C O N T E N T S

SECTION 01

BILL OF MATERIAL

QUANTITY	PART DESCRIPTION
1	Top Fuselage Plate (1.5mm CF)
1	Bottom Fuselage Plate (1.5mm CF)
1	Front Arm Stiffener Plate (1.5mm CF)
1	Rear Arm Stiffener Plate (1.5mm CF)
1	Middle Stiffener Plate (1.5mm CF)
1	ESC Tray (1.5mm CF)
1	FPV Camera Cage, Front Plate (3mm CF)
2	FPV Camera Cage, Side Plate (3mm CF)
1	POV Camera Cage Top Plate (3mm CF)
1	POV Camera Cage Bottom Plate (1.5mm CF)
1	POV Camera Cage Antivibration Plate (1.5mm CF)
4	Arms for 265mm Quadcopter Configuration ***If you purchased FULL KIT or 265mm quad only***
4	Arms for 320mm Quadcopter Configuration ***If you purchased FULL KIT or 320mm quad only***
2	Arms for 330mm Hexacopter Configuration ***If you purchased FULL KIT or 330mm hex only***
1	Lipo battery extended plate ***If you purchased FULL KIT or 330mm hex only***
1	Catalyst Machineworks Power Distribution Board
9	Catalyst Machineworks Vibration Damper – Dual Head
13	Standoff (Black aluminum M3 thread x 10mm long) ***If you purchased FULL KIT or 330mm hex only***
11	Standoff (Black aluminum M3 thread x 10mm long) ***If you purchased 265 or 320 quad***
8	Standoff (Black aluminum M3 thread x 37mm long)
2	Standoff (Black aluminum M3 thread x 50mm long)
4	Flight Controller Standoff (Black nylon M3 thread x 14mm long x female ends)
4	Flight Controller Screw (Black nylon M3 thread x 6mm long x phillips head)
4	Power Distribution Board Screws (Black nylon M3 thread x 10mm long x phillips head)
16	Washer (Black nylon 3mm hole)
4	Landing Gear Feet (Black rubber)
20	Socket Head Screw (M3 X 12mm long x stainless steel)
12	Socket Head Screw (M3 X 10mm long x stainless steel)
5	Socket Head Screw (M3 X 8mm long x stainless steel)
31	Socket Head Screw (M3 X 5mm long x stainless steel)

QUANTITY	PART DESCRIPTION
7	Button Head Screw (M3 X 10mm long x stainless steel)
1	Button Head Screw (M3 X 8mm long x stainless steel)
2	Socket Head Screw (M2.5 X 10mm long x stainless steel)
2	Socket Head Screw (M2.5 X 14mm long x stainless steel)
4	Washer (M2.5 x stainless steel)
20	Nylock Nut (M3 x stainless steel)
4	Nylock Nut (M2.5 x stainless steel)
20	Washer (M3 x aluminum)
6	Frame Spacer (M3 x 4.5mm OD x aluminum)
6	Set screw (M3 X 12mm long x stainless steel)
1	FPV Camera Lense guard (3D Printed Black Plastic)
1	Mobius Camera Mount (3D Printed Black Plastic) ***If you purchased Mobius option***
1	Mobius Camera Mount Top Plate (1.5mm CF) ***If you purchased Mobius option***
8	Phillips head screw (#4 x 1/2" long x stainless steel) ***If you purchased Mobius option***
1	Gopro Camera Mount (3D Printed Black Plastic) ***If you purchased Gopro option***
4	Phillips head screw (#4 x 1/2" long x stainless steel) ***If you purchased Gopro option***
4	Spacer #4 hole x 1/4" long (White Plastic) ***If you purchased Gopro option***

SECTION 02

REQUIRED TOOLS

QUANTITY	TOOL DESCRIPTION
1	File
1	Sandpaper
1	2mm allen driver or allen wrench
1	2.5mm allen driver or allen wrench
1	5.5mm socket driver
1	Small phillips head screw driver
1	Needle Nose Pliers
1	Open face wrench
1	Loctite
3	Adult beverage of choice or apple juice if you are under 21

SECTION 03

BUILD PREPARATION

Build preparation involves rounding off the corners of all carbon fiber parts. This is not absolutely necessary to fly your Speed Addict but it is highly recommended and standard practice among top builders and racers. Catalyst Machineworks carbon fiber plate parts are cut by state of the art CNC machines. Cutting the raw material could leave a sharp edge on parts and it is possible this sharp edge could rub against wiring insulation, resulting in wiring shorts against the frame. Rounding the edges is quite easy to do, but does take some time as the process must be done with caution. Take your time and do it right, scratches on the flat surface will show. Keep that carbon fiber looking good!

To round the edge of each part simply take a file or sanding block and hold the sanding edge at a 45º angle to the sharp edge. Work the sanding surface along the edge of the part until the sharp edge is gone. You want a smooth, rounded edge along the entire perimeter of the part and also any large open cutouts on the interior of a given part. It is not necessary to round small holes, such as screw holes, etc.

SECTION 04

ASSEMBLY PROCESS (GENERAL)

GENERAL

The Speed Addict frame is designed to be configurable into three different craft types using the same fuselage. A 265mm quadcopter, 320mm quadcopter, and 330mm hexacopter. The only difference between the 265mm and 320mm quad configurations is the length of the arms and location of the rear arms. While the hexacopter configuration differs from the quads by adding two more arms to the center section and also 2 extra standoffs that extend down to the ESC tray. In addition the hex's front and rear arms sit in a different location compared to the quads.

Since all 3 craft configs are so similar, we will use the 265 quad as our assembly example for this manual. If you are building the 320 quad or 330 hex please see section 5 or 6 for assembly considerations specific to those configs. Due to a nearly endless amount of possible electronics build variations this manual will speak very little about the integration of your electronics gear. For a complete video tutorial of a typical Speed Addict electronics install please visit our website and youtube channel.

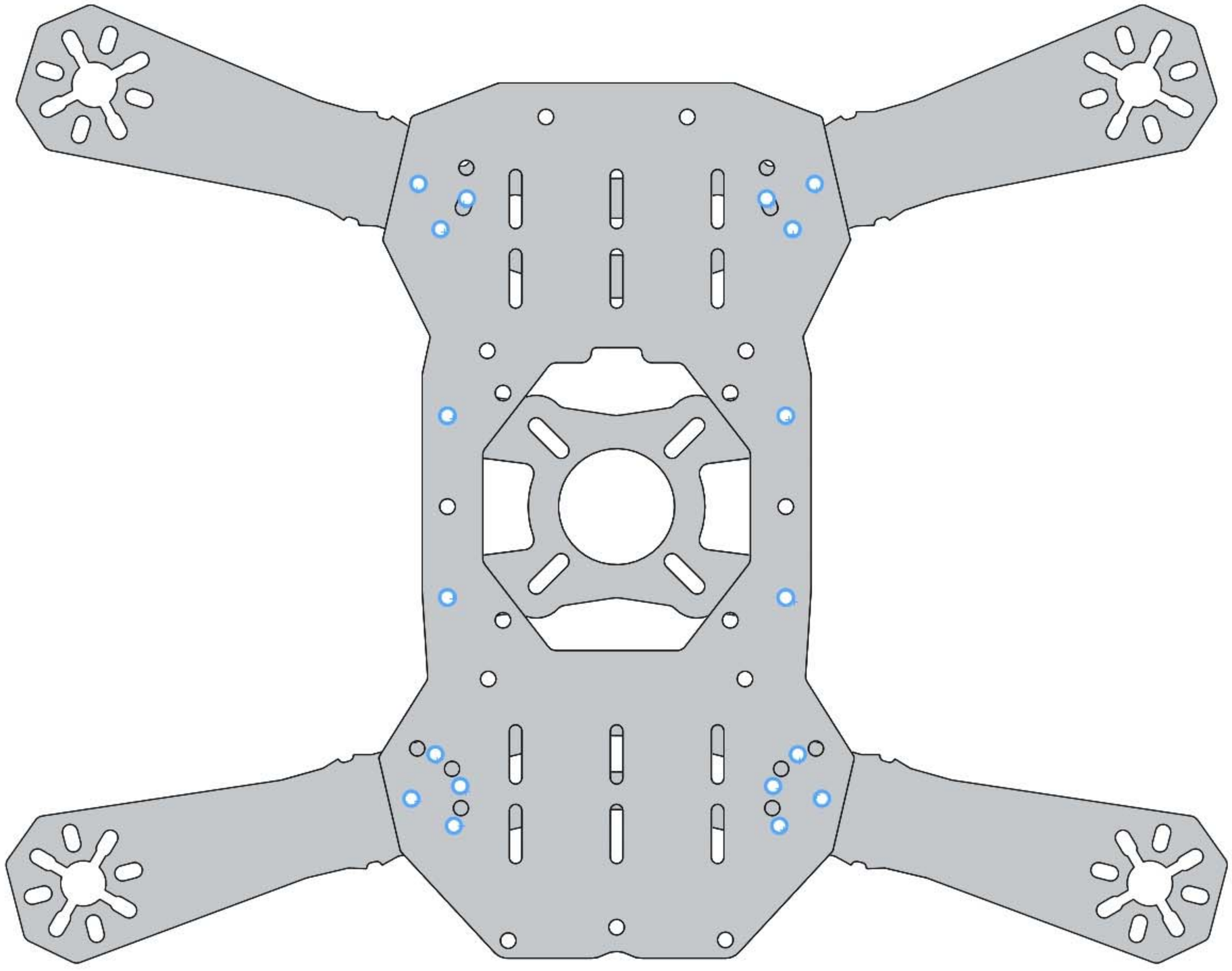
STEP 1

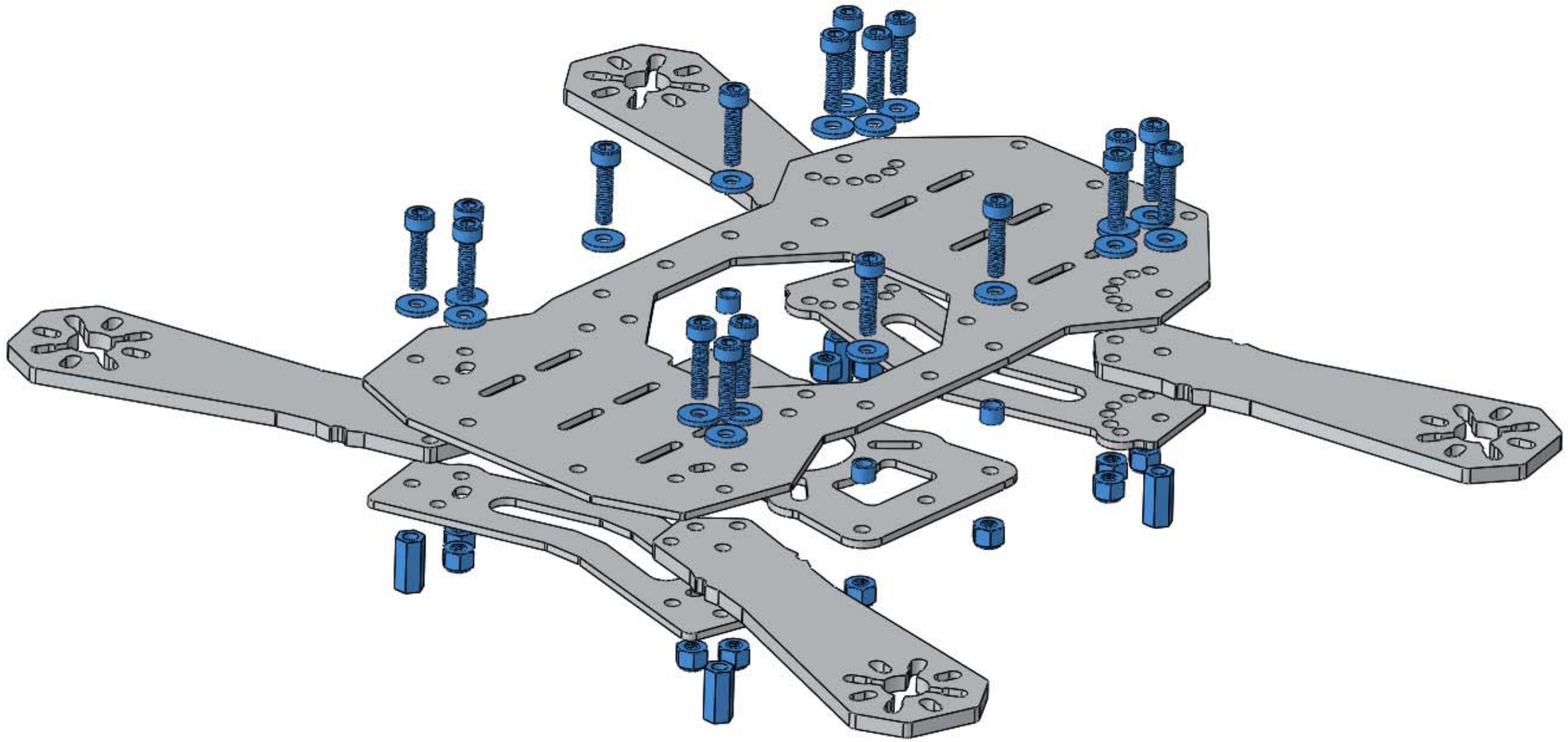
Parts Required:

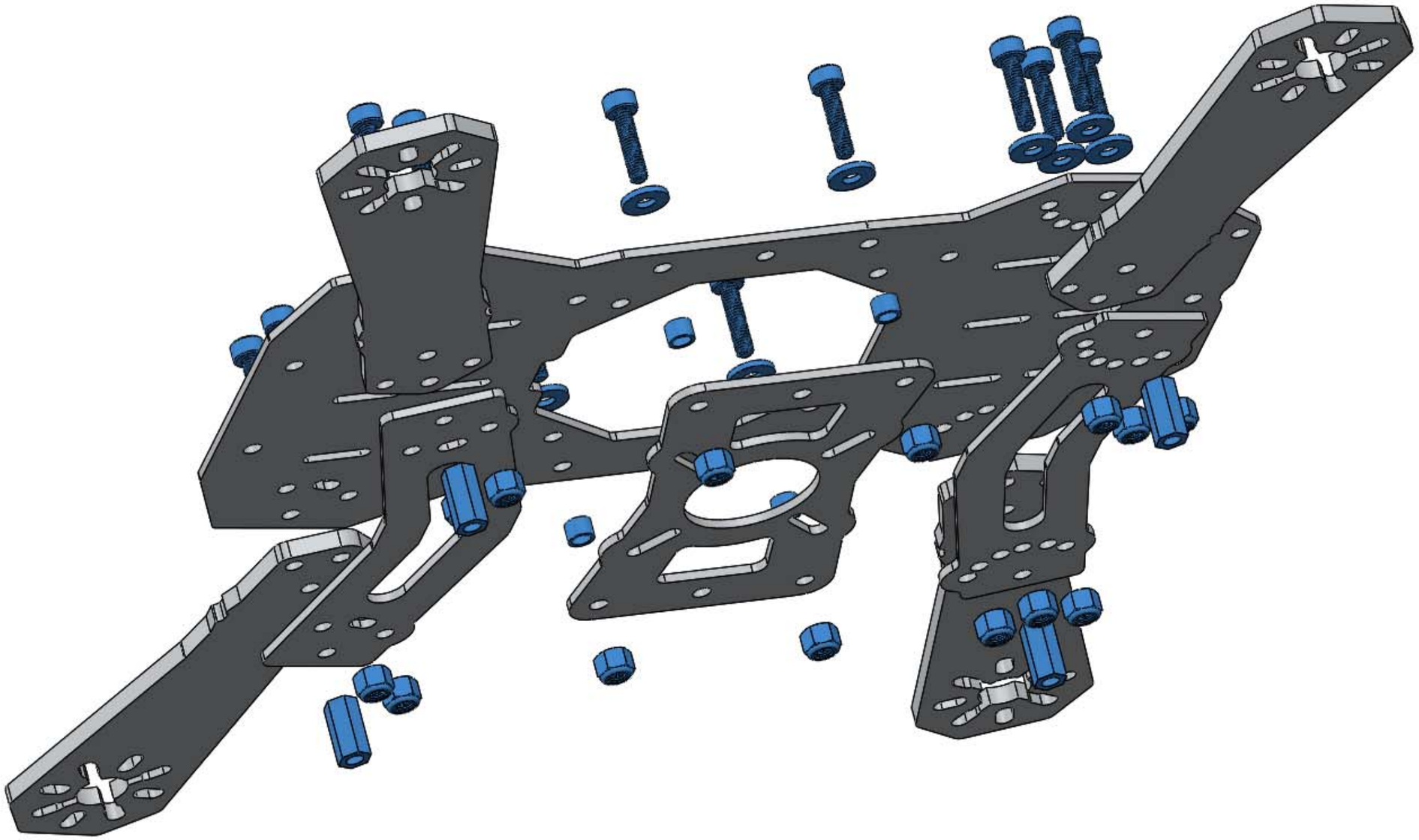
1 X Bottom Fuselage Plate (1.5mm CF)
1 X Front Arm Stiffener Plate (1.5mm CF)
1 X Rear Arm Stiffener Plate (1.5mm CF)
1 X Middle Stiffener Plate (1.5mm CF)
4 X Arms (3mm CF)
18 X Socket Head Screw (M3 X 12mm long x stainless steel)
14 X Nylock Nut (M3 x stainless steel)
18 X Washer (M3 x aluminum)
4 X Frame Spacer (M3 x 4.5mm OD x aluminum)
4 X Standoff (Black aluminum M3 thread x 10mm long)

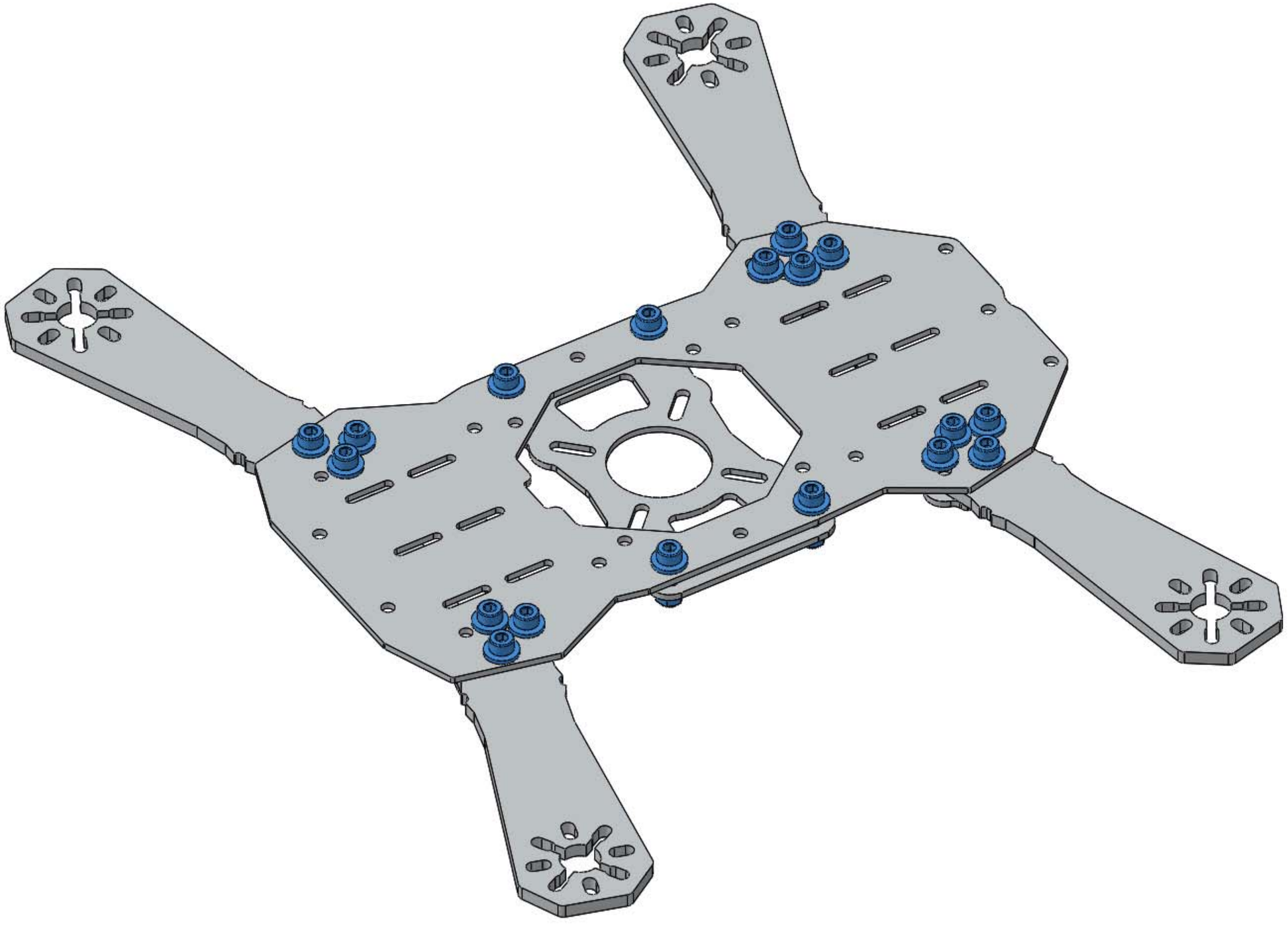
Assembly Process:

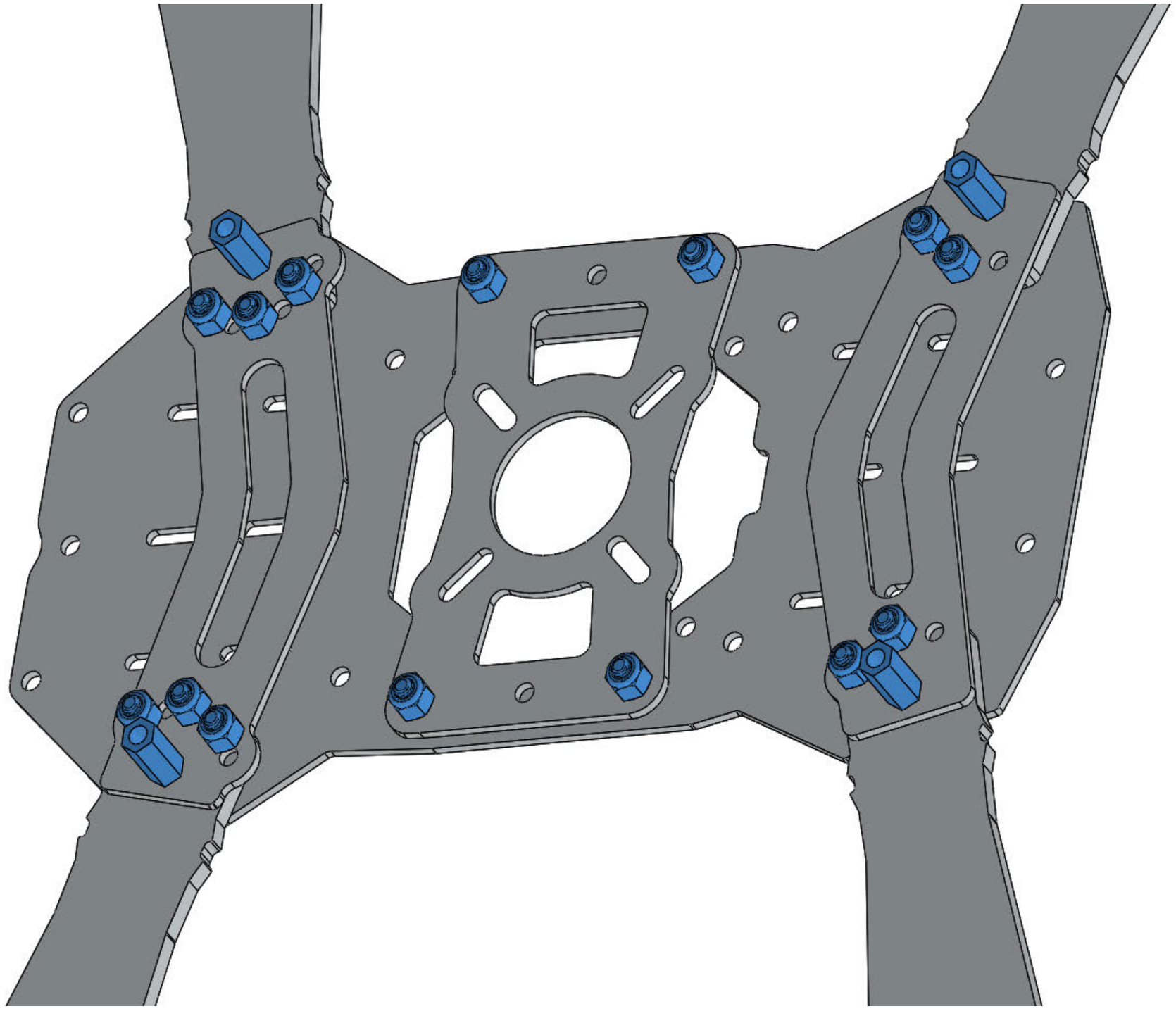
Position the carbon fiber parts as show. Install 12mm screws into the correct holes in the Bottom Fuselage Plate. The next page shows these holes highlighted blue. The outermost hole in each arm requires it's screw to be threaded with a standoff. The rest of the screws are threaded to nylock nuts. Be sure to place frame spacers between the Bottom Fuselage Plate and the Middle Stiffener Plate. Once all the fasteners are in place torque everything down.

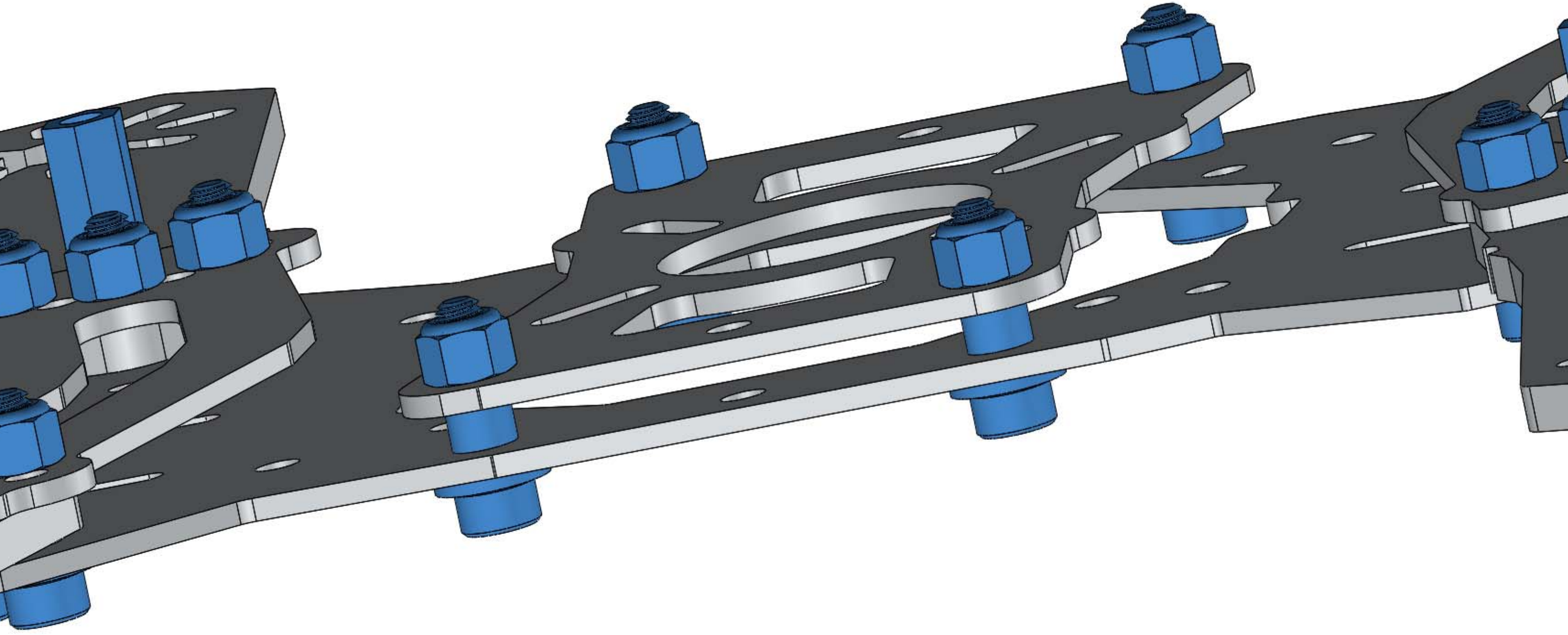












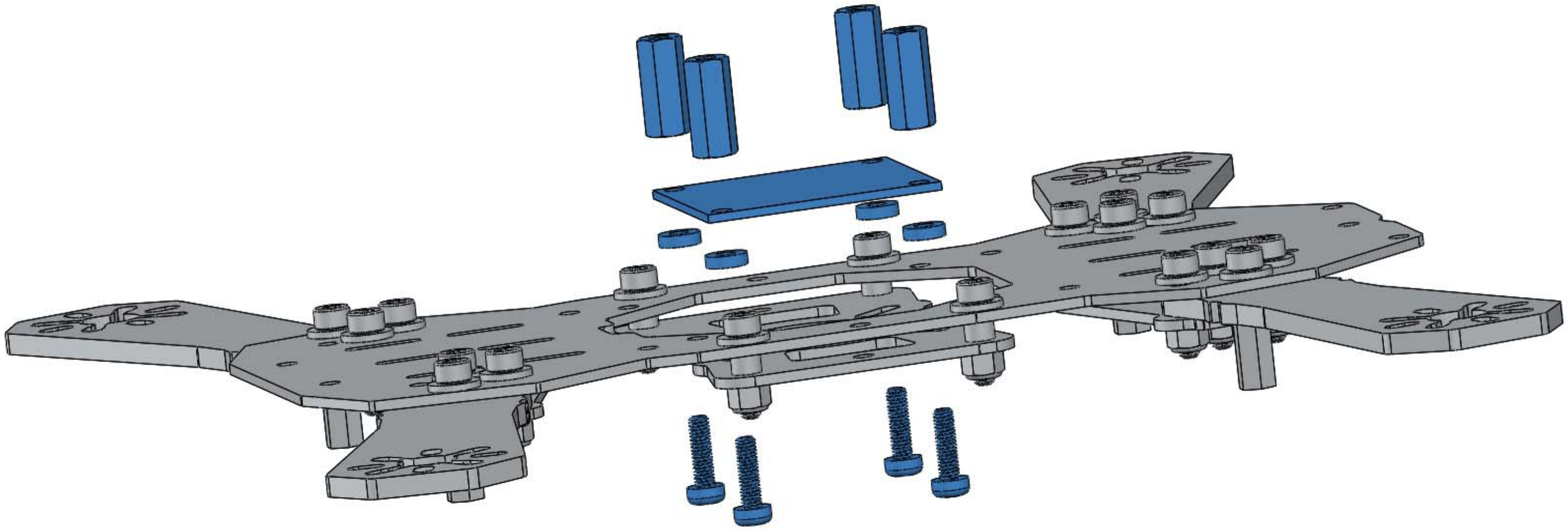
STEP 2

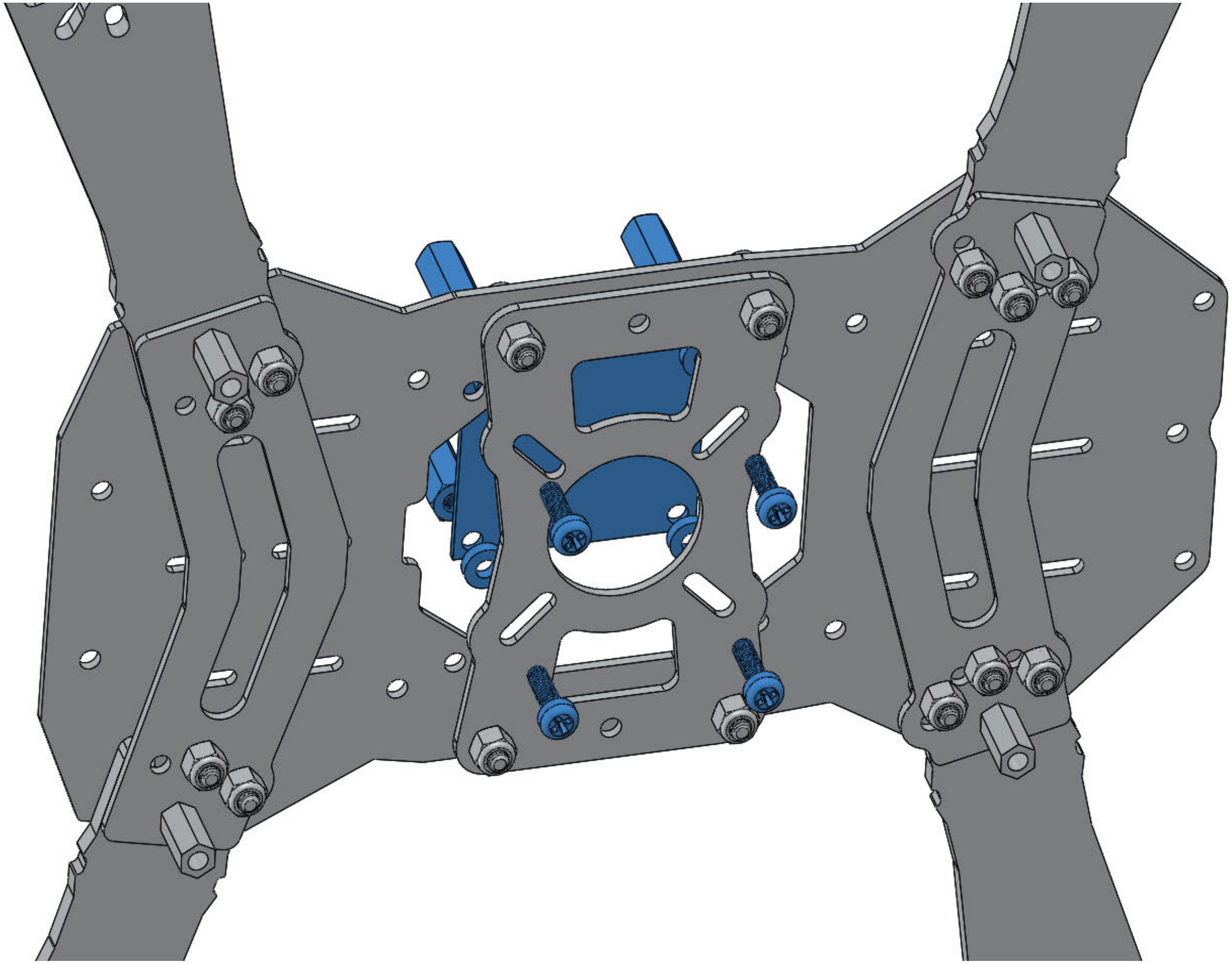
Parts Required:

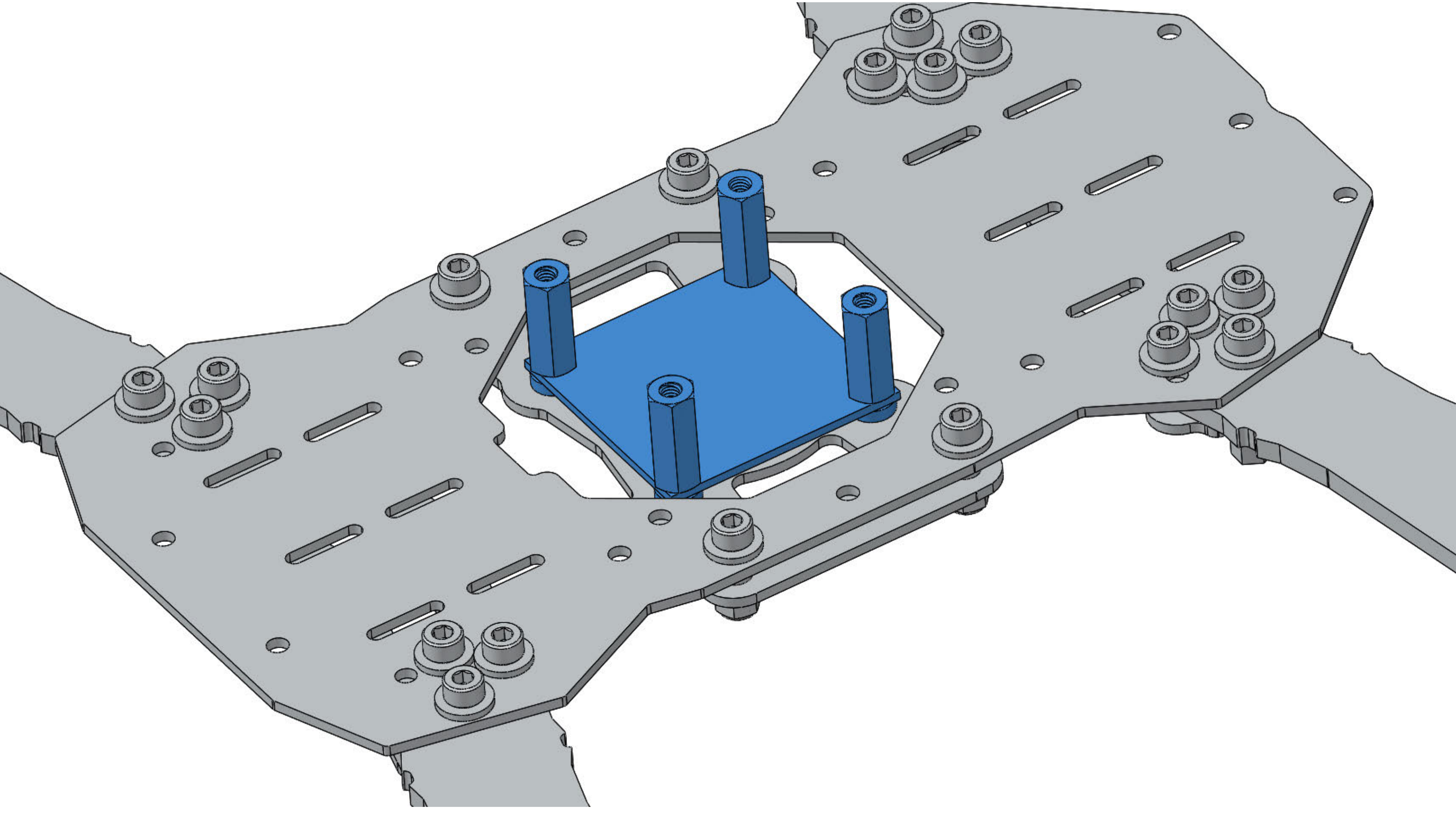
1 X Catalyst Machineworks Power Distribution Board
4 X Power Distribution Board Screw (Black nylon M3 thread x 10mm long x phillips head)
4 X Washer (Black nylon 3mm hole)
4 X Flight Controller Standoff (Black nylon M3 thread x 14mm long x female ends)

Assembly Process:

Position the screws in the slots as shown. Install a washer onto each screw at the opposite side of the plate. Then install the PDB. Thread a standoff onto each screw and torque down.







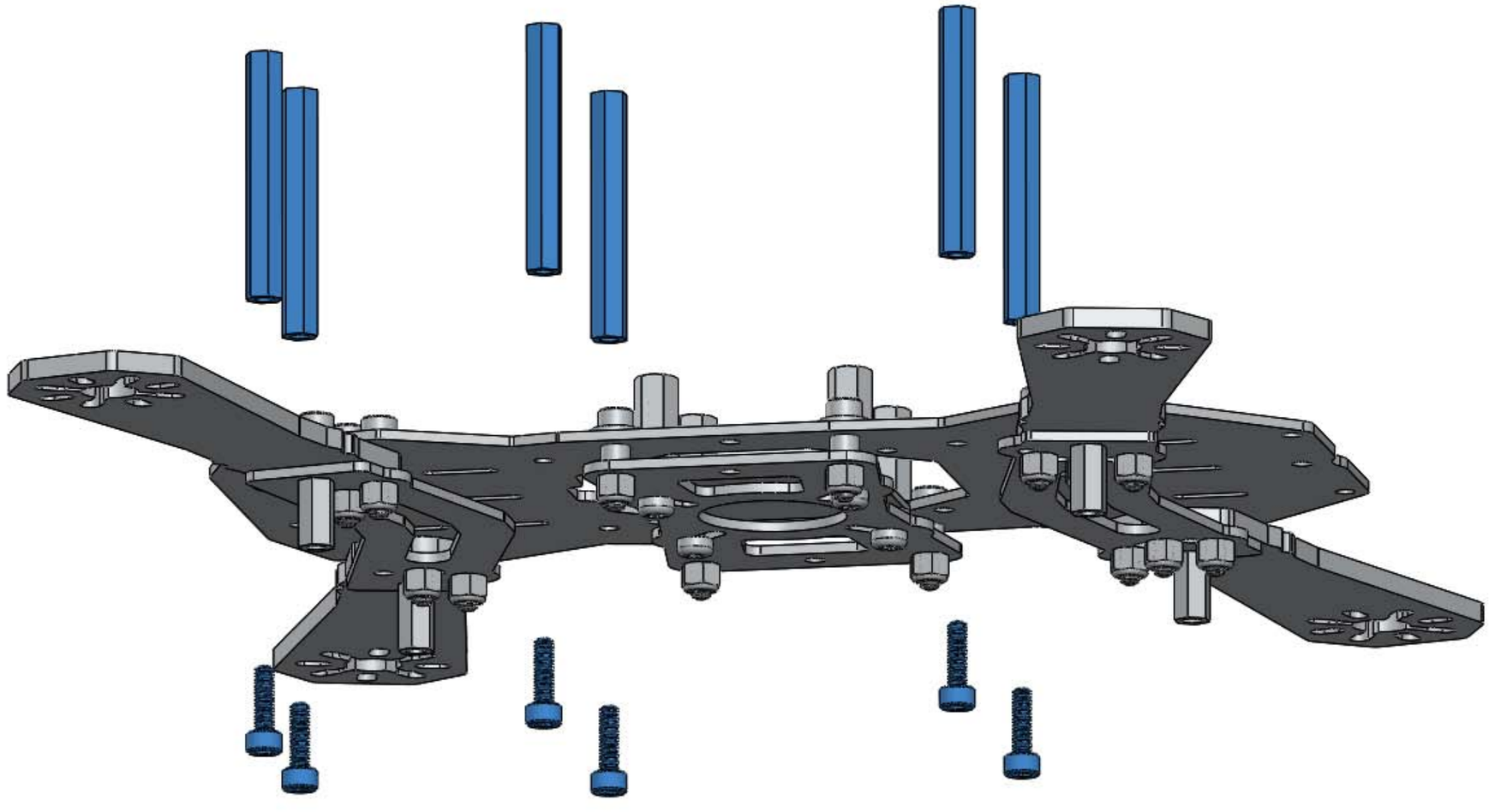
STEP 3

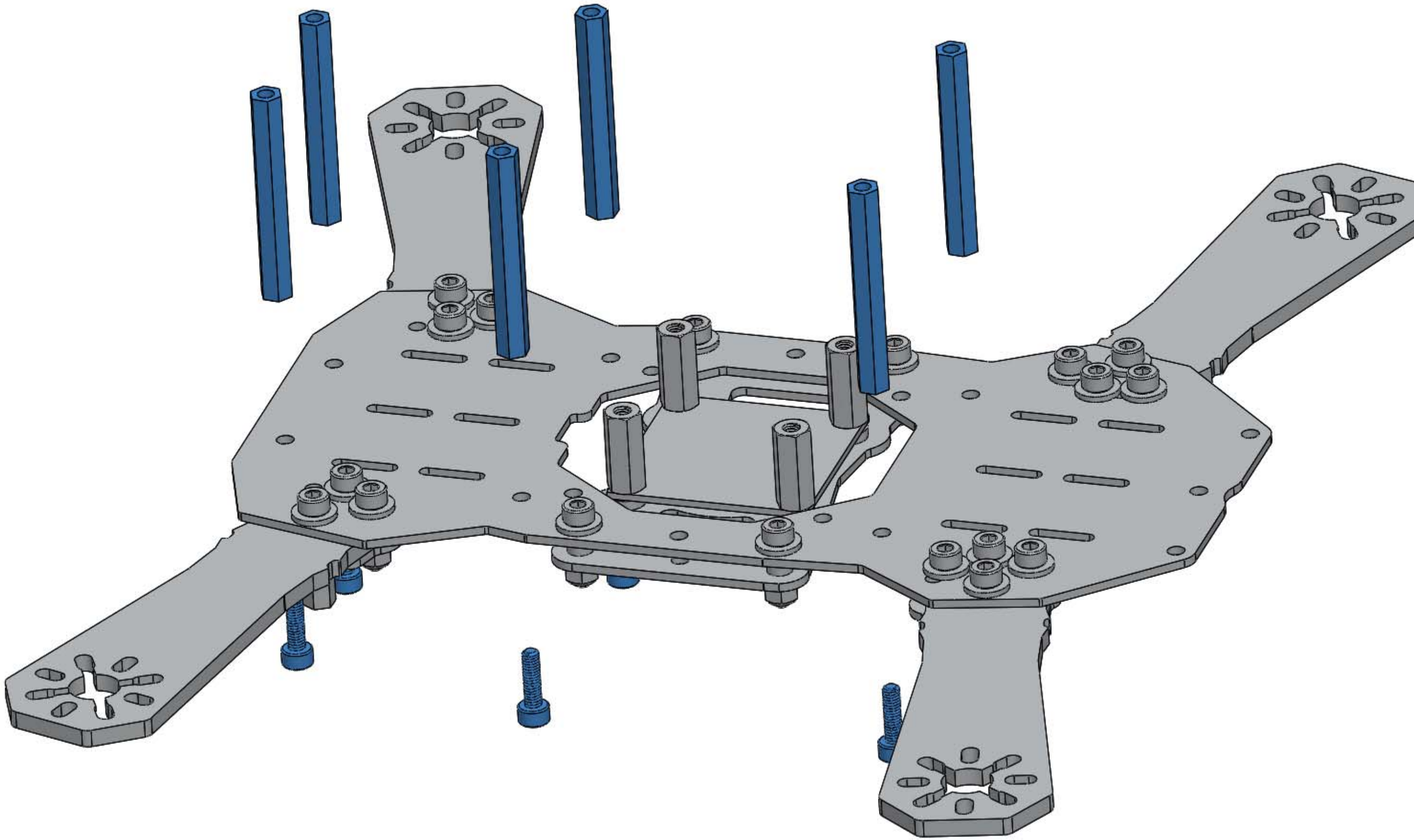
Parts Required:

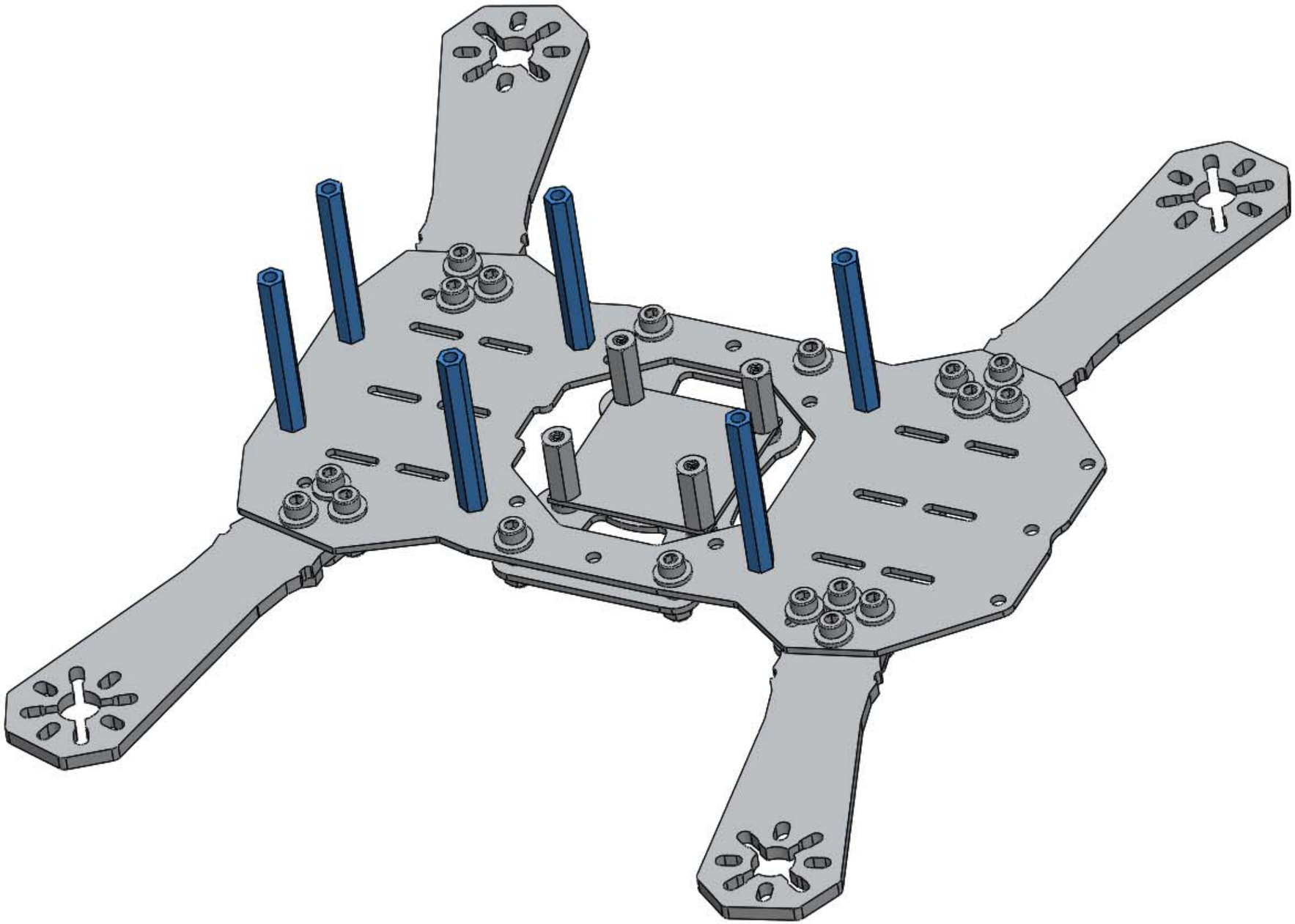
6 X Socket Head Screw (M3 X 10mm long x stainless steel)
6 X Standoff (Black aluminum M3 thread x 37mm long)

Assembly Process:

Install screws into the holes show. Thread a standoff onto each screw and torque down.







STEP 4

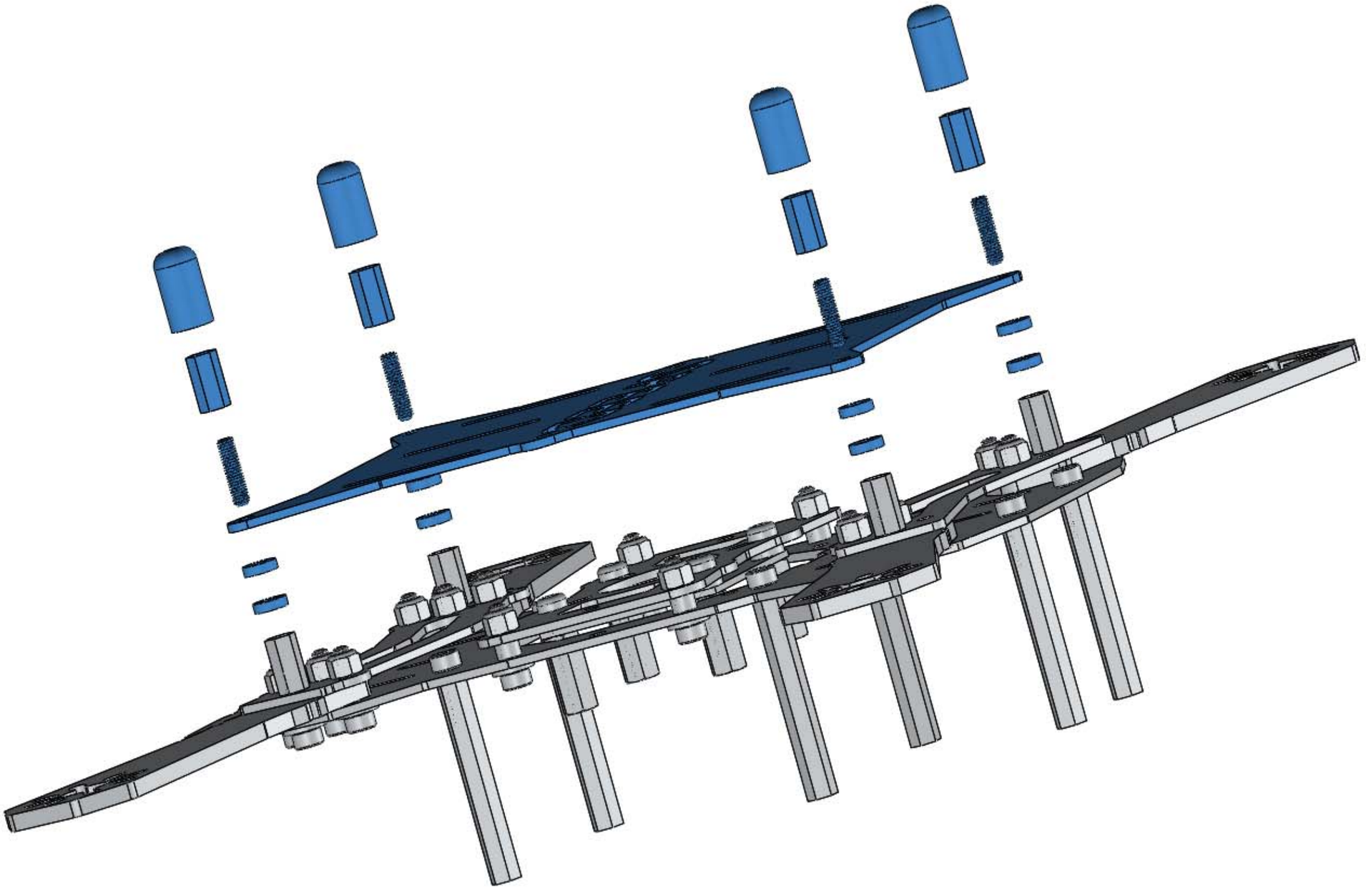
Parts Required:

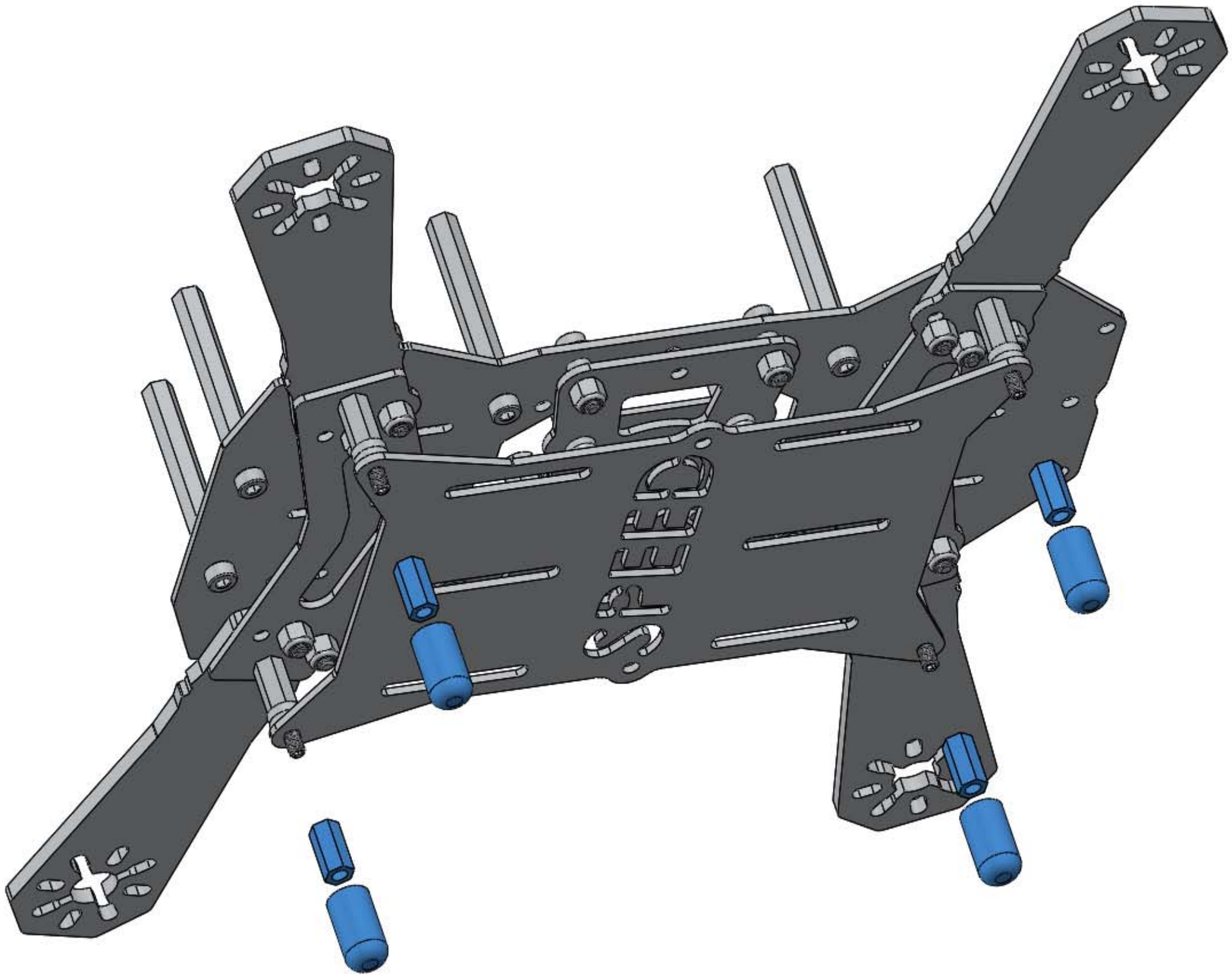
1 X Electronic Speed Controller Tray (1.5m CF)
4 X Standoff (Black aluminum M3 thread x 10mm long)
4 X Set screw (M3 X 12mm long x stainless steel)
8 X Washer (Black nylon 3mm hole)
4 X Landing Gear Feet (Black rubber)
4 X Electronic Speed Controller ***Sold separately***

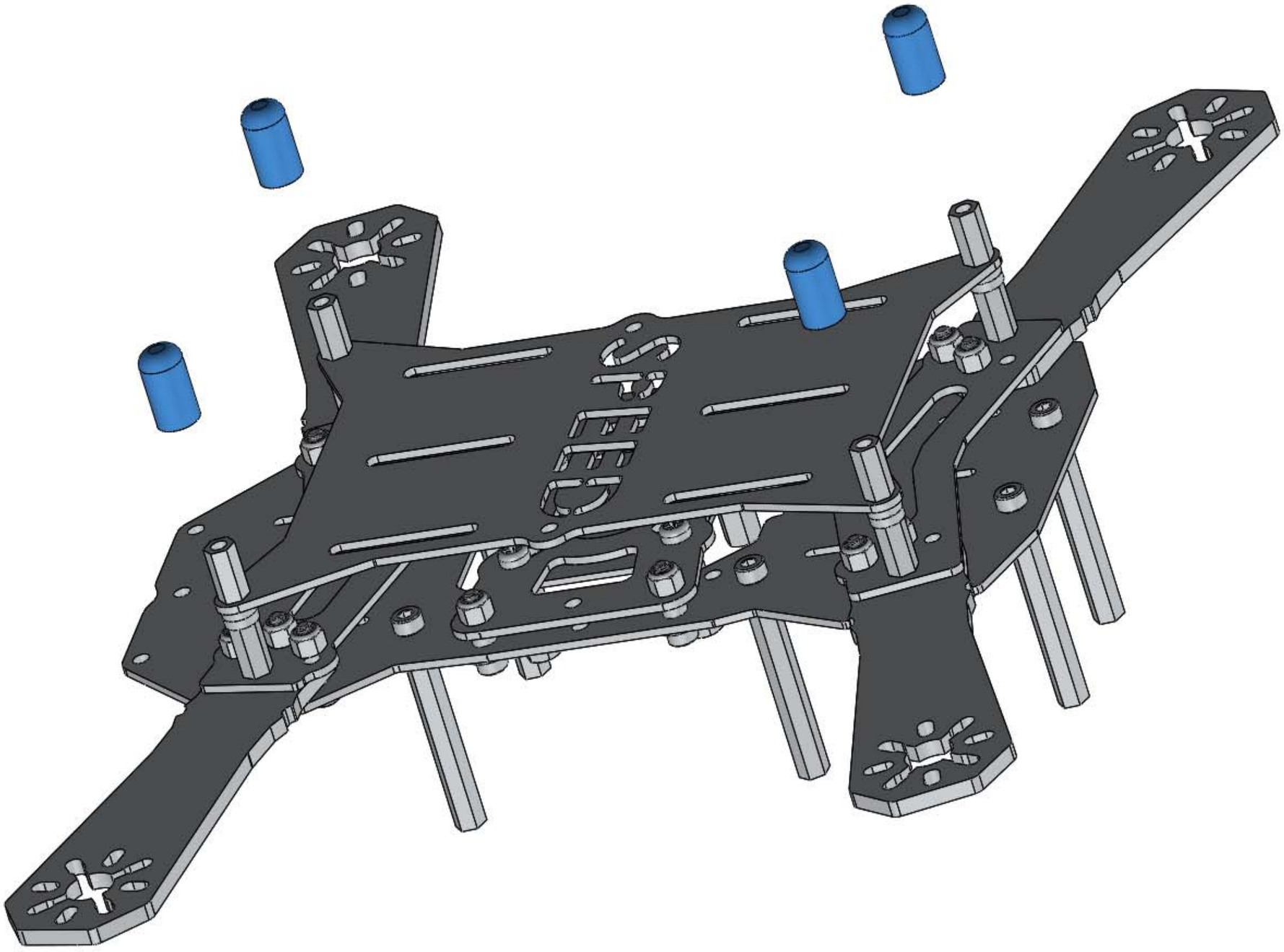
Assembly Process:

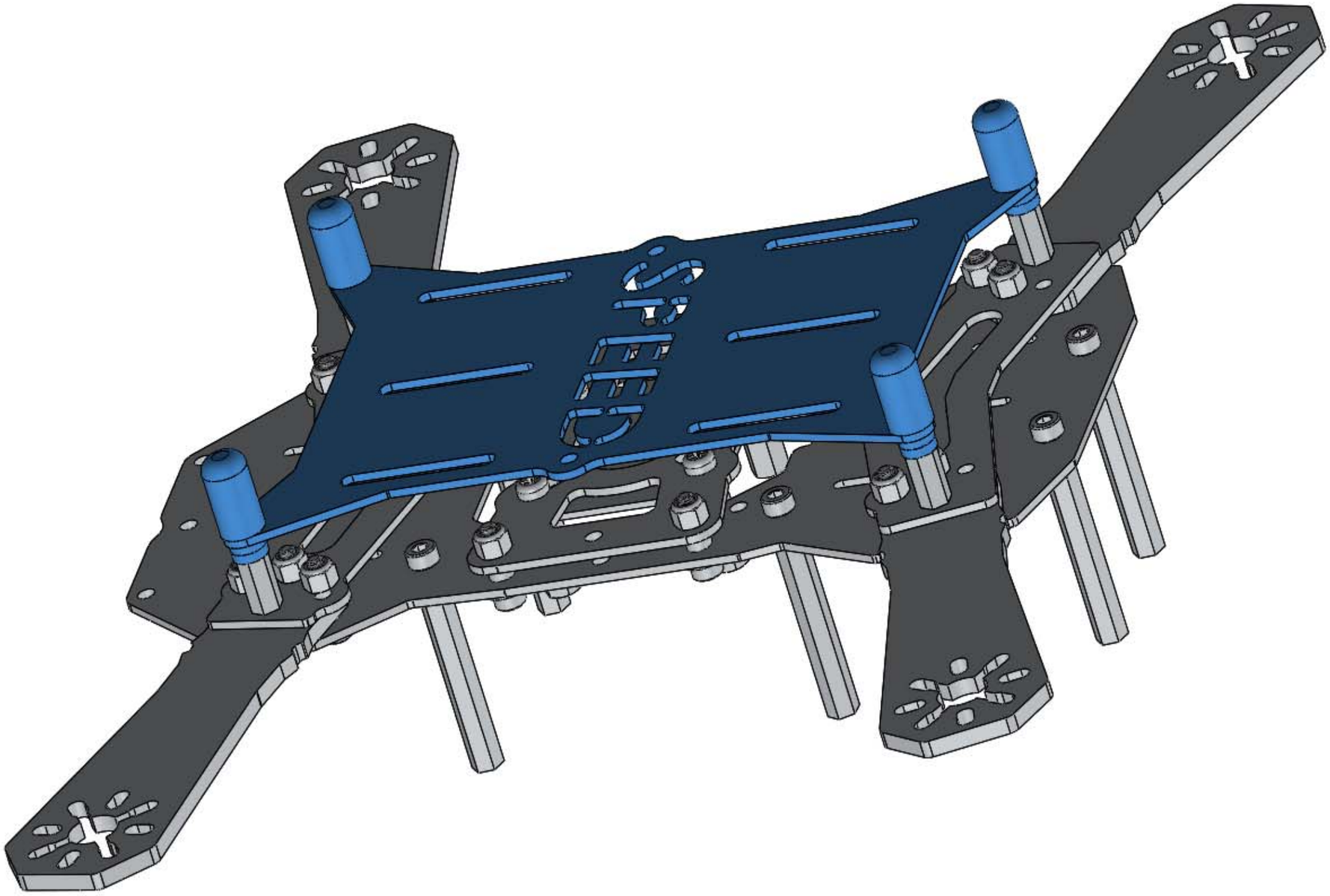
Mount your ESC's on the ESC tray. You can use whatever method you prefer, but we suggest double sided stick tape. If you prefer to use zip ties there are slots in the tray that can facilitate this. As you join the tray to the underside of the fuselage route the ESC wires up through the open holes on either side of the PDB board. You will soldier the ESC leads to your PDB board later (for more detailed instruction on this see our video tutorial on our website). There are 4 holes in the tray that mate up to the 4 standoffs on the bottom of the fuselage. Make sure to install 2 black nylon washers between each standoff and the tray. The purpose of these washers is to create more room for your ESC's. Thread the set screws into the standoffs such that about 5mm of the screw is exposed. We suggest to use loctite on these screws. Thread a standoff onto the exposed end of each set screw. Finally install a rubber landing gear foot onto each standoff.

Note – Electronic speed controllers are not shown graphically in this step for clarity









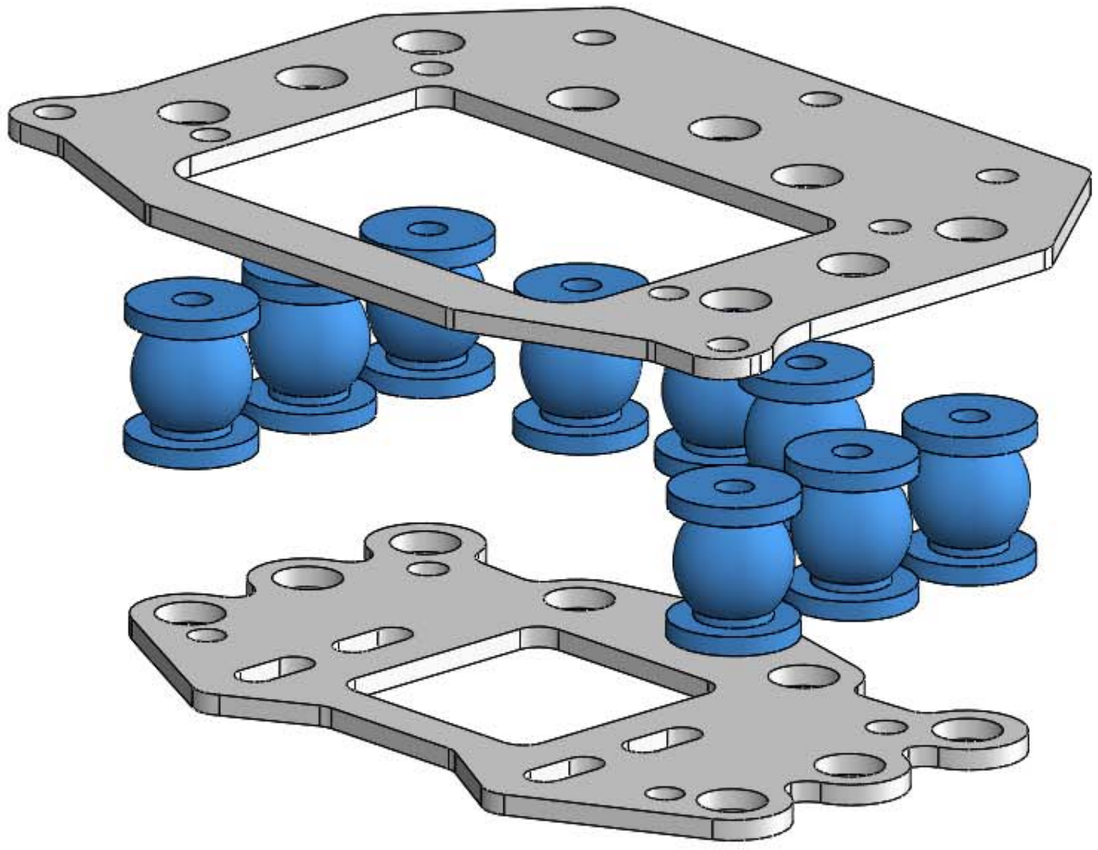
STEP 5

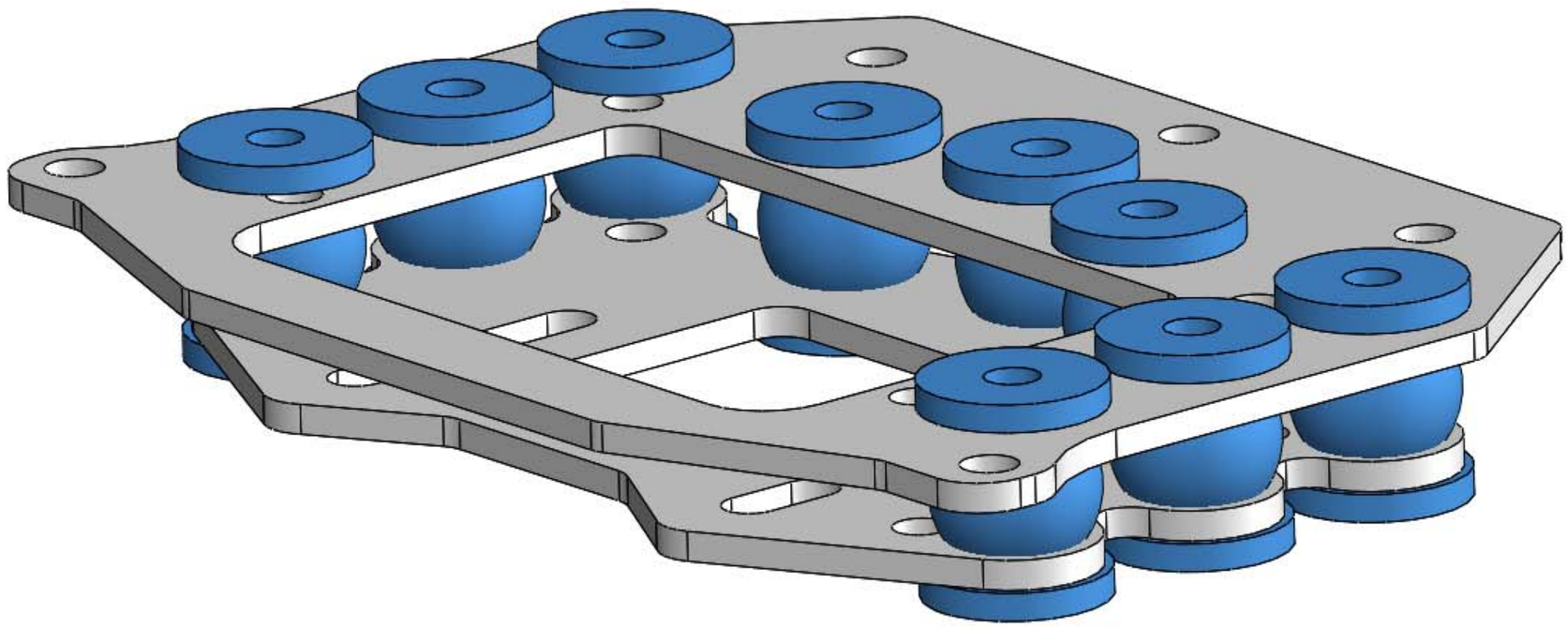
Parts Required:

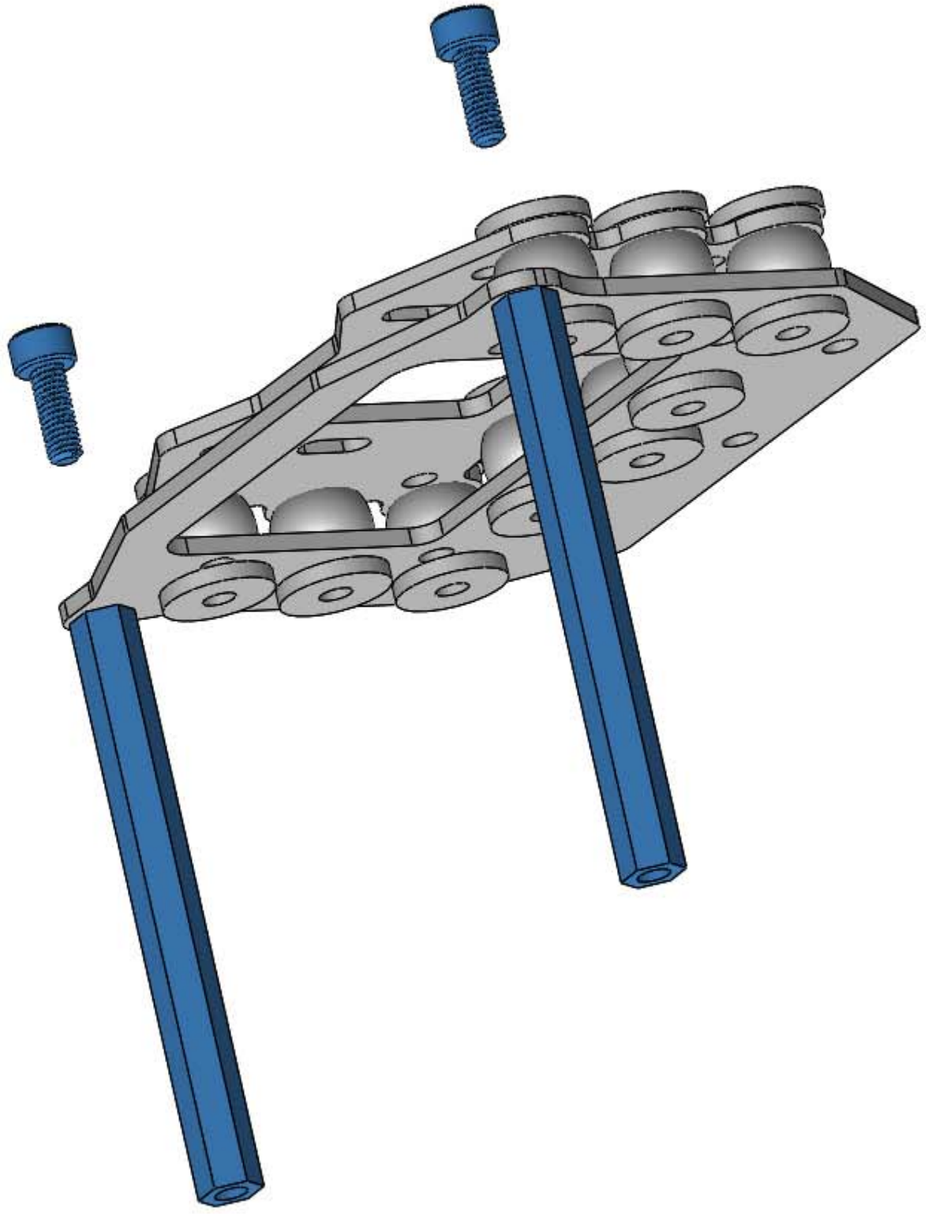
1 X POV Camera Cage Bottom Plate (1.5mm CF)
1 X POV Camera Cage Antivibration Plate (1.5mm CF)
9 X Catalyst Machineworks Vibration Damper – Dual Head
2 X Standoff (Black aluminum M3 thread x 50mm long)
2 X Socket Head Screw (M3 X 10mm long x stainless steel)

Assembly Process:

Install vibration dampers into the holes in the POV camera bottom plate. Then position the POV Camera Cage Antivibration Plate and pull each damper into place, one by one. You may use a blunt tool like an allen driver to aid installing the dampers but be careful not to tear the soft rubber material. Next position a standoff at each of the forward holes in the Camera Cage Bottom Plate and thread in a screw. Be sure to apply sufficient torque on these screws. This camera cage will withstand the brunt of crash impacts.







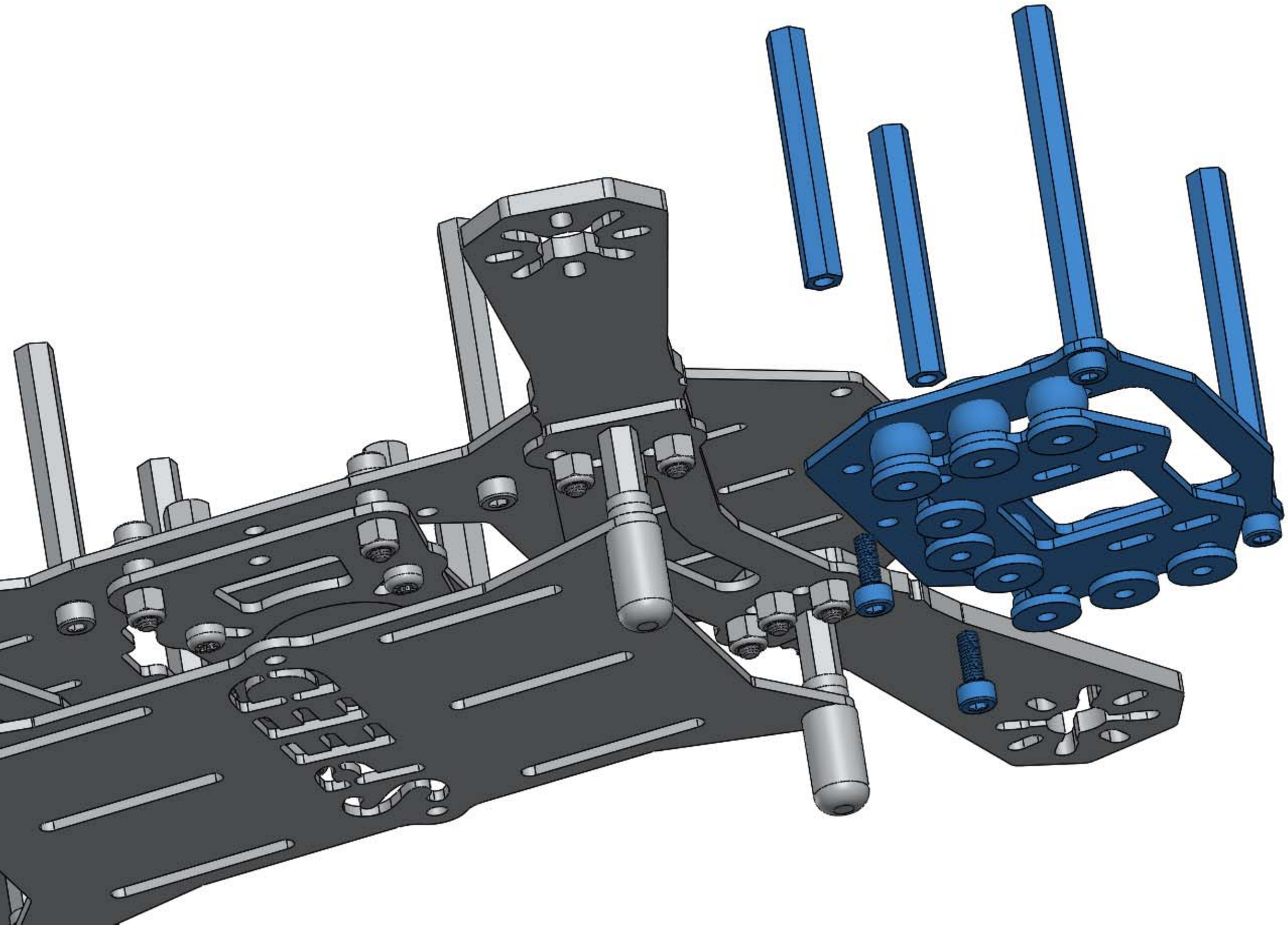
STEP 6

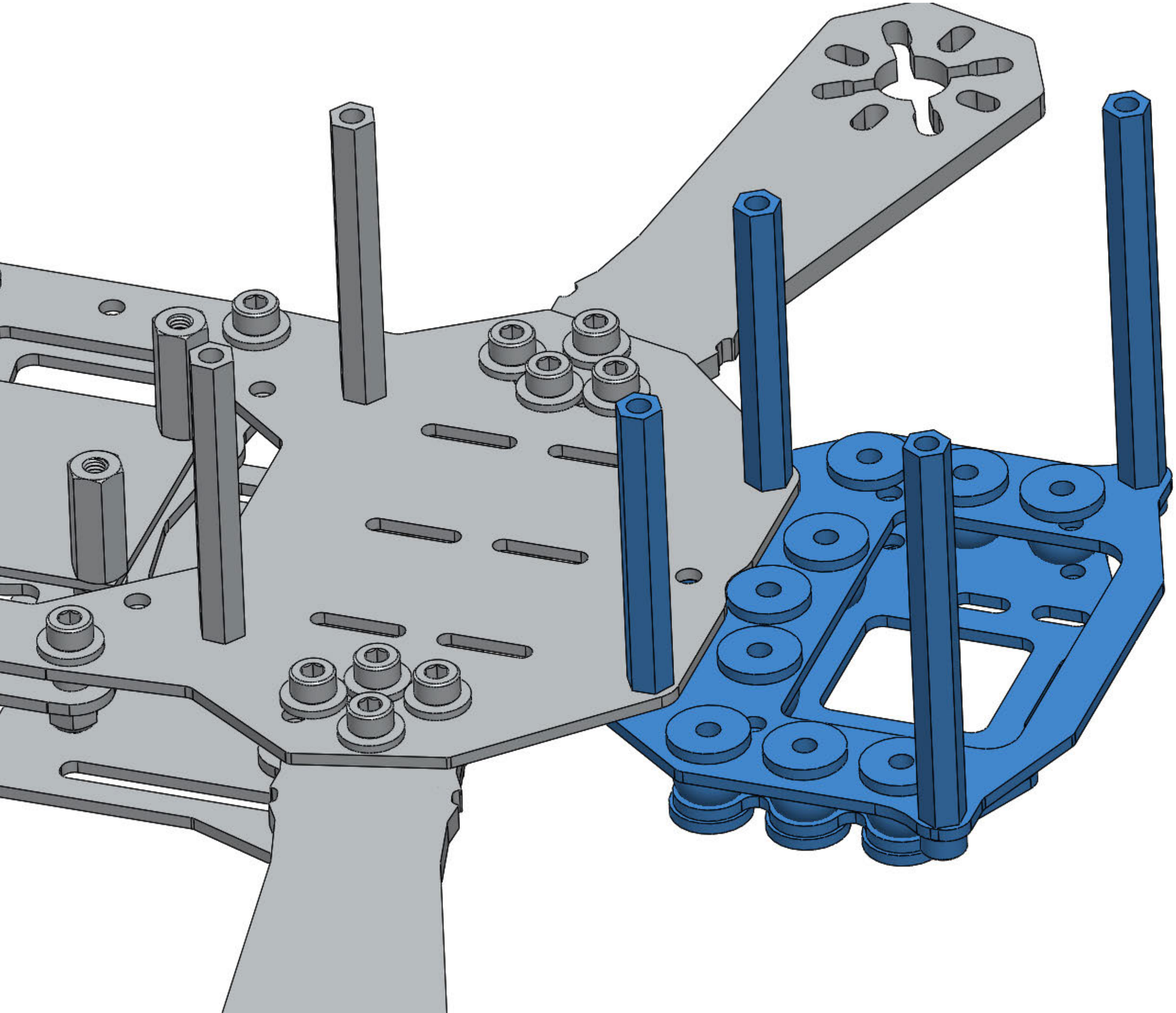
Parts Required:

1 X Partially Assembled POV Camera Cage (from last step)
2 X Standoff (Black aluminum M3 thread x 37mm long)
2 X Socket Head Screw (M3 X 10mm long x stainless steel)

Assembly Process:

Position the Camera Cage under the two holes shown then install one screw into each hole. Thread in a standoff and torque down. Be sure to apply sufficient torque on these screws. The camera cage will withstand the brunt of crash impacts.



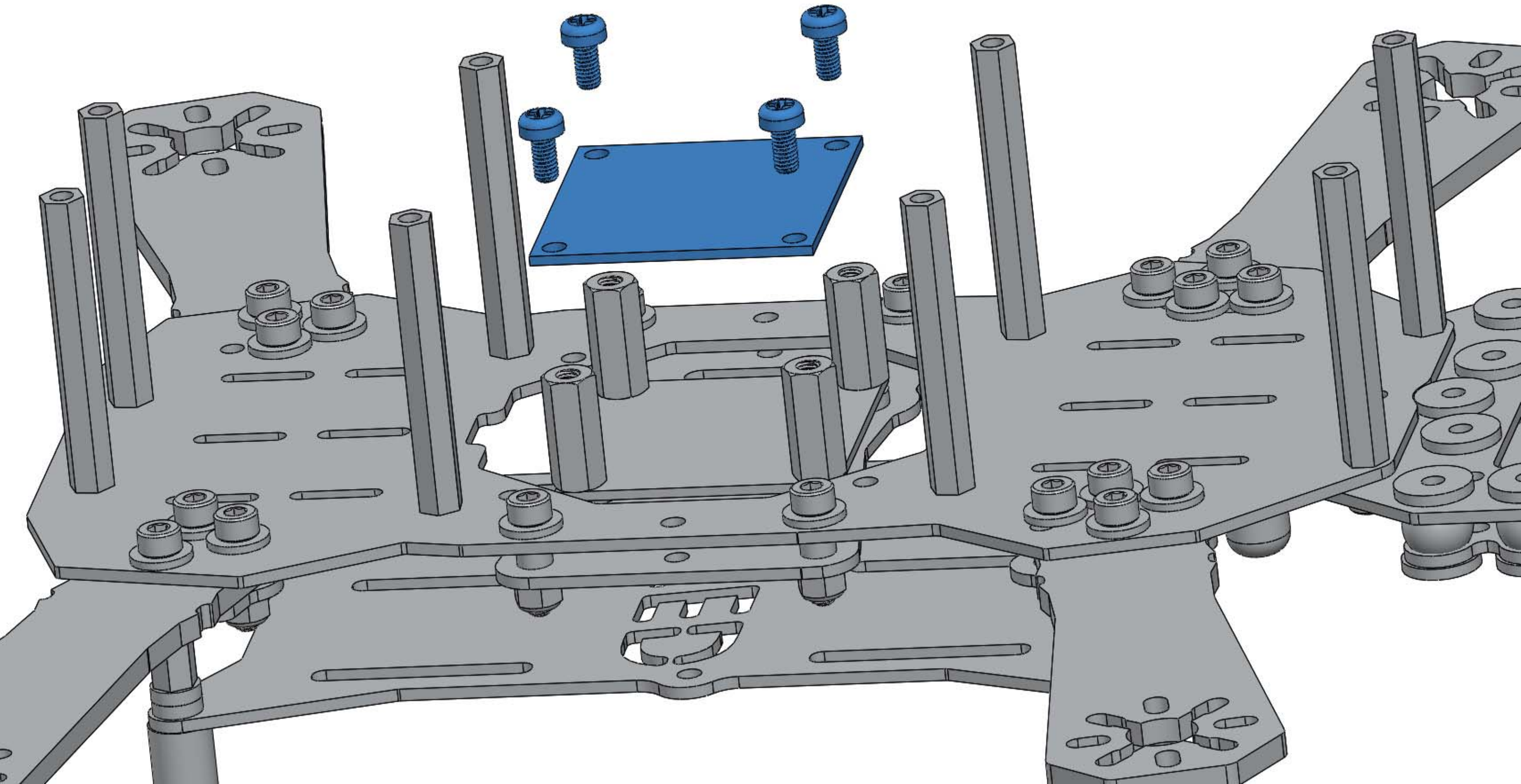


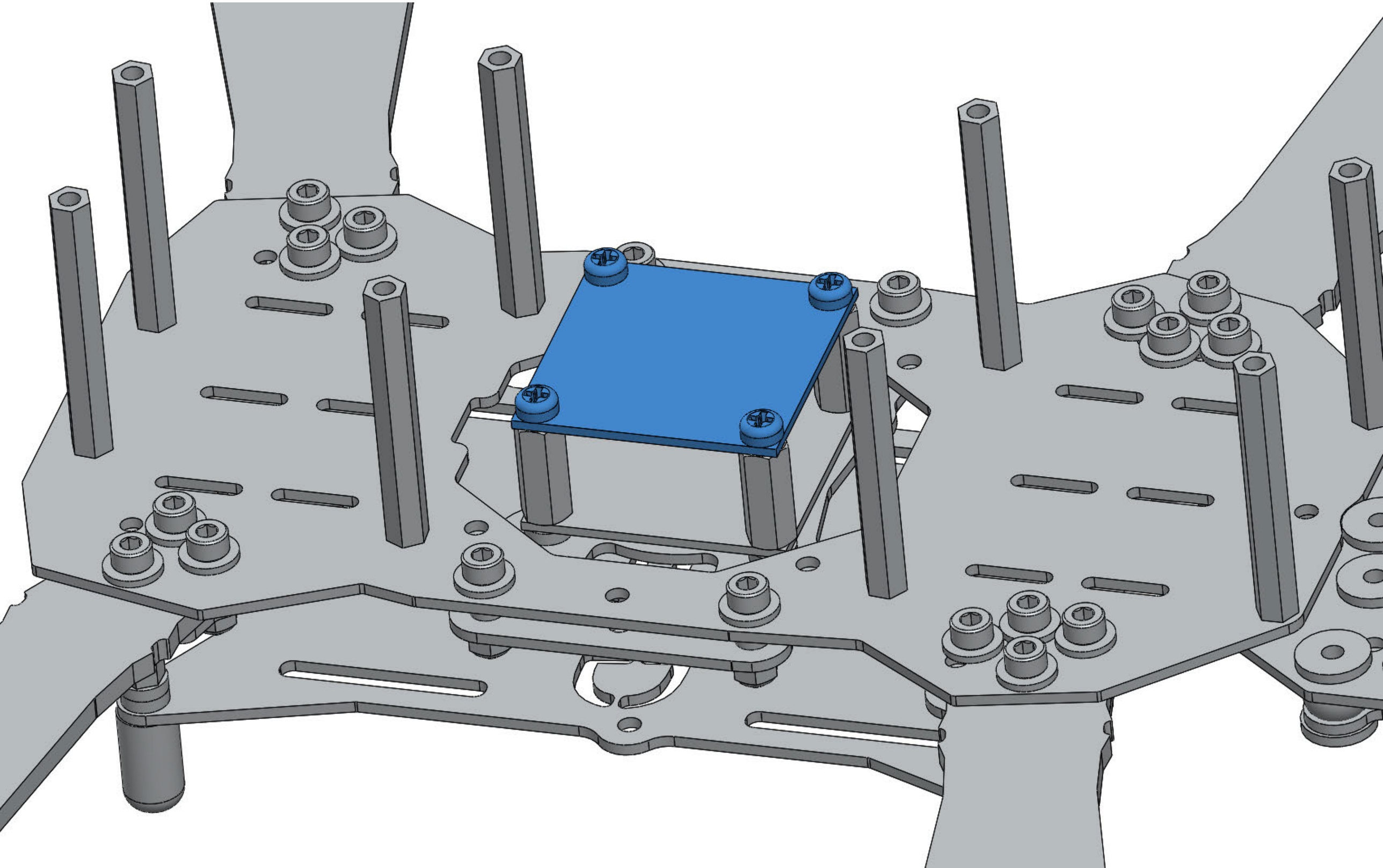
STEP 7

Parts Required:

4 X Flight Controller Screw (Black nylon M3 thread x 6mm long x phillips head)
1 X Flight Controller ***Sold separately***

Assembly Process:
Install your flight controller onto the standoffs at the center of the craft using the 4 nylon screws. We suggest to use a flight controller with bottom mount right angle header pins. This keeps ESC signal plug connection(s) under the flight controller and makes for a nice clean install. For a detailed explanation on flight controller install steps please see our tutorial video on our website.





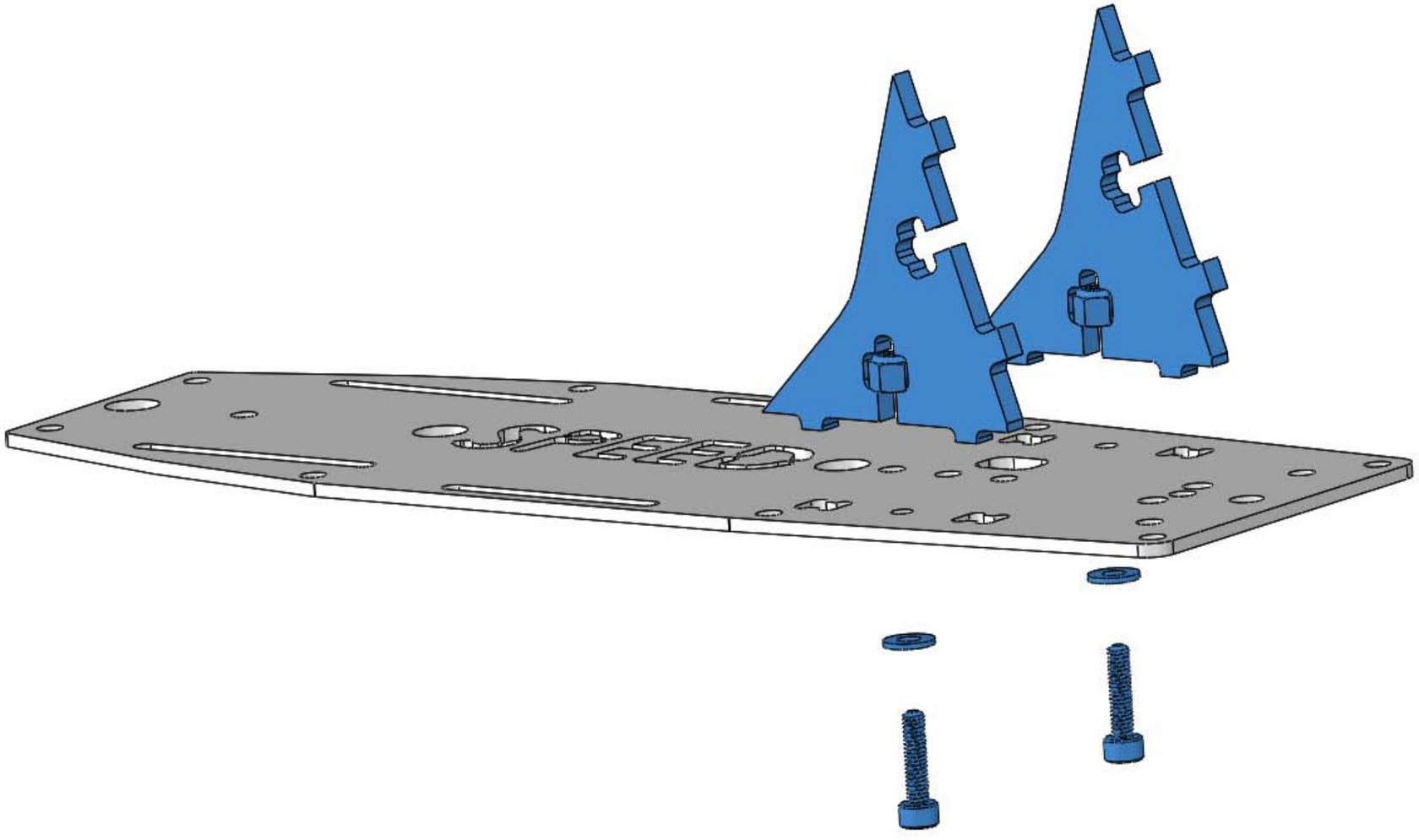
STEP 8

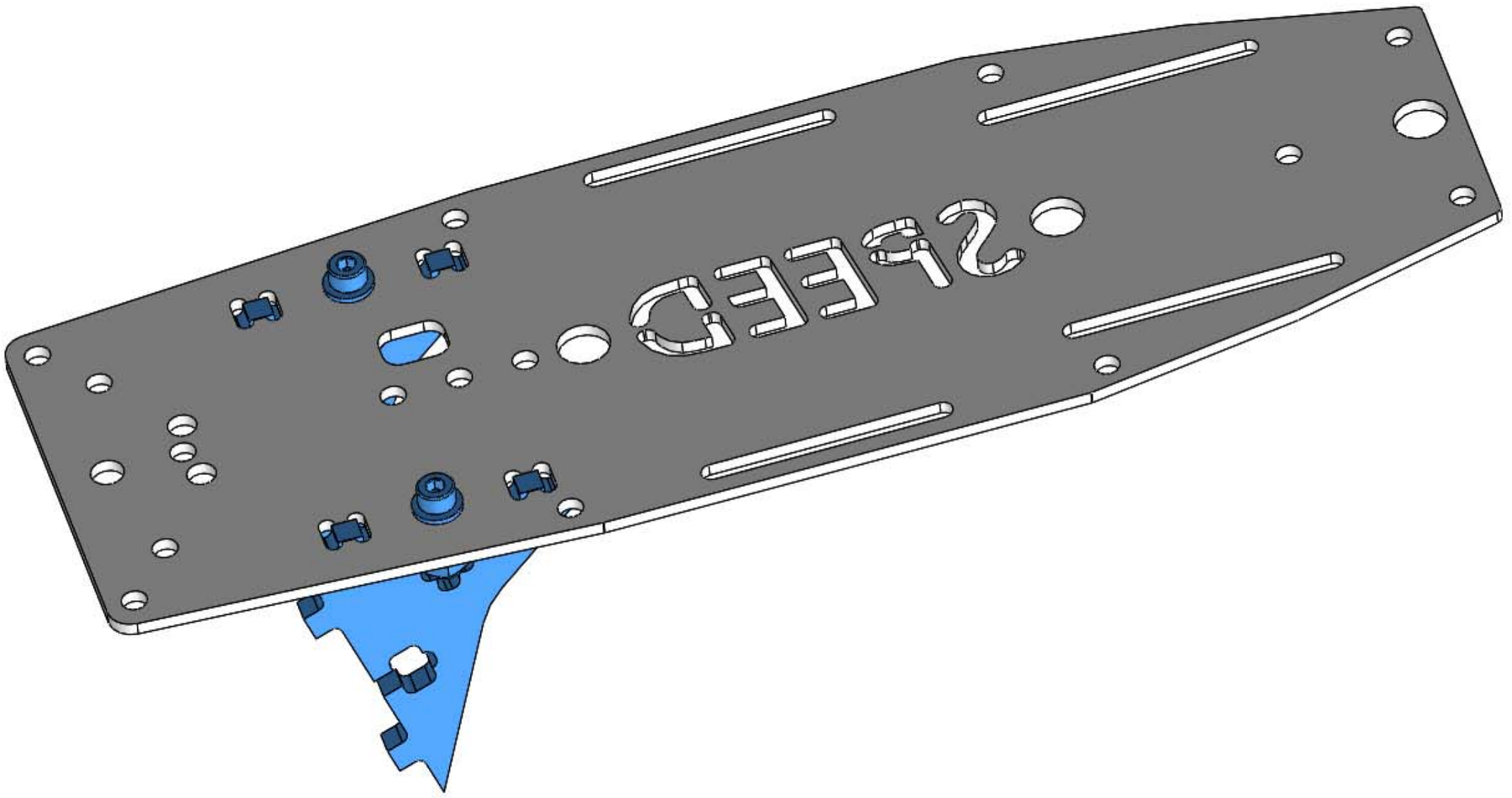
Parts Required:

1 X Top Fuselage Plate (1.5mm CF)
2 X FPV Camera Cage, Side Plate (3mm CF)
2 X Socket Head Screw (M2.5 X 10mm long x stainless steel)
2 X Washer (M2.5 x stainless steel)
2 X Nylock Nut (M2.5 x stainless steel)
1 X Standoff (Black aluminum M3 thread x 10mm long)
1 X Socket Head Screw (M3 X 5mm long x stainless steel)

Assembly Process:

With a washer in place, pass a M2.5 screw up through the holes in the Fuselage Plate as shown. Position each FPV Camera Cage Side Plate into the corresponding slots on the Fuselage Plate. Please note there are two different sizes of tabs in the sides plates. The smaller tabs interface with the slots. The larger tabs should be oriented out. Install a Nylock Nut in each side plate and torque the screws such that they pull the side plate tight against the Fuselage plate. Next install the standoff using the M3 X 5mm screw.

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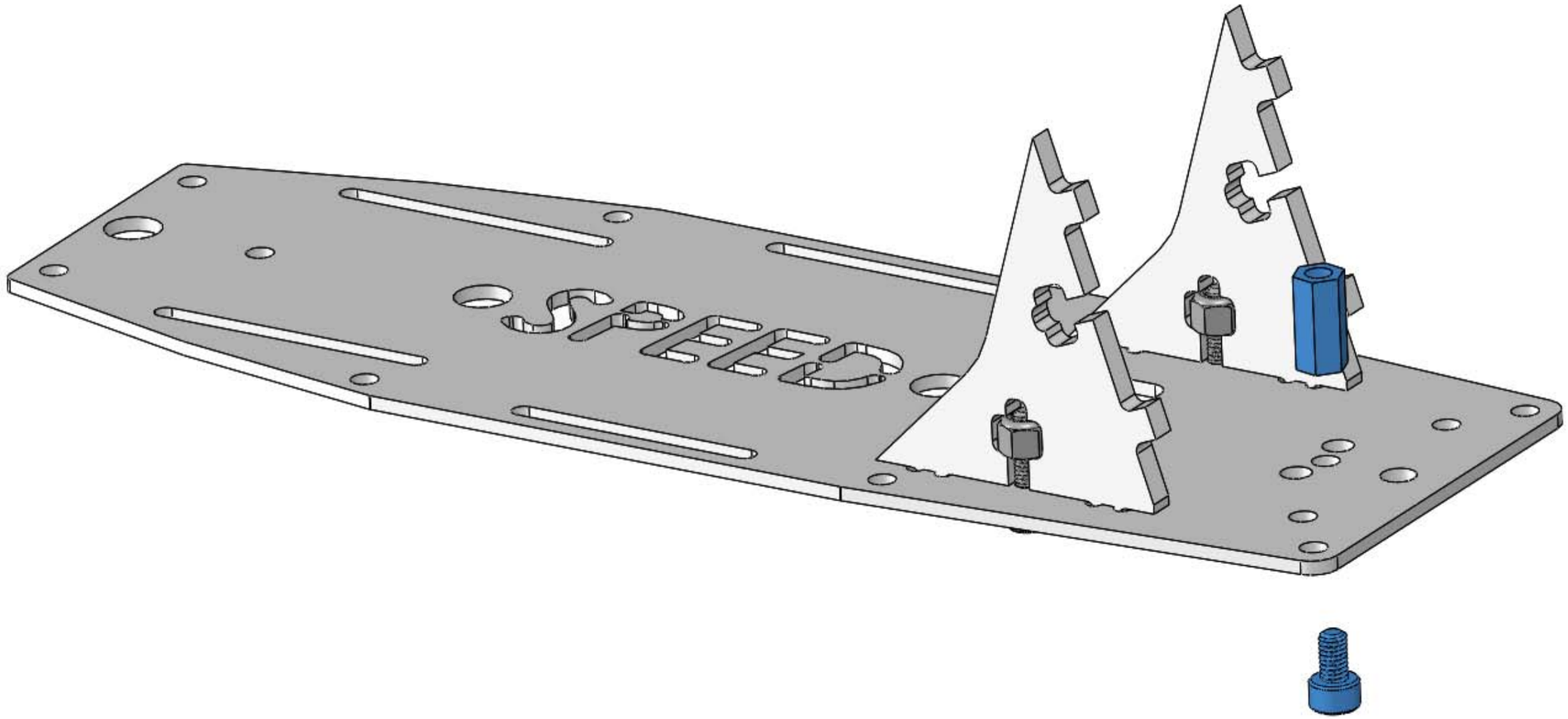
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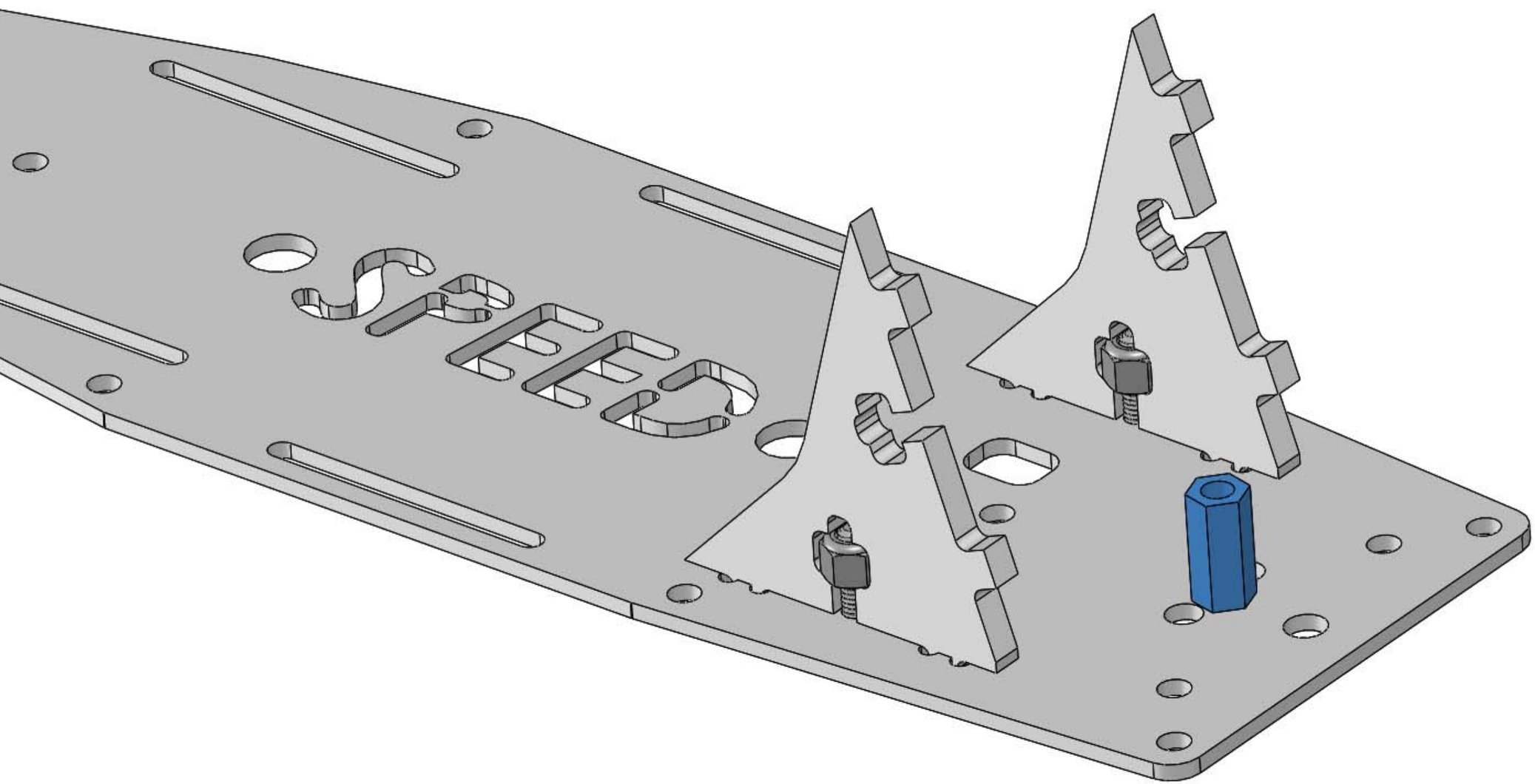
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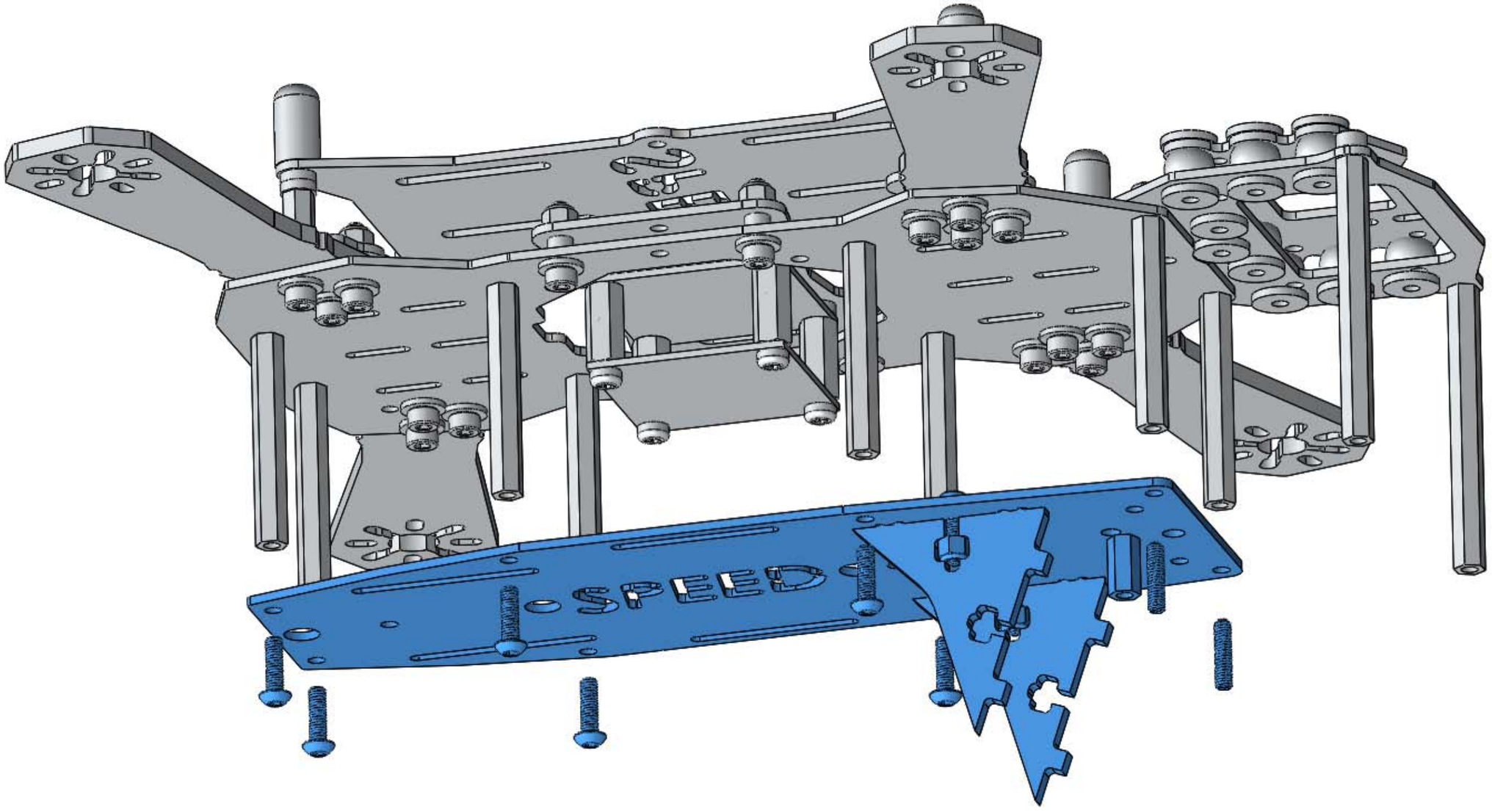
STEP 9

Parts Required:

1 X Partially Assembled Top Fuselage Plate (from step 8)
6 X Button Head Screw (M3 X 10mm long x stainless steel)
2 X Set screw (M3 X 12mm long x stainless steel)
2 X Standoff (Black aluminum M3 thread x 10mm long)
1 X POV Camera Cage Top Plate (3mm CF)
2 X Socket Head Screw (M3 X 10mm long x stainless steel)
3 X Socket Head Screw (M3 X 8mm long x stainless steel)
1 X Button Head Screw (M3 X 8mm long x stainless steel)
1 X Nylock Nut (M3 x stainless steel)

Assembly Process:

Install the Top Fuselage Plate onto the standoffs of the Bottom Fuselage Plate using the 10mm long button head screws and the 12mm long set screws. Install the set screws such that there is 4mm of the screw exposed. We suggest to use loctite on these screws. Install standoffs onto the exposed set screws. Next install the POV Camera Cage Top Plate using the required screws. The 10mm long socket screws go into the two front holes, the 8mm long socket screws go into the middle holes, and the 8mm long button screw goes into the rear hole. Finally install the last 8mm long socket head screw into the bottom hole shown. Thread on a nylock nut on it and torque down. Be sure to apply sufficient torque on all of these screws. The camera cage will withstand the brunt of crash impacts.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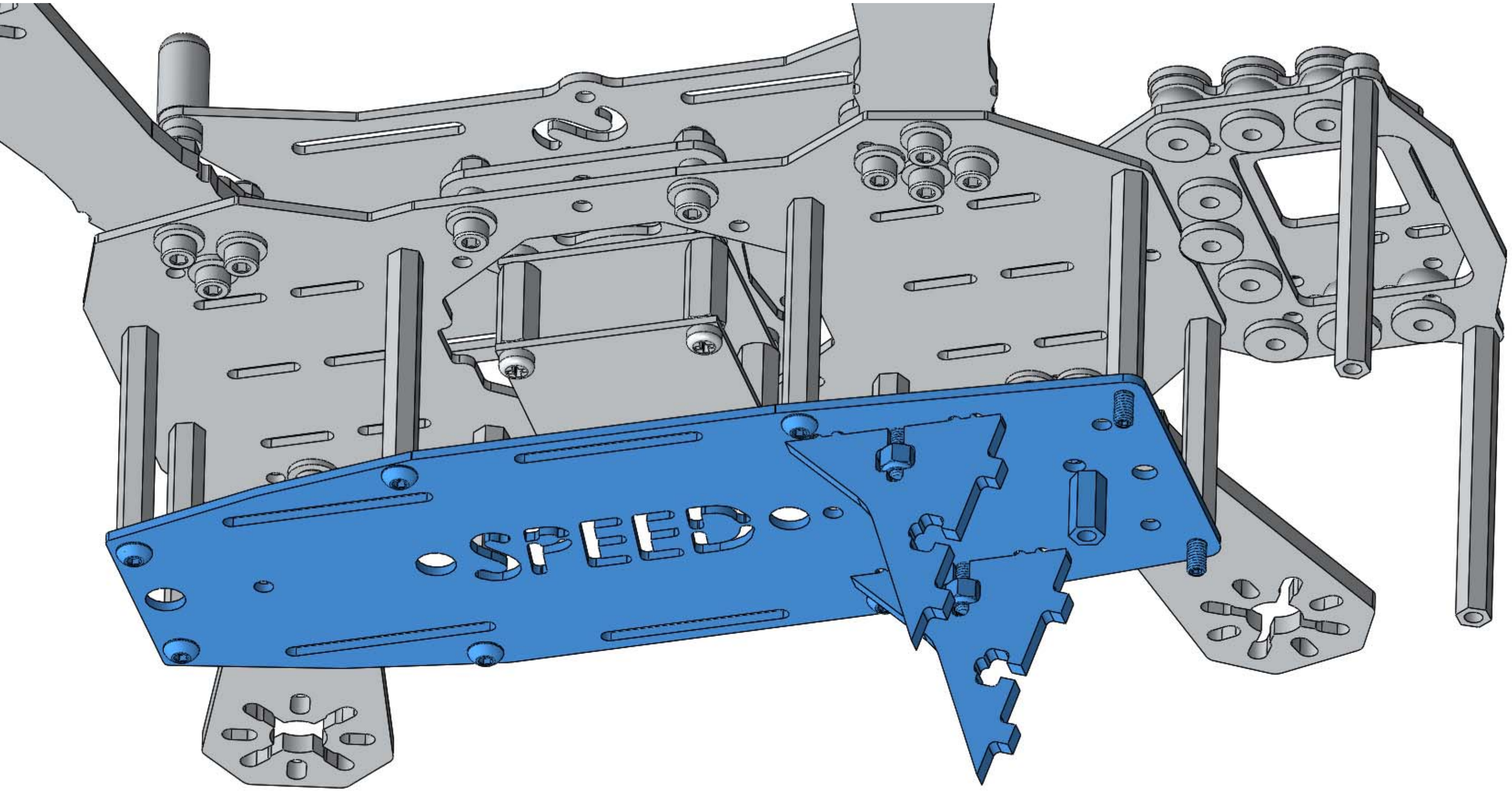
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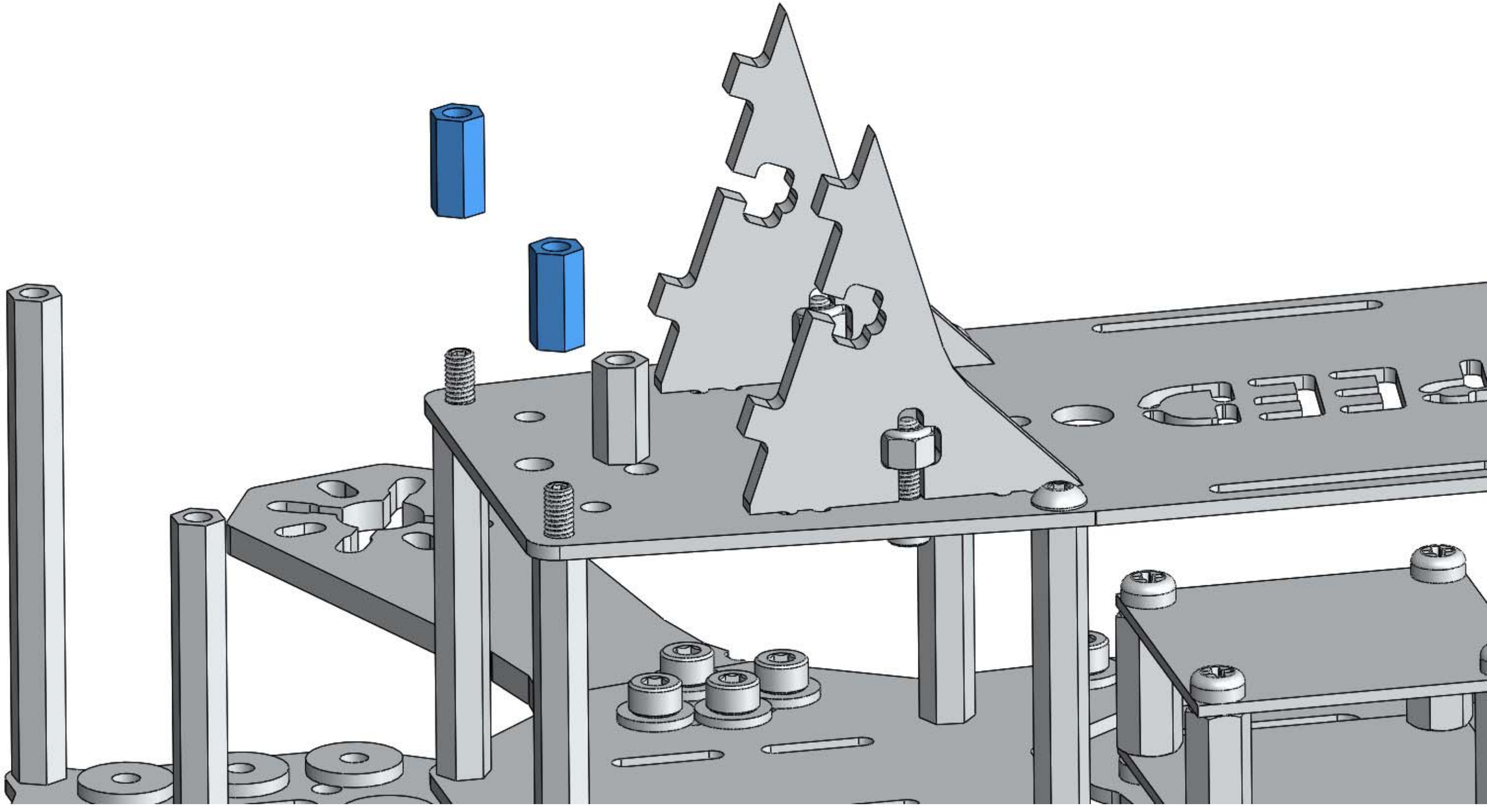

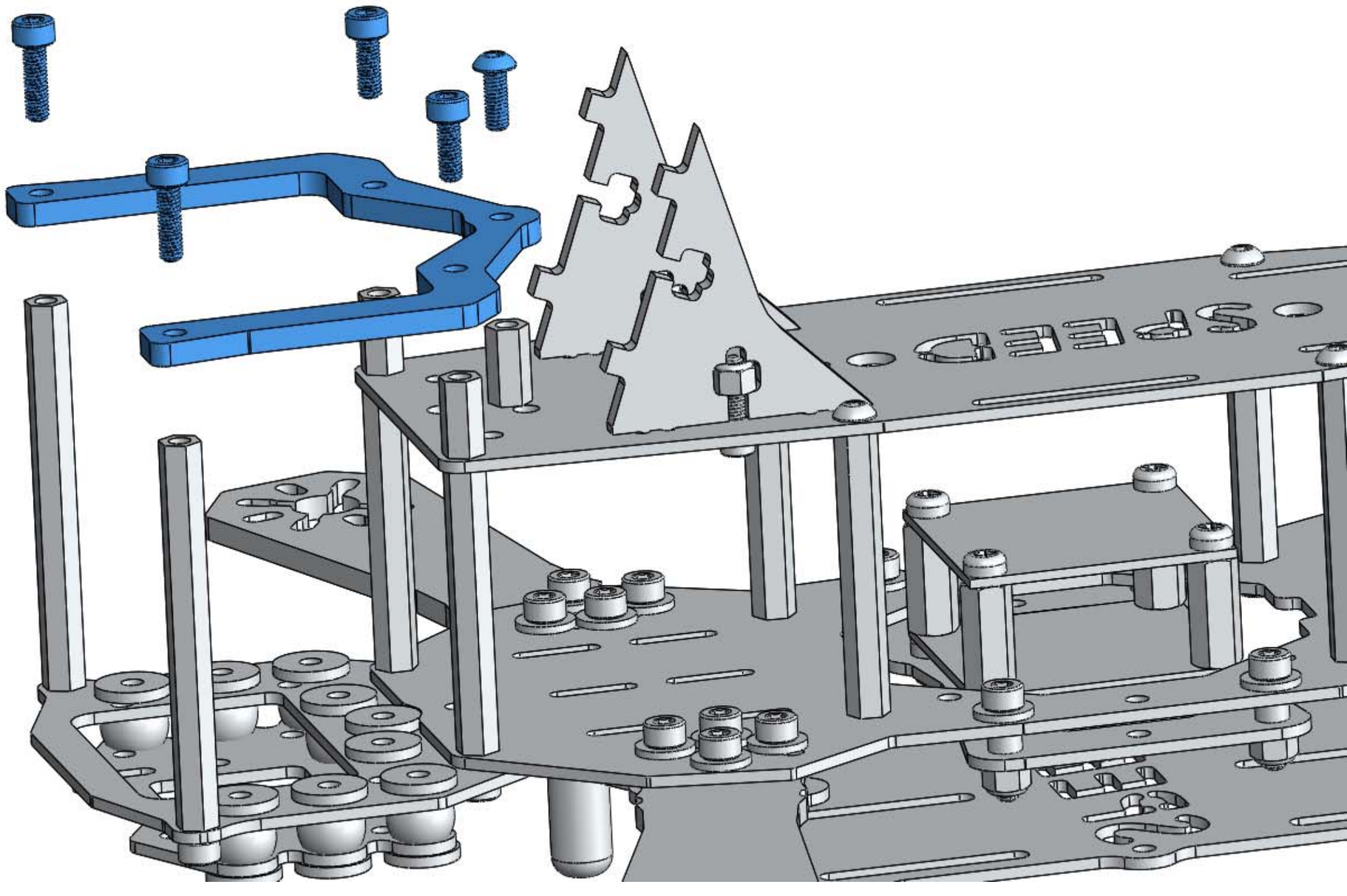
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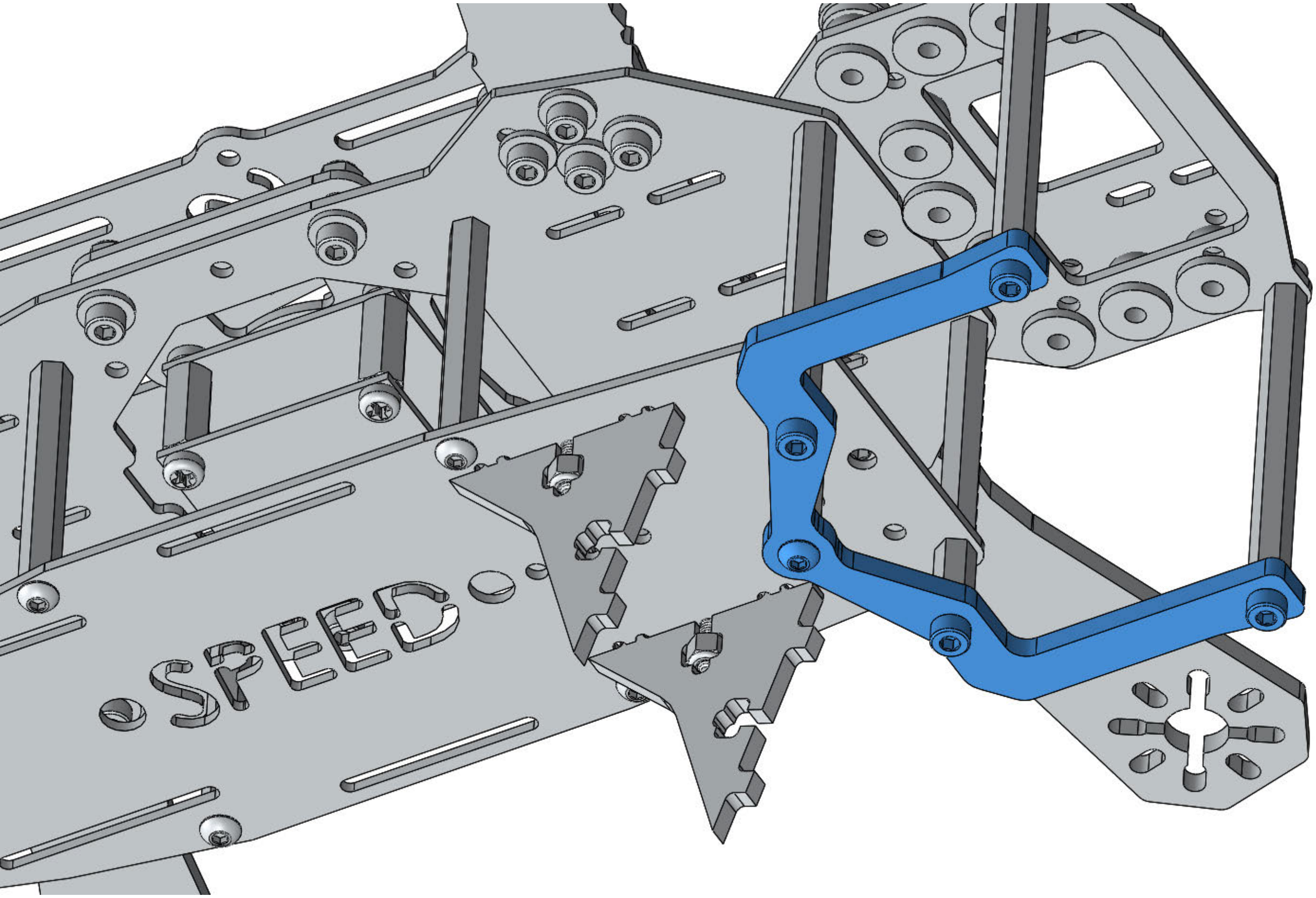
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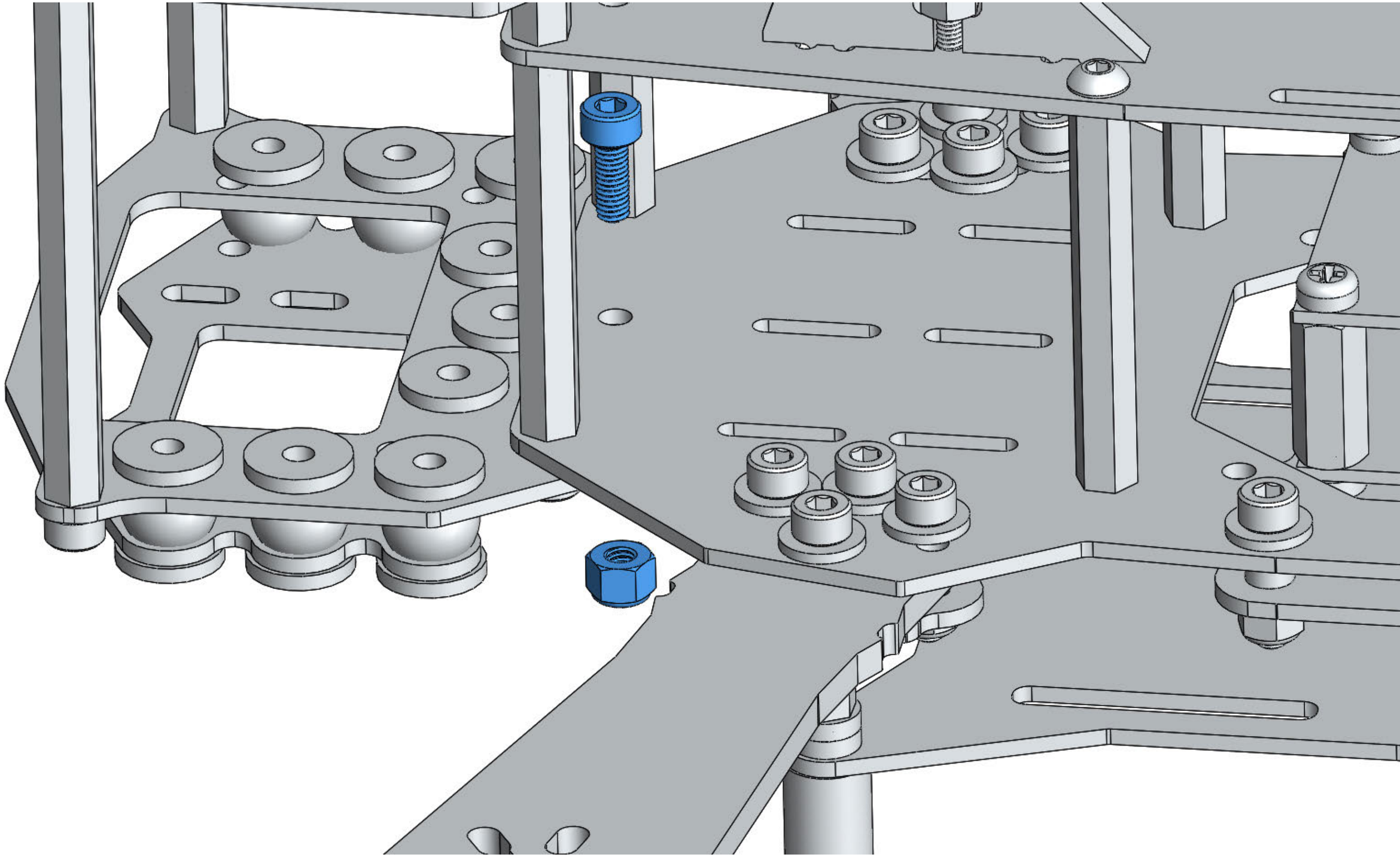
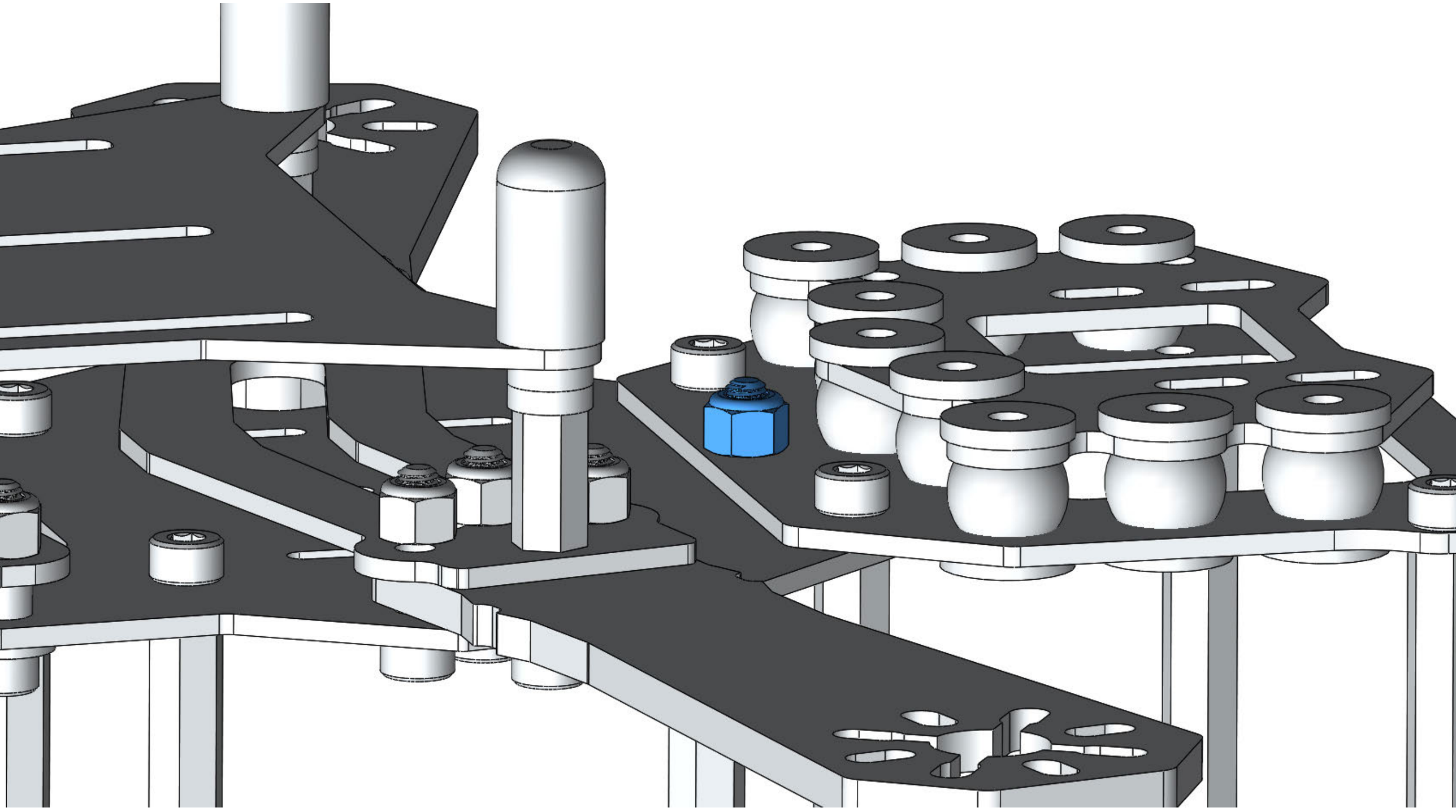


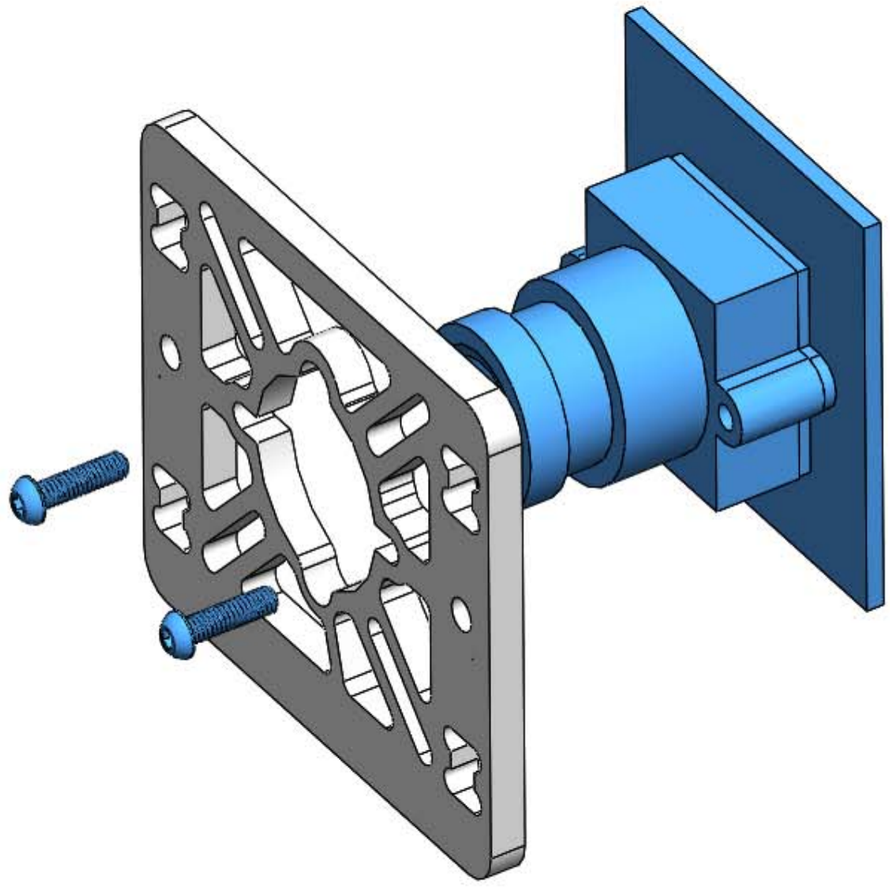


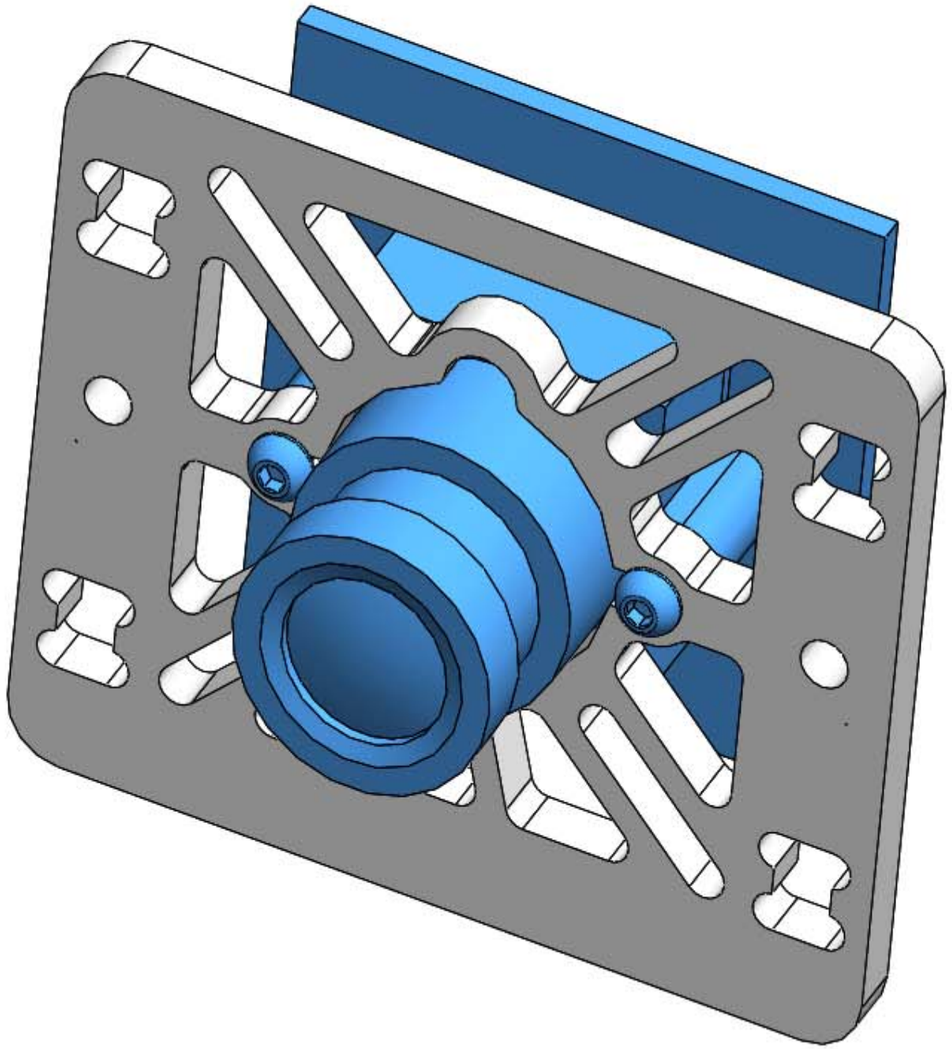
STEP 10

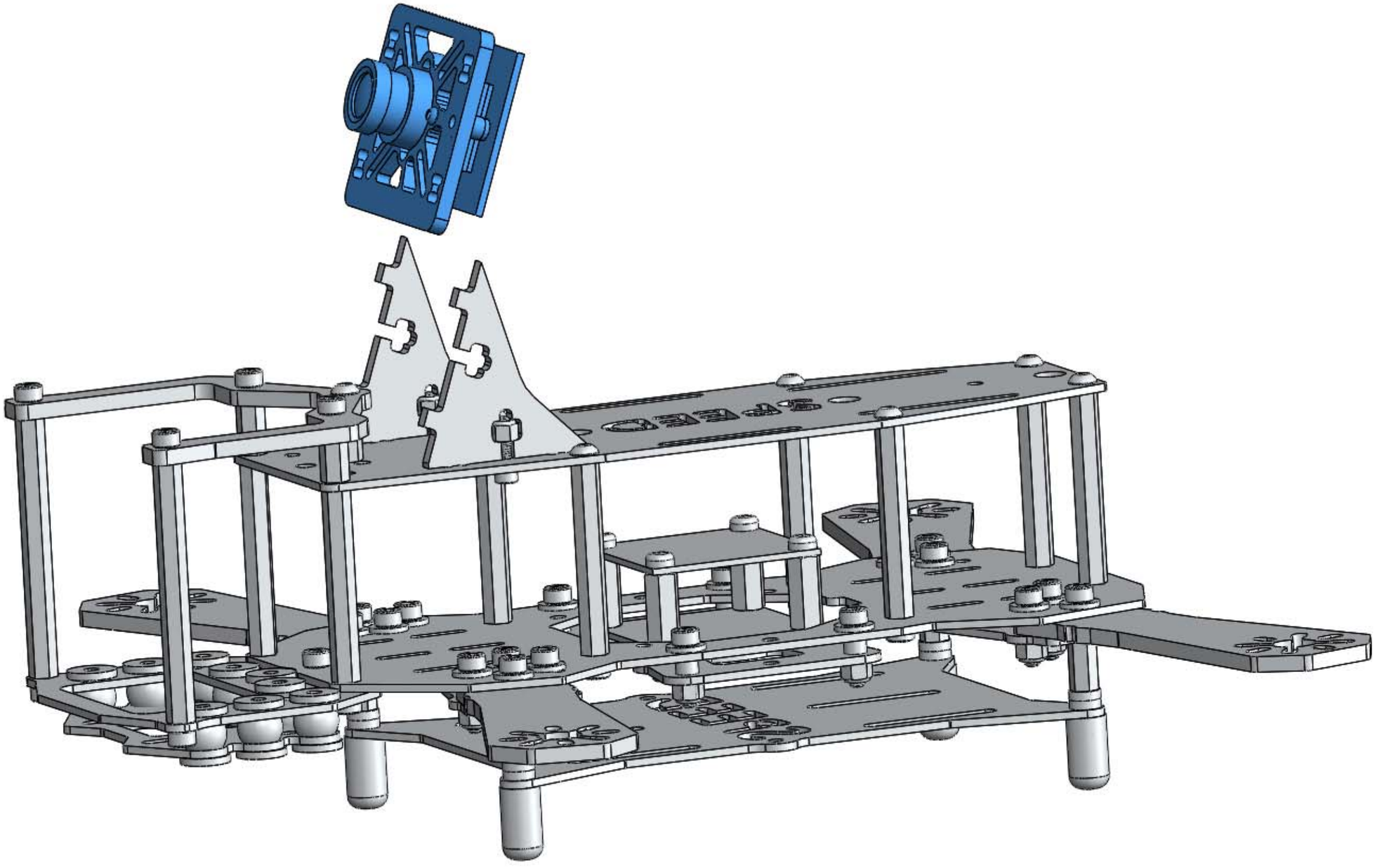
Parts Required:

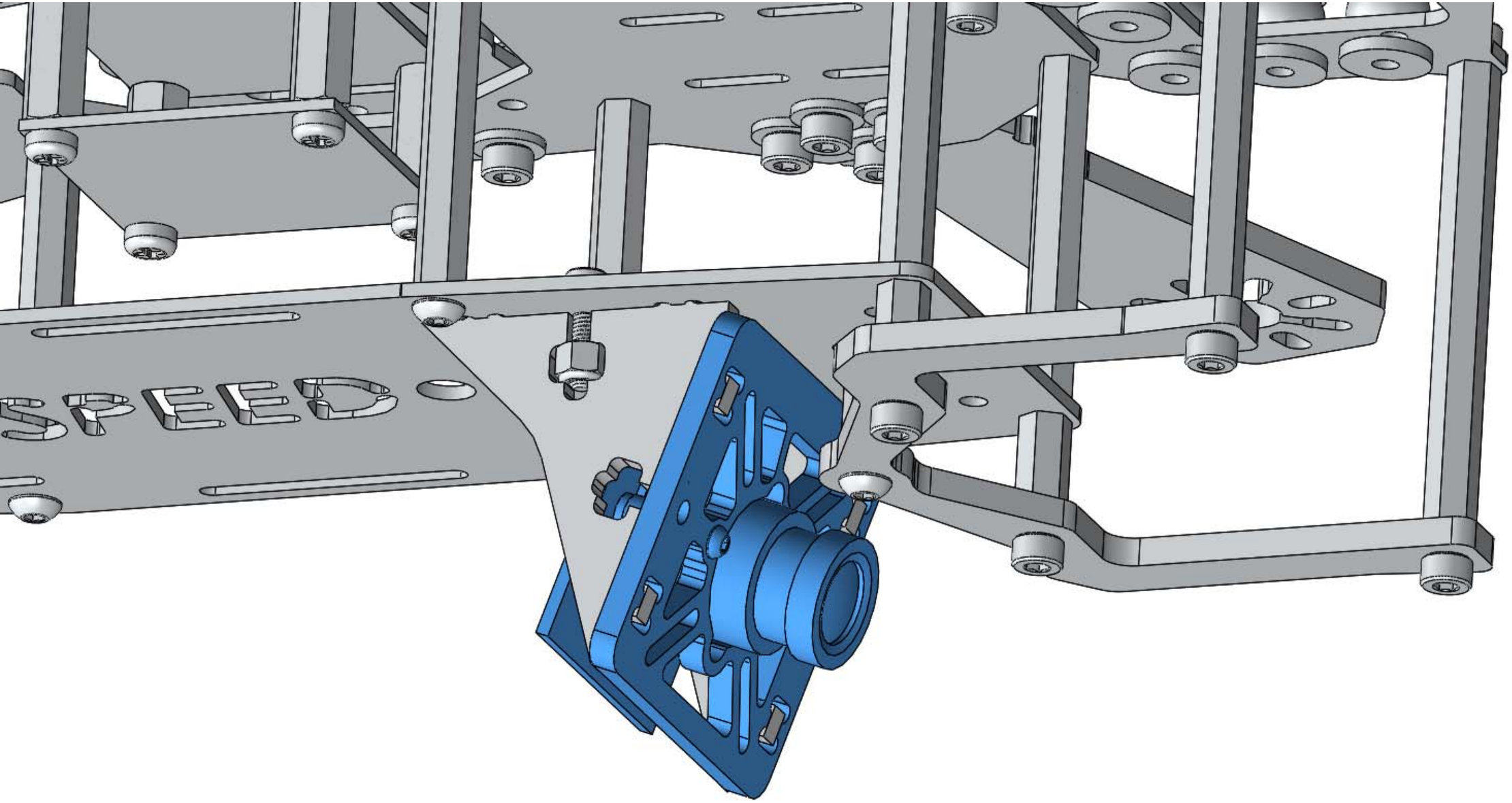
1 X FPV Camera Cage, Front Plate (3mm CF)
1 X FPV Board Camera ***Sold Separately***
2 x FPV Board Camera Mount Screws ***Sold Separately – These should be included with your camera***
2 X Socket Head Screw (M2.5 X 14mm long x stainless steel)
2 X Washer (M2.5 x stainless steel)
2 X Nylock Nut (M2.5 x stainless steel)
1 X FPV Camera Lense guard (3D Printed Black Plastic)

Assembly Process:
Orient the FPV Camera Cage Front Plate as shown and install your camera using the screws supplied with it. Next install the assembly onto the Camera Cage Side Plate tabs as shown. With the Lense Guard in position, use the M2.5 fasteners to pull the Camera Cage Front Plate tight against the side plates. In order to torque these screws tight you will need to pass needle nose pliers down into the nylock nut and hold it in place while turning the M2.5 screw. Be careful not to damage your camera's board during this process.





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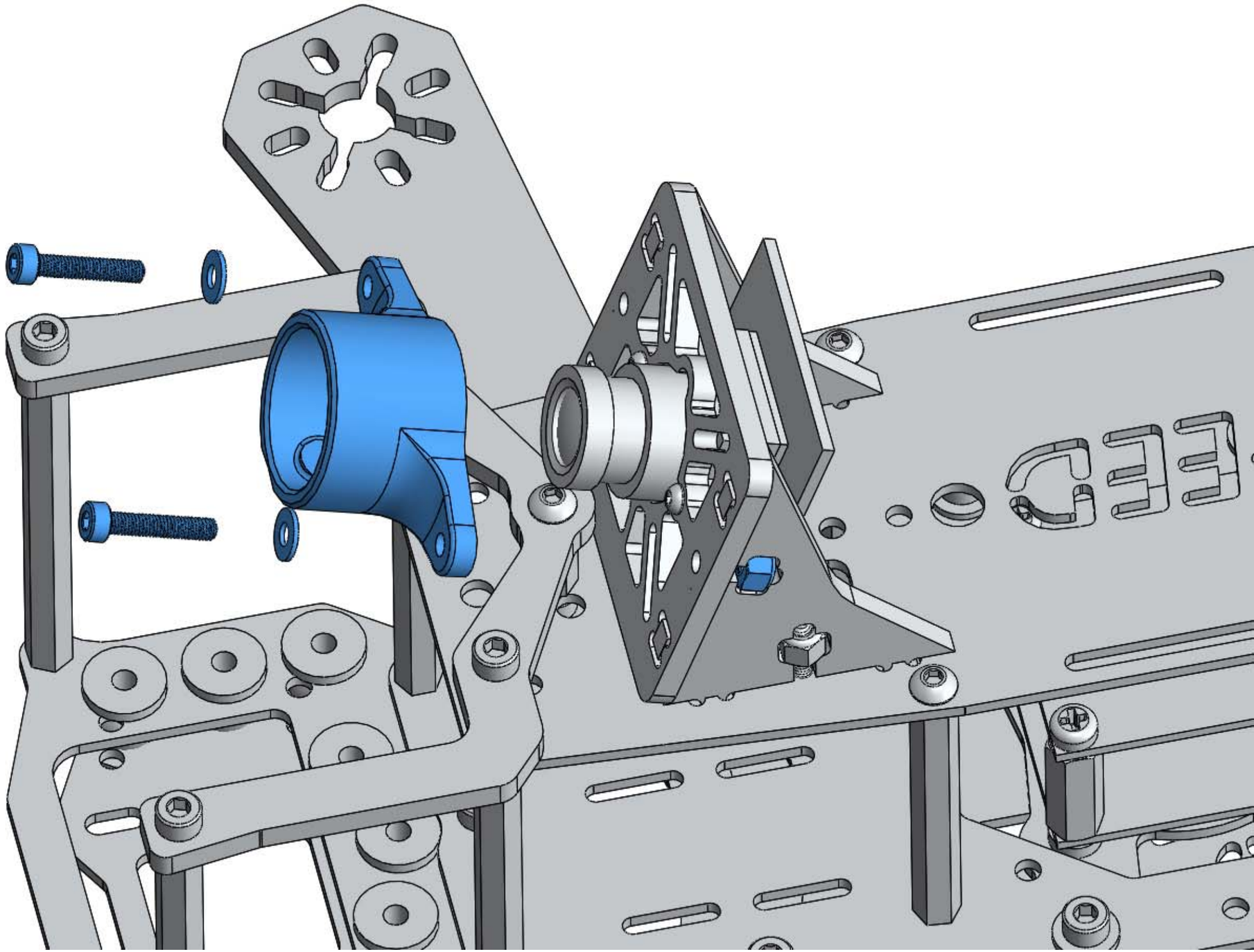
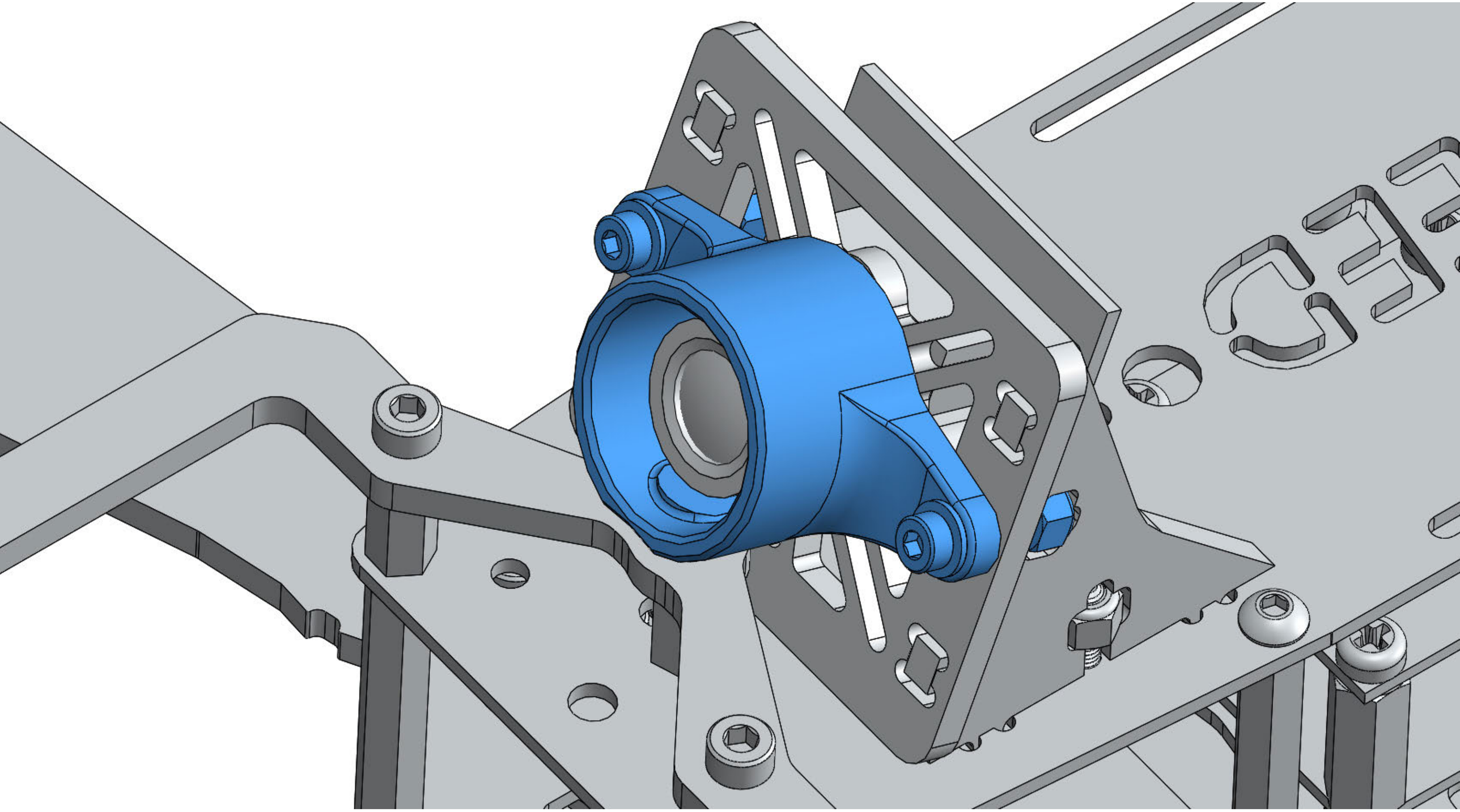




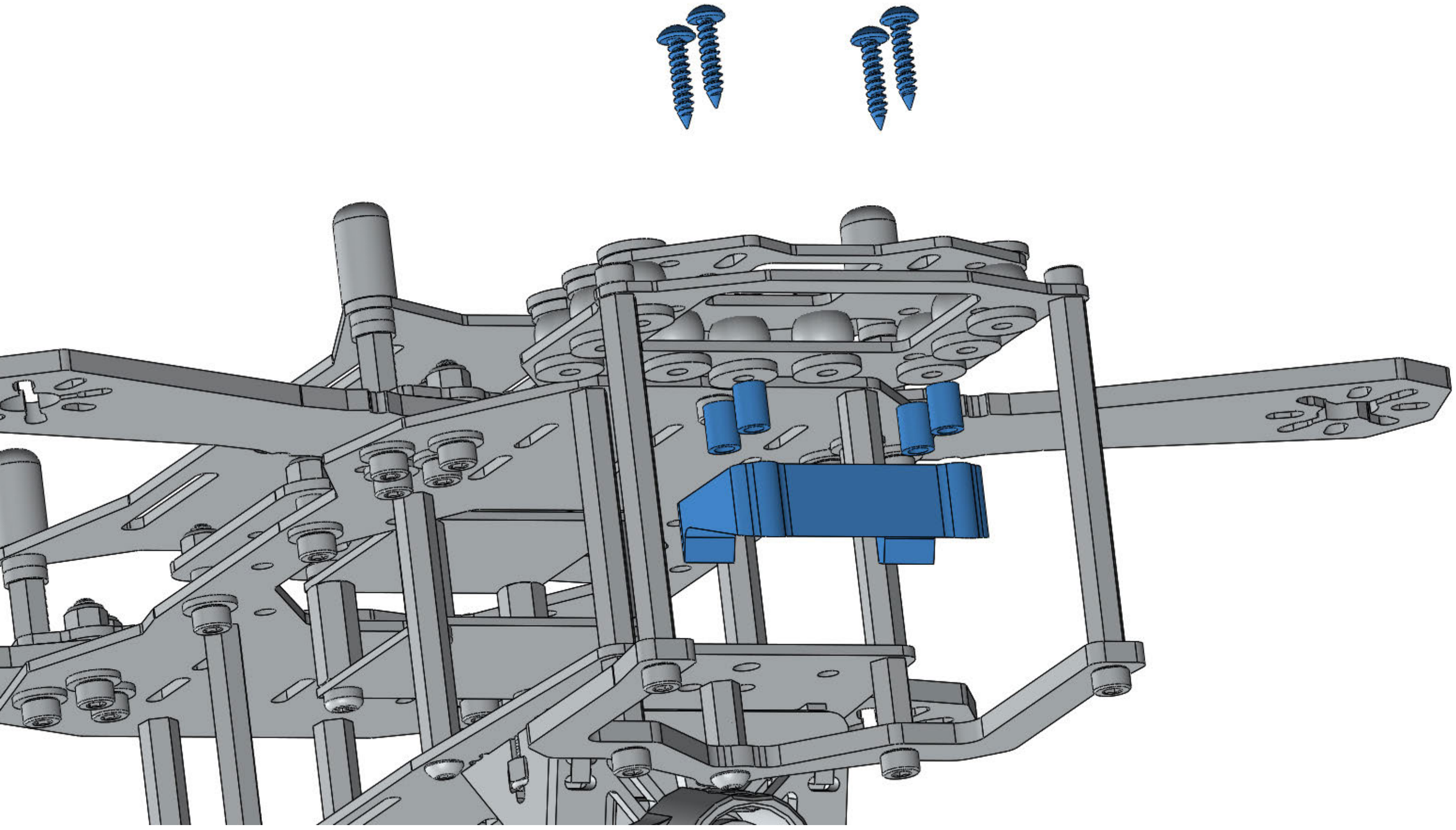
STEP 11

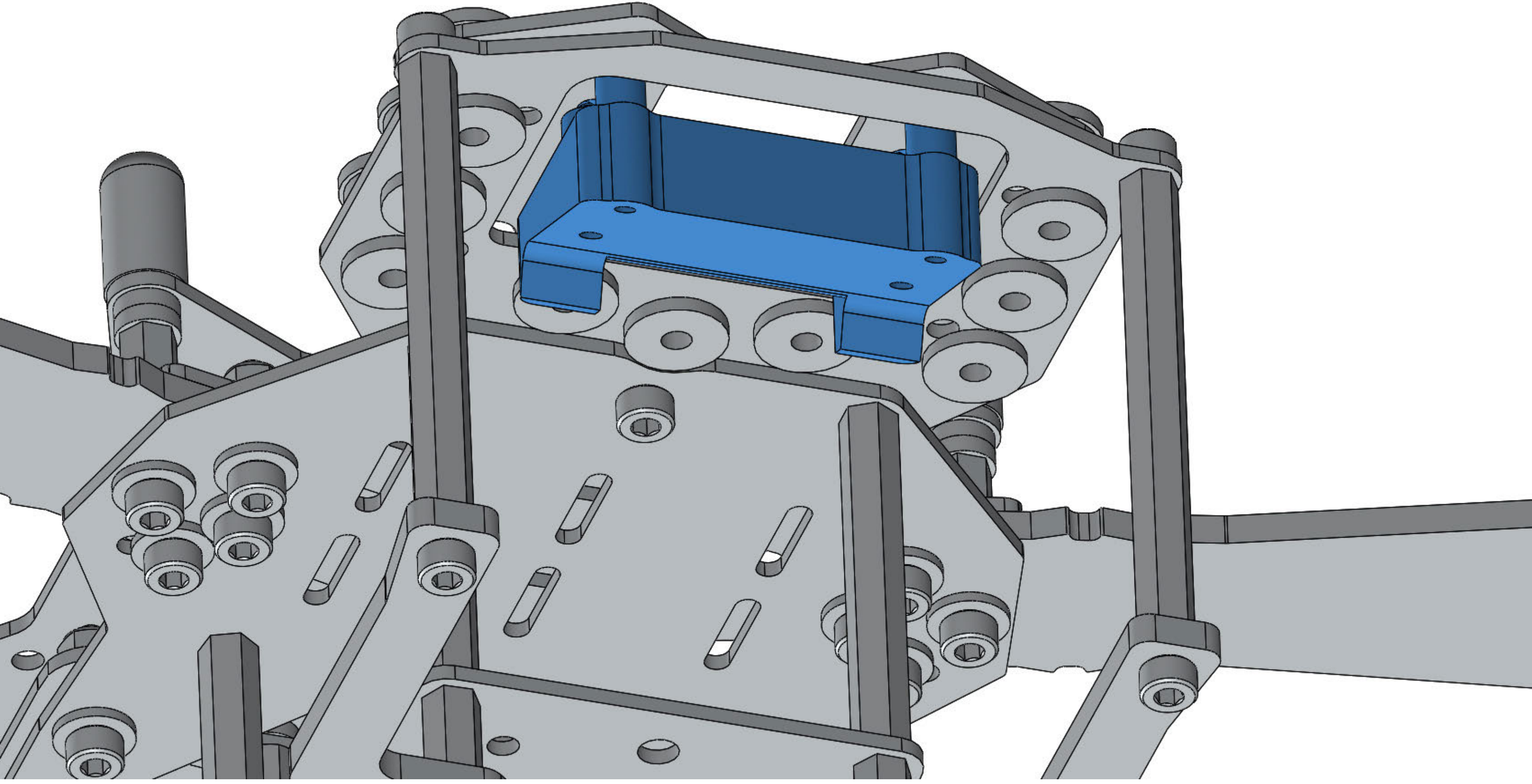
Parts Required:

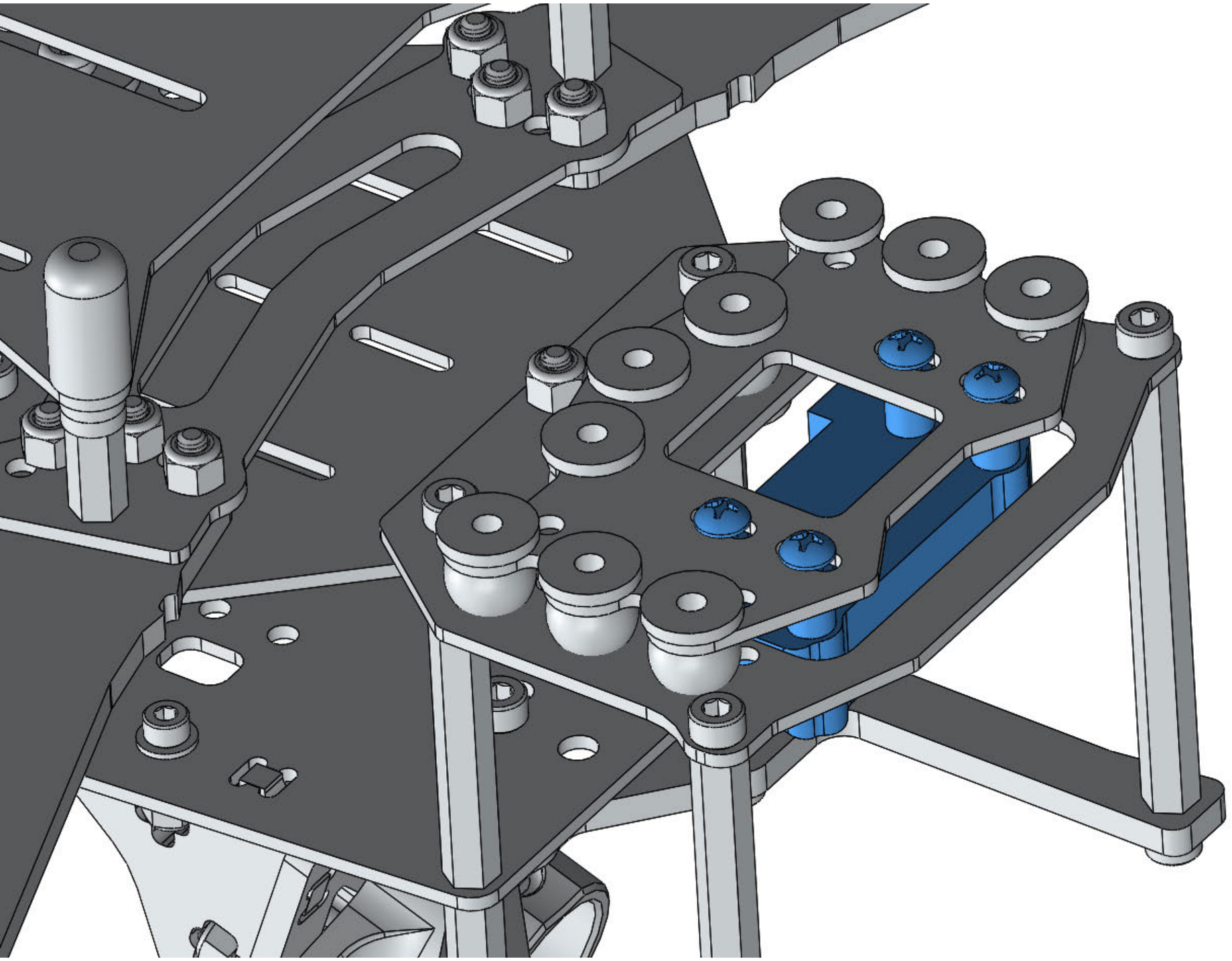
1 X Gopro Camera Mount (3D Printed Black Plastic)
4 X Phillips Head Screw (#4 x 1/2” long x stainless steel)
4 X Spacer #4 Hole x 1/4” Long (White Plastic)
1 X Velcro Strip or Double Sided Stick Tape ***Sold Separately***
1 X Velcro Cinch Strap ***Sold Separately***

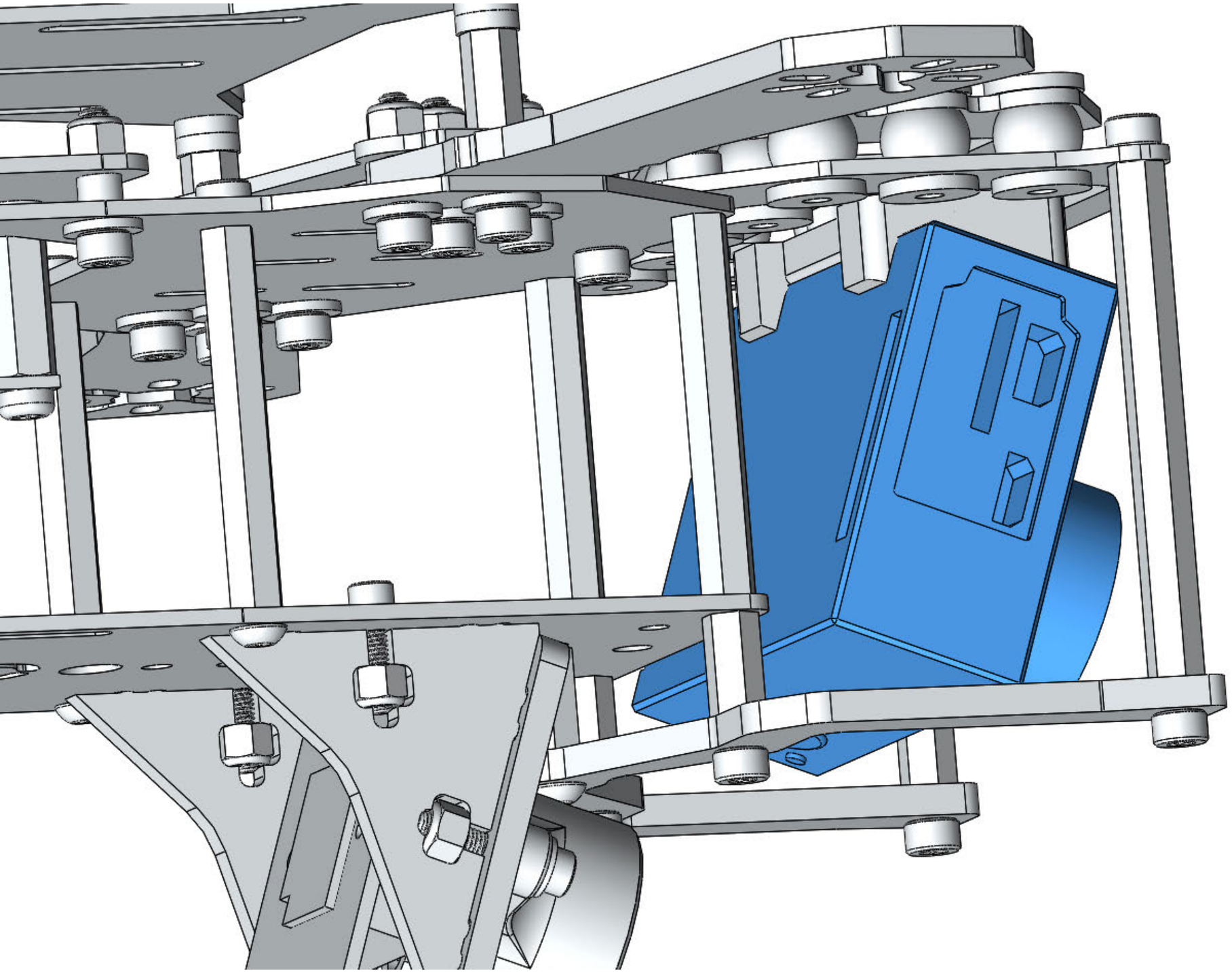
Assembly Process:

Note – If you are using a Mobius camera skip this step and go on to Step 12.
Install the screws up through the slots in the POV camera cage, through the spacers, and into the mount. These slots allow for fine adjustment and locating of your camera forward and aft. Set the mount where you prefer and torque down the screws. There are a number of ways to attach a Gopro camera to the mount. We have found the best way is to fix a small strip of double sided stick tape or velcro to the bottom of the camera and the top of the camera mount. Once the Gopro is in place use a Velcro Cinch Strap to clamp it down onto the mount. There is a channel under the mount which will allow you to pass the strap through and then over the camera.









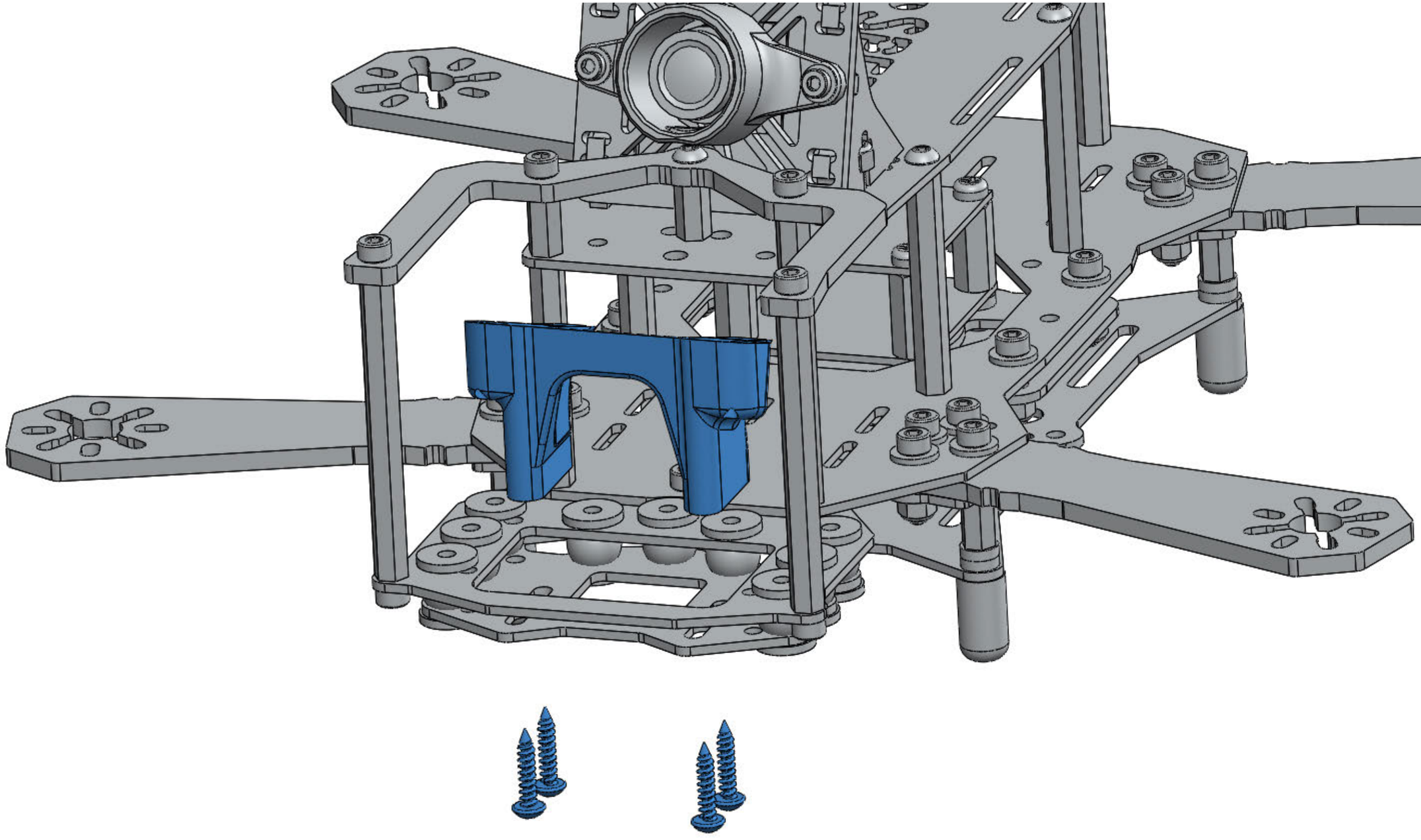
STEP 12

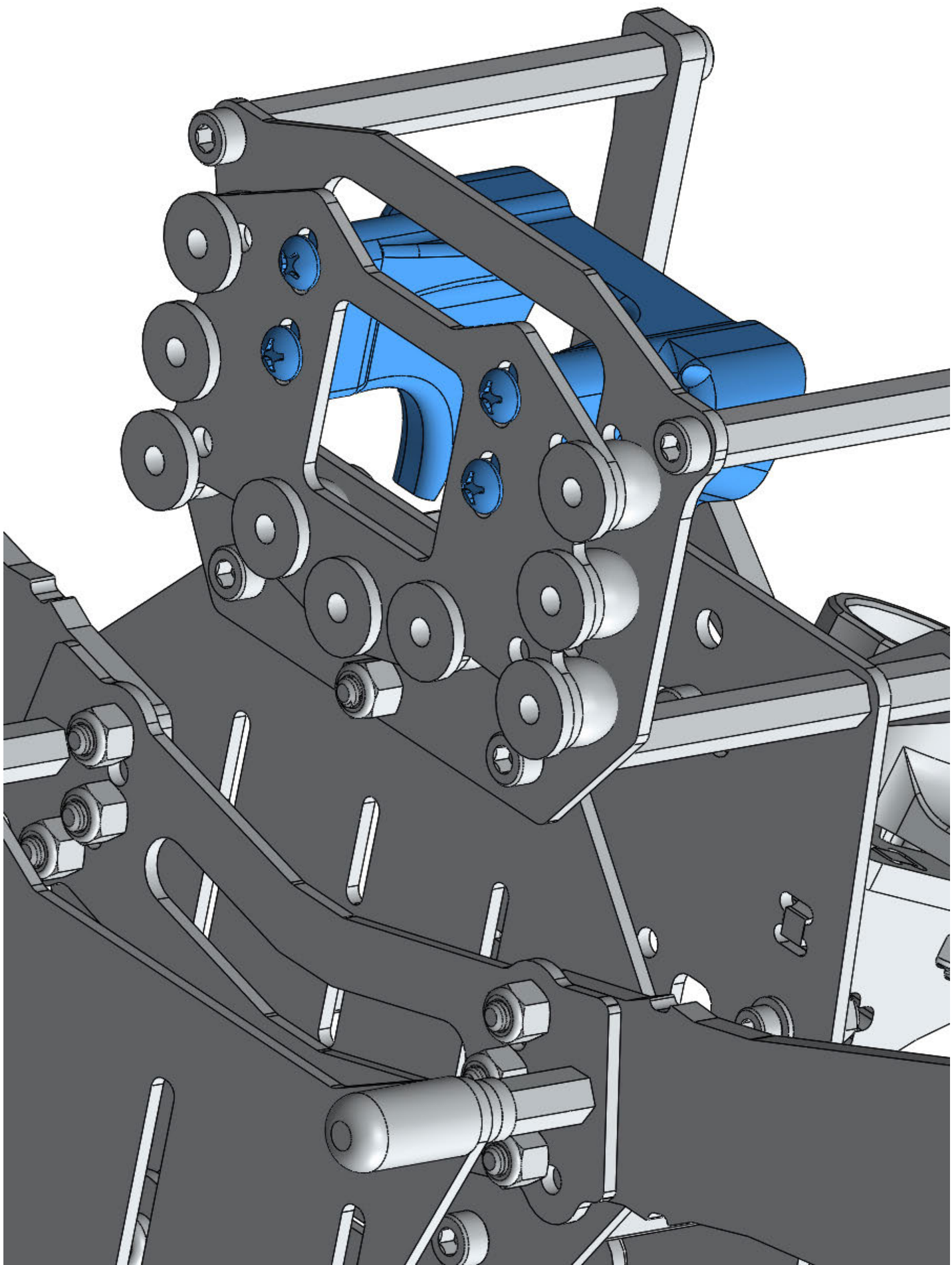
Parts Required:

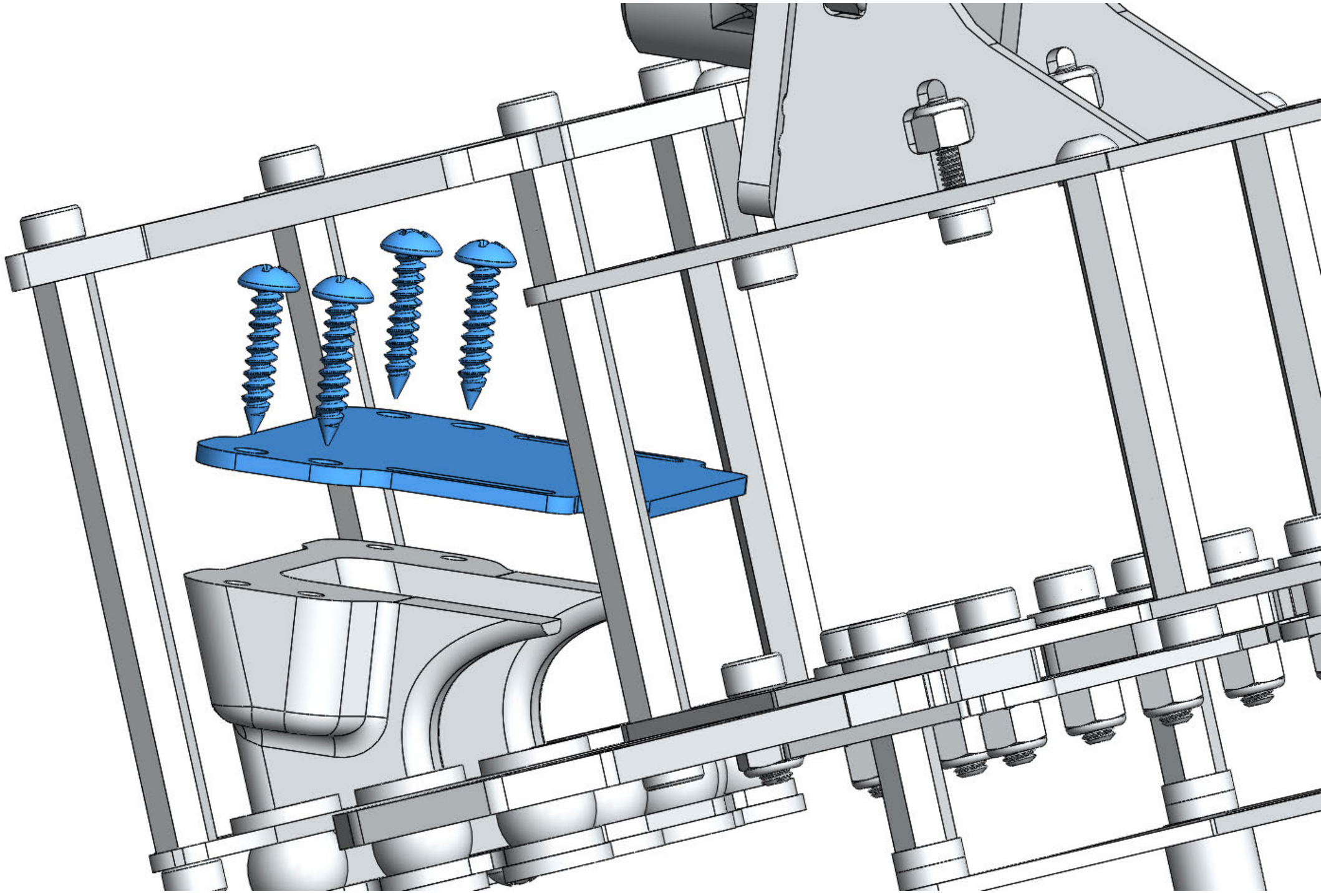
1 X Mobius Camera Mount (3D Printed Black Plastic)
8 X Phillips Head Screw (#4 x 1/2” long x stainless steel)
1 X Mobius Camera Mount Top Plate (1.5mm CF)
1 X Velcro Strip or Double Sided Stick Tape ***Sold Separately***
1 X Velcro Cinch Strap ***Sold Separately***

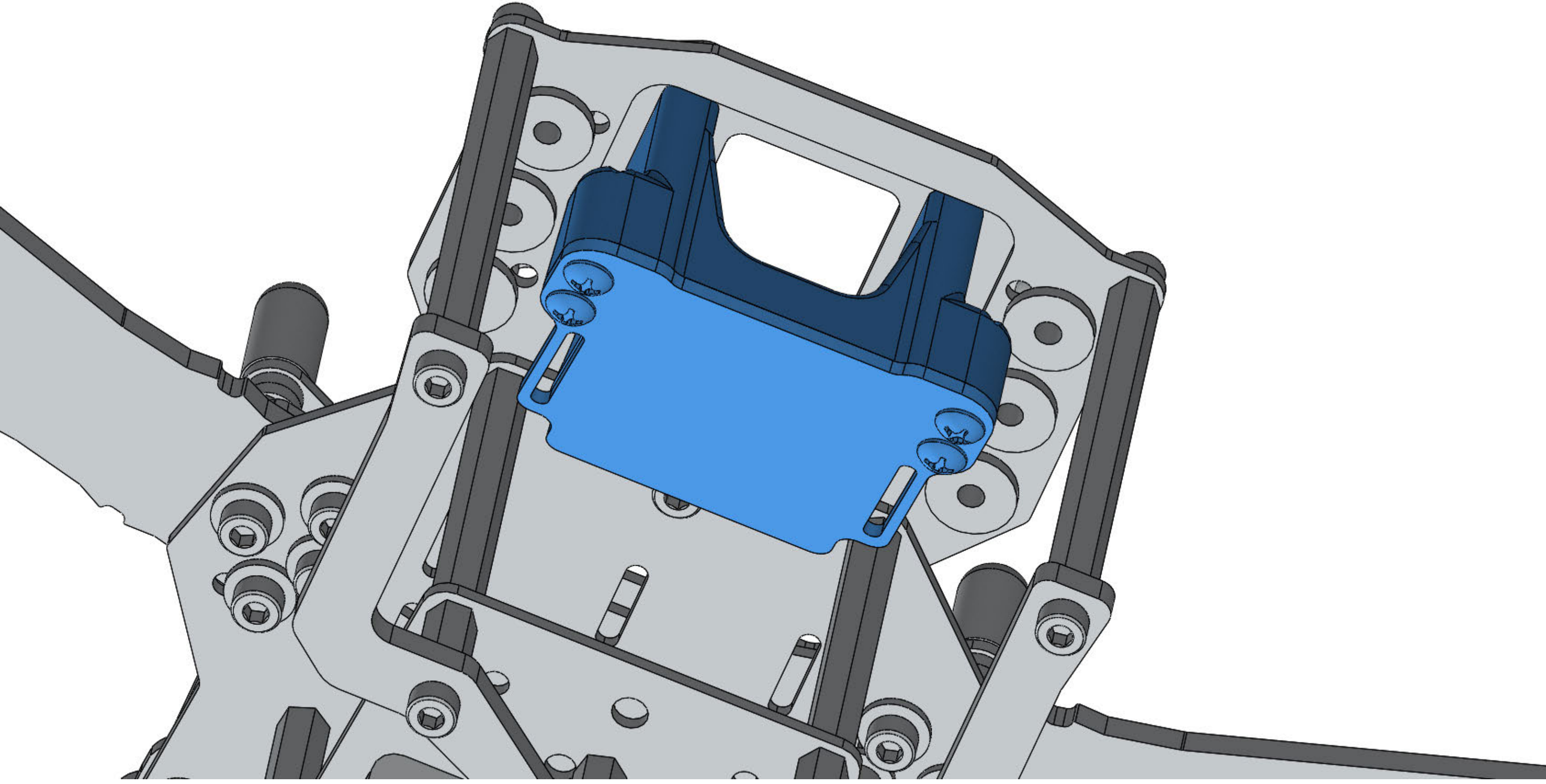
Assembly Process:

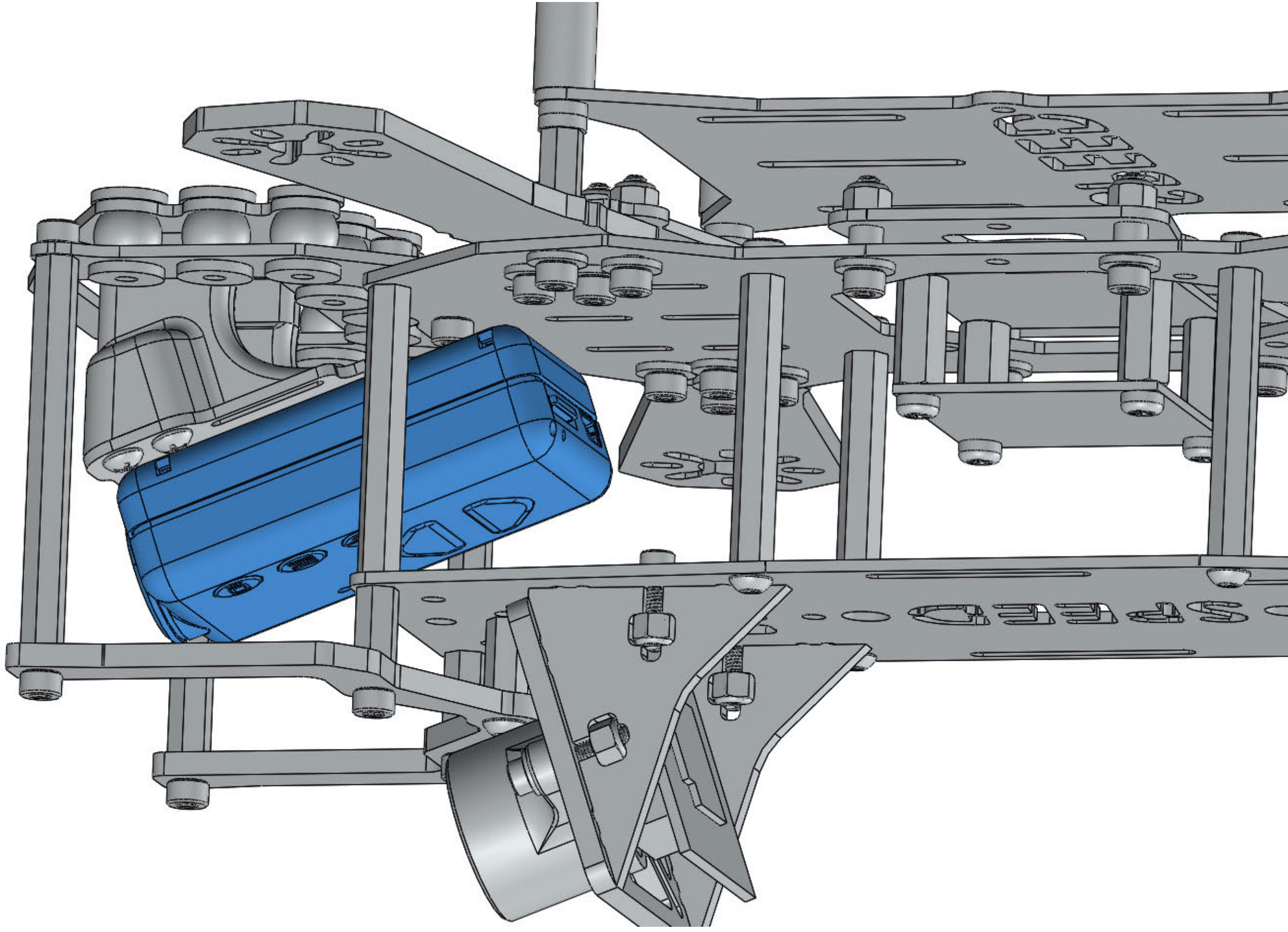
Note – If you are using a Gopro camera skip this step and go on to Step 11.
Install the screws up through the slots in the POV camera cage and into the mount. These slots allow for fine adjustment and locating of your camera forward and aft. Set the mount where you prefer and torque down the screws. Next place the Carbon Fiber Top Plate on the mount and line up the holes. Install a screw in each hole and torque down. Next install your Mobius camera. There are a number of ways to attach a Mobius camera to the mount. We have found the best way is to fix a small strip of double sided stick tape or velcro to the bottom of the camera and the top of the carbon fiber plate. Make sure to adjust the camera so there is an equal amount of space between the sides of the camera and the frame standoffs. Once the Mobius is in place use a Velcro Cinch Strap to clamp it down onto the mount.

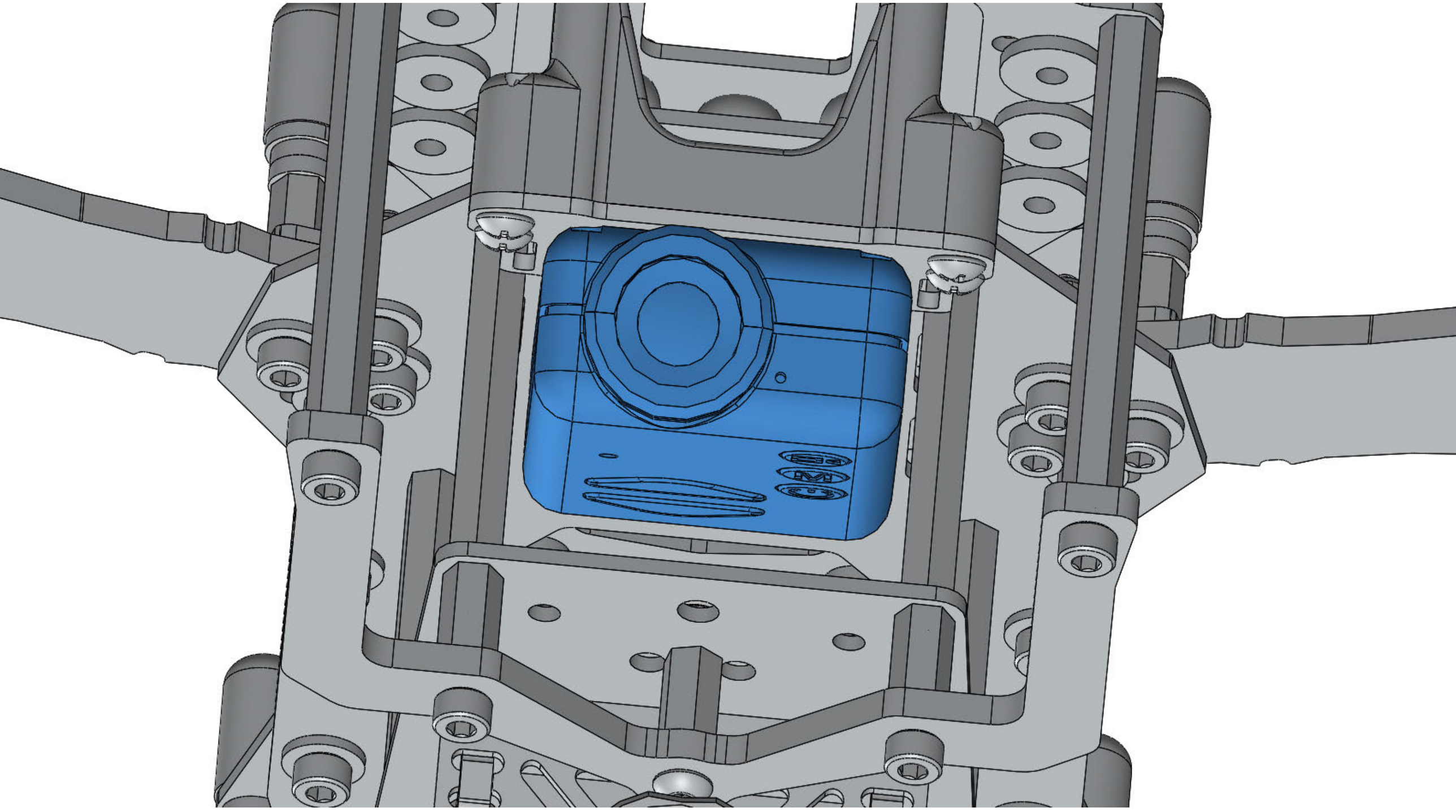












SECTION 05

ASSEMBLY CONSIDERATIONS

320 QUAD

The purpose of flying a 320mm quad over a 265mm quad is to run oversized 7” props. HQ makes a 7”X4.5 prop that produces an unreal amount of thrust when paired with a proper motor. Contact us for suggestions on motors/ESC's that can spin 7” props. Keep in mind that due to the large size of this prop not all motor and ESC combos will work.

The differences between the 320mm quad and the 265mm quad are the length of arms and also the requirement to rotate the rear arms towards the rear of the craft. This allows for running 7” props. There is a small slot in the Bottom Fuselage Plate. This slot makes it possible to rotate the arms back. Assembly steps for the 320mm quad are identical to the 265mm quad except for where the rear arms are located.

SECTION 06

ASSEMBLY CONSIDERATIONS

330 HEX

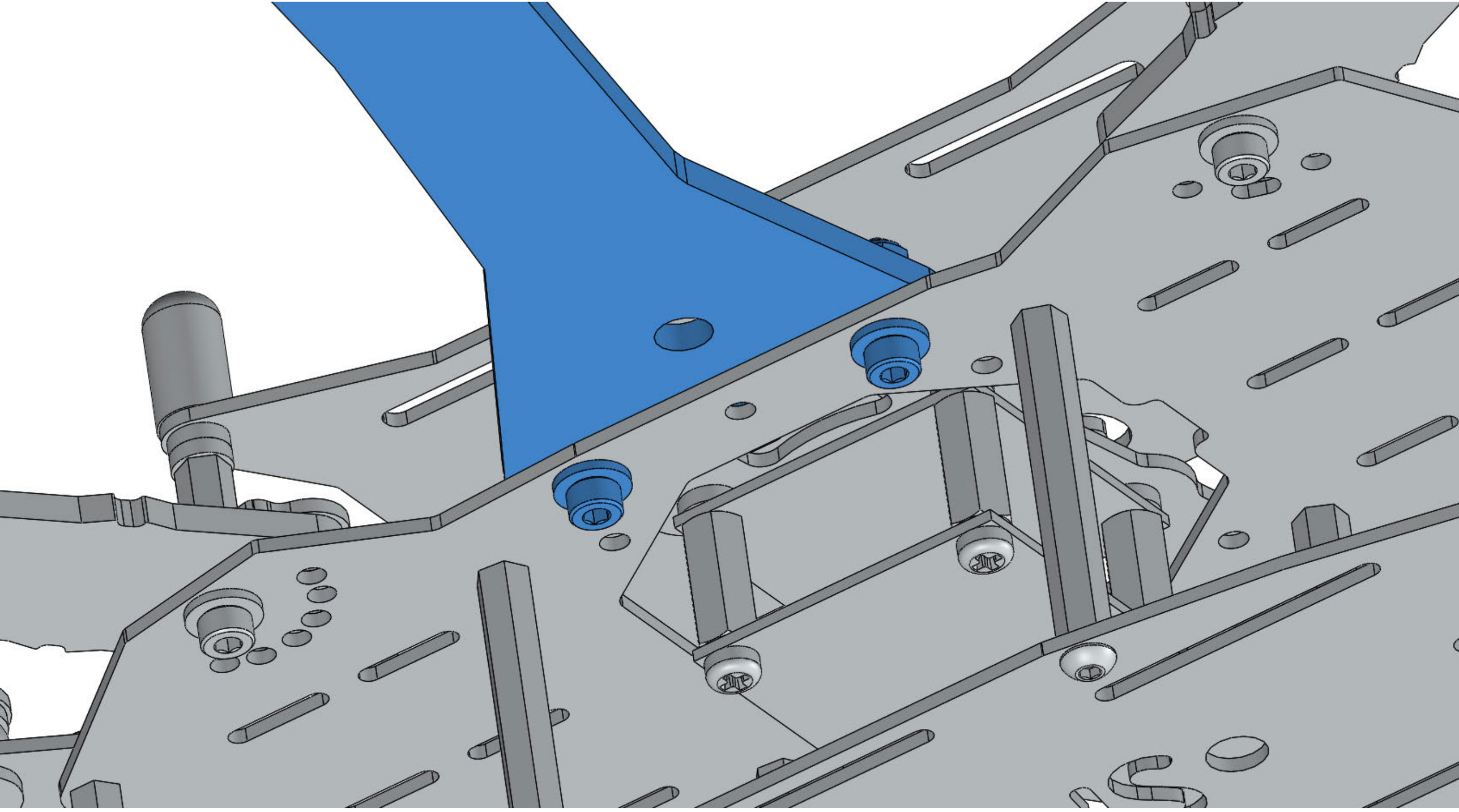
The 330mm hexacopter configuration differs from the quads by adding two more arms to the center section and also 2 extra standoffs that extend down to the ESC tray. In addition, the hex's front and rear arms sit in a different location compared to the quads. The only steps that will be different from the 265 quad are **STEPS 1 and 4**. Please see the alterations below and apply these changes to build your 330 hex. All other steps will be identical.

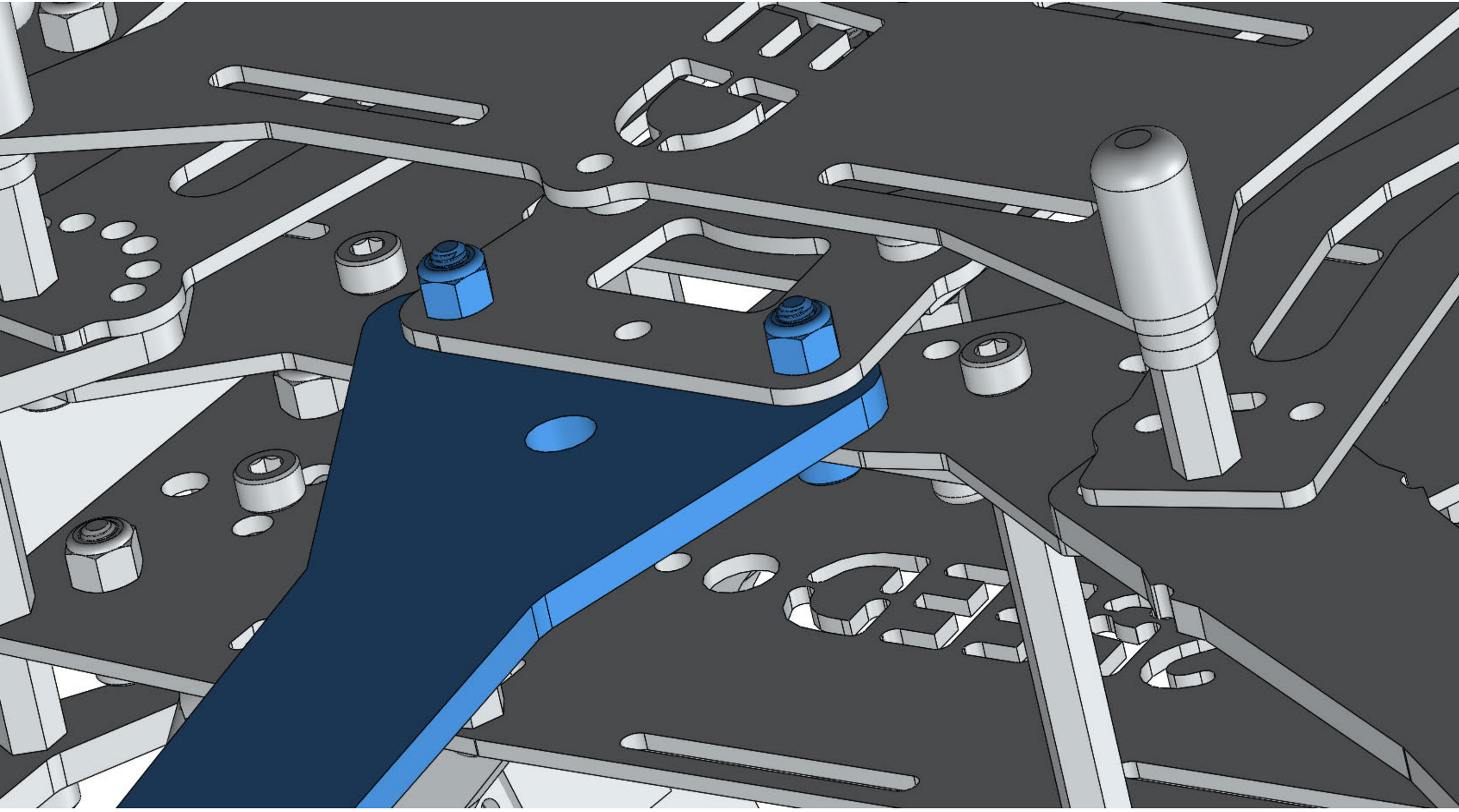
STEPS 1 and 4 Alterations (330mm Hex Configuration)

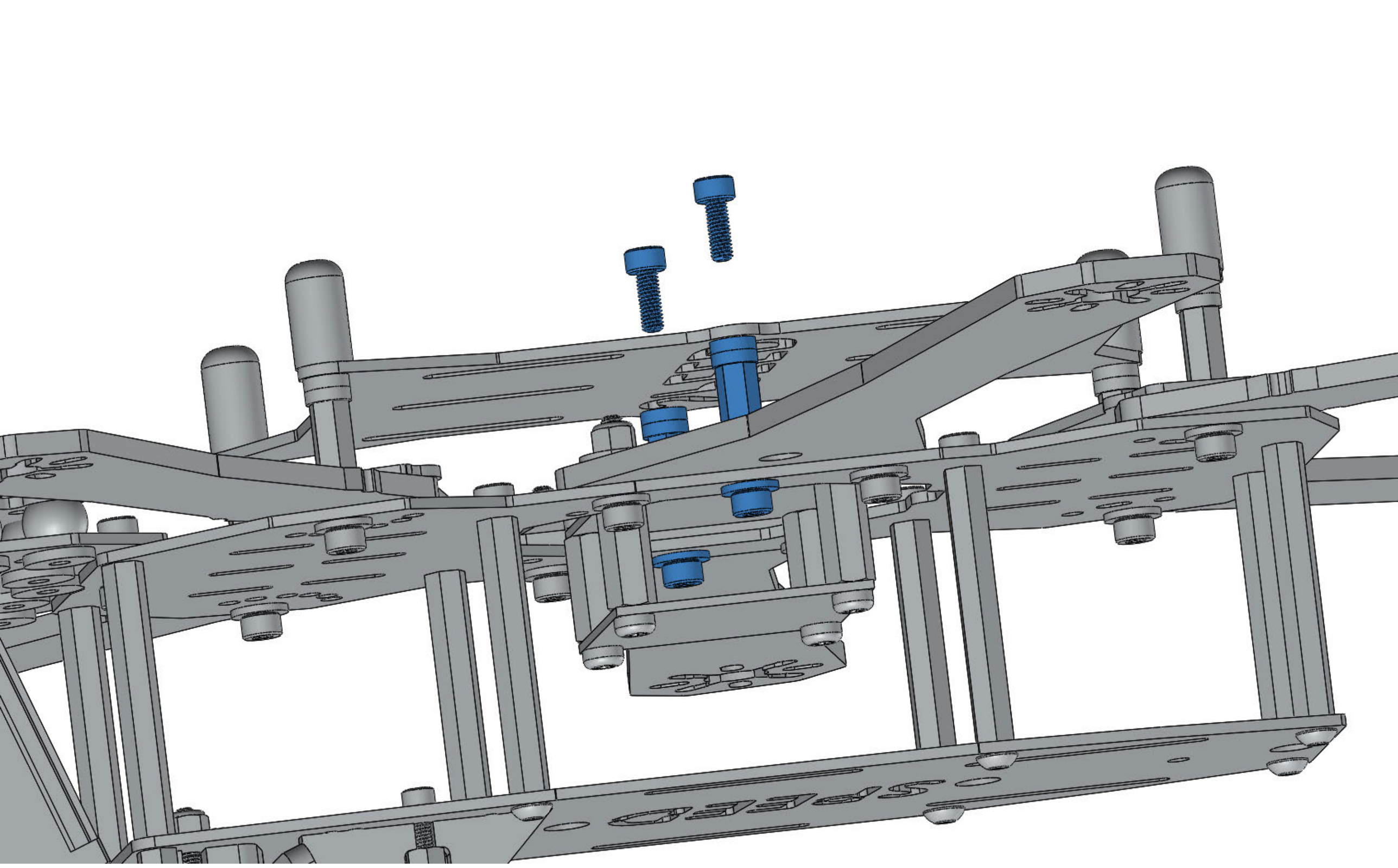
Additional Parts Required:
2 X 330mm Hex Center Arms (3mm CF)
4 X 330mm Hex Front and Rear Arms (3mm CF)
2 X Socket Head Screw (M3 X 12mm long x stainless steel)
2 X Socket Head Screw (M3 X 8mm long x stainless steel)
2 X Nylock Nut (M3 x stainless steel)
2 X Washer (M3 x aluminum)
2 X Standoff (Black aluminum M3 thread x 10mm long)
4 X Washer (Black nylon 3mm hole)

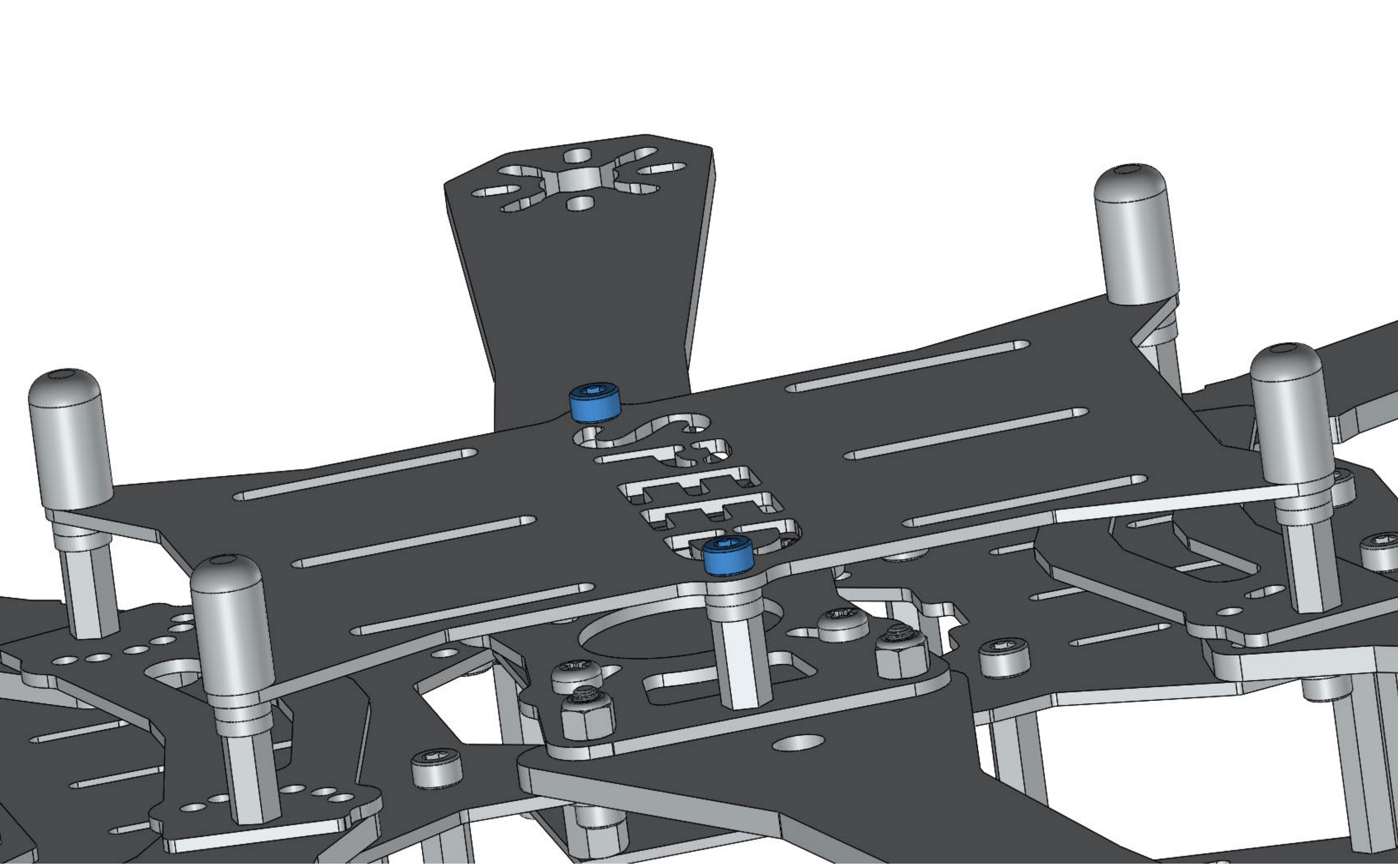
Additional Assembly Processes:
Each center arm should receive 3 screws (M3 x12mm). The center screw is threaded to a standoff and the two outer screws thread to a nylock nut. Use two black nylon washers between the standoff and the ESC tray. Then install one M3 x 8mm long screw through the ESC tray hole into the standoff.

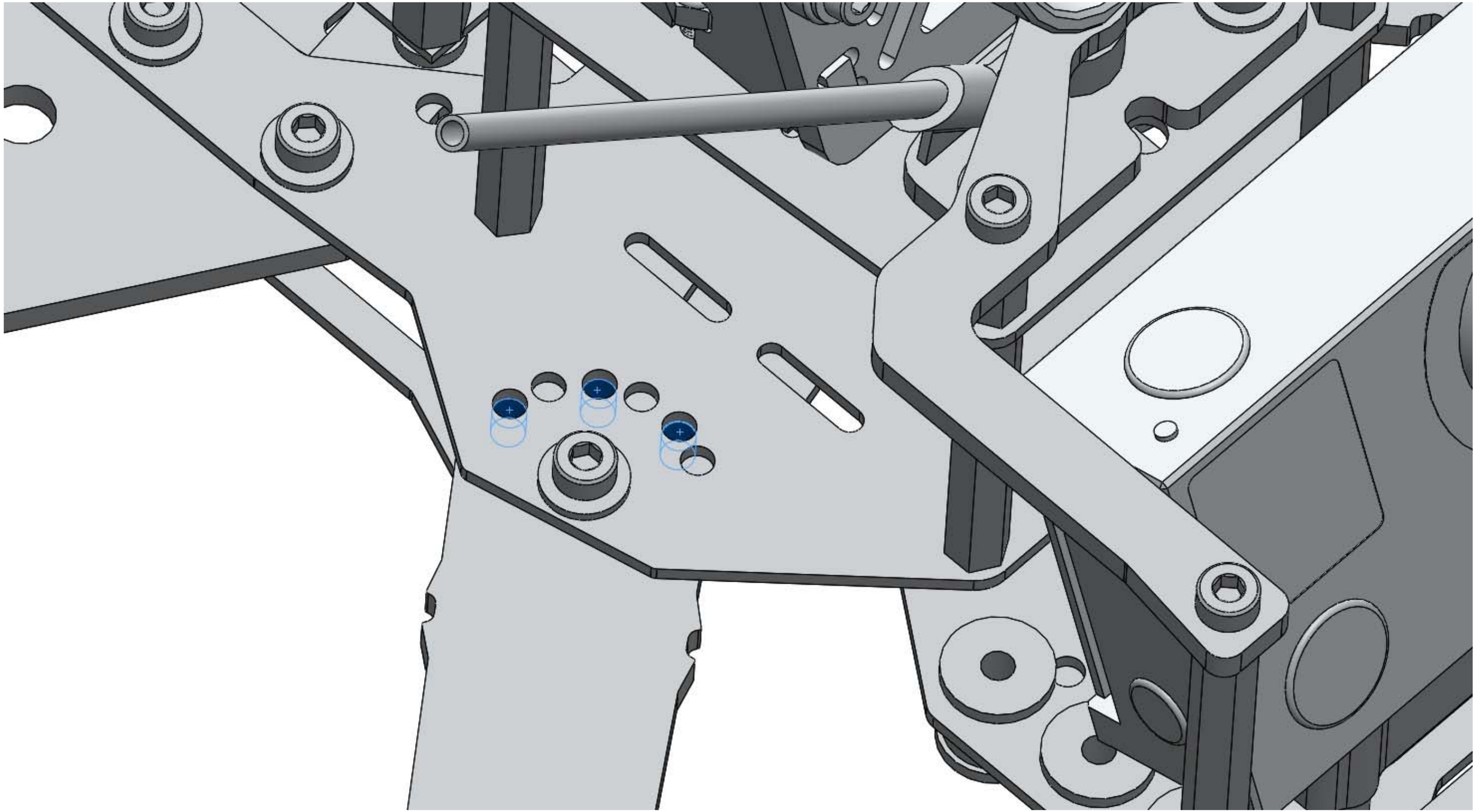
The pictures below show which holes in the fuselage plates the front and rear arms should be mounted to. You should use 4 screws for each front arm and 3 screws for each rear arm.

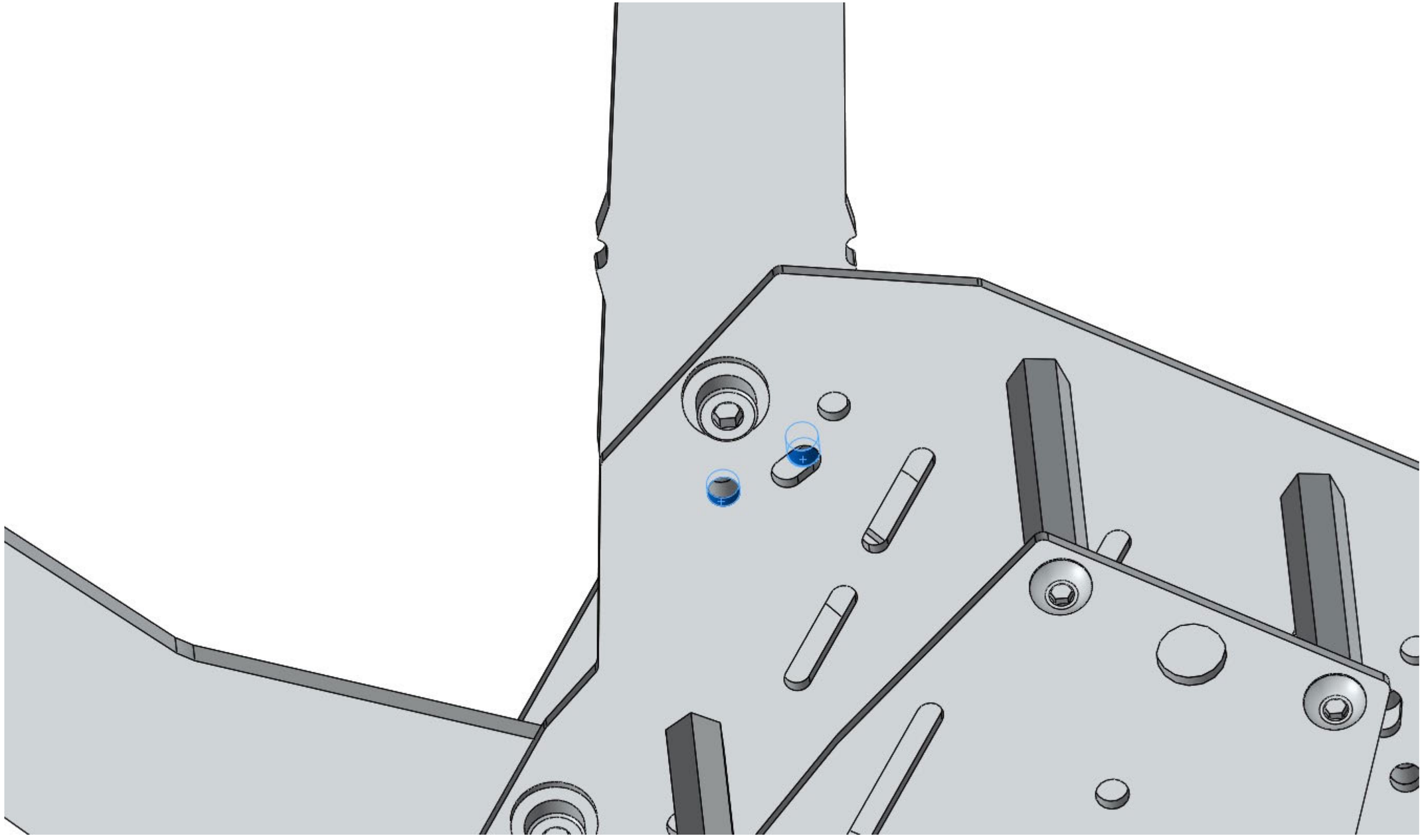


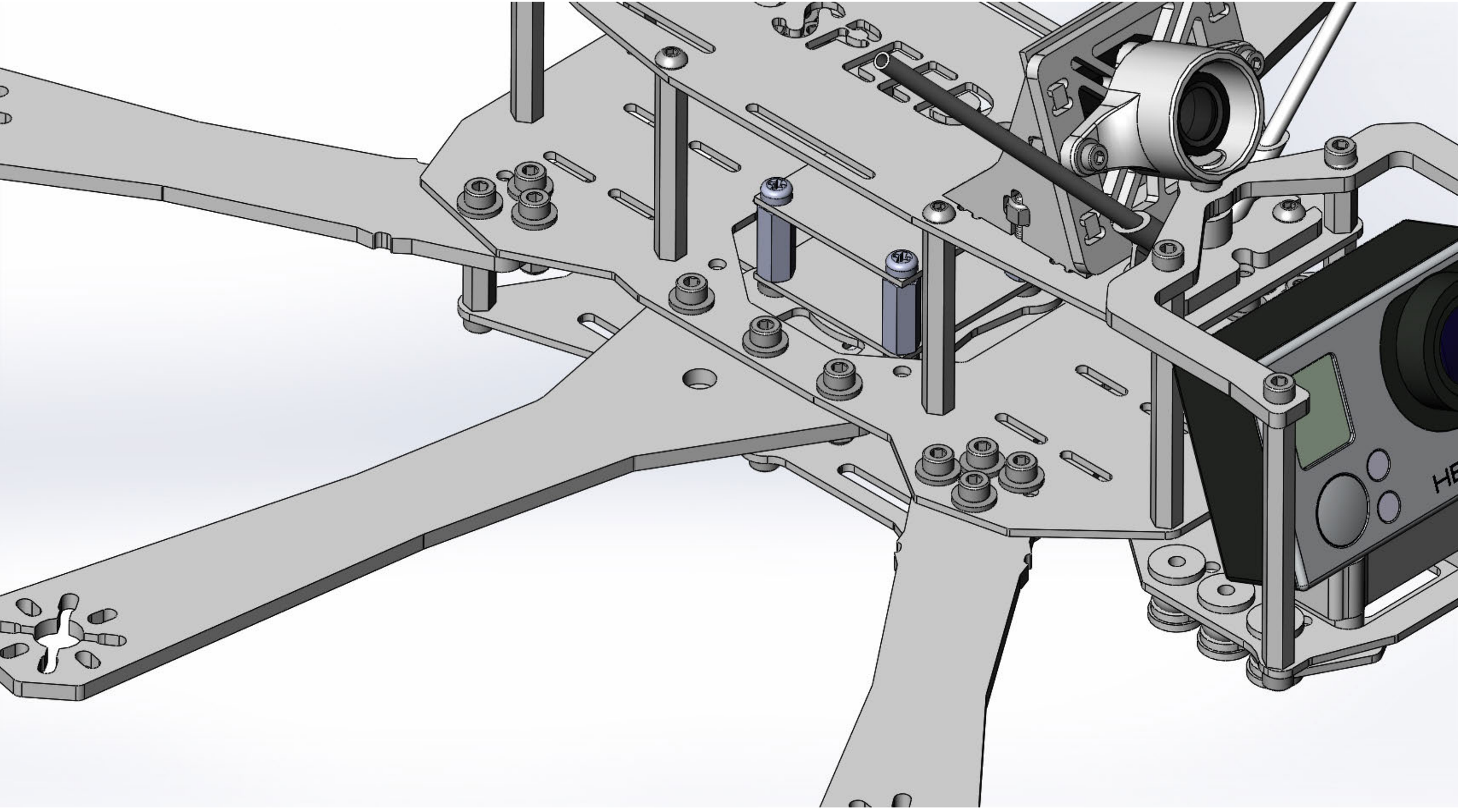











SPEED

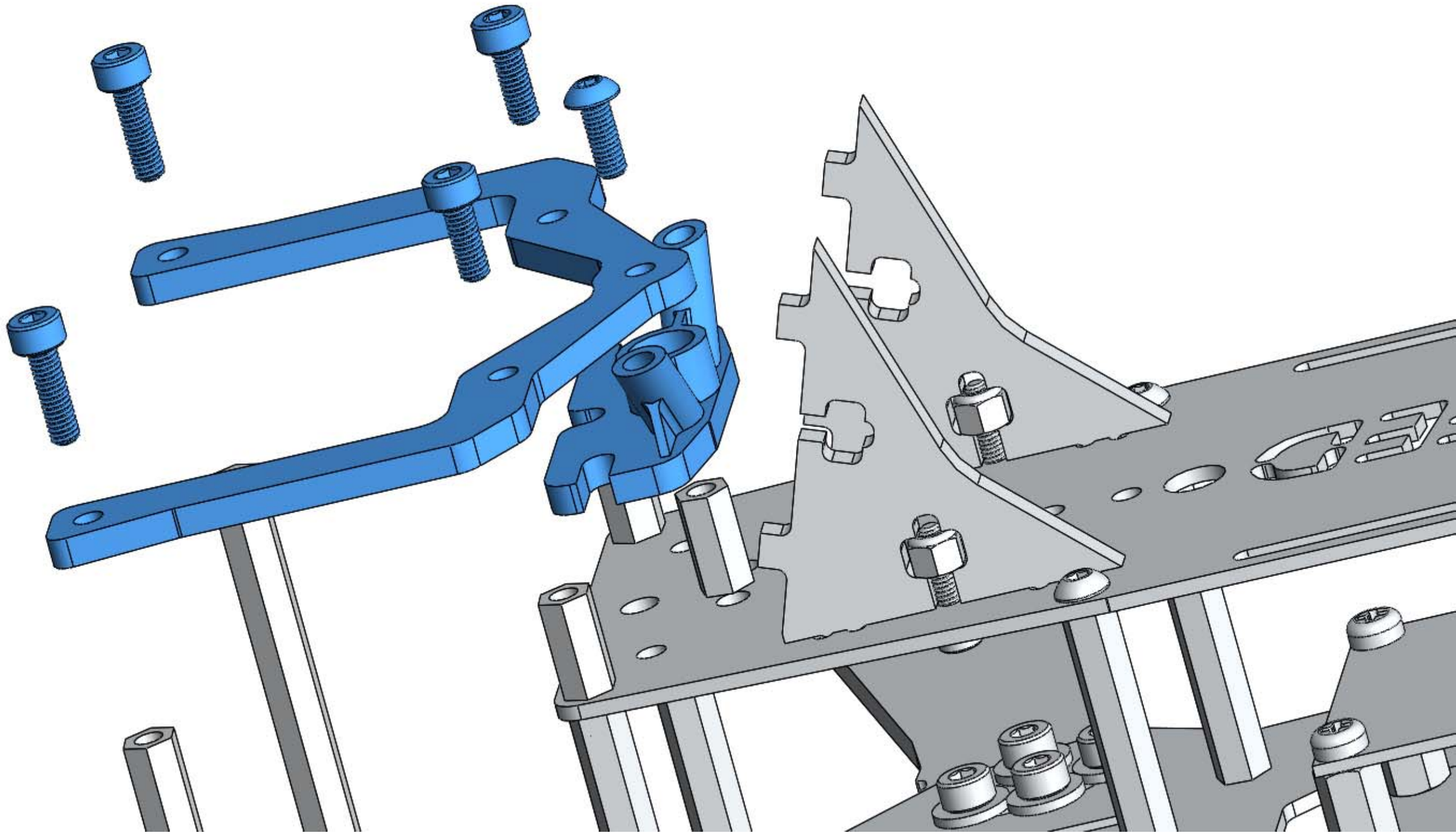
SECTION 07

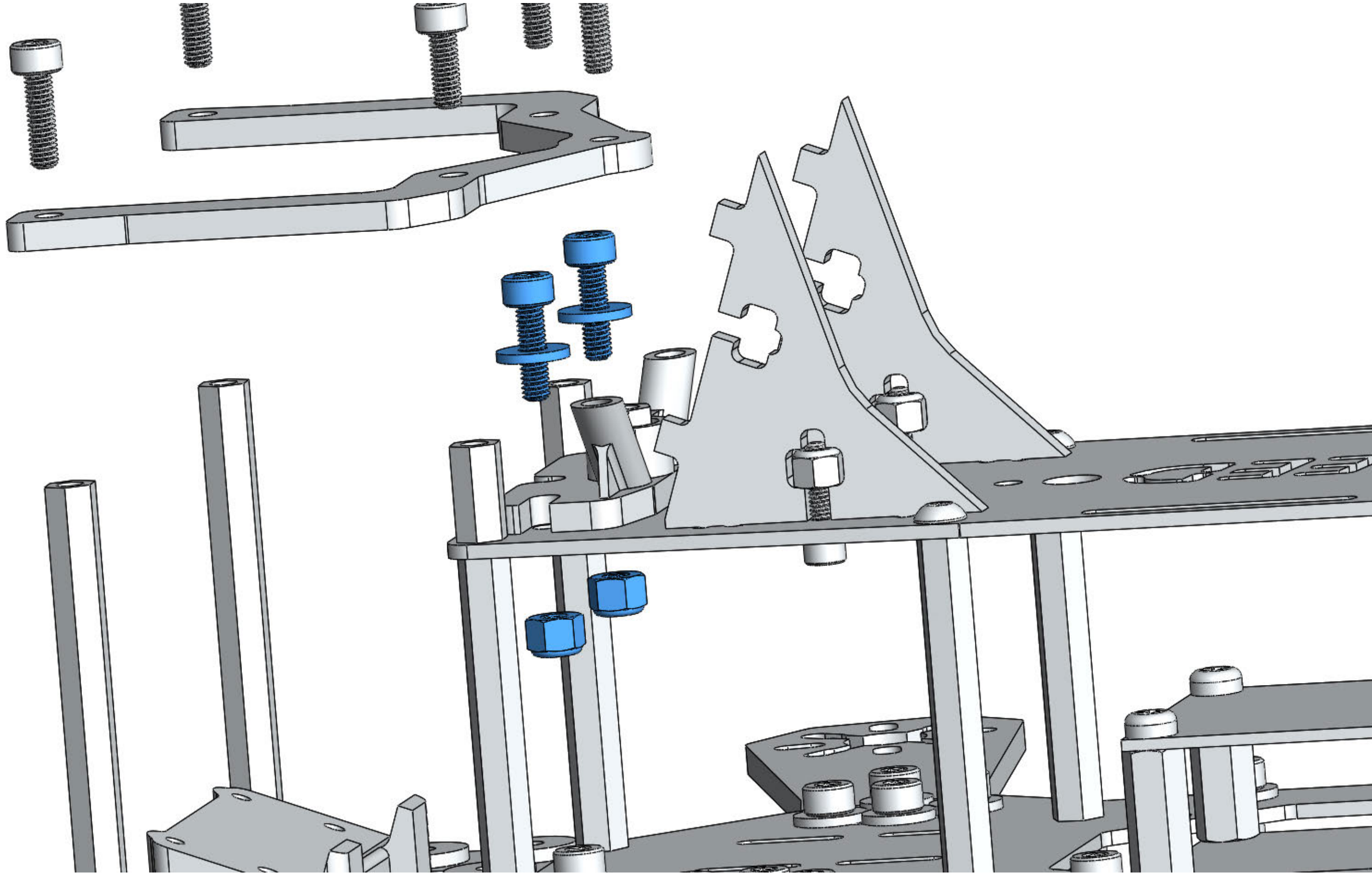
ANTENNA MOUNT INSTALLATION

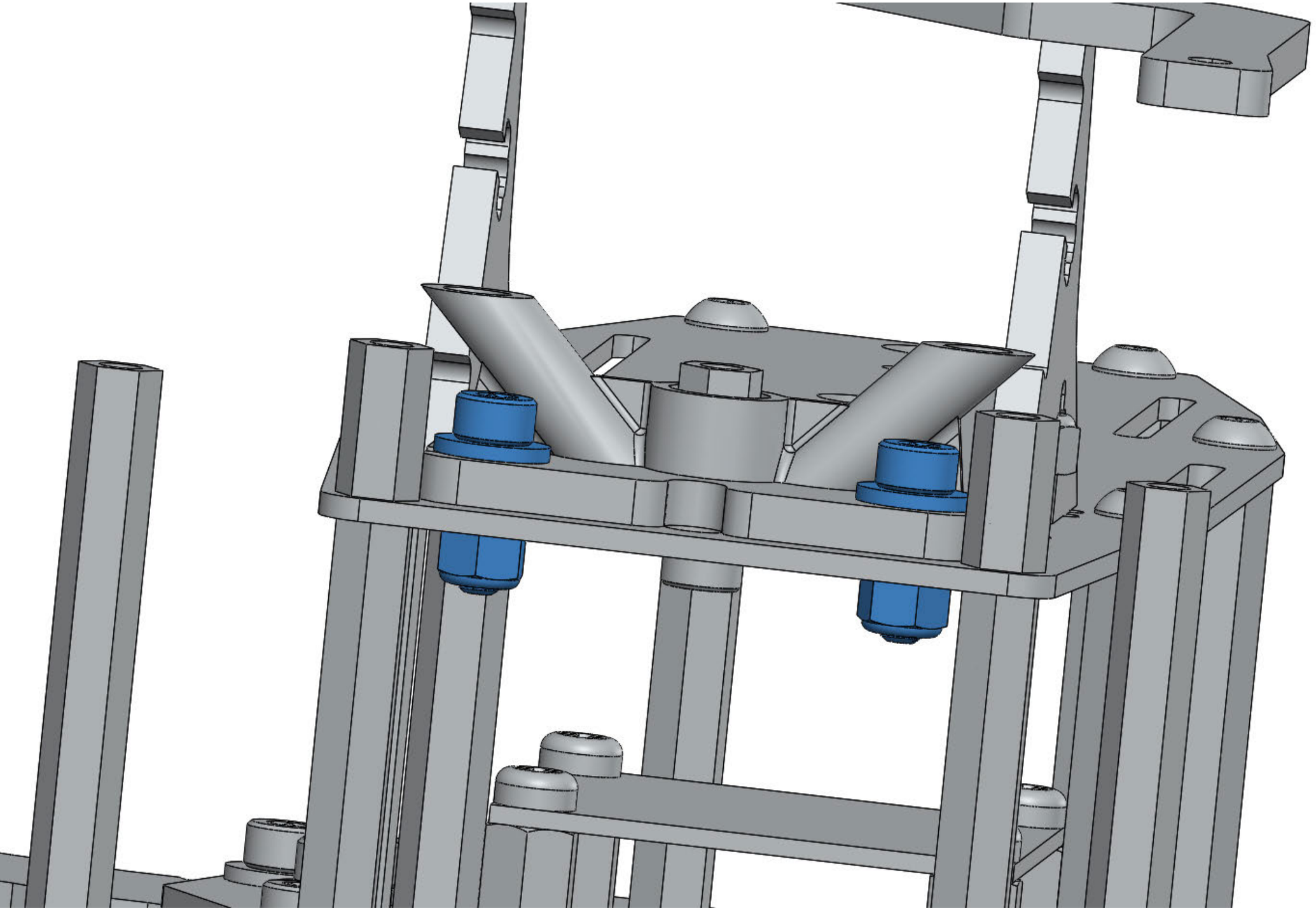
This antenna mount does not come with your Speed Addict kit. You can purchase it separately from our accessories page on our site.

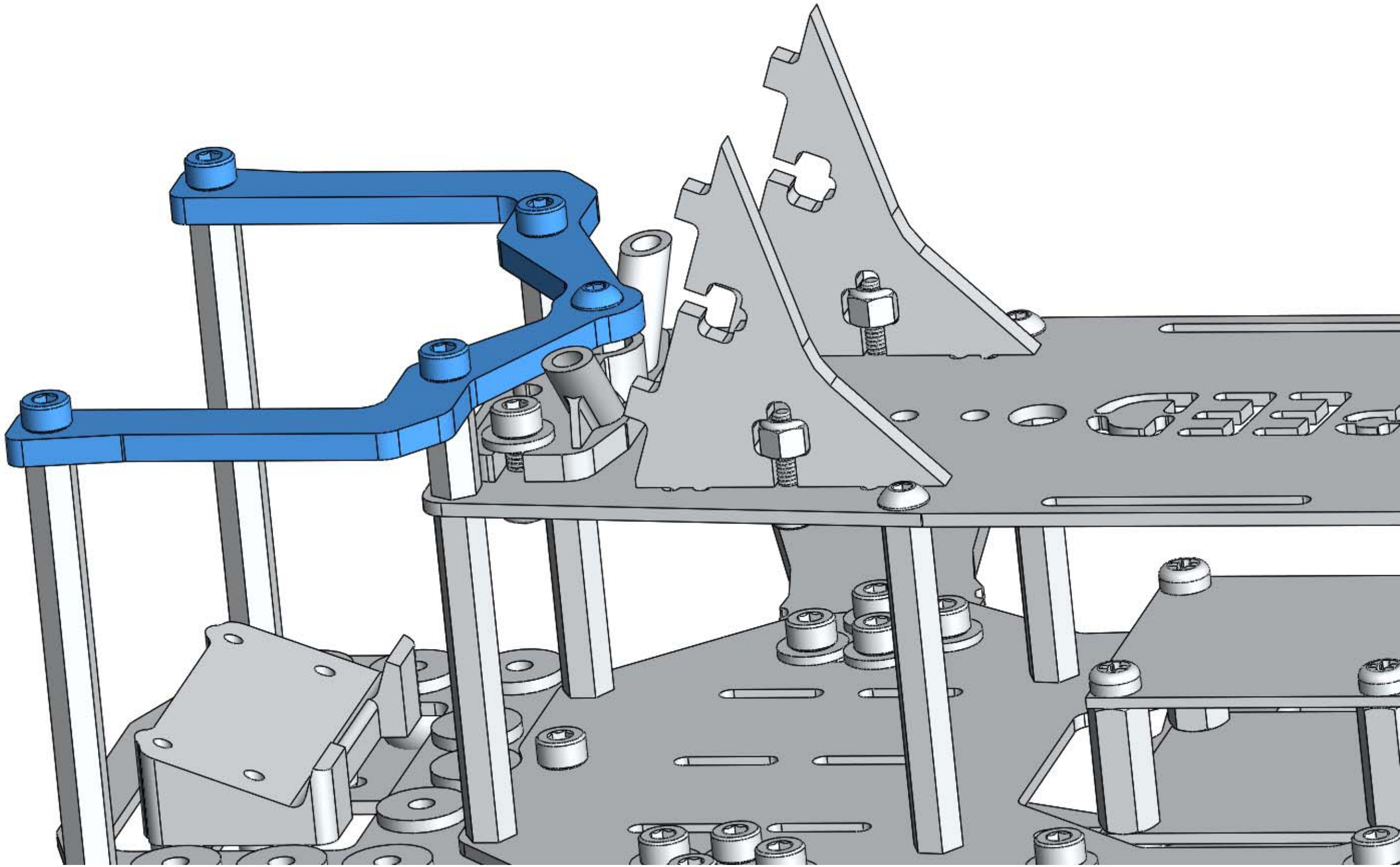
Parts Required:
1 X Antenna Mount (Black 3D printed plastic)
2 X Socket Head Screw (M3 X 10mm long x stainless steel)
2 X Nylock Nut (M3 x stainless steel)
2 X Washer (M3 x aluminum)
2 X Antenna

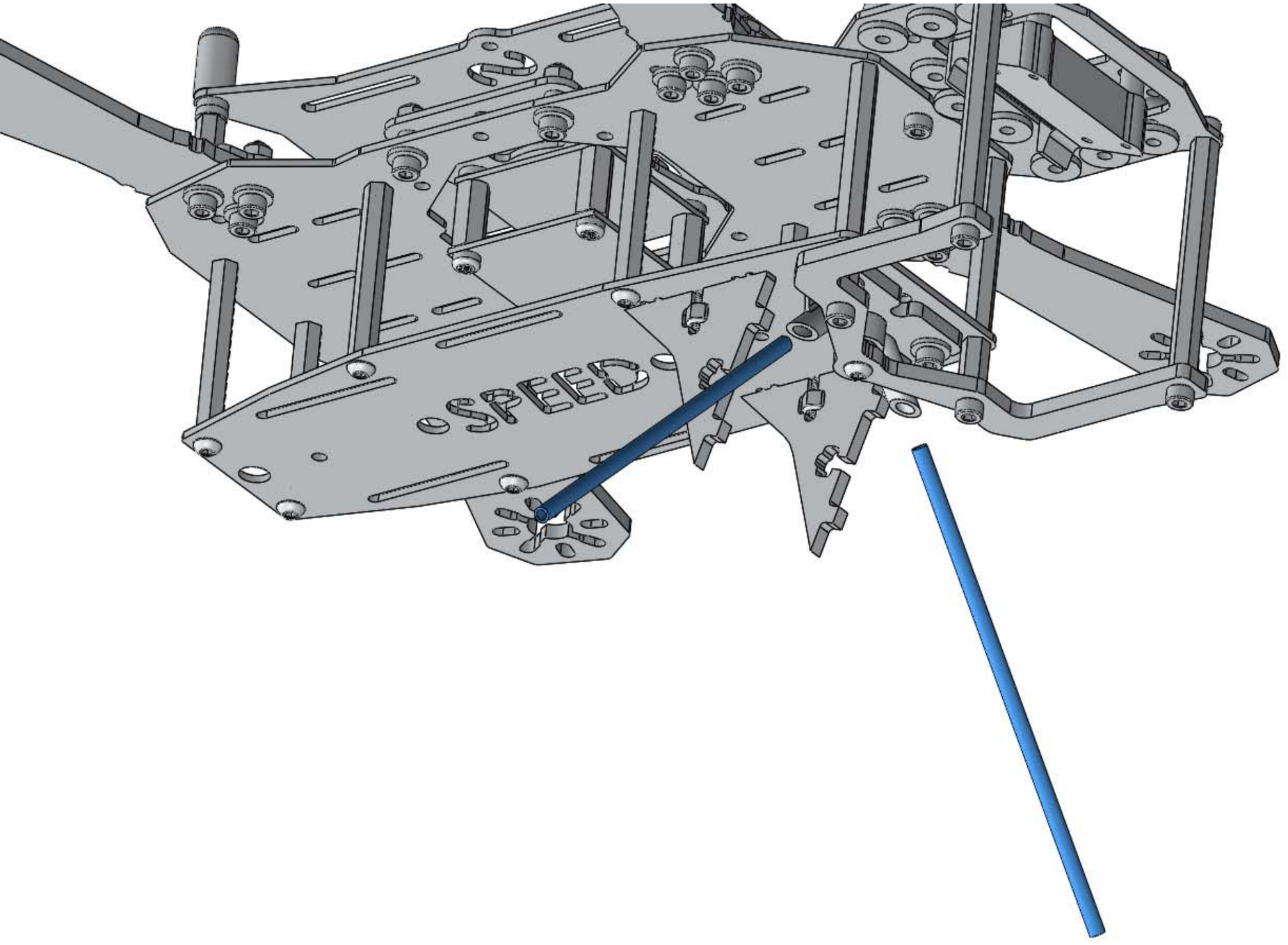
Assembly Process:
The antenna mount goes between the FPV Camera Cage Top Plate and the Fuselage Top Plate. Insert it at **STEP 9** during the assembly steps earlier in this manual. Use 2 screws, 2 washers, and 2 nuts to join the mount to the fuselage plate. Press in the antenna into the angled holes in the mount. Some force will be required to press them in. This is by design, and holds the antenna in place without the need for glue. There are two small holes on the underside of the antenna tubes that will allow you to pass your receiver's antenna wires up into the mount.







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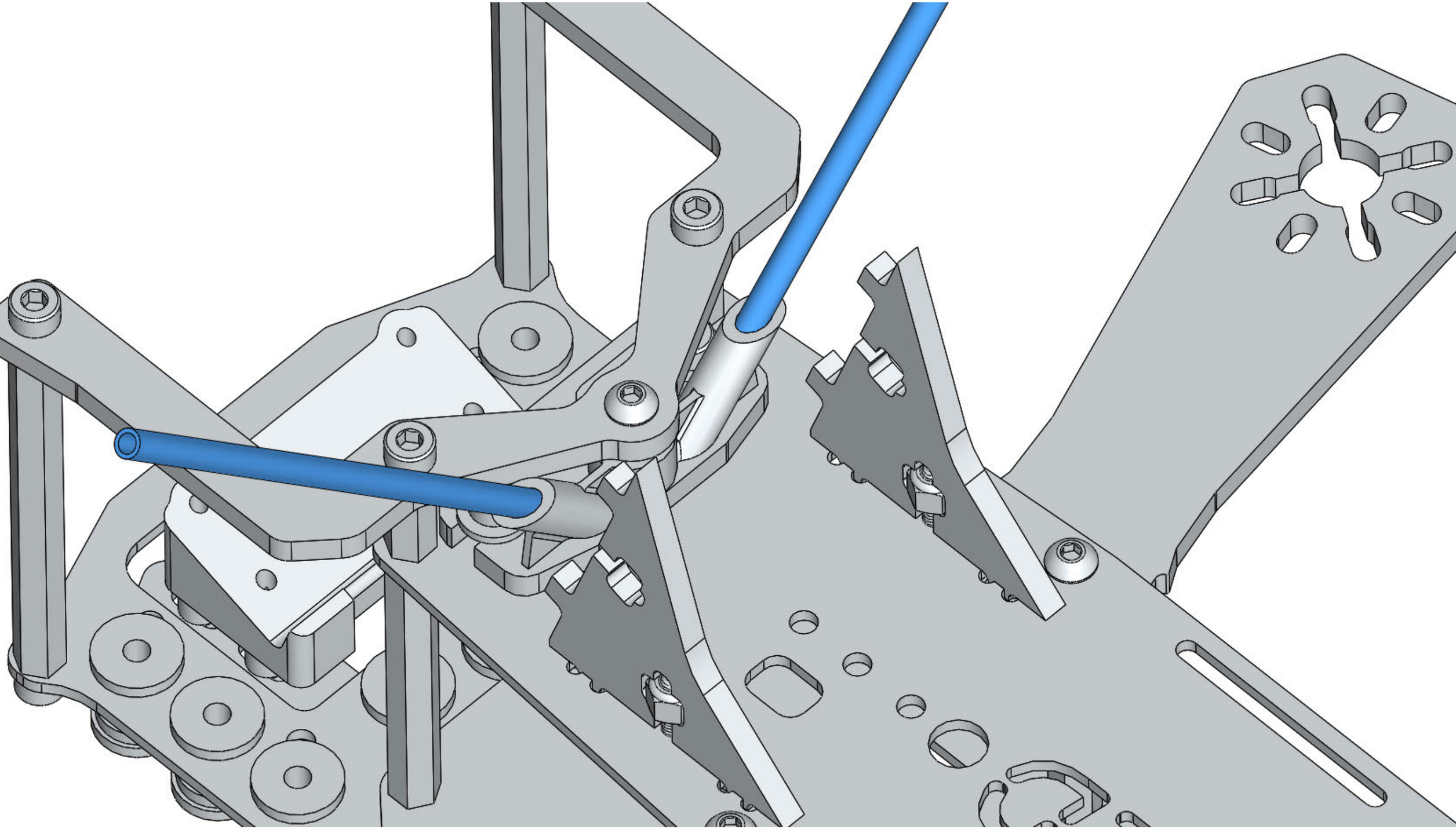


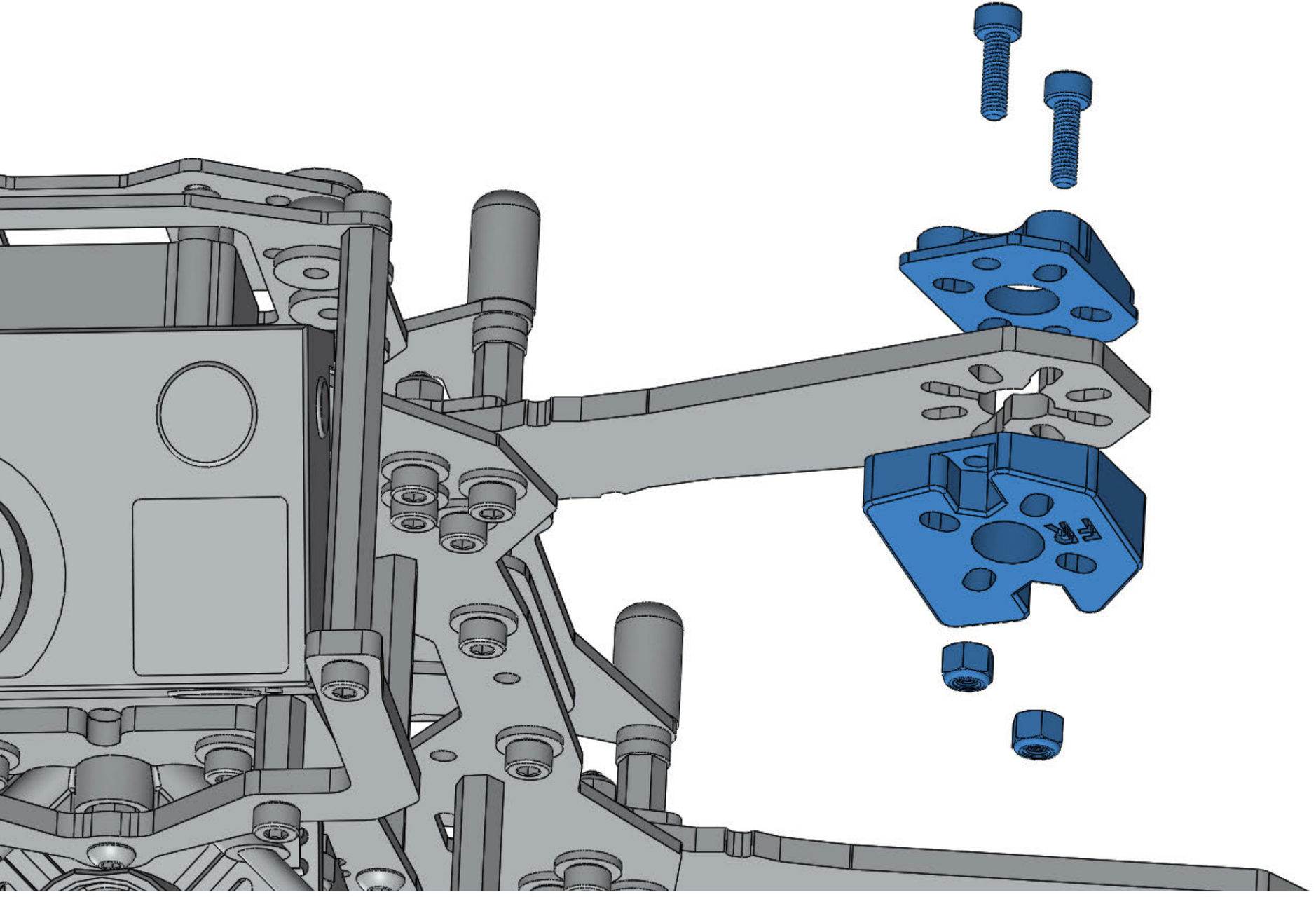
SECTION 08

WARP SPEED MOTOR PADS INSTALLATION

These Warp Speed Motor Pads do not come with your Speed Addict kit. You can purchase them separately from our accessories page on our site.

Parts Required:
1 X Top Pad **F**RONT **L**EFT (Black 3D printed plastic)
1 X Top Pad **F**RONT **R**IGHT (Black 3D printed plastic)
1 X Top Pad **R**EAR **L**EFT (Black 3D printed plastic)
1 X Top Pad **R**EAR **R**IGHT (Black 3D printed plastic)
1 X Bottom Pad **F**RONT **L**EFT (Black 3D printed plastic)
1 X Bottom Pad **F**RONT **R**IGHT (Black 3D printed plastic)
1 X Bottom Pad **R**EAR **L**EFT (Black 3D printed plastic)
1 X Bottom Pad **R**EAR **R**IGHT (Black 3D printed plastic)
16 X Socket Head Screw (M3 X 18mm long x stainless steel)
2 X Socket Head Screw (M3 X 10mm long x stainless steel)
2 X Nylock Nut (M3 x stainless steel)

Assembly Process:
There are small letters printed into the face of each pad. This allows you to correctly locate the pads onto your Speed Addict's arms. With the craft facing away from you the **FRONT RIGHT** arm is to your right. Each arm will receive a top pad, bottom pad, and18mm long screws X 4. The 10mm long screws and nylock nuts are only used for positioning. After your motor is installed remove the 10mm long screws and nuts for use on the next arm. We suggest to use loctite on the motor mount screws.



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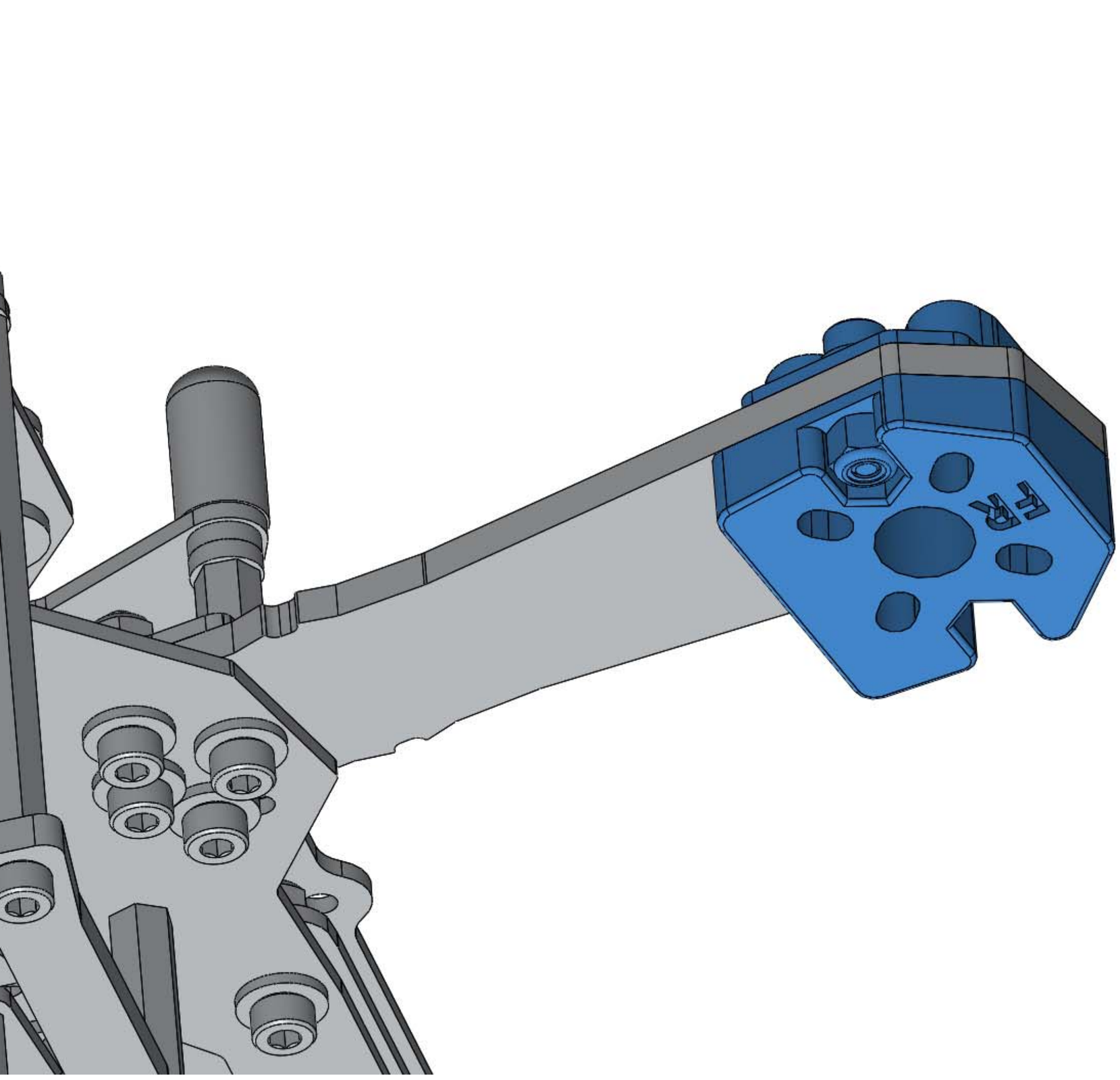
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