



## Serpent speaker box



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[VIEW IN BROWSER](#)

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### Summary

Revamped Back Horn speaker



42.00 hrs



1 pcs



0.30 mm



0.60 mm



PLA



1500 g



Creality  
CR-10 V1

[Gadgets](#) > [Audio](#)

Tags: [audio](#) [hifi](#) [horn](#) [speaker](#)

### Serpent Speaker

Remodeled version of Back Horn speaker in onshape with threaded insert pockets. Fully customizable. I named it Serpent.

Apart the “original” (scad) version all dimensions are calculated from speaker driver diameter, there is only single speaker driver version. Heated threaded inserts are used rather than hidden nuts.

Uploaded STLs are designed for 100mm speaker driver. Walls are 8mm thick. Keep the orientation of the parts as they are in the STLs. With 100mm driver it fits to the CR10 buildplate (300x300mm) without any problem. The biggest part is 228x168x130mm.

No audio measurement have been made regarding this speaker box. It may sound bad for you, it may be complete mess regarding to audio speaker box design but overall I'm very satisfied how it came out and how it sounds. You need to plug them to the amplifier, can't be operated directly from e.g sound card output!

### **Print settings (recommended/tested)**

- PLA 214C/60C (two different colors looks better/or even three)
  - Black/Silk Gold combo looks good. I've tried to match the speaker driver color.
- TPU for feet (optional)
- 0.4mm nozzle with 0.6mm extrusion width or just 0.6mm nozzle
- 0.3mm layer height
- 3 perimeters
- 5 top/bottom layers
- 18% gyroid infill
- 60mm/s speed
- 50% or no part cooling at all (layers takes long time, and no cooling prevents warping)
- Brim or brim ears to prevent warping
- no supports needed

### **For ONE speaker you'll need:**

- ~200g for each side panel (~400g total) - one color
- ~930g for the main body parts - other color
- so for stereo/two of them you'll need almost 3kgs of filament!
- Some TPU for feet

### **Estimated print times per each part (with above settings):**

- side panel ~8h
- inner smaller part ~10h30m
- back bigger part ~21h30m
- front panel (with the speaker hole) ~1h10m
- mesh cover ~20m
- TPU foot ~20m

### **BOM (for one speaker)**

This list is for uploaded model, you can change all parameters in onshape so your list may vary. Links are only informational (Czech shops) about what I've used.

- 14x M5 threaded inserts for side panels ([3dfoxshop.cz](https://3dfoxshop.cz))
- 14x M5 bolts

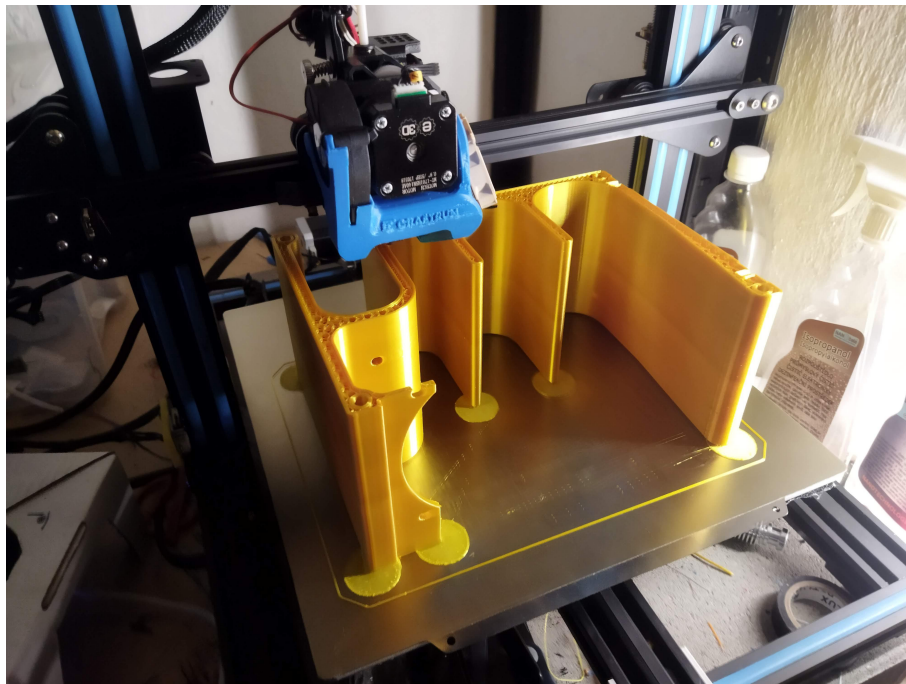
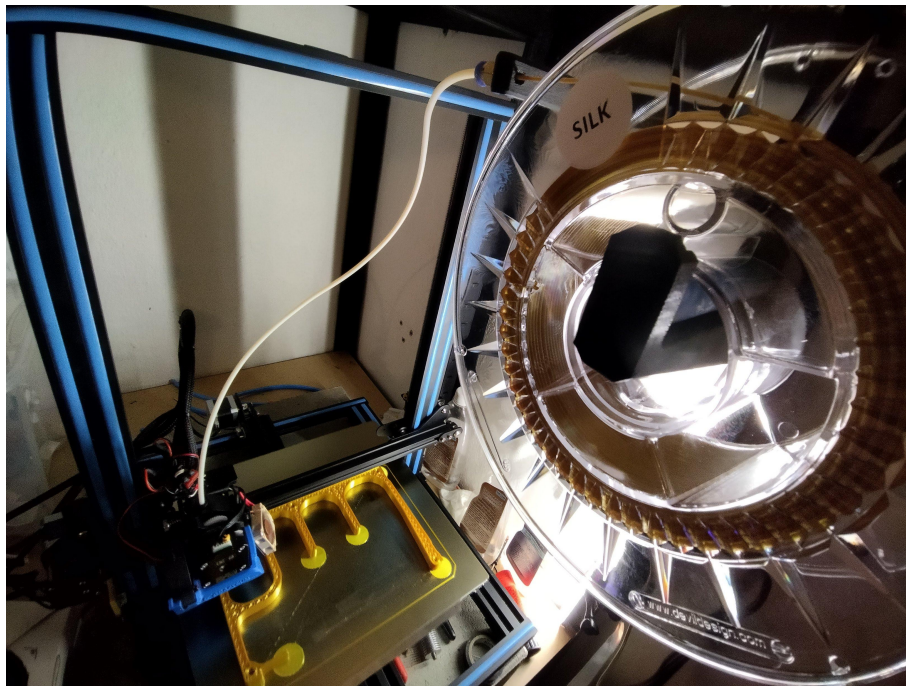
- 4x M5 threaded inserts for back panel mounting holes (optional)
- 4x M4 threaded inserts for speaker driver
- 4x M4 bolts
- 4x M4 threaded inserts for rubber feet
- 4x M4 bolts
- 1x speaker driver ([gme.cz](http://gme.cz))
- 4x rubber feet or you can print them ([alza.cz](http://alza.cz))
- 2x Audio terminals and appropriate banana style plugs for them ([ebay.com](http://ebay.com))
- Wires
- Glue (optional, I'm using B7000 the one for cell phones repairs)



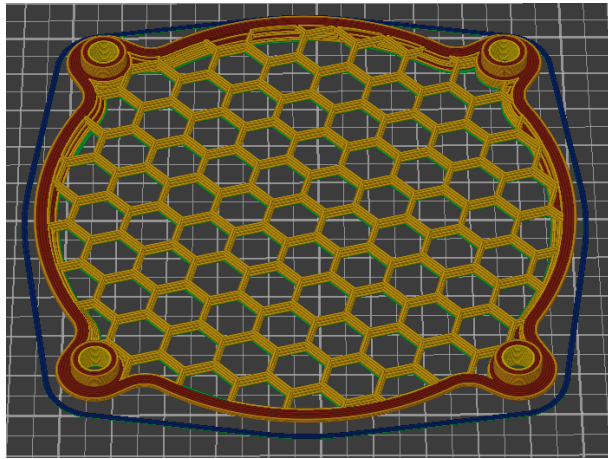
## Instructions

At first I recommend print the test (for threaded inserts you have) and one front panel with the speaker hole to test if all fits, otherwise calibrate your printer or change variables in onshape document for your exact dimensions (and export all the model parts with your settings).

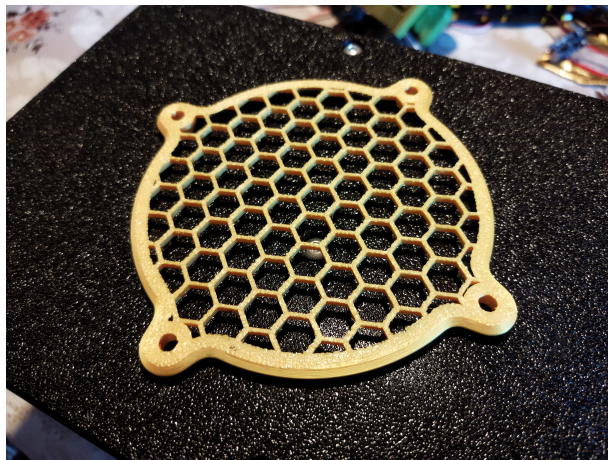
Print all the parts - I've printed side panels and the front panel (with the speaker hole) on the powdered PEI sheet for better surface look/finish. Keep the orientation of the parts as they load into slicer. No supports, only brims or brim ears, no cooling (or small % of part cooling). Clean the edges with exacto knife, or sand/file imperfections.



If you want mesh cover in front your speaker, print it with exposed honeycomb infill. That means 0 top and bottom layers, 6 perimeter lines and 10% infill do the trick. Try different infill types for different effect. Honeycomb is good for its strength (cells are bonded/stitched together). It will look like this:

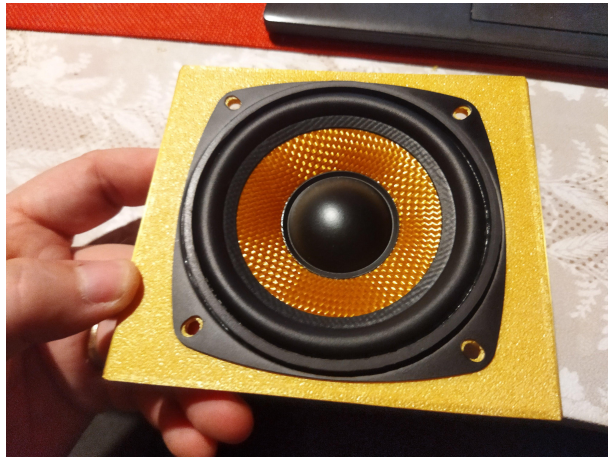


And came out like this:



I'd go without the mesh, because it looks better.

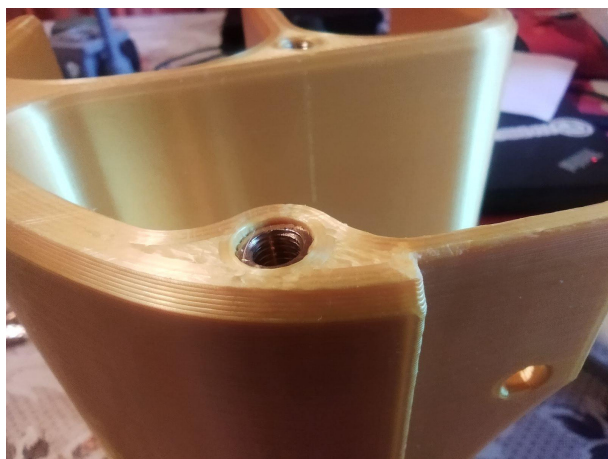
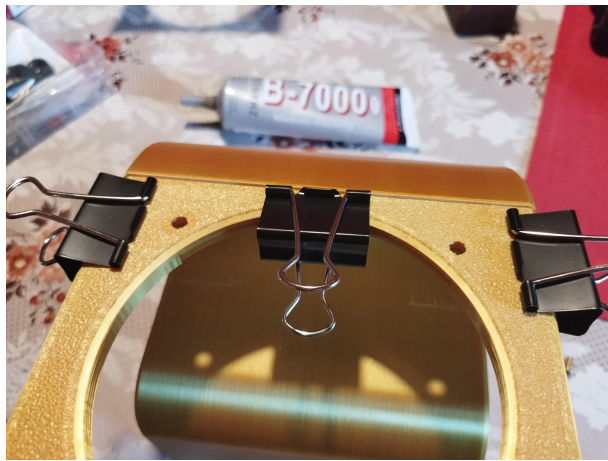
You can chose if you mount the speaker driver from inside the front panel or from outside. Use threaded inserts or simple nut+bolt based on your choice. I've chose mount from outside and used threaded inserts then.



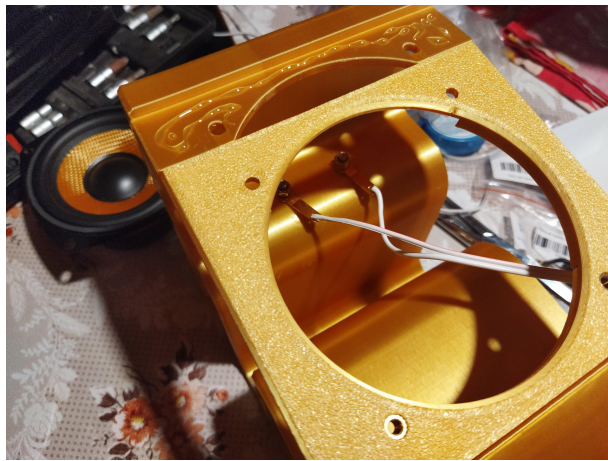
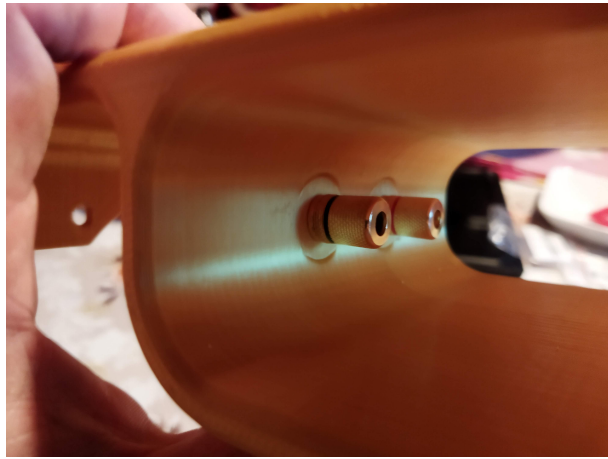
Drill holes on the side panels with 5mm drill. They are intentionally blinded with 0.3mm layer of material for better printing.



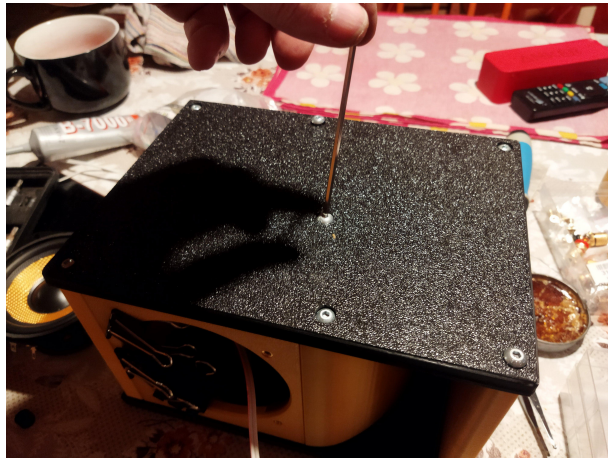
Assemble the main serpentine body part, use some glue on the front panel (optional). Insert all 14 side and 4 feet threaded inserts and optionally 4 into the back mounting holes. You can sink them little bit deeper below the surface line (holes are modeled deeper than the depth of the threaded inserts).



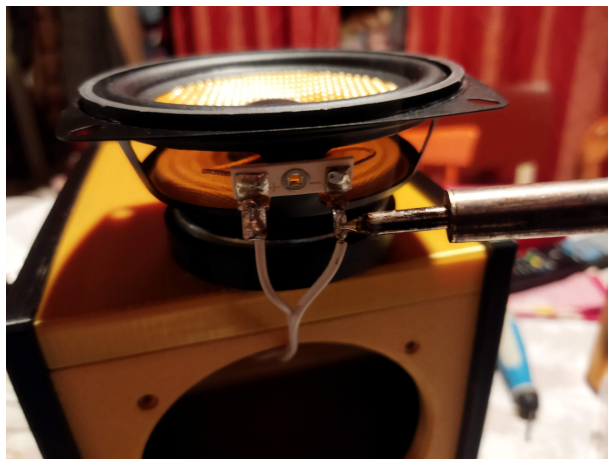
Mount the audio terminals, attach wires.



Put some glue into the wall grooves of the side panels (optional), lay the side panel onto body and secure with the screws. Tight them firmly. Same with the opposite panel.

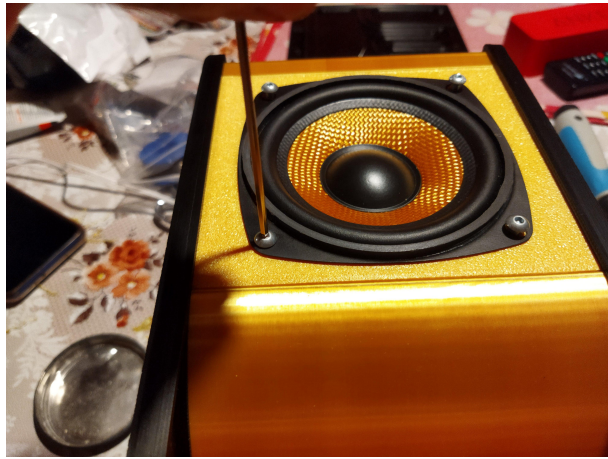


Almost ready. Solder/attach the wires to the speaker driver.



Test before mounting the driver in!

Finally mount the driver to the main body, attach the feet with screws.  
Also attach the mesh cover if you've printed one.



Job done! Enjoy!





## **Own customization**

### **Original Onshape document**

The document is fully customizable. Variables are on the first configuration "tab"

onshape **Serpent Speaker Box** Main

Insert Variable Studio

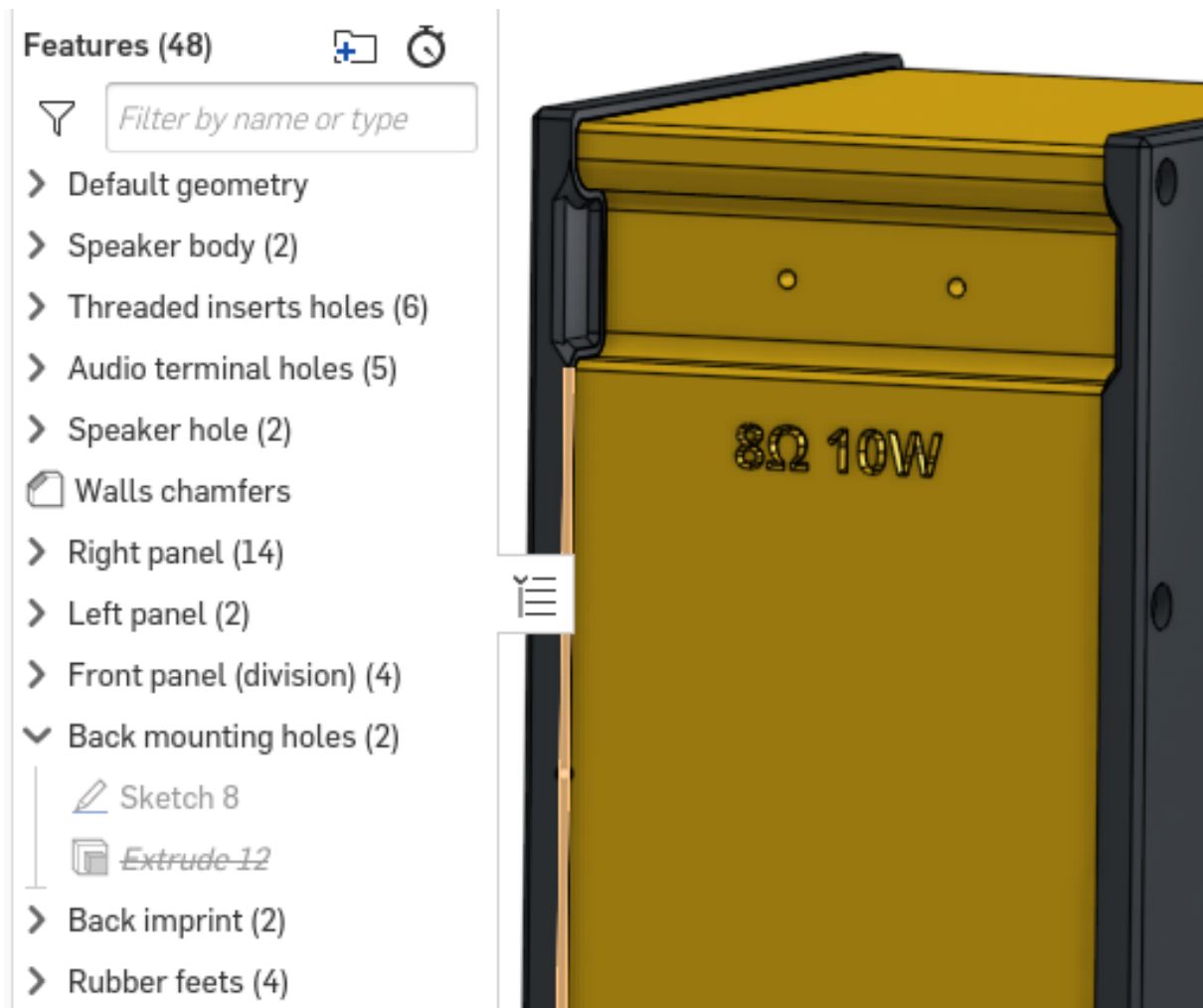
Configuration			
Name	Variable ...	Value	Description
thr_insert_depth	Length	10 mm	Threaded insert len ...
thr_insert_dia	Length	6.5 mm	(M5) Threaded inse ...
thr_insert_dia_small	Length	5.4 mm	(M4) Thread insert f...
bolt_head_depth	Length	3.5 mm	Depth of the bolt's ...
bolt_head_dia	Length	9.5 mm	Diameter of the bolt...
bolt_dia	Length	5 mm	Bolt diameter (thre ...
speaker_hole_dia	Length	100 mm	Diameter of the spe ...
speaker_depth	Length	52 mm	Depth of the speake...
speaker_screws_dia	Length	115 mm	Diameter of the circ ...
speaker_mesh_clea...	Length	3 mm	Dimension for mesh...
wall_thickness	Length	8 mm	Thicknes of all walls

Insert into all Part Studios and Assemblies

Configuration Speaker box Mesh cover Rubber foot (TPU) Threaded insert test

If you change some variables it may break the model or sketches (lose constraints something is above or below other things or similar mishaps). You need to fix it manually in the sketches then. Broken features will be marked red. Dimension of the speaker box itself is calculated from the speaker\_hole\_dia variable. Almost all features/parts within the models are named for better orientation.

You can also suppress features of the box. For example if you don't want to use mounting holes on the back side - suppress the extrude in proper feature folder



If you need different text on back of the box, don't forget to change it directly in the sketch (variable can't be used there). Open "Back imprint" feature folder, double click on "Text sketch", then right click onto text area → edit text. Mine says "8Ω 10W". If you don't want any text, just suppress extrude for this feature.

### Post note

My speaker body parts are little bit different from the final/uploaded version. As it was hard to reach the terminals (too deep cavity after assembly), I reworked the back panel (and corresponding changes to the side panels) for the final version. So the photos in this "howto" slightly differ from final model but the assembly process is exact the same.

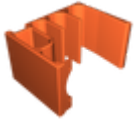
## This remix is based on



## Customisable Back Horn Speaker Enclosure

by Chris Hill

### Model files



#### speaker-box-body-back.stl

☐ 8mm wall thickness, 100mm speaker diameter

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#### speaker-box-body-inner.stl

☐ 8mm wall thickness, 100mm speaker diameter

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#### speaker-box-left-panel.stl

☐ 8mm wall thickness, 100mm speaker diameter

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#### speaker-box-right-panel.stl

☐ 8mm wall thickness, 100mm speaker diameter

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#### speaker-box-front-panel.stl

☐ 8mm wall thickness, 100mm speaker diameter

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#### mesh-cover.stl



#### rubber-foot-tpu.stl

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**rubber-foot-washer.stl**



**threaded-insert-test.stl**

## Print files



**print\_settings.gcode**

🌀 PLA   🌀 0.60 mm   ≡ 0.30 mm   ⌚ 42.00 hrs   ⚖️ 1500 g

[Find source .stl files on Thingiverse.com](#)

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