REMark

Issue 32 • September 1982

Official magazine for users of Heath/Zenith computer equipment.

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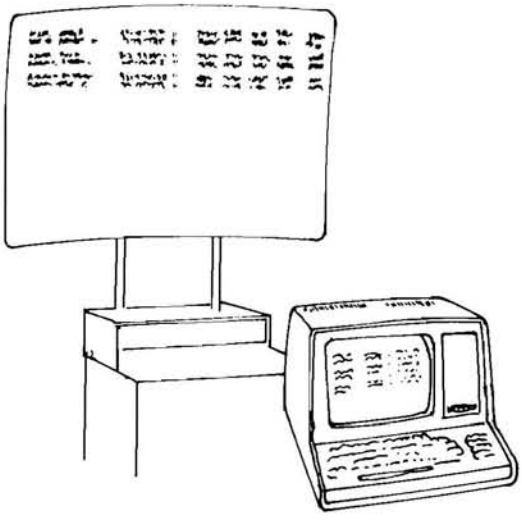

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REMark Issue 32 • September 1982

on the stack

>CAT

New HUG Products 7
HUG Product List 9
Buggin' HUG 11
Questions & Answers 11
Video Output *William Cohn* 12
Moving Up To Soft-Sector *Alison Philips* 13
Ole Sysop Hits The Trail *Terry Jensen* 16
First National HUG Conference *Walt Gillespie, Jim Blake* 17
A Conference View *Nancy Strunk, Margaret Bacon* 24
Grand Prize Winner *Bob Ellerton* 26
New Goodies (Drool!) *Patrick Swayne* *27*
The Unknown HUGGIE *Bob Ellerton* 28
H19 Speed Up!! *Peter Shoemaker* 29
How To Flip/Flop under CP/M *Bob Sutherland* 30
Expanding Your H89 Disk Space *Van C. Baker* 31
Ed-A-Sketch and MBASIC *Clement Pepper* 38

ON THE COVER: Mike Caddy (on the right), winner of the new Z-100 micro computer given at the First National HUG Conference, is congratulated by Don Moffett, President of Zenith Data Systems.

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64K MEMORY for the H8*

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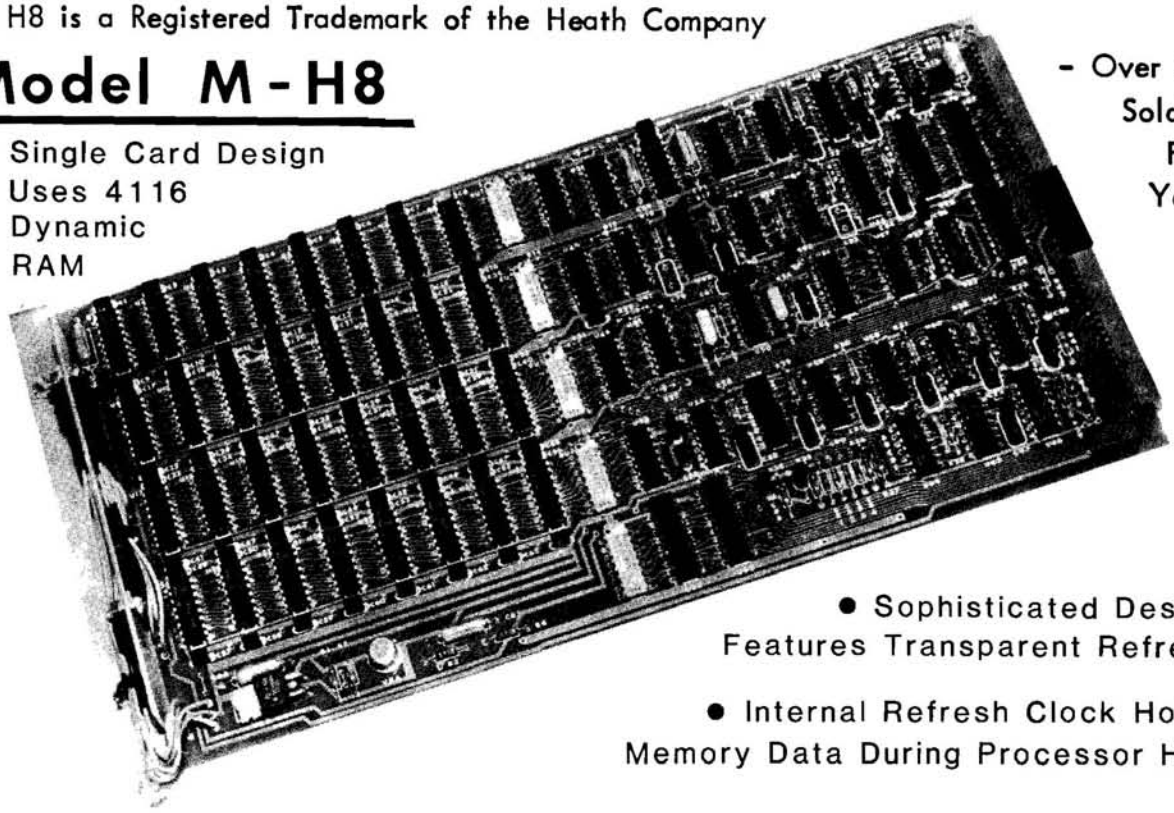

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Life In The Fast Lane.....

For the past few months that's exactly what I have been doing, living "Life In The Fast Lane". Between getting adjusted to my new position, trying to get my family resettled here in St. Joe, preparing REMark for publication and helping the other staff members in preparing for the National Conference it seems like there is never enough time.

Trying to keep up with the fast pace of things seems to be a problem for just about everybody today, except maybe a few who are content to sit back and watch the world go by. It's to those who want to help make the world go round, well at least the HUG world that is, that I address these remarks. In my last editorial I indicated that we are interested in articles for REMark, specifically we need feature articles to compliment the numerous small items we receive for publication. I know that many of our HUG members have written programs for special applications. It is these special applications that I'm sure our readers would like to hear more about.

If you feel that you have a unique program or hardware application sit down and write us about it. Did you write a program for the bowling team, or the softball team, maybe a special business or farm program. Possibly you have interfaced your computer to some special machine to gather data for later evaluation. I'm sure that many of our members would like to hear about it, it might give them some new ideas of their own.

Six to ten pages of double spaced typewriter manuscript will suffice. Be kind to those who might not quite understand your application and explain your special programming tricks with a little extra detail. It's these "tricks" that help others to comprehend programming techniques and to be better programmers themselves.

Please submit all feature materials on disk, 5 1/4 or 8", as unformated raw text files, (no printout codes, they have to be removed here). Also include a hard copy listing, which can be formatted if you wish. Also please include with your materials a small clear portrait photo of yourself suitable for printing.

Sharing is what the Heath Users' Group is all about. If you have a good way of handling a particular programming or hardware problem share it with others through HUG and REMark. I know that my interest in computers, and possibly the interests of many others, would not have lasted very long if it had not been for the willingness of others to share their ideas, programs and experiences with those around them. It might be the way you happen to handle a certain area of your program or your approach to a hardware modification that will spark the creative juices of another member.

Life in the fast lane is a lot smoother when we help each other.

Walt Gillespie
REMark Editor

for Heath/Zenith

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My specific areas of interest are:_____

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New HUG Products

885-8009
HDOS and CP/M
GALACTIC WARRIOR by Evryware $20.00

Editors Note: *The Part Number 885-8009 is for the HDOS and CP/M versions, with both versions resident on this disk. To order CP/M Soft-sectored simply add a "-37" to the P/N, the same as other disks. The soft-sectored will not run on HDOS however.*

Introduction: GALACTIC WARRIOR is a quality action game for one or two players from **EVRYWARE**. The program is a fast action arcade style game that will challenge the user as he battles through space on a mission to save the galaxy.

Requirements: The game requires the HDOS operating system version 2.0 or the CP/M operating system version 2.2 or later. Either version requires an H19/H8/H17 or H89 with 48K of memory. Only one drive is required.

NOTE: *This game requires the H19 (H89) terminal to play the game.*

Program Content: GALACTIC WARRIOR simulates a space battle between an enemy force against the users spaceship. The enemy force consists of six levels of force groups, with each succeeding group more powerful than the last.

The user maneuvers the ship around by using the horizontal arrow keys of the keypad of the terminal. The spaceship is equipped with a powerful force field which will shield against the enemy weapons. The ship is armed with deep space missiles and a powerful short range laser. Only two missiles may be launched at a single time.

The user is allowed four hits and then the ship is destroyed. Bonus (extra) hits are allowed if the user scores high enough.

The higher levels of the galaxy, contain some surprise ships and creatures. These obstacles are very powerful and difficult to destroy.

Scoring is based on the level of formation and the type of ship. The 25th line of the terminal maintains an accurate account of the status of the game.

Comments: HUG is privileged to have a game such as this in its library. We thank **EVRYWARE** for the submission of same.

885-8010 HDOS
885-8011 CP/M
CHECKOFF (Checking Account) $25.00

Editors Note: *The HDOS and CP/M abstracts have been combined into one, because the systems are identical in operation with the exception of the reference to disk drives, i.e. SY0:, SY1:, SY2: with HDOS and A:, B:, C: with CP/M.*

Introduction: CHECKOFF is a "checkbook" program which will allow the user to edit, sort, merge, and search records of the file. This program is designed to handle a home checking account.

CHECKOFF may be configured for any number of different systems. A graphic terminal is not required and a mod for 56K of memory is also included. (See specifics below.)

Requirements for HDOS, P/N 885-8010: This package will require the HDOS operating system version 1.6 or 2.0 on an H8/H17 or H89 with 48K of memory. Two drives are required and any 24 line terminal. Microsoft BASIC version 4.82 is required.

Requirements for CP/M, P/N 885-8011: This version will require the CP/M operating system version 2.2 on an H8/H17 or H89 with 48K of memory. Two drives are required and any 24 line terminal. Microsoft BASIC (BASIC-80) version 5.2 will be required.

NOTE: *The H19 terminal is not required to run this program. The author wrote this such that any 24 line terminal may be used. Special configured programs are included for the H19 terminal and the H9 terminal.*

Author: James Meyers

Programs: The following programs of CHECKOFF are explained briefly:

CHECKOFF.MAS — This is the master CHECKOFF program. In this form CHECKOFF is configured for any system using a dual drive system, 48K RAM, and any 24 line terminal. The program can be run in this form but by merging the configured files listed below the user can tailor the program to his particular system.

CHECKOFF.BAS — This program is an already configured version of CHECKOFF for an H-89 or H8/H19 combination. The data will be written to the second drive. It is the merger of CHECKOFF.MAS and H19.CON (explained below). This version is provided as a convenience to those H19 (H89) users.

H19.CON — This program may be merged with the master program to configure to the H19 terminal. (See CHECKOFF.BAS above.) The main improvement provided by this file is to implement screen erase instead of multiple line feeds to clear the screen.

K56.CON — This program when merged with the master program, will build a 56K system to hold more transactions.

H9.CON — This program is configured for 12 line terminals such as the H9.

SY0.CON (HDOS) or A.CON (CP/M) — This program configures the master program to tell it which disk the user wants to store his data on. The .MAS version is configured to access the second drive, i.e. SY1: (HDOS) and B: (CP/M).

SY2.CON (HDOS) or C.CON (CP/M) — This program configures the master to access a third drive for storing data, i.e. SY2: (HDOS) or C: (CP/M).

Program Content: Once the user has CHECKOFF configured for his particular system, he is ready to use CHECKOFF.

CHECKOFF holds 50 transactions (150 for 56K) in memory at one time. This is as many as are likely to be outstanding for an average household during a period.

This package is menu-driven. The menu functions are self-explanatory. The following is a list of the main menu:

1) Enter Transaction
2) Clear Transaction
3) Find
4) Delete
5) Input a File
6) Output a File and/or Quit
7) File Scan
8) Summary
9) Advanced Functions

The following is the "Advanced Functions" menu:

10) Edit
11) Sort
12) Merge
13) Date
14) Menu
15) Help
16) Catalog
9999) Clear All

The following is a brief description of some of the options:

Find: This routine finds an item by number, comment, or amount and is one of the most useful routines because the program can do much better at finding items than a person. When an item is searched by "comment" the total of all transactions with that comment is displayed.

Delete: This routine deletes the entire entry. Once deleted the entry is gone from the file forever.

File Scan: This is the typical way to view the entire file. If the user chooses to view only a portion of the file, the program prompts for the starting and ending Transaction Numbers.

Edit: This routine lets the user change a line entry thus allowing the user to repair any goof. Cleared transactions can be reversed and duplicate entries, as a result of merging, may be removed.

Edit will also allow the user to step through the data by lines in case a certain transaction is unreachable in other ways. For example, if two transactions have the same number.

Sort: This routine will sort all four data columns (fields) and also into open and clear transactions. It can sort to separate checks from adjustments. The sort will result in a file in which the specified column is listed in ascending order.

Merge: This routine lets the user merge a file with the file in memory.

Date: This routine lets the user change the date which the program writes on the checks entered in that session. This does NOT change the date in the operating system (HDOS).

Catalog: This option prints the catalog of the working disk.

File handling — CHECKOFF consists of four data fields as follows:

Transaction Number
Payee (or Comment)
Date of Entry
Amount

The program deals with check numbers and adjustment numbers entered on sequential lines in its data base. Each is assigned a transaction number, with a transaction being either a check or an adjustment.

An adjustment is a deposit, or interest received, or a fee, etc, anything that is not a check. Adjustments are numbered automatically by the program and are suffixed with the letter "A". The "A" becomes part of the Transaction Number.

The descriptive data that is entered to describe the transaction is termed a "Comment" in the case of adjustments and "Payee" in the case of checks.

CHECKOFF has three types of files which can be saved to the disk:

Full File
Partial File
Separated Files

The "Full File" writes everything to the disk. With the "Partial File" the user will be asked for a beginning and ending transaction number, which all numbers between these will be saved to the disk. The final option, "Separated Files", is the most interesting and useful one.

When the user selects the "Separated Files" option, CHECKOFF performs a complicated housekeeping chore. First it will sort the user file into open and cleared transactions. Then it will write the cleared transactions to the disk followed by the open transactions to the next higher file number than the one specified. This feature would normally be used once a month to clear out all the dead transactions and write a new file with only the open ones in it. To complete the task after saving both files, CHECKOFF clears its memory and returns to the menu.

Comments: CHECKOFF does not POKE into memory at any time. Upper and lower case characters may be intermixed.

The documentation is extensive, with a first-time step through section to get the user started.

885-1220

HUG ACTION GAMES FOR CP/M $20.00

Introduction: The games on this disk are BASIC-E versions of games previously released for HDOS and MBASIC on HUG disk 885-1096. BASIC-E was chosen for the CP/M versions because it can be included with the games, and an additional language or program does not have to be purchased.

Requirements: This disk requires the CP/M operating system version 2.2.03 on a H8 with H19 or H89 computer with 48K RAM. BASIC-E is included on the disk.

A Little about BASIC-E — BASIC-E was released as a product of HUG back in issue 26 of REMark as P/N 885-1215. It consists of two programs, the compiler BASIC.COM and the run time monitor RUN.COM. Before a BASIC program can be run with BASIC-E, it must be compiled by entering the command:

A>BASIC FNAME

assuming that the program is called "FNAME.BAS", and it is on drive A: along with BASIC.COM. The output of the compiler will be a file with .INT for its file type (FNAME.INT in this case). Now the program can be run by entering:

A>RUN FNAME

assuming that the .INT file and RUN.COM are on drive A: The .BAS file and BASIC.COM do not need to be present in order to run the program. All of the games on this disk should be run using only the RUN.COM program supplied on this disk, which has been patched as shown in REMark issue #27 page 23.

Author: All BASIC programs are by:
Terry L. Perrino
353 Wagner Drive
Claremont, CA 91711

BASIC-E conversion by: P. Swayne, HUG

SAMPLE picture by: P. Swayne, HUG

The Games: Here is a brief description of the games on this disk. Each game contains instructions for playing it, which will be printed when the game runs.

TANKS — This is a game for two players. A player can score points by shooting the other player or by running him into a mine.

SURROUND — In this two player game, each player controls a "wall builder", and tries to surround the other player. When a player runs into a wall, either his own or the opponent's or the playing field border, the other player scores a point.

BLAST — In this game for two players, each player controls a tank and tries to blast out as many "chips" as possible. He can also shoot a "mine", and get points for every chip that the mine destroys. But if he gets blown up by the mine, or hit by the opponent's tank, he gets sent "home" and has to start out again.

SCENIC DRIVING — In this game, the player steers a "car" moving down a winding road. The object is to drive as far as possible without running off the road. The game is over when you run off 6 times.

PLANES — This is a target game in which you try to shoot down "planes" that fly across your video screen.

DOODLE — The DOODLE program allows the user to draw pictures using rectangles of reverse video on the screen. The user can use either the entire block (a space in reverse video) or the upper or lower half of a block.

The first 23 lines of the screen are for the picture, which gives an effective resolution of 46 by 80 (using half blocks). While the user is drawing, the kind of block in current use is displayed in the lower right hand corner of the screen. To deposit a block of video at the current cursor position (or to remove one if in the erase mode), just move the cursor with one of the direction keys (explained in the DOODLE program itself). If the "pen" is up, the cursor can be moved without depositing or erasing blocks.

A sample picture, SAMPLE.PIC, is included on this disk.

Comments: The modification to CP/M was made without taking away from the programs involved.

CP/M ® is a registered trademark of Digital Research, Inc.

HUG PRODUCTS LIST

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

Part numbers shown in **bold print** are available in soft sector 5.25-inch format. Add -37 to the part number to order soft sector. For example, to order 885-1206 in soft sector, use 885-1206-37.

Part Number	DESCRIPTION	Selling Price	REM #
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885-1013	Volume II Documentation and Program Listings	$12.00	
885-1014	Tape II ASM Cassette H8 Only	$ 9.00	
885-1015	Volume III Documentation and Program Listings	$12.00	
885-1026	Tape III Cassette	$ 9.00	
885-1036	Tape IV Cassette	$ 9.00	8
885-1037	Volume IV Documentation and Program Listings	$12.00	8
885-1039	WISE on Cassette H8 Only	$ 9.00	
885-1057	Tape V Cassette	$ 9.00	
885-1058	Volume V Documentation and Program Listings	$12.00	
HDOS SOFTWARE	H8/H17 or H89 — (5-inch only)		
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885-1069	Disk XIII Misc H8/H89	$18.00	
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885-1077	TXTCON/BASCON H8/H89	$18.00	
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885-1098	H8/HA-8-3 Color .ABS/.ASM	$20.00	19
885-1099	H8/HA-8-3 Color in Tiny Pascal	$20.00	19
885-1105	HDOS 2.0 Device Drivers MX-80, Paper Tiger, Clock, etc.	$20.00	24
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885-1042	PILOT H8/H89		$19.00	
885-1059	FOCAL-8 H8/H89		$25.00	13
885-1078	HDOS Z80 Assembler		$25.00	21
885-1085	PILOT Documentation		$9.00	
885-1086	Tiny Pascal H8/H89		$20.00	13
885-1094	HUG Fig-Forth H8/H89 2 Disks		$40.00	18

BUSINESS, FINANCE AND EDUCATION

885-1047	Stocks H8/H89		$18.00	
885-1048	Personal Account H8/H89		$18.00	
885-1049	Income Tax Records H8/H89		$18.00	
885-1055	Inventory H8/H89	*	$30.00	
885-1056	Mail List H8/H89	*	$30.00	
885-1070	Disk XIV Home Finance H8/H89		$18.00	
885-1071	Small Business Package III 3 Disks H8/H19 or H89	*	$75.00	17
885-1091	Grade and Score Keeping	*	$30.00	14
885-1097	Educational Quiz Disk H89 or H8/H19	*	$20.00	18
885-1118	Payroll	*	$60.00	30
885-8010	HDOS Checkoff		$25.00	32

DATA BASE MANAGEMENT SYSTEMS (DBMS)

885-1107	Amateur Radio Logbook and TMS		$30.00	23
885-1108	Telephone/Mail Info. System	*	$30.00	23
885-1109	Retriever (2 disks)		$40.00	23
885-1110	Autofile		$30.00	23
885-1115	Aircraft Navigation H8/H89	*	$20.00	25
885-8008	Farm Accounting System	*	$45.00	30

AMATEUR RADIO

885-1023	RTTY Disk H8 Only		$22.00	6
885-1106	Morse Code Transceiver Ver. 1.1		$20.00	22

* Means MBASIC is required

H11 SOFTWARE

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

CP/M SOFTWARE (5-inch only)

885-1201	CP/M (TM) Volumes H1 and H2	%	$21.00	
885-1202	CP/M Volumes 4 and 21-C	%%	$21.00	
885-1203	CP/M Volumes 21-A and B	%%	$21.00	
885-1204	CP/M Volumes 26/27-A and B	%%	$21.00	
885-1205	CP/M Volumes 26/27-C and D	%%	$21.00	

The above CP/M products are 2 disks each.

885-1206	CP/M Games Disk	*	$20.00	11
885-1207	TERM and H8COPY		$20.00	26
885-1208	HUG Fig-Forth H8/H89 2 Disks		$40.00	18
885-1209	Dungeons and Dragons Game MBASIC and H89 or H8/H19	*	$20.00	19
885-1210	HUG Editor		$20.00	20
885-1211	Sea Battle Game for CP/M		$20.00	20
885-1212	CP/M Utilities I		$20.00	21
885-1213	CP/M Disk Utilities		$20.00	22
885-1214	Amateur Radio Logbook	*	$30.00	23
885-1215	BASIC-E		$20.00	26
885-1217	HUG Disk Duplication Utilities		$20.00	26
885-1218	CP/M MBASIC Payroll	*	$60.00	31
885-1219	CP/M Aircraft Navigation H8/H89	*	$20.00	31
885-1220	CP/M Action Games		$20.00	32
885-8011	CP/M Checkoff	*	$25.00	32

% Means CP/M 1.43 only (ORG-4200).
%% Means CP/M 1.43 or 2.2 (Heath).
MBASIC programs on these disks are for version 4.8 or earlier.
Other CP/M disks are for 2.2.
* means MBASIC is required.

MISCELLANEOUS

885-4	HUG Binder	$ 5.75	
885-4001	REMark VOLUME I	$20.00	23
885-4002	REMark VOLUME II	$20.00	

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Watch for the

WATZMAN ROM

also watch for more

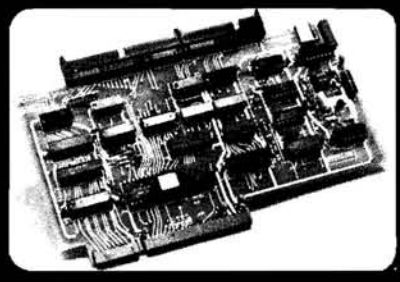
helpful articles

and

a new REMark writers

incentive program

1 CONTROLLER



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Tel. (714) 275-1272

BUGGIN' HUG

Dear HUG;

Just a note you might want to include in the next issue of the HUG magazine. I am starting a Northern Illinois HUG group under the name **NI-HUG** for NORTHERN ILLINOIS HEATH USERS GROUP. Any interested parties may write me or call (815) 248-2241.

Would appreciate mention in the next issue.

Jim Isenhart
427 Lockwood Rt 1
Davis, IL 61019

Dear HUG,

For those Heath users who need more printing speed, an alternative printer is the OKIDATA Microline 82A. It is comparable to the MX-80 in features and price and prints at 120 cps (50% faster). Additionally, it comes standard with both serial and parallel interface.

Connecting the OKIDATA to the H89 requires a 5 conductor cable with an RS-232 make (DB25P) connector on each end, wired as follows:

H89 End		OKIDATA End
1	<——————>	1
3	<——————>	3
4	<——————>	11
7	<——————>	7
20	<——————>	20

Connect the cable between the H89 'LP:' port (340-347) and OKIDATA RS-232 port.

Set the printer front panel DIP switch to all OFF, except #8=ON. The jumper and DIP switch on the circuit board at the rear of the printer should be set as follows:

Jumper SP1 = "B"
DIP sw. = 1-OFF, 2-ON, 3-OFF, 4-ON, 5-OFF, 6-OFF

The above wiring and settings provide full "handshaking" capability between the H89 and the OKIDATA at 1200 baud and allows the use of standard Heath supplied HDOS and Heath/Zenith CP/M drivers with minimum re-configuration.

You must 'SET' your 'LP:' driver(s) for 1200 baud (they are defaulted to 4800). Use LPH14.dvd for HDOS and 'SET.LP: BAUD 1200'. For CP/M, either run 'CONFIGUR' and set the baud rate for LST: to 1200 on your disks, or, each time you boot enter 'SETLP 1200' at the > prompt (SETLP.COM must be on the disk). The standard CP/M printer handshaking settings of 'LOW' polarity and 'RTS' do not require changing.

Hope this info is helpful to someone. I know I would be lost without REMARK and fellow "HUGGIES".

Michael E. Warren
15533 Sand Hill Circle
Eden Prairie, MN 55344

QUESTIONS & ANSWERS

(EDITOR'S NOTE: Some of the following Questions & Answers were contributed by Zenith Data Systems Software Consultation to help get this column started. If you need answers to specific questions on software or hardware please drop us a note, Heath User's Group, Hilltop Road, St. Joseph, MI 49085. Please keep your questions brief and to the point. We will do our best to answer you here in this column in future issues.)

Q: How do I set up my printer for special features under software control?

A: In HDOS the best way to accomplish this is to set up a BASIC program to send the necessary ESCape sequences to the printer, using the CHR$ function. For example, to set the H-14 printer to 6 lines/inch, we need to send ESC x. This can be accomplished by the BASIC (Benton Harbor) program lines:

```
OPEN "LP:" FOR WRITE AS FILE #1
PRINT #1,CHR$(27);CHR$(120)
CLOSE#1
```

For CP/M follow the same procedure using MBASIC. With MBASIC, the program becomes simpler since it is not necessary to open a file for the printer. Use:

```
LPRINT CHR$(27);CHR$(120)
```

Q: My new version 2.2X03 of CP/M comes up on my H-8, automatically running CONFIGUR as it should. It asks for "Standard system (Y or N)?<Y>:" and hangs, accepting no input at all, regardless of what it is. What can I do to correct this problem?

A: H-8-4 Board should have the interrupt enable jumper in the "on" position and the level jumper at level 3. The interrupt enable jumper is on the top of the board near the addressing jumpers and the level selector is on the bottom right.

Q: What causes the "MEDIA INCOMPATIBLE ON DISKETTES" error message during the DUPlicate command, even though I have correctly formatted my 8" disk?

A: Often the disk you are DUPlicating is single-sided and the disk you are using for the copy is double-sided. The sector hole window on the diskette envelope will be in the same location if both are single-sided. You get an "incompatible media" error even though you have formatted the destination disk single- density if it is a double-sided disk. You may, however, use the PIP program to transfer the files from the distribution disk to the new 8" disk.

Q: What are the formulas for "Supercalc".?

A: The formulas for a "Supercalc" program are of your own choosing. This is one of the best features of "Supercalc", it allows you to put together your own mathematics formulas and to change them at will. With the change of one formula any other equation that relies on it's results will also change.

Q: Why doesn't REMark magazine print more articles for beginners?

A: Like most club magazines REMark relies mainly on contributions and comments from members. As HUG has progressed so has the experience of the members, and as such the level of interest has also risen. We try to have items of interest for all levels of experience, although not every issue can reflect this. Give us some specific areas that you would like to hear more about and maybe we can find somebody willing to write an article about it.

Dear HUG,

I have been asked by our local membership to notify you of the following:

The TAMPA HUG CLUB now called **AL LYNCH HUG** is still alive and well. We meet at the Tampa, Florida Heathkit store every 1st and 3rd Wednesdays of the month where we HELP each other.

Thank you,

Richard R. Gunderson
AL LYNCH HUG
P.O. Box 155
Ruskin, FL 33570

Dear Editor,

It is my belief that there are a number of "HUGGIES" in my area but I do not know how to reach them to form a local club. I would appreciate any help you can give me in organizing a local HUG and if you would print a notice with my name, address and telephone number in REMark.

Thank you for your consideration and the fine magazine which you produce.

Peter Shkabara
29924 Road 168
Visalia, CA 93291

Dear HUG,

Hi. I am interested in starting a HUG group in the Schenectady, New York area and would like anyone interested in forming a club to contact me.

The address given is a work address and not a possible meeting place.

Walter Whipple
General Electric Co.
1 River Road 5-227
Schenectady, NY 12345

Dear Sir:

I am announcing the formation of an Austin Heath Users' Group, AHUG. We meet once a month from 8:00 pm to 10:00 pm at Applied Research Laboratories, The University of Texas at Austin, 10,000 Burnet Road, Austin, Texas. Anyone wishing additional information may contact George Koehler at 4206 Tamarach Trail, Austin, TX 78759. Phone (512) 255-0376.

I would appreciate any help you can give getting this group started as we do not have a Heathkit store in Austin. We have a membership of 15.

Thanks,
George Koehler

Vectored to Page 27☞

HARDWARE

VIDEO OUTPUT

William Cohn
Zenith Radio
7630 Kedvale
Skokie, Il 60076

In undertaking the design of the ZVM-121 monitor, it became obvious we would need a signal source to test the video monitor. Because we already had a Z89 computer in the design lab it appeared to be a logical choice for us to use. With the 80 column by 25 line display we could effectively test any video monitor. However, the Z89 had one problem, it did not have a composite video output. Also we needed operation of up to eight displays. Solving these problems led to the design of an interface card allowing the computer to drive up to eight video monitors. This modification may also be used in other applications, for example classroom demonstrations. This modification will work equally well on H89's and H19/Z19's.

The composite video signal is made up of positive video and negative horizontal and vertical sync pulses. The three signals, separate in the computer terminal logic board, are combined by the interface circuit into one signal suitable for input to a video monitor like the ZVM-121.

On the terminal logic board the video signal is already positive and the vertical sync is negative. This is acceptable, however, the horizontal sync is positive. The horizontal will have to be inverted once more. The initial circuit combining these signals was contained in one open collector hex inverter (7405) and would have worked except for a time duration problem of the vertical pulse. The pulse in the computer is approximately one millisecond long. During this time you would not receive horizontal sync. Lack of horizontal sync causes the top of the picture to hook. This problem was solved by reforming the vertical pulse with a monostable set to 200 microseconds.

The circuit in *figure 1.* is the result of all the experimentation. Each output has its own 74LS05 IC, making it independent. The vertical, processed by the 74121, makes the proper duration pulse. The three signals from the computer are buffered by the 74LS04 so as to not load down the terminal. The circuit with its own 7805 regulator, will not tax the computer's power supply. The interface could have less than eight outputs just by deleting the unneeded 74LS05's and the associated circuitry.

One last note, the timing in the 89's terminal logic is such that not just any video monitor will work. The horizontal and vertical retrace times of the monitor must be fast enough so the top and sides of the screen are not cut off. The ZVM-121 is excellent at reproducing the screen of the H89/Z89. ✱

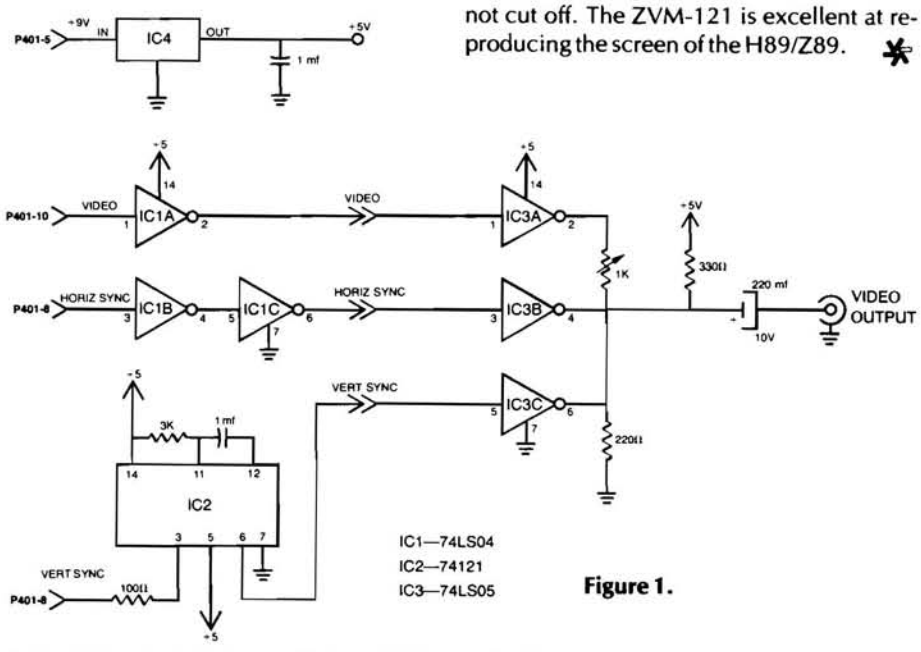
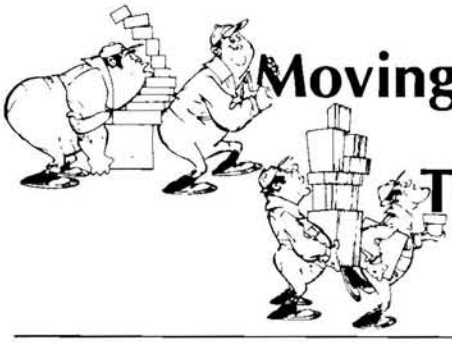


Figure 1.



Moving On Up To Soft-Sector Operation

Alison Philips
4012 Thoroughgood Dr.
Virginia Beach, VA 23455

There are many Heathkit H-88 and H/Z-89 owners using and enjoying hard-sectored floppy disks. These disks utilize the Heath H-88-1 floppy disk accessory kit (hard-sectored controller board) and the H-17-1 Siemens 5.25 drive(s). The drive may be mounted in the computer cabinet or the H-77 drive cabinet. This configuration has been eminently satisfactory, but is limited to 100K bytes per side for the 5.25-inch floppy disk.

One of the nice things about the Heath/Zenith line of computers is their upward compatibility. There are a number of ways of enjoying the advantages of increased disk storage capacity at a range of costs. One way is to add the Z-89-37 soft-sectored double-density controller board. This board works with either the H-17-1 single-side 48 tracks-per-inch (TPI) drive or the H-17-4 double-sided 96TPI drive. The Z-89-37 board immediately increases the storage capacity to 160K bytes per side for the 5.25-inch soft-sectored double-density floppy disks used on the H-17-1 drives.

For those who use the H-17-1 floppy disk drives and have added the Z-89-37 board, there is still more upward mobility by replacing the H-17-1 drive with the H-17-4 drive, or by adding the H-17-4 drive. This increases the 5.25-inch soft-sectored floppy disk storage capacity to 320K bytes per side, or to 640K bytes per disk. The increased storage capacity is accompanied by other advantages including faster access time. The beauty of it is, that by upgrading in this manner, none of the former capability is lost, and if desired you may operate concurrently with a group of drives using hard-sectored floppy disks and another group of drives working soft-sectored floppy disks. At even greater cost you may enjoy the advantages of 8-inch floppy disks and hard disk drives.

There is a caveat however to be observed in the building of the H-89 computer from kit. The all-in-one H-89 computer is actually furnished as a series of individual kits which form the whole. This is done for two reasons. First to allow the user to select the options he wants and to tailor his computer to his needs and pocketbook. The second is to allow backfitting of existing computers to reflect advances in technology. It is not abundantly clear to prospective builders (and I suspect of some Heathkit sales personnel) that it is necessary to assemble the H-88-1 Floppy Disk Accessory Kit (hard-sectored board) prior to the assembly of the Z-8937 soft-sectored double-density controller board. If you already have an H-88 or H-89 working with hard- sector, no problem, just buy and install the Z-89-37.

If you are starting from the beginning and wish to build a HS-89 all-in-one computer with 64K of RAM and with a built-in soft- sectored floppy disk drive, you would have, upon completion, the equivalent of the Zenith Z-90-82 fully assembled computer. The necessary kits for this particular configuration are listed below:

HS-89-2	All-in-one computer kit with 48K RAM.
WH-88-16	16K RAM expansion kit. (to 64K RAM)
H-88-1	Hard-sector floppy disk accessory board.
Z-89-37	Soft-sector double-density controller board.
HA-88-3	Serial interface accessory.
H-17-1	Single-sided floppy disk drive.

When the above kits are assembled you will find that you can operate from only the hard-sectored or the soft-sectored board at a given time. You can change from one board to the other by changing the ribbon drive cable, within the cabinet, which connects the controller board to the drive. This is not convenient and you will undoubtedly wish to use the soft-sectored system because of its advantages. Effectively, this will leave the hard-sectored board surplus, but this is one of the prices of technological advancement. If you are fortunate enough to have two disk drives, there may be times when you wish to have one drive connected to the hard-sectored board and the other connected to the soft-sectored disks, but most of the time you would wish to work with all the drives soft-sectored.

*

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CONGRATULATIONS!

DG congratulates HUG on the first NATIONAL HUG CONFERENCE. In celebration DG is offering special price discounts on all H8 hardware products during the month of August. The sale ends August 31, 1982. Call for details or see us in Chicago.

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IF YOU STILL BELIEVE YOU WOULD RATHER USE STATIC MEMORY...OR IF YOU NEED A PROM/EPROM BOARD...
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OR IF YOU HAVE BEEN WAITING FOR STATIC MEMORY FOR THE H8 TO BECOME REASONABLY PRICED.
WE HAVE THE ANSWER—THE STATIC 64 RAM BOARD

SUPER LOW POWER—Power dissipation typically less than 4 watts (less than any memory board available for the Heath H8). Uses Single Supply 5-Volt memory devices.

CAPACITY—Up to 64K RAM OR Up to 64K EPROM (type 2716/2516) OR any combination of RAM and EPROM up to 64K.

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Bank-select fully compatible with the DG-64D.

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Software Support for HDOS 2.0

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Space saving diskette back-up utility. For use with 5¼" or 8" disk systems. $39.95 (Source: add $40.00)

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FEATURES	DG-SUPER 89	H/Z 88/89
USER MEMORY The DG Super 89 comes standard with 64K of user RAM "on-board". This configuration can be increased up to 256K of bank selectable/write protectable RAM.	64K-256K	16K-64K
Ø ORIGIN MODIFICATION No further modification, such as required on the H/Z-89, is necessary to operate in either a standard Heath/Zenith CP/M or HDOS 2.0 Operating System environment.	NOT NECESSARY	ADD-ON
CP/M-HDOS COMPATIBLE	YES	REQUIRES MODIFICATION
PERIPHERAL EXPANSION SLOTS DG Electronics has made provision in the design of the unit not only for compatibility with the standard factory expansion slots, but also for future expansion by doubling the number of available expansion slots on the unit to 6 instead of the standard 3.	6	3
ON-BOARD AMD9511 For those users who perform large amounts of arithmetic computations the DG Super 89 has provision on-board for use of the AMD 9511 arithmetic processor.	YES (PURCHASE SEPARATELY)	NO
CPU CLOCK FREQ. The CPU in the DG Super 89 operates at twice the speed of the standard H/Z-89.	4MHz+	2.048MHz
MULTI-USER CAPABILITY With up to 256K of bank selectable RAM on board the DG Super 89 offers the option of MULTI-USER CONFIGURATIONS of up to 4 users.	YES	NO
ENHANCED MONITOR Enhanced monitor supports the advanced features of the Super 89.	YES	NO
REAL TIME CLOCK The DG Super 89 comes standard with an on-board real time clock.	YES	NO
PARITY CHECK ON RAM For those who are sticklers for accuracy, the DG Super 89 has parity check to make the user aware of errors occuring in the RAM during use.	YES	NO
SERIAL PORTS ON BOARD The DG Super 89 offers an additional serial I/O port for greater convenience and flexibility.	2	1

Now you can have all of the features in your H/Z-89 that you have always wanted. High speed and greater expandability are only the beginning of what our NEW DG SUPER 89 has to offer. DG Electronic Developments Co. has given the "89" capabilities of fast number crunching and data verification through parity. We have incorporated into the DG SUPER 89 such necessary items as 64K of user RAM, a powerful Keyboard monitor, and CP/M compatibility, items others require you to "add-on". Add to these features an extra serial port, a realtime clock, three more peripheral expansion slots, and multi-user capability and you have the computer that you really wanted to begin with; for a lot less than you would think.

Compatible with all currently available Heath/Zenith hardware devices.

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Ole SYSOP Hits The Trail!

Terry Jensen
HUG Software Developer

Well, when Walt *ordered* me to write about the highlights of my weekend, my first thoughts were "no one wants to hear of my boring experiences surrounding the HUG Conference!". I can express the greatest part of the weekend in three terrifying words; **load and unload!!** But I am sure you will find shortly that I had the most "exciting" duty of the weekend.

As the time grew nearer for the HUG Conference, we began to accumulate a few supplies to take over to Chicago. It became apparent the supplies, including seven Z-Machines, three or four H-89's, two H-37's, five or six ZT-1 monitors, and a host of other insignificant products (not to mention 15,000 posters) would not fit in the back of a Chevy Chevette.

Bob began to check around to find anyone who had driven anything larger than a Chevy Chevette with the size shipment we had acquired. Well, I quickly responded with an affirmative, not knowing what was about to take place. Of course, it was just a few months ago I let my chauffeur license expire, because after all for the last three or so computer years of my life I had not needed one, why should I renew?

"Ole SYSOP" Terry Jensen demonstrating the ZT-1 Terminal to Dennis Hamilton

After breezing through two written tests and one driving test to waive the driving test, I was well on my way to feeling great about the HUG Conference, knowing now that I was the only one with a permit to drive the Heath Company five speed, (dual or split rear axle for 10 forward speeds,) underpowered gasoline flat bed truck. What's more Heath had just installed on the truck an air horn and CB radio!

Finally Thursday arrived! I came to work dressed appropriately in blue jeans, corduroy shirt, and cowboy boots. (I would have worn my cowboy hat but that was moldy from the lack of use these last few years.) I was all set to supervise the loading of the truck, because after all I was the driver, and every driver needs to know his rig is loaded properly.

As I arrived, at the HUG dispatcher office, I was horrified to find that not only was I the supervisor of the dock personnel for loading the cargo, but I **WAS** the dock personnel! That in itself was bad enough, however, the supplies were in the HUG office and the loading dock was only about 50 rod from there. Yuk, and I didn't bring my tennis shoes!

Four hours and eleven blisters later, the truck was well on its way to being loaded . . but wait, VEC (the Heathkit store head office) wants to put "part" of its load on our truck because theirs is too small. That was fine, because once we get to the Hyatt Regency, surely the union will insist that their people have the honor of unloading the cargo!

The trip on Friday to the Hyatt was really neat. Blowing the air horn, flashing my lights at all the passing fellow truckers, and hacking over the CB in that funny jargon was well worth the headache and ulcers that I acquired in route, (and to think that the toll booth attendant wouldn't even take an H8 Poster for payment).

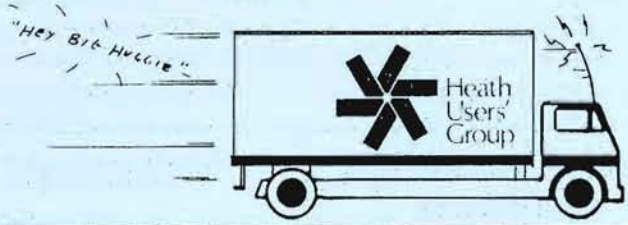
Fortunately, Gerry Kabelman accompanied me in the company car which he had mysteriously equipped with his CB. (I got the feeling he didn't trust me or was it the hundreds of lurking "Z" hi-jackers?) Anyway, for some unforeseen reason we got split up just before I-294 splits three ways! Well, being the cool, calm trucker that I was, I blurted out over channel 19 . . "Break one nine for that Big Huggie, this is Ole SYSOP, **W H I C H W A Y ???**"

After the frightening experience of Chicago traffic, once again I had been mislead. The Spanish speaking waiters had never heard of the Union, and furthermore didn't even understand sign language. So, I found I had two choices: 1) unload everything by hand at the door that was 20 feet from the room the Conference was held in, or 2) unload at the loading dock which was only 150 rod maze of corridors and hallways that were used by the dodging hotel personnel. Just so I would not feel that I would take advantage of one or the other, I proceeded to unload our truck at the loading dock and the VEC truck at the door.

Later, as I slouched at a table in the Garden Terrace, awaiting my 5 o'clock lunch, there at the next table was an individual wearing a strange looking . . oh no . . a HUG T-shirt. Good grief this was my time, why did that hostess set him there? Oh well, after all I was a "celebrity" for this weekend, why not muster up enough strength to at least wave and smile at this individual.

To my surprise, the funny looking HUG shirt belonged to Dennis Hamilton, who as my fading memory recalled was a member of the National HUG Bulletin Board. Well, that was enough to spark the seventeenth breath and I began to strike up a lasting friendship with someone I had "known" for a long time on the BB. While we were chatting, Greg Greene from British Columbia was shown to his seat right next to ours and obviously as we found out he was a HUGGIE, we included him in the conversation. Not ten minutes later, there at another table was Tom Jorgenson and Dale Lamm surrounded by six other HUGGIES. The HUG Conference was turning into a success already and I hadn't even gotten a shower.

The people I talked to were fired up about the whole idea of a HUG fling and bubbling over with enthusiasm. My sore feet, aching back, burning ulcers, and splitting headache became insignificant once I realized this HUG Conference was going to be a success and I had a small part in helping it along.



First National HUG Conference

Walt Gillespie
REMark Editor

Jim Blake
Software Coordinator

It all started with an idea in the heads of Bill Parrott and Tom Jorgenson back in the Spring of '82 and was followed up at a users group meeting in St. Louis, MO. With this basic idea, that of gathering Heath computer users from around the country in one place, Tom Dornback, Vice President Software Development Zenith Data Systems was contacted and asked; "can we do it?". Bob Ellerton, Manager of HUG suggested that the Heath/Zenith management be approached on the idea, they were, and they agreed...."DO IT!"

The task of contacting and gathering HUG members in one place to talk seems simple. Well, if you are involved with your local HUG group as an officer, you know how hard it is to get 20 to 30 individuals together at one time, multiply that by a factor of 50, include hotel accommodations, convention facilities, meals, speakers and problems....yes problems, they always seem to tag along on these things, and you have some idea of the magnitude of the task.

The tension here at the HUG office began to rise the first of the week just before the conference was scheduled to open. Last minute arrangements were made, check lists were checked twice and then again to make sure nothing was forgotten (can't fit the list of forgotten items in here). Nancy Strunk and Margaret Bacon of the HUG staff were jumping between the needs of the conference and their busy daily schedules taking care of registration problems as they surfaced. The rest of the staff, Jim Blake, Terry Jensen, Pat Swayne and Walt Gillespie were jumping-to on directions from HUG manager Bob Ellerton. It's a good thing we have a WATTS line to Chicago as the calls to the Hyatt would have broke the HUG budget during this period. As the week progressed towards 'boot-up', Jim polished arrangements with the Hyatt Regency O'Hare in Chicago, Pat completed the finishing touches on demonstration software while Walt put together the programs and signs. Enter Gerry Kabelman past HUG staff member (around here you're not sure he ever really left), with programs for registration and demonstration equipment.

Friday, AUG 6, 1982, BOOT-UP day dawned with the pace quickened as the flurry of last minute arrangements were made (those lists were checked again). Off to Chicago bright and early, the "HUG Traveling Road Show" began to arrive at the Hyatt Regency around 10 a.m. Chicago time, some a little awed at their first sight of the cavernous lobby of this their home for the next three days. Arrangements were made for the arrival of HUG materials as well as for the support vendors. This was one of the most busy times for the HUG staff as preparations for all activities had to be finalized.

As the day wore on, the pace of activity stepped up and an increase of people arriving and milling around the lower lobby became evident. By 6 p.m. a large crowd of HUGGIES had gathered in front of the reservation booth anxiously awaiting it's opening. Meanwhile in the United rooms immediately behind the registration booth vendors were frantically trying to prepare their displays. Pat Diehl from Kres Engineering was trying to remain calm but Bob Koepke and Ken

Bill Johnson, President of Heath Company, is introduced to the HUGgies by HUG Manager Bob Ellerton.

Smith had missed their flight and with them was all their materials and Walt was talking of opening the Vendor area a day early.

The Vendor area did open that evening and the isles were crowded with 200 to 300 HUGgers and HUGgies looking over the latest offerings from people like Walt Bilofski of Software Toolworks who thinks that cotton 'T' shirts also qualify as software along with his disk programs. Rick Kerbel from Sunflower Software brought along his namesake in the form of a 50# sack of sunflower seeds which were generously available from a bowl on his table placed among his program offerings. Movement among and around the displays was at best difficult as groups of Heath/Zenith enthusiasts tried their individual best to get the attention of vendors or try their hands at hardware demonstrations such as the Z100 and H89 units. Gerry K. now of ZDS (Zenith Data Systems) and Pat Swayne of HUG put the new 'Z' units through their paces to amazement of wide eyed HUGgies, 'Oos' and 'Ahhs' were evident during the color graphics demonstrations.

Ray Massa and his wife Nancy from Keyboard Studio shared a booth with John Matlock of MPI (who lost a lot of sweat trying to keep up with inquiries about his graphics printer). Ray tried his best to get an early copy of the August issue of REMark from Walt (it was to be handed out early the next morning at the opening session), as it is Ray's artwork that graces it's cover. Not succeeding at this, Ray returned to answering questions about the many software pieces he had available at the conference as well as explaining how come he was discounting Z100's when nobody thought they were ready for shipment yet!!! (Ray's warm smile helps make friends fast that could be the answer). The Houston drawl of Brian Gram and Bruce Denton

of D G Electronics could be heard fielding questions concerning their Super 89 board which is now shipping. Charlie Floto of Buss/Sextant was seen wandering through the vendor room and outer areas gathering notes for future publication. Materials from Microprocessor Associates were seen stacked at their booth early Friday evening but Steven Peterfreund and his wife could not be found. Steve and Gail arrived later in the evening having slept in after a straight thru drive from Nashua, New Hampshire. The vendor area was closed down at 10 p.m. after a lot of prodding and promises that it would be reopened at 8 a.m the next morning.

Bright and too early (well, that's what he says) Saturday morning, Bob Ellerton opened the vendor area to a group of very sleepy hard-

Bob Ellerton introduces the HUG staff Saturday morning.

ware and software sellers. Don Long, of Enviromental Control Systems, warmed up his home control system, which on command would turn on various colored lights representing different rooms of a home, while Ted Bengal of Micro Interface, who shared the table, demonstrated his V-8 Voice synthesizer and modem kit. Across the room Ray Livingston, of Livingston Logic Labs, who when taken away from his software can become the life of the party, was ex-

About the Heathkit Store

"...Those prices are quite interesting, you just got another H-89 fella out of Alan (Jacobs)."

Dave Hamilton
Kalamazoo, MI

pounding the virtures of his BIOS-80 software. Dean Gibson, best known to HUG members for his work on the SY: device driver, displayed software available from Ultimeth.

The numbers of prospective purchasers (well, that's what the vendors hoped) and the decible level began to grow as more HUGGIES rolled out of their nice comfortable beds and made their way down stairs. Doug Sauby of Magnolia Microsystems manned his booth space early so he could catch these anxious HUGgers and explain his hardware options. Alan Finger of Caraby unfortunately didn't arrive till late in the afternoon but still was happy and impressed with the attendees response to his interface board and color graphics controller.

The vendor area was closed for an hour so that all could attend the fantastic luncheon provided courtesy of Heath company. This closing allowed for the HUG staff, the Heath and Zenith personnel, the

HUGgies gather for coffee during a break between speakers.

vendors and attendees to gather, mix and talk in an informal atmosphere about mutual interests concerning H/Z computers.

Cleveland Codonics had Peter Botten and Mike Kolberg there to demonstrate their new H19 add-on graphics board which had a big impression on those who could push through the crowd watching the 504 by 247 pixel graphics presentation. Dave Murray and Joe Gargiulo of Evryware kept busy showing their neat games software. Also with some really good games software was Janet Hoyle of Hoyle and Hoyle who joined the HUG staff in the center booth area

".....Well worth the bother of coming!"

Rod Damron
Bolingbrook, IL

giving demonstrations using a H89. Also in the center booth was Margaret Gustafson of Tektronix with displays of some terrific scopes plus her own humorous personality.

The vendor room shut down early Saturday afternoon so that both the attendees and the vendors could be at the social hour starting at 6:30 before moving on to the Rosemont Ballroom for a very fine dinner courtesy of ZDS.

HUGgies line up at the temporary Heathkit store to take advantage of the super bargins there.

Again, the vendors were dragged from their comfortable beds so as to have the display room open at 8:00 a.m Sunday morning. The blinking eyes of Dave Powers could be found at the Generic Software booth along with his lovely wife Erma, here they were displaying their many faceted line of utility software. Also during these early hours could be heard Reuel O. Launey putting the Artra Housemaster unit through it's paces while Shelly Launey Fielded questions from inquizitive prospects.

As the day progressed and the participants began to wear down from all the goings on, it was announced that the vendor room would close at 2 p.m., for good. Members made last minute decisions to take advantage of the great show specials that vendors were offering, then to slowly make their way back to their rooms to pack for the trip home. As the excitement of the day began to wane Tom Jorgenson of Software Wizardry, along with his helpers Dale Lamm and Greg Green, began to toss small green frizbees around the vendor room as they tried to relax from two hectic days of selling such items as their MDS Spooler program.

From the Conference Floor

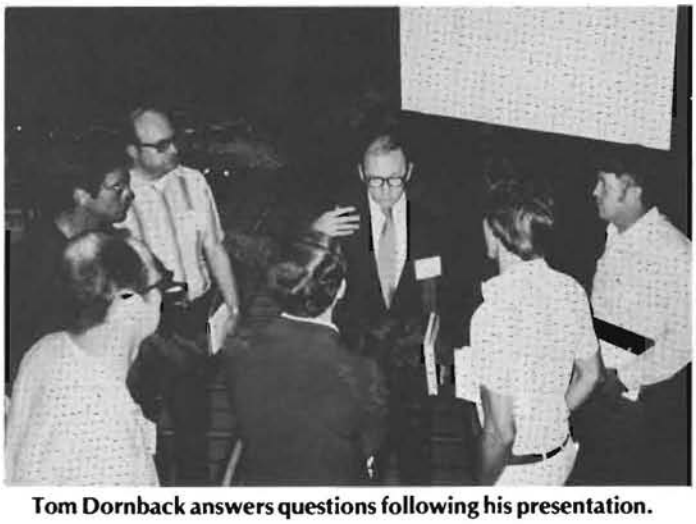
"...Very Good, I don't own a Heath computer right now, I came here to decide if I should, I own a different brand. I think I will get a Heath."

Jeffrey Singer
Maple Grove, MN

Don't think that the vendor display area was the only thing going on during these two days because at the same time in another part of the hotel an ongoing series of meetings and talks were taking place.

So reporting from the Rosemont Ballroom is Jim Blake....

The big news from the first HUG National Conference is that there was little news. Just a few days before, and not because of the HUG conference, ZRC management passed out 'future product filters' in the form of wide sticky tape complete with instructions for applying it over all employees mouths. Thus many talks were re-written, visuals re-shot and the program re-printed. Even HDOS 3.0 fell off the program. The standard answer was... "I'm not allowed to discuss future products." All day Saturday the audience heckled each speaker about HDOS 3.0. It became the by-word of the day.



Tom Dornback answers questions following his presentation.

But all 1000 in the audience rolled over in laughter when the normally quiet and reserved Don Moffet, ZDS President stepped to the microphone following dinner and announced, "I'd like to discuss with you tonight... HDOS 3.0!"

About the Z100's

"The (IBM) PC and the APPLE will never be able to call themselves graphics machines again....."

Mike Cogswell
Vienna, VA

The day began with HUG manager Bob Ellerton placing the mike to a nearby H89 as he applied power which rendered the familiar beep- beep and announced the first National HUG conference "up and running!" Applause. Then he made some remark about the wives possibly seeing their husbands out of the computer room for the first time in light years. Applause. Boo! Seems there were a few female computer enthusiasts who had dragged their husbands along! After introducing the already exhausted HUG staff he introduced Heath President Bill Johnson and wife Patty who were celebrating their 28th wedding anniversary. Bill briefly recounted the history of Heath and presented a visual tour of Heath as it is today, generously sprinkling humorous anecdote along the way. After telling of the first Heath product, the parasol airplane and the death of (Heath founder) Howard Anthony in a plane crash some years later, he was to quick point out that he and Patty had DRIVEN over the night before! Bill joined Heath Company in 1958 as dealer sales manager, "which I thought sounded pretty good.... except when I got there I found out we didn't have any dealers!" Bill is largely responsible for the Heathkit Electronic Centers as we know them today. "In 1979 a good thing happened to Heath Company. Zenith Radio Corporation acquired us from Schlumberger, and that makes sense. We are both in the consumer electronics business and we're both number one in our business." HUGGIES enjoyed the visual tour through the production facility, an explanation of how a product is developed, and learned of the rapid growth of the company. "It took us 33 years to reach $100 million in sales in 1980. It is now clear that in 1983 we will reach the $200 million dollar mark. And that's a lotta growth in a very short period of time. We've had some growing pains, but that's a high class problem." He concluded by saying, "There are going to be many more 'buttons to push' than there were 6 or 7 years ago. We don't know what they are yet, but we have the ideas, resources, engineering talent, enthusiasm and desire to bring you new products at prices you can afford!". Cue the applause.

A wifes point of view

"I'm enjoying the show, I'm picking up a lot of knowledge and insight into questions people have about their systems...."

Shirley Hackney
St. Joesph, MI

Enter Jerry Pearlman, Senior VP of Finance, Zenith Radio Corporation. "Did the marriage work? And are we still in love?" Referring to the acquisition of Heath, Mr. Pearlman assured the group that the marriage worked, and that Zenith is still 'in love.' "We have a con-

HUGgies inspect the Z-100's.

Bob Ellerton, HUG M
National Conference.

Bob gets his point across.

Janet Hoyle and Dean Gibson watch HUG's Pat Swayne put an H89 through it's paces.

Gerry Kabelman of ZDS, (formerly of HUG) fields questions on the new Z-100's.

Jerry Pearlman of

Bill Parrott, inventor of the National Conference, with our youngest HUGGIE, Billy.

Walt, Tom and Doug discuss the day's events during a coffee break.

Bob Ellerton, with his wife Jill, listens to comme
lunch as Dave Hamilton of Kalamazoo, MI look

anager, opens the First HUG

Bill Johnson, Heath President, congratulates Gary Madison winner of an H89.

Bill Johnson of the Capital Heath User's Group, leads the general HUG meeting.

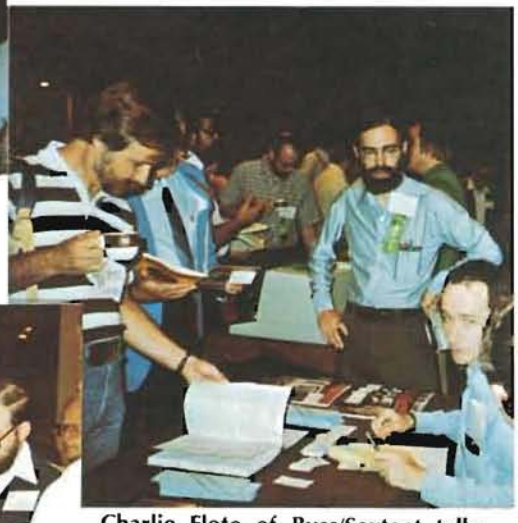
Zenith.

Lafe Nelson is presented a H25 printer (door prize) from Joe Schulte, Veritechnology President.

Gordon Letwin discusses software with a group after his talk.

Walt Gillespie, REMark Editor, discusses the conference with HUG's Jim Blake.

Henry Fale of H-Scoop was seen taking notes around the conference.



Charlie Floto of Buss/Sextant talks with fellow vendors.

ıts from HUGgers during on.

HUGgies push closer to hear a vendor tell of his wares.

siderable investment in this business and I can assure you that we're here to stay!"

"I'm not allowed to discuss future products." Thomas Dornback, VP of Software Development told the 'Tale of Two Cities', citing the division of responsiblities in the software group between Operating System software which is developed in the Benton Harbor-St. Joseph facility (because the hardware development is here) and the block long facility in Chicago where the applications software is developed. Tom was quick to point out that his group prefers to acquire software from outside vendors and use his staff of engineers to add the unique Heath/Zenith touch. He detailed procedures for software developers who wish to have ZDS market their product, then explained the rigorous development and testing procedure used before the product is released. He also touted the significant enhancements that were made to MS-DOS by the St. Joe group and the new efforts in the Z series documentation. Also he described some of the features of a new product called Multi-Plan, an electronic spreadsheet developed by Micro-Soft which is accompanied by "perhaps the best documentation I have ever seen." He said one of the most significant differences that make Multi-Plan "a third generation spread sheet product" is the ability to access multiple data bases on the same disk and display up to 8 different sections on the screen at the same time. Any questions from the floor?" Yes.... When is HDOS 3.0!? What about CP/M 86? Will you have Fortran 86? Will there be a cross assembler for the Z? "I'm not allowed to discuss future products." Cue the laughs. Cue the Applause.

Barry Watzman Computer Product Line Manager outlined the Z-100 hardware features and system software and answered a wide range of questions. Q. When will the new rom for the H19 be released? A. That rom (which Barry wrote) will be released through HUG including source code on disk in late September. Kit firmware! Q. Will any of the existing drives work in the Z-100? A. Yes. The soft sectored drives in the 37 will plug right in. Obviously, you have to re-assemble the BIOS if you want 96 tpi capability. Q. Why did you use 48 tpi drives instead of 96 tpi drives in the Z- 100? A. Three reasons. We wanted to retain compatibility with the IBM PC. The cost-per-byte is better for 48 tpi and back when that decision was made, it wasn't clear that the user would be able to reliably read distribution software. Q. Will the Z-100 support networking? A. Yes. Q. How about multi-user? A. Clearly we designed the machine so that multi-user capabilities are possible. Q. Will there be a color CRT offered for the All-in- one. Q. No... There isn't room in the cabinet for any existing color CRT. But it will drive a color monitor. Q. What is the future of the H-8? A. It is no longer being manufactured, however, we will continue to support it both from a hardware and software point of view. A new controller card that supports the 47 and 67 will be out in about 60 days. Q. Will a light pen be available soon for the Z-100? A. I don't know. Q. Will the Z-100 come with the source to the BIOS of CP/M85? A. Yes. Thank you, Mr. Watzman.

After a short break, the program presented two surprises. Since Gregg couldn't talk about HDOS *.*, Dave Perkins, the project engineer for Z-DOS and Bill Zurney, his counter-part for CP/M-85 came to the rescue and explained all the one's and zero's for almost two hours. Gregg goes first and explains the firmware for the Z..

This is technical..... "Given that the 8085 can only address 64k, we've designed the system so that the 8085 can be at any 64k page in ram. (The Z can have as much as 756kb). There's a latch to specify the high order address bits and by doing that we can put the 8085 at any 64k boundary. Therefore you can have the 8088 initialize things and if you want, switch to the 8085 which may run your program anywhere in memory. When the system powers up the first processor that executes is the 8085. It executes three or four instructions and immediately switches to the 8088 and it leaves the 8085

A note from a NUA (Non-User Attendee)

"I did enjoy myself very much—more, perhaps, than I had expected to. Everyone was very friendly, the accomodations were excellent, and the conversations and talk were not** always **over my head."

Karen Bakos
Merrillville, IN

At the Heath store

"I'm enjoying myself...It's a lot more than I expected. Very informative. The prices here are fantastic."

Joesph Walker
Cleveland, OH

The cavernous main lobby of the Hyatt Regency O'Hare.

ZENITH
MAGNOLIA
SUNFLOWER
CLEVELAND CODONICS
GENERIC SOFTWARE
MPT

Program Counter at 0 so that the next time it's needed it looks just like it would at power-up reset... What all this means is that we can use either processor either of which can force an interrupt to switch to the other processor, depending on the application and memory requirements." Moving right along?! Refer to the memory map in the July issue of Remark. The Z is always in the graphics mode. Each of the 144,000 dots on the screen is individually addressable and represents a bit in the video ram. Gregg continues. "Looking at the screen, the left, upper most corner would represent location '0' in RAM and is organized in 8 bit bytes so the first line is 79 bytes long. Therefore, if you wanted to turn one bit or dot or pixel) you would read the entire byte, do an ORI nn and write it back. So, to write a full character, you would have to modify 10 bytes. However, in ROM there's a font pattern for each of the characters, when you want to display a character, you move that particular font pattern from ROM to video RAM." Referring to the monitor in an overview, Gregg said, "The ROM was designed to be readily extensible. With very little problem, the user can re- implement a number of what I have defined as primitives and change the entire behavior and personality of the terminal emulator. For example, if you don't want 8 by 9 characters and want double-wide characters, and are willing to do just a little software work, you can have anything you want." Anyway, you missed an interesting talk, and it can't be entirely covered here.

Vectored to Dave Perkins..."Z-DOS is much like CP/M with some major enhancements implemented by us. While all the CP/M system calls are the same, some important calls have been added.. For example, you can read, write a byte to or from the console, printer or auxiliary port. Also, you can do disk read/writes/status step the head in or out, format etc. In other words, the user has access to the disk on a byte basis through the Operating System." Dave said, "No more BDOS error on drive n.. instead, a legible error message is returned and an opportunity to recover is given." Also, drive A: is always drive A: unless you change it. If you boot from drive D:, D: is still D:. And you don't have to 'mount' or log disks.. change them all you want! Z-DOS keeps the exact EOF indicator, and the time and date the file was last modified, and no extents. Dave also pointed out that "files are not limited to 128 bytes.. you can specify the length of file... even one byte." Dave added to MS- DOS a menu driven 'configur' program that sets the parameters for almost any printer you can think of, as well as the AUX port, or modem. As a matter of fact, you could hook up your 19 to one of the ports. Included on the distri-

A Conference View

Nancy Strunk
REMark Assistant Editor

This 'blurb' on the first National HUG Conference comes to you from a novice computerist. Never having attended a convention, let alone a computer convention, I had no idea what to expect. Now that it is a dream come true that I will not soon forget; I will share with you some of my experiences that weekend.

First, I would like to say thank you to all the HUG members for standing by HUG and supporting us through times of good and bad. The enthusiasm of the 1000 plus attendees helped calm my fears and show me that we truly are working together. Please - stand up and take a bow members!

When I wasn't busy with conference responsibilities I walked through the exhibit area, the Heathkit store, and the Rosemont Ballroom where the talks were being held. It was like someone had given those people a new toy and they couldn't get enough of it.

Meeting people from all over the United States and beyond and even being able to answer computer questions was exciting. Finally being able to put a face on a voice and then remembering them later was to say the least a real challenge.

I had a chance to speak with some HUGgies who were asking questions of the same caliber I asked everyday. I don't feel so alone now as a new comer to the computer world as I find there are many people like me; very, very, eager to learn. And speaking of learning, I never realized how many questions you HUGgies would ask me – by Saturday evening I felt like I'd had a frontal lobotomy. It was great though; everyone sharing the same unique interest, and being able to tell of their experiences and problems helped tremendously.

Being close to the main entrance of the hotel at the Registration Booth, we heard many comments as to what HUG stood for. After explaining that we were the HEATH USERS' GROUP – they usually continued with questions. One incidence of humor; while in the ladies room I heard two ladies talking. One said, "Did you see that sign, The HUG Conference," and the other said "What can they be doing in there?" The first said, "I think it has something to do with health, but that's even worse." A third lady walked in, listened to the conversation and told them that HUG was with Heathkit and that is was a computer convention. About that time I walked into the room with my official badge telling my position on the HUG staff and the room was silent. Finally one lady asked me if I really liked computers. I said "Yes, and that this conference was very exciting and interesting to me." She looked at me strangely and said "I'm sorry." Thinking back I probably would have said the same thing had I not been introduced to the computer as I was.

Margaret and Nancy getting the Registration Booth ready.

For the most part, we all worked very hard and had a most enjoyable time. I think by the time Sunday rolled around the only thing that kept us pushing harder was fatigue and all the new friends we had made. I truly hope to meet many more HUG members in the future!!

Margaret Bacon
HUG Secretary

It's all a warm fuzzy blurr– that's what I told my husband when I finally got home late the evening of August 8th. But then I started seeing the happy and sometimes excited faces moving around. We talked about how great the hotel people were and how they made it possible for the conference to work smoothly and we talked about how everyone really pitched in whatever the problem or the job that needed to be done. I remembered how great the HUGGIES were, waiting patiently in those sometimes long lines at the registration booth, waiting patiently while Jill Ellerton fixed all those 'typos' on their name tags. And I told him about all the stuff that I took over to Chicago to help fix all the problems I just knew you would be bringing with you to the conference, and you know what – I didn't use any of it. I guess what I am trying to say is that I spent the weekend with just about the greatest goup of people anyone could ask for.

bution diskette is foreign fonts and the source to the BIOS, which assembles in less that 30 minutes.

Bill Zurney then explained his implementation of CP/M for the Z called CP/M-85. and the compatibility between the 89 and 100. "The soft sectored 89 diskettes can be read by the 100, but not the reverse. It is a 8 by 512 format. The Z can also read 47 diskettes.... We decided to split the BIOS into two sections... An 8 bit version, which is just a 1k stub, and the rest is written in 16 bit. This results in a reduction of memory usage, thereby leaving more user memory. This also allows us to speed up the disk I/O which has 40k of disk buffer." Memory's cheap! "All of this renders a 8 to 1 performance increase. All interrupt processing is done on the 8088 side. CP/M also supports the foreign fonts. We've expanded on the well known 'CONFIGUR' program to provide character I/O and with one driver we can support almost any printer." Yes, the source to the BIOS and the FORMAT utility will be provided. Any questions??? Yes. When is HDOS 3.0?! and will I be able to up-load my HDOS programs to the Z? Gregg goes "Of course that would be desirable.. I have a lot of HDOS disks myself." In other words... "I can't talk about it."

Well, sometime after five o'clock, most took time to rest, while others nailed these guys in the corner for some more tech-talk.

Cocktails at 6:30... Dinner at 7:30... Talk about neat. 84 big round tables dressed in red, beautifully set and waiting for a thousand friends to enjoy a great steak and evening. In his talk, Mr. Moffet pointed out that over 25% of the installed Heath/Zenith computer customer base are HUG members. He re- affirmed that ZDS is in the computer business to stay and that the HUGGIE's all over the world are an important input in development decisions. Cue the applause.... cue it again!

Cue the suspense... What is everyone waiting on? The drawing for the BIGGIE! So not to keep everyone in suspense, the names of the winners of the Z-100, the H-89 and the H-25 printer were drawn first! Then.... each name was placed in an envelope on the back drop! (he-he). Then on with the drawing of some twenty other prizes (listed elsewhere) and some notable recognitions such as an 'unannounced new product' presented to Tom Jorgensen. Tom can be found on MNET most evenings chatting with other HUGGIES and generally stirring up interest in everything but HDOS. So, enter the all new MO-1 modem kit.. It included the familiar acoustical couplers complete with connectors, two small cans of tomato soup (transducers) and 160 feet of serial I/O string. It was said to be an originate only model. (Tom, the manual is still in type- set.)

Attractive plaques suitablely inscribed to recognize outstanding contribution to HUG and Heath/Zenith product support were presented to Doc Campbell (by mail), Bill Parrott, Henry Fale and Charlie Floto.

Ray and Nancy Massa designed the HUG posters, so it seemed fitting that they should have one of their very own, so Ray received the one designed by Nancy and Nancy is now the proud owner of her very own H-8 power poster. Touching.

Out came, an operable, albeit dirt H10 paper tape punch that has been cluttering the garage for the past four years. It seemed appropriate at the time to present this to Charlie Floto to assist him in the preparation of SEXTANT. He showed his gratitude by standing on stage, behind the head table and blowing up balloons. (personal note: It's nice to know some of that hot air was captured.)

And, some of the HUG staff found time Friday nite to prepare a gag for :BE: It was a new MASS STORAGE DEVICE.. A roll of toilet paper, inscribed in dot matrix "for storing anything, or for when it hits the fan."

Then the biggies. Joe Schulte revealed the name of the H-25 winner. Not present. Draw again. And again! Finally, Lafe Nelson Sr. wins!. Then Mrs. Bill Johnson announced to the screams of Mrs. Gary Madison that Gary now had TWO H89's and as BOB details elsewhere in this issue, Mike Caddy is the first owner of a Z-100 with the complete software package... What a nite!

Sunday morning, (much too early) Bill Johnson, the founder of the Capital HUG led the group through a lively discussion which mainly centered around the HUG policy concerning the pricing and sale of software. HUG management listened intently and promised to review it. Also, several of the club officers present from all over the country exchanged ideas and local HUG procedures.

Gordon Eubanks, VP of languages at Digital Research proclaimed dual processor machines are THE thing and explained how CP/M 86 takes advantage of the architecture of the Z-100. He also, volunteered to speak at any of the local meetings. Just drop him a note and the next time he or any of the other members of the DR staff are in your neighborhood, they'll be more than happy to join you.

Following a leisurely lunch, JGL (Gordon Letwin of MicroSoft) described the 'idea' operating system and, of course, pointed out the features of Xenix. Later in the day, Gordon Letwin, and Gregg could be seen cornered with many of the members in a highly technical session.

And the day concluded with Doug Bonham Director of Educational Products detailing the role of computers in the educational market and how Heath see's their position in this field.

Bob Ellerton fielded some last minute questions, the most prominent being, "are we going to do it again next year?" That's the plan!

HUG staff member, Terry Jensen, just melted away after returning from the conference.

And Now For The Grand Prize Winner.....

Bob Ellerton
HUG Manager

Don Moffet, President of Zenith Data Systems, stood on the Speakers Platform in front of 1000 anxious HUGGIEs and slowly opened a piece of paper that had been placed in a floppy disk jacket labeled #1. As he announced that name, a scream of delight filled the Rosemont Ballroom at the O'Hare Hyatt Regency in Chicago, the sight of the First National HUG Conference. Lynn Caddy was jumping with joy over the result of the prize drawing that left her husband, Mike, with a new ZF-120 "Z" Machine, the Grand Prize of the evening. Later we were to learn the interesting story of these loyal HUGs that attended the Conference.

It seems that Mike, a long and loyal member of the Heathkit family, had decided to attend the First National HUG Conference as soon as he learned of the event. He had registered with HUG National months before the big day and was primed to meet other members with similar interests. As fate would have it, Mike was confronted with the typical problem facing most of us computer types .... HOUSE WORK! Mike and Lynn's house was in need of a face-lift. They both budgeted the project to fit in with both their financial capabilities and busy schedule.

As the Conference grew close, Mike began to realize a simple project can always become more expensive and time consuming than normally expected. Lynn told us that he began making noises about not attending the HUG Conference, even though he was extremely disappointed. Mike suggested that the money wasn't available to do both the needed repairs and to go off to Chicago. Lynn went to work on Mike, explaining that this may be their chance to get out of the house and away from the everyday problems. She told us that the task took awhile, but there they were at the Saturday night gathering with the HUG Group.

When Mike's name was called, he went into immediate shock until he had the chance to chat with Don in the Vendor Exhibit Area and have the featured cover shot for REMark taken in front of a "Z" that will soon be delivered to his home.

What can we say Mike but.....CONGRATULATIONS from all of us at the Heath Users' Group and a special THANKS to Lynn for allowing us to share this experience with this great individual! ✱

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NEW GOODIES (DROOL!) AT THE CONVENTION

P. Swayne
HUG Software Engineer

I think I spent most of my time at the HUG Convention in the exhibit area, constantly resetting the Z machines and restarting the demo disks. Folks just couldn't keep their hands off of them, and who can blame them? They were the highlight of the exhibits, but there were plenty of nice new things for our good old H8's and H89's also, both hardware and software.

High Resolution Graphics, Clocks, Controllers, etc.

The new hardware item that impressed me the most was an add-on board for the H19, H19A, and Z19 terminals, called the "iMAGiNATOR" by Cleveland Codonics, Inc., P. O. Box 45259, Cleveland, OH 44145. It is an intelligent, microprocessor controlled high resolution graphics unit with a resolution of 504 by 247 pixels. It features its own powerful instruction set that makes it easy to draw pictures from BASIC or any other language. It is available for less than $400 as a complete kit of parts, and also as a bare board and ROM for even less. The only drawback is that it was designed for the H19 and fits in the same location occupied by the processor board in an H89. This means that although it is electrically possible to install one in an H89, the problem is where to put it. I have a feeling that Codonics is working on that one, though, because of numerous requests for an H89 version at the Conference.

Among other impressive hardware add-on displayed at the conference was the Housemaster multi-function peripheral by Artra, Inc., P. O. Box 653, Arlington, VA 22216. This unit, which was reviewed in REMark #31, includes a clock calendar, voice recognition, sound synthesizers, home control interface, and software. You can also add battery backup, two RS-232 ports, and two kinds of voice synthesis.

Another company featuring a remote controller was Environmental Control Systems, 9319 Willowview Lane, Houston, TX 77080. Their unit can control up to 256 channels — you could control a whole factory!. They also feature an H89 clock calendar board that installs on the LEFT side, and an H8 clock calendar board as well. These boards add several parallel ports to the computer in addition to the clock and calendar, and provide the interface to the remote controller.

Caraby Systems of 29 Mark Road, North Andover, MA 01845, brought their GPIB (IEEE-488) Controller for the H89 to the conference. I know that many of our more technical Huggies will be pleased to know about that board, which can handle all IEEE-488 functions including Talker, Listener, Controller, and System Controller. Software is included with the board. Caraby Systems also demonstrated their H89 color graphics board which features the TMS 9918A Processor. An optional Terminal Adapter lets you put graphics on the H89 screen in addition to an external monitor.

The folks who brought you the HA-8-3 color graphics board, New Orleans General Data Services, Inc., 7230 Chadbourne Drive, New Orleans, LA 70126, brought their new HA-89-3 board for the H89. This board gives the '89 the color and sound capabilities of the HA-8-3 and more, including optional voice synthesis. I brought along demo software for the board which was the least I could do, since they gave me one to play with. Great folks there at NOGDS!

These are just some of the great new hardware add-ons for Heath computer equipment that I saw at the Convention. The "old" guys were there, too, such as DG Electronics and Magnolia Microsystems. Those two companies, who are well represented by ads in REMark, have been a tremendous support to the Heath/Zenith computer line.

Games Were EVRYWARE!

In spite of all the effort to do more real work with microcomputers, games are probably still the most popular kind of software sold. The Software Toolworks, 14478 Glorietta Drive, Sherman Oaks, CA 91423, who brought you some of the first really good graphic games for the H89/H19 were there. They brought along some "real" software as well, including the latest version of their C/80 compiler, probably the best C compiler for the money anywhere.

Hoyle and Hoyle Software of 716 S Elam Avenue, Greensboro NC 27403 was represented by lovely Janet Hoyle, who told me that the funny looking character on the folder that comes with "A Remarkable Experience" is her husband! Well, I won't hold that against him, because if you are an Adventure freak you won't find better games than from Hoyle and Hoyle.

The game that impressed me the most was a new one from Evryware, P. O. Box 60802, Sunnyvale CA 94088 called "The Exterminator Battles the Anthropods of Yargon". It must have taken an hour just to think up the title! This game features the most clever graphics using the limited H89/H19 characters I have seen yet. When you play the game, you are the Exterminator on the planet Yargon, and it is your job to destroy the alien Hammerhead Anthropods. They are being dropped as eggs from enemy space ships, and they hatch into larvae which are nearly identical in appearance to the native anthropods. The native anthropods aren't exactly friendly, but some do-gooder conservationist has made it illegal to shoot them, and you lose points if you do. If your gun is damaged, you have to run over to a tower where the Star Copters are kept (wait until you see that little stick figure run!), ride up the elevator, board the Star Copter, and fly over to another tower to get a new gun barrel. And all this is only the beginning because winter and spring are approaching, when things change drastically!

In all, I enjoyed the First HUG Conference a lot. Thanks to all of the exhibitors who let us see, and in most cases play with those new goodies for Heath computers.

Vectored from Page 12

Dear Editor,

I would like to find other HUG members in my area to exchange info with and hopefully learn more about my H8, CP/M and MBASIC.

I specifically would like to get more info on handling files.

Your help will be appreciated.

Ray Poli
2322 Calumet
Flint, MI 48503

The Unknown Huggie .....

Bob Ellerton
HUG Manager

How can you explain the excitement of the First National HUG Conference? "You had to be there!" would be the most practical way most individuals would explain the mutual comradeship that seemed to develop as soon as you hit the door. You were finally getting the chance to connect faces with those illusive software authors, hardware developers or just friends who support your favorite hobby. It's really hard to describe how it felt to meet your Bulletin Board Buddies in person, your surprise to know that the software gurus supporting Heath/Zenith were "real people" after all, and finally, very hard to describe the air of enthusiasm that existed for that short weekend when the HUGGIEs descended on the O'Hare Hyatt Regency in Chicago.

"Being at the wrong place at the right time" will help those readers come to know how all these people generated a tight and lasting bond of friendship by describing a humorous but true story that simply happened during the events of the busy weekend.

It seems that our newest HUG member started the day in quite the normal fashion with one exception. Our Mr. X was traveling through the Chicago area and had picked the O'Hare Hyatt Regency as a rather nice quiet place to spend the night on Friday, August 6, 1982. Little known to our unsuspecting gentleman, 1000+ HUGs had also chosen the same haven for their First National HUG Conference.

When Mr. X entered the Hyatt he was greeted by a noisy bunch of strange individuals walking around at the entrance mumbling something about "bits", "bites" and, of all things, "hugs". He thought to himself, as he observed the sign which read National HUG Conference, "Wow! This has to be either the kinkiest group I have ever seen or one of the most fun". It was with this thought that Mr. X decided to check in for the entire weekend just to observe the activities and celebration. Mr. X had already suffered the first blow. He had the type of spirit it requires to play "Adventure" and he now felt his first "bit".

Bright and early Saturday morning, our Mr. X walked bravely up to the Registration Booth which had seemed to have been a mass of chaos the evening before and asked: "Do you have to be a member of this group to participate?" The answer was swift. "NO! Twenty dollars please." Mr. X was now feeling the second "nibble". He proceeded through the large entrance of the Rosemont Ballroom to find himself surrounded by 1000 HUGGIEs all speaking in a foreign language. Mr. X had forgotten to bring his axe or bird and he couldn't remember the magic words that could get him out of this strange place.

To Mr. X's surprise, he found a friendly atmosphere existed inside and he began to listen more closely to the conversations that surrounded him. By this time, he had collected several more "nibbles" and, little did he know, he was about to pass the point-of-no-return. As he listened, Mr. X found that he was beginning to understand some of the language. He had figured out that he was in the "First National" meeting of the Heath Users' Group which was founded to promote the use and uses of the Heath/Zenith Computer Product Line. Since he always had some interest in computers anyway, Mr. X decided to stay awhile to see if there was really anything to this personal computer phenomenon which was sweeping the country.

As the meeting gained momentum, our "not-yet-a-member", Mr. X, now found himself being swept along the corridors of the Hyatt to the International Ballroom for a sit-down lunch with all of these "HUGGIEs". Now he was beginning to feel a little uncomfortable. What if someone asked if he was a member? Worst yet. What if one of these computer fanatics asked what kind of computer he owned? God forbid! What if one of these people asked him about the latest program he had written?

We now find Mr. X slouching in his chair during lunch trying to make himself as small as possible. "If only I could recall those magic words to get me out'a here!" he thought to himself. "At least I'll take care of one of the problems after lunch ... I'll become a member." Too late! Other members at the table were starting to ask him those embarassing questions. "What type of system do you have?" came the first. Thinking quickly, Mr. X grabbed his napkin as if to wipe his mouth before responding, only to mumble a few unintelligible sounds to cover for his lack of an appropriate answer. It worked! Nobody asked him to repeat his answer. Now he knew he had to get out of there! OOPS! "How long have you been a member of HUG?" came the second. Mr. X swallowed a choking gulp of coffee and excused himself from the table.

Hurrying, Mr. X returned to the Registration Booth. This time he was not so calm. However, Mr. X cleared his throat and asked, "Can I become a member of the Heath Users' Group?" As swiftly as he had received his first response, came the next, "Sure! Eighteen dollars please." As he felt relieved to be a bonafide member, he was also feeling an even bigger "bit". In fact, our Mr. X was now past the point-of-no-return. He liked the friendly people he had met and now he was beginning to feel like one-of- the-guys. He had decided to visit the exhibit area to see if he could quietly learn more about the hardware, software and people who were all supporting the Heath/Zenith computers.

On the way to the exhibit area, Mr. X eavesdropped on a conversation where he learned of the great buys to be had at the temporary Heathkit Electronic Center in the North Central Room. Thinking this would be a great opportunity to take a look at some of the computers, Mr. X detoured into the Center. Now Mr. X was about to receive his first full-fledged "byte".

To Mr. X's amazement, not a computer to be seen! Stacks and stacks of boxes filled the room as he was pushed into a crowd of about 50 people all ordering KITS from a strange looking piece of paper they all carried guardedly through the room. He was speechless. "A computer is one thing. But, a KIT COMPUTER?!!!" he thought to himself as he pressed tightly against the counter to get a closer look.

Then it happened! Like being shot from a cannon, Mr. X was being confronted by a gentleman that looked as though he didn't get enough sleep. The man's tie was undone and sweat was running down the side of his face. The man asked Mr. X a very direct question, "Cash or Charge?" Our new HUGGIE couldn't back up or even turn around so he responded, "Cash." "Good God!" thought Mr. X I am actually buying a computer.

"What model would you like?" came the next question. By this time all the HUGGIEs around Mr. X were patting him on the back for he was buying "another" computer system. One HUGGIE suggested the "green CRT" of the H89 was the best he had seen of the three available. Mr. X didn't know what the other two looked like, not to mention that he didn't know what a "CRT" was, so he responded, "Give me the one with the green CRT." The salesman scribbled on the order form for a few seconds then came the next question, "Would you like the HOS-8917-2 or the HOS-817-1? Say What?!!!" responded Mr. X. The salesman could detect the nervousness and politely repeated, "Which Operating System do you prefer?" An im-

mediate hush fell over the crowd as sweat was beginning to pour from the face of the frustrated new HUGGIE. Mr. X was now beginning to show signs of being a beginner and he realized he must come up with some answer that would take the heat off the situation. Without thinking he cleared his throat and asked his first question about the computer software, "Which one of the two Operating Systems is BEST?"

It became readily apparent that Mr. X has asked the wrong question at the wrong time in the wrong place. A bearded gentleman in a baby-blue sportcoat was talking rather technically and heatedly to another programmer in a green T-shirt. Discussions began springing up all over the place as the crowd began to echo the merits and faults of both Operating Systems. Mr. X was again beginning to feel the pressure as the intensity of the voices increased. By this time our new HUGGIEs knees were weakening and he blurted, "I'll take BOTH!" This move silenced the stirring crowd for about two seconds before the applause filled the room. Mr. X was now being escorted out of the Center by his new found friends just as a bearded programmer mumbled, "...LWPI..." and disappeared smiling in a puff of orange smoke!

Mr. X was last seen on Saturday, August 7, 1982, retiring to his room with 40 pounds of books, a new HUG membership, and yes, the H-89 computer kit with several HUGGIEs to help him through the long night of reading before the busy events of Sunday morning were opened to the group.

We lost track of our Mr. X on Sunday as he was heading toward the Vendor Exhibit Area with a Group of HUGGIEs. All we could hear was a bunch of mumblings about "bits", "bites" or something to that effect. We can only imagine the words from this excited individual as he arrived home and tried to explain the gapping hole in his back pocket where his wallet used to be....."Honey, the strangest thing happened to me in Chicago this weekend.....EOF.

H19 Processor Speed Up!!

Peter Shoemaker
3510 41st Street
San Diego, CA 92105

That's right. For anyone who's interested, my H19 terminal is now operating at 4.096 MHZ with the help of a Z80-A CPU and a small piece of #30 wire wrap wire. I did a little probing into IC U413 (7429), the IC that develops the 2.048 MHZ, and found that one section of the chip was doing a divide-by-three on the incoming 12.288 MHZ. This in turn produced a usable 4.096 MHZ on pin 9 (which is N.C.) of U413.

So I:

1) Removed the jumper between JP10-5 and JP10-2 (2 MHZ) or JP10-1 (3 MHZ).
2) Soldered a piece of wire wrap wire from pin 9 of U413 (on foil side) to JP10-5.
3) Checked pin 6 of the Z80-A CPU (clock input) with an 'o'scope and verified a 4.096 MHZ clock pluse. The H19 processor was now operating at twice its normal speed!

Notes:

This does not work for a plain Z80 CPU, must be a Z80-A. I tried it with the original Z80 CPU and obtained some interesting results.

Although the waveform isn't the best, I've had no problems with the modification over a month of operation so far. Also due to the lack of the right software, I don't know how much improvement there is to the tearing effect problem the H19 has during certain programs like PIE and animation programs.

It should be greatly improved.

The Z80-A was picked up at a real good price of $5.50 from Micro Ace (mail order - found in Popular and Radio Electronics).

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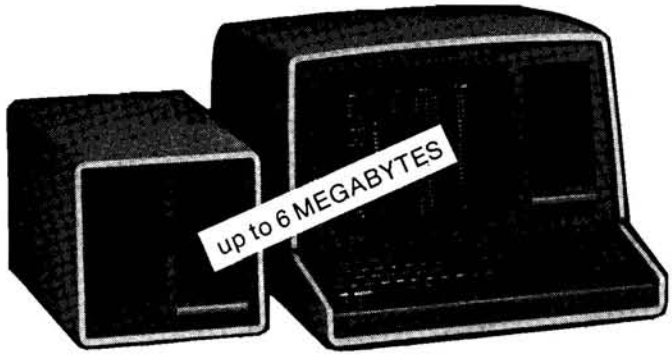

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FORM-IT (for MBASIC, **$19.75**) & **FORM-REL** (for FORTRAN, **$19.75**) are data entry kits for the H19 terminal which allow the user to design his own screen forms.

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The following **UTILITIES** are available from **GENERIC SOFTWARE.**

REMREF ($12.00) is an ASCII text file containing Author, Title, and Keyword information for REMARK Issues 1-20.

E24DVD ($15.95) is an enhanced WH-24 driver for HDOS V2.0. Source included.

GENERIC also offers some unique **EDUCATIONAL/ ENTERTAINMENT** products.

WORLD-MAP ($19.95) is an introduction to world geography which provides a graphic picture of the earth's surface on the H19 terminal!

GAME-PAC-1 ($19.95) includes **GUNS-OF-THE-ALPS**, a projectile shooting game, and **NUMBER-ROTATION**, a number memory game.

==========

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How to FLIP/FLOP

From Printer to CRT under CP/M 2.2.03

Bob Sutherland
Fletcher Lane
Shelburne, VT 05482

Back in Issue #11 of REMark there was an article by John R. Thomas who pointed out how to get around the apparent limitation in the CP/M version of MBASIC which precluded being able to use the HDOS capability of selecting either TT: or LP: for output while in the MBASIC mode.

John showed us in the article that CP/M's IOBYTE function allowed for the assignment or re-assignment of logical I/O devices to a variety of physical devices. Thus, said he, with a simple poke command one can make the console device become the hard-copy device...and vice-versa...to suit your purposes while running in MBASIC.

All true and very good. However....when this appeared (October, 1980), I suspect that not too many REMark users were into CP/M; and even if they were, the CP/M version at that time was #1.43 and, consequently, the memory locations and values no longer apply.

So...for those of you who have now gone into CP/M in order to run SUPERCALC and have since gone on to running MBASIC with this disk system, jot down the following in your note book:

* While in the CP/M command mode (A>, B>, etc.) you can select your output from terminal or hardcopy device by typing CNTRL P. It's an ON-OFF toggle with the default being output to the CRT.

* In MBASIC you lose this capability; but cheer up!

* Try the following statements in your program:

  1) Poke 3,171.....for output to printer
  2) Poke 3,169.....for output to CRT (default)

* With appropriate 'IF' statements and sub-routines, you can run a CP/M MBASIC program which will enable you to update files or view data on the screen and then list final results on a printer. *

OOOoooooops again.....

In REMark 31 (August 1982) on page 14 in the review of the Housemaster Home Control System, we have a couple of errors. The company name is ARTRA. They are available by mail at PO Box 653, Arlington, VA 22216. Reuel O. Launey, the president of the company can be reached at (703) 527-0455.

Sorry, our apologies to the Launeys.

Expanding Your H89 Disk Space on a Shoestring Budget

Van C Baker
2801 58th Way North
St. Petersburg, FL 33710

Like money and time, disk space never seems to go quite far enough. And because of other priorities, many of us are not in a position to lay out cash for new drives until the price is just right. Unfortunately, the establishment isn't always very sympathetic to our budget woes. But there are always alternatives to the "established" way of doing things.

If you are an H89 owner, this article will show you how to add 400K bytes of disk space for under $400. To use CP/M with this system, there is a slight catch: You've got to make some patches to your CP/M version 2.2.03 software. But if you follow the procedure I describe, the modification should be relatively painless. If you already have sufficient disk space for your CP/M system, you may want to read the article anyhow to learn more about how the BIOS interfaces with disk drives. But first, let's look at some of the more conventional solutions to the disk space problem.

If you are a CP/M user with one or two standard 40-track drives, you have had only one relatively inexpensive alternative for expansion: Add another standard drive for about $345 (if purchased from Heath) or somewhat less if you shop around a bit. If you need an enclosure and power supply, the Heath drive will cost you about $625. Adding such a drive, though, increases your online storage by only 100K bytes, of which you'll actually get to use only about 92K after formatting.

The other, more dramatic alternatives can be rather expensive. If you want to add a double-sided, 80-track drive, which will increase your online storage by 640K, the drive itself will cost you $550. But Heath's CP/M doesn't support this drive using the H-17 controller (installed in the H89 when you buy it). Therefore, you will need to spend another $395 for the Z89-37 double-density controller board. (If you need an enclosure and power supply, add $300.) Of course, you can install the H47 controller and 8-inch floppy system and get 2.5 megabytes for $3500. Or you can really shoot the works and buy the Z67 Winchester and get about 11 megabytes for a mere $5995!

Having followed price trends for 80-track, two-sided disk drives (e.g., Tandon TM-100-4) for several months, I was pleasantly surprised when I saw the magazine ad for Floppy Disk Services of Princeton, New Jersey. This company was offering a new Siemens drive (the FDD-221-5), which also provides 80-tracks and dual sides, for $350 for the drive or $395 for the drive with cabinet and power supply. Compared to the $425 price tag of the Tandon counterpart, I quickly ordered one of these new minifloppies. I then began planning how to interface one of these new drives to Heath's CP/M 2.2.03 without having to buy a new controller board.

It turns out that the new drives can be used "as is", with no software modifications to CP/M, but the operating system will treat them as though they were standard forty track drives with a storage capacity of 100K (unformatted) bytes. However, those forty tracks take up only half the diskette surface, since the tracks are now twice as close together with the new minifloppy. This means that a disk formatted on the new drive cannot be read or written using the standard drive, although the storage available is the same for both. Clearly, there is no advantage in configuring such a system.

In the remainder of this article, I shall describe the process by which the Heath CP/M version 2.2.03 can be modified to support the extended capacity disk drives to provide an additional 400K bytes of disk storage. You can use either the Tandon or the new Siemens driver. Just remember, my plans call for a 96 TPI (tract per inch), two-sided, 80-track minifloppy. If you want to use other extended capacity drives, this procedure should at least point you in the right direction.

This system allows using the H17 controller and preserves the ability to support the standard drives. However, with my approach, the new 80-track drive will not read diskettes formatted on the standard 40-track drives. (Note that the HDOS "SY:" device driver sold by the Heath Users' Group does support such a feature. I just didn't feel that for my purposes it would be worth the extra programming effort required.)

As you may already know, the CP/M operating system has been designed in such a way that all the machine-dependent software routines, including the disk drive device handlers, reside in a special area called the BASIC Input/Output System (BIOS). In the Heath/Zenith versions of CP/M, the BIOS is actually a system file which is loaded into memory as part of the bootup procedure. Part of the modification involves changing the BIOS to reflect the physical capacity and dual sided characteristics of the new disk drive. Of course, if one or more standard drives are to be used in addition to the extended capacity drive, the BIOS must also reflect the physical characteristics of the standard drives.

In addition to the BIOS modifications, several other changes to the standard CP/M are required if we wish to be able to boot the system with the new drive. Of course, it does no good to build a system which can read 80 track double-sided diskettes if we have no facility for formatting those diskettes. (CP/M simply will not write or read files on an unformatted medium.) Consequently, we shall also have to develop a means to format the new diskettes.

If the new drive were not going to be used to boot the system, only the BIOS and FORMAT software would have to be changed. In order to produce a bootable diskette, however, we need to get the necessary disk drive characteristics onto the boot tracks of that diskette. A slightly altered MOVCPM17 program (See the Heath CP/M User's manual for a description of MOVCPM17) is a convenient means for producing a memory image of the system tracks which can then be written to the diskette via a subsequent SYSGEN.

Before going about the task of designing patches for these programs we must choose an appropriate diskette format to use. For standard single-sided, 40 track drives, the concentric tracks are numbered 0 to 39, track 0 being the outermost track. These "physical" tracks are numbered when the diskette is formatted and correspond on a one-for-one basis to track numbers specified by CP/M itself. The track numbers specified by the CP/M disk operating system (BDOS) are "logical" track numbers, however, and are passed to the BIOS whenever the disk is accessed. For the 40-track case, the BIOS simply seeks the track requested by BDOS.

If we were going to use a single-sided, 80-track drive, we would

have only to make modifications to reflect the larger number of tracks available, that is, we would then have logical and physical tracks numbering from 0 to 79 rather than from 0 to 39. For our 80-track, double sided case, however, an additional change is needed: the ability to switch from one side of the diskette to the other based on the track number CP/M requests.

The way CP/M (i.e., BDOS) generates track numbers is actually derived from parameters stored in the disk parameter block (DPB) within the BIOS. If you look at the description of the DPB in the CP/M Alteration Guide, you'll find that the total number of tracks on a disk is not specified explicitly. Instead, the total number of bytes available on the medium is specified as well as the number of bytes per track. From this information, the BDOS infers the total number of tracks (these are "logical" tracks) available. For our case of double-sided, 80 track disks, we shall assume that we have 160 logical tracks, since the BDOS knows nothing about the number of sides a diskette has. For simplicity's sake, we shall assign these 160 logical tracks to correspond to the 80 physical tracks which are present on each side of the diskette. The BIOS, therefore, must be able to map from logical tracks 0 through 159 (with no side number specified) to physical tracks 0 through 79 plus a side number (0-1). Following this convention helps to minimize the required number of modifications to the CP/M software. Figure 1 is a diagram which shows the numbering of physical tracks on the new medium, and shows the relationship of logical to physical track numbers. Noted that there is no impact to the way that logical to physical sector mapping is performed.

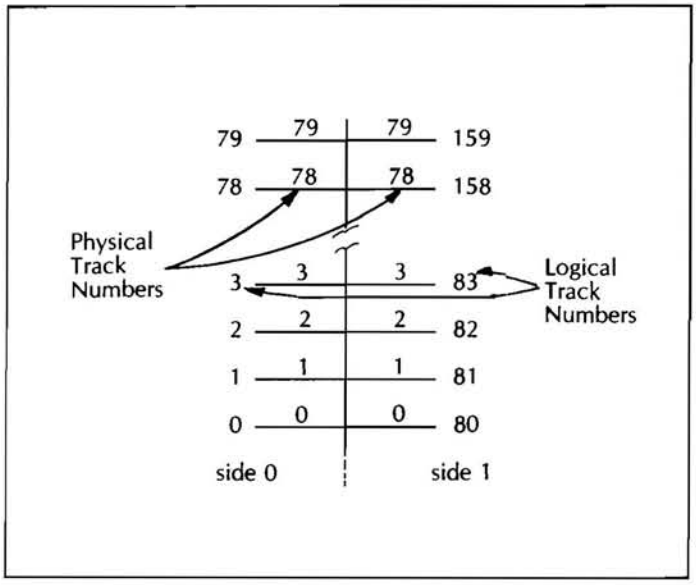


Figure 1. Logical and Physical Track Mapping for 80-Track Double-sided Disk Drives.

In the modification steps which follow, it will be necessary for your system to have the capability to boot from either device 0 (standard BOOT) or device 1 (BOOT 1). I assume that most persons owning CP/M also have installed the new Monitor ROM which comes with the "ORG Zero" ROM kit from Heath. This monitor allows you to boot your system from any of three drives (0, 1, or 2). In the event that you have not installed this monitor ROM, I suggest that you do so now, or else use a friend's machine to perform the modification procedure.

BIOS MODIFICATIONS

The first step I'll present is that of modifying the BIOS source code in order to produce an assemblable BIOS.ASM file to support the 80-track, double-sided drives. This modification consists of five main parts, which are detailed below. However, before the changes can be made, we must first provide ourselves with two disk drives and the necessary files to work with. To do this, first use the jumper headers on the disk drives and configure them as follows:

A. Standard 40-track drive as Drive #1 and 80-track, two-sided drive as Drive #0. The following table shows how the jumpers should be arranged:

80-Track Drive (#0):	40-Track Drive (#1):
HS (Open)	HS (Open)
DS1 (Open)	DS1 (Open)
DS2 (Open)	DS2 (Shorted)
DS3 (Shorted)	DS3 (Open)
MX (Open)	MX (Open)
(Blank)	(Blank)
HM (Short)	HM (Short)

Table 1. Disk Drive Jumper Configuration

B. Boot the system on unit 1 (BOOT 1), i.e., using the 40-track drive. Note that drive 1 becomes unit A: in CP/M. Next, FORMAT and SYSGEN a diskette in drive A: (the 40-track drive) and label it "MAIN-40". PIP the files listed below onto MAIN 40. (To PIP files from another diskette, type "PIP A:=C:BIOS.ASM",etc. Then, when the system prompts you to do so, insert the source diskette (disk C) into drive A: (the 40-track drive). Alternatively, you can copy files to disk B with the distribution disk in drive A:, then, after a warm boot, PIP the files from B: back to the desired destination disk in drive A:.)

PIP.COM
ED.COM (Or, an editor of your choice)
BIOS.ASM

C. Now, with your system diskette in drive A:, FORMAT a disk on drive B: (the 80-track drive). Label this diskette "SEC-80". Note that we are temporarily using the 80-track, double-sided drive as a standard, 40-track drive. Next install the "MAIN-40" disk into drive A and enter the editor by typing "EDBIOS.ASM B:". Upon completion of the following modifications to the original BIOS.ASM source file (on disk A), this type of ED entry will produce a new BIOS.ASM file on disk B. If you wish, you may delete the conditional assembly lines of code for the H37, H47 and H67 drive types while in the editor in order to reduce the overall size of the final source file. Now, from the editor, perform the following steps:

1. DPE Table Modifications

In order to reflect the extended storage capacity of the new drive, we must change the entries in the DPE portion of the BIOS source code. It will be to your advantage to refer to the Heath supplied source listing as I describe the necessary changes to the source code. In the listing, find the Label at DPE0 on page #021. Notice that there are also labels DPE1 and DPE2. These three parameter tables are associated with the physical drive numbers 0, 1, and 2, respectively. Although I assume you wish to use the new drive as Drive #0, you may assign as either #1 or #2 if you like by following a procedure similar to what I am describing but substituting for the drive numbers I use those you wish to use.

Locate the second line down from DPE0, which reads:

```
DW      DIRBUF,DPB17S
```

and, using the editor, change it to:

```
DW      DIRBUF,DPB96
```

This changes the DPB table for drive #0 to a new one, which we'll create in Step 3, corresponding to the physical parameters of the 80-track, two-sided drive. Now, five lines down, change:

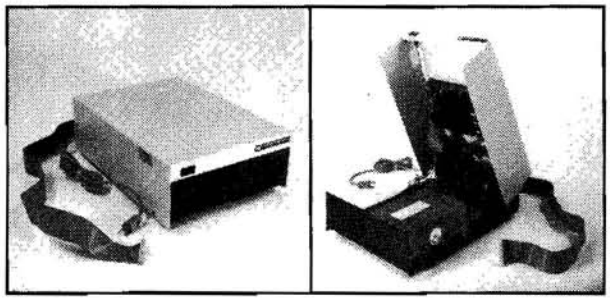
```
        DB      8
To:
        DB      16
```

This changes the number of records per allocation block from eight to sixteen, which is the case for our extended capacity drive. If you are configuring your disk system differently from mine, just remember the following rule of thumb: For each device (0, 1, or 2) which is an 80-track, double-sided drive, use DPB96 instead of DPB17S in the appropriate DPEx table entry and leave the table as is for standard, 40-track drives.

2. Adding Side Selection to the BIOS

On the H89, the side select for the H17 disk controller is actually a dedicated bit in the control latch at port F2 (hex). If this bit is zero, then side zero (the side always selected for the single-sided drives) is selected. If this bit is set, then side one is selected. What we must do, then, is to provide the logic to determine the appropriate side to be used, and to add the necessary command to output the correct side bit to the control latch.

But how do we determine the correct side (or, more exactly, correct drive head) to select? Recall from our previous discussion that the 80-track, double-sided disk will appear to the CP/M BDOS to have 160 tracks and only one side. If you refer to Figure 1 again, you will see that, because of the way the physical and logical track numbers are assigned, we can easily determine which side to select by testing whether the logical track number is 80 or greater. If the requested logical track is less than 80(i.e., 0 through 79), then we select side 0 and if the requested track is 80 through 159, we select side 1.



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Notice that if the requested track is on side 0, then the physical track we need to use is the same as the logical track requested. However, if the logical track number is 80 or greater, then we must subtract 80 to determine the "actual" or physical track number.

With this in mind, we will "intercept" the logical track number requested by the BDOS and, before sending it to the disk drive handlers, convert it to a side number and physical track number. The modification is made in two steps: Step A performs the "interception" to determine the correct physical track and side number, and Step B actually selects the side. (This approach was taken only to preserve some of the "structure" of the BIOS which performs interaction with the disk drives at the lowest level of software routine; both operations could have been performed in a single step with the same results.)

Step A. If you turn to page #045 in the BIOS source listing, you will find a routine labelled "RD17M" and a routine labelled "WR17M". Notice the two lines following the "STA SECTOR" instructions in each routine:

```
        LDA     HSTTRK
        STA     TRACK
```

It is at this point in each routine that we will do the "intercepting" of the logical track number (stored at HSTTRK) and, if necessary, convert it to a physical track and determine the correct side. In both RD17M and WR17M delete these two lines and replace them by the single line:

```
        CALL    GETTRK
```

Now, insert the following routine after the "RET" which is preceded by the label "WRH1:"

```
GETTRK: MVI     B,0         ;ASSUME DESIRED TRACK ON SIDE 0
        LDA     HSTTRK      ;GET THE LOGICAL TRACK NUMBER
        CPI     80          ;SEE IF 80 OR GREATER
        JC      GETTRK1     ;SKIP IF IT IS NOT
;HAVE A TRACK NUMBER 80 OR GREATER
        INR     B           ;SET (B) TO '1' (SIDE)
        SUI     80          ;CONVERT TO PHYSICAL TRACK
GETTRK1: STA    TRACK       ;NOW SAVE PHYSICAL TRACK
        MOV     A,B         ;GET SIDE INDICATOR
        STA     SIDE        ;STORE IT
        RET                 ;RETURN
```

Notice that in the above routine, no actual interaction with the H89 hardware has yet occurred, but the parameters to be used later by the hardware drivers have been determined.

Step B. Now, locate the label at "SDT:" (See page #054 of the BIOS source listing.) Remove the label SDT:, that is, change:

```
SDT:    LHLD    TRKPT
```

To simply:

```
        LHLD    TRKPT
```

Now, immediately ABOVE this line add the following lines:

```
SDT:    LXI     H,CTLPRT    ;GET LATCH VALUE
        LDA     SIDE        ;SEE WHICH SIDE
        ANA     A           ;SEE IF SIDE 1
        MOV     A,M         ;LOAD LATCH VALUE
        JNZ     SDTONE      ;SKIP IF SIDE 1

;SIDE 0. BE SURE IT IS SELECTED
        ANI     0BFH        ;CLEAR SIDE BIT
        JMP     OUTSIDE     ;SKIP
SDTONE: ORI     40H         ;SET SIDE BIT
OUTSIDE: MOV    M,A         ;SAVE LATCH VALUE
        OUT     H88CTL      ;DO THE SELECT
```

Note that these changes ensure that the proper side will be selected and that the 2mSec clock interrupt service routine (See page #097) cannot de-select it since the state of the side bit is safely tucked away in the variable CTLPRT, which holds the current value of the control latch.

3. DPB Table Modifications

Now, referring to the source listing page #121, locate the label DPB17S. Count down ten lines from this line and insert, just before the "ENDIF", the following lines:

```
DPB96:  DW    20
        DW    4
        DB    15
        DB    1
        DW    195
        DW    63
        DB    080H,000H
        DW    16
        DW    3
```

These lines of data comprise the new DPB table for the extended capacity drive. To understand the meaning of these items, you should refer to your CP/M Alteration Guide in the user's manual. Of particular significance is the entry

```
        DW    195
```

This entry is called "DSM": in the Alteration Guide, and determines the total storage capacity of the disk drive. Specifically, DSM is equal to the total number of allocation blocks minus one. The second and third entries (4 and 15, respectively) imply, as explained in the Alteration Guide, that each allocation block is 2048 bytes in length. Let's see how the entry 195 for DSM is derived.

Our extended capacity diskette contains 80 tracks on each side for a total of 160 tracks. Each (physical) track contains ten sectors of 256 bytes each. Thus one track will contain 2560 bytes and the entire diskette contains 2560*160 or 409,600 bytes. According to the Alteration Guide, we must reduce this number by the amount of storage required for booting the system, which, for the Heath system is 3 tracks, or 76890 bytes. Thus, the total available storage capacity of the double-sided, 80-track diskette is 401,920 bytes. Dividing this by the number of bytes per tracks (2560) gives 196, which is DSM+1. Hence, the value of DSM is 195.

4. Fixing a Subtle Problem

Now, we are going to correct a very subtle problem with our BIOS. I discovered this problem while attempting to PIP a file from one 80-track diskette to another using the "imaginary" drive capabilities of Heath's CP/M. This feature can be used by specifying a non-existent drive name (C: on a two-drive system) as the source device for the PIP operation. CP/M will then prompt you to "insert disk C into drive A:". After the copy is complete, CP/M then prompts the user to insert the original diskette into drive A:. This is a very handy addition and is solely the workings of the BIOS in that the logic for the "swapping" of the diskettes is totally transparent to the BDOS. But whenever I booted with the new drive, this "virtual PIP" wouldn't work properly. In fact, after the files had been PIPped, they ended up in a total shambles on the destination drive. After some head scratching, I realized that the problem was due to the fact that, for the H17 portion of the BIOS, there was originally only one DPB table. Although the routines handling the imaginary drive mapping provided for proper device select logic, they did not provide for a device-dependent DPB. As a result, the allocation blocks weren't being acessed properly from the imaginary drive (drive C:) diskette, since drive C's DPB parameters had been defined at DPB17S (see the source listing). Changing the CPB address in the DPE2 block from DPB17S to DPB96 would have corrected this problem, but would then have precluded using the 40-track drive for "imaginary" device operations. Consequently, I have made the additional change below to fix the imaginary drive mapping problem.

The logic below is performed at boot-up time when the imaginary mapping table is being constructed. Refer to page #135 in the source listing and locate the LAST line of code on that page:

```
        MVI     C,DPEHL
```

Delete that line and replace it with the following lines:

```
        LXI     B,-DPEHTH       ;BACKUP TO DPE
        XCHG
        DAD     B
        XCHG
        DAD     B
        MVI     C,DPEL          ;MOVE ENTIRE TABLE
```

5. The Last BIOS Mod

Now, locate the label ALVO (page #140 in the source listing) and change the line:

```
    ALVO:   DS  12
To:
    ALVO:   DS  26
```

The purpose of this change is to accommodate the additional storage requirement for the allocation vector as described on page 34 of the Alteration Guide.

Now, double check your source code and exit the editor to save the edited file onto disk B: as you leave. This completes the changes to the BIOS source code.

ASSEMBLING THE NEW BIOS

Now that the BIOS source has been updated with the necessary modifications, the next step is to create a new BIOS.SYS file. To do this, use PIP to copy the following files from your distribution disk III to disk B: (on the 80-track drive), which also contains the BIOS source:

```
PREL.COM
MAKEBIOS.COM
```

Then, delete the file BIOS.BAK from disk A: to free up the space necessary to continue. (Be careful not to delete the BIOS.ASM file on drive B:.) Now copy the following files from your distribution disk to disk A:

```
MAKEBIOS.SUB
STAT.COM
SUBMIT.COM
ASM.COM
```

After this, type "SUBMIT MAKEBIOS B: B:". After a few seconds you will be asked to select the desired disk configuration. Respond by selecting option A, which specifies the H17 driver only. (I am assuming that you do not have either the H37, H47, or H67 devices. If you do, I can't imagine why you would go to the trouble of performing these modifications!) The MAKEBIOS program performs two assemblies and several other operations, so do not be concerned if this step appears to be taking a long time to finish. However, if you observe any assembler error messages or system error messages, you should double check the BIOS source code for errors and verify that you have the necessary files on the correct drives to run the MAKEBIOS utility. When this step is done, type

```
STAT B:*.*
```

and you should find several files, including a BIOS.SYS file, on disk B:. Now use STAT to set the BIOS.SYS file ON DRIVE A: to R/W, and then rename the BIOS.SYS file on drive A: to OLDBIOS.SYS. Now PIP the new BIOS.SYS file on drive B: over to drive A: using the command:

PIP A:=B:BIOS.SYS[R]

You now have a new BIOS on drive A:. Using the imaginary drive C: as the source, PIP the file CONFIGUR.COM onto the disk in the 40-track drive (drive A:). If you have performed all the mods correctly, the 40-track disk in drive A: should still be bootable using the BOOT 1 command from the H89 monitor. To test part of the new BIOS, RESET the H89 and perform the BOOT 1 command. The system should boot normally, although the BIOS will be configured to its default values for baud rates, etc. If the system will not boot, be sure the terminal baud rate is set to 9600 and try again (use ESC r L while offline, then type BOOT 1). If the system still will not boot, you have probably made an error in the BIOS source code and must correct it before proceeding. Remember, you should be booting up the 40-track drive containing the diskette labelled MAIN-40. First, when CONFIGUR asks if you want the standard system, type "Y" (Yes). Now, assuming you have successfully booted the system, the new BIOS should be able to read and write files on a formatted, 80-track, double-sided diskette.

If you had a formatted, 80-track, double-sided diskette, that is! Which brings us to the next step in the re-hosting procedure: patching the FORMAT utility to initialize diskettes for the new drive. First, however, run the CONFIGUR program to let the new BIOS know that the 80-track drive is on line. To do this, select CONFIGUR's option B and set the step times for drives 0 and 1. (remember, the 80-track drive is #0.) I suggest that you try about 6 msec track timing for the new drive and use whatever you have found optimum for the standard drive.

PATCHES TO THE FORMAT PROGRAM

To initialize diskettes in the extended capacity format requires that we make two rather straightforward patches to the FORMAT program. One patch is made to increase the number of tracks from 40 to 80 while the other patch is made to provide a second pass through the initialization procedure to format the second side of the diskette.

For the next steps, you will need to copy the FORMAT.COM and DDT.COM utilities from your distribution diskette onto the 40- track disk in drive A:. Next, type

DDT FORMAT.COM

after which DDT will respond with

NEXT PC
1780 0100

Using the S (substitute) command in DDT, perform the following patches:

MEMORY LOCATION	OLD CONTENTS	NEW CONTENTS
0396	28	50
039A	CD	3A
039B	45	0D
039C	04	00
039D	DA	E6
039E	63	BF
039F	03	32
03A0	C3	0D
03A1	6B	00
03A2	03	D3
03A3	FE	F2
03A4	60	CD
03A5	C2	45
03A6	B9	04
03A7	03	DA
03A8	CD	63
03A9	9A	03
03AA	07	3A
03AB	D2	0D
03AC	6B	00
03AD	03	F6
03AE	0E	40
03AF	09	32
03B0	11	0D
03B1	C3	00
03B2	15	D3
03B3	CD	F2
03B4	05	CD
03B5	00	5A
03B6	C3	04
03B7	6B	DA
03B8	03	63
03B9	CD	03
03BA	5E	C3
03BB	0C	6B
03BC	D2	03

Type a space and a carriage return after the last substitution to exit the S command. Use the D (dump) command to verify that you have entered these patches correctly. Then type a CONTROL C to exit DDT. Now, ERAse the FORMAT.COM file from disk A: and immediately type:

SAVE 23 FORMAT80.COM

This creates a patched version of the format program, FORMAT80.COM, which you can use to initialize the 80-track, double-sided disks. Let's test this new program.

Insert a blank disk into the new drive (drive B:). Type FORMAT80 and a carriage return. If the patches have been performed correctly, the program will begin to run, displaying the usual prompts. In fact, the only difference you'll observe is that the new format program takes four times as long to run as the standard 40-track version. (If you like, you may use the command:

FORMAT80 *

in which case the automatic media check performed by the program will be by-passed. Although I do not recommend it, this will speed up the process considerably. Incidentally, this is an undocumented feature which works for the standard FORMAT program as well.)

After formatting the diskette, reboot by typing a carriage return and, with the 80-track disk in drive B:, do a DIR B:. The system should respond with "NO FILE". The FORMAT program is probably working properly, but later on, we'll test it more thoroughly. Now do a STAT B:DSK:. The system should respond with:

B: Drive Characteristics
3136: 128 Byte Record Capacity
392: Kilobyte Drive Capacity
64: 32 Byte Directory Entries
256: Records/Extent
16: Records/Block
20: Sectors/Track
3: Reserved Tracks

If you've gotten this far, you're almost there. In fact, you should be able to PIP files from the 40-track drive to the 80- track drive even now, and start using up those 3136 available records! However, if you want to be able to boot up on the 80- track drive, you must complete the final few steps below so that the new disk can be SYSGENed.

MAKING THE NEW DISK DRIVE BOOTABLE

First, if you have copied any files onto the new diskette, delete them (i.e., delete all files from the disk in the 80-track, double-sided drive). I should explain why this is necessary.

There is one constraint that my approach has placed on the operation of the system: The BIOS.SYS file must be located on SIDE 0 of the two-sided disk in order for it to be bootable. This is because the BIOS loader routines on the boot tracks will not contain two-sided disk drive handlers, since no modifications to the loader routines are made. Consequently, to guarantee that the BIOS.SYS file resides on side 0 requires that it be written onto the disk while the disk is at least half empty. The best way to ensure this is to PIP the BIOS.SYS to the 80-track disk as soon as possible after it has been formatted. PIP the new BIOS over to the 80-track drive by typing:

PIP B:=BIOS.SYS[R]

Also PIP the file CONFIGUR.COM over to the new drive and do a DIR to verify that the files were transferred.

Now select drive B: by typing "B:". If the system does not respond with the "B>" prompt, the BIOS is not functioning properly and, I am sorry to say, you must then go back and re-do the BIOS source patches and MAKEBIOS steps. Assuming that the BIOS is okay, we will now make a final patch: to the MOVCPM17 program. Select drive A by typing "A:" and a carriage return.

Type "DDT MOVCPM17.COM" and a carriage return. DDT will respond with:

```
NEXT    PC
2B00    0100
```

The only patch we'll make is to the disk parameter table which will be copied onto the boot tracks later when we do a SYSGEN with the new disk. Using the S (substitute) command, make the following patches:

MEMORY LOCATION	OLD CONTENTS	NEW CONTENTS
23D2	03	04
23D3	07	0F
23D4	00	01
23D5	5B	C3
23D9	C0	80

Type a CONTROL C to exit DDT and then delete the file MOVCPM17.COM from disk A:. Next type:

SAVE 43 MOVCPM80.COM

This step will save the new file MOVCPM80.COM, which is to be used for creating a memory image of CP/M for SYSGEN. Now, type

MOVCPM80

When finished, the program will indicate that a SYSGEN or SAVE can be performed. Now type SYSGEN. When asked for the source drive, just type a carriage return so that the memory image created by MOVCPM80 will be used. When asked for the destination drive, type "B". If you have followed this procedure correctly, you now have a bootable disk in drive B:. Do a RESET and type BOOT. The new drive should now boot up the system.

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The new BIOS should be carefully tested before you begin to use the new system. First, PIP as many files as the new disk will hold so that both sides are written on. When using PIP, specify the Verify switch so that what is written to the disk can be compared with the original file. Be sure that the disk becomes rather filled up in order to ensure that files are written onto both sides of the medium.

You can now PIP from disks in drive B: (the 40-track drive) any files you may want (including the entire 3-disk CP/M distribution set!) onto the new 80-track disk and build a master distribution disk for the extended capacity drive. To create new 80-track bootable diskettes, you can simply use SYSGEN with the master disk (or any disk SYSGENed with it) as the source and copy the new BIOS all in the same step. Remember to use the new FORMAT80 program to initialize diskettes for use in the double-sided drive.

Although a bit tedious, this modification to CP/M, paired with the new Siemens extended-capacity disk drive, has proven to be an economical, yet invaluable addition to my system and, hopefully, to yours. I'd be interested in hearing from readers who implement this approach. ✱

About The Author

Van C. Baker is a principal software engineer with the ECI division of E-Systems in St. Petersburg, Florida. He received a BS degree in engineering physics, and an MS degree in nuclear engineering at the University of Tennessee. In his spare time, he likes to play with his H89, write, and go fishing with his two sons, Aaron and DJ.

And Now The Conference Winners.....

Arthur Seebach, Northfield, MN	MPI Printer & AP Pack	Micro Peripherals, Inc., Salt Lake City, UT
		Keyboard Studio, Birmingham, MI
Robert Pearce, Walon, KY	Super 89 (CPU) Board	D-G Electronics, Denison, TX
Ernesto Barreyro, Bartlett, IL	Color Graphics Controler	Caraby, N. Andover, MA
Tim Miller, Boling Brook, IL	HA-89-3 Color Graphics Board	New Orleans General Data Services
Betty Waters, Hudson, NC	Imaginator Display Board Kit	Cleveland Codonics Inc., Cleveland, OH
Milton Krauthoff, Menomonee Falls, WI	House Master System	ARTRA Inc., Arlington, VA
Donna Bretl, Overland Park, KS	Pascal/MT+	Kres Engineering
Irving Ruben, Northbrook, IL	V-8 Voice Synthesizer	Micro Interface (MI-8), Ft. Collins, CO
George Bullwinkle, Hinsdale, IL	Command-8	Micro Interface, Ft. Collins, CO
E.S. Critz III, Norfork, VA	Modem Kit	Micro Interface, Ft. Collins, CO
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Steven Robbins, San Antonio, TX	Key-It Program	Keyboard Studio, Birmingham, MI
John Cole Jr., Pekin, IL	UDUMP Program	Keyboard Studio, Birmingham, MI
Richard Lain, Boling Brook, IL	Terminal Program	Keyboard Studio, Birmingham, MI
Ernest Duesterhoeft, Helenville, WI	Parallor Program	Keyboard studio, Birmingham, MI
Pat Swart, Grand Rapids, MI	BIOS-80 Program	Livingston Logic Labs, Pasadena, CA
Dave Woodard, Morristown, NJ	BIOS-80 Program	Livingston Logic Labs, Pasadena, CA
Mollie Jewel, Falls Church, VA	BIOS-80 Program	Livingston Logic Labs, Pasadena, CA
Mike Deffendall, Reading, PA	BIOS-80 Program	Livingston Logic Labs, Pasadena, CA
Mike Kolberg, Houston, TX	BIOS-80 Program	Livingston Logic Labs, Pasadena, CA
Kay Havranek, Crown Pt., IN	dBASE II Program	Micro Processor Associates, Nashua, NH
Timothy Payne, Bloomington, MN	dBASE II Program	Micro Processor Associates, Nashua, NH
John LaMonte, Pontiac, MI	ZSPOOL-plus Program	Micro Processor Associates, Nashua, NH
Toni Snoblen, Lapeer, MI	EMAIL Program	Micro Processor Associates, Nashua, NH
Jim Ripberger, Metairie, LA	EMAIL Program	Micro Processor Associates, Nashua, NH
Robert Shapiro, Chicago, IL	Super 19 ROM	Extended Technology Systems, Bensalem, PA
Jim Schuster, Cary, IL	Heath/Zenith CP/M Computer Course	Tektronics, Inc.
Donald Wright, Ventura, CA	One of 22 available Programs	Sunflower Software, Prairie Vlg., KS
Daniel Sandman, Poynette, WI	4 Software Products	Ultimeth, CA
Bill Johnson, Manassas, VA	SEQ-BASE Program	Generic Software, Troy, MI
Charlie E. Waters, Hudson, NC	Space Odyssey Program	Evryware, Sunnyvale, CA
James Donlon, Longwood, FL	Y-Wing Fighter	Evryware, Sunnyvale, CA
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J. Mackenzie, Chicago, IL	"T" shirt	Software Toolworks, Sherman Oaks, CA
Stephan Peterfreud, Nashua, NH	Fast-Full Screen Editor	Zeducomp, Stirling, NJ
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H.P. Jones, St. Charles, IL	24 issues of BUSS	Sextant-Buss, Washington, DC
George Potter III, Moundsview, MN	MDS SPOOLER	Software Wizardry, Inc., St. Charles, MO
Lyle Marschand, Lisle, IL	ZLYNK Modem Utility	Software Wizardry, Inc., St. Charles, MO
Raymond Bissonnette, Quebec, Canada	CRASH Recovery Program	Software Wizardry, Inc., St. Charles, MO
Robert Todd, Jr., Bensalem, PA	EDBS Data Base File Manager	Software Wizardry, Inc., St. Charles, MO

ED-A-SKETCH and Microsoft BASIC

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The Software Toolworks **ED-A-SKETCH** is a graphics editor I have found very helpful in creating screen displays for my H89. Of particular value is its ability to store the completed pattern in ASCII, Microsoft BASIC, Benton Harbor Extended BASIC, and Assembly language. The program experience I am describing is with Microsoft BASIC. It may apply to BH BASIC as well, I have no experience with BH BASIC. Perhaps it is worth a try; I used the "I wonder if..." approach and discovered I could do things I was unaware of.

ED-A-SKETCH is used very similarly to a full screen text editor. The thirty-three symbols comprising the "menu" is portrayed in the 25th line, and may be displayed (and utilized) in either normal or reverse video. Both the graphics and character mode are available, allowing for display generation in which graphics are intermixed with text, as you see in figure 1. Saving the completed picture in PICTURE mode allows it to be viewed using the command TYPE < filename>. Saving in either BASIC mode puts the picture on disk ready to be run as a subroutine in your program by the addition of a calling routine. The statements have the form seen in the partial listing of figure 2.

The example listing is, in its entirety, 86 lines in length. It will reproduce the picture of figure 1. But it also takes up about 5K bytes of memory, which may do for a short program, but if you are working on a video game, say, with several figures, an alternative coding is needful. Not only is the revised format more compact, but it will execute in a shorter time, an essential for screen action programs.

Statements 8990-9025 in the listing for INVAMPLI represent the alternative I use, replacing 86 lines with 25, and saving some 3000 bytes in the process. There is work involved, keeping track of all those CHR$'s is rather tedious. Mistakes, I have found, come easy. With a bit of practice you can write the new by translating on screen from a listing of the old. But I do make fewer mistakes when using a printout for a guide and checking off each translation as I go.

Reference:

ED-A-SKETCH Graphics Editor by Gail Halverson Version 1.1, 11-19-81
The Software Toolworks Walt Bilofsky, Prop. 14478 Glorietta Drive Sherman Oaks, CA 91423

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```
1 REM ********************************* INVAMPLI *********************************
2 REM ****  A GRAPHICS EXERCISE USING ED-A-SKETCH WITH MICROSOFT BASIC  ****
3 REM ********************************** BY **********************************
4 REM ***************************** C.S.PEPPER *****************************
5 REM ***************************** MAY 29, 1982 *****************************
6 REM ************************************************************************
8 REM ::
9 REM *** HEATH ESCAPE SEQUENCES ***
10 A$=CHR$(27)+"A"  : REM ** CURSOR UP
11 B$=CHR$(27)+"B"  : REM ** CURSOR DOWN
12 C$=CHR$(27)+"C"  : REM ** CURSOR RIGHT
13 D$=CHR$(27)+"D"  : REM ** CURSOR LEFT
14 E$=CHR$(27)+"E"  : REM ** CLEAR DISPLAY
15 F$=CHR$(27)+"F"  : REM ** ENTER GRAPHICS MODE
16 G$=CHR$(27)+"G"  : REM ** EXIT GRAPHICS MODE
17 J$=CHR$(27)+"j"  : REM ** SAVE CURSOR POSITION
18 K$=CHR$(27)+"k"  : REM ** GOTO SAVED POSITION
19 P$=CHR$(27)+"p"  : REM ** ENTER REVERSE VIDEO MODE
20 Q$=CHR$(27)+"q"  : REM ** EXIT REVERSE VIDEO MODE
21 Y$=CHR$(27)+"Y"  : REM ** DIRECT CURSOR ADDRESSING
22 WD$=CHR$(27)+"w" : REM ** DISCARD AT END OF LINE
30 REM *** STRING VARIABLES ***
32 M$=C$+C$         : REM ** CURSOR RIGHT 2 PLACES
33 N$=M$+C$         : REM ** CURSOR RIGHT 3 PLACES
34 O$=N$+C$         : REM ** CURSOR RIGHT 4 PLACES
35 R$=O$+C$         : REM ** CURSOR RIGHT 5 PLACES
36 S$=R$+C$         : REM ** CURSOR RIGHT 6 PLACES
37 T$=S$+C$         : REM ** CURSOR RIGHT 7 PLACES
38 V$=T$+C$         : REM ** CURSOR RIGHT 8 PLACES
39 W$=V$+C$         : REM ** CURSOR RIGHT 9 PLACES
40 Z$=W$+C$         : REM ** CURSOR RIGHT 10 PLACES
41 U$=CHR$(95)      : REM ** DISPLAY INV.VIDEO WEDGE SYMB.
100 PRINT E$        : REM ** CLEAR DISPLAY
120 GOSUB 1000
989 END
1000 PRINT Y$;CHR$(32);CHR$(32);J$:GOSUB 8990:RETURN
8990 WIDTH 255 : REM ** DO NOT DELETE THIS STATEMENT WHEN CONVERTING.
9000 PRINT WD$;K$;J$;V$;V$;V$;M$;"ZF";V$;T$;"INVERTING AMPLIFIER";F$;
9002 PRINT K$;B$;J$;Z$;Z$;"faaaaaZZZaaaasac";T$;"zzzzzzzzzzzzzzzzzz";
9004 PRINT K$;B$;J$;Z$;Z$;"'";G$;R$;"iF";F$;"a)";N$;"'";C$;"Z ZL";C$;"   ";
9006 PRINT G$;"i1= (e1-es)/Z1= (es-eo)/ZF= iF";K$;B$;J$;Z$;N$;"Z1";F$;
9008 PRINT R$;"'";M$;" q";P$;U$;Q$;" ";S$;"'";C$;"'";K$;B$;J$;S$;"   ";G$;
9010 PRINT "+";F$;"faaZZZaaaauaaaq";P$;"-";U$;Q$;"     ";C$;"'zaz";G$;
9012 PRINT S$;"eo= -Aes  :: A ";F$;"h";G$;" infinity";
9013 PRINT K$;B$;J$;T$;"ei( )";C$;"i1";
9014 PRINT F$;"a)";G$;N$;"es";F$;"+ q";P$;"  ";U$;Q$;"     '"G$;C$;"+";Z$;
9016 PRINT T$;"             ";K$;B$;J$;W$;"-";F$;"'    ";G$;N$;"ZB";M$;
9018 PRINT "- ";F$;"q";G$;"A";P$;" ";Q$;F$;"rzzzzzzz";G$;"(eo)"O$;
9020 PRINT "eo/e1= -ZF/Z1";N$;":: ZB= Z1";K$;B$;J$;T$;"  ";F$;"zaz    fa";
9022 PRINT G$;"ZZZ";F$;"aaaq";P$;"+";Q$;"r";R$;"   -";"'";
9023 PRINT K$;B$;J$;V$;"    ";
9024 PRINT N$;"zaz";S$;"qr";V$;" zaz";G$;R$;"i1= e1/Z1"
9025 WIDTH 80 : RETURN
```

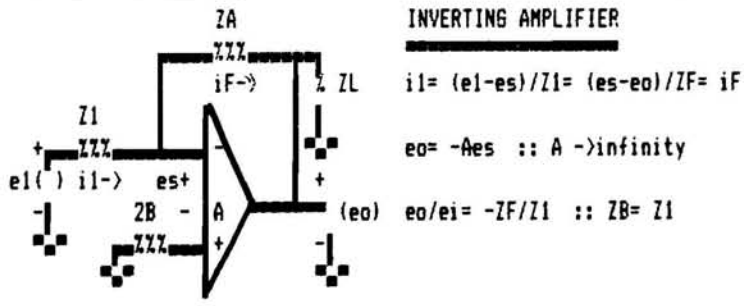

Figure 1. This is very close to what you will see on your screen when you run the INVAMPLI program. Close because the Epson MX-80 fonts used are close, but not an exact match to the Heath, and I had to draw in the triangle's slanted edges. On your screen the triangle will appear in reverse video.

```
1 REM **** THE MICROSOFT LISTING AS IT COMES FROM ED-A-SKETCH ****
2 REM **** THIS IS A PARTIAL LISTING FOR ILLUSTRATION. THERE  ****
3 REM **** ARE 86 LINES IN THE TOTAL INVERTING AMPLIFIER      ****
4 REM **** AS SEEN IN FIGURE 1.                               ****
9000 WIDTH 255
9001 PRINT CHR$(27);"w";CHR$(27);"j";CHR$(27);"6";CHR$(27);"q";
9002 PRINT CHR$(27);"C";CHR$(27);"C";CHR$(27);"C";CHR$(27);"C";
9003 PRINT CHR$(27);"C";CHR$(27);"C";CHR$(27);"C";CHR$(27);"C";
9004 PRINT CHR$(27);"C";CHR$(27);"C";CHR$(27);"C";CHR$(27);"C";
9005 PRINT CHR$(27);"C";CHR$(27);"C";CHR$(27);"C";CHR$(27);"C";
9006 PRINT CHR$(27);"C";CHR$(27);"C";CHR$(27);"C";CHR$(27);"C";
9007 PRINT CHR$(27);"C";CHR$(27);"C";CHR$(27);"C";CHR$(27);"C";
9008 PRINT CHR$(27);"C";CHR$(27);"CZF";CHR$(27);"C";CHR$(27);"C";
9009 PRINT CHR$(27);"C";CHR$(27);"C";CHR$(27);"C";CHR$(27);"C";
9010 PRINT CHR$(27);"C";CHR$(27);"C";CHR$(27);"C";CHR$(27);"C";
9011 PRINT CHR$(27);"C";CHR$(27);"C";CHR$(27);"C";CHR$(27);"C";
9012 PRINT CHR$(27);"CINVERTING AMPLIFIER";CHR$(27);"F";CHR$(27);"k";
9013 PRINT CHR$(27);"B";CHR$(27);"j";CHR$(27);"C";CHR$(27);"C";
9014 PRINT CHR$(27);"C";CHR$(27);"C";CHR$(27);"C";CHR$(27);"C";
9015 PRINT CHR$(27);"C";CHR$(27);"C";CHR$(27);"C";CHR$(27);"C";
9016 PRINT CHR$(27);"C";CHR$(27);"C";CHR$(27);"C";CHR$(27);"C";
```

Figure 2.

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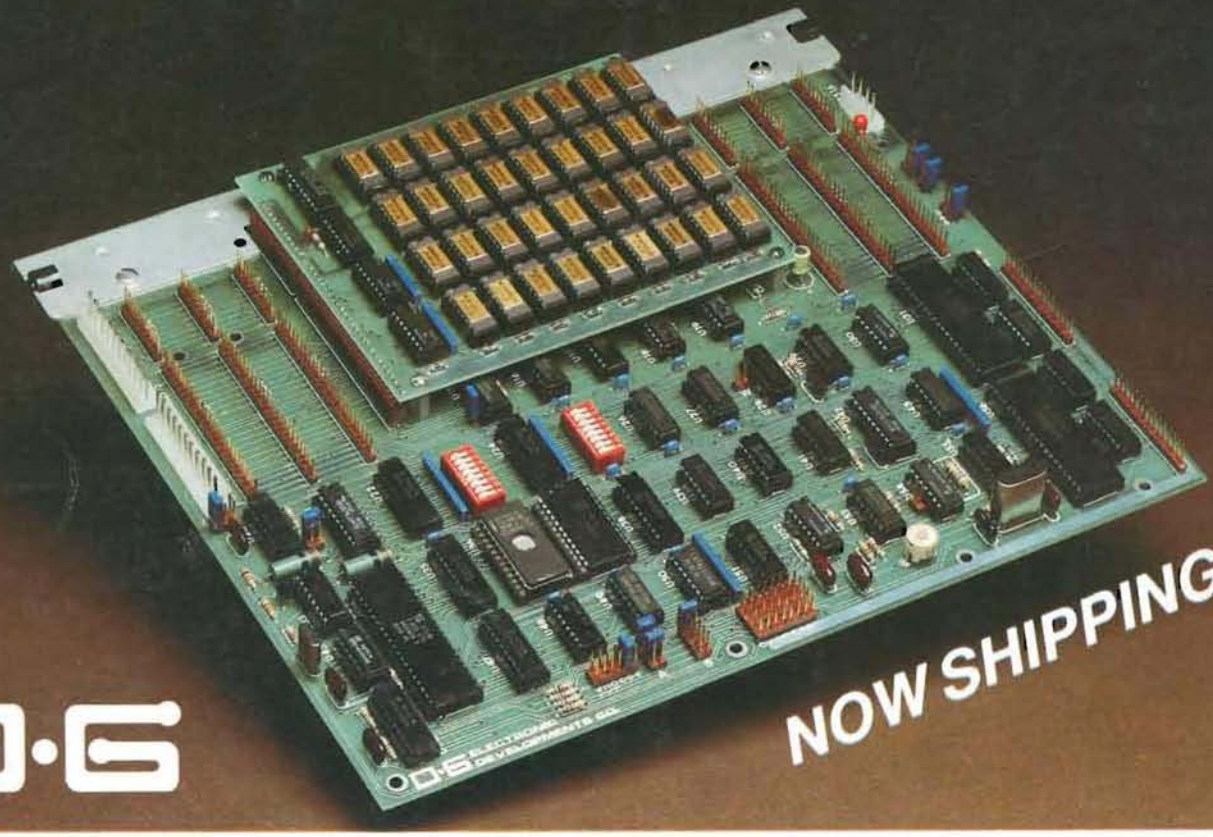

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