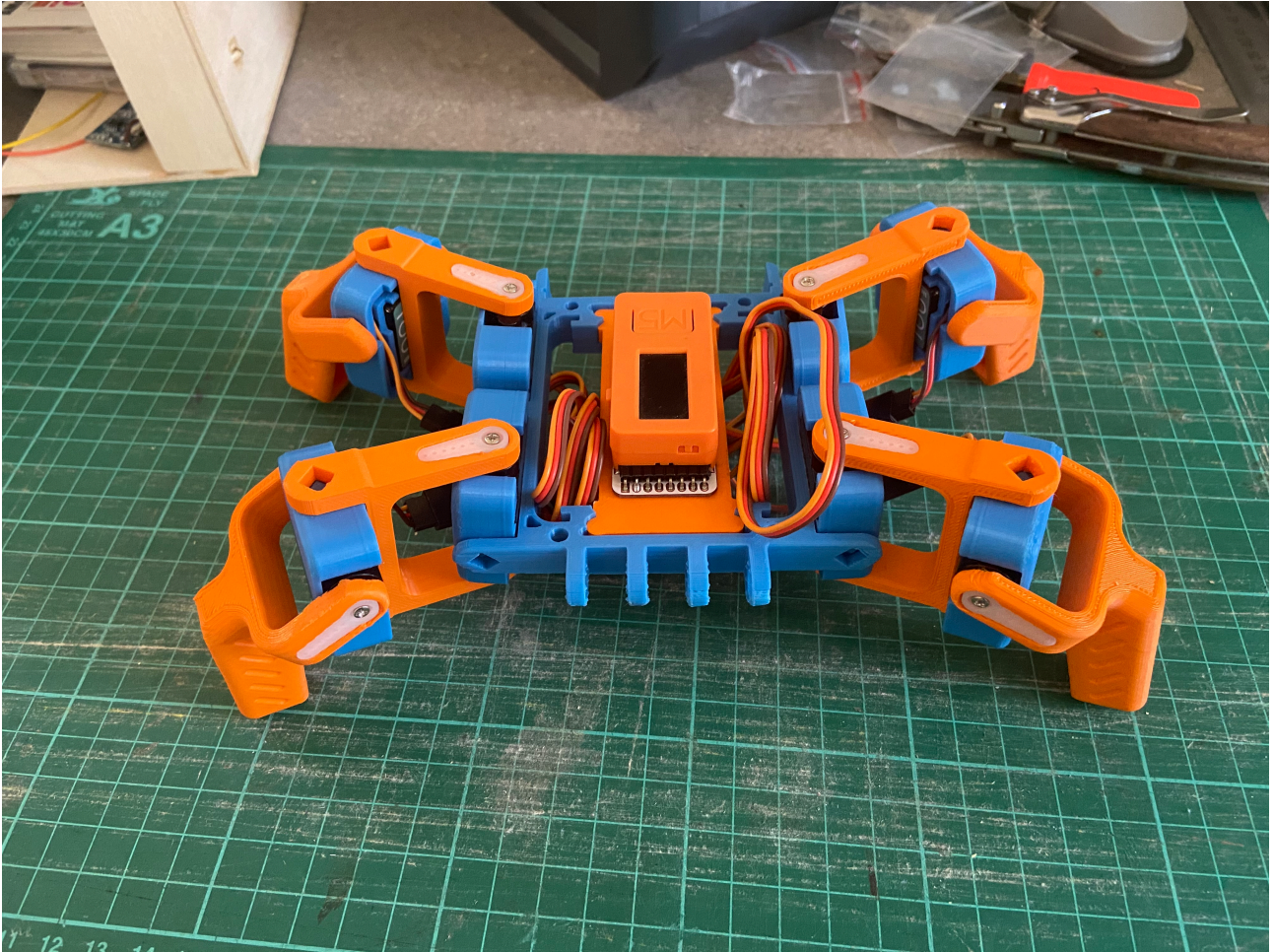


M5.A.R.S QUAD.



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Introduction.

S.M.A.R.S stand for **S**crew-less **M**odular **A**ssemble-able **R**obotic **S**ystem and was originally created by Kevin Thomas from Switzerland and made available on thingiverse. The S.M.A.R.S platform has gone through many revisions and conversions with the **S.M.A.R.S Quad** being the version that this guide is based on.

<https://www.thingiverse.com/thing:2755973>

In this guide I will show you how to build the **S.M.A.R.S QUAD** based robot using **M5Stack 180 Servo** pack, **M5StickC** controller and **Servos Hat** in order to bring the chassis to life.

This guide is broken into several steps which I hope make the assembly clear enough to follow.

Step 1 - Print the Parts.



The 3D Printed Parts and Electronic Parts (minus M5StickC)

Go to <https://www.thingiverse.com/thing:2755973> and download the S.M.A.R.S QUAD parts.

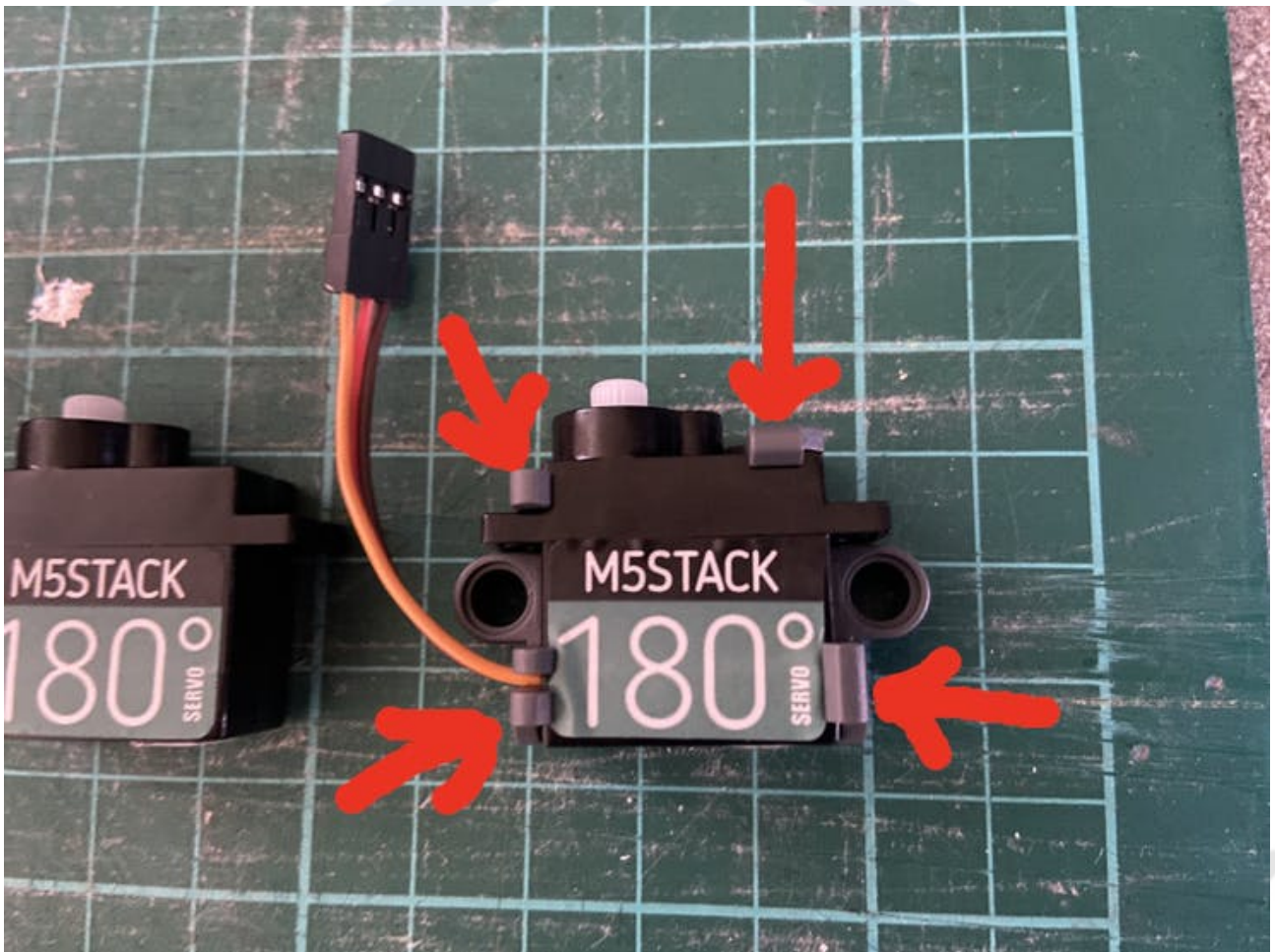
Print out 4 for the servo covers, 4 of the servo cover M's, 2 feet and 2 feet M's and the frame2.0. Next goto https://github.com/Ajb2k3/M5sars_quad/tree/main/3D and download 8servomountv3.stl and print out.

Check your printers tolerances as the fit of the mount was very tight to the frame and has been designed to fit securely.

Step 2 - Modify the Servo's

Modifying the servos to use in the **S.M.A.R.S QUAD** is not as scary as it sounds. The modification is none damaging, non permanent, and does not break the warranty.

The servos come fitted with a mounting cage which allows it to be fitted to the frame found in the kit. To use the on the **S.M.A.R.S QUAD** we need to remove this frame. To remove the frame I just gently pushed the clips that hold the servo on so that the servo just pops out without breaking the clips.



Push these clips outward gently to release servo. Start with the top two and then by gently twisting the servo, the bottom two will release. Do Not twist too much or you risk damaging the wire that are held between the left hand side clip.

Step 3 - Fit servos to the S.M.A.R.S QUAD servo mounts.

The M5Stack servos come with short leads and extensions. Place all the servos into the 8 mounts but don't press the cables in. Take 4 extension leads and connect them to 2 of the servos in the servo case and two to the servo M case, these will be the leg/knee servos.



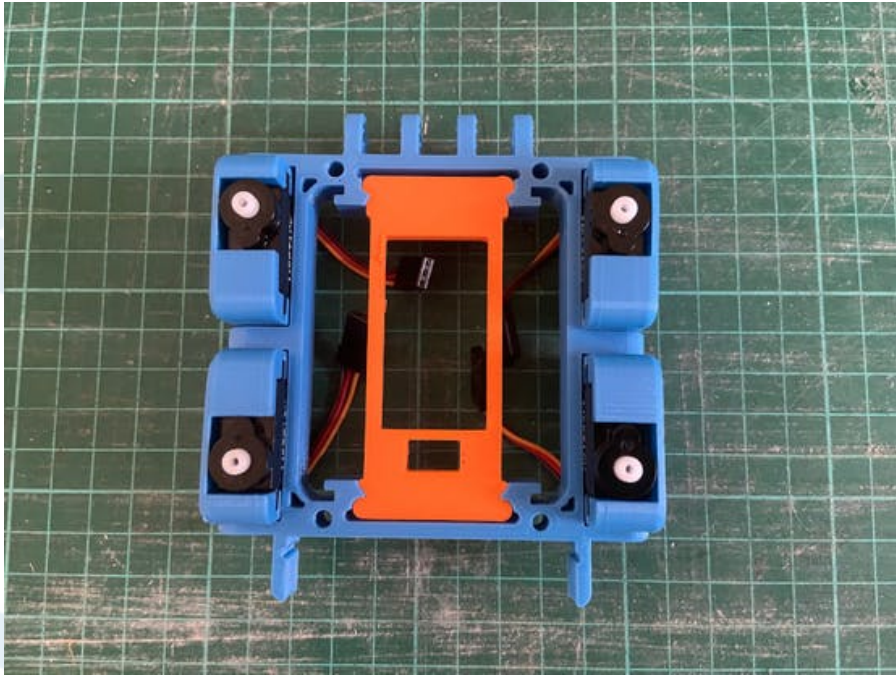
When done, tuck the cables with the extension leads into the covers so that they look like the above image. This is a tight fit with the extension leads but will fit with care.

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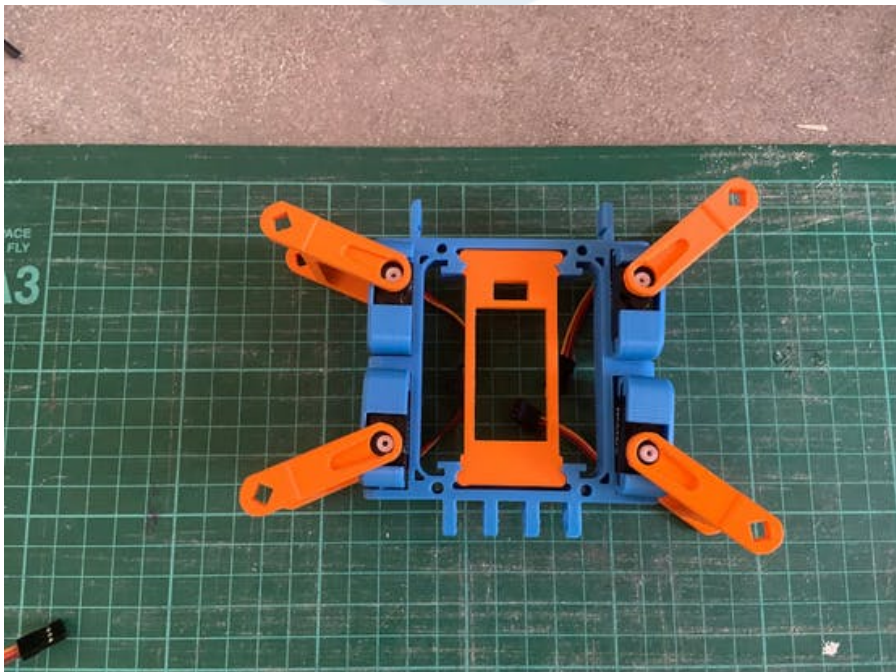
Step 4 - Assemble the 3D Printed parts.

Place the 8Servomount into the frame and gently press into place. As mentioned earlier, this should be a tight fit without twisting the frame. If it doesn't fit then the support may need some adjustment with a file.

Place two of the servomounts and two of the servomount M's so that the horn mounts (white round bits) are close to the corners of the frame.

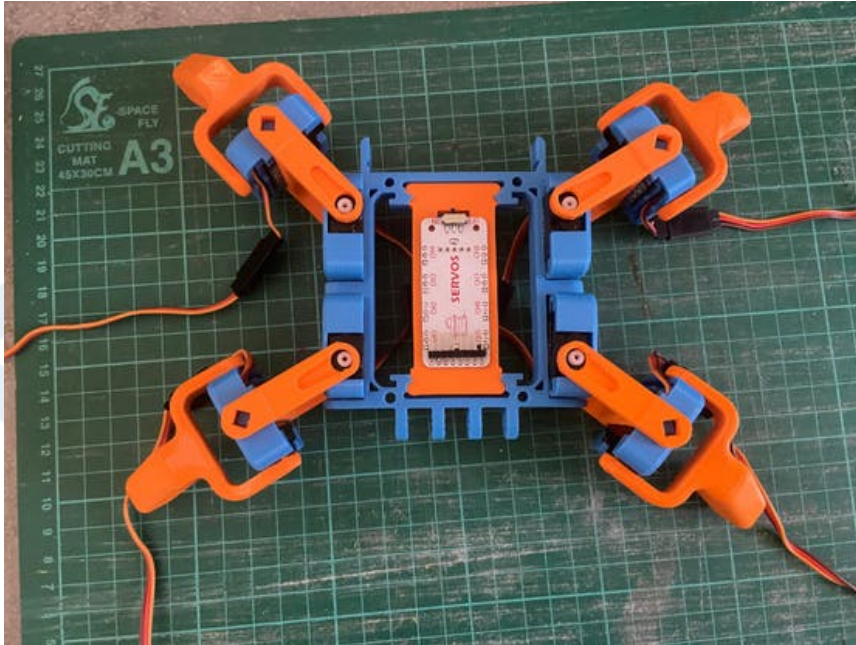


Next take the four servo arms and clip them over the servo cases but don't fit the servo horns yet.



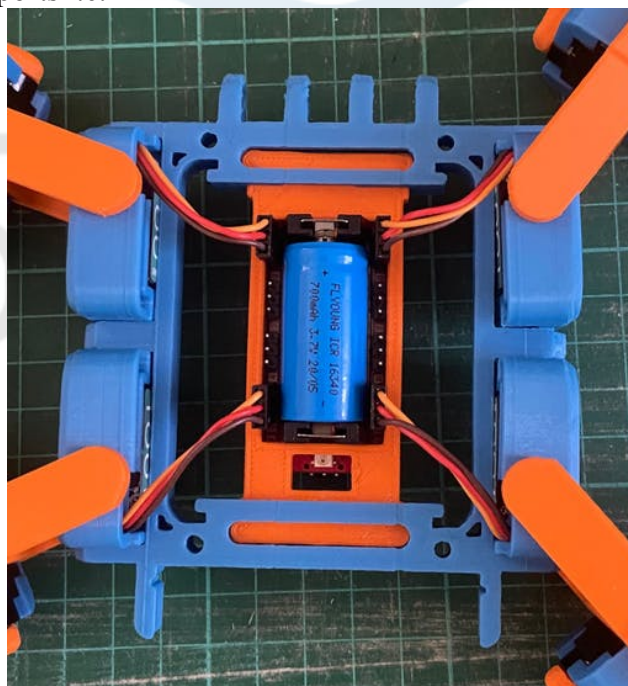
Step 5 - Connect the electronics.

The 8servo module should just fit into the support frame but the frame may need some filing if it doesn't. The switch points to the rear so that the RGB LED on the underside can shine through the hole of the support frame.



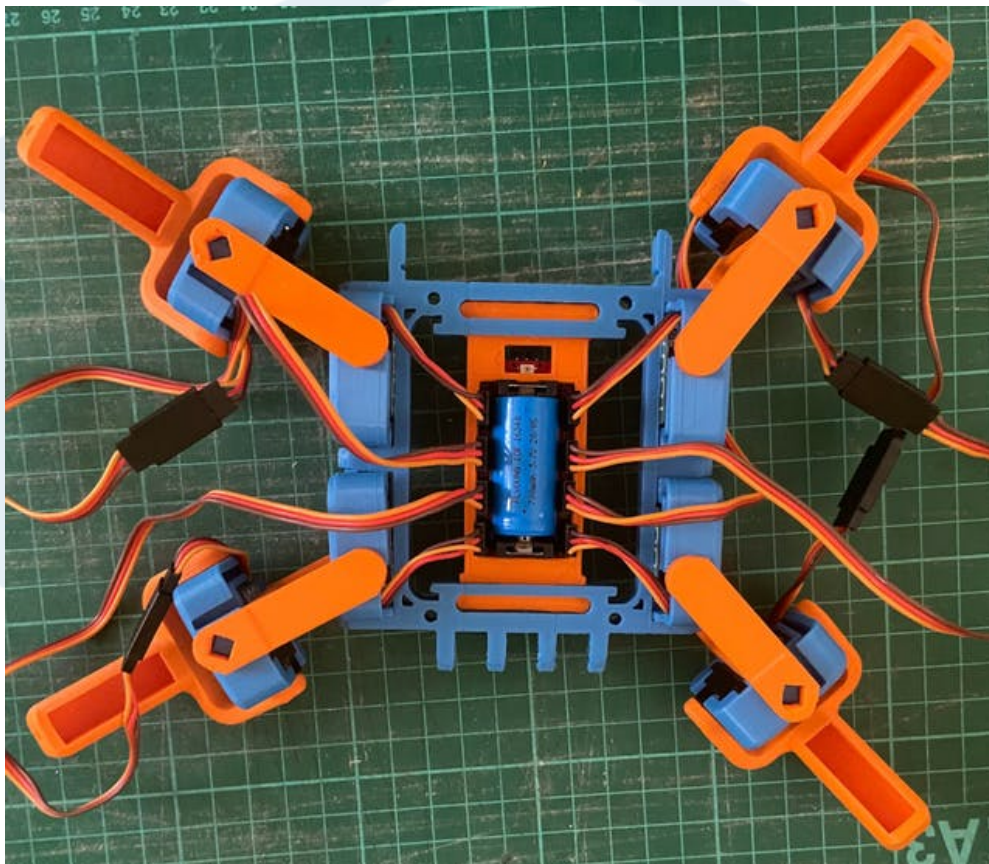
Next turn the assembly upside-down and connect the four "Hip" servos to the four outer servo ports marked CH1, CH4, CH5 and, CH8. These ports are used because the short leads mean that they won't reach any other port.

Next connect the four knee servo's making sure that the wire from each go to one of the corresponding available ports i.e.



When connected the for servos should be connected as follows:

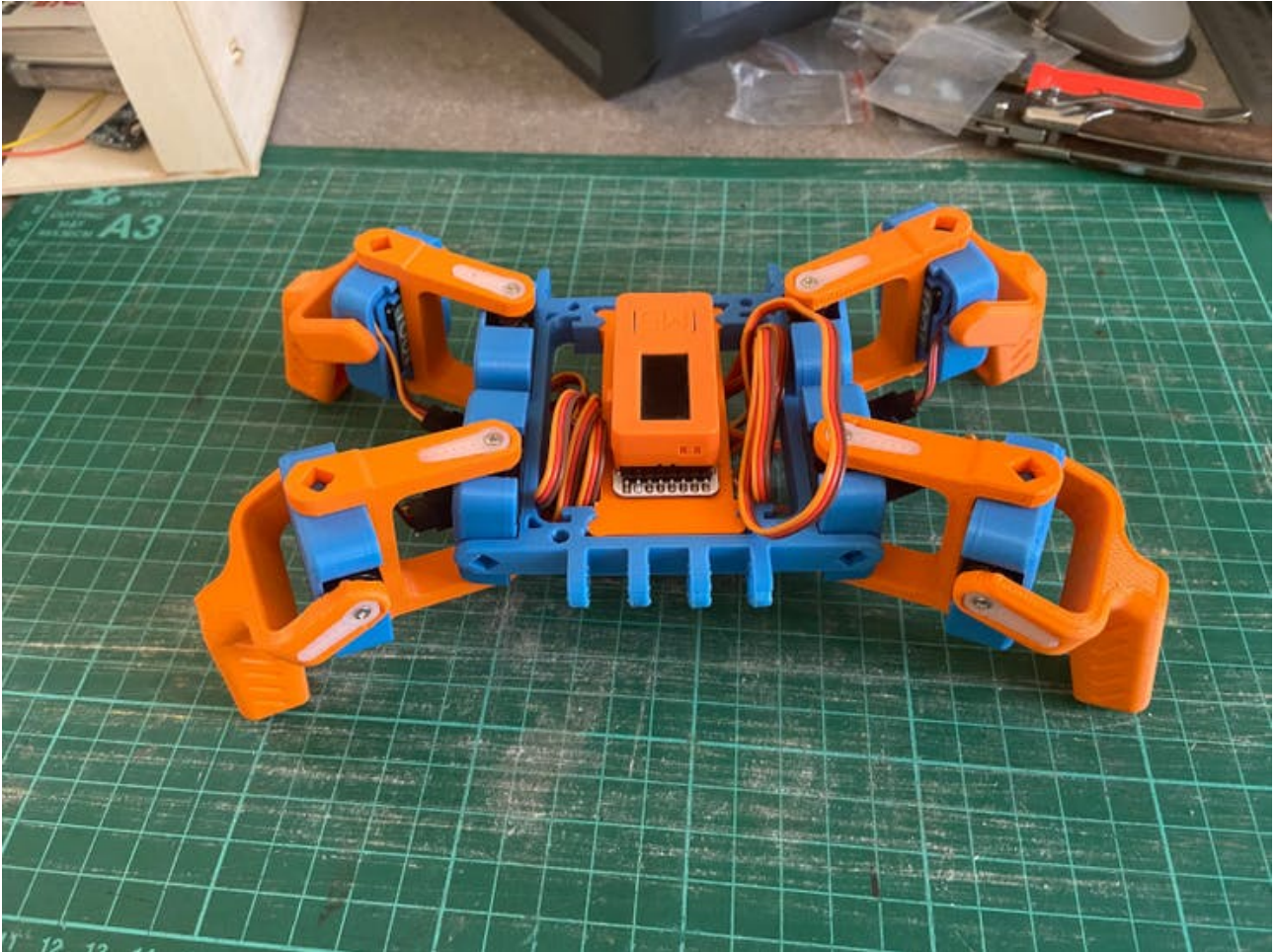
- Front Left Hip = CH4,
- Front Left Knee = CH3,
- Front Right Hip = CH8,
- Front Right Knee = CH7,
- Rear Left Hip = CH1,
- Rear Left Knee = CH2,
- Rear Right Hip = CH5,
- Rear Right Knee = CH6,



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Finished Assembly

Now that the **M5.A.R.S QUAD** is complete, the next step is testing calibration and programming.



Further reading.

For good information and guides for non M5Stack based **S.M.A.R.S** projects you can check out <https://www.smarsfan.com> by Kevin McAleer.