# Robotic arm kit assembly instructions

General info:

The entire robot shell is 3d printed, so there may be some minor inconsistencies. The printer adds a raft and scaffolding to help the printing process which we then remove from each piece separately. Some of it might be left on a piece of your kit. So, if you spot a little bit of plastic that is blocking a hole or keeping a servo from inserting properly, you can remove it using a file, a screwdriver and some patience. The material that we use to print the kits is Makerbot PLA, which is a renewable bioplastic made from corn. It is not hard plastic and melts at around 200-230 degrees, if you feel like tinkering with a soldering iron.

Contents:

The kit contains:

- Suction base with 3 suckers.
- 3-d printed parts, four.
- Screw terminal
- One piece of red wire, one black.
- 3 SM-S2309S servos with arms and screws
- One GY-521 sensor

Assembling your robot:

1. The first step you should take before attempting any assembly is to actually check that all the parts are working. Connect the arduino board to your computer, and test the servos and sensor individually to make sure everything works.
2. Put each of the three servos in their extreme positions.
3. Attach the red and black wire to one end of the screw terminal.
4. Put your robot together as shown in image.
5. Before attaching each servo arm, turn the servo carefully to one extreme as shown in images.
6. Attach the servo extensions to each servo. Connect all red wires together and attach to the screw terminal. Do the same with the black wires. On the other side, use the red and black wires to connect to the arduino.
7. Attach the white wires to the digital pins of the arduino board.
8. Attach the extra coloured wires from the servos to the analog inputs on the arduino.
9. Attach the gyro sensor close to the edge of the “arm” with some cable tie.
10. Run all wires down the robot's body, and out of the base hole.
11. Connections table follows.

Now that you have everything put together, upload the code to the arduino and watch the robot go! Enjoy!

## Connections Table:

| Cables | Arduino Pins |
|---|---|
| Red servo cable | 5V |
| Black servo cable | GND |
| “Hip” servo white cable | 9 |
| “Knee” servo white cable | 10 |
| “Ankle” servo white cable | 11 |
| “Hip” servo coloured cable | A0 |
| “Knee” servo coloured cable | A1 |
| “Ankle” servo coloured cable | A2 |
| SDA gyro cable | A4 |
| SCL gyro cable | A5 |
| VCC gyro cable (Red) | 3.3V |
| GND gyro cable (Black) | GND (second) |

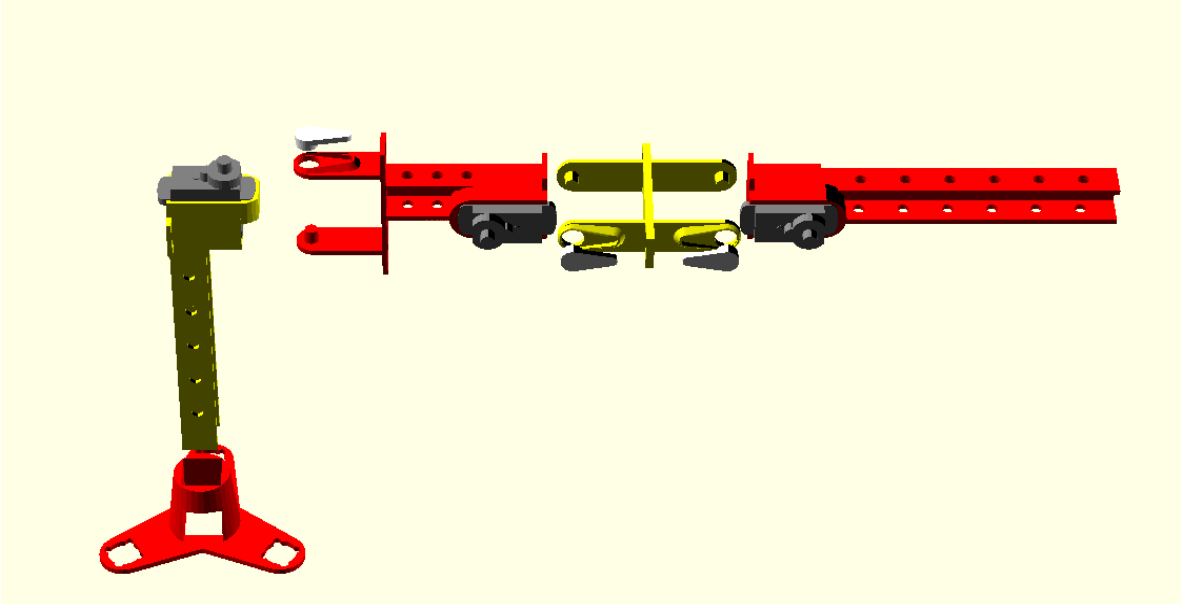

Image 1: Putting everything together.

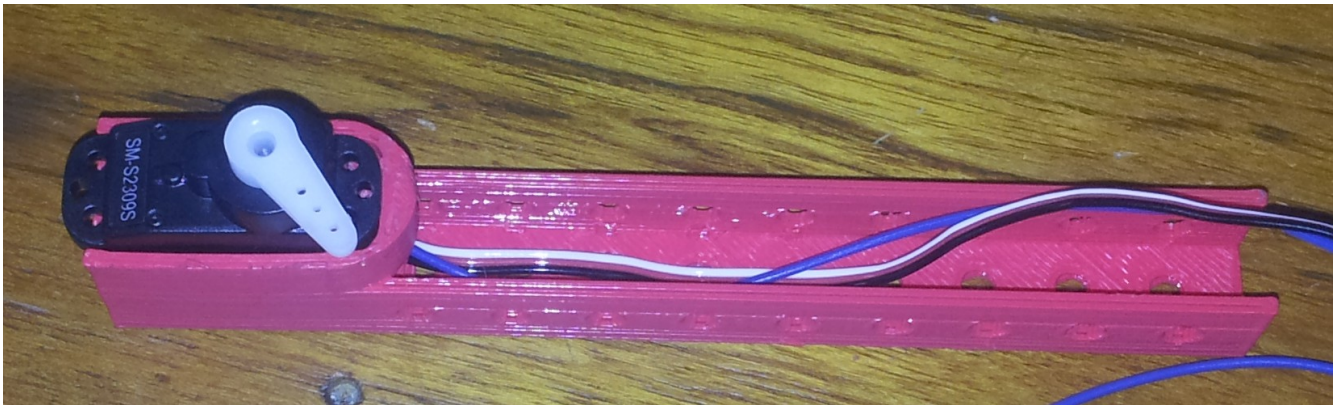

Image 2: Servo in place.

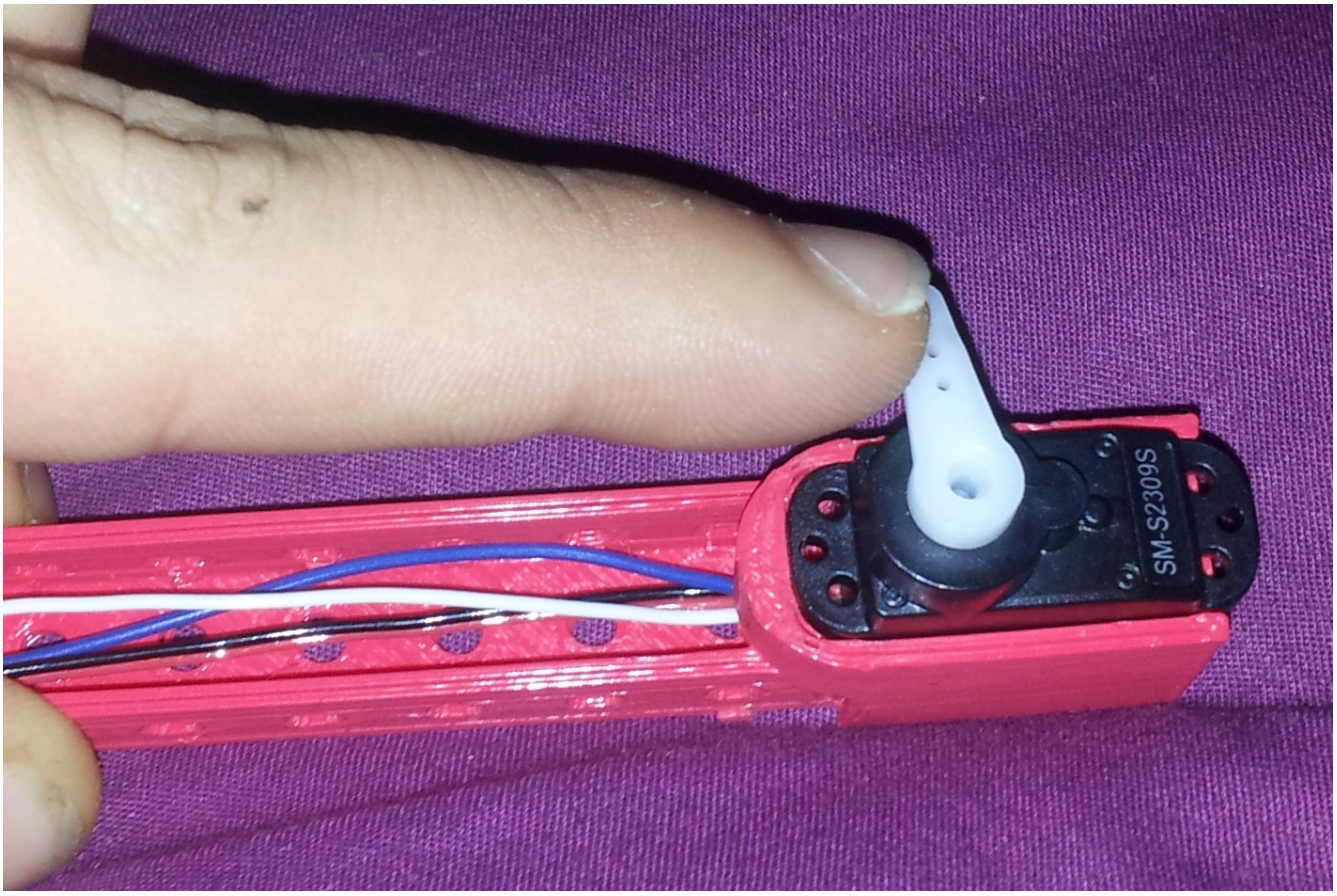


Image 3: Servo in extreme position

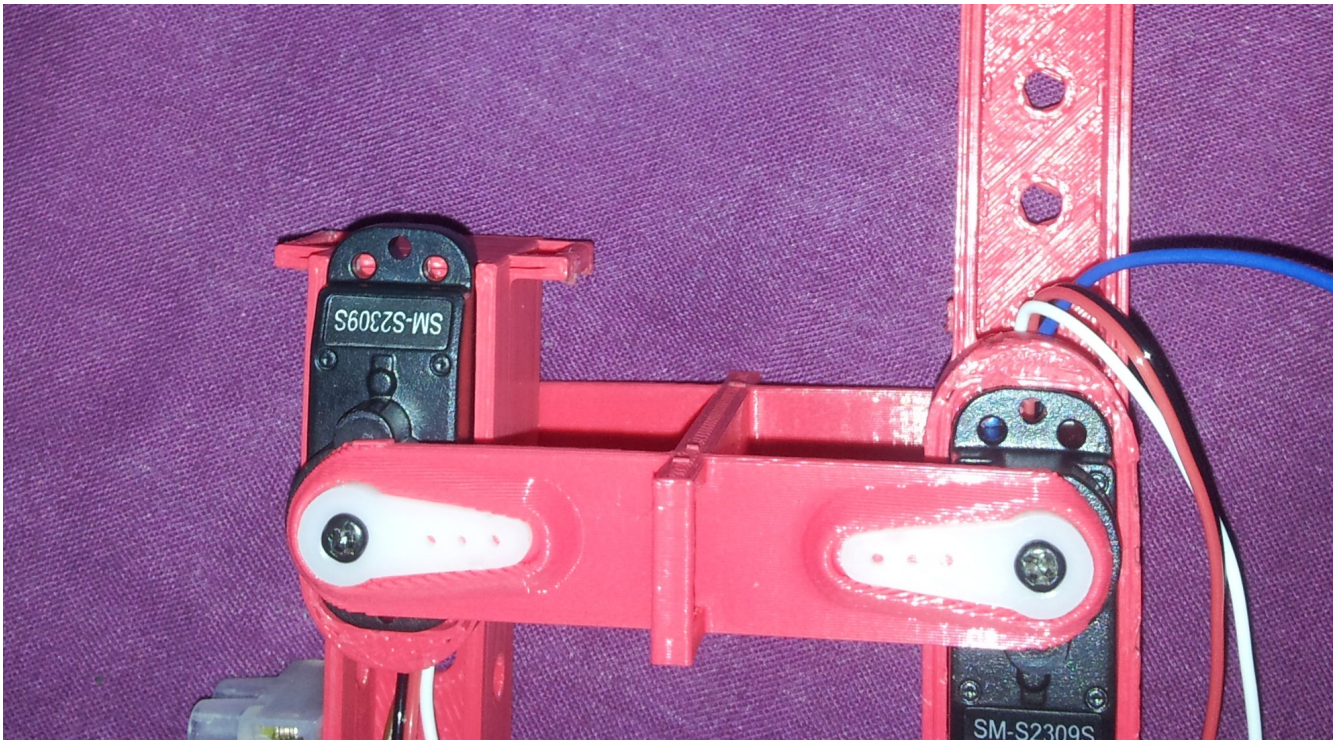

Image 4: Servos in extreme positions.

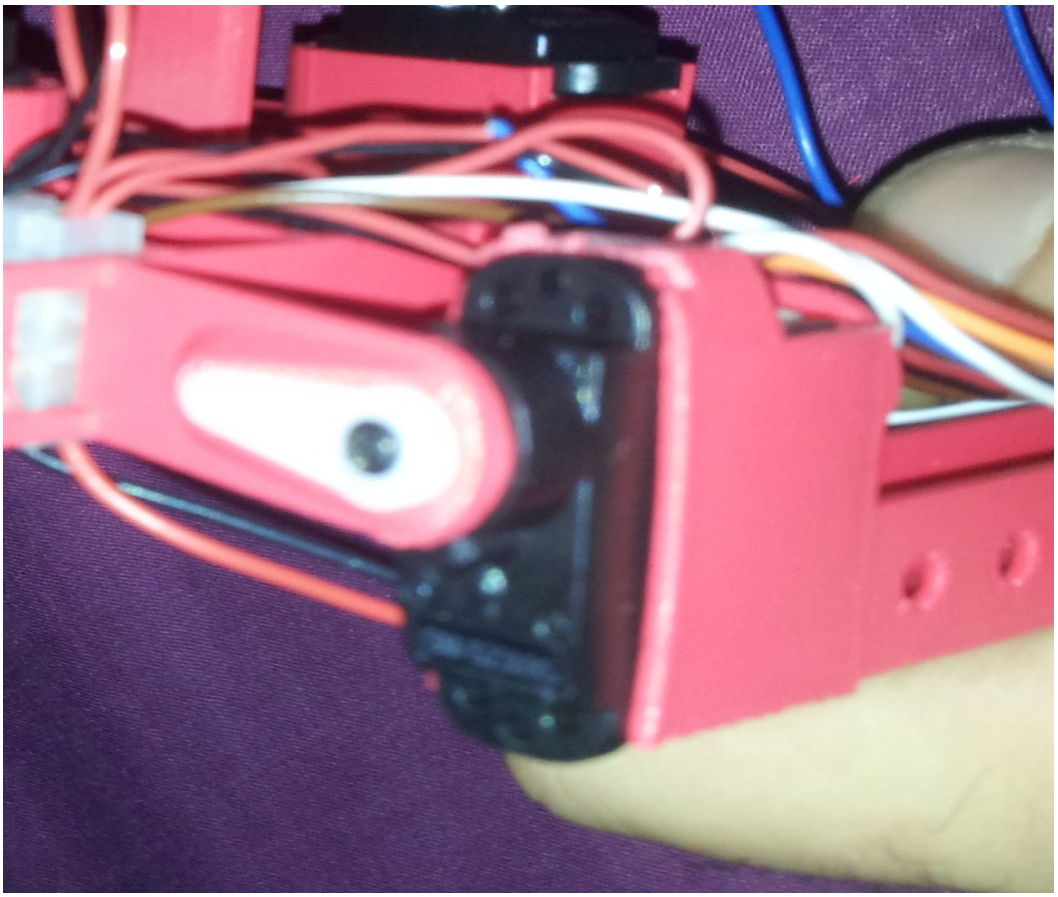

Image 5: The third servo in extreme position

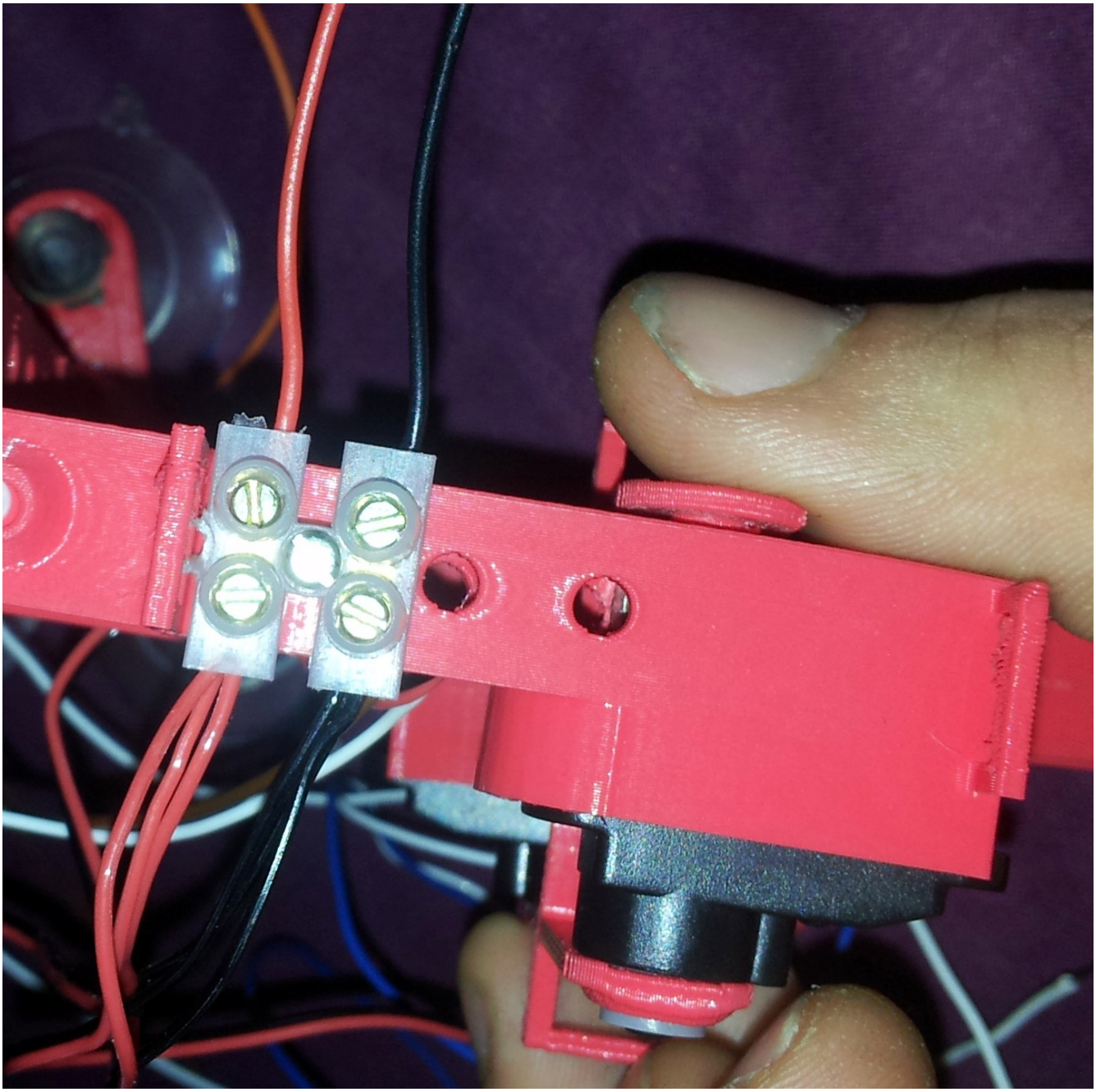

Image 6: The screw terminal block and the connected cables.