


Note: the aluminum bed plate is delicate and very very flat! For the next few steps, work with the bed plate on top of a piece of cardboard to prevent it from resting directly on a table.

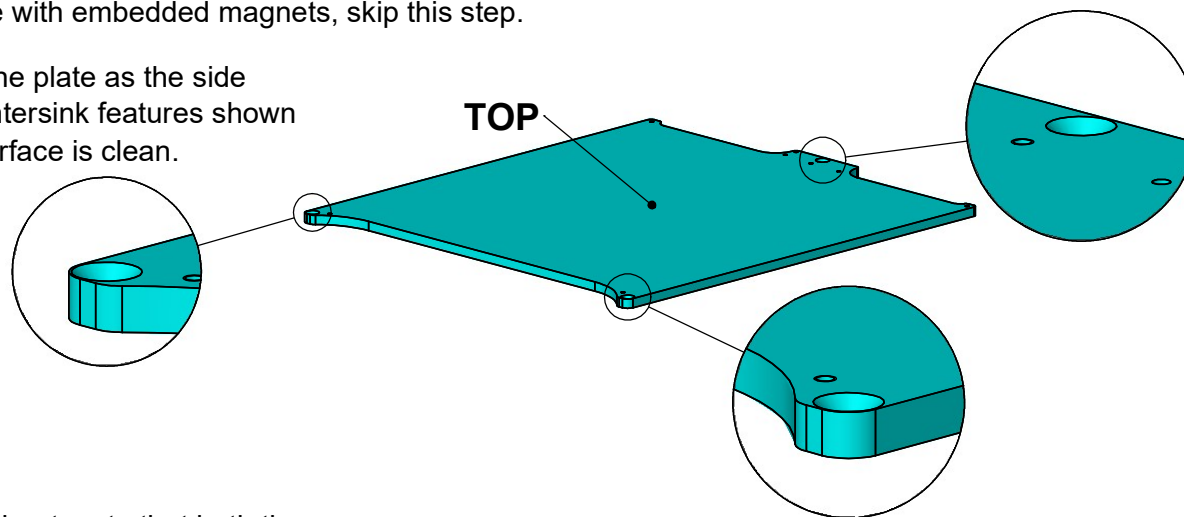
Build Plate Assembly		
	Created by: Joshua Vasquez	last edited: 6/1/2020
	SCALE: 1:2	SHEET 1 OF 13

2

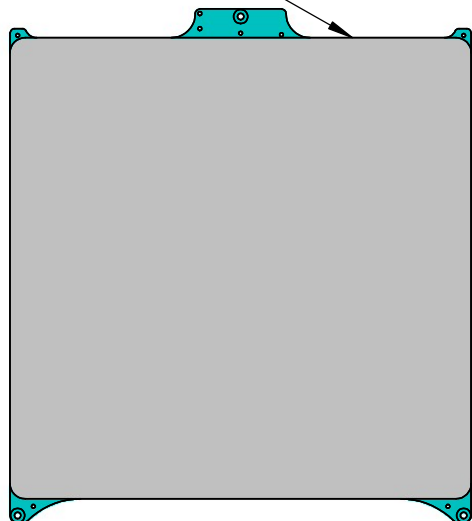
1

Note: if you have a plate with embedded magnets, skip this step.

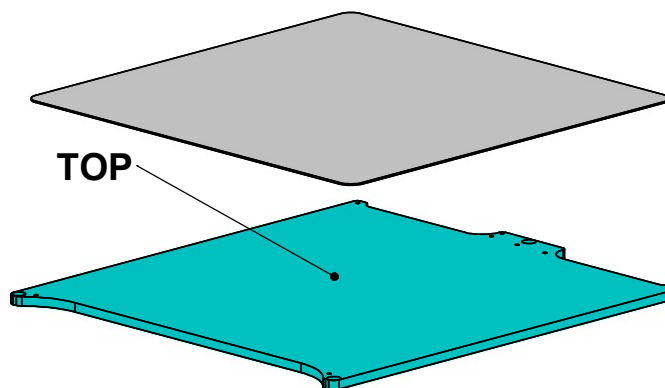
First identify the top of the plate as the side with the "funneled" countersink features shown here. Ensure this top surface is clean.



Before you apply the sheet, note that both the mag sheet and bed plate primary dimensions are 305x305mm, so they will overlap evenly with each other.



Apply the Mag Sheet to the top.



Remove the sticky backing gradually from one side of the sheet and tack down one edge of the bed. Then gradually peel away the sheet while sticking it to the plate. Note: once tacked down, the sticky sheet cannot be repositioned.

### Magnetic Sheet Application



Created by:  
Joshua Vasquez

last edited:  
6/1/2020

SCALE: 1:5

SHEET 2 OF 13

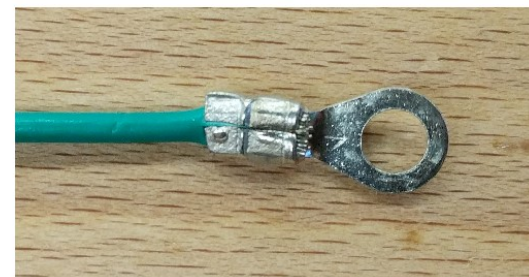
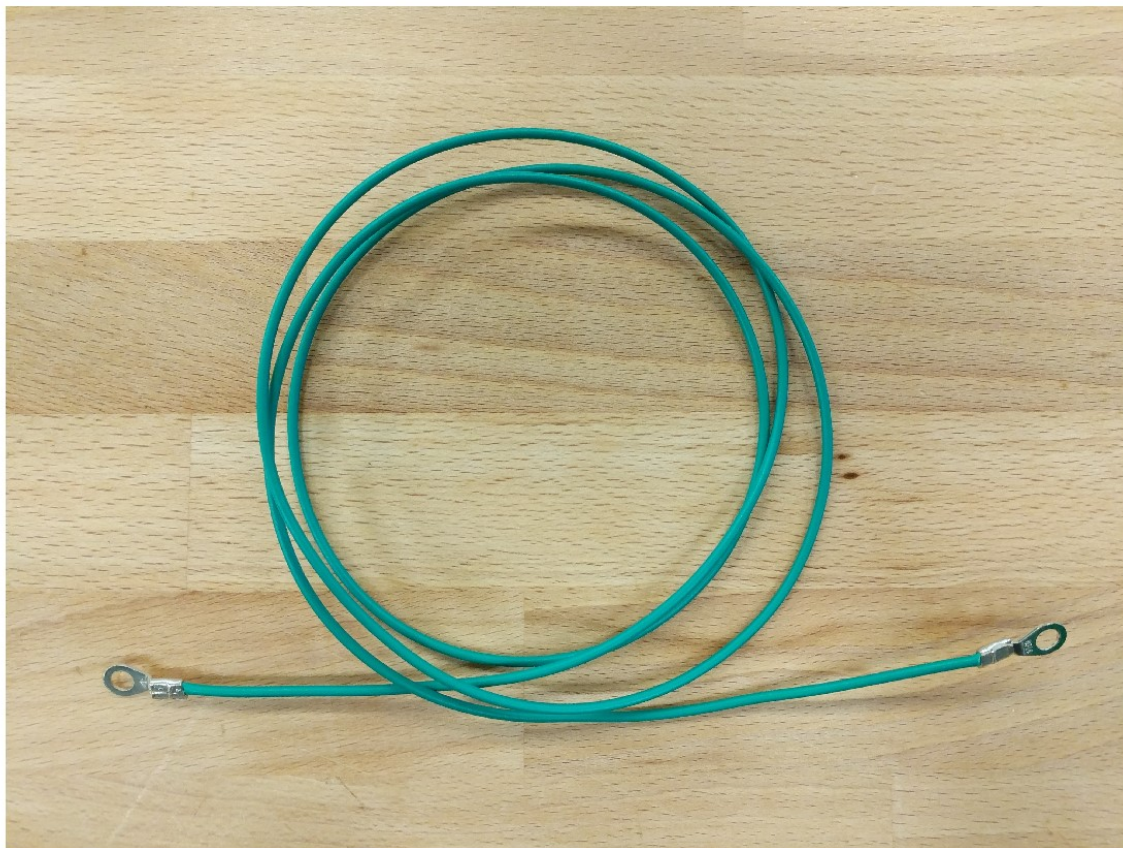
2

1

2

1

Cut a length of 16 AWG wire to 1250mm. Strip the ends and crimp a ring terminal to either end.



Note: a good crimp:  
(1) partly bites into the insulation  
(2) bites securely into the wire

Note: do not twist the stranded ends of the wire before crimping.

### Grounding Wire Fabrication



Created by:  
Joshua Vasquez

last edited:  
6/1/2020

SCALE: 1:2

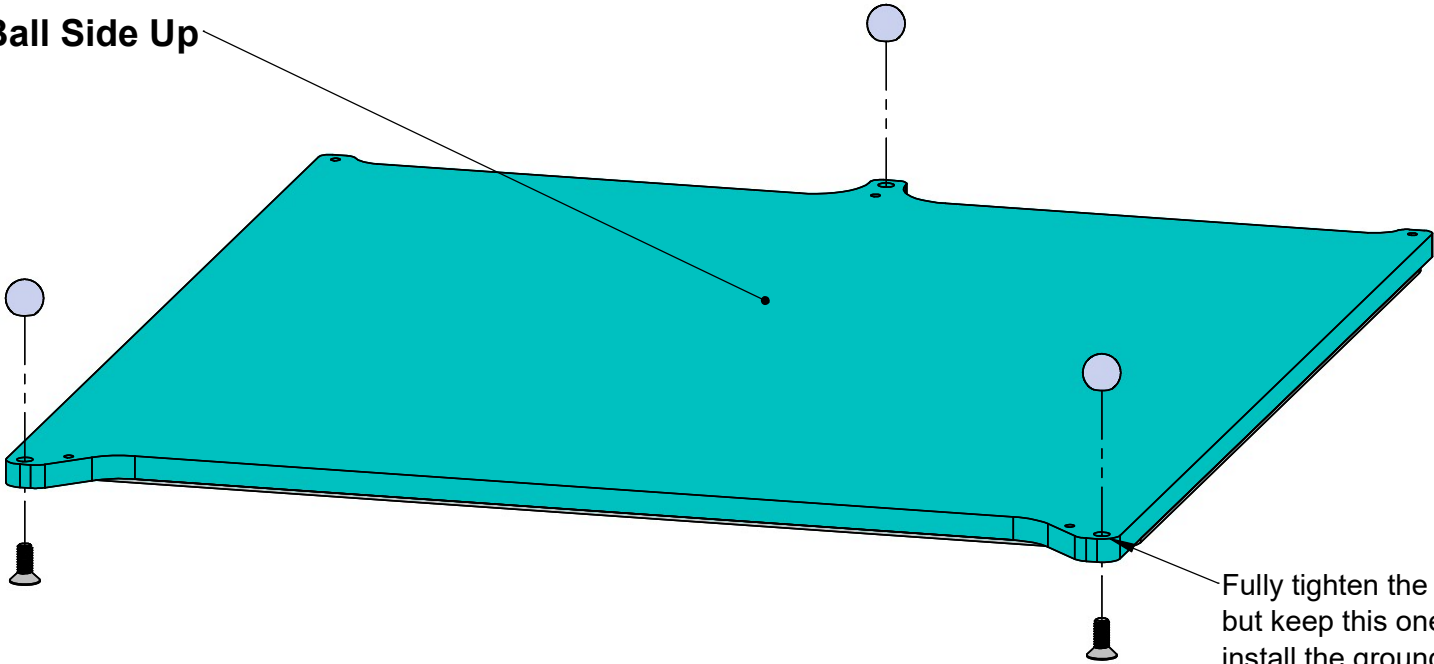
SHEET 3 OF 13

2

1


Note: the aluminum bed plate is delicate and very very flat! For the next few steps, work with the bed plate on top of a piece of cardboard to prevent it from resting directly on a table.

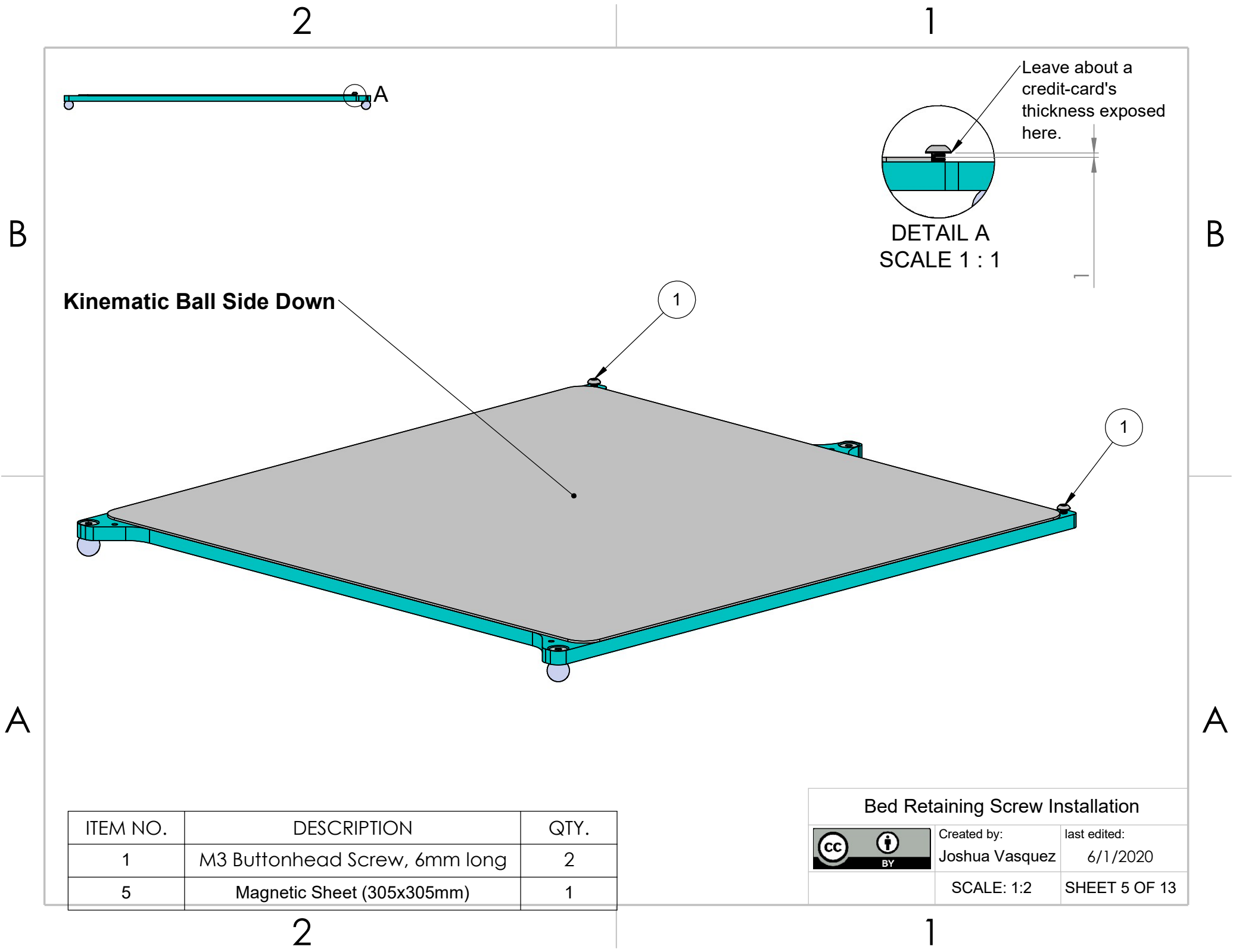
Kinematic Ball Side Up



Fully tighten the other two balls, but keep this one loose. We will install the grounding wire here later.

ITEM NO.	DESCRIPTION	QTY.
1	Bed Plate	1
2	10mm steel balls with M4 threads	3
3	M4 Flathead screw, 10mm long	3
4	Magnetic Sheet (305x305mm)	1

Kinematic Ball Installation		
	Created by:	last edited:
	Joshua Vasquez	6/1/2020
SCALE: 1:2		SHEET 4 OF 13



ITEM NO.	DESCRIPTION	QTY.
1	M3 Buttonhead Screw, 6mm long	2
5	Magnetic Sheet (305x305mm)	1

Bed Retaining Screw Installation		
	Created by: Joshua Vasquez	last edited: 6/1/2020
	SCALE: 1:2	SHEET 5 OF 13

You may use either the Keenovo pad's built-in thermistor, or the extrenal NTC Ring Lug Thermistor for measuring bed temperature.

If you use the external thermistor, you may cut the two thin red wires from the existig thermistor and reuse them by soldering them onto this sensor and insulating them with heat shrink tubing.

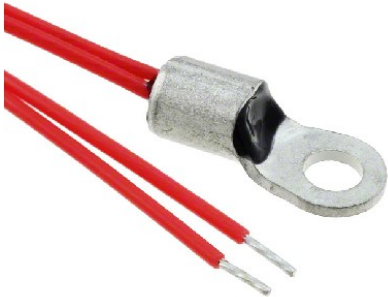



Image Credit: Digikey

Thermistor Wiring		
	Created by: Joshua Vasquez	last edited: 6/1/2020
	SCALE: 1:2	SHEET 6 OF 13



B



Grip a Solder Terminal Lug firmly with pliers at the base of the stem.



Then bend the stem 90 degrees.



Finally, bend the remaining part of the stem over, forming a loop as shown in the next image.

B

A



Loop a free bed spring into the stem and close the loop, ensuring that the loop is still bent away from the screw hole.



Make three of these.

A

### Spring Anchor Creation 1/2



Created by:  
Joshua Vasquez

last edited:  
6/1/2020

SCALE: 1:2

SHEET 7 OF 13

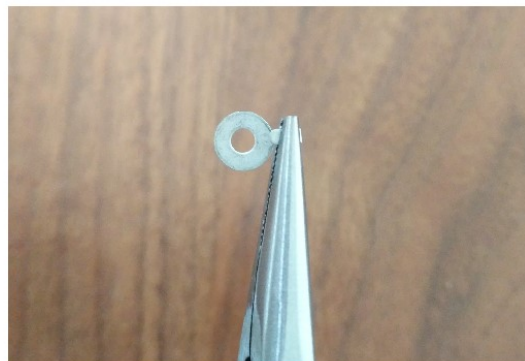
2

1

B



Grip a Solder Terminal Lug firmly with pliers at about the  $\frac{2}{3}$  point of the stem.



Curl it around the pliers, forming a loop.



Close the loop on each free end of the springs from the previous page.

B

A



Make three of these.

A

2

1

### Spring Anchor Creation 2/2



Created by:  
Joshua Vasquez

last edited:  
6/1/2020

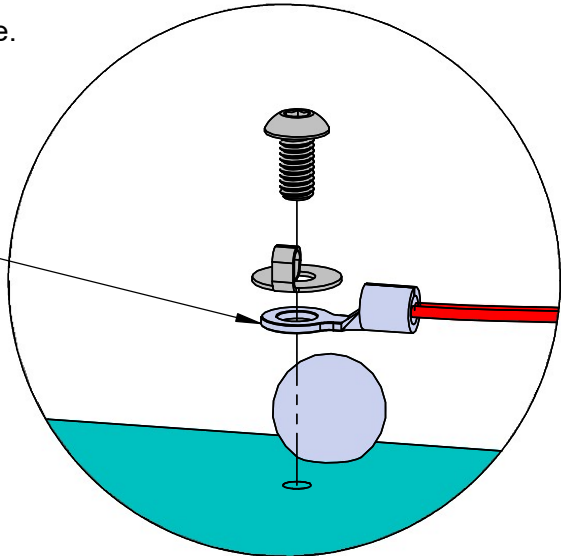
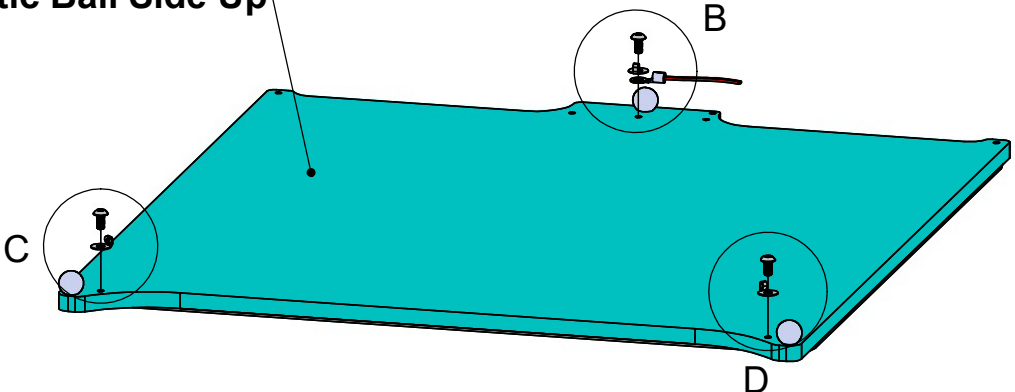
SCALE: 1:2

SHEET 8 OF 13

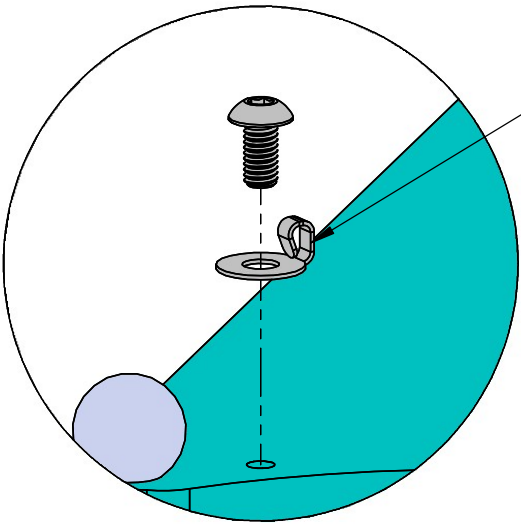


If you are using the NTC Lug thermistor, install it here such that it touches the metal part of the plate.  
 Note the orientation of the thermistor.

**Kinematic Ball Side Up**



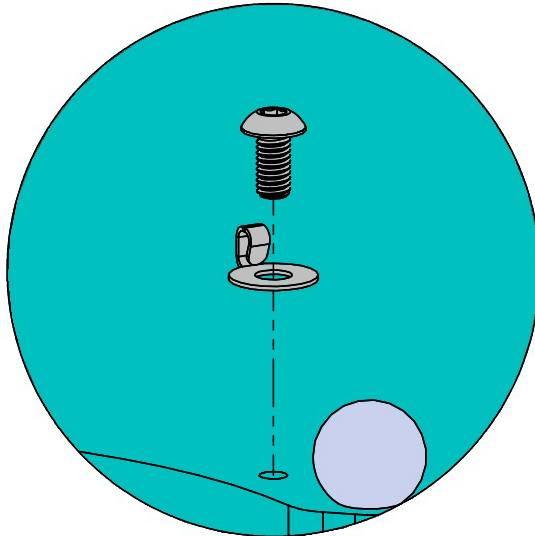
DETAIL B



DETAIL C

Install the bed spring assembly from the prior step here, attaching the terminal lug with the extra 90 degree bend.

Note: attached springs are not shown in the render.



DETAIL D

ITEM NO.	DESCRIPTION	QTY.
3	M3 Buttonhead Screw, 6mm long	3
5	Bent Solder Terminal Lug with springs	3
6	Ring Lug Thermistor	1

Spring Anchor Installation		
	Created by:	last edited:
	Joshua Vasquez	6/1/2020
SCALE: 1:3		SHEET 9 OF 13

2

1

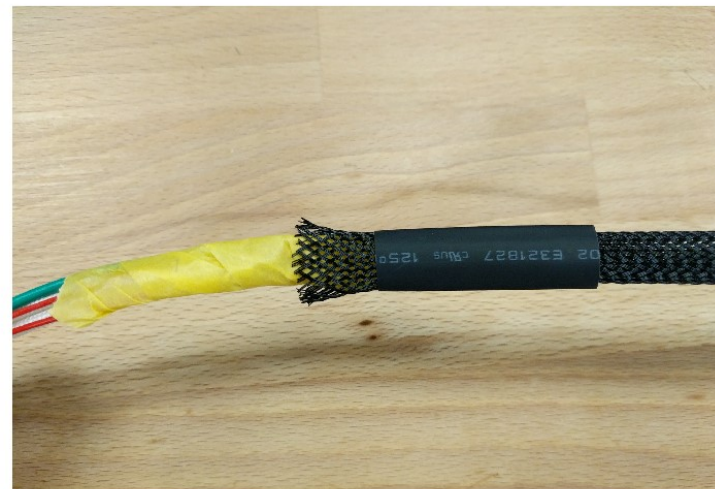
B



Cut 750mm of 1/2-in. cable sleeving. Slide two 10mm bits of heat shrink tubing onto the ends.

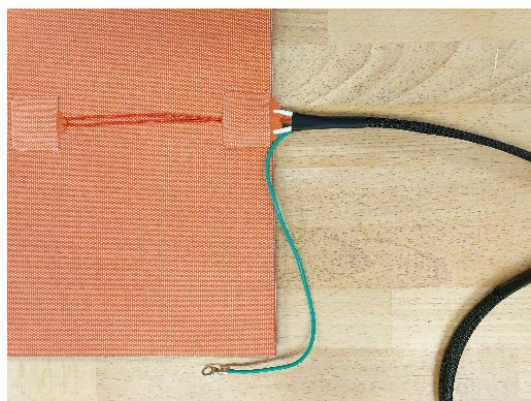


Collect the thermistor wires, grounding wire, and bed heater wires into once bunch. Tape the far ends together and run the bunch all the way through the cable sleeve.



B

A



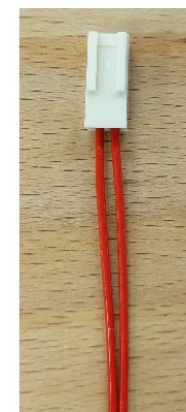
Pull out the ground wire near the pad such that it extends just past the nearest corner of the pad as shown above.



Crimp Ring terminals on the bed heater wires. From the **Duet Ethernet** box, crimp two small pins from the loose bag and click them into a two-prong connector.



1



2

A

2

1

### Heated Pad Wire Management 1/2



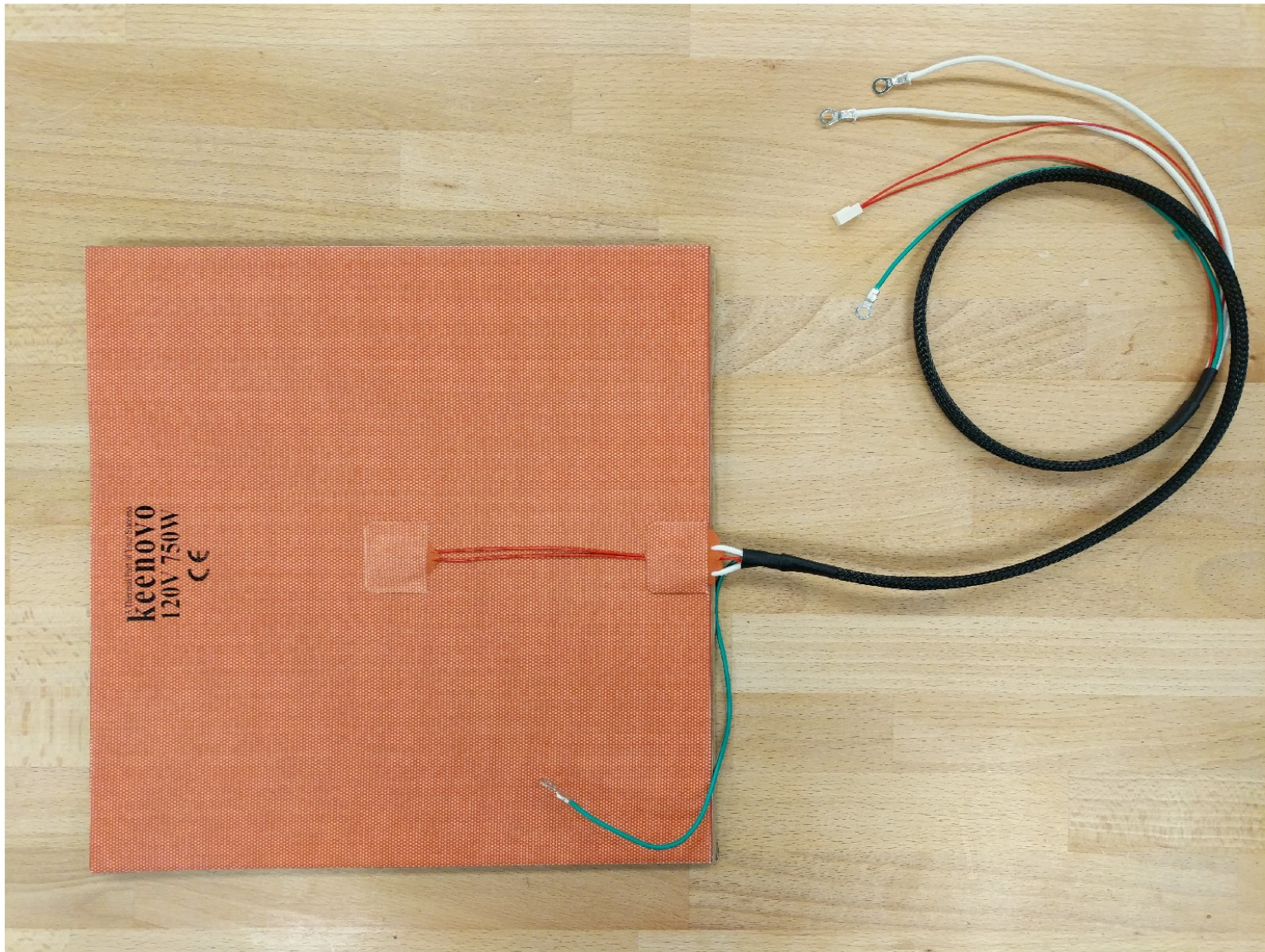
Created by:  
Joshua Vasquez

last edited:  
6/1/2020

SCALE: 1:2

SHEET 10 OF 13





Heat shrink the two loose heat shrink sleeves. The result should look like above.

## Heated Pad Wire Management 2/2



Created by:  
Joshua Vasquez

last edited:  
6/1/2020

SCALE: 1:2

SHEET 11 OF 13



2

1

If you are using the **SeeMeCNC** or **713Maker** bed, install the Heated Pad by peeling away the sticky layer and placing it **over the magnet side such that the magnets can no longer be seen**. If you are using the **Mandala Rose Works Bed**, install the Heated pad by peeling away the sticky layer and **placing it on the bare side, not the magnet side**.

B

B

A

A



Note the orientation of the plate! The wires will stick out from the side. Also note that there will be a border on all sides since the pad is 300x300mm and the plate is 305x305mm.

#### Heated Pad Installation



Created by:  
Joshua Vasquez

last edited:  
6/1/2020

SCALE: 1:2

SHEET 12 OF 13

2

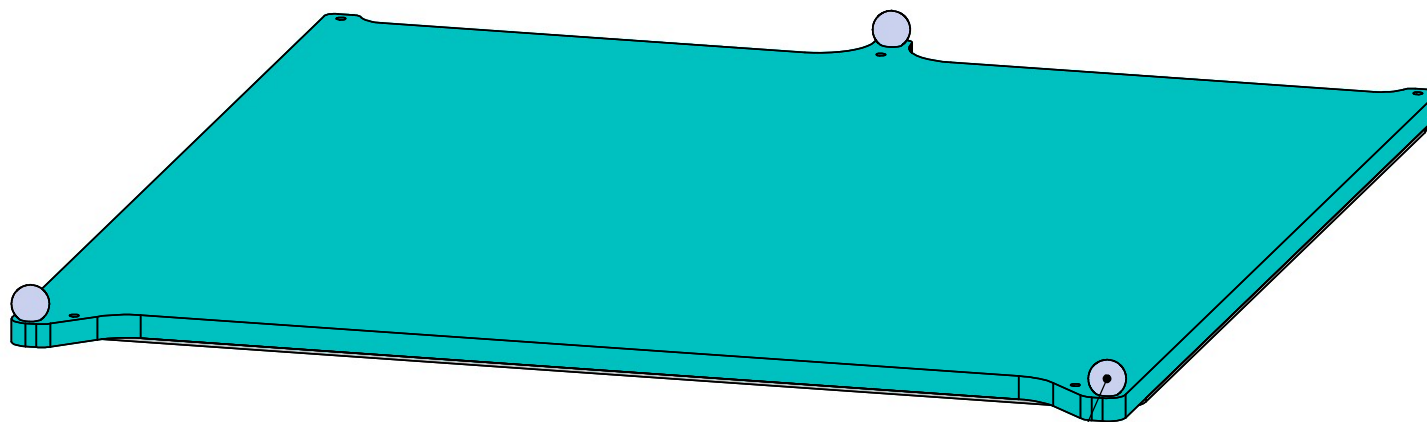
1

2

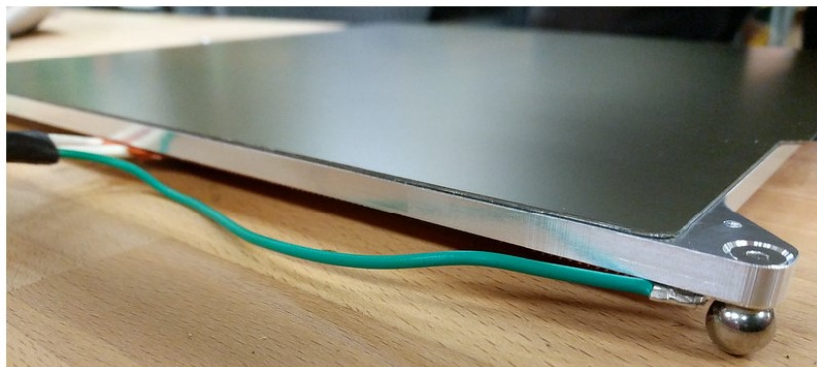
1

B

B



With the Heated Pad installed, install the grounding ring terminal between this kinematic ball such that the terminal is contacting the metal plate. but not touching the pad. Securely fasten the kinematic ball back.



A

A

2

1

### Grounding Wire Installation



Created by:  
Joshua Vasquez

last edited:  
6/1/2020

SCALE: 1:2

SHEET 13 OF 13