

Re: 4017 Counter skips under load

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- *From:* "David L. Jones" <altzone@xxxxxxxx>
 - *Date:* Tue, 03 Jul 2007 15:14:00 -0700
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On Jul 4, 6:50 am, jcargile2...@xxxxxxxx wrote:

On Jul 3, 1:24 pm, Joerg <notthisjoerg...@xxxxxxxxxxxxxxxxxxxxxxxx>
wrote:

jcargile2...@xxxxxxxx wrote:

On Jul 2, 3:24 pm, "David L. Jones" <altz...@xxxxxxxx>
wrote:

On Jul 3, 7:11 am, jcargile2...@xxxxxxxx
wrote:

I have a fairly simple circuit
that consists of a 4017
decade counter
and nine relay/LED
combinations. The relays
are very small and the
circuit operates just fine
with no load, or when I
connect an LED to
the relay output. But when I
try to operate the circuit
under load
(it is being used to fire
nichrome ignitors), then the
counter simply
skips the loaded relay and
moves right to the next
output. So if I
send the counter a series of

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5 clock pulses, and put a load on the relay attached to output 3, then the count goes 1,2,4,5,6. The final count ends up being one off, so it's almost like the output in question doesn't exist. What I don't understand is why this is happening, since the relay is what bears the load, not the 4017. Shouldn't the output requirement on the counter be the same regardless of what the relay is switching?

Yes, it should be, but only if you have used proper circuit physical circuit layout techniques to ensure that there is no ground or power bounce. Think "star grounding" and power decoupling. Very common trap for young players.

Dave.

I installed the final power setup (on the tests I just had the board jumpered onto the power supply) and now it will fire the ignitors. The problem is that the counter is now behaving irrationally. It will skip several counts when receiving a clock pulse and will jump around with the slightest change in ground (even connecting a single lead from the multimeter to any point on ground advances the count). I've tried several different caps (.01–10 uF) connected directly to the

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power leads of the 4017 with no luck. All of the info I can find on decoupling keeps talking about selecting the capacitor based on frequency. But I'm only sending a single pulse of about 25 ns every 10–20 seconds. Does this mean I can use a larger cap? I'm seriously freaking out at this point cause I only have 24 hours to get this working. Thanks for the help!

How on earth do you get a 25nsec pulse out of a CD4017? That's like clocking a moped at 100mph.

Anyhow, since things seem to become desperate over there I can only suggest to build it up again on an experimental board that has a ground plane. And no, you do not have to select decoupling caps based on frequency. A 0.1uF plus a nice 10uF electrolytic should do, more if your power supply is wimpy.

Can you post schematic plus photo?

—
Regards, Joerg

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Sorry, I mistyped. The clock pulse coming into the 4017 from the PC parallel port is 25 ms in length.

Ah, the alarm bells start ringing right there, no pun intended. You probably have ringing on your clock line from the PC. Keep the lead from the parallel port as short as possible. Are you able to view the signal with an oscilloscope?

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Classic problem with PC parallel port driven equipment.

Dave.

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