

Re: Crystal drift

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From: John Larkin (jjlarkin_at_highSNIPlandTHIStechPLEASEnology.com)

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On Fri, 24 Sep 2004 11:28:06 -0400, Phil Hobbs
<pcdhSpamMeSenseless@us.ibm.com> wrote:

>> Also, depending on the frequency, a simple D-flop makes an excellent digital
>> mixer. Put one input on the clock, the other on the D. The Q output will switch
>> at the difference frequency.

>

>Not with a PFD--metastability will blow you right out of the water. Every
>lost cycle equals lost lock. The D flipflop trick can work with a narrow loop
>and a multiplying phase detector though--I used it when I built a pilot tone
>generator for what I think was the first commercial direct broadcast satcom
>system, in about 1982. (I had just got my bachelor's degree in astronomy and
>physics at the time, and they hired me to look after all the ultrastable PLL
>stuff--talk about being thrown in the deep end. For the frequency reference
>board (different from the PTG) I had to invent a fractional-N synthesizer
>based on resynchronized rate multipliers. It worked great, eventually.)

>

This one

<http://www.highlandtechnology.com/DSS/V880DS.html>

uses an EclipsLite ff as the phase detector, locking the local 155 MHz
rock to the incoming OC-3 data stream. BW is about 10 KHz for acquire,
2 KHz when tracking, with the uP switching loop filters when it feels
it ought to. About 200 of these are scattered all over the NIF laser
to fire everything at the right time. You can barely make out the
crystal oscillator sitting up on tiny springs.

Biggest hassle was the (expletive deleted) 850 nm VCSELs for the
optical-out option. What nasty parts!

John