OWLplane.com

ST1 OWL

User Guide

Rev. 1.2

Print Your Plane As Many As You Like

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OWLplane 3D Printed Models

Thank you for your interest/support/purchase of our RC Flying Models. It is all started in 2108 with the introduction of 3D Printer Technology (becoming our hobby). After having understand much with the technology, we continued creating and developing RC Flying Models. Once we feel that the designed Models are fun to fly, easy to assembly, acceptable strength and weight, it is time to share and introduce the Models to the market.

We believe that 3D printing technology will continue to grow supporting and becoming part of aeromodelling hobby. Certainly, it is not merely without challenges. Printing single perimeter on a CAD design to come up with a strong and light 3D printed object is not easy since most available filaments in the market still having too high in their density (comparing to the final result of airplane model in traditional aeromodelling hobby). Fortunately, there is filament manufacturer that producing a lightweight filament. It is called LW-PLA. Comparing to final printed PLA density, it is very promising to 3D printed aeromodelling hobbyist. Unfortunately, it is still not widely available yet in the market to purchase and also relatively having high price tag.

Another issue in 3D printed aeromodelling is that it is also quite challenges when assembling the parts. It really depends on how the designer come up with his/her 3D model creation. The designer also needs to consider the total weight produced when designing the plane without sacrificing simplicity and easiness when assembling the parts. Here is the list of challenges but not limited to when designing a 3D printed plane:

- Material Density and Other Characteristics (Filament types and its characteristics)
- Printer Capability Delivering Printed Object (Printer and its technology used)
- Single Parameter Printing Technique (Slicer capability)
- Design Factor (CAD Model itself)

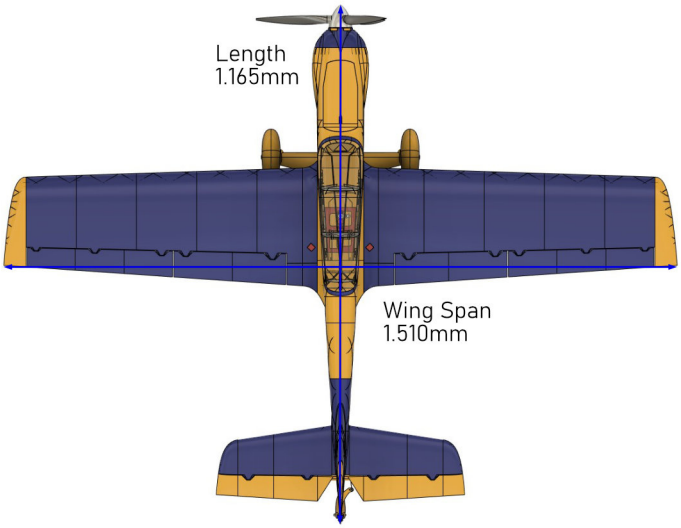
We understand the challenges but will always try to improve and find the best solution. It is understood that this new hobby still have much room of improvement. It will be never end since the hobby itself always seeks for improvement and new things anyway. So far, we are very happy with our design after we feel finding the optimal result printing with available widely used filaments such as PLA, ABS, ASA and HIPS. It does not mean that OWLplane does not support LW-PLA. For sure, printing with LW-PLA always deliver less weight but to go down reducing weight up to 30%, we do not need LW-PLA, replace your Nozzle to 0.3mm and it will rock the results ! The following are what would you expect to have in downloadable file emailed to you:

1. STL files.
2. G-code using PLA type filaments with Prusa i3 Direct Driver and/or Bowden type Printer.
3. ideaMaker, Cura and S3D OWLplane Profile files for 0.3mm and 0.4mm Nozzle.
4. Instruction Manual Documents.
5. Motor Mount, Servo Cover and/or Servo Bridge STEP files for you to customize whenever necessary (subject to the plane model).

HAPPY AND SAFE FLYING

ST1 OWL

Specification



Wing Loading : 58.0 - 65.2 gr/dm^2.

AUW/Flying Weight : 2.000 - 2.250 gr (with battery 2200mah 4s).

Wing Area : 34.5 dm^2.

Wing Cube Loading (WCL) : 10.5 - 11.1.

Flight Performance Category : Sport Aerobatic.

Radio Channels : Throttle, Aileron, Flap, Elevator and Rudder.

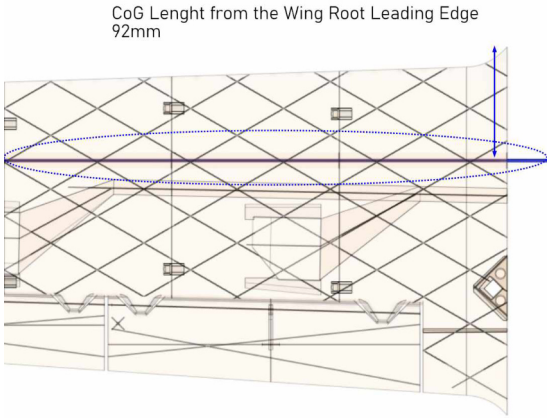
Length : 1.165mm.

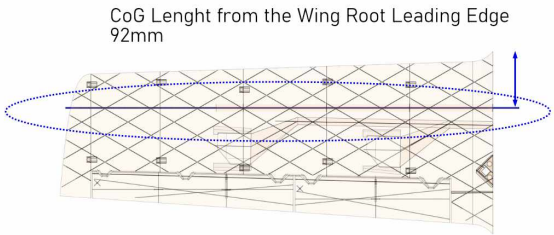
Wing Span : 1.510mm.

Click here if you would like to know about WCL (comparing how easy to fly the plane best described by utilizing WCL instead of Wing Loading. The plane with the same Wing Loading is easier to fly with higher Wing Area than smaller one). It can be best desribed by WCL value.

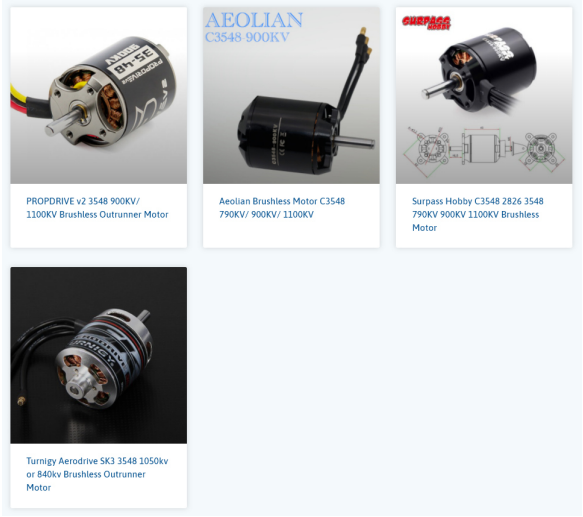
Center of Gravity (CoG)

CG is 92mm from Wing Root Leading Edge.During maiden, it is safe to have CG around 92mmm or exactly on the spar. After that, you may want to adjust it as per your preference CoG. It is already considered if miss by couple millimeter.





Recommended Setup



Motor Options : 3548 with 790KV/900KV/1100KV motor type (already tested it with 900KV, should work also with 790KV - 1100KV, see options above but not limited to).

Servo Options : 17gr Servos (see some options above but not limited to).

ESC Options : ESC with 60A, just pick your favorite ESC but make sure that rated at least 60A.

Propeller Size: depending on your motor KV. For 900KV above, tried with 12x6 and also 11x7, it works great.

Battery Size : LiPo 4s 2200ma - 3300mah.

Tools and Materials

- **Printer, in general** 200mm x 200mm x 200mm (W x L x H) for all OWLplane Models.
- **Filament such as** PLA, ABS, HIPS and ASA (do not use silk PLA, it tends to be very weak in layer to layer adhesion).
- **CA glue with** accelerator. Use thick glue to join surface to surface. Use thin CA glue for coating the joint surface areas.
- **Velcro sticker/polyester hook** and loop peel-n-stick self-adhesive for locking the battery.
- **Fine sandpaper.**
- **Sharp knife.**
- **Screwdriver and/or allen** wrench for chosen screws/bolts.
- **Pliers, Needle-Nose** Pliers, Nippers.
- **Steel bolt cutter.**
- **Dremel/Rotary Tool for** cutting carbon fiber tubes and rod with more than 2.5mm.
- **Electric drill, its** drill-bit size from 1.5mm - 5mm and step cone drill.
- **Propeller shaft reamer** or hole puncher reamer.

Hardware Needed

For Fuselage, Canopy and Hatch:

- M3 x 0.5mm thread x 12mm screws with their washers for outrunner motor to motor mount wall - 4x.
- Self tapping screw M3x20mm or M2.5x20mm with their washers for mounting motor wall to the fuselage (Fuselage - N0) - 6x.
- 4mm OD and 63mm steel long shaft for main wheel axles - 2x.
- Landing gear wheel stop set collar 9x4.1mm for main wheel axles - 4x.
- 2.0mm OD and 32mm steel long shaft for tail wheel axle - 1x.
- Landing gear wheel stop set collar 9x2.1mm for tail wheel axles - 1x.
- Ballpoint pen springs for Canopy and Hatch - 2x.

For Wings (excluded control surface):

- 3D printed wing and fuselage pin left and right - 2x.
- 1mm OD aluminum wire with about 40mm length- 2x.

For Elevon, Stabilizer and Elevon Servos:

- 1.5mm - 2mm OD rod for creating flap, aileron, elevator and rudder hinges (ER308L - TIG Stainless Steel Rod).
- 1.5mm - 2mm OD rod for flap, aileron, elevator and rudder pushrod (ER308L - TIG Stainless Steel Rod).
- Landing gear wheel stop set collar 9x2.1mm for flap, aileron, rudder and elevator - 6x.
- Linkage stopper D2.1mm for for flap, aileron, rudder and elevator - 6x.
- 2.0mm-2.5mm OD shaft for creating pins connecting two parts for aileron, flap and stabilizer.

Setup for Servo Travel/Throw

Suggested setup for medium travel/thrown are depicted below and you may adjust the setup according to your need.

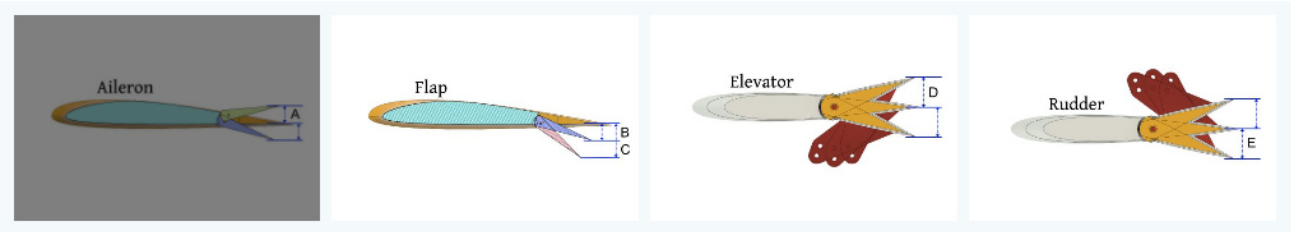
Aileron A = 12-15mm.

Flap B = 15 - 20mm.

Flap C = 35 - 45mm.

Elevator D = 12 - 15mm.

Rudder E = 15 - 20mm.



3D Printed Motor Mount, Propeller Spinner, Collet and Spar

Motor Mount Requirement

Motor mount wall should be 3D printed with more heat resistance filaments such as ABS, ASA or HIPS. If your 3D printer does not have enclosure you may want to try with PETG filament (more heat resistance than PLA/PLA+). In case you still would like to use PLA, please do annealing process (not sure can do for standard PLA), some successful with HT-PLA/Hight Temp-PLA. Click here for you to read about annealing article.

Propeller Spinner and Collet Requirement

OWLplane does not provide STL file for printed propeller spinner due to our concern about strength, shape and uniform weight when spinning at high speed. Not all 3D Printer has really free of skew issues for all their axes. The skew issue generates uneven shape that will lead to problem when spinning. Good spinner should be available in your local hobby store or online store, even that spinner, you still need to balance it before using it.

ST-1 OWL Spinner and Collet Requirement :

1. 50mm Diameter Size Spinner.

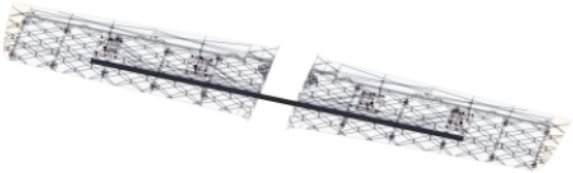
2. 5mm or 4mm Shaft Propeller Colet (check your purchased motor shaft to pick the right size propeller colet).

Please watch the following Videos to balance your Propeller and Spinner:

- Youtube Video Part #1.
- Youtube Video Part #2.
- Youtube Video Part #3.

Spar Requirement

ST-1 OWL uses 1 x “12mm OD – 1000mm Long” Fiber Carbon Tube as Spar.



AGE RECOMMENDATION 14+

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

By using our download files, an RC Model Airplane can be manufactured using a 3D Printer from our Model Design.

By purchasing our Model Design, you are responsible for safe operation that does not endanger you or others, or that does not damage property of others.

OWLplane assumes no responsibility for any damage to persons and property caused by related the usage of our Model Design.

Filaments, printing supplies, hardware or consumables that can not be used after faulty 3D printing will not be replaced by OWLplane in any way.

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

The RC Model Airplane 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 to minimize risk.

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 children reach.

Avoid water contact with all components that are not specially designed and protected. Moisture can damage 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 RC Model Airplane.

Always keep the RC Model Airplane in view and under control.

Always keep the transmitter switched on when the RC Model Airplane is switched on.

Always remove the battery before disassembling the RC Model Airplane.

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.

Contact Us:

FB - https://www.facebook.com/OWLplanePilot

Instagram - https://www.instagram.com/owlplanepilot

Youtube - https://www.youtube.com/channel/UCdmaSQaqYB1TcjppIqmr1FA

E-mail - dolly.siregar@OWLplane.com

Please note that the models have potential risks altough we create our models to our best of knowledge and belief. We accept no liability for consequential damage and injuries caused by improper use. Be careful when handling motors, batteries, EDF, propellers, etc. and make sure you play in under safe environment.

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We believe you will respect and support our work, please do not share the STL files.