Re: Where is the RFI detected?

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- *Date*: Wed, 04 Oct 2006 13:17:41 −0700

PN2222A wrote:

> Greetings:
>
> I'm working on remediating RFI for a lab instrument.
> The detector end picks up small (microamp) signals from
> a resistive transducer, intended bandwidth is in the hundreds of KHz.
>
> The input is sent thru a DC−blocking capacitor, 0.1uF, past two clamping diodes (silicon diodes back−to−back to ground), then into the − input of an OP−27. Feedback resistor is 82K shunted by 10pf.
>
> There's another gainstage with voltage gain of 50.
>
> My RF input is swept from appx. 100MHz thru 500MHZ, radiated, 3V/M strength.
> It's amplitude modulated at 1KHz.
>
> The RF is probably being coupled into the cables (from the sensor and power supply), and the cable design isn't perfect: the shield on the cable is tied directly to the negative lead from the sensor and to ground on the PCB.
>
> The RF shows up as the 1KHz signal at the output of the second stage: it's being detected somewhere in the amplifier chain, it seems.
>
> We're working on standard spells and incantations for RFI: ferrites on the cabling, improved shielding for the circuits, animal sacrifices and so forth.
>
> My question: How is the 100MHZ RF being detected? I think it isn't the diodes, but can check that. If I have RF coupled into the − input of the Op Amp, does it get rectified? What if I'm pushing the ground node around?
>
> Thanks for any help!
> PN2222A

Biased? Of course I'm biased!

i can't imagine 100Mhz−−500Mhz ever being detected and past via a resistive transducer how ever, i can see how the detector it self
would react to the signal and use it's own structural capacitance
to filter the high frequency and thus produce a low frequency that
is a variation of amplitude of the original frequency.

also, taking in light of things, you have miller effects in
components (op−amps, transistor amps etc.) that in it self, can produce
the same effect and only show you the end results of the variant levels
of amplitude. fairly a common practice for cheap detection and also an
hindrance in other cases.

just my 2 cents worth.

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Real Programmers Do things like this.
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