Subject: Re: 2 pi tower variants
Posted by Wayne Parham on Sun, 30 May 2010 20:13:13 GMT
View Forum Message <> Reply to Message

I'll send you the plans for the towers, some additional thoughts below.

tuning mechanism is Helmholtz, so the shape doesn't matter... with the following caveats.

I say it "doesn't matter" but in fact what I mean is the internal standing waves are attenuated rather than incorporated as a tuning mechanism like a horn or transmission line. But even that being the case, it is still important to consider internal standing wave behavior because it will be significant in a cabinet this size.

The only difference between a large bass-reflex cabinet and a large T-Line is that the fundamental standing wave mode in a transmission line is used wheras in a bass reflex, it isn't, or at least it shouldn't be. In a bass-reflex box, Helmholtz resonance is used instead. I suppose you could build a hybrid where both mechanisms were used.

In a transmission line, the port is physically placed where the funadamental node is in a pressure node. If you're building a bass-reflex box, the port should be placed somewhere else, where the fundamental standing wave node is not strong, but rather at a zero-crossing. That way, the only thing present at the port is Helmholtz resonance.

Whether the tuning mechanism is Helmholtz or standing waves, the harmonics should be attenuated with absorbent damping insulation. It also helps to position the port so that odd-harmonics fall on zero-crossings, like I mentioned above. This will also assist in attenuating internal standing waves. If you have pressure modes that line up with the port, they'll show up as little blips in the response.

between about 1.5ft3 and 5.5ft3, and tune the box to 40Hz. Smaller boxes will have higher cutoffs, larger boxes will go deeper. Put the woofer and tweeter on the baffle fairly close together. It's that simple, in theory. In practice, the larger boxes will start to have internal standing waves that line up in the lower midbass and bass range near where the port is tuned, too low for the insulation to absorb very well. So you'll want to position the woofer and port in the box where the port isn't in a pressure node, and you'll want to span the cross-section with insulation to help attenuate what's left.