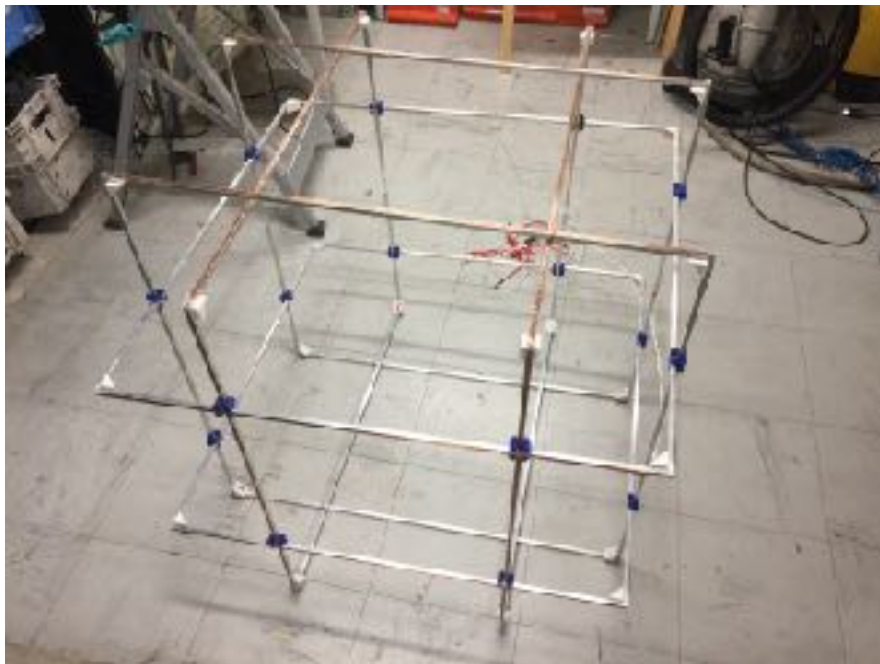


# Installation manual for the Helmholtz magnetic simulation system



## Parts necessary:



The 6 coils, 3 pairs numbered 1 to 3. The bigger is pair 1 and the smaller is pair number 3.

The 16 clips to maintain the coils together



The control box

12 cables with banana connectors:  
3 shorts red, 3 shorts black  
3 long red, and 3 long black



Some generators, capable of producing 30V DC with a total of 9A.

Here we are using 3 DC generators producing 30V and 3A each.

The mount for the cubesat, with the half-sphere.





The CubeSat in a waterproof plastic sphere

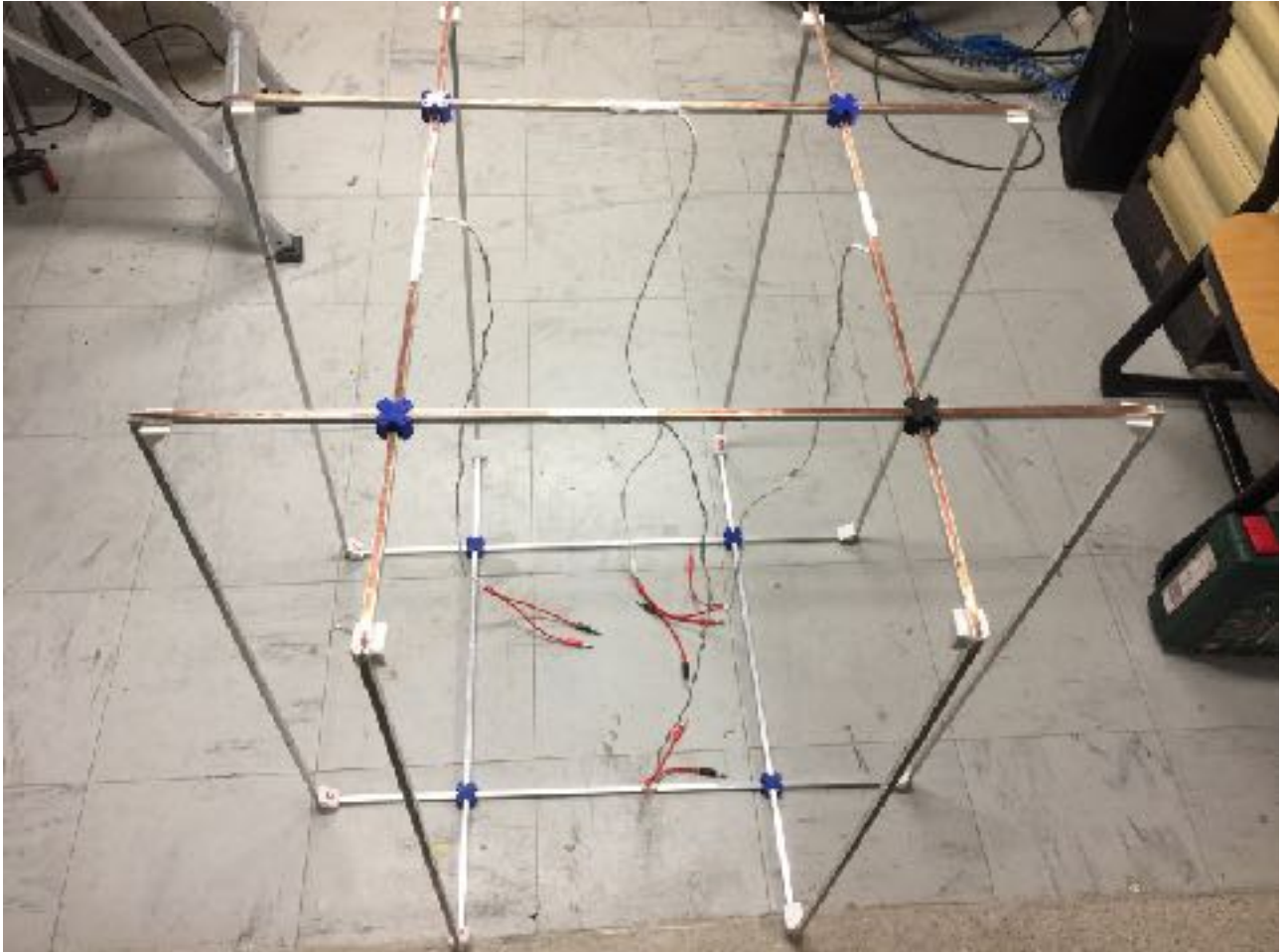


Step 1: Set up the coils

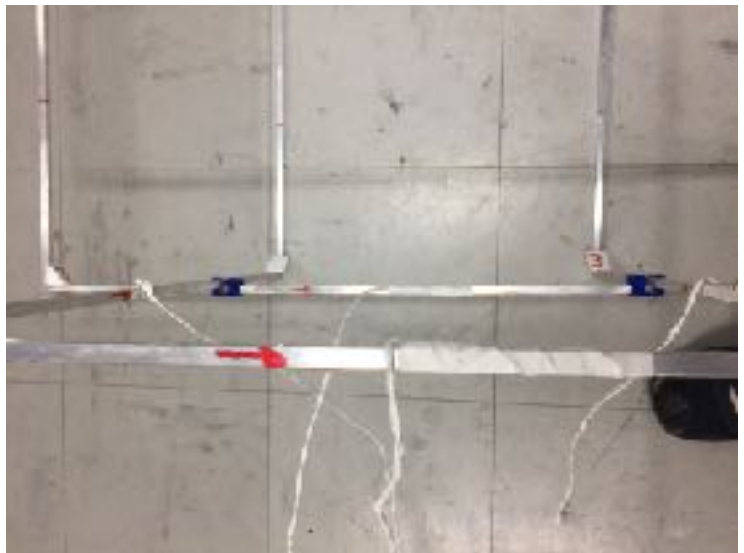
First, take 2 pairs of coils, preferably the ones marked with number 2 and 3.

Take the number 3 coils and place them facing each other.

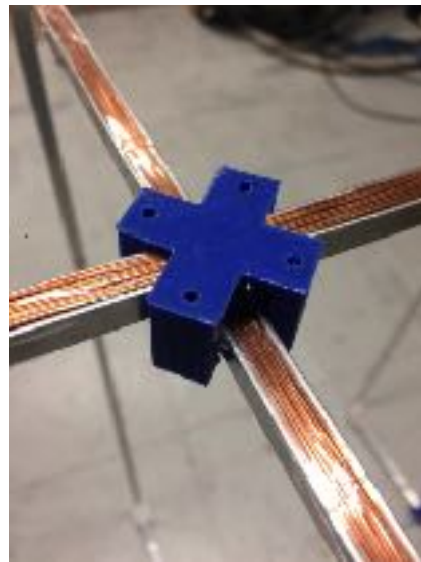
Insert the first number 2 coil outside them, and then the second, like shown below:



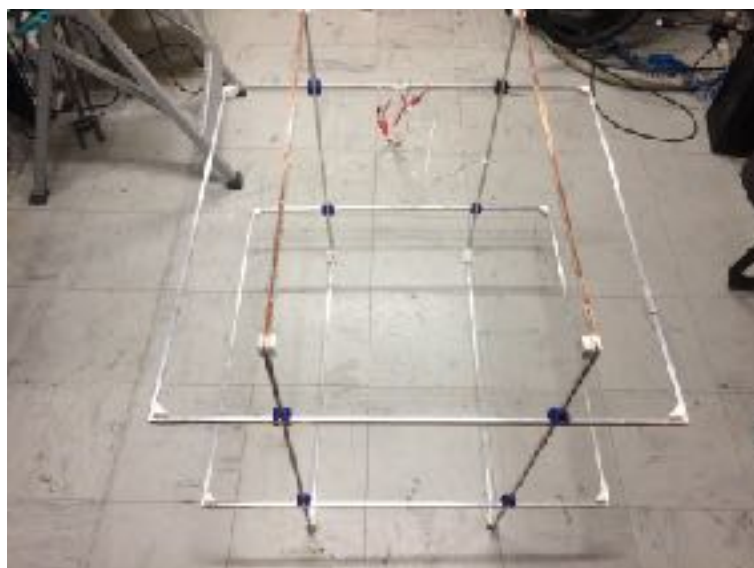
!! Take care of placing the pair of coils with the arrow drawn next to the cables pointing in the same direction for each of the 3 pairs.  
The cables should be on the same side



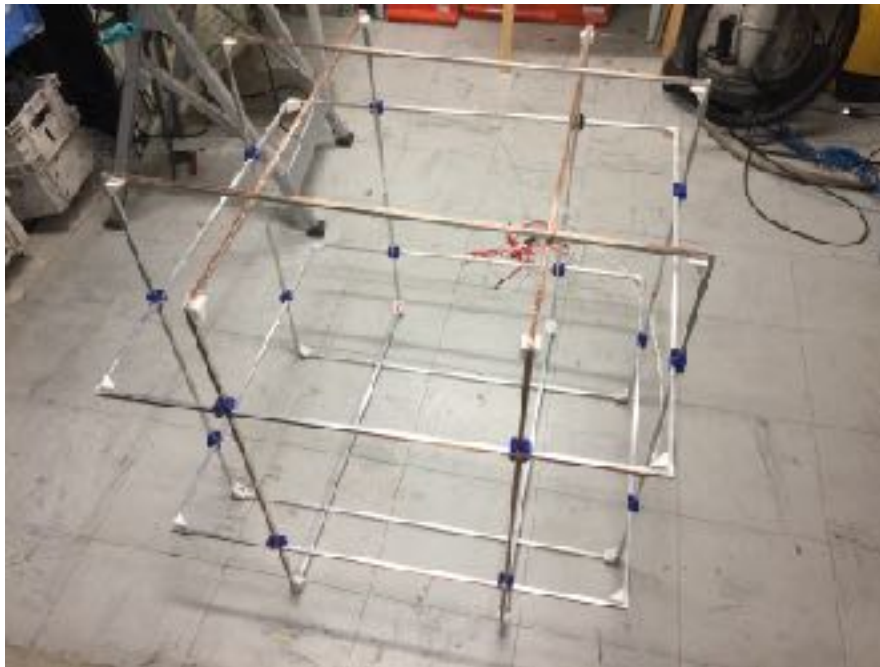
Place the coils on the red marks and then use the clips to attach them to each other



After that, rotate the whole structure by 90°

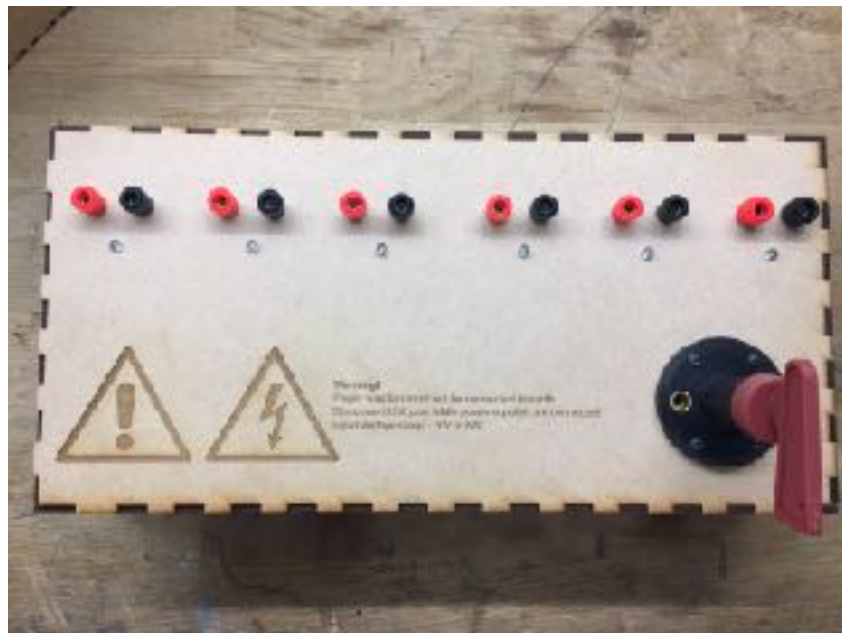


Place the number 1 coils on the last axis left, with the arrows on the same direction. Use the clips on the coils number 2 only, not on the coils number 3.



## Step 2: Set up the control box

Place the control box on the ground, next to the coils cables.



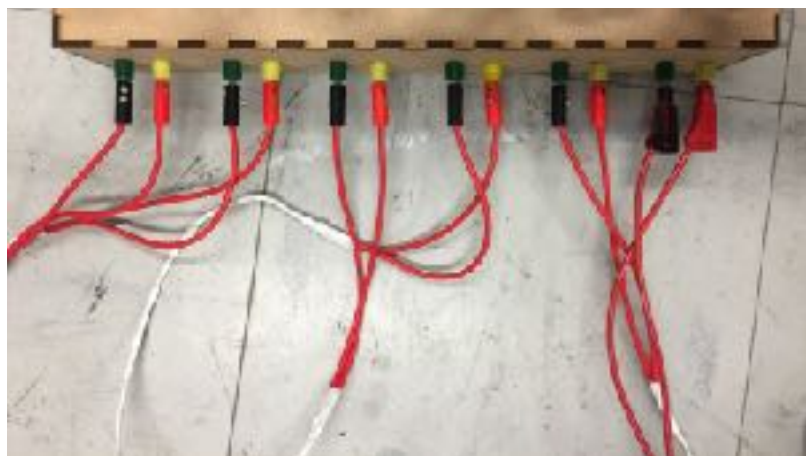
Arm the system by rotating the red stick to the right by 90°. Push hard to do so.



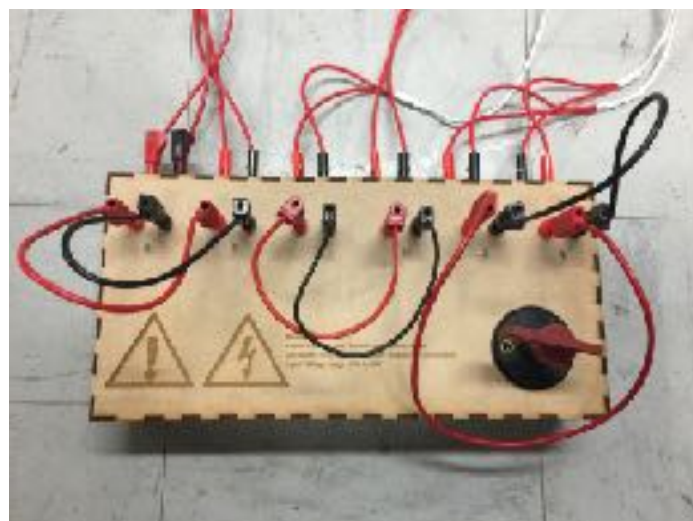
If the USB cable is not connected to the Arduino, do so by opening the top of the box to the left, and inserting the USB cable through the hole.



Plug the coils to the box on the back to the connectors Yellow and Green. For the first one, plug it as you like, Red to Yellow or to Green, but do the same for the 5 next coils.



Use the short cables to plug together the generator input on the top of the box for the same pair of coils.



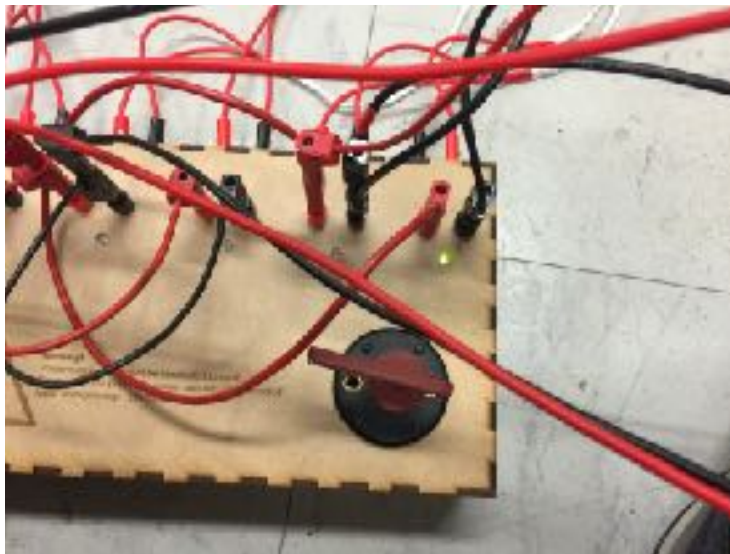
⚠ The power supply cards are not protected to reversal polarity. Respect the colours of the connectors.

Turn on the generators before plugin them

Connect the generators to each pair. Use the black and red connectors, not the ground (Green).



Turn on the logic board by giving power with the USB cord with an USB Battery. It may be a risk to power it with a PC. The LEDs indicates that the power card is set to give power to the pair of coils connected.



### Step 3: The CubeSat

Place the mount for the CubeSat in the center of the coils.

It should be about 40cm high, to be on the center of Z axis.





Put a small amount of water in the half sphere

Place the CubeSat inside the plastic sphere and place it on the water.

