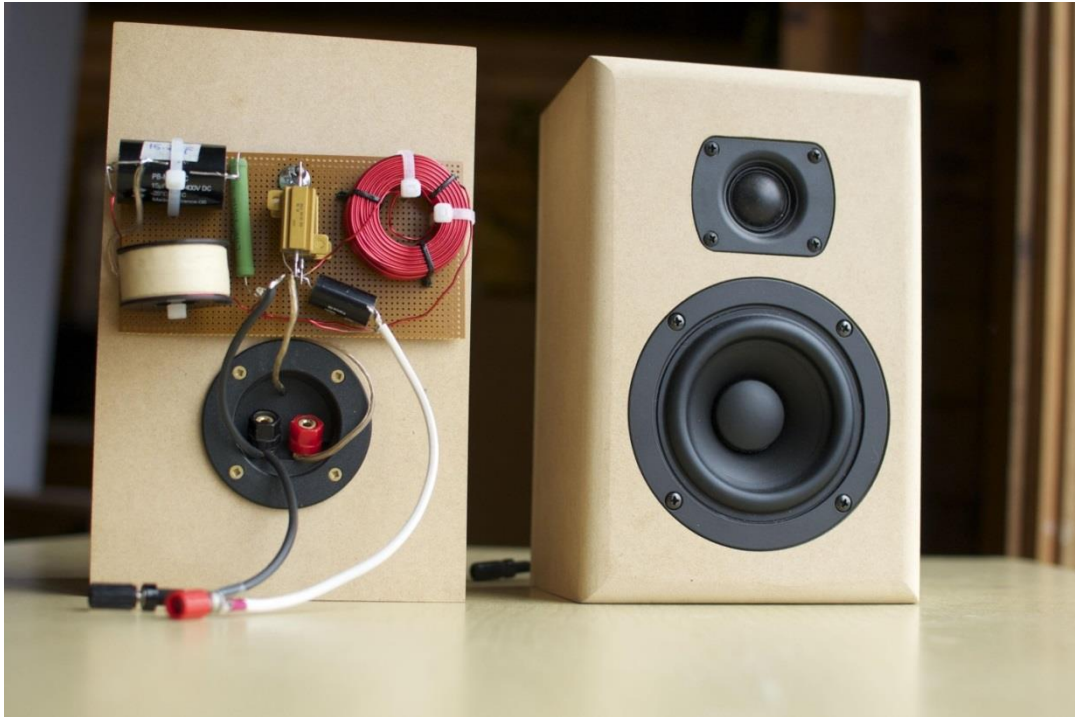


## The Napoleons: Part 2 of 2

Small Speakers that punch above their weight



The Napoleons are a small DIY loudspeaker designed to deliver a natural tonal balance and clean loud playback from of a small box optimized for small reflective rooms, but still perform well in larger spaces, at a reasonable price. This write up was in response to requests from the 2013 Ottawa DIY fest, where the speaker was first shown <http://www.diyaudio.com/forums/clubs-events/223294-diy-ottawa-winter-2013-a-17.html>

## Appendix I: First Published Crossover

This is the first iteration of the crossover, original published at diyAudio in 2013. This voicing may be preferred in large or well damped rooms.

<http://www.diyaudio.com/forums/multi-way/234674-napoleons-compact-2-way-punches-above-its-weight.html>

### Low pass

L1: 1.5 mH inductor, 0.7 ohms dc resistance (18 gauge air core).

C1: 15 uF cap (not electrolytic)

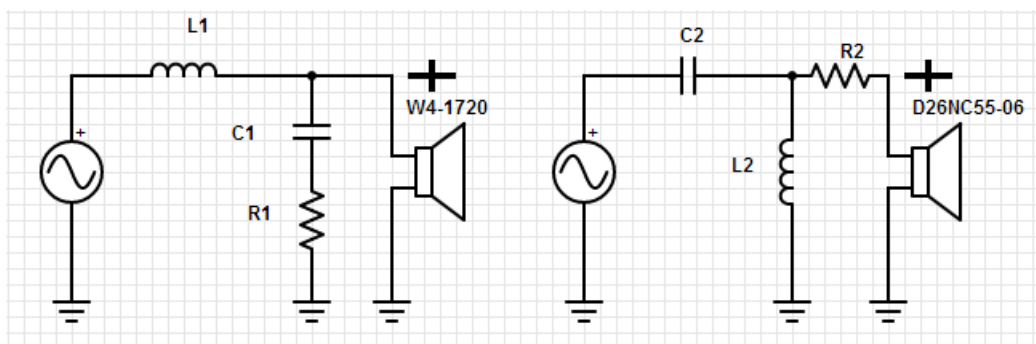
R1: 1 ohm power resistor (10W or greater)

### High Pass

C2: 2 uF cap (not electrolytic)

L2: 1.1 mH inductor, 0.5 ohms dc resistance (18 gauge air core)

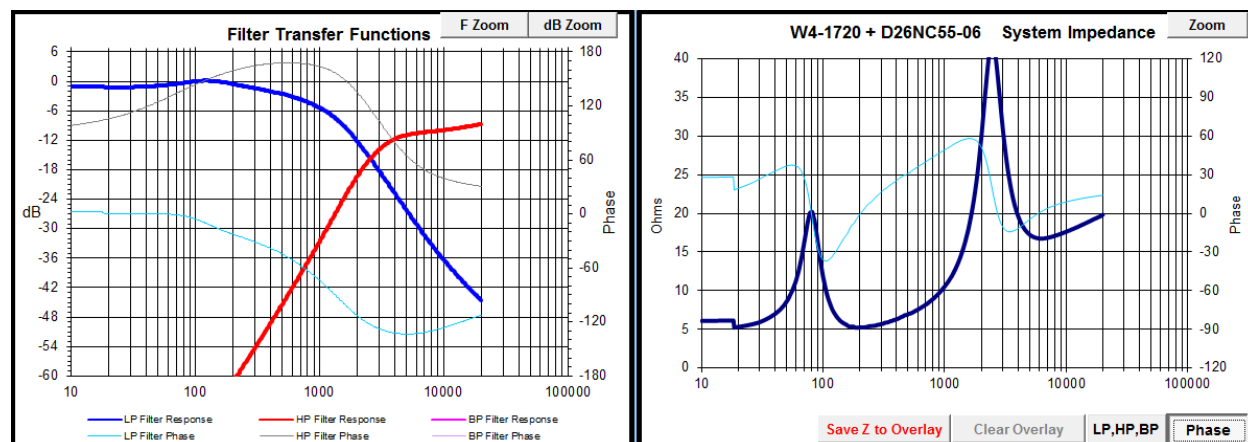
R2: 15 ohm resistor, high power (25W or greater)

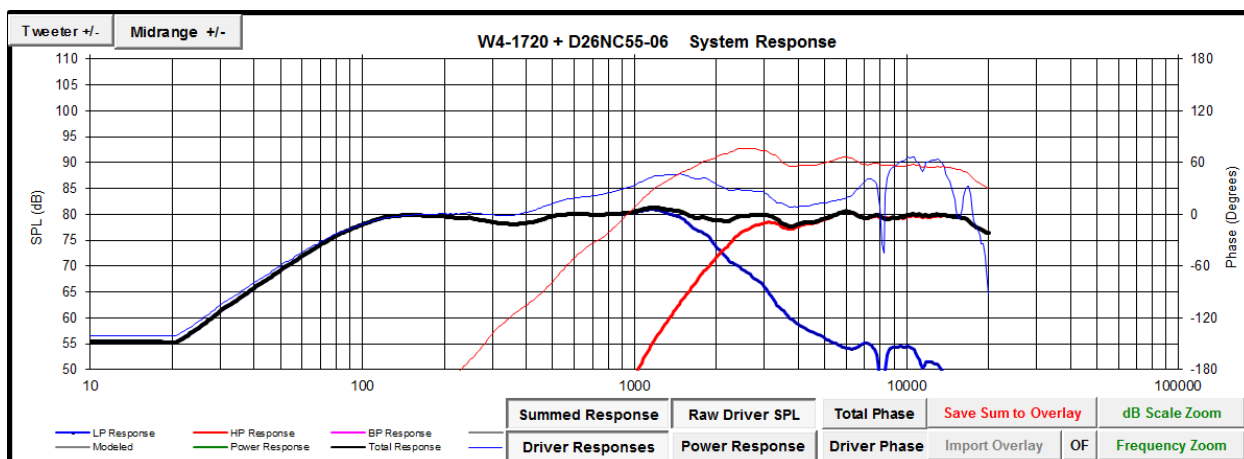
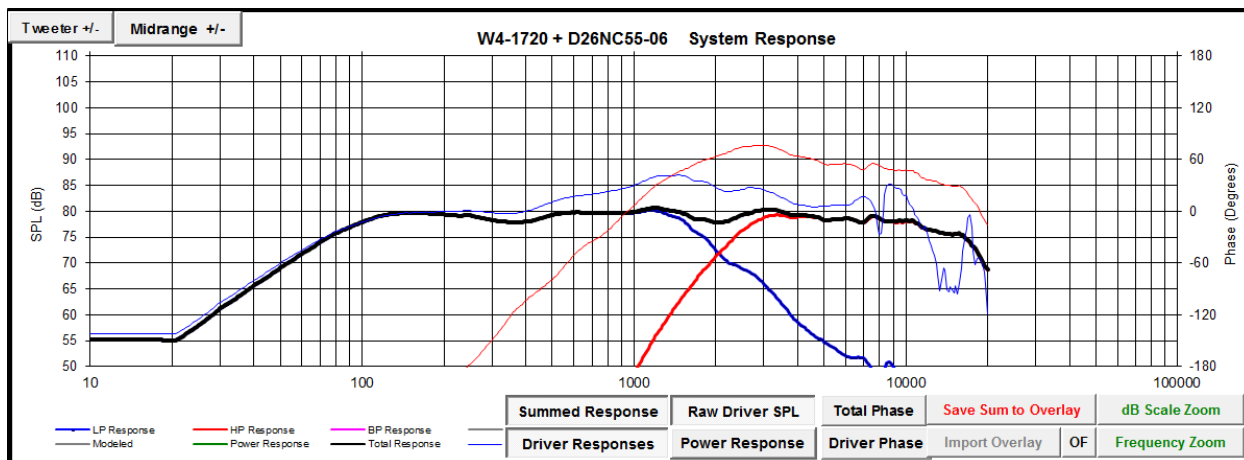
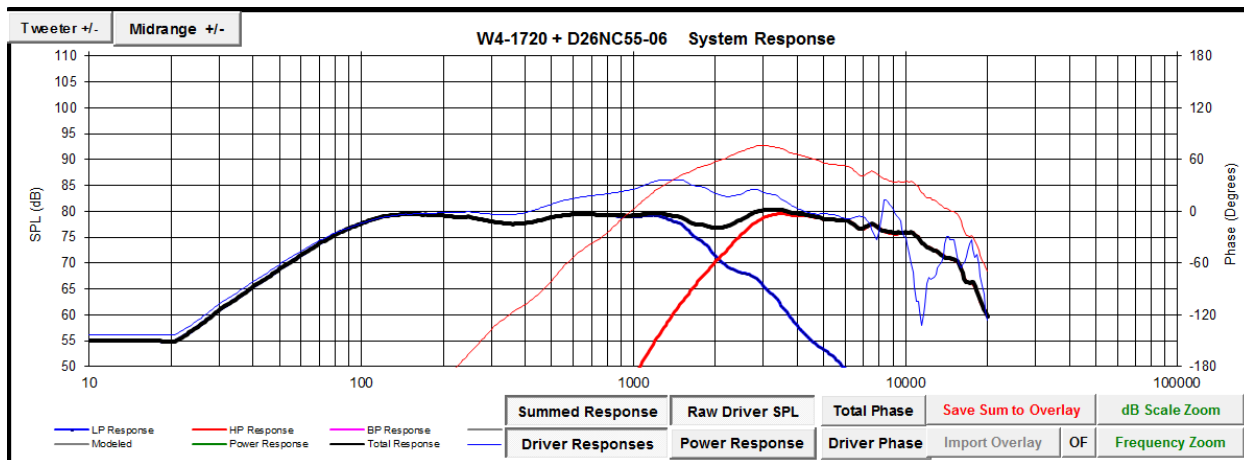


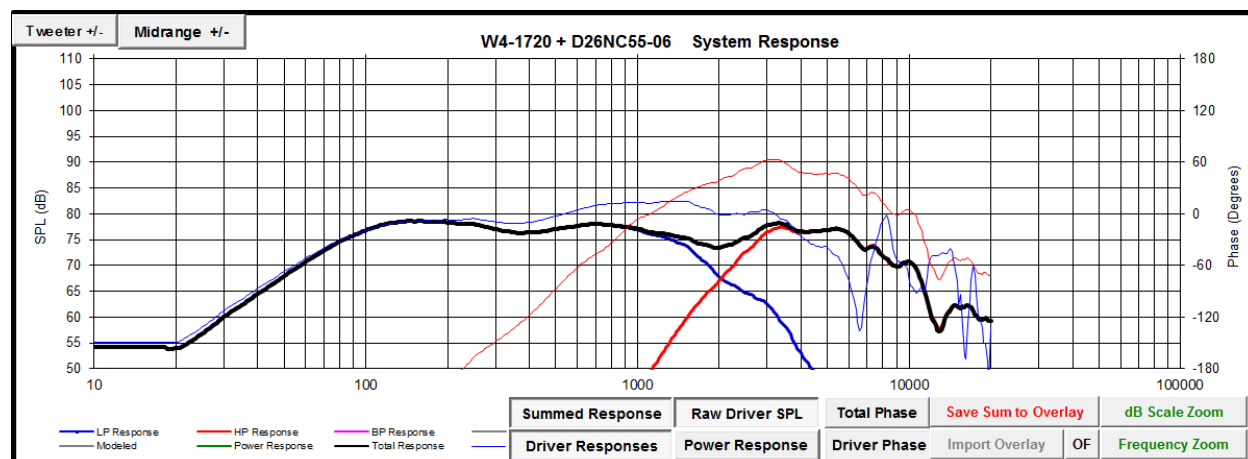
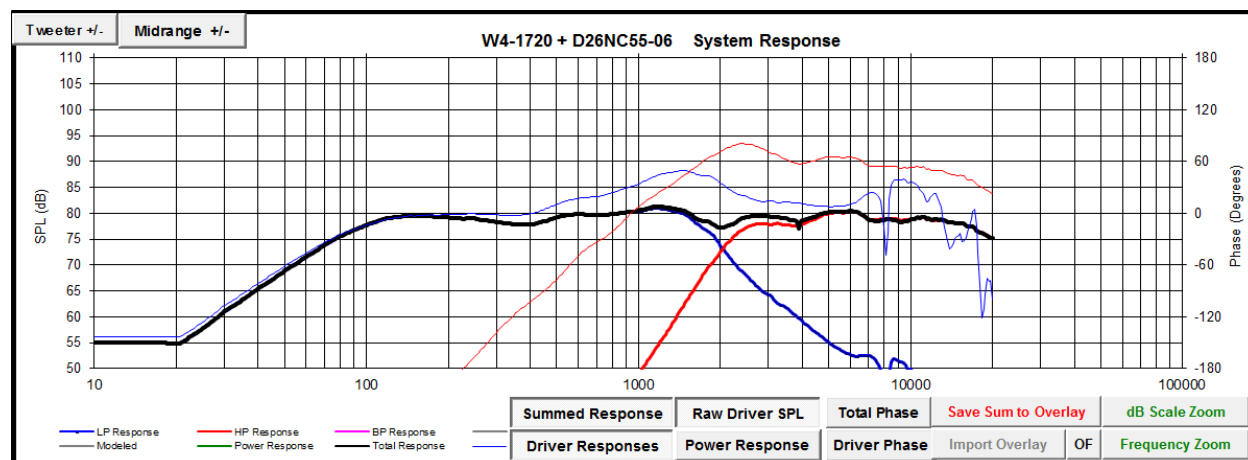
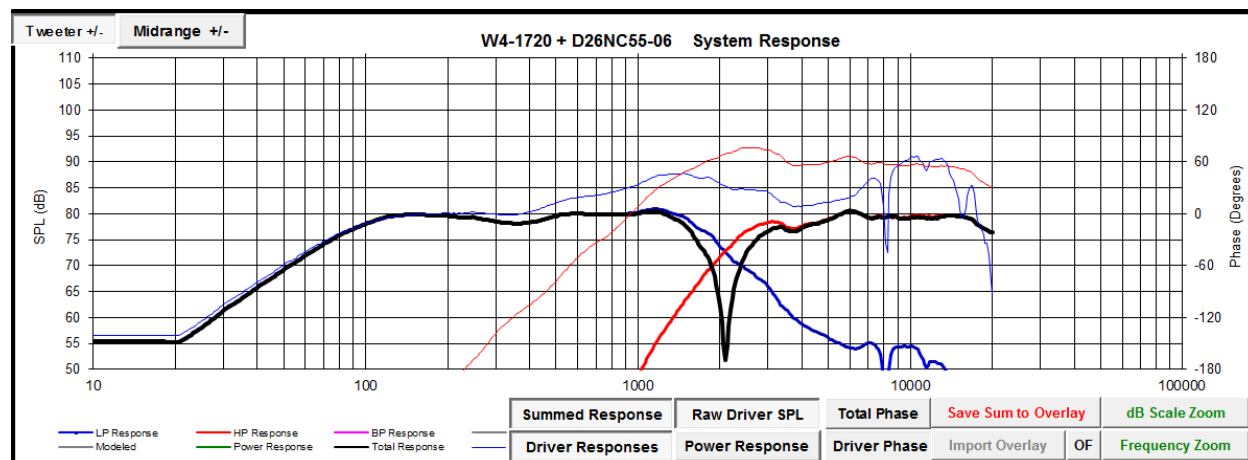
### Filter Electrical Response loaded by the drivers and the System Impedance

Filter shapes were chosen for as high a crossover point as possible while maintaining a good off axis response, acceptable rejection of woofer break up and a good tonal balance standing up.

Electrical System Impedance is an easy drive even for chip amps as it never dips below 5 ohms, and never gets too capacitive.



On Axis15 Degrees Horizontal30 Degrees Horizontal

60 Degrees Horizontal+15 Degrees Vertical (represents "listener standing")On Axis Reverse Null

## Appendix II: More BDC

A second alternative crossover is shown which offers more BDC and less sensitivity above 500 Hz. Theoretically this offers more perceived upper bass, but it wasn't built due to concerns that it would have too much energy in the 3 kHz to 5 kHz range but not enough high frequency air. It's included here for the adventurous.

### Low pass

L1: 1.8 mH inductor, 0.7 ohms dc resistance (16 gauge air core).

C1: 15 uF cap (not electrolytic)

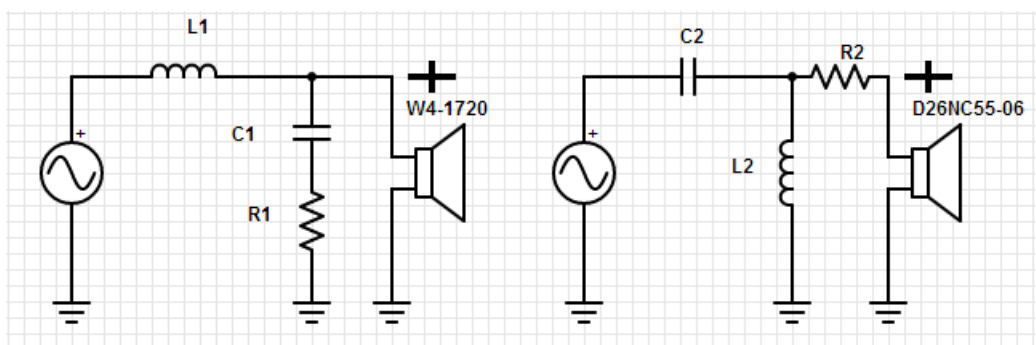
R1: 2 ohm power resistor (10W or greater)

### High Pass

C2: 2 uF cap (not electrolytic)

L2: 1.3 mH inductor, 0.85 ohms dc resistance (20 gauge air core)

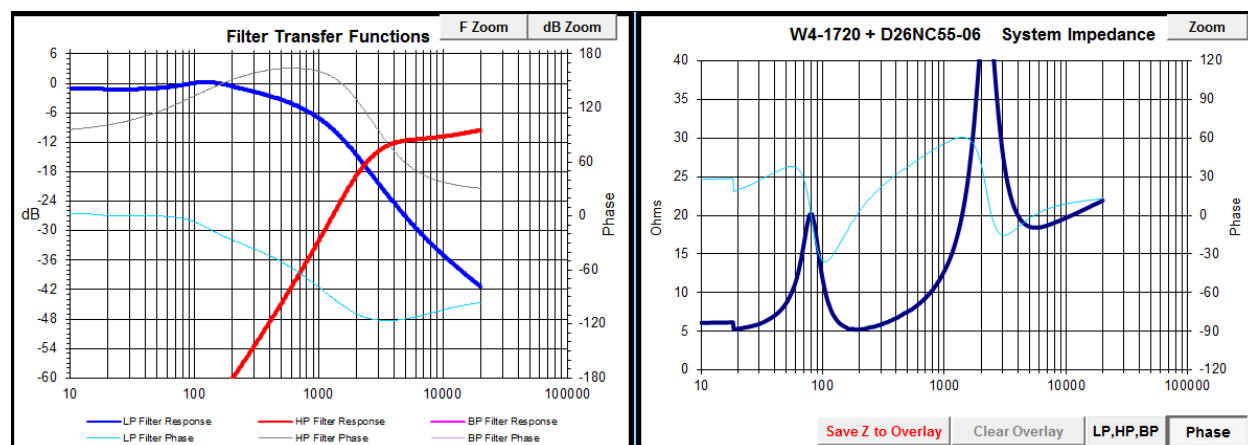
R2: 17 ohm resistor, high power (25W or greater)

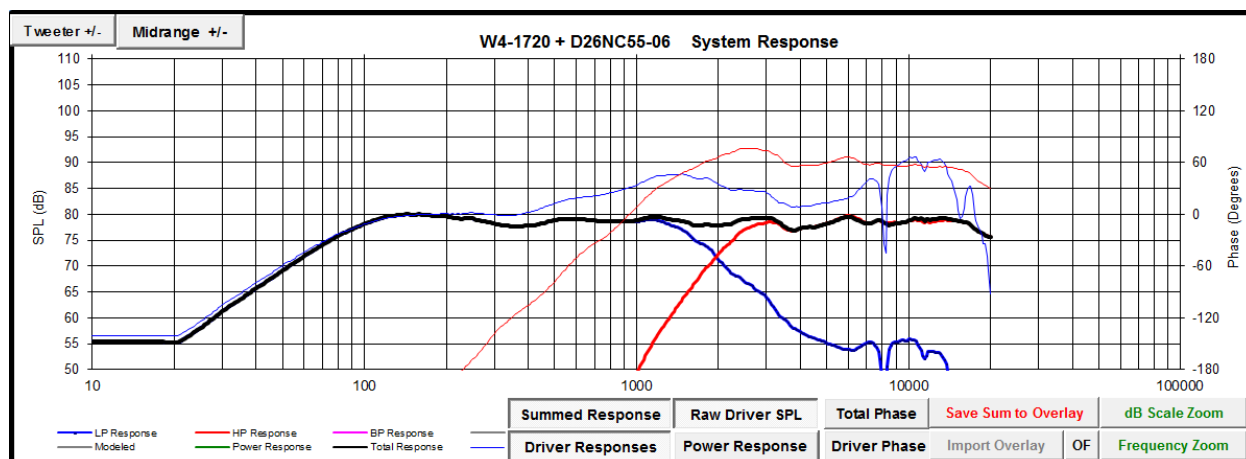
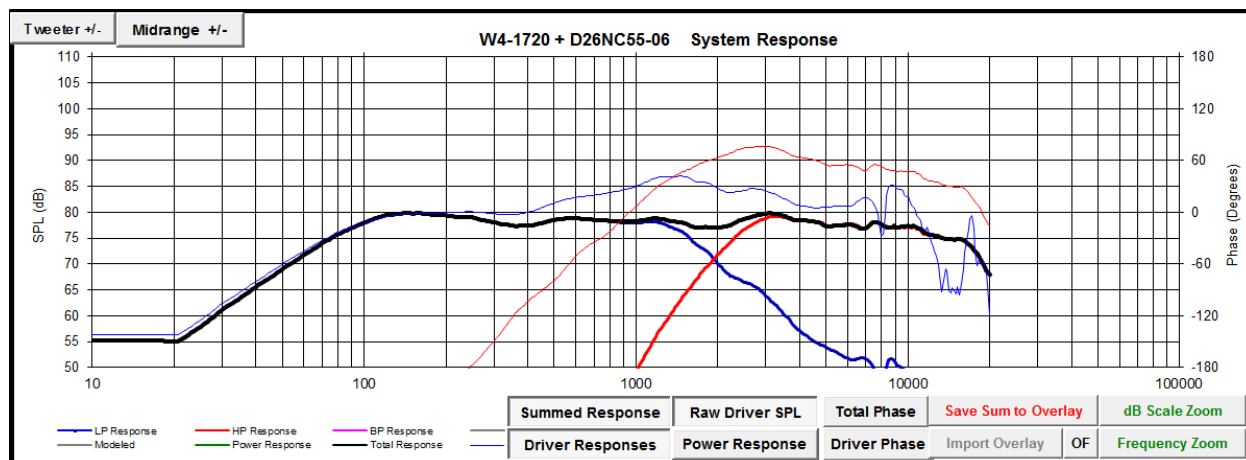
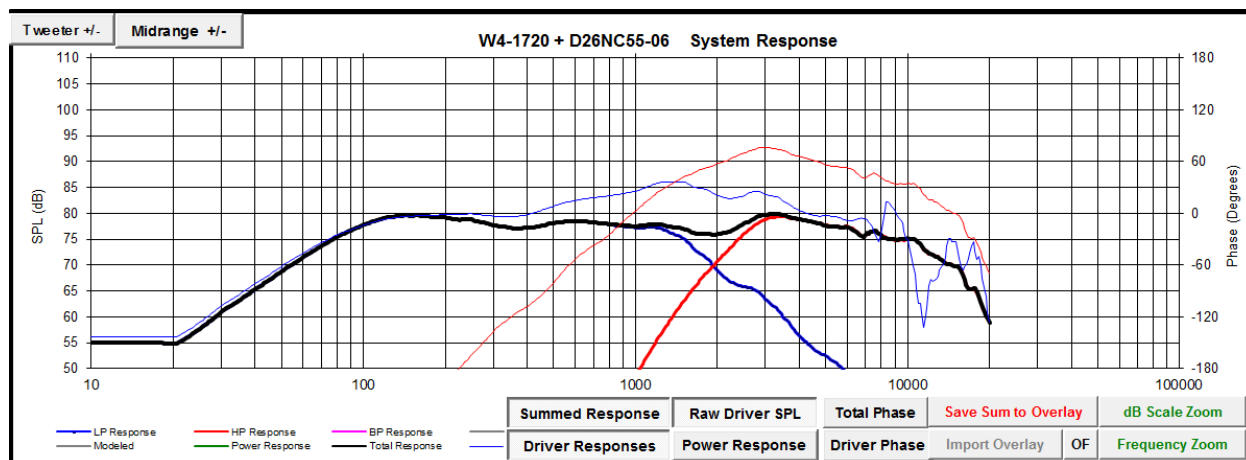


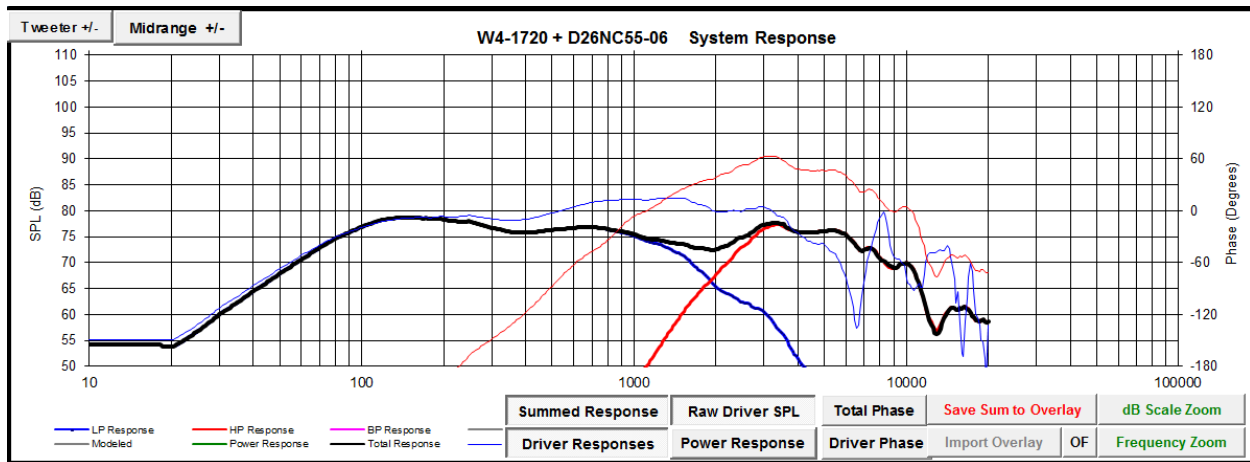
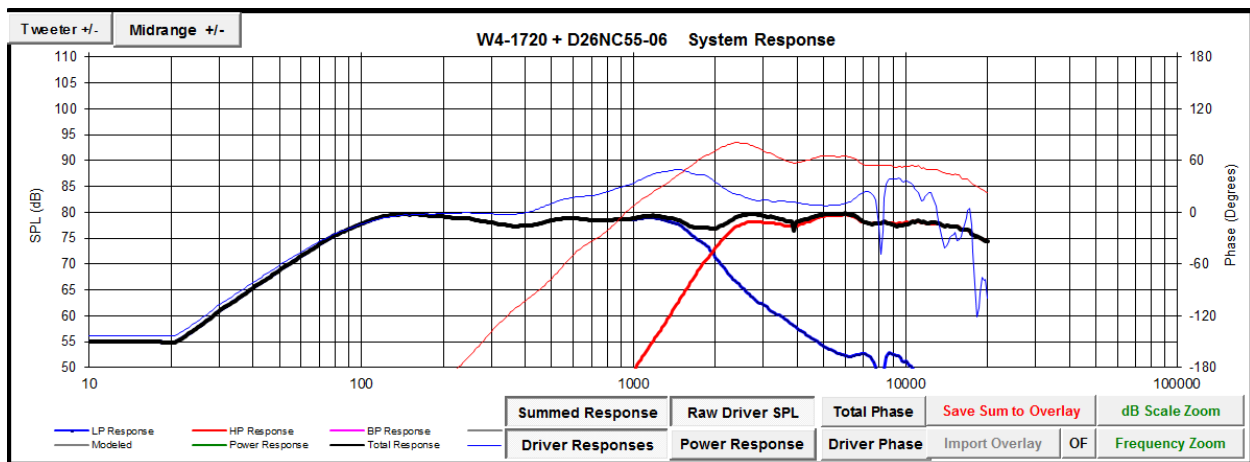
## Filter Electrical Response loaded by the drivers and the System Impedance

Filter shapes were chosen for as high a crossover point as possible while maintaining a good off axis response, acceptable rejection of woofer break up and a good tonal balance standing up.

Electrical System Impedance is an easy drive even for chip amps as it never dips below 5 ohms, and never gets too capacitive.



On Axis15 Degrees Horizontal30 Degrees Horizontal

60 Degrees Horizontal+15 Degrees Vertical (represents "listener standing")On Axis Reverse Null