My Balsa & Glass Workshop

X-100 Infinity Wing V2 3D Print/Build Description

Updated as of 18 March 2026

Well, it finally happened. Given that I had my new 3D printer up and running, it was only a matter of time before I would venture into ***an attempt***> at building a 3D printed RC airplane model. And to beat all, it is yet another electric powered RC model, which as you know from my other builds is out of the normal for me.

I started my web search for something that was an unusual design, not a large RC airplane model (15 - 40 size), ***something I would not attempt using balsa and plywood*** and was not something with a hundred pieces to print out. Using these requirements, I found a very nice website that had just what I was looking for, and that being the **X-100 INFINITY WING V2,** a 3D printable model designed by Eric Haddad.

The X-100 Infinity Wing is a 3DAeroventures (https://www.3daeroventures.com/infinitywingv2) original, designed by Eric Haddad, which features a very unique wing configuration that is rarely modeled and seldom seen in full-scale aircraft. Sometimes called a closed wing, joined wing or box wing, this configuration's unique wing tip design not only has structural benefits, but is expected to come with some aerodynamic advantages, namely the reduction of wingtip vortices. Wingtip vortices form a major component of wake turbulence and are associated with induced drag, which is a significant contributor to total drag in most aircraft. The previous sentence is just science-y aerodynamics talk for: **"It flies really nice."**

X-100 INFINITY WING V2 Model Specifications:

Aircraft Type: Flying Wing

Wingspan: 1,270mm / 50"

Length: 879mm / 34.6"

Height: 242.5mm / 9.5"

Wing Area: 437.5 in^2 / 3.04 ft^2

Wing Loading (LW-PLA Hybrid): 13.3 oz/ft^2

Wing Loading (PLA): 17.6 oz/ft^2

Flight Performance Category: General Sport and Scale Aerobatics

Center of Gravity Location: 45mm in Front of Trailing Edge at the Wing Root

Weight of Printed Parts (LW-PLA Hybrid): 684g / 24.1 oz

Weight of Printed Parts (PLA): 1,048g / 37 oz

Flying Weight (3S 2,200 mAh): 1,130g (LW-PLA) to 1,520g (PLA) / 39.9 – 53.6 oz

Recommended Max Flying Weight: 1,800g / 63.5 oz

No. of Channels: 4 – Throttle, Aileron/Elevator (Elevons), and Rudder (for Upgraded Version only)

Figure 1 – An Example of a Nice X-100 Infinity Wing V2 Build

Image Source: https://www.3daeroventures.com/infinitywingv2

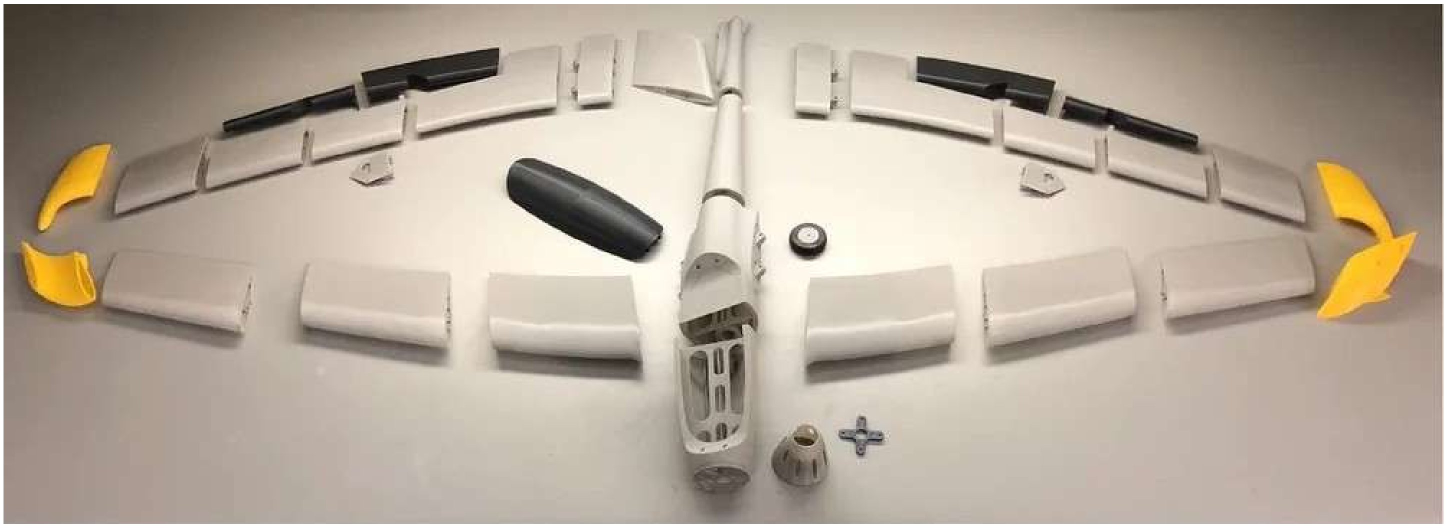


Figure 2 - X-100 Infinity Wing V2 3D Printed Parts

Image Source: https://www.3daeroventures.com/infinitywingv2

Quoting Eric – "The X-100 Infinity Wing has been re-designed into this V2 version to meet several goals: Improved stall performance, better printability/surface quality, increased part strength, the ability to print the parts in any material – PLA, ABS, ASA, PETG, and especially LW-PLA or LW-ASA, and much simpler slicing and the ability to use any slicer (like Prusa Slicer). I am now a big proponent of using multiple material types to build a good performing and long-lasting craft. So, you should find this style of part design to be simpler to slice on your own and print in many different materials. The outer walls of the parts now print like a corrugated plastic – two single perimeter walls filled with a very low infill, anywhere between 3 – 7%. The downside is, printing this style of design in standard PLA leads to a heavier aircraft, though not too heavy to fly well. That's why I am particularly excited about the results I've got printing this aircraft as a hybrid with LW-PLA. I recommend at least printing some of the parts in LW-PLA to keep the weight as low as possible and for the ideal weight distribution. The hybrid version balances perfectly at the new recommended CG position with a 3S 2,200mah battery located in the middle of the battery compartment. A standard PLA version may require a larger battery or a small amount of nose weight to properly balance. If you do only print a few of the parts in LW-PLA I recommend printing the Back Wing parts in LW-PLA for better weight distribution."

You should take a few minutes and view a video produced by Eric about his design of the original X-100 Infinity Wing, 3D printing and assembly, and some funny moments during his *first flight attempt*. This can be viewed @: https://www.youtube.com/watch?v=j8DPAJttj5g/. Another great video produced by Eric about his redesign efforts and 3D modeling of the X-100 V2 can be viewed @: https://www.youtube.com/watch?v=4zso0JTmDNw&t=400s/. And finally, another very nice X-100 3D printing and build video produced by Troy McMillan with lots of 3D printing pointers can be viewed @: https://www.youtube.com/watch?v=JPTcQ3Jrm5w/.

All the required STL files can be downloaded for free from the X-100 INFINITY WING V2 Webpage (https://www.3daeroventures.com/infinitywingv2/). Included in the download are: X-100 V2 STL Files (total of 48); Simplify3D Factory Files (individual parts and grouped builds); Cura and PrusaSlicer Profiles; Recommended Slicer Settings for Different Materials (Excel and PDF format); Generic Gcode for i3 style printers; X-100 Wing Dolly files; and a X-100 Infinity Wing V2 3D Printed R/C Aircraft Build Guide.

You can also download the X-100 INFINITY WING landing gear and rudder upgrade @: https://www.3daeroventures.com/infinitywingv2upgrade/. This free upgrade kit is compatible with the X-100 Infinity Wing V2 file set. It carries the Infinity Wing design to a whole new level with a new fuselage design complete with landing gear and rudder capability.

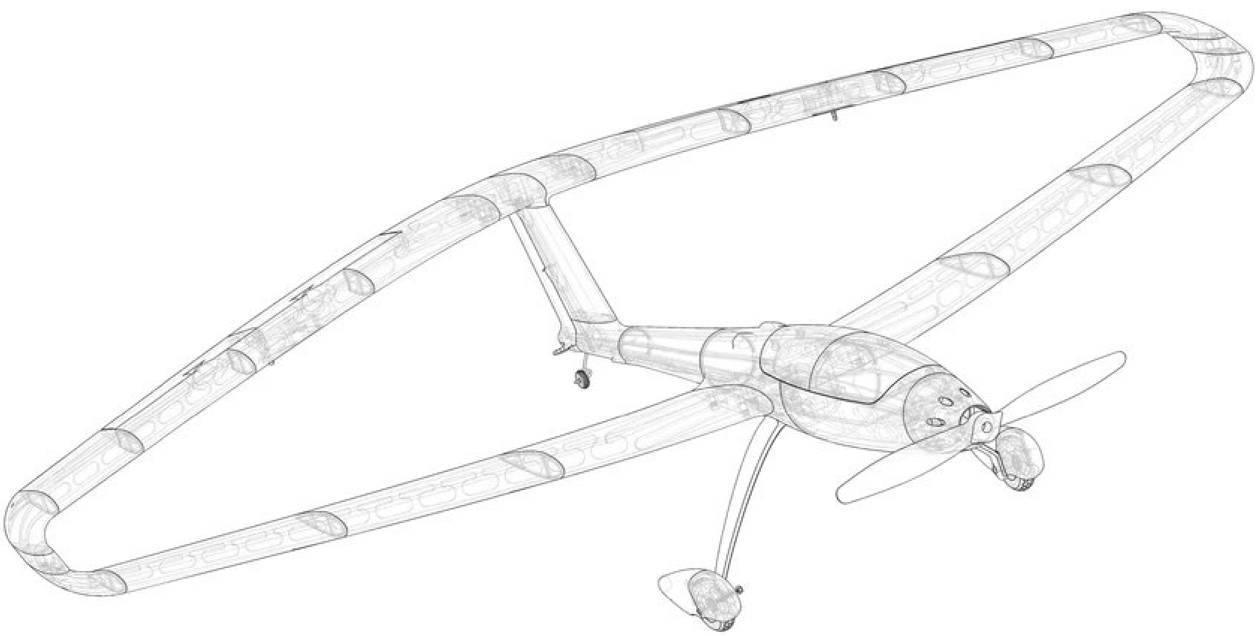


Figure 3 – X-100 Infinity Wing V2 Landing Gear & Rudder Upgrade

Image Source: https://www.3daeroventures.com/infinitywingv2

X-100 Infinity Wing Materials, Tools, and Hardware List

The Minimum requirements for successfully printing 3Daeroventures X-100 are:

- 3D Printer with 200mm x 200mm x 205mm Print Bed Size
- 0.4mm Nozzle
- Heated Bed (recommended)
- Any Slicer Software (I used Creality Print 6.3)
- Lightweight PLA like ColorFabb LW-PLA, OVERTURE Air PLA, Polymaker LW-PLA, or **3D LabPrint Polylight 1.0 LW-PLA**
- High quality PLA like Creality Hyper-PLA or Paramount3D (feel free to test other materials like PETG, PC, ABS, ASA, etc.)

Other Materials and Tools Needed:

- PETG, ABS, ASA, or PC for motor mount
- TPU or TPE for Belly Wheel Tire, or MLG Tires for Landing Gear Upgrade
- Medium Bodied CA/Super Glue
- Accelerator for CA
- Sandpaper and/or Small Files
- Soldering Iron (for heat set threaded inserts)
- Screwdriver and/or allen wrench for chosen screws/bolts

Flight Control System:

- Spektrum A610 6-Channel 2.4GHz DSMX Receiver
- EMAX ES08MA II (12g) Metal Gear Servos or equivalent 23x11.5x24mm size servo (x2)

https://amzn.to/3dnzknX

https://emax-usa.com/collections/wing-uav/products/emx-sv-0275-es08ma-ii-metal-analog-servo

- 24" Servo Lead Extension (x2)
- 6" Servo Lead Extension (x2)

Recommended Electric Power System:

- E-Flite Power or 15 Leopard 3536-7T 1100kV Motor: or motor with equivalent X mounting pattern

https://amzn.to/2WF3tJl

https://www.e-fliterc.com/product/power-15-brushless-outrunner-motor-950kv-3.5mm-bullet/EFLM4015A.html

- 50A ESC like HobbyWing Skywalker Series 50A ESC

https://amzn.to/2xiBW5Q

https://www.e-fliterc.com/product/40-amp-bec-brushless-esc-ec3/EFLA1140W.html

- LiPo Battery 3S 2,200 mah or 4S 2,200 – 3,300 mah
- APC Electric Folding Propeller 11x8 (E-Flite) or 11x6 (Leopard) Folding Propeller; or 10x6 to 11x7 Propeller for landing gear version (do not use a prop larger than 11" for proper ground clearance)

https://amzn.to/2UjcBlv

https://www.apcprop.com/?s=APC+Electric+Folding+Propeller+11x8&v=7516fd43adaa

- APC 45mm Hub for Folding Prop

https://www.apcprop.com/product/fh45mm/?v=7516fd43adaa

- MPI Aluminum Folding Spinner - APC 40mm SKU PA40; or Innov8tive Aluminum Folding Prop Spinner, 40mm (1-9/16") Diameter for 5mm Motor Shafts with Gemfan Folding Cam Style Nylon Blades, 11x8

https://innov8tivedesigns.com/aluminum-folding-prop-spinner-40mm-diameter-for-5mm-motor-shafts.html

https://innov8tivedesigns.com/gemfan-folding-cam-style-nylon-blades-11x8.html

Hardware Needed:

Fuselage:

- M3 x 0.5mm Thread Heat-set Threaded Inserts for wing bolts (x8)
- M3 x 0.5mm Thread Lock Nuts for motor mount (x4)
- M3 x 0.5mm Thread x 15mm (or 30mm) Long Socket Head Screws for motor mount (x4)
- 5mm O.D x 3mm Thick Rare Earth Magnets for Removable Canopy (x4)
- 3mm O.D. Carbon Fiber rod or equivalent O.D. wood or plastic dowel for wheel axles (x2)
- M2 or #2 Thread Forming or Tapping Screws for mounting cowl (x4) (spare servo mounting screws will work)

Wings:

- M3 x 0.5mm Thread Heat-set Threaded Inserts for wing tip bolts (x4)
- M3 x 0.5mm Thread x 10mm Long Socket Head Screws for removable wings (x12)
- M2 or #2 Thread Forming or Tapping Screws for mounting servo covers (x8)
- 6mm O.D. x 4mm I.D. (or 0.150" I.D.) x 600mm long carbon fiber hollow tubes for wing spars cut to these lengths:
    - 300mm Long (x3)
    - 200mm Long (x1)
- 1mm – 1.5mm O.D. x 400mm long carbon fiber rod or steel wire for elevon hinges (x2)
- 1.2 mm steel wire for servo control rods (x2)

For Landing Gear and Rudder Upgrade:

- 1 additional EMAX ES08MA II (12g) Metal Gear Servo or equivalent 23x11.5x24mm size servo for rudder
- M3 x 0.5mm Thread x 15mm Long Socket Head Screws for landing gear mount (x5)
- M3 x 0.5mm Thread Lock Nuts for main tires (x4)
- M3 x 0.5mm Thread x 30mm Long Socket Head Screws for main tires (x2)
- Wheel collars to fit 1.5mm – 2mm steel wire for tailwheel (x2)
- 1mm O.D. x 10mm Long Pins cut from scrap carbon fiber rod for wheel pants (x8)
- 1mm – 1.5mm O.D. x 150mm Long Carbon Fiber rod or Steel Wire for Rudder Hinge
- 1.8mm – 2mm steel wire for tailwheel
- 1.2mm – 1.5mm steel wire for rudder servo control rod
- Pushrod Connector Linkage for Rudder Servo

3D Printing the X-100 Infinity Wing V2

So, with all that said, how about we get started with the X-100 Infinity Wing 3D printing and build. As I indicated earlier, there is a very nice X-100 3D printing and build video produced by Troy McMillan with lots of 3D printing pointers that you can view @: https://www.youtube.com/watch?v=JPTcQ3Jrm5w/. I found this video very helpful, especially since I have never tried 3D printing using LW-PLA filament.

I decided to start with the fuselage by setting up each of the various STL files in Creality Print 6.3. For the E-Flite Power 15 motor mount STL file and three Fuselage Tray STL files, for added strength I printed all these using Clear Creality Hyper-PETG. For the Cowl STL file, two Canopy STL files, two Servo Cover STL files, and two Tire Hub STL files I used Black Creality Hyper-PLA. **Note:** I used the recommended slicer settings spreadsheet and reviewed the 3D printing tips in the X-100 Infinity Wing V2 3D Printed R/C Aircraft Build Guide. Both of these were provided in the 3Daeroventures download. The results of the PLA and PETG parts are shown in Figure 4 below.

Figure 4 – X-100 Infinity Wing V2 3D Printed PLA & PETG Parts

Ok, so let's see what we can do using some LW-PLA filament. To start I purchased a roll of Bright Yellow Polymaker Light Weight PLA Filament from Amazon, where you can find this on the web @: https://www.amazon.com/dp/B0B1DGJSTQ/?tag=lstir-20&th=1. The features of this filament are captured in the next few paragraphs below.

Lightweight PLA: Polymaker LW-PLA filament has a low density of $0.9g/cm^3$, compared to $1.17g/cm^3$ for standard PLA (***a 23% reduction in weight***). It uses the same printing settings as regular PLA, ensuring easy compatibility with most 3D printers. ***Unlike the traditional foaming LW-PLA, Polymaker LW-PLA <u>does not</u> foam during printing, preventing common foaming issues. Compared with the filament of Foaming-When-Printing, it has higher printing density stability and is better at suppressing stringing.***

High Rigidity & Good Layer Adhesion: Polymaker LW- PLA filament provides high rigidity and excellent layer adhesion, making it ideal for creating stiff parts for radio-controlled planes. This reliable LW-PLA features great bed adhesion, consistent color, and dimensional accuracy, while eliminating issues like warping, jamming, blobs, and layer delamination. **Note:** Turn off the model fan for the first layer to improve bed adhesion.

7 Colors Available & Matte Finish: Polymaker LW-PLA is available in white, black, grey, wood, bright yellow, bright orange, and bright green. It produces a matte surface finish that conceals layers and is easy to paint.

Tangle-Free & Moisture-Free: Polymaker LW-PLA filament is carefully wound to avoid tangling, then dried and vacuum-sealed in a Ziplock bag with desiccant. Always hold the filament tip to avoid nodes and utilize the spool holes to help prevent tangling.

Printing Settings: Nozzle: 190°C, Bed: 50°C, Speed: 50mm/s.

So, after I bought it, I started looking for how to print with the stuff. Here's a helpful video on it: https://youtu.be/eDBtZeIY5aE. It seems like a happy medium between foaming LW-PLA and standard PLA in both strength and weight, as in it is stronger than foaming LW-PLA it seems, and lighter than standard PLA, but not quite as light as the ColorFab LW-PLA. However, it is allegedly very easy to print, and at a lower price.

Another source of pre-foamed LW-PLA is OVERTURE Air PLA Filament, Pre-Foamed PLA Low-Density, Lightweight PLA, which you can purchase from Amazon @: https://www.amazon.com/OVERTURE-Filament-Cardboard-Dimensional-Probability/dp/B0BQRG6FBW/?th=1.

Well, after many hours of adjusting slicer settings (varying extruder nozzle temps, cooling fan settings, print bed temps, print speeds, and whatever else I though could rectify my print issues), I finally decided to stop with the LW-PLA. A test cube I can get to print, but when trying a model part, forget it. One primary issue I'm having with the Pre-foamed LW-PLA is that it has a sandpaper outside surface and is very brittle, which causes it to keep breaking inside the printer plastic feed tube between the extruder head and "out-of-filament" sensor. I even bypassed the filament sensor to see if that would help, but still no-go. Slicer settings won't fix this issue.

My fallback will be to continue printing the remaining parts using Creality Hyper-PLA which will yield a model 8 approx. 23% heavier than if I could have gotten the LW-PLA to work. Oh well, I'm well known for having RC planes that are built like tanks anyway.

After some more research, I decided to try the pre-foamed LW-PLA again, but this time I removed the issue of filament breaking in the feeder tube. This was accomplished by **not** using the filament dryer while printing and placing the filament roll directly above the extruder using a spool holder I downloaded from Printables (https://www.printables.com/model/864918-ender-3-v3-top-spool-holder-rear-facing). Using this setup as shown in Figure 5, I started another 3D print of the vertical stab using the Overture Air PLA recommended setting. *I can tell you this, watching a print job at 30 mm/s is like watching the grass grow!*

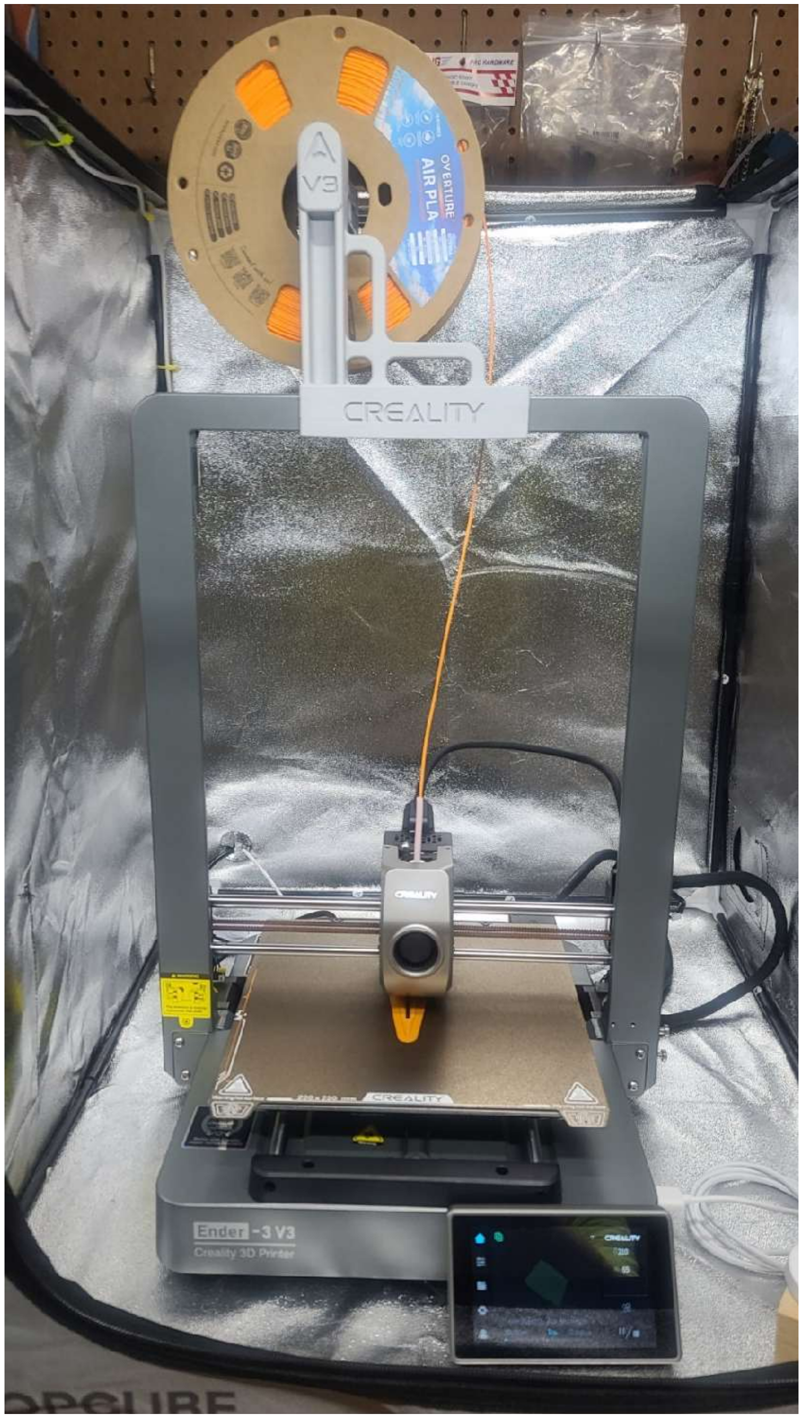


Figure 5 – Ender-3 V3 Setup for Printing LW-PLA Parts

The Overture Air PLA vertical stab 3D print job finally finished after 6h 52m. There was some minor stringing inside the Air PLA part. Now for the final results. In Figure 6 on the left is the White Hyper-PLA stab (200 mm/s print speed), and on the right is the Orange Air PLA stab (30 mm/s print speed). I'm sorry folks, but there is no way I can justify taking almost 7 times longer to print and only get a 1 gram savings in weight. Please note, the structure of both of these parts is identical, only the material used and the slicer settings required to use each material were changed. Bottom line, the Overture Air PLA filament will not be used for my X-100 build.

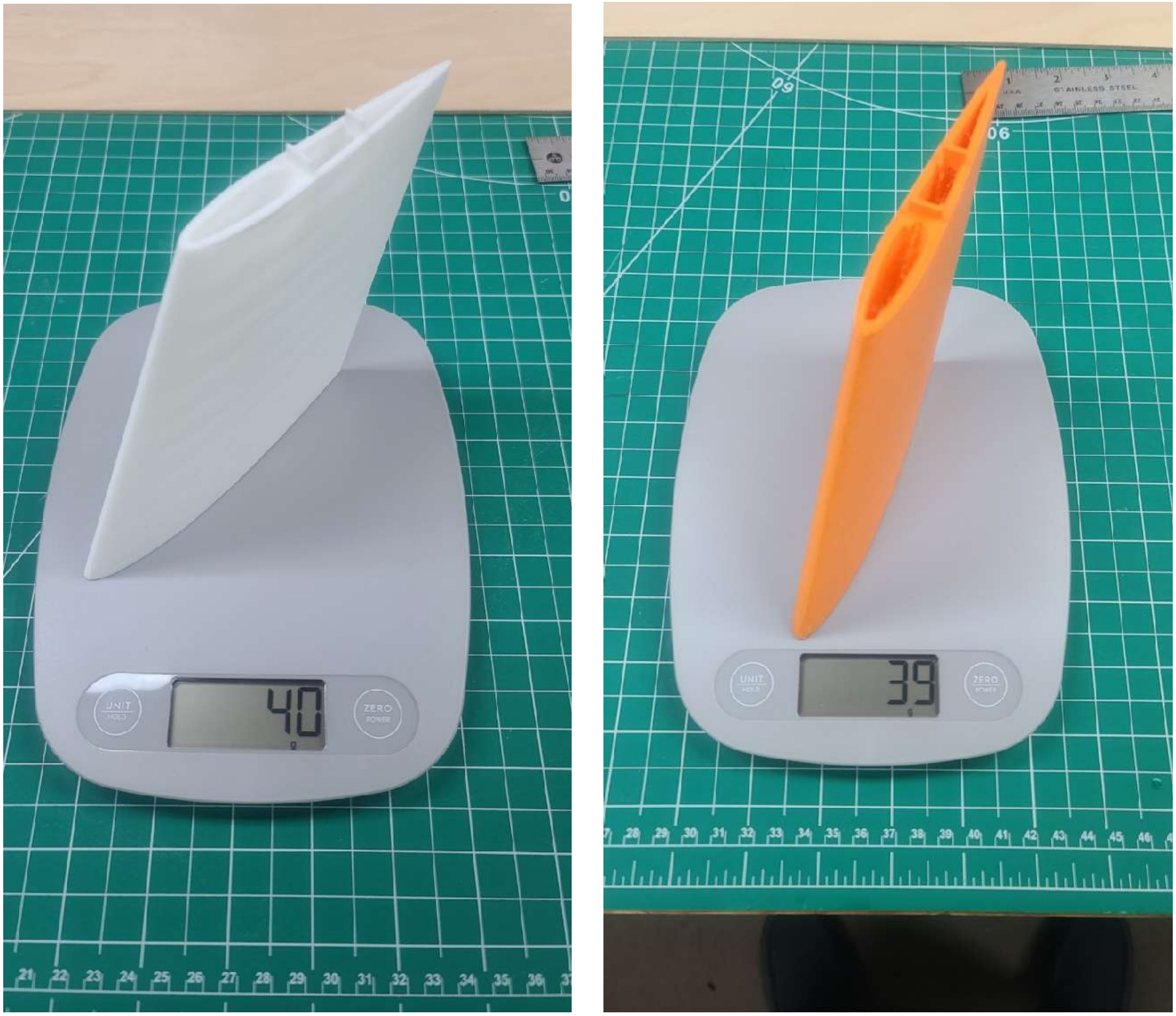


Figure 6 – Vertical Stabilizer 3D Prints Using Hyper-PLA (white) & Air PLA (orange)

I started back with the 3D printing of fuselage parts but this time using White Creality Hyper-PLA. After completing parts Fuse 3 and Fuse 4, based on the resulting weights (see the table below) it was obvious that going this route was going to produce an RC model that would be **way too heavy.** So, it was back to the drawing board again to see what other options I could find.

After some more searching on the web, I finally decided I would have to resort to the *foaming* LW-PLA. While I really did not want to have to mess with all the setup required to get the optimal slicer settings to print with *foaming* LW-PLA, I could not find any other alternate method that would produce the lightweight parts I needed. So, I decided to try a LW-PLA filament produced and distributed by a company called 3D LabPrint (https://3dlabprint.com/). 3D LabPrint was founded in 2015 in Brno, Czech Republic as an aeronautics company focused on the use of an additive process for a variety of manufacturing from small RC models to manned aircraft. They not only produce their own filaments and 3D printed models but also provide all kinds of information in their website "Help" section on using the LW-PLA filament and the ***many*** slicer settings needed to obtain good 3D printing results. So, I ordered two rolls of their Polylight 1.0 filament, a spool of Red for the wings and a spool of Balsa for the fuselage to give it another try.

My 3D LabPrint filament order arrived, and I set off working through the setup of all the Creality Print 6.3 filament and slicer settings specifically for the Polylight 1.0 LW-PLA. I first established a new filament profile for Polylight with a 0.4mm nozzle, then I adjusted the Global Process settings for printing with Polylight 1.0 LW-PLA. I next ran a test cube to see the results of my efforts. The test cube printed out fine and the wall width was only 0.06mm wider than what I had set in the slicer settings. I reduced the extractor print temperature by 5 degrees Celsius and decided to attempt the fuselage vertical stabilizer once again.

The left image in Figure 7 below is a screen shot from Creality Print of the print status for the fuselage vertical stabilizer. As you can see in the upper left of the image, this was taken at 57 minutes into the print, with 2 hours 32 minutes remaining, or 37% complete. There was some stringing during the printing. The right image shows the final results of this 3D printing. At 8 grams I think <u>*this may work*</u>. Having only a single wall thickness makes for a fragile part. Some slicer profile settings may need changed after I print another part, so let's move on with printing Fuselage 4.

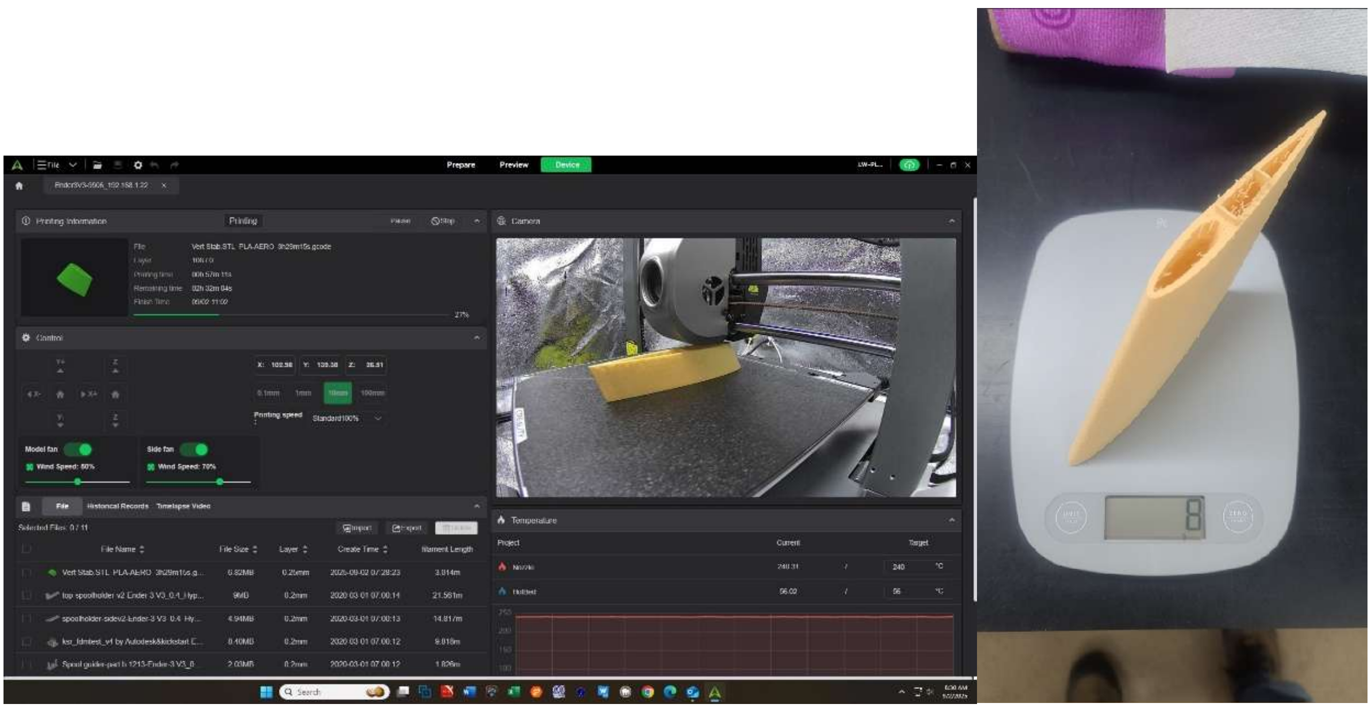


Figure 7 – Vertical Stabilizer 3D Print Using Polylight 1.0 LW-PLA *(Balsa)*

After printing the Fuselage 4 part there still were issues that needed to be addressed. The first was the extensive stringing on the inside of the part. It was so bad that I was not able to run the PETG fuselage tray down into the part channels, even after I tried to remove the stringing. The other issue was the single wall thickness and strength. To try and address these it was obvious I was going to have to run through various slicer settings to see if I could find the best setup. So, I downloaded a stringing test STL file and ran through several iterations of nozzle temperatures, flow ratios, retraction distances and rates, layer heights, wall thicknesses, and print speeds. After **many stringing test runs,** I finally arrived at what

I felt resulted in the best *foaming* LW-PLA part printout. Basically, my Creality Print 6.3 slicer settings **for 3D LabPrint Polylight 1.0 LW-PLA** printing are as follows:

Printing Nozzle Temperatures:
- First Layer: 210°C
- All Other Layers: **215-230°C** (Increased temp gives a higher foaming factor)

Build Plate Temperatures:
- First Layer: 60°C   Other Layers: 50°C

Flow Ratios: **0.70** (Decrease to 50% when using higher print temps)
Retraction Distance: 4.0 mm
Retraction Speed: 40 mm/s
Cooling Fans Speeds: 20%
Print Speeds: 40 mm/s
Travel Speed: 200 mm/s
Layer Height: 0.24 mm (Try using the "Variable Layer Height" function when possible)
Line Width: 0.42 mm
Seam Position: Back
Walls Printing Order: Inner/Outer
Wall Loops Count: 1
Top Shell Layers: 3
Bottom Shell Layers: 3
Sparse Infill Density: 10% Gyroid (for lightweight prints, **adjust as needed for strength**)
Support when Needed:
- Type: Tree(auto)   Style: Tree Hybrid
- On build plate only: Checked   Support critical regions only: Checked

Brim: Auto (**Use "Outer brim only" for any tall parts with a small base layer area**)
Skirt:
- Skirt type: Combined
- Skirt loops: 2   Skirt distance: 3 mm   Skirt speed: 20 mm/s

Special Slicing Mode: Even-Odd

Using these slicer settings, I re-printed the Vertical Stabilizer and Fuselage 4 parts. Stringing was **greatly reduced**, and the resulting weights were 12 grams for the vertical stabilizer and 10 grams for Fuselage 4. While the higher flow ratio added a few grams, the resulting higher print density has added more stiffness and strength to the thin single wall thickness. I think we are ***finally*** ready to press forward with 3D printing the rest of the parts needed (31 more to go) for this puppy.

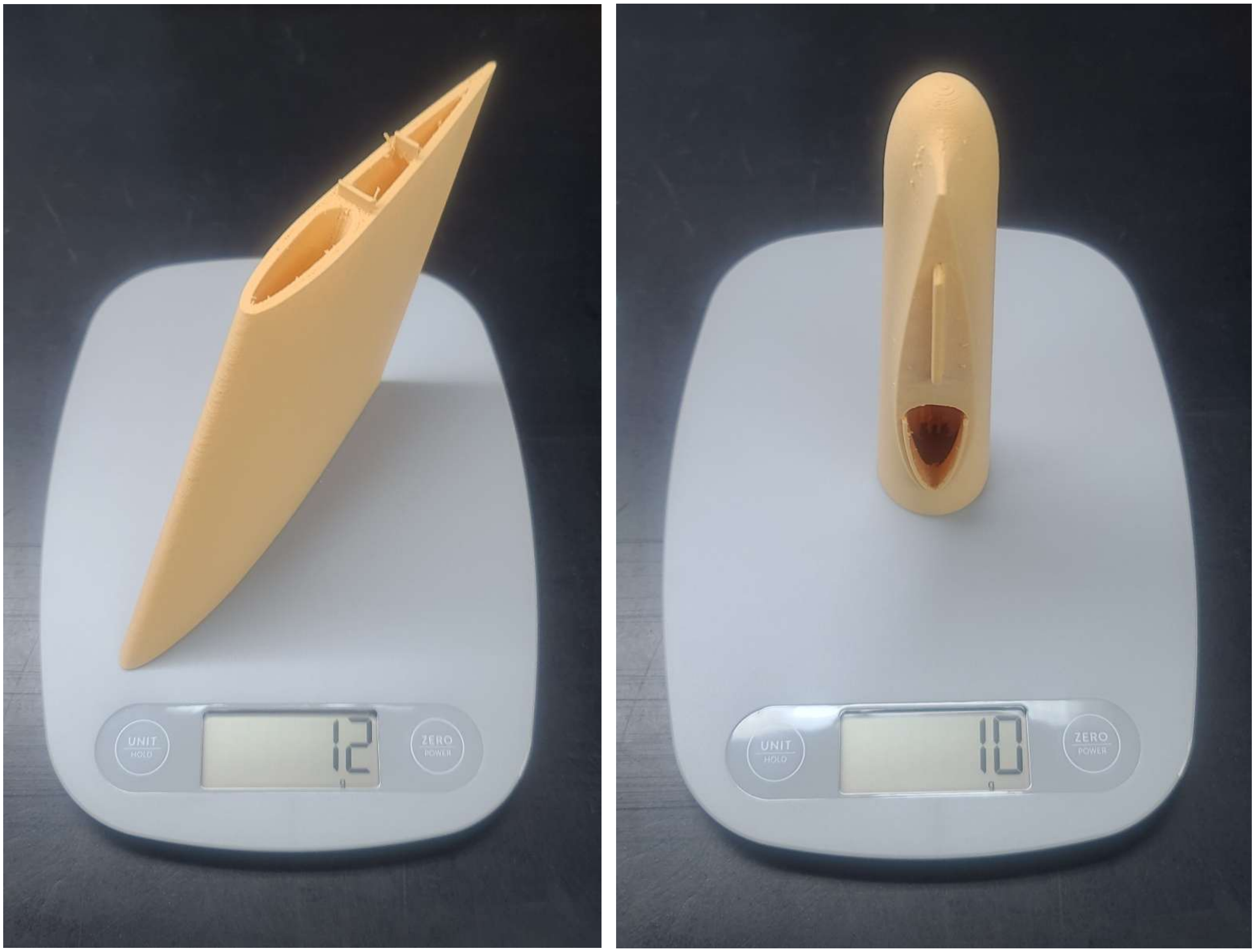


Figure 8 – Vertical Stabilizer & Fuselage 4 3D Print Using Polylight 1.0 LW-PLA *(Balsa)*

All of the fuselage parts are shown below in Figure 9. Print times and part weights are all listed in Table 1.

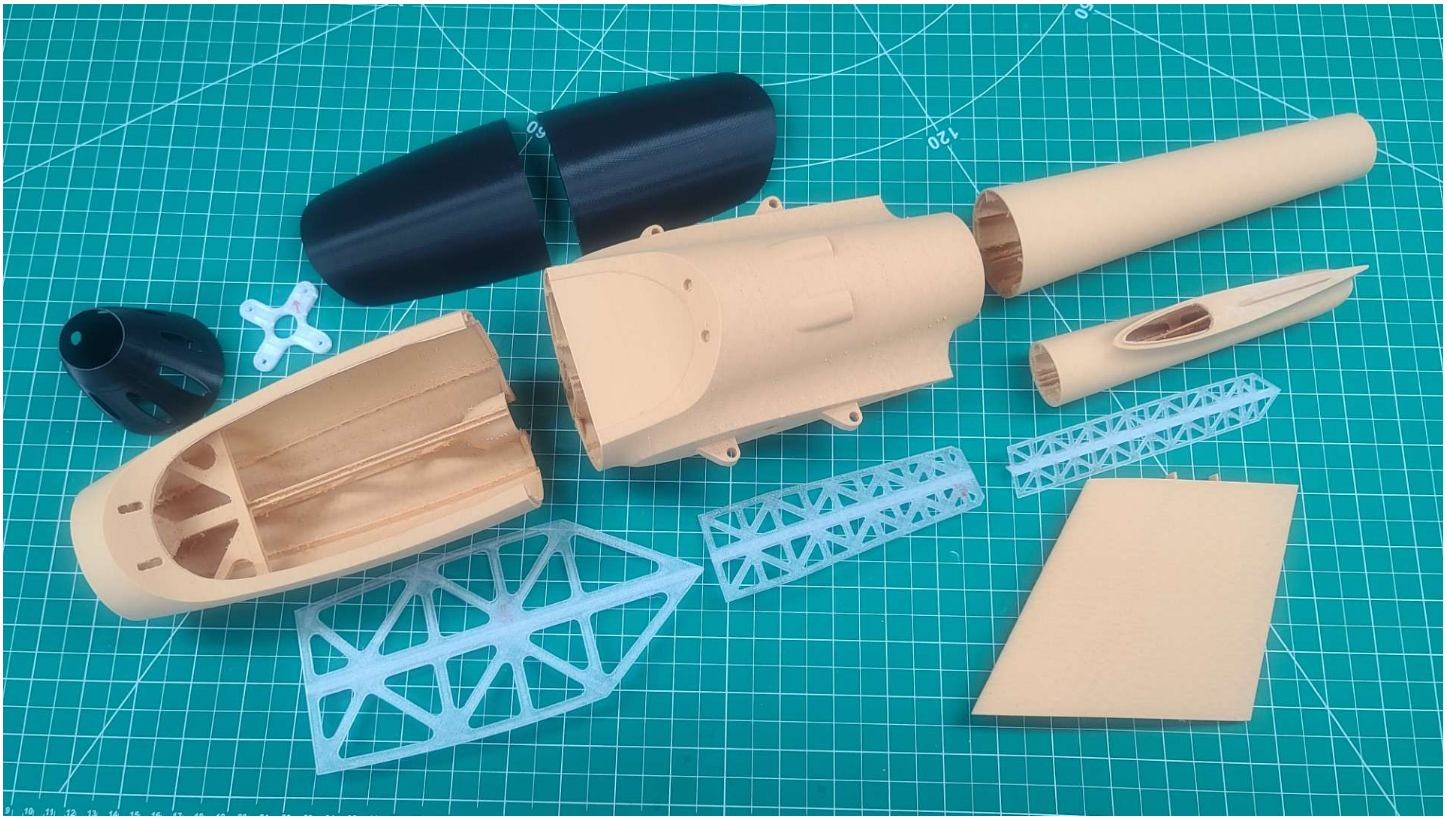


Figure 9 – X-100 Infinity Wing V2 Fuselage Parts

With all the fuselage parts finished, I swapped out the Balsa color filament for a spool of Red Polylight 1.0 LW-PLA filament and pressed forward with printing the 26 wing parts. For the Back Wing L1 & R1 parts, to increase the strength of the attachment points in these two critical parts I increased the infill density to 30%. You can see this in the Creality Print 6.3 screen capture shown in Figure 10.

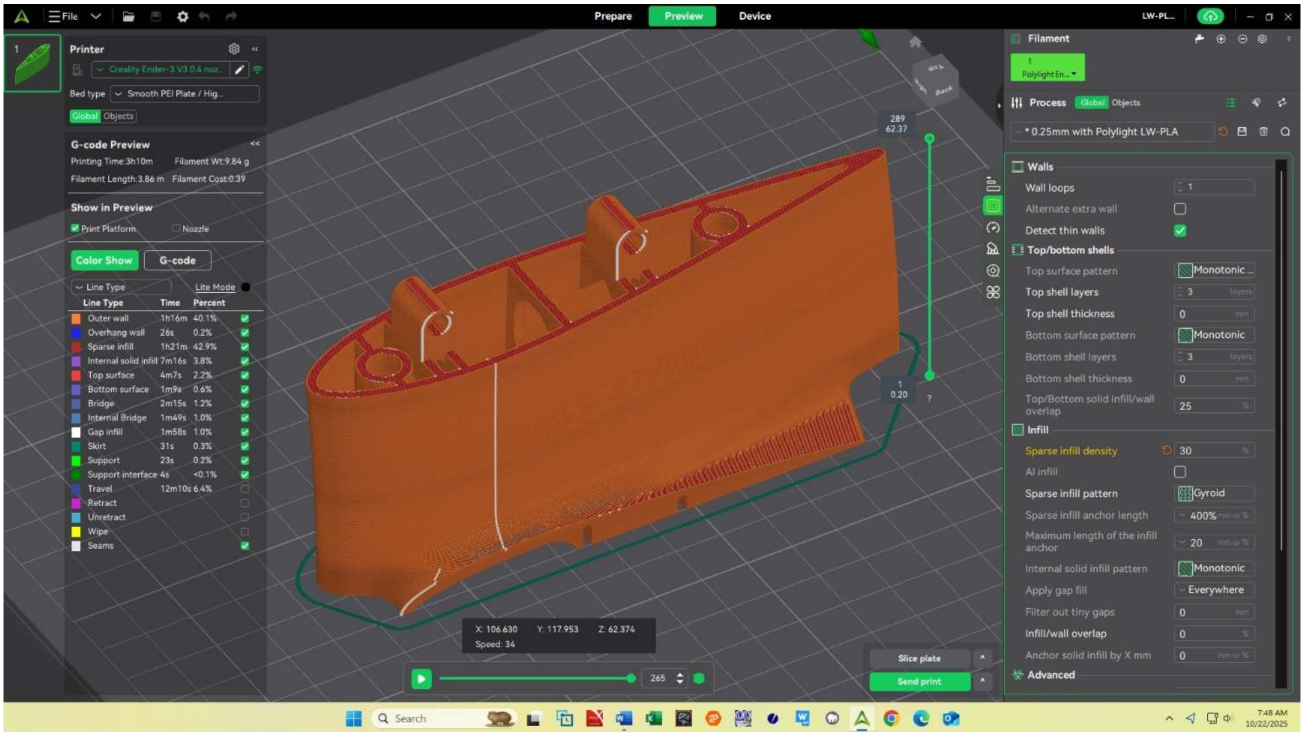


Figure 10 – Back Wing L1 Creality Print 6.3 Set-up

Red Polylight 1.0 LW-PLA filament Back Wing parts are rolling off the printer. I had a small issue when printing an elevon when it tipped over at 97% print completion (over 3 hrs. of printing). I corrected this with the addition of a brim on the textured hot plate to help hold the part in place when printing 200mm above the bed. The Right Back Wing parts are shown in the image below.

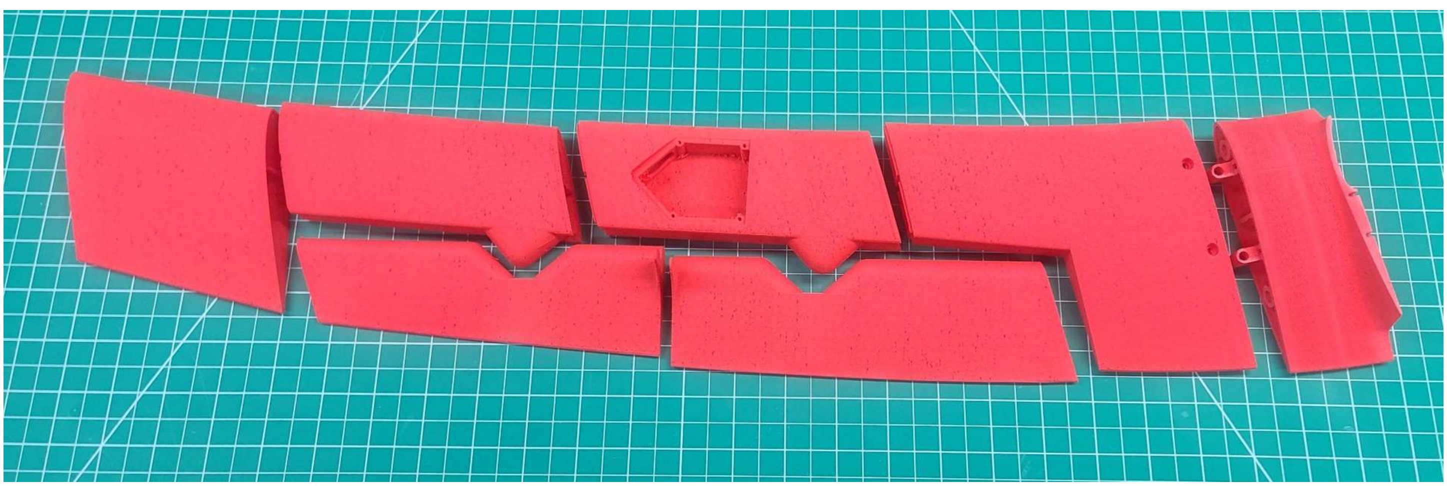


Figure 11 – Right Back Wing Parts

When it came time to print the Front and Back Wing Tip parts, I elected to use **Balsa** color Polylight 1.0 LW-PLA to have a contrasting color at the end of wings that matches the fuselage. I had a small issue when printing the Back Wing Tips in that the lower front edge would not print out to the very leading edge, resulting in a small gap when mated with the Middle Wing Tip parts. I tried to correct this using other printing orientations but those drove larger issues in the part printout. I decided to use the parts printed in the *"default"* orientation and filled in the gaps using some lightweight balsa filler. All the LW-PLA parts for the Left Front & Back Wings are shown in Figure 12.

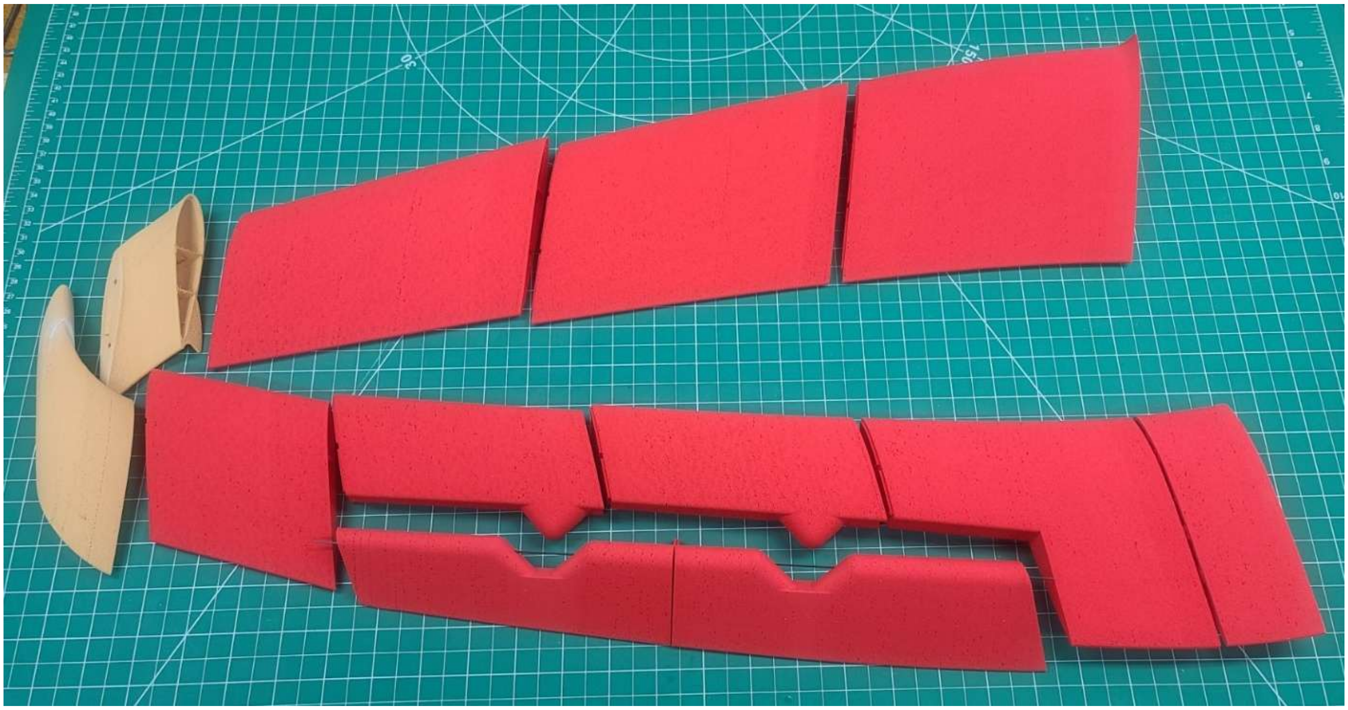


Figure 12 – Left Front & Back Wings Parts

With all wing and fuselage PLA and LW-PLA parts finally printed, the last couple items needed were the Belly Wheel and Tailwheel tires. Using Black Giantarm TPU filament (TPU is short for Thermoplastic Polyurethane and is a flexible filament) with a 0.4mm nozzle and my Creality Print 6.3 filament profile to use TPU (which you can find in my downloadable "3D Modeling-Printing Information" pdf file) , I printed out the two tires which you see in Figure 13 below. This was some **slow** 3D printing due to the 20mm/s print speed required for TPU.

Figure 13 – Belly Wheel and Tailwheel Tire Parts using TPU

Assembling the X-100 Infinity Wing V2

Having all 3D printed parts, required hardware, and flight components in hand, it was time to put this little beast together. Since the 3DAeroventures X-100 Build Guide along with the assembly video I provided a link to earlier on page 3 are both great sources of information, I will not duplicate the assembly process in my build description, other than should I come across any differences, or for some helpful suggestions.

The first thing I found when starting the assembly of the Front Wing was that the holes for the M3 x 0.5mm thread x 8mm long Heat-set Threaded Inserts were too large to require a soldering iron to properly set them into the LW-PLA. I had to resort to using 20 minute epoxy to ensure the inserts were solidly secured into the wing tip parts. The remainder of the Front Wing assembly went as called out in the build guide. Just a small amount of light sanding using 120 grit sandpaper on my aluminum sanding bar, some Medium CA along the wing joints, place the parts together, a light spray of some CA accelerator on the joints, and I had the two Front Wings you see in Figure 14.

Next I assembled the two Back Wings. Same process as used for the Front Wings, with a couple additional steps. After joining Back Wings parts #1 & #2, I wanted to install the elevon servos to ensure I was able to get the servo leads worked through the inside of the wings. **Builders Note** – Remember to first hook up your servos to your receiver and ensure they are centered before installing them into the wings. Once that was done I attached the servos to the Hyper-PLA servo covers, installed the servo control arms, routed the servo leads through the wings, and then attached the servos plates to Back Wing parts #2 using #2 x 3/8" pan head screws. With that done I assembled the rest of the Back Wing parts, attached the elevons to the wings per the build guide, and I had the two Back Wings you see in Figure 15. I will add the servo control rods and attachment fittings later.

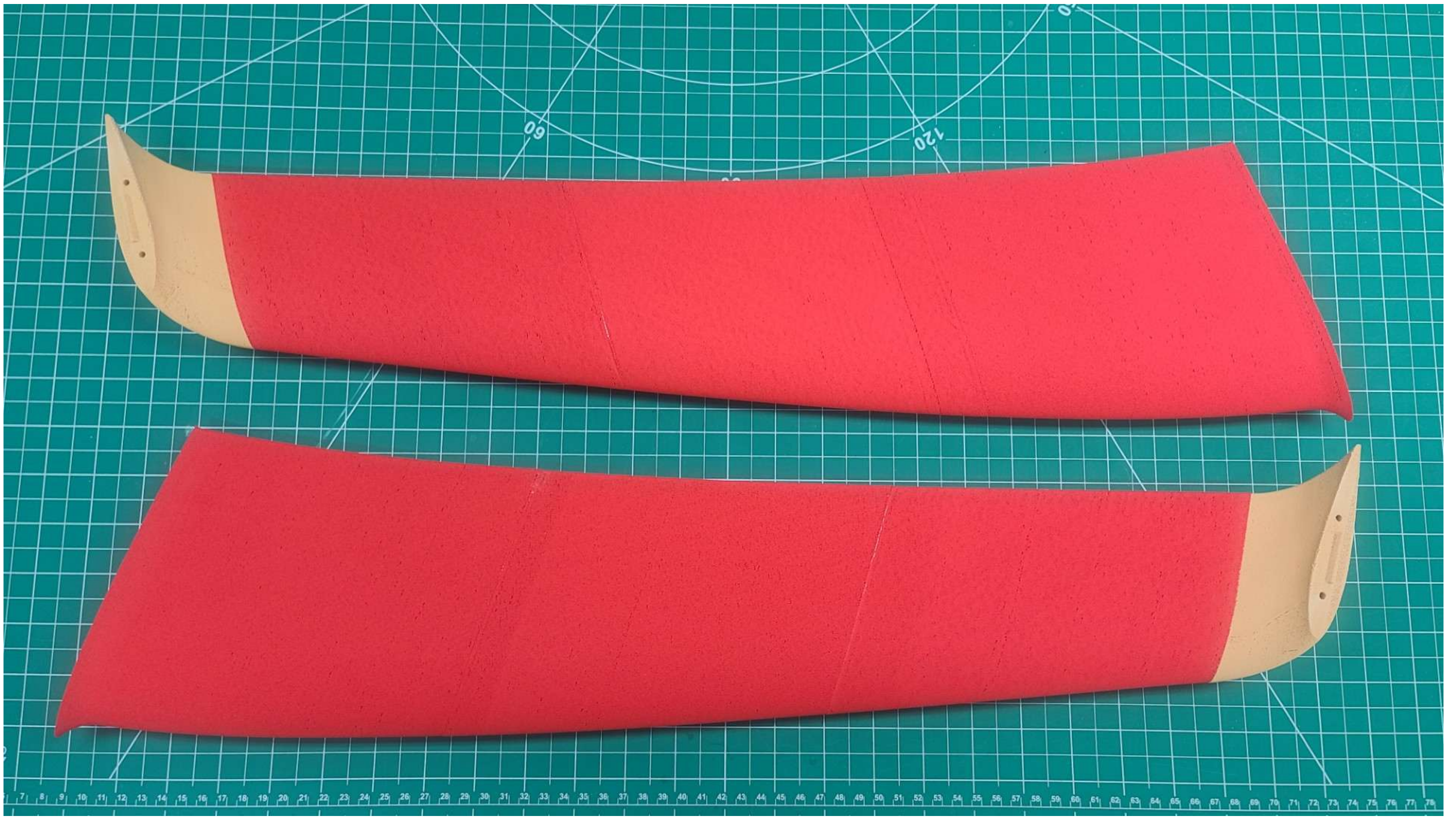


Figure 14 – Front Right (top) & Left Wings

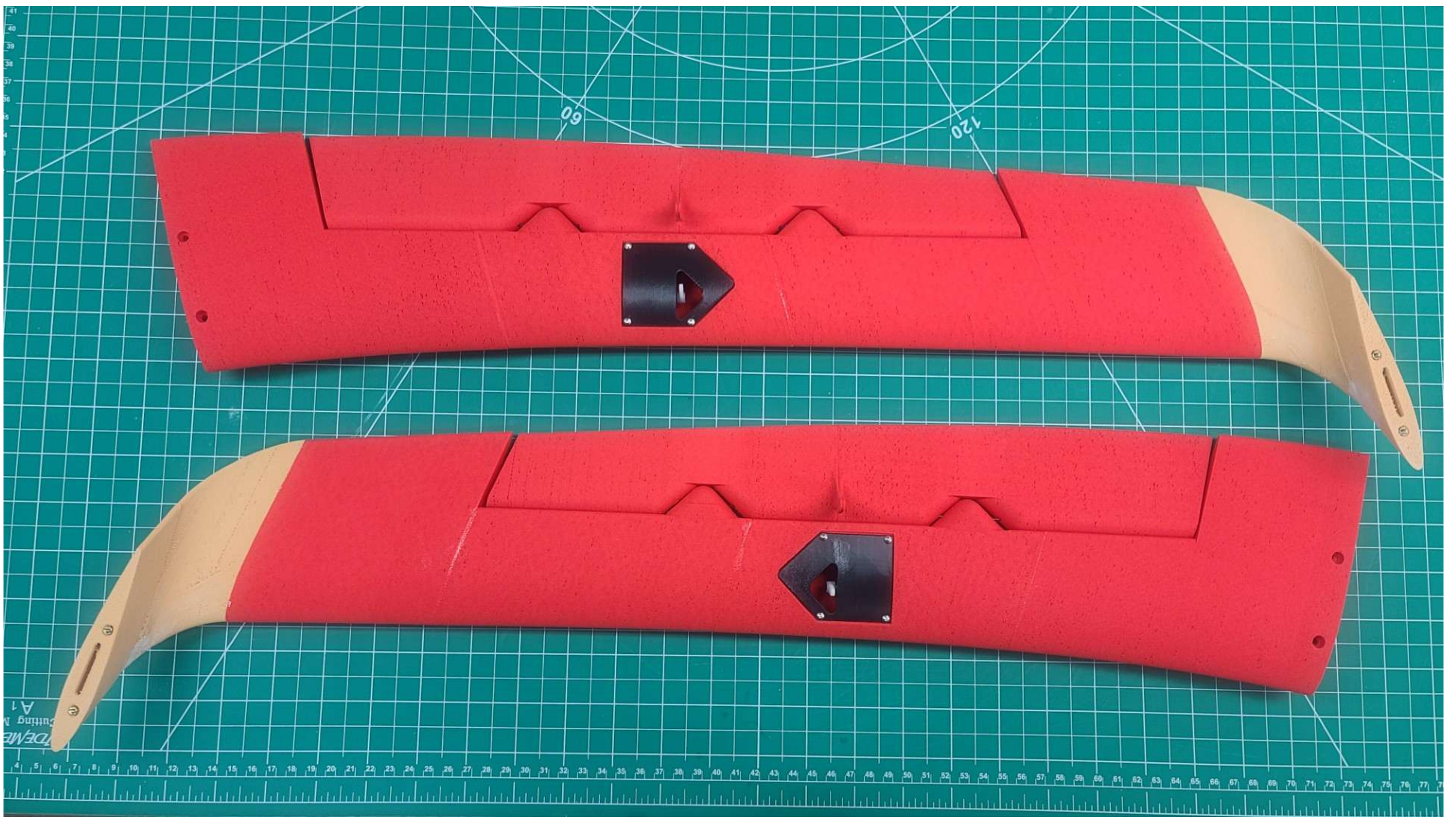


Figure 15 – Back Right (top) & Left Wings

With the wings done, I then moved to the fuselage. Here again, just as I found with the wings, the holes for the M3 x 0.5mm thread x 8mm long Heat-set Threaded Inserts in Fuse 2 were too large to use a soldering iron to properly set them into the LW-PLA. I again used 20 minute epoxy to ensure the inserts were solidly secured into Fuse 2. The remainder of the fuselage assembly went as called out in the build guide. Just a small amount of light sanding using 120 grit sandpaper on my aluminum sanding bar, some Medium CA along the fuselage parts joints, place the parts together, a light spray of some CA accelerator on the joints, and I had the fuselage you see in Figure 16. Two other changes I made from the assembly manual were that I used 30" servo extensions, and I secured the four M3 lock nuts on the inside of Fuse 1 for the motor mount bolts with epoxy versus the CA.

Figure 16 – Fuselage Assembly

Moving on, I next install the electric power system and receiver. As you can see in Figure 17 below, the motor and motor mount get bolted to the front of Fuse 1, the ESC is placed below Fuse Tray 1, the receiver is placed aft of the canopy bay opening and held in place with Velcro, and the LiPo battery is strapped to Fuse Tray 1.

Note – If you are using a Spektrum A610 6-Channel 2.4GHz DSMX Receiver, the AR610 receiver is compatible with elevons and can be programmed to control them. However, it is important to ensure that the servos are plugged in in the correct order into the receiver. The right wing elevon should be connected to channel 1, and the left wing elevon to channel 2. The ESC should be connected to channel 3. Channel 4 should be used for rudder if you are building the X-100 upgraded version. If you encounter any issues during binding, such as the transmitter beeping rapidly or the motor not responding, it may be due to incorrect channel setup or other configuration issues.

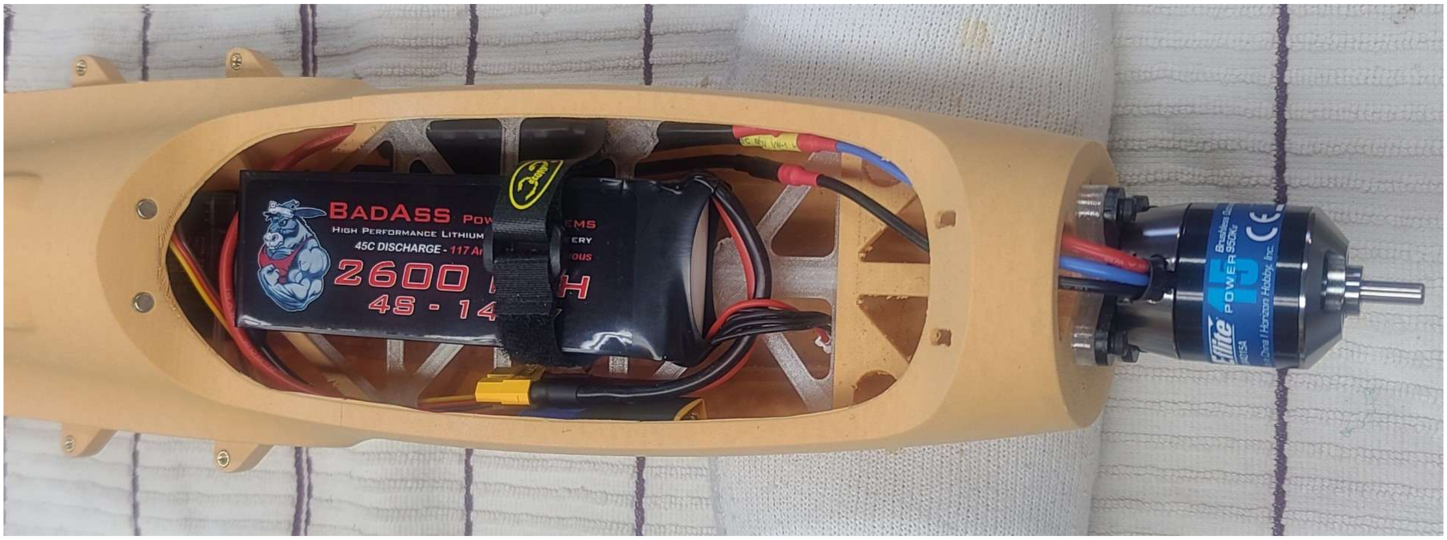


Figure 17 – Power System & Receiver Installation

As I've done for all my RC model builds, the next step was to check and verify the models Center of Gravity (CG). While the X-100 Build Guide states the *<u>CG should be 45mm in front of the aft edge of the front wing</u>*. I wanted to do a double check on this by running a CG calculation based on the actual X-100 physical structure and related "aerodynamic" areas. I plugged the required measurements of my X-100 model into a **very nice** online *CG* calculator from eCalc (https://www.ecalc.ch) to calculate the ***"required"*** *CG* range <u>*based on a measurement from the leading edge of the wing*</u>. After inputting all the required measurements as shown in Figure 18, the results are then shown in Figure 19.

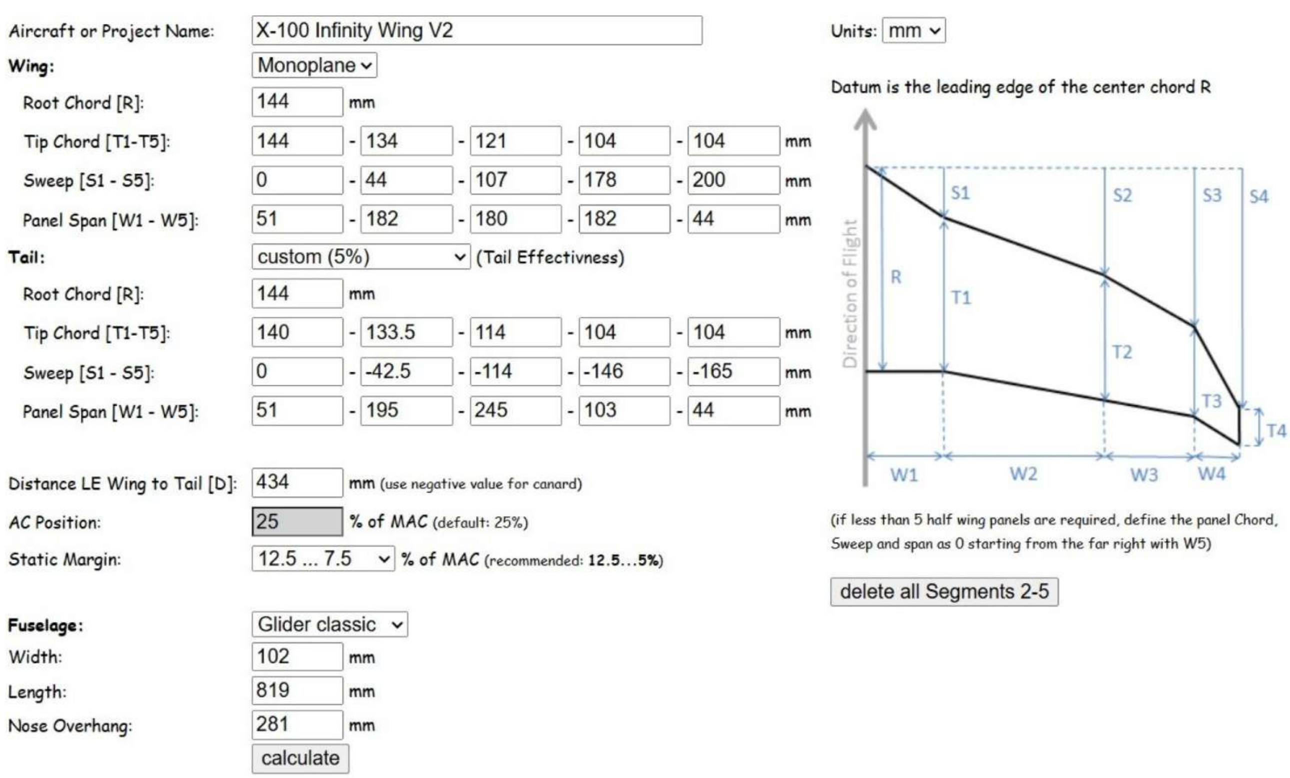


Figure 18 – X-100 eCalc Measurement Entries

Results:	Link to recall X-100 Infinity Wing V2		
Aircraft CG range [•]:	**94.77 ... 101.15** mm (@ 15.63 ... 20.63% of MAC)	Aircraft NP [•]:	110.71 mm (@ 28.13% of MAC)
Wing AC [•]:	106.72 mm (@ 25% of MAC)	Tail AC [•]:	-31.74 mm (@ 25% of MAC)
Wing MAC @ Distance	127.57 mm @ 300.41 mm	Tail MAC @ Distance	126.65 mm @ 301.12 mm
Wing Sweep @ MAC:	74.83 mm	Tail Sweep @ MAC:	-63.41 mm
Wing Span:	1278.00 mm	Tail Span:	1276.00 mm
Wing Area:	**161286.00** mm²	Tail Area:	**160060.00** mm²
Wing Aspect Ratio:	10.13	Tail Aspect Ratio:	10.17
Fuselage influence:	-4.86mm (= -3.81% of MAC)	Stabilizer Volume (V_{bar}):	2.30

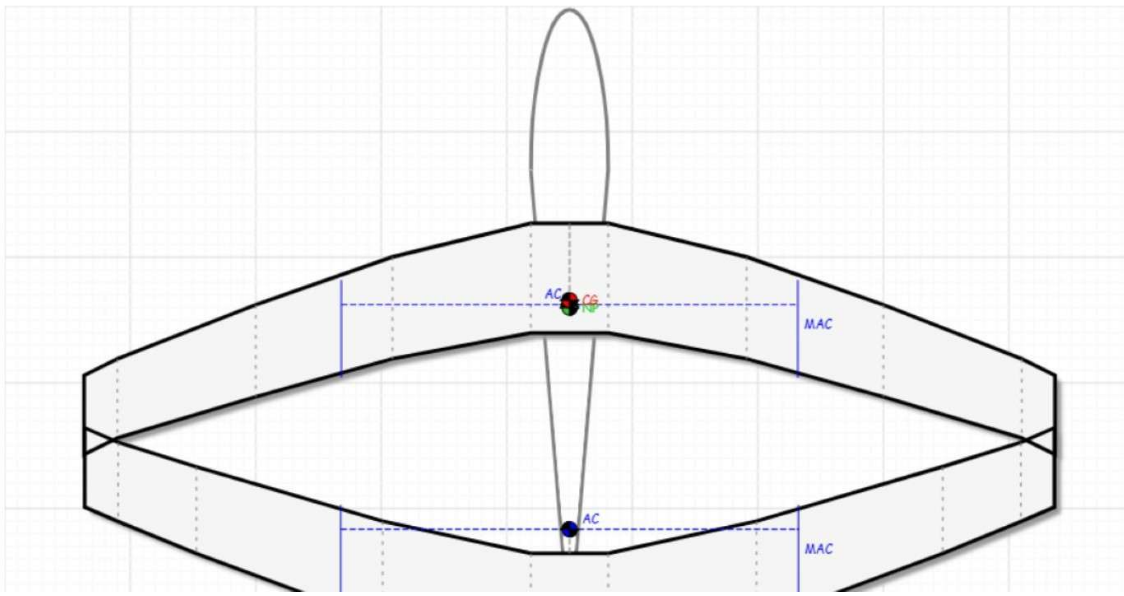


Figure 19 – X-100 eCalc Results

Using the eCalc method with the static margin set at 12.5 – 7.5% of MAC and an AC position of 25% of MAC, the calculated model CG range works out at 95 – 101mm *aft of the front wing leading edge*. The required CG location given on the X-100 Build Guide is *45mm forward of the front wing aft edge*, or as shown in Figure 20, ***100mm aft of the front wing leading edge.*** Therefore, I need to make sure my **final** CG is located slightly forward of the CG location in the X-100 Build Guide.

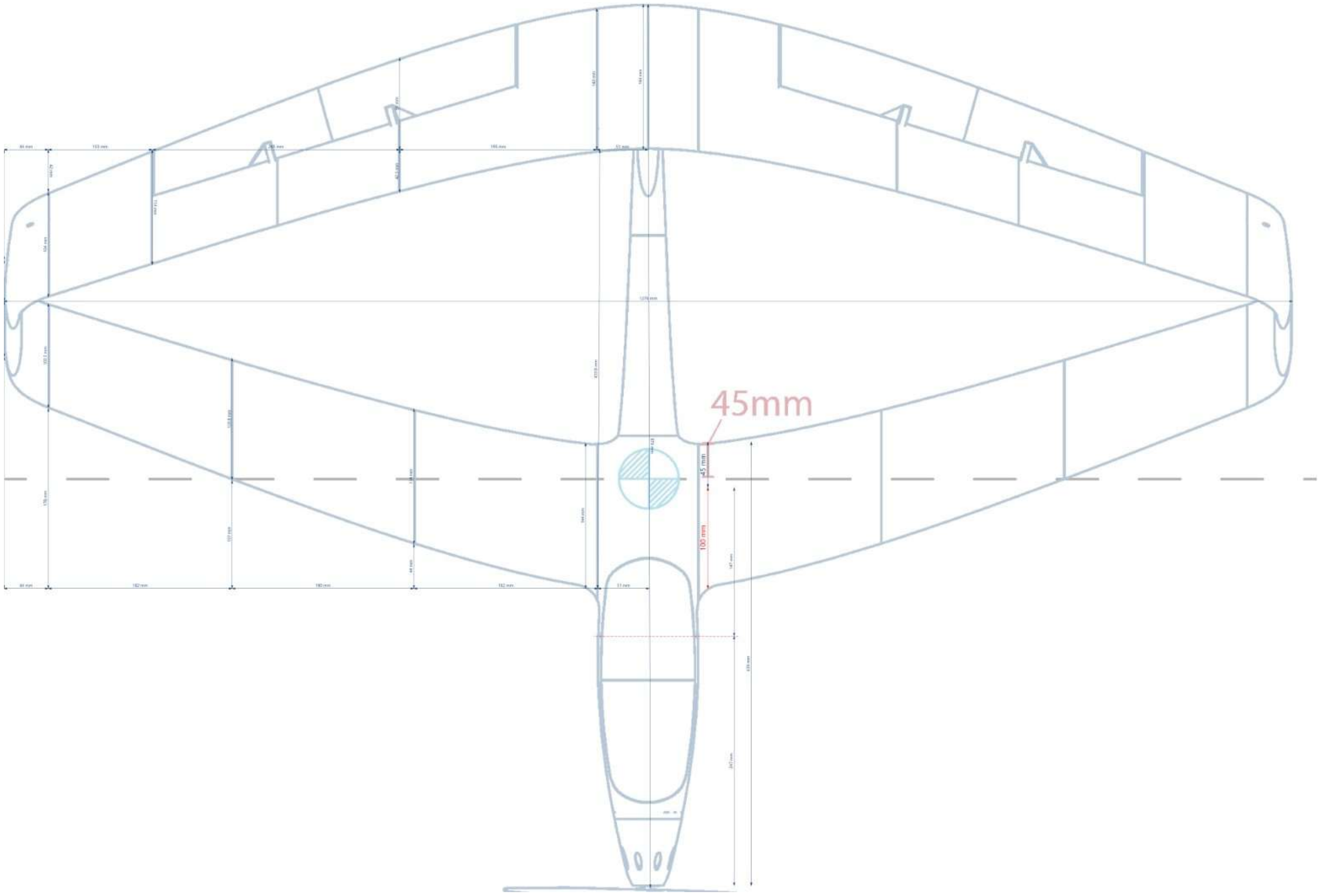


Figure 20 – X-100 Top View & CG Location Measurements

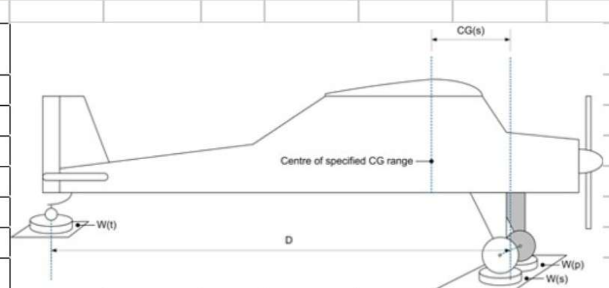
Alright, with the *CG* location established and double checked, I needed to measure where my X-100 *CG* actually was. I placed my fully assembled X-100 model (Figure 21), with the LiPo installed, on two digital kitchen scales ***in a normal flying attitude*** (wing zero angle of attack) and recorded the resulting weights at the MLG wheel and tail wheel. Using the X-100 3-view drawings, I measured the distance from the MLG axle to the tailwheel axle, and the distance from the MLG axle to the required location of the *CG*. I then input all these measurements into my handy dandy "*CG* Calculation by Weight" spreadsheet, and the resulting **initial** *CG* location was calculated as shown in Figure 22.

Figure 21 – X-100 Fully Assembled

X-100 Infinity Wing V2 CG Calculation by Weight (Initial)

Model			Details		Weight:	2.64 lbs.
X-100 Infinity Wing V2			**Tail Dragger**	**Imperial**		

D	520.0	mm	Distance between center point of MLG and tail wheel	20.5
CG(s)	147.0	mm	Distance of specified CG location from MLG axles	5.8
W(p)	470.0	g	Measured weight at left wheel	16.6
W(s)	470.0	g	Measured weight at right wheel	16.6
W(t)	256.0	g	Measured weight at tail wheel	9.0
W(total)	1196.0	g	Total weight of plane: W(p) + W(s) + W(t)	42.2
CG(a)	111.3	mm	Actual CG location from MLG: W(t) x D / W(total)	4.4
W(t)	338.1	g	Weight required at tail wheel for balanced CG: W(total) x CG(a) / D	11.9
W(delta	82.1	g	Delta from weight required at tail wheel	2.9
CG(diff)	**-35.7**	**mm**	Difference between actual and specified CG: CG(a) - CG(s)	**-1.4**



Legend:		
	(green)	Aircraft-specific; enter once and do not alter for this
	(yellow)	Measured weights; change with every weight session
	(blue)	Calculated values; do not edit these fields

Figure 22 – X-100 Initial CG Location Calculations

So, the model is <u>initially</u> nose heavy with a CG difference of -35.7mm, or 1.4" forward of the required CG location, and she comes in at a total weigh of 1,196 grams or 2.64 lbs. (42.2 oz.). Given the LiPo is a 4S 2,600 mah at 284 grams, placed toward the rear of the LiPo battery bay with approx. 1.5" still available to move aft, I think we are ok for now. Once I have finished everything I will run through another CG check to determine if any ballast will be needed in the tail to obtain the correct final CG location. I first need to move the receiver forward of the LiPo bay opening so I can move the LiPo battery further aft.

To get this little beast ready for first flight I needed to first finish a few items. The prop adapter supplied with the E-Flite Power 15 motor would not work with the APC 45mm Hub for my APC Electric Folding 11x8 propeller, so I ordered an MPI Aluminum Folding Spinner - APC 40mm SKU: PA40 from RC Dude Hobbies. I than ran through all the servo set-ups on my DX8 transmitter to make sure I had the correct elevon deflection directions and at the deflection measurements indicated in the X-100 Build Guide for low and high rates. I installed the new MPI spinner and the APC 11x8 folding props. I had to remove 10mm off the front of the motor cowling for proper spinner to cowling clearance, but this also resulted in a perfect match in cowling/spinner diameters. I checked the current draw of my power system setup and found that ***at full throttle the system pulls 24.7 amps***. This is well within my ESC limits.

To get the CG within an *acceptable range* I ended up having to put 85 grams of lead ballast inside parts Back Wing L1 & R1. With that the final CG calculations are shown in Figure 23. Having a "ready to fly" total weight of 45.7 oz. results in a wing loading of 15 oz/ ft^2 which should give me a gentle flyer. My X-100 Infinity Wing ready for first flight is in Figure 24.

X-100 Infinity Wing V2 CG Calculation by Weight (Final)

Weight: 2.86 lbs.

Model			**Details**	
X-100 Infinity Wing V2			**Tail Dragger**	**Imperial**
D	520.0	mm	Distance between center point of MLG and tail wheel	20.5
CG(s)	147.0	mm	Distance of specified CG location from MLG axles	5.8
W(p)	473.5	g	Measured weight at left wheel	16.7
W(s)	473.5	g	Measured weight at right wheel	16.7
W(t)	349.0	g	Measured weight at tail wheel	12.3
W(total)	1296.0	g	Total weight of plane: W(p) + W(s) + W(t)	45.7
CG(a)	140.0	mm	Actual CG location from MLG: W(t) x D / W(total)	5.5
W(t)	366.4	g	Weight required at tail wheel for balanced CG: W(total) x CG(a) / D	12.9
W(delta	17.4	g	Delta from weight required at tail wheel	0.6
CG(diff)	**-7.0**	**mm**	Difference between actual and specified CG: CG(a) - CG(s)	**-0.3**

Legend:		
	(green)	Aircraft-specific; enter once and do not alter for this
	(yellow)	Measured weights; change with every weight session
	(blue)	Calculated values; do not edit these fields

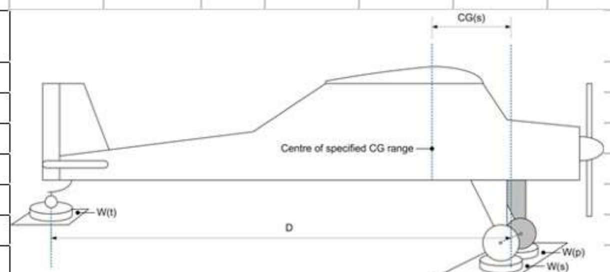


Figure 23 – X-100 Final CG Location Calculations

Figure 24 – My X-100 Infinity Wing Ready for First Flight

Table 1 - X-100 Infinity Wing V2 Parts Material, Print Time, and Weights

Part Name	Print Filament Used	Print Time	Part Weight
Fuse 1	Balsa Polylight 1.0 LW-PLA	6hr 30m	25g
Fuse 2	Balsa Polylight 1.0 LW-PLA	8hr 46m	35g
Fuse 3	Balsa Polylight 1.0 LW-PLA	3hr 43m	15g
Fuse 4	Balsa Polylight 1.0 LW-PLA	2hr 43m	10g
Fuse Tray 1	Clear Creality Hype-PETG	45m 21s	12g
Fuse Tray 2	Clear Creality Hype-PETG	23m 25s	8g
Fuse Tray 3	Clear Creality Hype-PETG	23m 33s	5g
Canopy 1	Black Creality Hyper-PLA	1hr 53s	22g
Canopy 2	Black Creality Hyper-PLA	1hr 50m	21g
Vert Stab	Balsa Polylight 1.0 LW-PLA	6hr 50m	12g
Back Wing R1	Red Polylight 1.0 LW-PLA	3h 9m	11g (with 30% infill density)
Back Wing R2	Red Polylight 1.0 LW-PLA	4h 56m	20g (with 20% infill density)

Back Wing R3	Red Polylight 1.0 LW-PLA	2h 59m	11g
Back Wing R4	Red Polylight 1.0 LW-PLA	2h 33m	10g
Back Wing R5	Red Polylight 1.0 LW-PLA	2h 36m	10g
Back Wing L1	Red Polylight 1.0 LW-PLA	3h 9m	11g (with 30% infill density)
Back Wing L2	Red Polylight 1.0 LW-PLA	4h 56m	20g (with 20% infill density)
Back Wing L3	Red Polylight 1.0 LW-PLA	2h 58m	11g
Back Wing L4	Red Polylight 1.0 LW-PLA	2h 33m	10g
Back Wing L5	Red Polylight 1.0 LW-PLA	2h 37m	11g
Front Wing R1	Red Polylight 1.0 LW-PLA	7h 27m	31g (with 20% infill density)
Front Wing R2	Red Polylight 1.0 LW-PLA	5h 8m	25g
Front Wing R3	Red Polylight 1.0 LW-PLA	4h 25m	19g
Front Wing L1	Red Polylight 1.0 LW-PLA	7h 27m	31g (with 20% infill density)
Front Wing L2	Red Polylight 1.0 LW-PLA	5h 8m	25g
Front Wing L3	Red Polylight 1.0 LW-PLA	4h 25m	19g
Back Wing Tip R	Balsa Polylight 1.0 LW-PLA	2hr 47m	7g (with 20% infill density)
Back Wing Tip L	Balsa Polylight 1.0 LW-PLA	2hr 41m	7g (with 20% infill density)
Front Wing Tip R	Balsa Polylight 1.0 LW-PLA	2hr 43m	6g (with 30% infill density)
Front Wing Tip L	Balsa Polylight 1.0 LW-PLA	2hr 43m	6g (with 30% infill density)
Middle Wing Tip R	Balsa Polylight 1.0 LW-PLA	44m 58s	3g (with 20% infill density)
Middle Wing Tip L	Balsa Polylight 1.0 LW-PLA	45m 7s	3g (with 20% infill density)
Elevon R1	Red Polylight 1.0 LW-PLA	3h 36m	12g (with 20% infill density)
Elevon R2	Red Polylight 1.0 LW-PLA	3h 11m	9g (with 20% infill density)
Elevon L1	Red Polylight 1.0 LW-PLA	3h 36m	12g (with 20% infill density)
Elevon L2	Red Polylight 1.0 LW-PLA	3h 11m	9g (with 20% infill density)
Cowl	Black Creality Hyper-PLA	44m 38s	10g
Servo Cover R & L	Black Creality Hyper-PLA	48m 12s	7g
Motor Mount	Clear Creality Hype-PETG	10m 46s	3g
Belly Wheel Tire	Black Giantarm TPU	1h 27m	10g
Tire Hubs 1 & 2	Black Creality Hyper-PLA	15m 22s	4g
Tailwheel Tire	Black Giantarm TPU	8m	1g

First Flight *Attempt*

The weather here in North Carolina was great on 8 January 2026. Upper 60’s, hardly any winds, and high clouds. Just what I was waiting for so I could get the first flight accomplished on my new X-100 Infinity Wing. So, I charged up the LiPo battery packs and headed out to the WS-RC Flying Field.

Being a Thursday in the early afternoon, the flying field was dead quiet and empty. I first flew my Gentle Lady to get the old fingers warmed up on the transmitter. As usual, she flew great. Now for the X-100. I installed the 4S 2,600mah LiPo battery pack, used the fingertips under the wing method to re-check the CG which was still somewhat nose heavy, re-checked all the flight surface control throws, briefly ran up the motor to verify everything was working as it should, and then I stepped out to the flight line in prep for first flight.

I established my handhold on the fuselage underside just aft of the forward wing, flipped the transmitter switch to allow power to the motor, used my nose to advance the throttle, took a deep breath, and lofted the X-100 forward at about a 35 degree angle nose up.

As you can see from the two images below, my first flight didn’t last very long. I attributed these results to several things, including a hand launch by myself, my slow reflexes at getting both hands back on the transmitter, the nose heavy condition, and **not** using full throttle at launch. Basically, the X-100 started to climb out, stalled, and before I could apply more power she was already headed straight nose down for the ground. Total time of first flight was maybe 15 seconds.

Figure 25 – My X-100 Infinity Wing First Flight Results

Oh well, as I've said before, this is something you must be able to accept if you want to enjoy the hobby of flying RC model aircraft. But all is not lost. I will recover all the power system and flight control system components, minus the folding propeller (which I have more), the carbon fiber tubes, MLG and tail wheel, nose cone and canopy. And just maybe I will attempt another print/build of the X-100 Infinity Wing, but with some modifications. First, I will build the upgraded version with landing gear to eliminate the hand launching issues, and **I will NOT use LW-PLA again**.

3D Printing the X-100 Infinity Wing Upgrade Version

First thing I did was to download the X-100 INFINITY WING landing gear and rudder upgrade STL files. This free upgrade kit is compatible with the X-100 Infinity Wing V2 STL files set. It carries the Infinity Wing design to a whole new level with a new fuselage design complete with landing gear and rudder capability.

Next, I took the ***"first flight crash pile"*** of my first X-100 which you can see in Figure 26 below and salvaged everything that could be used in the rebuild of my second X-100, which is shown in Figure 27.

Figure 26 – First X-100 Infinity Wing Pile from its First Flight

Figure 27 – First X-100 Infinity Wing Salvaged Parts

Then I set out to 3D print the new *upgrade* fuselage by setting up each of the various STL files in Creality Print. Using Black Creality PETG filament, I printed all the parts listed using the Black filament in Table 2 below. Resulting print times and part weights are also listed in Table 2.

With that complete, I next 3D printed the rest of the *upgrade* fuselage parts using White Creality PETG filament as listed in Table 2. Again, all print times and part weights are listed in Table 2.

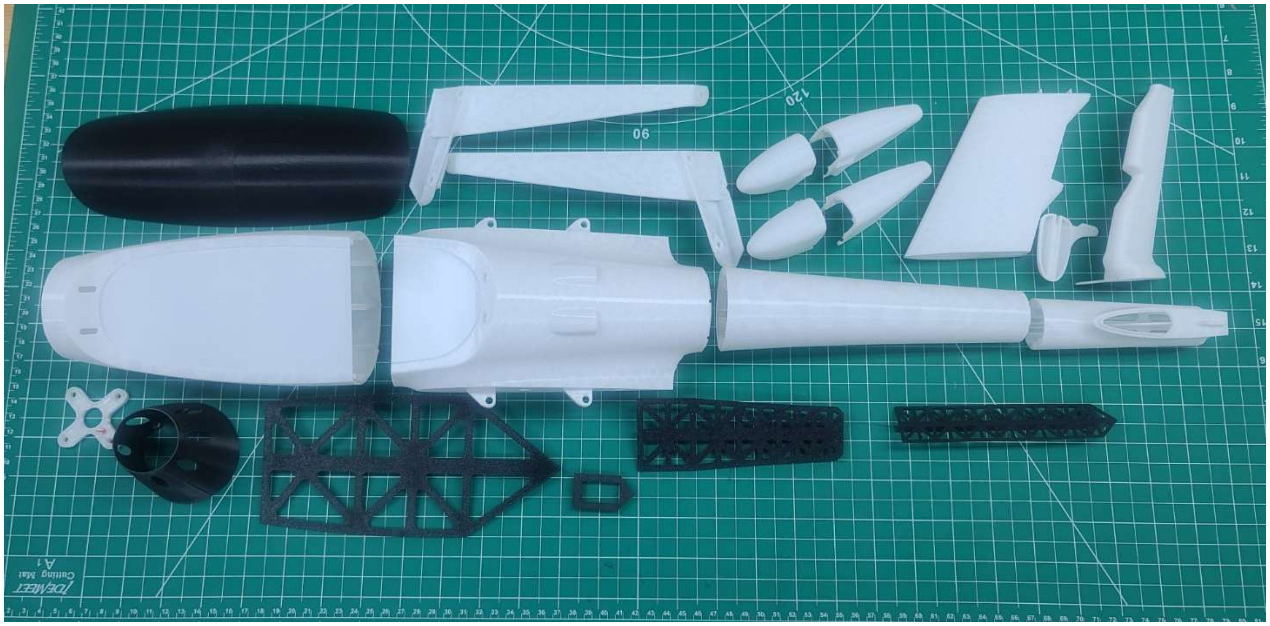


Figure 28 – X-100 Infinity Wing Upgrade Fuselage Parts

With the Upgraded fuselage parts printing complete, my next step was the Front Wing. After swapping out the filament on my Ender-3 V3 printer, I then 3D printed all of the Front Wing parts in Red Creality CR-PETG filament at a 60 mm/s print speed, 0.2mm layer height, with single walls and a 5% Gyroid sparse infill pattern, using a 0.4mm nozzle. Again, all print times and part weights are listed in Table 2. Results of my efforts are shown in Figure 29 below.

Figure 29 – X-100 Infinity Wing Upgrade Front Wing Parts

With the Front Wing parts printing complete, my next step was the Back Wing. After swapping out the filament on my Ender-3 V3 printer, I then 3D printed all of the Elevon and Back Wing parts in Blue Creality CR-PETG filament at a 60 mm/s print speed, 0.2mm layer height, with single walls and a 5% & 10% Gyroid sparse infill pattern, using a 0.4mm nozzle. Again, all print times and part weights are listed in Table 2. Results of my efforts are shown in Figure 30 below.

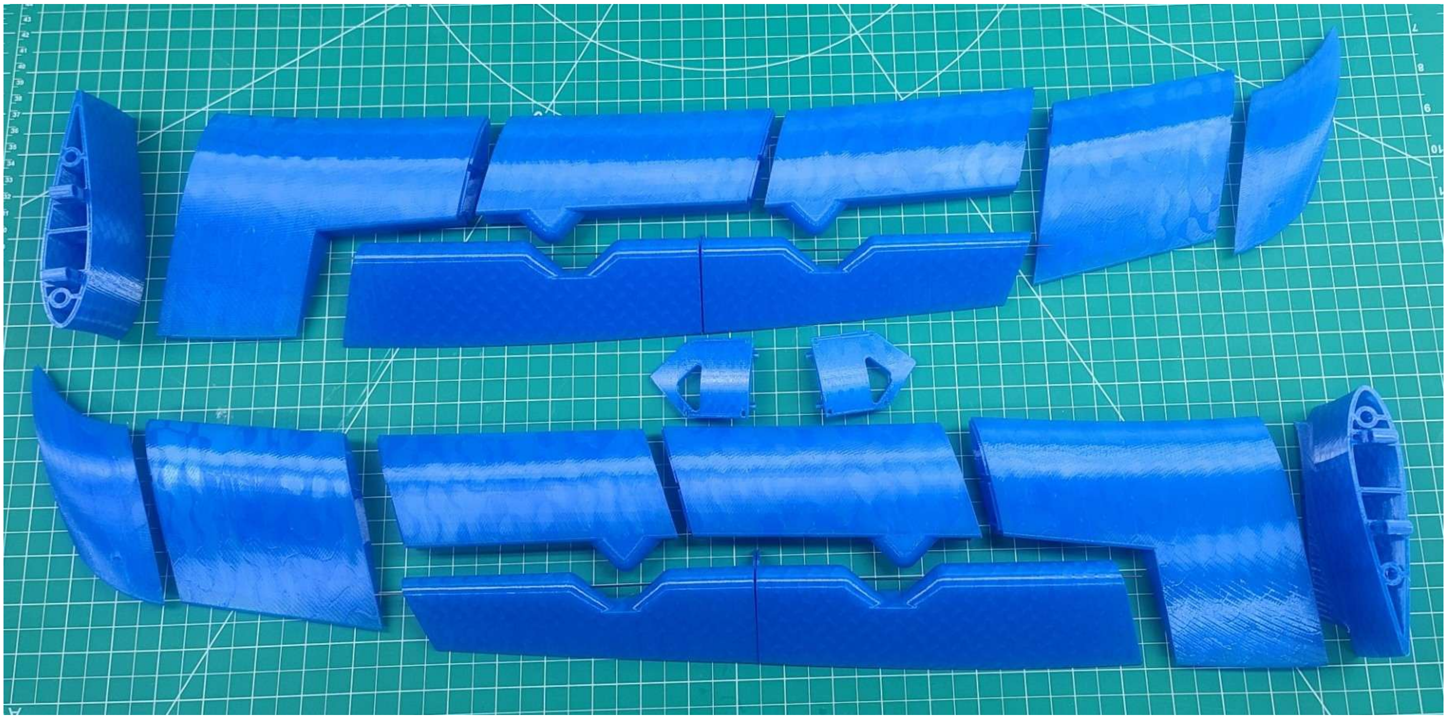


Figure 30 – X-100 Infinity Wing Upgrade Back Wing Parts

Table 2 - X-100 Infinity Wing w/Upgrade Parts Material, Print Time, and Weights

Part Name	Print Filament Used	Print Time	Part Weight
LandingGearR	White Creality PETG	1hr 39m	15g (with 10% infill density)
LandingGear L	White Creality PETG	1hr 35m	15g (with 10% infill density)
Wheel Pant L1	White Creality PETG	47m	4g (with 5% infill density)
Wheel Pant L2	White Creality PETG	1h 14m	7g (with 5% infill density)
Wheel Pant R1	White Creality PETG	47m	4g (with 5% infill density)
Wheel Pant R2	White Creality PETG	1h 15m	7g (with 5% infill density)
Rudder Servo Tray	Black Creality PETG	9m	<1g (with 30% infill density)
Fuse 1 Upgrade	White Creality PETG	5hr 31m	70g (with 5% infill density)
Fuse 2 Upgrade	White Creality PETG	7hr 47m	100g (with 10% infill density)
Fuse 3 Upgrade	White Creality PETG	3hr 19m	35g (with 5% infill density)
Fuse 4 Upgrade	White Creality PETG	2hr 6m	17g (with 5% infill density)
Fuse Tray 1	Black Creality PETG	56m 43s	13g (with 10% infill density)
Fuse Tray 2	Black Creality PETG	41m 4s	7g (with 10% infill density)
Fuse Tray 3	Black Creality PETG	29m 46s	5g (with 10% infill density)
Canopy 1	Black Creality Hyper-PLA	1hr 53s	21g (used old one)
Canopy 2	Black Creality Hyper-PLA	1hr 50m	21g (used old one)
Vert Stab Upgrade	White Creality PETG	2hr 4m	28g (with 10% infill density)
Rudder 1	White Creality PETG	2hr 2m	17g (with 10% infill density)
Rudder 2	White Creality PETG	20m	4g (with 10% infill density)
Back Wing R1	Blue Creality PETG	1hr 57m	26g (with 10% infill density)
Back Wing R2	Blue Creality PETG	3hr 36m	44g (with 5% infill density)
Back Wing R3	Blue Creality PETG	3hr 31m	30g (with 5% infill density)
Back Wing R4	Blue Creality PETG	2hr 55m	27g (with 5% infill density)
Back Wing R5	Blue Creality PETG	2hr 16m	27g (with 5% infill density)
Back Wing L1	Blue Creality PETG	1hr 57m	26g (with 10% infill density)
Back Wing L2	Blue Creality PETG	3hr 36m	44g (with 5% infill density)
Back Wing L3	Blue Creality PETG	3hr 20m	30g (with 5% infill density)
Back Wing L4	Blue Creality PETG	2hr 55m	27g (with 5% infill density)
Back Wing L5	Blue Creality PETG	2hr 16m	27g (with 5% infill density)

Front Wing R1	Red Creality PETG	4hr 45m	67g (with 5% infill density)
Front Wing R2	Red Creality PETG	3hr 54m	54g (with 5% infill density)
Front Wing R3	Red Creality PETG	3hr 25m	46g (with 5% infill density)
Front Wing L1	Red Creality PETG	4hr 49m	67g (with 5% infill density)
Front Wing L2	Red Creality PETG	3hr 54m	54g (with 5% infill density)
Front Wing L3	Red Creality PETG	3hr 25m	46g (with 5% infill density)
Back Wing Tip R	Blue Creality PETG	2hr 10m	16g (with 5% infill density)
Back Wing Tip L	Blue Creality PETG	2hr 10m	16g (with 5% infill density)
Front Wing Tip R	Red Creality PETG	1hr 52m	17g (with 5% infill density)
Front Wing Tip L	Red Creality PETG	1hr 52m	17g (with 5% infill density)
Middle Wing Tip R	White Creality PETG	30m	7g (with 10% infill density)
Middle Wing Tip L	White Creality PETG	30m	7g (with 10% infill density)
Elevon R1	Blue Creality PETG	3hr 56m	35g (with 10% infill density)
Elevon R2	Blue Creality PETG	3hr 16m	25g (with 10% infill density)
Elevon L1	Blue Creality PETG	3hr 56m	35g (with 10% infill density)
Elevon L2	Blue Creality PETG	3hr 16m	25g (with 10% infill density)
Cowl	Black Creality Hyper-PLA	44m 38s	9g (used old one)
Servo Cover R & L	Blue Creality PETG	1h 4m	7g (with 10% infill density)
Motor Mount	Clear Creality Hype-PETG	10m 46s	3g (used old one)
MLG Tire (x2)	Black Giantarm TPU	1h 28m	28g total (used 1 original print)
Tire Hubs 1 (x2)	Black Creality Hyper-PLA	20m 17s	4g total (used 1 original print)
Tire Hubs 2 (x2)	Black Creality Hyper-PLA	20m 17s	4g total (used 1 original print)
Tailwheel Upgrade	Black Giantarm TPU	8m	<1g