Posted by Wayne Parham on Thu, 17 Mar 2005 19:36:26 GMT
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some have misunderstood this design. It is designed as a simple bass-reflex box. But some have likened it to a transmission line because it is tall and thin. I don't suppose the identification matters much, since the end result is that it measures well and sounds very nice. But I felt like responding to this anyway.I tend to reference Daniel Russell's paper a lot, because it briefly and accurately describes several kinds of acoustic filter chambers. Some people get hung up on labels, and don't realize that there are several phenomenon that come into play in all loudspeakers. Most have one primary tuning mechanism, but several secondary mechanisms usually affect the system to some degree. Daniel Russell's paper I'm talking about is called "Acoustic High-Pass, Low-Pass, and Band-Stop Filters."In all loudspeakers with a duct, there is both standing wave and Helmholtz phenomenon going on. That means they are capable of acting as tuned quarter-wave pipes and as bass-reflex speakers at the same time. This can be intentional or unintentional. But just because a cabinet is tall doesn't mean its quarter-wave resonance will dominate, and the Helmholtz frequency may still be the primary tuning mechanism. The converse, of course, is also possibly true.If the box has physical dimensions that prohibit standing waves from forming in the lower octaves, and a port that tunes the Helmholtz frequency in the bass, then the Helmholtz tuning is what is significant. That's what most would call a bass-reflex speaker.If dimensions are such that standing waves form in the lower octaves, and the port is open where high pressure nodes form, then the cabinet will operate as a tuned pipe. If the Helmoltz frequency formed by cabinet volume and port dimensions is well below the speaker's passband, then Helmholtz tuning will have little effect. Most people would call this some form of a tuned pipe.If a cabinet has dimensions that allow standing waves to form, the port is placed in a high pressure node, and the Helmholtz frequency is in the pass band, then both properties act

The primary tuning mechanism is Helmholtz resonation because the box volume and port dimensions make it so. Quarter-wave resonance doesn't have much impact because of the position of the driver and the port. Of course, the speaker has long panels which must be braced well. Good wood stock should be used, as with all loudspeakers. If built properly, the tower two

design, most vented box modeling programs like BoxPlot will provide accurate bass response graphs. But you can also model the cabinet as a tuned pipe, using Martin King's spreadsheets at www.quarter-wave.com. The results are in agreement. Measurements also show nice smooth response, as is predicted by either of these methods.

Subject: Alpha 10 question
Posted by spkrman57 on Sun, 20 Mar 2005 13:44:58 GMT
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Wayne, Would the Alpha 10 be usable in a transmission line? If there are curious audiophiles out there, and you can say there is at least a small chance of the alpha 10's working well in them, I

might give it a try. I have a TL that was designed for a 8" driver, but might be able to enlarge it for the Alpha 10 and try out. It is a 2 - tube design, 4 ft tall and a board down the middle on a angle separates the twin tubes(areas). I also have a Radford TL with the larger area behind the driver, then exits down the back and folds a few times(can't see that part), and exits to the bottom of the front. I could try these if you give a indication that it might work, or let me know what the downfalls to this would be. TL's generally have drivers with higher "Qts", and the Alpha 10 is sort of middle of the road.What comments would you have on this!!!!!Ron

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Subject: Re: Alpha 10 question
Posted by Wayne Parham on Sun, 20 Mar 2005 15:24:17 GMT
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Transmission lines and bass-reflex speakers have some similarities. Both have a primary resonance that is used in conjunction with the driver's resonance, to control it and to tune the system. The thing that makes transmission lines tricky is the fact that there are multiple higher resonants that need to be addresed. I suggest that you model any proposed TL speaker with Martin King's spreadsheets at www.quarter-wave.com.
