Issue 82/1

# PolyLetter

January/February 1982

## NEWS FROM POLYMORPHIC

PolyLetter spoke to Ken Gudis and Lennie Araki to get the latest news. Ken says the business is doing very well, even better than predicted, in spite of the poor economy.

Poly has been receiving many orders lately, including several large orders for Poly 88 boards and chassis. OEM customers are using the "little orange hot boxes" for such things as stockbroker video displays, and control systems for automotive assembly lines in Detroit. The U. S. Navy is using 88's for ship-to-shore data communications.

The Poly 88 was PolyMorphic's first product. Poly had considered dropping the 88 line at one time, but Ken Gudis says "the 88 just won't go away." It's a good product for black-box computer applications. And the cards in the 88 are the same cards found in Poly's 8813 systems.

Poly is stepping up their field service capability. Field service is now available in some parts of Indiana and Texas, as well as other isolated areas. Ken Gudis says regional service agreements are being developed in many areas of the country.

### New Products

Poly is stepping up their hardware development efforts once again. Some items on the horizon:

- A Z-80 processor card for the 8813, which would run at speeds more than 3 times the current 8080 speed. This would allow the 8813 to support multi-user systems effectively.

- The 35 Megabyte Hard Disk is being shipped. Currently the time lag is about 60 days after receipt of order. The cost of the 35 MB without any backup device is $10,695 (suggested retail). A new 8813 with 35 MB disk and one 8" DSDD floppy for backup is $14,495. When using the Hard Disk, you must always boot your system from a floppy. Once the system is running, you can then boot to the HD and make it your system drive. This procedure was adopted since systems must have a floppy for backup capability anyway... for now! (See below.)

- A 70 Megabyte Hard Disk will be available soon! Poly will being taking orders for this drive in about 90 days. At about the same time, a tape drive for backup will be offered. Poly is still evaluating tape drives to determine which one suits the system best. Prices are not yet available.

- Poly is also evaluating a 5" Hard Disk. This would be installed in place of one of the 5" floppy drives in a standard 8813 cabinet. Price is not available, but the 5" HD would store about 18 to 27 Megabytes!

- The PolyNet interface is being revived. This is a method of interconnecting several Poly systems within an office environment, allowing communication and file transfer between systems. One system might have a HD, and the others could share storage on the large drive. PolyNet was designed several years ago, but never released... Ken couldn't explain why. Systems on the PolyNet would be connected through coaxial cable, and communicate through a high-speed serial port.

### 16 or 32-Bit Systems

- 16 and 32-bit processors are now being evaluated. Poly says a product of this type is about 6 months away. This would probably NOT be upward-compatible from the current 8813 systems, since the S-100 bus architecture is not designed to support 16 or 32-bit systems effectively. The new product might use the 8086 or 68000 processor, and might be Multibus compatible (the Intel bus standard for their 16 bit systems). It's too soon to be sure, but at this point the 68000 processor looks like the favorite. One primary concern with

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this new system would be old software - Poly would prefer to make the new system software-compatible to some extent. This may be difficult.

## CP/M News

- CP/M will be supported on the Hard Disk soon. Ken Gudis expects this to be released within 30 days. Also, the MOVCPM command will allow CP/M to use the full 56K memory space, so Poly CP/M will run larger programs.

- Within 60 days, Poly expects to release software which will allow CP/M programs to run under the Poly operating system. This is important: most CP/M users who have contacted PolyLetter say that it's great to have CP/M programs, but the CP/M operating system is difficult to use compared to Exec. So, the best of both worlds is coming soon!

If you are currently using Poly CP/M, upgrades for these new features will be available. Ken Gudis says the charge will be nominal, enough to cover handling and reproduction costs only.

CP/M users, note: Poly's CP/M is version 2.2, and the disks are North Star format, 5" SSSD. The Marketing Department at Digital Research (creators of CP/M) can provide sources for compatible software. Their number is (408) 649-3896.

## SOFTWARE PACKAGES AVAILABLE

Poly now has software packages for the following applications: radio station management; farm management; truck rental management. Accounting and database management packages are being evaluated. And, don't forget the large number of applications packages available from CP/M software houses.

## DEALERS WANTED

PolyMorphic is aggressively looking for dealers in almost all parts of the country. If you are interested in becoming a dealer for PolyMorphic Systems, contact Ken Gudis at (805) 967-0468.

## POLY USERS ON TIMESHARING

Here is our latest list of Poly owners who are members of the Source timesharing network.

CL1543: Bob Measle, Lexington, Kentucky

TCB203: Frank Stearns, North Hollywood, California

TCC609: Joe Toman and Illini Microcomputing Ogden, Illinois

TCC611: Jim Kaufman and Bob Zimmerman, Naperville, Illinois

TCC870: Stuart Woods, Atlanta, Georgia

TCD098: Bob Schwartz, Cincinnati, Ohio

TCD125: P o l y L e t t e r

TCI127: Ralph Kenyon, Portsmouth, Rhode Island

TCG256: Russ Nobbs, Spokane, Washington

PolyLetter recently joined another timesharing service, Micronet (also called Compuserve). Micronet subscriptions are only sold through Radio Shack stores, and we initially had some problems... one store had never heard of the service (which is described in Radio Shack's own catalogs), and another store believed that we needed a TRS-80 computer in order to use the service!

But, we're finally on Micronet, account number 70575,1342. And, we have found several other Poly users are also members of Micronet. PolyLetter will have a Micronet article in the near future.

If you want to become a member of one of the timesharing services, you can use your Poly as a terminal. You'll need a modem, and also a "terminal program" to send and receive data. (See PolyLetter's ads for several suitable programs.) Services like the Source and Micronet provide access to large databases. such as UPI news and the Dow Jones stock reports. Games, electronic mail, shop-at-home services, and many applications programs are also available. Timesharing computers also offer vast amounts of disk storage for data, at very low prices.

## OPERATING SYSTEM REVISIONS

The current release of the operating system is Exec/95, 6/12/81. BASIC's release number is C03, 4/14/81. (There are two versions of BASIC C03, with different release dates.)

The word processing system, WPS, is at revision 1.2, release date 2/17/81. The printer driver is Printer/42, and the assembler is version 5.1.

A complete set of disks with the latest of everything is available for $75 (suggested retail). This includes BASIC, Asmb, WPS, and all programs normally shipped with new systems. The programs are shipped on one disk unless you order 5" SSSD; in that case it requires two disks to hold everything.

The $75 fee above does not include manuals. Three manuals are available: the User's Manual, the BASIC and Assembler Manual, and the WPS Manual. Each is available for $75.

The ROMs are currently at version 81. Two variations of these ROMs exist: one type supports 5" SSSD, and one is for 5" DSDD. Both types support the MS, and either is suitable if your only drives are the 8" type.

ROM version 81 is called the "one-size-fits-all" ROM. Some old programs made reference to certain locations deep inside the ROMs, and when the ROMs began to be revised frequently, these locations changed. Consequently, some old programs (and certain releases of the operating system) didn't work with some ROM versions. Version 81 corrects many of these problems by moving routines back to their former locations. Thus, version 81 ROMs are compatible with almost all older software, as well as the new TwinSystem. (Version 81 is required for the Twin.)

From the discussion above, it seems that you must choose between 5" SSSD and 5" DSDD disks, if you use 5" disks at all. The ROMs contain software which knows how to talk to three 5" drives (numbered 1 to 3), and up to four 8" drives (numbered 4 to 7). But it is possible to include both types of 5" drives on the same system: A program called Driver.DD contains software which interfaces to either type of 5" drives.

## POLY - TALK

This column presents questions from our readers. If you can help, please write to the address listed, or to PolyLetter.

Does anyone have a version of Pascal for the 8813? If not available yet, what is the projected date? Also, is anyone familiar with a program called CASHFLOW? I have a copy of it, but cannot get it to function properly. Patrick Mulloy, 4371 Toledo, Las Vegas NV 89121.

## MICROPOLIS USERS GROUP

Many Poly 88 owners added Micropolis disk drives and controllers to their systems, to produce a disk-based computer system. This was an alternative to the upgrade kit offered by PolyMorphic, which converted an 88 to an 8813 (at a rather steep cost).

PolyLetter was recently contacted by MUG, the Micropolis Users Group. If you are using Micropolis equipment, or know someone who is, you can contact the MUG at 604 Springwood Circle, Huntsville AL 35803. Phone: (205) 883-2621.

The ROMs do not know how to access any drive numbered above 7. But Driver.DD allows access to the Hard Disk as drives 11 through 14, and also lets you access three more 5" drives as 8, 9, and 10. A possible (but expensive) system might be configured this way:

| Number | Type |
|---|---|
| 1 - 3 | 5" DSDD |
| 4 - 7 | 8" MS |
| 8 - 10 | 5" SSSD |
| 11 - 14 | Hard Disk |

This kind of system might be used by a dealer, to reproduce software in all possible disk formats. (The list above also assumes that you have an extra chassis to hold the extra three 5" drives!)

Of course, the Volume Manager allows you to reconfigure the drive numbers so that (for example) the 5" SSSD drives could be drives 1 - 3 again.

# INDEX TO POLYLETTER - 1981

This index is organized as issue/page. For example, Assembly language opcodes are discussed in issue 81/3, page 2.

## KEEP IT SIMPLE...

A favorite way to improve Poly BASIC programs is to incorporate some machine language routines into your programs.

Interactive System Services, a software house in Santa Barbara, has developed KISS.RL, a set of machine code routines to help your BASIC applications programs run better and easier. KISS takes up about 3K of memory, which is comparable to the amount of memory it would take to duplicate KISS's functions. But, KISS works faster than the equivalent BASIC functions, and it's already written for you. Brian Smith, formerly with PolyMorphic, was the principal author of KISS.

These are the functions in KISS.RL:

Test or fill a string.
INPUT, test, and fill a string.
Line correction.
Display error messages.
Clear part of the screen.
Input yes/no answers (foolproof).
Screen drop.
Print on screen, optional centering.
Record search in a file.
The Ripper (a fast MID$).
Strip blanks from a string.
String comparison to a string array.

PolyLetter received two brochures about KISS.RL, and the information contained in them is very good. A listing of an actual program using KISS.RL was not included, but would be included in the program documentation if you purchased the package. KISS.RL is priced between $200 and $400, depending on options and your type of system.

For more information, write to ISS, PO Box 6784, Santa Barbara CA 93111, or call (805) 964-0062.

```
REM  I forgot who pointed this one out to me.
REM  Try this trick with the FOR-NEXT loop ***
>10 S=1 \ P=3
>20 FOR I=S TO P \ PRINT I, \ NEXT \ PRINT
>30 FOR I=S TOP \ PRINT I, \ NEXT \ PRINT
>40 FOR I=STO P \ PRINT I, \ NEXT \ PRINT
>50 FOR I=STOP \ PRINT I, \ NEXT \ PRINT
>RUN
 1 2 3
 1 2 3
 1 2 3
50 FOR I=STOP \ PRINT I, \ NEXT \ PRINT
          ^
Syntax error     *** Without spaces, the string "S TO P" is
                 *** parsed as the reserved word "STOP"!
```

## POLY - ADS

WANT TO BUY: Poly 8813 and 88/MS with manuals, software and peripherals. Please send list with price per item and total system price to: Carl J. Bobenhouse, 2318-14B Harding Road, Des Moines IA 50314, (515) 255-1148.

FOR SALE: Hardware and software to make POLYMUSIC or sound effects. For more information write to Al Levy, PO Box 71, Hicksville NY 11802. Demo music (on audio cassette), played by 8813, available for $5.

## INCOME TAX PROGRAM FOR POLY

This is an income tax program which calculates and prints 1981 IRS Forms 1040 and Schedules A, B, C, and G. It does income averaging, figures medical deduction, interest and dividend exclusions, etc. Input material is saved in a data file for future use (this also allows partial input). The program displays all figures on the screen prior to hard-copy printing on standard IRS forms. It also allows changing input figures (recalculates).

The program uses Exec/95 and BASIC C03 (furnished). Purchasers can get annual updates for half price so long as IRS does not do a major change on 1040 and schedules. Price for 5.25" SSSD or SSDD is $50 for individuals (not tax preparers), $100 to bookkeepers, tax preparers, etc. (honor system!). For 8" add $10. Price includes diskette and first-class mailing. Charles A. Thompson, Atty, 2909 Rosedale Avenue, Dallas, TX 75205 (214) 368-8223.

PolyLetter

Now in its third year of publication...

thanks to YOU!

## PROBLEMS IN LATEST SOFTWARE RELEASES

Ralph Kenyon has investigated the latest releases of BASIC and the Formatter, and has this report. This information pertains to the most recent releases of software, to the best of our knowledge.

### BASIC C03 !BUGS!

```
$BASIC
System 88 BASIC C03, 04/14/81.  30164 bytes free.
>100 DIM A$(4:63),B$(4:15) \ MAT B$="                "
>110 MAT A$="                                " \ MAT A$=A$+A$
>120 FILE:5,OPEN,"DATA.DT",OUT \ MAT PRINT:5,A$ \ FILE:5,CLOSE
>130 FOR I=1 TO 4 \ FOR J=1 TO 4
>140  B$(J)="("+STR$(I,$#1I)+","+STR$(J,$#1I)+")"          "
>150 NEXT \ FILE:5,OPEN,"DATA.DT",INOUT \ FILE:5,POS,I
>160  MAT PRINT:5,B$ \ FILE:5,CLOSE \ MAT PRINT B$,
>170  OUT(0)"EXEC"+CHR$(13)+"TYPE DATA"+CHR$(13)
>180  OUT(0)"CON"+CHR$(13)+"CON"+CHR$(13) \ STOP \ NEXT
>RUN
(1,1)          (1,2)          (1,3)          (1,4)
Stop in line 180
>>EXEC
(Exec 95 06/12/81)
$TYPE DATA
(1,1)          Notice that BASIC has written out the proper
(1,2)          stuff to the data file at this time.
(1,3)          Examination of the file with dump shows that
(1,4)          This version writes on field boundaries only!
$CON
>>CON
(2,1)          (2,2)          (2,3)          (2,4)
Stop in line 180
>>EXEC
(Exec 95 06/12/81)
$TYPE DATA
(1,1)          Notice that at this time MAT PRINT:5,B$ seems
(2,1)          to have lost its fourth element (2,4) but BASIC
(2,2)          DID NOT REPORT "That record is beyond the end
(2,3)          of the file" error.
$CON
>>CON
(3,1)          (3,2)          (3,3)          (3,4)
Stop in line 180
>>EXEC
(Exec 95 06/12/81)
$TYPE DATA
(1,1)          Here again the array starts to be written out
(2,1)          at the proper location, but the last two
(3,1)          elements are lost (again no error reported).
(3,2)
$CON
>>CON
(4,1)          (4,2)          (4,3)          (4,4)
Stop in line 180
>>EXEC
(Exec 95 06/12/81)
$TYPE DATA
(1,1)          By this time, it should be obvious that C03
(2,1)          BASIC strictly enforces the record length
(3,1)          in fixed length fields.  However, the failure
(4,1)          to report a "beyond end of file" error is a
               serious bug.
```

### More BASIC C03 Bugs

```
$BASIC
System 88 BASIC C03, 04/14/81.  30164 bytes free.
>10 DIM A$(3:5) \ FILE:5,OPEN,"TEST.DT",OUT
>20 WRITE:5,"TEST1" \ WRITE:5,"TEST2"
>30 WRITE:5,"TEST3" \ FILE:5,CLOSE
>40 FILE:5,OPEN,"TEST.DT",INOUT \ MAT READ:5,A$
>50 MAT PRINT A$," ", \ PRINT \ MAT A$="12345"
>60 MAT PRINT A$," ", \ PRINT
>70 FILE:5,POS,1 \ MAT WRITE:5,A$ \ FILE:5,CLOSE
>80 OUT(0)"BYE"+CHR$(13)+"TYPE TEST.DT"+CHR$(13)
>RUN
TEST1 TEST2 TEST3
12345 12345 12345
>BYE
(Exec 95 06/12/81)
$TYPE TEST.DT
12345
TEST2        Please note: MAT WRITE:5,A$ did not write out the
TEST3                     entire array, only the first element.
```

### Still MORE C03 BUGS

```
$BASIC
System 88 BASIC C03, 04/14/81.  30164 bytes free.
>10 DIM A$(3:5),B$(3:7) \ FILE:5,OPEN,"TESTE.DT",OUT
>20 WRITE:5,"TEST1" \ WRITE:5,"TEST2"
>30 WRITE:5,"TEST3" \ FILE:5,CLOSE
>40 FILE:5,OPEN,"TESTE.DT",INOUT \ MAT READ:5,A$
>50 MAT PRINT A$," ", \ PRINT \ MAT B$="1234567"
>60 MAT PRINT B$," ", \ PRINT
>70 FILE:5,POS,1 \ MAT PRINT:5,B$ \ FILE:5,CLOSE
>80 OUT(0)"BYE"+CHR$(13)+"TYPE TESTE.DT"+CHR$(13)
>RUN
TEST1 TEST2 TEST3
1234567 1234567 1234567
>BYE
(Exec 95 06/12/81)
$TYPE TESTE.DT
12345          BASIC Truncated the array to fit in the
12345          predefined field length (even though there
12345          was plenty of room in the file).  No error
               was reported here either.
```

### What, again? More C03 BUGS

```
$BASIC
System 88 BASIC C03, 04/14/81.  30164 bytes free.
>10 DIM A$(16:3)
>20 MAT A$=STR$(#,$#2I)+"|"
>30 PRINT "Output to Screen (1), or Printer (2)"
>40 INPUT "Select 1 or 2 please: ",A
>50 IF A<1 OR A>2 THEN 130
>60 PRINT "MAT PRINT:1,A$,"
>70 MAT PRINT:1,A$, \ PRINT
>80 PRINT "MAT PRINT:A,A$,"
>90 MAT PRINT:A,A$, \ PRINT
>RUN
Output to Screen (1), or Printer (2)
Select 1 or 2 please: 1
MAT PRINT:1,A$,
 1| 2| 3| 4| 5| 6| 7| 8| 9|10|11|12|13|14|15|16|
MAT PRINT:A,A$,

(Cmdf abort)
90 MAT PRINT:A,A$, \ PRINT
                ^
                               *** Invalid Error!
Dimension error                *** Note that BASIC fails to properly
                               *** handle the file channel variable.
>MAT WRITE:1,A$,
That channel not open!  *** Another invalid error (See next)

>FILE:2,LIST
>MAT WRITE:2,A$,
I can only do that to a disk file     *** Why did they do this?
```

### - MORALS -

1. Don't use MAT WRITE at all.
2. Variable output channels don't work correctly with MAT.
3. Don't expect your old software which uses variable length fields in fixed length data files to work properly.
4. Don't expect BASIC to report all errors.

### FORMAT Changes

Sometime between Version 5.3 (02/26/81) and Version 5.5 (06/09/81), Poly changed the parser for the commands which take numerical arguments. Earlier versions would accept the commands without any space between the command and the number. Version 5.5 demands a space and refuses to recognize the command without one. The following demonstrates the change.

```
$TYPE <2>TEST     (**** This file has a set of the commands. ****)
{lm5,rm5,ind5,skp2,ne4}

Now we run FORMAT Version 5.3....

$<3<FORMAT <2<TEST

                PolyMorphic Systems Text Formatter
                   - Version 5.3 (02/26/81) -

FORMAT.IN
<2<TEST
*Finished formatting.*     (**** Notice, no errors. ****)

Now we run FORMAT Version 5.5!

$FORMAT <2<TEST

                PolyMorphic Systems Text Formatter
                   - Version 5.5 (06/09/81) -

FORMAT.IN
<2<TEST

[ file=<2<TEST.TX, page=1, line=0 ][lm5]
*I don't recognize this command.*

[ file=<2<TEST.TX, page=1, line=0 ][rm5]
*I don't recognize this command.*

[ file=<2<TEST.TX, page=1, line=0 ][ind5]
*I don't recognize this command.*

[ file=<2<TEST.TX, page=1, line=0 ][skp2]
*I don't recognize this command.*

[ file=<2<TEST.TX, page=1, line=0 ][ne4]
*I don't recognize this command.*

*Finished formatting.*
```

## COLD KEYBOARDS

Does your Poly keyboard have trouble getting started in the morning?

Until recently, my keyboard would not operate for the first minute or two after the system was powered on. After a couple of minutes, it worked reliably, so I never bothered to try and fix the problem.

The problem showed up again when I started to build my second Poly system. I built my systems out of used Poly parts, including boards from old Poly 88s; and the video board in the Poly 88 has a wire which can be changed to feed either a 5 volt or 8 volt supply to the keyboard. In the 88 boards I had, this jumper was set to 5 volts. But the Poly keyboards (at least the recent ones) want 8 volts. I was starving my keyboard and didn't even realize it!

If your Poly has the same symptoms when you first turn it on, have your technician check the video board. You, too, could have an undernourished keyboard. BB

## CP/M CORNER

Dick Jacobi submitted this month's CP/M Corner.

"I finally have CP/M running on my Poly 8813. The original CP/M disk from Poly (received around April 1981) had a flaw in PCOPY. Poly ignored my return and a letter follow-up, and finally sent me a new disk (3 months later).

"It is easier to use the regular Poly IMAGE command to reproduce the CP/M disk, rather than using INIT, SYSGEN, and PIP B:=A: *.*[V] to make a backup disk.

"Has anyone figured out how to use CP/M's EDIT? Compared to CP/M, Poly is a great system."

On another subject, Dick writes: "Did you know that the #3 ROM in the CPU has R. T. Martin's name in the end of the chip, and if you make an EPROM without it, certain older versions of BASIC won't run? Talk about ego!"

## ALL THOSE THINGS YOU WANTED TO KNOW...

(...but Poly didn't put in the manuals!) "Addendum to the PolyMorphic Manuals, 3d Edition (1 May 81)" includes sections on Poly utilities, the Text Editor and WordMaster II, command mode hints, BASIC aids (including all the new PEEK, POKE, and CALL capabilities and extensive examples of MAT usage), some screen display help, and some really helpful BASIC programming aids. Table of contents. 42 pages total plus cover. Addendum and the WordMaster II supplements have all been reviewed by (now former) Poly software department folks, who were most complimentary. $6.00 postpaid, from address below.

WORDMASTER II SUPPLEMENTS: 4-page Table of Contents and 6-page cross-referenced topical index to the WordMaster II manual (which has neither). 11-page (plus cover) "Command Summary" explains every available command in the Formatter (including several not documented by Poly). In alphabetical order, Summary gives each command and proper abbreviation, parameter guidance, how it works, and limitations. Attractively printed and very useful. $6.00 for the set of three (not available separately). If you get an "Addendum to the PolyMorphic Manuals" at the same time, $10.00 for all four, postpaid. Charles A. Thompson, Atty, 2909 Rosedale Avenue, Dallas, TX 75205 (214) 368-8223.

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

Recently, I was talking with a very experienced self taught Poly programmer here in Dallas and discovered that he was not familiar with user-defined functions. I told him how to do a few simple ones and he has been having great fun with them since. Poly BASIC has fine capabilities in this area, and if you are not using user-defined functions, you are probably doing it the hard way!

User-defined functions are mentioned in the Poly BASIC manuals, but Poly assumed you know all about user-defined functions. We self-taught programmers aren't always as proficient as Poly assumes, unfortunately.

OK, a good way to start explaining is to say that a user-defined function is really just a very flexible form of GOSUB. The user-defined function (as with built-in functions in BASIC) uses "dummy" variables (as well as "real" variables). Following are a pair of functions I haved used in a number of programs.

```
REM      Input Answers; conv to upper case
65040 DEF FNC$(X)
65050  PRINT" (Y or N) ",
65060  C1$=FNC1$(X)
65070  PRINT X$\RETURN X$
65080           FNEND
65090 DEF FNC1$(X)
65100 FOR I=1 TO 15
65101  IF INP(0)=0 THEN 65110 ELSE 65130
65110   NEXT\POKE 3,X\POKE 0,191
65120   PAUSE 10
65121 POKE 3,X\POKE 0,127\GOTO 65100
65130  X$=CHR$(INP(1))
65135  IF ASC(X$)=<90 THEN 65140
65136   X$=CHR$(ASC(X$)-32)
65140  RETURN X$
65150           FNEND
```

I use these functions when I want a single character answer (Y, N, some other letter, or a number 0 - 9). The functions provide part of the input instructions (line 65050), replace the cursor with a flashing question mark, convert lower-case letters to capitals, and allow entry without having to hit RETURN. This double function fits in one disk sector and I have been able to shorten my general ledger system by about 8 sectors by saving the functions as a separate program, FLASH.BS, and loading it from each program where I want to use it. The big line numbers put it at the end of the calling program.)

Let's examine these functions in a little detail. Each of these has only one dummy variable, "X", but virtually any number can be used in a user-defined bunction, limited only by what will fit on a single BASIC line. A function call to use FNC$ might look look this:

```
350 PRINT"Is this PolyLetter",
351 A$=FNC$(PEEK(0))
```

A$ is the variable you have assigned for your answer while PEEK(0) is the current location of the cursor (I should mention that these two functions require BASIC C03, - C02 might work - because several of the great new PEEK/POKE routines are used). Using PEEK(0) allows extremely flexible use of these functions, as the programmer need not worry about where the cursor is -- Poly does it automatically.

In the function definition, "(X)" is the dummy. "X" represents the screen location required by the POKE 3,X command (which moves the cursor). When you call the function as in line 351 above, "X" will be replaced by the value in PEEK(0). You could also use a value (0 to 1022 are the screen locations) or another variable. BASIC will evaluate whatever you put into the function call. FNC$ will add " (Y or N) ", display a flashing cursor, and wait for you to press a key. When you do press a key, the function will replace the flashing question mark with your entry (if a printable character) and return to program execution. You could, of course, trap for an improper answer (e.g.: IF A$<>"Y" AND A$<>"N" THEN 350).

I used a paired function to allow flexibility. For example, should you not want " (Y or N) " added to your question, you could

```
450 PRINT"Enter a single-digit number ",
451 A$=FNC1$(PEEK(0))\PRINT A$
```

FNC$ adds " (Y or N) " to the question and prints the answer. FNC1$ provides the flashing question mark and converts lower case letters to capitals. FNC$ requires FNC1$ but FNC1$ may be used alone. Incidentally, if all you want is to display some value or string, you can use the

(continued on page 9)

(HELPFUL HINTS - from page 8)

format "PRINT FNC$(PEEK(0))" without assigning the result to a variable.

The mandatory parts of a multi-line user-defined function are the definition line -- DEF FNC$(X), the RETURN line -- RETURN X$, and FNEND. The definition line names the function and specifies what dummy variables are involved. FNEND tells BASIC the function is completely defined, and the RETURN line is just like a RETURN in a GOSUB -- it returns program execution to the point where the function was called. Between the definition line and the RETURN line, you may include any legal program statements, commands, etc. Indeed, the function I first had to figure out was a complicated printing routine which had a number of dummy variables -- something like

```
DEF FNP$(X$,X1$,X2$,X,Y,Z)
```

and the function routine did calculating, formatting, printing to the printer and screen, etc. You can do this with a subroutine, you say? True, but with the function, you can do identical procedures in various parts of long programs without having to use identical variables. You merely substitute whatever it is you want handled for the variables in the function definition, and the function does the rest. The program might call the above function

```
P$=FNP$(A$,"MAY",STR$(A,%#3I),7,B,PEEK(0))
```

The numeric variables might represent a date, tab setting, etc.

There are only a few "must do" requirements. The function must "RETURN" some value. It is not necessary that you use the value for anything (though you can). In numeric functions, such as DEF FNP(X,Y), I frequently just use RETURN 0. In string functions such as DEF FNP$(X$,X), you must return a string, such as RETURN X$. Variables used in the function will affect regular program variables. For example, if you use a FOR-NEXT loop in the function, such as FOR I3=1 TO 10, and you are using I3 as a variable elsewhere in your program, the function will reset I3 (this may or may not be desirable). And, you must use the same number of variables in the function call as contained in the function definition. You may locate function definitions anywhere in a program without affecting program execution time. Since I have several standard function I use regularly, I have assigned them line unique numbers in the 60000+ range and, using the Editor, merely put them at the end of the appropriate program or call them from the program itself (see below for how I do this).

Don't forget to dimension the variables you use in a function (including dummy variables) in the usual fashion. The name of the function can be the same as a variable used elsewhere in the program without affecting the variable but it can be confusing. For example, you can have a variable P$ and a FNP$.

One-line functions are much more simple. These take the form (for example)

```
DEF FNS9(X,Y,Z)=X+LOG(Y)+RND(Z)
```

Here, RETURN and FNEND are not used. The single-line function is called in the same way as a multiple-line function.

Now, as mentioned above, I save disk space by saving FLASH.BS as a separate program and then loading it into each program where it's used. Here's how I load it:

```
25 P9$=CHR$(13)
30 OUT0"LOAD <?<FLASH.BS"+P9$+"CON"+P9$
35 STOP
44 PAGE\Z=CALL(4)\REM clear buffer
```

In one program, I even redefined line 65050 after loading FLASH.BS (substituted several spaces for " (Y or N) ":

```
12 P$=CHR$(13)
14 OUT0 "LOAD <?<FLASH"+P$
15 OUT0 "65050  PRINT"
16 OUT0 CHR$(34)+"  "+CHR$(34)+","+P$
17 OUT0 "RUN 19"+P$
18 STOP
19 PAGE\Z=CALL(4)
```

(Good programmers will no doubt note that in several of the examples in this article, space could be conserved by putting several statements on a line. Quite true.)

I found this article extraordinarily hard to write but hope that I may have given a clear enough picture to get you started if you're not already into user-defined functions. Do some experimentation with them, and try some complex routines. You may find you've been missing one of Poly's truly outstanding features.

# PolyLetter

1437 Sugarwood Lane
Norcross, GA 30093
(404) 925-2480 (night)

Issue #82/2

# PolyLetter

March/April 1982

PolyLetter is now well into its third year of publication, and I want to take a moment to talk about the status of our Poly user group.

First, let me thank all the people who have written articles and tips. Your input is superb, and PolyLetter could not exist without you. I couldn't begin to list all the names here, but our readers know you well.

Please, keep those articles coming in! We are always in need of information for new issues. Any Poly-related stories you can send in would be very much appreciated. Even if you don't consider yourself a writer, scribble some thoughts on a post card and send it in. We can always use your ideas.

We have been running two kinds of articles in PolyLetter: the "programmer-oriented" articles, which only appeal to someone with a fair knowledge of BASIC or assembly; and the "general" articles, which can be helpful to almost anyone. The feedback tells me that we need more "general" articles. Most of our subscribers are not programmers, but Poly users who want to get their jobs done in the easiest way possible. So we will be leaning toward articles that everyone can understand and benefit from. We'll still have an occasional article "for programmers only," and I hope everyone will bear with us machine-language hackers!

I realize it is sometimes difficult to reach me by telephone. PolyLetter is run from my home, and I often find myself spending long hours at my (full-time) job. The best time to catch me at home is 7-10 PM, Eastern. I have considered leaving my Poly hooked up as an answering machine when I'm not home... but this would only benefit those of you who own modems. What do you think - would this be a good idea?

Now for some bad news. PolyLetter's subcription list was about 250 people at one time. It has now dwindled to less than 150. We have conducted a survey, and found that most people let their subscriptions expire because they bought other systems, and sold their Polys. PolyMorphic Systems has been helpful in finding new subscribers, but I'm anxious to really increase our numbers if possible. (See the SPECIAL OFFER in this issue.) We need more members to make this group survive! I would welcome any ideas you might have, about getting new subscribers. There must be more Poly owners out there... where are they?

PolyLetter is the only regularly-published newsletter for Poly computers, to our knowledge. I still feel that Poly systems are among the best in the industry, and I intend to keep mine for a long time. Let's all hang in there and keep PolyLetter going.

## POLYS IN THE NEWS

An article was recently published in the Journal of Microscopy of the Royal Microscopial Society, about a program written in BASIC for the Poly 8813. The program is used for data collection and analysis. The authors commented on the wide availability of small microcomputers, and chose a micro instead of a mainframe computer for their task, mainly because of the cost savings.

The program, while written specifically for the 8813, was designed with portability in mind. It was written using statements which could be included in almost all versions of BASIC, so the program could be run on other systems with a minimum of changes. The authors commented that they wanted to be able to offer the program on CP/M systems eventually. They also wrote that the one modification they made to the Poly hardware was to add a numeric keypad to the existing keyboard. Interestingly, CP/M and a numeric keypad are now part of the standard Poly product line!

## ELIMINATING AUTOMATIC LINEFEED

by J. H. McNally
Teresa B. Finn Associates
PO Box 2336
Goleta, CA 93118

My son is majoring in Computer Science at the University of California, which provides 300 baud modem access for students via either "Wylbur" or "Unix" software interfaces. Poking away at a keyboard is very slow (extra cost for terminal connect time), and the editing facilities on the Poly are far superior to those of Wylbur and Unix; so we needed to be able to edit and transmit disk files from the Poly.

We have written a simple "dumb terminal" hybrid BASIC/assembly program for the 8813 to transmit source language disk files to the university system. First, we print files to our regular printer for editing. We need the automatic linefeed for the printer at this time. Then we transmit the same files via modem to a computer using the Unix operating system. Unfortunately, Unix also inserts an automatic linefeed so we get double spacing in the received source files. We can't change Unix, so we need to eliminate our automatic linefeed while transmitting.

The method of sending characters directly to the printer driver (given in PolyLetter 81/3, page 5, and in the System Programmers' Guide), which is "Z=CALL(12288,X,256)", works fine, provided that every character is sent this way. But if we use the BASIC insruction "PRINT:2,A$," with the trailing comma to eliminate the carriage return and linefeed, and then include the "CALL" above, it doesn't work. At 300 baud, Poly executes the "CALL" before it finishes sending A$, so the carriage return gets inserted in the middle of the line.

After considerable effort, we found that you can eliminate the automatic linefeed after carriage return by doing a "POKE 12106,195". Then the statement "PRINT:2,A$" can be used, which will send a carriage return, but no automatic linefeed will be generated. This works on Printer/42, and also 36 and 37. To return to normal, do a "POKE 12106,194".

We've had quite a struggle getting this far into terminal operation. We would be happy to correspond with other people who are using Polys as terminals, and we can also provide a copy of our program to anyone who is interested.

(Unix is a trademark of Bell Laboratories.)

## MORE ON ROM VERSIONS

Last issue we discussed the versions of ROMs in Poly systems. Several readers wanted to know how to tell which version ROMs they had in their systems.

Some ROMs are marked with a number like "V.75" for version 75 ROMs. The ROMs are on your CPU card, which is the card with a cable out to the printer interface.

Without removing your CPU card, there is another way you can easily see what version your ROMs are: Type ENABLE, and hit Control-Z to bring up the Front Panel.

```
$EN
$$ <Ctrl-Z>
```

The lower half of the screen shows a "window" into memory, displaying 64 bytes. Notice the arrow to the left of this window. Now type:

```
L439
```

and hit RETURN. The arrow should now be pointing to the data in location 0439 (hex). This location is called VERLOC, and holds the version number of your ROMs. It should be a number in the 70's or 80's for most systems. Version 81 is the latest ROM version "offfically" released, although I have information that version 82 is kicking around somewhere.

Incidentally, my experience shows that version 75 is by far the most common version in older systems. This is the version which supported only 3 SSSD 5" drives, and was released before the 8" systems became available.

## MORE ON "PACK" IN COMMAND FILES

In issue 81/6 we warned about using the PACK command in command files, with system versions before Exec/90. Al Levy writes that if you ENable the system before PACKing the disk, it won't bomb out.

## IBM PERSONAL COMPUTERS AND THE 8088

By now, everyone has heard about IBM's entry into the small computer marketplace with the IBM "PC" (Personal Computer). Harold C. Kinne writes to us from Dallas: "I have an 8813 with 3 drives, use a Xymec (Olivetti) printer, and now have an IBM PC with Hayes Smartmodem in addition. The IBM is great, but nothing can replace that wonderful Poly operating system. No one has come close to the user friendliness that system has!"

The IBM PC uses an 8088 processor. This is a 16-bit processor, made by Intel, the company that invented the 8080 processor used in Polys. The 8088 is part of a family of 16-bit processors: the 8086 is equivalent to the 8088 as far as software is concerned; only the bus (the signals at the card-edge connector) is different. There is also an 8089 for i/o processing, and an 8087 for math calculations.

None of these processors can run existing software that was written for the 8080 or other older processors. This creates major problems for IBM and similar companies: in order to sell lots of computers, there has to be software available, but writing 8088 programs means starting from scratch! Or does it?

To help speed the writing of new programs, there are "translators" available. A translator takes a program written on the 8080, and converts it to a program for the 8086 or 8088. (The 8080 is similar enough to these new processors that a translator is not too difficult.) Of course, no translated program can take advantage of the greater power a new processor has, so translated programs won't be as efficient as new ones would be. The translator method simply helps get a new system off the ground in a hurry.

There is also a new version of CP/M for the 8086 family. It's called CP/M-86, and it will certainly make an attempt to become as popular on new systems as CP/M is now. Don't be mislead, though: CP/M-86 is **not** CP/M. CP/M programs will not run on CP/M-86, unless the "translator" process is applied to them. Even then, massive changes may be necessary to make the program run on a new system.

How does this all fit into a Poly newsletter? It's possible that Poly's new product line of 16-bit systems may use the 8088 or 8086. That's good news, since many other manufacturers will also be going the 8088 way, with IBM leading the pack. (In fact, an 8088 processor for the Apple is under discussion.) Using the 8088 would allow Poly to translate their existing programs and save a lot of development time: totally rewriting BASIC might take years unless a translator helps out. And the 8088 is just about the only way a 16-bit system can fit into the S-100 bus in Poly's current chassis.

(CP/M is a trademark of Digital Research.)

## POLY-TALK

This column presents questions from our readers. If you can help, please write to the address listed, or to PolyLetter.

Has anyone had experience in intefacing a Houston Instruments digital plotter to the Poly? Are there any difficulties? I am planning to buy such a plotter this year. Jack G. Hills, 11 Loma Vista Drive, Los Alamos NM 87544.

The purpose of PolyLetter is to create a forum of ideas for users of Poly equipment.
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\- - -

Put me on your mailing list:
Name _____
Business _____
Address _____
City/State _____ Z _____
Phone _____
System _____
Printer _____
Uses _____
Future uses _____

## NEW OFFERINGS FROM RALPH KENYON

Ralph has a new modem program available, for use with the D.C.Hayes Micromodem 100 card. This program, **FTPH.GO**, simulates the functions of the Poly FTP program. It runs in originate and answer modes, at 110 or 300 baud, half duplex. It will send and receive files with any other Poly running FTP.

Ralph's new address is:

Ralph E. Kenyon Jr.
Abstract Systems, Etc.
RFD Lower Prospect Hill
Chester, MA 01011
(413) 354-7750

All of the following programs are available on SSSD 5" disk only unless noted. Call Ralph for details on these and other programs for the Poly.

### QuickSort Overlay

This sort overlay sorts a string array in BASIC. It uses the QuickSort algorithm and is implemented recursively. Any one-dimensional string array that can be created in BASIC can be sorted. $25.

### HeapSort Overlay

This sort overlay sorts a string array in BASIC. It uses the heap sort algorithm. The heap sort algorithm is more stable in time required than quicksort. Quicksort takes three to five times as long to sort data which is already in sorted order. $40.

### D.C.Hayes MICROMODEM 100 terminal operating system

Available for Exec/83 (includes modified System disk). Includes file send and receive capability and is able to log incoming data to printer. $85.

### Select and VSelect

These programs select data file records. They are general file utility programs which search an input data file for a specified character string. VSelect allows variable length fields withing each data record. Select: $65. VSelect: $85.

## POLY-ADS

FOR SALE: 8813, 3 drives, monitor, keyboard. $800! Pat Patton, 2203 Plaster Road #H-2, (404) 325-0976 evenings.

FOR SALE: Hardware and software to make Poly music or sound effects. Comes with Editor.BS, Compiler.BS, Muse.OV, and PLAY.GO for creating and playing music. I am selling the board **with software** for the usual price of the board alone. Al Levy, PO Box 71, Hicksville NY 11801. Demo music on audio cassette, played by 8813, $5.

### CopySelf DataDisks.

These disks have a tailored operating system of only 3 sectors! Will copy itself to another drive and boot. Ideal for use with non-system packages or data backup files. $20.

### One Drive List

1LIST.GO allows an 8810 or other one drive system to LIST or DIRECTORY a non-system disk. $10. (Since you only have one drive, send me a system disk to put it on).

### Special Languages

Little-Ada, a complete compiler system for a limited subset of the new DoD language Ada.

FORTH, an interpreter for the FIG-FORTH implementation.

### North Star Conversion Service

Conversion of disketts from 5" single density North Star format to 5" SSSD Poly format and vice versa. $10 for each disk; include an additional $3.50 per disk if you want the original and the converted copy both.

North Star BASIC programs can be "un-tokenized" (converted from tokens to text) also. Minimum of $5.00 per conversion, call for estimate on multiple jobs. (Note: straight conversion contains North Star syntax and is not fully compatible with Poly BASIC. Editing the programs to run under Poly BASIC is an additional item available at $25.00 per hour).

## DISK-OF-THE-MONTH

This month's Disk has an interesting assortment. First, an overlay which prints BIG characters on the Poly screen, using plot dots! Useful for titles, warnings, and other things your Poly would like to shout about. **Bchr.OV** can be called from Assembly or BASIC, and it comes with sample programs in both languages, **BCHR-TEST.BS** and **BCHR-DEMO.TX** (which is assembled to **bchr-demo.GO**).

Next, a couple of utilities for assembly language programmers. We developed these for interfacing to a ROM programming machine. **FETCH.GO** brings any file into memory at any address... sort of a super "GET" command. **PUNCH.GO** sends memory bytes out the serial port in a hexadecimal format, used by ROM burners and other devices.

Finally, PolyLetter presents **ADVENTURE!** This is the original, unreleased version, written for Poly (but never completed) by Bob ("the Wiz") Martin, formerly of PolyMorphic Systems. It still has bugs, but it's fun, and a lot cheaper than playing Adventure on a timesharing system.

Because of the special Adventure program on this disk, it is shipped with Adventure as an INITIAL file, meaning the system will start playing Adventure when you boot this disk. To access the other programs, you will have to boot your regular system disk and put the Disk-Of-The-Month in another drive.

The Disk-Of-The-Month is available for our usual low price of $15 on 5" SSSD, or $20 on 8" SSDD.

(MAILIST - continued from page 6)

```
; Set up Name.DT with the next name to do
(or quit).
Next.BS
; Format this one letter.
FORMAT Header.TX,Name.DT,Body.TX
; Call myself to do the next one!
Letter.TX
```

And there you have it.

Note: Ralph Kenyon and Abstract Systems are moving to Chester, Massachusetts as of April.

## OLD DISKS FOR SALE

Well, actually the disks are new. It's the programs on the disks that are a little old. These are some of our past Disk-Of-The-Month offerings, and they're still available.

April 1980: with **CONTROL-U.GO** (prints the screen at any time), **COUNT.GO** (a word-counting program), and **CALENDAR.BS.**

August 1980: with **Szap.GO, POP.GO** (changes system files to non-system), **COPY-SUB-DIR.BS** (copies files from one subdirectory to another), **CURSOR.GO** (changes the cursor to any character), **ROOM.GO** (tells how much room is left in a disk's main directory), and **POKE.BS** (a zany BASIC demo).

January 1981: with **SORT-DEMO.BS** (demonstrates various sorting algorithms), **MAZE.GO** (generates random mazes), and three non-working BASIC programs for the tinkering programmer: **READABILITY, GENE,** and **Home-Inventory.**

March 1981: with **TABBER.BS** (prints a grid on the printer for lining up output), **PEEK-DUMP.BS** (dumps memory to the printer, in ASCII, hex, and decimal), **FNTIMER.BS** (times parts of a program to let you optimize better), and **Tran.OV** (translates numbers to words, for check-writing).

May 1981: our first GAMES disk, with **BIORHYTHM.BS, BATTLESHIP.BS, CHESS.GO, HANGMAN.BS, SPIRAL.BS,** and **ART.BS.** A

July 1981: with **READ.GO** (simulates the TYPE command, and lets you go backwards), **COUNT.GO** (version 2.0, with multiple files, and line/page counts), **INPUT.BS** (a subroutine to accept and check input), and **FLIES.BS.**

December 1981: with more games, including **SLOT.BS, BACKGAMMON.BS, ARTIL.BS** (an artillery range game), **MOON-LANDER.BS,** and **Sex-Appeal.BS.**

## SPECIAL OFFER

This is a special offer for new subscribers. If you are not on our subscription list now, join PolyLetter for one low price and receive:

- A complete set of back issues, 12 in all, from February 1980 to the present.

- A one-year's subscription, 6 PolyLetters, starting with our next issue.

This package deal would normally cost over $45. If you subscribe before June 1, all of the above can be yours for only $25.

When you place your subscription order, you can also choose any Disk-Of-The-Month at the special price of only $10 (regular $15). See our Disk-Of-The-Month catalog in this issue.

## Merging Mailing Lists with FORMAT

by Ralph Kenyon

Several people have asked about modifying FORMAT.GO to allow merging mailing lists with custom addressed letters. While that might be a nearly impossible task by itself, there is a way to achieve the same end without modifying FORMAT.

Let's say you have an address file consisting of names you want printed individually on a letter using FORMAT. Suppose the address file has 4 lines for each name. The lines are the name, the company name, the street address, and the city, state, and zip code.

Example:

```
Line 1  : Ralph E. Kenyon Jr.
Line 2  : Abstract Systems, etc.
Line 4  : RFD Lower Prospect Hill
Line 5  : Chester MA 01011
```

Suppose you want to to merge several such names into the following letter:

```
{ce}Abstract Systems, etc.~
RFD Lower Prospect Hill
Chester MA 01011~
{jr}March 3, 1982
{skp}{jl}
{insert person's name}
{insert Company name}
{insert street address}
{insert city address}
{skp}Greetings,
{skp}{fill}{par}We are considering making a
directory of software for the PolyMorphic
8813.  If you have any items to include,
please complete and return the enclosed
sheet.  {par}If you have more than two
items, please furnish the information on 5"
SD diskette.
{nfil}{jr}{skp 3}Sincerely,~~~~~~~~~
{skp 3}Ralph E. Kenyon Jr.
```

### How to do it.

First, break the letter into two files which I'll call Header.TX and Body.TX.

Header.TX has the following in it:

```
{ce}Abstract Systems, etc.
RFD Lower Prospect Hill
Chester MA 01011~
{jr}January 24, 1982
{skp}{jl}
```

Body.TX has the following in it:

```
{skp}Greetings,
{skp}{fill}{par}We are considering making a
directory of software for the PolyMorphic
8813.  If you have anyitems to include,
please complete and return the enclosed
sheet.  {par}If you have more than two
items, please furnish the information on 5"
SD diskette.
{nfil}{jr}{skp 3}Sincerely,~~~~~~~~~
{skp 3}Ralph E. Kenyon Jr.
```

Second, I'll create two data files which I'll call Name.DT and Pos.DT.

Pos.DT starts out with 3 blanks and a 0 in it. Name.DT starts out with 4 long blank lines in it.

Third, I write a BASIC program called Next.BS which:

1. looks in Pos.DT to get it's place,
2. marks its new position,
3. goes to Address.DT and reads the next address,
4. and puts the new name into Name.DT.

```
10 DIM A$(4:64) \ REM space for one name and address
15 FILE:4,OPEN,"Pos.DT",INOUT \ REM our position keeper
20 FILE:4,POS,1 \ READ:4,P \ REM Get the last position
25 P=P+1 \ REM Increase position by 1
30 FILE:4,POS,1 \ PRINT:4,$4I,P \ REM Write new position
35 FILE:4,CLOSE \ REM Force data out to disk
40 FILE:4,OPEN,"Address.DT",INOUT \ REM mailing list
45 FILE:4,POS,P*4-3 \ REM We use 4 lines for each name
50 MAT READ:4,A$ \ REM Read the new name.
55 MAT IF A$="" THEN POKE 11656,0 \ REM Turn off Comand
60 FILE:4,CLOSE
65 FILE:4,OPEN,"Name.DT",INOUT \ REM file with one name
70 FILE:4,POS,1 \ MAT PRINT:4,A$
75 FILE:4,CLOSE \ REM Force data out to disk
80 Z=CALL(1027) \ REM Go to Exec
```

Now, whenever Next.BS has run, the next name to be formatted in a letter is in the file Name.DT. If the last name in the file is reached, the POKE 11656,0 will cause the command file to terminate.

Forth, I create a command file called Letter.TX which has the following stuff in it:

(continued on page 5)

## CONFIDENCE TESTING THE POLYMORPHIC

by Bob Bybee

Each PolyMorphic computer is shipped with Confidence disks, one for each drive in the system. These disks allow you to verify that the system is running normally. The programs on the Confidence disk will check out most of the elements of the system, and report if any problems are found.

It is unfortunate, but many computer systems (Poly and others) are taken for granted after installation. As soon as they are up and running, doing the job for which they were purchased, the system becomes the victim of neglect. Then several months (or years) later, when problems begin to develop, the system is blamed for being "poorly designed." In fact, the system is usually doing its best under adverse conditions, and in some cases it's a credit to the designers that the system runs at all! (One especially common problem is dust, including ashes, cigarette smoke, and chalkboard dust. These are serious enemies of disk systems.)

The answer to this problem is preventative maintenance. Like any complex machine, the computer needs some regular care or it will eventually show signs of wear and tear. You wouldn't expect your car to run for five years without a tuneup; and while the computer doesn't need its oil changed, it does need to be checked regularly. The Confidence disk supplied by Poly allows you to do this checking, even if your knowledge of computers is limited to pressing "Load".

Literally: to run Confidence, all you have to do is insert a Confidence disk in each drive, and press the Load button. The system does the rest, performing self-tests and reporting results on the screen. Because the screen is small, the results are presented in an abbreviated form that may be difficult to understand. In the rest of this article, we will be helping you decipher the Confidence display.

At the start of the test, immediately after pressing Load, the system does some quick checks to insure that it will be able to proceed with the tests. The video circuitry is tested to see that Confidence will be able to display good data on the screen. This video test produces some wild patterns on the screen for a moment; don't let that bother you.

Next, the main Confidence Test display comes up. It looks something like this:

```
System 88 Confidence Test   V 3.0      Elapsed Time:00:00:02:43
CPU Test: good                         Passes completed: 0004
Memory Test- Cumulative errors:0000  Hex memory address blocks:
   CP  20  30  40  50  60  70  80  90  A0  B0  C0  D0  E0  F0
   ********************************************************
High:...:...:...:...:...:...:...:...:...:...:...:...:...:...
Low :...:...:...:...:...:...:...:...:...:...:...:...:...:...
Disk Read Test -- Drives:    1          2          3
Motor Speed Test:          good       good       bad
Write Protect:             good       good       bad
Read Results:              good       good       bad
CTRL/S displays the confidence tests.   CTRL/Y returns to Exec.
```

The top of the display shows that the CPU card tested good. If it had problems, they would be reported next to "CPU test:", and the system might stop testing at that point. (Without the CPU running properly, nothing else in the system can be trusted!)

The "Elapsed time:" area shows about how long the test has been running. This is based on the internal Poly real-time clock, which gets shut off during certain functions (like disk accesses). This time display will be something less than the actual time you have been running the test, but it gives a rough idea.

(Continued on pages 8 and 9)

The "Passes completed:" display shows how many times this test has been run. After each pass, this test repeats itself (forever!) unless you interrupt it. This allows you to run the test overnight, and look at the results the next morning. Poly suggests you run Confidence AT LEAST ONE HOUR EACH WEEK.

The next area of the display shows how much RAM the Confidence test thinks you have. At this point you will need to know what your "Top of RAM" is... remember, when you boot your system, if your disk doesn't have a file named INITIAL on it, Exec will come up and say something like

(Exec/83 - Top of RAM is DFFF)

This DFFF is a hex number, and corresponds to the amount of memory in your system, as follows:

| Top of RAM | Amount of RAM |
|---|---|
| 5FFF | 16K |
| 9FFF | 32K |
| BFFF | 40K |
| DFFF | 48K |
| FFFF | 56K |

IMPORTANT: If your "Top of RAM" does not end with FFF, or is not one of the numbers in the table above, your system has a memory problem and should be serviced immediately!

When the Confidence test begins, it prints a message in the lower area of the screen that says something like

I see 01K of memory starting at 1800H.
I see 48K of memory starting at 2000H.

This means that the screen memory starts at address 1800H, and is one K (1024 bytes) long. It also means that main memory starts at 2000H, and is (in this case), 48 K bytes long.

Getting back to our sample display above: the asterisks on the line below "CP 20 30..." indicate where memory exists. Each asterisk is equal to 1024 bytes, one K. In the sample display, memory is shown to exist from 2000 to just below E000, which agrees with the statement "Top of RAM is DFFF." The first asterisks on the line, under "CP", correspond to RAM which exists on the CPU card. Its address is from 0C00 to 0FFF hex.

Now that the system knows where memory is, it proceeds to test memory. A little arrow travels under the asterisks to indicate where testing is going on at any time. If any errors occur, numbers will show up under the asterisks, replacing the periods and colons. If this happens, HAVE YOUR SYSTEM SERVICED IMMEDIATELY. Memory errors are serious, and can cause you to lose data, destroy disks, and waste money.

The next section of Confidence tests the disk drives. For this section to operate properly, a Confidence disk must be in every drive in your system, and they must all be write-protected. Three tests are performed on the drives: Motor Speed, Write-Protect, and Read Results.

Motor Speed tests the 5" drives for proper speed adjustment.

Write-Protect simply checks to see if the disk has the write-protect tab installed (or removed for 8" disks). If the tab is not installed, the test will show "bad." This is not a cause for alarm; simply install the tab and repeat the test. If the Write-Protect test shows "bad" with the tab properly installed, THEN you have a problem!

Read Results tries to read data from the disk. Any errors are accumulated in the "Soft" and "Hard" error columns at the bottom of the screen. A soft error is one which is corrected by re-reading the disk, and many disks will give you a certain number of soft errors. One or two soft errors occurring while running the test overnight is not a cause for alarm. Hard errors are a different story: they mean that some section of the disk is totally unreadable. This could be caused by a bad disk, or a system failure. HAVE THIS PROBLEM CHECKED!

Finally, note that our sample display shows "bad" on drive 3. The Confidence disk doesn't know how many drives are in your system, so it will try to test every drive, even ones you don't have. You will see "bad" listed under non-existant drives. (Eventually, Confidence will give up and say "not there" for those drives.)

- - - -

If Confidence shows any errors on your system, you can choose to run more tests. Press Ctrl-S, and you will get a menu of the tests available:

System 88 Confidence Tests

1. Confidence Test (Includes Brief Memory Test, CPU Test, Disk Read Test)
2. Video Interface Test
3. Extensive Memory Test
4. Disk Certification Test
5. Printer Interface Test
6. Error Printout
7. Error Summary Printout

Test number 1 is the test which runs automatically when you boot the Confidence disk. The other tests can be run once you suspect a problem with some part of the system. These tests are discussed in the System 88 Confidence Manual, which you should read.

## WHEN TO RUN CONFIDENCE TESTS

PolyMorphic suggests you run Confidence for at least an hour each week. The extensive memory test should be run once a month, overnight.

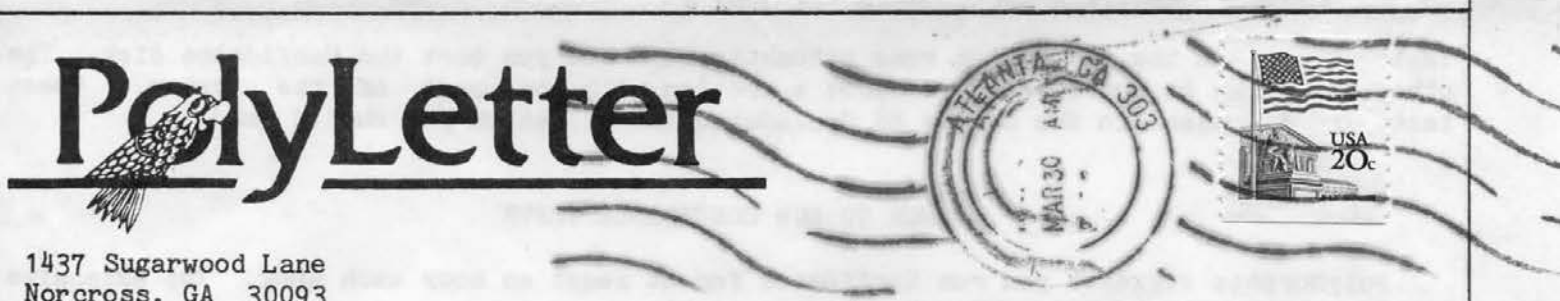
You should also run Confidence whenever you suspect some problem with the system. Don't wait for some problem that destroys data! Here are some conditions which should lead you to run Confidence:

Top of RAM does not end with FFF.

ANY error on a disk, such as "Disk Directory Destroyed," "Hard Error," "Verify Error," or similar errors. (First suspect the disk. If the problem persists with different disks, run Confidence.)

System jumps into front panel unexpectedly. This could be a memory failure.

The Confidence Manual is something every Poly owner should read. It goes into much more detail than we can in this article. Remember that the 8813 is a real computer, and should be repected as such. Large mainframe computers are typically taken "off-line" once a week for preventative maintenance, and to make a backup copy of all the files. Try to set up a similar schedule for your Poly.

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Norcross, GA 30093
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Issue #82/3

# PolyLetter

May/June 1982

## NEWS FROM POLYMORPHIC

This month, Poly is announcing their newest mass storage device: a 5-inch hard disk! A prototype system has been running for several months in Poly's factory. Ken Gudis reports the 5" HD will be available in 60 to 90 days. It consists of a 5" winchester drive, holding 16 to 18 megabytes of data, housed in an 8810 chassis with its own power supply and controller. A ribbon cable connects the 8810-type box to your main system chassis. The price will be $3995.

We inquired about the fate of the 8" 10 megabyte hard disk. Ken admitted that its sales were not as high as Poly had expected, due to the availability of cheaper hard disks on competing systems. This led Poly to develop the 5" HD. For applications requiring larger amounts of storage, the 35 megabyte HD is available, and a 70 megabyte version is not far away.

Now that hard disk systems are becoming attractively priced, Ken Gudis thinks that the 88/MS may become less popular. A tape drive for HD backup will be available soon, making the need for floppies even less.

In previous issues, we've mentioned several items which may appear in future Poly offerings: a Z80 CPU card to improve the peformance of existing 8813 systems; and a totally new 16-bit system. Now it appears these two ideas may be consolidated soon into a single product. Poly's engineers are working on preliminary designs for a new CPU card. This card would use the Z80 or possibly the new Z800 processor. The Z800 (not the Z8000) is software-compatible with the Z80 and 8080, Poly's current processor.

This new card would be much more than a CPU. It would include a 24 by 80 character video display, and at least 64K of memory. If the Z800 is chosen, it would be possible to have 128K of memory or more, since the

(continued on page 2)

The last two months' correspondence has been very gratifying. Many people responded to the fact that PolyLetter's subscription list is dwindling, and offered to help, or suggested ways to help. Here are some of the ideas readers presented:

"PolyLetter can serve as a clearing house for programs, to encourage development of Poly programs." --Jose Lipana. As Jose pointed out in his letter, a big problem with Poly systems is lack of software. (Often the software is available - somewhere - if only we knew where!) We would be happy to run notices of any programs you have for sale or trade.

"I placed an ad in Computer Shopper, advertising PolyLetter." --John McNally. Thanks, John! We appreciate the mention. Other readers can help by posting a copy of PolyLetter on the bulletin boards in nearby computer stores (most stores have them). Even if the dealer doesn't carry Poly, he will probably cooperate. And some lonesome Poly owner may respond to it.

Many Poly owners are moving up to larger systems, as their computing needs grow beyond the capabilities of their current systems. Often they move up to a minicomputer or other multi-user system; this tells me that the Poly is probably as powerful as any micro on the market these days (for most applications). If you do (sigh!) find it necessary to sell your Poly system, you can help us out by giving the new owner a copy of PolyLetter.

Incidentally, what magazines (computer-related or otherwise) do you read? We's like to get an idea of the reading habits of Poly people, and possibly place ads in some of the big-time magazines.

If there is a dealer or computer club near you, PolyLetter can provide you with sample issues or brochures to distribute and spread the PolyLetter name. Just let us know how many you need!

(NEWS - continued from page 1)

Z800 has more addressing capability than the 8080 or Z80. The amount of memory on the CPU card would be limited by the available space, after other features are included.

The new Z800 card would be usable in existing 8813s, with some restrictions. But more importantly, it would be the central card in a new product line for Poly. This new line will be more attractive to dealers, by bringing Poly's technology up to date with other manufacturers. Lennie Araki is looking forward to the day when Poly's new CPU can be integrated into a single chassis with a 5" hard disk, making an extremely powerful and compact system.

A multi-user configuration of this new system is even more exciting. A CPU card would be installed for each user, so that the system's computing power would not be reduced by running multiple jobs. Only the disk controller and other peripherals would become "shared" resources.

Ken Gudis stresses that the new system will be compatible with current Poly hardware and software, as much as possible. Current users will not be abandoned. The operating system and BASIC will require changes to run under the new CPU, but most user-written programs will run with few changes. Ken says the new system has two goals: to eliminate problems in the current 8813, and to increase the system's power to today's state of the art.

(We should point out that Poly's record in this area is exceptionally good. Few other manufacturers have expanded an operating system to this extent and maintained as high a degree of compatibility with early systems. Consider the Apple, where versions 3.2 and 3.3 of the operating system are incompatible, and a disk written on one cannot be read by the other.)

The new CPU might have trouble running with some of the other cards in current 8813s. The video board would not be used, of course, and neither would the memory boards. But some i/o boards (Poly's and others) might be too slow to keep up with a full speed Z800. This is the only place where hardware incompatibility might occur.

## ASSISTANCE FROM THE FACTORY

PolyLetter has received some complaints about the way PolyMorphic Systems responds to customer requests. It seems that some users are unsatisfied with the speed or completeness of the factory's answers to questions.

We discussed this problem with Ken Gudis and Lennie Araki. They point out that Poly is running with a small staff, and sometimes has trouble responding quickly to requests. Ken apologizes for any delays, and suggests the following procedure:

- If possible, write instead of calling. As we all know, a letter is easier to respond to and harder to forget.

- General questions should be directed to Ken Gudis. Specific software questions should go to Lennie Araki. Lennie is available by phone Tuesdays and Thursdays, from 1:30 to 5 PM Pacific time.

Poly's address is:

PolyMorphic Systems
5730 Thornwood Drive
Santa Barbara, CA 93117

telephone (805) 967-0468.

The PolyNet interface is no longer under active development. It has been postponed until the release of the new CPU. PolyNet will probably be more useful with the new CPU anyway, and should be refined along with that new hardware.

Overall indications are that Poly's plans are now long-range. The new CPU card and PolyNet are aimed at the end of 1982, as are the marketing plans. Ken Gudis says that Poly doesn't anticipate adding many new dealers until the new product line is ready; Poly wants to have something attractive to encourage new dealers. However, Poly has contracted with an advertising agency to begin new publicity campaigns. Ken says we can expect to see mass mailings, along with feature articles in Byte and other magazines. This will also begin cranking up around the end of 1982.

## OPERATING SYSTEM REVISIONS

The latest release of the operating system is Exec/95, and BASIC C03. Lennie Araki says that no changes have been made for several months now, and none are planned for the near future. This latest release appears to be quite bug-free, according to PolyMorphic. (See PolyLetter 81/1, page 6, for a few exceptions.)

After our recent series of articles about system revision levels and ROM versions, several readers wanted to know which versions of ROM worked best with which versions of Exec. Poly's excellent compatibility insures that just about any ROMs will work with any Exec. Of course, some users have written programs which look deep inside the ROMs in undocumented places, and if you change your ROMs you may find a few programs that don't run the way they did. This is not often a problem.

At PolyLetter we have used version 75 and 81 of the ROMs. Between the two, there appears to be no operational difference on any version of Exec we have tried, including Exec/4D, 76, 80, 83, 90, 93, and 95.

One pleasant change is that version 81 ROMs run the 5" SSSD disks a bit faster than version 75 did! In general, the later releases of anything run a little faster and more solidly than the older versions. The newer versions have more safeguards built-in; for example, you can't hit Ctrl-Y accidentally and leave the Editor anymore. The newer BASICs run faster because GOTOs have been sped up. The latest assemblers have some enhancements that make life easier.

Our advice is this: if your system is running pre-Exec/83 software, it would probably be a good investment to buy a new release from Poly or your dealer. This is especially true if you write your own programs. If you do purchase any new system disks, be sure and order the manuals at the same time.

It will not usually be necessary to change ROMs unless you change some of your hardware. For example, adding an MS to an older system will require new ROMs. Ask the factory about this when ordering any new hardware, especially disk drives. The TwinSystem upgrade also requires the latest ROMs.

## POLYLETTER ARTICLE FORMAT

We are always happy to receive articles, in any form you send to us. But some readers have wanted to know exactly how PolyLetter is formatted, so they can write their articles accordingly.

We use an 8813 running WordMaster II, part of Poly's WPS word processing system. Single-column articles are formatted with this FORMAT.IN file:

```
{lpp 66,tm 0,bm 0,lm 0,rm 0,wid 43,skp,ce}
```

The title of each article is centered. After the title, the article contains a blank line and

```
{fill,tind 4}
```

Paragraphs begin with {skp}, or a blank line, and {tind 4}.

Full-page printout is only used when the content of an article requires it. For example, if the article contains illustrations or copies of the screen, a width of 43 columns won't work. Then we use {wid 90}, or sometimes photographic reduction to make the article fit one column.

The purpose of PolyLetter is to
create a forum of ideas for
users of Poly equipment.
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Printer _____
Uses _____
Future uses _____

## MORE ON CONFIDENCE AND MEMTOP

In our last issue, we said that your "Top of RAM" should end with the letters "FFF", and that if it doesn't, you have a memory problem. Doug Schirripa and other readers pointed out that this isn't true with the newer Execs. In a version of Exec which includes the Volume Manager, **Vmgr.OV**, top of RAM now ends with 9FF instead of FFF! This is not a cause for alarm. It simply means that Vmgr.OV has stolen some of your memory from high RAM. This situation developed with Exec/93, I think, or whichever was the first Exec that supported the Hard Disk and Vmgr.

Some other programs also reside in high memory, and reset the "top of RAM" so they won't be disturbed. The debugging program **RDB.GO** and the **Form.OV** by Don Moe are two examples. After running these programs, if you type the Exec "DISPLAY" command, you'll see a top of RAM something less than you might expect.

## BUT WHO NEEDS VMGR, ANYWAY?

This episode brings up an interesting question. What does Vmgr.OV do in return for the memory it steals from you? Vmgr.OV was developed in order to support the Hard Disk. It allows you to break up the HD into several "volumes" which can be addressed as separate "disks". Vmgr.OV also lets you re-map the drive numbers, so that the notation "<1" no longer has to correspond to a particular drive. The CONNECT program allows you to connect any drive to any "volume number".

If you don't have an HD, and if you don't use these features of the Volume Manager, you can save yourself some memory and disk space by removing Vmgr from your system disk. Use POP, TweakSys, or BIT to make Vmgr.OV and Driver.DD non-system files, then delete them. You can also remove CONNECT, CONFIGURE, V-SETUP, and VLIST, since they only work with Vmgr.

## WHAT ELSE DON'T WE NEED?

Now that the operating system is so big, we 5" SSSD users have trouble getting any free space on our system disks. But if you know what's what, you can remove a lot of files. Each application requires some files and doesn't use others at all. Here's the roster:

## USER REPORT - HARD DISK
by Charles V. Trayser, D.V.M

I have started using a Priam 10MB hard disk with my Poly system. It works great! Imaging from one section of the hard disk to another section, the equivalent of an 8" DSDD disk, takes about 90 seconds. Doing the same image between two 8" drives takes about 15 minutes. All file access and editing functions are much faster. Configuring and installing the HD took about 15 minutes.

I have also been using the sort, search and other facilities of Interactive Systems Services KISS.RL package. It works very well and is very fast.

**Exec.OV, Gfid.OV, Dfn1.OV, Dfn2.OV, Dfn3.OV, Pack.OV,** and **Emsg.OV** are the core of the operating system. Leave them alone. Also leave **Edit.GO** and **Efun.OV**, unless you're very sure you won't be editing any files with this disk. **Prnt.OV, Sio.PS,** and **Setup.GO** operate the printer, and should also be left alone in most applications.

**BASIC.GO, Berr.OV, Bslv.OV, Bfun.OV, Xref.OV,** and **Bdir.OV** are only used with BASIC programs. You can remove these if your application involves only assembly language files.

**Asmb.GO, SYSTEM.SY, Pdat.SY,** and **Amsg.GO** are the assembler and its helpers. Remove these if you don't write any assembly language (machine code) programs.

**Vmgr.OV** and **Driver.DD** are the Volume Manager, discussed above.

**Cache.ZO** is used in MS systems, and possibly in 5" DSDD systems as well. It can be removed in 5" SSSD systems.

My systems are 5" SSSD, with two drives, so I need to recoup all the disk space I can. I use a different system disk for each project, so I can customize it according to the rules above. This usually leaves enough room for program development on a single disk. Of course, when removing files, always use a COPY of your system disk. Keep your original, master disk in a safe place, with all its files intact, and write-protect it!

## STATIC ELECTRICITY ON 5" DSDD?

Chuck Thompson reports that his 5" DSDD drives act up in dry weather, during the rough Dallas winters. The disks would sometimes give hard errors, or the wonderful "Disk Directory Destroyed!" message. He solved the problem by installing a humidifier, so the problem was apparently caused by static buildup on the rotating disk.

(Presenting this kind of quick solution for a serious problem is the whole reason for having a PolyLetter! Thanks, Chuck.)

## NEW BASIC STATEMENTS

New versions of Poly BASIC, C02 and newer, have a couple of new statements.

**ON ESCAPE :** (note the colon) works like ON ESCAPE in that it is executed when you hit Ctrl-Y. But the new ON ESCAPE : clears the "runtime stack" and gets you out of any GOSUBs or functions that were being executed when the user hit Ctrl-Y.

**ON ERROR :** works like ON ERROR, but clears the "runtime stack" as above.

BASIC version C02 also allows a 128 character line length, up to two full screen lines.

These changes are documented in the BASIC Manual, version 3, available from PolyMorphic Systems.

## POLY - TALK

I purchased PolyCom Associates 1040 Tax Preparation System from our good friend Charles A. Thompson. I was pleasantly surprised to find a program that worked perfectly, had an excellent manual, had a sample program to quickly illustrate all the features, and at the same time found a $61 error (in my favor) over my hand calculated tax return. Finding a program that works without all sorts of fixes and special conditions is not only rare but **unbelievable.** As you can tell, I'm very pleased and found the program easy to use.

--Dick Jacobi

## POLYLETTER HAS SECOND SYSTEM

PolyLetter recently acquired a second computer system. This system is a functional equivalent of an 8813 with two 5" SSSD drives. It consists of a PolyMorphic CPU, video, disk controller, and 48K RAM boards, housed in an Integrand chassis with two Shugart 5" drives.

This second system lives at my office (at Chromatics, Inc.), where it is connected to an NEC 5515 Spinwriter. This gives PolyLetter the ability to do more complex formatting, with underlining, bold type, and other WordMaster features we could not previously use. Until now, PolyLetter was printed on this same NEC printer, but it was connected by modem over phone lines to my home Poly system. This configuration made life difficult, and made it impossible to use WordMaster's more interesting features.

PolyLetter's first system is a similar "hybrid" box. It contains Poly boards, running in a North Star Horizon chassis, with extra serial and parallel ports. It's still running fine, but our second system makes PolyLetter less vulnerable if any failures do occur.

We discovered this ad in Computer Shopper. The company will convert 8" CP/M disks (the "standard" CP/M format) to North Star SSSD 5", which is the proper format for Poly CP/M.

### DISK COPY/CONVERSIONS FOR CP/M OR OASIS DISKS

**MQD** = Micropolis/Vector Quad Density Single Sided 5¼" Disk
**NSSD** = North Star Single Density Single Sided 5¼" Disk
**NSDD** = North Star Double Density Double Sided 5¼" Disk
**8" SD** = IBM Compatible Single Density Single Sided Disk

| Source Disk | Destination Disk | Copy/Conversion Price Each |
|---|---|---|
| MQD | 8" SD | $5.00 |
| NSDD | 8" SD | $5.00 |
| NSSD | 8" SD | $5.00 |
| 8" SD | MQD | $5.00 |
| ~~8" SD~~ | ~~NSDD~~ | ~~$5.00~~ |
| 8" SD | NSSD | $5.00 |
| ~~NSDD~~ | ~~MQD~~ | ~~$10.00~~ |
| NSSD | MQD | $10.00 |
| MQD | NSDD | $10.00 |
| MQD | NSSD | $10.00 |

If destination disk will not hold all the source disk files, send multiple destination disks. It is permissable to copy multiple source disks to a single destination disk where this is possible. Charges are based upon the greater of the Source or Destination disk count.

Send source and destination diskettes with a signed statement that copying the disks will not violate copyright laws. Send to:

**DISK COPY SERVICE, 423 E. 800 N., Orem, UT 84057**
**Phone: 801-224-2852**

**After being copied, your disks will be returned COD in the amount of the copying charge plus a $5.00 handling charge per order plus freight. A signed statement that no copies other than those requested were made will also be enclosed. Allow a two week turn-around.**

## DEALERS TAKE NOTE!

PolyLetter wants to compile a list of the available applications running on 8813s. If you have any applications programs or packages available, please write to PolyLetter. We will publish a complete, up-to-date list in a future issue. This list will be for users, dealers, and PolyMorphic Systems, to help answer users' questions about available software.

This is your chance for free advertising exposure! Don't miss out! We will publish descriptions of your programs along with any promotional material you care to send. (All material will be subject to editing for space restrictions.)

## CUSTOM SOFTWARE AVAILABLE

Custom programming services and special programs are available from Dan deForest, (219) 432-3406. Here are some of his offerings:

- Data transfer to/from many other systems, including DEC, Superbrain, Burroughs, North Star. These will transfer files or programs.

- Communication protocols to connect to Burroughs and other mainframe systems. These can operate from BASIC file channels or the wormholes.

- Remote disk operations and multi-system networking.

- Automatic phone answering.

- Adding extra boards to the Poly, including clocks, parallel ports, 8 serial ports, terminals (instead of memory-mapped video).

## NEXT ISSUE!

In our next PolyLetter, look for another Disk-Of-The-Month... info on a good, cheap printer... a new release of the BASIC Editor... all the latest news from PolyMorphic Systems... and whatever <u>you</u> send us!

## POLY-ADS

Ads are published as a free service to PolyLetter subscribers.

FOR SALE: Poly video board, $145. Poly CPU board, $145. Poly SSSD disk controller, $200. Shugart SA400 drive for Poly, $200. All items guaranteed to be in good working condition. Charles Trayser, 1844 Washington Blvd., Fremont CA 94538, (415) 651-0100.

FOR SALE: Helpful hints for the Poly. The "Addendum to the PolyMorphic Manuals, 3d Edition" is available for $6. I also have three useful items for WordMaster II: "Table of Contents" (4 pages), cross-referenced "Index" (6 pages), and "Command Summary" (11 pages) which includes all documented and undocumented commands. Price for the set of three is $6, or $10 with the Addendum. Charles A. Thompson, 2909 Rosedale Avenue, Dallas TX 75205.

PLEASE DON'T JUNK your Poly. If you can't sell it, offer it (or components) to me as parts to help keep mine alive. Especially need printer interface kit. J.H. McNally, Finn Associates, PO Box 2336, Goleta CA 93118, (805) 968-4628.

WANTED: Voice recognition hardware and software for Poly 8813. Finn Associates, PO Box 2336, Goleta CA 93118, (805) 968-4628.

WANTED: Accounts payable, general ledger, accounts receivable software for Poly 8813 (not CP/M). Jose G. Lipana, 12892 Palm Street, Suite D-7, Garden Grove CA 92643, (714) 636-7361.

## POST OFFICE PROBLEMS?

Occasionally PolyLetter gets an issue back from someone who received it in terrible condition, mutilated by the Post Office. Sometimes only the address label remains intact, and all inside pages are missing. Are your PolyLetters reaching you in good condition? If not, please let us know. We have considered going to heavier paper for the outside sheets, or taking even more drastic measures. Let us know if you think this would be worthwhile. (It might raise the mailing costs - we're right at the one-ounce mark now, on a 10 page issue.)

## USING WORDMASTER II WITHOUT WPS

The current Poly word processing program is called WordMaster II, or WPS. It is a tremendous upgrade from the original WordMaster, and includes a menu-driven system that prompts the user at each step and prints "help" messages when requested.

To run the new system, you need the WordMaster II disk. Then just type "WPS" and you will be into a totally new menu-driven world, not at all like Exec. The new system is good for a novice, but has its drawbacks. Since it's menu-driven, WPS does a lot of disk accesses. This makes it fairly slow on a 5" disk system. Note also that WPS requires at least 48K of memory.

The old WordMaster was different. It used two programs, the editor and formatter, and was run directly from Exec. If you're more comfortable with this mode of operation (as I am), you can use WordMaster II directly from Exec also. This means you can run with considerably less than 48K of memory.

To create or change a file, you'll use the Poly text editor, just like always. When you're done editing, the editor will exit, and you'll be back in Exec. Now comes the interesting part: formatting a document, with WordMaster II, **without** using WPS. Here's how.

First, decide which file(s) you want to format. If it's only one file, you can format it with a command line like this:

```
$FORMAT myfile
```

And the formatter does its thing. This works just like the old WordMaster, except that FORMAT doesn't ask any questions - it expects the document to contain all appropriate commands. Remember that WordMaster II uses different commands than the old WordMaster.

If your document takes up more than one file, you'll have to say so:

```
$FORMAT file1 file2 file3
```

But what if you have too many files, and can't type them all in on one command line? The formatter allows you to type in their names one at a time, prompting for each one. You would just type

```
$FORMAT
```

and the formatter will say: "Give me the name of a file to format (RETURN to exit):" At this point, type the name of the first file. It will be formatted. When the first file is done, FORMAT will ask for another. Continue to type in the filenames until the document is complete, then just enter a RETURN.

You might want to create a command file that does all this automatically. It would look something like this:

```
FORMAT
file1
file2
file3
file4
file5
```

At the end of the file, put in an extra RETURN to end the formatting procedure. Then run this command file by typing its name, and it will run FORMAT for you.

### The "Environment" Form

The WPS manuals mention an "environment" which you can set up. An environment, as WPS defines it, is a set of formatting commands that would pertain to the entire document you're formatting. An environment might contain the printer type, the number of lines per page, the width, and maybe the headers and footers for a document. You can create your own environments without running WPS, simply by typing the commands into a file, and formatting that file along with your document. We might create an environment file that contained the commands

```
{spin,lpp 66,tm 5,bm 5,wid 60,pause}
```

This would set us up for a "spin" printer, such as the NEC Spinwriter, 66 lines per page, 5 lines for top and bottom margins, a width of 60 characters, and the printer will pause after each page so we can insert a new sheet of paper. Let's put this into a file called "envir". To use this

(continued on page 9)

## HELPFUL HINTS IN LAYMAN'S LANGUAGE

by Charles A. Thompson, Attorney
2909 Rosedale Avenue, Dallas, TX 75205

For some time now, I've more or less blindly followed examples (including some published in my Addendum to the Poly Manuals) using the BASIC "CALL" to overlays. For example, I knew that

```
10 DIM Z$(1:33)\Z$="Diablo"+CHR$(13)
20 Z=CALL("Prnt",2,0,0,MEM(Z$))
```

would invoke my Diablo printer driver named "Diablo" but I really didn't know why and wasn't too sure how to use this information in other situations.

Bob Bybee came to the rescue not long ago, and although I still can not be too proud of my newly-derived knowledge, it's already come in so handy that it's the subject of this article.

I'm not about to try to explain how CALL works, except to say that you "notify" BASIC that you want to use the capabilities of some overlay with CALL. You then specify which overlay and what values the overlay is to use. Above, "Prnt" is the overlay, while "2,0,0,MEM(Z$)" are the values passed to the accumulator A, and the BC, DE, and HL registers, respectively.

Aha! But how do you know what to put into those registers? What does "Prnt" expect? The answers are contained in the System Programmer's Guide (1981) along with just about everything you always wanted to know about the Poly, floppy breath.

You can do some truly slick things with that little CALL above. For example, if you want to start "LOG" in the middle of your BASIC program, just insert

```
300 Z=CALL("Prnt",4,0,0,0)
```

and everything you enter from the keyboard (or the program generates on the screen) will be printed on your printer. To turn it off, it's Z=CALL("Prnt",3,0,0,0). In both of these examples, all you need to pass to "Prnt" is a function code. There are 8 function codes, as follows:

1-hookup default printer
2-send "Printer" command. Use HL to point to string (printer name or command)
3-turn off LOG
4-turn on LOG
5-show current page parameters on screen
6-set page parameters from keyboard
7-set page parameters from registers
8-get page parameters into registers

Of these function codes, numbers 1, 3, 4, 5, and 6 only need the name of the overlay ("Prnt") and the function code. The last three registers are 0, and indeed, may be omitted (but it's probably a better idea to use the zeros to keep everything nice and tidy).

OK - how do you figure out what to put in the registers for function code 7? The registers require the following:

B=lines per page
C=characters per line
D=top margin
E=bottom margin (line # from page bottom)
H=left edge offset

That's easy enough to understand - provided you know how to make a 16-bit figure from two simple decimal numbers. You see, there are only three zeros, we have to load five registers -- and to complicate it further, there's still register L (which isn't used).

Here's where Brother Bybee came to the rescue. First, let's figure what we want for page parameters: 66 lines per page, 85 characters per line, 4 top margin, 3 bottom margin, and 5 left offset. We know from the list above that B is lines per page and C is characters per line. We also know that the 8080's register pairs are BC, DE, and HL plus an accumulator (A). So the format for CALL is:

```
Z=CALL("Name",A,BC,DE,HL)
```

We know where the overlay name goes (in quotes) and we know that the function code goes into A. Now, we want to put 66 and 85 into BC. How? Simple. (Remember that 8 binary bits can represent 0-256). Multiply 66 times 256 and add that to 85. Indeed, you do not have to do the actual calculation, as BASIC will do it for you:

```
Z=CALL("Prnt",7,66*256+85,DE,HL)
```

(continued on page 9)

(WPS - continued from page 7)

"environment" to format a document, we could type

$FORMAT envir file1 file2 file3

The commands in "envir" would remain in effect for the entire document, unless cancelled by something in one of the other files.

Notice that when the formatter cranks up, it prints the names of the files it's printing; but first it prints the name FORMAT.IN. The formatter always looks for a file called FORMAT.IN before it formats any of the files you named. Think of this as an automatic environment file. If you create a file called FORMAT.IN, you can put your standard environment into it. What formatting commands do you find yourself putting into nearly every file? Put these in FORMAT.IN, and don't bother entering them in each file anymore. Of course, if you format anything that doesn't use the same environment, you'll have to explicitly cancel whatever you need to change. The best things to put in FORMAT.IN are printer type, pause (if you use it consistently), and margins.

If you like this method of operation, you can generate a stripped-down WordMaster II disk that has enough room left over for some text files. Using an IMAGE of the disk, not the original, remove the files WP.DX and WPS.GO from the disk. Then you'll have a minimum WordMaster II disk that's not too crowded to be useful in 5" SSSD systems.

Be sure to see Chuck Thompson's ad for WordMaster II goodies on our advertising page. They are invaluable!

(HINTS - continued from page 8)

Put the top (4) and bottom (3) margins into DE the same way:

```
Z=CALL("Prnt",7,66*256+85,4*256+3,HL)
```

and, finally, put the left edge offset offset into HL:

```
Z=CALL("Prnt",7,66*256+85,4*256+3,5*256)
```

and we're finished. Note that we don't use L in the HL pair so we in effect just add zero to 5*256.

There are a number of user-callable functions available in Dfn1.OV, Dfn2.OV, and Dfn3.OV (RENAME, LIST, DIRECTORY, DLIST, Sniff, boot, PRINT, TYPE, and COPY). These work in conjunction with command strings pointed to by CMPTR. If you have my Addendum, you can see examples of RENAME and DELETE in Section VI, paragraphs 6.01(o) and 6.01(p).

Incidentally, the new PEEK(4) and POKE 4,X available in BASIC C03 make it easy to get the 16 bit command pointer CMPTR and to change it. To COPY an existing file from BASIC, for example, try this:

```
5 DIM Z$(1:50)
10 Z$="<2<Existing <3<New"+CHR$(13)
15 D=MEM(Z$)\REM Get location
20 C=PEEK(4)\REM Save contents of CMPTR
30 POKE 4,D\REM  Put loc of Z$ in CMPTR
40 Z=CALL("Dfn3",3,0,0,0)\REM   Execute
50 POKE 4,C\REM  Repl orig value of CMPTR
```

The ability to do some of these things from BASIC can reduce the need to split programs in order to execute command files. Being able to set or reset printer parameters is invaluable. Just put the desired parameters in each BASIC program and forget about being sure you have the printer set up correctly! (You could even switch back and forth between the printer and the screen).

Keep those cards and letters coming. I answer all of them.

PolyLetter

1437 Sugarwood Lane
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Issue #82/4

# PolyLetter

July/August 1982

## NEWS FROM POLYMORPHIC

With any luck, we should be seeing some Poly publicity before long. Ken Gudis reports that Information Systems News plans to run a Poly article shortly. There should be quite a story to tell; PolyMorphic is one of the longest-lived companies in the microcomputing business.

These and other Poly articles will be appearing thanks to the work of Poly's advertising agency, which will also be running a mail campaign to dealers (and, hopefully, users). Poly's new system is the reason for the excitement, of course. As the system design becomes firm, we should be hearing more details about it.

What we know so far is that it will probably have a floppy and a hard disk built in, along with an 80 by 24 video display and at least 64K of RAM. The system will be set up so it can run programs from several operating systems, including CP/M, MS-DOS (from the IBM personal computer), and a new version of Poly's own Exec. The new system will initially be packaged in an 8813 chassis, but that may be upgraded later.

Poly's 5" hard disk has not yet been shipped. It should be very close to shipment by the time you read this.

Many readers have asked the (painfully honest) question, "How does Poly stay in business?" Ken Gudis chuckled a bit when we asked him this question. He replied that the odds have been against Poly for some time, but the company is hanging on mainly through OEM sales. Poly 88s, and boards for the 88 and 8813 systems, are Poly's main output these days. Ken also admitted that the sale of complete systems has slowed somewhat lately, as dealers "wait and see" what Poly's new product line looks like.

## ASSISTANCE FROM THE FACTORY

In our last issue, we reported that some users have had trouble getting PolyMorphic Systems to respond to their calls and letters. The situation appears to be getting better now... we received several positive letters from readers who had gotten answers from PolyMorphic.

John Barrett, of Florida, sent us copies of the letters he mailed to PolyMorphic. He wanted information on upgrading his 8813 to an MS. John sent his letter on May 26, and received a reply from Ken Gudis on June 7 (mailed on June 2). Ken's reply seemed to answer all of John's questions.

William Davis, of Portland Oregon, writes: "Over the last six years I have had the opportunity to use a variety of microcomputers, Apple, TRS, Osborne, etc. None of these systems are as friendly as the Poly, nor was the technical assistance available from the manufacturer worth much."

(continued on page 2)

## ABOUT YOUR SUBSCRIPTION

The mailing label of each PolyLetter has your subscriber number, along with the expiration date of your subscription. For example, your label might read:

John Q. Polyperson 8206 123
654 Cool Breeze Road
Miami, FL 98765

This subscription would expire with the 6th issue of 1982 (8206), which is the November/December issue. The subscriber number is 123.

We try to enclose a notice with your last issue, reminding you to renew. You can help us by keeping an eye on your mailing label; don't let us forget about you! It's also a big help if you write your **subscriber number** on your check or letter.

(ASSISTANCE - from page 1)

On the other side of the coin, Dick Jacobi writes from McLean, Virginia: "Nix on your article about writing to Poly... wrote to them on March 26, and still no answer." We got Dick's letter a few weeks ago, so hopefully PolyMorphic has responded by now.

It appears that you get better results from PolyMorphic if you do these things: (1) Write instead of phone. (2) Ask very specific questions. (3) Make it easy for them to respond quickly. Don Barrett uses a multi-part form for his letters, so the recipient simply mails back a part of the original letter.

## FRONT PANEL LOCKOUT

As we know, Polys like to jump into the Front Panel. The usual reason seems to be static discharge. Some printers also confuse the CPU card, causing the Front Panel to appear.

John McGaw, of Anchorage Alaska, has the same problem. He has written a program called Front Panel Lockout (FPL), which prevents the system from jumping into the Front Panel. You can store this program as your INITIAL file, so it will run every time you boot the system. Its only drawback is that it prevents the single-step function of the Front Panel from working. You can still use the Front Panel by hitting control-Z.

And if you're not interested in assembling this program yourself, you can buy it on this issue's Disk-Of-The-Month!

```
        REFS    SYSTEM
        REF     Ioret
        REF     SRA7
        REF     Msg
        REF     USER

        ORG     USER    ;run in USER area
        IDNT    $,$

        LXI     H,Ioret ;safe way back
        SHLD    SRA7    ;save in FP entry
        LXI     H,MESS  ;say we did it
        CALL    Msg
        RET             ;back to Exec

MESS    DB      '(FPL 1.1 - 3 May 82)'
        DB      13,0

        END
```

## THE BLINKING "LOAD" LIGHT

Jon Wolfert, of Dallas Texas, wrote a nice letter with several interesting questions. One of them was, "I've always wondered what the indicator light inside the LOAD button was trying to tell you. Can one derive any useful info from its seemingly random flickerings?"

The answer is yes. The light inside the LOAD button is operated by a signal from the CPU card called Halt Acknowledge. This means the light is on whenever the CPU is halted (not running).

(Now wait a minute. I bought this CPU to do work for me, and now you're telling me it's not running whenever that light is on? What is this, a ripoff?)

Well, there are times when the CPU can't get any work done. Normally these are times when it's waiting for I/O (input or output) to occur. The light is on whenever the system is waiting for keyboard input, or for the printer to finish, or for disk I/O to take place. In all of these cases, an interrupt will happen when the operation is complete. This interrupt gets the CPU out of its halt state and starts it running again.

In addition, the real-time-clock generates an interrupt every 60th of a second, so the CPU is never halted for longer than that. When the light appears to be on continuously, the clock is still getting updated 60 times every second, and the CPU is halting again immediately. This happens so fast you con't see the light flicker.

The only time the LOAD light is off is when the CPU is totally "compute-bound." This occurs a lot in BASIC programs, and a few assembly-language programs are also complex enough to completely occupy the CPU's time.

So the LOAD light indicates these things:

Light ON: waiting for I/O.

Light BLINKING: doing intermittant I/O (disk or printer).

Light OFF: computing its little brains out.

## CP/M CORNER

(This month's CP/M corner was written by Russ Nobbs, Spokane, Washington. CP/M is a trademark of Digital Research.)

The reason for the desire to have CP/M on Poly is obviously all the software available that runs under the CP/M operating system. There are large numbers of accounting programs for sale that have been debugged by the hundreds of current users. There is a handful of screen oriented spread sheet programs that are almost as simple to use as our Poly editor, but produce crunched number output much easier than Poly's PLAN. There are dozens of packages for the "vertical markets" that Poly talks about -- medical, dental, legal office, CPA's, and much more.

There are many other languages like FORTRAN, Pascal, C-BASIC, Microsoft BASIC and numerous programs written for each special dialect. There are bulletin board systems running CP/M, and a file transfer program called XMODEM can do fast and accurate transfers of public domain programs to your system.

All they need, in order to work on your Poly, is the (comparatively) primitive CP/M, a way to read a program disk written under CP/M (or a program transfer through a modem), and often a 24 x 80 screen. This is a major problem, as I'll discuss in a minute.

Until I added 5" drives to my 8" 8813 system I could only get programs off the CP/M Remote Bulletin Board Systems through my modem, or by paying my dealer $25 an hour to set up a transfer between an Altos and a Poly. Now I have expanded my CP/M horizon to include SSSD NorthStar disks but find few dealers who have any CP/M software in this format.

Most NorthStar software seems to be available only in the NorthStar double-density or quad-density format. I ordered some CP/M User Group disks from N.Y. in NorthStar format but received **double** density disks rather than the single sided **single** density I ordered. In looking at the brochure CPMUG sent, it appears that NorthStar CP/M disks may only come in double and quad density.

(Editor's note: after checking with several NorthStar CP/M users, I find that NorthStar SSSD format IS available, but is becoming less common. Most NorthStar Horizon systems can use single or double density, so NorthStar users have no reason to use SSSD anymore. I'm told that the new NorthStar "Advantage" system does NOT use SSSD. But many software vendors still support SSSD, so be sure to request SSSD when you order NorthStar CP/M software for use on your CP/M Poly. -BB)

Being able to read CP/M disks in NorthStar format, and having the CP/M mods installed on my 8813, does NOT mean I can go out and buy the popular, debugged and widely available CP/M applications software! Most of the business programs available <u>require</u> a 24 x 80 screen. We are still stuck with Poly's 16 x 64 memory mapped video. Unlike the new Osborne's 24 x 52 screen (which has an awkward but useable sideways scrolling feature), CP/M programs on the Poly are going to lose text off the top or the right side of the screen. Menus, input forms, instructions, and all other screen displays will be broken up. If you are thinking that these problems don't make CP/M sound very worthwhile on the Poly right now, I have to agree with you.

Would a new video interface board and a serial terminal mean giving up the speed and ease of Poly's editor and the existing memory mapped screen? There would undoubtedly be some changes in this area. If Digital Research's ED is the only CP/M editor you have seen, you have reason to worry about the loss of Poly's editor! ED is straight out of the dark ages of line-oriented mainframe editors. None of the "move the cursor and start typing" that PolyUsers enjoy. However, if you have used a <u>good</u> CP/M text editor like WordStar and its kin, you know they are nearly as good as our beloved Poly editor. They usually have the great advantage of presenting the text on the wide screen the as it will appear when printed.

My own response to the dilemma has been to remain hopeful that we can keep working with the Poly and expand it to fully operate under CP/M. I must admit I'm tempted by the portable Osborne I, but it's hardly a machine for a 5000 name mail list or a 1000 account AR/AP/GL. It <u>would</u> allow a traveling salesman to converse with the Poly in the home office.

## HELPFUL HINTS IN LAYMAN'S LANGUAGE

by Charles A. Thompson, Attorney
2909 Rosedale Avenue, Dallas TX 75205

I've recently begun to use the expanded capabilities of my Diablo 1650 KSR printer/terminal. It's equipped with a special word-processing package, and can do some fancy things if it receives the proper codes. Particularly, it will do some slick things with proportional spacing, automatic underlining, centering, right justification, bold and shadow printing, and more.

It's virtually impossible to use FORMAT to send special code sequences to the printer. I did write a BASIC routine which worked fairly well, but this took a lot of time, going from Editor to BASIC program and then back if corrections were needed. And, it was a most complicated program which didn't always work as intended. So I started using the capabilities of the Editor, using right and left pointing arrows to mark my text and ESC CTRL-P to send it to the printer.

But, with the exception of a very few characters, I was stymied in trying to send most ESC sequences, since the Editor would (for example), grab my ESC B and move the cursor to the top of text. Also, I used a very awkward procedure to get ESC itself into the text.

Enter New England's resident PolyGenius Ralph Kenyon. He first told me how to get ESC anywhere I want it. ESC is represented by a left-pointing arrow. Again, the problem is that the Editor uses the left-pointing arrow to mark text. "Easy," Ralph said. "Just create a left-pointing arrow in the usual fashion by hitting ESC left-arrow, then delete it with the delete key, and then undelete it with CTRL-U." Apparently this removes a pointer the Poly uses to keep track of where the temporary arrows are, because it works!

This was a great advance, but I still had problems. The Diablo uses, for example, ESC TAB n, to do absolute tabs. If I want to do a tab of 14 from the left margin, I need ESC TAB CTRL-N (CTRL-N is ASCII 14). But CTRL-N is immediately executed by the Editor to move the cursor down 14 lines. Our New England cavalry rode to the rescue again. You can create and save virtually any CTRL code by following this procedure:

- Enter CTRL-F (get double cursor)
- Enter the control code you want
  (Greek letter shown)
- Hit ESC (double cursor disappears)
- CTRL-U twice to undelete
- Left arrow twice to move cursor
- Delete key to delete double cursor

So, now I can enter virtually any ESC or ESC CTRL sequence I want, easily. These can be sent to the printer either by the arrows and ESC CTRL-P or by saving the file and using PRINT from Exec.

(This kind of use for control-characters has been mentioned to Poly. Perhaps some future version of FORMAT will accept a command like {chr 27} to send an ASCII 27, or ESC character, directly to the printer.)

These two techniques may have limited application for most Poly users, but since most printers have special capabilities, perhaps you'll also be able to get more from your printer. I'd appreciate knowing of any other uses you may find.

On another subject, I was recently given the opportunity to review and try out Bob Bybee's new FIND and SDIR utility programs. In a word, buy them, especially if you ever use subdirectories. I'm sure Bob will describe these utilities elsewhere in PolyLetter, so I won't. These two should become as well used as ARISE and DLIST.

## FLOATING POINT BOARD

We received an inquiry about a North Star Floating Point Board, designed to speed up math calculations in BASIC. It seems that some earlier versions of Poly BASIC could make use of this board, and increase their number-crunching power dramatically.

Although North Star still sells the board, the current versions of Poly BASIC do not support it as far as we can tell. This is a shame, since BASIC is painfully slow in many applications. Perhaps the new Poly system will have some hardware math processing abilities.

If you have any information about using the North Star FPB in an 8813, please write to PolyLetter.

## A GOOD PRINTER FOR POLYS

Several Poly users have recently connected an Okidata "Microline 80" printer to their systems. PolyLetter installed one of these printers for Bob Schwartz in Cincinnati, so we had a first-hand look at it.

This appears to be a good, low-cost, dot-matrix printer. It sells for about $350 to $400 through several mail-order companies. A low-cost unit like this would probably not hold up forever in a business that used it 8 hours a day, but it seems to be suitable for applications that don't do a lot of printed output. (Okidata makes three other models which are more expensive, and might be more sturdy.)

The printer has some nice features, such as compressed and expanded print, and 6 or 8 lines per inch. We have a program called "OkiTweak" which selects these options. It's available for free if you send us a disk to put it on. We can also supply wiring details on how to connect the Okidata to your Poly.

Dick Jacobi also uses a Microline 80, but his has a parallel interface instead of the serial interface. He had to add a parallel port to his Poly system, and write a custom printer driver program in assembly language. But this arrangement also gives him some features that Poly doesn't support; for example, a command that makes a full printed copy of the screen, including graphics! The program is too long to reproduce here, but you can write to us for a copy, or directly to Dick at 913 Whann Avenue, McLean VA 22101.

## DEALERS TAKE NOTE!

PolyLetter is still looking for information on programs available for the 8813. We received little response last issue, so we're asking again! If you have any applications programs or packages available, please write to PolyLetter. Send descriptions of the programs, and any other promotional material about your software or your company.

We will publish a complete, up-to-date list in a future issue. This list will be for users, dealers, and PolyMorphic Systems, to help answer users' questions about available software. Your input is needed!

## CHEAP LETTER QUALITY?

You have probably read about the newest letter-quality printer on the market. It's the TP-1 by Smith-Corona, and is the first daisy-wheel printer to sell for less than $1000. It is being sold for $700 to $800 by mail, compared to $2000-$3000 for other letter-quality printers like Spinwriters, Diablos and Qumes.

Before you jump for joy and mail off a check, we should warn you that you "get what you pay for." The TP-1 is a fine little printer, and produces letter-quality output. But it is built by a company whose reputation is for typewriters, and this printer has much in common with typewriters. First of all, it's slow. The TP-1 runs at 12 characters per second, compared to other letter-quality printers which can print at up to 55 CPS. No tractor feed is available, although one is planned for the future.

Installing the TP-1 on a Poly was difficult. It has a serial interface, but there was little documentation on how to connect the unit. The switches which set baud rate were buried deep inside the printer, and were difficult to find. (The instructions made no mention of their location.) Once we found and set the switches, the printer worked perfectly.

Well, almost perfectly. The TP-1 has a "feature" which is a drawback to Poly users, and probably affects other systems in the same way. Whenever the printer gets a RETURN character, it performs both a carriage return and a line feed. (This is probably due to the unit's typewriter ancestry... IBM Selectric printers have the same "feature.") For this reason, the TP-1 cannot do bold type or underlining when used with WordMaster II. There is a way for the unit to do automatic underlining, but it's non-standard, and WordMaster can't use it.

Conclusion: buy the TP-1 if you can live without bold type and underlining, and if you don't mind <u>very</u> slow output. It's still a good deal at $800. You can contact us for details on how to connect the TP-1 to your PolyMorphic.

## DISK-OF-THE-MONTH

This month's Disk has an embarrasment of riches! We received a lot of contributed programs recently, and this is a sample of the fine work PolyLetter readers can do.

**DX.GO,** by Frank Stearns, grabs the directory off a disk and writes it into a file. You can then edit the file and add commands, perhaps to FORMAT or PRINT all the files shown. I use it for printing out dozens of different stories when assembling PolyLetter.

**BOWLING.BS,** by Chuck Thompson, is a fun way to get some exercise - for your fingers, at least. Control the ball with cursor keys.

**MASTERMIND.BS** is the classic guessing game. I spent hours with it the day John Warkentin sent it to me. It's annoying to have a computer outsmart you!

**CHANGE.GO** is also by John Warkentin. It lets you swap system disks, safely, without rebooting the system or booting to another drive. Very handy.

**TEXT-TRAN.BS,** by Russ Nobbs, translates a text file into a set of BASIC "PRINT" statements. Just the thing for generating menus or other elegant displays. It has error-checking and translation for unprintable characters, and comes with extensive instructions and examples.

**FPL.GO** is the Front-Panel Lockout program, described elsewhere in this issue.

**FIND.GO** and **SDIR.GO** are utilities written especially for MS and DSDD users. FIND searches all directories on a drive for a given file. It first checks the main directory, then all sub and sub-sub directories on the disk. SDIR (Super DIR) will let you see the sum total of the files on your disk. SDIR can list deleted files along with the undeleted ones; system and non-system files; and lists the files in all subdirectories to give a complete record of the files on a drive.

The Disk is still a bargain at only $15, or $20 on 8" SSDD. Order from PolyLetter, 1437 Sugarwood Lane, Norcross GA 30093. Some of the BASIC programs on this Disk will require Exec/93 or later in order to function properly. Exec/95 is the current version and is available from PolyMorphic Systems.

(If you sent in a disk to PolyLetter and we haven't used the programs yet, don't worry! We will.)

The purpose of PolyLetter is to create a forum of ideas for users of Poly equipment.
One year (six issues) subscription $15 US and Canada, $20 overseas.
Editor: Bob Bybee
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PolyLetter is not affiliated with PolyMorphic Systems in any way.

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## NEW BASIC-EDITOR

This is an all-new release of the PolyLetter BASIC Editor. A must for serious BASIC programmers, this utility allows you to edit lines of a BASIC program without leaving BASIC!

This version of the BASIC Editor is self-relocating, and is independent of the amount of RAM in your system and the version of ROMs you are using. It will work with any version of BASIC.

The BASIC Editor edits a line in screen memory. It runs when you hit Control-DELETE (or key IV on the new keyboard). The arrow keys will then allow you to move the cursor in the program line, making changes as you like. When you press RETURN, the entire line is passed to Poly's keyboard buffer as if you had retyped it.

The BASIC Editor is priced at $25. Order from PolyLetter.

## POLY-ADS

Ads are published as a free service to PolyLetter subscribers.

FOR SALE: QT Systems real-time-clock card, modified to work in 8813. Complete with documentation and programs to read and set the time/date. Cost over $100 new, will sell for $75 including software. Contact Bob Bybee at PolyLetter.

FOR SALE: Hayes Micromodem 100 (for S-100 bus). Age 3 months, perfect condition. Original cost was $345, will sell for $225, in original carton with manuals. Software to operate this card on 8813/8810 is available for $50. Sidney Mullen, 1324 Inverness Ave., Pittsburgh PA 15217, (412) 462-6421 or 683-0509.

FOR SALE: 8813, monitor, keyboard, with 8" MS and three 5" drives, in a desk enclosure. Also selling NEC 5515 KSR Spinwriter, with or without Poly system. John Maceda, 14229 Proton Rd., Dallas TX 75234, (214) 934-9156.

FOR SALE: 8813, 3 SSSD drives, 48K, keyboard, monitor. With mail-list and other software. Kerry McCalla, (205) 967-4556.

WANTED: Any business software for 8813, accounts receivable, mail list, etc. Also, is anyone familiar with Poly's AR program? Ken Heinemann, 8474 Colorado St., Merrillville IN 46410.

WANTED: 8813 with at least one 5" SSSD drive. Will consider systems with/without MS or printer. Graham Mullins, 1431 Marlowe Dr., Montgomery AL 36116, (205) 288-7059.

## A SUPER SPELLER

A unique spelling program for Poly, designed and written by a professional technical writer:

* FAST -- 500 to 5,000 words per minute depending on error density. (Speed can nearly double on 8" systems.)

* STANDARD HUGE ROOT DICTIONARY -- The 20,000+ root word dictionary (including many proper names) is user-expandable.

* USER DICTIONARY FACILITY -- ANY FILE (even assembled machine programs!) can be converted into a modular user dictionary. "Plug" or "unplug" different user dictionaries as required.

* The program understands suffixes and prefixes, thus enhancing the efficiency and power of the core and user dictionaries.

* One of the few commercially available spelling programs that will reside on one 5" "flippy" diskette, and work from one drive. (Including the dictionaries!)

* Based on a new algorithm, one designed specifically for Poly hardware.

SPELL 2.0 is a life-, deadline-, and eye- saver, and an excellent buy at $99.50 for the 5" version. Add $10.00 for 8". (Please specify your disk size and type and top of RAM when ordering.)

Order directly from:

Frank Stearns Associates
14305 NE 13th St
Vancouver, WA 98664
(206) 892-3970

## A COLUMN FROM POLY

PolyMorphic Systems has agreed to begin writing a regular column for PolyLetter. They have asked <u>you</u>, the readers, to suggest a title for the column and some subjects you'd like to see discussed. Write to PolyLetter or to Ken Gudis at PolyMorphic Systems, 5730 Thornwood Drive, Santa Barbara, CA 93117.

## POLY 88 UPGRADE KITS

Several PolyLetter readers own Poly 88s. PolyMorphic used to sell an upgrade kit, which added a disk drive and a larger cabinet to an 88. This effectively converted it to an 8813. Ken Gudis says the upgrade kit is no longer an active product, but it would be possible to get one on special order. If you own an 88, contact PolyMorphic for details. (You just won't believe how much you'll like having disks!)

## SQUEEZING SPACE IN BASIC

Articles in several microcomputer magazines have pointed out that you can save memory by removing all the REMark statements from a program. PolyUsers don't have to consider this problem because Poly BASIC removes all REM statements when loading a program from the untokenized disk file, as long as the REM statement doesn't start with a line number.

If you do use line numbers on REMs, they will be loaded when tokenized with SAVEF or SAVEP. If you write your programs while in BASIC (perhaps you like PolyLetter's BASIC-EDITOR instead of Poly's text editor) or if you simply like to keep the REMs in while developing your program, there is a very simple way to remove them when the program is finished.

Use Poly's editor on the program and the sneaky "Global Search and Destroy" method popularized by Charles Thompson to remove just the line numbers. Your text file will still have the REMarks but BASIC will drop them when it loads the program to run.

Simply type: ESC : (ESCape followed by colon gives you the double cursor)

Now type: ^FREM^[^XREM
followed by another ESC.

Relax for a minute while Poly does the work.

This finds each REM with ^F, removes it and everything else to the left of it with ^X and puts in a new REM. Note that it will <u>also remove a whole program line</u> if the REM is at the end of a line of BASIC statements.

For example:

100 GOSUB 1000 \REM read file
would turn into
REM read file

To avoid destroying these lines, use the editor to search for each \REM and replace it temporarily with another unique string. (The ESC Ctrl-G command is handy for this.) After removing the line numbers before the other REMs, you can search for your substitute string and change it back to REM.

Much simpler than all the complicated programs for NorthStar, Pet and the rest. Kinda makes you wish Poly's operating system became the "standard" rather than CP/M.....

In the newer versions of the editor the ^[^H can be used to stop after each successful search, and the user can signal what should be done. The user inputs are the same as for the formal global search-and-change routine (ESC Ctrl-G):

<CTRL Y> quits the search,
<ESC> skips this change,
<space> does this change,
<RETURN> does all the rest.

The manual method would be ^FREM^[^[^H^XREM. The response to the flashing question mark have varied during several versions of the editor. Test your version out on a dummy file before trusting this article.

## IN CASE YOU WONDERED...

There are two types of MS units on 8813's: SSDD (single sided, double density) and DSDD (double sided, double density). A disk written on one type can be read on another type.

The 5" disks are either SSSD or DSDD. A few users have SSDD systems, produced by using a double density controller on single sided drives, but the System Programmers' Guide says this combination is not supported by Poly.

The SSSD 5" disks use "hard sector" formatting. This describes the way in which the data is stored on the disk, and also the fact that the disk has 10 "sector index" holes in it. The only other computer we know of that uses this type of formatting is North Star; but the data on their disks is formatted differently, so you would need a special program in order to read North Star disks. (Poly CP/M can do this.)

The DSDD 5" disks use a data format that is not readable by any system other than a Poly, as far as we know.

## USING FORMAT FROM EXEC

by Russ Nobbs
Spokane, Washington

The last PolyLetter discussed FORMATing text without the use of WPS. Although I have the "full box" of memory I find that it is often easier to simply type FORMAT <name-of-file> rather than go thru the WPS menu. I use WPS mostly when I want to format letters or reports with standarized headers & footers which I keep in WPS environment files. As the PolyLetter article pointed out these formats, headers and footers can be kept in a text file that you call at the head of your list of files to format. Yor would simply type:

$FORMAT HEADER,<5<PART1,<5<PART2, ...etc.

I have noticed one problem when creating a file that might be used directly by FORMAT and also by WPS. If your printer parameters (set when you invoke "Setup") include an offset for the left edge, you will get different printout depending on how you call FORMAT.

WPS overrides the values Poly reads from Setup (and sometimes stores new values there causing confusion at other times.) FORMAT adds the left edge offset kept in Setup to the left margin specified in FORMAT.IN and your file. Thus if you call FORMAT directly your left margin will print farther to the right that it will when WPS calls FORMAT. The extra margin will be the left edge offset value.

Using a printer Setup that has a zero offset can be a help but you will print right on the edge of the paper when you PRINT a file from Exec. I find it helpful to define a zero offset printer which I call after FORMATing files with complex printer commands. This sets everything back to zero for the next printing. Calling your "normal" printer may do the same thing for you. (The call is simply typing: $Printer NEC0 (or whatever your printer is named.)

It took me a while to understand why my margins would be off when I FORMATed a file that had printed fine from WPS. I'd be glad to hear from other PolyLetter readers if they have found a better way to overcome this problem.

## ELECTRICAL SPIKE PROBLEMS?

In many areas, power line noise is a source of trouble for computers. A "glitch," or pulse on the line, can cause your system to crash. You might consider installing a device to suppress this noise. PolyMorphic has had success with surge protectors manufactured by Inmac Corporation. They contain up to eight outlets, and can supress noise and spikes that might otherwise get into your system. Prices range from $78 to $149.

Inmac also sells a power line diagnostic tool, for use when you suspect the power line has problems. For information on any of their products, call Inmac at (213) 852-0973.

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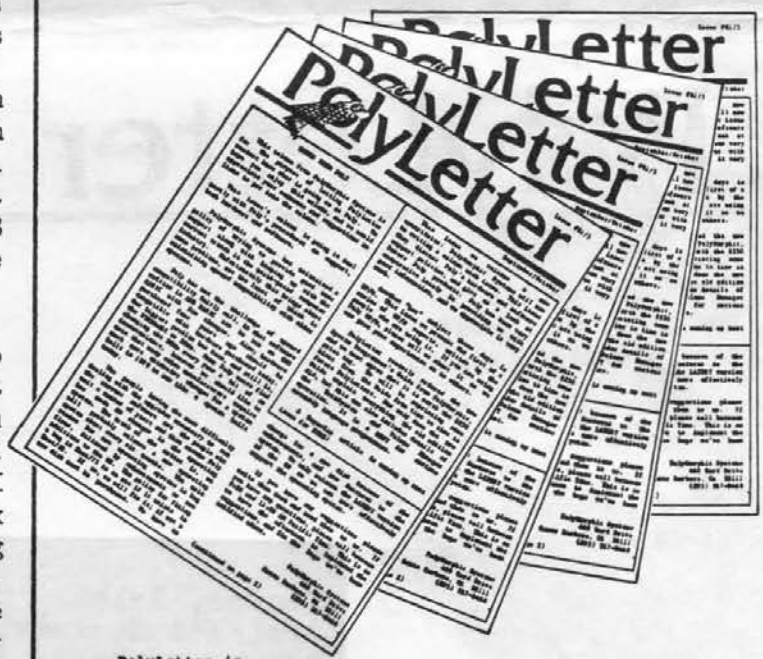


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Issue #82/5

# PolyLetter

September/October

## NEWS FROM POLYMORPHIC

Poly's emphasis this time is again on the long-awaited new system. The design is coming into focus, but has gone through a few changes which may force the schedule to slip a bit. PolyMorphic reports that the system design has been completed on paper. This means the actual construction of a prototype has not yet begun.

We reported earlier that the new system would be based on Zilog's Z800 processor. This has changed now, and Ken Gudis tells PolyLetter that the new system will now use an enhanced processor from the Intel 8086 family. (Poly made this change partly because the Z800 was not available yet.)

**This has serious ramifications for current Poly users,** both positive and negative consequences. On the plus side, the 8086 is a well-accepted processor that has received much support. It will run the Digital Research operating system CP/M-86 (which is not the same as CP/M), as well as the programs and operating systems of the popular IBM Personal Computer. Poly plans to be the first company to release a product using the new Intel processor, although IBM has also chosen this chip for a future product.

On the negative side: the Z800 would have been totally software-compatible with Poly's current machine. This would have allowed us to move our 8813 assembly language programs to the new system with minimal effort. The 8086 processor will not be compatible at this level, and our current assembly programs will need translation and tweaking in order to function properly. We should be able to move BASIC programs to the new system, though.

PolyMorphic has hinted at some more features of the new machine. It will have 256K RAM, a video screen of not less than

(continued on page 2)

The summer is always a slow time for PolyLetter. Our writers and contributers, as well as our readers (and of course, your humble editor) are occupied with vacation and other tasks.

And once again it's time to ask for your input. PolyLetter is always in need of articles, tips, programs, or anything related to your computing chores. Sometimes just a question from you, the reader, will develop into an interesting article. All you have to do is ask the question.

This issue, we have the good fortune to present some fine user-written software. Frank Stearns' **SPELL** program, introduced last PolyLetter, has been met with rave reviews from the field. (In fact, we are now using SPELL to help proofread PolyLetter.) Another interesting entry is **GPF.BS,** a set of BASIC functions by Norm Shimmel. These would be tremendously useful to any BASIC programmer. The demo program included with GPF is quite impressive.

We have recently had hands-on experience with a hard disk system on an 8813. The performance is absolutely astounding. Hard disks are the wave of the future, yet are available today at reasonable prices. If you are in need of extra storage or better system performance, consider adding an HD to your Poly. It will load BASIC in about one second, or open a file for editing in under 2 seconds (even if the file is in a subdirectory, and including the TXdef.ED loading). You owe it to your whirring floppies to consider an HD.

Two subjects for articles have been brought up by readers, and as yet we haven't been able to respond: (1) **Cache.ZO:** what is it? What does it do for you? (2) **Volume Manager:** How does it work? What do the associated programs, like CONNECT and CONFIGURE, do? Our readers would appreciate hearing from anyone who can fill us in on these 8813 mysteries.

## APPLICATIONS SOFTWARE

Several software vendors replied to PolyLetter's call for information about applications packages. Ken Gudis at PolyMorphic Systems commented that these new packages have directly contributed to PolyMorphic's recent sales increases.

Business Data Management Inc. (BDMI), of Sandpoint, Idaho, has developed a "Big Five" package of 8813 software. This includes General Ledger, Accounts Receivable, Accounts Payable, Payroll, and Order Entry/Inventory Control. This package received praise from PolyMorphic Systems, and several other users have recommended it to PolyLetter.

BDMI also provides a Printer's Management System which includes the above programs in a form tailored to the printing industry. In addition to the "Big Five," this package also includes Estimating and Mail List programs.

Another BDMI product is a set of routines called PolyMfs and Vari-List. These assist in handling data files from BASIC. These routines maintain files in sorted order, check input, provide menus, and keep files organized to make the most efficient use of disk space. These functions are used extensively in BDMI's other programs above.

For information, contact Jerry White at Business Data Management Inc., 227 Pine Street, Sandpoint Idaho 83864, (208) 263-8145.

Church/Davis Architects, of Portland Oregon, have developed a package for architects called Management Information Service Program. The functions supplied by this package include: Accounts Receivable, Project Invoicing (with automatic aging and expensing, and various types of job invoicing), and Job Journals and Costing. The system also provides status summaries of current jobs, weekly project work forecasting, and summed gross weekly earnings.

The MIS programs can handle projects up to $10 million. Up to 50 consultants and 60 personnel can be accommodated. Projects can be divided into 10 separate phases, and individual records may be kept for each phase.

For more information, contact William Davis, Church/Davis Architects, 600 SW 10th Street, Suite 444, Portland Oregon 97205.

(NEWS - from page 1)

24 by 80 characters, and high-resolution color graphics. The system will include a hard disk and floppy, plus a tape cartridge drive for backup. Ken Gudis says there are "half-height" 5" hard disks and tape drives which fit in half the space of a current 5" floppy drive, yet hold 50 megabytes or more.

The advanced hardware of Poly's new system will be capable of running several different operating systems, all designed for the 8086 processor family. The list includes CP/M-86, OASIS-86, MS-DOS, Unix, MP/M-86, and of course, a new version of our beloved Poly operating system. Ken Gudis believes CP/M-86 will be the first OS to run on the new system.

Of the operating systems listed above, most are designed to support a multi-user system. Poly's hardware design will also support this: the machine will be divided up into a "system card" and one or more "user cards." This approach has been used by other manufacturers, and has the advantage that each user has his own CPU and RAM. Only the more expensive peripherals, such as disks and printers, become shared resources.

PolyMorphic predicts that publicity for the new system will begin within 60 days, and current plans call for releasing the new system during the first quarter of 1983. (PolyLetter wishes them all the best, but considers these plans to be slightly optimistic.)

Closer to the hearts of current 8813 users: PolyMorphic reports that the 5" hard disk system is receiving heavy interest. Now that the economy is picking up, system sales are also increasing. Several vendors have introduced impressive software packages for the 8813 (see "Applications Software" inside this issue), which have also given 8813 sales a boost. Based on these good tidings, Ken Gudis promises that "PolyMorphic will be around for a long time."

## CP/M CORNER

A new CP/M-oriented publication has just arrived. It's called The User's Guide. This magazine costs $16 per year, and is published bi-monthly by Bove and Rhodes Associates, PO Box 3050, Stanford CA 94305.

The User's Guide claims to cover all CP/M and systems, with tutorials and information on new products. Recent articles have covered SuperCalc, WordStar, dBase II, and other popular CP/M programs. For information, write to Bove and Rhodes at the address above.

## POLY USERS ON THE SOURCE

More and more, the Source timesharing service is a good place to find Poly companionship. We add three more Poly users to our Source list this time.

TCZ587: Jon Wolfert, Dallas, Texas. Jon is with JAM Creative Productions, and is a frequent PolyLetter contributor.

CL1970: Frank McGuire, Washington DC. Frank uses his 8813 to publish Helicopter News, a bi-weekly newsletter.

TCN206: Jim Wyman, a world traveller now based in North Carolina.

CL1543: Bob Measle, Lexington, Kentucky.

TCB203: Frank Stearns, Vancouver, Washington.

TCC609: Joe Toman, Ogden, Illinois.

TCC611: Jim Kaufman, Naperville, Illinois.

TCC870: Stuart Woods, Atlanta, Georgia.

TCD098: Bob Schwartz, Cincinnati, Ohio

TCD125: PolyLetter, Atlanta, Georgia.

TCI127: Ralph Kenyon, Chester, Massachusetts.

TCG256: Russ Nobbs, Spokane, Washington.

For information on joining the Source, call 800-336-3330. There is an initial signup fee, and an hourly rate for connect time. You can use your 8813 to connect to the Source through a telephone modem... call PolyLetter for details.

We have received some inquiries about a new modem by D.C. Hayes, called the SmartModem. It includes features like auto-dialing. Write to PolyLetter if you're interested. If we receive enough requests, PolyLetter will develop some 8813 software for the SmartModem.

The purpose of PolyLetter is to create a forum of ideas for users of Poly equipment.
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## MORE ON USING FORMAT FROM EXEC
by Russ Nobbs

Because of the ways FORMAT & WPS use the printer parameters I have uncovered another minor bug when FORMATting from Exec. If I use the printer left edge offset in SETUP as, say 6, and use {lm 0} at the top of the file, I get some strange results when bold printing.

The standard printing of each paragraph works fine with the left margin at 6 as requested. The carriage return (without line feed) to do the overstrike bold printing goes back to a 0 margin and counts characters till it gets to the overstrike location. But now it's off by 6 characters! It prints a mess. The simplest way I have found to overcome this is to use {lm 1} in the file.

Apparently FORMAT has a couple of places it looks for the left edge & margin settings. The {lm 0} causes it to use the left edge offset for most things but it uses only the {lm } setting when backspacing for bold print.

## IS YOUR POLY COVERED?

Columbia National General Agency sent a press release to PolyLetter, concerning insurance coverage of small business or home computer systems. PolyLetter has not investigated this offering, but we are reprinting part of the release for your information. You may also be interested in contacting your current insurance agent, to see if your system is covered, or if it can be added to an existing policy.

"Most standard homeowners' policies don't cover computers used in business. Yet many people who've purchased microcomputers for fun are now using them for business as well. They usually don't realize this could leave their $4000 or $5000 system completely unprotected.

"Columbia National General Agency (CGNA) has just developed the first comprehensive policy for personal computers regardless of use. [It] covers a wide range of mishaps, from fire and theft to accidental damage.

"The cost of insurance for personal computers used for business is tax deductable."

The coverage program is called SAFEWARE. For more information, contact Sherry Scott at CGNA, 88 East Broad Street, Suite 1800, Columbus OH 43215.

## DIABLO HABITS

Here's a bit of trivia from my own experience. After using WPS with my 8813 and Diablo 1610 (and having the WPS environment system make the Diablo print at 12 CPI - 12 characters per inch), I then loaded MAILIST to print some labels. Even though the Diablo was itself set for 12 CPI, I was surprised to see the MAILIST letters and labels coming off at the more-space-using 10 CPI.

I found out that the WordMaster WPS overrides the Diablo's own 12 CPI switch, resetting it to 10. Then the environment system implants a temporary 12 CPI instruction. So when you put in another system disk (such as MAILIST), the printer is still at 10 CPI no matter where its switch sits.

To get the printer to print at 12 CPI after putting in the MAILIST (or BASIC or whatever), you have to power-off the printer and then restart it. Then its own switch setting determines what CPI it prints at.

Michael A. Aquino

(Editor's note: if the Diablo is like our NEC Spinwriter, it only looks at its own front-panel CPI switch when powered-up, or if you press the master "clear" button.)

## HELP!

Whom to call for help:

PolyMorphic Systems
5730 Thornwood Drive
Santa Barbara, CA 93117
(805) 967-0468

Ken Gudis is handling hardware and software questions. If he can't help you, Ken will refer you to someone who can answer your question.

## NAME THAT DISK

When your employees run a program, how do they make sure they're using the right disks? Sam Dimiceli has a BASIC program to verify that the correct disks are in the drives, and not the backup copies of those disks. The program checks the disk names, and refuses to let the system proceed if the wrong disks are in the drives.

The program calls Dio (the disk i/o routine) to read one sector of the directory into a string variable, A$. It then extracts the disk name from that variable. You will have to use a recent (C02 or later) version of BASIC in order for the "CALL 1" statement to work properly.

```
100 DIM A$(1:256)  \REM room for 1 sector
110 A$="123456789"  \REM put junk in A$
120 M=MEM(A$)  \REM memory addr of A$
130 D=4  \REM do drive 4 first
140 Z=CALL(1,1,256+D,M,0)  \REM read 1st
   sector of directory, using Dio
150 B$=MID$(A$,2,9)  \REM get disk name
160 D=5  \REM now do drive 5
170 Z=CALL(1,1,256+D,M,0) \REM same deal
180 C$=MID$(A$,2,9)  \REM get other name
190 IF B$<>"PROG-ORG" THEN 1000
200 IF C$<>"DATA-ORG" THEN 1000
210 REM correct disks are in drives,
220 REM ok to proceed to application pgm
230 CHAIN"MAIN-PROGRAM.BS"
970 REM --------------------------
980 REM come here if wrong disks
990 REM were found in the drives.
1000 PRINT"You are using the wrong disks!"
1010 STOP
```

In order to use this program, call it INITIAL.BS and put it on your system disk. It will run automatically when the system is booted. Be sure to use whatever drive numbers are appropriate for your system (lines 140 and 160). Name your system disk PROG-ORG, and your data disk DATA-ORG, or else change the names in lines 190 and 200 to whatever you use. If the proper disks are found, this program will execute MAIN-PROGRAM.BS or whatever you put in line 230.

This program can only work if your backup disks have different names from your normal disks. After IMAGEing onto a backup disk, use DNAME to name it something different.

## MISCELLANEOUS POLY EQUIPMENT

Bob Tripi, of Massachusetts, reports that he has seen parts of Poly systems for sale. Bob upgraded his Poly 88 to an 8813 by buying "bits and pieces" of PolyMorphic equipment (as PolyLetter did). You might be interested in acquiring some PolyParts as spare boards for your system. If you're the tinkering type, you might even be able to assemble a complete system as Bob did.

Bob Tripi writes: "It is possible to go from an 88 to an 8813 for about $1000 for a two-disk unit. I've seen 8813 chassis (empty) around $300, disk controllers are available at $200-250, and 5" drives can be had for about $200 or so (new) in this area."

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## THE "SYSTEM" DISK

What does the phrase "system disk" mean to you? To many of us, the System Disk is a mythical, magical beast which should not be tampered with. Removing it from the drive has a nasty habit of crashing the system. Exchanging it with another System Disk has an even nastier result of scribbling all over our data. Why is the System Disk such a sacred cow?

Let's start with an overall look (a very brief look) at how the Poly disk operating system works. I consider Poly's system to be of medium complexity... not as complex as large minicomputer disk systems, yet more intricate in some ways than CP/M, North Star, and other microcomputer disk systems. In most microcomputers, the DOS, or Disk Operating System, resides in memory all the time. Either it's in ROM, or it gets loaded off the disk when you boot the system and stays put. Either approach takes quite a bit of memory, especially when the system is powerful.

Poly's designers took a different approach. Only a small part of the operating system resides in memory at any given time. (This is the way most large mainframe computers work.) By using overlays (the .OV files on your sacred System Disk), parts of the operating system can take turns residing in memory. When one part is needed, another part makes room. In the Poly, this happens between memory addresses 2000 and 27FF.

Let's take an example of how the overlay mechanism works. Normally the system executive overlay, called **Exec.OV**, is in memory at address 2000 hex. When Exec wants to report an error message, it asks for the error message overlay, **Emsg.OV**, to be brought into memory. Since all overlays occupy the same place in memory, Exec gets "overlaid" by Emsg, and Exec is no longer in the system memory.

Now Emsg prints the error message (hopefully something not too fatal), and its job is done. We no longer need Emsg in memory. The system wants to accept another command, but only Exec knows how to do that. And Exec is not in the system's memory now... remember, it got replaced by Emsg. The ROMs realize this, and bring Exec.OV off the disk. Now Exec overlays Emsg, and the system runs Exec again.

All this happens in a matter of a few seconds. On the screen, it looks like

```
$XXX
I can't find that file
$
```

This example shows one reason why the System Disk is so precious: it holds the overlays. All the overlays are actually part of the operating system, so they all must be available at all times. If an overlay is missing from the System Disk, it usually constitutes a fatal error.

OK, we have to have a System Disk in the drive at all times. What happens if we change System Disks while the machine is running? If the new System Disk has all the necessary files on it, shouldn't everything work?

Unfortunately, no... life isn't that simple! As you know, each disk has a directory on it, stored as the first 4 sectors of the disk. Poly spends a lot of time reading the disk anyway, and it would have to spend even more time if it had to read the directory every time it went for a file. So the system keeps a copy of one directory in memory at all times, and this is usually a copy of the System Disk directory.

If you change System Disks, and the new disk is not an exact duplicate of the old one, the directory on the disk will not agree with the directory in memory. But Poly doesn't know that! So the first time the system tries to do anything with the disks, it will probably go straight to the moon (if you're lucky).

If you're unlucky, and the new System Disk is an almost exact duplicate of the old one, the system may continue to run for a while. Then, it may scribble all over some irreplaceable file. This happens because the system is still believing the (outdated) directory it has in memory, instead of reading the directory on the new System Disk you inserted.

If you can't swap disks in the System drive, how about the other drives? Is it safe to change disks in them?

You do this all the time, and so do I, so the answer is obviously "yes." But there is one situation that I've run into where you can't swap disks in a non-System

drive, and you should know about it.

Suppose my System drive is number 1, and I want to edit a file in drive 2.

$EDIT <2<FILE

Poly "opens" a new output file on drive 2, and I begin editing. When a file is "open" for output, it means the system has read the disk's directory, and knows where some free space exists on that disk for a new file. This is the place the file will be written to when I exit the Editor with ESC Ctrl-E.

Suppose I now decide I want my output file on some other disk. Drive 2 is not the system drive, so I assume I can swap disks in it. I put a new disk in drive 2 and exit the Editor. Suddenly my new disk is garbaged! What happened?

Remember I said Poly keeps a copy of one disk directory in memory. While my output file was open on drive 2, the directory in memory was a copy of drive 2's main directory. When I changed disks in that drive, the system never read the new directory off that disk. It believed the directory in memory, then probably wrote my new output file on top of some existing file, and corrupted the directory of that disk.

In this particular case, we could force the system to read a new directory from drive 2, which means we can then change disks in that drive. First we have to get rid of the "open" output file on that drive, by hitting ESC Ctrl-O. Edit will ask:

New output file name: **<1<JUNK**

We entered a filename that was <u>not</u> on drive 2. Poly now has to get off drive 2 and onto drive 1, so it does:

Output file: closed
New Output file: opened

Now we have no open file on drive 2. We have an open output file on drive 1. We could exit the Editor and have our output file appear on drive 1 now, but our objective was to swap disks in drive 2, so let's do that now. Then, use ESC Ctrl-O again:

New output file name: **<2<NEW-JUNK**
Output file: closed
New Output file: opened

The file <1<JUNK was never written on drive 1, since we changed output filenames without ever writing anything to that output file. But the act of opening it forced Poly to read the directory from drive 1, so the in-memory directory copy no longer corresponded to drive 2. When we used ESC CTRL-O the second time, it forced Poly to read the <u>new</u> directory from our new disk in drive 2. Now if we use ESC Ctrl-E, the file <2<NEW-JUNK gets written safely to drive 2.

Morals to the story:

Don't change System disks.

Don't change disks in any drive where Poly has an "open" file active, for either reading or writing.

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Butler, PA 16001

## POLY -- FOUR YEARS LATER

by Frank Stearns
Frank Stearns Associates
Vancouver, Washington

I'm in the spare bedroom of my home, a dedicated office where miscellaneous technical manuals and programs like SPELL 2.0 come to life. It is a cool summer's evening in Southwest Washington; moist, rain-touched air makes the rounds through open doors and windows. An occasional car passes through the quiet street, but the only sound really heard is the airy hum of an 8813's whisper fans (the noisy ones were replaced last year).

I think about that gray and brown box -- its power, its failings -- and how things have changed since that Spring day in late April, 1978, when I took delivery.

And I think about the correspondence from those of you who ordered SPELL 2.0, and the underlying feeling put forth in those notes. There is a pervasive sensation of uncomfortable indecision of what to do with or about a computer system that seems to be obsolete; disappearing or unconcerned dealers; a company that at times may be hard to communicate with; fewer and fewer offerings of third-party software and nothing substantially new from the company itself. Many expressed absolute dread at the thought that if their system ever died they'd be in deep, deep trouble, unable to find qualified technical support. Those of you in the East feel particularly vulnerable and isolated -- the company is "out there, in California somewhere."

With no dealer for several hundred miles I too am a little nervous about system failure. But one can get useful help from other Poly users -- and from the factory itself. Their attitude has changed tremendously, so much so that I have recently cleared up some minor but annoying long-standing system problems. (Look for upcoming PolyLetter articles.) In the rare case of a major system failure, you'll find sympathetic help and direction -- it only takes a phone call or two, starting with PolyMorphic.

What about the other question -- if you have the opportunity to get a different system, should you hang onto a Poly?

We can start by reviewing the reasons for buying Poly in the first place -- are they still valid? If not, why not? Will something else -- right now -- really do a better job? (Consider the effort required to transfer your people, software, and data to a new system!)

I just finished writing an article for Interface Age magazine. It's a survey and analysis of text editors, inspired partly because I hadn't really seen an editor as useful as Poly's (a standard-issue piece of software that is quietly potent) and because secretly there was a desire to see what was "out there." Research for a "major publication" was the perfect excuse to go bother area computer dealers. The results were interesting.

There has been a lot of hoopla about Applewriter, Scripsit (Radio Shack), and WordStar, but I'm not impressed enough to dump Poly. For the writer, nobody's editor is more powerful. Then there is the ease of developing assembler programs using the editor -- that's another article all by itself.

Poly's hardware construction, while not in every case state of the art, is very good. It is "commercial grade." Take the typical 8813: twin isolated power supplies, a backplane made from 3/16" stock, an effective EMI line filter, twin fans, S-100 bussing, and so on. In most of the popular micros you'll see "consumer" grade construction, hardware that is incapable of sustained, commercial use.

Neither the Apple III or TRS-80 are anywhere near as well built. The Apple has high component density and no fans. (Same with IBM.) Apple still has their own bussing system. Their new and improved keyboard (so-called "professional") still lacks. Rumor has it nothing worked (hardware or software) in the first Apple IIIs, and the designers of the Apple III were "let go" as a result. In many instances Apple software is not compatible from one generation to the next.

For the most part, Poly has been very good about trying to keep the new compatible with the old. (Yesterday I received a disk with Exec 4D and Edit 31 -- it ran!) Yes, there were the occasional ROM problems, but that's a matter of plugging and unplugging a few chips. Some

of the more popular micros view "software compatibility" as spending several hours with a soldering pencil and wire-wrap.

In 1978/79 a Poly dealer on the other side of Washington State was making a killing fixing TRS-80s, even though he was not a Radio-Shack dealer. At any one time it seemed the ratio of in-store working Polys to dead TRS-80s was at least 1 to 3, if not more. Even today the raster (video display) of some TRS-80 systems still shrinks when the disk-drive is accessed; this is a tribute to poor power supplies.

An 8813, particularly one equipped with 5" drives and an 8-bit CPU, will become obsolete but with very minor maintenance should never become unusable. It is one of those rare pieces of fundamentally well-designed American hardware that is timeless. In another ten or fifteen years the 8813 will be in the same ranks as the DC-3 aircraft and 1957 Chevrolet automobile.

When I finally take my 8813 offline several years hence and get something else, the Poly will become a "central house controller" (CHC) and will take care of lights, energy monitoring, security, household accounts, etc... It may be at that job well into the next century. Perhaps in 2010 or 2020 I'll replace the Poly CHC with a speck of crystal or green fungus that is the latest thing in self-contained mainframes. Even then I'll not let Poly rest. She'll be awakened occasionally to remind me of my by then lost youth.

The immediate future for Poly should be an interesting one, and one worth waiting for. If you've been looking at Apple, TRS-80, or even IBM, hang on for a moment. The new Poly will have a bonafide CP/M system. It will also run UNIX, MDOS, and other "hot" items. (If you're unfamiliar with these, think of the new Poly in terms of a super television set capable of receiving 160 channels, answering the phone, and making orange juice. All this instead of channels 2-13 in black and white.) Perhaps best of all will be that the new system will support some of the old, familiar software -- great items like the unbeatable editor.

It will be a 16 bit system using an enhanced Intel CPU, not less than 128K RAM (probably 256K), hard disk, 80x24 screen, and the list goes on. By the time this PolyLetter reaches you Poly should have released preliminary specifications.

Want to do something for your old Poly? For $4000, you can add a 5" Winchester built into an 8810 chassis with provisions for tape or floppy backup. Your complaints about disk access time and storage space will be a thing of the past.

How about software for us old die-hards who, more for financial considerations than anything else, are going to hang onto what we've got? Ken Gudis tells me Poly has a "captive market" and would be foolish to ignore it. Does "captive market" mean we're going to find a Poly-controlled black-hole in our bank accounts? Probably to some degree, but nothing that horrendous. They know we wouldn't stand for it.

Each owner's situation is different, but right now I'm in no hurry to get a new system. I want to see what Poly, IBM, Apple, and others are going to do. IBM and APPLE in particular seemed to have ushered in the "next generation." Let them have all the exploratory headaches. If Poly is wise and can learn from others' mistakes (as they've already done in choosing a 16-bit CPU) then it will be worth the extra six-month to a year wait. Looking for software packages that Poly doesn't offer? You will see more, from this software author and probably others. Suggestions are welcome.

Don't give up on Poly. If you do some real "sit down and try it" shopping you may be surprised to learn that your "ancient" PolyMorphic computer still has many clear-cut advantages.

# PolyLetter

1437 Sugarwood Lane
Norcross, GA 30093
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H11

Issue #82/6

# PolyLetter

November/December 1982

## NEWS FROM POLYMORPHIC

The work is continuing on PolyMorphic's new system. But we also have much good news about the current 8813 system! First of all, Ken Gudis has reassured us that Poly will continue to support the 8813 in several ways.

A new release of the operating system, **Exec/96**, should be ready within a few weeks. There are no real surprises in this Exec, but it does fix some bugs that have shown up in Exec/95. And, it is comforting to know that Poly is still paying attention to the current operating system.

The 8813 hardware received a boost recently, as the new **HD/18** boxes began rolling off the production line. This is a hard-disk subsystem you can add to your 8813, which provides 18 megabytes of data storage on a 5-inch winchester disk. Not only is the storage area large, but access time on a hard disk is incredibly fast! Poly does not yet offer a tape drive for backup, but one is expected shortly and it will be integrated into the HD/18 cabinet. Of course, you can use your existing floppies for backup, and if you order soon you can save money: The HD/18 is priced at $4439 retail, but for a limited time the price will be $3995. This price is very competitive with similar add-on hard disks being offered by other vendors. The tape drive, when available, will add about $2000 to the HD/18 price tag.

Poly is still shooting for a February release date on the new system. This box will incorporate a vast number of features on a single S100 circuit card. It will use the Intel iAPX 186 microprocessor, which is software-compatible with the IBM Personal Computer and all other 8086/8088 processors. It will have 128K or 256K of user memory, plus 128K of high-resolution color graphics memory (for a 16-color display). Floating-point hardware will be available for very fast math operations, using a math chip such as the Intel 8087.

Poly plans three avenues of software support on the new system. The first OS will be CP/M-86, a popular operating system by Digital Research. Ken Gudis explained that this will be the fastest way to get the new system "up and running." And, quite a bit of CP/M-86 software is already available, thanks to the IBM PC and others.

The second OS will be the original CP/M, now known as CP/M-80 since it runs on the 8080. The new Polys will not have 8080s in them, but Poly will provide an "8080 emulator" which allows the system to execute 8080 instructions. Such programs will run slower, Ken explained, but they will run; and this emulator mode will allow the new system to run any of the thousands of off-the-shelf CP/M programs now available. (We can only hope that this time, Poly provides us with a disk format that is in wide use!)

And last but not least, Poly will create a version of our beloved Exec for the new system. Last issue we speculated on the difficulty of moving our programs to this new system. Ken Gudis explained that Poly will provide a translator program, especially designed to make this move as painless as possible for assembly language programs. Of course, BASIC programs should transport quite easily anyway.

Which of these operating systems will be best for the new Poly? It depends on your application. "We believe CP/M-86 will be the most important in the long run," said Ken Gudis, "but today there's a lot of CP/M-80 software out there that we can use. This will help us in the short term." And if your programs now rely heavily on Poly's current OS, you will probably want to use Exec on the new system. In this case, you can look forward to improved performance, cheaper hardware (in the long run), and larger memory capacity, all without the pain of moving to a totally new system. The familar "I can't find that file" will still be there, and we won't be forced into hearing "BDOS ERR ON A:" unless we want to.

## DATA FROM "THE STACK"

Al Levy is a frequent PolyLetter contributor and avid Poly user. He also edits The Stack, the neweletter of the Long Island Computer Association (LICA). Like most user groups, LICA has members whose interests range from Apple, Atari, TRS-80, IBM, PET, and other popular computer systems. But editors have their influence, and Al has published several Poly-oriented articles recently. The Stack also publishes articles of interest to CP/M users and BASIC programmers, and other topics that you might find useful. To subscribe to The Stack, write to Al Levy at PO Box 71, Hicksville NY 11801, or call (516) 293-8368.

Al Levy has offered to make public-domain CP/M programs available to Poly users on Poly-CP/M format disks. LICA has a large collection of such programs. **If you bought Poly CP/M and can't find programs to run on it,** this is your chance to stock up! Contact Al at the address above.

Worried about getting your Poly serviced? Al Levy's suggestion: "I have put Ken Gudis in touch with a local computer store and they are acting as my repair shop. I, of course, am paying for parts, manuals, and other assorted items. ...it is not difficult to do. Cost should run between $100 and $200, and it is worth it for the peace of mind."

The purpose of PolyLetter is to create a forum of ideas for users of Poly equipment.
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System _____
Printer _____
Uses _____
Future uses _____

## NEW DEALER IN THE SOUTHWEST

PolyMorphic has a new dealer in the Phoenix area. They are Aztec Center, 7820 North 27th Avenue, Suite 6, Phoenix, AZ 85021. Aztec offers sales and factory authorized service on Poly systems. Other brands and services are also available from Aztec, including consultation.

## CACHE.ZO - EXPLAINED

by Joe Spahn
Advanced Management Systems
Denver, CO (303) 752-2972

I think I can give you some answers as to the purpose of Cache.ZO. My understanding of the function of this file, is that it is sort of a "driver" for the double-density disk controller. This controller features a Z80 processor which allows it to provide rapid access to 8" and 5" DSDD diskettes without tying up the main CPU. When the CPU issues a logical read to a drive connected to this card, the Z80 takes over and actually reads 8K worth of data into the controller RAM, providing a "cache" of data.

This often improves performance, particularly during sequential I/O, as subsequent "logical" reads are transferred quickly from the controller RAM rather than involving physical motion of the drive head. The physical component of motion in "stepping" the read/write head is the slowest operation in the entire process, especially compared with data transfer from RAM to RAM. Hence many slow "physical" reads from the disk are eliminated from an I/O bound program, being replaced by faster "logical" reads from the 8K cache of memory on the disk controller.

As I understand it, the Z80 processor on board the disk controller takes care of all the tedious "housekeeping" functions like checksumming data. I believe that Cache.ZO is that portion of the disk resident system software which allows this performance enhancement to occur.

(Editor's note: have you seen the ads for some new CP/M systems that have a "Cache BIOS"? What a new and innovative idea! Once again, Poly scores first.)

## ADDING MASS STORAGE TO POLYS

As prices continue to drop, it becomes more and more attractive for people to add their own disk drives (and other devices) to their Poly systems. We should stress at the start of this article that this is not a project for beginners. It takes a solid, working knowledge of hardware and software, plus the willingness to tear into the "guts" of your system. But if you have the time and patience, the rewards can be great.

John Barrett (of Barrett Associates, Maitland FL) added some 8" DSDD drives to his Poly system. His system now consists of 5" SSSD drives plus a homebrew 88/MS. John writes, "The operation of this system is <u>great</u> and requires no changes in the operation of the rest of my system. I now have no need to consider another computer. The 8" add-on gave me what I needed: more storage and faster response. And as you know, there is no friendlier operating system than Poly."

John's conversion required these parts:

8" DSDD Exec/95 system disk
Disk cables, p/n 103510, 103501, 103512
88/MS manual
ROMs version 81
8" DS disk controller board

All of the above were purchased from Poly, for a total cost of about $940. John also purchased a cabinet and power supply with two Shugart 851 drives, for $1400. Total cost: about $2340.

"Our biggest problem was getting the jumpers and switches set properly on the drives. We are most grateful to Ken Gudis and Mark Macklin at Poly, for their assistance by phone and letters." For more details on this add-on MS system, you can write to John at 1122 Black Acre Court, Maitland FL 32751, (305) 678-0172.

John Barrett's system is basically a homebrew 88/MS. He saved money by buying the pieces and assembling them himself. The resulting system works just like a Poly-built 88/MS. A somewhat more adventurous approach was taken by John McGaw of Anchorage, Alaska. John bought some Tandon 100-4 5" drives, which are dual-sided and 80 tracks per side, compared to the single-sided 35-track SA400's used in Poly's SSSD systems. John's Tandons have a total of 1600 sectors per disk. He uses the Poly 5" SSSD controller (slightly modified) to run two Tandons and one standard 5" Shugart drive.

This project, obviously, took John much deeper into the Poly operating system. It requires custom software to talk to the new drives. John plans to make this software available to PolyLetter readers, along with info on the necessary hardware changes. We will keep you informed on this project.

Finally, some notes from your editor's tech scrapbook. At PolyLetter, all our work has been done on a homebuilt 8813, using two 5" SSSD drives. As you can imagine, it gets quite limiting at times without a third drive or some kind of larger disks.

To alleviate this problem, I've put together a hard disk add-on system. It uses a 5 megabyte 8" Shugart SA-1002, with an OMTI controller, in an Integrand chassis. The software I wrote makes the HD look like four separate drives, <4 thru <7, each with 4090 sectors. The system took about a year to assemble, since I was looking for bargain prices on every piece, but I estimate the total parts cost was about $1500.

At one time, I was planning to offer this type of add-on HD system for sale thru PolyLetter. But it would take a lot of effort to market and manufacture these units. Plus, it would put PolyLetter in competition with PolyMorphic's newest 5" HD system, which is very reasonably priced. So, while I can't offer a complete HD subsystem for you to plug in to your Poly, I will offer the software and hardware information to anyone interested. And if you prefer not to build one yourself, do consider the HD systems available from PolyMorphic.

A final note: we've all seen the ads recently for hard disk subsystems, offered in Byte, Creative Computing, and other magazines. Most of these systems are aimed at one type of computer, such as IBM, Apple, or TRS-80. Some ads claim "S-100" compatibility. But in this case, S-100 usually means Z80, CP/M, and 8" drives capable of reading standard CP/M disks. We've looked into several HD add-on systems, and found that it would not be easy to interface these with an 8813. So, it seems that PolyMorphic is still your best bet as a source for 8813 add-ons.

## HOW ABOUT "REAL" CP/M?

We've talked about it in these pages before. Poly CP/M has some real drawbacks. The 5" disk format, the 64-column screen, and the availability of less than 52K for user programs, makes Poly's version of CP/M less than perfect for most users.

The advantages of having CP/M, of course, are that you can get much more software for your Poly. But some of this software doesn't run well, or at all, on an 8813. Is there anything that can be done?

To implement a "true" CP/M on the Poly, the designers would have needed a much bigger effort in hardware and software. If we look at most currently available CP/M systems, we see these features as being "standard:"

Z80 processor
8" soft-sectored, IBM-format disk drives
24x80 video screen, or external terminal
64K of total RAM
At least 60K of available user RAM

These seem like desirable features. Why didn't Poly include them? The answer is obviously cost. By using the existing hardware as much as possible, Poly keeps the cost of a CP/M conversion to under $500 in many cases.

OK, let's agree that Poly did a good job with a low-cost CP/M conversion. But if it doesn't do what I need, the cost is irrelevant. So let's assume I want to shoot the works, and convert my Poly to a full-tilt CP/M system with state-of-the-art features. If I wanted to do the job myself, what would I need?

We can start by throwing out all of the cards in the Poly chassis. The CPU uses an 8080, and we need a Z80 in order to run certain CP/M programs. Plus, we would want a Z80 for its faster speed anyway. Next, we would throw out our video card, since it's 16x64 and we want 24x80. Next, throw out all the memory cards. The memory cards built by Poly were designed to work with the current CPU card, and probably won't work with another CPU. They're certainly too slow for a fast Z80.

What about the disk controllers? We need a new controller to run "standard" 8" CP/M disks, so throw out your 88/MS controller. And, unless you can patch your CP/M BIOS to talk to the 5" drives, throw out your 5" controller and your 5" drives. Finally, since you can't read any of your Poly disks without these controllers, get rid of <u>all</u> your Poly software, including the programs you've been writing for the past five years.

It would seem that converting a Poly system into a typical 1982 CP/M system would require "gutting" the Poly, and throwing out everything but the chassis. This is basically true. The Poly hardware was designed many years ago, before CP/M was established as the standard for S-100 systems. As a result, Poly's electronics are not really designed to run CP/M, and it is a credit to the designers that they could run CP/M at all.

If you add up the cost of buying all new cards for the Poly and converting it into a Z80-based CP/M box, you end up with a price tag in the $2K range. You can buy a new, complete CP/M system for this same price. And, if you need true CP/M compatibility, that is exactly what you should do.

If you're like me, on the other hand, and your Poly does the job you bought it for, don't worry too much about not running CP/M. For my applications, the friendliness of the Poly beats everything. It is as programmable as any system on the market, if you need to write your own applications. And most Poly owners will agree that the system is as solid as a rock.

## A FIX FOR CHESS.GO

If you purchased the Disk-Of-The-Month in May 1981, take note: the **CHESS.GO** program has a bug. CHESS resets the stack pointer to somewhere inside user memory, so that if you exit CHESS using Ctrl-Y, then run some other program, your system will bomb.

To avoid this problem, after you finish playing CHESS, always give the Exec command:

$RESET

This will reset the stack pointer to a reasonable value and prevent a crash.

## POLY - ADS

Ads are published as a free service to PolyLetter subscribers.

FOR SALE: Checkbook program in BASIC. Poly demo program (using command files) which illustrates many system features, resides on 3 SSSD 5" disks, $25. CP/M program conversion service, to/from Poly format. Music program, hardware and software, with music editor, a tutorial, a music compiler, and **PLAY.GO** to play the result. Also, I am buying and selling Poly systems and parts. Call me with your requirements! Al Levy, PO Box 71, Hicksville NY 11801, (516) 293-8368.

FOR SALE: 8813 and 88/MS, single sided. We "inherited" this equipment when we purchased a firm, and have no use for it now. Also have a DECwriter for sale, with or without the Poly system. Ed Chapman, (800) 527-0436 or (214) 242-6062.

FOR SALE: Poly video board, $145. SSSD disk controller, $195. Shugart SA400 drive (used in SSSD 5"), $195. Poly 8813 with 48K and two 5" DSDD drives, $2850. 88/MS, $2295. Poly 8" hard disk, 10 megabyte, can interface with any Poly system, $3400. Dr. Charles Trayser, (415) 651-5931 or (415) 651-0100.

FOR SALE: 8813 with 48K, two 5" drives, monitor and keyboard. Also have a DECwriter IV, for sale with Poly or separately. Mike Falk, 300 Interstate North, Suite 340, Atlanta GGA 30339, (404) 952-4460 office, 977-2424 home.

## A LISTING OF POLY USERS?

Several people have requested that PolyLetter publish its user list. After all, there are only a few of us using Polys... why not get to know each other better? There might be a Poly person around the corner from you and you would never know it.

Would you like to have your name and address published in PolyLetter? Would you mind, or would it be an invasion of privacy? Let us know your feelings on this. If we get some negative reaction, we will only publish names of people who have given permission. But if the response is all positive, PolyLetter will publish its user directory in a future issue.



## 1982 INCOME TAX PROGRAM

Charles Thompson is revising his Tax Return Preparation System for the 1982 IRS season. Advance orders are now being accepted, at $75 for individual use, and $150 for people in the tax business.

This program saved many PolyLetter subscribers hundreds of dollars last year. Don't wait until April 14! Contact Chuck soon at 2909 Rosedale Avenue, Dallas TX 75205.

## CP/M PROGRAM EXCHANGE

Russ Nobbs has asked all Poly-CP/M owners to get in touch with him. Russ has an Osborne I available, and is interested in setting up a CP/M program transfer service between the Osborne and the Poly. If you run CP/M on a Poly and would be interested in this service, get in touch with Russ Nobbs at PO Box 1753, Spokane WA 99210, (509) 624-8565.

Al Levy has offered a similar service. See "Data From The Stack," in this issue.

## RELOCATING LOADER FOR POLY

PolyLetter is pleased to announce a relocating loader for Poly assembly language programs! This loader will allow your assembly programs to relocate themselves into high memory, just as some Poly system programs now do.

- Programs can load themselves into high memory automatically

- Utilities can stay in memory during execution of other programs
- Programs can be independent of system memory size

- Ideal for i/o drivers or interrupt-level routines

The PolyLetter relocating loader comes complete with **source code** so you can understand and customize it easily. We also include complete instructions and a working example of a self-relocating program, a new version of the popular **CTRL-U** screen-printer utility.

Price for the PolyLetter relocating loader is $35 (5" SSSD only). Order from PolyLetter, 1437 Sugarwood Lane, Norcross GA 30093. Note: you will also need a version of the Poly assembler which supports the RELOC instruction. A current release of the Macro-88 assembler is available from PolyMorphic Systems.



## A CHECKBOOK FOR POLY

Do you hate your personal or small-business checking account? Do you already own "checking software" that is rigid and doesn't really do the job? **CHECK 2.0** can change all that.

CHECK 2.0 does the usual things: writes checks, records deposits, and handles miscellaneous account maintenance.

CHECK 2.0 does the UNUSUAL things:

* Vertical/horizonal Cash-Flow Analysis. Find out where the money went (and where it came from), where it is going, and where it is likely to go.

* Keyword Searches

* Exhaustive transaction monitoring

* In all, more than 40 menu and interactive functions. Finally, be the boss of your money.

(Free program updates for one year from date of purchase.)

5" SSSD - $129.50. Please specify Top of RAM and disk type when ordering. All other PolyMorphic Formats add $10.00.

Order directly from:

Frank Stearns Associates
14305 NE 13th St
Vancouver, WA 98664
(206) 892-3970

## THE PAST CAN BE BOUGHT

Due to popular demand from new subscribers, PolyLetter back issues are still available. We published five issues in 1980, six in 1981, and six (including this one) in 1982. The price is $4 per issue, or you can get all the issues of any calendar year for $15.

The Disk-Of-The-Month is not dead... just resting! It will return as soon as we can gather enough programs for a good diskful. (Your input is invited!) In the meantime, here are some old Disks that you may have missed.

April 1980: with **CONTROL-U.GO** (prints the screen at any time), **COUNT.GO** (a word-counting program), and **CALENDAR.BS.**

August 1980: with **Szap.GO, POP.GO** (changes system files to non-system), **COPY-SUB-DIR.BS** (copies files from one subdirectory to another), **CURSOR.GO** (changes the cursor to any character), **ROOM.GO** (tells how much room is left in a disk's main directory), and **POKE.BS** (a zany BASIC demo).

January 1981: with **SORT-DEMO.BS** (demonstrates various sorting algorithms), **MAZE.GO** (generates random mazes), and three non-working BASIC programs for the tinkering programmer: **READABILITY, GENE,** and **Home-Inventory.**

March 1981: with **TABBER.BS** (prints a grid on the printer for lining up output), **PEEK-DUMP.BS** (dumps memory to the printer, in ASCII, hex, and decimal), **FNTIMER.BS** (times parts of a program to let you optimize better), and **Tran.OV** (translates numbers to words, for check-writing).

May 1981: our first GAMES disk, with **BIORHYTHM.BS, BATTLESHIP.BS, CHESS.GO, HANGMAN.BS, SPIRAL.BS,** and **ART.BS.**

July 1981: with **READ.GO** (simulates the TYPE command, and lets you go backwards), **COUNT.GO** (version 2.0, with multiple files, and line/page counts), **INPUT.BS** (a subroutine to accept and check input), and **FLIES.BS.**

December 1981: with more games, including **SLOT.BS, BACKGAMMON.BS, ARTIL.BS** (an artillery range game), **MOON-LANDER.BS,** and **Sex-Appeal.BS.**

July 1982: with **DX.GO** (puts a directory into a file), **TEXT-TRAN.BS** (makes a BASIC program from a text file), **FIND.GO** and **SDIR.GO** (locate and print files in subdirectories), **CHANGE.GO** (lets you swap system disks), and the games **BOWLING.BS** and **MASTERMIND.BS.**

Any of these disks is available at the usual price, $15 for 5" SSSD, $20 for 8" SSDD. Order from PolyLetter, 1437 Sugarwood Lane, Norcross GA 30093.

## PORTABILITY

There's a new buzzword in the vocabulary of computer programmers. Like most buzzwords, it can be intimidating. Unlike some of the others, this one has no easy definitions or explanations. It is important, though, to understand how this term applies to you, your Poly, and your next computer (be it a third-generation Poly or some other machine).

The word "portability," applied to computers, usually refers to a piece of software which can run on more than one machine. This has become a major concern, especially to those who make their living from writing software. A portable program is a great time-saver: there is no need to rewrite it from scratch when running it on another system.

Since we don't yet know exactly know how the new Poly system will look, it's important to write your programs in a way that encourages portability. This will allow you to move to Poly's new system, or any other computer, and take your software along with a minimum of effort.

To visualize how portability fits into a computer system, consider the system to be divided into four parts:

```
High level-->   User
   .            Program
   .            Operating System
Low level--->   Hardware
```

Users deal with programs. Programs deal with users and operating systems. Operating systems deal with programs and hardware. There are exceptions (users deal with hardware when turning on the power), but this diagram is a useful simplification.

If a program is portable, it can be run on different operating systems. If an operating system is portable, it can run on different hardware. Using this diagram, we can say that portability is achieved when a higher level is independent of a lower level.

In today's competitive computer business, portability is a great asset. CP/M is an example of a portable operating system, and this is the reason for its widespread success. The lack of portability can be a great drawback, as

Poly owners know when trying to purchase software. Incompatibility with other systems has led us to virtual isolation.

On the other hand, there are successful computers without the virtue of portability. Apple, for instance, is one of the most popular small computers in the world, yet its disks can only be read by other Apples. The success of the Apple cannot be attributed to compatibility with other manufacturers' systems.

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Poly's new system will have different hardware from an 8813. This is inevitable, since much of the 8813 design is almost 10 years old. If you have written programs on your 8813, you will probably be very concerned about running those programs on Poly's new system. Will this be possible? It will be, if your programs are "portable." Here is a quick checklist to help you see whether your programs will move to the new system without major effort.

Are they written in assembly language? Traditionally, assembly programs are very non-portable, since the slightest change in hardware can force the program to change drastically. The way to write portable assembly language on a Poly is to make extensive use of the REF statement. Let the assembler plug in the right addresses for system routines and symbols. This will help you when Poly upgrades the current 8813 operating system. Unfortunately, Poly's next generation won't use the 8080 or Z80 processors, so your assembly language programs won't run without some careful rewriting. PolyMorphic has promised to help in this area, by providing a translator program to convert your old assembly programs.

If your programs are written in BASIC, do they do any PEEKing or POKEing? PolyMorphic Systems has promised that their new system will run existing BASIC programs with minimal changes, **unless** you use PEEK and POKE. Beware also of non-standard statements, such as ON ESCAPE or DIGITS. These will probably exist in all Poly BASICs yet to come, but this kind of statement causes problems when moving to some other manufacturer's BASIC.

You will still probably have to make changes in your programs, especially where I/O is concerned (file I/O as well as screen and keyboard). Make your programs modular, so that the I/O sections are close together and easy to find when Editing Day arrives.

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Some programmers will tell you that portability is the greatest virtue a program (or operating system) can have. While commendable, portability does not come without its costs. One of the highest costs can be in terms of performance, such as the speed of program execution.

If a program is portable, it makes few assumptions about the system it is running on. Most CP/M systems have a terminal, connected through a serial port, instead of a memory-mapped screen like Poly. This means a CP/M program can't depend on a memory-mapped screen, and therefore, no CP/M editor will ever approach the speed of the Poly editor.

Portable programs cannot take advantage of the advanced capability of the hardware, since the program is designed to run on other (not-so-advanced) hardware as well. For example, some newer microprocessor chips know how to multiply. A portable version of the BASIC language would be designed to run on new and old microprocessors, and so could not take advantage of this.

Because assembly language programs are so notoriously non-portable, most attempts at portable programming tend to be written in high-level languages such as BASIC or Pascal. A newer language, called 'C', is becoming widely used for writing portable programs and portable operating systems. High-level languages are well suited for many applications, but they do not guarantee portability. Only thoughtful, well-structured programming can do that. And a program which is modular and easy to understand will bring other benefits: easier maintenance (making changes or upgrades), and easier correction of bugs.

There are many good books on "structured programming" available, and a serious programmer should read some of them. If you have learned to produce well-written programs, you already know most of the techniques for writing programs which are portable as well. These techniques will serve you well as your computing needs move you to more powerful systems in the future.

## MACROS, ANYONE?

Warning: if you're like Chuck Thompson, and believe that assembly language is a figment of the imagination, skip this article! Otherwise, here are four macros that can make your machine-code life easier. **Pushem** saves all CPU registers, and **Popem** restores them, in the "Poly standard" order of saving registers. If you save registers with Pushem, you can restore them with Popem or with Ioret (in the ROMs).

The other two macros are even handier. **Print** uses Msg to print a string to the screen. It adds a zero to the string as a terminator for Msg. **Reg** prints the contents of any register or register-pair.

```
          REFS    SYSTEM
          REF

          ORG     USER
          IDNT    $,$

Pushem    MACRO
#L        PUSH    PSW
          PUSH    B
          PUSH    D
          PUSH    H
          ENDM

Popem     MACRO
#L        POP     H
          POP     D
          POP     B
          POP     PSW
          ENDM

Print     MACRO           ;Print 'string'
#L        PUSH    H
          PUSH    PSW
          LXI     H,$+11
          CALL    Msg
          POP     PSW
          POP     H
          JMP     $+LEN[#A]+4
          DB      #A,0
          ENDM

Reg       MACRO           ;Reg A / AF / etc
#L        Pushem
Q         SET     '#1'
          IF      Q<'AF'

          IF      Q='L'
          LXI     H,0
          ELSEIF  Q='H'
          LXI     H,1
          ELSEIF  Q='E'
          LXI     H,2
          ELSEIF  Q='D'
          LXI     H,3
          ELSEIF  Q='C'
          LXI     H,4
          ELSEIF  Q='B'
          LXI     H,5
          ELSEIF  Q='F'
          LXI     H,6
          ELSEIF  Q='A'
          LXI     H,7
          ELSE
          FAIL: bad reg name passed to Reg
          ENDIF

          DAD     SP      ;index off stack
          MOV     A,M     ;get value of reg
          CALL    DEOUT+5 ;print it
          Popem

          ELSE            ;try reg-pairs now

          IF      Q='AF'
          PUSH    PSW
          ELSEIF  Q='BC'
          PUSH    B
          ELSEIF  Q='DE'
          PUSH    D
          ELSEIF  Q='HL'
          PUSH    H
          ELSE
          FAIL: bad reg pair passed to Reg
          ENDIF
          POP     D       ;get what's pushed
          CALL    DEOUT   ;print it
          Popem
          ENDIF
          ENDM

;now let's try out the macros.

          Print   'Poly wanna macro!',13,13

          MVI     A,11H   ;load registers
          LXI     B,2233H
          LXI     D,4455H
          LXI     H,6677H

          Print   'A='
          Reg     A

          Print   9,'B='
          Reg     B

          Print   9,'C='
          Reg     C

          Print   9,'D='
          Reg     D

          Print   9,'E='
          Reg     E

          Print   9,'F='
          Reg     F

          Print   9,'H='
          Reg     H

          Print   9,'L='
          Reg     L

          Print   13,'AF='
          Reg     AF

          Print   9,'BC='
          Reg     BC

          Print   9,'DE='
          Reg     DE

          Print   9,'HL='
          Reg     HL

          Print   13
          JMP     Warm

          END
```

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