Re: Missing Schmitt Gates??

Source: http://sci.tech−archive.net/Archive/sci.electronics.design/2007−12/msg00555.html

- *From*: Spehro Pefhany <speffSNIP@xxxxxxxxxxxxxxxxxxxxxx>
- *Date*: Tue, 04 Dec 2007 21:53:49 −0500

On Tue, 04 Dec 2007 19:54:53 −0600, the renowned John Fields
<jfields@xxxxxxxxxxxxxxxxxxxx> wrote:

> On Tue, 04 Dec 2007 16:47:14 −0800, John Larkin
> <jjlarkin@xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx> wrote:
>
> > On Tue, 04 Dec 2007 16:45:54 −0700, Jim Thompson
> > <To−Email−Use−The−Envelope−Icon@xxxxxxxxxxxxxx> wrote:
> >
> > > On Tue, 04 Dec 2007 15:40:47 −0800, D from BC
> > > <myrealaddress@xxxxxxxxx> wrote:
> > >
> > > > On Tue, 04 Dec 2007 22:17:36 GMT, Rich
> > > > Grise <rich@xxxxxxxxxxx> wrote:
> > > >
> > > > > On Mon, 03 Dec 2007
> > > > > 19:07:08 −0800, John
> > > > > Larkin wrote:
> > > > >
> > > > > > On Mon, 3
> > > > > > Dec 2007
> > > > > > 17:57:28
> > > > > > −0800,
> > > > > > "Joel
> > > > > > Koltner"
> > > > > >
> > > > > > > "D
> > > > > > > from
> > > > > > > BC"
> > > > > > > <myrealaddress@xxxxxxxxx>
> > > > > > > wrote
> > > > > > > in
> > > > > > > message

A
crystal
needs
a
good
linear
amp.

Everything
is
linear
if
you
look
closely
enough...

I
am
being
a
little
obtuse
here
−−
the
kind
of
oscillator
I
was
thinking
of
was
your
canoncial
microcontroller/FPGA
clock
that
doesn't
need
to
be
particularly
accurate
−−
it's
common

to
use
50
or
even
100ppm
rocks
in
such
systems;
this
is
a
completely
different
league
of
oscillator
than
those
you
build
for,
e.g.,
fancy
RF
applications
where
you're
after
2.5ppm
or
better.

I was never
able to get
the Schmitts
to oscillate
anywhere
near the
supposed
crystal
frequency.

Maybe it's a little late in the
thread to bring this up, but
I'd
think that with the Schmitt

characteristics of the input,
the crystal
would have to be drastically
overdriven, just to get the
gate to
notice that there's a
feedback signal.

But I wouldn't have any
qualms about an HCU
inverter or 3. ;−)

Cheers!
Rich

I think Ht for Logic with Schmitt inputs is
about 1V @ 5V.

A crystal..well... isn't it just tiny jiggling
piece of rock?
Ooops...I might be thinking piezo..
Damn..forgot all my crystal theory...cuts,
shapes, modes and all that
jazz.
Anyways.. I can imagine that one has to be
kind to a tiny piece of
crystal and not bash it with lots of drive.
However....depends on the precision
required..
As someone posted, for clocking an uC or
CPU ...who cares about some
drift..

D from BC

A crystal oscillator using an inverter with hysteresis WILL
NOT
self−start.

...Jim Thompson

Of course it will self−start. It just won't run anywhere near the
crystal frequency!

−−−

> Nope.
>
> There's no guarantee that it'll self−start because you've only got
> one delta V (on turn−on) to cause the crystal to ring, and if it
> doesn't ring hard enough to get to the opposite switching threshold
> it'll just sit there, squeezed.

At what input voltage? Of course it's assumed you will also have a
high−value bias resistor across the ST inverter.

> The right way to do it is to use an inverter which can be biased so
> that the input and the output are both at about Vcc/2 and then let
> noise tickle the crystal until it takes off.

The MCS48 used a ST in the clock oscillator IIRC. It would oscillate
at some tens of kHz before the crystal got going. Maybe a "feature"
kind of a limp−home thing if the crystal failed (usually, not always,
open).

Best regards,
Spehro Pefhany
−−
"it's the network..." "The Journey is the reward"
speff@xxxxxxxxxxx Info for manufacturers: http://www.trexon.com
Embedded software/hardware/analog Info for designers: http://www.speff.com
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