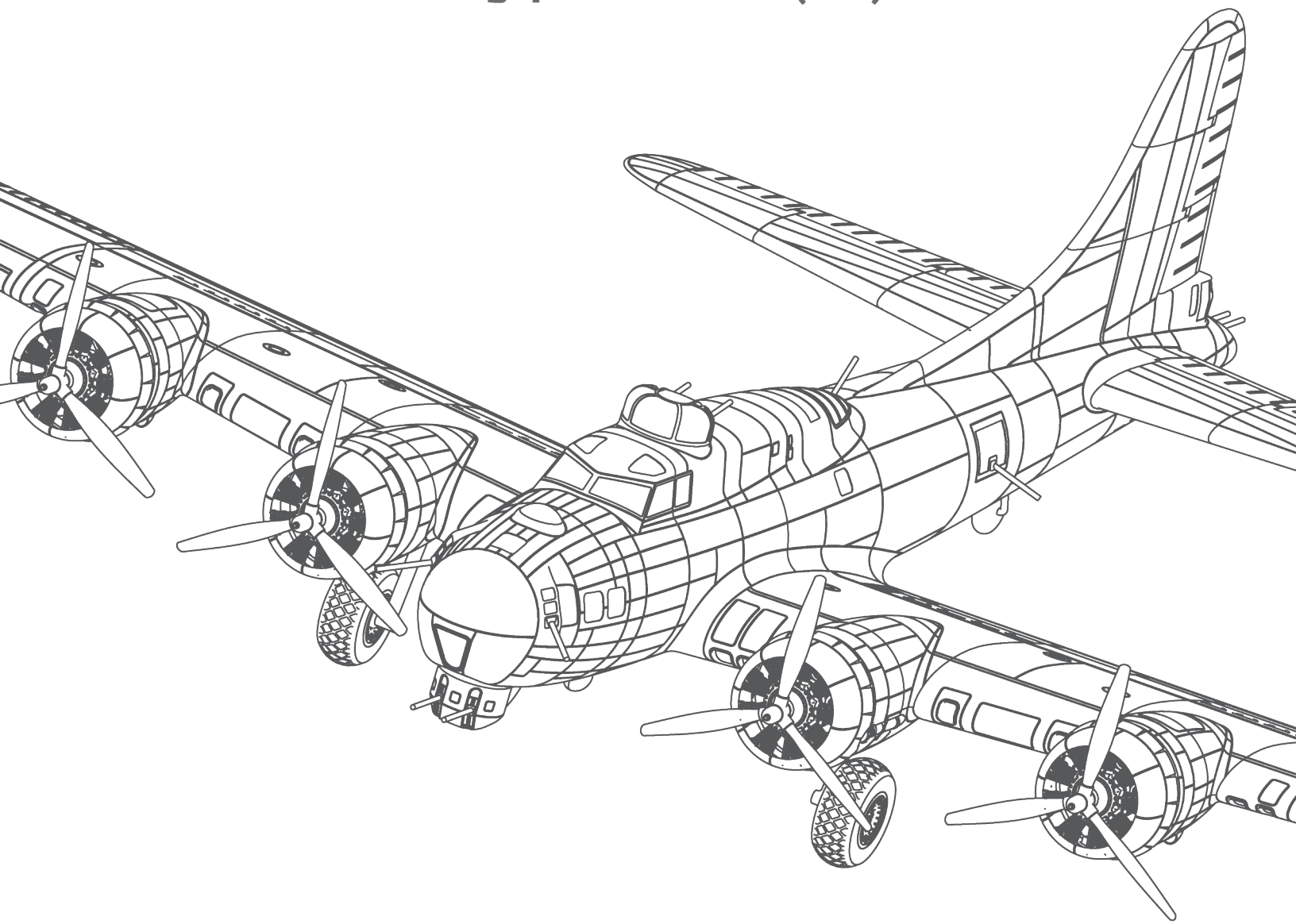
B-17 Flying Fortress

3D Printed R/C Aircraft Specs, Recommended Setup, and Hardware

Wingspan: 2108mm (83”)



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Included in Your Download:

1. STL Files
2. Simplify3D Factory Files (for the recommended materials)
3. Recommended Slicer Settings for different materials(Excel and PDF format)
4. Generic Gcode for i3 style printers (for the recommended materials)
5. PDF Build Guide

Please Read A Note from the Designer:

Like my other designs (other than the Micro SportCam), the outer walls of the B-17 parts 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 heavy aircraft. That's why I highly recommend printing this aircraft as a hybrid, using LW-PLA on most of the parts and a more rigid plastic like PLA, PETG, or ABS/ASA in strategic areas. A full PLA build is not recommended.

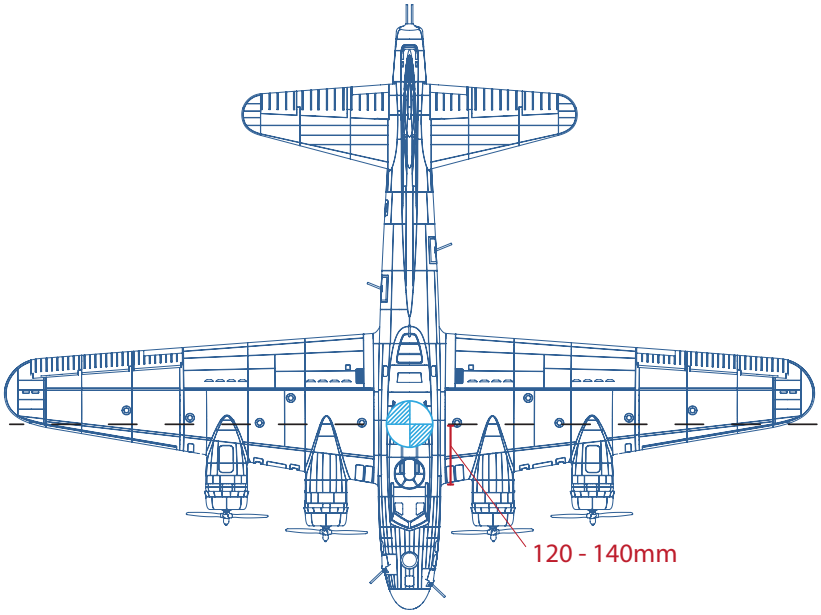
You'll see most of the images of this design are of the B-17G model, with the chin turret. But I've also included a separate nose piece for those who want to build the B-17F model (like the Memphis Belle!).

Unfortunately, I can no longer promise to be available for customer support or troubleshooting via email. But, you can get support during your build from fellow modelers through RC Groups forums or the 3D Printed Pilots group on Facebook.

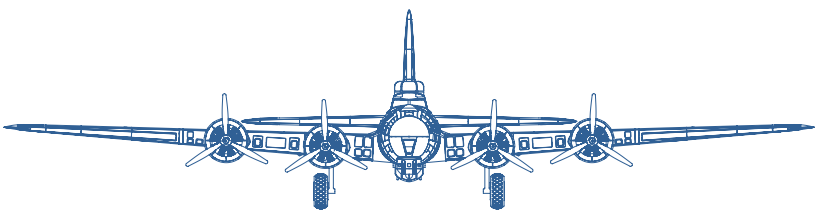
Thanks for your support and enjoy your flight!
Eric Haddad
Pilot in Command

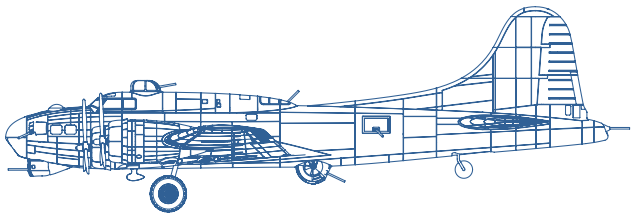
Specs:

Scale:	**1/15 Scale**
Wingspan:	**2108mm / 83”**
Length (not including tail guns):	**1520mm / 59.8”**
Height:	**518mm / 20.4”**
Wing Area:	**919.13 in²**
Wing Loading (LW-PLA Hybrid):	**30.39 oz/ft²**
Wing Cube Loading (LW-PLA Hybrid):	**12**
Flight Performance Category:	**Scale Warbird**
Center of Gravity Location:	**120 - 140mm behind the Wing’s Leading Edge**
Weight of Printed Parts (LW-PLA Hybrid):	**1900g / 67 oz**
Flying Weight (Painted):	**5500g / 194 oz**
Recommended Max Flying Weight:	**6860g / 242 oz**
No. of Channels:	**6 - Throttle, Aileron, Elevator, Rudder, Retracts (optional), Flaps (optional)**



CG Location 120 - 140mm behind the Wing’s Leading Edge





Recommended Setup:

Motor Options: Flightline 3530 - 860kV (x4)
Leopard 3536-7T - 1100kV (x4)

ESC Options: For Flightline Motors: Flightline 30A ESC for Inboard Motors (x2)
Flightline 30A ESC for Outboard Motors (x2
For Leopard Motors: 50A ESC (x4)

Rec. Prop Size: For Flightline Motors: 9.5x7 3-Blade (recommend 2 standard and 2 reverse)
For Leopard Motors: 9 x 6 2-Blade (recommend 2 standard and 2 reverse)

Batteries: 2x 4S 5000 mAh LiPo (one for the two inboard motors and one for the two outboard motors)

Radio: Radio + 8ch Receiver

Servos: Hitec HS-85MG (x5) for 2 Elevators, 1 Rudder, and 2 Ailerons
Hitec HS-85MG (x2) for optional flaps*

Retracts(optional): Robart #532RSE 75 deg Reverse Electric Main Retracts (x2)**

Tailwheel Retract: E-Flite Part #EFLG01256 Tailwheel Retract for 1.5M P-51D Mustang

***The prototype was built without flaps and slows down fine f landing. If you decide not to add flaps, still print the flap parts and permanently glue them in place.**

**** Robart's website says the 532RSE retract is out of order. They are available for special order by calling the number shown on their website.**

Tools and Materials Needed:

- Min 250mm x 250mm x 210mm desktop 3D Printer
- ColorFabb LW-PLA or other Lightweight, foaming material
- High Quality Standard PLA, ABS, ASA, or PETG
- Varioshore TPU for Tires
- Medium Bodied CA/Super Glue
- Accelerator for CA
- Two-Part Epoxy Adhesive - 30 minute cure time
- Sandpaper and/or Small Files
- Spray Paint or Airbrush Paints
- Velcro strips with adhesive backing
- Screwdriver and/or allen wrench for chosen screws/bolts
- Needle Nose Pliers
- Dremel/Rotary Tool for cutting carbon fiber tubes

Hardware Needed:

Quantity:

- Robart #660 7/16" dia Straight RoboStrut 2
  - For Fixed Gear Option Cut down to a length of 127mm measured from center of wheel hub
  - For Retract Option cut down to a length of 96.7mm measured from center of wheel hub
- 2" Clevis Pin with Retaining Ring for main gear axles 2
- 6mm O.D x 3mm Thick Rare Earth Magnets for Top Fuse Hatch (x4),
  Rear Fuse Hatch (x12), Motor Cowlings (x6 each) , and Nacelle Hatches(x4 each) 56
- 4mm O.D x 20-25mm Long Compression Spring for Canopy Latch 1
  - The spring from a click pen or mechanical pencil will work
- 6-32 Thread x 1" Long Screws for Mounting Optional Retracts to Retract Mounting Trays 8
- 6-32 Thread x 5/8" Long Screws for Mounting Fixed Gear Mounts to Retract Mounting Trays 8
  and for retaining RoboStruts into Fixed Gear Mounts 4
- 6-32 Thread x 1/4" Length Heat-Set Threaded Inserts for Retract Mounting Trays 8
  and for retaining RoboStruts into Fixed Gear Mounts 4
- M3 x 10mm Long Thread Forming Screws for Optional Flap Servo Mounts 8
- M3 x 0.5mm x 8mm Long Flat Head Screw for Nacelle Hatches and Aileron Servo Mounts 24
- M3 x 0.5mm Thread Heat-Set Threaded Inserts for Nacelle Hatches and Aileron Servo Mounts .. 24
- M4 x 0.7mm Thread x 10mm Long Screws for mounting outer wing 4
- M4 x 0.7mm Thread Heat-Set Threaded Inserts for Outer Wing Connectors 4
- M3 x 0.5mm Thread Lock Nut for motor mounts 16
- M3 x 0.5mm Thread x 25mm Long Screws for mounting Freewing motors 16
- or M3 x 0.5mm Thread x 35mm Long Screws for mounting Leopard motors 16
- 16mm O.D. x 1000mm (1M) Carbon Fiber Tube for Main Wing Root Spar 1
- 10mm O.D. Carbon Fiber Tubes
  - 220mm Length for Vertical Stab 1
  - 760mm Length for Horizontal Stab 1
  - 1000mm (1M) Length for rear Wing Root spar 1
  - 550mm Length for outer wing spar 2
- 6mm O.D. Carbon Fiber Tubes
  - For Reinforcing Inboard Nacelles:
    - 300 mm Length (x4) 4
    - 120 mm Length (x2) 2
  - For Reinforcing Outboard Nacelles:
    - 260 mm Length (x4) 4
    - 120 mm Length (x2) 2
  - 20mm Length For Outer Wing Alignment Pins 4

Hardware Needed (cont'd):

Quantity:

- 4mm O.D. Carbon Fiber Tubes (795mm total length)
  - 65mm Length for Chin Turret Cannons and Canopy Latch Cannon(x3)..... 3
  - 60mm Length for all other Cannons(x10)..... 10
- 2mm O.D. x 20mm Long Dowel Pins (cut from scrap carbon fiber or steel rod)..... 21
  - For aligning Fuse 1 to Fuse 2 (x5), Fuse 2 to Fuse 3 (x2), Top Fuse Hatch 1 to Top Fuse Hatch 2 (x5), Top Fuse Hatch 2 to Top Fuse Hatch 3 (x5), Ailerons (x4)
- 2mm O.D. x 10mm Long Dowel Pins for aligning Loop Antenna R and L..... 2
- 1.5mm O.D. x 25mm Long Carbon fiber rod for dummy engine pushrods..... 18
- 1mm - 1.2mm O.D. Carbon fiber rod or Steel Wire
  - 395mm Long for Aileron Hinges..... 2
  - 335mm Long for Elevator Hinges..... 2
  - 195mm Long for Rudder Hinge..... 1
  - 495mm Long for Optional Flap Hinges..... 2
- Du-Bro 36" Lazer Rod for elevator pushrods..... 2
- 2-56 steel rod with Kwik-Links for Aileron pushrods and rudder-to-tailwheel linkage..... 3
- Du-Bro 2-56 pull-pull system for Rudder control..... 1
- 2-56 steel rod with Kwik-Links for optional flap pushrods..... 2
- Super Strength Servo Arms for long arms on elevator and pull-pull rudder(optional)..... 1
- 30 Gauge Copper Wire for dummy engine spark plug wiring(optional)..... 1

Printing Options

Step 1. 3D Printing the Included Parts

Minimum Requirements:

- 250mm x 210mm x 210mm Print Bed Size
- 0.4mm Nozzle
- Heated Bed (recommended)
- Any Slicer Software

Your Options for Printing the Parts:

Option 1: G-Code

Transfer the included G-Code to an SD Card and run directly on your i3 style printer using the materials we recommend. The provided G-Code is for our recommended PLA / LW-PLA Hybrid build. We've had good results with LW-PLA at 250º Celcius and standard PLA at 225º Celcius but experiment with your printer to make sure you achieve strong layer adhesion. If you wish to print this aircraft from a different material, reference the included Slicer Settings PDF and use your preferred slicer.

Option 2: Simplify 3D Factory Files

If you prefer to use Simplify3D as your slicer, open the included Factory Files and edit the preset profiles for your printer/material to ensure nice outer surfaces and excellent layer bonding.

Option 3: STL + Your Preferred Slicer

If you prefer to use another slicer or create your own profiles in Simplify3D, use the included STL files and reference the included Recommended Slicer Settings PDF.

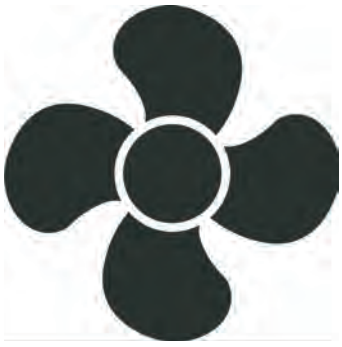
3D Printing Tips

ColorFabb LW-PLA

ColorFabb LW-PLA is an interesting material that uses foaming technology to achieve lightweight, low density PLA parts. This material is printed at a higher temperature (which causes it to expand) and a much lower extrusion multiplier than standard PLA. In order to determine the proper nozzle temperature and extrusion multipler for your particular printer you can follow our instructions: https://www.3daeroventures.com/how-to-print-with-lwpla We had good results printing LW-PLA at 250ºC at an Extrusion Multiplier of 0.4 and a bed temp of 60ºC. You will also likely combat quite a bit of stringing with LW-PLA. We increase X/Y Axis Movement Speed to 200mm/s and run the cooling fan at 25% to help combat stringing.

Standard PLA Temperatures:

We see good results printing Paramount3D PLA at 225ºC with a bed temperature of 70ºC. Experiment with your particular printer and brand of material to ensure proper layer bonding but you will likely land somewhere between 210 and 240ºC.



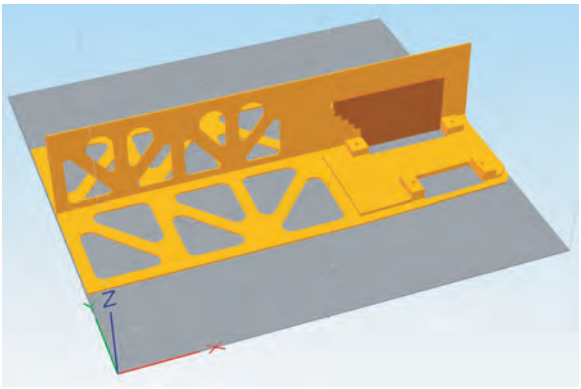
Cooling Fan:

Typically, PLA is printed with the fan set to 100%. However, this can cause layer bonding issues when printing thin walled aircraft. We have experienced nice , clean outer surfaces when keeping the fan speed up to 20% without negatively affecting layer bonding. Experiment with fan speeds set between 0 - 20%.

3D Printing Tips (cont'd)

Standard Materials Extrusion Multiplier (Flow):

You will need to experiment with extrusion multiplier for your particular printer and material. You will likely land somewhere between 0.95 and 1.05 extrusion multiplier.

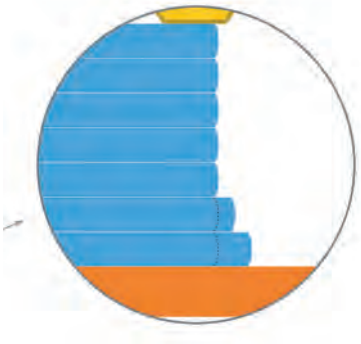


Support Structures:

Some parts of this aircraft require support structures and it's recommended to use your slicer's auto-generated support structures. See the included PDF file titled "B-17 Estimated Part Weights and Slicer Setting Categories" to see which parts require supports The GCode and the Simplify3D Factory Files already have the support structures in place.

Elephant's Foot:

Try to avoid the first few layers of each print from squishing too far outside the designed wall dimensions, also known as "elephant's foot". This can be caused by your nozzle being too close to the print bed or first layer width set too high in your slicer. A small amount of elephant's foot is okay but too much will interfere with the designed alignment aids.



Assembly Tips

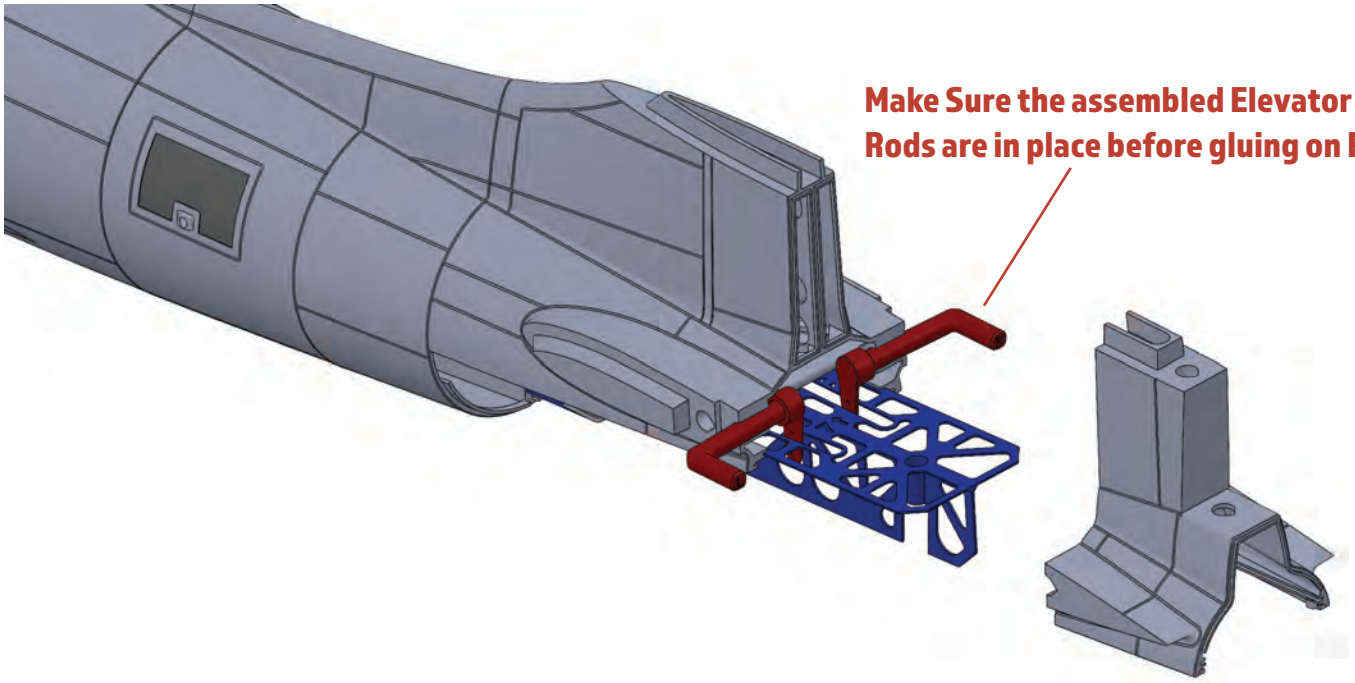
A PDF file titled "B-17 Estimated Part Weights and Slicer Setting Categories" is included with the download. This sheet shows the recommended material for each part, estimated weights for each part, the recommended slicer setting category for each part, and which parts require support structures.

Assembly Tips (cont'd)

ATTENTION: DO NOT GLUE ALL OF THE FUSE PARTS TOGETHER WITHOUT THE FUSE TRAY PARTS IN PLACE!

Always dry fit the parts to understand how they go together before gluing. The fuselage is designed with separate Fuse Tray parts. This was done in order to strengthen the Fuse parts that are printed in LW-PLA. The Fuse Tray parts should be printed in a more rigid plastic like standard PLA, ABS, PETG, or PC. The Fuse parts must be assembled with the Fuse Tray parts in a certain order. You will notice the Fuse Tray parts slide into rails located in the Fuse parts. The Trays overlap the seams of the Fuse parts and make for a very strong, rigid fuselage. Start with Fuse 1, glue in Fuse Tray 1, then Fuse 2, then Fuse Tray 2, and so on.

STOP AFTER GLUING FUSE TRAY 7 INTO PLACE. MAKE SURE YOU INSERT THE ELEVATOR CONTROL RODS IN PLACE BEFORE GLUING FUSE 8 TO YOUR ASSEMBLY AS SHOWN IN THIS PICTURE. MAKE SURE NOT TO GET ANY GLUE ON THE ELEVATOR CONTROL RODS SO THEY REMAIN FREE TO ROTATE:



About 3DAeroventures

3DAeroventures is a YouTube channel and informational website where content creator and Pilot in Command, Eric Haddad, uses engineering technology and model aviation to encourage his viewers and fellow aviation enthusiasts to never stop exploring, never stop questioning, and never stop playing.

3DAeroventures' fully 3D-printable, functional RC aircraft designs can be fabricated on hobbyist level desktop 3D printers out of common materials. The digital files of 3DAeroventures' aircraft are free and available online. If you'd like to download other designs, or stay up to date on 3DAeroventures' latest content and designs, visit www.3daeroventures.com and sign up for our email list.

Other ways to connect with 3DAeroventures:

- Consider subscribing to the YouTube channel at www.youtube.com/3daeroventures

- Connect with 3DAeroventures on Instagram

- Get help with your build from fellow modelers through RC Groups forums or the 3D Printed Pilots group on Facebook.