

Saving Our HEATH Eight-Bit Machines!

SEBHC JOURNAL

Volume III, Number 9

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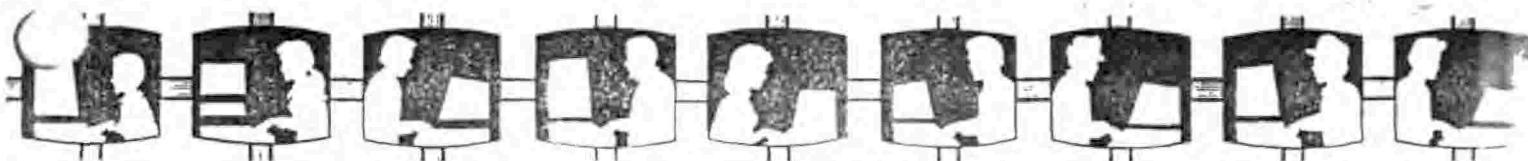
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CARE TO HACK SOME HARDWARE?

A CASE FOR PUBLIC DOMAIN HARDWARE

by

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You and I continue to use HEATH/ZENITH eight-bit computers despite the world's insistence on going to MS-DOS. This is fine; these [8-bit] machines are still capable of doing what we need a computer to do. Public Domain Software has made it possible to employ these older microcomputers for many applications at a very reasonable cost. But, when it comes to upgrading our hardware, that's another story. A soft-sector disc controller costs as much--or more--than our computers' resale value. And a 16k RAM expansion is outrageously expensive for what you get. Is there a way around this situation? I think there is: Public Domain Hardware.

The concept of public-domain hardware is basically the same as with public-domain software. There are commercial products which are no longer produced because the market is not large enough to be profitable any more. Many of you have designed and built upgrades for your own computer which you are willing to share with your fellow users. Others just like to design electronic gizmos, and would like to see someone get some use from our efforts. If printed circuit boards could be sold cheaply with a parts list and placement drawing, parts are available from several mail-order suppliers at very reasonable prices. And most HEATHKIT users are not afraid of a soldering pencil.

A (semi-universal) soft-sector disc-controller board which would interface all kinds of floppy drives would be at the top of the list of desirable public-domain hardware. Ideally, it should permit one to use 3.5-inch, 5.25-inch, and 8-inch floppies, and up to four units "mix or match" as one chooses. And 1.2Mb "AT" drives would be perfect in an H89 (these drives are readily available new for under \$100). I see that 8G MICRO advertises Western Digital's 2797 disc-controller chip--which should make a very low-chip-count board possible--for only \$7.25.

Hard discs are the norm in the MS-DOS world, but I'd wager that most of us just dream of one for our H/Z eight-bit computers. Look through any computer magazine and you'll find that \$225 will get a 20-megabyte hard drive and controller for an XT compatible. For us eight-bit users, they cost two or 3 times that amount. How about an inexpensive board which would allow us to plug an XT-type hard-disc controller into our H/Z 8-bit computers at a cost commensurate with our bank balance?

Memory expansion is another item that we need. Some of us still squeak by, desperately needing a 16k memory expansion board. Today 250uSec RAM chips can be had for 40 cents each

from at least one supplier. Other than the basic eight memory chips on the Heath 16k expansion board, there is one transistor, four capacitors, and a few resistors on it. Why should that cost us fifty to 65 bucks?

Even more desirable is a banked memory board. How about using 256k 32 x 8bit CMOS static RAM chips? They presently sell for less than \$20 each. Such a board could be expanded a chip at a time if one was short of cash...

Another type of public-domain hardware that comes to mind are interface boards. Most of the H/Z 8-bit machines came with only serial I/O ports. This is fine if you want to use a daisy-wheel printer, but it makes it rather difficult to find an inexpensive dot-matrix printer to use with a serial I/O card. A combination 2-serial, 1-parallel I/O card seems to be a natural public-domain hardware item.

Clock/calendar boards and math co-processors are other upgrades which would be nice to have if they didn't cost so much. A ROM upgrade which would allow CP/M to be used on the H/Z89 and '90 is yet another item ripe for public-domain. It could be either a bootstrap ROM for folks who don't care about HDOS, or a public-domain duplicate of Heath's MTR90 ROM. (We'd probably have to get ZDS's blessing for the latter but it shouldn't be difficult as they've already published the source code.) For these items soldering or assembly wouldn't be required, just plug-it-in-and-go...

Well, we've established that the idea of public-domain hardware is great, but how could it be made to work? Who'd design the devices? Where would we get fabricated, blank printed circuit boards and the parts to stuff into them? How would information be distributed?

The design for public-domain hardware should come from the same sources that public-domain software does: Commercial designs that manufacturers no longer care about producing and are willing to release to public domain. Designs by talented hobbyists. Printed circuit boards from short-run prototype houses (or some hobbyist's basement). Parts from suggested mail-order dealers supplied with the p-c boards. Mass distribution could be by either a user's group, or in our particular case by--or through--the SEBHC JOURNAL.

Here's the basic concept: Inexpensive hardware upgrades for our elderly but still spry eight-bit computers. Designs for which would have been placed into public domain, or have been freely licensed for non-commercial production. Inexpensive printed-circuit boards made available together with parts lists and component-layout drawings. All of which to be distributed non-commercially at the lowest possible end-user price.

Now we'd like to hear your comments and opinions. Do you

HARDWARE & In This Issue Notes

believe that this is a viable idea? Do you have a design that you'd like to release to public-domain? Are there other devices for H/Z eight-bit computers you think should be in this category? Please write me at my address above, or, if you think your opinions or suggestions deserve wider publicity, write to "P-D HARDWARE CONCEPT", c/o SEBHC JOURNAL, 895 Starwick Drive, Ann Arbor, MI 48105.

EDITOR'S COMMENTS ON "P-D HARDWARE CONCEPT"

Here's an idea which is well worth the paper it's written on! Many outside vendors who were once active, manufacturing and selling very fine H/Z 8-bit items have just dried up and wafted off into the sunset. For example, FBE Research has dropped all but a teaspoonful of their 8-bit items. Trionyx seems to have vanished from the face of the earth--just as I was about to buy some goodies for Hachibanko, my H8! Henry Fale (Quikdata) is preparing to drop his '89 soft-sector controller board. D-G Electronics hasn't answered their phone in quite a while (guess Bruce Denton is too busy with Zenith stuff), and I most urgently need a circuit diagram and service documentation for both my D-G Super89 CPU boards. Magnolia Microsystems still carries a couple 8-bit items, but how long will that last?

We can all sit around and grouse about the hardware shortage, or we can get up off our duffs and do something practical along the lines Tom has suggested.

I have often designed, laid out and photographed printed circuit masters for limited production runs by one of the many prototype houses in this general area. It isn't difficult to make a master, but it does take a fair amount of time. Having an all-ready working wire-wrap board can speed this operation tremendously since you pretty well know how and where to place your integrated circuits.

In many cases you will have refined your original design so that it uses only one or two ICs to do the work of a dozen or more. This means more space on a single right-hand slot board to put other neat things onto. I know of one Magnolia controller board which can handle an H47 8-inch floppy or a hard disc drive and has (count 'em) three standard Heath serial I/O ports on it. H&H Electronics once sold a serial & parallel I/O card as well.

And speaking of slots, our friends at SigmaSoft and Systems in Texas puts their 89/90 hard-disc interface card and the card for their graphics controller over on the left-hand side of the CPU where nothing much larger than Heath's 16k memory expansion card will fit. Couldn't you do something along similar lines? Think about it. Get out paper and pencil and jot down a few rough ideas. Don't just sit there!

OTHER GOOD STUFF IN THIS ISSUE:

KEEP YOUR FLOPPY DRIVES GOING...FOREVER!

Mike Morse of Micro Computer Repair Services in Ann Arbor, MI has placed an ad in this month's edition. I've been urging Mike to do this for the last couple of years because he does such good work on the JOURNAL's drives and at v-e-r-y reasonable rates.

Mike regularly checks out hard-disc drives short of opening them up (his clean-room set up is still pending). And he can save you lots of bucks because more than two-thirds of the hard-disc setups he's checked out have most of the problems in their external controller circuitry and DON'T have to be opened. That's a saving of a couple hundred bucks right off the top!

And if he sees that the hard-disc drive is so old and bad that it can't be repaired at a reasonable cost, his firm usually will offer to take it in exchange and give you credit for a new drive at a substantial savings over what you'd expect to pay elsewhere.

Remember, MCRS is as close as your local UPS office.

MORE GOOD STUFF FOR OPERATING SYSTEM NOVICES

HDOS-3 HOW-2 BEGINS IN THIS ISSUE

Associate Editor Allie Lingo gives us folks who are not too sure about getting started with HDOS-3 (and still need help with HDOS-2) a whole bunch of plain-English information. If you don't read this, don't complain to me that the SEBHC JOURNAL doesn't print anything worthwhile! This article is in three parts. Part two will be in our May issue, part 3 in the June edition. (Note: We've run through many of the preliminary steps Allie has written up. They work as advertised, without mental strain or pain. Put that drum-can of industrial strength Excedrin away!)

Z-COM FOR BEGINNERS

In keeping with the SEBHC JOURNAL's tradition of providing good, plain working information and help to its' readers, Associate Editor Rick Swenton has written a very thorough but easy to understand explanation of how ZCPR3 and Z-COM makes life easy for everyone. Rick compares plain-vanilla CP/M with ZCPR3 and illustrates how the latter's operation is far superior to plain CP/M. There's enough detail in his writeup that you may find yourself "lusting in your heart" after your own copy of ZCPR3! And if you run both HDOS-3 and CP/M you will appreciate how much more similar to HDOS that ZCPR3 works. Our heartfelt thanks to you, Rick!

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PAY ATTENTION: THIS IS ABOUT HDOS-3!

GETTING STARTED WITH HDOS 3

BACKING UP HARDSECTOR HDOS-3 DISTRIBUTION DISCS USING A SINGLE H17 DRIVE

by
Allie C Lingo,
South-East Associate Editor

I hope that this "how-2" article may help those who may be about to or have purchased HDOS-3 on seven hardsector discs. And I've written it as if you have only one H17-type hardsector drive and that you aren't familiar with HDOS. (If you've been using HDOS-2, read on; '3 is a little different!)

Before we start, we need a total of seven blank discs, or at least this number of discs which have data that we won't care about erasing. These discs will have to be initialised (FORMATTed to you CP/M types), and one of the seven will have to be made a bootable copy of the System Distribution disc.

**** STOP! If your distribution discs came without write-protect stickers on them, Put One On Each Disc Right NOW! ****

We now bring up HDOS-3 using software Disc One, that is, the disc labeled SYSTEM DISTRIBUTION. (I presume you've turned on the computer and are at the "H:" prompt.) Insert the distribution disc into the H17 drive and type "B" on the keyboard, then hit the return key. (We'll abbreviate RETURN key as <cr> henceforth; example, B<cr>.)

If you have hard and soft sector controllers installed and you normally boot from a softsector drive, you will have to type a "B" followed by an "S" to boot from the H17 drive. The H17 drive will now become SY0:. After typing a "B" (or "B" and "S"), hit <cr>. You may have to hit the spacebar two or three times until the baud rate is determined and you should see the message ACTION? <Boot> prompt. Hit return and HDOS-3 will identify itself and notify you how much RAM and what drivers were found: (example, 64K/TT: & SY:).

A message asking for the date will be printed. Enter the current date and <cr>. If you made a mistake and tried to correct it by the backspace key and get garbage, just type CTRL-U (hold down CTRL key and press U) and HDOS will ignore the previous line and you can reenter the information. Or, just hit <cr> and HDOS will try to make sense of what was typed and give you an error message, after which you may once more try keying in the information.

After entering the date, you will be informed of the disc's volume number and that it is mounted on SY0:, and that the LABEL is HDOS 3.0, Issue #50.07.00, System Distribution. HDOS-3 then prints the system prompt (S:) on the next line. We're now ready to prepare fresh discs for backing up the system software discs.

To prepare our discs we use INIT (short for INITIALise). At the S: prompt, type INIT<cr>. INIT will identify itself and print a warning that it will destroy any files on the discs it initialises and ask for you to answer YES or NO (the default is NO--just a <cr>). Type YES<cr> (capital letters only!). The disc will be dismounted and we are asked to remove the disc. Next enter <cr> when prompted for the device. This tells INIT to use SY0: (the default drive) for this operation. We are then prompted to insert the volume (disc) we want initialised into SY0:. Insert a blank disc (or one you don't mind re-writing on) close drive door and hit <cr>.

The drive will start up. After a few seconds a message that the volume in the drive hasn't been initialised before (if it's blank) is printed on the screen. We are given the choice of YES to continue, or NO to cancel. Type: YES<cr>. Next, when prompted for a unique volume number, just type 0<cr> (that's zero). Then when asked for a label, type in the distribution disc's label, that is, HDOS 3.0 System Distribution. Don't forget the <cr>. Remember, if you make a mistake, hold down the CTRL key and press letter U (CTRL-U or ^U) and retype the entry correctly.

INIT next asks for the number of sides. For an H17 drive, the default is 0 so just hit <cr>. When asked for the density, a <cr> gives the default of 48 tpi. When asked for the number of bad sectors, hit <cr>. A few seconds later, if all goes well, the message DISK INITIALIZATION COMPLETE will be printed on screen.

Follow the same steps for the remaining six discs. After the last disc has been initialised and READY? appears, type CTRL-D (hold down control key and press D) and at the DEVICE prompt enter another CTRL-D. Then, when asked if you have more discs to initialize, hit <cr>. If you have a single H17 drive you will probably get an error message that SYSCHD.SYS is not present on SY0: when the system tries to re-boot. Don't worry, be happy! Reinsert the original System Distribution volume, hit <cr> and the system prompt will return. (If more than one drive was used and if the System Distribution disc was left in SY0: the System disc reboots.)

Now that all your blank discs have been initialized, we begin the process of backing up our system software. We'll first make an exact copy of the original System Distribution disc. This copy will need to be bootable just like the original. We'll use a program named SYSGEN (SYSGEN--short for "System Generation"). Enter: SYSGEN *.*<cr>. The *.* (a "wildcard" filename) causes all files to be copied to the new disc. Don't forget the space between SYSGEN and *.*!

The original system distribution disc will be dismounted, but when asked to "remove the disc and hit return", just hit <cr> (because it's our source disc). When asked to insert

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the source disc hit <cr>. When asked for the destination, remove the system disc and insert one of the newly initialised discs (it must NOT have a write-protect tab). There will then follow a series of prompts for you to swap source and destination discs as files are read from the source disc and then written onto the destination disc.

If all goes well during the disc swapping, a message will be printed on the screen saying that X number of files have been copied (around 19 files) and the HDOS 3.0 S: prompt will return. Now we have a bootable backup copy of the original System Distribution disc and the original disc can now be put away in a safe place. If you want, you may dismount SY0: (D 0:<cr>) and place a label on the disc, then re-mount it (M 0:<cr>). Note: All newly-sysgened discs need to determine the console baud rate. If the computer appears to hang up on re-mount just type a few spaces.

In this next procedure we shall use all remaining initialised discs to make backup copies of the other system software discs. For this we use the program ONECOPY.ABS. ONECOPY lets you copy files from a distribution disc onto a newly-initialised disc in one drive. (If you have more than one H17 drive connected you could use PIP, but let's keep it simple!)

At the system prompt, enter ONECOPY<cr>. ONECOPY will identify itself and ask us to insert the initial SOURCE disc and hit return when ready. Just insert original software disc number two: DEVICE DRIVERS and UTILITIES and enter a <cr> In a second or two the ONECOPY prompt "O:" appears. At this prompt just type *.* (the good ole wildcard) since we want to copy all the files to the new disc. ONECOPY will display a bunch of filenames on screen and ask that the DESTINATION disc (one of the newly INITed discs) be inserted. For the next few minutes you will be prompted to swap between source and destination discs after putting labels on the newly INITed discs you want to copy files onto.

If all goes well with the disc swapping you should end up with the SOURCE disc in the drive when ONECOPY finishes with the message that X number of files have been copied. We have now successfully completed a backup of software distribution disc number two.

The procedure for making copies of the remaining system software is the same as described above, except we replace the SOURCE disc in the drive with another system disc by entering /MOU.<cr>, remove the previous disc and put the next system disc into the drive and proceed as before.

After the last disc has been copied and O: prompt returns, type /MOU<cr> and remove the source disc. Put your NEW HDOS-3 System disc in the drive, hit <cr>, then CTRL-D, exiting ONECOPY and return to the HDOS-3 prompt.

This completes backing up all your original HDOS-3 discs. I presume you remembered to put labels on all the new copied discs. Did you put write-protect tabs on them too?

To end this session, at the "S:" prompt you may key in BYE or QUIT, remove all discs from the drives, then power down unless you are itching to go until you drop. In that case, proceed to Part Two.

Note: We have written this part as though your system has only one hard-sector drive. If you have two hard-sector drives, or both hard and soft-sector drives and have never used HDOS 2.0 we suggest that you follow the one-drive method given here to avoid frustrating accidents.

PART TWO

CREATING A BOOTABLE HDOS 3 HARDSECTOR SYSTEM VOLUME
USING ONLY ONE H17 DRIVE

Now that we've backed up our HDOS-3 system software discs in the H17 drive we need a Working System Disc (or System Volume). We'll create one from the NEW backup copy of the original System Distribution disc we made. We need one of the newly-INITed 40-track hardsector discs done in Part One.

Insert the System Distribution disc into the H17 drive and boot up the system to the "S:" prompt. Now initialise a blank hardsector disc using INIT. INIT will ask for a volume number. Give it, say, the number 10 or whatever number you wish between 0 and 65535. (Note: Volume numbers greater than 1 thru 255 are permitted by HDOS-3.) For the label, key in HDOS 3 SYSTEM VOLUME. After INIT finishes, remove the newly initialised disc, install the System Distribution disc and enter <cr>.

When the system re-boots and at the system prompt, enter SYSGEN<cr> (SYSGEN's "ID"). When asked for the Destination device, enter SY0: or just <cr>. (If you have more than one H17, then enter the appropriate drive designation (SY1:, SY2:, etc.) and that drive will be used.) The disc will be dismounted and you're asked to remove the disc and hit return when ready. Just leave the System Distribution disc in the drive and hit <cr>.

On the SOURCE disc prompt, enter <cr>. Then follow the prompts until SYSGEN is finished and prints on screen how many files were copied (9 files). You should end up with the newly-created System Volume in the drive and the system prompt should be back. Don't put your backup System Distribution disc away just yet. We'll need it again.

All backup-copy System Distribution disc files were not copied to the new System Volume (*.*) not used). Three files needed later were also not copied: ONECOPY.ABS, INIT.ABS and SYSGEN.ABS.

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To copy these files, dismount (D 0:<cr>) the Working System Volume we just created. Then insert the backup System Distribution disc and mount it (M 0:<cr>). At the system prompt type ONECOPY<cr>. When asked for the SOURCE disc hit <cr>. At the "0:" prompt enter ONECOPY.ABS,INIT.ABS,SYSGEN.-ABS<cr>. The destination disc is the newly created System Volume. After ONECOPY copies the files, you will end up with the backup System Distribution disc in the drive. At the ONECOPY prompt, type /MOU to change the disc. When prompted, insert Working System Volume and type CTRL-D to exit. You will be back at the system prompt.

Remember what happened if you made a mistake and tried to use BACKSPACE to correct it, or you tried to enter lower case letters and found that neither worked? Well, we are now ready to set the TT: driver to eliminate that problem.

First, type in SET TT: HELP <cr>. You'll see a list of the TT: settables. The first one will be "BKS". This is backspace, which will let us correct mistakes. At the system prompt, enter SET TT: BKS<cr>. When the prompt next returns, enter SET TT: NOMLI<cr>. (This instructs the system to allow you to enter either lower case or upper case letters.) Lastly, enter SET TT: NOMLO<cr>. (This tells HDOS to display all lower case input as lower case output.)

These changes will not take effect until you exit HDOS and cold boot the system (right-shift and reset keys depressed). You may want to type BYE or QUIT at the prompt and after the disc(s) have been dismounted do a RIGHT SHIFT-RESET and re-boot the system. After you return to the system prompt, you can try typing in some letters to see if the BACKSPACE key will erase them. Also try keying in some lower case letters and see if the terminal (TT:) will display them correctly.

You have now successfully created a Working System Volume which can be used to initialise non-bootable data discs or INIT and SYSGEN more bootable system "working discs". After setting TT: on the System Volume, you need not set TT: on the working discs you later create.

You may now make a non-system "working disc" (Example: ED WORKING BOOT DISC). To do this, first INIT a blank disc and then SYSGEN (not SYSGEN *.*) it. Now you can copy your HDOS-3-compatible printer driver and any applications programs you want onto it, including perhaps the README.DOC (HDOS-3 documentation) from the DEVICE DRIVERS and UTILITIES disc for printout.

NOTE: If you are using hardsector and later add a soft-sector drive, continuing use of the hard-sector drives as primary boot devices, you can copy the soft-sector device driver (H37.DVD) from Disc Two of the HDOS-3 software (DEVICE DRIVERS and UTILITIES) and rename it 'DK.DVD' to support soft-sector drives. Use 'SET DK0: STEP 6' to set drive step

rate to 6 ms. Most soft-sector drives will reliably step at this rate, especially the half-height types. Then do a COLD boot for the driver to be recognised and the changes to take effect.

NOTE: We did not use SYSGEN *.* when creating the System Volume because this would have copied ALL files which could result in not having enough room for programs such as a printer driver.

PART THREE

CREATING AN HDOS-3 SOFT SECTOR SYSTEM VOLUME FROM AN HDOS-3 HARD SECTOR SYSTEM VOLUME

In Part Two we made a hard sector Working System Volume. We use that disc to INITIALISE data discs or make more bootable working discs for use with various programs such as text editors, assemblers, MBASIC and so on. Now we're going to make a soft-sector System Volume (for use with soft-sector controller and H37 drives) from our newly-created hard sector System disc. This procedure is pretty much the same as for hard-sector discs but with a few important differences, outlined in the following steps.

To start, we need the hard sector Working System Volume we previously created, the backup copy of Disc Number Two, HDOS-3 system software, DEVICE DRIVERS and UTILITIES, and a blank double-sided, double-density soft sector floppy disc. (NOTE: If you have already copied and renamed the H37 device driver to your hard sector System Volume, skip that step in the following explanation.)

Boot the system with the System Volume and at the system prompt enter ONECOPY. When asked to insert the source disc, insert the DEVICE DRIVERS and UTILITIES disc followed by <cr>. At the "0:" prompt type H37.DVD<cr>. After a moment or two you will be asked to insert the destination disc. Insert the System Volume. ONECOPY will copy the file to the System Volume. At the end of the copy operation, the DEVICE DRIVERS and UTILITIES disc will be in the drive. Type /MOU at the "0:", remove the disc, and replace it with the System Volume. Again at the "0:" prompt, type CTRL-D to exit back to the system prompt.

You will have to rename H37.DVD. Since the H17 driver is SY.DVD the H37 driver must be renamed DK.DVD; enter RENAME DK.DVD=H37.DVD<cr>. The system will not recognize the new driver until we do a COLD BOOT (Right-SHIFT RESET). Re-boot and check that HDOS-3 prints out DK: when reporting the drivers found. You may now set DK: for drive step rate. Enter SET DK: HELP<cr>. Note that units "0" thru "2" are set for 30 mSec. Most soft sector drives will step reliably at 6 mS. To change DK0:, key in SET DK0: STEP 6<cr>. Do the same for DK1: and DK2:. Remember that these changes will not take effect until you do a COLD boot. Re-boot now.

HDOS 3.0 fini -- Advertisement

Now we need a blank soft sector disc. At system prompt enter INIT<cr>. Follow the messages printed to the screen, but when asked for the DEVICE enter DK0:<cr>. (This is the first soft sector drive ("Drive 0") connected to the soft sector controller.)

When asked to insert the volume into DK0:, insert the blank soft sector disc into drive DK0:. Then as prompted, enter the volume number and the label: HDOS 3 SYSTEM VOLUME. Since most soft sector drives reliably step at 6 ms, at the prompt for step rate, enter 6. The next prompts ask for track density, number of sides and the number of tracks. Answer YES or NO depending upon the type drive you have connected. For an H37 96tpi drive answer YES (or just a <cr>) to all three prompts. INIT will then prepare the disc in DK0: ending with the message DISK INITIALIZATION COMPLETE. You're then asked to insert another disc to be initialised and to hit return when ready. If you do want to initialise more discs just insert them one by one and follow the INIT prompts. When the last disc is done, type CTRL-D and another CTRL-D at the Device prompt and then <cr>. This brings the system prompt back.

Now enter SYSGEN *.*<cr>. When asked for the Destination Device, enter DK0:<cr>. The disc will be dismounted; hit <cr>. You'll then be asked to insert the SOURCE disc; another <cr>. At the 'insert DESTINATION in DK0:' prompt, hit another <cr> (and be sure you left the newly-initialised disc in DK0:). SYSGEN will now create a bootable soft sector System Volume and copy all files from the hard sector System Volume over to it. SYSGEN will return you to the system prompt after it finishes. Now mount DK0: (M DK0:<cr>), and enter DIR DK0:<cr> to see if the files made the trip.

If your soft sector controller and drive(s) are set up as the primary boot device(s) (you'd normally boot the system from the softsector drive), you can exit HDOS 3, and do a COLD BOOT from soft sector drive, SY0:. (If the hard sector drive is primary boot, then type B S<cr>).

Thus far: We have gone from backing up the HDOS 3.0 system software, to creating a hard sector System Volume, to creating a soft sector System Volume. Either system volume can be used to INIT data discs and create bootable "working" discs. If both the H17 and H37 device drivers are present on both System Volumes, data and working discs, either soft or hard sector, can be created with each. Just use the appropriate type drive to work from.

We recommend that you SYSGEN (not SYSGEN *.*) INITed discs when making working boot discs to conserve disc space. Also, copy only those applications programs (printer drivers, etc.) you absolutely need. Also send README.DOC from the DEVICE DRIVERS and UTILITIES disc to your printer so you have a handy reference copy. You'll soon grow to love HDOS 3.0!

FOR SALE

Z-89s I've been advertising these as Z-89As, but Lenny (your editor) tells me they're just later model Z-89s. Anyway they have the MTR89 PROMS which allow them to run CP/M and address 64K. I have a couple working units left. \$99.00 as is.

One only Z-90. CPU not working. I've spent too much time trying to fix this. So, if you think you're better at digital troubleshooting than me (that's easy), here's a real bargain. The Z-37 controller, MTR90 ROM set, and 3 port serial card are worth more than this. \$139.00.

H-77 dual disk drive unit. Checked and working, only one available. \$99.00.

Inquire about availability of other units, printers, etc.

Z-89 PARTS

Need parts? Look at these prices.

Used, working:

CPU board, MTR89 ROM set, 48K	\$25.00
Terminal board	\$25.00
Video board complete with flyback xformer	\$25.00
Z-17 disk controller, hard sector	\$15.00
Serial card, 2 ports populated	\$25.00
CRT white or green	\$15.00
Keyboard, cleaned & checked	\$35.00
Disk drive, 40 track single sided	\$25.00

Any of the above for parts, not working, or broken, etc. \$10.00 each.

Inquire about other parts, hardware, cables, etc.

TERMS:

Check or Money Order.	
Shipping & handling, parts:	\$ 5.00
Shipping & handling, computers:	\$15.00

SOFTWARE WANTED:

Spellstar, Infostar, etc. Will buy or swap, call.

Tom Rittenhouse

9035 Lincoln

Whitmore Lake MI 48189

(313) 229-4079

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Z-System For Novices & Others

NZ-COM For The Beginner

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What happened? Together with many other long-time ZCPR3 enthusiasts, I was able to persuade many CP/M users to cross over to NZ-COM. And lots of users took our advice. But it is now time for the rest of you! No longer does ZCPR3 installation require knowledge of system integration and assembly language. No longer is ZCPR3 reserved for the elite few, it's now available to "the masses". Plain old CP/M is simply too awkward and restrictive. Nobody should be left struggling and sweating with any version of CP/M 2.2 now that NZ-COM and Z3PLUS are today readily available.

I've been inundated with phone calls and letters since the JOURNAL has published my articles about ZCPR and its' variations. At first I thought that people would be asking for help bringing up NZ-COM. Rather, I found that they were very successful getting NZ-COM running but their main question was "What do I do with it, now that it is running?".

In my opinion the problem is that many users haven't really tried to explore CP/M or push it to its' limits. They've never experienced the feeling of CP/M fighting back at them, not really understanding the limitations of CP/M. Therefore they don't now understand how much better NZ-COM is. Many people limit their CP/M systems to running applications such as word processors and spreadsheets. Many others never have used hard discs, and more never (not ever) used a user area other than zero! (Most CP/M owners still don't know what a user area is to this very day.)

In this article, I am approaching NZ-COM from the new user or novice's viewpoint, answering many of the common questions asked by new users. And I'll compare some of the NZ-COM features to plain CP/M's to help you understand the similarities as well as the differences.

I have heard it said many times, "the way to learn ZCPR3 (or the many associated environments, Z-SYSTEM, NZ-COM, etc.) is to first read the documentation. Then read the documentation again. Finally, read the documentation a third time!"

Z-System is so comprehensive that it is almost impossible (if not quite difficult) to learn everything about it. Some of the material I am presenting here is a rehash of things I've published in previous SEBHC JOURNAL articles. But this time I'm writing more for the beginner or HDOS-only readers who're thinking of using CP/M so they might exploit the public domain sources. By contrasting NZ-COM and plain CP/M CP/M we all can appreciate the progress Z-system represents.

NZ-COM - What you get

With NZ-COM, you have the following basic features never before available in plain CP/M:

- 1 - Multiple commands on a single command line, separated by a semi-colon
- 2 - Enhancement of the directory (drive/user areas and named directories)
- 3 - Enhanced command processing (search paths and error handling)
- 4 - Memory-Resident Commands
- 5 - Flow Commands
- 6 - Shells
- 7 - Environment Descriptor
- 8 - Aliases
- 9 - ZCPR3 Enhanced Utilities

This is not by any means an all-inclusive list but it's a good start. Let's talk about these one at a time.

1 - Multiple Commands are permitted on a single line. Each command is separated by a semi-colon. Here's an example:

```
WS MYFILE.DOC;ERA *.BAK;DIR
```

This command line will invoke Wordstar to edit MYFILE.DOC. When you finish with Wordstar, the rest of the command line will be automatically invoked. First, all files *.BAK will be erased and then the directory will be displayed.

2 - Directory Enhancement: In CP/M, you are accustomed to seeing the A> prompt where "A" is the currently logged drive. In ZCPR3, you will see the AD> prompt. "A" is the currently logged disc and "D" is the currently logged user area.

CP/M limits you to 16 User Areas on each disc but NZ-COM gives you 32. (User Areas are sub-divisions of the disc and of great value to hard-disc owners.) While you are logged in to one user area, you can access files only in that area. This is a great way of keeping related files in a separate area. For example, your Wordstar disc could have Wordstar and supporting files in User Area 0, your personal documents in User Area 1, your business documents in User Area 2, and so on. You're limited by the disc's maximum storage space.

Under CP/M, you change User Areas with the USER command and the A> prompt stays unchanged. Even worse, while logged into another Area, all those files in Area 0 are not available. And if you log into any User Area other than 0, DIR won't show files you know are in 0!

But with NZ-COM you change user areas by simply typing the number and a colon. Enter 2: and you're in User Area 2:, B4: puts you on Drive B, User 4 and the prompt changes to B4>.

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NZ-COM also allows you to assign names to a drive or User Area. You can create names and load them in the Named Directory Buffer. Now you may change Areas not only with the drive or User command, but also with the directory name. YOU create these directory names, so YOU choose names (or abbreviations) which mean something to you. Let's suppose that our Wordstar disc is in drive B and we have files in User Areas 0, 1 and 2 as previously described. We can see our Wordstar files by typing B0: or WORDSTAR:. We can see our personal documents by typing B1: or PERSONAL:, and we can see our business documents by typing B2: or BUSINESS:

4 - Enhanced Command Processing: Under CP/M, if you type a command name and it isn't found on the currently logged disc and current User Area, the command is simply typed back at you with a question mark. Under NZ-COM, there are a number of routes that can be taken to resolve a command. The first is the Path.

The Path is the route that ZCPR3 searches in finding a specified COM file. For example, you might specify that A0: is always searched for command files. This means all COM files which reside in A0: are always available to you, even if you are currently logged onto a different drive or User Area. You don't have to keep separate copies of utilities in or on each drive or User Area with other files. The concept of a path may not be readily evident to you if you have never tried to take advantage of User Areas under plain CP/M. And it is far from an advantage because CP/M makes it VERY difficult to exploit User Areas.

Before I began running ZCPR3 the only time I entered a User Area other than zero was on archive discs (backup discs which I store away for safekeeping). I used the popular NSWEEP to group related files in a common User Area. NSWEEP made it very easy to bounce around in different User Areas but that flexibility was only available while NSWEEP was running.

Another method to resolve commands is called the Extended Command Processor. Some people build a library file (LBR) of infrequently-used commands and save it somewhere on disc, for example in A15:. There's a two-fold reason for this. First, the many files grouped into a library file use only a single directory space. Second, they occupy less disc space. These are important considerations with floppy-disc-only systems.

There's a ZCPR3 utility (LX.COM) which can run COM files that are stored in libraries. By naming LX.COM as the system's Extended Command Processor (ECP), you can automatically search this library file (typically called COMMAND.LBR) for COM files which were not found along the search path. It will take a bit more time to do this but all those COM files will appear to be "on-line" even though they are stuffed away in a single file. In my COMMAND.LBR I have ancient copies of

PIP, STAT and DDT as well as infrequently-used utilities such as MENUCK and WHEEL.

We can take this even further by making ARUNZ the system ECP. ARUNZ is a special program which accepts your command and searches a text file to see if there is a match. If it finds a match, it tries to execute the command associated with the match. Here's an example. Create a text file called ARUNZ.CMD with your text editor. Then create the following ALIAS definitions:

```
WSTAR=WORD,STAR=EDIT ws $*
```

Assuming that WS.COM exists on the disc, you can now invoke Wordstar with any of the following commands:

```
WS filename
WSTAR filename
WORD filename
WORDSTAR filename
EDIT filename
```

The first command would run anyway, but the last 4 would be processed by ARUNZ. Since WSTAR.COM, WORD.COM, WORDSTAR.COM and EDIT.COM to not exist, no matching COM file would be found if they are run. ZCPR3 passes the request to the ECP. The ECP (ARUNZ) then scans its list of commands for a match. If there is a match, the requested command (WSTAR and others) is translated to a different command (WS) and executed.

Finally, you might place LX.COM as the last definition in an ALIAS.CMD file so that ARUNZ and LX could be run together. If the command was not found in the ALIAS.CMD file, then COMMAND.LBR would be scanned for the request automatically. To do this, the last command should look like this:

```
: lx / $0 $*
```

(Don't ask! The answer to why it appears like this is beyond the scope of this article!)

Now suppose we've exhausted all features and still haven't found the command. If we installed an Error Handler, ZCPR3 will invoke it and we will likely be shown the whole command line which failed and we will be able to edit the line using Wordstar (or other) control keys.

5 - Memory-Resident Commands are stored in the Resident Command Package (RCP). RCP typically occupies 2k in memory, and contains familiar commands such as ERA, REN, TYPE, PRINT, REG, P, POKE, PORT, ECHO, CLS, DIR and H. It may not have them all. (Use "H" to see what's available in your RCP.) Since ZCPR3 was crammed with extra powerful features, there was no room left for many of the standard built-in commands. Placing them in the RCP makes them available again without

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having to resort to equivalent COM files such as ERA.COM, REN.COM, etc. Because they are memory resident, they execute almost instantly. Under plain CP/M, the commands DIR, ERA, REN, TYPE, and SAVE are built into the Console Command Processor (CCP) and are very basic in nature. RCP equivalent commands under NZ-COM are more versatile and flexible. For example, under CP/M, when you type a file on the screen (TYPE FILE.DOC), the file is displayed line by line until you either stopped it with control-S or until the whole file scrolls off the screen's top. But under NZ-COM the system automatically stops after displaying 24 lines and waits for you to press any key before showing you another screen-full.

The advantage of ZCPR3 Resident Commands is that there can be an infinite number of Resident Command Packages (RCP) which can be loaded into memory to enable the features desired at the particular moment. Under NZ-COM, the size of the RCP can dynamically be as large or as small as you wish.

6 - Flow Commands give you the ability to test for certain conditions and alter the sequence of commands based on these conditions. Among the primary flow commands are IF, AND, OR, ELSE, and FI (endif). Among the conditions you can test with these flow commands are EMPTY, EXIST, INPUT, REG and even BG, DS and many more. Here is an example. Suppose you have the following command line:

```
if input SHOW FILES?;dir;else;if exist time.com;time;
else;ztime;fi;fi
```

When you enter this line the following things will happen: First, you are asked "SHOW FILES?" and the system waits for you to type "Y" or "N". If you type "Y", then "dir" is run. If you type "N", then the system will check to see if "time.com" exists. If it does it's run. Otherwise, "ztime" is run. You may not see any use for this if it was typed in as a command line. The most valuable application of this feature is when this kind of command is part of a batch file (running under SUB or ZEX), part of an alias (created by SALIAS or part of the ARUNZ.CMD file) or contained within a menu (MENU, VMENU or ZMANG) as well as being a ZFILER macro (in the ZFILER.CMD file).

There is nothing remotely similar to Flow Control under plain CP/M.

7 - Shells: Several Shells come with NZ-COM and newer ones are regularly being created. But describing a Shell to a CP/M user is rather difficult because nothing similar exists under plain CP/M.

To put it simply, a Shell is a program which acts as a system "front-end". It accepts your input, performs pre-determined operations based on this input, and then gets automatically re-invoked. It is an endless loop (sometimes).

Menus are generally shells. You select a menu option and certain pre-programmed events take place, then you return to the menu instead of the A0> prompt. If the menu's author didn't provide an exit from it, then you're "stuck" in the menu environment and limited to whatever else the menu contains. But if a particular menu is to be used by people knowing nothing about computers and you want to prevent them from ever seeing the A0> prompt where they could potentially cause havoc then this might be advantageous.

In Z-System, you have the ability to make ANY program into a shell. Of course you have to be careful because certain programs, when made into shells would simply cause infinite loops. The program would continually re-invoke itself and would require a cold boot to get out of the loop.

This quick overview of shells doesn't do the subject justice. Rick Charnes recently wrote a two part series on ZCPR3 shells in "The Computer Journal" in issues 36 and 37. This series is rather comprehensive and possibly intimidating to the novice user. The beginner would more likely use the shells SH, MENU, VMENU, ZMANG, ZFILER, EASE and most recently LSH.

Under plain CP/M, the only thing which comes close to a shell is CP/M's ability to run a command on Warm Boot. If you CONFIGUR CP/M to run a command on Warm Boot, then every time a program ends, you will run that command. With this scheme, you should never be able to drop down to the A> prompt.

Suppose you had a command such as "MBASIC" entered as the command to run on Warm Boot. Every time the system was turned on, you would go directly to MBASIC. Every time you typed "SYSTEM" to exit to CP/M, you would immediately return to MBASIC! The only way to change this would be to SYSGEN the disc or to boot the system from another disc, copy the BIOS.SYS to that disc, run CONFIGUR on that BIOS and then copy it back to the original disc. Tedious!

Under ZCPR3, you can have as many shell programs as you want. They can be changed and exited (generally) at will.

The Environment Descriptor and Selecting your Terminal

Many times, those of us who have had long-time exposure to the ZCPR series of enhancements take for granted some things that the newer users are finding difficult to understand. One such cloudy area is your terminal and the TCSELECT utility. Let's talk now about how to make your terminal selection and what effects a correct and an incorrect terminal selection will have on your system.

What is a terminal? Is a terminal the same as a computer? Why do we need to select the correct definition? These are

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common questions I have been receiving because my name is on the list of volunteer helpers which comes on the NZ-COM disc.

A terminal is generally a stand-alone video display with a keyboard. The internal terminal electronics may consist of simple digital logic along with standard video display circuits or it may consist of a microprocessor-controlled intelligent system with fancy screen displays and options. But it is not a computer. It is only a computer I/O device which can display computer data on its screen or receive computer data from a user through its keyboard. Some computers require that you connect a terminal in order to use them.

The Ampro Little Board, the Micromint SB-180, the Heath H8 and Morrow systems are among those computers which require a terminal. The older S-100, CompuPro, Cromemco and BigBoard systems (am I showing my age?) also required terminals.

Many newer CP/M systems have built-in terminals. The Kaypro, Osborne, Heath H89 and Xerox 820 systems had built-in terminals. But with the H89 things get a bit confusing.

The Heath H89 is essentially an H8 computer (with Z80 CPU) built right into the H19 terminal cabinet. There are two independent microprocessor chips in the box. One Z80 CPU is for the terminal, the other is the computer's CPU. They operate independently and are connected only by a serial I/O cable. You can remove the computer board and have a stand-alone intelligent terminal.

The other systems (Kaypro, Osborne, etc.) have only one CPU chip. This CPU is programmed not only as a CP/M computer controller but to also share control of the video display and keyboard simultaneously. This is usually done with a very complex interrupt-driven software routine which writes characters to the screen and reads characters from the keyboard by suspending what the CPU is doing, and then picks up computing action where it left off.

Since we have determined that there are many different kinds of computer terminals, one can only assume that they all operate differently, which is true.

Most of the time, terminals simply receive a character from the host (the CP/M computer) and display that character on the screen. But many of the better terminals (such as the H/Z19 or H/Z29) have fancy bells and whistles which can be accessed to provide complex displays. Some of those features are cursor positioning, screen attributes (reverse video, underlining, blinking, bold or dim), graphics and editing (delete/insert character, delete/insert line). The commands which perform these functions are called "Escape Codes" because they generally begin with the Escape character as the first character of the command. The terminal's command set

of Escape Codes is defined by the manufacturer and resides in the terminal's firmware (ROM software).

Applications programs which exploit a CRT's "bells and whistles" must be capable of running on a wide variety of terminals if the author expects to sell many copies. This is why programs like Wordstar and dBASE-II have installation programs (WINSTALL.COM or INSTALL.COM) which allow the user to tell the program what terminal is being used.

With the introduction of ZCPR3, space was reserved in the operating system to store details of the system's terminal. This provided a very efficient way for ZCPR3 utilities to access the special features of the CRT without having the special sequences "hard coded" into each utility. Because of this one copy of a ZCPR3 utility will perform properly on many different systems employing a wide variety of terminals. The utility extracts terminal information from the ZCPR3 TCAP (Terminal Capabilities) which resides in memory. Without the TCAP, each ZCPR3 utility which uses terminal features would have to be installed by the user for the particular terminal desired.

Furthermore, if you are fortunate and own more than one terminal and want to operate a different one on the system, all you do is run TCSELECT and select the new terminal from the menu. Now, all the same on-line ZCPR3 utilities will work properly with the new terminal.

Several people have asked for help with TCSELECT; for example, one caller had a Televideo TPC-1 portable computer and said, "My computer isn't on the menu! What do I do now?" He was understandably confused. After referring him to his owner's manual to find out what kind of terminal the TPC-1 emulated, we determined that his correct selection was the Televideo 803. Many non-hacker folks have difficulty understanding the difference between computer and terminal. As this person discovered, the Z-Helper's List (on the NZ-COM disc) contains names of volunteer consultants to help you with problems such as this.

If you select the wrong terminal for your system, don't be surprised if the screen is garbled when you try to run ZFILER, ZMANG or VLU and many other programs. In severe cases, the system may even lock up (or seem to). A typical example would be if a certain terminal used ESC-) to clear its' screen. If you incorrectly selected this terminal instead of your trusty Heath H19 terminal, your system would appear to lock up. This is because the ESC-) sequence which cleared the other terminal's screen is the H19's Disable-Key-board Command!

(I can't resist offering another of my H89 trivia tidbits: If your keyboard locks for any reason such as the program deliberately did it, line noise over the modem, incorrect

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terminal selection, etc., you can enable the keyboard without resetting or rebooting. Just press these keys all together: CTRL T Y BACKSPACE.)

8 - Aliases:

A ZCPR3 Alias is a program (or a command) which itself invokes another program (or commands). An Alias can be a COM file created by an Alias utility. This COM file simply passes a command line to ZCPR3. For example, let's create an alias we'll call TEST.COM. It will contain the following command line:

```
B4::MBASIC WHUMPUS;A0::DIR
```

When we type "TEST", the above command line will be sent to ZCPR3. The system will log into drive B, user 4 (B4>), and run MBASIC. MBASIC will load WHUMPUS.BAS and execute it. When we're done playing WHUMPUS, the system will log us into drive A, user 0 (A0>), and display the directory. That long command line exists in the TEST.COM file. The other contents of TEST.COM is code which will place that long command line into the ZCPR3 Multiple Command Line Buffer (MCLB). As soon as ZCPR3 detects that the MCLB is suddenly no longer empty, it begins processing its contents. Notice that while WHUMPUS is running, the remainder of the command line (A0::DIR) is still lurking in the MCLB waiting to be processed after you're done with WHUMPUS.

An Alias can also be a command expression. The ZCPR3 utility ARUNZ (Alias RUN ZCPR3) can process Aliases contained in a text file. In our example above we created an alias which was a COM file. You can also create a list of aliases with your word processor or editor just as you would create a document. Call this file ALIAS.CMD, your Alias Command File. Let's say you have a few BASIC games and you want to be able to run them by just typing their name. Create the following ALIAS.CMD file:

```
WHUMPUS b4::mbasic whumpus;a0:  
WARS b4::mbasic wars;a0:  
DND b4::mbasic dnd;a0:
```

WHUMPUS, WARS and DND are the names of the BASIC game programs. Now if you type ARUNZ WHUMPUS or ARUNZ WARS or ARUNZ DND, the requested game will run and you will return to drive A, user 0 when you are done.

Invocation of the aliases contained in the ALIAS.CMD file can become automatic. Just rename ARUNZ.COM to CMDRUN.COM. CMDRUN is the default name of ZCPR3's Extended Command Processor (ECP). CMDRUN is invoked after ZCPR3 exhausts all possibilities while searching for a requested COM file. Assuming no COM files exist with the same names as our BASIC games, all you have to do is type the name WHUMPUS. First, ZCPR3 will search all the drives (and user areas) defined in

the PATH. (Really, I'm trying to keep this simple!) Not having found WHUMPUS.COM anywhere, it invokes CMDRUN and passes WHUMPUS to it. Since CMDRUN is really ARUNZ in disguise, it begins to scan the ALIAS.CMD text file for the word WHUMPUS. Having found it as the first entry, it passes the command line B4::MBASIC WHUMPUS;A0: back to ZCPR3 (in the MCLB) for ZCPR3 to execute.

Using ARUNZ, you do not have to create a COM file for each alias you desire. All you have to do is type a few bytes into the ALIAS.CMD text file. This technique saves disc space and directory entries.

Some novice users have asked what's the difference between an Alias and SUB or ZEX. The main difference is that an Alias sends a command line directly to the ZCPR3 command line buffer. As such, the length of the command line is limited to 203 characters. Each alias definition can not exceed this line length. Under SUB or ZEX, the length of the command line still has this character count limitation but the number of LINES is almost unlimited. Furthermore, SUB or ZEX batch jobs must be handled by the overhead of their respective utility (SUBMIT.COM or ZEX.COM) where either speed or memory usage are affected. A SUB or ZEX job cannot exist as a COM file, ready to be run. You have to type SUB JOBNAME or ZEX JOBNAME. For those short jobs under 204 characters long, use an Alias. For the long ones consisting of many lines, use SUB or ZEX.

ZCPR3 Enhanced Utilities

The many ZCPR3 utilities were written to take advantage of ZCPR3's increased versatility. As I stated before, many of these generate screen displays and access the CRT's special features. All conform to ZCPR3's syntax rules. For example, you could reference a drive/User Area with an expression such as A3:, or a Named Directory like WORDSTAR:.

Nearly all ZCPR3 utilities will display a brief help message if invoked with a double slash (ARUNZ // or ZEX // etc.). Most ZCPR3 utilities take advantage of your system information contained in the ZCPR3 Environment Descriptor. If you have correctly defined your environment, these utilities know how many floppy or hard discs you have (and if there are gaps, that is Hard Discs A:, B:, and Floppy Discs E: and G:). They will also know your CPU clock speed, and when time delays are involved the utilities will run correctly on everyone's system. They will know about your printer--how many characters/line, how many lines/page, does it accept form feeds, and so on. Also, they know about the terminal and send the correct codes to it to perform enhanced full-screen operation. Even Wordstar-4 is capable of accepting ZCPR3-style syntax. It lets you to log on/in drives or User Areas with drive/user specification (DU: like B3:) as well as the named directory specification (DIR: like TEXT:)

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IN CONCLUSION

I realize that I've covered much of this information in previous articles. But I hope that I have met many of the needs of the NZ-COM novice in the way I've presented this information this time around. My objective is to instill the "Read, read, then read again" philosophy into my reader's subconscious mind together with knowledge of Z-System.

I strongly recommend that you seek out a CP/M users' group which is known to support ZCPR3 and NZ-COM. Unfortunately, these users groups are often a well-kept secret. Let's face it; people are not flocking to CP/M club meetings. After all, CP/M is "believed to be dead".

Check into the Z-Nodes (the Bulletin Board Systems you can call with a modem). A list is provided on your NZ-COM disc. Jay Sage, author of ZCPR34, runs a Z-Node in the Boston area. His system is always flooded with the latest dialog as well as the latest releases of publically distributed enhancements of ZCPR3 software.

Check with your local "Z-Helper" to find out where the closest "hot spots" of ZCPR3 activity are in your area. The list of Z-Helpers is also on the NZ-COM disc.

Subscribe to "The Computer Journal". This is the authoritative source for the latest ZCPR3 and advanced CP/M information. Jay Sage, Bridger Mitchell (author of Background-ii and Datestamper) and many other noted personalities are regular contributors. A subscription to "TCJ" also entitles you access the Lillipute Z-Node in Chicago--one of the largest and most comprehensive dial-in systems in the country.

Next time around--

I am currently planning a product review of Lee Hart's Superset upgrade to the H19/H89. You might as well order this now so that you can have it ahead of time!

Also I'm planning on releasing my latest programming effort: CP/M software to control the X-10 CP-290 Computer Interface. This unit (see your Heath catalog) allows your computer to control lighting and appliances connected to the X-10 Powerhouse system. Until now, software was available only for the IBM and MacIntosh computers. If you order this unit (\$39.95) for use on the IBM, the cable supplied with it will directly connect to the H89 (or H8 with H8-4 serial board) modem port.

I have written a program in 280 assembly language (16K COM file) which will access nearly all the features of the interface. You can program all 128 events, perform immediate commands, read and set the clock, and read/write the events to/from disc files or print them on your printer. You can

even edit events saved to disc with an ordinary text editor. The program operates dynamically in either menu mode or will accept commands directly from the CP/M command line. On-line help displays can be called from the menu.

If you currently have an X-10 system in your home, this computer interface will rapidly transform you into a home-control junkie (if you are not one already)!

By the way, the reason that the X10 program is as large as 16k is because of all those paragraphs of Help Text and Error Messages!

BULLETIN BOARDS, NETS & SOURCES

Sage Microsystems East	Lillipute Z-Node
1435 Centre Street	Chicago
Newton Centre, MA 02159-2469	(312) 649-1730 and
Voice: (617) 965-3552	(312) 664-1730
Z-Node: (617) 965-7259	two systems
300/1200/2400 24 hours	Leave a message to the
password = DDT	SYSOP if you're a TCJ
MABOS on PC-Pursuit	Subscriber

You can reach me on "The Computer Club" PBBS-RCP/M at (203) 673-8752, 300/1200/2400 baud, 24 hours a day.

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[Editor's note: The SEBHC JOURNAL and its' subscribers would be much poorer without Rick Swenton's unselfish help and "smoking keyboard". Rick, please continue with your excellent work!]



=====

READER'S MAIL BOX



Dear Lenny,

Here's an idea for those of your readers who are assembly-language programmers: Why not produce a public-domain clone of Zenith's CP/M 2.2.03 or 2.2.04? I'm sure that since HDOS 2.0 was released into the public domain, ZDS would be willing to release their portions of CP/M 2.2 also.

Since you can use the old ZCPR version 1 as a direct replacement for the CCP portion of CP/M, that leaves only BDOS as the operating system portion actually belonging to Digital Research. So, if a programmer could write a clone of the BDOS (using different code which performs the same functions), he could produce a CP/M 2.2 clone. The package could also include clones of the various utilities normally included with CP/M, such as SUBMIT, ASM, LOAD, etc. Public-domain clones

of most of these [and other] utilities already exist. If this [proposal] sounds preposterous, consider that the ROM BIOS in every clone PC was produced by [someone] writing a BIOS which functions like IBM's but uses different code.

I realise that the "Z-System" operating system is available, but there are probably some users who might like the simplicity of the original CP/M. If I had the time, I'd try this project myself. From time to time we [at HUG] still get calls from people who've bought used H89s and are looking for CP/M for their machines. It would be nice if I could just send them a couple discs containing a functionally-identical clone.

PATRICK SWAYNE, HUG Software Engineer, P O Box 217, Benton Harbor, MI 49022-0217

[Hey Pat! You must have read Tom Rittenhouse's article back on page 2 before we received it here! Indeed, why not clone CP/M's BDOS?! It can't be more than a hundred lines or so of assembly code, judging by what authors Rick Swenton and L Van Hemelryck have written about "The Zees" in past JOURNALS. (Sigh!) Sure wish I knew more about assembly! C'mon, you language hackers! Write us a new H8/89/90 operating system, Real Soon Now! -- ed]

Dear Lenny,

Here's this month's Letter to The Editor (or The Ramblings of a Contented JOURNAL Subscriber):

Just finished reading the March JOURNAL and I must say I'm impressed. There's quite a bit of Good Stuff in that issue!

I too have observed that REMark and SEXTANT for some time have become less fat than they once were--not much fatter than many of the newsletters and not nearly as interesting, especially [because of the lack of] 8-bit machine articles.

But, a little while back someone said that it seemed that the Staunch 8/89er had all the How-2 articles and the SEBHC JOURNAL had the letters column. All I can say to that is, "Have you read the JOURNAL lately?" May be [lots] of letters but oh, what letters! Also there's lots of How-2 stuff.

Lenny, I hope you don't let John Brough get by with just mentioning the fact that he'd just assembled the Heath SK-203 [buffer kit] without letting us JOURNAL readers know about his experiences both in building it, and in hooking it up to a trusty ole H8 or H89! [Didja get that hint John?! -- ed]

I linked up with Micronics Technology's BBS the other day just to see what was there and mainly to get information on How-2 use the system. Didn't stay too long; long-distance phone call, y'know! I'm also interested in an HDOS modem program which supports XMODEM file transfers. I'll drop a note to Darrell asking if the program uses interrupts. If the program does let you use interrupts, which ones does it handle? I use ACCESS for CP/M and it uses interrupt 5; I'd hate to have to change the interrupt when using a modem program with HDOS. I prefer any program which don't require me to take a college course on how to use it!

On another note: I saw a note in the Staunch 8/89er that Mr William Lindley is updating his "Ultimate" and "UPC" drivers for HDOS 3. I'm using the Ultimate driver for my MPI printer, and as soon as I can I shall let him know that I'm interested in an upgrade for Ultimate. I think that all the JOURNAL's subscribers who use HDOS and have obtained a copy of HDOS 3 should support Mr Lindley in this [driver] and other endeavors. There are not very many programmers left who are willing to devote their time to writing HDOS programs.

As stated in the MAR-APR Staunch 8/89er, Bill needs INPUT from US, the bunch still using HDOS! I think it is very nice of Mr Lindley to make such an offer. I've done business with Lindley Systems for quite some time and I have been especially satisfied with their Ultimate driver for the MPI, and with their ribbon refills. But I did see in their latest catalog they no longer list the latter. I'll have to check directly and see if they're still available.

Be sure to let me know when you have the "next" HDOS Games Disc ready for sale, also the long-promised CP/M-80 Programmers' Helper Disc #0. (I've had a disc formatted and labeled "CP/M HELPER DISC" quite some time now.)

And here's how I feel about the possibility of there one day being a SEBHC PBBS (sounds nice, doesn't it?):

* I'm in favor of the JOURNAL running a bulletin board for subscribers only which provides "helping hand" information and services. I'd personally be willing to make a reasonable donation toward setting up such a PBBS.

* It would be nice to leave a "help needed" message on the board and find that someone had the answer to my problem, either through the board, or directly, instead of having to

More MAIL BOX

wait for the next JOURNAL to wash up with the tide. Having to wait weeks to find the solution to a problem is quite vexing.

* It also would be nice to be able to leave a private message to the JOURNAL's Editor, or just upload articles for him to review, or just to check out some possible 8-bit utilities for our computers. And sending program discs through the mail can sometimes be a pain. We all know about the horrible things which can (and do) happen to the data, and also know a disc can wind up on the bottom of the pile and not be found until some indefinite future date.

Yes, I support a subscriber-backed PBBS; in fact I have, ever since it was first hinted at in the JOURNAL. COUNT ME IN!!

ALLIE C LINGO, P O Box 118, Dierks, AR 71833-0118

[OK, You're IN! Right now I'm involved in repairing a rather decrepit 5MB hard disc I found in a pile of junk someone gave me to run on my "spare" 290. If it works, I may even be able to buy a copy of CP/M RBBS software through the good offices of D:KUG's Gus Bakalis (he puts out the D:KUG.DOC, Detroit Kaypro User's Group newsletter). D:KUG has their own PBBS up & running with this software and are doing essentially what Rick Swenton is with his Connecticut PBBS and what you've suggested. I have all necessary hard-disc software and the interface diagram for a card to mount in the H/ZB9/-90's right-most slot (usually occupied by the H17 driver card). It's quite a simple card with just 4 ICs, a filter capacitor, two resistors, one pre-comp mica capacitor, three bypass capacitors and a diode on it. I have most of the other necessary parts in my junk box--wirewrap sockets, mm-tool and perfboard! I don't think it'll take me "more'n a couple days" to get a clone of that interface card up and running. Maybe more good news in our next edition (I hope)! -- ed]

Dear Len,

Thanks for all the much-needed help in installing an 80trk Livingston BIOS. Assuming I understand you correctly, if the half-height 80trk ds drive is paired with my 40trk ss drive, I'll be able to boot it with the CP/M-80 disc you created even though it is a 40trk disc. I also assume I can read but not write to 40-track discs in the 80trk ds drive.

My CP/M system distribution disc is booting and reading [sic] 40trk ss discs. Since my [CalDigital] 80trk system disc hasn't been configured for two drives, I assume I will not be able to transfer files between discs until the original disc has been reconfigured (MOVCPM?).

The PC-XT 5-1/4" floppy is a 40trk ds drive. These drives are inexpensive and readily available. Can this drive be used instead of the ss drive to read and write hard-sector discs with hard-sector discs and the H17 controller?

ANTHONY P MUSNICK, P O Box 136, Broomall, PA 19008

[Heck, yes! Just dismount the old drive, remove the laminated drive shield and steel housing, put the two new drives side-by-side and measure the mounting-hole spacings. Transfer those measurements to the '89's drive-mounting housing and laminated shield, prick-punch and drill the two necessary extra holes, buy a power cable "wye" adaptor plus an extra 34-conductor-ribbon/card-edge connector and fix it onto the existing 34-conductor drive cable about 2-inches from the present connector. (Use a machinist's vise to squeeze connectors onto the ribbon cables; a special connector tool costs about \$15!) Now put everything back together. Be careful that you set the left-hand drive's program plug with position 3 shorted (makes that drive zero) and the right-hand (80trk) with position 2 shorted. The HS spot should also be shorted on both drives and there should be only ONE terminating resistor pack present on the drive at the ribbon cable's end, NONE in the other drive. Good luck! -- ed]

Hi, Len--

Thanks for another interesting and helpful SEBHC JOURNAL issue. I received it on 2-Apr-89.

I'm very interested in the CRYPT program Jack Wirt sent you and the source for HDOS 2.0 on disc from Bob Olson. I also wrote Robert Swanson to inform him that I have an extra copy of the MBASIC compiler he's looking for. It's great the way you tie the [H/Z] 8-bit community together.

Some want ads are enclosed. I hope you can squeeze them into the April edition.

TERRY HALL, 516 East Wakeman, Wheaton, IL 60187; 312-665-4594

[Glad to be of help, Terry! Your want ads follow "LETTERS". -- ed]

Dear Mr Hansen:

Thank you, thank you, thank you!! In response to my letter in the JOURNAL III:6, p8 concerning horizontal jitters at sign-on, I followed your suggestions to remove the two orange wires between BR101 lugs 2 & 4 and plug P103 pins 1 & 3 on the power-supply printed circuit card. I then followed your directions to remove the two yellow wires coming from the power transformer to P101 and solder them directly to BR101 pins 2 & 4.

I checked if the plugs and connectors on the power supply video circuit board were discoloured or burned. They looked ok so I just made sure they were all well reseated. Also I rocked the two 8-pin ICs on the video board back and forth and reseated them. The jitter problem has disappeared!

Thanks also to Bob Olson, JOURNAL III:7, p10 for the HDOS patches for new members and those others of us too scared to mess with HDOS patches the first time around back in the early '80s. Re-indexing all those years of REMark and Sextant is a time-consuming process, and we have more assurance that suggestions [printed in them] will now really work since you "old timers" have worked out the bugs. Also

SEBHC JOURNAL

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MAIL BOX [EOF] - WANT ADS

thanks for your response to my "P.S." in JOURNAL III:5, p5. You provided me with exactly the information I needed to use a Panasonic Penwriter RK-P400 as a printer. It really flies now, after a year of previous frustrations and bad advice!

Thanks to the JOURNAL and its' readers for "sharing the wealth"!

HAROLD W BRETZ, 1215 E Castle Avenue, Indianapolis, IN 46227

[Hey, Hal! You're welcome! Also, thanks to Brian and Bob from your frazzled -- ed!]

Dear Mr Geisler,

Just received the March edition. Hope my note on PREL is understandable as I'm not too good (and rather slow) at writing things.

As you suggested, I did check my mailing label: enclosed is a cheque for another year's subscription. For some reason --probably a couple of snowstorms with which this area does not cope too well--I didn't get the February edition (III:7). Can you mail me a duplicate?

I shall keep you informed if anything important develops out here.

L VAN HEMELRYCK, 16514 14th Ave SE, Mill Creek, WA 98012

[Hey, L-V, I meant for you to notice that I'd reimbursed you for the PREL article with a year FREE extension to your subscription! So now you have that year, plus the year you've paid for. And the replacement issue is "in the mail". Don't worry about not writing well. I didn't have any trouble understanding your article, but I did fix it some to make it a little more easy reading. That's what us editors exist for! (Sigh...) It's no easy life, but it's v-e-r-r-y interesting. So when are you sending us another article?! -- ed]

Dear Lenny,

I've been so busy lately that I'd almost forgotten to renew my JOURNAL subscription. That would be unforgivable.

The February edition contained some pretty heavy stuff, especially the intra-subscriber correspondence. I must say though that I understood more of the letter than I thought I would. It pays to read the SEBHC JOURNAL.

You may note on my renewal form that I now have a 2159 and am running MS-DOS 3.21 on it. It's dedicated solely to business use. But just because I have a "messy-dos" computer doesn't automatically mean that I'm going to junk my trusty ole '89 (or CP/M, HDOS 2 & 3). It still has its' spot in my computer shack, and I intend to use it daily until it turns into a pile of dust!

You're doing a fine job with the JOURNAL, and in this year of the '89 I wish you both much success.

ALLIE C LINGO, P O Box 118, Dierks, AR 71833-0118

[Thanks Allie for the good wishes! Did you notice that you are now an Associate Editor? I also extended your subscription by two years (one plus the one you'd paid for) because of those "donated" 3 HDOS-3.0 discs and for the articles you've submitted. Now when are you sending us "How-2 Happily Run HDOS 3.0"? -- ed]

Dear Lenny,

Saw my letter and your reply in the Dec JOURNAL and should have written sooner but have been busy at work going to Educational Computer Conferences. Our workplace has moved and had to be set up again. Still haven't received Vol III:1 nor the Vol II backissue set I'd ordered. [OOPS! -- ed]

Brian Hansen wrote about my H89 troubles but again haven't had time to delve into it. I also have bad QRM from my H89--it's one of the earliest models. Sits about 14 feet from my TV and about the same distance in another direction from my HF and VHF receivers. They are also affected by '89 QRM. Can you help? (This could be a good subject for an article about the problem and possible cures!)

ROBERT W SLOAT, K4VGN, P O Box 1319, Ft Meyers, FL 33902-1319

[Bob, your back issues will be there long before you read this--I've been busy too! Regarding your '89 QRM generator, I had a similar problem with my H8's antique H19 terminal but fixed that with one capacitor change on the video board and a home-brew a-c line filter. Still have trouble with both my H8 and H89 radiating noise from the "shielded" serial port I/O cables on FM and local TV channels two and 4. (Try pulling them and see if it temporarily helps yours.) The QRM seriously louses up my Heathkit SW7800's shortwave reception. I've been trying to find time to fix this on my '89 and maybe can put something into our next edition... -- ed]

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- 1 - D-G Super-89 manuals, LLL HDOS software, spare parts, D-G heartbeat cabinets. Have 4 D-G boards without documentation!
- 2 - Internal REMEX and CORVUS hard-disc interface cables.
- 3 - H47 HDOS driver for the Magnolia interface card.
- 4 - Expansion board and HDOS software for a CDR RAMdisk.
- 5 - HDOS software for Magnolia 128k card.

Write/call TONY VENTICINQUE, 536 Redwood Road, Bolingbrook IL 60439; (312-353-8798 only after 6pm CST, please)

+++++

- 1 - Installed a MAKO H89 buss expander & I NEED HELP making a new CP/M 2.2 BIOS to recognise my 2-drive H47 at port 030!

- 2 - FOR SALE: Z25 printer, good working condition, serial I/O cable, all manuals & several new ribbons. \$200 plus shipping or best offer.

- 3 - FOR SALE CHEAP: Lots of Really Neat Heath software, etc. Write/call TERRY HALL, 516 E Wakeman, Wheaton IL 60187; 312-665-4594.

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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/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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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).

* Subscriptions: \$17.50/year in Canada, Mexico, USA and its' possessions. FIRST CLASS and FOREIGN are US\$25/year. Subscriptions start the month following order receipt. PLEASE MAKE CHEQUES or MONEY ORDERS PAYABLE TO L E GEISLER, NOT "the JOURNAL" or "SEBHC". Single back-issue copies are available at \$2.50 each. See order blank for bound volume discounts.

* Subscribers are automatically Society of Eight-Bit Heath Computerists members. Member's subscription number and expiration follows their name on mailing label. The three member classes are: REGULAR (voting H/Z 8-bit user) ADVERTISING (one vote/vendor) and ASSOCIATE (non-8-bit computerist, library, etc.). REGULAR members can hold any elective Society office. ASSOCIATE members cannot hold office or vote. The Society's official yearly meeting place and time is announced every July in the JOURNAL. Advance registration of US\$25 for each attendee is required by May first, please.

* All advertising is printed Free Of Charge. Vendors: Please do submit your B&W "camera-ready" ad copy, 7" w x 9" h (1 page to an issue) no later than the 10th of month in which it's scheduled to appear. All Society members can run one new free 250-word (maximum) Unclassified Want Ad every month.

* All subscribers/members are urged to submit their H/Z-oriented computer articles on disc in standard ASCII format rather than as hard copy. If a word needs to be emphasised or italicised please insert these symbols PRECEDING the word: [EMPH] for emphasise, [ITAL] for italics. We'll return your disc after copying it and will gladly copy any SEBHC JOURNAL software disc onto it. Note: We can't pay authors but we do extend their subscription another year for a published article.

* 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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