

The Acapella SE

drivers, drawings and construction pictures





Fig. 1. New ribbon tweeters: Aurum Cantus G2Si



Fig. 2. Midrange driver: SEAS W18EX001



Fig. 3. New bass driver: SEAS W22EX001



Fig. 4. Cutting rear edge of side panels.



Fig. 5. Marking right side panel.



Fig. 6. Checking panels with drawing.



Fig. 7. Chamfering driver hole.



Fig. 8. Making a mould for gluing the side and front panels. This ensures correct angles and rear width.



Fig. 9 and 10: Thanks to the mould used for gluing: two identical structures. Not that easy to accomplish I can tell from previous projects. Now the top, rear and bottom panels can be made. A small 5 x 5 mm fillet will be inserted between side and front panels.

Cabinet drawings

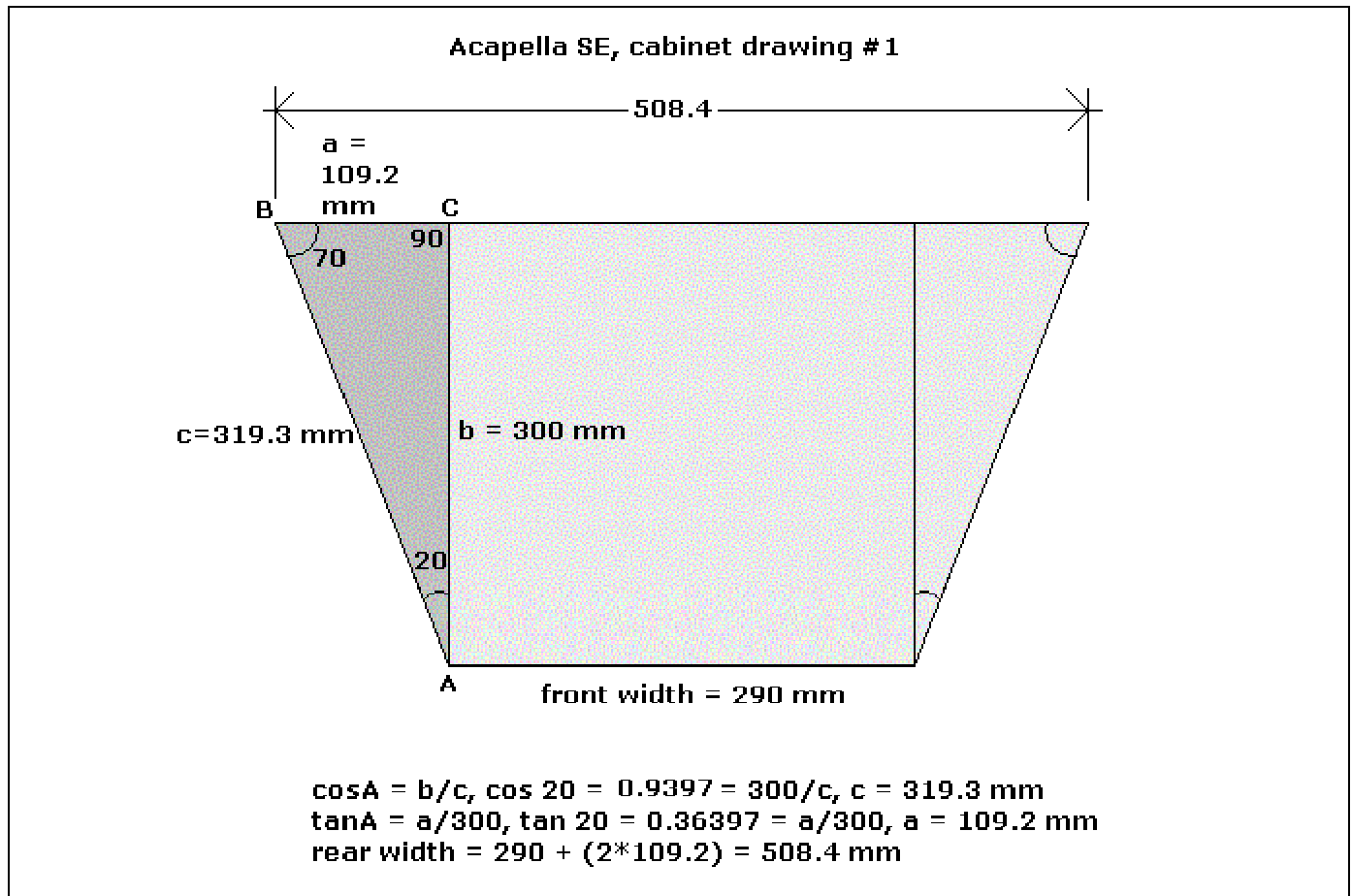


Fig. 11. Drawing of bottom plane. Calculating with of side panels and total width of cabinet rear. The Acapella SE cabinet is based on the following preconditions: Front width = 290 mm. Total depth at bottom = 300 mm. The angle between front and side panel is 110 deg. Front panel is tilted 10 deg. Total height = 1190 mm.

Acapella drawing #2, base dimensions. Seen from top.

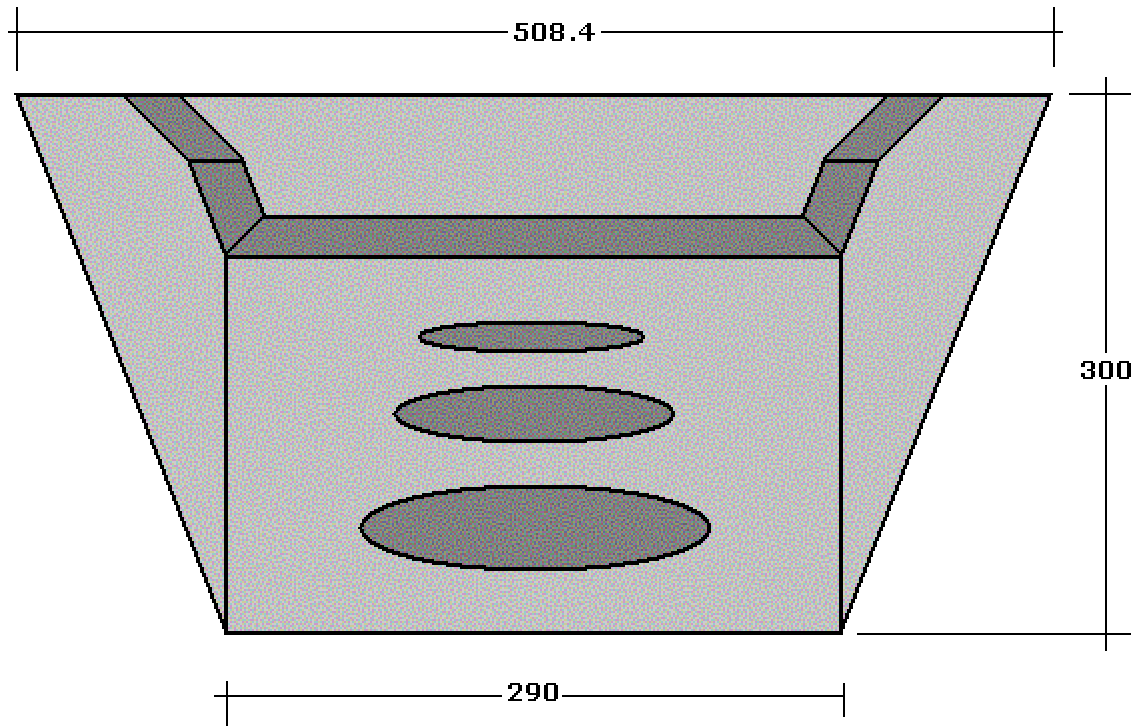


Fig. 12. Acapella SE cabinet dimensions. Seen from top

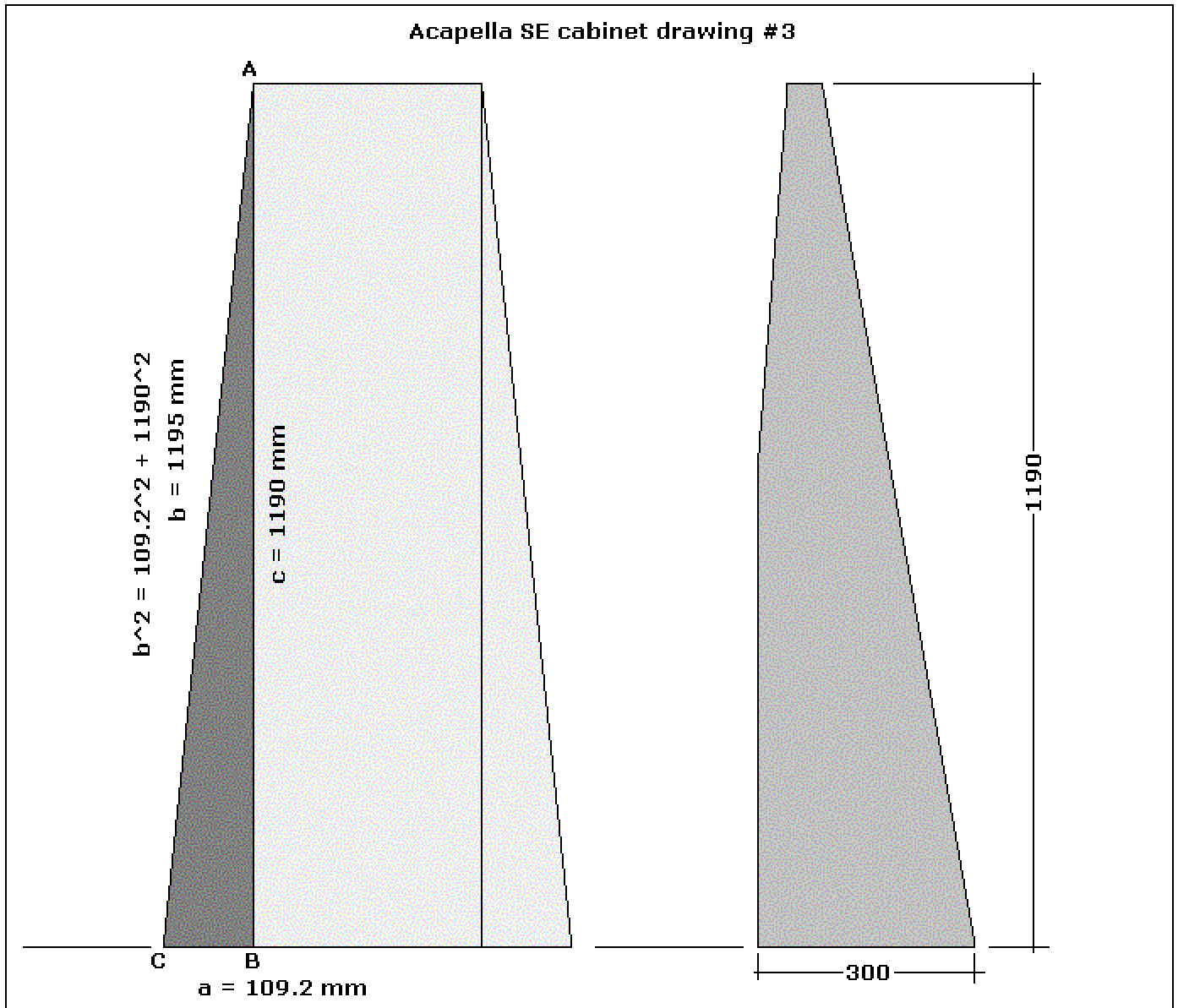


Fig. 13. Drawing of cabinet seen from front and side. Dimensions of rear plane.

Acapella SE, drawing #4 Cutting plan, side panels

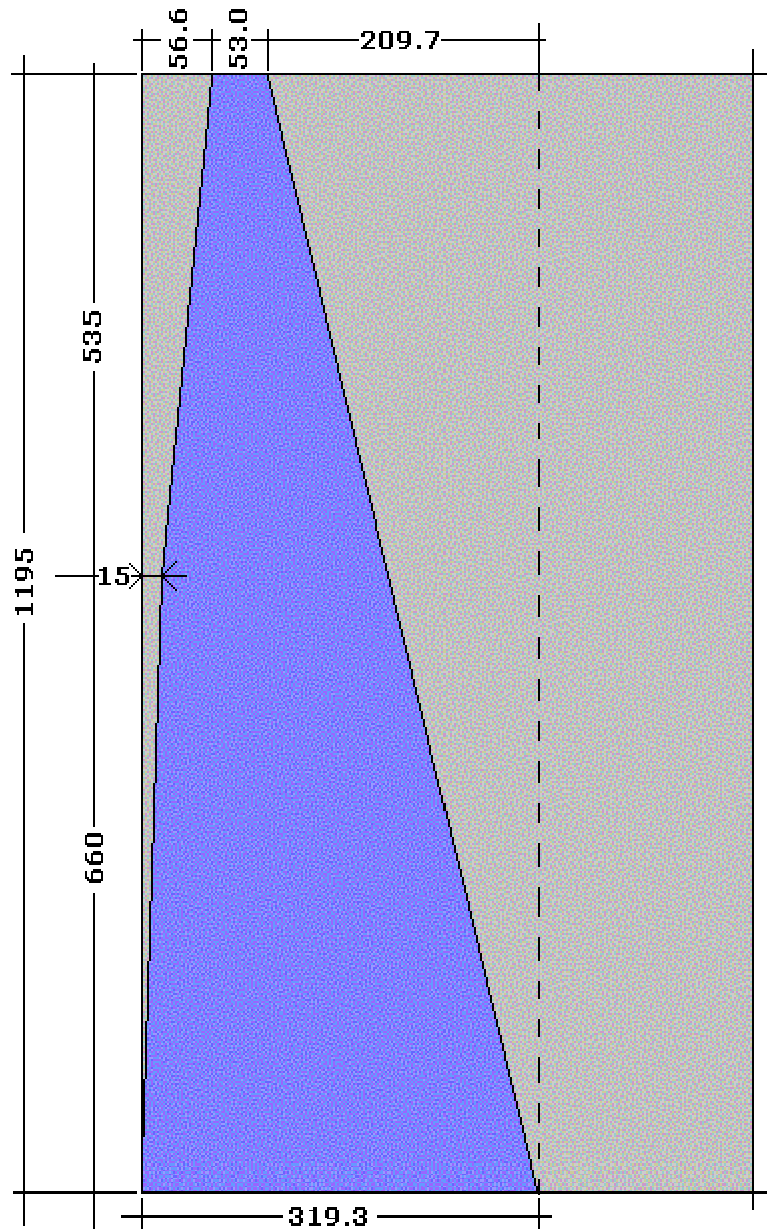


Fig. 14. Drawing #4: Side panel cutting plan. The side panels are made from a 1220 x 450 mm pre-veneered 25 mm MDF, same veneer on both sides (!). Top and bottom is cut 4 deg., front edge is cut 35 deg. and rear edge is cut 20 deg. The transverse cut forms the front edge of both side panels. After cutting the first side panel, place this panel mirrored on the residual MDF panel and mark the cutting lines with a pencil. Then cut the second side panel. See fig. 15. As mentioned several times in the Point75 and Acapella files: do yourself a favour and make a test cut of the side panels. This can be done in 16 or 19 mm MDF. All you need is a sheet of 122 x 450 mm MDF.

Acapella SE, drawing # 5, side panel cutting

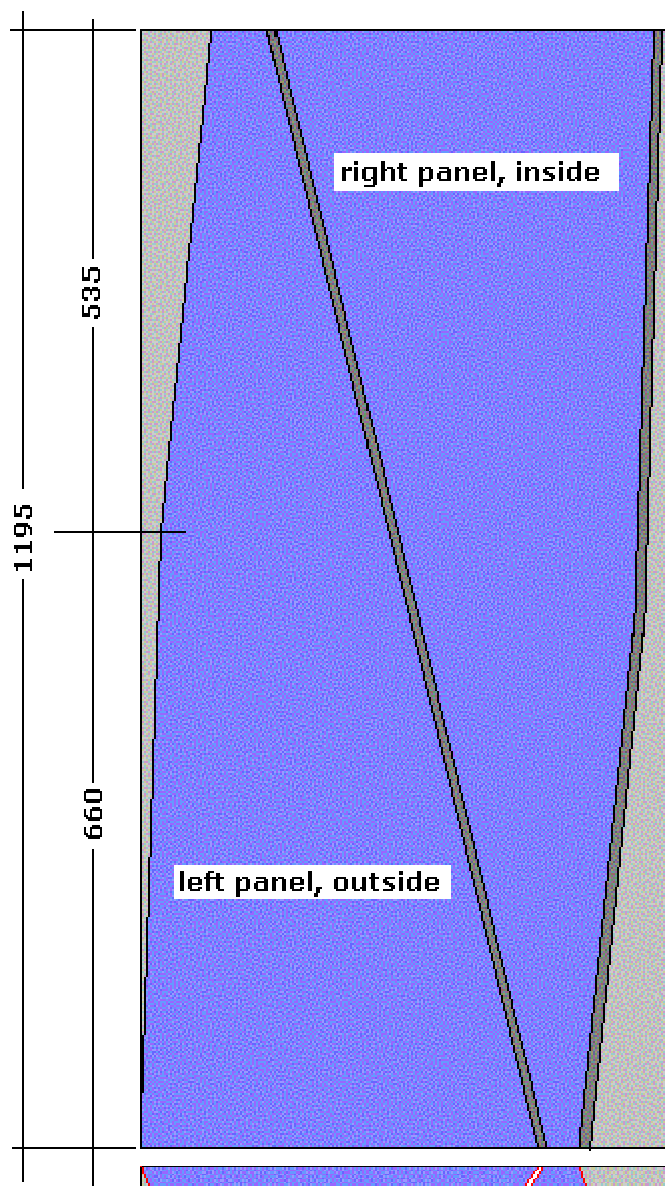


Fig. 15. This drawing shows how you first make the left side panel seen from outside and the right side panel seen from the inside.

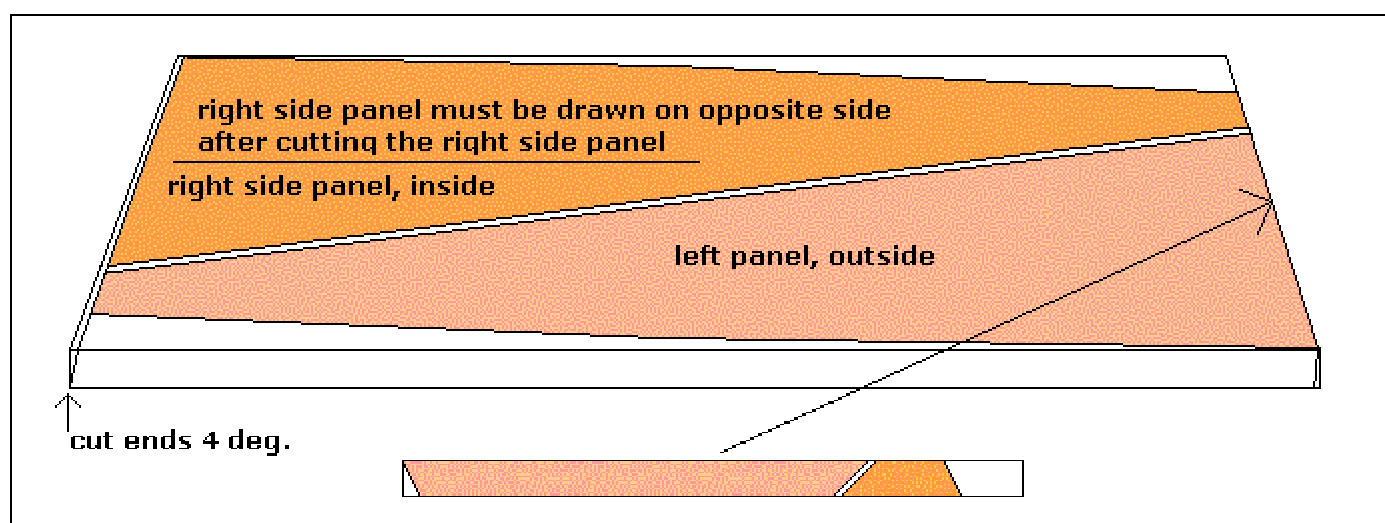


Fig. 16. Additional drawing on side panel cutting. Ends are cut 4 deg. due to minor tilting of the side panels towards the front panel.

Acapella SE, cabinet drawing #6, front panel dimensions

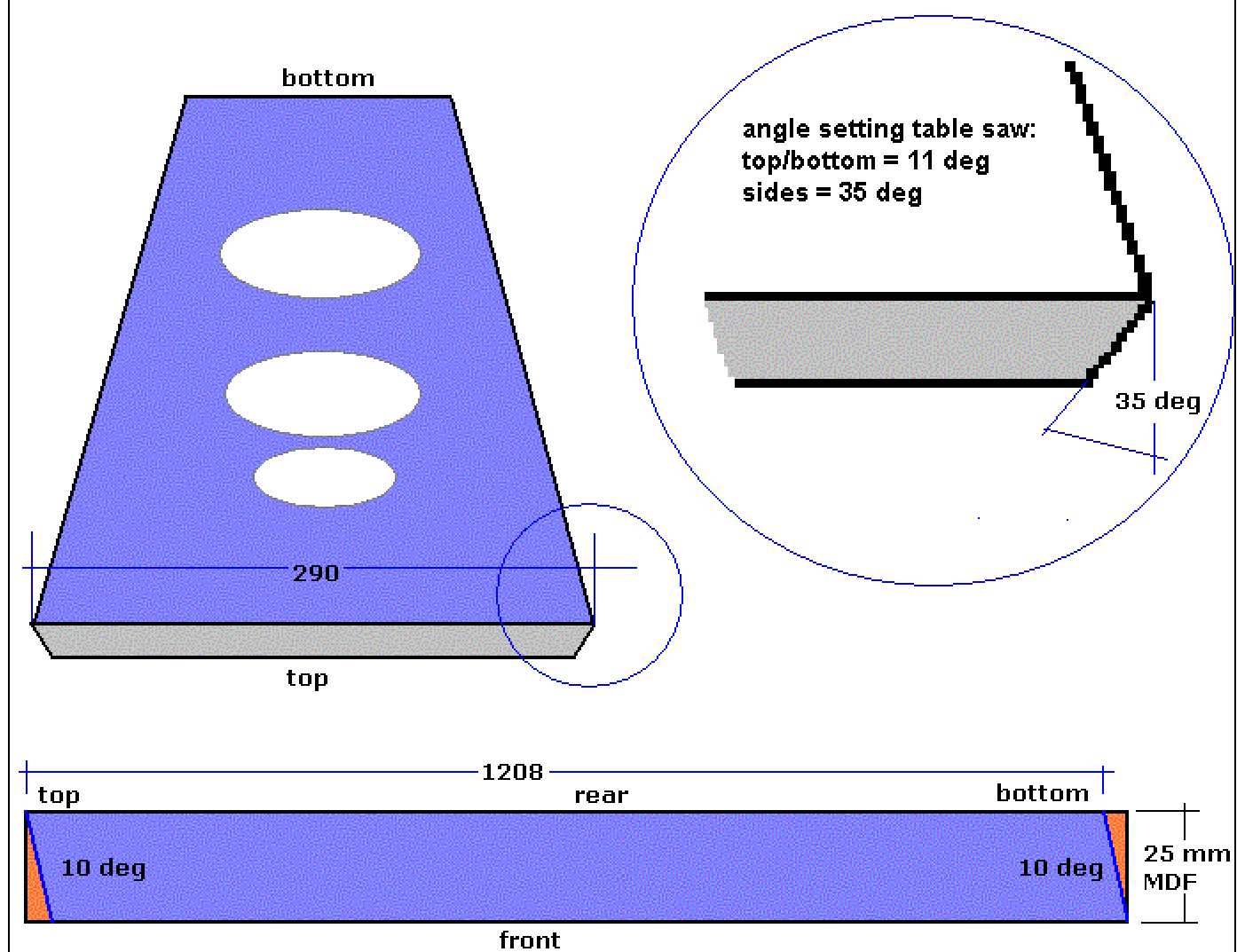


Fig. 17. Cutting plan for front panel.

Acapella drawing #7, bass enclosure, driver placement, vent dimensions

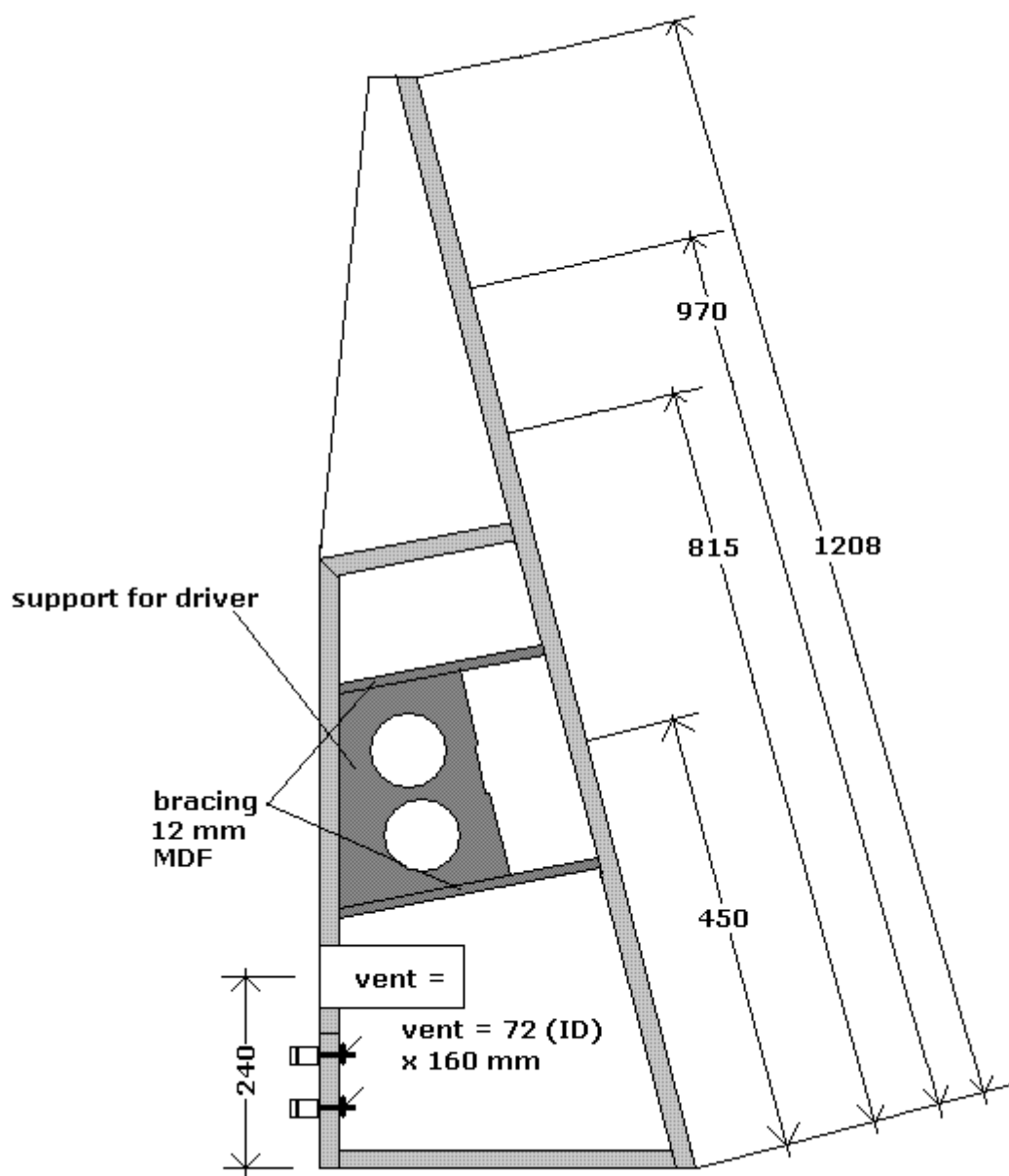


Fig. 18. Vent dimensions/placement, bracing and driver placement. Final vent length still to be determined. 160 mm produces a vent tuning of 35-37 Hz, which is likely to be the end result.



Fig. 19. The bottom panel is going to be attached by screws, thus fillets being glued in place here.



Fig. 20. The top panel is 90 deg. to the front panel (fig. 19), so the rear and top panel are both cut at a 40 degree angle.

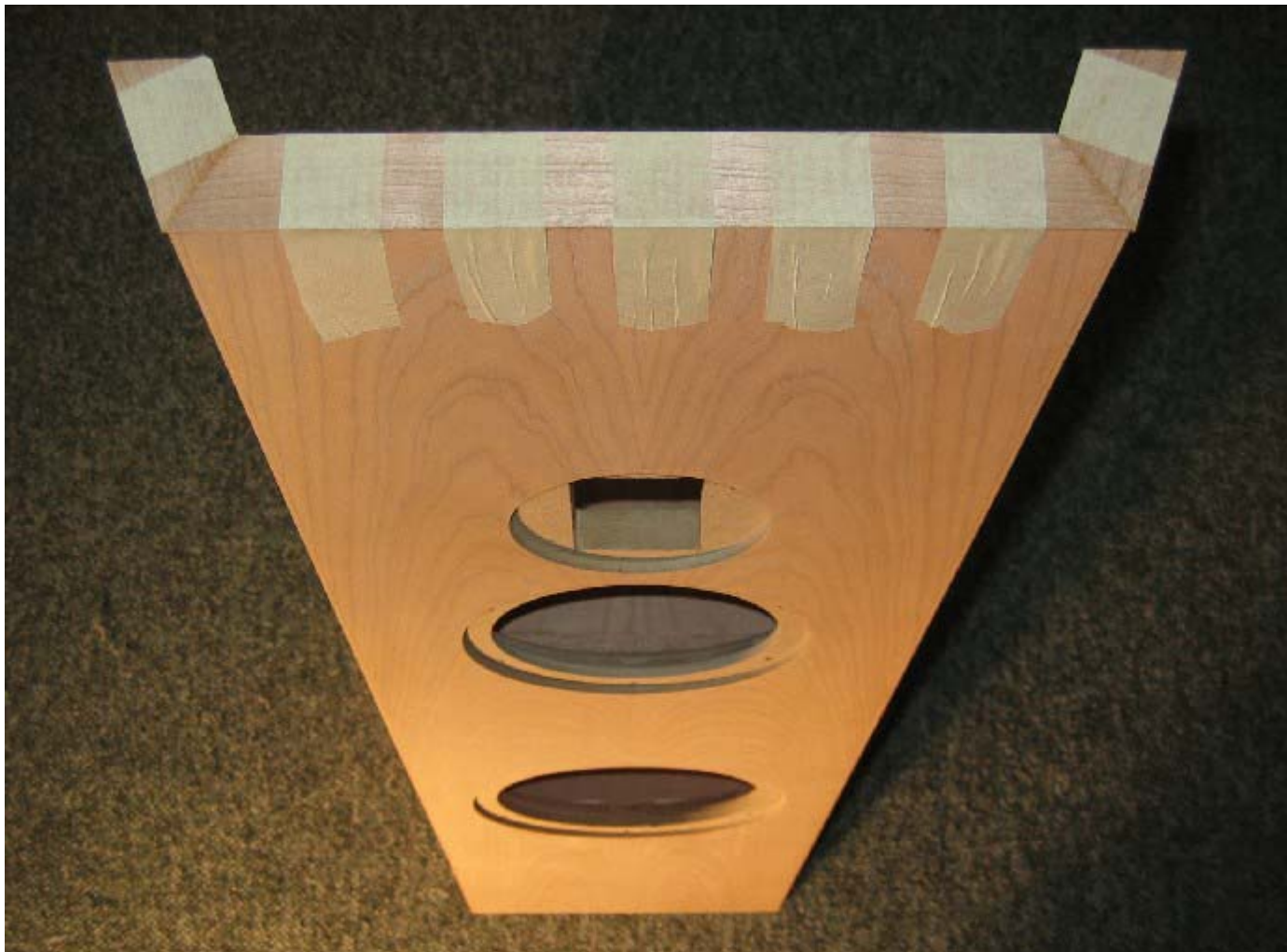


Fig. 21. Gluing fillets to the top.



Fig. 22. Finally, the cabs are finished and ready for all the fun work.

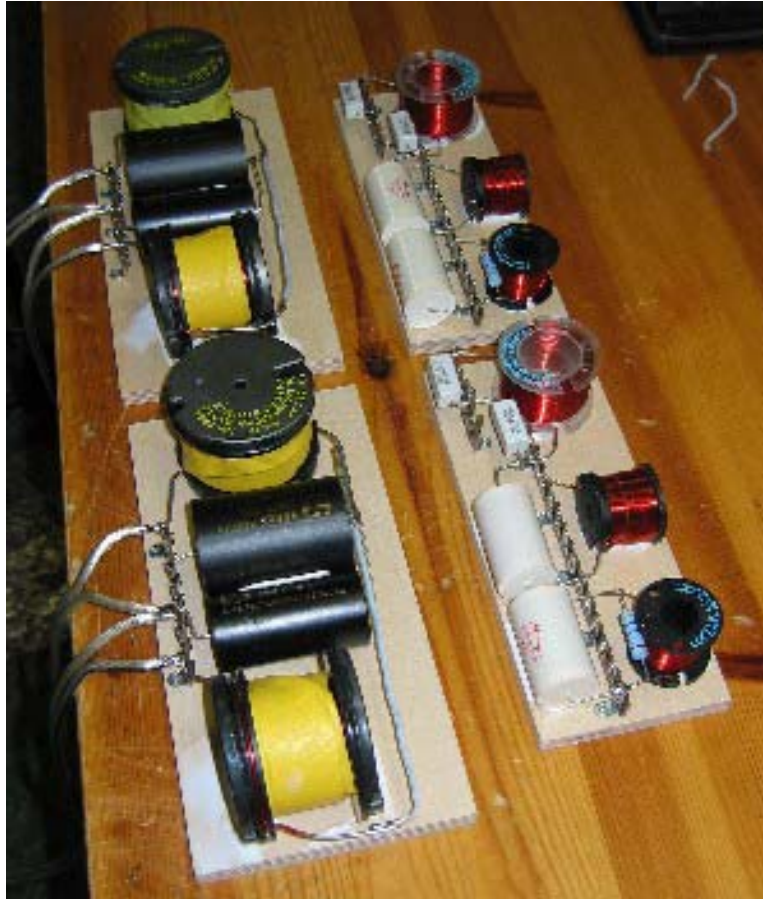


Fig. 23. Crossovers are piling up. Here for the tweeter and bass driver.

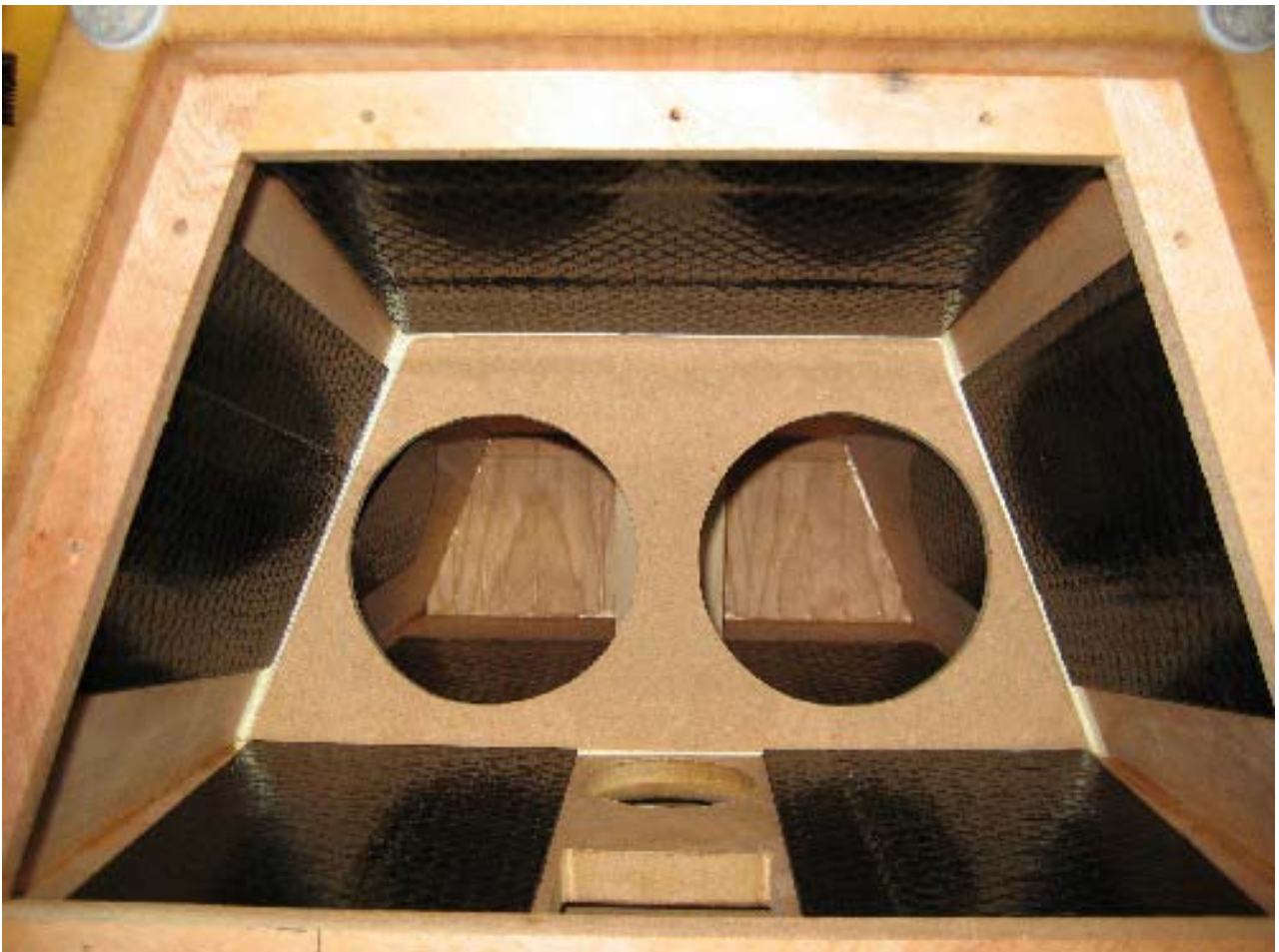


Fig. 24. Applying bitumen pads to bass enclosure.



Fig. 25. Bitumen pad on rear of front panel.



Fig. 26. Mounting ribbon crossover. Still some polyester foam to be glued to the rear. Fillets will be glued to the sides to support rear grille as seen in Point75A file.



Fig. 26a: Fillets for supporting the rear grille.
Residual rear damping on top of bass enclosure and side panels.

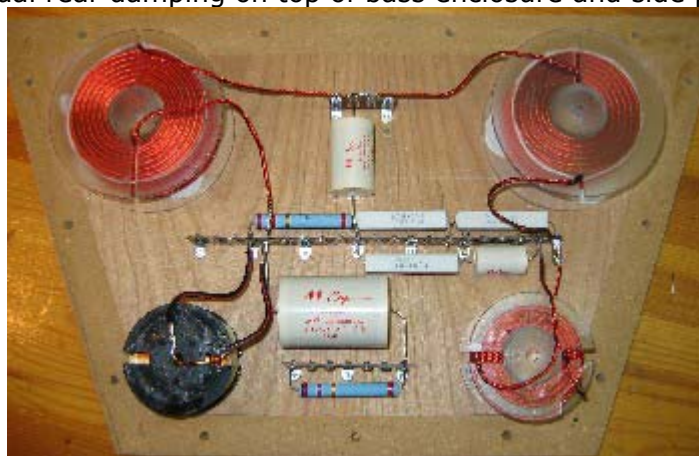


Fig. 27. Midrange crossover on inside of bottom panel.



Fig. 28. Wiring up the mid-section and fine-tuning LCR-circuit. A piece of 30 x 60 cm damping material is folded and placed on top of bottom panel before assembly. Soon ready!



Fig. 29. 31 October, 2004: So, here is the final result on display for the camera. These speakers throw a wide, solid soundstage with a clarity and lack of distortion better than any other speaker system I have ever had. I'm sure they would make up to even better amps than what I have, although I'm very pleased with the sound from my homemade valve preamp and Copland power amp.

Acapella SE, crossover version 3

SEAS W22EX001 + SEAS W18EX001 + Aurum Cantus G2Si

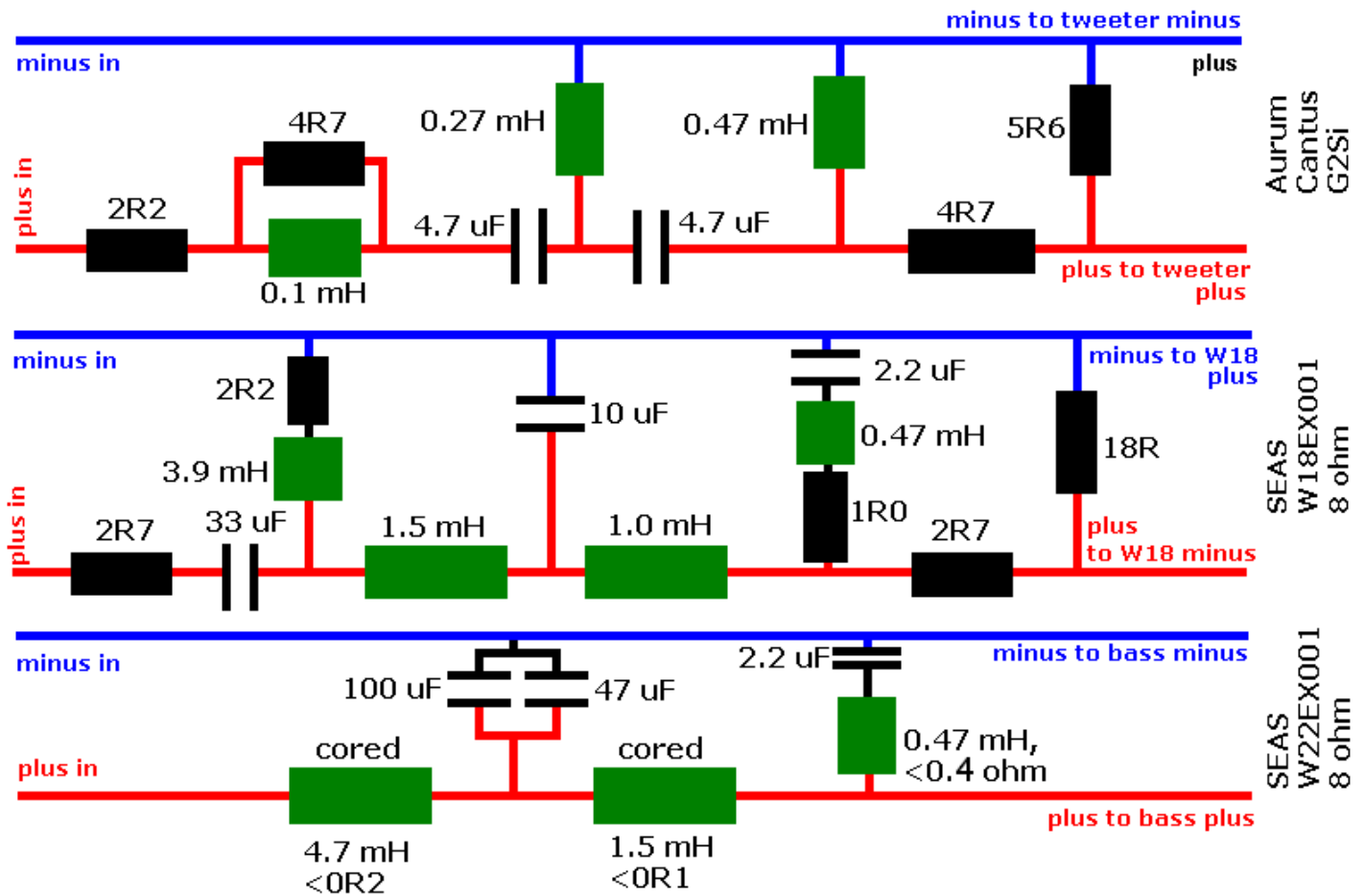


Fig. 30. Acapella SE, crossover, version 3. Initially I left out the bass driver notch filter (0.47 mH + 2.2 uF), thinking it was a bit too much targeting a small notch more than 40 dB down, but it does appear to have a minor impact on tweeter performance in the 5-8 kHz region. Try listening to pink noise with only the bass driver connected and then insert the notch filter and hear a faint hiss disappear. It's clearly audible. So in it goes again. Small operation and for the benefit of the doubt.

Crossover parts:

Tweeter:

2.2 ohm, 5 W, MOX
 4.7 ohm, 5 W, MOX
 5.6 ohm, 5 W, MOX
 0.1 mH, 0.17 ohm, 0.9 mm wire
 0.27 mH, 0.29 ohm, 0.9 mm wire
 0.47 mH, 0.41 ohm, 0.9 mm wire
 4.7 uF, 400 Vdc, polypropylene, Mundorf Mcap

Midrange:

2.7 ohm, 10 W, MOX
 2.2 ohm, 10 W, MOX
 1.0 ohm, 10 W, MOX
 2.7 ohm, 10 W, MOX
 18 ohm, 10 W, MOX
 3.9 mH, cored, 0.42 ohm, 1.12 mm wire
 1.5 mH, 0.33 ohm, multistrand wire, $7 \times 0.6 \text{ mm} = 1.98 \text{ mm}^2$
 1.0 mH, 0.27 ohm, multistrand wire, $7 \times 0.6 \text{ mm} = 1.98 \text{ mm}^2$
 0.47 mH, 0.17 ohm, multistrand wire, $7 \times 0.6 \text{ mm} = 1.98 \text{ mm}^2$
 33 uF, 400 Vdc, polypropylene, Mundorf Mcap
 10 uF, 400 Vdc, polypropylene, Mundorf Mcap
 2.2 uF, 400 Vdc, polypropylene, Mundorf Mcap

Bass:

4.7 mH, cored, 0.19 ohm, 1.4 mm wire
 1.5 mH, cored, 0.07 ohm, 1.4 mm wire
 0.47 mH, 0.41 ohm, 0.9 mm wire (0.41 ohm is OK)
 100 uF, MKT, polyester, 100 Vac
 47 uF, MKT, polyester, 100 Vac
 2.2 uF, 400 Vdc, polypropylene, Mundorf Mcap

