

Open Source - Very Big Stick MKII

MECHANICAL BUILD GUIDE

2023-06-19



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Mechanical Build Guide Video

Instructions on how to assemble the OS_VBS MKII gimbal is available on rightrudder-leftstick's youtube channel. Please watch and follow carefully on how to assemble these components.



You can watch the video at this URL:

<https://www.youtube.com/watch?v=IdYbF5dOYag>



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Bill of Materials

This is a live link to a spreadsheet containing the bill of materials for hardware and parts to be printed.

Note that as this time the Electrical section is just a placeholder

Part name	Quantity	Thicker walls required?	grams each	Total grams	Optional?
PitchFrame_TopPlate	2	n	134	268	
PitchFrame_SidePlate	2	n	47	94	
TM_M36_2020_Adapter	1	y	31	31	Y
Cam_rollerSpacer	2	n	1	2	
Cam_bearing_washer	4	n	1	4	
MainSleeve	1	y	54	54	
PitchFrame_PillowBlock	2	y	95	190	
RollFrame_PitchPin_Gear	1	y	43	43	
RollFrame_PitchPin_Camside	1	y	46	46	
RollFrame_GearSide	1	y	49	49	
RollFrame_CamSide	1	y	49	49	
M12_WasherSpacer	2	n	2	4	Y
SOFT_CAM	4	y	23	92	
TOTAL Filament PETG				926	grams

HARDWARE	Notes
1KG PETG 1.75mm filament	PLA+ untested
2020 v slot aluminum rod - Cut to length	Length depends on your choices
608 bearings	
6003 bearings	
18x24.7x1 Teflon Washers	https://www.aliexpress.com/item/4000935512060.html Y
M3x8mm	Do not use countersunk heads
M4x20mm Socket head	
M5 vslot drop in nuts	
M5x8mm Socket Head	6 less if TM adapter is not used
M5x16mm Socket head	Put into the middle of the camside 6003 bearings for extra strength Y
M5x50mm	For the counterweights Y
M8 washers	
M8 Spring Lock washer	
M8 Nylon Lock nuts	
M8x35mm HEX Head	Must be hex head for clearance



M8x50mm socket head	3	Two of them must be Socket Headed		
M8x80mm HEX or Socket Head	2			
M8x100mm HEX head	4	HEX head only		
M12 Washers	20	For counterweights		Y
FRT-C2-301-G1 Rotary damper	2	Make sure to get the kind that dampens both directions!		Y
Extension spring with loop ends. ~60mm unloaded	2	I used this mcmaster part in the design (3630n293), untested! You'll want to test many springs		
Extension spring with loop ends. various lengths	2	This is the second set of side springs, try several to tweak		Y
ELECTRICAL (WIP)		Notes		
5pin mini din connector (male) for TM adapter	1	https://www.aliexpress.com/item/32859748866.html		y
TLE5010 sensor kit with magnet and PCB	2	https://www.aliexpress.com/item/4000549883214.html		

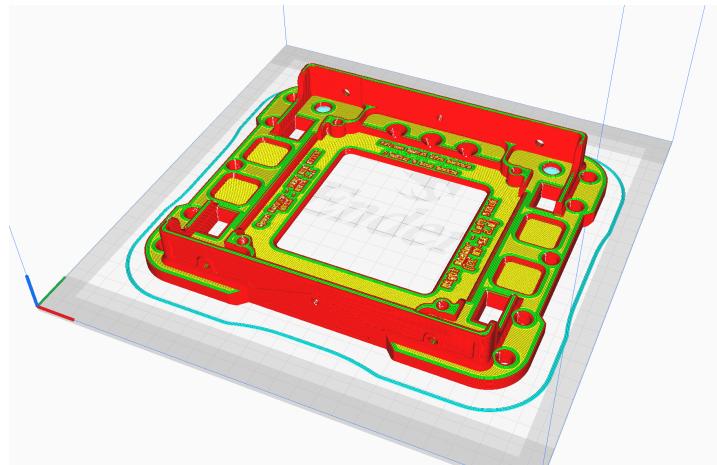
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3mf Part Reference

Here is information on each 3mf file included with the build and a reference image showing the correct print orientation.

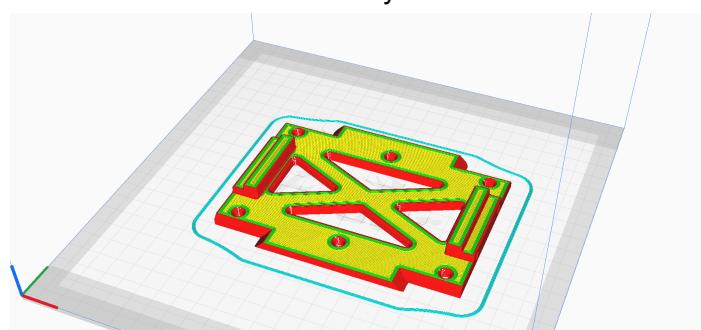
PitchFrame_TopPlate.3mf

Quantity: 2



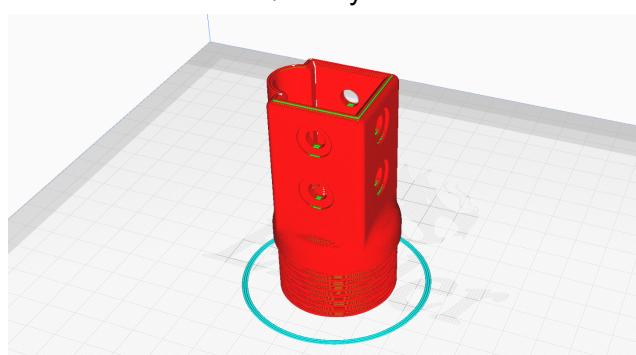
PitchFrame_SidePlate.3mf

Quantity: 2



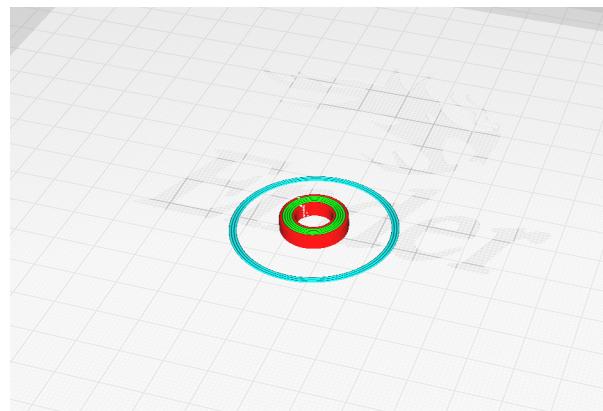
TM_M36_2020_Adapter.3mf

Quantity: 1



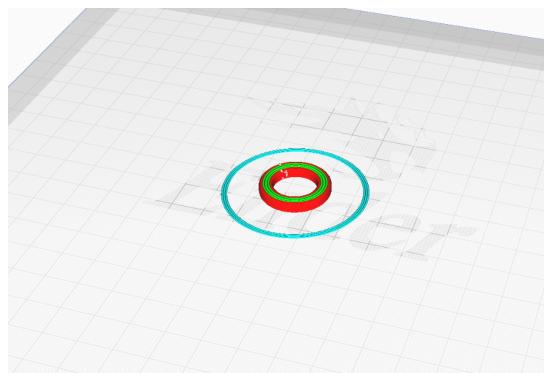
Cam_rollerSpacer.3mf

Quantity: 2



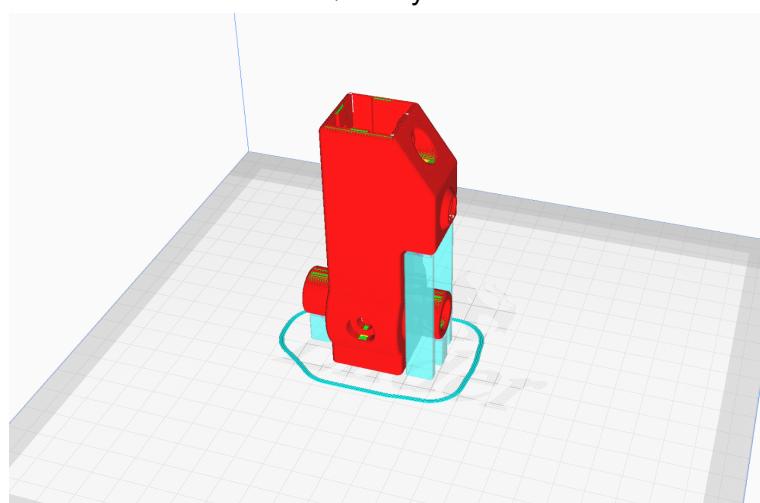
Cam_bearing_washer.3mf

Quantity: 4



MainSleeve.3mf

Quantity: 1

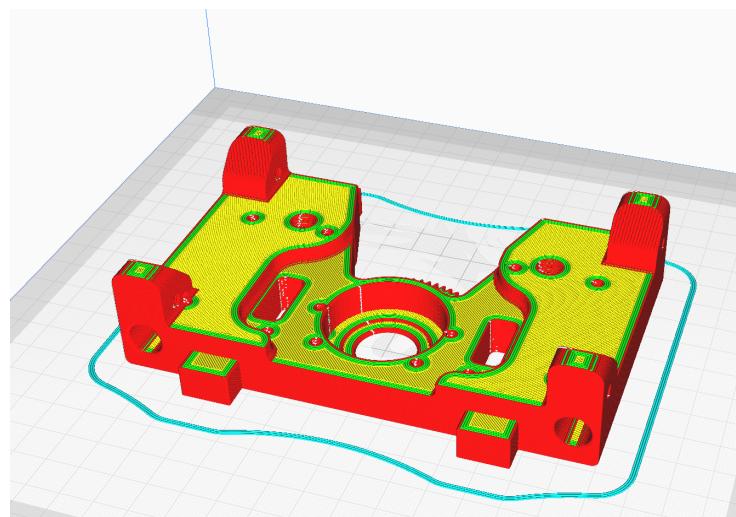


PitchFrame_PillowBlock.3mf

Quantity: 2

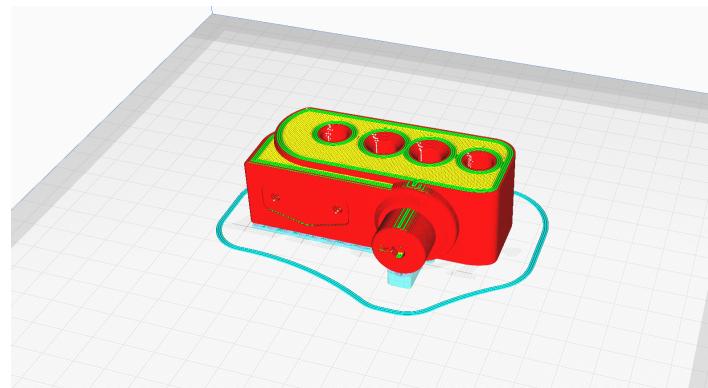


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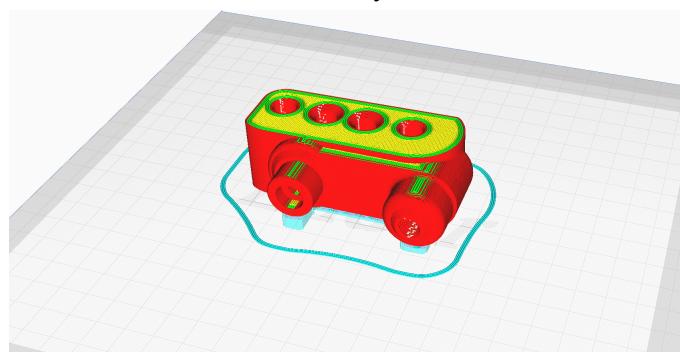
RollFrame_PitchPin_Gear.3mf

Quantity: 1



RollFrame_PitchPin_Camside.3mf

Quantity: 1

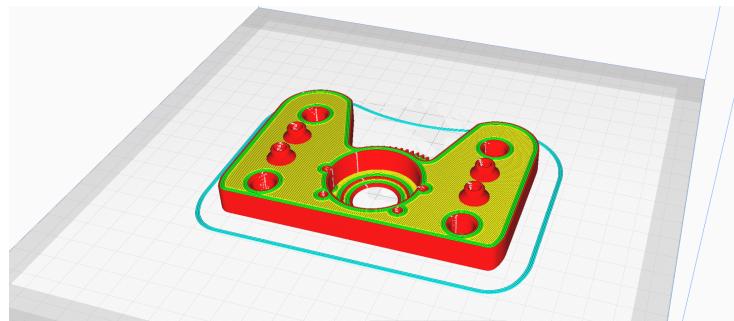


RollFrame_GearSide.3mf

Quantity: 1

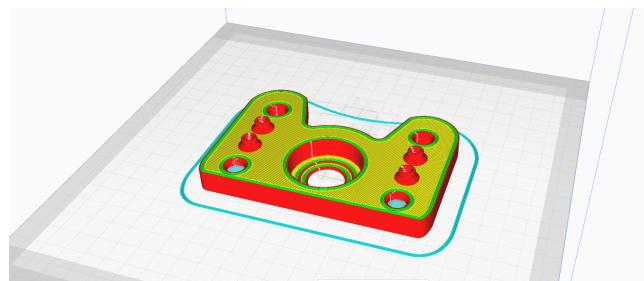


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RollFrame_CamSide.3mf

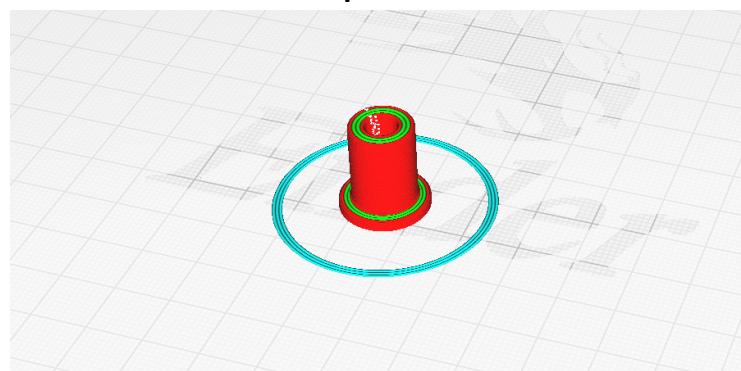
Quantity: 1



M12_WasherSpacer.3mf

Quantity: 1

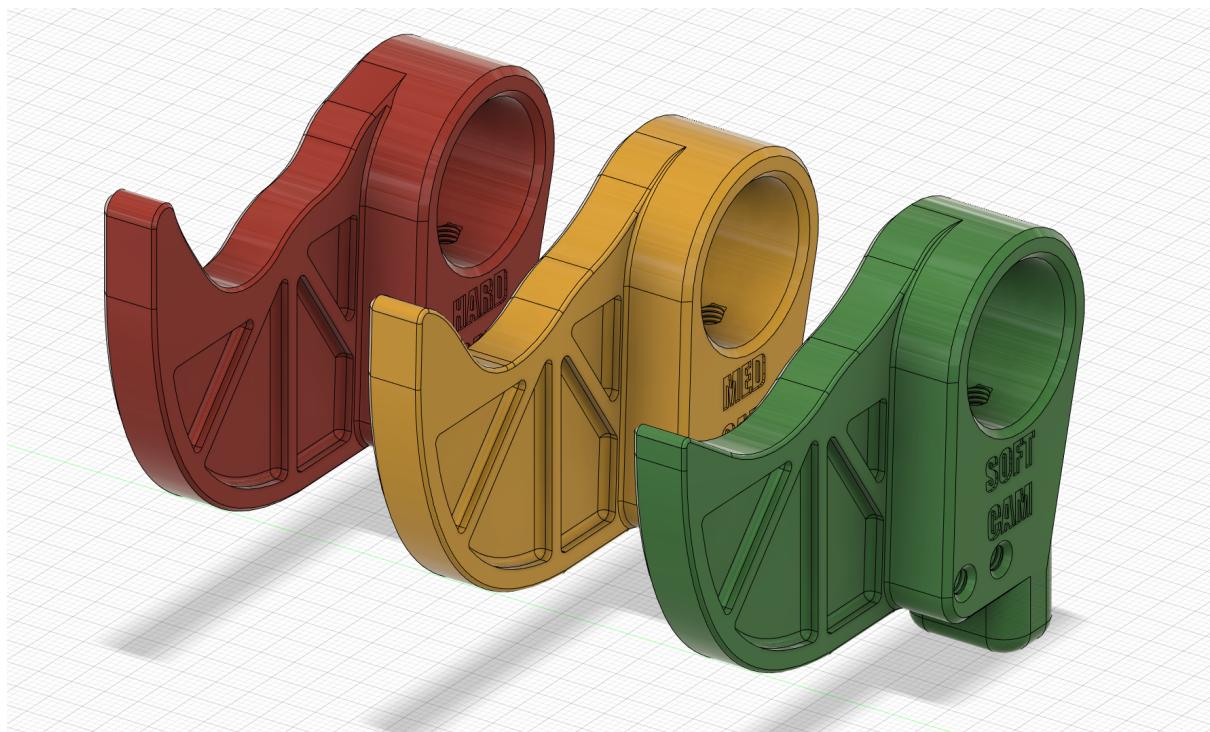
Optional



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CAM Profile Options

The design currently comes with three different options of CAM profiles. They can be mixed and matched on different axis to produce different force feelings, such as a stiffer pitch but a lighter roll motion. They are scaled from Soft to Hard.



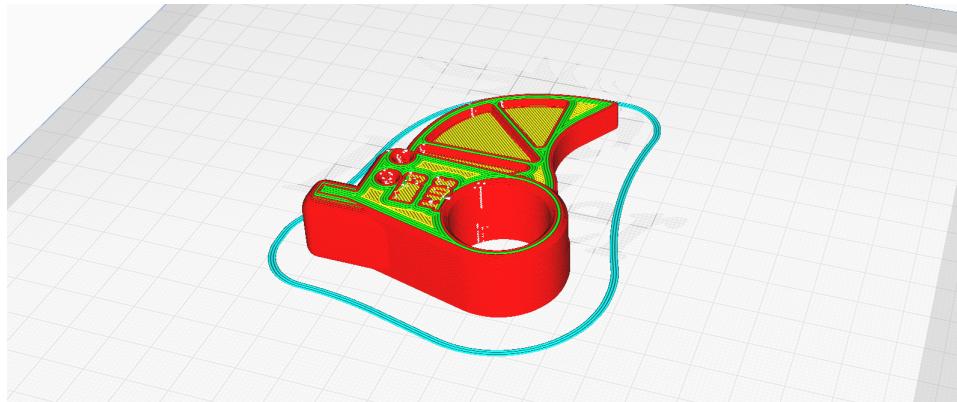
They also feature mounting for a bottom extension spring as well as 4 M4 holes on the side for mounting a secondary side spring. This can either augment the force of the primary spring or allow the use of a very light spring for low spring force applications like helicopter cyclics.



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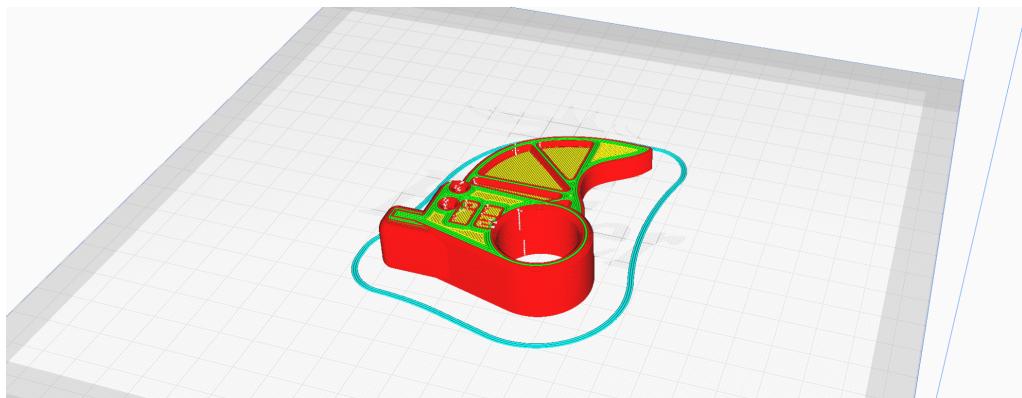
SOFT_CAM.3mf

Quantity: 4



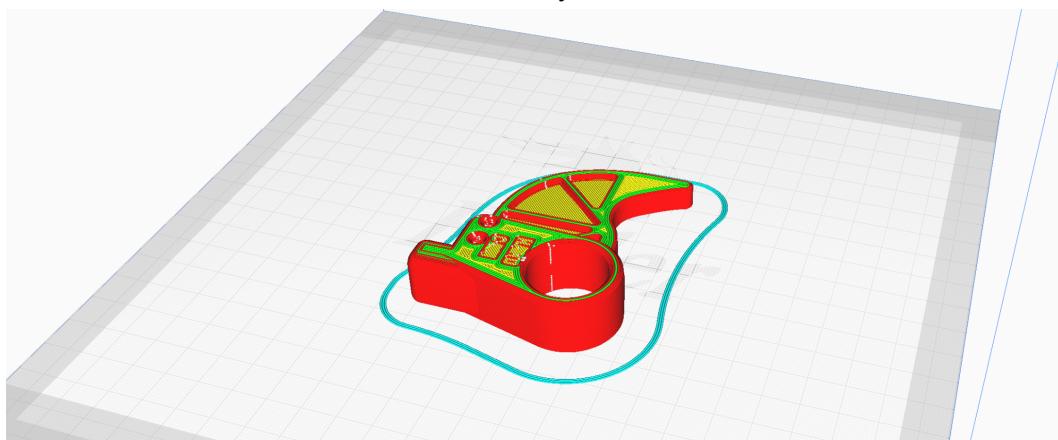
MED_CAM.3mf

Quantity: 4



HARD_CAM.3mf

Quantity: 4



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