Subject: Re: Resonance
Posted by Tom Danley on Sun, 07 Nov 2004 23:33:56 GMT
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Hi WayneWhat you say is true as (assuming one has a minimum phase speaker) but so is what Mike E. said about the transient action of the various alignments he listed. The reason is that regardless of how the response shape (transfer function) is obtained, it is the amplitude and phase of those slopes which govern impulse response.The steeper the slope at band edges, the greater the phase shift and so the signal is spread out in time more. Extending Low frequency response alone does not adversely effect impulse response but increasing the slope at either end or narrowing the bandwidth does. Taken alone, a wider bandwidth system (with the same band edge slopes) automatically has better impulse response. While one might associate the increasing group delay numbers with lower frequency alignments with a "problem", one has to remember that in the context of the wave period, a nominal 2nd order alignment at 40 Hz and another at 20Hz, both exhibit a 180 degree rotation in phase through resonance while (because of the period) the lower one has twice the GD. Passing a complex or impulsive signal through both shows as before, the wider BW system has better impulse response, not to mention reproducing the parts of the music the 40 Hz system was too far down in level to produce audibly.The real problem with Bandpass speakers is twofold. First that they are limited Bandwidth (if they have gain) and so automatically suffer "in time". If ported, the real big problem shows up which are the organ pipe resonance's which can be of greater amplitude than the main response and also make for terrible impulse measurements due to the ringing.These (just like the duct in a normal vented box) are at the half wave length multiples for the duct and can present 20 dB + of acoustic gain..The issue is that keeping them high in frequency (way above the crossover) means a short port, small diameter duct, one which will also choke off (falling Qb) easily even at low powers. Really, a passive radiator is the fix for this and its impulse response can be the same as an ideally acting ported system with out the organ pipe resonance's.Nice forum Wayne.Best,Tom Danley