

Re: 8088 vs. 80c88?

Source: <http://coding.derkeiler.com/Archive/Assembler/comp.lang.asm.x86/2009-02/msg00045.html>

- *From:* "Rod Pemberton" <spamtrap@xxxxxxxxxxx>
 - *Date:* Thu, 12 Feb 2009 04:13:06 -0500
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"Jim Leonard" <spamtrap@xxxxxxxxxxx> wrote in message
news:688e017a-5739-4334-b149-d16a710229ed@xx

I posted this in another forum but didn't hear back; I think this is a better group suited to this question anyway:

I was always under the impression that when Intel moved to a CMOS manufacturing process for the 8088/8086, they fixed a bug regarding a repeated LODSB with a segment override — that the REP prefix was ignored (bug) in the old 8088s, and was honored (correctly) in the newer chips. So a simple routine to try to identify the 8088 vs. the 80c88 would look something like:

```
mov cx,2 ; test if following instruction will be
; repeated twice.
db 0F3h,26h,0ACh ; rep es: lodsb
jcxz Yes ; intel non-CMOS chips do not care of rep
jmp Nope ; before segment prefix override, NEC and
; CMOS-tech ones does.
```

If I run this on my 5150 with (C)1978 8088, I see the bug (cx does not update). If I run this on my 5160 with "80c88" printed on the chip, I do not see the bug (cx goes to 0). So all is well, right?

The immediate link below might be of interest to you. It uses a very similar method but different to detect NMOS vs. CMOS 808x. The comments indicate that the "rep es" on "movsb" must be interrupted by an interrupt. The NMOS version supposedly will fail to resume after the interrupt. That seems to be why cx is large.

This link lists ability to detect 8088(NMOS), 8086(NMOS), 8088(CMOS), 8086(CMOS), NEC V20, NEC V30, 80188, 80186, 80286, 80386+:
<http://groups.google.com/group/comp.lang.asm.x86/msg/5d3a43fae26697df>

Well, I use this routine in a detection library for a project I recently completed(*) and someone is claiming that the code is

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broken. It reports an 80c88 when the chip is *not* marked 80c88, but rather "8088 (C) 1983 Intel". So what's going on? Is the chip from 1983 actually an 80c88, since it doesn't have the bug? Or did Intel fix the bug before moving to a CMOS manufacturing process?

(*) project is a CGA compatibility testing program; you can grab it from www.oldschool.org/pc/cgacomp

Well, let's take a look at some of the cpu images in cpu collections and see if we can find one marked "8088 (C) 1983 Intel" or "8086 (C) 1983 Intel":

28 8088 cpu images here, none marked as he/she indicated:

<http://www.cpushack.com/chippics/Intel/808x/8088/>

16 8086 cpu images here, none marked as indicated:

<http://www.cpushack.com/chippics/Intel/808x/8086/>

4 8088 cpu images here, none marked as he/she indicated:

<http://www.cpu-collection.de/?tn=0&l0=co&l1=Intel&l2=8088>

3 8086 cpu images here, none marked as he/she indicated:

<http://www.cpu-collection.de/?tn=0&l0=co&l1=Intel&l2=8086>

1 8088 cpu images here, none marked as he/she indicated:

<http://www.cpu-collector.com/menu/searchresults/record/158.htm>

1 8086 cpu images here, none marked as he/she indicated:

<http://www.cpu-collector.com/menu/searchresults/record/157.htm>

1 Intel 8086 and 9 other manufacturer 8086 cpu images here, none marked as he/she indicated:

<http://www.cpu-world.com/CPU/8086/index.html>

1 Intel 8088 and 8 other manufacturer 8088 cpu images here, none marked as he/she indicated:

<http://www.cpu-world.com/CPU/8088/index.html>

Well, we didn't find one. Rare cpu? Um, so I guess you get to tell him the copyright symbol (C) is actually for CMOS for those who know how to read the fine print, wink... ;-) Seriously, are you sure he wasn't looking at a BIOS ROM or some other chip in the PC? Interestingly, except for the year, the MHS 8088 cpu markings are close to what your individual claims the chip is marked. Could it be that the individual thought it was an Intel chip because of the Intel copyright markings, but Intel isn't actually the manufacturer? Anyway, maybe have him try the code, compiled by you for him of course, at the link above?

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Entering "+rep +lodsb +bug +8086 OR 8088" into Google Groups advanced search also pulled up these CPU identification links (or helped me find them). The links all have assembly code to detect early cpu's. The first claims the ability to detect early FPU's also.

This lists 8088, 8086, 80188, 80186, 80286, NEC V20, NEC V30 and 8087, 80287:

<http://groups.google.com/group/comp.sys.ibm.pc/msg/21a866afb6842a4b>

This lists 8088, 8086, 80186, 80286, 80386:

<http://groups.google.com/group/comp.sys.ibm.pc/msg/1d64fd1561dc0f40>

This lists 8088, 8086, 80286, 80386:

<http://groups.google.com/group/comp.sys.ibm.pc/msg/b2d86584664f84e2>

This lists 8088, 8086, 80186, 80188, 80286, 80386, 80486:

<http://groups.google.com/group/comp.sys.ibm.pc/msg/c0acb32629bc7c96>

This lists 8088, 8086, NEC V20, NEC V30:

<http://groups.google.com/group/alt.lang.asm/msg/a18be7267a5cefbdb>

HTH,

Rod Pemberton

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