Subject: Re: Comb Filtering Misconceptions
Posted by Keith Larson on Sun, 11 Oct 2009 15:09:18 GMT
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Getting back on track for comb filtering, I could point out a number of highly successful commercial systems where interference patterns were intentionally created for a sense of realism. Back side and cross firing drivers producing L+R, L-R etc. were quite popular at one time. The advertisements would even tout the effects of comb filtering as a positive effect. Nowadays there are electrostats, dipoles, bi-poles, and line arrays. There is even a realization that speaker placement has an effect on comb filtering.

As a half fact half subjective observation, I would point out that comb filtering in the 300-3k intelligibility band is probably the most noticeable. On the other hand, we don't often listen to high frequency sine waves. In fact, most high frequency content is found in transients like the crash of a cymbal, the ting of a bell, or noise like 'S' sounds.

What is interesting is that when you examine these kinds of signals in the frequency domain they are highly complex in frequency, time and amplitude, but the duration is usually short. This is where Fourier analysis over a wider (often vastly) time window does not produce the right results. Technically, the FT is produces an observation of the average content over a finite length window of time. If the signal is a transient it splatters all over the spectrum. The solution is to use a sliding or overlapping window and watch the response take shape like a movie.

For me at least, its difficult if not imposable to directly hear comb filtering in a transient signal, especially when it is above the intelligibility band, and maybe this is the key. In the end however, this is technically a coloration, so its a matter of taste. Some will like it, others will not.