

# User Guide

rev. 2019/12



Fully 3d printable

## Bomb Bay Doors (servo operable) for North American B-25J Mitchell

Note: use included parts instead original B25J fuselage parts, refer to [B25J userguide](#)

Future of flying - Print your own plane.

Just a little addition to our B25J Mitchell files, so if you have free channels left on our receiver...

We hope you enjoy printing, building and flying it, although this build will truly test your abilities and quality of your printer.

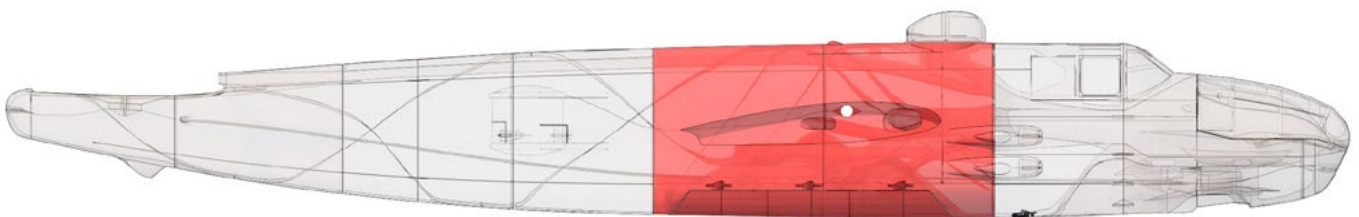
Welcome to the thin wall printing!

**The first fully printable** airplanes with files prepared for your 3Dprinter, with flight characteristics, comparable or even superior to classic build model airplane. This is not a dream, now you can print this HI-TECH at home. Simply download and print the whole plane or spare parts anytime you need just for a cost of filament only about \$40

**Extensive hi-tech 3d structural reinforcement** making the model very rigid while maintaining a lightweight airframe and exact airfoil even it's just a plastic. This perfect and exact 3d structure is possible only thanks to additive 3dprinting technology. So welcome to the 21st century of model flying and be the first at your airfield.

**Easy to assemble**, you don't need any extra tools or hardware. Just glue the printed parts together. The most complicated operation is probably shaping the landing gear legs, the rest of the assembly is very easy. Simply add brushless motor, ESC, servos and radio system. Detailed step by step PDF/VIDEO is included. You will get a superb performing precise and detailed legendary plane.

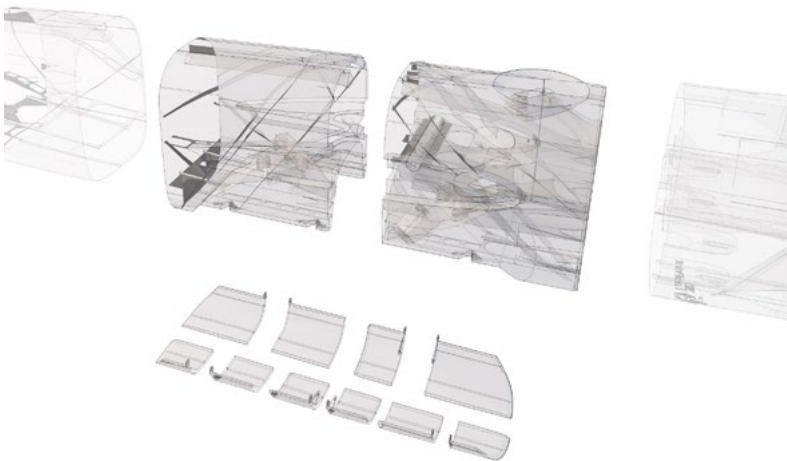
Note: use included parts instead original B25J fuselage parts, refer to [B25J userguide](#)



## Included:

### 1. STL 3d files

Universal STL files designed for use with desktop FDM 3D printers and slicer software such as Simplify3D (recommended) CURA or MatterControl (these STLs are not compatible with Slic3r/PrusaSlicer or Makerware slicers).



### 2. Factory files for Simplify3D slicer

With all our settings, these Factory files include all you need. Note: we use PRUSA i3 ORIGINAL printers so you may need to adjust the basic printing parameters to match your printer or use it as a starting point for you. Please look at [Simplify3D](#)

### 3. Step By Step PDF/VIDEO userguides

Please use this user guide along with the Printing Guide where you can find Tips and Advice for airplane printing (Thin Wall Printing).

### 4. Gcodes

Basic Gcodes prepared for direct use. We made it as universal as possible, 100% compatible with PRUSA i3 ORIGINAL and most i3 style printers. Feel free to try it out, but we're not able to guarantee it's gonna work with your printer.

Note: use included parts instead original B25J fuselage parts, refer to [B25J userguide](#)

## Step By Step PDF/VIDEO userguide (please go through all videos)

Choose airplane at [www.3DLabprint.com](http://www.3DLabprint.com). Our [Facebook](#) for live information.



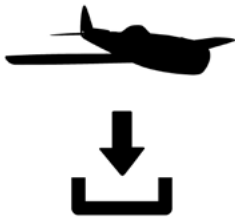
**Basic requirements for our B-25J are: at least 200/200/200mm build volume.** Nozzle 0.4mm recommended. Heated bed highly recommended.

PLA filament (or PETG, APLA, htPLA, PC-max.... not ABS) and some flex for tires...

If you're unsure your printer can handle this project, download the test part from our [FORUM](#) (usually the largest part)

### 1. Create account, download

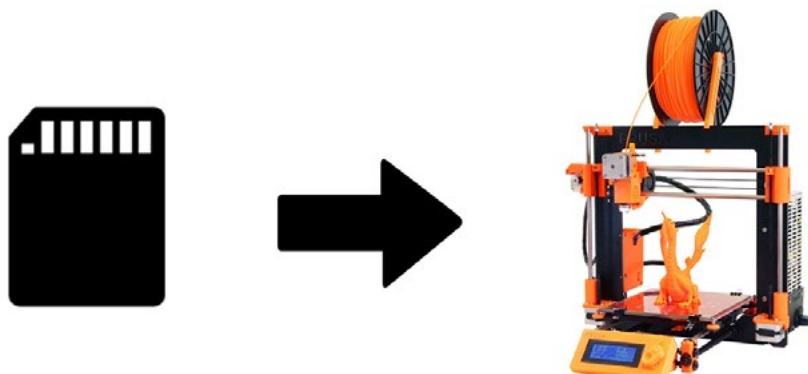
You'll get the download link for all zipped files to your email, or log in to your account and download directly from our website. If you don't receive the link right on checkout, please contact us on [support@3dlabprint.com](mailto:support@3dlabprint.com) mentioning the order number. (WC-XXXXX on PayPal receipt)



### 2. Gcodes preparing

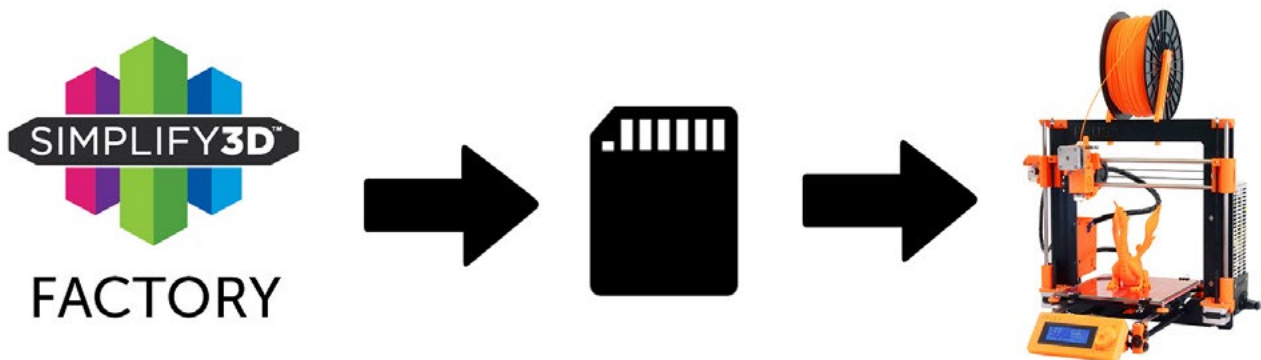
option A Gcodes:

If your printer is i3 compatible you can directly use the **prepared gcodes**. Simply save each to an SD card and let 3d printer do his job. The HE temperature is set to 225°C for the best layer bonding. You can edit speed and temperature on your printer LCD only. If prepared gcodes doesn't work for you, please proceed to the next options...



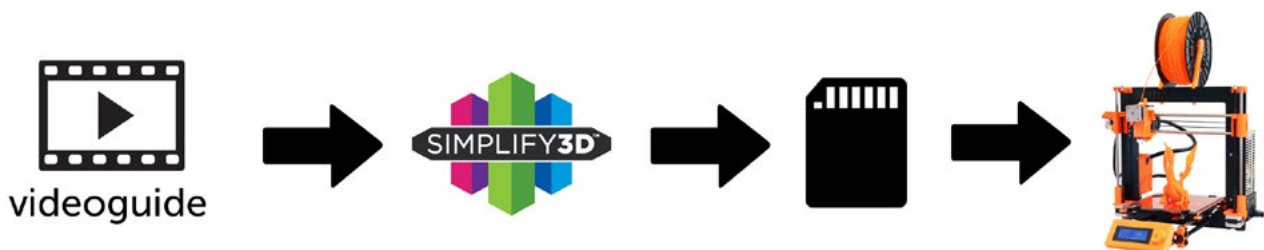
### option B FACTORY files for Simplify3D (recommended)

We prepared all you need in the factory files (basic FFF profiles, parts arranged on the bed, etc.) Use our settings as a starting point and edit according to your needs (adapt it for your printer), choose the parts to print etc. Most 3d printers should be ok with files as they are, however if you need some customization, please do so. We are not liable for any damage resulting from the use of our settings. If you still encounter any difficulties, please proceed to the next option.



### option C Simplify3D manual setting (watch and learn)

Use our [VIDEOGUIDE](#) and [how-to](#) to find explanation of proper settings. This is great option to learn a lot about Simplify3D and become a 3D expert. Of course you spend a lot of time and the youtube pause button will become your friend. For simplification we explain only our basic settings for wings and fuselage, please consult our prepared Factory files for the right settings of other parts like motor mounts, landing gears etc.



**AND... please watch the VideoGuides:**

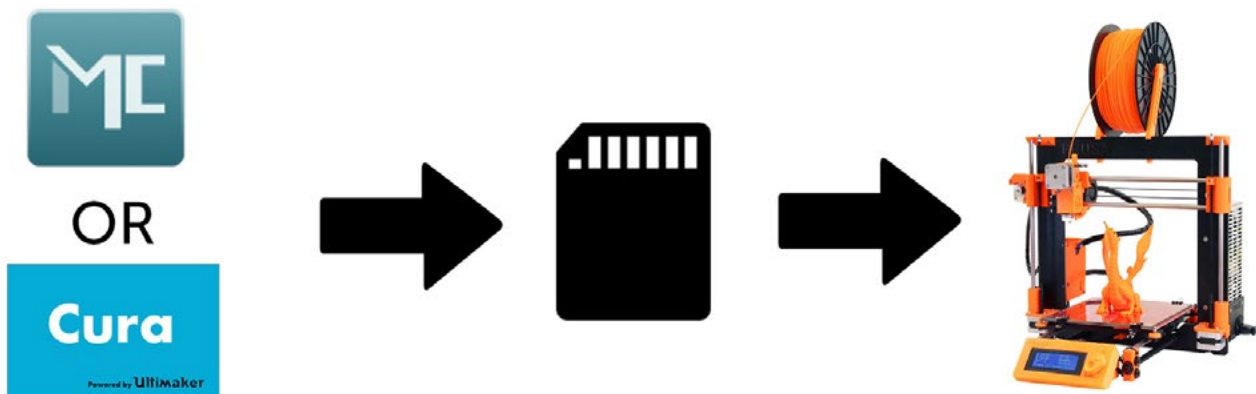
[video 2 Simplify3D setting](#)

[2.1 video about Thin Wall Printing](#)

option D CURA or MatterControl (considered as the last resort, we recommend Simplify3D) MatterControl and CURA are free and provide good results. The airframe is still strong enough, but don't expect the best quality. Both slicers lacks some very useful features, and finer settings, like multiple processes according to Z height, retraction options, layer start, etc. Please try to find the best extrusion multiplier and temperature for good weight and best possible layer bonding. Check the suggested parts weight list for proper multiplier settings.

Please check the [Cura setup guide](#) in the Help section.

As a starting point you can use our predefined CURA profile. Always adapt the settings for your printer, change build volume, filament diameter, etc. according to your printer. Please be aware some parts require different settings of perimeters, top/bottom layers and infill. For some thick part you'll need to use support structure. Check our gcodes in printing simulation for more details about how the result should look like. NOTE: some parts (nose, canopies, engine covers,...) require top layers to cover the steeper overhangs, but only for a certain spot. This is not possible to be set in Cura, however you can use the text editor gcode merge procedure described in the Cura setup guide article.





### 3. Print it

Save generated Gcodes and insert SD card to your printer, prepare your printer and start printing. We prefer to use SD rather than a direct connection via USB

**Note: ABS filament is not suitable for this. Scaling the model will lead to unusable result!**

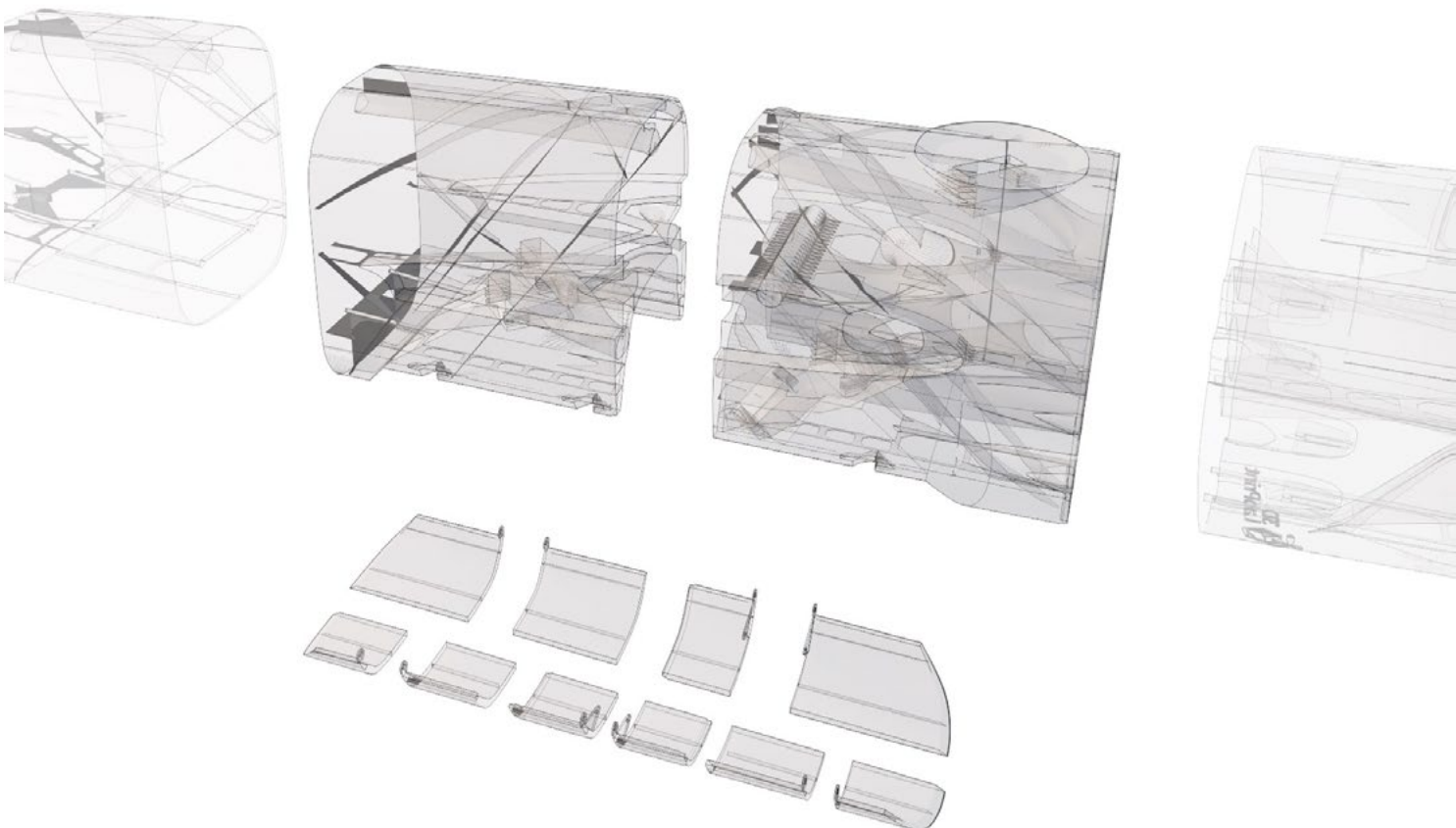
Note: ninja flex or simmilar fillaments can stick very hard to PEI based surfaces be careful...

You will need: PLA filament - good quality (we need good layer bonding)  
Strong hair spray (or your favorite adhesive bed surface)  
(disregard with PEI or similar bed surface, Mk2/3...)  
Razor blade

**AND... please watch the VideoGuides:**

[video printing guide #3](#)

North American B-25J Mitchell - parts diagram:

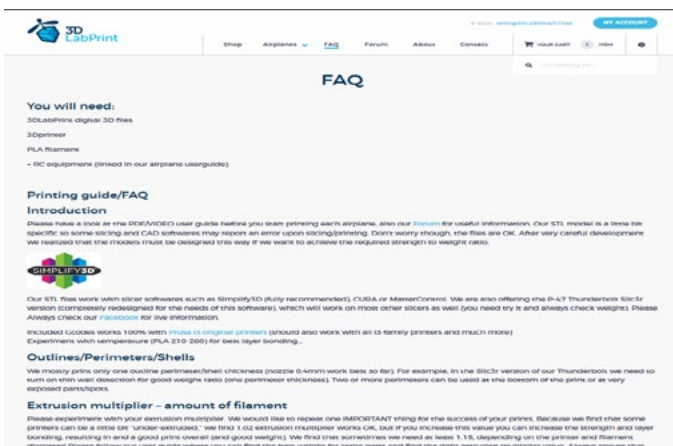


## Basic Tips and Advice

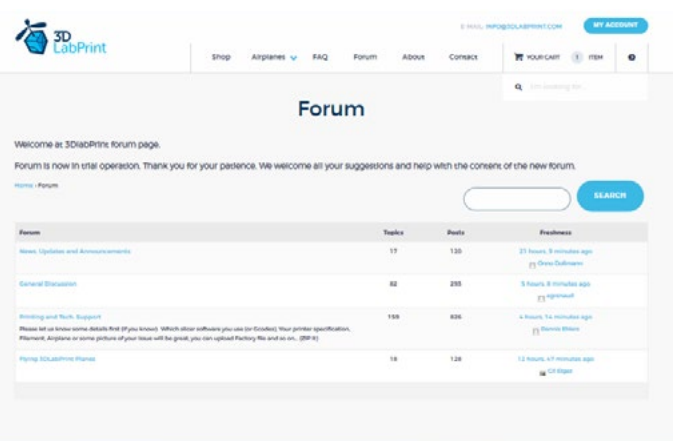
Please experiment with your extrusion multiplier to achieve the similar weights as in the list. **HotEnd temperature is very important** for a strong result. The reason is, the plastic leaving the nozzle has to melt the previous layer to create solid joint. Please print the thinwall temperature tower to find the best hotend temperature value (215° up to 260° Celsius) to achieve strong strong layer bonding without underextrusion on layer starts.. **Turn OFF cooling fan** (Heatbreak fan of course has to be left ON). Thin walls easily cools down on its own and the cooling fan worsens the layer bonding. You can use cooling fan for thick or very small parts if needed...

Heated bed is very recommended, use 50-56° Celsius to print without warping ends. Any standard quality PLA is suitable to print our planes, but the result depends on combination of PLA vs. Extruder vs. HotEnd. Some colors and brands of filament has lower layer adhesion, please do experiment with it. There are a lot of 3dprinters on the market, most of them are OK for printing our aircraft (specific thin wall printing...) with sufficient volume, heated bed, 0.4 mm nozzle.

Please look at [FAQ](#) and our [Forum](#) for further information:



The screenshot shows the FAQ page with sections like 'You will need:', 'Printing guide/FAQ Introduction', and 'Extrusion multiplier - amount of filament'.



The screenshot shows the Forum page with a table of topics and a search bar.

Forum	Topics	Posts	Freshness
News, Updates and Announcements	17	120	21 hours, 5 minutes ago [3] Steve Dalbey
General Discussion	82	283	5 hours, 8 minutes ago [3] rghmnd
Printing and Tech. Support	199	826	4 hours, 14 minutes ago [3] Steve Dalbey
Printing Substrate Plans	16	128	12 hours, 47 minutes ago [3] rghmnd



Some advice for rubberlike filament printing (printable tyre): it is a good IDEA to use some adhesive tape or foil... first layer bonding could be too strong or on the other hand too weak depends what filament is used... (picture:RubberJet - TPE32 245/30 print temperature)

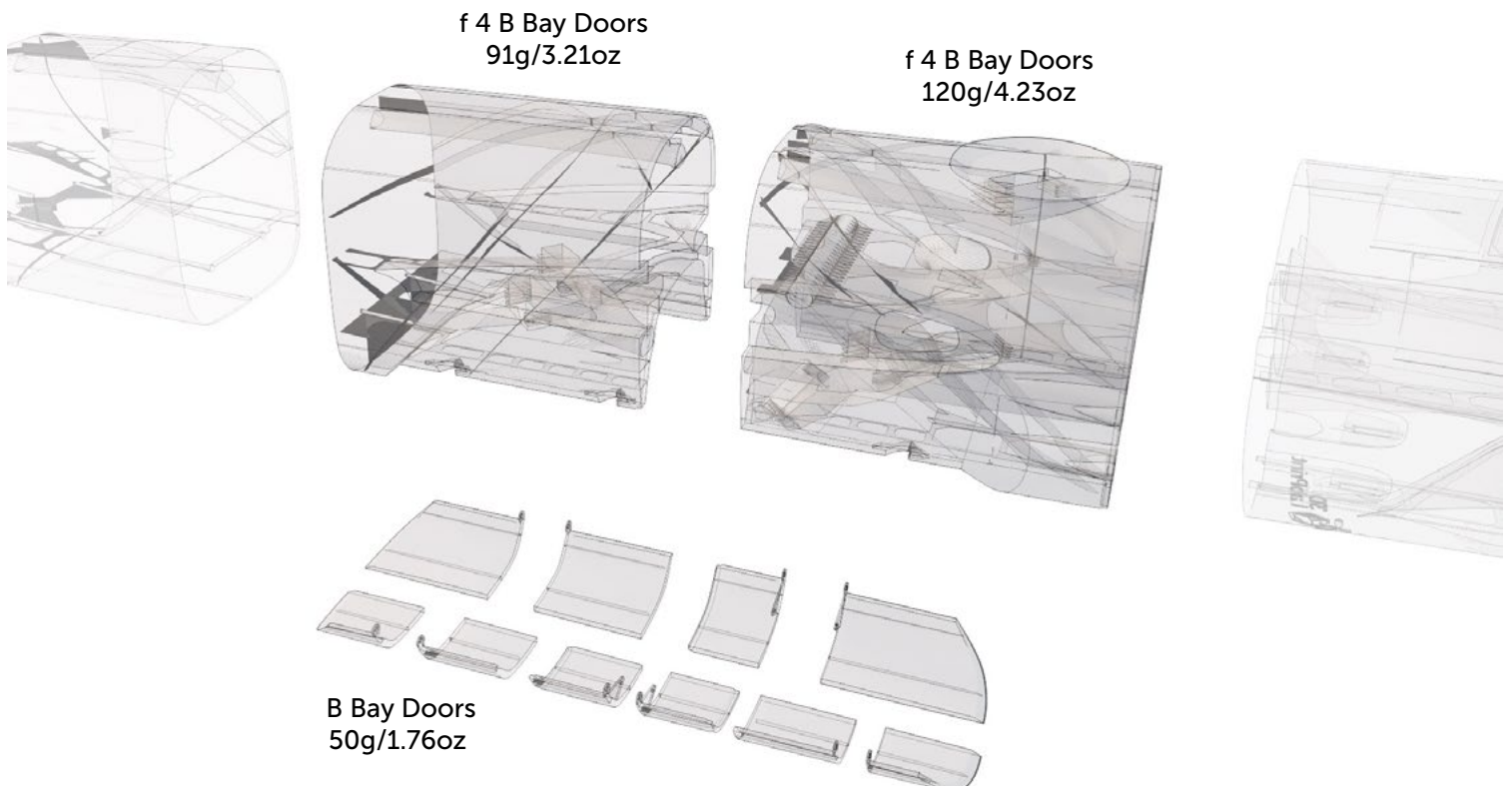
After printed, heat up bed to 80 Celsius and remove tape along with printed tyre, clear the bed with isopropylalcohol...



## 4. Assembling printed parts

you will need: [CA Glue](#) - [medium](#) or similar medium viscosity CA glue  
[Activator for CA Glue](#) or similar, (gas presurized works better)  
1.75-2mm rod/axle for door hinge (we use fillament or toothpick)

The weight of parts can vary +/- 8% due to diff PLA color or brand...!!!



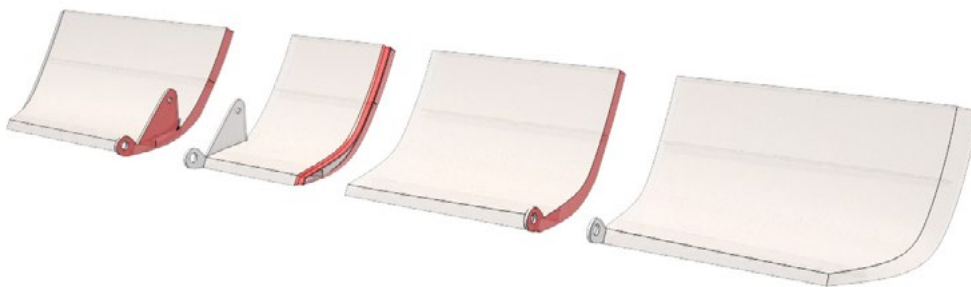
Proceed the way shown in videoguide:

...it is very similar to this video guide (B25J): [See video guide #4.1](#)

Apply CA glue to the contact surfaces (marked red in the picture) and assemble together, then apply the activator, proceed this way with gondola parts and glue them together:

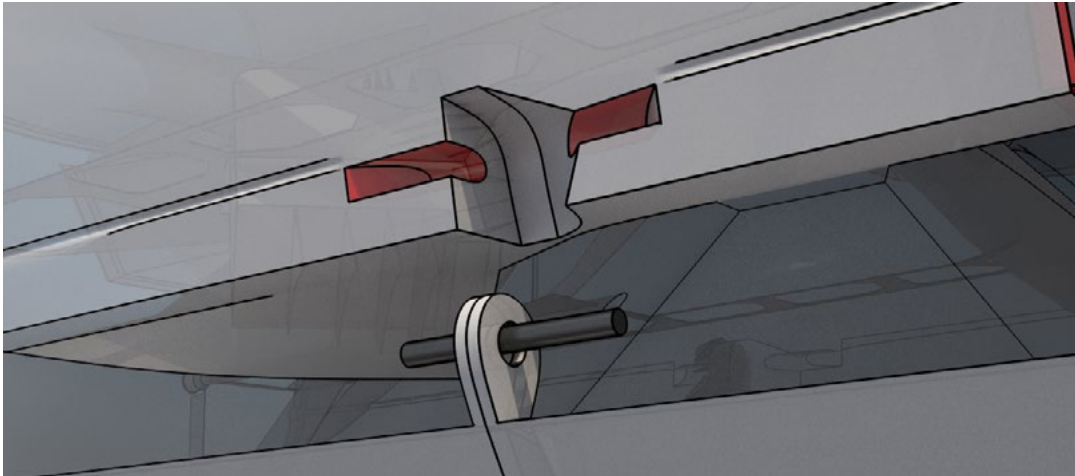


Apply CA glue to the contact surface of the doors parts (marked red in the picture) :

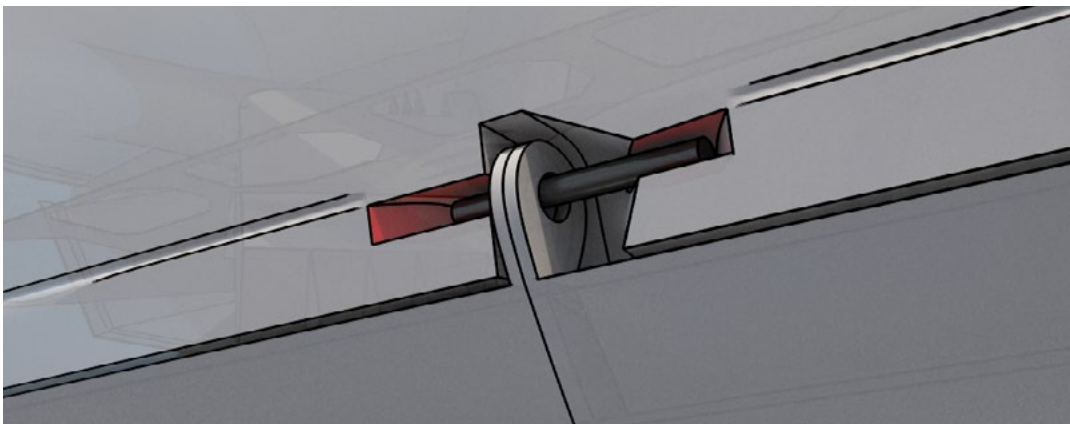


Note: use included parts instead original B25J fuselage parts, refer to [B25J userguide](#)

For door hinges you can use any 1.75-2mm rod (we use piece of filament or toothpick) :



Apply CA glue to the contact surfaces (marked red in the pictures) and insert doors with hinges, then apply the activator and operate the flaps till CA glue is completely cured:



## 5. Servo installation

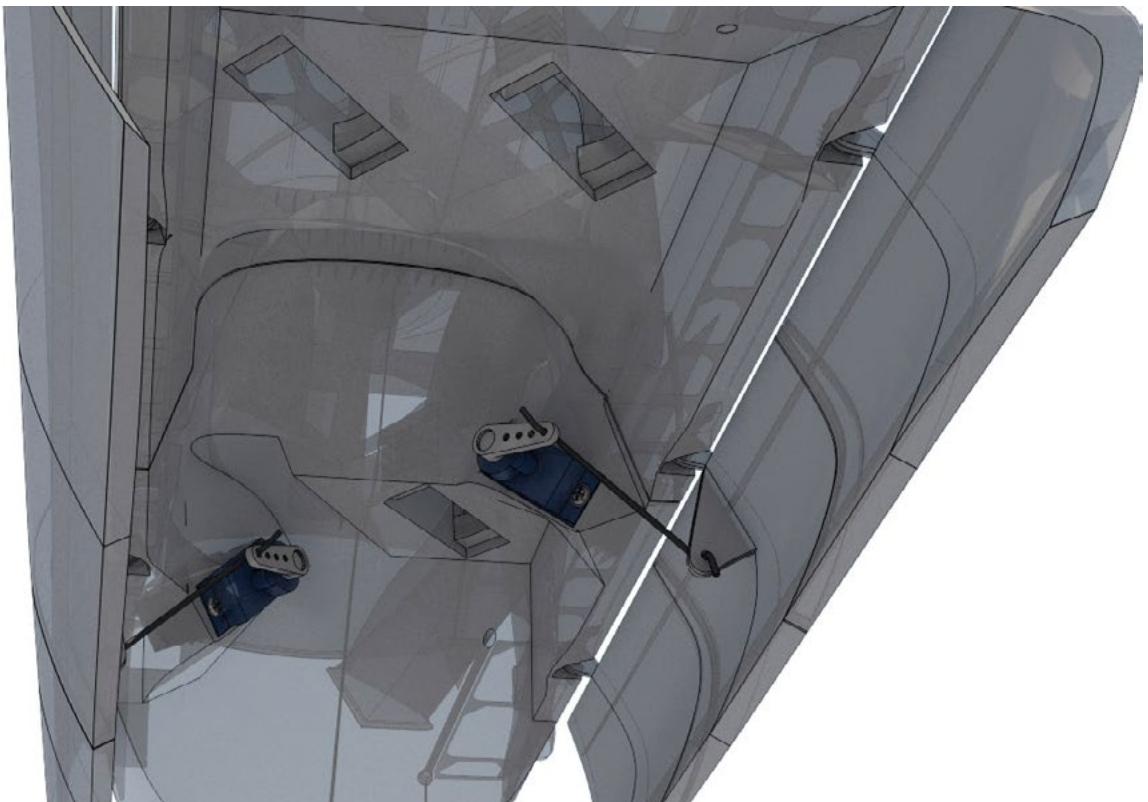
You will need 2 servos (micro size 21/12/22 HXT900, G90 or compatible)

**Note: in case you want to use all the servos (and retractable LG), you might want NOT to use servo extension leads, but solder the wires directly. It makes running the cables through the tunnels easier.**

...it is very similar to this video guide (B25J): [See video guide #5.1](#)

You will need:

- 2x micro size servo
- light servo extension cables (300 and 900mm) and Y cables
- 1.2 mm /16AWG steel pushrod wires (1-1.2mm)
- use also as a hook for cables running through the tunnels...
- torch or lighter (to heat up the wire) for servo instaling
- Wire cutter, Z bend pliers or just pliers.
- some gauge (f.e. ruler) or just pen for marking
- soldering iron... and thin shrink tube.



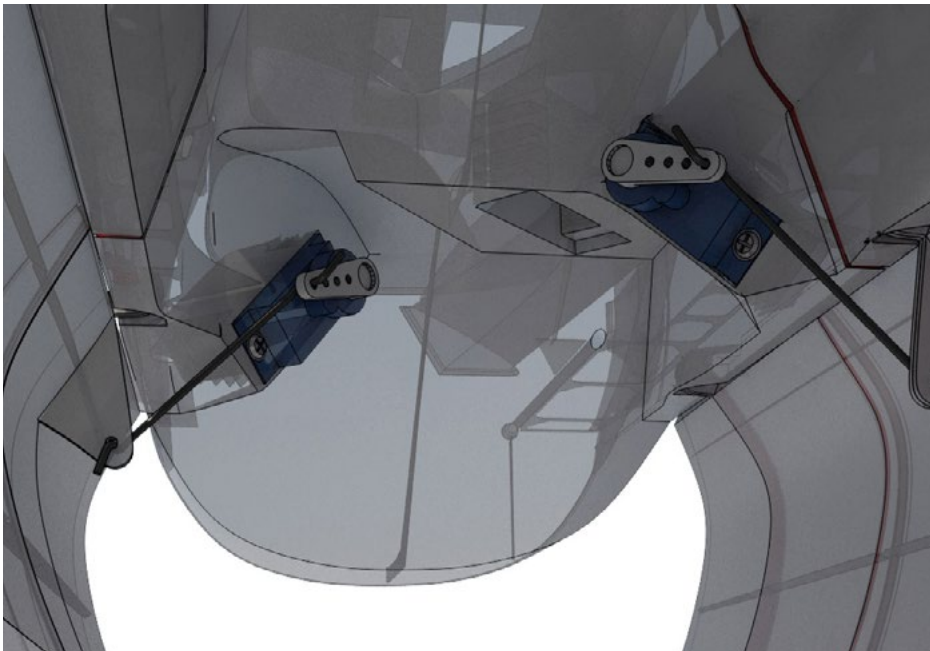
Proceed the way shown in videoguide (this pictures will help you):

...it is very similar to this video guide (B25J): [See video guide #5.1](#)

Start with connecting the servo extension cable. Center servo to its neutral position (use your RC system or servo tester) and attach the included servo arms.

**Note: in case you want to use all the servos (and retractable LG), you might want NOT to use servo extension leads, but solder the wires directly. It makes running the cables through the tunnels easier.**

Use any hot wire to make hole for instaling servo with two included self-tapping screws. Make Z bend on both end sides of the wire then insert it in to the door arm hole and release servo arm and slide the Z bend wire in and put the servo arm on the servo again (secure with included self-tapping screw). Left side servo linkage (wire) is exactly **49mm** and the right **45mm** (hole to hole). Try to shape the Z bend that to be angled about 25 degrees to each other.





## 10. Pilots Please Attention (a few general recommendations)

Make sure the battery is well fixed in proper position. If it moves during flight it will cause the CoG move aft and can lead to uncontrollable flight behavior. Standard CoG is 83mm / 3.27 from the Leading Edge of the wing (see the CoG tags on wings).

**NOTE:** always use appropriate throttle when flying with extended flaps (above stall speed).

**PLEASE MAKE PRE-FLIGHT CHECK** motor mount, screws, Ailerons, Rudder, LG and Elevator linkage before each flight (use Loctite when suitable), this is not a Toy...

**IMPORTANT:** retraction of the landing gear must pass smoothly without any contact with the fuselage, the landing gear (mainly wheels) must NOT touch in any case, or there is a risk of LG failure and crash... (we know this is the most common reason of the LG failure, not the QC problem). Check LG function after each landing.

**Do NOT** leave this PLA plane on direct summer sun or in car. (max. PLA temp is about 60C)

**Never fly aft** (out of recommended) positioned Center of gravity.

Please, use these files only for your own purpose, do not send further. Thank you very much. Enjoy your flight.

