

Saving Our CLASSIC Heath 8-Bit Machines!

SETHO JOURNAL

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IT'S THE SELLING SEASON!



The READER'S MAILBOX

Dear Mr Geisler:

I acquired my '89 in November of last year. I bought it at a garage sale, not knowing what I'd purchased. I also knew very little about computers in general. Without support by guys like you, Mark Thompson, and Lee Hart, my computer would most likely have ended "on the heap". That's a sickening thought after [considering] the time I've spent learning and upgrading what seems now to be a part of me. It's been a really-neat learning experience. [Therefore] I'd like to thank all of you for the work you do for H-89 users such as me!

TOM SLAVIK, 5205 Links Drive,
Waco, TX 76708

[Hey, Tom--we're happy that we've made YOU happy! We finally got your subscription un-screwed (see your mailing label) and your copy of MYCHESS is probably in your hands as you read this. Incidentally, that's the last copy we had in stock--there ain't no more! Enjoy it.... -- ed]

Dear Mr Geisler:

It has been well over a year that I wrote you regarding the anxiety I held about getting my dear ole H89A repaired. Welllll--it happened, and since there were no local repairmen who could [or would? -- ed] tackle it, I sent the unit to the Heath/Zenith Company in Orlando. That was in February, 1989. Finally, after many phone calls and cries of anguish, I got my computer back...in November!

"Aha", [I cried in high spirits], "I'm again up and running"...but the video was soon doing fading dances in early Spring. Then I remembered the "Vanishing Video" article in the February 1989 issue. Still, I knew I was no electronics wizard, and my husband was dubious about tackling the soldering. I [then] called several local yokels who all agreed that they didn't want to even try to fix the unit.

Another call to the Orlando outfit [resulting in their] complete denial of anything to do with Heath/Zenith; but they DID give me the factory's address. Viola! Success!

I sent the unit off [on] August 22, got a note that they'd received it plus their estimate last week [Sep 1st], and just yesterday [10 Sep] received the bill (copy enclosed). [This] verified my suspicions about the [bad] solder joints malady. I expect to get my computer back next week.

I wanted to pass along the information that should there be others like me who fear [making their own] repairs and can not get satisfaction from repairmen, or who have no HUGS



around, they should send their equipment directly to Heath Company. [They can] expect results and few--if any--delays.

After eight years of continuous use and many published articles in various magazines, I am totally attached to my H89A and MAGIC WAND software. I have no desire to purchase another computer, even if my poor writer's income could allow it!

SUE MOSELY (Mrs F Donald),
3760 North Highway 1, Cocoa,
FL 32926; phone 407-631-7575

[Sue-baby, glad you got your machine back in good health! We've shipped HeathKit items (non-computer devices) back to the factory for repair and

have always been happy with the results. After all, they DO have (almost) all the replacement parts, all the schematics, and definately the know-how! Your invoice copy lists the service performed as: "Resoldered P203 pins 9 & 10 on video circuit board--cracked solder connections." Where've we seen that problem described and explained previously??? We wish you long and happy keyboard pounding.... -- ed]

Dear Lenny,

On or about 1-Jul-90 I sent you an original of the H/Z100 CP/M-85 documentation; this included the license.

In a separate mailing, I sent you a cheque for renewal of my subscription, plus a letter explaining what I was doing (see enclosed copy).

Since I've yet to hear from you I have no idea whether you ever got the package. If you didn't get it, please let me know and I'll have the Postal Service put a tracer on it. [Don't bother, we got it ok and regret to say we've not yet thanked you; THANKS! -- ed]

I hope you're enjoying your '100 computer, [but] I still find that I can type fastest on the '19 keyboard.

PS: Maybe I'm wrong, but I thought you wanted this material. Can't seem to remember, or even find the issue in which you mentioned it! If it's something you don't want, please pass it along to someone who can use it. /s/BB

BAYARD BADENHAUSEN phd, 96 Glen Oaks Drive, Rye, NY 10580

[Doc, you're one swell guy, a peachy dancer, and--on the proper occasion--a heck-of-a-classy dresser! We were able to

More READER'S MAILBOX

install your CP/M-85 in our H100 where it's now happily residing and running. And we agree, the '19/89 keyboard IS a lot easier to use than the 100-series board. But we have yet to find an original copy of Newline Software's H/2100 version of TeXT PRoCessor. We cut our teeth on the 8-bit version and find it very hard to use any of those intimidating word-processing programs. Our CP/M-80 version of TXTPRO won't run on the '120--function key assignments are completely different than the '19/'89/'90's. We do have the original H/2 distribution copies of MicroSoft's WORD (Ver 1), and Micro-Pro's WORDSTAR, both of which came with our '120, and which run ok under MS-DOS. But we haven't been able to find and devote the many hours required to learn how to use either of these purportedly "wizard" packages. So we just go along with Heather (our Super89), TXTPRO, COLUMNS, and Calligraphy's Graphic Text Formatter, printing the best-possible edition we'er capable of every month. We get quite a giggle from the looks of amazement on peesee and Mac owner's faces when we tell 'em what tools we're using for our desk-top publishing, and how very little money we've put into our "plant" compared with theirs. Hey--8 Bits 4-Ever! -- ed]

Dear Lenny,

Just received your August issue...congratulations on your [publication's] birthday. Glad to hear [that] you are ready to carry on for another 5 years!

I noticed in your 'Clearance Sale' that you have some HA-88-3 [3port] serial [I/O] boards for the H89. I can use one of these to bring another H89 up to the level of the one I use regularly. There have been a couple versions of this board, the earlier ones not having the U610 (and U601?) timing-control chips, and others with only 2 ports populated. I hope the ones you have are not the (very) old ones. My \$30 cheque's enclosed...(I don't need the cables and db25 jacks).

I [have attached for "Ask Rick"] some comments triggered by Bob Evans' complaints in your last issue. One of these days I may send you an update on my NZ-Com adaptation for the H89 if it seems likely [that] anybody has any interest in it.

Keep it up! We're all with you.

LUDO Van HEMELRYCK, 16514 14th Ave, SE, Mill Creek, WA 98012

[Yoh, Ludo! Thanks for your I/O card order--it went out 1st-class mail this AM (18-Sep) and you'll have it before you read this! And thanks for your good wishes; we're going to try to keep on publishing through July, 1996. After that we shall see if it's worth-while continuing into the next decade but it's mainly up to our subscribers if we shall make it that far. Also, thanks for your note to "Bob" Evans. We're sending a copy along to "Ask Rick" to see what he makes of it (sent him a photo-copy so he can add his 2-cent's worth in our October edition). In connexion with your NZ-COM update: I've been using a very early version of ZCPR on my H89 equipped with D-G Electronics' Super89 CPU card. It has a very few--but extremely-useful--features of ZCPR-3 which does

make running this machine a whole lot easier than with "barefooted" CP/M! The S-89 CPU card is hardware-switchable between two or 4 megacycles/second clock rates and has 256k RAM--47k of which I can use as a printer buffer, the rest acting as an incredibly-fast 147k RAM disc. Whenever I work on this publication I run a SEBHC-JOURNAL boot disc which automatically puts all my *.COM files onto the RAM disc and then leaves that disc's letter on as the prompt. Boy, does that ever save wear and tear on my floppies and drives! I'm in and out of TXTPRO, COLUMNS, SETMX, Calligraphy GTF and other programs in about one percent of the time it takes to load any one of them directly from a floppy. Also, ZCPR lets me call other utilities from the RAM disc (which I'm logged onto) without having to specify where they are, another labour-saving feature! Incidentally, I've managed to make the same version of ZCPR work in my H8, on both hard and soft sector sides. The H8 isn't as fast as the '89, but ZCPR does help operations greatly on that machine too. Please do send us a "How-2" article on adapting NZ-COM to run on standard H89s; we're sure our other subscribers will appreciate it as much as they have all the other articles on ZCPR's ramifications we've printed earlier! -- ed]

Dear Lenny,

I'm going to send you the Zenith CP/M-85 MBASIC software and you can do with it what you will. Perhaps put it in the SEBHC JOURNAL's software bargain center "to help the cause". Don't know if you have checked the Quikdata liquidation [sale] on Henry's BBS but there are lots of good stuff there, including booklets and schematics for H8s, H89s, etc.

ALLIE P LINGO, P O Box 118, Dierks, AR 71833-018

[Hi y'all Allie! Thanks for the post card. Haven't done any modem-ing since re-arranging the computer room but I intend to get around to that Really Soon Now! And thanks for the offer of MBASIC for the '100-series computers. We'll try to put it to good use, perhaps tie it in with sale of that 2100 we picked up at University of Michigan's surplus sales office if we don't dispose of it otherwise. By the way, we haven't heard of anything really exciting from your corner of Arkansas lately. Why not send us a "guest editorial" or the like on any subject you think will be of general interest to our readers. Please do keep in touch! -- ed]

Dear Sir:

A note from the Heath User's Group indicated that you may have information about hardware and software available for H/289 computers. I wish to read or write PROMs for robot controls. Heath did have [something along that line] years ago but my foresight was not as good as my hind-sight.

CHARLES W WILSON, W3819 Weile Avenue, Spokane, WA 99208

[Hey, readers--PLEASE help Charlie with his problem! -- ed]

SEBHC JOURNAL

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= > ASK RICK ! < =

The SUPERHELP Column!
Conducted by
North East Associate Editor
Rick Swenton

To Stanford R "Bob" Evans, c/o "ASK RICK":

Hi there Bob! Sorry that you got lost in some of my earlier exchanges with Rick about NZ-Com. No, I was not born with a computer in one hand. This happened well before our H89s became available. As to my interest in Assembly [language], that comes from fooling around with That Wonderful Tool [that] Heath Company provided us. Try it, you'll like it!

Regardless of what you may think, the real satisfaction one may draw from using computers cannot be bought, nor is it Just Given to a selected few. [The satisfaction] is in direct proportion to one's effort to assimilate whatever he can lay his hands on. Read your manuals, read the Staunch 8/89er and SEBHC Journal [newsletters], contact local and national Z-nodes and bulletin boards, and broadcast your problems (you seem [presently] to do this one right). I assure you: if you put enough effort into mastering the 8-bit world, you'll never feel that you may become lost in the 16-bit wilderness! And if you eventually do get into that, you will have gained an insight that most 16-bit users will never have been exposed to.

Your comments about some way stumbling into NZ-Com without realising it are an illustration as to how easy it really is to implement Z on a standard CP/M system. In general, the first inkling one gets that the operating system is up and running is CP/M's prompt changing from A:> to ZCPR's AO:> prompt. It may help to understand that NZ-Com substitutes ZRDOS for CP/M's BDOS, at the same time that the CCP is replaced with a Z-CPR. When you return to CP/M from NZ-Com (via NZCPM), the original BDOS is re-inserted, then the normal CP/M warm boot is entered. So, you most likely use a different DOS under Z than under CP/M, but it's possible to 'borrow' the NZ-Com ZRDOS and use it under CP/M. In which case, you'd get the ZRDOS error messages even under CP/M.

Rick has already handled most of your questions much better than I could (he has a degree in didactics [That means teaching. -- ed] in addition to an engineering degree). The Software Update Service he refers to is provided by Chris McEwen (via Socrates Z-Node #32, 909-745-9067). Orders are processed by Sage Microsystems East, or by Plu*Perfect Systems (via Ladera Z-Node #2, 213-670-9465). Catalogues of available files are listed on most Z-Nodes.

The originators of NZ-COM are publishing articles explaining how the utilities can be used in "The Computer Journal"--published every two months--by Technology Resources, 190 Sullivan Crossroad, Columbia Falls, MT 59912. Subscription is \$18/year. In that publication, and in the .HLP files is information on how to use the many features NZ-Com provides. Take them [on] one at a time, and expect to come back to any one of them many times. Even if you live a hundred years,

there will always be something more to learn!

By the way, If you could give me an inkling about where I lost you, we both might benefit.

LUDO Van HEMELRYCK, 16514 14th Ave SE, Mill Creek, WA 98012

Hi Rick,

Here I go again, different problems. I'm trying to get a QuikStor hard-disc system to go and am running into a problem. Since you [had] indicated that you had used Henry's system, I hope that maybe you can pinpoint my error(s).

First, hardware: I bought the MM77320 board from Henry, along with his QuikData software. I had the Xebec 1410 board, the cabinet and power supply, and a Tandon TM262 20Mb hard drive, which I had intended to use with the CDR system, but got disenchanted with that system and moved it to my other machine. Henry indicated that it would be fine for his system. So I set up everything as shown by the limited info he had sent me--Port at 7CH for HD, 7BH for floppys. MM77320 set at 7CH, SASI jumper at OFF, I/O jumpers set as on the old I/O board according to the MM instruction sheet. SW501 on CPU set for Z67, #1 to 1, #0 to 0. On the Xebec board, sector size set to 256 (SW W3). Monitor ROM is 444-142, with a 444-83 at U516.

Now the only thing which MAY be causing the problem is that MM says that the I/O decode ROM--U550--MUST be changed. Henry says nothing about it in his documents that I can find, and he didn't send me a new one as is indicated to be part of the the MM77320 package. I've written to him, but he seems to object strongly to giving any help to anyone if they didn't get the whole system from him. I reminded him that I had not asked for any system integration help, only the parts which were indicated that I must have. Haven't heard from him yet, so maybe this letter is a bit previous, but I wanted you to at least check out my setup.

Software: I patched the SASIX.COM file (NO HDOS used here, so the .ABS file wasn't used) using DDT, had no problems and came out with SASIXX.COM filename to differentiate. Ran the thing and typed in all the info as I had it on the TM262. I do NOT have info such as Wcomp & Wreduc for that drive--it's not in the manual--so I assumed zero for those two. Also, seek type isn't listed. Anyway, I ran the format program and it seemed to work ok, taking only a few minutes to re-format the whole disc. Ran Check Cntrlr--it showed OK; ran Check Drive, also showed OK. I wanted six partitions so set it up to come out as 615 cylinders--the size of the drive. BUT, when I try the Write Track, I get an error message, "MEDIA--ADDR MARK NOT FOUND ???". I've tried it with both SASIX versions but with no difference. Also did change partitions to four, no difference. Can't set it up to boot off the HD until I can get some partitions. There is no indication of what the error [message] means.

Perhaps [the problem] is in the U550, but Henry doesn't mention it along with his information on the MTR-90 [444-142], but MM does. So I don't know if [U550] should be

More "ASK RICK"

answer. If you can see anything I'm doing wrong, drop a line when you can--no hurry. Everything else seems to be going ok--hope it's the same with you. Many thanks for everything you've helped me with!

BOB EVANS, Hemet, CA

To Bob, from Rick:

Hi, Bob,

Your hardware setup for hard disc and boards looks OK to me. I believe that if you are using standard Heath I/O ports you will not have to change the I/O decode ROM. I think that is needed only if you want to use MMS ports required by some of MMS's products. I'm not using the 77320 interface, instead I'm using a Heath H67 interface board, but I did set up a friend's system with the 77320 and everything went smoothly.

About the Tandon TM262, I have that drive listing showing four heads, 615 cylinders, and both Reduced Write Current and Precompensation set to 615--that is, both none rather than zero as you'd stated. That would make them both active (ON) for the entire disc surface. I don't think that this should cause your problem, but it's possible. [Murphy was an optimist! -- ed]

The error message, "MEDIA--ADDR MARK NOT FOUND", is usually associated with a drive problem, or bad cables between the drive and controller. If you can access the drive (the drive LEDs will come on) and you can format the drive (you can hear the stepper pulsing) then you can assume that the 77320, 1410, and computer to controller cables are probably OK. The fact that the controller check and the drive check don't fail confirms this, but I'm suprised that the drive check was successful. That implied that drive and drive cables are probably OK. "MEDIA--ADDR MARK NOT FOUND" error message can mean that the controller was not able to read the track format. It's lost and can't find its' place. But the drive check should have failed as well. If it were bad cables, the drive test should have failed. The simplest fix is to change the RWC and WP values to 615--as I said before--and test again.

Why do you want six partitions? You can have only four active at any given time, and you must use the QSASSIGN utility to define the active ones. You can have four active 5Mb partitions at A:, B:, C:, and D:.

On patches to SASIX.COM, keep in mind that they affect only the hard disc's ability to bring up the Boot Partition Menu Screen with a terminal that IS NOT fully H19 compatible. If you're successful in creating the partitions with SASIX and you can't get the boot menu, you can still boot with the MTR-90 command: "BOOT:0" (assuming you SYSGENed a working CP/M system to partition zero).

The Boot ROM can also affect the ability to bring up the Boot Partition Menu screen. It can mess up auto-baud-rate detection (my patch fixes this), or it would be required if

you expect to boot the hard disc system from a non-standard (i.e., non-Heath) port. Otherwise, it's not usually a problem.

Was your hard disc system working properly on the CDR system???

I don't have any documentation for the MMS board, so I can not double-check your settings. That SASI jumper set to OFF sounds wrong to me, but again, I don't have the manual....

I hope this letter helps. Maybe we'll [all] get lucky and find that it will simply be the drive parameters. Good Luck!

/s/ RICK

Dear Rick,

Biff Bueffel sent me a copy of yur letter on speeding up the H19 [terminal]; very interesting! You seem to have found a solution to the problem of finding faster 2112s. I have a few comments to add in case this is an article for future publication.

CLOCK SPEED:

The TLB was designed to run at one, 1.5, 2, or 3MHz. As you know, Heath always used 2MHz and chose their IC speeds accordingly. Four megacycles is rather a "bastard" speed, and Peter Shkabara even worked out a modification for 6MHz. [Using] four or 6 megs result in assymetric clock waveforms and other out-of-spec conditions. I might try it for fun, but wouldn't recommend it to others. Three megs is the fastest [clock rate that] I consider practical to ensure reliable [TLB] operation.

Originally I bought Toshiba TM5514APL-2 200nSec CMOS RAM ICs. They were great; fast, microscopic power consumption, and immune to supply voltage variations (full speed operation from four to 6 volts). Importation [of these ICs] was banned [by our government] after Toshiba sold computers to the Russians, and nothing I've found since is as good.

H19A:

Heath apparnetly anticipated the problem of finding 2112s. The H19A board is laid out so 2114s can be used in place of the 2112s. This is also documented on the TLB schematic.

Because a 2114 has 2 more pins [than the 2112], you replace the 16-pin sockets at U438 and U439 with 18-pin sockets (the extra holes are already there). Then you must move five jumpers. This ain't easy--they're not labelled, and the jumpers [actually] are foil traces which must be cut. Once done, it has the advantage of being very clean; there's no sign of any "hacking about" on the board.

I like your approach better; it is cheaper, esier, takes less power, and adds more RAM. The only disadvantage would be the [to some] "ugly" appearance.

A side note: Zenith added RF chokes to the H19A TLB to reduce Electro-magnetic Interference (EMI). These chokes introduce considerable voltage drop, and many H19A boards thus deliver 4.5 volts or less to their ICs. Speeding up the

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clock increases power consumption, which only makes the voltage drop problem worse.

Transistor-Transistor Logic (TTL) and NMOS ICs are rated for [a voltage spread of] 4.75 to 5.25 volts. Below this they don't work right; they get slower, have less output drive, are more sensitive to noise, and so on. If you [intend to] speed up the H19A's clock, I recommend one of the following steps:

1. Short out the RF chokes
2. Replace them with ferrite beads--they have almost no direct current resistance
3. Replace the positive-supply five-volt regulators with types which deliver slightly more than +5v to compensate for RF-choke voltage drop
4. Install CMOS ICs; they draw very little power and work anyway with low supply voltages.

H89 TLB:

You're correct; a 6116 RAM IC works just fine in place of the Superclock. All you lose is the battery back-up feature.

Digi-Key sells NEW parts; JAMECO and JDR sell SURPLUS (unused but not current date codes) parts. Usually this doesn't matter (ICs don't spoil), but you may get ICs from oddball companies which have gone out of business. For example, JAMECO has lots of 74HCT parts from Zytrex which are slow, but cheap.

I doubt that there's room to stack a Superclock plus a 6116 RAM in an H89; wouldn't the combined height [of these two chips] hit the CPU board?

Another choice: The Superclock IC is an 5G5-Thompson (formerly Mostek) MK48T02 which has 2k of RAM. They also make an 8k RAM version--the MK48T08. You would need to make a 28-to-24-pin socket adaptor (as I did for the program ROM) and wire the extra two address lines to the Z80. It would be addressed in the 16k block from 8000-BFFF. Since the H19 partially decodes its' memory, the 8k would be repeated twice (8000 and A000 are the same, etc.). I would need to re-assemble the Superset source to move the 2112 variables to the new Superclock RAM (which is very easy, a single equate).

By the way, you don't have to hunt around in the dark to study the Superset code. I'd be happy to supply source code to you--or anyone with a legitimate need for it.

EXTRA TLB RAM:

Having more than 256 bytes of non-screen RAM could be used to good advantage in a number of ways. For instance, I'd extend the input buffer from 128 characters to 256. Besides making it less likely to miss characters at high baud rates without handshaking, 256 is a "magic number" which would considerably speed up the software to manage the input buffer. (I even designed an adapter board about the size of a credit card which replaces the four 2114s and both 2112s with a single 8k or 32k static CMOS RAM.)

What could the extra RAM be used for? Eight-k could provide 4 pages of off-screen storage, but I don't know of

any software using Superset's 2nd page now (except my own Write-Hand-Man). I know how to make the hardware do downloadable fonts, 640x250 graphics, etc., but it would require special software on the CPU board to be of any use to anyone (and no-one will write such software, nor will they pay anyone else to do it).

What features of the Superset do you actually use? What features of other computers seem to be missing on the H89 that the Superset could fix?

PARTIAL DECODING:

Partial address decoding is looked upon as a fault, but it is actually very useful. The H19 video RAM occupies a 16-k block, with the same 2-k repeated 8 times within it. Heath's H19 code makes many tests to be sure that video RAM R/W always uses F800-FFFF. These tests slow things down. Every time an operation is done to video RAM, the address is masked to F800-FFFF.

The Superset simply insures that each video RAM R/W address is somewhere (anywhere!) between C000-FFFF. This takes less code and so is faster. The Z80's bit SET and RESET instructions are very handy for this.

Z80 BIOS:

I finally got the Bueffel/Swenton Z80 BIOS to assemble under ordinary CP/M. Am starting to play with it to see if I can contribute anything useful. Specific goals are to add things such as a print spooler, my ROM disc, and WHM at the BIOS level. Wish me luck!

LEE A HART, TMSI, 323 West 19th Street, Holland, MI 49423

Dear Rick,

I saw your comments on Superset/Quikstor compatibility in the latest SEHC JOURNAL. You seem to have found a solution to a problem which has evaded me and several of my customers.

As I understand it, the Quikstor boot ROM displays a menu of bootable partitions on the hard disc so [that] you can select the boot partition (CP/M#1, CP/M#2, HDOS, etc.). This program does not work with anything but a stock H19. An H29 or H19 equipped with Superset, Super-19, Ultra-ROM, or HUG/Watzman ROM all fail.

Once booted, the problem goes away. Any terminal or upgrade ROM then works normally. There is also a DIP switch on Quikstor's host adapter board which lets one select the boot partition. If this option is used, there's no problem.

Dean Gibson wrote the Quikstor boot code. He had a habit of including an auto-baud-rate determination code in all his programs. I asked him about it, and he said that the auto-baud-rate routine wasn't strictly necessary, rather it was a form of copy protection to keep his programs from running on non-Heath systems.

As you observed, you need not worry about correcting the console baud rate to match the CPU board; they MUST match on power-up or you could never have gotten an H: prompt.

Even MORE "ASK RICK"

I don't have a Quikstor, and couldn't fix the problem at its' source, so I made a special version of the Superset which contained BOTH the stock H19 and Superset codes. An external switch can then switch between H19 and Superset modes. I've sent this version to several people who needed it, but your method sounds as if it fixes the problem at the source. How did you patch out the auto-baud-rate routine in the ROM? Or is it in a program on the hard disc? If you can provide a better description, I'll include it in my Superset manual!

TERMINATION RESISTORS:

I'm constantly re-arranging disc drives. If they're not terminated correctly, you get all sorts of goofy problems that are hard to track down. So I've developed some short-cuts.

In the dark ages of the [early] '80s disc interface cables tended to be many feet long. You had to "tune" them (much as with a radio transmitter's transmission line), otherwise the sharp, noisy edges of TTL logic signal [transitions] bounced back and forth much like a bullet in a boxcar. It's similar to trying to communicate in a cave; you can hear each other fine, but the echoes make understanding impossible!

One hundred fifty ohms is a pretty heavy load for a TTL gate rated at 30 mA. One such load on each gate is all they can safely drive, and even that takes special high-output driver ICs (7406, 7438, or similar). That's why you can have only one terminating resistor, even though there are two ends to the cable.

ALTERNATIVES:

1. Instead of a single 150-ohm resistor tied to the positive five volt supply, use two resistors in a voltage divider. That is, 220 ohms to +5v, 330 ohms to ground. This cuts current demand to 20 mA. This was done by the special 220/330-ohm terminators used on early Siemens FDD100-5 drives. With two such terminators on a cable, TTL gates had to sink only 40 ma, not 60 mA. That's still beyond IC ratings, but it often works anyway.
2. Shorten your cables so termination isn't needed; TTL signals can travel about two feet before they start noticeably degrading due to ringing. If your cables are shorter than this, even a 10-k pullup resistor will suffice--you need something, because output gates have open collectors.
3. Compromise: The longer the cable, the more it needs terminating. That means that a cable that's only "a little" long needs only "a little" terminating (no, it's not like being "a little pregnant"). I put 1-kilohm resistors on all my drives. That's enough termination from an internal drive with its' short cable. When I connect two external drives (with their longer cables), the parallel combination of the three 1-k resistors lowers the [total] resistance [on each gate] to 330 ohms; still acceptable.
4. Modern technology: CMOS outputs have "soft" output rise

and fall times and high-noise-immunity inputs. They can drive much longer wires without termination but they don't come in open-collector versions. For up to five to 6-ft cables, you can remove all terminator packs and replace the 7406 drivers with 74HC04s. One "catch" is that 74HC outputs can drive ten 74LS gate inputs, but only TWO regular 74-type TTL gate inputs. Thus, 74HC04s can't drive three "antique" disc drives with non-74LS logic. Also CMOS is quite susceptible to static [electricity] damage; these ICs can be "zapped" by touching the pins in the external drive jack on the '89's rear apron.

LEE A HART, TMSI, 323 West 19th Street, Holland, MI 49423

Hi, Lee,

Thanks for both your recent letters. I'm very sorry that I hadn't responded sooner, but it was good that my dialogue with Bob Evans prompted another discussion about booting Quikstor with Superset [installed in the '89's TLB].

Quikstor's system doesn't require a special boot ROM as do other vendor's cards--example, Magnolia may need one, but Quikstor itself does not. The problem code is in SASIX.COM or SASIX.ABS. This is the program which writes the partition table and boot code to the drive. It is in the boot loader where that auto-baud-detection routine is located. I have no experience with HDOS, but SASIX.COM for CP/M does do that auto-baud-rate stuff. This prevented my system from working with a standard H29 terminal. The patch I gave to Bob NOPed out any attempt to program the baud-rate divisors in the 8250 console UART. You make the patch to SASIX.COM and the next time you use it to write the boot partition table, it writes a patched boot loader to the disc.

Again, the patch to SASIX.COM was to replace occurrence of D3 EB at two locations--031H and 031FH--with zeros (NOP). I imagine that if you searched SASIX.ABS for D3 EB and did the same thing, you could likely fix that one too.

Your observations about the system working fine if you selected a boot partition with the switches is correct. You only run into problems when you try to boot with the MTR-90 (or other) B(oot) command and try to select the partition from the menu. If you had no boot partition selected with the dip switches and you passed a command through MTR-90, such as B(oot):0, it would boot partition zero without coming up with all the fancy, full-screen partition menu, which, incidentally normally runs in ANSI mode. As I told Bob, I am running Quikstor on both an H8 and H89 with both H19 TLBs running Superset with no (known) problems. I originally discovered the SASIX patch so that I could use the Watzman ROM years ago.

Thank you for sharing your valuable insight on the H19 TLB as well as the tutorial on terminating resistors. Most importantly, thanks for letting me share your letters with the SEBHC JOURNAL's readers. We're all there are left to help each other, and we all seem to be doing our respective parts.
/s/RICK SWENTON

SEBHC JOURNAL

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"ASK RICK" Concluded ++ Un-Classifieds ++

[Hey, guys! What can I add to what you've both said here?! But here's a letter from Henry Fale of Quikdata Computer Services we just received while transcribing your letters above. It's too good to leave out! -- ed]

Dear Len,

In the last SEBHC Journal (August--it's already September!) the WH8-37 board for the H8 computer has two interfaces on it, neither [of] which are parallel interfaces which you infer. [Drat! I keep making that same mistake! - ed] There is a [soft-sector] disc-drive H37 interface [port] on it which is] functionally equal to the H89-37 interface, and there is the H/Z67 hard-disc interface [port] which must be connected by a special 40-to-50-conductor cable to a Xebec 1410 [controller] which then goes to the hard-disc via standard 20 and 34-conductor cables. Although the '67 portion of the card is something like a parallel port, it can't be used as a standard parallel port for the H8. [Right! I have an H8 2-parallel-port I/O card in mine! But you know me, Henry, I get confused SO easily.... -- ed] That 34-pin connector on the card is for soft-sector double-density drives, and the 40 pin connector is for a hard disc via the Xebec controller.

In other letters in the same edition, our Quikstor is mentioned. The Quikstor unit was housed in a cabinet with a power supply and fan, and contained the Xebec 1410 [controller] and hard-disc.

As for TMSI/Lee Hart's H89 Superset, there were some problems with operating the Quikstor with most TL8 ROMs, save the standard H/Z ROM. Hey! We were here first, and followed standard H/Z conventions when designing this product. ANSI escape codes were used because they were then the H/Z standard. Many developers [later] came along and decided we didn't need that standard and designed their own TL8 ROMs without the ANSI feature. We [then] went back and modified our code because of this, and got some other ROMs to work with the Quikstor, but it's been so long ago--that, without some digging which I don't have time for right now, I can't supply you with a list of those which do work properly. The standard H/Z equipment always DID, and always WILL work with our Quikstor [system].

60-baud recognition was used to make the product easier to use. This way, whatever the terminal was set for, Quikstor would recognise and set itself to. Remember the old days when the CPU, TL8, and software had to all be set to the same baud rate or the system would [appear to] die and hang forever, creating major problems for those not aware of these matters? We wanted to make it simple: [Just] plug it in and go!

Lee Hart came up with a fix/kludge to make it work with Superset while working on it for John Turley, who has both the Quikstor and Superset. I believe [that] it involved a switch which made everything work OK. Perhaps he's the one to speak with about this. [See Lee's letter above. -- ed]

Contrary to what Rick Swenton said about the H29 not working with Quikstor, that's just not true. I have an H29 on my

system and it works fine with the Quikstor, but the first release of the software didn't work with the '29 since Heath/Zenith chose to call it "compatible" without really making it so with the H19. Much work went into the second release of the software to solve these problems. The second release is the only supported release, and the only one which works with the H/Z29 without problems.

Hope this helps!

HENRY E FALE, QUIKDATA COMPUTER SERVICES, Inc., 2618 Penn Circle, Sheboygan, WI 53081

[Well, Henry, you've said it all! This'll have to wrap up our "Ask Rick" feature for this edition--we're running out of space! But keep those cards & letters coming! -- ed]

=====
CLASSIFIEDS.... CLASSIFIEDS.... CLASSIFIEDS.... CLASSIFIEDS
=====

* F O R * S A L E *

An operating H8 system consisting of the following:

H8 computer with p/n85-1935-1 front panel and gold-plated connectors

HAB-6 280 CPU, four 16k Static RAM cards, H8-4 multiport serial I/O card, WH8-37 Soft-sector/Hard-disc controller card

H29 terminal

=> Best offer over \$100 for complete system <=

Separate H8 boards as follows:

H8-2 2-port parallel I/O

WH8-4 multiport serial I/O

HAB-6 280 CPU

HAB-3 New Orleans Data General Color Graphics Board

WH8-64 64k DRAM

HAB-2 NODG Music Board

=> Give your best price for each or all these boards <=

Note: Most of the boards and the computer have been upgraded or repaired to Heath Tech-Notes specs and REMark articles. Manuals for all boards plus many Heath Tech Notes AND complete set of REMarks containing articles pertaining to the H8 computer.

CONTACT: Charles A Guidot, 579 South Linwood Beach Road, Linwood, MI 48634-9434; phone 517-697-5280

=====
ALE.... FOR SALE.... FOR SALE.... FOR SALE.... FOR SALE
=====

Restorable H8 computer, no memory card(s), has "orig zero" card, 280-modified CPU card, 2-port parallel I/O card, 2-port serial (cassette) I/O card. Restored & working H19 terminal. Most documents. Best offer over \$75 buys this Perfect Match to above-advertised cards to complete 2nd computer! Shipping extra. Contact: Lenny c/o SEBHC JOURNAL; phone 313-662-0750

TWO-COLUMN PRINTING w/MBASIC

by Bernard L Waltuck, M.D.
1411 North Flagler Drive #7700
North Palm Beach, FL 33401

There are a few commercial programs which have been written for the purpose of printing newsletters such as this one in 2 (or 3) columns. These sources have previously been mentioned in articles in this publication (most recently, in the July issue) as well as in the *Staunch* 8/89er. I don't plan to write a newsletter, but I have had to publish an address list from a database. I wrote *TWOCOL.BAS* in MBASIC to take a single column listing and make it into a two column list. The program listed below works very nicely under CP/M and requires only very simple modifications to run under HDOS.

I have run this program to take the file *MAST.CAT* (from *YANC*) and printed it in two columns, but in contrast to the standard listing, the entries are listed one below the other rather than side by side. This makes duplicates much easier to identify. If the records in your database--whether a catalog of parts, a list of your favorite CD's, or a catalog listing of your disk files--are over one line long, you will need to make a few changes, since you won't want to put the name and address at the bottom of one column and the city, state, and zip at the top of the next one. You could use *QUERY!3* to print a 2 column list but it prints them left-right, left-right down the page. I wanted an up and down, telephone book-type list. (Imagine how difficult it would be if you had to read a telephone book across the page like *YANC* or *QUERY!3* would have you do.)

If you wish to create only a simple database, *PIE*, or any word processor or text editor will work just fine. You can use the search key to find records and you can move them around. This works with any list. Just be sure, if you are creating text, that you keep your columns slightly less than 1/2 page wide. This creates a narrow blank "gutter" between the columns so that any long lines won't run clear across the page.

```
5 REM                TWOCOL.BAS                A UTILITY
10 REM PRINT SINGLE COLUMN FILE IN 2-COLUMN FORMAT
20 REM PRINTING ONE SIDE FIRST, NOT STRAIGHT ACROSS
30 REM by BERNARD L WALTUCK
40 DEFINT A-Z
50 OPEN "I", #1, "MAST.CAT"
60 FF$=CHR$(12):T$=CHR$(9)
70 CO=0:P=1:LN=0:MA=57:DIM L$(MA):
80 LPRINT "":LPRINT "":LN=LN+2
90 LPRINT T$;"Title Goes Here (if wanted)":LN=LN+1
100 LPRINT "":LN=LN+1
110 SL=LN
120 FOR X=SL TO MA:L$(X)="":NEXT X
130 LINE INPUT #1,P$
```

```
140 IF EOF(1) GOTO 240
150 IF CO=0 THEN L$(LN)=P$ ELSE LPRINT T$;L$(LN);TAB(40);P$
160 LN=LN+1
170 IF LN<MA+1 GOTO 130
180 IF CO=1 THEN CO=0 ELSE CO=1:LN=SL:GOTO 130
190 IF P>1 THEN LPRINT "":LPRINT TAB(40);P
200 LN=0
210 LPRINT FF$
220 P=P+1
230 GOTO 90
240 IF NOT CO THEN A=SL:B=LN-1 ELSE A=LN B=MA
250 FOR X=A TO B
260 LPRINT T$ L$(X)
270 NEXT X
280 FOR X=B TO MA :LPRINT "":NEXT X
290 IF P>1 THEN LPRINT TAB(40);P
300 CLOSE ----
310 END
```

How the Program Works

Line 40--Whenever possible, processing numerical variables as integers is faster and takes up less memory

Line 50--Change *MAST.CAT* to whatever file you plan to process

Line 60--FormFeed becomed FF\$ and the Tab becomes T\$

Line 70--CO is the COLUMN; 0 for left and 1 for right. P is the page number. LN is the Line Number. MA is the MAXimum number of printed lines per page. DIMension the variable of Lines.

Line 80-100--Print Header on page 1

Line 110--SL is the Starting Line number. This must be the same on both sides of the page.

Line 120--Empty all lines to be printed for filling later

Line 130--Read the line into memory

Line 140--If you pass the end of the file go to The End

line 150--If you are on the first column just put the line in memory, otherwise print the left side, tab to the center, and print the right half. If you have a page width other than 80 characters--as with condensed print--you might use 68.

Line 160-170--Increment the LiNe counter and repeat if not at end of page

Line 180--Change COLUMNS. If finishing the first side, Reset to the starting line and continue on side 2.

[Continued overpage]

TWOCOL.BAS concluded

A Last-minute READER'S LETTER!

Line 190--I like Page Numbers on all but the first page

Line 200--Reset Line counter

Line 210--Go to top of next page

Line 220--Increment Page number

Line 230--Go print smaller header on inside pages. Change to 110 to skip inside header if desired

Line 240-270--Print all stored lines since there are no more lines to read

Line 280-290--Skip to bottom of last page, print number

Line 300--CLOSing file empties buffers to ensure everything gets to the printer or files

I have also added a simple routine to ignore any blank lines at the top of the column to make it look neater: (145 IF LN=SL THEN IF P\$="" GOTO 130) and if your database is more than one line long add these lines:

```
4 RE=4:REM Set record length to whatever is appropriate +1!
1 FOR Y=1 TO RE
- 145 IF P$="" GOTO 162:REM IF YOU WISH TO SKIP BLANK LINES IN
  THE DATABASE
162 NEXT Y
164 LPRINT ""
166 LN=LN+1
```

Also, change 170 TO: IF LN<(MA-RE) GOTO 125:REM (NOTE BOTH CHANGES)

If using HDOS you will need to insert this line:

```
35 CLEAR 20000
```

This makes available more space for string storage. Also, HDOS does not allow CP/M's 'LPRINT' command. You must add this line:

```
55 OPEN "O", #2, "LPO:"
```

and change all 'LPRINT' statements to 'PRINT #2,'. Whether you use CP/M or HDOS you can store the two-column listing for printing later or for processing by CALLIGRAPHY by changing LPO: to any new file name and continue changing 'LPRINT' to 'PRINT #2,'. [Don't forget MBASIC's CLOSE statement! -- ed]

[Editor's note: Copy listing with an editor before running it under MBASIC in either CP/M or HDOS. Change all LPRINT to 'PRINT #2,' statements with the SEARCH--REPLACE function. It saves time and eliminates potential typing errors! The pro-

gram may function similar to the CP/M COLUMNS.BAS utility; certainly it's worth trying that way. Heartfelt thanks to Dr Waltuck for such an interesting and practical utility!]

Hi, Len,

I recently experimented with converting my H8 to run at a clock speed of six megacycles/Sec and was very surprised when it worked at that speed. I thought surely it was a waste of time since I'd never read of anyone [else] doing it. Can't believe I'm the first one to try it, so guess I must not be reading all the right stuff. For those who are interested, this is my system's configuration:

Standard Heathkit motherboard
D-G Electronics CPU board with Z80B (was 4-mc/S)
--CPU and H17 ROMs are shadowed (copied) into RAM
D-G Electronics 64k static memory board w/HM6116s
--about 50/50 120nSec and 150nSec RAM ICs
Standard Heathkit serial I/O board
PC-12 clock/parallel board
Sigmasoft & Systems controller w/winnie & ss drives

To make the conversion I replaced the CPU's 4-mc/S crystal with a 6-mc/S crystal and made a minor modification to the front-panel board correcting the 2mSec clock timing. D-G had supplied a small board along with their original Z80 CPU which modified the front-panel 2mSec clock plus the single-step circuitry. I cut that board in half and used the single-step portion in the IC108 position. I then piggy-backed a 74LS92 divide-by-3 IC on top of IC109 and diverted pin 12 through the 74LS92 for the 2mSec clock correction.

I've been running for a couple weeks since the change with out problems, but haven't gotten around to modifying my H17 board so I'm not sure it will run at the new speed. That'd necessitate dividing down the controller card's clock and alter the driver timings (either in ROM or the driver). The controller's RAM chips would also probably have to be changed but my system isn't using them because the D-G system substitutes the 64k RAM board's memory for the H17's. By the way, I didn't modify the Sigmasoft hardware or software.

I hope this information is useful to other H8 owners, and wonder if the H89 might run at 6 mc/S--has anybody done it?

Recently I ran another successful experiment: I copied my regular Sigmasoft hard-disc driver (SY.DVD), renamed it WD.DVD, and was able to assign partitions to this driver. Now I have 12 HDOS drives online--SY0: to SY7: and WD0:--WD3:. If I didn't have four partitions dedicated to CP/M, I could have 16 HDOS drives, but I must avoid making duplicate assignments. ASSIGN.ABS isn't set up to handle multiple drivers so it doesn't detect duplicates when they're on different drivers. Also, ASSIGN doesn't show the second driver assignments, but the Sigmasoft system is GREAT!

BOB OLSON, 24450 Kirby Street #146, Hemet, CA 92343; phone 714-929-5146

[Thanks for a very practical H8 "HOW-2" letter, Bob! -- ed]

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#4	-H89 w/48k RAM, sssd 40trk internal drive, 2-port serial I/O card.....	\$100
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#7	-H/Z89A Working Central Processing Board (CPU) & 48k RAM; use as-is for replacement or parts....	\$ 55
#8	-H/Z-37 Working soft-sector disc I/O card with jumper cables & resistor, no MTR-90 ROM chip...	\$100
#9	-H/Z89/90 Working 3-port serial I/O card w/back panel cables & DB25 jacks.....	\$ 35
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(Note: Names, addresses and phone numbers listed below were believed to be correct as of 25-Sep-90.)

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8-bit machine memory devices, software, etc.

DIGI-KEY CORP., P O Box 677, Thief River Falls, MN 56781; phone, orders only--800-344-4539

Integrated circuits, other computer components

D-G Electronics -- no longer in business

JAMECO ELECTRONICS, 1355 Shoreway Road, Belmont, CA 94002; phone, 24-hr orders--415-592-8097, other--415-592-7108

Integrated circuits, keyboards, p-c board kits, etc.

JDR MICRODEVICES, 2233 Branham Lane, San Jose, CA 95124; phone, orders--800-538-5000, other--408-866-6200

Integrated circuits, misc. small components

MAGNOLIA MICROSYSTEMS, 2818 Thorndyke Avenue West, Seattle, WA 98199; phone 206-285-7266

Special memory upgrades and op-systems for H/Z89, 90s

MICROPRO Corp -- Information not available at press time

MICROSOFT Corp -- Information not available at press time

New Orleans Data General Services, 7230 Chadbourne Drive, New Orleans, LA 70126; phone 504-241-9388

Colour and sound boards for H8, H89. No longer in business but can provide technical advice

NEWLINE SOFTWARE, P O Box 289, Tiverton, RI 02875; last-known phone 401-624-3322 reassigned. Business closed 2 years

QUICKDATA COMPUTER SERVICES, Inc., 2618 Penn Circle, Sheboygan WI 53081; phone 414-452-4172

Mfrg, sales, service, 8-bit machine support & parts publishes H-SCOOP Heath/Zenith user's newsletter, operates 24-hour H/Z user's BBS

SIGMASOFT & SYSTEMS, 17000 Dallas Parkway #207, Dallas, TX 75248; phone 214-380-6187

hardware/peripherals mfrg, software publisher, hardware & technical support, RAM drives, hi-res graphics add-ons for H/Z89s, '90s

TMSI/LEE HART, 323 West 19th Street, Holland, MI 49423
"Inovative Products for the H/Z89"

SEBHC JOURNAL

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Our Software Catalogue Page

Discontinued ("Vintage") H/Z Eight-bit CP/M software in Original Factory-Sealed Packages. Warranties WILL BE HONORED by Heath. All "Demo" software runs EXACTLY AS WARRANTIED PACKAGES DO, but updates aren't available (usually won't matter). Continuing Education (EC) packages are complete w/lectures on cassette & final (college-acceptable credits) examination.

Item	H/Z cat #	Description	Price
----	-----	-----	-----
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SJ-1	EC-1101	Programming in FORTRAN	* 39.95
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SJ-3	173-66-1	Programming in COBOL	* 29.95
SJ-4	173-58-1	COBOL-80 v4.0 Demo w/documents	* 19.95
SJ-5	EC-1110	Programming in Microsoft BASIC	* 29.95
SJ-6	HMS 837-1	CP/M MBASIC-80 softsector (wty)	* 29.95
SJ-7	HMS 817-1	CP/M MBASIC-80, hardsector "	* 29.95
SJ-8	173-56-1	CP/M MBASIC-80, demo w/manual	* 10.95
SJ-12	173-60-1	Softstuff CPS modem pgm (demo)	3.95
SJ-13	173-67-1	"Micropro" SUPERSORT for Wordstar	9.95
SJ-14	173-91-1	M-Pro MAIL MERGE w/warranty	9.95
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SJ-24	173-70-1	DATASTAR (w/warranty)	10.95
SJ-27	SF9110	MYCHESS w/wty, manual -- OUT OF STOCK!	

1 - Prices include shipping inside continental U.S.A. only.
 2 - We WILL NOT accept opened returns.
 3 - All "Demo" software packages work EXACTLY as warrantied versions except manual pages are red over-stamped. (They're easy to read through red cellophane.)

4 - Some CP/M programs may not work on non-Heath machines, but usually can be patched with DDT (or equal) to run ok.

5 - If requested we'll convert between hard- and soft-sector formats, between H/Z 5.25" and 8" formats (KAYPRO ss, sd 5.25" discs on special order) at \$5 each 5.25" target disc. Original distribution disc(s) will be included with converted discs. (Caveat: Some Heath Terminal escape codes aren't Kaypro 8-bit-machine compatible.)

Contact Gus Bakalis at D:KUG.DOC, 313-755-2060, or L Geisler at SEBHC JOURNAL, 313-662-0750 if you need more information. Note: Profits from any software sales made thru D:KUG.DOC go toward D:KUG.DOC's operating expenses.

NOTE: "*" means 10% off both packages- if ordered as a pair w/matching course--example: MBASIC & Programming in MBASIC, COBOL & Programming in COBOL, etc.

(Most CP/M-80 software runs on Z100 under CP/M-85!)

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- 1 - Pay ONLY by US Dollar Cheques or Money Orders.
- 2 - Allow about four weeks for single back-issues.
- 3 - Allow 5-30 days for discs, software & bound volumes.
- 4 - Use order blank on opposite page; list catalog number price and quantity of each item and mail with payment.
- 5 - Include latest issue's mailing label with your order.

NOTE: Unless otherwise indicated, postage, "handling" and shipping is included in all above-listed prices.

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

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