

# Isobaric ported subwoofer using PYLE 2\*PLPW15D



# Design objectives

- Maximum output at 30Hz
- Can easily be carried by two people and repositioned short distances by one
- Uses PLPW15D driver (I have a lot of them)
- Under 1m tall
- Output from only one face
- Daisy chainable to speed up deployment

# Specifications

- 16  $\Omega$  nominal (actual minimum 18 $\Omega$ )
- > 90 dB/1W/1m from 30Hz
- Quasi continuous SPL > 116dB/1m/2pi 30Hz -120 Hz (outdoors)
- 2 subs = 122dB, 4 subs = 128 dB, 8 subs = 134 dB
- Can run without limiters on inuke6000, otherwise limit to 90Vrms (peak) as evidence of power compression at tune for 94V sweep.
- THD mostly less than 10% for 41V sweep (-7.2dB from 94V sweep), THD >10% at end of sweep is likely amp limiting.
- HP 4<sup>th</sup> order Butterworth at 27Hz for excursion protection

# Hornresp inputs

- From impedance measurements of broken in driver, all tested drivers quite similar

Hornresp - Input Parameters pyle

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Ang	2.0 $\times$ Pi	Eg	4.00	Rg	0.00	Cir	0.00
S1	0.00	S2	0.00	L12	0.00	F12	0.00
S2	0.00	S3	0.00	L23	0.00	F23	0.00
S3	0.00	S4	0.00	L34	0.00	F34	0.00
S4	0.00	S5	0.00	L45	0.00	F45	0.00

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Sd	820.00	Cms	1.08E-04	Mmd	178.81	Re	6.89
BI	17.15	Rms	7.06	Le	3.60	Nd	2s
Vrc	110.00	Ap	200.00	Vtc	0.00		
Lrc	40.00	Lpt	54.00	Atc	0.00		

Comment: Pyle\_PLPW15D 28.2Hz tune isobarik, real port is 37.3 cm long, near wall

Previous Next Edit Add Delete Record 3 of 8 Calculate

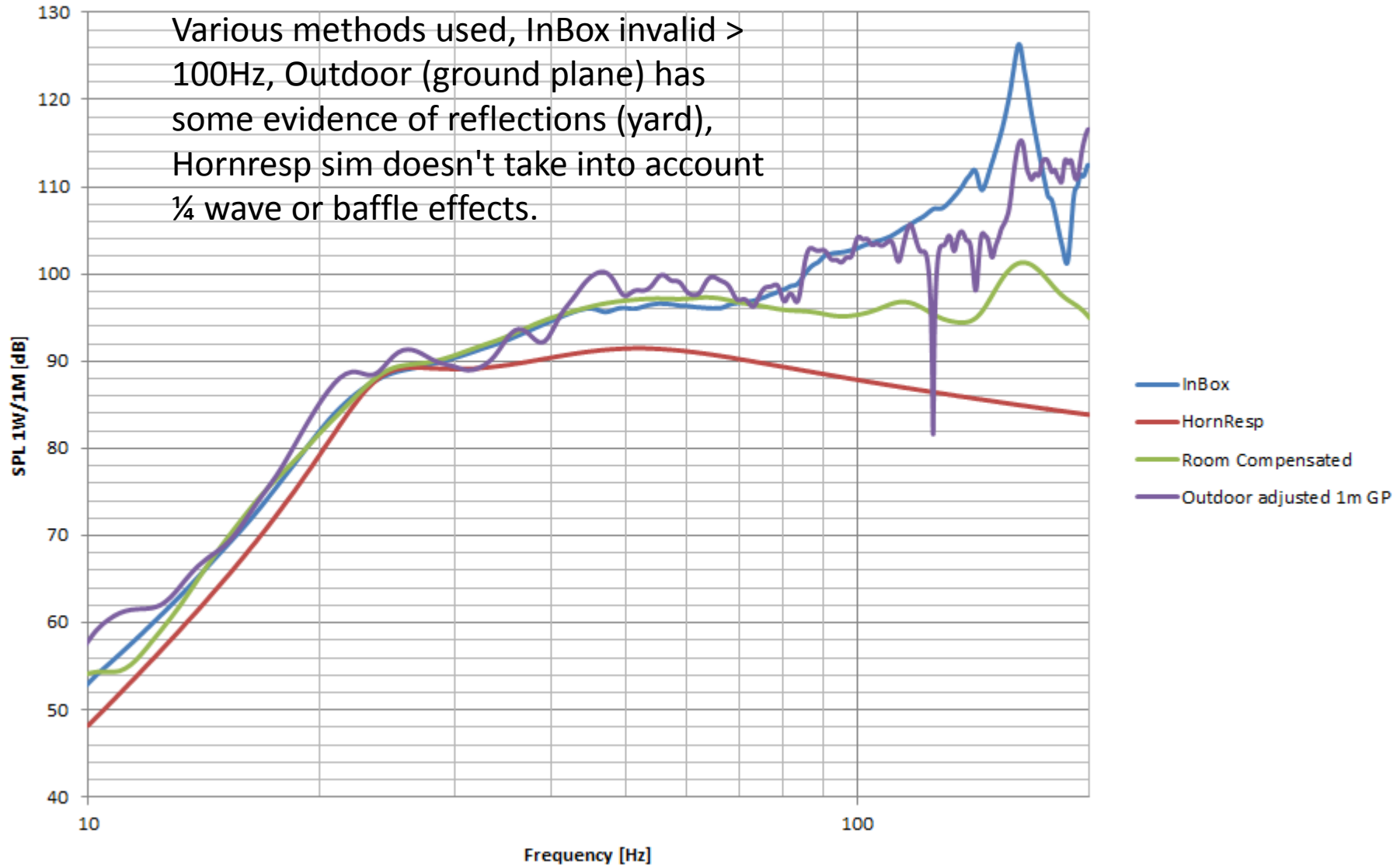
Semi-Inductance Model

Re'	6.89	ohms
Leb	0.58	mH
Le	7.16	mH
Ke	0.41	sH
Rss	253.70	ohms

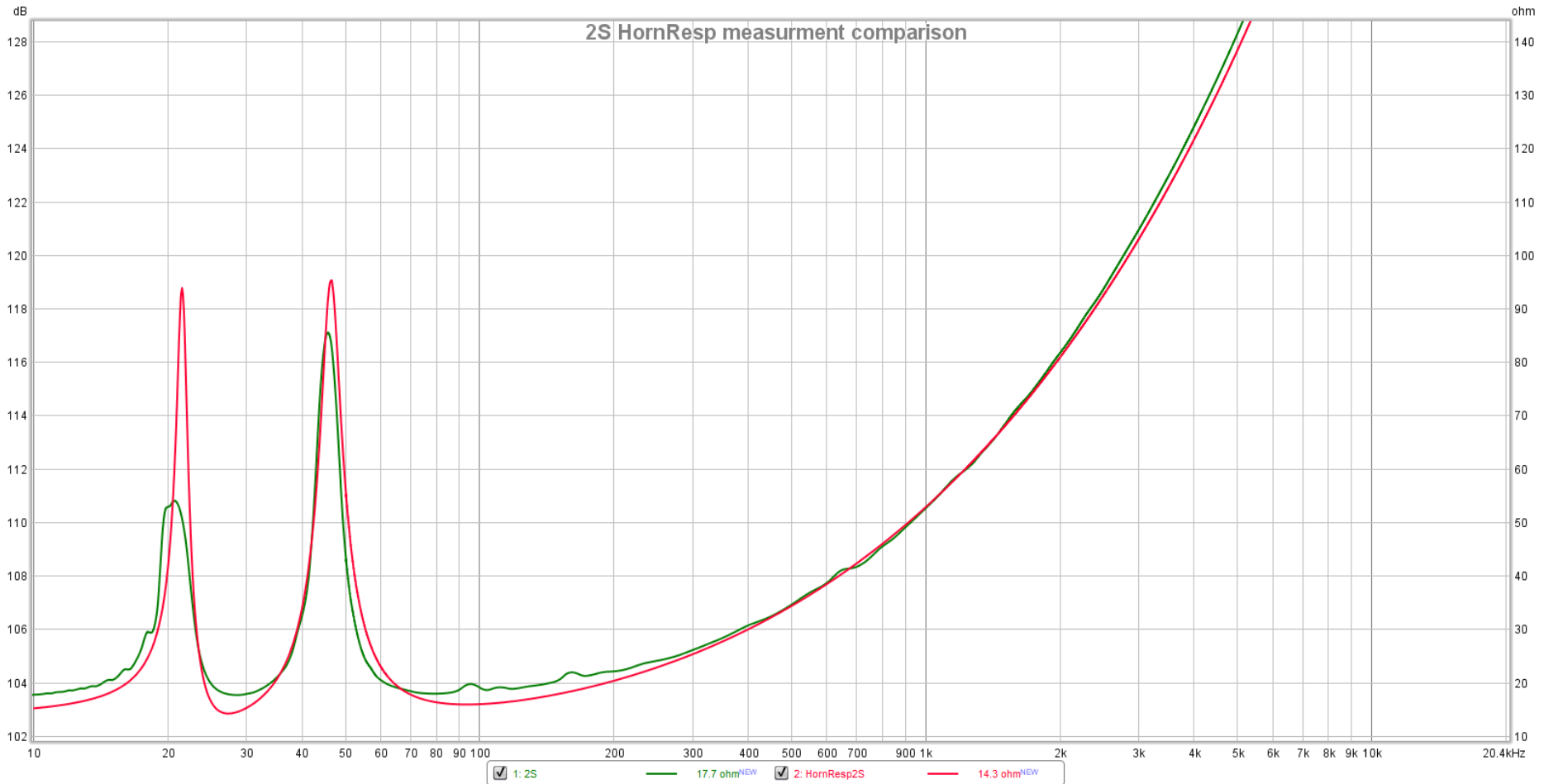
On Off

# 1W/1m/2pi SPL

Various methods used, InBox invalid > 100Hz, Outdoor (ground plane) has some evidence of reflections (yard), Hornresp sim doesn't take into account  $\frac{1}{4}$  wave or baffle effects.

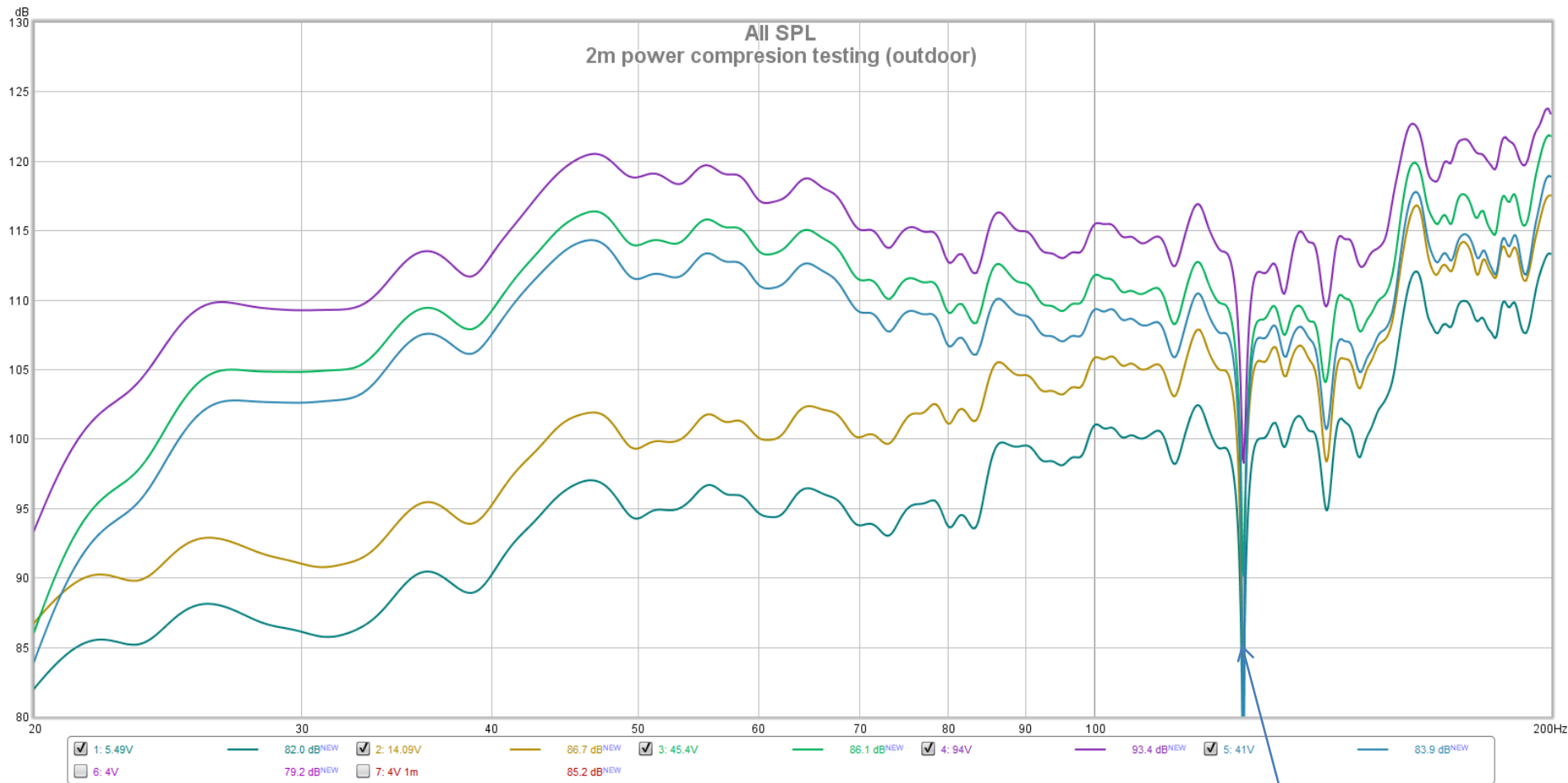


# Impedance



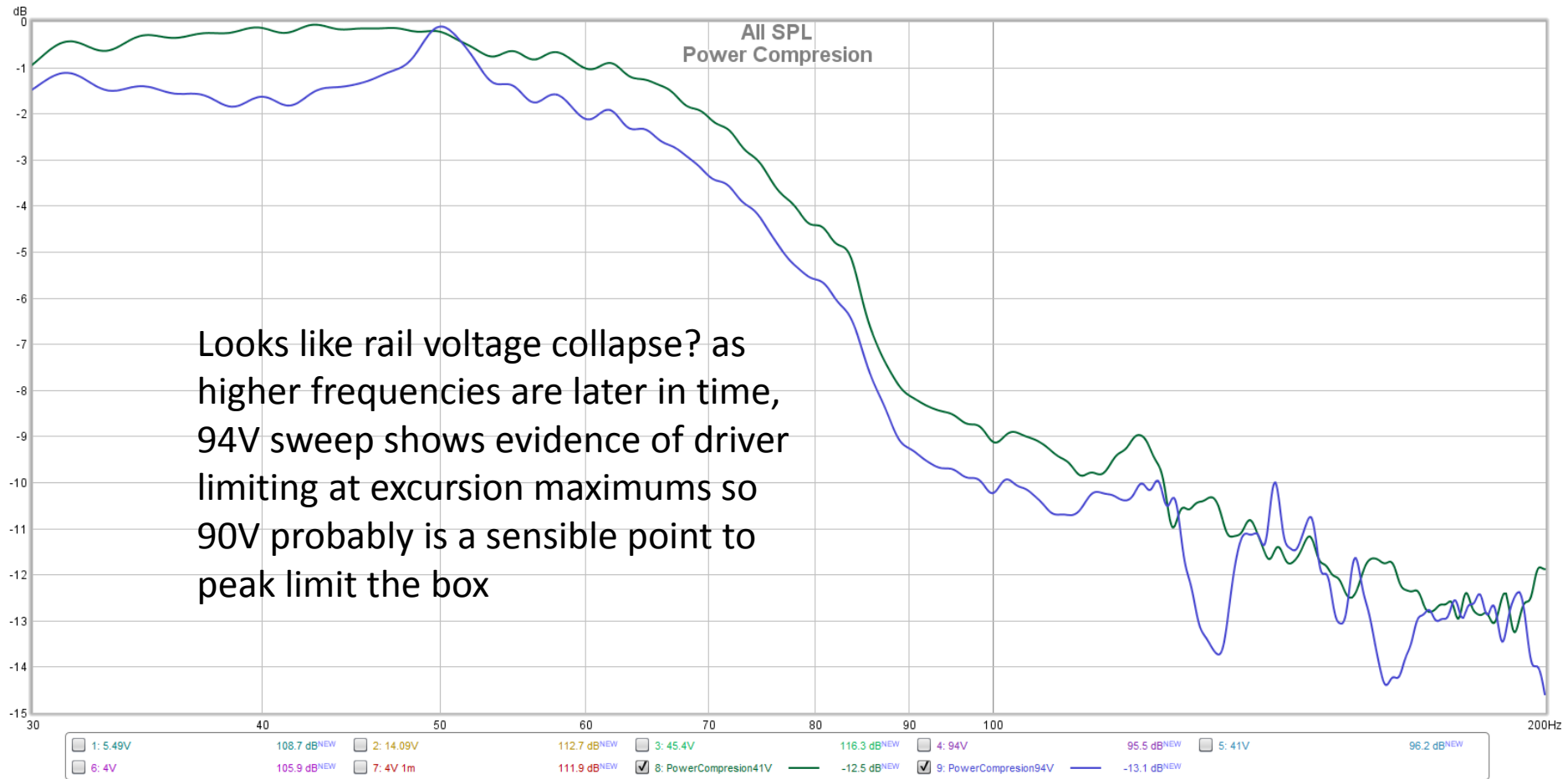
Good agreement with simulation, no frequency dependent damping model used so first peak is expected to be lower than simulation, 28.2 Hz tune, port length in sim = 400mm, actual = 373mm.

# High level sweeps (2m 2pi)



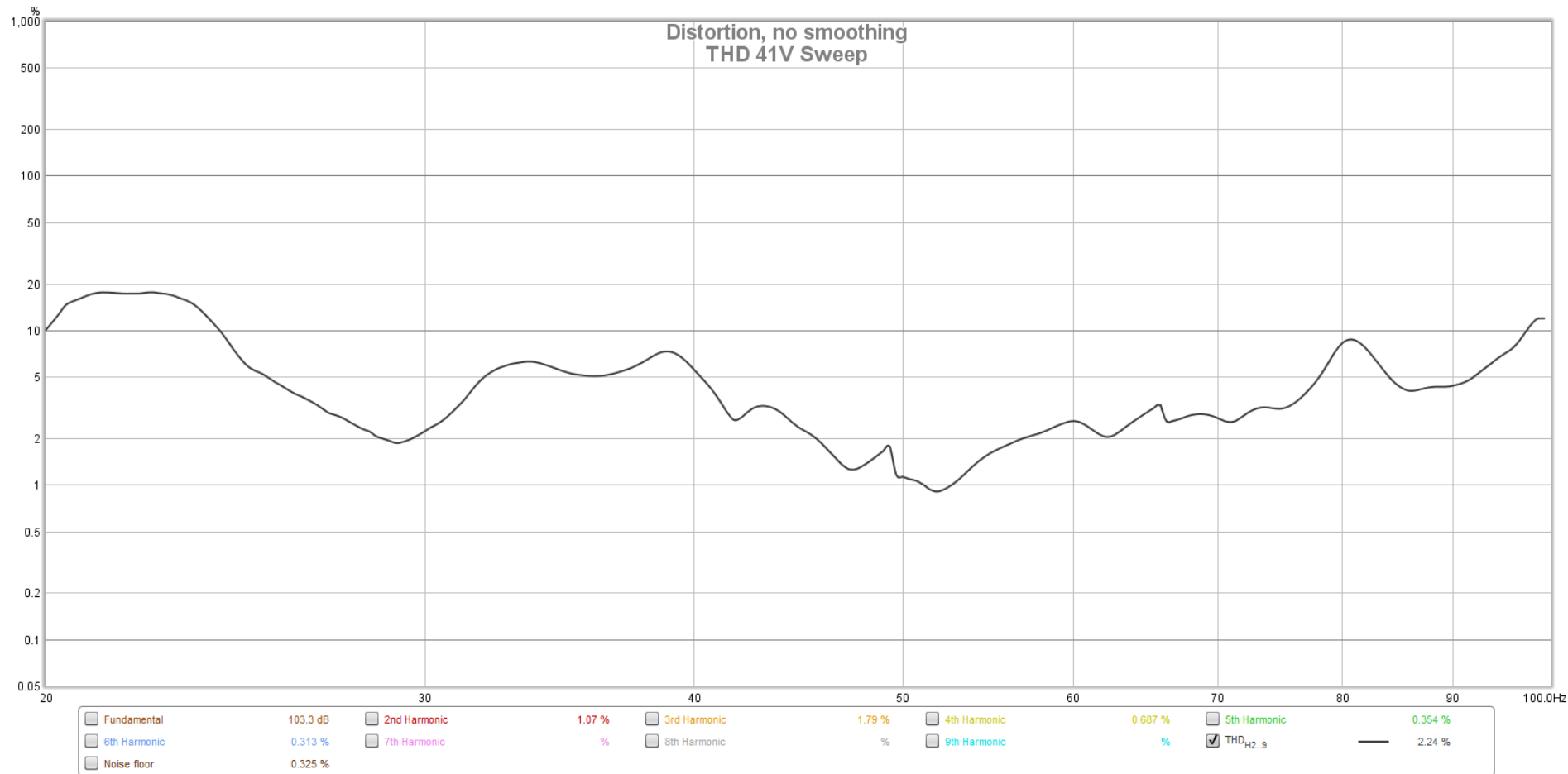
Only on outdoor so  
probably reflection

# Power compression in 41V and 94V sweep





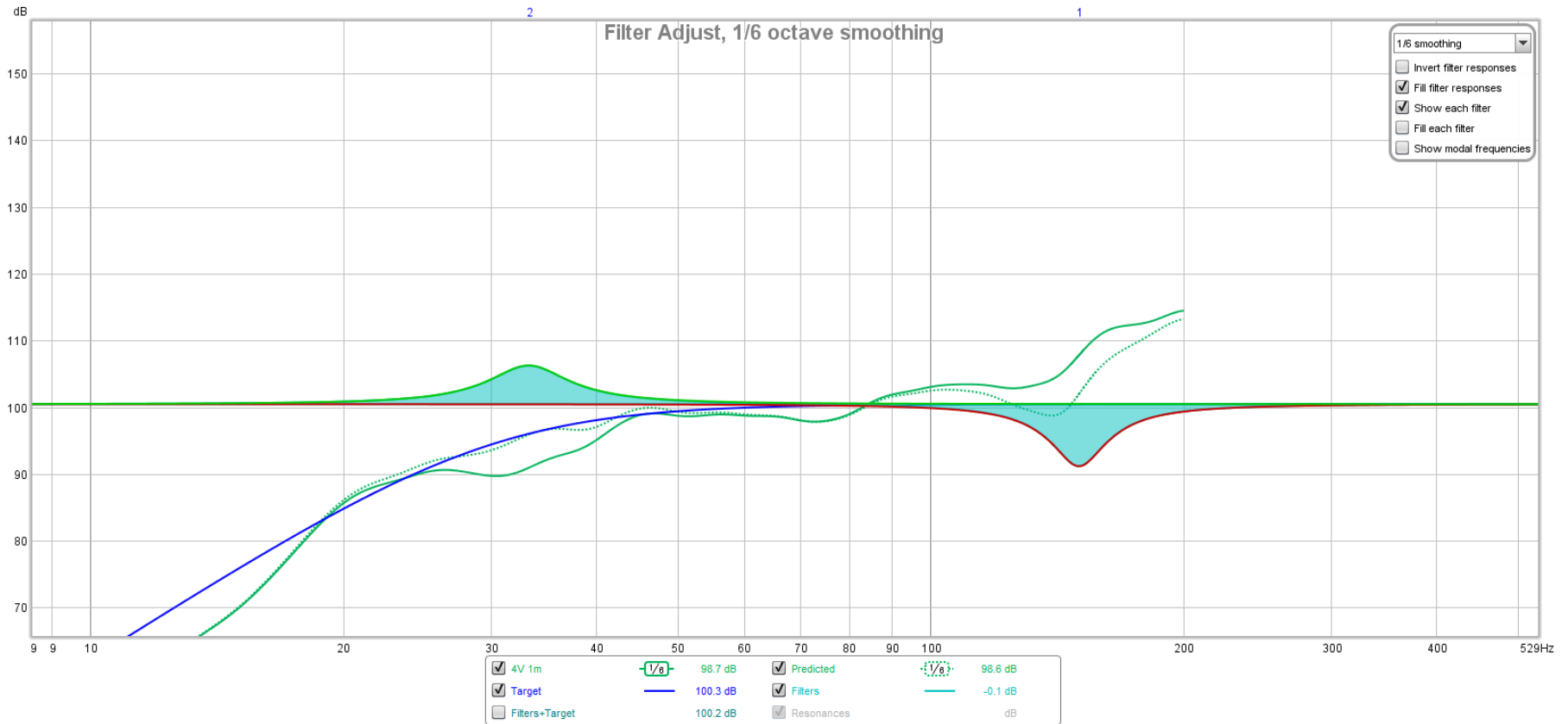
# THD for 41V sweep

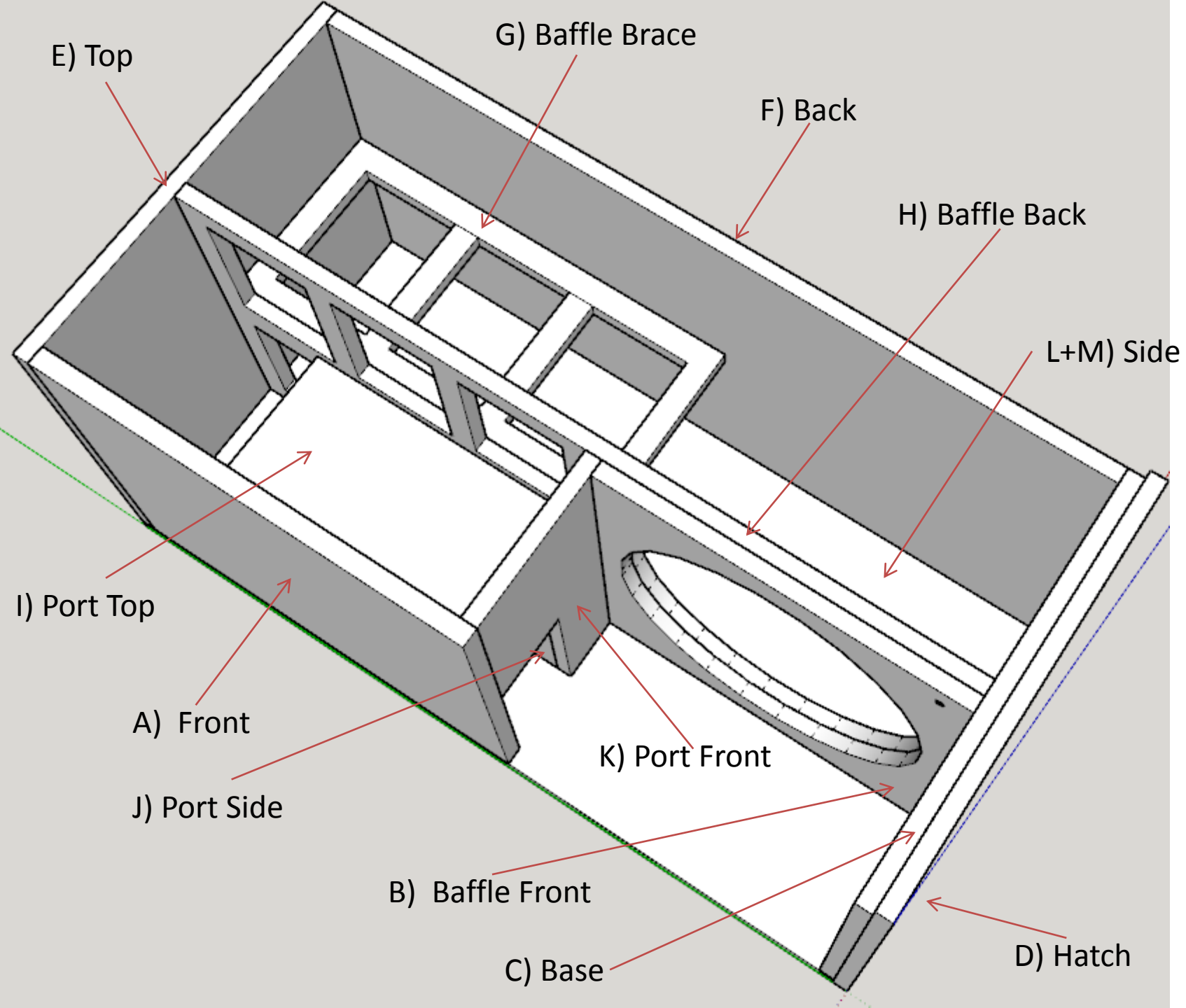


Upper range there is likely to be significant amp distortion due to the previously observed limiting behaviour

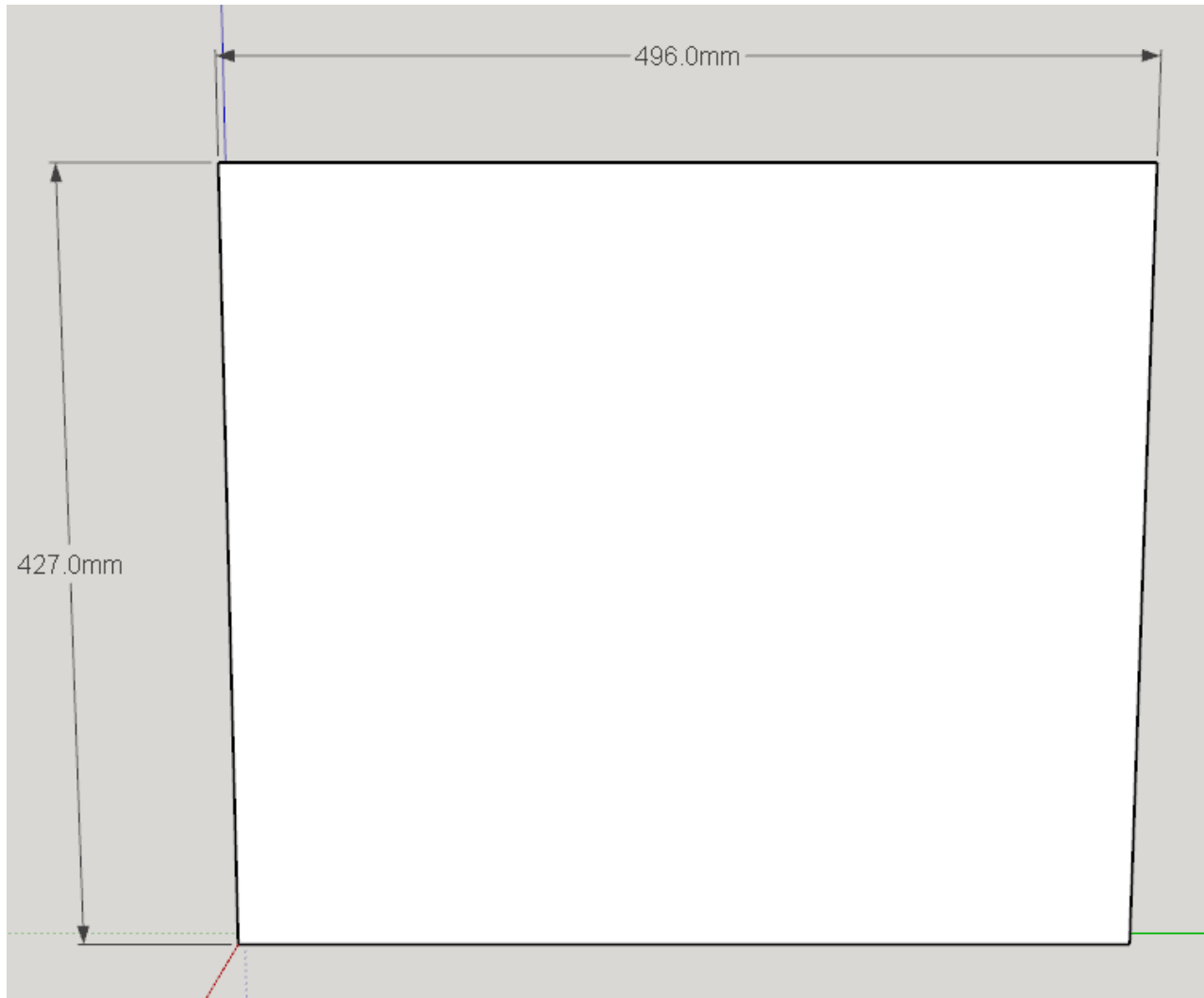
# EQ settings

- 150 Hz, -9.3dB, Q=5
- 33.2 Hz, +5.8dB, Q = 3.579



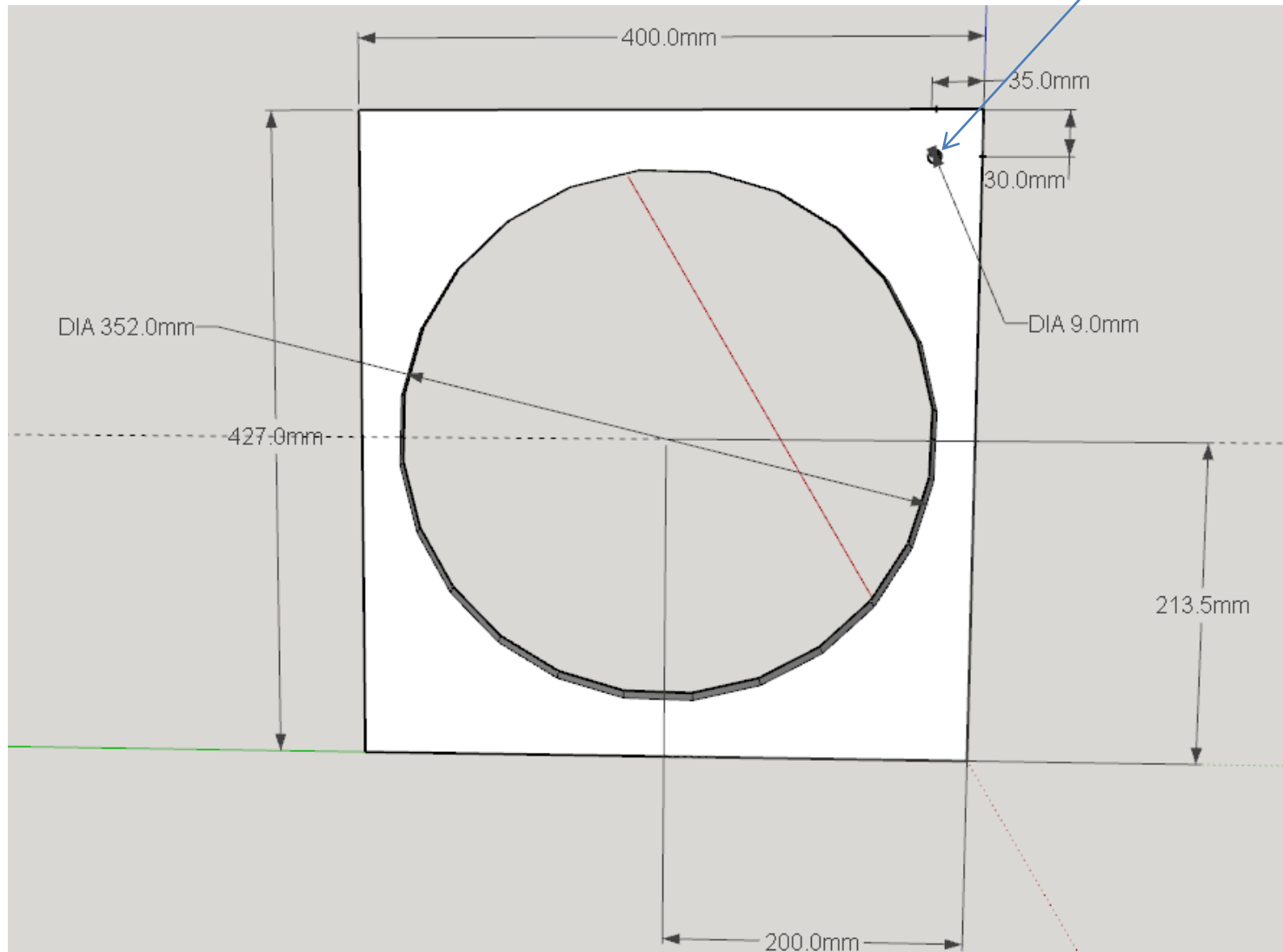


# A) Front

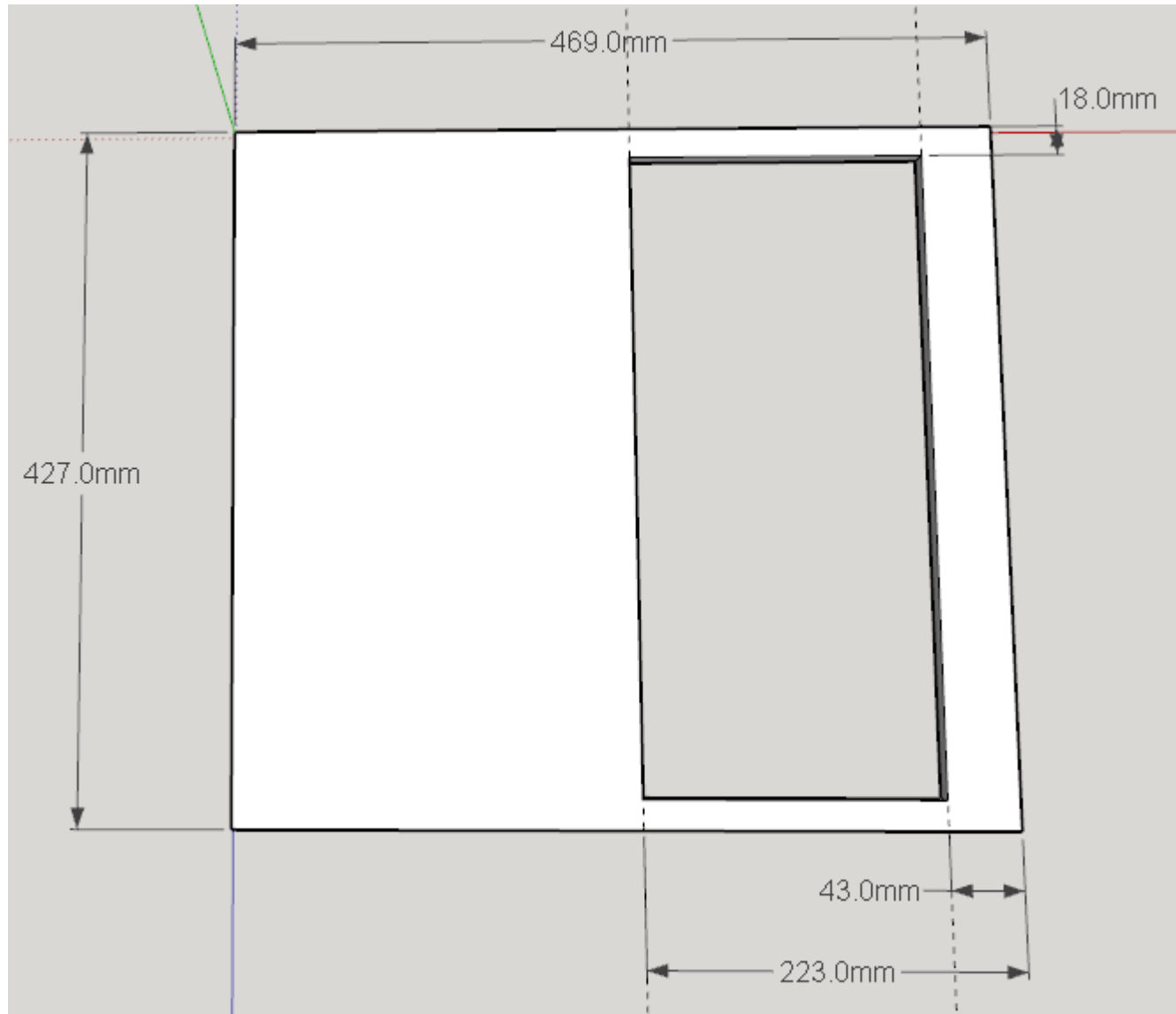


## B) Baffle Front

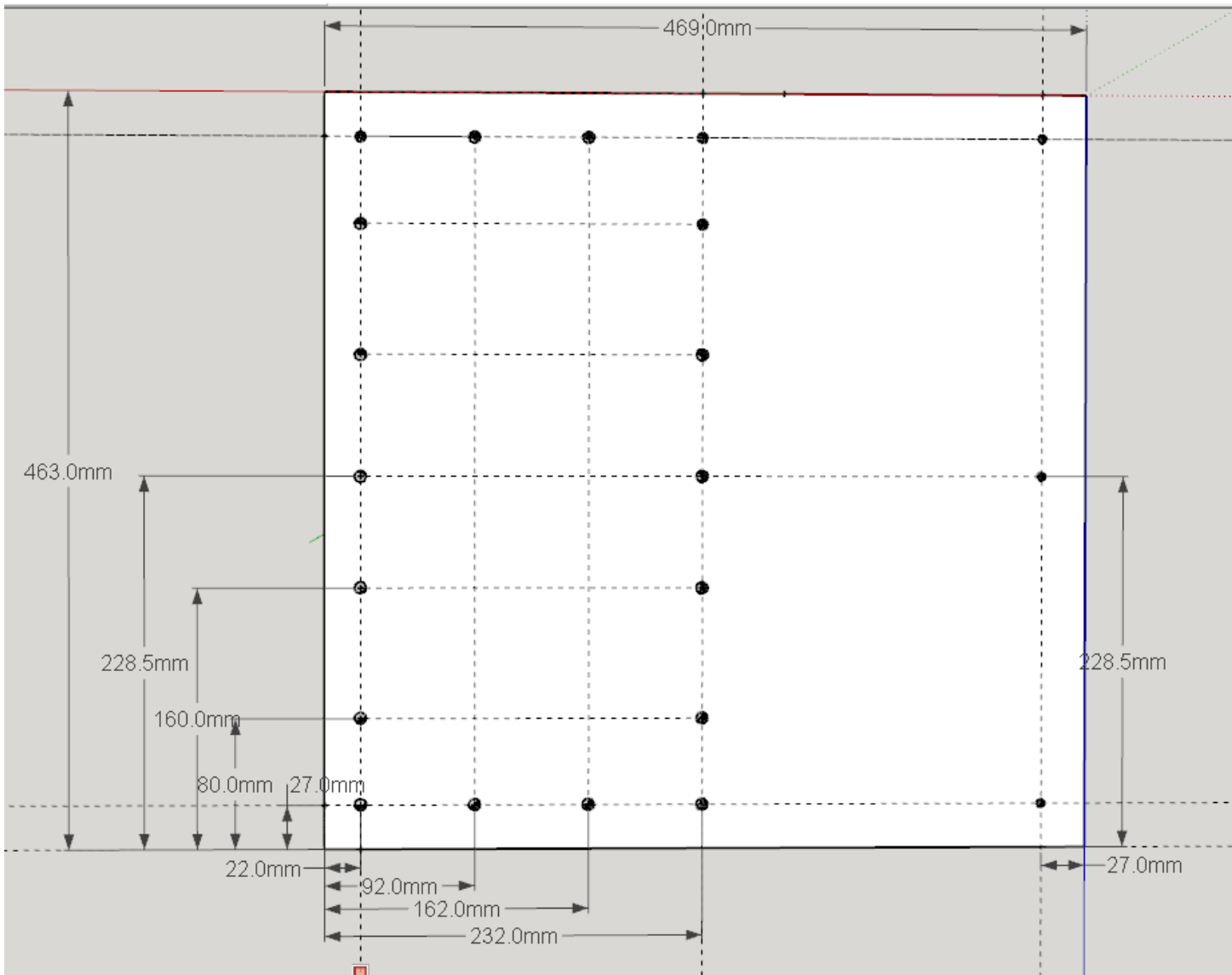
Hot glue wires to seal



## C) Base



# D) Hatch



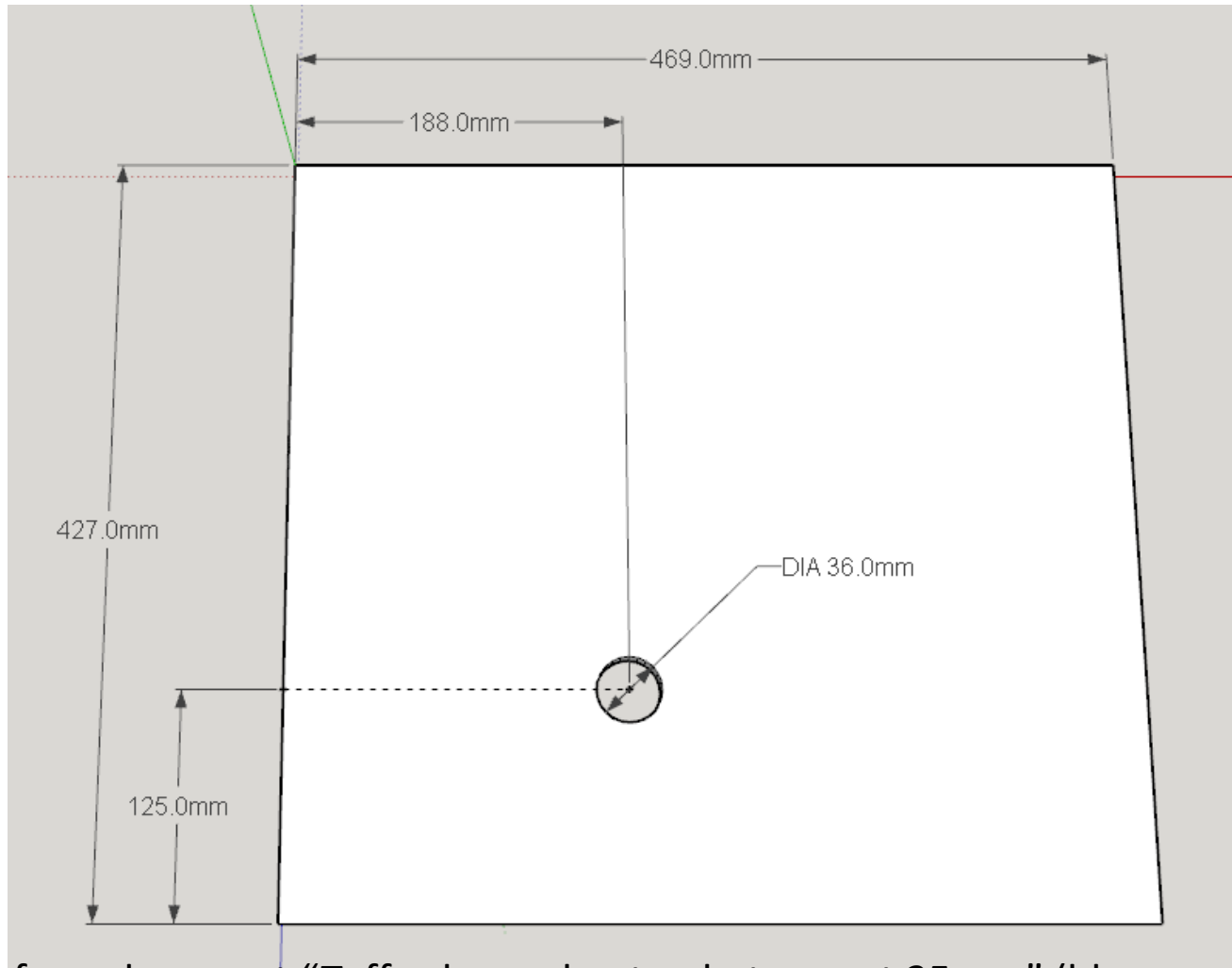
Make hatch last, position on base and then drill pilot holes through hatch to mark base.

Then drill LHS holes for M5 clearance and RHS for M4 clearance

The Base marks should be drilled LHS 7.5mm (through) and RHS 5.5M (12mm) for insert of D-TYPE threaded inserts

Needs feet (skids?)

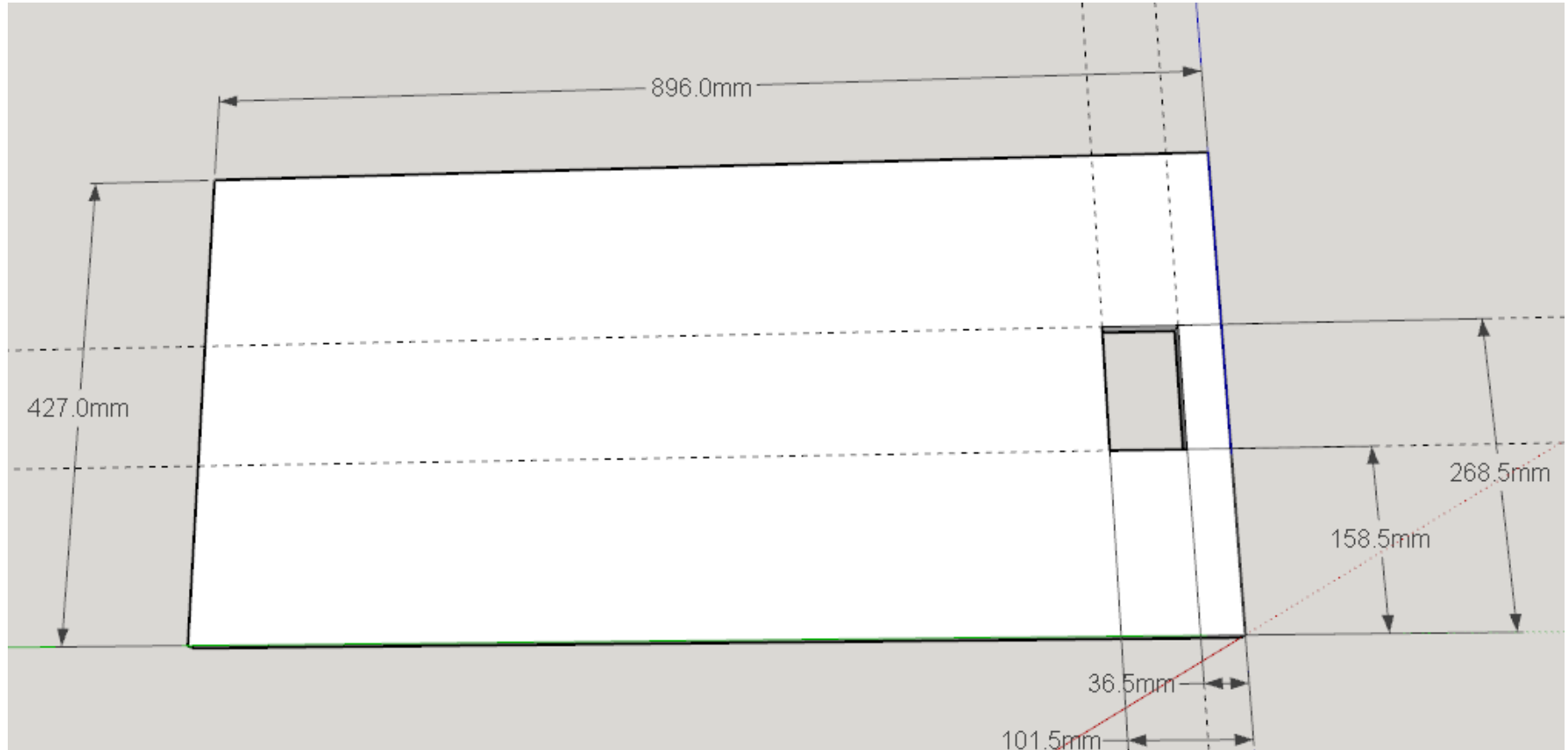
# E) Top



Hole is option for pole mount “Tuff cab speaker top hat mount 35mm” (blue arran) Both a left and right sub have this hole, left is not above port and right is above port both towards front. If using pole mount ratchet strap subs as a block for stability.

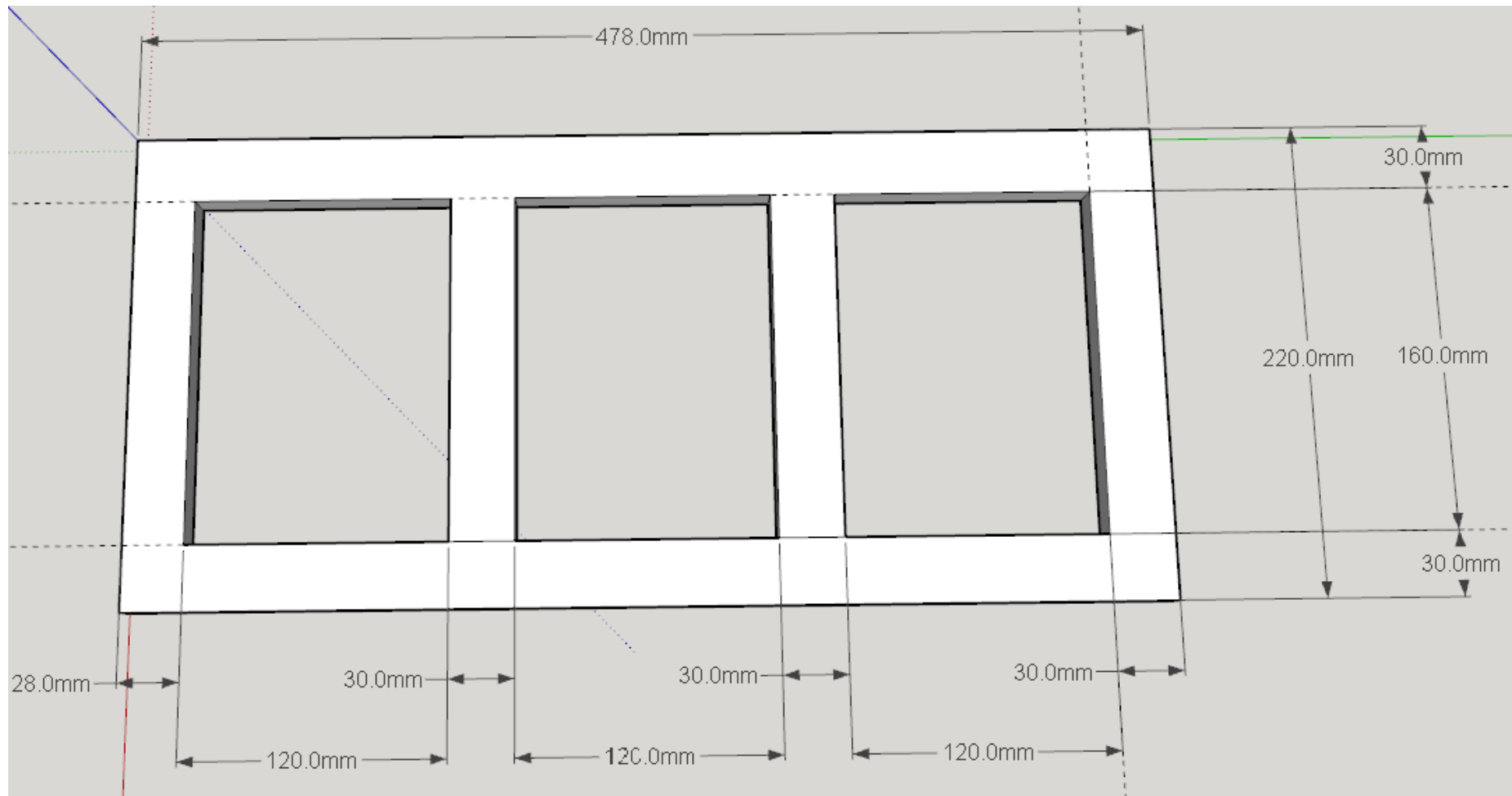


## F) Back

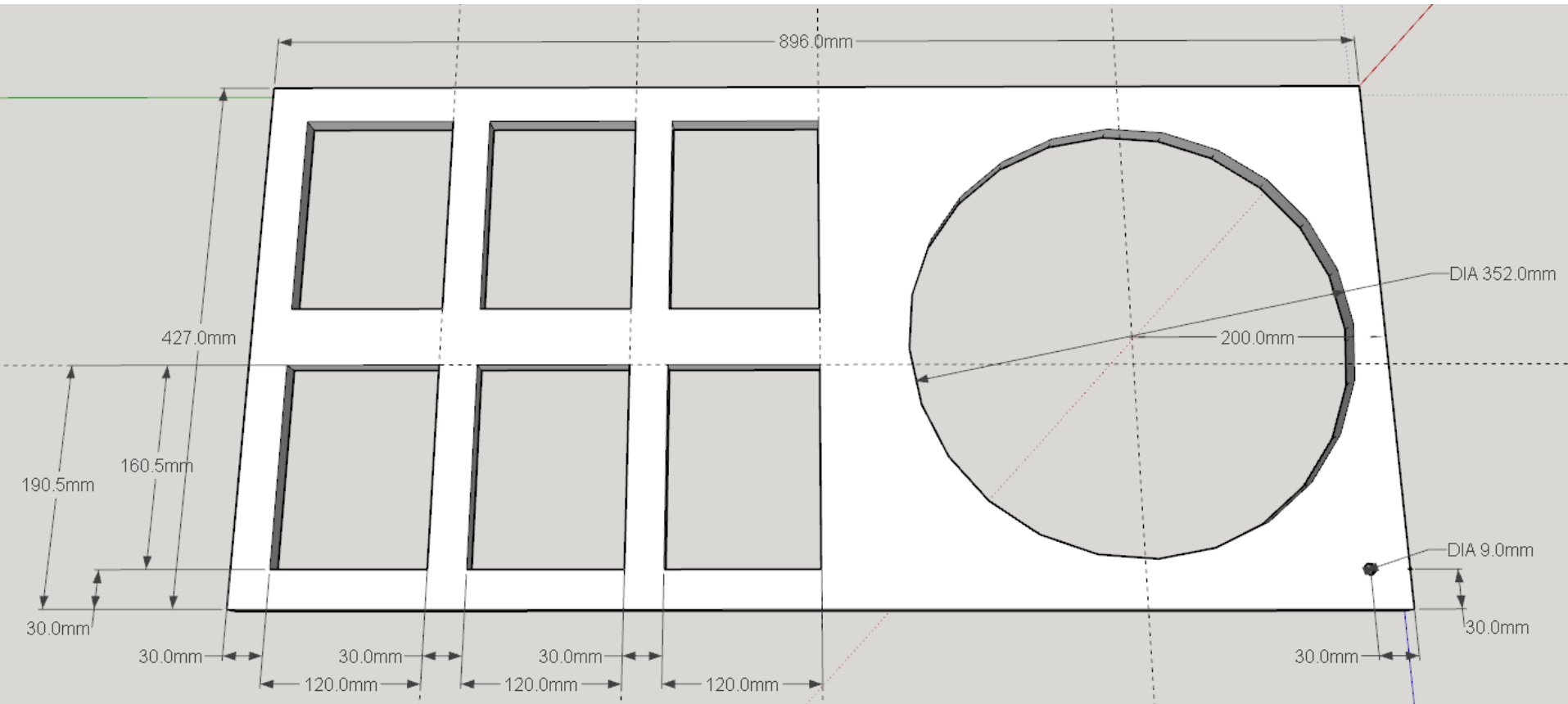


Hole for Blue Arran "Recessed Connector Plate for 2 x Speakon or XLR"

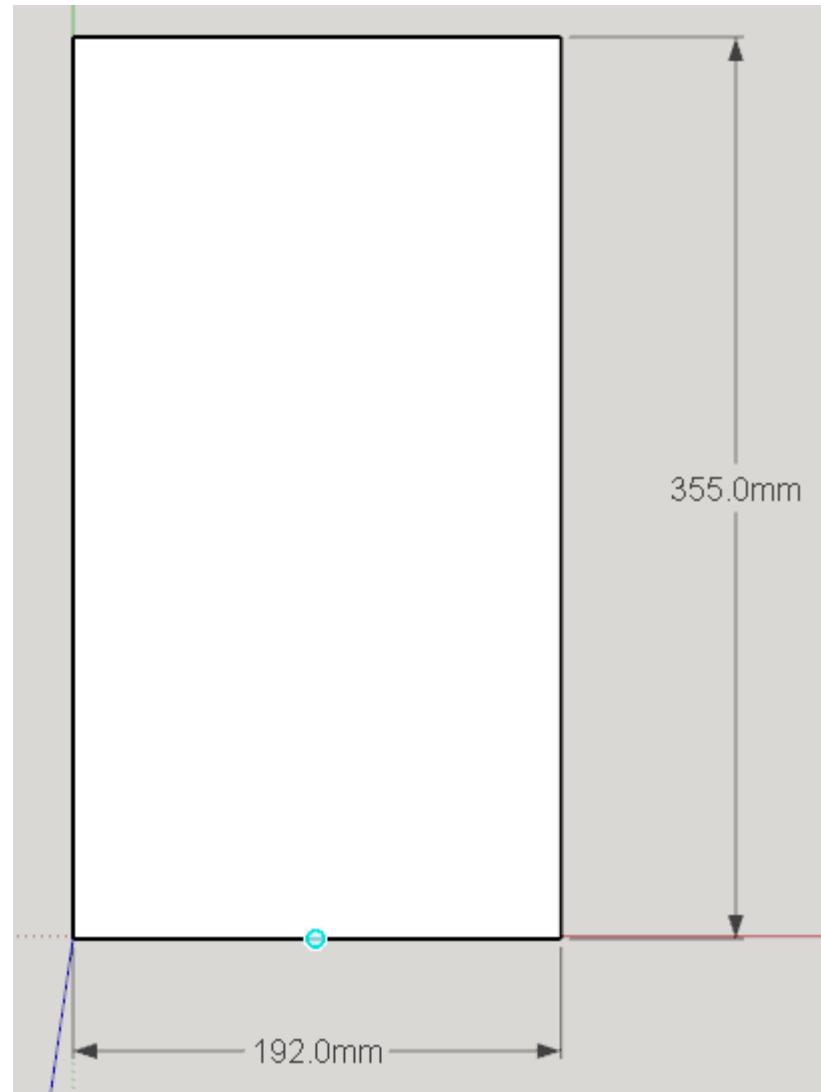
# G) Baffle Brace



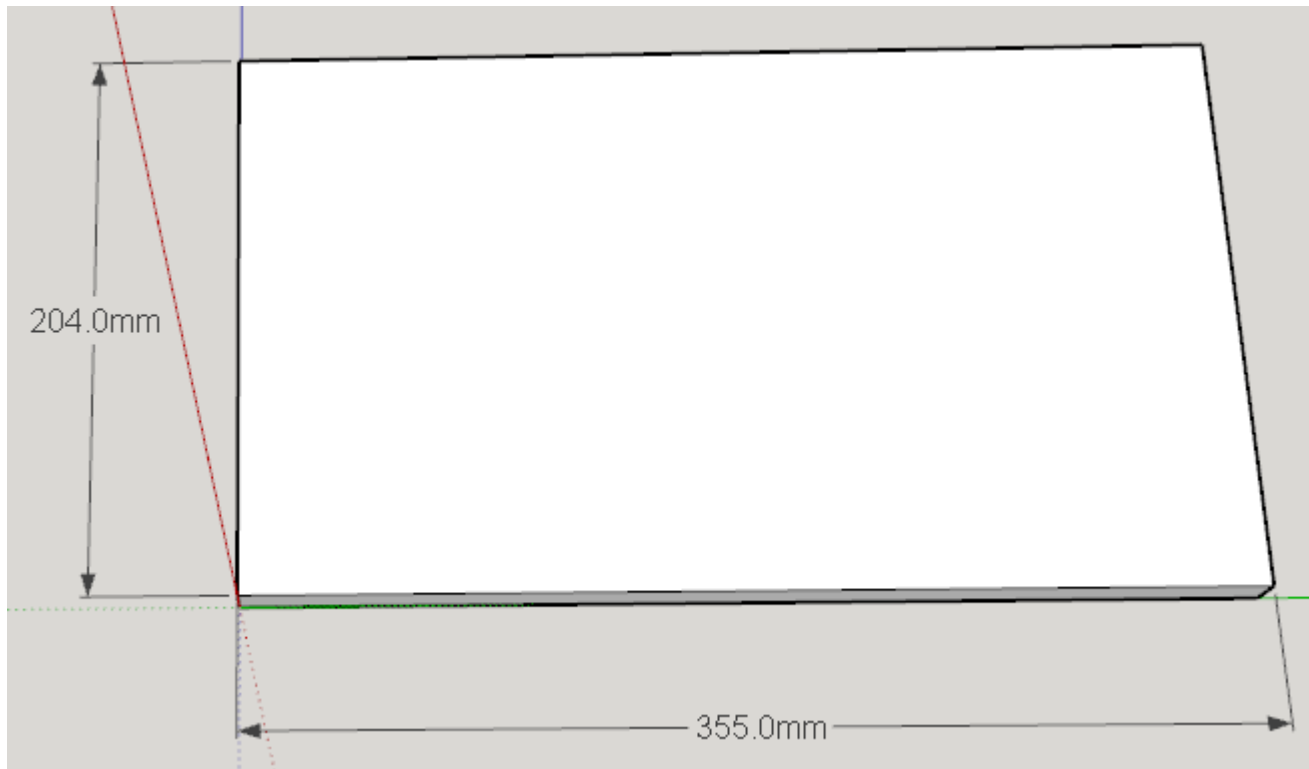
# H) Baffle Back



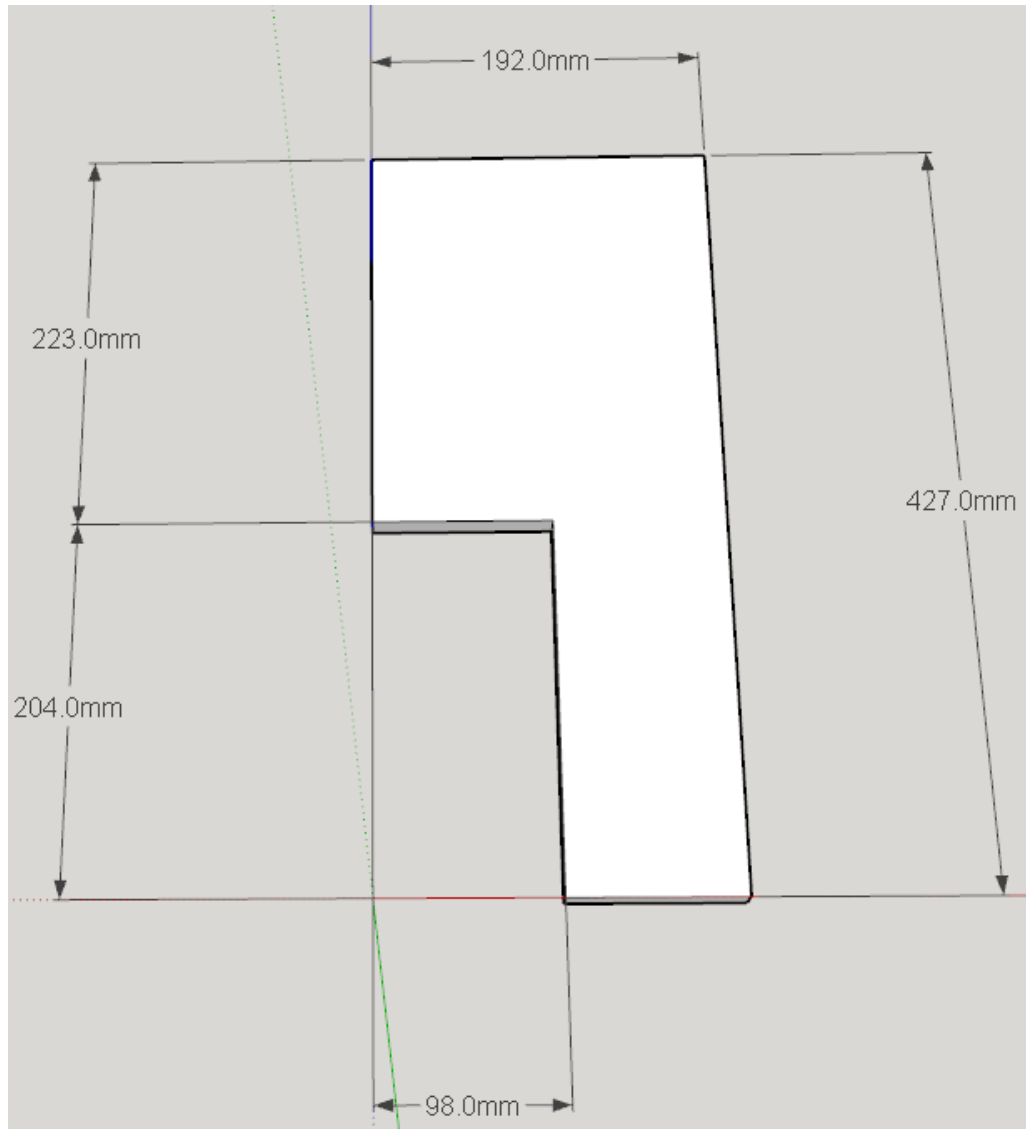
# I) Port Top



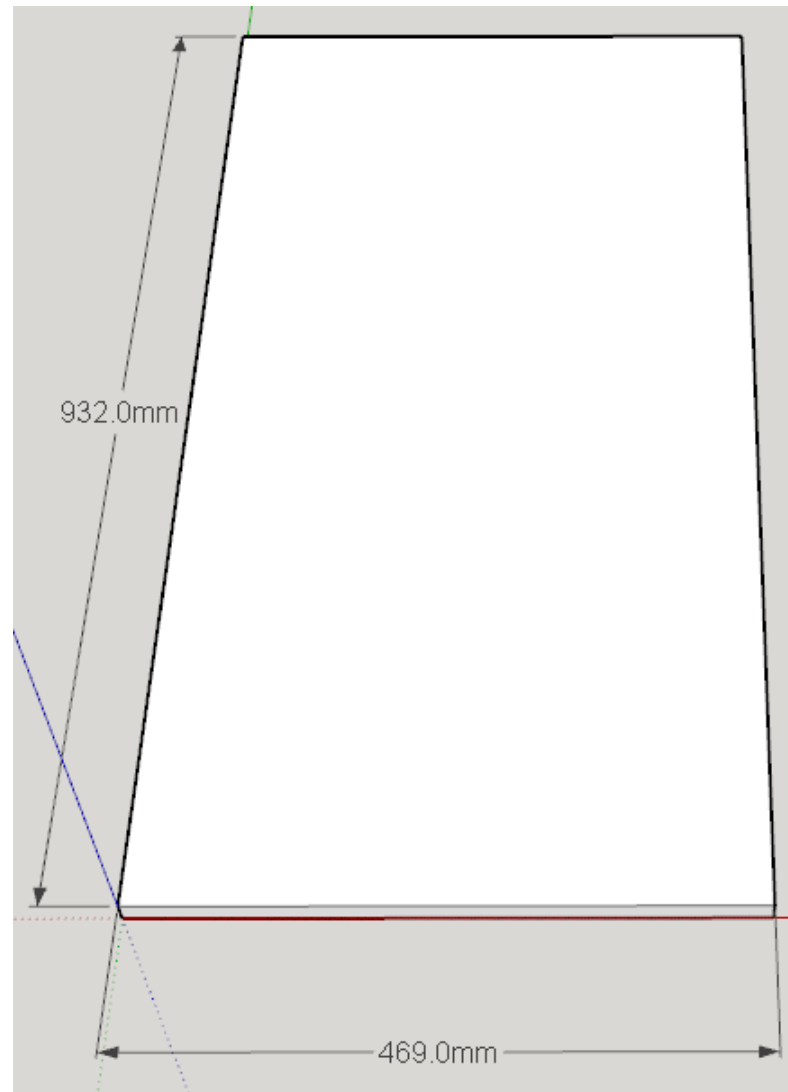
## J) Port Side



# K) Port Front



# L+M) Side



# Board List (18mm material)

Board Names	Quantity	Dimensions [mm]
A		496 x 427
B		400 x 427
C, E	2	469 x 427
D		469 x 463
F, H	2	427x 896
G		478 x 220
I		355 x 192
J		204 x 355
K		427 x 192
L, M	2	469 x 932
H1	2	60 x 320
H2		386 x 320



Optional driver cover, for PA use, gap at top and bottom and slightly less wide than front hole to allow for sealing gasket tape

