

ASSEMBLY MANUAL AND USER GUIDE



PR1

POND RACER

1200mm

By 3D AEROWORKS

OVERVIEW:

This replica of the Pond racer is designed for quick and easy construction and printed using regular PLA. Designed to suit the 3548 900kv motor this model has a significant amount of power and is happy to cruise around at 50% power on 3s. Utilizing 6 channels; Ailerons, Elevator, Flaps, Rudder, Throttle and Landing gear, this model is sure to turn some heads at the local flying field. Links to components used can be found on the last page of the user guide. The modular design means it has the capability to be broken down into smaller sections for either easy transporting or changing parts should it be required.

AIRCRAFT HISTORY:

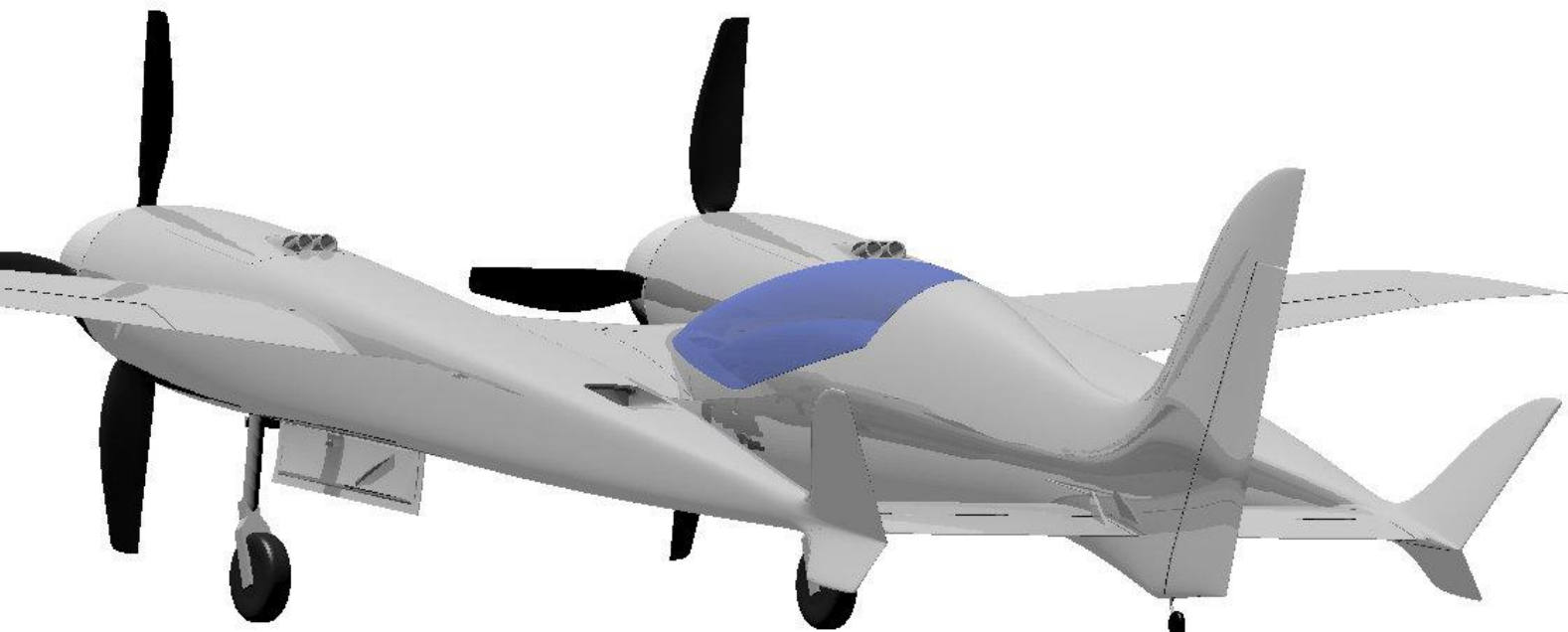
The Pond Racer is a unique and innovative high-speed aircraft that stands out among its contemporaries. It was designed and built by Robert J. Pond, a renowned aviation enthusiast and president of the R.J. Pond Company, Inc. The aircraft first took to the air in 1991, and it immediately captured the imagination of aviation enthusiasts around the world.

One of the most striking features of the Pond Racer was its sleek and streamlined design, which gave it an unmistakable appearance in the skies. Its distinctive shape and impressive speed capabilities made it a favorite among aviation enthusiasts and spectators alike.

The Pond Racer was flown in several air races throughout the 1990s, often competing against other high-performance aircraft like the Mustang and the Bearcat, and it held its own against these formidable competitors.

In addition to its racing success, the Pond Racer also played a vital role in the development of new aviation technologies. Its innovative design and use of advanced materials helped pave the way for future aircraft designs and engineering advancements.

Today, the Pond Racer remains an iconic aircraft in the world of aviation. Its unique design, impressive speed capabilities, and important contributions to aviation history continue to make it a source of inspiration and admiration for aviation enthusiasts around the world.



HELP US CONTINUE TO PRODUCE QUALITY MODELS

This model has taken many hours of hard work and testing in order to provide a nice flying aircraft. Please do not share it. Please show your appreciation by directing interested parties to the link below.

<https://cults3d.com/en/3d-model/various/pond-racer-1200mm>

GENERAL SPECIFICATIONS

WINGSPAN:	1200mm
PRINT WEIGHT:	1600g
FLYING WEIGHT:	2450g
CENTER OF GRAVITY	32mm aft of L.E at wing root. (Marked with indentation)

ELECTRICS

MOTOR:	3548 900kv
ESC:	40 amp (min for 3s)
SERVOS:	standard 9g
BATTERY:	2200mah 3s 50c (175g) (or similar)

INCLUDED WITH THESE FILES

STL files for all parts

FFF factory files for Simplify 3d

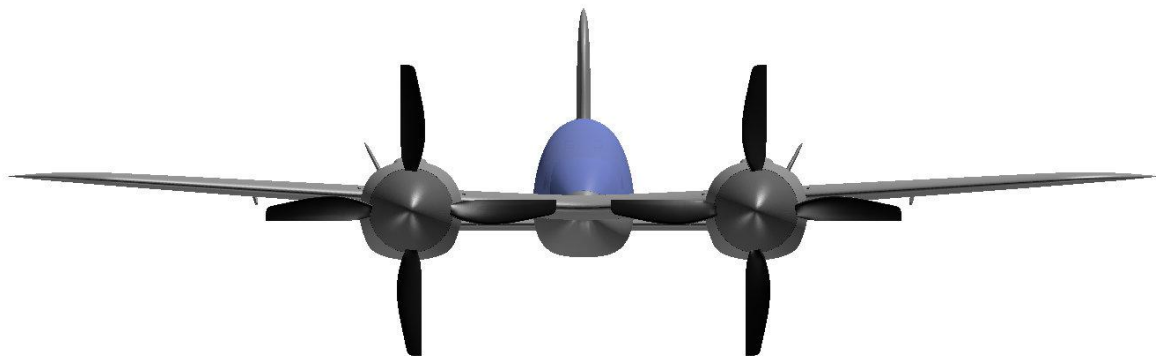
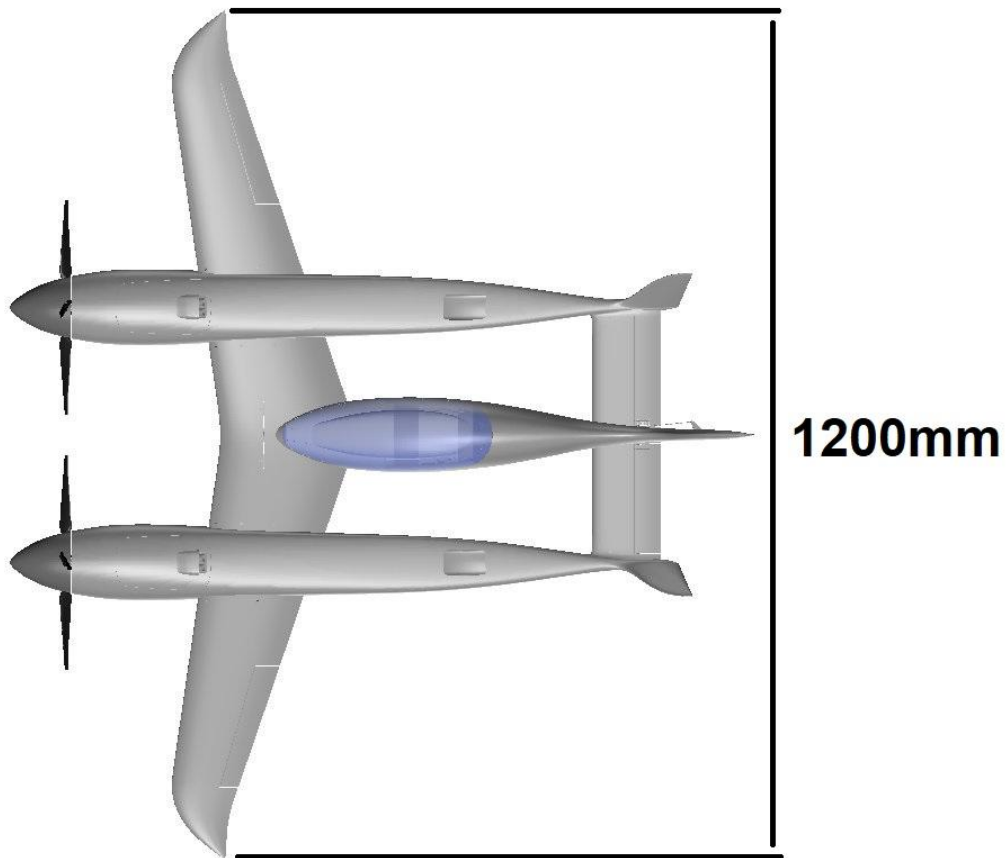
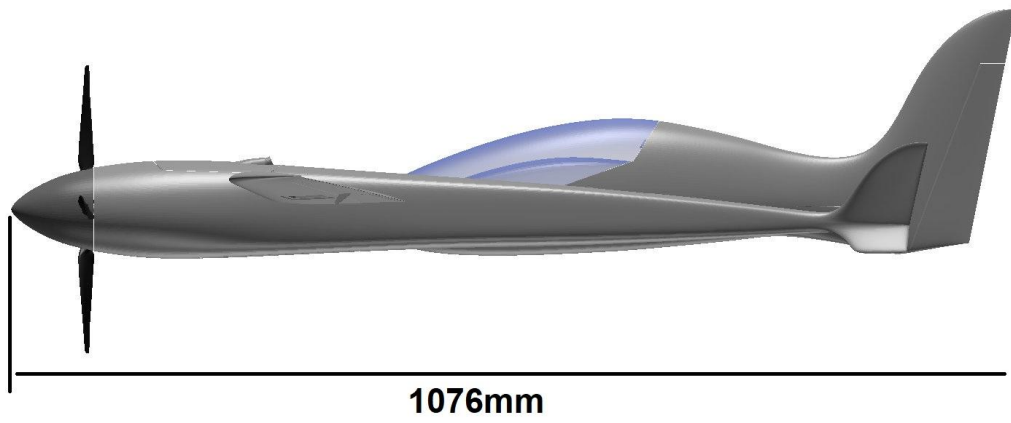
GCODE files for all components

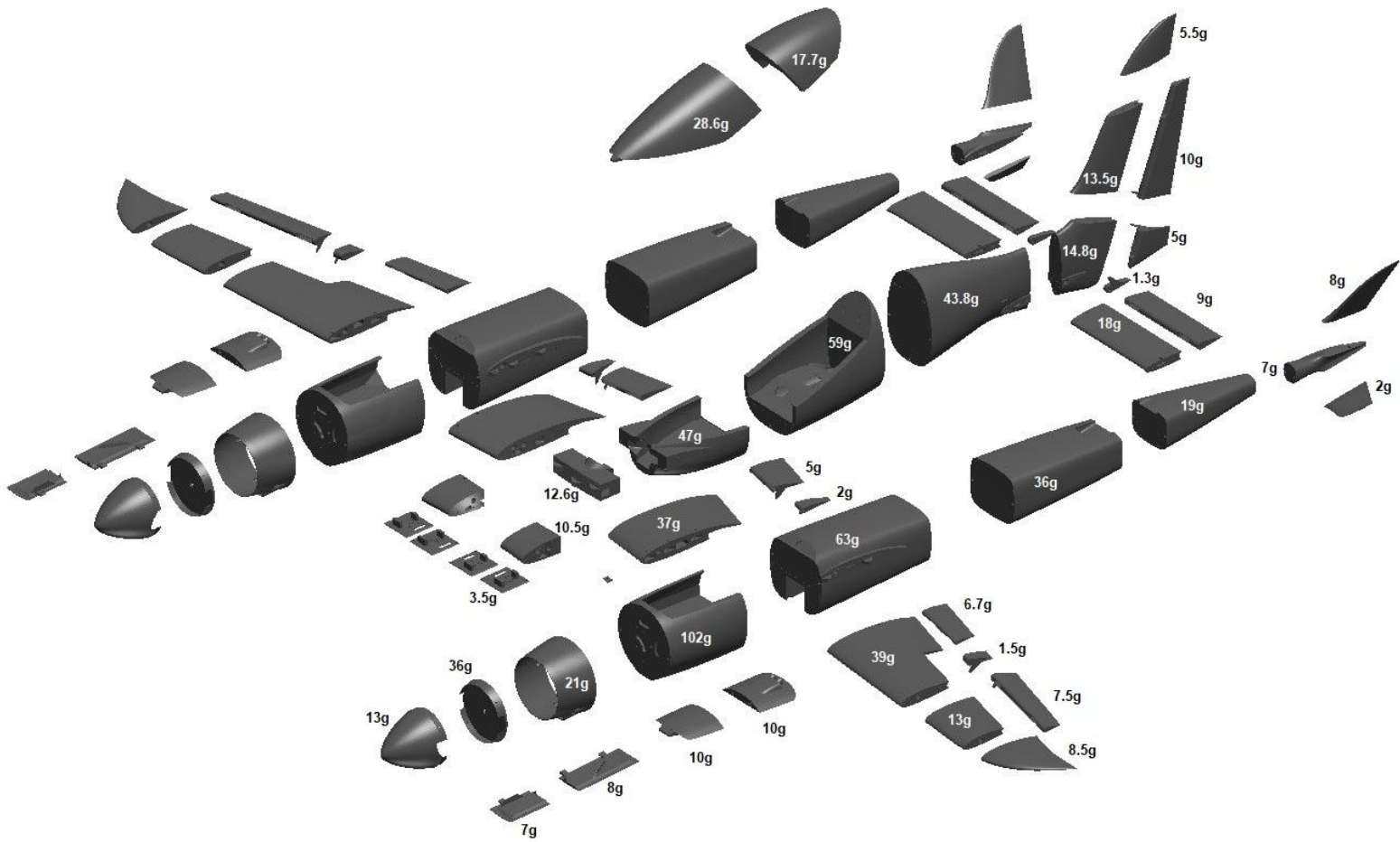
Print settings guide

Print orientation images (POI)

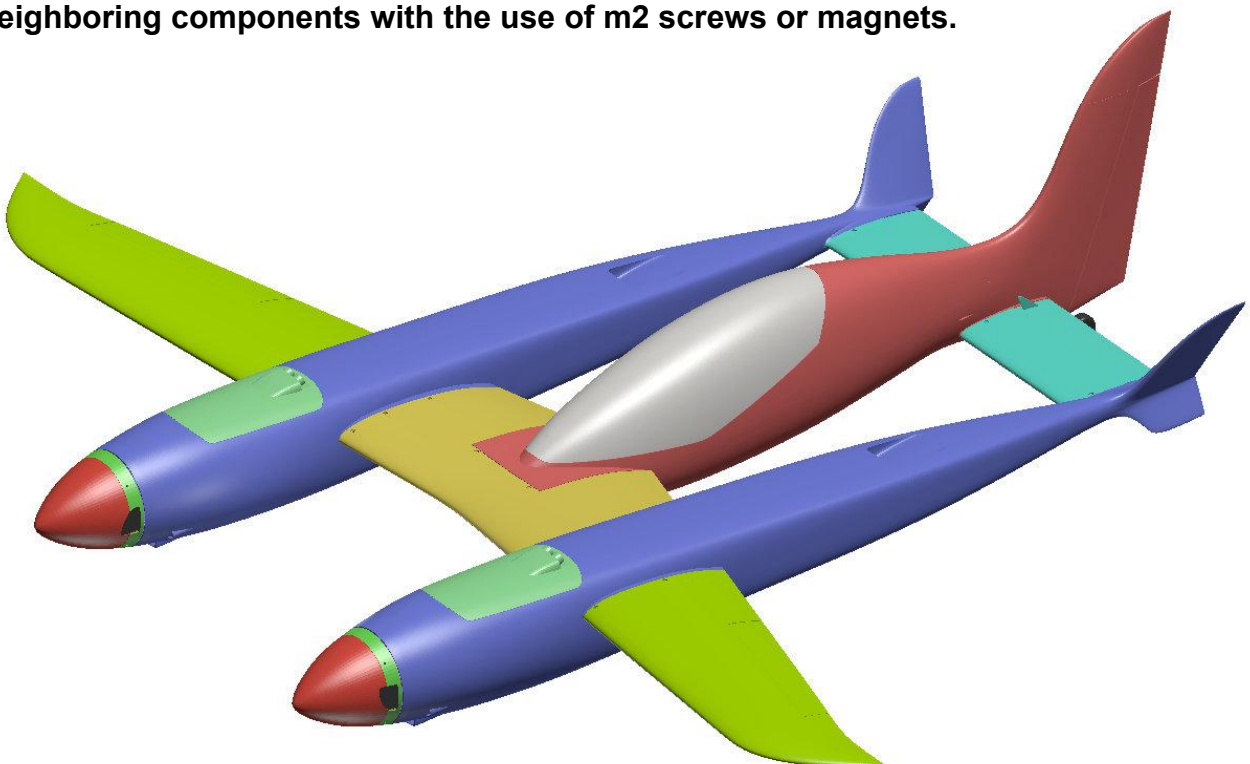
NOTE!

MINIMUM BUILD VOLUME: 200mm x 200mm x 200mm





Different coloured parts indicate sections which can be attached or separated from neighboring components with the use of m2 screws or magnets.



REQUIRED TOOLS:

KNIFE

LIGHTER

SANDPAPER (MEDIUM GRIT)

PLIERS

CA GLUE + HOT GLUE

SCREW DRIVERS (PHILLIPS AND HEX)

FILE (flat)

DRILL AND BITS (1mm, 2mm)

REQUIRED COMPONENTS:

X2 3548 900kv

X2 11x10 propeller

X2 40amp esc (for 3s operations)

X2 2200mah 3s 50c LIPO OR SIMILAR
(175g)

X6 9g servo

X2 2.5kg retracts 4mm pin

X2 landing gear leg 120mm long

Hardened stainless steel rod 4mm (x2
50mm min)

1mm Piano wire

X2 1.5mm Piano wire (350mm min)

X8 10mm X 10mm X 2mm Magnet
(ROUND)

X18 16x29mm nylon hinges (OPTIONAL)

X6 m1.5 linkage stopper

M2 screws (6mm, 10mm, 14mm, 20mm)

X8 M3 screws (25mm) (for landing gear)

X3 10mm round carbon tube (500mm)

X1 3mm square carbon tube (65mm min)

X2 3mm carbon tube (200mm)

X1 25mm foam wheel (tail wheel)

Velcro

Braided fishing line (or similar)

Bamboo skewers 3mm

Small extension spring 0.3mm

X2 Extension spring 1.2x30x8mm (for grass
runways)

ASSEMBLY INSTRUCTIONS

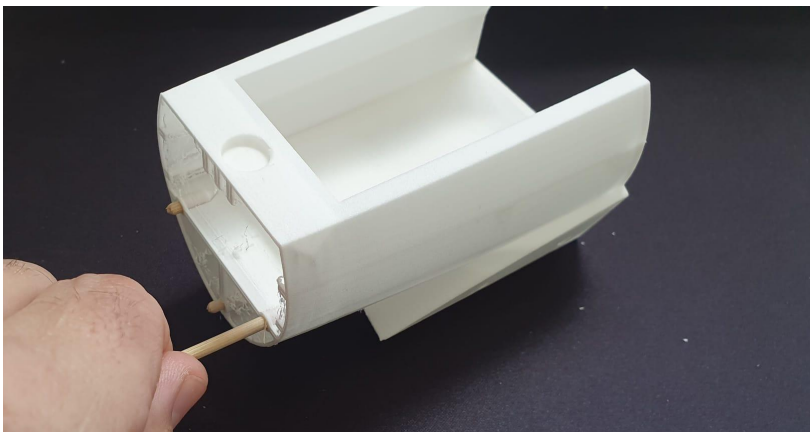
All faces which are to be glued to other parts need to be given a light sanding (scuff the surface) to assist with glue adhesion.



Almost all components which are to be joined will have 3mm alignment pin holes printed into the mating faces of the parts. Cut 10mm sections of 3mm skewer and place them into the alignment holes.

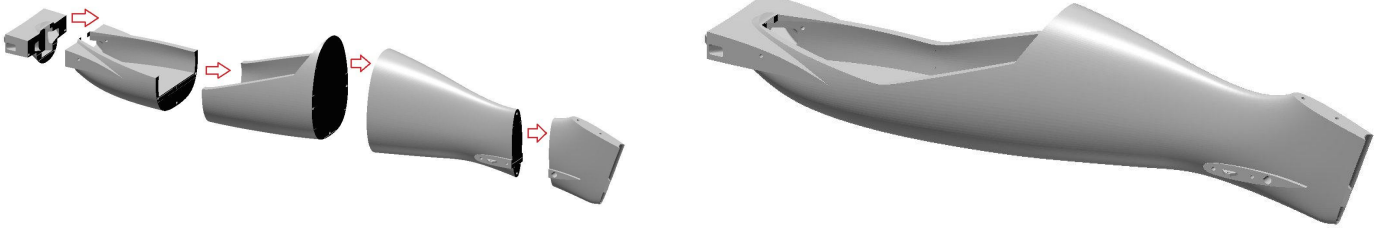
NOTE - It may be required to open up the holes a small amount if the fit is too tight. Do this by using a 3mm drill bit. Gently spin it in reverse as you insert it into the hole. This will ensure the bit does not tear the print.

Test fit the sections of the fuse before gluing to ensure a clean fit.

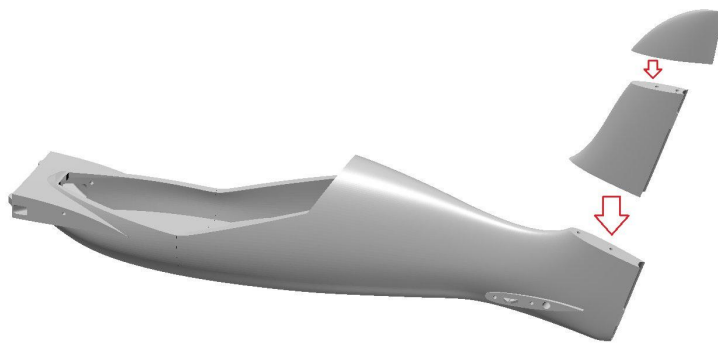


1 CENTER FUSELAGE ASSEMBLY

- Glue Center fuselage sections 1-5 of the fuse together.

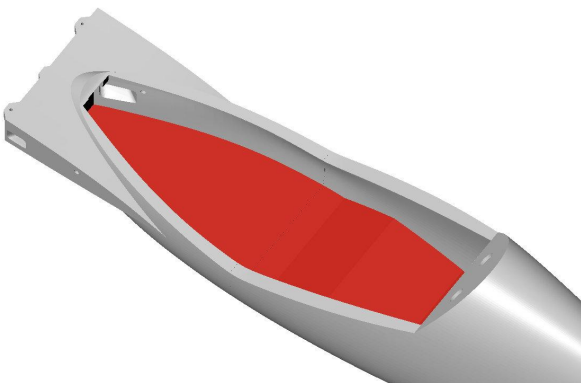


- Glue the sections of the vertical stabilizer together and then to the center fuselage section.



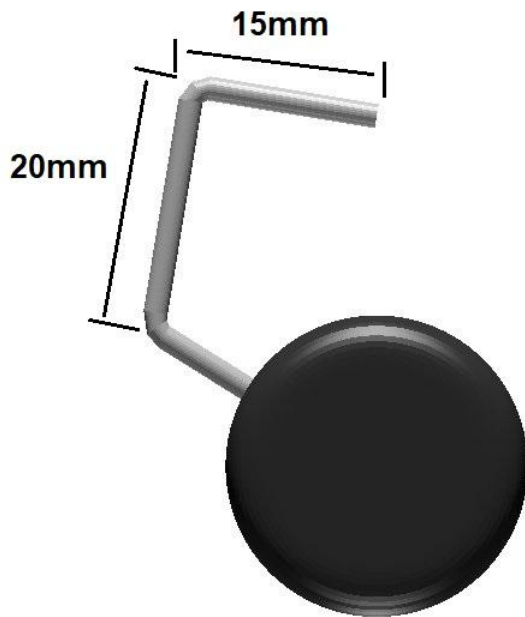
- Once glued, with a sharp knife, remove the false floor of the battery hatch. (see pic/ highlighted faces)

Should look like this!



2 RUDDER AND TAIL WHEEL ASSEMBLY

- Glue the sections of the Rudder together and bend up a tailwheel axle to mount into the rudder.



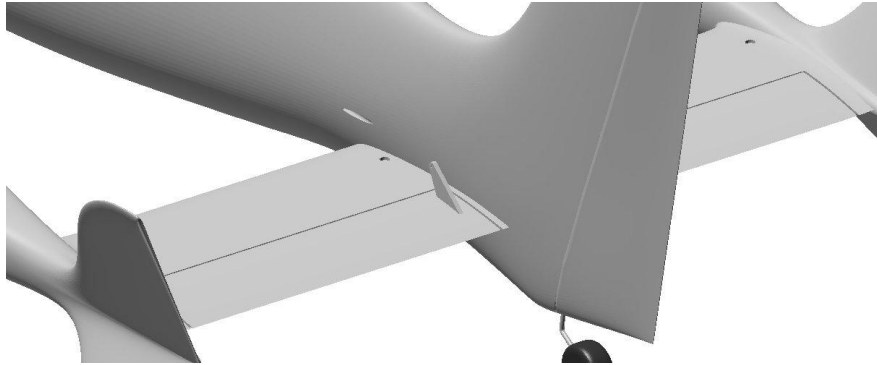
- Mount the 20-25mm tail wheel and secure it in place with a m1.5 collar.
- Glue the tail wheel assembly into the Rudder using CA.(the fitment should be tight)
- Test fit nylon hinges into the Rudder and the Vertical stabilizer, then once happy with the fitment and rotation, glue the Rudder in place with CA.

TIP: After adding the CA, use a tissue to wipe away the excess.

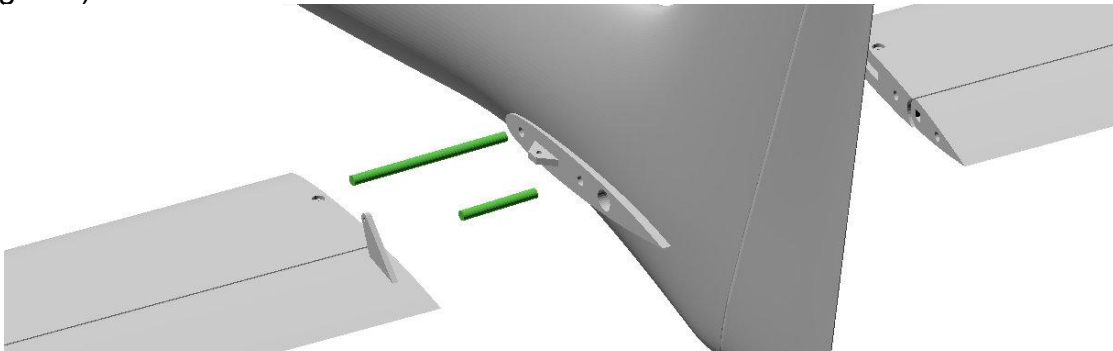
IMPORTANT! Only 2 drops of CA is needed for each slot for the hinges. Too much CA and the hinge will bind and be unusable.

3 HORIZONTAL STABILIZER ASSEMBLY

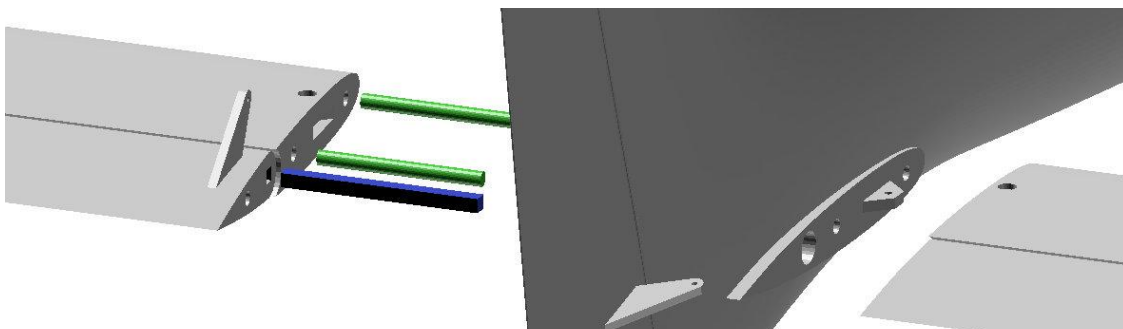
- Glue the sections of the elevator together. NOTE- the elevator horn is on the top side when fitted to the horizontal stabilizer.



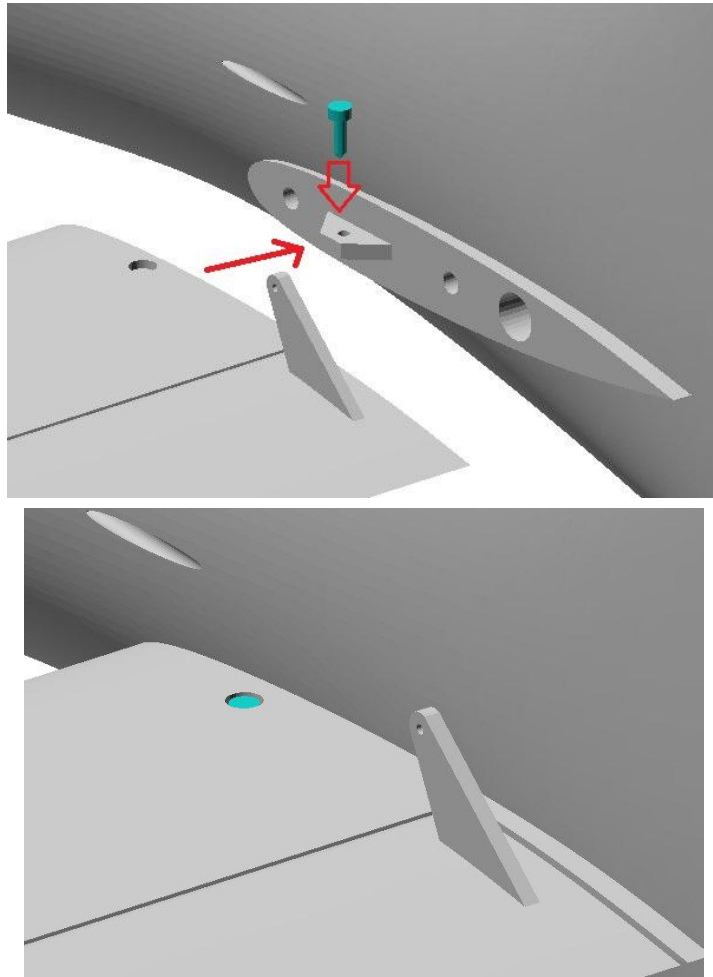
- Test fit the elevators to the horizontal stabilizer using the nylon hinges, then glue them in place.
- Cut one 110mm (front) and one 45mm (rear) section of 3mm round carbon rod. These will be used to brace the horizontal stabilizer against the center fuselage. (indicated in green)



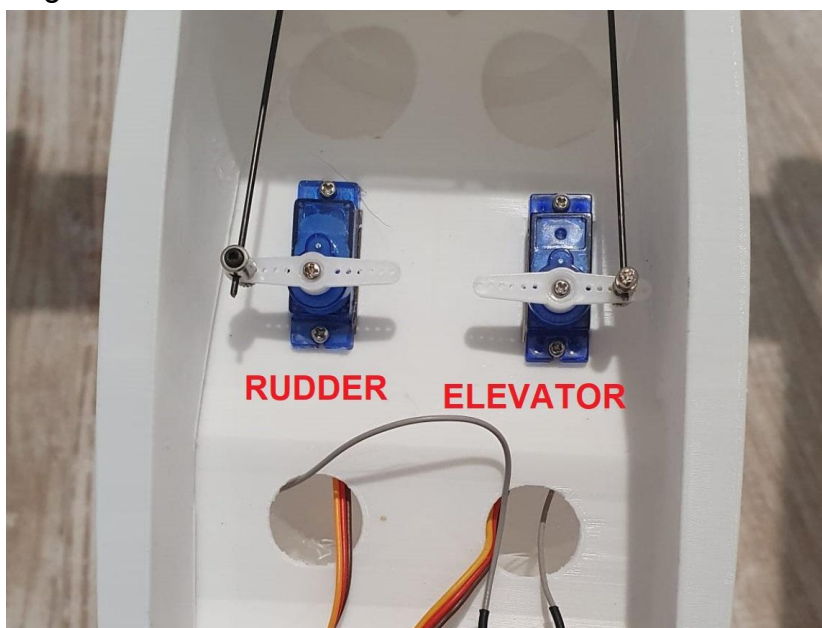
- Cut one 50mm length of square carbon rod. This will be the torque tube through the fuselage to operate the right elevator. (indicated in blue)



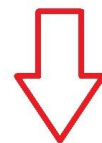
- Test fit the horizontal stabilizer to the center fuselage section by securing it with an m2 x 10mm screw.



- Install the elevator and rudder servo. Use a 1.5mm push rod to connect the elevator and rudder to their respective servo's through the printed bowden tubes in the fuselage.



FRONT



- Remove the horizontal stabilizer for later installation.

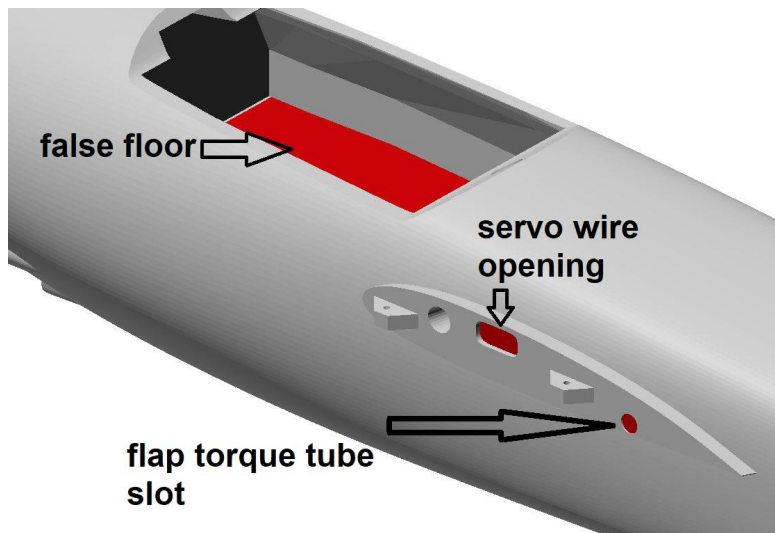
4 CANOPY/BATTERY COVER ASSEMBLY

- Glue the respective sections of the canopy and battery bay covers together using CA.
- Glue the magnets into the canopy, battery bay covers, center fuselage and motor pod sections.

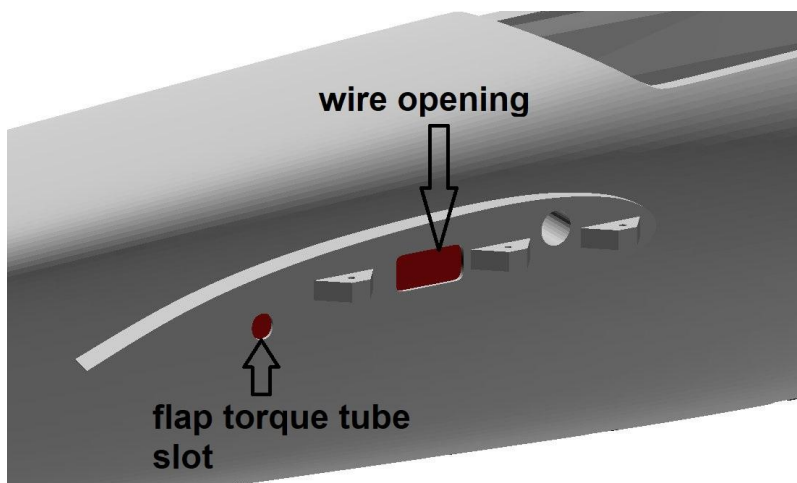
5 MOTOR POD ASSEMBLY

- Glue sections 2-6 of the motor pod together using CA. Leave off section one until after installing the motor.
- Glue the pod fins to the tail of the motor pods.
- Using a sharp knife, remove the false floor of the motor pod battery bay. Use a soldering iron, remove the other faces highlighted in red.

OUTBOARD



INBOARD

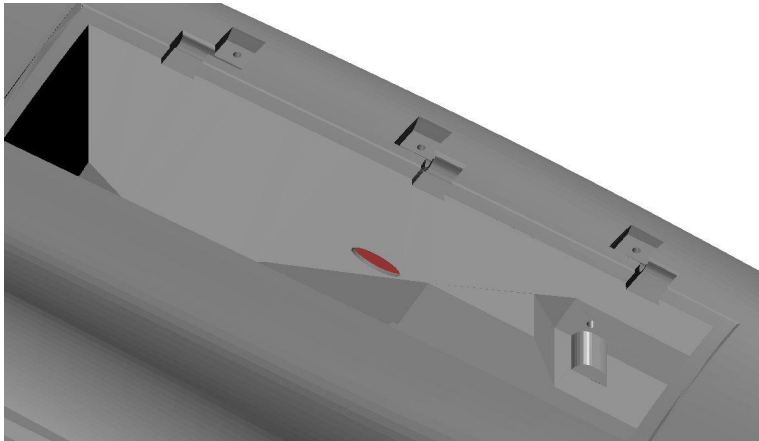


6 MOTOR INSTALLATION

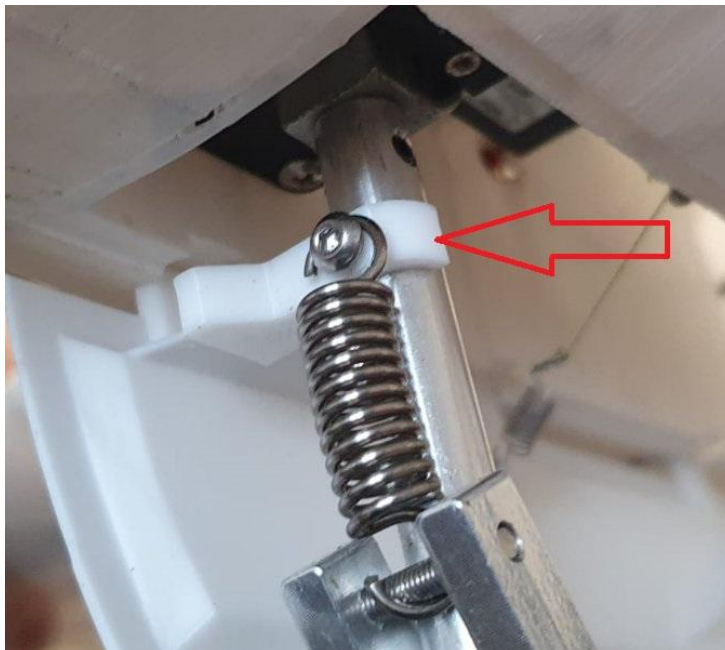
- Install the motor using m2 or m3 screws.
- Check the fitment and spacing of fuse 1 to the spinner backplate and add washers as required. There should be a 1mm gap between the spinner backplate and the front of fuse 1.

7 LANDING GEAR INSTALLATION

- Using a soldering iron, remove the indented face highlighted in red from the gear bay. This will allow the servo wire for the retract to pass into the motor pod fuselage.



- Install the gear door blocker to the upper section of the leg using the bolt that holds the gear spring in place on the gear leg. It should face inwards towards the center of the model.



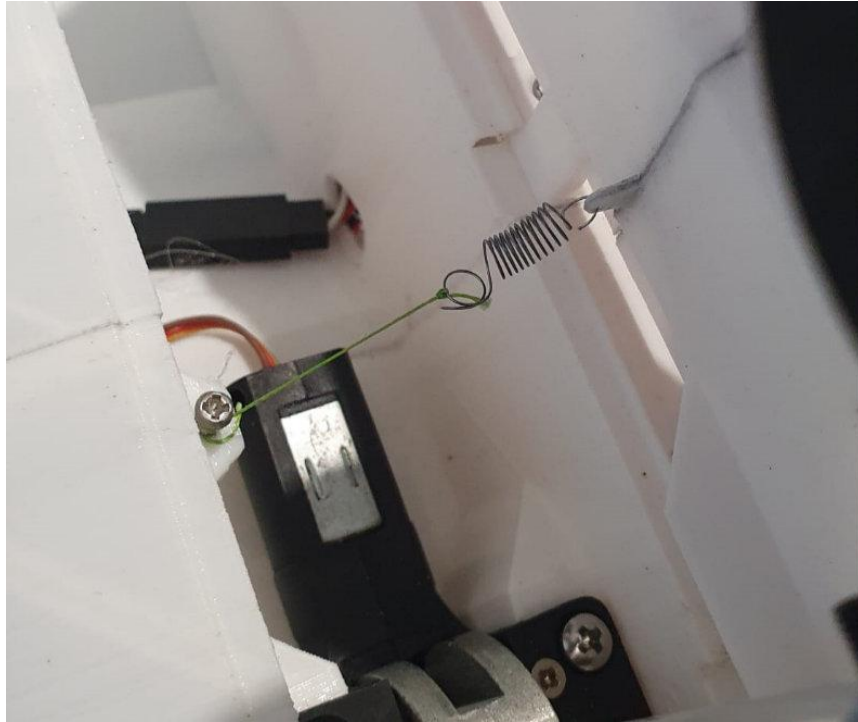
- For long grass, the stock spring should be exchanged for a 1.2mm x 30mm x 8mm spring. (pictured below)

- Install the gear leg into the retract.
- Install the retract into the gear bay using m3 x 25mm screws.
- Fit a connecting wire long enough that it will reach the center fuselage section and leave the wire in the motor pod battery bay.

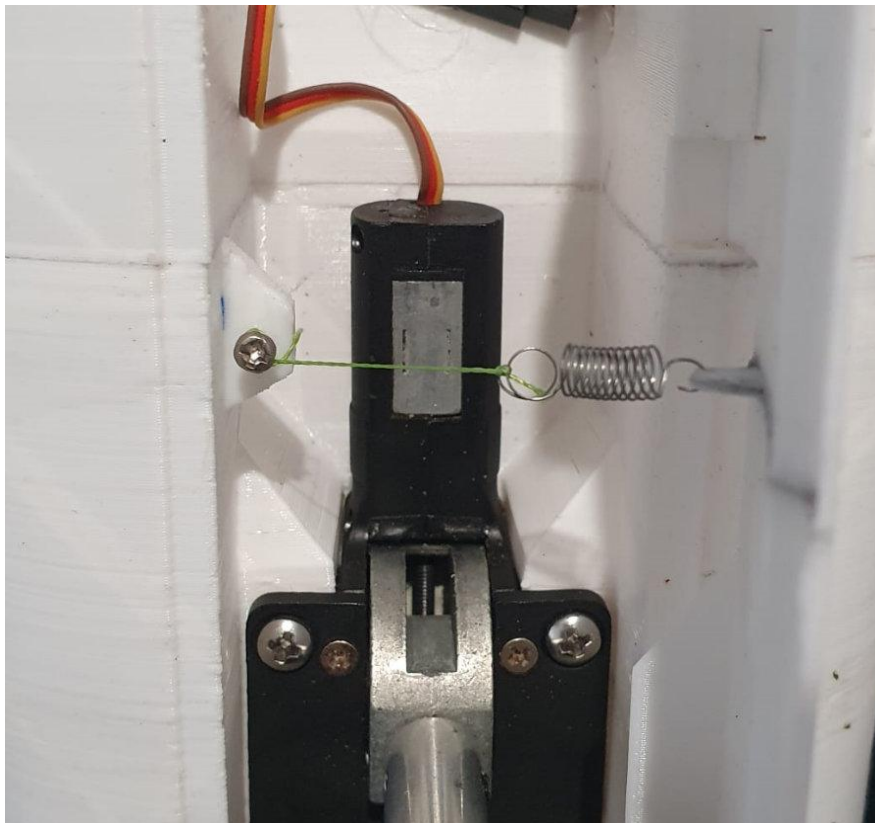
8 GEAR DOOR INSTALLATION

- Use a 1mm drill bit on the gear door control arm to ensure the tension spring will be able to be installed.
- Glue the sections of the gear doors together.
- Cut 15mm lengths of the 1mm push rod and insert them into the gear door hinge plates.
- Test fit the Gear door to the motor pod with the hinge plates loosely fitted. The hinge plates have small indentations indicating their position.
 - 1 dot = front hinge plate
 - 2 dots = middle hinge plate
 - 3 dots = rear hinge plate
- Once happy with the fitment, glue the pins to the hinge plates with a small amount of CA.
- Using small m2 x 6mm screws, install the gear door to the motor pod.

- Attached a small length (5mm or less) of small extension spring to a length of braided line. This will be the tension wire which pulls the gear door closed when retracting the gear.
- Fit the other end of the braided line to an m2 x 8mm screw and install the screw into the gear bay. There should be a very small amount of tension on the spring when the gear is down.

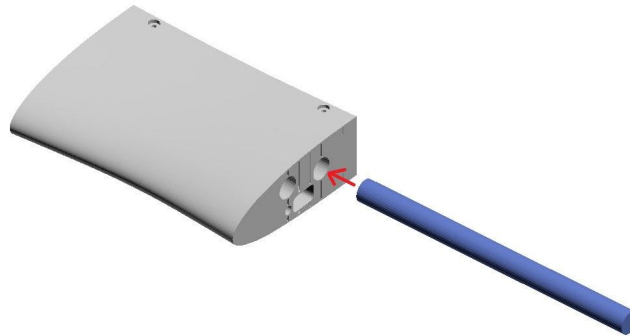


- As the gear is retracted, check the tension on the gear door. Adjust the screw to increase or decrease the tension on the gear door.

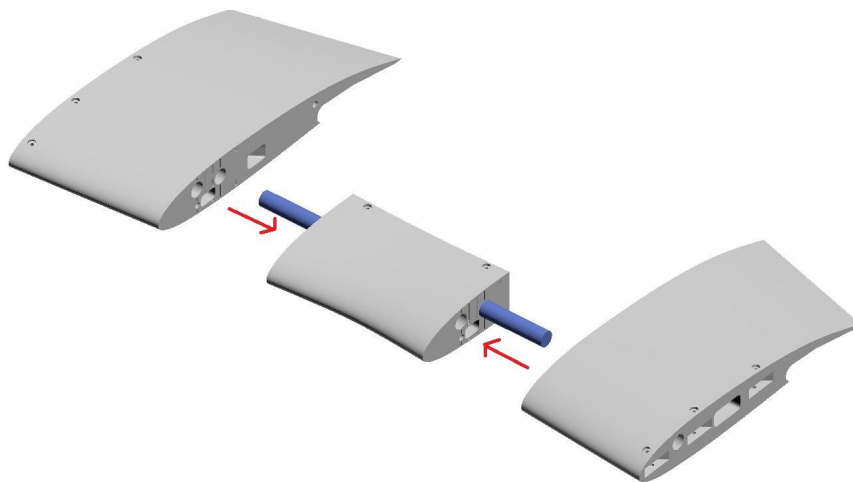


9 CENTER WING ASSEMBLY

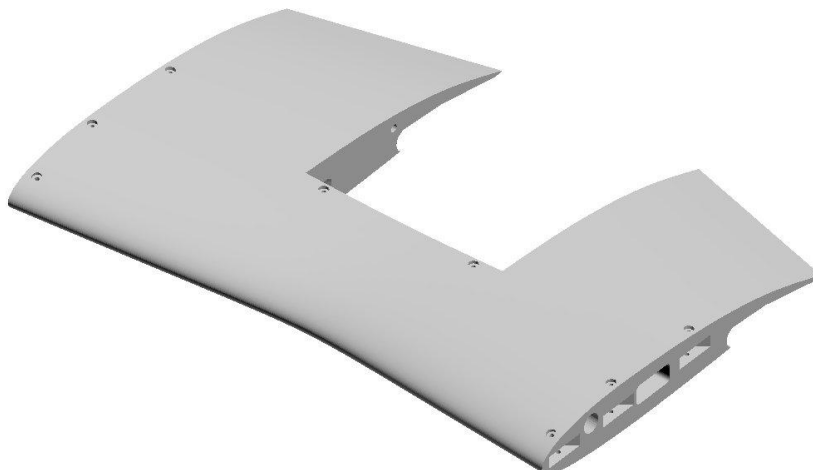
- Glue inner wing (1) sections of the center wings together.
- Cut an 180mm length of 10mm round carbon tube and insert it through the inner wing sections.



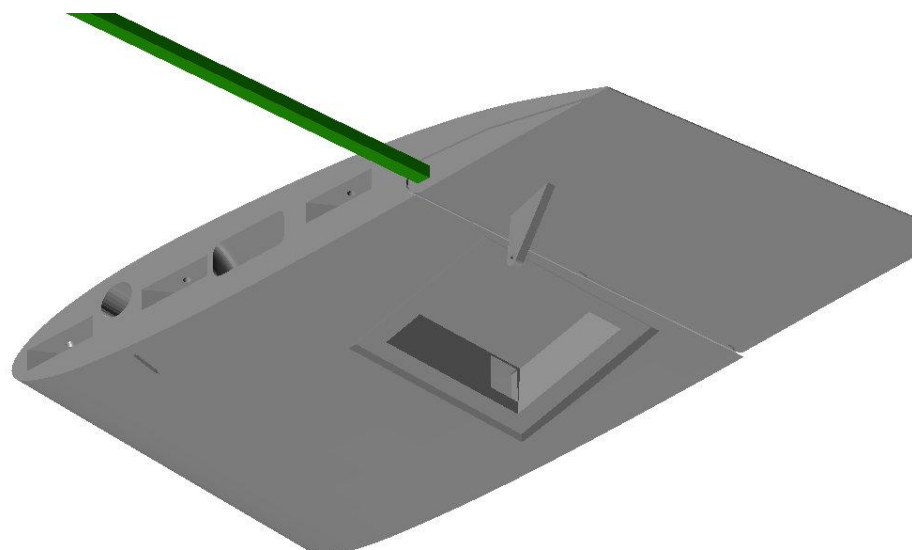
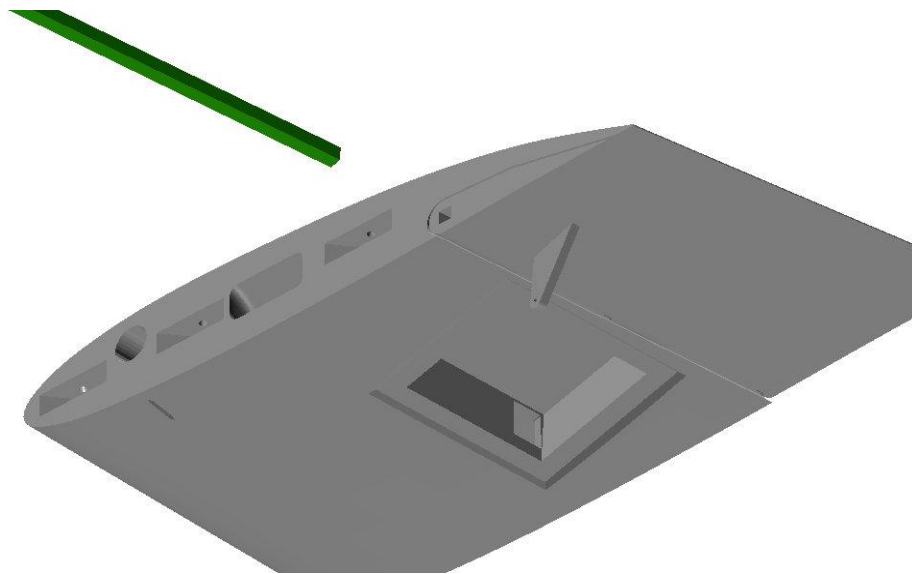
- Glue inner wing (2) sections to the center wing assembly.



ASSEMBLED INNER WING SECTION



- Glue the sections of the inner flap together
- Test fit the inner flap to the inner wing section using the nylon pinned hinges. Check that the flap does not bind with the center fuselage section or the motor pod through its range of travel.
- Glue the inner flap sections to the inner wing assembly.
- Install the flap servo to the flap servo cover using supplied screws.
- Install the flap servo cover into the wing using m2 screws and connect up the flap using 1mm pushrod. The servo wire should feed into the center section of the inner wing which will later pass into the center fuselage section.
- Cut a 140mm length of 3mm square carbon tube and install it into the inner flap.

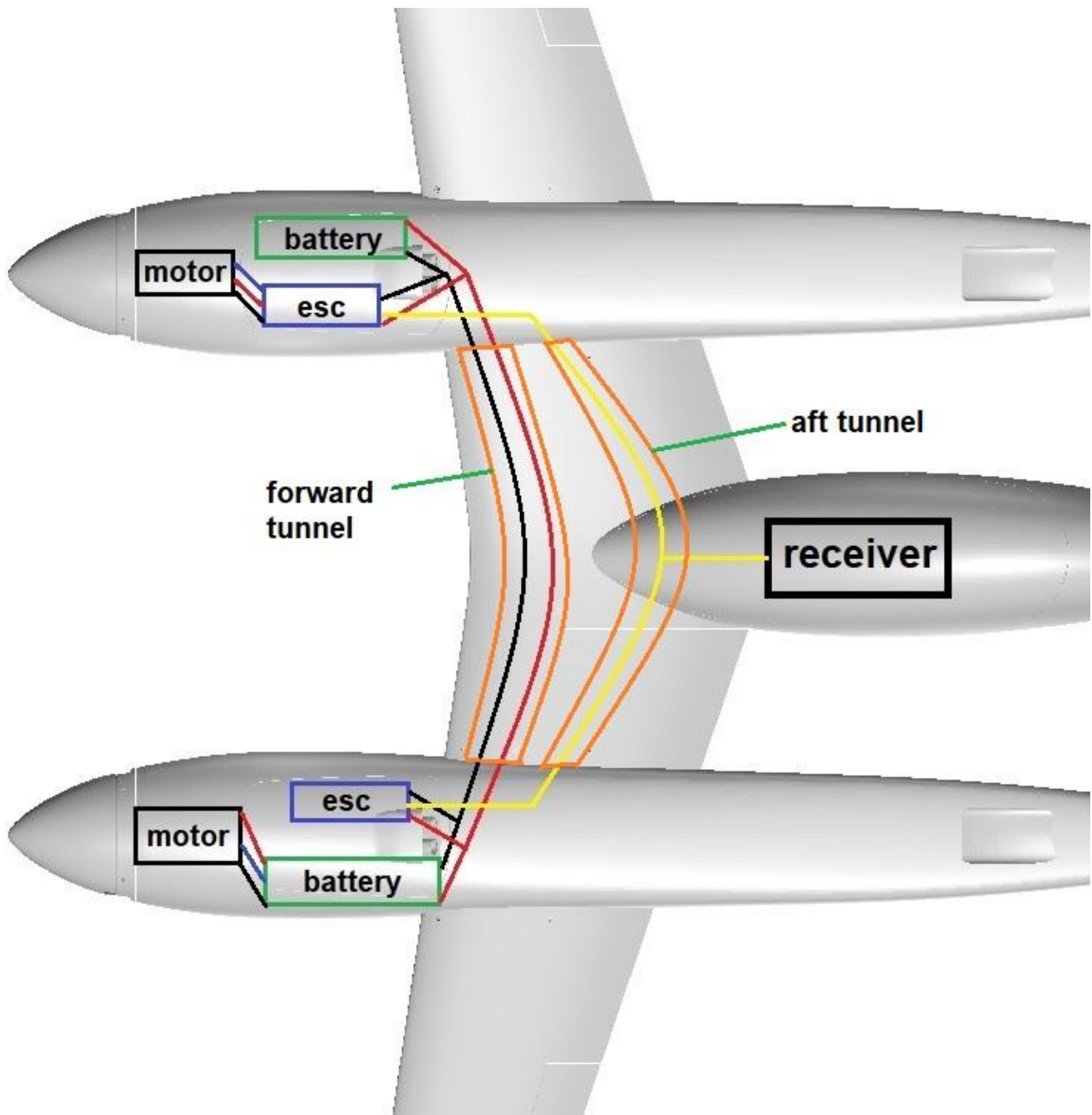


10 OUTER WING ASSEMBLY

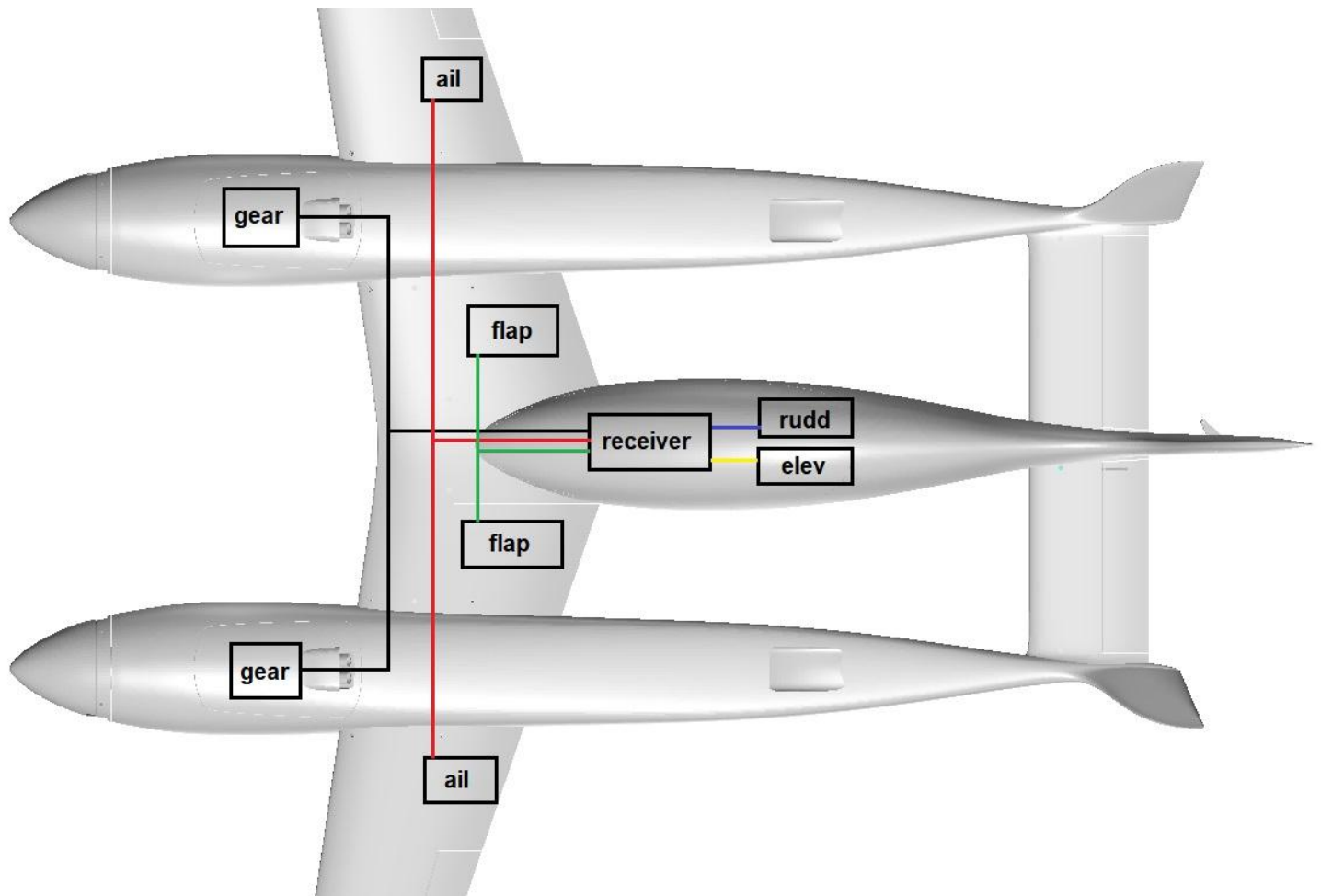
- Glue the sections of the outer wing together using CA.
- Glue the sections of the ailerons together and fit the aileron to the outer wing section.
- Glue the aileron and outer flap to the wing using nylon hinges.
- Install the aileron servo to the servo mount plate and screw the mount plate to the outer wing section.
- Connect the aileron servo to the aileron using 1mm pushrod. The outer flap will be connected in the final assembly with the torque tube from the inner flap.

11 WIRING

- Wire up the esc's so that there is a common positive and negative wire connecting the two. This will ensure the motors spin with the same rpm and power reducing the chances of adverse thrust.
- The wiring tunnel splits into two tunnels inside the center wing section. One forward and one aft. The power leads for connecting the esc should be fed through the forward tunnel and all the servo wires through the aft tunnel.

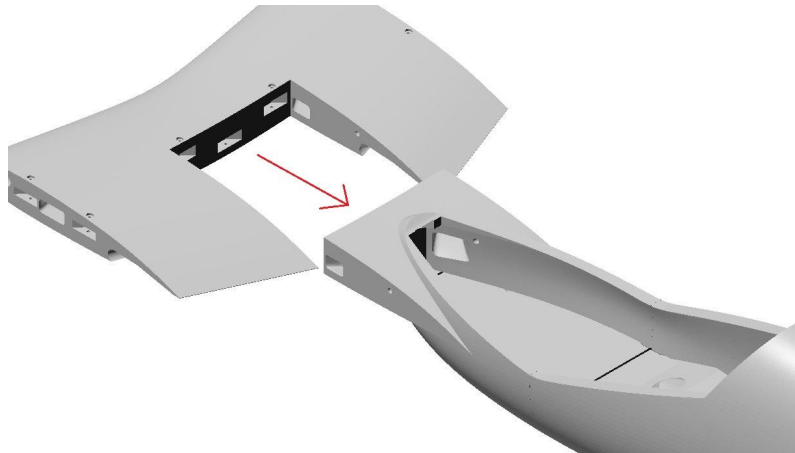


- Connect up the gear, ailerons, flaps, elevator and rudder to the receiver.

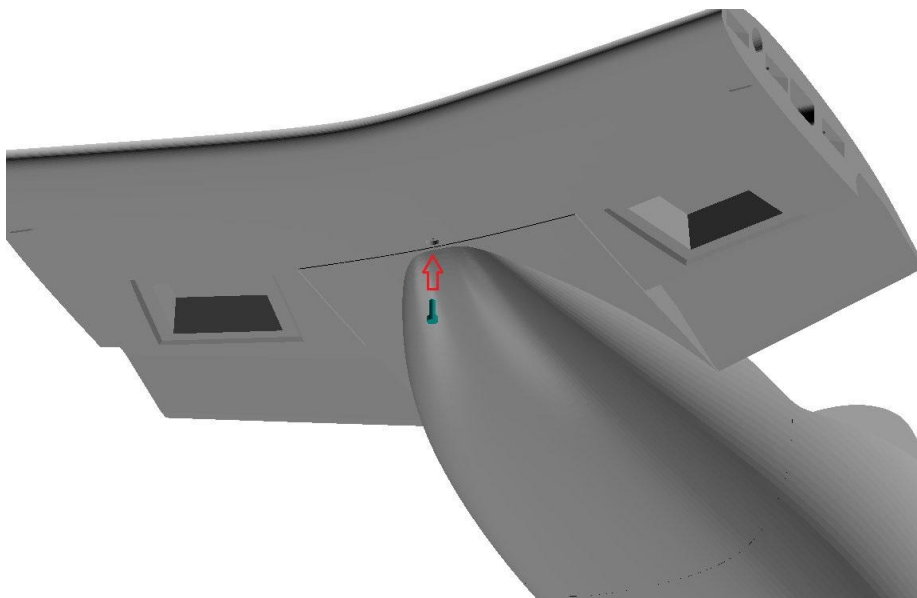
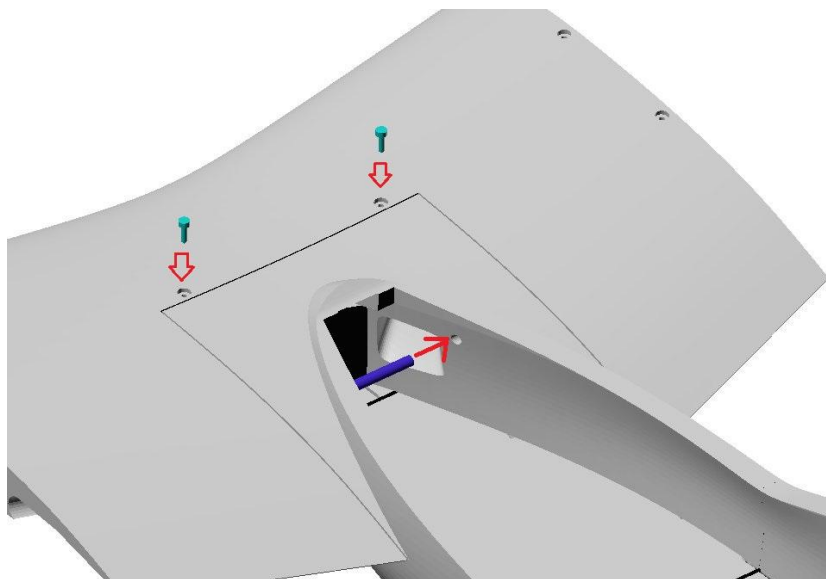


12 FINAL COMPONENT ASSEMBLY

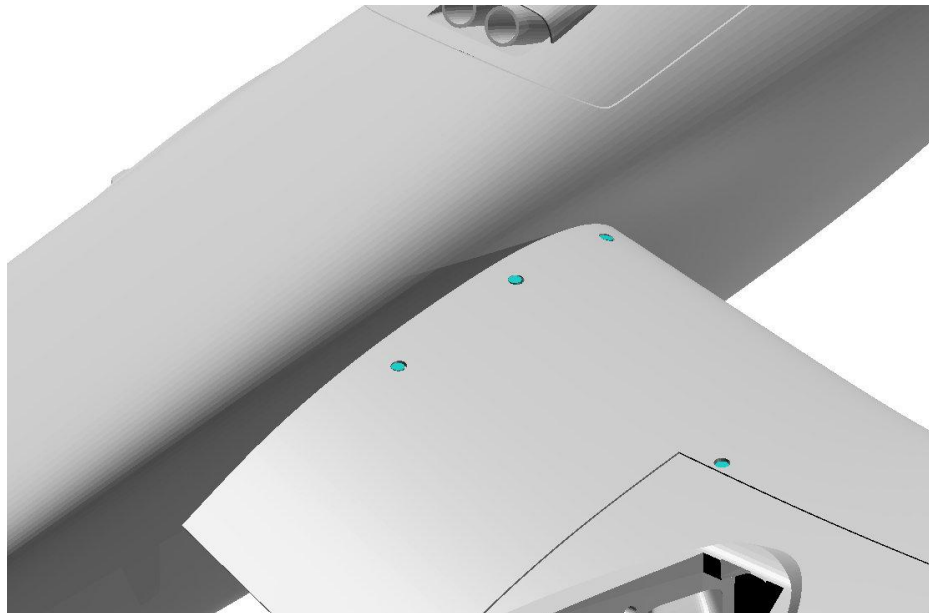
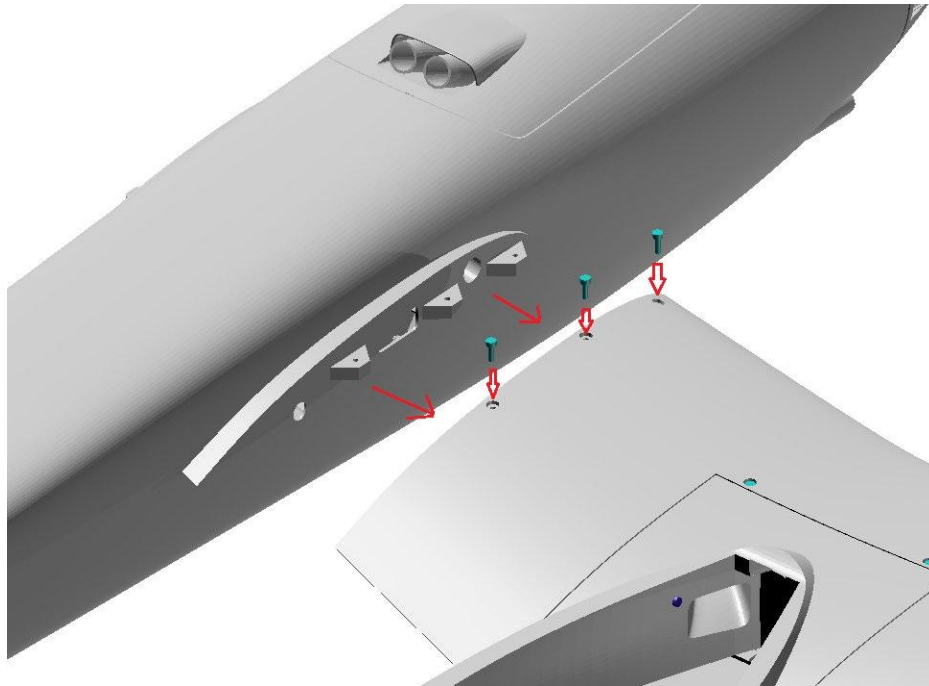
- Slide the center wing onto the mounts for the center fuse



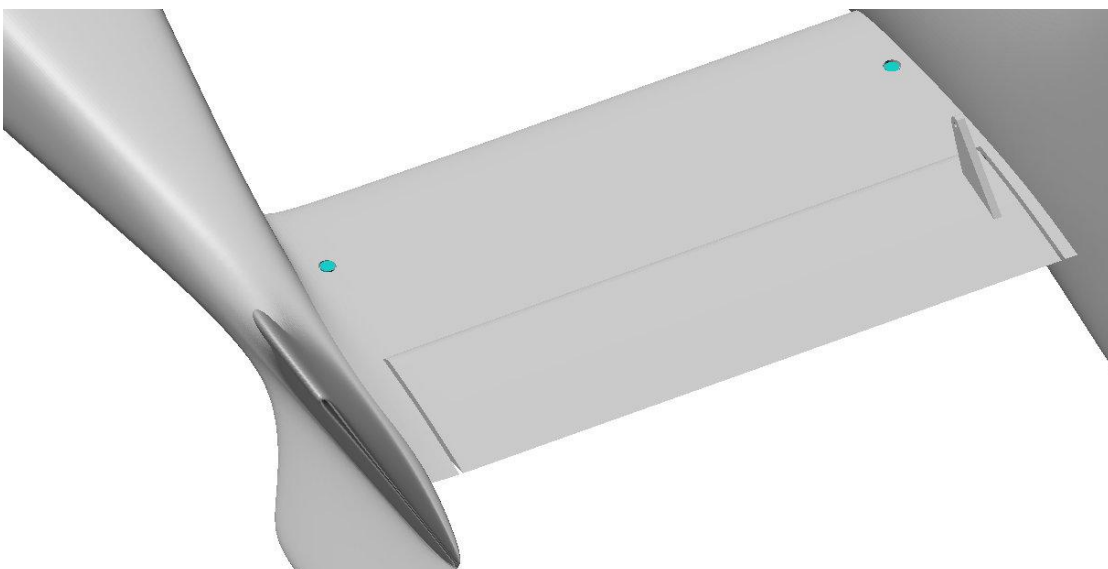
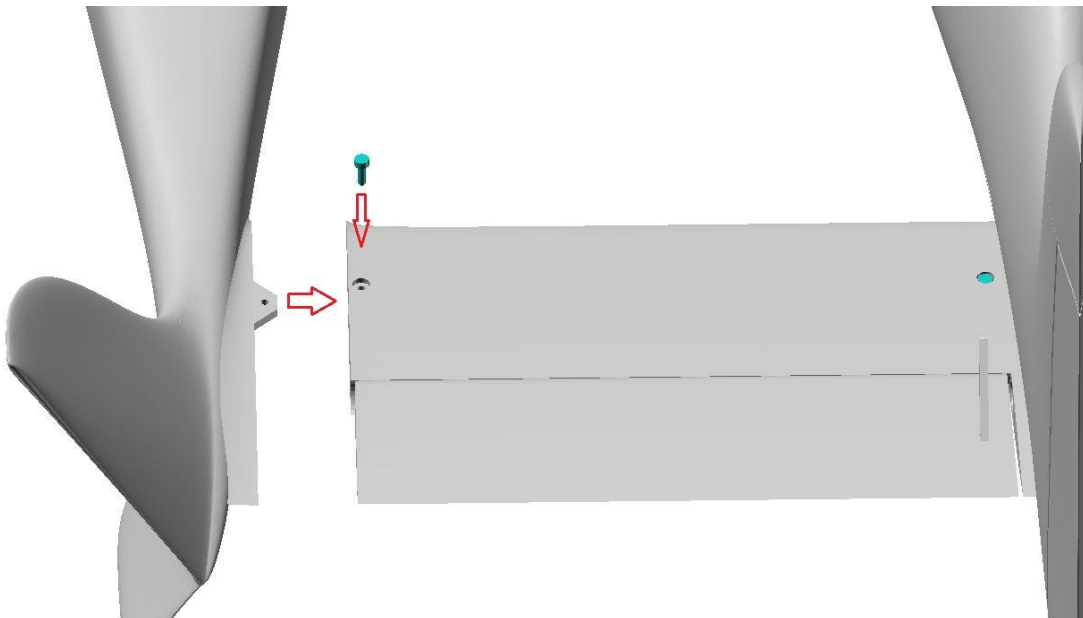
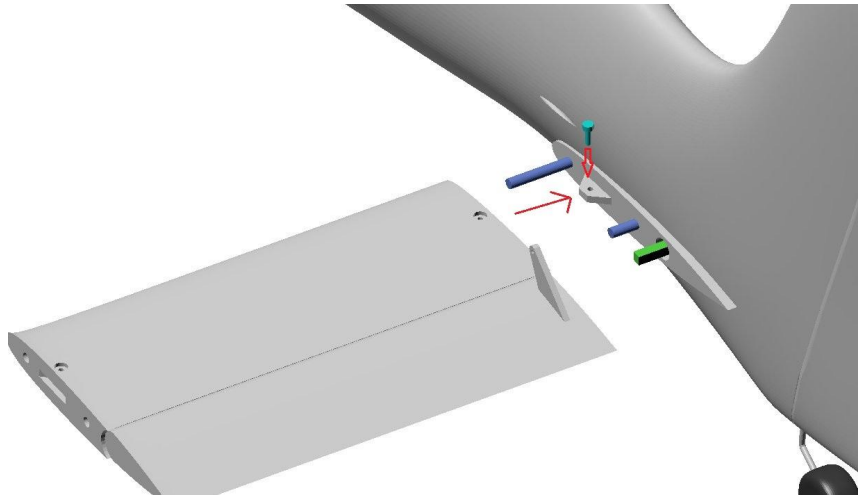
- Cut a 35mm length of 3mm skewer and install it into the side of the center fuselage and push it through into the center wing.
- Secure the center wing to the center fuselage using m2 x 12mm screws.



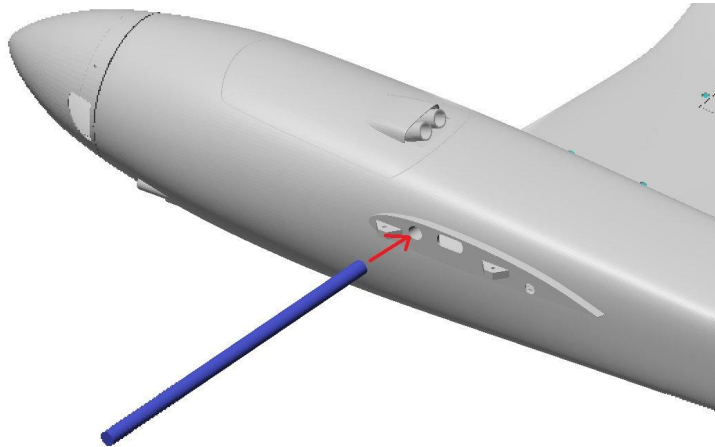
- Secure the motor pods to center wing using m2 x 12mm screws



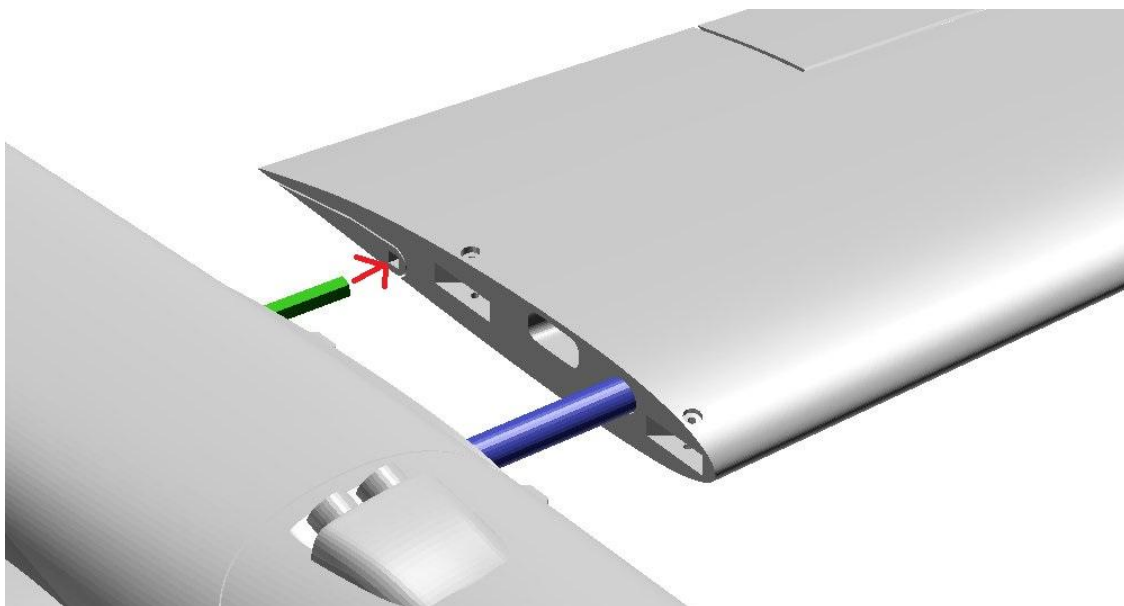
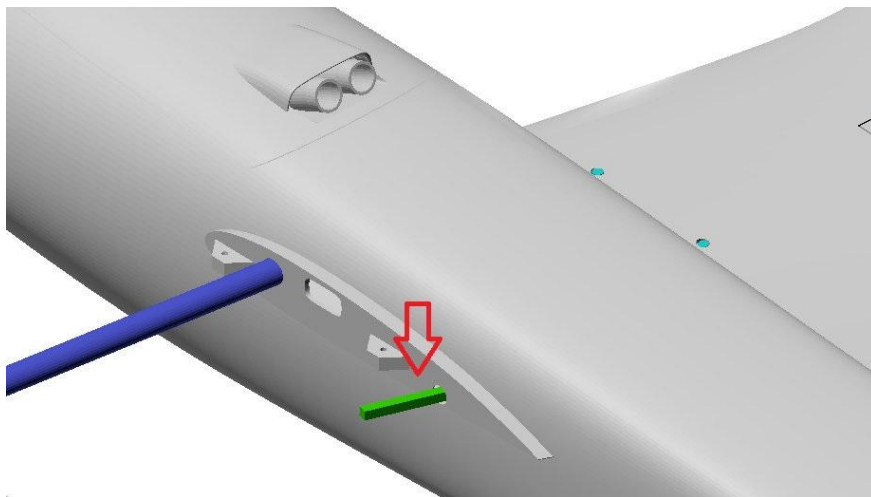
- Secure the horizontal stabilizer to center fuse and motor pod using m2 x8mm screws.



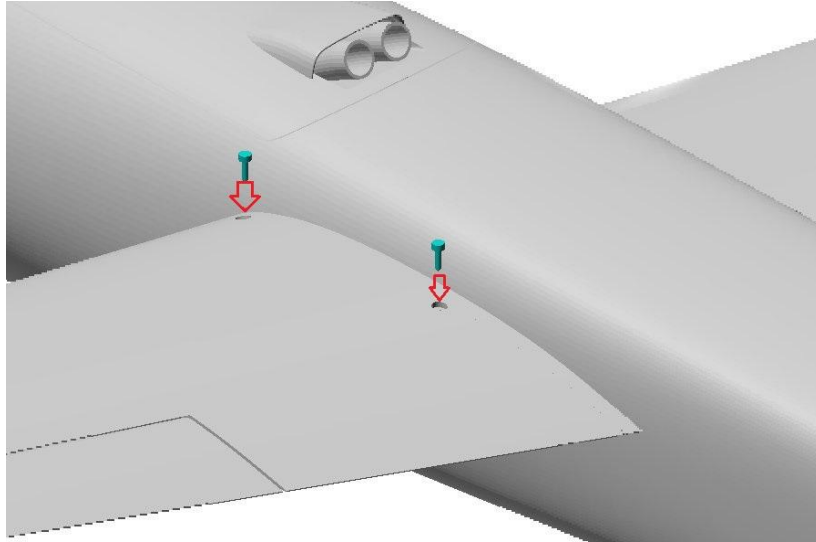
- Insert an 8mm x 500mm round carbon tube through the motor pod and into the center fuselage section.



- Ensure that the flap torque tube and carbon spar line up as the outer wing is installed.



- Secure the outer wing to the motor pod using m2 x 12mm screws.

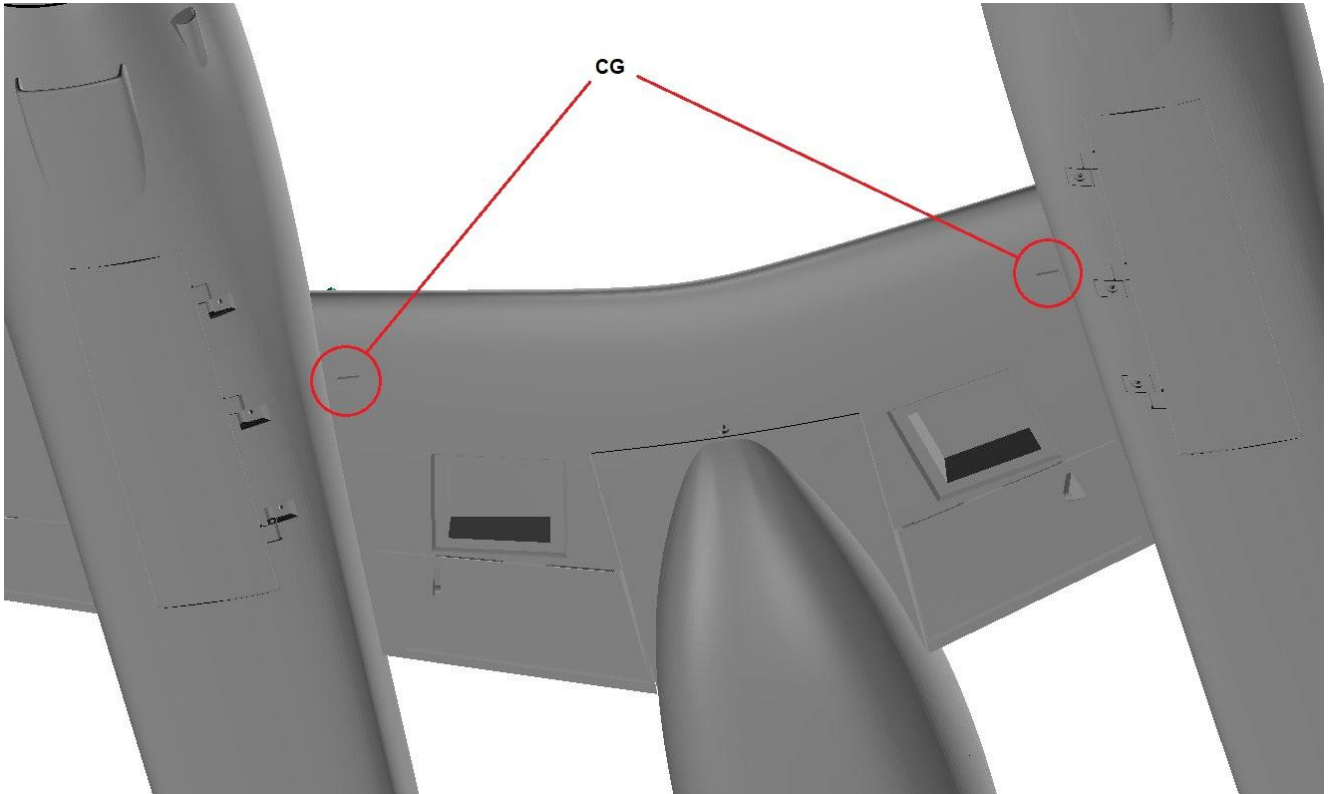


- Fit the spinner back plate to the motor shaft.
- Install the propeller
- Secure the Spinner in place using m2 x 6mm screws. Be sure to tighten the screws diagonally so that the spinner spins straight. If the spinner wobbles, remove it and try again.

BALANCING AND CG

Fit the batteries using Velcro as required and balance the aircraft on the CG marking points located **32mm aft of the leading edge at the wing root.**

Balance the model with the landing gear retracted!



RANGE OF TRAVEL:

MAIDEN FLIGHT:

Elevator	+/- 10mm
Rudder	+/- 20mm
Aileron	+/- 10mm

AEROBATIC FLIGHT:

Elevator	+/- 15mm
Rudder	+/- 25mm
Aileron	+/- 15mm

Flaps Take-off / Approach 25 degrees

Flaps Landing 50 degrees

PARTS LINKS:

3548 900kv

https://hobbyking.com/en_us/propdrive-v2-3548-900kv-brushless-outrunner-motor.html?queryID=0c6168bd15eaaf0dde6d5909e3f425eb&objectID=58899&indexName=hbk_live_products_analytics

11x10 propeller

https://de.aliexpress.com/item/1005001718982171.html?spm=a2g0o.order_list.order_list_main.116.54a65c5fFneeHb&gatewayAdapt=glo2deu

40amp esc (for 3s operations)

https://de.aliexpress.com/item/1005004861859210.html?spm=a2g0o.order_list.order_list_main.106.54a65c5fFneeHb&gatewayAdapt=glo2deu

2200mah 3s 50c LIPO OR SIMILAR (175g)

https://www.ampow.com/products/ovonic-50c-2200mah-3s1p-deans-2pcs-lipo-battery?_pos=3&_sid=36799dfeb&_ss=r

9g servo

https://hobbyking.com/en_us/turnigytm-tg9d-digital-micro-servo-1-8kg-0-09sec-9g.html?queryID=5140502f0f9e21619bc511d4a45d6cf1&objectID=41779&indexName=hbk_live_products_analytics

2.5kg retracts 4mm pin

<https://de.aliexpress.com/item/32780245176.html?gatewayAdapt=glo2deu>

landing gear leg 120mm long

https://de.aliexpress.com/item/4000908270111.html?spm=a2g0o.order_list.order_list_main.238.54a65c5fFneeHb&gatewayAdapt=glo2deu

Hardened stainless steel rod 4mm (x2 50mm min)

https://de.aliexpress.com/item/32900671645.html?spm=a2g0o.order_list.order_list_main.268.54a65c5fFneeHb&gatewayAdapt=glo2deu

1mm Piano wire

https://de.aliexpress.com/item/4000342547852.html?spm=a2g0o.productlist.main.21.44cf7aa2jfk10j&algo_pvid=17edd28d-76ed-44c7-a6ae-fa240a35227d&algo_exp_id=17edd28d-76ed-44c7-a6ae-fa240a35227d-10&pdp_npi=3%40dis%21EUR%2112.79%2112.79%21%21%21%21%21%4021021d7b16814702034604233d06d0%2110000001408348415%21sea%21DE%21118672630&curPageLogUId=cGmPYkUyBoll

1.5mm Piano wire (350mm min)

https://de.aliexpress.com/item/32654012150.html?algo_pvid=8361ad95-f602-4965-9e1b-5862b770f1fb&algo_exp_id=8361ad95-f602-4965-9e1b-5862b770f1fb-0&pdp_npi=3%40dis%21EUR%219.99%219.99%21%21%21%21%21%40211bf31616814702830091640d0754%2165399088922%21sea%21DE%21118672630&curPageLogUId=aMjHTxQjF8OI

10mm X 10mm X 2mm Magnet (ROUND)

https://de.aliexpress.com/item/1005001530832872.html?spm=a2g0o.productlist.main.39.20c563d4d8xLqU&algo_pvid=ff8dd49a-ece5-4f55-9126-a55d6cbb6cdf&aem_p4p_detail=202304140405307959858700496280003924452&algo_exp_id=ff8dd49a-ece5-4f55-9126-a55d6cbb6cdf-19&pdp_npi=3%40dis%21EUR%213.41%212.59%21%21%21%21%21%40211be3d216814703305047047d077e%2112000029553597407%21sea%21DE%21118672630&curPageLogUId=bUSEgYd8m695&ad_pvid=202304140405307959858700496280003924452_4&ad_pvid=202304140405307959858700496280003924452_4

16x29mm nylon hinges (OPTIONAL)

https://de.aliexpress.com/item/4000509445431.html?spm=a2g0o.productlist.main.1.28632f37zcual9&algo_pvid=8dde8809-9866-44f9-8cda-f52d1d9e7f8d&algo_exp_id=8dde8809-9866-44f9-8cda-f52d1d9e7f8d-0&pdp_npi=3%40dis%21EUR%212.55%211.51%21%21%21%21%21%40211bc2a016814703627224262d0757%2110000002484729194%21sea%21DE%21118672630&curPageLogUId=kya54TyjMRX5

m1.5 linkage stopper

https://de.aliexpress.com/item/33022776233.html?spm=a2g0o.productlist.main.7.5ed75047HiBvVT&algo_pvid=8fab5415-28b2-4c58-b445-c393d8674214&algo_exp_id=8fab5415-28b2-4c58-b445-c393d8674214-3&pdp_npi=3%40dis%21EUR%214.39%212.8%21%21%21%21%21%40211bf14716814703858114165d077e%2167285276495%21sea%21DE%21118672630&curPageLogUId=pj75vIDxlpNc

M2 screws (6mm, 10mm, 14mm, 20mm)

https://de.aliexpress.com/item/1005004079348711.html?spm=a2g0o.productlist.main.5.7e6516caFkwXPA&algo_pvid=bf6afd00-e2bd-45b1-ab9c-45e1079c8d8d&aem_p4p_detail=20230414040646115799707303840003927264&algo_exp_id=bf6afd00-e2bd-45b1-ab9c-45e1079c8d8d-4&curPageLogUId=23PtbBxizTOm&ad_pvid=20230414040646115799707303840003927264_1&ad_pvid=20230414040646115799707303840003927264_1

M3 screws (25mm) (for landing gear)

https://de.aliexpress.com/item/4001083281057.html?spm=a2g0o.productlist.main.45.6b151a9chPdIk&algo_pvid=6d31d3d5-1d97-4d37-b8e7-a27e8b7fd9cd&aem_p4p_detail=2023041404080117278536978500050004022775&algo_exp_id=6d31d3d5-1d97-4d37-b8e7-a27e8b7fd9cd-44&curPageLogUId=NdfFWleGqJfy&ad_pvid=2023041404080117278536978500050004022775_10&ad_pvid=2023041404080117278536978500050004022775_10

10mm round carbon tube (500mm)

https://de.aliexpress.com/item/4000407024494.html?spm=a2g0o.productlist.main.29.682d7ab5hiFi6H&algo_pvid=31948e8e-7091-42e7-bc62-a5e6b77f1ac0&aem_p4p_detail=20230414040841970929659074950004024367&algo_exp_id=31948e8e-7091-42e7-bc62-a5e6b77f1ac0-14&pdp_npi=3%40dis%21EUR%215.4%215.4%21%21%21%21%21%21%402102176616814705215366974d0767%2110000001678731776%21sea%21DE%21118672630&curPageLogUId=9ebqbBfCag8S&ad_pvid=20230414040841970929659074950004024367_3&ad_pvid=20230414040841970929659074950004024367_3

3mm square carbon tube (65mm min)

https://de.aliexpress.com/item/1005002475812331.html?spm=a2g0o.productlist.main.1.44aa45f1qAn4x6&algo_pvid=936ebbb3-d51b-4453-a004-60b66ebdd10e&algo_exp_id=936ebbb3-d51b-4453-a004-60b66ebdd10e-0&pdp_npi=3%40dis%21EUR%213.92%213.92%21%21%21%21%21%21%402102196716814705429114752d071e%2112000020786026365%21sea%21DE%21118672630&curPageLogUId=RWyujXZVjSuH

3mm carbon tube (200mm)

https://de.aliexpress.com/item/1005004263451845.html?spm=a2g0o.productlist.main.5.4d3e6c96bFDcQe&algo_pvid=402c4dc5-7725-4b54-a69e-03cdf586144f&algo_exp_id=402c4dc5-7725-4b54-a69e-03cdf586144f-2&pdp_npi=3%40dis%21EUR%214.45%213.6%21%21%21%21%21%21%40212243c016814705630608974d06cc%2112000028564033051%21sea%21DE%21118672630&curPageLogUId=1nRedyz8HOPx

25mm foam wheel (tail wheel)

https://de.aliexpress.com/item/32649247647.html?spm=a2g0o.productlist.main.1.2f467f7ceLcM4a&algo_pvid=a82ef8c7-48c9-4e5a-8491-50ada29c522f&algo_exp_id=a82ef8c7-48c9-4e5a-8491-50ada29c522f-0&pdp_npi=3%40dis%21EUR%2113.79%2113.79%21%21%21%21%40211bec8616814705890197999d077c%2112000019585409121%21se a%21DE%21118672630&curPageLogUid=cfVOta6A9NWW

Braided fishing line (or similar)

https://de.aliexpress.com/item/33018161006.html?spm=a2g0o.productlist.main.15.2fd97be51GQWrY&algo_pvid=b8b2314c-462b-4cd1-b08e-5871caecc672&aem_p4p_detail=202304140410046353375629606280003952210&algo_exp_id=b8b2314c-462b-4cd1-b08e-5871caecc672-14&curPageLogUid=corn7LDB5O35&ad_pvid=202304140410046353375629606280003952210_3&ad_pvid=202304140410046353375629606280003952210_3

Small extension spring 0.3mm

https://de.aliexpress.com/item/1005003240212391.html?spm=a2g0o.productlist.main.20.20d14c4e37Mko7&algo_pvid=087e9fd3-aaba-4311-a095-8f6057197290&aem_p4p_detail=202304140411383140391802712440003955724&algo_exp_id=087e9fd3-aaba-4311-a095-8f6057197290-19&curPageLogUid=6UYTxFBcNKhl&ad_pvid=202304140411383140391802712440003955724_4&ad_pvid=202304140411383140391802712440003955724_4

Extension spring 1.2x30x8mm (for grass runways)

https://de.aliexpress.com/item/1005003298102282.html?spm=a2g0o.order_list.order_list_main.56.54a65c5fz0g38O&gatewayAdapt=glo2deu

Thank you for supporting us! We hope you enjoy many hours flying your Pond racer. If you have any questions regarding the build process or set-up of your model, please contact us at:

Aeroworks3d@outlook.com

