

Re: twin crystal oscillator

Source: <http://sci.tech-archive.net/Archive/sci.electronics.design/2005-04/msg03693.html>

- *From:* "colin" <no.spam.for.me@xxxxxxxxxxxxxx>
 - *Date:* Tue, 19 Apr 2005 20:11:05 GMT
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"Tim Wescott" <tim@xxxxxxxxxxxxxxxxxxxxxxxxxx> wrote in message
news:116aj537n0mkr19@xxxxxxxxxxxxxxxxxxxxxxxxxx

> Michael Black wrote:

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>> Tim Wescott (tim@xxxxxxxxxxxxxxxxxxxxxxxxxx) writes:

>>

>>>colin wrote:

>>>

>>>>while im waiting for my OCXOs to arrive and thinking about what makes
one

>>>>OCXO better than others with regard to 1hz phase noise, i thought what
if 2

>>>>crystal/amp stages were used for the oscillator, the bandwidth must be

>>>>reduced quite considerably and hence the close in phase noise too.

>>>>

>>>>not much came up on a search, maybe i will build one and see. i have
read

>>>>that very old crystals are better because their ageing has settled down
to a

>>>>low rate and are the larger size gives better Q.

>>>>

>>>>Colin =^.^=

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>>>I wouldn't try two crystals in an oscillator, but I believe that you

>>>can get good results by following an oscillator with a crystal filter.

>>>

>>

>> Or there's that circuit, I first saw it in an article by Rohde and

>> I thought it was his idea, where you extract the signal from the side

>> of the crystal away from the active device. I can't remember the

>> circuit, or even if it was special, but he moved the side of the

>> crystal that normally was grounded off ground, I think with a

>> resistor, and took the signal from there. The crystal was

>> then acting as a filter between the oscillator and the rest of

>> the world.

>>

Re: twin crystal oscillator

>> Michael
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> That would certainly reduce phase noise. If it were me I'd look at
> implementing the best oscillator I could (I'd probably check the Butler
> oscillator for starters). If that weren't enough I'd follow it with a
> filter and accept the inevitable tradeoff between filter bandwidth and
> the difficulty of matching the filter passband with the oscillator
> frequency.
>
> There is literature out there on low phase noise oscillators, but
> crystal and otherwise.
>
> --
>
> Tim Wescott

doh, too late done it already, managed to get it working @ 20mhz with 2 bfe520 transistor inverters stages, would rather use series resonant sc cut crystals rather than the at cut parallel resonance mode crystals wich is all i seem to be able to get hold of easily. was thinking a 3 stage might be better still as the phase needed for each stage would more convenient.

I figured a second one inside of the loop will be beter than on the outside due of the effect of positive feedback, although of course one (or more) on the outside is a possibility too. ive not tried it in circuit yet as i need to make a second one, also the colector waveform has a weird kink in it almost like its trying to oscillate at 2nd harmonic (wich it shldnt) but i need to multiply it anyway. (and the ocxos have turned up now too :)

Ive seen the circuit refered to in a couple of places, ideal if you need a clean sinewave. there are many low phase noise circuits out there wich appear to be as good as the (single) crystal used.
my circuit feedback is similar in nature to a butler type.

Colin. =^.^=

• **References:**

- ◆ **twin crystal oscillator**
◇ From: colin
- ◆ **Re: twin crystal oscillator**
◇ From: Tim Wescott
- ◆ **Re: twin crystal oscillator**
◇ From: Michael Black
- ◆ **Re: twin crystal oscillator**
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