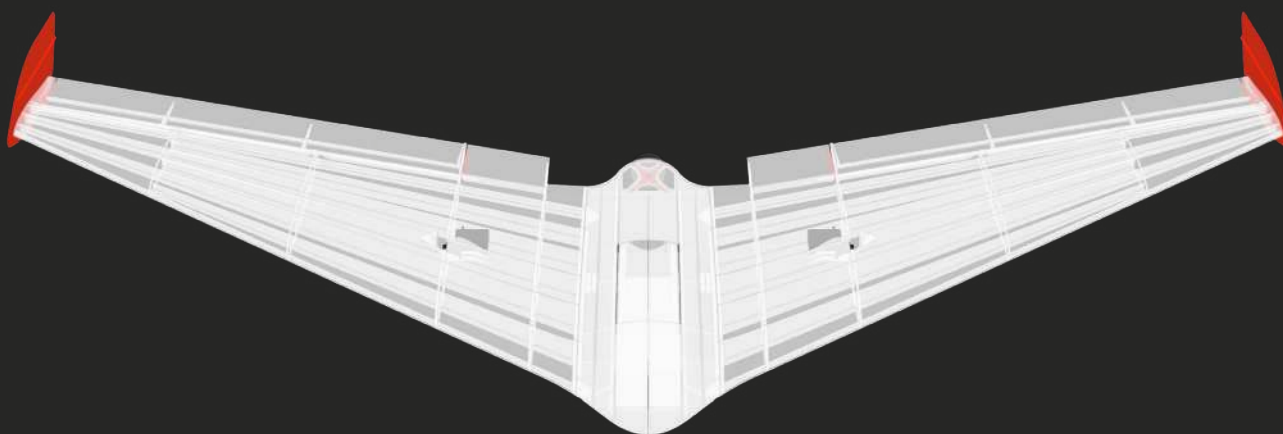


AVION
airplanes



DUCK
user manual

What you need

Filament	PLA LW / POLYLIGHT 1.0 PLA	
Hardware	<div> <div> <div>ø1x285mm carbon rod (fuselage)</div> <div>2x</div> </div> <div> <div>ø1x571mm carbon rod (wing front)</div> <div>2x</div> </div> <div> <div>ø1x487mm carbon rod (wing back)</div> <div>2x</div> </div> <div> <div>ø1x361mm carbon rod (elevons)</div> <div>2x</div> </div> <div> <div>ø2x385mm carbon rod (elevons axles)</div> <div>2x</div> </div> <div> <div>Steel wire, carbon rod or clevis (pushrods)</div> <div></div> </div> <div> <div>Snap-off knife</div> <div></div> </div> <div> <div>CA glue</div> <div></div> </div> <div> <div>Activator</div> <div></div> </div> </div>	
Motor	HGLRC Aeolus 2004 1800Kv (my setup) or similar 20XX size motor	1x
ESC	iFlight Succex-E Slick 45A (my setup) or similar (with or without BEC)	1x
BEC	iFlight Micro 5V 3A (my setup) external BEC is optional	1x
Servos	Corona DS-843MG (my setup, recommended)	2x
Propeller	HQPROP T5X3 (my setup) or similar 5" or 6"	1x
Main bat.	CNHL Ministar 450mAh 6S 70C (my setup) or 40x18x72mm (max. size for main battery)	1x
RX bat.	Turnigy Nano-Tech 460mAh 2S (my setup) RX battery is optional	1x
RC	at least 3 channel RC system (elevon mix)	



Possible to print with Prusa Slicer 2.4.0 and Cura.

Profiles



Prusa Slicer
2.4.0

Use 3MF files as starting point to find sweet spot with your printer.



Cura
4.13.0

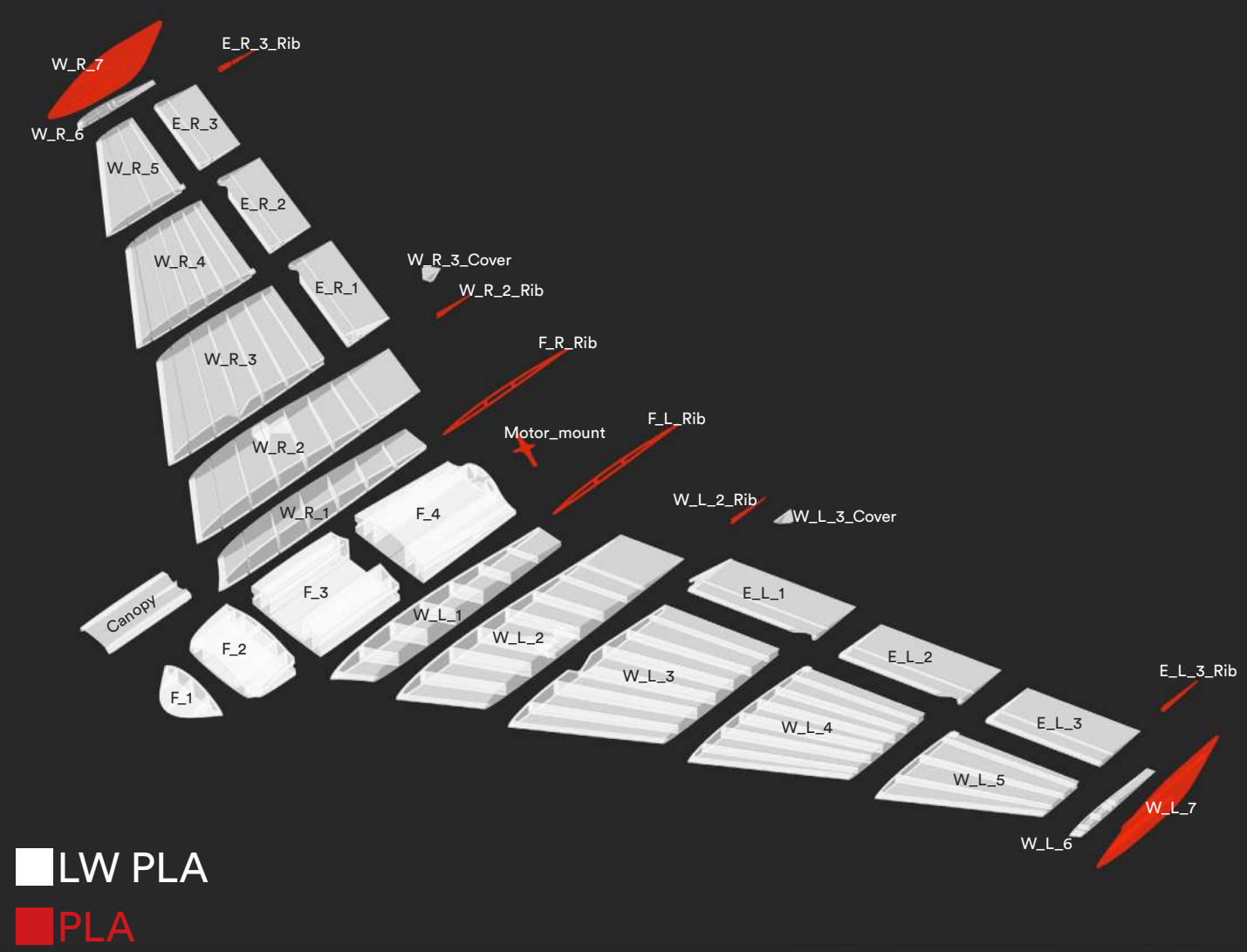
Use included Cura profiles as starting point to find sweet spot with your printer.

Before printing big parts make sure, that everything will fit perfectly (carbon rods etc.)

Model specifications

Wingspan	1000mm
Length	518mm
Print weight	approx 279g
Takeoff weight	approx 484g
Wing area	21,5 dm ²
Wing load	22,5 g/dm ²

Printed parts



Parts list

Fuselage

F_1	3,48g
F_2	14,56g
F_3	25,29g
F_4	25,26g
Canopy	4,95g
Motor_mount	0,99g
F_L_Rib	1,42g
F_R_Rib	1,42g

Wing LEFT

W_L_1	9,09g
W_L_2	18,88g
W_L_2_Rib	0,49g
W_L_3	21,41g
W_L_3_Cover	0,14g
W_L_4	16,69g
W_L_5	9,35g
W_L_6	0,88g
W_L_7	7,39g

Elevon LEFT

E_L_1	5,91g
E_L_2	5,48g
E_L_3	5,18g
E_L_3_Rib	0,56g

Wing RIGHT

W_R_1	9,09g
W_R_2	18,88g
W_R_2_Rib	0,49g
W_R_3	21,41g
W_R_3_Cover	0,14g
W_R_4	16,69g
W_R_5	9,35g
W_R_6	0,88g
W_R_7	7,39g

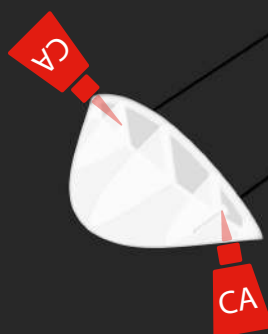
Elevon RIGHT

E_R_1	5,91g
E_R_2	5,48g
E_R_3	5,18g
E_R_3_Rib	0,56g

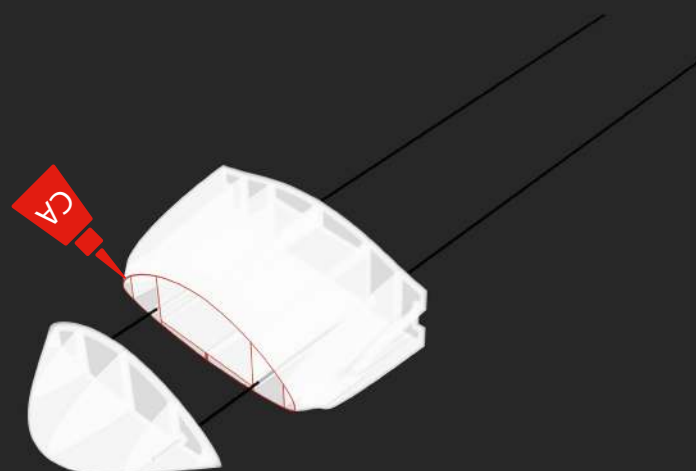
Fuselage assembly

You will need F_1, F_2, F_3, F_4, F_L_Rib, F_R_Rib, Motor_mount, CA glue, Activator, Snap-off knife, $\varnothing 1 \times 285 \text{mm}$ carbon rod 2x

1. Glue $\varnothing 1 \times 285 \text{mm}$ carbon rod 2x with medium CA glue into F_1 part. If you have problem with printing very end of the F_1 part, use putty to fill imperfections.

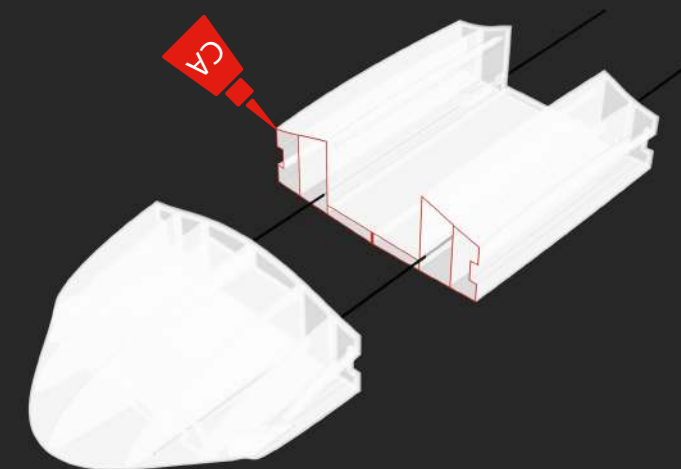


2. Glue F_1 and F_2 with medium CA.

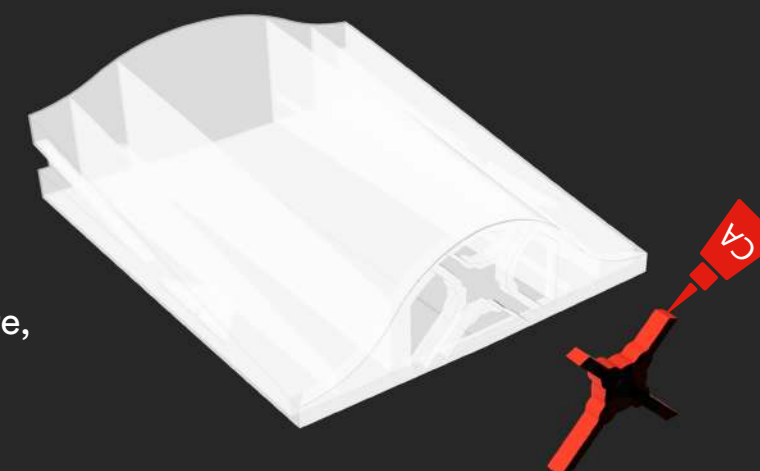


Fuselage assembly

3. Glue F_2 and F_3 with medium CA.

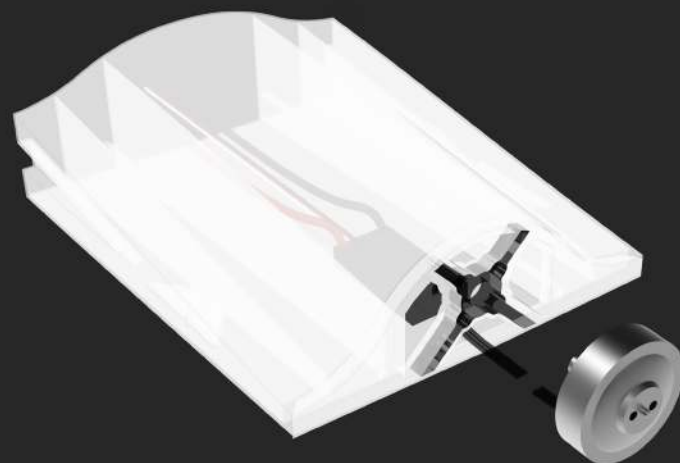


4. Glue Motor_mount and F_4 together with medium CA. Before applying CA glue make sure, that parts fits together easily.

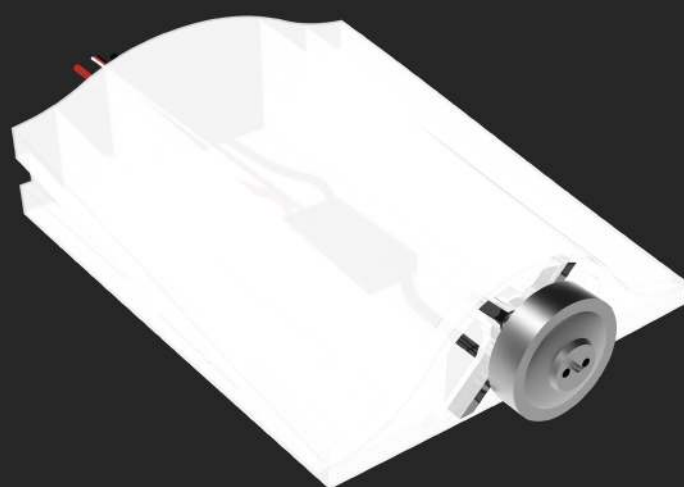


Fuselage assembly

5.
Prepare your **Motor** and **ESC**.
Before soldering Motor and ESC
together make sure, that all
cables has necessary length.

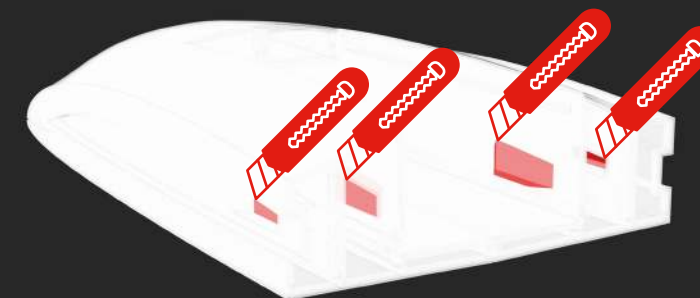
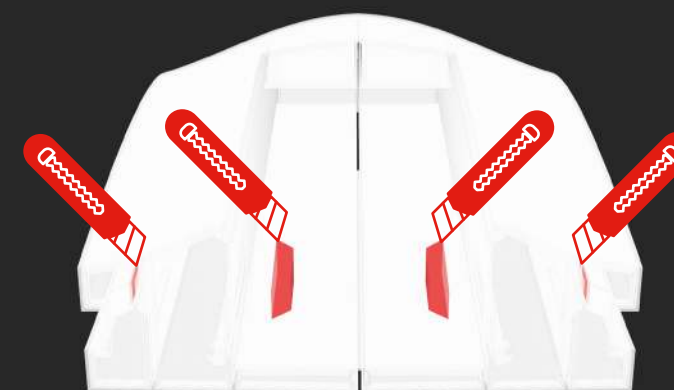


6.
Install **Motor** and secure **ESC**.



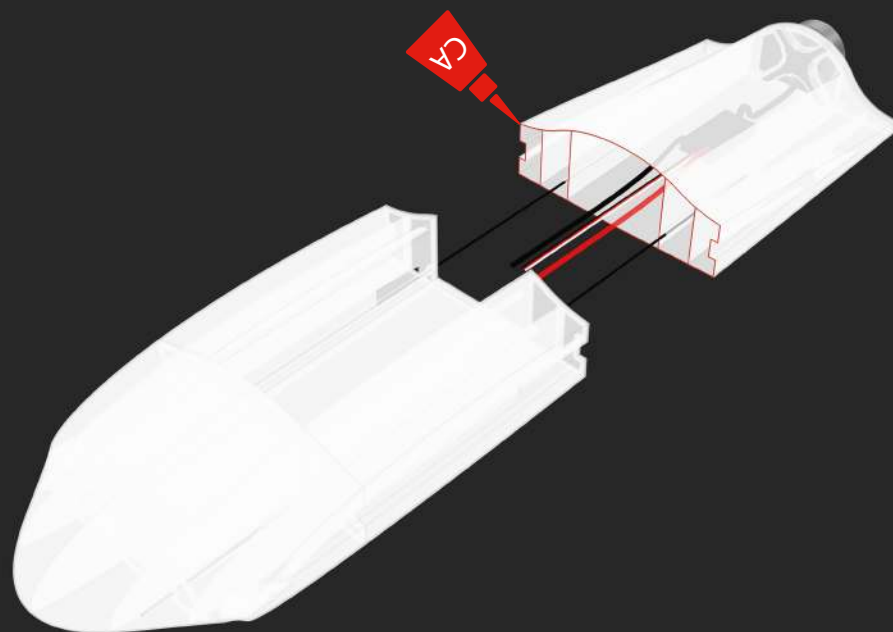
Fuselage assembly

7.
Cut or drill **4x hole** for
servocables into
F_3 part. Inner parts cut
completely off.

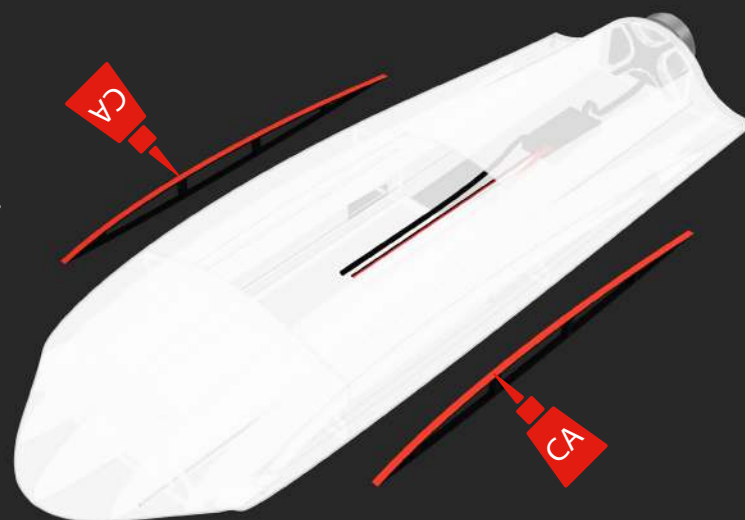


Fuselage assembly

8.
Glue **F_3** and **F_4**
with medium CA.



9.
Glue **F_L_Rib** and **F_R_Rib**
with medium CA into fuselage.



Fuselage assembly

10.
Fuselage is done.

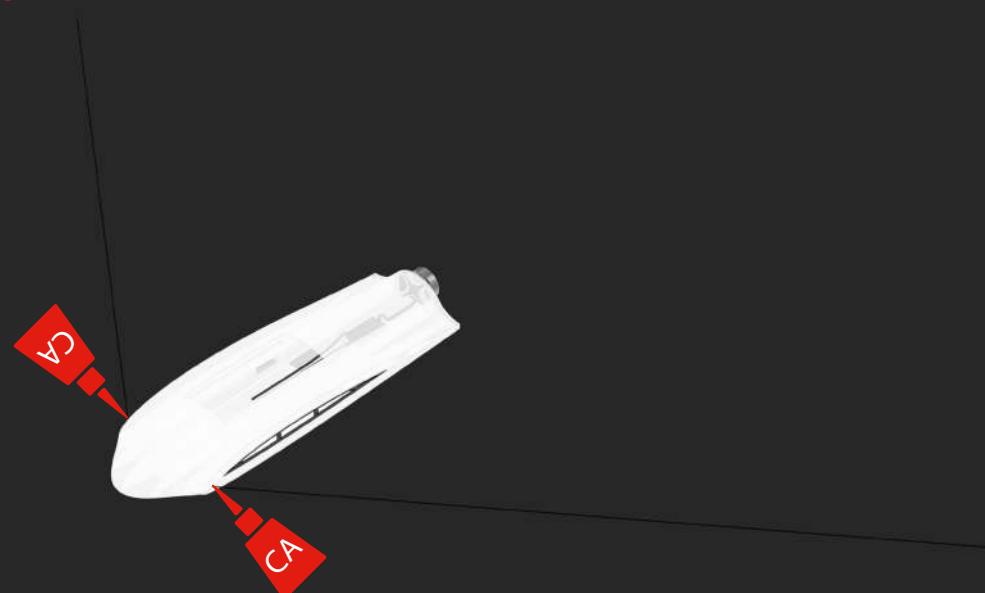


Wings assembly

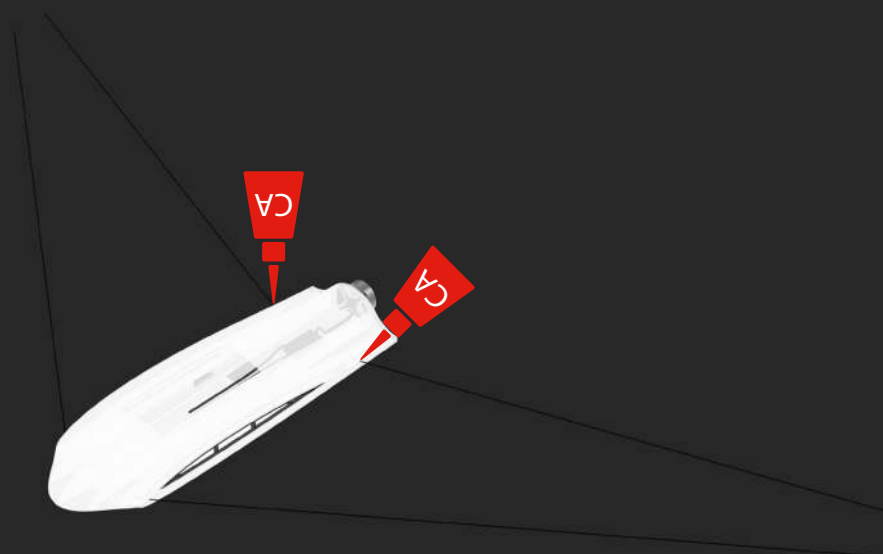
You will need

W_L_1, W_L_2, W_L_3, W_L_3_Cover, W_L_4, W_L_5,
W_L_6, W_L_7, W_L_2_Rib
W_R_1, W_R_2, W_R_3, W_R_3_Cover, W_R_4, W_R_5,
W_R_6, W_R_7, W_R_2_Rib
ø1×571mm carbon rod 2x (wing front)
ø1×487mm carbon rod 2x (wing back)
CA glue, Activator

1.
Glue ø1×571mm
carbon rod 2x
with medium CA
glue into F_2 part.
Make sure, that
parts W_L_1 and
W_R_1 will fit
correctly.

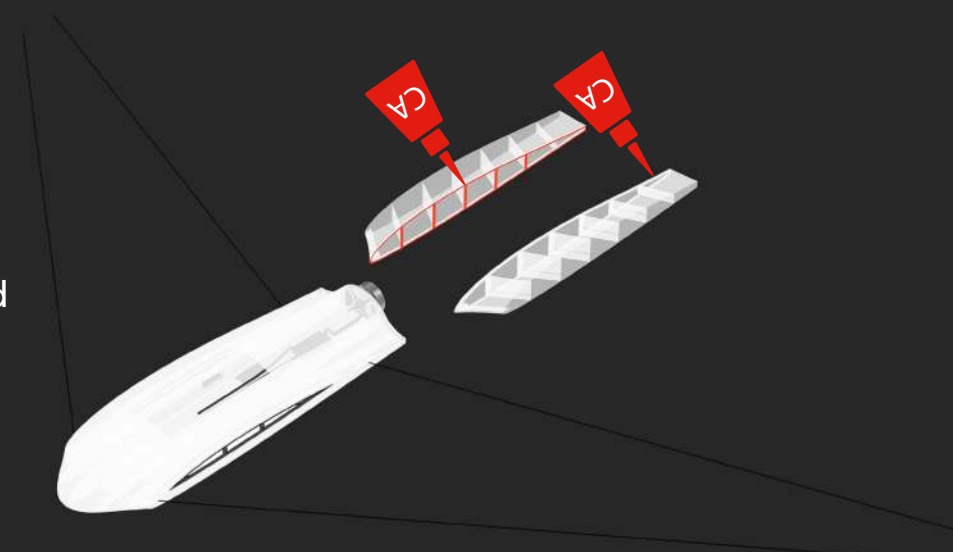


2.
Glue ø1×487mm
carbon rod 2x
with medium CA
glue into F_4 part.
Make sure, that
parts W_L_1 and
W_R_1 will fit
correctly.

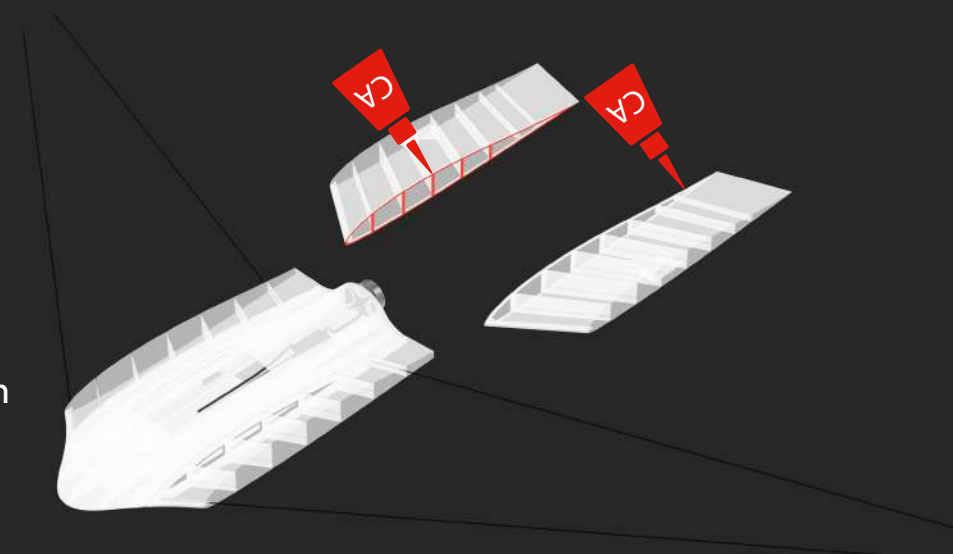


Wings assembly

3.
Glue parts W_L_1 and
W_R_1 to the fuselage.
Apply medium CA glue on
wing parts (or fuselage) and
then slide them on the car-
bon rods all the way to the
fuselage.

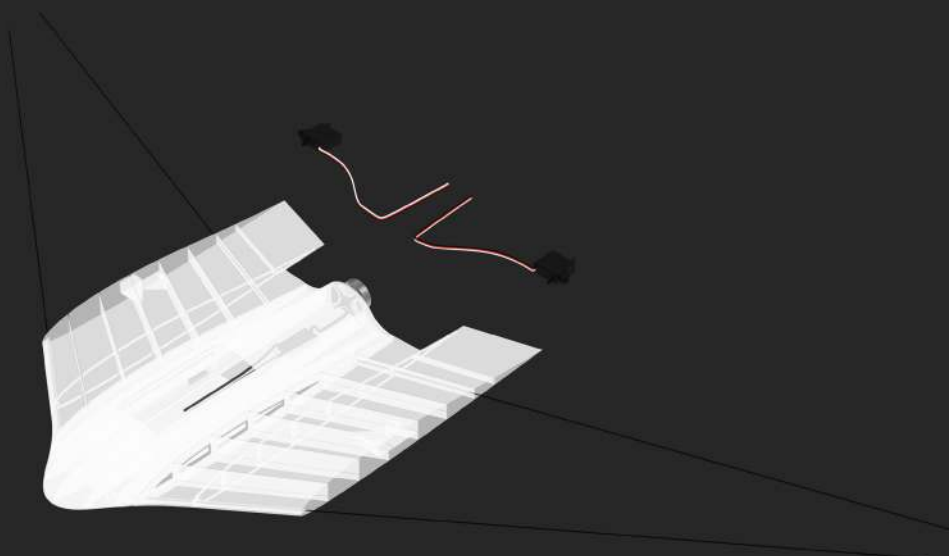


4.
Glue parts W_L_2 and
W_R_2 to the W_L_1 and
W_R_1. Apply medium CA
glue on wing parts and then
slide them on the carbon
rods all the way to the
previous part of the wing.

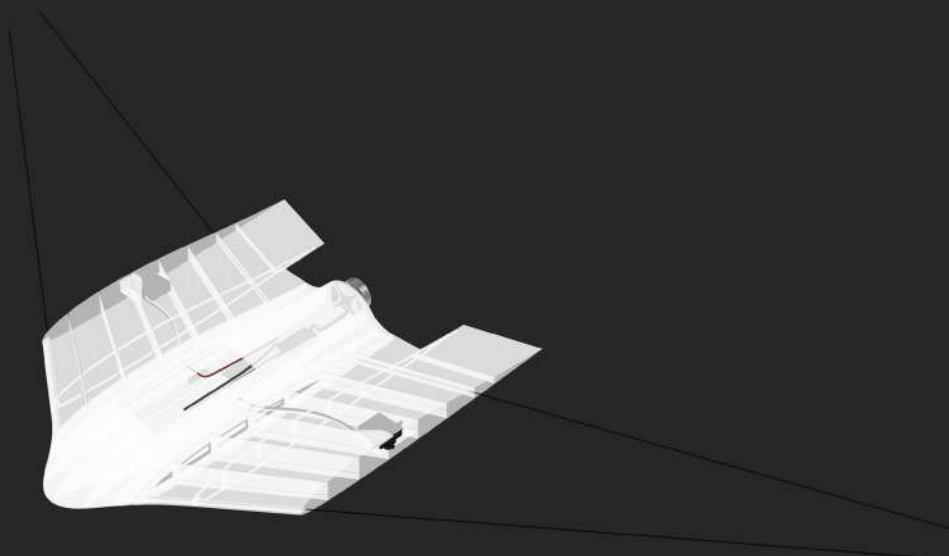


Wings assembly

- 5.**
Prepare **Corona DS-843MG** servos and make sure, that servo cables has necessary length.



- 6.**
Install servos into **W_L_2** and **W_R_2** parts with original screws. Servo horns must be installed before gluing next parts of the wing!

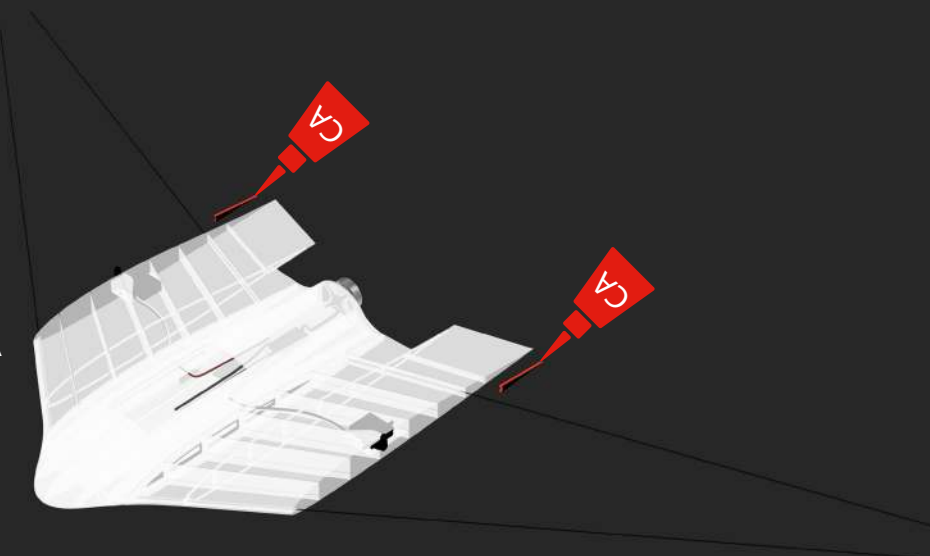


Wings assembly

- 7.**
Servo and servo horn position.

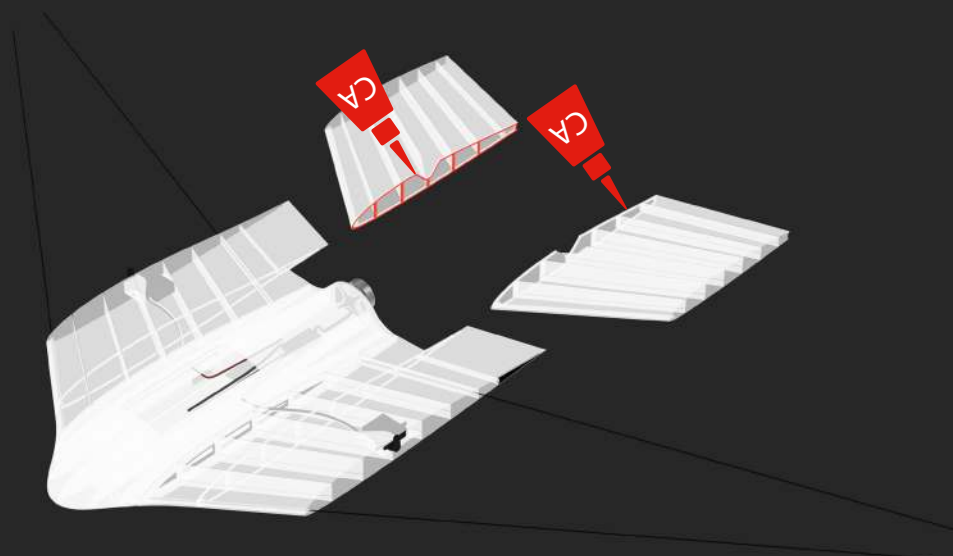


- 8.**
Glue parts **W_L_2_Rib** and **W_R_2_Rib** to the **W_L_2** and **W_R_2** with medium CA glue.

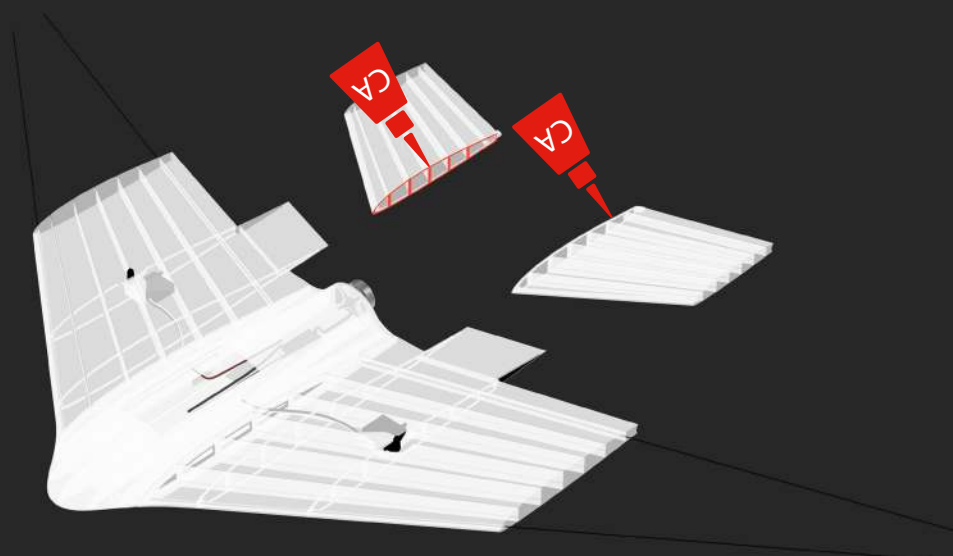


Wings assembly

9.
Glue parts **W_L_3** and **W_R_3** to the **W_L_2** and **W_R_2**. Apply medium CA glue on wing parts and then slide them on the carbon rods all the way to the previous part of the wing.

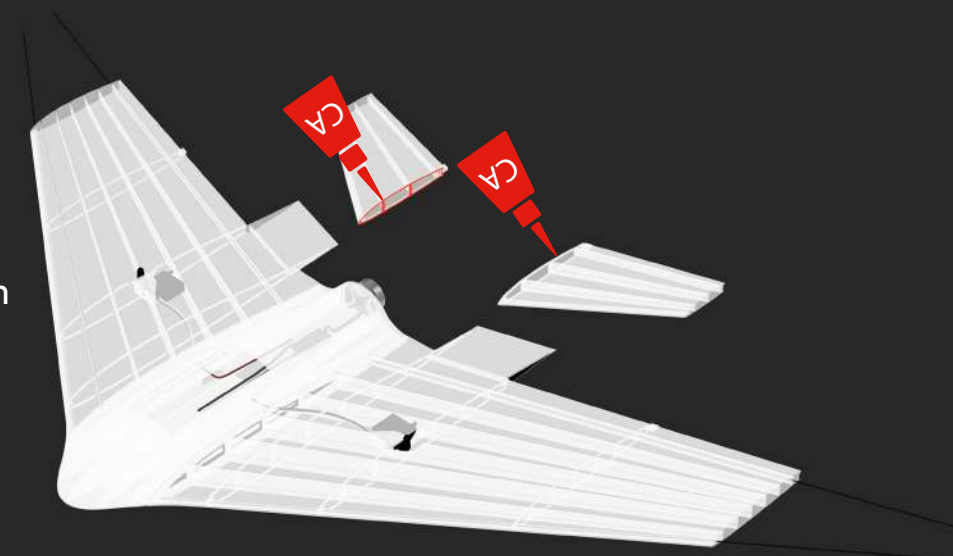


10.
Glue parts **W_L_4** and **W_R_4** to the **W_L_3** and **W_R_3**. Apply medium CA glue on wing parts and then slide them on the carbon rods all the way to the previous part of the wing.

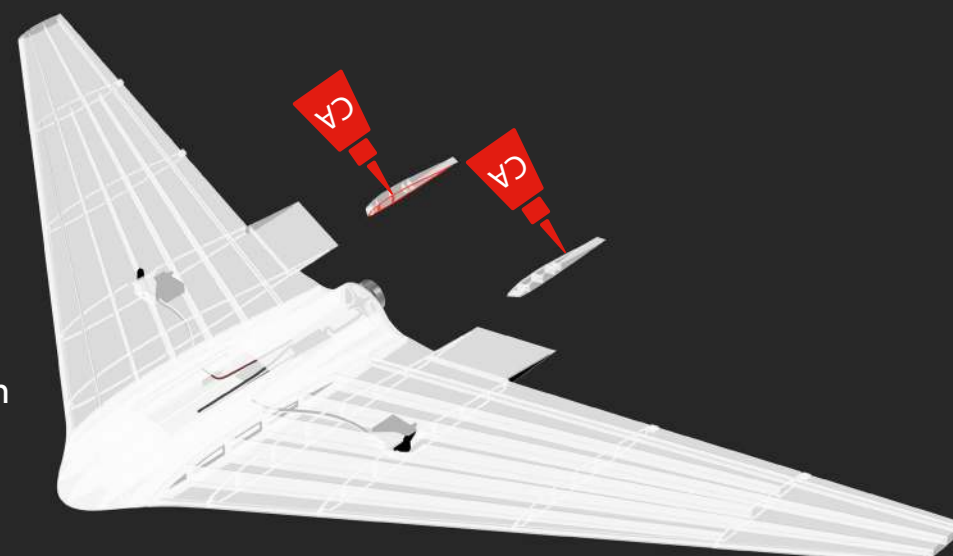


Wings assembly

11.
Glue parts **W_L_5** and **W_R_5** to the **W_L_4** and **W_R_4**. Apply medium CA glue on wing parts and then slide them on the carbon rods all the way to the previous part of the wing.

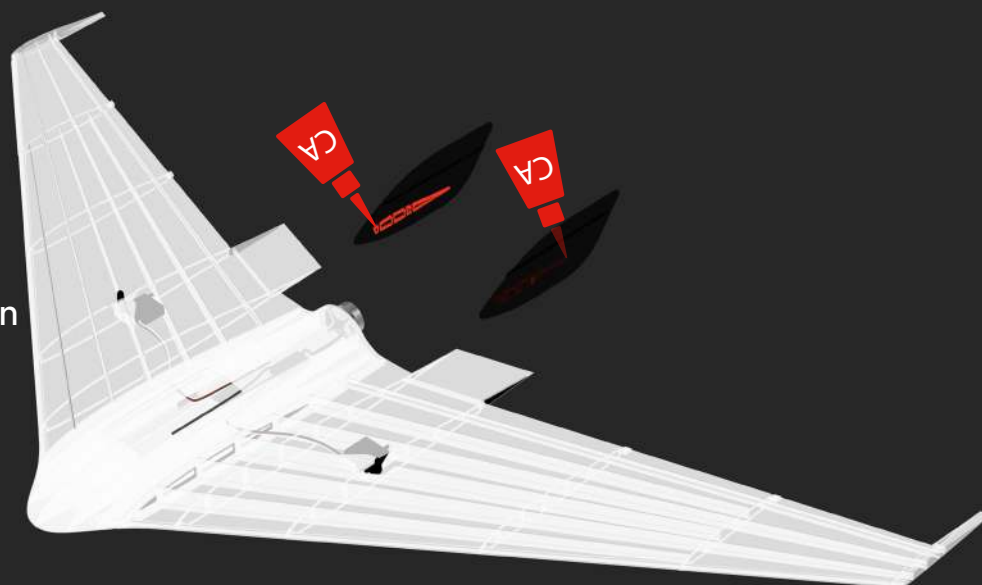


12.
Glue parts **W_L_6** and **W_R_6** to the **W_L_5** and **W_R_5**. Apply medium CA glue on wing parts and then slide them on the carbon rods all the way to the previous part of the wing.

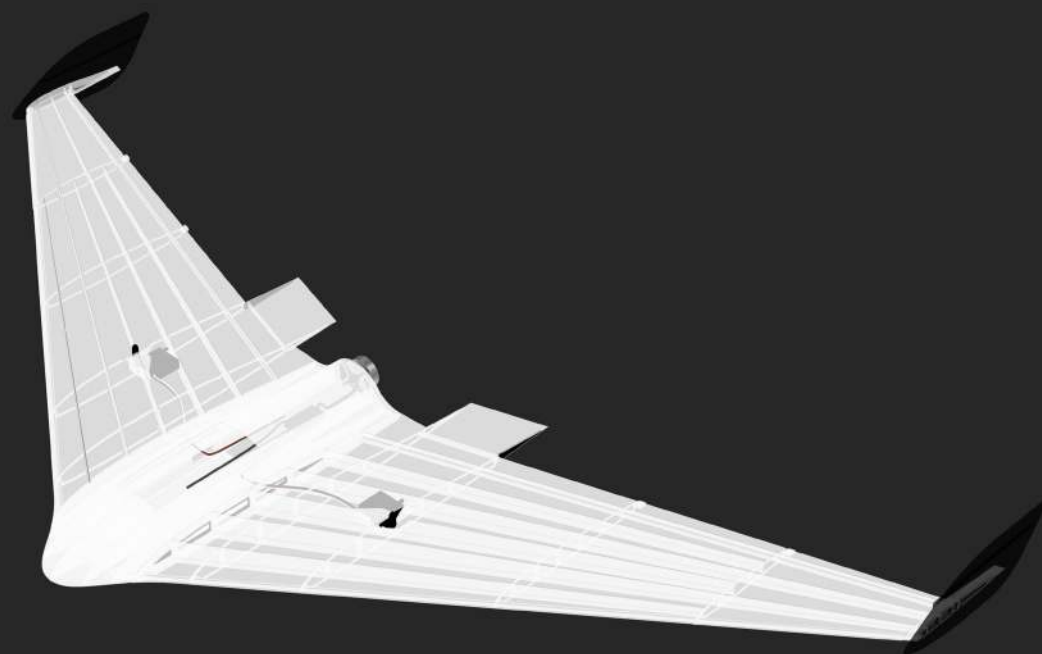


Wings assembly

- 13.**
Glue parts **W_L_7** and **W_R_7** to the **W_L_6** and **W_R_6**. Apply medium CA glue on wing parts and then slide them together.



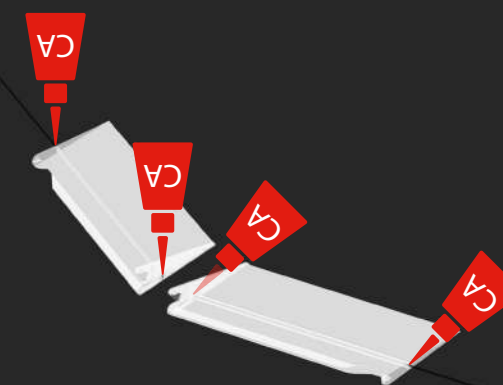
- 14.**
Wings are done.



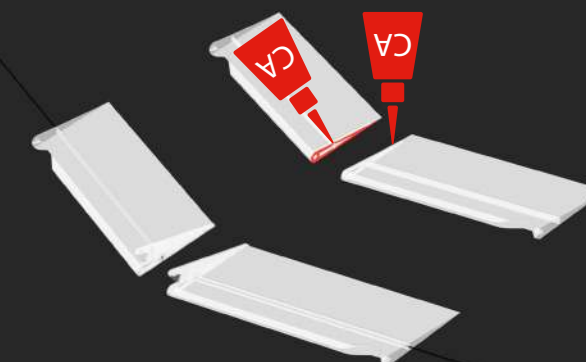
Elevons assembly

You will need **E_L_1, E_L_2, E_L_3, E_L_3_Rib, E_R_1, E_R_2, E_R_3, E_R_3_Rib, ø1×361mm carbon rod 2x (elevons)**

- 1.**
Glue **ø1×361mm carbon rod 2x** with medium CA glue into **E_L_1** and **E_R_1** part.

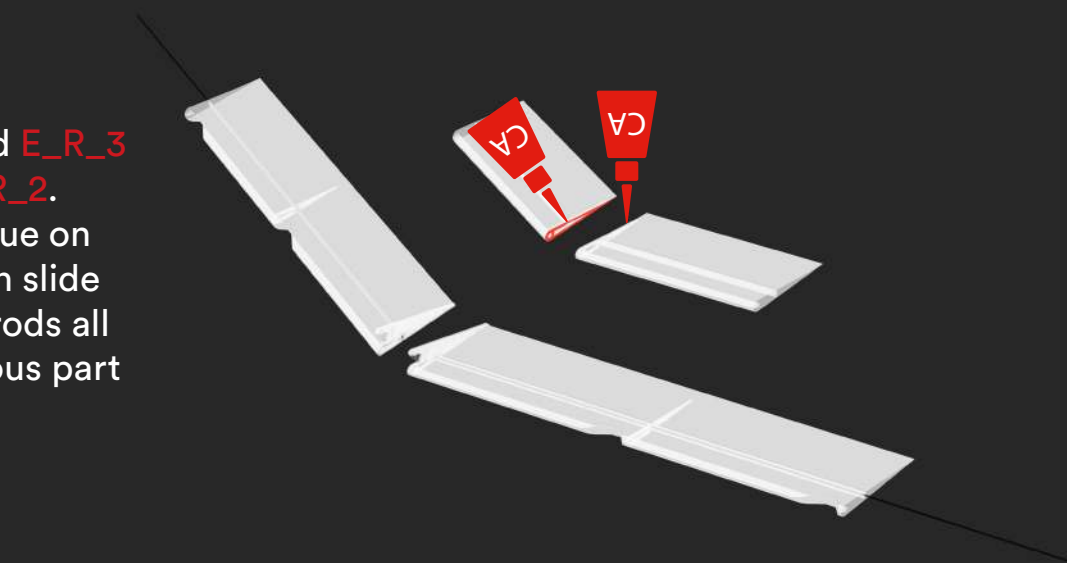


- 2.**
Glue parts **E_L_2** and **E_R_2** to the **E_L_1** and **E_R_1**. Apply medium CA glue on elevon parts and then slide them on the carbon rods all the way to the previous part of the elevon.

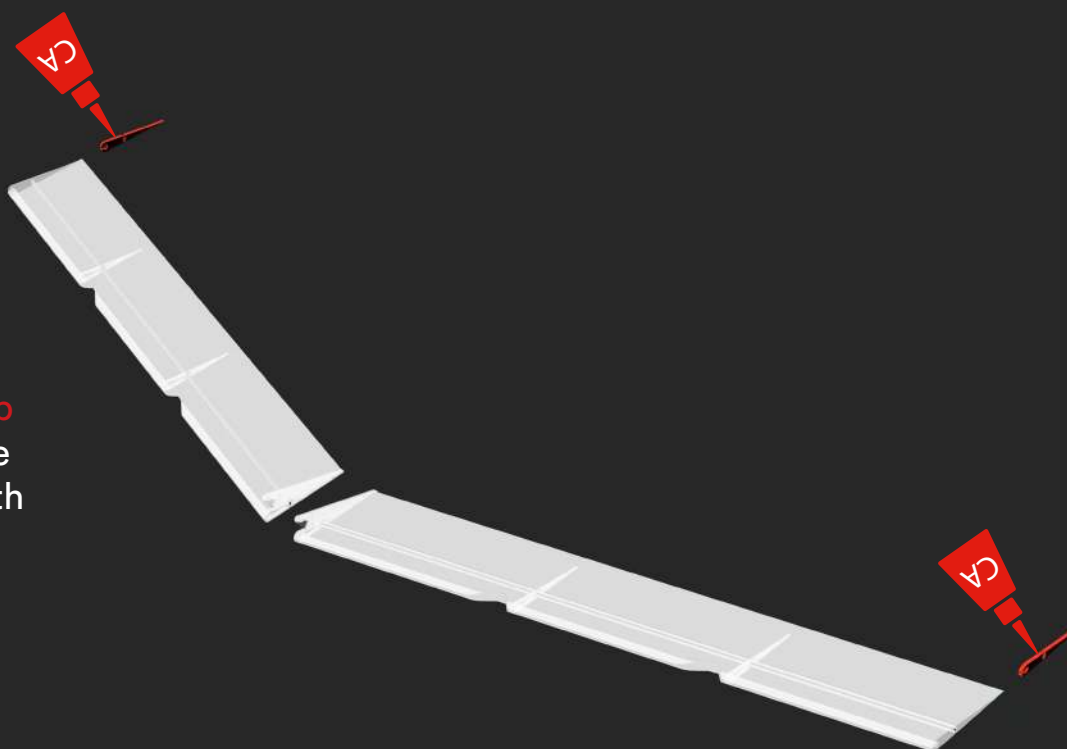


Elevons assembly

3. Glue parts **E_L_3** and **E_R_3** to the **E_L_2** and **E_R_2**. Apply medium CA glue on elevon parts and then slide them on the carbon rods all the way to the previous part of the elevon.

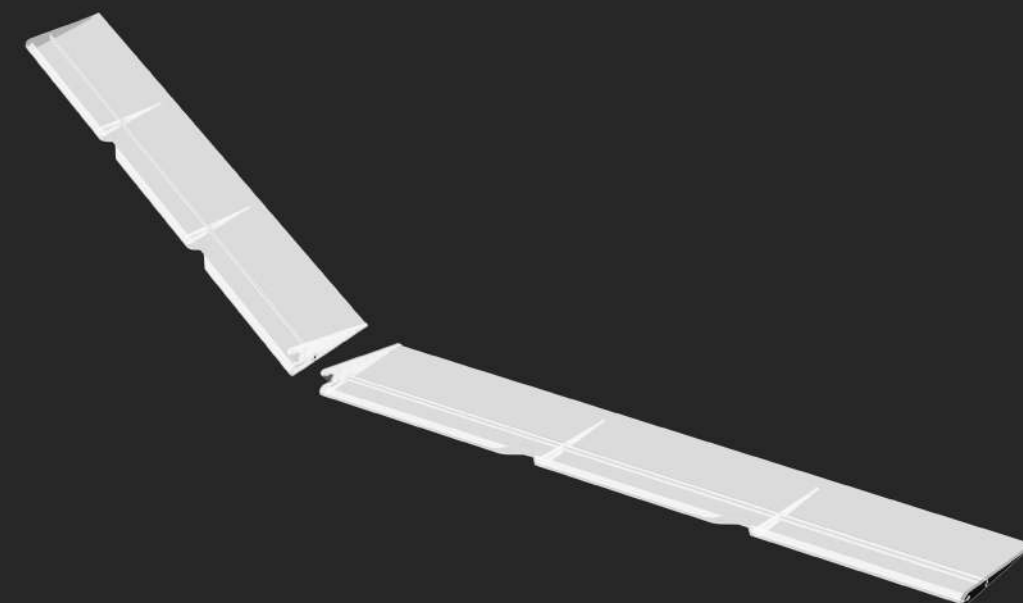


4. Glue parts **E_L_3_Rib** and **E_R_3_Rib** to the **E_L_3** and **E_R_3** with medium CA glue.



Elevons assembly

5. Elevons are done.

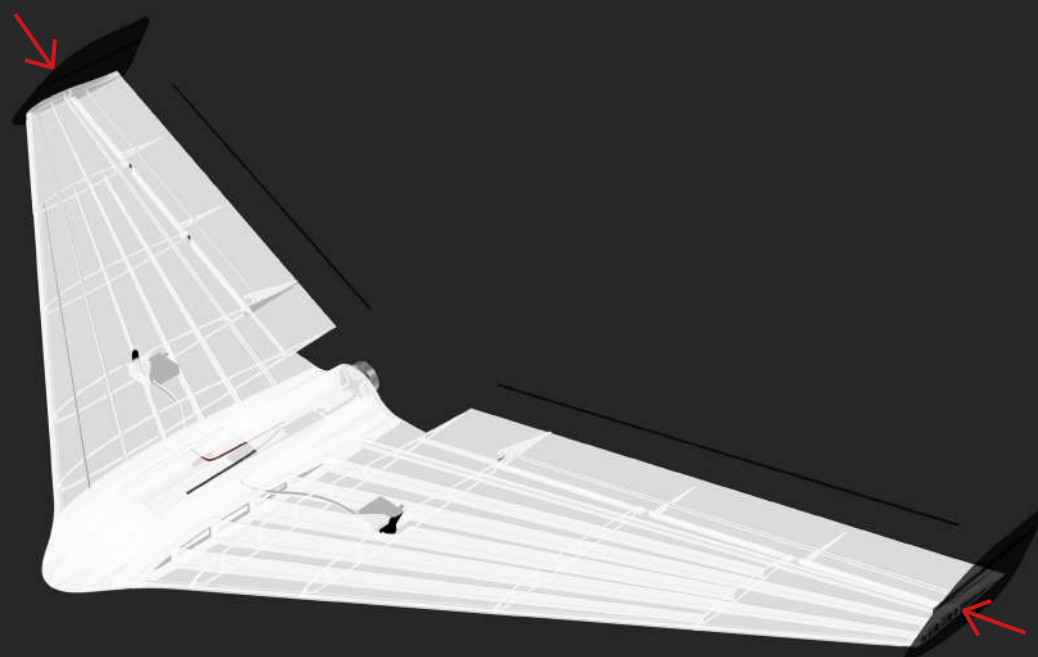


Completion

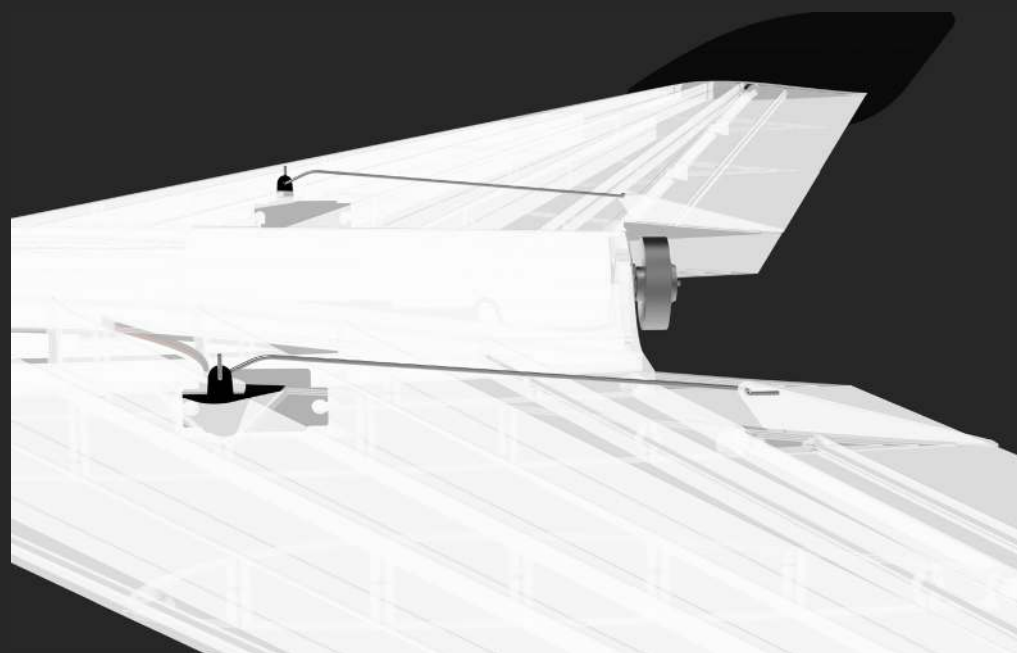
You will need

Canopy, W_L_3_Cover, W_R_3_Cover,
ø2×385mm carbon rod 2x (elevons axles),
Steel wire, carbon rod or clevis (pushrods)
CA glue

1.
Use ø2×385mm carbon rod 2x as elevons axles. Don't insert them all the way in at this point in case that you will need to make pushrods or other adjustments.

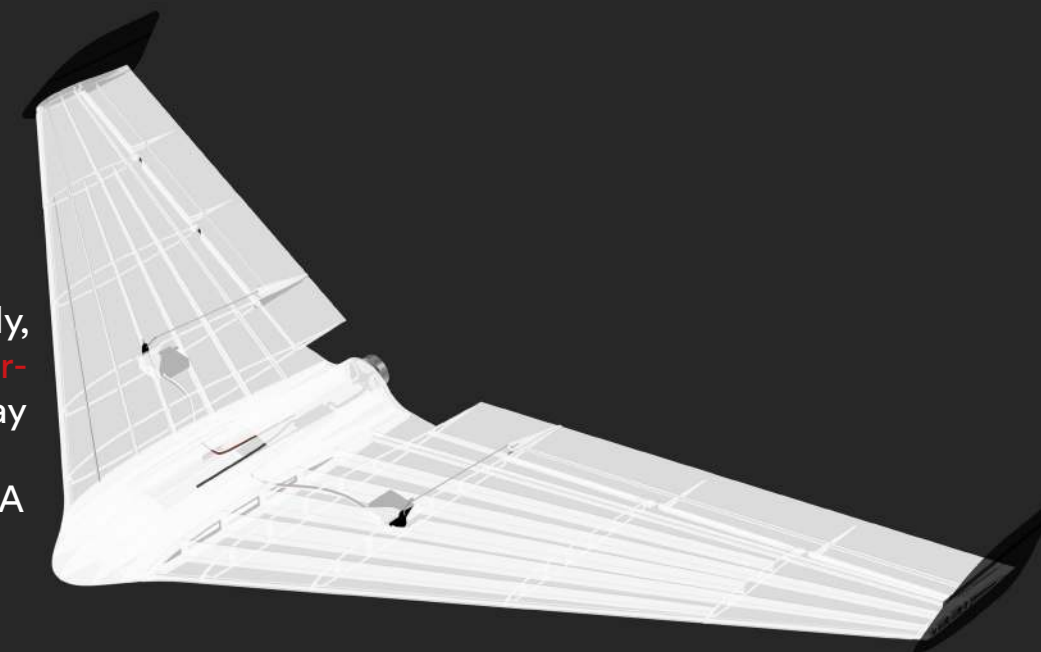


2.
Set elevons to neutral position and install pushrods. Make sure, that everything moves freely. If not, use sand paper or drillbit and make necessary adjustments.



Completion

3.
If everything moves freely and pushrods are installed correctly, insert ø2×385mm carbon rod 2x all the way in and secure them with small drop of CA glue to the elevons.



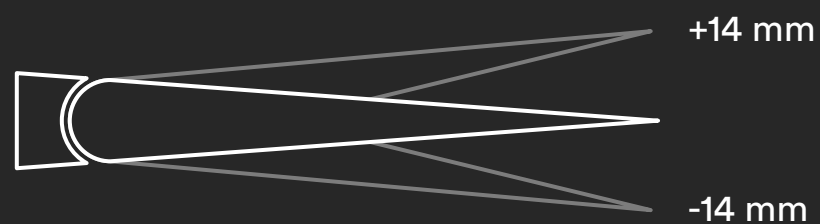
4.
Install RX and battery. Now you are ready to start programming servos and set right CG.

Center of gravity

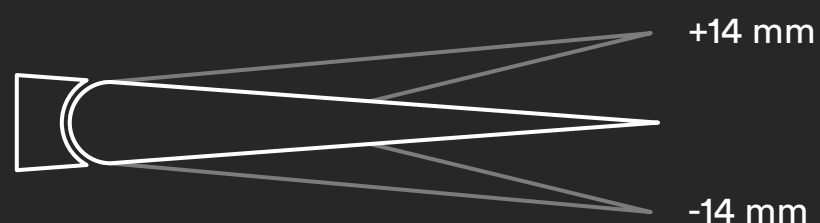
CG is marked on **W_L_1** and **W_R_1** on the bottom side and it is 206mm from the very tip of the **F_1** part. After maiden flight you can shift CG slightly front or back to fit your flying style perfectly. Don't shift CG position too much at once, wing can lose it's stability. It is also possible to change a little bit angle of the motor with small washers to adjust behavior of the wing during flight. (It is a bit tricky with assembled wing, but it is possible)

Elevons setup

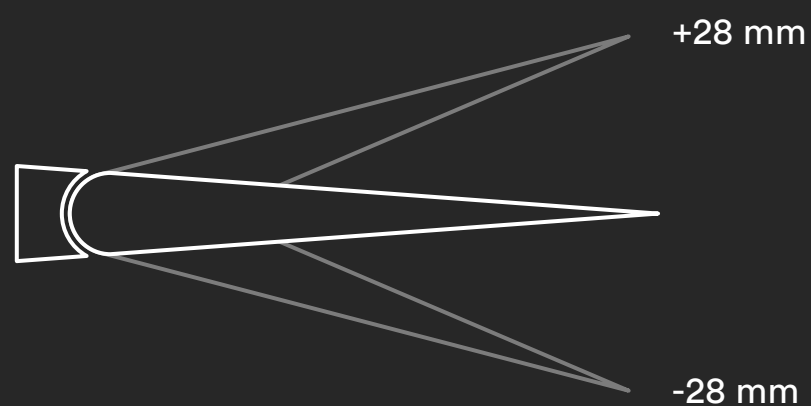
Aileron



Elevator



Aileron + elevator



Before first flight

Make sure, that your battery is properly charged. Check position of CG and elevon mix. Good luck.

Always fly in safe zone and in good conditions. In case of accident designer or seller is not responsible for incurred damages.

Thank you for purchasing my product and thereby supporting me in further creation.

Please do not share your files with friends or other people.

Flight video

