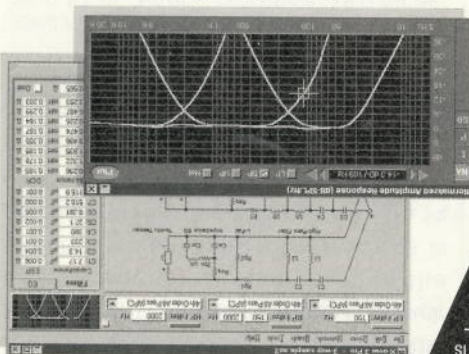


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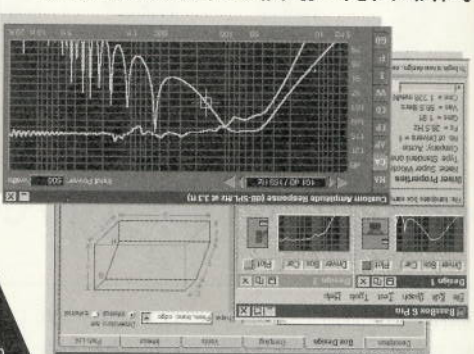
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Passive Crossover Filters and Scalable Driver Modeling

- 1st, 2nd, 3rd and 4th-order "ladder" filter topologies. • Parallel crossover topology. • 2-way crossovers offer Bessel, Butterworth, Chebyshev, Gaussian, Legendre, Linear-Phase and Linkwitz-Riley filters. • 3-way crossovers offer All-Pass Crossover (APC) and Constant-Power Crossover (CPC) filters. • X-Over Pro's capabilities scale to fit the amount of driver data. • A crossover, filter or L-pad can be designed with just the nominal impedance of each driver. • With full Thiele-Small parameters, impedance equalization can be designed and the performance graphed. • Graphs include: Normalized Amplitude Response, Impedance, Phase & Group Delay. • Graphs can include the full speaker response including the box. • Estimate component resistance (ESR & DCR). • Calculate the resistance of parallel or series components.



Design speaker boxes for any space: car, truck, van, home hi-fi, home theater, pro sound, studio, stage, PA and musical instruments. Import acoustic measurements. For example, the response of a car can be imported to simulate the in-car response.

BassBox Pro

Design speaker boxes with

NOTES ON DRIVERS

The MCM driver will make a very good subwoofer that will be well worth the time spent for a very reasonable cost. The Audiomobile driver will be outstanding at a higher cost. The following set of distortion measurements are made at a 91dB level at one meter.

Frequency	MCM	Audiomobile	Adire Audio Brahma 10
40Hz	6%	2.2%	1.5%
30Hz	12%	5.5%	1.75%
25Hz	12%	12%	4.5%

Many other drivers will work in this cabinet; the general requirements are: $X_{MAX} = 12mm$ or greater, Q_{TS} of 0.4 or greater, Q_{MS} of 3 to 15, and an f_s between 25Hz and 35Hz. Here's a short list of available drivers (an "an" indicates drivers installed and tested).

Dayton T1600, $X_{MAX} = 16mm$ and $f_s = 28Hz$, Parts Express PN 295-412

Audiobahn AW10080, $X_{MAX} = 20mm$, $f_s = 35Hz$.

Audiobahn AW10081 (This year's model of the above).

Rockford Fosgate RFR 3110, specs similar to the Audiomobile.

Adire Audio model Brahma 10, $X_{MAX} = 27mm$, $f_s = 35Hz$ (measured 28Hz). Extremely linear, see URL.

<http://www.acoustic-visions.com/brahma10.htm>

- PARTS LIST**
- One 4" x 8" sheet of 3/4" particleboard—sides, front, back, top, and bottom.
 - One 2" x 4" sheet of 1/2" particleboard—covers, divider braces, divider, and subtop.
 - One 4" x 4" sheet of 3/8" particleboard—separators.
 - One 4" x 4" sheet of 1/4" hard board—walls, corners, stops, and free corner braces.
 - 16 oz bottle of polyurethane wood glue.
 - Small bottle of white glue.
 - 1lb of craft felt.
 - Ten #8 T-nuts.
 - Ten #8 cap head or Phillips head screws, 1.25" long.
 - Ten #8 steel washers.
 - Two 6" lengths of #12 stranded wire, one red and one black, or your favorite colors.
 - One dual binding post with 3/4" centers for single or dual banana plugs.
 - 13" x 1/4" x 1/4" self-adhesive weather proofing tape, MCM driver only.
 - 1lb fiberfill.
 - Five 7" x 4.5" x 2.375" polyester utility sponges from Ace Hardware or equivalent.
 - MCM 55-2325 or Audiomobile MASS 2010 2/4 driver. If the MASS 2010 series is no longer available the new MASS 2410 2/4 is the replacement and has ±3mm more throw.
 - The 5/8" x 3/4" x 8" strips are cut from the 3/4" sheet scraps.

REFERENCES

Audiomobile.
<http://www.audiomobileinc.com/main.htm>

MCM.
<http://www.mcmelectronics.com>

Elements of Acoustical Engineering, 2nd Edition, Harry F. Olson, E.E. Ph.D., D. Van Nostrand Co. 1947.

Don Morrison Audio.
<http://www.donmorrisonaudio.com/>

❖ The integration of the subwoofer and the stereo speakers should be seamless; the only noticeable change in sound should be that the low-frequency range has found a lower octave. When set up properly, the low bass may almost sound a little thin but very articulate, just like a live concert!

alignment and test CD and try it out. Because the LF and HF channels of many second- and third-order crossovers are 180° out of phase around the crossover point, you may choose to try switching the phase to the subwoofer for effect. If required, readjust the channel gains so that the subwoofer disappears in the sound stage.