

CELESTION

AN2775 Compact Line Array

Bass Reflex / Front Horn

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Design Goal

The project was to create a compact line array using small full range drivers. The goal is to have great sound dispersion while maintaining a flat response curve that would dip into the low end spectrum while maintain a respectable high end, with no accompanying HF drivers.

Driver Selection

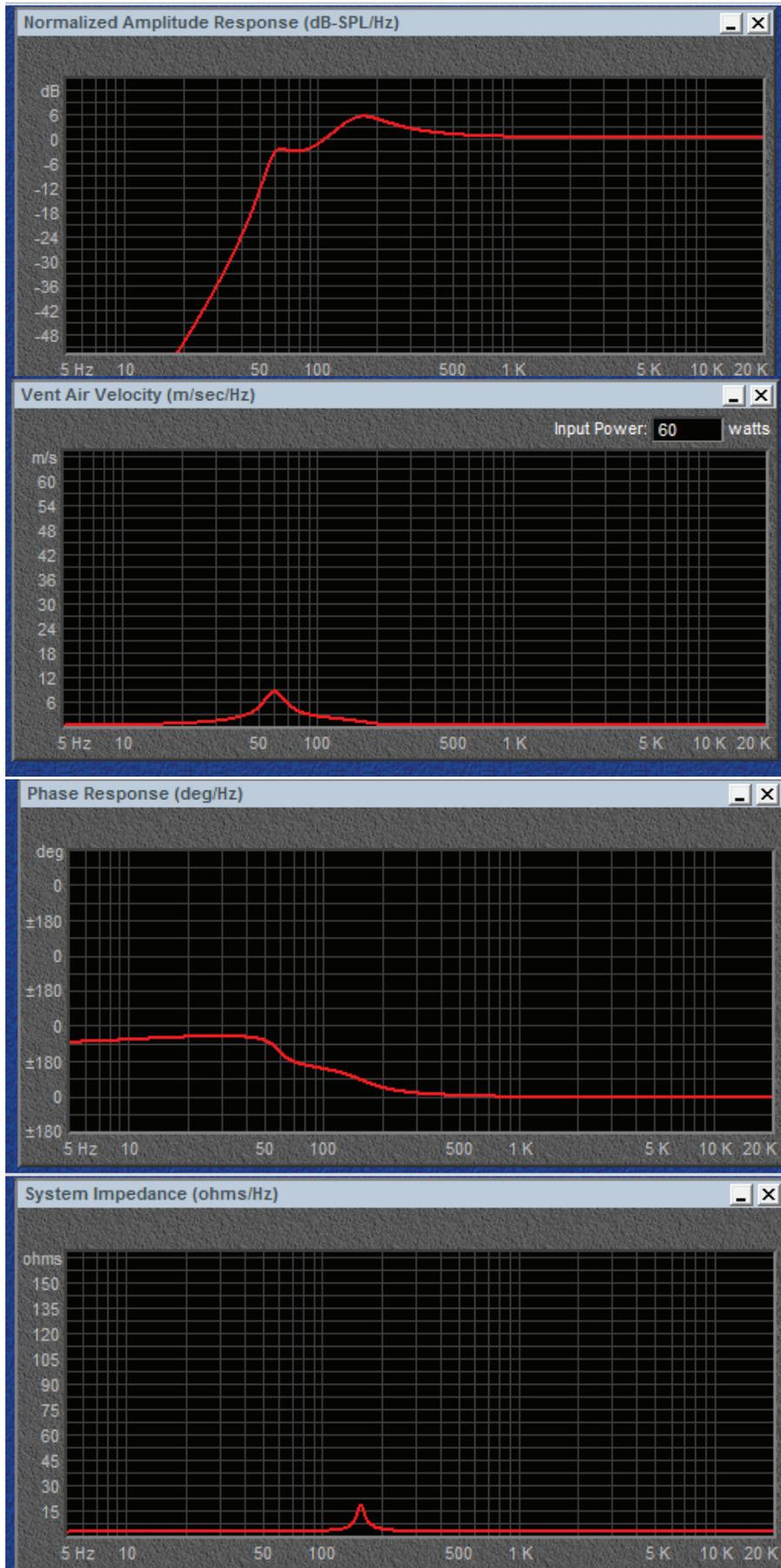
I chose the AN2775 due to it having the flattest low end response of the 3 models. With the high FS I plan on using the multiple drivers accompanied with the enclosure to gain a good low end response.



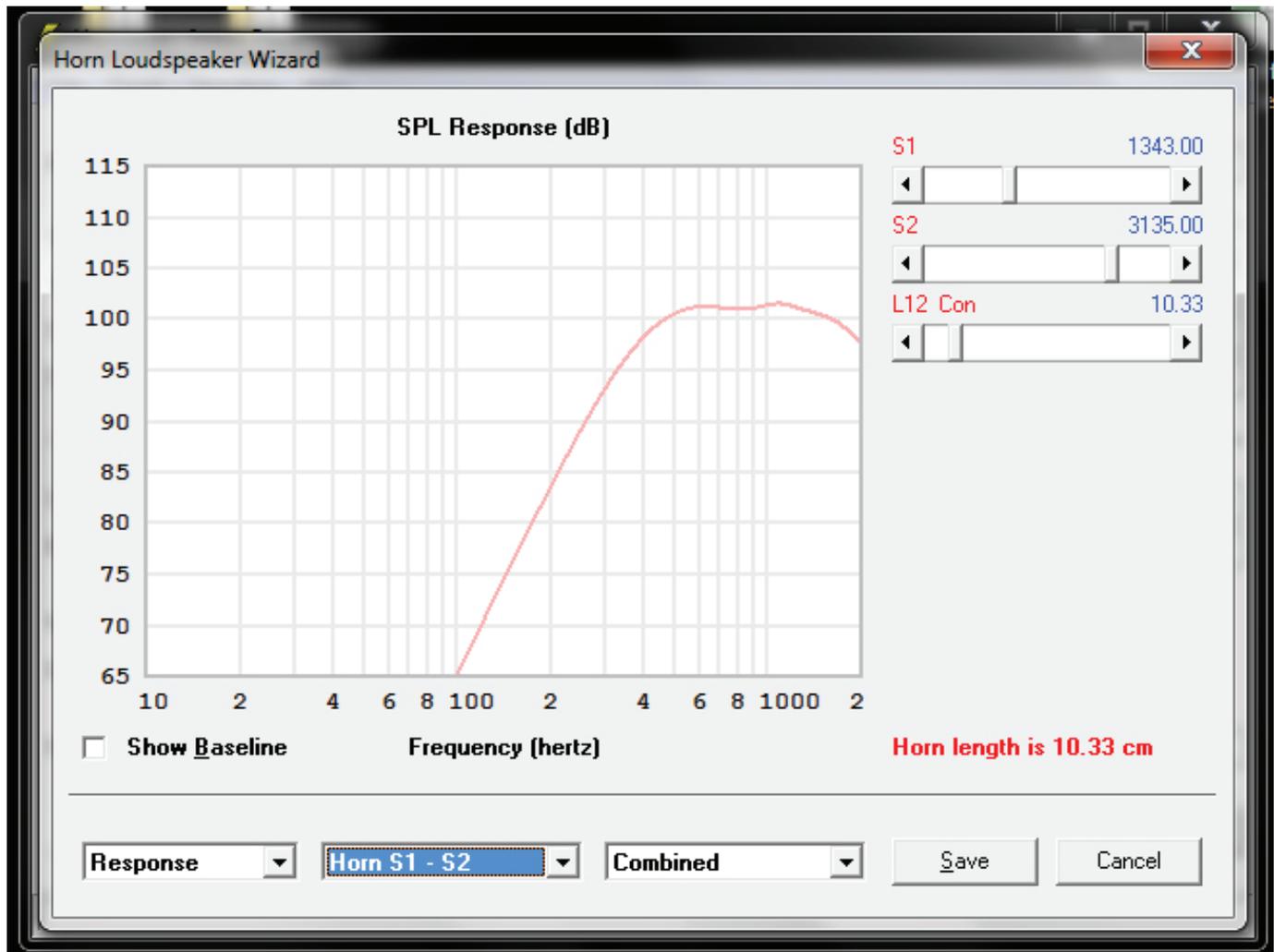
Enclosure Design

In my design the biggest obstacle to overcome was the low end response as the driver has a FS 150hz. To overcome this I designed a slightly curved bass reflex enclosure. Using the multiple driver setup, in a slightly curved enclosure, helped direct the back wave toward the four 2" ports while limiting the internal wave reflection. In addition to the curves I added 1" acoustical foam on the interior to help aid in reflection and help smooth out the peaks in the lower frequency range. With all this in the rear of the speakers I have accomplished a lower frequency roll off of 61.8Hz. With the rear enclosure designed I turned to the front of speakers. Since I had accomplished a great low end response I wanted to keep a great mid range response too. Since this is a compact array I wanted to assist in wave direction to obtain a great wave dispersion. For this I could only come to the conclusion of using a front horn. With this I designed a short horn with a wide mouth to help disperse the sound. This design gave a great flat response in the mid frequency range with a great wide dispersion pattern. I will be relying on the small drivers to produce the high frequencies. Since the enclosures are only 37 1/2" tall they are a little short for towers. So I will be building a 12" tall stand to bring the center of the speaker to around 31" which should be perfect for a sitting listening position.

Bass Reflex Enclosure



Front Exponential Horn



Crossover Designs

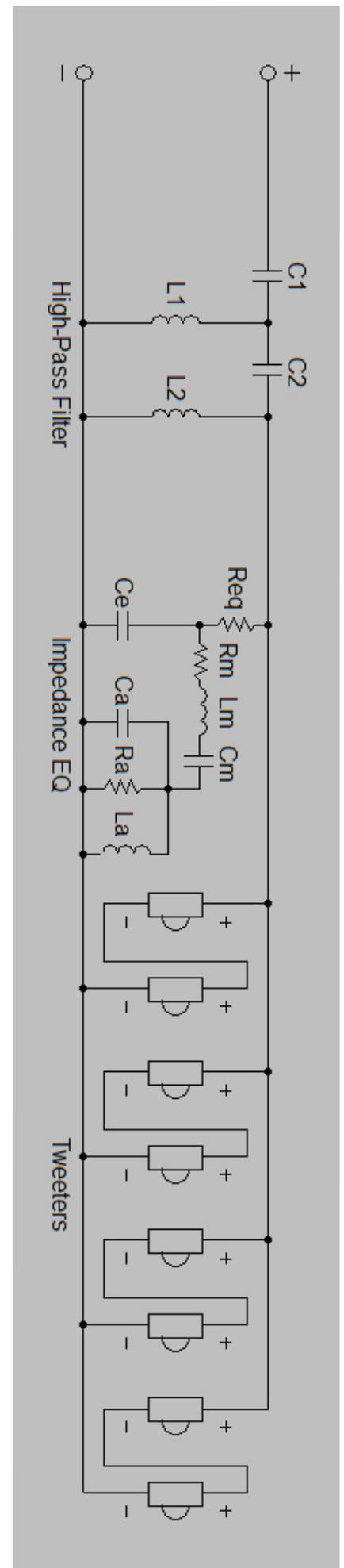
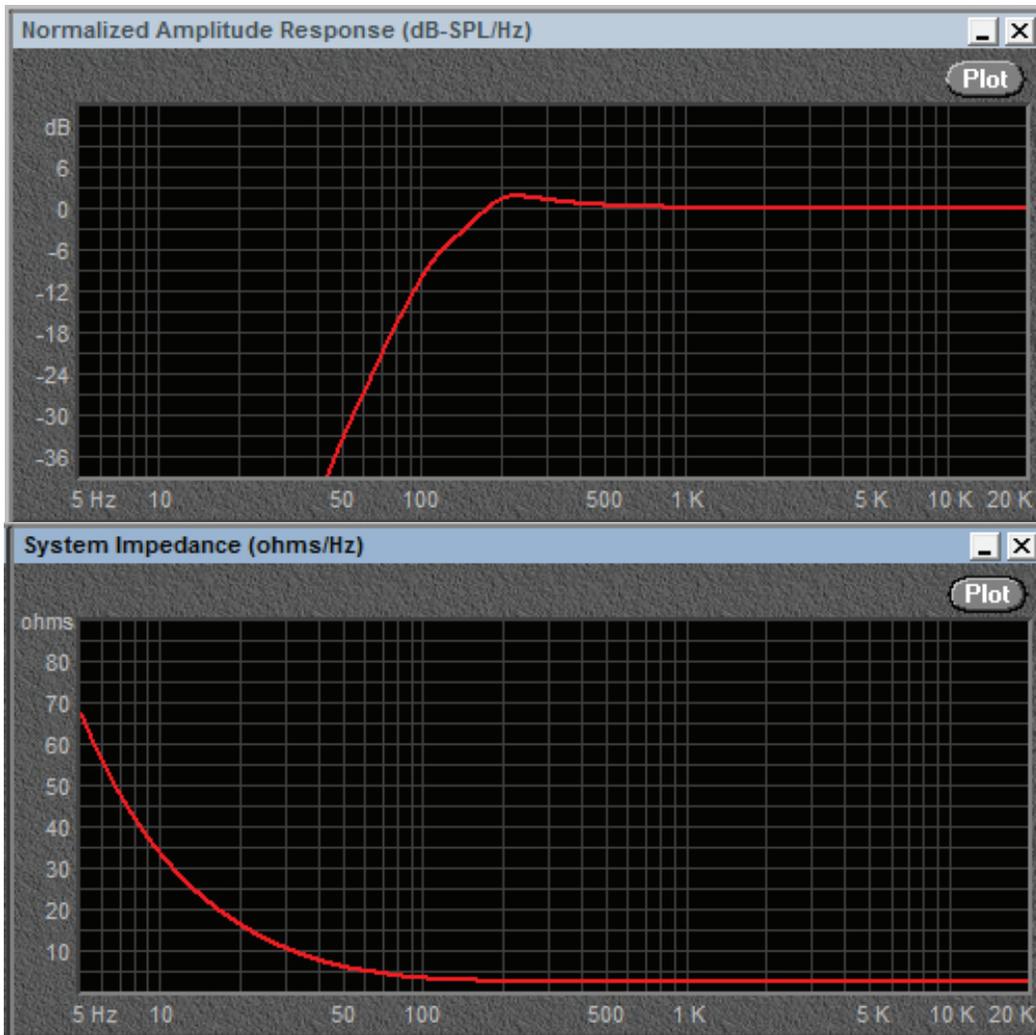
The crossover design is a 4th Order Linear Phase HP filter. Using a 60hz crossover point allowing the speakers to play low enough for a LF speaker to take over. I also decided to add an Impedance EQ since they are a full range driver. This, accompanied with the bass reflex enclosure, helped smooth out the low end response even more.

Cross Over

- C1 - 470 uF
- C2- 1000 uF
- L1- 4.7 mH
- L2- 16 mH

Impedance EQ

- Req- 2.7 ohm
- Ce- 0.0082 uF
- Rm- 0.33 ohm
- Cm- 250 uF
- Lm- 4.7 mH
- Ra- 6 ohm
- Ca- 2700 uF
- La- 2.2 mH



Finished Modeling

