THE ADDRESS BUS

PORT TO PORTAL -- Editorial

Putting this issue together for you has been more than a pleasure. Two items account for that. The first of these is the appearance in **Staunch** of **reprints** from **REMark** magazine. Last summer, HUG gave me permission to reproduce HDOS-oriented articles. Between then and the end of the year, I surveyed **REMark** back issues and obtained permission from the authors of many articles I targetted for use. I expect these articles to be scattered over the next several years; I have a substantial backlog of **new** material to publish, too. So I express my thanks to HUG and **REMark**'s managing editor, Jim Buszkiewicz, for their unexpected support. For the first such article, by HUG's inimitable Pat Swayne, I'm going back to one of the first **REMark**s I received. It appears later in this issue.

Speaking of HUG, by extension Heath Co., and "goaded" by Micronics Technology's Darrell Pelan, I've urged Heath to release its proprietary code for CP/M-80 so that Darrell is able prepare a public domain version for our systems. You can read the details in this issue's "MISCELLANY" section.

Further, some of you have asked about a catalog of the software in **Staunch**'s collection. Regrettably, I **still** haven't found the time to assemble one. So in coming issues, when no other material is available, I'm going to reproduce inserts from old issues to refresh your memory of what I carry and the first of those is included with this issue. Actually, this particular one was **based** on the insert in #7 but was reworked for CHUGCON 88, as you'll see.

Finally, note my **change of address** at the end of this issue. Unfortunately, I've recently had stamps lifted from outgoing mail and **incoming** letters broken into when left in my street-side mailbox! The new post office box should eliminate that and **ensure** that your correspondence reaches me.   Kirk L Thompson

THE EIGHT-BIT R/W -- Letters

Comments on #16. [From Terry Hall, Wheaton, IL] "Thanks for a great issue 16! In response to your

and Alex Bodnar's query, both RM [Richard Musgrave] and I have HDOS 3, 3.02, and x3.1 running fine on 8" H47. Be glad to supply these directly to Alex or to you. Probably easiest would be to supply some copies to you for customers who require 8-inch...

"I'm just finishing what I can do to edit the HDOS 3 manual. Has grown into quite a tome! But I think it's going to be super-helpful and breathe new life into "old" HDOS! Dan has done a herculean job with it. He and I are both grateful for RM's super-cooperative and helpful spirit. Incredible what he's built into experimental HDOS 3.1 (which he predicts is many moons away from being ready for dist[ribution] ..." [Thanks for the offer to provide HDOS 3.02 on 8-inch, Terry. If anyone is interested in getting the system on that media, please let me know. -Ed.]

Transferring HDOS 3.0 to 8-inch. [From Ralph Money, Largo, FL] "For those of you who were curious as to whether HDOS 3.0 would work with the H/Z-47 system: Yes, it does. When my former local HUG club near Omaha, NE, (OMAHUG) was blessed with copies of the original release of HDOS 3.0 in 5" hard sector format (five disks worth), provided by fellow club member and editor of **The Staunch 8/89'er**, Kirk Thompson, I archived the programs onto an H/Z-47 8" disk. Same procedure as with version 2.0: LOAD the appropriate device driver (renamed to DK.DVD), INIT the 8" disk, SYSGEN *.* it (you can't read a 3.0 disk successfully with 2.0), then PIP all the goodies from the other four 5" disks. Worked fine for me." [Thanks for the information, Ralph. I figured it could be done! -Ed.]

Lee's and Pete's Contributions. [From two letters by Hank Lotz, Pittsburgh, PA] "I sincerely think Lee Hart is remarkably altruistic. With his knowledge of computers and electronics he could be almost an island, yet he's willing to take the time to share it in **Staunch**. The same must be said of Peter Shkabara, who I'd also hate to lose. (Please give him the "feedback" he mentioned in #16, p.10, and be **sure** not to "fire" him, as he lightheartedly puts it!)

"Concerning Lee's note to me in #16, p.4, here too I appreciate the thought. Indeed, I **do** tend to overlook PIP's capabilities from time to time. (I forgot totally about the Z option --if I ever knew it!). However, I was at a loss **why** Lee was telling me this! My final guess is he may be replying to my HSORT mod article in #15, but I hope **that's** not so, else it means he may be missing the thrust of that article. PIP certainly could force everything to lowercase to let HSORT order things properly, but afterwards we'd have to go back and **manually** restore tons of **scattered** occurrences of all-cap words: I assumed it to be clear that my mod is for **mixed-case** listings **you want to keep that way!** Please reread the next-to-last paragraph in said article (#15, p.8), where I even try to reassure readers **the mod will NOT do any case-conversion on their disk files!**

SOFTWARE LISTING
>--<
For HDOS Only

HDOS FORTRAN Library (Pt. 2)
(By Rick Lutowski)
(Provided by Mark Hunt)

[See #13, p. 2, for the first portion of this massive contribution and an explanation of the codes. -Ed.]
FORTRAN Utilities:
"MLD"   Trionyx Mass Memory Load/Dump, Version
   1.0, HS disks: 1, codes: SAD

FORTRAN-callable ASM Subroutine Libraries:
"PPL11"   AM9511 Parallel Processing Library, Ver
   1.0, HS disks: 2, codes: SRDT
"AM9512B" FORTRAN-transparent AM9512 Library for
   HA-89-3 graphics board, HS disks: 1, codes: SRDT
"AM9512" FORTRAN-transparent AM9512 Library for
   other 9511 implementations, HS disks: 1, codes:
   SRDT
"HDOSLIB" HDOS Interface Library, Version 2.0, HS
   disk 2 of 2, codes: SRDT

MICRO-CORE Device Drivers
"HA83"   For HA-8-3 graphics board, Version 1.0,
   HS disks: 1, codes: SRDT
"CRAYON" For Percom Electric Crayon, Version 1.0,
   HS disks: 1, codes: SRDT

For CP/M Only

LASM
(By Christenson, Mack, Schlaifer, and Rudenko)
MLOAD
(By Ron Fowler, Nightowl Software)
(Provided by Dave Haube)

LASM is a linking Z80 assembler. Directives recognized by it (but not by CP/M's ASM.COM) are LINK, COPY, XREF, SYM, TITLE, EJECT, and DEF. It permits assembly of a program from a **library** of files either by concatenation or insertion. MLOAD is a replacement for CP/M's LOAD command. Instead of "prepending" blank space to a file intended to load above 100hex as LOAD does, MLOAD sets the origin to that at the beginning of the hex file; a "bias" (offset) may be specified to change this. MLOAD also permits hex records with mixed load addresses, pre-loading of a non-hex file for patching, and multiple hex files loaded into one program. Assembler source is included for both, as is UNARC for de-archiving the files. This package occupies 90K.

KERMIT: Program and Documentation
(By Columbia University)
(Provided by Dave Haube)

This package is the executable program (configured for the '89) and documentation for this modem and file transfer package. Although it could be used as a modem program, Kermit is technically a file transfer system, using **only** the Kermit protocol developed by Columbia University's Center for Computing Activities. Kermit was originally used by many mainframe and mini systems not otherwise set up for telecommunication to pass files between incompatible hardware and system software. It has seen some growth in recent years amongst micros and university-sponsored BBS's. Kermit is entirely command-driven. This package occupies 737K.

KERMIT: Source Code
(By Columbia University)
(Provided by Dave Haube)

Assembly source for Kermit. This package is split into 17 source code files and includes LASM and MLOAD for generating the object code. This package occupies 520K.

Placing an Order— .. .._.

Your cost for this software depends on what you supply:

Formatted disk(s) and self-addressed, stamped return
   mailer .... $2.00 per disk
Formatted disk(s) without mailer .... $4.00 per disk
No disk(s) or mailer .... $6.00 per disk

Disk formats available are standard (SS/SD) and double-sided (DS/SD) 48-tpi hard-sector and 40-track (48-tpi) soft-sector, single- or double-sided, for both HDOS and CP/M. Please clearly indicate the format you are supplying or require. If you desire double-sided hard- or any soft-sector format, I will pack multiple items onto one disk. I will **not** subdivide a disk. Send mailorders to:

Kirk L Thompson / **The Staunch 8/89'er** / P.O. Box
   548 / #6 West Branch Mob Hom Vil / West Branch,
   IA 52358
>--<
THE EIGHT-BIT R/W (Continued from p. 1)

We certainly don't want it to, we only want it to sort..."
   "On page 4 [of #16], Lee Hart probably means ESC z where it says 'OFF-LINE, then **ESC x**'? (He correctly refers to ESC z a couple inches above that.)"

Potpourri. [From Bob Groh, 420 Sunview Circle, Blue Springs, MO 64014] "Just a few notes and comments. First - keep the good work on **The Staunch 8/89'er** going. I enjoy it even tho my main machine is now my Z-110 using mostly MSDOS 3.1. My H-89's are, however, in active [use] by my two girls (14 and 18) for word processing mainly.
   "(#2) I have a **pair** of H-47 systems for sale, trade, whatever. One is kaput (sector errors on read, I think), but the other, I think, works. Neither has been used for a couple of years and are definitely 'as-is'. The cost/price is not important--I just want to cover costs involved in shipping, etc. I can be reached at (816) 228-6402 most nights after 7 pm. Ideal would be a deal where the H-47's get picked up. In that case, I might be convinced to let the things go for $0...
   "(#3) I can, via my Z-100, copy from 8" to 5-1/4" soft-sector, 48tpi if anyone is in a crunch for that service.

"(#4) I have WordStar 4.0 both for CP/M and MSDOS (using Pat Swayne's patches). CP/M version worked fine on my Z-110 under CP/M-86 using Epson (parallel) printer but I could **not** get it to work on the H-89 using serial Epson. Not the printer or the system--seems to be some[thing] weird with WordStar 4.0. Finally had to revert ... to WS 3.1 on the H-89. Looking for anyone who might have run across this and licked the problem.

"(#5) Interesting idea for H-89: redo memory banks using 256K chips. Pull all the 16K banks [out] and replace one bank with 120 mS chips (256K). Will require some type of memory select (bank switching) circuit and then some way (software) to handle the extra memory. Would be nice to use ZCPR et. al.-- cost would be low and capabilities awesome...."

Mitsubishi Drives. [From David A. Shaw, Manassas, VA] "As to the question of which disk drives have been found to work [asked in MISCELLANY in #15 -Ed.], after burning the bearings out of a set of original Siemens drives, I went to the Downers Grove, Il, Heathkit store and picked up three Mitsubishi 1/2 height, double-sided, 48 tpi drives. I was told by the guys at the store that they were installing them in H100's at that time. (We're back in the 1984 time frame.)

"I have an original H17 enclosure for two full-sized drives. I had to work out my own method of mounting the drives in the enclosure. I ended up with two drives in the right-hand opening, mounted together with some light sheet aluminum and some sheet-metal screws. The one on the left is mounted to the floor of the cabinet. I used some plastic to fill the gap above the left-hand drive.

"I was afraid of mangling the cable, so I bought another one from Benton Harbor, bought a press-on connector from Radio Shack, and had at it. This worked great. I had to daisy-chain the power connector for the right-hand drive, but this worked fine as well.

"The drives came right up as single-sided drives with the original [HDOS] driver. I then got a used Extended Configuration card for the side-select line and installed the HUG SY: driver, following the installation instructions. This went in just fine, and I was in business with three times the disk capacity.

"After four or five years of using the Mitsubishi drives, I have had one problem that took quite a while to track down. SY1: wouldn't mount consistently. I'd get hard errors and a mount failure. Once a disk mounted, it would work fine. It started out as an occasional thing, then got worse and worse until the drive was almost unusable. To make the story short, there is a small lever, controlled by a solenoid, that raises and lowers the head mechanism, and this lever was sticking to the top of the solenoid enclosure, almost as if it had become magnetized. My stop-gap solution was to cut a thin piece of paper and insert it between the top of the case and the lever, breaking this bond. It's worked fine ever since. All they need now is a good cleaning, as I am getting a few I/O errors.

"I would recommend the drives. They have worked well for me.

"As a closing note, I am very glad I stumbled across **The Staunch 8/89'er**. Having access to a group of people interested in the same great machines has brought back my interest in the old H8. I hope we can keep this up for years to come." [Thanks for the info on the Mitsubishis, Dave. And I would draw you readers' attention to Dave's CATALOG package listed in #16. -Ed.]

Maney's HMODEM II. [From Nelson Howard III, East Derry, NH] "...[I]f I can bend your ear a bit, the following may be of interest to **Staunch** folk like myself. Just last summer I finally got a modem working and learned how to go online with some BBS's. One of my major motivations was to pick up the excellent H-89 modem program, HMODEM II by Harold D. Maney, 510 Barrack Hill Road, Ridgefield, CT 06877. This program was reviewed in **Sextant** #37 (Early Fall, 1988), and was the main reason for my joining GEnie: to download the program. After using it for a few months, I sent the requested $25 off to Mr Maney and received complete documentation and an upgraded version of the program (currently v. 2.1.07).

."Now I know that there is much interest in the MTMDM program from Micronics (which I have not seen), but I can attest to the utility of HMODEM II! First of all, it was written specifically for the H-89 and makes special use of the function keys. It supports X-, Y-, and Z-modem transfers, as well as ASCII; will print the screen and/or echo-print an online session (both are switchable); has a dialing directory for up to 20 numbers with settable line parameters, long distance access support, and automatic redial of number lists; a HOST mode with password protection, H-19 keypad macros to simplify log-ons and allow user customization for special functions; status bar on screen with 'soft' function labels; interrupt-driven input supporting transfer rates as high as 19,200 bps; full file transfer progress reporting using the H-19 screen control functions; selectable automatic capture of screen data to a disk log file; full user-configurability of the program; sorted disk directory display; and the new version even includes support for UltraROM and SUPER-19 terminal upgrades (which also works adequately for the TMSI SUPERSET with SUPERCLOCK I can confirm).

"Frankly, HMODEM II is the kind of program I though was only available in the MS-DOS or MAC worlds, and I have been thrilled to use it with my H-89! Not the least of its charms is that you can do everything (especially upload and download) from the terminal mode!! Also, as I do much batch downloading of ASCII text, the ability to switch disks easily (even get directories, rename the log file and delete unneeded files), while essentially in the middle of receiving all that text has been a great blessing! Perhaps Mr. Maney would make the program available through **Staunch** in addition to the BBS's it is currently on?! In any case, it is a welcome addition to my software library and worth every cent of the $25 cost!" [Thanks for the "ad," Nelson, and I'm exploring HMODEM II's addition to my library. -Ed.]

PGSORT for FORTRAN. [From Mark Hunt, Barrow, AK] "Would you mind mentioning in your newsletter that **PGSORT** [from Rick Lutowski's HDOS FORTRAN library] is not in the public domain (Peter Gural's software)

... Would appreciate it." [Thanks for the information, Mark. Readers will find the balance of Lutowski's large FORTRAN library, less PGSORT, in this issue's Software Listing. -Ed.]

=====

SAFE DISK RESET
by Patrick Swayne
(Reprinted from REMark #16 (April, '81), p. 10,12)

[NOTE: This is an assembly language article, intended for HDOS Version 2.0. - Ed.]

On my home system I have two 5-inch disk drives, and with them I work on some fairly large files (for example, the source for FOCAL-8), so I use 'stand-alone' quite a bit and do a lot of disk RESETting. The first time I did a RESET, I wondered if it was safe, so I looked into the drive and saw that the head load arm is pulled away from the disk when the door is opened, even though the drive solenoid is engaged. I thought that all was OK until I took a closer look into the drive and saw that a little foam pad that holds the disk against part of the drive frame does not disengage when the door is opened with the solenoid engaged. This pad is below and behind the spindle. Each time you remove and replace a disk in RESET, it rubs against this pad.

It seemed to me that the pad might wear out eventually, so I wrote the program in the listing below. This little program uses the .MOUNT and .DMOUNT SCALL's to accomplish a reset so that the drive solenoid is not engaged when you open the door. If the source is named R.ASM, and the resulting .ABS file (R.ABS) is placed on your system disk, then giving the command R or R 0 will reset SY0:, the command R 1 will reset SY1:, and the command R 2 will reset SY2:. If you enter another number or character, the program will just return control to HDOS. The only difference from a normal reset is that you must press RETURN after you insert the new disk. The program prompts you to do this by printing "Replace disk in SYn:, hit RETURN" on the console (n in SYn: is the drive number). If no disk was already mounted in the drive, the prompt is "Insert Disk in SYn:, hit RETURN".

You must set HDOS STAND-ALONE to use this program to reset SY0:. You only need to do it once for each system disk, because when you set STAND-ALONE a flag is set and recorded on the disk indicating the STAND-ALONE condition. The next time you turn on your computer and boot that disk, the flag will still be there, and will remain set until you set HDOS NOSTAND-ALONE.

If you never use STAND-ALONE, but would like to use this program to reset drives SY1: and SY2:, you can make the following changes. Change the line JZ RZERO to JZ BAD, and the line CPI '0' to CPI '1'. After these changes, the program will not reset SY0:.

Another change you can make to this program is to use the .MONMS and .DMNMS SCALL's, instead of .MOUNT and .DMOUN. If you do this, the only message printed on the screen will be the prompt to hit RETURN.   PS:

Listing

```
           TITLE   'R.ASM -- SAFE DISK RESET'
           STL     'by Patrick Swayne 27-Feb-81'

* THIS PROGRAM RESETS DISK DRIVES BY DISMOUNTING
* AND MOUNTING INSTEAD OF RESETTING.  THIS METHOD
* IS SAFER FOR BOTH DISKS AND DRIVES.

.SCIN      EQU     1            SINGLE CHARACTER INPUT
.LOADO     EQU     10Q          LOAD OVERLAYS
.CLEAR     EQU     55Q          CLEAR CHANNEL
.MOUNT     EQU     200Q         MOUNT DISK ON DRIVE
.DMOUN     EQU     201Q         DISMOUNT DISK
$TYPTX     EQU     31136A       TYPE TEXT ON CONSOLE
WBOOT      EQU     40100A       WARM BOOT ENTRY

           ORG     42200A       NORMAL USER ENTRY
START      LXI     H,0
           DAD     SP           LOCATE STACK POINTER
           MOV     A,L
           CPI     80H          ANY ARGUMENT ENTERED?
           JZ      RZERO        IF NOT, RESET SY0:
GETNUM     MOV     A,M          GET ARGUMENT CHARACTER
           CPI     40Q          IS IT A SPACE?
           INX     H            INCREMENT POINTER
           JZ      GETNUM       IGNORE SPACES
           CPI     '0'          LESS THAN ZERO?
           JC      BAD          IF SO, EXIT
           CPI     '3'          MORE THAN TWO?
           JNC     BAD          IF SO, EXIT
           STA     DNAME+2      CORRECT MESSAGE
           STA     DRIVE+2      SET UP DRIVE NUMBER
RZERO      MVI     A,0FFH
           SCALL   .CLEAR       CLEAR CURRENT CHANNEL
           XRA     A
           SCALL   .LOADO       LOAD FIRST OVERLAY
           JC      BAD
           MVI     A,1
           SCALL   .LOADO       LOAD SECOND OVERLAY
           JC      BAD
           LXI     H,DRIVE      POINT TO DRIVE
           SCALL   .DMOUN       TRY TO DISMOUNT DISK
           JNC     REPLACE      GOOD DISMOUNT, TYPE
*                               "REPLACE"
           CALL    $TYPTX       NO DISK, TYPE "INSERT"
           DB      12Q,'Insert',240Q
           JMP     TDISK
REPLACE    CALL    $TYPTX
           DB      12Q,'Replace',240Q
TDISK      CALL    $TYPTX
           DB      'disk in '
DNAME      DB      'SY0:, hit RETURN',212Q
           SCALL   .SCIN        WAIT FOR RETURN
           JC      *-2
           LXI     H,DRIVE
           SCALL   .MOUNT       MOUNT DISK
BAD        JMP     WBOOT        RETURN TO HDOS
DRIVE      DB      'SY0:',0
           END     START
```

[If you're running HDOS 2.0 and have never done any assembly language tinkering, this little jewel by PS: is, I think, a good place to start. First, set up a bootable disk with ASM.ABS and your favorite text editor on it. If you have room, you can also put most of the contents of the "Software Tools" distribution disk on it, but those won't be required for this exercise.

[Next, create a new file with the editor called

"R.ASM" by typing in the listing above. But the assembler (ASM) has certain conventions you have to abide by as you're doing this. One of these is that lines beginning with "TITLE" and "STL" are treated as comments. Another is that lines beginning with an asterisk (*) are comments. A third is that **tabs** separate columns of code.

[The last means that, for instance, when you finish ".SCIN" on the first line following the comments above, press the tab key then type "EQU", press TAB again and type "1", then press TAB **twice** and key the comment "SINGLE CHARACTER INPUT". (I had to squeeze the code together to fit it into one column.) In the same manner, key in the rest of the program, being sure you hit one TAB if there's nothing in the first column. When done, the four columns should be even all the way down.

[Next, proof your program code against the listing above, make any corrections, and save the file. Now, from the HDOS prompt, key "ASM". When an asterisk (*) appears and presuming your R.ASM is on SY0:, type "R,=R" and **press** RETURN. Within a few seconds, the assembler should spit out something like:

```
00058 Statements Assembled
38848 Bytes Free
  No Errors Detected
```

Your first assembly was successful! Now test the program by typing "R 1" or "R 2" (the latter if you have three drives). The program will instruct you to insert a disk and press RETURN. Repeat the command(s) and the program will dismount the drive and tell you to **replace** the disk. Now try the minor changes Pat suggests in his last two paragraphs and re-assemble.

[This shorty has three limitations: 1) if a disk is bad, it **won't** display any error message; 2) if you realize after you've dismounted a disk that you don't want to replace it, the only exit (beyond putting another disk in) is to hit CTRL-Z twice; and 3) it only works for the primary (SY:) drives. I might add that this one-sector utility **also** works on soft-sector, one of the advantages of HDOS's device independence. -Ed.]

=====

CONTACTS
(A Wanted/For Sale/Swap Column)

Lee Hart (323 W. 19th St., Holland, MI 42432, 616-396-5085) Lee called me on 1 March. He'd picked up a Housemaster board, but didn't get any information with it. Could someone supply same.

James M. Glennon (6919 Palm Bay Drive, San Antonio, TX 78218) "Is there any program available to allow me to send to the printer a specific screen. I seem to remember one called "SCREEN DUMP". I run ... CP/M."

Alex M. Bodnar (C33 Conowingo Circle, Oxford, PA 19363) "I would ... like to know if you or any of your readers have been able to run C/80 or COBOL-80 under Magnolia's CP/M with NZCOM 3.4. After about 2 seconds into execution it comes back with a system prompt."

Raymond P. Van Stockum (Attorney at Law, P.O. Box 1612, Upland, CA 91786, 714-946-6679) [From two letters] "As we have updated our offices I now have three H/Z 89's with accessory [external soft-sector] disc drives. All three have serial and parallel ports with hard sectored drives on board. If you know of anyone that would like to make use of them or take them as a donation please let me know and we will make arrangements for their pick-up ... Each [H-77-A] drive cabinet contains two soft sectored drives. One is a 720K drive and the other a 1.2M drive."

Hank Lotz (2024 Sampson St., Pittsburgh, PA 15221) "I've often wondered if it is possible to override the hardware write-protect tab on a 5-1/4" disk, say, via the controller (but with software). In other words, can you write to a physically protected disk by means of some kind of assembly code? And now, recently, this question was addressed to me by a guy who wants the answer because of its implications to his MSDOS sysem. Namely, if it is possible to defeat the tab, then applying a tab does not necessarily protect MSDOS'ers' diskettes against clever virus mongers!"

James J. Schmidt (587 Trumbull Court, Sunnyvale, CA 94087, 408-739-2925 evenings after 6 pm PST and weekends) "I am decommissioning my H-89 fleet and would like to offer the following through the **Staunch 8/89'er** Contacts column:

"I have two CDR SuperRAM89 sets (used), each with 1 meg memory, clock, manual, and original software for CP/M use on H-17 format (10-hard-sectored disks) for $250.00 each plus $8.00 shipping.

"I also have the service manual for the REMEX drives used in the original 8" H-47 for $25.00, shipping included.

"I do have the H-47 with controller card and an extra set of drives, but its an unreliable system. I only mention it as someone may be trying hard to get one of these working and be interested. If so they can call me to discuss price/shipping."

John Cofer (2622 Northwoods Lake Court, Duluth, GA 30136) "...[A]t one time Digital Research had a PL/I compiler for CP/M. Has anyone managed to pry it loose from Digital Research, or have you heard of anyone that has a copy of it gathering dust on a shelf somewhere? Would like to find one if I could."

Terry Hall (516 E. Wakeman, Wheaton, IL 60187-3760) "A TON OF H/Z-89/90 HARDWARE & SOFTWARE, BOTH HDOS & CP/M, both new and used--far too much to list here. Send business-size SASE for free listing. Everything available for best offer of what its worth to you."

John Burch (136 Arlington, Elmhurst, IL 60126, 708-833-4294) [From a letter from Terry Hall] "...[A] complete H89 system he'd like to sell cheaply or give away for a tax receipt to a non-profit org."

Gary Appel (1318 Old Abbey Place, San Jose, CA 95132) "I remember reading something back in the early H89 days about the lifespan of floppy disks. I

read a comment that the data on the floppy had a finite lifespan, perhaps five years, maybe more. Here I am in the eighth year of me H89, and I've never done anything to protect my software, except for original backups, which are almost as old as the originals. If my working disketter fails I'll find out. But by the time I find out that my original fails, it may be too late to do anything about it.

"Is there anyone out there that you know of who could address that concern in **Staunch**? Should we all be going back and re-copying our original diskettes before the disks become unreliable? It would be nice to get an expert opinion."

=====

QUERY!3 Closely Examined and Newly Explained
(An Exhaustive Analysis in 2 Parts) -- Part 1
by Hank Lotz and Kirk L. Thompson

The Appeal of QUERY!3. To be honest, this software description is also intended as a bit of a supplement to QUERY!3's doc. Our in-depth probe is meant for prospective buyers, but it also includes facts even **current** QUERY!3 users have probably overlooked! We'll give you a few odd usage tips, and we'll discuss shortcomings, not just features. Both of us run and enjoy QUERY!3 (Kirk, HDOS; Hank, CP/M) and we think it deserves our praise. Thus, it also rates our investing the time to criticize it.

Most good database management systems (DBMS's) are of the "relational" type and are priced beyond the average computer hobbyist's budget. But Hoyle & Hoyle's QUERY!3 is a capable, lower-priced data file manager, and it's available for H/Z systems under HDOS, CP/M-80, and, yes, MSDOS.

By today's standards H-8 and H-89 memories are small; however, adapting an ambitious concept like QUERY!3 to limited memory is merely a matter of **technique**: powerful applications for 64K computers are commonly split into several smaller modules, and one module at a time is loaded when needed. This requires a little additional load time if the task you want resides in a different module, but remember, even the super-memory machines don't necessarily sport super time-advantages when programs are bulky.

QUERY!3 is sold as 2 packages. In line with the technique just stated, the core package consists of **12 program modules** which include the functions of a data file management system. But **to get the software's full potential, you must also purchase CALC** (CALCulator enhancement package). Therefore, we'll cover these 2 packages as one unit.

Features. QUERY!3's core system has the following broad specifications:
- o field length -- up to 255 characters
- o field descriptor length -- up to 16 characters
- o record length -- up to 4,095 characters
- o file length -- up to 65,535 records
- o report generation using a special language
- o search "AND/OR" conditions -- up to 40
- o sorts in ascending ASCII order on single fields
- o prints individual or multiple records
- o has a batch processor to automate processes

The CALC enhancement (a number cruncher and report formatter) adds these capabilities:

- o a **tutorial program** for your 1st applications
- o an expanded report-generation language
- o 4 arithmetic operators, and SQRT and ABS funct
- o up to 12 places before decimal; up to 5 after
- o output formatting of numbers and char. strings
- o 3 IF...THEN constructions
- o user-defined printer code sequences
- o user-defined expressions for calculations
- o up to 3 database files open during report gen.

QUERY!3's programs can be run from a menu. Only 8 programs can be on the menu concurrently, but **which** 8 is always up to you. You **can** bypass the menu (more on this shortly). The AUTOPRO program can be run only from the operating system prompt. Also present on disk is a small data file for QUERY!3's internal use.

Documentation. Organization of the manuals isn't bad, but **there are no indexes**. The main manual comes in a three-ring binder; the manual for CALC (apparently unrevised, with its references to "QUERY!2") is a separate packet you put in the same binder.

The CALC manual tells **how** a command file (for generating an output "report") is constructed. It analyzes 2 of the 4 sample command files included on disk with sample data files. Some of these would apply in a small business situation. These demos give solid info on many CALC commands, but demos of more complex applications would have been nice.

We missed on-disk samples to demo the program, WRITER. We think experienced DBMS users will fare better than novices who rely wholly on the manual.

Analysis of the Modules. Three of the programs are driven by command characters. "H" (Help) lists the commands. The other programs prompt for input. ESCape works almost universally as a "terminate function" key -- we will note exceptions. Let's look at each QUERY!3 program separately:

QUERY. This is the main **menu** mentioned earlier. Item 9 on this menu exits to your DOS.

An options menu is accessed by typing "XYZZY" (caps only) at the main menu. It displays **your** current **default** names for a database file and a report command file (for WRITER or CALC) and **your** defaults for disk drive and file extension. You have 6 options: change each of the above 4 defaults, change which programs you want on the menu, or return to the main menu. TIP: If you make a change via this options menu, you must "save" it (when asked) or it will not be active.

The programs do not **have** to be run from the menu. You can call them directly from a system prompt, but you sacrifice some conveniences. First, you must respond to a "fail-safe" (namely, type "Y" if you really want to run the program). Then too, any defaults you may have set at the options menu (except for the .DTB extension) are not applied, so you **must** type drive and file name.

CREATE. This module sets up the structure of your data file. You are first asked the **file name**; you are warned if that file already exists. You next enter **how many** fields you want in each record. After that, you give the **length** of your first field, then its descriptive **name** (not its contents yet, see ADD). Then follows the length and name for

[f1] [f2] [f3] [f4] [f5] [ERAS]

---> K E Y B O A R D   O V E R L A Y S <---
---> F O R   H E A T H / Z E N I T H   S Y S T E M S <---

These overlays (or templates, if you like) wrap around the keypad (numeric on the -19/88/89/90 and -100, function on "classic" PC-compatibles) and stretch across the top of the keyboard. Plenty of space is available on it for you to mark key definitions, program name and version, and any other information you might deem necessary during use. All overlays are printed on card stock and die cut. They also include double-faced tape for more permanent attachment to the keyboard if desired.
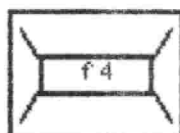
OVERLAY USEAGE
====================
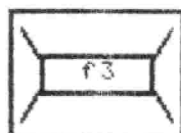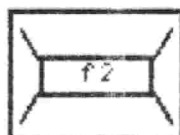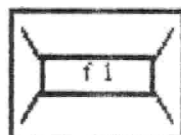
Use your **OVERLAYS** to label function keys for:

    p.d. programs
    .
    cheap software
    .
    PC emulators
    .
    program development
    .
    software emulators

on your H/Z-19/89/90, H/Z-100, or PC-compatible. Use them, too, to replace that well-soiled overlay. Or a totally incompatible one enclosed with commercial software.

[f1] [f2]

[f3] [f4]

[f5] [f6]

[f7] [f8]

[f9] [f10]
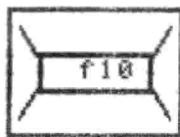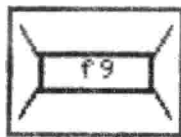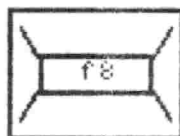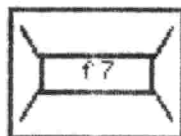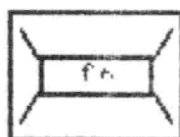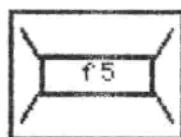
PRODUCT INFORMATION
=====================

KO-19: overlay for H/Z-19/88/89/90.

KO-100: overlay for the H/Z-100 series (not IBM).

KO-150: full-sized overlay for "classic" IBM-compatibles (-148, -150, etc.).

KO-386: function-key overlay for 101-key IBM-compatible keyboards (under development, not yet available!).

PRICING
(per set of six)
====================
All models, $6.00 post-paid!

Order from:

Kirk L Thompson
#6 West Branch Mobile Home Village
West Branch, IA 52358

If you have a custom requirement, write to me with details.

---> Iowa Residents please include 4% sales tax! <---

For: CHUGCON 88

ANAPRO Corp. Products
(Courtesy of Peter Shkabara)

CP/M software

CLOCK   Support software for C.D.R. or Analytical Products real time clock.
EPSON   Menu utility for MX80 functions.
KRESMOD   Patches to Zenith BIOS's 2.2.03 and 2.2.04 for most 4 MHz speed mods.
PIEPATCH   Patches to Software Toolworks's PIE 1.5(d) editor to select tabbing and BAK files from within program; uses DDT.
WAND   Patches to Magic Wand 1.11 and 1.12 to display function keys on 25th line and reset terminal to power-up state when exiting; uses DDT and SUBMIT file.
WSPATCH   Patches to WordStar 3.0 and 3.3 to use function keys and shifted keypad or Epson MX80 or FX80 printer; uses DDT and SUBMIT file.

(Available as a package on either two (2) standard hard-sector disks or one single-sided soft-sector disk.)

HDOS software

EPSON   Menu utility for MX80 functions; ASM source included.

(Available on either standard hard-sector or single-sided soft-sector disk.)

Frazer Users' Group Library
(Courtesy of Terry Hall)
HDOS only

(Of the 30 hard-sector disks prepared, **Staunch** presently has 11.)

Vol 000   Catalog disk.
Vol 101a   MBASIC games.
Vol 102a   MBASIC utilities and demos.
Vol 103a   MBASIC games and utilities.
Vol 104a   More MBASIC games.
Vol 105a   Further MBASIC games.
Vol 106a   MBASIC games and utilities.
Vol 107a   Assorted MBASIC programs.
Vol 140a   ABS games.
Vol 141a   ABS utilities.
Vol 142a   More ABS utilities.

(Available on standard hard-sector or soft-sector disk; please specify format desired in the latter since more than one hard-sector can be squeezed onto one soft-.)

Hank Lotz's Utilities
(Written by Hank Lotz)
CP/M only

LP   Command utility for H-14 printer.
MAKFIL   Experimental sequential file creation utility.
SALVAGE   File recovery utility for Magic Wand.

(Available on standard hard-sector and soft-sector disk; these programs are more fully described in this issue's MISCELLANY column.)

QDELETE   Utility for QUERY!3 to change all records in a file to "deleted."
TXT2Q3   Compiled version of Kirk Thompson's utility to convert ASCII files to QUERY!3 format.

(Available on standard hard-sector and soft-sector disk; these programs are more fully described in issue #5, p. 3.)

OMDOS/SMALLDOS
(Written by Skip Chambers)

Clone of HDOS 2.0 using less memory and without the system overlay structure; requires MTR-89 or -90; now includes INIT.ABS to format disks. NOTE: This package is **not** in the public domain; **Staunch** serves as a distributor.
(Available only on two hard-sector disks for $12 postpaid; this package is described in issue #6, p. 8.)

TXT2Q3
(Written by Kirk L Thompson)

MBASIC utility to convert ASCII files to QUERY!3 dbms format; program has a bug which crashes it when destination .DTB file exceeds 32K, but a workaround is available. A complete rewrite is in progress and will be supplied free to all "registered" users when finished.
(Available for HDOS and CP/M on standard hard- and soft-sector disk or in MSDOS XT-format [program conversion required in the latter case!]; this package is described in issue #3, p. 1.)

Utilities for HDOS
(From OMAHUG library)

BASE5   Convert or calculate numbers in decimal, octal, split octal, hexidecimal, and binary.
CRASH   Disk file recovery utility similar to DUMP.
DD   Brief directory lister with file sizes.
DK.DVD   H37 (soft-sector) device driver.
RESTORE   File undeleter.
Z19/89 DIAGNOSTICS Complete suite of programs to test and troubleshoot TLB and CPU boards.

(Available on either standard hard- or soft-sector disk.)

How to Order

Your cost depends on what you supply. If you send:

Formatted disk and self-addressed, stamped return mailer -- $2.00
Formatted disk without mailer -- $4.00
No disk or mailer -- $6.00

Formats available are standard (SS/SD) hard-sector and 40-track (48 tpi) soft-sector, single- or double-sided, for both HDOS and CP/M. Please clearly indicate the format you are supplying or require. If you desire soft-sector, I will pack multiple items as described above onto one disk for the **single-disk** charge. But I will not subdivide a disk.

Send your order to:

Kirk L Thompson / **The Staunch 8/89'er** / #6 West Branch Mob Hom Vil / Rte 1 / West Branch, IA 52358

NOTE: **Staunch**'s software catalog is growing! To keep abreast of that and everything else that's happening related to your 8-bit H/Z machine, you should have subscribed month's ago!

the **second** field, and so on. Optionally, CREATE can print a table showing the structure of your new file. This is your only chance to get this hardcopy.

ADD. With this program you enter records into your file. In QUERY!3, records can be added **only at the end** of a database file. When you have entered each field's contents, you may record that data to disk as is, or change it, or reenter the data from the beginning of that whole record. You then type in the next record if any.

If you expect to enter fields longer than the available screen width, you must set your terminal for wrap-around for proper visibility. If any field does wrap around, the end-of-field marker (an asterisk, which is normally displayed) does not display unless you try to **exceed** the field length. But the terminal also beeps if you try to exceed a field's length under any circumstance.

VIEW. VIEW is for examining the records in a data file. With it you can alter whole records or individual fields, "delete" or reactivate records, or print individual records.

QUERY!3 puts only 21 **effective** lines on the screen. Still, you can conveniently view records longer than 21 lines: the "X" and "Y" commands turn "screen hold" on or off, then the "P" command views the first few fields; RETURN(s) display the rest. Field descriptors take up room at the left, so fields longer than 60 characters wrap around.

For printouts of **individual** records, you have a choice of 3 left-flush formats: **with** field descriptors, **without** them, or a **mailing-list format** for labels. The last requires the **first 7** fields of the record to be (in this order): first name, last name, business name (or empty -- just a carriage return, **no spaces**), street address, city, state, and zip code. You may **have** more fields, but this option uses these only. The other 2 options do print **all the fields.** The "with field names" option centers the record number above the record. "Without field names" omits the record number.

When printing other than **individual** records, use PRINTER, WRITER, or CALC.

RECOVER. RECOVER restores to "active" all records you have marked as inactive ("deleted").

PURGE. PURGE gets rid of "deleted" records, freeing the space they occupy. This released space is later reclaimed if you add records to the file. PURGE does **not** reduce the **physical size** of the file, but you can compress the file using SEARCH. **Neither PURGE nor RECOVER informs the user how many records were actually processed.**

SORT. This program sorts only on a single field and **only in ascending ASCII** order. The sorting algorithm is chosen automatically, apparently depending on file length. SORT **will** handle files larger than memory, by using free disk space as a scratch area.

SORT cannot directly handle multiple-field sorts, but you can do this in multiple passes, sorting on fields in reverse order of priority.

PRINTER. This will send **multiple** records to the printer. Its 3 formats are as in VIEW, but the mailing-list format here is more flexible. You control 6 parameters: number of spaces between labels; single-sheet or continuous-form mode; which records to print (all, undeleted, or deleted); how many labels across the page (up to 4); max char

width of each label; and starting cols for each label across the page. You must answer those 6 questions the first time you do it, but you may **save** that setup for later use. Fields longer than your given label width are truncated. PRINTER lets you do a "test run", printing dummy lines of "X's" to check your formatting.

We found an inconsistency among the 3 formats when aborting printouts. ESCape aborts nicely when doing mailing labels. When printing "with field names" you may hit **any** key to quit. But printing "without field names" is extremely hard to abort; hitting keys only echoes them to the screen. Only repeatedly hitting ESCape works.

SEARCH. Commands here let you search on single or multiple fields. You may use "AND" conditions, "OR" conditions, and combinations of the two. You can also search for "deleted", "undeleted", or "all" records. Five comparison operators are available: =, <, >, S[ubstring], and F[irststring]. The first 3 compare with the ASCII value. "S" strings can occur anywhere in the field. "F" finds a string only at the start of a field. The "=", "S", and "F" operators always match **both** upper and lower case **regardless of what you type.** The "find all records" option can be used (for example) to back up an entire file to another drive without leaving QUERY!3.

After a fruitful search you select an output option. You can create subsidiary disk files in 2 formats (ASCII or QUERY!3) from the found records. You can also examine or change the found records, as with VIEW.

SEARCH has a few weaknesses. First, a **count** of found records is shown, but once it scrolls off the top of the screen, it is **not redisplayed.**

Second, you can also print or display a list of the record **numbers** themselves that were found, but the list is in a single column. On the printer this wastes paper. On the screen it zips past too quickly and scrolls partially off the top if it's too long. TIP: Set "screen hold" in SEARCH's "VIEW RECORDS" option! It stays in effect for the other "OUTPUT OPTIONS".

Third, when SEARCH creates an **output file**, it **does not ask you** (as the other modules do) before **overwriting** an existing file, so when you **want** a **new** file, be sure to type its name **correctly.** TIP: This danger is more in evidence when you run from the QUERY menu, because in that case the name of your current default command file (if any) will automatically appear at the prompt, even if it is a totally inappropriate response. Hence, at that point, do **not** inadvertently just hit <RETURN> or that default file gets **overwritten.** As always **if you've backed up your files, relax, you're safe.** Also, it helps just to **look** before you type!

Fourth, specification of complex search conditions is somewhat awkward. The program prompts you for the search info it requires, but beforehand you should make some penciled notes. The manual is not entirely clear here, particularly on combining "AND's", "OR's", and different fields with your search strings.

And finally, there is no "NOT" operator to **exclude** records containing certain data.

REDESIGN. This module transfers records from an "old" data file to a "new" one, in a **very**

flexible way. Therefore, you can effectively modify (even radically) the design of an existing data file, or merge several files. You merge by using the same destination file in different runs, thus concatenating the newer records to the older ones.

You can save your custom transfer design (which directs fields from source file to destination) as a disk file. This is handy where you need the same procedure again later and field transfers aren't just one-for-one.

Refielding takes longer than straight field-for-field transfers. And if your destination file structure has **new** fields, you enter that additional data later with VIEW.

A few problems exist. First, the ESCape key does not abort at the prompt where you select the **type** of data transfer (that is, from a S<AVED> design file, a N<EW> transfer design, or between files with I<DENTICAL> structures).

Second, if you choose **not** to save a new transfer design, you **must** enter "N" despite the default "<N>" indicated at the prompt. If you hit RETURN, the terminal just beeps.

Third, if you change your mind during transfer, there's no graceful way to stop the process.

Next time. In our concluding installment next issue, we cover WRITER, AUTOPRO, PREPARE, and CALC. We also look at **unique properties** of the HDOS and CP/M versions of QUERY!3. And we summarize the weaknesses and strengths of the overall package.

Ordering Information. Hoyle & Hoyle Software, Inc. / 111 Sparrow Drive / Isle of Palms, SC 29451. $99.95 for the QUERY!3 core system, $49.95 for the CALC enhancement package. Add $3 shipping.

We (Kirk and Hank) have written additional (well-documented) public-domain programs for use with QUERY!3 to add new capabilities: **TXT2Q3**, by Kirk Thompson, converts an ASCII text file to QUERY's database format. This can save you retyping existing ASCII data. Or, when you have similarities in records, it can save you from entering one record at a time, because a standard editor used first can replicate portions. Also, you can convert existing QUERY!3 databases to ASCII (using SEARCH) to do **mass editing**, then convert back to QUERY!3 with TXT2Q3! It's in MBASIC for **all 3 systems**, and also comes as a .COM file for CP/M. **QDELETE**, by Hank Lotz, sets all records to "deleted" (for CP/M only). For more info see **Staunch** back issues, e.g., Issue #7's Insert. Or write Kirk (address on back page). Also, **Staunch** #2 details a nice **patch** to ADD.COM (under CP/M).

=====

Pete on CP/M
by Peter Shkabara

Cooling. I enjoyed reading Lee Hart's discussion on the cooling of the H89 and the related component problems [see issue #16 -Ed.]. Lee is a practical man who has put a lot of effort into researching ways to improve the '89 and has taken the time to share his knowledge. We should all be thankful that he is continuing his efforts... On the subject of the bridge rectifier problem, I can add an expanded view. While Lee is correct in stating that only 5 amps or so is going through the rectifier, there **is** a reason for going to a higher amp rating unit.

There are two things to consider. One is the amount of heat generated by the bridge, and the other is how well the heat gets out of the diode assembly. The heating of the bridge is due to the forward voltage drop of the diodes multiplied by the current being carried. Many of you may "know" that a silicon diode has a forward drop of 0.7 volts. What you may not know is that this is a textbook value. The actual drop can range from about 0.4 to 1 volt while operating within its rated current. By choosing a higher rated device and operating it at a low current, the forward drop tends to be lower. If we cut the forward voltage in half, the power dissipation (heat) is also cut in half!

The second consideration is the "thermal resistance" of the package. This has to do with how well the heat gets out of the rectifier package. High current devices don't require as much external cooling to stay within their ratings. So there you have it. Follow Lee's advice for keeping the unit cool, and **do** get a 25amp rated bridge. The idea of a Schottky rectifier may be intriguing but I don't think it is worth the effort and cost. Any savings in voltage drop at this point causes an increase in drop at the linear 5 volt regulator. In the end, the total heat produced is the same!

Micro Basics. With this installment, I would like to introduce a tutorial into the basics of a microcomputer. When I was first introduced to microprocessors, it was hard to grasp the "essence" of what made it tick. Now that I have mastered the art, I can share the knowledge with others.

A microprocessor is the computing element of a "personal" computer. There are other components which are sometimes even more complex, but only the microprocessor responds to the program steps. The main building blocks of a computer system are the CPU which is the microprocessor in small computers, some interface devices for input and output, and some memory where the CPU stores and retrieves instructions and data.

The memory is divided into RAM (Random Access Memory), and a some minimum amount of ROM (Read Only Memory). The term RAM is actually a misnomer since even ROM is random access. What is really important is that RAM is a read/write memory. This means that information can be stored there as needed. A characteristic of this part of memory is that all information is lost when the power is turned off. When the computer is first turned on, the CPU would not have any program to follow even as simple as reading a disk to boot from. This is taken care of by ROM which is permanent memory storage. The H89 monitor ROM is such a device which contains enough program material to get the computer started at first turn on.

A computer operates by following a sequence of instruction steps which are called a program. This is similar to a cook following the steps of a recipe in baking a cake. At the "primitive" level of the microprocessor, machine instructions are needed to get it going. At first power turn on, the microprocessor goes to address zero and reads the first instruction. It then executes that instruction and fetches the next instruction. This process

continues till the instructions put the computer into a loop, the instructions run out and the system crashes or the power turns off. Note that the first address to be looked at is not always zero. The H89 with it Z80 uses zero, but some other brands of microprocessors start at other points in memory.

An example of a looping program is the H89 monitor ROM. When you see the H: prompt and can key in "B" for boot or one of the other commands that the ROM responds to, the microprocessor is actually in a loop looking for keyboard input. If "B" is pressed, the program branches to another part of the ROM to begin loading information from the "boot" tracks of a floppy disk.

The process of programming a microprocessor in its own language would be quite tedious since it only understands binary codes. To make it easier for humans, the binary code vocabulary is usually translated into "mnemonics" such as ADD, MOVE etc. These are easier for humans to remember. A program written in this mnemonic code is called assembly language. A special program called an assembler can read the assembly code and convert it into the actual machine language (binary code) which the microprocessor understands. This conversion is done once and the result is saved as "object code". You then have a program which can be run. The object code can be saved on disk, or can be put into a ROM for permanent storage for applications such as the monitor ROM.

High level languages such as Pascal, C or BASIC are themselves programs which respond to an instruction set which is more English like. An example is the familiar PRINT statement in BASIC. Ultimately, all languages convert the source program steps into machine code. Programming languages come in two types, interpreters and compilers. An interpreter reads the program steps and converts them into machine code as it executes each time that the program is run. A compiler does the conversion once and produces an object code result much as the assembler does. Sometimes the compiler produces assembly code which is then assembled to machine code.

Most computer languages are compiled. BASIC is an example of an interpreted language. An **interpreter is easier to learn because it provides instant feedback.** However, compilers are more efficient from the standpoint of speed of execution and total memory requirements. These are generalities of course, and there will be exceptions in specific cases. Most professional programming is done with compilers because it does not require the programming language to be present.

Extended DD. Now to the subject of the H89 CP/M system. A reader writes to ask about using the extended double density format with the Heath BIOS version 2.2.04. Since there has been quite a bit of confusion on the subject, I feel it appropriate to explain a bit about the different formats of a floppy disk. This will be only a brief introduction. I will provide a detailed discussion of disk format in general in another installment.

The difference between single and double density has to do with how many bits per unit length get packed into a track. The Western Digital controller IC used by the H37 has two modes of operation to support both densities. With today's high quality of drives and media, it seems very silly to use single density.

With double density there is a choice of different logical assignment of sectors. A sector on a disk is a pie shaped area partition of a disk track. At an extreme, we could conceivably write a single sector per track [I've seen this done on third-party interfaces for the Timex-Sinclair 1000 "toy" Z80 computer - Ed.]. The problem with this is that each time a unit of information was saved, it would need to use a multiple of tracks. Thus, if you needed to save only a single byte, a whole track would be used up anyway! If we divide the track into many small sectors, we can save smaller units of information, but the overhead of marking the sector divisions eats away at our total space available. The difference between double density and extended density has to do with the sectoring arrangement.

To make a long story shorter, double density can store a larger amount of small information pieces while extended density can store more total information. If you have a large number of small files (less than 1K each) you will find that double density format will hold more of the files than the supposedly larger capacity extended density! This is because extended density requires a minimum of 2K per entry.

To answer the original question, Heath BIOS 2.2.04 supports extended density format just as it is. It can read and write to the format, but the FORMAT utility that comes with that package does not include the capability to generate new disks. Version 3 of the FORMAT program will work just fine under BIOS 04 and will format the undocumented extended density. Heath never acknowledged the presence of the extended density option, but the program included the appropriate message within the code. To unlock this hidden feature, simply do the following patches using DDT. Using a copy of 2.2.03 FORMAT type DDT FORMAT.COM and wait for the - (dash) prompt. Then enter the following commands:

```
DDT VERS 2.2
-S0267
0267 94 d1
0268 13 .
-S07A6
07A6 94 d1
07A7 13 .
-S0C6B
0C6B 94 d1
0C6C 13 .
-^C
A>save 25 FORM.COM
```

That's all there is to it. You can then erase the old version of FORMAT and rename FORM.COM to FORMAT if you wish or just keep it with the shortened name.

With the density logo patched, there is another patch you may wish to install. This patch will allow you to press ^C (control C) to abort the format program before it starts. The location of the old logo message is now available to install the new code. At location 13D1h install the following:

```
-S13D1
13D1 0D fe              this adds:
```

```
13D2 0A 03
13D3 0D ca         CP 3
13D4 0A 80         JP Z,0380
13D5 57 03         JP 0005
13D6 68 c3
13D7 69 05
13D8 63 00
13D9 68 .
-S0289
0289 05 d1
028A 00 13
028B C3 .
-S07D0
07D0 05 d1
07D1 00 13
07D2 C3 .
-S0803
0803 05 d1
0804 00 13
0805 C3 .
-^C
```

Then do a save just as before for the first patch. Be sure to use another name this time or you will get an error message when trying to save it a second time.

For the more adventurous among you, the following is a list of locations in version 3 of the Heath FORMAT program which may be of interest.

Various logo locations

```
12DDh        ; Which drive ...
1394h        ; Density logo
13D1h        ; Density logo with EXTENDED
13FBh        ; Sides selection logo
14C3h        ; Put the disk ...
1549h        ; Do you have more disks ...
```

Routines which ask for input

```
021Ch        ; Which drive ...
028Fh        ; Put the disk ...
036Bh        ; Do you have more disks ...
012Fh        ; exit routine
```

Locations of the density option display vectors

```
0267h        ; density option 94h
07A6h        ; density option 94h
0C6Bh        ; density option 94h
```

I feel that I may have overstayed my welcome so this will be all for this installment. More to come next time. Lets get some feedback coming. If I don't hear from you, I don't know what is best to write about. Let Kirk or me know!

=====

VENDOR.UPDATE

The Computer Journal. This programmers' and advanced CP/M users' magazine sent me a note late in March that the subscription rate is going up on 1 May. Presently, that's $16/year; in May, it goes up to $18. So now's a good time to send a check! You might ask about receiving issue #43 while you're at it. My brief history of HDOS is in that issue.

Contact **TCJ** at:

The Computer Journal / 190 Sullivan Crossroad / Columbia Falls, MT 59912 / 406-257-9119

PC89LINK for CP/M. Issue #6 of Z-100 LifeLine included a half-page ad from **Lindley Systems**. Of interest for us is the just-released version of PC89LINK for CP/M. I noted the existence of it's HDOS and MSDOS permutations in issue #14 (p. 11). This is a package for high-speed file transfer via serial ports. One end can be an '89 and the other another '89 or an IBM-compatible. Dan Jerome will have a review of this and Lindley's "Ultimate" printer driver beginning in the next issue. If you want information immediately, contact:

William Lindley / Lindley Systems / 4257 Berwick Place / Woodbridge, VA 22192 / 703-590-8890

Computer Insurance. [From Dan Jerome, Burnsville, MN] "I ran into another secret I can share. This comes from Terry Hall. A company named 'SAFEWARE' offers insurance for your computer system: hardware and software. It covers just about everything except earthquake. The deductable is only $50. And one grand item: they reimburse you for the original purchase price: no depreciation knocked off for use. And the price is right. A $39 premium covers up to $2000 purchased hardware and software, including printers, drives, [software,] and what have you, for one year. If your system is more elaborate, a $69 premium covers a system valued from $2001 to $5000. Such a deal, eh? Terry dropped a screwdriver into his H89 when trying to make an adjustment while the computer was on, and he fried his video card. They simply sent him enough loot to purchase a replacement card - minus $50. If you are interested, call this number: 1-800-848-3649." [I might add that you also should check your present homeowner insurer to see if any riders can be added to your existing policy. But many of those **only** cover hardware; ask anyway, and compare. You **should** prepare a complete inventory, too. -Ed.]

ZDS Drops Quikdata as Distributor! Undoubtedly, the biggest news to hit my desk since the demise of Sextant Publishing last year is the recent termination of Quikdata's (and many other dealers') distributor contract(s) with Zenith Data Systems. The cutting was **entirely** one-sided, by Z.D.S. According to Henry Fale, the reason given was that Z.D.S. no longer wants to sell its products by mail order! Frankly, with that kind of rationale, I'm surprised Heath is still doing business! (Although I also noticed that the spring '90 Heath catalog I just received included **no** completely-assembled systems, as most past catalogs have.)

Anyway, Henry discussed the situation at some length in **H-SCOOP** #'s 120 and 121. And although he's presently looking for other IBM-compatible make(s) and model(s) to sell, he plans to continue supporting the H-8, H/Z-89/90, and H/Z-100 as he has in the past. You might send him a note encouraging him to do that:

Henry Fale / Quikdata, Inc. / 2618 Penn Circle / Sheboygan, WI 53081-4250 / 414-452-4172

=====

ASCII Codes, Computers and Printers
by Frank Hutchison

Have you wondered what happens when you push the Ctrl-P buttons on your keyboard and suddenly everything you type appears on your printer as well as on the screen? Or are you frustrated because you know your printer has many features you don't know how to activate? Do you want to know how to get to them? Do you have a pain in the ASCII? The answers involve an understanding of how the parts of your system operate and what an ASCII is.

First, ASCII stands for American Standard Code for Information Interchange. It is a collection of 128 symbols which are supposed to mean the same thing for everyone. (See the chart of ASCII characters on page 12-1 thru 12-4 of the operation manual for the H-88 or most any book on programming or printers will have one.) The problem comes in the fact that most computer systems use 8 bits (a bit is a single 1 or 0) to transfer each character of information, which gives 256 (2^8 or 2-to-the-8th power) possible combinations, not 128. In addition, while all the alphabet, both capital and small letters, and all the "American" punctuation characters are included in the original 128 characters, there is also 32 "characters" which have no counterpart in the written language. These 32 (and the extra 128) are used for control codes or to convey special information (like special characters or graphics) at the discretion of the designers of the computers, printers and whatever else is part of the system.

Secondly, the hardware and software that make up the computer system must agree what the codes mean or else the result is poetry in, garbage out. Starting with the keyboard, when a key it hit, the keyboard automatically translates the response into a 7 or 8-bit code. If I assume that the H-89 is being used, then the code is the correct ASCII code for the key hit. If an IBM compatible extended keyboard is being used, then there will be more codes than just the 128 ASCII codes because there are more keys which generate more codes.

Next, the character is sent to the keyboard interface unit on the computer (Terminal Logic Board for the H-89) which passes the character to the computer's data bus. The computer has interface units to handle all communications with the "outside world", i.e. the keyboard, screen, printers, modems, etc. These interface units can be strictly input, strictly output, or both input and output.

Once the character is on the computer's data bus, the Central Processing Unit (CPU) will process the character. What the CPU will do with the character depends on the operating system and/or the application program being run. The purpose of the operating system (HDOS or CP/M on most H-89s) is to let the CPU know what to do--it's the collection of rules that the CPU operates by. The result is order for everyone. It's the operating system which tells the CPU to tell the screen to put the character just received from the keyboard at the location where the cursor is currently blinking. It's an electronic version of playing Post Office.

If there's an application program running, say a word processor or spreadsheet, then the operating system will pass the character to the program and the program decides what to do with the character. The program should receive and send all characters via the operating system. This allows for easy upgrades to the operating system or program without incompatibility creeping in. Unfortunately, doing everything via the operating system slows down performance, so many popular programs circumvent the operating system and deal directly with the interface units. In this case, the program has the responsibility of insuring that all the codes used are understood by all parts of the computer system.

Finally, there's the printer. The printer recognizes two types of codes--control codes and non-control codes. Remember those 32 "extra" characters in the ASCII set? Using those characters and combinations of those and the "real" (non-control) characters, you can control the size, spacing, and, in fact, every characteristic of the type that your printer is capable of. The particular meaning of any one of these characters or combinations depends on the specific printer. However, the Epson (for dot-matrix printers) and Diablo (for daisy wheel printers) collections of control codes are often used by other manufacturers. The non-control characters are printed according to the instructions given by the control characters.

To better understand what happens, let's look at two examples of the steps involved when a key, the capital A, is hit on the keyboard.

Example 1: An H-89 with Heath ROM, the CP/M operating system with CTRL-P (echo to the printer) activated, and an Epson MX-80 or compatible printer. Pressing CTRL-P under CP/M causes terminal input/output (I/O) to be echoed to the printer as well as the screen. CTRL-P usually does not work if there's a program running.

When the "A" key is hit, the ASCII code 1000001 (binary or 65 decimal), meaning A, is sent to the Terminal Logic Board (TLB). The TLB gives the character to the data bus where the CPU, under the direction of the operating system displays an A on the screen and sends the character to the printer interface unit. The character is then transferred to the printer which examines it, checks for any control codes; in this case it finds none, then prints the character that represents 1000001, which should be an A. The same train of events would be true for a daisy wheel printer.

Example 2: Same as example 1, except that the Greek alphabet has been downloaded to the printer or a Greek Alphabet daisy wheel has been substituted for an ASCII daisy wheel. Some dot-matrix and laser printers can change their character sets, called fonts, either by having the instructions for each character sent to the printer (i.e. download the font) or they're held in Read-Only-Memory (ROM) within the printer. This is equivalent to changing the daisywheel on a daisy wheel printer.

If the Greek alphabet has been downloaded or a Greek alphabet daisy wheel has been substituted on the printer in example 1, then when the A is hit, the only change will be in what the printer does with the code for A. To aid in understanding what happens, manufacturers of printers with the capability to change their fonts will provide a conversion table. For example, an A would be printed as an alpha, a B as a beta, a C as a gamma, etc. Or, if a scientific character set is used, then A could

mean the integral sign, B a square root sign, C a summation sign, etc. The particular conversion table is determined by the designer of the printer.

Depending on the capabilities of each component of your computer system, it is possible to:

1. Type "plain English" on the keyboard,
2. Have the screen display Greek characters (as some adaptations to the H-89 allow), and
3. Have scientific symbols printed.

What would happen is that

1. The keyboard would generate ASCII code of what was typed,
2. The hardware, operating system, and/or the application program would tell the screen to display a Greek character based on a conversion table, and
3. Send a code to the printer (not necessarily the same code generated by the keyboard), which would examine the code and print the corresponding character from its' conversion table.

In fact, this type of system is used to generate secret code. The operator will type in the plain language message and the computer will scramble each character by a prearranged algorithm. The output is then a mixed-up mess of characters.

An understanding of the ASCII codes and how they are handled by the computer and printer is important if you are to avoid the poetry in, garbage out syndrome. It also allows you to use all the features you paid for in your printer and computer.

=====

MISCELLANY

Maybe Public Domain CP/M?? In late February, Darrell Pelan (Micronics Technology, Suite 159, 54 Dalraida Road, Montgomery, AL 36109) wrote me that he'd "left messages on the HUG BBS asking about making the Zenith programs for CP/M public domain (PD) ... We would need the BIOS and FORMAT programs at minimum. The SYSGEN and Zenith portion of MOVCPMxx would make creating a PD CP/M much easier." I'd become increasing concerned with the availability of CP/M for our machines myself. Sources have seemed to dry up over the past year. You may also recall Pat Swayne's letter in #12 suggesting that H/Z might be willing to release its proprietary portions of CP/M.

So Darrell's letter prompted my involvement in the question. In early March I wrote to Heath president William E. Johnson (Heath Co., Benton Harbor, MI 49022) and observed, in part: "I'm quite aware that ver. 2.2 continues to be a viable product for Digital Research and I have no desire to infringe in any way on D.R.I.'s rights [see issue #12, p. 8 for details] ... [I]f you are willing to ... [release the BIOS, FORMAT, SYSGEN, and MOVCPM], I would like to see the remaining proprietary utilities (MAKEBIOS, BACKUP, RESTORE, CONFIGUR, LIST, PREL, ASSIGN, and DUP), the proprietary portions of the 2.2.04 set-up disks and (of course) the non-D.R.I. documentation also released...."

On 19 March, pres. Johnson replied (also in

part), "I had forwarded your earlier CP/M release request (i.e., your letter of March 5th) to Chas Gilmore, VP Heath Company and asked that he review the request with regard to both legal and business implications. This will take some time. When we have completed the review, we'll be back in touch with you."

I must say that the release of H/Z CP/M is very "iffy!" The reason is mainly because, unlike HDOS, Heath doesn't own CP/M! The core code (the CCP and BDOS) is **owned** by Digital Research. Extricating Heath's proprietary code will depend heavily on the wording of the original distribution contract with D.R.I. I **am** pleased that Heath is, at least, considering the question. But the legal impact will, I'm sure, be a significant part of its final decision, unlike wholely-owned HDOS.

This is also a reason why I favor the interest of Micronics in the release, if it does occur. Not only does Darrell Pelan have the programming background and tools (ZSDOS and NZCOM, see #14, p. 10) to construct a p.d. version. He **also** is running a business and, I'm sure, would have no desire for any legal entanglements that might ensue from a fumble during the process.

But you can do something, too. Write to Heath pres. Johnson (whose address is above) encouraging Heath to release its proprietary code. Mention that you understand the potentially legal complications in any release and, because of that, understand the hesitation Heath may feel about it. Write, too, to Darrell, thanking him for considering assembling a p.d. release and, perhaps most of all, putting the bug in my ear!

Still, the release of the proprietary portions of CP/M is uncertain. I hope that Heath will, again, be able to support us as it did with the release of HDOS 2.0. In my opinion, even if it doesn't, its support of our long out-of-production systems has **still** been more than we could have asked and undoubtedly more than any other computer manufacturer has **ever** provided! We owe considerable thanks to Heath Company.