

# **ASSEMBLY MANUAL AND USER GUIDE**



## **Cessna Citation C550**

By 3D AEROWORKS

## OVERVIEW:

This replica of the Cessna Citation C550 Business jet is designed for quick and easy construction and printed using lightweight PLA (LW-PLA). Designed to suit the QX 30mm edf this model has loads of power and is happy to cruise around at 50% power thanks to its lightweight yet sturdy construction. Utilizing full 3 or 4 channel controls; aileron, elevator, rudder and throttle, this model performs extremely well given its small size and lightweight. 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/creations/cessna-citation-c550-twin-30mm-edf-700mm>

## GENERAL SPECIFICATIONS

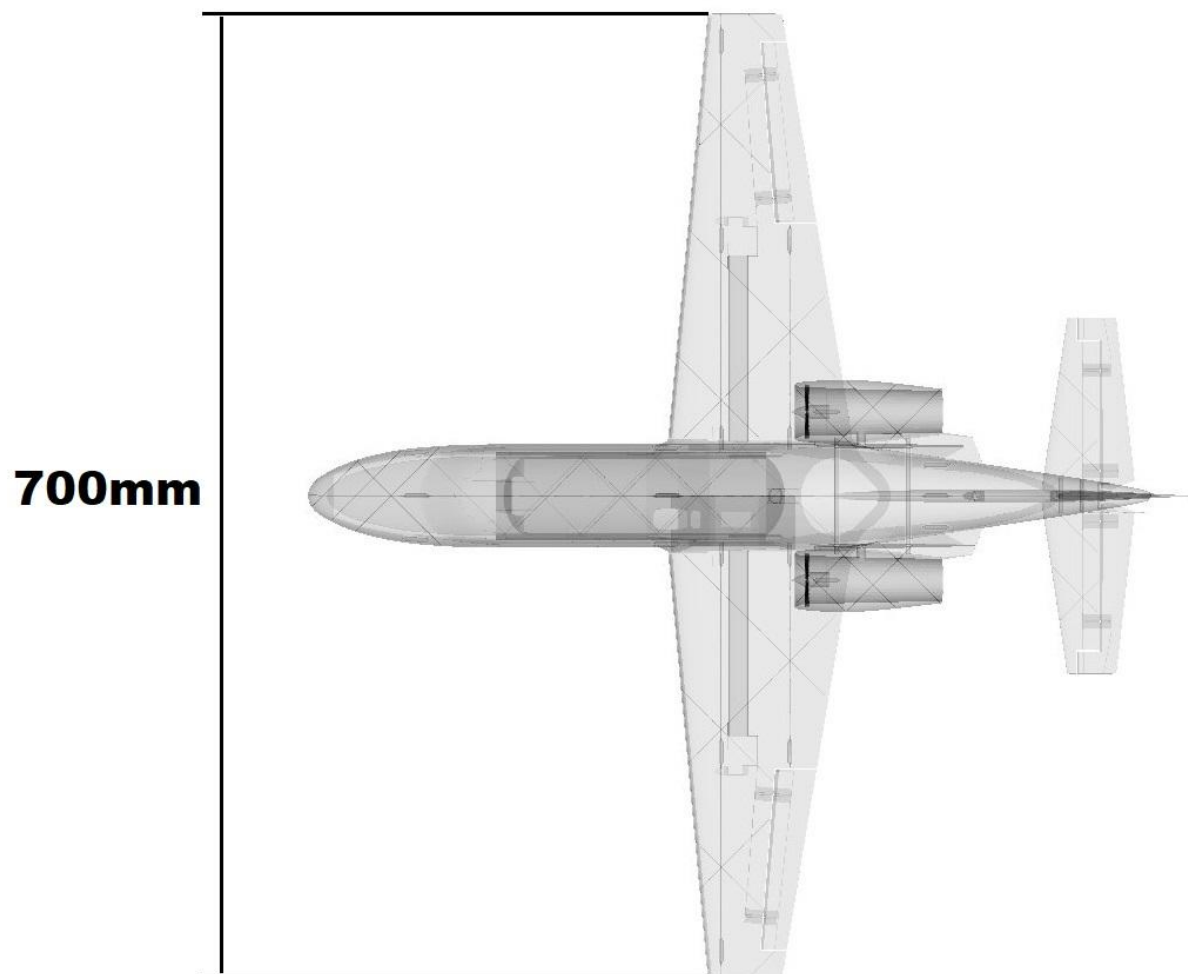
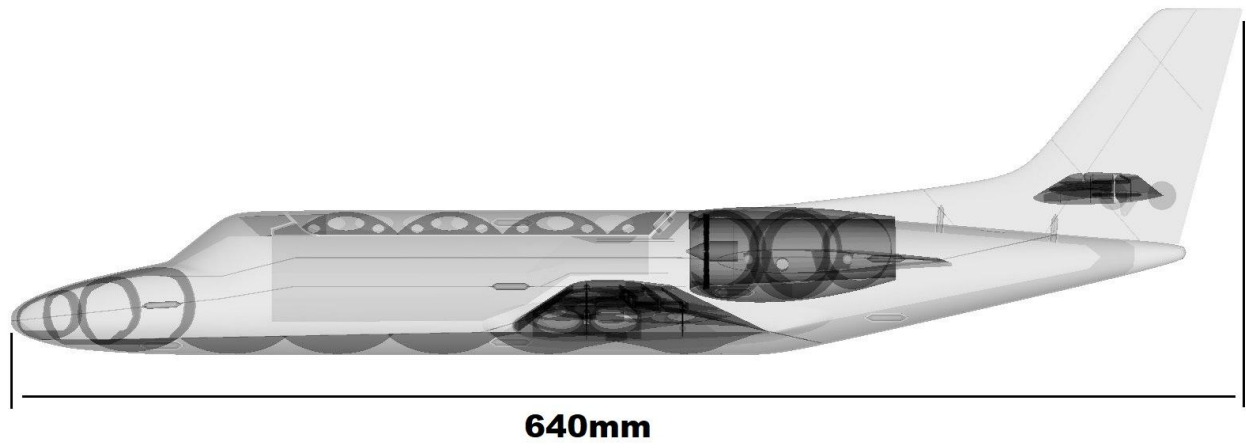
WINGSPAN:	700mm
PRINT TIME:	70 hrs
PRINT WEIGHT:	170g
FLYING WEIGHT:	395g
CENTER OF GRAVITY	32mm aft of L.E at wing root. (Marked with indentation)

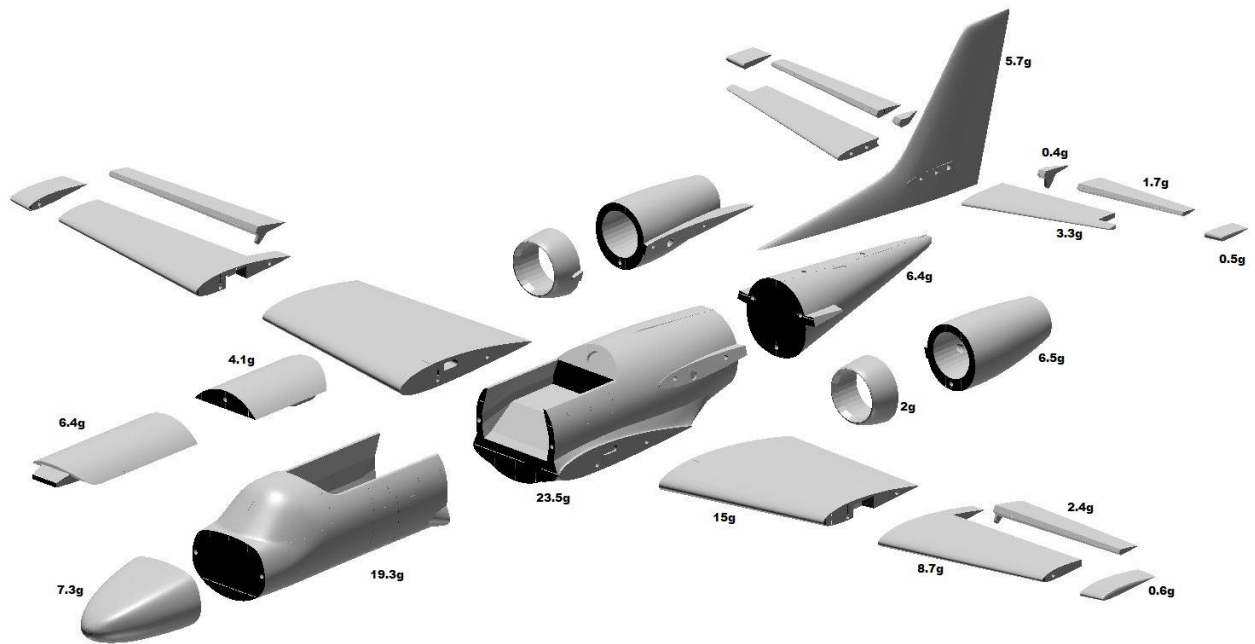
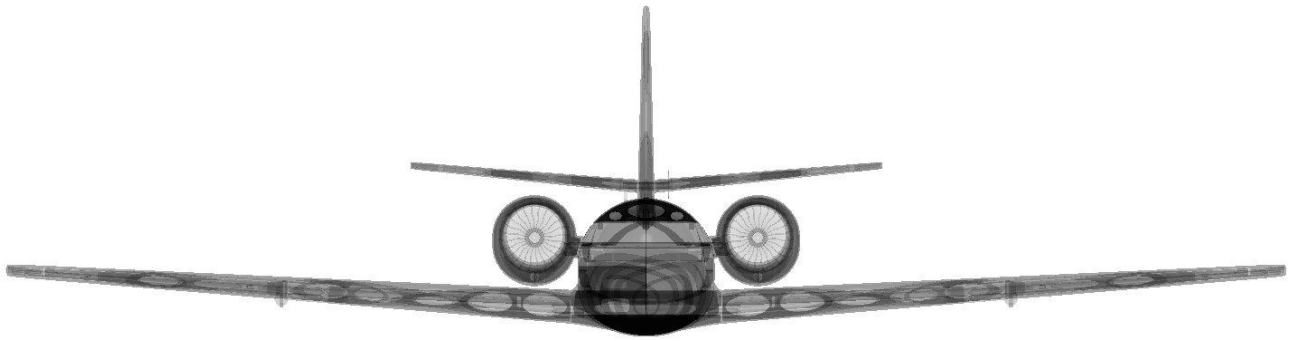
## ELECTRICS

MOTOR:	QX motor 30mm edf 7000kv
ESC:	15amp
SERVOS:	3.7g MICRO
BATTERY:	1300mah 3S (115g) (or similar)

## NOTE!

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





## **REQUIRED TOOLS:**

KNIFE

LIGHTER

SANDPAPER (MEDIUM GRIT)

PLIERS

CA GLUE

SCREW DRIVERS

FILE OR RASP

DRILL

## **REQUIRED COMPONENTS:**

X2 QX motor 30mm edf 7000kv

X2 15amp esc

X1 1300mah 3s LIPO OR SIMILAR (115g)

X4 3.7g Micro servo

Bamboo skewers 3mm

Heat shrink tube 3mm

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

X10 Micro hinges (OPTIONAL)

Velcro

1mm Piano wire

X3 M2 Push rod (200mm MINIMUM LENGTH) (ONLY REQUIRED FOR FIXED GEAR OPTION)

X2 M2 Wheel stop collar



## ASSEMBLY INSTRUCTIONS

**1**

After all parts have been printed, some may require to be cleaned as LW-PLA is prone to stringing. Do this by gently sanding back the rough sections with a file, sandpaper or blade until the surface is smooth.

**2**

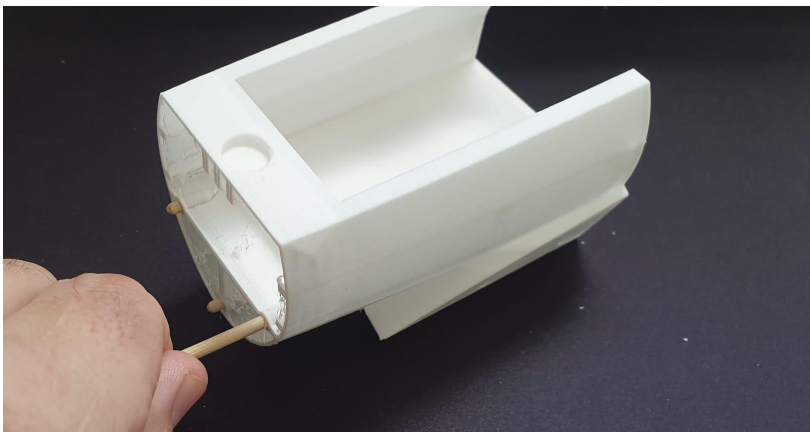
All faces which are to be glued to other parts need to be given a light sanding (scuff the surface) to assist with glue adhesion.

**3**

Cut 15mm sections of skewer and place into alignment holes in the fuselage sections.

**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.

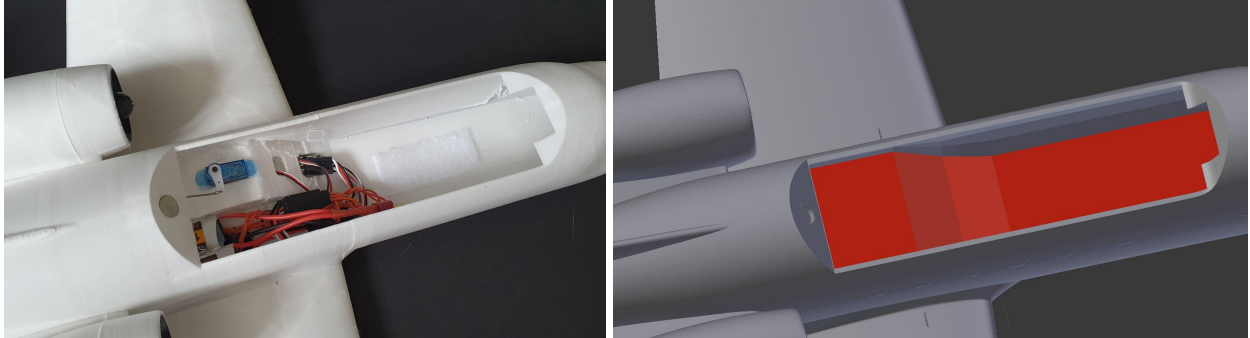


4

Glue all sections of the fuse together. **NOTE:** If fitting fixed gear, do not glue fuse 1 to the rest of the fuselage. This will be done once the nose gear is fitted and will make fitment of the gear leg easier.

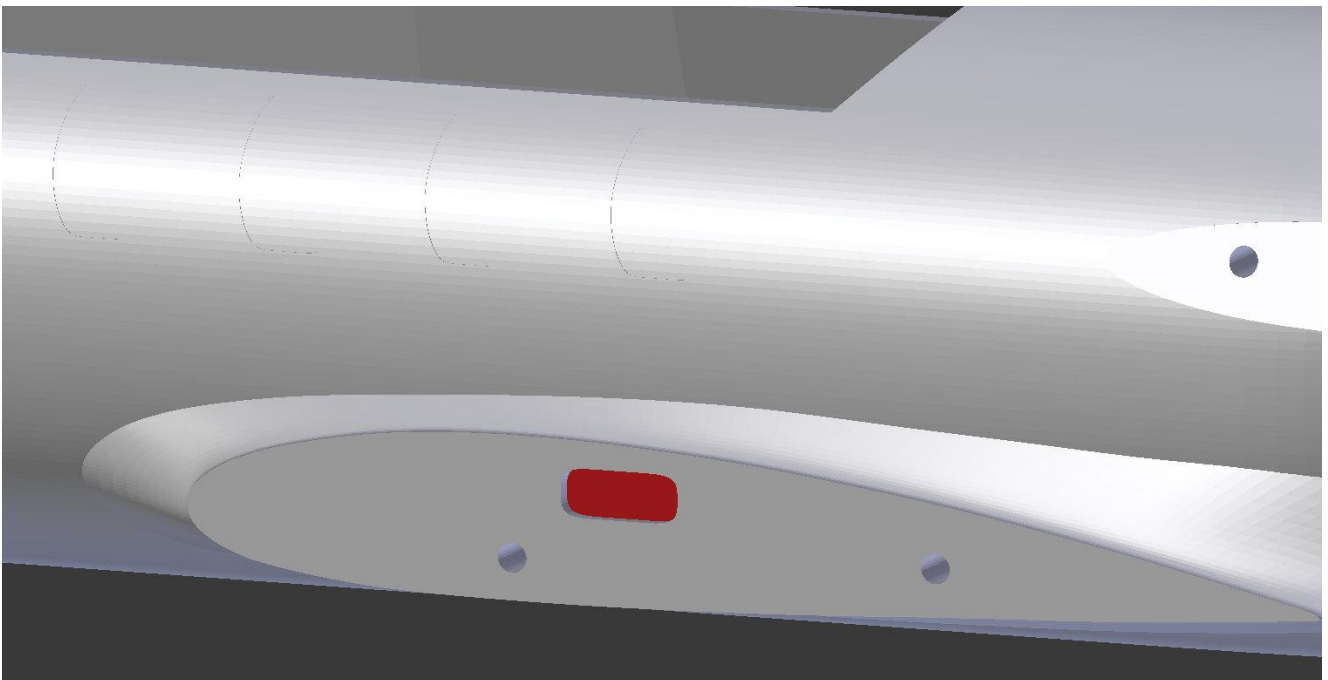
5

Once glued, with a sharp knife, remove the false floor of the battery hatch. (see pic/ highlighted faces) **NOTE:** The removed sections of LW-PLA that is the false floor will be used as hinge pieces later. **Do not throw away.**



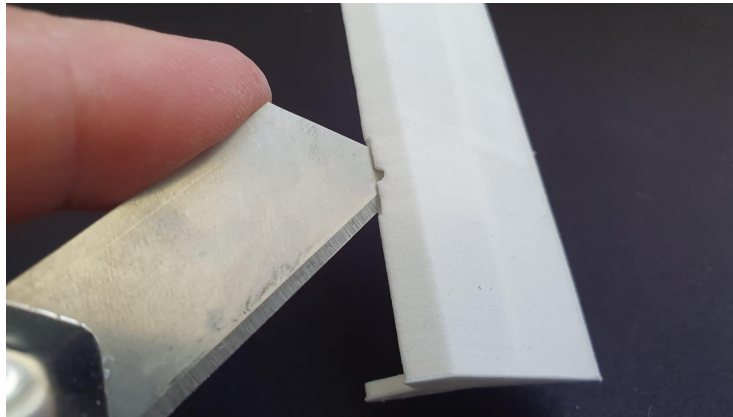
6

From part “fuse 3” remove the inner section of the lead tunnel with a knife or heated metal rod to allow the servo lead for the aileron to pass through. (marked red)



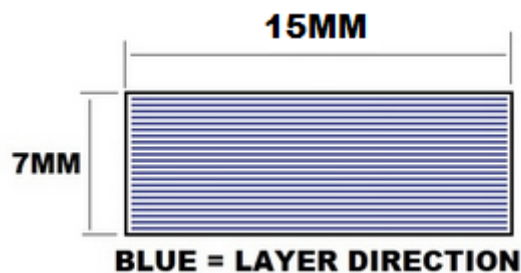


Test fit the hinges in the hinge slots for each control surface and its parent part, this will make gluing the control surface easier when the time comes. **NOTE**- Do not force the hinge if it is too tight. Loosen the slot by gently inserting a stanley knife.



Using the LW-PLA as a hinge:

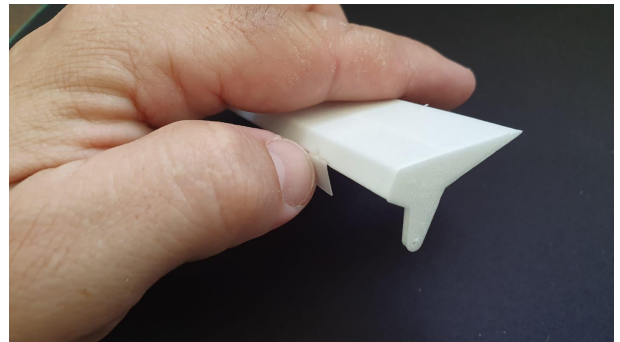
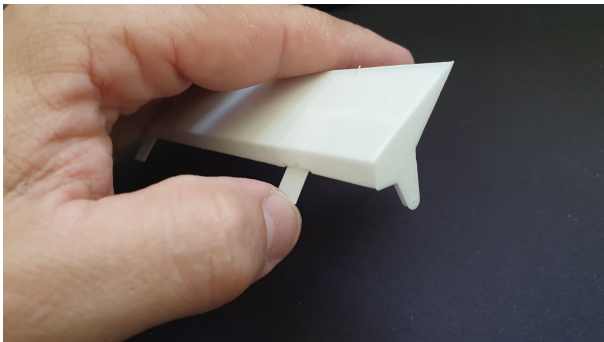
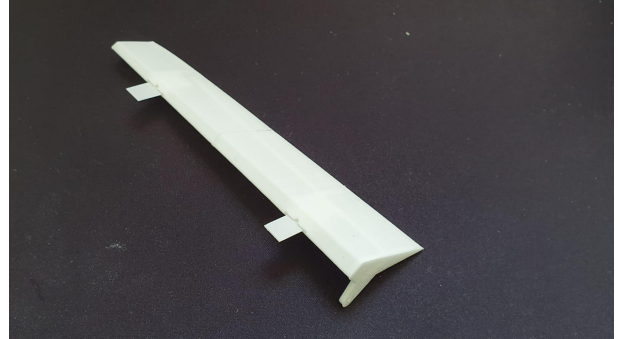
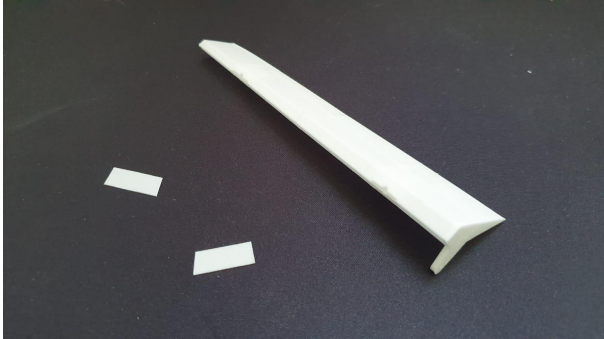
From the off-cuts from the fuselage false floor, cut small sections of 15mm x 7mm with the 7mm side being against the grain of the layers. Test fit the pieces into the hinge slots of the control surface and stabiliser or wing.





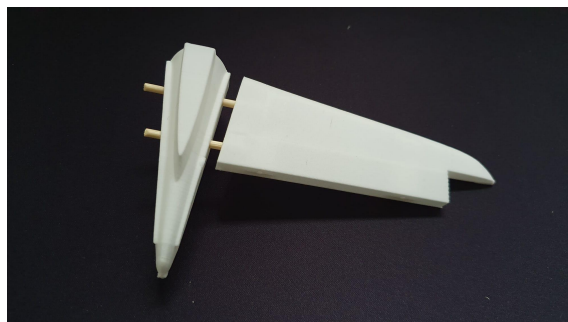
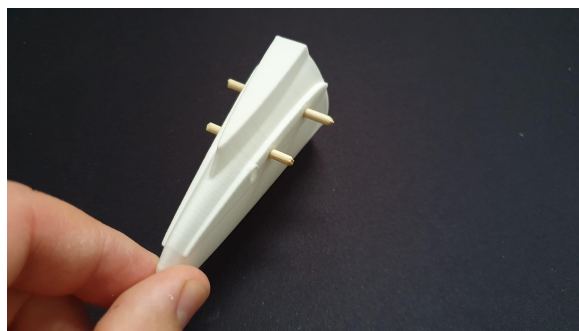
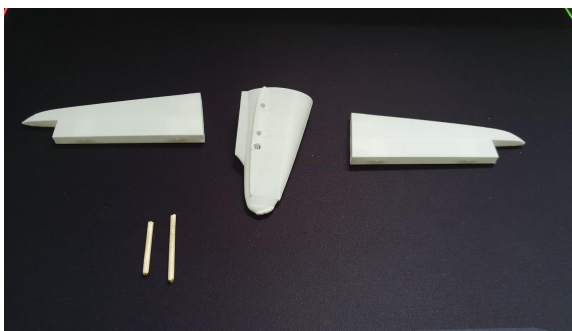
8

Place a drop of CA in the hinge slot of the control surface and insert the hinge. Be sure that the hinge is perpendicular to the control surface. Then bend the hinges to 90deg back and forward a few times to make sure they are appropriately loose. (the outer aileron and elevator hinge may need to be trimmed). **See below**



9

Fit the horizontal stabilizers to the Vertical stabilizer using small sections of 3mm bbq skewers to align the stabilizers and glue with CA. (images for demonstration only)

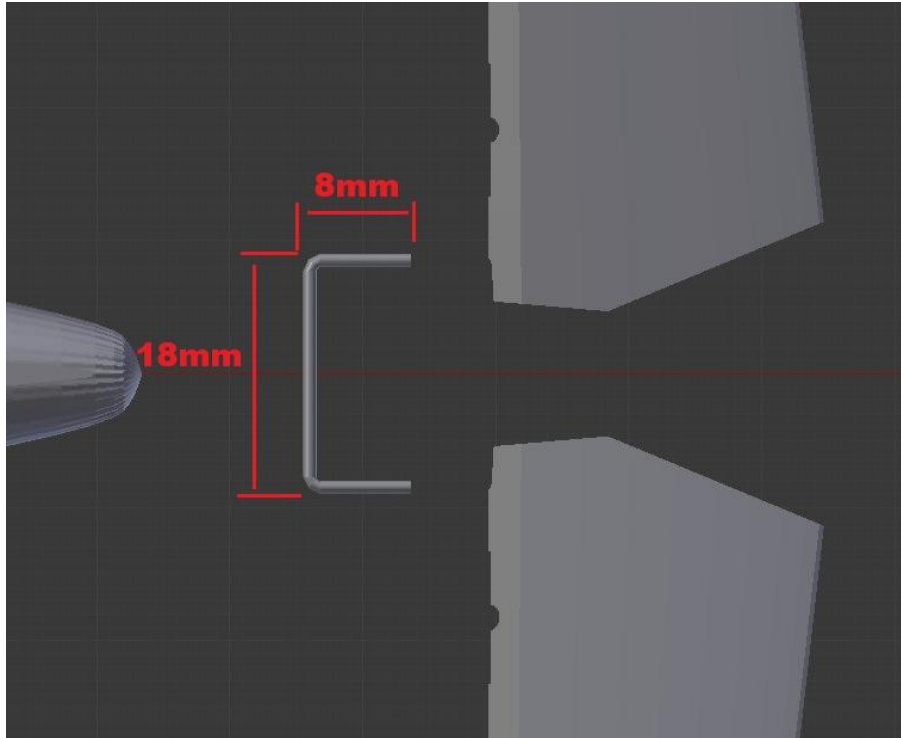


10

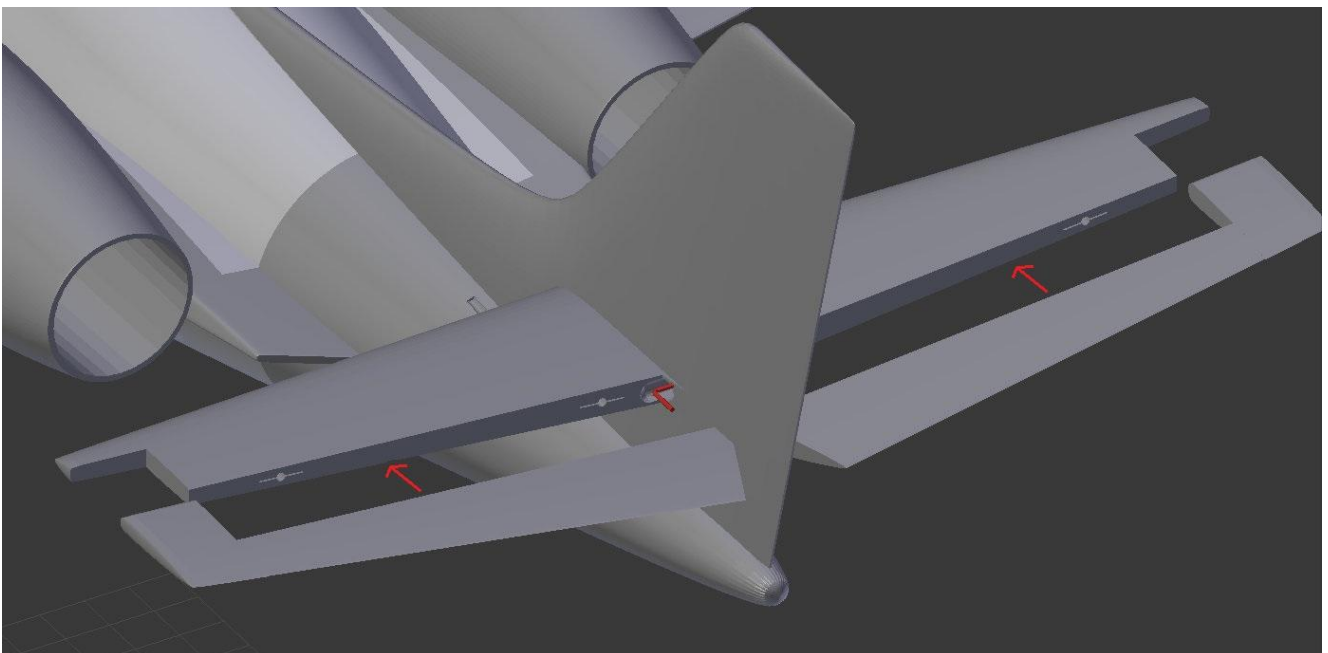
Glue the Vertical/horizontal stabilizer assembly to the fuselage.

11

Bend a section of 1mm steel wire to connect the elevators together.



Test fit the wire and the elevators connection to the horizontal stabilizers before gluing the wire to the elevators, or the elevators to the tail plane. There should be un-obstructed travel.



### 11a FIXED GEAR OPTION

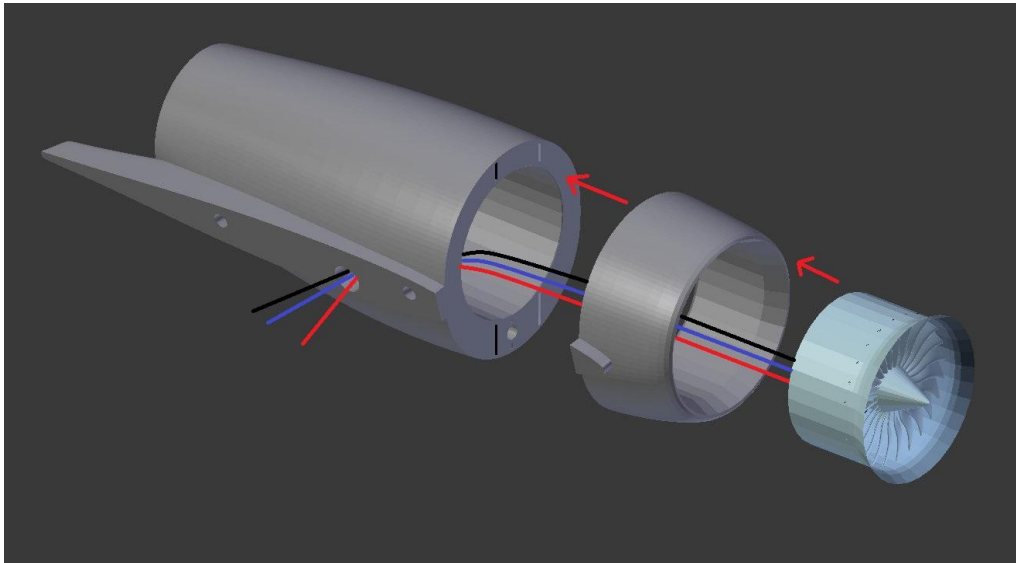
If using the fixed gear parts, fit the hinges to the rudder, then glue the rudder to the vertical stabilizer.

### 12

Glue the elevators in place. Make sure each control surface has equal, full and free movement.

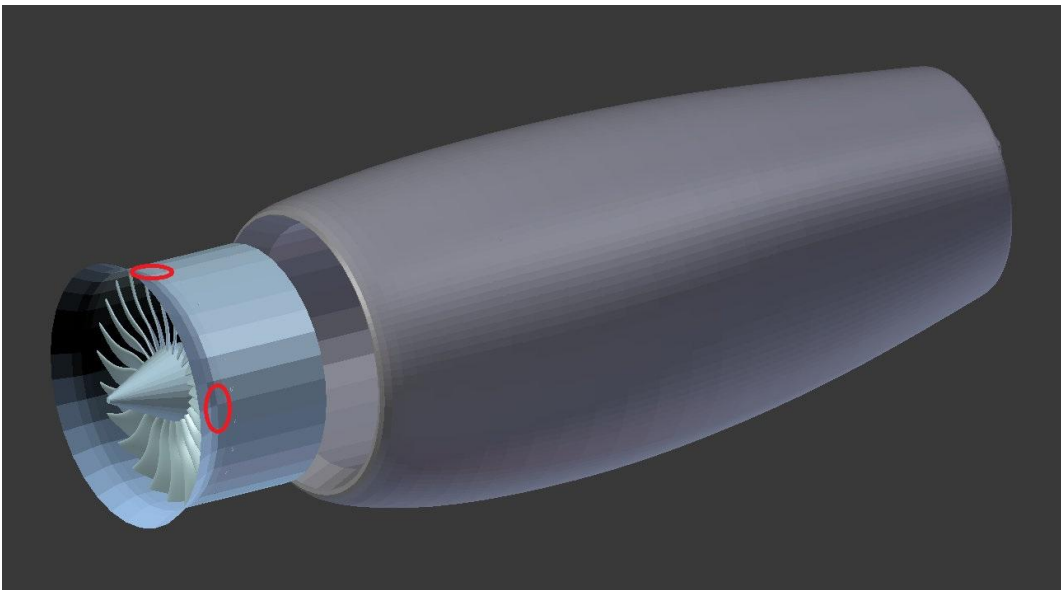
### 13

Feed the wires for the EDF units through the nacelle front and rear sections. Then glue the nacelle sections together with CA.

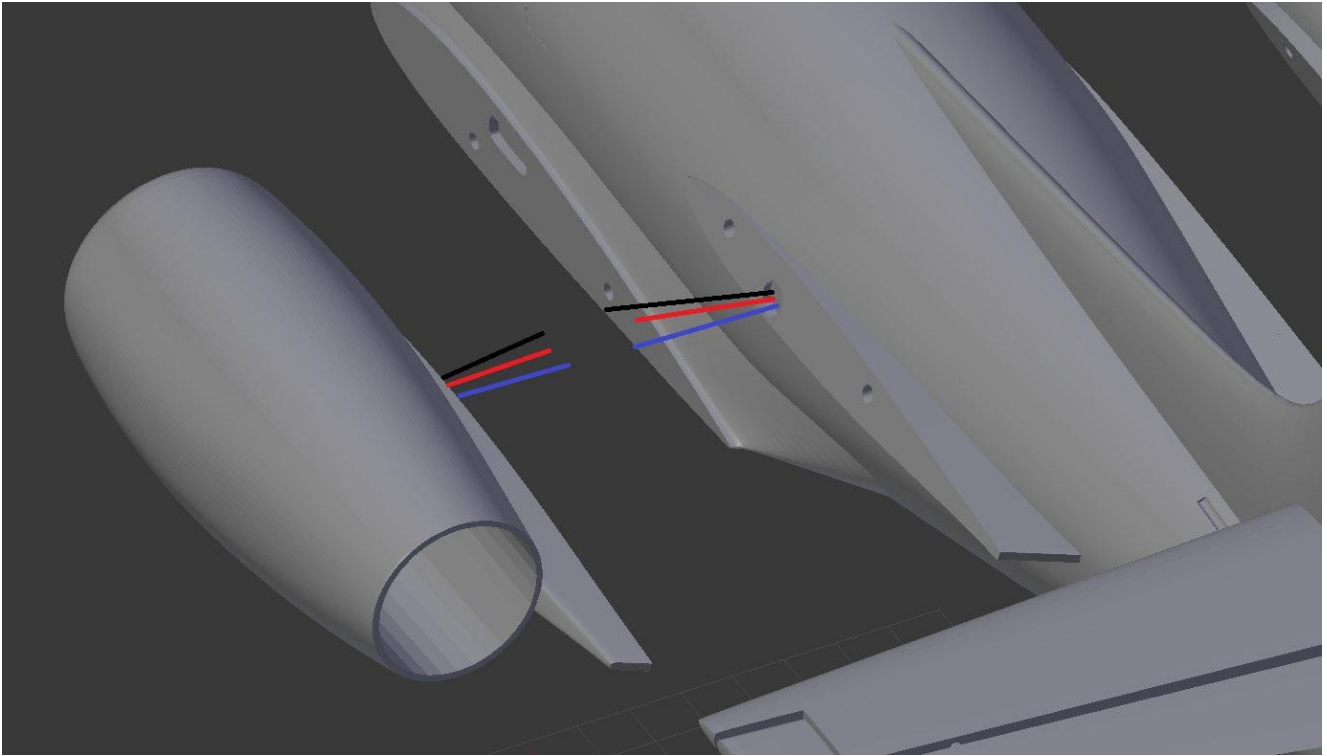


### 14

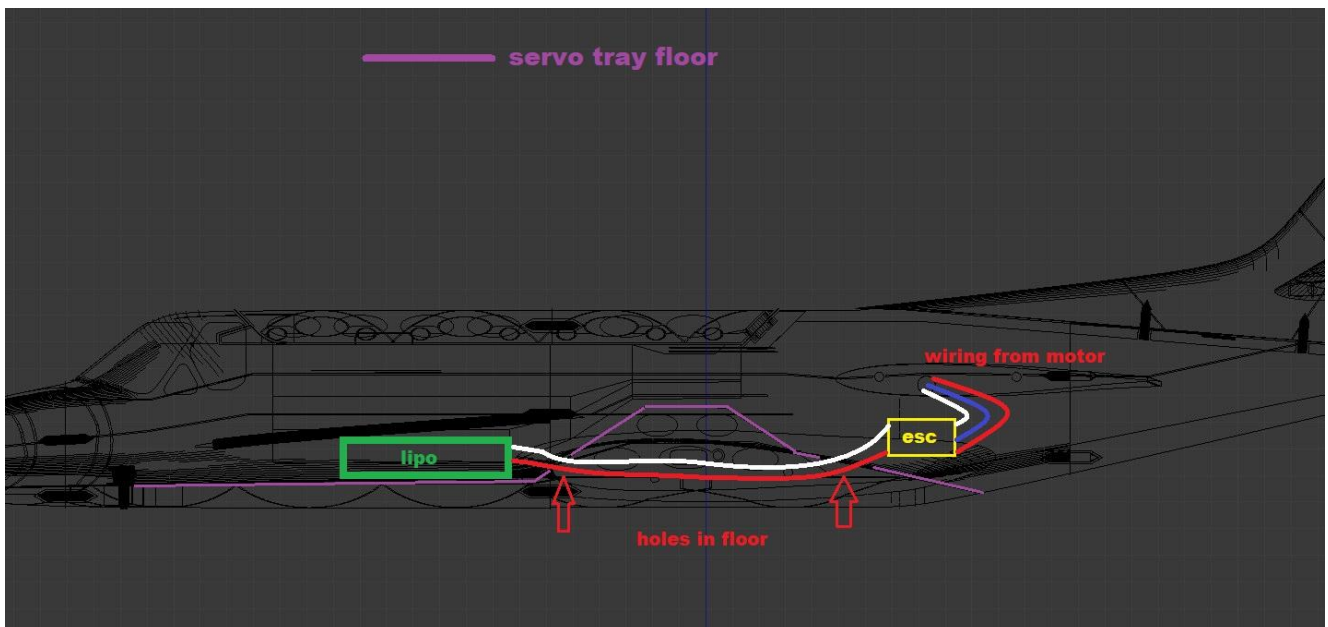
Secure the EDF in place using a small amount of hog glue placed 90deg apart around the front lip of the EDF. Ensure the EDF housing is sitting flush with the front of the nacelle.



Connect up the esc wires to the EDF between the fuselage and the nacelle. Once soldered, confirm the motor direction before moving on.

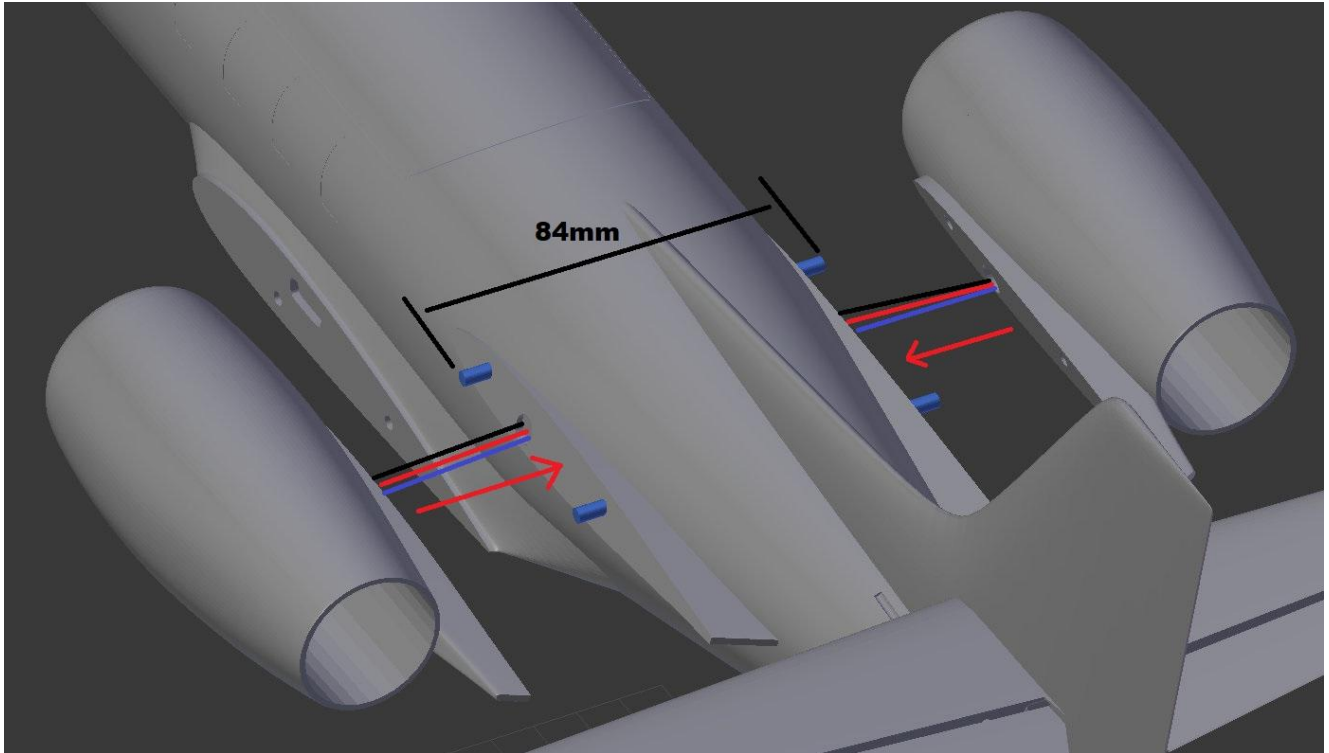


- The fuselage is designed to have the esc's in the rear of the fuselage and run the cables under the servo tray floor to the battery compartment. (see below)



**16**

Cut two 84mm lengths of bbq skewer and feed them through the nacelle alignment holes in the fuselage. Test fit the nacelles then secure with CA.

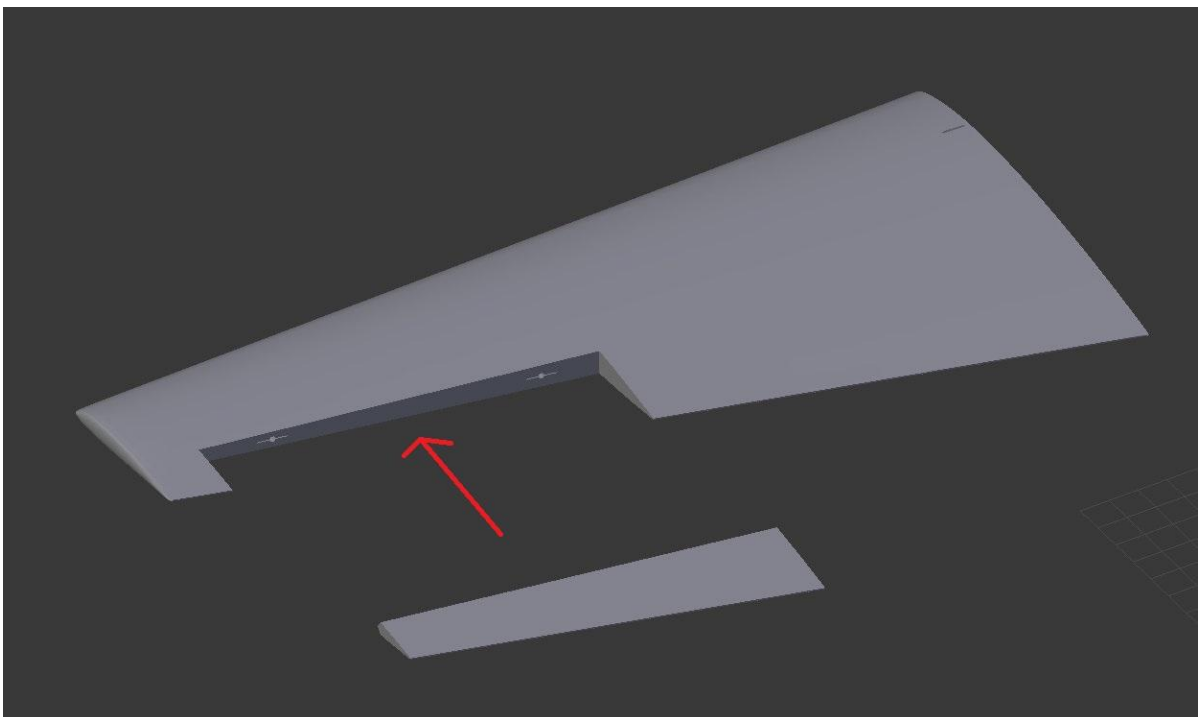


**17**

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

**18**

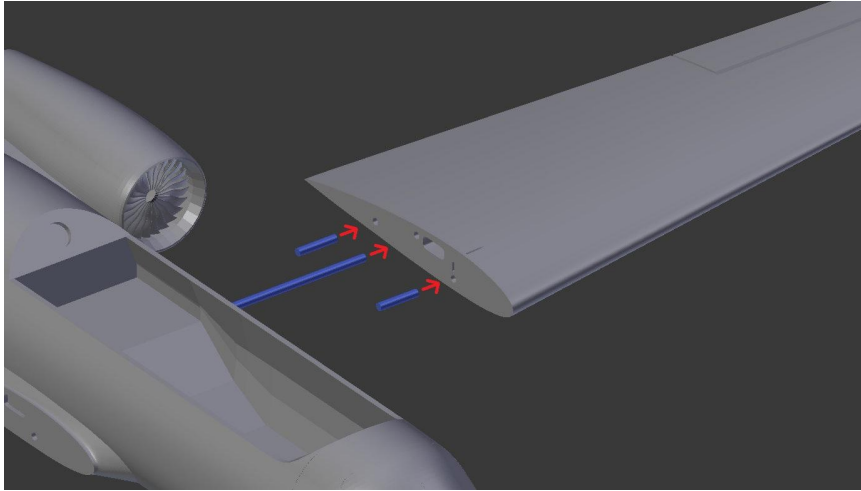
Fit the ailerons using steps 7 and 8 to fit the hinges





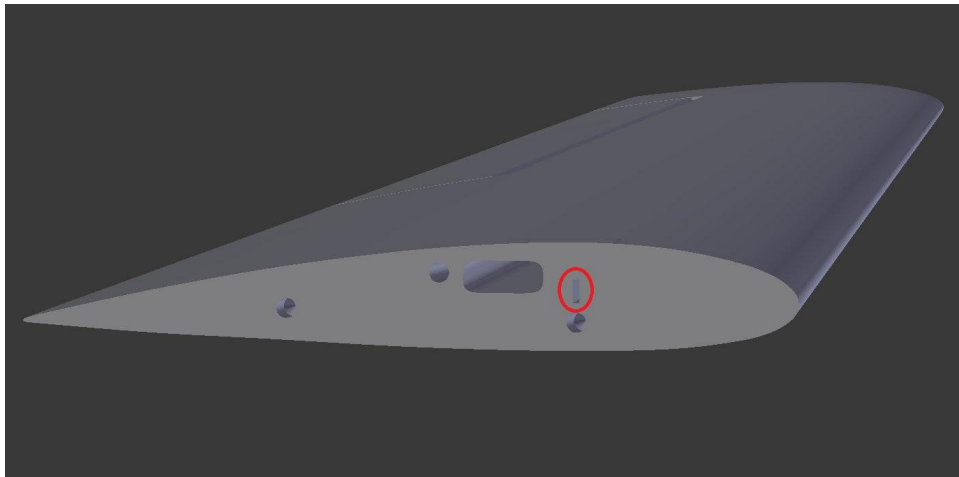
## 19

Cut a 24cm section of skewer and feed through the fuselage into the middle alignment just aft of the servo tunnel. This will act as a spar to support the landing gear through the fuselage. The smaller sections are to be cut to roughly 1cm.



## 20

Glue the wings to the fuselage **NOTE** – if using 3mm x 0.6mm carbon strip, now is the time to install it. Simply slide the carbon strip into the slot and cut it so it does not protrude out of the wing (circled in red, see image). The cross structure of the fuselage spreads the load of the wings at the root which negates the need of a connecting spar in the fuselage.



## 21

Glue the sections of the battery hatch together.

## 22

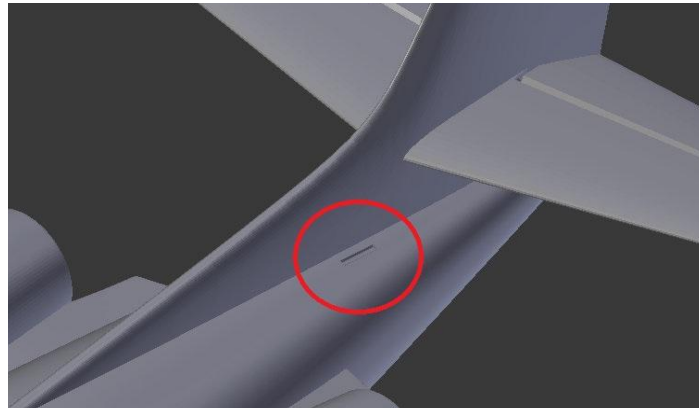
Install the magnets to the battery hatch and fuselage.

## 23

Install the aileron servos using hot glue. (the mount brackets will need to be removed)

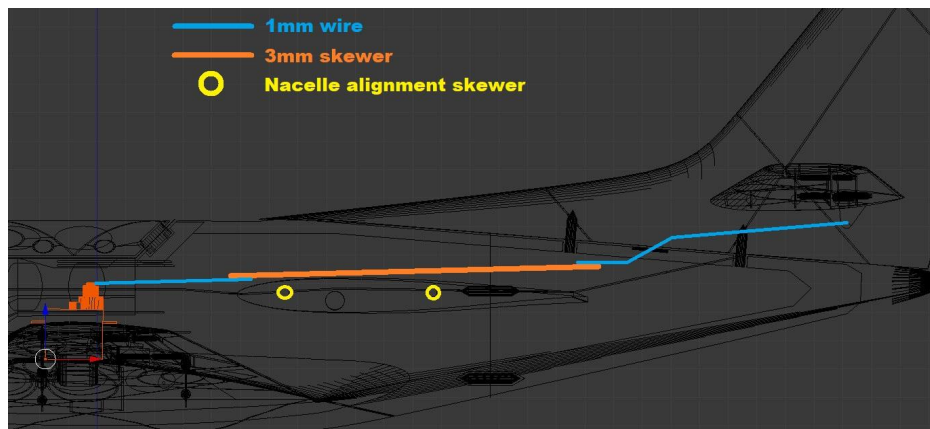
24

Make a small slot with a hot piece of wire where the indent in the rear of the fuselage is located for the elevator (and rudder **“only for fixed gear variant”**) control arm to pass through.

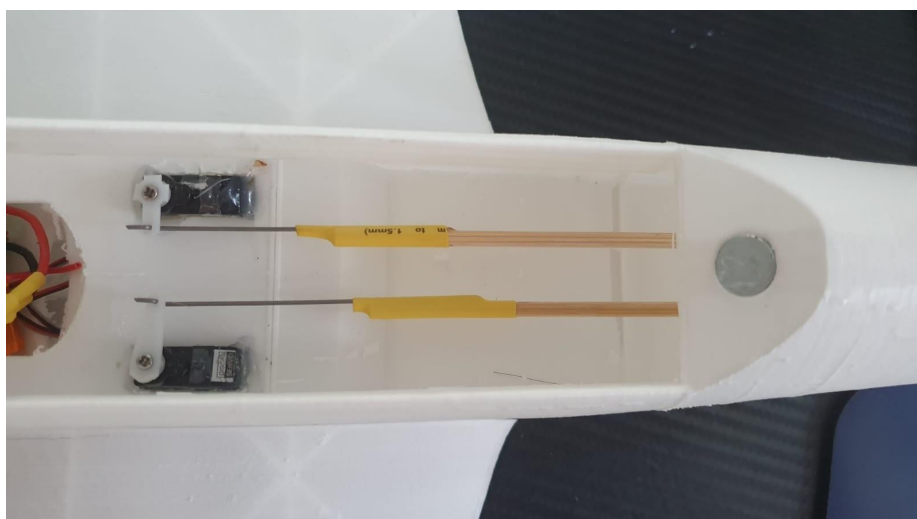


25

Install the elevator servo and connect it up to the elevator. The push rod should pass above the nacelle alignment skewers. Using an appropriate length of skewer with 1mm steel wire on each end covered in heat shrink tubing, connect the elevator and rudder to their relative servo.



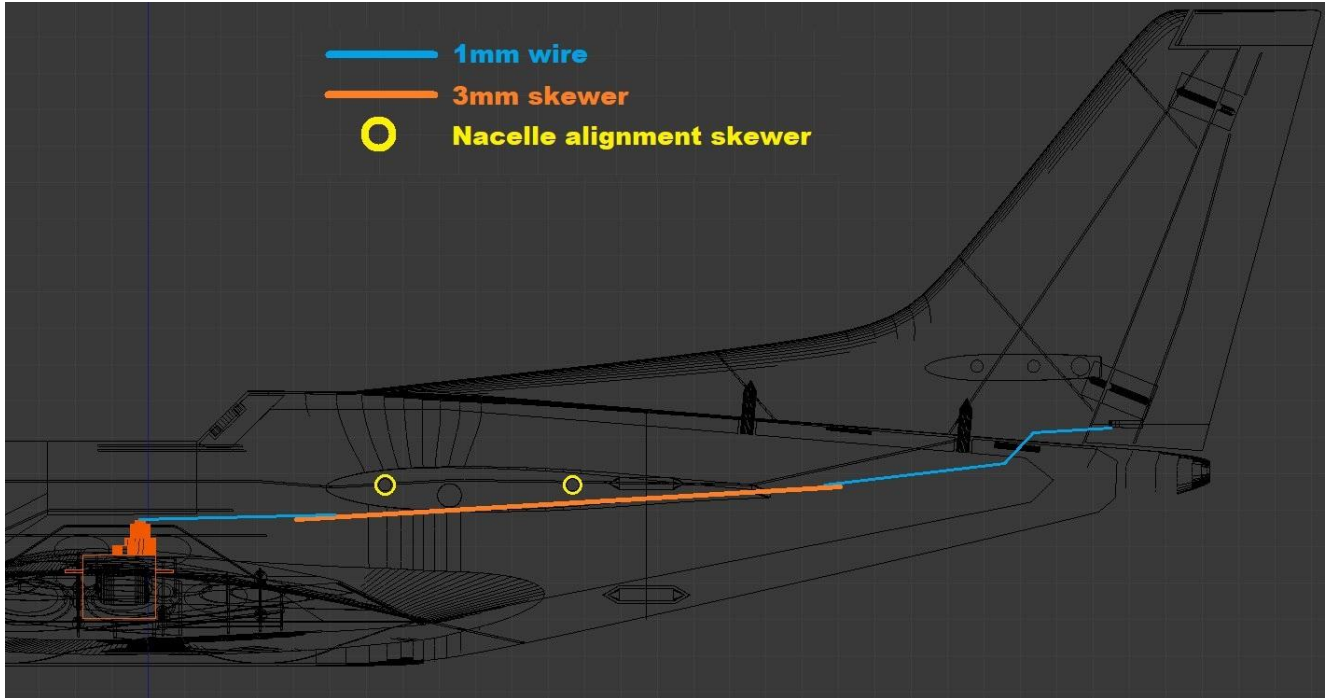
Example of skewer - 1mm rod connection





## 25a **FIXED GEAR OPTION**

Install the rudder servo and connect it up to the rudder. The push rod should pass under the nacelle alignment skewers. Using an appropriate length of skewer with 1mm steel wire on each end covered in heat shrink tubing, connect the elevator and rudder to their relative servo.

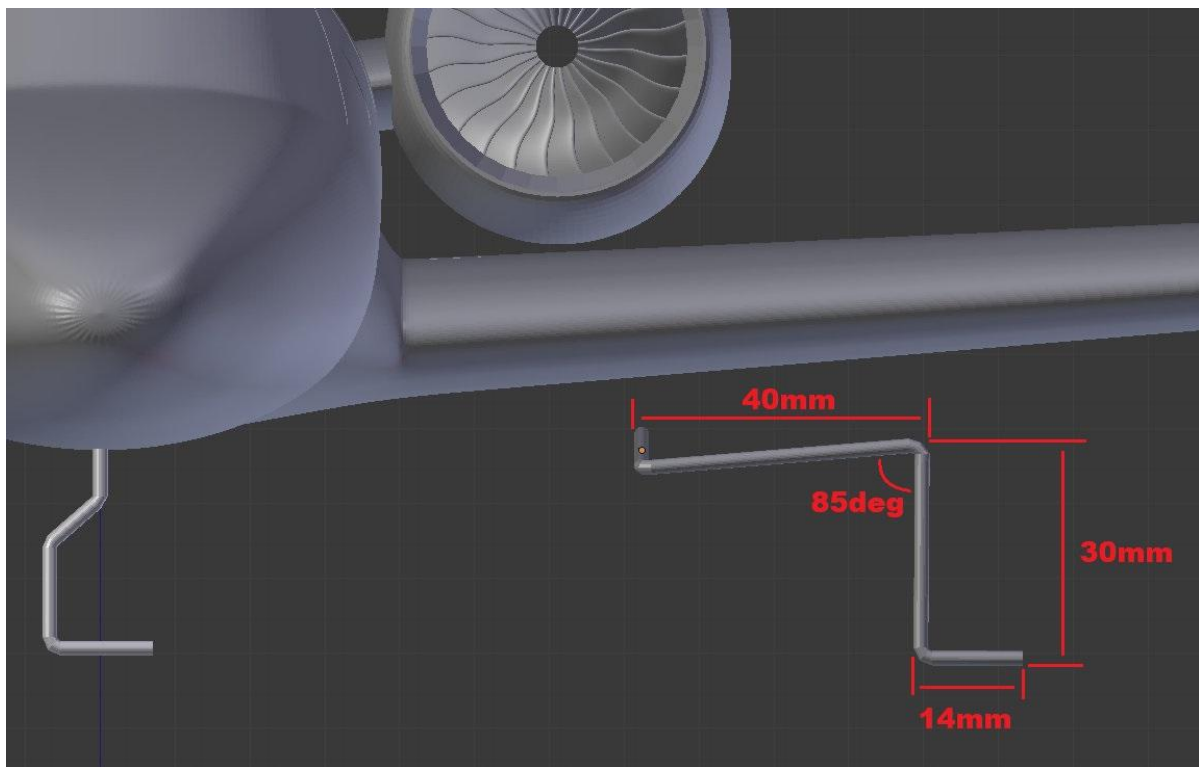


**\*\* IF NOT USING LANDING GEAR SKIP AHEAD TO BALANCING AND CG \*\***

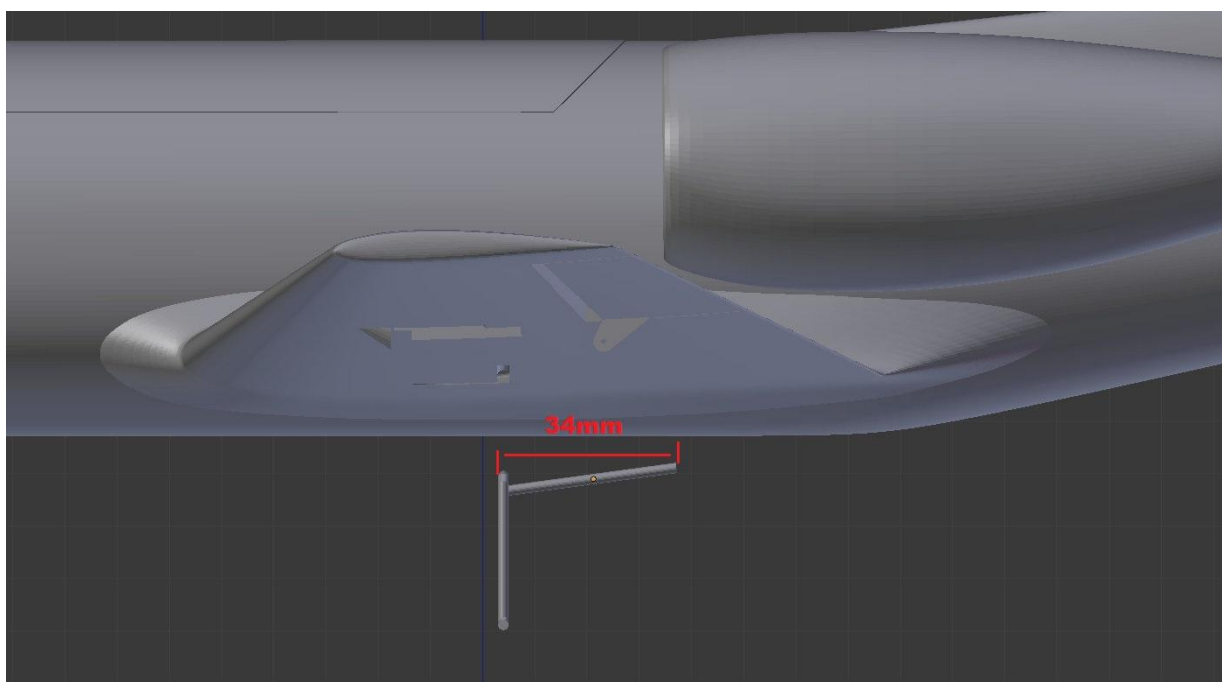
**26**

Cut a 120mm section of 2mm wire and bend according to the diagram below. Make a mirrored version for the right side.

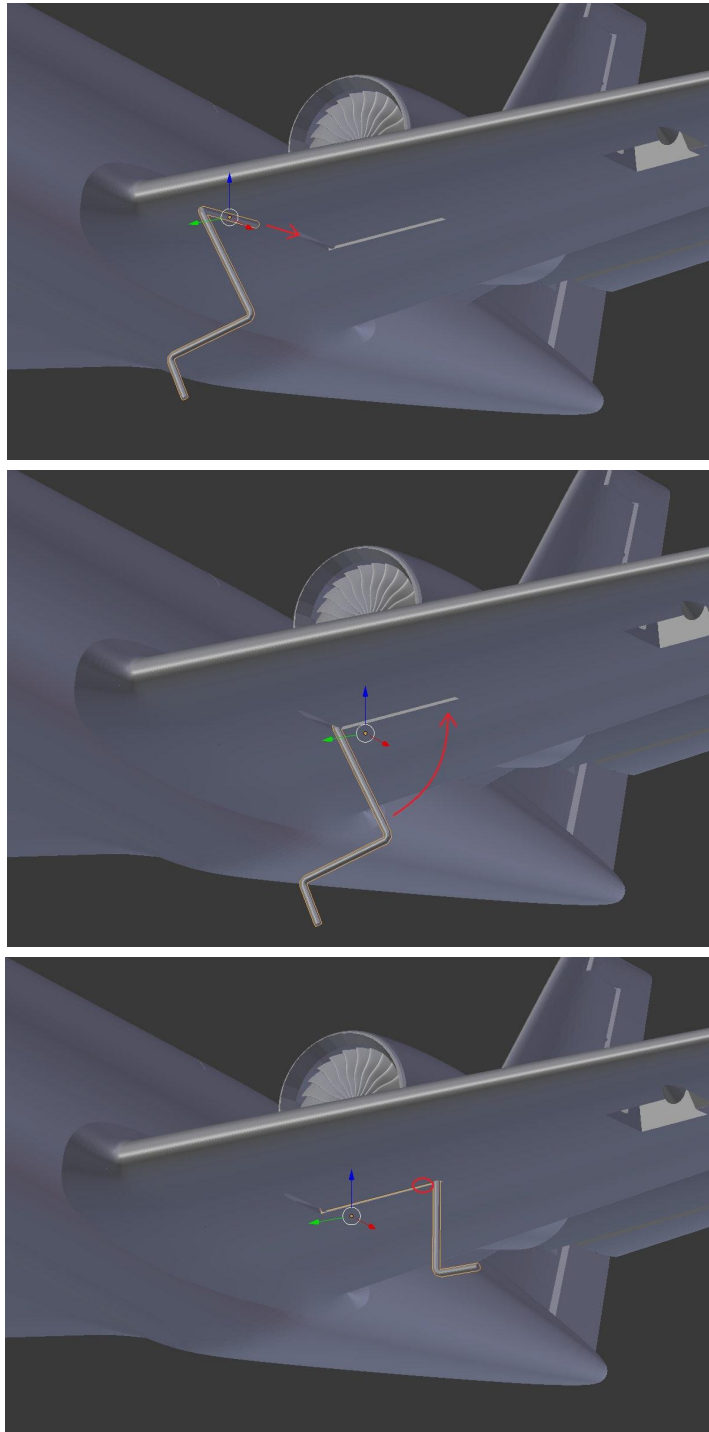
**FRONT VIEW**



**SIDE VIEW**



Insert the gear leg into the wing as pictured below.



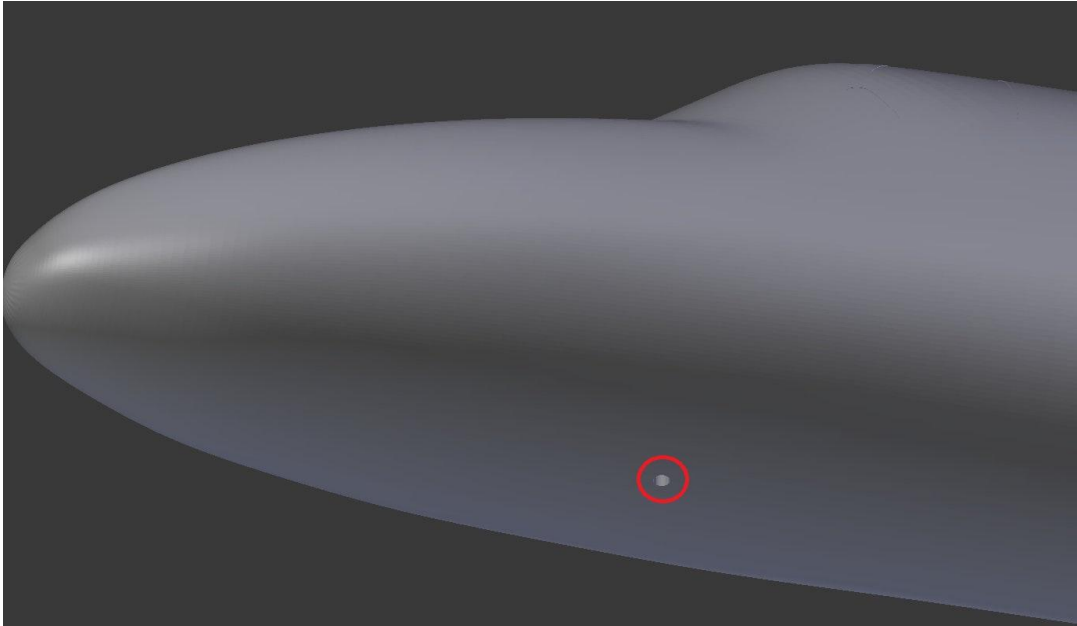
Apply a small amount of hot glue to the outer bend of the leg (red circle on image above). This will hold it in place but also allow it to be removed if desired. Fit the wheel and secure it with a shaft collar.

**28**

Fit a 25-30mm foam wheel and secure with either an M2 wheel stop collar or the 3d printed stop collar and secure in place with CA.

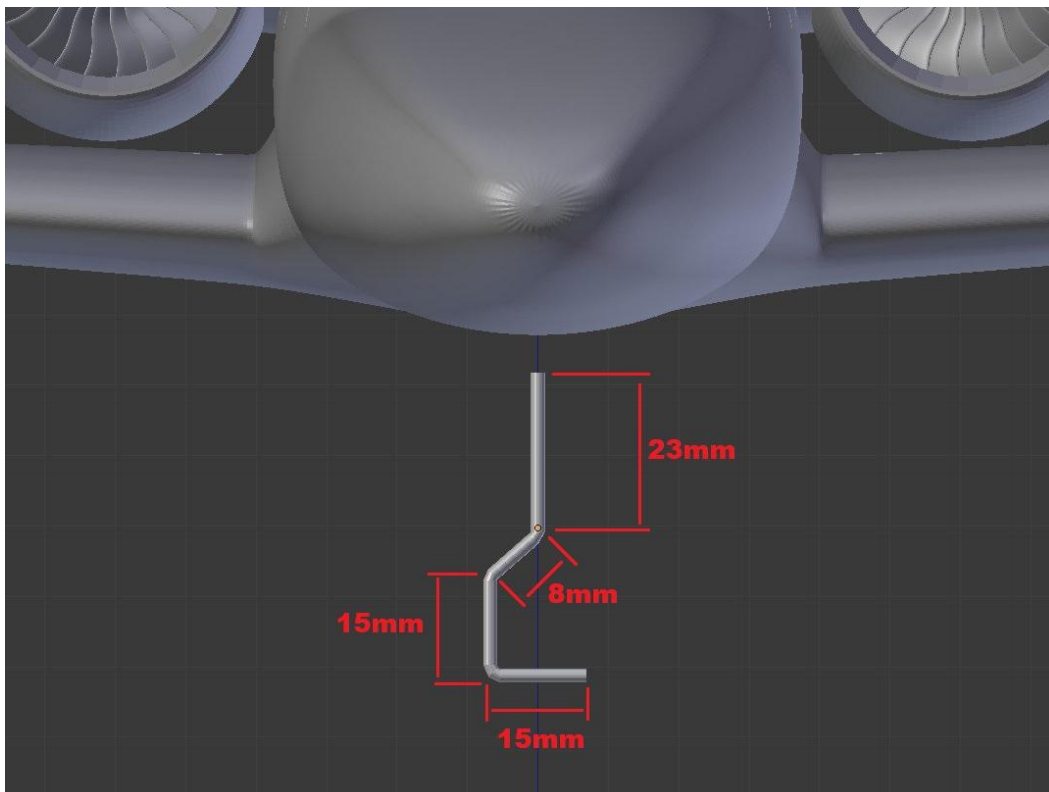
**29**

Run a 2mm drill bit up through the nose gear hole to clear out any filament.



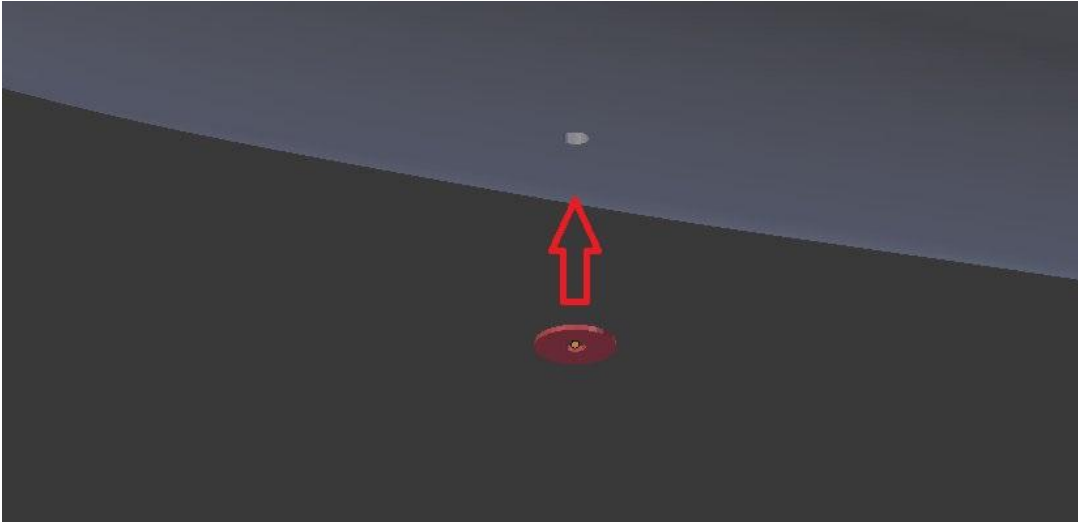
**30**

Cut a mm section of 65mm wire and bend up according to the following diagram.



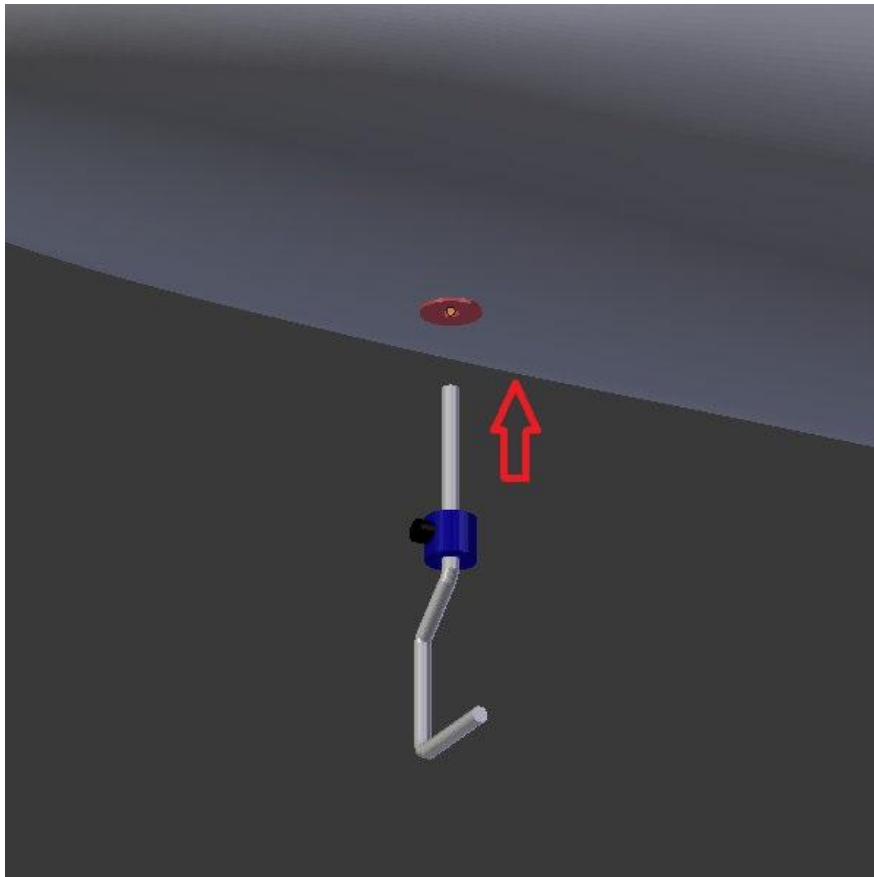
**31**

Glue the small gear washer over the nose gear hole. This will add support to the lower half of the nose gear against lateral forces. You may need to run a 2mm drill bit through the hole again.

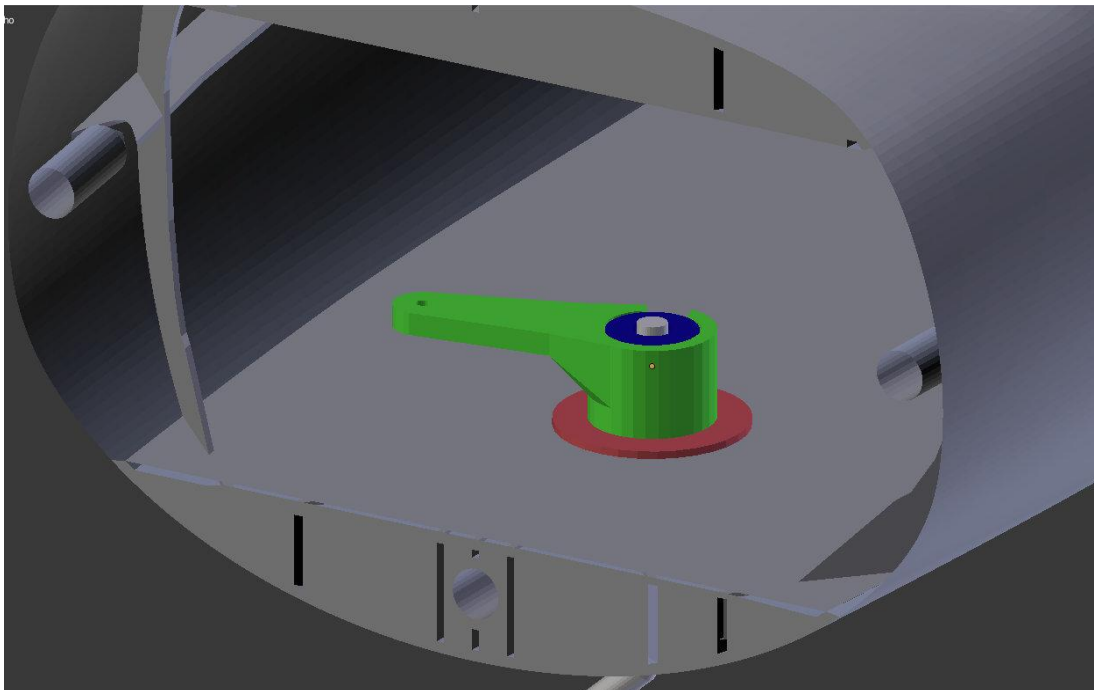
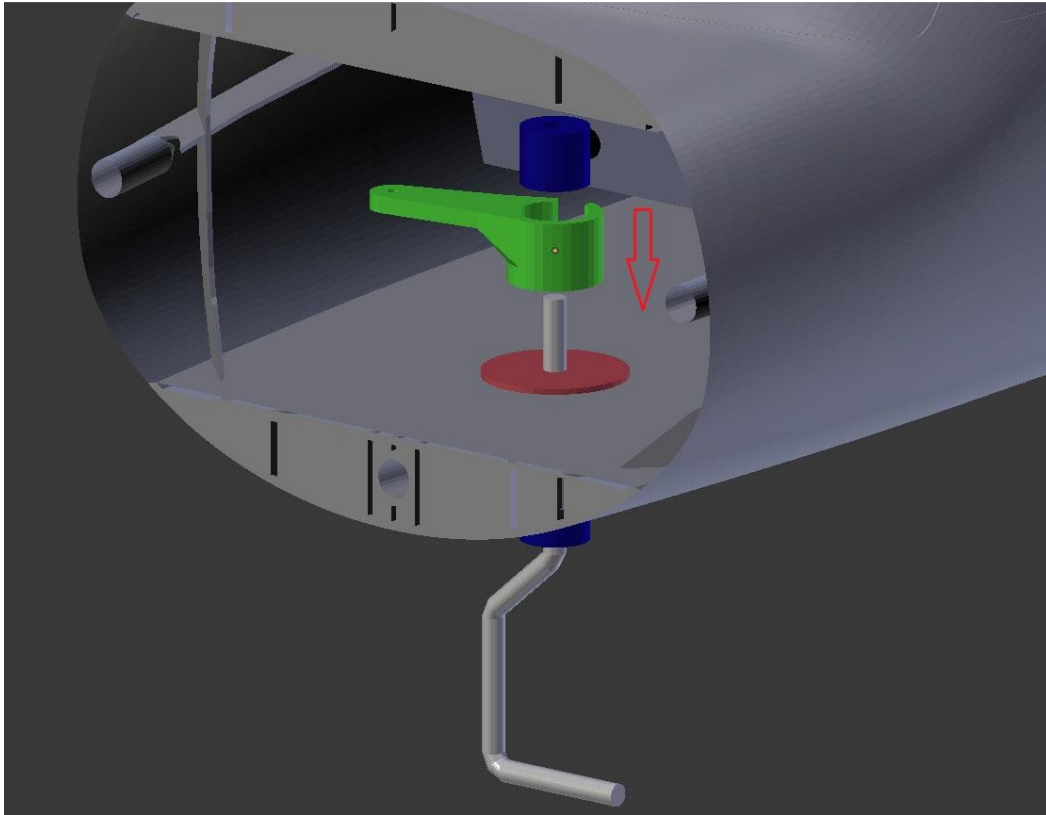


**32**

Slide a stop collar over the gear leg and insert the assembly into the nose gear slot.

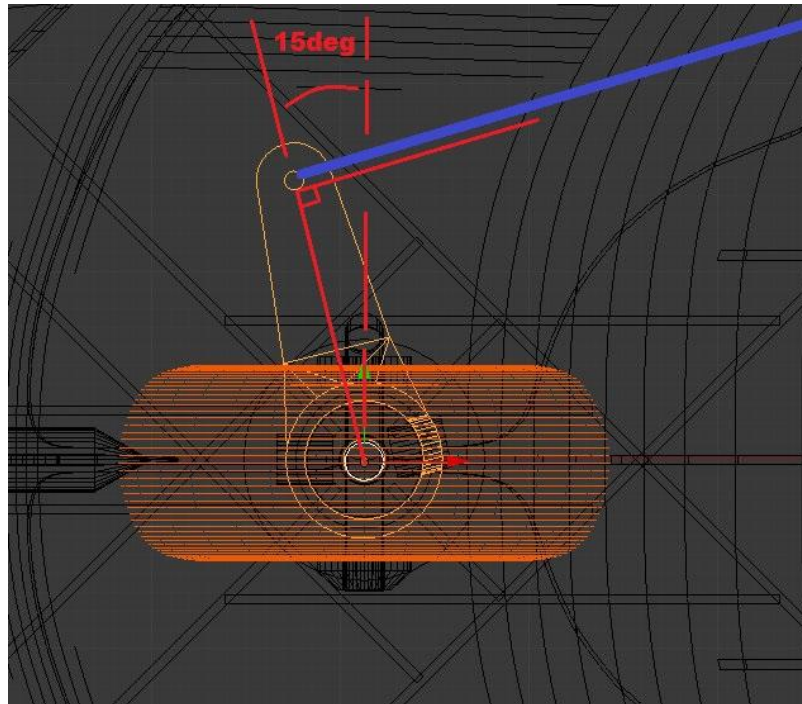


From the inside of the fuselage, slide the larger gear washer, then the gear steering arm and finally, another stop collar of the protruding end of the nose gear leg. (see images below)



**34**

To ensure the nose wheel has the same steering angle in both directions, offset the steering arm from the main wheel by as close to 15deg as possible. (see below)

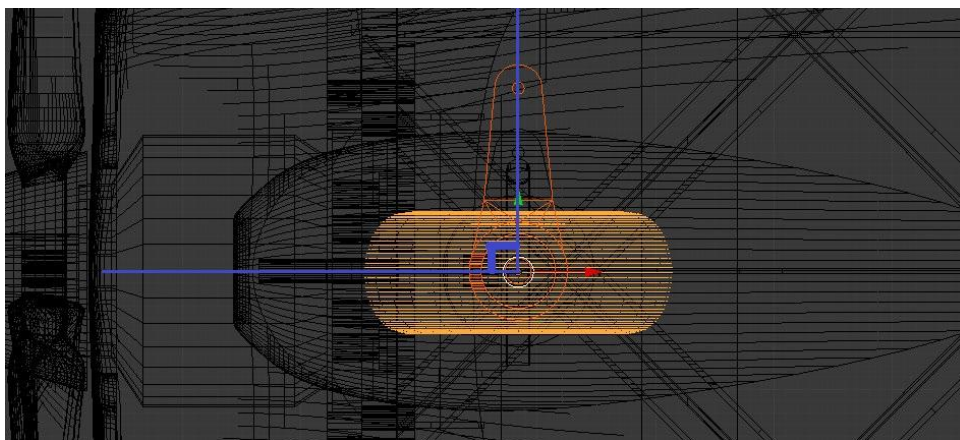


**35**

Feed a section of 1mm wire through the bowden tube in fuse 2 and connect the steering arm with the rudder servo.

**36**

Fit a 25mm wheel to the nose gear and secure with either an M2 wheel stop collar or the 3d printed stop collar and secure in place with CA.



**37**

Glue fuse 1 to the rest of the fuselage.



## BALANCING AND CG

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

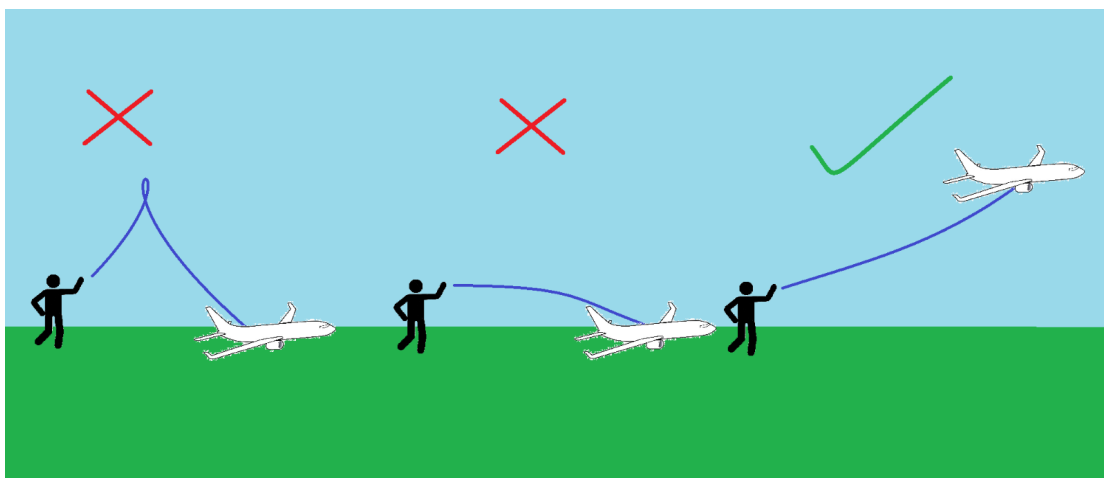
## RANGE OF TRAVEL:

### MAIDEN / NORMAL FLIGHT:

Elevator	+/- 5mm
Rudder	+/- 10mm
Aileron	+/- 10mm

### LAUNCHING:

It was found that the safest and most successful launch technique for this model was the under-arm style, gripping the model from the fuselage just in front of the nacelles. The aircraft should be launched at approximately 20deg nose up at 80% to 100% power. Too steep and the aircraft will stall, too shallow and it will contact the ground.



## **PARTS LINKS:**

x2 QX-MOTOR 30MM EDF 7000KV

<https://de.aliexpress.com/item/4000366589347.html?spm=a2g0s.8937460.0.0.63a72e0epETMZR>

X2 15AMP ESC

[https://de.aliexpress.com/item/4000386815523.html?spm=a2g0o.order\\_list.0.0.1f451802R7sOas&gatewayAdapt=glo2deu](https://de.aliexpress.com/item/4000386815523.html?spm=a2g0o.order_list.0.0.1f451802R7sOas&gatewayAdapt=glo2deu)

1300MAH 3S LIPO OR SIMILAR

[https://hobbyking.com/en\\_us/turnigy-nano-tech-1300mah-3s-45-90c-lipo-pack.html?\\_\\_store=en\\_us](https://hobbyking.com/en_us/turnigy-nano-tech-1300mah-3s-45-90c-lipo-pack.html?__store=en_us)

X3 3.7G MICRO SERVO (x4 for fixed gear option)

[https://www.aliexpress.com/item/32965734270.html?spm=a2g0o.productlist.0.0.57d95e97aWNNAJ&algo\\_pvid=4824ea1c-06ed-43e8-b6c7-9737d1226dbe&algo\\_expid=4824ea1c-06ed-43e8-b6c7-9737d1226dbe-0&btsid=0bb0623415991458444523660eb7bd&ws\\_ab\\_test=searchweb0\\_0,searchweb201602\\_,searchweb201603\\_](https://www.aliexpress.com/item/32965734270.html?spm=a2g0o.productlist.0.0.57d95e97aWNNAJ&algo_pvid=4824ea1c-06ed-43e8-b6c7-9737d1226dbe&algo_expid=4824ea1c-06ed-43e8-b6c7-9737d1226dbe-0&btsid=0bb0623415991458444523660eb7bd&ws_ab_test=searchweb0_0,searchweb201602_,searchweb201603_)

BAMBOO FOOD SKEWERS (3mm diameter)

X2 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_)

X10 MICRO HINGES

[https://hobbyking.com/en\\_us/super-light-pivot-round-hinges-d2xw8xl24mm-12pcs.html](https://hobbyking.com/en_us/super-light-pivot-round-hinges-d2xw8xl24mm-12pcs.html)

VELCRO – (local hardware store)

M2 PUSH ROD (200mm MINIMUM LENGTH) (**ONLY REQUIRED FOR FIXED GEAR OPTION**)

<https://de.aliexpress.com/item/4000682811650.html?spm=a2g0o.9042311.0.0.27424c4dO7QvIJ>

M2 WHEEL STOP COLLAR

[https://de.aliexpress.com/item/32367176766.html?spm=a2g0o.productlist.0.0.103f8bdcGo69MK&algo\\_pvid=269e7532-755e-49b1-963f-c5fc23d25ace&algo\\_exp\\_id=269e7532-755e-49b1-963f-c5fc23d25ace-2&pdp\\_ext\\_f=%7B%22sku\\_id%22%3A%2266304162649%22%7D&pdp\\_pi=-1%3B2.18%3B-1%3BEUR+5.01%40salePrice%3BEUR%3Bsearch-mainSearch](https://de.aliexpress.com/item/32367176766.html?spm=a2g0o.productlist.0.0.103f8bdcGo69MK&algo_pvid=269e7532-755e-49b1-963f-c5fc23d25ace&algo_exp_id=269e7532-755e-49b1-963f-c5fc23d25ace-2&pdp_ext_f=%7B%22sku_id%22%3A%2266304162649%22%7D&pdp_pi=-1%3B2.18%3B-1%3BEUR+5.01%40salePrice%3BEUR%3Bsearch-mainSearch)

X2 x 200mm carbon strip 3mm x 0.6mm (optional)

[https://www.aliexpress.com/item/32576381076.html?spm=a2g0o.productlist.0.0.4e922cc3nR6757&algo\\_pvid=500714e5-ce74-4e52-a1b0-e349cac3f595&algo\\_expid=500714e5-ce74-4e52-a1b0-e349cac3f595-7&btsid=0bb0623e15991463277515177efc08&ws\\_ab\\_test=searchweb0\\_0.searchweb201602\\_.searchweb201603\\_](https://www.aliexpress.com/item/32576381076.html?spm=a2g0o.productlist.0.0.4e922cc3nR6757&algo_pvid=500714e5-ce74-4e52-a1b0-e349cac3f595&algo_expid=500714e5-ce74-4e52-a1b0-e349cac3f595-7&btsid=0bb0623e15991463277515177efc08&ws_ab_test=searchweb0_0.searchweb201602_.searchweb201603_)

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)

Thank you for supporting us! We hope you enjoy many hours of flying your micro Citation 550. 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)