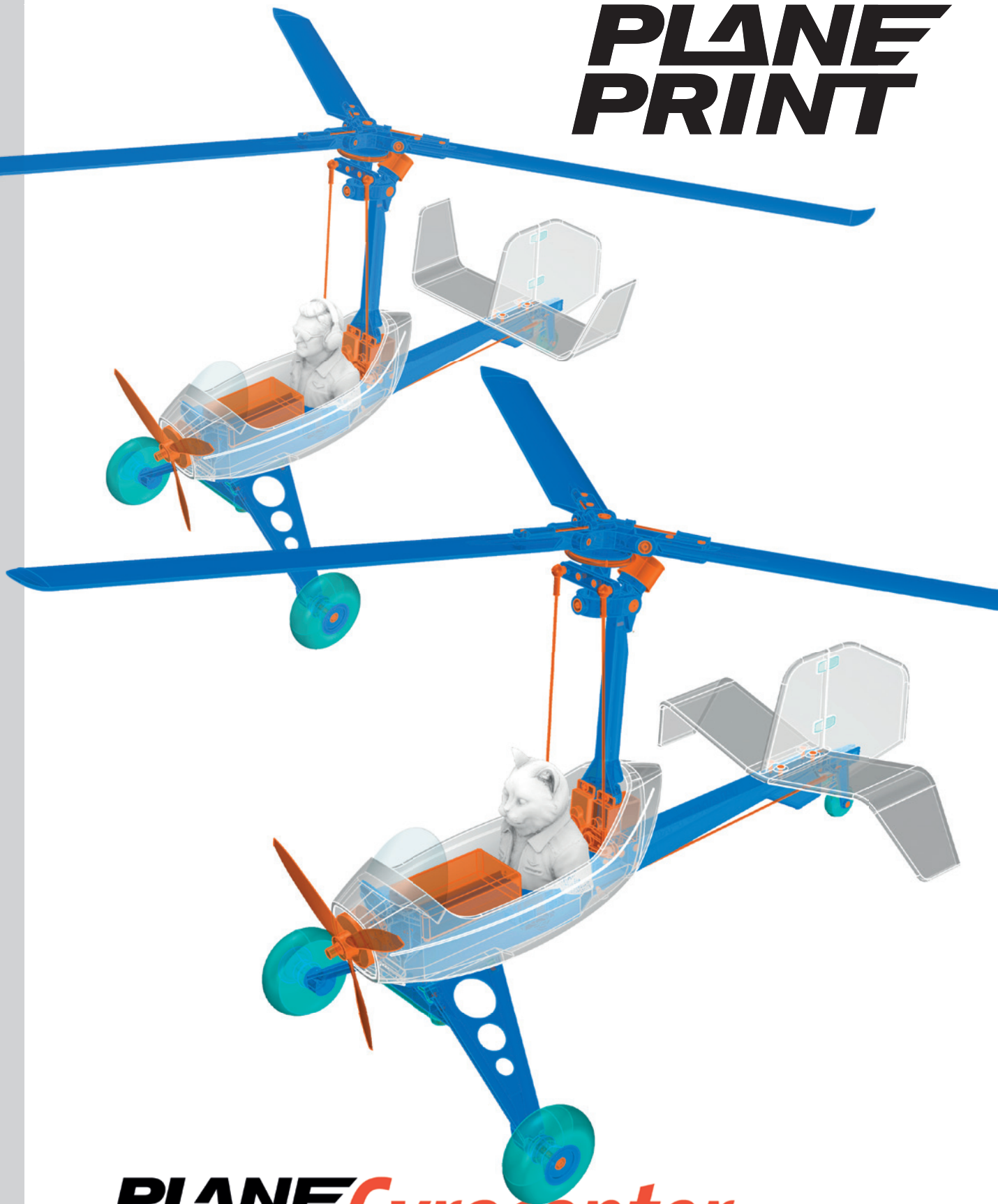


PLANE PRINT



PLANE PRINT *Gyrocopter*

RC Gyrocopter with Pre-Rotator-System



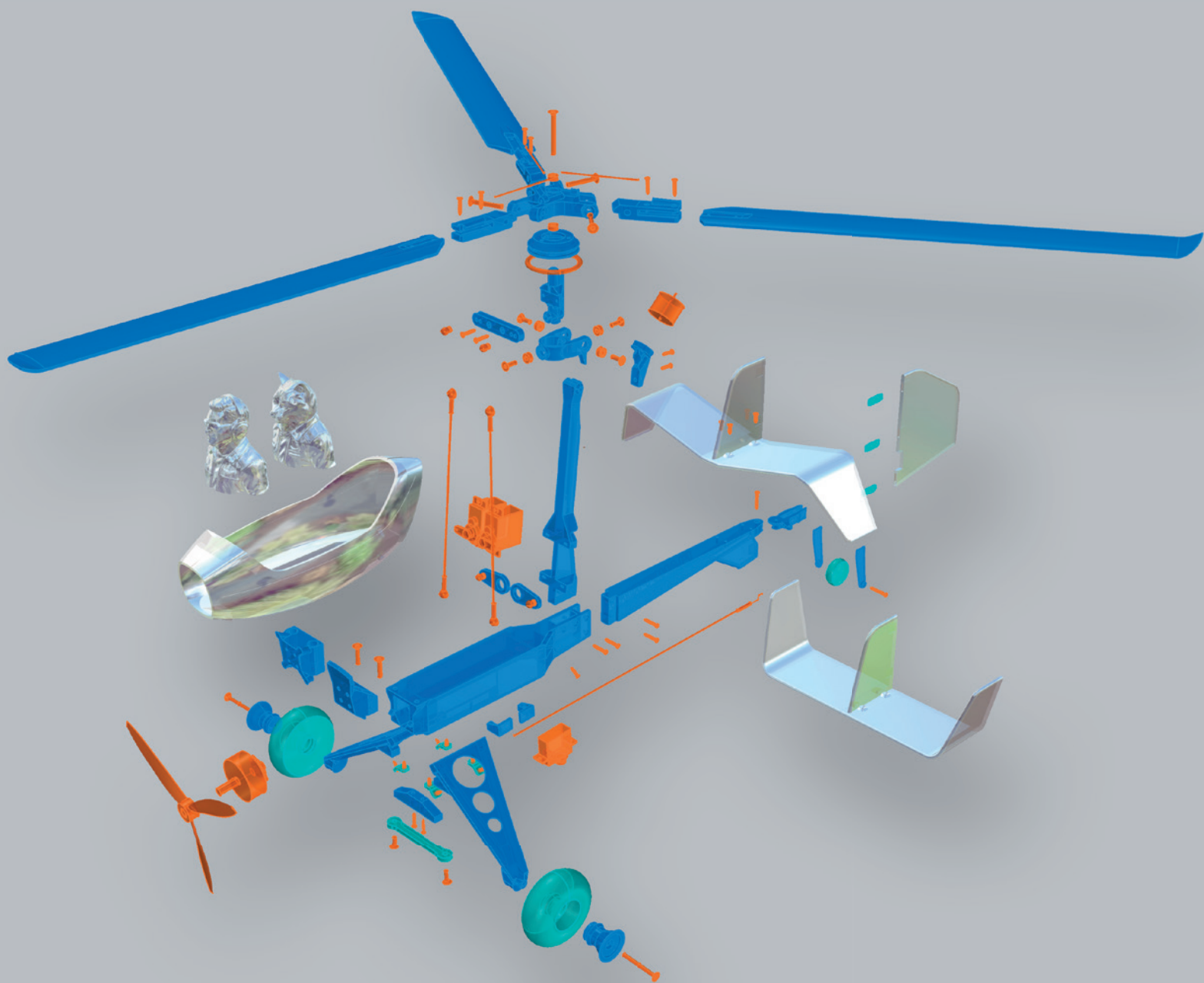
www.planeprint.com

the **ONLY** place where you can get
original Planeprint STL files **legally!**

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PLANE PRINT *Gyrocopter*



OTHER

RC Components

Power System Recommendation: The following power system recommendation is based on the fact that both the main motor and the pre-rotator motor are **powered by the same 3S LiPo battery**.

Main Motor: Requires a high KV rating (~2800) because most standard motors of this size are optimized for 4S to 6S setups. A high-KV motor ensures efficient performance when running on a 3S power source.

Pre-Rotator Motor: Requires a low KV rating (~2000 to 3000).

Alternative Setup Options: If you are building the version without a pre-rotator motor, or if you prefer to use a separate, dedicated small battery just for the pre-rotator, you can freely choose a standard 4S setup for the main motor.

MOTOR Size **2203.5** or **2204** motor with more than 2000 KV like **Xnova FPV 2203.5 V2 2800KV** (5mm shaft)

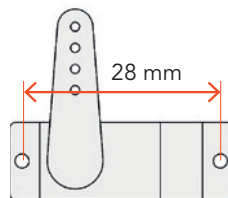
ESC **ZOHD 30A ESC Lite** (ideal because it already has a second power cable for the pre-rotator motor)

RECEIVER **5 Channel** (4 Channels without Pre-Rotator Motor)

PROP **HQProp ETHiX S5 5X4X3** or equivalent (Use only clockwise-rotating propellers. If you also want to use counterclockwise-rotating propellers, you'll need to mirror the motor mount in Slicer!)

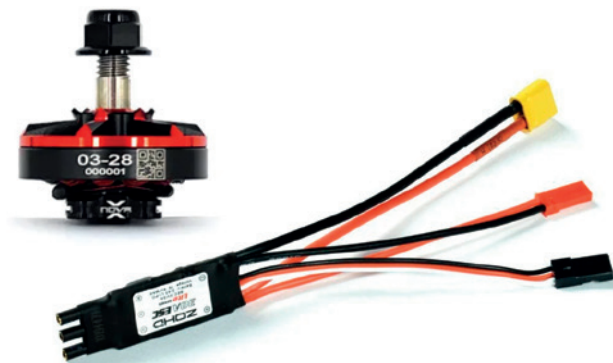
BATTERY **3S LiPo Battery**, 650 to 1000 mAh (Ideal weight: 50 to 80 grams)

SERVOS **2 pieces** like **Corona Servo CS939MG**, **KST Clubman CM509MG V6** or equivalent size
(Since high forces are exerted on the rotor, these servos should not be too weak and should have metal gears)



and **1 piece Micro or Nano Servo** like

- PICCO 8 DIGITAL SERVO
- CHASERVO D S 06
- Hitec HS 40 Eco Servo 4,8g or equivalent size

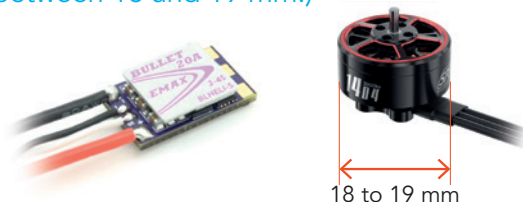


Optional Version with Pre-Rotator Motor

The Pre-Rotator version allows for **takeoff in calm conditions**. Without a Pre-Rotator motor, a moderate wind is required to bring the rotor up to speed before takeoff. **You can easily add it later at any time.**

MOTOR size 1404 with low KV rating (~2000 to 4000) like **GEPRC SPEEDX2 1404 3000KV** or equivalent
(**Important:** The motor must have a diameter between 18 and 19 mm!)

ESC **ESC Emax Bullet 20A** or equivalent



Required accessoires – basic equipment

Links to recommended accessories can be found on www.planeprint.com/gyrocopter (scroll down)

- PLA oder better **Tough PLA**, ~40 grams
- LW-TPU Colorfabb VarioShore (A95 possible), ~40 grams
- LW-PLA (**cannot be replaced by PLA!**), ~40 grams

Materials

- CA super glue (thin)
- CA activator
- **UHU POR** or a comparable **contact** adhesive (optional)
- Sortiment of Metal screws Countersunk head M3
(search for: **M3 countersunk head metal screw assortment**)
- some M2 tapping screws
(search for: **M2 flat head tapping screw assortment**)
- Carbon rod Ø1.5mm*1000mm, 1 piece
- Ball Joint; thread Ø2mm (M2), 6 pieces
- Ball bearings 3x6x2.5mm, 6 pieces
- Self-adhesive Velcro tape
- Duct Tape
- Overhead foil or binding cover of scripts, small piece (optional)
- Rubber O-ring 30*3mm (optional for Pre-Rotoator)

Tools

Cutter knife, small Philips screwdriver, Allen wrench, 1.5 mm drill bit, Sandpaper P150, Metal saw, Needle nose pliers, soldering Tools



Metal screws Ø3mm countersunk head

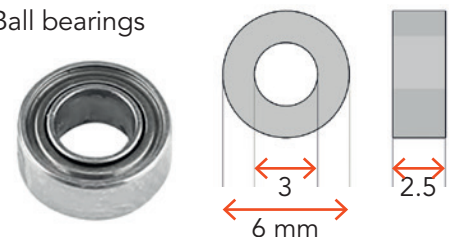


Tapping screws 2mm



Carbon rod

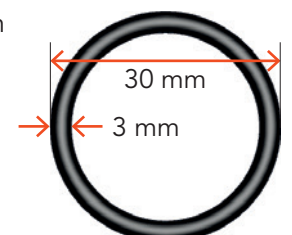
Ball bearings



Ball Joint; thread Ø2mm (M2)



O-ring 30*3mm





The development of a complex, airworthy RC flight model to express on any standard 3D printer is a very extensive process. **Therefore, we appeal to your fairness not to forward the STL data you have acquired to third parties.**

Thank you for your understanding and have fun with your PLANEPRINT MODEL!

Printing the parts – Printing profiles

This manual is constantly being improved and supplemented, we recommend downloading the **latest version** from our website **before building**.

You can find the description at www.planeprint.com/print

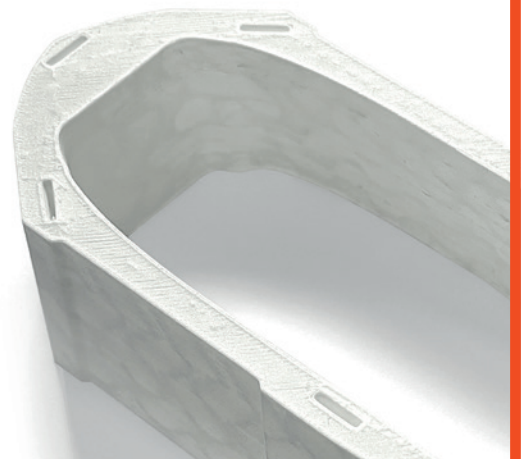
For this model you need the following profiles:



PROFILE P5_Gyroid

It is **essential for the necessary stability** of the **LW parts printed with PROFILE_5 are as stable as possible**. Please use a test part to check the strength by fracture tests. It must not break along the layer lines under any circumstances! Also note that the printing temperature for LW-PLA is as low as possible to obtain a wall thickness of 0.4 to 0.6 mm at a flow of 60 to 70 % (depending on brand).

Caution: at too high temperatures, LW-PLA becomes brittle and breaks more easily.



PROFILE P1_Fullbody **PLA+** (Tough PLA)



The information about the basic settings you can find on our website at [PRINT](https://www.planeprint.com).
Please note the additional settings for the individual parts!

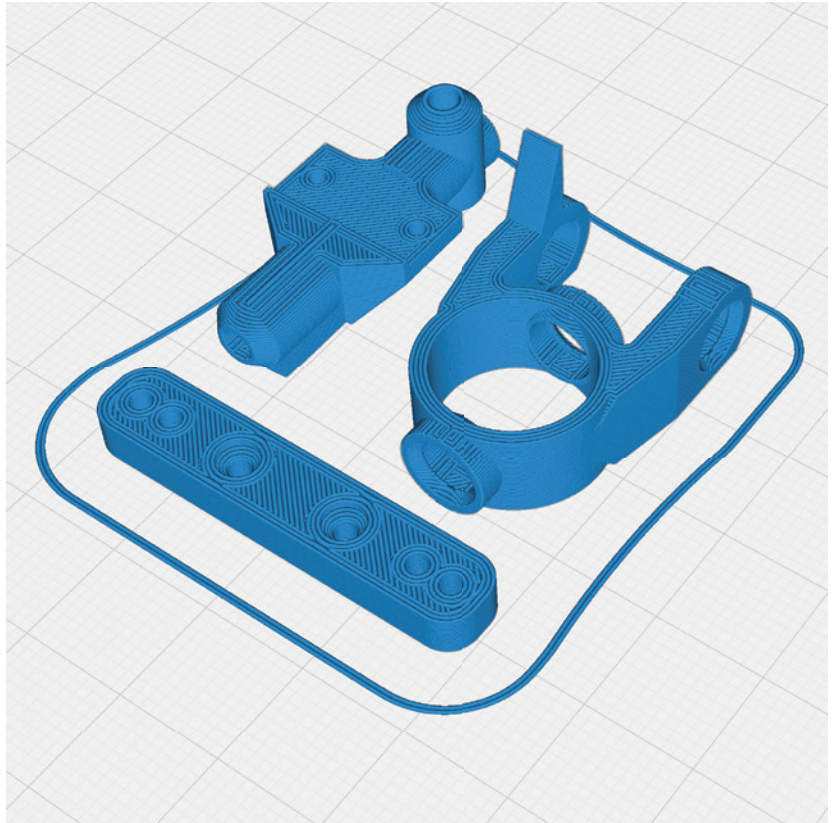
P1_Rotor Joint_gy.stl

MATERIAL PLA+, Weight: ~ 6 g

ADDITIONAL SETTINGS

- Depending on your printer, you may need to enable **support**

This part is critical to safety and must be manufactured with optimal layer adhesion and the appropriate filament!



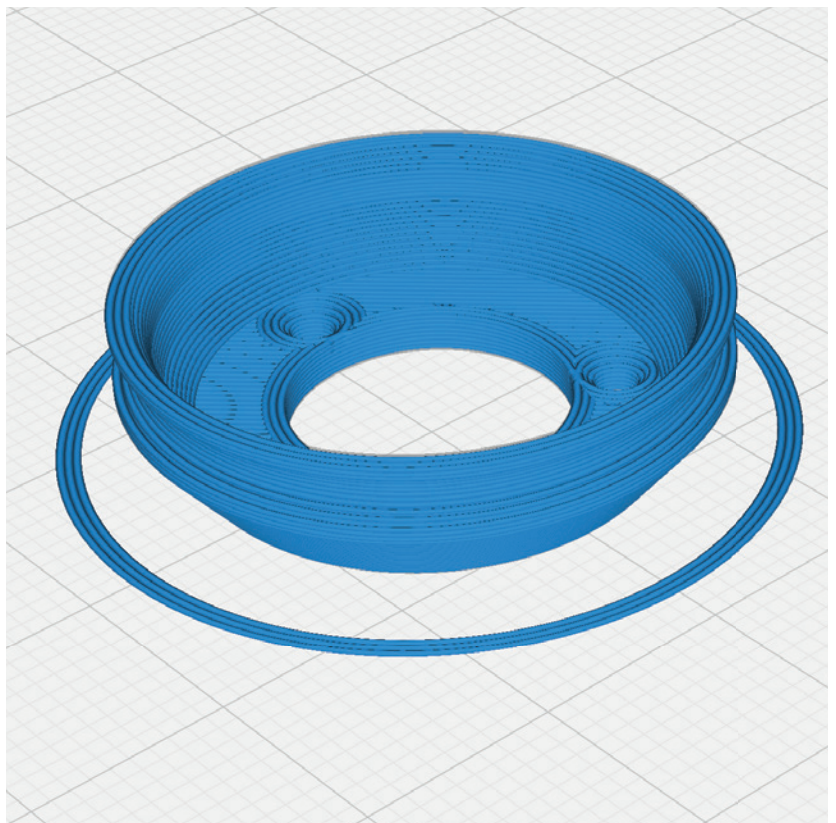
P1_Pre-Rotator_gy.stl

MATERIAL PLA+, Weight: ~ 2 g

ADDITIONAL SETTINGS

None required

Only needed if you want to install the **pre-rotator motor**



PROFILE P1_Fullbody **PLA+** (Tough PLA)



The information about the basic settings you can find on our website at PRINT.
Please note the additional settings for the individual parts!

P1_Mount Pre-Rotator XX_gy.stl

MATERIAL PLA+, Weight: ~ 2 g

ADDITIONAL SETTINGS

None required

Only needed if you want to install
the **pre-rotator motor**

INFO The appropriate version depends
on the diameter of the pre-rotator motor
used; see the manual later on.



PROFILE P2_Hollowbody PLA+ (Tough PLA)



The information about the basic settings you can find on our website at [PRINT](https://www.planeprint.com).
Please note the additional settings for the individual parts!

P2_Blade_gy.stl

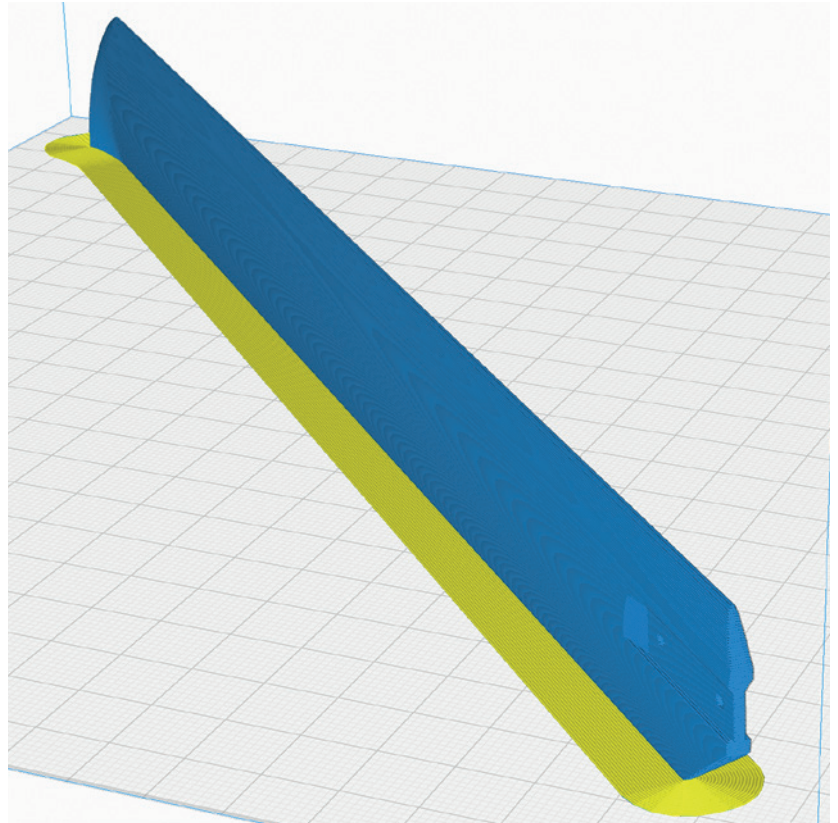
MATERIAL PLA+, Weight: ~ 9 g

ADDITIONAL SETTINGS

- Wall Line Count/Perimeters: 1
- Infill Density: 8 %
- Infill Pattern: Gyroid
- Maximum length of (sparse) infill anchor: 1 mm
(only Prusa and Bambu Studio)
- use Brim

IMPORTANT Always print the blade exactly the same way and with the same filament, that way, you won't have any problems with imbalance.

This part is critical to safety and must be manufactured with optimal layer adhesion and the appropriate filament!

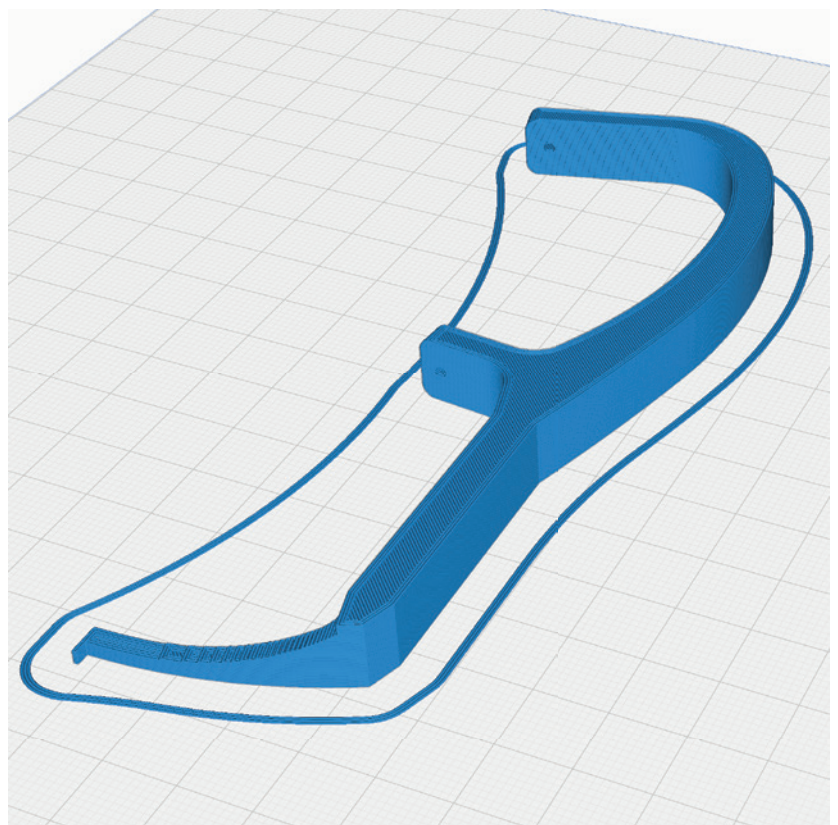


P2_CG Tool_gy.stl

MATERIAL PLA+, Weight: ~ 7 g

ADDITIONAL SETTINGS

None required



PROFILE P2_Hollowbody PLA+ (Tough PLA)



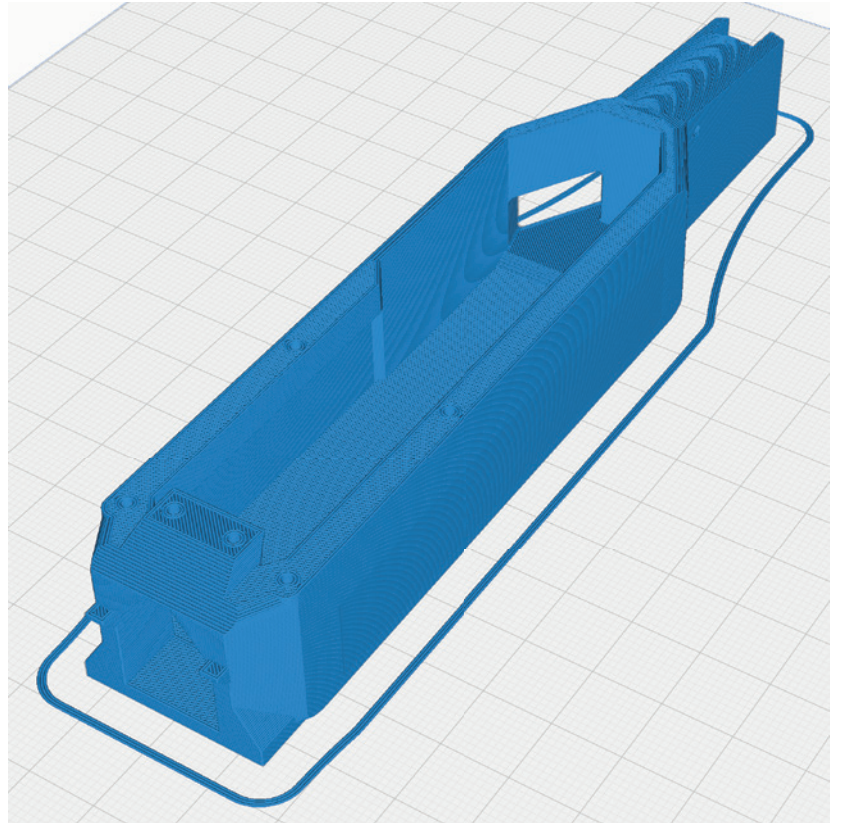
The information about the basic settings you can find on our website at [PRINT](https://www.planeprint.com).
Please note the additional settings for the individual parts!

P2_Fuselage_gy.stl

MATERIAL PLA+, Weight: ~ 16 g

ADDITIONAL SETTINGS

- Wall Line Count/Perimeters: 1
- Infill Density: 10 %

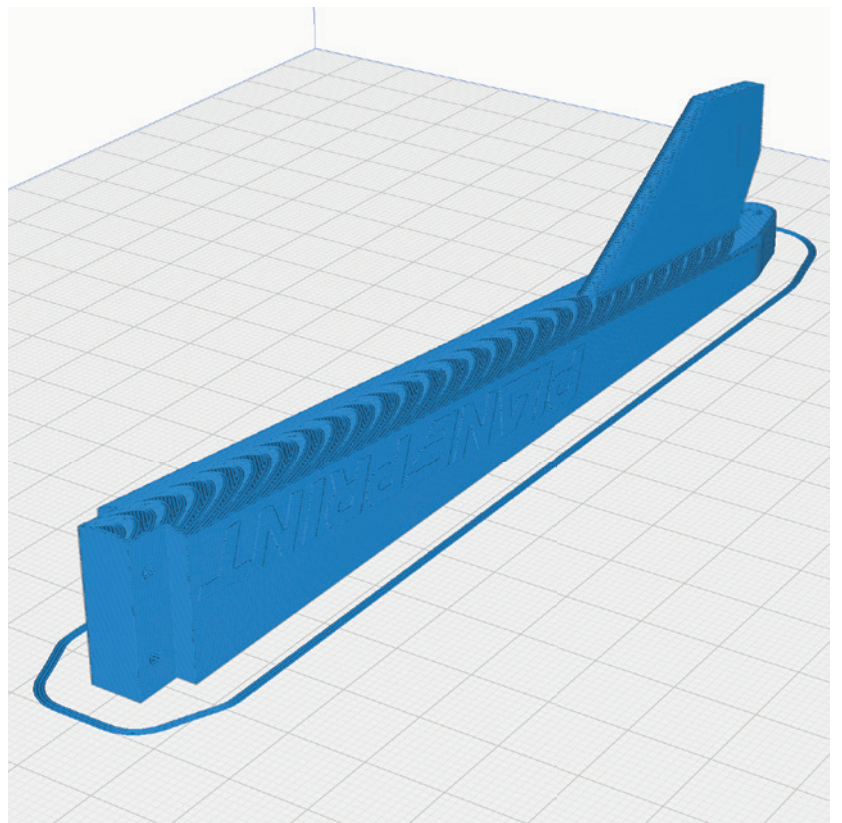


P2_Tail boom_gy.stl

MATERIAL PLA+, Weight: ~ 8 g

ADDITIONAL SETTINGS

- Wall Line Count/Perimeters: 1
- Infill Density: 10 %



PROFILE P2_Hollowbody PLA+ (Tough PLA)



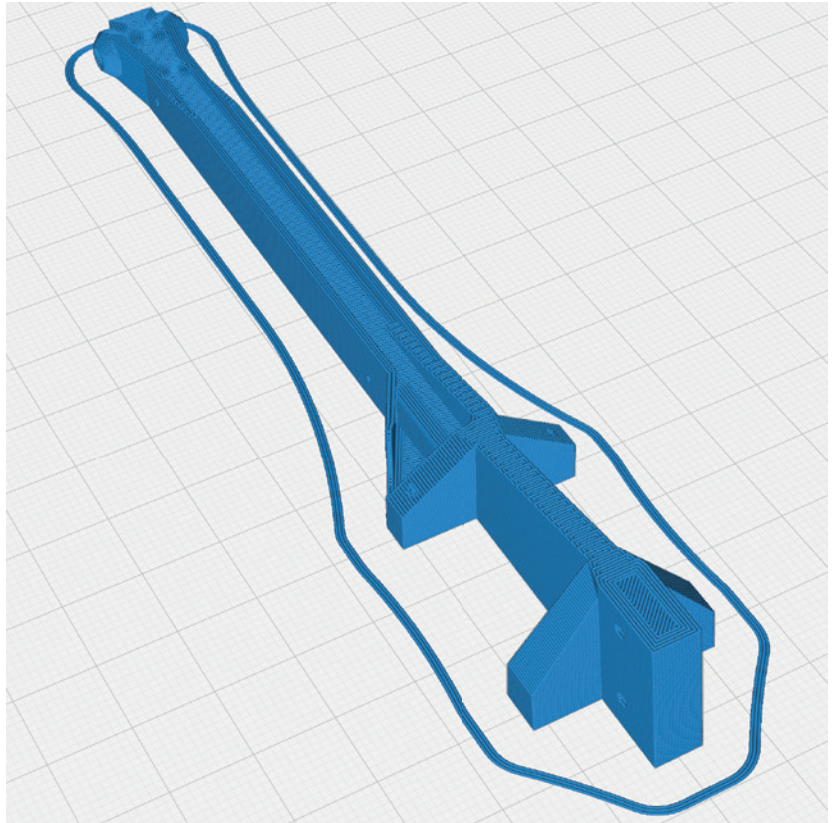
The information about the basic settings you can find on our website at [PRINT](https://www.planeprint.com).
Please note the additional settings for the individual parts!

P2_Mast_gy.stl

MATERIAL PLA+, Weight: ~ 11 g

ADDITIONAL SETTINGS

- Wall Line Count/Perimeters: 4
- Top Layers: 4
- Bottom Layers: 4



P2_Rotor Head_gy.stl

MATERIAL PLA+, Weight: ~ 15 g

ADDITIONAL SETTINGS

- Wall Line Count/Perimeters: 4
- Top Layers: 4
- Bottom Layers: 4

This part is critical to safety and must be manufactured with optimal layer adhesion and the appropriate filament!



PROFILE P2_Hollowbody **PLA+** (Tough PLA)



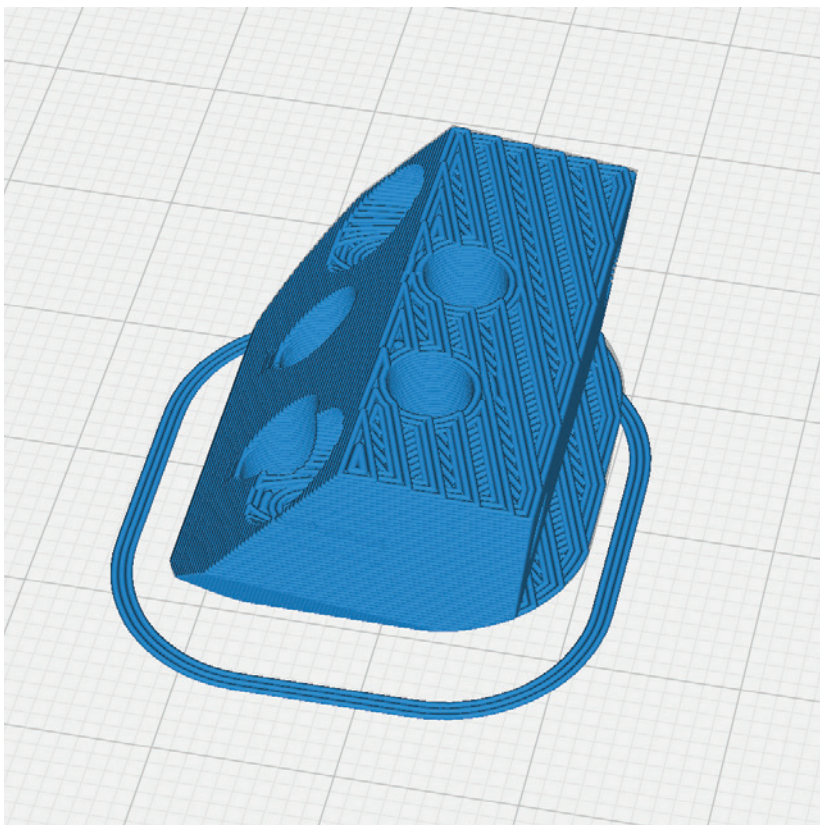
The information about the basic settings you can find on our website at [PRINT](https://www.planeprint.com).
Please note the additional settings for the individual parts!

P2_Mount Nose Motor 12_gy.stl

MATERIAL PLA+, Weight: ~ 4 g

ADDITIONAL SETTINGS

- Wall Line Count/Perimeters: 4
- Top Layers: 4
- Bottom Layers: 4

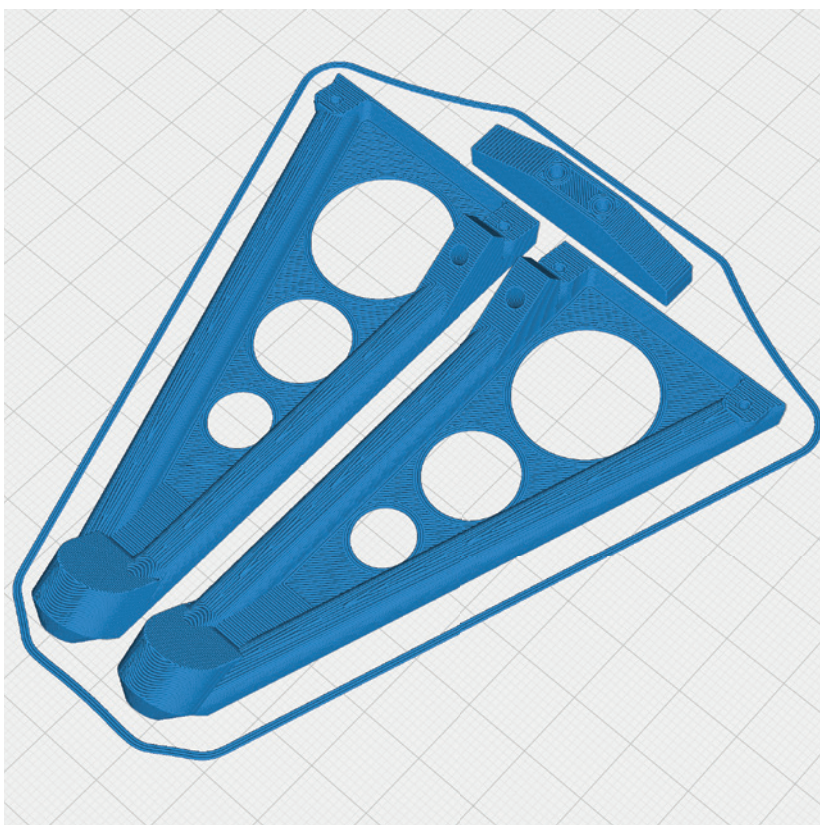


P2_Gear_gy.stl

MATERIAL PLA+, Weight: ~ 10 g

ADDITIONAL SETTINGS

None required



PROFILE P2_Hollowbody **PLA+** (Tough PLA)



The information about the basic settings you can find on our website at [PRINT](https://www.planeprint.com).
Please note the additional settings for the individual parts!

P2_Parts_gy.stl

MATERIAL PLA+, Weight: ~ 4 g

ADDITIONAL SETTINGS

None required

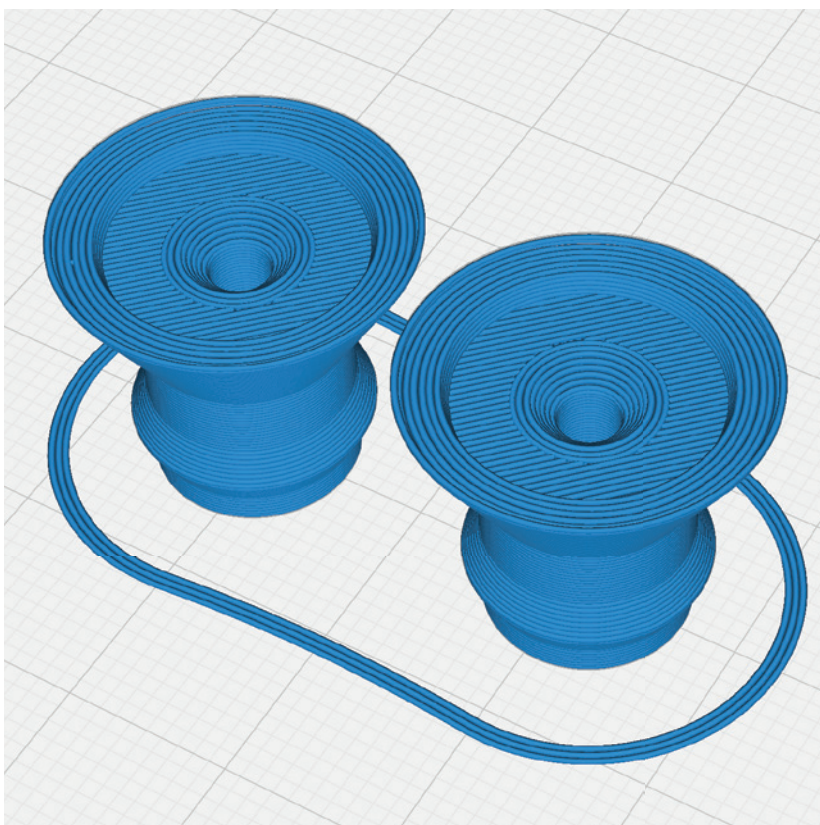


P2_Rims_gy.stl

MATERIAL PLA+, Weight: ~ 3 g

ADDITIONAL SETTINGS

None required



PROFILE P4_Flex TPU (A95)



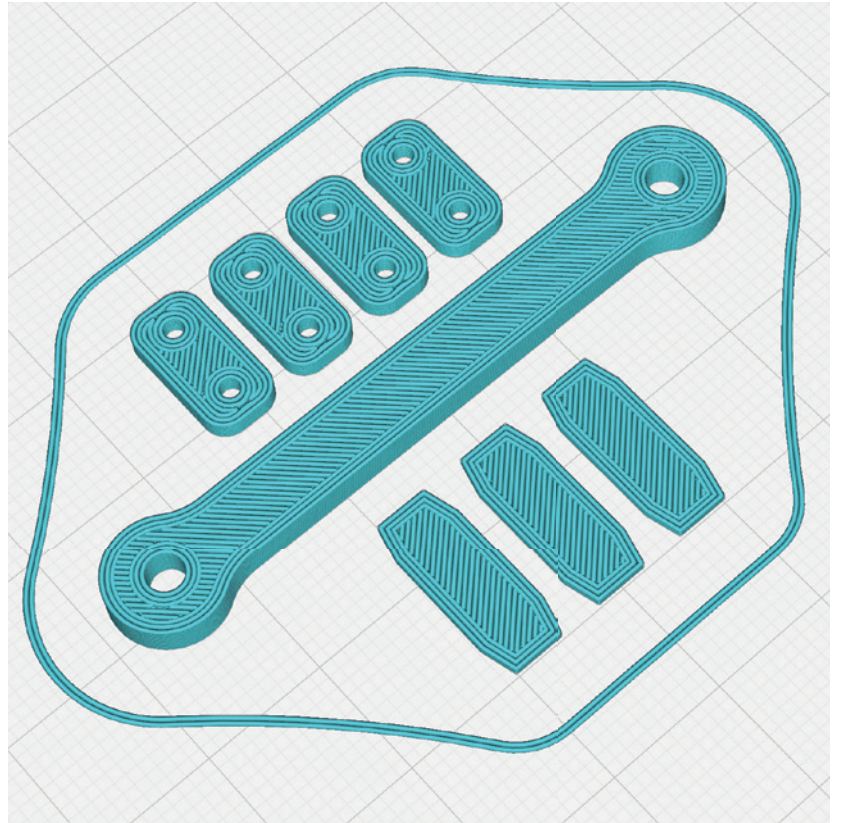
The information about the basic settings you can find on our website at [PRINT](https://www.print.com).
Please note the additional settings for the individual parts!

P4_Parts_gy.stl

MATERIAL TPU A95, Weight: ~ 2 g

ADDITIONAL SETTINGS

- Infill Density: 100 %



PROFILE P4_Flex LW-TPU (VarioShore)



The information about the basic settings you can find on our website at [PRINT](https://www.planeprint.com).
Please note the additional settings for the individual parts!

P4_Tire_gy.stl

MATERIAL VarioShore or TPU A95

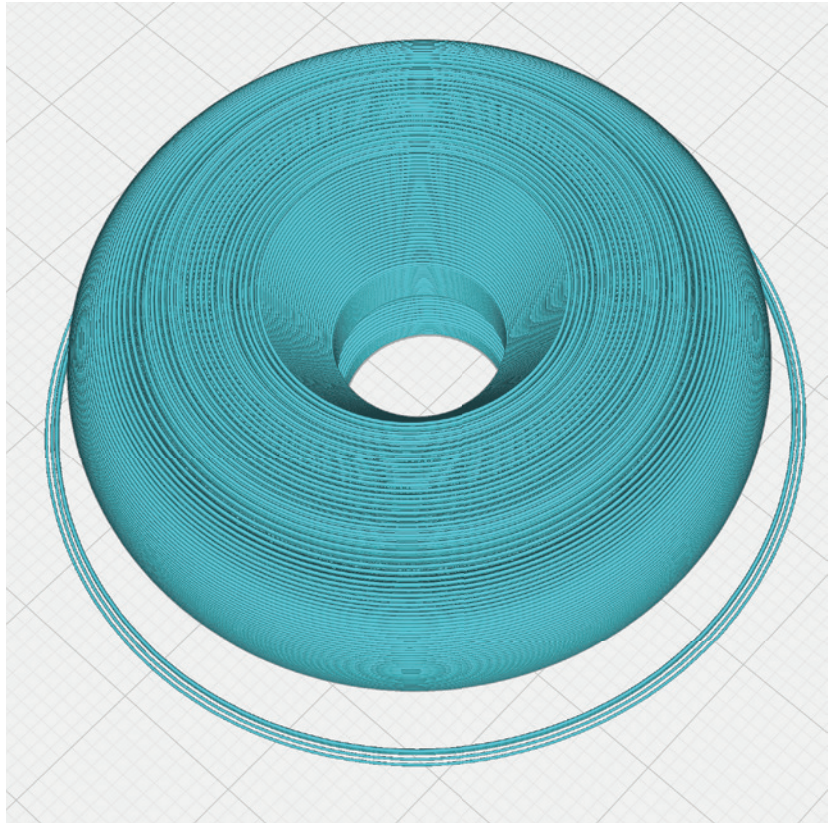
ADDITIONAL SETTINGS

VarioShore with Flow 70 %:

- Wall Line Count/Perimeters: 4
- Top Layers: 4
- Bottom Layers: 4
- Infill Density: 10 %
- Infill Pattern: Gyroid

TPU A95:

- Wall Line Count: 3
- Top Layers: 3
- Infill Density: 6 %
- Infill Pattern: Gyroid



P4_Tail Wheel_gy.stl

MATERIAL VarioShore or TPU A95

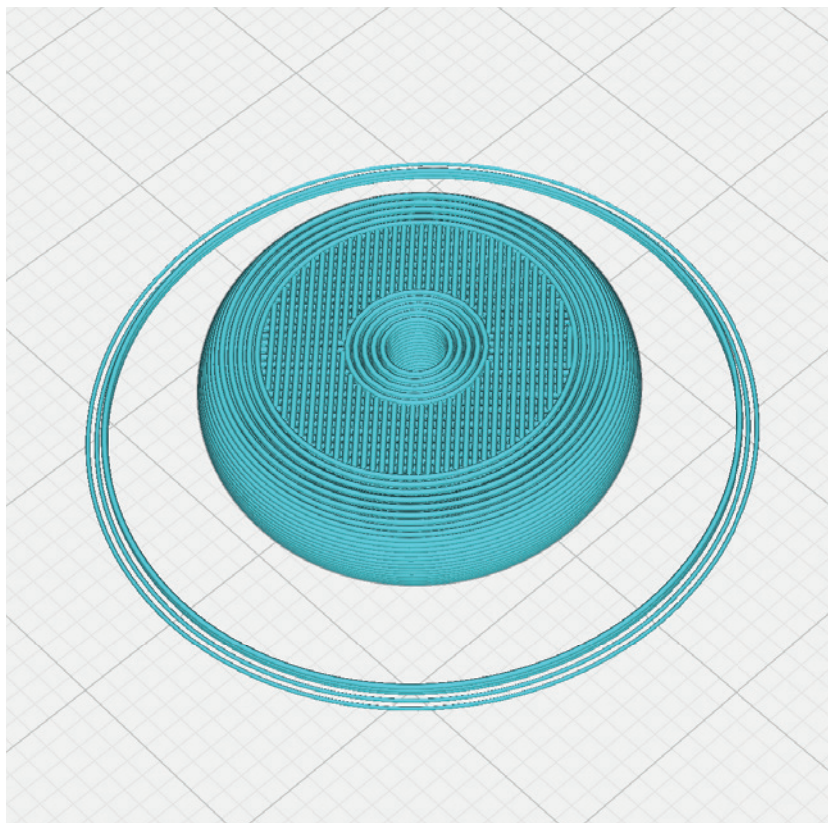
ADDITIONAL SETTINGS

VarioShore with Flow 70 %:

- Wall Line Count/Perimeters: 4
- Top Layers: 4
- Bottom Layers: 4
- Infill Density: 10 %
- Infill Pattern: Gyroid

TPU A95:

- Wall Line Count: 3
- Top Layers: 3
- Infill Density: 6 %
- Infill Pattern: Gyroid



PROFILE P5_Gyroid LW-PLA (foaming)!



The information about the basic settings you can find on our website at PRINT.

Please note the additional settings for the individual parts!

It is essential to print these parts with foaming LW-PLA (pre-foamed is heavier)!

Basic settings for LW-PLA: Please follow the instructions in our **WINGTEST AND CALIBRATION TOOL** on our website for correct adjustment! Print only one STL at a time!

P5_Cowling_gy.stl

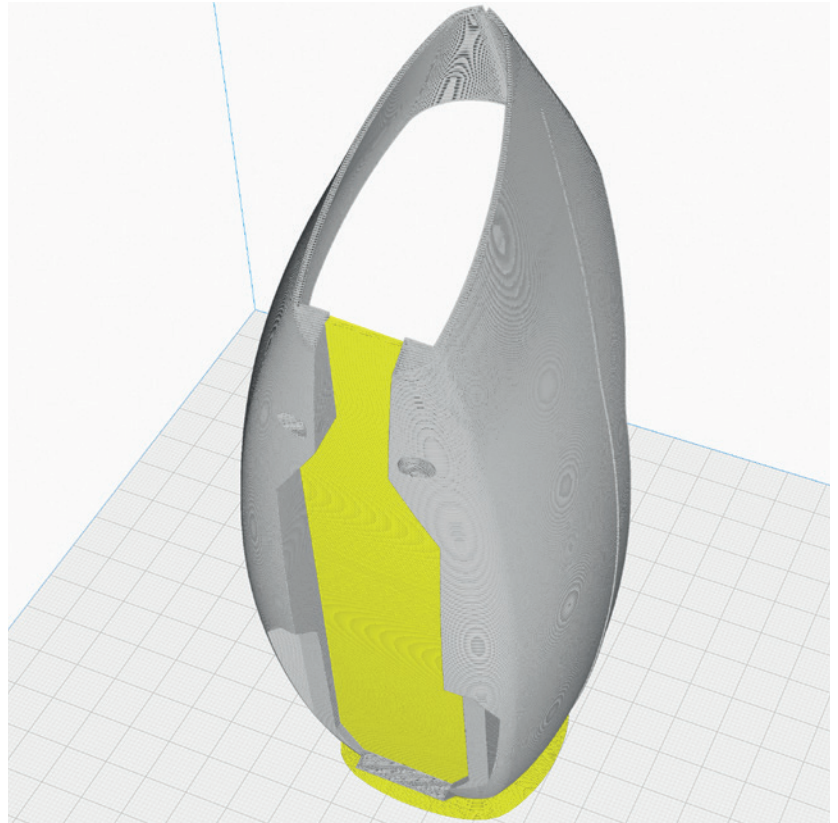
MATERIAL LW PLA, Weight: ~ 18 g

TIME ~ 2 hours 20 minutes

ADDITIONAL SETTINGS

None required

Remove the yellow-marked **support** with a knife and sand paper.



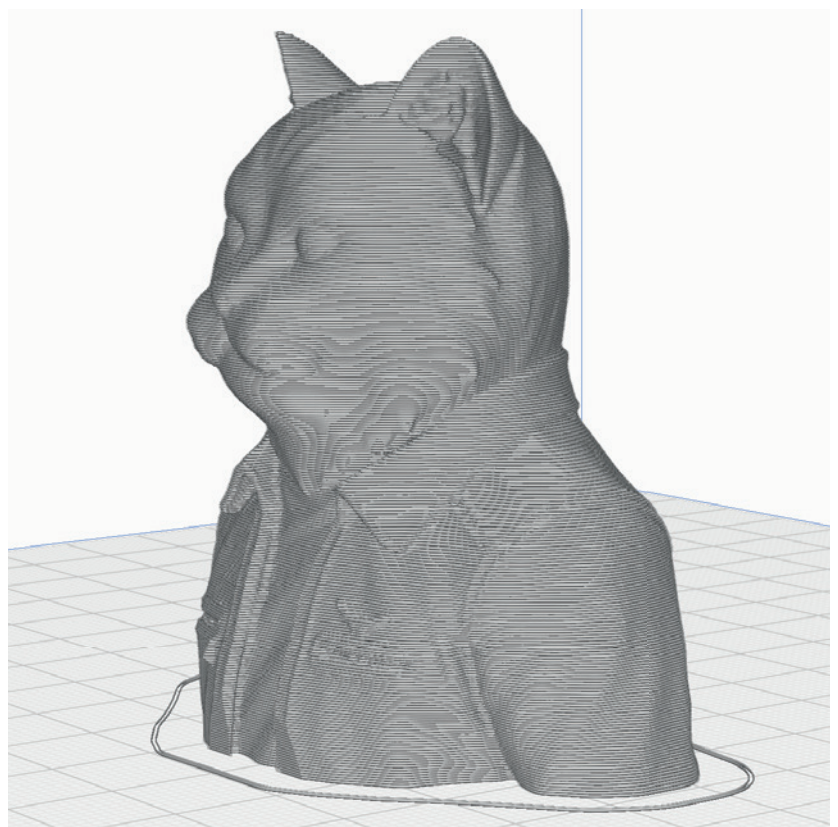
P5_Pilot_gy.stl or P5_Pilot Cat Inspector_gy.stl

MATERIAL LW PLA, Weight: ~ 5 g

TIME ~ 50 minutes

ADDITIONAL SETTINGS

None required



PROFILE P5_Gyroid LW-PLA (foaming)!



The information about the basic settings you can find on our website at PRINT.

Please note the additional settings for the individual parts!

It is essential to print these parts with foaming LW-PLA (pre-foamed is heavier)!

Basic settings for LW-PLA: Please follow the instructions in our **WINGTEST AND CALIBRATION TOOL** on our website for correct adjustment! Print only one STL at a time!

P5_Tailplane V1_gy.stl or
P5_Tailplane V2_gy.stl

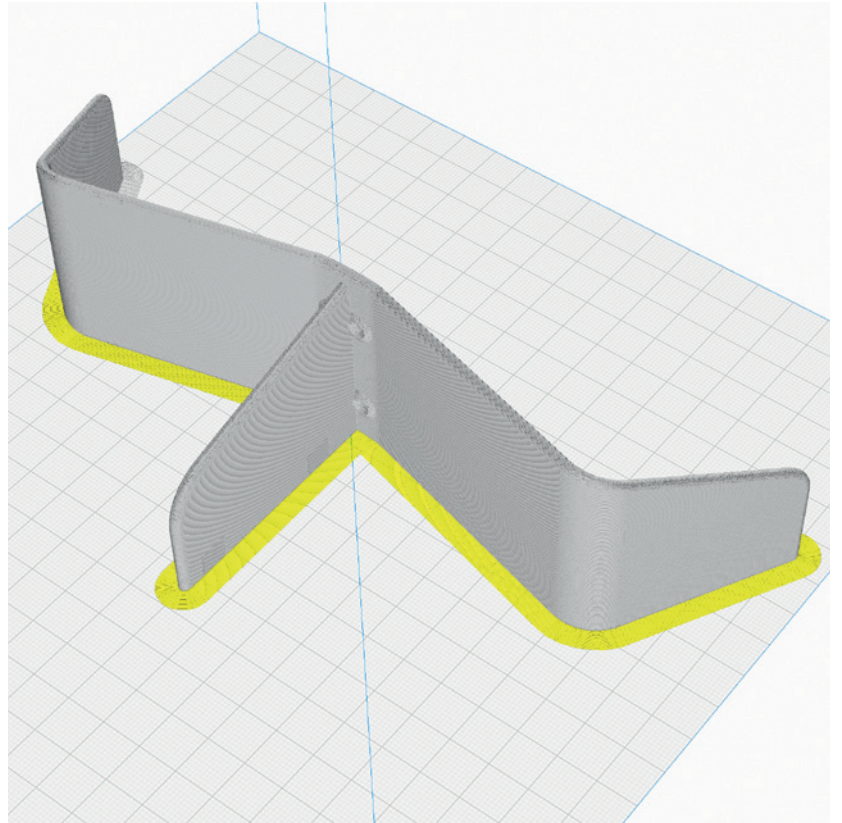
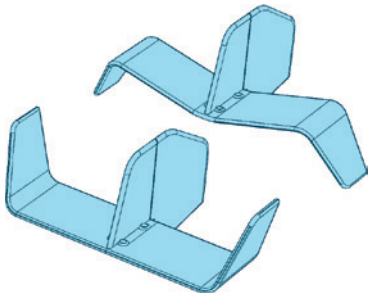
MATERIAL LW PLA, Weight: ~ 10 g

TIME ~ 1 hour 30 minutes

ADDITIONAL SETTINGS

None required

Remove the yellow-marked **support** with a knife and sand paper.



P5_Rudder_gy.stl

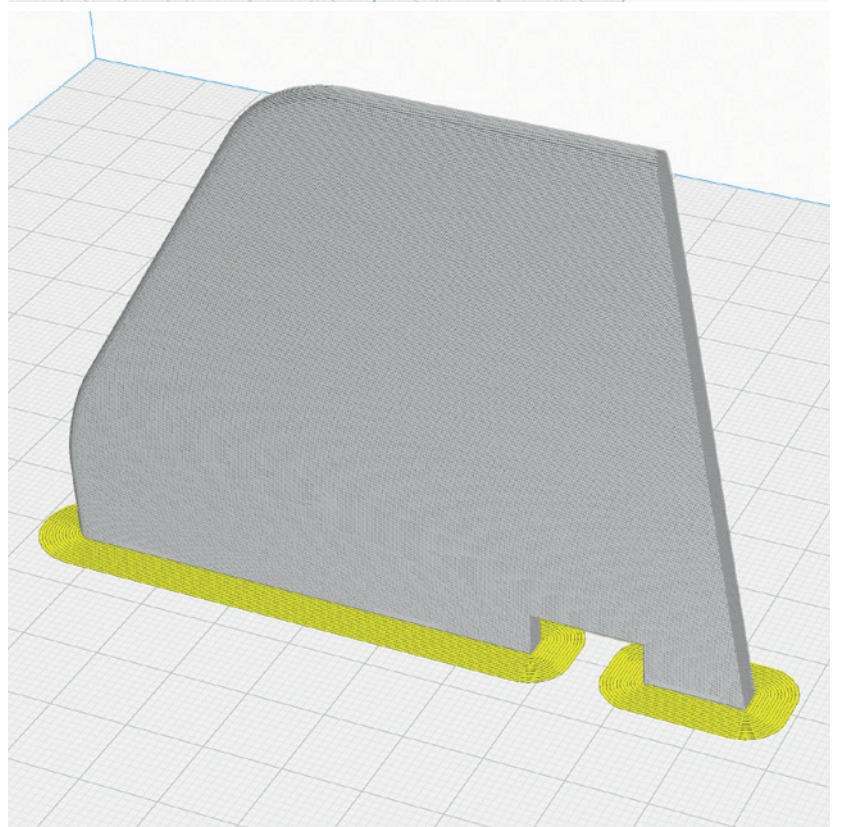
MATERIAL LW PLA, Weight: ~ 4 g

TIME ~ 50 minutes

ADDITIONAL SETTINGS

None required

Remove the yellow-marked **support** with a knife and sand paper.



Basic Information:

Gluing the parts printed with PROFILE P5

- STEP 1** As a first step, it is important to **roughen and smooth the adhesive surfaces** with sandpaper.
- STEP 2** Insert the **interconnects into the slots** provided on one side.
- STEP 3** Apply **a lot of glue** to the side with the interconnects. It is important that there is glue everywhere, especially on the outside and inside of the wall surfaces, in order to achieve a perfect connection. The interconnects only serve to align the parts to each other. It is better **not** to apply glue here, otherwise it can happen that the glue suddenly hardens while the parts are being put together and stops the process.

Use medium viscosity CA glue, thinner glue would run down the parts too easily.

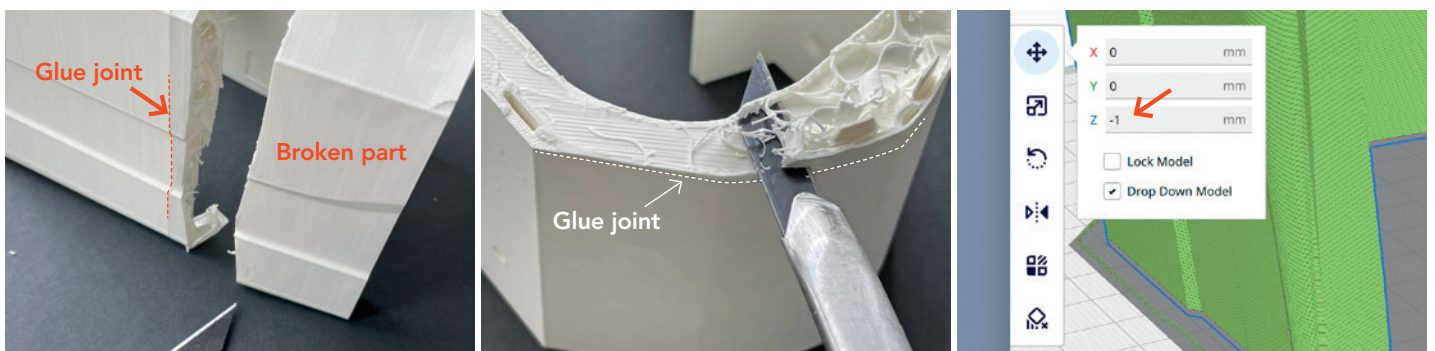
After assembly, **align the two parts exactly** and wipe off the excess CA glue from the surface with a cloth. Now spray with activator spray along the gluing surface and carefully press the parts together.

- STEP 4** Clean the glued areas slightly with a **sharp-bladed** cutter.

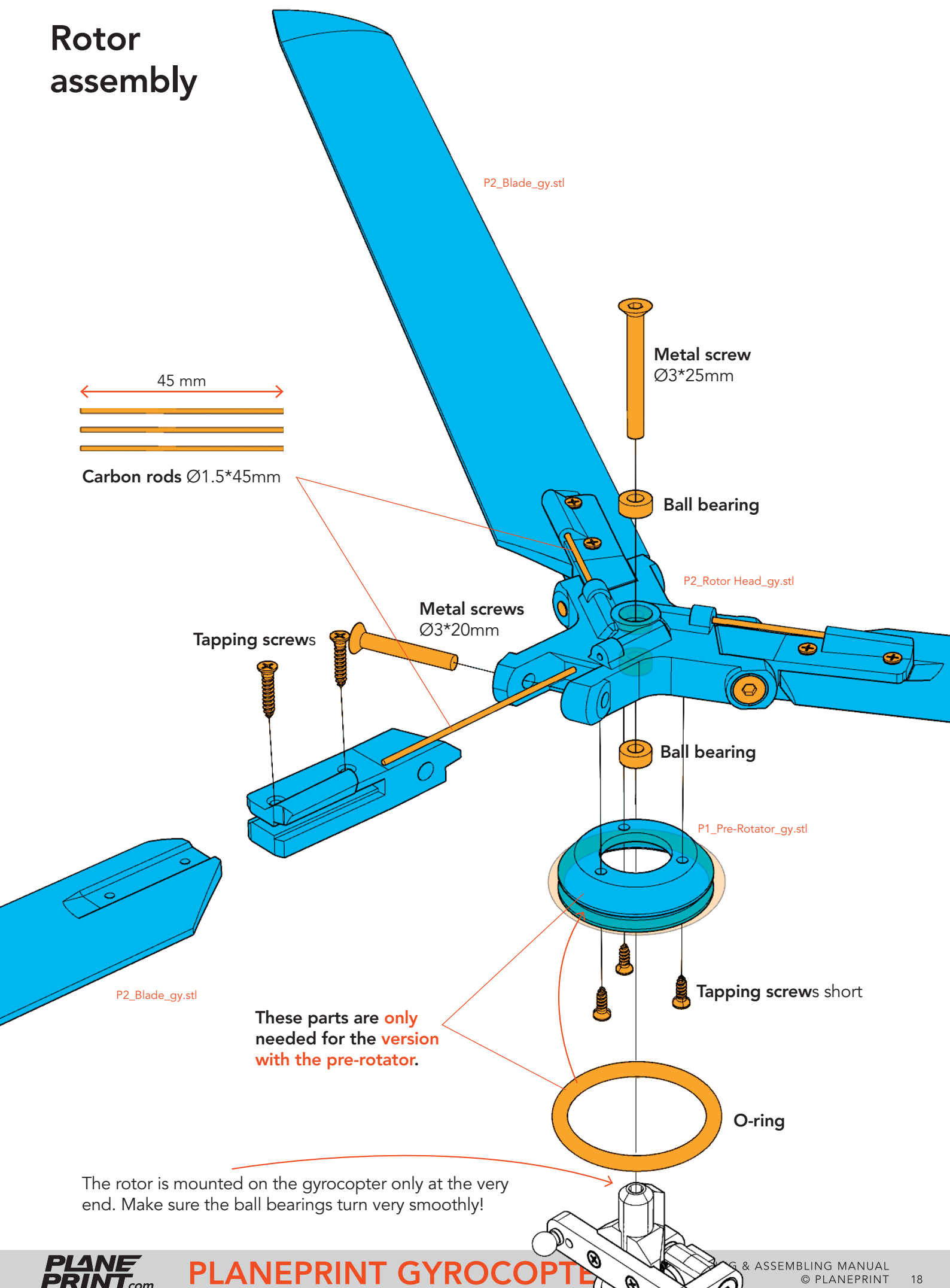


PROFILES 5 parts are easy to repair

- STEP 1** Using the knife, carefully remove the damaged part about 3 mm from the glue joint between two parts.
- STEP 2** Cut wall and infill and clean the surface with sandpaper. **The top surface of the damaged part remains!**
- STEP 3** The remaining top surface is about 1 mm thick. To compensate for this, you can move the new part to be printed down the Z axis in Cura by 1 mm.



Rotor assembly



Rotor Joint assembly

STEP 1

Tapping screws

Ball joints

Metal screw
Ø3*8mm

P1_Rotor Joint_gy.stl

Ball bearings

Metal screw
Ø3*8mm

Ball bearings

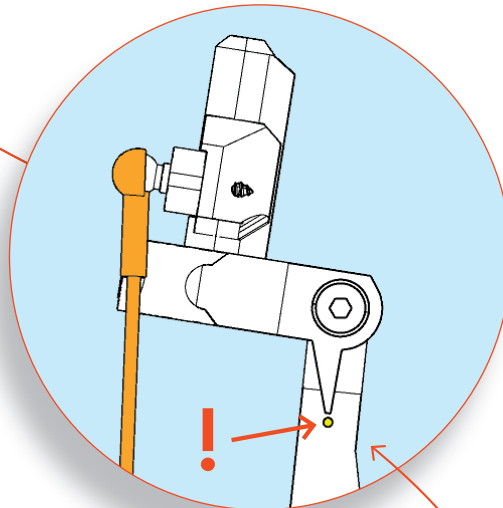
STEP 2

Metal screw
Ø3*8mm

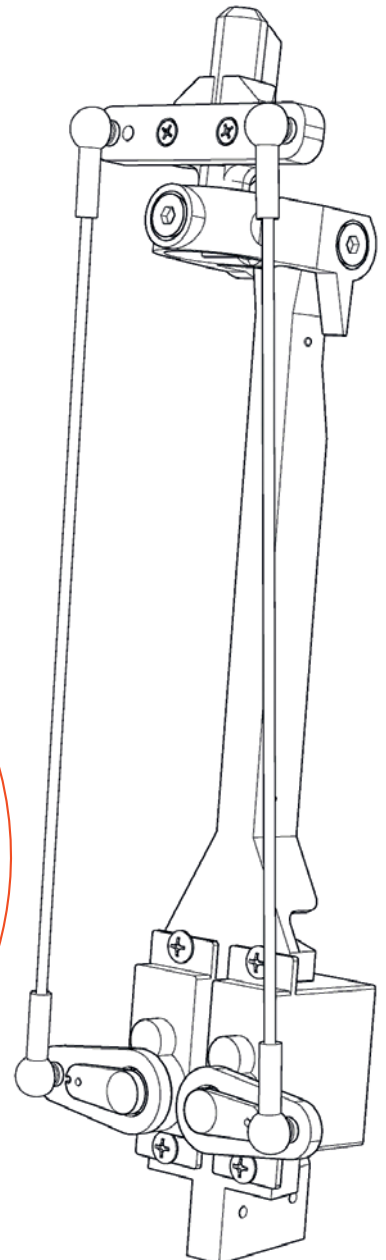
Metal screw
Ø3*8mm

P2_Mast_gy.stl

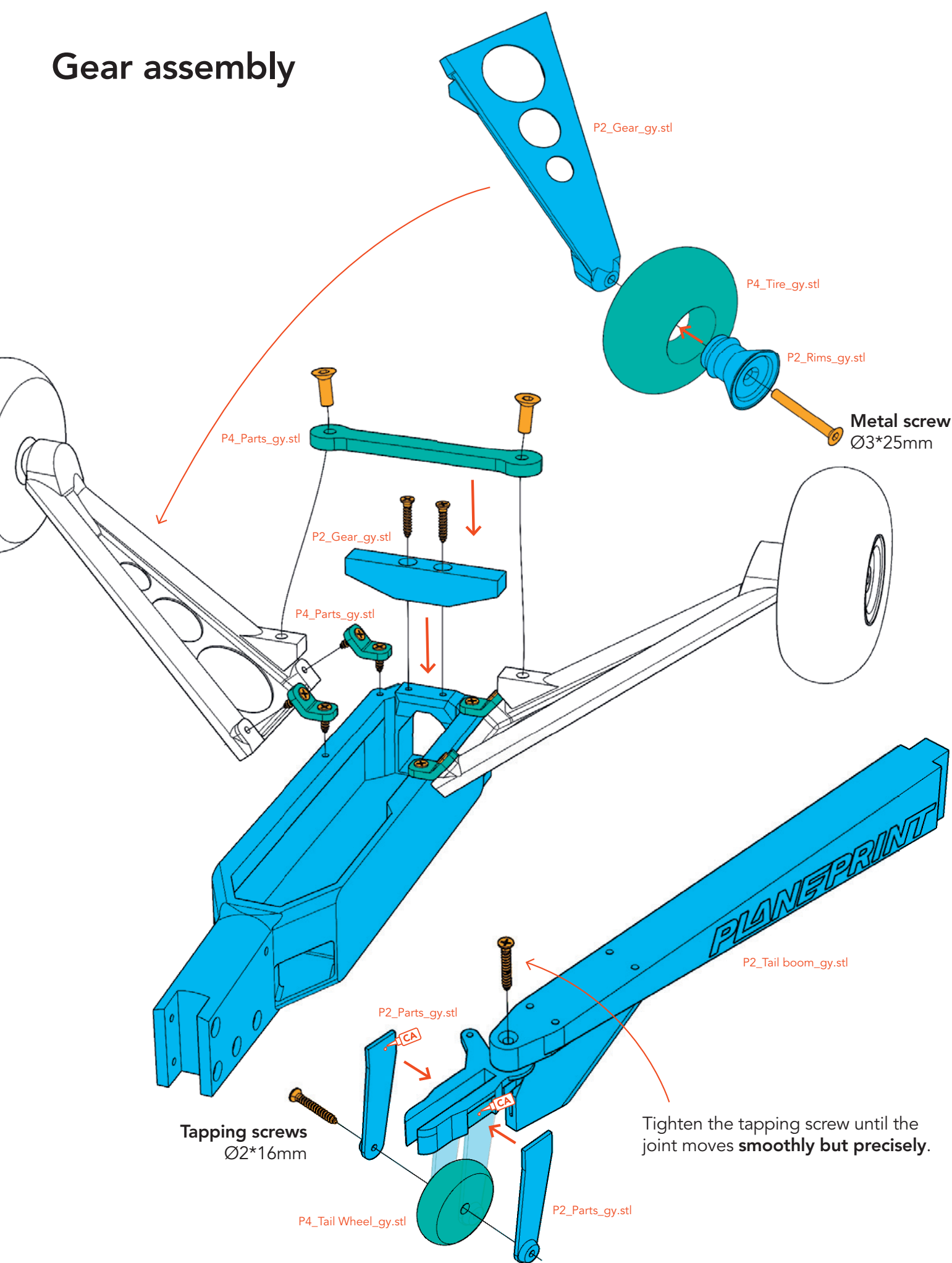
Make sure all Ball bearings
moves smoothly after assembly.



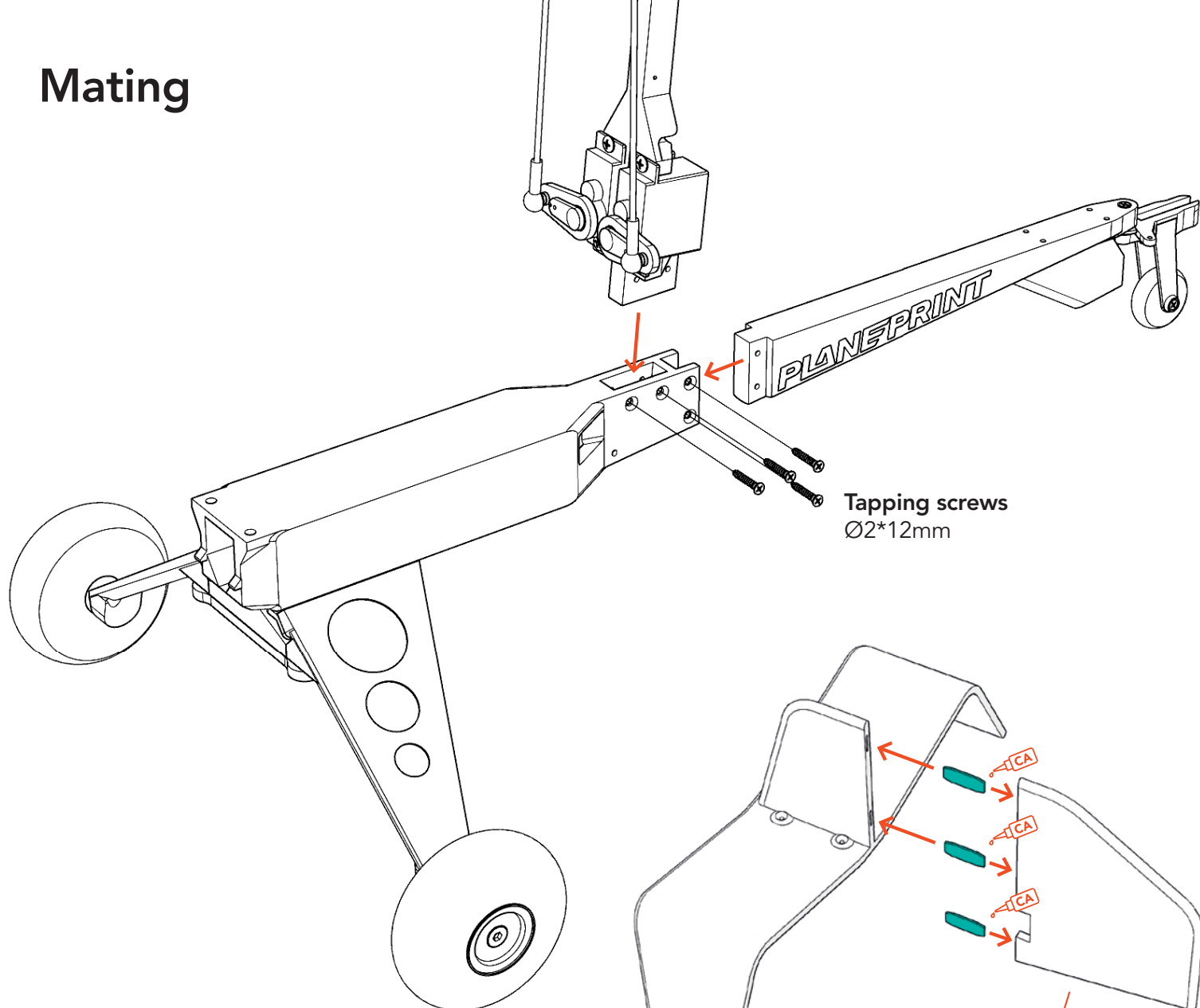
NOTE the angle of the **Rotor Joint** must be aligned **exactly** like this in this position!



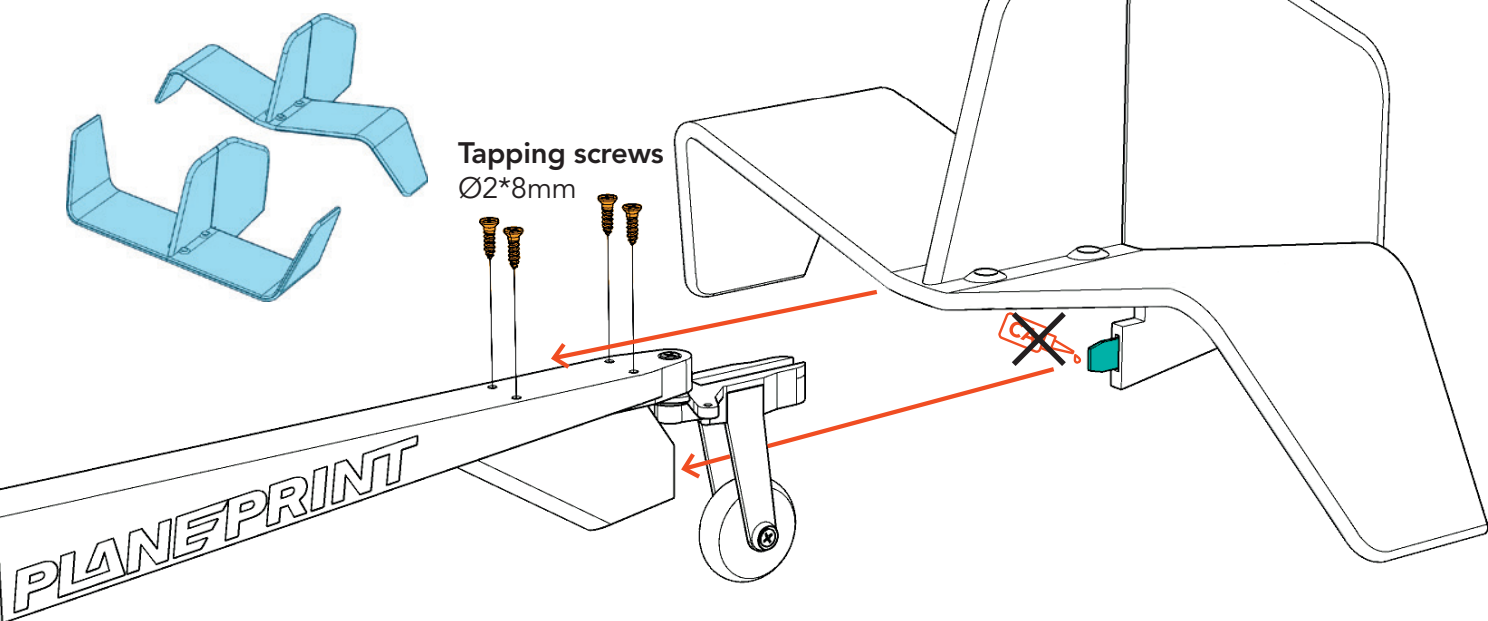
Gear assembly



Mating

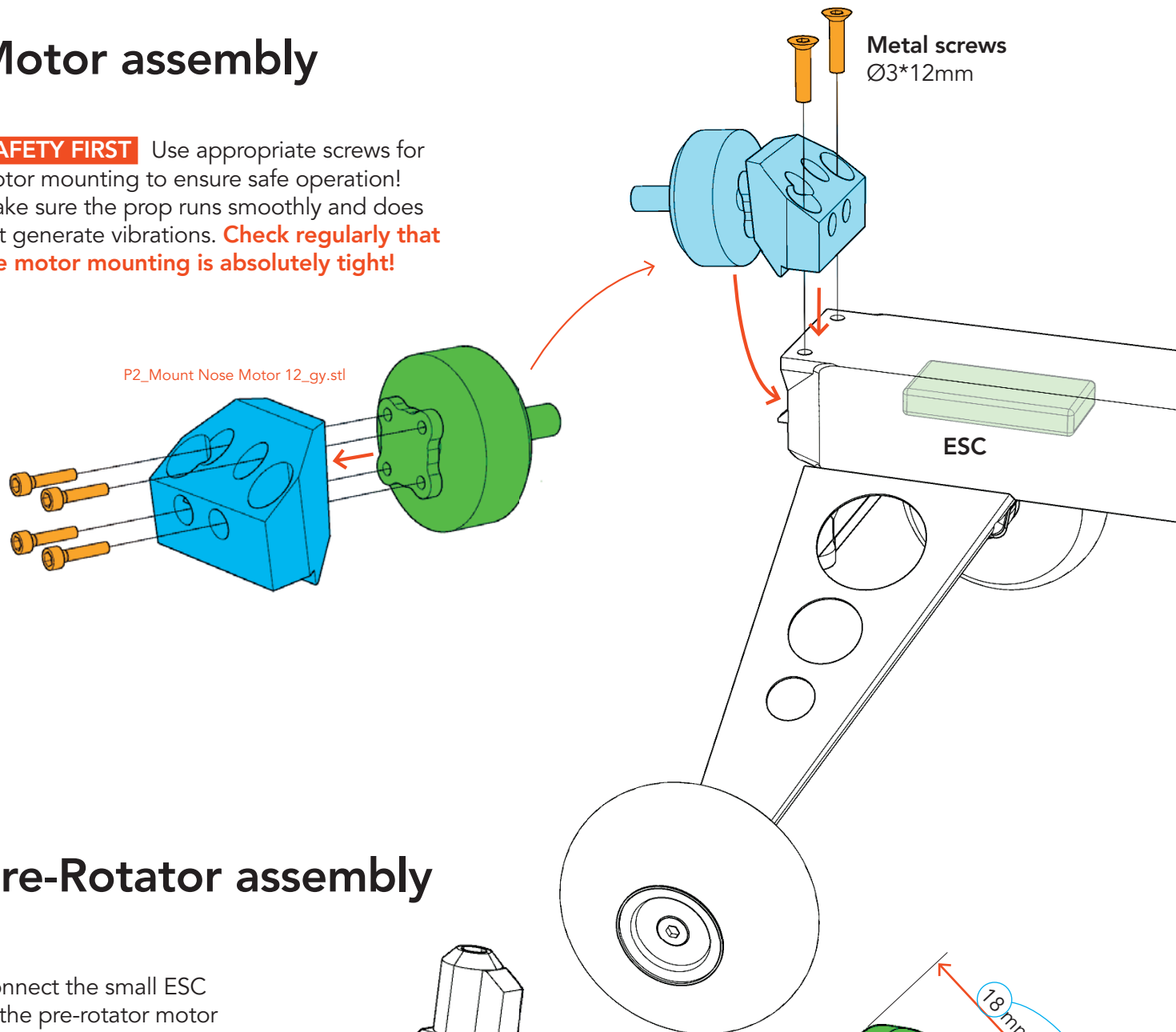


You have two different tail planes to choose from; you can use whichever one you prefer, they don't make any difference in terms of flight performance.



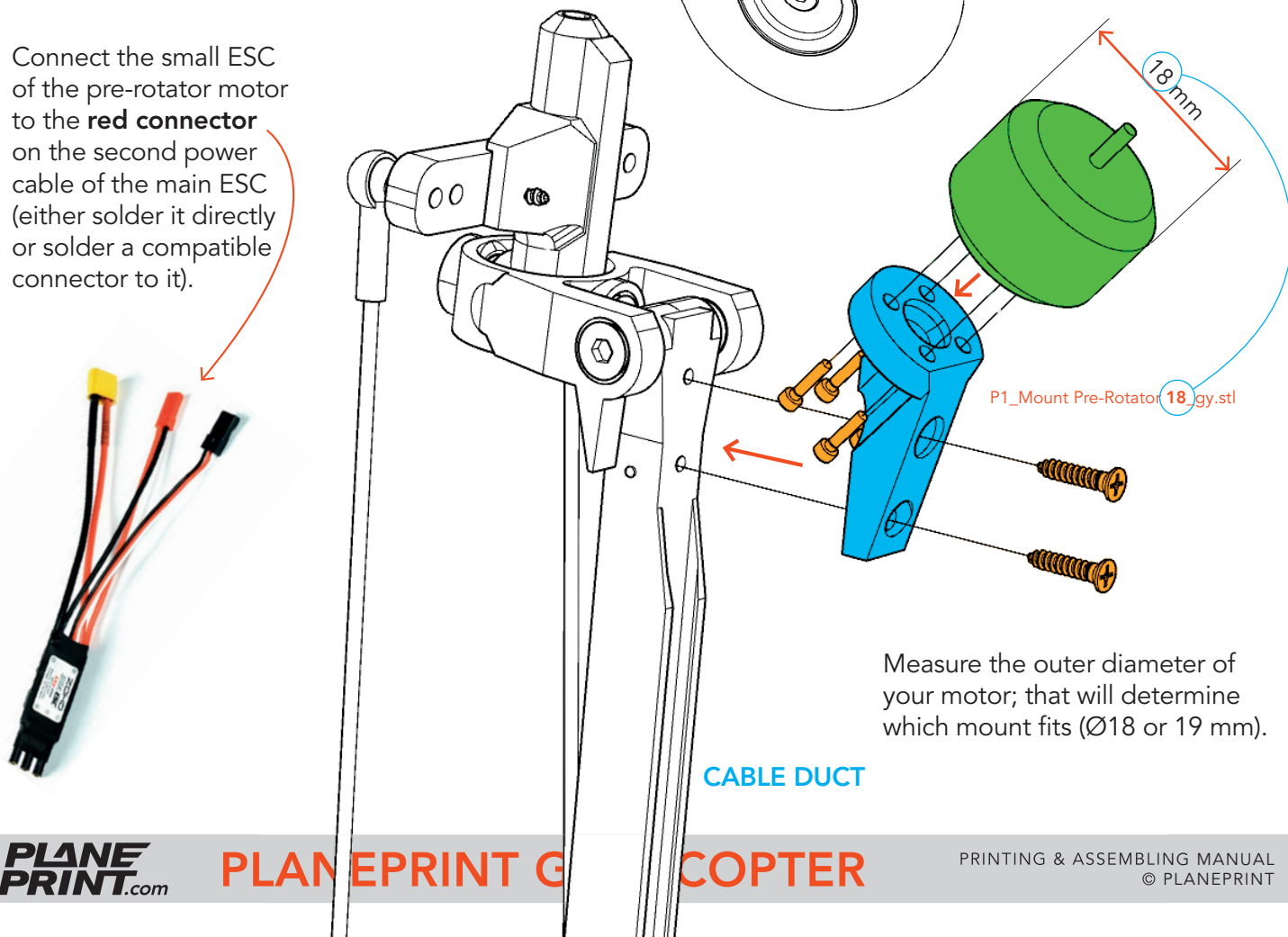
Motor assembly

SAFETY FIRST Use appropriate screws for motor mounting to ensure safe operation! Make sure the prop runs smoothly and does not generate vibrations. **Check regularly that the motor mounting is absolutely tight!**



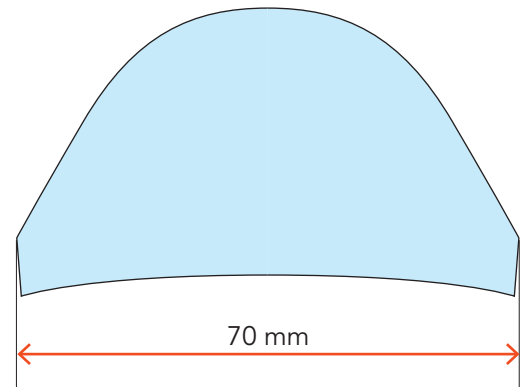
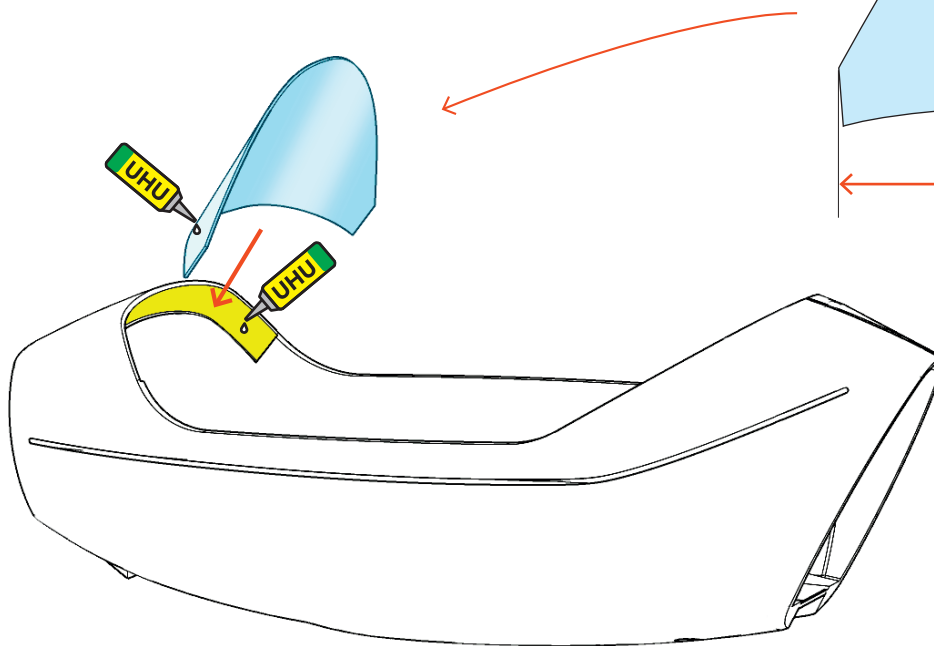
Pre-Rotator assembly

Connect the small ESC of the pre-rotator motor to the **red connector** on the second power cable of the main ESC (either solder it directly or solder a compatible connector to it).

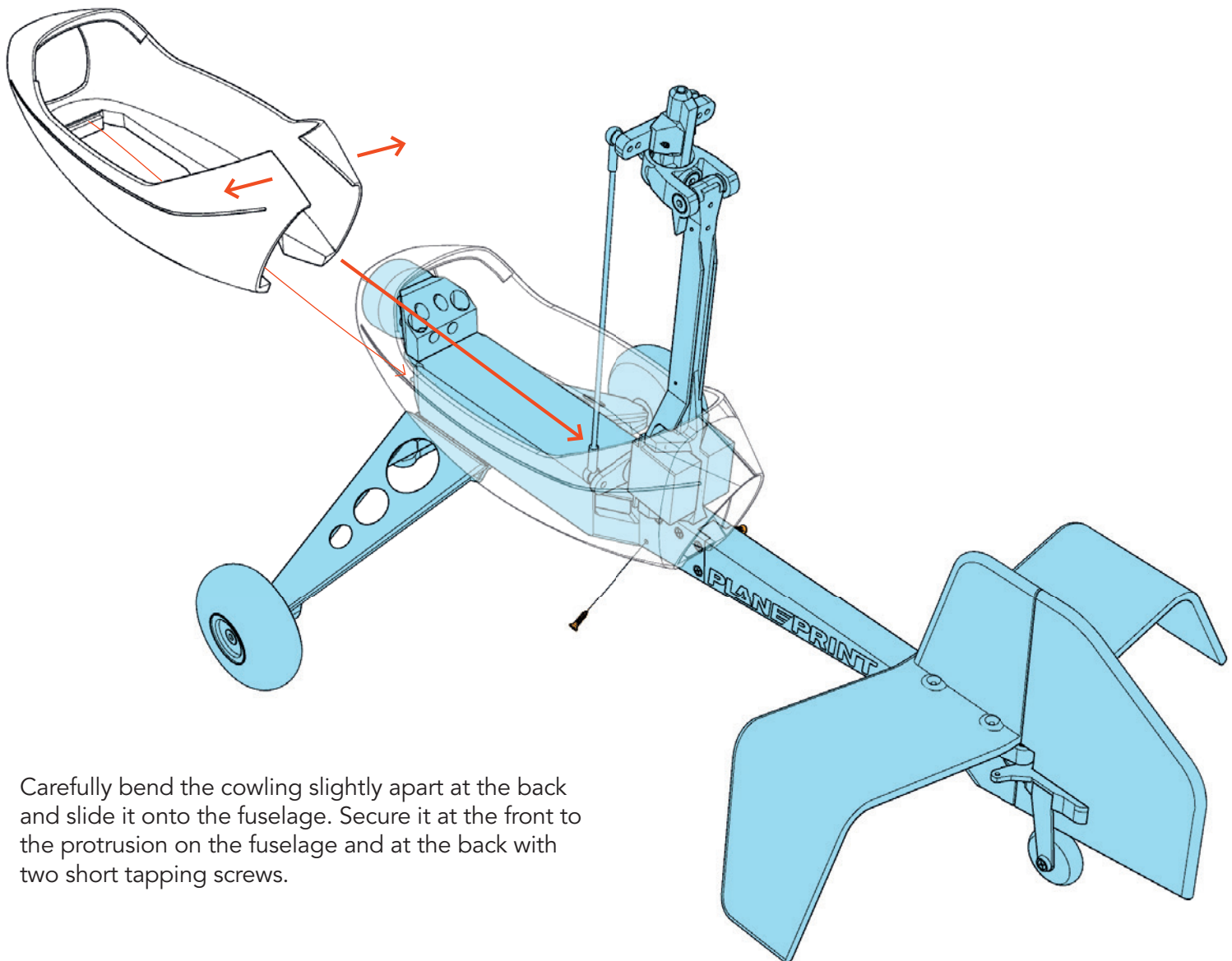


Cowling

The Windshield is optional and can be omitted.

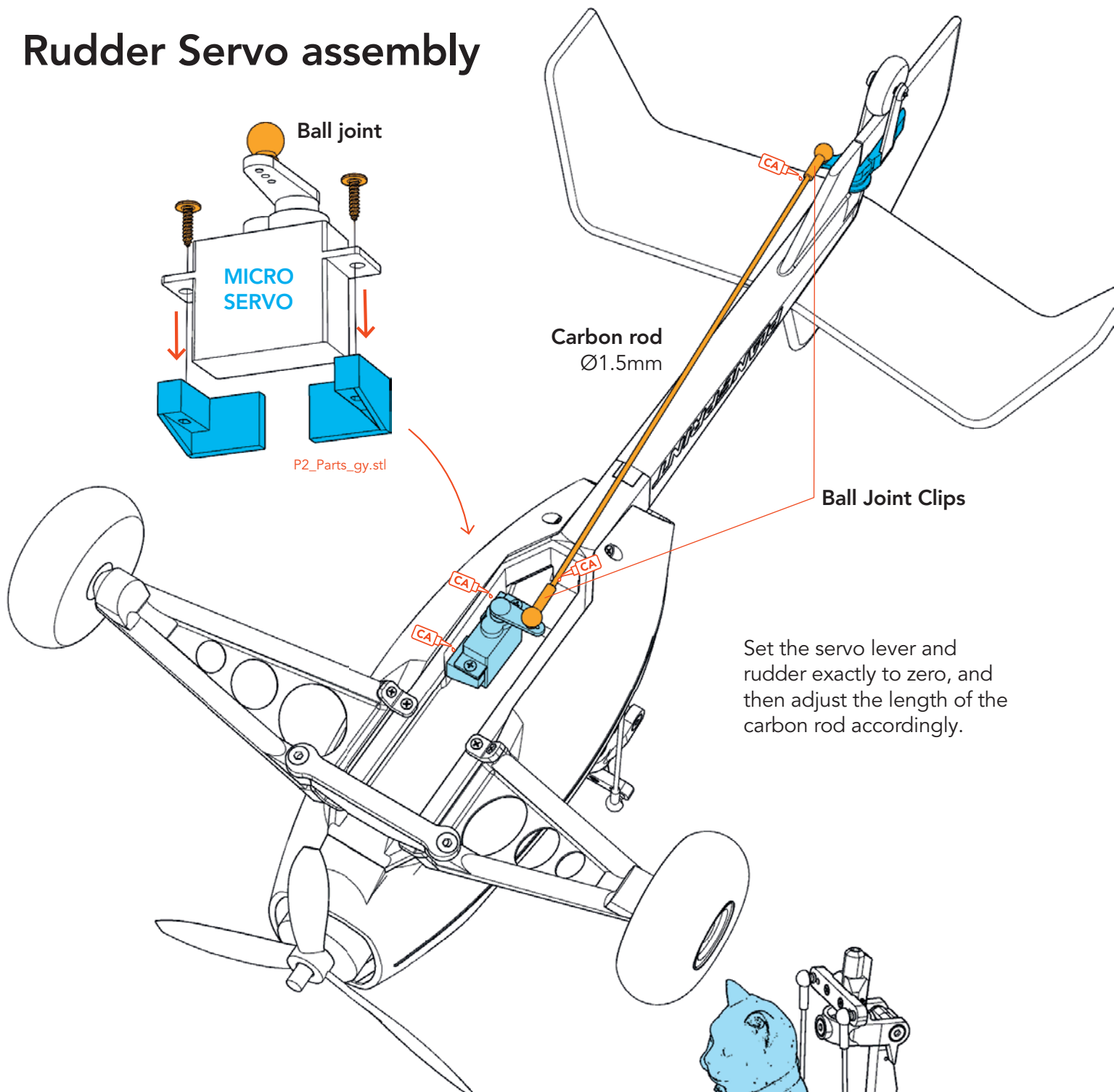


Apply contact adhesive to the windshield and cowling and let it dry. Then you can insert the film and press it into place.



Carefully bend the cowling slightly apart at the back and slide it onto the fuselage. Secure it at the front to the protrusion on the fuselage and at the back with two short tapping screws.

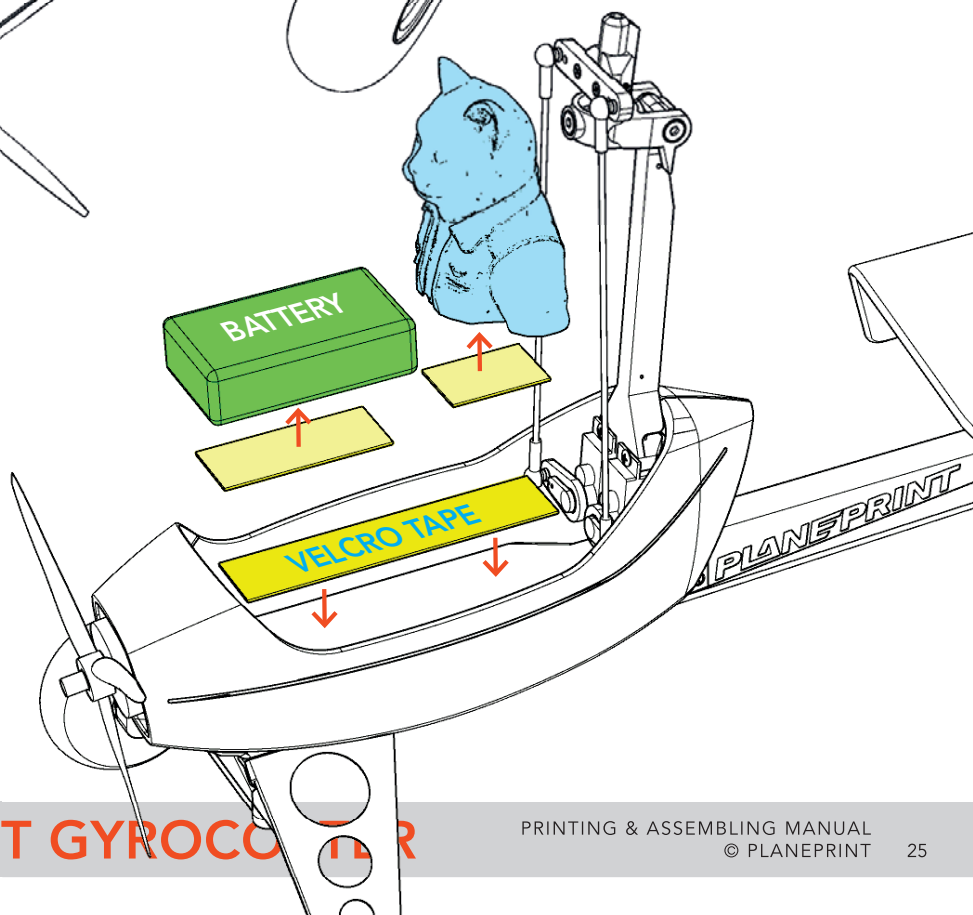
Rudder Servo assembly



The **battery** and **pilot** are secured with **self-adhesive Velcro**.

There are openings on the sides of the fuselage for the ESC cable.

TIP If your battery is too large, you can pull the pilot under the build plate by the thickness of the battery while slicing and print only the head. You can attach the head directly to the battery with Velcro or leave it off altogether.



PLANEPRINT *Gyrocopter*

Technical specifications

ROTOR CIRCLE 600 mm/23.6 inches

LENGTH 390 mm/15.3 inches

FLIGHT WEIGHT 330 g

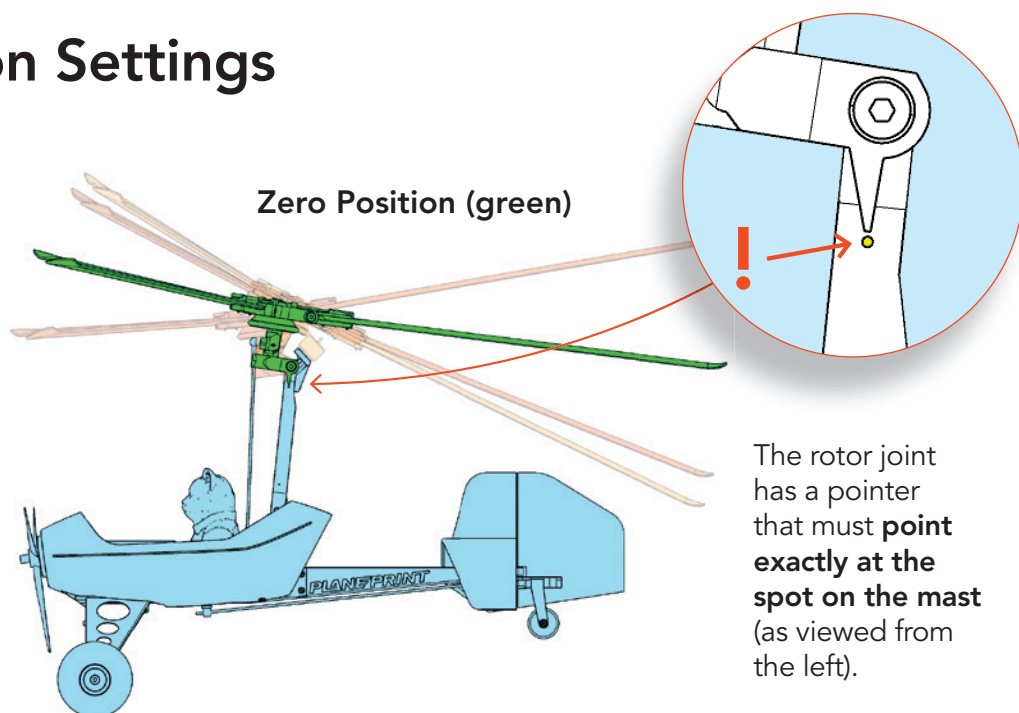


Control Direction Settings

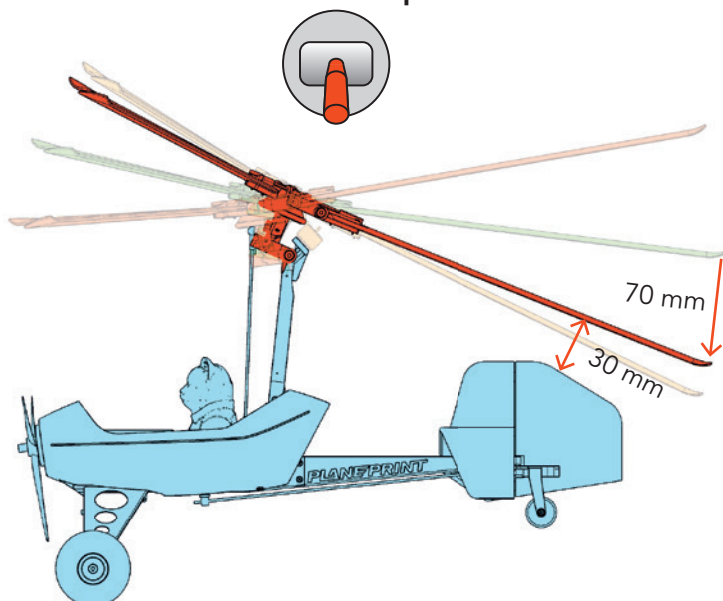
Mix the two **Servos** on the **rotor** as shown in the pictures in your remote control.

The **maximum travel** is the **same for both the elevator and aileron** functions and, measured at the blade tip, is **70 mm (2.75 inches)** up or down from the zero Position.

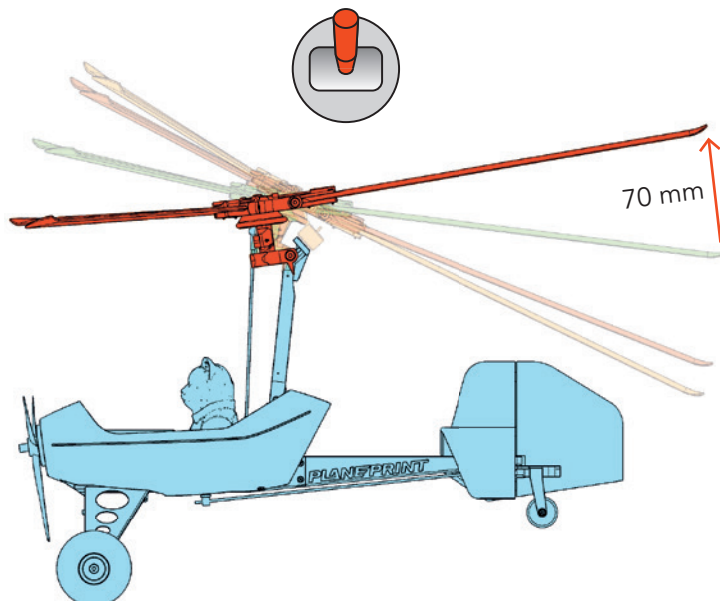
If you have installed the pre-rotator motor, make sure it does not touch the O-ring with these settings!



Elevator up

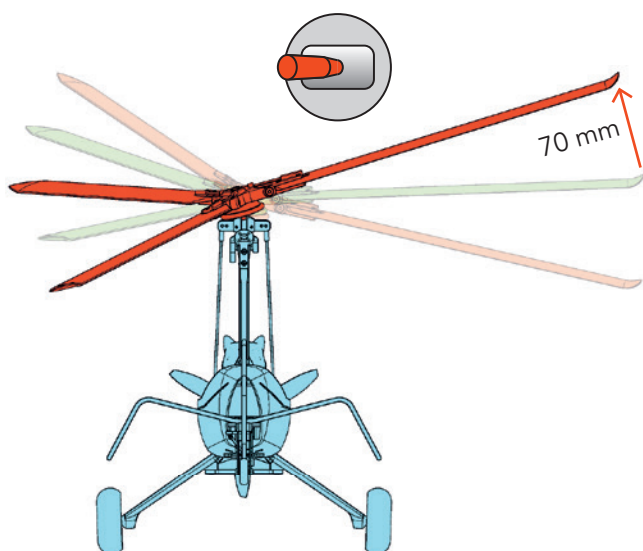


Elevator down

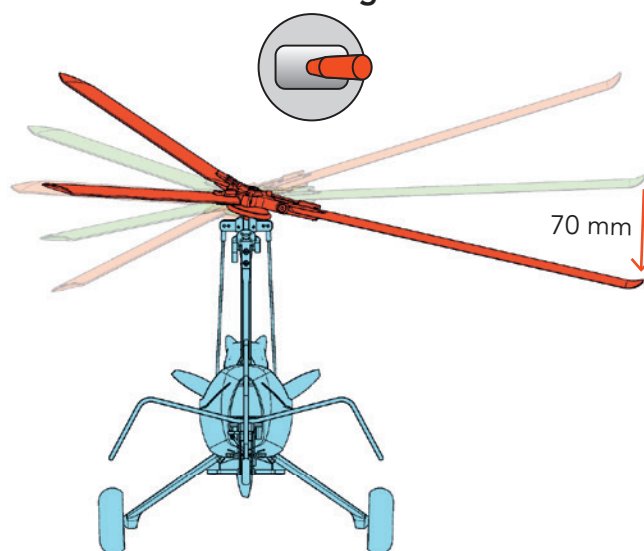


Aileron left

View from behind



Aileron right

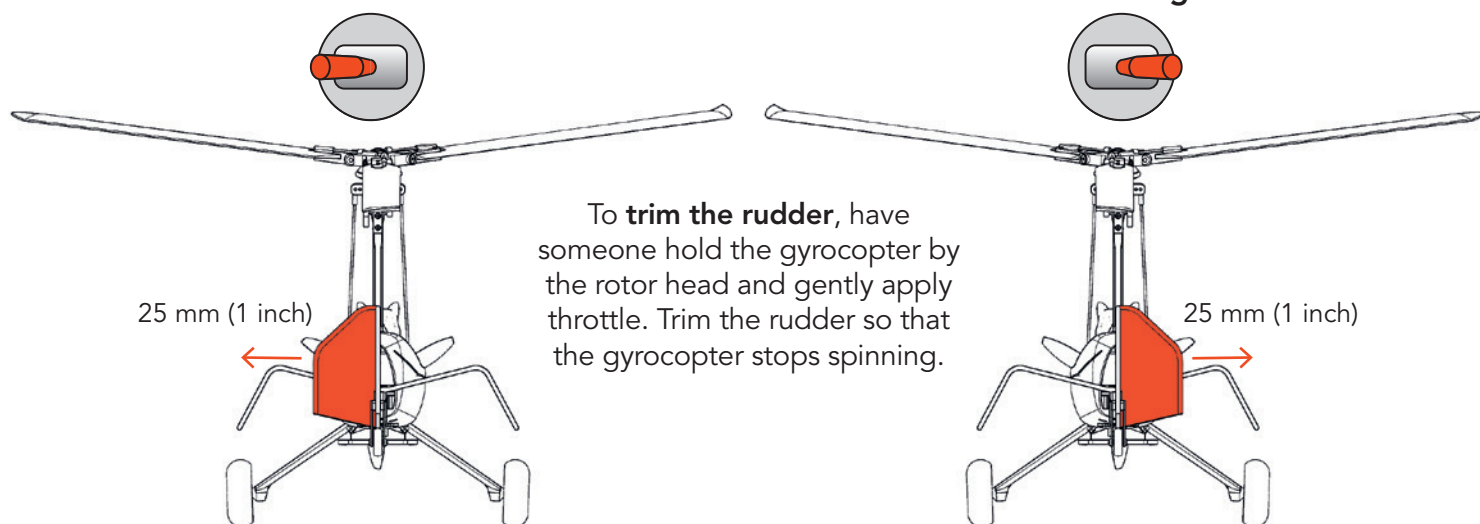


Control Direction Settings

Rudder left

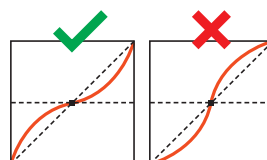
View from behind

Rudder right



Expo setting

AILERON 40 % **ELEVATOR** 40 % **RUDDER** 0 %



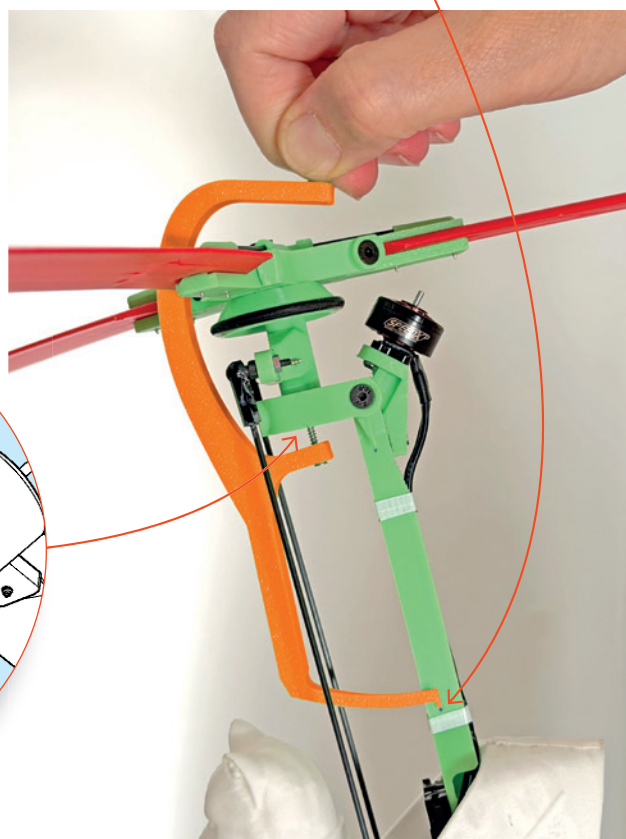
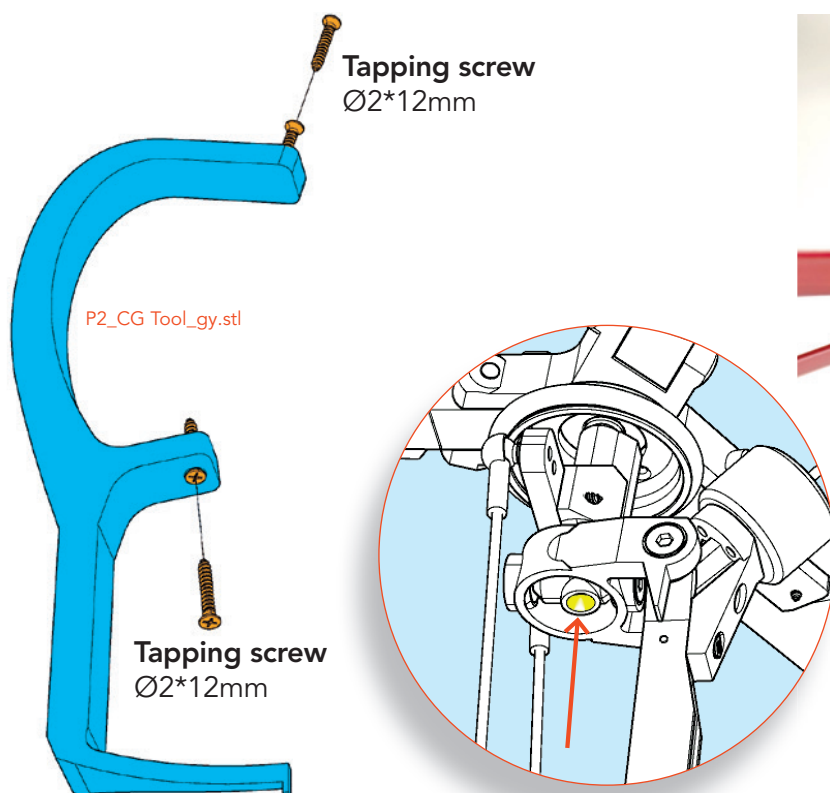
(for some remote controls a minus has to be in front of the number)

Center of Gravity (CG)

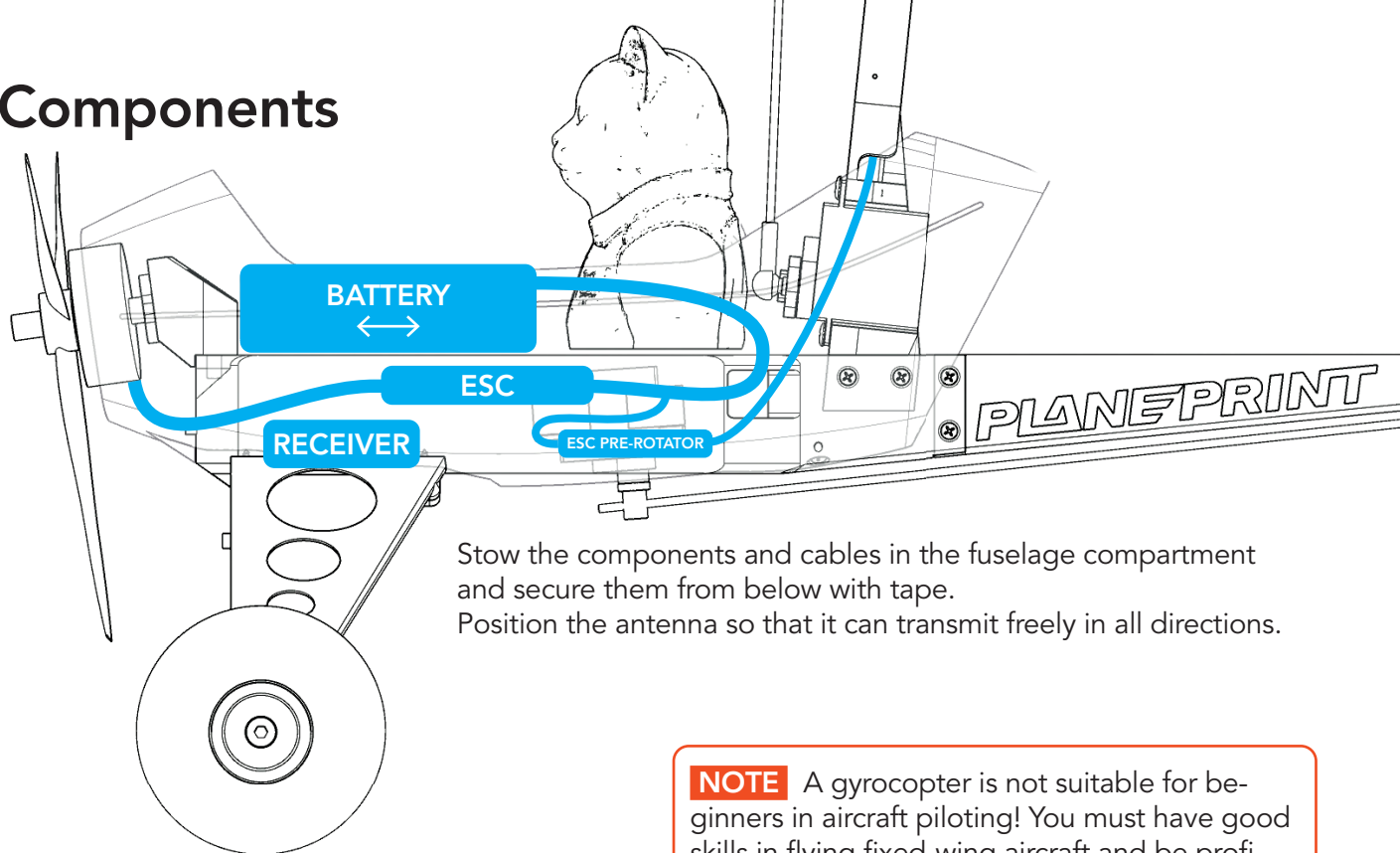
The correct CG is especially important for a gyrocopter!

Use the CG tool as shown in the picture. The pointer at the bottom must align with this **Dot** on the mast. Adjust the position of the battery until the center of gravity is set correctly.

NOTE The Remote Control must be turned on during measurement so that the rotor joint is properly aligned.



RC Components



Stow the components and cables in the fuselage compartment and secure them from below with tape. Position the antenna so that it can transmit freely in all directions.

NOTE A gyrocopter is not suitable for beginners in aircraft piloting! You must have good skills in flying fixed-wing aircraft and be proficient in actively using the rudder during turns.

How do I fly a Gyrocopter?

TAKEOFF (Version **without** pre-rotator)

The **PLANEPRINT Gyrocopter** is best launched from a grass runway with a moderate headwind.

In moderate winds, the gyrocopter can be launched without a pre-rotator motor by holding it (preferably by the gear) into the wind until the rotor spins fast enough that it starts to “sing” (you can hear this in our video). Then carefully position it against the wind and accelerate with the elevator stick slightly pulled back.

Once the rotor has built up enough speed, the gyrocopter will lift off gently; then you can ease off the elevator slightly and fly normally. **Don’t make the mistake of taking off with too little rotor speed** – this will inevitably cause the aircraft to veer to one side.

FLIGHT Use the throttle gently and avoid sudden changes in throttle input.

When **flying turns**, it’s very important to **actively use the rudder** to help steer! This is similar to how a helicopter uses the tail rotor for input. Since **the aircraft’s attitude is often difficult to discern**, **be sure not to fly too far away** so you can always maintain good situational awareness.

Since it will likely happen more often at first that the gyrocopter tilts to one side during takeoff or landing and a rotor blade makes contact with the ground, you should **always** carry a few spare rotor blades with you.

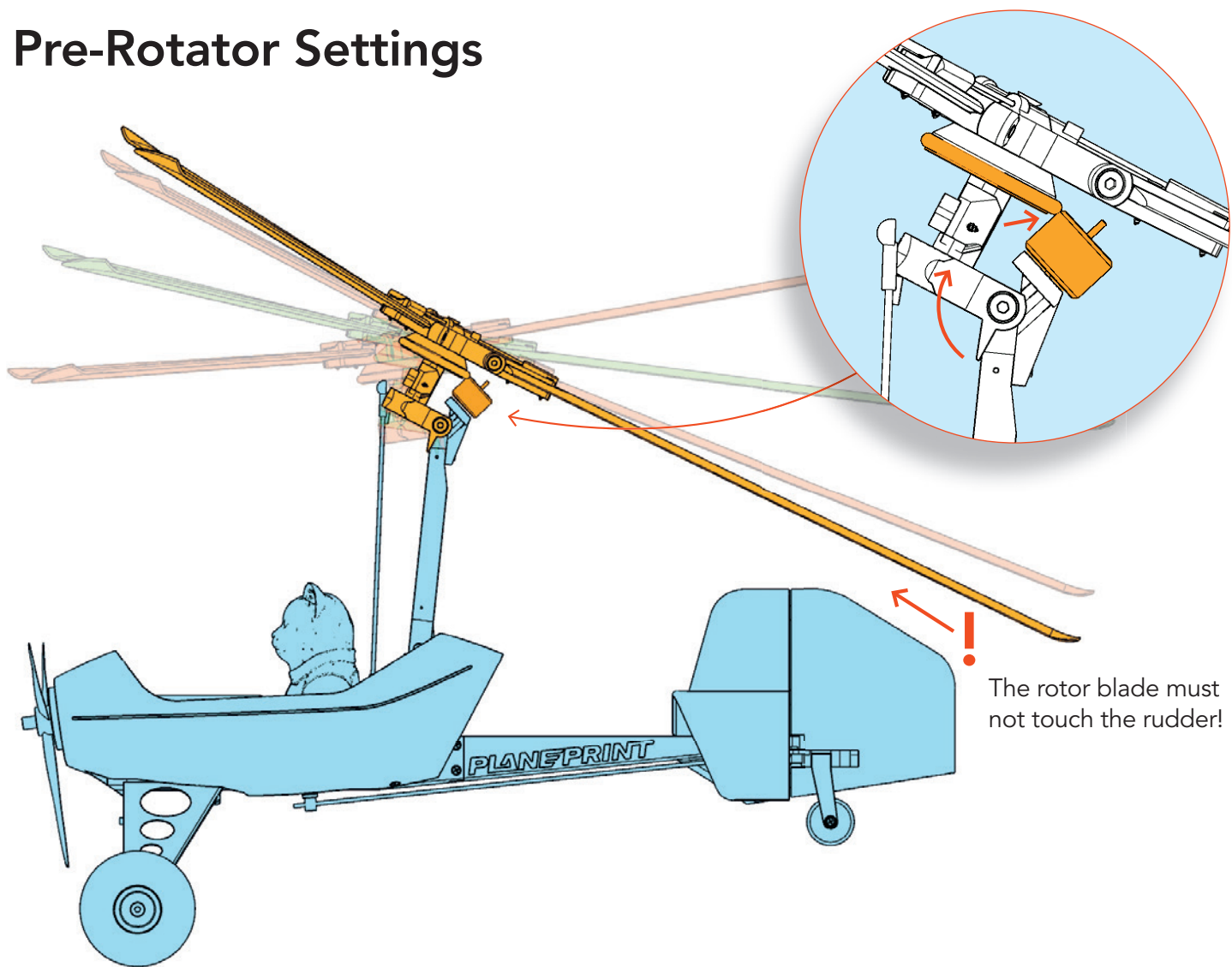
SAFETY ALWAYS COMES FIRST:

Please be aware that you are responsible for ensuring that the rotor **blades are printed with good layer adhesion and the appropriate filament!**

After **every** flight, check whether the rotor blades are still **completely** intact and **replace them immediately, even if they show only the slightest damage!** **Never** hold the rotor in such a way that you or someone else could be struck by a flying rotor blade!

LANDING For a soft landing, fly – against the wind, of course – with little throttle, and the gyrocopter will descend at a relatively steep angle. Just before touching down, pull the elevator stick back significantly one last time. Use gentle throttle inputs to control the optimal flare angle.

Pre-Rotator Settings



To bring the rotor up to a certain speed during **takeoff in calm conditions**, move the rotor back in the **"start"** position until the O-ring touches the motor bell.

We recommend programming a separate Flight Mode named **"start"**: Define a **switch** – or, better yet, a **pushbutton** – that allows you to trim the elevator function separately. Pull the **elevator stick all the way back and** hold down the pushbutton (to activate the **Flight Mode "start"**), **then** trim the elevator back just enough so that the O-ring **gently** touches the motor (**not too tightly, or the motor will seize up!**)

Then **program the ESC of the pre-rotator motor** so that, when **"start"** is activated, it slowly accelerates from zero to a very low RPM (approximately 15% of full throttle). When the Pushbutton Start **"start"** button is released, the engine must stop again.

TAKEOFF WITH PRE-ROTATOR Give the rotor a **little spin by hand** to protect the motor. Then **pull the elevator stick all the way back** and press the pushbutton for the **"start"** flight mode. The motor will accelerate the rotor for a few seconds until you hear the rotor **"sing"**. Now release the **"start"** button and initially accelerate the gyrocopter with the **main engine at half throttle**. Pull the **elevator stick all the way back** to continue increasing the rotor speed. Slowly increase the throttle, and **when the gyrocopter takes off, return the elevator to the zero position** (you should not do any of this abruptly).

NOTE Unfortunately, there are no motors that run very slowly on 3S, so the gear ratio between the rotor and the motor isn't optimal. But this is the simplest technical solution. **It's important to make sure that the pressure between the O-ring and the motor housing isn't too high, so that the motor never seizes up (which can cause damage to the motor or ESC!)**

AGE RECOMMENDATION 14+

**NOT FOR CHILDREN UNDER 14 YEARS.
THIS IS NOT A TOY!**

The STL data (or data processed from it, such as G codes) must never be passed on to third parties!

The purchase of the STL does not authorize the production of models for third parties.

By using the download data, an RC model airplane, called „model“ for short, can be manufactured using a 3D printer. As a user of this model, only you are responsible for safe operation that does not endanger you or others, or that does not damage the model or property of others.

PLANEPRINT.com assumes no responsibility for damage to persons and property caused by pressure, transport or use of the product. Filaments, printing supplies, hardware or consumables that can not be used after faulty 3D printing will not be replaced by PLANEPRINT.com in any way.

When operating, always keep a safe distance from your model in all directions to avoid collisions and injuries.

This model is controlled by a radio signal. Radio signals can be disturbed from outside without being able to influence it. Interference can lead to a temporary loss of control.

Always operate your model on open terrains, far from cars, traffic and people.

Always follow the instructions and warnings for this product and any optional accessories (servos, receivers, motors, propellers, chargers, rechargeable batteries, etc.) carefully.

Keep all chemicals, small parts and electrical components out of the reach of children.

Avoid water contact with all components that are not specially designed and protected. Moisture damages the electronics.

Never take an item of the model or accessory in your mouth as this can lead to severe injuries or even death.

Never operate your model with low batteries in the transmitter or model.

Always keep the model in view and under control.
Use only fully charged batteries.

Always keep the transmitter switched on when the model is switched on.

Always remove the battery before disassembling the model.

Keep moving parts clean and dry at all times.

Always allow the parts to cool before touching them.

Always remove the battery after use.

Make sure that the Failsafe is properly set before the flight.

Never operate the model with damaged wiring.

Never touch moving parts.

We develop our models to the best of our knowledge and belief.
We accept no liability for consequential damage and injuries caused by improper use or incorrectly printed parts. **Please be careful when handling motors, batteries and propellers** and only move your model with insurance and in approved places!

PLANE PRINT