

Saving Our CLASSIC Heath 8-Bit Machines!

SEHC JOURNAL

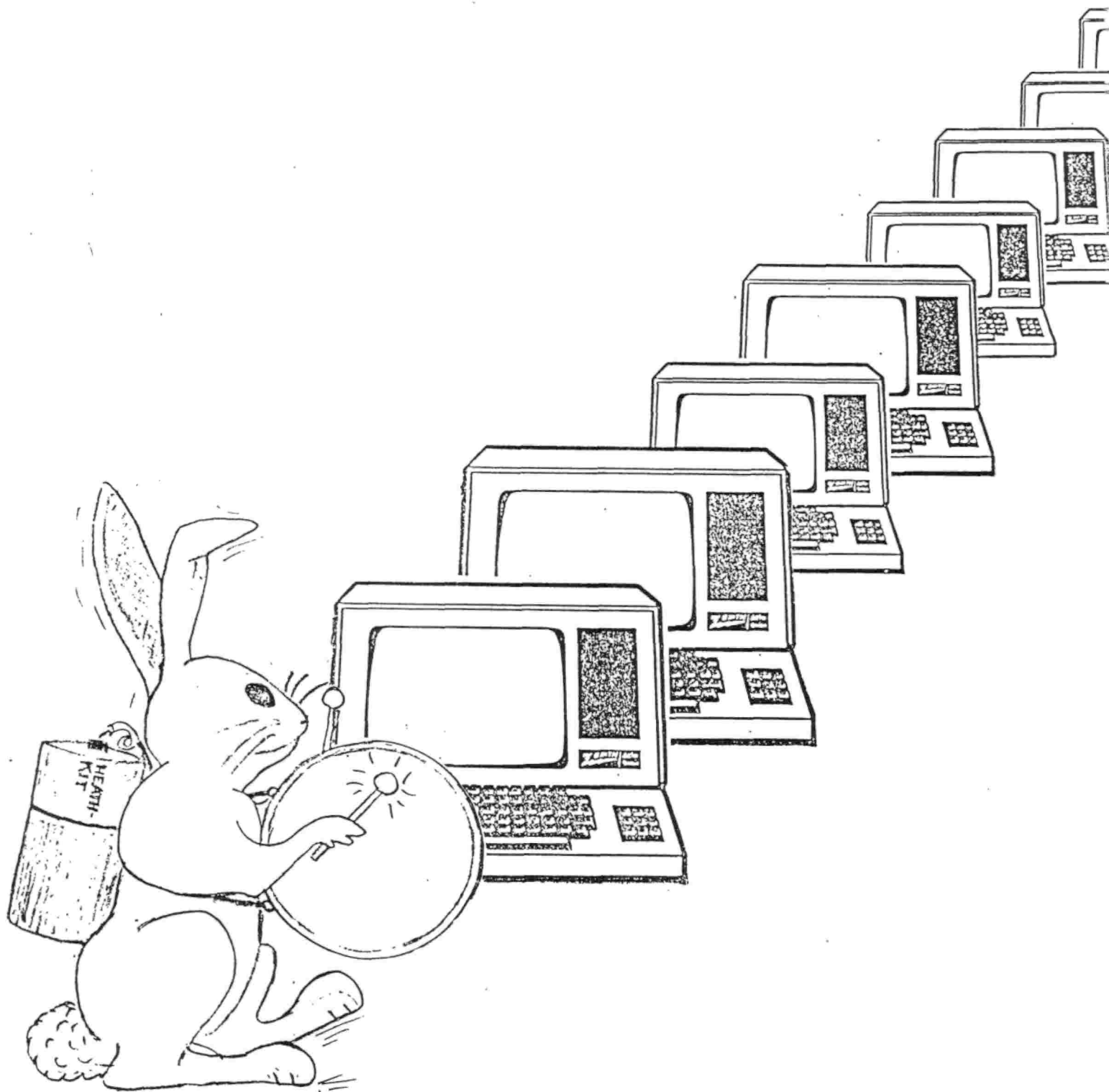
The Society of Eight Bit Heath Computerists' Monthly Newsletter

Volume IV, Number 12

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July, 1990

**We Can Take A Lickin' &
We're Still Kickin'... & Kickin'... & Kickin'....**



The READER'S MAILBOX

Dear Len,

Is there another school teacher in the US (and maybe the world) using hard-sectored 289s in computer class? I have three units in one school: an H89 single-drive, a 289 single-drive (my first computer!) and a 290 dual-drive. We use TXTPRO for grades two through eight and SUPERCALC for grades seven and eight. These antiques [sic] share space with Commodore 64s, Apple][s, Radio Shacks and ibm XTs.

I am looking to expand my [stable of] 289s into another school, which has a mixed complement of Apples, Commodores and ibms. So my next question is: where can I get three or four H/289s?

Here's the interesting part: This August I shall be traveling from Boston to Moline, Illinois for a meeting of EDSEL [afficianados]! My 1959 Edsel sedan has a huge trunk and a wide back seat, so it could swallow several computers and avoid the problems of shipping heavy computers cross-country.

Here's what I need:

- 3 to 4 [standard] H/289s w/64k RAM & internal hard-sector drive
- 4 to 5 serial RS232C printer cables

Could you see what you have and send me a price quote? I have also written similar letters to Henry Fale, Lee Hart and Kirk Thompson to see how many 289s we can scrounge up.

My current plan is to be in Michigan, Wednesday evening--August first--through Thursday morning, August 2d. I'll come back through late Sunday, August 5th, if my Edsel is cooperative. Let me know if either of these times would be convenient. [No problem! And there's a spare bedroom to crash in if necessary! -- ed]

Here are some thoughts on the issue of putting CP/M into the Public Domain:

I haven't seen so much legal baloney flying around since lawyers prevailed over a decade ago on software publishers to put those intimidating legal notices on software which effectively say: You-Don't-Own-Anything-We-Don't-Promise-You-Anything-And-If-You-Think-Otherwise-Have-We-Got-A-Gulag-For-You!

The real question is: "How do we get these *GE#DD&#EN* lawyers to crawl back under their rocks and never be heard from again? (At least on 8-bit software, that is!)

Let's review what we have:

1. Traditional up-front licenseware (typical commercial software)
2. Shareware (use first, pay later & get updates, manuals, help)
3. Freeware (pay nothing, get NO updates, manuals or help)to which I'd like to add this category:
4. SamaritanWare (that is, help without obligation, but you can say thanks if you want.)

This last means that the original manufacturer--still the "owner"--of 8-bit programs could put them into the public domain, provided that there was no obligation or liability attached to any use of the software. Users appreciative of this effort could send a contribution of any dollar amount to the original manufacturer or a designated charity.

Any disc or program so released to the public domain would [perforce] be required to include a READ.ME text file describing the conditions of release and the address for any contributions. There would be no obligation to provide updates, manuals, or technical assistance. [Sounds fine to me! -- ed]

Discs could be released to the various 8-bit enthusiast's groups and distributed by them. [Us being one such! -- ed] We would [then] have a situation where there could be three types of discs in circulation: 1- Original purchased software would still technically be owned by the issuing company and licensed to the user. 2- The usual "pirated" copies. 3- User-owned SamaritanWare. Software manufacturers would be covered legally, would maintain good relations with user groups, and would reap the benefits of [charitable] contributions at minimal investment. This sounds like a win-win situation for everyone. (I know the Good Samaritan analogy is not perfect--the Biblical case involved an open-ended offer of help and no request for contributions, but....)

STEPHEN H KAISER, 191 Hamilton Street, Cambridge, MA 02139; 617-491-8277

[Yo, Steve! We have enough "spare" H/289/90s that you won't have to go anywhere else. At roughly 42 pounds each, that's enough to make your Edsel tail-heavy! When I discussed your letter with you on the phone you said that you preferred all units to be fitted with standard-height, single-sided 40-trk drives. I understand this means all computers would appear similar to your young operators, but wouldn't a pair of half height, double-sided internal drives be just as effective? More file storage space, less disc swapping with less disc damage is an obvious result (and it's easy to modify your CP/M bios to handle high-capacity double-sided drives--I'll show you how! But I'm with you on that SamaritanWare concept! Wonder why some smarmy P-R man hasn't come up with such a potentially hot idea before you did?! Just think of the paperwork it'd eliminate--not to mention high-priced lawyer's jobs! Of course, corporate manager "brass hats" probably will see this idea as a kind of bleeding-heart turf invasion. Maybe even equate it with GreenPeace, Save The Dolphins-type movements, or a Nader-type Pro Bono Publicus effort intended to put all software vendors and publishers out of business. Oh! You didn't mention the tremendous good will on the part of 8-bit and other "obsolete" machine owners toward said vendors adopting your suggestion. There's other potential there also. If a programmer knows his work eventually will get into the public domain, he may try to write better programs with tighter--less memory-hungry--code. He should realise that can ensure him a respected place in computer history--unless he's a complete blockhead (the type who writes grab-all-available-memory stuff *EXCLUSIVELY* for peesees). Readers, it's your turn to fill us in on your thoughts about this nifty proposal Real Soon Now! -- ed]

MORE READER'S MAILBOX

Dear Len Geisler,

A note from Heath User's Group indicated that you may have information about hardware and software available for Heath/Zenith 89 computers. I wish to read or write (or both) PROMs for robot control. Heath did have one years ago, but my foresight was not as good as my hindsight. [My forgettery is better than my memory; you're not alone! -- ed]

I have enclosed a SASE [Self-Addressed Stamped Envelope].

CHARLES W WILSON, W 3819 Weile Avenue, Spokane, WA 99208

[Hey, Charlie! Thanks for sending the SASE. Too few people do that these days, so we appreciate it. Unfortunately I've not gotten into making Programmable Read-Only Memory chips so I can't help you directly with that problem. Many of our subscribers are well into that sphere of computerdom. So those of you who "know all about PROMs" please do contact Charlie as soon as you read this. I'm sure that he shall be most grateful for all the expert help he receives! -- ed]

Dear Lenny,

How's the weather up in Michigan these days? Down here in South West Arkansas it has gone from one extreme to another! It is now dryer than a [gun] powder house.

I hope you caught William Adney's "Powering Up" article in the July ['90] issue of REMark on connecting a modem to your [H120] computer. [I did, but shall have to re-read it again; this time with all my hardware handy! -- ed]

Speaking of computers.... Recently I ran into some computer stuff at a giveaway price and there was a copy of CP/M-85 BASIC-80 (p/n MS-253-1) in the stuff. If you still need a copy, let me know and I'll send it to you post-haste. [It] has warranty and all paperwork. Just drop me a card....

ALLIE LINGO, Dierks, AR 71823

[Right on Allie! And thanks for thinking of me and that copy of BASIC-80 for CP/M-85. Unfortunately, someone else beat you to the punch and sent me an intact distribution copy of the same BASIC and asked me to send back a copy of HDOS MBASIC V4.82 in exchange. Somehow my extra MBASIC V4.82 manual got lost, so I couldn't send him a genuine copy with the original distribution disc, hence I'm busy "Canon-izing" (our copier is a Canon, so we don't Xerox anything) my manual for him.... But I'm sure someone who needs BASIC-80 for CP/M-85 will read this and get in touch with you Real Soon Now. About our weather: There's an old Michiganian's saying, "If you don't care for our weather, just wait fifteen minutes" which fits what we've been having for the past six weeks. Blistering heat, interspersed with chilly, windy rain and very occasional sunshine, followed by intense sunshine and hot, dry air. Not always within the same twenty-four-hour time block. Conditions sometimes change so quickly that our basement dehumidifier can't keep up and its' evaporator coil encases itself in ice three inches deep! -- ed]

[This letter--printed in our June edition--bears repeating, since it deals with HDOS 3.0! -- ed]:

Hi, Lenny,

I have an '89 with 64k using the piggy-back method for the last 16k [of memory]. I have HDOS 2.0 and 3.0, but I am using HDOS 2.0 most of the time as I have it working at 4 Mc/s [clock rate], and 2 Mc/s for HDOS 3.0. I wonder if there is anyone out there who has figured out how to make HDOS 3.0 run at 4 Mc/s. I have two half-height 40trk disc drives in my machine and use hard-sectored discs.

I'm a licensed radio amateur (since 1940) but so far have not used my computer for ham radio. I think the main reason is that I don't have any room for any more equipment.

WES TOWSLEY, 23816 S E 276, Maple Valley, WA 90038

[We do hope that one of our HDOS 3.0x users gets back to Wes As Soon As Possible! He sounds like our kind of people and Really Needs Help. (I'd like to know how to patch HDOS 3.0x to run at 4 Mc/s too!) -- ed]

Lennie,

Gary Melander wrote offering advice on a problem. Whew! This paper gets [out] all over the world! Unfortunately, a video problem has popped up on two of our '89s, and solving this problem has occupied a great deal of time!

I wonder how many different sets of schematics and video boards were delivered by Heath. I have three different boards and two different schematics!

MARION R DAVIDSON, WABMFL, 30 Mill Road, Battle Creek, MI 49017

[Hey there Marion old man! Your November, '88 and January, '90 copies "are in the mail"! You should have received our June, '90 edition by now; if not, give us a call on the land line. Our service data shows three different versions of the '89 video board. One had no RF filters in the lines going to the CRT, the next version had them inserted in capsules in the conductors going to the CRT socket, and the last version had an auxilliary board perched on the heat sink across the video board's rear edge. This one also has a brightness control mounted on the rear panel. A very intermediate versions also had a rear-panel brightness control--appeared as if it were a flanged-up afterthought. Usually earlier '89s--those without an in-line A-C RF filter--didn't have the piggy-back addition, but a few had the rear-panel brightness control. And these early models also had video synch lines coming down to a different connector on the video board. Later models ran synch through those big power connectors on the left-hand side of the CPU card. But the basic circuitry is essentially the same for all of them. If you need to look at our service manuals and schematics, c'mon over! We'll photo-copy Any Stuff That You Really Need. (Do phone first to make sure I'll be here.) -- ed]

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More READER'S MAILBOX

Dear Len,

While attending a local computer show I had the urge to purchase a dot-matrix printer. Got to thinking that I'll need a driver for this printer with CP/M (perhaps also w/HDOS 3.0) used on my Z90.

Wonder if any SEBHC JOURNAL readers have had a similar need and how they solved the problem. There must be both commercial and public domain printer drivers available, but are there any for some of the newer 24-pin Near Letter Quality (NLQ) type printers? I've considered Epson LQ-510, LQ-1050, Panasonic KX-81124, Okidata, N.E.C., Star, and even considered an HP Laserjet type.

I would enjoy corresponding with anyone who may be running similar systems, with either parallel or serial interface. If interested, please contact me at my address I've given at the end of this letter.

I had occasion in the past year or so to pick up a parallel interface kit from FBE Research. But until now I've not needed to use it. Anyone looking to buy or swap an Anderson-Jackson AJ-832 daisy-wheel serial Qume Head printer with wide carriage and tractor? It's nice, but too big for my new residence. (I'm sending a copy of this letter to Kirk Thompson--The Staunch 8/89er--to cover the bases....)

In closing: Len, I enjoy your issues with all the latest scoop on 8-bit H/Z machines. We are lucky to have so much talent on your editorial staff--[they're doing a] great job! Thanks! Also, I see that Lee Hart (TMSI) has become your new neighbor (so to speak) just down the road in Holland, MI (Tulip Country, ha).

ALBERT F BJORLING, P O Box 216, Circleville, NY 10919; phone 914-361-1672

[Well, Al, Holland is way over on the other side of Michigan, opposite to us. Lee once ran his operation right here in Ann Arbor; then he was about twelve minutes on foot from our location. He next moved some 3-1/2 hours drive away to Dowagiac, MI, near Benton Harbor (look it up in your atlas). Now he's moved to Holland, MI, a goodly 4-hour drive! You might say that he's a former neighbor, twice removed! Now about your 24-pin printer question: We're sure all the various parallel & serial interface printer you listed will work just fine with your 8-bit machine with either interface as long as they are "Epson compatible". We use two different ones here; an Epson LQ-800, and a Nippon Electric Company (NEC) Model P2200. They both run just fine under CP/M-80 on both my 8-bit machines ('89 & H8) and equally well under both CP/M-85 and MS-DOS 3.2 on the H120 *WITHOUT* any special drivers! They also perform flawlessly under HDOS 2.0 and Lindley Systems' MXV44.DVD on both my own 8-bit machines and any other H/Z89/90. This driver I acquired while still using my Graftrax-equipped MX-80 9-pin printer. I think the Lindley boys are still selling this driver, and Just As Soon As I Get Time, I'll be trying it out on my H8 with HDOS 3.01. (No HDOS 3.0 version will run on Heather, my '89 equipped with a

D-G Electronics Super89 CPU board unless I buy a different monitor ROM for it). I'm fairly sure Hachibanko (the H8), HDOS 3.0x, and MXV44.DVD will all get along together just famously. Do call Lindley Systems; their address and phone number is: 4257 Berwick Place, Woodbridge, VA 22192; 703-590-8890. And be sure you mention the SEBHC JOURNAL! -- ed]

Hi Len,

I've a few comments regarding Marion Davidson's letter in the May JOURNAL.

CP/M 2.2.04 does support the H89-11 Serial/Parallel board and does default to that mode "out of the box". But it's a very simple matter to run CONFIGUR and make CP/M 2.2.04 support the older (and more popular) HA-88-3 three-port serial I/O board. That choice is made first by selecting 'N' (no) to the question, "Standard System (Y or N)?". Then select 'A' "Set Terminal and Printer Characteristics". Finally, option 'P' will toggle support of the H89-11; each time you press 'P' the selection alternates between 'SERIAL' and 'PARALLEL'. 'SERIAL' means CP/M's supporting the HA-88-3 serial I/O card, and 'PARALLEL' means it's supporting the H89-11 combination 2-port serial, 1-port parallel I/O card. [Editor's note: You CANNOT run with both cards mounted!]

To Laszlo Vesei's letter let me add that even if all the jumpers are set properly, in order for an H89 to run both hard and soft sector drives, the operating system [and boot ROM] MUST support both drive systems. Under CP/M, this means that you must run MAKEBIOS and create a new BIOS.SYS which supports both drive interface cards. With HDOS you need both disc device drivers, that is, SY.DVD for hard-sector, and DK-.DVD for soft-sector. (Ho boy! I never did do much with HDOS! I hope I'm close.) [You did just fine, Rick! -- ed] And, as you pointed out, the boot ROM must be an MTR-90 (Heath part number 444-94 old style, or 444-142 new style). The decoder ROM at U550 must be a Heath type 444-61, and the secondary decoder ROM at U516 must be a Heath type 444-83. Also be sure to check the settings of CPU board switch SW501 which should have only 5 ON, and all others off unless you've installed an H47 (Remex 8-inch drive) setup, then 4 must be on too. [See Figure 1 overpage (copied from a Heathkit H89 manual) which illustrates SW501 settings.]

=> RICK'S MUSINGS <=

I noticed a few very interesting things happening lately. I have both an AT and an XT clone at home. I also have a Toshiba 1200HB laptop (occasionally borrowed from the office). I've become the resident laptop expert where I work, supporting five laptop users, and three IBM AT users.

Because I brought myself up through the earlier days when CP/M and HDOS were king [sic], the details of MS-DOS don't bother me. If I need a mouse, I add a mouse driver. If I need disc caching, I add a disc cache driver. If I need a printer, I add the necessary hardware and then configure the word processor to support the printer. If something still

More READER'S MAILBOX

isn't right, I edit the printer driver and experiment with different escape codes. You [should] get the point....

The interesting thing is that more and more people are expected [by top management] to 'become productive' by [a boss simply] handing them a computer, when it [actually] is sometimes as difficult today as it was yesteryear to just get a system running! For example: The local computer marketing company [recently] installed a laser printer in our office. Now the word processor is messing up document formats. The sales representative makes changes to install the new printer driver in the word processor. It appears that he made the correct choices, but the page breaks are not happening at the printer, even though they appear properly on-screen.

The rep says there's a problem with the printer and that it's not processing the form-feed character. I promptly say, "Send a form-feed from somewhere other than the word processor". He says, "It can't be done!"

I pull up BASIC and type 'LPRINT CHR\$(12)' and the printer ejects a sheet! He leaves with the problem unresolved.

Later I discovered the problem's cause: The old printer had two paper cassettes; the new one only one. The word processor was configured to send the first sheet from cassette #1, the next sheets from cassette #2. This was confusing the laser printer. I just changed everything to cassette #1, and all was right with the world.

My associate installed the latest software enhancements on his laptop. The newest feature permitted capturing a screen to a disc file while he was connected via modem to the mainframe computer. Later, he disconnected from the modem and tried to use DOS to 'TYPE' that disc file which consisted entirely of screen-saves. The file wouldn't 'TYPE'! Nobody told him the file was saved in the modem sub-directory. He doesn't know what a sub-directory is, let alone how to get to it....

People tell me that the MacIntosh doesn't have these problems. This is apparently due to the Mac's closed architecture. It only supports a few printers, and these are very popular BECAUSE THEY ARE SUPPORTED BY THE MAC. Also, the user interface is supposed to be very simple, and standard between all applications. You "point and shoot" and are supposed to get what you want. (All this you get for a mere \$8,000, to start!)

Sure, I'm exaggerating about the Mac, but the point is, unless you want to spend a lot of money to get something that someone else has figured out for you in advance, you can spend less and figure it out for yourself. MS-DOS users have had many of the same problems we [8-bit users] have already figured out. [On the other hand] Mac users don't know, don't have to know, and don't care that they're broke!

It's funny. I ran across a shareware program called 4DOS. It's a replacement for DOS's COMMAND.COM (the command processor). "4DOS" is to MS-DOS what ZCPE3 is to CP/M. It is a completely re-written command processor which incorporates almost all of ZCPE3's features: multiple commands on a command line, command history storage/recall/editing, aliases,

memory-resident batch file processing, flow control, on-line help, plus major enhancements to built-in standard DOS commands. It even uses less memory by swapping part of its' code to either extended or expanded memory, or to a disc file. And all this comes after people are abandoning MS-DOS and looking towards their "new salvation", OS-2!

Got to thinking about the recent exchange of letters between Bob Evans and me about his H89 problems. I realised how much gratification I've received from helping him, and then realised that there was very little difference between helping him and helping a DOS user at work. The problems were only slightly different, but the mission was the same. And how many 8-bit machines are still out there, turning in a full day's work? The only problem is finding a [good] consultant when you need one. [But] you can always turn to the SEBHC JOURNAL for help!

RICK SWENTON, 106 Melinda Lane, Bristol, CT 06010-7176

[Never stop springing delightfully-informative surprises on us, do you Rick! In connexion with the H89 switch settings, you've put your point across VERY well. And your psychodynamic review of "other computer" users certainly drives a whole lot of nails home! It's a fact that many 16-bit machines are said (by non-technical sales people) to run several times faster than the speed of light. They do run fast, but our steam-powered 8-bit machines and the non-memory-clogging software we run on them do pretty good too, and for far less money! Our D-G Super89 CPU and the H89A it runs in cost less than \$1000 when we bought it xx years ago. We use a very nice TEXT PROCESSOR (\$39.95) for writing "non-document" text files, run them through COLUMNS.COM (\$29.95) and put them into 2-column page-printing files. If we want to do any Real Fancy Fonts, we use Skycastle Computer's CALLIGRAPHY-II (\$69 for starter w/4 fonts, \$19.95 for extra fonts) Graphic Text Formatter package to make up page headers, etc.. Note that the last package is intended for use with 9-pin dot matrix printers, but it works just fine on our 24-pin printers (at an average price of \$399 each). Our entire desk-top-publishing equipment and software setup comes to less than one quarter the price of a Mac or Apple with a laser printer. And--in our opinion--it does as nice a job as the fruity machines do. The only limitations are the user's ingenuity and his pronounced reluctance to go heavily into debt for fashion's sake! (Never have wanted, owned, or worn a swishy tuxedo in my life!) That 4DOS package sounds very interesting. Wonder if it'll run on our H120 (w/ZPC)? We're sure that most--if not all--our 8-bit users are delighted to hear about all those very interesting things out there in "computerland" (sure isn't Kansas, is it, Toto?!) Please do keep us informed of your continuing digital adventures! --ed]

Dear Len,

Thanks for re-running our ad for HDOS 3.02 in the June is-

READER'S MAILBOX - CLOSE

sue (IV:11). [No problem; we like HDOS! -- ed] [I noted] you devoted much if that issue to a COBOL listing. Originally developed in the mid-50s, COBOL is an OLD language. Many [users] have been predicting its' demise for at least a decade! But there's no sign of that happening, and I wouldn't be surprised if it survived well into the next century.

As far as I can tell, COBOL's the standard language on IBM mainframes. So, anyone interested in mainframe programming must learn COBOL. Some "shops" which use COBOL on their mainframes also require its' use on peesees [located] on the same premises, so programmers using the language could find themselves writing [similar] software for radically different environments.

KIRK THOMPSON, Editor, The Staunch 8/89er, PO Box 548, West Branch, IA 52358

[Ye Kirk! Sent your COBOL Programming Course and software order out yesterday. Hope that it will do everything you are looking for. And you're correct in saying COBOL is still the language of choice on many "other" mainframes. I've briefly looked into and sampled both the Course and Demo packages enough to realise that my life expectancy of 30-odd years is not enough time for me to learn how to use COBOL in addition to all my other "chores". So I'll leave that to you! Frankly, I prefer plain-vanilla MBASIC for which I completed its' "programming-in" course several years ago with very little strain/pain. (Someday I may even master BASCOM!) And I hope you are getting some sales from your JOURNAL ad! -- ed]

Dear Len,

Thank you for your help in sorting out some of my computer start-up problems and getting me a very workable word processing programme (TXTPRO). I'm especially grateful that you continued sending [us] the SEBHC JOURNAL. But, after assessing my current needs on the church's H89, I've decided to not subscribe now. [S-ok, Rev., consider the JOURNAL a donation! -- ed]

I'm having a lot of fun with this (affectionately called) "dinosaur". It's great being able to type and correct any problems before they get [put] on paper (even though they still sneak past me). We have a SuperCalc program for doing the church financial statement, and that has certainly been interesting, getting it set up. And it is fun to see what these old machines can do; yet not knowing what a new one can do. This one also had an aggravating malfunction which I was actually able to fix--by pulling out the CPU board and cleaning it up and pressing down on all the chip connections.

It took forever to get the Olympia daisy-wheel printer to work with the H89. It's just what I want in letter quality (the bulk of my computer needs), but it's not a whole lot faster than a quick typist. I guess my point is, I can see what 8-bit users' fascination is about.

I did appreciate your help and sending the Journals. I'll probably be getting a hold of you when I see our needs expanding for this H89. The [Journal] reading is still interesting, yet the expense [of a subscription] is a bit difficult for me now. I still feel indebted by your help. So I thank God for you.

ALLEN GAUTHIER, Minister, Battle Mountain Church of Christ, 477 S Reese Street, Battle Mountain, NV 89200; phone 702-635-5466. Home address is 816 E Wilson 38-1, Battle Mountain, NV 89820; 702-635-9097

[Allen, I'm one of those sceptics who may pray: "Dear God (if there is a God), hear my prayer (if you feel like it)". But I am pleased that we could help your machine become a useful tool for you and your Church. And don't worry about paying for a subscription--you need the SEBHC JOURNAL for all that good "how-2" stuff in it. It might be worth while to let some of your brighter parishioners browse through back issues --maybe someone might be interested in sharing your enthusiasm. It's always pragmatic to have someone capable around who can take over computer operation should you accidentally fall off your horse or suffer something else equally debilitating! At the risk of sounding "pessimistically preachy", we've had two instances of ladies who've seen their H89-expert husbands die catastrophically. And there these unfortunate people sat, unable to run the machines--which contained all their business data and software. Let me tell you, it took a lot of time and effort to get them into mainstream computing! And I'm still not sure that they feel confident enough to write any programs. Having a real live computer-savvy sidekick around it almost better than having a well-prepared last will and testament tucked away in your personal papers! -- ed]

Dear Len,

Thanks for sending me those SEBHC JOURNAL back issues which the P.O. returned to you [stamped "addressee unknown"]. Let me know if I owe you any postage due or forwarding charges. My current and, I hope, permanent address is below. And it was a pleasure to receive so much good material at one time!

BEN VIOLETTE, 1637 N College, South Bend, IN 46628

[Yo, Ben! We were really getting a hard time from the Indiana postal folks because we didn't have your latest--correct--address. Had to phone the South Bend Postmaster in order to get the correct address from him! But we're happy that you're now back in scynch with our late-as-usual monthly editions. And we hope this mixup didn't cause any problems for you with other publications! Don't worry about the postage-due charges, they were not very much (besides, our postal carrier "needed the exercise"). -- ed]

Our "ASK RICK" Column

Conducted by Rick Swenton,
Associate Editor--North East

Hi Rick,

Got back from a week in Oregon the other day and have been busy with the computer doing word processing. I have a camper club newsletter to get out, also have been asked to do a new membership roster for them. So [I] have been pecking away at those. I'm going to use "Bradford" to print out the roster--it's starting to look pretty good.

Other problems: Before I left on the trip I had decided to switch my disc drives around a bit--those on the 2nd computer which I'd written to you about (and you to me). Now I've taken the H88 board out (rightmost slot) and put the resistor in its' place. I'm trying to use the H17-1 as a single-sided soft-sector drive connected to P3 on the Z89-37 [board]. I have my two double-sided 5.25" drives connected to the external P4 outlet [on the 89-37 board]. I've configured the drives thus: H17 inboard drive as "zero", outboard 48tpi drive as "one", and 96tpi outboard drive as "two". This seems to me as if it's ok, as, after scanning the Z89-37 schematic that it is all in parallel, except the 4 [lines] coming from U13 (p/n 443-799), of which the outputs are IOa to P3, IOb to P4, and so forth. (On the CDR machine I have had three 8" drives paralleled--they work fine as long as the configuration is correct.)

BUT this [above described] setup DOES NOT work fine! It works, but not like it seems to me that it should. Maybe you could say that "what I have here is a failure to communicate"! Here is the way it [now] works: If I boot drive "zero" it comes up as "A:" as it should; drive "one" comes up as "B:"; drive "two" doesn't come up at all from either of the other drives, using any designation--C:, D:, E:, etc..

If I boot drive "one" it comes up as "A:" as it should (no light on drive "two"), and neither of the other two drives will activate at all. [Now] if I boot on drive "two" (80trk) it comes up as "A:", then "zero" comes up as "B:", and "one" comes up as "C:", and they all interact back and forth--that is, I can go from one to the other, no problem. BUT THAT AIN'T WHAT I WANTED, DURN IT!

I'm getting so confused I don't know anymore what I want from the thing, I think. I've just about exhausted the possibilities for re-connecting the programming switches and re-arranging drives from one place to another. I have to keep the H77 at the internal spot, due to shielding and heat problems as you know. I'm evidently missing something--probably something the good ole Heath manual forgot to mention. As far as I can decipher it, I've followed it to the letter, except for adding a drive mixture, which "we know will not work", isn't that so?! HA--I do have terminating resistors in both the "zero" and "two" drives as required.

Well, what I really wanted [originally] was to have drives "zero" and "one" in the external cabinet, and drive "two" internal. It just won't work for me, even though the Z89-37 manual shows that type arrangement. Mull this one over a

while, as there has to be an explanation.

I'm using ZDE13, renamed as Z3 to do a lot of my writing now. It lends itself better to a few things I do, and especially to using "Bradford". I am using it now [to write this]. I did get WS 3.3 installed and have used it a little. [But] I have to get rid of a half-hour of logo before it is in the shape I have my old V3.0 in. Get out the DDT! In one of my letters I indicated that ZDE seemed complicated. Well, familiarity breeds contempt, or at least knowing a bit about what you are talking! I'm getting to like it.

I'm planning to put a hard drive on the "Pete" machine if I can get enough parts gathered up. I got the MMS interface and software from Henry Fale [of Quikdata, Inc] and am supposed to have an Xebec controller coming from another source, one day. Have a good summer....

BOB EVANS, K6MAC, Hemet, CA

Hi, Bob,

In order to get the drive setup you desire, you need to make sure that jumper J6 on the '89-37 soft-sector controller board is in place, AND that the single-sided internal drive is also jumpered with a short at DS3 (Unit 2) and at HS.

The purpose of the four '89-37 jumpers--J4 through J7 (internal select)--is to tell the board which units will be connected to the internal P3 connector. It is automatically assumed that the rest of the drive units will be connected to the external P4 connector. The internal drive's select jumper [as I noted above] must match the internal select jumper on the '89-37 board.

So I believe that, if you have J6 in place on the ['89-37] board, and DS3 and HS [jumpers] in place on the internal drive, it should respond as Unit 2, the third drive in your chain of three.

Glad to hear that you are making progress. It seems that every time we "talk" you have conquered another obstacle. Good luck!

/s/RICK

[Rick, I've noticed an interesting text mixup in the caption for one of my manuals with Heath's drive designation figures in it. This particular figure is of three different drive-select plugs programmed in reverse as required for HARD sector use. But the caption says that's how one should set up the programming plugs for SOFT sector use!! All other illustrations in that manual are perfectly normal. Maybe Bob has another mixed-up manual? In connexion with Bob's travel-group newsletter, a "local" subscriber with a 3-soft-sector drive H89 setup like Bob's puts out a small monthly newsletter for her "downline associates". Uses TXTPRO, an Epson MX-80 and "clip art" to create originals which a "fast copy" shop then runs off for her (see also Kaiser's letter on pg2); Our Classic Eight Bit Machines Shall Live 4-Ever! -- ed]

SEBHC JOURNAL

Volume IV, Number 12, Page 8

ODD BITS (NO PARITY CHECK)

by A. Stapher
Editorial Assistant

We received a letter recently from zip-code area 92306 in which a subscriber asked us to not send any more "gratis" editions of the JOURNAL, saying, "You put out a very good publication and I am sure that it serves a very great need for most of your subscribers, but it has gotten beyond my knowledge and needs. Good luck with your efforts." Hmmp!!! Well, it's his loss, not ours; we just got three renewals and a new subscriber during the last week or so....

Then there are those long-standing subscribers who suddenly move to a new address and "forget" to notify either the PO or us (or both) for some reason. After the first three or so did this we finally have decided to just put their names in the "deleted" file and not send any more JOURNALS until they either let us know where they are, or are never heard from again. In the latter cases, it's OUR profit and THEIR loss!

Remember, if you're moving and want continuing delivery of the SEBHC JOURNAL you MUST notify us--and the Post Office--of your new address, else we'll just drop you from our subscriber database. 'Nuff said?

Recently the Post Office delivered--in a plastic baggie--a renewal cheque in the mail in highly distressed form, that is, one corner of the badly crumpled envelope appeared as if a small animal had gnawed it off! And a small portion of the cheque had also been removed by the same entity. This is the first time that we're aware of that this has happened to a cheque--although it has happened in the past to random SEBHC JOURNALS before we started plastic-bagging them.

So, children, remember to wrap a piece of paper (blank or written on) around the next cheque you send us. That way those mean old Post Office sorting machines will have an envelope fat enough that it shouldn't slip through their clumsy mechanical fingers!

Tom Rittenhouse suddenly decided that he needed to seek greener pastures elsewhere than in Ann Arbor, so we've lost him. While associated with the JOURNAL Tom helped around the computer shack tremendously. We already miss him. Good luck Tom, wherever you are....

A former A*SQR*HUG member--Ian Scott--has come on board the SEBHC JOURNAL in the capacity of highly-skilled "solder slinger". With his help we've been able to fix up subscriber OSCAR YOHAI (of variously Cape Cod, MA, and Bonita Springs, FL) with a virtually-new H89A to replace an H89 Lenny had originally sold to him last year. This machine is actually an H90A whose soft-sector controller card is replaced with a standard hard-sector card. Works really peachy-keen with a pair of half-height drives replacing the original full-

height, single-sided drive.

Now Oscar, Lenny tells me that you will have the best of both disc format worlds if you install a soft-sector controller in that empty slot. You could then run hard-sector inside as you now do, and soft-sector drives outside, and never again have to worry about searching for hard-sector discs! As Lenny would say: "Do call us Real Soon Now!"

Late breaking news from Micro Computer Repair Services' (MCRS) Mike Morris: "I have nearly seven hundred 5-1/4" disc drives in stock and am without any more space for them! If you want a really great deal and low prices for either full- or half-height drives (40 or 80 track, single or double-sided) give me a call NOW! The office number is 313-995-0040 between 9am and 4pm Eastern Time, Monday through Friday. We accept MC and Visa plastic, but do prefer checks or money orders. We'll prepay shipping on orders totalling \$100 and up."

[Editor's note: Old A. Stapher forgot to mention that we always have Mike work on all our JOURNAL drives and that Mike is very quick & good at repairing them. You should ask Mike to fix your drives whenever they need looking after!]

["Old" A Stapher's note: I did so not "forget"! You snuck in on to the keyboard while I was "out back mowing the crabgrass".]

=====

Please note that the SEBHC JOURNAL "Vintage Software Catalogue" page is doing a land-office business these days! We're completely out of HDOS MBASIC (but WILL fill that one LAST order) and Heath FORTH, we're getting low on PROGRAMMING IN MBASIC and have only one set of PROGRAMMING IN COBOL left. But we still have several sets of CP/M MBASIC (Version 5.2) left, and a Whole Lot of Softstuff's business programmes such as INVENTORY, GENERAL LEDGER, ACCOUNTS (receivable & payable), etc., plus several packages of SuperSort remaining.

There are only six CP/M 2.2.0x3 (H47 8" discs) operating system packages left; after they're gone there "ain't gonna be no more"! As we previously stated, we'll convert the 8" format discs to either hard or soft sector for you at no extra charge. Don't hesitate very long now!

Please do check our Catalogue Page and see if there's anything you want or need. As a Special Inducement, we shall give you a 45% discount on each package when you order three or more different items at the same time! Get together with some of your Komputer Kronies, order a Whole Bunch of Stuff and REALLY SAVE money! And remember: Heath's CP/M software runs virtually 100% on almost ANY 8-bit CP/M machine such as Kaypros, Osbornes, etc.... (You D:KUG users over there in "Motor City", pay attention now! These bargains won't last 4-ever!)

=====

RE-USEABLE SHIPPING CONTAINER

"How-2" Make It For Your H/Z89 or '90! -- by A Stapher

Figure 1 - Re-use-
able Shipping
Container for an
H/Z89 or '90 Com-
puter...

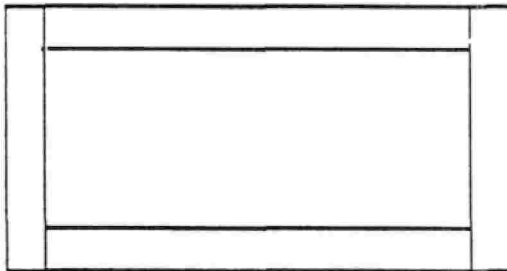
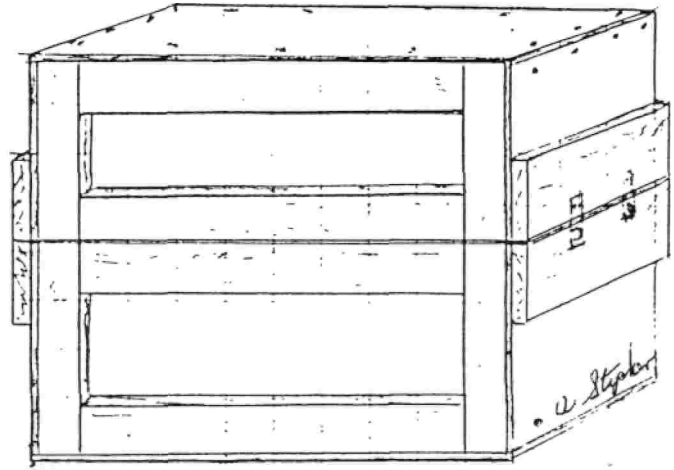


Figure 2 - End panel A,
B, C, and D. See text
for dimensions and con-
struction details...

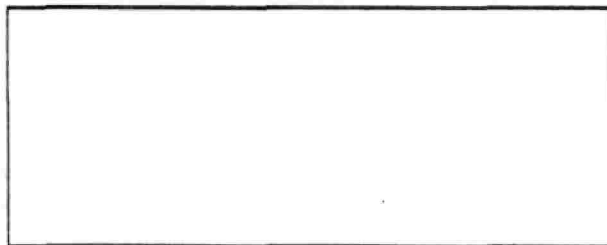


Figure 3 - Side Panel
E, F, G, & H. See
text for dimensions...

BILL OF MATERIALS

Framing material: "Sterling Grade" white pine or equal

NOTE: "3/4 x 1-5/8" is the finished size that lumber yards call "One by Two" material, "3/4 x 3-5/8" is "One by 4", etc.

Description	Finished Dimensions	Qty
Side Rail	3/4" x 3-1/2" x 23-1/4"	4
Top	3/4" x 1-5/8" x 18"	2
Bottom Rail	3/4" x 1-5/8" x 18"	2

End Rail	3/4" x 1-5/8" x 18"	8
End Cleat	3/4" x 1-5/8" x 8-1/8"	8
Panel material: "Crezon" (Kraft-paper-coated) exterior-grade plywood (cut with uncoated side down to avoid damage)		

Description	Finished Dimensions	Qty
End Panel	3/8" x 8-1/8" x 19-1/4"	4
Side Panel	3/8" x 8-1/8" x 24" Crezon	4
Top Panel	3/8" x 20" x 24"	1
Bottom Panel	3/8" x 20" x 24"	1

[Continued on pg 9a]

More H/Z89/'90 SHIPPING CONTAINER

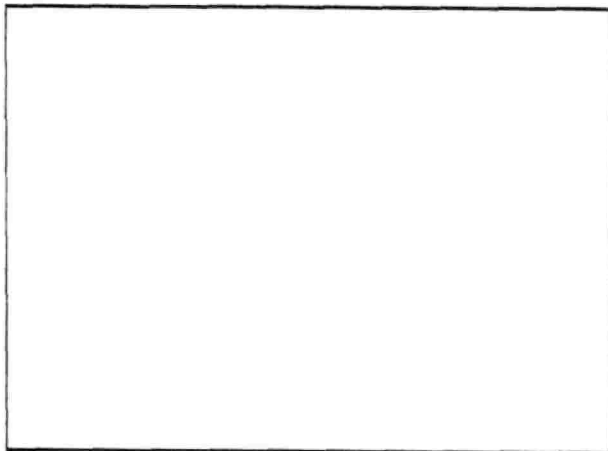


Figure 4 - Top & Bottom panels I and J; dimensions: 3/8"t x 20"w x 24"l...

Tools Required:

- | | |
|--|---|
| <input type="checkbox"/> Carpenter's square | <input type="checkbox"/> #2 Phillips driver |
| <input type="checkbox"/> C clamps | <input type="checkbox"/> scratch awl |
| <input type="checkbox"/> steel tape measure | <input type="checkbox"/> sharp #2 pencil |
| <input type="checkbox"/> sabre or circular power saw | <input type="checkbox"/> small lump of beeswax |
| <input type="checkbox"/> saw guide set or equal | (used to lubricate screws) |
| <input type="checkbox"/> Handyman's utility knife | <input type="checkbox"/> Felt waterproof marker |

Work schedule:

1 - Lay out and cut plywood according to Figures 2, 3, and 4. Use carpenter's square for accurate 90-degree cuts.

2 - Clamp saw guide to work so saw blade -> centers <- on cut mark. This ensures accurate cutting and saw-kerf allowance calculation isn't required.

3 - Measure "one by two" stock and cut longest pieces first, then shorter pieces. Also cut the four "one by four" outside rails. See the carpenter's square as a saw guide in cutting these parts. To ensure cutting accuracy, mark pieces to exact measurements, then center saw blade so it removes pencil mark as in step 2 above. Also mark these pieces so they won't get mixed up.

4 - Clamp one 8-1/8" x 3/4" white-pine piece to short side of panel A, B, C, or D flush with its' edge on FINISHED side, NOT rough side. When clamping, make sure that all white pine pieces are square and flush with plywood edges as in Figure 2 to ensure a nicely-finished container.

5 - Use scratch awl and punch a screw-starting hole in plywood's ROUGH side above the rail's center. Use a 1-inch screw rubbed on beeswax and start it with Phillips driver into plywood. Turn driver until screw head is drawn slightly below plywood surface. Three screws will suffice.

6 - Likewise install the other 8-1/8" x 3/4" piece onto other short side of this panel. Use beeswax sparingly--especially if you intend to also glue rails on or paint the container.

7 - Refer to Figures 1, 2, and 5, and install a 16" x 3/4" rail on each long side of panels.

8 - Assemble remaining three end panels as in steps 4 thru 7.

9 - See Figures 5 and 5a and C-clamp one 24" x 3-5/8" white pine rail to OUTER face of a top or bottom side panel. Fasten with 1-inch drywall screws as above. Three screws, one at the center and the others six inches either side of center will suffice. Repeat with remaining three side panels.

10 - See Figures 5 and 5a and fasten a 20" x 3/4" white pine rail onto INNER face of plywood side panel with 1-inch drywall screws located as in step 9 above. Use C-clamps to hold pieces together while driving screws. These side panels, together with the end panels are the framing for the two top and bottom panels. Repeat with remaining side panels.

11 - Use C-clamps to steady two end pieces, narrow end up, then lay a side panel atop them. Use 2-inch drywall screws two inches in from edges (see Figures 1 and 5) and fasten side panel to both end-panel framing pieces. Be quite sure all screws enter the pine frame, NOT end-panel plywood! Two screws in each end are more than adequate to secure parts. Repeat on opposite side of end pieces. When finished, a top and bottom assembly should stack together as seen in Figure 1 with less than 1/8" overall error.

12 - Fasten a top or bottom panel onto inner rails of side panels. Kneel on this panel to hold it steady after squaring the assembly it is resting on, then secure panel with 2-inch

End H/Z89/90 SHIPPING CONTAINER

Top (Bottom) go on last

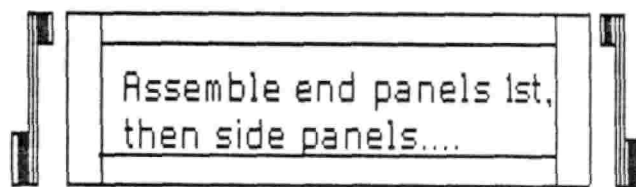


Figure 5 - Assembly sequence reference drawing. Note that the 2 side panels are next assembled to end panels, THEN top is attached....

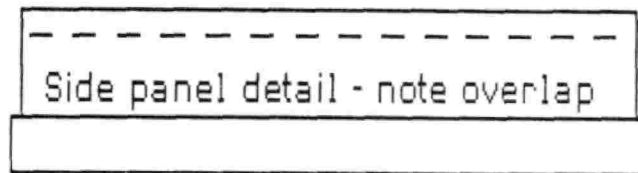


Fig 5a - Fastening side rails to panel BEFORE assembly....

drywall screws driven into the framing members from the FINISHED plywood face. As before, run each screw in until it's slightly below plywood surface. Duplicate this assembly with other large panel.

Final assembly, hinge and hasp installation:

1 - Lay the two half shells beside each other and align them squarely with the 3/4" x 3-5/8" side rails not quite touching.

2 - Lay 2 hinges atop the rails about six inches in from each end. Accurately mark each hinge outline on rails. Use wood chisel to carefully remove wood the thickness of hinge from both rail and plywood (because hinge also lays on it). This will allow box halves to meet properly when swung together.

3 - Lay a hinge into chisled-out area on one rail and fasten it to rail with supplied screws; use beeswax so screws drive easily. DO NOT cock hinge or screws as hinges won't operate correctly, and you'll quite probably will split the rail!

4 - Fasten other half of hinge to other rail. Repeat with remaining hinge and try closing box. It should close without twisting or pinching--if hinges were properly installed.

5 - See Figure 1 and place closed box hinge side down. Install the two locking hasps with their supplied screws. Be sure hasps and tangs line up properly without binding before finally tightening screws. When hasp is closed NO screws will be visible.

6 - Install the 8 trunk corners using supplied wood screws. This ends assembly.

Packing it:

1 - "Press-fit" place styrofoam insulation inside top and bottom halves of box so that it forms a perfect cushion surrounding H/Z89/90 computer. There'll be open space at the back and keyboard ends, so cut a piece of foam board out to clear power switch, fuse holder, and brightness control (if there is one) and press it into place at computer rear.

2 - Wedge extra foam between box sides and end, and computer shell at keyboard end so that computer can't move. Lay some foam board over keyboard, then fill a plastic bag with enough "plastic peanuts"--or equal--to cushion the CRT when box is closed. Make sure bag folds over sufficiently that "peanuts" won't fly all over when box is opened! Note: If you want to put the power cord or other items inside the "peanut bag" be sure that they are sealed in their own bag, then CENTERED in the "peanut bag". Also put in a few extra cable ties if you want your computer returned to you. Press out excess air and tape "peanut" bag shut.

3 - Close one hasp and loop a cable tie at least three times around the hasp staple, then pull it so loops are snug. Cut off excess nylon tie. Similarly secure other hasp. Write on box exterior with waterproof marker: "DELICATE EQUIPMENT -- PLEASE HANDLE GENTLY!" on top, one side and one end. Also mark it "Re-useable shipping container. Please return to shipper." And tape a shipping label on top and at least one end. Labels should have your return address and name and address of consignee. Use wide, clear, waterproof tape over paper labels.

NOTE: This container will weigh roughly thirty pounds; the average single-drive H/Z89/90 weighs about 40 to 43 pounds. An 89 or 90 with two internal half-height drives may weigh slightly more. Note that UPS won't accept more than seventy pounds so you'll have to use motor freight. We recommend Rodeway Motor Freight; they're usually careful, and do try to avoid breaking your computer.

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The JOURNAL'S 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
SJ-XTRA	CP/M-80 for WH47, re-formatted onto either hard or soft sector 5.25" discs (please specify)		29.95
SJ-1	EC-1101	Programming in FORTRAN	* 39.95
SJ-2	173-57-1	MICROSOFT FORTRAN v3.4 (demo)	* 39.95
SJ-3	173-66-1	Programming in COBOL	* 29.95
SJ-4	173-58-1	COBOL-80 v4.0 Demo w/documents	* 29.95
SJ-5	EC-1110	Programming in Microsoft BASIC	* 29.95
SJ-6	HMS 837-1	CP/M MBASIC-80 softsector (wty)	* 39.95
SJ-7	HMS 817-1	CP/M MBASIC-80, hardsector	* 39.95
SJ-8	173-56-1	MBASIC-80 (CP/M) demo w/manual	* 29.95
SJ-12	173-60-1	Softstuff CPS modem pgm (demo)	8.96
SJ-13	173-67-1	"Micropro" SUPERSORT for Wordstar	29.95
SJ-14	173-91-1	M-Pro MAIL MERGE w/warranty	29.95
SJ-15	HDR-837-3	M-Pro DESPOOLER w/warranty	29.95
SJ-16	173-201-1	MICROSTAT database wty, manual	49.95
SJ-19	HRS 817-37-1	Peachtree GENERAL LEDGER	39.95
SJ-20	HRS 837-37-1	Peachtree ACCOUNTS PAYABLE	39.95
SJ-22	173-61-1	Clark GENERAL LEDGER (PT equal)	21.95
SJ-23	173-62-1	Clark INVENTORY (PT equal)	21.95
SJ-24	173-70-1	DATASTAR (w/warranty)	21.95
SJ-27	SF9110	MYCHESS w/wty, manual (1 only)	19.95

- 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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V-II	= Volume II (Nos 1 thru 12) Aug-87 -- Jul-88....	\$22.50*
V-III	= Volume III (Nos 1 thru 12) Aug-88 - Jul-89...	\$22.50*
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All subscriptions start in the month your order is received. Renewals continue from expiration month (example: address label reads "John Smythe [999.8.89]". If renewal payment is received in or before August, 1989 you get another full year. Label would then read "John Smythe <999.8.90>".) NOTE: To improve understanding we now put subscriber number & subscription's expiration date on mailing labels above subscriber's name--space permitting.

SOFTWARE DISCS

Order No.	Description	Price
CGD#OS	40trk ss soft-sector CP/M-80 Games Disc #0.....	\$ 6.96
	(Assorted games & utilities)	
CGD#OH	40trk ss HARD-sector CP/M-80 Games Disc #0.....	\$ 7.96
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HPCP#OH	40trk ss HARD-sector HDOS 2.0 "Prgrmr's CARE"..	\$ 3.66
WSKPS	40trk ss soft-sector WordStar CP/M Version 4 H/Z19/89 Keypatch for Special Function Keys....	\$12.50
WSKPH	40trk ss HARD-sector WordStar Keypatch.....	\$13.50
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	Version 4.1 for H/Z CP/M-80	
CTXTH	40trk ss HARD-sector TeXT PRoCessor DEMO disc..	\$ 2.50

=> When ordering Please:

- 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.

LETTERS POLICY

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.

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

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Zip/PO Code _____Country_____	[_____]	[_____]	\$_____	\$_____
Phone number(s)_____	[_____]	[_____]	\$_____	\$_____
H/Z Computer: H8[_] H88/89[_] H90[_]	[_____]	[_____]	\$_____	\$_____
Oper Sys: HDOS Ver____ CP/M ____Ver____	[_____]	[_____]	\$_____	\$_____
Other (show as ZCPR, etc.)_____	[_____]	[_____]	\$_____	\$_____
Computer used mainly for _____	[_____]	[_____]	\$_____	\$_____
Favourite Programming Lanugage(s)_____				
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Please, NO C.O.D. orders!				

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THANK YOU FOR YOUR ORDER!

Rev #890725

The SEBHC JOURNAL's Back Page



Society and Journal Policies



* The SEBHC JOURNAL is published once a month and strives to be mailed by the 20th of a month. Editorial copy deadline is the 10th of every month (weather & holidays permitting).

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* The SEBHC JOURNAL is composed, edited and published by L E Geisler at 895 Starwick Drive, Ann Arbor, MI 48105. Phone 313-662-0750, 9am - 6pm Eastern Time, Monday thru Friday. Other times (EMERGENCIES ONLY): 313-769-6052 (residence).

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