Subject: Re: port/duct position question in a simple ported system
Posted by Herbsbuddy on Sat, 24 Mar 2007 17:27:32 GMT
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Hello, I am still reading up on this there seems to be a few issues/concerns if the duct is very long (significantly longer than the diameter of the duct. In The Loudspeaker Design Cookbook (sixth edition) by Vance Dickason, I spotted something that raises a concern about a "pipe organ" effect if the duct is excessively long. I guess the general rule is "dont go crazy". For example, if the design calls for a 30" long 6" diameter duct then a better compromise might be a 4 or 5" diameter duct much shorter like 15" or even less. As far as port/duct placement, I feel it matters to some degree but not greatly. Many formulas and simulation software for speakers I have seen assume the port is on the same side as the driver. If it really didn't matter then they wouldn't specify or assume a driver side mounted port/duct. I have to do more research it is an interesting concern that some "simple" speaker books do not address in depth but in my recent design, I have a need for it. It seems to me that if the woofer is virtually silent at Fb in a simple ported system that the position of the ducted port should not be critical as long as a few simple rules are followed such as reasonable length and not too close to any wall of box interior (3" minimum clearance I think). In my room the woofer will be "pointing" to the large opening of the room whereas the port opening will be very close to a wall so when the port "takes over" around Fb, I am wondering if there will be any sonic quirks like a shift in perceived location of the source of bass. My guess is I should be ok but with all the phase shifting going on it is hard to predict. I have walked around my apt playing test tones under 20Hz and some places are dead silent while others almost make my ears "pop" like when the pressure drops outside so where you sit makes a big difference many times. The loud spot was at the end of a hallway by my front door not even in the same room as the sub and not inline with the direction the speaker was "pointing". We are really fortunate to have all the books, formulas and simulation software for ported/ducted systems readily available. I was able to model a great subwoofer in only a few hours (but of course have been playing with the design for days). I have settled (for now) on a 8.22 cu. ft. box with a Fb of 16Hz and an F3 of 15Hz. That should handle any deep pipe organ note down to super low C which is about 16.3Hz. A super low A below that is about 13.75Hz but I dont know if anything musical (pitchwise) can be perceived that low but it might be good for movies and such for impact. It is also "good" to have a subwoofer that can go lower then the lowest note you want to hear so it is not "maxed" out. Caution must be exercised with ported/ducted designs when subsonic material is introduced. The cone is basically "unloaded" below Fb and is basically acting as if it was not in a box so excessive cone motion may cause problems. A very sharp subsonic filter (24dB/octave) may help as long as it is at the proper frequency and not in the range you want to hear. My subsonic filter is at 15Hz but I dont use it because I want to hear 16.3Hz and that is very close to 15Hz.