

Nerdy Gurdy

Assembly instructions



This manual describes how to assemble a **version 6.3** Nerdy Gurdy kit. Go to <https://www.nerdygurdy.nl> for more info about these instruments.

Changes in v6.1

- Dual strap pins added
- Bridge updated to increase volume
- Old version of drone bridge removed
- Redundant plate removed from lid assembly
- Tangents changed to increase tuning range
- Front bearing support improved, to increase volume
- Added adjustment screws to buzzing bridge supports
- Buzzing bridges and drone supports moved backwards (mainly to make adjustment of buzzing bridges accessible)
- Holes in top plate removed
- Full overhaul of the manual
- Various small aesthetic and functional changes

Changes in v6.2

- Removed support plates for strap pins on the outside (not needed and hard to make them look nice)
- Changed buzzing bridge supports to include a nut, instead of screwing directly into the plastic

Changes in v6.3

- Introduced new knob, eliminated shaft nut

Jaap Brand
The Netherlands

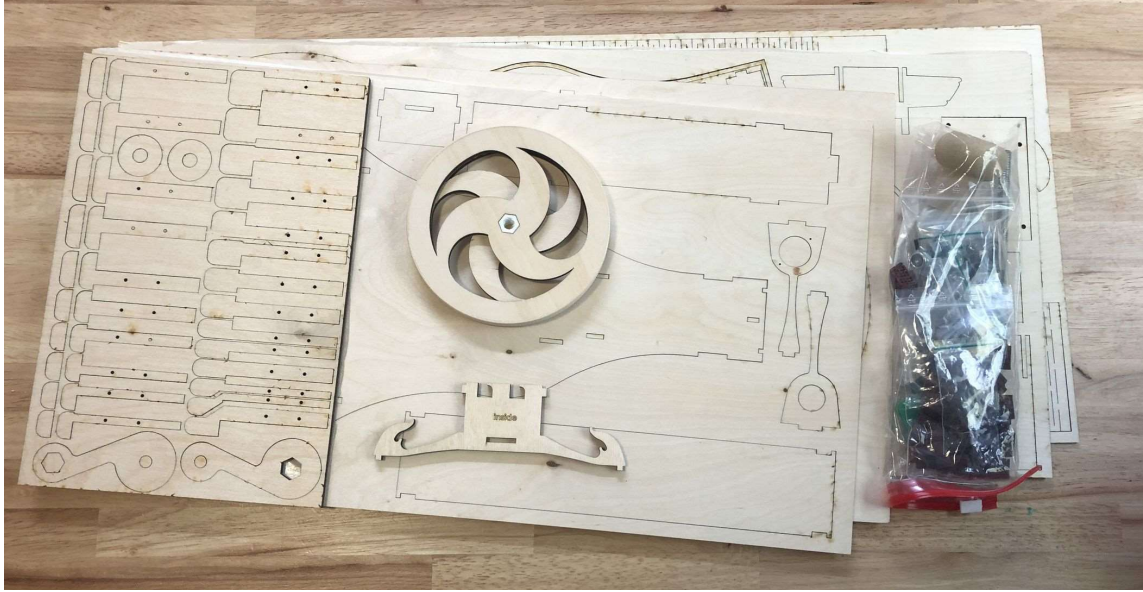
General directions

- The parts are glued together with regular wood glue (not included in the kit).
- Don't glue the bridge or any part that's adjustable.
- Make sure that all surfaces that touch are fully glued together. This prevents undesirable vibration when you're playing.
- When removing parts from the plate that are still attached, it's best to cut the attached points with a sharp knife, to avoid splintering.
- Before glueing, 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.
- It's best to read through the whole sequence, before starting.
- If you do something wrong, it is possible to release wood glue by heating it (e.g. with a hot air gun)

Please note: If you live in a very hot and/or humid climate you may need to take extra care with the type of wood glue that you use. Some glues may not be able to keep the required strength

Parts Included in the kit

wood	sheet 3mm	4x	
	sheet 6 mm	1x	
Loose parts	nut M3	4x	NG-18
	bolt M3 x 10	4x	NG-19
	bolt M3 x 12	2x	NG-20
	Bolt m3 x 20	2x	NG-21
	Screw 2,5 x 13	4x	NG-22
	Screw 3,5 x 17	7x	NG-23
	Screw 3,5 x 20	2x	NG-24
	spacer ring	5x	NG-25
	Strip of felt	1x	NG-26
	string holders	4x	NG-27
	bearing 8mm	2x	NG-28
	bolt M2,5 (for tangents)	48x	NG-29
	nut 8mm	8x	NG-30
	Metal tuners + washers	6x	NG-31
	wooden violin pegs	2x	NG-32
	threaded rod M8 22cm	1x	NG-34
	bearing 5mm	1x	NG-35
	Locking nut M5	1x	NG-36
	nut m5	1x	NG-37
	Bolt m5 x 50	1x	NG-38
spacer tube	1x	NG-39	
strings	chantarelle low G (viola G)	1x	
	chantarelle high G (viola A)	1x	
	trumpet C	1x	
	trumpet G	1x	
	bourdon high C (cello G)	1x	
	bourdon low G (cello C)	1x	
printed parts	Strap pin alignment tool	1x	NG-1
	backplate glueing help	1x	NG-2
	Upper trumpet edge support	1x	NG-3
	buzzing bridge support lower	1x	NG-4
	buzzing bridge support upper	1x	NG-5
	buzzing bridge	2x	NG-6
	Bearing holder ring	2x	NG-7
	Drone support bushes	2x	NG-9
	strap pin	3x	NG-10
	knob	1x	NG-40
	Strap pin support plate (inner)	2x	NG-13
	tangent high	28x	NG-15
	tangent low	20x	NG-16
Semi-Finished parts	wheel	1x	



The complete kit

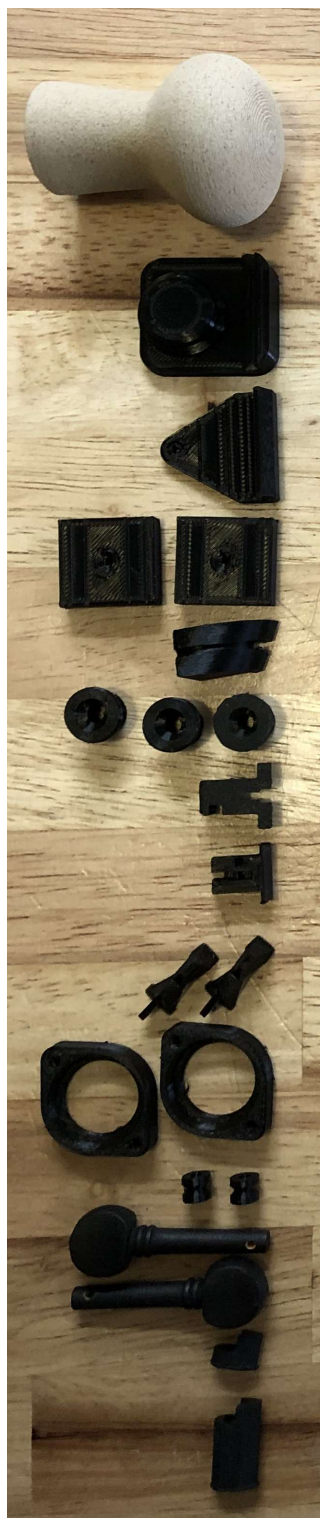


tuners NG-31



Strip of felt [NG-26]

Threaded rod M8, 22cm[NG-34]



Knob NG-40

Backplate gluing help NG-2

Strap pin alignment tool NG-1

Strap pin support plate (inner)
NG-13

Upper trumpet edge support
NG-3

Strap pin NG-10

Buzzing bridge support lower
NG-5

Buzzing bridge support upper
NG-4

Buzzing bridge NG-6

Bearing holder ring NG-7

Drone support bushes NG-9

Wooden violin pegs NG-32

Tangent low NG-16

Tangent high NG-15



Nuts-M3 NG-18

Bolts M3x10 NG-19

Bolts M3x12 NG-20

Bolts M3x20 NG-21

Screws 2,5x13 NG-22

Screws 3,5x17 NG-23

Screws 3,5x20 NG-24

Spacer rings NG-25

String holders NG-27

Bearings 8mm NG-28

Bolts M2,5 NG-29

Nuts M8 NG-30

Bearings 5mm NG-35

Locking nut M5 NG-36

Nut M5 NG-37

Bolt M5x50 NG-38

Spacer tube NG-39

note: the colours of the printed parts may be different in your kit

Not included in kit

You will need the following materials to build your Nerdy Gurdy (not included in the kit):

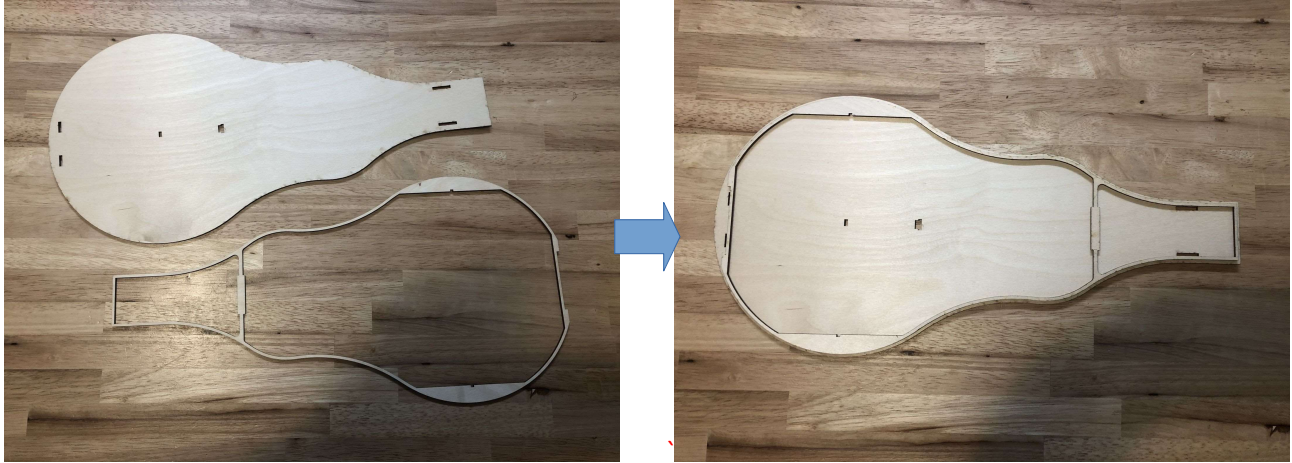
- Wood glue
- (retractable) knife
- A number of gluing clamps
- Varnish (optional, but recommended)
- Sand paper
- Some tools (screw drivers, 13 mm spanner, small drill etc.)
- Some basic woodworking skills and patience :)

Glue the ridges to the top and bottom plates

Notes:

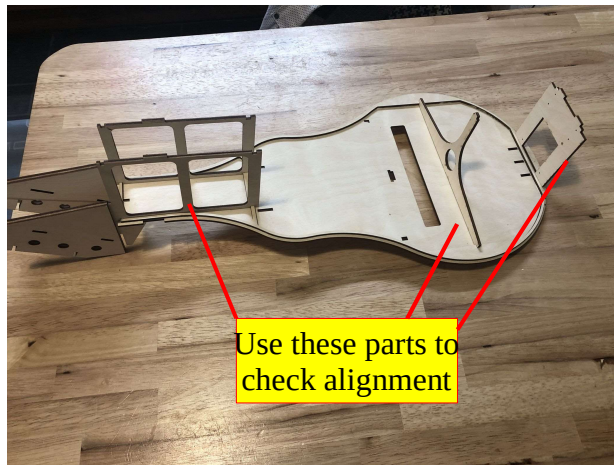
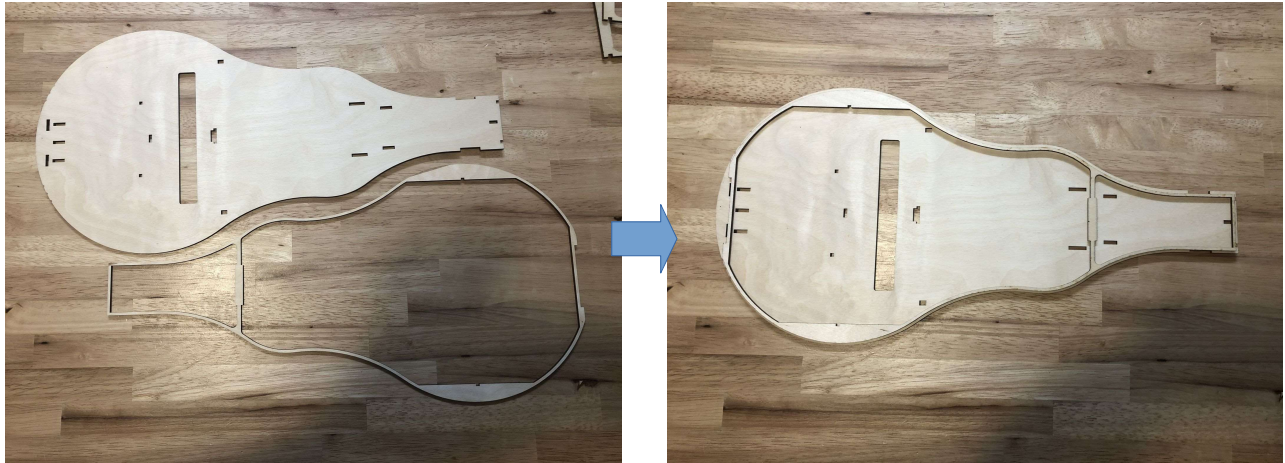
- These parts are all symmetrical, so pick the nicest looking surfaces as outsides of your instrument
- Make sure that the parts are nicely centered. You can use mating parts to check alignment (picture below)
- You can use some books to press the parts together
- There should be a plate thickness all around the glued-on ridge

Bottom plate:



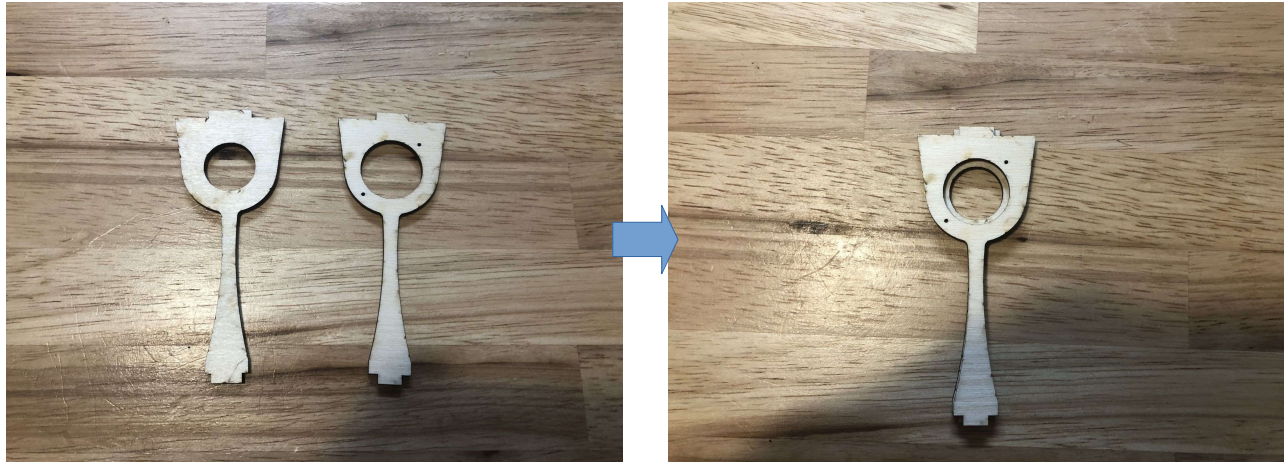
(only use them to align, don't glue these yet)

Top plate:



(only use them to align, don't glue these yet)

Bearing support



Combine the two plates that will support the front bearing



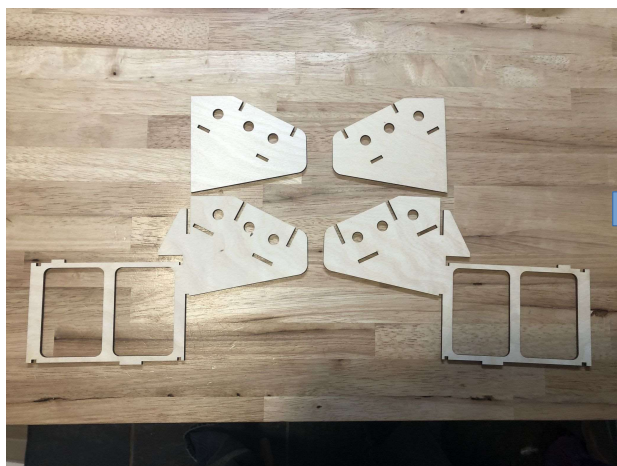
Use

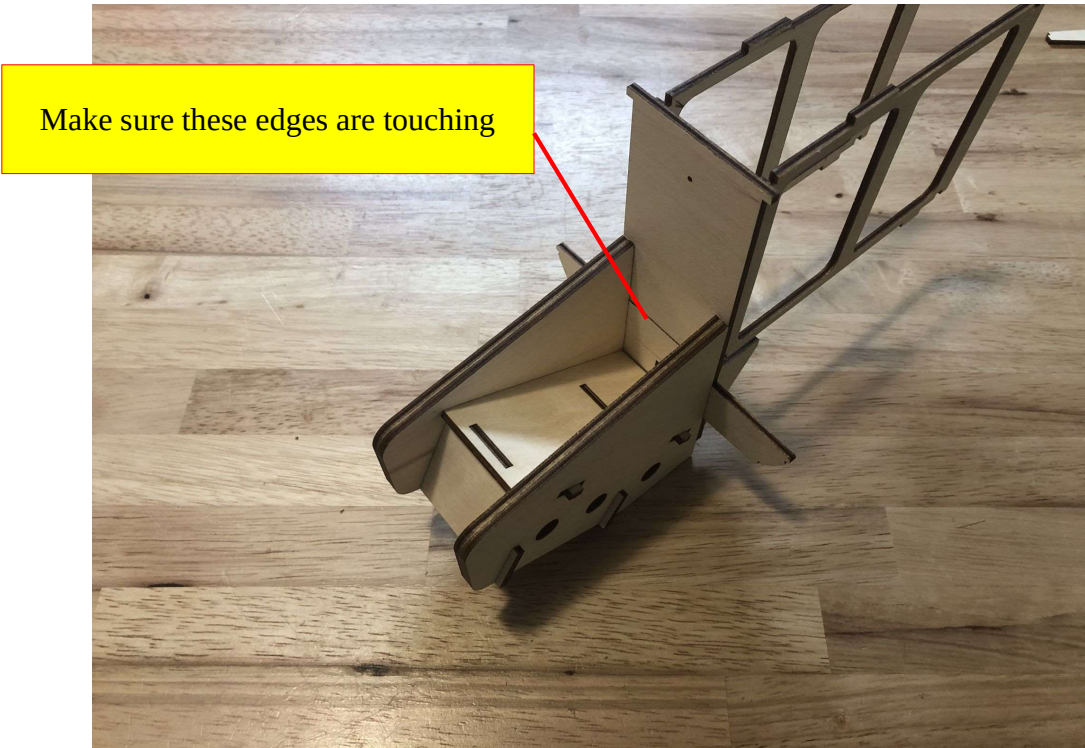
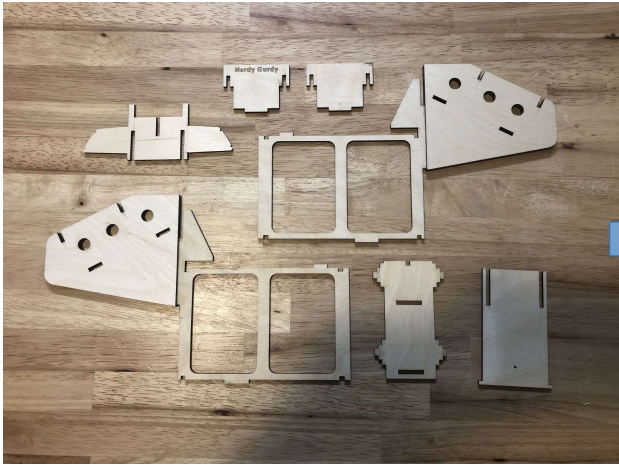
parts: NG-28 and NG-7

A

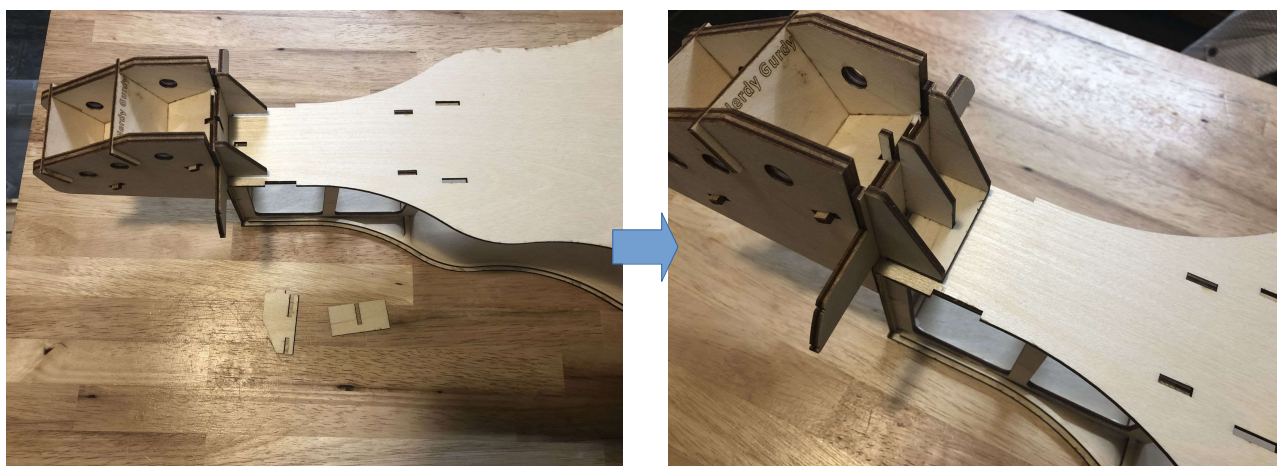
the bearing

Assemble the head

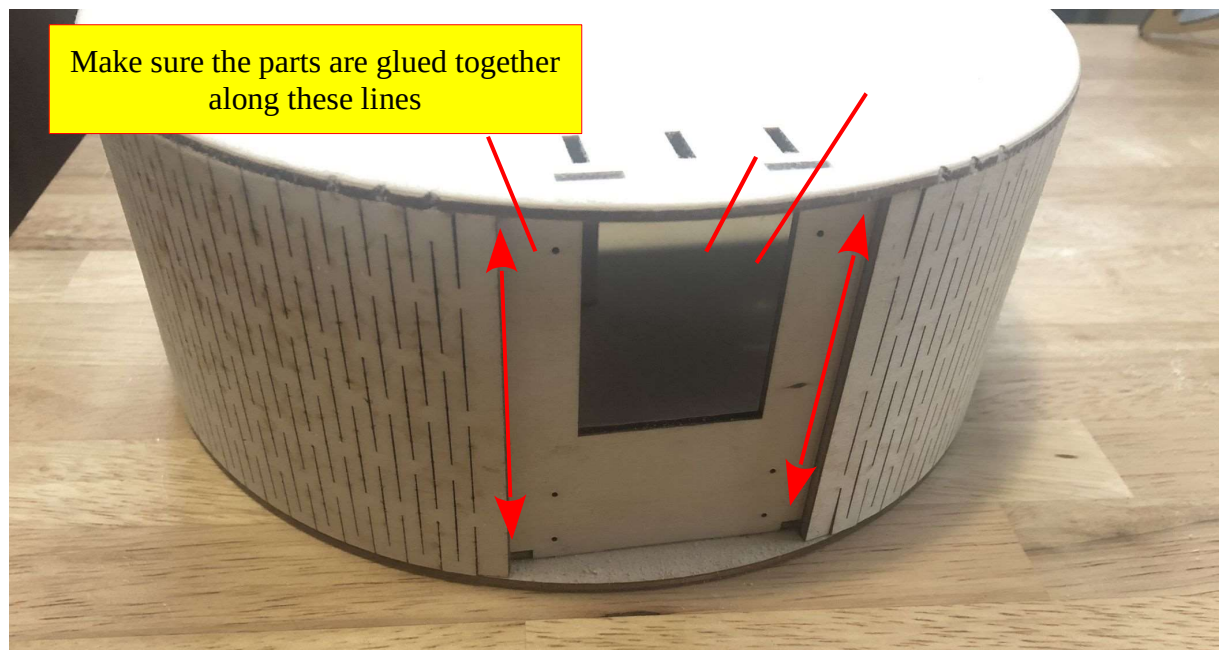
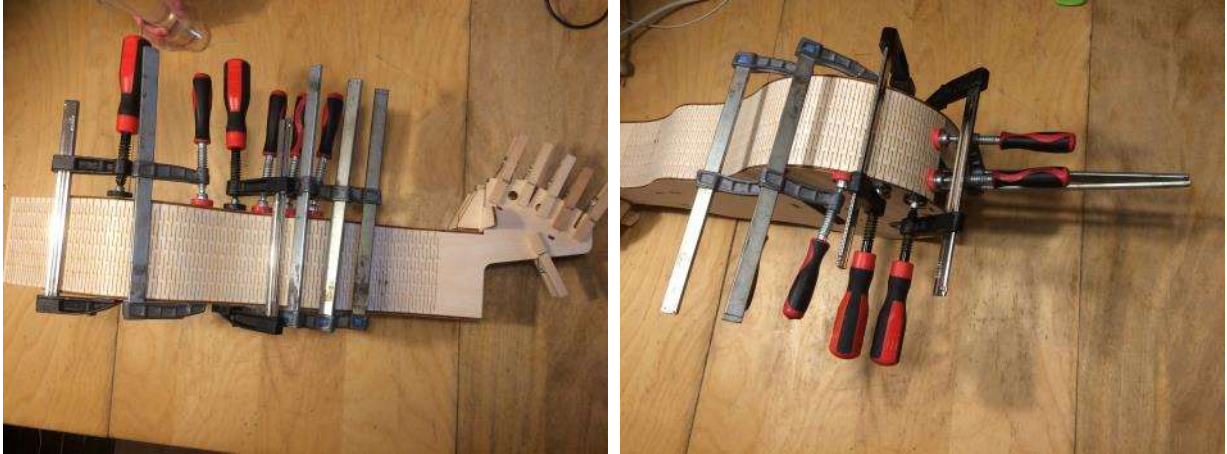




Mount the head, bearing support and rear between the top plate and bottom plate.

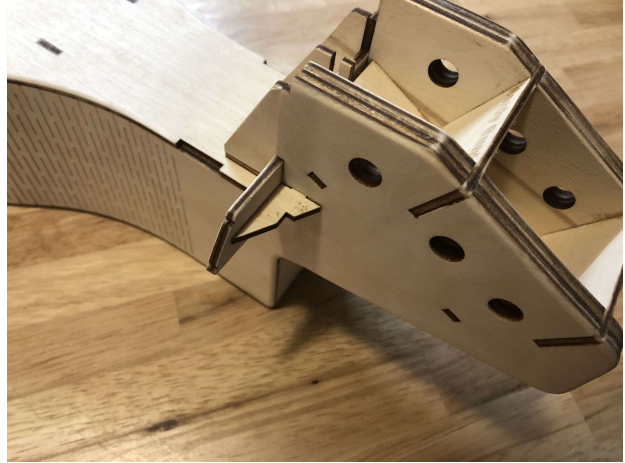
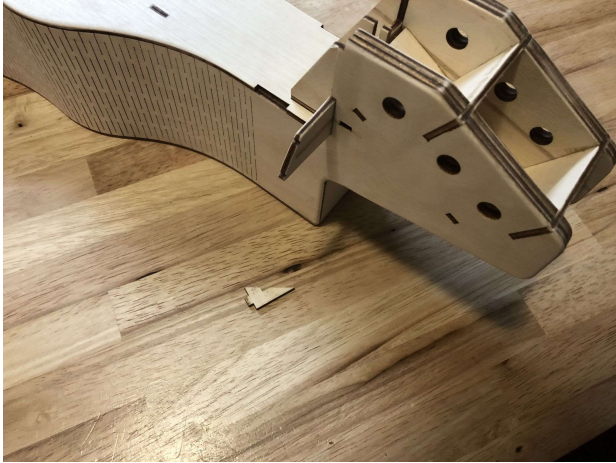


Mount the sides, starting from the head

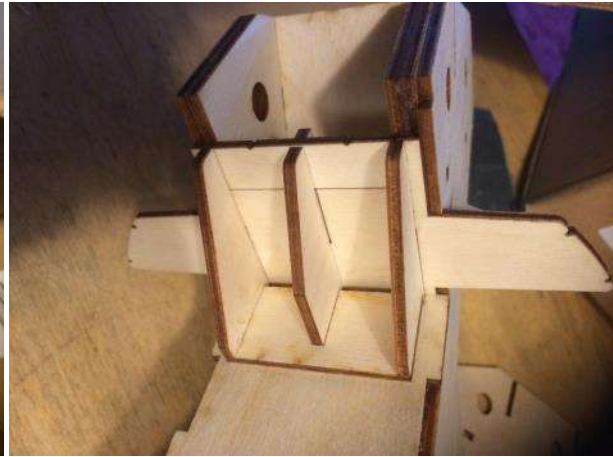
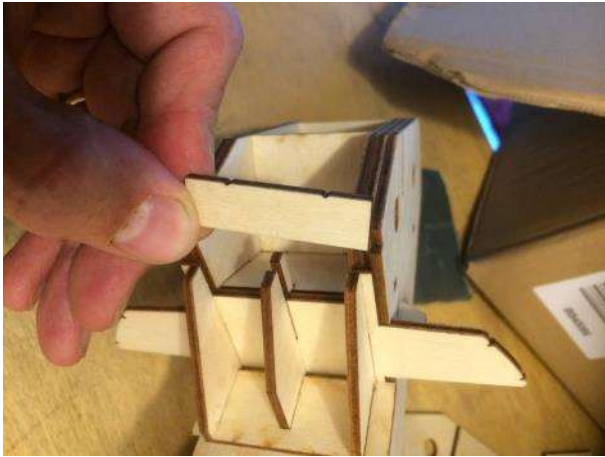


- **Notes:**
- You can glue the parts in steps, if you don't have enough clamps (like me).
- Make sure that tabs are fully inserted into the slots.
- Make sure that all surfaces are glued together well, especially at the rear of the instrument. This is necessary to resist the force of the strings.

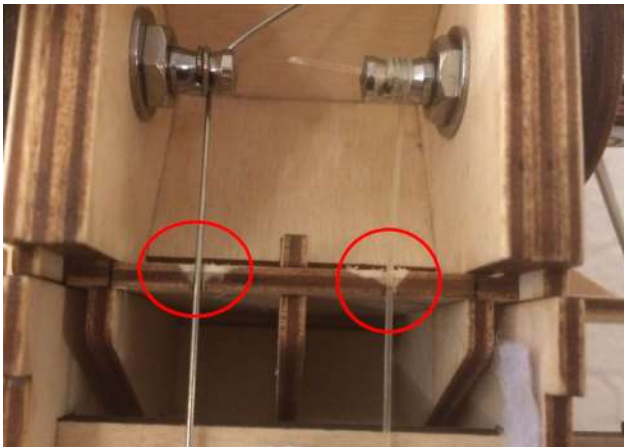
Put the wedges at the head



Install the bridge

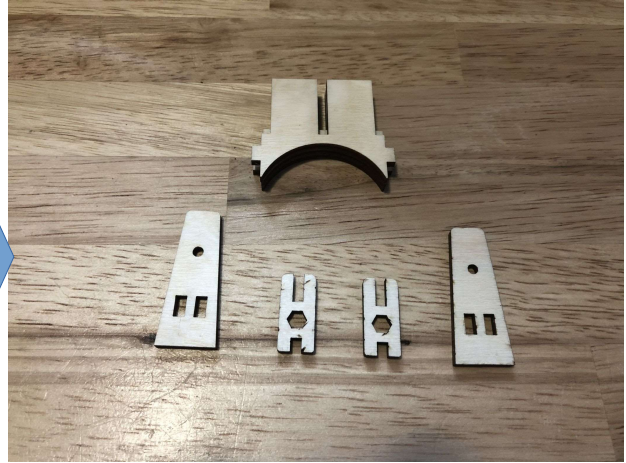
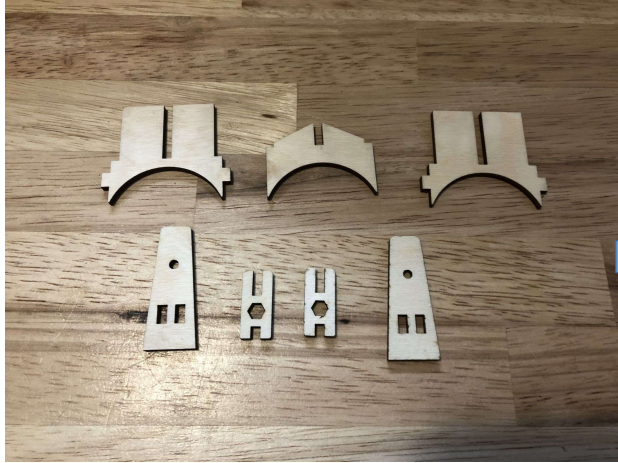


- You don't need to glue the bridge: it may be nice to be able to replace it.



It's recommended to file a bit of a V shape in the bridge pieces, so that each string touches the bridge just at the end. This ensures that the two strings of different thickness have the same effective scale length.

Assemble the tailpiece



use

parts NG-18 and NG-19





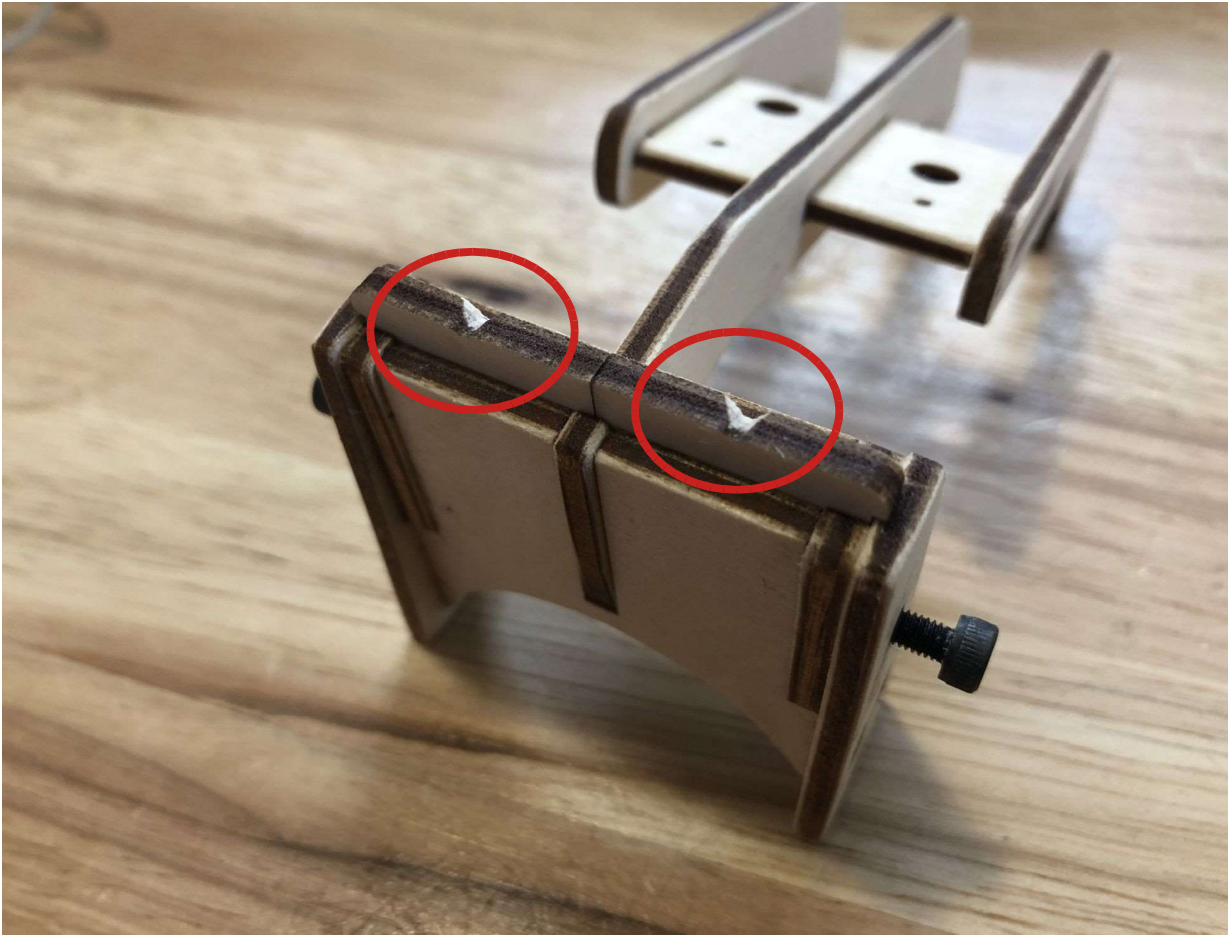
Notes:

- Make sure that you insert the nuts, before you glue everything together.
- Use two of the M3 bolts to make sure that there is no glue in the nuts.

Place the bolts, wedge parts and bridge segments



Don't glue these, they need to be adjustable with the bolts!

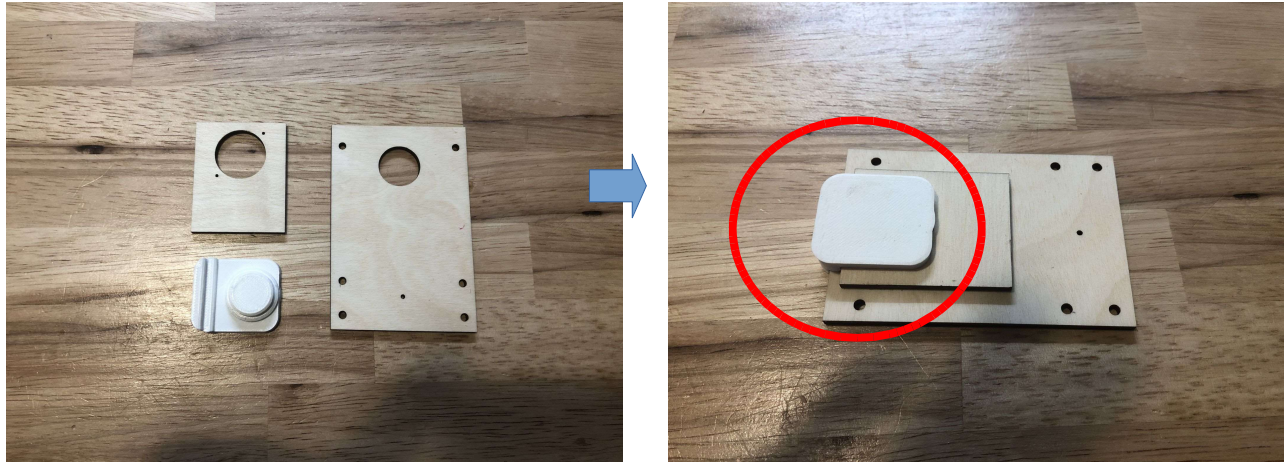


Grooves should be filed into the bridge segments, so that you're sure that the string is touching it at the front.



use parts NG-32

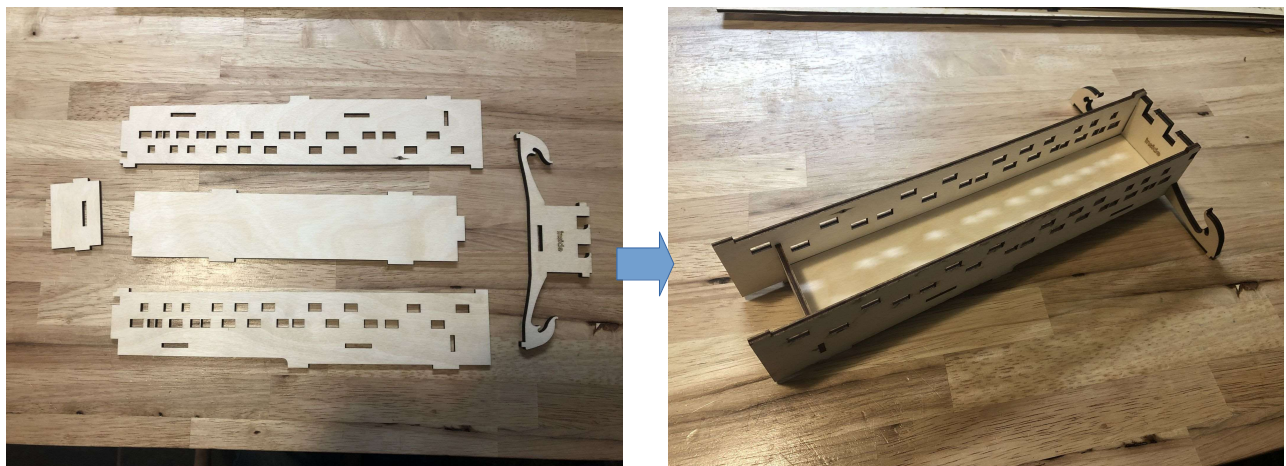
Glue the rear cover pieces together



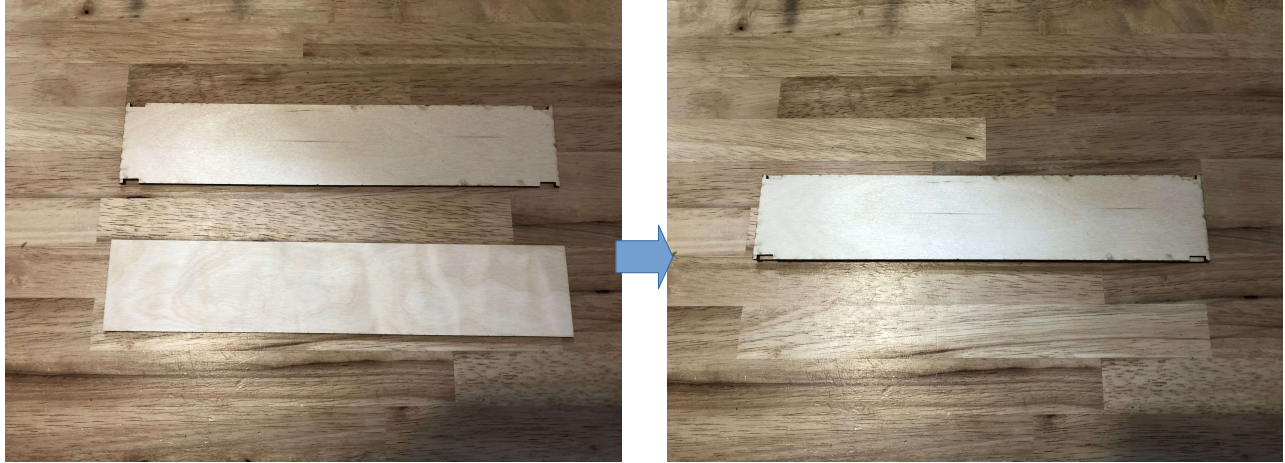
use the glue tool ([NG-2](#)) to align the two parts, and then discard the printed part



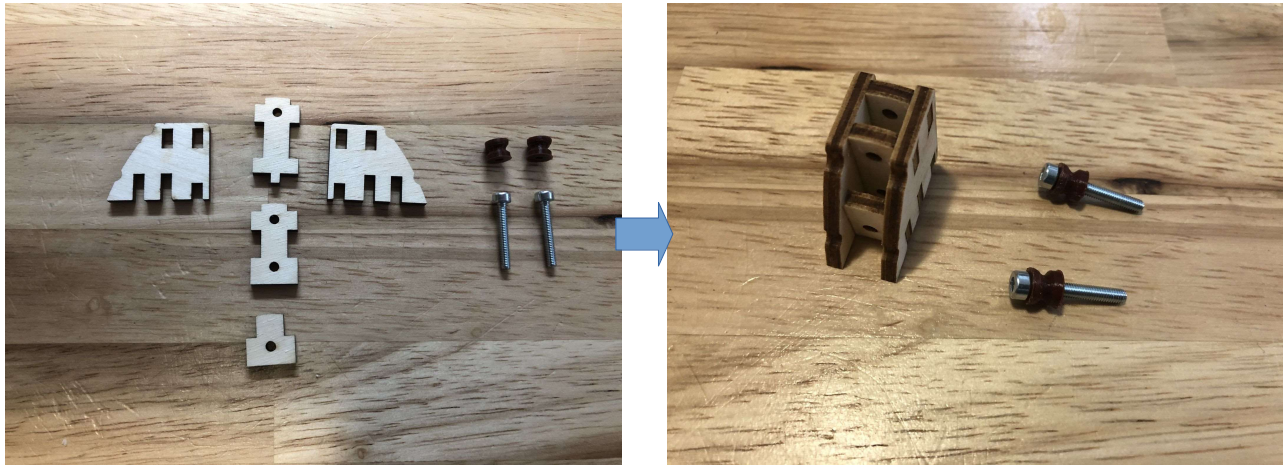
Assemble the keybox



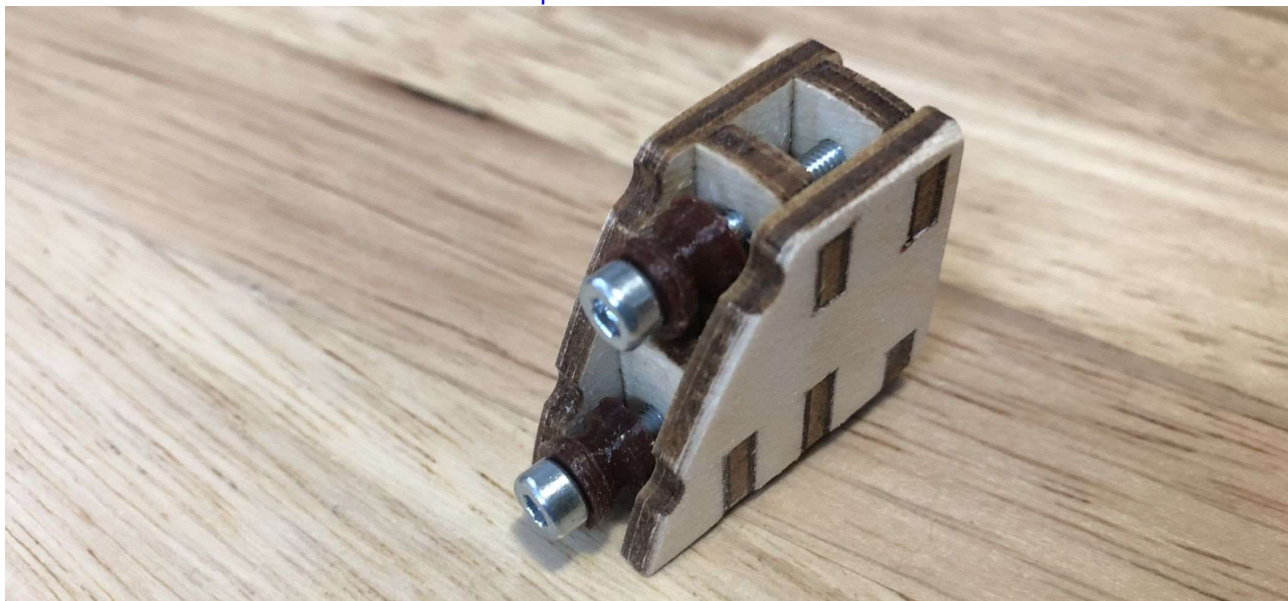
Glue the lid pieces together



Assemble the drone bridge support



use parts NG-21 and NG-9



Assemble the supports for the buzzing bridges



Put the M3 nuts into the buzzing bridge supports
use parts NG-4, NG-5, NG-18

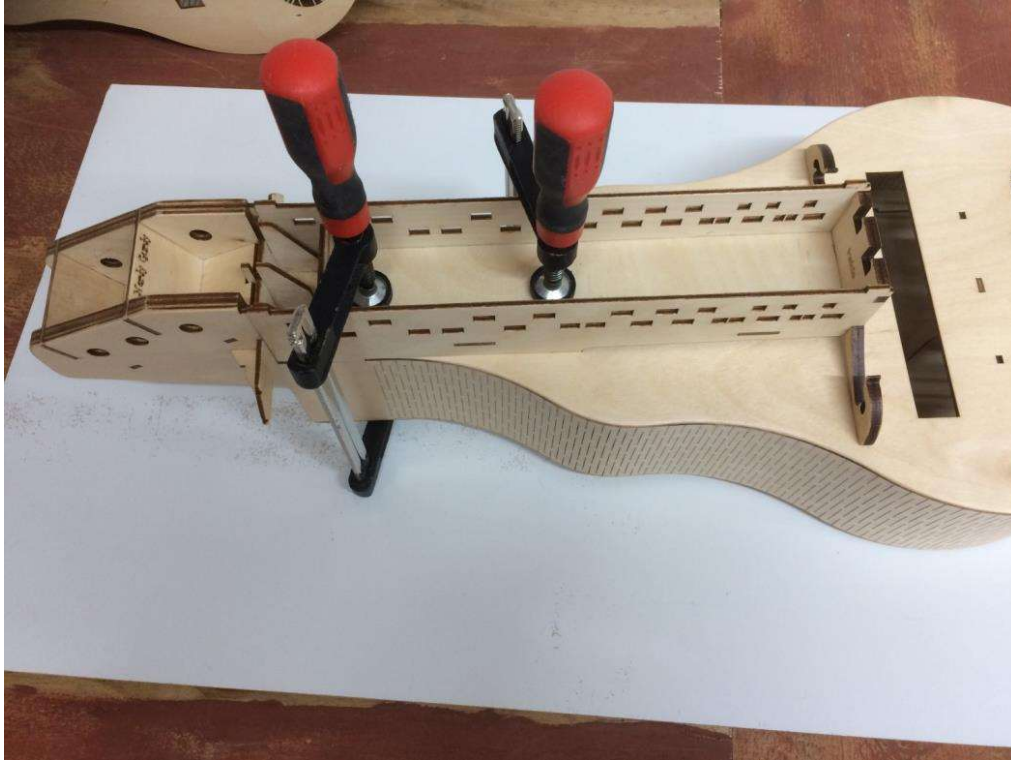


use parts:NG-19, NG-20, NG-6

Apply lacquer

You may want to lacquer or paint your parts at this point in the assembly, before mounting the key-box to the body.

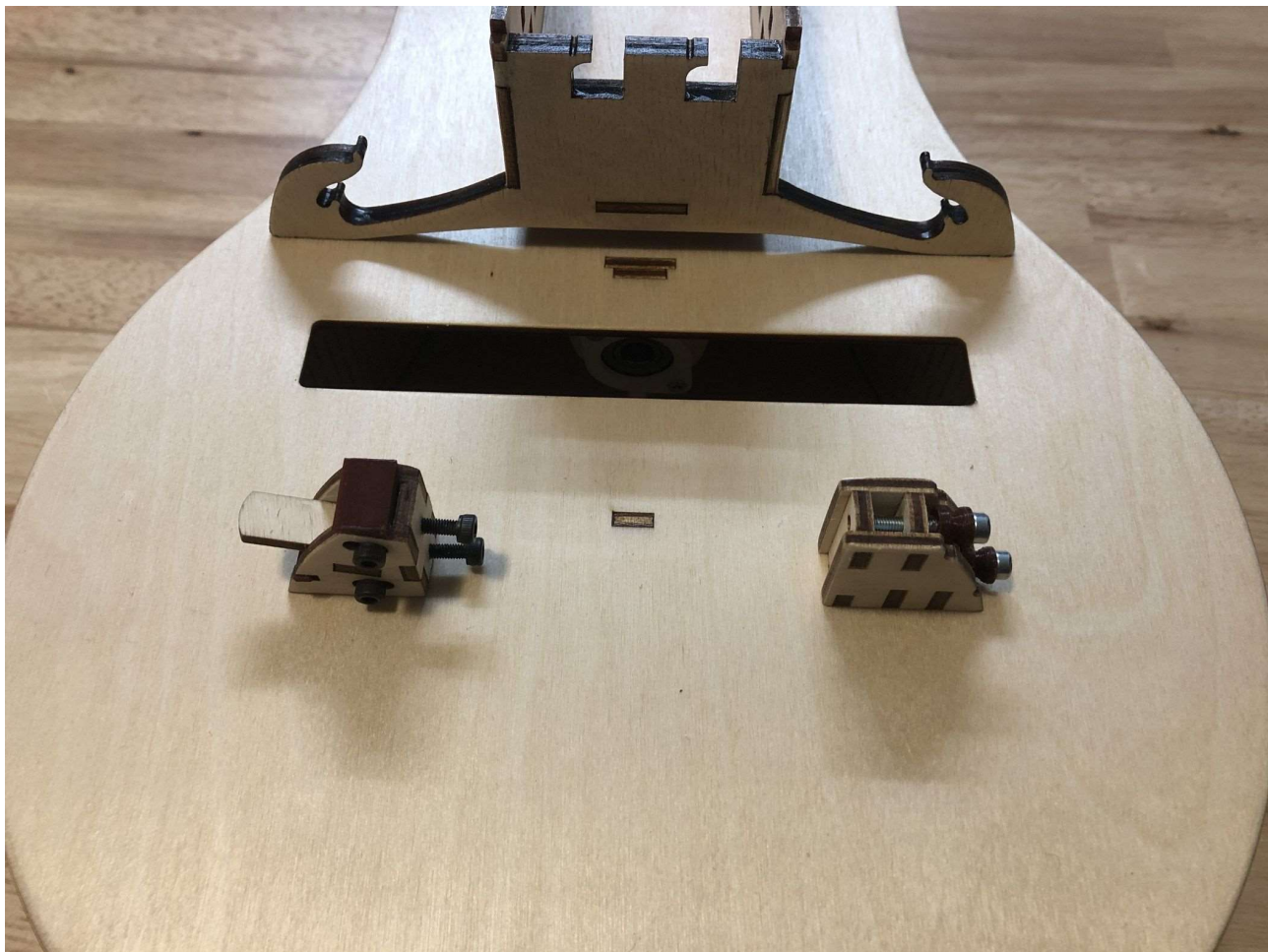
Glue the key-box to the body



Mount the supports to the body



Use a straight part, e.g. the lid, to align the parts. It is easiest to temporarily remove the support of the buzzing bridge when you do this, to avoid gluing it to the to plate.

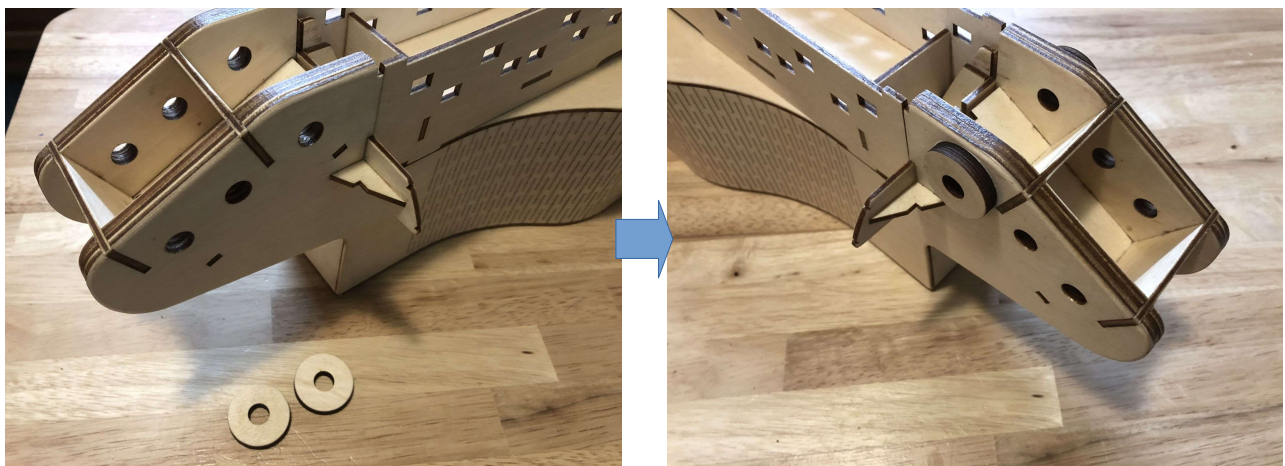


Mount the tail piece

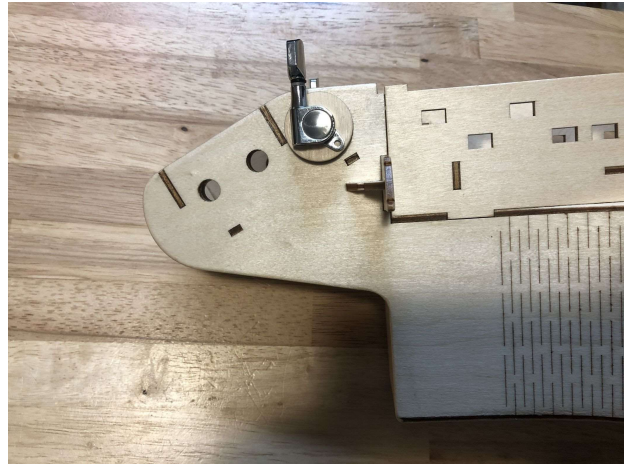
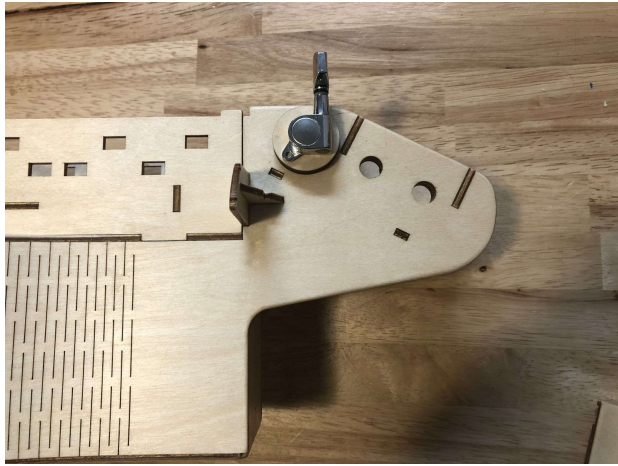


You don't need to glue the tail piece in place, but it makes it a bit more stable.

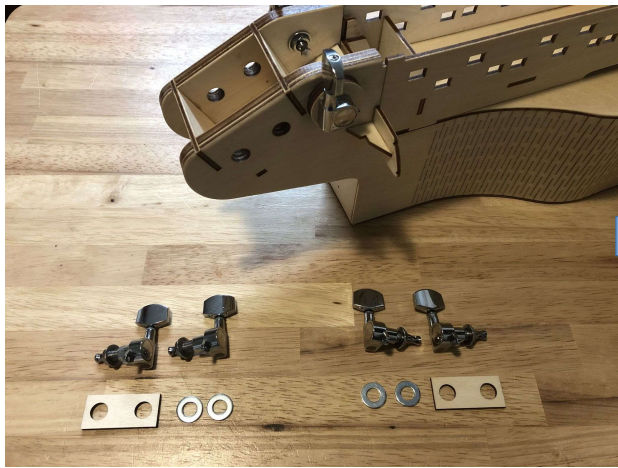
Assemble the machine heads



Mount the wooden spacer rings on both sides of the head



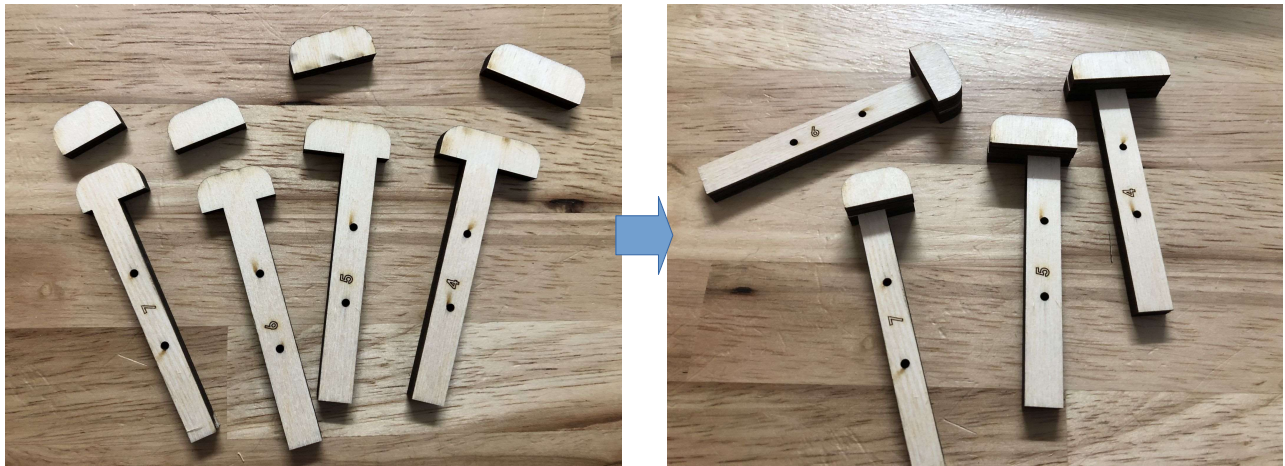
Mount the tuners for the melody strings
use part NG-31



Mount the other tuners, with the wooden spacer on the inside, and an extra washer on the outside.
You do not need the little screws that come with the tuners, but if you can find a way feel free to put them in.

Use part NG-31

Glue an extra layer on top of the short keys



- Notes: The numbers are on the top of the keys. That's the side on which you need to stick the extra layer. Except when you're building the kit for a left-handed player: then the numbers go on the underside!

Assemble keys and tangents





Mount the tangents. The strip of felt is glued inside the key box, to dampen the sound of keys dropping back.
Use parts [NG-15](#), [NG-16](#), [NG-29](#)

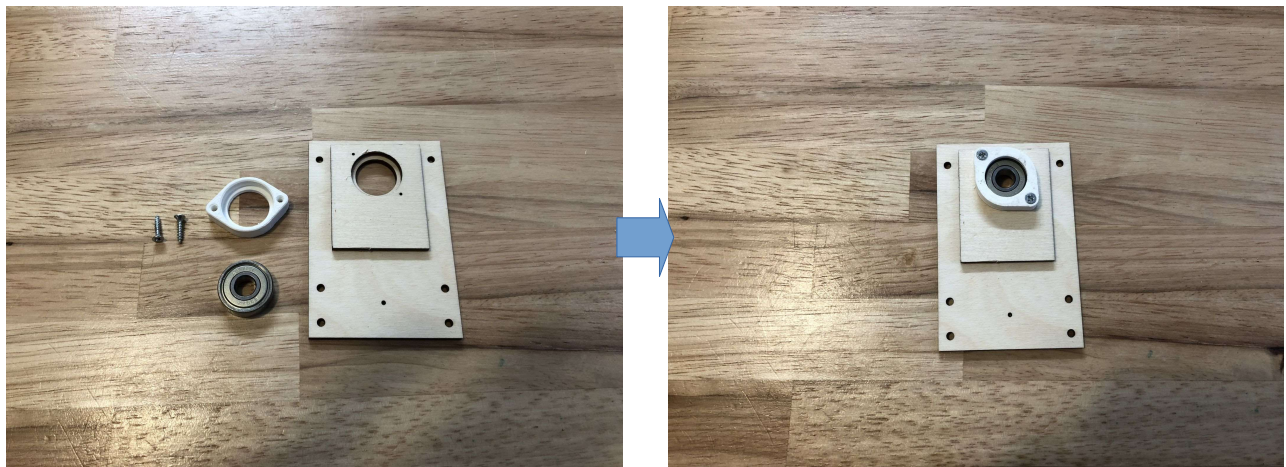
Assemble the shaft



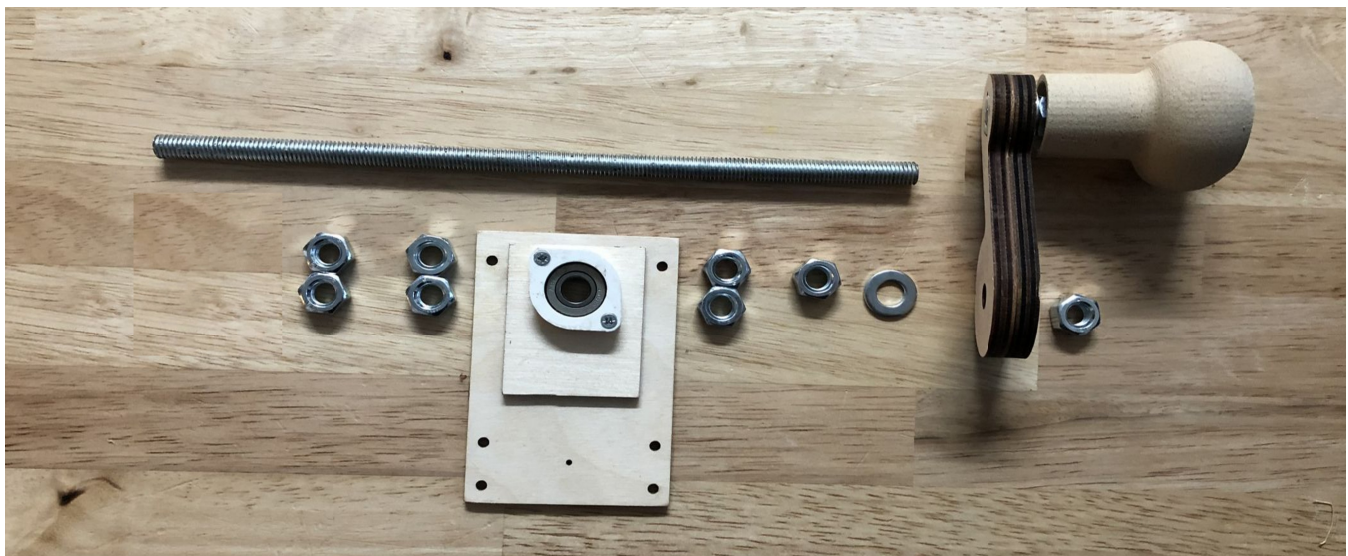
Use parts [NG-35](#) [NG-36](#), [NG-37](#), [NG-38](#), [NG-39](#), [NG-40](#)



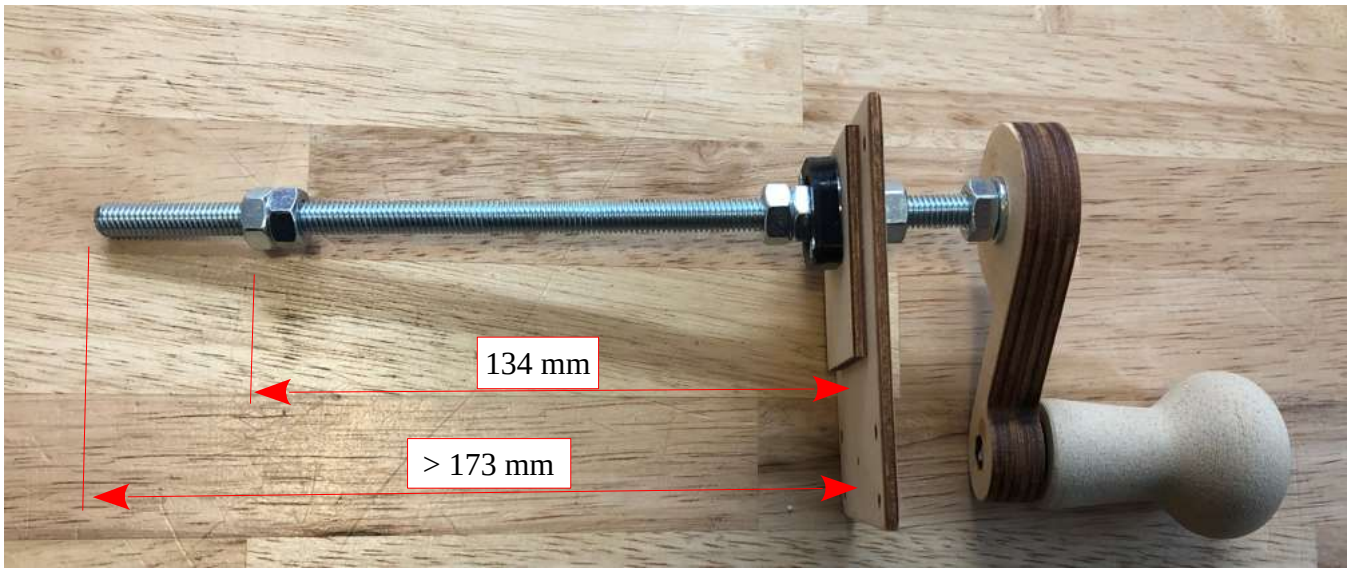
Gently press the knob onto the bearings



The printed ring is screwed to the back plate, to secure the bearing (2 x [screw, 2.5 x 13])
use parts NG-22, NG-28, NG-7



use parts NG-25, NG-30, NG34



Mount the strap pins

The v6.1 is designed for two strap pins at the rear. This gives you more options to decide how to hold the instrument. You can also attach a Y-strap, like these from Sergio González: <http://www.hurdygurdystraps.com/>



There is a small tool included that you can use to accurately place the strap pin support plates.
Use parts [NG-1](#), [NG-13](#), [NG-10](#), [NG-24](#)



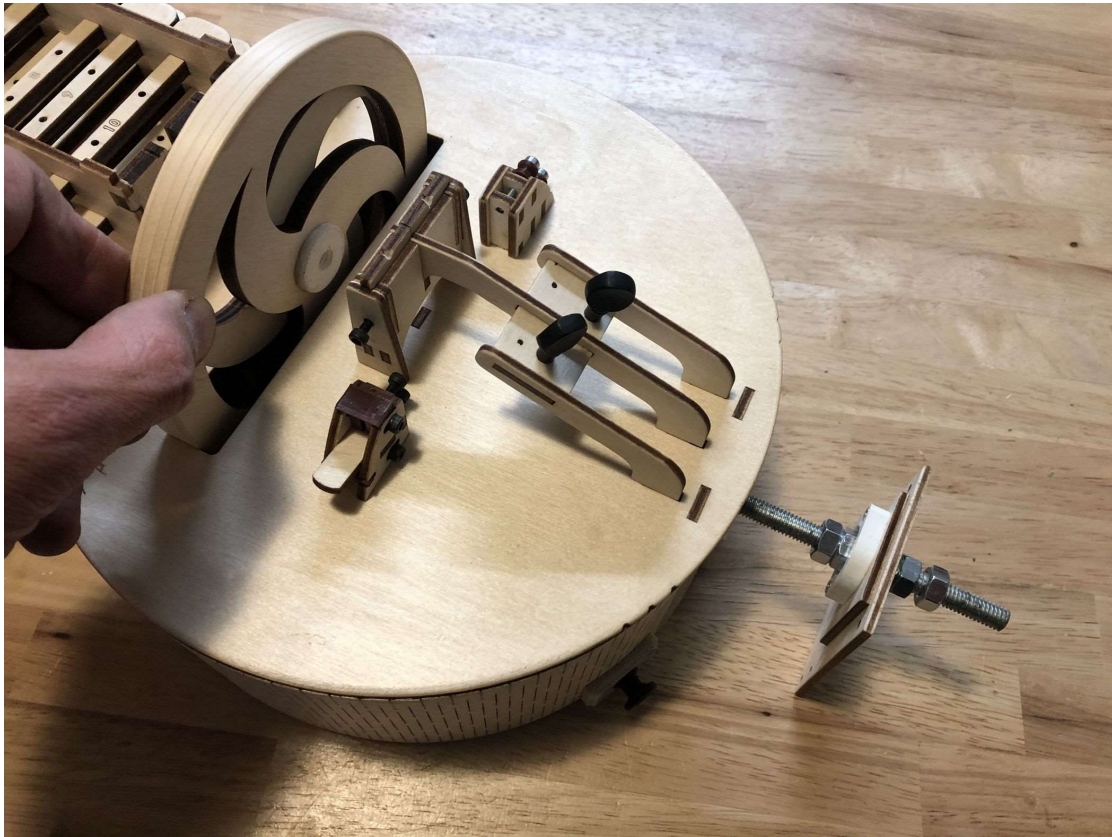
The plate goes on the inside, and is meant to divide the force over a larger area



use parts NG-10, NG-23

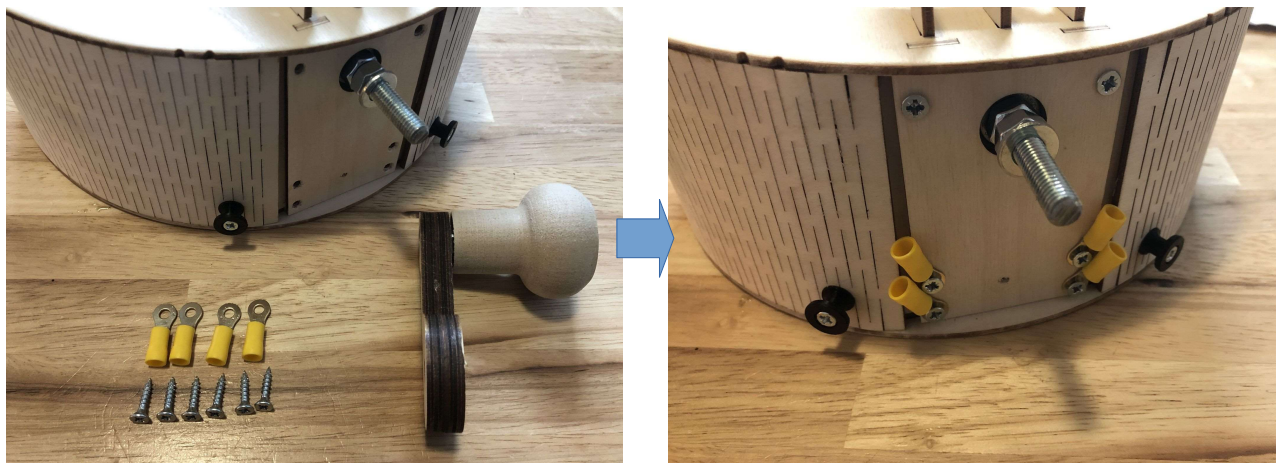
Assemble the wheel

The wheel slides into the slot on top, and you screw the shaft into the wheel. In the end, the shaft needs to slide into the front bearing.



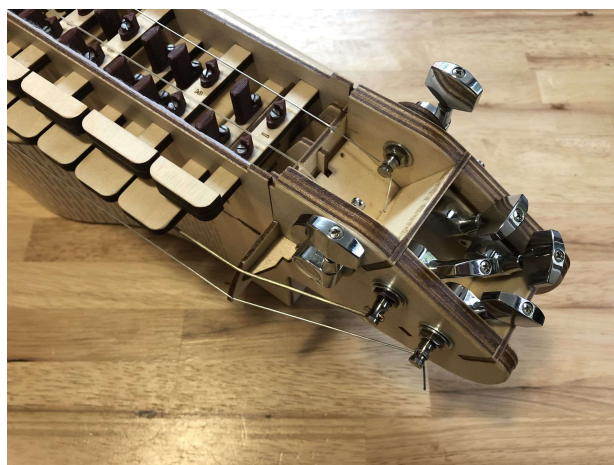
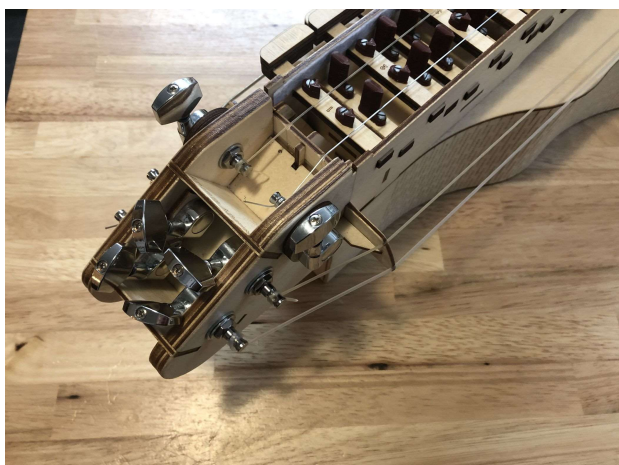
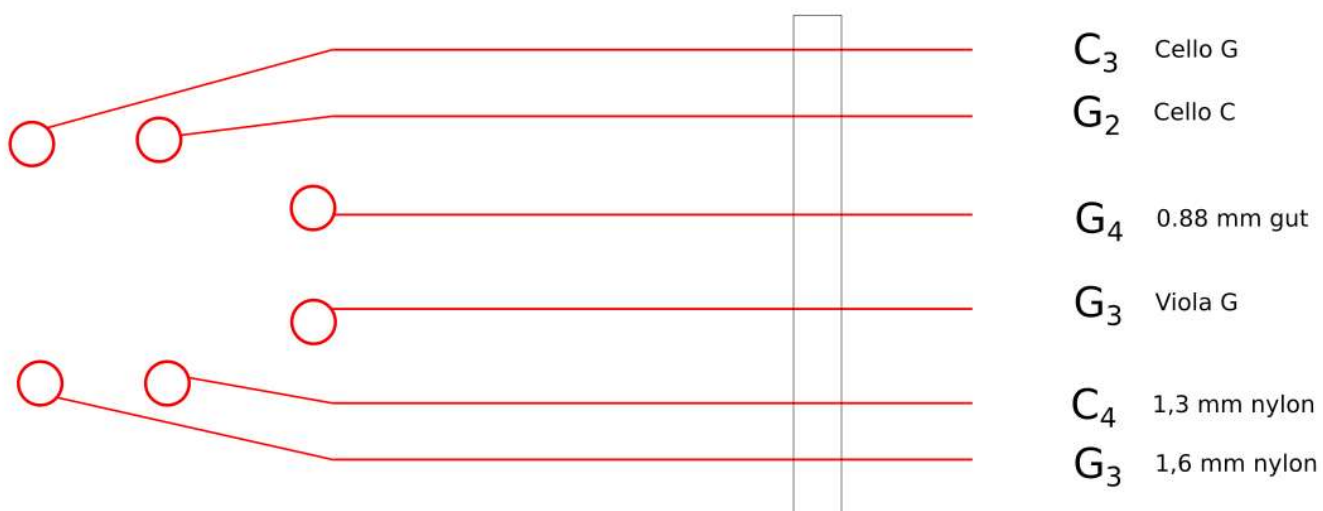
- You may need to tweak the locations of the nuts on the shaft a bit, to get the shaft properly aligned and straight.
-
- The wheel should rotate freely, without touching the sides. A slight wobble (up to 1 mm) is acceptable (and can't be completely avoided with printed and laser cut parts). Most important is that the wheel is nicely round, so that it touches the strings constantly when you turn it. If you don't like the wobble, you can try reversing it.
-
- If the shaft is not perfectly straight you may need to 'true' the wheel after you assemble it. Rotate it by hand and apply a scraping iron or horizontal chisel, until it is perfectly round. Afterwards, finish with fine sanding paper. The smoother, the better.

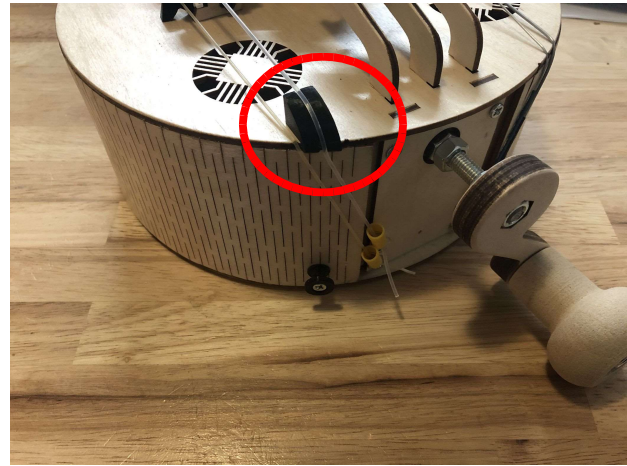
Mount the back plate



use parts NG-27, NG-23

Mount the strings

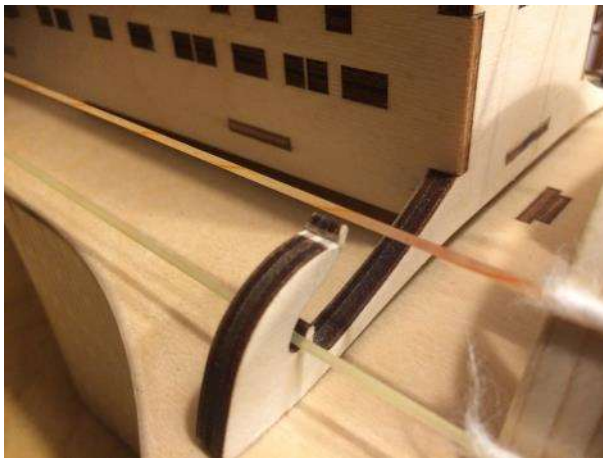




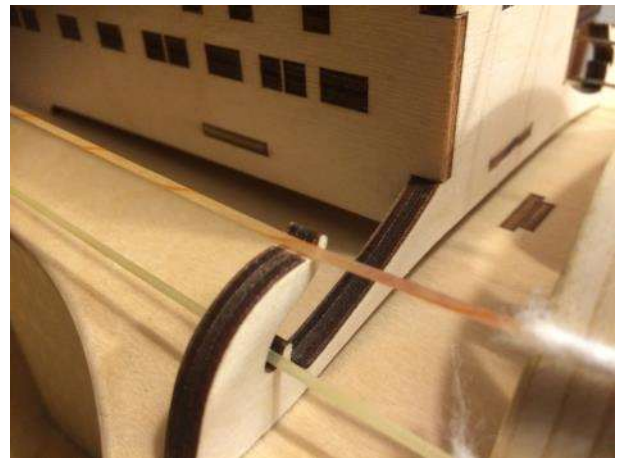
The inner trumpet is lifted from the sound board with an edge support. You want to glue this in place.

- Even though the force of the strings on the wheel is adjustable, it's still possible that due to part tolerances or assembly inaccuracies you are outside the adjustment range (too much force, or too little).
 - If the force is too little, you can sand down the bridge pieces, or deepen the recess with a file.
 - If the force is too much, you can raise up the bridge pieces a bit, by adding a few strips of paper under the bridge pieces.

The strings can be muted at the front:

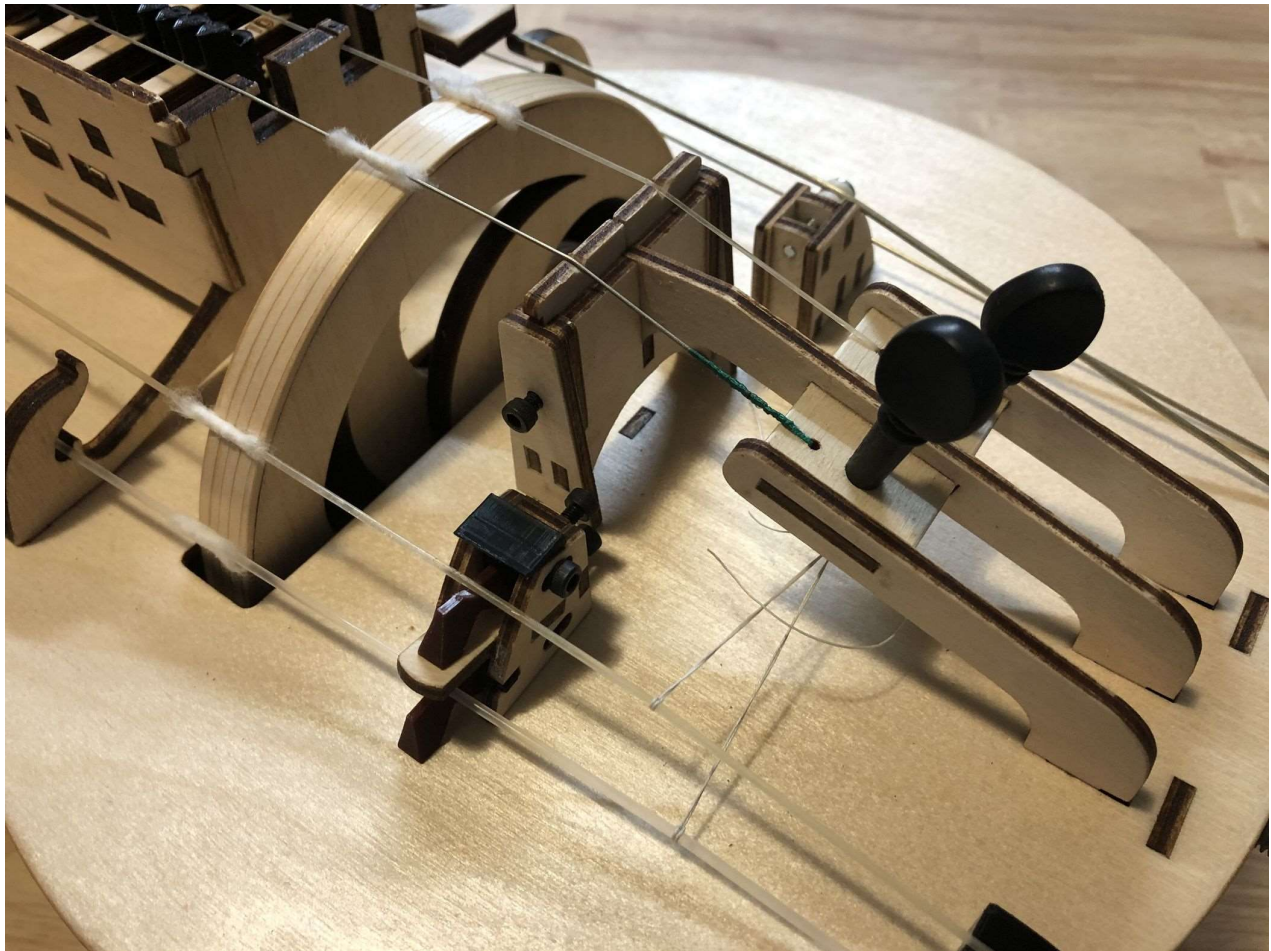


Upper trumpet in playing position



both trumpets muted

You need to tie a short string from the tuning pegs on the tail piece to the string. With these you can adjust the trumpet effect:



You may need to tweak the location of the string a bit, to get a good buzzing effect.

Other factors that affect the buzzing are:

- Force of the trumpet string on the wheel
- Amount of rosin on the wheel
- Amount of cotton on the string
- The direction in which the tensioning string (tirant) pulls the string sideways

And according to some people:

- The direction of the wind
- The color of your eyes
- The position of Ursula Major in the night sky
- Yesterday's BitCoin exchange rate
- ... etc... you get the point 😊

Final notes

I've designed this instrument with the purpose of making a Hurdy Gurdy with an acceptable sound, for a very good price. I hope that it enables people to start playing the instrument who would not have had the means otherwise, or are hesitant to invest thousands of dollars straight away.

The design is unconventional: it was designed from scratch with the above purpose in mind. Therefore the construction method is in many ways different from traditional instruments. It does however sound pretty good, and it is very playable. And because of the material and the method of construction, it is very stable

New players will still need to learn how to properly apply rosin to the wheel, and cotton to the strings. But there are many tutorials online, if you don't have experienced players who can teach you.

Enschede, October 2020

Ps. This manual and the Nerdy Gurdy itself are an ongoing project. Please let me know how they can be further improved.