk of the month. Good Luck! "youreditorcharlessteinhauser".

HELPFUL HINTS IN LAYMEN'S LANGUAGE
by Charles A. Thompson, Attorney
2909 Rosedale Avenue, Dallas, TX 75205-1532

This column has been absent from PolyLetter for more than two years now, despite requests from Bob Bybee and Frank Stearns. Charles Steinhauer is more persistent, however, and since he's in my local calling zone, it was easier to write the column than hear from him several times a day.

Several folks have asked recently about Poly BASIC's "format" statements. These are very similar to those used in FORTRAN, according to the Poly BASIC Manual. DO NOT confuse "format" statements with the WordMaster program FORMAT.60.

The format statements will allow you to print numbers with properly inserted commas, dollar signs if desired, decimals lined up properly, etc. It's all in the wrist (on the hand you use to enter the format commands).

First, let's establish that there are two types of format statements: default and one-time. Poly's default print format is a floating decimal point, so that if you enter 123.456, that's what the Poly will print (with a space in front of the 1). However, you may change that default print statement.

All user generated format statements begin with a percent sign (%). This is followed by several optional codes, then a number, then a letter, and then perhaps by another number. The optional codes are:

- C -- to cause the formatted number to contain commas
- \$ -- to print a dollar sign immediately before the number
- # -- to change the default print statement to this one
- Z -- eliminates trailing zeros.

OK, let's build a format statement. First, we'll enter %##C

This will be a default (the # sign), each number will begin with a dollar sign, and there will be commas inserted.

Next, we have to determine the size of the total number field. This field must be large enough to accommodate all the numbers and all the "punctuation" (commas, decimals, and dollar signs). Let's say we want to be able to print up to 999,999.99. This means we'll have to have 12 spaces (because we have specified a dollar sign AND we must make provision for a minus sign in the event the number is negative). Within this field, all numbers will be printed right justified, so that 123.45 and 9876.54 will be printed

123.45
9,876.54

Therefore, our format statement is now %##C16

Next, we'll add an F2, which specifies that two digits are to follow the decimal. If the amount is an integer, then .00 will be printed. Now, our finished format statement is %##C1F2

It's used this way:

PRINT %##C16F2, nnnnn

where nnnnn is the number to be printed. You can also just PRINT the format statement (followed by a comma if you don't want the screen to scroll one line), and you'll invoke it as a default. Once a format default has been established, it'll be used to print ALL figures, including those to the printer and to disk files. What if you want to do something different for just one figure. Simple -- just create a new format statement but leave out the #, such as:

PRINT #6I,nnnn

and, for this one number, the field will be 6 characters long, and will print only an integer (no decimal, no dollar sign, no commas). The very next number will go back to the previously established default format.

Since I've mentioned the integer format, let's list the three possibilities:

- F - means a decimal, with the number of digits following the decimal determined by the number following the F.
- I - will cause only integers to be printed, and all

fractions

will be suppressed.

E - works like F, except that scientific notation will be used.

In ALL of these formats, the numbers will be RIGHT-JUSTIFIED in the field, with the appropriate number of blanks preceding the number.

One more matter must be mentioned. The format statement only determines what the printed number will look like -- you must still use the DIGITS statement to determine the number of significant digits. For example, if you wanted to print 9,999,999.99, you would have to specify DIGITS 9 at the beginning of the program (and remember that when you use the DIGITS statement, it wipes out all variable dimensioning and clears all variables).

The format statement can be very handy if you want to print to a disk data file, and have all the numbers line up neatly. For example, to write some formatted numbers, you might enter:

PRINT:5,%7F2,A,%14I,B,%12ZF2,C
and that would fill 33 spaces (7+14+12).

Another caution -- if you use a format statement, but your number is too large to fit, you will see *****. Let's say you specified %C8F2, and tried to print 123456.78. You would see ***** because you forgot about the comma and decimal. In order to print 123,456.78 you would have to use a format statement %C10F2 (or %C11F2 if a negative number is possible).

REMEMBER: there can be ONLY one default print statement at any one time. If you set the default while printing to the printer, it will also be effective for printing to disk files and to the screen.

If you haven't been using format statements, crank up the Poly and experiment.

Charles said I could remind you that my 1985 1040 Tax Preparation System is almost ready for shipment. It does the 1040 and Schedules A, B, C, G, and W. This is the fourth year for the 1040 System. Prices is \$75 for first-time purchasers (\$150.00 for tax professionals). Annual updates are one-half price (return previous year's diskette). Operating manual is included.

11/17/85

Dear Charles,

Last PL, Kenneth Lowe wrote a letter lamenting the popularity of the IBM-PC, and suggesting that PL should not run so many articles concerning PC-compatibility. I agree with many of the points in Kenneth's letter, especially his comments that the Poly operating system is far superior to MS-DOS. But since I'm to blame for many of those PC-oriented articles, perhaps I should explain my point of view.

I'm probably one of the world's most enthusiastic Poly supporters, as most of you know. I've edited PolyLetter for three years, and written articles for it during all six years of PL. I own two Polys, and have written many programs and designed hardware (including the infamous Poly Peripherals hard disk). Nevertheless, I am now also an IBM-PC owner! (I pause, as the crowd gasps.) I didn't obtain my PC to replace the Poly; I have no plans to scrap all of the work I've done with my Poly systems, and as you'll see from an ad in this issue, Poly Peripherals is continuing to develop new products for the 8813.

Why did I buy a PC? In order to remain in touch with the "mainstream" of small computing systems. Like it or not (and sometimes I hate it), the PC is here, it's popular, and it's staying.

The world of the PC is an unfamiliar one to me. Imagine being able to walk into a retail store, and actually buy a program. Off the shelf! Just like buying a pair of shoes! Poly owners have never been able to do that, and they never will. No, the PC world isn't heaven... but it's a big hell, and hard to ignore.

goto 7

MACRO's Anyone?

MACRO's are a pattern of text or code with places to insert variable information. If you use a block of code several times, it is probably a good idea to make a macro of it and put it in a library. There are several blocks of code that are frequently used by anyone who does more than just try his or her hand at assembly language programming.

The places to insert variable information are called "parameters". In a macro, a parameter is marked by the number sign (#). Since we may want to have the number sign in some text, there has to be some way to signal that it is not a parameter. This is done by preceding it with another one. A macro is used just like an the opcode of an assembly language instruction, and the parameters are used like arguments. To define a macro the pseudo-op (POP) codes "MACRO" and "ENDM" are used. The label on the MACRO POP becomes the name of the macro. The ENDM POP marks the end of the macro definition. To use the macro, the name defined is placed in the opcode field.

Sample definition:

```
demo MACRO
#L DB #1,#2,#3
    DB #A
ENDM
```

Sample use:

```
test demo 'Here ','is ','a ','macro ',0
```

which expands to:

```
test DB 'Here ','is ','a '
      DB 'Here ','is ','a ','macro ',0
```

The "#" marks the place to insert a parameter. The parameters are #1,#2,... #9. #L is a special parameter for the label on the macro. #A calls for all the parameters. Now, lets look at some usefull macros.

Checking to see which of two 16 bit numbers is bigger is a very common thing to do. Suppose you wanted to compare the contents of registers DE and HL to see which one is bigger. The code would be:

```
HLcmpDE    MOV A,H           ;First try
            CMP D            ;the high bytes
            RNZ              ;Dey ain't de same, so we is done.
            MOV A,L          ;Gotta see about
            CMP E            ;the low bytes.
            RET
```

But you don't want to compare HL to DE? -- You say you want to compare HL to BC? Ok, well that goes like this.

```
HLcmpBC    MOV A,H           ;First try
            CMP B            ;the high bytes
            RNZ              ;Dey ain't de same, so we is done.
            MOV A,L          ;Gotta see about
            CMP C            ;the low bytes.
            RET
```

Now, there are 3 pairs of registers, and each pair could be in the first place. So, that's six different routines!

Well, step right up, folks! Here the greatest thing since sliced bread. We gonna make you a MACRO which will turn into each and every one of these routines.

```
cmp MACRO
IF NULL[#L]
#1#2cmp#3#4
ELSE
#L
ENDIF
MOV A,#1
CMP #3
RNZ
MOV A,#2
CMP #4
RET
ENDM
```

So, if we want to compare HL to DE, we just get:

```
cmp H,L,D,E
#1=H, #2=L, #3=D, #4=E #L=(NULL)
```

which expands to

```
cmp MACRO
IF NULL[]
HLcmpDE
ELSE
ENDIF
MOV A,H
CMP D
RNZ
MOV A,L
CMP E
RET
```

Another macro computes the negative (two's complement) of a 16 bit register.

```
neg MACRO
IF NULL[#L]
neg#1#2
ELSE
#L
ENDIF
MOV A,#1
CMA
MOV #1,A
MOV A,#2
CMA
MOV #2,A
INX #1
IF NULL[#3]
RET
ENDIF
ENDM
```

My next macro subtracts two 16 bit registers and puts the result in one of the 16 bit registers

```
m MACRO
IF NULL[#L]
#1#2m#3#4#5#6
ELSE
#L
ENDIF
MOV A,#2
SUB #4
MOV #6,A
MOV A,#1
SBB #3
MOV #5,A
IF NULL[#7]
RET
ENDIF
ENDM
```

Another common macro stores a value in a location.

```
set MACRO
#L
IF NULL[#2]
XRA A
ELSE
MVI A,#2
ENDIF
STA #1
ENDM
```

Use:

```
set location,value
set location           ;sets location to 0
```

Anybody having trouble with assembly language mnemonics? Want to change them? ... Well, with the PolyMorphic Macro-88 assembler, you can do just that! -- Interested? -- Well, read on!..

Let's use the conditional jumps and the zero flag as an example: Suppose you're comparing and want to branch if the contents are equal.

```
JUMP IF A EQUALS REGISTER R.
```

Well, you have to remember that when the value is compared, it is subtracted... and that if they are the same, then the result would be zero. So... we write:

```
CMP R
JZ addr
```

What we need is something like the example given in the book "Practical Microcomputer Programming: The Intel 8088" by Weller, Shatzel & Nice

JEQ (JUMP IF A EQUALS) We can use the MACRO facility

to make it happen. Start by defining a MACRO as follows:

```
JEQ MACRO ;(Address)
#L JZ ENDM
Now, whenever we write:
CMP R
```

```
Label JEQ address ;comment
the macro converts the JEQ to JZ.
CMP R
```

```
Label JZ address ;comment
But, we need more than just a jump; we also need a return.
Return if equal.
REQ MACRO
#L RZ ENDM
```

How about another one... I have trouble remembering the meaning of the carry flag after operations, so: The carry is set if A is less, so

```
JLT (JUMP IF A IS LESS) for JC
JLT MACRO
#L JC #1 ENDM
```

```
And return:
RLT MACRO
#L RC ENDM
```

```
Also, not equal:
JNE MACRO
#L JNZ #1 ENDM
```

```
RNE MACRO
#L RNZ ENDM
```

```
Greater than or equal:
JGE (JUMP IF A IS GREATER OR EQUAL) for JNC
```

```
JGE MACRO
#L JNC #1 ENDM
RGE MACRO
#L RNC ENDM
```

These mnemonics make life easier.
On to bigger and better...

My "If" macro does a test of the value according to different choices, and jumps or returns according to the result of the test.

```
Use:
Label If condition,value,vector ;comment
Test the accumulator against the value, and jmp to the vector if the condition holds.
```

```
Example
If EQ,0,GitHere
MVI A,-1
GitHere ...
```

Here's the actual macro.

```
If MACRO
#L
IF LEN['#2']=1
IF '#2'='B' OR '#2'='C' OR '#2'='D' OR '#2'='E' OR
'#2'='H' OR '#2'='L' OR '#2'='M'
CMP #2
ELSEIF #2=0
ORA A
ELSE
CPI #2
ENDIF
ELSE
IF #2=0
ORA A
ELSE
CPI #2
ENDIF
ENDIF
IF NULL[#3]
R#1
ELSE
J#1 #3
ENDIF
ENDM
```

If can be used in many ways:

```
If EQ,0 ;Return if A=0
If LT,30H,ToSmal ;'0'
If GE,3AH,ToBig ;'9+1'
If LT,B,ToSmal
If GE,C,ToBig
```

Another useful macro is "ck". "ck" gets a value from some location, and checks it with If:

```
ck MACRO
#L LDA #1
If #2,#3,#4
ENDM
```

Examples:

```
ck Drive,EQ,0,BadPram
ck Flag,NE,B,Exit
```

Here's a couple of more.

```
move MACRO
#L LXI H,#2
LXI D,#3
LXI B,#1
IF NULL[#4]
JMP MOVE
ELSE
CALL MOVE
ENDIF
ENDM
label move -number,from,to
```

```
user MACRO
ORG USER
IDNT $,$
IF NOT NULL[#1]
JMP #1
IF NOT NULL[#2]
JMP #2
ENDIF
ENDIF
ENDM
label user Start,ReEnt
```

But wait, there's more. If you are as lazy as I am (I always say laziness is the mother of invention), then you don't want to write these again and again and ... Let's create a library of these little MACRO's to be used Again and again and ...

Try the following:

```
; Open a library file called MNEMONICS
; (remember to define # before assembling
; or an error will result)

DEFS <#>MNEMONICS.SY
JEQ MACRO
#L JC #1
ENDM
JLT MACRO ;put this into the library
#L JC #1
ENDM
DEF JLT ;put this into the library
JGE MACRO
#L JNC #1
ENDM
DEF JGE ;put this into the library
; (etc) add your own

ENDM
```

Later, all you'll have to do to use these will be to open the library file with the REFS POP:

```
REFS MNEMONICS.SY
REF JGE
REF JAL
REF JEQ
; (etc) ;your other macros
```

Mailist Cont.

Press ESC=7

press the left arrow two times, type ctrl/d three times, type 718, press the right arrow two times

Press ESC

Press ESC/7 and type a phone number. Type ESC E

See how easy. For (212) I would use ESC 2 etc.

Next step Getting rid of the field names and loading the mailist with names

Type ESC=0

Type ctrl/f, a colon, ^[, ctrl/x, ^[0^[0^[0

Press ESC

Type ESC=Q for quit!

Type ctrl/b, ^[0, ctrl/e, ctrl/x, ^[ctrl/e

Footnotes:

So far we have edited a psuedo-command file. More important, we have set up our ESCape library for the command file.

Once the .ED file is working, make a back up copy of MYdef.ED

MYdef.ED can be modified in either of two ways.

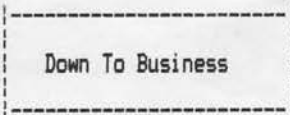
1) Using the system editor, change MYdef. Do this only if you are comfortable reading text such as:

^[=2^^[[^^Q^^F;^^[[^^[[^^S^^M^^F ^^[[^^T^^[[^^T^^[[^^R^^

2) The lines of the escape library are called macros. Edit a (FAKE.MY) file. Try your macros without changing the existing ones.

If you can not remember the codes for the existing macros type ESC and a question mark. Look at the left hand side of the screen. You will see the numbers and letters already in use. (Use others)

When creating a macro, think out what you need. It is helpful to know the Poly's Editor commands. I will supply a "cheat sheet" and PolyMorphic literature for those who send a stamped, self addressed envelope. At worst, EDIT a fake file or copy something you already have. Try out all control characters. Are you aware that control/d is the same as the delete key?



The files you need and should now have on disk are:

- Drive <1>
a) OLDFILE.BS
b) MYdef.ED
c) COMMAND.MY

- Drive <2>
a) NAME.DT
b) NAMEC.DT

Delete COMMAND.MY and pack the disk.

* the semicolons are used for comments not commands
* I am using NAME.DT as the name of the data file
You use the name of your Mailist File

Edit COMMAND.MY as follows

ESC 1 = Layout Fields
ESC N = Replace Name
ESC Z = Insert Zip Code
ESC E = Finish Fields
ESC Q = QUIT
ESC 7 = (718)
OF
NAME
2
Y

A

At this point press ESC 1 and start entering data
When you have entered at least three names etc
press ESC Q

Do not press RETURNS when entering data!

After exiting the editor, type COMMAND and watch the computer enter the data for you.

I am assuming that MAILIST has stopped and we are back in Exec.

Next step is to re-edit the MYdef.ED
I prefer doing this by editing a FAKE.MY file.

Step 1) ED FAKE.MY

ctrl type ESC=
Type NAME, ^[, ctrl/x, ZIP, ^[Q
Press ESC

Type ESC=!
Press ctrl/f,
Type
ZIP, ^[, ctrl/x, NAME, ctrl/f,
Y
A

Type ^[, right arrow, ctrl/e, left arrow, ^[_ (shifted delete)
Type _ (shifted delete), ctrl/e, ^[, 1
Press ESC

Press ESC ctrl/w
Answer the prompt with "MYDEF"
Press ESC ctrl/e (quit the editor)
DEL MYdef
REN MYDEF MYdef

CREATING COMMAND FILES TO ALTER THE COMMAND FILES

- 1) From Exec Type ED EC
2) Type ED COMMAND
3) Press ESCape
4) Press a left arrow key
5) Press ESCAPE
6) Press ESCAPE
7) Press a left arrow key
8) Type Q
9) Exit the Editor

- 1) From Exec Type ED EC1
2) Type ED COMMAND
3) Press ESCAPE
4) Press a left arrow key
5) Type !
6) Exit the Editor

USING EC1.TX (command file) to alter COMMAND.TX

- 1) From Exec - Type EC1
2) Swap NAME.DT disk for ZIP.DT (drive 2)
3) Type COMMAND

The "ZIP" file will now contain be identical to the "NAME" file.

Next time you want to add names, type EC from Exec.

Next installment.....

What about mistakes? or Changing an entry?

Questions concerning this series will be answered if you write to me (Al Levy - Box 71 - Hicksville NY 11802)

When I write an article mentioning the PC, I try to do it in a way that educates the reader. Many PL readers may need this information. One day, the boss will plunk a PC down on your desk, and say "use it." You won't have any choice in the matter. Oh, you'll be able to keep the Poly, probably, but on that day, you'll have to start using words like MS-DOS and BASICA, and typing in the entire names of commands (no more "T", it's gonna be "TYPE" from now on). It'll be a rude shock, but it's bound to happen to many of us. The point of my "PC-slanted" articles is to ease that shock as much as possible.

As for Kenneth's other recommendation, adapting the Poly operating system to new hardware so that we can keep our systems viable, I agree! Let's do it! As I see it, we have two ways we could proceed:

The Hardware Way.

Build new, faster hardware, that can run existing Poly software but do it better, and also run CP/M-80 programs, and maybe IBM programs as well. This is expensive and time-consuming, but if done right, would allow us to run most of our existing Poly programs without any changes at all.

The Software Way.

Write a new operating system, maybe running on some commonly available hardware like the PC. It would have the features we love on the Poly - editor, formatter, SZAP, and even commands like L and INIT. Only trouble is, this way forces us to throw out every single one of our machine code programs, including things we've come to rely upon. ARISE, SZAP, CTRL-U, and everything you and I have written, would have to be re-written. Plus, we'd need a BASIC interpreter, and writing one of those takes many man-years of labor.

Is there another, cheaper, easier way? I'd love to hear from anyone who knows how to get a 1985 model of the Poly 8813, one that runs Exec/96, BASIC C04, and MS-DOS, and get it for \$399.95!

But until that happens, I'm going to stick to my position, which can be summarized as: keep the Polys running, doing what they do so well, and even improve them if it makes economic sense. But there's a lot happening in the computer world today, so if computers are important to you, keep an eye on other things besides the Poly.

New Products from Poly Peripherals

Poly Peripherals is pleased to be approaching the new year with a new address, and two new products!

SM/3.0 is an updated version of our "smart terminal" program for the 8813. It includes new features for automatic logging-on to most dial-up systems. Other features include:

- Auto-dialing (Hayes compatible)
- XMODEM and ASCII file transfers
- Capture buffer
- Macro commands

SM/3.0 is priced at \$75. Customers who purchased a previous version of SM can upgrade to SM/3.0 for \$30 by returning their original disk.

Poly Peripherals is about to unveil a spreadsheet program for the 8813. (It hasn't been named yet; we're considering SuperVisiProPerfectPoly4-5-6Calc, but we're open to suggestions.) It will include:

- 64 rows, 26 columns
- formula editing
- variable column widths and formatting
- math, finance and scientific functions
- screen, printer, or file output
- disk storage of data and formulas
- calendar functions

The spreadsheet will be available in the first quarter of 1986, and will be priced at \$300. If you place your order before January 15, you can receive the spreadsheet, and free updates for one year, all for only \$150. Send no money now, but orders must be received in writing. Call Poly Peripherals for more details.

Poly Peripherals
5011 Brougham Court
Stone Mountain, GA 30087
(404) 498-3556

Do you remember when Frank announced that I would take over the duties of editing PolyLetter? He said that his time had vanished and that I had a more timely schedule, well if your business needs a boost if it is not doing all that you expect of it then you need to edit PolyLetter for at least an issue! Maybe I will offer to rotate the editor around to people that want their business to take off. No but seriously, sorry for this issue being late, with the holidays and everything else, opening a new business, repairing systems for friends I have never seen and then somehow finding time to move. Please note PolyLetter's new address, also Bob Bybee's new address.

In answer to Percy Roy's letter, I only convert Poly 16k cards to 64k.

To Ron Moffitt, John Warkentin did offer to furnish his software as a disk of the month. I have however, not heard from him regarding this matter. I suppose we could hassle him a little about it and offer it next issue. To your second question, Pith Helment Kenyon has some experience in using higher level languages on the Poly. Such as Fortran, Pascal, Tiny Basic, Little Ada and occasionally English.

In response to Charles Trayser's letter, PolyLetter will continue to be published as long as there are subscribers and support from them. I have successfully contacted Poly by phone, I assume that they are still hanging in there.

To James Salinger, PolyLetter will offer more tips and articles on the system itself. James wants to see more non-technical info in the future. One such article will be on the use of Setup. I have talked to several people that have had problems in using their printer. Hopefully this will clear up their problems.

The Subscriber count is still remaining at the one hundred mark. Next issue I think we will publish a list of all the names and addresses. There has been a lot of inquires if there are users in some certain areas. Give me some feedback.

Macros Cont.

You can also get them all out with a single REF by enclosing them all in a single larger MACRO (MACRO within a MACRO) But here you've got to use two #'s for one. Example:

```

Mnemonic      MACRO ;this MACRO defines the other
MACRO's
JEQ MACRO
##L JC ##1
      ENDM
JLT MACRO
##L JC      ##1
      ENDM
JGE MACRO
##L JNC    ##1
      ENDM
      ENDM

DEFS <#>MNEMON
DEF Mnemon

END

```

Later, all that's needed is:

```

REFS MNEMON
REF Mnemon
Mnemonic      ;Invoking this macro once
               ;defines all the other macros

```

If you want more details, call me at (413) 458-8421.

Ralph Kenyon

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PolyMorphic Systems
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Santa Barbara, Ca. 93111
(805)967-0468

A Traumatic Ad

The following is a list of manuals available for sale at special prices by PolyMorphic Systems. All prices include binders. Please add \$5.00 for shipping and handling.

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
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8	Confidence	25.00
9	Hard Disk	15.00
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12	Twin System Confidence	25.00
13	Twin System Diagnostics	25.00
14	Plan	35.00
15	Mailist	35.00
16	Assembler	25.00
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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	Viedo Board	20.00
5	CPU Board	20.00
6	4.0 Monitor ROM	20.00
7	48K & 16K RAM	15.00

Also on special this month is the 16K to 64K conversion at \$125.00, which includes parts and labor. The 16K board has to be a Poly board and in good working condition.

My dear Polys, I never would have left you. But my clients forced me into it. Had to join the IBM-AT world and therefore I must part with you. May you find a new home where you will be as well-cared for as I cared for you: FOR SALE: 8813 with three drives, hard disk, full memory, keyboard III, Zenith P-31 13 inch green screen monitor, spares, and so many utilities and goodies you'd hardly believe it. This system has also been modified for the following: reduced EMI emissions, faster keyboard, and a stabilized VTL. Power supply has been rebuilt. Includes EXEC 96, several of Poly Peripherals, Abstract Systems, and Frank Stearns Associates utilities; and includes, at no additional charge, Frank Stearns Associates SPELL 3.0, CHECK 2.3, and TIME ACCOUNTANT 2.0 software packages (with source code and full documentation). All original system and subsystem manuals included. \$1600. Also for sale: 8810 with keyboard II, 32K (expandable to 56K and I have a line on the expansion chips) and Hitachi monitor. This is the perfect backup to the 8813 noted above. The 8810 has been checked out with the hard disk. \$550.00. Also for sale, hundreds of hard-sectored diskettes (these are becoming harder to find), priced at \$1.00 to \$2.00 each based on age (several dozen are virtually new or have been used only for archival). All disks sold are guaranteed to pass INIT, as this will be done to each before they go out the door. Package price (8813 with HD and applications software, 8810, and diskettes) \$2000. Save over \$300. (Systems available January 15, 1986.)

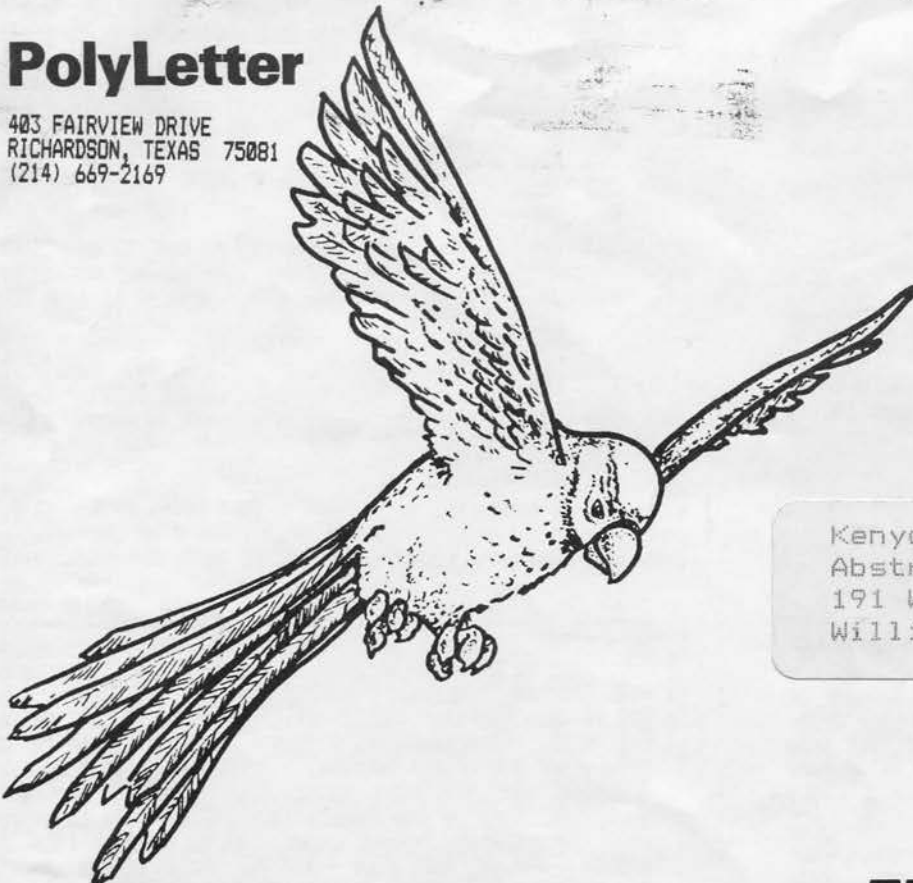
Call any time and be prepared to be sympathetic. For me this is like selling two dear children.

Contact:

Frank Stearns 14307 NE 16th St Vancouver, WA 98684
206/892-3970

PolyLetter

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RICHARDSON, TEXAS 75081
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