

## BITS & PIECES

### H89 SUPPORT

I want to clarify my policy on H8SCOOP. My general policy is to support only the H8. Many have taken me wrong on this point as far as the H89 is concerned. Due to software similarities, and components such as disk drives, and memory chips, the H8 cannot be separated from the H89. In that respect, I support the H89 as well. Many of my subscribers do have the H89, and tell me they are receiving benefit from the newsletter. I will try in the future to be more open to the H89ers. Now that a parallel port is available for the H89 (see REMark issue 10), many of my projects and those of others, designed exclusively for the H8 will now run on the H89 as well.

So H89ers, don't feel left out, send me your comments and information as well. The Technical Forum section contains some good info for the H8 that was contributed by an H89er, in response from a request I made in last months issue.

To start the H89ers out, did you know the H89 has a third port? Just purchase the following: 443-874, 443-795, 134-1073. Now you have port 320Q.

In last months H8SCOOP an issue of Memorex disk noise was discussed. I have received information that this noise is due to jacket design, and there is no problem with head wear. Memorex has corrected this problem, and the new MEMOREX disks should be quieter.

### H8 CONTROL OF BSR-X-10 CONTROLLER

The August issue of BYTE had a letter from Ted Benglen to Steve Ciarcia about interfacing the H8 to his BSR controller interface circuit. Steve printed an interfacing circuit to make the H8 buss compatible for the BSR interface circuit, by converting it to the TRS-80 buss compatible circuitry. Those interested in the BSR controller to interface to the H8 may want to check this out. Another easier method, which is the way Ted went, is to use the H8-2 parallel card as mentioned below.

Ted Benglen II, 522 E County Rd. 30, Ft. Collins, CO 80525 (303) 669-4116, writes in and tells me he has completed and working, an interface for the H8 using the H8-2 parallel card to the BSR controller. He also has a program which

displays channel number, room name, and status(on/off). If anybody has been looking for this, contact Ted. Ted says it can be built for about \$30, and basically uses the circuit in BYTE, January 1980 by Steve Ciarcia. Using the H8-2 however, the address circuitry can be eliminated.

Ted points out, however, that BSR now has available a programmable control for the system with a 24 hour timer for 16 channels for about \$60. Sometimes computer control is not the answer, and this may be one of them. You will have to ask yourself if you want to tie up a computer when a \$60 accessory will do the trick? There are times, such as if this will be used for security applications, that the controller with the H8 will make an unbeatable combination.

Ted also tells me he is working on a voice synthesizer. Ted has written me long ago, and has wanted this project. I wish you all the luck Ted. Food for thought--When the relocatable front 8K circuit mod comes out, probably in the fall from Heath, the first 8K will be user available. Then circuits like the TRS-80 VOICE SYNTHESIZER will probably be easily adaptable to the H8. Ted has heard that this can now be used directly with the H8 if the H8-2 parallel board is used, this eliminates all the addressing problems.

Anybody willing to try it? Don't underestimate the power of the H8-2 board, or any parallel I/O circuitry. It's your link with the outside world!

### AY-3-8910 PSG

Last month I told you of Greg Saville's PSG circuit for the H8. Previous to this I have received lot of inquiries about this chip. OK! Here's more info on the chip. A circuit which would be compatible with the H8, using the H8-2 parallel card can be found in May issue of BYTE on page 238-242, again the column by Steve Ciarcia. This may give some of you ideas of how to interface and use this chip.

### H8-5 CASSETTE USERS!

Steven Kopp wrote in "When I built my H8-5, I made an error that has proved to be a blessing in disguise. I installed the two phone jacks from the foil side of the board instead of the component side. This permits me to plug in the two cables from the back of the board and directly out through the slot in the back of the H8. I do not have to worry about crimping the cables between two hot heat sinks or bringing the cables over the top of the H8-5 board. I keep the H8-5 board

installed as the last board so access to the plugs is not blocked by another board." If this sounds useful to you, it may be worth the effort to undo the right way, and to do the wrong way!

#### HEATH REPORTS

There has been a change in Heath's plans on the low cost color board as reported in JULY H8SCOOP. There were reported problems with the 6847 chip design they were using, such as no control over background color, permanent border, etc. The new design proposed will use Texas Instruments 9918 chip, and have features such as any background color, sound effects, and an on board arithmetic chip. But be expected to pay a little more for this board, from the reported \$65 for the old design, to about \$400!

A possible October release may be the 0 ORG mod for the H8 for about \$75, which will be a small board to plug into the H8 expansion slot, containing 6 IC's. This will also require a mod to the disk controller, and a replacement of the 1K CPU ROM to a 4K ROM.

It is reported to me that the new versions of HDOS 1.6 have no problems with INIT and other problems which were reported. The flaws present in the early 1.6 version have been taken care of under the new release.

It is reported that Heath has a mod for the H19 to cut down on RFI. I have been told that you can get it free if you complain to them.

What's HOS-817-1? I was informed this is the DOS to handle 3-5 1/4 inch drives and 4-8 inch drives, giving a total storage of 5 MEGS!

Heath should be comming out with a "C" Compiler for HDOS latter this year.

#### H9 24 LINE MOD

Ted Mieske, 4848 71st. St., San Diego, CA 92115 (714) 460-4152 tells me he will again be offering his 24 line mod board for the H9, bare circuit for about \$20. This should include plans, instructions, and schematics. Many of you have written me about the info, and seeing Ted is making it available, and supporting it, I will leave this up to Ted. If you would like more info on the 24 line mod, get in touch with Ted.

#### HUMOR-READER RESPONSE

Every month I receive a large amount of mail, some for technical advice, and most giving me a pat on the back for the contents of H8SCOOP. The following I received this month, which I will print

in case you may want a few laughs. This gets to be hard work, and once in a while, we all deserve to sit back and laugh.

"Henry: For an intelligent man you still refuse to use a dictionary for your spelling...Remember a wise man will seek the correct way to do things and only a fool will remain stubborn and refuse to learn...I don't mind the spelling lesson each month as long as it helps...I hate to see everyone laughing at you when reading your bulletin...What do you think your overseas readers think when an American cannot spell the simplest English words??? The words you have misspellid in your latest bulletin are: FINIALLY COMMING SHAPPED ERRANOUSLY ENVOIRNMENT BELEIVE. Look up and correct these words! Let's don't see spelling errors next time, OK????"

I understand from my Wife this is the second postcard I received from this guy, postmarked San Fransisco, CA. She threw the first one away after getting a few laughs herself, because like this one, it was not signed! She just thought I'd enjoy this one, which I did, and hope you do.

Let me make a point again. I'm after the content, which everyone, including my overseas readers seem to be very satisfied with. I doubt if the person who sent me this is a subscriber, if he is, Please have the GUTS to sign your name, and if you want, I'll gladly refund you the remainder of your subscription price! If you have a word fetish, read a dictionary, not my newsletter. I sure hope this guy does not have an H8, as I'd be ashamed to have the same computer.

Most H8ers are level headed and understanding, not picky like this. For everyone's information, putting together a newsletter is not an easy task. I'd say 6 spelling errors out of a few thousand words is not bad. Since 99.99 percent of my readers are concerned about content, and not spelling, fine. The other .01 percent should read dictionaries, and not bother with computers, because computers, you see, are only as accurate as the person programming them, and the individual spending all his time with destructive criticism, certainly can't have much time to learn programming.

Enough for that. I don't want to waste anymore of my time, or yours on a guy who isn't man enough to sign his postcards, and too cheap to use proper stationery, an envelope, and a 15 cent stamp.

## DIABLO PRINTER ON HDOS 1.5

To run the DIABLO under version 1.5 of HDOS, some hardware changes will be necessary. Jumper 5-6-20 on the cable, and it will run. Version 1.6 takes care of this in the software. From T B T Digital.

## H19 REPEAT RATE

To speed up the repeat rate of the H19, for early terminals (first run 1979), change R214 from 100K to 47K. On the newer versions which do not have this resistor, change R414 from 4.7K to 2.2K. From T B T Digital.

## MORE ON THE MSM5832 CLOCK

Donald Long Jr., has a new address which you should make note of if you have been following the write-ups in H8SCOOP about his clock circuit. He no longer lives in Florida, but 9319 Willowview, Houston, TX 77080. Donald told me he has been having all kinds of problems, and the circuit board for the clock has been again delayed, perhaps another month or so. He did send me a complete kit of parts for my breadboard circuit.

I'll hopefully be building the clock in the next few weeks and try to have a report for this newsletter next month. In the meantime, any interests or questions should be made to Donald.

## STRETCH-8

Del Stanton called to tell me the STRETCH-8 (see July issue) is now shipping on schedule, with a delivery time of less than 2 weeks. He says the response on his H8 expansion is picking up. This expansion makes room for more boards in the H8, by giving the H8 a longer cabinet with a larger mother board and boosted 8 volt power supply, effectively doubling the H8 capacity.

Anyone who wants to order one, the price will be \$180 till the end of August. He may give a few extra days. After that, the price will be going up to \$200.

Del tells me he does all the sheet metal work and wood work himself, and thus there is a lot of labor involved. I hope to have a full report on this unique H8 expansion in the near future. Del tells me future plans include an extra 18 volt power supply, for cards that use lot of 12V such as DG cards.

For more information on this, contact Del Stanton, POB 1120, Burbank CA 91507. He can be reached at (213) 849-2721, or if he is not available, an answering machine will take the information. If you want to

talk to a STRETCH-8 customer in your area, Del will refer you to one.

## COBOL OFFER

From time to time I try to make available at a reasonable cost, which is usually nothing besides postage and handling, plus a little wear and tear, offers of software to interested disk users. I've offered TINY Pascal in the past for \$5 (where else can you get something like that for \$5). Most of the software that will be occasionally be offered I do not write, therefore I do not like to sell, just break even and cover costs.

I thank my many sources for my material and software I have to make available to H8SCOOP subscribers. This month I'm offering a COBOL package, for CP/M users. I wish I had it for HDOS, but this is what I have this month. The COBOL package comes in 2 disks, one a 53 page text user manual and the other is the COBOL compiler. If you have CP/M, a minimum of 40K system, and would like to experiment with COBOL (even though this is not a standard COBOL), send me twenty five bucks, that's right, \$25 for the COBOL offer, and I'll send you back by first class mail, within one day of receipt, the two COBOL disks. Am I good to you?

## NEW STUFF

Available from OWEN PHARIS Computer Products, POB 3400, Big Bear Lake, CA 92315, is a color graphics board for the H8. It generates 8 different graphic display modes, up to 8 colors, and will interface to a color TV via RF output. Its highest resolution is 256 by 192 pixels, with a display of 32 characters per line, by 16 lines, and capable of displaying 64 ASCII characters. The price on this is \$379 in kit form, and \$479 assembled and tested. For more information, contact the above.

Not new, but another source for the Novation CAT MODEM is Jade Electronics, 4901 W. Rosecrans, Hawthorn, CA 90250. The sale price is \$149, order number IOM-5200A. To place orders toll free inside California, 1-800-262-1710, and in the Continental US, 1-800-421-5500.

NEW from MINIT-MAN PRINTING, 211 E. Allegan St., Otsego, MI 49078 are pads of "VIDEO LAYOUT SHEETS" for the H19/H88/H89. You have to see these sheets to believe them! They contain every cursor location of the CRT, and are divided into grids with the line numbers (1-25) and column numbers (1-80), and the associated Decimal Values and ASCII equivalents. The bottom of the sheet

contains all the graphic symbols with the ASCII and DECimal codes.

With sheets like this, anybody can come up with good graphics for the H19. The sheets will be available in pads of 50, minimum 5 pad order for \$5.00 plus \$1.50 shipping and handling, Michigan residents must add 4% sales tax. By the way, they are made and punched to fit in a 3 holed binder, and all the printing is in blue.

Not real new, but something for the H19 from Micro Interfaces, INC., Box 14520, Minneapolis, MN 55414, is a new PROM for the H19 which allows denser graphics by replacing the paragraph character with one that lights opposite corners of the character block. If you wish, they can program the PROM with any other graphic characters you care to have, at \$.75 per character.

Also available and recommended is a disk of software to make maximum advantage of the graphics capability of the terminal, using a graphics device driver. The total package is available for \$49.95, delivery being within 3 weeks.

## REQUESTS

Clifford Tweedy wants to know if anybody is using the ATARI TELE-GAME SYSTEM with the H8 for use as a color graphics system? I have an ATARI Video Computer System, and have myself wondered if there is an easy way to interface the H8 and perhaps generate one's own games instead of buying the ROM cartridges at \$20 and up each. If anybody is in this area of interface, write in, and let me know.

A request has come in from D. Woodruff which all H17 owners may be interested in. Does anybody have information on how and when to clean the floppy disk head? Is demagnetizing necessary as on a tape recorder? If anybody has info on this, send responses to H8SCOOP, I'll print it next month for all to see.

Attorney Malcolm H. Aukerman, 350 Poplar St., POB 67, Newport, IN 47966 (317) 492-3350 has been corresponding with me on a desire he has for a computer application of a telephone timing system. He wishes to consider dedicating a computer to the bookkeeping end of timing telephone messages, calculating a rate of time on the phone, plus toll charges if long distance calls are being made, for billing purposes.

Malcolm says He and his associate make 25 to 40 calls a day, of which 50 per cent are long distance. He is interested in a computer developed to timing of these

calls to be sure the date, the time and cost of the call gets into the file from a billing standpoint. Also since non toll calls(local) are not listed on the phone company's billing information, He needs to keep track of this time and charge also.

Since my father and brother are both attorneys, I can appreciate Malcolm's desire. This would mean dedicating a computer and terminal for this purpose, which would be expensive, but Malcolm feel the cost would be recovered in a short time because the secretary would be freed from these duties.

Malcolm writes "I believe that there is a whole gob of business out there for the right computer man to take advantage of if he can come up with a system designed to meet small law firm needs. Large firms have receptionists who make all outgoing calls, local and long distance and enter them on the appropriate records. Since the receptionist in law firms is generally doing little between calls, she has ample time to make up the appropriate paper work.

"In a small country practice a secretary does everything.. . In a short time we could pay for extra computer system totally dedicated to time keeping. . . Since all dictation is done on a Sony dictator, that time needs to be recorded too."

I have read about this type of request before, and a good software package coupled with a computer, an H8 or H89 could accomplish this. I would think that a language like a C compiler, or Pascal could accomplish this best, since the overhead of an interpreter would not be required, thus saving memory space for the dedicated system.

If anybody has an idea, or would like to undertake this venture, contact Malcolm. I'm sure this software would easily be marketable to more than Malcolm once perfected.

## WHO'S WHO

If you are interested in sophisticated SCREENS for the H19/H89, James Czebiniaak has developed some excellent software under MBASIC using protected screens, which simulate an intelligent buffered terminal like the ones used on the BIG machines. In this case, the computer does the buffering, but the result is VERY impressive. James is a SHAKLEE distributor, and uses these programs with the screens for data entry and display for his inventory, which by the way, also

utilize random disk I/O.

If you are interested in this type of thing and want to experiment with the capabilities, which really make use of H19 graphics, contact James, 199 Vly Road Ext., Schenectady, NY 12309. James, by the way, works with these screens in his every day work, so he knows about screens.

## TECHNICAL FORUM

MORE YET STILL ON HDOS

From an H89er, Vance Fisher. Last month I wanted to know how to modify the disk spin clock so the disk drives would not spin so long after a disk read/write. Vance told me to look at location 040.110. If you enter 010 in this location, the disk only spins for about 5 seconds and will stop. The smaller this number, the shorter spin time. You have to enter this after each boot, since each boot re-initializes this value. But once done, it will stay all night long, until you reboot. Many thanks for this one. Play around with it and see what happens. Anybody know how to patch this on the 1.6 version disk? This way it will be there at each boot.

Again from Vance, to go along with this, now that you can cause the drive to cease spinning in between times, what about keeping the head loaded all the time? I beleive Apple does this with their drives. There is a tradeoff here. Wearing disk and head surfaces vs head drive mechanism wear and noise. As long as the disk does not spin in between, I see no reason why it could not stay loaded to cut noise and head mechanism wear.

You'll have to deceide yourself. To implement this, remove the cover from the drive, and on the jumper strip, cut open strip HS and close strip HM. I removed those eyesore things long ago, and have installed a dip switch in my drives, which makes it easy to experiment with. Now the head is loaded whenever the disk is accessed, and stays loaded until the access is through, much quiter!

The following are all things you can do using SuprDUMP, a program which allows you to access the disk on track/sector level, and patch any location. SDUMP provides HEX dumpings, while there are others which use OCTAL. If you don't have these, write me. Send me a blank disk and a buck, or \$4 and no disk, and I'll send it to you.

The following patch causes HDOS to bypass asking for a date when the system boots up IF a date already exists in memory from a subsequent boot. This is really neat, as you don't have to keep entering the date all night long, just one time at the beginning.

VERSION 1.6

ON TRACK 2 SECTOR 1

ADDRESS	FROM	TO
117 (4F)	040 (20)	072 (3A)
120 (50)	250 (A8)	240 (A0)
166 (76)	303 (C3)	311 (C9)
215 (8D)	051 (29)	177 (7F)

FOR VERSION 1.5

ON TRACK 1 SECTOR 10

324 (D4)	040 (20)	072 (3A)
325 (D5)	250 (A8)	240 (A0)
373 (FB)	303 (C3)	311 (C9)

ON TRACK 2 SECTOR 1

022 (12)	051 (29)	177 (7F)
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How about auto reboot upon BYE. Now when you enter BYE, you must do a CR first, and then the SPACES message appears. With this patch installed, the system automatically goes to the SPACES message with no CR needed.

VERSION 1.6

ON TRACK 2 SECTOR 10

ADDRESS	FROM	TO
130 (58)	377 (FF)	076 (3E)
131 (59)	001 (01)	012 (0A)

VERSION 1.5

ON TRACK 2 SECTOR 9

331 (D9)	377 (FF)	076 (3E)
332 (DA)	001 (01)	012 (0A)

### PROGRAMMING GOODIES

I first want to clarify an item in July H8SCOOP, under BITS AND PIECES, MBASIC HELP. I told of an excellent guide to MBASIC by Dilithium press for \$8.98. I did not at that time have the address, but now I do.

DILITHIUM PRESS  
POB 92  
FOREST GROVE, OR 97116

I hope I have not caused any inconvenience. It seems that the 8 may have also been interpreted as a 3, making the price look like \$3.98 instead of \$8.98. I wish you could buy a book for \$3.98.

Feedback from last months H8SCOOP, for those with an H14 line printer, to get a form feed when using the text editor, simply enter a "CNTRL L" in the code. When you enter it in the text editor mode, you will see 6 blank lines inserted, and when the code is outputted to the H14, it will cause a form feed.

If you have the H19 and use B.H. Basic, just type ESC p and type your text. It will appear in reverse video. To exit, hit ESC q. This will save you typing.

Did you know if you are loading a program in BASIC or MBASIC, with a .BAS extension, you don't have to type the extension to load a program, since you are already in BASIC.

In MBASIC, when loading a file, you only need one quote mark like the following: RUN "FNAME", which makes it a lot easier. You can also print a line by typing a '?' instead of 'PRINT'. If you want to print 4 blank lines, simply type '??:??:?'. When you list it back, it will say PRINT: PRINT:PRINT:PRINT.

If you did not already know, while in MBASIC, to get a listing on hardcopy without exiting the system, just say SAVE"AT:",A or SAVE "LP:".A whichever you are using, and the program is SAVED or PRINTED on the terminal.

Ever get I/O DISK ERROR? in MBASIC? This can be caused by two things. Your device driver is not loaded, or when saving a file, you'll have to KILL the file first. Say KILL "FNAME.EXT" and then say SAVE "FNAME". This will allow you to save something you have been typing for hours.

## GOOD GUYS and BAD GUYS

BAD GUYS--COVER CRAFT CO., POB 555, Amherst, NH 03031. D. Woodruff tells me in the past their orders have been filled within a few weeks, but his last order for a cover which he ordered in March, was not received until July. Mr. Woodruff says "Even though I received letters from the Company promising 'immediate shipping', I waited 17 weeks for my last cover. I would recommend those who don't

want to wait many weeks for a cover, to order elsewhere." I have noticed some Heath stores now sell covers for certain computer equipment, you may want to check here before placing an order.

## CLASSIFIEDS

FOR SALE--1 8K static RAM board for \$90. Also 1 Anderson-Jacobsen 841 SELECTRIC based printer WITH parallel board for \$800. I know lot of you have written to me about available of a good hard copy printer, this is one. For more information, contact Ellen Craner of ARCAN's INC., Box 317, Plainwell, MI 49080. Phone (616) 685-6861.

FOR SALE--Maps of the Heathkit Adventure Game. 10 pages for \$3.00 per set, includes mazes and cheat sheet. Contact Diane Barron, 1441 Unit B North Red Gum, Anaheim, CA 92806. Phone (714) 639-4238.

FOR SALE by H8SCOOP, a NOVATION CAT MODEM from Heathkit, complete with all necessary software (several different MODEM packages), power supply, and cables. Practically brand new! Selling because nobody around here has a computer and all my calls are long distance--too expensive. \$150 for the complete setup, just plug it in, connect to H8-4 and you're up and running.

FOR SALE-TI Silent 700 Printer and H9 Video Terminal. Both excellent condition with complete documentation. Also available, a Printer terminal GTE Novar 5560 with IBM 72 Selectric and tape drive all with documentation. Best offer. R. A. Ackerman, 2 Hillside St., Red Bank, NJ 07701 (201) 291-0680 or 741-0923.

FOR SALE--4 Heath 8K memory boards in excellent condition. \$75 each. Parnell Lewis, 199 Cherokee Dr., Memphis, TN 38111. (901) 454-0783.

## REPORT

### REPORT ON WALT BILOFSKY'S SOFTWARE

Due to space limitations I have put off writing and publishing this review long enough. Walt's software is top notch stuff. If you want good software for the H8/H89, Walt's programs can be counted on, as well as Walt for technical questions on the software and updates to new revisions.

Walt is the proprietor of The Software Toolworks, a thing he put together for software support. He has numerous

computer degrees, which is a plus to his credit. A name you see associated with Walt's products is Dr. Jim Gillogly, who is not a medical doctor, but has a PhD degree in computer sciences. Jim also writes top notch software, and he markets lot of his stuff through Walt. You will find both of their software packages in lot of the Heathkit Electronic Centers, which is another plus, and speaks highly of his products.

A good point found in Walt's selling techniques is the price. He sets his prices low enough so a prospective user will buy it rather than steal it, a lesson lost on a great many other writers out there, who think they can get rich by selling twenty copies at \$500, an example being CP/M-based Word Star, which in addition you need another \$150 for CP/M itself. Anyway that's good marketing, sell lot of copies reasonable, rather than a few high priced.

It must be mentioned here that the software is written utilizing the graphics and special features of the H19/H89, and all require HDOS, with 32K memory.

First on the list is PIE, his FULL SCREEN EDITOR, which is easy to learn and use. The H89 or H19 screen is a window into a file. Cursor motion keys allow changes to be typed anywhere on the screen. Standard editor commands are provided for character and line insert, delete, search, move and copy single and multiple lines (something HDOS EDIT does not have). The newest release, 1.5 has powerful macro capability providing search and replace, along with continuous display of line numbers. The special function keys on the numeric keypad make working with the editor much easier, i.e. pressing a key rather than entering a command.

FULL SCREEN EDITOR is just that, an editor, and not a word processor. If you desire features such as right justification, pagination, headers, centering, underlining, than you must use it with a TEXT FORMATTER to form a complete word processor package. The price on the editor is 29.95, and the TEXT FORMATTER by Jim Gillogly is 34.95. New features in TEXT FORMATTER besides what is already mentioned, are bold face, disk resetting, and pause within text for changing type elements or whatever.

PIE is a first-rate piece of applications software, and an example of what a really good programmer can produce. There is a version for the Z80 (H89) and 8080 (H8), and both versions come on the same disk, so if you latter change computers, you're still on line with PIE. The documentation is superior, a trademark of Walt's work.

It makes full use of the H19's controllable cursor and special function keys.

On the negative side, is PIE's inability to append files, something I find very useful when preparing text like this newsletter which is written in peices, and put together latter. This must be done under HDOS. Another feature which would have been nice, is automatic wrap-around to the next line, although a bell does sound near the end of the line to remind you the end of the line is near. Anything over 80 characters is lost.

PIE is highly recommended for those who want a good powerful editor for use on the H19/H89. For a complete word processor package, the unbeatable combo of PIE and TEXT FORMATTER for \$65 will be hard to match.

Another piece of good software is the C COMPILER for \$39.95 which is a subset of the full system written to run under the UNIX operating system (it's also the language that UNIX was written in, so you might gather it's rather powerful.) It falls somewhere between assembly and a BASIC-like language, a close comparison being made with Pascal, being highly structured and not very high level.

The object code is a compiled 8080 source code, so programs run very fast with minimum of memory since an interpreter like BASIC is not part of the run time package. Walt's version is not as complete as the BDS C compiler for the H8 under CP/M, but at about 1/3 the price, it's well worth it. Again, the documentation is exemplary, but the Kernighan and Ritchie text is the standard reference. There is a HDOS-oriented library of useful subroutines included, and some sample C programs.

The C COMPILER supports character and 16 bit interger data, pointers, arrays and strings, macros, data initialization, a full complement of arithmetic and logical operators, and all C control statements including WHILE, IF-THEN-ELSE, FOR, SWITCH-CASE and GOTO.

On the not so serious side, is FLIGHT CONTROLLER GAME by Jim Gillogly for \$19.95. Some computer games are genuinely trivial and others are rather repetitive (Star Trek type games). Then there are rare ones like the origional ADVENTURE (Heath's version written by Wil Crowther and converted by Gordon Letwin). The Flight Controller Game, AIRPORT, belongs in the ADVENTURE class. In fact, it may be superior in that it has something to teach the player rather than just provide

entertainment. If you can't, or don't like to think, than you won't like AIRPORT. If you have a short fuse and a low tolerance to frustration, then you especially won't like AIRPORT! I suppose you might sum it up by saying it's not for children--of any age!

AIRPORT is a natural for the computer, making good use of the H19/H89 graphics and special function keys. It is one of the best-written games ever to come along. Based on a game written by David Mannerling, a former air traffic controller and written by Jim (who writes other C-based programs for Walt to distribute; is Airport written in C?), the game simulates in a most realistic manner the operation of an FAA regional air traffic radar control center. The screen is filled on one side with the radar display complete with airports, beacons, airways, entry and exit points, and 26 aircraft that will appear within the 90 minute game duration. Duration may be reduced to as low as 16 minutes, but things happen so fast you probably couldn't keep up with the mental gymnastics required to keep the aircraft straight, on course, and without crashing one or allowing another to run out of fuel.

The rules are fully explained, and the objectives are few and simple: Keep the aircraft on course, get them to their destinations, and don't let them collide or run out of fuel. Each time you play the game it is different!

REACH is a Modem and File transfer program for the H89, which turns it into a remote timesharing station operatable up to 9600 BAUD. This high transfer speed would indicate possibilities of communication between two computers hardwired together via RS-232 for up/down loading of programs. REACH is available for \$19.95.

Other programs Walt offers are LISP INTERPRETER, requiring 48K, sells for \$39.95. PACK and CRYPT for \$24.95 are file compression and encryption programs designed to save disk space and provide security for data, both by Jim Gillogly. PACK uses Huffman coding to compress files saving 25-50% on text and program source. CRYPT takes a user provided password and employs a sophisticated Tausworth-Lewis-Payne based cipher algorithm to protect files against unauthorized readers.

UVMAC is a absolute macro assembler for both Z80 and 8080. The 8080 version accepts the same source files as ASM, but includes macro capabilities. One nice feature is they are selectable for OCTAL or HEX listings. Specify 8080 or Z80 when ordering. The price is \$29.95 each.

Walt tells me if anyone has software that they want to market, and they feel it comes up to Walt's quality standards, they should get in touch with Walt.

All programs are available from The Software Toolworks, 14478 Glorietta Dr., Sherman Oaks, CA 91423. Add \$2.00 per order for first class postage and handling charges. California residents, add 6% sales tax.

## NEXT MONTH

Next month, I will try to publish two letters to Heathkit, showing two totally opposite views of their service and customer relations. It's really amazing how two letters can be so different in their comments to Heath. Also comments from myself on Heath's service, how I've just received my fourth letter of delay on a scope I ordered back in June. Also some configurations and general use of the CAT MODEM. More on HDOS and more offers for Software. A report on the CLOCK circuit.

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