



ADDON Spitfire Mk I, II, V & VI

Edition 2

3D Lab GANG project

ADDIMP 3D

This addon is based on the 3D LabPrint Spitfire Mk IX.

These variants can be realized

Wing \ Variant	Mk I	Mk II	Mk V	Mk V - Clipped wing	Mk V HF	Mk VI	Mk VI HF
Type « a »	X	X	X				
Type « b »	X	X	X	X			
Type « c »			X	X	X	X	X
Vokes trop.			X (b or c wing)	X	X	X	X
Aboukir trop.			X (b or c wing)	X	?	?	?

You should have the 3D LabPrint Spitfire Mk IX files to complete this model, refer to the 3D LabPrint SpitfireIX_userguide for general assembly.

Files modified or new from the Mk IX :

- new cowl,
- 3 different exhausts,
- Motor mount
- new horizontal stabilizer,
- new rudder (rounded),
- new tail wheel suspension,
- new main wheel disc,
- new center wing with Ø18 mm carbon tube added,
- either wing « a » with 4 miniguns or « b » with 1 cannon & 2 miniguns and according cowls
- new cannon for « b » wing and cannon & minigun for « c » wing

Some of these files can be used with the Mk IX variant (wing « b », « c », rudder and stabilizer)

Tropicals version are also printable with either the Vokes filter or the Aboukir filter.

❖ Edition 2, what's new :

- stl, Factory & gcode files modified to enhanced quality or resume errors
- New fuselage nose area from F1 to F5 with :
 - o more space for batteries,
 - o elevator and rudder servos moved forward
- New carburetor air intake (wing RL1A)
- New features with small cowls



- News wing tips with add of position light on std L/R 6 and the new HF wing tip

❖ modified parts

	STL	Factory (S3D)	Gcode	comment
Fuselage				
F1	New	Updated	Updated	More space for battery, added cowl & structure line
F2	New	Updated	Updated	More space for battery & structure line
F3	New	Updated	Updated	More space for battery, new servo location
F4	New	Updated	Updated	Removed servo location
F5A	New	Updated	Updated	Added tube for elevator & rudder cde
Battery cover front & rear	New	Updated	Updated	Added cowls
Motor mount	New	Updated	Updated	Design modified with new nose
Battery harness	New	Updated	Updated	Modified harness path
Vertical stabilizer	New	Updated	Updated	Axis ribs modified
Rudder	New	Updated	Updated	Updated ribs locations, bugs fixes in gcode
Wing				
R1A	New	Updated	Updated	New carburator air intake
L1A				
RL6 (wing tip) standard	New	Updated	Updated	position lamp housing
Aboukir & Vokes filter	New	Updated	Updated	Rear part modified in accordance with the new R/L1A

❖ new parts

	STL	Factory (S3D)	Gcode	comment
Mirrors	New	New	New	Rectangular & circular shapes
RL6 (HF wing tip)	New	New	New	Elongated wing tip for the high altitude fighter (Mk V – VI – VII)

F1, new design & new g-code



F3 with servo mount (F4 & F5A modified)



HF I/R 6 & std L/R6



Mirrors



1- Parameters

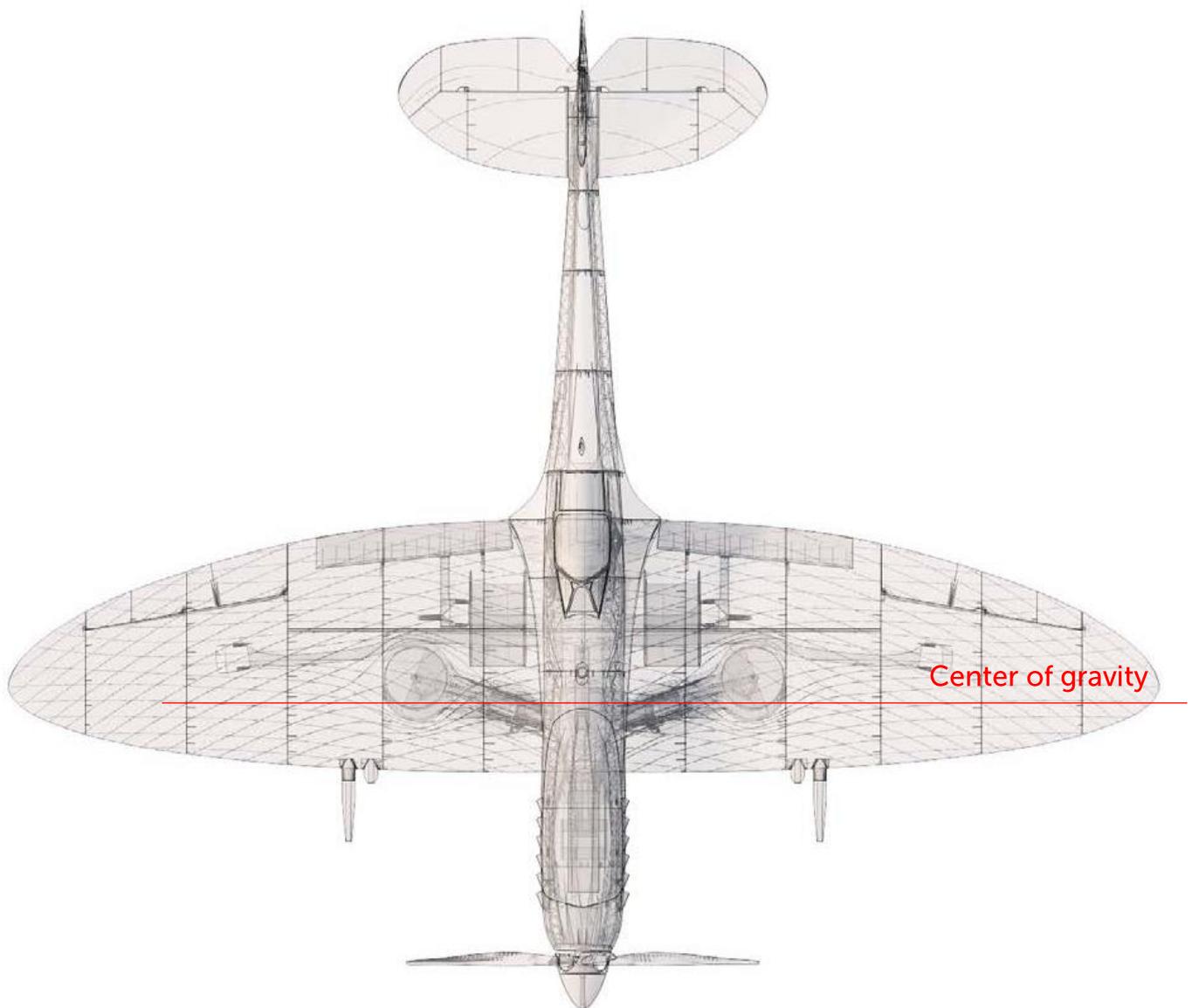
scale ~ 1:6.6

Length: 1458 mm / 57,4 inch

Wingspan: 1700mm / 66.9 inch (classical wingtip)

Weight of the prototype 4500 g with LiPo 6S – 5000 mA

Center of gravity is the same than the Mk IX variant (locator is printed on the L/R 1A underside)



2- Requirements

All parts are printable on a 200 x 200 x 200 mm 3D printer with 0.4 mm nozzle.

Slicing software is Simplify 3D, all factory and G-codes files are provided. All printed parts need approx. 2kg of PLA

A profile for Simplify 3D is proposed as example in the directory E2/factory (MK3PLA-3DP.fff)

3- Print settings

Few quantity of parts needs special parameters, they are describe bellow.

For all the other parts, use the same printing setting as 3D LabPrint Spitfire Mk IX.

All the new files are named with « Spitfire_Mk_V » at the beginning.

G-Codes are based on Prusa Mk3 & Mk 3S, Ø1.75mm PLA from Ariane Plast. The use with other 3D printer or filament could have bad results.

As often as possible use the factory files to adapt to your 3D printer and your filament.

example of possible parameters :

nozzle diameter = 0.4 mm

general layer thickness = 0.25 mm

extrusion width = 0.42 mm

default printing speed = 60 mm/s

1st layer thickness = 80% or 0.2 mm

1st layer width = 105 to 110%

1st layer speed = 50 to 66%

Retraction distance, depend of the filament, ~ 1 to 2 mm, to be adjust

Retraction speed = 30 mm/s

Extra restart distance (distance to begin extrusion before printing the part) = 0.05 mm

Vertical lift (avoid collision between nozzle & part during travel moves) = 0.4mm

The 3 or 4 fist layers should be at 2 outline / perimeter shells. The same for the 3 or 4 last (select outside shell first)

Temperatures

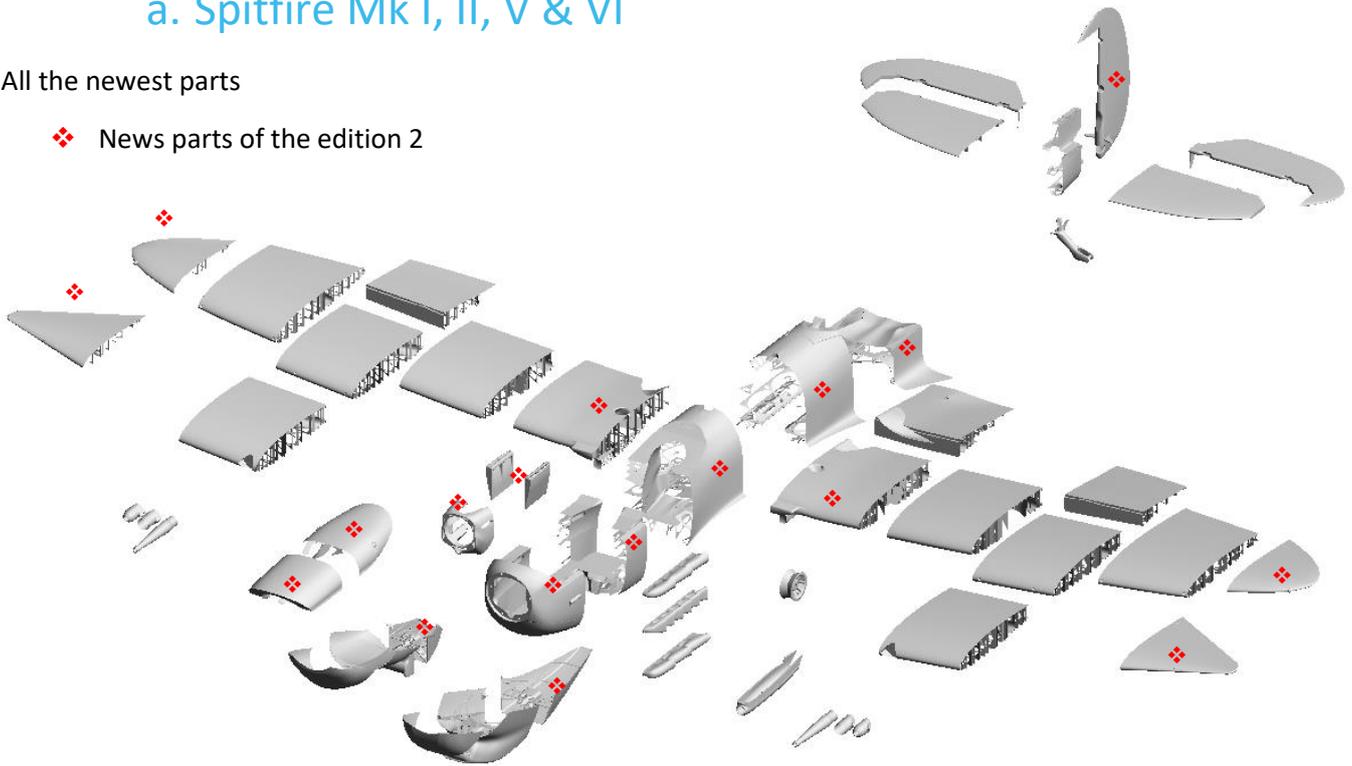
- Bed = 55 to 60° C
- Extruder = 225 to 230 °C
- No cooling

4- parts diagram:

a. Spitfire Mk I, II, V & VI

All the newest parts

❖ News parts of the edition 2



b. Spitfire Mk VII & VIII

Summer 2019

Mk VII & VIII are based on Mk IX with retract tail wheel

5- Wings

- ❖ Have a look at this site to understand the differences between variants :

<http://spitfiresite.com/2010/04/concise-guide-to-spitfire-wing-types.html>

5.1- Center wing carbon tube

The new wing is designed with a $\varnothing 18 \times 500$ mm carbon tube in the L/R1A & 2A to reduce the wing break at root.

A specific tool is designed (accessories\tool) to facilitate the setting to length and shape of this tube.



a- insert the tube



b- cut as close as possible of the tool



c- finish the end of the shape by sanding



d- do the other side without removing the tube

5.2- Under left wing radiator

Under the left wing (and only at left) is a new radiator shape, rounded, instead of the original rectangular.

Under the right wing is kept the rectangular radiator.

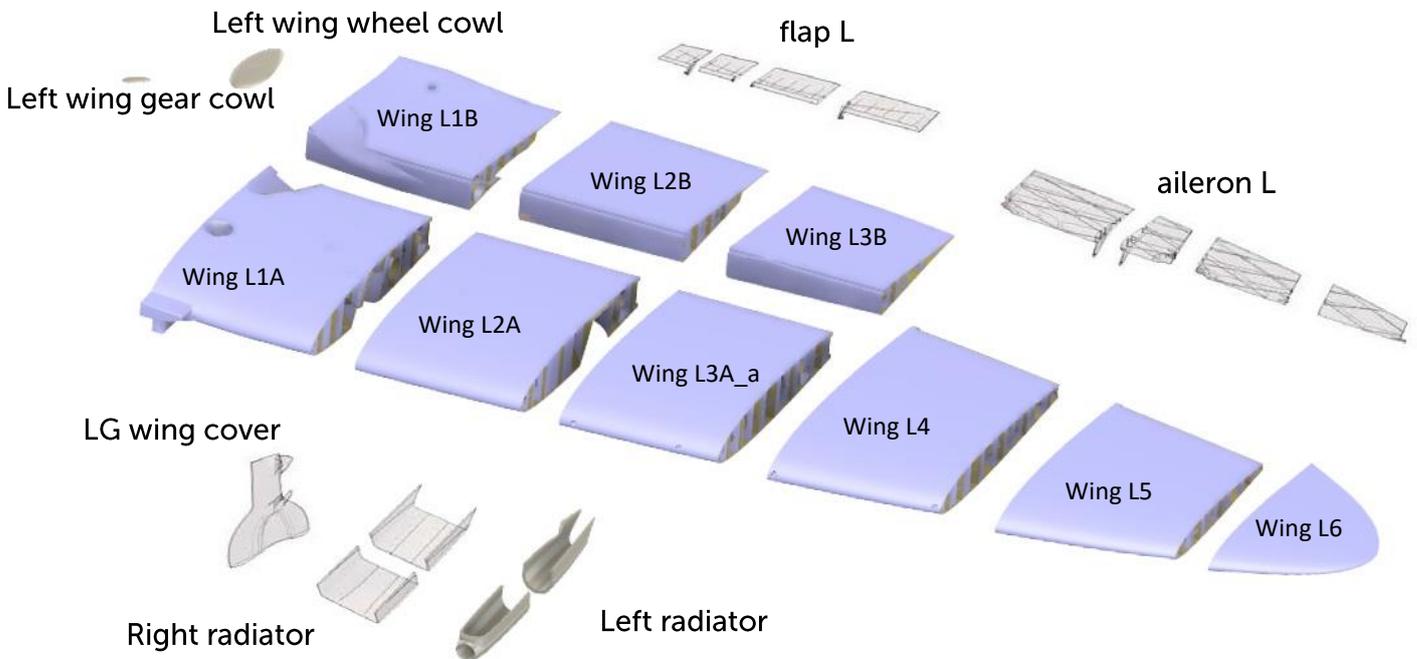


5.3- Wing « a » assembly

Wing chart, use CA glue and activator - **Don't glue RL6 parts before you add Ailerons**

Left wing	From new Mk I to V pack	From Mk IX	File name
L1A	X		Common\Spit_mkV_L_wing_1A.stl
L1B	X		Common\Spit_mkV_L_wing_1B.stl
L2A	X		Common\Spit_mkV_L_wing_2A.stl
L2B		X	
L3A	X		a_wing\Spit_mkV_L_wing_3A_a.stl
L3B	X		Common\Spit_mkV_L_wing_3B.stl
L4	X		Common\Spit_mkV_L_wing_4A.stl
L5		X	
L6		X	

Right wing			
R1A	X		Common\Spit_mkV_R_wing_1A.stl
R1B		X	
R2A	X		Common\Spit_mkV_R_wing_2A.stl
R2B		X	
R3A	X		a_wing\Spit_mkV_R_wing_3A_a.stl
R3B	X		Common\Spit_mkV_R_wing_3B.stl
R4	X		Common\Spit_mkV_R_wing_4A.stl
R5		X	
R6		X	

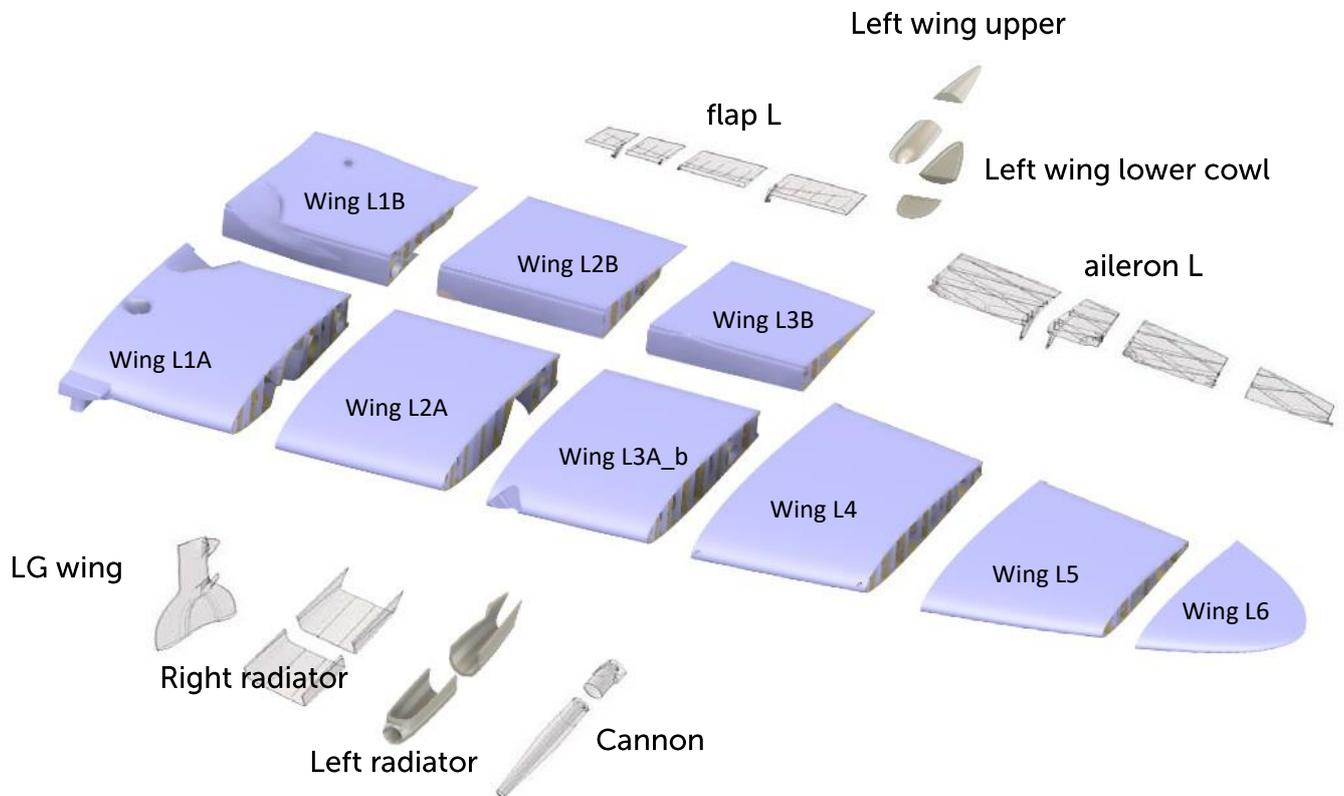


5.4- Wing « b » assembly

Wing chart, use CA glue and activator - **Don't glue RL6 parts before you add Ailerons**

Left wing	From new Mk I to V pack	From Mk IX	File name
L1A	X		Common\Spit_mkV_L_wing_1A.stl
L1B	X		Common\Spit_mkV_L_wing_1B.stl
L2A	X		Common\Spit_mkV_L_wing_2A.stl
L2B		X	
L3A	X		b_wing\Spit_mkV_L_wing_3A_b.stl
L3B	X		Common\Spit_mkV_L_wing_3B.stl
L4	X		Common\Spit_mkV_L_wing_4A.stl
L5		X	
L6		X	

Right wing			
R1A	X		Common\Spit_mkV_R_wing_1A.stl
R1B		X	
R2A	X		Common\Spit_mkV_R_wing_2A.stl
R2B		X	
R3A	X		b_wing\Spit_mkV_R_wing_3A_a.stl
R3B	X		Common\Spit_mkV_R_wing_3B.stl
R4	X		Common\Spit_mkV_R_wing_R4A.stl
R5		X	
R6		X	

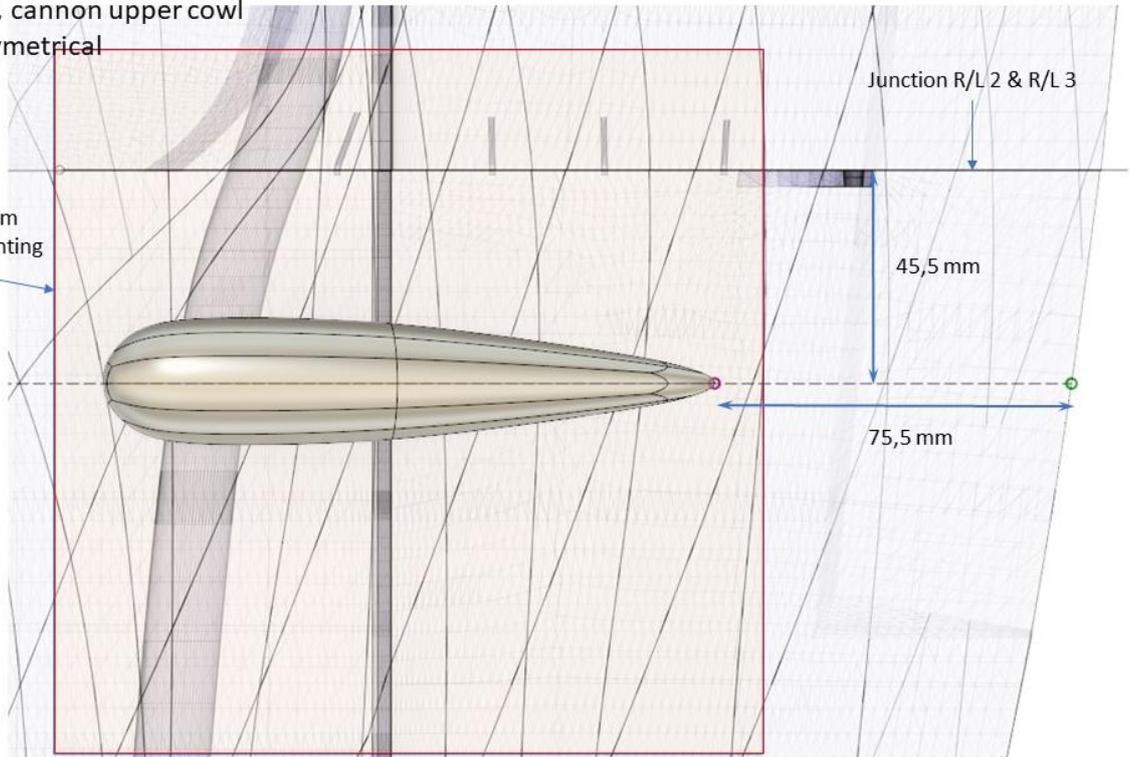


5.4.1- Position of the cannon upper cowl

Use CA glue and activator

Left Wing « b », cannon upper cowl
Right Wing is symetrical

Square 150x 150 mm
As reference for printing

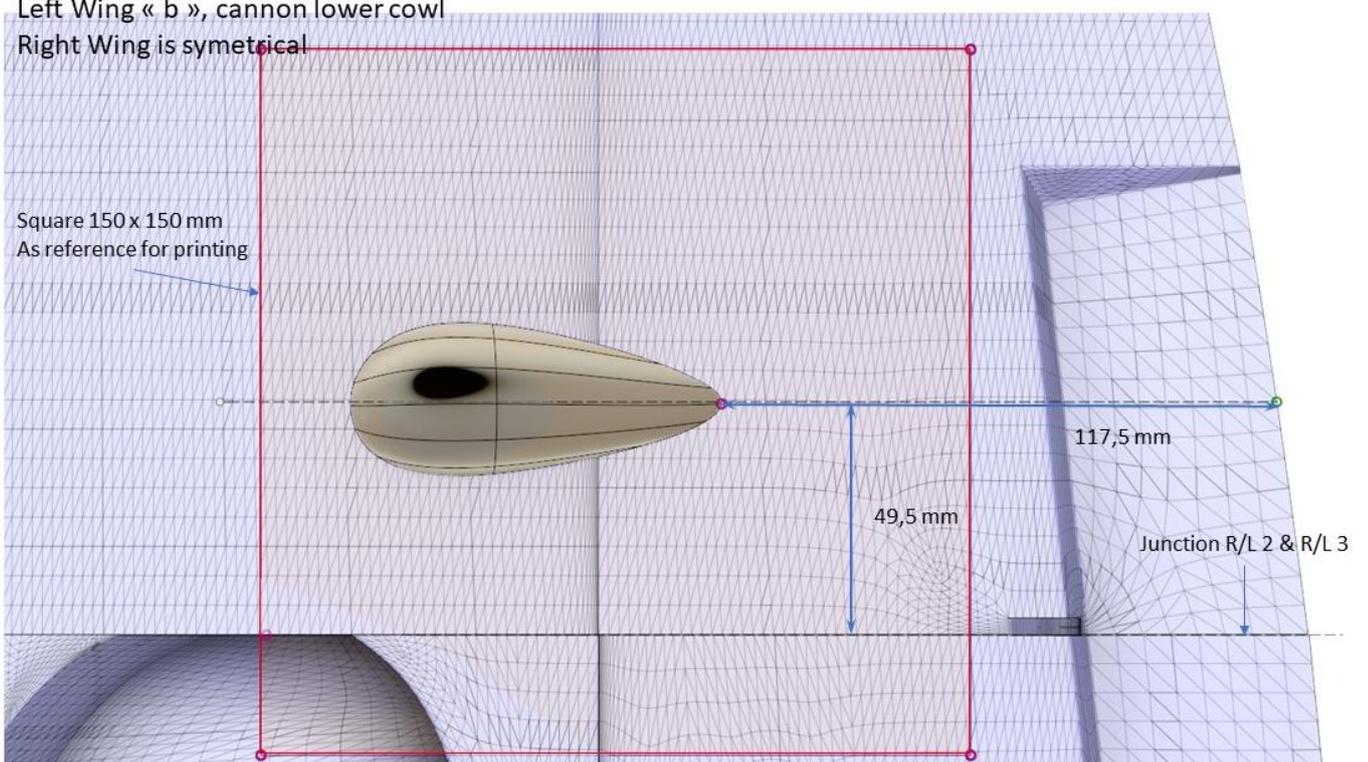


5.4.2- Position of the cannon lower cowl

Use CA glue and activator

Left Wing « b », cannon lower cowl
Right Wing is symetrical

Square 150x 150 mm
As reference for printing

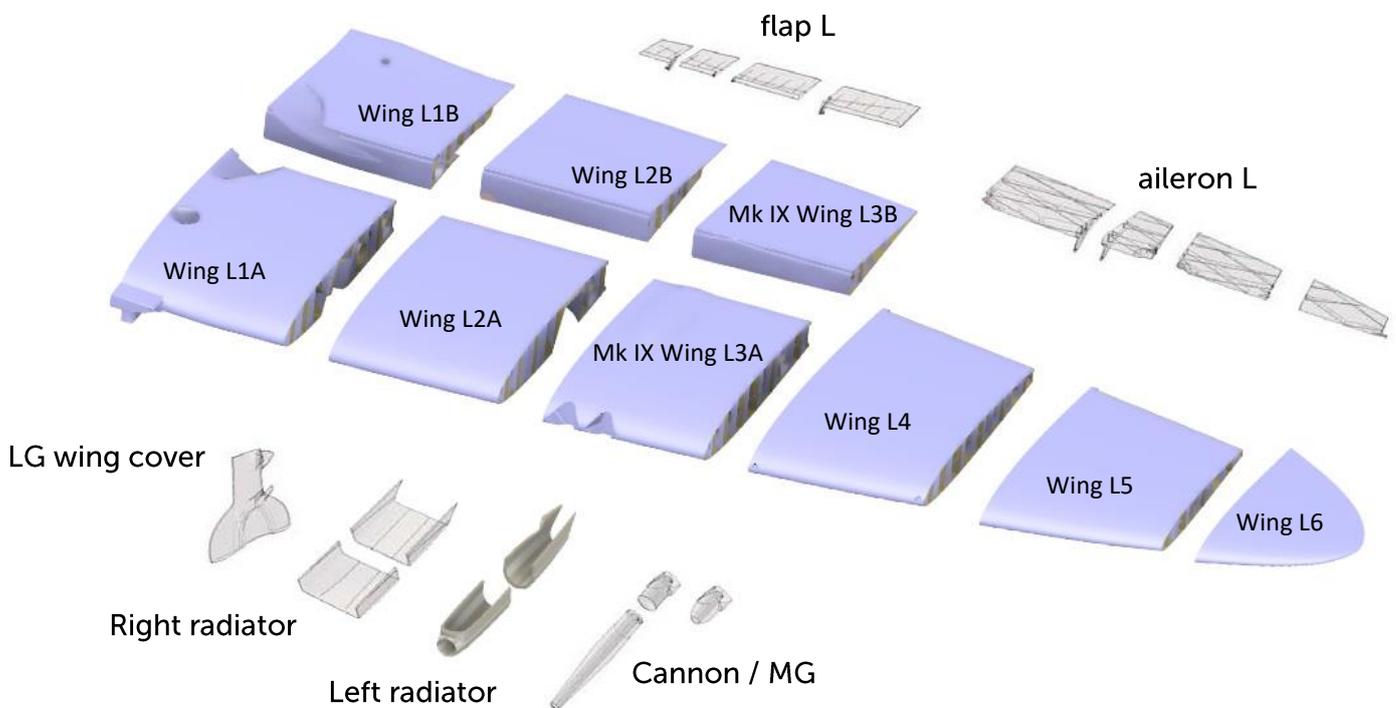


5.5- Wing « c » assembly

Wing chart, use CA glue and activator - **Don't glue RL6 parts before you add Ailerons**

Left wing	From new Mk I to V pack	From Mk IX	File name
L1A	X		Common\Spit_mkV_L_wing_1A.stl
L1B	X		Common\Spit_mkV_L_wing_1B.stl
L2A	X		Common\Spit_mkV_L_wing_2A.stl
L2B		X	
L3A		X	
L3B		X	
L4	X		Common\Spit_mkV_L_wing_4A.stl
L5		X	
L6		X	

Right wing			
R1A	X		Common\Spit_mkV_R_wing_R1A.stl
R1B		X	
R2A	X		Common\Spit_mkV_R_wing_R2A.stl
R2B		X	
R3A		X	
R3B		X	
R4	X		Common\Spit_mkV_R_wing_R4A.stl
R5		X	
R6		X	



- ❖ The « C » wing could also be equipped with 2 cannon and no minigun, in this case, use the L/R 4 from the Mk IX

6- Fuselage

6.1- Motor mount options

Motor could be mount either by front montage or rear with specific part.

The one included in this pack is for the Turnigy Aerodrive SK3 - 5055-430KV.

Please ask if you want one for other motor (send motor mount specifications).

For others recommendations, see the 3DLabPrint Spitfire Mk IX userguide.

Use CA glue and activator



6.2- Fuselage assembly

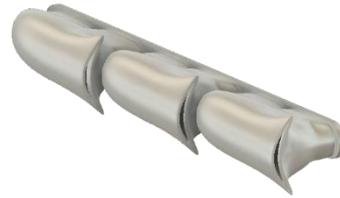
Parts F1, F2, F3 and F11, Batt cover and batt holder are new, all others (F4 to F10) are the same than the Mk IX variant

3 new exhausts are included

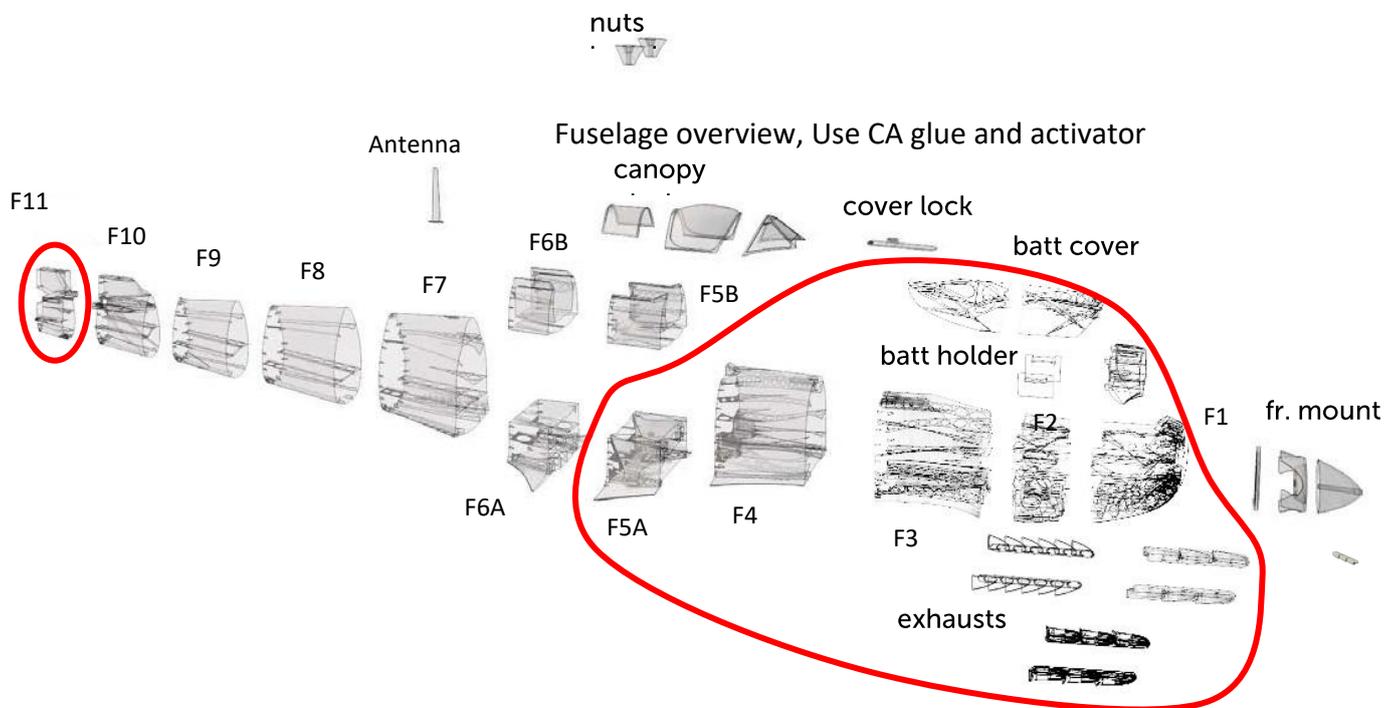
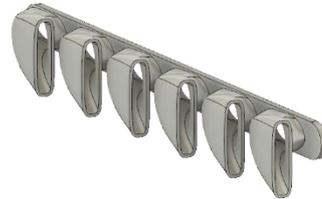
- 2 in 1, rounded



- 2 in 1 snapfish



- 6 slots



6.3- Vokes Filter (option)



The Vokes filter was introduced during the North Africa and Malta campaign in order to filter out the dust on airfields.

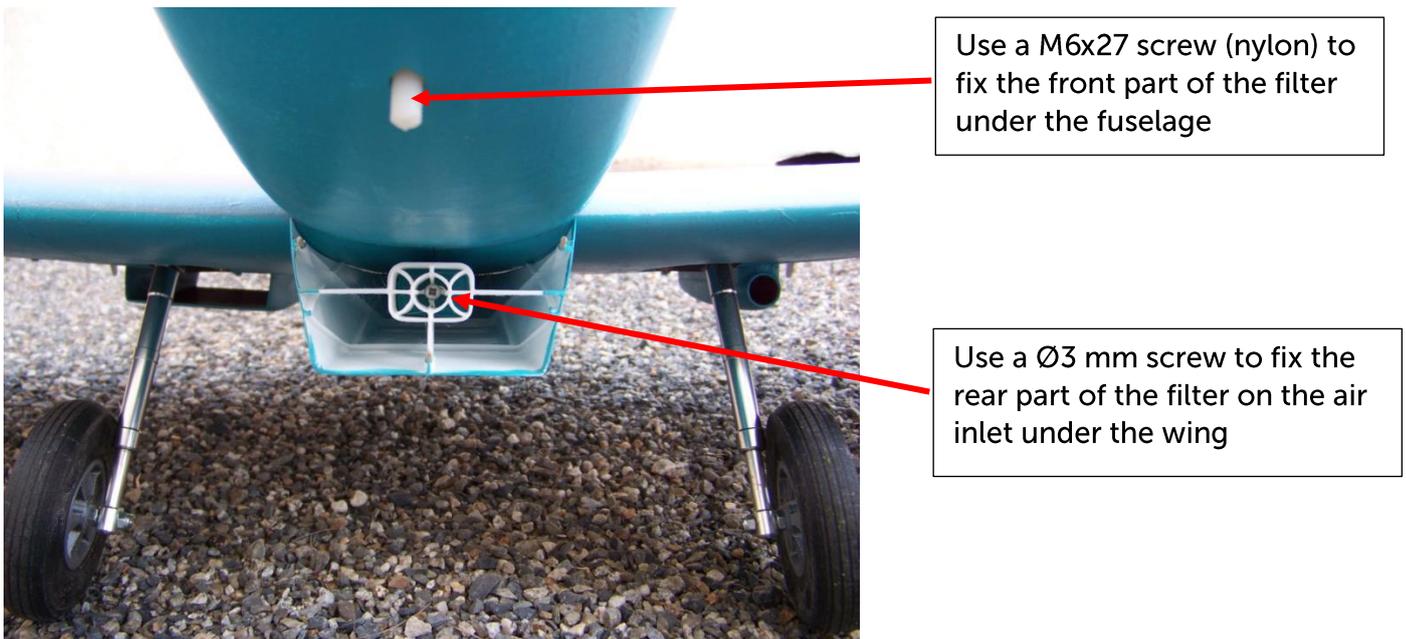
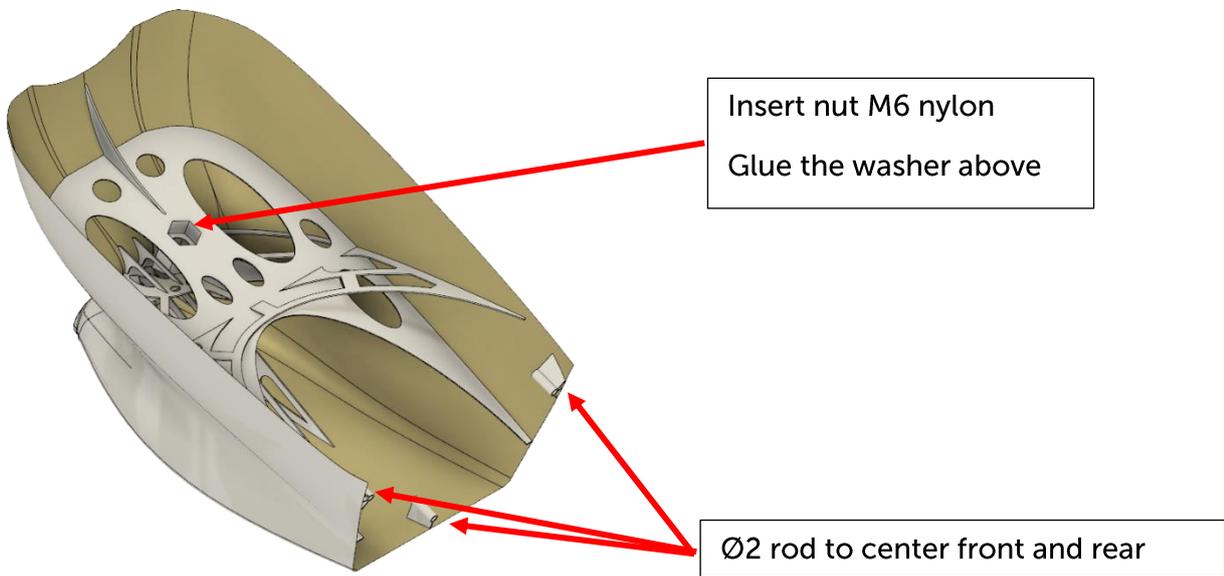
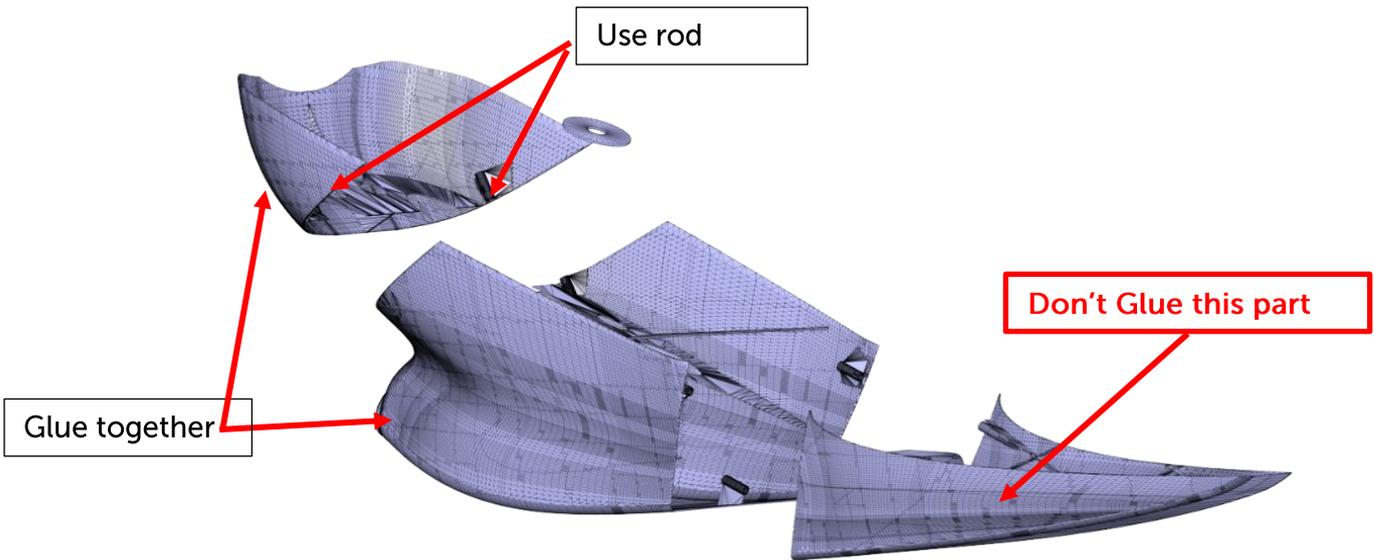
<http://www.darwinspitfires.com/index.php?page=the-vokes-air-filter-controversy>

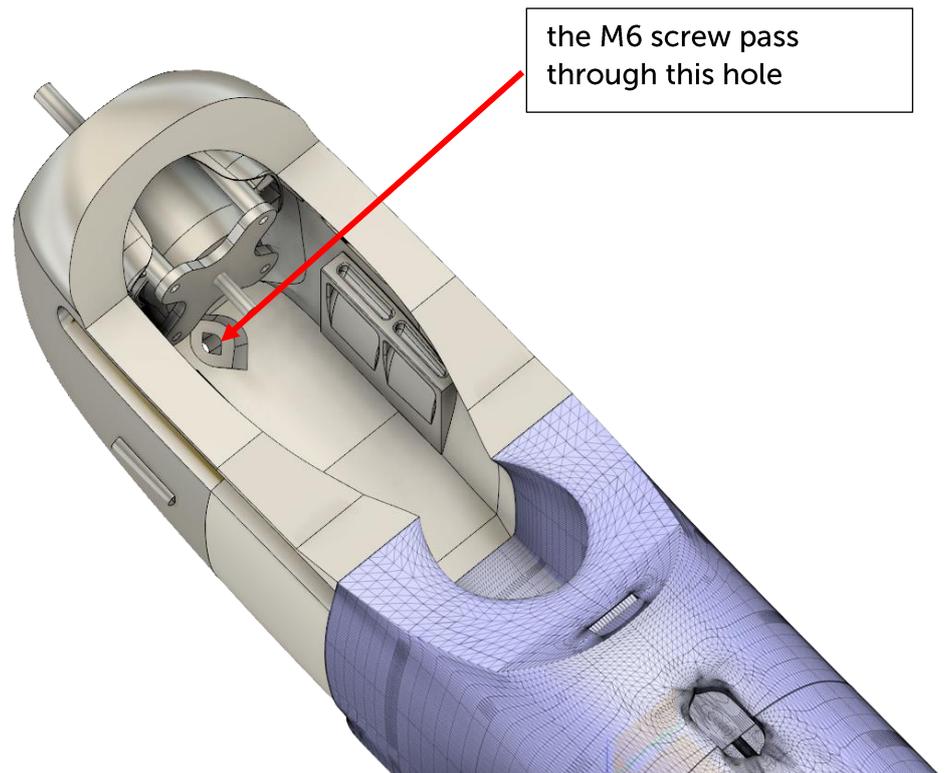


Use CA glue and activator

All parts are assembled together with \varnothing 1.5 or \varnothing 2 mm x 8 mm carbon or wood rod.

6 mm nylon nut and washer are glued in the front part,
use a M6 x 27mm nylon screw for assemble the front part to the fuselage
use a \varnothing 3 x 15mm screw for assemble the rear part to the wing





then, assemble front and rear parts thanks to the rods.

!!! Don't glue front and rear part of the filter, you could not unassemble the plane !!!

6.4- Aboukir Filter (option)



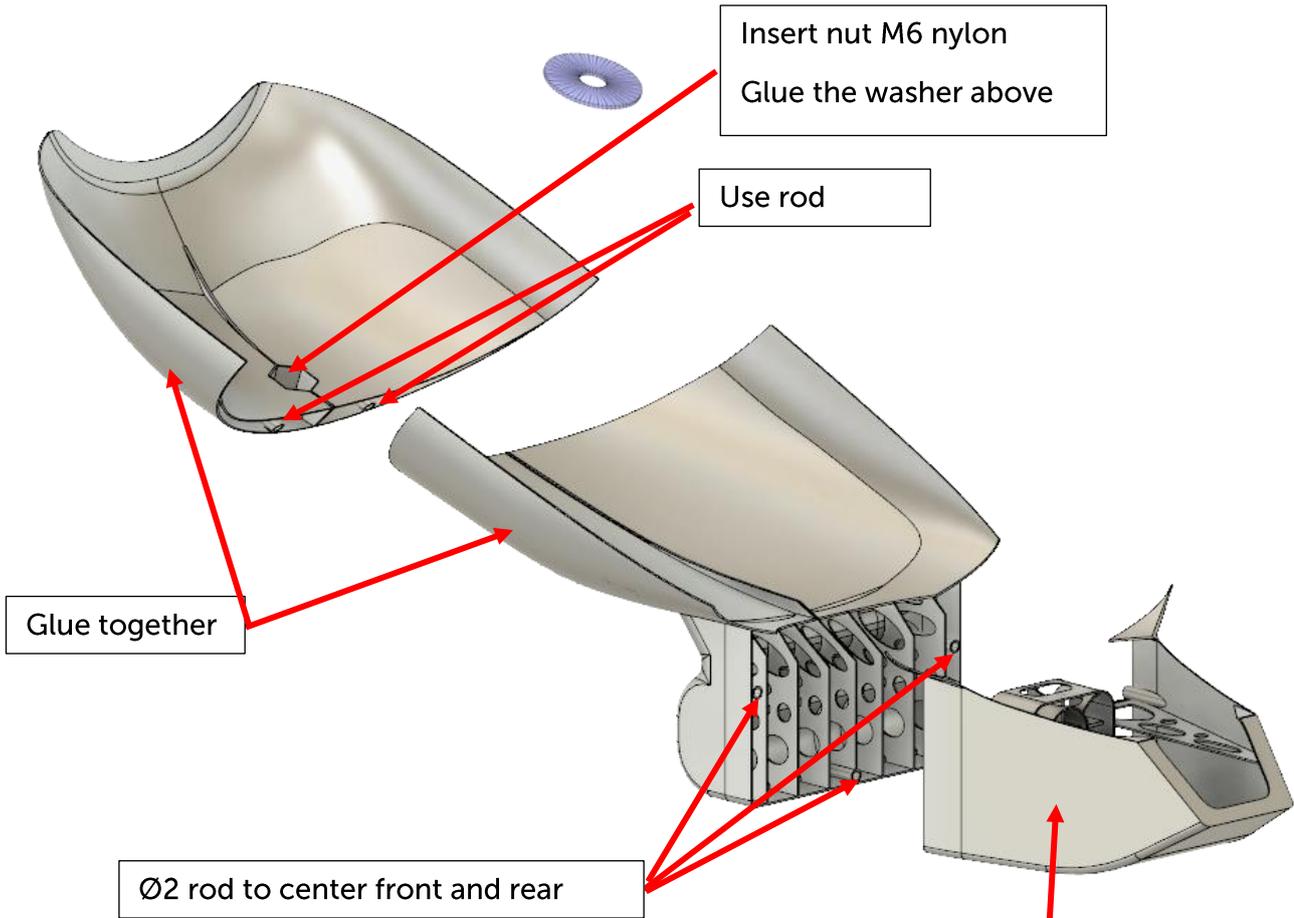
© live.warthunder.com

From wikipedia ([https://en.wikipedia.org/wiki/Supermarine_Spitfire_\(early_Merlin-powered_variants\)](https://en.wikipedia.org/wiki/Supermarine_Spitfire_(early_Merlin-powered_variants)))

« Many VB(trop)s were modified by 103 MU (Maintenance Unit-RAF depots in which factory fresh aircraft were brought up to service standards before being delivered to squadrons) at Aboukir, Egypt by replacing the Vokes filter with locally manufactured Aboukir-type filters, which were lighter and more streamlined. Two designs of these filters can be identified in photos: one had a bulky, squared off filter housing while the other was more streamlined. These aircraft were usually fitted with the wide blade Rotol propeller and clipped wings. »

The general assembly is the same as for the Vokes

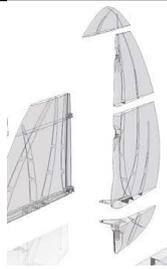
!!! Don't glue front and rear part of the filter, you could not unassemble the plane !!!



7- Fuselage tail - rudder, elevator pushrods and servos

H stab : chamfered is from Mk V addon, Beveled is from Mk IX

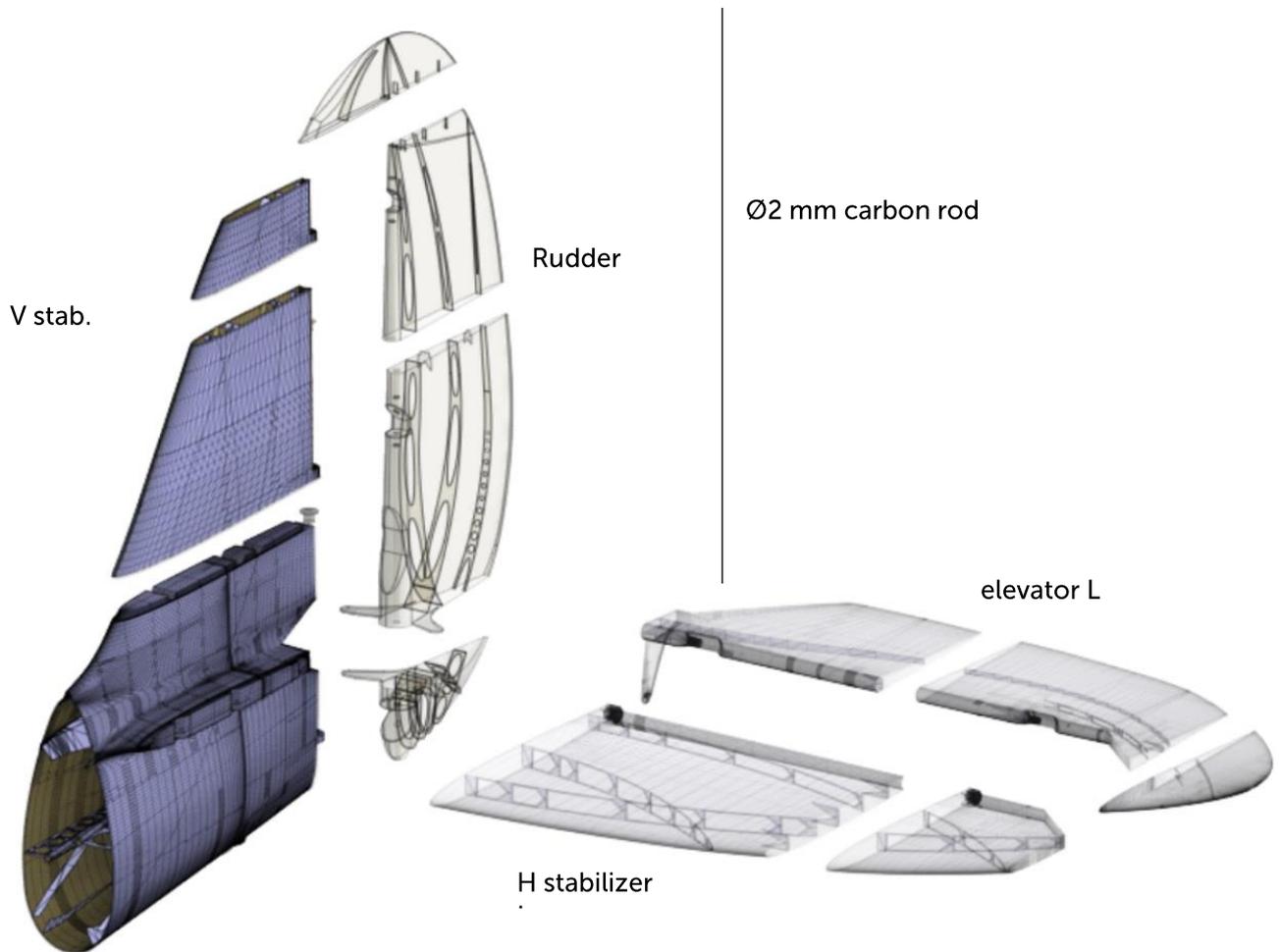
Rudder : rounded is from Mk V addon, sharp is from Mk IX

Model	Horizontal stabilizer	rudder
Mk I	<p>Chamfered</p> 	<p>Rounded</p> 
Mk II	<p>Chamfered</p> 	<p>Rounded</p> 
Mk V	<p>Chamfered</p> 	<p>Rounded</p> 
Mk VI	<p>Beveled</p> 	<p>Rounded</p> 
Mk VII	<p>Chamfered</p> 	<p>Sharp</p> 
Mk VIII	<p>Chamfered</p> 	<p>Sharp</p> 

Horizontal and vertical stabilizer and rudder are different than the Mk IX.

Same assembly process than the Mk IX variant, except for the rudder hinge which is with a $\varnothing 2$ mm carbon rod.

Use CA glue and activator (if needed)



Proceede exactly as shown in the spit Mk IX video

To use this rounded rudder with the Spitfire Mk IX, you will find, in the directory tail/MkIX_rudder_adaptator, three adaptators to print and to glue in the F11 / V_Stab holes for hinges. You can have some adjust to make to install these washers.

8- Landing gear

8.1- New tail leg

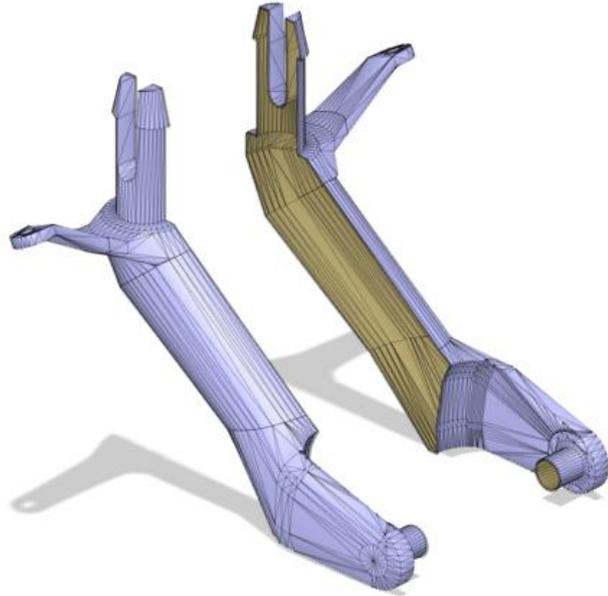
8.2.1- Printing parameters

2 perimeters

3 top layers, 2 bottom

Layer height 0.2 mm

15 to 20 % infill rectilinear, angle 45 & -45°



8.2- New main wheel disc

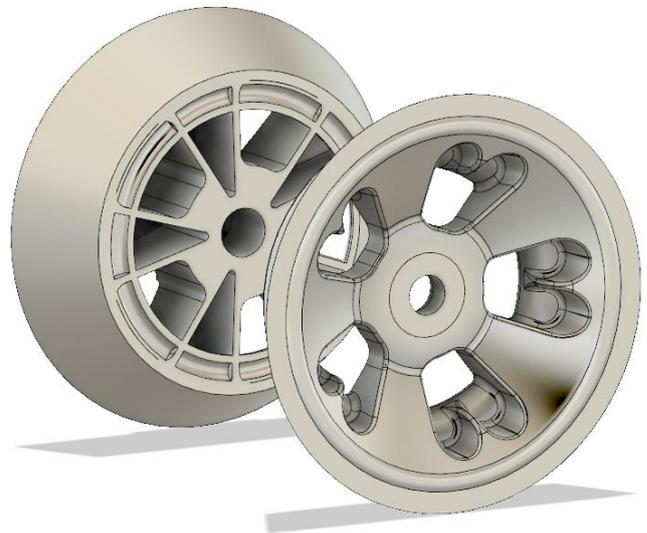
8.2.1- Printing parameters

2 perimeters

3 top layers, 0 bottom

Layer height 0.2 mm

15 to 20 % infill rectilinear, angle 45 & -45°



9- Paint & markings

There are many web site which propose photos of the Spitfire.

For exemple :

Spitfire Mk I (model 300)

- <https://www.airliners.net/search?keywords=spitfire+300&sortBy=dateAccepted&sortOrder=desc&perPage=84&display=card>
- http://www.primeportal.net/hangar/mark_hayward/supermarine_spitfire_mk1a_p9444/

Spitfire Mk II (model 329)

- <https://www.airliners.net/search?keywords=spitfire+329&sortBy=dateAccepted&sortOrder=desc&perPage=84&display=card>

Spitfire Mk V (model 349)

- <https://www.airliners.net/search?keywords=spitfire+349&sortBy=dateAccepted&sortOrder=desc&perPage=84&display=card>
- http://scalemodels.ru/modules/photo/viewcat_cid_505.html
- http://walkarounds.scalemodels.ru/v/walkarounds/avia/before_1950/Spitfire_MkVb/
- http://www.primeportal.net/hangar/mark_hayward/supermarine_spitfire_vb_bm597/index.php?Page=1
- http://www.primeportal.net/hangar/mark_hayward/supermarine_spitfire_vb_bm597/

for paint & marking, you can use plastic models as reference

- <https://www.moiehobby.pl/products/Supermarine-Spitfire-Mk.Vb-Trop-14738020.html>
- <http://www.hobbyboss.com/index.php?g=home&m=product&a=show&id=442&l=en>
- <https://modelingmadness.com/scott/decals/aero/am48597.htm>
- <https://www.aviationmegastore.com/spitfire-mkvb-late-camouflage-x32042-xtra-decal-x32042-aircraft-scale-modelling-decals/product/?action=proinfo&art=122878>
- <https://www.eduard.com/eduard/decals/?token=10AF2C1C&&textcatfilter=spitfire&fireBtn=Look+Up>
- ❖ <https://www.hannants.co.uk/product/AMLD4818> (Russian Spitfire Mk V & Mk IX)
- ❖ https://www.hannants.co.uk/search/index.php?product_category_id=&product_division_id=&manufacturer_id=&code=&product_type_id=all_decals&scale_id=953&keyword_search=Spitfire&setPerPage=25¤cy_id=
- ❖ https://en.wikipedia.org/wiki/Non-British_personnel_in_the_RAF_during_the_Battle_of_Britain
- ❖ <https://callie-graphics.com/collections/spitfire> (stencils & graphics sets)



10- Pilots Please Attention!

For the first flights we recommend to increase expo settings on your transmitter for elevator and aileron to 60 % (this calms response from your stick inputs) and you can decrease elevator and ailerons deflection a bit.

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.

Check motor mount and screws before each flight...

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

Never fly aft positioned Center of gravity.

Please, use these files only for your own purpose, do not send it further.

Thank you very much.

Enjoy your flight.

11- Information and contact

For all informations, please contact us :

contact@addimp-3d.com