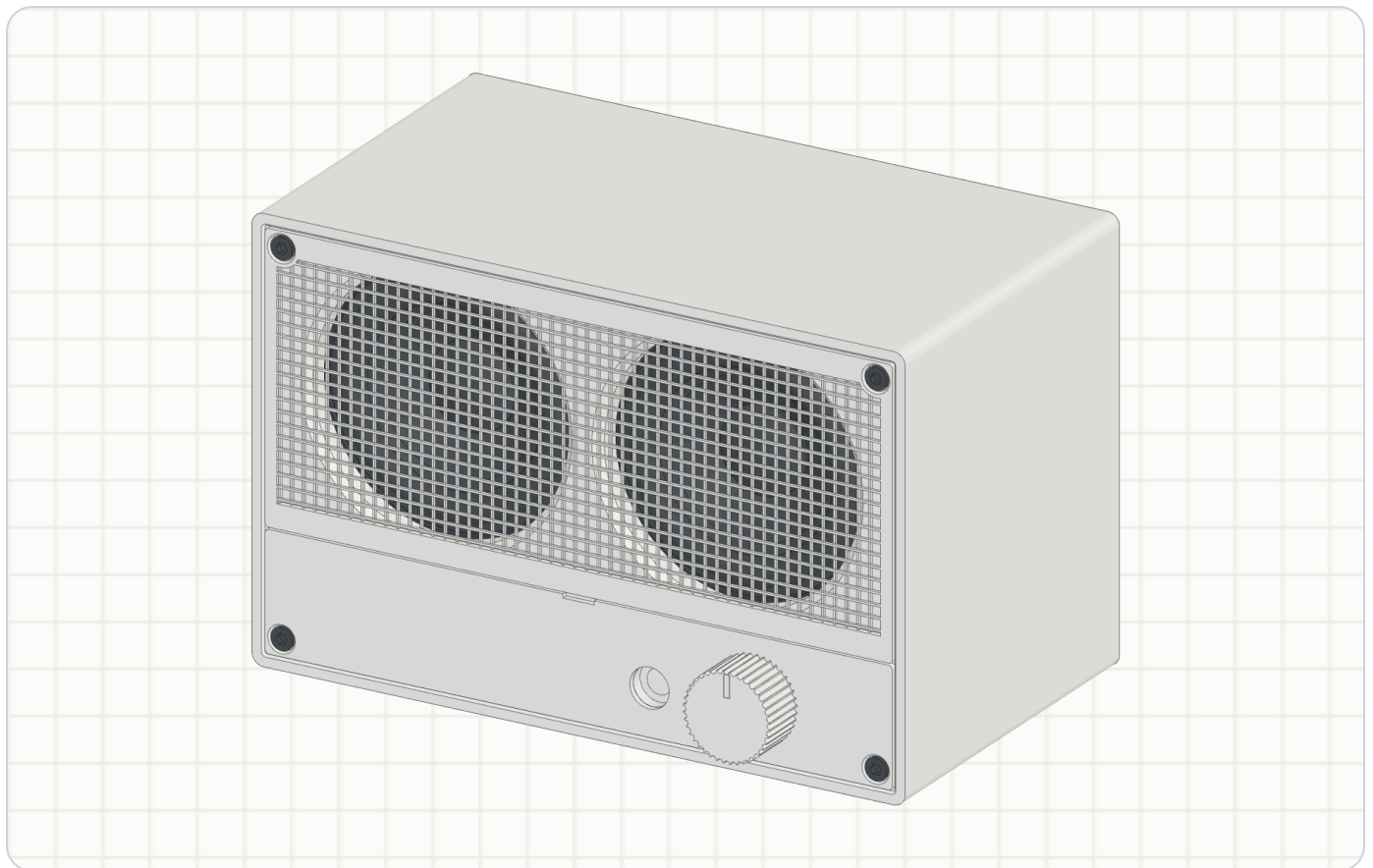


BLUESPEAKER MINI

Two drivers. One small box.

A Bluetooth desk speaker that you print in three colours of PLA.
Socket head screws on the face. Covers that snap on. The panels and covers print with no support.



166 × 108 × 94

mm, W × H × D

2 × 2.5 in

Dayton Audio PC68-4 full-range drivers

Bluetooth + AUX

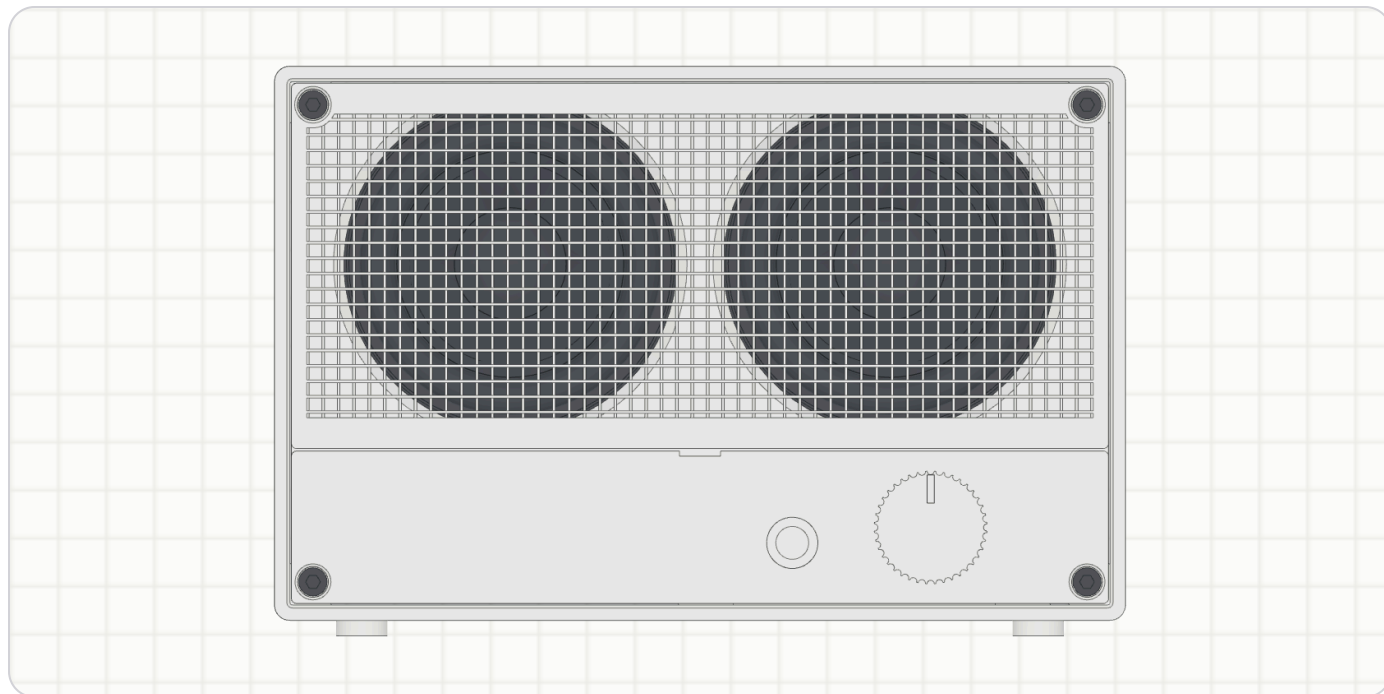
ZK-502C amplifier board

12–24 V

DC adapter, 2 A or more

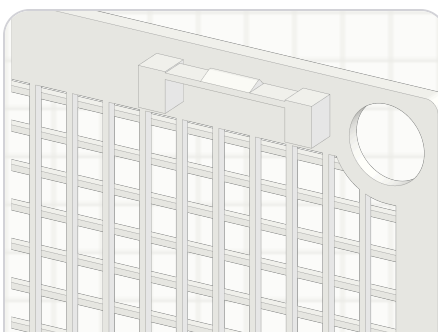
The screws are part of the face.

Four black socket head cap screws hold the front module in the sleeve. Their heads go through round ports in the grille and the strip. **Each head is flush with the face.**



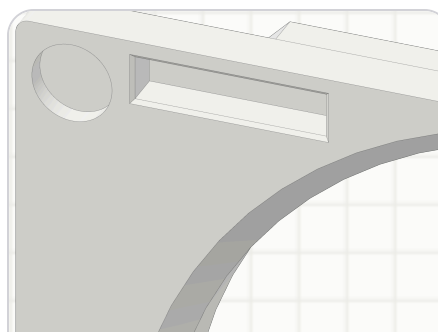
Head ports

6.0 mm ports for 5.5 mm heads. A thin orange ring of the baffle shows around each head. A 0.5 mm chamfer at 45° prints face down with no support.



Snap catches

Four catches on each cover back. Each beam is one 0.5 mm line that bridges between two posts. It flexes along its printed lines, not across the layers.



Pockets

A lip at each pocket mouth holds the catch. The lip face is at 45°, so a pull releases the grille. A 0.05 mm preload holds the grille flat.

Bluespeaker Mini

Size	Width: 166 mm Height: 108 mm Depth: 94 mm Sleeve wall 3 mm. Corner radius 3 mm.
Enclosure	Sealed, about 1.1 L. Both drivers share the volume. About 0.55 L for each driver: Qtc near 1.0, F3 near 150 Hz.
Drivers	2 × Dayton Audio PC68-4, 2.5 in full-range, 4 Ω Fs 117 Hz, Qts 0.65, Vas 0.7 L. Rear-mounted on 3 mm spacer frames, 74 mm apart.
Amplifier	ZK-502C Bluetooth amplifier board Lies flat on a printed tray. The volume control nut holds the board against the baffle.
Inputs and controls	Bluetooth 3.5 mm AUX in, on the front Volume knob, on the front
Power	12–24 V DC adapter, 2 A or more, into the rear panel Check the plug size of the ZK-502C socket before you buy the adapter.
Colours	● Grey: sleeve, grille, rear panel, tray, feet ● Orange: baffle (shows through the grille), knob ● White: control strip, knob mark
Front grille	Lattice of 0.5 mm ribs at a 3.0 mm pitch, about 69 % open Two other options: slicer-infill grille (Cura 3MF) and a round-hole grille for resin. Grille and strip each snap on with four catches. Pry slot at the top edge of the strip.
Fasteners	M3 socket head cap screws (ISO 4762): 6 × M3 × 8, 4 × M3 × 6 M3 pan head screws: 8 × M3 × 5 (drivers) M3 heat-set inserts, short (3 mm long, 4.0 mm hole): 18
Printer	LulzBot TAZ Workhorse SE, 0.5 mm tool head, 2.85 mm PLA Klipper firmware. Cura 5.13 profiles in cura/.

Designed for filament.

Heights use the 0.25 mm layer. Widths use the 0.5 mm line. **Calibrated profiles.**

Printed parts

FILE	COLOUR	ORIENTATION	CURA PROFILE
sleeve.stl	● Grey	Front opening down. Supports below the four front posts only.	PLA Shell 0.25
baffle.stl	● Orange	Front face down. Supports off.	PLA Parts 0.25
grille.stl	● Grey	Front face down. One line for each rib.	PLA Grille 0.25
grille_infill*.3mf	● Grey	Front face down. Cura infill makes the mesh.	PLA Grille Infill 0.25
control_strip.stl	● White	Front face down.	PLA Parts 0.25
rear_panel.stl	● Grey	Outer face down.	PLA Parts 0.25
tray.stl, feet.stl	● Grey	Flat.	PLA Parts 0.25
knob.stl, knob_mark.stl	● Orange, white	Knob front face up. Glue the mark into the groove.	PLA Parts 0.25

Calibrated values

SETTING	VALUE	PROFILES
Shrinkage compensation XY	100.21 %	All
Shrinkage compensation Z	100 %	All
Printing temperature	220 °C	All
Horizontal expansion	0.095 mm	Shell, Parts
Hole horizontal expansion	0.17 mm	Shell, Parts

The Grille profiles have no expansion: it would change the width of each one-line rib. **The model adds the expansion to the grille catches (0.095 mm) and ports (0.075 mm).**

Layers and lines

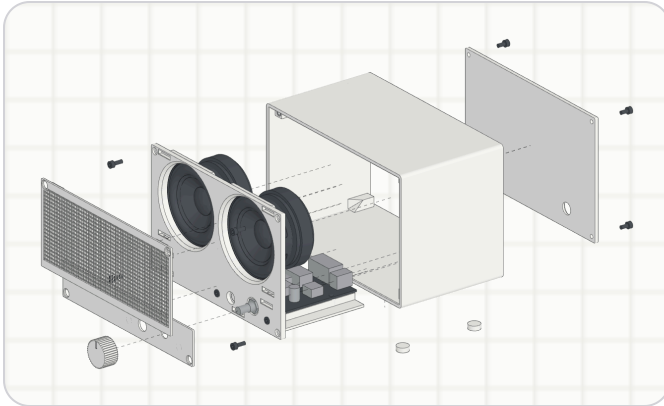
FEATURE	SIZE	LAYERS OR LINES
Grille and strip	1.5 mm	6 layers
Baffle	4.0 mm	16 layers
Front counterbore	1.5 mm	6 layers
Membrane	0.25 mm	1 layer
Snap catch	2.5 mm	10 layers
Snap beam	0.5 mm	1 line
Ring around a head port	1.5 mm	3 lines
Head clearance	0.25 mm	½ line

Drilled holes

PART	HOLES	DRILL	DEPTH
Sleeve	4 front post holes (inserts)	4.0 mm	7 mm
Tray	2 tab holes (inserts)	4.0 mm	Through the tab
Baffle	6 counterbore membranes	3.4 mm	From the back

BUILD

Six steps.



- 1 Prepare the sleeve.** Remove the supports. Drill the front post holes. Install 8 inserts. Glue the feet.
- 2 Mount the speakers.** Drill or cut the baffle membranes. Install 8 inserts in the spacer frames. Fit the drivers with M3 × 5 screws.
- 3 Fit the tray and the amplifier.** Screw the tray to the baffle. Put the board on the rails. The volume control nut holds it.
- 4 Install the front module.** Push it into the sleeve. Install four M3 × 8 cap screws.
- 5 Install the rear panel.** Install four M3 × 6 cap screws.
- 6 Fit the covers and the knob.** Push the strip on, then the grille, until each set of four catches clicks.

Hardware

ITEM	QTY	USE
Dayton Audio PC68-4 (Parts Express 295-150)	2	Drivers
ZK-502C Bluetooth amplifier board	1	Amplifier, Bluetooth, volume control
DC adapter, 12–24 V, 2 A or more	1	Power
M3 heat-set insert, short (3 mm long, 4.0 mm hole)	18	Sleeve 8, spacer frames 8, tray 2
M3 × 8 socket head cap screw	6	Baffle 4, tray 2
M3 × 6 socket head cap screw	4	Rear panel
M3 × 5 pan head screw	8	Drivers
Speaker wire, 2 × 0.5 mm ² , 150 mm	2	Drivers to the amplifier
Closed-cell foam tape, 3 × 6 mm	0.6 m	Driver flanges, panel seams
Drills: 3.4 mm and 4.0 mm	1 each	Pilot holes and membranes

Before you print. Print the three snap test parts: `fit_test_snap_baffle`, `fit_test_snap_grille`, and `fit_test_snap_strip`. Measure your ZK-502C and check its shaft type. The board positions in the model come from photos.

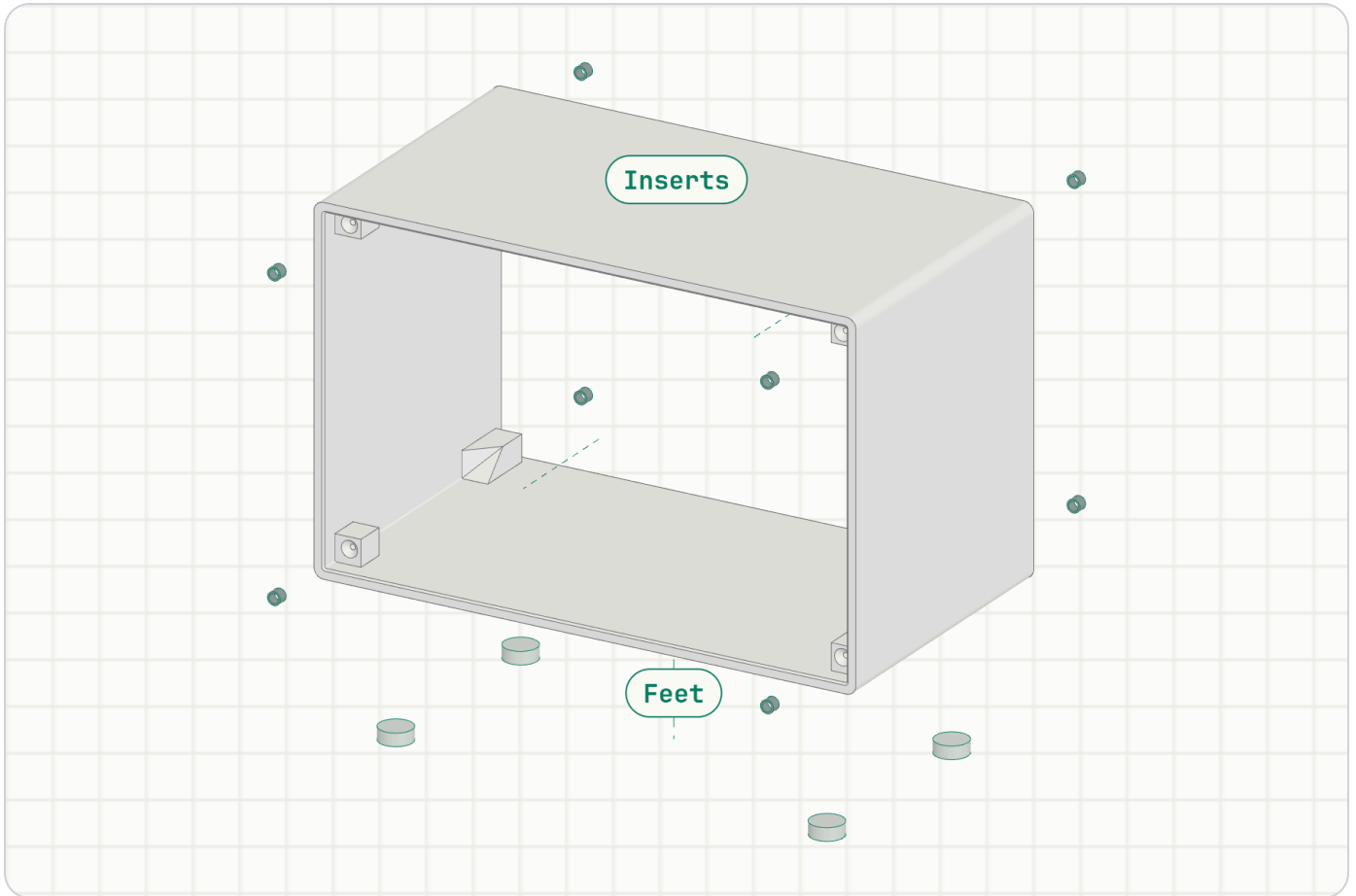
1 Prepare the sleeve

Sleeve

Feet

8 × insert

4.0 mm drill



1. Remove the supports below the four front posts.
2. Drill the four front post holes: 4.0 mm, 7 mm deep.
3. Install 8 short inserts in the sleeve posts: 4 at the front, 4 at the rear.
4. Glue the four feet into the recesses on the bottom.

2 Mount the speakers on the baffle

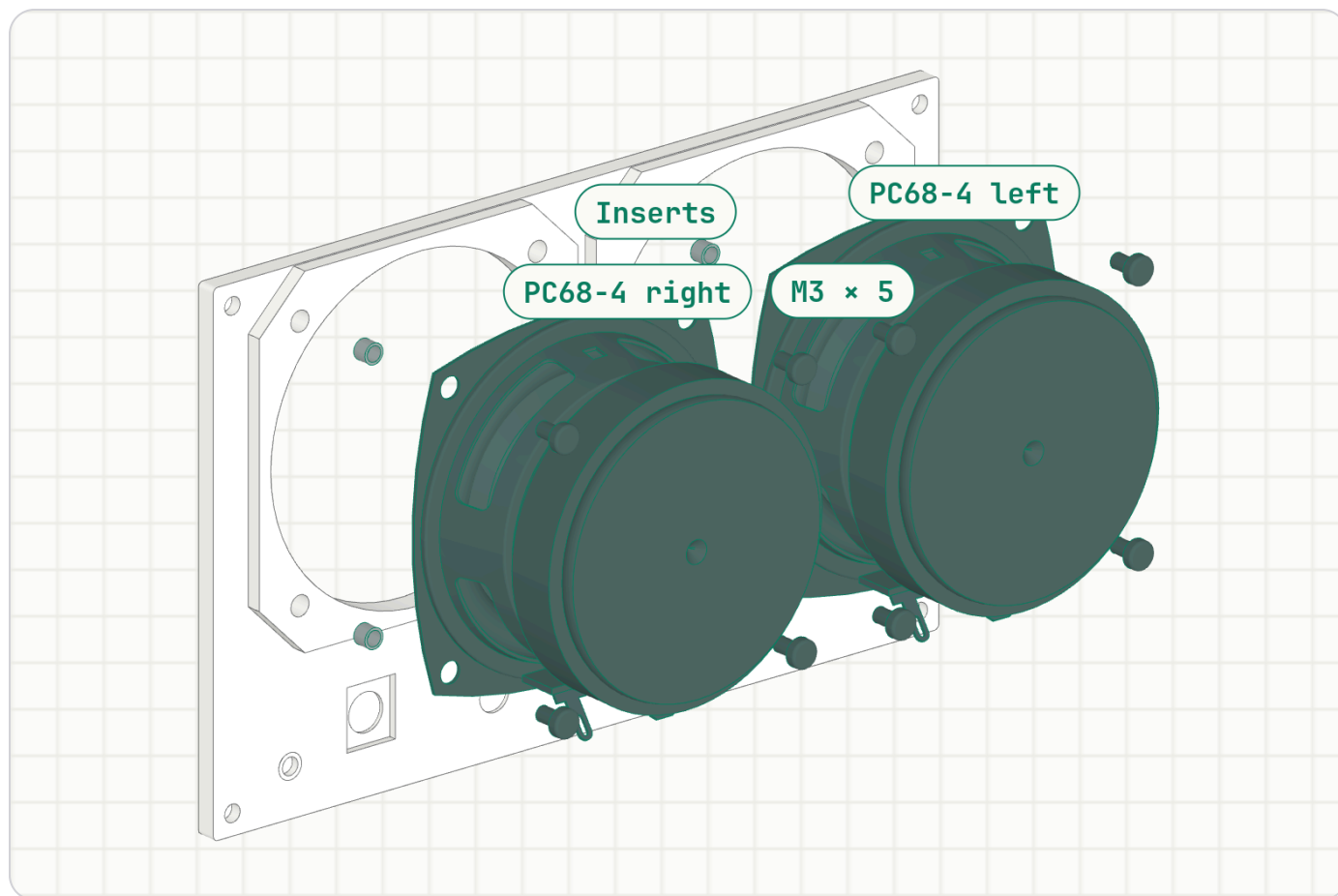
Front baffle

2 × PC68-4

8 × insert

8 × M3 × 5

Foam tape



1. Drill or cut the membranes in the baffle.
2. Install 8 short inserts in the two spacer frames on the back of the baffle.
3. Apply foam tape to the front face of each driver frame.
4. Put each driver on its spacer frame from the back. The terminals point down.
5. Install four M3 × 5 pan head screws in each driver.

3 Fit the tray and the amplifier

Amp tray

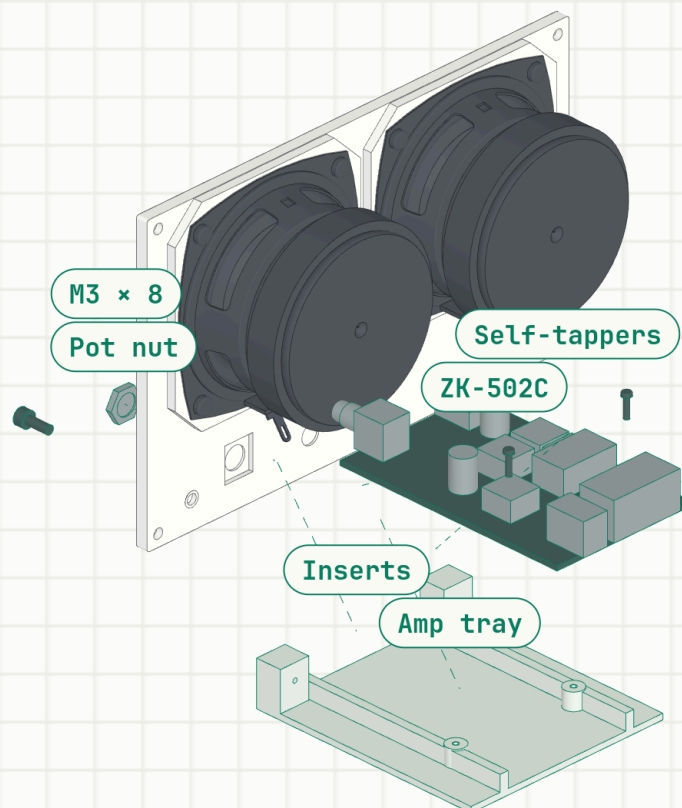
ZK-502C

2 × insert

2 × M3 × 8

2 × self-tapper

Speaker wire



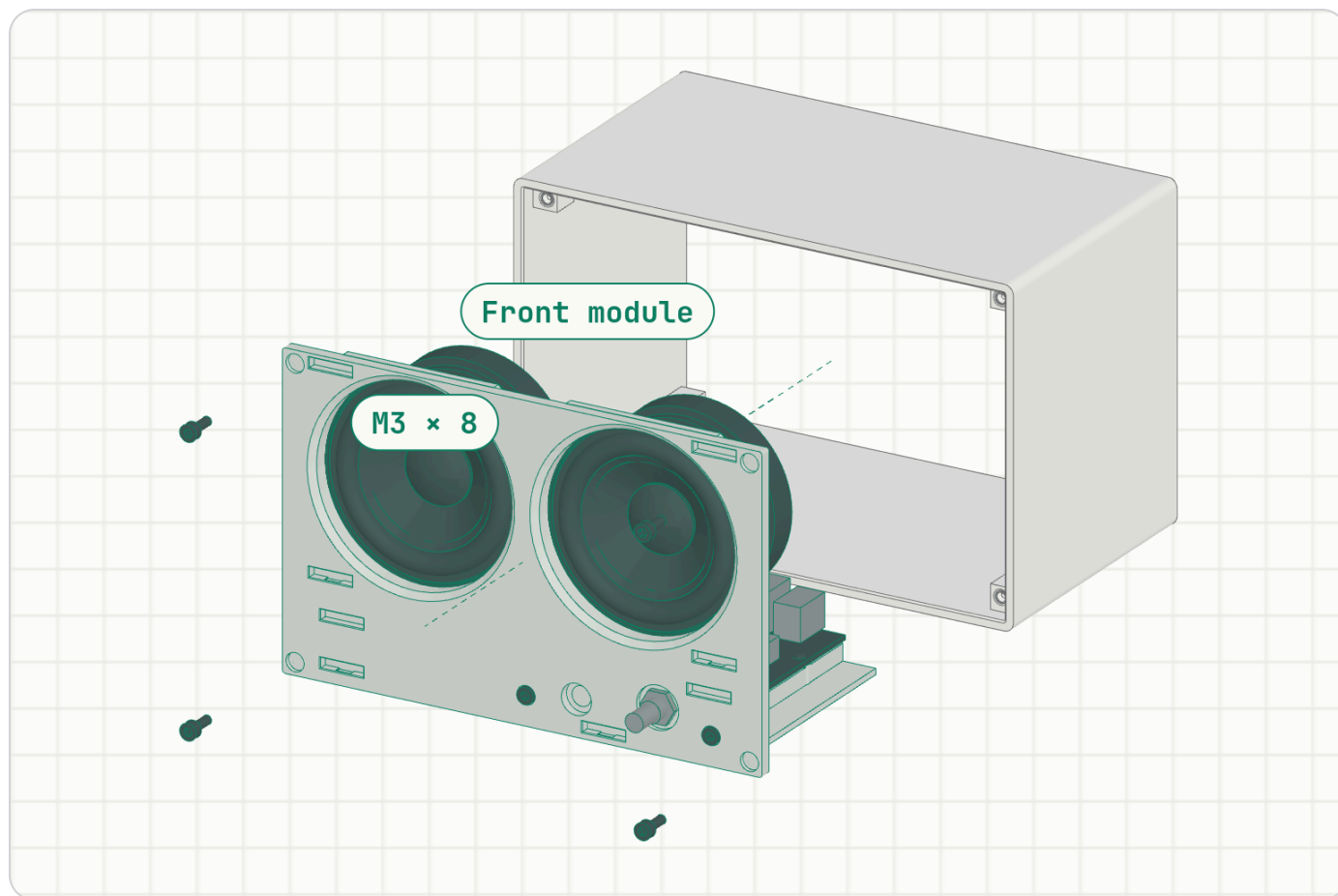
1. Drill the two tab holes of the tray: 4.0 mm, through the tab. Install 2 short inserts in the tabs.
2. Put the tray against the back of the baffle. Install two M3 × 8 screws from the front of the baffle into the tabs.
3. Remove the knob and the nut from the ZK-502C volume control.
4. Put the board on the tray rails. Push the volume control bushing and the AUX socket into their holes in the baffle.
5. Install the nut on the bushing from the front. It pulls the volume control body onto the pocket floor.
6. Install the two self-tapping screws through the rear holes into the tray posts. Stop when the head touches the board.
7. Connect the speaker wires to the drivers and to the ZK-502C terminals.

Note. Do not tighten the self-tapping screws more than snug. The thread strips the 1.5 mm plastic hole.

4 Install the front module

Front module

4 × M3 × 8

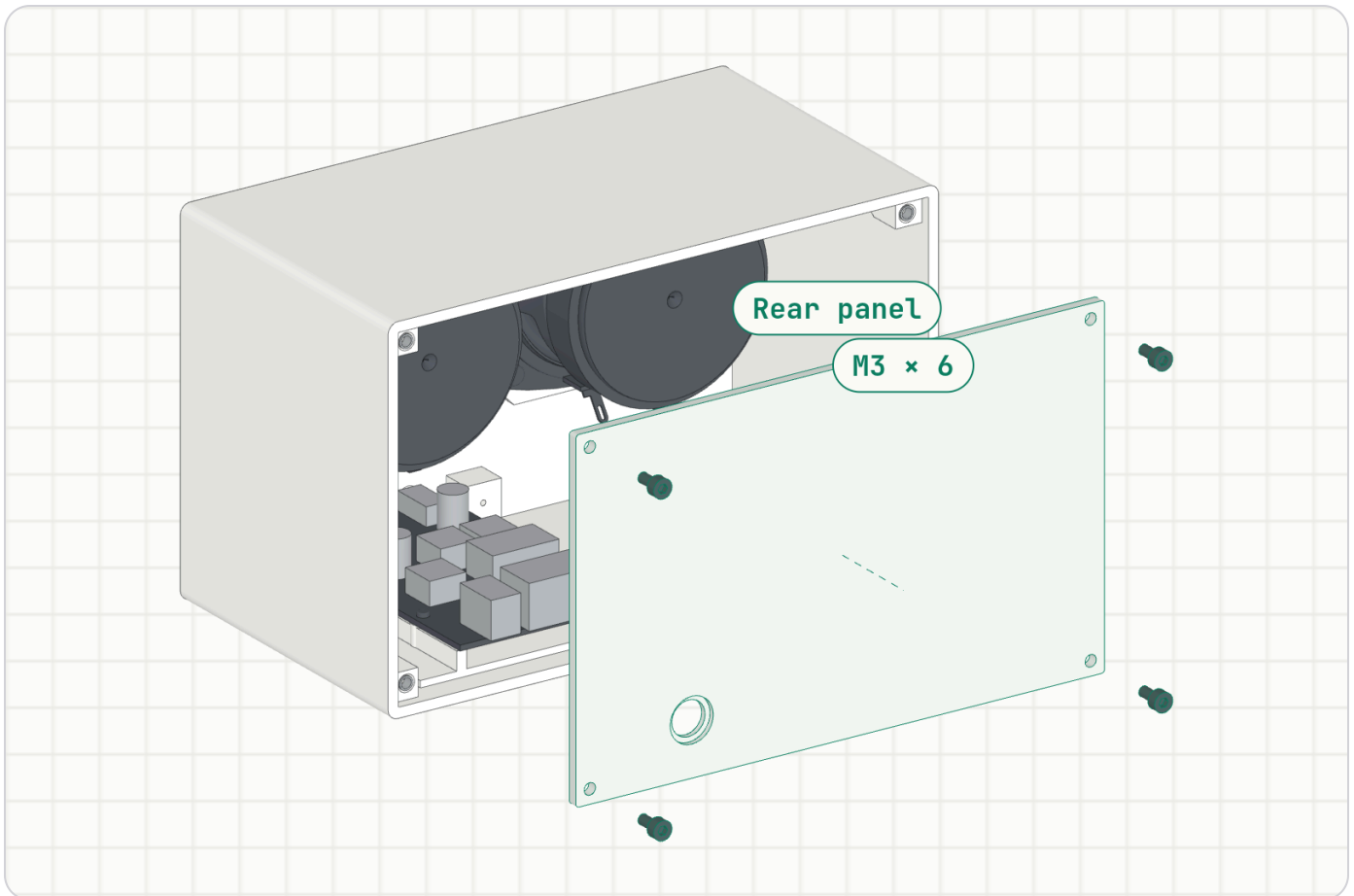


1. Push the front module into the front of the sleeve.
2. Install four M3 × 8 socket head cap screws through the baffle into the posts. The heads are flush in their counterbores.

5 Install the rear panel

Rear panel

4 × M3 × 6



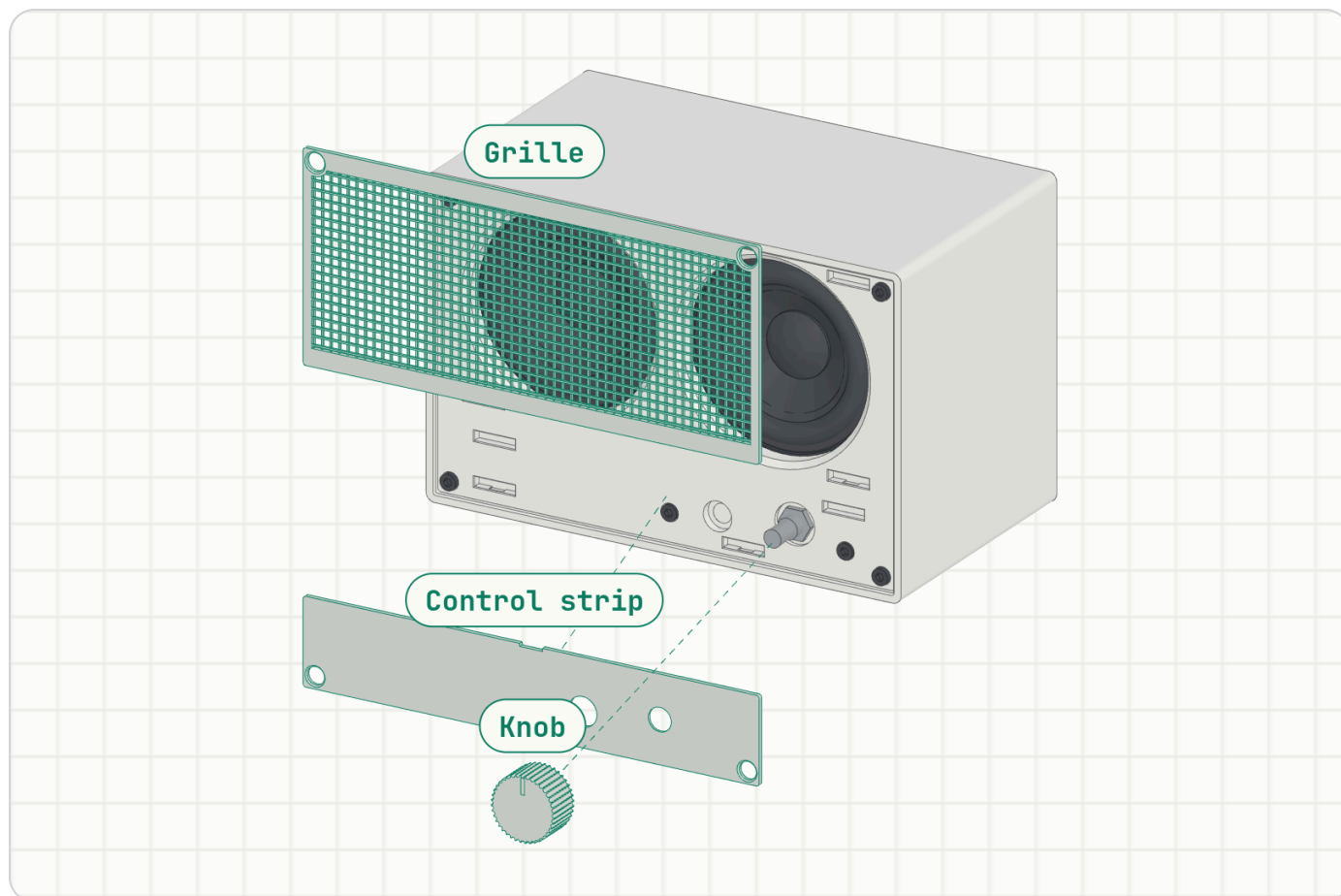
1. Push the rear panel into the sleeve. The DC socket aligns with the hole.
2. Install four M3 × 6 socket head cap screws.

6 Fit the covers and the knob

Control strip

Grille

Knob



1. Align the white strip with the two lower screw heads and the volume control. Push it on until the four catches click.
2. Align the grille ports with the two upper screw heads. Push the grille on until the four catches click.
3. Push the knob onto the volume control shaft.

Note. To remove the covers, pull off the knob. Put a flat blade in the pry slot at the top edge of the strip. Lift the bottom edge of the grille, then pull the grille off. Do not pry at the center of the lattice.