

ASSEMBLY MANUAL AND USER GUIDE



TRACER 2000

Thermal glider

By 3D AEROWORKS

OVERVIEW:

This blend of thermal soarer and hotliner is bound to turn some heads at the local flying field. Designed for quick and easy construction printed in PLA. Designed to suit the 2836 1500kv outrunner on an 8x4 folding propeller. Utilising ailerons and a V-tail rudder/elevator, this model flies like it is on rails. With an extremely thin wing profile and sleek fuselage, the Tracer 2000 has a fantastic glide ratio and penetrates strong winds easily. 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/tracer-2000-thermal-glider-3d_aeroworks

GENERAL SPECIFICATIONS

WINGSPAN:	2000mm
PRINT TIME:	80 hrs
PRINT COST:	\$10 USD
PRINT WEIGHT:	630g
FLYING WEIGHT:	1030g

ELECTRICS

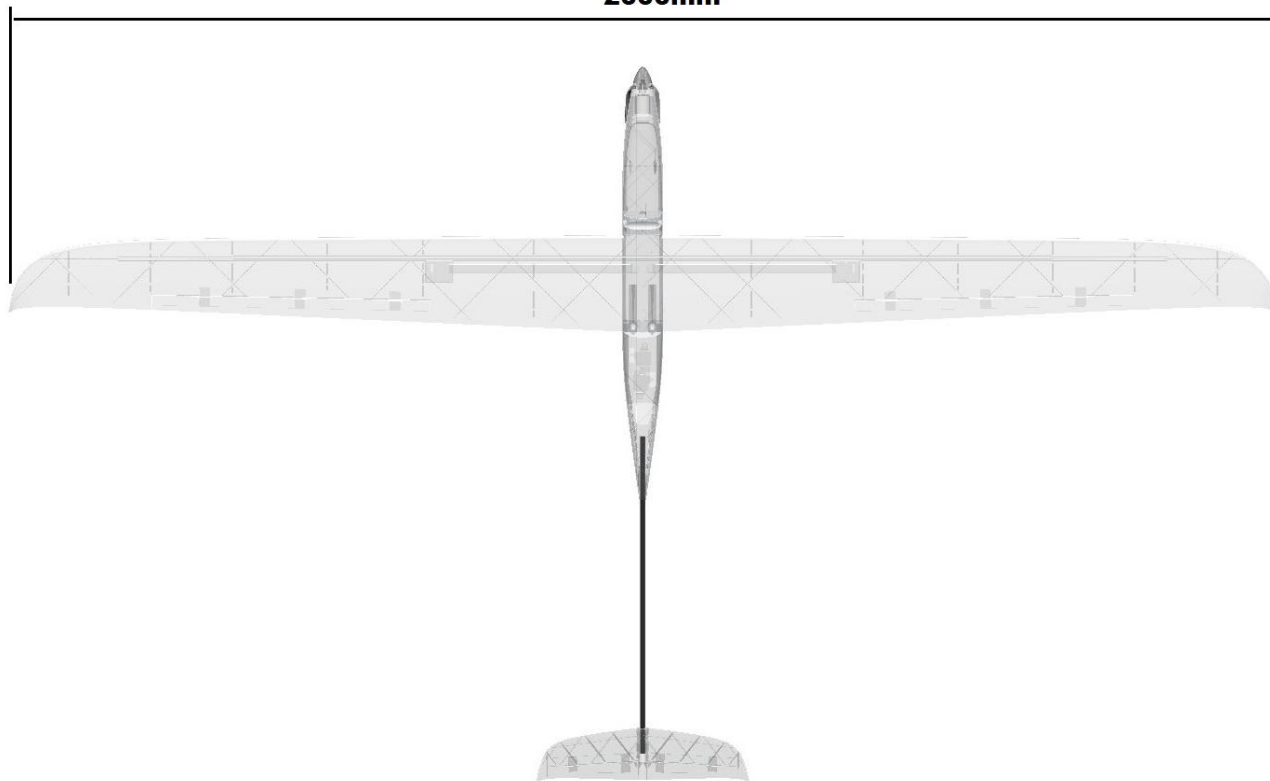
MOTOR:	2836 1500KV
ESC:	40 amp
SERVOS:	x2 9g x2 slim 10g
BATTERY:	2200mah 3s (or similar)

INCLUDED:

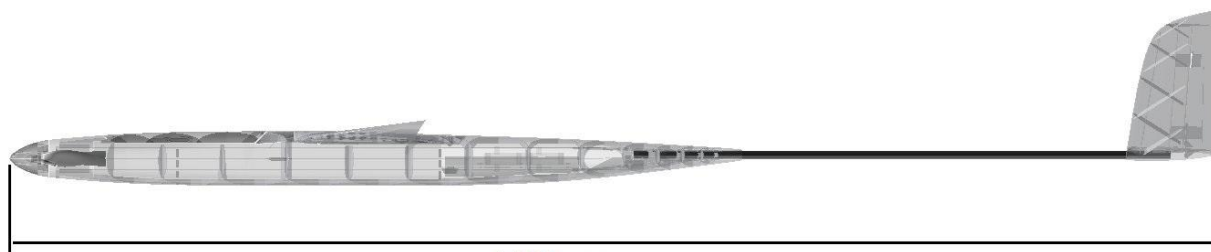
STL FILES OF ALL COMPONENTS **(scale to 1000% if not using S3D)**

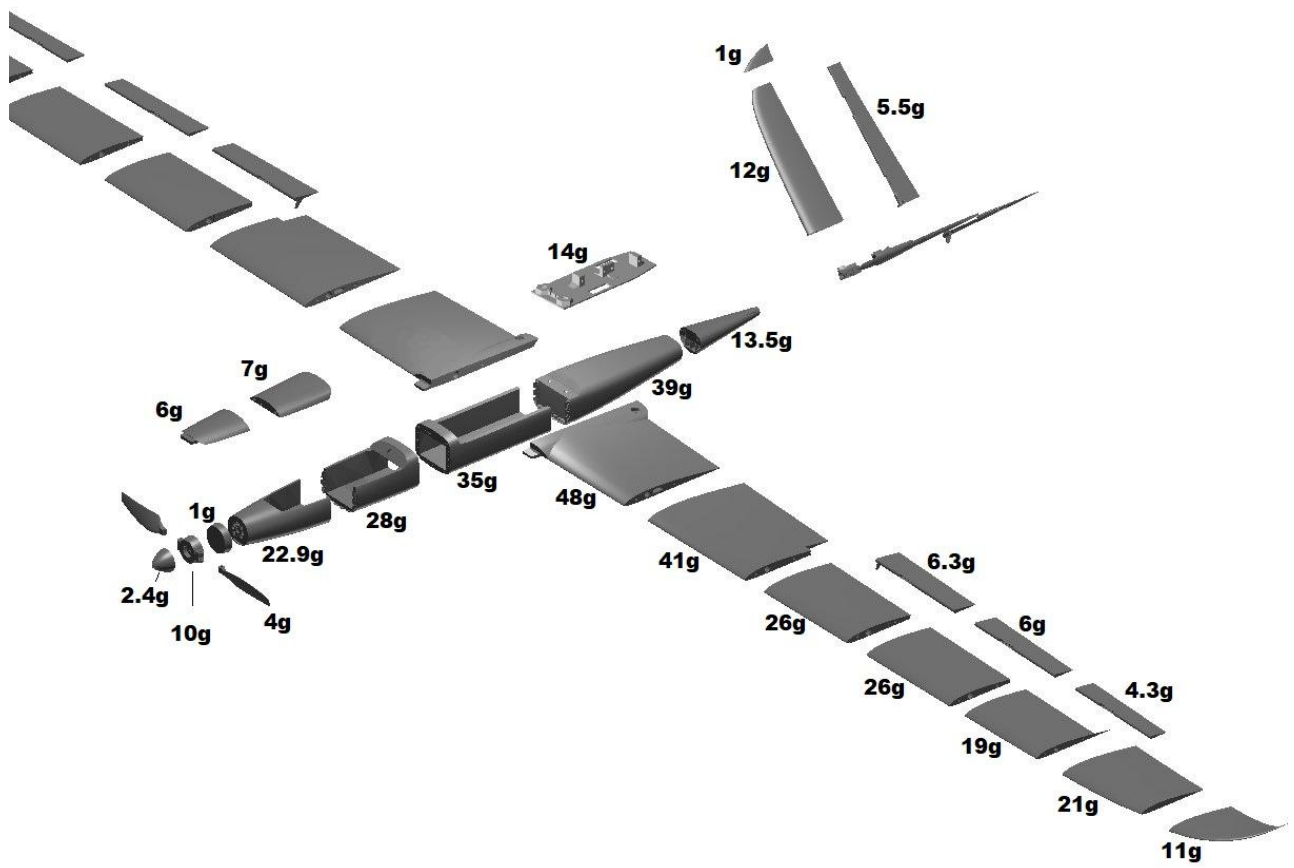
FACTORY FILES FOR (S3D) SIMPLIFY 3D FOR PRINTERS: 200x200200

2000mm



1120mm





REQUIRED TOOLS:

KNIFE

LIGHTER

SANDPAPER (MEDIUM GRIT 320 recommended)

PLIERS

CA GLUE

SCREW DRIVERS

FILE OR RASP

DRILL 8mm, 3mm, 1mm

REQUIRED COMPONENTS:

X1 2836 1500KV MOTOR (or similar)

X1 40AMP ESC

X1 2200MAH 3S LIPO OR SIMILAR

X2 9G SERVO

X2 10G SLIM 2.6KG SERVO

BAMBOO SKEWERS 3MM

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

X10 16mm x 29mm HINGES

X2 m6 nylon bolts and nuts (min 40mm length)

VELCRO

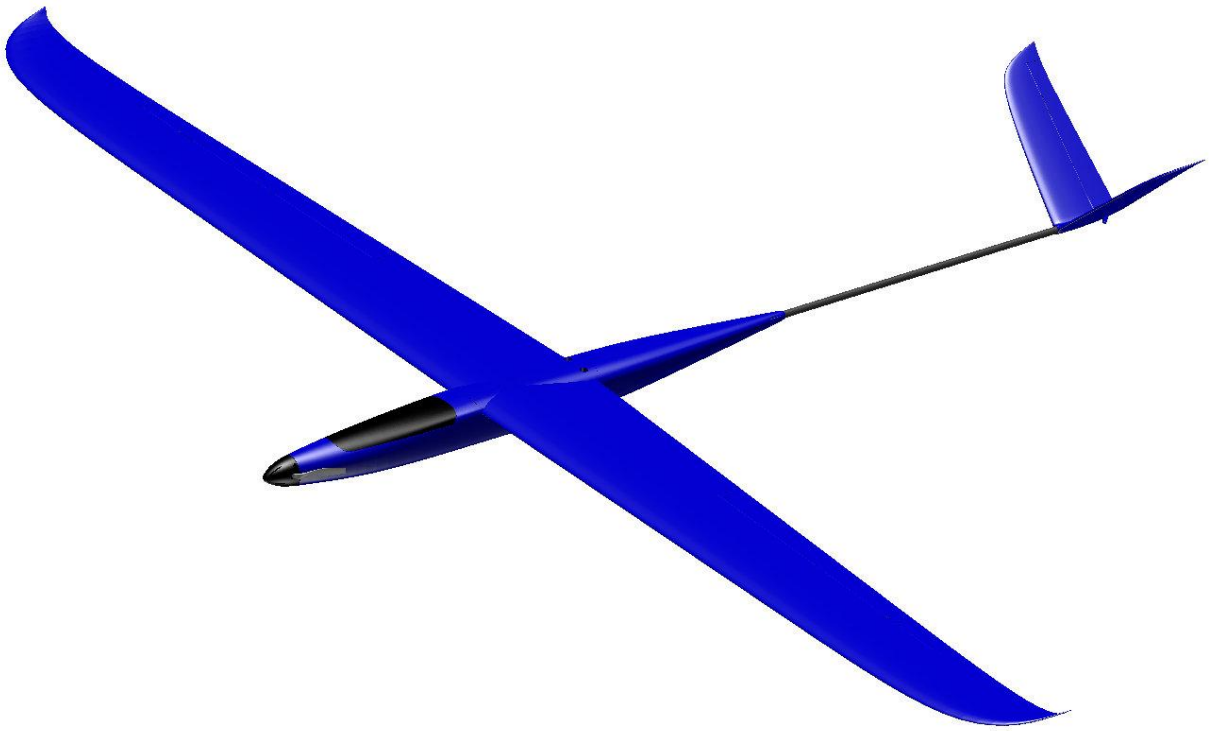
X4 8mm x 6mm x 500mm Twill carbon tube

X1 6mm x 500mm carbon rod solid

M2 x10mm screws (x1 20mm M2 screw optional)

1mm or 1.5mm piano wire

Braided fishing line (20lbs)



ASSEMBLY INSTRUCTIONS

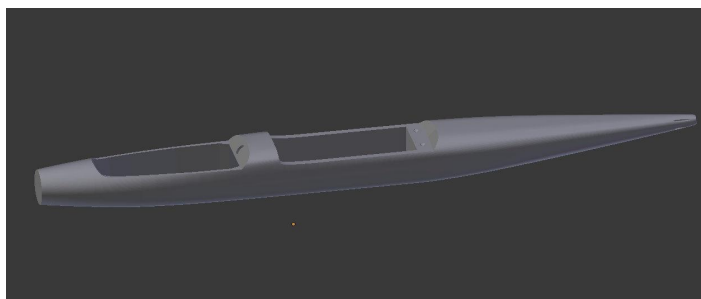
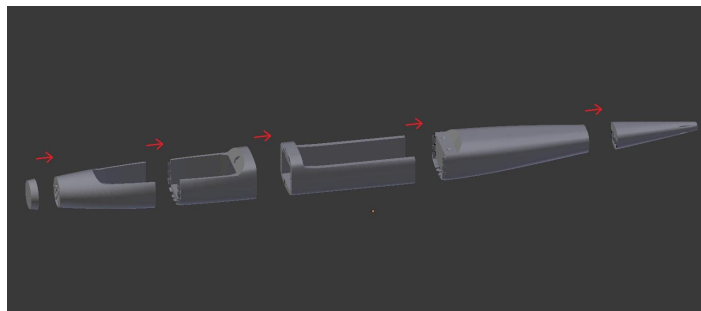
1

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. Fuse 3-4 and 4-5 are joined using 10mm lengths of food skewer.

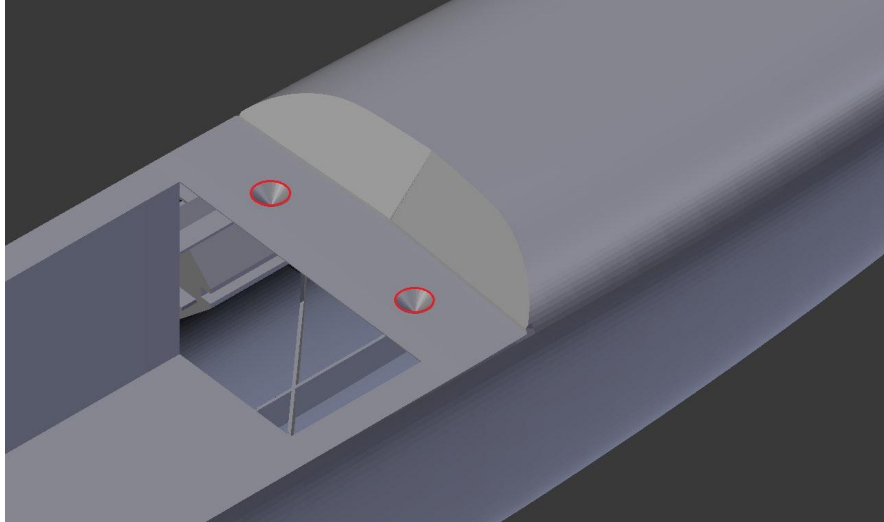
Glue sections of the fuselage together using CA glue. (see images)



3

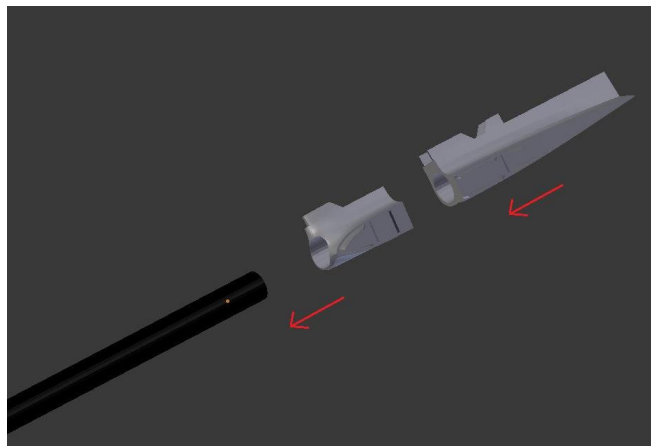
Using a soldering iron, melt small holes in fuse 6 where the nylon wing bolts will pass through.

The holes should be just big enough for the m6 nylon bolt to fit through. (marked in red)

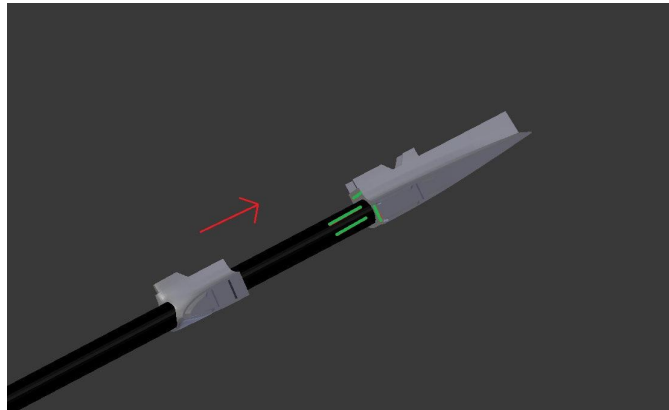


4 Assembling the V-tail

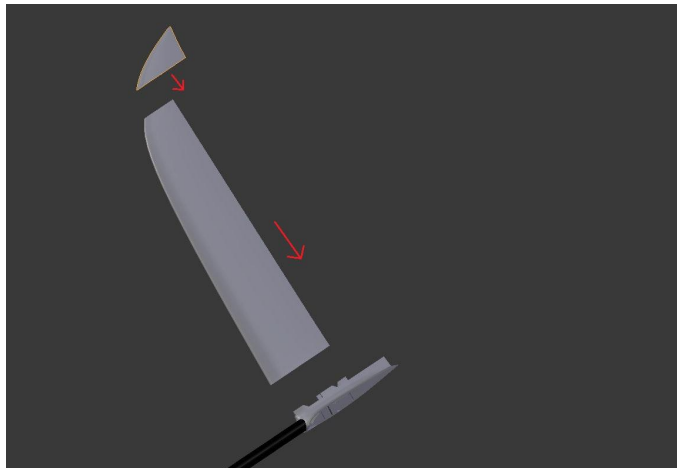
- Slide the center pieces of the v-tail over the 8mm carbon tube.



- Glue the rear section to the v-tail to the tube.
- Place glue (marked in green) and join the two sections of the v-tail together.

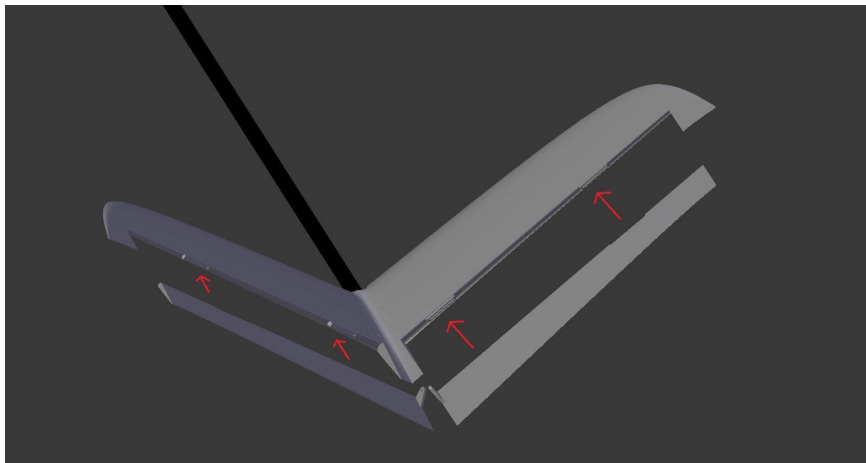


- Glue the stabilisers to the center pieces.
- Glue the tips to the stabilisers.



- Run a 1mm drill bit through the control horn of the elevator to make sure the fishing line will pass through easily.
- Test fit the hinges to the control surfaces and to the stabilisers before gluing.

Note - when gluing hinges, make sure all excess CA glue is removed. Any excess will cause the hinge to bind and be unusable.

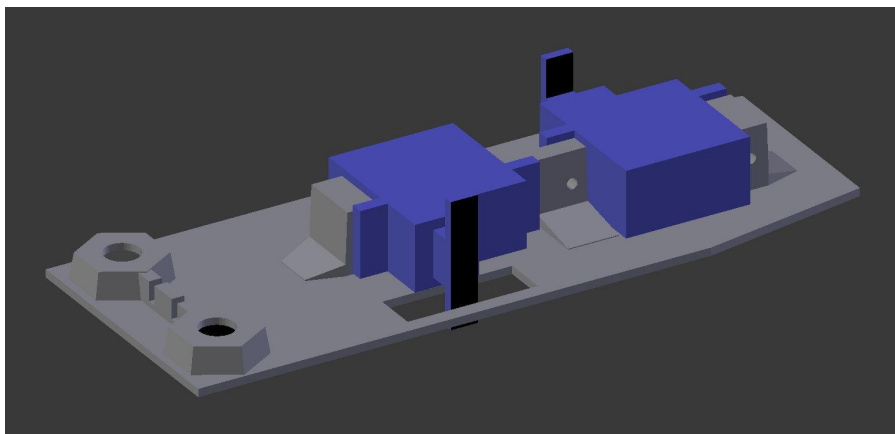


5 Assembling the servo tray

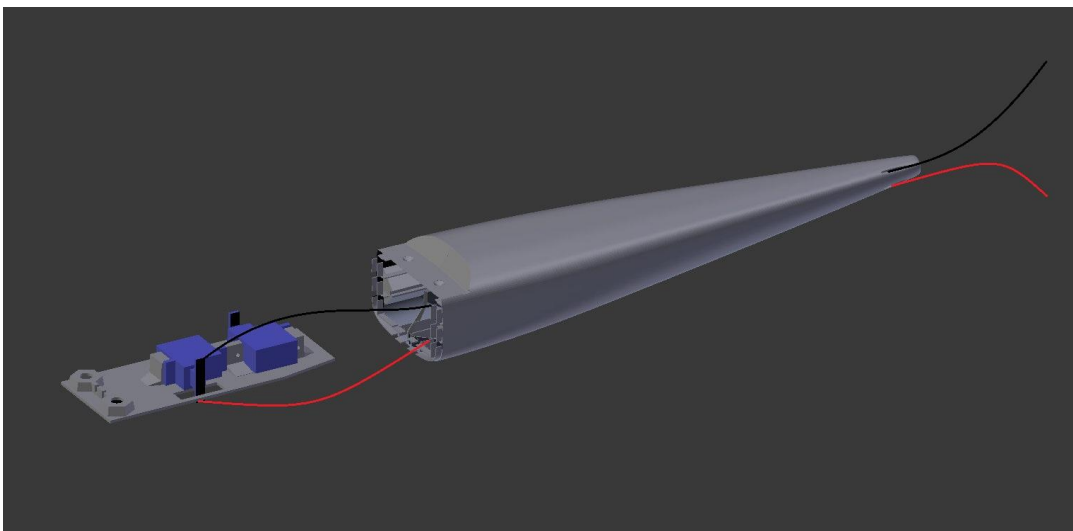
- Trim the servo arm down so that the fourth hole is the outermost hole.



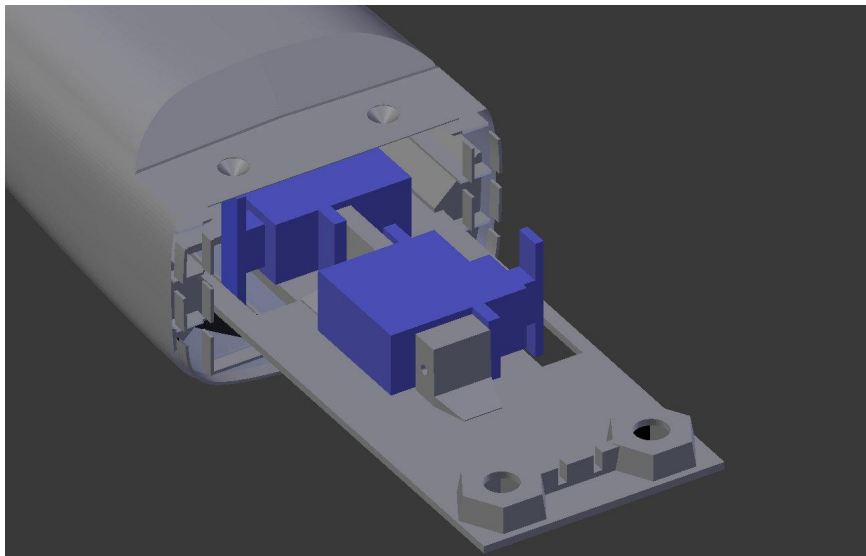
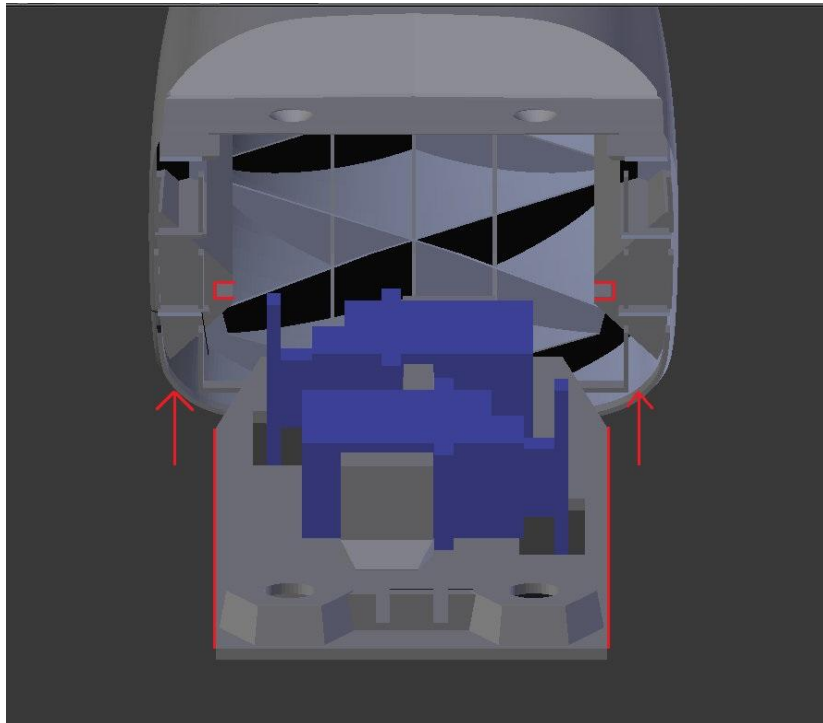
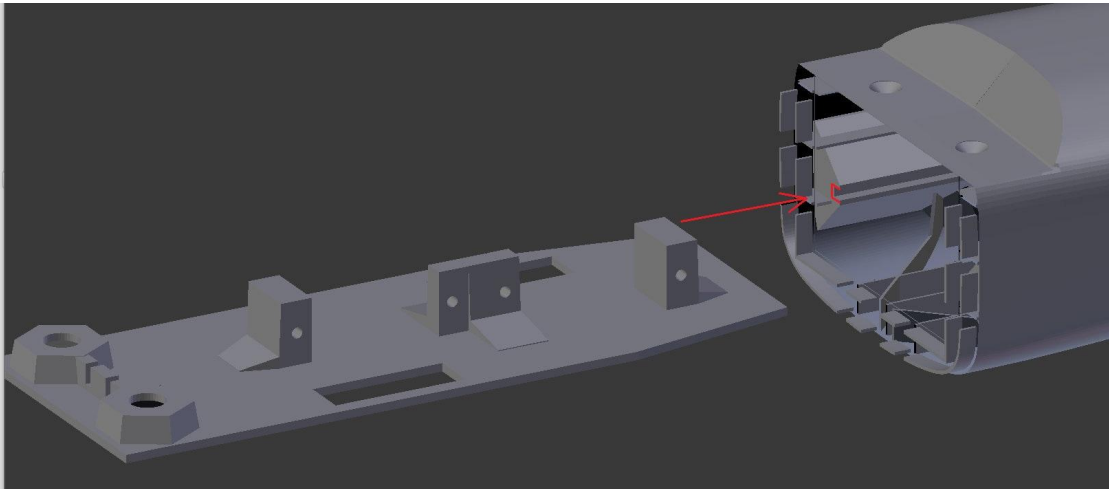
- Screw or hot glue the servos in place.



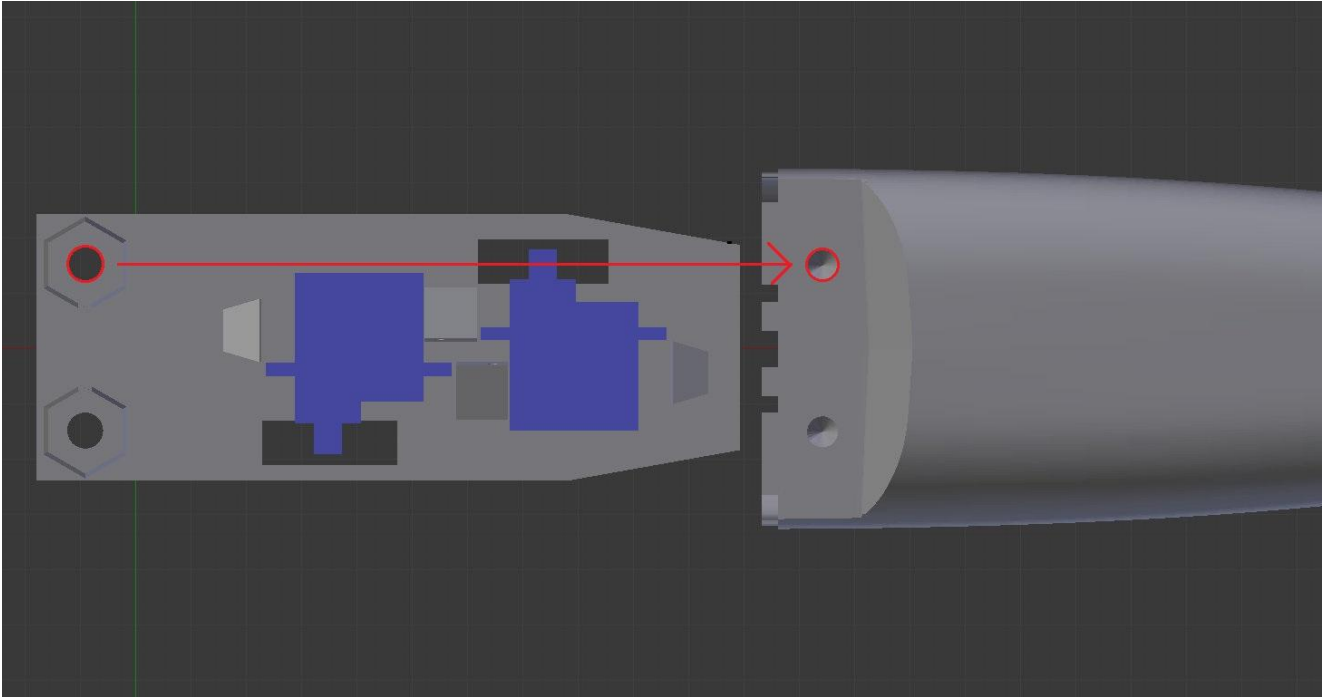
- Glue the m6 nylon nuts in their slots in the underside of the servo tray.
- Thread fishing line through the 4 holes at the rear of the tail and connect the ends to the servo arms for both servo's. Place a drop of CA on the knot to secure it. Be sure to leave plenty of excess to be attached to the elevators later on.



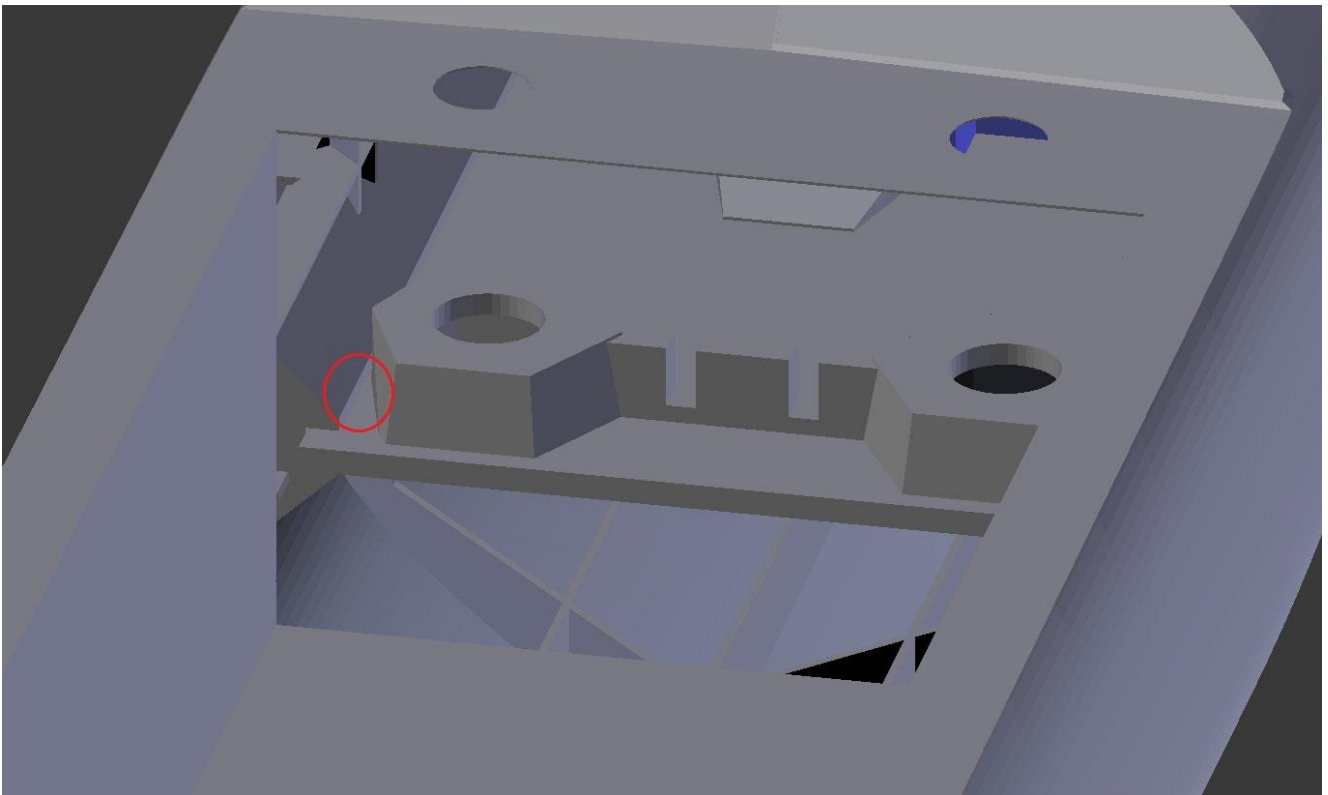
- Slide the servo tray into the aft section of the fuse along the rails. Be sure to keep some tension on the fishing line as you do this or the lines might jam in the rails.



- Align the servo tray with the holes in the aft section of the fuse.

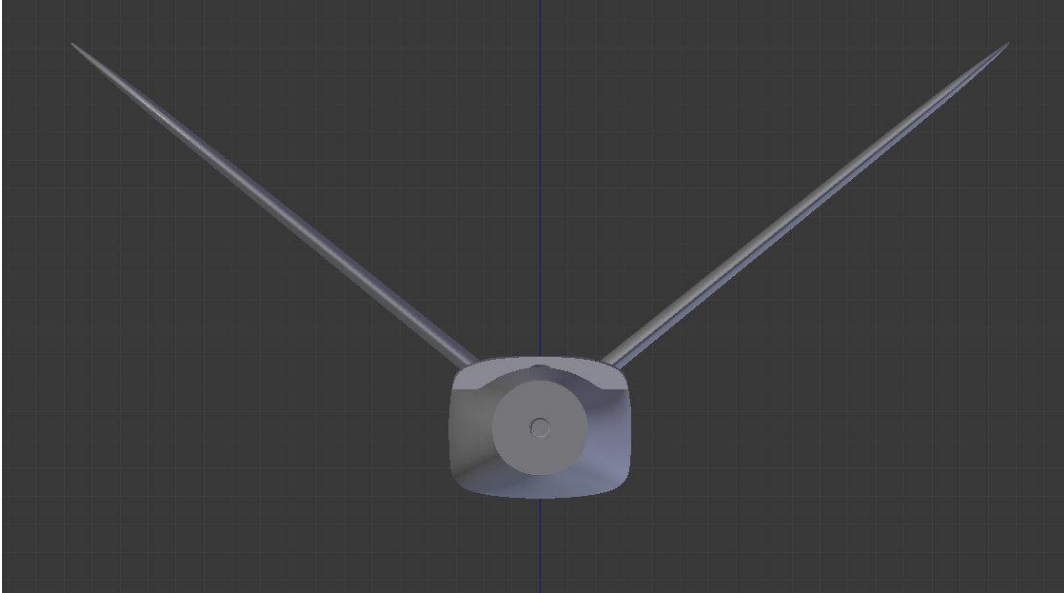


- Place a small bead of hot glue to both sides where the tray meets the rails. It is only needed to stop the tray from moving in flight. (circled in red)



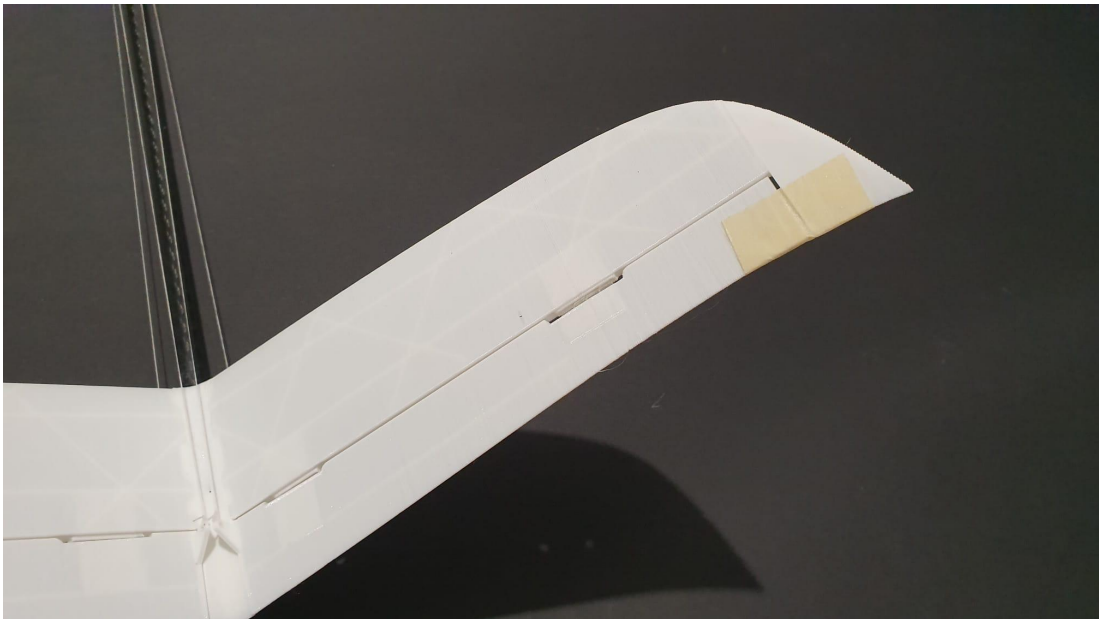
6

Install the tail boom to the rear of the fuse. There is an optional small hole in the aft of the fuse for a M2x20mm screw to secure the tail boom to the fuse, otherwise the tail boom can be glued in place. Be sure to confirm the v-tail is level with the fuse before fixing the tail in place.



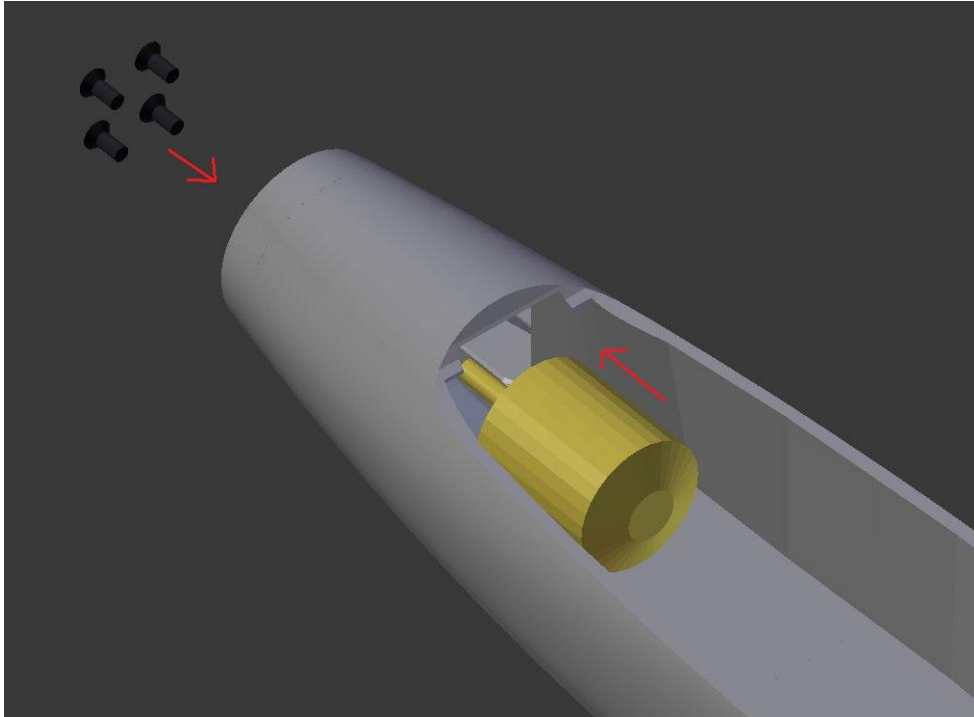
7

Place tape at the end of each elevator to hold it level while connecting the fishing line to the elevator. It is advised that the servo's be centered and programmed before connecting the control lines. Place a drop of CA on the knot to secure it. The knot should be firm and not overly tight, if it is too tight you risk adjusting the angle of the tail-plane which could lead to adverse flying characteristics.



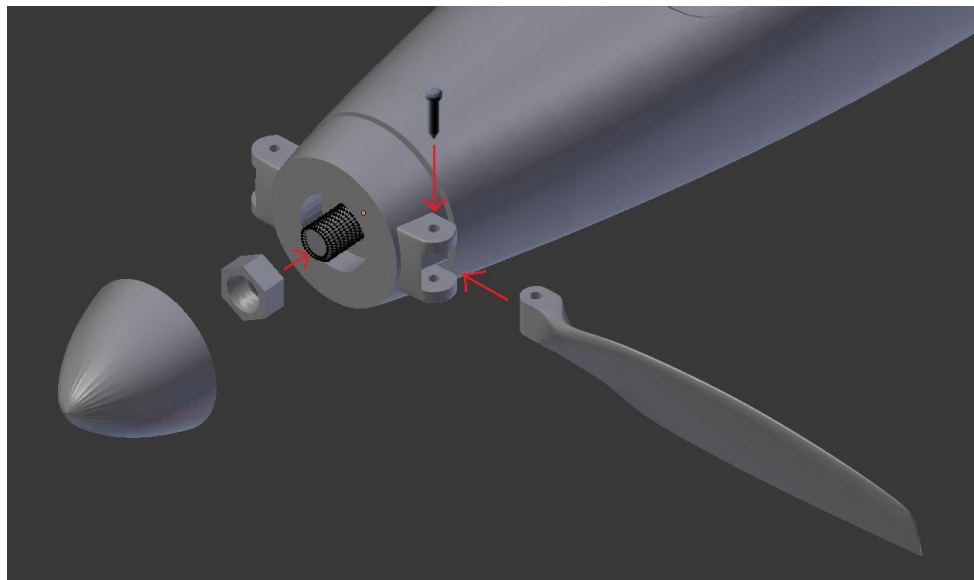
8

Install the motor and esc. Depending on the motor, the shaft position may need to be adjusted. Be careful not to bend the shaft if this is required!



9

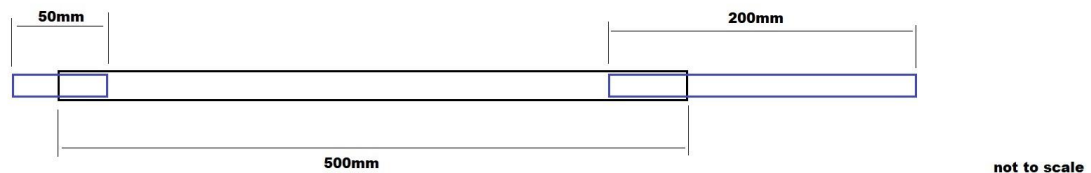
Fit the propeller blades to the hub and secure the hub to the motor.



The spinner is designed with an m6 thread and will screw on to most 28 sized motor adapters.

10 Assembling the wings

- Run an 8mm drill bit in reverse through the spar tubes of wing sections 1,2,3 and 4 to free up any small over-extrusions during printing.
- Cut 10mm sections of food skewer to align the wing sections during gluing. (you might need to reverse a 3mm drill bit into the hole if the skewer does not fit easily)
- Cut two 50mm lengths of 6mm carbon rod, glue one in each of the wing spars with 25mm protruding from the end. Round the exposed end so the next tube slides easily over it.
- Cut the remaining 400mm of 6mm carbon rod in half and test fit it to the other end of the same carbon tubes.
- Glue sections 5, 6 and 7 together and test fit the carbon tube assembly to make sure the 6mm carbon rod reaches the end of the tube in the wing. Mark where the rod enters the 8mm tube.
- Glue the 6mm rod into the 8mm tube with the marking recessed into the tube by 1-2mm. Round the exposed end so the next tube slides easily over it.
- Glue the remaining wing sections 1,2,3, and 4 to the outer section of the wing.
- Insert the carbon tube assembly into the wing and make sure the tube assembly reaches the end of the slot in section 6.



- Join the wings using the third (middle spar) 8mm tube in the wings and measure the required length to be cut from the third tube.
- Cut the third tube to length and test fit by joining the wings. If the previous steps were performed correctly, the length of the third tube should be about 285mm

11

Run a 1mm drill bit through the aileron control horn then glue the aileron in place.

12

Install the aileron servo to the aileron cover and screw the aileron cover to the wing using short m2 screws (less than 6mm).

13

Test fit the nylon wing bolts and cut them to length (roughly 30mm).

NOTE - When installing the wing bolts, do not over tighten them. They only need to be firm.

BALANCING AND CG

Fit the battery using Velcro as required and balance the aircraft inverted on the CG marking points located **51mm 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:

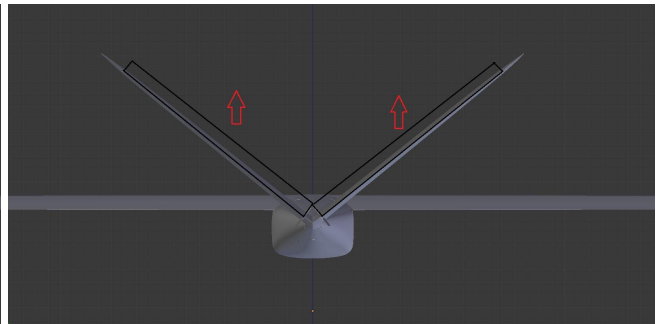
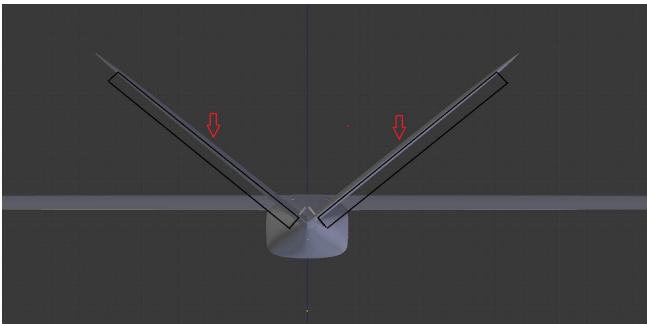
Elevator/rudder +/- 8mm

Aileron +/- 15mm

V-TAIL CONTROL DEFLECTION:

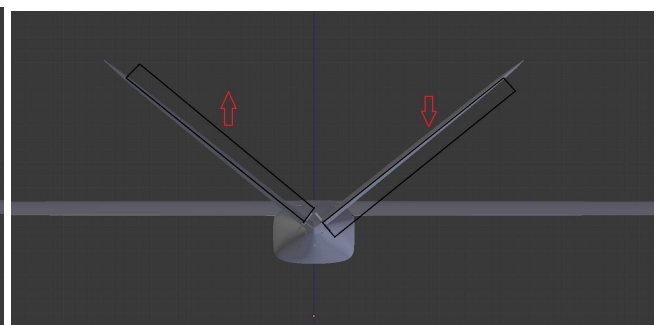
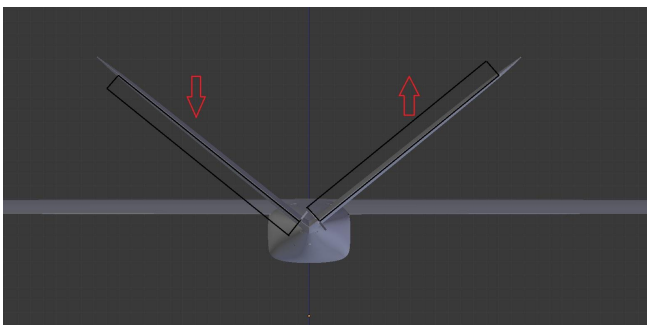
ALL IMAGES ARE VIEWED FROM THE REAR OF THE AIRCRAFT

_____DOWN ELEVATOR_____UP ELEVATOR



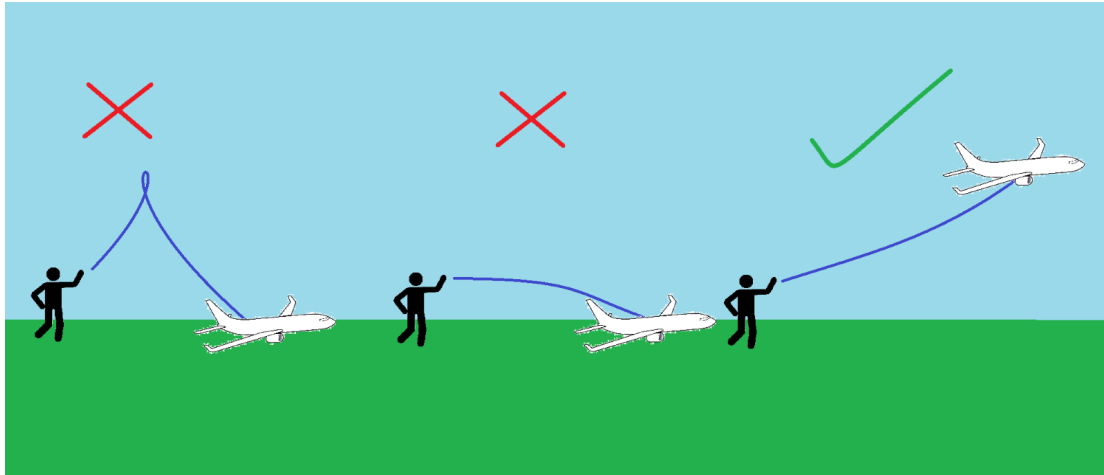
_____LEFT RUDDER

RIGHT RUDDER



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:

2836 1500KV

https://de.aliexpress.com/item/4000467084027.html?spm=a2g0o.productlist.0.0.50a15d656lneyt&algo_pvid=9ade1609-f086-435a-9d02-562ffa9b6759&algo_exp_id=9ade1609-f086-435a-9d02-562ffa9b6759-0

40AMP ESC

https://de.aliexpress.com/item/32725855320.html?spm=a2g0o.productlist.0.0.12dd1f0cEgb4SA&algo_pvid=1202b8d4-4da8-47ed-92a0-b4fcbb99730e&algo_exp_id=1202b8d4-4da8-47ed-92a0-b4fcbb99730e-10

2200mah 3s LIPO

https://de.aliexpress.com/item/32833411481.html?spm=a2g0o.productlist.0.0.64ef480aYCzI2n&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_

10G SLIM WING SERVO

<https://de.aliexpress.com/item/4001119653424.html?spm=a2g0s.9042311.0.0.42a54c4dM9oDXn>

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_

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_

VELCRO – (local hardware store)

8mm x 500mm CARBON TWILL TUBE

https://de.aliexpress.com/item/4000407024494.html?spm=a2g0o.productlist.0.0.32df5b46n32vY9&algo_pvid=69139a75-2a6a-4251-88d0-f62f90858532&algo_exp_id=69139a75-2a6a-4251-88d0-f62f90858532-0

M2 SCREWS (PAN HEAD)

https://de.aliexpress.com/item/1005001706301780.html?spm=a2g0o.detail.1000060.3.5292252bbHpjfk&gps-id=pcDetailBottomMoreThisSeller&scm=1007.13339.169870.0&scm_id=1007.13339.169870.0&scm-url=1007.13339.169870.0&pvid=1aee377b-969f-4c74-820e-036608804b82&t=gps-id:pcDetailBottomMoreThisSeller,scm-url:1007.13339.169870.0,pvid:1aee377b-969f-4c74-820e-036608804b82.tpp_buckets:668%230%23131923%2380_668%230%23131923%2380_668%23888%233325%238_668%23888%233325%238_668%232846%238109%231935_668%235811%2327189%2390_668%236421%2330829%23723_668%232717%237567%23902_668%231000022185%231000066058%230_668%236808%2332777%23804_668%233468%2315614%23539_668%232846%238109%231935_668%235811%2327189%2390_668%236421%2330829%23723_668%232717%237567%23902_668%233164%239976%23266_668%236808%2332777%23804_668%233468%2315614%23539&&pdp_ext_f=%7B%22sceneId%22:%223339%22%7D

PIANO WIRE 1mm

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

BRAIDED FISHING WIRE (20lbs)

https://de.aliexpress.com/item/33018161006.html?spm=a2g0o.productlist.0.0.ba8f548fOuMxn0&algo_pvid=af1af9a3-d15a-4b88-b305-62a04c76b5ad&algo_exp_id=af1af9a3-d15a-4b88-b305-62a04c76b5ad-2

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

Aeroworks3d@outlook.com