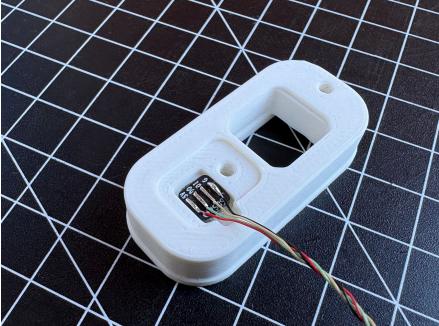


LTS Respooler - Assembly Guide

General Assembly and Printing Notes

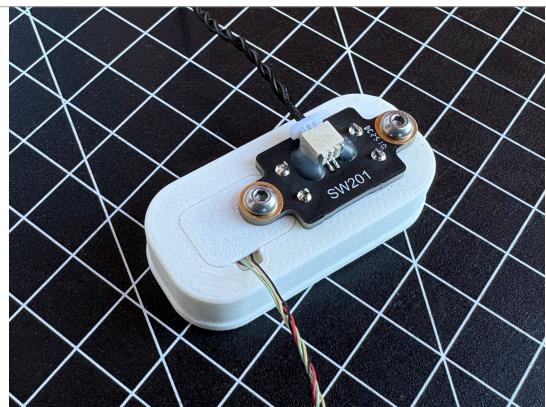
- the screws thread right into the plastic (no inserts), don't over-tighten them!
- it's best if the black parts are printed with a durable filament like PLA-CF or PETG
- some parts use supports that need to be removed
- the screws are not pictured in the assembly guide

Assembly Guide

<p>Start the assembly with the part <i>Motor Base</i>.</p>	 A black 3D-printed rectangular base plate with two circular cutouts on top corners and several mounting holes.
<p>Insert the Nema 17 stepper motor and secure it using 3 M3 x 6 screws.</p>	 The Motor Base with a black Nema 17 stepper motor mounted on its side. The motor's shaft is protruding from the side.
<p>Install the <i>ESP32 PCB</i> or the <i>Control Board</i> onto the Motor Base and screw it down using 4 M3 x 6 screws.</p> <p>Place one M3 nut in each of the hexagonal holes.</p>	 The Motor Base with the ESP32 PCB installed. The PCB has various electronic components and a microcontroller. A small white M3 nut is visible on one of the hexagonal holes.
<p>Take the part <i>Control Panel</i> and insert the LED as seen in the picture. No need to use glue, it will be secured in the next step.</p>	 A white 3D-printed control panel with a central circular cutout and a small LED module attached to its bottom edge. Wires are visible extending from the module.

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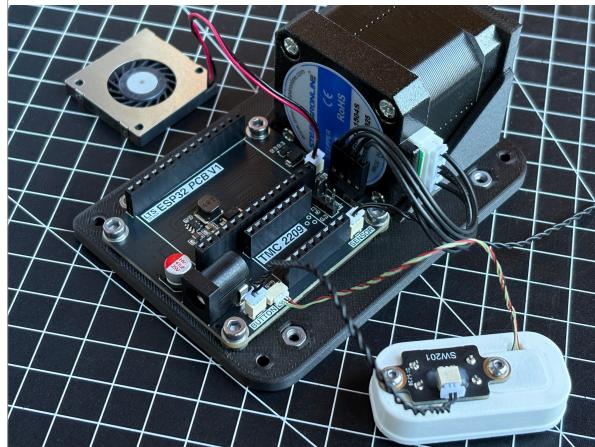
Place the *Control Panel Plate* on top of the LED. Install the Button as seen on the picture and secure everything using 2 **M2 x 8** screws.



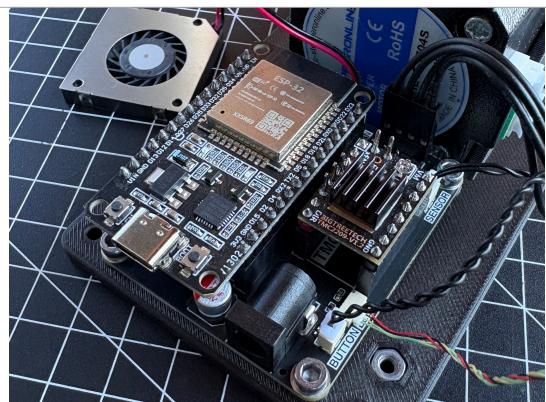
Connect all the wires to the PCB according to the labels it. Connect the long 200 mm cable to the connector labeled „SENSOR“.

Make sure to insert the connectors carefully.

The cooling fan is optional, you don't have to use it.



Install the ESP32 Dev Board and the TMC2208 stepper driver. Pay attention the orientation of the driver PCB!



You can now install the *Electronics Case*. First, thread the Control Panel through the corresponding opening from below, then push it into position.

Screw the case to the Motor Base from underneath using 4 **M3 x 6** screws.

Make sure not to pinch any wires.



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Slide the Fan into the slot in the case with the exhaust facing up.

Push the printed *Control Panel Button* onto the button, the friction should be enough to keep it in place.



With all the electronics in place, you can now close the Electronics Case with the *Electronics Case Lid* and 5 **M3 x 6** screws.

Route the wire for the filament sensor through the little hole in the lid (see arrow).

You can now upload the code to the ESP32 Board using the [Web Flasher](#).



Take the *Motor Pulley* and slide a **M3 nut** into the small slot next to the hole.

Push the Pulley onto the shaft of the stepper motor and secure it using a **M3 x 6** screw.



Attach the Electronics Case to the *Base* using 4 **M3 x 10** screws (from below).



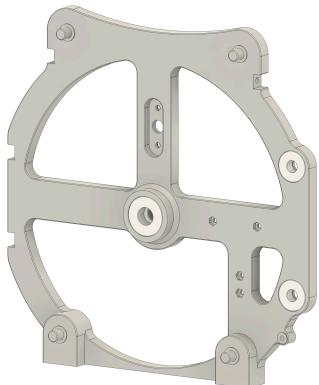
Take the *Spool Center* and insert the *Spool Shaft* into it. Secure it using a **M3 x 10** screw through the long hole in the Spool Center part.



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Remove all the supports from the *Frame R* and press the 4 bearings into position.

Two of them (608zz) are installed in the front and the other two (6001zz) on each side of the center.



Push the Spool Shaft through the two central bearings as seen on the picture.

Slide the *Spool Shaft Washer* onto the shaft (here pictured in red).

You can also screw on the *Spool Nut* now.



Attach the *Small Gear* and secure it using a **M3 x 10** screw.



Install the *Gear Shaft* and secure it using 2 **M3 x 10** screws and 2 **M3 nuts** (on the other side).



Attach the *Tension 1 Holder* as shown in the Picture and secure it loosely with 2 **M3 x 10** screws.

Don't forget to add the washers (pictured in red) and the **M3 nuts** on the other side. The black piece should be able to move side to side.



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Assemble the tension pulley by taking the parts *Tension Pully Top* and *Tension Pully Bottom* and sticking them together.

Insert a small *MR85zz* bearing on each end.



Attach the pulley with an **M3 x 16 screw**.



Repeat these steps for the second tensioner.
Don't forget the washer.



Take the *Filament Guide* and insert two PTFE tubes as seen in the picture. You can use the spare ones that probably came with your printer.



Insert the two *Worm Gears* as pictured.



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Slide in the two *Filament Guide Pins*, pictured in red. You might need to spin the Worm Gears a bit to wiggle the Pins into place.



Secure the Pins with the *Filament Guide Lids*. Use 2 **M3 x 6** screws to attach them.



Slide the two shafts of the Worm Gears through the corresponding bearings on the right Frame. Attach the two *Filament Guide Pulleys* and secure them with one **M3 x 6** screw each.

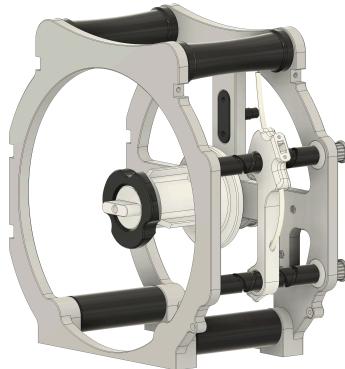


Take the four *Rollers* and press a bearing (608zz) into each of their ends.



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You can now slide the Rollers into position and attach the *Frame L*. Don't forget to add the bearings to the left Frame.



Attach all three *Braces* between the two Frame sides using 8 **M3 x 10** screws in total.

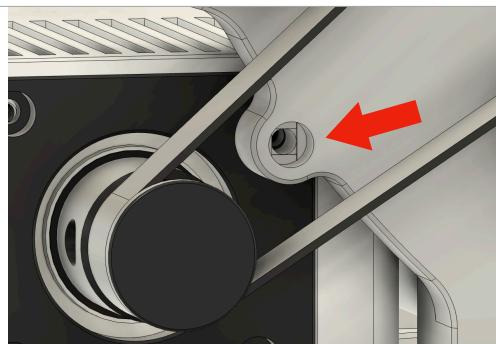


Lower the Frame onto the Base and connect the drive belt. Secure the Frame from below using 8 **M3 x 16** screws.



Connect the Frame to the Electronics Case using 2 **M3 x 10** screws.

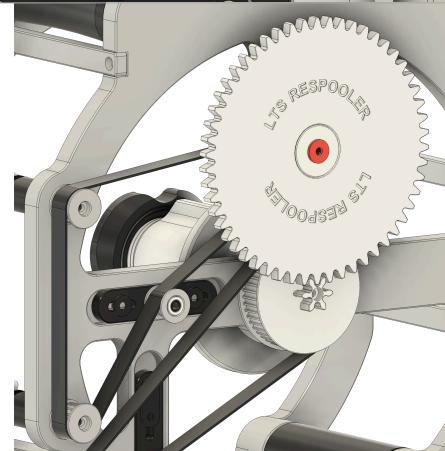
This step is **important** because without it the belt might start skipping, even at low resistance



Press a bearing into the *Big Gear*. Slide the gear into position, together with the belt. Be careful to not break the shafts. Secure the gear with a **M3 x 6** screw and the *Gear Washer* (red).

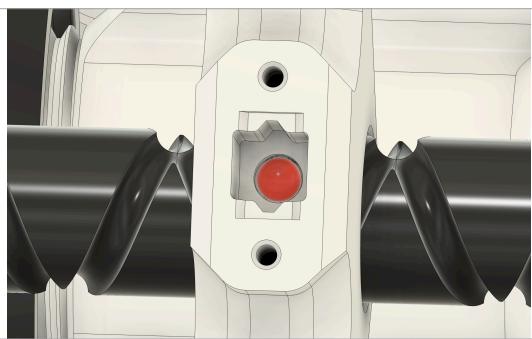
!! Make sure the two worm gears are in sync, meaning they're both at the same angle/position.

If needed, you can now adjust the belt tension.

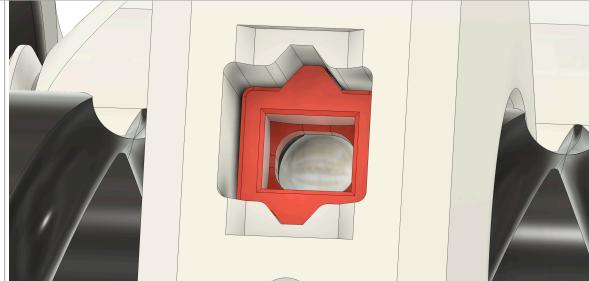


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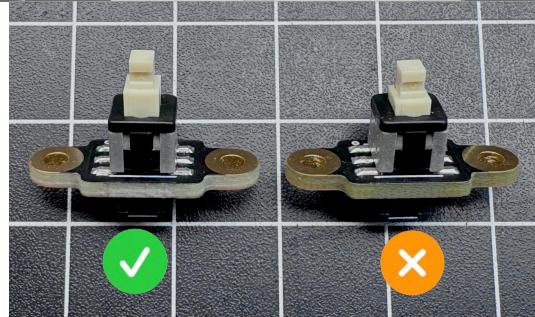
Drop the 4 mm steel ball into the hole of the Filament Guide, as seen on the picture.



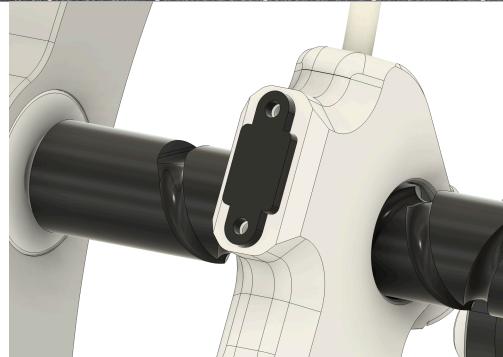
Place the small *Filament Switch Stopper* part on top of the steel ball. It's pictured in red. The rounded side should be facing down.



Take the „*Self-Locking Button Switch*“ from Maker's Supply. Make sure that it's in the unlocked position like in the picture.



Attach the switch to the Filament Guide using **2 M2 x 8** screws. You can now connect the cable from the Electronics Case, the connector should be facing to the right.



If you want, you can now glue the *TPU Feet* into position.



And with that, your Respooler is complete! :)
Let me know if you run into any issues!

