Saving Our HEATH Eight-Bit Machines!

SEBHU JOHBNAU

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GUESS I DIDN'T MISS THE BEG DINNER!

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CHUGCON '87 NOTES, LETTERS

At CHUGCON '87 (unlike HUGCON-VI) the SEBHC JOURNAL actually had a vendor's booth--shared with Kirk Thompson. It was the first time the JOURNAL has "officially" sold subscriptions at any HUG convention. And the JOURNAL picked up several new subscribers beside selling a satisfactory number of the "hardcover" versions of Volume 1.

Although we didn't earn the trip's costs, it was well worth the time and effort. I was lucky enough to meet a couple of our software authors, exchanged gossip with them, and compared notes about the 8-bit scene. Also met many subscribers who almost uniformly seemed pleased with our publication's gradual improvement, especially the LQ-800's printing. We were lucky enough to find a male-to-male "gender mender" at Floppy Disc Services' booth for five bucks (Heath charges about double that!) to connect our LQ-800 printer to Heather (our '89). This enabled us to print out some ad banners for the booth and helped business considerably.

Both Kirk and I did a fairly good business, but I believe he actually did better than he'd expected; he sold all his H19/'89 keyboard designator kits. I believe he also signed up several new subscribers to our "friendly competitor", The Staunch H8/H89er. He did pretty well in sales of his other (blue-compatable) keyboard designator kits also. I think Kirk's designator kits are great for those of us whose "forgetteries are better than our memories', especially when it comes to software which we don't use very often, and which has a whole bunch of "invisible" keyboard command sequences (such as PIE, etc., has) assigned to the various special-function, and key-pad keys.

Kirk Thompson found that all the CHUGCON attendees who had brought H/2 8-bit machines to sell were able to dispose of them with virtually no haggling. This proves there's still a legitimate, on-going demand for these dependable "obsolete" grey boxes!

One attendee gave us a want ad to run in this issue. (See Want Ads elsewhere in this issue.) He has (had?) sixteen Z90s currently in working condition, with software and all H/Z documentation. And he asked only \$300 apiece! Ron Rochlieu of Newline Software broght in his complete H8 outfit (hard & soft sector drives, doublesided 8° drives, H19 terminal and documents) and sold it for \$450. Somebody very lucky got a real prize!

There were a number of talks given during the convention, which neither Kirk or I were able to attend, due to having so much to do at our booth. Because vendors and users are increasing their pell-mell rush to the pee-see type machines, I don't believe we missed very much...

Although Kirk had to leave at about 3:30pm Sunday, I stayed on to partake of CHUG's "banquet"--rubber chicken and all--because I'd wanted to find out who had won our two complete SEBHC JOURNAL Volume-I door-prize sets. But Sheraton's abyssmal pee-eh?! system drove me to leave in the middle of an ZDS executive's virtually-inaudible speech. So I never did find out who the lucky recipients were. Looking back, I believe I should have left about the same time Kirk did, then I would have retained my otherwise good impression of CHUGCON '87! Well, we'll see what next year's CHUGCON brings. .

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TTERS	LETTERS	LETTERS	LETTERS	LETTERS	LETTERS

Dear Mr. Geisler,

On October 12, I ordered a copy of a hard-sectored CP/M GAME DISC #0. [Since then] I have tried to run both the ACES and WOODCUTS programs and can make no sense of either one. No documentation is contined on the disc to provide either the objectives nor commands for the games.

Running the disc under CP/M 2.02.04 and MBASIC, elaborate displays result using the 1-26 commands shown on the disc but [they] appear to have no purpose. [Do you mean ACES.BAS?] A complete listing comes up on LIST with no syntax problems.

In order to understand the games, can you provide some instructions?

ANTHONY P. MUSNICK, Broomall, PA 19008

[You're only the second (of several dozen people) who bought CP/M GAME DISC #0 who've have had trouble with it. The other buyer said she couldn't get ACES to work as a stand-alone ('.COM) file. After we informed her that it was an MBASIC program, and it had to be LOADed into resident MBASIC, everthing worked fine. Remember this: ACES.BAS is just a (WOODCUTS.BAS is a UTILITY.) When you run ACES, the game. computer takes on the personality of a World War One German fighter pilot who is trying to shoot you out of the sky. The various key-pad commands are for you to use to control your fighter plane and eventually shoot down as many of the enemy planes as possible. It isn't a very complex game, and you should be able to master it after three or four trial runs. My next-door neighbor's little boy (age 8-1/2) was able to knock down about 11 enemy planes after running the game a half-dozen times, so it shouldn't be too hard to master. WOODCUTS.BAS is possibly different than other utility programs. It does have an introduction which may possibly leave too much to the first-time user. So I'll try to make it a bit more clear for you. Suppose you want to build a fairly complex computer desk and have only one expensive piece of "furniture-grade" plywood. The first thing you do is make a rough pencil sketch of the desk, complete with dimensions. Then you letter (or number) each piece (ends, top, shelves, etc.) making sure of their dimensions. Turn on your printer, load MBASIC and run

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WOODCUTS. Enter each piece's dimensions as WOODCUTS requests, including wood grain direction. When you've entered the last item WOODCUTS will check all entries to find the best-possible, virtually scrap-free way to cut all the pieces out of your expensive four-by-eight-foot plywood. It then prints a cutting list, showing you exactly which cuts to make and their correct sequence. If WOODCUTS finds your design calls for more wood than you have, it will notify you of this before ending, but it still gives a complete (with extra plywood required) cutting guide. This is pretty nifty, for you then may substitute less-costly materials where they won't affect overall appearance of your desk. I suggest that you try WOODCUTS' ability on a piece of existing furniture you've measured and let WOODCUTS think you have one and a half 4x8-foot sheets of wood. See what it does. Of course, you'll waste a little time and paper, but this is a very good--cheap--way to learn what a handy tool WOODCUTS really is without wasting wood .- ed]

Dear Len,

I'm in need of some assistance in locating an assembly-language subroutine or a device driver so that I will be able to read from, and write to the RS-232 port at 3300 at 1200 baud from MBASIC V4.7. I have tried directly accessing port 3300 from [within] an MBASIC program but the interpreter is just too slow to accurately read the port. The other option that I've tried with little success is the [HDOS] ATH84.DVD or alternate terminal device driver. This works fine only if you send a 256-character block to the port in either direction but it does little if one wants to use an alternate terminal for one-, or two-character commands, one-, or two-word commands, or single line command with a carriage return denoting the input string's end.

This type subroutine or device driver would be the key to writing a mini-bulletin-board program for packet radio using the H/Z89, or for using a remote terminal to enter data to an MBASIC probram. Ideally it could be used to enter a data string with a <cr> denoting the string's end. Then the MBASIC program could go about its' business until more input was required. Possibly some sort of buffer arrangement might be necessary while the program was doing its' thing, or perhaps just XON-XOFF would suffice.

Now I know that there must be some way to read port 3300 from an MBASIC program on an H89 (not necessarily by compiling the program), and it is possible that yourself--or one of your subscribers--has run across this very same problem somewhere along the line. If anyone has a solution, PLEASE let me know!

By the way, I like the way the printing of the JOURNAL has improved in the Volume II issues. It's really nice to have this type of newsletter support left for the Heath B-bit machines! Keep up the good work!

WALTER J FONDA, Schenectady, NY 12306

[Responding to your last command: Yes, SIR!! Until I drop, SIR!! In connexion with your problem, I've looked through the

Continued

last eighteen issues of REMark and a few recent Sextants for some clue to solving your problem. There are a couple articles telling you how to write MBASIC-callable assembly-language routines which can be stored in the unused 4k portion of low memory which HDOS 2.0 normally locks out. It is possible that this is a workable approach, but I've not personally done anything with it. I did find one HUGger's letter about the Heath Packet Radio I/O kit, but it apparently is reserved exclusively for use with the pee-see machines. Have you contacted anyone at 73 magazine for help? Lots of Heath/Zenith computerists subscribe--as you do--to 73; maybe one of them has solved this problem ... On the other hand, I hazily remember seeing something in Radio-Electronics magazine (or was it Hands-On Electronics?) about using a modem for packet radio, or maybe it was RITY. It's too bad most of the radio hams who participated in developing the H8 and H89 are no longer with Heath Company; I'm sure most of them would have jumped at a chance to help you out--but (sigh!) them days is gone forever! Will any of you other clever & inventive SEBHC JOURNAL readers PLEASE help with Walt's problem and write it up for publication here? Real Soon ?! -- ed]

Dear Len:

Enjoyed talking with you at CHUGCON. It's a real treat to meet an H/Z 8-bit type in the flesh! I know of but only one other member of the clan here in Richmond. I eagerly look forward to receiving each issue of your JOURNAL, even though my favorite operating system (HDOS) doesn't get much of a play. [We're working on that problem, Parks!] You and Hank Lotz--with his Staunch H8/H89er--get my enthusiastic and unqualified appreciation for the job you are doing. Long live the H8 and H89!!

I've enclosed brochures for SigmaSoft and Systems' hard disc system which I've installed in my H89 (I'd told you about it at CHUGCON). This equipment is first-rate, and the documentation, although not up to Heath standard, is entirely adequate. I did have to call Clay Montgomery--their resident guru--with a couple dumb questions, but he fielded them expertly and cheerfully. In my book, Clay is one of the "good guys".

I'm looking forward to receiving my "Write-Hand Man" disc I bought from you at CHUGCON. But I was disappointed to note in the instruction book that WHM isn't compatible with PIE--conflict with function-key usage, I suppose. If I have to choose between PIE and ANYTHING, PIE wins, hands down! I have WORD-STAR, but it isn't worth the trouble to me (I'm a s-1-o-w learner!). I haven't found any job I need done--including double columns on my MPI printer--which PIE and TEXT can't handle (although double columns require two passes through the printer).

Best wishes for your continued success and growth!

PARKS WATSON, Richmond, VA 23221

[Checked our database and you're not there; SUBSCRIBE man! About Write-Hand Man and PIE--TMSI's Lee Hart has modified WHMT

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so that it works correctly with Newline Software's TEXT PROcessor. You can't use the special function keys, but there is a list of some WordStar-like control codes in the WHM manual which permit one to run WHMT and TEXT PRO without conflict. I've tried these on both my systems (H8 and SuperH89) and haven't yet had a major complaint (other than the usual "operator malfunctions"). Perhaps you might try using the WStype control codes with PIE; it may work ... Now in connexion with two-column printing--get a copy of COLUMNS from Roy Lipscomb at Logics Associates, 1433 W Thome, Chicago, IL 60660-phone 312-274-0531, it will save you from having to run copy through your printer twice! (And you won't have to worry about getting the paper aligned correct on the second run!) I got an evaluation copy from them several months back and learned to use it with only 45-minutes' practice time! Before COLUMNS, I used either Lindley System's HDOS Epson printer driver or Skycastle Products' CALLIGRAPHY-II graphics print formatter to generate two-column printing text files for the JOURNAL. (See my writeup in Vol I:6, p2.) It usually took a full work day--not counting time lost because of my stupid errors--to generate only one page of 2-column text (more if I included graphics). With COLUMNS, I now generate a two-column text file in about five minutes! Graphics I do with Calligraphy-II, printing them out before resetting the printer and sending condensed (132 chars/line) text to it. I think COLUMNS costs about \$29, but call Roy before you order it! By the way, I've condensed the SignaSoft brochures you sent and put them elsewhere in the issue; have to keep our readers fully informed, right ?! -- ed]

Sir:

Here's my renewal for SEBHC JOURNAL. I'm Charter Member 15 and don't want to miss an issue!

Same data as before, except that I now have THREE '89s and a '100. Have run into a problem about which you might advise readers [who are] trying to reclaim junked parts. Seems many dip switches are assembled 180 degrees out of phase. Check for continuity [before installing a recycled switch] to be absolutely safe.

MARION R DAVIDSON, Battle Creek, MI 49017

[You bet we'll check 'em! I've run into similar problems with other parts, such as diodes with the band on the wrong end or other nasty surprises such as NO polarity marks on electrolytic capacitors, etc. Thanks for the advice. Now that you have a '100, are you going to write something for us about how you run your 8-bit software on it? Since ZDS and Heath have now abandoned the H/Z100 models, we may be getting more multiple-model H/Z users joining our ranks, and we don't want to see them left dangling like us 8-bit users were. Keep US informed so we're able to keep YOU informed! -- ed]

Dear Mr. Geisler:

I believe your CP/M Games Disc #0 is worth its' asking

Continued

price, so please send me a hard-sector copy.

Since it's Veteran's Day and I managed to get a couple hours to myself to catch up on a few things, I decided to share some newfound knowledge with you.

You mentioned in one of your issues the scarcity of hardsectored diskettes. It's almost impossible to find them in computer stores, and when you do find them, they want between \$19 and \$30 for a box of 10. I found a decent mail-order source selling double-sided/double-density/10 hard-sectored discs for \$8.20 a box: GREEN TREE Computer Supplies, P.O. Box 249, 11 Osage Road, Rockaway, New Jersey 07866. Their phone numbers are 201-627-9472 and B00-367-2897. I bought their Dennison Carter's Elephant #6, but they also sell Wabash for \$9.90 a box.

I recently purchased two worthwhile software items from P/N 885-1226: CP/M UTILITIES by PS (Remark Issue 38), HUG. and P/N 885-1230: CP/M KEYMAP (Remark Issue 42). You mentioned the CP/M Utilities disk in one of your recent Journals; the disk labeling program and directory programs are outstanding. What's really neat is that after putting volume numbers and labels on all your CP/M disks with "DISKID," you can produce hardcopy directories with "PDIR." This provides for an excellent way of organizing all your program and data files with a catalogue. I think it would be possible, and someday I may find the time, to modify the programs somewhat to produce a database on disk of all disks and their contents, allowing for cross-indexing. Speaking of cross-indexing, there is a HUG disk for HDOS providing this capability (P/N 885-1044).

I bought KEYMAP primarily to use with WORDSTAR. I use the non-Heath version 3.3 of WORDSTAR and found it cumbersome to use compared with the MS-DOS version I use at work. Cursor control was my main complaint--having to use Control-E for line up instead of simply using the up-arrow on the H19 keypad. KEYMAP solved this problem. The disk comes with a version of KEYMAP tailored for WORDSTAR, but I personally didn't like its setup; I found it very easy to configure my own following the KEYMAP directions.

Now I use my keypad keys to move the cursor anywhere in the document. I have the function-keys setup to do things such as SAVE, mark text, toggle bold and underline, center text, etc. In fact, each of the keypad and function keys can have two functions, a normal and shifted function. You can map up to 35 functions this way. It also provides for a 25th line on the screen to identify the function keys. I feel that Keymap was one of my better \$20 investments for my H8.

Now I have some questions. Is there a way, in Assembly Language to load one program from another? Or, I remember reading something about an AUTOEXEC equivalent being worked on for CP/M - any word on that? SUBMIT is a little to cumbersome for my purposes.

I now have two printers connected to my computer. Since I had an extra serial port that it made no sense to go buy an A/8 switch. I have my H14 on port 3200 and my letter quality printer on 3400. This works fine as long as I boot with the properly-configured disk for the printer I want to use. What's

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LETTERS,

needed is a way to dynamically change the LST device's handshake lines, port number, and baud rate. The baud rate can be changed by SETLP, but that's not a big help.

I did manage to solve the problem on my WORDSTAR application disk since WORDSTAR is pretty flexible in the printer department. I configured two versions of WORDSTAR. If I want draft quality, I call in WS-DRAFT which uses my LST device configured for port 320 for the H14. If I want letter quality, I call in WS which uses the TTY device configured for port 340 and utilizes WORDSTAR'S XON/XOFF protocol to talk to my Typewriter/LQ printer.

I wish CP/M had a built-in XON/XOFF protocol. By using the TTY driver in conjunction with WORDSTAR'S XON/XOFF protocol, I can set the baud rate at 9600 and not worry about losing characters. I once tried using the TTY driver outside WORDSTAR and overran my printer's 8k buffer in a hurry!

I'd also like to step my H8 system up to a Z80 processor and WH8-37 controller but prices are prohibitive. If any subscriber knows of someone who got on the PC bandwagon after upgrading their H8 with one of these cards, we might be able to strike a deal. I recently heard in WORDSTAR NEWS that Zilog now produces a Z280 chip which will run 8080 and Z80 code and will directly address up to one Megabyte--I'm searching for more information on that.

GARY S MELANDER, Virginia Beach, VA 23452

[Gary, I'm sending you a Zerox copy of Pat Swayne's old Kilobaud/Microcomputing article on how to piggy-back a 280 chip onto your H8's CPU card. My H8 has this modification installed and has run for three years without problems. If any members have information on setting up the piggy-back modified CPU and the Orig-Zero card switches so I can use the H8-37 soft-sector controller, please, PLEASE send details! About printer output: I vaguely remember an article which told how to switch ports from within MBASIC programs with PEEK and POKE statements, but where did I see it? MANY thanks for your welcome news about additional sources of 10-sectored discs!! Lyben Computer Supplies, 1050 E Maple Rd, Troy, MI 418083, phone 313-589-3440) has hard-sector floppies at similar prices, but they may dry up and blow away soon. GAME DISC #0 will have arrived long before you read this! Please check it out and let me know what you think of it as I've put some extra stuff If you think they're worthwhile, we'll add them to on it. future discs GD#0 issues. Your correspondence disc is coming back to you with a review copy of a BHBASIC Adventure-type game (MONSTERS.BAS) I copied and extensively modified from an old BYTE. Let me know how the game runs for you, and if you like it we'll add it to the HDOS CARE Package disc. We have several other BHBASIC programs kicking around. And you other readers, please let us know if you think we should add BHBASIC items to our HDOS disc(s). -- ed]

Dear Lenny,

Thought I'd write a general letter to bring you up to date,

Continued

ask a few questions and maybe gripe a little.

First, how is Charlie [my brother -- ed] doing with his '90 and H25 printer? I've not heard from him since he was at my place with his computer. We had a very nice session and he left me his address so I can pop in on him if I ever get to Sarasota. He was going to buy and install the FINA chip set in his H25, and I'm curious as to how it worked out.

Next, this really where I feel bad. I know you told me Lee Hart wouldn't let me fall through the cracks on the MS-DOS package which I ordered from him (as TMSI's president) in July of 1986. But I honestly do feel that I am having trouble, keeping my balance and not falling through. This hurts!

I called TMSI and talked with his part-time office girl, asking her for some information on my order's status. She said she would talk with Lee (who had just moved his operation to Kalamazoo, Michigan, I understand) and get back the first of the following week. As I write this (14-Nov-87), nobody from TMSI has called back!

So I now appeal to you as the only person who can get any answers for me on some things, this being one of them. I want very much to find out WHEN--IF EVER--THSI is going to ship MS-DOS to me. This is really important to me because of things that I want to do down the road with some MS-DOS programs that I can readily get. I'm rather unhappy, and feel Lee Hart isn't quite being fair to me.

I wrote to Hank Lotz (STAUNCH) and told him how pleased I was with TMSI's H-1000 and H37 soft sector boards. I asked him to publish my letter and assume that he will. Also wrote to Kirk Thompson with the same praise. Kirk wanted to know what I thought of the H37 board.

Also how about sending me a copy of Kirk's QUERY!3 program? I have Query!3 in CP/M, and Query!2 in HDDS, and would like to try his program on them.

Currently I have two disks from you--Ace of Aces (a great game), and one with HDOS utilities on it. Are there any others? I try to keep up with everything from the SEBHC JOURNAL...

Now the biggie. I've bought these packages very cheaply: ZDOS Ver. 1; CP/M-B5; Condor FMS; Multiplan; ZBASIC; BASIC-80; MS-DOS Ver 2. All of these are for the Z-100. Could you find out from [TMSI's] Lee Hart how I to bring these up on the H-1000? And do you have his new phone number? Whenever I ask him a technical question, he's always right there with an answer.

My check for \$15.00 is enclosed. Please renew my subscription. I think the JOURNAL is a fine publication and has helped me a great deal. Sure would like to see some tutorials on assembly language as I really would like to start programming in it.

JIM FRANK, Kissimmee, FL 32743

[Thanks for getting in touch with us. Charlie isn't phoning me from Sarasota so much these days--guess he's getting accustomed to using the H25 FINA font chip set. I do like the way

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LETTERS, Concluded

your new printer works. It must be a 24-pin type from the way the letter looks. About your TMSI problem: As you said, Lee moved his operation to Kalamazoo. Seems to have been a much more complex job than just throwing a few items into his van and trundling off down the highway. I finally got his new office phone number in Kalamazoo--616-345-2960--which rings endlessly. When Lee gets around to answering his phone, I'll TRY to have him contact you directly about your non-delivery problem. (If you're in a big hurry, try writing him at his new residence, 530 W. Walnut, Kalamazoo, MI 49007.) I understand that his part-time office girl quit the day after you'd called; that may be ONE reason why Lee hasn't gotten in touch with you... In connexion with Kirk Thompson's TXT2Q3.BAS conversion utility, Kirk dropped me a postcard saying that his program bombs out after transfering around 32k-worth of files. He's furiously working on correcting this problem and will let the JOURNAL know when the software is ready for final release. Thank you for letting us know about how you like our two software discs. We're working on some additional items (see our reply to Gary Melander) which may cause us to go to two more discs. We'll print an upgraded disc listing in our December issue--be sure to watch for it. We are getting LOTS of requests for assembly-language articles these days, many by With any luck--plus a tail wind--I'll have sometelephone. thing in assembly in our next issue. Putting out the SEBHC JOURNAL virtually single-handed is very time-consuming (you should hear what the Missus has to say about it!), so don't expect any miracles. But do keep in touch! -- ed]

Dear Lenny,

In my last letter I forgot to wish the SEBHC JOURNAL Happy Birthday. How does it feel to have been in print for over a year now? [GREAT!!!--ed] I know that I am looking forward to the JOURNAL's next and coming years. I believe you have done a good job so far.

In the for-what-it-is worth department... I have recently received information from MICRO PRODUCTS INTERNATIONAL of Houston, TX that they have been appointed by Micro Peripherials, Inc. as the National Service Center for MPI. From the information they sent me "Micro Products International is prepared to respond to all you MPI requirements, SERVICE, PARTS and SALES". Their address is: Micro Products International, 11011 S. Wilcrest, Suite A, Houston, TX 77099, Ph. (713) 568-6160.

Again, Happy Birthday, JOURNAL and may your second year be even better!

ALLIE C. LINGO, Dierks, AR 71833

PS: Like Mr. Walter Scott, III; my primary OS is still HDOS.

[Nice to hear from you Allie, I'm sure our other readers will appreciate the info you have provided. You might like to know that we're getting ready to work with HDOS 3.0, and will tell you .all about it as soon as we get the system up and running.

Received a copy of HDOS 3.0 from a former member of our A-SQR-HUG who needed to use one of my computers for "just a half hour to read two discs of math software I need at the University--my '89 stopped working!" While I was trying every trick in the book to read his discs, he was copying HDOS 3.0 from the original hard-sector distribution discs over onto a couple 80trk, ds, extended density soft-sector discs. Unfortunately, he forgot to rename the help files from the original discs as "HELP1", "HELP2", and so on, so I ended up with only the LAST help file! Not to worry though, he swapped me his no-longerused "repairable" H8 computer in exchange for my efforts, plus a JOURNAL subscription. Wonder who got the best deal? -- ed.]

Dear Len,

Apparently my renewal was a little early and it was treated as a new subscription. I thought the [extra] September issue was a coincidence as I received two September copies, but then I received two October copies!

According to the two sets of mailing labels, I now have two subscription numbers, my charter-member number (016) and the new one (263). Can you fix this?

And thank you for inserting my want ad in the October issue. Keep up the good work on the JOURNAL, I enjoy it very much, and am learning some things about my computer system.

MARVIN F ROBERTS, Topeka, KS 66614-2207

[DDPS! Checked our QUERY!2 subscriber's database and found you're there twice! Normally we modifiy the subscriber's last-name field to include the new subscription expiration date. But in this case, one of my daughters is learning how to use QUERY so that she can set up a mailing service and she hadn't yet discovered my "secret codes" for keeping track of all you good SEBHCers. But all is well, now that you've put us straight. Double thanks for the kind remark that the JOUR-NAL is helping you learn more about your computer. You are proof the SEBHC JOURNAL is achieving its' stated purpose: Helping To Keep Our Eight-Bit Machines Alive. -- ed]

EDITOR'S MAILING LABELS NOTE: A yellow high-lighted date after your name means your subscription expires in two months. RED means that is your LAST issue.

WANT ADS... WANT ADS... WANT ADS... WANT ADS... WANT ADS... * FOR SALE - H89 Computer - 64K - Kres 4MHZ speedup - Hard and Soft Controllers - Real Time Clock - Two DS 80 Track drives, internal - HDOS and CP/M operating systems - \$300.00 plus shipping. - Don M Deck, P.O. Box 1240, Lone Pine, CA 93545 --619-876-4217.

* FOR SALE - FRIDAY! by Ashton-Tate - abridged form or dBase II - Runs under CP/M for the H8, H89 or any 8-bit machine. \$50.00 postpaid. - Don M. Deck, P.O. Box 1240, Lone Pine, CA 93545 -- 619-876-4217.

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"PORTABLE" CP/M COMPILER -- Part Two by Tim Brengle

First, a pop quiz:

1) What is a compiler?

2) What is an interpreter?

Perhaps you answered "It's a big program" or, "Something which translates some language into machine code", or "I don't have the slightest idea". All are acceptable, but the correct answer is: "A compiler or an interpreter is nothing more than a complex computer program". Either one takes statements in some language (referred to as the "source language") and translates them into some other language called the "target language" or, more commonly, "object language"). In order to actually make that transformation, the translator program has to have a fair "understanding" of the source code.

The quote marks around the word "understanding" above are a clue to you that I am not telling the whole truth. A translator doesn't truly understand the source code in the sense of knowing what the author is attempting to accomplish. What it DOES know is how to deal with things which are correct as far as the source language's syntax and semantics are concerned. As long as you do everything that the source language demands, the compiler will be happy. It CAN'T complain about a program which is syntactically and semantically correct (as far as the source language is concerned) but which doesn't do what you want it to do.

Allow me to define a couple of terms: "Syntax" refers to the structure of sentences, while "semantics" refers to the meaning of sentences. It is entirely possible to have syntactically-correct statements which are semantically incorrect (meaningless). That is exactly what Lewis Carroll achieved in his Alice In Wonderland nonsense poem, "Jaberwocky". It has correct English sentence structure, but no meaning. Programmers appropriated the gramarian's words "syntax" and "semantics" and then slightly modified their meanings. Instead of referring to sentences, they refer to statements in some computer language.

Let's reexamine what a translator does: It transforms statements in a source language to semantically-equal (or functionally-equal) statements in an object language. That is to say, object-program statements "mean the same thing" as the original source statements. For compilers and interpreters that means "it does what I told it to do".

The Compiler Compontents

There are five different sorts of things which a compiler has to do. They proceed somewhat in the following order:

Scan -> Screen -> Parse -> Constrain -> Generate

Let's examine each in turn.

The scanner is responsible for looking at the source program character by character. It uses rules for how things such as numbers, words, and operators are formed so as to lump characters together into "tokens". It cares nothing about the order in which the tokens occur-only about how they are constructed.

The screener is responsible for a lot of things. It throws away comment tokens, then checks word tokens to see if they're words reserved by the source language, and enters new words into the "symbol table"--which is nothing more than a central place for keeping track of words, "symbols", or "identifiers" used in the source program. The symbol table holds various pieces of information about each symbol--for instance: name, type (integer, string, routine, etc.), and value.

The parser uses source-language syntax to verify that tokens occur in correct order, to group tokens together into statements, and to group statements together into routines, subroutines, or programs.

The constrainer uses source-language semantics to check that statements have real, useful and working meanings.

Finally, the generator uses all of the above information to actually produce an object program.

Note: Size or complexity of each piece is in no way related to the size of its description here.

Source-language phases need to occur in correct sequential order because each phase depends upon the output of the previous one. There're modern compilers which actually check out each phase throughout an entire source program before proceeding to the next phase. The scanner for such a compiler might examine an entire source file and produce a temporary file full of tokens for screener examination. We use a method that interleaves all of the phases and thereby serves to cut down on the amount of stuff that has to be kept hanging around. We achieve that by running the phases statement-by-statement, and by combining the phases wherever practical.

Recursive-descent Compilers

The basic technique which I used for the overall structure of the ADL compiler is called "recursive descent". You probably are asking: "What does that mean?" "How does that apply to the phases described above?" Here are the answers:

The adjective "recursive" comes from the verb "recur" which means "to occur again". In mathematical and programming parlance, it is used when talking about things which are defined in terms of themselves. As an example, consider the

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COMPILER -- Continued

normal definition of the factorial function (the canonical example of a recursive function). In English it might be something like this:

```
The factorial of x is:

1 if x = 1, and

x times the factorial of x - 1 otherwise.
```

Examine the last line. There is a reference to the very thing that we are defining! That's why this definition of the factorial is recursive. Look what happens if we try to figure out the factorial of 3. Start by substituting 3 for x in the definition:

```
The factorial of three is:

1 if 3 = 1 [it isn't], and

3 times the factorial of 3 - 1 [or 2] otherwise.
```

So the factorial of three is 3 times the factorial of 2. Now we need to know the factorial of 2:

```
The factorial of two is:

1 if 2 = 1 [it isn't], and

2 times the factorial of 2 - 1 [or 1] otherwise.
```

Similarly for one:

The factorial of one is: 1 if 1 = 1 [it is!]

So, the factorial of one is 1. Then the factorial of two is 2 times factorial of 1 (which is 1) or 2. And the factorial of three is 3 times the factorial of 2 (which is 2) or 6.

Note that our factorial definition didn't go on forever because each time through the value of x was one less. Eventually, x was reduced to one--and that's the only case for which we had an answer. Then the desired answer was obtained by working backward from the one we knew. This reductionist behavior is the hallmark of recursive functions. They tell you how to do things for the simplest cases, and when those aren't good enough, they tell you how to make the problem simpler.

So much for "recursive". How about "descent"? Without burdening you with even more compiler jargon, it means that the parser "descends" through levels of expressions and parentheses until it finds simple things that it knows how to handle, and builds the more complex pieces up from those.

In practical terms, the upshot of this is that a recursive descent compiler is controlled by the parser, which is trying to reduce complex things to simple things by means of recursion. When the parser needs another token in order to continue, it calls the scanner (which includes the screener).

While combining tokens into statements, the parser is checking semantics as well. Then, when the parser decides that it has something which is correct, it creates corresponding object code.

In order to talk more about parsers, it is necessary to understand BNF.

What Is BNF?

BNF stands for "Backus-Naur Form" (or "Backus Normal Form", depending upon whom you ask). It is a notation for describing language syntax. For any language. It happens to be particularly useful for computer languages.

There are only four things that you can do within BNF: insert strings, concatenate strings, choose between alternatives, and "delegate authority". (Caveat: The particular symbols used in expressing BNF vary from person to person, so you get to look at my favorites. Please understand that others would most likely write the same things in a different manner.)

Simple strings are represented by themselves. String concatenation is represented by putting the things to be joined next to each other on a line. To show you about choosing between alternatives and "calling subroutines", we need an example.

Suppose we're interested in the language consisting of all fully-parenthesized pairwise sums of variable A. Here are some syntactically-correct "sentences":

A (A + A) (A + (A + A)) (A + ((A + A) + A))

And here is the BNF for the language:

I usually think of the ::= operator as "is made up of", so the BNF might be read as: "An expression is made up of either an A, or a left parenthesis followed by an expression followed by a plus sign followed by an expression followed by a right parenthesis."

Let's derive a couple of the example "sentences". The first one ("A") comes directly from the first line of the BNF. The third one could be derived as follows:

Since the sentence is not simply A, it must be of the form

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COMPILER -- Conclusion of Part Two

 $(\langle expr \rangle + \langle expr \rangle)$. The first $\langle expr \rangle$ can just be A, giving us Start with RECOGNIZE which (A + $\langle expr \rangle$). The remaining $\langle expr \rangle$ can then expand, giving does SCAN-TOKEN which p (A + $(\langle expr \rangle + \langle expr \rangle)$). Replacing each of the ones left with does EXPR which A gives us the desired result: (A + (A + A)). tests if TOKEN = "A

(The derivation of the second and 4th examples are, to borrow one of my favorites phrases found in math books, "left as an exercise for the reader".)

Yes, BNF is recursive. Heavily so. It turns out that this form of BNF is sufficient to express all of the languages in which we might be interested. The purpose of a parser is to tell if some string of character is really valid for some particular set of BNF "equations". It is pretty easy to write a recursive descent parser for a given set of BNF. Here is a pseudocode skeleton of a parser for the above set of BNF:

```
boolean function RECOGNIZE
SCAN-TOKEN
if ( not EXPR ) then
return false
if ( TOKEN # EOT )
error("Expected <eot>")
return false
return true
boolean function EXPR
if ( TOKEN = "A" ) then
SCAN-TOKEN
```

```
return true
else
    if ( TOKEN # "(" ) then
        error("Expected (")
        return false
    SCAN-TOKEN
    if ( not EXPR ) then
        return false
    if ( TOKEN # "+" ) then
        error("Expected "+")
        return false
    SCAN-TOKEN
    if ( not EXPR ) then
        return false
    if ( TOKEN # ")" ) then
        error("Expected )")
        return false
    SCAN-TOKEN
    return true
```

The function SCAN-TOKEN reads text and puts a token value into the global variable called TOKEN. Function EXPR returns true or false and always makes the *next* token in sequence available.

Let's trace the thing for the sentence (A + A):

does SCAN-TOKEN which puts "(" into TOKEN does EXPR which tests if TOKEN = "A" [no, so try something else] tests if TOKEN \$ "(" [no, so no complaint] does SCAN-TOKEN which puts "A" into TOKEN does EXPR which tests if TOKEN = "A" [yes] does SCAN-TOKEN which puts "+" in TOKEN returns true to EXPR tests if EXPR returned false [no, so go on] tests if TOKEN # "+" [no, so no complaint] does SCAN-TOKEN which puts "A" in TOKEN does EXPR which tests if TOKEN = "A" [yes] does SCAN-TOKEN which puts ")" in TOKEN returns true to EXPR tests if EXPR returned false [no, so go on] tests if TOKEN # ")" [no, so no complaint] does SCAN-TOKEN which finds no more text so puts. EOT into TOKEN returns true to RECOGNIZE tests if EXPR returned false [no, so no complaint] tests if TOKEN # EOT [no, so no complaint] returns true

Take the time (hopefully, only a few minutes) to verify that obviously incorrect sentences (like "(A +") generate appropriate error messages. See if you can discover for yourself why I wrote:

```
if ( not EXPR ) then
return false
```

rather than:

```
if ( not EXPR ) then
error("Expected an expression")
return false
```

and generally understand how the procedure EXPR really implements the BNF for (expr).

Don't be surprised if all this is NDT obvious. Nor should you feel bad if it doesn't make total sense. Years of experience as an instructor have taught me that the best way to understand something is to get in there and try it. So you'll be doing yourself a favor if you take the time to go through the above code until you understand what is going on in it. And don't worry--there will be more on BNF and recursive descent parsing in our next installment of this exciting narrative! Also, we'll cover: * Scanning techniques, * BNF and Finite State Machines, * Symbol table implementation, * Design trade-offs, * The easy way to code generation, * And lots more neat stuff...

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TUTORIAL in "C" -- Part Two

```
"C" The Light
by
Darrell Pelan
```

Last month I mentioned that version 3.1 of Software Tool Works' C/80 compiler corrected some bugs. It also added a couple of nice touches. Scanf now works with everything except floats. I suspect that the problem is the integration of the mathpack and compiler. Software ToolWorks shipped version 3.1 free and were very helpful over the phone. The two new compiler options are -o for faster, slightly larger code, and -x which does not extend the sign bit when switching between char and int variables. This is a real benefit for CP/M programming. For example:

```
main()
{
  static int j = 0xE5 ;
  static char c = 0xE5 ;
  if( j == c )
     printf(*j = %d, and c = %d*, j, c );
}
```

The printf statement will never be executed. C will convert the char to int type to make the equality comparison. Most C implementations will extend the sign bit across the second byte of the integer making it large and negative. This new option will allow you to make the above comparison. However, the value printed for c will be -27. E5 is the binary representation of -27 store in 1's complement. The value printed for j will be 229 since the sign bit is not extended. The following program calculates the check sum of two character hex values typed at the terminal. The most interesting features are the generic conversions in ishex() from ASCII to a number and chgtohex(cp,sum). Chgtohex uses a divide by 16 to shift the byte four bits to the right. The upper bits are then masked off and the result is used as an index to the char array hex[]. Cp must be a pointer so that chgtohex can store the char string in the proper place. If anyone wants the code, please leave a message on my BBS (904-897-4966 and I will make sure that the files and text are available.

Listing 1 -- "C" Checksum calculator

#include <printf.h>
#define ESC 0xlb /* escape character */
extern int Cmode;

```
main()
{
    char hexval[2], c ;
    int alor16;
    unsigned cksum ;
```

```
Cmode = 0; /* One character at a time console mode */

cksum = 0; /* Initialize ckeck sum */

alor16 = 16; /* Hutliplier */
```

```
printf("Welcome to the Palan checksum calculator\n\n");
printf("Enter the first hex value\n");
while( (c = getchar()) != ESC )
if( c == 0x03 )
                      /* ^C - exit the program */
   exit();
 c = toupper( c );
 if((c = ishex( c )) < 0 )
    if( c != '\n')
        printf("*Not a hex value try again *\n"
    continue; /* Try again for valid number
 cksum += (c * alor16) ; /* Mutliply by 1 or 16 */
 if( alor16 > 1 )
      alor16 = 1;
   else
       { /* Change the value of the multiplier
       alor16 = 16;
       putchar('\n');
       3
chgtohex( hexval, cksum);
printf("The checksum is ts\n\n", hexval);
3
ishex( c ) /* Check if character is legal Hex value*/
char c;
{ if ( ((c >= '0')&&(c <= '9'))) /* Hex values */
 c -= '0';
```

);

\$/

1/

```
chgtohex( cp, sum) /* converts number sum into a hex*/
char *cp ;
                 /* character string pointed to */
unsigned sum;
                 /* by cp
                               $/
{
static char lowmask = 0x0f ;
static char hex[] = "0123456789ABCDEF":
                               /* Legal Hex values */
#cp++ = hex[((sum/16)& lowmask)];
/* shift high nibble right */
*cp = 0;
                     /* string terminator */
}
 [Read TUTORIAL in "C" -- Part Three In Our Next Issue -- ed]
```

Volume II, Number 4, Page 11 SOFTWARE NOTES

A HARDWARE REVIEW

A Cheap Daisy Wheel Printer

by

Lee Hart 530 West Walnut Kalamazoo, MI 49007

Computer Direct advertises the Alphacom "Pro 20" daisy wheel printer in COMPUTE and other "popular" magazines for under \$100, an amazing bargain. I called their technical support number, and was told it used the same commands, daisy wheels, and ribbons as the Diablo 630. The printer itself was \$99.95, and they had interface cables for \$19.95 each for RS-232 serial, Centronics parallel, the IBM PC, Apple, and Commodore computers. Because I can make my own cable for less than \$20, I ordered only the printer.

Two weeks later the printer arrived. It had a gaping hole in the back, and no electronics inside. I called Computer Direct; it seems they decided to include the circuit board that actually runs the printer with the interface cable; their "interfaces" are a mandatory option. So I order the RS-232 serial interface.

A month later, no interface. I call; they are out of serial interfaces, so I switch to a Centronics parallel. Two more weeks, nothing. I call again; they are out of Centronics, too. I ask what they DO have for sure. They say actually, they don't have interfaces for anything but the IBM PC, and so I order that.

Two more weeks, and the interface and circuit board finally arrive. Since my H89 has only serial ports, I bought a little serial-to-parallel adapter for \$50. The printer works in self-test mode, but won't print from the computer unless handshaking is disabled. Now it prints but misses characters. I tried it with a friend's PC clone; it prints, but it hangs the computer up with "Device error on PRN: Abort, Retry, or Ignore" messages. Len Geisler gave me a surplus Z-89-11 parallel board for my H89 and I got the same results with it.

Calls to Computer Direct were useless; one person actually refused to believe that Zenith made computers. They can't help and won't allow an exchange or refund since more than 15 days have elapsed since they sent the printer. The toll-free number given for Alphacom service is disconnected.

Now that I was stuck with it, I tore the interface apart. It turned out that Alphacom failed to provide pull-up resistors on the output lines, and didn't hook up the Error and Dut-of-Paper lines. The Centronic interface (and IBM's version of it) define six printer status lines to indicate printer plugged in, turned on, acknowledge, busy, out of paper, and error. Unlike disk drives, pull-up resistors are normally located on the transmitting end. Once I added pullups to these lines, everything worked! For the Z-89-11 board,

I added lk-ohm resistors to pins 10, 11, and 15 of P605 (the parallel I/D port).

and

Conclusions: At last, it works. Both Magic Wand and Wordstar work fine with the Pro-20, by telling them it is a Diablo 630. The printer supports proportional spacing, shadow printing, underline, and much more. It even does reverse line feeds, and graphics by hammering away slowly with the "." character. I've only had it working for a week now, but so far I'm satisfied. But, the worst part was having to do business with Computer Direct. My \$100 printer cost \$153.90 with their mandatory options, shipping, handling, and service charges. Caveat Emptor!

Alphacom	Pro-20	printer:	\$99.50 without electronics
			\$19.95 interface electronics
			\$34.00 shipping and handling
			\$153.90 actual cost
		from:	Computer Direct

22292 N. Pepper Road Barrington, IL 60010 (312) 382-5050

[NDTE: Hr. Hart and TMSI have relocated to Kalamazoo, HI. The new address is given at the head of this article and their new phone number is 616-345-2960. We thank Mr. Hart for this valuable article, one of many he has so generously provided us since having helped us get out our first edition in August of 1986. Look for more of Lee's entertaining and highly-informative articles in future SEBHC JOURNAL issues. -- ed]

SOFTWARE WE REALLY APPRECIATE... SOFTWARE WE REALLY APPRECIATE

Recently bought a copy of Pat Swayne's CP/M Utilities Disc, H.U.G. P/N 885-1226 [-37] because it was so highly recommended to me by various SEBHC JOURNAL subscribers. (I had purchased earlier Pat's CP/M Disk Duplication Utilities, H.U.G. P/N 885-1217 [-37] because my H89A has D-G Electronics' Super89 CPU card installed and the LLL BIOS-80 won't work with Heath's bare-bones CP/M DUP.COM utility.) As usual with any software which Pat writes, he provides the '.ASM files for each utility --which allows one to make minor changes if desired. The CP/M Utilities Disc has some VERY useful stuff on it which makes living with CP/M much less difficult--especially if you (as I did) "cut your teeth" on any version of HDOS. For you CP/M diehards, HDOS lets you do a number of things with great ease which you can't easily do with CP/M. In fact, HDOS virtually insists that you write a label and volume number to every disc (bootable or not) by alloting space on track zero for volume number and label. CP/M reserves a "disc label" area which is largely unused and virtually invisible. [Continued overpage]

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SOFTWARE WE REALLY APPRECIATE Continued

If you're especially skilled and experienced with any of the file manipulation utilities, such as HUG's DDEU or SDUMP, or Software Toolworks' SZAP, you might access a disc's label area and write a label and disc number there but could you read it?

HDOS automatically reads and prints onscreen a disc's volume number and label whenever you mount or dismount it, or exit HDOS with BYE. Also DIR--or CAT if you've installed ZCPR--lists CP/M files in either linear or tabular alphabetical order. CP/M's STAT *.* gives a linear alphabetical listing and does let you know how much space is occupied by each file and how much remains. DIR gives a four-column tabular directory listing, but it's horizontally alphabetised and gives you NO clues to file sizes or remaining space--very crude!

Pat Swayne did us all a great favor by joining HUG's staff! He wrote a nifty HDOS utility (DIR19) which uses H19 graphics and prints a sorted, four-column disc directory display which includes volume number and label across the screen's top. AND he included PDIR, a printer driver which makes hard-copies similar to the screen display. There's one drawback which I may eventually try to patch in my copy; it won't print reverse video (I label my discs thus to make the labels stand out!) but imprints "p" and "`q" bracketting the label. Its' switches let you see S-flagged files, or files in non-alphabetical order.

Pat's CP/M DIR19 prints a similarly-boxed, sorted directory display, and there's a PDIR utility which duplicates the HDOS version. But how do you put volume numbers and labels on CP/M discs? In an earlier SEBHC JOURNAL we published a little assembly-language utility which automatically lets you write and display a boot disc's label if you configure CP/M to do so. But this feature won't work on non-bootable discs. And, unfortunately, Pat's DIR19.COM won't either unless you insert DIR19 with CONFIGUR--and then you get the whole directory on every warm boot. Nice, but it can eventually get tiresome.

Pat got around the number and label problem with his DISKID utility. You may enter any number from zero up to the available space on the label line (!) and a label in any remaining space. The program prompts you line-by-line, ending up asking which disc the label goes on. Now, when you enter DIR19 dn: (cr), the disc number, label and sorted directory appears pretty much as with the HDOS version, but with file R/O, R/W, and SYS status shown by reverse video letters in the filename's extension. Also shown is space occupied by each file, plus remaining disc space at the display's bottom. There're a couple other ZCPR directory-listing utilities which run somewhat similarly--also William Derby's SD.COM--but none have graphics or show disc ID! Also, you must enter CTRL-P with any of the latter to get a hard-copy directory. Pat's way is better!

Speaking of Derby's CPM/DOS Utilities (description in last

month's JDURNAL--II:3), I checked out all four utilities from the review disc Bill'd sent me and found they worked exactly as Bill's article described. I rather like his CMP (CoMPare files) because it lets me find out which one of two similarlynamed text files is the latest version (usually that one has more disc space tied up). But since I haven't had time to write '.ASM stuff lately I couldn't check out how CMP worked on that kind of file. The COPY utility works pretty much the same in its' simplest mode as Pat Swayne's COPY.COM (from REMark) does. But Derby's COPY lets you do anything PIP can do, but easier--and COPY.COM is smaller than PIP.COM. Now I REALLY appreciate that. And being smaller, COPY.COM loads and runs twice as fast as PIP! I've replaced PIP.COM (8k) and Pat's COPY.COM (2k) with Derby's COPY.COM (4k) on several boot discs and eventually will have done it to all the rest.

Since I hardly ever use SUBMIT, all I did was check out SUB to see what it does. As with the other utilities, it does exactly what Bill says it should do. I'm looking forward to his Command Line Editor mentioned last month--maybe after checking that out I may start using SUBMIT, who knows?

I received two other CP/M utility packages, one from Compu-Magic (about 3 months back--blush!) and UTILISET (advertised on the front page of II:2) from Tom Bohon. I'm still checking out the CompuMagic software (I also received their SEARCH utility) and can report only on those I've finished. R-O.COM and R-W.COM are pretty neat--you need not use STAT to set the R/O or R/W flags on any file, including \$SYS files. Together they take up only 4k of disc space, two less than STAT. Since most folks very rarely set the \$SYS flag on files, one could almost do without it. Their RENAME.COM takes up 6k of disc space while the SEBHC JOURNAL'S RENAME.COM takes only 1k. CompuMagic's RENAME uses CP/M's reverse-Polish command syntax. Our RENAME uses English syntax--RENAME dn:fname TO newname. Their DIRSPACE.COM (4k) summarises USER area space, Files space and Remaining space. MDIR.COM (4k) gives an alphabetically-sorted directory similar to Bill Derby's SD.COM without reference to space, while MDIRS.COM (4k) displays everything except \$SYS files. (The public-domain XDIR.COM (Bk) does all of this in one swell foop!) UDIR.COM gives a directory of all USER files and space. There are nearly a dozen more utilities on the disc which I've not vet had time to check out and report on, but I shall do so at the very earliest opportunity.

Tom Bohon's UTILISET package still gathers dust waiting for my testing. I PIPed the '.DOC file to the printer and got a surprise! Something in it changed most words' trailing Roman letters into Italics! Having run into this with some files downloaded from CompuServe's HUG library, and not knowing how to fix it, I called Tom. He said the quickest fix is: PIP UTILISET.DOC=UTILISET.NEW[Z]; this removes those pesky Word-Star embedded control codes.

==>Above report by Your Editor, L Geisler<==

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b Society and Journal Policies 1

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