AS Models

AS-VTOL
V1

MANUAL

Content

UAV Parameters

1 – Dimensions

Span: .....1310 mm
Length: .....995 mm
Height: ..... 160 mm
(without LG)

2 – Weight

MTOW: .....3000 g
Print Weight: .....~1000 g

3 – Speed:

Cruise Speed: .....65–72 km/h

4 – Performance:

Calc. Flight Time FW-Mode: .....40 min.
(4S 5000mAh @65 km/h @3kg)
Deployment Time: .....<2 min.

Overview

AS-VTOL aircraft is full of versatility and flexibility. With its modular design, it is easy to assemble and simple to maintain. Whether for free flights, FPV flights or aerial photography - this device is suitable for a wide range of applications.

The innovative tilt technology reduces the overall weight of the aircraft, which increases its performance and efficiency.

Thanks to the tool-less, detachable payload module, users can easily switch between a wide range of cameras and other optical devices to ensure they always have the perfect equipment for their application.

Required Accessories

1 – Propulsion (recommendation)

Motor:.....EMAX ECO II Series 2807 1300kv
ESC: .....SpeedyBee BLS 60A 30x30 4+1
Propeller:.....Gemfan 7042
Battery:.....4S Turnigy 5000mAh 25C LiPo

2 – Tilt

Servo:.....2 pcs. EMAX ES09MD Digital 14,8g
Bearing:.....2 pcs. 4x9x4mm Ball Bearing link
Screw:.....2 pcs. M4x10
Horn screw:...2 pcs. M2x4

3 – Avionics:

GPS: .....Matek M10Q-5883
FCU:.....Matek F405-WING V2

4 – Control Surfaces:

Servo:.....4 pcs. 9G Micro Servo Motor link
Horns:.....4 pcs. Nylon Horns link

5 – Carbon Rods *(SP=Spars)*

Wings
2 pcs. 8x500mm (Main)
4 pcs. 5x250mm (SP 1/2)
2 pcs. 5x304mm (SP 3)
2 pcs. 3x265mm (SP 4)

V-Tails
4 pcs. 5x207mm (SP 5/6)
2 pcs. 3x210mm (SP 7)

VTOL Booms
4 pcs. 3x415mm (SP 8/9)

Tail-Fuselage
2 pcs. 5x207mm (SP 10/11)

6-Threated Inserts

Landing Gears
4 pcs. M4 max. 6mm long

Fuselage
8 pcs. M3 max. 4mm long

7-Screws & Nuts

Landing Gears
4 pcs. M4x10mm

Latches
8 pcs. M2.5x12mm cylinder head screw
8 pcs. M2.5x14mm cylinder head screw

Servo Caps and Wing Latches
20 pcs. 2.9x9.5mm metal screws

Wing and Tail Latch Pivots
4 pcs. M5x8mm cylinder head screw
4 pcs. M5 nuts

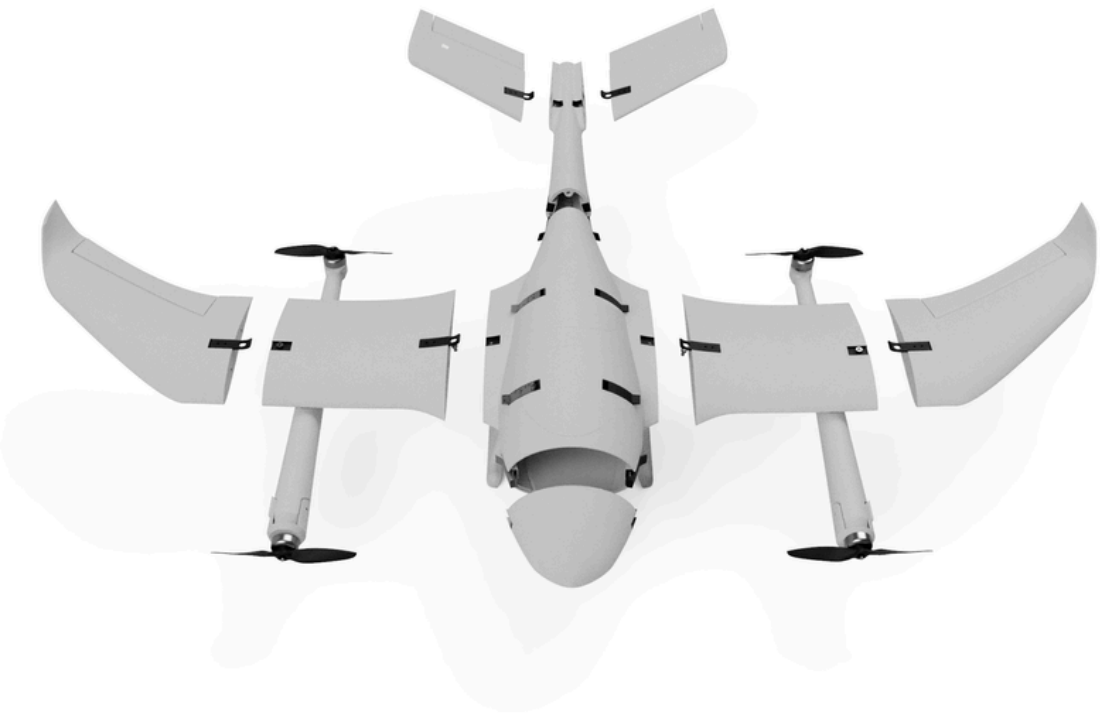
Front Motors
8 pcs. M3x4mm

Rear Motors
8 pcs. M3x8mm

FCU & ESC Holder

8 pcs. M3 threaded inserts max. 5mm long
4 pcs. M3x12+6 mm nylon spacer

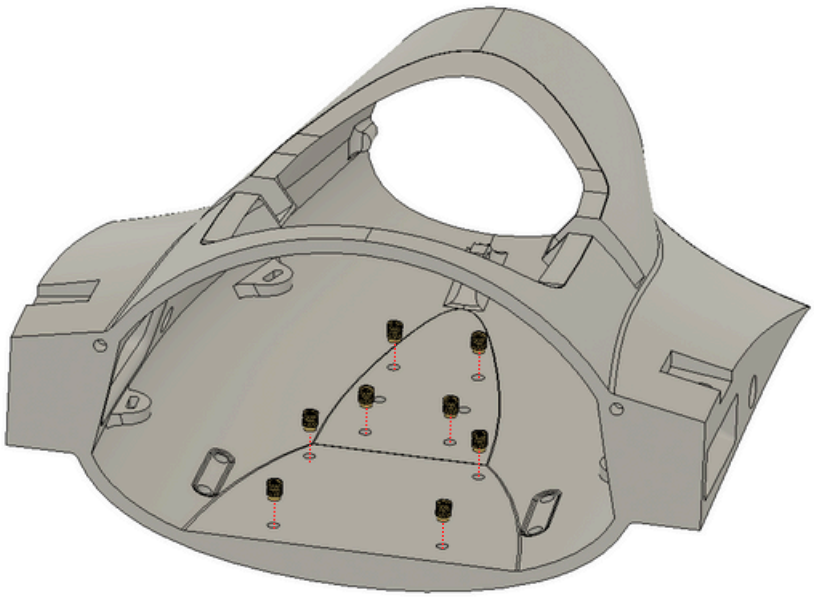
Build Instruction

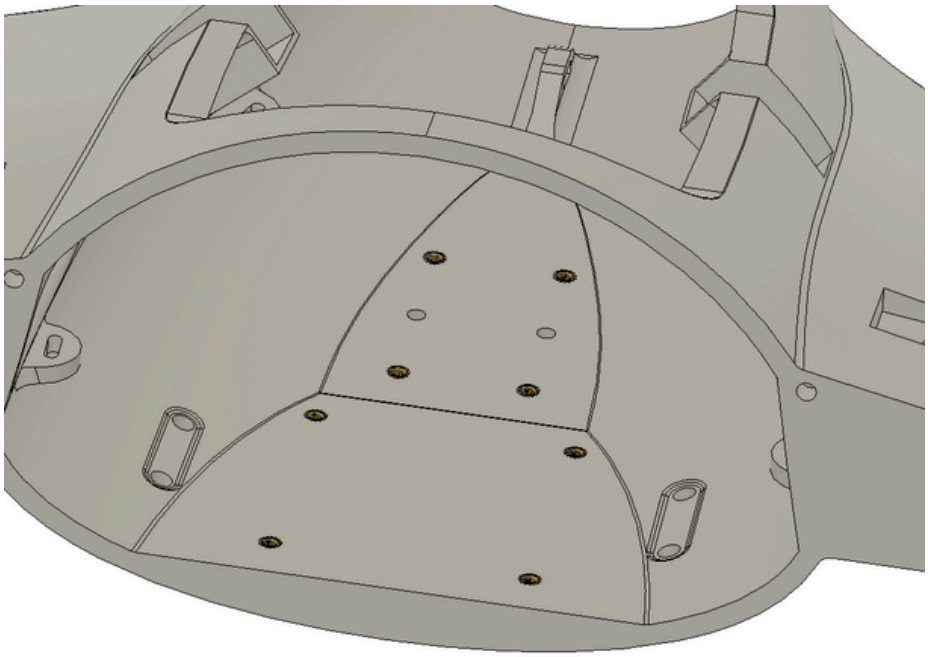


Basic Tools

-Superglue Cyanacrylat
-Activator
-Screw Driver
-Scalpel

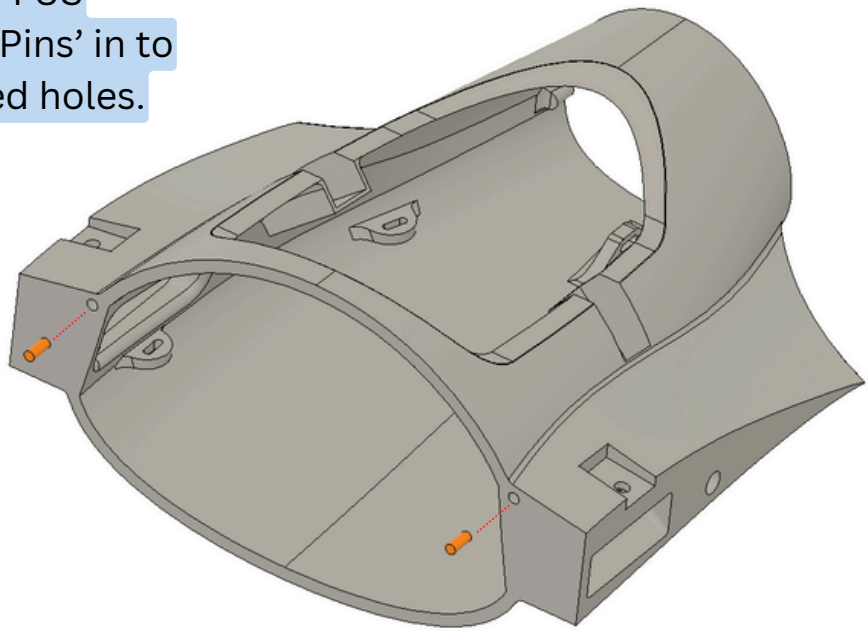
Fuselage Threaded Inserts



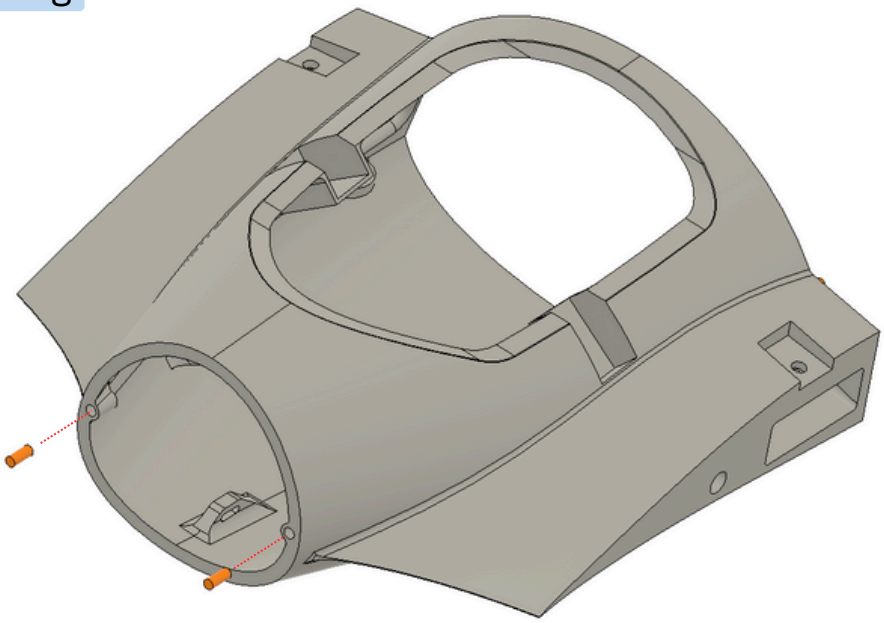


Fuselage Modules

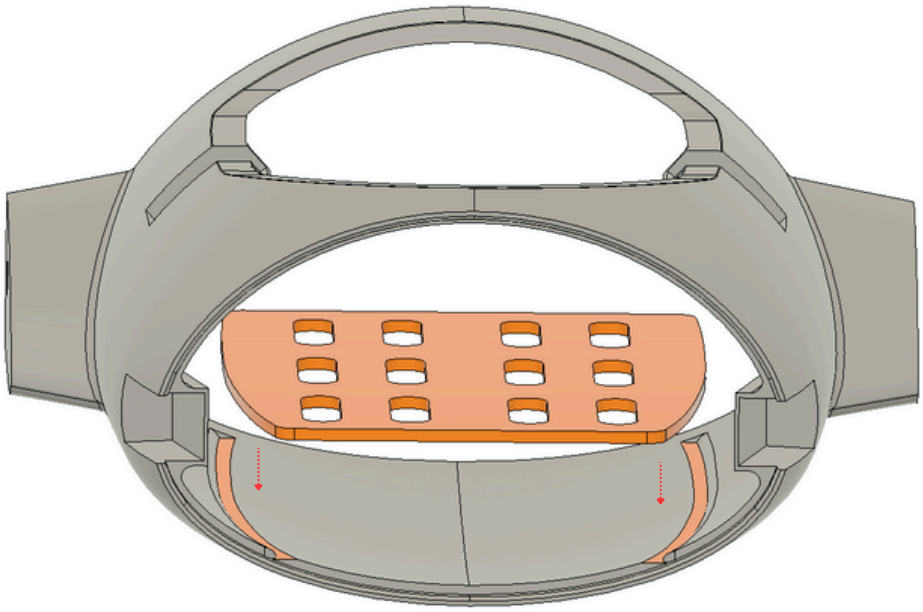
Insert ‘FUS Connector Pins’ in to the marked holes.

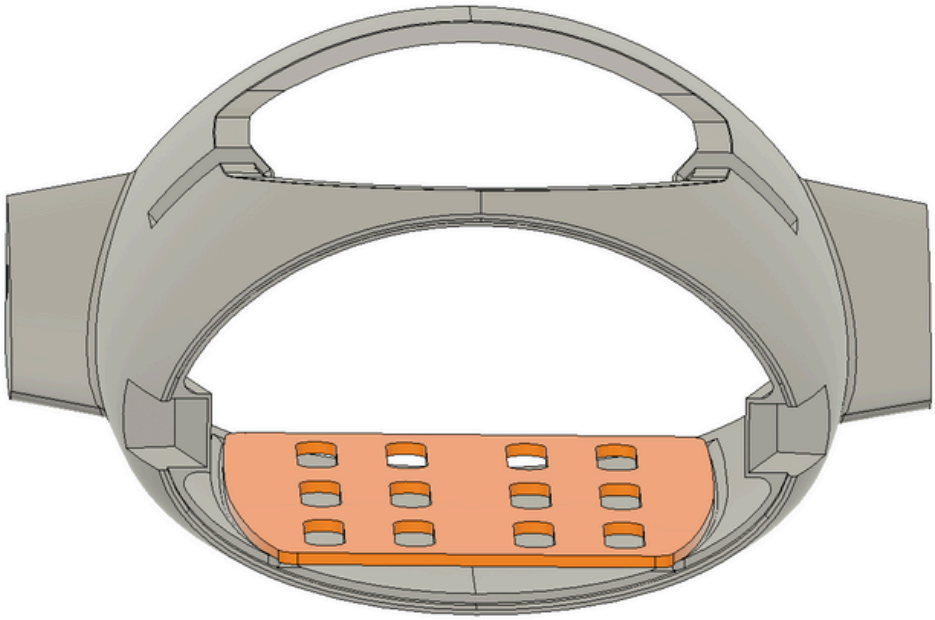


It is recommended to drop glue in to the holes for better handling.

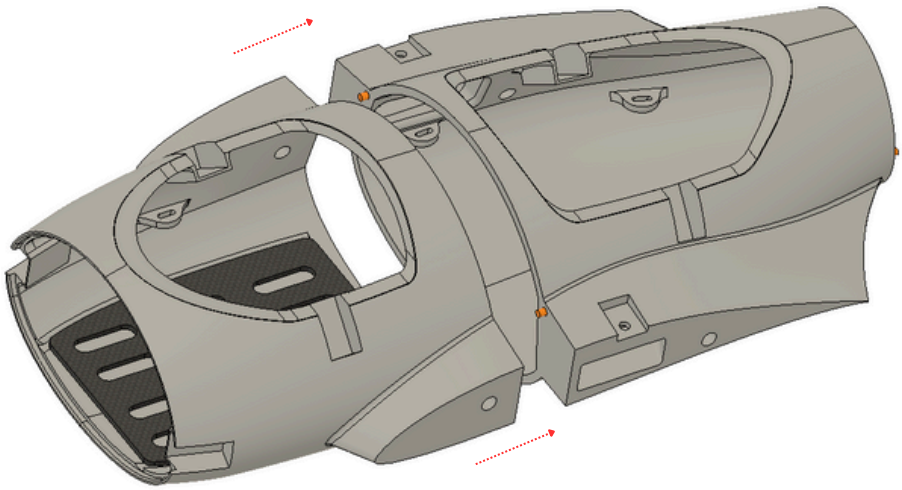


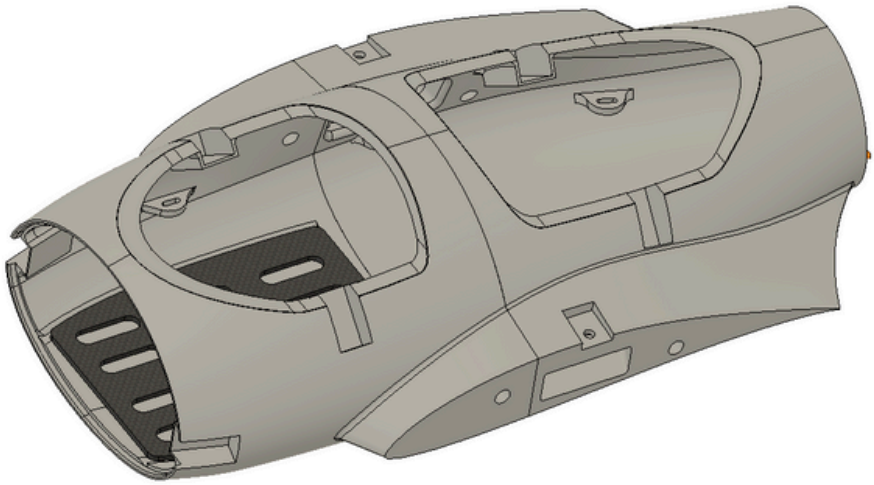
Put gently glue on the marked surfaces on FUS2 and press ‘Battery Plate’ on them until the glue dried.



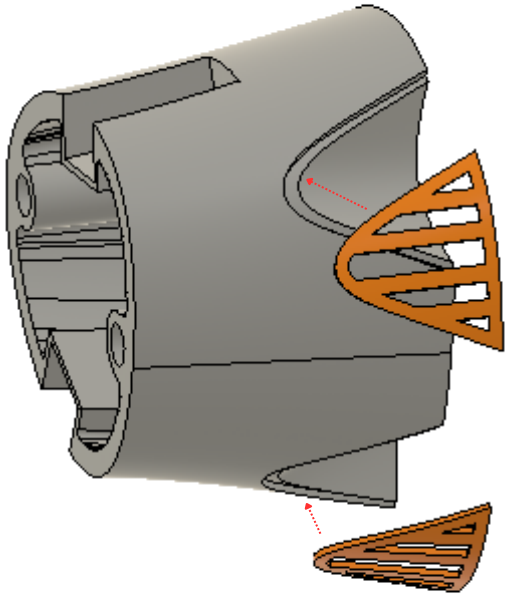


Put gently glue on FUS2 or FUS3 and connect them.

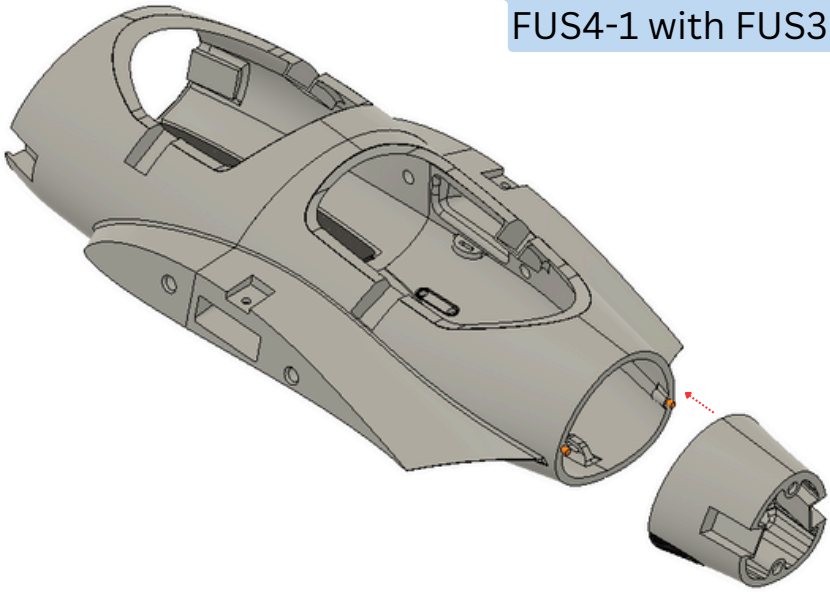




Put glue on the slots on FUS4-1 and press ‘FUS4 Outlet’ carefully, because they are very fragile. Repeat it on the other side.

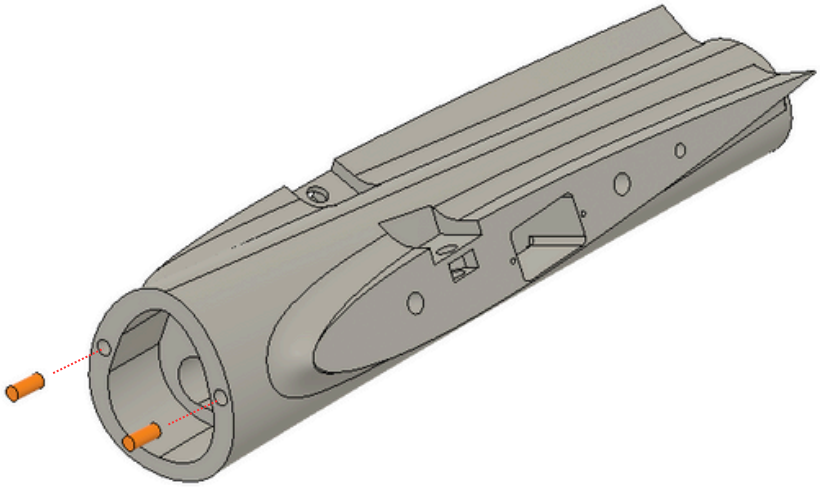


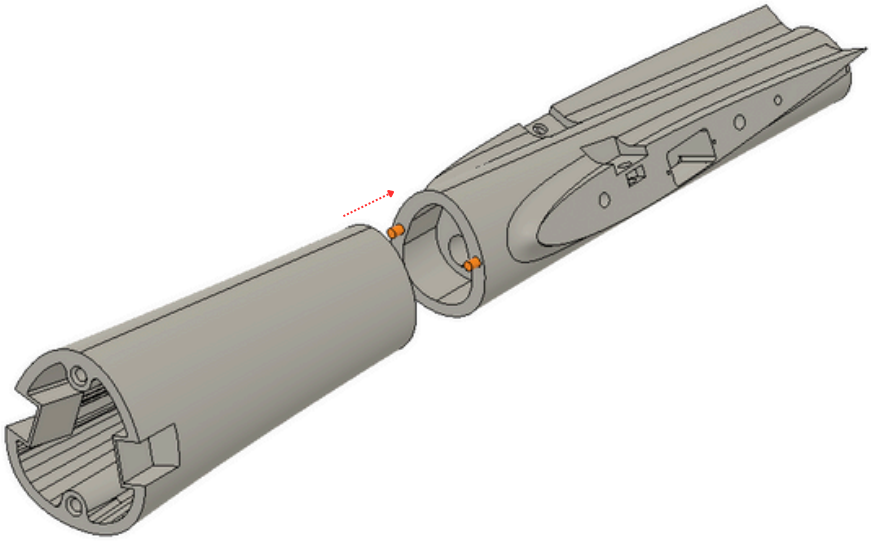
Use glue to connect FUS4-1 with FUS3.



Tail Modules

Insert ‘FUS Connector Pins’ in to the marked holes.
Then glue FUS4-2 and FUS5 together.

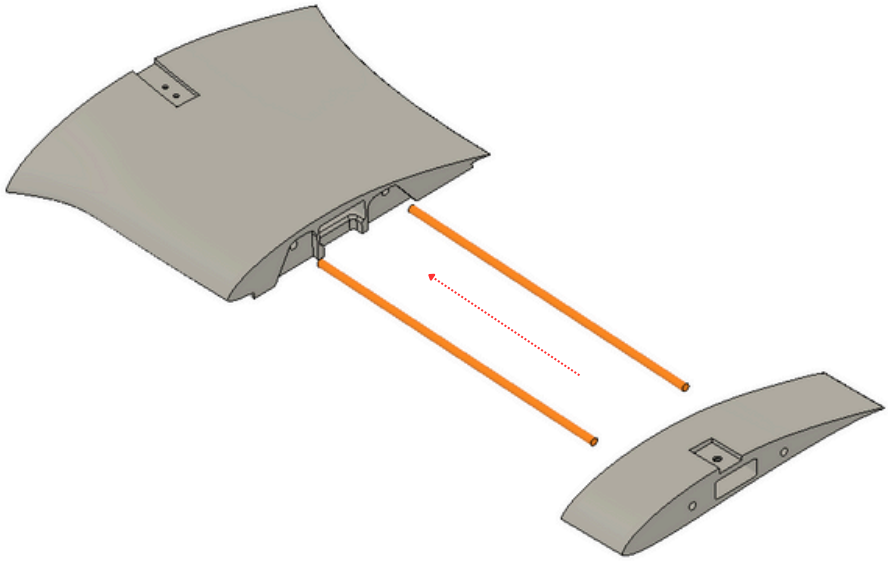




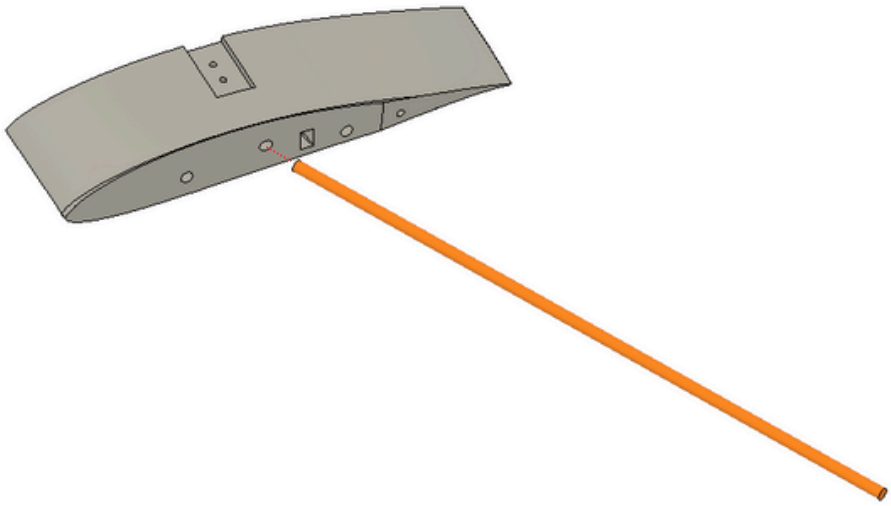
Wing Modules

Slide ‘Spar 1’ and ‘Spar 2’ in W1-1. Do **NOT** use glue for the spars. It is necessary that Spar 1&2 are detachable to assemble/disassemble the VTOL Booms. The rods act here only for allignment.

Use glue to connect W1-1 and W1-2.

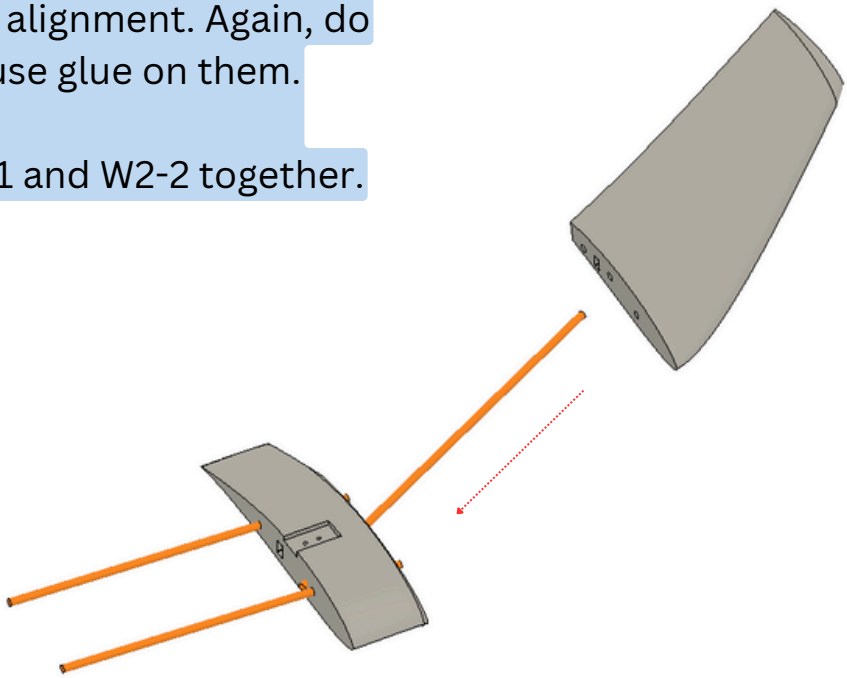


Slide ‘Spar 3’ in ‘W2-1’ or ‘W2-2’.



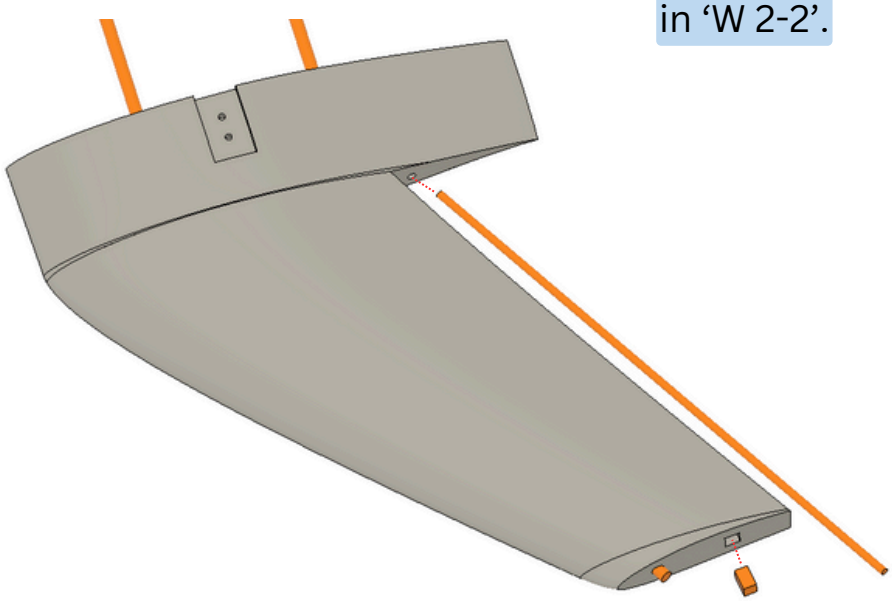
Slide ‘Spar 1’ and ‘Spar 2’ in ‘W2-1’ for alignment. Again, do **NOT** use glue on them.

Glue W2-1 and W2-2 together.

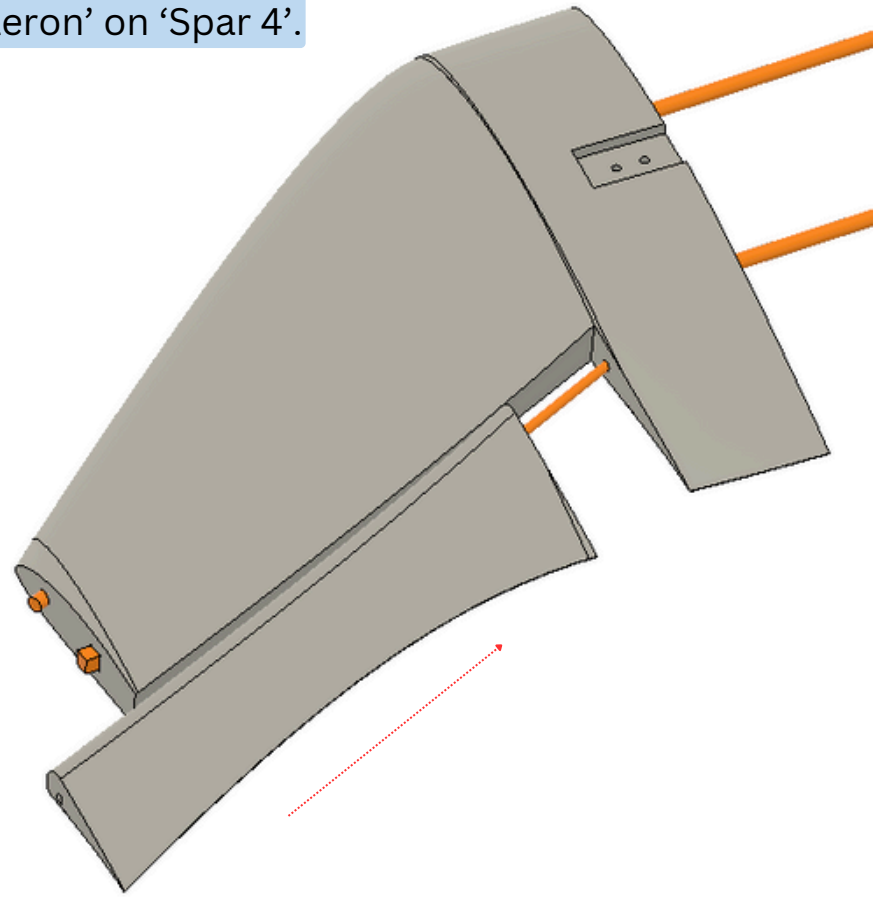


Slide ‘Spar 3’ in ‘W2-1’.

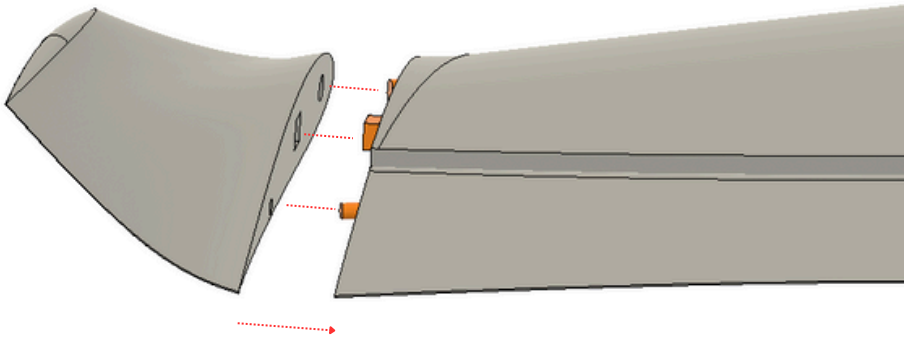
Then glue ‘W3 Connector Pin’ in ‘W 2-2’.



Slide ‘Aileron’ on ‘Spar 4’.

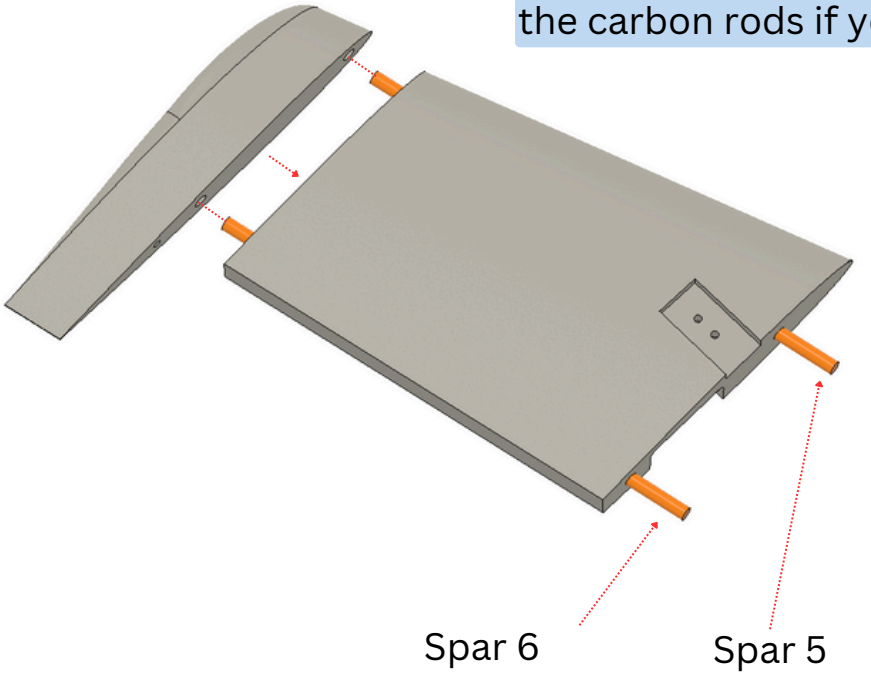


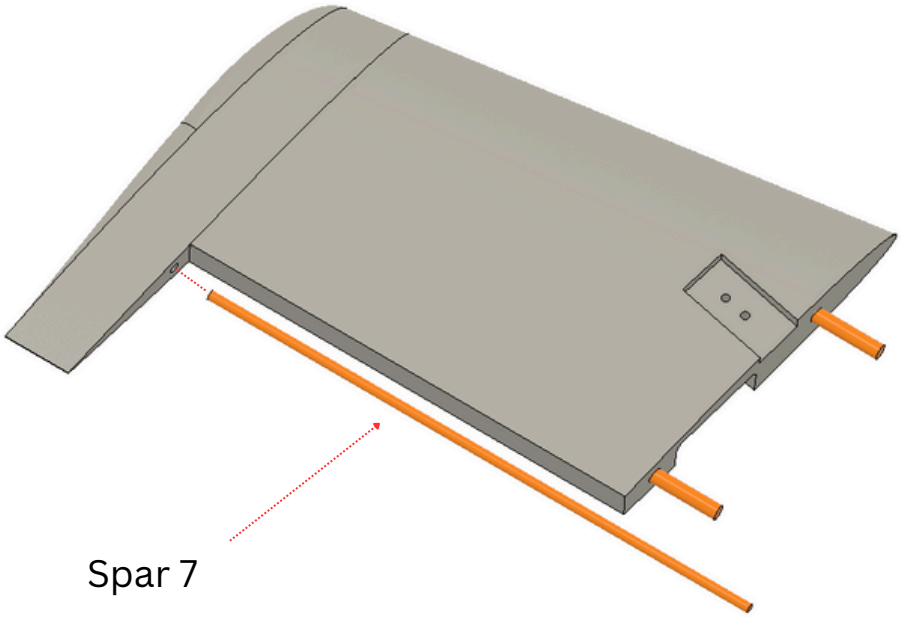
Glue ‘W3’ with ‘W 2-2’ together.

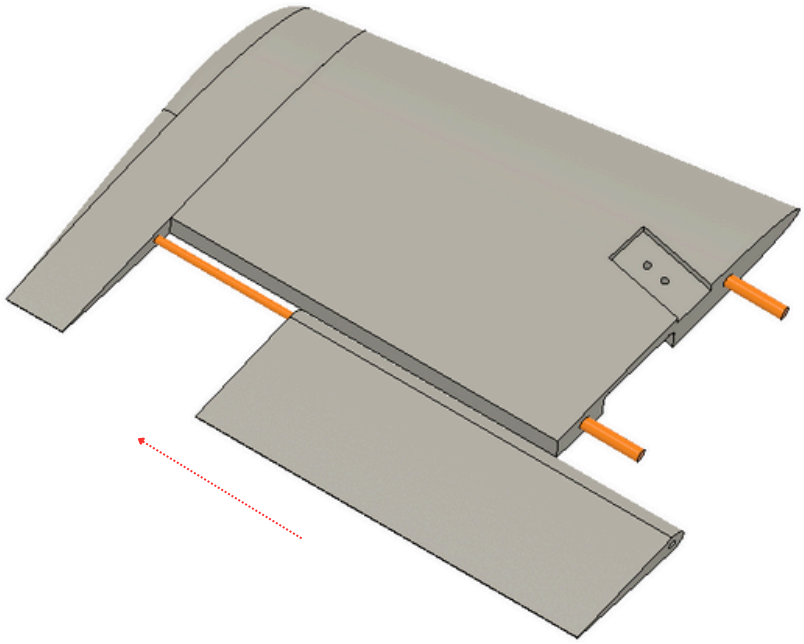


V-Tail Modules

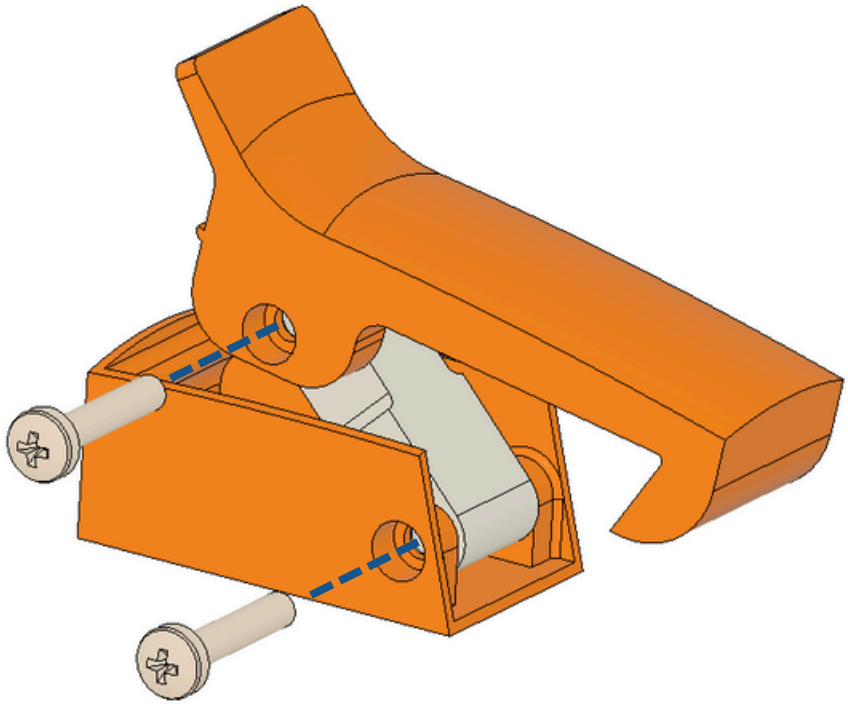
Assemble the V-Tail similar to the wing. Here, you can glue the carbon rods if you want.







Latches



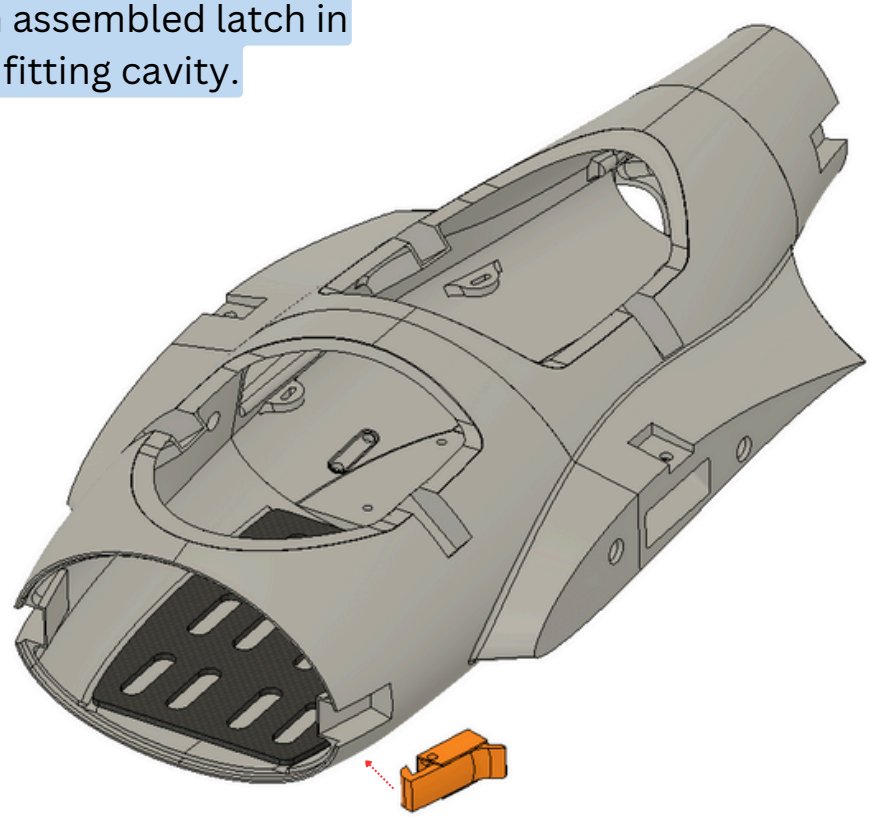
Insert the ‘M2.5x12/14’ screws in to the fitting holes and drop a small amount of glue on the feet side of the screws, so they do not fall out.

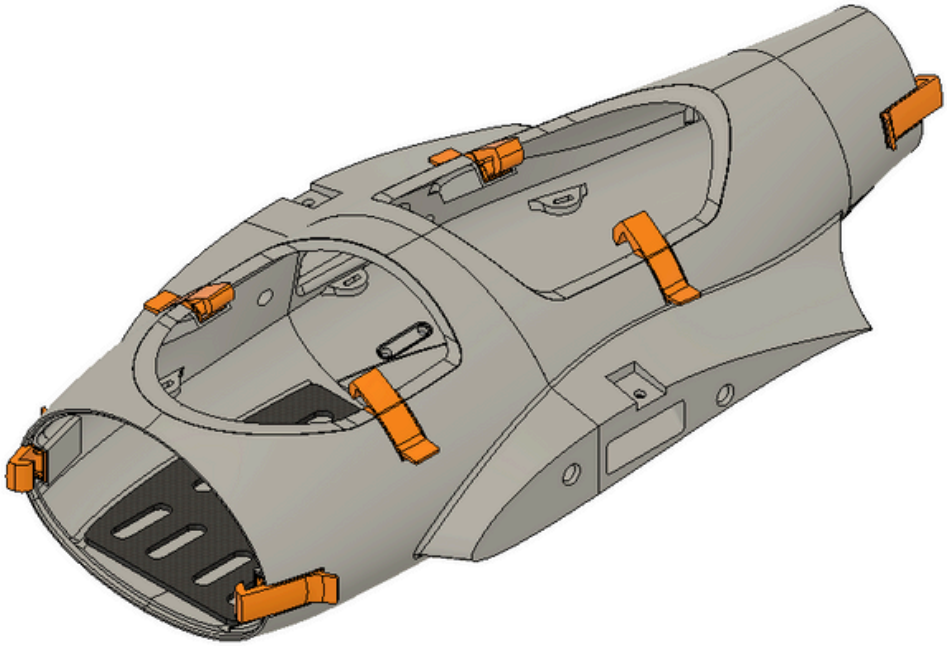
If there are no matching screws or the head of the screw does not fit into the hole, then you can also use PETG filament pieces.

Take care, that the screw heads are sinked fully in the hole.

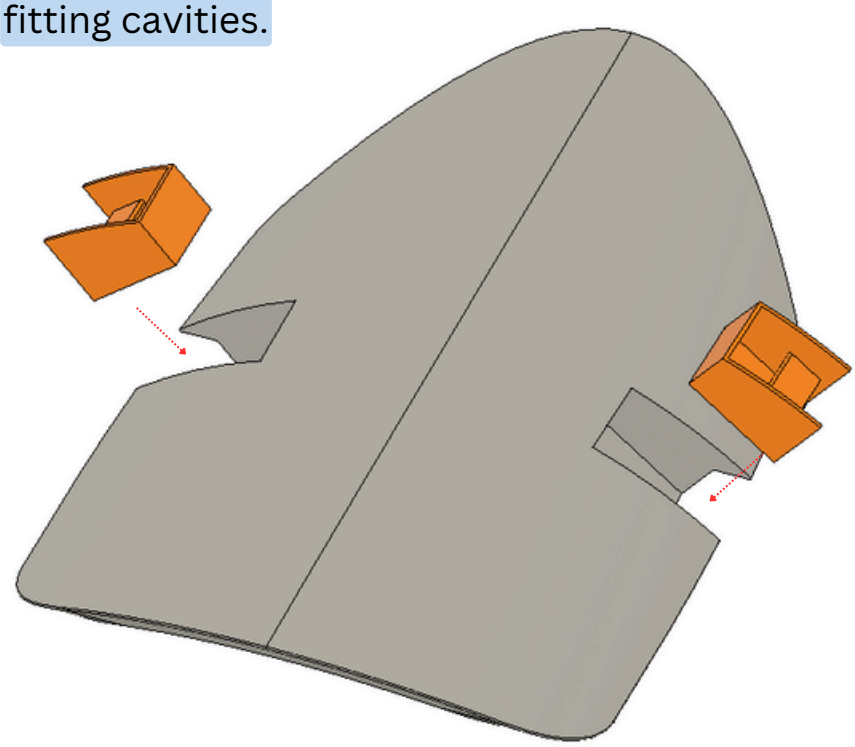
Attention, all latch parts should be movable.

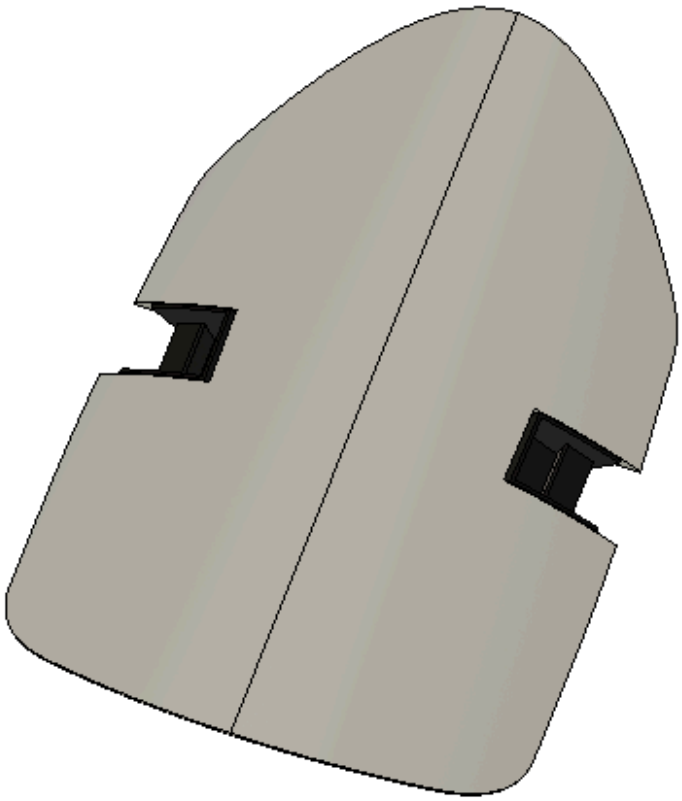
Glue each assembled latch in the fitting cavity.

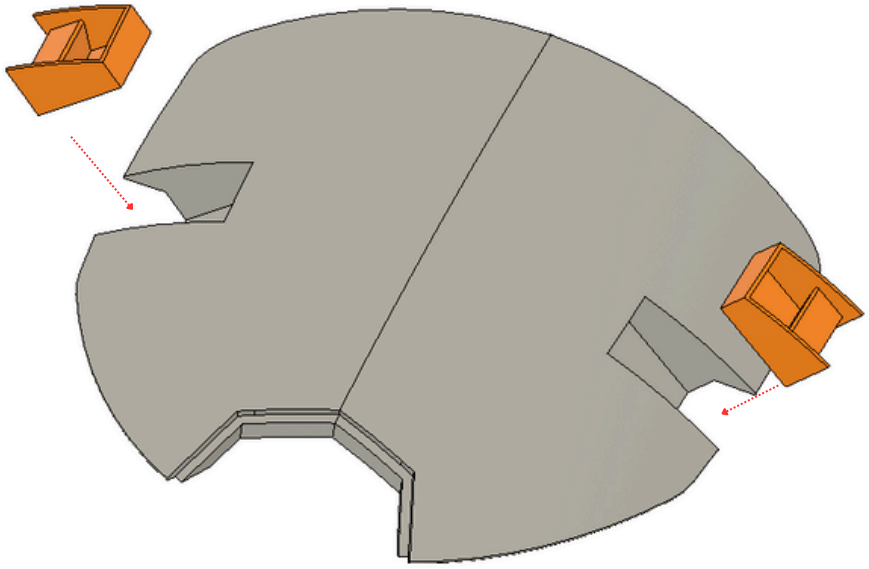




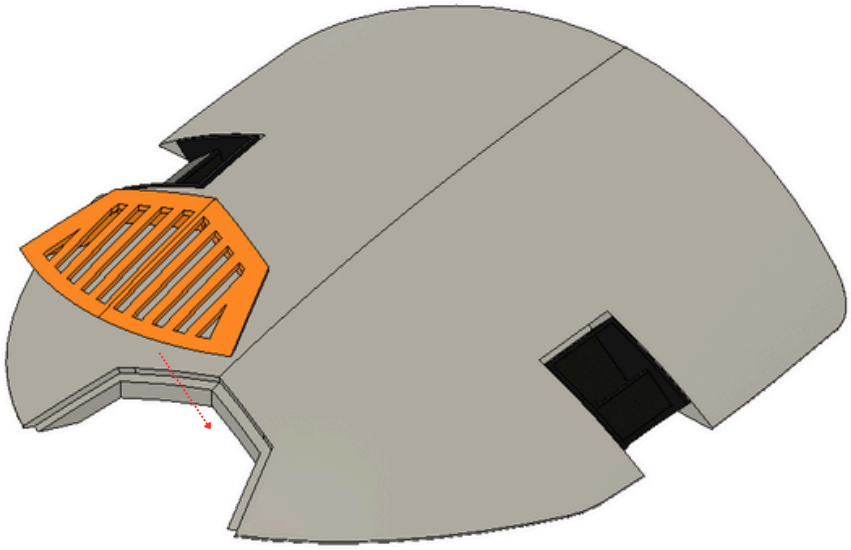
Glue the latch housings in the fitting cavities.

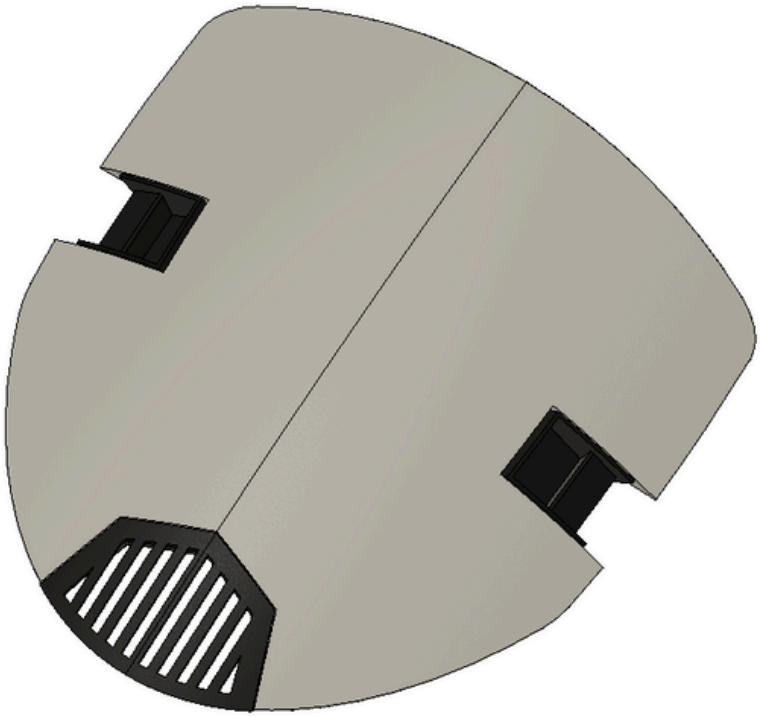


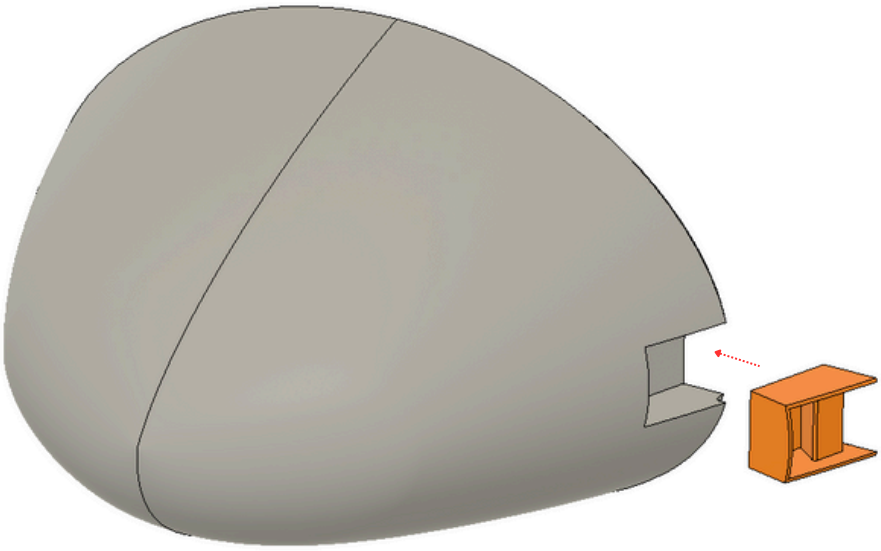


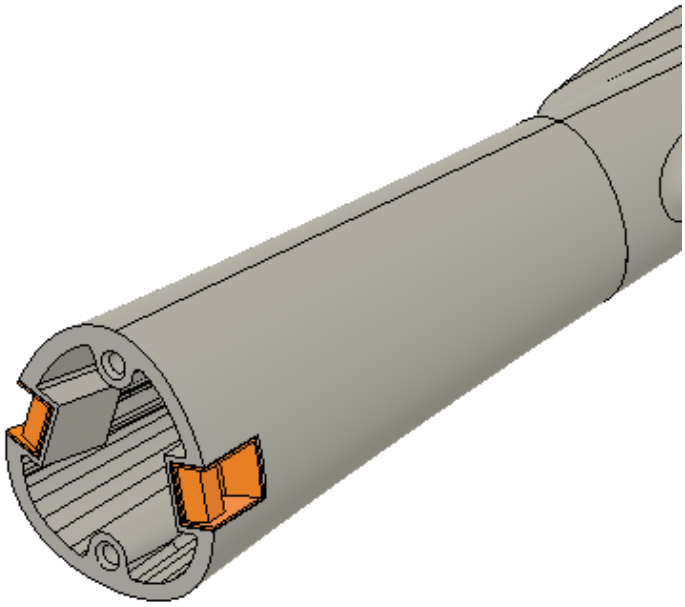


Put carefully glue on the slot on ‘FUS2 CAP’ and press ‘FUS2 CAP Inlet’ gently, because it is very fragile.

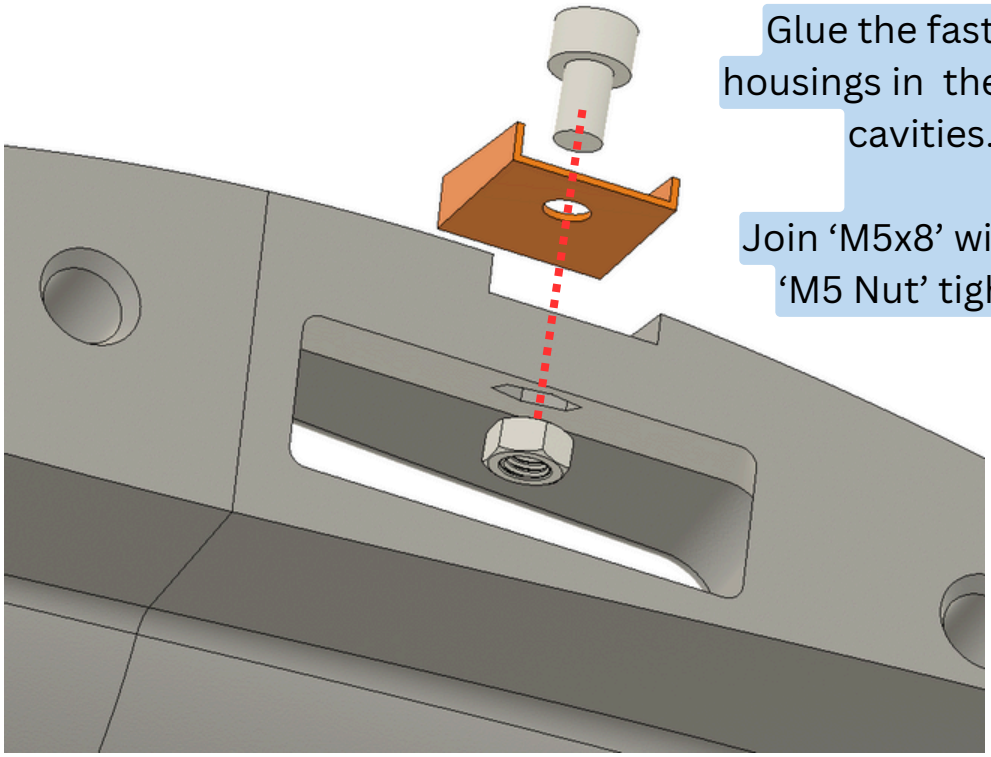






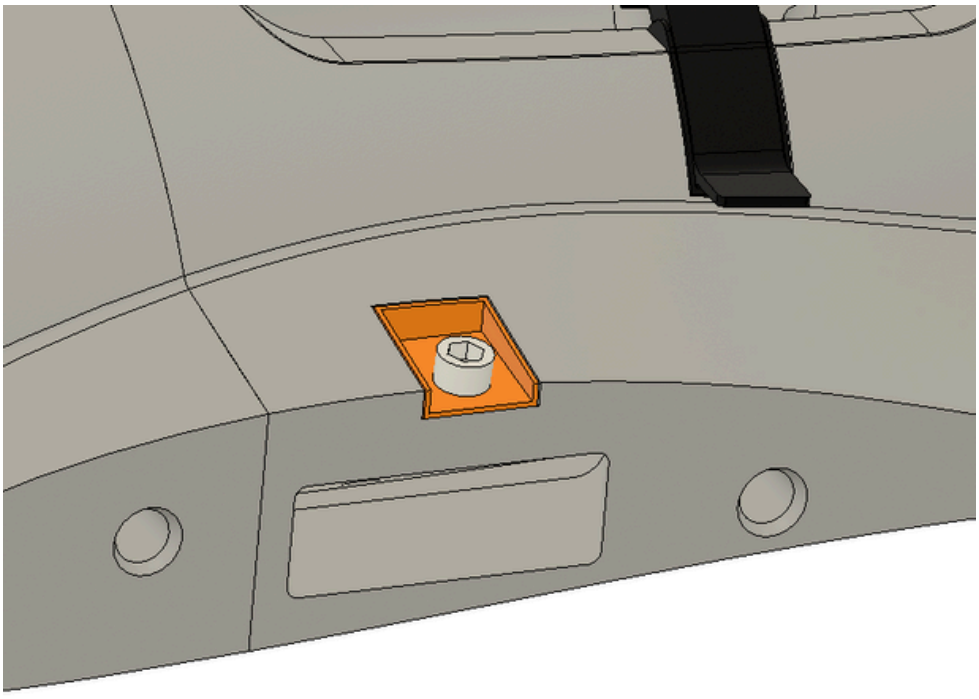


Wing and Tail Fasteners



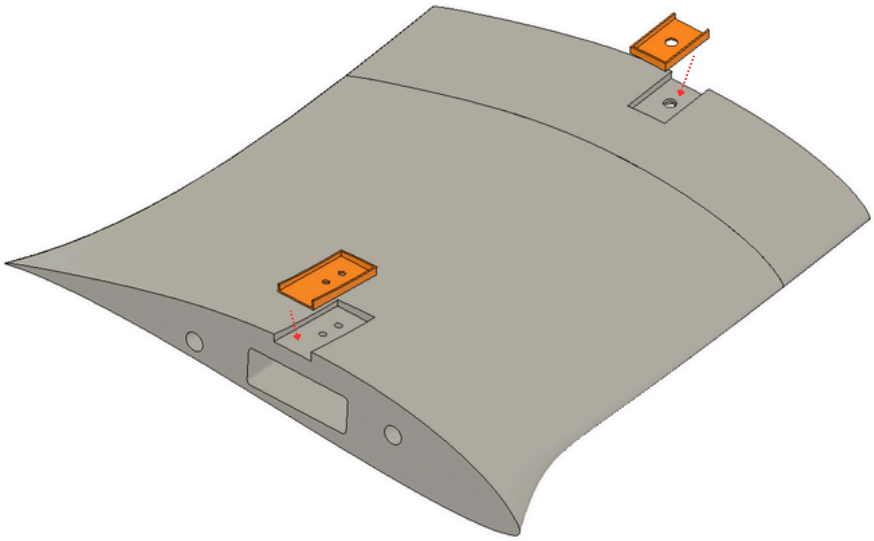
Glue the fastener housings in the fitting cavities.

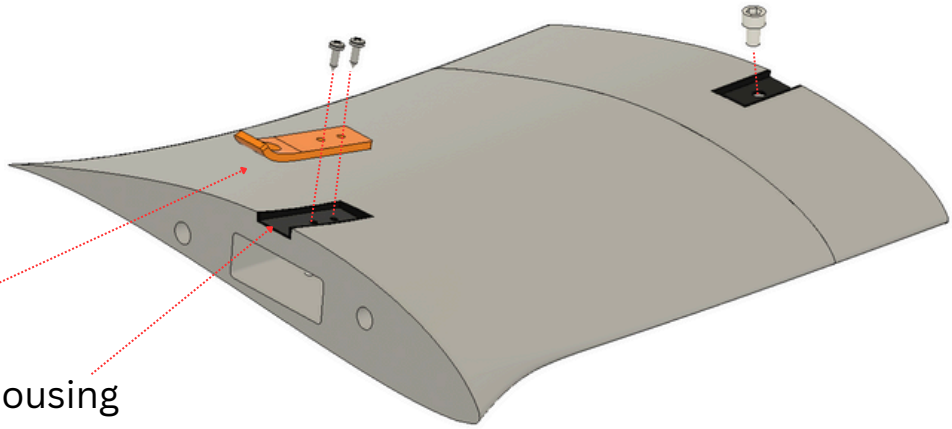
Join ‘M5x8’ with the ‘M5 Nut’ tightly.

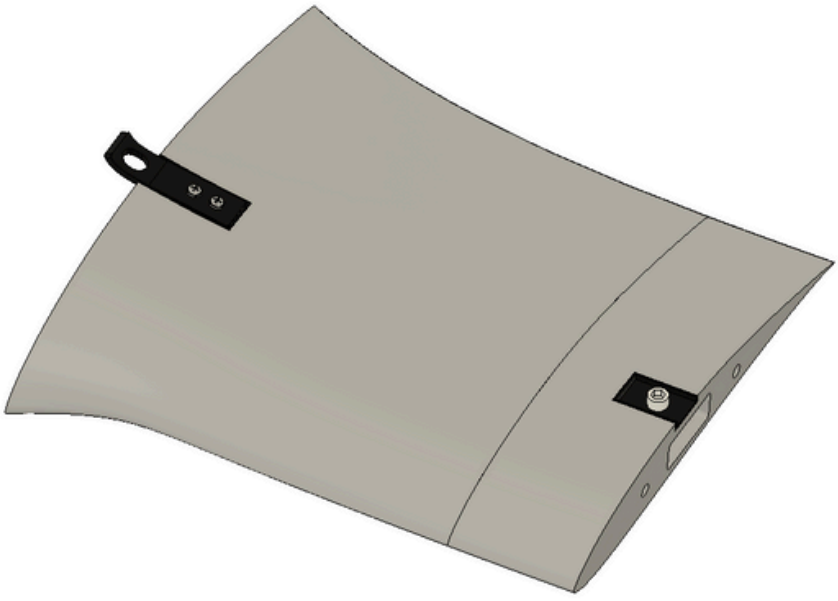


Glue the fastener housings in the fitting cavities.

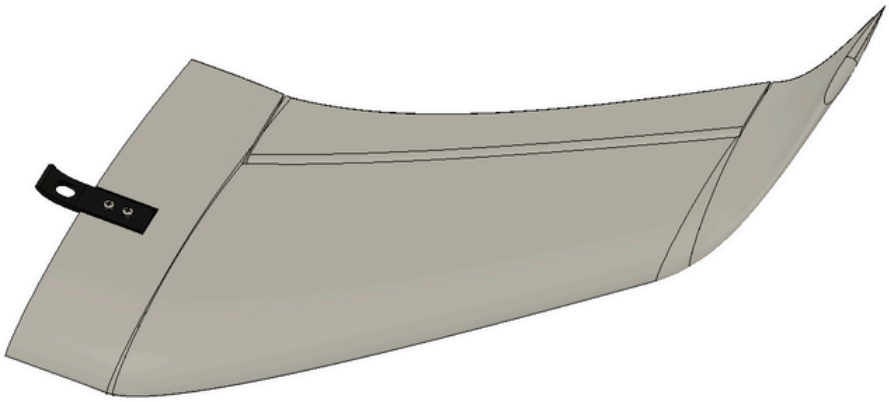
Do **NOT** glue the snap fits on the fastener housings. Instead use ‘2.9mm x 9.5mm metal screws’ to easy assemble/disassamble in case of any damage.

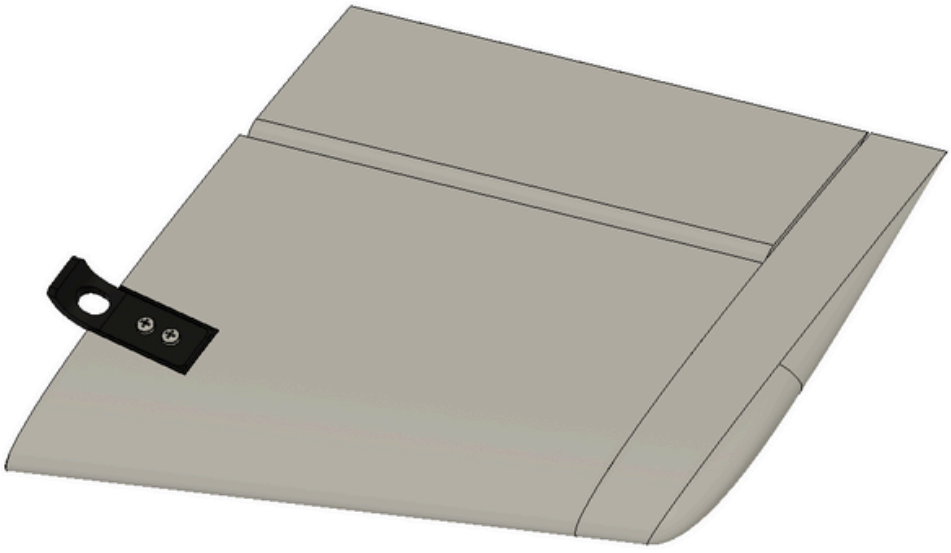




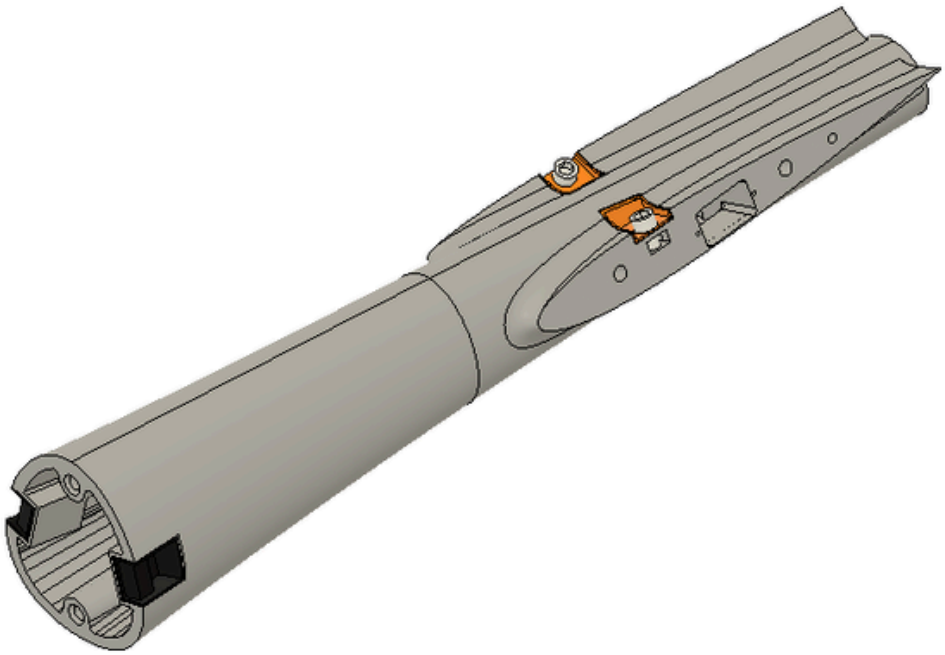


Repeat the same on ‘W2’ and ‘VTail’.

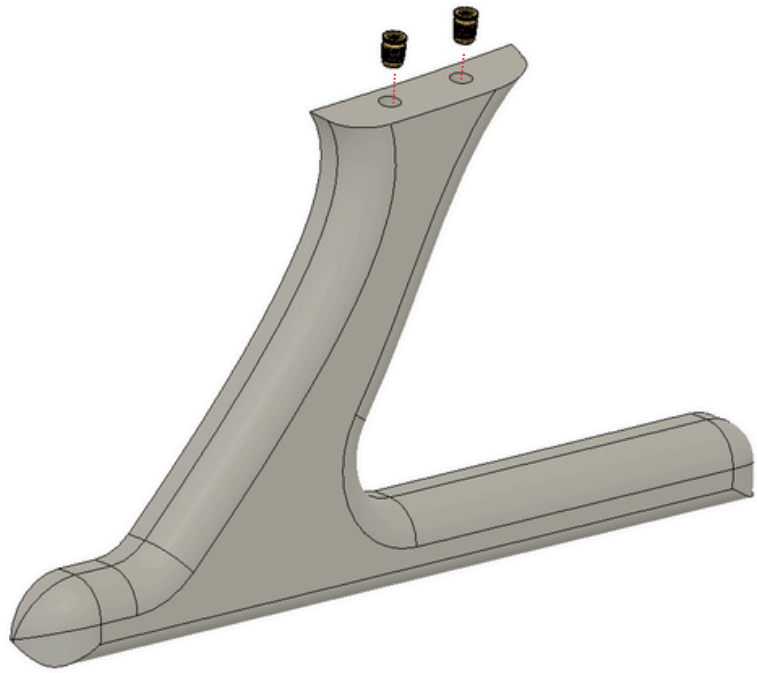


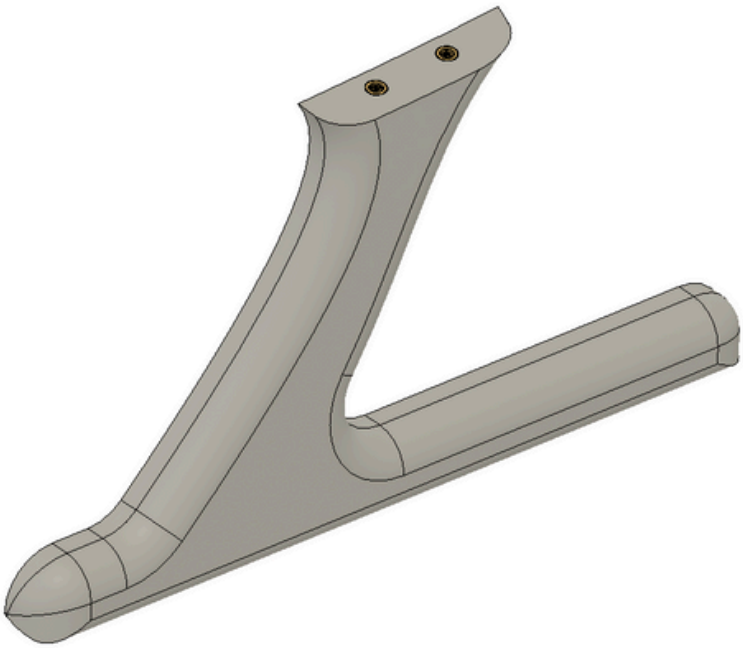


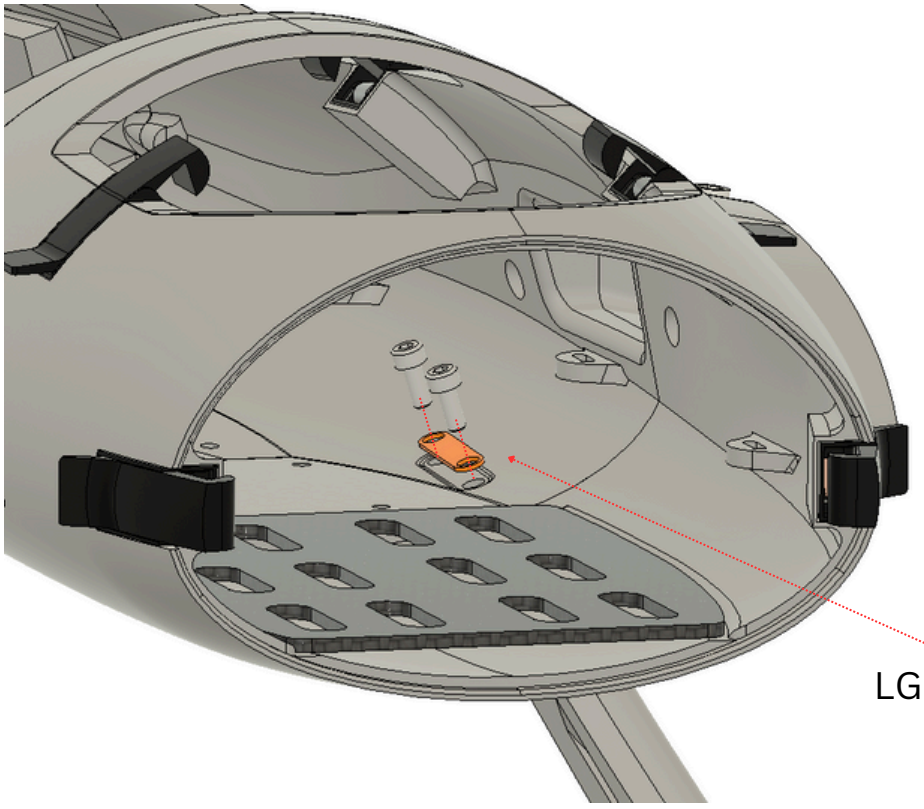
Assemble the fastener parts on ‘FUS5’ similar to the wings.



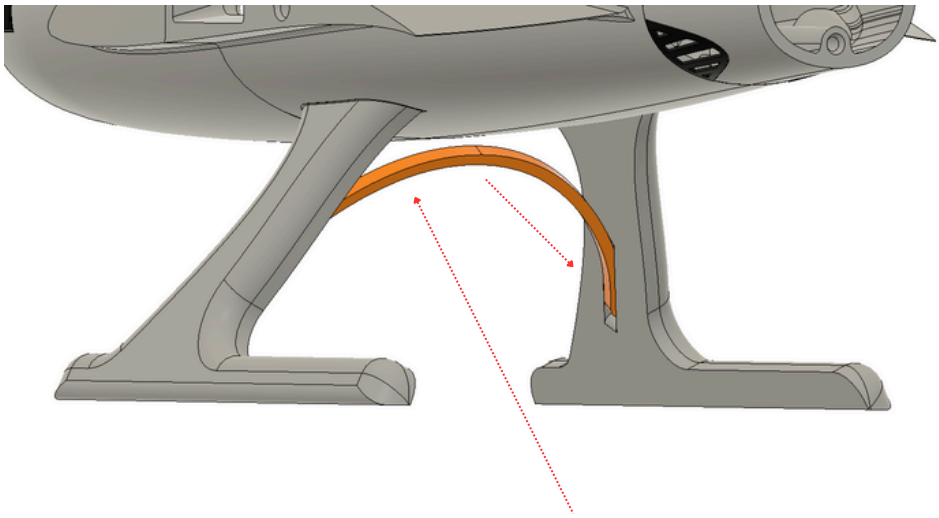
Landing Gear-A Assembly



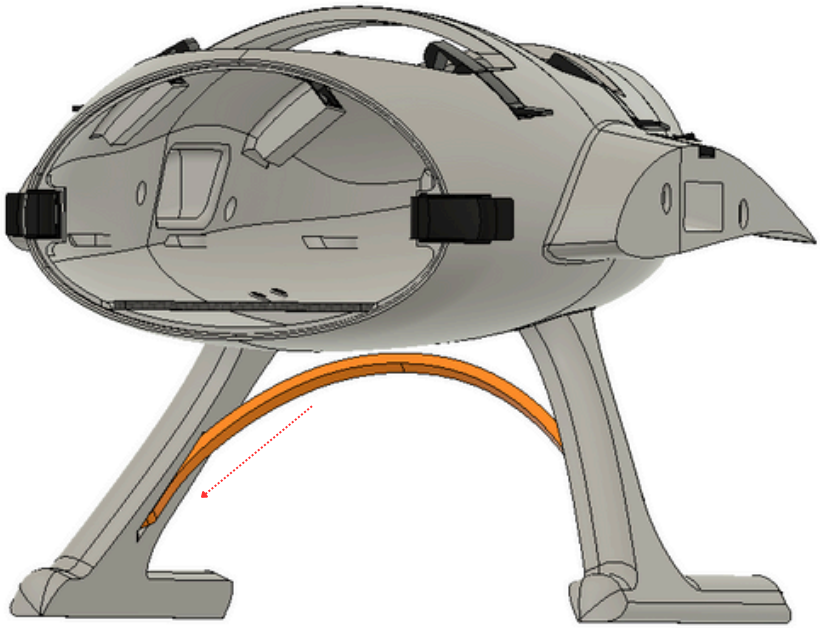


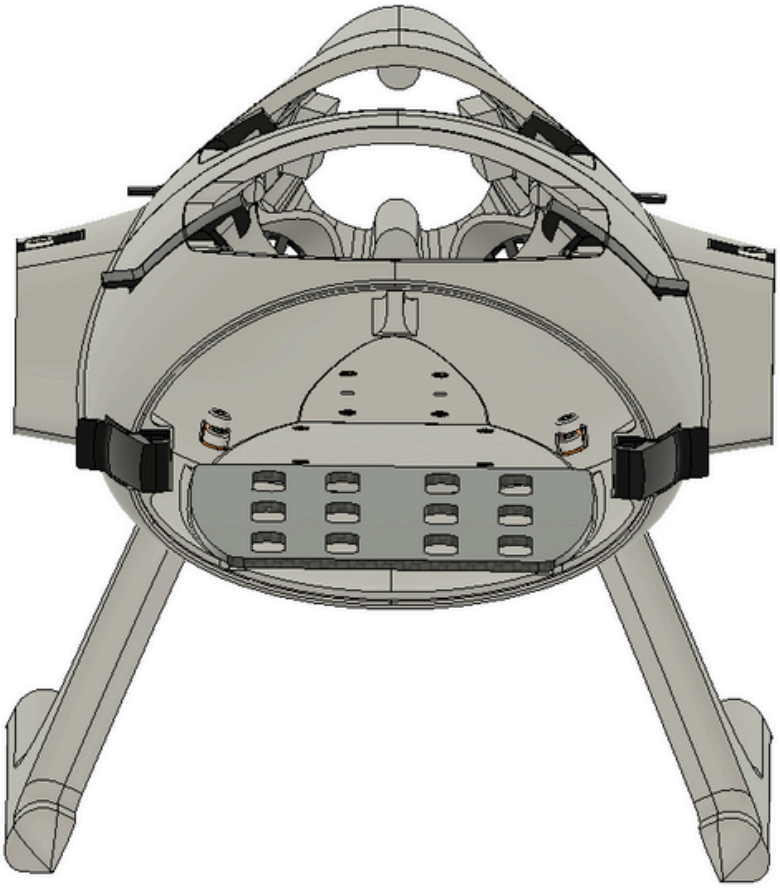


LG Washer

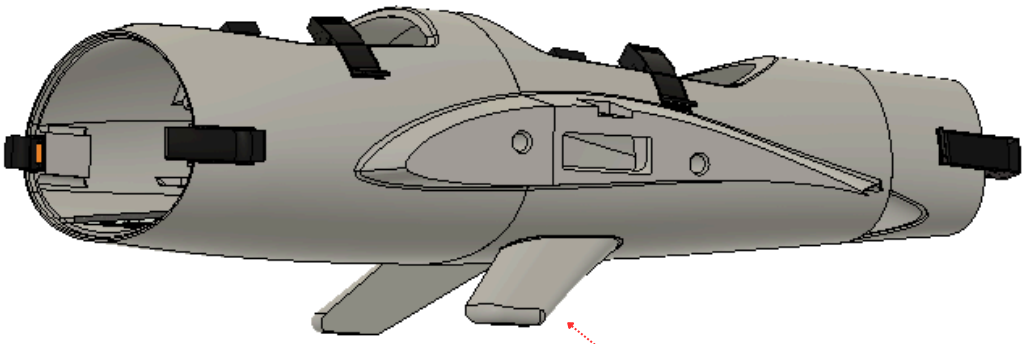


LG-A Reinforcer

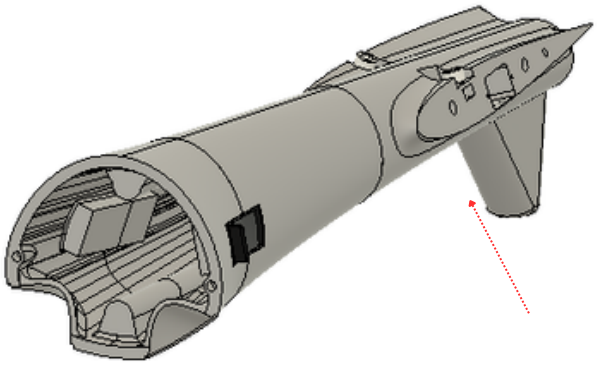




Landing Gear–B Assembly



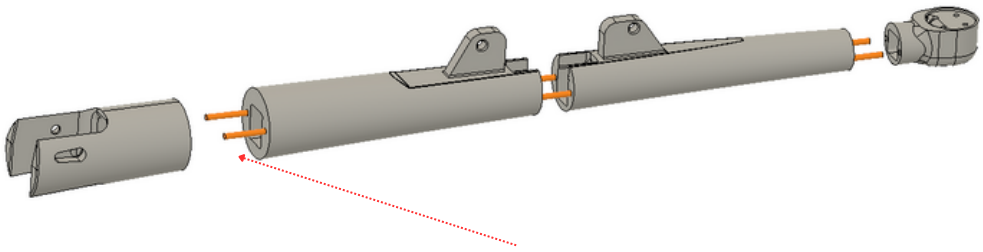
L-/R-LG-B Front

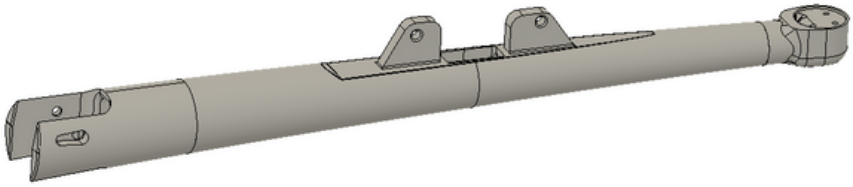


LG-B Rear

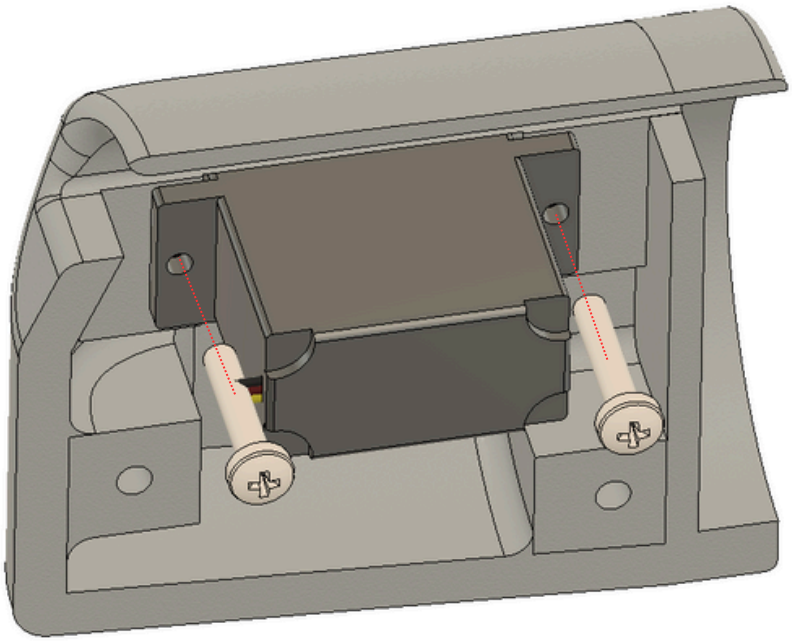
The assembly of LG-B is similar to LG-A. Use threaded inserts for the ‘L-/R-LG-B Front’ parts. Glue ‘LG-B Rear to the tail module. Try to center it underneath.

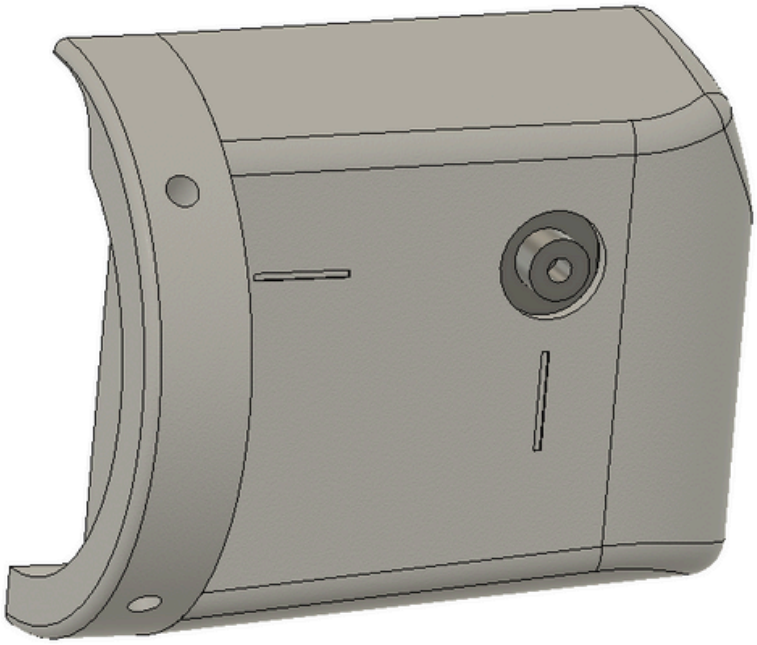
VTOL Arm Modules

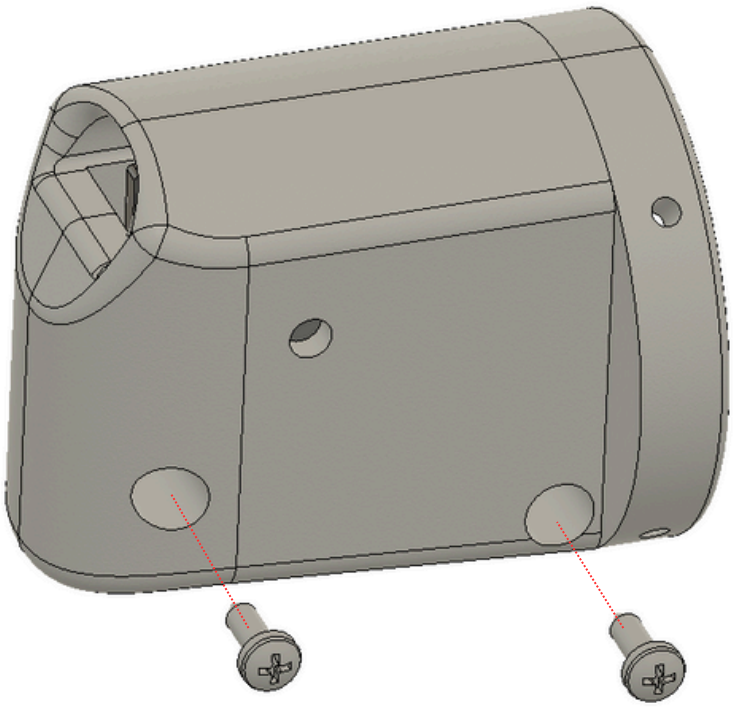


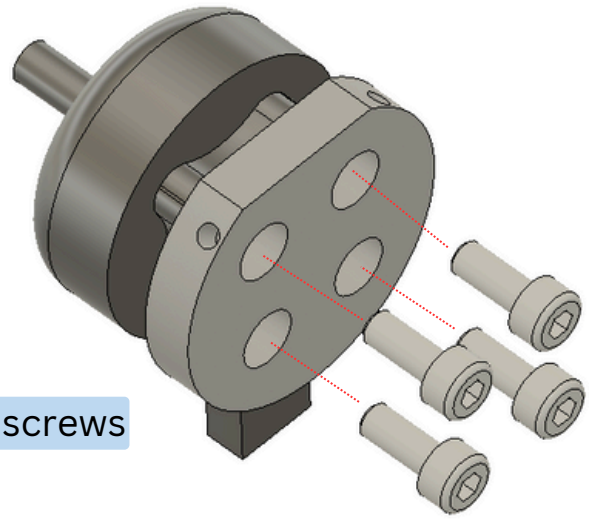


Tilt Mechanism & Propulsion

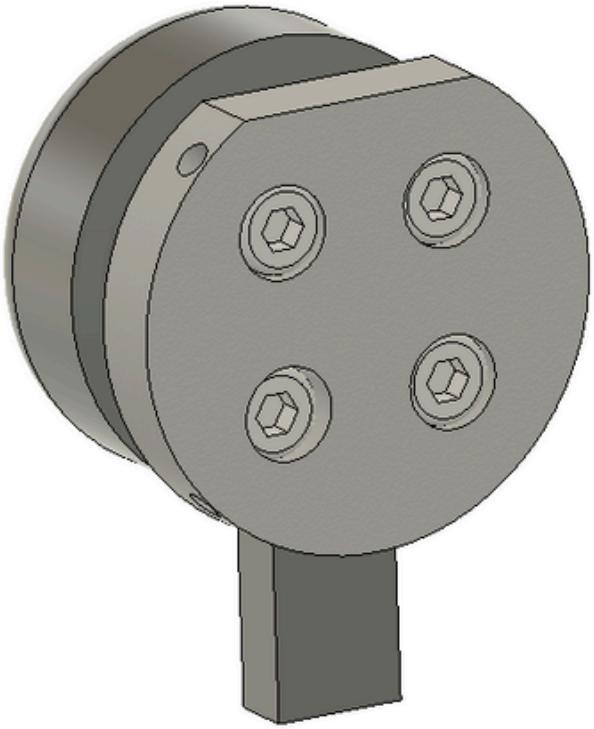


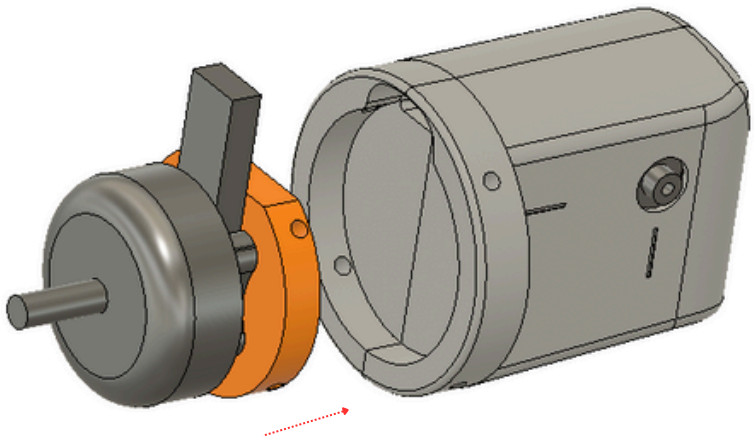


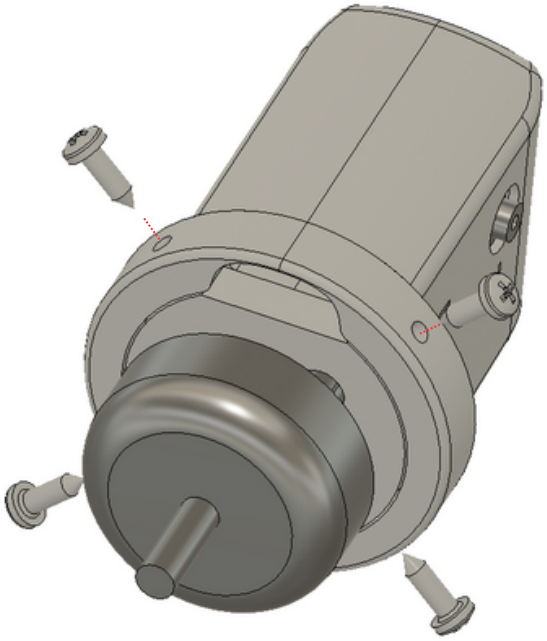


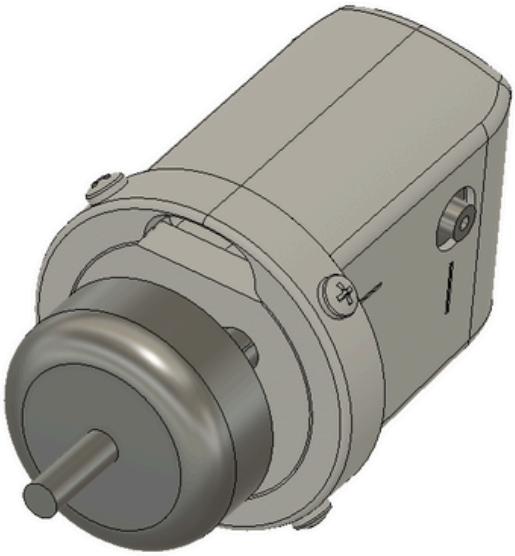


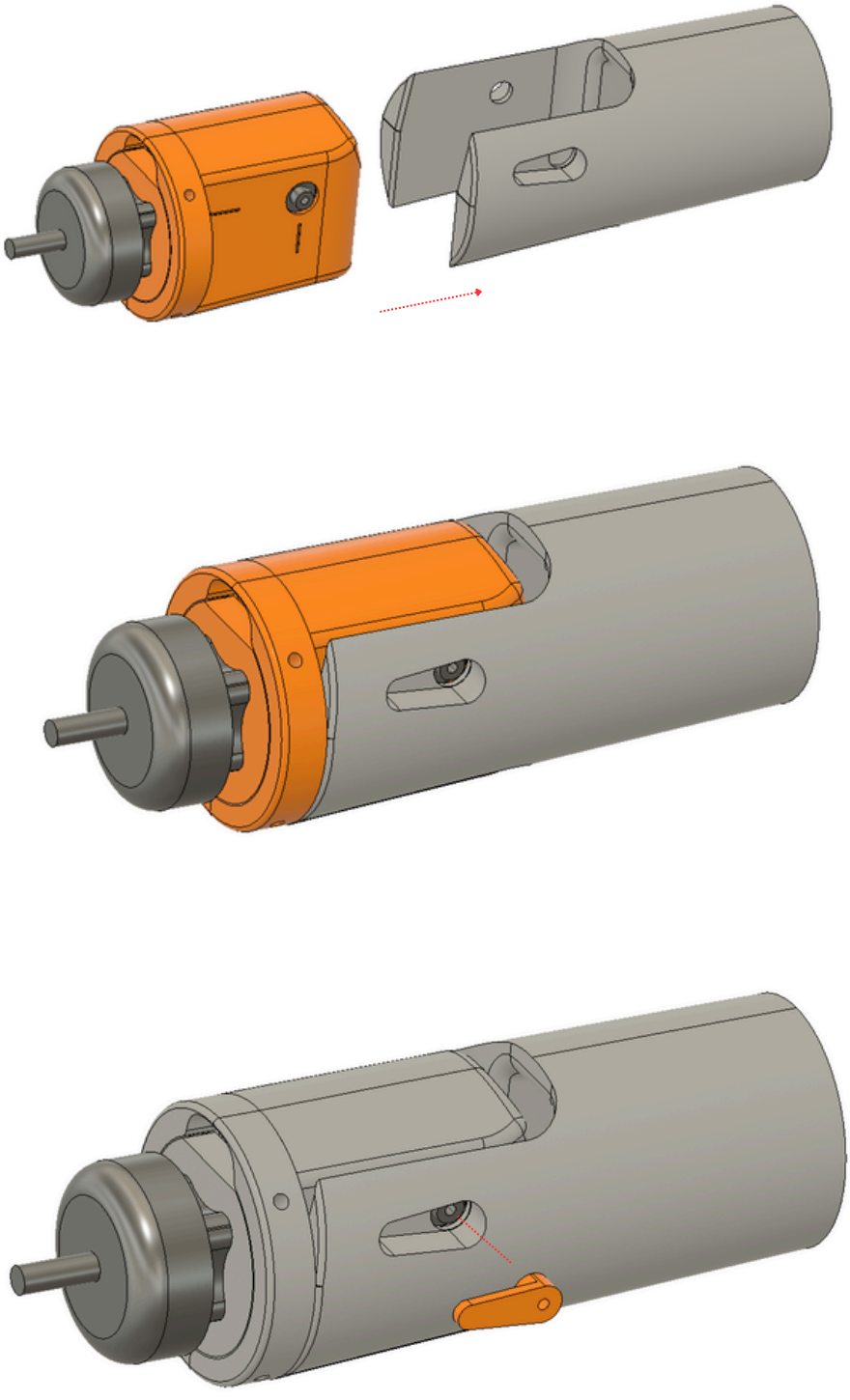
Use short M3x4 screws

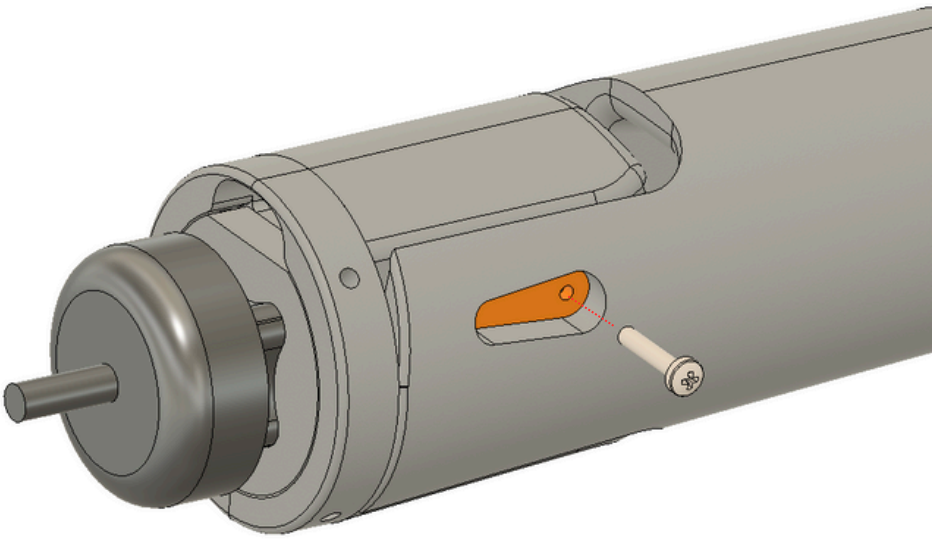




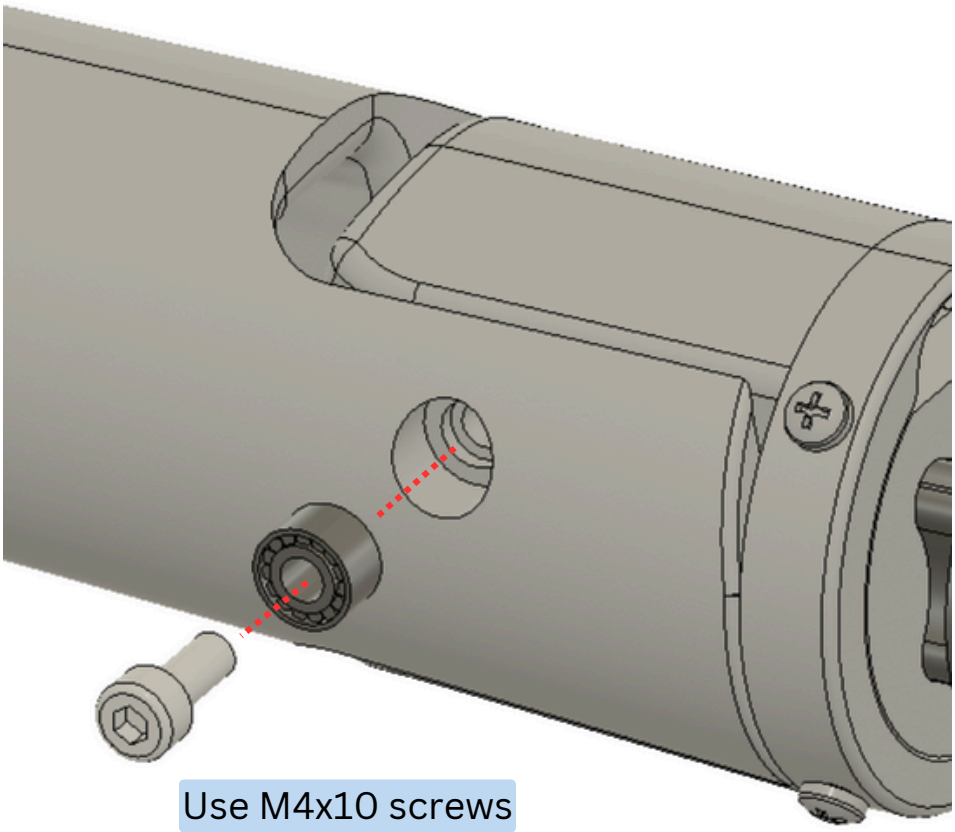




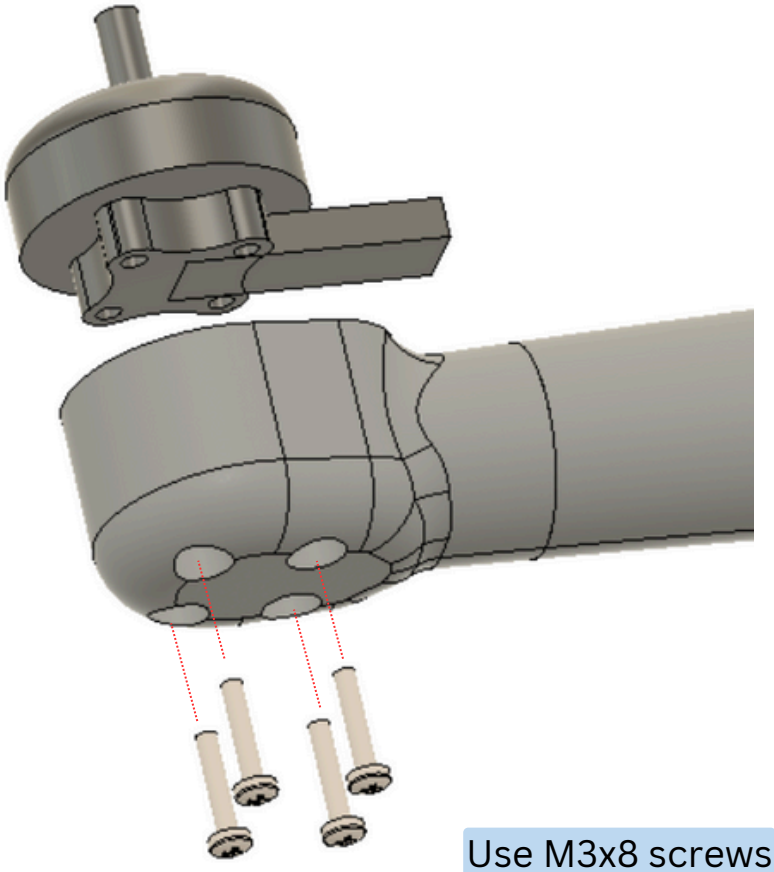




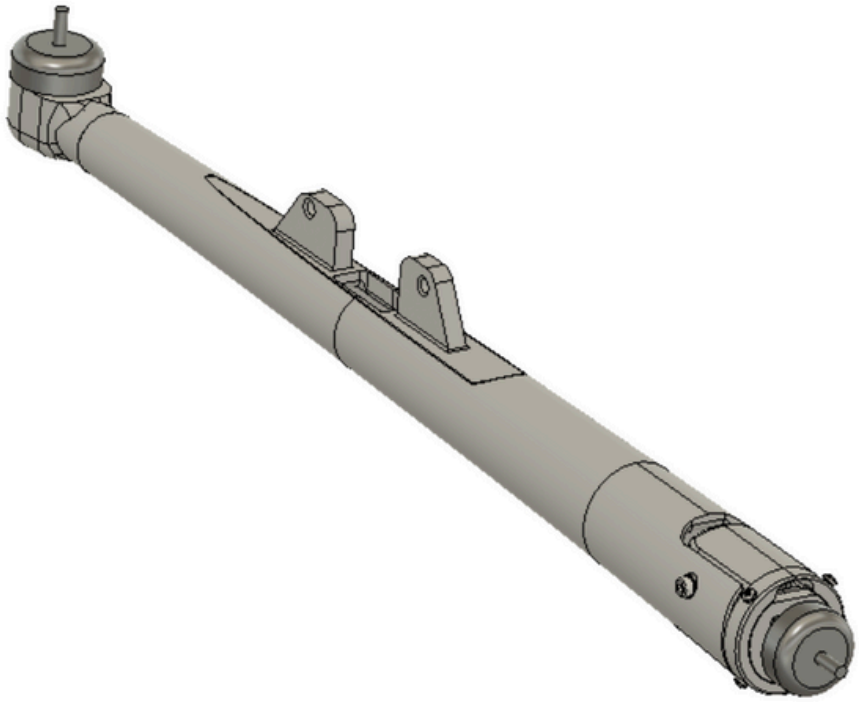
Use M2x4 screws



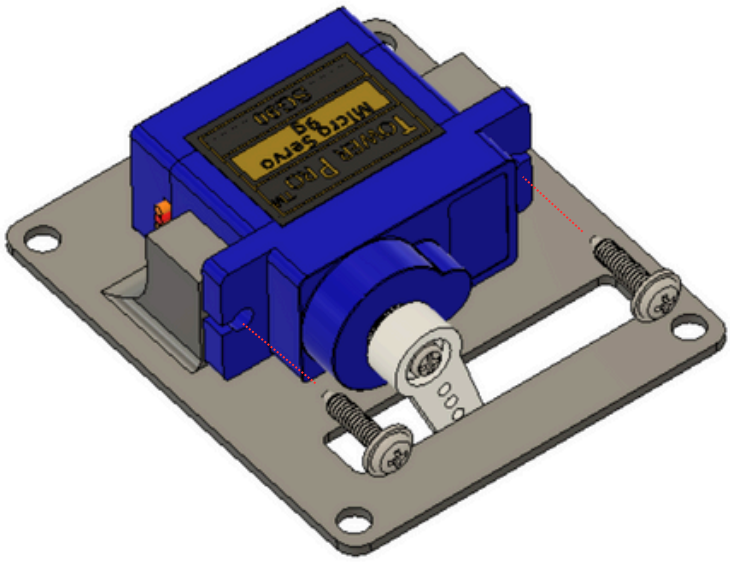
Use M4x10 screws

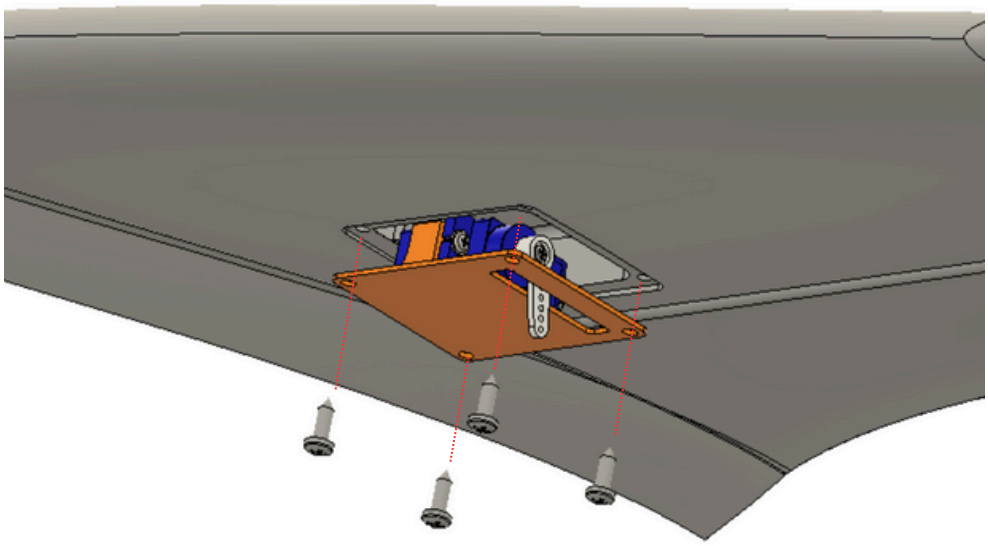


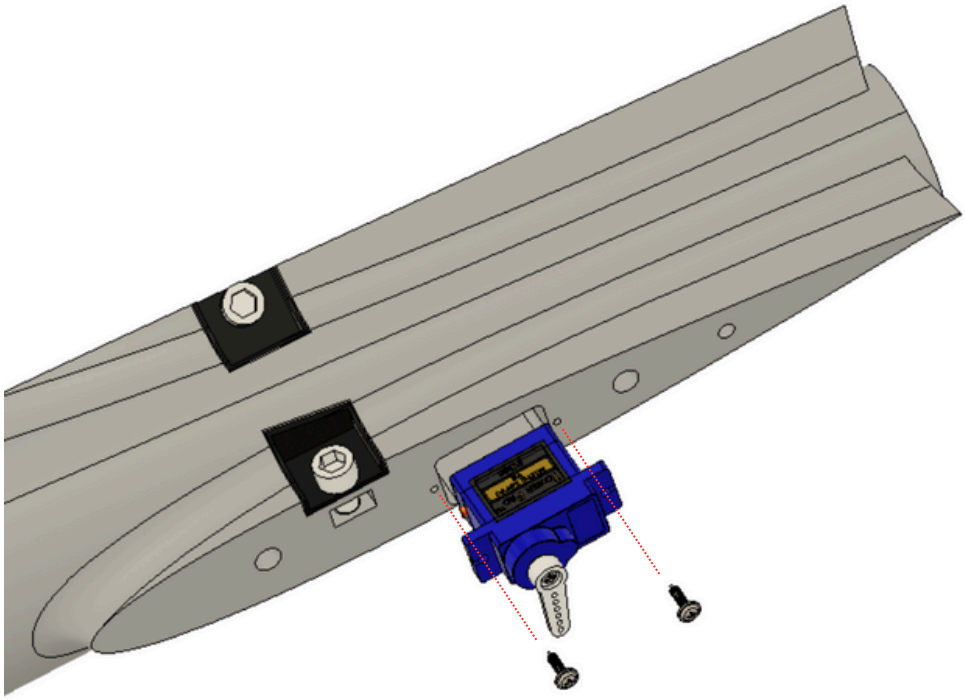
Use M3x8 screws

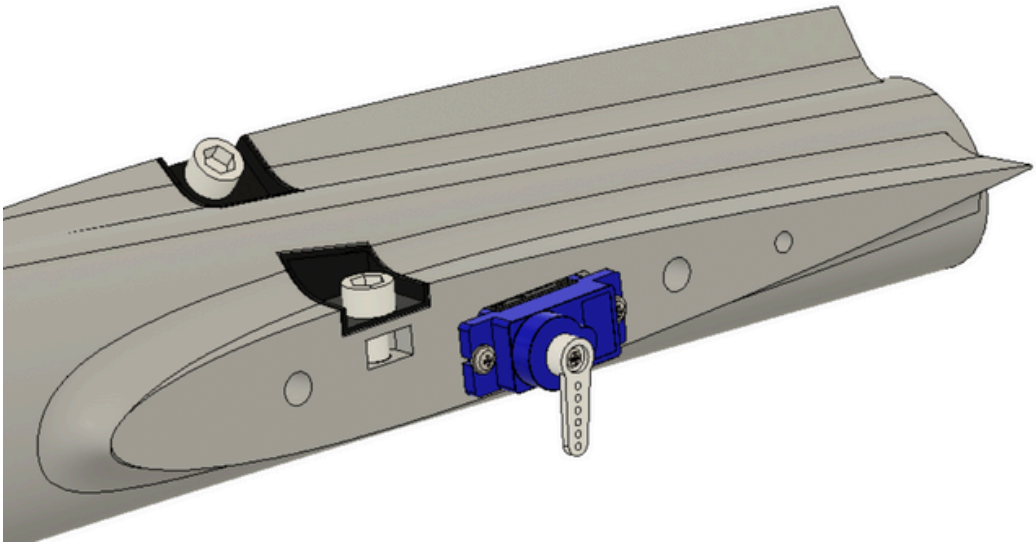


Servo Integration

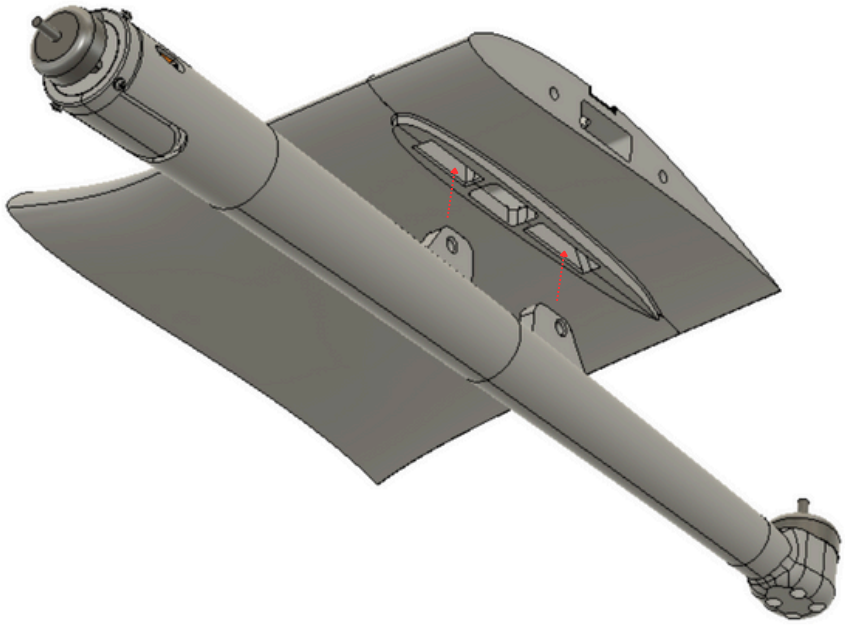


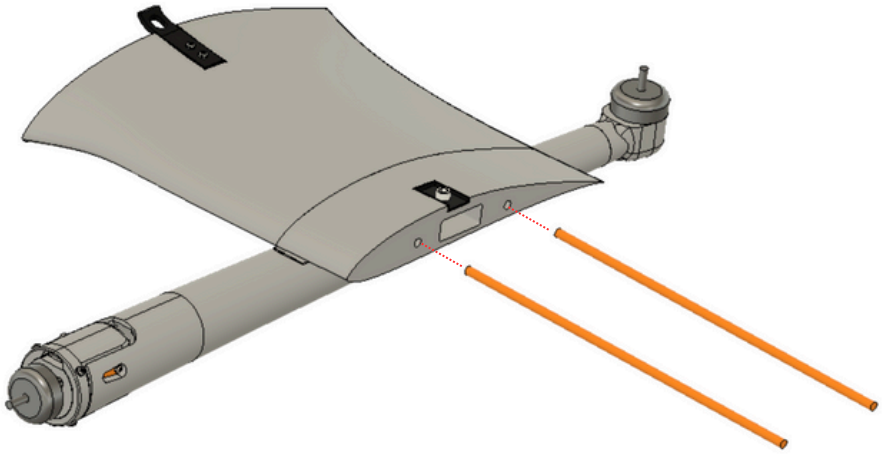


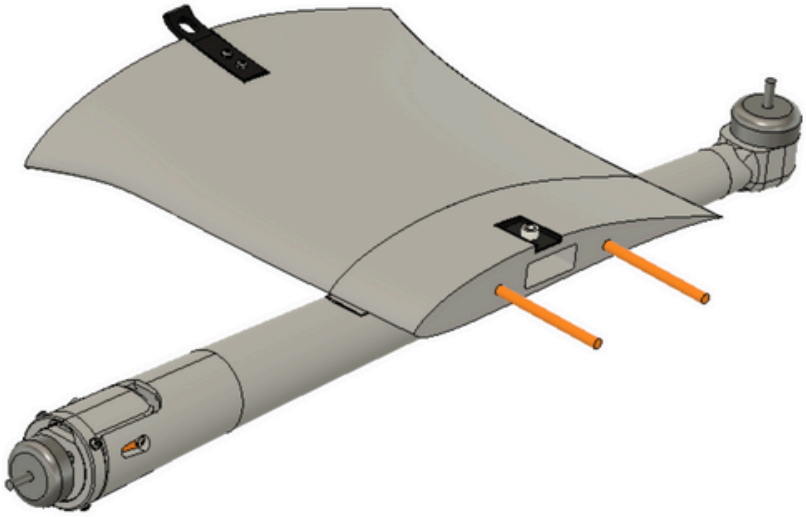


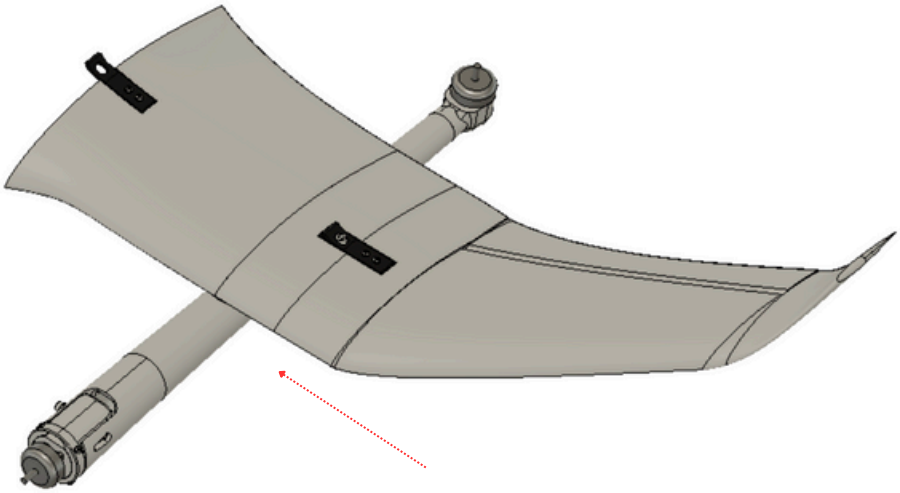


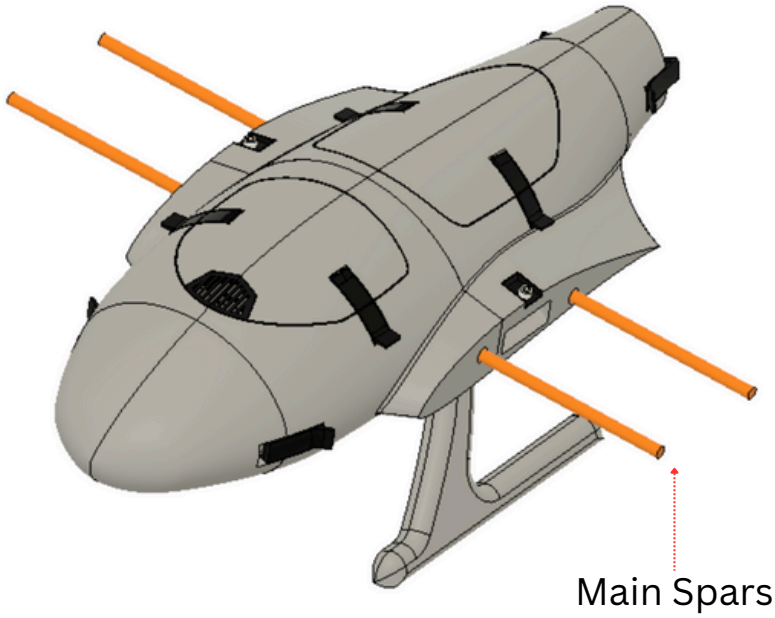
UAV Assembly

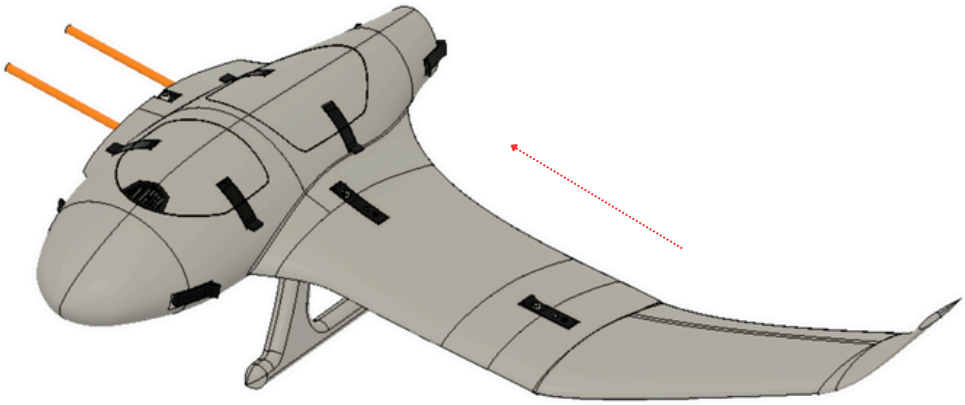


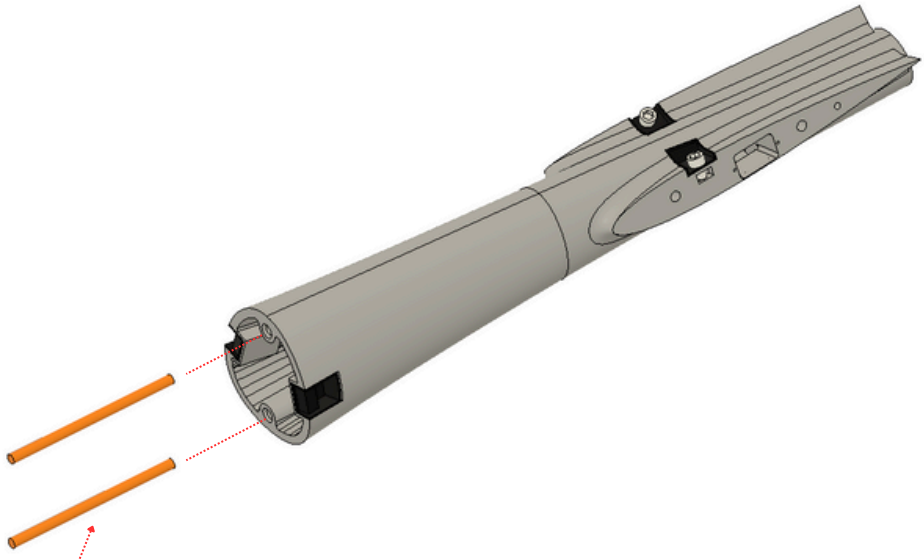




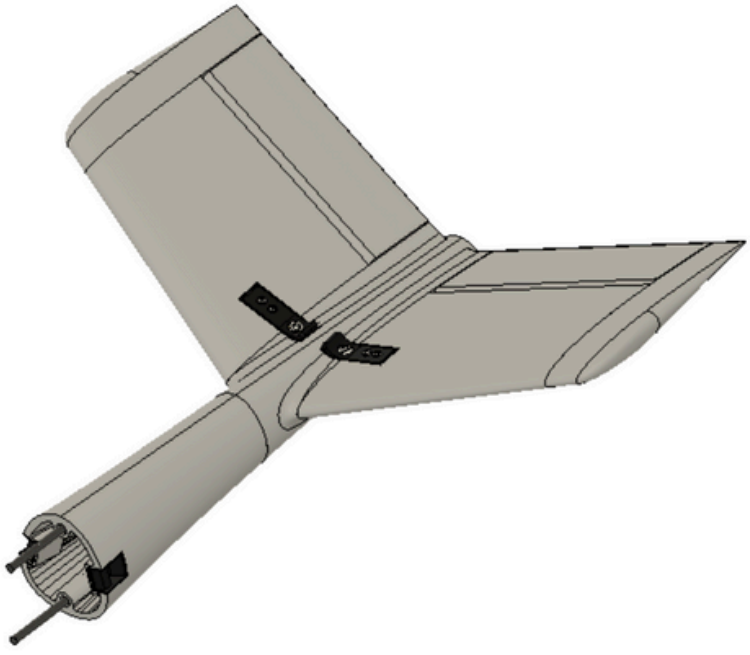


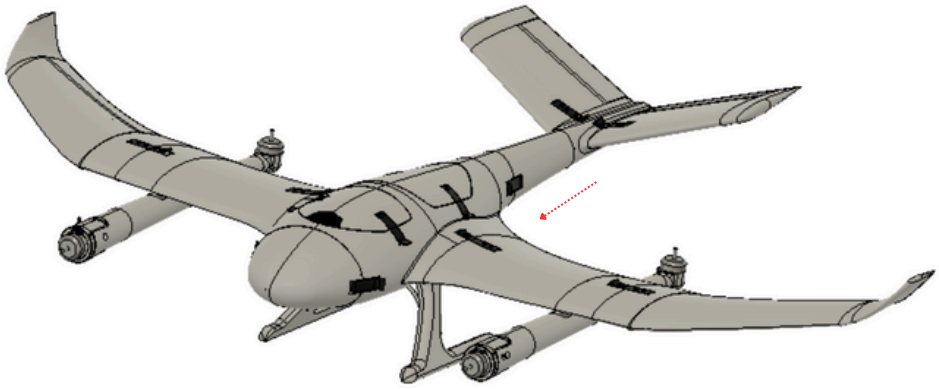

Main Spars





Spar 10 and 11

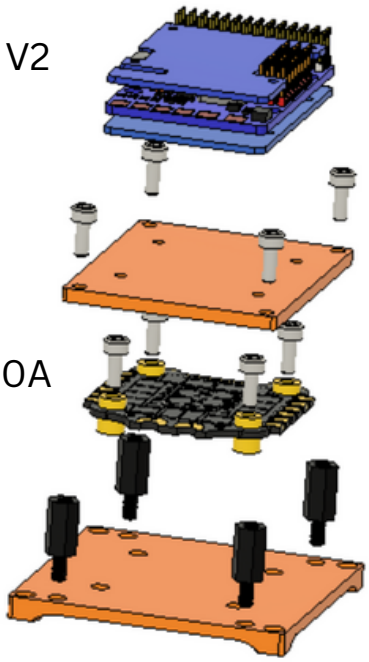


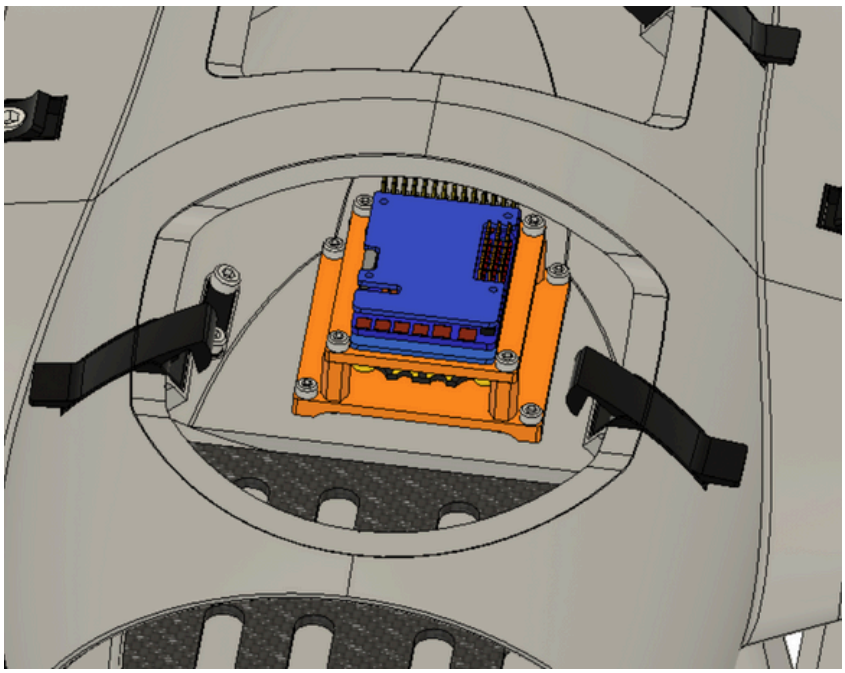


Avionics Integration

Matek F405 Wing V2

SpeedyBee BLS 60A

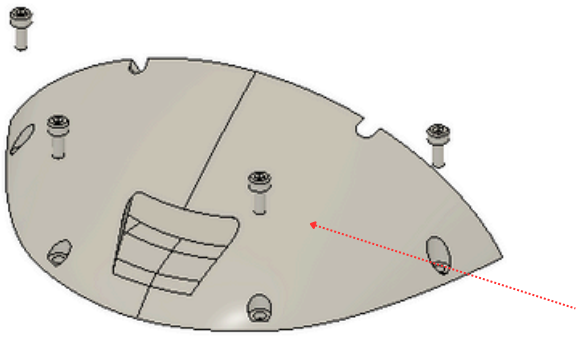




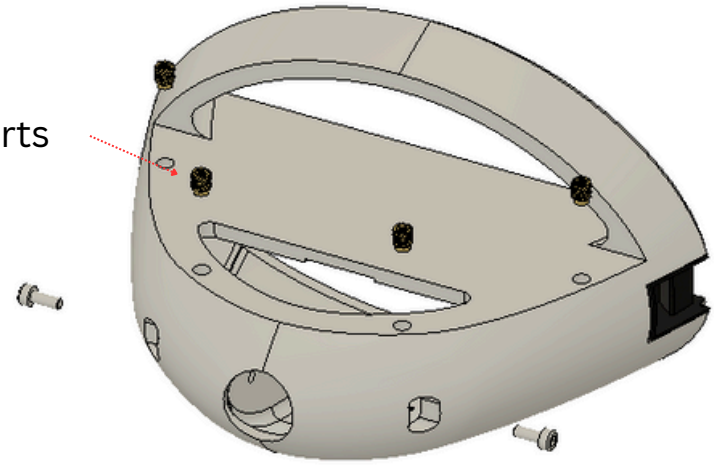
FUS1 Standard Version

There is a standard version of the FUS1 module for different FPV Systems. In the folders you will find ready to use parts for the WALKSNAIL MOONLIGHT and the AVATAR V2/HD MINI systems.

Anyway we will provide the STEP files for custom designs.

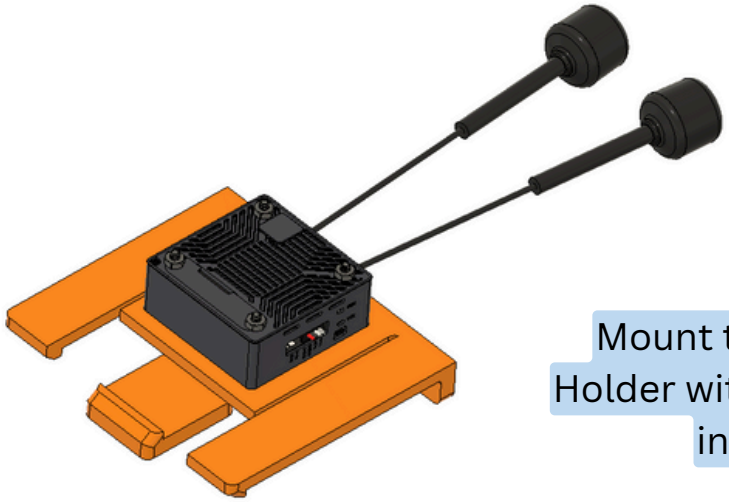


M3x6mm scews

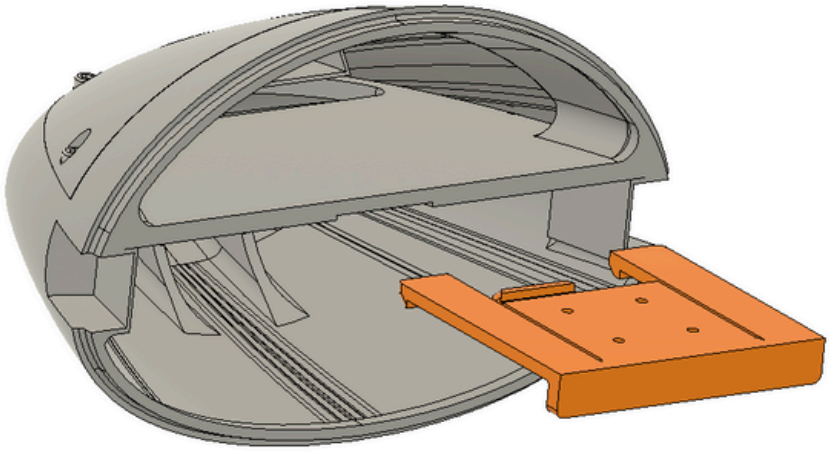


M3 Inserts

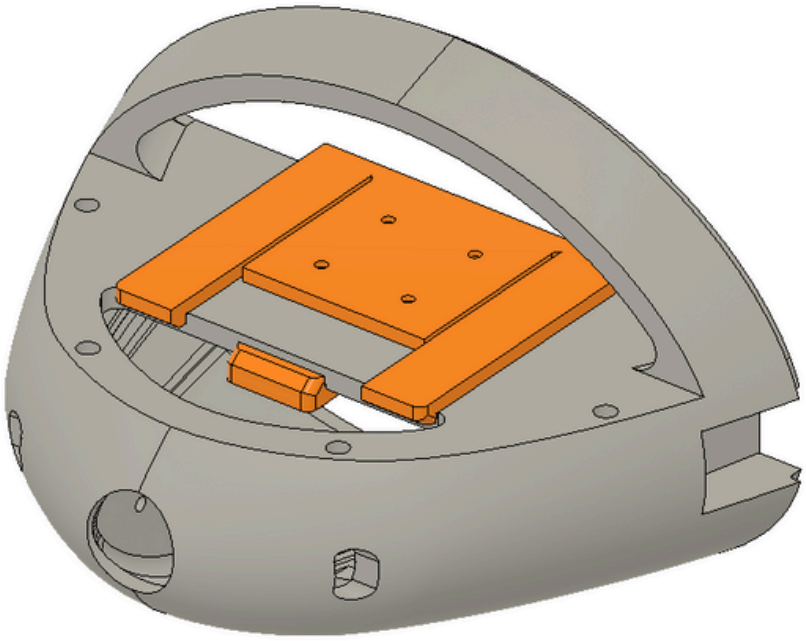
Use M3 threded inserts to assemble the CAP on FUS1.
Fitting scews are M3x6mm.



Mount the VTX on the VTX Holder with the original screws in the package.



Slide the VTX Holder on FUS1. Pay attention to the slot guide on the underside.



Check if the VTX holder sits tightly on FUS1.

There are a 1 antenna version and a 2 antenna version of the CAP. Choose one of the two.

Part List

	Part	Quantity	Print Profile	Support
Fuselage	FUS1 Standard	1	A	-
	FUS2	1	A	yes
	FUS3	1	A	yes
	FUS4-1	1	A	-
	FUS4-2	1	A	-
	FUS5	1	A	yes
	FUS Connector Pin	6	B	-
	FUS2 CAP Inlet	1	B	yes
	FUS4 Outlet	1	B	-
	FUS1 Standard VTX Holder	1	C	-
	FUS1 Standard 1 / 2 Antenna CAP	1	A	yes

	Part	Quantity	Print Profile	Support
Wings	L-W1-1	1	A	yes
	L-W1-2	1	A	yes
	L-W2-1	1	A	-
	L-W2-2	1	A	-
	L-W3	1	A	-
	R-W1-1	1	A	yes
	R-W1-2	1	A	yes
	R-W2-1	1	A	-
	R-W2-2	1	A	-
	R-W3	1	A	-
	L-Aileron	1	A	-
	R-Aileron	1	A	-
	W3 Connector Pin	2	C	-
	L-Aileron Servo CAP	1	C	-
	R-Aileron Servo CAP	1	C	-

	Part	Quantity	Print Profile	Support
V Tail	L-VTail1	1	A	-
	L-VTail2	1	A	-
	R-VTail1	1	A	-
	R-VTail2	1	A	-
	L-Ruddervator	1	A	-
	R-Ruddervator	1	A	-

	Part	Quantity	Print Profile	Support
VTOL Booms	L-Boom1	1	A/B	yes
	L-Boom2	1	A/B	-
	L-Boom3	1	A/B	-
	L-Boom4	1	A/B	yes
	L-Cowling1	1	A/B	yes
	L-Cowling2	1	A/B	yes
	R-Boom1	1	A/B	yes
	R-Boom2	1	A/B	-
	R-Boom3	1	A/B	-
	R-Boom4	1	A/B	yes
	R-Cowling1	1	A/B	yes
	R-Cowling2	1	A/B	yes
	L-Motor Holder	1	C	-
	R-Motor Holder	1	C	-

	Part	Quantity	Print Profile	Support
Accessories	Battery Plate	1	B	-
	Avionics Plate	1	B	-
	ESC and FC Holder	1	B	-
	GPS Holder	1	B	-
	VTX HOLDER_xx	1	B	-

	Part	Quantity	Print Profile	Support
LG-A	L-LG-A	1	A	-
	R-LG-A	1	A	-
	LG-A Reinforcement	1	B	-
LG-B	L-LG-B Front	1	B	-
	R-LG-B Front	1	B	-
	LG-B Rear	1	B	-
	LG Washer	1	C	-

	Part	Quantity	Print Profile	Support
Latches	L-L1	1	C	yes
	L-LH1-L	1	C	-
	L-LH1-S	1	C	-
	L-L2	1	C	yes
	L-LH2-L	1	C	-
	L-LH2-S	1	C	-
	L-L3	1	C	yes
	L-LH3-L	1	C	-
	L-LH3-S	1	C	-
	L-L4	1	C	yes
	L-LH4-L	1	C	-
	L-LH4-S	1	C	-
	R-L1	1	C	yes
	R-LH1-L	1	C	-
	R-LH1-S	1	C	-
	R-L2	1	C	yes
	R-LH2-L	1	C	-
	R-LH2-S	1	C	-
	R-L3	1	C	yes
	R-LH3-L	1	C	-
	R-LH3-S	1	C	-
	R-L4	1	C	yes
	R-LH4-L	1	C	-
	R-LH4-S	1	C	-
	Latch Connector	8	C	-

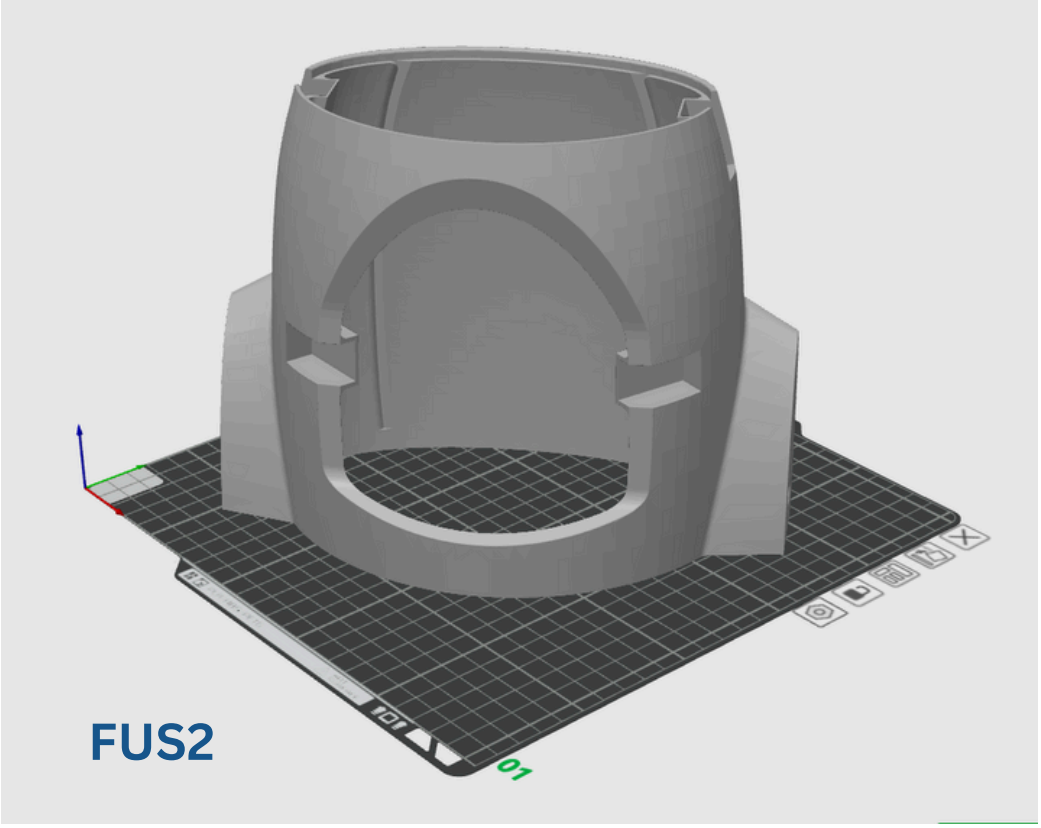
	Part	Quantity	Print Profile	Support
Fasteners	L-F1	1	C	yes
	L-FH1-L	1	C	-
	L-FH1-S	1	C	-
	L-F2	1	C	yes
	L-FH2-L	1	C	-
	L-FH2-S	1	C	-
	R-F1	1	C	yes
	R-FH1-L	1	C	-
	R-FH1-S	1	C	-
	R-F2	1	C	yes
	R-FH2-L	1	C	-
	R-FH2-S	1	C	-

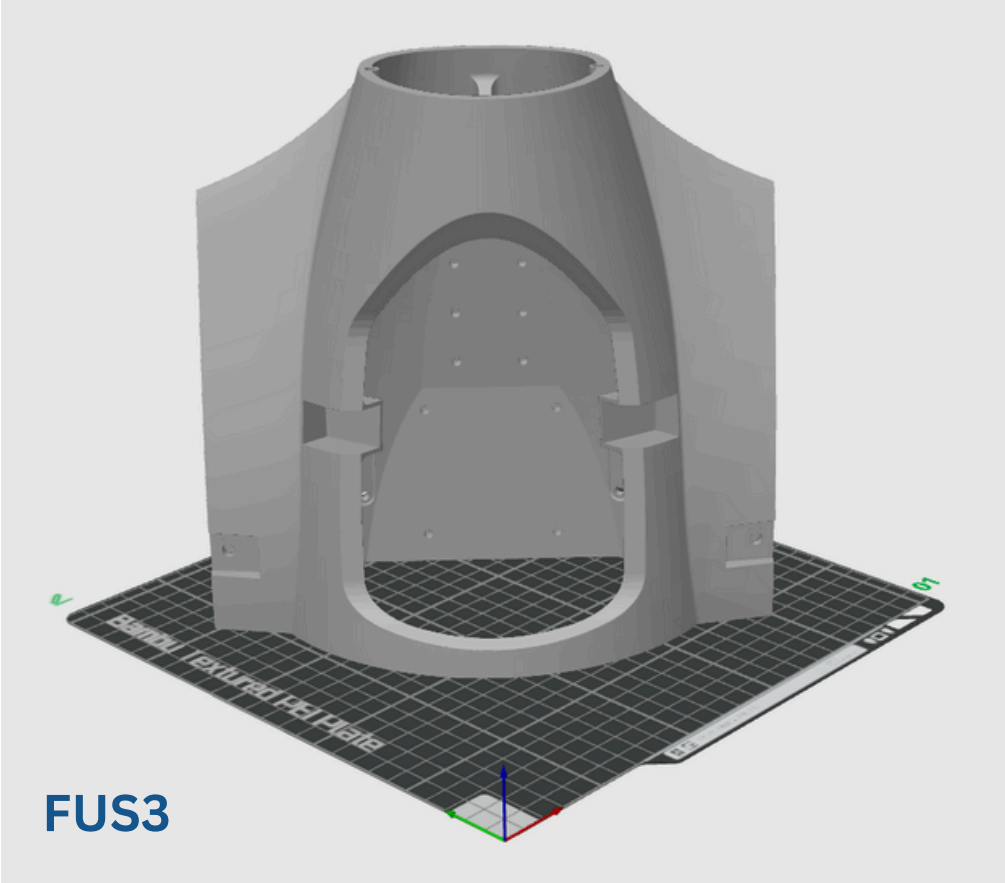
Print Settings

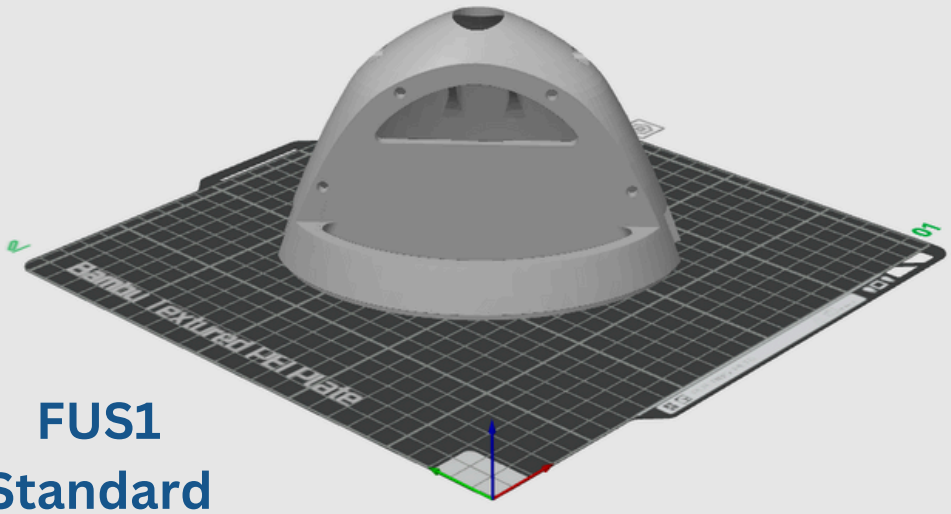
Part	A	B	C
Filament Type	LW-PLA	PLA	PLA (or other strong material)
Wall Loops	LW-PLA	1	2
Layer Height	0.2	0.2	0.2 or finer
Top Layers	2	2	5
Bottom Layers	2	2	3
Infill Type	Gyroid	Cubic	Rectilinear
Infill %	4	6	20
Intial Speed	default	default	30mm/s
Speed	default	default	30mm/s
Support only on build plate	yes	default	default
Support Top Z Distance	0.5mm	default	default
Support/Object xy Distance	0.6mm	default	default
Avoid Crossing Wall	yes	default	default
Filament Flow Ratio	0.6	default	default
Nozzle Temp	235 degC	default	default
Retraction Length	2mm	default	default
Z Hopp When Retract	0mm	default	default
Re-/Detractiton Speed	35mm/s	default	default
Rectraiton When Change Layer	yes	default	default

These settings are only recommendations. Filaments and 3D printers are very different. Moisture, hardness and other material characteristics can influence the results. You may therefore need to adjust the settings to your specific conditions.

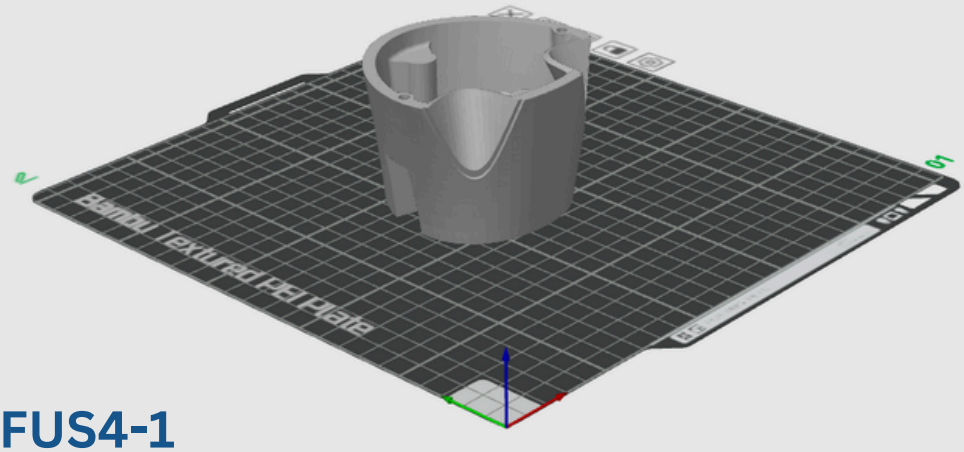
We used printers from Bambu Lab and filaments from colorFabb.


FUS2

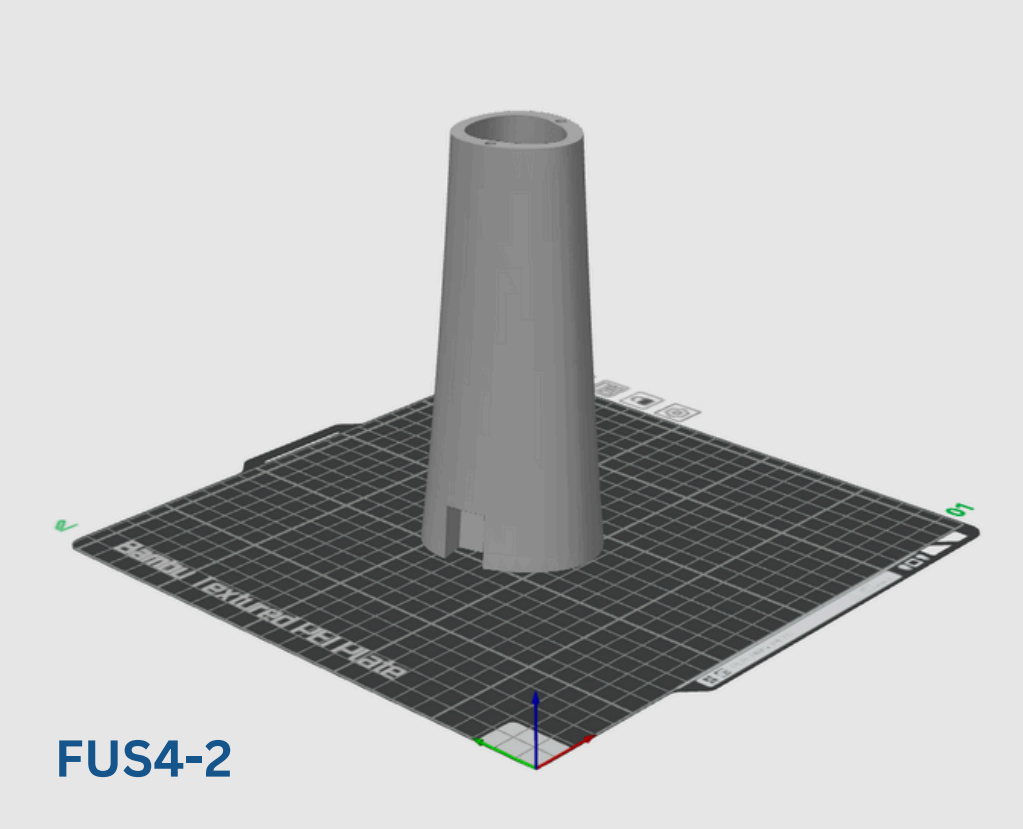

FUS3



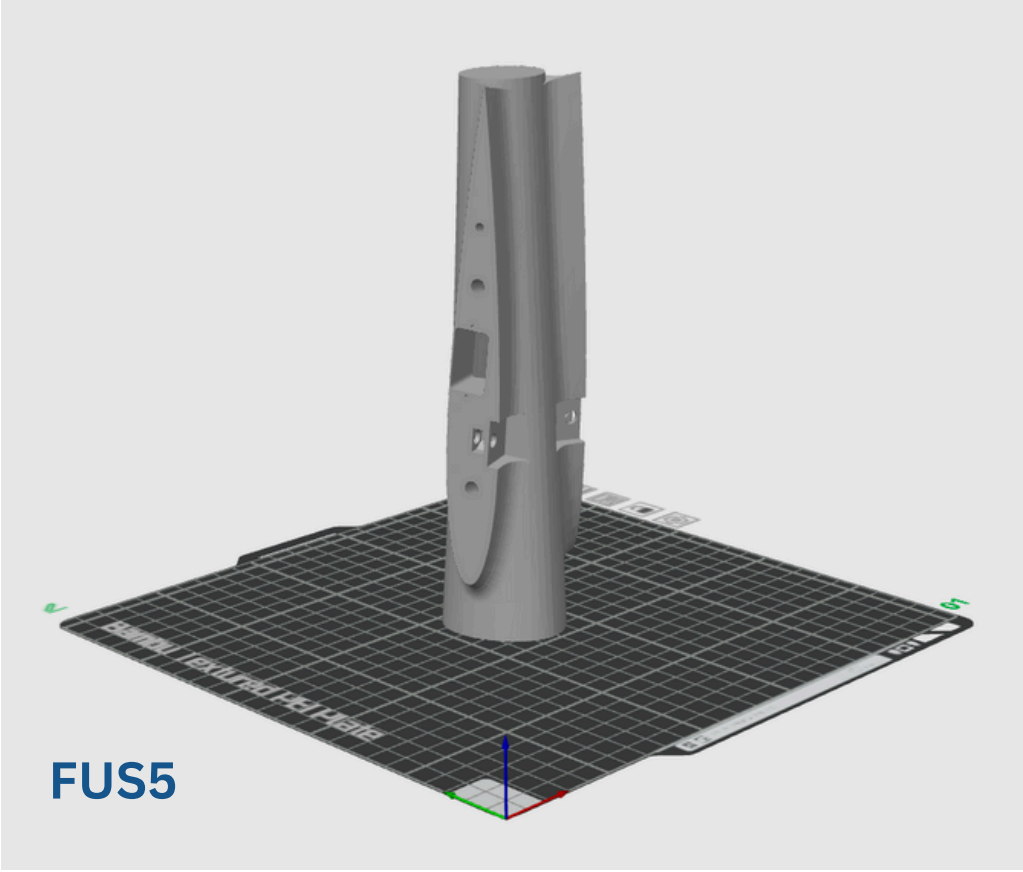
FUS1
Standard



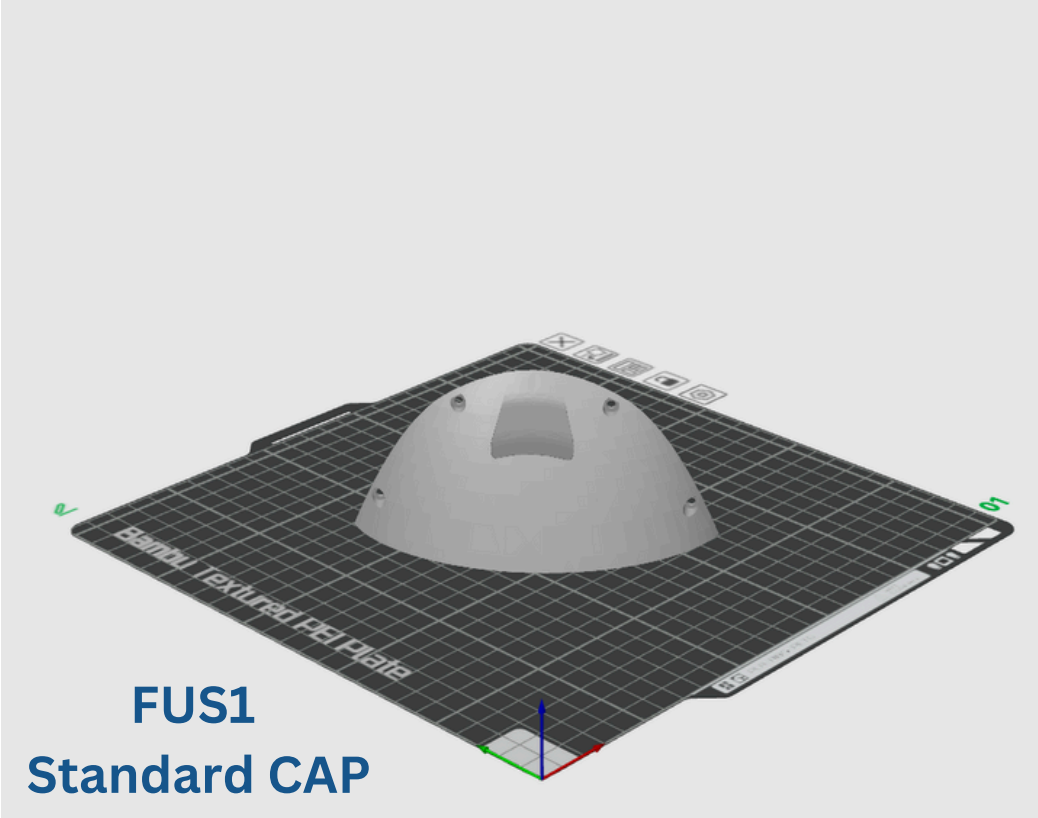
FUS4-1



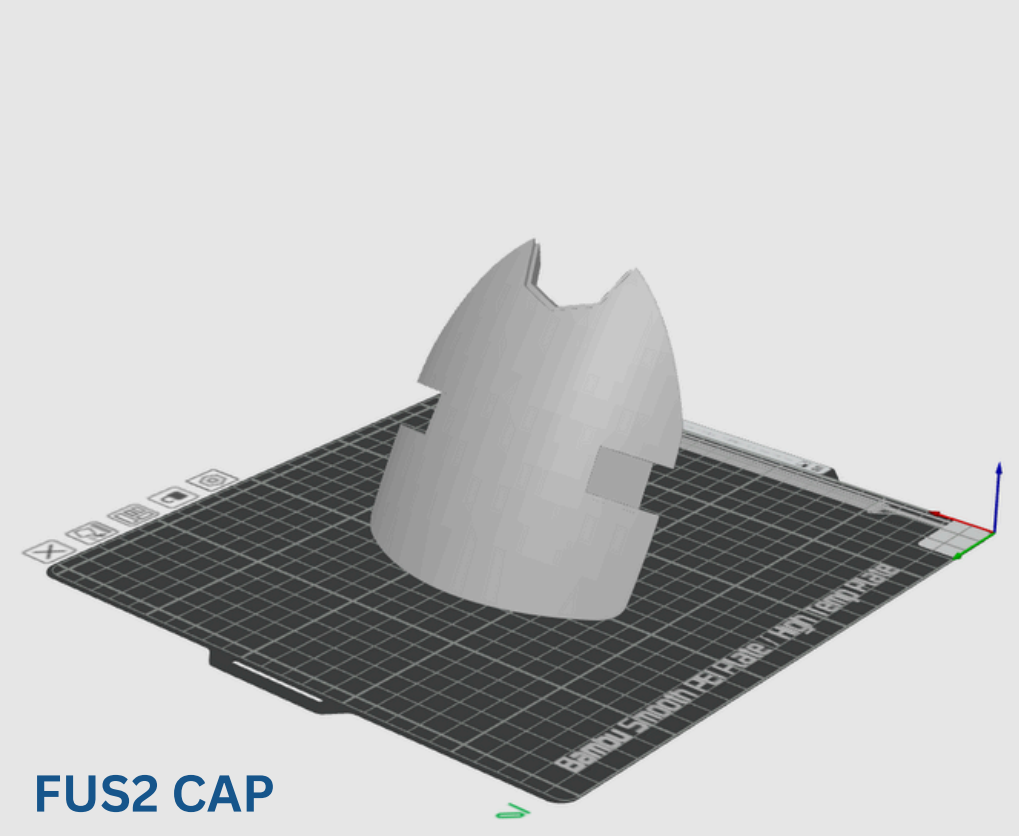
FUS4-2



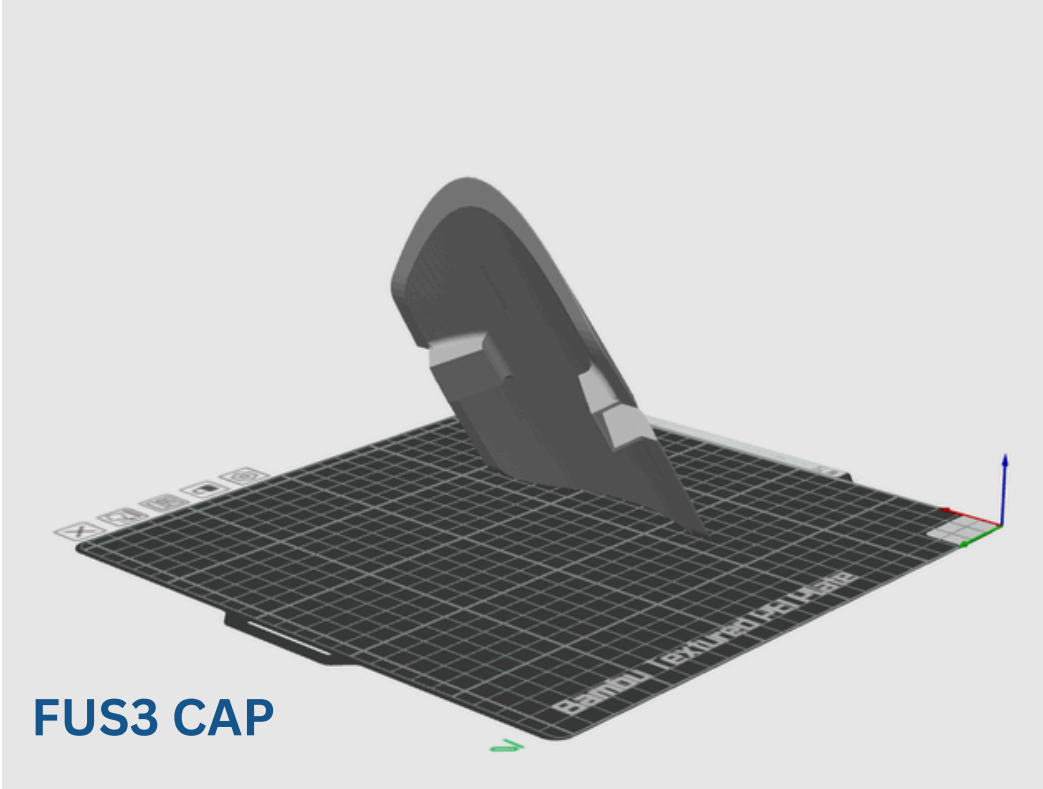
FUS5

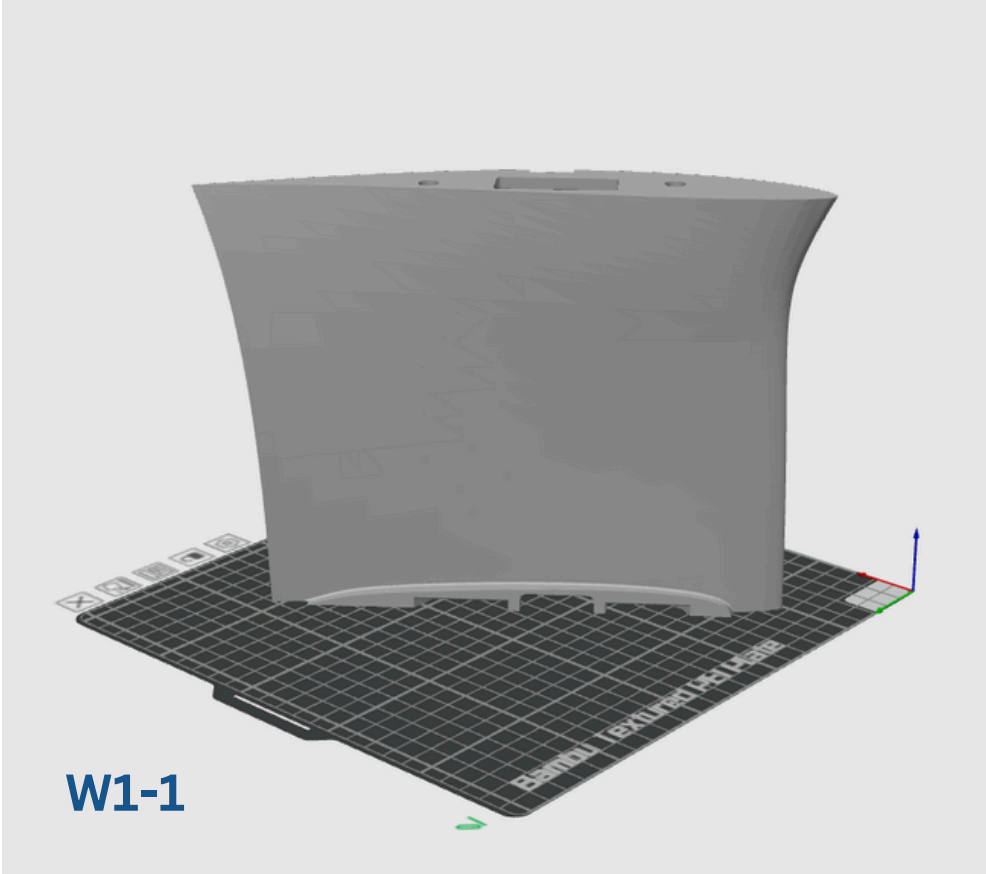


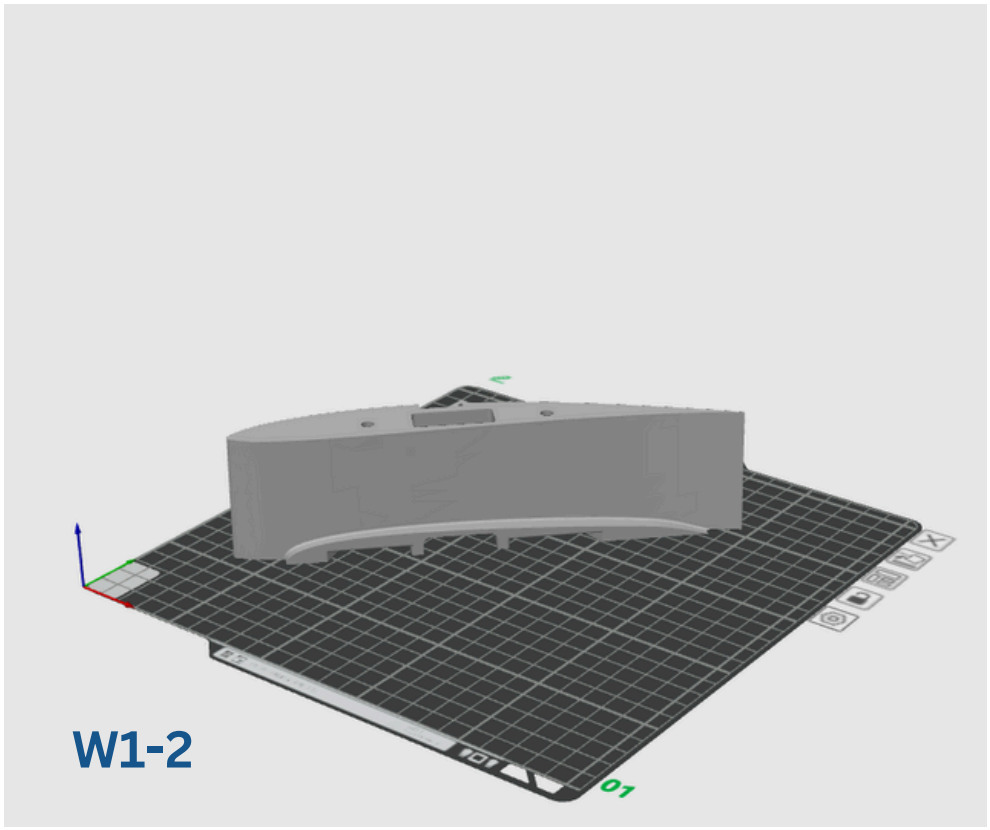
FUS1
Standard CAP

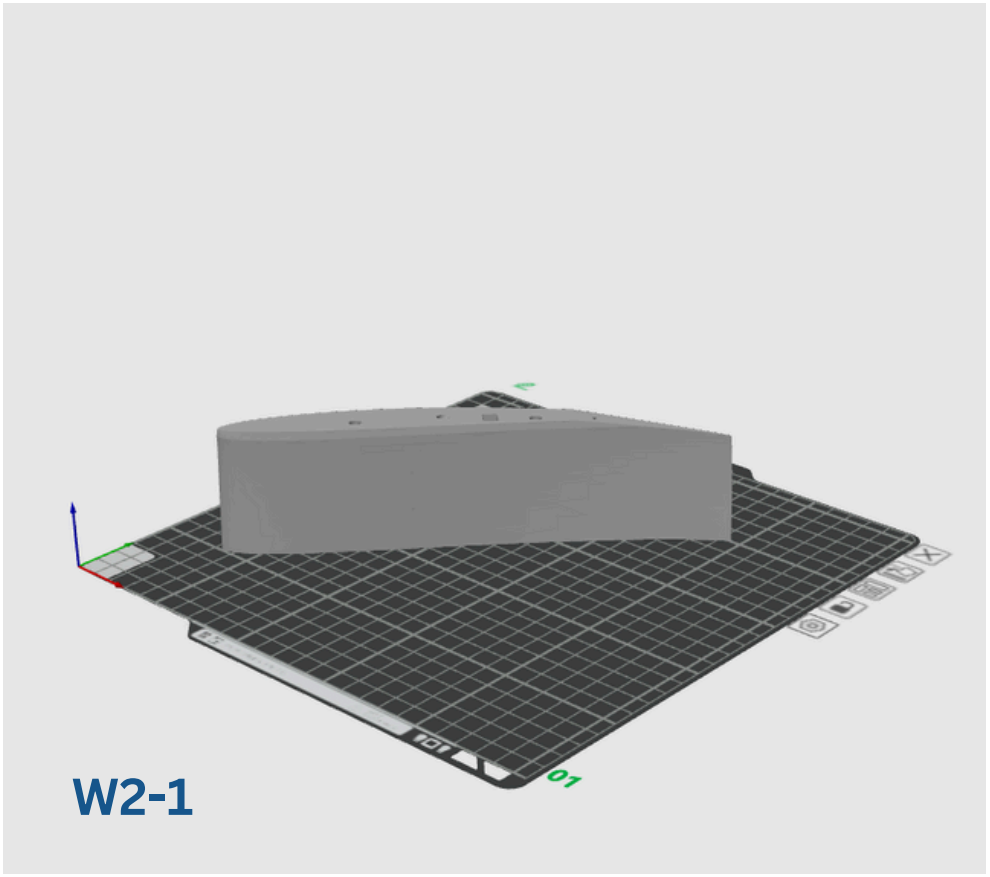


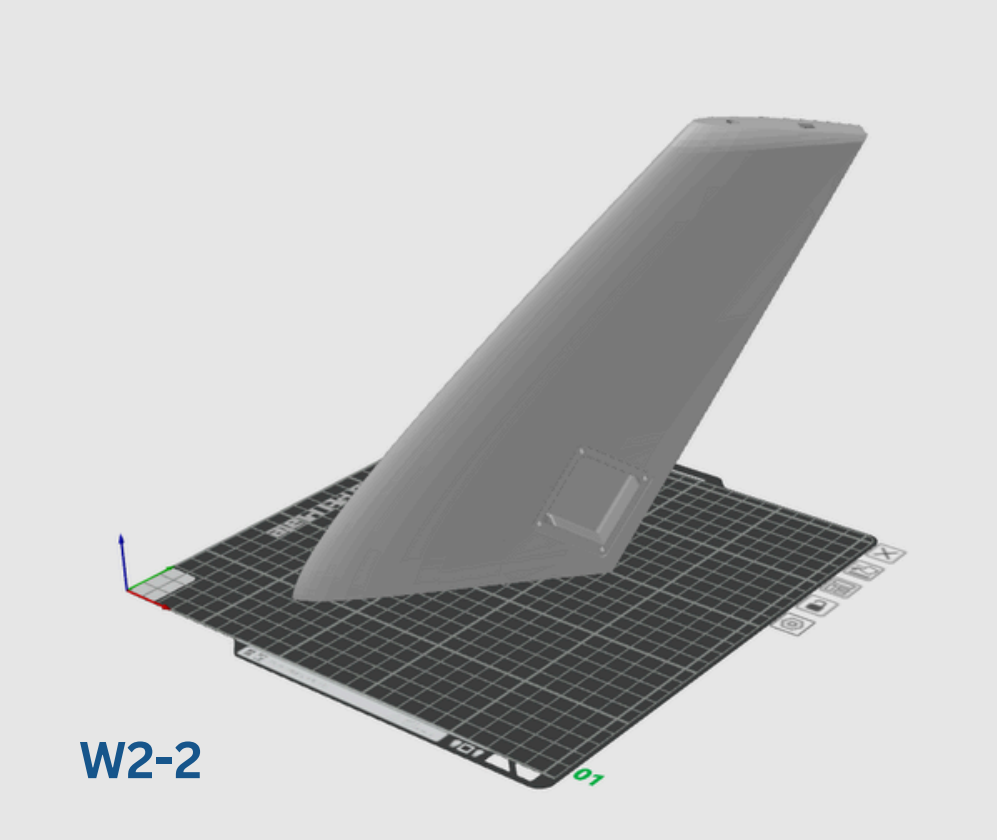
FUS2 CAP

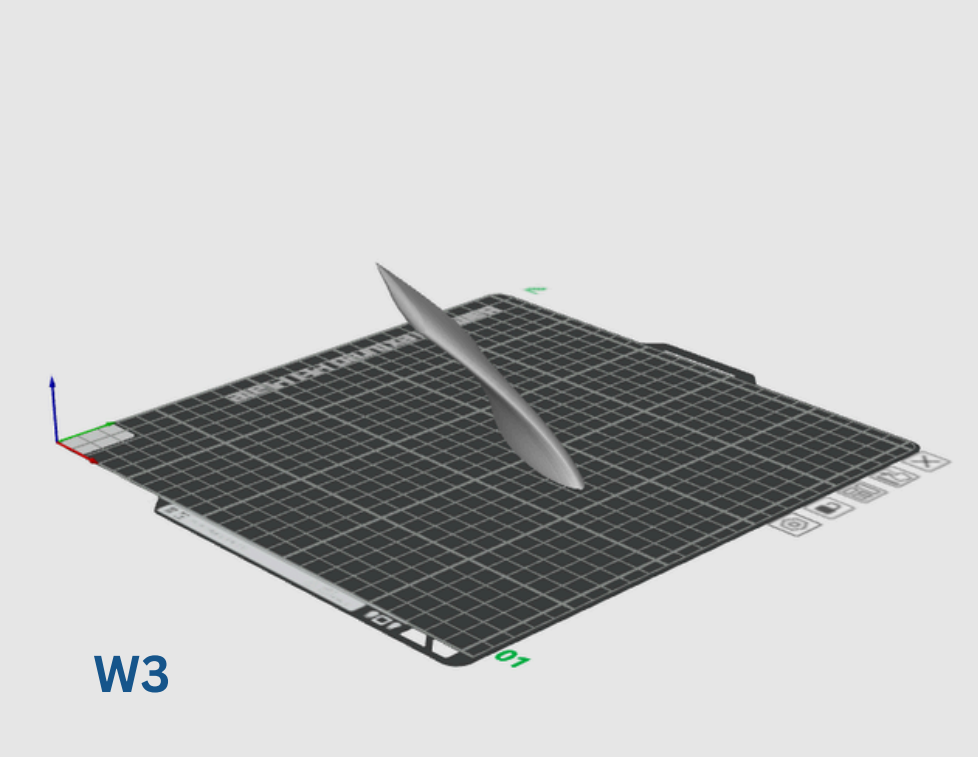

FUS3 CAP

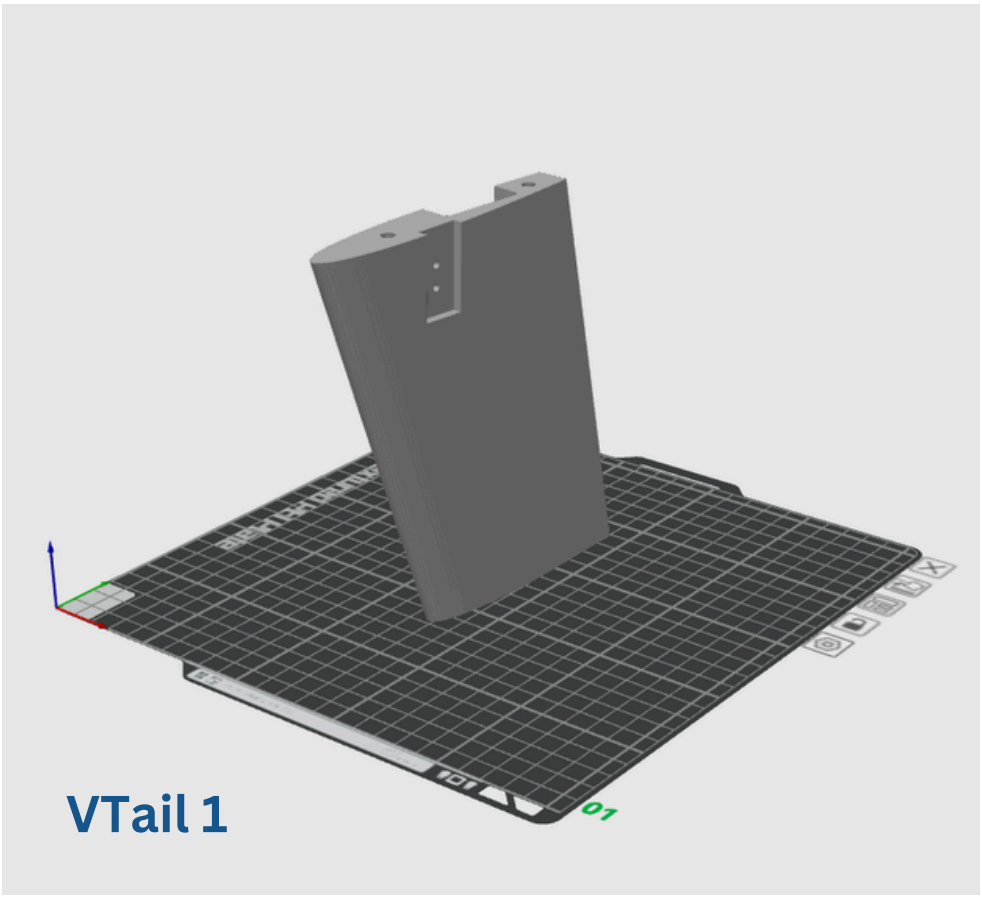

W1-1

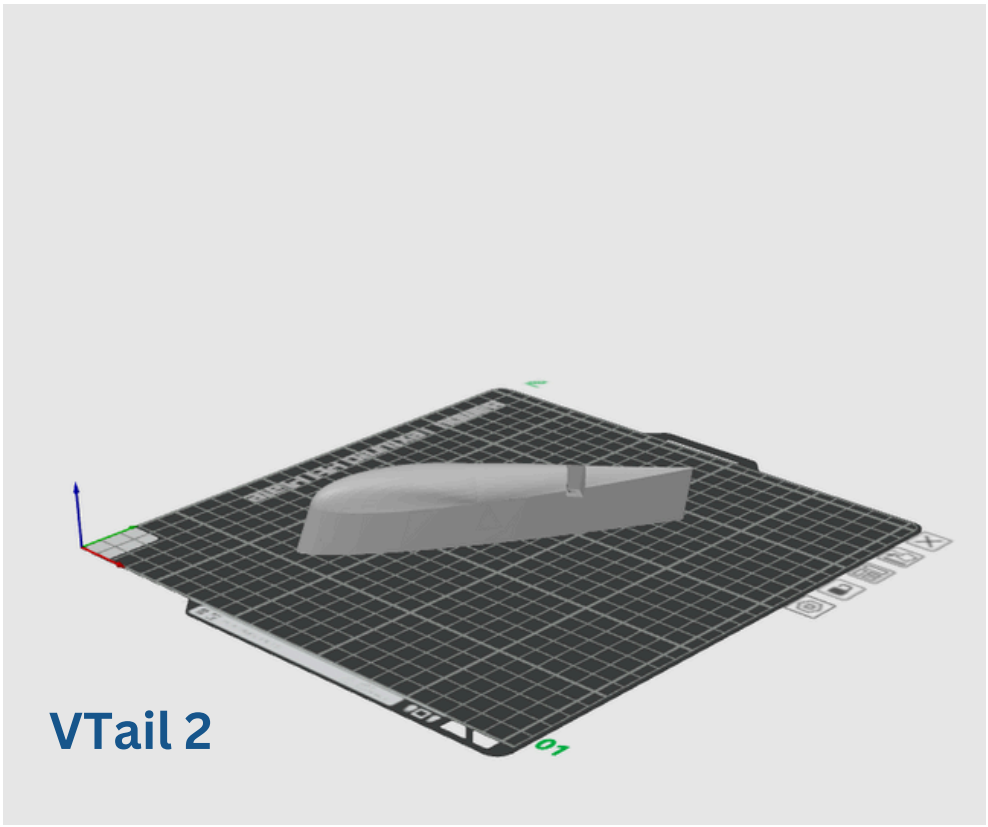

W1-2

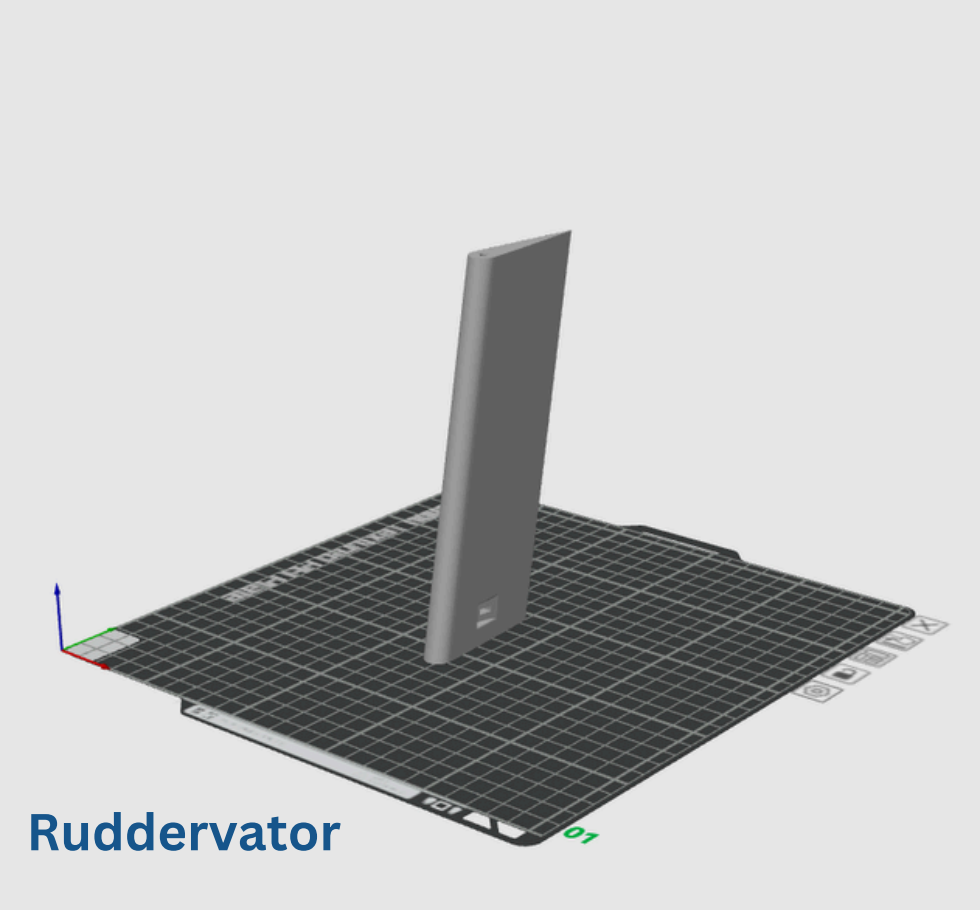

W2-1

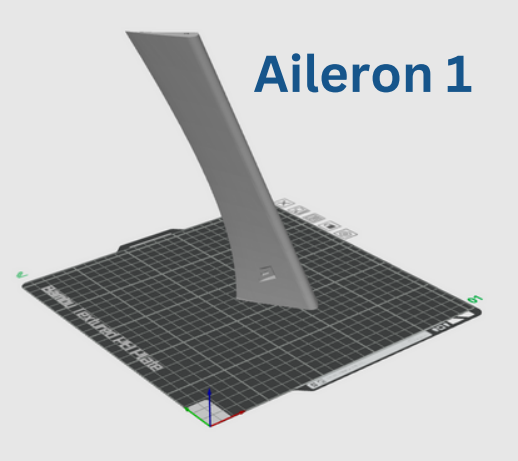

W2-2

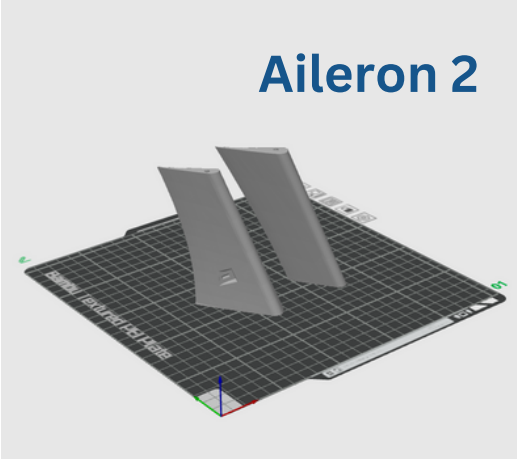

W3


VTail 1

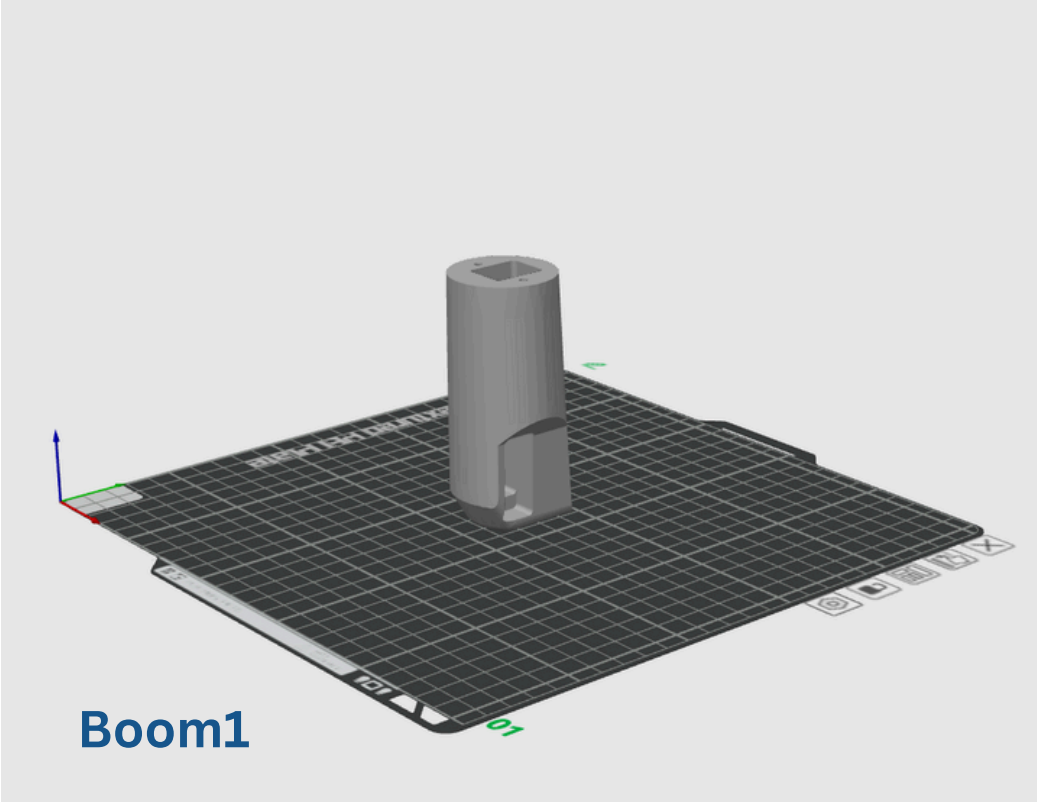

VTail 2

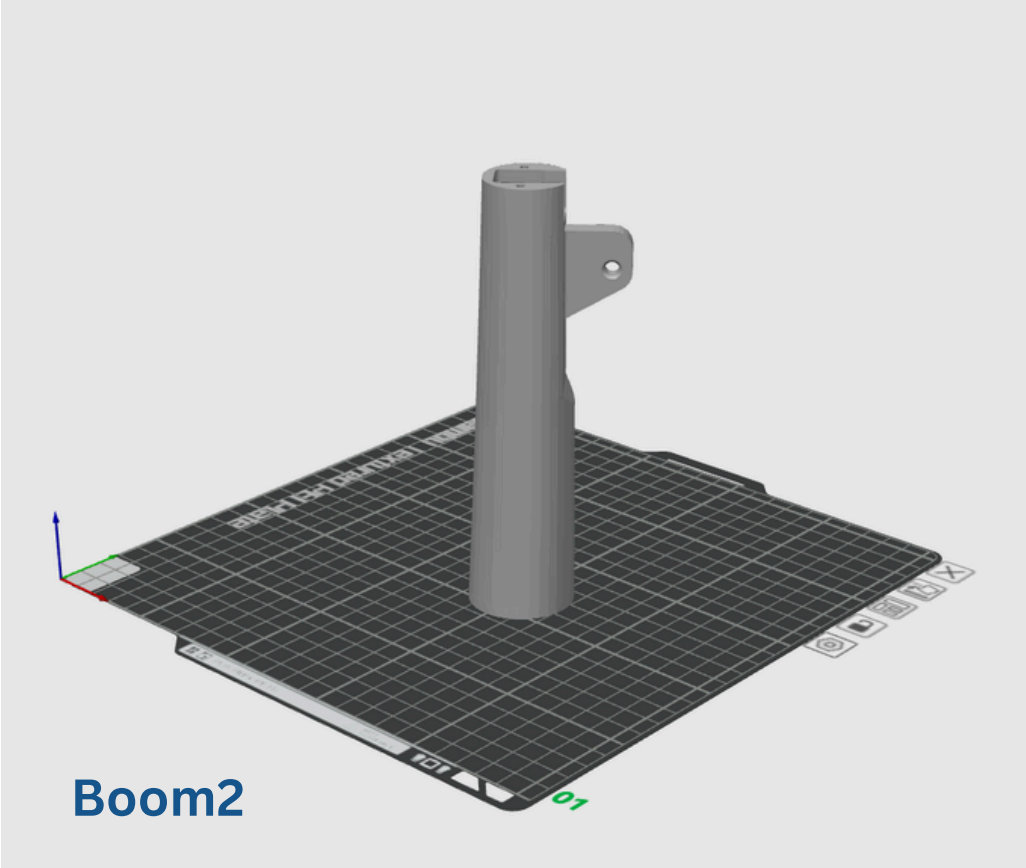




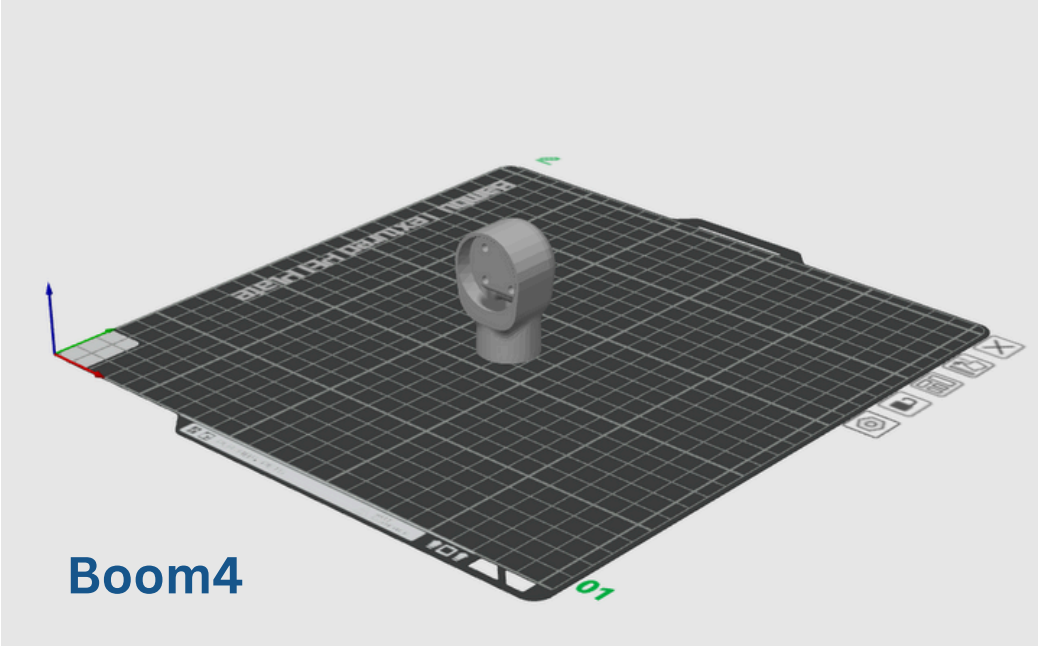


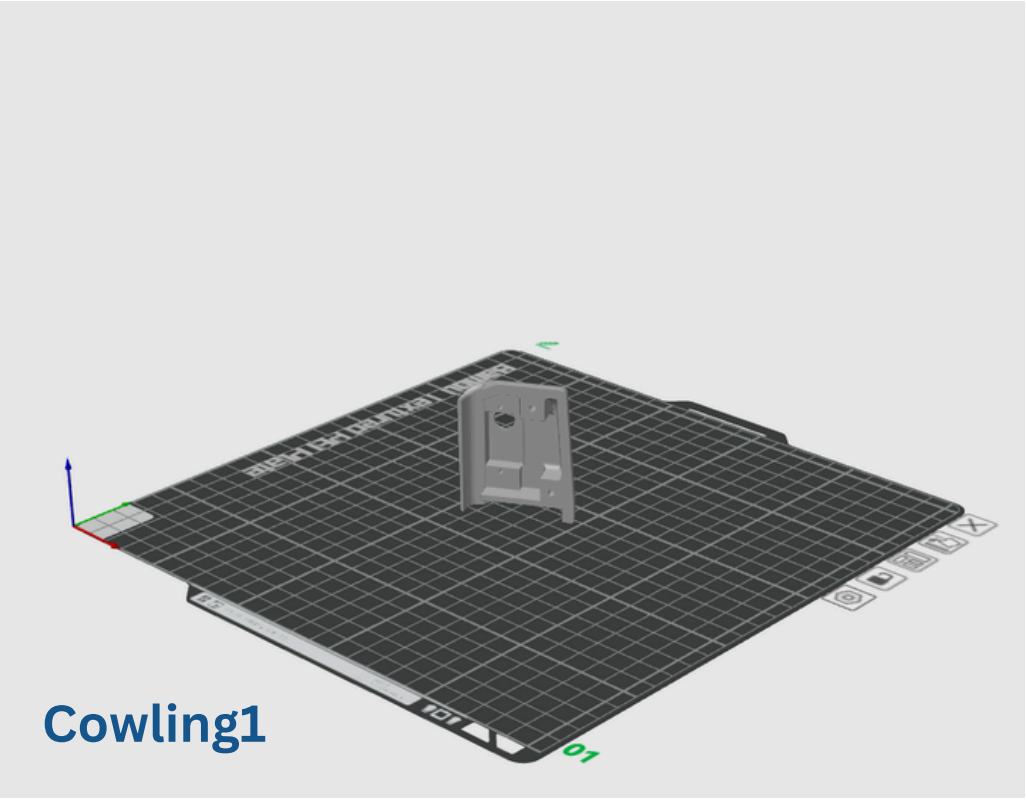
If you don’t succes to print the ailerons in one piece, so you can split them in two pieces with your slicer software. Anyway you can find the STEP files in the folders.


Boom1

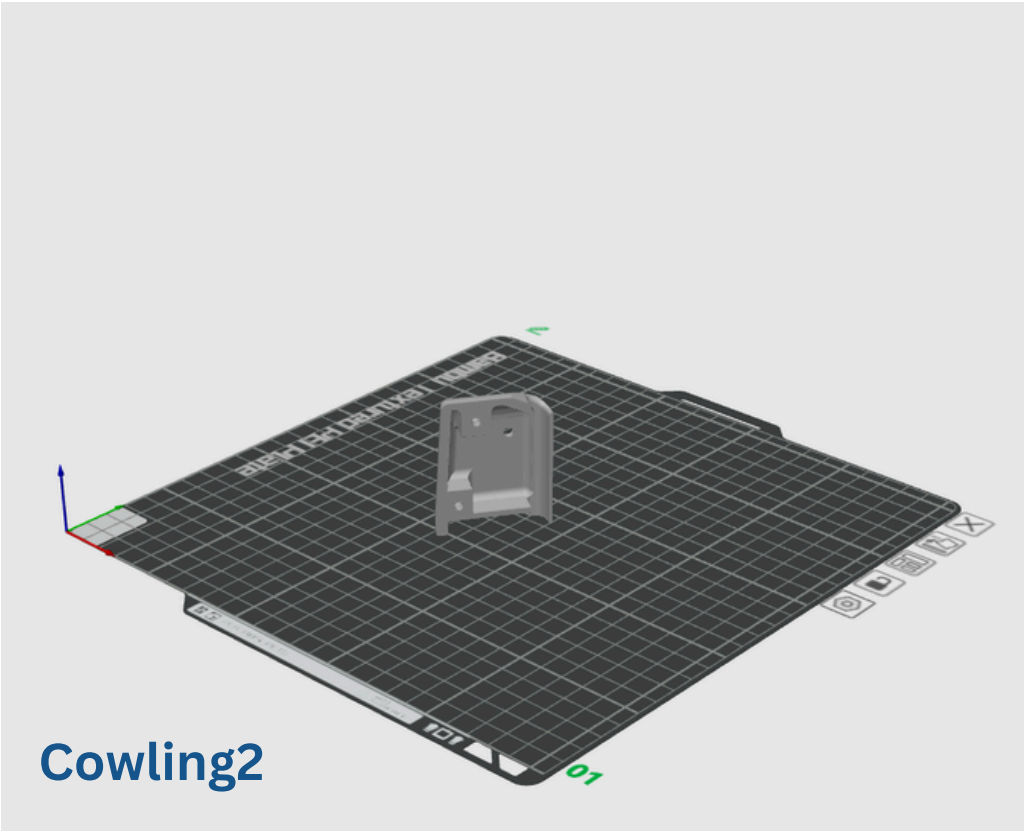

Boom2


Boom3


Boom4

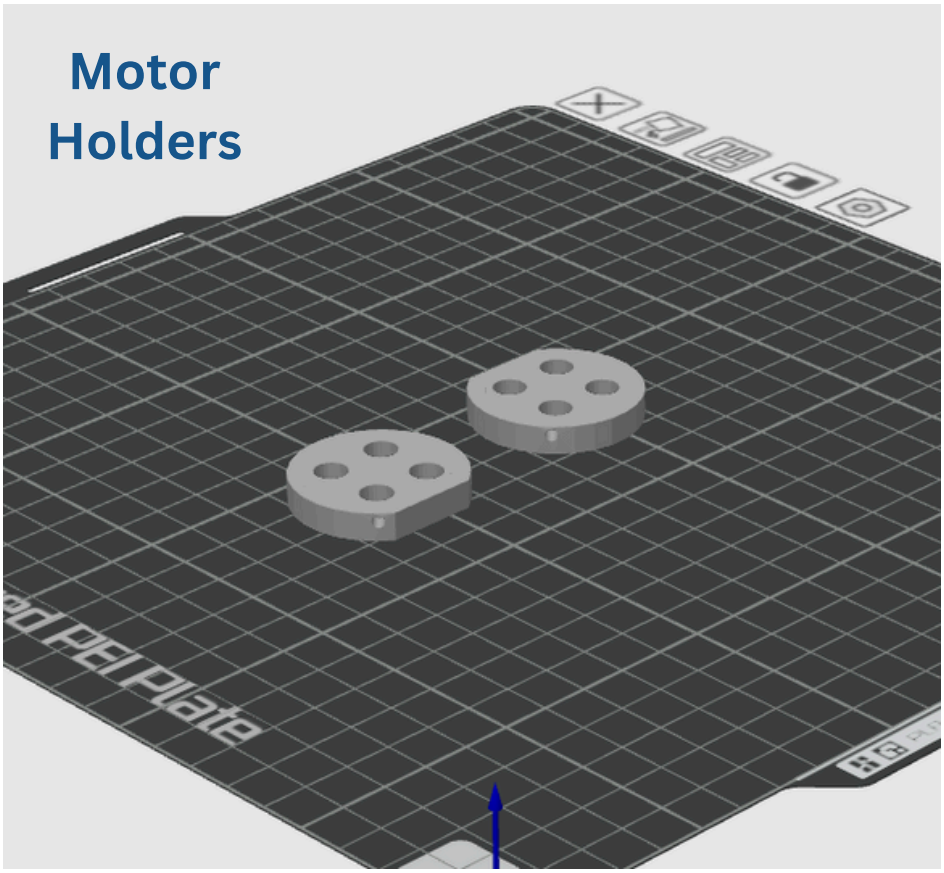


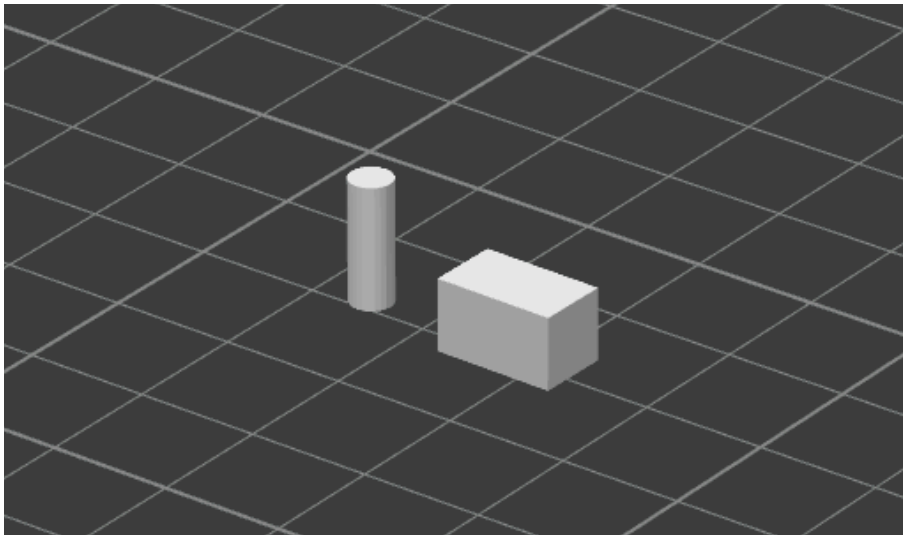
Cowling1



Cowling2

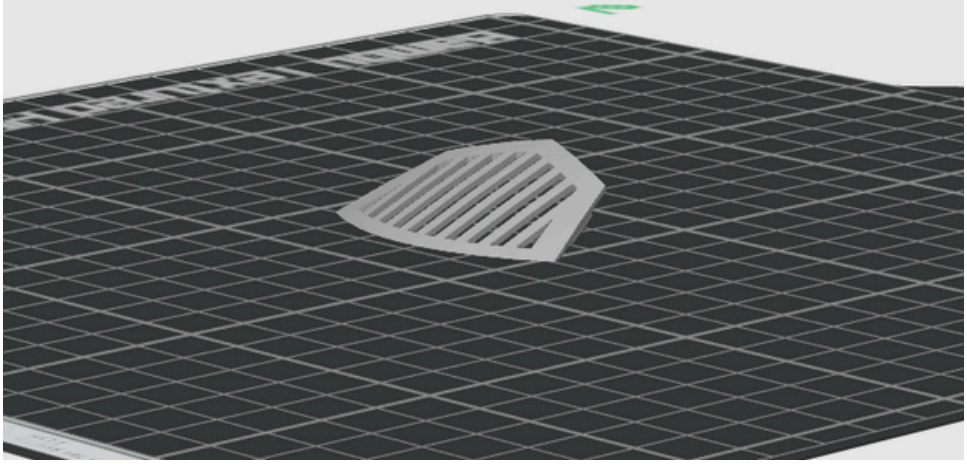
Motor Holders



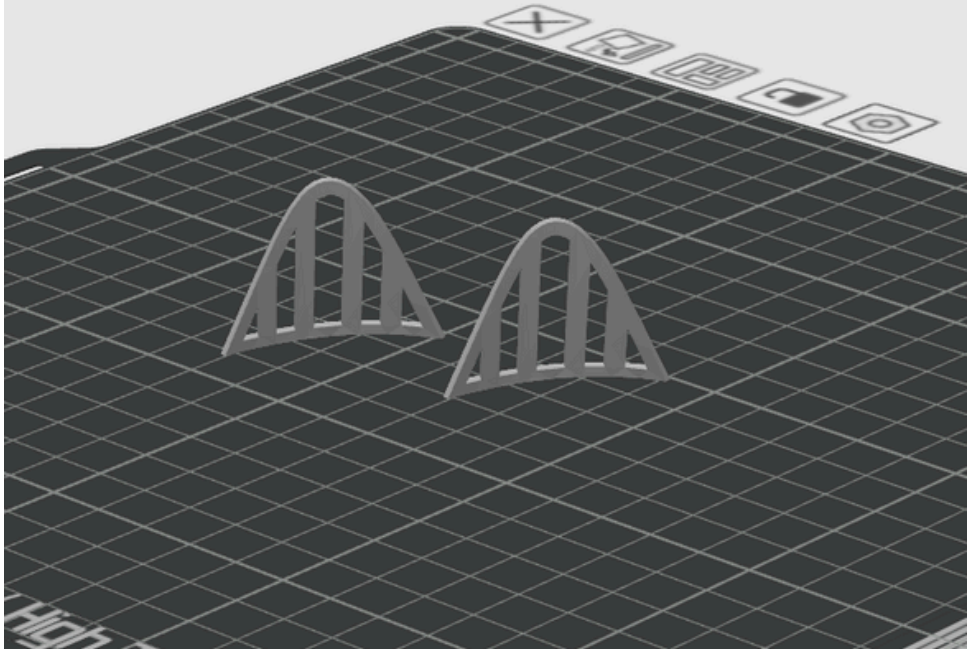


FUS and W3 Connector Pins

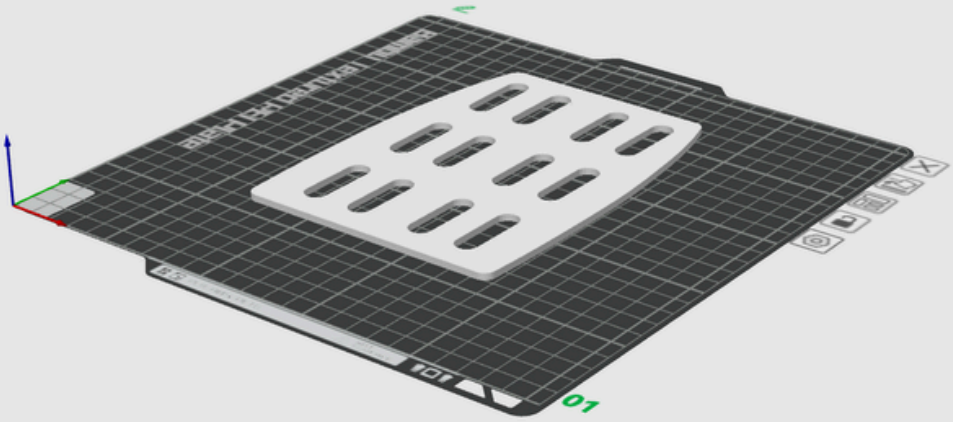
FUS2 CAP Inlet



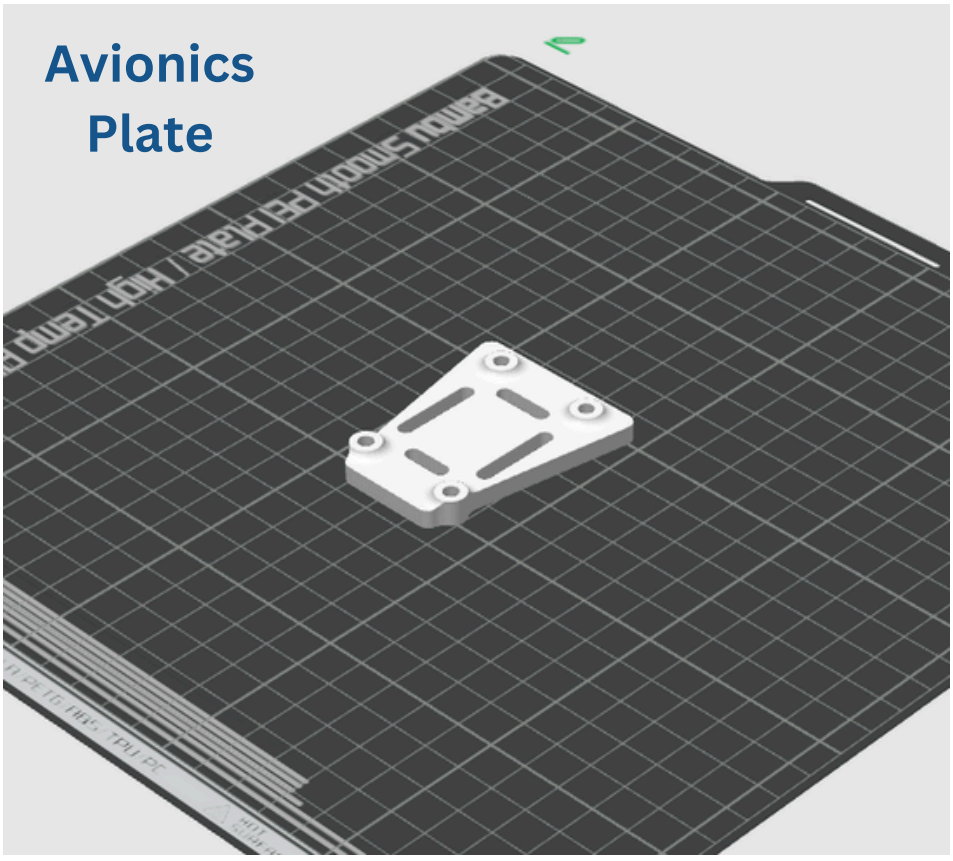
FUS4 Outlet



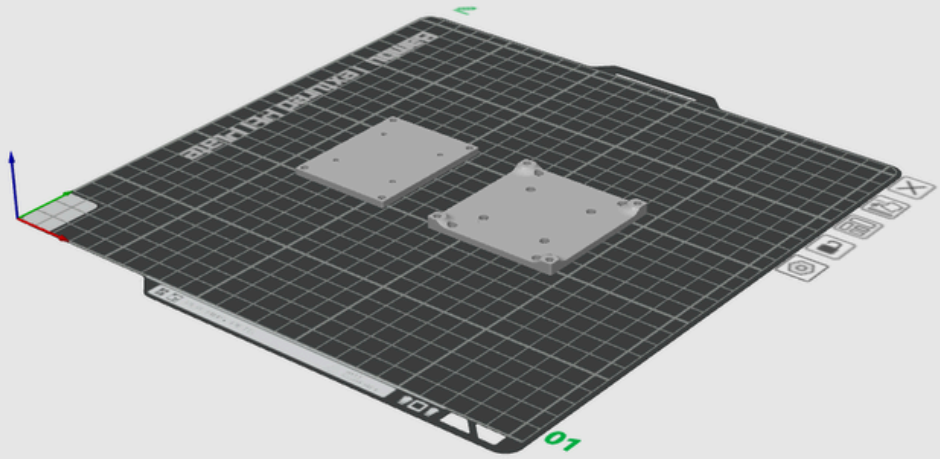
Battery Plate

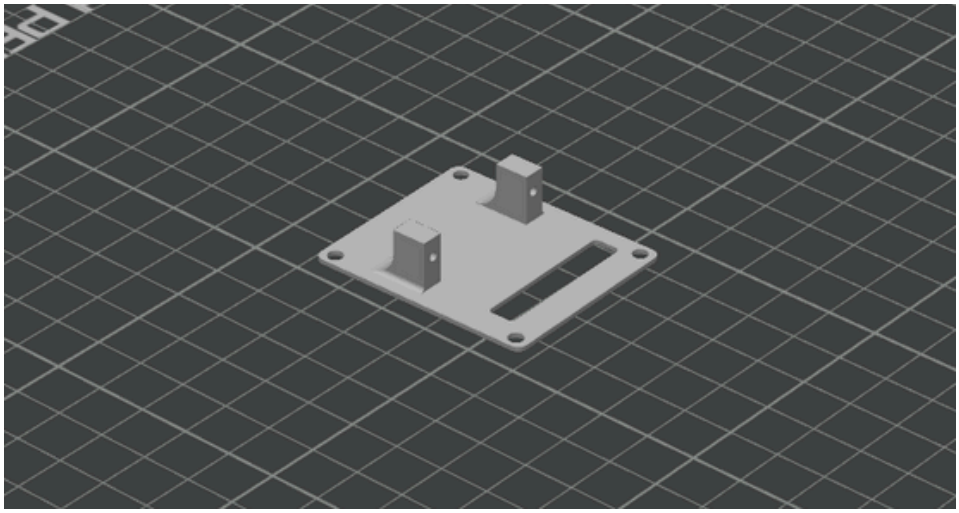


Avionics Plate

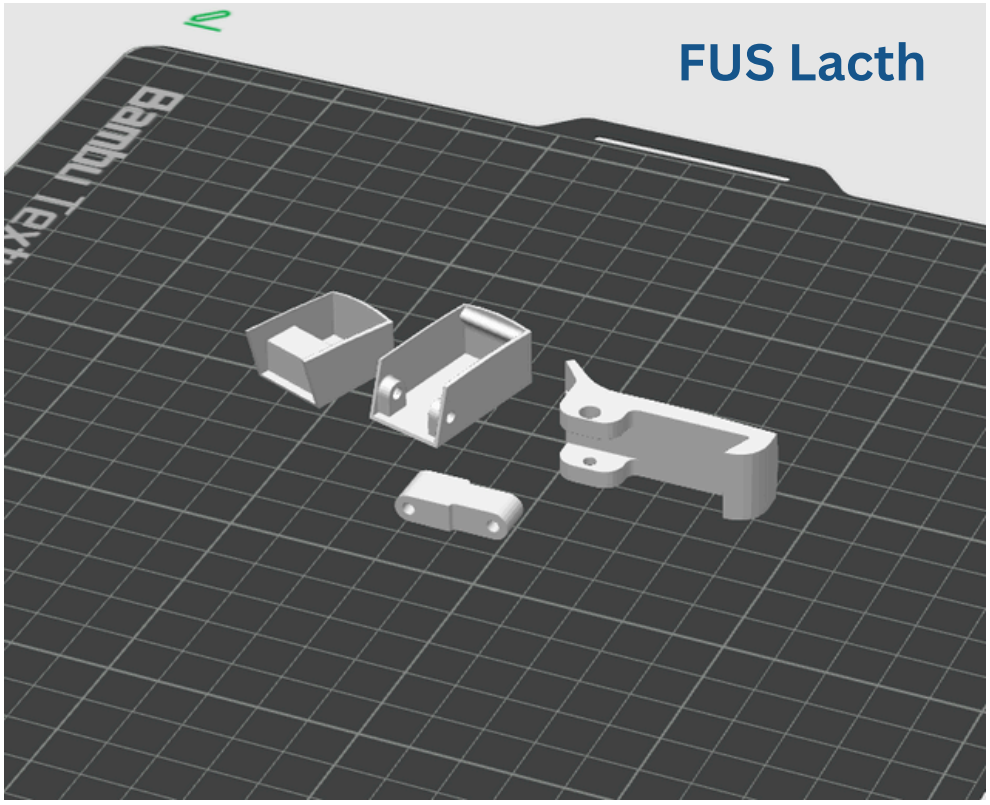


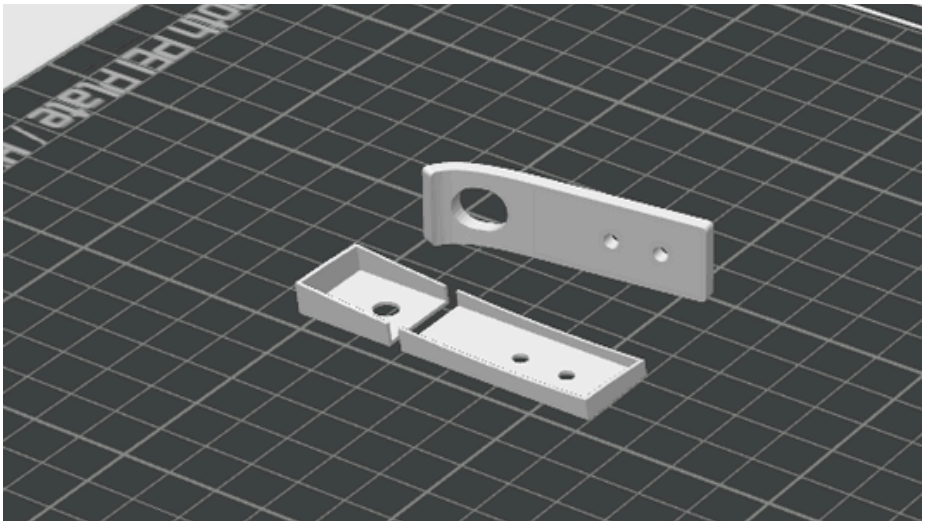
ESC and FC Holder



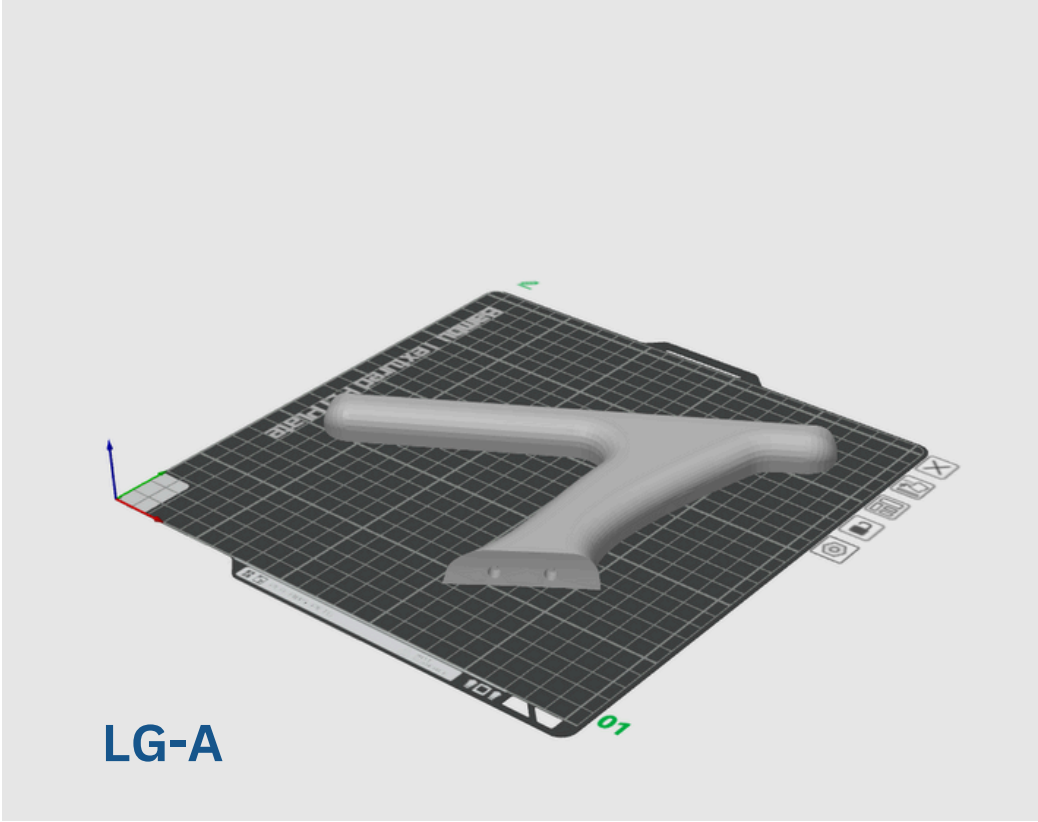


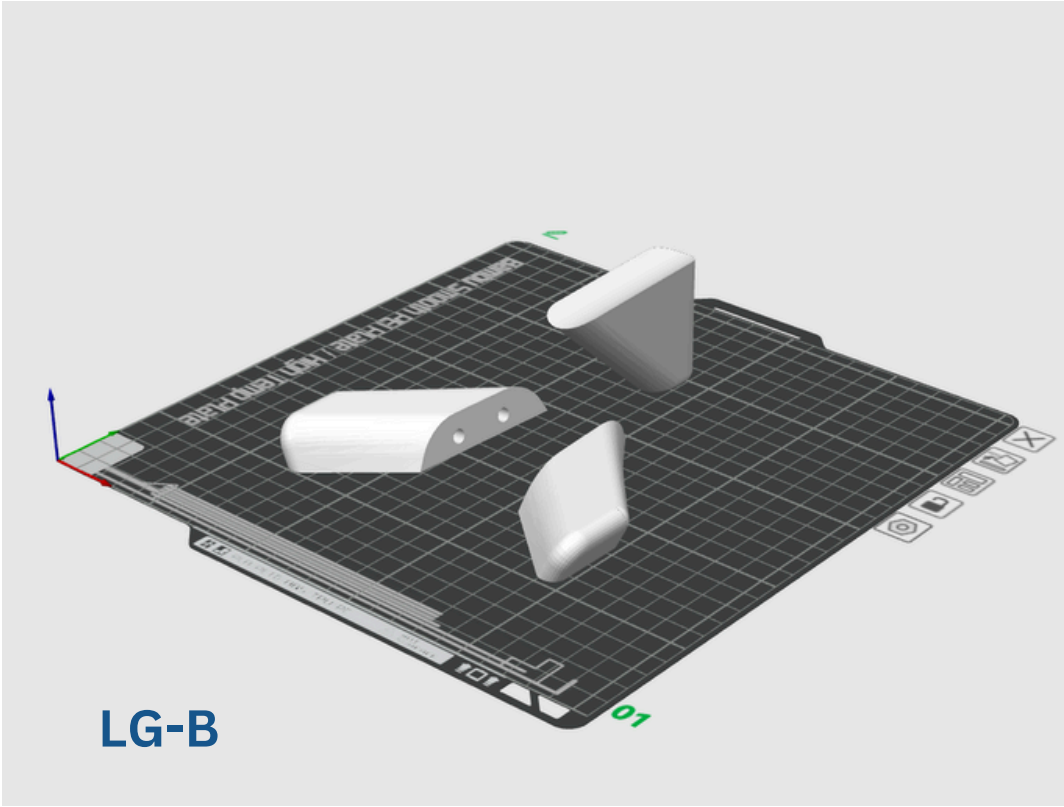
Aileron Servo CAP

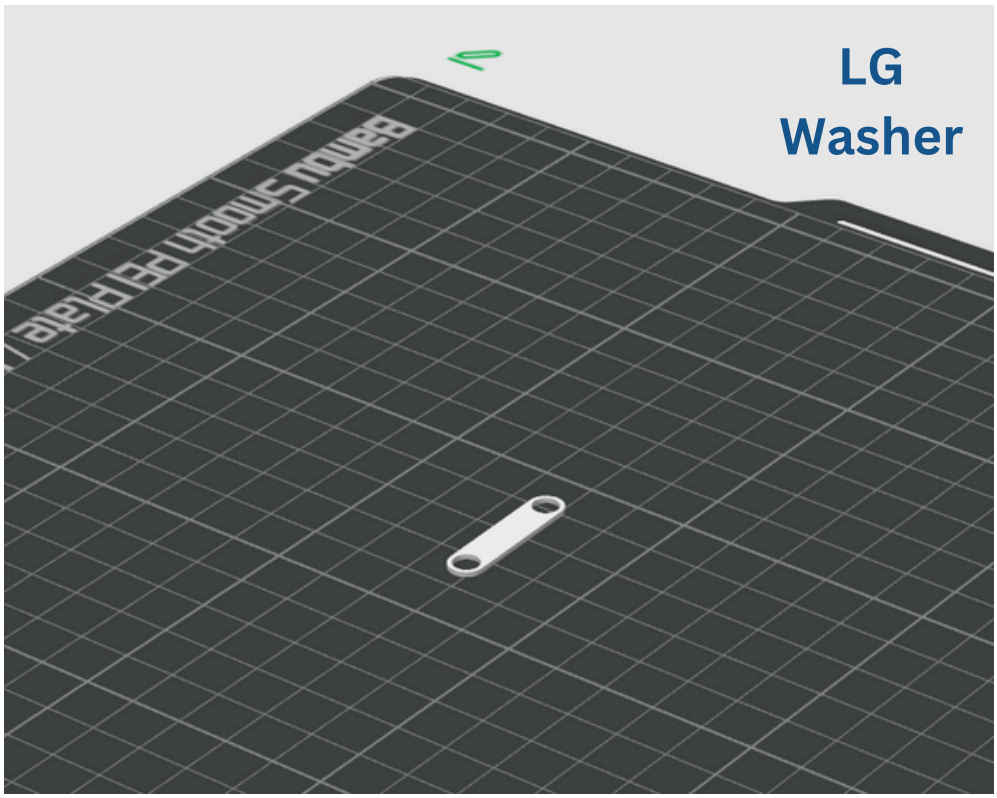


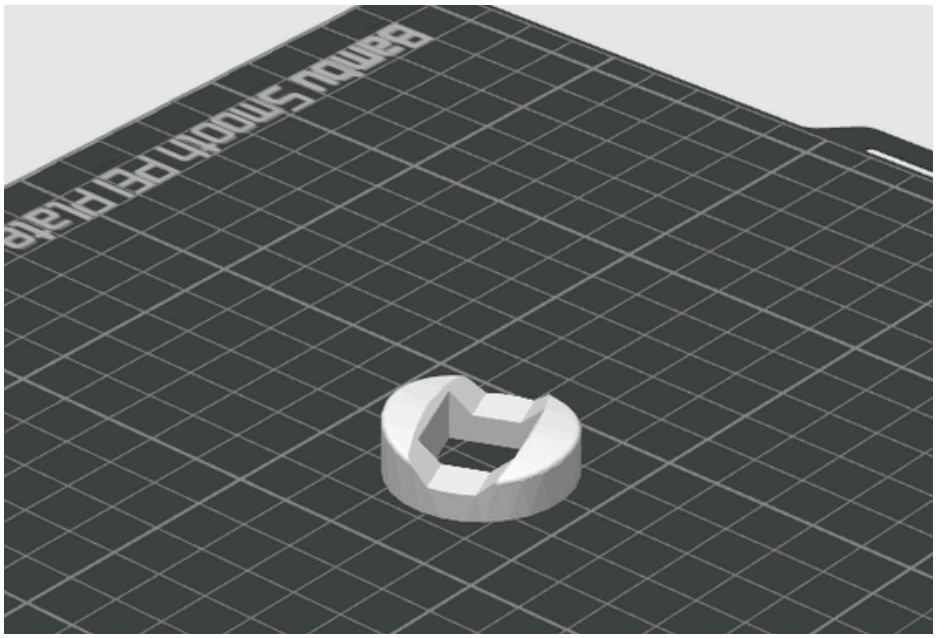


Wing Snapfit

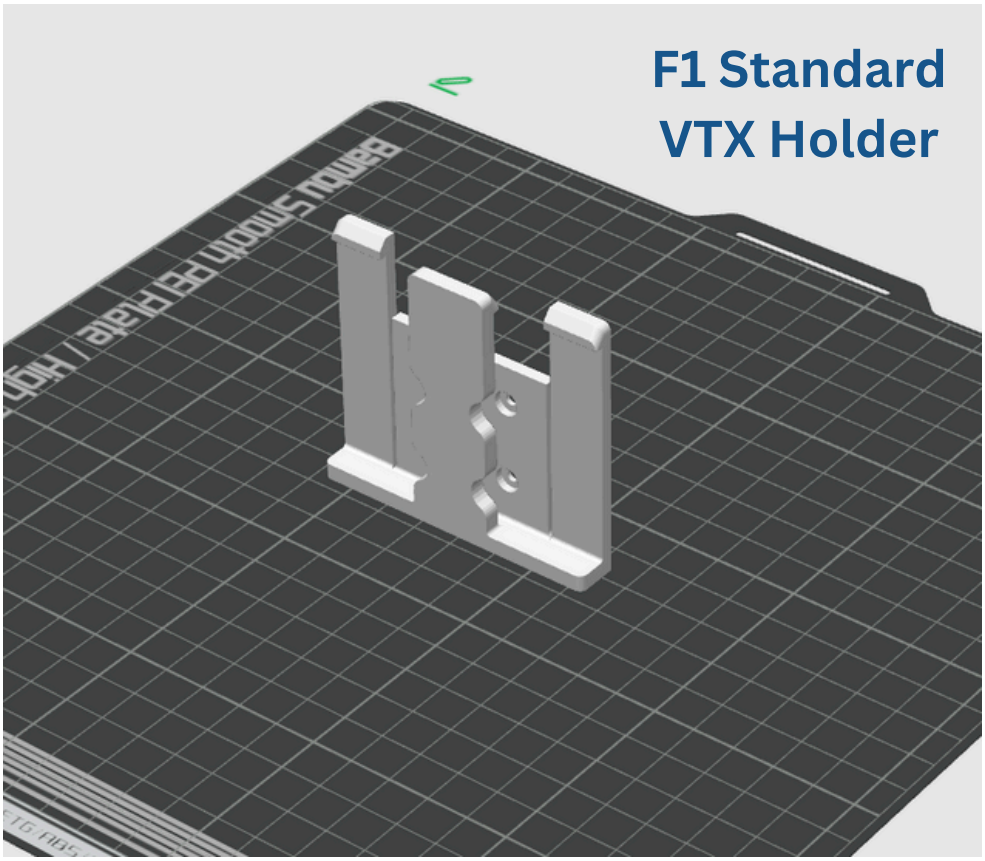

LG-A

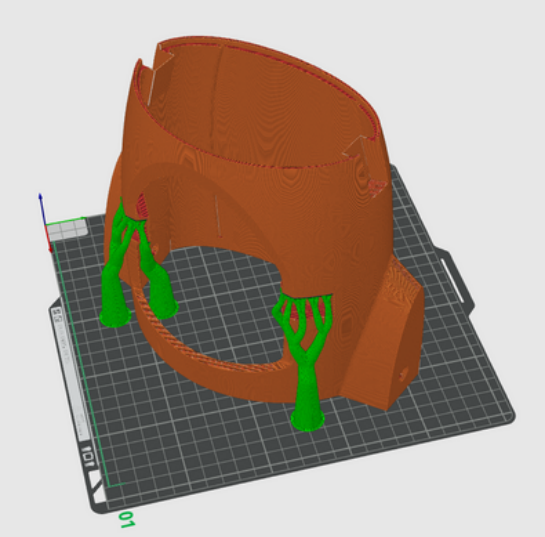

LG-B

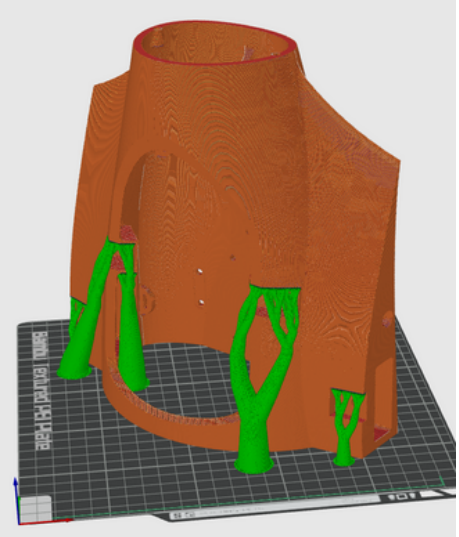


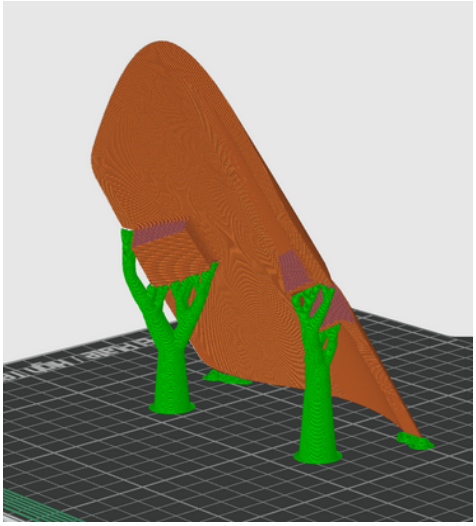


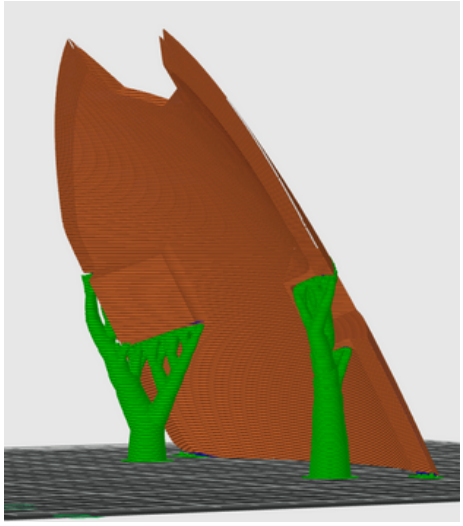
GPS Holder

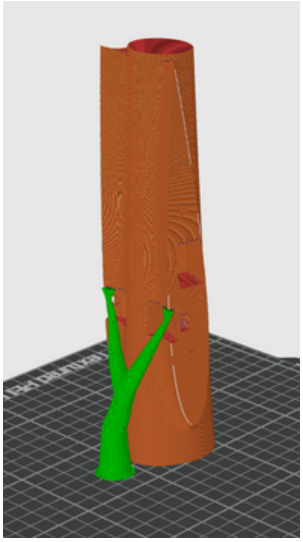

F1 Standard
VTX Holder

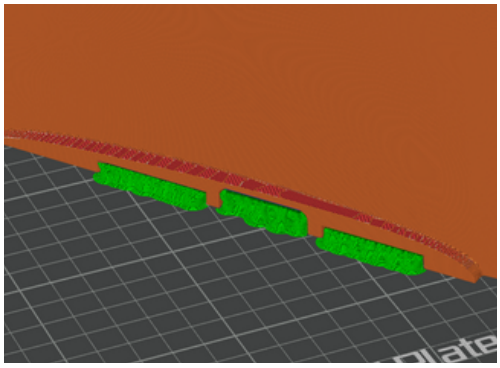












Depending on your printer performance it is enough to support only the vertical latch cavities (inner and outer sides). For this set manual support feature.

As desired, all overhangs can be supported.

Follow us on social media and look forward to great news and offers!

With your support, we can grow together and make many exciting new products possible.

Onlineshop

Instagram

YouTube

Facebook Tech Group