

Saving Our HEATH Eight-Bit Machines!

SETHO JOURNAL

Volume II, Number 6

\$2.50 a copy, \$15.00 a year

January, 1988



A Happy and Prosperous New Year to All

READER'S LETTERS

Len,

Thanks for your kind words about COLUMNS in the September issue of SEBHC Journal. Thanks also for sprucing up our ad with those two Roman columns. (Where DID you ever get that idea?) [I used some "boiler-plate" graphics which came with Skycastle's CALLIGRAPHY-II software. Neat package! -- ed]

Couple of notes on your description of COLUMNS. First--you can make COLUMNS pause by pressing any key (not just control-S). At that point, COLUMNS will ask you to press "X" to exit back to the menu, or to press any other key to continue the interrupted processing. So if the preview page doesn't look like you intend, you can skip back to the menu immediately; you don't have to wait until COLUMNS finishes displaying the page. [You're correct! It does! -- ed]

Second--COLUMNS will allow printing any number of columns (up to 250), not just two or three. This makes it useful for creating (and uncreating) tables, mailing lists, etc., in addition to pasting up newsletters. [Haven't got aRound Tewit yet...but soon. -- ed]

Third, you mention that COLUMNS is written in compiled C-BASIC. This may give some people the false impression that you need CBASIC to run COLUMNS. In fact, as you know, COLUMNS is a stand-alone .COM file, and can be run like any other .COM file, by simply typing its name. [You're correct, but after any BASIC program has been run through a compiler it becomes a stand-alone .COM file. Some of our readers may not know about BASCOM, so your note should help clear away the fog. -- ed]

Fourth--you mention that preparing a page of the Journal use to take 3 hours, but with COLUMNS it takes 5-10 minutes. Is that print time? [Total, including printout. I do one page at a time as I often make changes after seeing the hard copy. -- ed] I ask because the process of converting a page into columns should take only a few seconds. I imagine that five minutes would be enough to columnize all the pages in one issue of the Journal: Just set up a batch job to do each page, one after the other. (And have you looked into setting up a batch job to print the entire journal, start to finish, headings and text, with no human intervention? I'm sure it's feasible, and you deserve every break you can get!) [Yep, shore dew! -- ed]

Finally--the "fragrance" you noticed from the manual is due to the coating on the paper back. The paper is very heavy to prevent print-through, also it is coated to prevent offsetting of ink from the page below. I felt the paper's opacity outweighed the minor odor, which in any event dissipates with time. [It did go away; I'd never run into this kind of paper before, so it was a surprise to me. Hope you're not offended! -- ed]

Now on another subject: You mentioned a problem you encountered when printing certain files that the last character of each word would print as italic, though others printed normally. You also describe the fix as being PIP NEW-FILE.TXT=OLDFILE.TXT[Z]. Please note that this fix will also undoubtedly cure the problem you mentioned in a pre-

vious issue, that sending certain files to the screen will cause the screen to go screwy. Both problems have the same cause: The high bit of the offending characters is a one. The PIP parameter "Z" tells PIP to set the high bits of each character in the output file to zero, which is the normal convention for ASCII characters. Whenever that bit is a one instead, the screen thinks the character is a graphic control character, and your printer think you're asking for an italic. The "Z" option doesn't delete characters, it only zeroes their high bit. [You're right. Both Magic Wand and WordStar text files with micro-proportioning switched on are Bad News to any TEXT processor or editor--except Heath's ED.COM; it'll handle ANYTHING, even though your printer is unable to! -- ed]

Don't forget to send me a blurb about SEBHC suitable for posting on CBBS and other BBS's here in Chicago. Or two blurbs, one to solicit 8-bit software houses, and one to solicit new subscribers. The postings are free, and they sure can't hurt.

Your Journal is great, and it just keeps getting better. Keep'm coming!

ROY J. LIPSCOMB, LOGIC ASSOCIATES, Chicago, IL 60660

[Thank you very much for your letter, the I/O-CAP assembly-language listing, and the encouraging remarks. Although I am usually rather busy with outside consultation jobs at year end, I did take time to check out everything you mentioned about the batch file and COLUMNS. I am hesitant about running batch files; I'm constantly switching the LQ-800 between so many different modes--text, graphics, special characters, etc., on every page. And (see remark inserted above), I copy-read every page and make any required corrections on the spot--with batch files I don't think that is as easy to do. Even with all the proofreading, at least one mistake persists in sneaking onto every page! By the time you read this you'll have received a disc with the BBS blurbs requested. Our subscriber base gets bigger every week but a few more subscribers won't hurt. -- ed]

Dear Len,

My cheque is enclosed for renewing my subscription to the JOURNAL, plus the CP/M Game Disc #0, and HDOS 2.0 Programmer's CARE Package Disc #0.

If there are any other mechanical or civil engineers among SEBHC JOURNAL readers, they may be interested in knowing about an MBASIC program I wrote which analyses straight beams for stress and deflections. The program follows the format of Table 7 in Roark & Young's book "Formulas for Stress and Strain" (McGraw-Hill, 1975). Requirements: HDOS or CP/M, 56k and MBASIC. It will also run on the Z100's 8-bit side (MBASIC and CP/M-85). For those readers who want to find out more, send me a large, stamped, self-addressed envelope and I'll return it stuffed with a more detailed writeup, or enclose a \$10 cheque (specify hard- or soft-

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sector disc) and I'll send them both the HDOS and CP/M versions of the program on the same disc, together with documentation.

8ILL ST. CYR, 7206 Florita Court, New Orleans, LA 70126 ph: 504-241-7905 (days)

[Your discs went out on 19-Dec-87 and you should be having fun with them by now! Nice to see that you are still enjoying your 8-bit machine profitably! As I constantly say, 'Because it always works properly, that's no excuse to discard your 8-bit machine!' -- ed]

Dear Lenny,

Enclosed you will find a disc containing GASMLG.BAS, documentation for it and associated files along with a hardcopy printout. I started writing the program back in '81 and added the finishing touches in '87. I originally wrote it in HDOS, so if you want the HDOS version, I'll send it. Hope you can add it to the Utilities disc. [You betcha! - ed]

Also included on the disc is a utility program REDIR.COM, and its' associated HELP file. I downloaded it from a local bulletin board and it works great with my H-8 and CP/M. It redirects console output to a printer or disc file; you can even APPEND to a disc file. It was very helpful in doing the documentation for GASMLG. REDIR's command syntax is in the help file (which comes up if you use improper syntax). For example, suppose I want to send a directory to a disc file in addition to the console. I would type:

```
REDIR > CON:,DISKFILE.EXT DIR.
^  ^  ^  ^  ^
|  |  |  |  |
|  |  |  |  |  -- program to
|  |  |  |  |  run with redirected
|  |  |  |  |  output
|  |  |  |  |  -- Output redirected to
|  |  |  |  |  2nd device (discfile)
|  |  |  |  |  -- Comma req'd to separate
|  |  |  |  |  multiple destination devices
|  |  |  |  |  -- Output also redirected BACK
|  |  |  |  |  to the console
|  |  |  |  |  --- means redirect
|  |  |  |  |  --- Load Redirect program
```

If I then wanted to APPEND another directory to the SAME disc file, I would enter:

```
REDIR >> CON:,DISKFILE.EXT DIR.
^--- means append to
```

I used this technique to make a MASTER catalog of my CP/M discs which I had LABEled with HUG's DISKID program (CP/M UTILITIES by PS, P/N 885-1226), except that I eliminated DIR19's direct-cursor addressing function. The modification is available to anyone who's interested enough to write me.

I've completed the [Pat Swayne's piggy-back plug-in] Z80

mod for my H8. It's been running great for the past 5 or 6 weeks now. In fact I installed it the day after I mailed my last letter to you. Now I can run TURBO PASCAL and ZCPR which came with BIOS80--both of which require a Z80 CPU. I also finished putting that WH8-37 board together but I'm having a problem getting the interrupts to work with it. I ran the jumper cable from the WH8-37 card to the IC217 socket on the 8080 (modified) board and jumpered the interrupt enable from the Z80 to pin 9 of IC-217 (which equates with instructions for use with the Z80 CPU board). On power-up I got a blank monitor; I'm not sure if there's a problem in my WH8-37's interrupt circuits. [Have you tried phoning Henry Fale for help? -- ed]

In connexion with your response to my question on printer switching (JOURNAL, II:4, p5), procedures to do MBASIC peeks and pokes to change ports and physical device are in REMARK #43, page 24, entitled "LPRINT in CP/M MBASIC." I used these procedures in my GASMLG program to select between terminal and H14 printer.

In reference to CLS.ASM on CP/M GAMES DISC #0: Frequently, I've abnormally exited a program which uses the 25th line. Neither rebooting nor running CLS will clear the 25th line. And if the cursor happens to be on the 25th line ... what a mess! To correct this situation, I end up going OFF-LINE and typing <ESC-z> (Reset to Power-up Configuration). Why not include an esc-z sequence to the terminal in CLS.-ASM? [Easy! Find and replace the Heath ESC-E sequence with ESC-z in our assembly listing and re-assemble CLS. -- ed]

I am looking forward to another year of the journal.

GARY S MELANDER, 460 Garrison Place, Virginia Beach, VA 23452

[Gary, we're looking forward to another great year of your excellent correspondence! I looked GASMLG.BAS over and found it rather similar to a CP/M program I bought on clearance from Newline Software at CHUGCON-87. Their program (Fleet Vehicle Management--FVM) allows tracking of every possible thing concerned with operating up to one hundred commercial vehicles. Who needs all that? Your program will do just fine for the average family! About your Quikdata WH8-37 board problem--I had difficulty with mine, and since my H89A was running, I just sent the H8 CPU and WH8-37 cards off to Henry Fale to see if he could find anything wrong with them. After about a week he called and said everything checked out just fine on their H8; it had to be in the drives somewhere. When I got my boards back and into my H8, I found that I'd forgotten to remove the 150-ohm pull up resistor pack from my 2nd drive. Once that was corrected, everything worked just "peachy-keen". But now I've a new problem with three two-sided drives (two 40trk, 1 80trk) bought thru an ad in Gernsback's Radio Electronics magazine. The 80-track unit works just fine in either hard or softsector service (HDOS or CP/M). But neither 40trk drive writes soft-sector in position #0 or #1 with CP/M on the H8! These

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two Shugart full-size 40trk drives work normally under HDOS in either hard or soft-sector service for both the H8 and H89A. I know the H8-37 board is ok; it ran fine with two different Hitachi 1/2-height 40/80trk drive sets--one set from the H89, the other I use regularly with the H8. I even tried configuring these two ornery drives for 30-millisecond track-select stepping, and THAT didn't do anything for them. I'm completely baffled! Anyone have any suggestions? By the way Gary, I think your REDIRECT program is good enough that we should make it available to JOURNAL subscribers on CP/M GAMES & SOFTWARE DISC #1. Let me know if this is ok with you and what percentage of our net profit you'd like as royalty. This new disc will be priced the same as our CP/M GAMES DISC #0 (\$6.96 ss,dd soft, \$1 more in hard-sector ss,sd format). Phone me if you're confused... -- ed]

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SPECIAL NOTICE TO SEBHC JOURNAL READERS

Tom Bohon has contacted me in connexion with two UTILI-SET, version 1.0 problems and asked me to pass the information along to any of our readers who have purchased version 1.0 ... They are:

Problem 1: LASTDISK and EXTRCT will not work properly if there is a single excluded file in MAST.CAT--that is, if MAST.CAT looks (for example) like this:

(STAT.COM)

--rest of files--

you can work around the program bug simply by writing a "garbage" file named AAA.XXX and put it into the excluded list, thusly:

(AAA.XX

STAT.COM)

--rest of files--

This excludes any file named AAA.XXX from future catalog- and LASTDISK and EXTRCT will now work ok.

Problem 2: There was an omission of an executable (.COM) file from the library file "ROLODEX.LBR", apparently before I downloaded it from a bulletin board last year. If you have Turbo Pascal, you can easily compile the source code which IS provided, but if you don't have the Pascal compiler the program isn't usable.

Tom goes on to apologize for these oversights and say he has newer version of LASTDISK and EXCTRCT which correct the above bugs. He also says he can supply a compiled (runable) version of ROLODEX for your machine if you send him your order with a SOFT-SECTOR disc plus an EXACT specification of your hardware and software environment. This is important because Turbo Pascal generates exclusively Z80 code and ROL-ODEX will not work with 8080 or 8085 CPUs. For more details write Tom Bohon, P.O. Box 5154, Albuquerque, NM 87185-5154.

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Dear Len,

HELP!!

I need some help! I'm using a Heath H8 with the 8080 CPU and one disc drive. I've developed a program using C/80 and the .ASM files take up so much space that there's no room left for ASM.ABS to assemble the program! Presently I have three drives which are not working. They once occupied my SY1: drive position--one by one--and, for whatever reason, have given up the ghost. If at all possible, I'd either like to get in touch with someone who repairs drives at a reasonable price, or will take them off my hands for recycling. Also, do you know where I can get drives equal to the stock H-17 (Tandon TM 100-1)? The one which came with my H-17 in 1982 is still working perfectly, despite the abuse I've given it.

I'd like to get in touch with someone who is using HDOS with the 8080 CPU, and two (or more) disc drives and a printer and who would be willing to collaborate with me on some programs.

I was talking with a fellow [8-bit] computerist a few days ago and asked him what he would like to see written (I have run out of ideas). He gave me the idea for DUP (see copy on enclosed disc). Since I have just one drive now, DUP is not fully tested. (I'm fairly sure it will work as I intended, but one can never be absolutely sure!) DUP mounts a disc on SY1: and then sequentially copy files from a disc in to SY0: over to SY1:. Once all files have been copied, DUP prints the new disc's directory and then resets SY1: so that you can put in another disc to receive the same files from SY0:. This operation continues until you enter CTRL-C. Please let me know how DUP works for you.

And please tell all my fellow SEBHC JOURNAL subscribers to write me about what they'd like to see in the way of programs or utilities.

BERNARD HELMS, 4210-1 Walnut, Berrien Springs, MI 49103

[Thanks for the test software disc Bernie! Thus far I've only checked the directory to see what is on it, but I'll try to give DUP.ABS a run and report on it Real Soon Now to you. Your description sounds as if someone doesn't like the way HUG's SDUP.ABS works! I have never had trouble with my copy (since having applied Pat Swayne's 2-side, 40/80trk patch to it), but then I don't do that much duping--maybe five or six a month. There's a different DUP on Henry Fale's software disc he supplies with the H8-37 cards he sells for the H8 computer, but this is for soft sector only. It is quite reluctant to copy a 40trk disc mounted in an 80trk drive to another 40trk disc in a 40trk drive. Since I don't have the source code, I've been reluctant to try patching the program. Maybe this is another utility idea for you? About repairs to your "extra" drives; I called Nancy Strunk at HUG HQ and she gave me Heath's Service Department head man's name: Dave Seamon. She said Heath has/had a vendor who fixes drives for them and Dave might be

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able to put you in touch with them, assuming they're in your (and Heath's) general vicinity. If you find out that it is possible to get your drives refurbished to "like new" condition cheaply, please let us know at once! I just took five of my own malfunctioning drives in for repairs to a local shop (Sherwood Computer & Periphial Co., 1960 Industrial Drive, Ann Arbor, 48104, 313-995-0040) which is pretty good at drive refurbishing. They checked out several of my 1/2-height drives a few years back and I haven't had any trouble with these drives since then. Sherwood has reasonable rates and are pretty quick in getting equipment back to you. Might try giving them a call (ask for Mike & tell him I tipped you off) if you can't do better locally. Good luck! -- ed]

Dear Lenny,

HAPPY NEW YEAR

I have just finished reading the December JOURNAL for the 'first' time. GOOD JOB!

On page 3, II:5 under *ERRATA!* about an error in the REMIND program listing: Somehow the error-containing line,

LXI B,040402A (the center four is wrong)

got transposed with the correction,

LXI B,040302A (This is correct!).

If you try to assemble the listing with the wrong address value of 040402A you will get a "V" error. [You're not the only one who told me about this. Did you catch our spelling error on the front page of II:5? -- ed]

But you're not the only one who can goof! See my letter in the same issue, page 3, where I said, "I tried changing SY0: step time to 6mSec, but got only zilch!" That should have read 30mSec instead of six! I had thought that maybe setting the Z37 drive to a SLOWER access time would get the programs to work. It is possible that using 48tpi drives in the Z37 instead of 96tpi drives that the programs could possibly run. I do know that nothing ever changes with screen printout using [your] SYSERR and SYSCHECK [utilities] until I mount my H17 (hard-sector) drive, and then only READS, WRITES, etc., to and from this drive are recorded.

I also have a comment on Lee Hart's article, "A REALLY, REALLY 'CHEAP' PRINTER". I believe this is the same model printer which I purchased about a year and a half ago for roughly \$25. When it arrived I found the manufacturer's logo and model tags had been removed (the discount vendor explained that this was because it was a closeout at a very low price). I later called the vendor to find out where I could get thermal paper for it and he said, "Just go down to your local IBM supplier". I finally deduced that the printer was made by Cannon for IBM's peesee-jr. I enclosed a copy of Cannon's printer instructions for your information. [Thanks! I forwarded the instructions to Lee Hart; it is his printer he described in the review. -- ed]

One last note: While re-reading some past issues I ran across several mentions of people who had renewed their not having been credited for it. This prompted me to check my

own subscription expiration date and I found that it had happened to me also! I had sent you a \$20 cheque in September of '87, \$15 of which was to extend my subscription from April, '88 to April, '89. The remaining \$5 was to cover the cost of Vol I, Nos 1 - 7. Can you check this out when you have time?

ALLIE C LINGO, P.O. Box 118, Dierks, AR 71833-0118

[My sincere apologies for this latest goof! I had someone "helping" me update the JOURNAL's database "to learn how databases worked"! She failed to get the information into our current QUERY!2 database, and instead wrote it over the backup copy. Later I showed her how to use the QUERY!2 SORT program and she SORTed the CURRENT file, NOT the backup file! Then she copied the sorted file OVER the backup file, and--of course--that erased all updated information! This fiasco wiped out several new subscriber records as well as your data. (Another disaster: I had made duplicates of the two discs--working .dtb and backup .dtb--and thought my "helper" was using them, when in fact, she was using the originals. To this day I have not found the two duplicate discs!) I had managed to fix all the new-subscriber records, but didn't notice your renewal had gotten upsampled as well. Thanks for bringing it to my attention! Check your mailing label on this copy--you'll see it has been corrected. By the way, the "helper" had been working on a "big-computer" terminal at the huge local pizza franchiser's headquarters and "knew a lot about computers"! Guess who's going to get into my computer room, ever--not NEVER--again!? -- ed]

Dear Len,

I don't know if you've used EDIT-19 or not. I do, and I have found an annoying quirk (bug?) in my copies. It is in string search--EDIT-19 consistently won't take the cursor to the first letter of the string. And sometimes the cursor stays in its' last-column position on new lines. It's frustrating to have it do this in the middle of a long "search-view-change" session. Once EDIT-19 starts this wierd behaviour, I can't make it go to a first letter even with repeated new search commands. I copies of EDIT-19 from two sources, one I bought from Steve Robbins, the other I got with patches so it works with HDOS 3.0. Both copies misbehave identically! I did call Steve about the problem sometime back, and he said the program should always go to the first letter of a searched-for string. Has anyone else run into this problem? I need HELP!

TERRY HALL, 516 E. Wakeman, Wheaton, IL 60187 - 312-665-4594

[Wish I could help you Terry, but I know zilch about EDIT-19. I use TXTPRO exclusively because it is simple AND WORKS. Somebody HAS to know the fix for your problem! You other readers, get in touch with Terry, REALLY QUICK! -- ed]

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LETTERS, Continued

Dear Mr. Geisler:

On October 12th, 1987, I sent you a letter and a cheque for \$15, asked to join your Society and receive the Society's JOURNAL. My cheque was cancelled, but that is the only indication I've had that you got my letter or that the Society exists. I have waited over two months for a copy of the JOURNAL or a notice that "the JOURNAL is in the mail". What's up? When can I expect a copy of the JOURNAL?

KARL G RULING, Wilkes-Barre, PA 18702

[Karl, did you read what happened to another subscriber over on page five, and HOW it happened? Your case stems from the same source! I've mailed all your back issues first class; you probably have read them all by now. To avoid this kind of problem, we've set up three complete data sets, and only I know where the backup set is! It shouldn't happen again; we apologise most sincerely. -- ed]

Dear Mr. Geisler:

Here is another source for hard-sector discs (ref: Gary Melander's letter, JOURNAL II:5)--

Lyben Computer Systems, 1050 E Maple Rd, Troy, MI 48063, phone 313-589-3440 lists the following ssdd 10-sector discs:

0015 JMScotch 744D-10 RH.....	12.50
0015 Dysan 107/1D RH.....	17.90
0017 Maxell AMH1-10M RH.....	11.50
0018 Memorex 5A11 RH.....	11.90
0019 Verbatim Datalife MD525-10 RH....	12.50

These prices are for boxes of 10 discs. And shipping is a flat \$2.50 for each order.

I have used Scotch, Memorex, and Verbatim from this supplier on my H89 for several years. Shipment has always been prompt.

I have also bought replacement ribbon cartridges for my LQ-1500 printer from Lyben.

You may be interested to know that, although I also have an HS/2248 computer, I much prefer using my H89 for the work it can handle under CP/M, PIE, Supercalc, etc. I guess I am too lazy to fathom all the intricacies of MS-DOS. This letter comes to you, courtesy of my H89 and PIE.

J D MINER, 316 S Rosedale Ave., Lima, OH 45805

PS: Can anyone explain why the price column is misaligned in the above printout, but looks ok on the screen? I used the REPEAT key to print the dots. JDM

[JD, you didn't tell us what kind of printer you used. My guess is that your printer has an "auto justification" feature which is permanently switched on, and that is why your dots are so close together. Check your printer manual and see if there is a dip switch or a printer command (or both) which lets you toggle auto-justification on or off as desired. -- ed]

Dear Len,

Just received the November (#4) issue of the JOURNAL and I noticed I still haven't received my October issue. I understand putting out the JOURNAL [single-handedly] is a very demanding task, but could you send me a duplicate of the "lost" issue? [Not MY fault this time; the Post Office did it! We mailed a replacement first class on 15-Dec-87 -- ed] Also please note my enclosed cheque for \$15 to cover the extension of my subscription for another year. [Noted & done! -- ed]

I feel the SEBHC JOURNAL and "Staunch 8/89er", by their subscription fees, should "subsidize" advertisers so as to allow them to advertise at a low cost or even free because of the small market. We must keep these suppliers going out there!

BERNARD L WALTUCK md, 1500 S Dixie Hwy #101, W Palm Beach, FL 33401

[Bernie, check this issue's Back Page. We have--since the JOURNAL's inception--offered any interested 8-bit vendor one page of FREE advertising in each edition! And the "Staunch 8/89er" is now putting into effect an inexpensive paid-ads insert for their newsletter. Don't overlook the fact that YOU are entitled to ONE FREE 250-word "want ad" insertion in every edition of our JOURNAL. We want everyone to be as well informed as possible, even though we may never do more than barely break even! We're here to HELP THE H/2 8-BIT COMMUNITY! Vendors, where IS your advertising copy? -- ed]

Dear Mr. Geisler:

What happened?! I just realised that I haven't been receiving my SEBHC JOURNAL! I did get the September '87 issue but nothing since. Can you fix this?

R G ROLFE, Rockville, MD 20853

[Bob, we first-class mailed your missing issues on 2-Jan-88, and hope you have received them by now. As I explained to two other readers--above and on page 5--a bunch of subscriber's records got wiped out, including you! You are formally back in full 8-Bit status as of this issue. Enjoy! -- ed]

Dear Editor:

Are back issues of the newsletter available?

TOM HOPPER, Woodview Accountants, Howell, MI 48843

[Yes, Tom, they are! See the order blank on our back page! Also please note, we have only three soft-cover bound sets of Vol I (#1 thru #12 @\$22.50/set) and four loose-leaf bound Vol I sets (#1-#12 @\$25/set) left in stock. Prices include packing and postage. After they are gone, that's it! Are your pen and cheque-book handy? -- ed]

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LETTERS, Continued

Dear Leonard,

Thanks for publishing my article in the October '87 SEBHC JOURNAL. [You're welcome! - ed] I have since received some favorable comments on the article.

In your November '87 issue your comments on page 12 indicate some confusion about my COPY program. I won't elaborate the details since Hank Lotz was kind enough to do this first--he got his copy of that issue before I received mine (on the West Coast).

I have enclosed a copy of my "Derby CP/M Utilities" programs and the documentation which you may keep for your own use and review. I hope this will clarify the programs [for you].

The Command Line Editor program I mentioned is finished and working on my H89. I'm still working on the documentation and a simpler installation procedure which will preclude the need for MAKEBIOS, but it still needs MOVCPHxx and SYSGEN to complete a proper installation.

WILLIAM S DERBY, P.O. Box 2041, Livermore, CA 94550

[Hey, Bill! We try our best, but sometimes things get up-screwed! In October I was pretty busy, what with a service trip to two different locations in Florida and getting stuff set up to take to CHUGCON '87 (including an almost-completed October JOURNAL edition). My mind was working ok, but there were a number of stumbling synapses telling my fingers other things when I wrote that review. Here's what I was trying to say: 'The COPY.COM program which we adapted from a listing in REMark is smaller and easier to use than PIP. When I'm stuck with very little space on a bootable disc, I leave off PIP.COM. Bill Derby's COPY utility accepts keyboard input essentially the same way our COPY program does, but it calls PIP to do the actual file transfer. Our program does the work, so we don't need PIP for straightforward file transfers.' Is that clearer now? And thanks for the disc of utilities. I'll be checking it out and trying to write a follow-up review, Real Soon Now. -- ed]

Dear Mr. Geisler:

Thank you for sending me the last three issues of the SEBHC JOURNAL; I enjoyed reading them. My order and cheque are enclosed for the bound Vol I set, issues 1 and 2 of Vol II and both your program discs.

I've also enclosed a copy of MICROTheater, a newsletter published by myself and Lewis Louraine, with help from Margaret Dillon and Richard Gamble. We publish only six times a year. I can appreciate the amount of work you must do to get out a longer newsletter--twice as often. And we have about half as many subscribers as the SEBHC JOURNAL. I am quite interested to read how you are formatting your text and creating the graphics with your H8.

[If you like, please tell your readers about US Computer Supply I mentioned] in the 2nd column of my article in MICROTheater. When I last talked to a salesperson at US

Computer, they still had several hundred [hard-sector] discs in stock. I've no idea what the demand is for them, so I don't know how long the supply will last.

Their address is: US COMPUTER SUPPLY, 511-104 Encinitas Blvd., Encinitas, CA 92024-9890; phone US toll-free, 800-992-1992; CALIF., 800-992-1993; foreign, 619-942-9998.

KARL G RULING, 83 Lawrence Street, Wilkes-Barre, PA 18702

[By now you know why you got three issues of the JOURNAL in a lump! Thanks for your order; it's on its way. The sample copy of your newsletter looks quite professional--I like it! Our three-hundred-plus readers like to know of other sources for hard-sector discs, so your mention of US Computer is most helpful. Look through the bound set of Volume I; there are some fairly detailed stories about the techniques we developed to put together JOURNAL editions. Compared with your newsletter, ours looks pretty crude (I assume you have access to some fairly expensive type-setting equipment), but we try to make each edition look better than its' predecessor. Also, we are at the mercy of our local copy shop's sometimes inexperienced personnel (this IS a college town), and that often affects the appearance of our final product. Some Day we expect to be able to get our own copy machine; things will then look much better! -- ed]

Dear Len,

Hope things are thawing out up your way by the time you receive this. [Nope! - ed] I lived in Ypsilanti when I was eight years old (47 years ago) and still remember playing in the snow on a frozen lake. Here in Mt. Whitney's shadow (14,495 feet) at 3700 feet up on the East side of the Sierra Nevada we get cold temperatures and snow, but seldom as severe as your recent storms.

Although circumstances have forced me to move to the pee-see world (boo, hiss!), I very much appreciate what you are doing, and the opportunity to reach 8-bit users. Your newsletter has helped me place my unused H8/H89 equipment and software in the hands of people who can benefit [from it] rather than have it sit idle or ????

My cheque and subscription renewal order is enclosed for another year of the SEBHC JOURNAL in recognition of the help it has provided.

I have also enclosed an ad to dispose of my remaining 8-bit hardware and software. I know it is larger than your 250-word maximum, but maybe you can treat it as a "vendor" ad? Best wishes for 1988 --

DON M DECK, P.O. Box 1240, Lone Pine, CA 93545

[Thanks for the kind words and cheque. But Don, why abandon ALL your 8-bit machines? Many readers have a stable-full of 16-bit whizzeroos but they still keep and use a reliable H/Z 8-bit machine for software development. But--sigh--it's your decision. Your ad is elsewhere in this issue. -- ed]

SEBHC JOURNAL

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LETTERS, Continued

Dear Len,

Enclosed is a copy of a letter that I mailed to TMSI on 16-Oct-87, to which I have received no response.

This type of treatment is becoming more and more typical of the small vendors who are dealing with eight-bit users. And it will cause me to leave the eight-bit world much sooner than the H-8's limitations will. (I've had problems with other vendors, but have managed to solve them on my own.)

I think that those of us who are being ripped [off] by TMSI would like you to print the State of Michigan Attorney General's address and phone number so that we can attempt to recoup our losses through that avenue.

I also plan to contact the Postmaster General's office and see if a postal fraud complaint is in order.

Please print both of these letters as a warning to others who might wish to order from TMSI.

If TMSI [ever] gets their act back together, let us know.

JOHN G McFARLANE, 503 Diablo Street, Rockport, WA 98283

Monday, 16-Oct-87

T.M.S.I.

Gentlemen:

On 5-Oct-87 I mailed an order to you for your SUPERSET, SUPERFONT and SUPERCLOCK for the Heath H-19 terminal. Included with the order was my personal check #5124 for \$109.85. You cashed the check on 14-Oct-87 and it cleared my bank on 16-Oct-87. So far I have paid for three long distance phone calls to your recording machine which will not accept a message. I have received no chip sets nor any message that any are forthcoming.

I trust that you will look into this matter and take care of it before 1-Dec-87.

/s/John G McFarlane

[Ok, John, here are your letters--as you requested. We received them on 15-Jan-88. The evening of 17-Jan-88, I contacted Lee Hart (TMSI) by phone about your problem. He told me (for publication): "My part-time office worker received your order and cheque and deposited the cheque on the date you indicated. Because my office worker was quitting TMSI, and I was in the process of moving TMSI's business from Ann Arbor to Kalamazoo, vital business records were not always in my control. I didn't find out about your problem until today when Mr. Geisler phoned me." Mr. Hart went on to say that he couldn't promise to fill your order expeditiously, "because I do not physically have Mr. McFarlane's order, only my former business partner, together with my former part-time office worker know anything about its whereabouts. And they are not communicating with me, but I am in communication with my lawyer!" To get another view of your problem I contacted Mr. Hart's former business partner,

explained everything to him, and found out that the partner had turned over all of TMSI's business records for October and November, 1987 which he had gotten from the former part-time office worker to Mr. Hart earlier in the week of January 10, 1988. I presume that your order should be taken care of in due course. I suggest that you write Mr. Lee A Hart/TMSI directly for more information--His new address is: 430 W Walnut Street, Kalamazoo, MI 49007. You may be able get in touch with him by telephone on weekends, or between 3 and 5pm weekdays at 616-342-4956. And here is the other information you asked for: Michigan State Attorney General Frank Kelly, 535 West Ottawa, Lansing, Mich., 48933, phone 517-373-1110. Good luck! -- ed]

Dear Len,

The "beep-beep" of my '89 when I turn its' power on is always music to my ears. In effect, my '89 is greeting me, saying, "Hi! Everything's fine with me; what can I do for you today?"

It's somewhat sickening to hear only one "beep" instead of two. My '89 is then saying, "Sorry, I have problems--not much I can do for you; what can you do for me?" You try to boot, but the '89 can't cooperate.

Often the solution to this one-beep problem is fairly simple--either the bridge rectifier (BR-1) has failed or one of the contacts in the power-supply connector has become resistive, or has opened. I have two '89s and the bridge rectifier went bad in both of them. Neither computer had any add-ons drawing extra current, other than a 16-k memory expansion board.

Much has been written about the solution of this problem, including rewiring of the power-supply to bypass the trouble prone connector and installation of a beefier bridge rectifier (a Radio Shack 25amp-50piv). Heath recognised the poor design in wiring and modified the '89A at the power-supply [p-c] board. Although the power-supply voltage regulators have been mentioned as causing problems, I've not had any so far, probably because of minimal current draw.

As bad as one "beep" makes you feel, no beep at all is worse. Now you may have really serious problems. I recently had this happen to me, and am passing my experience along to you and your readers.

On power-up, there was no video. The CRT filament wasn't glowing, indicating the probability there were no horizontal sync pulse coming from the terminal logic board. (CRT filament voltage is supplied by a winding on the horizontal fly-back transformer.)

The terminal logic board (TLB) gets 5-volt power from the bridge rectifier d-c output by way of five different connectors (P103-2, P102-3, P514-6, P515-6, and P401-6). It passes through the power-supply board for filtering by two electrolytic capacitors. Checking for voltage entering the board I found a substantial voltage drop--almost no +5-v d-c was measurable coming from either 5-volt regulator. It appeared the rectifier wasn't getting a-c input.

LETTERS, Concluded -- WANT ADS

The fix for this was simple. I spliced a length of wire to the red wire entering the p-c board at P401-6 and connected it directly to the bridge rectifier terminal, thus bypassing four of the 5 connectors. Additionally, I improved the contacts at P103-4 and P103-2 to assure filtering by the electrolytics--essentially duplicating the double ground connectors Heath had put on each board. I can only presume Heath did it to ensure proper filtering but they did it only for the negative circuit return!

After completing these repairs I turned my '89 back on. It responded with its' usual cheery "beep-beep" and the "H:" prompt came on screen.

Considering how many years H/289s have been around, I believe the unreliable connector contacts problem will quite likely occur with all un-modified '89/'90 power supplies. [The H/288s also! And they had no heat sinks and radiators for rectifiers and regulators! -- ed] The original connector pins slowly lose strength and temper due to high currents passing through them. Also they are tin-plated, so corrosion eventually builds up and the connector simply cooks itself to death. One may periodically rock the connectors. This burnishes some corrosion byproducts away, also using TV tuner clean on them helps. Probably the best solution is to replace all connectors with higher-quality types. The second best is to hard wire around the higher-current paths.

The '89 remains as one of the wonders of the computer age because of the amount of documentation and manuals supplied with it by Heath Company. Additionally, there is a vast wealth of user-originated literature and software still available for this durable machine which makes it unequalled for personal use. Do you wonder why I prefer it to any of the newer machines on the market? I can understand why the commercial users need machines with greater memory requirements to meet the demands of MS-DOS or OS-2/3, but for me, nothing beats my '89 working with CP/M. I have no need for memory in excess of 64k.

My congratulations to you for the good work to keep this venerable machine perking along. It truly deserves the effort. I look forward to each issue of the SEBHC JOURNAL (I finally did get the October and November issues I wrote you about). And I am patiently waiting for the December issue.

ANTHONY P MUSNICK, P.O. Box 136, Broomall, PA 19008

PS: Recently bought a used 10-meg 8-bit hard disc containing two disc drives, each 5-meg. Works beautifully w/o any problem thus far. Unfortunately no instructions came with it. It was manufactured by American Computer and Telecommunications Co. (ACT), but I cannot locate this firm. Our local HUG, public library's Thomas Register, and Heath Company have all been unable to help. I'm worried that Murphy's Law will eventually have its' way with it, and I'll not be able to have it repaired. If you or your readers know of a source for manuals, schematics, or the present location of ACT, please let me know! /s/APM

[Thanks for your detailed letter, Tony! You other readers, please help Tony in his quest to locate either ACT manuals, schematics or other technical data for his hard-disc setup. His address is given above. -- ed]

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WANTED, Preferably Alive:

New or used CDR Super RAM-89 RAM disc. Write or phone JOE CARUNA, 322 Molasses Lane, Mount Pleasant, SC 29464 803-881-0576 office, 803-881-1218 residence. Cash Reward offered.

=====

FOR SALE, H89/H1000:

This is an H89A with the TMSI H1000 CPU board installed. The original H89A CPU board is included for backup or to revert to the original configuration. The TMSI H1000 gives you 2 or 4 MHz operation and 256K of ram that can be used as a ram disk under 8 bit CP/M or HDOS. In addition to the Z80 processor the H1000 has an 8086 processor. Software is provided that will allow you to run CP/M86 and MS-DOS operating systems and software. I have had limited success using the 8086 side but the Z80 side works fine. All software provided by TMSI is included for CP/M86 and MSDOS 2.11. On the Z80 sided, software to run under CP/M-80 or HDOS is included.

The system includes a real time clock, three port serial card, hard sector controller (H17), soft sector controller (H37), two internal 80trk 96tpi dsdd drives hooked to the soft sector controller. Externally in an H17 three drive cabinet is a 40trk dsdd 48tpi drive hooked to the soft sector controller, a 40trk ssdd drive and an 80trk dsdd drive hooked to the hard sector controller. Gives you all sorts of storage and flexibility.

The machine also has a Watzman ROM from HUG, keyboard repeat circuit, upgraded power supply and is in top operating condition. All schematics, manuals, and miscellaneous included. Any software not otherwise sold will be thrown in with the deal.

Asking \$500 plus shipping for the complete package. Will consider all offers.

DON M DECK, P.O. Box 1240, Lone Pine, CA 93545, 619-876-4217

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CP/M SOFTWARE FOR SALE

CP/M Utilities -- Miscellaneous disk from ??	\$ 5
Microsoft Basic Compiler (CP/M) as sold by Heath	\$35
Individual Learning Course in CP/M by Heath	\$25
DISAS Disassembler by Jin Teixeira (SoftShop)	\$10

[Continued overpage]

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WANT ADS -- DISC-DRIVE REPAIR

DDEU Disk Dump/Edit program, HUG 885-1225	\$15
Fast Eddy & Big Eddy Text Processor, HUG 885-801	\$10
UVMAC Macro Assembler V2.3 (8080 & Z80) Software Toolwks	\$25
KEYMAP Function Key Mapper, HUG 885-1225	\$10
8080 to 8086 Source Code Translator (Digital Research)	\$15

HDOS SOFTWARE FOR SALE

AUTOSCRIBE Word Processor modified to run under HDOS 2.0 (Includes Mailmerge program in BASIC)	\$35
Microsoft Basic Compiler (HDOS) as sold by Heath	\$35
LPH14.DVD - H14 Printer Driver by T&E Associates	\$10
LABELER DATABASE (1984) by Viking Software-very flexible	\$25
EDGE Text Editor/Generator, HUG 885-1022	\$10
SE Screen Editor, HUG 885-8001	\$10
EDIT19 V2 Line Editor by Steven & Kay Robins	\$10
TEXTSET V1.4 Text Processor for Diablo Printer or compatible, HUG 885-8015	\$10
ZLYNK Communications (Modem) Dale Lamm/Software Wizardry	\$25
REACH-II Communications (Modem) by Software Toolworks	\$25
MAPLE 2.0.8 Communications (Modem) W Parke, HUG 885-8005	\$25
SMALL C Compiler, HUG 885-1134	\$15
C/80 Compiler with Math-Pac V3.1 by Software Toolworks	\$35
AZTEC C-II Compiler V1.04, MANX	\$25
CATALOG-MASTER Disk Cataloger by Generic Software	\$15

Above asking prices are postpaid for each item. If you combine several items, take 20% off the total. I'll send you the whole bunch postpaid for \$250. I'll consider any reasonable offer.

Includes original documentation as provided on disk or paper.

DON M DECK, P.O. Box 1240, Lone Pine, CA 93545, 619-876-4217

SPECIAL NOTICE TO ALL CORRESPONDANTS

The READER'S LETTERS feature is provided as an open forum for the free exchange of H/Z 8-bit computer information between all subscribers and readers of the SEBHC JOURNAL. We ask all correspondants to keep their letters reasonably concise and preferably around 250 words maximum length (about six screens, 24 lines/screen of ASCII text). The JOURNAL shall exercise its' right to condense letters exceeding this recommended maximum unless that might destroy their intent or meaning. In such cases we shall contact the writer.

The SEBHC JOURNAL RESERVES THE RIGHT TO REFUSE TO PRINT any letter containing profanity, derogatory racist, or sexist remarks, specific political or libelous statements of any nature directed toward any individual or organisation. The JOURNAL will not knowingly publish malicious fabrications, lies, or distortions of fact, but will take appropriate legal action against any individual(s) uttering them.

How NOT to Fix Delicate, Expensive Equipment
by
Lee Hart
530 W Walnut St.
Kalamazoo, MI 49007

A few years back my company (TMSI) purchased a #0\$%*!^)! Heath H47 8-inch disk drive. For those lucky souls unfamiliar with the beast, the H47 contains two Remex 8" double density, double sided drives in a cabinet bigger and heavier than the H89 itself. It provides relatively fast, quiet access to 1.2 megabytes of data on each drive, and reads industry-standard IBM 3740 format eight-inch disks. .when it works, that is!

Ours never did work properly. Failure to Boot... BDOS errors... Random disk crashes... Heads falling off... Disks which one drive could read, but not the other... Ad nauseum! It went back to Heath four times, to two different stores, and had at least 3 different drives in it without success. We tried Servi-Tech in Chicago (an authorized Remex repair center), with equally-dismal results.

Glen Roberts--our programmer--finally refused to work with the damned thing any more. We gave up; no support, no manuals, no hope. The H47 was reassigned as a desk anchor (to keep the desk from floating away in case of gravity failure). The world switched to 5-1/4" disks. Years passed...

Then Murphy thought of a wonderful joke; I wound up needing to read some data on eight-inch disks, and had nothing but the cursed H47. I resolved to either cure it or kill it (if I couldn't fix it, at least I would have fun trying).

There are advantages to electronic necrophilia; it's dead already, so you can't hurt it any more. Plus, our H47 had been depreciated to zero; I could do things you'd never dream of doing to a expensive, new unit. Bob Gunderson of Gunderson Equipment Co. had graciously supplied me with a Remex service manual. So I warmed up my chain saw and began work on the monster...

Of the H47's two Remex drives one is the "master", which is both an eight-inch disk drive, and a soft-sector disk controller. The other drive is a "slave". It turns out to be an ordinary eight-inch drive, but with non-standard pinouts and cables. The drives are made entirely of plastic and bent sheet metal. This is amazingly shoddy; even the cheapest 5-1/4-inch drives have a diecast metal chassis which provides excellent dimensional stability.

Initially, only the master drive worked. It would format, read, and write its own disks OK, but made frequent BDOS errors when reading other eight-inch disks. If a disk

DISC DRIVE REPAIR -- MISC.

had been formatted on another drive, writing to it with the H47 would trash the disk--a good indication of alignment problems.

I disassembled the cabinet (top, left side, and front), so the drive was completely exposed. Then I found that it worked better lying on its side, especially if I "stressed" the frame by twisting it with my hands. Aha!! I remounted the drive, but with washers under various corners and wound up with a 1/8-inch thick washer under the front right corner. When I tightened the mounting screws it produced a "calibrated twist" in the drive's chassis. Surprise! The read/write errors were gone.

Now for the slave. The motor ran, but the head would never select or load. In fact, I got the same error message regardless of whether the drive was plugged in or not. Hmm; the manual said the slave interfacing with the master drive is handled by three ICs. At random I selected one and replaced it--724, a 74LS373. It worked on the first try! Could I have beaten Murphy so easily?

Not quite. The slave only worked single-sided. Moreover, it made odd little "shuff-shuff" noises as the disk turned. I pulled out the disk. "Horrors!" I exclaimed, "It's scraping the oxide right off!" The second side head had broken free, and was hanging by its leads.

The head itself was undamaged. But it was mounted in a tiny set of springs that let it "rock and roll" to stay in intimate contact with the disk. In operation, the disk is pinched between a fixed head and a "floating" head, which also serves as a pressure pad, and the floating head's springs had broken in two places.

First I soldered a piece of #30 wire-wrap wire across the broken springs. This remounted the head, but the solder was so stiff that the head could no longer conform to the disk. So I removed three screws which mounted the head assembly to the arm and replaced them with 3 little pads of silicone rubber stickum. I closed the door with a disk in the drive, and let the silicone to cure overnight.

Sure enough, it worked. The slave works fine as a single-sided drive. It works double-sided too, but only if a disk is formatted in it. The second head was hopelessly out of alignment, much too far for my washer-torque trick.

I had discovered a "bug" in Ray Livingston's last version of BIOS-80. When you build BIOS-80 for an H17/H47 system, H47 read errors never time out; they retry forever. Remembering how Ray's BIOS-80 bug acted on a normal drive, I tried formatting a double-sided disk in my master drive, and reading it with his FINDBAD program in the slave. FINDBAD tries to read every track on a disk consecutively, so it

went into an infinite loop trying to read track 0 side 2. I experimentally loosened the head alignment screws and gingerly wiggled the head around. Then I hit the right spot and FINDBAD printed "*" for "good track" and stepped to the next track. Ah-ha!!

The head position is incredibly touchy, and gets worse the farther into the disk you go. Just when you think you've got it and tighten the screws, the flimsy plastic "gives" and shifts the head out of position. I wound up tightening the screws most of the way, and then lightly tapped on the head assembly with a screwdriver to move it ever so slightly. Considering that there are three degrees of freedom (left-right, in-out, and rotation), I had hours of "fun"! But my perseverance finally paid off for I now have a working, two-drive H47.

If you need to fix a disk drive in the WORST way, this is it. It's disgustingly-crude, vulgar, cheap, and the H47 has never worked better! My only regret is that it cheated me out of my fondest dream, that is, tossing the H47 off the top of a very high building!

=====

... WANT AD... WANT AD... WANT AD... WANT AD... WANT AD

=====

FOR SALE

Item 1: H8 with Trionyx motherboard, Z-H8 CPU board. M-H8-/B 64k memory board, C-H8 disc controller board and Heath H8-4 serial board. \$300

Item 2: H19A w/green screen and beefed-up power supply to support two floppy drives. \$300

Items 3 - 5: H8-17 disc controller board, \$25. Two 8k Heath static RAM boards, \$10 ea. H8-5 Cassette board, \$5. Heath H8 motherboard, \$5.

Willing to negotiate. JARED FREEMAN, 600 Ginger Trail, Lake Zurich, IL 60047, 312-435-0513 after 6pm Central Time.

=====

HTEN UP! LIGHTEN UP! LIGHTEN UP! LIGHTEN UP! LIGHTEN UP!

=====

* Davy: "This dog of mine is a police dog." Danny: "He doesn't look like a police dog." Davy: "I know. He's in the secret service."

* Dora: "Charlie says he's going to marry the prettiest girl in town." Nora: "Why the very idea! I don't even know him!"

First soldier: "What're you in the brig for?" 2nd soldier: "I was assigned to the officer's party. The captain told me to stand at the door and call the officers names."

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PORTABLE CP/M COMPILER -- Part 5

Confessions of a Game Hacker

by

Tim Brengle

FINITE STATE MACHINES

Imagine, if you will, a small and not-very-intelligent robot. Its entire world consists of two rooms, called A and B, and a parking place. Both rooms have switches on the wall which control overhead light fixtures. Suppose that we want the robot to make sure that all the lights are turned off at, say, midnight. Consider the following "program":

1. Is it before midnight?
If yes, go back to step 1.
If no, move to room A and go on to step 2.
2. Is the light on?
If yes, turn the light off,
move to room B, and go on to step 3.
If no, move to room B and go on to step 3.
3. Is the light on?
If yes, turn the light off,
move to parking place, go on to step 1.
If no, move to parking place, go on to step 1.

If our little robot friend follows the directions, all the lights will be off shortly after midnight.

Considering this section's title, you might suspect that the above example has something with finite state machines. Then again, if you knew me better, you might suspect that I threw it in just to confuse things. The first guess is the better one. It is a little finite state machine. Why are these things important? What are they anyway?

Let's look at the name for a moment. The word "state" does not refer to one of the component parts of our country, but rather to a "state of being". Each one of the steps in our little example is a state. It is intended that our little robot is working on some one of those steps at all times, that it only is working on one of them at a time, and that it is never working on anything else. Precisely, the robot is "in" (or "working on") EXACTLY one of those states.

The word "finite" is used to say that there must not be an unbounded number of states in the specification. That keeps things from getting too complex.

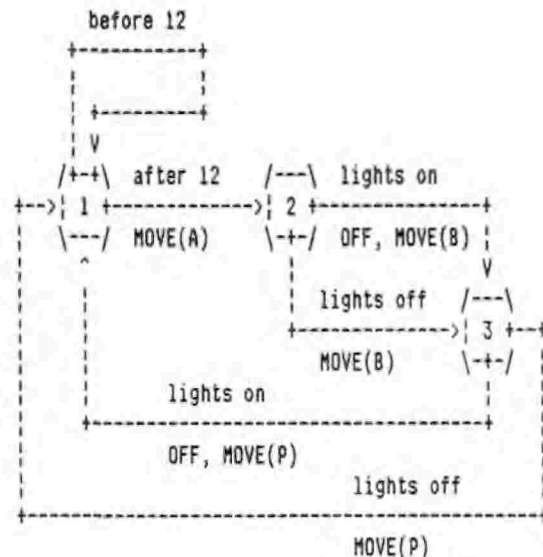
The word "machine" really should be "automaton" (as in "Automata Theory"--a branch of computer science), but that has too many syllables to say quickly. The idea is that there is some (as yet unspecified) mechanism for looking at the specification and doing the things required.

What good is such a thing?

Aside from the fact that computer scientists can prove all sorts of wonderful things about them, finite state machines are a very powerful programming tool. Although not all-powerful, there are a lot of problems which they can solve very elegantly and efficiently. For example, there is a class of languages for which finite state machines are particularly well suited as parsers. In fact, part of the motivation for talking about finite state machines at all, was to use one for a parser for the language defined last time.

Before we go into that, let's look at three ways of representing finite state machines. They are graphical, procedural, and tabular. We'll apply each one to our little robot example.

The first is a graphical representation. Each state is drawn as a circle which is tagged with the state name or number. The circles are connected by arrows--each arrow labeled with the conditions under which that path is taken. When there is room, it is also nice to label the arrows with any actions that are to be performed as that particular path is taken. For our robot example, we have:



The graphical form is the way that almost all my finite state machines start out. I find it the easiest to follow by hand when trying to figure out what is going on. It is too bad that no machine that I know of can execute my hand-drawn graphs. Instead, I have to resort to one of the other two representations.

The second form is purely procedural--that is, the finite state machine is described as program fragments which, when executed, perform the appropriate actions:

[GOTO next page]

COMPILER, Continued

from Page 12

```
STATE1: if (time < midnight)
        then goto STATE1
        else MOVETO(A), goto STATE2
```

```
STATE2: if (lights on)
        then TURNLIGHTSOFF
        MOVETO(B)
        goto STATE3
```

```
STATE3: if (lights on)
        then TURNLIGHTSOFF
        MOVETO(park)
        goto STATE1
```

Note how closely the pseudocode mimics the example. That is only partly by design.

The third implementation has most of the information in tables. Two tables are usually required: one for telling what state to go to next, and the other for indicating what actions are to be performed:

NEXT STATE

CURRENT STATE	BEFORE 12?	AFTER 12?	LIGHTS ON?	LIGHTS OFF?
1	1	2	x	x
2	x	x	3	3
3	x	x	1	1

ACTION

CURRENT STATE	BEFORE 12?	AFTER 12?	LIGHTS ON?	LIGHTS OFF?
1	x	A	x	x
2	x	x	OB	B
3	x	x	OP	P

Where "A" means "move to room A"
 "B" means "move to room B"
 "P" means "move to parking place"
 "O" means "turn off the lights"
 "X" means "don't do anything"

Associated with these tables is a small procedure which

interprets them:

```
loop
  do-action( ACTION[state,input] );
  state = NEXT-STATE[state,input];
endloop
```

Note that here a variable called "state" tells which state the robot is in at any given time. In the procedural example, the state of the robot is implied by the computer's program counter--that is, which instruction the computer is executing. In the graphical example, the state of the robot is identified by the circle upon which my fingertip is resting.

Now that the waters are sufficiently muddied, a question arises: Why should a programmer choose one representation over another?

The hand-drawn graph seems to me to be the obvious representation to start with. It is the easiest for humans to read and (if you write in pencil) the easiest to modify.

The procedural representation should be used where execution speed is of the essence, and memory usage is less important. I rarely use it. The programs which I typically write spend very little time executing finite state machines--at least compared to the time spent doing other things (like waiting for the user to type something). The other major drawback to the procedural implementation (other than using a lot of memory) is that it is harder to modify an existing machine than when it is expressed in tabular form.

The tabular form uses less memory than the procedural, especially for machines with LOTS of states. It does away with the repeated testing and branching code--at the cost of running slower. In fact, the tabular form is nothing but yet another interpreter. Although it is the hardest form for a human to follow, it is the easiest to modify. Basically, the little table interpreter remains the same and only the contents (or size, or both contents and size) of the arrays need change.

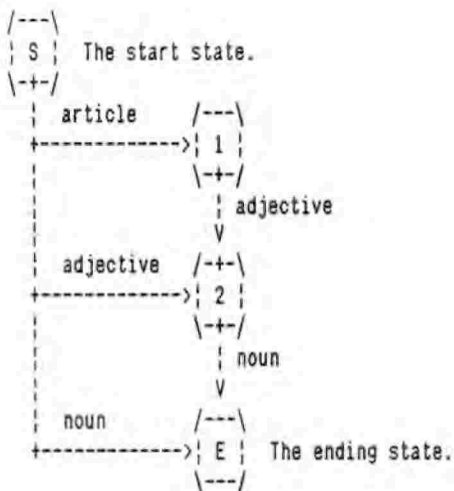
There are several other things to mention about the mechanics of finite state machines. In order to actually make one DO anything, one of the states must be identified as the start state. Also, most finite state machines will need to know when their task is done. This is handled by marking one or more of the states as final states. When the machine enters one of the final states, it stops, reports success and (usually) resets itself to its starting state.

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COMPILER Concluded - MORE Letters

So then how does one use a finite state machine as a parser? I thought you'd never ask!



That is the graph of a finite state machine to parse simple noun phrases. The arrows coming out of any state tell what to do if the next word is of the appropriate type. Implied here is that as soon as a word is used to traverse one of the arrows, another word is read so that the process can continue.

Try it on "the blue ball". You should reach the end state. The same for "the apple" and "red block". But, when you try it on "the tiny green bottle" you should end up stuck in state 2 without an arrow marked "adjective" to follow. The finite state machine will report an error whenever it finds itself in a non-final state with no arrow that it can follow. Can you see a simple way to modify this machine to handle "the tiny green bottle" correctly? What about "a large red juicy apple"?

That's all for now. Next time I will try to describe how I draw finite state machine graphs.

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RE LETTERS... MORE LETTERS... MORE LETTERS... MORE LETTERS...
=====

Dear Len:

Thank you for the kindness in sending me the December issue even though I was a bit tardy sending my renewal (enclosed). I don't want to miss a single issue of your good stuff!

I am happy to hear you are beginning to work with HDOS 3, and will be writing more about it in future issues. I am delighted with its many features, but am mainly unhappy that I can't get UD.DVD to run with it. UD.DVD is Jim Teixeira's (of SoftShop) universal device driver for HDOS, which let me have seven (!) printer drivers/configurations

under one. This is one of the main reasons I still use HDOS 2.0 for my everyday work and correspondence. If any other reader has been able to successfully run UD.DVD under HDOS 3.0, I'd love to hear about it or get a patched version. Letters to Jim Teixeira, Bill Parrott and Al Heigl haven't as yet brought any response...

TERRY HALL, 516 E Wakeman, Wheaton, IL 60187, 312-665-4594

[Hey, man, don't feel bad--I haven't yet gotten Jim's UD.DVD to work under HDOS 2.0! Let us in on whatever you do find about making it run for you (especially if you have an MX-80 or equal printer) under BOTH '2 and '3! -- ed]

Dear Len,

The cheque I sent you to renew my JOURNAL subscription was written on an LQ-800 with a program for writing single personal cheques which I hope to send you. The program is mostly menu-driven, the only typing required is for miscellaneous cheques, choices, and their amounts. Another program recalls the cheques for reconciliation. But the program needs COMMENTS. I'll get to that...someday. I believe some people may like a cheapo home-brewed cheque writer.

A Yugoslavian exchange student helped me with it several years ago. His variables letter usage isn't like ours, but he is a whiz in programming.

I've taken only a quick glance at the November issue, but I hope you'll continue with the good work! I'll keep on reading it as long as you publish!

GEORGE A DeKELVER, 6832 Corte Sonada, Pleasanton, CA 94566

[George, would you send a us copy of Cheque Writer? Surely that will make many other SEBHCers happy! -- ed]

Dear Mr. Geisler:

Here is my cheque for another year of the SEBHC JOURNAL.

I bought my two H89s because they looked as if they would do all the things I needed from a computer--and they were cheap. Now I wish I could learn to use them to do all that fancy stuff people write about in the JOURNAL.

I wonder if there is a one of the old-timers who remembers what it was like in the old days when they first got their H89, and who would like to write a tutorial column for people like me? For instance, how do you use the external disc drives with HDOS? Keep the explanation simple because I am only at the point where I can spell computer correctly two out of three times! Any simple clues will be appreciated. Keep up the good work!

WILLIAM H. ALLEN, P.O. Box 879, Anza, CA 92306-0879

[Bill, we're writing something RIGHT NOW for MANY people who bought H/289s so cheaply (abt \$50 ea) at University of Michigan's Property Disposition Office. Read it here Soon! -ed]

TUTORIAL in "C" -- Part 4

C the Light
by
Darrell Pelan

This month we will look at using C/80 with M80 and L80. Writing modular code is the only way to go. The biggest advantage is the speed you can code and debug programs. Each module can be separately developed and then linked with L80 to generate the '.COM' file to test it. The compiler and assembler only have to work with the small section of code you are working on. This saves an incredible amount of time.

An additional advantage is that you can create a library of REL files containing all your most used modules. This could include code for terminal control used by several of your programs. This library can be selectively linked with the program you are working with by using the /s switch in L80.

I use a top down method for writing C programs. The main program contains the logic of what you want the program to accomplish. Lower level functions are kept in a separate file as dummy stubs. A dummy stub is function or module called by the main program. Rather than actually performing the function it always returns a no-fault value. Once the top level program is debugged, you can start working with the dummy stubs coding one function at a time. The top level program is then separately compiled and assembled. When you are ready to test a new function or section of code, the main program is linked to the code you are working with L80. You have to be careful that you don't call two programs the same thing or have two routines called "main". A sample .SUB file for use with SUBMIT is shown below:

```
c -t $1
m80 -$1.MAC
l80 $1,blast,cclib/s,$1/n/e
```

This submit file compiles and assembles the program represented by \$1 and then links it with my library and and "blast". Blast is my top level program that writes all the menus to the terminal and decides which routines to call. As modules are coded and debugged they are added to blast which is then re-compiled and assembled. Using this method, the new code is kept comparatively small, considerably reducing the time required for each compilation while debugging.

I found a slight bug in C/80. The two functions listed below should produce the same code when compiled. Test will compile and assemble correctly. Test1 compiles but generates a fatal error when assembled by M80. The problem is that C/80 marks the location of each array with a DS 0 assembler statement. It then uses a DB assembler directive to generate text for each string. In "test1" it puts the DS and DB statement for the first array on the same line. This

generates the assembler error. With C/80, for arrays like those shown below, always start the text strings on the next line. This applies to arrays of numbers also. I talked with Software Tool Works' Walt Bilofsky about this problem and learned that this only occurs when using the -t option (includes C source in with the assembly code). So my advice still applies if you are using this option.

```
test()
{
    static char *list[] = {
        "This is test 1",
        "Hello there ",
        "This is also a test",
        "This is the last test"};

    int j;

    j = 0;
    while( 1 )
    {
        printf("\nPrint which string? ");
        if( (scanf("%d", &j)) == 1 )
            if( j < 5 )
                printf("%s\n", list[ j - 1 ]);
            else
                break;
    }
}

test1()
{
    static char *list[]={ "This is test 1",
        "Hello there ",
        "This is also a test",
        "This is the last test"};

    int j;

    j = 0;
    while( 1 ) {
        printf("\nPrint which string? ");
        if( (scanf("%d", &j)) == 1 )
            if( j < 5 )
                printf("%s\n", list[ j - 1 ]);
            else
                break;
    }
}
```

[EOF]

Editor's note: This concludes "Tutorial in C". Please let us know if you liked this particular series, and if you were able to put to use anything you learned from it. It's quite possible that if enough readers let us--and author Pelan--know you liked it, we may be able to persuade him to write more "C-stuff". This series has inspired me to try my hand at C/80 which I haven't touched since buying it 3 years ago.

NOTES From Here and There

RESPECTED

COMPUTER SMYTHE

IS GONE!

COMPUTER SMYTHE, the nuts-&-bolts how-2 computerists' magazine, announced in its' December, 1987 issue (Vol. 3, No. 4) "Opinion" editorial feature, that it officially ceased publication with that edition. According to the article, subscribers with unexpired subscriptions have a choice of getting either the "Speaker Builder" or "Audio Amateur" to fill out their remaining COMPUTER SMYTHE subscription.

Editor T. Dell, Jr., stated in his farewell editorial, "My experience as an editor/publisher for over 25 years tells me that when readers do not respond or interact, the articles are either very good or very bad or that the editorial mix is not satisfying."

The quarterly publication's death enlarges the aching void created by the demise of other computer magazines such as "Popular Computing", "COMPUTE!", and "Microcomputing". The Computer Smythe's case is different from those: It failed because readers just didn't support it, not because some stiff-necked corporation executives didn't like what one of the above magazines had to say about their product or way of doing business, and so cancelled their firm's advertising contracts with the magazine.

[Us ordinary folk just have NO understanding of the "corporate mentality"! But a death is a death, no matter whose or how. We shall long mourn the loss of our friend, "The Smythe". -- ed]

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EPSON PRINTER NOTES

by Vern Mastel, "SmythBits", Computer Smythe III:4

The only way to reset an Epson printer is to turn it off and on again. This is hard on the printer, especially when doing graphics mixed with text. For about \$2 and 15 minutes, you can add a master reset switch to your Epson. You'll need a momentary NO (push-button) single-pole switch and a 330-ohm, 1/4-watt resistor. Wire the switch in series with the resistor and locate pins 16 and 31 on the printer's 36-pin Centronics connector. (Vern connected his reset switch inside his A-B printer-selector switch box.) Pressing the switch resets the printer by momentarily pulling pin 31 low (to logic zero) without causing any damage. [This works even when using the serial printer input channel. -- ed]

Most Epson FX-type printers have a hidden "gotcha": The printer's CPU is a "centipede chip" with staggered pins inserted into an I-C socket. These pins eventually work loose because of thermal cycling and can cause the printhead to fail, equalling \$175 to \$250 in repair costs. Eliminate the problem by carefully removing the chip and socket, then solder the chip's leads directly to the printed circuit board. An Epson warranty service center has confirmed this repair information is correct.

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The SEBHC JOURNAL's Back Page

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- * All advertising is printed free of charge. Vendors will please submit B&W "camera-ready" ad copy, 7" wide by 9" high (one free page/issue) no later than 15th of month in which it's scheduled to appear. All Society members are entitled to run one free--fresh--250-word Want Ad a month.
- * Subscriptions are US\$15/year in Canada, Mexico, the USA and its possessions (FOREIGN: \$25/year) and start in month following receipt of application. Please make cheques or money orders payable to L.E. Geisler. Single back-issue copies by special order--allow 5 weeks for processing.
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- * The SEBHC JOURNAL is composed, edited and published by L.E. Geisler at 895 Starwick Drive, Ann Arbor, MI 48105. Phone 313-662-0750, 9am - 6pm Eastern Time, Monday thru Friday. Off hours, try 313-769-6052 (home).

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