

Lower Frame Assembly



Created by:
Joshua Vasquez

last edited:
10/8/2019

SCALE: 1:3

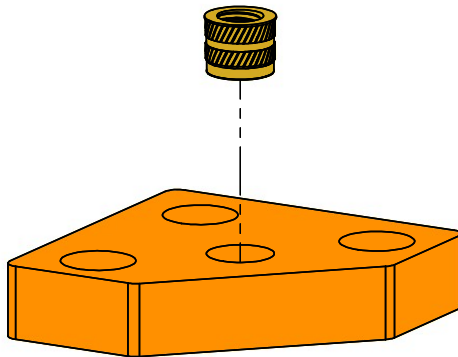
SHEET 1 OF 14

Install heat-set inserts into each part using the plate-press technique.

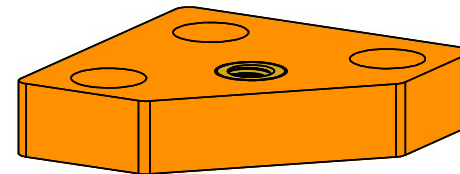
More info on the plate-press technique can be found here:

<https://hackaday.com/2019/02/28/threading-3d-printed-parts-how-to-use-heat-set-inserts/>

Make four assemblies.




Exploded View

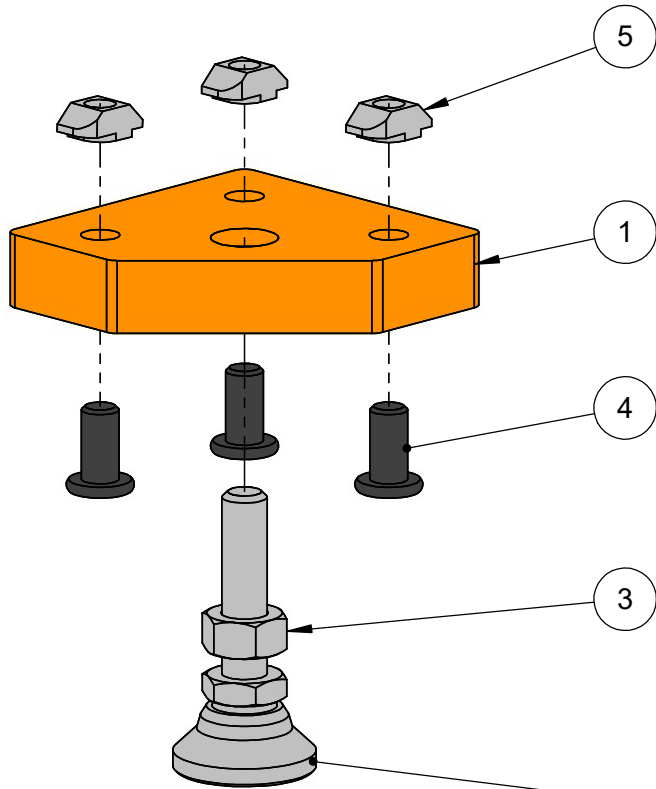


Assembled View

ITEM NO.	DESCRIPTION	QTY.
1	Corner Foot Plate	4
2	M6 Tapered Heat-Set Insert	4

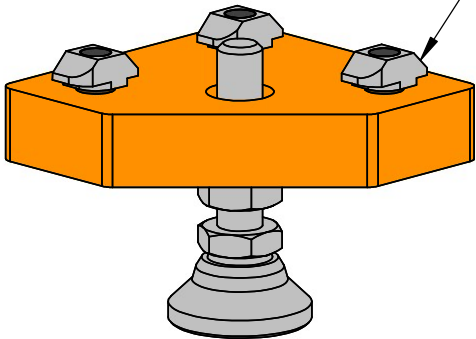
Heat-Set Insert Installation		
	Created by: Joshua Vasquez	last edited: 10/8/2019
	SCALE: 1:1	SHEET 2 OF 14

Make 4 assemblies.



Exploded View


Keep these T-Nuts Loose; only two full turns.
They will be tightened into the frame later.



Assembled View

Screw this foot partway into the assembly such that it protrudes from the top. (Exact amount doesn't matter as the printer will be leveled later.)
Ensure that all four feet are approximately even with each other.

ITEM NO.	DESCRIPTION	QTY.
1	Corner Foot Plate with insert	4
3	M6 Swivel Foot	4
4	M5 x 0.8 Screw, Low Profile, 10mm	12
5	M5 Drop-In T-Nut for 20x20 Extrusion	12

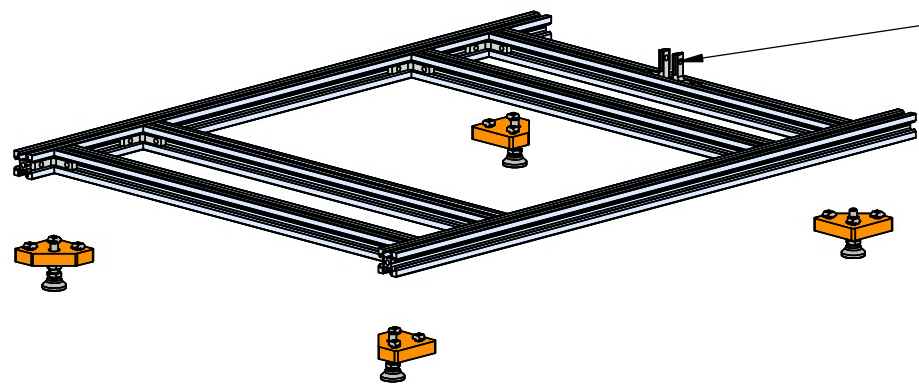
Corner Foot Assembly		
	Created by:	last edited:
	Joshua Vasquez	10/8/2019
SCALE: 1:1		SHEET 3 OF 14

2

1

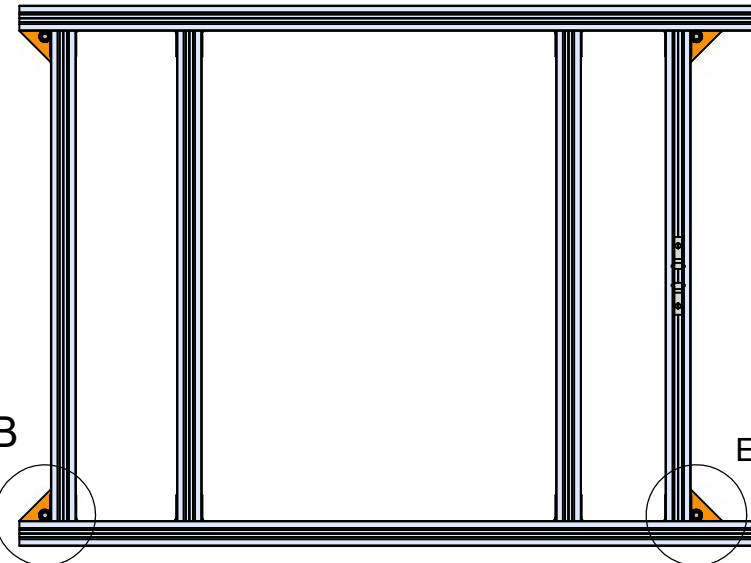
B

B

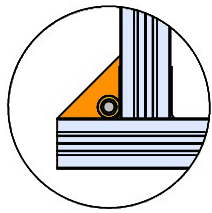


Note that these inside-corner brackets should face upwards.

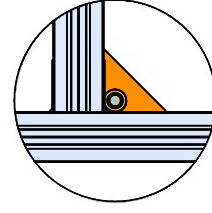
Securely screw down all four feet such that they are flush with the inside corners of the frame as shown below.



DETAIL B
SCALE 1 : 3



DETAIL E
SCALE 1 : 3



A

A

ITEM NO.	DESCRIPTION	
1	Base Frame Assembly	1
2	Corner Foot Assembly	4

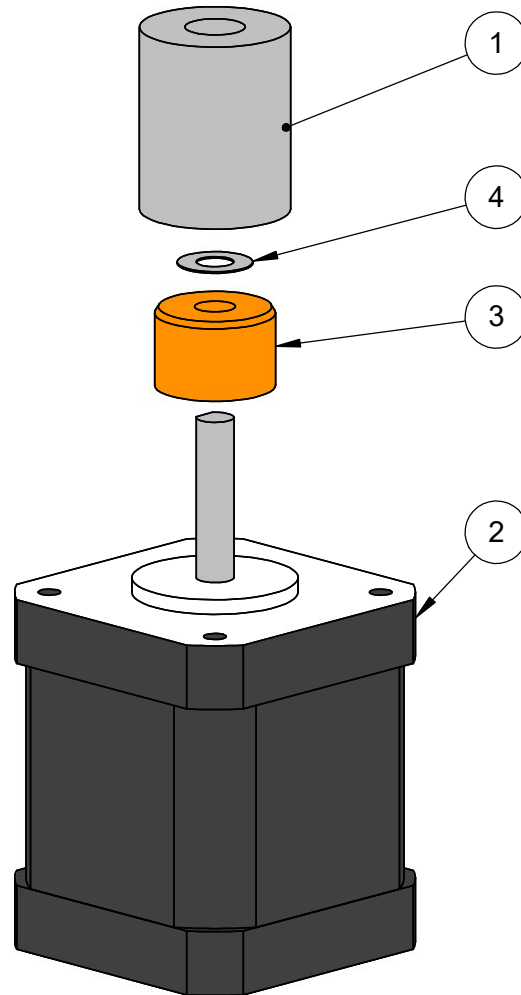
Corner Foot Installation		
	Created by:	last edited:
	Joshua Vasquez	10/8/2019
SCALE: 1:6		SHEET 4 OF 14

2

1

B

Make 3 Assemblies.



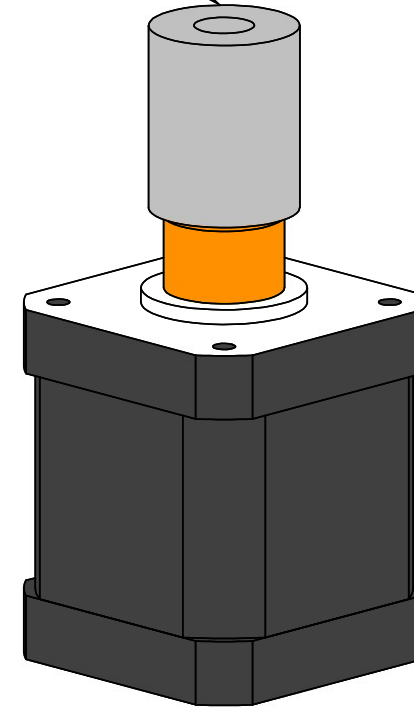
Exploded View

ITEM NO.	DESCRIPTION	QTY.
1	5mm to 8mm flexible plumb coupler	1
2	Nema 17 Stepper Motor	1
3	Z Thrust Bearing Spacer	1
4	M5 Shim, 0.2mm thick	1

2

1

With one hand, compress the coupler onto the motor shaft to remove any space on the motor shaft. Securely screw down the coupler in this configuration.



Assembled View

Z Motor Thrust Coupling Assembly		
	Created by: Joshua Vasquez	last edited: 10/8/2019
	SCALE: 1:1	SHEET 5 OF 14

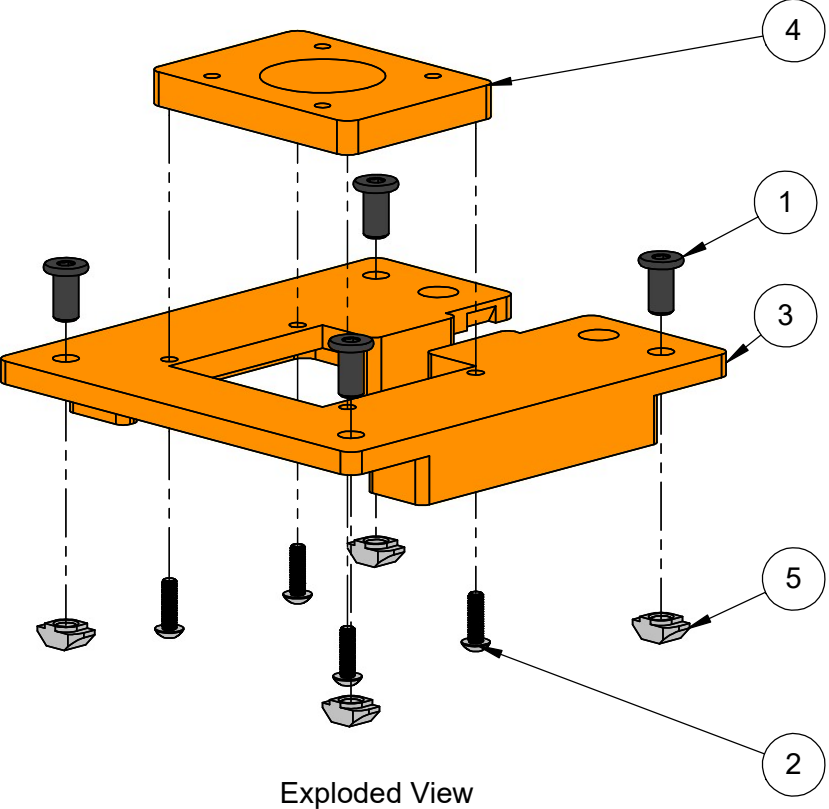
1

B

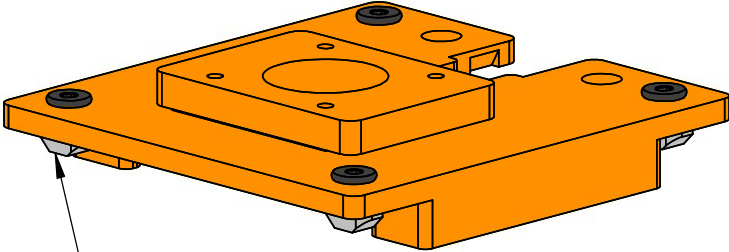
A

B

Apply a dab of threadlock to the four M3 screws before tightening them down securely. (M5 screws do not need threadlock.)



Exploded View



Assembled View

Keep these T-Nuts Loose; only two full turns. They will be tightened into the frame later.

A

ITEM NO.	DESCRIPTION	QTY.
1	M5 x 0.8 Screw, Low Profile, 10mm	4
2	M3 Buttonhead Screw, 10mm long	4
3	Back Z Panel	1
4	Z Motor Offset Plate	1
5	M5 Drop-In T-Nut for 20x20 Extrusion	4

B

A

Back Z Motor Plate Assembly 1		
	Created by: Joshua Vasquez	last edited: 10/8/2019
	SCALE: 1:1.5	SHEET 6 OF 14

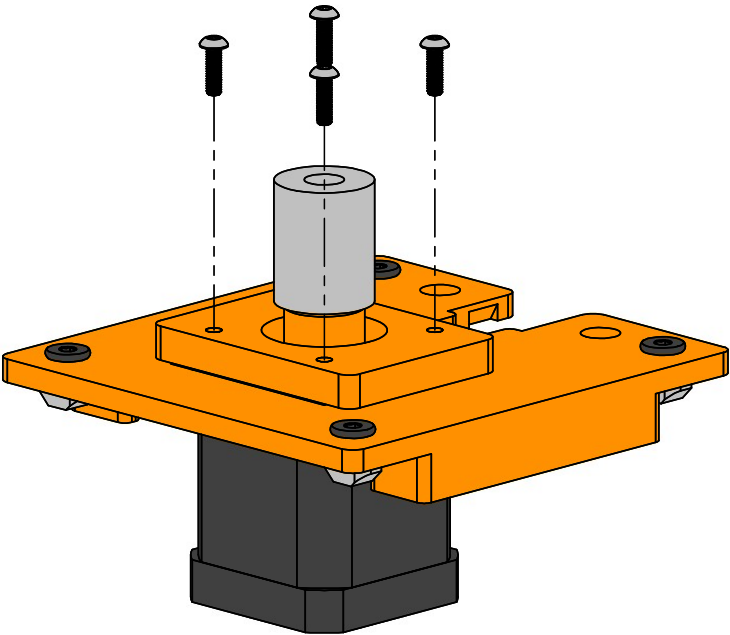
2

1

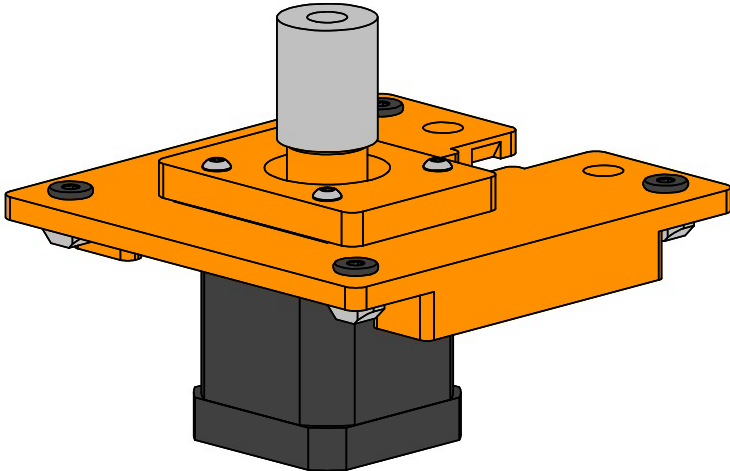
Apply a dab of threadlock to the four M3 screws before tightening them down securely.

B

B



Exploded View




Assembled View

A

A

ITEM NO.	DESCRIPTION	QTY.
2	M3 Buttonhead Screw, 10mm long	4
3	Back Plate Assembly	1
6	Z Motor Thrust Coupling Assembly	1

Back Z Motor Plate Assembly 2		
	Created by:	last edited:
	Joshua Vasquez	10/8/2019
	SCALE: 1:1.5	SHEET 7 OF 14

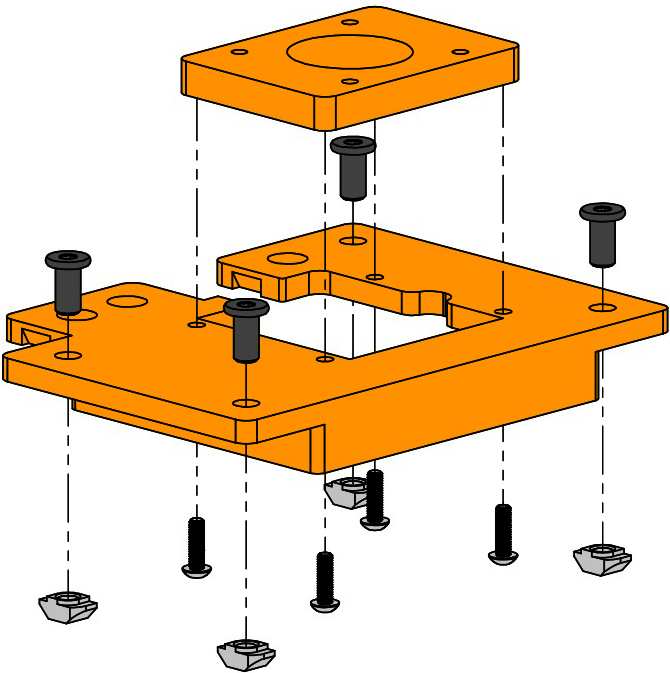
2

1

B

A

Apply a dab of threadlock to the four M3 screws before tightening them down securely. (M5 screws do not need threadlock.)



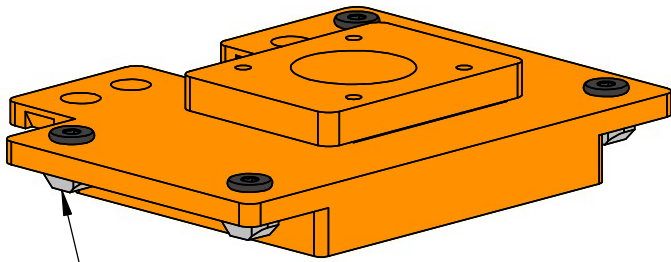
Exploded View

ITEM NO.	DESCRIPTION	QTY.
1	M3 Buttonhead Screw, 10mm long	4
2	M5 x 0.8 Screw, Low Profile, 10mm	4
3	Z Motor Offset Plate	1
4	Front Z Panel	1
5	M5 Drop-In T-Nut for 20x20 Extrusion	4

1

B

A



Assembled View

Keep these T-Nuts Loose; only two full turns. They will be tightened into the frame later.

Front Left Z Plate Assembly 1



Created by:
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last edited:
10/8/2019

SCALE: 1:1.5

SHEET 8 OF 14

2

1

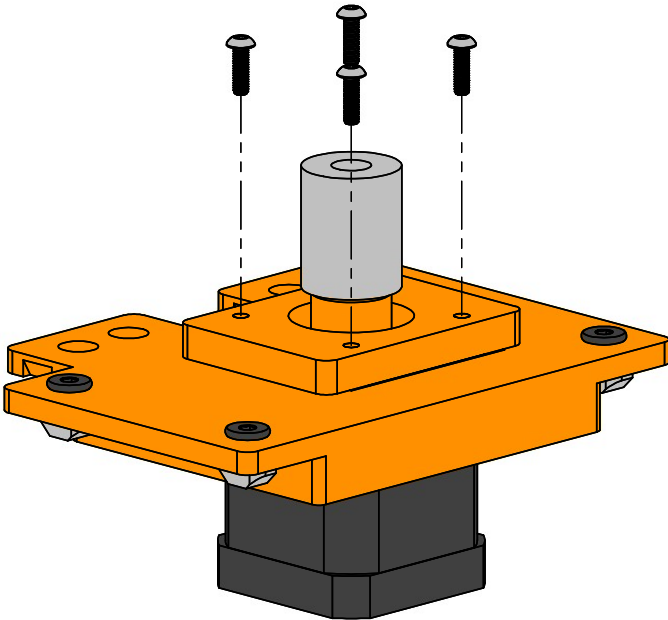
2

1

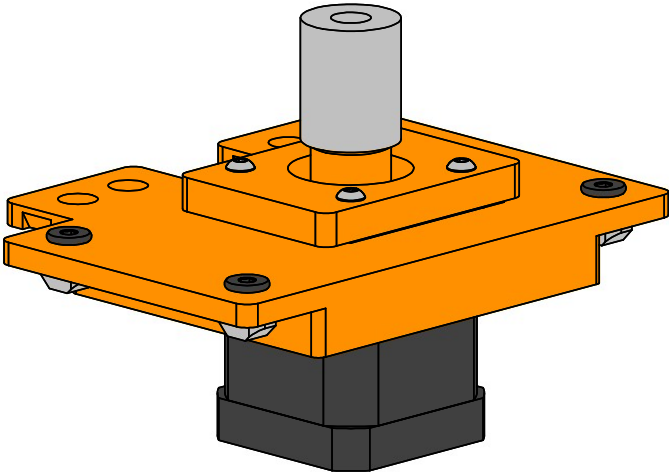
Apply a dab of threadlock to the four M3 screws before tightening them down securely.

B

B



Exploded View



Assembled View

A

A

ITEM NO.	DESCRIPTION	QTY.
1	M3 Buttonhead Screw, 10mm long	4
3	Front Left Z-Plate Plate Assembly	1
6	Z Motor Thrust Coupling Assembly	1

2

1

Front Left Z Plate Assembly 2



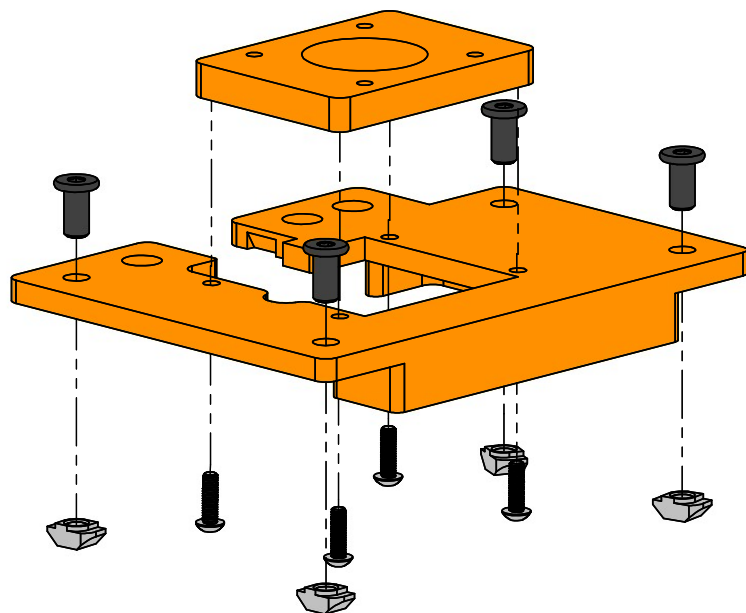
Created by:
Joshua Vasquez

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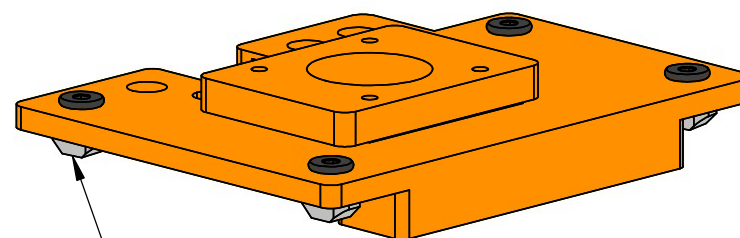
SCALE: 1:1.5

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Apply a dab of threadlock to the four M3 screws before tightening them down securely. (M5 screws do not need threadlock.)



Exploded View



Assembled View

Keep these T-Nuts Loose; only two full turns.
They will be tightened into the frame later.

ITEM NO.	DESCRIPTION	QTY.
1	M3 Buttonhead Screw, 10mm long	4
2	Z Motor Offset Plate	1
3	M5 x 0.8 Screw, Low Profile, 10mm	4
4	Front Z Panel	1
5	M5 Drop-In T-Nut for 20x20 Extrusion	4

Front Right Z Plate Assembly 1



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Joshua Vasquez

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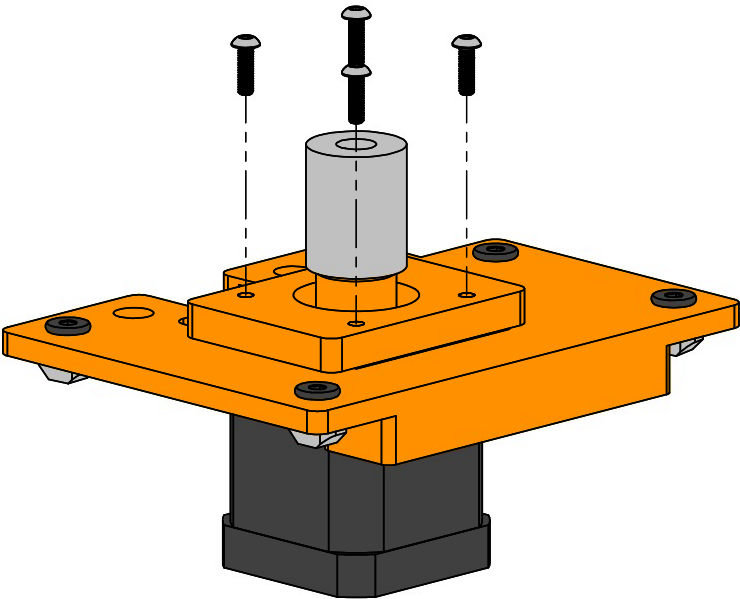
SCALE: 1:1.5

SHEET 10 OF 14

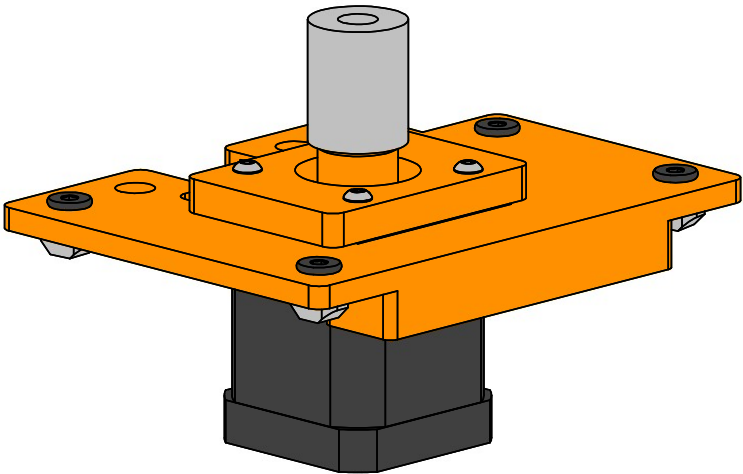
2

1

Apply a dab of threadlock to the four M3 screws before tightening them down securely.



Exploded View



Assembled View

ITEM NO.	DESCRIPTION	QTY.
1	M3 Buttonhead Screw, 10mm long	4
2	Front Right Z-Plate Plate Assembly	1
6	Z Motor Thrust Coupling Assembly	1

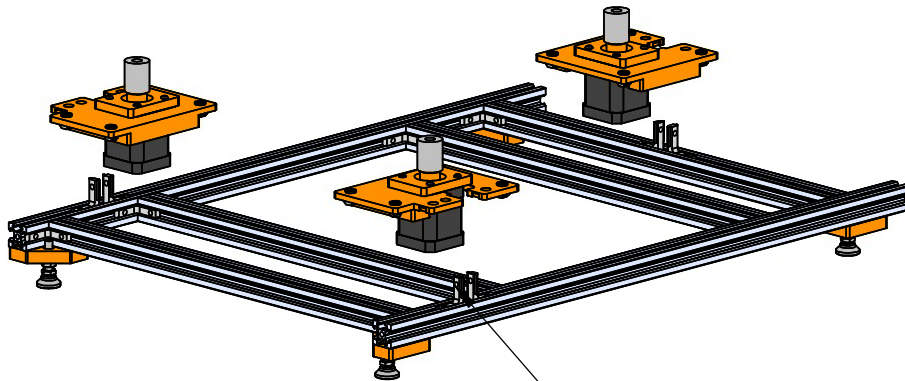
Front Right Z Plate Assembly 2		
	Created by: Joshua Vasquez	last edited: 10/8/2019
	SCALE: 1:1.5	SHEET 11 OF 14

2

1

Adjust the loose internal frame extrusions such that they matches the z motor assemblies. Then tighten down their set screws.

B

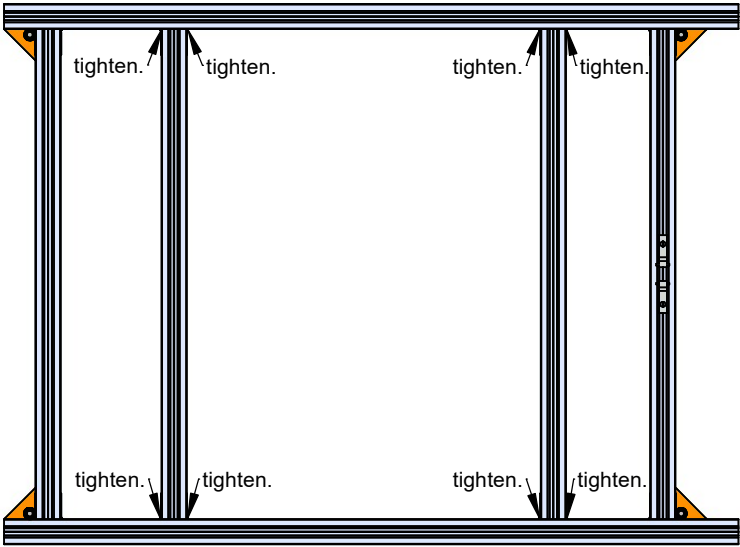


Slide 2 pairs of inside-corner brackets into position between the coupler plates, but do not tighten them.

A

ITEM NO.	DESCRIPTION	
1	Base Frame Assembly with Feet	1
3	Back Z Plate Assembly	1
4	Front Left Z Plate Assembly	1
5	Front Right Z Plate Assembly	1
6	Inside corner bracket	12

B



Top View

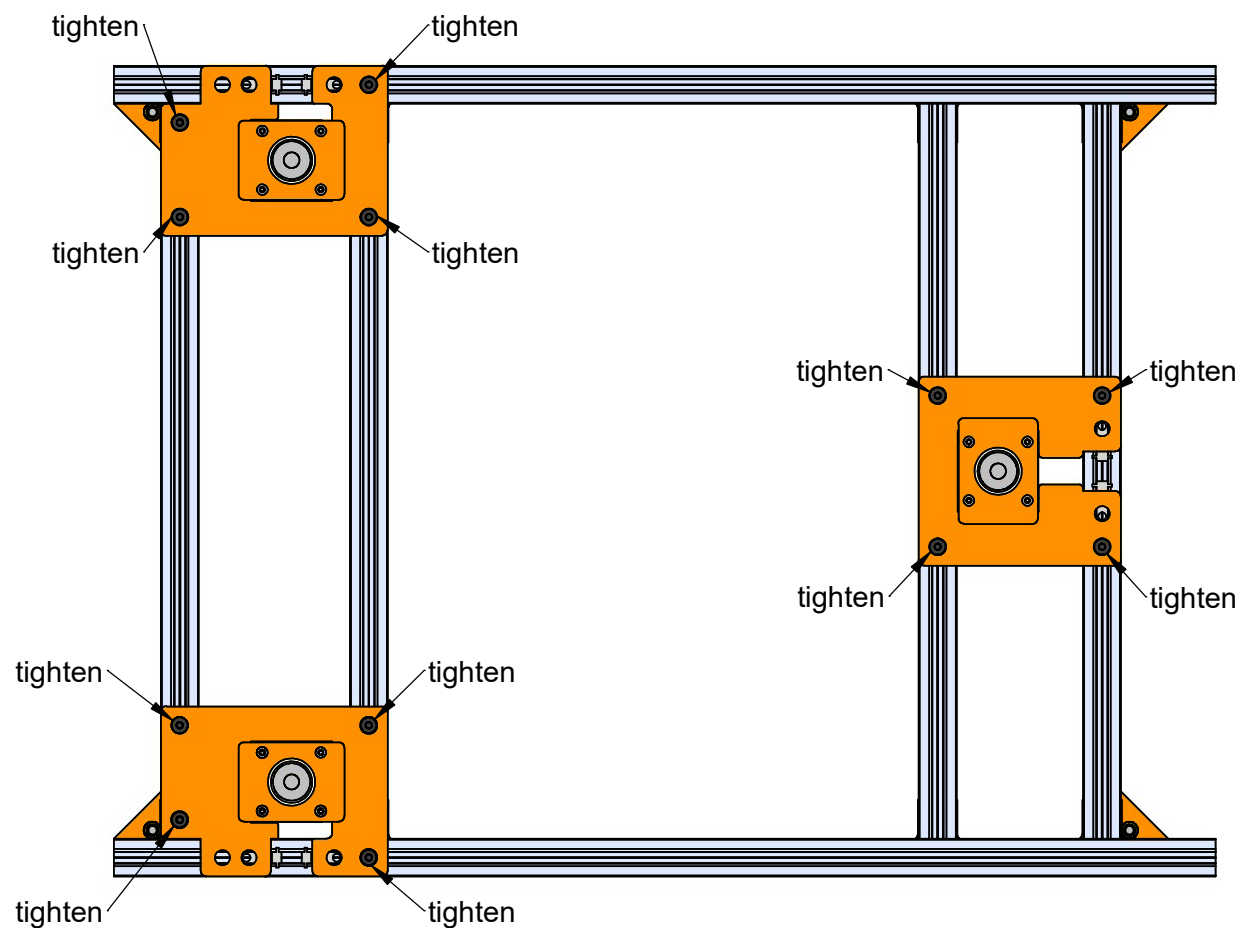
A

Internal Extrusion Alignment		
	Created by:	last edited:
	Joshua Vasquez	10/8/2019
	SCALE: 1:6	SHEET 12 OF 14

2

1

With the internal frame's extrusions tightened, securely install the 3 Z plate assemblies and tighten them down.



Top View

Z Plate Installation



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Joshua Vasquez

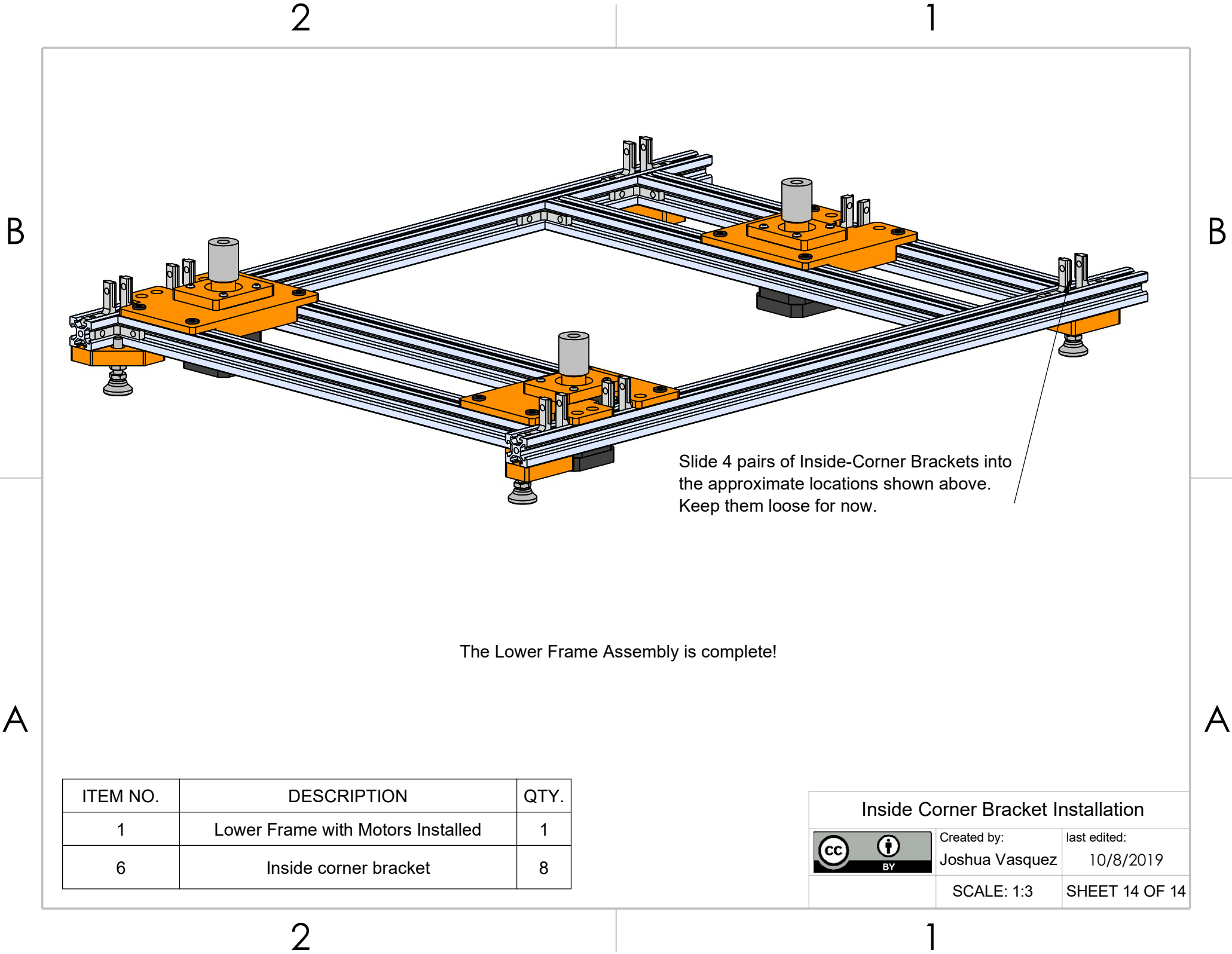
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10/8/2019

SCALE: 1:4

SHEET 13 OF 14

2

1



Slide 4 pairs of Inside-Corner Brackets into the approximate locations shown above. Keep them loose for now.

The Lower Frame Assembly is complete!

ITEM NO.	DESCRIPTION	QTY.
1	Lower Frame with Motors Installed	1
6	Inside corner bracket	8

Inside Corner Bracket Installation		
	Created by:	last edited:
	Joshua Vasquez	10/8/2019
SCALE: 1:3		SHEET 14 OF 14