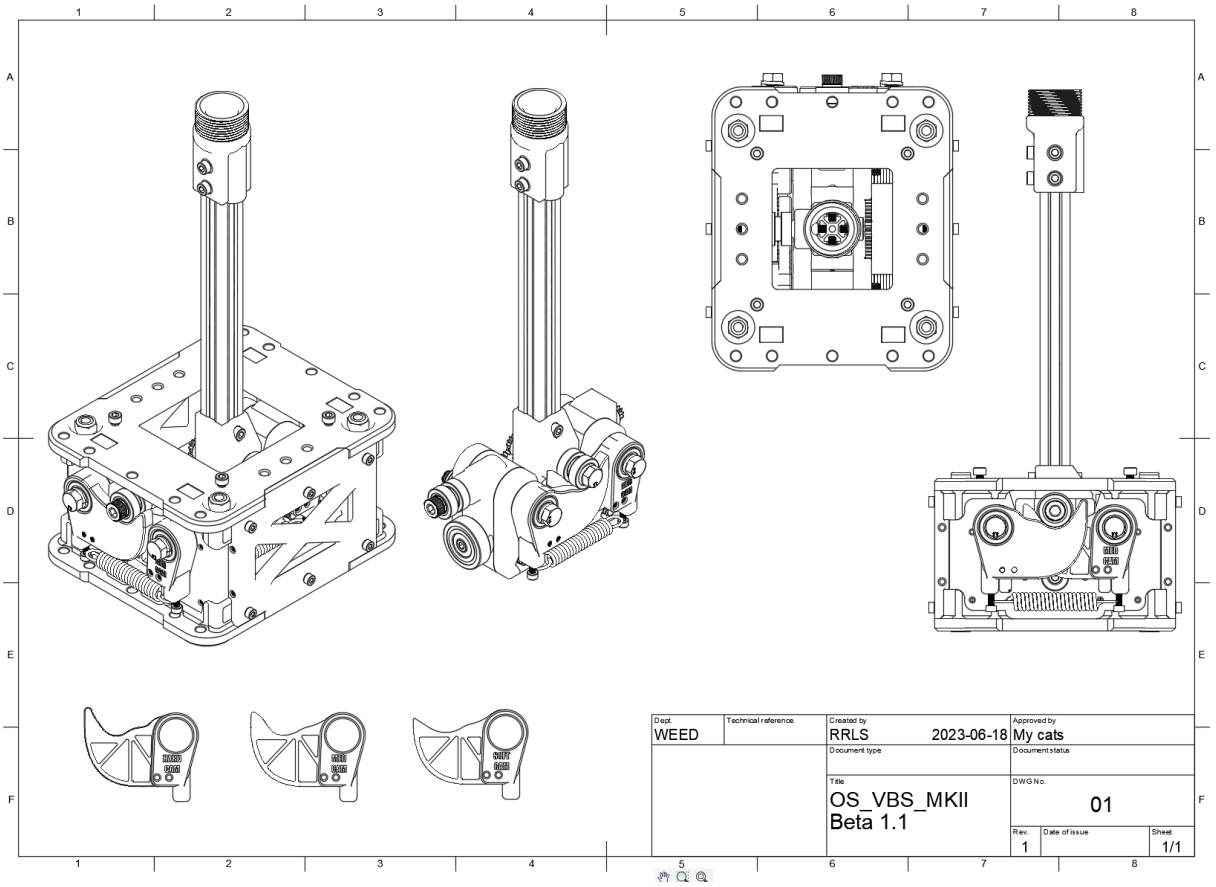


Open Source - Very Big Stick MKII

MECHANICAL BUILD GUIDE

2023-06-18

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://youtu.be/H9XChODXeRQ

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	1	PLA+ untested			
2020 v slot aluminum rod - Cut to length	1	Length depends on your choices			
608 bearings	12				
6003 bearings	4				
18x24.7x1 Teflon Washers	4	https://www.aliexpress.com/item/4000935512060.html			Y
M3x8mm	4	Do nut use countersunk heads			
M4x20mm Socket head	20				
M5 vslot drop in nuts	11				
M5x8mm Socket Head	10	6 less if TM adapter is not used			
M5x16mm Socket head	2	Put into the middle of the camside 6003 bearings for extra strength			Y
M5x50mm	2	For the counterweights			Y
M8 washers	4				
M8 Spring Lock washer	6				
M8 Nylon Lock nuts	8				
M8x35mm HEX Head	3	Must be hex head for clearance			

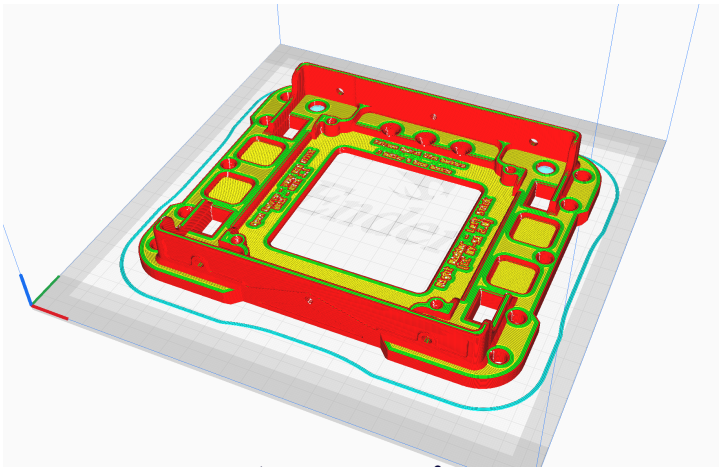
M8x50mm socket head	3	Two of them must be Socket Headed	
M8x80mm HEX or Socket Head	2		
M8x100mm HEX head	4	HEX head only	
M12 Washers	20	For counterweights	Y
FRT-C2-301-G1 Rotary damper	2	Make sure to get the kind that dampens both directions!	Y
Extension spring with loop ends. ~60mm unloaded	2	I used 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	

3mf Part Reference

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

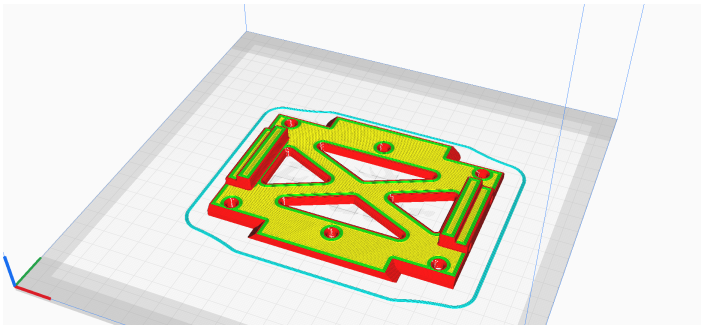
PitchFrame_TopPlate.3mf

Quantity: 2



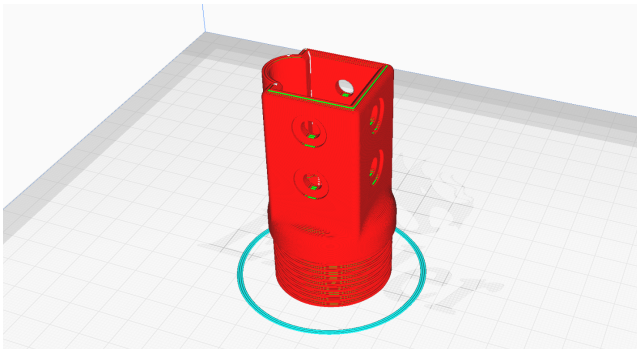
PitchFrame_SidePlate.3mf

Quantity: 2



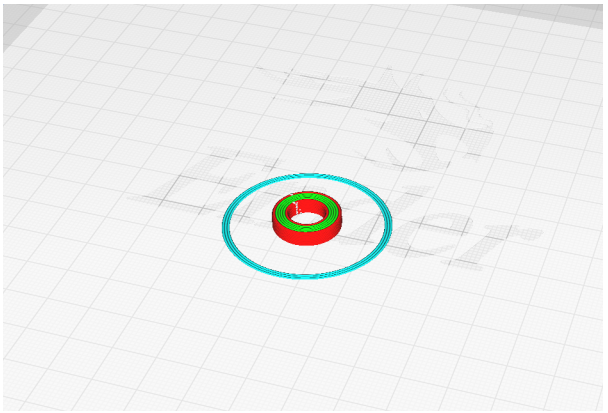
TM_M36_2020_Adapter.3mf

Quantity: 1



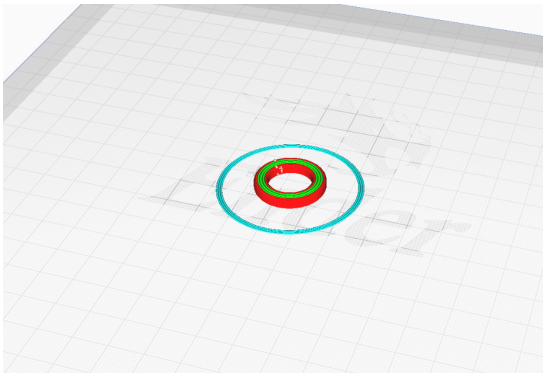
Cam_rollerSpacer.3mf

Quantity: 2



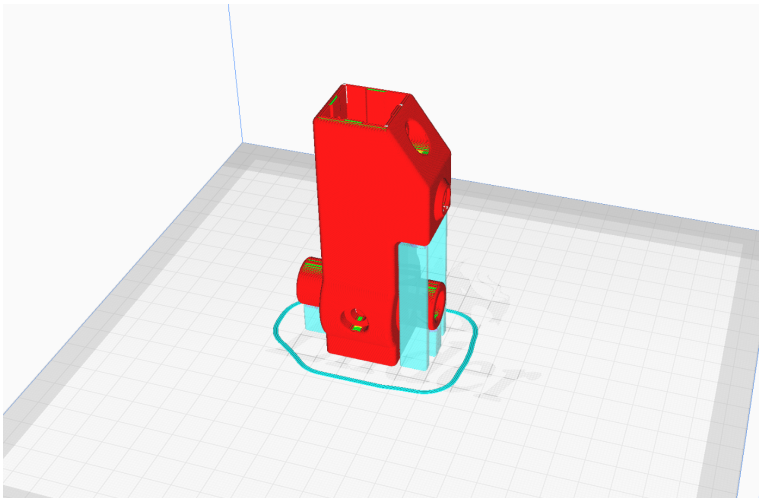
Cam_bearing_washer.3mf

Quantity: 4



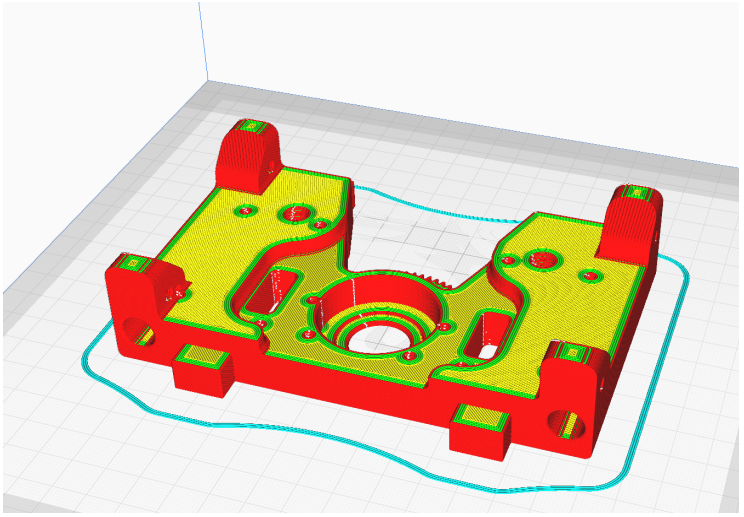
MainSleeve.3mf

Quantity: 1



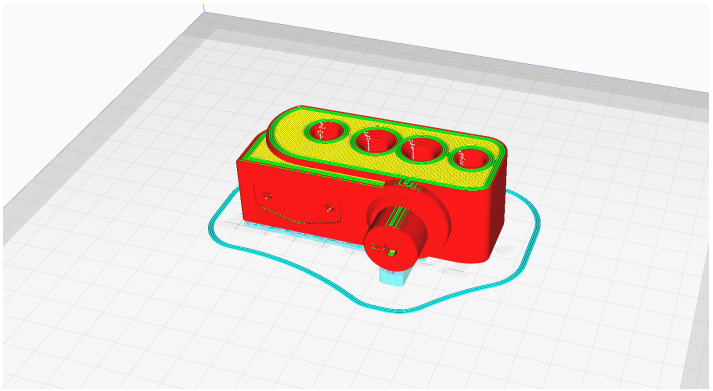
PitchFrame_PillowBlock.3mf

Quantity: 2



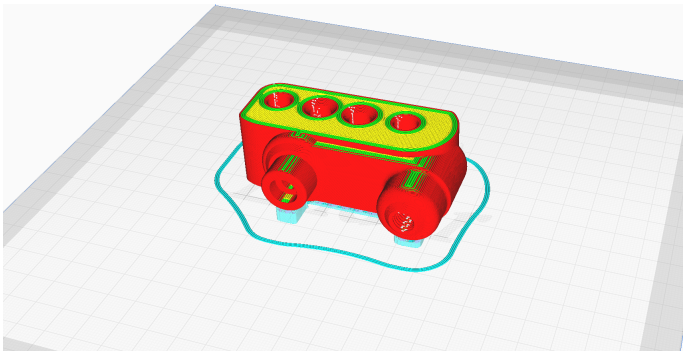
RollFrame_PitchPin_Gear.3mf

Quantity: 1



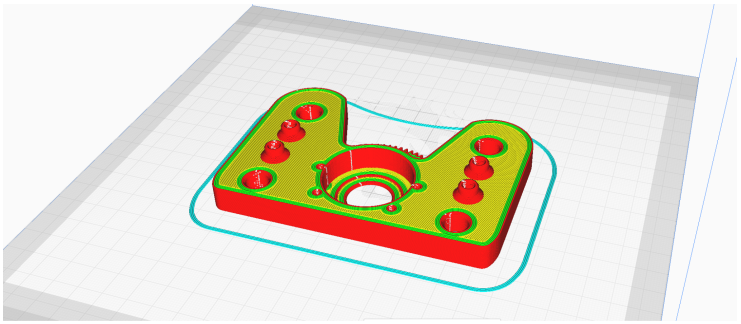
RollFrame_PitchPin_Camside.3mf

Quantity: 1



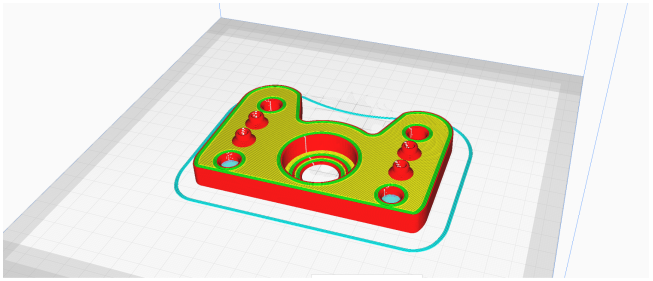
RollFrame_GearSide.3mf

Quantity: 1



RollFrame_CamSide.3mf

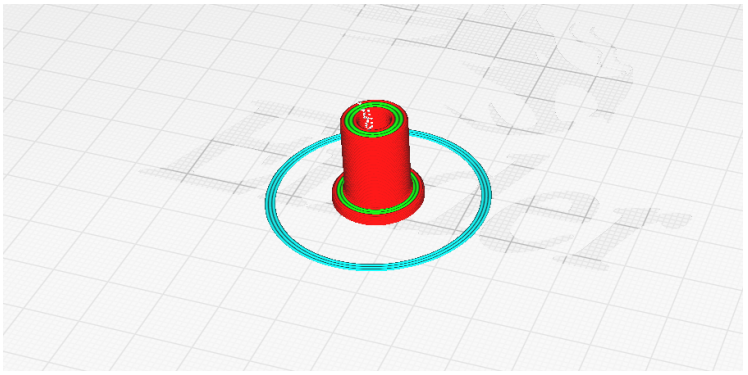
Quantity: 1



M12_WasherSpacer.3mf

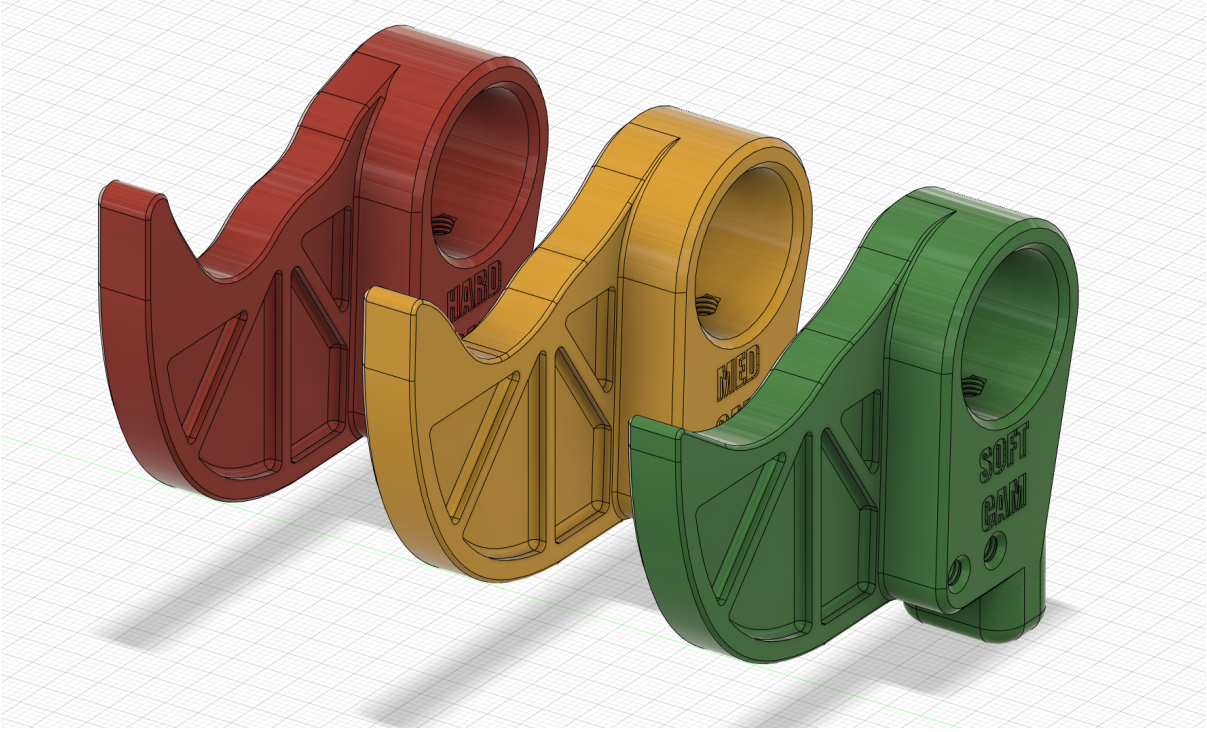
Quantity: 1

Optional



CAM Profile Options

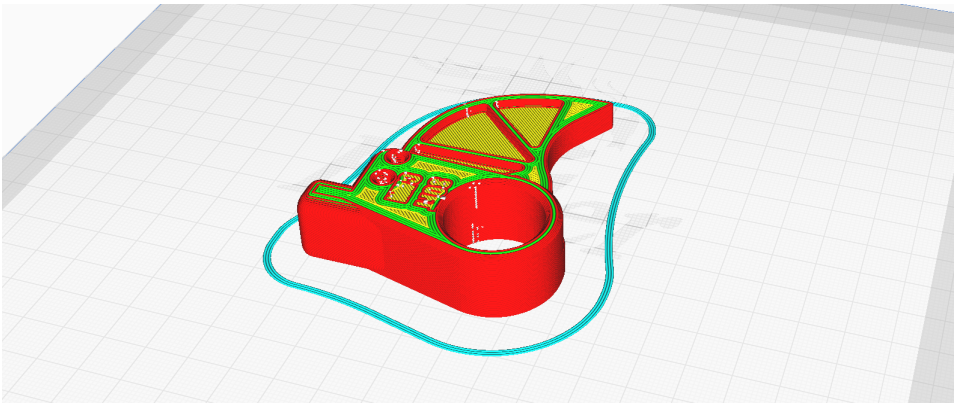
The design currently comes with three different options of CAM profiles, They can be mixed and matched on different axis to produce different force feelings, such as a stiffer pitch but a lighter roll motion. They are scaled from Soft to Hard.



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.

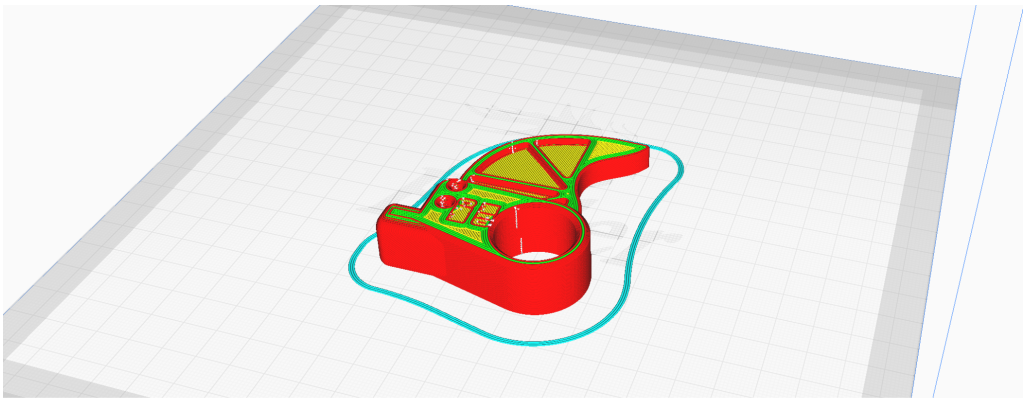
SOFT_CAM.3mf

Quantity: 4



MED_CAM.3mf

Quantity: 4



HARD_CAM.3mf

Quantity: 4