

# **ASSEMBLY MANUAL AND USER GUIDE**



**STINGRAY**

By 3D AEROWORKS

## OVERVIEW:

This custom design of a high speed futuristic fighter is designed for quick and easy construction printed in PLA. For best results the canopy should be printed with clear PLA and the motor mount and propeller assembly in regular PLA or PETG. Designed to suit the 2826 2200kv outrunner on a 5x5 propeller. Utilising only ailerons and elevator, this model performs high speed and aerobatic flight extremely well. Links to components used can be found on the last page of the user guide.

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/stingray-800mm-pusher>

## GENERAL SPECIFICATIONS

WINGSPAN:	800mm
PRINT TIME:	55 hrs
PRINT COST:	\$10 USD
PRINT WEIGHT:	450g
FLYING WEIGHT:	745g

## ELECTRICS

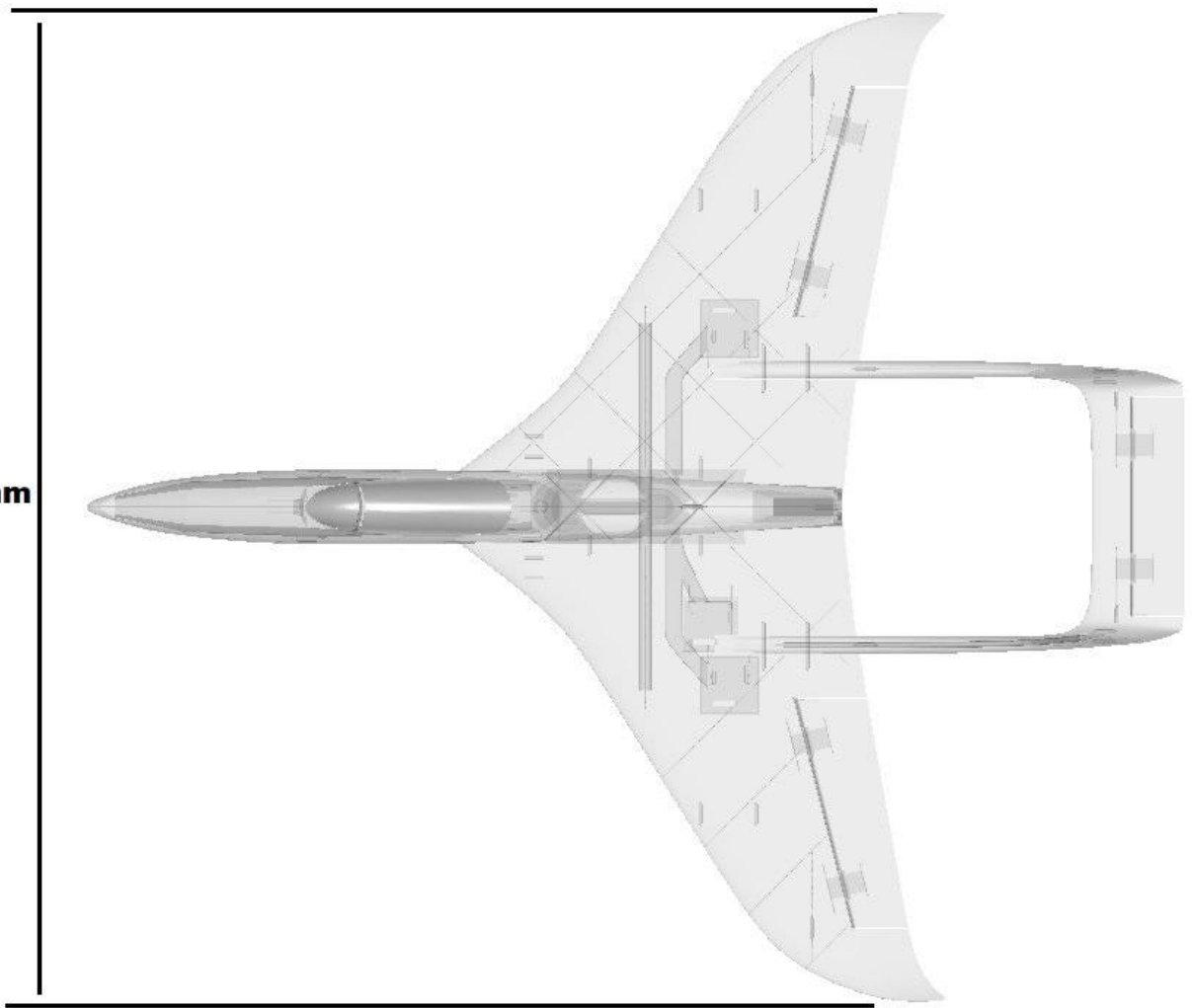
MOTOR:	2826 2200KV or (2836 2500kv high power)
ESC:	30amp
SERVOS:	9g MICRO
BATTERY:	2200mah 3s (or similar)

## INCLUDED:

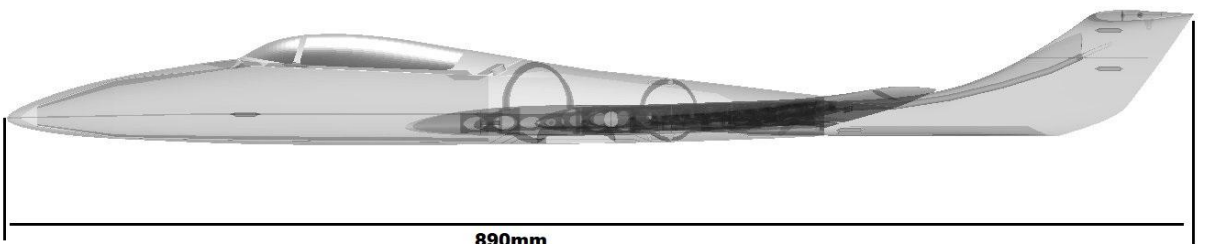
STL FILES OF ALL COMPONENTS **(scale to 1000% if not using S3D)**

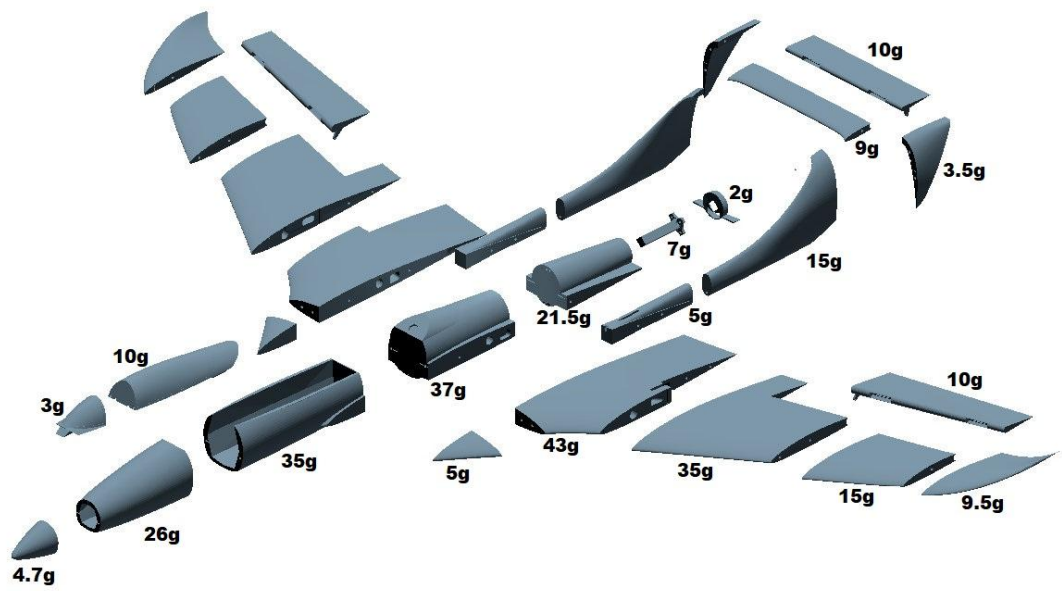
FACTORY FILES FOR (S3D) SIMPLIFY 3D FOR PRINTERS: 200x200200

**800mm**



**890mm**





## **REQUIRED TOOLS:**

KNIFE

LIGHTER

SANDPAPER (MEDIUM GRIT 320 recommended)

PLIERS

CA GLUE

SCREW DRIVERS

FILE OR RASP

## **REQUIRED COMPONENTS:**

X1 2826 2200KV MOTOR (or similar)

X1 30AMP ESC

X1 2200MAH 3S LIPO OR SIMILAR

X2 9G SERVO

BAMBOO SKEWERS 3MM

X2 10mm X 10mm X 2mm MAGNET (ROUND)

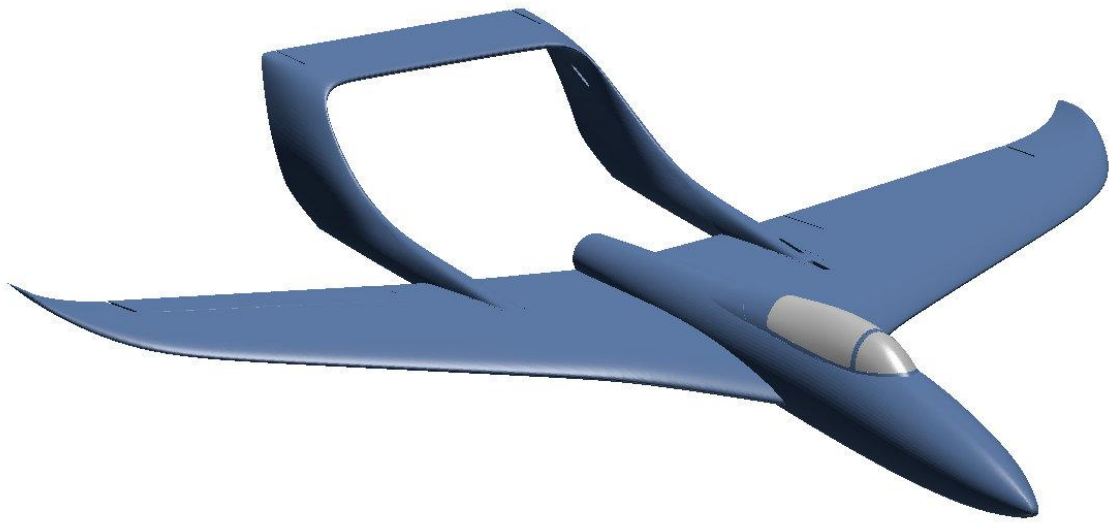
X4 16mm x 29mm HINGES

VELCRO

X1 10mm x 8mm x 300mm carbon tube or pine rod (OPTIONAL)

M2 x10mm screws

1mm or 1.5mm piano wire (400mm min length for elevator)



## ASSEMBLY INSTRUCTIONS

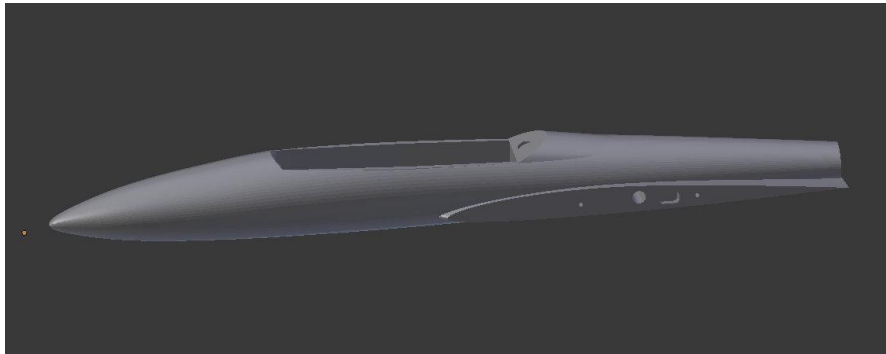
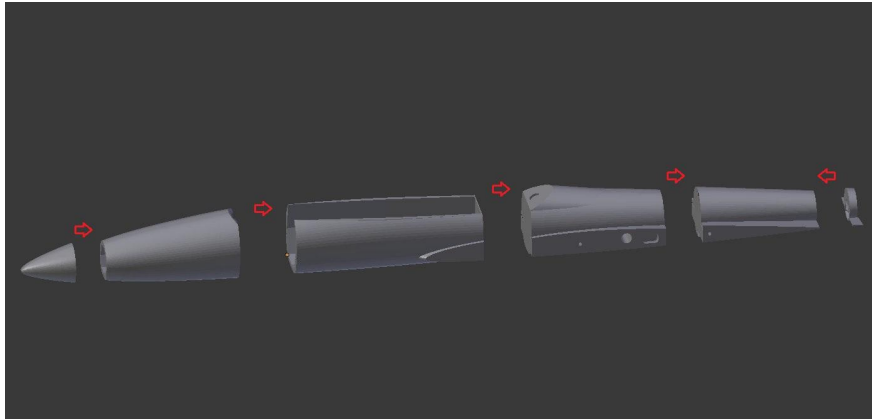
1

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.

## 2

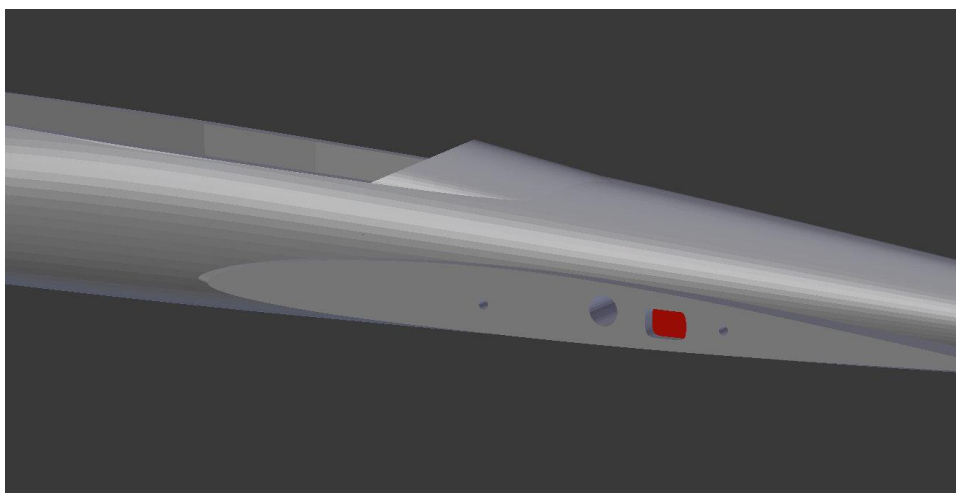
Check the fitment of all parts before gluing to make sure a good bond takes place. There should not be any gaps visible in the joins.

Glue sections of the fuselage together using CA glue. (see images)



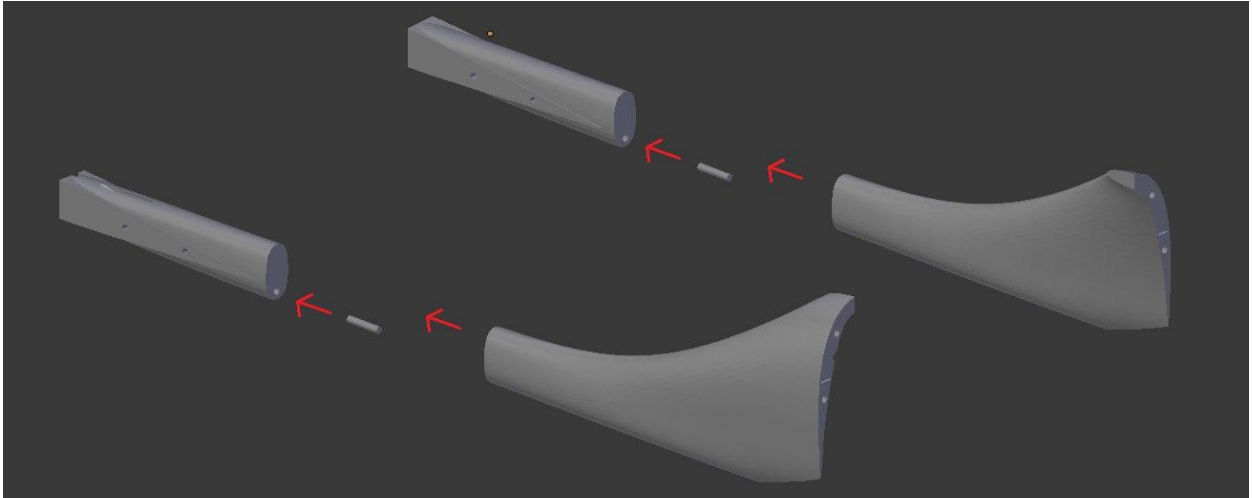
## 3

Remove the servo tunnel access in the fuselage section. (highlighted red)



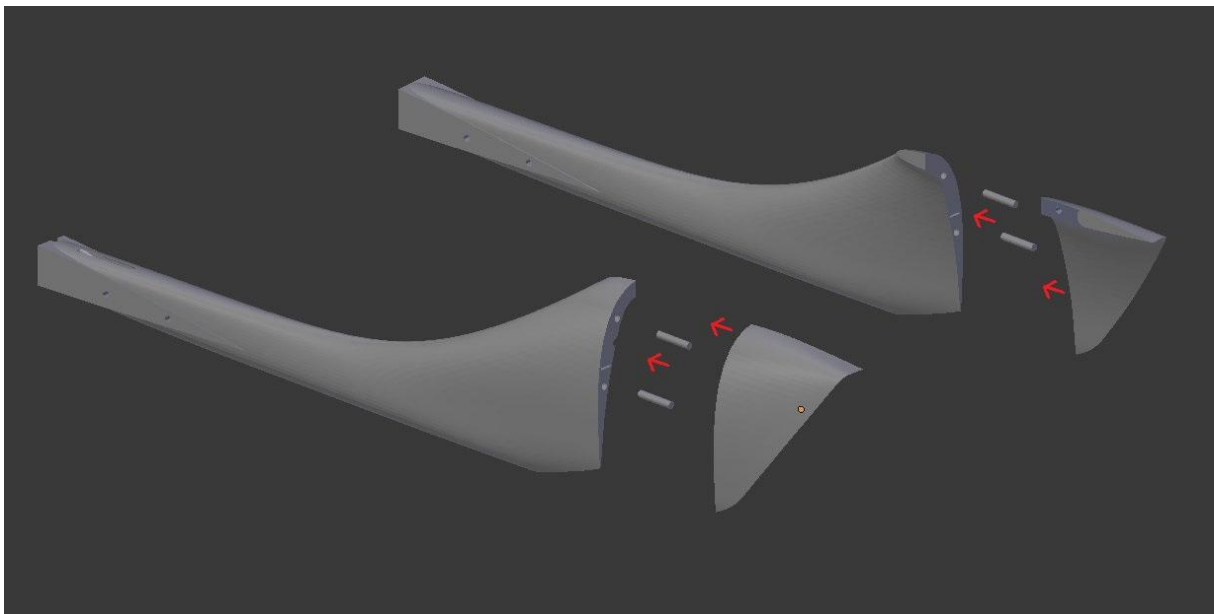
**4**

Cut two 10mm-15mm sections of food skewer. Insert into the “Boom 1” sections and glue the “boom 2” sections in place as shown.



**5**

Do the same for connecting “Boom 3” to “Boom 2” as shown.



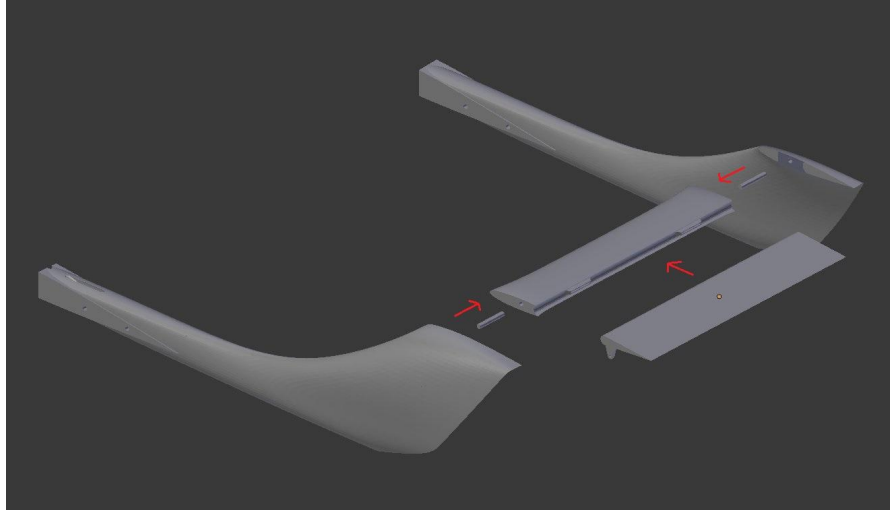


## 6

Fit the elevator to the horizontal stabiliser and connect the stabiliser to each side of the booms.

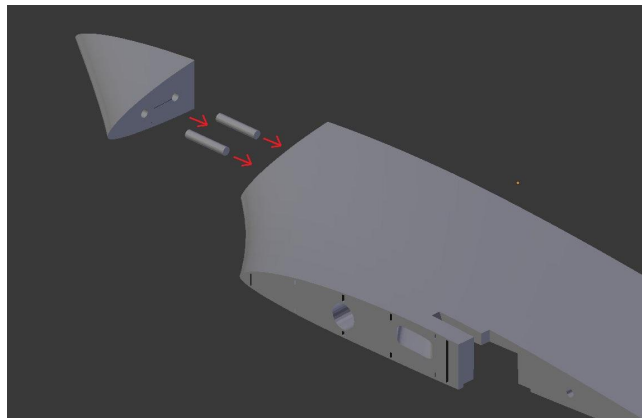
**IMPORTANT!** Only 2 small drops of CA is needed for each slot for the hinges. Too much CA and the hinge will bind and be unusable.

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



## 7

Connect the front and rear wing sections using 3mm skewer.

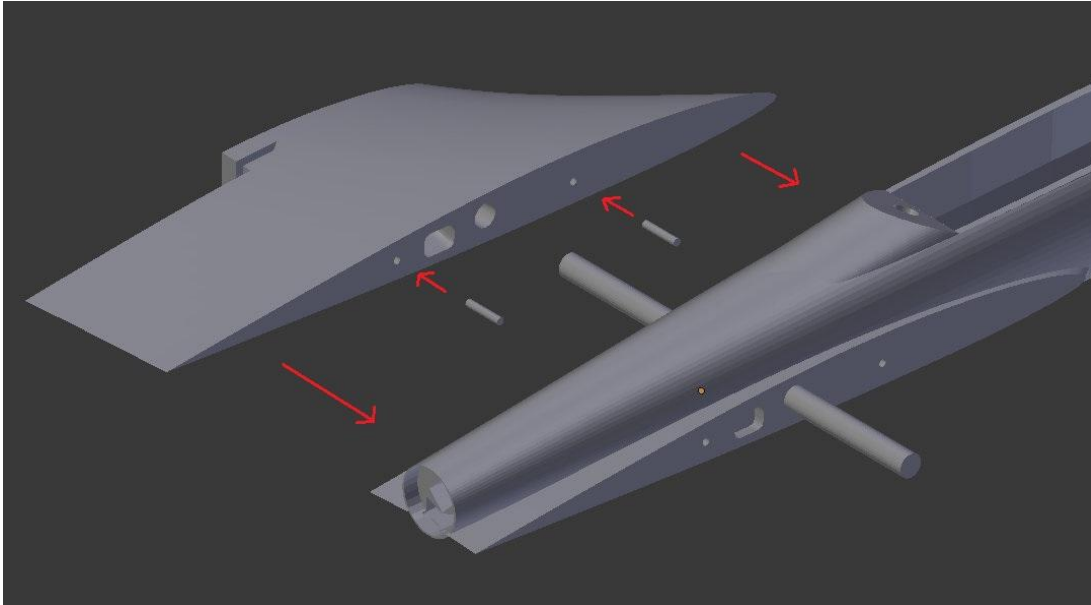


## 8

Cut the main spar to fit (290mm) and insert it through the fuselage.

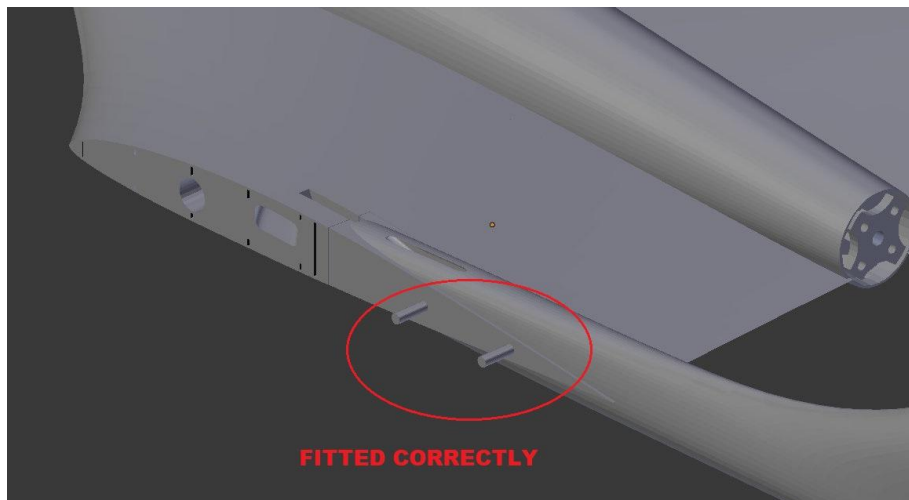
9

Fit small sections of 3mm skewer into the inner section of both wings. Align these tabs with the holes in the fuselage as the wings are glued to the fuselage.



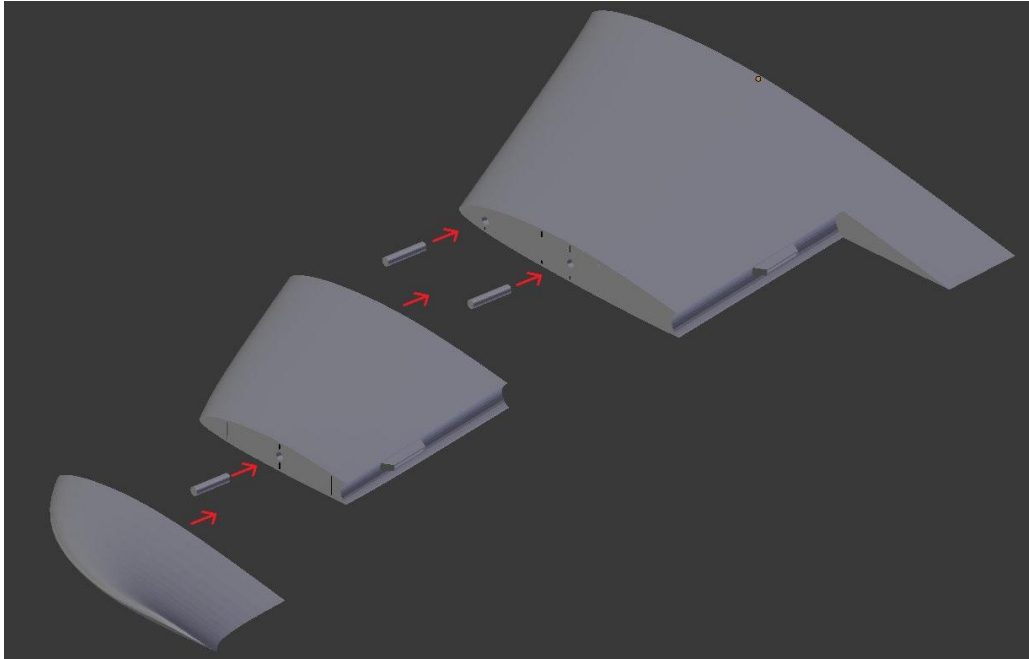
10

Cut four 35mm lengths of 3mm skewer and pin the tail boom to the aft section of the inner wings. The pins will protrude from the booms as they also align the middle wing section and hold the boom in place. Glue around the boom to secure it in place.



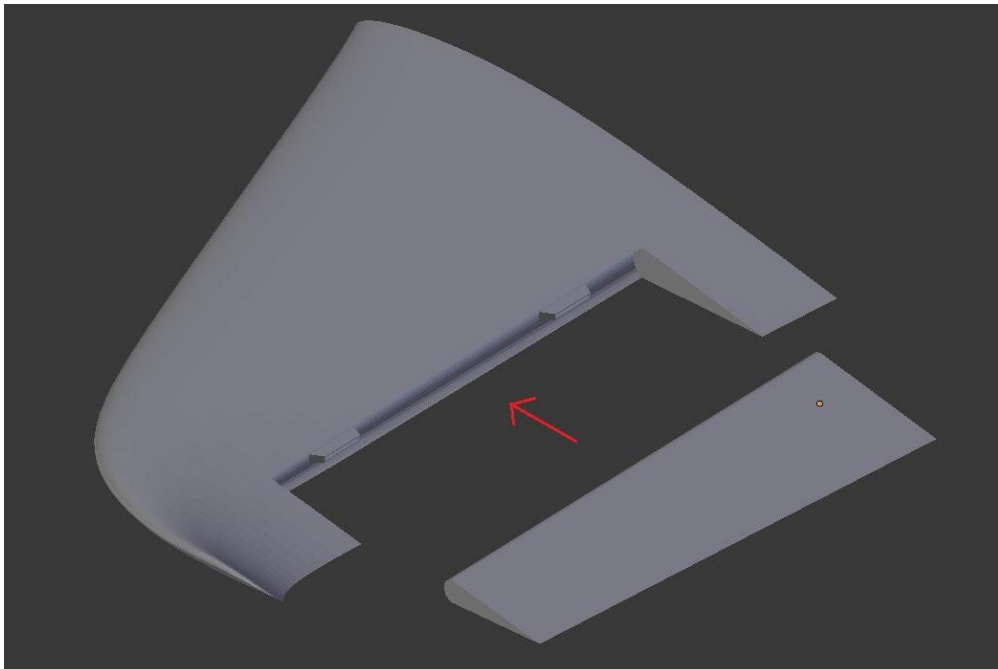
**11**

Glue the outer sections of the wings together using 10mm sections of 3mm skewer to align the parts.



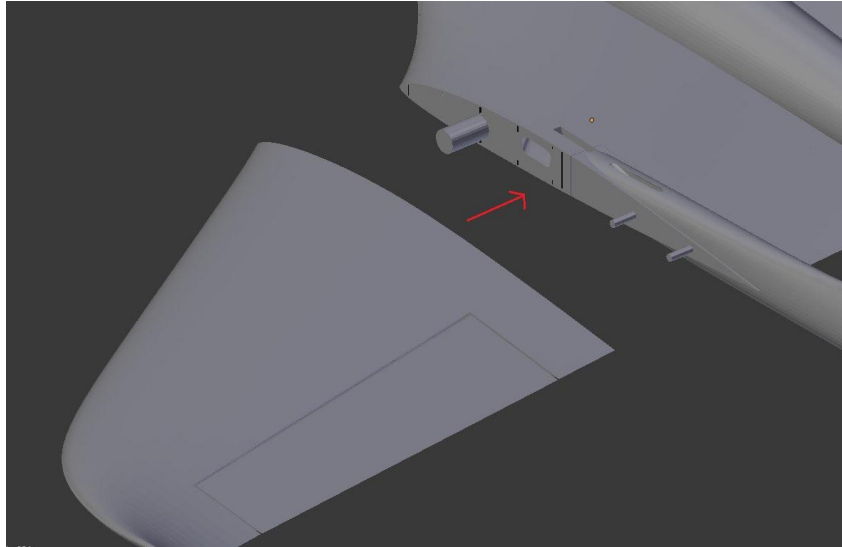
**12**

Glue the aileron in place, the control horn is to be on the underside of the wing.



**13**

Glue the outer and inner sections of the wings together.



**11**

Glue sections of the canopy together using 3mm skewer.

**12**

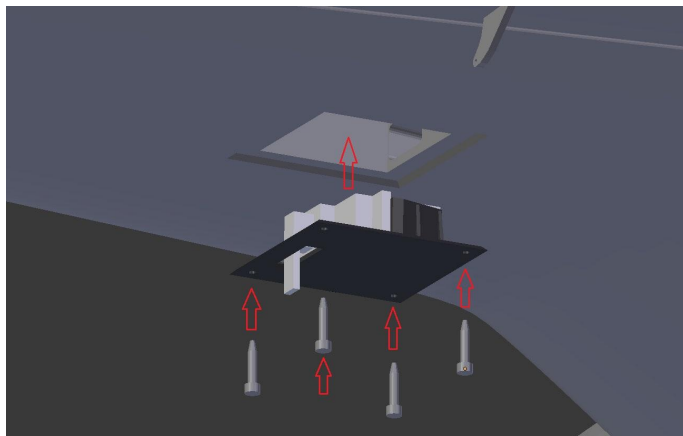
Fit the magnets into the canopy and fuselage.

**13**

Fit the motor to the motor mount and connect to the esc. The motor mount is designed to be a relatively firm fit. Do not glue it in place. Designed as a pusher it will not fall out during flight and should be able to be removed for servicing if required.

**14**

Hot glue or screw the servos to the servo covers and install the aileron and elevator servo wires through the wing into the fuselage. The servo covers can be screwed to the insert of the wing with m2 screws. Finally, wire up the control surfaces with 1mm wire.



***Image of left wing***

## BALANCING AND CG

Fit the battery using Velcro as required and balance the aircraft inverted on the CG marking points located **141mm aft of the leading edge at the wing root.**

**It is advisable on the first flight for the aircraft to be balanced on the cg markings, then move forward or aft as desired.**

## RANGE OF TRAVEL:

### NORMAL / MAIDEN FLIGHT:

Elevator      +/- 10mm

Aileron        +/- 10mm

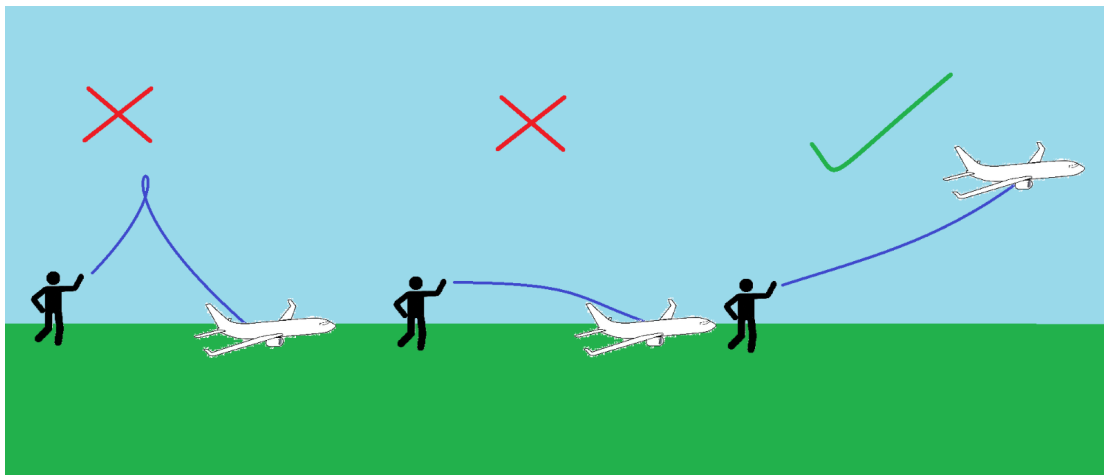
### AEROBATIC:

Elevator      +/- 18mm

Aileron        +/- 25mm

## LAUNCHING:

It was found that the safest and most successful launch technique for this model was the over-arm style. The aircraft should be launched at approximately 10deg nose up at 50% to 75% power. Too steep and the aircraft will stall, too shallow and it will contact the ground.



## **PARTS LINKS:**

2826 2200KV

[https://de.aliexpress.com/item/1005002196959683.html?spm=a2g0o.productlist.0.0.686554692gBgqu&algo\\_pvid=2a35bba8-713a-4d82-be03-7d09757fa32e&algo\\_expid=2a35bba8-713a-4d82-be03-7d09757fa32e-0&btsid=2100bdf016211821631778504e2ed8&ws\\_ab\\_test=searchweb0\\_0,searchweb201602\\_,searchweb201603\\_](https://de.aliexpress.com/item/1005002196959683.html?spm=a2g0o.productlist.0.0.686554692gBgqu&algo_pvid=2a35bba8-713a-4d82-be03-7d09757fa32e&algo_expid=2a35bba8-713a-4d82-be03-7d09757fa32e-0&btsid=2100bdf016211821631778504e2ed8&ws_ab_test=searchweb0_0,searchweb201602_,searchweb201603_)

30AMP ESC

[https://de.aliexpress.com/item/32905648461.html?spm=a2g0o.productlist.0.0.edb7519evyB8Nr&algo\\_pvid=52adfa0e-b4fe-41e1-8092-1d356607a5ba&algo\\_expid=52adfa0e-b4fe-41e1-8092-1d356607a5ba-0&btsid=2100bdf016211822080491111e2ed8&ws\\_ab\\_test=searchweb0\\_0,searchweb201602\\_,searchweb201603\\_](https://de.aliexpress.com/item/32905648461.html?spm=a2g0o.productlist.0.0.edb7519evyB8Nr&algo_pvid=52adfa0e-b4fe-41e1-8092-1d356607a5ba&algo_expid=52adfa0e-b4fe-41e1-8092-1d356607a5ba-0&btsid=2100bdf016211822080491111e2ed8&ws_ab_test=searchweb0_0,searchweb201602_,searchweb201603_)

2200mah 3s LIPO

[https://de.aliexpress.com/item/32833411481.html?spm=a2g0o.productlist.0.0.64ef480aYCzl2n&algo\\_pvid=f86fc7a0-0324-4584-9081-c8b4b1a543a2&algo\\_expid=f86fc7a0-0324-4584-9081-c8b4b1a543a2-1&btsid=2100bdf016211822705142563e2ed8&ws\\_ab\\_test=searchweb0\\_0,searchweb201602\\_,searchweb201603\\_](https://de.aliexpress.com/item/32833411481.html?spm=a2g0o.productlist.0.0.64ef480aYCzl2n&algo_pvid=f86fc7a0-0324-4584-9081-c8b4b1a543a2&algo_expid=f86fc7a0-0324-4584-9081-c8b4b1a543a2-1&btsid=2100bdf016211822705142563e2ed8&ws_ab_test=searchweb0_0,searchweb201602_,searchweb201603_)

9g servo

[https://de.aliexpress.com/item/32898059654.html?spm=a2g0o.productlist.0.0.7d394771z9xfZq&algo\\_pvid=26dd1d90-4d3b-4f94-955c-e26a127ba26c&algo\\_expid=26dd1d90-4d3b-4f94-955c-e26a127ba26c-3&btsid=2100bdf016211823001362964e2ed8&ws\\_ab\\_test=searchweb0\\_0,searchweb201602\\_,searchweb201603\\_](https://de.aliexpress.com/item/32898059654.html?spm=a2g0o.productlist.0.0.7d394771z9xfZq&algo_pvid=26dd1d90-4d3b-4f94-955c-e26a127ba26c&algo_expid=26dd1d90-4d3b-4f94-955c-e26a127ba26c-3&btsid=2100bdf016211823001362964e2ed8&ws_ab_test=searchweb0_0,searchweb201602_,searchweb201603_)

X2 BAMBOO FOOD SKEWERS (3mm diameter)

HEAT SHRINK TUBE 3mm

[https://hobbyking.com/en\\_us/turnigy-3mm-heat-shrink-tube-black-1mtr-1.html?queryID=c16c094bb26b18e39fabcb12a93a96cb&objectID=46911&indexName=hbk\\_live\\_magento\\_en\\_us\\_products](https://hobbyking.com/en_us/turnigy-3mm-heat-shrink-tube-black-1mtr-1.html?queryID=c16c094bb26b18e39fabcb12a93a96cb&objectID=46911&indexName=hbk_live_magento_en_us_products)

X4 10mm X 10mm X 2mm MAGNET (ROUND)

[https://www.aliexpress.com/item/1005001362617359.html?spm=a2g0o.productlist.0.0.5da3607dAATH5j&algo\\_pvid=b9e32b8a-0d4f-469a-b838-b478442dda50&algo\\_expid=b9e32b8a-0d4f-469a-b838-b478442dda50-0&btsid=0bb0623a15991797178681785e1811&ws\\_ab\\_test=searchweb0\\_0,searchweb201602\\_,searchweb201603\\_](https://www.aliexpress.com/item/1005001362617359.html?spm=a2g0o.productlist.0.0.5da3607dAATH5j&algo_pvid=b9e32b8a-0d4f-469a-b838-b478442dda50&algo_expid=b9e32b8a-0d4f-469a-b838-b478442dda50-0&btsid=0bb0623a15991797178681785e1811&ws_ab_test=searchweb0_0,searchweb201602_,searchweb201603_)

16x29 HINGES

[https://de.aliexpress.com/item/32659926010.html?spm=a2g0o.productlist.0.0.5e7f7ef2zlc3qX&algo\\_pvid=478c4573-19ad-4939-ba11-475e3dc6139e&algo\\_expid=478c4573-19ad-4939-ba11-475e3dc6139e-0&btsid=2100bdf016211823370763498e2ed8&ws\\_ab\\_test=searchweb0\\_0,searchweb201602\\_,searchweb201603\\_](https://de.aliexpress.com/item/32659926010.html?spm=a2g0o.productlist.0.0.5e7f7ef2zlc3qX&algo_pvid=478c4573-19ad-4939-ba11-475e3dc6139e&algo_expid=478c4573-19ad-4939-ba11-475e3dc6139e-0&btsid=2100bdf016211823370763498e2ed8&ws_ab_test=searchweb0_0,searchweb201602_,searchweb201603_)

VELCRO – (local hardware store)

10mm x 1000mm carbon tube

[https://de.aliexpress.com/item/4000390835692.html?spm=a2g0o.productlist.0.0.63ab4e77kW2VnK&algo\\_pvid=3877bd8c-0e1c-46e8-8888-d99e4a90ccd2&algo\\_expid=3877bd8c-0e1c-46e8-8888-d99e4a90ccd2-2&btsid=2100bdf016211824187545230e2ed8&ws\\_ab\\_test=searchweb0\\_0,searchweb201602\\_,searchweb201603\\_](https://de.aliexpress.com/item/4000390835692.html?spm=a2g0o.productlist.0.0.63ab4e77kW2VnK&algo_pvid=3877bd8c-0e1c-46e8-8888-d99e4a90ccd2&algo_expid=3877bd8c-0e1c-46e8-8888-d99e4a90ccd2-2&btsid=2100bdf016211824187545230e2ed8&ws_ab_test=searchweb0_0,searchweb201602_,searchweb201603_)

m2 x10mm screws

<https://www.ebay.com.au/itm/400PCS-M2-M2-6-Pan-Head-Self-Tapping-Screws-Assorted-Kit-Stainless-Steel-Black/254399626404?hash=item3b3b663ca4:g:CLEAAOSwQLZdsqkd&frcectupt=true>

Piano wire

<https://de.aliexpress.com/item/32975279180.html?spm=a2g0s.9042311.0.0.2e0f4c4d0HE2dZ>

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

[Aeroworks3d@outlook.com](mailto:Aeroworks3d@outlook.com)