

**To clock or not to clock (..part3)**

Experiences:

Well, just one. I listened to UcD400 once and did not notice the so called birding.

Overall impression was not fully my taste, but OK.

Obviously a self oscillating approach does not automatically cause serious trouble to my ears.

Examinations:

Examination 1:

Two signal generators, two ultrasonic frequencies, difference around 2kHz.

Both signals summed up by two resistors of 220R. Summed signal fed into left and right of headphone

==> Strong 'beeeeepp' and when the difference of both frequencies moves then you really get something that is perfectly fitting to the word 'birding'.

Examination 2:

Two signal generators, two ultrasonic frequencies, difference around 2kHz.

Both signals fed as independent signals into headphone. One signal left, the other signal right.

==> No 'beep'. But an uncertain perception that there might be something.

Examination 3:

Two signal generators, two ultrasonic frequencies, difference around 2kHz.

Both signals summed up by two resistors of 47R. Summed signal fed into a tweeter.

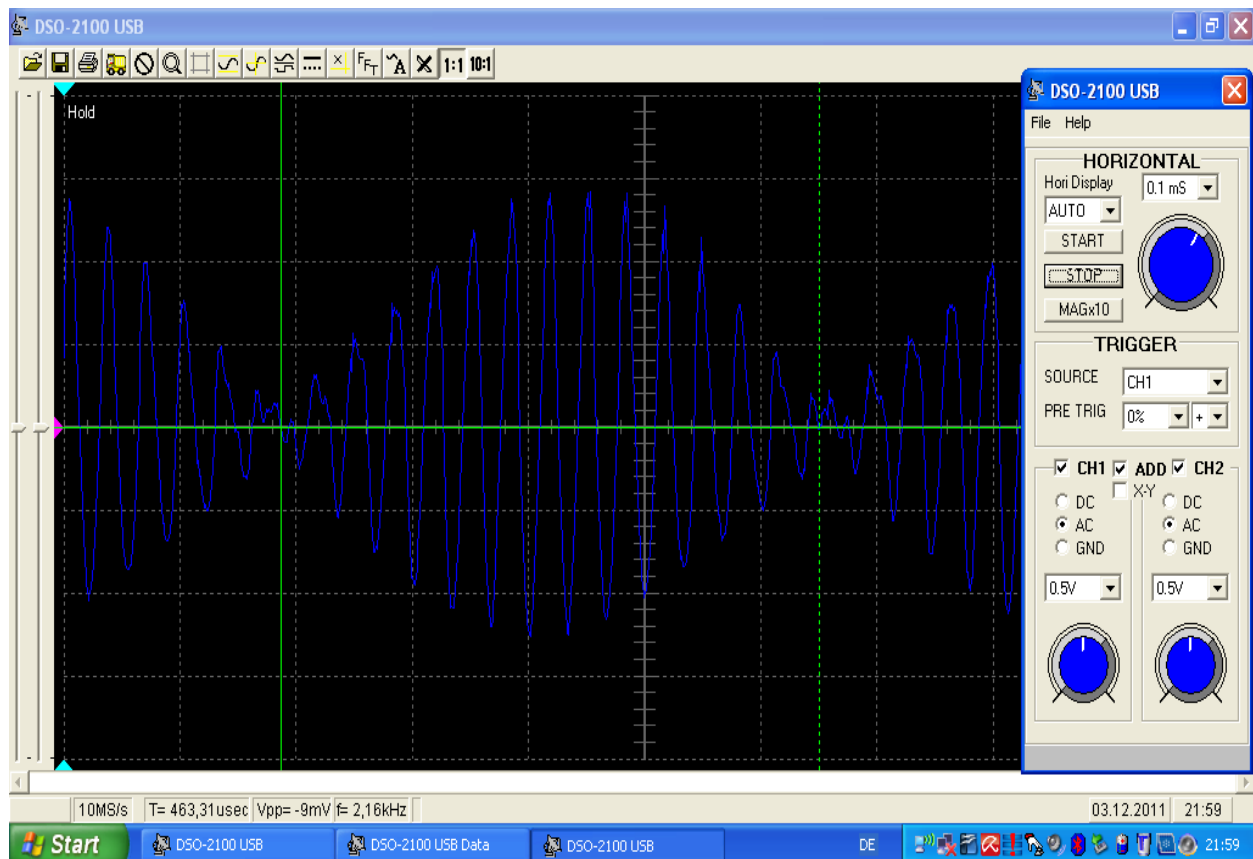
==> Strong 'beeeeepp' and when the difference of both frequencies moves then you really get something that is perfectly fitting to the word 'birding'.

Examination 4:

Two signal generators, two ultrasonic frequencies, difference around 2kHz.

Both signals fed as independent signals into headphone. One signal left, the other signal right.

==> No 'beep'. I ensured by measurement that the applied two signals still do show the beating sum. Both signals were measured by scope and summed both in the scope.



These findings are kind of amazing to me! First I thought the difference between 1&3 vs 2&4 would have been caused by the low roll off frequency of real world speakers. Note in case of 2&4 we do the summing after signal attenuation, in case of 1&3 we do it before attenuation. In case of ultra sonic signals around 400kHz and speakers with 12db/octave above 20kHz, it is like summing 'nothing+nothing'. Consequently nothing can beat. Unfortunately this simple thinking, seems to be misleading! Because:  
When doing the tests with signals around 30kHz, I am getting the same results like around 400kHz. (Above screen shot shows examination 4 with two signals around 30kHz.)

Further ideas:

- In case of electrically summed signal: Do the nonlinearities of the speakers and/or signal generators act like a demodulator?
- Is summing in our brain fundamentally different from electrical summing?
- Is summing in the air fundamentally different from electrical summing?