IMSAI FP trouble with Cromemco ZPU

Hello,

I'm having a little trouble getting a Cromemco ZPU card working in my IMSAI 8080. The original MPU-A card works just fine. The ZPU works in a limited way, but front panel operations only work for a couple of cycles after a reset. In other words, after RESET, you can do a couple of EXAMINE/EXAMINE NEXT/DEPOSIT/DEPOSIT NEXT successfully, then they stop working. I believe the FP has all the recommended mods. And it doesn't matter what other cards are installed, or not installed.

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If I have valid code at the ZPU's POJ address, it will run just fine if I enable automatic jump and use RESET then RUN.

This is exactly how it always behaves, not just sometimes. And it does this whether set to 2 MHz or 4 MHz. None of the wait state options change this behavior, either.

According to the ZPU manual, you didn't need to do anything special to use this card in an IMSAI. I would suspect the ZPU, but I have a second card and it behaves exactly the same way. So it's most likely something with the FP, but that works fine with the MPU card. So I'm a bit puzzled here. Hopefully one of you can help.

Thanks,

Denver



Reply

denverh (8) 11/27/2006 9:31:37 PM


"Denver Hull" <denverh@comcast.net> wrote in message news:4PednZsbJs2nxPbYnZ2dnUVZ_rednZ2d@comcast.com...
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-J

-John

 0   Reply  **John** 11/27/2006 11:08:26 PM 

It's a variety of timing issues. First, of course, the front panel was
designed for the CP-A, which aside from being an 8080, runs at 2MHz.
But the ZPU can run at 4Mhz (and usually does in most people's systems).
You may find that if you run it at 2MHz, the problems go away.

Second, in some cases hand selection of some of the chips on the CP-A
was necessary to make the board compatible with the ZPU.

Also, some of the operations are controlled by one-shots whose timing
was controlled by capacitors with a wide tolerance. Selection of the
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It is possible to get a CP-A that works with a ZPU, but it's not
automatic. The design of the CP-A was quite marginal.

Actually, there are worse problems (FAR worse) getting a CP-A and a
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0 Reply WatzmanNOSPAM (5711) 11/28/2006 12:12:37 AM

John Crane wrote:

>"Denver Hull" <denverh@comcast.net> wrote in message
>news:4PednZsbJs2nxPbYnZ2dnUVZ_rednZ2d@comcast.com...
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>-J
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RAM cards installed, so I don't think they're a factor. I believe the
document you pointed to is the one I used a while back to make sure the
FP was up to date, but I can certainly check again.

Thanks,

Denver

0 Reply denverh (8) 11/28/2006 3:52:56 AM

Barry Watzman wrote:

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> was designed for the CP-A, which aside from being an 8080, runs at
> 2MHz. But the ZPU can run at 4Mhz (and usually does in most people's
> systems). You may find that if you run it at 2MHz, the problems go away.

No, it behaves _exactly_ the same way running 2 MHz as it does at 4
MHz. It also behaves _exactly_ the same way when I take out all boards
except the FP and the ZPU.

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> Second, in some cases hand selection of some of the chips on the CP-A
> was necessary to make the board compatible with the ZPU.

Any suggestions about which ones, or what to look for?

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> Also, some of the operations are controlled by one-shots whose timing
> was controlled by capacitors with a wide tolerance. Selection of the
> capacitors can also make the CP-A work or not work.

So I have heard, but then I would almost expect some functions to work
(or not work) one way, others another. In this case, all functions
(mis)behave exactly the same way. On top of that, they all always work
twice after a RESET, then misbehave. I can do a RESET, then an EXAMINE
followed by a DEPOSIT or EXAMINE NEXT, and those two work. After that
they don't - until I RESET again. I don't see any connection between
the one-shots on the FP and the RESET switch. I admit that the
one-shots are a possability, but it doesn't sound likely.

Any ideas about what the timings should be, in case I want to persue that?

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> It is possible to get a CP-A that works with a ZPU, but it's not

> automatic. The design of the CP-A was quite marginal.
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> Actually, there are worse problems (FAR worse) getting a CP-A and a
> 16FDC to work together. By default, they don't. At all, ever.

I've heard that, too. Fortunately, I'm not trying to use a 16FDC, so
I'm not going to worry about that one.

Thanks,

Denver



Reply

denverh (8) 11/28/2006 4:05:11 AM


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> was up to date, but I can certainly check again.
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> Thanks,
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> Denver

Denver,

I pulled the memory card when I ran the test, as I tried to duplicate your
test conditions.

The text: "some RAM cards still don't play well with it" refers to RAM
cards not playing well with the front panel, not the ZPU. Sorry about the
confusion.

I mentioned RAM cards because it's the only known incompatibility with my
system when running normally. In particular, later cards don't work with
the FP. I normally run with the ZPU, a Compupro RAM17, an IMSAI SIO serial
card, and a Cromemco 16KPR holding my monitor in EPROM. In this setup, the
FP is useless - although power on jump gets me to the monitor. But if I
swap out the RAM17 for an earlier card - like a genuine IMSAI 4K, the FP
works. Ive done the CPA (FP) ECO for the "non IMSAI" memory cards, to no
avail. I suspect the problem is due to a difference between the
"Altair/IMSAI" bus and the IEEE 696 bus standard. I just haven't had the
time (or desire) to pull it all apart again as it does work for what I need.

With regard to the other thread about one shots - this is true, they can get
flakey. It may be that the waveforms generated are just within tolerance of
the 8080 mpu, but cause problems with the Z80. It may save time to just
replace components on the FP. 74xx chips and caps are cheap - much cheaper
than you spending days scratching your head.

-J

-J

0 Reply John 11/28/2006 7:18:34 AM

Denver Hull wrote:
<snip>
> Thanks,
>
> Denver

Hi Denver,

Looking at the address the Z80 jumps to, 0x0066, I would especially check the wiring of the Z80 NMI line.

0x0066 is the NMI restart address. Perhaps it sees an NMI.

Regards,
Hans Bus

0 Reply thisis (6) 11/28/2006 8:13:35 AM

Hi,

I run a CPA and ZPU together with no issues... along with CompuPro Disk 1 + Ram17.

I started with an unmodified CPA, did some but not all the mods. I also had to modify the ZPU since only one card should be generating the Mwrite signal, and that card should be the CPA. Make sure to mod the ZPU to not generate Mwrite... I lifted a pin on one of the chips.

~ J

Denver Hull wrote:
> I'm having a little trouble getting a Cromemco ZPU card working in my
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0 Reply jsnospam (141) 11/28/2006 4:17:04 PM

Hans Bus wrote:

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Hah! That was the clue! One of the FP mods, for MPU-B compatibility, calls for a connection between S-100 bus pins 3 and 12. That ends up connecting XRDY (FP processor control) to the ZPU NMI input. The MPU-A doesn't use pin 12, so it didn't bother that card, but it sure made the ZPU act strange. Of course this mod is under the switch support bar, so it's hard to see, and harder to get at. But I took it out, and everything works just fine now.

Thanks all,

Denver

jsnospam@cimmeri.com wrote:

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>Mwrite signal, and that card should be the CPA. Make sure to mod the
>ZPU to not generate Mwrite... I lifted a pin on one of the chips.
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"Some but not all the modes" is significant. As it happened, the mod for MPU-B was installed, which connected XRDY to the ZPU NMI. After I removed that one, things improved dramatically.

I'll check that MWRITE signal though. That's a good tip.

Thanks,

Denver