



Introduction

This manual describes how to assemble a Nerdy Gurdy BASIC kit. Go to <https://www.nerdygurdy.nl> for more info about these instruments.



General directions

- It's best to read through the whole sequence, before starting.
- When removing parts from the plate that are still attached, it's best to cut the attached points with a sharp knife or chisel, to avoid splintering.
- Before gluing, it is wise to assemble the parts without glue, so that you're sure how they fit together. You can assemble most of the instrument without glue, to get an idea of how the parts go together.
- Make sure that all surfaces that touch are fully glued together. This prevents undesirable vibration when you're playing. Use plenty of glue on the wooden parts, and wipe off any excess glue with a wet cloth.
- If you want to stain the wood: it is best to do this before gluing, with a water-based stain. Stain may not take well on areas that have seen glue. And glue may not take well on oil-based stain.
- If you do something wrong, it is possible to release wood glue by heating it to sufficient temperature (e.g. a with hot air gun).
- The parts are glued together with regular wood glue (not included in the kit), except a few plastic parts that need to be glued with all-purpose glue. The following icons will show you which glue to use:







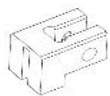
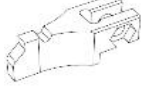



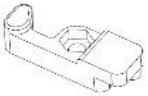



Wood glue



All-purpose glue

Parts included in kit (1)





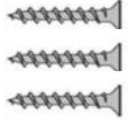









Printed parts

<p>Capo base</p> 	<p>Trumpet capo</p> 	<p>Drone capo</p> 	<p>Strap pin</p> 	<p>Dog support</p> 	<p>Drone support</p> 	<p>Shaft bush</p>  <p><i>(version 1.2 and newer)</i></p>
<p>Drone and dog base</p> 	<p>Trumpet capo lever</p> 	<p>Drone capo lever</p> 	<p>Tuning peg</p> 	<p>Buzzing bridge (dog)</p> 	<p>Bridge</p> 	

Strings:

Drone string: Viola C
High melody: 0.85 gut
Low melody: Viola G
Trumpet string: 0.81 - 1.0 mm fluorocarbon

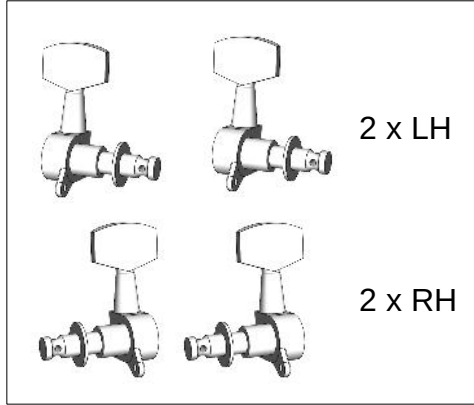
Fasteners, bearings, etc.

<p>Bolt M3 x 10</p> 	<p>Countersunk bolt M3 x 10</p> 	<p>M3 lock nut (nyloc)</p> 	<p>M5 nut</p> 	<p>Ring 5,3 mm</p> 	<p>Large screw 3,5 x 25 mm</p> 	<p>Small screw 2,5 x 13 mm</p> 	<p>Bearing 8x22 mm</p> 	<p>Bearing 5x16 mm</p> 
<p>Bolt M5 x 50</p> 	<p>Tube ID 5 mm</p> 	<p>M5 lock nut (nyloc)</p> 	<p>M3 nut</p> 	<p>Ring 8,3 mm</p> 	<p>Middle screw 3,5 x 17 mm</p> 	<p>Hinges</p> 	<p>Flange bearing FL8</p> 	<p>M8 nut</p> 

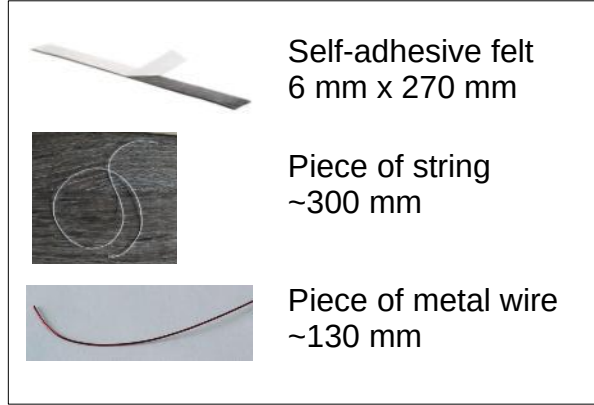
In newest kits these are all 3,5 x 20 mm (5x)

Parts included in kit (2)

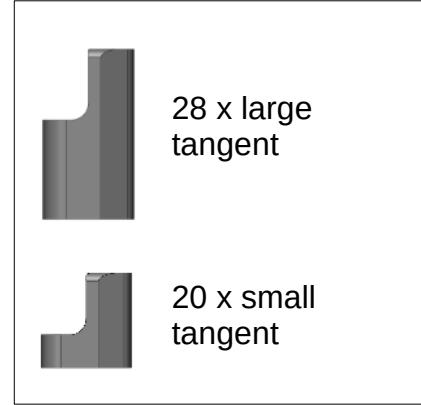
Machine heads (tuners)



Wire and felt



Tangents



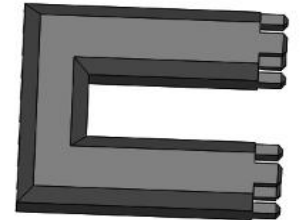
Tangent bolts



Shaft (M8 threaded rod)



Crank knob



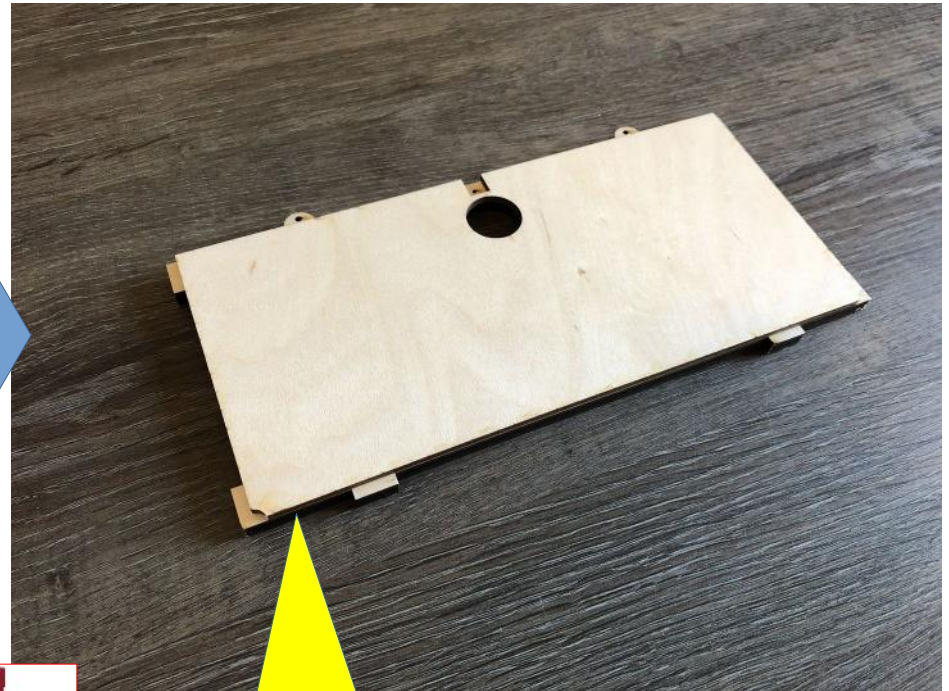
Soundbar U

Tooling list

Tools, glue and paint are not included in the kit. You may need the following tools and materials to build your instrument:

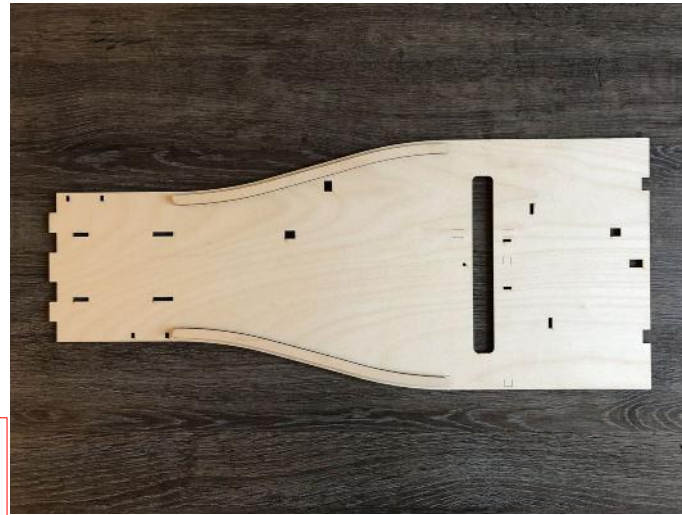
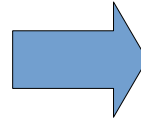
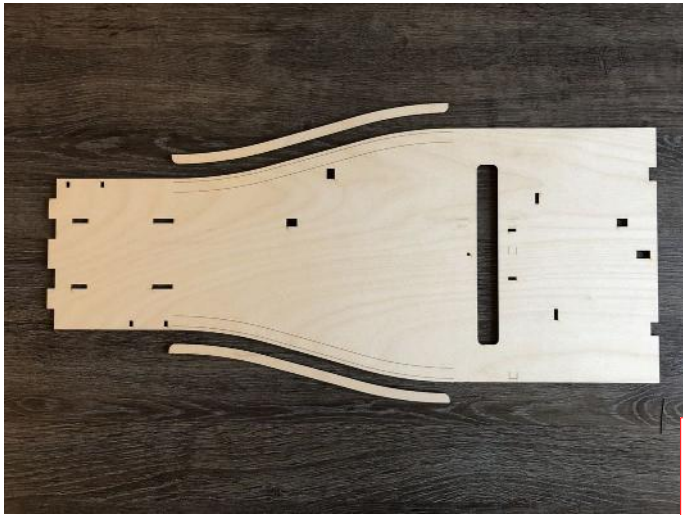
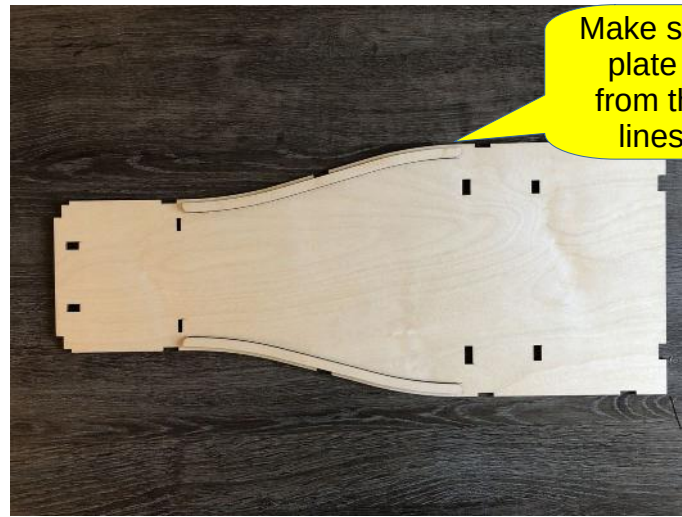
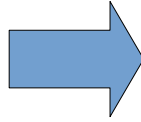
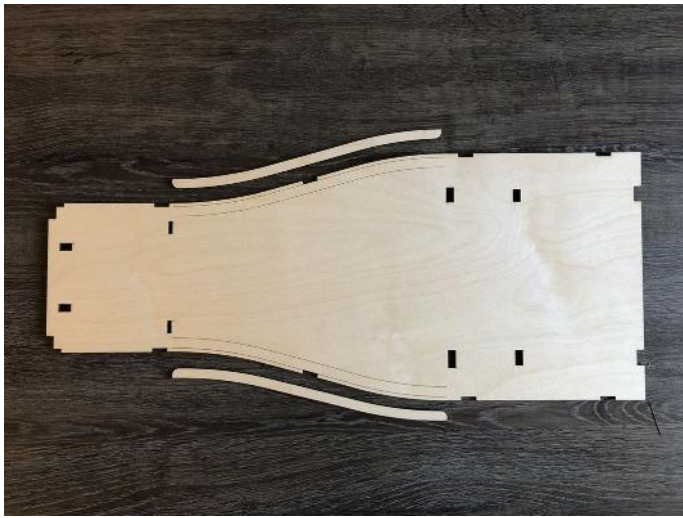
- Wood glue
- All-purpose glue
- Some screwdrivers
- Size 13 and size 10 wrenches (or pliers if all else fails)
- Hex keys
- Lots of glue clamps (5 to 10)
- A (retracting) knife
- Sand paper
- Varnish/ paint
- Some basic woodworking skill and patience :)
- Violin rosin, cotton

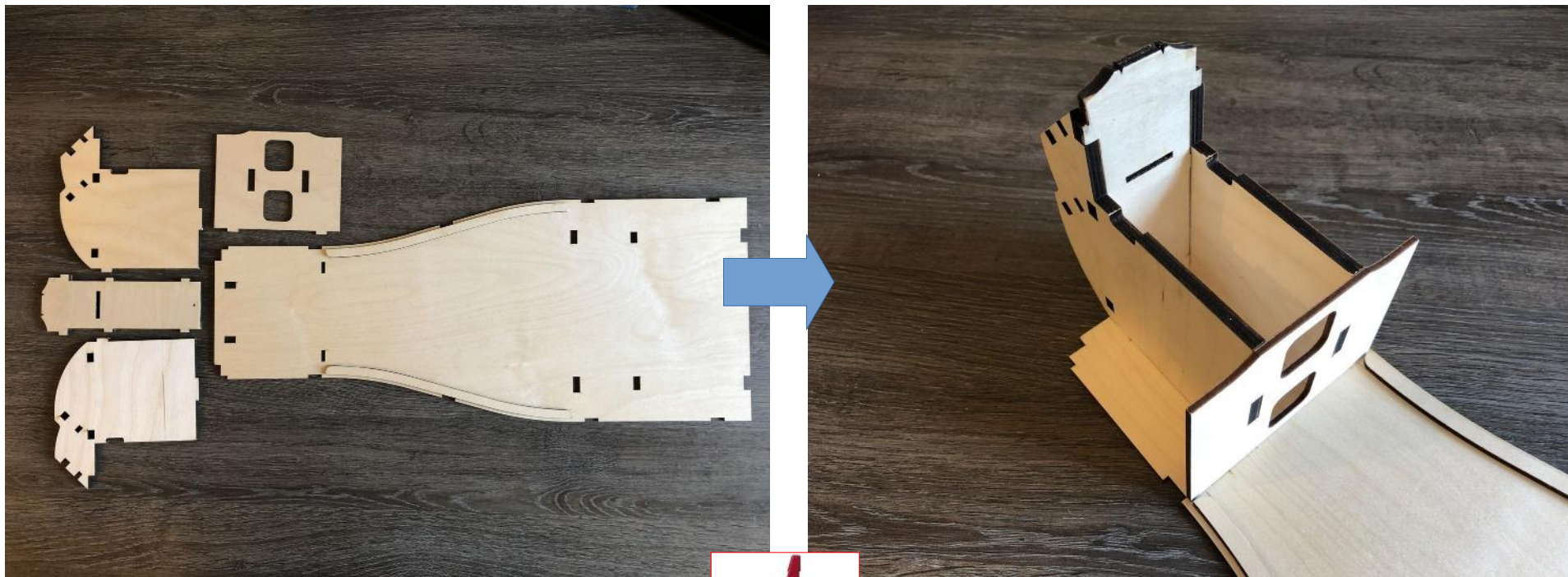
Let's start building!



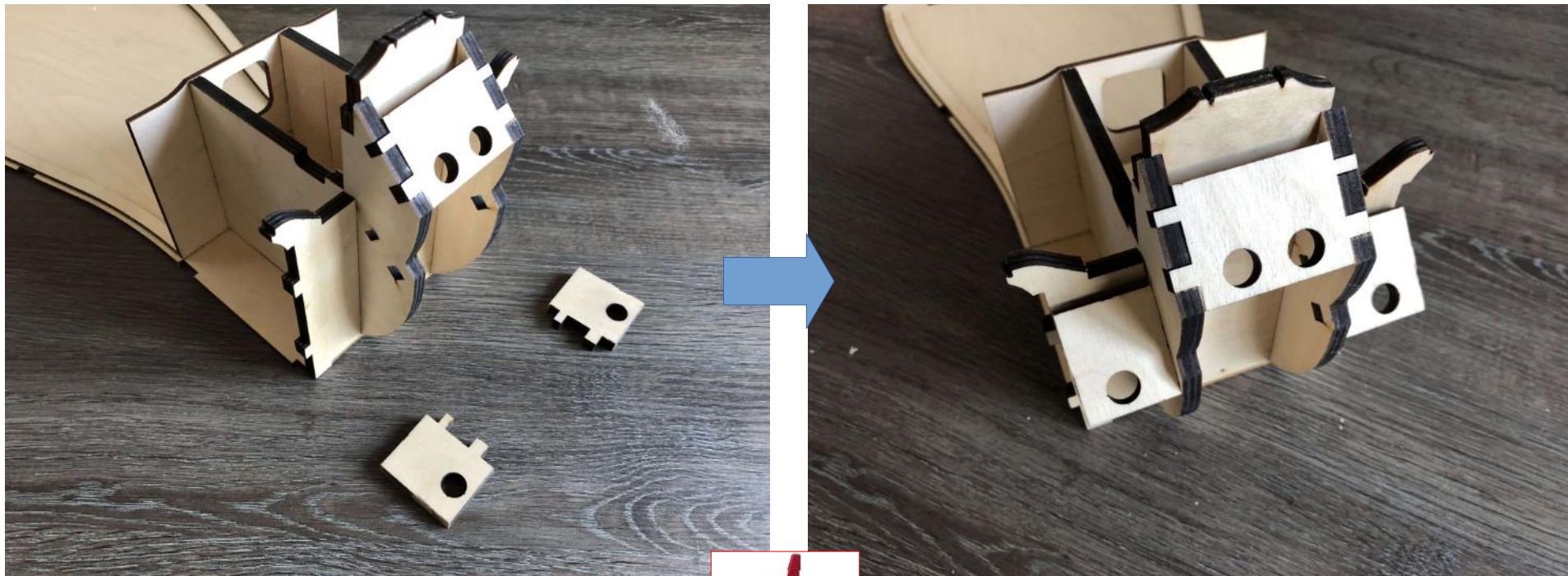
Make sure the sides are well aligned.

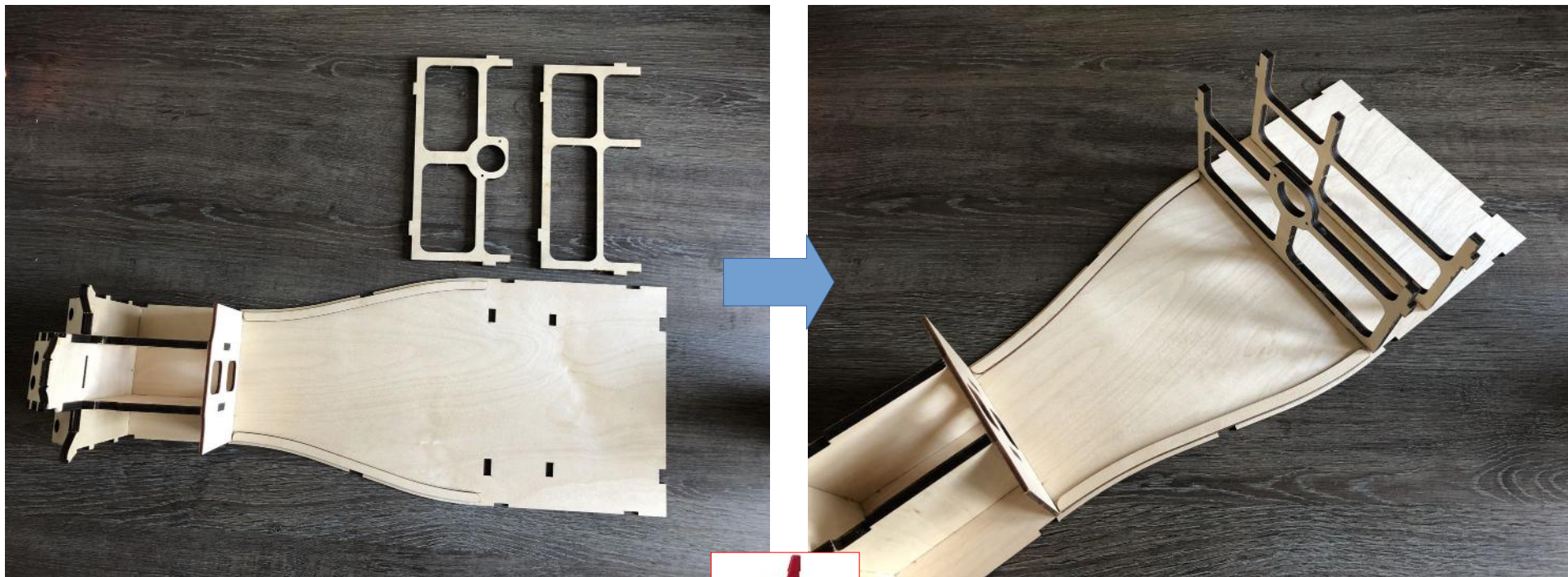
Remove any excess glue with a wet cloth

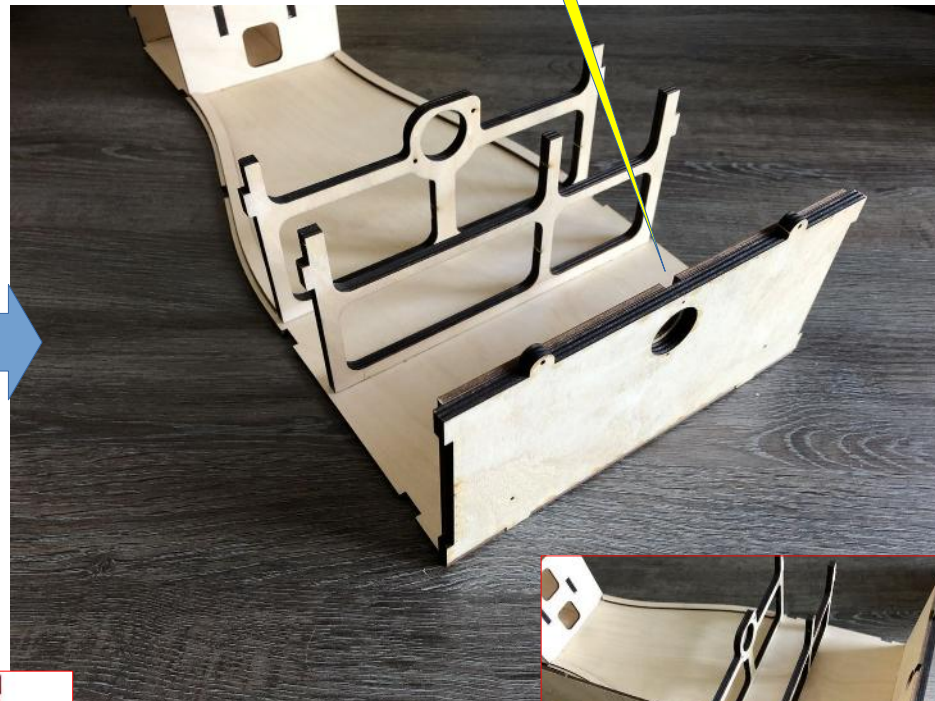
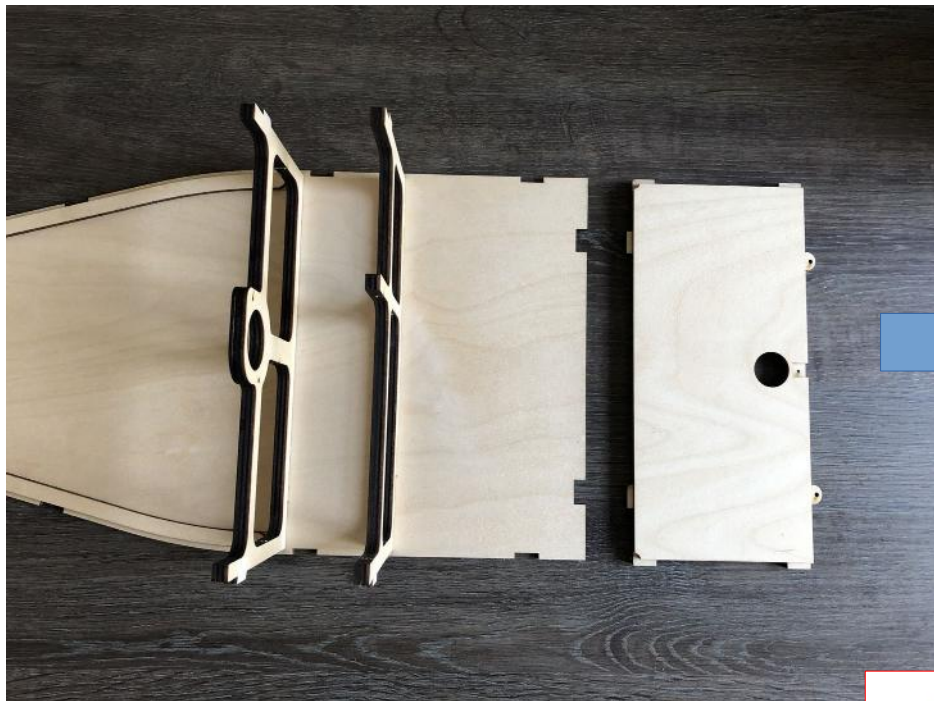












You can use one of the side-panels as a jig to ensure the back-plate is vertical







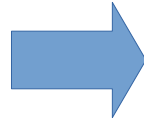
The inside of the bearing can be flipped. Use the shaft to flip the inside around, to that the set screws are on the correct side. They may take a bit of force.



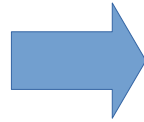


Use all purpose glue

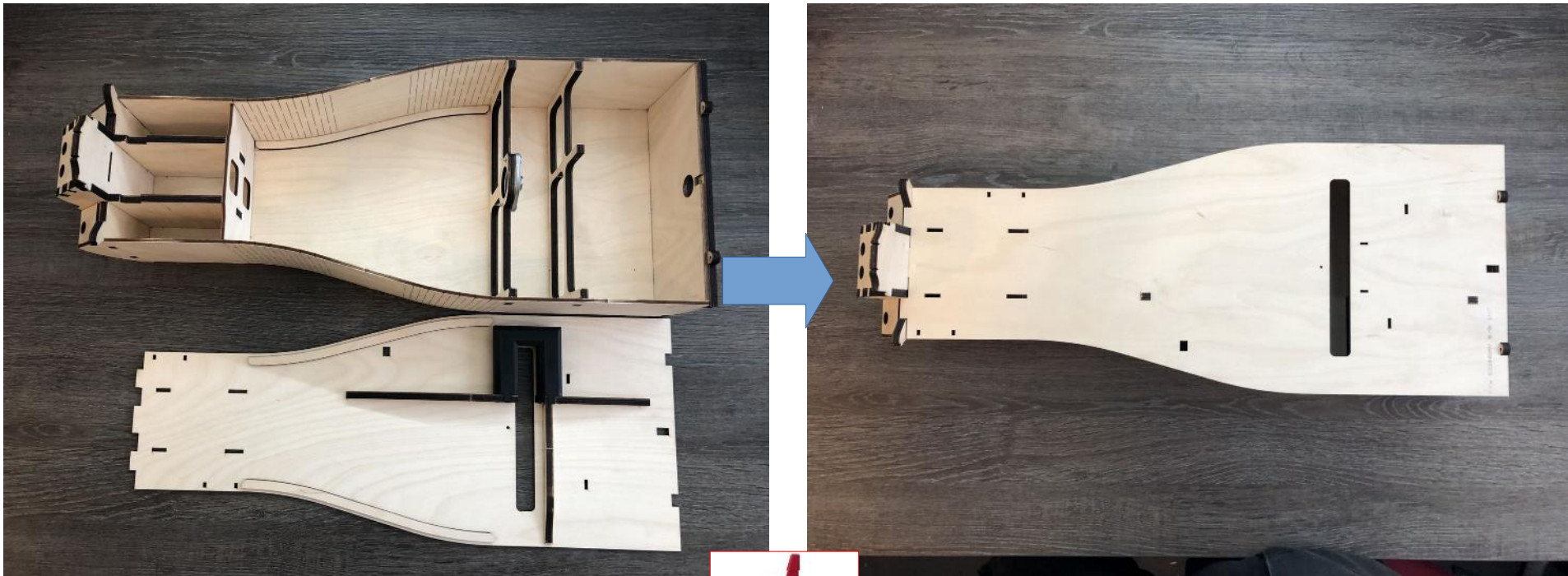
There are some lines engraved on the plate to help you position the beam

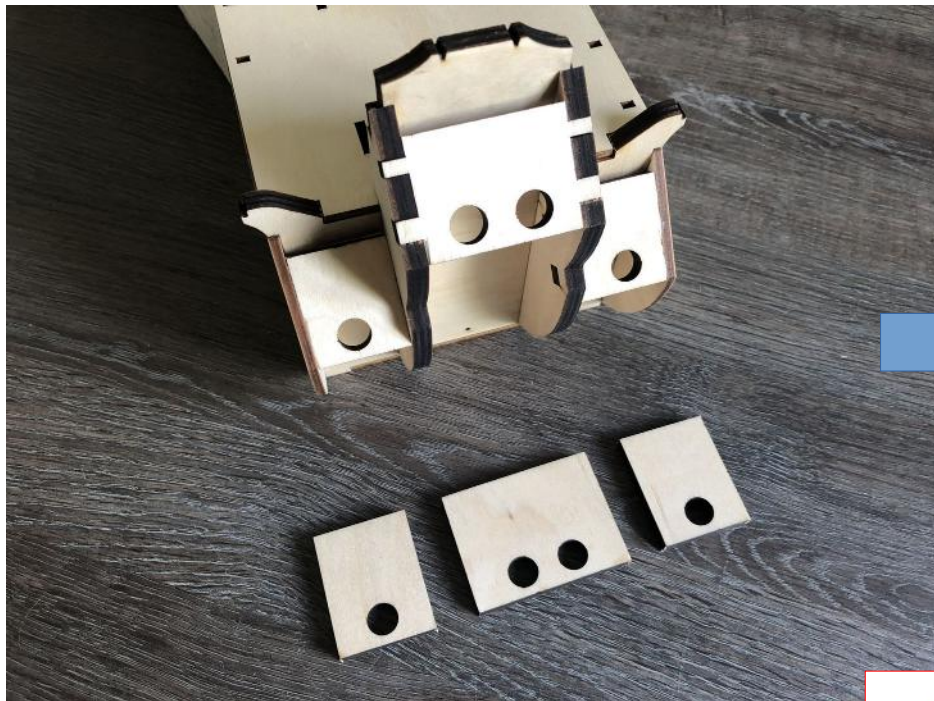


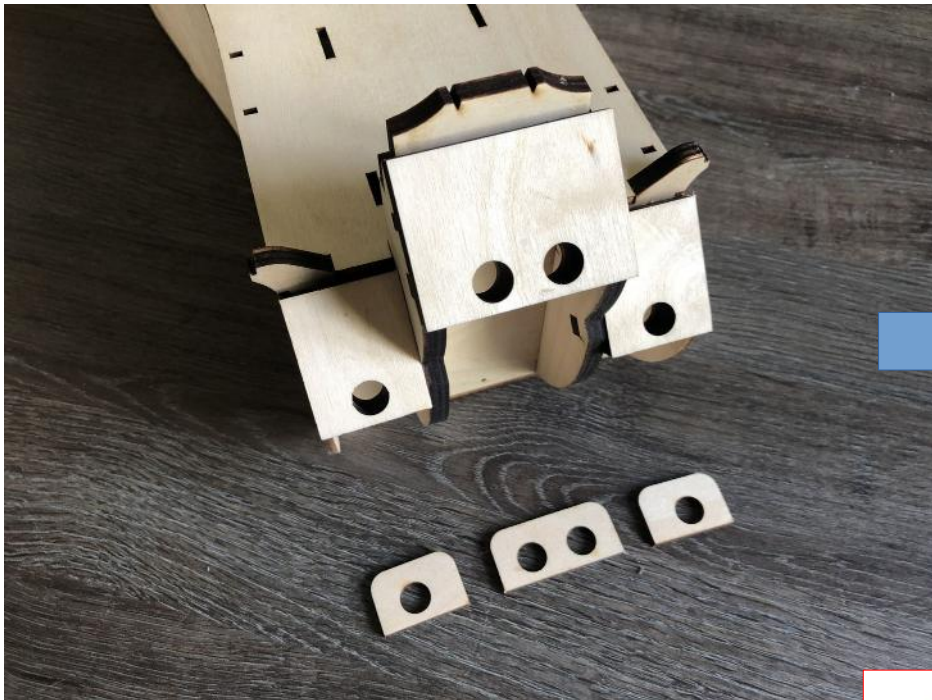
Make sure to keep 3 mm plate thickness away from the edge



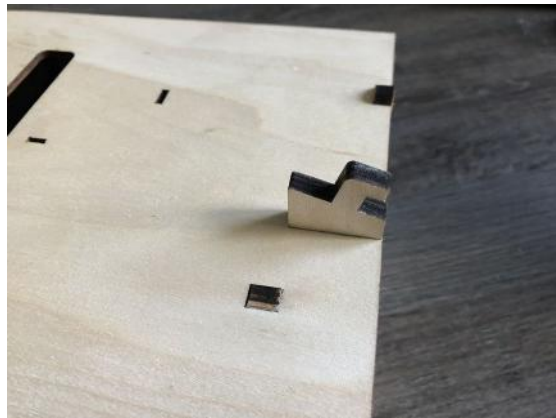
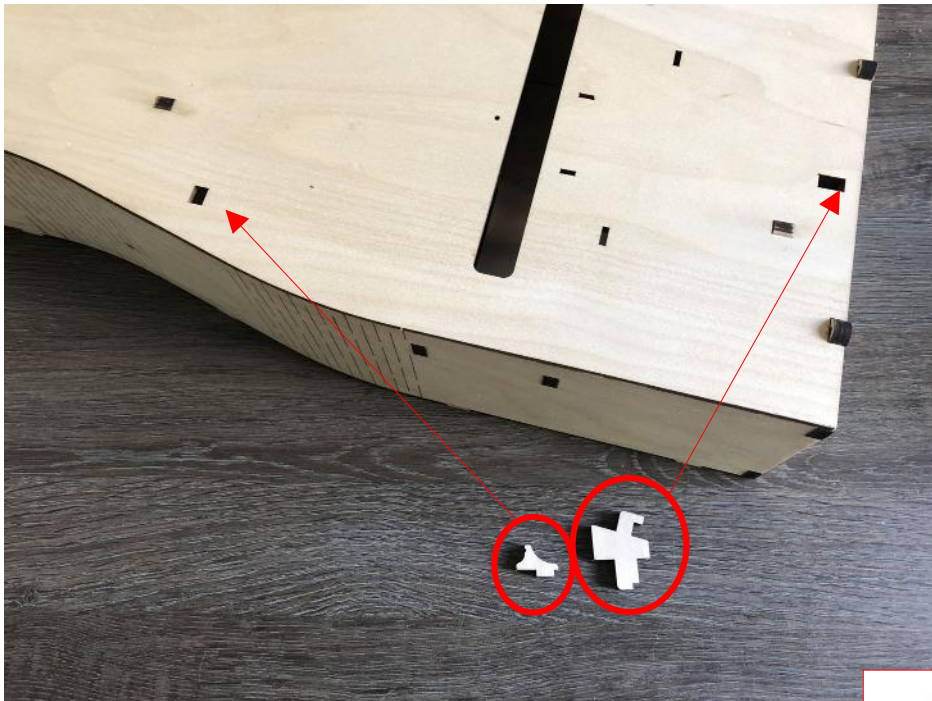
There should remain a small gap between the U piece and the plate, so the sound board is free to vibrate

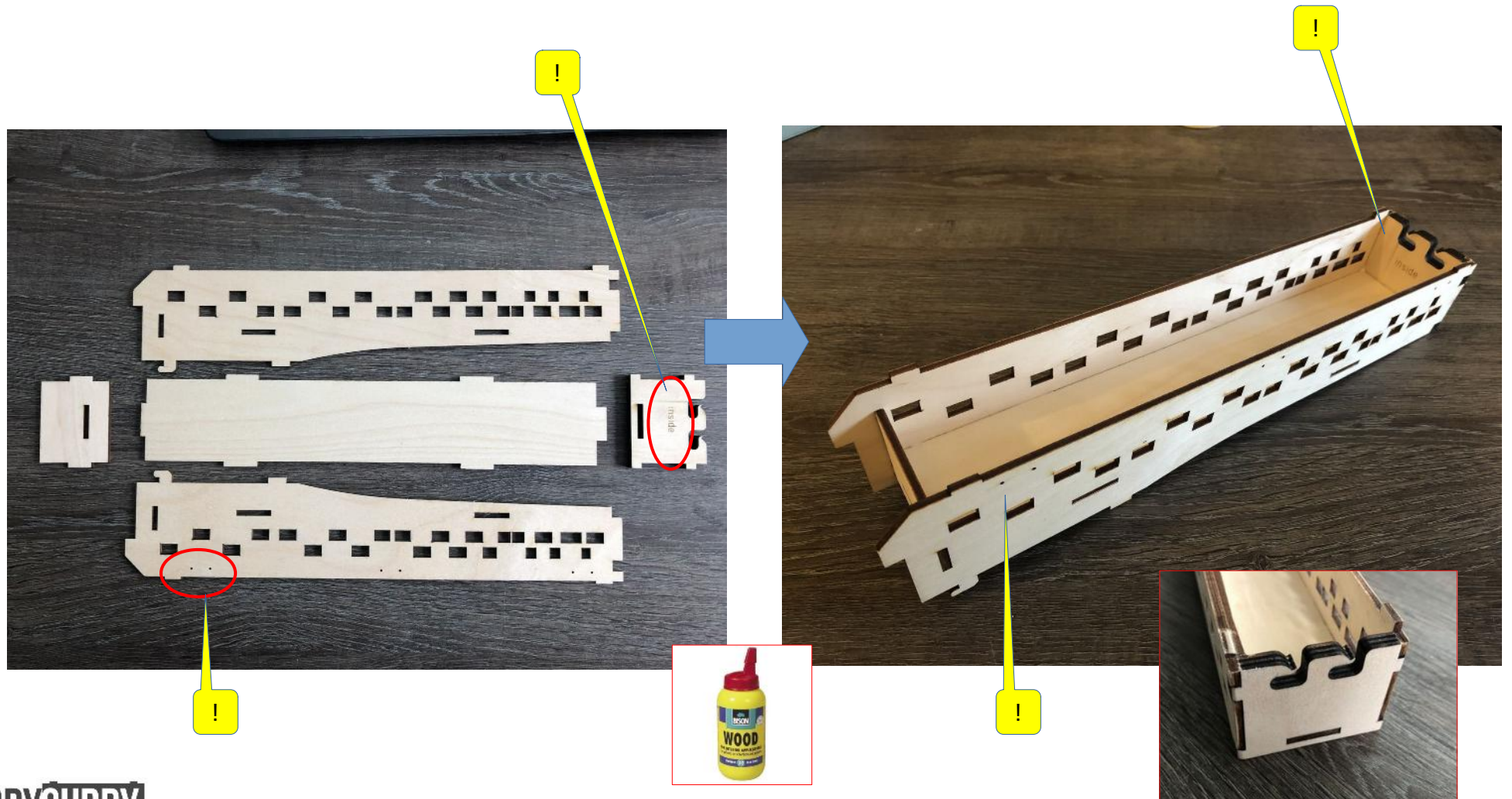


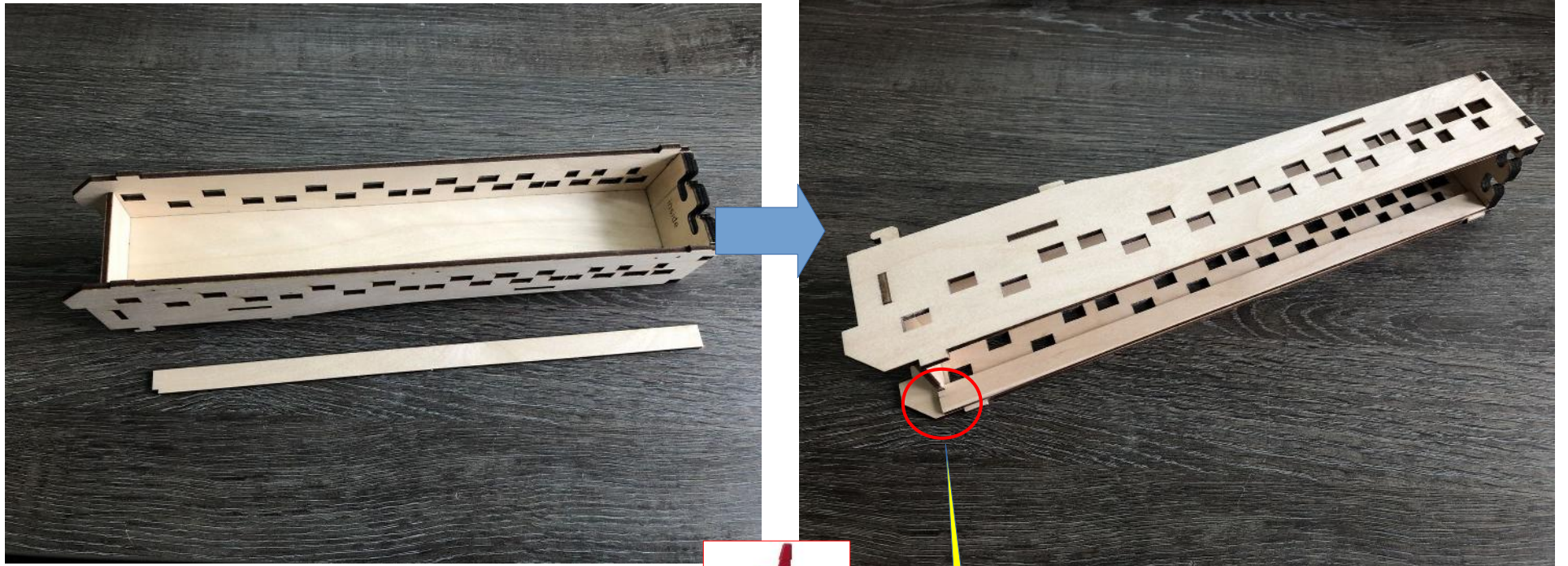




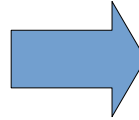
Insert these plates
on the underside!





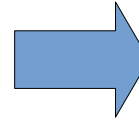


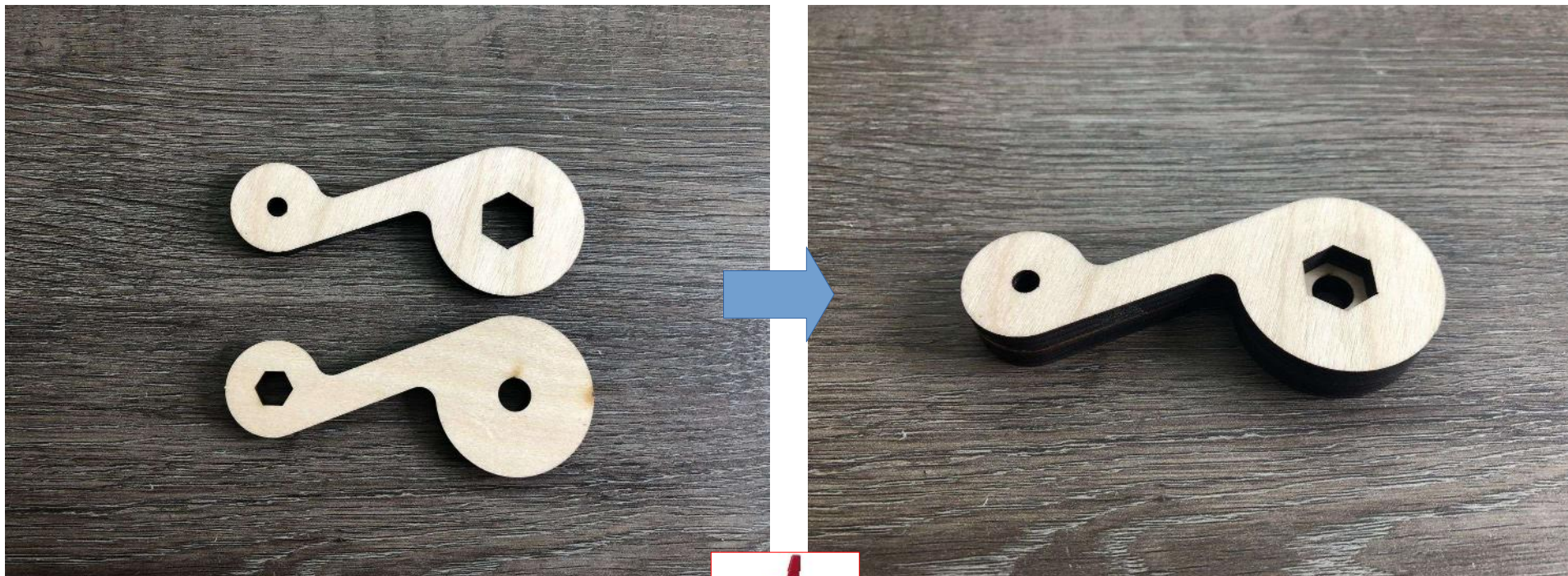
Version A



There are two versions of the lid. If you have the version with the logo, then it needs to be visible after gluing to have the correct orientation

Version B



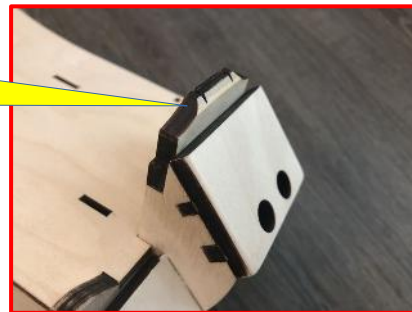


Sand and paint

This is where you can get creative and bring personality into your instrument. Below is how we often paint them: a clear coat on the keybox and body, and black for the other parts. But you can do whatever you like here of course.

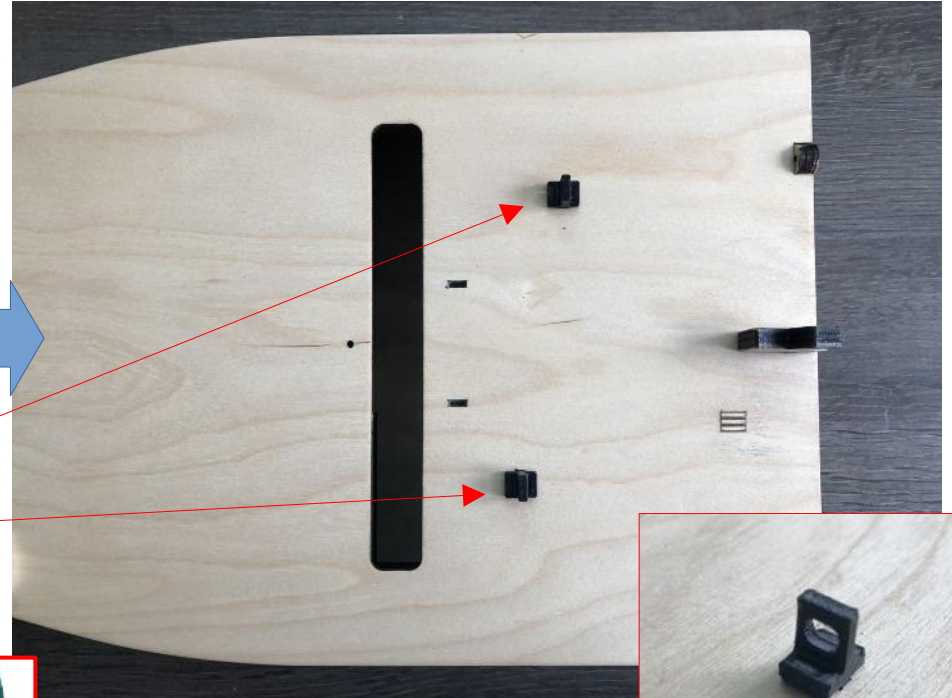
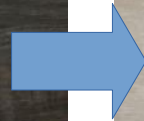
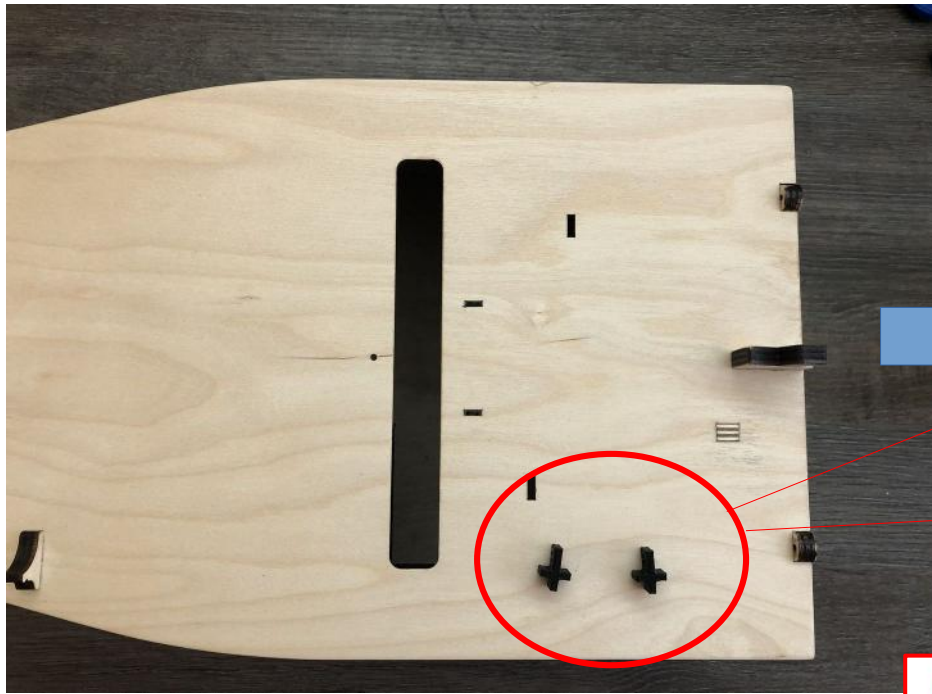


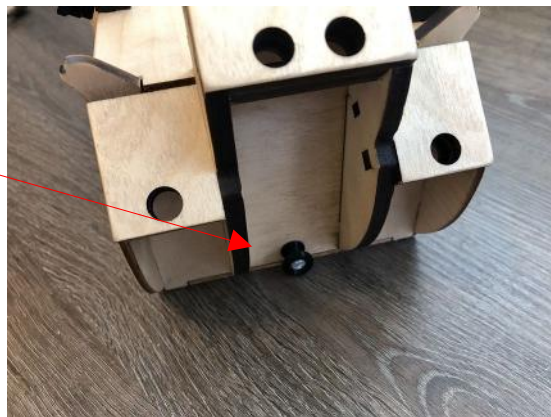
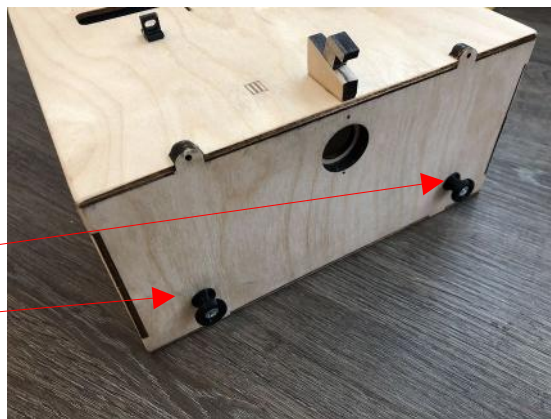
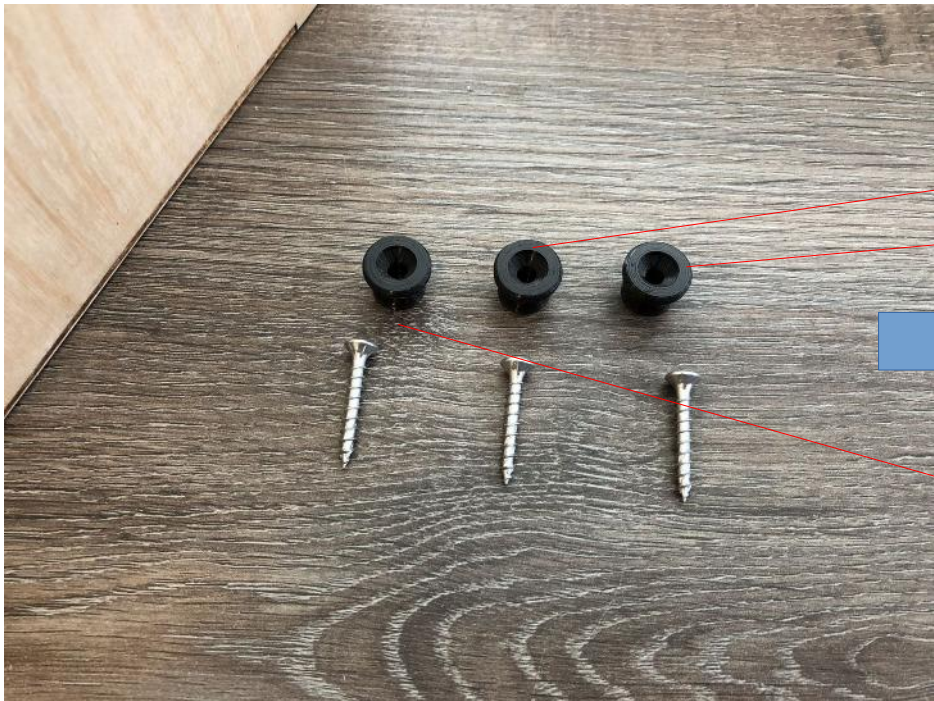
Add a chamfer to the plate that will hold the strings



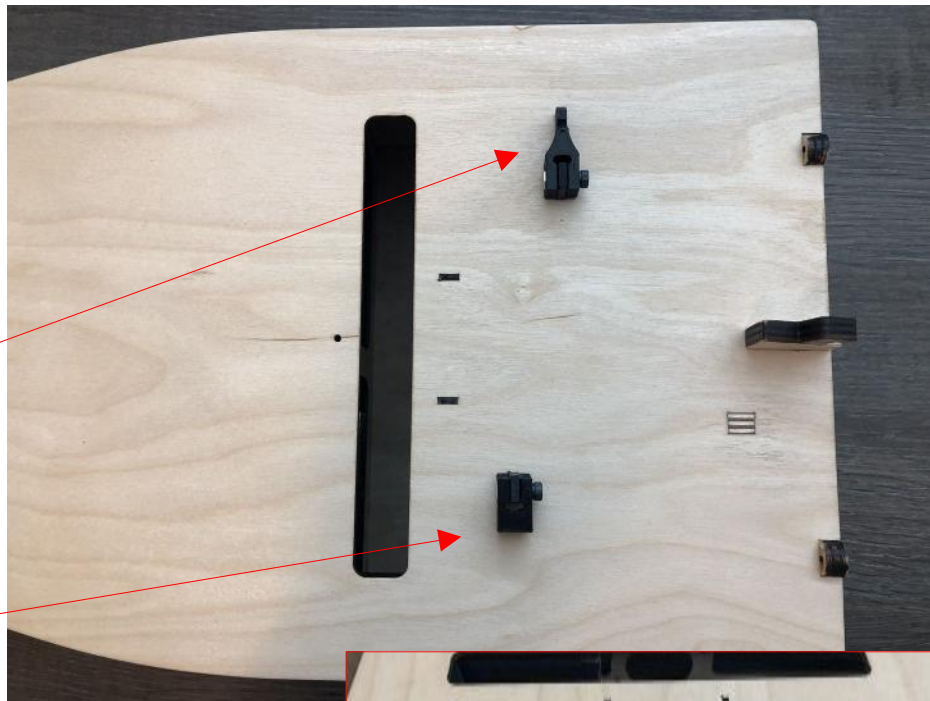
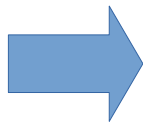
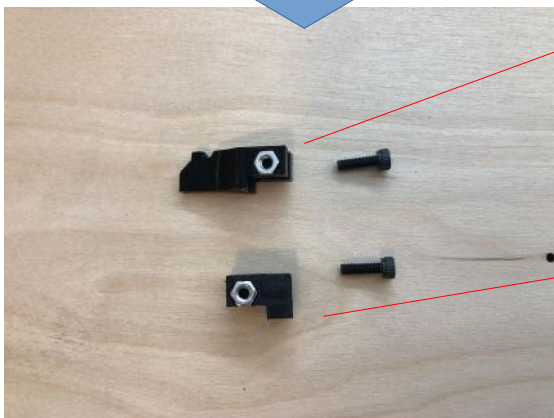
No paint inside the slots for the keys!





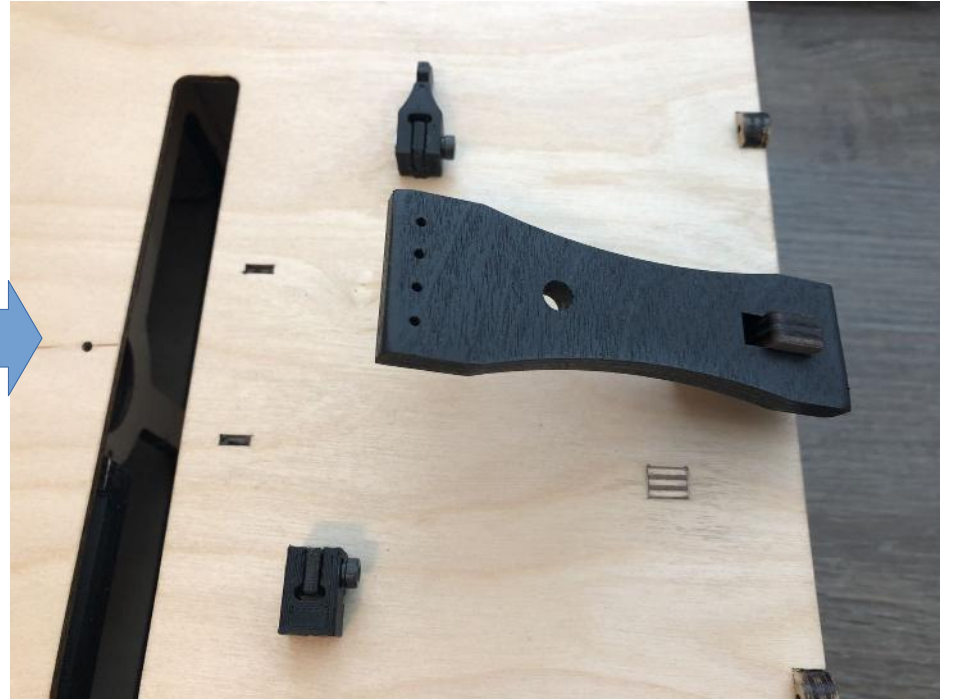
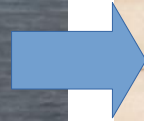
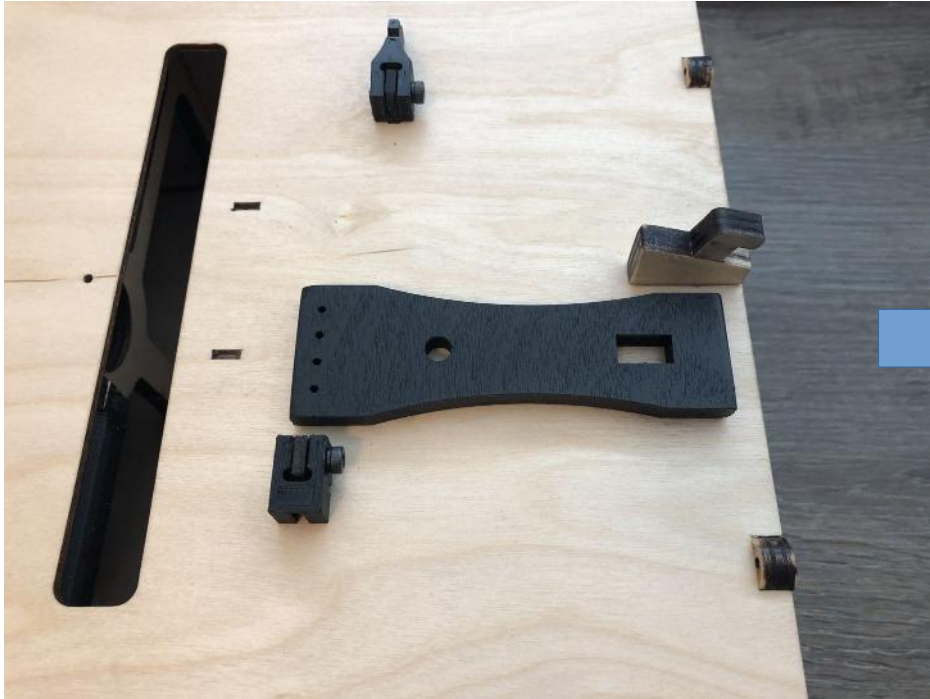


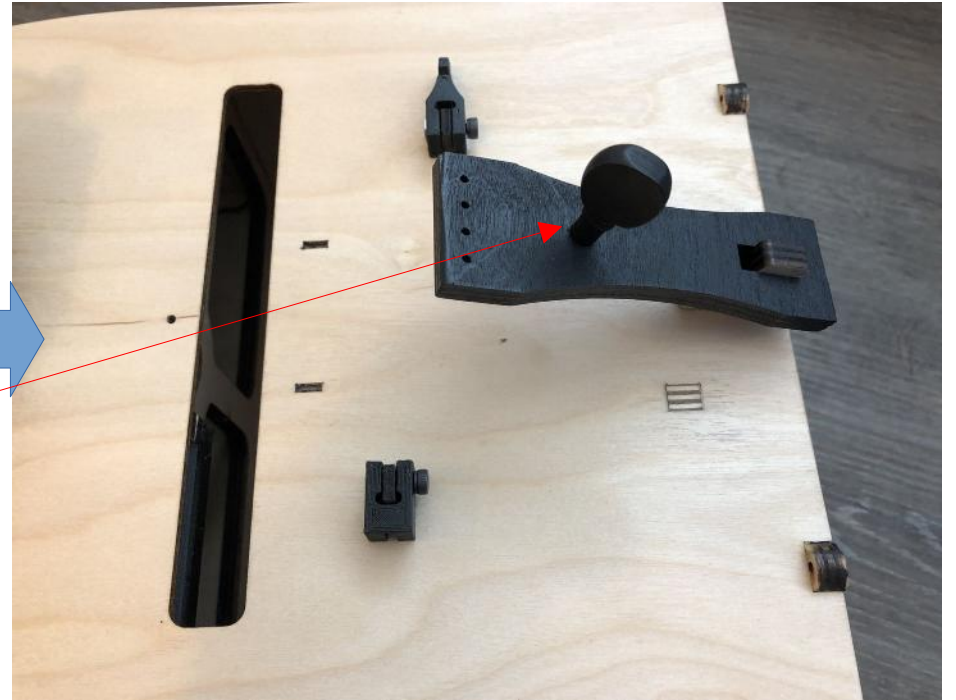
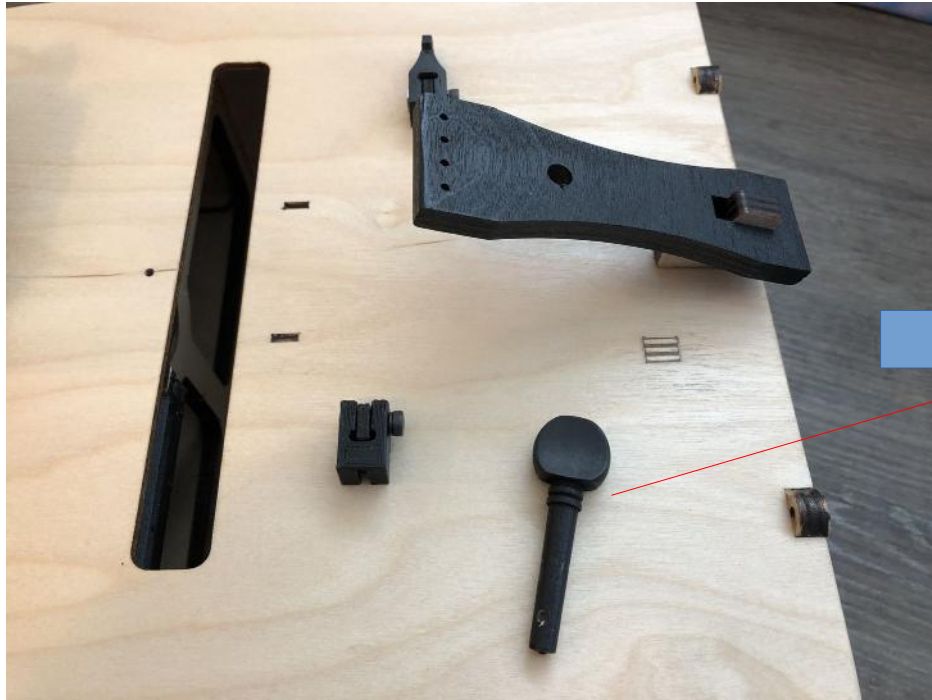
Do NOT glue



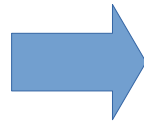
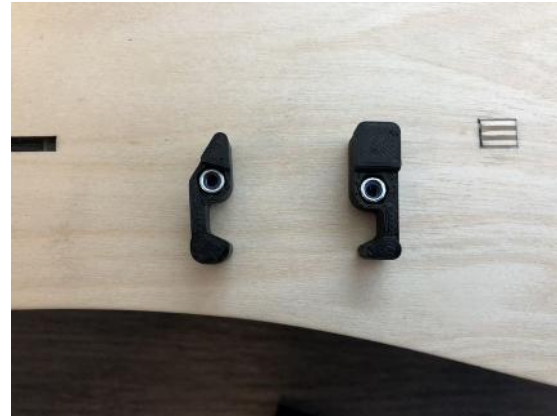
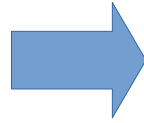
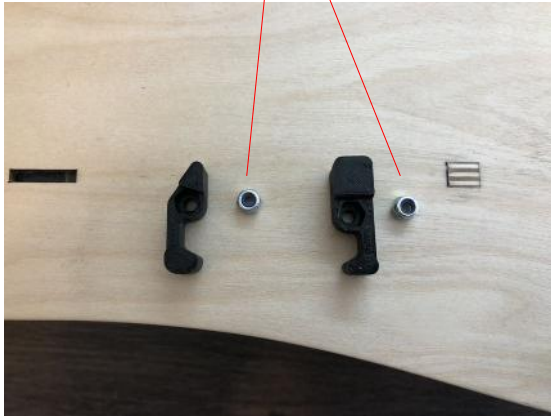


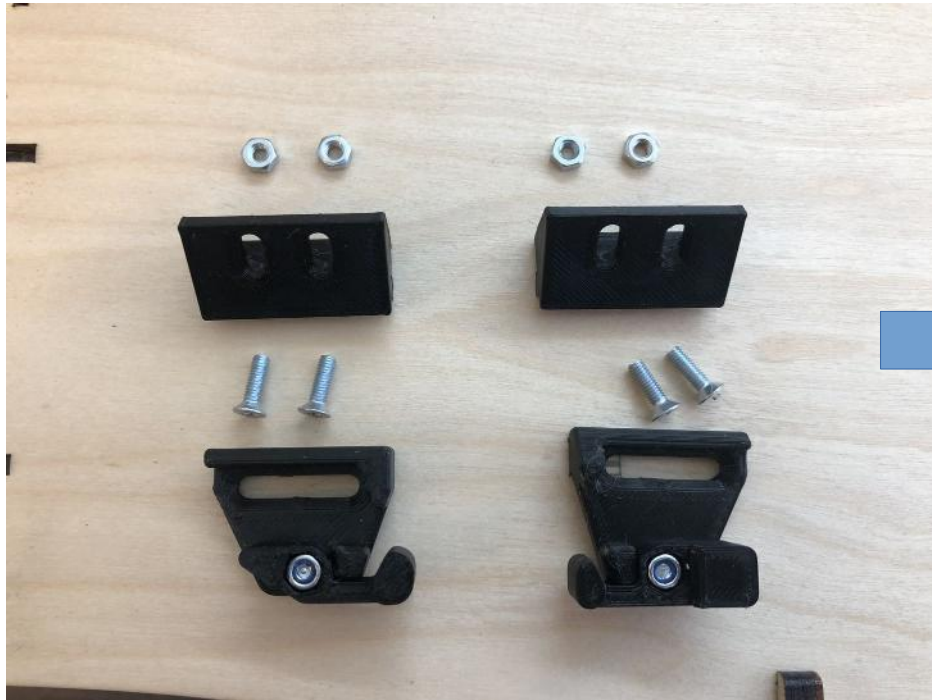
Smallest type of screw in the kit (2,5 x 13 mm)



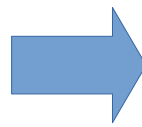
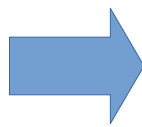


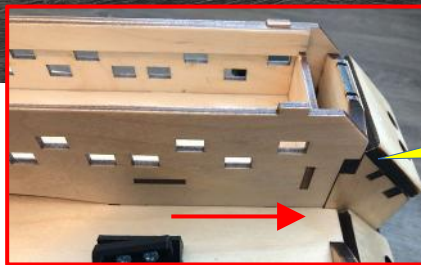
(nyloc)
lock nuts



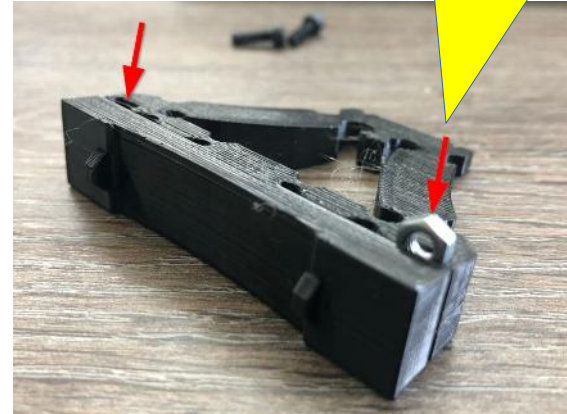
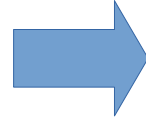
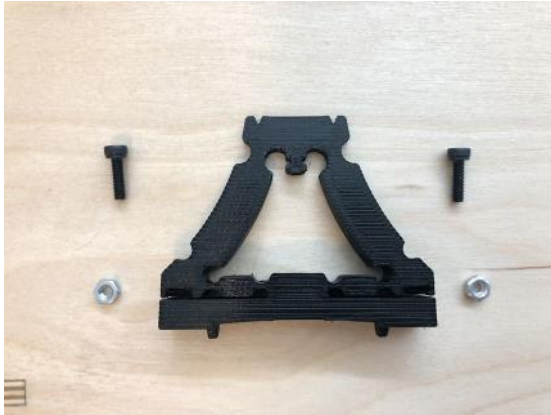


Insert the nuts in the slots on the back side





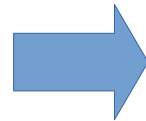
Slide keybox all the way towards the head

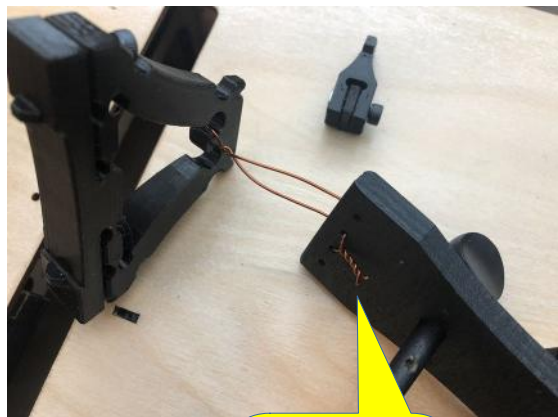
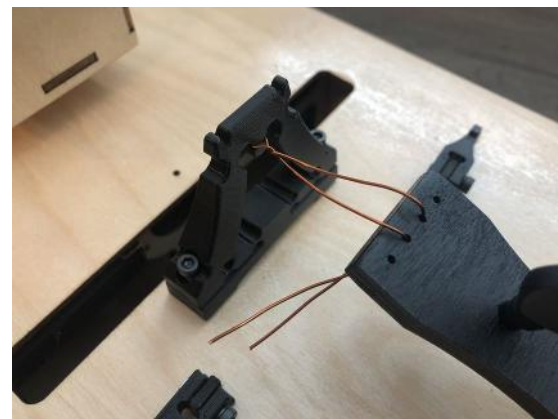
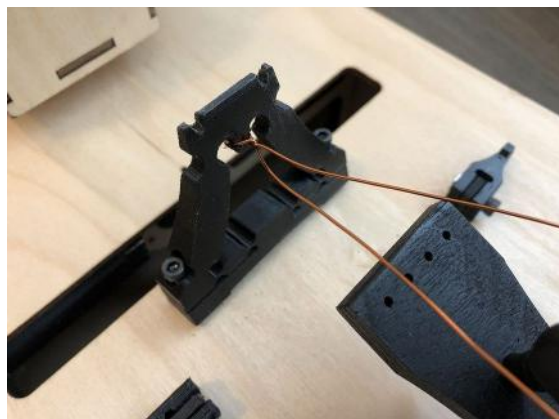
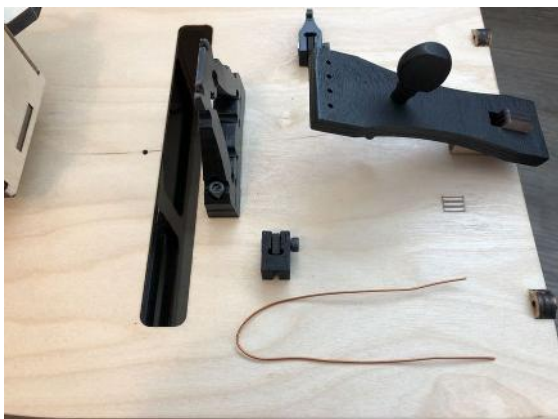


Insert the M3 nuts into these slots

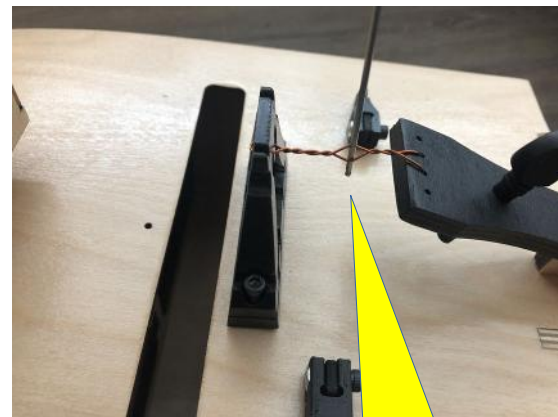
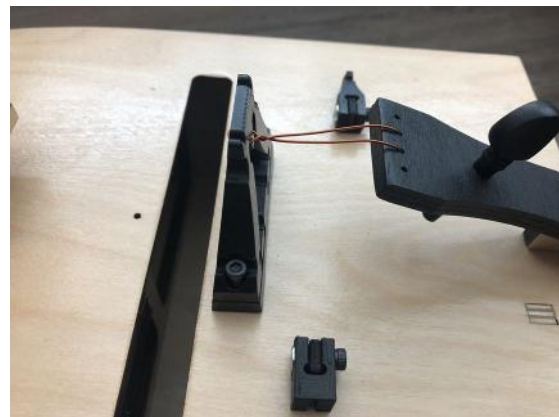


Screw the bolts in from the top (only until the bolts pass through the nut on the bottom side). Later we will use these bolts to adjust the force of the strings on the wheel.





Twist wires together to fixate



Twist the wire to adjust the bridge upright



Add a drop of glue here, so they won't come loose





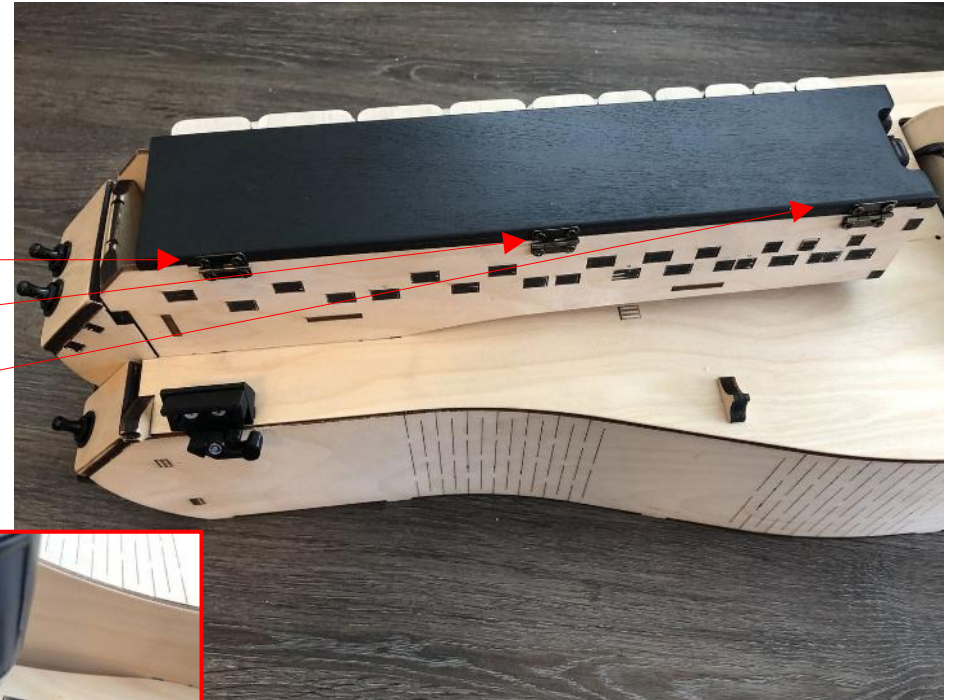


Remove the backing from the self-adhesive strip of felt



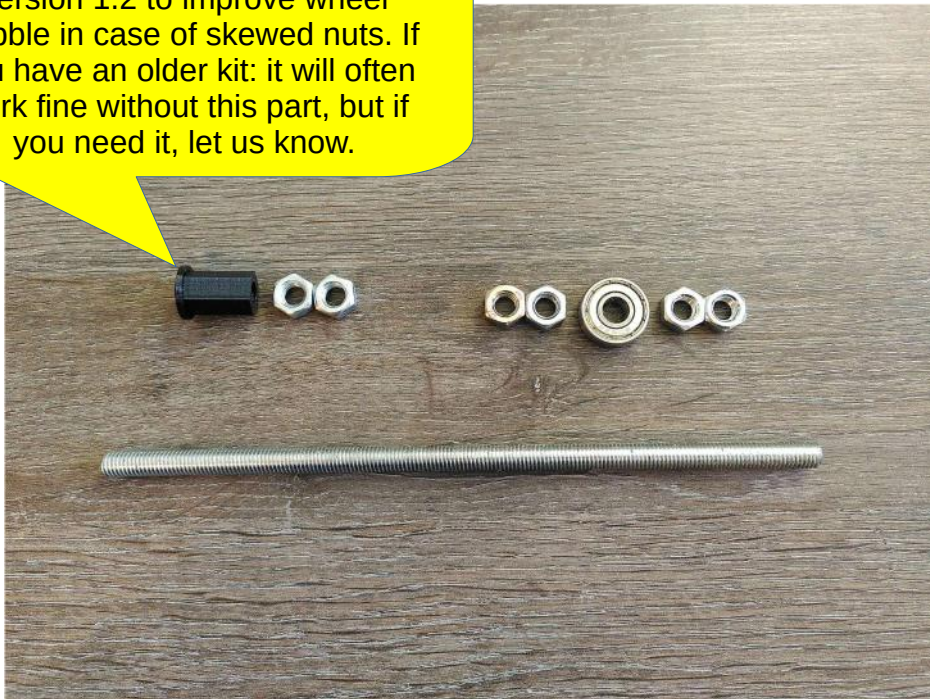
Stick the strip of felt inside the key-box, just above the keys. This reduces the sound of the keys hitting the key box

Attach the lid, with the hinges

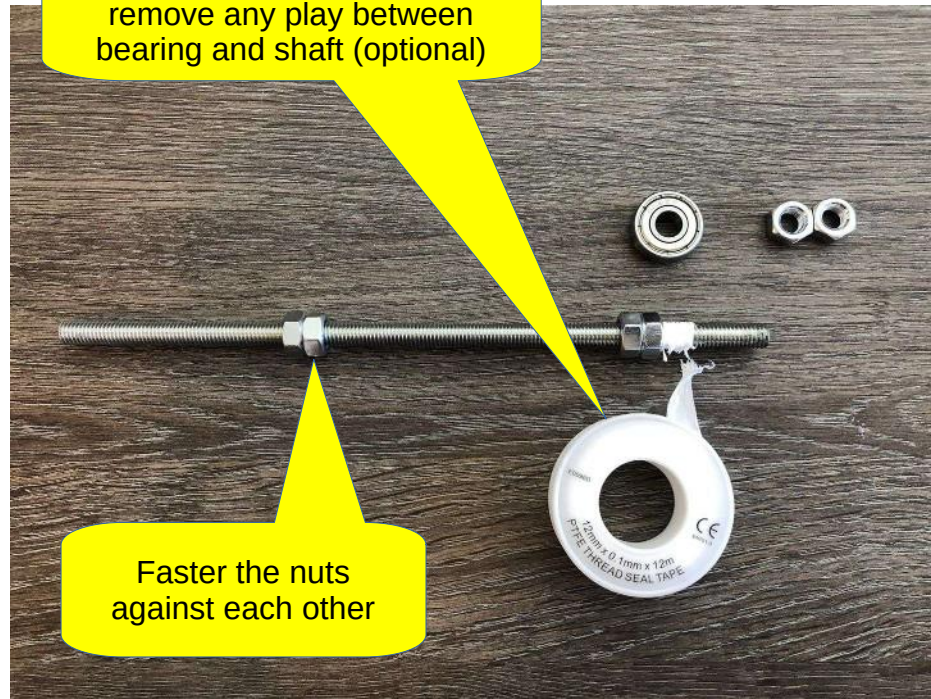


It's best to pre-drill some 1 mm holes in the side on the lid, to reduce the risk of it splitting when you screw in the screws

Note: shaft bush was added from version 1.2 to improve wheel wobble in case of skewed nuts. If you have an older kit: it will often work fine without this part, but if you need it, let us know.



You can use some tape to remove any play between bearing and shaft (optional)



Faster the nuts against each other



~118 mm

11 mm

Insert hex key into one of the small set screws. Loosen the set screws a bit, and make sure that the shaft can in.



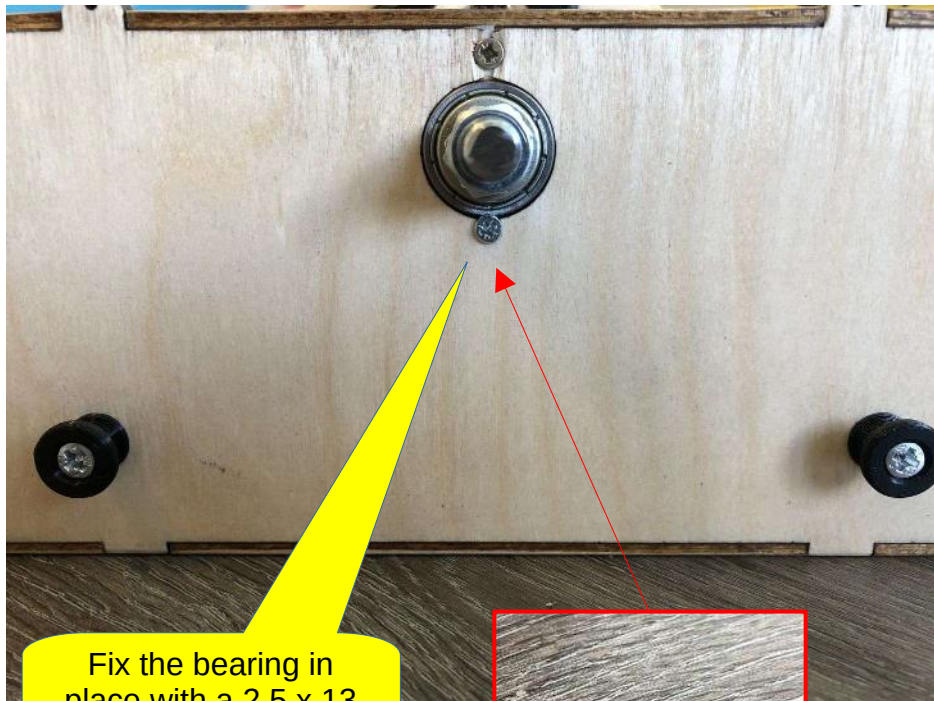
Insert wheel from the top



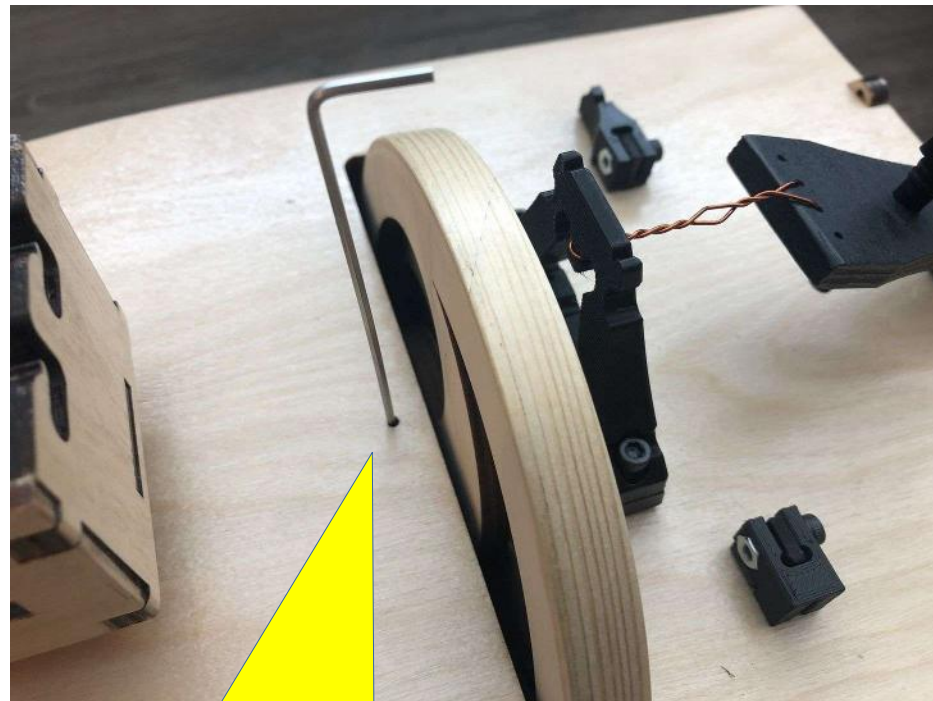
Adjust the position of the nuts if needed



Screw the shaft into the wheel (be careful not to damage the thread!)



Fix the bearing in place with a 2,5 x 13 screw



Tighten the set screw to fixate the shaft. Pull the hex key out and rotate the shaft to find and fix the other set screw by touch (this is a bit tricky, but doable)

It might be necessary to 'true' the wheel after it has been assembled, to make it perfectly circular. You can also do this in a later stage. This is how it's done:

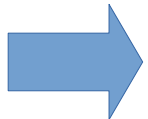
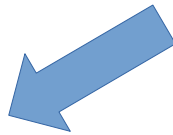
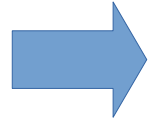
- 1) Add some tape to the sound board to avoid damaging it.
- 2) Turn the wheel with a drill or just with the crank
- 3) Scrape the surface with a sharp chisel or utility knife blade until it is perfectly round
- 4) Finish the surface with a fine grain sanding paper



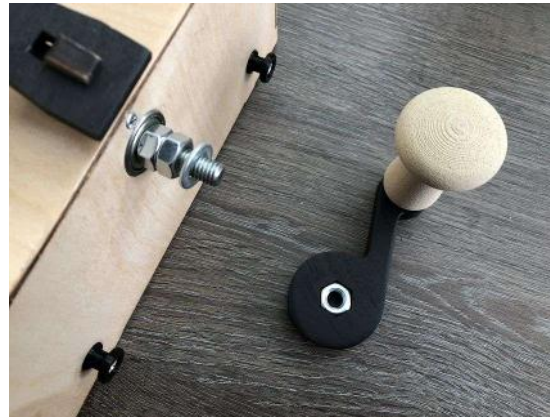
Note: some sideways motion (wobble) is no problem (~1 mm). Roundness is more important, so that the force of the string on the wheel remains constant. If the wheel has excessive wobble, it might help to reverse the nuts and/or shaft as this is the usual source.



(nyloc)
lock nut



Gently press
the knob onto
the bearings

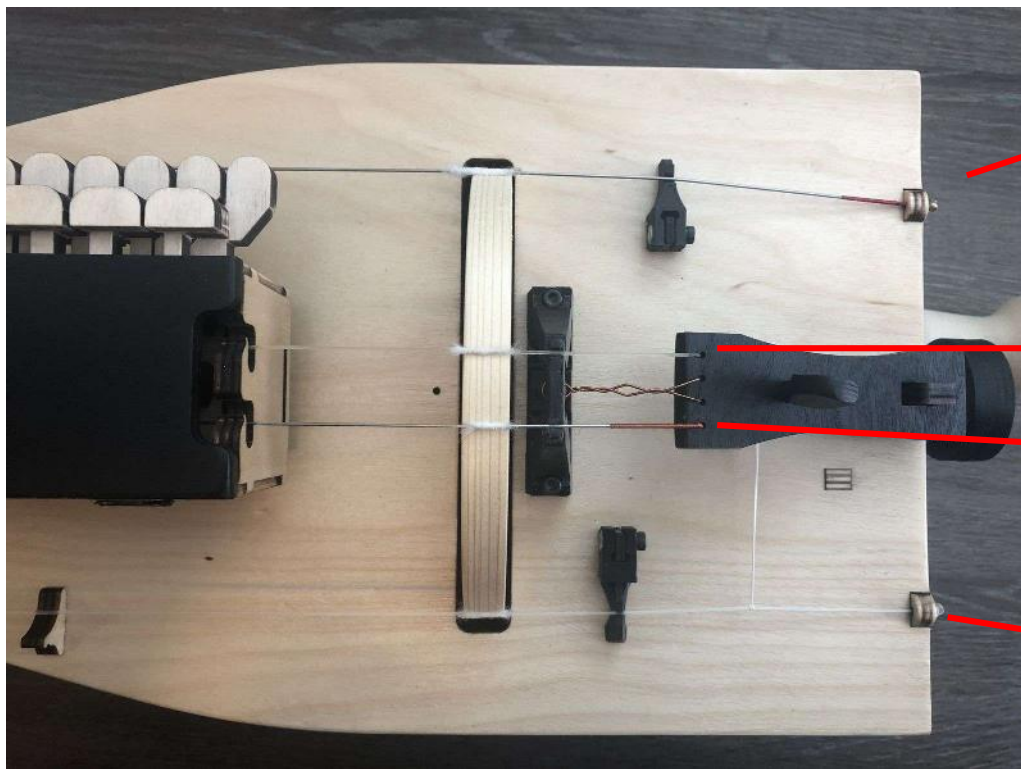


Place the buzzing bridge (dog) . It should be free to slide and vibrate.



Make an 8-knot in the trumpet string and in the high melody string, so you can mount them.





String (tuning)

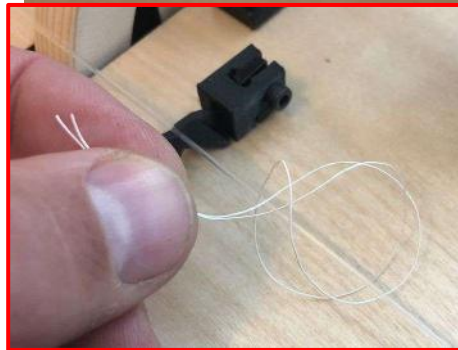
Drone string
Viola C (G2 with capo on C3)

High melody
0.85 gut (G4)

Low melody:
Viola G (G3)

Trumpet string
1.0 mm fluor carbon (C4 with capo on D4)



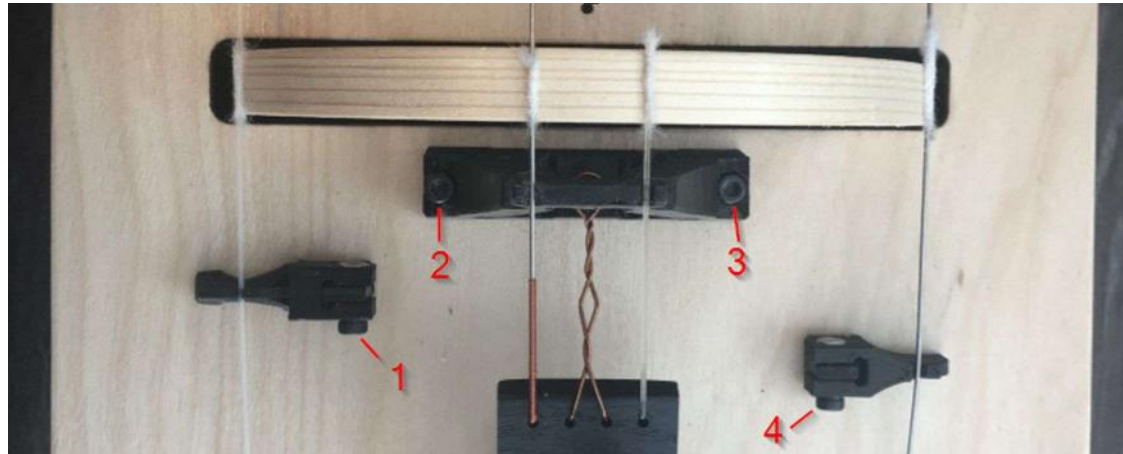


Fold the wire in half, and pass the loop under the trumpet string. Pull the double wire through the loop, to knot it around the string. Then attach the wire to the tuning peg (tirant).

Adjusting the strings on the wheel

Adjusting a hurdy gurdy to sound nice takes practice and patience. If your instrument sounds like two cats fighting: do not despair! We'll try to take you through the steps:

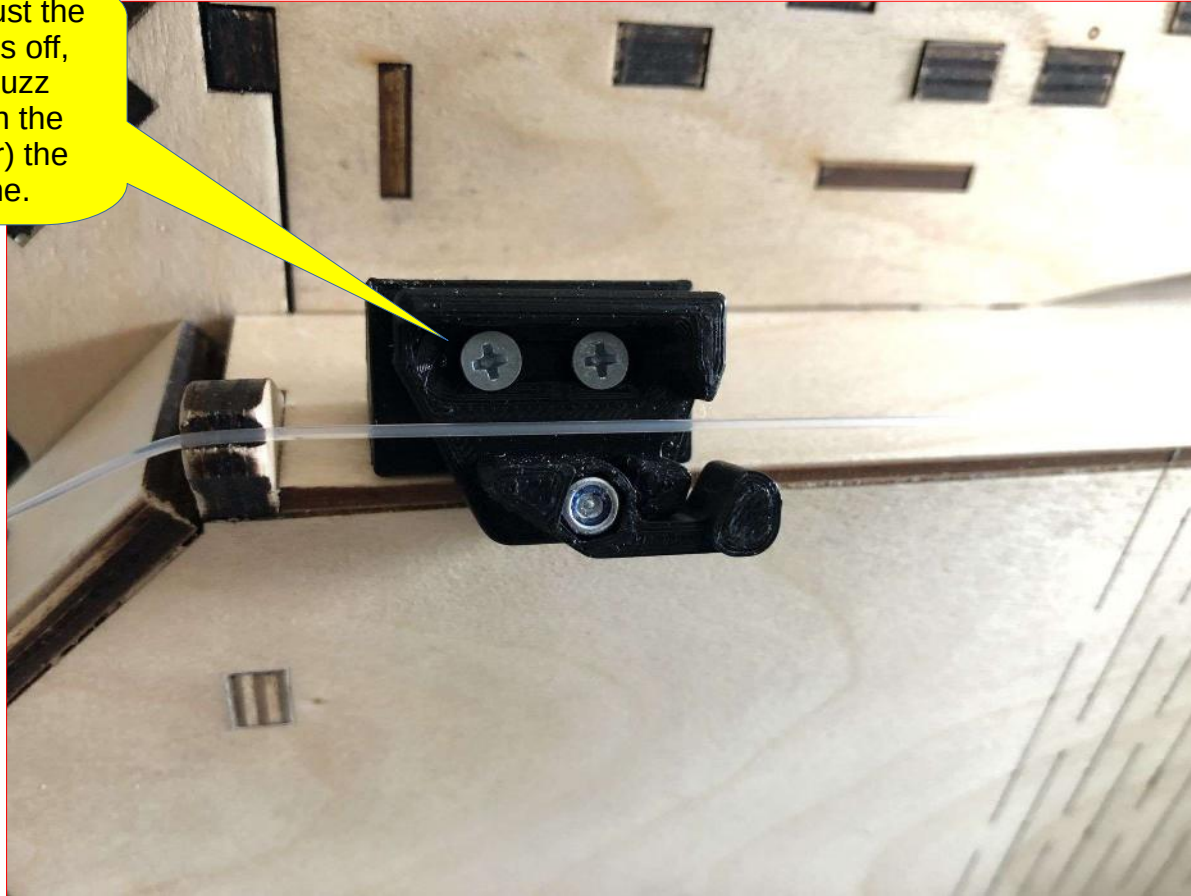
- 1) Apply rosin to the rim of the wheel. You can do this by holding a block of rosin against the rim and rotating the wheel, or you can use liquid rosin (YouTube will explain). Without rosin you won't get a sound. Too much rosin will give a scratchy sound. You can remove rosin by firmly rubbing the wheel with a cloth.
- 2) Use the 4 bolts in the picture below to adjust the pressure of the strings on the wheel. The strings should lightly touch the wheel. If pressure is too low, the sound will be thin. Too much pressure will give a scratchy sound.



- 3) Apply some cotton to the strings, where they touch the wheel. There are a lot of tutorials online on how to do this. Main thing to note here: too much cotton on a melody string will increase the weight of the string in such a way that it becomes difficult to get the two melody strings in tune, especially in the high notes.

Adjusting capos

Use these screws to adjust the capos. When the capo is off, the string should not buzz against the edge. When the capo is on (flip the lever) the tone should be in-tune.



Happy cranking!



Now start practising, like our two youngest kids here! And let us know if you find things that we can improved. The Nerdy Gurdy is a perpetual work-in-progress, and with your experience we may be able to further improve the design for builders to come!

Revisions

- V1.1.0 first release of kit
- V1.1.1 corrections to parts list
- V1.1.2 Inserted missing assembly step (slide 12)
- V1.1.3 Clarified wheel position adjustment in slide 47
- V1.1.4 Updated remarks on slide 49, updated parts list (slide 5 + 6), corrected drone string (slide 53)
- V1.2.0 Added 'shaft bush' (slide 5 and 46) to reduce influence of skewed M8 nuts on 'wheel wobble'.
- V1.3.0 Removed slots on one side of the lid (slide 26). Added remark on shaft bush (slide 46).
- V1.3.1 Merged two types of screw to one length