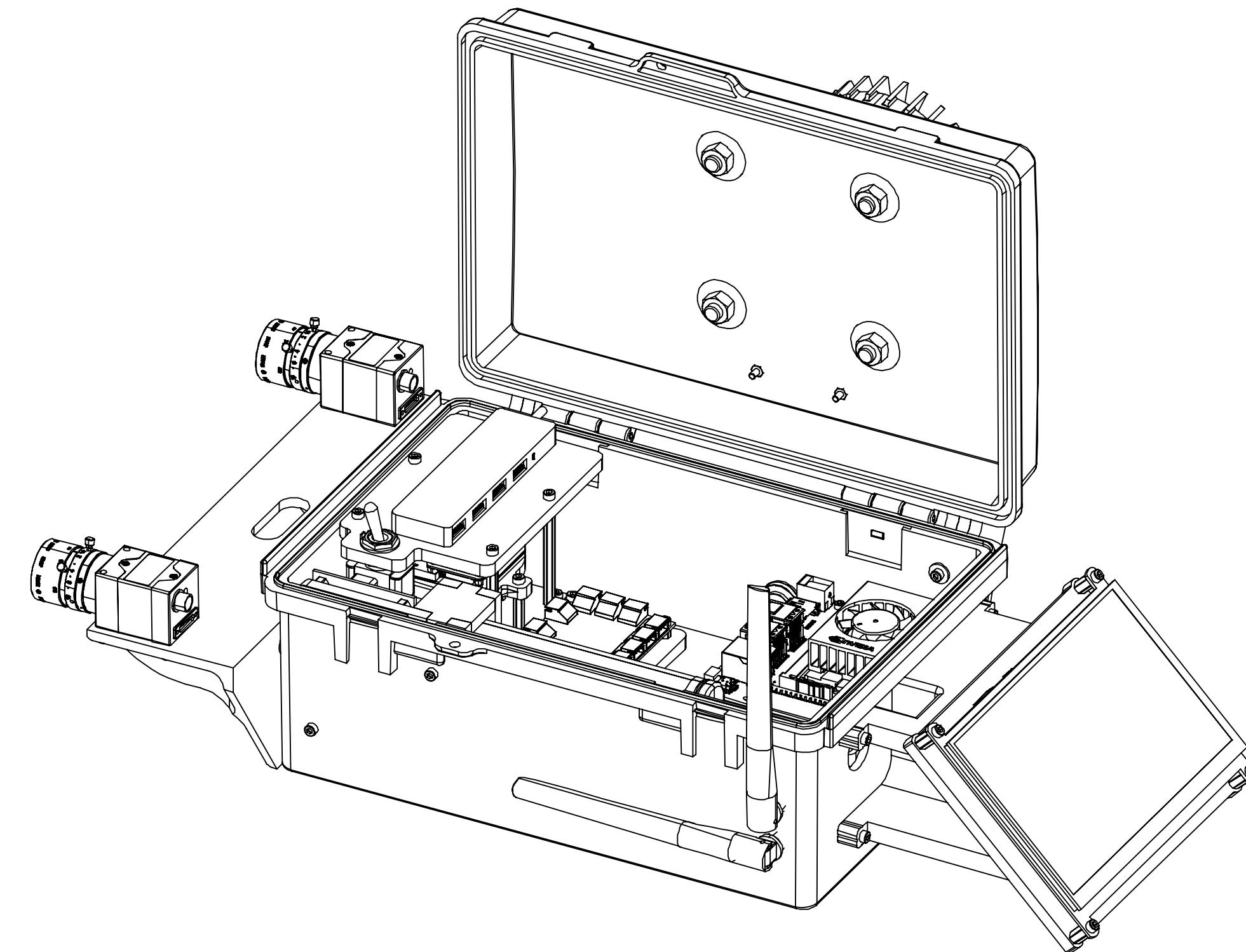


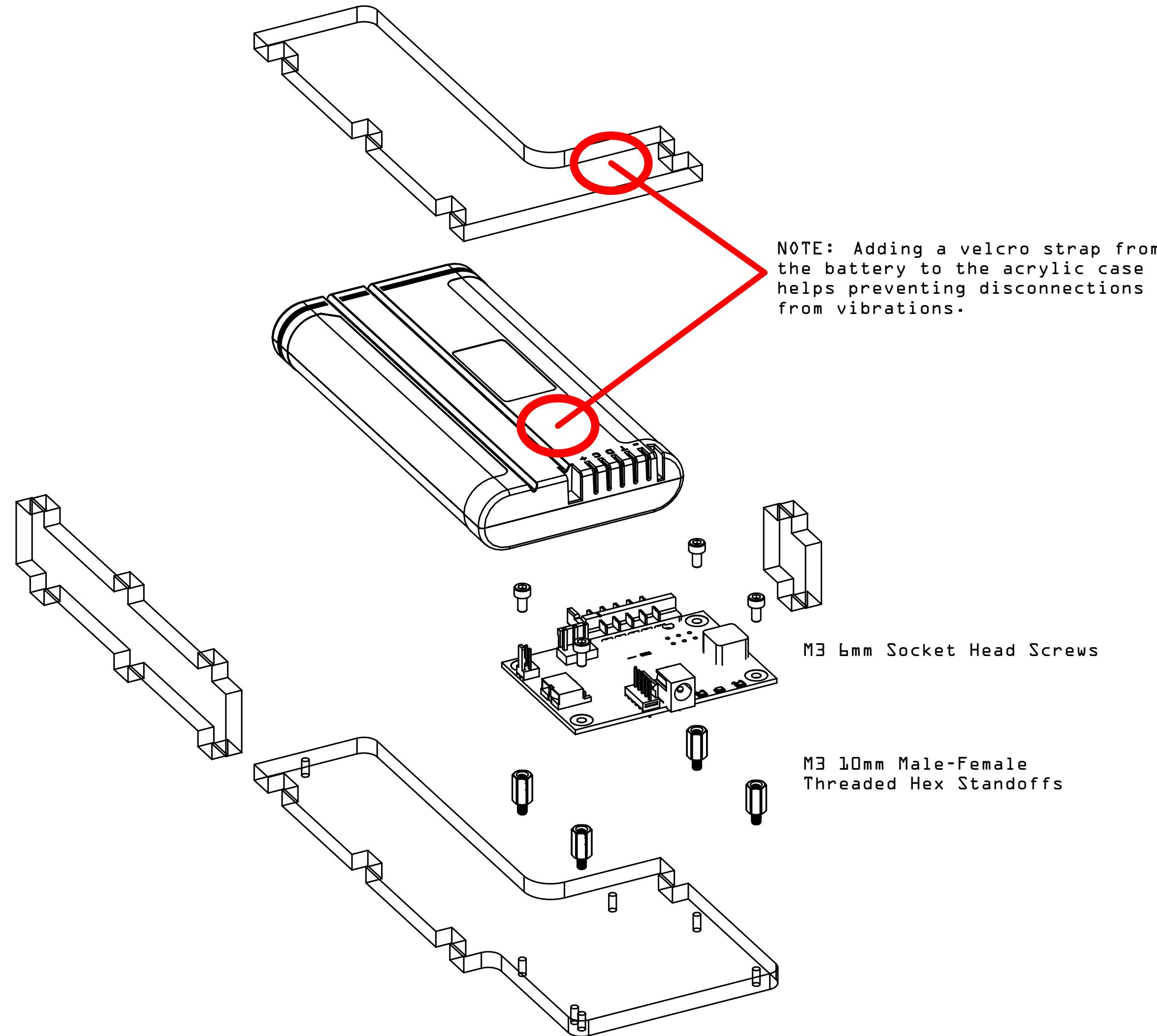
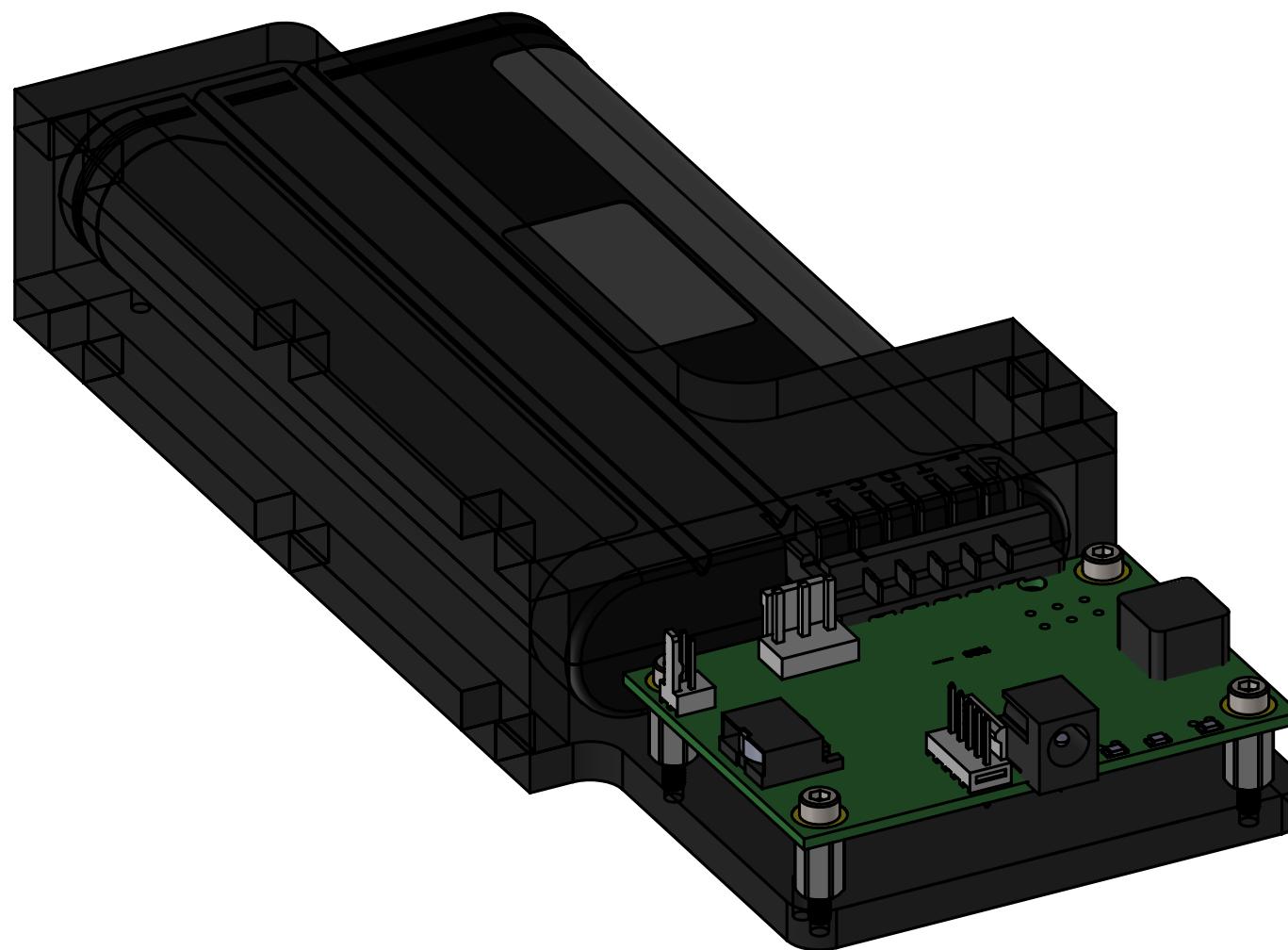
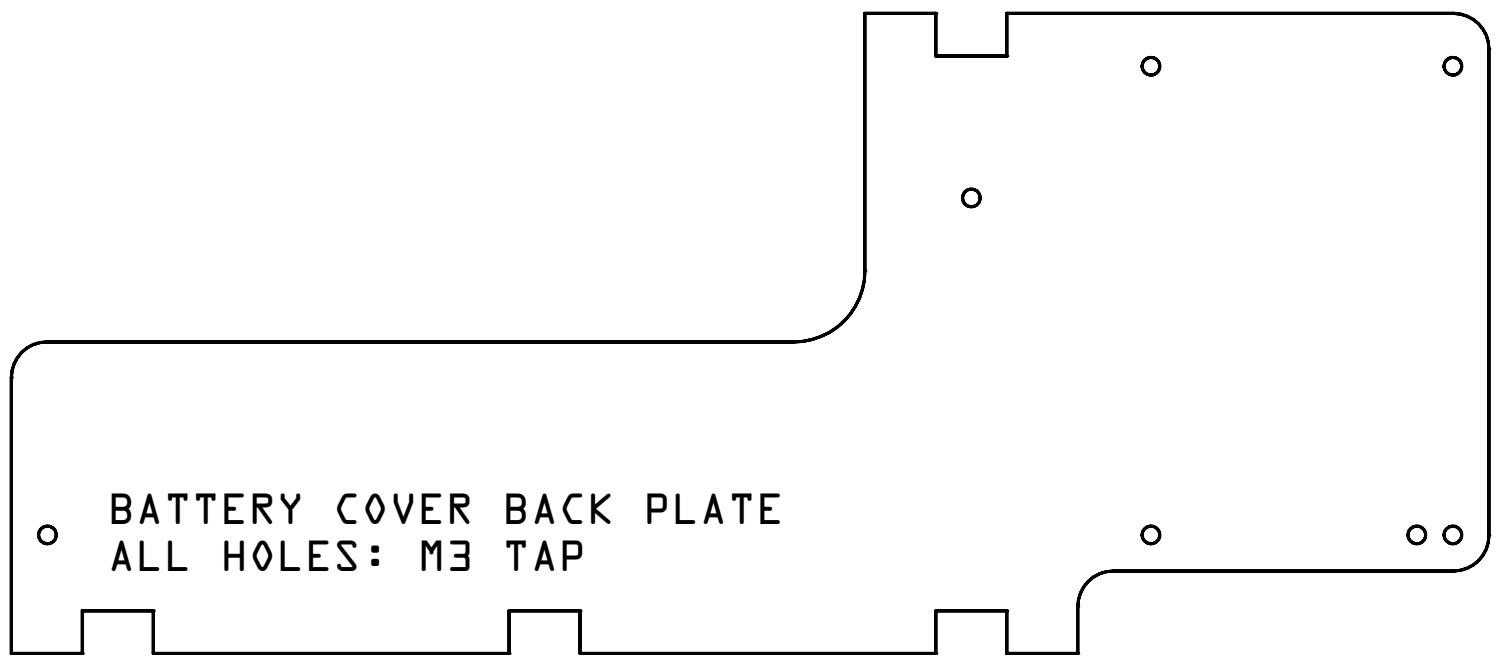
# NeuROAM

## *Sensor Payload*

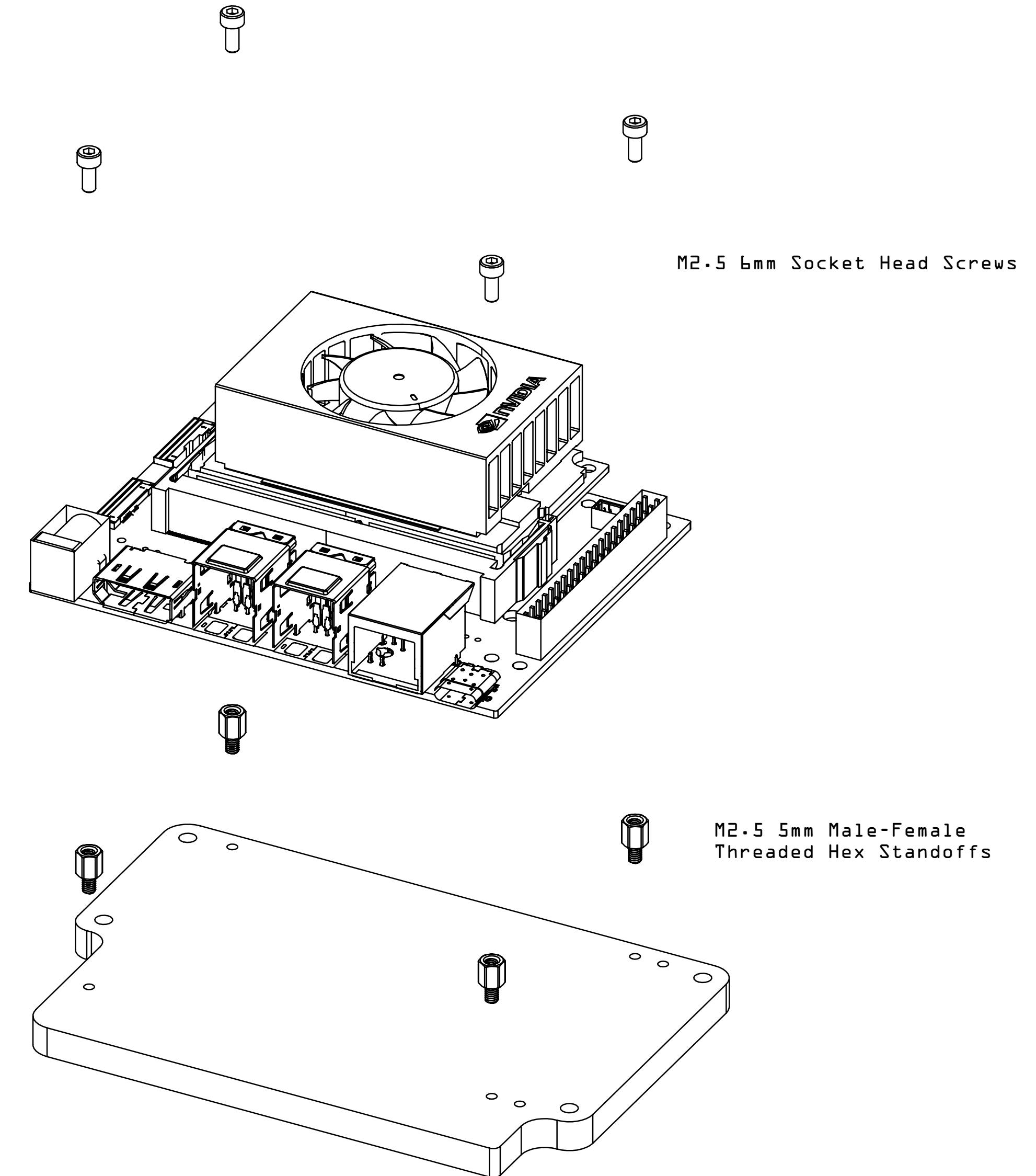
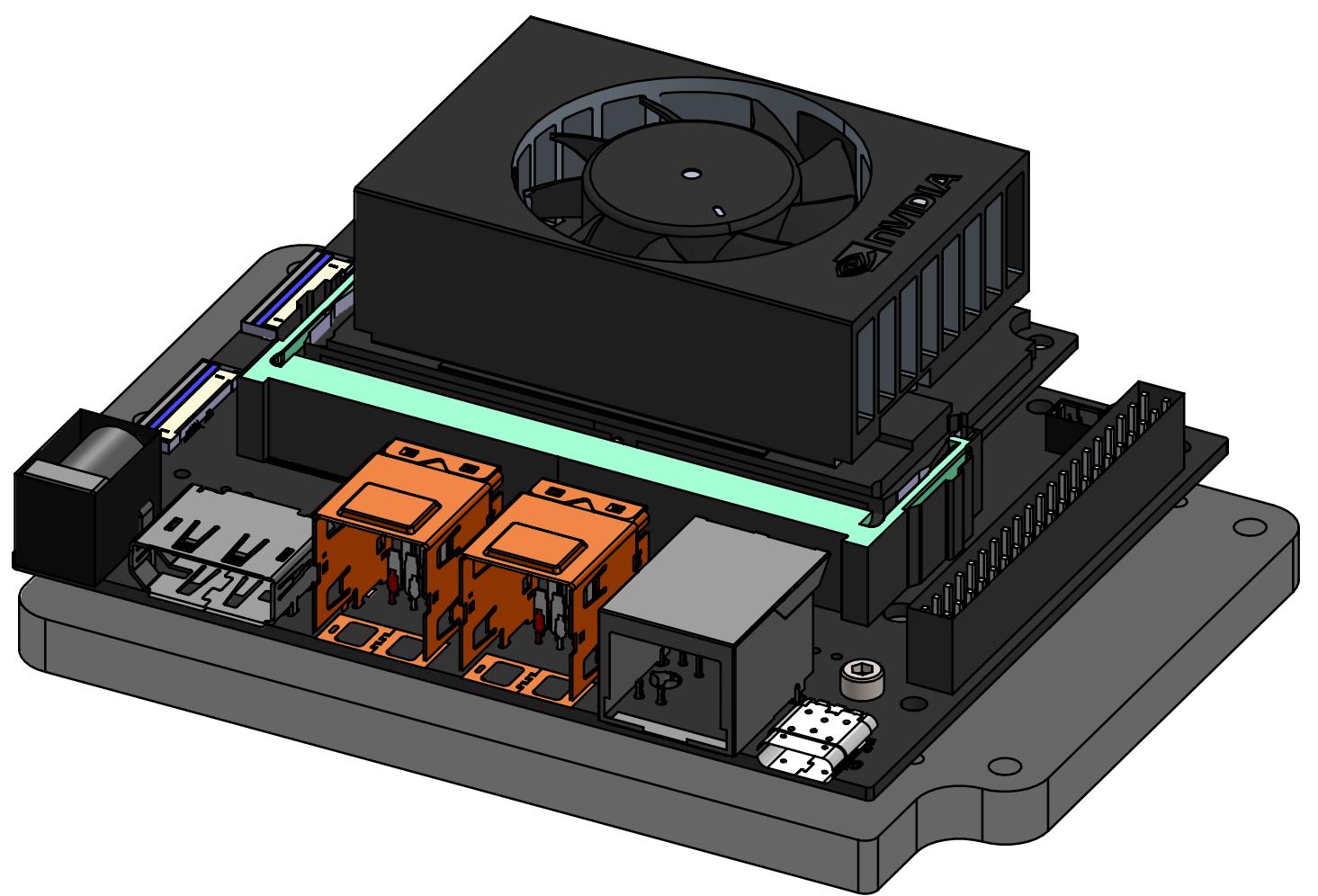
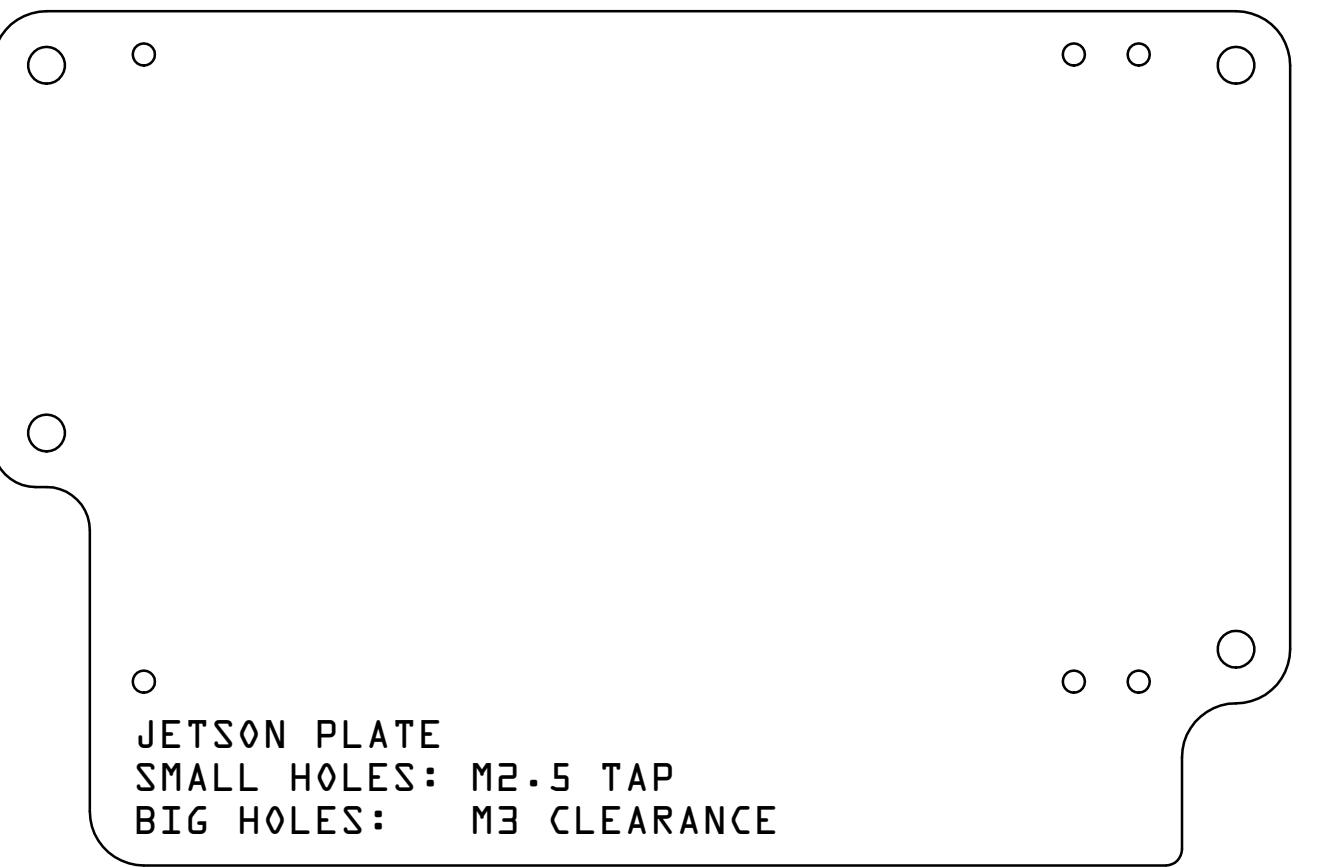
## *Manufacture & Assembly Instructions*



# Battery & Charger Module



# Jetson Module



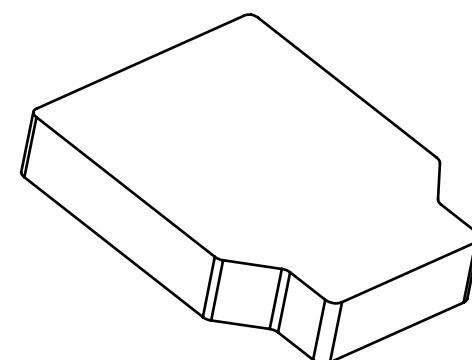
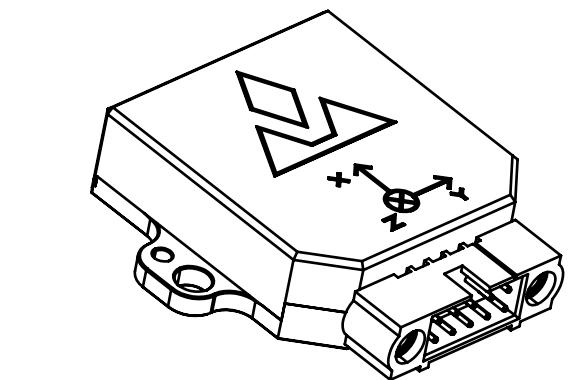
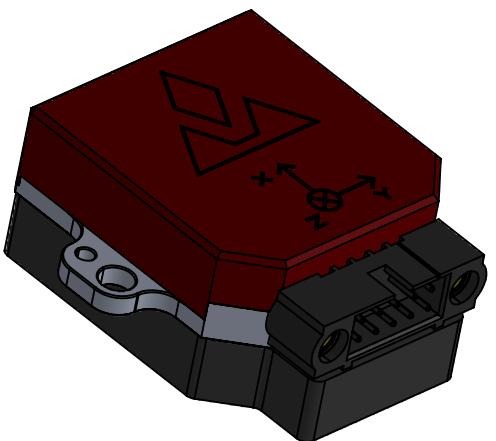
# IMU Module

NOTE: We used two different configurations for the IMU module.

Configuration B was used on Boston Dynamics' SPOT in an attempt to minimize vibration impact on the IMU data.

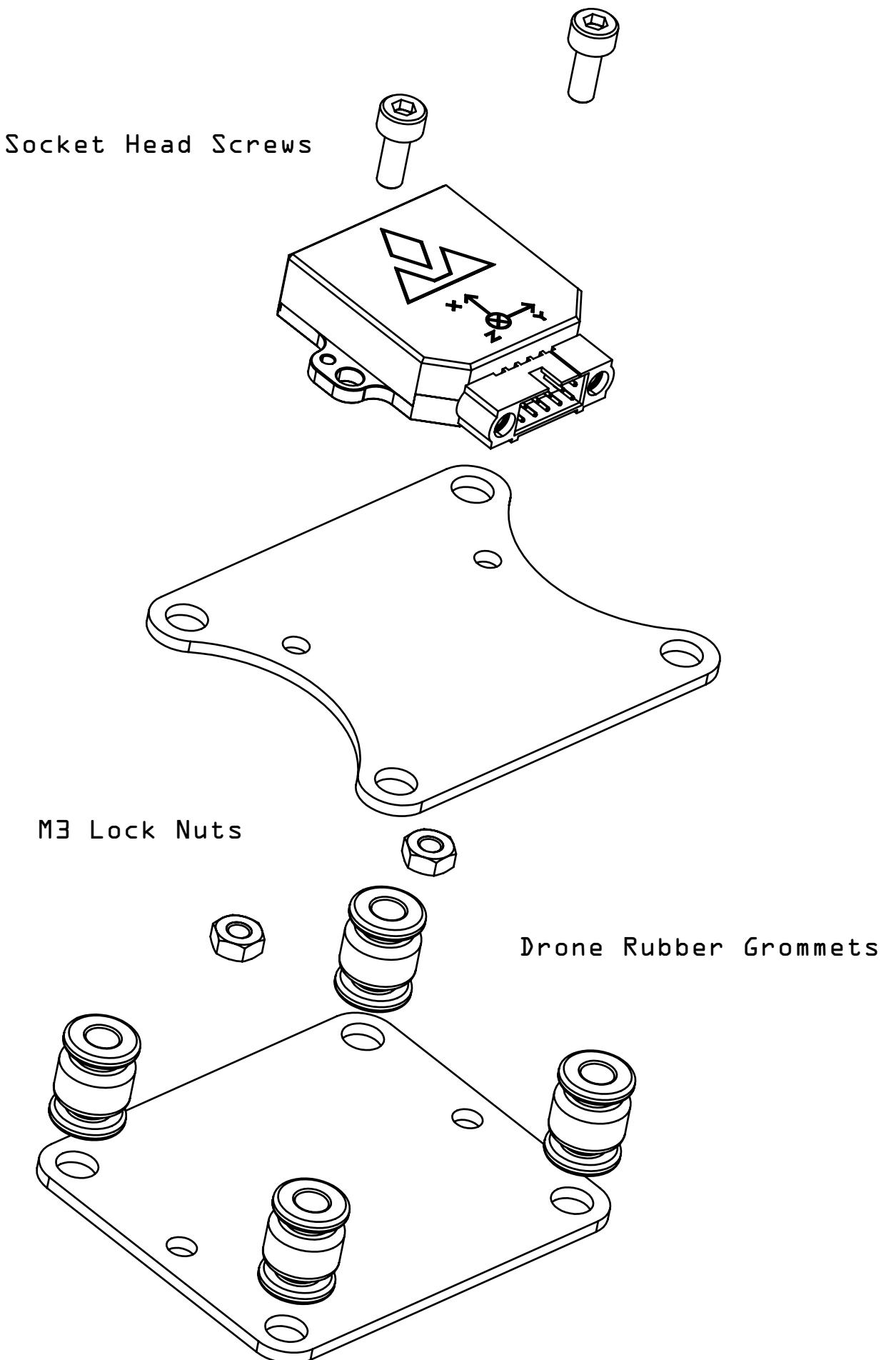
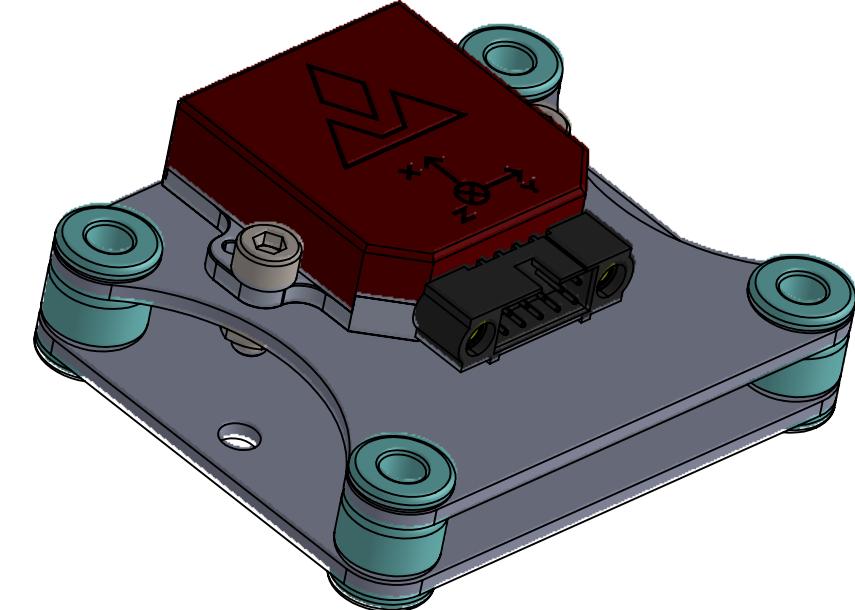
Configuration A was used in the rest of the payloads deployed, including Unitree Go2 & Go2W, and AgileX Hunter & Scout.

## CONFIGURATION A

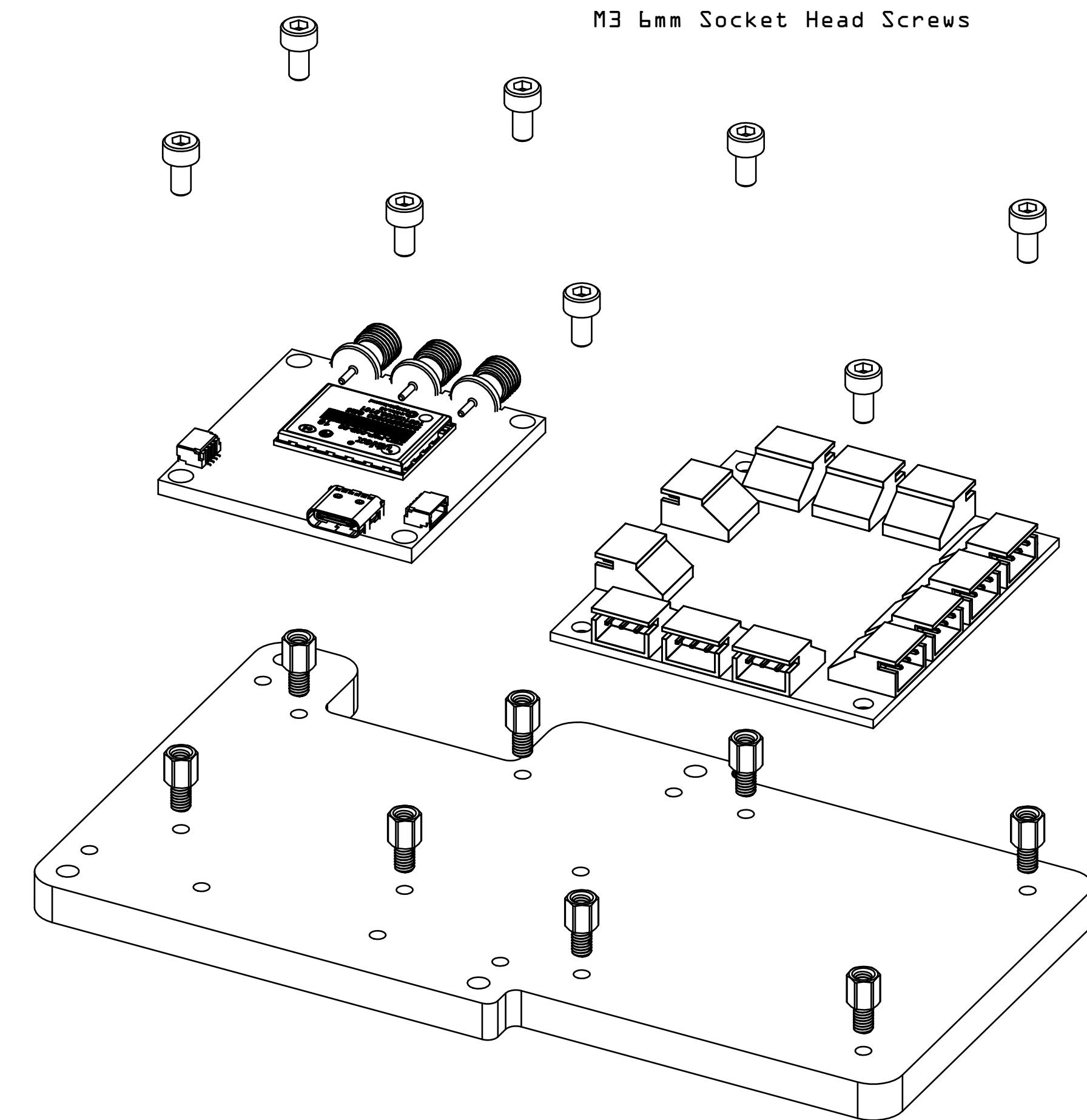
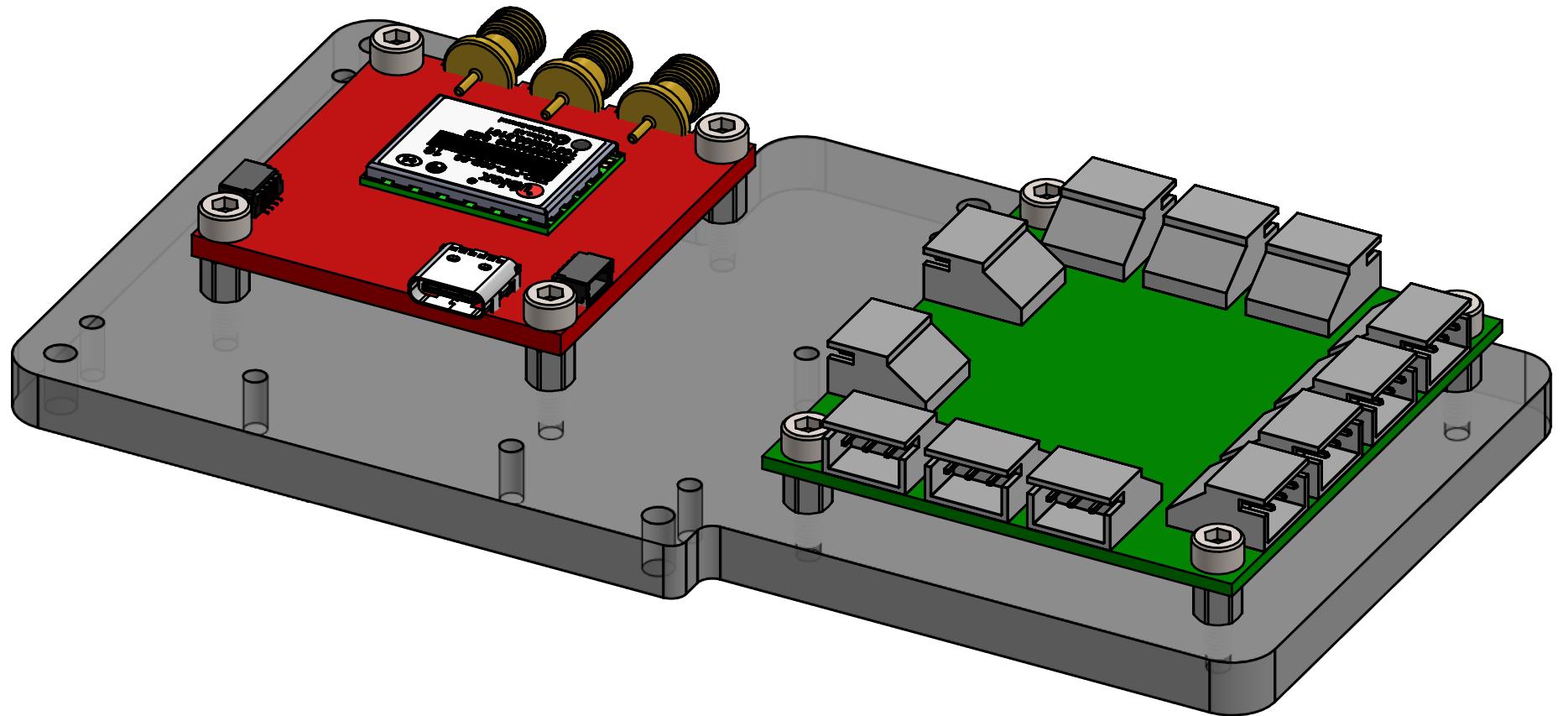
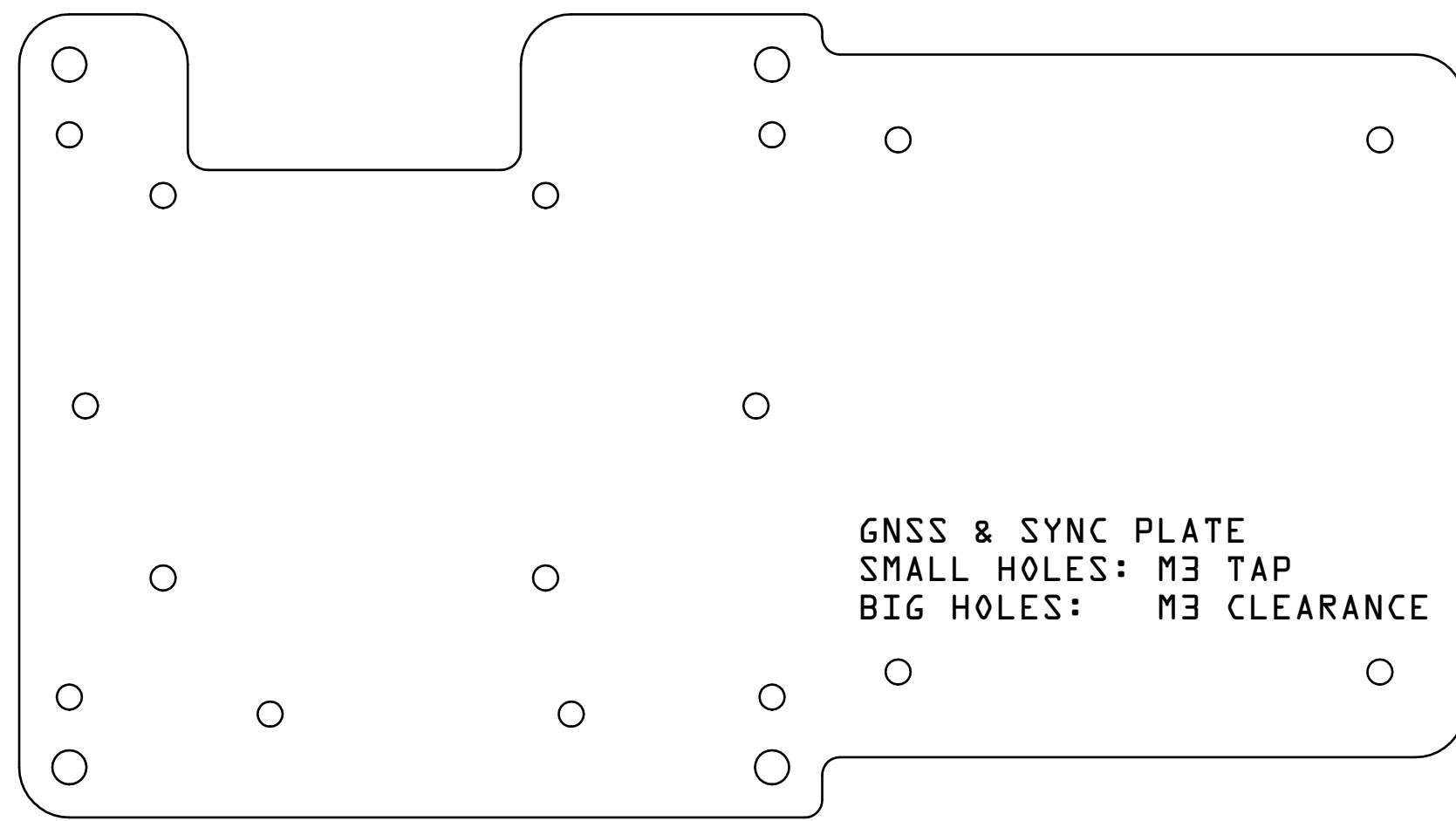


0.25in 3000 Sorbothane  
(Polyurethane Rubber)

## CONFIGURATION B



# GPS & Sync Board Module

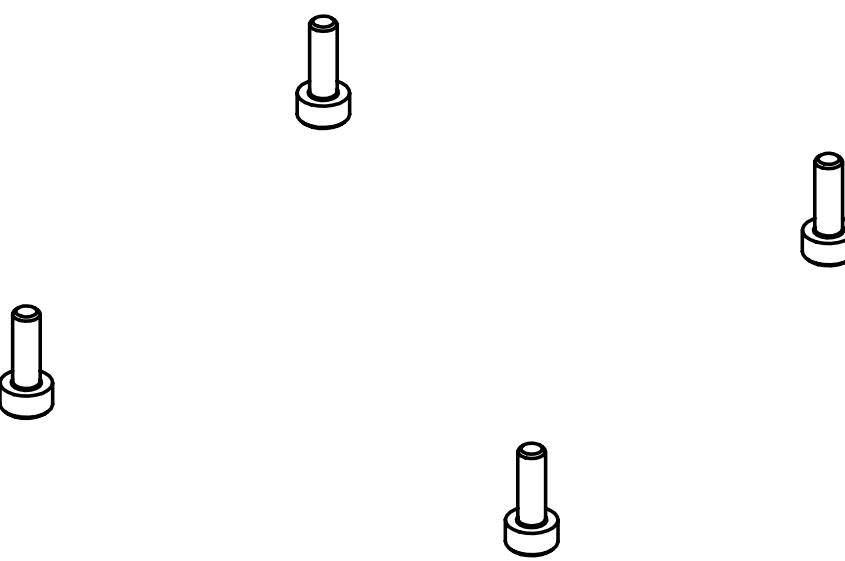
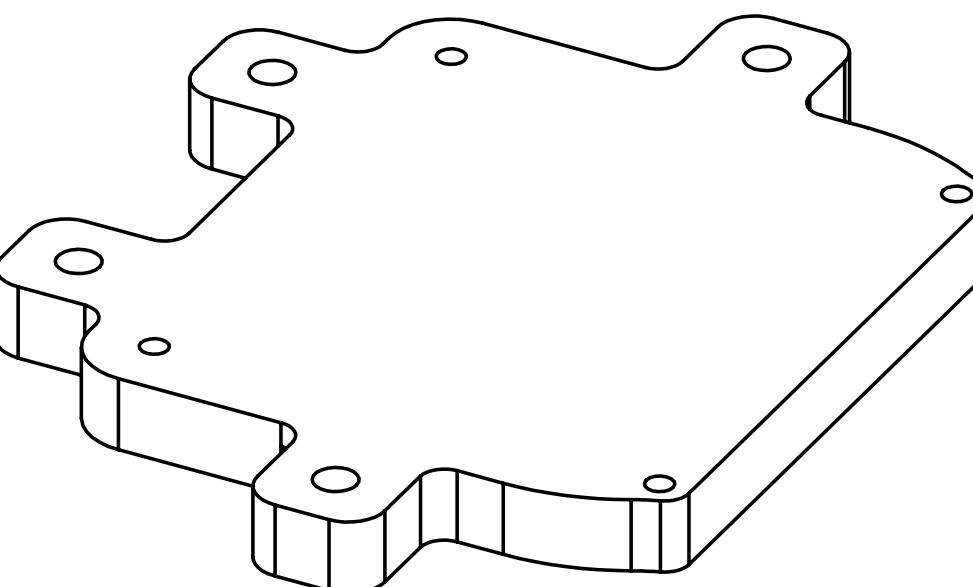
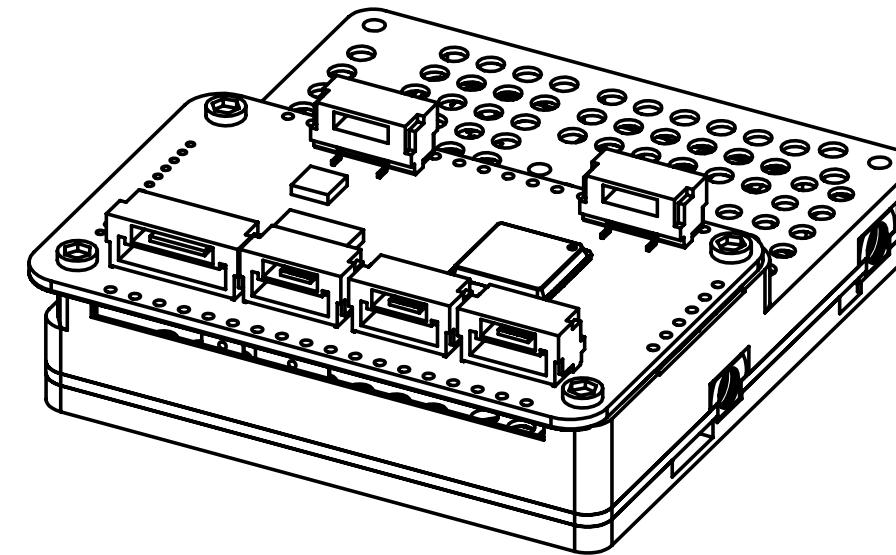
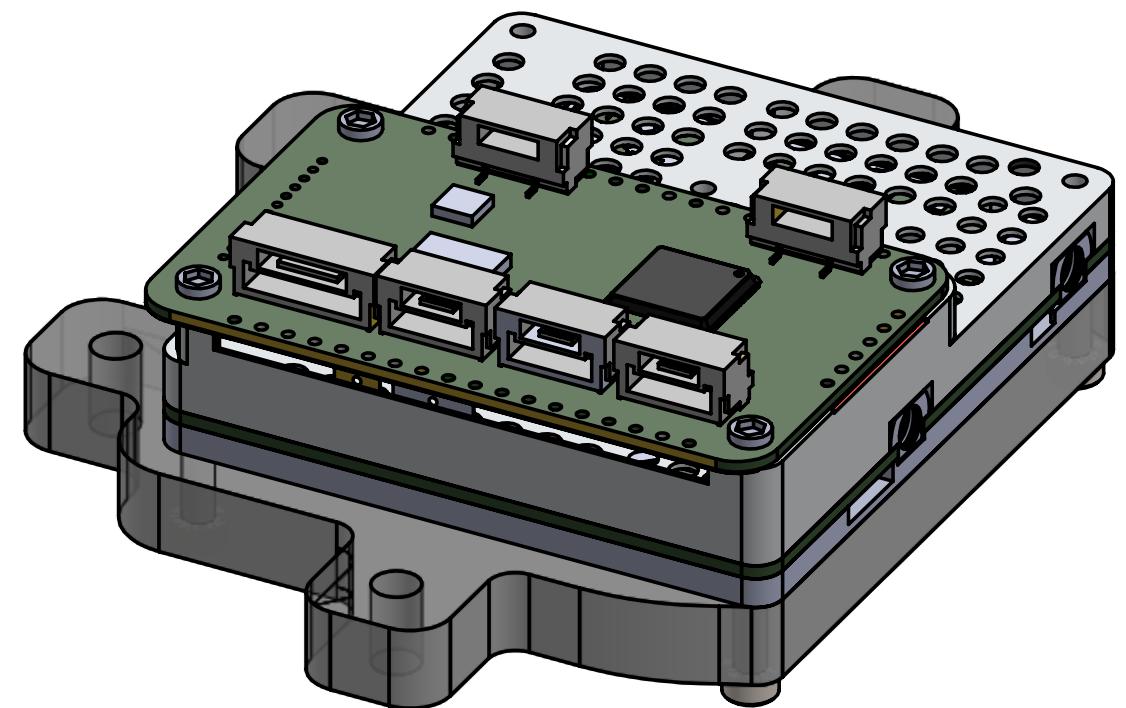
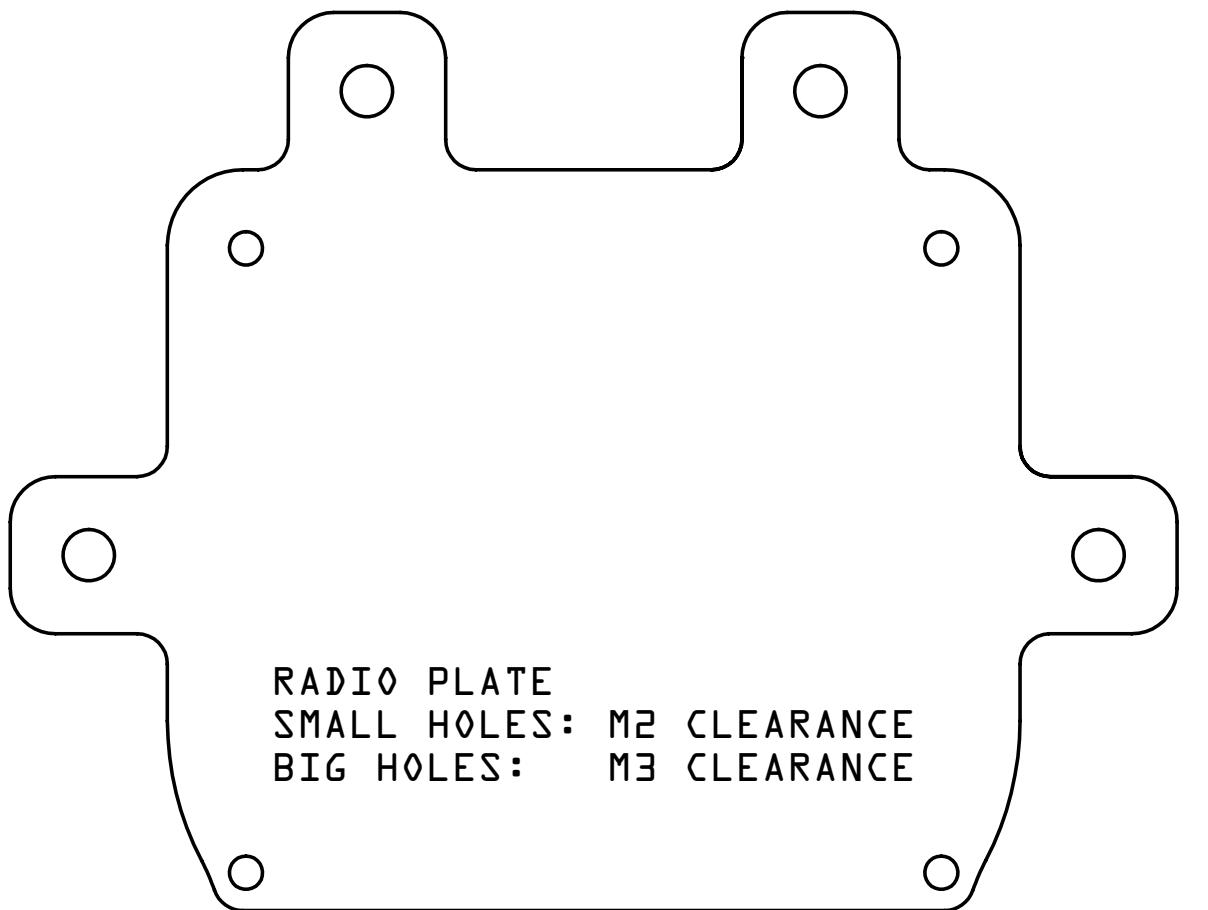


M3 5mm Male-Female Threaded Hex Standoffs

M3 6mm Socket Head Screws

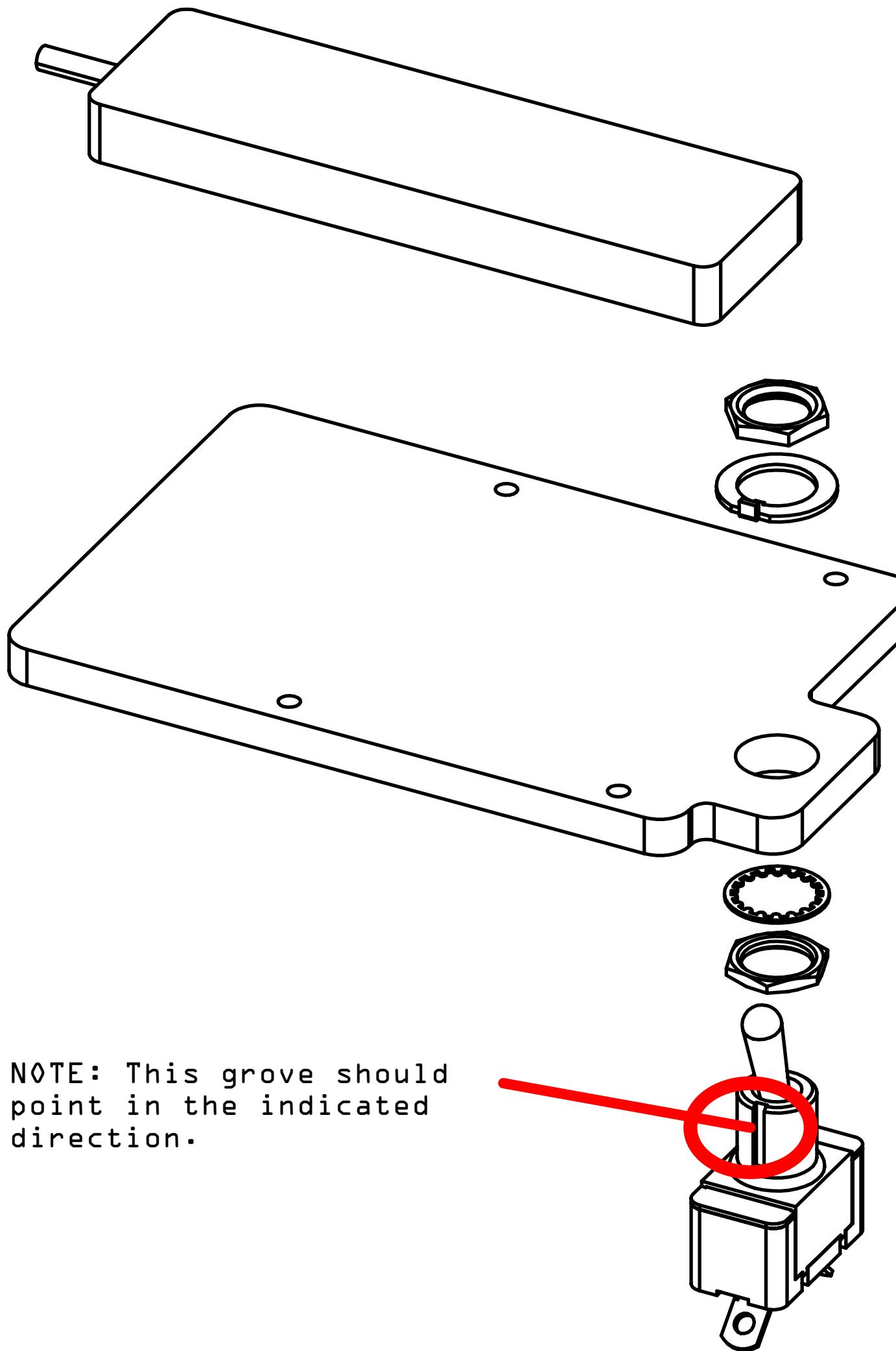
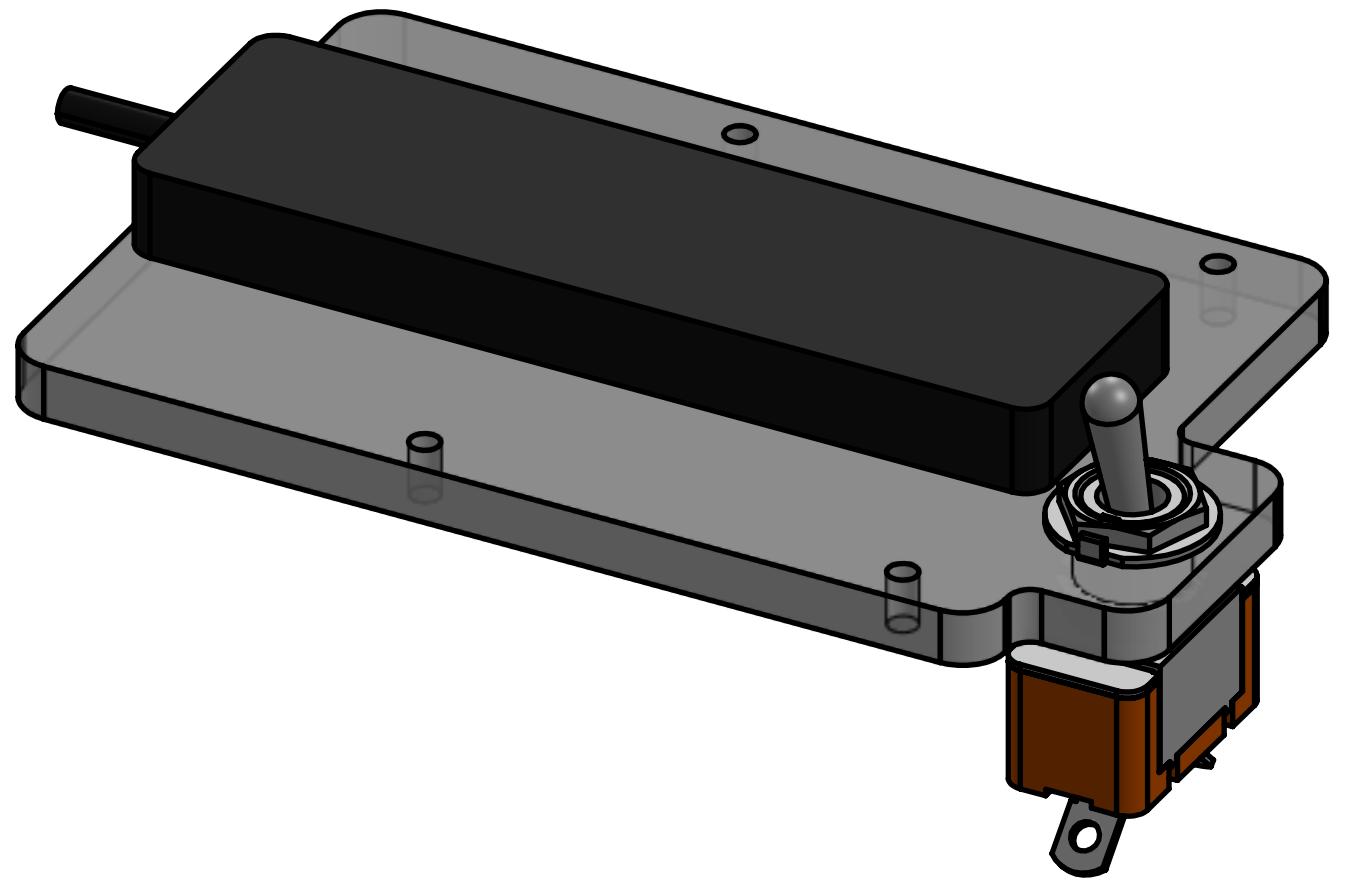
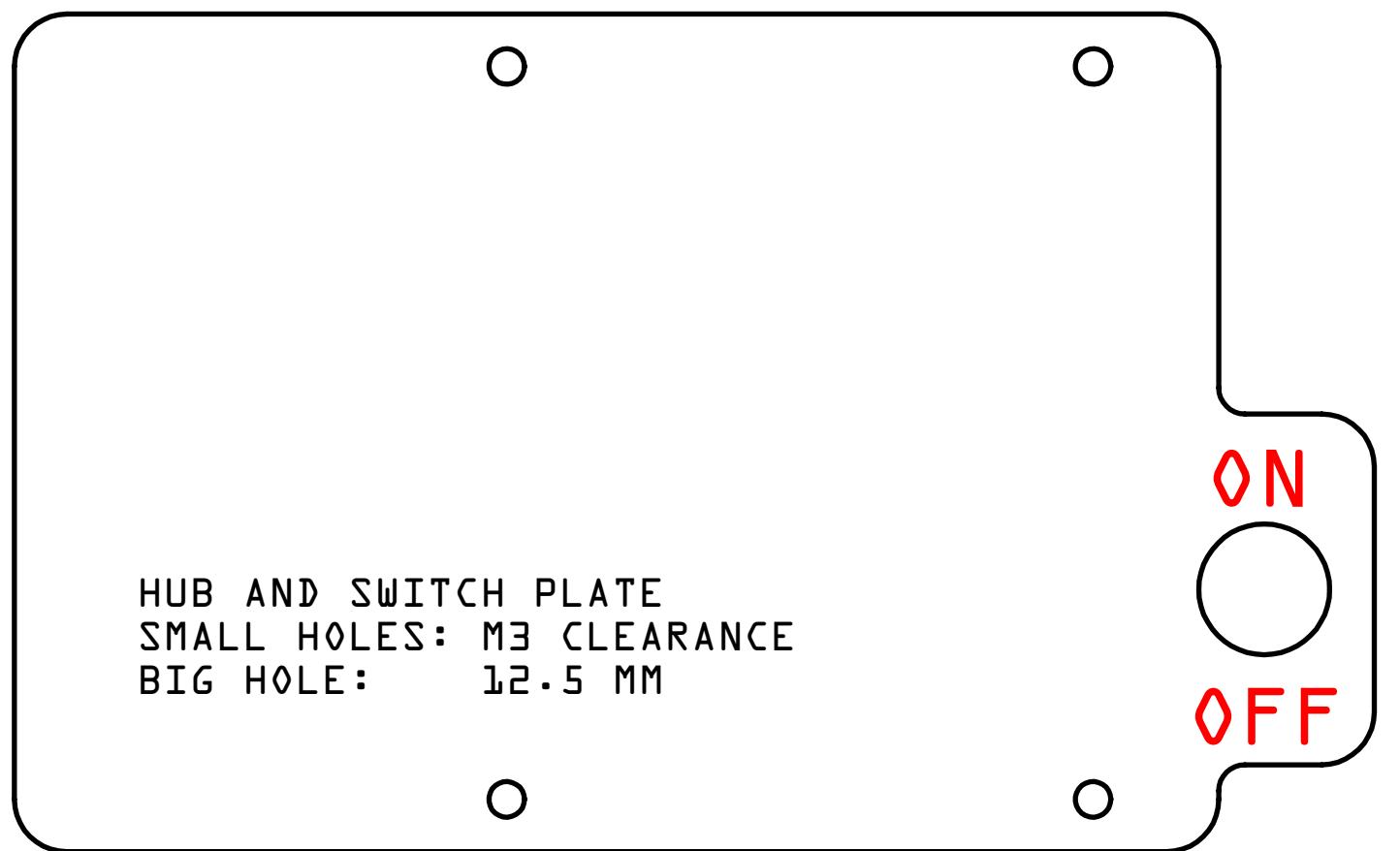
# Radio Module

NOTE: We removed 4 of the original screws  
in the radio module and substituted them for  
M2 10mm (or 12mm) socket head screws.

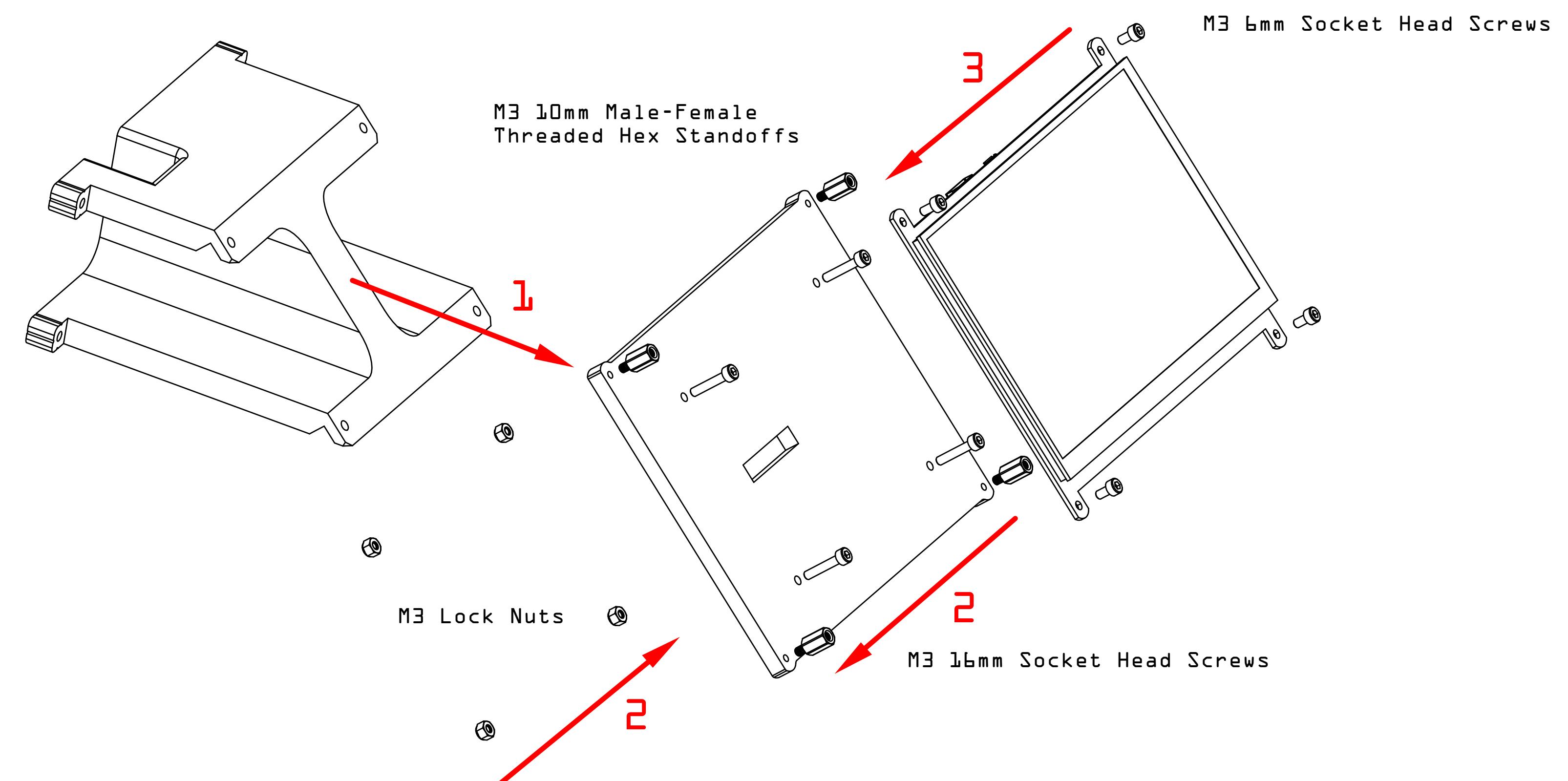
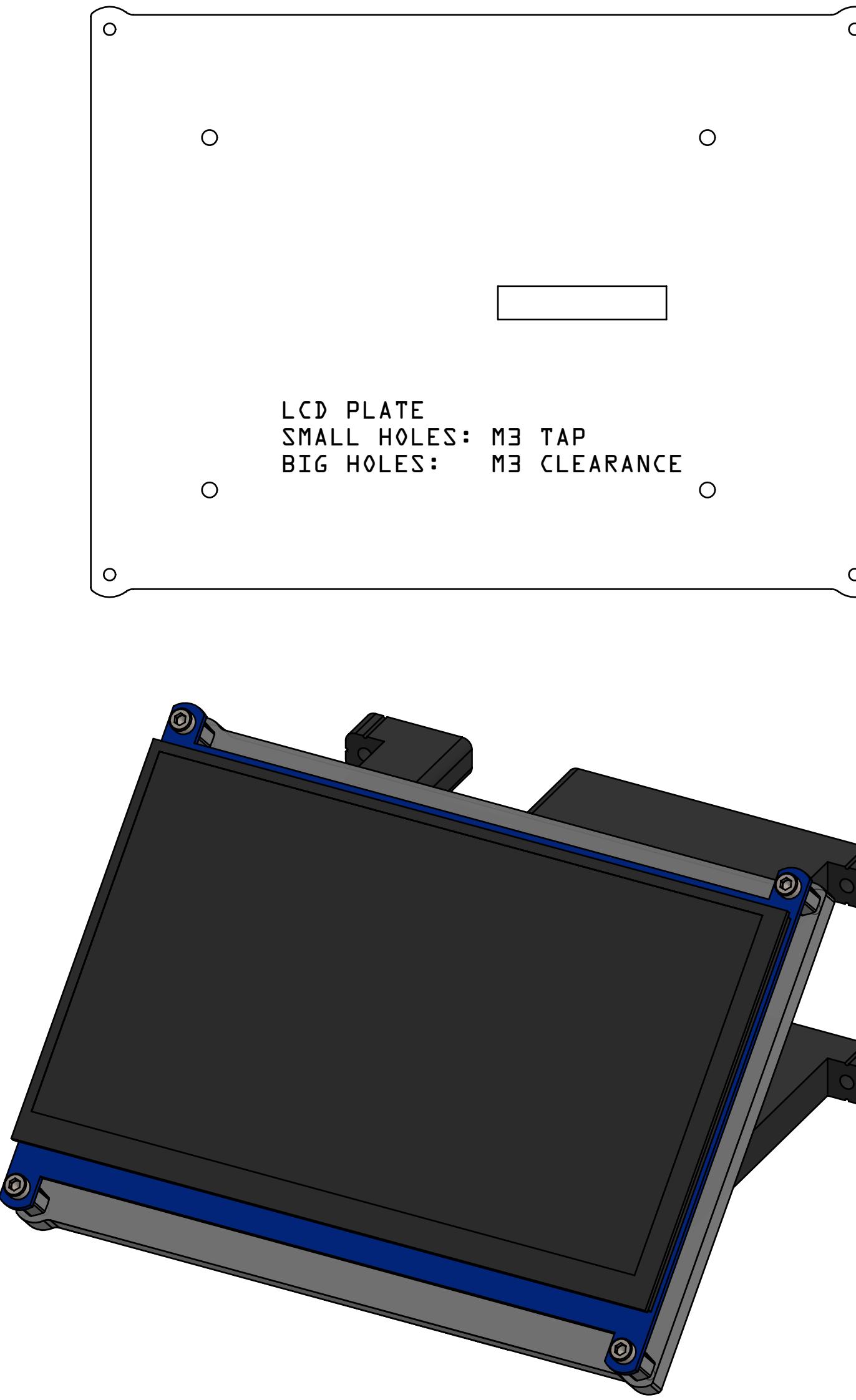


M2 10mm (or 12mm) Socket Head Screws

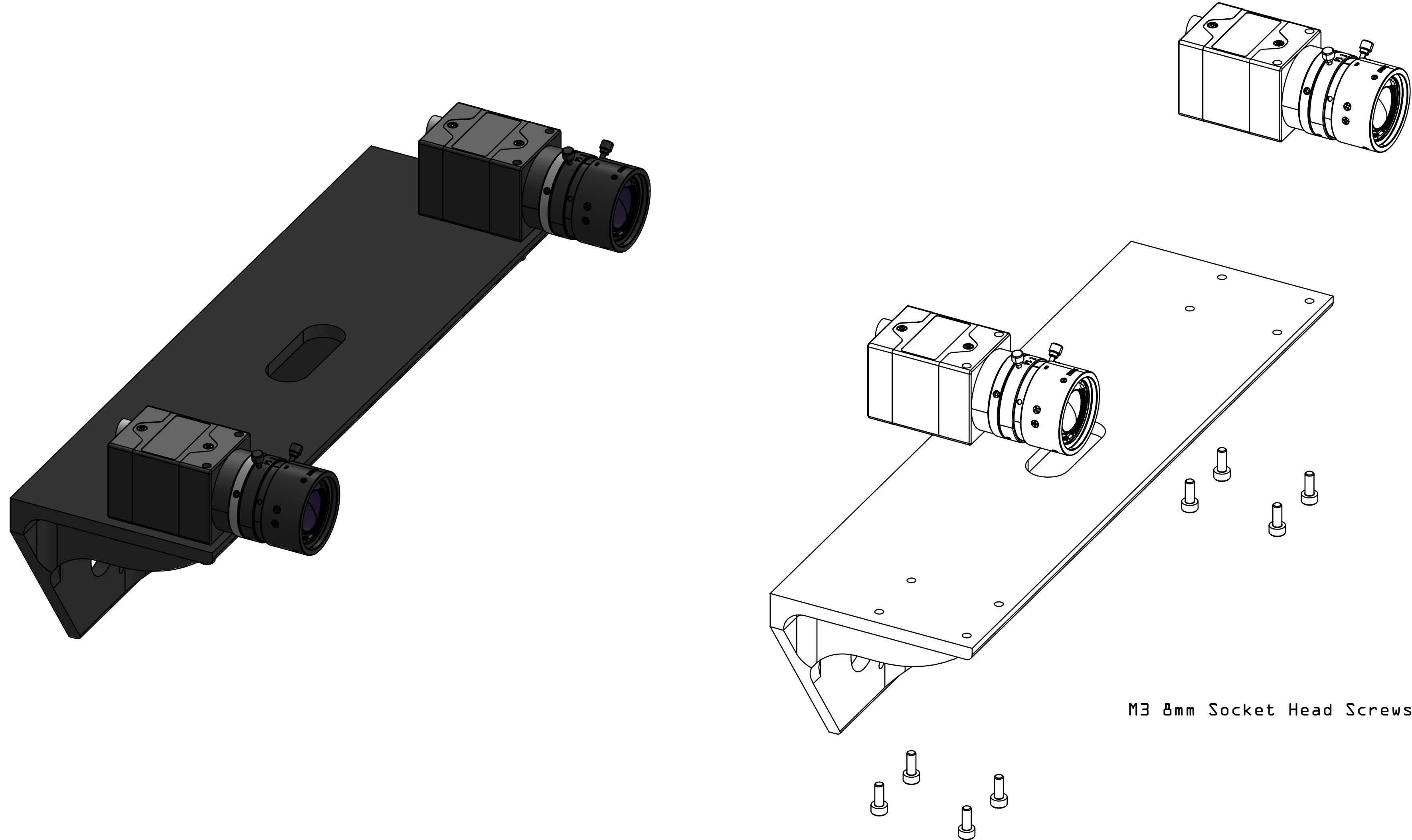
# USB Hub & Switch Module



# LCD Module

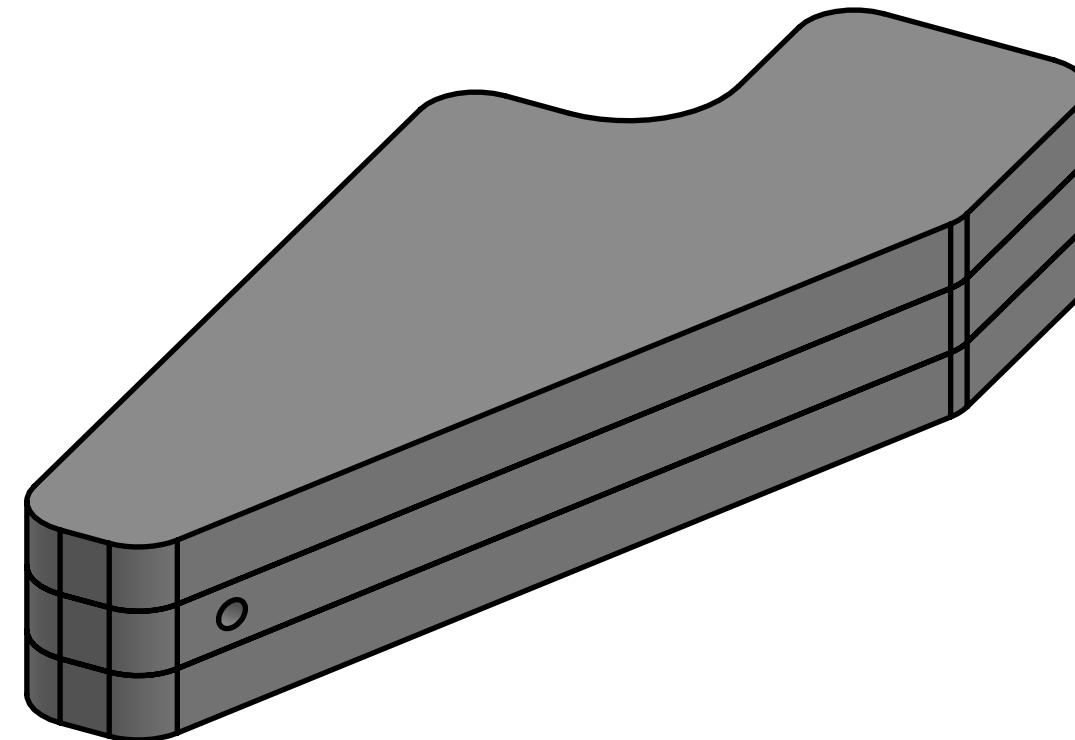
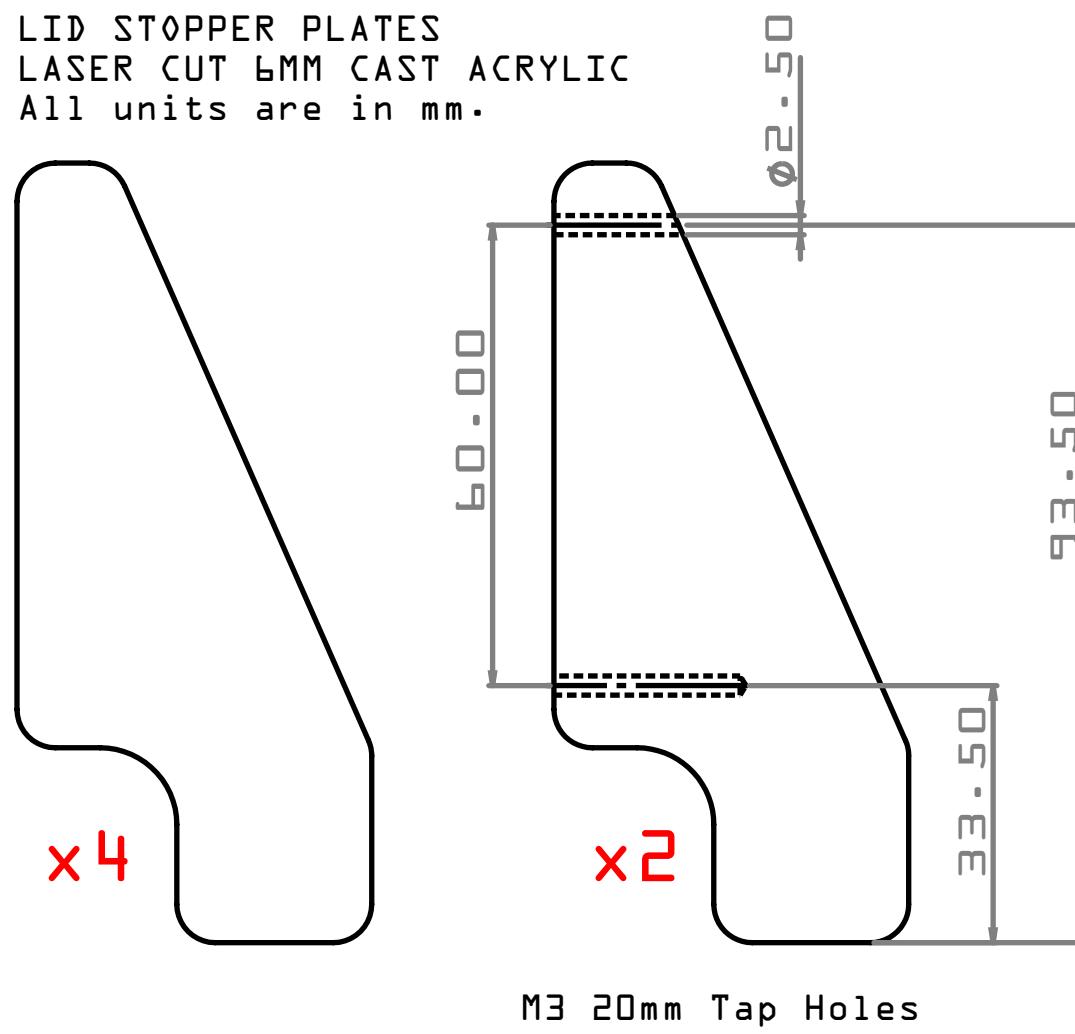


# Cameras & Bracket Module



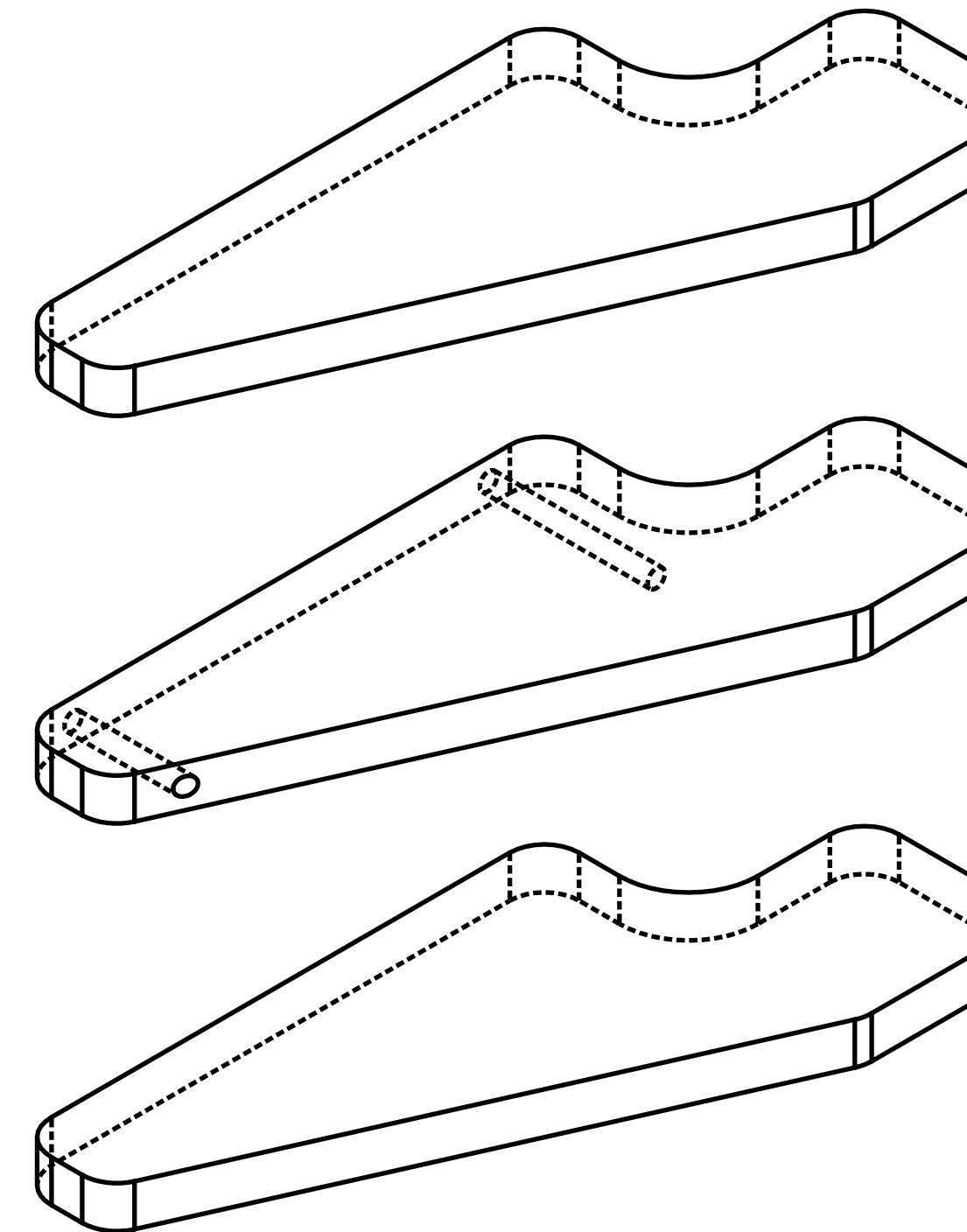
# Lid Stopper

LID STOPPER PLATES  
LASER CUT 6MM CAST ACRYLIC  
All units are in mm.



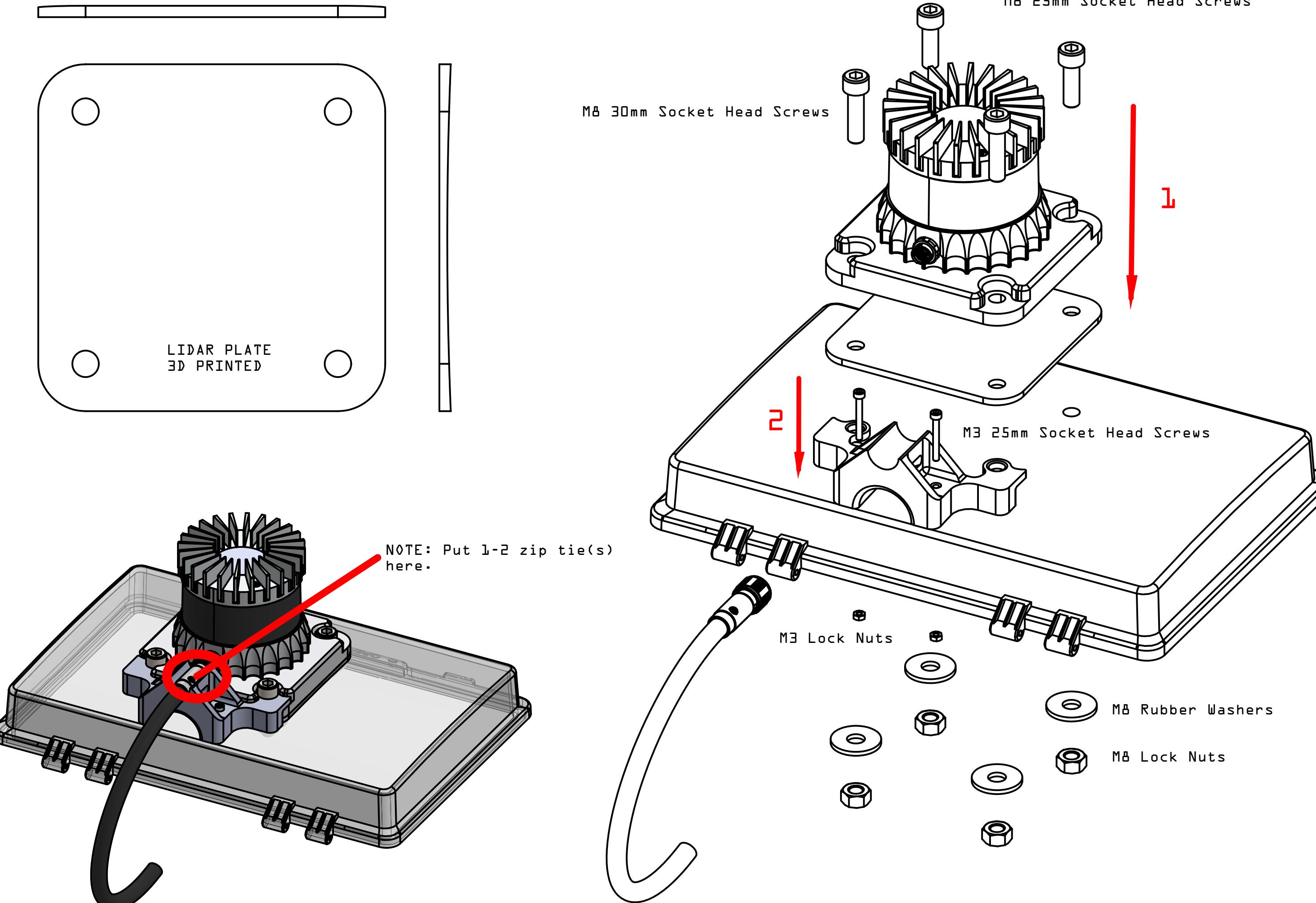
## MANUFACTURE STEPS:

- 1) Lasercut 6 plates.
- 2) Glue 3 plates to each other.  
We used acrylic liquid cement.
- 3) Drill two holes of 2.5mm diameter.  
Check diagram for precise locations.
- 4) Use an M3 tap bit to tap the holes.
- 5) Repeat for the remaining 3 plates.

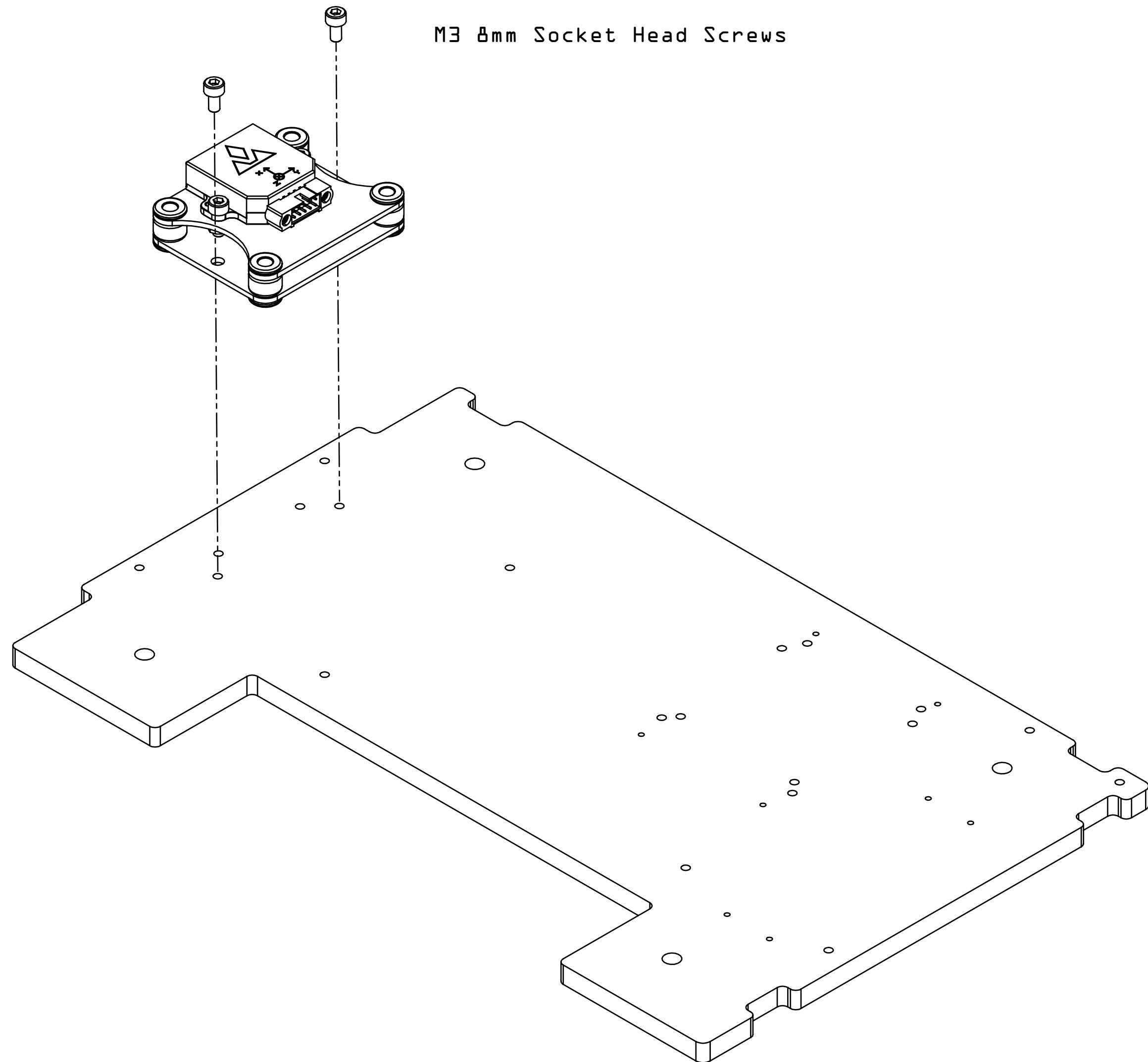


# LiDAR Module

NOTE: Don't assemble this module yet.  
It should be assembled after the lid  
stoppers are attached, and the main  
plate is secured to the enclosure.



# Main Module



M3 8mm Socket Head Screws

NOTES:

Attach the IMU module to the main plate.

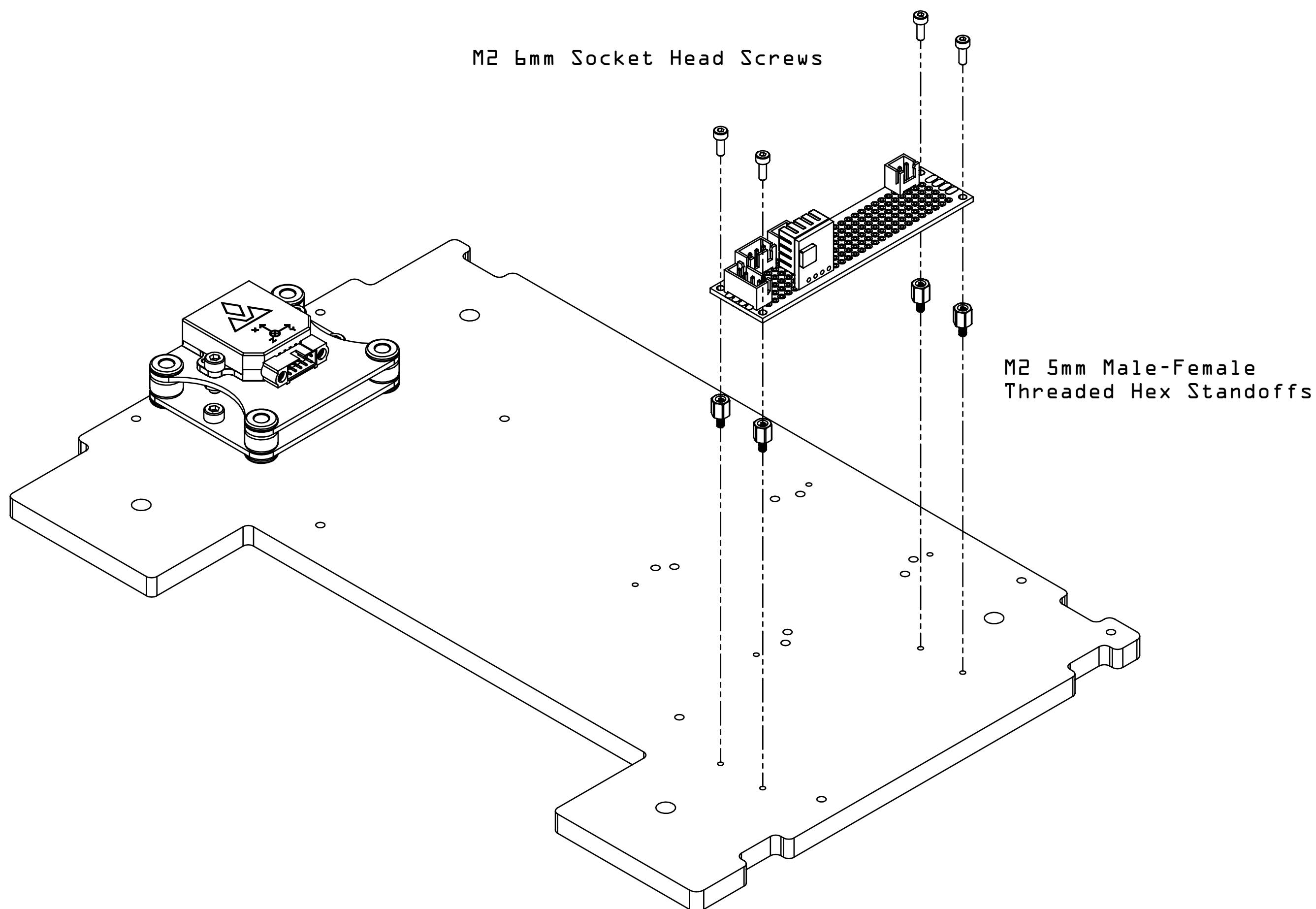
The IMU configuration A may require longer screws.

# Main Module

## NOTES:

Screw the power distribution board (PDB) standoffs to the main plate.

Attach the PDB to the standoffs.



# Main Module

## NOTES:

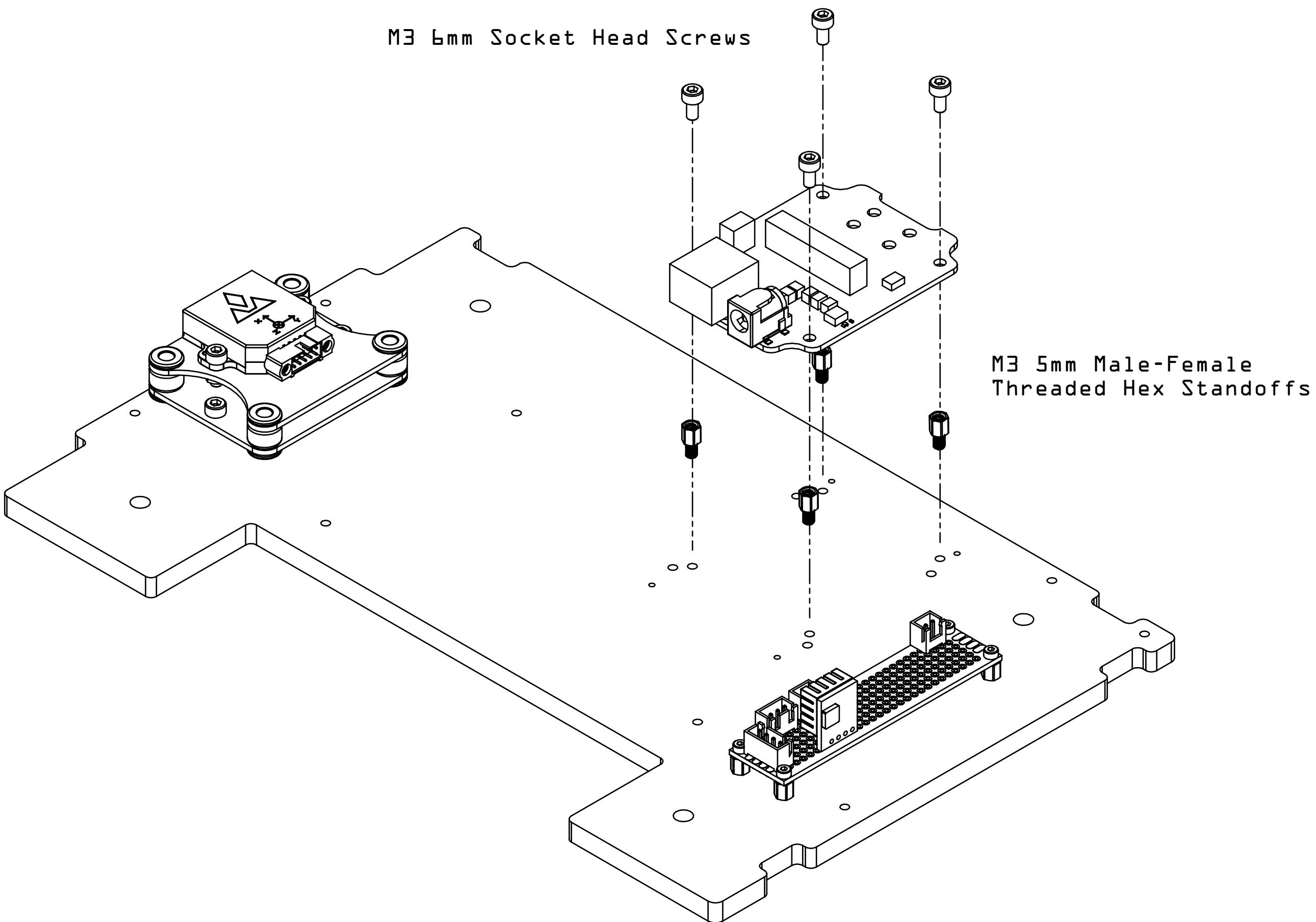
Screw the LiDAR interface board standoffs to the main plate.

Attach the interface board to the standoffs.

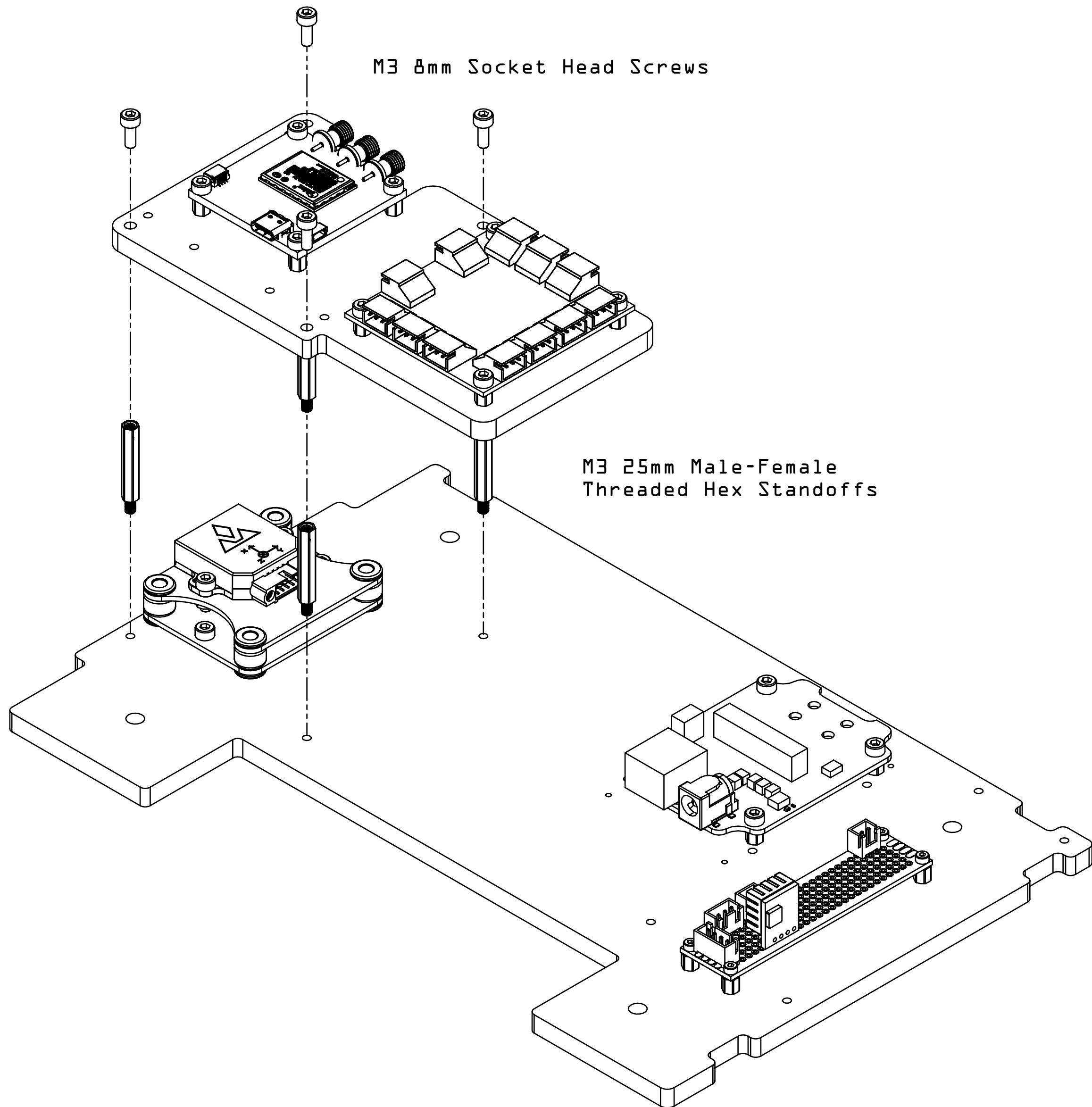
The main plate has 3 different hole positions and types for different interface board versions.

It supports Ouster's LiDAR interface boards of type 1, 2, 3, and a custom prototyping board (50x70mm).

The prototyping board uses the M2 holes. Ouster's use the M3 holes.



# Main Module

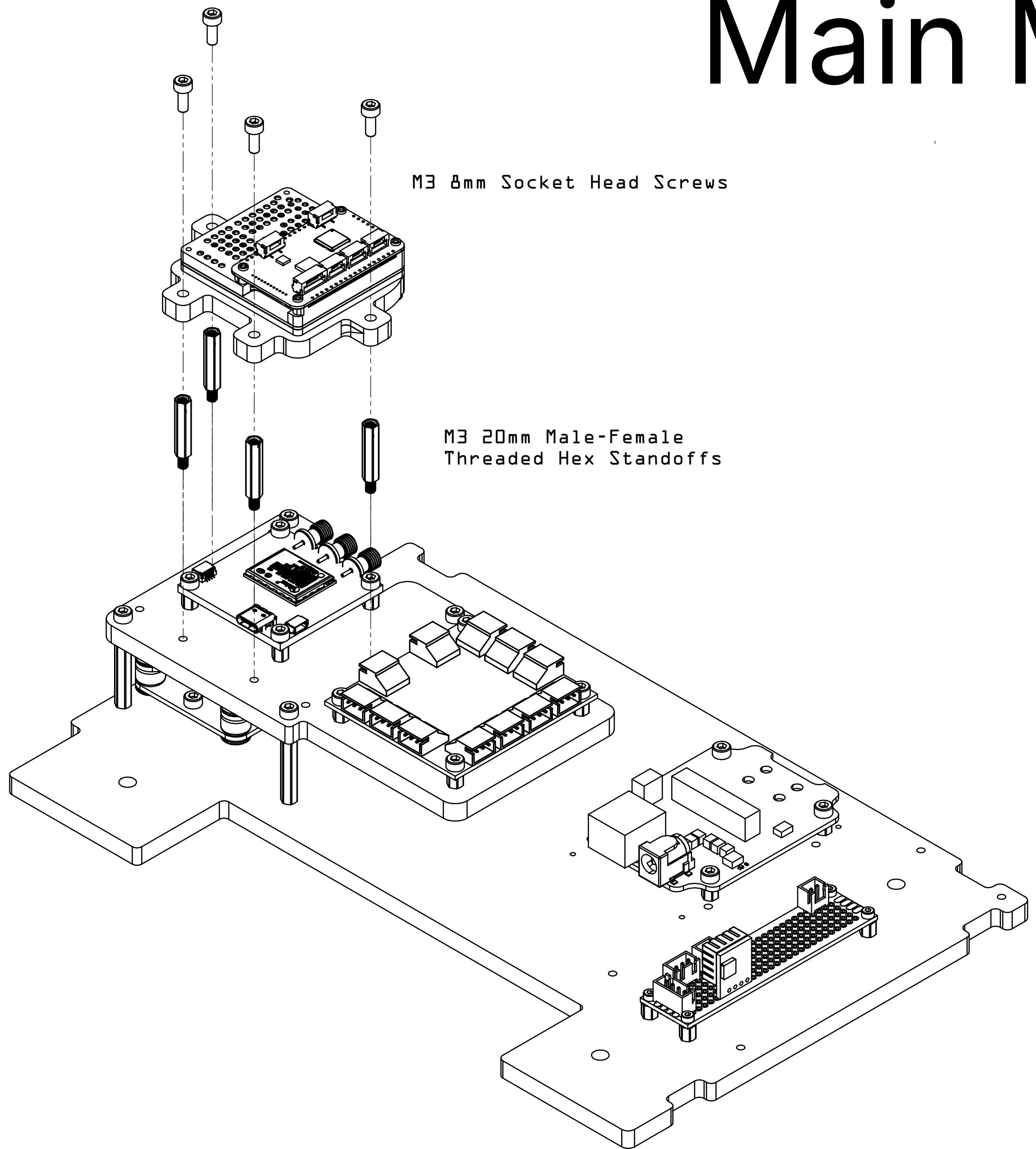


## NOTES:

Screw the GNSS and sync board standoffs to the main plate.

Attach the GNSS and sync module to the standoffs.

# Main Module

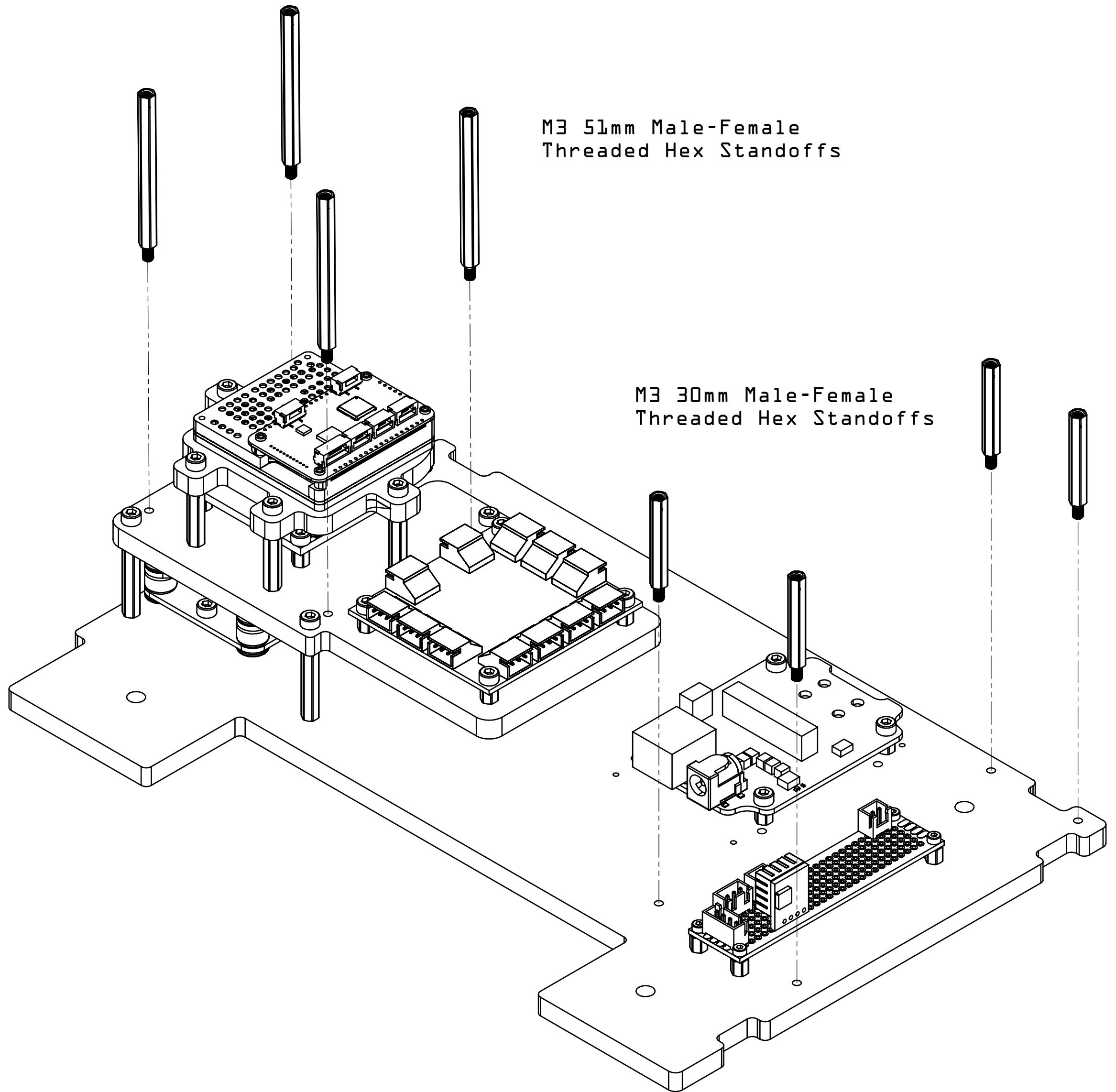


## NOTES:

Screw the radio module standoffs to the GNSS and sync module.

Attach the radio module to the GNSS and sync module standoffs.

# Main Module



## NOTES:

Screw the USB hub and switch module standoffs (51mm) to the GNSS and sync module.

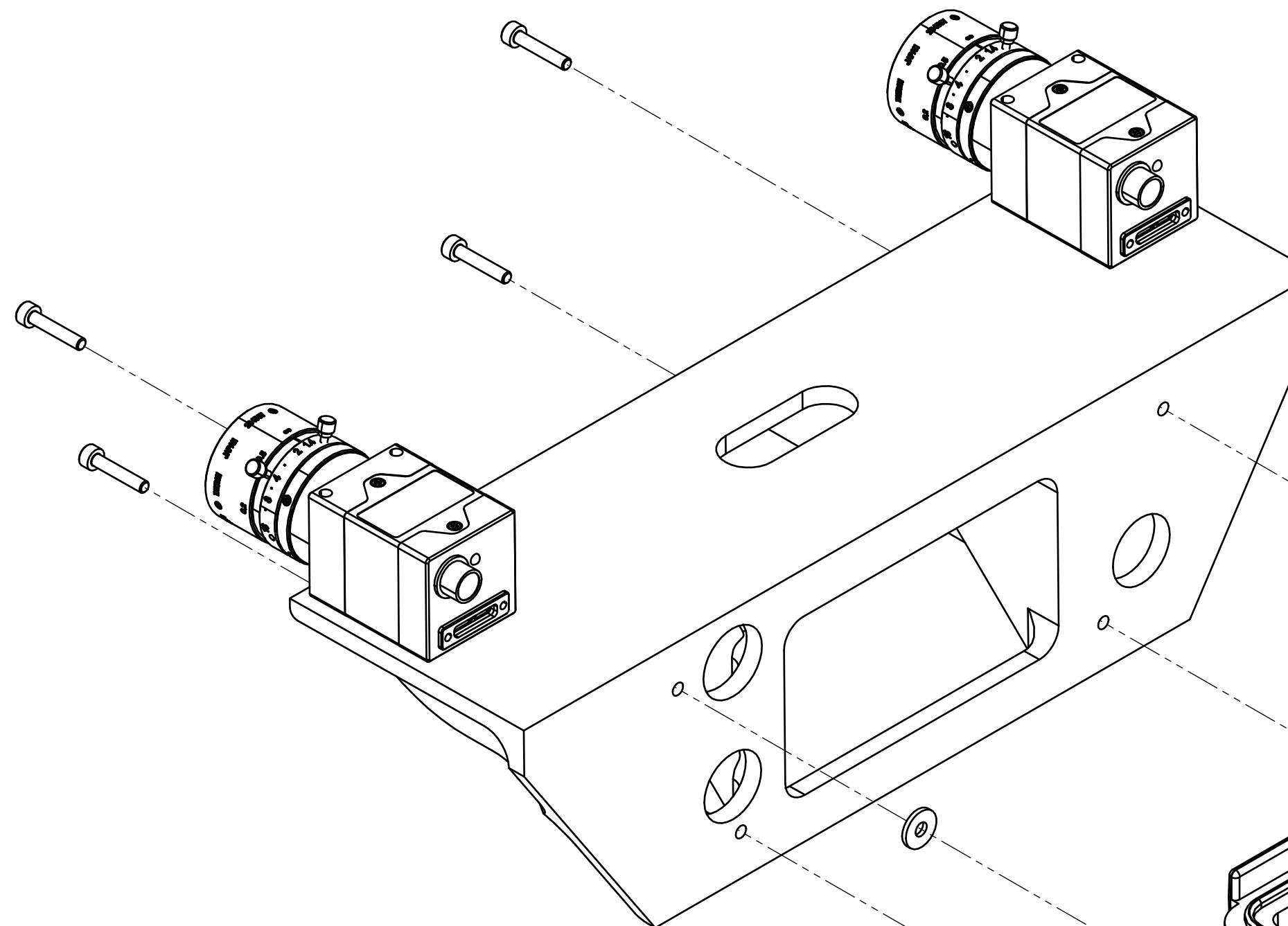
Screw the Jetson module standoffs (51mm) to the main plate.

Put the main plate apart. At this point, it can't be attached to the enclosure, and other components from the main plate can't be attached to it either.

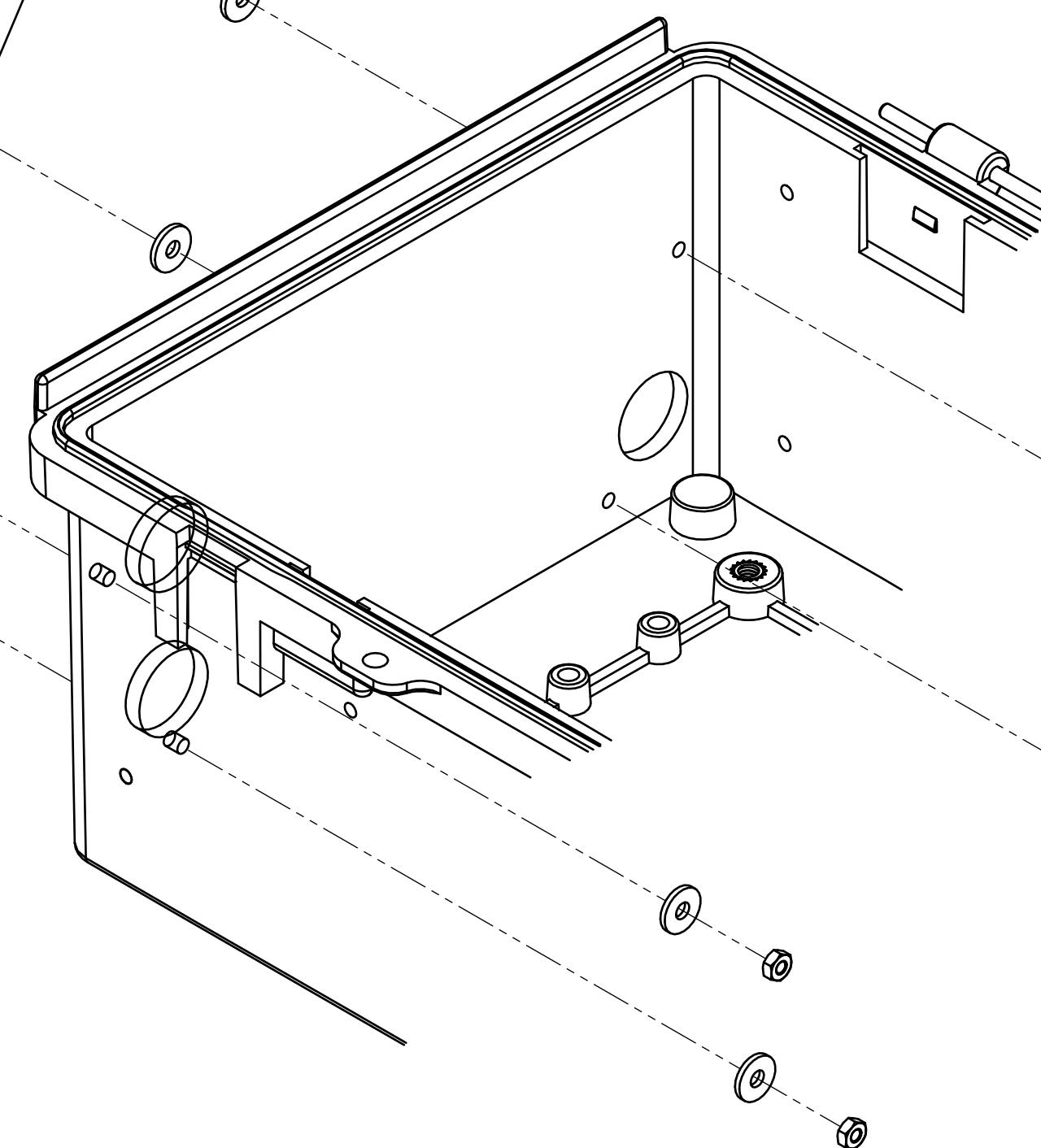
Otherwise, attaching the enclosure's outer modules will be very hard, and the mounting holes from the main plate to the enclosure will be occluded.

# Enclosure Module

M3 16mm Socket Head Screws



M3 Rubber Washers



M3 Stainless Steel Washers

M3 Lock Nuts

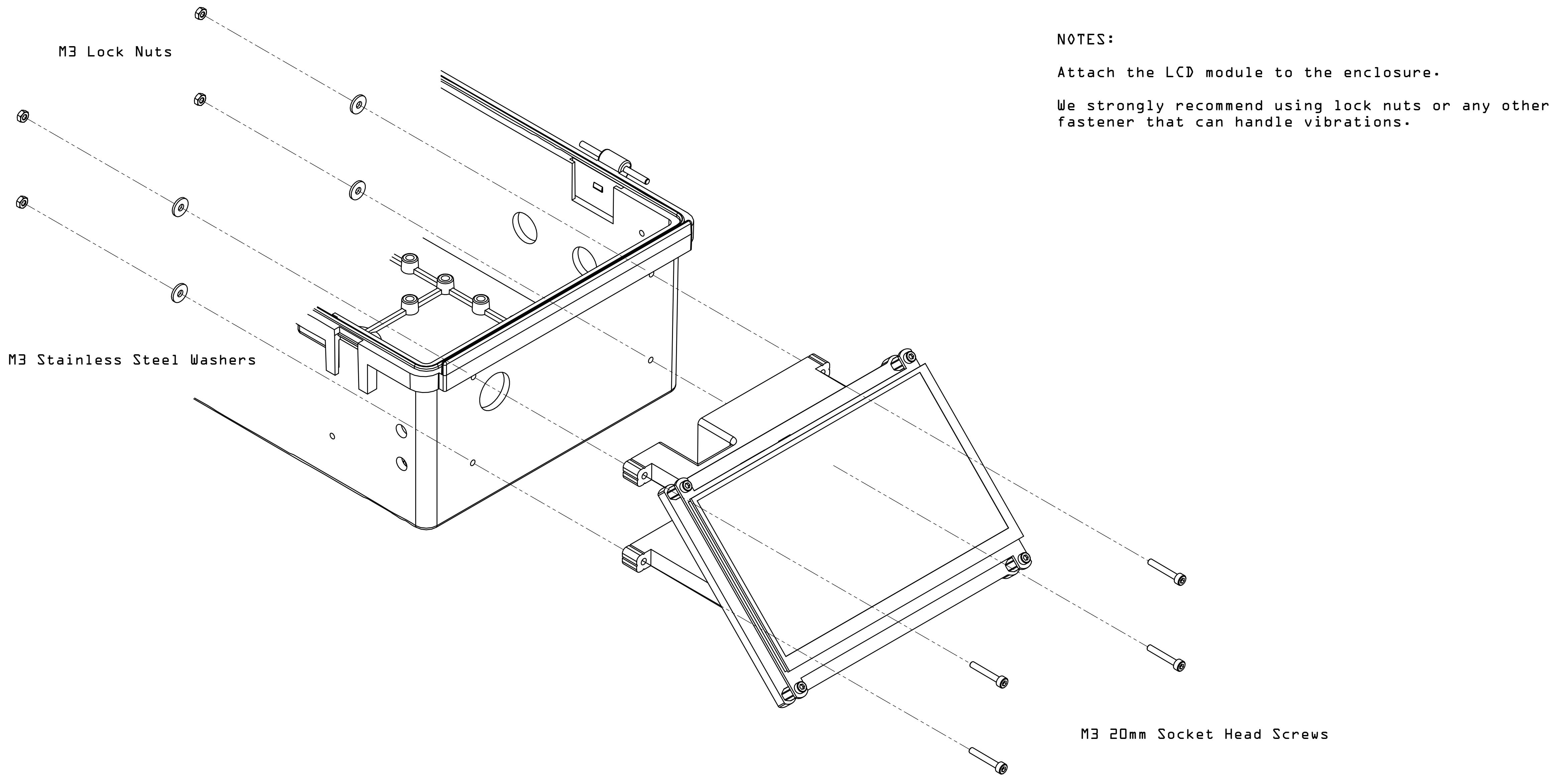
## NOTES:

Attach the camera & bracket module to the enclosure.

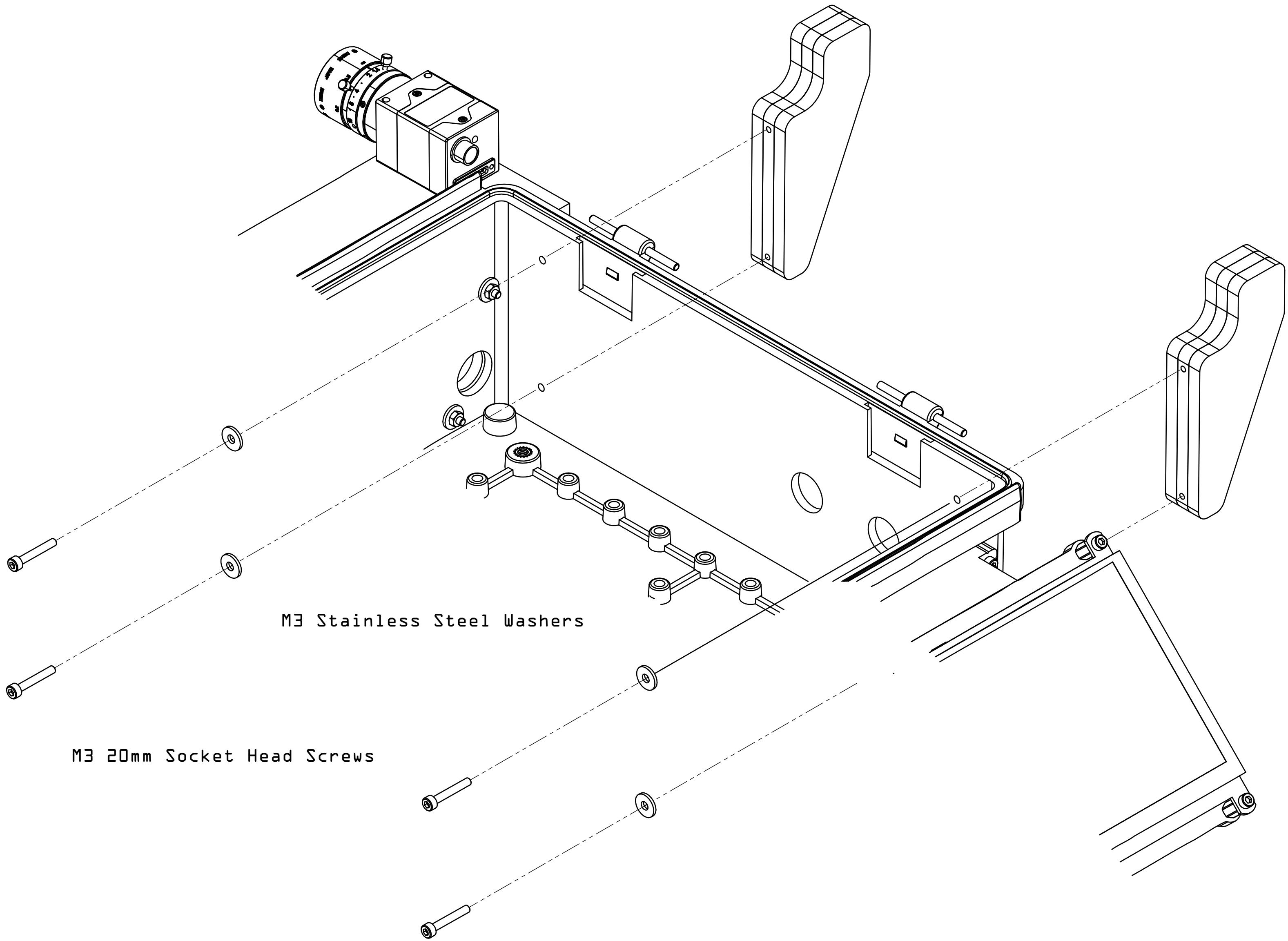
Make sure to add rubber washers between both, and steel washers inside the enclosure.

We strongly recommend using lock nuts or any other fastener that can handle vibrations.

# Enclosure Module



# Enclosure Module

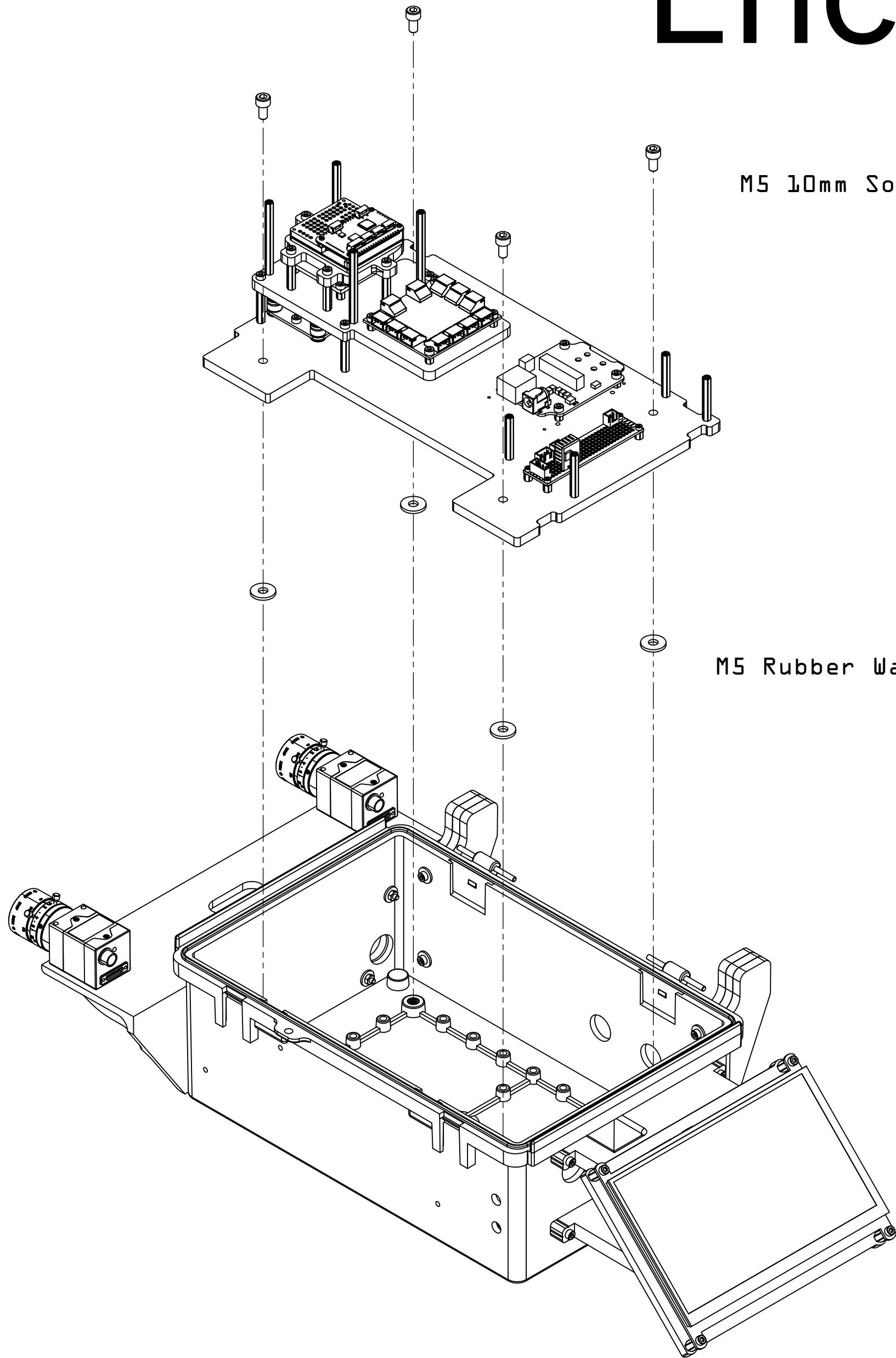


## NOTES:

Attach the lid stoppers to the enclosure.

We strongly recommend attaching these before the LiDAR is mounted on the lid because its weight will tip over the enclosure and can damage components.

# Enclosure Module



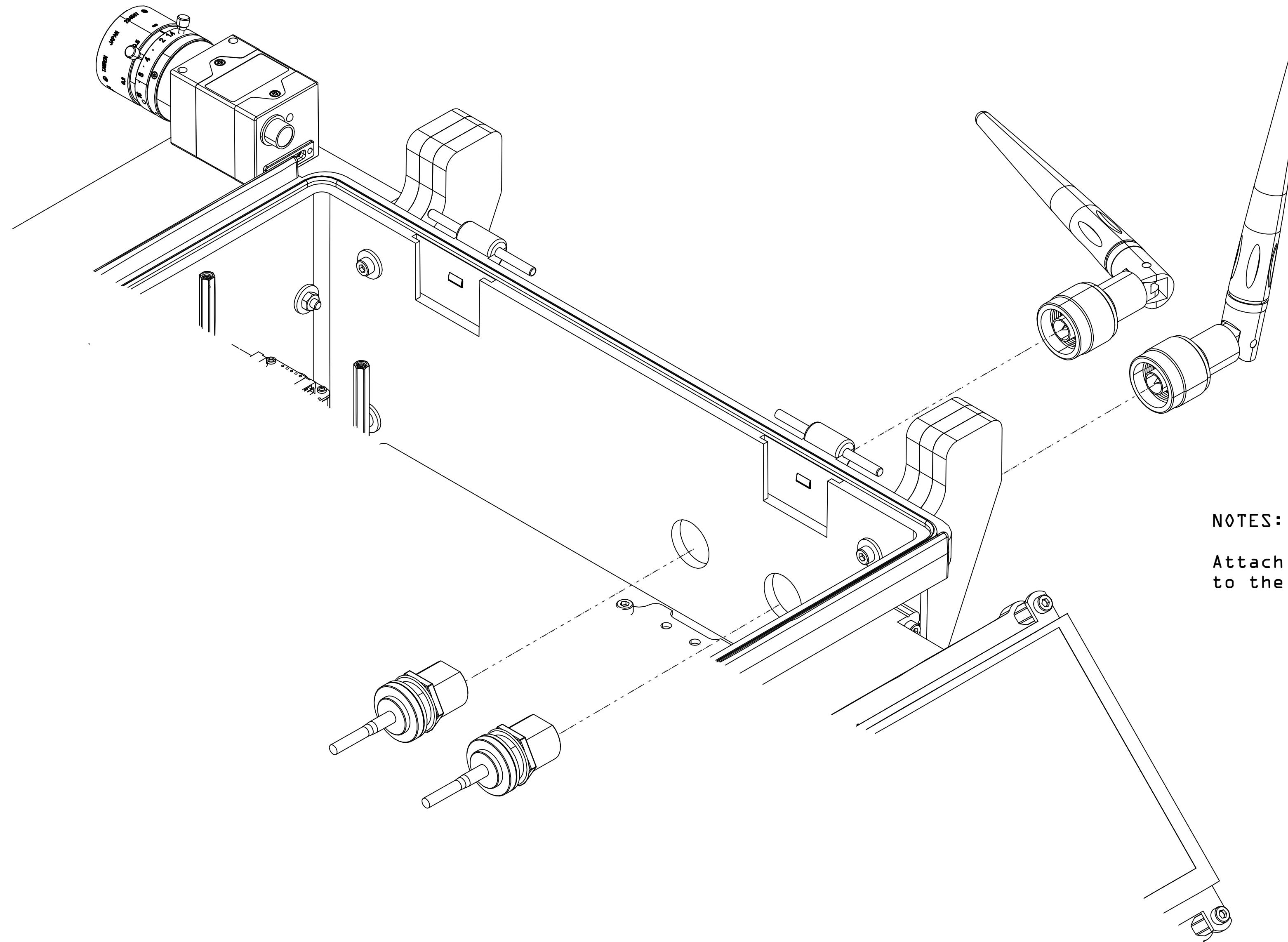
## NOTES:

Attach the partially assembled main plate to the enclosure's inner mounting points.

We recommend adding rubber washers between both.

After this step, the LiDAR can be safely attached to the enclosure lid.

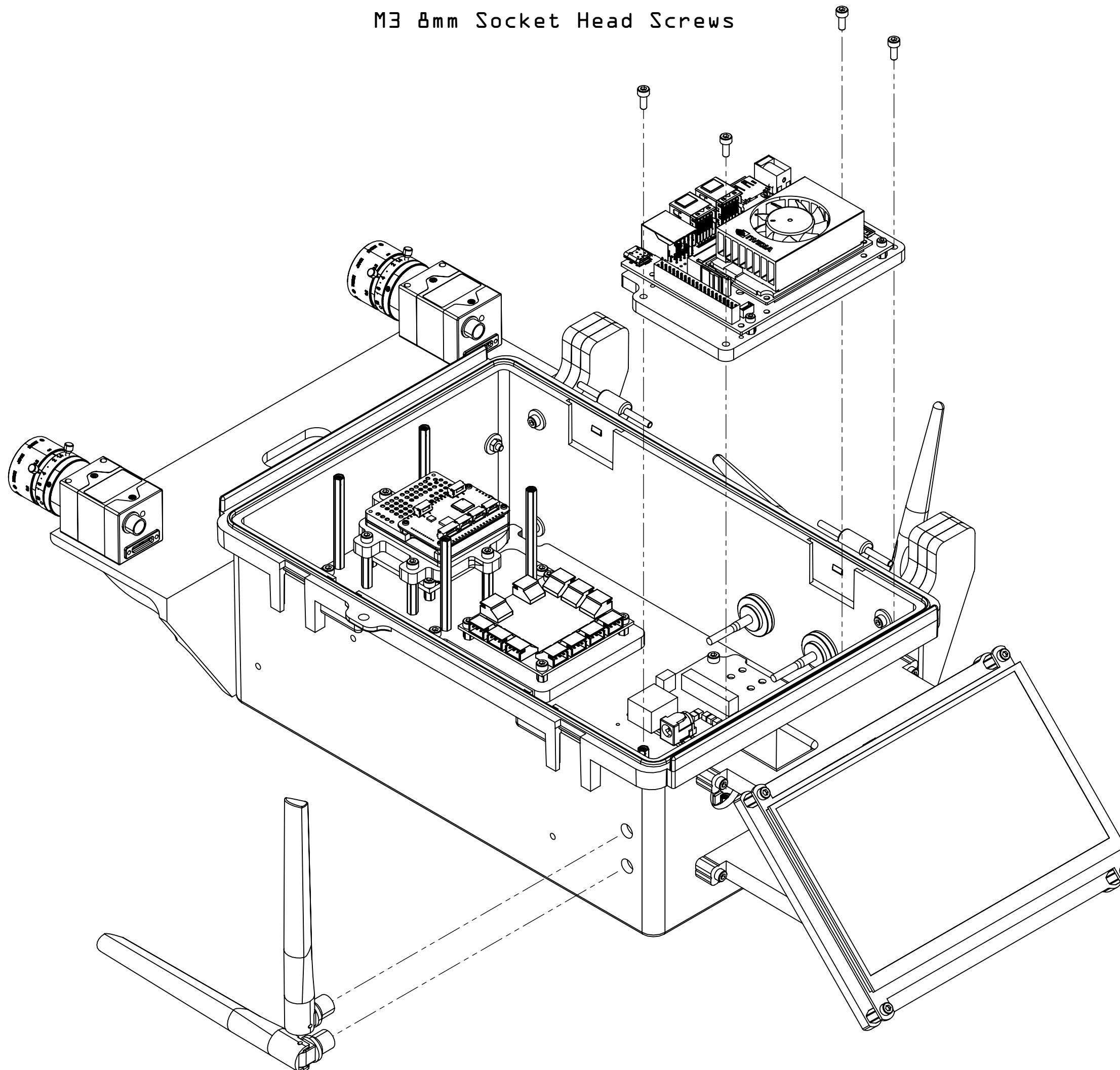
# Enclosure Module



**NOTES:**

Attach the radio's bulkhead connectors and antennas to the enclosure.

# Enclosure Module

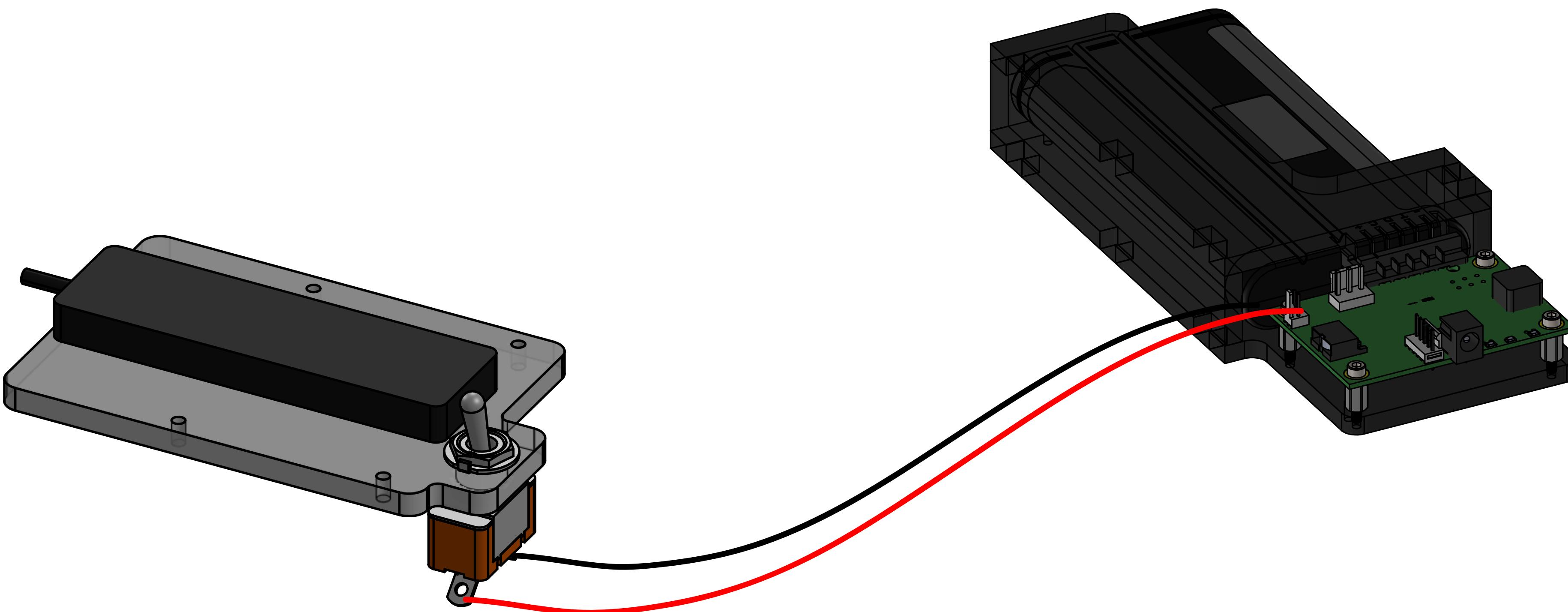


## NOTES:

Attach the Jetson module to the main plate.

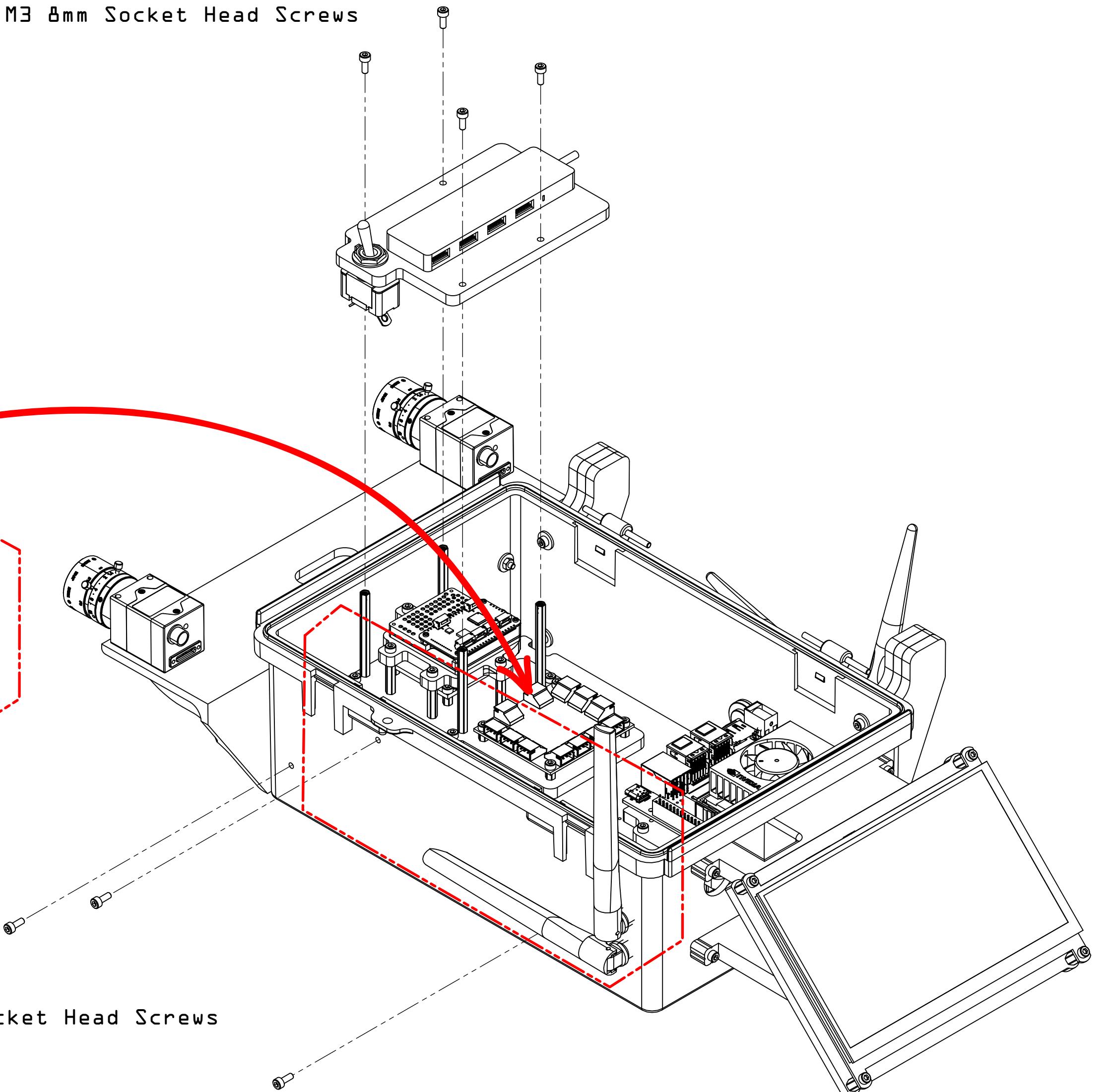
Attach the Jetson's connectors and antennas to the enclosure.

# Charger to Switch Connection



# Enclosure Module

M3 8mm Socket Head Screws



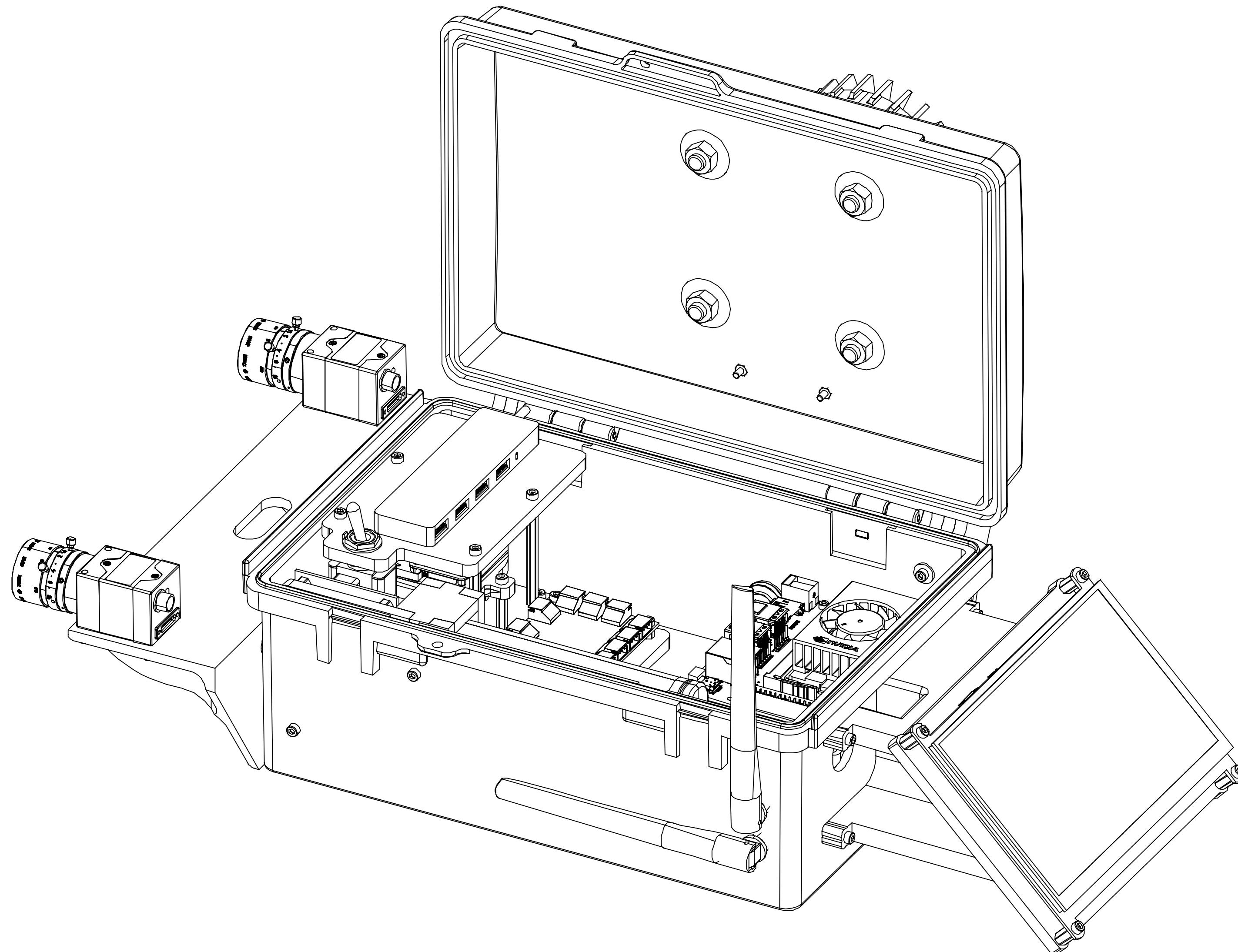
NOTES:

To make wiring between the charger and the switch easier, connect them to each other first and place them inside the enclosure at the same time.

Attach the USB hub and switch to the GNSS and sync module.

Attach the battery and charger module to the enclosure. The battery doesn't have to be connected.

# Complete Payload



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	BOTTOM_PLATE		1
2	ENCLOSURE	NOT SPECIFIED	1
2.1	ENCLOSURE		1
2.2	PIN		2
2.3	94459A180	Heat-Set Inserts for Plastic	4
3	IMU_MODULE		1
3.1	IMU		1
3.2	SPOT_IMU_MOUNT		1
3.3	SPOT_IMU_MOUNT		1
3.4	BALL_DAMPER		4
3.5	B18.2.4.1M - Hex nut, Style 1, M3 x 0.5 --D-N		2
3.6	B18.3.1M - 3 x 0.5 x 8 Hex SHCS -- 8NHN		2
4	B18.3.1M - 3 x 0.5 x 6 Hex SHCS -- 6NHN		6
5	93655A090	Male-Female Threaded Hex Standoff	4
6	PDB		1
6.1	Universal_board_20x80mm		1
6.2	BABY_BUCK		1
6.3	JST - XH - Thru (V) - 2Pin - 2.54mm.stp	JST - XH - Thru - 2Pin - 2.54mm	2
6.4	JST - XH - Thru (V) - 3Pin - 2.54mm.stp	JST - XH - Thru - 3Pin - 2.54mm	1
6.5	JST - XH - Thru (V) - 4Pin - 2.54mm.stp	JST - XH - Thru - 4Pin - 2.54mm	1
7	B18.3.1M - 2 x 0.4 x 6 Hex SHCS -- 6NHN		4
8	JETSON_MODULE		1
8.1	JETSON_PLATE		1
8.2	JETSON		1
8.3	93655A090	Male-Female Threaded Hex Standoff	4
8.4	B18.3.1M - 2.5 x 0.45 x 6 Hex SHCS -- 6NHN		4
9	93655A223	Male-Female Threaded Hex Standoff	4
10	B18.3.1M - 3 x 0.5 x 8 Hex SHCS -- 8NHN		19
11	WiFi Antenna		2
12	GNSS_SYNC_MODULE		1
12.1	GNSS_RADIO_PLATE		1
12.2	SYNC_BOARD		1
12.2.1	TIME_SYNC_BOARD		1
12.2.2	3-PIN-H-JST-MALE		12
12.3	GNSS		1
12.3.1	BOARD		1
12.3.2	USBC	NONE	1
12.3.3	SMA		3
12.3.4	ZED-F9T		1
12.3.5	QWIIC		2
12.3.6	USB C Male		1
12.4	93655A091	Male-Female Threaded Hex Standoff	8
12.5	B18.3.1M - 3 x 0.5 x 6 Hex SHCS -- 6NHN		8
13	93655A360	Male-Female Threaded Hex Standoff	4
14	RADIO_MODULE		1
14.1	RADIO_PLATE		1
14.2	RADIO		1
14.3	B18.3.1M - 2 x 0.4 x 6 Hex SHCS -- 6NHN		4
15	93655A019	Male-Female Threaded Hex Standoff	4
16	BULKHEAD_CONNECTOR		2
16.1	N_FEMALE_CONNECTOR		1
16.2	N_CONNECOR_RUBBER_SEAL		1
16.3	N_CONNECOR_SEAL		1
16.4	N_CONNECOR_NUT		1
17	ANTENNA		2
17.1	CONNECTOR		1
17.2	EXTENSION		1
18	HUB_SWITCH_MODULE		1
18.1	HUB_PLATE		1
18.2	ANKER 4 PORT USB HUB v2		1
18.3	AT503M		1
18.4	AT506M		1
18.5	AT527		1
18.6	Lockwasher		1
18.7	S301		1
18.7.1	SMHC_body_SPST_1		1
18.7.2	SMHC_plate_SP_1		1
18.7.3	STD_toggle		1
18.7.4	AT527		1
18.7.5	AT506M		1
18.7.6	Lockwasher		1
18.7.7	AT503M		1
18.7.8	SMHC_trmn1B		2
19	93655A227	Male-Female Threaded Hex Standoff	4
20	LIDAR_INTERFACE_BOX		1
21	93655A091	Male-Female Threaded Hex Standoff	4
22	B18.22M - Plain washer, 5 mm, regular		4
23	B18.3.1M - 5 x 0.8 x 10 Hex SHCS -- 10NHN		4
24	LIDAR_MODULE		1
24.1	LIDAR		1
24.2	BASE_PLATE		1
24.3	LIDAR_PLATE_ADAPTER		1
24.4	LIDAR_CABLE HOLDER		1
24.5	CABLE_CONNECTOR		1
24.6	CUSTOM_LID		1
24.7	B18.3.1M - 8 x 1.25 x 30 Hex SHCS -- 30NHN		2
24.8	B18.3.1M - 8 x 1.25 x 25 Hex SHCS -- 25NHN		2
24.9	B18.22M - Plain washer, 8 mm, regular		4
24.10	B18.2.4.1M - Hex nut, Style 1, M8 x 1.25 --D-N		4
24.11	B18.3.1M - 3 x 0.5 x 25 Hex SHCS -- 18NHN		2
24.12	B18.2.4.1M - Hex nut, Style 1, M3 x 0.5 --D-N		2
25	LCD_MODULE		1
25.1	LCD HOLDER_V3		1
25.2	7inch HDMI LCD	NOT SPECIFIED	1
25.3	LCD_MOUNT		1
25.4	B18.3.1M - 3 x 0.5 x 16 Hex SHCS -- 16NHN		4
25.5	94205A220	316 Stainless Steel Nylon-Insert Locknut	4
25.6	93655A102	Male-Female Threaded Hex Standoff	4
25.7	B18.3.1M - 3 x 0.5 x 6 Hex SHCS -- 6NHN		4
26	B18.3.1M - 3 x 0.5 x 20 Hex SHCS -- 20NHN		8
27	B18.22M - Plain washer, 3 mm, regular		16
28	B18.2.4.1M - Hex nut, Style 1, M3 x 0.5 --D-N		8
29	BATTERY_AND_CHARGER		1
29.1	BATTERY		1
29.2	CHARGER		1
29.3	BATTERY HOLDER BACK PLATE		1
29.4	Part5		1
29.5	Part6		1
29.6	Part8		1
29.7	93655A102	Male-Female Threaded Hex Standoff	4
29.8	B18.3.1M - 3 x 0.5 x 6 Hex SHCS -- 6NHN		4
30	LID_STOPPER		2
30.1	LID_STOPPER		1
30.2	LID_STOPPER		2
31	CAMERA_MODULE		1
31.1	8982K254	Multipurpose 6061 Aluminum 90 Degree Angle	1
31.2	CAMERA		2
31.2.1	SENSOR		1
31.2.2	M118FM08		1
31.2.3	HR10A-7P-6S		1
31.2.4	USB_CABLE		1
31.2.4.1	USB_CABLE		1
31.2.4.2	USB-3-0-Type-Micro-B-Plug-Shield		1
31.2.4.3	THUMBSCREW		2
31.3	B18.3.1M - 3 x 0.5 x 8 Hex SHCS -- 8NHN		8
32	B18.3.1M - 3 x 0.5 x 16 Hex SHCS -- 16NHN		4
33	FRONT_TEMPLATE_BATTERY_SIDE		1
34	BACK_TEMPLATE_RADIO_ANTENNA_SIDE		1
35	LEFT_TEMPLATE_CAMERA_SIDE		1
36	RIGHT_TEMPLATE_LCD_SIDE		1
37	TOP_TEMPLATE_LIDAR_SIDE		1