

Background Info

In the past I have built many loudspeakers from DIY magazines.

Earlier this year I started to study the basics of loudspeaker design i.e. get familiar with the basics of loudspeaker design theory.

I started with Vance Dickinson "Loudspeaker Design Cookbook" and J. D'Appolito's "Testing Loudspeakers".

I did have some good old (cheap) Visaton W200 drivers and decided to give it a go with these drivers.

Based on the things I had learned I measured the Thiel and Small parameters per unit which showed up to be in line with the data provided by the manufacturer. In other words my test setup seems to be OK!

As a next step I calculated a Sealed enclosure for the W200. First measurements of the frequency response were encouraging to continue.

Alternatively I calculated a Transmission Line as well. Also for this enclosure the first measurements were in line with the predicted outcome.

Based on these 'promising' results I decided to go one step further i.e. make it a 2-way loudspeaker by adding a tweeter. I decided to have a tweeter in the same (low) price range of the woofer (Thymphany XT19TD00).

After multiple measurements I have been able to generate representative results i.e. frequency responses for both Sealed as well as Transmission Line.

Up to now this has been test environment only to get familiar with basic enclosure calculations as well as measuring appropriate frequency responses.

The final step ... calculate a crossover filter. To be honest I have had a hard time to get even near to a "flat" frequency response. In addition changes based on trial and error is quite cumbersome and moreover expensive due to the fact that you need to have various capacitors and coils to experiment with.

In the mean time I have been "googling" around to get more familiar with active filter solutions either hardware wise or software wise (DSP).

Finally I decided to go for the software solution i.e. the BeoCreate.

Although setting up the BeoCreate was a bit cumbersome I was quite flabbergasted about the sound quality of the BeoCreate.

Initially wanted to use the BeoCreate as a test setup for filter design and appropriate frequency response measurements. However the sound quality convinced me to use the BeoCreate as a power amplifier as well i.e. make it fit in a neat case.

Attached some pictures of "Sjrakes BeoCreation" as I have nicknamed the amplifier.

The BeoCreation Amplifier

- Besides the BeoCreate board a Raspberry Pi Model 3+ is put on top
- An AD-Converter (Oehlbach) provides in an external analog input
- Both HDMI and USB input from the Raspberry Pi are available on the rear for local login
- The boards MUTE input is available as a switch on the front, with appropriate LED indication
- The DSP controlled MUTE (MP7) is available as a LED indication on the front as well
- The input selection (AUX or Pi) is done manually using the free DSP MP7 input
- The DSP profile is a simplified version of the Beovox S35 profile i.e.:
 - * Simplified input selection section using MP6 to select either Aux or Pi
 - * Master/Slave select section deleted
 - * Channel select section deleted

Although the changed profile still needs some fine tuning I am quite happy with the final result. The profile for the S35 does sound already quite good on the loudspeakers, both Sealed and Transmission Line.

Finally I can start in optimizing the DSP filter for the loudspeakers and get familiar with both filter design and appropriate frequency response measurements (where it all started about).



