Re: Debouncing....at About 1Mhz

Source: http://sci.tech−archive.net/Archive/sci.electronics.design/2007−11/msg01326.html

- *From*: John Fields <jfields@xxxxxxxxxxxxxxxxxxxx>
- *Date*: Sat, 10 Nov 2007 09:13:06 −0600

On Fri, 09 Nov 2007 17:38:26 −0800, John Larkin
<jjlarkin@xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx> wrote:

> On Fri, 09 Nov 2007 18:46:37 −0600, John Fields
> <jfields@xxxxxxxxxxxxxxxxxxxx> wrote:
>
> > −−−
> > Hazard free? There still remains the RFI issue from all that
> > chatter, which you haven't adequately addressed.
>
> I was referring to timing hazards, which all of the hairball circuits
> have. And I can't understand your fears about running signals through
> gates. How are you ever going to do logic if you're afraid to run
> signals through gates? "All that chatter" is in fact the input signal.
>
> −−−

I'm surprised that you don't seem to know this, but if you have a signal with sharp edges then, at each transition, a multiplicity of harmonics will be generated and radiated into space.

Look at it like this:

```
.. _____________________________
..FIN ___| |_____________________
.. _ _
..NFIN____| |_____________________| |_____________________
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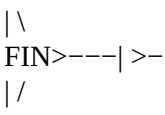
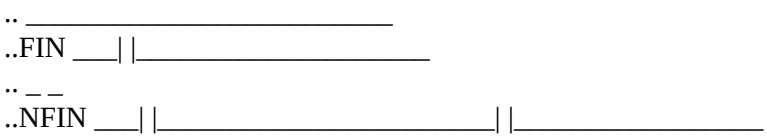
where FIN is the input signal and NFIN represents the spectral products generated by FIN's transitions, i.e. noise, if you have no use for the harmonics.

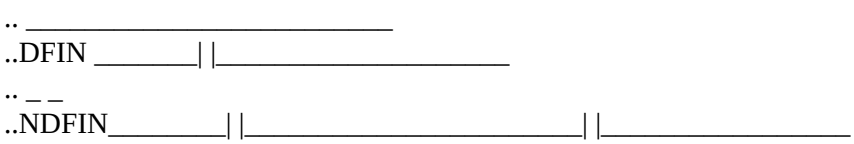
Now, if that signal is delayed by sending it through a gate:



we'll have:



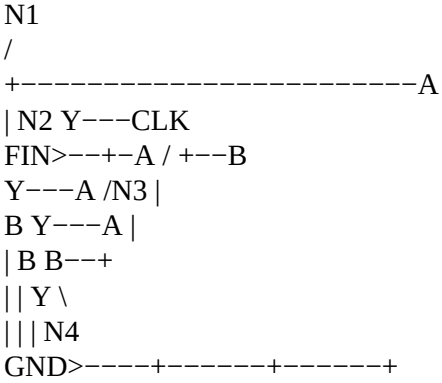
on the input to the gate, and:



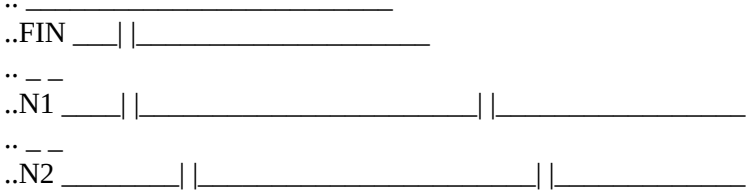
on the output of the gate.

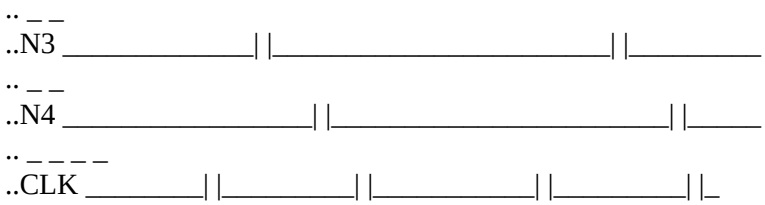
Notice that there are now twice as many noise pulses as there were before, since there's one on each of the incident as well as the delayed transitions.

The chain in your circuit: (View in Courier)



(assuming equal gate delays) generates noise pulses that look, roughly, something like this:





with the result that your circuit (assuming edge rates equal to
those of the comparator) is generating five times as much noise as
the output of the comparator, FIN.
−−−

Measuring the ugliness of your designs is like evaluating 0/0.

−−−
Fred's designs aren't ugly, they're just panoramic, and they work.

Fred doesn't design things. He's said so. He sure didn't take a shot
at this problem. Mostly what Fred does is criticize designs for
emotional reasons, and look up a lot of old papers and cite them.

And, evaluating 0/0 to the limit leads to:

$$\frac{0}{0} = 1$$

which would seem to lend credence to his designs as being valid, '1'
being assumed to be true.

He doesn't design.

−−−
Sure he does. They're archived on Google if you'd like to enlighten
yourself.

−−
JF
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