



A Professional Journal Exclusively for the Heath/Zenith Z-100 Computer

Z-100 LifeLine Web Site: <https://z100lifeline.swvagts.com>

*Merry Christmas*

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### HOWGOZIT

Merry Christmas! This issue has two inserts that have nothing to do with the Z-100, though one is a fix to an oscilloscope that I thought you might like and the other is a repair to my Remington chainsaw that I thought was valuable enough to warrant publishing here.

Personally, I've been kept very busy. Fall around here is always a busy time. But, then I got a gift of an old HP Presario laptop from a neighbor that she thought I could use. Never one to turn down a free electronics toy, I decided to play with it. See the next article, "Presario Notebook Escape".

While this was going on, I heard from another friend that wanted to upgrade his newly acquired Z-100 computer and was having difficulty getting his "IDE Controller" to work. He shipped me his Controller with the request that I check it out.

What I received was a generic S-100 bus IDE controller that I had bought from **s100computers.com** and shared with another friend many years ago with the hope of finally getting help making it work on the Z-100 under CP/M. Time and other projects, however, caught both of us and we never did get to work on that project.

What a complete surprise! I had never thought I would see that board again, but here it was. I arranged to keep this board (with the hope that someone will eventually help with the CP/M project), and sold him our Z-100 Lifeline IDE Controller Board at a discount in its place.

### Compaq Presario Escape

As I already mentioned, I received a gift of an old HP Presario laptop from a neighbor that she thought I could use.

So, as an escape from the humdrum fall chores, I thought I would use the notebook as a spare for my present Internet Desktop that I use for all my email, website maintenance, and internet business. All my other computers were too old to do this and if this one failed suddenly, I would need to purchase another. Here we had a free late model, gently used, computer that could be a quick replacement if I set it up correctly.

What should have taken a few hours of effort for a computer literate person, quickly consumed weeks of mental work and frustration...

Running Windows Vista, it really was not old by my standards. But the best part was that it had wireless capability for our Wi-Fi, though for some reason, it would not recognize my router.

Now, you must recognize that my knowledge of Windows and PCs is extremely limited, and it is very easy for me to screw things up royally.

Anyway, I set about deleting all the garbage files and applications it had accrued over the years, but the wireless capability was lost about the time I was removing everything, then installing Chrome and Norton Security. Thinking that I somehow deleted its driver, I spent weeks trying to troubleshoot and recover the wireless capability.

I purchased another LAN card from E-bay, but this computer has a physical orange button on the keyboard that is supposed to turn blue to show the wireless capability is ON. If I held the switch, the LAN detected my Wi-Fi, but when I released the button, it turned off again.

Then I made the **BIG** mistake of doing a system recovery! I thought it would reload the computer back to its factory fresh condition. Well..., it did.

The hard drive was wiped clean and Windows Vista was reloaded - along with the factory-loaded bloat-ware. The wireless button still would not work and this was the original, old version of Windows Vista and Internet Explorer.

I could use an ethernet cable to connect to the router, so I attempted a Windows upgrade, but the older Internet Explorer was nearly worthless on the internet. I could not do an Internet Explorer upgrade, Windows upgrade, or even download Chrome or Firefox!

Fortunately, Ebay had several persons selling the same model computer, used, with Windows 10 installed. And the prices were outstanding. But, seeing that Windows 10 could be successfully loaded on this computer by using a USB Flash Drive, I decided to try going that route.

I bought a license key and downloaded Windows 10 Pro. Then I copied it to a USB Flash Drive. I was fully expecting a nice clean Win10 install. NOT.

The installation bogged down with 'OOBExxxx' errors, where the x's were any of the Keyboard, Region, or other error versions. According to the web, this was not a problem with hardware, but it was a problem with the Windows install software. There were several fixes to try and I tried them all, but to no avail.

Finally, I repeated the process with Windows 7 Ultimate; bought a license key and programmed the USB Flash Drive with it. This worked GREAT! The only downside was that the wireless button was still inoperative.

Further complications quickly became apparent. When I attempted to download and install Chrome, or when I tried to install Norton Security, both reported that they could NOT run on this version of Windows! Supposedly, they do work with Win7 (with service pack 2). Yet, the Ultimate version has considerably more capability than the plain Win7! It just did not have updates?

Again, I looked at the E-bay listings, and they grew more impressive by the day as I was trying to sort out the above issues.

I finally broke down and ordered one of the same model notebook computers, with Win10Pro and a normal hard drive, but without a battery, and it

reportedly had a loose screen hinge and sticky left button on the touch pad.

When it came, its condition was as advertised, and the Win10Pro was a clean install. Other than that, it worked perfectly and had wireless capability. I programmed it as needed for a spare.

Finally, I took both Presario notebooks apart. I found that the loose screen hinge was simply two loose screws and I swapped the motherboard and base to fix the wireless issue on the original. I now have the original Presario with Win10Pro and working wireless capability.

Next? Well, I have always wanted to play games between multiple computers. I have written several LifeLine articles addressing that very desire, using two Z-100's. I hope to be able to connect the two laptops together to try playing Scrabble. As there is limited discussion on how to do this on the internet, you may see a future article here, next time.

### Z-100 LifeLine Projects

I've been told that a bug has been found somewhere that interferes with the display of lines on the screen if lines are 80 characters or longer. As it turns out, if you run SETLPS 24 twice, the problem goes away.

However, this brought back memories of all the projects that I have put off with the hope they could eventually be addressed and fixed. So, I went back several years and retrieved issues that I am still aware of needing to be done and am listing them here in the event one of you is looking for a Z-100 project for the winter.

Back in 2007 our software guru, John Beyers, apparently decided to move on to other things. This left us to finish the IDE project on our own and thankfully everything proceeded fine. However, we are still looking for a replacement software programmer. Though the pay is non-existent, the hours are very flexible. If you are interested, please give me a shout.

Many of these issues were given in greater detail in issue #113 in 2008. In no particular order, future projects still include:

- \* Changing CP/M and PC-DOS software to accommodate the newer IDE Controller, 3.5" floppies and IDE devices.

- \* Generate (disassemble) the source code for our latest ZROM chip.

- \* We still rely on the free version of FDISK to prepare our IDE devices on a PC before using them in the Z-100. We need a similar utility to run on the Z-100.

\* For those who like numerous partitions on their IDE device, it would be great if we could have a partition listing utility similar to ZDIR, which lists directories and files. It is difficult keeping track of all those drive letters and what files are on each.

\* DIAG, the disk-based diagnostics, is still the same old original set of utilities. It should be updated to include 3.5" drives, IDE board tests, and other capabilities. John had just started updating these when he left.

\* When copying files from a Windows PC to a Z-100 floppy disk, the PC creates additional labels on the disk to store the longer, Windows filename characters and other information. These appear as additional volume names that are not recognized by DOS and hence cannot be removed by the normal Z-100 DOS utilities.

\* ALSO, **AS A REMINDER**, do NOT place a Z-100 bootable disk in a PC. Windows messes with the boot code area of a Z-100 diskette, corrupting any boot code that may have been there. Windows now writes a unique 8 byte disk ID to the boot loader on sector 0 of floppy disks. For more information see the article: "Danger! - Understanding Disk Volume Tracking in Windows" in issue #84 of the "Z-100 LifeLine".

\* While attempting to compile my ZBASIC RATMAZE game, described in issue #117, I found that the ZBASIC compiler ignores the ESCape codes, CHR\$(27), used very extensively in the program. The problem is described in great detail in that same issue.

Again, if you have any interest in investigating any of these issues, just drop me a line.

### Last Z-100 LifeLine IDE Controller!

I am out of spare Z-100 LifeLine IDE Controller boards! If you were one of those sitting on the fence, I am indeed sorry, but I had put out many reminders that I was running low.

So, the time has come to decide if we want more. I have not checked yet about buying more boards from Sunstone Circuits - we last ordered them in August 2007, and I am sure that they have changed their facilities by now - if they are even still in business.

There are two critical parts that we would need. I have 13 of the NVSRAMs, when I bought the last of the stock last year at a reasonable price. So it would be nice to use about half of them and leave the rest as spares.

However, the \$17.00 Altera EPM7064SLC84-10 chips that we used are now obsolete - though still available when I checked it out last month. There were 3 available from Arrow Electronics for \$67.20 each! They also sold the newer 10N

chips for \$58.65 each with 10,000 available. Ebay also still has them for much less; some new, some used.

That left a few questions for Charles Hett:

- Are these Altera chips considered completely reprogrammable, or are there some limitations?

- Should I just consider the newer 10N chips at the higher price?

- Do you still have the capability to reprogram these chips?

If I could go used, I would want extra spares, in case of reprogramming difficulties, but that would still be cheaper than \$60. each (+ship).

Charles responded:

*"According to the Altera data sheet, the chips can be programmed 100 times. I don't think I ever programmed one more than 20 or so during development. So take your chances if buying used but it is probably a good bet they would still have some life left.*

*I was not able to determine the difference between the -10 and -10N parts. Are they just newer? Maybe a new design with the same features? I'll try to find out more. It would probably be a good idea to buy just one to try before going too far.*

*I THINK I still have the ability to program but have not verified it. I have three chips in use and three spares already programmed. I have the home made programmer and the old Altera programming software on my XP computer. It loads the necessary file to be programmed and seems ready to go but I have not taken the step to hook up the programmer. I think it should work though."*

My other thought is to offer a buy back plan for the mostly needed Z-100 parts and upgrades. While I NEVER heard a complaint about any operational problems with our IDE Controller Boards (congratulations on our GREAT work?), I am sure that there are computers out there no longer used and being sold on Ebay for a lot less than I would be willing to pay for some of the upgraded or needed boards.

So, I am thinking of offering about 50-60% back, off my current sale prices, for things like our IDE & SCSI Controllers, including the CF drives and adapters, Floppy cards (short in supply, but a MUST have for EVERY Z-100), Gemini Boards, Motherboards, and the like.

While there was a huge lull in sales after the initial IDE Controller shipment, the last few

years I sold about 1 per year to individuals that just obtained a Z-100 and wanted to upgrade it from floppies. The IDE Controller is really the BEST alternative to floppy operation.

So, I put the questions to you, the reader, and how you feel we should proceed. I would love to hear your thoughts and preferences. Please drop me a line if you have any desire - but there is no commitment for you to buy.

I constructed and bought a couple of ZCLK2 boards, but have **not sold any**. I can not afford to sink a lot of money on additional IDE Controller boards if there is no further interest. If there is sufficient interest - say five or six? - I will check further and price them out for you.

### Reprogramming the IDE NVsRAM

**"EEPROM is Corrupt!"** What a dreaded error message. It has the same affect as the IBM PC's 'Blue Screen of Death' but in the Z-100 world. But it should not have. It is actually quite common, but is also easy enough to fix.

The most common cause is that you tried placing the NVsRAM in program mode during Bootup.

Back in issue #132 I wrote the article "*IDE Controller Refresher*" that discussed the easy method of reprogramming the IDE Controller's NVsRAM. Briefly, it involved using the EPTEST.DAT file and the command EPWRFILE and a bootable floppy drive or hard drive, other than the standard 5" 48tpi drive that is **not** big enough to include the EPTEST.DAT file (524Kb) necessary to use those procedures. It also mentioned that the EPWRFILE.COM and EPTEST.DAT files could NOT be located on the NVsRAM nor on the IDE device, but had to use a floppy large enough to hold those files, or use another hard drive. And it encouraged creating an emergency floppy or hard drive directory just for reprogramming the NVsRAM, if necessary.

Well, what about those that only have the standard 5" 48tpi floppy drives? Are they left out? Not at all. Further, anyone wishing to change the default programming of the NVsRAM would need to run these same procedures.

The following procedures are easy, but just a bit more involved. Briefly, it involves placing the NVsRAM (EEPROM) in programming mode during bootup. Then we run a batch file, EPROMPGM.BAT, which will reload or copy all the files from a floppy or a special IDE directory to the NVsRAM and finally run the CHKSUMEP.EXE utility to finish the process by generating a new NVsRAM checksum.

Placing the NVsRAM in programming mode is easy. During the 3 second pause before loading the default CONFIG.SYS while booting up, you can

press any key to interrupt the boot process and load a special CONFIG.SYS subroutine. In this case, pressing the {P} key places the NVsRAM in WRITE (or programming) mode.

Please note, however, that any time the NVsRAM is placed in programming mode, the present NVsRAM programming becomes void. During the next bootup, the **"EEPROM is Corrupt"** message will appear. So, once placed in program mode, we must continue with the reprogramming or the NVsRAM will be unable to boot.

Let's cover the details here:

**Note:** The following procedures assume that we need to program the NVsRAM from a floppy drive. However, all the IDE devices that I prepared for users when they purchased the IDE Controller have an IDE partition that contains **ALL** the programming options included.

Locate and note the drive letter of the IDE partition **ZDOS4**. It contains, among other things, 2 directories, **EEPROM0** and **EEPROM1**, or similar. EEPROM0 is for those systems that have no MFM hard drives. The EEPROM1 directory contains the programming that will check for MFM drives and prepare for their use. You can copy the EPTEST.DAT file to any floppy large enough to contain it, or run the following EPROMPGM.BAT procedures from this partition (After booting from the floppy drive and putting the NVsRAM in programming mode, change the default drive letter to this IDE partition, then make that partition the default with the command **CD EEPROM0**).

1. During bootup to a floppy drive (5" or other) containing ZDOS4, at the 3 second pause before loading CONFIG.SYS, press any key to interrupt the boot process, then press the {P} key to enter Program mode.

2. The boot will continue as normal, but the EEPROM will now be listed twice; the normal "EEPROM on IDE LifeLine Board" listing, and another "512K EPROMDSK/Clock (programming) listing. **Note the drive letter of this last ... (programming) listing!**

3. Any IDE drive letters will slide down to the next successive drive letters.

For example, if the EEPROM device is normally drive E: and the IDE drive partitions are normally listed as drives F:, G: and H: (for 3 partitions), drive F: would now become the EEPROM in Programming Mode, and the IDE partitions become G:, H: and I:.

At this point the NVsRAM checksum changes and the NVsRAM programming is corrupted. However, all the present NVsRAM programming is still intact! You can run ZDIR on the EEPROM's drive letter to confirm.

So, if necessary, you could still copy all the contents of the NVsRAM to a bootable 5" floppy! This also means that if you had never made an emergency ZDOS4 floppy disk, you could still make it now!

To make an emergency ZDOS4 floppy disk:

- a. Make the EEPROM the default drive (the original drive letter E: in this example).
- b. Replace the boot disk with a new floppy.
- c. Run **FORMAT A:/s/v**.
- d. Copy all the files from the EEPROM to the floppy disk.
- e. Return to the floppy drive as the default drive (**A:**).
- f. Remember to run the **FLAGS** command on the system files to remove their flags:  
**FLAGS \*.SYS /**

4. **Now is the time to make any changes to the files on the floppy drive** OR, if planning to reprogram from an IDE partition, make the changes in the appropriate IDE partition).

a. Need to change the drive configuration? Run **DRIVECFG** to add, delete or change the drives as necessary. This will update the IO.SYS file with the new drive configuration.

b. Need to add a utility to the NVsRAM? Using your favorite text editor or EDLIN, change the batch file EPROMPGM.BAT to add or delete files as necessary.

c. Need to remove any files from the NVsRAM? The batch file will **not** delete the existing files on the NVsRAM. You either need to add the delete command to the EPROMPGM.BAT file or delete the existing file(s) on the NVsRAM yourself. Just make sure you are using the correct drive letter for (EPROM programming)!

5. When complete and ready to proceed, type the command **EPROMPGM X** (where X is the drive letter (F: on mine) for the NVsRAM in programming mode) and press **{RETURN}**.

6. An opening warning will appear asking to confirm the programming drive letter of the NVsRAM. Press **{CTRL}-{C}** to exit or any other key, such as **{RETURN}** to continue.

7. The batch file will copy all the files to the NVsRAM and at the end will run the CHKSUMEP utility. The NVsRAM has been reprogrammed per your desires.

8. Reboot to the NVsRAM with the command **{B}oot{F4}{S}** to check your work.

9. Remember to save the new NVsRAM programming to the appropriate files in your IDE drive or Compact Flash card partitions.

a. Locate the appropriate EEPROM0 or EEPROM1 directories in the IDE ZDOS4 partition and make it the default partition.

b. Run the command **EPRDFILE** to update the EPTEST.DAT file with the new NVsRAM image.

c. COPY this new EPTEST.DAT file to the IDE DATA partition, as backup copies.

d. Run **FC** between the various copies to ensure the backup copies are all the same.

### Closing

Don't let Covid ruin your holiday plans, but please do be safe and take no unnecessary chances. We wish you and your families all the best for a fantastic holiday season and pray that next year will be healthier for all of us. Keep your families safe and get vaccinated as soon as you can.

'Til next time,  
happy computing!

Cheers!!!




### Z-100 LIFELINE

*Supporting the H/Z-100 Community Since 1989*

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