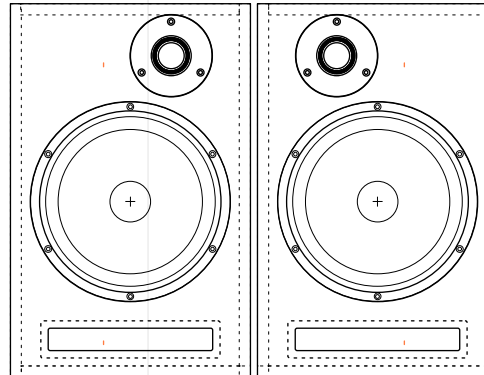


08-march-2023

Visualization here



The Dynaco A25 was a hugely popular loudspeaker for a decade (1970-80). In 2006 Peter Comou resurrected it with the WD25, which was taken up by SEAS and it has become the A26. The box provided is very simplistic and does not extract the maximum performance from the drivers.

We present 4 boxes using 15/18mm material and different levels of overkill. The simplest is 15mm with an 18mm baffle. If built with quality plywood as specified, given the braces, this will be a usefully more robust than the specified no brace 19mm MDF. From there a double 15mm baffle is added (you should be able to get away with a single sheet of 15mm). Then an 18mm drawing and a double baffle variation. 18mm is more commonly available and I would consider both overkill (so good :^)

Damping and the aperiodic vent are discussed. The XO is also very simplistic, we will look at suggested options.

With these better thought out boxes one should be able to extract the maximum from these drivers in a relatively compact box.

A quick look at other tops -- tweeters & midTweeter that have or could be used with the A26.

As a bonus, an initial misinterpretation of the drawing led to a full set of 35L boxes (A26S). These have a bit easier to deal with the peaked alignment and would be suggested if used as WAW (small FR as midTweeter with low XO), where a n enclosure would use up some or all of the extra 7 litres.

A large sealed Golden Ratio box (A26L) has also been done, this more optimal can be compared to see the size savings of the aperiodic box. F10 in the mid 20s, F6 low 30s anechoic. The sealed box can also be adapted for (the few) drivers like the SEAS FA22 that like a biggish sealed box.

The A26L has been turned into a monster miniOnken, the CGR SEA-Ken

A versatile midTweeter midTL for those who wish a separate matching box for the midTweeter.

Drawings/Contents (provisional)

i0/ Intro
i1/ Notes
i2/ Reference drawing

Plan 15mm/18mm baffle
Suggested 4x8 cut plan
Plan 15mm/double baffle
Suggested 4x8 cut plan
Plan 18mm
Suggested 4x8 cut plan
Plan 18mm/double baffle
Suggested 4x8 cut plan
A26 Details

Bonus Section A26S, A25L, CGR SEA-Ken
A26S Plan 15mm/18mm baffle
Suggested 4x8 cut plan
A26S Plan 15mm/double baffle
Suggested 4x8 cut plan
A26S Plan 18mm
Suggested 4x8 cut plan
A26S Plan 18mm/double baffle
Suggested 4x8 cut plan
A26S Details

SubTitle
A26L Sealed Plan 18mm
Suggested 4x8 cut plan
CGR SEA-Ken 18mm
Suggested 4x8 cut plan
Versatile midTweeter aperiodic midTL

Example stand for 70 litre box
Aim of box with stand

Clik test, impedance stuff
Basic Crossover
Crossover/3 optional tweeters
Ranshdow Series XO

SubTitle
midTweeter options
Versatile top mounted midTweeter TL
midTweeter TL drawings

simulations
SEAS T35C / driver dimensions
SEAS A26RE4/ driver dimensions

please email < david@planet10-hifi.com > with corrections & suggestions to improve this document

What's up with this box?

The SEAS A26 is their "app note" which is a 3rd generation variation on the Dynaco A25.

Dynaco introduced the A25 [AlNiCo 10" (250mm) bass driver XOed to a AlNiCo 38mm soft dome tweeter with a rudimentary capacitor and resistor XO] in 1970 and in 10 years sold near a million units (including A25XL). They were made by Scan at first and then by SEAS in Denmark. More info including drawing and XO here:

<https://www.t-linespeakers.org/classics/dynaco.html>

The A25 was aperiodic to help flatten out the bump at the bottom because of the small box. It is heavily damped with rock wool and has an aperiodic vent made from 2 pieces of plastic mesh sandwiching a piece of acoustic fiberglass (doesn't spew glass fibres).

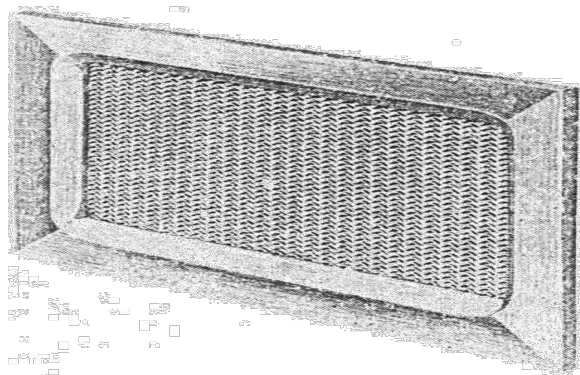
ScanSpeak for some time sold a fixed density circular version of the Dynaco vent. It lacks the versatility of variable damping in the vent that diy allows.

World Audio WD25 by PeterComeau in 2006 revised the design with the A26 and a SEAS 29mm tweeter. He had some good ideas on improvements which we poach for this revision.

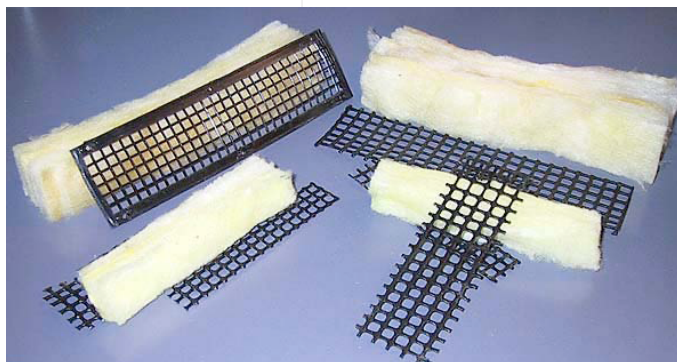
The first published work on aperiodic enclosures was the Goodmans ARU, described by Ted Jordan in the Feb 1956 Wireless World.
<http://p10hifi.net/TLS/downloads/TedJordanAperiodic.pdf>

The PEARL PR-2 was a very well researched, tested, and developed aperiodic loudspeaker.
https://www.pearl-hifi.com/o3_Prod_Serv/PR2/Refs/PR_2_Expanded_Info.pdf

Goodmans/Jordan ARU (Acoustic Resistance Unit)



Dynaco Aperiodic Vents (2 x A25/A10)



Unfinished

The specified box sealed is 28 litre [a more appropriate sealed volume would be 70 litres and vented some 100-140 litres]. The response has a hump as can be seen in the sim. A slightly underdamped alignment.

SEAS document has the comment "optional aperiodic vent, stuff lightly".

Damping material: Lightly stuffed and evenly distributed - approx. 50g of damping material
Aperiodic port: 12g of damping material

No indication as to the kind or quality of damping.

With the factory specified vent one needs a stiff grid (metal) to hold the damping material in place. The event after Comou is more versatile and easy to tune allowing higher densities.

The goal of the aperiodic vent is to damp the vent/add resistance so as to move the response towards the red curve and flatten the impedance response.

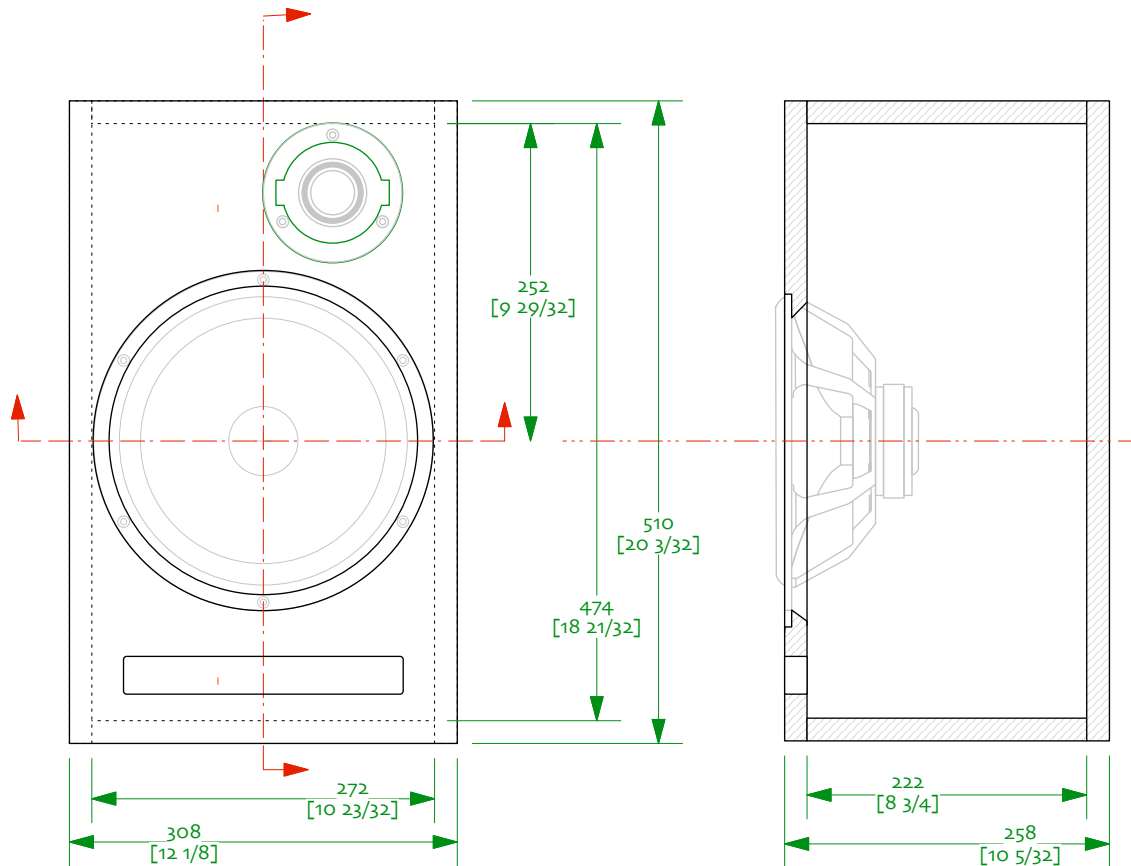
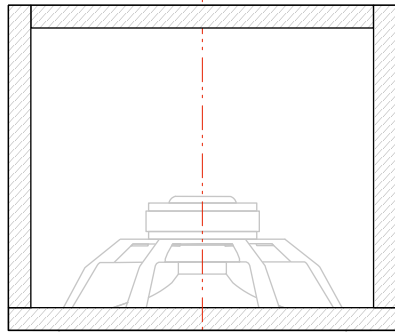
Dynaco used a piece of acoustic fiberglass insulation sandwiched between 2 plastic meshes. This works well, can be held in place with staples, start as specified as far as amount goes and play until the impedance is as flat as you can get it or use the click test (see separate drawing).

While the goal is clear, specific damping for your taste, room and room placement to be determined in the field.

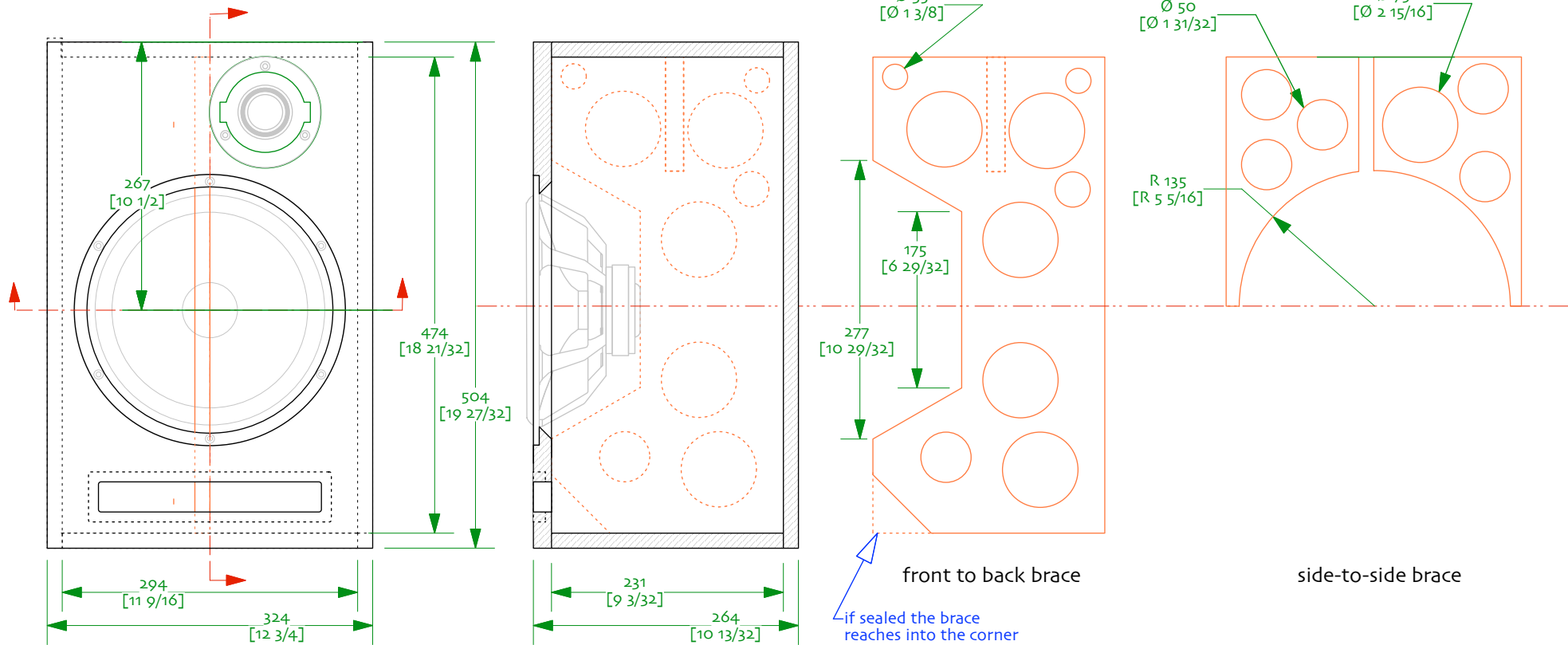
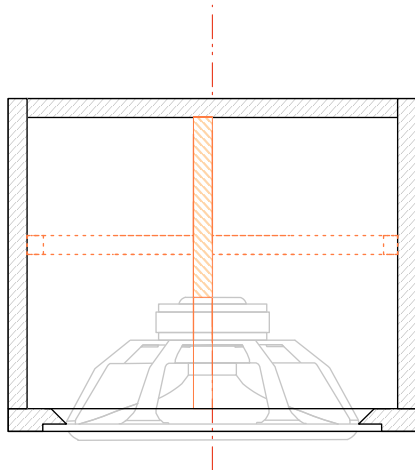
A26 Enclosure Simulation

For Reference Only
 Do Not Build

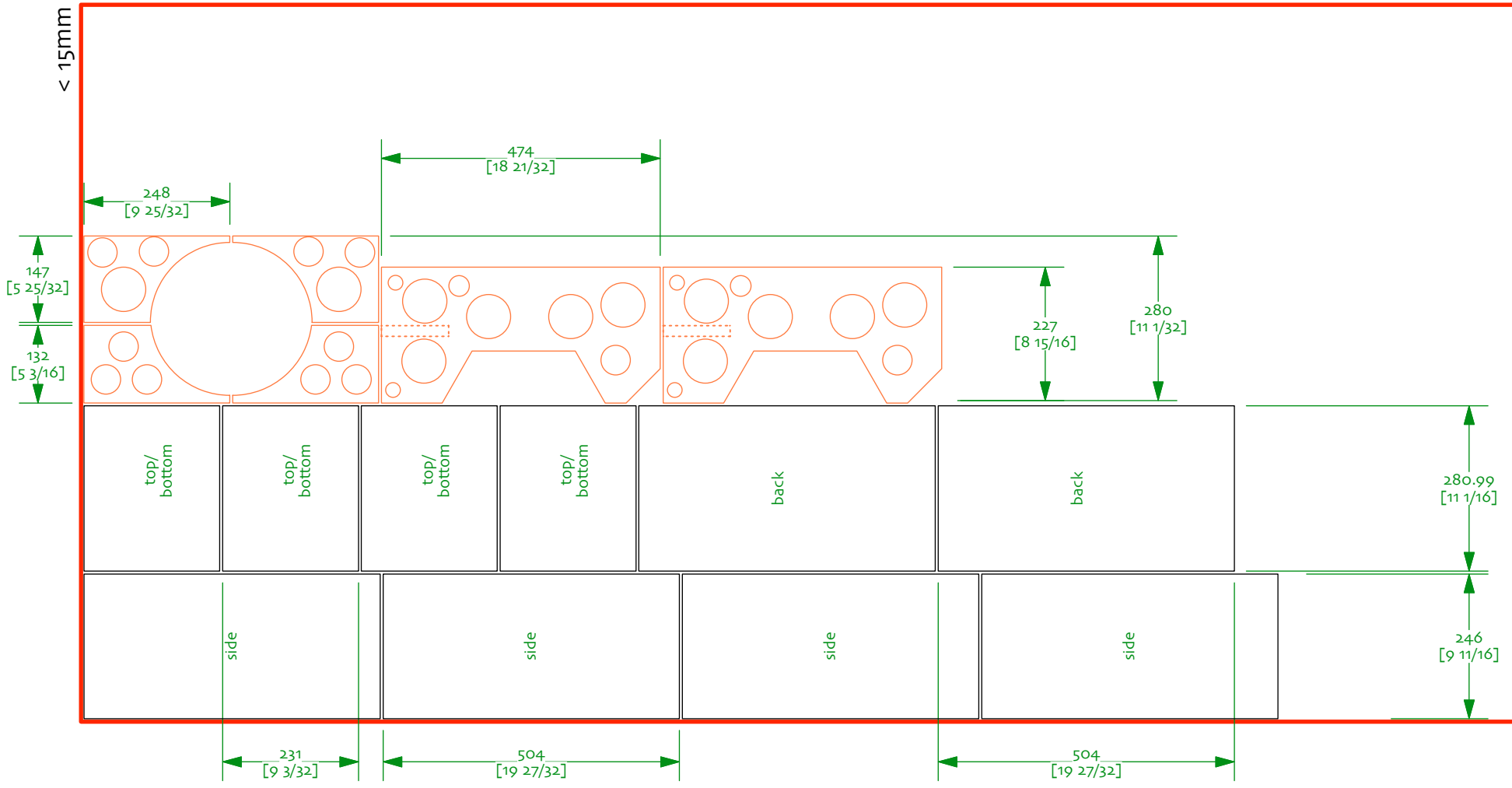
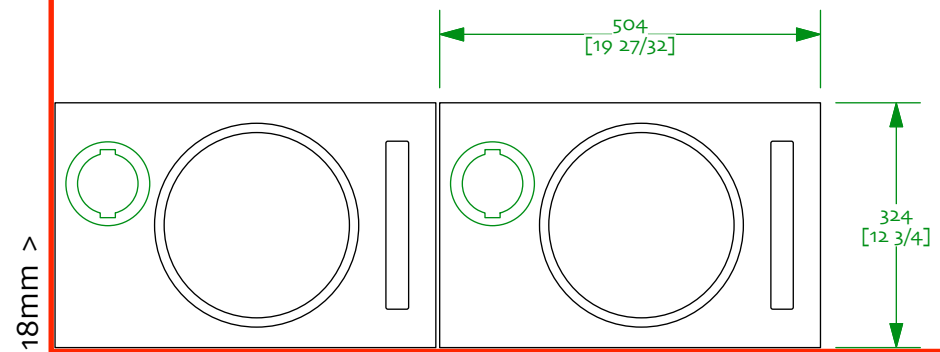
- Notes:
- 0/ 18 mm material, high quality plywood recommended
 - 1/ build mirrored imaged pairs.
 - 2/ Aperiodic vent may also be placed on the rear of the cabinet
 - 3/ 28 litres net volume



Notes:
 0/ 18 mm material, high quality plywood recommended
 1/ build mirrored imaged pairs.
 2/ Aperiodic vent may also be placed on the rear of the cabinet

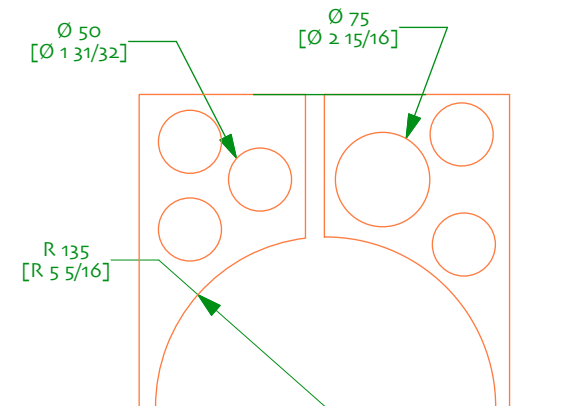
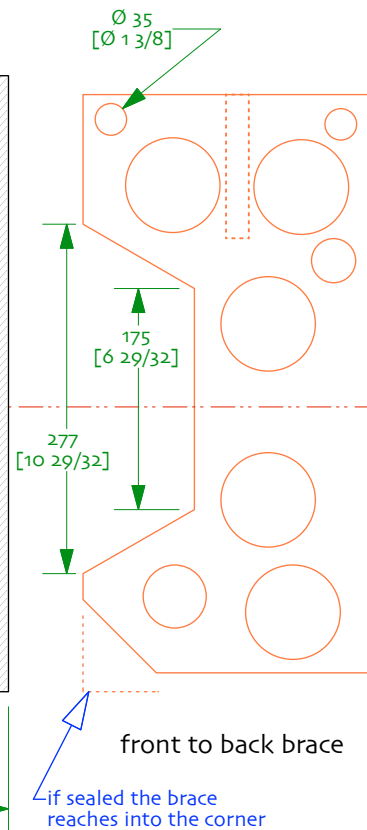
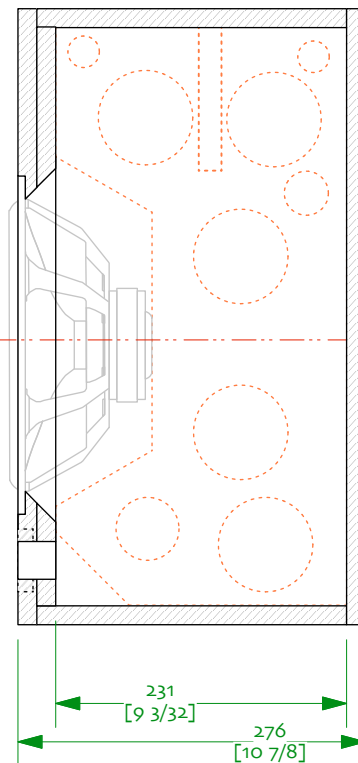
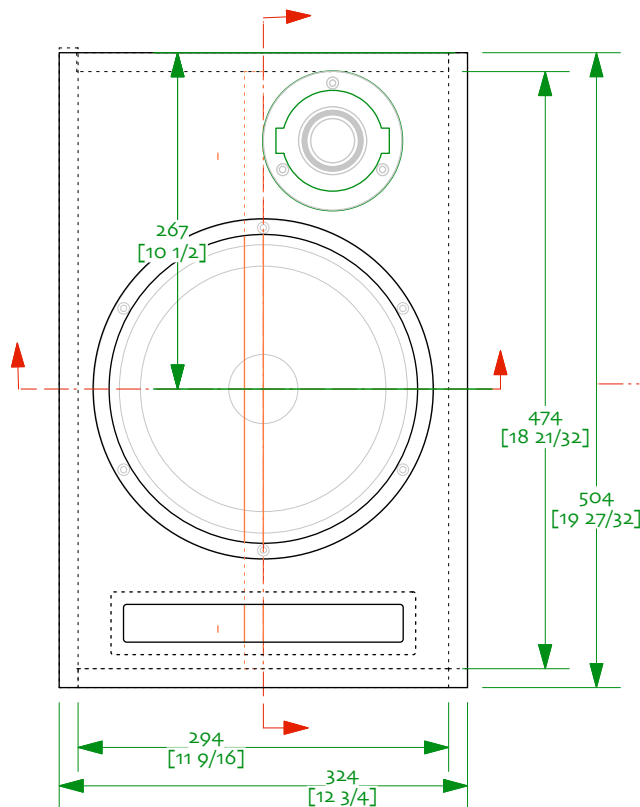
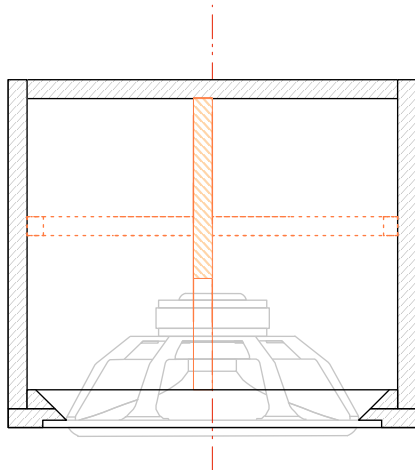


Notes:
 0/ 15 mm material, 18mm baffle
 1/ 5mm kerf and trim allowance



< 15mm | 18mm >

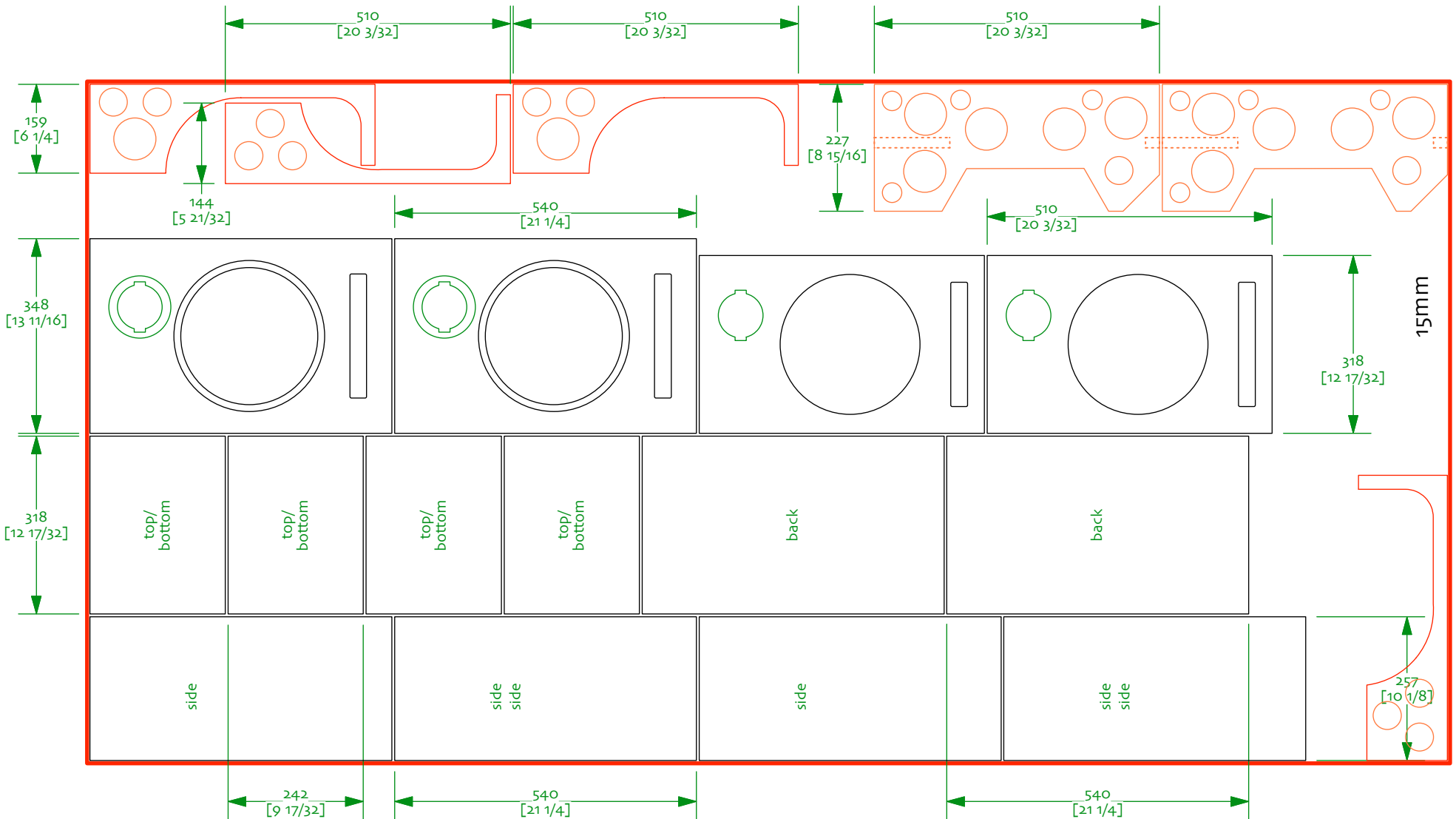
Notes:
 0/ 18 mm material, high quality plywood recommended
 1/ build mirrored imaged pairs.
 2/ Aperiodic vent may also be placed on the rear of the cabinet



front to back brace

side-to-side brace

Notes:
o/ 15 mm material
1/ 5mm kerf and trim allowance

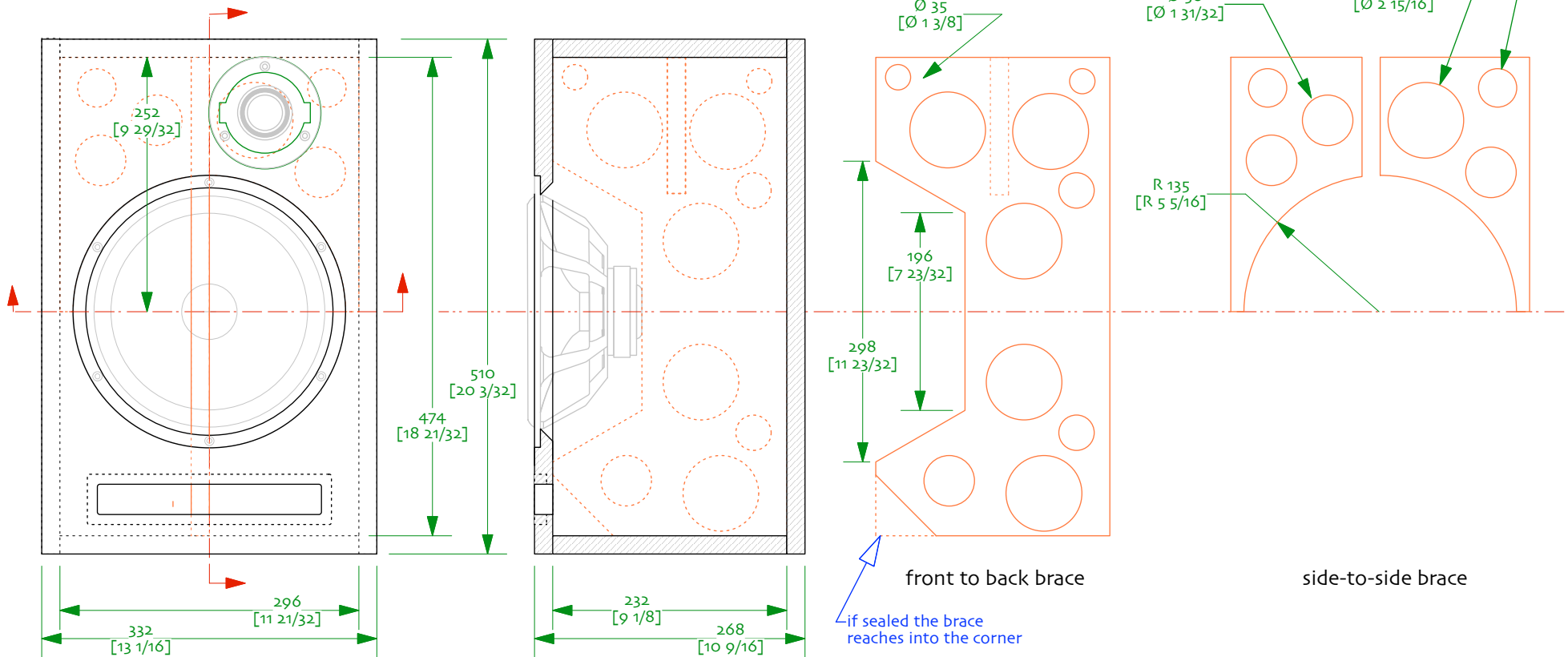
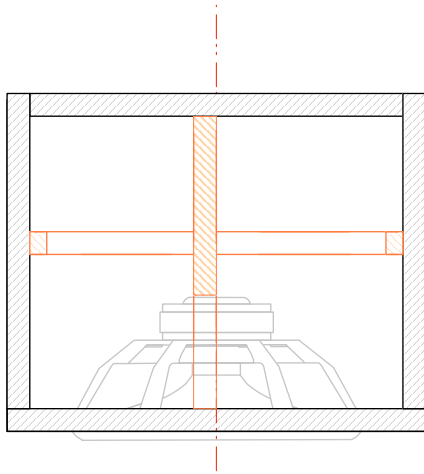


Notes:

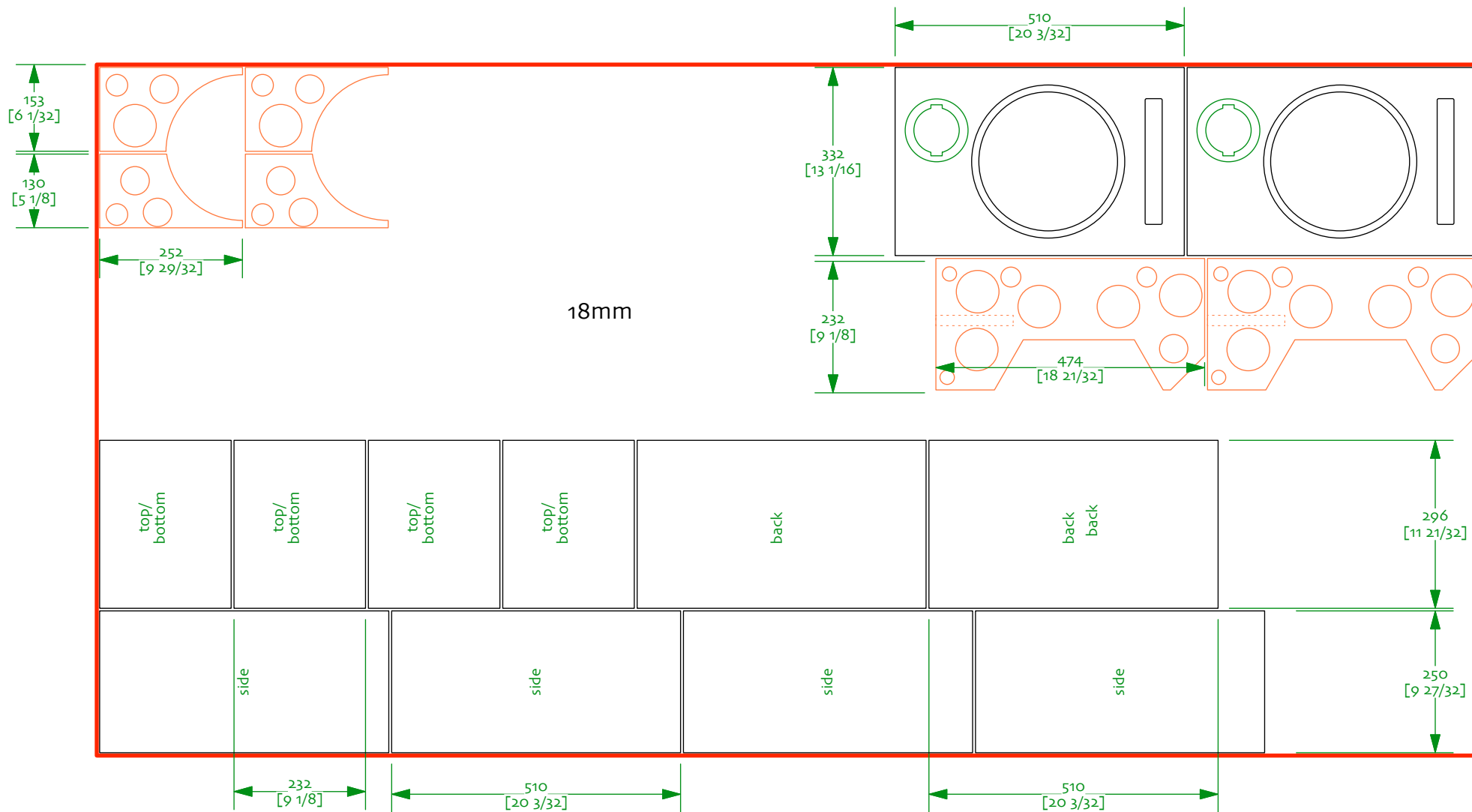
0/ 18 mm material, high quality plywood recommended

1/ build mirrored imaged pairs.

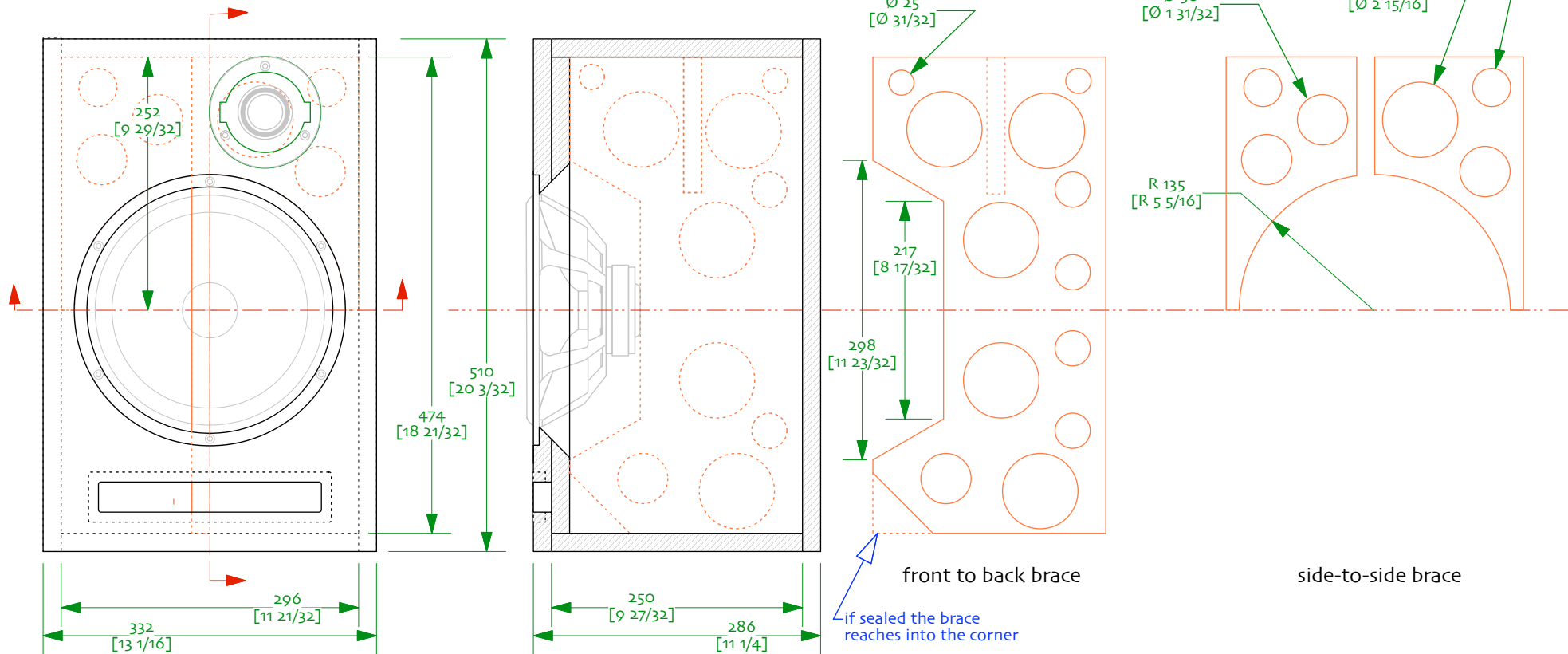
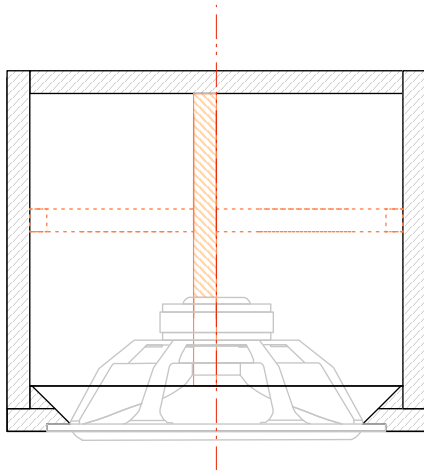
2/ Aperiodic vent may also be placed on the rear of the cabinet



Notes:
o/ 18 mm material
1/5 mm kerf and trim allowance



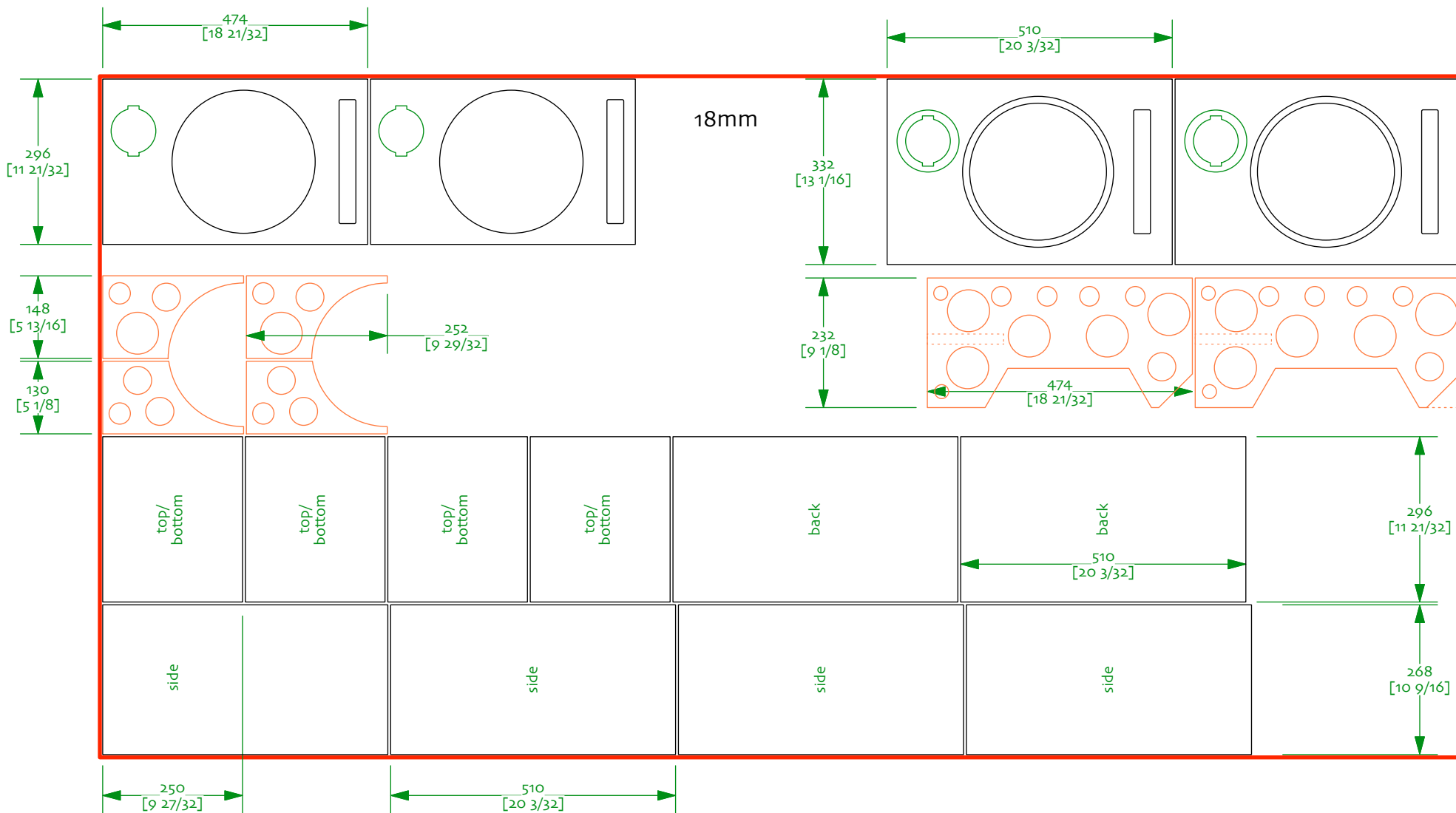
Notes:
 0/ 18 mm material, high quality plywood recommended
 1/ build mirrored imaged pairs.
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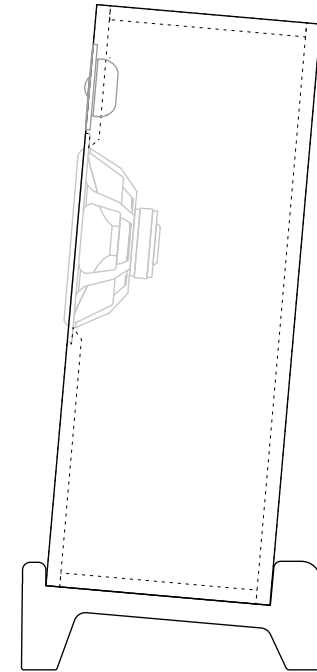
Notes:
 o/ 18 mm material
 1/5mm kerf and trim allowance



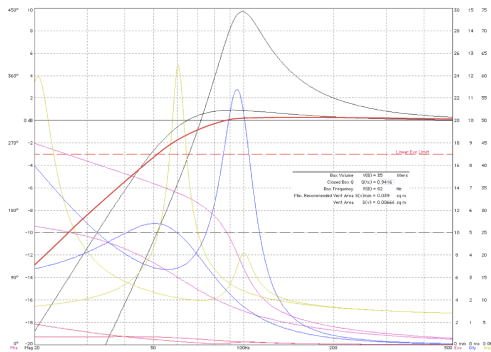
SEAS A26 reimaging ov88
 sheet a26c18-2 | 18mm dbl baffle 4x8 cut
 © 2011-21 planet_10 enterprises limited
 04-april-2021 | tweaked & drawn by dld
 free for personal use



Visualization here



A26S/A26L/SEA-Ken Enclosure Simulations



A bonus, an initial misinterpretation of the drawing led to a full set of 35L boxes. These make it a bit easier to deal with the peaked alignment and would be suggested if used as WAW (small FR as midTweeter with low XO), where an enclosure would use up some or all of the extra 7 litres.

A large sealed 70 litre, butterworth alignment Golden Ratio box, this more optimal can be compared to see the size savings of the aperiodic box. F10 in the mid 20s, F6 low 30s anechoic.

diyAudio member fatmarley suggested a 60 litre vented alignment which turns out to be a good start for a monster miniOnken. The sealed box has had a slot vent added to the bottom, it becomes a 66 litre SEA-Ken. The highRatio, highR vent supplies some aperiodic damping to flatten the peak just before roll-off and give a bit more extension than shown in the sim. One gains about 5 Hz from the sealed, and the slot adds the option of adding aperiodic damping to it.

Drawings/Contents (provisional)

io/ Intro

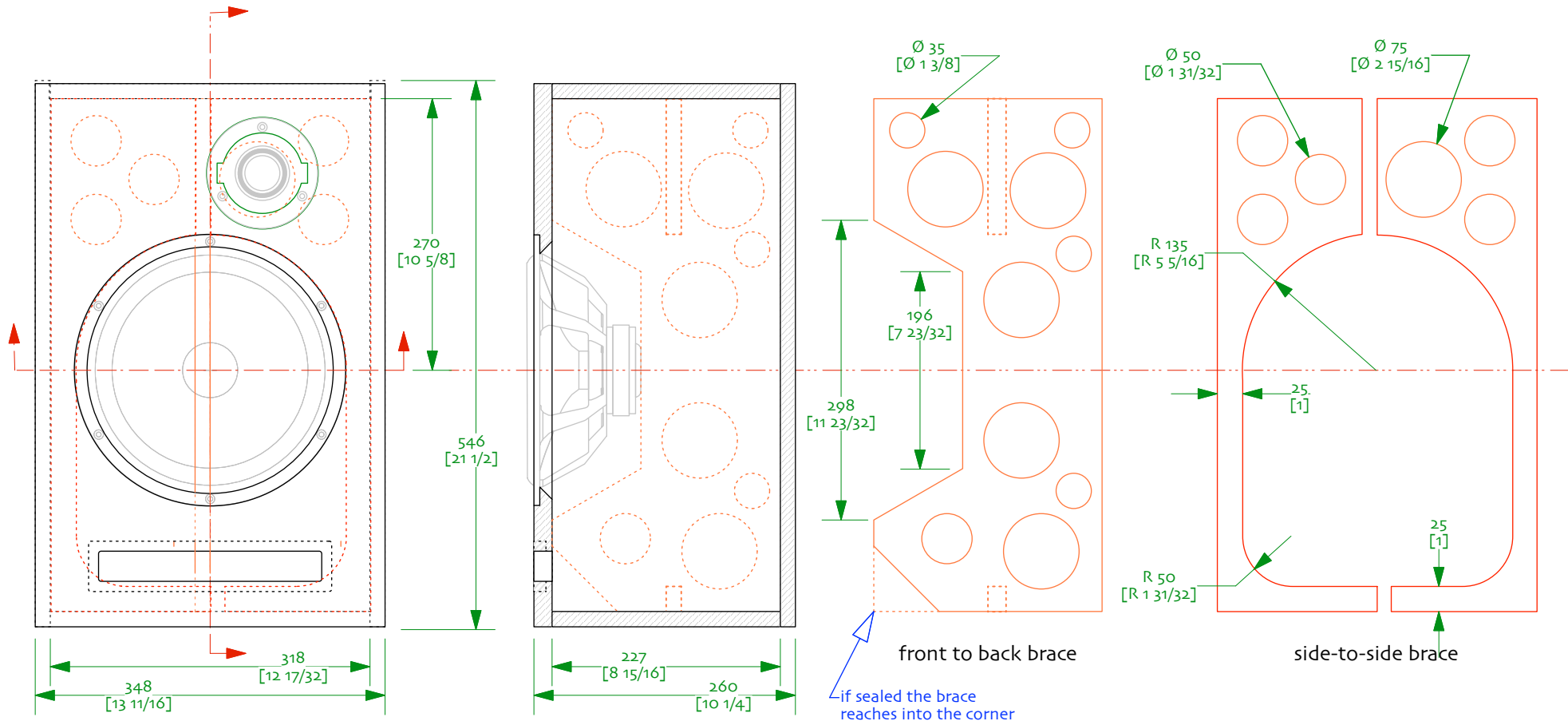
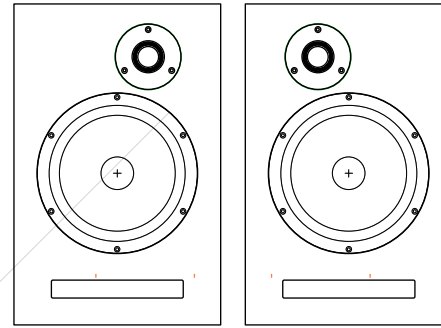
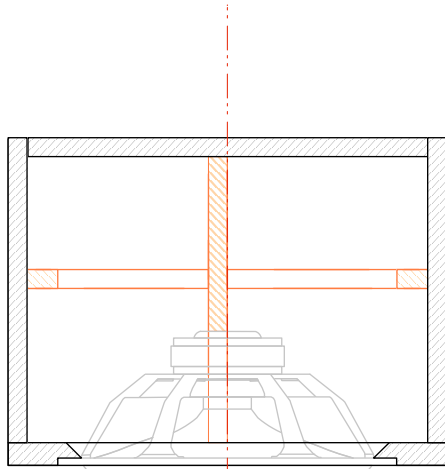
17/ options for up top
 35L Plan 15mm/18mm baffle
 Suggested 4x8 cut plan
 35L Plan 15mm/double baffle
 Suggested 4x8 cut plan
 35L Plan 18mm
 Suggested 4x8 cut plan
 35L Plan 18mm/double baffle
 Suggested 4x8 cut plan

70L Sealed Plan 18mm
 Suggested 4x8 cut plan
 CGR SEA-Ken Plan 18mm
 Suggested 4x8 cut plan

Example stand for A26L
 Reesulting aim

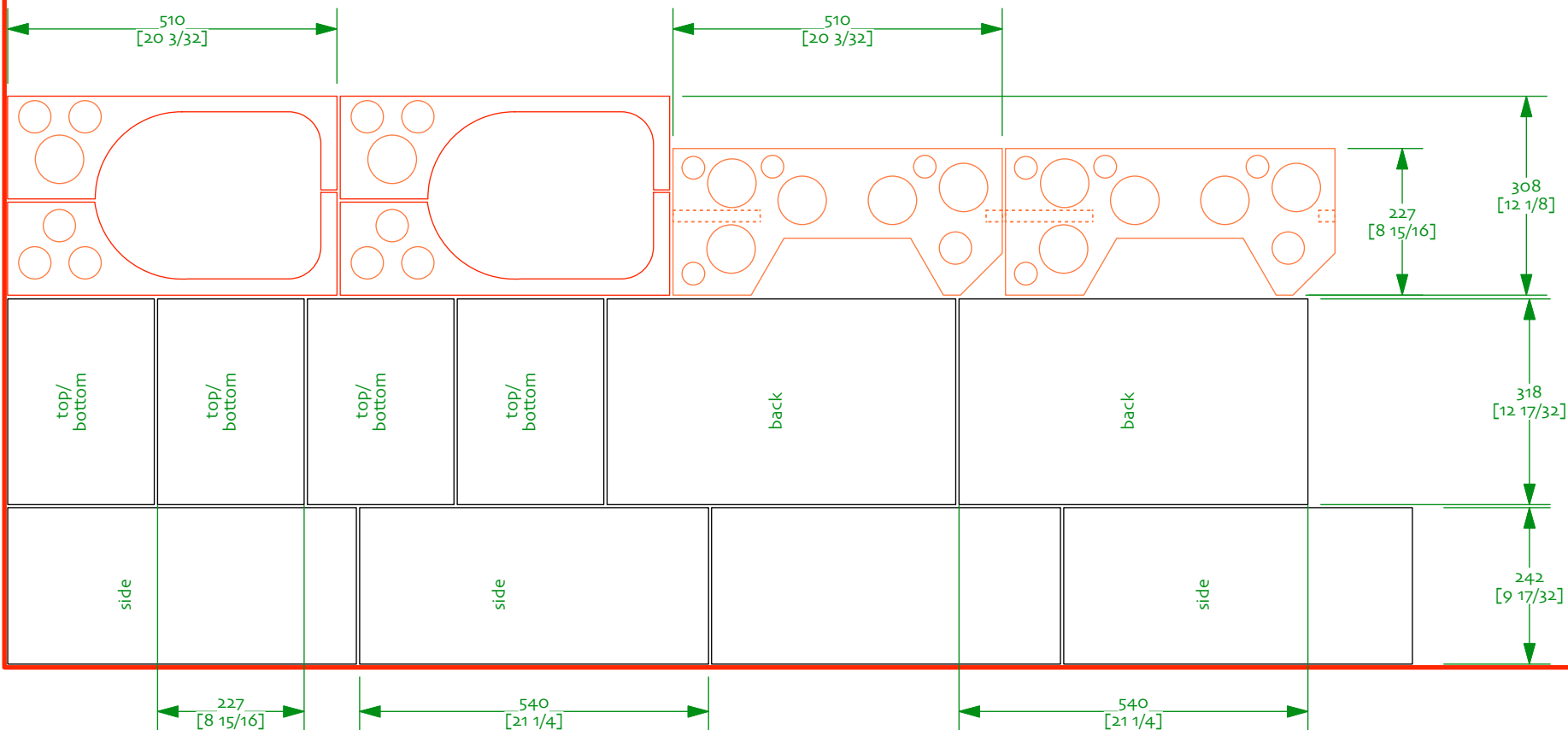
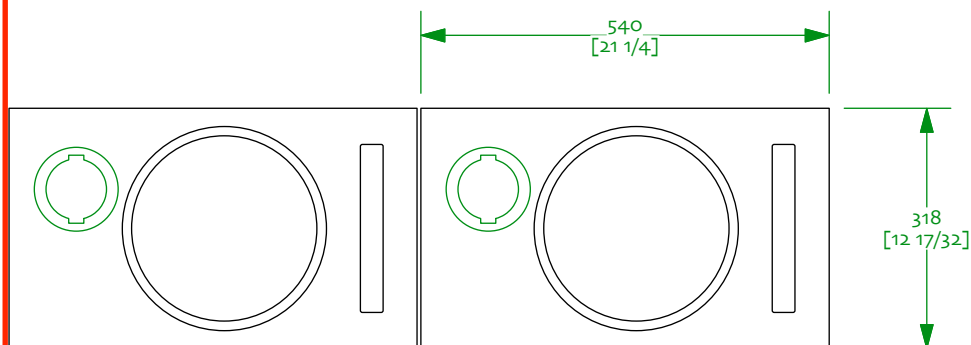
please email <david@planet10-hifi.com> with corrections & suggestions to improve this document

Notes:
 0/ 15 mm material, 18 mm baffle, high
 quality plywood recommended
 1/ build mirrored imaged pairs
 2/ Aperiodic vent may also be placed on the
 rear of the cabinet

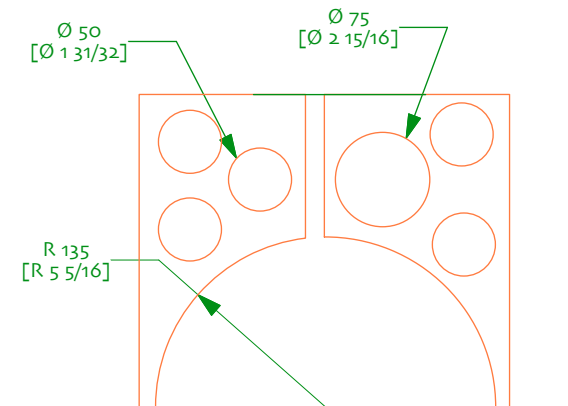
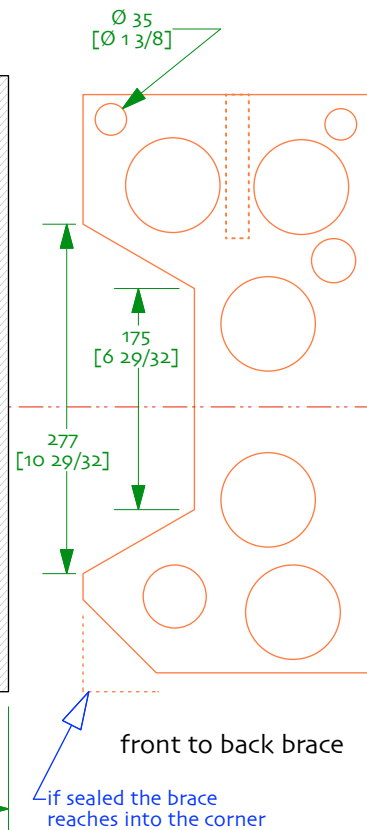
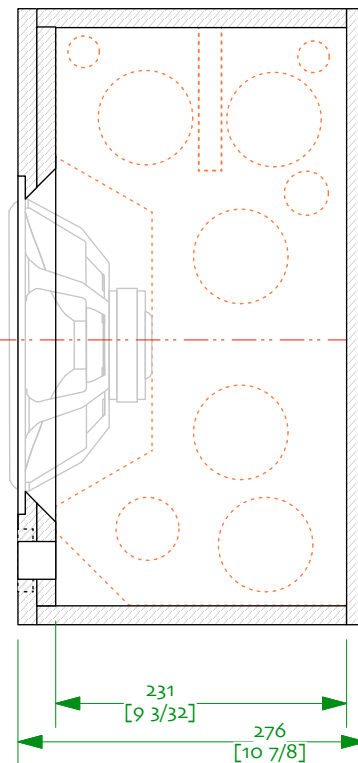
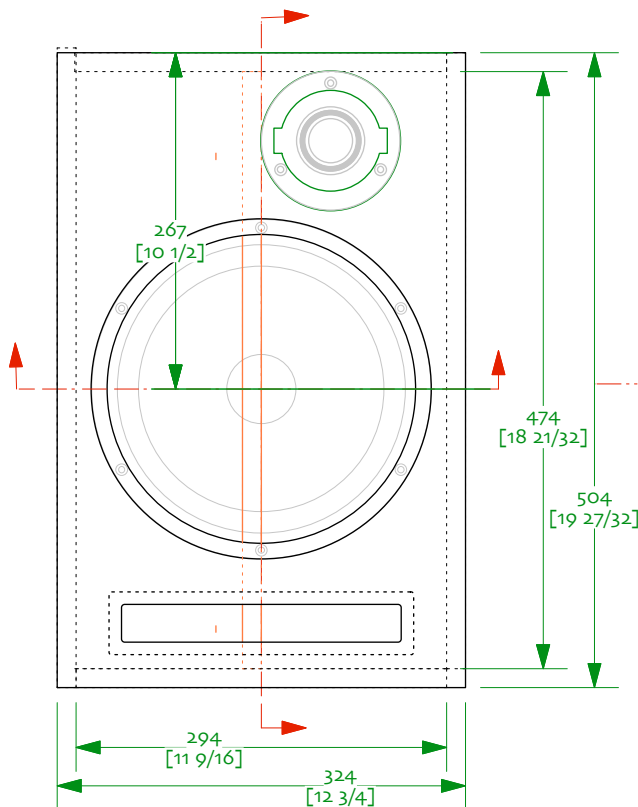
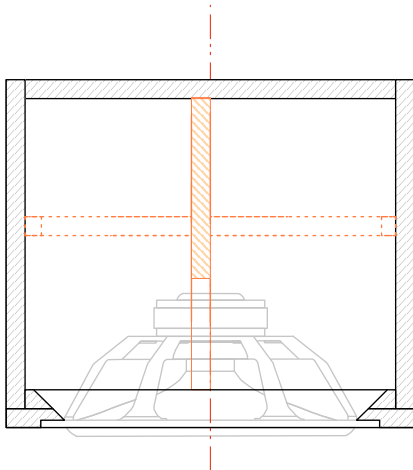


Notes:
 o/ 15 mm material, 18mm baffle
 1/ 5mm kerf and trim allowance

< 15mm | 18mm >



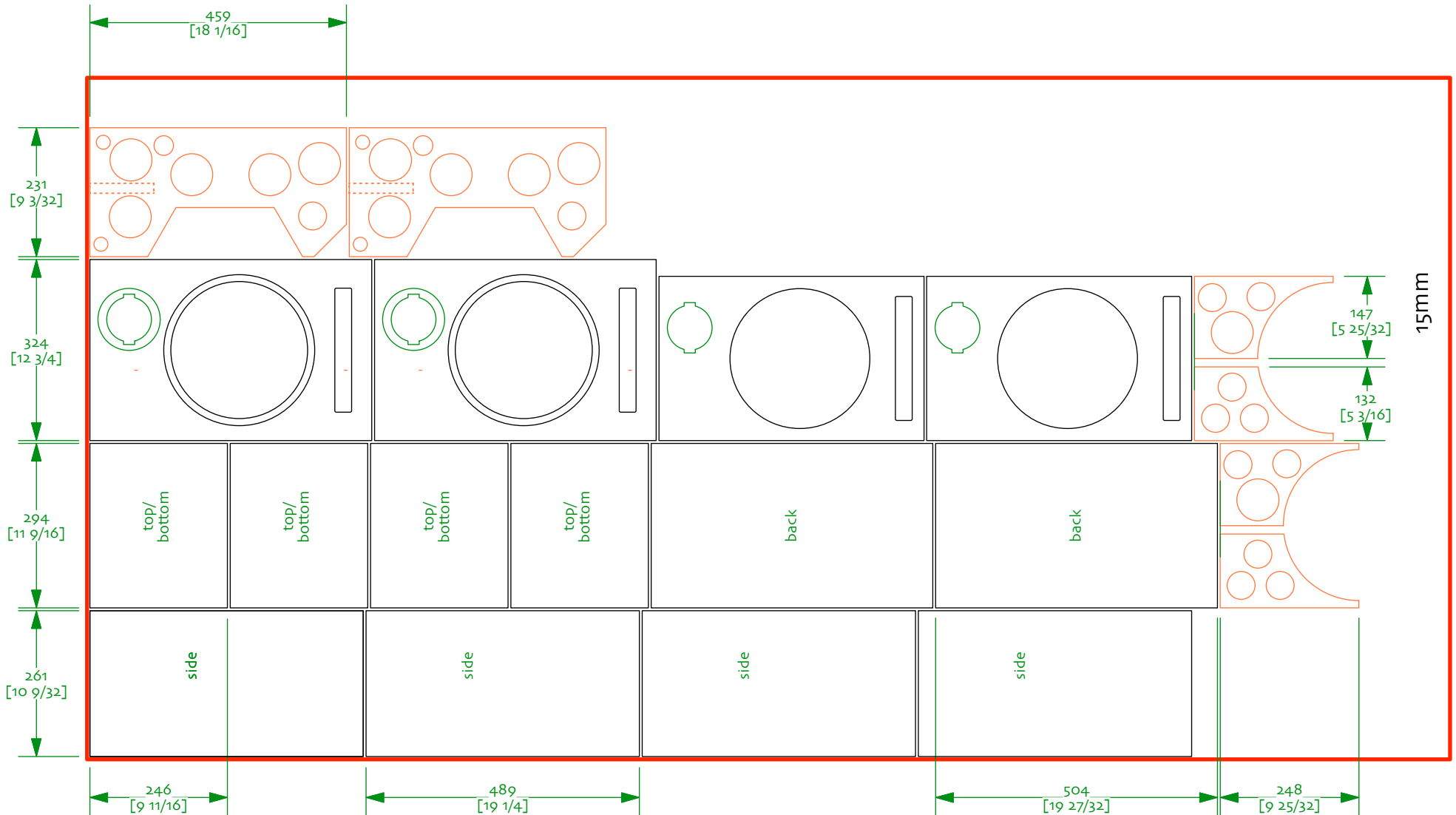
Notes:
 0/ 18 mm material, high quality plywood recommended
 1/ build mirrored imaged pairs.
 2/ Aperiodic vent may also be placed on the rear of the cabinet

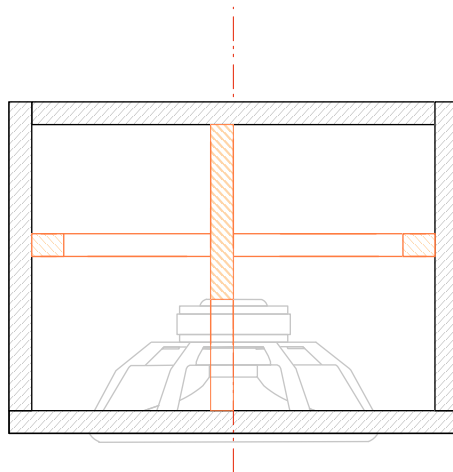


front to back brace

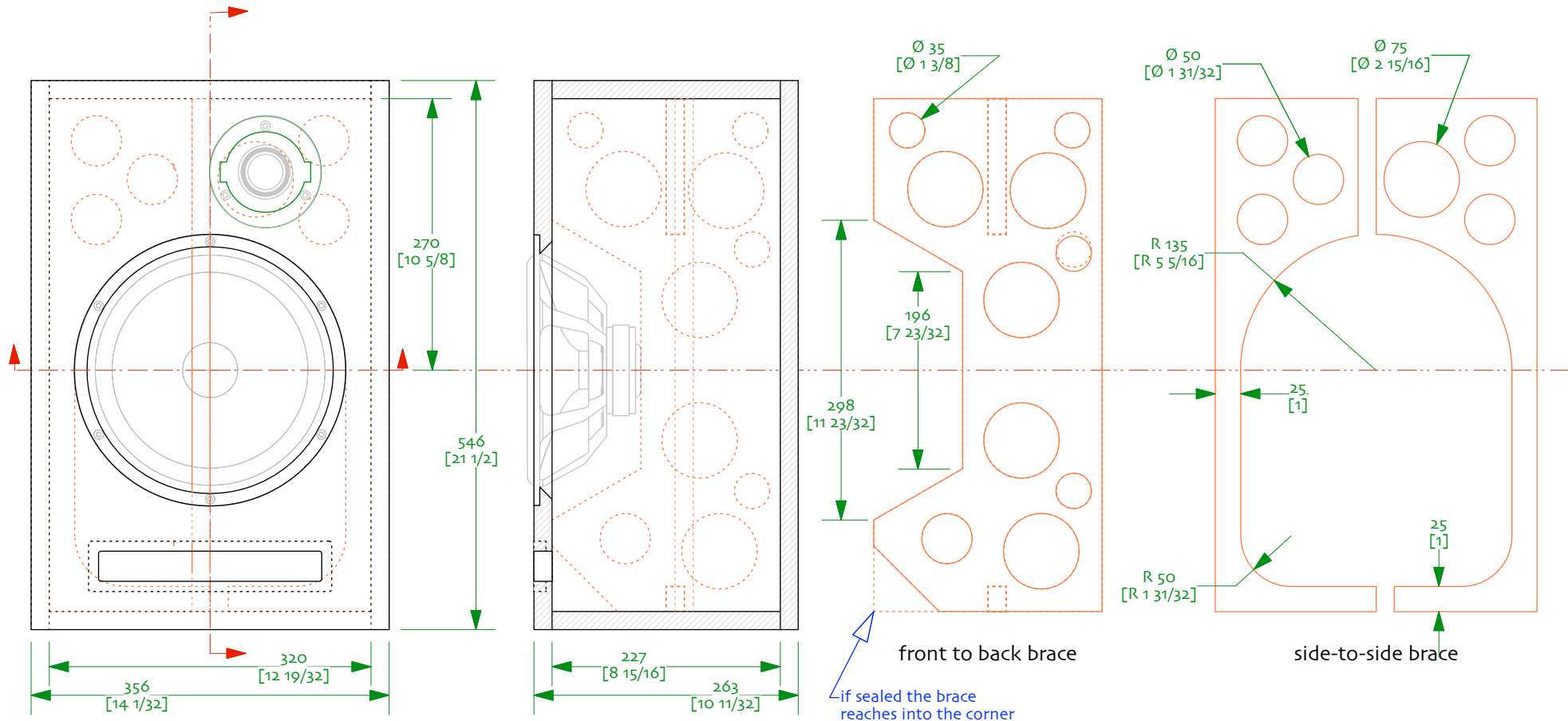
side-to-side brace

Notes:
0/ 15 mm material
1/ 5mm kerf and trim allowance

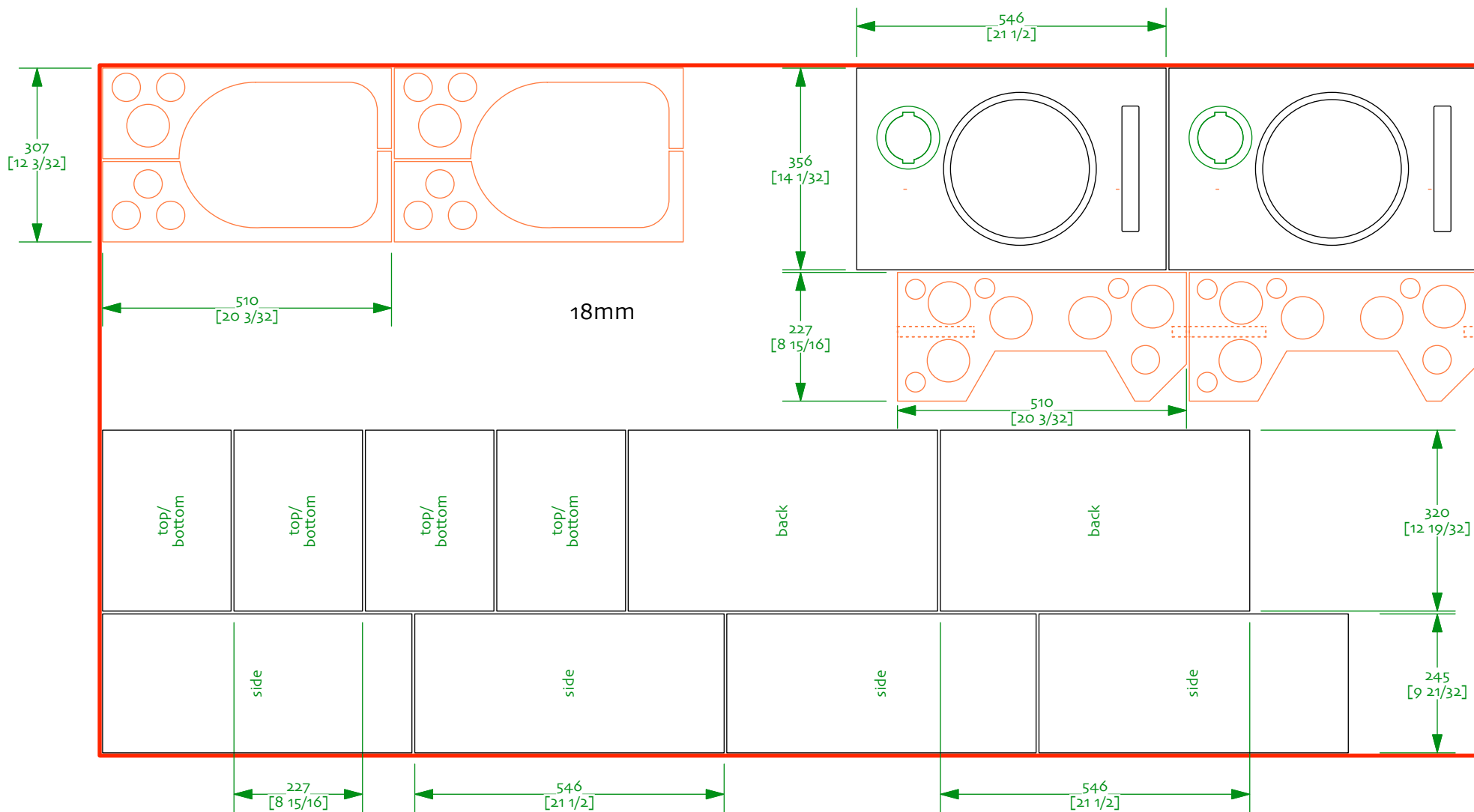


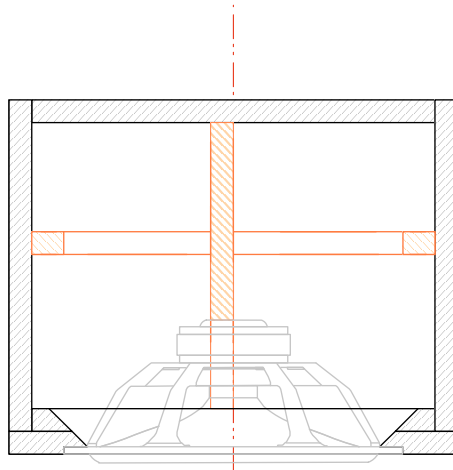


Notes:
 0/ 18 mm material, high quality plywood recommended
 1/ build mirrored imaged pairs.
 2/ Aperiodic vent may also be placed on the rear of the cabinet

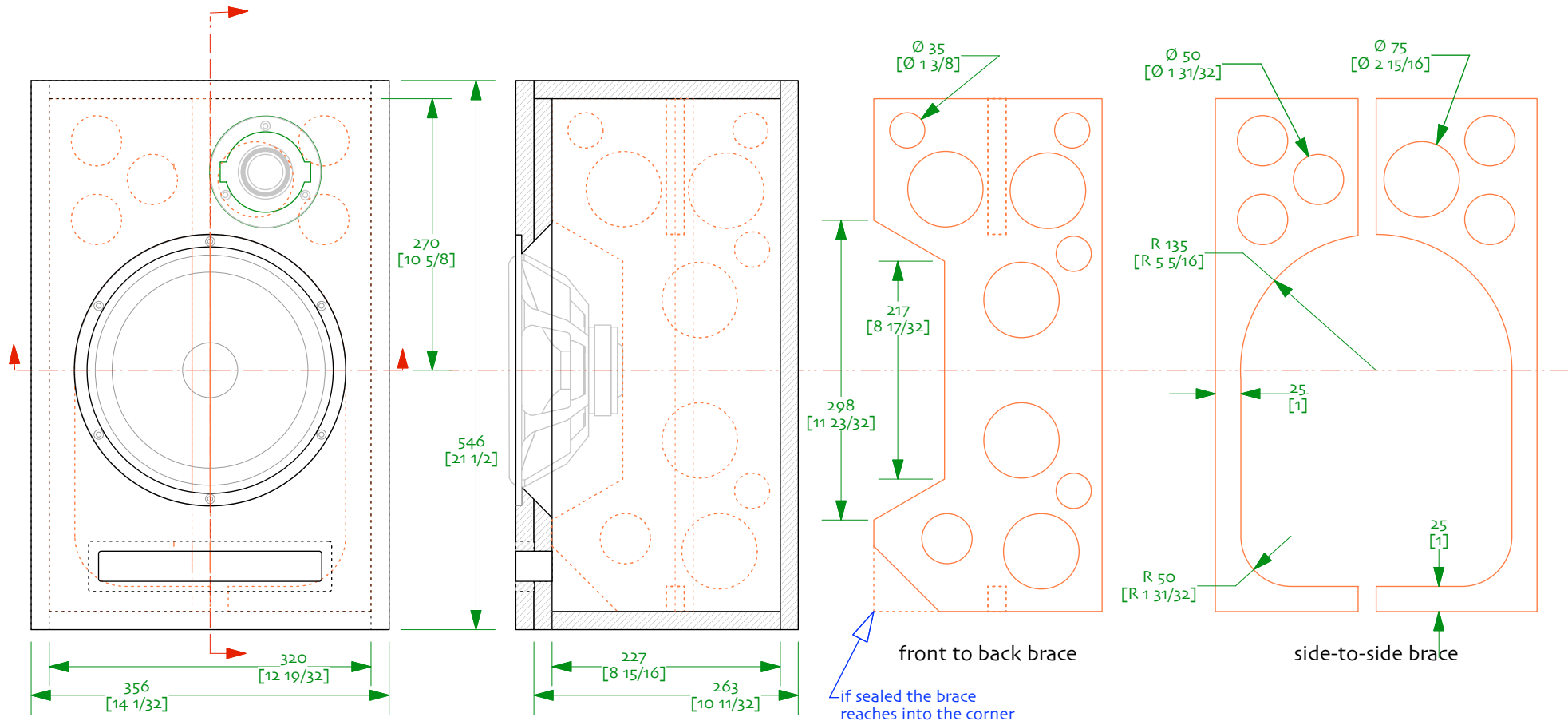


Notes:
o/ 18 mm material
1/5 mm kerf and trim allowance



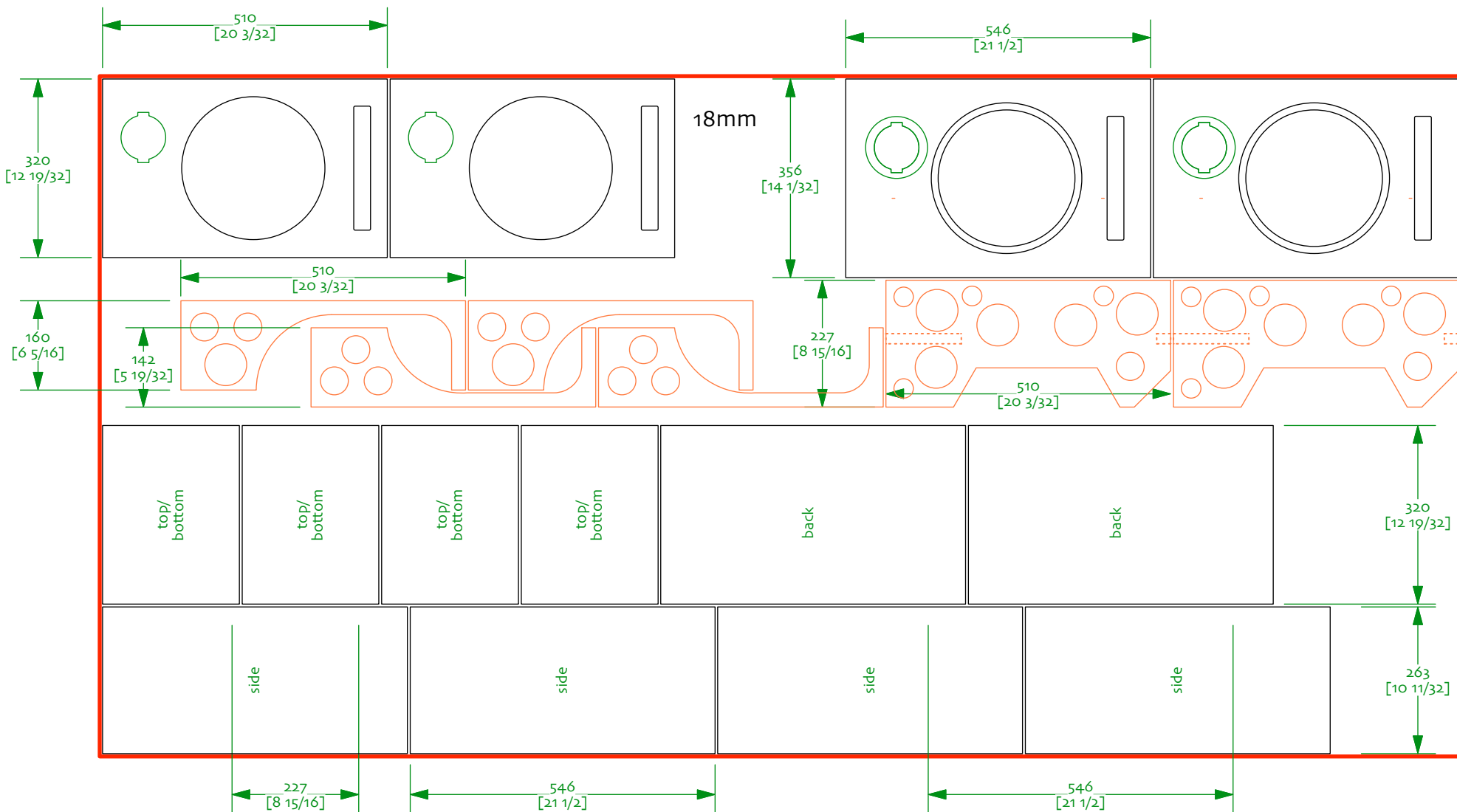


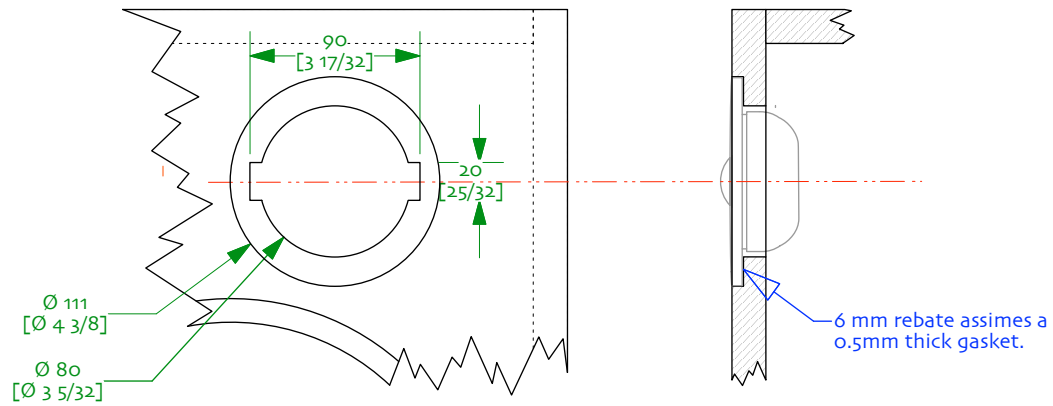
- Notes:
- 0/ 18 mm material, high quality plywood recommended
 - 1/ build mirrored imaged pairs
 - 2/ Aperiodic vent may also be placed on the rear of the cabinet
 - 3/ this variation is overkill, some will want that :^)



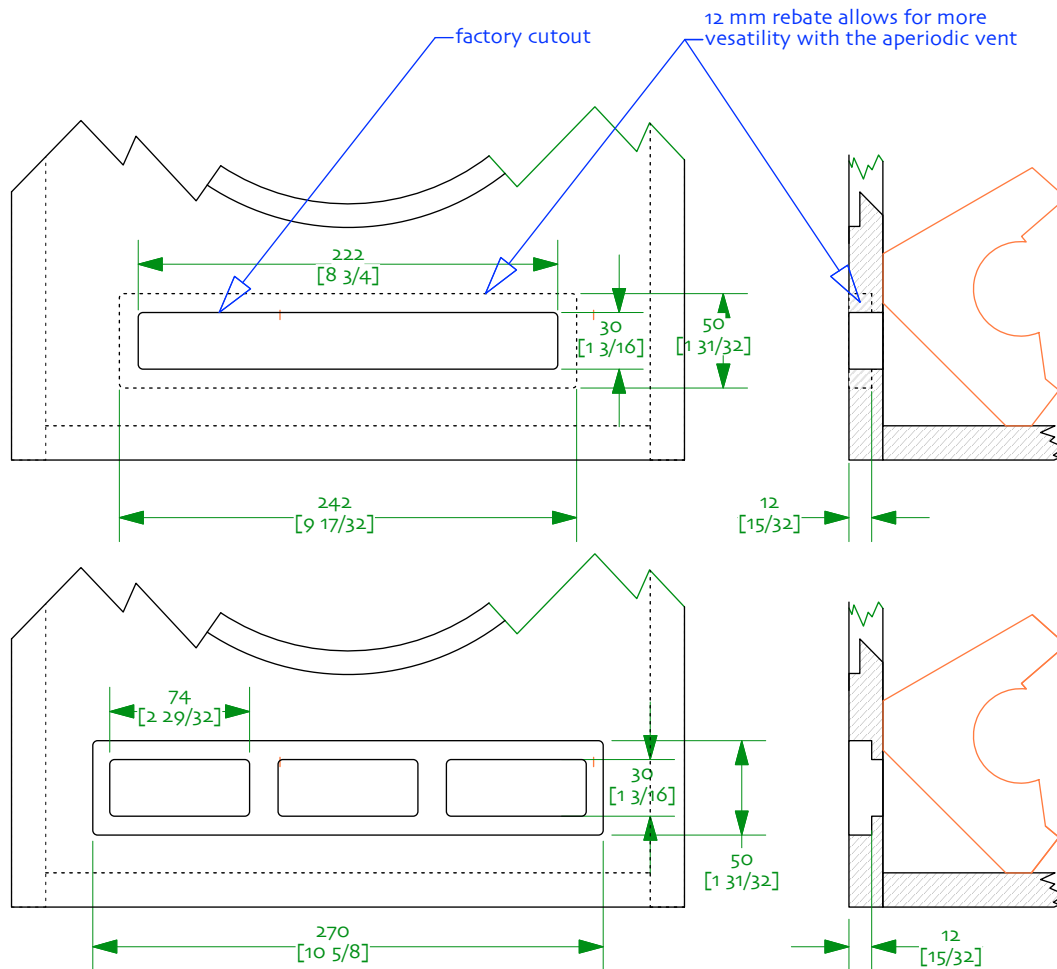
Notes:
 0/ 18 mm material
 1/ 5mm kerf and trim allowance

SEAS A26L reimagining ov88
 sheet a26lc18-2 | 18mm dbl baffle 4x8 cut
 © 2011-21 planet_10 enterprises limited
 04-april-2021 | tweaked & drawn by dld
 free for personal use





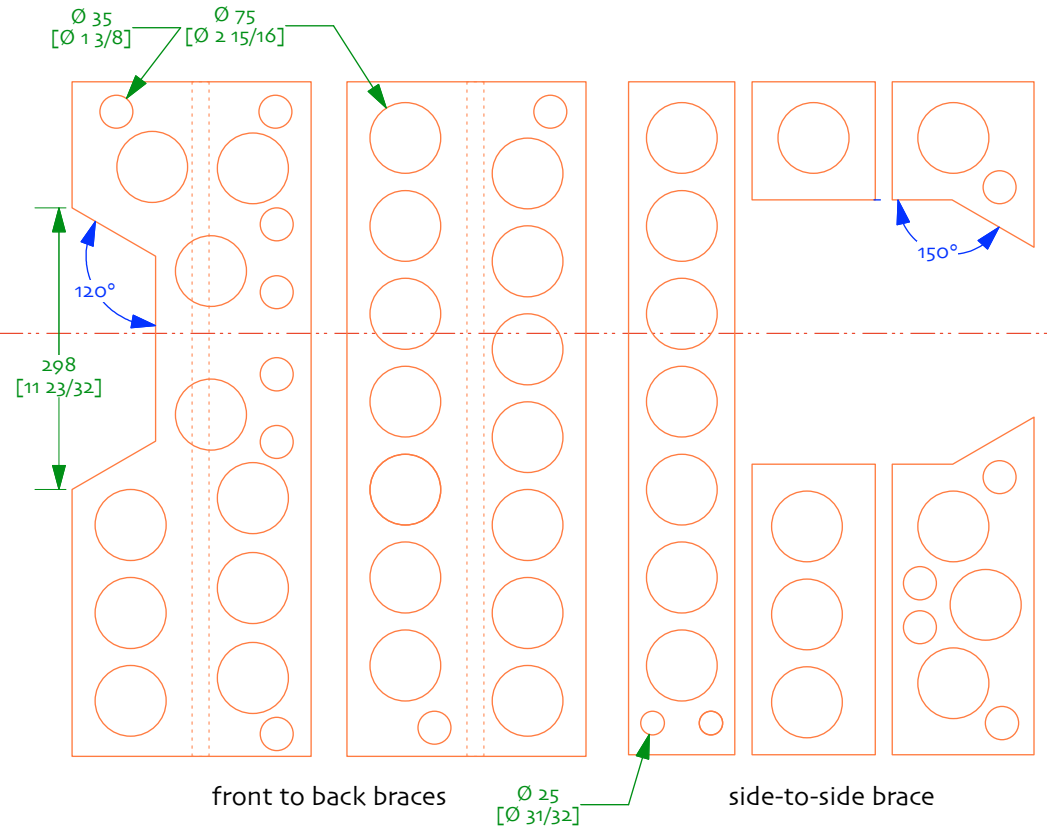
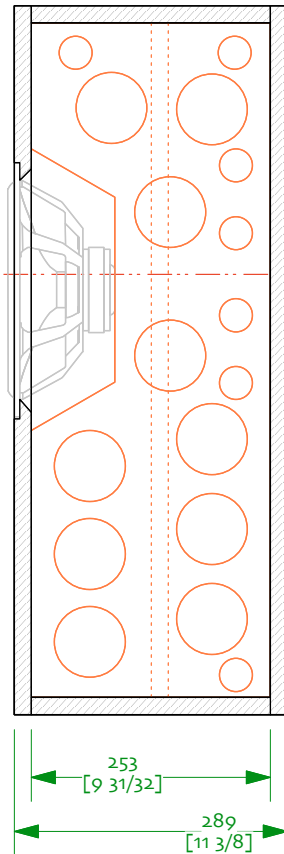
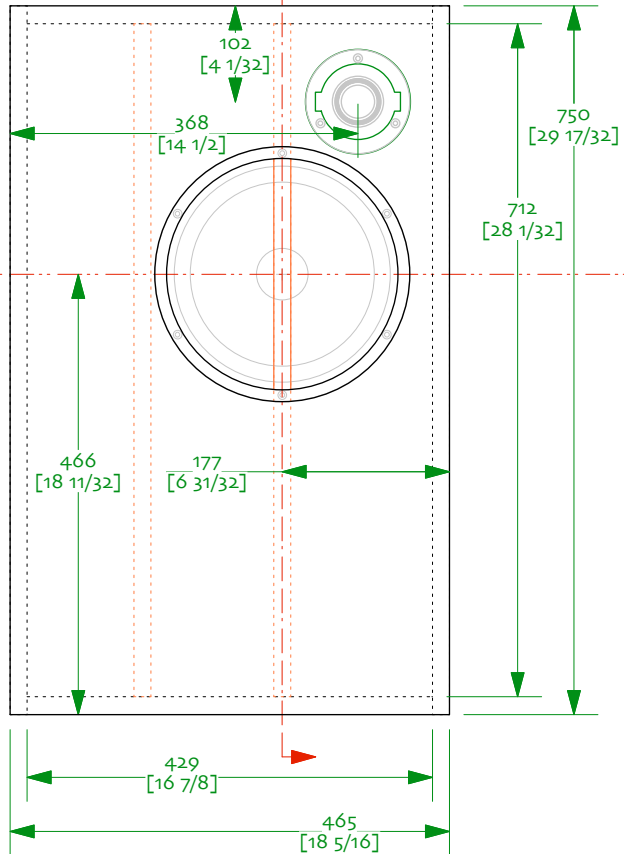
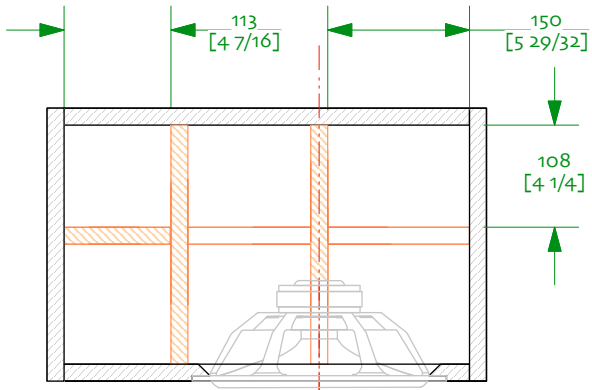
Notes:
 o/18 mm material, high quality plywood recommended

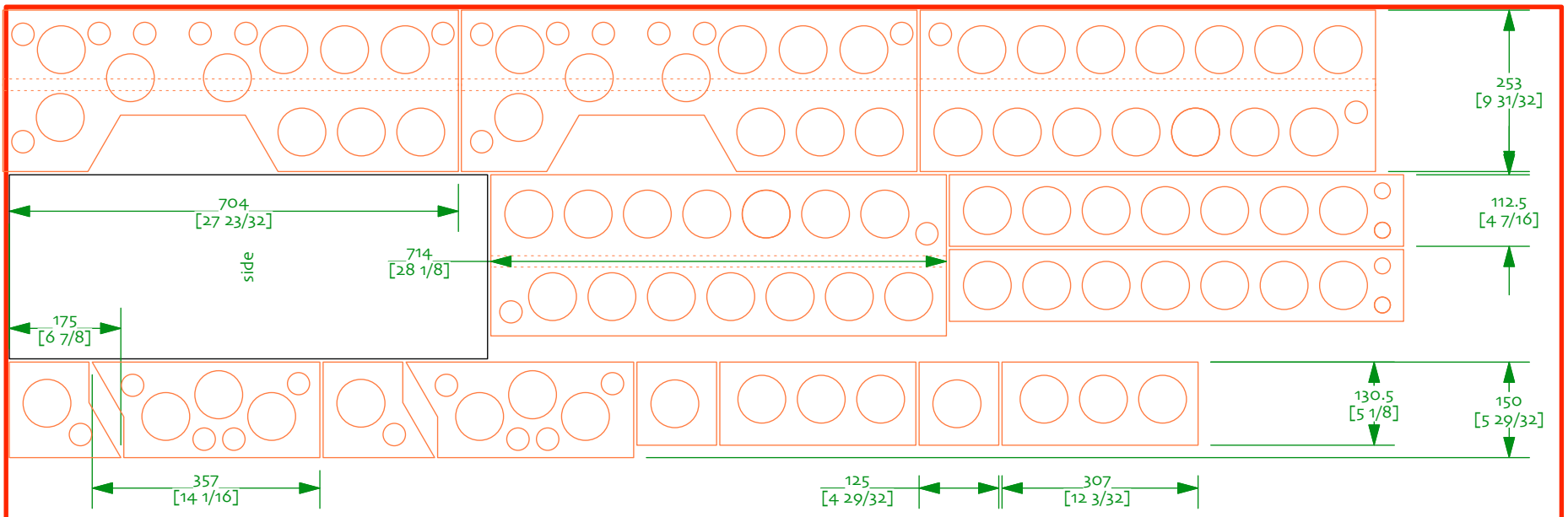
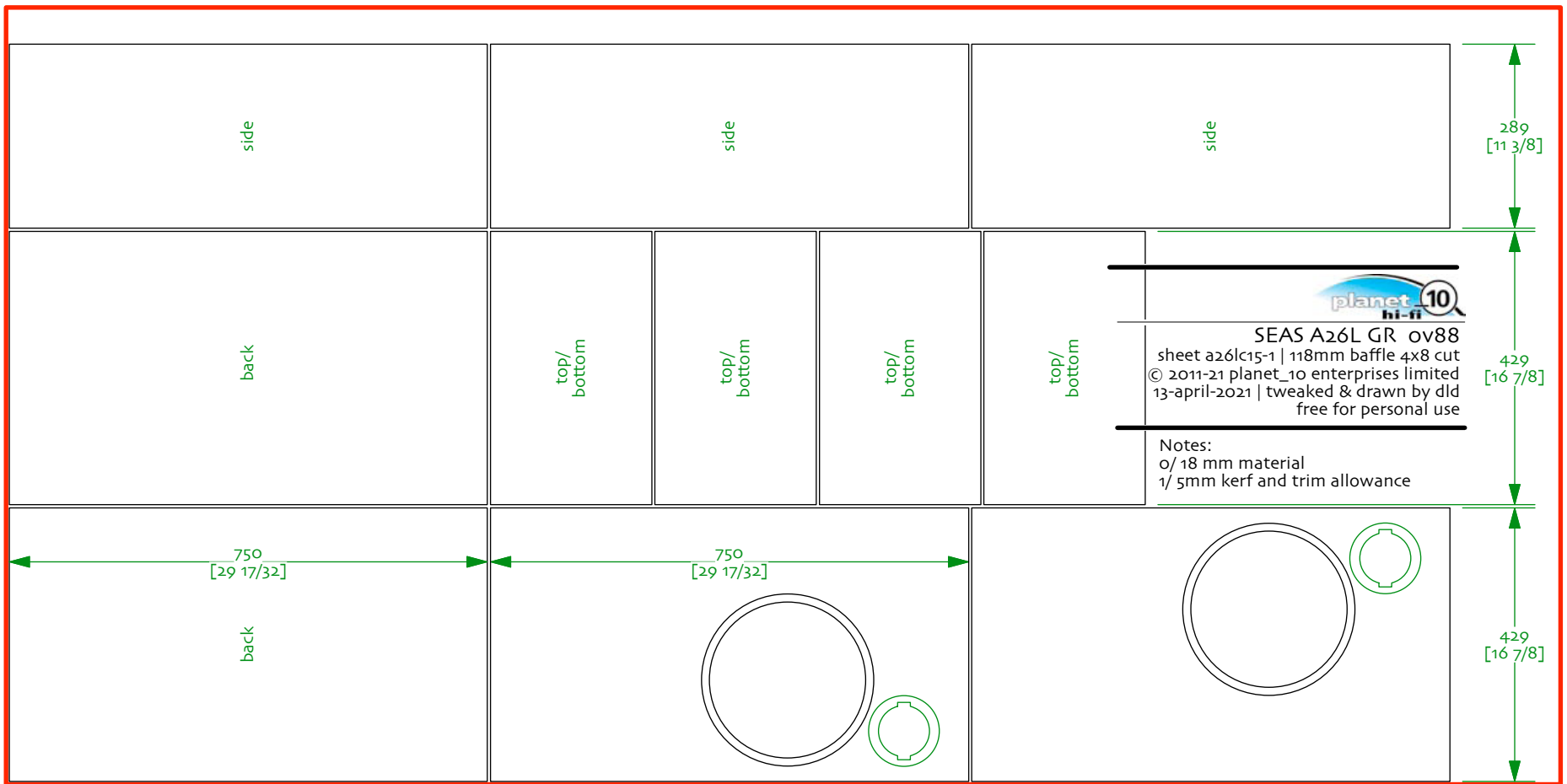


Commentary on aperiodic vent tuning and damping
 gutter mesh, fiberglass, Dyna A25, rockwool, vent recess, A26/SEAS take
 180% x 2/3

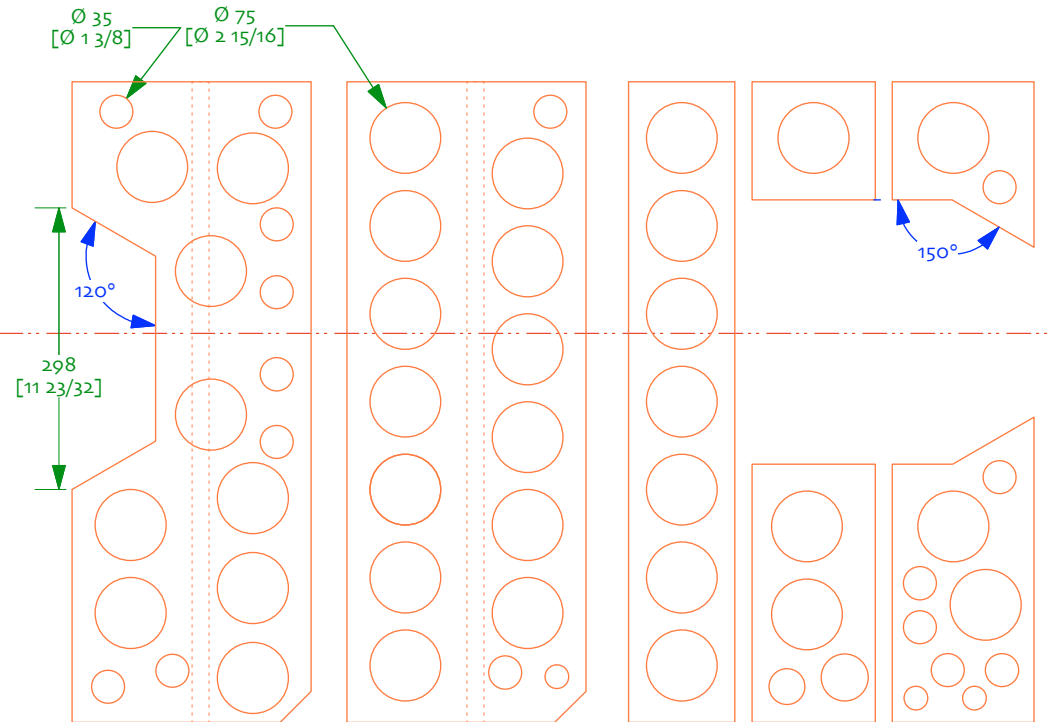
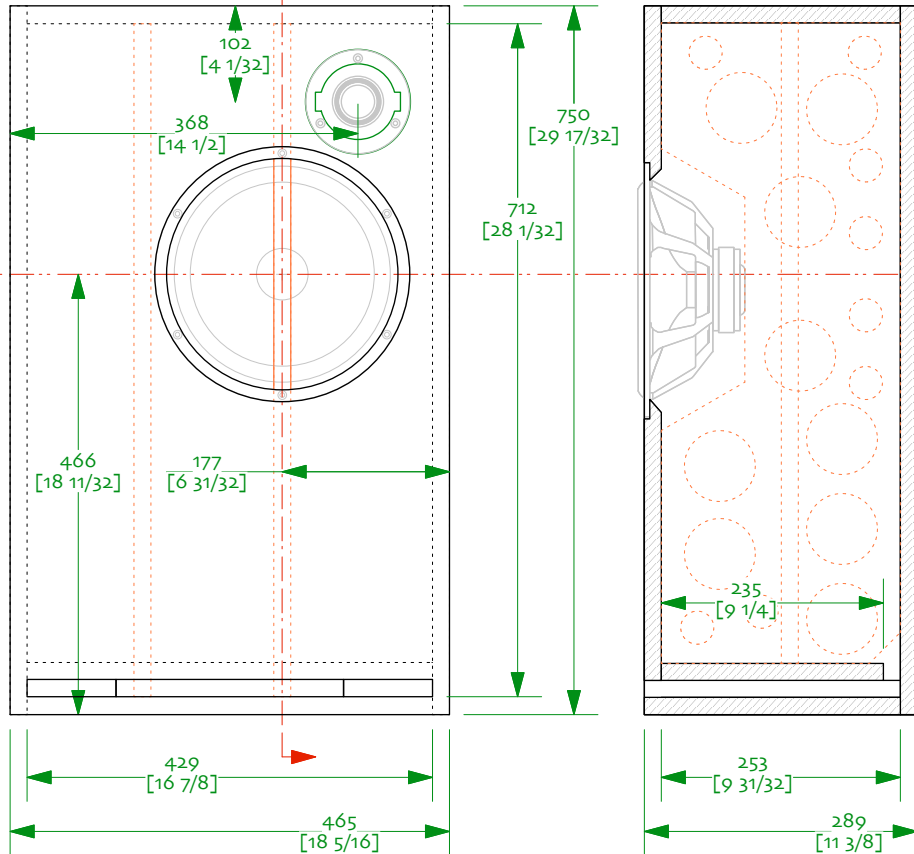
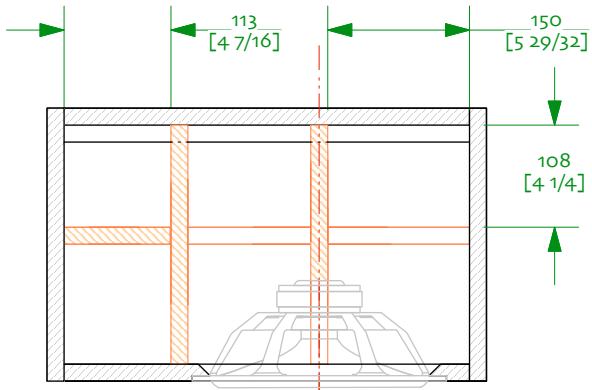
This is a more versatile variation on the cutout for the aperiodic vent
 about 200% the are, 2/3 the depth

Notes:
 o/ 18 mm material, high quality plywood
 1/ build mirrored imaged pairs, woofer
 placement based on golden ratio



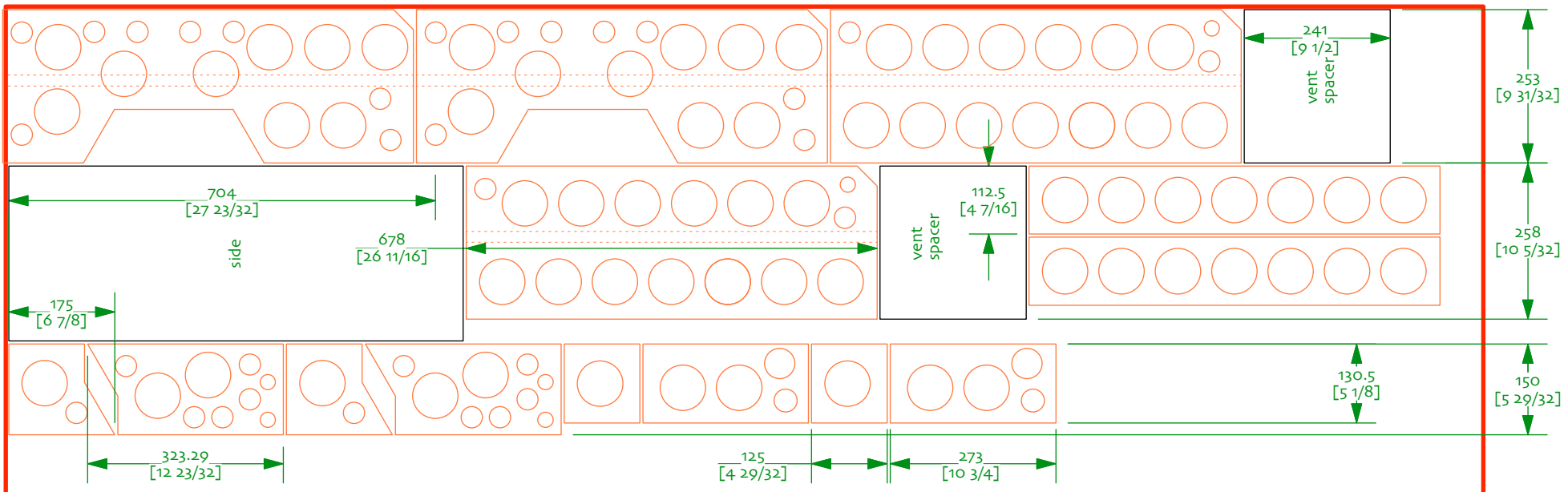
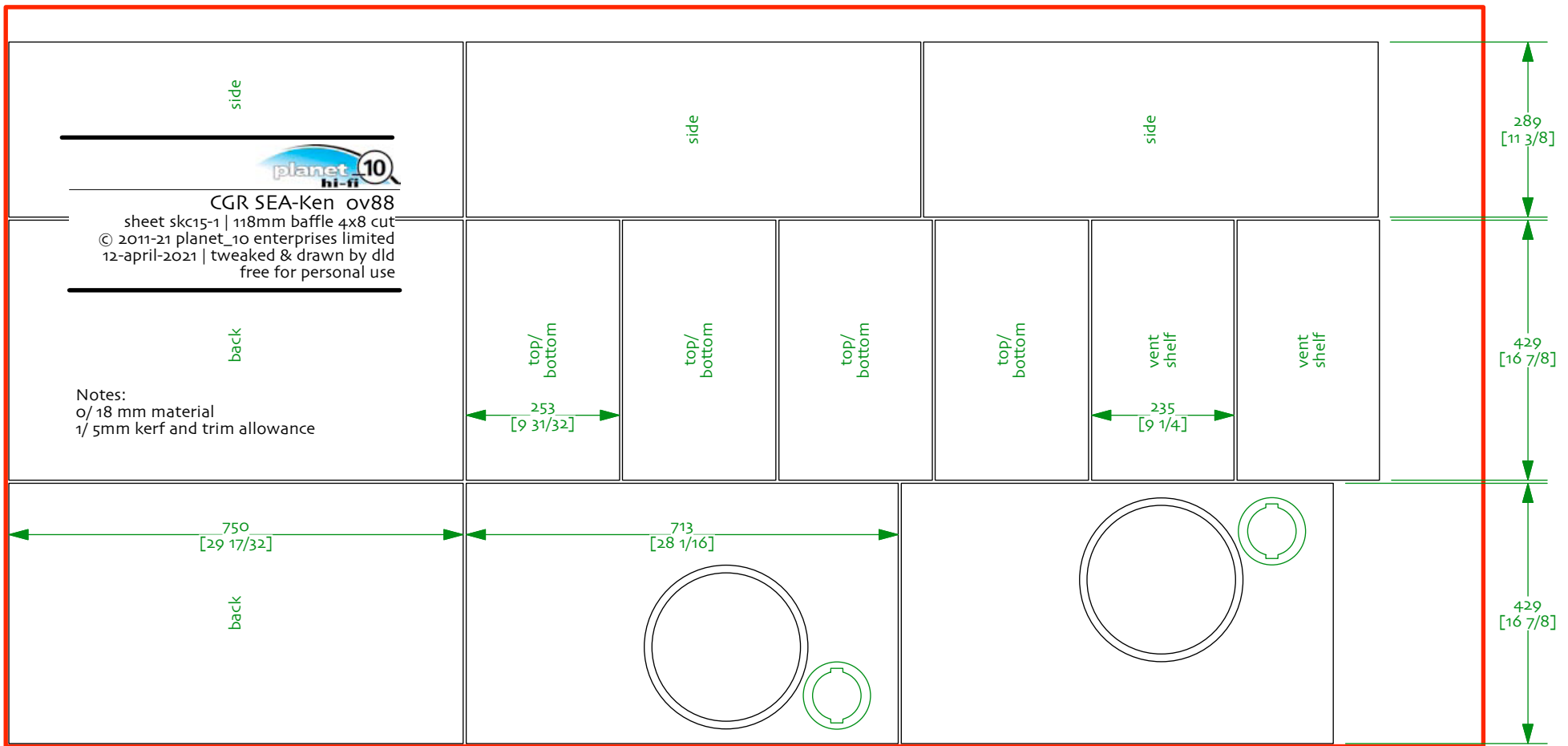


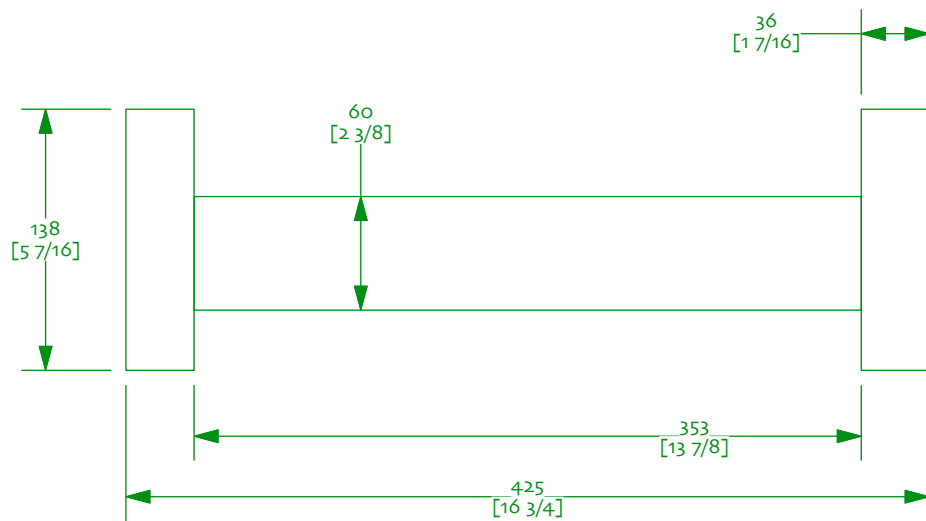
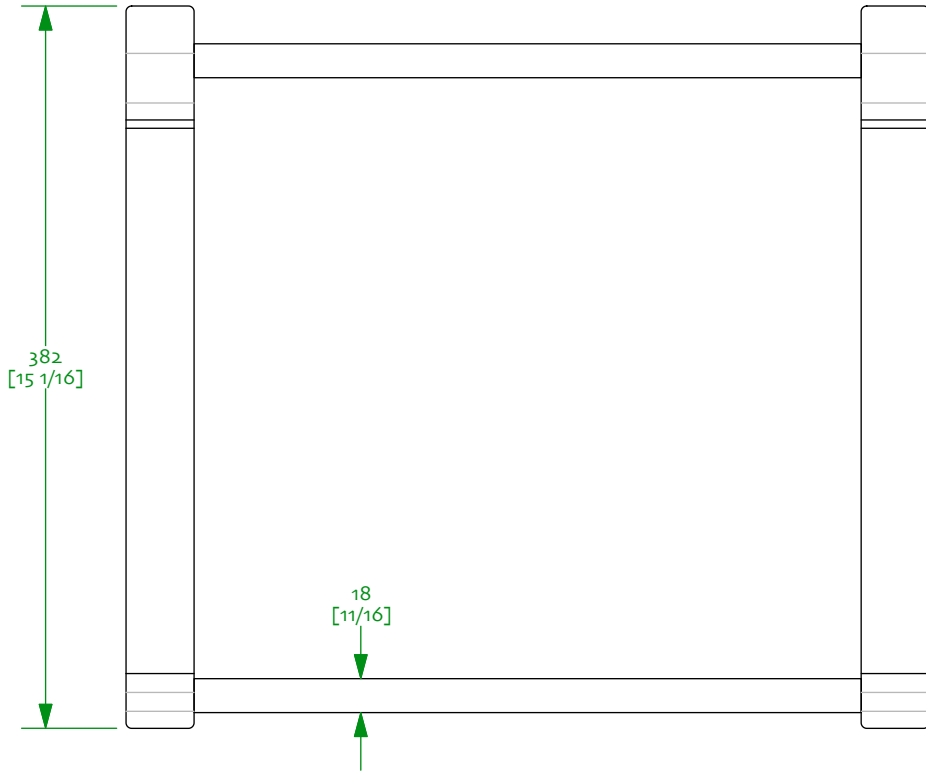
Notes:
 o/ 18 mm material, high quality plywood
 1/ build mirrored imaged pairs, woofer
 placement based on golden ratio



front to back braces

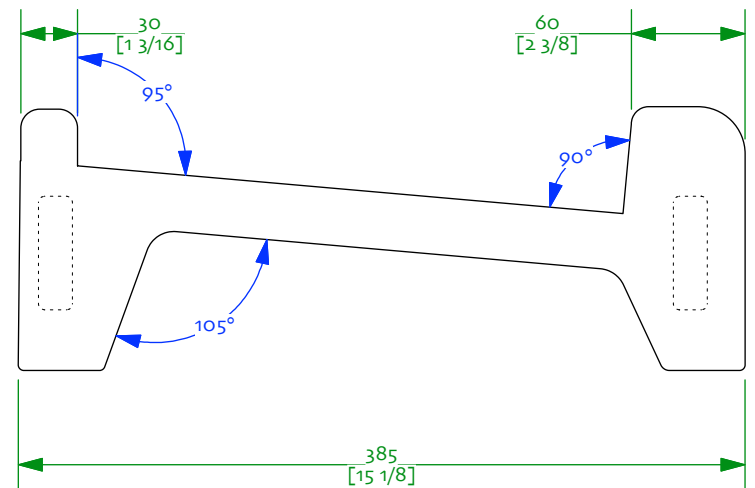
side-to-side brace



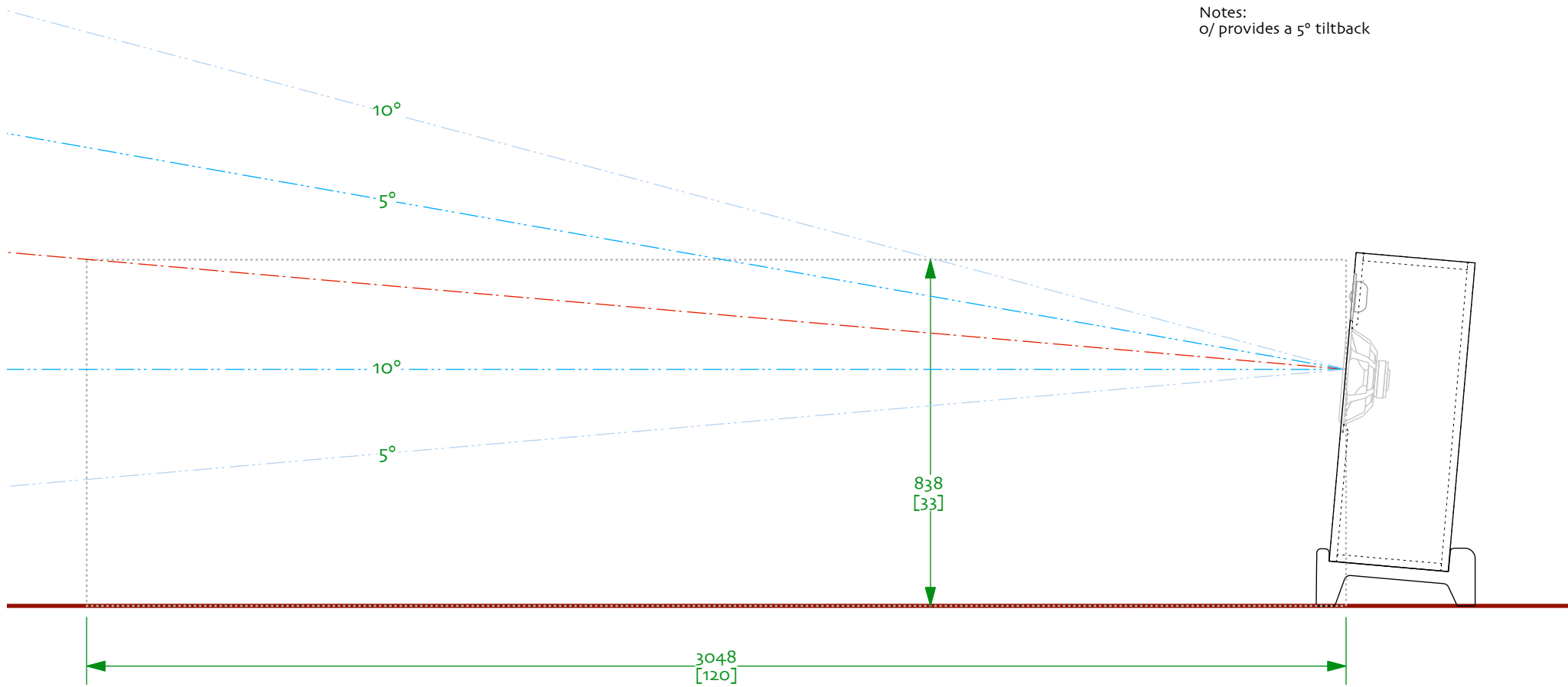


SEAS A26 Sealed GR Stand ov81
 sheet a26bp18 | 18mm plan
 © 2011-21 planet_10 enterprises limited
 15-march-2021 | tweaked & drawn by dld
 free for personal use

Notes:
 0/ drawn with 18 mm material
 1/ provides a 5° tiltback



Notes:
o/ provides a 5° tiltback





SEAS A26R3E4 Top options

looking at other options for covering the high frequencies

27-march-2021

Visualization here

The A26RE4 is a versatile woofer with a nice smooth roll-off. There is no reason other tweeters cannot be used and here we present 3 examples with SEAS 29TFF/W, SEAS T29CF01, and Morel CAT 378.

The XO's used for these can be an helpfuk in designing an XO for other tweeters.

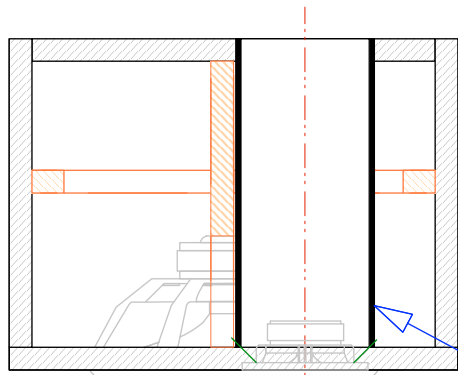
We will also consider using a midTweeter (ie small full-range) instead of a tweeter with a very low XO, bringing the seamlessness of no XO thru the mid-top, the ability to get the driver's physical spacing within the magic quarter-wavelength (effectively making the drivers coincident), and allowing for the XO point and the driver levels to be used for any needed Baffle Step Compensation.

Drawings/Contents (provisional)

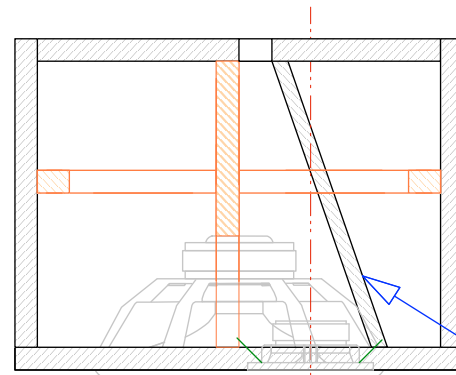
Title
Tweeter, Crossover options
midTweeter options, subenclosure
suggested XO start
impedance tuning

SEAS A26RE4/ driver dimensions

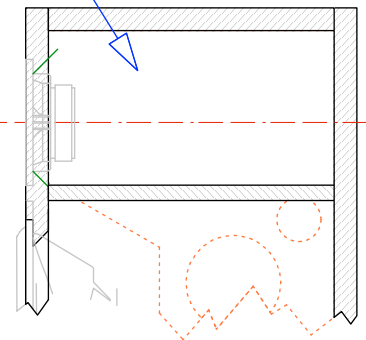
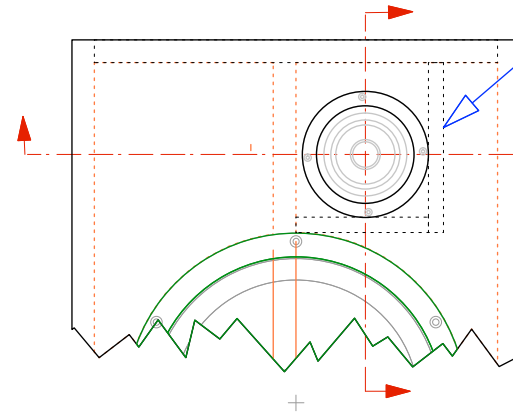
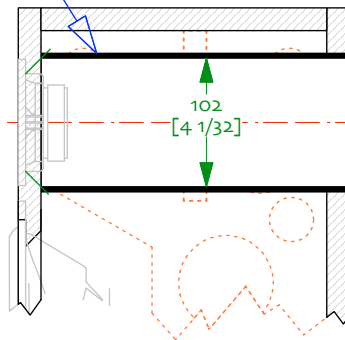
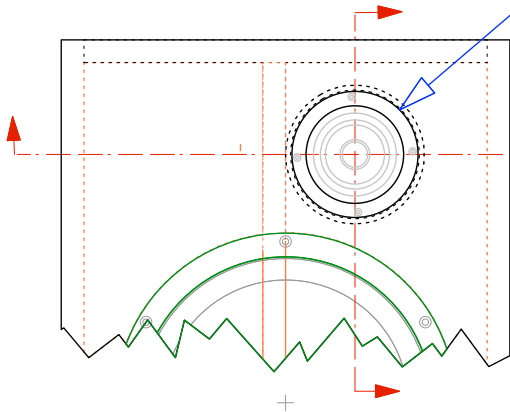
please email <david@planet10-hifi.com> with
corrections & suggestions to improve this document



4" pvc pipe out the back of the box and damped aperiodic, with increasing density fibre fill as you approach the terminus.



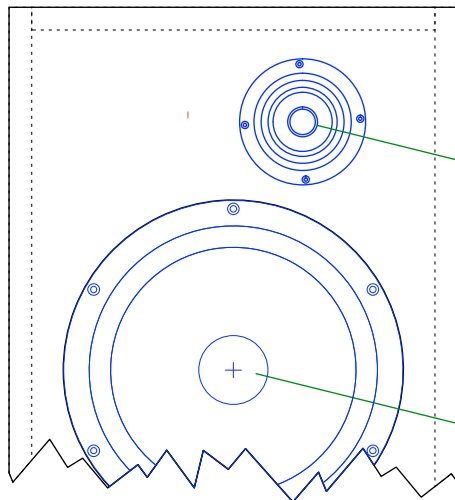
heavily tapered midTL using the centre brace as one of the side panels. Damp aperiodic, with increasing density fibre fill as you approach th eterminus.



356 [14]

$$4560 / 14 = 325$$

which suggests an XO between 230 - 325 Hz for baffle step compensation purposes.



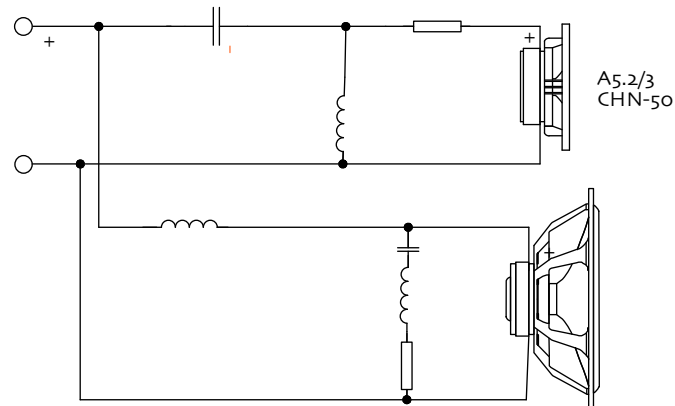
203 [8]

Quarter wavelength of the driver separation is about 240 Hz which suggests the XO be less than 240 Hz.

A26RE4 sensitivity is 89 dB, so if one wants to work out a passive XO then 85-87 dB to get appropriate BSC (with no padding), if you bi-amp then any good 3" driver would be suitable. The drawings use a Mark Audio Alpair 5.2/3 which I would suggest along with Fostex FF85wk or Faital Pro 3FExx (you should be able to find the sensitivity you need amongst the various versions).

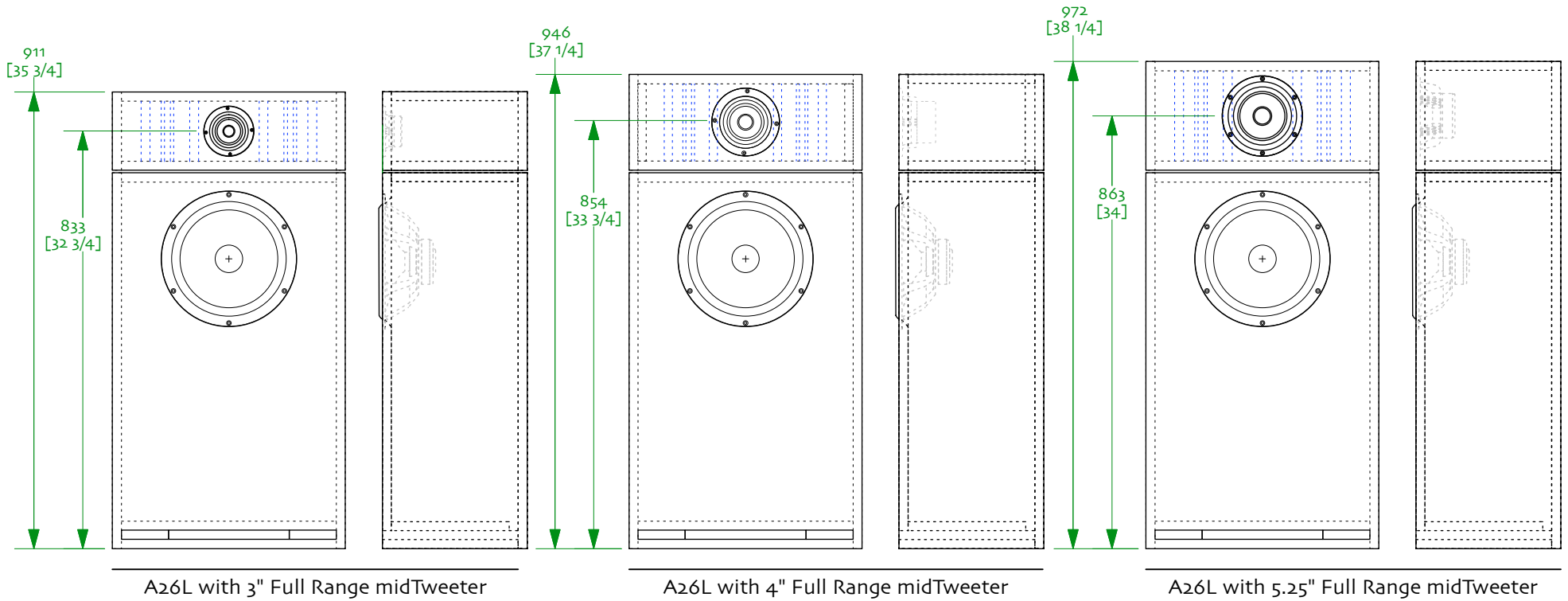


SEAS A26 reimaging ov88
sheet a26mt | midTL options
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28-march-2021 | tweaked & drawn by dld
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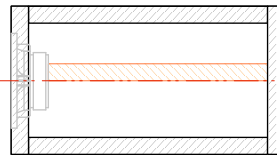
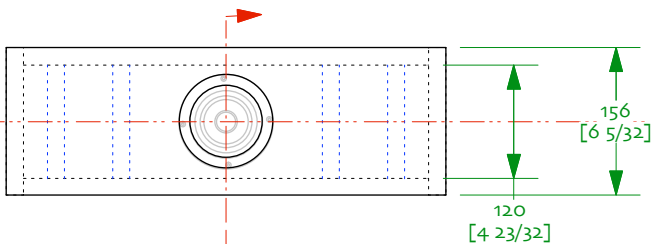
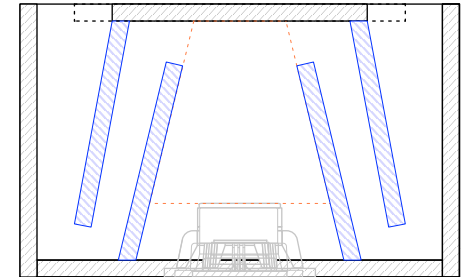
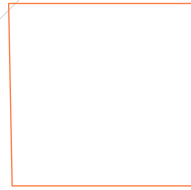
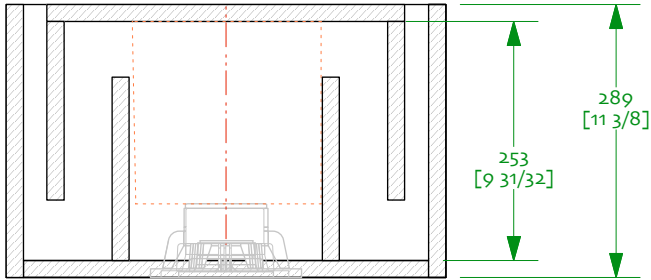
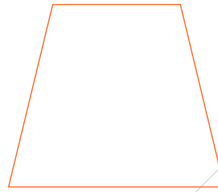
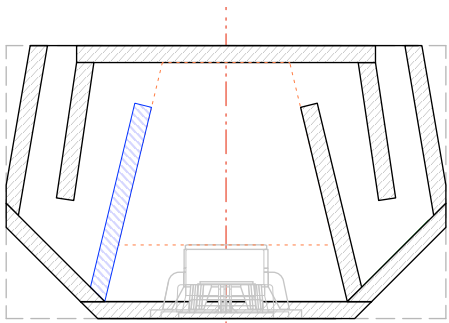


A5.2/3
CHN-50

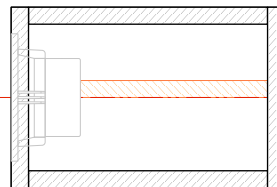
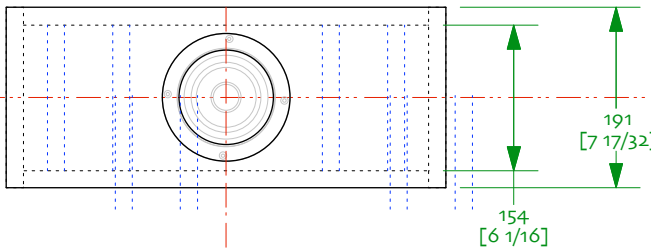
Notes:
 o/ 18 mm material, high quality plywood
 1/ build mirrored imaged pairs, woofer placement based on golden ratio



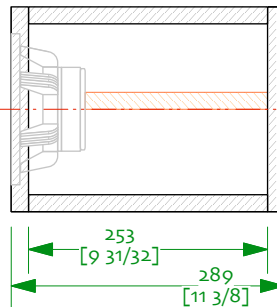
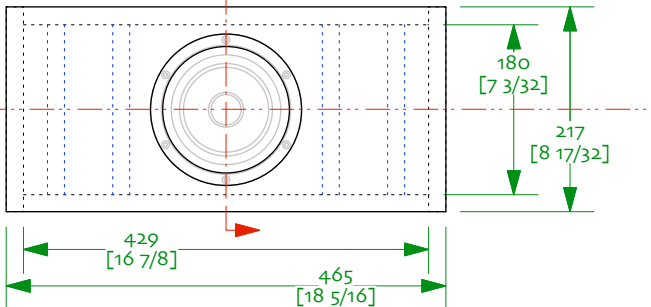
Notes:
 o/ 18 mm material, high quality plywood. If available it would not hurt to replace the internal pieces with 12 or 15mm to gain a bit more volume



3-3.5"

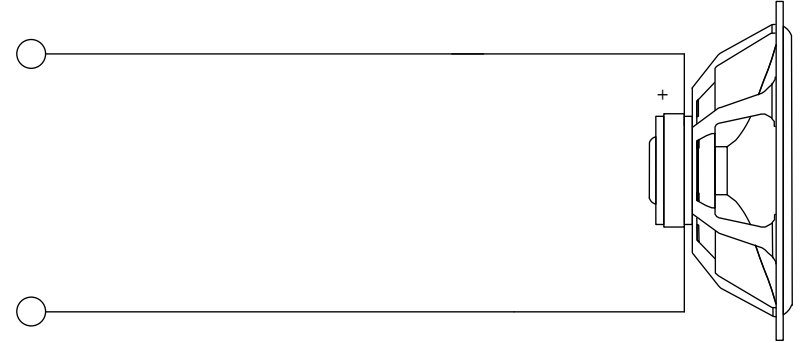
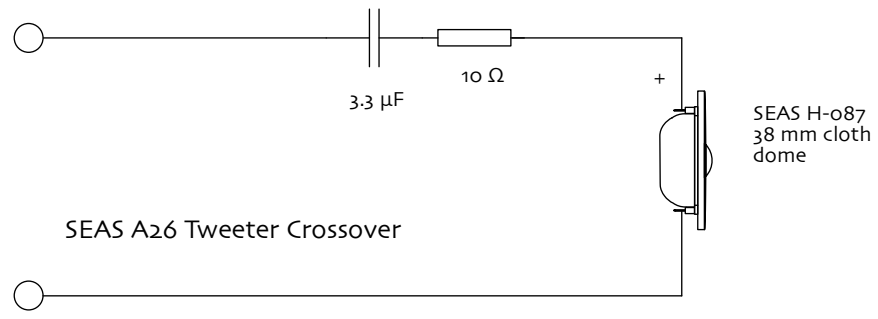
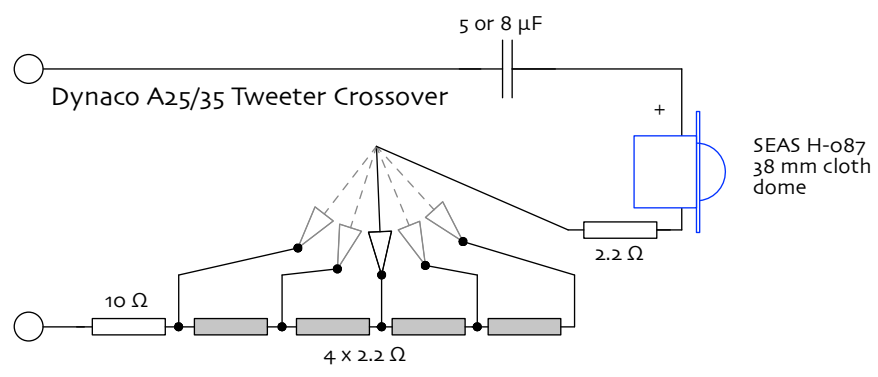


4-4.5"



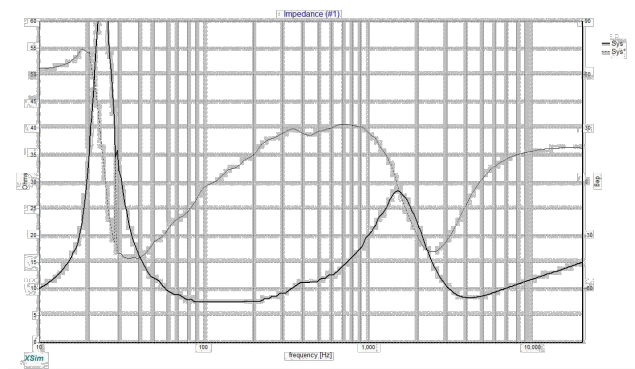
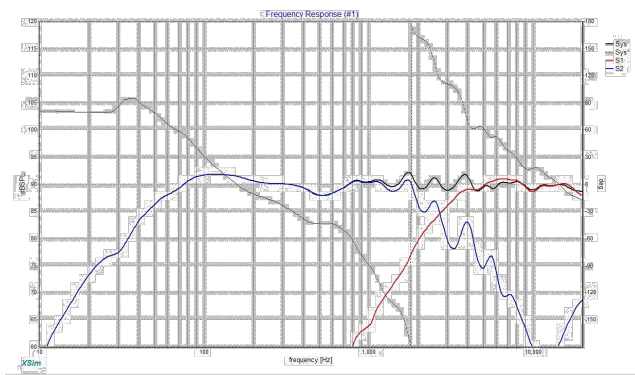
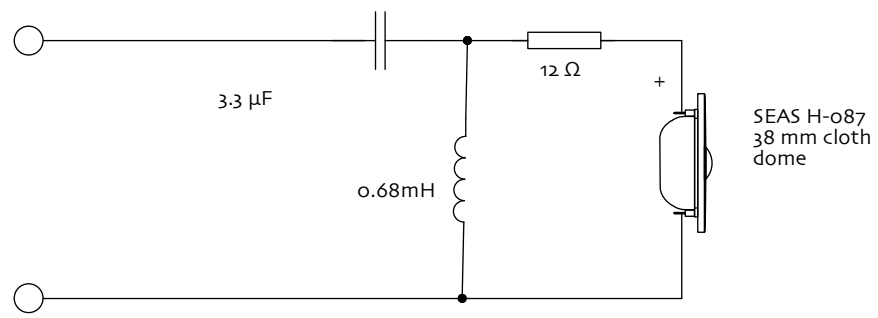
5.25", maybe 6.5"

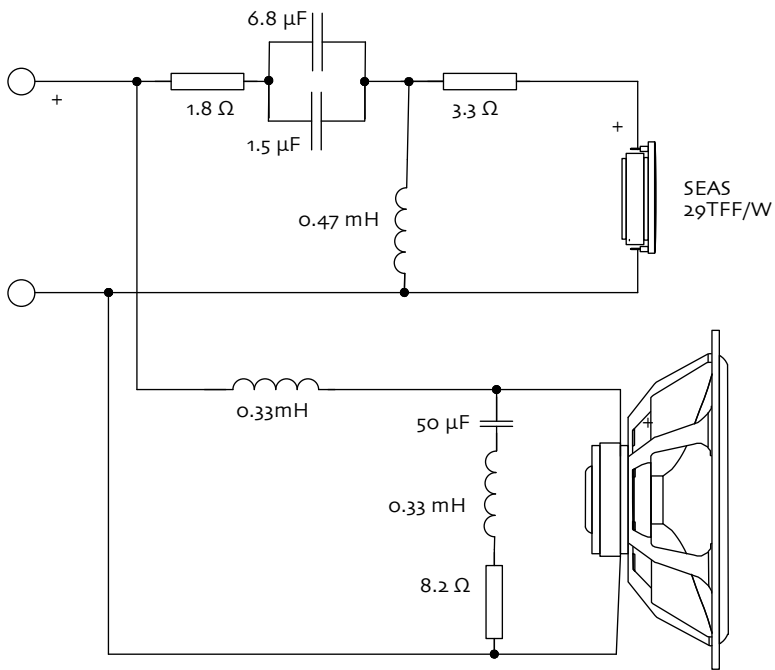
side-to-side brace



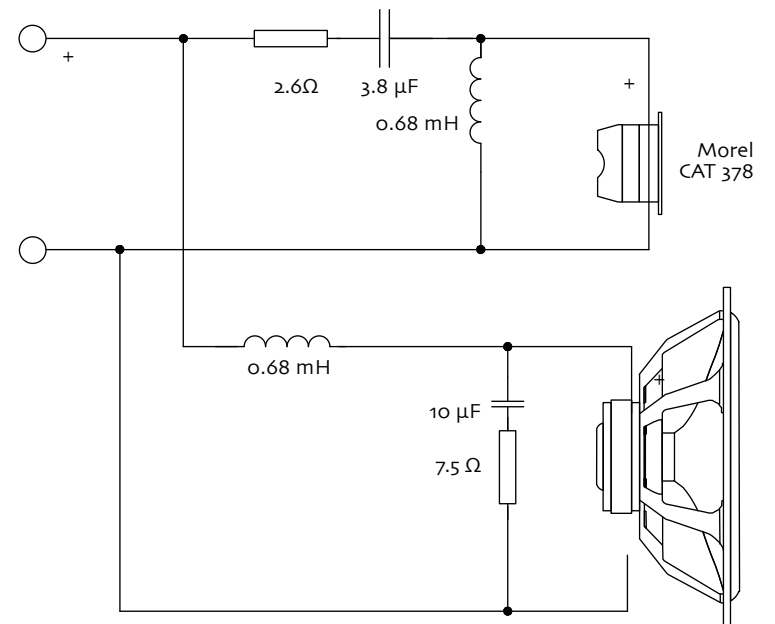
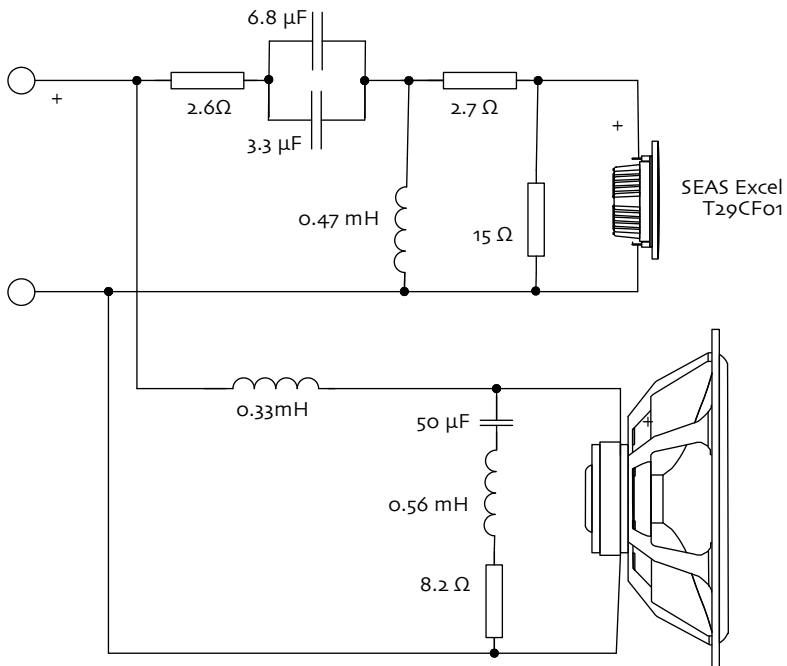
Suggested 2nd Order Tweeter Crossover by Lozek on diyAudio.com

A 2nd order filter on the tweeter will greatly improve its power handling, and the natural, roll-off will more closely resemble the roll-off of the woofer.



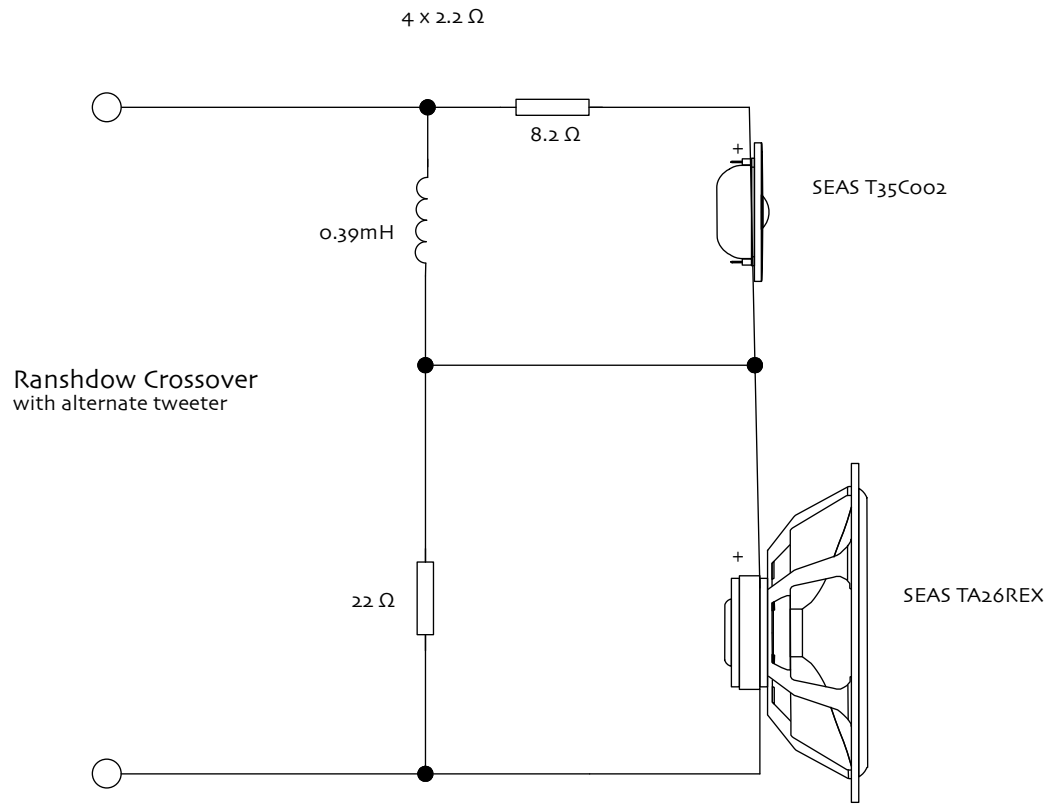


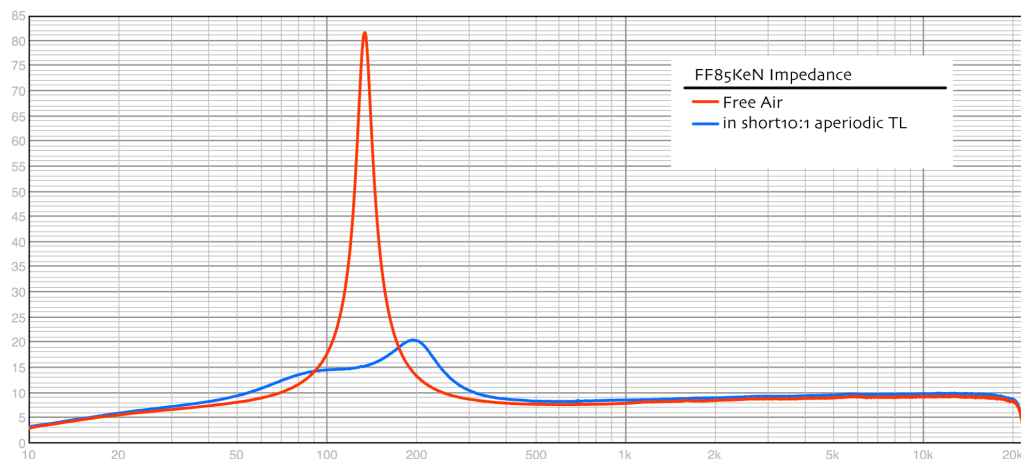
World Design WD25 Alternatives



The tweeter supplied with the A26 kit is not the only one. Here we look at published solutions with other tweeters used.

In the next drawing we will consider substituting a midTweeter with a very low XO to create a Woofer Assisted Wideband. This, really only suitable for the 2 larger enclosures to accommodate the volume of the midTweeter subenclosure.





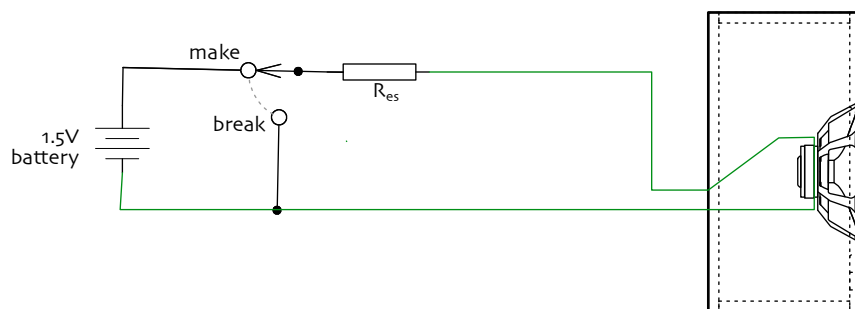
Fine-tuning the resistance of an aperiodic vent in an enclosure can be monitored by measuring the impedance of the loudspeaker. We are trying to flatten the impedance resonance as much as possible.

The example is not an A26, but a short midTL, but the chart is illustrative of the goal.

Resistance of the aperiodic vent involves increasing the amount and density of the damping sandwiched in the vent.

As well as impedance, some may want to keep more of the bump just before roll-off which will require less damping.

The amount of damping used in the vent will also be informed by your room, room placement, amplifier, & taste.



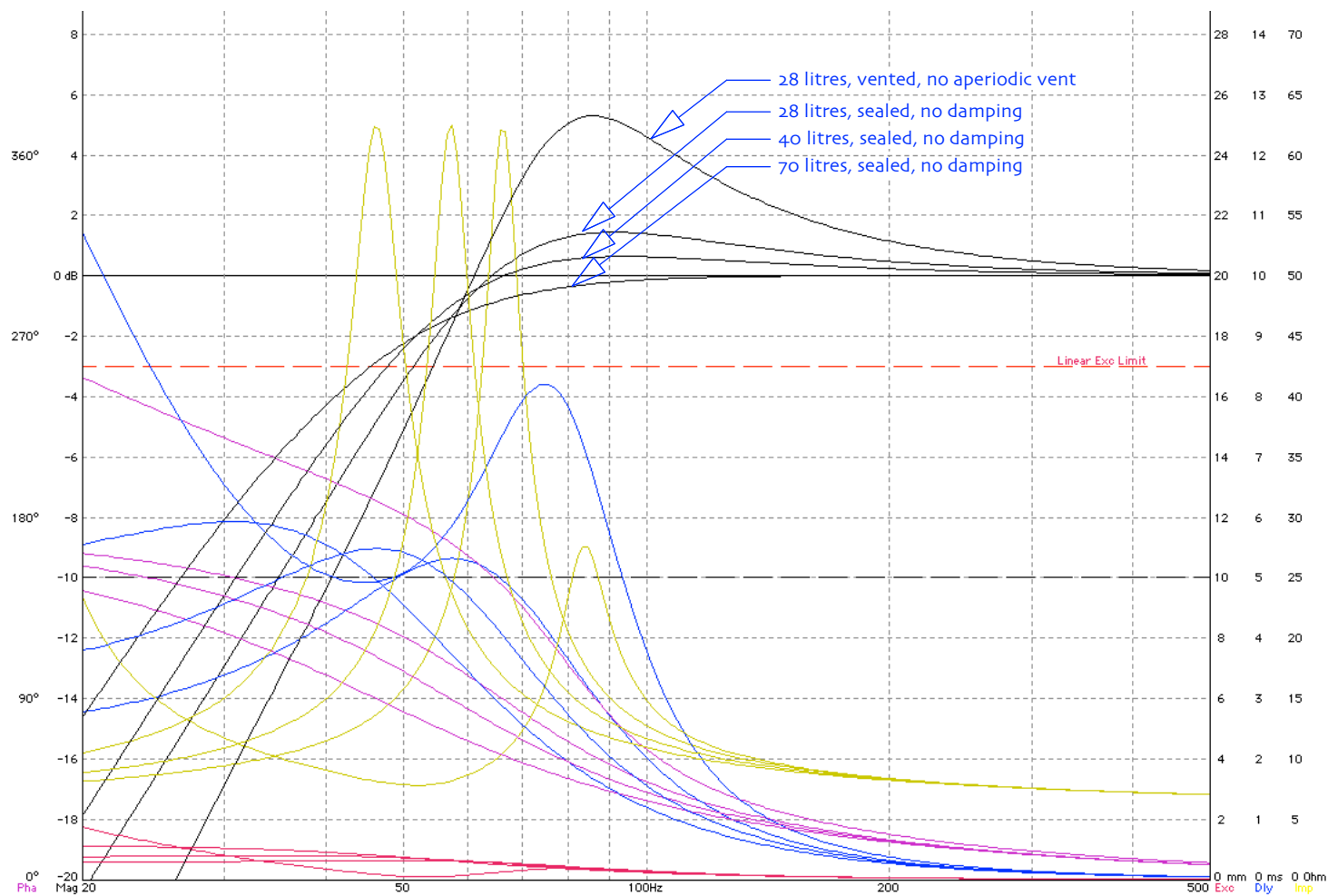
If you don't use a computer program to measure impedance, you can determine when it is damped "close enough" by ear using the simple circuit shown.

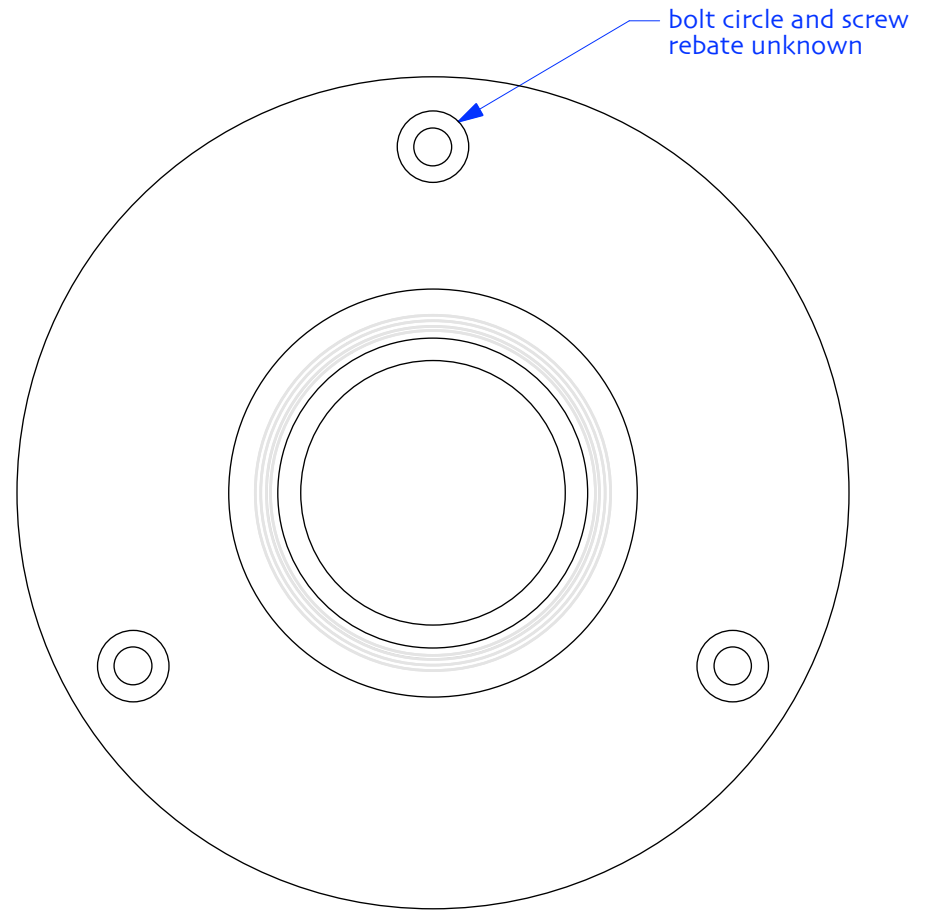
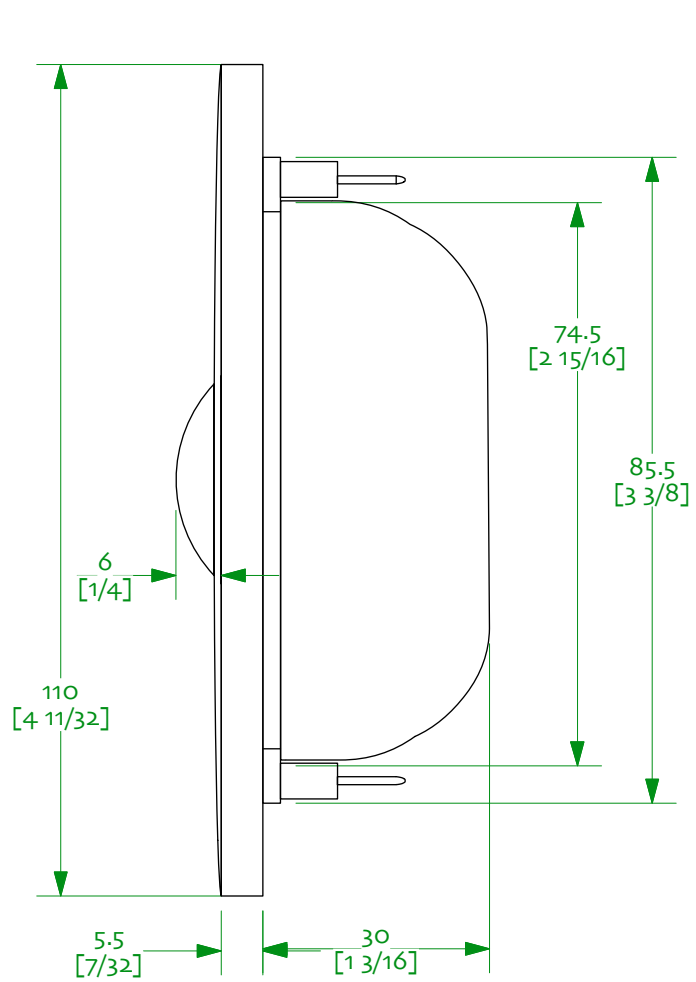
Make a tester with a SPDT toggle or pushbutton switch, 1.5V C or D size battery and a resistor.

If amplifier damping factor is known:

$$R_{es} = Z_{driver} / \text{damping-factor}$$

The speaker should reproduce a distinct "click" on 'make' and 'break'. If there is "hangover" or "boom" then increase damping density.





Notes:
o/ after the factory drawing

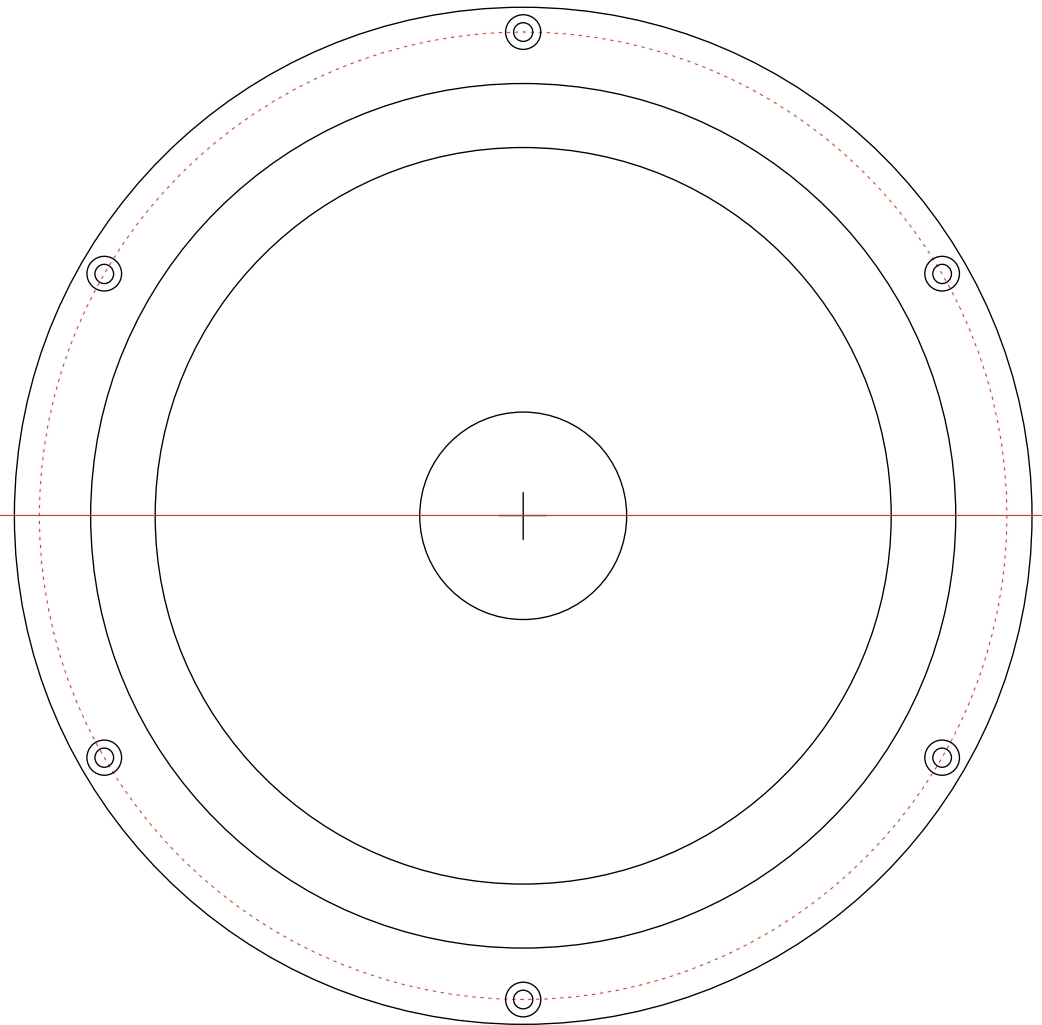
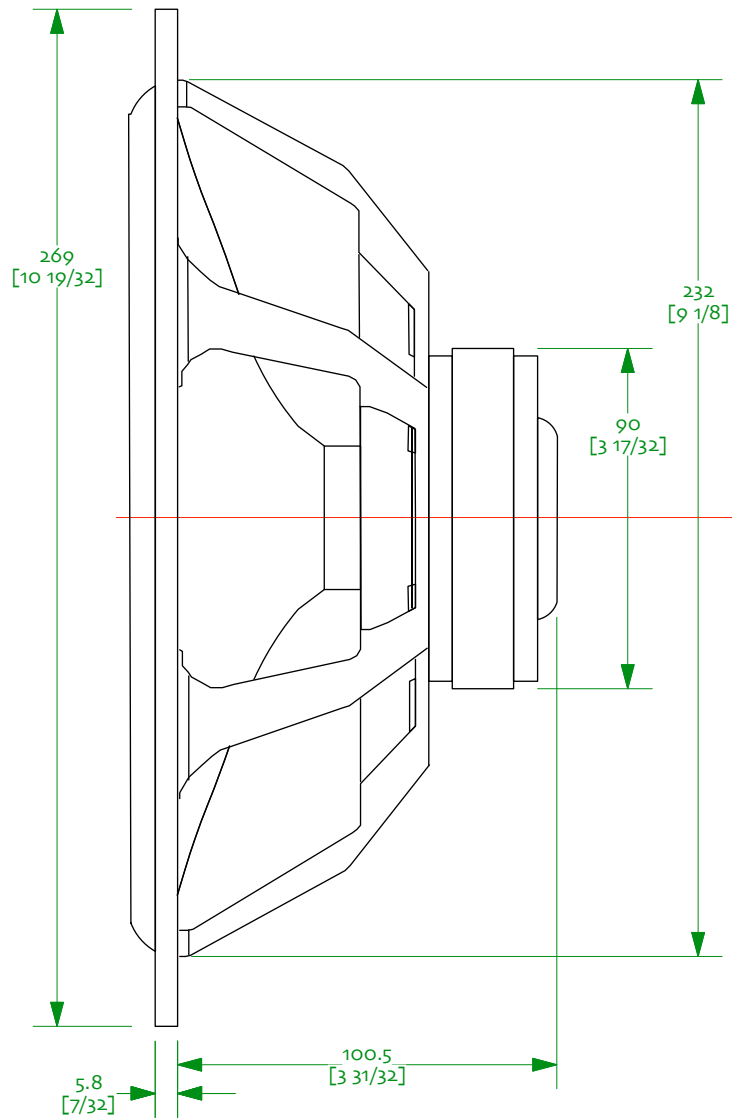


SEAS T35Coo2 Tweeter

Dimensions ov72

05-march-2021 | drawn by D Dlugos

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Notes:
o/ after the factory
drawing



SEAS A26Rxx Woofer

Dimensions ov72

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