

Cardboard Grass Skimming RC Airboat



by Kevr102

In this Instructable I will show you how I built an Airboat made out of Cardboard, I don't have the Everglades or Water nearby but plenty of Grass! So it should be Interesting!

For this build you will need an RC Transmitter and Receiver, In my case it will be a FLYSKY FS-i6 with the FS-iA6B Receiver. The Motor and ESC is a cheap Amazon kit and the Servo is a cheap Tower MG90s, Battery is a 11.1 Lipo.

I will be using a craft knife at times these are really sharp and thus will be adhering to the online safety guides, but when I can I will be using scissors.

To the build:

Supplies:

FLYSKY FS-i6 or FS-i6X Transmitter(Amazon UK)

FLYSKY USB Data cable (Amazon UK)

Stiff Cardboard (Creality Glass build plate box was ideal)

MG90s Servo

1mm Steel rod

Hot Glue

CA Glue

Craft Knife

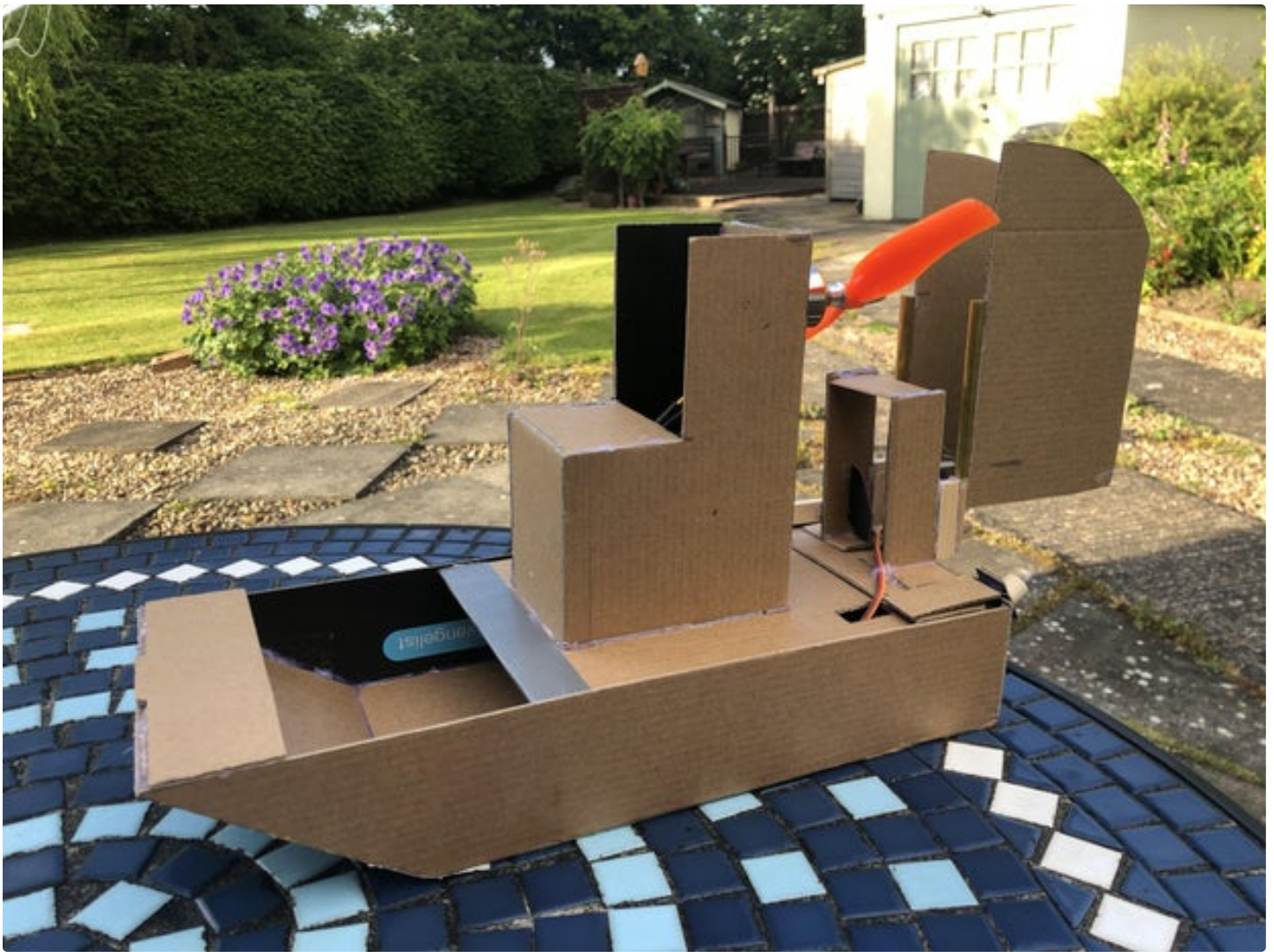
Scissors

Gaffer tape

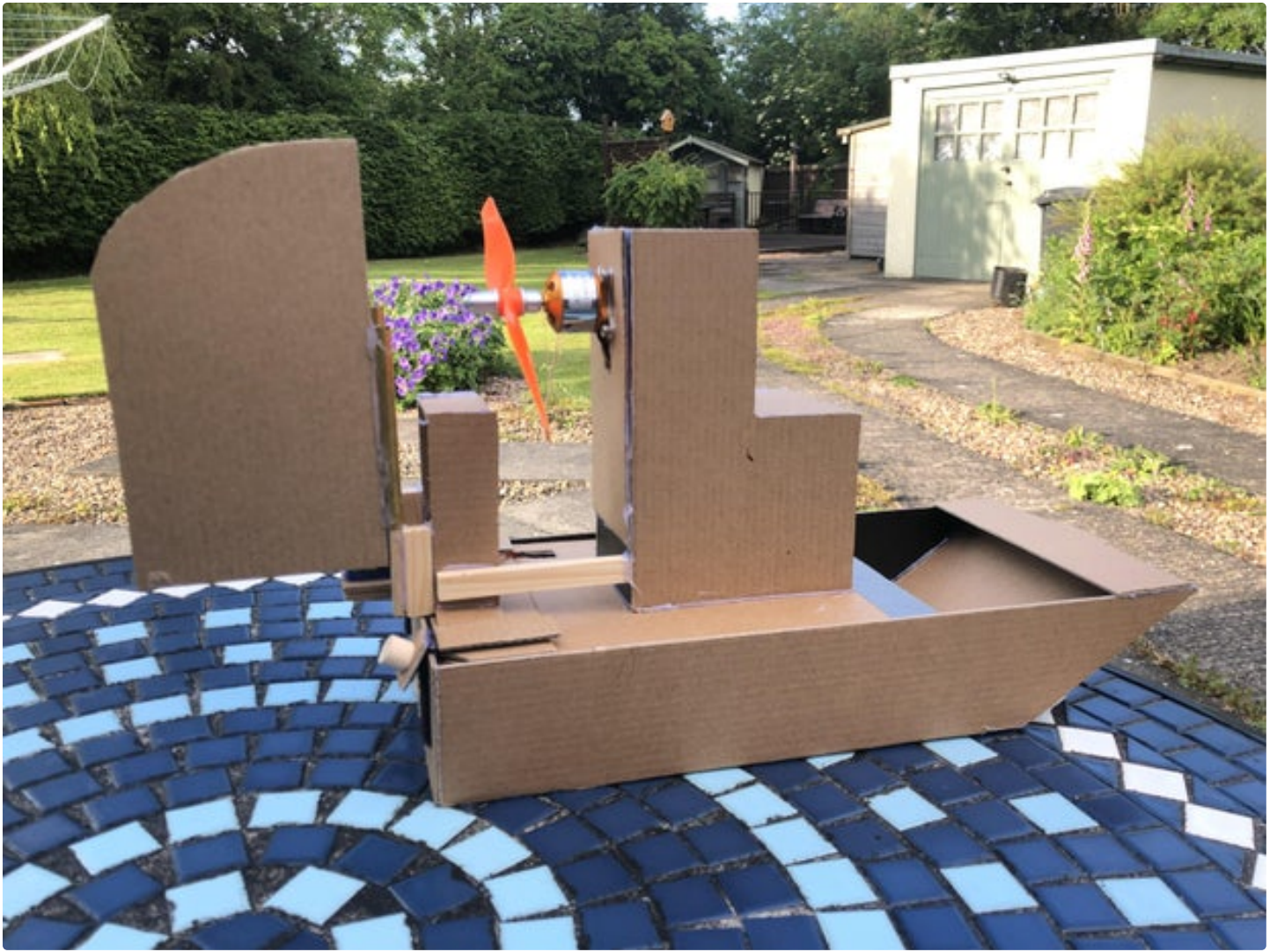
Wax

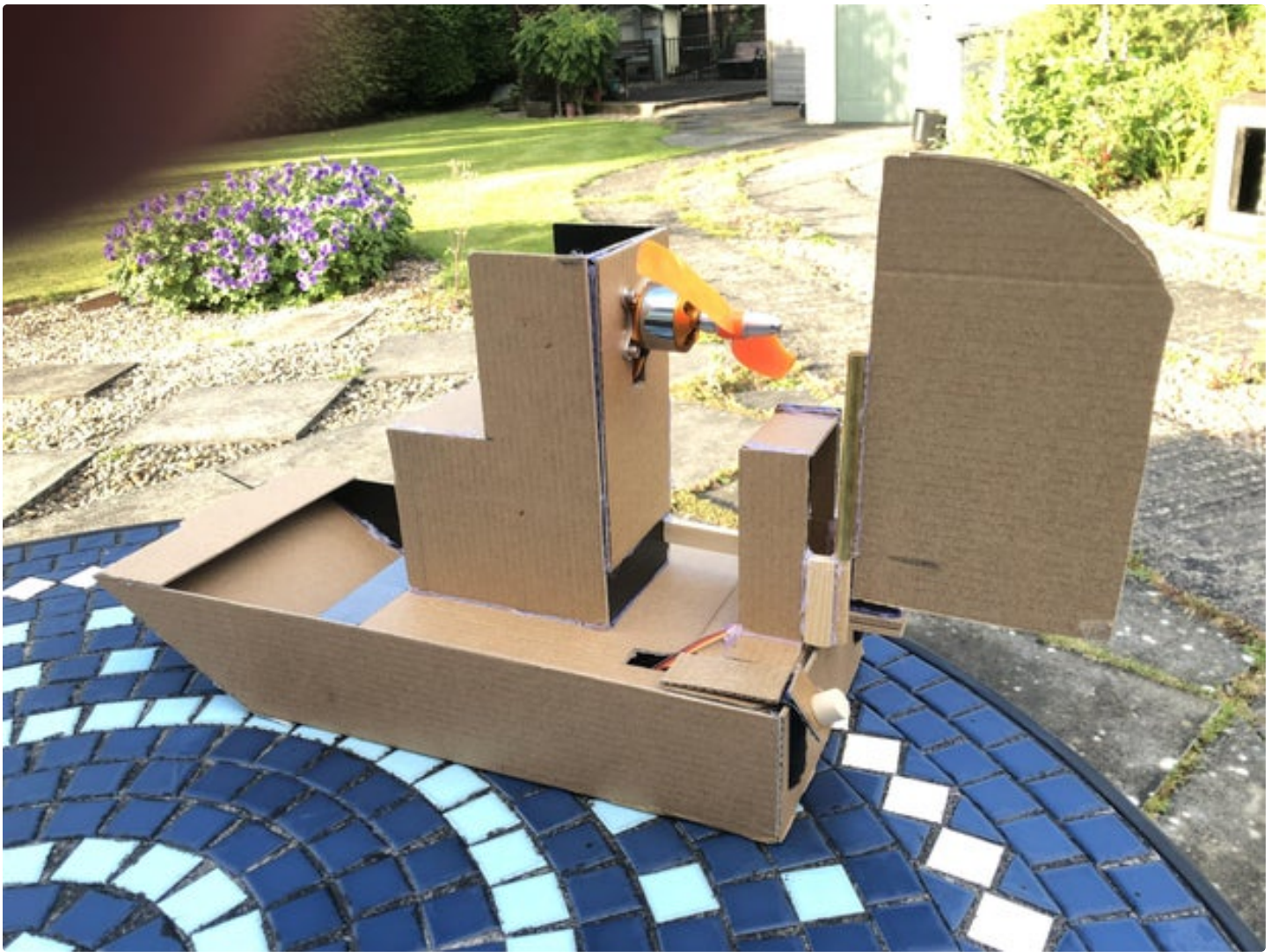
Velcro

Piece of 8mm doowel



<https://youtu.be/e0AFj-AIQz4>





Step 1: The Starting Point, Sides and Bottom of the Boat

The Box I have chosen to use for this project is a Creality CR-10 Glass Build Plate Box, It's really sturdy and should be just the job.

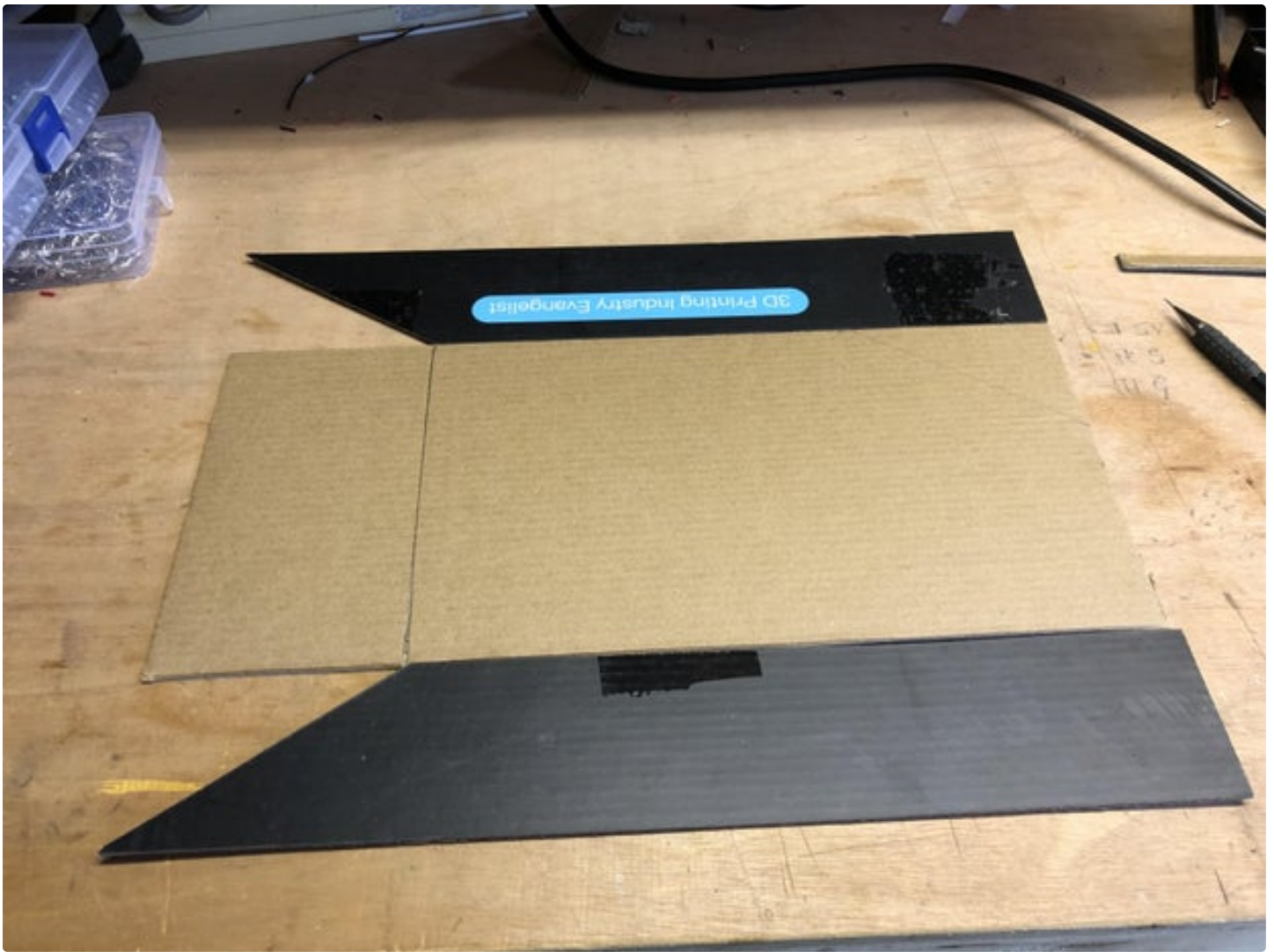
With no actual plan I started off by cutting out the 2 sides of the Airboat all the dimensions are just guessed and then the bottom was cut out, pushing one of the sides up to the bottom and spotting internally with hot glue, I used a 90 degree angle gauge to ensure the sides were straight, I scored the bottom piece where it meets the angle at the front of the boat and again spotted in place with hot glue, the bottom piece wasn't long enough so I added a piece and another piece for strength and used hot glue to secure, with the sides and bottom now in place I fully glued the sides internally for added strength, I put the outside of the box to the bottom, this was black and a smooth finish, Ideal I thought for skimming across the grass.

I cut and glued additional bracing pieces of cardboard in 3 positions, the centre and rear pieces were a few mm down from the top, this is where the seat and motor will be positioned on another piece of cardboard, the deck if you will? I cut angled notches in the rear corners to allow for the internal hot glue seam.

The next part is to make the seat component which will also accommodate the motor:

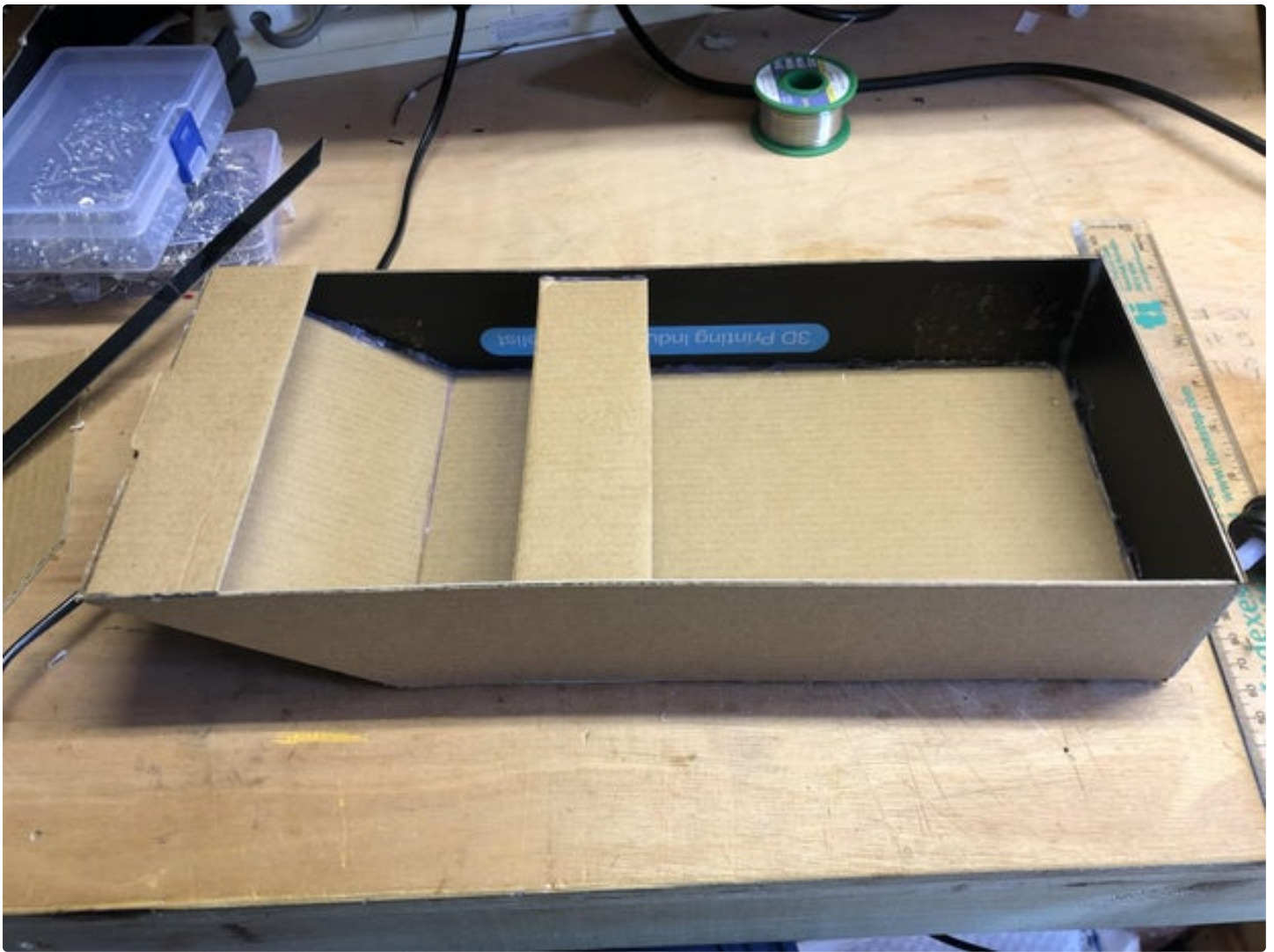














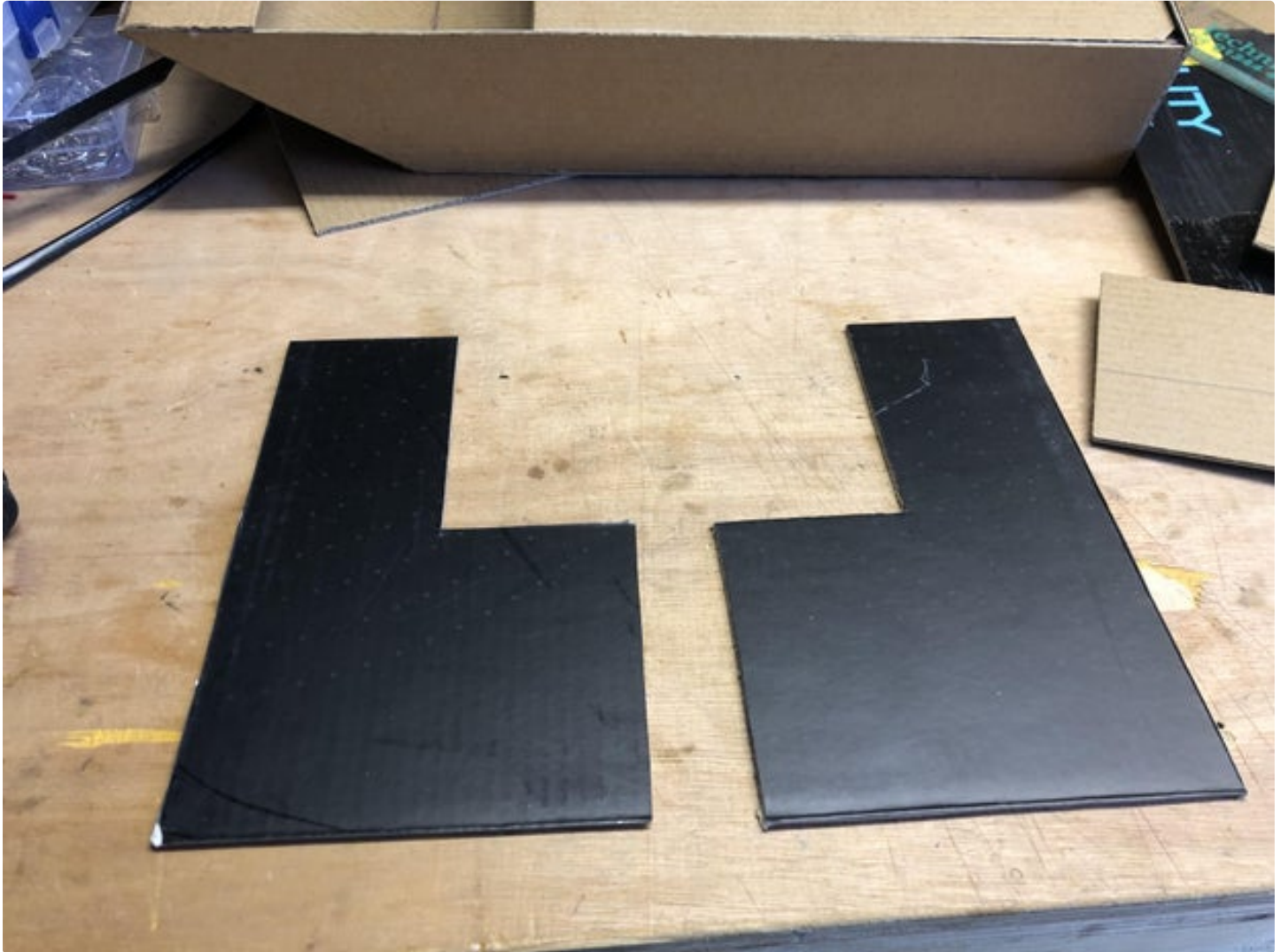


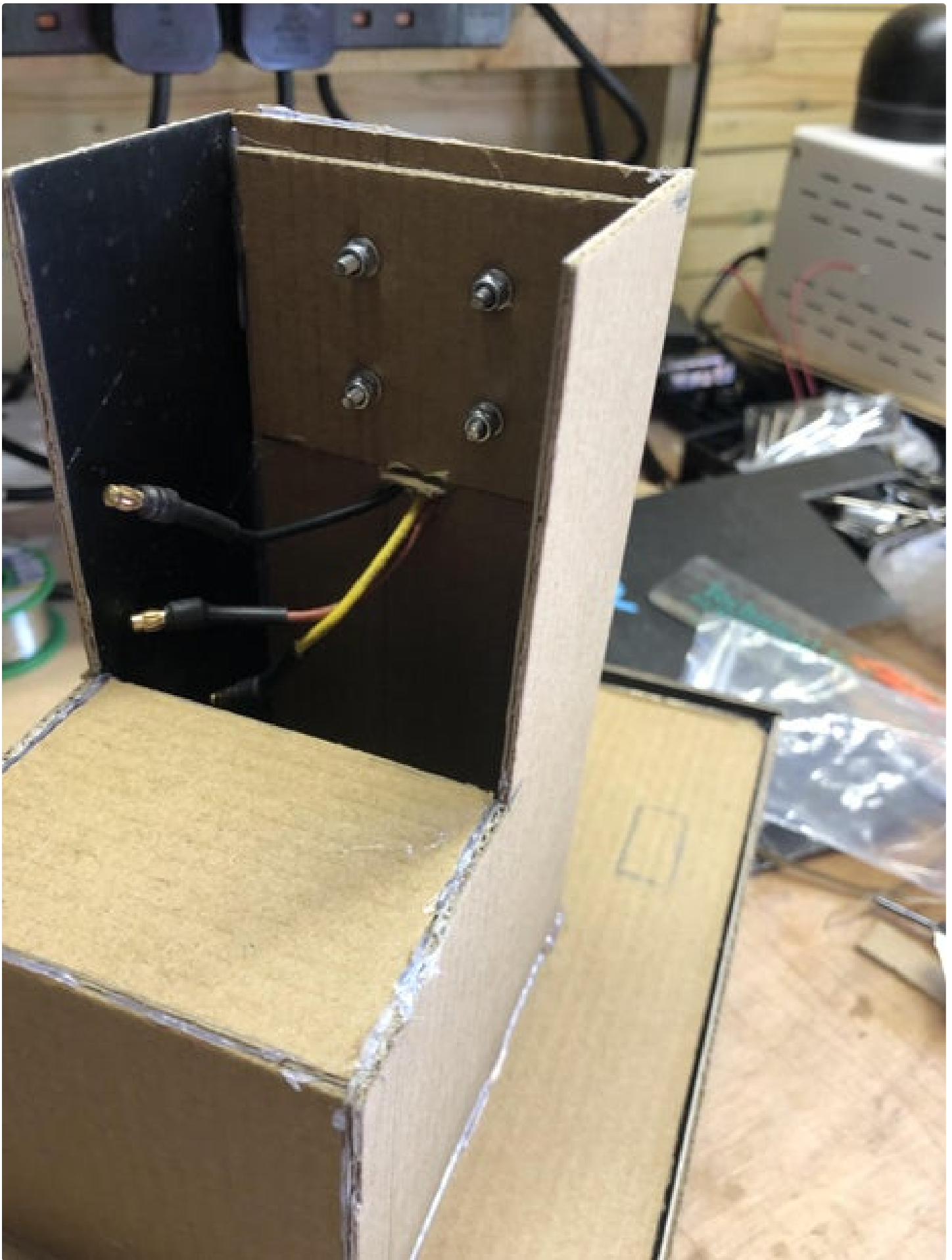
Step 2: The Airboat Seat.

I get a dimension for the height the seat needs to be by holding the propeller in roughly the position where it needs to be and measuring the height of it from there.

I then marked out a "L" shaped design seat arrangement and copied this to another piece of cardboard and mirrored another, I then cut a piece of cardboard out for the rear of the seat, the top part of this was braced with additional cardboard at the front and back, this will give additional strength for the motor, I cut another piece of cardboard for the front of the seat and hot glued to secure, I will leave the rest open until the motor is installed and connected to the ESC.

The next job is to cut a piece of cardboard which will be the deck of the airboat:





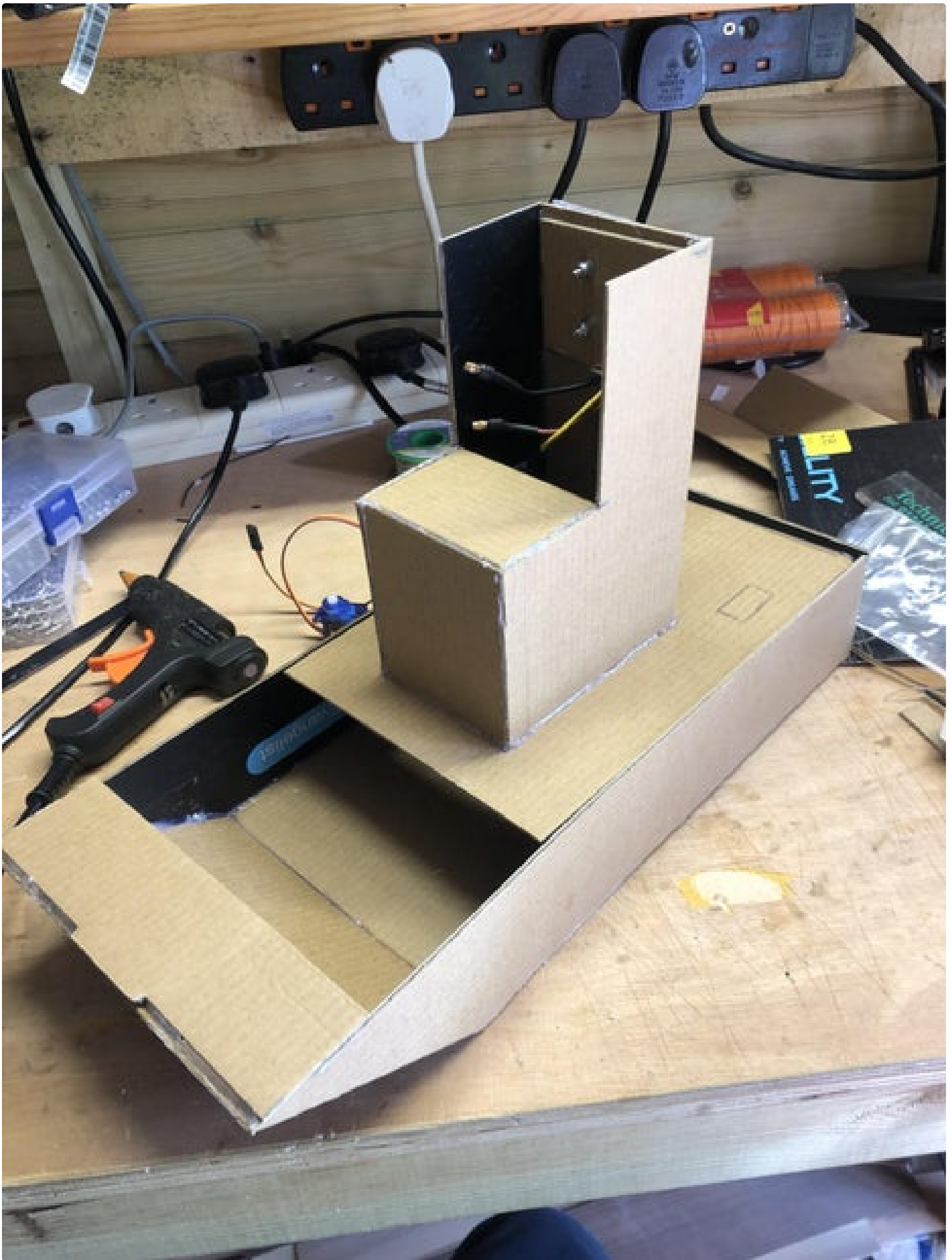


Step 3: Airboat Deck, Seat Positioning and Motor Fitment.

The deck for the Airboat is marked out on the cardboard and cut out, once again notching the back corners to allow for the hot glue seams, this was put in position adjustments made and then I could sit the seat on top of this in the position where I wanted it and mark and cut out a square for cables from the motor, I then hot glued the seat into position.

Its now time to install the motor, the metal crucifix which the motor is screwed to was positioned centrally and the holes marked out with pencil, a 3mm drill was used to drill the holes and after that the motor was attached to the crucifix with the 4no countersunk screws which came with the motor, the motor was then secured in position with 4no 3mm 20mm Allen head bolts washers and locknuts, I used locknuts in case of any vibrations from the motor, and also marked and cut out a small notch for the cables.

The next task is coming up with a rudder arrangement:





Step 4: The Rudder Arrangement

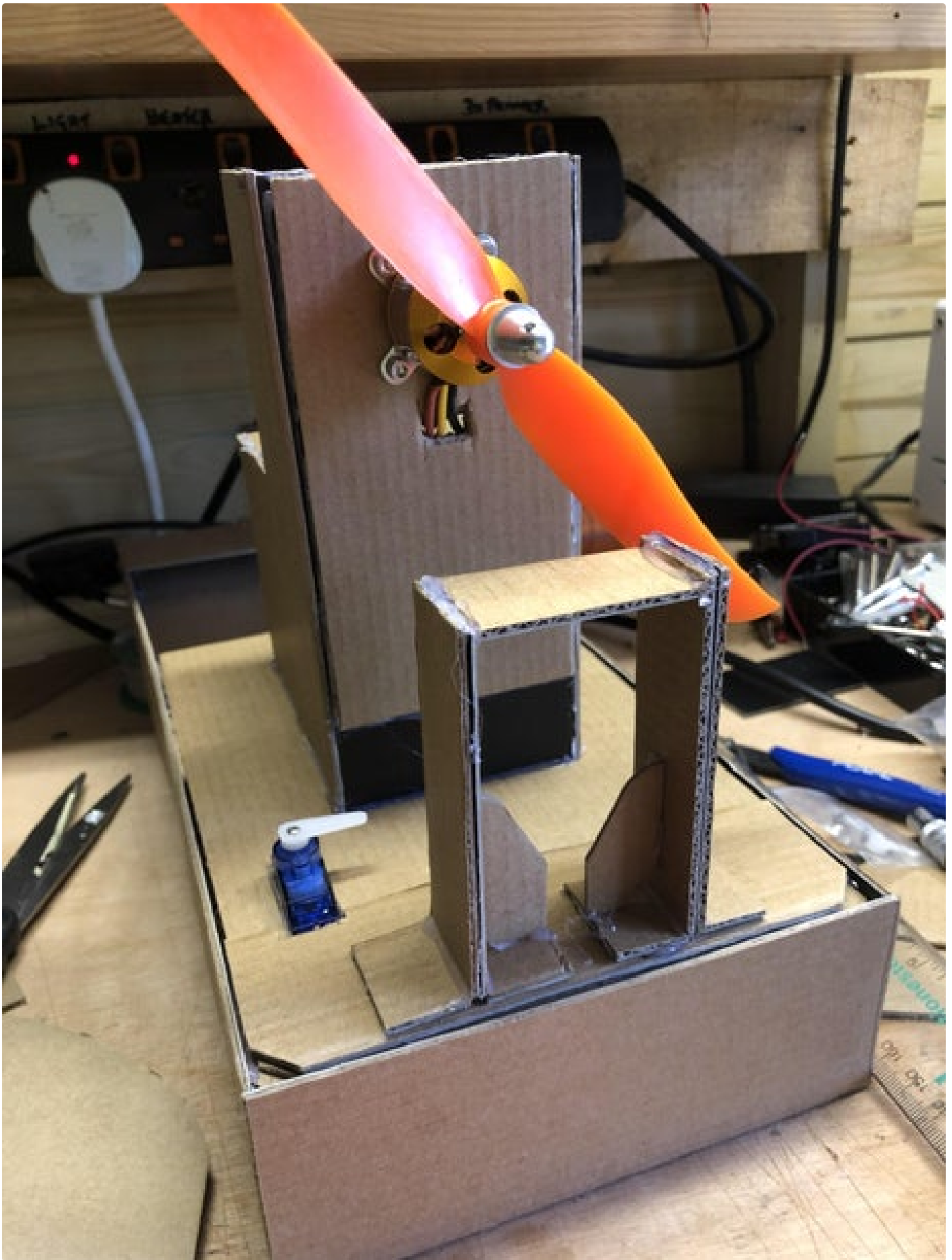
In most of the images of Airboats I've looked at the majority are a 2 rudder arrangement so I will go with the flow on this.

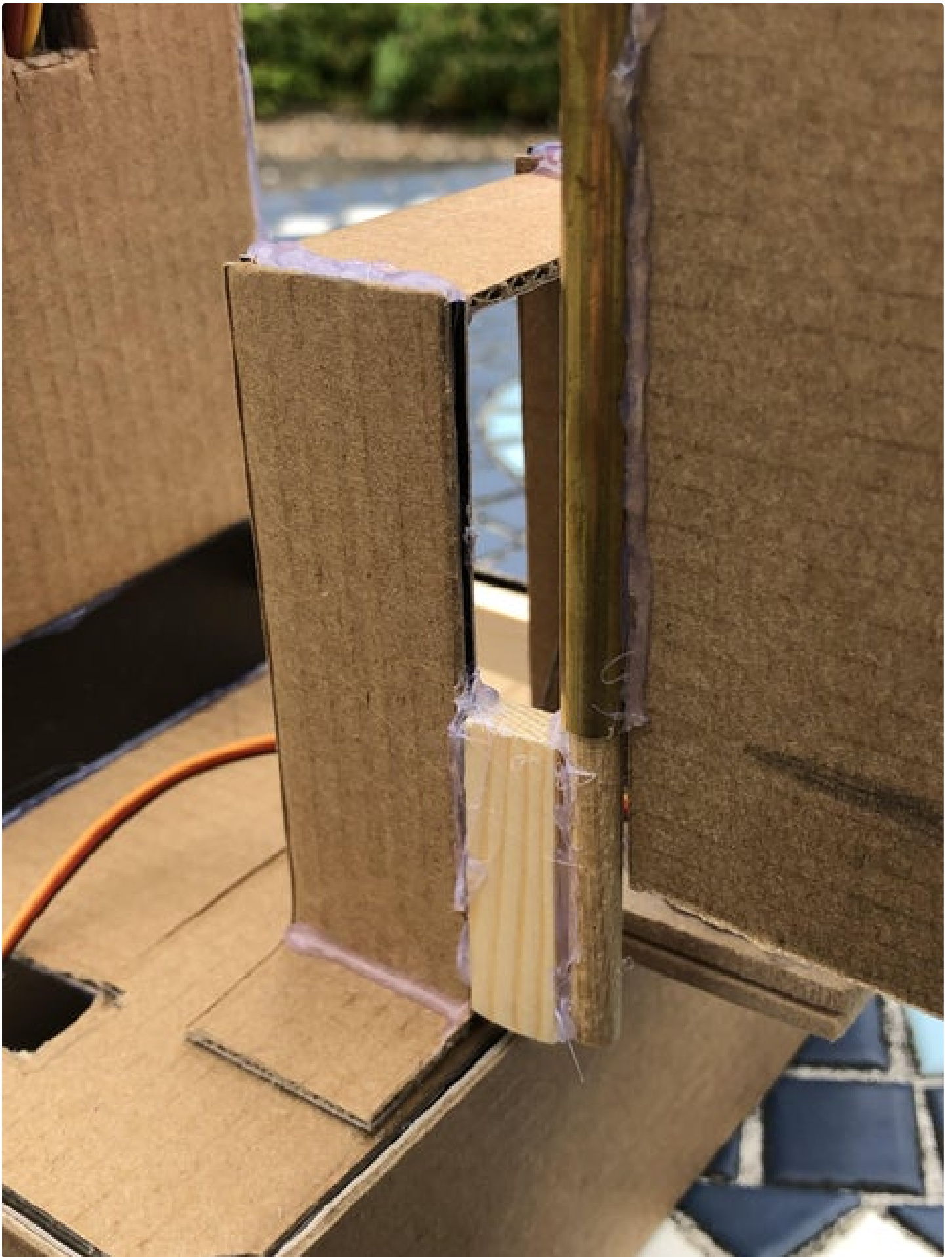
To start off with I made a framework to attach the rudders to this was 2 pieces of cardboard glued back to back and the bottom parts splayed out and hot glued into position on the rear of the deck in 2 positions, then a brace was added along the top, and gussets for additional strength added to the inner sides and a wooden spar for additional bracing.

I'm going to use some brass tubing and wooden dowel arrangement for the rudder hinges, I could have used tape to form a hinge but as this was being used on grass I wanted this area to be stronger I suspect there will be quite a lot of pressure in this area from the propeller wash which is quite big so this part needs to be free moving but robust.

I used 2 slats of wood approx 30mm long and 10mm depth and hot glued these to each side of the cardboard framework, I had a piece of 6mm dowel and cut 2 lengths of this and hot glued these vertically to the 2 slats I had already glued, I cut 2 pieces of cardboard for the rudders and offered these up to the dowel and marked off where to hot glue the brass tubing, this option worked great.

Time to fit the Servo for steering the Airboat:







Step 5: Steering.

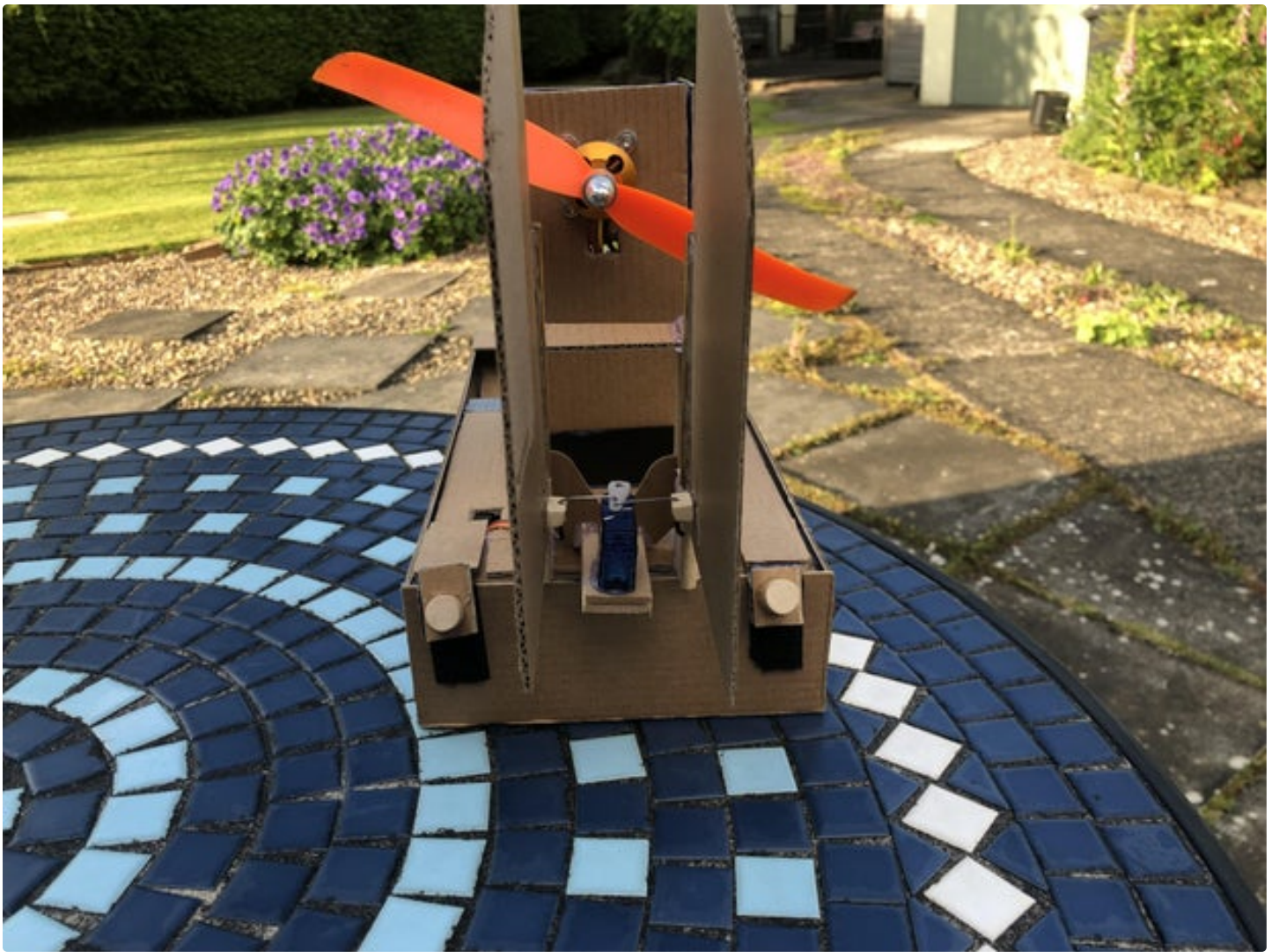
I initially was going to place the Steering Servo on one side of the boat I then realised that wasn't going to work, it would be ok in one direction but not the other so I opted for a central position between the 2 rudders.

I cut 2 slats of 3mm MDF and hot glued them together, then hot glued these to the rear of the deck board, this was sticking out to the rear by approx 20mm, I then hot glued the Servo onto the board, I made some little blocks of wood and drilled a 1mm hole through the centre, placing these at the same height as the Servo horn on each rudder and marking off I CA glued these into position, I made 2 control arms out of 1mm wire and on the protruding ends I cut 2 small lengths of heat shrink and used a blow torch to shrink, this will stop the control arms from coming out of the wooden blocks.

The next part is fitting the ESC and wiring up this and the Servo:







Step 6: Electrics, Testing and Summary

In this section we fit and connect the ESC the 3 motors wire are connected , if the motor spins the wrong way disconnecting any 2 wires and swapping will sort this.

The ESC is plugged into channel 3 on the receiver and the steering servo on channel 1, channel 3 is on the left hand side and moves vertically up and down for motor throttle control and is the only channel that doesn't return to a central position when using the sticks, channel 1 is on the right hand and it moves left and right for steering.

I'm using a 11.1 Lipo battery for power, when plugged into the ESC this provides 5v power for the Receiver, Motor and Servo.

With everything plugged in I tested the steering first, this worked really well and then pushing the left joystick up see's the Motor spinning up, this was going the wrong way, so I swapped 2 wires around and that worked so now it's time for the first test.

Before testing I applied a Piece of Gaffer tape to the front of the decking, this is applied to the front support and decking and will act as a hinge, I also made a couple of Velcro fasteners for the back part of the decking, I made a couple of knobs to assist opening the Velcro as well, on the first motor spin up the decking left the boat hence the hinge and fasteners :))

Initially tests on the grass were not too good so I cut the grass, It still wasn't very good, it kept lifting the rear of the boat up and flipped over a couple times then I realised that I had secured the propeller too far along the shaft so I reset it

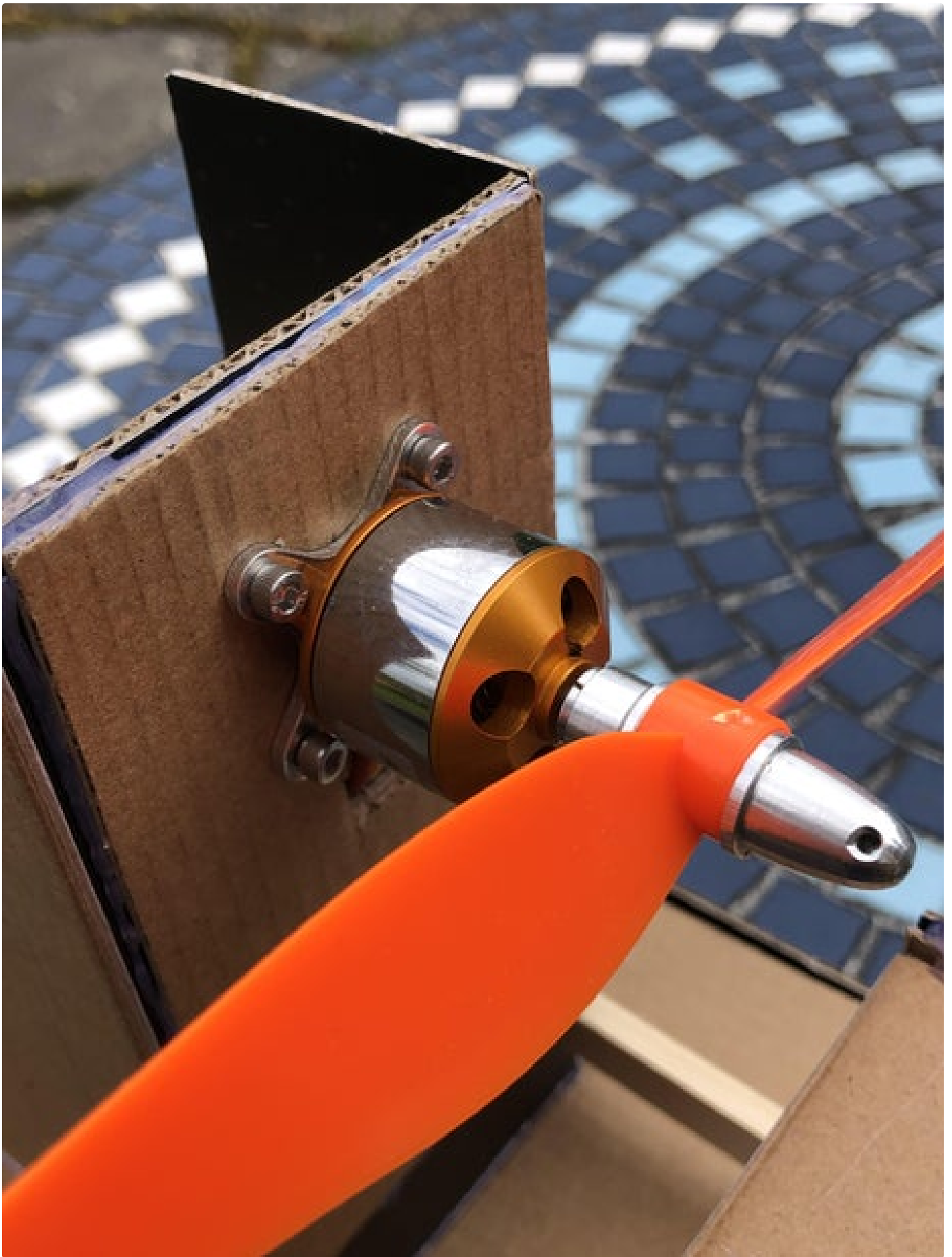
closer and this was a vast improvement, the boat is a bit flighty and turns very quickly catching me out and overturning on occasion, I trimmed the rudder Servo movements down by 50% and this worked better bearing in mind we are on grass, I also applied some gaffer tape to the underneath of the boat on the crease just to protect it.

For all the safety minded people out there, I was going to fit a prop guard of some description, but I couldn't find anything suitable, so for this test I was extra careful.

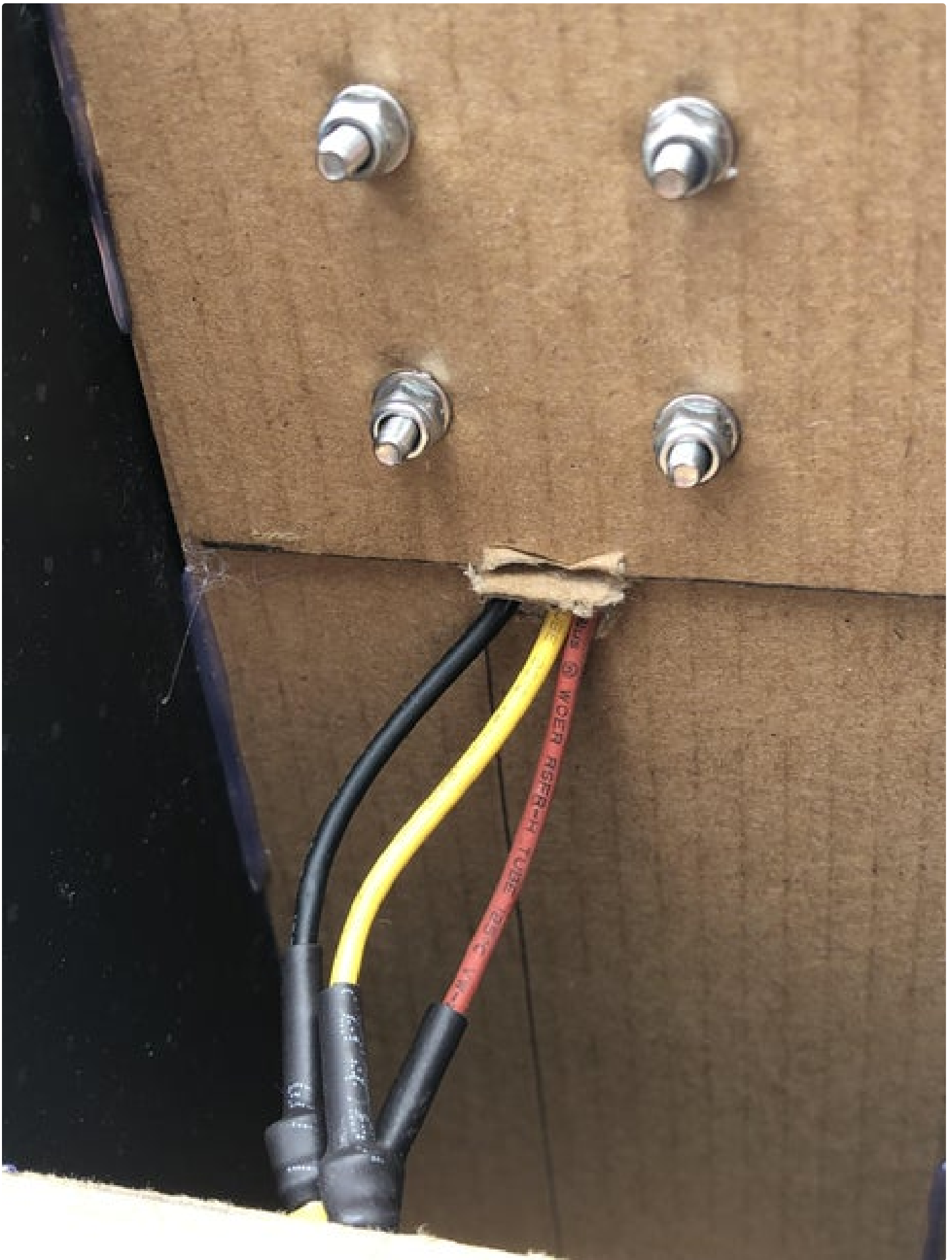
I think this Airboat would go really well on water but that would mean waterproofing which is not really feasible with it being cardboard, but good fun on the grass for sure, and food for thought with another build sometime.

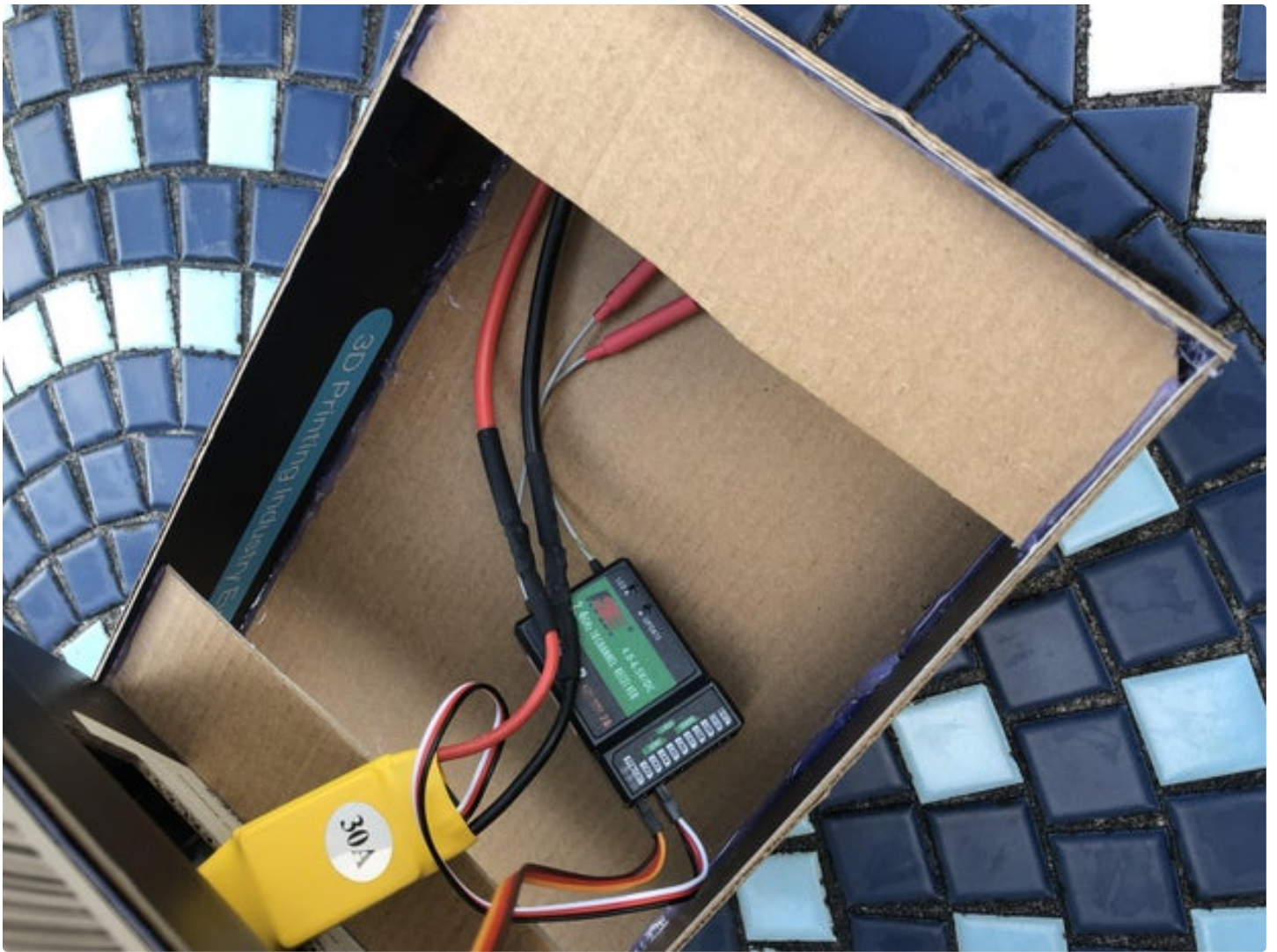
Its my 2nd Radio Controlled project and I've really enjoyed putting this build together, it's great setting out without a real plan and making it up as you go along and when it works is really cool, here's looking forward to the next RC project.

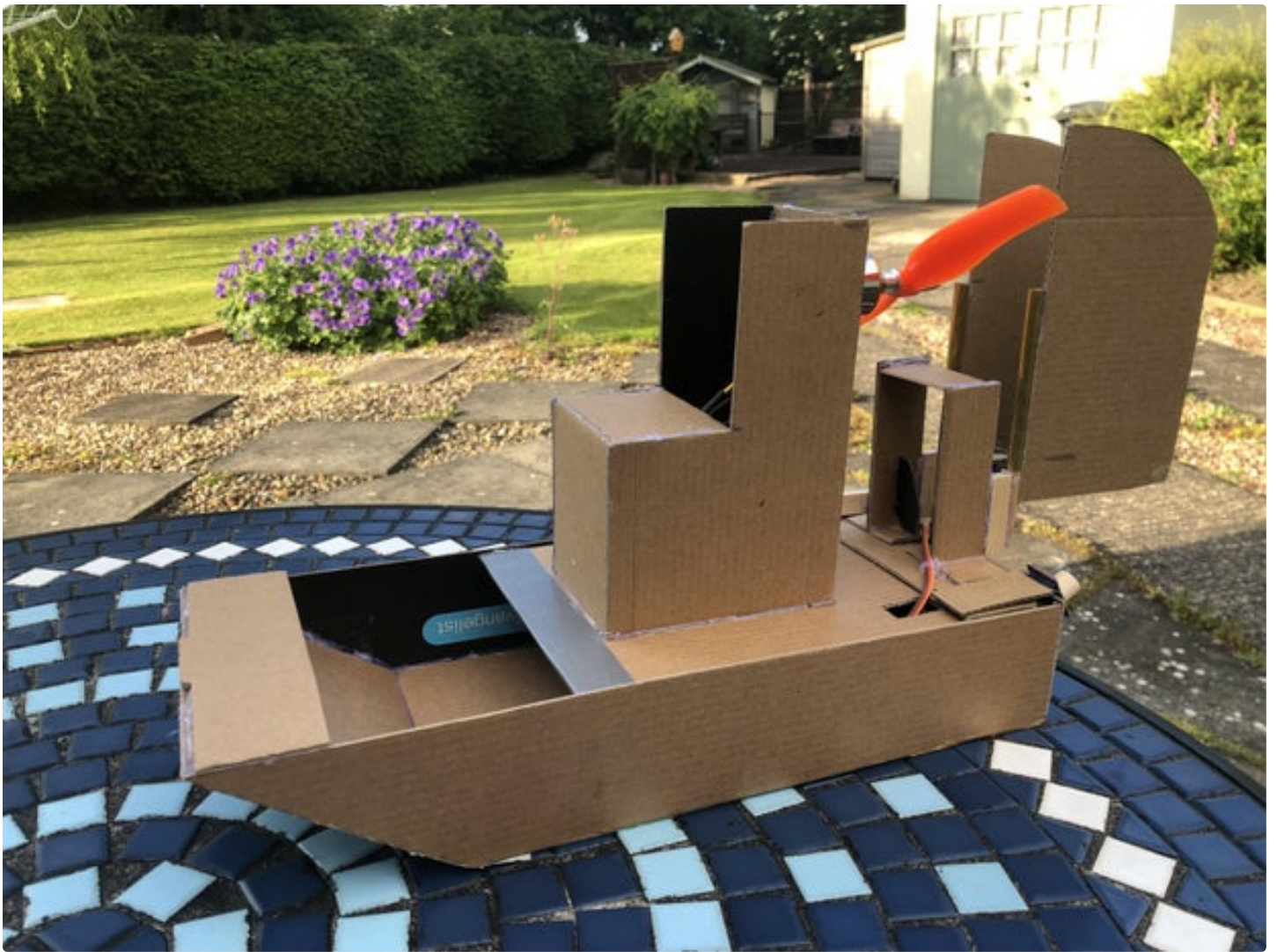
I hope you enjoyed this Instructable and thanks for looking.

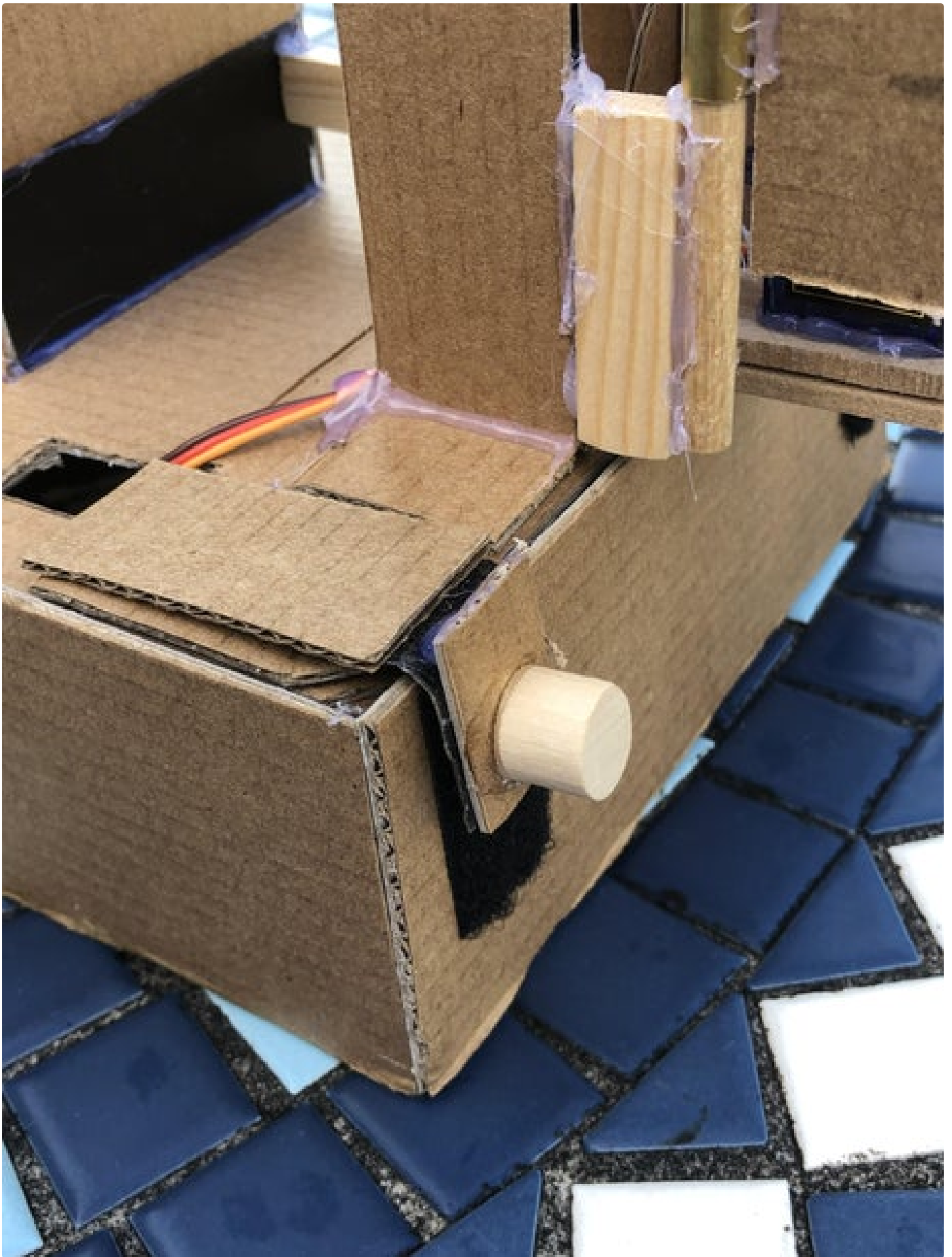














So cool, I predict a cardboard contest finalist!



This is awesome! Love the video. Definitely gonna need to share this on our social media :D



Hi and thanks Jessy, glad you like the Instructable,.