

REMark

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Official magazine for users of Heath computer equipment.

on the cover

HEATH/ZENITH introduces
state-of-the-art
Z-100 series desktop computers

on the stack

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...or, the secret is no longer secret



TYPE ZREVIEW.REM

ZDS unveiled a new generation of computers, 'Business Automation Tools', last week that should finally put to rest all the speculation that has prevailed for over a year. The Z-100 series of computers will be available in the following models:

ZF-110-22 - which is referred to as the low profile unit sans video monitor. It is equipped with two, 48 tpi double sided floppy disk drives and color.

ZF-120-22 - the 'all-in-one green-screen' with two, 48 tpi double density disk drives.

Later, several other configurations will be available, featuring a variety of disk drive options.

ALL 'off-the-shelf' units have dual processors running at 5 Mhz, 8085 and 8088, 128k memory, 2 serial ports, one Centronics type parallel port, four S-100 user available slots, on board 8253 programmable timer, Z-DOS (MicroSoft DOS), Z-BASIC (color commands), BASIC-85, CP/M-85, and a graphics demo diskette!.

Now for some nitty-gritty

The styling should be obvious from the cover shot, so we won't dwell on that.

Once you open the 'box', the most interesting part is partially obscured by the disk drives and video board. The mother board is about two square feet, is four layers and contains about 200 IC's. In other words, the mother board IS the computer. The only empty sockets are for another 64K memory for a total of 192K on-board memory (without using any of the S-100 slots).

INPUT and OUTPUT

Keyboard

The attached keyboard has its' own microprocessor. The 'feel' is professional, and has 95 keys (61 alphanumeric and 16 key-function and control section, plus an 18-key numeric and control section). It operates in two different modes, the normal ASCII mode and by sending it a special code, it enters an 'event driven' mode, which means that you can detect when a key has been depressed and when it is released. Neat for real time games. All keys return an eight bit byte with the high order bit set on the special function keys and numeric key pad. Firmware interprets these for you so your H/Z-19 software still works. Most of the familiar H/Z-19 modes have been preserved, such as key click on and off and, each key has auto repeat. It also has a 17 character FIFO buffer. Oh, there's a tiny little LED in the reset button to let you know you paid the electric bill.

'Z' Series Memory Map

The 'Z' series memory is arranged in 16 64k pages.

Reserved for firmware	
Green Color Plane	
Red Color Plane	
Blue Color Plane	
Optional User Memory (9 64k Pages)	192k
Optional on-board 64k	128k
Installed 64k user memory	64k
Installed 64k user memory	0k

768k total user memory available.

I/O

The two serial ports are either synchronous or asynchronous RS-232. One DTE, the other DCE at 110 to 38,400 baud using 2661's which means your current software that talks to the outside world is a little bit broke. The parallel port is 8 bits only configured for the Centronics printer as already mentioned.

Disk I/O

Disk I/O is through a WD 1797 and is the only board to occupy one of the five S-100 slots. It supports every color soft-sectored disk format and up to four drives of each kind including external 'plain vanilla' Shugart 8" drives. Next year, a 5.3 megabyte Segate compatible hard disk can replace one of the internal 5" drives. In addition to that, you could have a virtual 'disk drive' somewhere in memory providing for extremely fast temporary storage and data transfer.

Video

Black and white (actually green) and color will be standard on the low profile and color optional on the all-in-one. (Just a matter of plugging in some IC's). Resolution in the standard configuration is 640 horizontal by 225 pixels vertical with each individual pixel addressable. Standard characters are 'soft' or

user definable, in a matrix of 8 by 9 pixels. Although the current software doesn't support it yet, 640 by 500 is possible in the interlaced mode. With the color option, eight levels of gray and 8 basic colors are available. The display is 25 lines of 80 characters each. It features hardware scrolling.

Light Pen

One pixel resolution, but no software yet.

Color

Red, Blue, Green, Composite Video and seperated sync is available at the back panel.

Miscellaneous

At power-up the the 'Z' wakes up on the 8085 and after some housekeeping chores switches to the 8088. Two 8259A's control 15 levels of interrupts, one for the S-100 slots which cascades into another for the mother board. Any interrupt can force a swap to the 8088.

The principal operating systems are Z-DOS, an adaptation of MSDOS, or the same DOS as the IBM PC is using, and CP/M-85 which will allow you to run much of your exiting software. CP/M-85 tucks away the BIOS in memory outside the base 64k which means that there is never a disk read at warm boot, and the TPA is 4k larger.... FAST!!!

The differences between Z-DOS and CP/M-85 are few to the casual user. Z-DOS provides system date and time, a CHKDSK utility that states the health and condition of a diskette and FORMAT which allows a /S switch that copies over the system to the newly formatted diskette. It is also a bit more user friendly.

Your current CP/M and BASIC 80 will not run. That is why CP/M-85 and BASIC-85 are furnished with the Z-100. As a further aid to ease the transision, a utility is provided to move some of your 89 stuff to the Z-100 series.

Several new products will available for use on the 16-bit side of the Z-100. They will include Word Star 3.4 which will include horizontal scroll and the use of the Z-100 special function keys. In addition, an exciting new electronic worksheet from MicroSoft called Multi-Plan will be available in August. Later this year we expect a new business graphics program, a new version of SuperCalc with color, and UCSD PASCAL, version IV. The Z-100 users manual will include a complete list of which existing 8-bit software products that will run on the Z-100 (8085) and those that will not.

ZBASIC is a souped up MBASIC with some additional commands that provide graphics and color. Some of them are;

CIRCLE (X1,Y1),r,[n],s,e[a]]
Draw a circle, oval or arc.

CLS
Erase screen and home cursor.

GET (X1,Y1)-(X2,Y2),X
GET an image and store in an array.

LINE (X1,Y1)-(X2,Y2),n,b[f]
Draw a line, square or box.

PAINT (X,Y),n1,n2
Fill the graphics figure with color.

POINT (X,Y)
Returns the color number of POINT at coordinates X,Y

PRESET (X,Y)
Reset the point at coordinates X,Y

PSET (X,Y,n)
Set a point at coordinate X,Y to color n.

PUT (X1,Y1)-(X2,Y2),X,verb
Transfer image from memory to screen.

HUG CONFERENCE LOOKING GOOD!

The first National HUG Conference is shaping up nicely and if your plans are not firm yet, best make up your mind because seating is limited to 1000 and we're getting close. For the over 1200 new members that have joined in the last few weeks, a brief recap of what's happening.

The weekend of August 6th will be an excellent opportunity to meet many of the Heath and Zenith folks that are responsible for bringing you computer products as well as meet other users from all over the country with varying degrees of expertise and interests. It will be held at the Hyatt Regency O'Hare in Chicago. (See registration card on the inside back cover). Speakers include the author of HDOS and the Z-DOS ghuru, Gordon Letwin, who is now at MicroSoft. Also, the VP of languages at Digital Research, Gordon Eubanks, and several of the Heath/Zenith executives. Several of the new Z-100 series will be available to play with. Wouldn't you like to take home a 'Z' machine? Plus many other prizes! It's going to be a super weekend!

JB:

Improvements to BENTON HARBOR BASIC

A HUG member who read my article on improvements to BASIC-E (issue #27) wanted to know if I could do the same thing to Benton Harbor Disk BASIC. I guess I got carried away, because after it was all over, I wound up with the following improvements to B H BASIC:

1. The ability to call machine language subroutines from B H BASIC programs.
2. The ability to input single characters without hitting return, and the ability to check the keyboard for input while a program is running (like INPUT\$(1) and INKEY\$ in MBASIC).
3. A patch for B H BASIC that changes the function of FREEZE and UNFREEZE so that they save and load programs in compressed text format. This speeds up loading considerably. For example, a 170 sector Startrek game that takes about 7 minutes to load with OLD now takes about 15 seconds to load.
4. A loader program that lets you load and run a program at the HDOS prompt, and to set the high memory address to leave room for user machine language subroutines (the equivalent of MBASIC FNAME/M:nnn in MBASIC).
5. A line editor for B H BASIC that uses H19/H89 features for editing.

In this article, I will present the first four items, and in next month's issue, I will describe the editor. All of the programs and patches discussed here, along with the editor, are on HUG disk 885-1119, along with other B H BASIC items. If you are uncomfortable with making patches or typing in and assembling assembly programs, you should purchase 885-1119. This disk is described on the New HUG Software page in this issue.

Machine Language Subroutines in B H BASIC

In my BASIC-E article in REMark issue #27, I showed how to modify the INP (port input) function in BASIC-E to make it a USR function. The same thing can be done in B H BASIC to the PIN function, but in B H BASIC it is easier because we already have a POKE command to work with. With POKE, we can make the modification dynamically, from within a program, instead of making a permanent patch to BASIC. The code that does the PIN function looks like this:

```
PIN    CALL    IFIX          MAKE PORT INTEGER
        MOV     H,E          E = PORT NO.
        MVI    L,MI.IN      8080 IN INSTR.
        SHLD   .IOWRK       STORE IN RAM
        CALL   .IOWRK       PERFORM INPUT
        JMP    PEEK1        PROCESS RESULT
```

It can be patched to call subroutines like this:

```
PIN    CALL    IFIX          MAKE ADDR INTEGER
        PUSH   B            PROTECT BC REG.
        LXI    H,RETURN     GET RETURN ADDR
        PUSH   H            PUT IT ON STACK
        XCHG                    HL = USER ADDR
        PCHL                    JUMP TO SUBROUTINE
RETURN  POP    B            RESTORE BC REG.
        NOP                    ZERO 9TH BYTE
        JMP    PEEK1        PROCESS RESULT
```

If you are not an assembly programmer, this may look a bit confusing to you, but you really don't need to worry about it. Subroutine 40000 in the first BASIC program at the end of this article makes the above patch for you. Just include that subroutine in any program where you want to change the function of PIN to call machine language subroutines. After you GOSUB 40000, the statement

```
Y=PIN(X)
```

calls a machine language subroutine at X, and the value of the A register is stored in Y.

Single Character Input

Now that we have a USR capability, we can do some fancy things with it. One of the most useful things is to change the input mode of HDOS. Normally it is in the Line mode, which means that you have to hit RETURN after typing something before any program, such as BASIC, can see what you have typed. In the Character mode, a program can see each character you type as soon as you type it. Only a few lines of assembly code are required to change HDOS to the Character input mode:

```
LXI    B,8181H          CHAR MODE, NO ECHO
XRA    A                CONSOLE FUNCT. 0
SCALL  .CONSL           CHANGE CONS. MODE
```

Subroutine 50000 in the USR Function Demo program following this article changes HDOS to the character mode, and subroutine 51000 changes it back to the line mode. Subroutine 50000 also turns echo off (as shown in the assembly code above) so that HDOS does not automatically print each key you type on the screen. With these settings in effect, the CIN(0) function in B H BASIC becomes an exact equivalent of the INKEY\$ function in the CP/M version of MBASIC. It returns -1 if no key has been struck, and the value of the key otherwise. You can also implement the MBASIC INPUT\$(1) function as follows:

```
100 A=CIN(0):IF A=-1 THEN 100
110 A$=CHR$(A)
```

These lines are equivalent to

```
100 A$=INPUT$(1)
```

in MBASIC. It waits until a single key has been struck, and gives you the character entered. The two BASIC demo programs following this article

illustrate some uses of single character input capability. The first one waits for you to strike a function key, and prints the name of the key struck. It demonstrates a foolproof way to decode function keys. For example, the f1 key produces the code ESCAPE-W, but if you press the Escape key and the W key, the program does not respond. The only way to get out of the program is to type a true function key other than one of the keys at the top of the key board (for example SHIFT + any of the number keypad keys), or to type Control-C. Fortunately, B H BASIC fixes the console input mode back to Line if you Control-C out of the program.

The second example program is a little reflex test game. I did not include subroutines 40000, 50000, and 51000 in the listing presented here to save space, so you should copy them from the first program if you try to run the game. This program illustrates real time programming in B H BASIC (see REMark issue #18, page 24). If you strike a key before a loop times out and "GO" is printed on the screen, the program detects it, and prints "YOU JUMPED THE GUN!".

Where to Put Machine Code

Whenever you poke a machine code subroutine into memory, as in subroutines 50000 and 51000, you need to find a safe place to put it. If you are not careful, you can mess up things. In MBASIC, you can put machine code into arrays (dimensioned variables) or sting variables, because it can tell you the addresses those variables occupy in memory. B H BASIC does not have this capability, so you have to find a safe address yourself. One area you can use is the file name space within BASIC itself. This is where BASIC stores the names of files that you open for read or write. There are actually 5 file name areas, one for each user channel (1-5). Subroutine 50000 uses the name space for channel 4, and 51000 uses the channel 5 name space. Putting a subroutine in a name area does not harm anything as long as it is 17 bytes or less (the maximum possible number of characters in a file name), and the subroutine itself will not be harmed unless you open a file on the channel whose name space you are using. You could then re-POKE the subroutine after the file is closed. Here are the address (in decimal) of the 5 name areas:

AREA	ADDRESS
Channel 1	8893
Channel 2	8920
Channel 3	8947
Channel 4	8974
Channel 5	9001

Since the B H BASIC manual recommends using the lowest possible channel number for each file, I recommend using the highest possible number for each subroutine. Subroutines 50000 and 51000 are small enough that both of them could be POKEd into one name area, which you could do if you had to open 4 files at one time.

If you have a larger subroutine than will fit in the name area, you must locate it outside of BASIC and your program. In MBASIC, you can reserve

space between the area used by MBASIC and HDOS with the /M switch. For example, if you type

```
>MBASIC/M:40000
```

at the HDOS prompt, it reserves the space from 40000 (decimal) to the bottom of HDOS for your programs. Following the three BASIC programs after this article is an assembly program (LBASIC.ASM) that give this capability to B H BASIC. This program also has an added feature, the ability to load and run a program from the HDOS prompt. For example, if you have a program called WUMPUS.BAS on SY1:, you can enter

```
>LBASIC SY1:WUMPUS
```

This will load BASIC and load and run the program, the same as if you had entered

```
>BASIC
```

```
Extended Benton Harbor BASIC #110.06.00
*OLD "SY1:WUMPUS"
*RUN
```

If you want to reserve memory for machine code subroutines, you can enter

```
>LBASIC 40000
```

which would reserve memory starting at 40000 decimal. If you want to run a program and reserve memory, you can enter

```
>LBASIC 35000,SY1:WUMPUS
```

This would reserve memory starting at 35000 and load and run WUMPUS.BAS from SY1: (if there is enough memory with the address that low). The LBASIC program sets CNTRL 4,1 (which loads the HDOS overlays and causes BASIC to do disk accesses faster, including error messages loaded from the disk) if you do not reserve memory. If you do reserve memory, it makes sure that the address you specify allows room for the HDOS overlays, and CNTRL 4,1 is not set. You should not set it yourself either, because you will only cheat yourself out of some FREE space. To help you figure out addresses for machine code subroutines, I have included a little program BASE.BAS following this article, after the two USR demonstration programs. This program converts numbers from split octal to decimal and vice versa.

Faster Program Loading

One of the biggest complaints about B H BASIC is that it is so slow in loading programs from a disk, especially large ones. This is because it only allows programs to be saved in ASCII format, and must convert them to the format used internally while it loads them. Internally, all BASIC commands and functions are stored as "tokens", which are usually a single byte. The command PRINT, for example, occupies 6 bytes (including the following space) on a disk, but only one byte in memory. If you could somehow store a program on disk in this format, it would not only take less disk space, but it would load faster because it would not have to be converted as it

was loaded.

B H BASIC does have a way of storing programs in compressed text format with the FREEZE command. This command saves not only your program but the BASIC interpreter as well all together as one big file. For example if you are running BASIC and have loaded the file WUMPUS.BAS, you could enter

```
*FREEZE "WUMPUS"
```

and a file will be created called WUMPUS.BAF. You can load it back into memory by entering

```
*UNFREEZE "WUMPUS"
```

Since this file includes BASIC itself, it is a machine code file, and can be run directly from the HDOS prompt. If you entered

```
>WUMPUS.BAF
```

at the HDOS prompt, an asterisk (*) would soon appear, and you could then enter RUN, and you would be running WUMPUS. While FREEZE produces a file that loads much faster, it certainly doesn't save any space. It would be nice if FREEZE would save just the program, and UNFREEZE would load it back. I have developed a patch for BASIC that does just that. You can make this patch using the PATCH program supplied with HDOS. For HDOS 2.0 users, make the patch as follows (what you type is shown in bold print).

```
>PATCH
```

```
PATCH Issue #50.06.00
```

```
File Name? BASIC
Patch ID? IFOJIC
Prerequisite Code? IFBEIADPGEFFCF
```

```
Address? 47360
047360 = 200/260
047361 = 335/265
047362 = 031/      (hit RETURN)
047363 = 042/0
047364 = 022/0
047365 = 050/0
047366 = 021/0
047367 = 016/0
047370 = 050/0
047371 = 343/      (hit RETURN)
047372 = 001/0
047373 = 010/0
047374 = 000/0
047375 = 315/0
047376 = 047/0
047377 = 102/0
050000 = 301/      (hit RETURN)
050001 = 021/      (hit RETURN)
050002 = 200/120
050003 = 042/112
050004 = 315/ D    (Control-D)
Address? 54045
054045 = 103/41
054046 = 054/72
054047 = 021/257
054050 = 057/315
054051 = 054/5
054052 = 377/72
```

```
054053 = 040/303
054054 = 303/347
054055 = 223/114
054056 = 070/ D
Address? 54064
054064 = 106/130
054065 = 315/ D
Address? 114347
114347 = 000/21
114350 = 000/57
114351 = 000/54
114352 = 000/315
114353 = 000/21
114354 = 000/101
114355 = 000/1
114356 = 000/0
114357 = 000/377
114360 = 000/21
114361 = 000/120
114362 = 000/112
114363 = 000/72
114364 = 000/203
114365 = 000/112
114366 = 000/365
114367 = 000/257
114370 = 000/345
114371 = 000/377
114372 = 000/4
114373 = 000/341
114374 = 000/361
114375 = 000/62
114376 = 000/203
114377 = 000/112
115000 = 000/315
115001 = 000/335
115002 = 000/102
115003 = 000/303
115004 = 000/106
115005 = 000/043
115006 = 000/ D
Address? D
Patch Check Code? OBILFLHG
```

```
PATCH Issue #50.06.00
```

```
File Name? D
```

Here is the patch for HDOS 1.6 users:

```
>PATCH
```

```
PATCH Issue #50.05.00
```

```
File Name? BASIC
Patch ID? IFOJIC
Prerequisite Code? IFBEIADPGEFFCF
```

```
Address? 47360
047360 = 200/322
047361 = 335/265
047362 = 031/      (hit RETURN)
047363 = 042/0
047364 = 022/0
047365 = 050/0
047366 = 021/0
047367 = 016/0
047370 = 050/0
047371 = 343/      (hit RETURN)
047372 = 001/0
047373 = 010/0
047374 = 000/0
```



```

047375 = 315/0
047376 = 047/0
047377 = 102/0
050000 = 301/      (hit RETURN)
050001 = 021/      (hit RETURN)
050002 = 200/56
050003 = 042/112
050004 = 315/ D    (Control-D)
Address? 54045
054045 = 103/41
054046 = 054/72
054047 = 021/257
054050 = 057/315
054051 = 054/5
054052 = 377/72
054053 = 040/303
054054 = 303/305
054055 = 223/114
054056 = 070/ D
Address? 54064
054064 = 106/130
054065 = 315/ D
Address? 114305
114305 = 000/21
114306 = 000/57
114307 = 000/54
114310 = 000/315
114311 = 000/21
114312 = 000/101
114313 = 000/1
114314 = 000/0
114315 = 000/377
114316 = 000/21
114317 = 000/56
114320 = 000/112
114321 = 000/72
114322 = 000/141
114323 = 000/112
114324 = 000/365
114325 = 000/257
114326 = 000/345
114327 = 000/377
114330 = 000/4
114331 = 000/341
114332 = 000/361
114333 = 000/62
114334 = 000/141
114335 = 000/112
114336 = 000/315
114337 = 000/335
114340 = 000/102
114341 = 000/303
114342 = 000/106
114343 = 000/043
114344 = 000/ D
Address? D
Patch Check Code? BPDKFMNM

```

PATCH Issue #50.05.00

File Name? D

After you make this patch, files saved with FREEZE will have .BAX for their extension, unless you specify another one. You will notice that, even though the files are saved in compressed format, small programs will be the same size or a bit larger than the ASCII text versions. This is because part of the interpreter containing information about the program is saved with it. Larger programs will use less disk space in the com-

pressed format. If you FREEZE a program after running it, it will be a larger file because program variables are saved with the program. This means that you can run a program, halt it with Control-C or a STOP statement in the program, FREEZE it, and then the next time you UNFREEZE it, you can enter CONTINUE and pick up where you left off. This makes possible games or other programs that you can run as time permits and save the current state of things on a disk without the program actually having to open a file and write information to it. The old FREEZE had this capability, but used too much disk space to be practical, since BASIC was saved with the program.

The LBASIC program allows you to UNFREEZE programs from the HDOS prompt. If you enter

```
>LBASIC WUMPUS,F
```

it is the same as typing

```
>BASIC
```

```

Extended Benton Harbor BASIC #110.06.00
*UNFREEZE "WUMPUS"
*RUN

```

Some cautions should be taken in using BASIC with the FREEZE patch. Because of the small amount of patch space in BASIC, I was not able to include protection against loading files that are too big. You should be sure that you have enough memory for the file you want to UNFREEZE. This will normally be the case if you froze the file yourself. Files frozen with HDOS 1.6 BASIC should not be loaded under HDOS 2.0 and vice versa.

LBASIC can also reserve memory and run a frozen file:

```
>LBASIC 40000,WUMPUS,F
```

This example sets the memory limit at 40000, UNFREEZES WUMPUS.BAX, and RUNS it.

That's just about it for this installment on improvements to B H BASIC. In next month's issue, I will present an editor for B H BASIC that uses the H19/H89 left and right arrow keys to move the cursor on the line being edited, the DC key to delete characters, and the IC key to toggle the Insert mode off and on. You can edit the line number as well as the line text, so you can use the editor to replicate lines.

Before I quit, here is one more little item for B H BASIC users. The following little program illustrates a subroutine (at line 10000) that prints right justified dollars and cents with values up to \$20000.00. Above that amount, you may lose a cent or two because BASIC is only accurate to about 6.5 digits.

```

10 INPUT "ENTER FIRST NUMBER";A
20 INPUT "ENTER SECOND NUMBER";B
30 PRINT "A+B =";:N9=A+B:GOSUB 10000
40 PRINT "A+B =";:N9=A-B:GOSUB 10000
50 GOTO 10
60 REM      DOLLAR SUBROUTINE
10000 S9$=" ":IF N9<0 THEN S9$="-"

```

```

10010 N9=ABS(N9)
10020 I9$=STR$(INT(N9)):L9=LEN(I9$)
10030 I9$=RIGHT$(I9$,L9-1)
10040 FOR I=0 TO 6-L9:PRINT " ";:NEXT
10050 PRINT S9$"$"LEFT$(I9$,L9-2);
10060 I9=INT((N9-INT(N9))*100+.5)
10070 I9$=STR$(I9):L9=LEN(I9$)
10080 I9$="0"+RIGHT$(I9$,L9-1)

```

```
10090 PRINT ".";RIGHT$(I9$,3):RETURN
```

Try inputting 19999.99 and .01 to this program, and see what A+B comes out to. Then try 29999.99 and .01, and you will see why I say the accuracy is not good above \$20000.00.

PS:

```

00010 REM          FKEYS.BAS - USR FUNCTION DEMONSTRATION PROGRAM #1
00020 :
00030 REM          PATCH PIN FUNCTION TO CALL SUBROUTINES
00040 :
00050 GOSUB 40000
00060 :
00070 REM          INSTALL USER SUBROUTINES
00080 :
00090 GOSUB 50000:GOSUB 51000
00100 :
00110 REM          MAIN PROGRAM
00120 :
00130 A=PIN(X):REM SET SINGLE CHARACTER MODE
00140 PRINT :PRINT "PLEASE TYPE A FUNCTION KEY: ";
00150 REM          IN THE NEXT LINE WE GET A CHARACTER FROM
00160 REM          THE KEYBOARD. IF IT IS AN ESCAPE, WE LOOK
00170 REM          FOR A SECOND CHARACTER.
00180 IF CIN(0)<>27 THEN 180:REM WAIT FOR ESCAPE SEQUENCE
00190 A=CIN(0):IF A=-1 THEN 180
00200 A$=CHR$(A):PRINT :PRINT "YOU TYPED THE ";
00210 IF A$="J" THEN PRINT "ERASE KEY":GOTO 140
00220 A=ASC(A$)-ASC("O"):IF A<1 OR A>8 THEN 320:REM CHECK FOR VALID KEY
00230 ON A GOTO 240,250,260,270,280,290,300,310
00240 PRINT "BLUE KEY":GOTO 140
00250 PRINT "RED KEY":GOTO 140
00260 PRINT "WHITE (GREY) KEY":GOTO 140
00270 PRINT "f1 KEY":GOTO 140
00280 PRINT "f2 KEY":GOTO 140
00290 PRINT "f3 KEY":GOTO 140
00300 PRINT "f4 KEY":GOTO 140
00310 PRINT "f5 KEY":GOTO 140
00320 PRINT :PRINT "YOU DIDN'T TYPE A FUNCTION KEY!":A=PIN(Y):STOP
00330 :
40000 REM          USER SUBROUTINE PATCH
40010 REM          THIS PATCH ALTERS THE FUNCTION OF
40020 REM          Y=PIN(X)
40030 REM          SUCH THAT A SUBROUTINE AT ADDRESS X IS CALLED,
40040 REM          AND Y IS THE VALUE IN THE A REGISTER WHEN IT
40050 REM          RETURNS
40060 :
40070 X=12575:REM ADDRESS OF PATCH
40080 POKE X,197:POKE X+1,33:POKE X+2,38:POKE X+3,49:POKE X+4,229
40090 POKE X+5,235:POKE X+6,233:POKE X+7,193:POKE X+8,0
40100 RETURN
40110 :
50000 REM          SUBROUTINE TO SET CHARACTER INPUT MODE
50010 REM          WITHOUT ECHO
50020 :
50030 X=8974:REM ADDRESS OF SUBROUTINE (CHANNEL 4 NAME SPACE)
50040 POKE X,1:POKE X+1,129:POKE X+2,129:POKE X+3,175
50050 POKE X+4,255:POKE X+5,6:POKE X+6,201
50060 RETURN
50070 :
51000 REM          SUBROUTINE TO SET LINE INPUT MODE WITH ECHO
51010 :
51020 Y=9001:REM ADDRESS OF SUBROUTINE (CHANNEL 5 NAME SPACE)
51030 POKE Y,1:POKE Y+1,255:POKE Y+2,0:POKE Y+3,175
51040 POKE Y+4,255:POKE Y+5,6:POKE Y+6,201
51050 RETURN

```

```

00010 REM          REFLEX.BAS - USR FUNCTION DEMONSTRATION PROGRAM #2
00020 GOSUB 40000:GOSUB 50000:GOSUB 51000:REM SET UP SUBROUTINES
00030 PRINT CHR$(27);"E";"THIS IS A REFLEX TEST GAME FOR TWO PLAYERS"
00040 PRINT
00050 PRINT "ONE PLAYER MUST PLACE A FINGER ON THE 'Z' KEY, AND"
00060 PRINT "THE OTHER ONE MUST PLACE A FINGER ON THE '/' KEY."
00070 PRINT "I WILL CLEAR THE SCREEN AND WAIT A WHILE, THEN I"
00080 PRINT "WILL PRINT 'GO!'. THE PLAYERS SHOULD THEN PRESS"
00090 PRINT "THEIR KEYS. THE FIRST ONE TO PRESS A KEY WINS."
00100 PRINT :P1=0:P2=0:REM CLEAR PLAYER SCORES
00110 LINE INPUT "GIVE ME THE NAME OF THE PLAYER USING THE 'Z' KEY: ";P1$
00120 PRINT
00130 LINE INPUT "AND NOW, THE PLAYER WHO WILL USE THE '/' KEY: ";P2$
00140 PRINT
00150 PRINT "OK, GET READY...";:FOR I=1 TO 200:NEXT I
00160 PRINT CHR$(27);"E":A=PIN(X):REM SET CHARACTER MODE
00170 FOR I=1 TO 50+RND(1)*100:REM WAIT A RANDOM TIME
00180 IF CIN(0)<>-1 THEN PRINT "SOMEONE JUMPED THE GUN!":GOSUB 360:GOTO 140
00190 NEXT I
00200 PRINT CHR$(27);"Y+EGO!";CHR$(7);:REM PRINT 'GO' IN THE SCREEN CENTER
00210 A=CIN(0):IF A=-1 THEN 210:REM GET FIRST RESPONSE
00220 GOSUB 360:REM CLEAR OTHER RESPONSES
00230 A$=CHR$(A):FOR I=1 TO 100:NEXT I:REM LEAVE 'GO' ON AWHILE
00240 PRINT CHR$(27);"E"
00250 IF A$="Z" OR A$="z" THEN PRINT P1$;:P1=P1+1:GOTO 270:REM PLAYER 1 WON
00260 PRINT P2$;:P2=P2+1:REM PLAYER 2 WON
00270 PRINT " WON!":PRINT
00280 PRINT :PRINT "WANT TO TRY AGAIN? (Y=YES, N=NO, RETURN=YES) ";
00290 A=CIN(0):IF A=-1 THEN 290:REM GET ANSWER
00300 A$=CHR$(A AND 95):IF A$="Y" OR A$=CHR$(10) THEN PRINT "YES":GOTO 140
00310 IF A$="N" THEN PRINT "NO":PRINT :PRINT :A=PIN(Y):GOTO 340:REM FIX CONSOLE
00320 PRINT :PRINT "YOU DIDN'T SAY 'YES' OR 'NO'!"
00330 GOTO 280:REM GET ANOTHER RESPONSE
00340 PRINT P1$;" GOT";P1;"POINTS, AND ";P2$;" GOT";P2;"POINTS.":PRINT
00350 PRINT "THANKS FOR PLAYING!":PRINT :STOP
00360 :
00370 REM          SUBROUTINE TO CLEAR EXTRA CHARACTERS
00380 :
00390 IF CIN(0)<>-1 THEN 380
00400 RETURN
00410 :
00420 REM          PUT SUBROUTINES 40000 ,50000, AND 51000 HERE

00010 REM BASE.BAS -- SPLIT OCTAL TO DECIMAL AND VICE VERSA
00020 DIM Y(20),L(20):R$="0123456789"
00030 PRINT :PRINT "DECIMAL - SPLIT OCTAL CONVERSION PROGRAM"
00040 PRINT :PRINT "TYPE 'O' TO CONVERT TO SPLIT OCTAL"
00050 LINE INPUT "TYPE 'D' TO CONVERT TO DECIMAL: ";C$
00060 C$=CHR$(ASC(C$) AND 95):REM CAPITALIZE ANSWER
00070 IF C$="O" THEN 100
00080 IF C$<>"D" THEN 40
00090 GOTO 150
00100 PRINT :INPUT "ENTER A DECIMAL NUMBER: ";R1
00110 PRINT "IN SPLIT OCTAL IT IS ";
00120 B1=10;B2=8;N1$=STR$(INT(R1/256)):GOSUB 200:PRINT N2$;
00130 N1$=STR$(R1-(INT(R1/256)*256)):GOSUB 200
00140 N2$="00"+N2$:N2$=RIGHT$(N2$,3):PRINT N2$:GOTO 30
00150 PRINT :LINE INPUT "ENTER A SPLIT OCTAL NUMBER: ";O$
00160 O$="00000"+O$:O$=RIGHT$(O$,6):N1$=RIGHT$(O$,3):B1=8;B2=10
00170 IF VAL(N1$)>377 THEN PRINT :PRINT "ILLEGAL SPLIT OCTAL NO.":GOTO 30
00180 GOSUB 200:S$=N2$:N1$=LEFT$(O$,3):GOSUB 200:N=VAL(N2$)*256+VAL(S$)
00190 PRINT "IN DECIMAL IT IS";N:GOTO 30
00200 N2$="":IF LEFT$(N1$,1)=" " THEN N1$=RIGHT$(N1$,LEN(N1$)-1)
00210 IF RIGHT$(N1$,1)=" " THEN N1$=LEFT$(N1$,LEN(N1$)-1)
00220 FOR I=1 TO LEN(N1$):FOR J=1 TO B1:IF MID$(N1$,I,1)=MID$(R$,J,1) THEN 250
00230 NEXT J
00240 PRINT :PRINT N1$" IS NOT LEGAL IN BASE";B1:GOTO 30
00250 L(I)=J-1
00260 NEXT I:Q1=LEN(N1$):Q=0:Q2=1
00270 Y=0:N=0

```



```

00280 FOR I=Q2 TO Q1:N=N*B1+L(I):C=INT(N/B2):N=N-B2*C
00290 IF Y=0 THEN 320
00300 Y=Y+1
00310 L(Y)=C:GOTO 340
00320 IF C=0 THEN 340
00330 Y=1:GOTO 310
00340 NEXT I
00350 Q=Q+1:Y(Q)=N:Q1=Y:IF Y>0 THEN 270
00360 FOR I=Q TO 1 STEP -1:G=Y(I)+1:N2$=N2$+MID$(R$,G,1):NEXT I
00370 RETURN

```

```

00001 *          LBASIC - A Loader for BASIC
00002 *
00003 *          THIS PROGRAM ALLOWS THE B H BASIC USER TO
00004 *          LOAD BASIC PROGRAMS AND SPECIFY THE UPPER
00005 *          MEMORY LIMIT IN THE COMMAND LINE (AT THE
00006 *          HDOS PROMPT).  THE SYNTAX FOR THIS PROGRAM IS
00007 *
00008 *          >LBASIC FNAME          LOAD AND RUN FNAME.BAS
00009 *          >LBASIC FNAME,F       LOAD AND RUN COMPRESSED
00010 *                               FILE FNAME.BAX
00011 *          >LBASIC NNNNN,FNAME   SET MEMORY TOP TO NNNNN
00012 *                               AND LOAD AND RUN FNAME.BAS
00013 *          >LBASIC NNNNN,FNAME,F SET MEMORY TOP TO NNNNN
00014 *                               AND LOAD AND RUN FNAME.BAX
00015 *          >LBASIC NNNNN        SET MEMORY TOP TO NNNNN
00016 *                               (NO PROGRAM LOADED)
00017 *
00018 *          BY P. SWAYNE, HUG  21-APR-82
00019 *
00020 *          TYPE-AHEAD ROUTINES BY JAY H. GOLD
00021
000.000 00022 CTL41 EQU 0          SET CNTRL 4,1 FOR THE USER
00023 *          CHANGE THIS LABEL TO "CTL41 EQU 1" IF YOU DO NOT
00024 *          WANT CNTRL 4,1 SET
00025
042.200 00026          XTEXT  HOSDEF
000.207 00092          XTEXT  HOSEQU
042.200 00120          XTEXT  DIRDEF
000.027 00147          XTEXT  ESINT
041.123 00262          XTEXT  ESVAL
030.211 00323 $HLIHL EQU 30211A
030.216 00324 $CDEHL EQU 30216A
031.136 00325 $TYPTX EQU 31136A
000.002 00326 O.LC EQU 2
000.006 00327 O.QTPT EQU 6
000.010 00328 O.QHPT EQU 8
000.012 00329 O.BSTPT EQU 10
000.014 00330 O.BENPT EQU 12
00331
042.200 00332          ORG    USERFWA
00333
042.200 377 007 00334 LBASIC SCALL .CLRCO          CLEAR CONSOLE
042.202 377 001 00335 SCALL .SCIN          CLEAR TYPE-AHEAD BUFFER
042.204 322 202 042 00336 JNC *-2
042.207 041 015 044 00337 LXI H,NAMRET
042.212 021 007 044 00338 LXI D,DEFALT
042.215 076 377 00339 MVI A,-1
042.217 377 054 00340 SCALL .NAME          GET DEVICE LBASIC IS ON
042.221 041 000 000 00341 LXI H,0
042.224 071 00342 DAD SP          FIND STACK POINTER
042.225 175 00343 MOV A,L
042.226 376 200 00344 CPI 200Q          HAS IT MOVED?
042.230 312 155 043 00345 JZ LINK          NO ENTRY, LINK TO BASIC
042.233 176 00346 GETARG MOV A,M          GET A CHARACTER
042.234 043 00347 INX H          MOVE TO NEXT CHARACTER
042.235 376 040 00348 CPI ' '          SPACE?
042.237 312 233 042 00349 JZ GETARG          SKIP SPACES
042.242 053 00350 DCX H          BACK UP TO FIRST CHAR.
042.243 315 230 043 00351 CALL DECIN          CONVERT NO. TO BINARY

```

042.246	332	003	043	00352		JC	NAME	FILE NAME, NOT NUMBER
042.251	174			00353	GOTNUM	MOV	A,H	GET NO./256
042.252	376	132		00354		CPI	132Q	ADDRESS TOO LOW?
042.254	322	312	042	00355		JNC	NOTLOW	NO
042.257	315	136	031	00356		CALL	\$TYPTX	
042.262	012	101	144	00357		DB	12Q,'Address is too low.',212Q	
042.307	257			00358		XRA	A	
042.310	377	000		00359		SCALL	.EXIT	
042.312	107			00360	NOTLOW	MOV	B,A	SAVE PAGE IN B
042.313	072	325	040	00361		LDA	S.OMAX+1	GET OVERLAY PAGE
042.316	074			00362		INR	A	ADD 256 BYTES
042.317	117			00363		MOV	C,A	SAVE IN C
042.320	072	321	040	00364		LDA	S.SYSM+1	GET RESIDENT PAGE
042.323	221			00365		SUB	C	SUBTRACT OVERLAY SIZE
042.324	270			00366		CMF	B	ADDRESS TOO HIGH?
042.325	322	364	042	00367		JNC	NOTHI	NO
042.330	315	136	031	00368		CALL	\$TYPTX	
042.333	012	101	144	00369		DB	12Q,'Address is too high.',212Q	
042.361	257			00370		XRA	A	
042.362	377	000		00371		SCALL	.EXIT	
042.364	042	320	040	00372	NOTHI	SHLD	S.SYSM	SET NEW MEMORY LIMIT
042.367	076	001		00373		MVI	A,1	
042.371	062	365	043	00374		STA	MEMFLG	FLAG MEMORY LOWERED
042.374	032			00375		LDAX	D	GET NEXT CHARACTER
042.375	376	054		00376		CPI	','	NAME FOLLOWING?
042.377	302	155	043	00377		JNZ	LINK	IF NOT, GO TO BASIC
043.002	023			00378		INX	D	MOVE TO NEXT CHARACTER
				00379				
				00380	*		GET FILE NAME FROM STACK	
				00381				
043.003	041	070	044	00382	NAME	LXI	H,FNAME	PUT NAME HERE
043.006	032			00383	GNAME	LDAX	D	GET A CHARACTER
043.007	376	056		00384		CPI	','	LESS THAN PERIOD?
043.011	332	022	043	00385		JC	NAMEND	YES, END OF NAME
043.014	167			00386		MOV	M,A	STORE CHARACTER
043.015	043			00387		INX	H	INCREMENT POINTERS
043.016	023			00388		INX	D	
043.017	303	006	043	00389		JMP	GNAME	GET REST OF NAME
043.022	066	042		00390	NAMEND	MVI	M,'''	TERMINATE NAME
043.024	043			00391		INX	H	
043.025	066	000		00392		MVI	M,0	
043.027	376	054		00393		CPI	','	ARGUMENT FOLLOWING?
043.031	041	026	044	00394		LXI	H,OLD	ASSUME NOT, SO USE "OLD"
043.034	302	051	043	00395		JNZ	STUFF	STUFF NAME
043.037	023			00396		INX	D	
043.040	032			00397		LDAX	D	GET NEXT CHARACTER
043.041	376	106		00398		CPI	'F'	FAST LOAD?
043.043	302	051	043	00399		JNZ	STUFF	NO
043.046	041	034	044	00400		LXI	H,UNFRZ	YES, USE "UNFREEZE"
				00401				
				00402	*		STUFF FILE NAME IN TYPE AHEAD BUFFER	
				00403				
043.051	345			00404	STUFF	PUSH	H	SAVE COMMAND ADDRESS
043.052	052	346	040	00405		LHLD	S.DLINK	GET LINK TO TYPE-AHEAD
043.055	353			00406		XCHG		
043.056	041	002	000	00407		LXI	H,O.LC	GET OFFSET TO LINE COUNTER
043.061	031			00408		DAD	D	
043.062	042	367	043	00409		SHLD	LC	SAVE LINE COUNTER ADDRESS
043.065	041	006	000	00410		LXI	H,O.QTPT	OFFSET TO TAIL POINTER
043.070	031			00411		DAD	D	
043.071	042	371	043	00412		SHLD	QTPT	SAVE IT
043.074	041	010	000	00413		LXI	H,O.QHPT	OFFSET TO HEAD POINTER
043.077	031			00414		DAD	D	
043.100	042	373	043	00415		SHLD	QHPT	SAVE IT
043.103	041	012	000	00416		LXI	H,O.BSTPT	OFFSET TO START POINTER
043.106	031			00417		DAD	D	
043.107	042	375	043	00418		SHLD	BSTPT	SAVE IT
043.112	041	014	000	00419		LXI	H,O.BENPT	OFFSET TO END POINTER
043.115	042	377	043	00420		SHLD	BENPT	SAVE IT
043.120	341			00421		POP	H	RESTORE LOAD COMMAND
043.121	315	263	043	00422		CALL	INSERT	INSERT COMMAND

043.124	041	070	044	00423	LXI	H,FNAME	GET FILE NAME
043.127	315	263	043	00424	CALL	INSERT	INSERT IT
000.000				00425	IF	CTL41	
043.132	072	365	043	00426	LDA	MEMFLG	
043.135	267			00427	ORA	A	MEMORY TOP LOWERED?
043.136	302	147	043	00428	JNZ	NOCTL41	IF SO, DON'T SET CNTRL 4,1
043.141	041	047	044	00429	LXI	H,CNTRL	
043.144	315	263	043	00430	CALL	INSERT	INSERT "CNTRL 4,1"
043.147				00431	NOCTL41 EQU	*	
				00432	ENDIF		
043.147	041	062	044	00433	LXI	H,RUN	GET RUN COMMAND
043.152	315	263	043	00434	CALL	INSERT	INSERT IT
				00435			
				00436	*	LINK TO B H BASIC	
				00437			
043.155	041	001	044	00438	LINK LXI	H,BASIC	POINT TO BASIC FILE NAME
043.160	021	007	044	00439	LXI	D,DEFAULT	AND DEFAULTS
043.163	377	040		00440	SCALL	.LINK	LINK TO BASIC
043.165	315	136	031	00441	CALL	\$TYPTX	
043.170	012	103	141	00442	DB	12Q,'Can't link to BASIC.',212Q	
043.216	377	007		00443	SCALL	.CLRCO	CLEAR CONSOLE
043.220	377	001		00444	SCALL	.SCIN	CLEAR TYPE-AHEAD
043.222	322	220	043	00445	JNC	*-2	
043.225	257			00446	XRA	A	
043.226	377	000		00447	SCALL	.EXIT	
				00448			
				00449	*	CONVERT ASCII DECIMAL NUMBER AT ((HL))	
				00450	*	TO BINARY. RESULT RETURNED IN (HL),	
				00451	*	((DE)) POINTS TO CHARACTER AFTER NUMBER	
				00452			
043.230	021	000	000	00453	DECIN LXI	D,0	CLEAR DE
043.233	353			00454	XCHG		DE = POINTER, HL = ZERO
043.234	032			00455	DLOOP LDAX	D	GET A DIGIT
043.235	326	060		00456	SUI	'0'	REMOVE ASCII BIAS
043.237	247			00457	ANA	A	LESS THAN '0'?
043.240	370			00458	RM		IF SO, DONE
043.241	376	012		00459	CPI	10	MORE THAN 10?
043.243	077			00460	CMC		
043.244	330			00461	RC		IF SO, RETURN WITH CARRY
043.245	023			00462	INX	D	MOVE TO NEXT DIGIT
043.246	051			00463	DAD	H	* 2
043.247	345			00464	PUSH	H	SAVE IT
043.250	051			00465	DAD	H	* 4
043.251	051			00466	DAD	H	* 8
043.252	301			00467	POP	B	BC = N * 2
043.253	011			00468	DAD	B	(N * 2) + (N * 8) = N * 10
043.254	117			00469	MOV	C,A	ADD IN LATEST DIGIT
043.255	006	000		00470	MVI	B,0	
043.257	011			00471	DAD	B	
043.260	303	234	043	00472	JMP	DLOOP	GET ANOTHER DIGIT
				00473			
				00474	*	INSERT STRING INTO TYPE-AHEAD BUFFER	
				00475	*	((HL)) POINTS TO STRING TO STUFF	
				00476			
043.263	176			00477	INSERT MOV	A,M	GET A CHARACTER
043.264	043			00478	INX	H	INCREMENT POINTER
043.265	267			00479	ORA	A	DONE?
043.266	310			00480	RZ		IF SO, RETURN
043.267	062	366	043	00481	STA	SAVCHAR	SAVE CHARACTER
043.272	315	300	043	00482	CALL	PUTIN	PUT IT IN TYPE-AHEAD
043.275	303	263	043	00483	JMP	INSERT	GET ANOTHER CHARACTER
043.300	345			00484	PUTIN PUSH	H	SAVE POINTER
043.301	052	371	043	00485	LHLD	QTPT	GET TAIL POINTER ADDR
043.304	315	211	030	00486	CALL	\$HLIHL	POINT TO TAIL
043.307	072	366	043	00487	LDA	SAVCHAR	GET CHARACTER
043.312	167			00488	MOV	M,A	INSERT IT
043.313	376	012		00489	CPI	12Q	NEW LINE?
043.315	314	356	043	00490	CZ	INCLP	IF SO, INCREMENT LINE PTR.
043.320	043			00491	INX	H	NEXT POSITION IN QUEUE
043.321	353			00492	XCHG		SAVE IN DE

vectored to 21

Buggin'

HUG



Dear HUG,

Yes, there is an H-11 crowd out there which is happy to get any helpful information no matter how elementary it may seem to those who have it.

My H-11A is a company owned machine, purchased because of the Data Processing Department's preoccupation with the "more important" tasks of getting information processed for corporate headquarters and a couple other divisions.

While I built the H-11 I did not write the programs. A Georgia Tech student was hired for the summer to translate my desires into working programs. When he left I had to start learning more about programming.

Quality has become a popular word in industry lately. My efforts are going toward taking information that already exists and putting it into a form that management can use. That means generating reports.

For the past eight months I've been taking data off the H-19, taking the good, bad and sometimes ugly, and having a secretary produce the reports. Recently I got brave and decided XBASIC and a printer would save a lot of work.

The first monumental problem came about when trying to print columns of numbers. The HT-11 XBASIC "PRINT USING" feature would work to produce a single column, but not multiples. The solution is to put TAB statements on separate lines as below.

```
10 OPEN "LP:" FOR OUTPUT AS FILE #7
20 A=22.5
30 B=.75
40 C=37
50 D=100.073
60 X$="$$$#,###,###.##"
70 REM Print A, B, C and D at Column
   Locations for REPORT
80 PRINT #7: USING X$,A;
90 PRINT #7: TAB(20);
100 PRINT #7: USING X$,B;
```

```
110 PRINT #7: TAB(40);
120 PRINT #7: USING X$,C;
130 PRINT #7: TAB(60);
140 PRINT #7: USING X$,D
```

Having this information BEFORE writing a program can save a lot of grief.

Bob McKee
148 Cherokee Ridge
Athen, GA 30606

Dear HUG,

If you don't like waiting for error messages from BH BASIC 110.06.00, then here is a patch you might want to consider. It will allow you to choose between error messages and error numbers via the CNTRL 2,n command. In the normal mode (CNTRL 2,0), all errors will be represented as numbers which means BASIC will not have to go to the disk for the error message. In the other two modes (CNTRL 2,1 or CNTRL 2,2) an error will be represented in the normal way (ie. from ERRORMSG.SYS). In either case BASIC may still have to access the disk for the .CLEAR SCALL but this can be overcome by loading the overlaid SCALLs with the CNTRL 4,1 command.

	<u>ADDRESS</u>	<u>OLD</u>	<u>NEW</u>
CHANGE	075 072	046	315
	075 073	040	347
	075 074	377	114
	075 075	057	000

	<u>ADDRESS</u>	<u>ADD</u>
PATCH	114 347	046
AREA	114 350	040
	114 351	026
	114 352	000
	114 353	137
	114 354	072
	114 355	316
	114 356	043
	114 357	267
	114 360	312
	114 361	367
	114 362	114
	114 363	173
	114 364	377
	114 365	057
	114 366	311
	114 367	315
114 370	206	
114 371	100	
114 372	311	

Jim Johnston
PO Box 484
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AB CANADA T8V 3A7

TO ALL CP/M USERS

There is a large quantity of public domain software currently available to CP/M Users Group (CPMUG) (a subsidiary of Lifeboat Associates) and by SIG/M (the CP/M Special Interest Group of the Amateur Computer Group of New Jersey). Currently there are 60 volumes of SIG/M software and at least 78 volumes of CPMUG software, where most of the CPMUG software volumes beyond 54 are duplicates of SIG/M Volumes 001 thru 025. Each volume consists of one single sided, single density, standard 8 inch floppy diskette.

Both SIG/M and CPMUG distribute software on single sided, single density, standard 8 inch media only, effectively isolating Heath users who have only 40 track single sided or 80 track double sided 5 inch disk drives using hard or soft sectored controllers. Both SIG/M and CPMUG cannot afford the logistics of supporting multiple manufacturers non-standard 5 inch media formats as exist today. Both organizations recognize, however, that non 8 inch floppy users can benefit from the public domain software, and, SIG/M, at least, is willing to lend copies of their disks to clubs for copy down purposes. For clubs at any great distance from SIG/M this is not really a feasible possibility.

As a member of SIG/M and CPMUG, I am currently supporting the downloading of all SIG/M and CPMUG software to Heath hard sector formats and can supply both standard 40 track, and 80 track, double sided (preferred) formats. I expect to support Heath soft sectored formats soon and can, with some difficulty, support Magnolia 5 inch soft sectored formats now.

Volumes currently available are SIG/M Volumes 001-060 and CPMUG Volumes 1-54. More will be available as I purchase them and download them. The current prices are:

\$6.00 per volume, 80 track, double sided (1 disk/volume), and
\$16.00 per volume, 40 track, single sided (3 disks/volume).

Prices quoted include shipping via UPS. Since UPS cannot deliver to post office boxes, APO addresses and the like, delivery via US mail is available for \$1.00/volume additional. For a most recent summary of what is available and for news on what SIG/M is, order SIG/M Volume 051. Send check with order to: Robert Todd, 1121 Briarwood, Bensalem PA 19020.

Users who desire 8 inch standard format volumes should contact SIG/M, PO Box 97, Islen NJ 08830 or CPMUG, % Lifeboat

Associates in New York City, depending upon your requirements, or contact one of the many distribution points around the country.

For new CP/M initiates who are not aware of what types of software is available from SIG/M and CPMUG, the following is a partial list: games, assemblers, disassemblers, editors, BASIC compilers, many other languages, remote bulletin board systems, modem software, IBM disk conversion programs, dump utilities, directory utilities, disk diagnostics, and others too numerous to mention.

The New York (City) Amateur Computer Club (NYACC) currently publishes a very nice two volume catalog of exactly what is in the SIG/M and CPMUG libraries, or you can order a shorter disk based version by ordering SIG/M Volume 051.

It should be noted that software contributed to both the CPMUG and SIG/M libraries has been contributed to the public domain for non-commercial use only. For this reason, I have priced the software volumes at the SIG/M volume prices (which is less than the CPMUG prices) to allow the maximum number of users to benefit from the distribution of this software. A bit of cost analysis will show that I will not break even in the long run, but I am pricing this way to keep peace with SIG/M and CPMUG which I support. SIG/M and CPMUG were both founded on the idea of spreading public domain software to CP/M users at a minimum of cost. Therefore, I suggest you pool your resources and share this software among many users.

Robert H. Todd, Jr.
1121 Briarwood
Bensalem, PA 19020

Dear HUG,

Thanks for printing my article, "Protected Input in HDOS MBASIC" in Issue 27; however, when you expanded the routine to make it readable an error crept in. On page 27 in line 1090 where it says...
ELSE IF FI%=127 THEN 1260 ... it should read ... ELSE IF I%=127 THEN 1260 ... And now my error. Line 1620 serves no purpose. I use this routine in my programs and placed a cursor position function there and forgot about it.

Raymond H Thompson
12260 Welcome Drive
San Antonio, TX 78233

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New HUG Software

885-1119 B H BASIC Support \$20.00

Introduction: This disk contains programs and modifications to provide faster and more convenient operation using Heath Extended Benton Harbor BASIC (HDOS version).

Requirements: This disk requires HDOS 1.6 or 2.0 on an H8/H19 or H89 with a minimum of 48K of memory with one drive.

The following is an explanation of the files on this disk.

BAS16.ABS and BAS20.ABS -- This is the standard BHBASIC patched so that the FREEZE and UNFREEZE commands save and load programs in compressed text format. This results in faster load times and less disk space for large programs.

LBASIC.ABS -- This is a pre-loader for BASIC that allows you to load and run a program using a single command line entry from HDOS, e.g. "LBASIC SY1:FNAME".

The source code is included in LBASIC.ASM.

EDBASIC.ABS -- This is a co-resident editor for Benton Harbor BASIC. When you type EDBASIC at the HDOS prompt, the editor is loaded into high memory, and BASIC is loaded and started.

The editor is invoked by entering, within BASIC, a CTRL-D. The edit is done on the 25th line of the screen. The keypad of the terminal controls the functions of the edit. The details are contained in the documentation on the disk.

You can cancel the edit by entering a CTRL-D. You may edit any part of a line, including the line number, which allows you to replicate lines with the editor. The only restrictions are that a line cannot exceed 80 characters and there cannot be any unprintable characters e.g. control characters.

The source code is made up of ELOADR.ASM and BEDIT.ASM, which are included.

BC.DVD and MBC.DVD -- BC.DVD is a device driver which, when loaded, re-defines the use of the function and keypad keys to produce certain BASIC keywords with one stroke. MBC.DVD is the Microsoft BASIC version of BC.DVD.

The device driver is activated and disabled by toggling the CTRL-X. While it is active, the function and keypad keys will print their defined value. For example,

the "f1" key will produce "PRINT ", the "3" key (on the keypad) will produce "INPUT " and so on.

RENUM.ABS -- This is a renumberer for Benton Harbor BASIC programs. The source code (RENUM.ASM) is included.

MAP.ABS -- This program generates cross reference lists of all variables and referenced lines in a BASIC program. (No source is available for MAP.)

BASE.BAS -- This BASIC program converts numbers from split octal to decimal and from decimal to split octal.

SUBS.BAS -- This program contains three BASIC subroutines that may be incorporated into BASIC programs. The first subroutine patches BASIC to change the function of Y=PIN(X), such that a machine code subroutine is called at address X, and when it returns, the value of the A register is placed in Y.

The second subroutine sets up a machine code subroutine that sets HDOS to the character input mode without echo when you call it with V=PIN(X). In this mode, the CIN(0) function duplicates the INKEY\$ function in CP/M MBASIC.

The last subroutine sets up a machine code subroutine that sets HDOS back to the standard line input mode when you call it with V=PIN(Y).

FKEYS.BAS and REFLEX.BAS -- These are demonstration programs using SUBS.BAS.

885-8005 HDOS Modem Appl. Effector \$35.00

Introduction: MAPLE (Modem Applications Effector) is a program designed to allow the H8/H19 or H89 computer to communicate effectively with another computer, over the telephone or by direct connection.

Requirements: MAPLE requires HDOS 1.6 or 2.0 on the H8/H19 or H89 with a minimum amount of memory and one drive. A modem and appropriate connector will be required to communicate to another system.

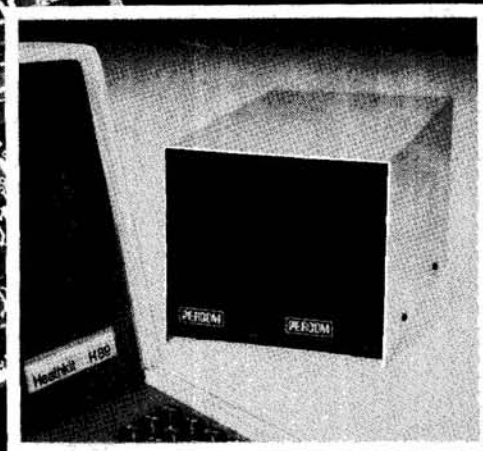
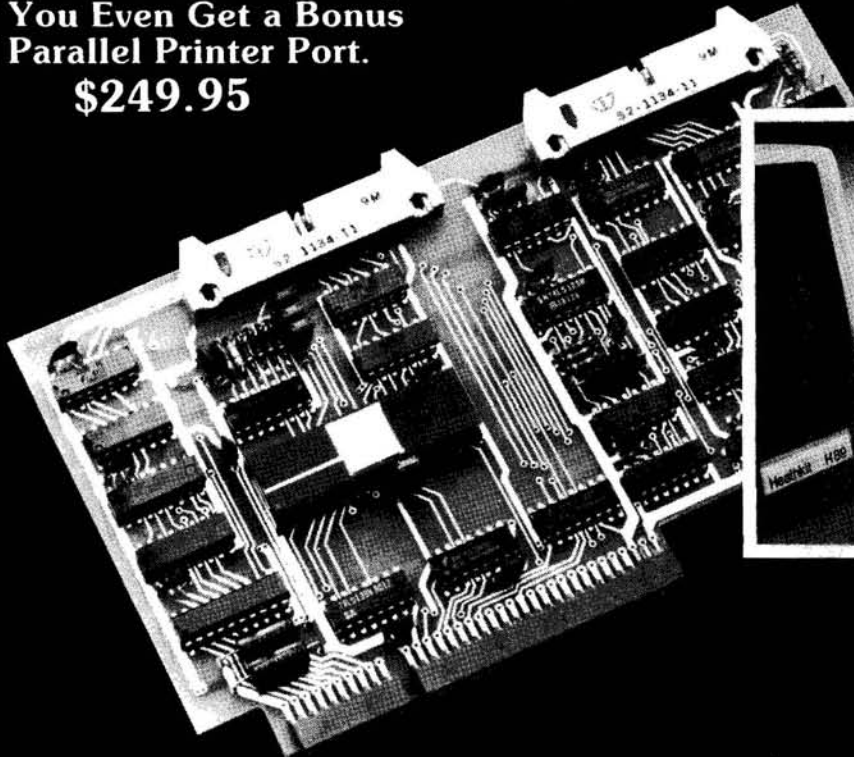
Author: Dr. William C. Parke

Program Content: MAPLE, when executed, enters the "communications" mode, with full file send and receive control. The mode and options are displayed on the 25th line of the terminal and are invoked by depressing the appropriate function key.

This program has too many features to mention here. The details are supplied in 20 page manual.

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System requirements - H-89 Computer with 24 Kbytes memory (min), Replacement ROM Kit H-88-7 and HDOS 2.0.



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System requirements - H-89 or H-8 computer with 16-Kbyte RAM, Heath first-drive floppy disk system, HDOS and drives interconnecting cable. (Two-drive interconnecting cable optionally available from Percom)

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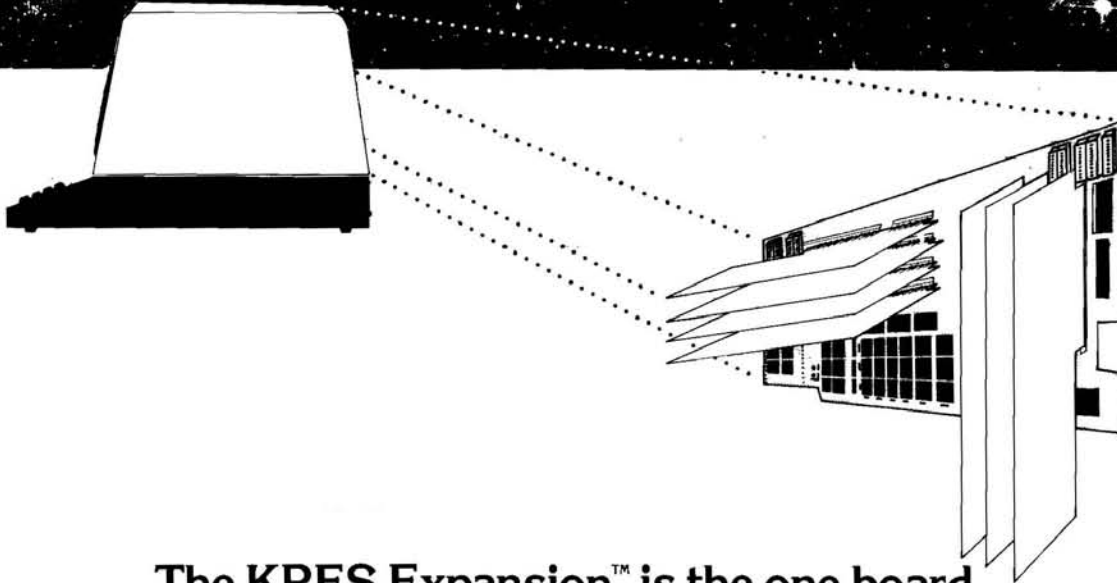
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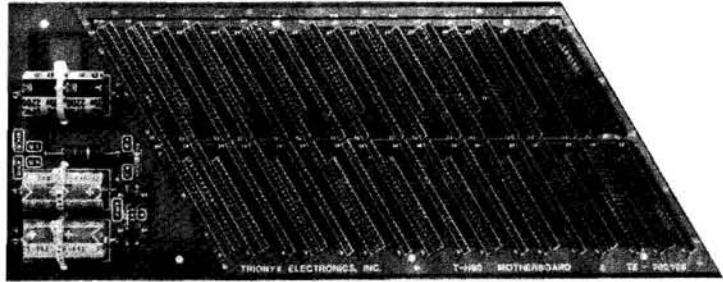
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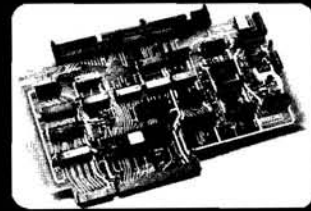
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043.322	052	377	043	00493	LHLD	BENPT	GET END POINTER ADDR
043.325	315	211	030	00494	CALL	\$HLIHL	POINT TO END
043.330	315	216	030	00495	CALL	\$CDEHL	AT END?
043.333	314	346	043	00496	CZ	SETHEAD	IF SO, SET TO START
043.336	052	371	043	00497	LHLD	QTPT	UPDATE TAIL POINTER
043.341	163			00498	MOV	M,E	
043.342	043			00499	INX	H	
043.343	162			00500	MOV	M,D	
043.344	341			00501	POP	H	RESTORE STRING POINTEF
043.345	311			00502	RET		
043.346	052	375	043	00503	SETHEAD LHLD	BSTPT	GET START POINTER
043.351	315	211	030	00504	CALL	\$HLIHL	POINT TO START
043.354	353			00505	XCHG		POINTER TO DE
043.355	311			00506	RET		
043.356	345			00507	INCLP	PUSH H	SAVE HL
043.357	052	367	043	00508	LHLD	LC	GET LINE COUNTER
043.362	064			00509	INR	M	INCREMENT IT
043.363	341			00510	POP	H	
043.364	311			00511	RET		
				00512			
				00513	*	CONSTANTS AND STORAGE	
				00514			
043.365	000			00515	MEMFLG	DB	0
043.366	000			00516	SAVCHAR	DB	0
043.367	000	000		00517	LC	DW	0
043.371	000	000		00518	QTPT	DW	0
043.373	000	000		00519	QHPT	DW	0
043.375	000	000		00520	BSTPT	DW	0
043.377	000	000		00521	BENPT	DW	0
044.001	102	101	123	00522	BASIC	DB	'BASIC',0
044.007				00523	DEFALT	DS	6
044.015	311			00524	NAMRET	RET	
044.016				00525		DS	8
044.026	117	114	104	00526	OLD	DB	'OLD ',0
044.034	125	116	106	00527	UNFRZ	DB	'UNFREEZE ',0
044.047	012	103	116	00528	CNTRL	DB	12Q, 'CNTRL 4,1',0
044.062	012	122	125	00529	RUN	DB	12Q, 'RUN',12Q,0
044.070				00530	FNAME	DS	18
				00531			
044.112	000			00532	END	LBASIC	

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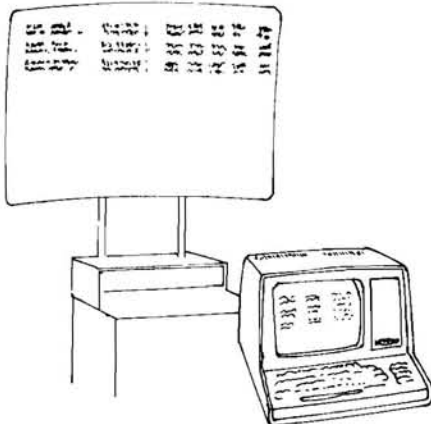
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	DS	48tpi [343K]	order no. S540DS	\$1095
	DS	96tpi [700K]	order no. S580DS	\$1295
Dual 5"	DS	96tpi [1.4M]	order no. D580DS	\$1995

COMPLETE SYSTEMS

As well as manufacturing enhancements for the '89 [also '88 and '90], we are a Zenith Data Systems OEM, and have all of their hardware and software products available as well. We can provide a completely integrated system, combining the best Zenith products with our own to provide the exact system capabilities to best satisfy your requirements.

ORDERING INFORMATION

Our products are available from many Heathkit Electronic Centers and independent computer stores throughout the United States. If your local dealer doesn't stock our products, you may order direct or request further information by calling our Sales Department on our toll-free number, (800) 426-2841.

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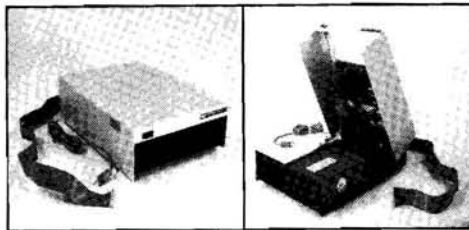
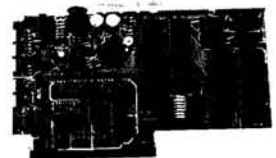
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The following is a general list of the features:

1) The keyboard may be changed from the standard ASCII to APL by a single key-stroke. Special APL characters are displayed with reverse video.

2) Any display may be sent to a printer exactly as seen on the screen. Full screen editing can be performed before printing.

3) All input and response can be echoed to a printer continuously or the printer may be turned off by a single control key.

4) The current stored file names can be displayed by one keystroke.

5) Files may be sent in block or line mode. (Block mode may be selected with linefeed, carriage return or both at the end of each line.)

6) User control of terminal settings include baud rate, parity, word length and stop bits per character byte. All settings are saved upon exit from MAPLE.

10) Single keystroke disk change or reset is available for any drive.

11) Automatic sending of ten active texts is possible.

MAPLE was designed so that the average user can make changes to common settings by the SET function within the program. "Patch Instructions" are include with the manual to aid the user in customizing MAPLE to his requirements.

Comments: MAPLE, one of the most complete modem packages, includes most any feature required for computer communications. The 25th line display "menu" and documentation make it a very user "friendly" package.

HUG Product List

NOTE: The number in the REM # column refers to the issue of REMark containing a description of the software. Usually, it refers to the "New HUG Software" column, but it may refer to an article.

Part Number	Description	Selling Price	REM #
-------------	-------------	---------------	-------

CASSETTE SOFTWARE (H8 and H88)

885-1008	Volume I Documentation and Program Listings (some for H11)	\$ 9.00	
----------	--	---------	--

885-1009	Tape I	Cassette	\$ 7.00	
885-1013	Volume II Documentation and Program Listings		\$12.00	
885-1014	Tape II ASM	Cassette H8 Only	\$ 9.00	
885-1015	Volume III Documentation and Program Listings		\$12.00	
885-1026	Tape III	Cassette	\$ 9.00	
885-1036	Tape IV	Cassette	\$ 9.00	8
885-1037	Volume IV Documentation and Program Listings		\$12.00	8
885-1039	WISE on Cassette	H8 Only	\$ 9.00	
885-1057	Tape V	Cassette	\$ 9.00	
885-1058	Volume V Documentation and Program Listings		\$12.00	

HDOS SOFTWARE (H8/H17 or H89 -- 5-inch only)

MISCELLANEOUS COLLECTIONS

885-1024	Disk I	H8/H89	\$18.00	6
885-1032	Disk V	H8/H89	\$18.00	8
885-1044	Disk VI	H8/H89	\$18.00	
885-1064	Disk IX	H8/H89	\$18.00	
885-1066	Disk X	H8/H89	\$18.00	10
885-1069	Disk XIII	Misc H8/H89	\$18.00	

GAMES

885-1010	Adventure Disk	H8/H89	\$10.00	4
885-1029	Disk II Games 1	H8/H89	\$18.00	8
885-1030	Disk III Games 2	H8/H89	\$18.00	8
885-1031	Music 8 & 89	H8/H19 and H89	\$20.00	25
885-1067	Disk XI Graphic Games		\$18.00	12
	.ABS and B H BASIC (H19/H89)			
885-1068	Graphic Games (H19/H89)		* \$18.00	10
885-1088	Graphic Games (H19/H89)		* \$20.00	14
885-1093	Dungeons and Dragons Game		* \$20.00	16
	Requires H89 or H8/H19			
885-1096	Action Games (H19/H89)		* \$20.00	18
885-1103	Sea Battle Game (H19/H89)		\$20.00	20
885-1111	HDOS MBASIC Graphic Games		* \$20.00	23
885-1112	HDOS Graphic Games		\$20.00	23
885-1113	HDOS Fast Action Games		\$20.00	23
885-1114	Color Raiders and Goop (HA-8-3)		\$20.00	23

UTILITIES

885-1019	Device Drivers (HDOS 1.6)		\$10.00	6
885-1022	HUG Editor (ED) Disk	H8/H89	\$15.00	20
885-1025	Runoff Disk	H8/H89	\$35.00	
885-1050	M.C.S. Modem for	H8/H89	\$18.00	
885-1060	Disk VII	H8/H89	\$18.00	
	SUBMIT, CLIST, FDUMP, ABSDUMP, etc.			
885-1061	TMI Cassette to Disk	H8 only	\$18.00	
885-1062	Disk VIII	H8/H89 (2 disks)	\$25.00	
	MEMTEST, DUP, DUMP, DSM			
885-1063	Floating Point Disk	H8/H89	\$18.00	
885-1065	Fixed Point Package	H8/H89	\$18.00	10
885-1075	HDOS Support Package	H8/H89	\$60.00	
885-1077	TXTCON/BASCON	H8/H89	\$18.00	
885-1079	HDOS Page Editor		\$25.00	15
885-1080	EDITX	H8/H19/H89	\$20.00	
885-1082	Programs for Printers	H8/H89	\$20.00	
885-1083	Disk XVI RECOVER, etc.		\$20.00	11
885-1089	MACRO, CTOH, and misc Utilities		\$20.00	20
885-1090	Misc. HDOS Utilities		\$20.00	22
	CCAT, HPLINK, AH, MBSORT, etc.			
885-1092	RDT Debugging Tool	H8/H89	\$30.00	14
885-1095	HUG SY: Device Driver	HDOS 2.0	\$30.00	18
885-1098	H8/HA-8-3 Color .ABS/.ASM		\$20.00	19
885-1099	H8/HA-8-3 Color in Tiny Pascal		\$20.00	19

885-1105	HDOS 2.0 Device Drivers MX-80, Paper Tiger, Clock, etc.	\$20.00	24
885-1116	HDOS Z80 Debugging Tool	\$20.00	27
885-1119	B H BASIC Support H8/H19 or H89	\$20.00	29
885-8001	SE UCSD-Style Screen Editor	\$25.00	28
885-8003	B H BASIC to MBASIC Converter	\$25.00	28
885-8004	UDUMP and FAKEMNT Disk Manipulation Utilities	\$35.00	28
885-8005	MAPLE Modem Program	\$35.00	29

PROGRAMMING LANGUAGES

885-1038	WISE on Disk H8/H89	\$18.00	
885-1042	PILOT H8/H89	\$19.00	
885-1059	FOCAL-8 H8/H89	\$25.00	13
885-1078	HDOS Z80 Assembler	\$25.00	21
885-1085	PILOT Documentation	\$ 9.00	
885-1086	Tiny Pascal H8/H89	\$20.00	13
885-1094	HUG Fig-Forth H8/H89 2 Disks	\$40.00	18

BUSINESS, FINANCE AND EDUCATION

885-1047	Stocks H8/H89	\$18.00	
885-1048	Personal Account H8/H89	\$18.00	
885-1049	Income Tax Records H8/H89	\$18.00	
885-1055	Inventory H8/H89	* \$30.00	
885-1056	Mail List H8/H89	* \$30.00	
885-1070	Disk XIV Home Finance H8/H89	\$18.00	
885-1071	SmBusPkg III 3 Disks H8/H19 or H89	* \$75.00	17
885-1091	Grade and Score Keeping	* \$30.00	14
885-1097	Educational Quiz Disk H89 or H8/H19	* \$20.00	18

DATA BASE MANAGEMENT SYSTEMS (DBMS)

885-1107	Amateur Radio Logbook and TMS	\$30.00	23
885-1108	Telephone/Mail Info. System	* \$30.00	23
885-1109	Retriever (2 disks)	\$40.00	23
885-1110	Autofile	\$30.00	23
885-1115	Aircraft Navigation DBMS H8/H89	\$20.00	25

AMATEUR RADIO

885-1023	RTTY Disk H8 Only	\$22.00	6
885-1106	Morse-89 H8/H19 or H89	\$20.00	22

* Means MBASIC is required

H11 SOFTWARE

885-1008	Volume I Documentation and Program Listings (some for H11)	\$ 9.00	
885-1033	HT-11 Disk I	\$19.00	
885-1053	H11/H19 Support Package EXEC Modem Software, etc.	\$20.00	27
885-1117	Pirate's Adventure for H11/H19	\$20.00	28

CP/M SOFTWARE (5-inch only)

885-1201	CP/M (TM) Volumes H1 and H2	% \$21.00	
885-1202	CP/M Volumes 4 and 21-C	%% \$21.00	
885-1203	CP/M Volumes 21-A and B	%% \$21.00	
885-1204	CP/M Volumes 26/27-A and B	%% \$21.00	
885-1205	CP/M Volumes 26/27-C and D	%% \$21.00	
The above CP/M products are 2 disks each.			
885-1206	CP/M Games Disk	\$20.00	11
885-1207	TERM and H8COPY	\$20.00	26
885-1208	HUG Fig-Forth H8/H89 2 Disks	\$40.00	18

885-1209	Dungeons and Dragons Game MBASIC and H89 or H8/H19	\$20.00	19
885-1210	HUG Editor	\$20.00	20
885-1211	Sea Battle Game for CP/M	\$20.00	20
885-1212	CP/M Utilities I	\$20.00	21
885-1213	CP/M Disk Utilities	\$20.00	22
885-1214	Amateur Radio Logbook	\$30.00	23
885-1215	BASIC-E	\$20.00	26
885-1217	HUG Disk Duplication Utilities	\$20.00	26

% Means CP/M 1.43 only (ORG-4200)
%% Means CP/M 1.43 or 2.2 (Heath)
Other CP/M disks are for 2.2

MISCELLANEOUS

885-0017	H8 Poster	\$ 2.95	
885-0018	H89 Poster	\$ 2.95	
885-0019	Color Graphics Poster	\$ 2.95	
885-4	HUG Binder	\$ 5.75	
885-4001	REMark VOLUME I	\$20.00	23
885-4002	REMark VOLUME II	\$20.00	

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Dear HUG,

Pat Swayne, in his article "Add LPRINT, PEEK, POKE, USR and INPUT\$ to BASIC-E" (April, 1982), began his discussion with an MBASIC example. In that example, he suggested using PRINT commands for all output, and changing the CP/M IOBYTE to direct the output to the console or the printer. He points out, and rightly so, that you must be sure to reset the IOBYTE or else you will look out the console.

If you are using CP/M with MBASIC, there is a cleaner way to accomplish the same thing, and you NEVER lose the console. That is because MBASIC already has the LPRINT command. The technique is to write all output that is always intended for the console with a PRINT command, and write all other output with the LPRINT command. (This is the normal way you would write an MBASIC program.) Then, you can toggle the IOBYTE to direct the printer (LST:) output to the console. To do this, you need to toggle the two most significant bits of the IOBYTE.

I have attached a short program listing which shows this. The listing follows the format of Pat's example. This method provides the MBASIC programmer with the ability to let the user decide where his output is to go, and never risks the loss of the console.

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Patch Pages

DUP17 Patch

The DUP17 program on HUG disk 885-1217 has an error that crept in somehow during last minute changes before it was released. The error prevents it from copying double sided and/or 80 track disks correctly. To correct the error, place DUP17.COM on a system disk containing DDT.COM, and enter the following (what you type is shown in bold print).

A>**DDT DUP17.COM**

```
DDT VERS 2.2
NEXT PC
0C00 0100
-L28D
  028D CALL 0505
  0290 STA 0B5E
  0293 ANI 09
  0295 MVI B,28
  0297 ORA A
  0298 JZ 02A9
  029B MVI B,50
  029D CPI 01
  029F JZ 02A9
  02A2 CPI 08
  02A4 JZ 02A9
```

If the L command does not display what is shown here, then you have a corrected version of DUP17, and you should type Control-C at this point to return to CP/M. Otherwise, make the patch as shown here.

-A290

```
0290 CALL C08
0293 .
```

-AC08

```
0C08 LXI D,10
0C0B DAD D
0C0C MOV A,M
0C0D STA B5E
0C10 RET
0C11 .
```

-GO (Type the letter G and a zero)

A>**SAVE 12 DUP17.COM**

A>

DUP17 is now patched and will work correctly. If you want to patch it in the source code and re-assemble it, load DUP17.ASM into your editor and find the label CPM. Add the lines shown in bold print below.

```
CPM      STA      VOLNUM      ;STORE AS
        LDA      SOURCE      ;GET SOURC
        MOV      C,A
        CALL    SELDSK      ;UPDATE TY
        LXI      D,16
        DAD      D
        MOV      A,M
        STA      STYPE      ;SAVE SOUR
```

Re-assemble DUP17 with these changes and you will have a correctly working version.

FORTH Patch

The SAVE command in the HUG version of Fig-FORTH will not work under CP/M version 2.2.03. To correct this problem, load FORTH.ASM into your editor, find the label SAVE, and add the lines shown in bold print.

```
SAVE     DW      $+2
        POP      H
        MOV      A,L
        INR      A
        CPI      0
        JC       NEXT
        CPI      4
        JNC      NEXT
        STA      FNAME
        PUSH     B
        MVI      C,16
        LXI      D,FNAME
        LXI      H,FCB
        XRA      A
        STA      FCB+32
MNAME    LDAX    D
```

Re-assemble FORTH.ASM and LOAD the resulting .HEX file to get a new FORTH.COM. The SAVE command will now work properly. Note: Your copy of FORTH may have this change already made.

HTERM Patch

The following patches are improvements to the HTERM program on HUG disk 885-1089. The first patch (at 50003) corrects the spelling of "Operiation" to "Operation". The second patch (at 50052) allows HTERM to store control characters in incoming data in its buffer. These patches should be made using the PATCH program supplied with HDOS, as shown below (what you type is in bold print).

>**PATCH**

PATCH Issue #50.06.00

File Name? **HTERM**

```
Address? 50003
050003 = 151/000
050004 = 141/^D      (you type Control-D)
Address? 50052
050052 = 376/000
050053 = 040/000
050054 = 330/000
050055 = 167/^D
Address? ^D
```

PATCH Issue #50.06.00

File Name? ^D
>

Make sure the old data (the numbers before the slashes) are as shown before you make the patch. The patch is not actually made until you type Control-D at the Address prompt, and you can type Control-C instead to abort the patch. The above example assumes that both PATCH.ABS and HTERM.ABS are on SY0:. If you use HTERM4 instead of HTERM, you should make the patch to it as well.

DEBUG Patch

This patch corrects a problem in the HDOS DEBUG program which causes the command completion feature to stop working after you use the STEP command. Two versions of the patch are presented. The first is for the HDOS 1.6 version of DEBUG, and the second is for the HDOS 2.0 version. Make the patches using PATCH, and, as usual, make sure you are patching the correct area by examining the old data.

DEBUG patch for HDOS 1.6

>PATCH

PATCH Issue #50.05.00

File Name? DEBUG
Patch ID? IFOJIC
Prerequisite Code? IFBEIADPGEFFCF

Address? 47022
047022 = 315/316
047023 = 052/^D (Control-D)
Address? 52315
052315 = 072/311
052316 = 114/72
052317 = 057/114
052320 = 062/57
052321 = 362/62
052322 = 040/362
052323 = 072/40
052324 = 115/72
052325 = 057/115
052326 = 062/57
052327 = 332/62
052330 = 040/332
052331 = 311/40
052332 = 311/^D
Address? ^D
Patch Check Code? IHNDAOKA

PATCH Issue #50.05.00

File Name? ^D
>

DEBUG patch for HDOS 2.0

>PATCH

PATCH Issue #50.06.00

File Name? DEBUG
Patch ID? IFOJIC
Prerequisite Code? IFBEIADPGEFFCF

Address? 47015
047015 = 310/311
047016 = 052/^D
Address? 52310
052310 = 072/311
052311 = 107/72
052312 = 057/107
052313 = 062/57
052314 = 326/62
052315 = 040/326
052316 = 072/40
052317 = 110/72
052320 = 057/110
052321 = 062/57
052322 = 332/62
052323 = 040/332
052324 = 311/40
052325 = 311/^D
Address? ^D
Patch Check Code? GLMDOGMP

PATCH Issue #50.06.00

File Name? ^D
>

EDIT Patch

This patch corrects a problem with Control-C processing in the HDOS editor, EDIT.ABS, and was first presented in REMark issue #28, page 27. We are presenting the patch again here in PATCH format for those who do not have one of the DUMP utilities mentioned in that issue.

>PATCH

PATCH Issue #50.06.00

File Name? EDIT
Patch ID? IFOJIC
Prerequisite Code? IFBEIADPGEFFCF

Address? 53060
053060 = 374/1
053061 = 042/43
053062 = 361/^D
Address? ^D
Patch Check Code? DLHFAPHN

PATCH Issue #50.06.00

File Name? ^D
>

This patch is valid for both HDOS 1.6 and HDOS 2.0.

HDOS 1.6 PIP Patch

The following patch is the HDOS 1.6 version of the PIP patch we presented in REMark issue #27, which causes PIP to list

files while they are copied (CP/M-style). Please note that this patch is for HDOS 1.6 only! If you want to make the patch in HDOS 2.0, see "PIP Patch" in REMark #27, on the ad page opposite page 17.

>PATCH

PATCH Issue #50.05.00

File Name? PIP
Patch ID? IFOJIC
Prerequisite Code? IFBEIADPGEFFCF

Address? 56223
056223 = 052/315
056224 = 326/61
056225 = 063/63
056226 = 021/^D
Address? 63061
063061 = 107/52
063062 = 114/243
063063 = 051/56
063064 = 051/43
063065 = 012/43
063066 = 012/43
063067 = 004/43

063070 = 012/176
063071 = 012/377
063072 = 103/2
063073 = 157/43
063074 = 160/247
063075 = 171/302
063076 = 162/70
063077 = 151/63
063100 = 147/76
063101 = 150/12
063102 = 164/377
063103 = 040/2
063104 = 050/52
063105 = 103/326
063106 = 051/63
063107 = 040/311
063110 = 110/^D
Address? ^D
Patch Check Code? MNABLAEK

PATCH Issue #50.05.00

File Name? ^D
>

PS:

The MX-80 Revisited

In past issues of REMark we have had little bits and pieces about the MX-80 printer. In this article, I will attempt to put in one place some of the information we have on the MX-80, which, although it is far from complete, should help users with problems they have been having.

HDOS and the MX-80

A device driver is available for the MX-80 (for HDOS users) from HUG (885-1105), and it is also available through Heathkit Stores on an "HDOS Upgrade" disk. Judging from calls that have been made to HUG, the documentation (if any) that comes with the Heathkit Store version is inadequate, and many people have had trouble setting up their printers. Usually, the problem seems to be with the switch settings in the printer. Here are the correct switch settings for the printer itself. The switches are located on the main board near where the serial interface card plugs in.

Switch No.	Setting
1-8	ON
1-7	OFF
1-6	ON
1-5	ON
1-4	OFF
1-3	OFF
1-2	ON
1-1	ON
2-4	OFF
2-3	OFF
2-2	ON
2-1	ON

The following switch settings are for the 8141 serial interface card, which is sold by Heath as catalog no. MX-80-2.

Switch No.	Setting
1-1	ON
1-2	OFF
1-3	ON
1-4	OFF
1-5	ON
1-6	OFF
1-7	OFF
1-8	EITHER

Any jumpers on the serial interface board should be left in their factory installed positions. A suitable cable to connect your MX-80 (with serial interface) to your computer is available from Heath as catalog no. HCA-10.

CP/M and the MX-80

To use the MX-80 under Heath/Zenith CP/M, you must have version 2.2.03. Run CONFIG-UR and answer N to "Standard System?", then select option A. When the menu for option A comes up, set the Printer Ready Signal Polarity (option M) to HIGH, and the Printer Ready Signal (option N) to DTR, pin 20. The switches in the printer should be set as shown for HDOS.

The GRAFTRAX Graphics Option

The device driver distributed by Heathkit stores must be modified to work with the GRAFTRAX option. Install the following patch using PATCH.ABS supplied with HDOS.

>PATCH

PATCH ISSUE #50.06.00

File Name? LPMX80.DVD
Patch ID? IFOJIC
Prerequisite Code? IFBEIADPGEFFCF

Address? 3314
003314 = 346/76
003315 = 357/3
003316 = 315/^D (Control-D)
Address? 4145
004145 = 350/0
004146 = 360/377
004147 = 370/^D (Control-D)
Address? ^D
Patch Check Code? KANPNMII

PATCH Issue #50.06.00

File Name? ^D
>

The second part of this patch is already present in the HUG version. You only need to install the first part, which follows (you do not need Patch Check Codes with the HUG version).

Address? 3314
003314 = 346/76
003315 = 357/3
003316 = 315/^D

To use the GRAFTRAX option, you need a special serial interface card (unless you use a parallel interface) that has a 2k memory buffer in it. Neither this interface nor the GRAFTRAX option are available from Heath, and we at HUG do not have access to either at this time, so we cannot test the above patch. We would appreciate information from members who have successfully interfaced the MX-80 with the GRAFTRAX option (or the MX-100) to their Heath computers.

H-8-2 Parallel Interfacing

The following information is from an article in the Jeri-HUG Newsletter (20 Jericho St., East Islip, NY 11730) by Ed McGovern.

The Epson MX-80 can be interfaced to the H8 computer using the H-8-2 parallel interface board. Using a parallel interface eliminates the need to add a serial interface to the MX-80, and it allows use of the GRAFTRAX option.

The MX-80 can be connected to the H-8-2 using a 12 conductor shielded cable connected to a Centronics connector at one end and a Heath connector at the other end. The Heath connector is made up using a 25-hole connector socket (part no. 432-948) and 12 spring connectors (part no. 432-866). The pin connections are shown below.

Table with 3 columns: H-8-2 Pin, Epson Pin, Use. It lists pin connections from 1 to 11 and their corresponding functions like Data Bit 0-7, Ground, and Data Taken.

The 12th wire in the cable is not used. If you elect to use a flat cable instead of a round shielded cable, it is recommended that you use a 20-wire cable, with every other wire connected to ground.

A suitable device driver for this configuration is available from Hulland Engineering, 555 Broadhollow Road, Melville, NY 11747, for \$24.95. Be sure to specify that you want a driver for the H-8-2. Hulland Engineering also offers a serial driver for the MX-80 and 100. Since the H-8-2 is similar to the H-8-5 from a software standpoint, you may want to experiment with the ATH85.DVD driver supplied with HDOS.

The following jumpers should be connected on the H-8-2 board: B1-B2, C1-C2, E1-E2. The following jumpers should be open: A1-A2, F1-F2, G1-G2, H1-H2, and all interrupt jumpers. On the MX-80, set the switches as follows.

Table with 2 columns: Switch No., Setting. Lists switches 1-1 through 4 and their settings (OFF, ON, OFF*, ALL OFF) and a note: * Switch 1-7 ON for slashed zero.

Ed McGovern did not provide any information on using the parallel interface under CP/M. Since the CRT: physical device is the only device in CP/M that supports the H-8-5 card (and hence, the H-8-2 card), you would have to assign the console to TTY: and the printer to CRT:, and set bit 0 of the MODE byte to 1 before printing. I have not tried any of this, and I welcome any input from HUGgies who have.

PS:

EDITOR'S NOTE:

Members have inquired whether or not it is possible to renew for more than one year at a time. ANSWER-YES, you may!

Heath Related Products

MICROFLASH COMPANY has an I/O Expansion available for H89/Z89 computers now, and has a nine slot mother board which is H89 I/O Bus compatible. More than compatible, the M89 Bus is wider (25 pins plus an additional 25 pins). The lower socket matches P504, P510 signals on H89 CPU board to allow extra control signals for the user.

The M89 Expansion has a heavy duty power supply (5V/5A, 12V/1.5A, -12V/1.5A), 3 inch cooling fan, AC line filter and replaceable front panel. There are 20 RS-232 mounting positions and 8 wider cuts for ribbon cables on the side panels. There are also two remote outlets and two 12 pin Molex connectors on the back panel for power control purposes. A 4 foot ribbon cable and a 5 inch by 5 inch interface board interconnect the M89 Expansion with the H89/Z89, the Data Bus, Address Bus (A0,A1,A2) and control signals are fully buffered to allow maximum suppression from the surrounding.

The M89 Expansion is available for \$395.00 in kit and \$495.00 assembled and tested from Microflash Company 4916B Carol Skokie, IL 60077 (312) 677-4928.

QUIKDATA is building a massive data base of names of persons who have a general, but sincere interest in the Heath/Zenith line of micro computers. We will be sending quarterly advertising packets from vendors to all names on the data base, automatically, and free of charge. Why? Because this is a cost effective way for vendors of non Heath software and hardware (but fully compatible and lower cost) to reach interested users for a prospective market. The vendors will reach more individuals, and at a lower cost, and the individual users are more likely to purchase from them. Therefore, the vendors will pay all costs for this service, not you, the user.

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H8 or H89. To get your name on the data base, write or call:

Quikdata Inc., Dept A.
2918 S. 7th Street
Sheboygan, WI 53081
(414) 452-4172

Local Hug News

Every so often we receive inquiries about whether or not there is an ET 3400 users' group. To our dismay we left this special group off the list of local HUG groups that appeared in Issue 25 of REMark. The name of the group is ETUG (ET/ETA 3400 Users' Group) c/o Charles Van Dyke 11231 Oak Street El Monte, CA 91731. Mr. Van Dyke reports that there are over 100 members throughout the world, and to his knowledge they are the only group of this kind. Communication is by mail and a Newsletter that is published four times a year. For full information, contact Charles Van Dyke by mail.

The Philadelphia HUG has formed and meets the second Wednesday of each month at 7:00 p.m. at the Heathkit Center at 6318 Roosevelt Blvd Philadelphia, PA 19149. They have a membership of approximately 135. For more information, call (215) 288-0180 or write.

Herb Friedman reports from Pomona, California of a new HUG forming there. The meetings are held the fourth Thursday of each month at 7:30 p.m. at the Heathkit Center at 1555 N. Orange Grove Ave. Pomona, CA 91767. For additional information, call (714) 985-5303 or write.

Another users' group has recently formed in Downers Grove, Illinois named HUG Metro. They meet at the Heathkit Center in Downers Grove every second Monday of the month at 7:30 p.m.. Mailing address is c/o Bob Naegele 15 W. 780 Fillmore Elmhurst, IL 60126. Larry Shipinski is contact person and can be reached at (312) 985-2381 evenings.

James Isenhardt is interested in starting another HUG in the Rockford, Illinois area. Anyone who would like to help him form this group may contact Jim at 427 Lockwood RT#1, Davis IL 61019.

EOF

Pascal Corner—Part V

by Henry E. Fale
QUIKDATA COMPUTER SERVICES, INC.
2918 S. 7th. St.
Sheboygan, WI 53081
(414) 452-4172

Welcome to part five of the Pascal Corner. The Lucidata Pascal I have been using for this column has recently been updated to version 3.8. This version has more features and more power. One really powerful feature is the run-time can be set to generate a p-code file bound with the essential portions of the run-time system for royalty free distribution of Pascal programs to non-system owners. If you have this Pascal, you can rig it so a P-code compiler is not required at run time. Of course this will make the file larger, but it then can be run by anyone without the Lucidata Pascal run time package. It is also now available in CP/M. Eight characters are now recognized rather than 6 for identifiers. Added are many TRIG functions. CASE allows multiple labels and OTHERWISE (we'll learn about CASE in this lesson). Relations have been extended to RECORD and ARRAY types. There are many more features. Registered owners of version 2.8 can get an update for \$60. New purchasers the price is \$145. For more info on any of this, contact Polybytes/ 325 19th St. S.E./ Cedar Rapids, IA 52403/ (319) 366-3077.

We have thus far covered many of the keywords of Pascal, with more to be covered. In this section I want to cover a few more which are very useful and expand the capabilities of Pascal. Among these are FUNCTION and CASE.

The FUNCTION

We have already covered the PROCEDURE, which will help. A FUNCTION is structured similar to a PROCEDURE. Remember the PROCEDURE can have it's own local CONSTANT and VARIABLE declarations. It can be thought of as a program module, or a mini program. The FUNCTION can also have CONST and VAR declarations and a BEGIN and END. The PROCEDURE can stand by itself as a statement while a FUNCTION can not. A FUNCTION can be used almost in any place a VARIABLE or CONSTANT can, and cannot stand by itself as a statement. To keep the two clear, think of a PROCEDURE as a replacement for a statement, and think of a FUNCTION as a replacement for an expression. Since FUNCTIONS are not used all that much, and I have never worked with them, I will not go into any more detail here. If you want to learn about them, consult your Pascal handbooks.

The CASE Statement

The CASE statement can be very useful. IF-THEN-ELSE statements can be used to make selections, or multiple choices. An easier method is using the CASE statement. This is especially useful for making menu selections, where you want to select one option out of several.

CASE can be compared to the BASIC statement ON X GOTO N1,N2,N3. It is used when you wish to execute one statement out of a list of several or many.

The general form of the CASE statement is:

```
CASE N OF
  1 : STATEMENT;
  2 : STATEMENT;
  3 : STATEMENT
END;
```

Note two important points. The last statement in the CASE before the END does not have a semicolon, all the others do. Also note this is one of the very few cases in Pascal where you will see an END statement without a BEGIN statement.

In this example, N is called the case-index. It must have been previously evaluated, and declared in variable or constants, and must match one of the case-constants (labeled 1, 2, 3 in this example). The Case-index can be a variable of CHAR, INTEGER, or BOOLEAN, or it can be an expression which evaluates to a variable (STRING or REAL variables are not permitted for the case-index). The numbers 1, 2 and 3 in this example are called case-constants as said earlier, and cannot appear more than once.

Having more than one on a line is permitted if separated by a comma. For example, assume ANSWER was declared as a VARIABLE CHARACTER. Also assume through a READ() statement the value is already known. This is a legal CASE statement.

```
CASE ANSWER OF
  'A' , 'B' : Writeln('YOU HAVE ENTERED A LETTER, EITHER A OR B');
  '1' , '2' : Writeln('YOU HAVE ENTERED A NUMBER, 1 OR 2');
  '3'       : Writeln('YOU HAVE ENTERED A NUMBER, 3')
END;
```

Take note that since CHARACTER was used as the VARIABLE, they are enclosed in single quote marks to show they are CHARACTER. Also note that if C, D, 4, or any other character was entered besides those listed as case-constants, a run time error would have resulted. When using this, it is a good idea to write some sort of module of code to trap any invalid answers. The OTHERWISE statement that goes with CASE could also take care of that. Refer to your manual if you have that statement. Here's another way of doing it using INTEGER values for the variable.

```
PROCEDURE WHATEVER;
  BEGIN
    REPEAT
      Writeln('ENTER INTEGER ');
      Readln(N);
      CASE N OF
        1, 2 : Writeln('NUMBER WAS ONE OR TWO');
        3    : Writeln('NUMBER WAS THREE');
        4, 5 : Writeln('NUMBER WAS FIVE');
        6    : ClearScreen;
        0    : Writeln('THE END')
      END; (* CASE N *)
    UNTIL N = 0
  END;
```

In this example, a procedure is reading in a INTEGER VARIABLE. If 1, or 2 are selected, NUMBER WAS ONE OR TWO is printed on the console, etc. A space is usually required if multiple case-constants are used and separated by a comma. Notice here that if 6 was entered, a PROCEDURE would be executed (think of a GOSUB or GOTO in BASIC) instead of just a print. Also notice that if 0 is entered, THE END is printed and the REPEAT...UNTIL loop is exited since now N is 0. Else you will continue in this input loop. This can be very useful. You'll see a good example of CASE next time.

The DO ... WHILE Statement

Another useful statement is the WHILE ... DO statement. This is in ways similar to the FOR ... DO which was explained in an earlier installment. The major difference is this. In the FOR statement the values used (control, initial and final) CANNOT be changed by the statement section. In the WHILE statement, the value or values MUST be changed in order to ever exit the loop. For instance,

```
WHILE BYE = 1 DO MENU;
```

will continue to execute the MENU procedure UNTIL the value of the variable BYE is changed to a number other than 1. Somewhere in MENU, perhaps in the exit program option the value will be changed, and MENU will not be executed again. Similarly,

```
WHILE BYE DO MENU;
```

is also legal. Assume BYE is a BOOLEAN VARIABLE and has been assigned to TRUE. The loop will continue till it is changed to FALSE, again, perhaps in the MENU section. You'll see more of this also, next time. The statement can also be compound such as

```
WHILE N <> 0 DO
  BEGIN
    N := N -1;
    Writeln(N);
  END;
```

Assume we entered this loop with N assigned to integer 10. The WHILE body will be repeated 10 times, and N will evaluate to 0. This will cause control to leave the loop. The versatility of format can be seen here as well as the CASE and most other

Pascal keywords. It can be simple, or complex with a BEGIN and END statement. Another similar keyword we covered was the REPEAT ... UNTIL. One point I wish to bring out, is the REPEAT-UNTIL statement repeats something UNTIL the condition is TRUE. The WHILE-DO repeats something WHILE the condition is true.

My past columns have been lengthy, so I will cut this short. Next month I will present a super program which covers all this and the previous stuff we learned plus much more. It will be a cute program which will teach you much about how Pascal can access your system memory, graphics, and perhaps disk I/O.

For those interested, a fellow HUGGIE, Rod Madsen, got some sneak disk I/O info from me and wrote a Pascal program under Lucidata Pascal to do statistical forecasting. I'm not going to print it here (maybe later), but anyone interested may want to contact Rod. His address is 9502 Mary Circle/ Villa Park, CA 92667.

I am including two Pascal programs submitted by others. The first is PRINT.PAS which was submitted by D. C. Shoemaker. This program was written in Tiny Pascal for the H8/H89 computers. It sets the H14 line printer parameters without having to use the HDOS SET command. Since everything in this program was covered in this corner previously, I will not take the space to explain the program. Both programs were entered without editing to format as they were sent in, since I am not familiar with either of the Pascal's.

```
{ PROGRAM PRINT.PAS }
{ Written in Tiny Pascal for the H8/H89 computers }
{ by D. C. Shoemaker }

VAR
    WIDTH,          { Number of characters/line }
    SPACE : INTEGER; { Number of lines/inch }

BEGIN
    { Main Program }

    WRITE (27,69);      { Erase H19/H89 screen }
    WRITE ('This program sets the H14 line printer parameters without');
    WRITE (10,'the necessity of using the HDOS SET command. ');
    WRITE (10,'If no on already, turn the H14 on now. ');
    WRITE (10,'Enter the desired width (80, 96, or 132): ');
    READ (WIDTH#);
    WRITE (10,'Next, enter the number of lines per inch (6 or 8): ');
    READ (SPACE#);
    IF WIDTH = 80 THEN PRINT (27,'u',1);
    IF WIDTH = 96 THEN PRINT (27,'u',20);
    IF WIDTH = 132 THEN PRINT (27,'u(');
    IF SPACE = 6 THEN PRINT (27,'x');
    IF SPACE = 8 THEN PRINT (27,'y');
    PRINT (26);          { Empty the print buffer }
    WRITE (10,'The H14 is now set to print at ',WIDTH#,' characters per line');
    WRITE (10,'and ',SPACE#,' lines per inch. ');
    WRITE (10,'The printer will remain so until reset. ');

END.    { MAIN PROGRAM }
```

Following is another program, submitted by Terry Smedley and written in UCSD Pascal. It's good to see these two side by side, as it shows there's more than one way to accomplish something. Terry uses a different approach than D. C. did, and a different version of Pascal. Again, there is nothing new here so no explanations will be given. Any differences you may detect to that already covered here, is because of differences in the Pascal's.

```
(* PROGRAM SETLP is a UCSD Pascal program written by Terry Smedley to set the *)
(* H14 printer characteristics *)
```

```

PROGRAM SETLP(INPUT,OUTPUT);
VAR      B,C      :CHAR;
        PRTR      :TEXT;

PROCEDURE CLRSCRN; (* THIS PROCEDURE WILL ERASE THE H19/H89 SCREEN *)
BEGIN
  WRITE(CHR(27),'E');
END;

BEGIN (* MAIN PROGRAM STARTS HERE *)
  REWRITE(PRTR,'PRINTER:');
  REPEAT (*UNTIL 'QUIT' IS SPECIFIED *)
    REPEAT (*UNTIL VALID COMMAND IS ENTERED *)
      CLRSCRN;
      WRITELN('H14 Printer Options: W)idth, L)ines, Q)uit ');
      WRITE('Select One - ');
      READ(B);
    UNTIL B IN ['W','L','Q'];
  WRITELN
  CASE B OF
    'W':^ BEGIN
      REPEAT (*Until Valid Option is Entered *)
        CLRSCRN;
        WRITELN('Width Options:');
        WRITELN('  A: 80,96 characters');
        WRITELN('  B: 80,132 characters');
        WRITELN('  C: 96,132 characters');
        WRITE('Select One (A,B,C)--');
        READ(B);
      UNTIL B IN ['A','B','C'];

      CASE B OF
        'A': C := CHR(4);
        'B': C := CHR(8);
        'C': C := CHR(24);
      END; (* OF CASE B *)

      WRITE(PRTR,CHR(27),CHR(117),C);
    END; (* OF BEGIN FOR 'W' *)

    'L': BEGIN
      REPEAT (* UNTIL VALID COMMAND IS ENTERED *)
        CLRSCRN;
        WRITELN('Line Spacing Options:');
        WRITELN('  A: 8 Lines per inch');
        WRITELN('  B: 6 Lines per inch');
        WRITE('Select One (A,B) -');
        READ(B);
      UNTIL B IN ['A','B'];

      CASE B OF
        'A': C :=CHR(121);
        'B': C :=CHR(120);
      END; (* OF CASE B *)

      WRITE(PRTR,CHR(27),C);
    END; (* OF BEGIN L *)

  END; (* OF CASE B *)

  UNTIL B = 'Q';
  CLRSCRN;
  CLOSE(PRTR);
END. (* OF MAIN PROGRAM BODY *)

EOF

```

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Special Device Handler for Printers and Typewriters

John F. Draffen
810 10th Avenue North
Texas City, TX 77590

For some time I have been using an IBM 731 Selectric typewriter with my Heath H11A computer. Finally after getting fed up with the slow speed of the typewriter, I bought an Okidata 82A printer. Getting the printer to run wasn't much of a problem. I ran the printer from a parallel port, and put a 0.1 mfd capacitor in series with the TD L line to simulate the strobe signal needed by the printer. However, getting the software right is more of a problem, and I thought you might like to have the device handler that I wrote to service both the typewriter and the printer.

Some comments about the program following are in order. The Okidata printer returns to the left margin after both a line feed and a form feed command. If the device handler is used with a printer that does not do this, the margin spacing feature will not work properly. This would be easy enough to fix, just don't reset the column counter after these commands. If you revise the program, be sure to make SIZE come out at 412 (octal), or you will have to patch the monitor. The addresses of the HT11 monitor tables for device handlers are as follows:

Base	17000	(for PATCH)
\$HSIZE	13620	
\$DVSIZ	13640	
\$PNAME	16434	(8 entries)
\$STAT	16454	
LOMAP	16326	

```
.TITLE LP.SYS
;SPECIAL DEVICE HANDLER FOR PRINTERS AND TYPEWRITERS
;INTERRUPT VERSION

;OPERATING SYSTEM: HT-11

;WRITTEN BY                JOHN F. DRAFFEN
;                          810 10TH AVENUE NORTH
;                          TEXAS CITY, TEXAS  77590
;APRIL 6, 1982

;THE FOLLOWING SET OPTIONS ARE SUPPORTED:
;
;  TAB,NOTAB                PRINTS HT CHARACTER OR SUBSTITUTES SPACES
;  PAGE,NOPAGE             PAUSES ON FF CHARACTER OR PRINTS FF
;  CR/LF,NOCR/LF          OUTPUTS CR/LF PAIRS OR IGNORES LF AFTER CR
;  MARGIN=N                INTRODUCES N SPACES AT THE LEFT MARGIN

;OTHERWISE THIS VERSION PRINTS ALL CONTROL CHARACTERS

.MCALL .REGDEF
.REGDEF

BS=10                      ;BACKSPACE
HT=11                      ;HORIZONTAL TAB
LF=12                      ;LINE FEED
FF=14                      ;FORM FEED
CR=15                      ;RETURN
BLANK=40                   ;SPACE
RMON=54                    ;POINTER TO RESIDENT MONITOR
OFFSET=270                 ;OFFSET FOR I/O COMPLETION MANAGER
VECTOR=204                 ;ADDRESS OF INTERRUPT VECTOR
PR7=340                    ;PSW FOR PRIORITY 7
```



```

PR4=200 ;PSW FOR PRIORITY 4
XCSR=177514 ;TYPEWRITER STATUS REGISTER
XBUF=177516 ;TYPEWRITER BUFFER REGISTER
ICSR=177560 ;TERMINAL INPUT STATUS REGISTER

.ASECT
.=400 ;INITIALIZE FOR SET PARAMETER TABLE
;AND THE MODIFICATION SUBROUTINES

NOP
.RAD50 /TAB /
.WORD <O.TAB-400>/2+100000 ;TAB & NOTAB
NOP
.RAD50 /PAGE /
.WORD <O.PAGE-400>/2+100000 ;PAGE & NOPAGE
NOP
.RAD50 /CRLF /
.WORD <O.CRLF-400>/2=100000 ;CRLF & NOCRLF
NOP
.RAD50 /MARGIN/
.WORD <O.MAR-400>/2+40000 ;MARGIN
.WORD 0 ;TABLE TERMINATOR
O.TAB: JMP 1$
CLRB TFLAG ;CLEAR TAB FLAG
BR 2$
1$: MOVB #1,TFLAG ;SET TAB FLAG
2$: RTS PC
O.PAGE: JMP 1$
CLRB PFLAG ;CLEAR PAGE FLAG
BR 2$
1$: MOVB #1,PFLAG ;SET PAGE FLAG
2$: RTS PC
O.CRLF: JMP 1$
CLRB LFLAG ;CLEAR LF FLAG
BR 2$
1$: MOVB #1,LFLAG ;SET LF FLAG
2$: RTS PC
O.MAR: MOV R0,MARSIZ ;SET MARGIN WIDTH
RTS PC

.=1000 ;INITIALIZE FOR HANDLER

HEADER: .WORD VECTOR
.WORD INT- ;OFFSET TO INTERRUPT HANDLER
.WORD PR7
.WORD 0 ;POINTER TO LAST QUEUE ELEMENT
CQE: .WORD 0 ;POINTER TO CURRENT QUEUE ELEMENT
ENTRY: MOV CQE,R4 ;POINT TO WORD COUNT
ASL 6(R4) ;CONVERT WORDS TO BYTES
BCC ERROR ;TEST TO ATTEMPT TO READ
BIS #100,@#XCSR ;ENABLE INTERRUPT
RTS PC
BR EXIT
INT: JSR R5,@INPTR ;NOTIFY MONITOR AND
.WORD ^C<PR4>&PR7 ;SET PRIORITY TO LEVEL 4
CMP COLCNT,MARSIZ ;IF MARGIN SPACING IS IN PROGRESS
BGE 1$
MOV #BLANK,R5 ;PRINT SPACE FOR MARGIN
BR 8$
1$: BIT TABCNT,#7 ;IF TAB IS IN PROGRESS,
BNE 4$ ; GO TO TAB ROUTINE
MOV CQE,R4
ADD #6,R4
TST (R4) ;TEST FOR TRANSFER COMPLETE
BEQ EXIT
INC (R4) ;COUNT CHARACTERS
MOVB @-(R4),R5 ;GET NEXT CHARACTER
BIC #177600,R5 ;DELETE EXTRANEIOUS BITS
MOVB CHAR,CHAR1 ;UPDATE CHARACTER SHIFT REGISTER
MOVB R5,CHAR
INC (R4) ;ADVANCE BUFFER POINTER
CMP R5,#BLANK ;IF CHARACTER IS DISPLAYABLE

```

```

BGE      8$
CMP      R5,#FF
BNE      3$
TSTB    PFLAG
BEQ      7$
2$:      BIT      #200,@#ICSR
BEQ      2$
BR       1$
3$:      CMP      R5,#HT
BNE      5$
TSTB    TFLAG
BNE      9$
4$:      MOV      #BLANK,R5
INC      COLCNT
MOV      COLCNT,TABCNT
SUB      MARSIZ,TABCNT
BR       9$
5$:      CMP      R5,#CR
BEQ      7$
CMP      R5,#BS
BNE      6$
DEC      COLCNT
BPL      9$
6$:      CMP      R5,#LF
BNE      9$
TSTB    LFLAG
BNE      7$
CMPB    CHAR1,#CR
BEQ      1$
7$:      CLR      COLCNT
BR       9$
8$:      INC      COLCNT
9$:      MOV      R5,@#XBUF
RTS      PC
ERROR:   BIS      #1,@-(R4)
EXIT:    CLR      @#XCSR
MOV      PC,R4
ADD      #CQE-. ,R4
MOV      @#RMON,R5
JMP      @OFFSET(R5)

CHAR:    .BYTE    0
CHAR1:   .BYTE    0
LFLAG:   .BYTE    0
PFLAG:   .BYTE    0
TFLAG:   .BYTE    0
         .EVEN
COLCNT:  .WORD    0
MARSIZ:  .WORD    0
TABCNT:  .WORD    0
         .=-.+30

INPTR:   .BLKW    1
         SIZE=-.HEADER

         .END

```

```

; PRINT CHARACTER
;ELSE IF CHARACTER IS A FORM FEED

;IF PFLAG IS CLEAR, RESET COLUMN
;COUNT AND PRINT CHARACTER
;ELSE PAUSE ON FORM FEED

;BUT DON'T PRINT IT
;ELSE IF CHARACTER IS A TAB

;IF TFLAG IS SET
;PRINT THE TAB
;ELSE PRINT SPACES FOR TAB

;ELSE IF THE CHARACTER IS A RETURN
;RESET COLUMN COUNT AND PRINT CHAR.
;ELSE IF THE CHARACTER IS A BACKSPACE

;ADJUST COLUMN COUNT
;AND PRINT THE CHARACTER
;ELSE IF THE CHARACTER IS A LINE FEED

;IF LFLAG IS NOT SET, AND THE
;LAST CHARACTER WAS A RETURN
;IGNORE THE LINE FEED
;ELSE RESET COLUMN COUNT AND
;PRINT CHARACTER.

;ELSE INITIATE TYPING

;SIGNAL HARD ERROR
;DISABLE INTERRUPT

;POINT TO ADDRESS OF CQE

;JUMP TO MONITOR

;NEW CHARACTER
;LAST CHARACTER
;LINE FEED FLAG
;PAGE FLAG
;TAB ENABLE FLAG

;LINE POSITION COUNT
;MARGIN WIDTH
;LINE POSITION COUNT FOR TAB
;ADJUST HANDLER SIZE TO AVOID
;HAVING TO PATCH MONITOR
;POINTER TO MONITOR INTERRUPT CODE
;CALCULATE HANDLER SIZE

```

vectored from 26

```

10 LPRINT "THIS LINE GOES TO THE PRINTER"
20 REM --- SWITCH LST: OUTPUT TO CONSOLE
30 POKE 3, PEEK(3) AND 63 OR 64
40 LPRINT "THIS LINE GOES TO THE CONSOLE"
50 REM --- SWITCH LST: BACK TO THE PRINTER
60 POKE 3, PEEK(3) AND 63 OR 128
70 LPRINT "BACK TO THE PRINTER AGAIN"

```

Incidentally, CP/M users of MBASIC might also want to read the April 1982 issue of "Lifelines". Bob Kowitt has an article in that issue describing another way to attack the same problem.

William R. Brandoni
37926 Wright Street
Willoughby, OH 44094

COLOR GRAPHICS SOUND EFFECTS

VOICE SYNTHESIS
ALL ON ONE BOARD
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