Subject: Tapered pipes to horns
Posted by Don on Thu, 16 Sep 2004 18:38:09 GMT
View Forum Message <> Reply to Message

There was some talk about response ripple from tapered pipes in the single driver forum. It occurs to me that there is a fuzzy line between tapered quarter wave pipes and horns. A narrow horn can be called a tapered pipe and a widely tapered pipe with large mouth area becomes a horn. All pipes will generate organ pipe resonances at harmonic intervals, so ripple is a part of the deal, seems to me. That is why they have stuffing. Horns spread out the resonances in a way that sort of fills in the gaps between peaks, at least that's this layman's way of viewing it. With the right amount of taper and mouth area, the ripples are reduced and an infinite horn is smooth as can be. Size is a factor though and smaller pipes are just as good for certain things.What are your views about tapered pipes and horns? How much ripple is acceptable, and what can be done to reduce size and reduce ripple too?Sorry for my lengthy drivvel,Don

Subject: Re: Tapered pipes to horns
Posted by Bill Fitzmaurice on Fri, 17 Sep 2004 12:55:27 GMT
View Forum Message <> Reply to Message

The answer is simple: put the opening on the small end and you have a TQWP. Put it on the large end and you have a conic taper horn. The TQWP has gain only in the octave or so above Fp, and that is attributable to its quarter-wave configuration. It has numerous ripples above the Fp, which must be damped out with stuffing. Ideally the pipe output of the TQWP is low frequency only, the higher frequencies eliminated by the damping. The horn has broadband gain, from both quarter-wave and acoustic impedance matching, and while not ripple free it's far less susceptible than a TQWP; you don't damp a horn as that would kill the higher frequencies passing through it, assuming it's a front loaded design. Rear loaded horns usually are folded, and that often serves as a sufficient low-pass filter.