Subject: Re: Basic requirements for phase plug in horn loaded cone driver?
Posted by Wayne Parham on Wed, 03 Dec 2008 02:20:05 GMT
View Forum Message <> Reply to Message

Another thing to consider is the low-pass acoustic filter formed by the front chamber. In my midhorn, for example, I really don't want output above 2kHz because of cone breakup. The volume of air between the cone and the throat forms a low-pass filter that attenuates high-frequency output, and that's good in this application.To me, you have to consider the cone material and shape when deciding how to horn load it. Just because electro-mechanical parameters are suitable for horn loading doesn't necessarily mean the cone will hold up under compression. The acoustic resistance seems to exacerbate cone breakup modes, so you have to consider that when making a midhorn.I've seen lots of horns like the Oris that have no compression, and they seem to be one of the most popular ways to implement a front loaded fullrange driver. I suspect this is partially due to the breakup modes. Rear loaded horns and transmission lines are also done without compression.On the other hand, there are some midhorns with phase plugs that offer pretty clean output up high. They usually have cones that are purpose designed for horn loading, and a phase plug specifically shaped for the cone and the horn they're mated with. This is a great approach, but not one for the casual DIY'er, I don't think. There's lots of testing involved on the front end, and fabrication and machine work for making the driver, horn and phase plug.So for me, the best approach was to make a cone driven midhorn with front chamber volume appropriate for low-pass. This sets a lower HF limit than a similar horn with a phase plug and cone that allows higher compression. But it has the advantage of being relatively easy to make. The requisite passband is easily obtainable too, when crossing over to a compression horn tweeter.