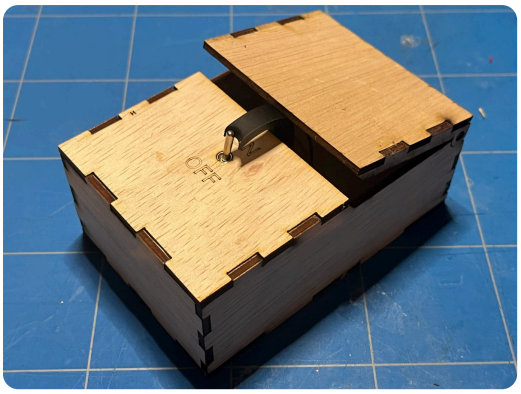


Useless box

Make a box that is absolutely... useless.

AGE	TIME
9+ yrs	30–45 min

electronics | laser cutting

Laser template (useless-box.dxf): scan the QR code
Arm (arm_def.obj): scan the QR code

Scan for the online version

What do you need?

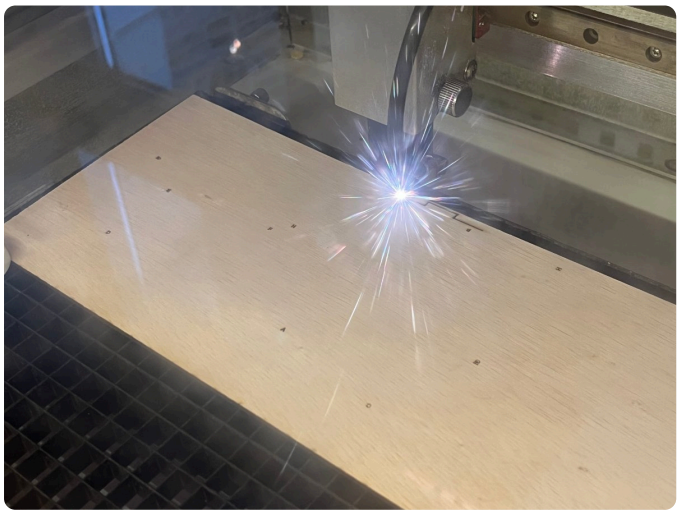
MATERIALS

- [ ] 3 mm plywood
- [ ] M3 x 5 screws (3x)
- [ ] M3 nuts (2x)
- [ ] 9v battery clip
- [ ] 9v battery
- [ ] Useless box circuit board
- [ ] Geared motor
- [ ] 3D printed arm
- [ ] Candle wax (optional)
- [ ] Double sided tape

TOOLS

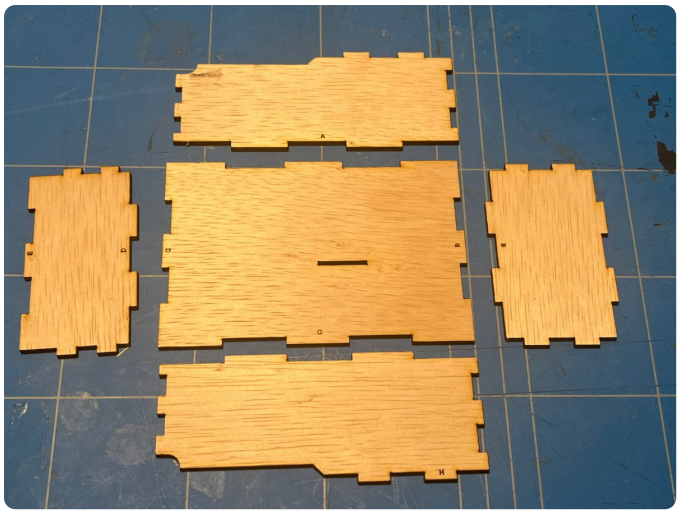
- [ ] Woodglue
- [ ] Screwdriver
- [ ] Soldering iron
- [ ] Painters tape
- [ ] Wire clippers
- [ ] Wire strippers
- [ ] Lasercutter
- [ ] 3D printer

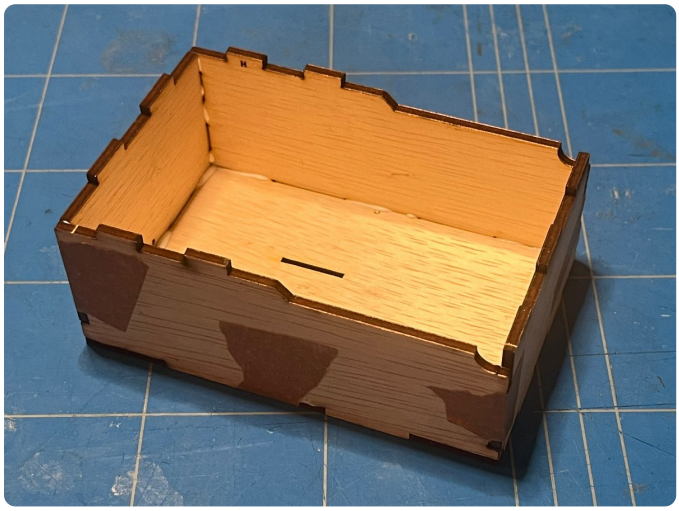
Steps



1 Cut the provided template

- Use the lasercutter to cut the design out of 3 mm plywood

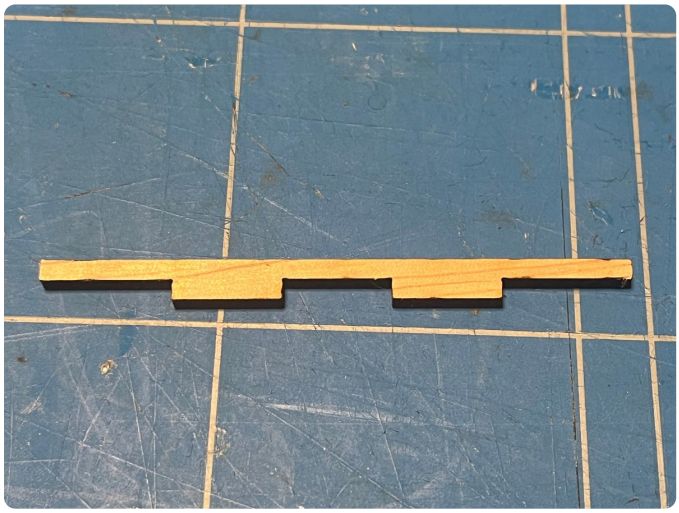




2 Assamble the box

GOOD TO KNOW
You can use some painters tape to keep the box together while the glue dries.

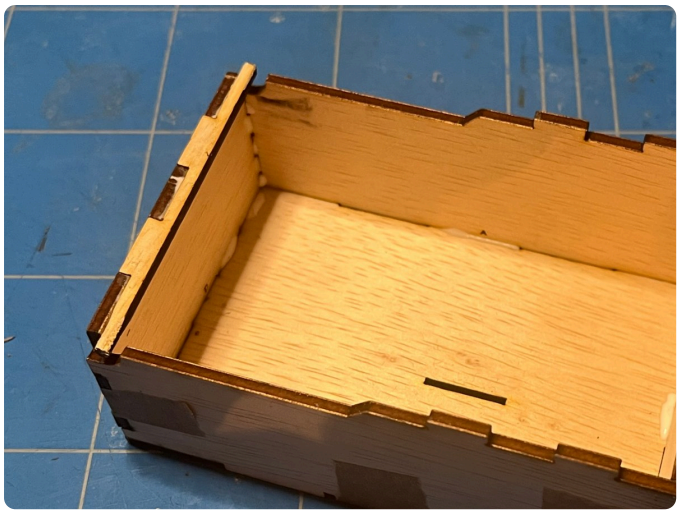
- Use some glue to glue the bottom of the box together.



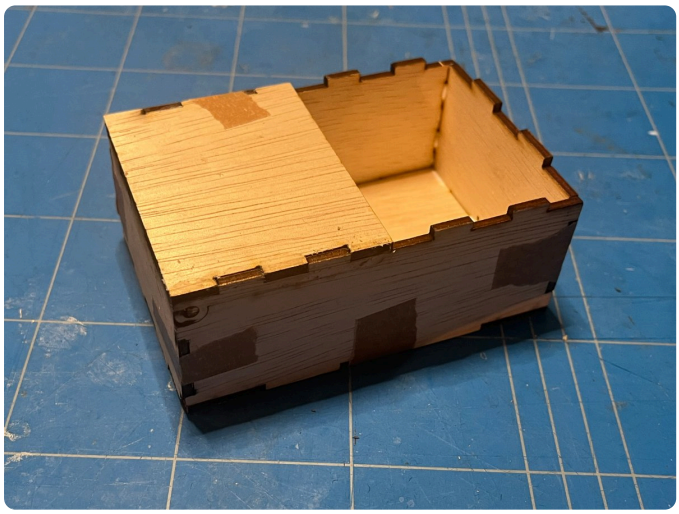
3 Add the lid

GOOD TO KNOW
For the best result: sand down the edges of the narrow piece marked 'E' with a little file or some sand paper. You can also apply some candle wax to the rounded pieces of the lid.

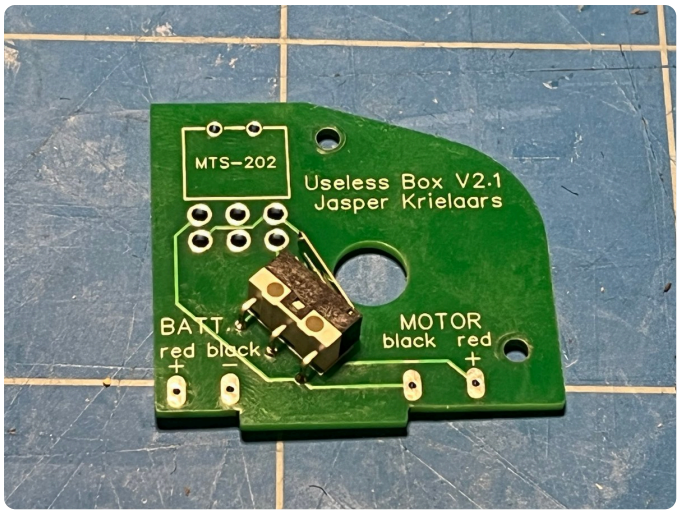
- Glue the piece marked E to the box as shown in the photo.
- Glue one side of the lid
- Place the lid over the piece marked 'E' and glue the second side of the lid while it is attached to the box.







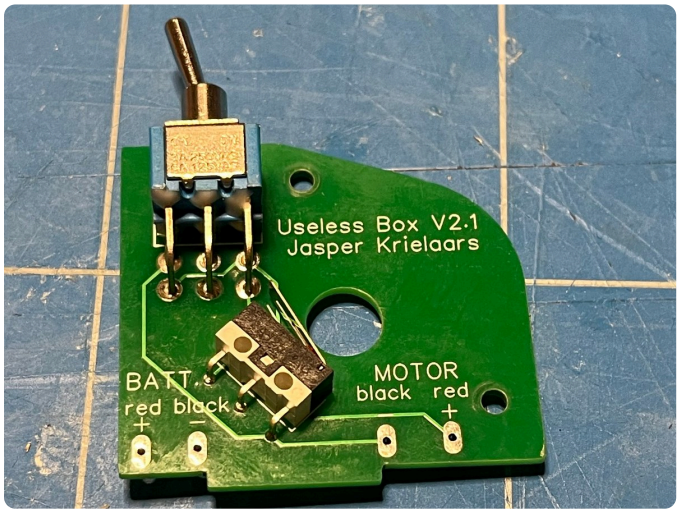
3 **Add the lid** — *continued*



4 Solder the cut-off switch

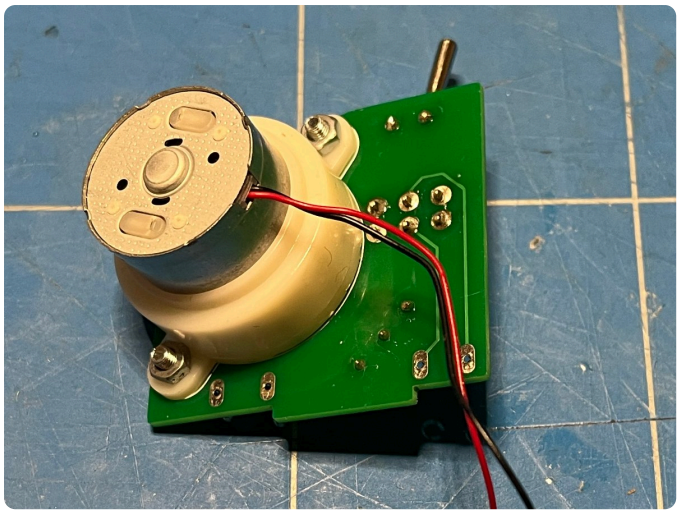
- Solder the cut-off switch onto the circuit board.

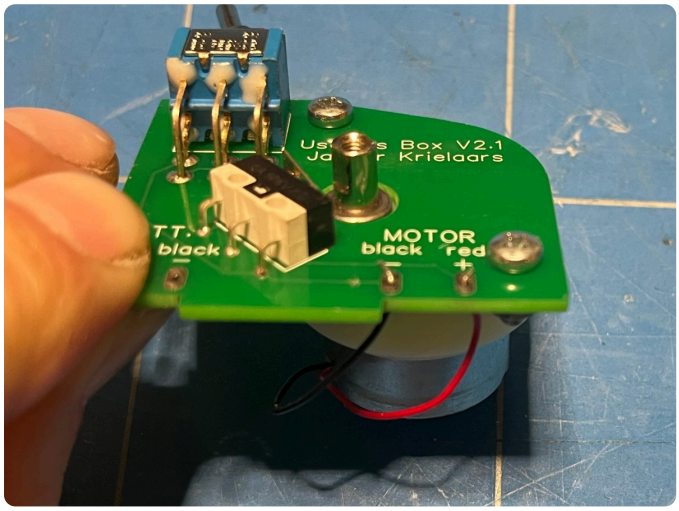




5 Solder the toggle switch

- Solder the toggle switch in place.





6 Attach and connect the motor.

- Attach the motor with 2 of the M3 bolts and nuts
- Trim the wires and solder the red wire to the MOTOR +, and black to the MOTOR - pad.

7 Add the battery clip

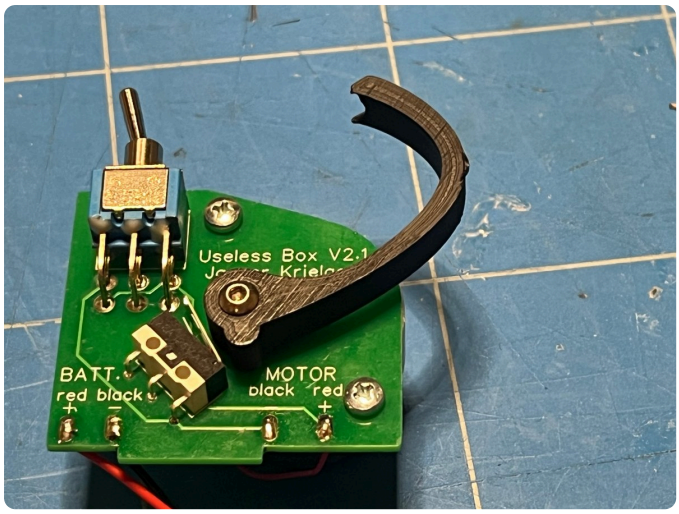
- Soilder the battery clip wires to the board. Red goes to 'Battery +', black goes to 'Battery -'

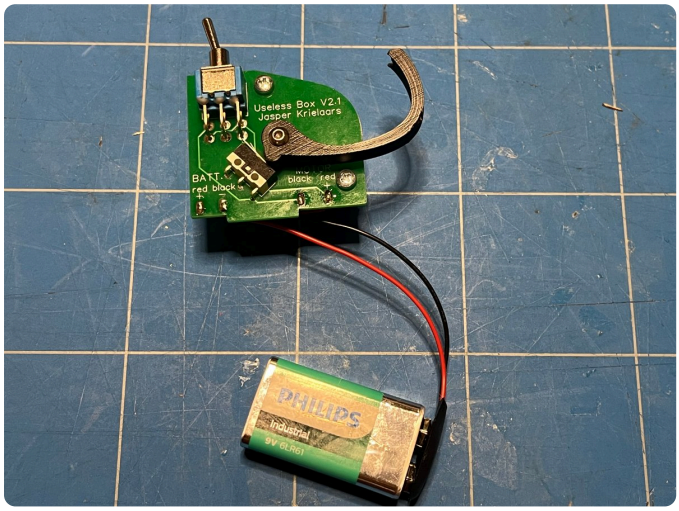


8 Attach the arm.

> **GOOD TO KNOW**
> The hole in the arm has a shape that should match the motor axle. Make sure you pay attention to the shape when attaching.

- Attach the arm to the motor axle using an M3 screw.



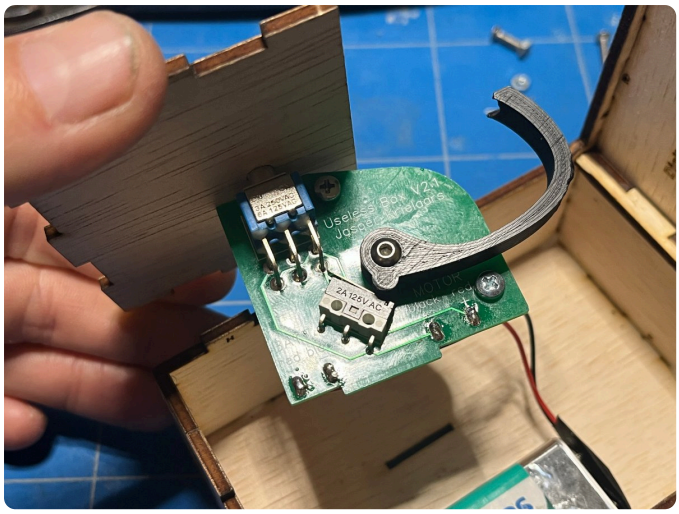


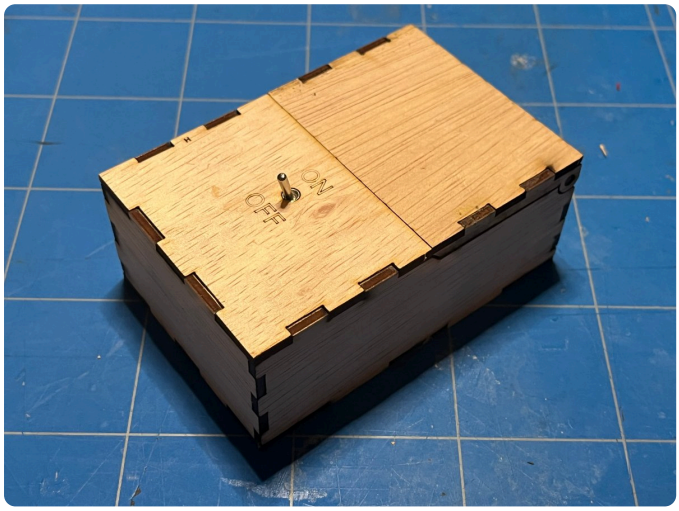
8 Attach the arm. — *continued*



9 CLose it up

- Use some double sided tape to place the battery in the box.
- Push the toggle switch trough the hole in the plywood, with the arm pointing to the narrower side of the wood.
- Align the shape of the PCB with the slit in the wood. Place the wooden panel on top of the box.
- Done!





9 **CLose it up** — *continued*