# (non)Rc sailing catamaran „Sta Ana”

## 1. Introduction

Hi! I would like to show some details about my new 3d model "Sta ana". My first idea was to build a fully remote controlled sailing boat, and all the RC features were applied from the very first minutes of the design. Eventually, I had made a few design mistakes and the model was shelved as a regular non-RC model. In this document I will show what happened and why.

## 2. About the boat

Sta Ana is a catamaran built by the Polish shipyard Wave Catamarans. There are only 2 pieces of this Wave 58 model. "Sta Maria" and her younger sister "Sta Ana". My design is based on the more modern "Sta Ana". As a sailor, I spent a lot of time on the "Sta Maria" ship, which gave me a lot of knowledge and motivation to build this model. I am very grateful to the owner, who provided a useful database. Some parameters of Wave 58:

- Total length - 17.60 m
- Width - 9.20 m
- Draft - 1.30 m
- Displacement - 14.00[m3]
- Sail area - 172 m2
- Volvo Penta D2-55 engine
- Engine power - 55 hp
- Fuel tank (diesel) 2x 400 L
- Water tank 2x 400 L
- Number of cabins – 6
- Number of berths – 10

Soruce : https://www.facebook.com/staana.wave58

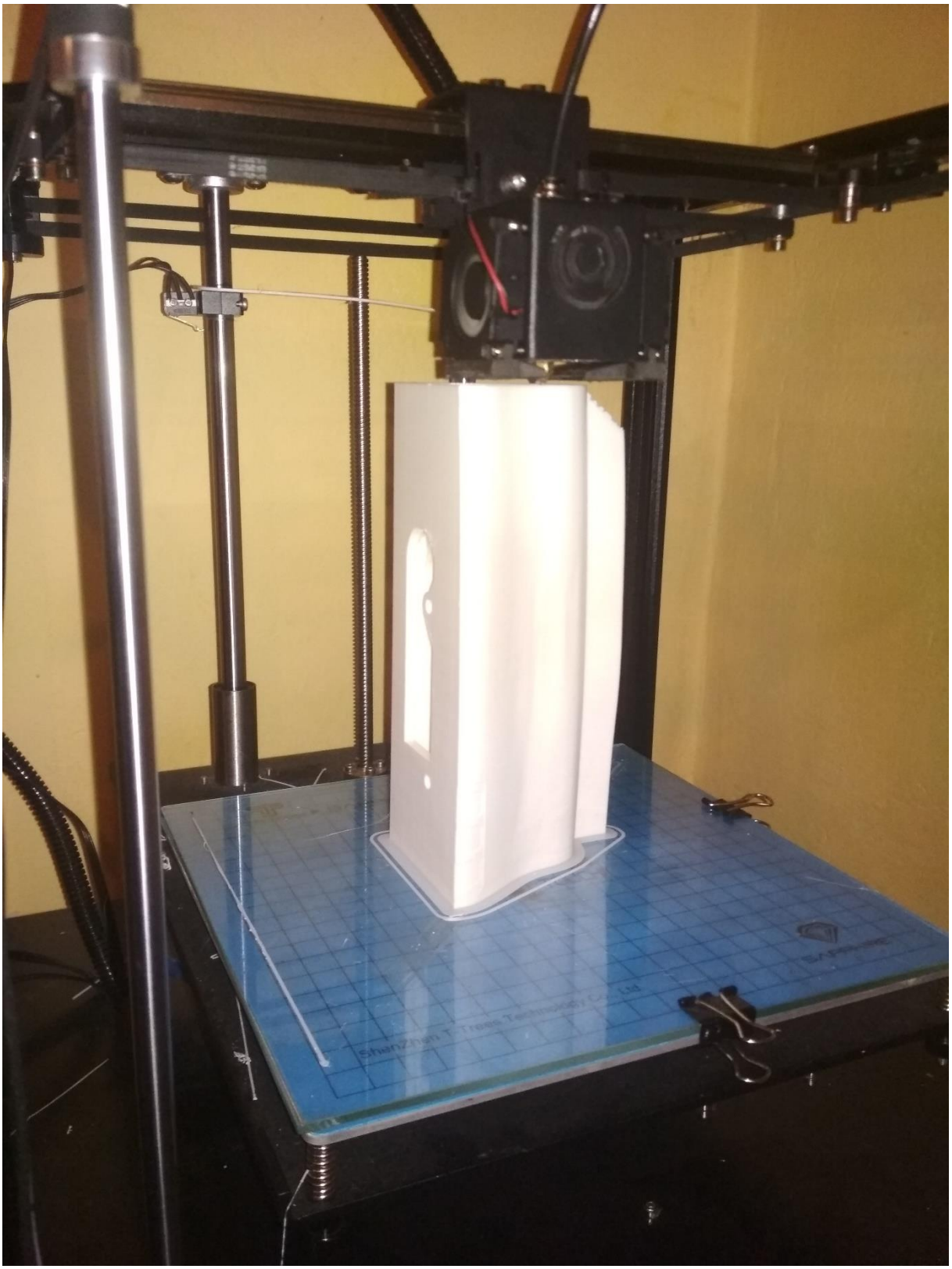
## 3. Idea

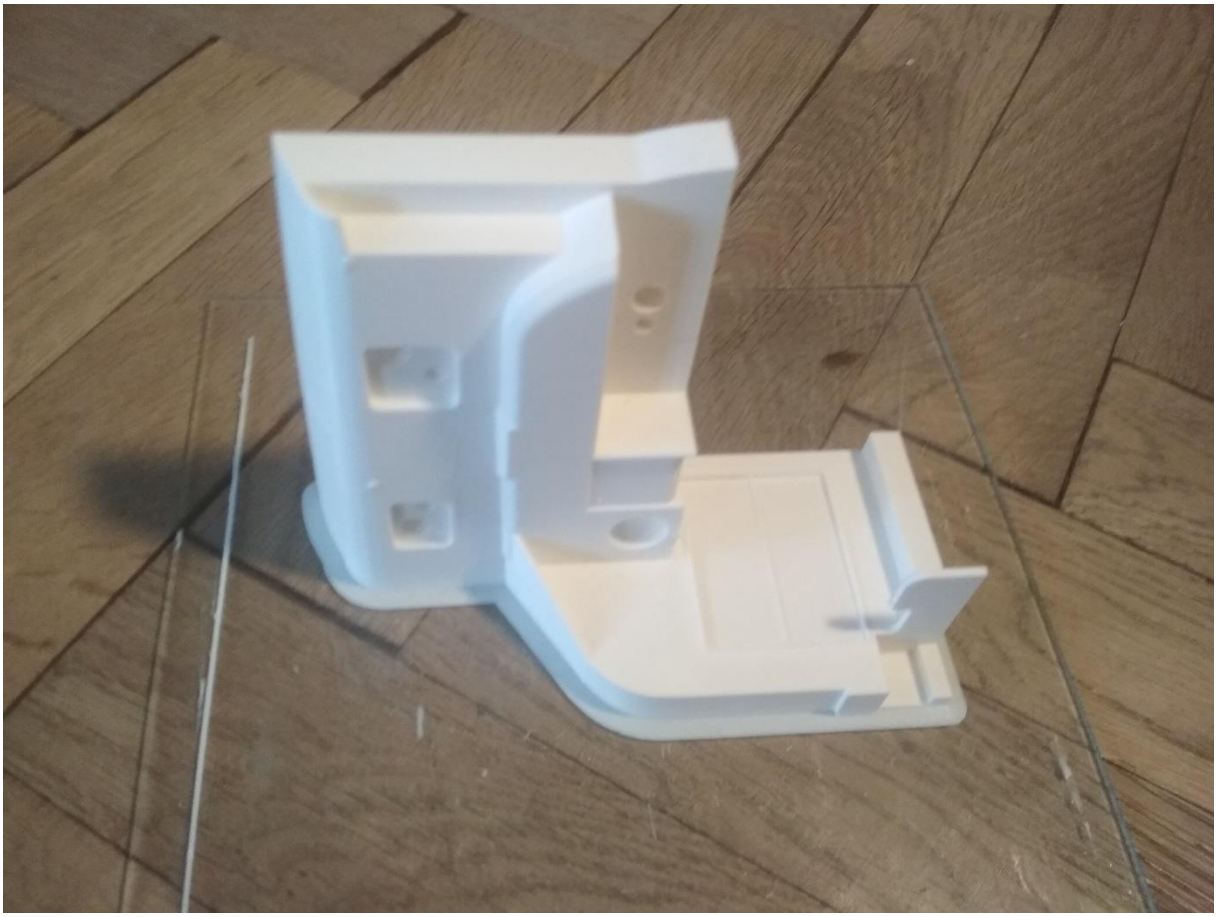
I decided to design the catamaran in 1:30 scale. This gives a size of approximately 58x28x92 cm. One of the biggest challenges was cutting this out, because like most amateurs, I only have a 2000x2000x200 build volume. Most of the connections are made with screws, hidden in the hull or under elements such as windows, furniture, etc. Either way, some connections had to be glued. There are many unprinted details.

### 3.0 Hull and superstructure

As I mentioned, hull is designed to be RC, and to be printable on small 3d printer. That's why there is so many parts and structures inside hull. Some mistakes had occurred on the late stage of design. It's hard to change the basics of model, so I decided to leave it as original design. Anyway, it's still a printable model, but sometimes more difficult to do so. Hull

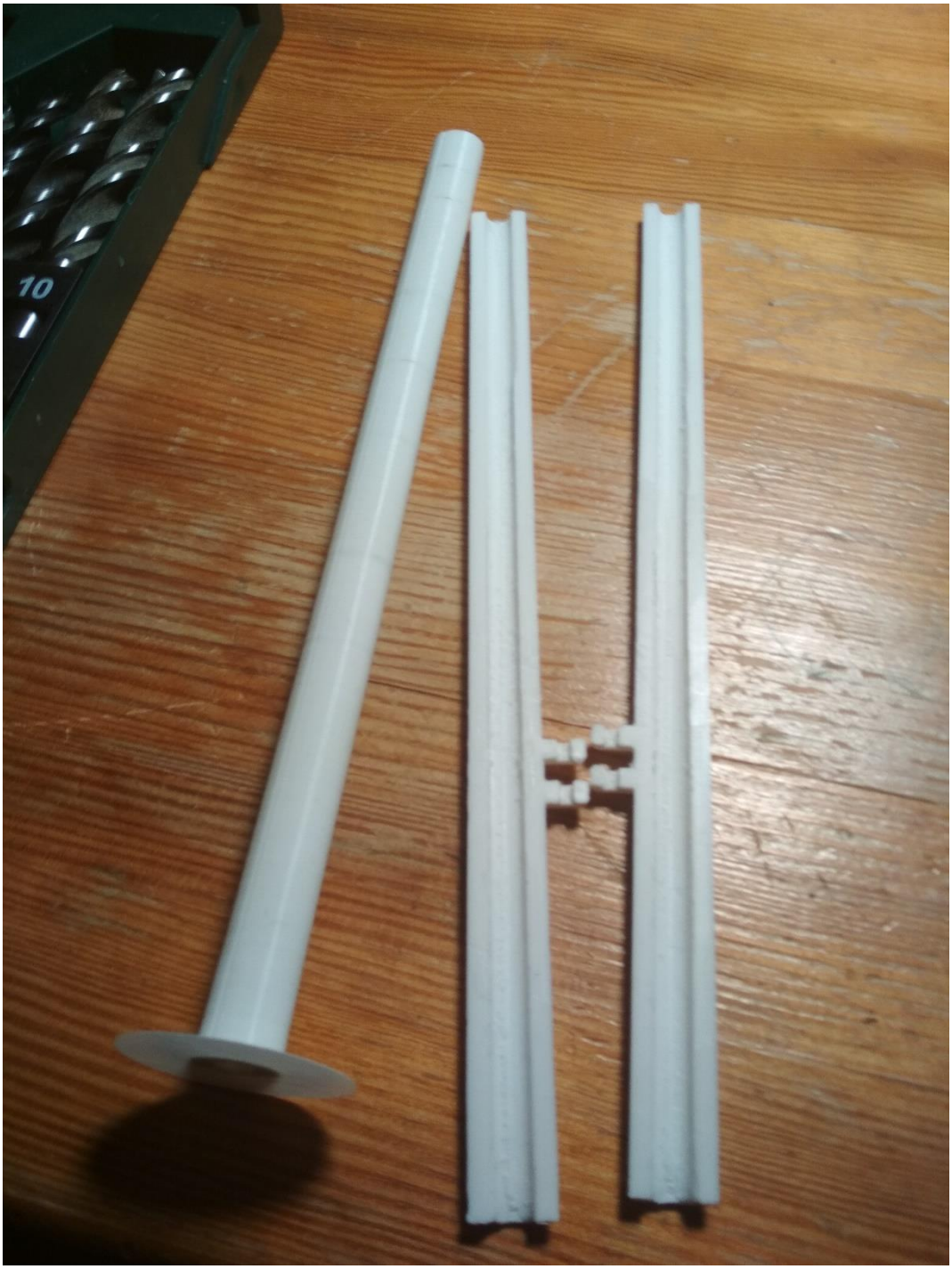
parts are designed to print vertically. There are some self support features where it was possible.





## 3.1 Mast and Rigging

The mast consists of 8 printed parts glued together and a 5 mm carbon rod as the core. This gives a realistic look and enough stiffness to carry sails. The boom is 100% printed, connected to the mast with a 2mm screw. All fixings, D-rings and holders are made of copper or stainless steel wire, glued into the drilled holes. The sails are made of ordinary sailing cloth. I had called the local sailing factory and asked about any leftovers. They gave me a lot of it, thank you SAIL SERVCE GDAŃSK! The size and shape of the sails are sketched in another document, which is uploaded on thingiverse. To put all these things together, I used fishing line.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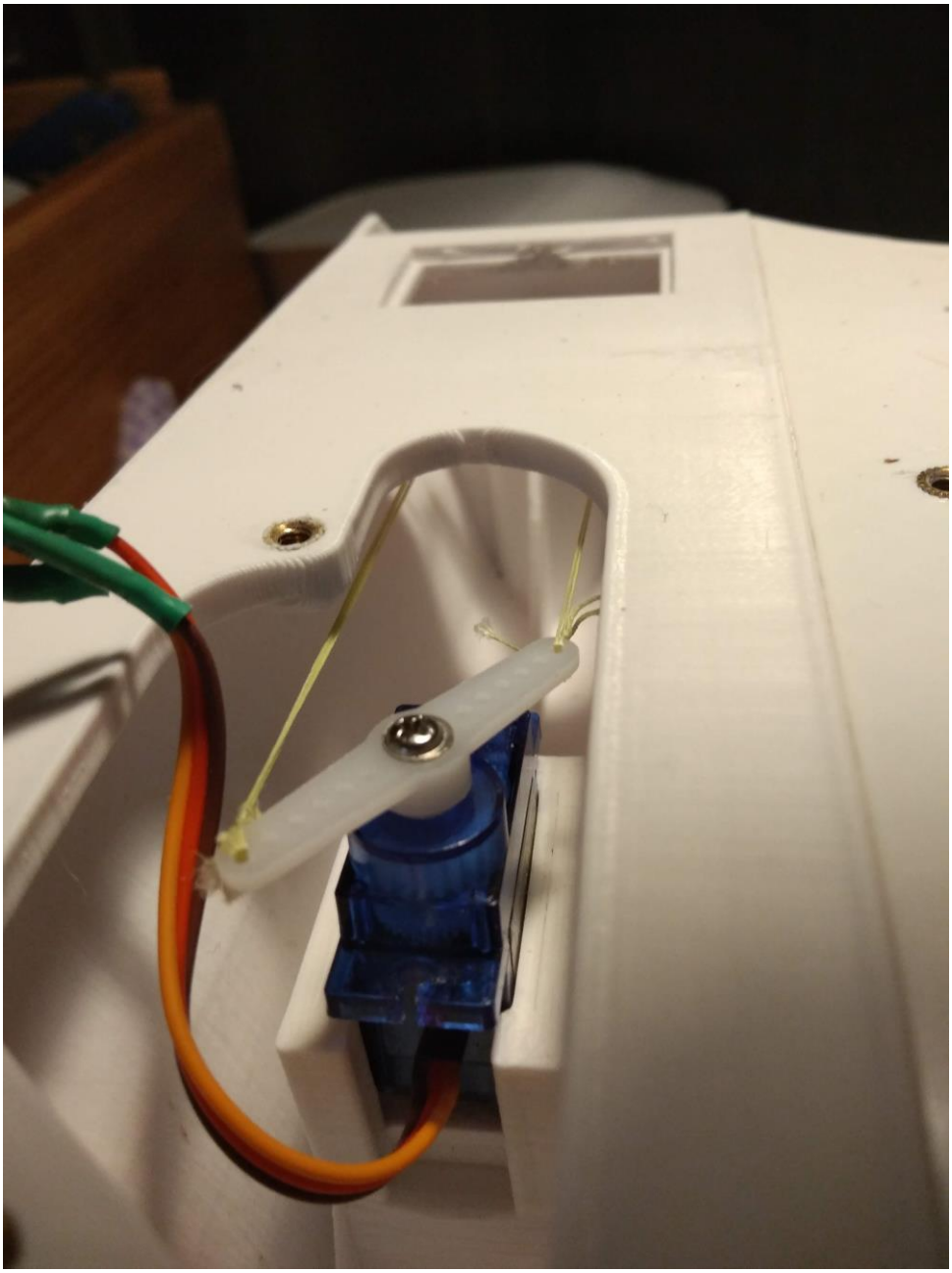
### 3.2 Movement

As the steering system, two rudders driven by 2 sg-90 servo motors were used. The running rigging is powered by slightly stronger 2 mg90S servos



**3.3 Railings, cleats**

Railings are made of copper wire and solder. Wires of diameter 05, 1 and 2mm. There is a lot of manual work, and it's one of the most difficult thing to make in this model. To form all shapes I have based mainly on photos. There is also 2 forms made to give shape to wire (file 76&77)

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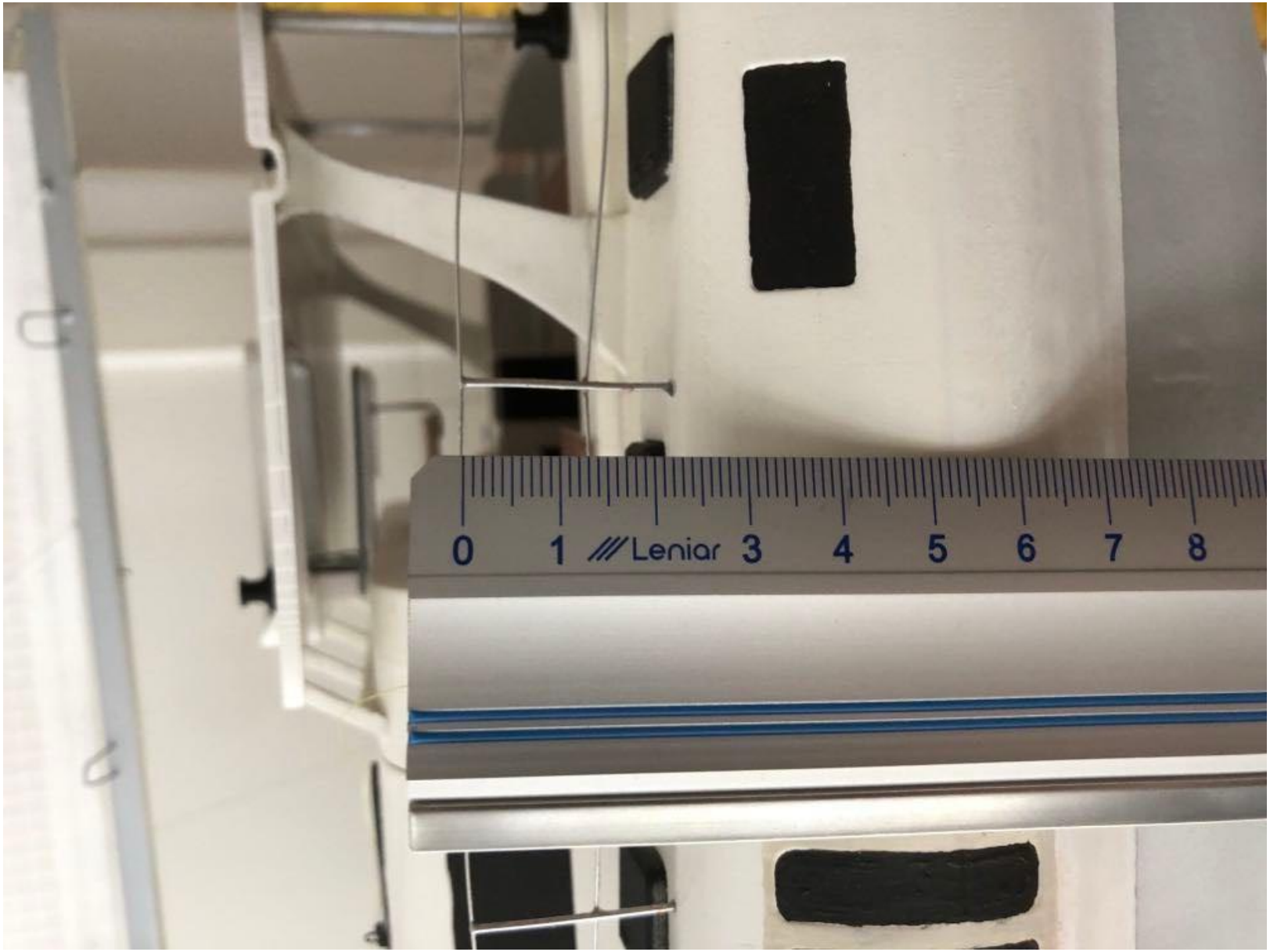
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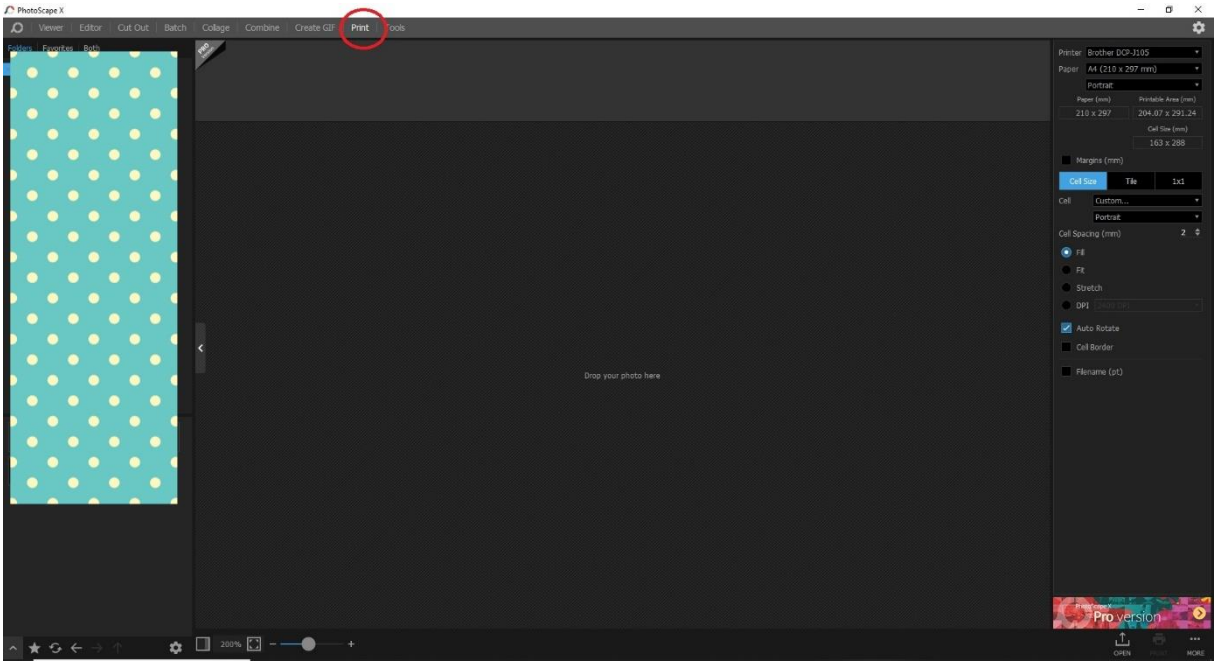
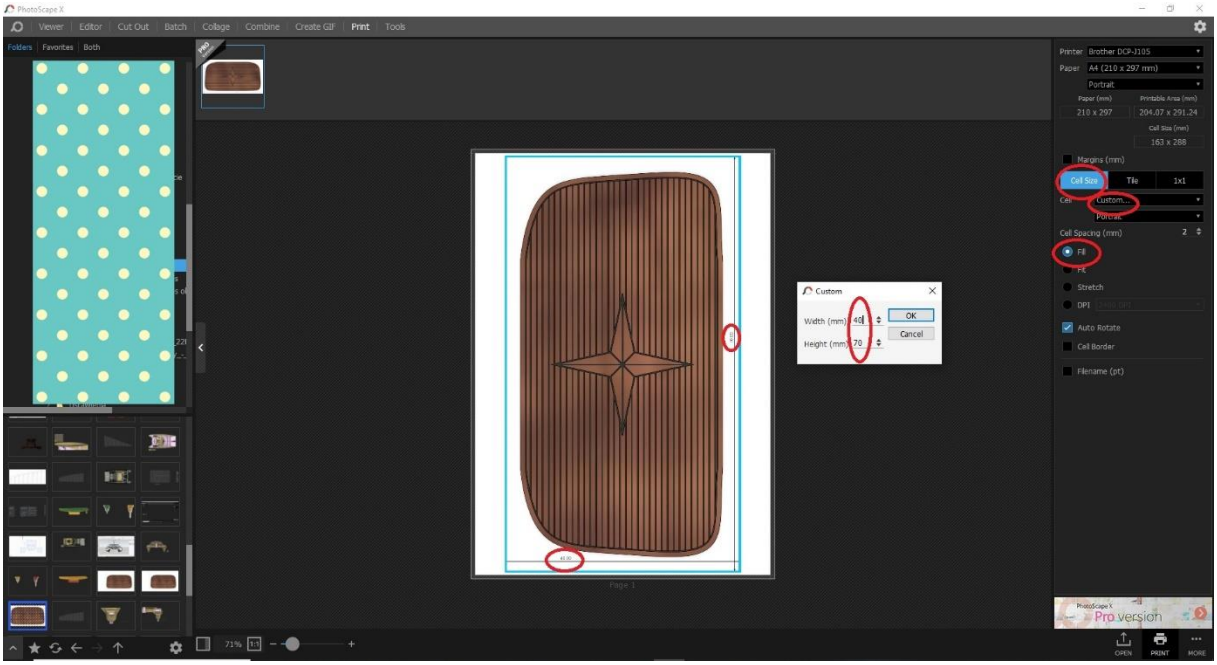
## 3.4 Deck and Timber

The wooden deck is printed. The main thing is to give it the right size. I have prepaired special photos of the deck with dimensions for printing. I have been using the free program PhotoScape X for this.

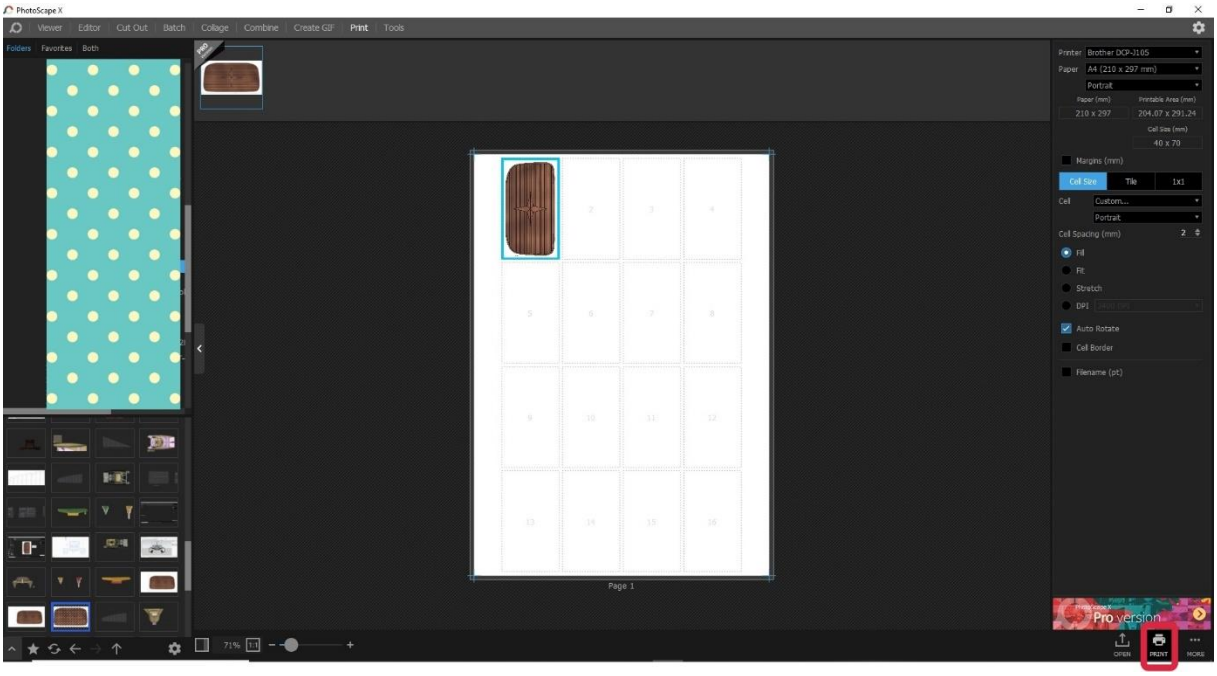
Step 1



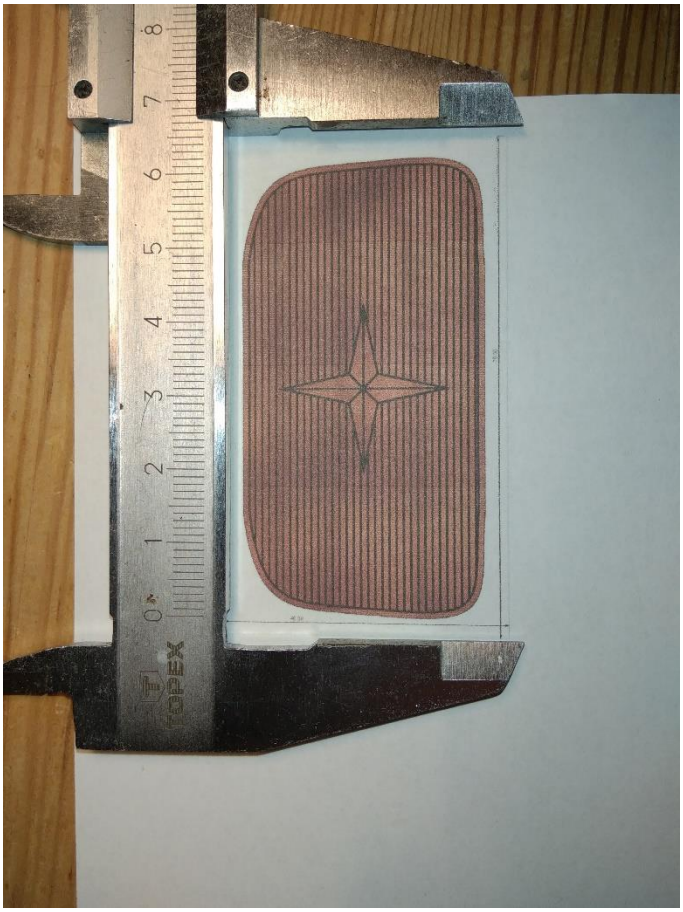

Step 2



Step 3




This is How it should look after print.



### 3.5 Nets

Nets are made with mosquito net attached to railings with thread. Again, there is a lot of manual work to do.

## 4. Why non rc ?

Finally, when almost 70% of the model was ready, I went to the nearby pond and made the "seatrials". The model turned out to be too heavy. The draft was greater than I expected. When she began to move, the friction of the hull was so strong that she capsized. I don't have pictures because I had to rescue her as soon as possible. Later I tried to slim it down, gave a little more buoyancy, but it was too much issues and I gave up. To fix it, it needs to be deeply redesigned, which would be very time consuming. That’s why now she stays on shelf.

**5. Summary**

I like this project very much. I do realize, there are some bugs and it's not easy to print, but I'd like to share my experiences which I have gained building this model. I hope someone tries to do this by himself, and even improve it. I look forward to hearing from you, thanks!

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