kevinnoki

DIY RETRO BRICK — DIGITAL FILES

ADHD ONE

Quick Start Guide



01

Disclaimer

⚠ **Please read first.** ADHD ONE is a DIY project for experienced electronics builders. You get the digital files and this build guide; the parts and the build are up to you. By building it, you confirm that you know how to solder, handle lithium batteries and work safely with electronics.

- You build and use this device entirely at your own risk.
- I am not liable for any damage to people, property or components caused by building, modifying or using it.
- Lithium batteries can catch fire if they are damaged, short-circuited or charged incorrectly. Never leave the Handset charging unattended.
- These files are provided as-is, without warranty of any kind.

02

Before you start

Watch the build video first. Most of the assembly is shown there, and this guide only covers the details you should pay extra attention to.

- The current model may differ slightly from the one in the video. These are minor changes and don't affect the build.
- All parts, quantities and shop links are in the bill of materials (BOM). Reference numbers in this guide (like W1) match the BOM.
- Test every part before assembly, especially the TP4056 charging module. Some modules, especially from low-quality sources, don't work.

03

What's in the download

Start with this guide and the BOM, then watch the video before you order parts. Both are online, so they always show the latest version.

Folder / file	What it is
Quick Start Guide	Safety notes, build tips, print settings, license (online)
BOM	All parts with quantities and shop links (online)

Folder / file	What it is
Firmware	ADHD_ONE_v1051026.uf2, the firmware for the Raspberry Pi Pico
PCB	Gerber and drill files. Zip the folder and upload it to a PCB maker such as PCBWay
STL_Files	All 3D-printable parts, including the Antenna, Keypad and Speaker_Covers subfolders

04

Updates and support

Future updates to the files and firmware are free for everyone who bought them.

This is a DIY project in its current state, and it may not be perfect yet. There may be issues with the firmware or the files. If you find an error or have an idea for an improvement, send a short note to . Please note that I can't offer personal help with printing, sourcing parts or building.

05

Flashing the firmware

Flash the firmware onto the Raspberry Pi Pico (A1) before you solder it onto the PCB. This is the easiest way.

1. Hold down the white BOOTSEL button in the middle of the Pico.
2. While holding it, plug the Pico into your computer with a USB cable.
3. Release the button. The Pico shows up as a USB drive (RPI-RP2).
4. Drag the .uf2 file from the firmware folder onto that drive.
5. The Pico disconnects automatically. The firmware is now flashed.

If it doesn't work, repeat the steps.

- You can still flash it after soldering. Use a USB cable with a short plug, otherwise the battery connector (J1) blocks it.
- Always unplug the battery before flashing, and keep the charging port empty.
- The firmware can only be flashed through the Pico's own USB port, not through the TP4056 charging module.

⚠ **Warning:** Never flash with the battery or a charger connected. Never plug USB into the Pico and the TP4056 at the same time. This can cause unexpected behavior and damage the parts.

06

Print settings

Print all parts with a 0.4 mm nozzle at 0.12 mm layer height, except the keys.

Parts	Nozzle	Layer height	Notes
All parts except the keys	0.4 mm	0.12 mm	Fuzzy skin recommended
Keys (Keypad folder)	0.2 mm	0.1 mm	Needs a multicolor printer (e.g. AMS)

- **Fuzzy skin:** I use point distance 0.1 mm and thickness 0.1 mm for the textured surface.
- **Keys:** assign the second color only to the top layers with the key labels, so only the text prints in the other color.

07

Soldering the PCB

Double-check polarity on every component before you solder or plug anything in. The PCB is marked with + and – where each wire and part goes.

⚠ **Polarity:** Don't rely on wire colors. Check yourself that + and – really match on the battery, speaker, microphone and every other component. Cheap battery packs often have the colors swapped.

- **Flux:** Use flux. It makes the joints cleaner and more reliable, especially on the SMD switches and the Pico.
- **Capacitors top right:** Make sure the ceramic capacitors in the top-right corner point straight up, as shown in the photo. They bend to the side easily, and then they get in the way of the plastic cover when you insert the mounting frame.
- **JST connectors (optional):** The JST sockets for the battery and speaker (J1, LS1) and the microphone socket (MK1) are optional. You can solder the wires directly instead. I recommend the connectors, because they make it easy to swap or replace parts later.
- **Trim all leads:** after soldering, cut every wire and component lead that sticks out as flush as possible with the PCB. Leftover leads can press against the housing or cause shorts.

PCB front

Bluetooth module, display header, amplifier, Raspberry Pi Pico and charging module. Zoom in to check the solder joints.

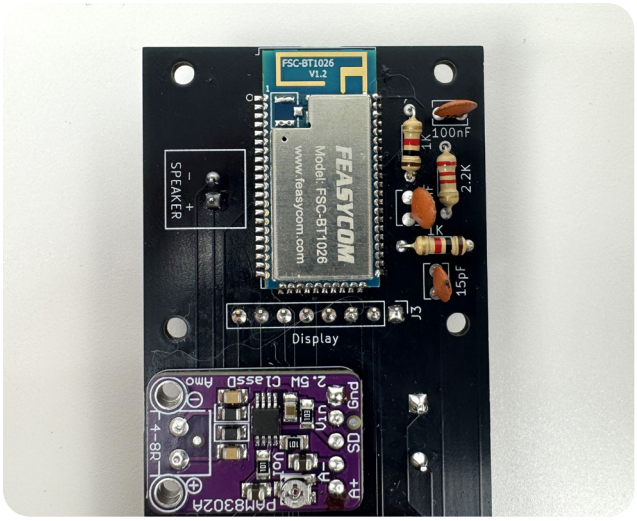


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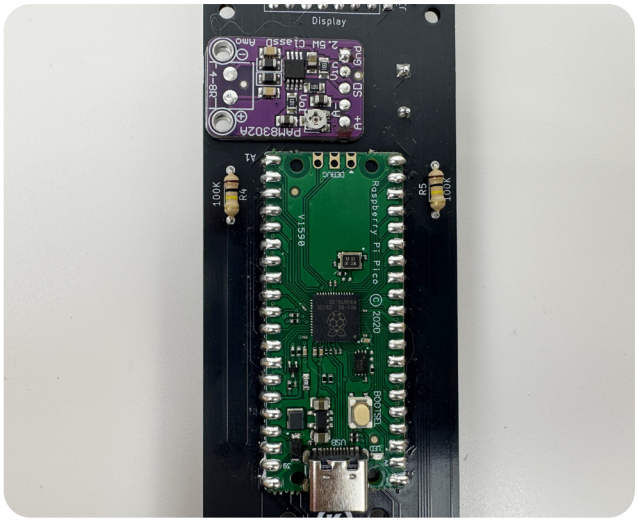
PCB back

Keypad switches, buzzer, display socket, speaker and microphone sockets. Zoom in to check the solder joints.

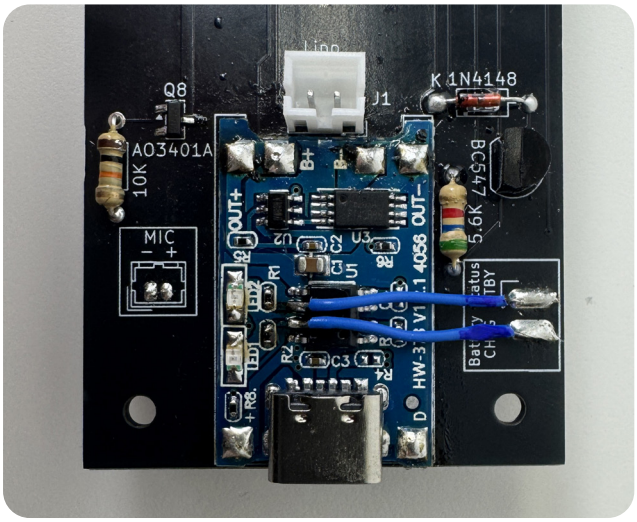




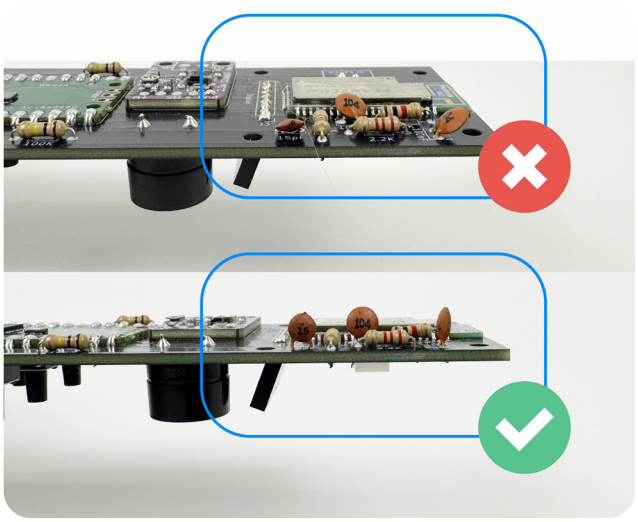
Bluetooth module (U1), resistors, capacitors and the 8-pin display header (J3).



Raspberry Pi Pico (A1) and PAM8302A amplifier module. The Pico is soldered flat onto the board by its edge pads.



Optional mod: the two thin wires let the battery icon on the screen show charging and full. The Handset works fine without them. Only do this if you're 100% confident. I don't recommend modifying the charging module.



Top: capacitors bent to the side, they hit the plastic cover. Bottom: capacitors pointing straight up, correct.

08

Battery and charging module

> ⚠ **Quality matters:** buy the battery and the TP4056 charging module from a reliable, quality source. Both must have a protection circuit.

- **Battery:** a 3.7 V LiPo, type 103450 (about 10 × 34 × 50 mm), with a built-in protection circuit and a JST PH 2.0 plug.
- **Charging module:** a TP4056 module with USB-C and protection circuit (DW01 + MOSFET). Modules without protection are not suitable.

- Test the charging module on its own before you solder it in. Check that it charges and that the status LEDs work.
- **Battery cushion:** cut a 50 mm piece of the 2 mm EPDM foam tape (BOM: G4) and stick it into the battery compartment. It keeps the battery from moving. Use the 2 mm version, not 1 mm.

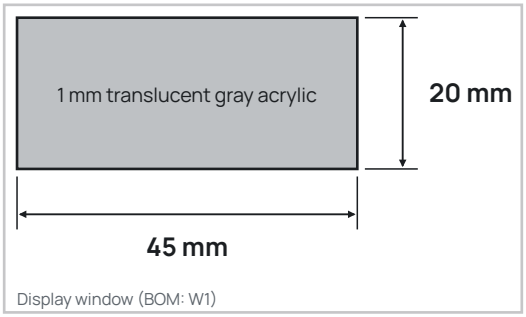
> ⚠ **Warning:** Never have USB plugged into the Pico and the TP4056 at the same time. This can cause unexpected behavior and damage the parts.

09

Display window

The display window (BOM: W1) is a 45 × 20 mm piece cut from 1 mm translucent gray acrylic, as shown in the video.

- **What I used:** 1 mm translucent medium gray acrylic, bought in a local hardware store.
- **Where to get it:** 1 mm tinted acrylic is hard to find online. Check local hardware or DIY stores for gray or smoked acrylic. The BOM lists online options.
- **Alternative (BOM: W1-B):** use clear 1 mm acrylic and apply car window tint film to darken it.
- **Cutting:** cut the piece to 45 × 20 mm. Score it several times with a sharp knife along a ruler, then snap it over a table edge.



Cutting template: 45 × 20 mm from 1 mm translucent gray acrylic. Printed at 100% scale, the drawing is true size, so you can use it as a template.

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Final assembly

Don't overtighten: tighten the screws on the back firmly, but not too tight. Overtightened screws push the keypad cover onto the buttons and keep them pressed.

1. Tighten the back screws until the housing is closed and firm.
2. Press every key. Each one should click clearly.
3. If a key doesn't click or feels stuck, loosen the nearest screw slightly and test again.

Heat-set inserts

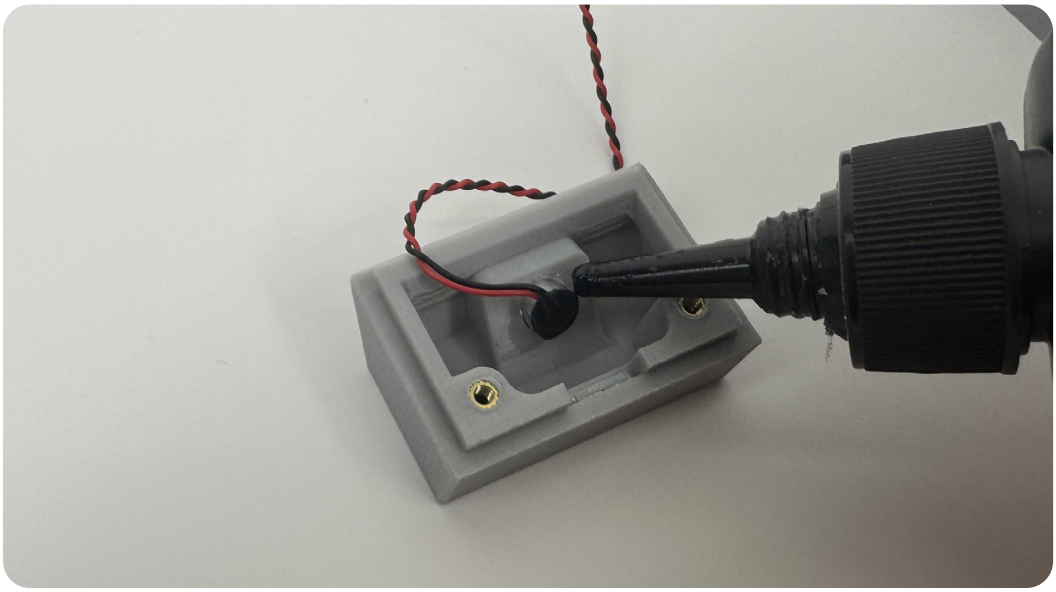
Melt the 8 M2.5 brass inserts (BOM: H2) into the printed parts at the marked spots before assembly.



Insert positions: mounting frame (2, one in the middle and one in the tab at the end, see close-up on the left), speaker cover (2), keypad cover (2), mic cover (2).

Microphone

Glue the microphone into the mic cover with UV glue (BOM: G1) and cure it with the UV light.



Microphone glued into the mic cover with UV glue.

Display

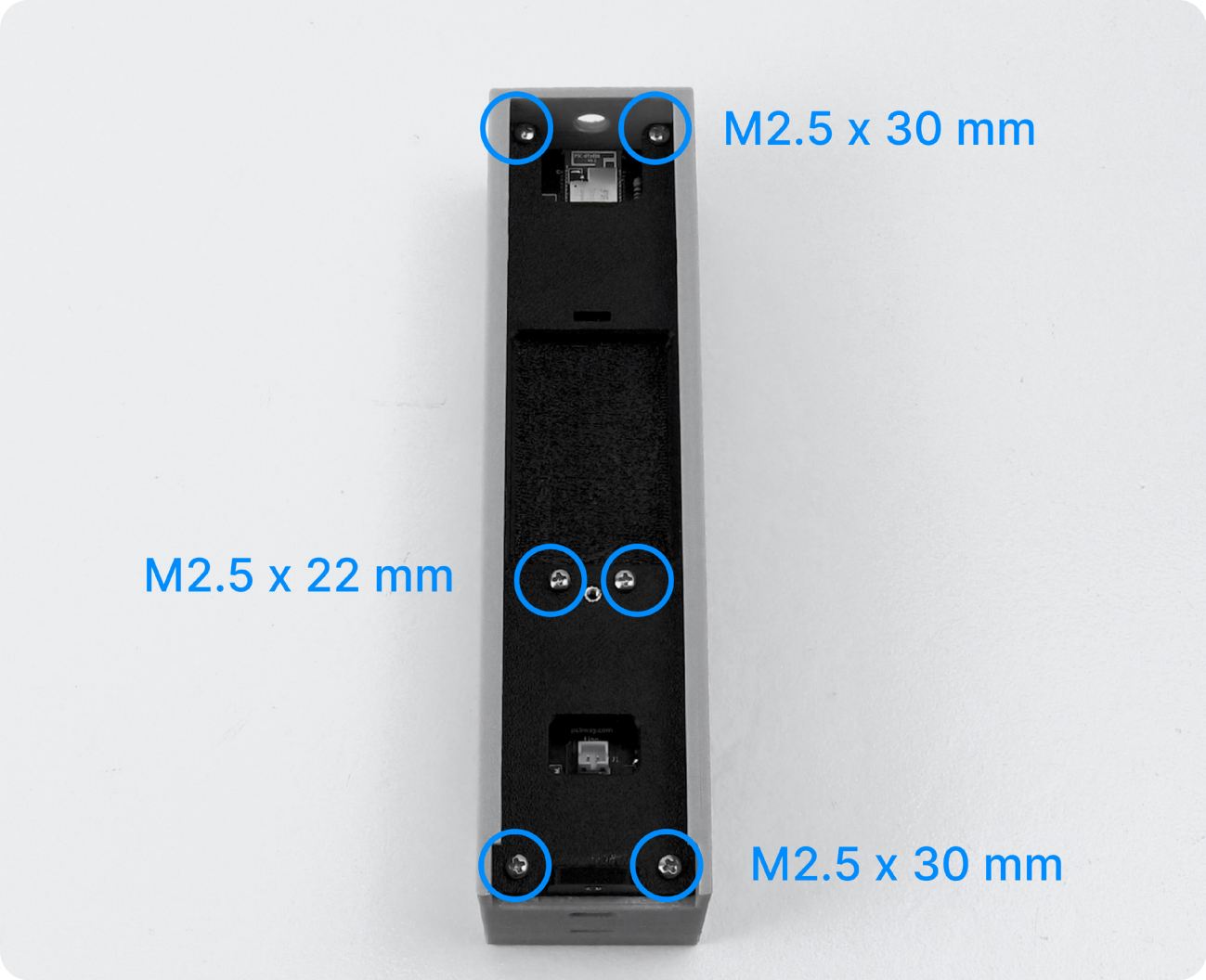
Mount the display with 4 M2.6 × 5 mm self-tapping screws (BOM: H3).



Display mounted with 4 self-tapping screws.

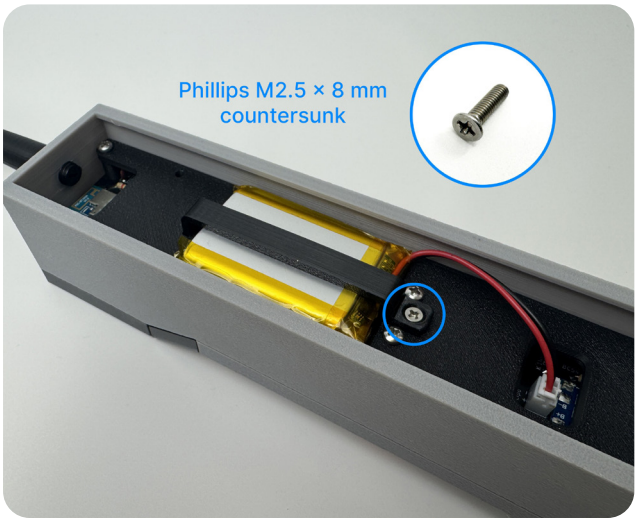
Back screws

The back holds the PCB in the mounting frame: 4 × M2.5 × 30 mm in the corners (BOM: H4) and 2 × M2.5 × 22 mm in the middle (BOM: H1). Tighten them firmly, but not too tight.



Battery holder and backcover

The battery holder and the ackcover each use one M2.5 × 8 mm countersunk screw (BOM: H5).



Battery holder screw.



Backcover screw.

11

Checklist before first power-on

- [ ] Firmware flashed on the Pico
- [ ] All parts tested, especially the TP4056
- [ ] Battery and charging module from a quality source, both with protection circuit
- [ ] Polarity checked on the battery, speaker, microphone and all other components
- [ ] Capacitors in the top-right corner pointing straight up
- [ ] Back screws firm but not too tight, all keys click
- [ ] All wires and leads trimmed flush with the PCB

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License

All files in this package are licensed for **personal, non-commercial use only**.

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This package includes 3D model files (STL), PCB manufacturing files (Gerber and drill files), firmware, this guide and the bill of materials (together, the "Files"). By purchasing or downloading the Files, you agree to this license.

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