# Assembling You WizFi Trundlebot

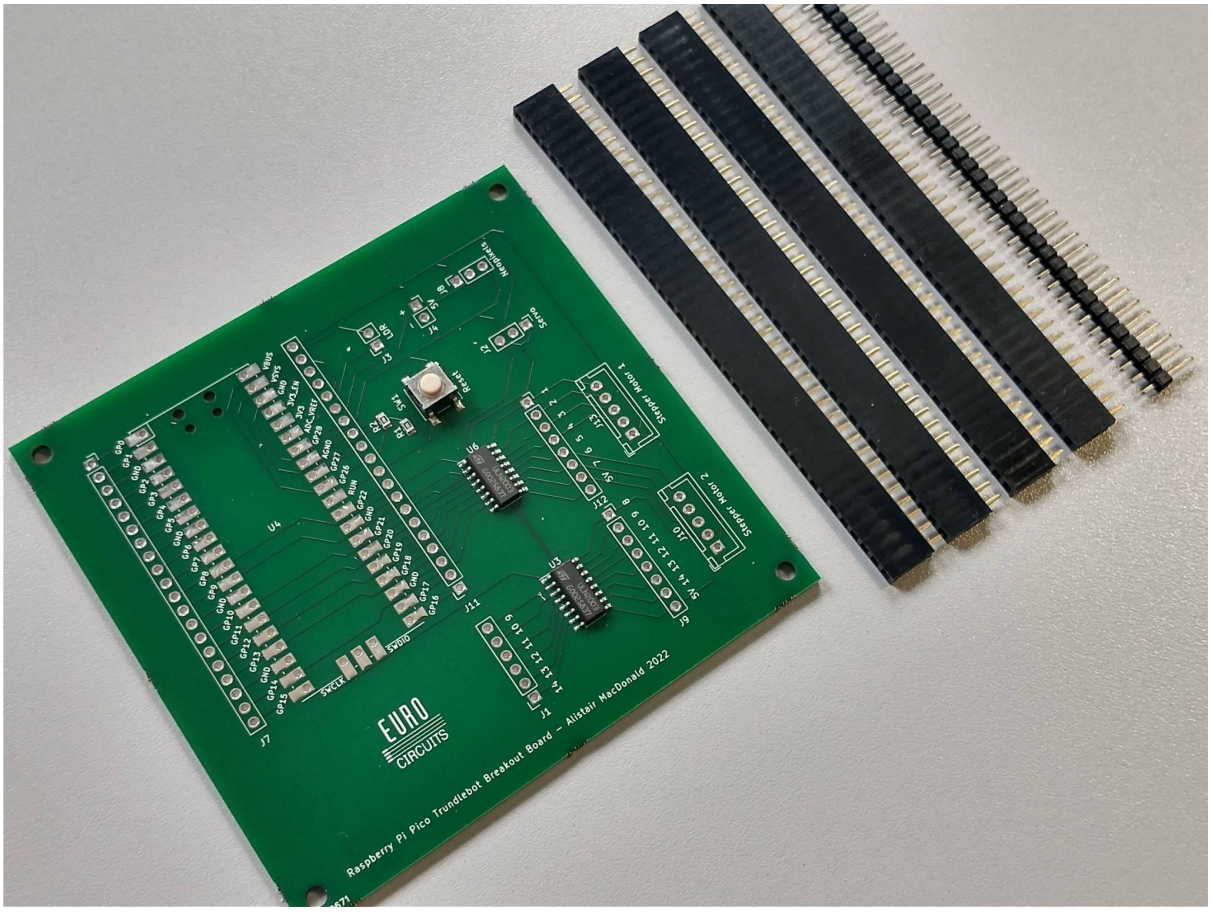
The trundlebot consists of two key elements. The heart is Trundlebot PCB with the WizFi360-EVB-Pico attached. The body is the mechanical body.

## Assembling the PCB board

You need to have a Trundlebot PCB that can be ordered online. All the details a manufacturer needs are in the “Trundlebot KiCad PCB File” and the “Trundlebot BOM File”.

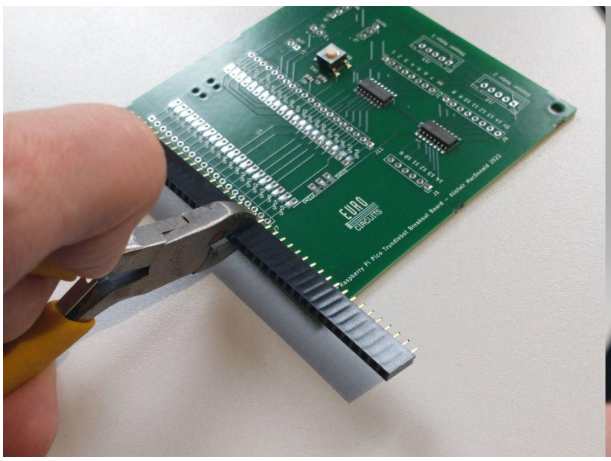
Most of the components will have been assembled by the board manufacturer, but we still need to add some connectors. This is not hard to do and is good practice if you are new to soldering. Don’t worry, it is really really hard to break, and there are many really good tutorials online if you have not done it before.

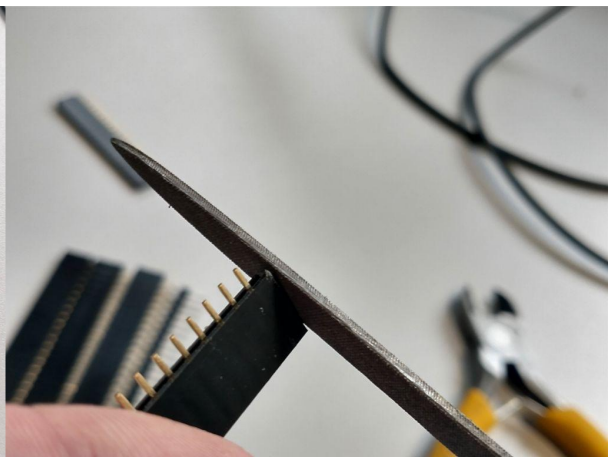
First let's get all the parts we need for this.



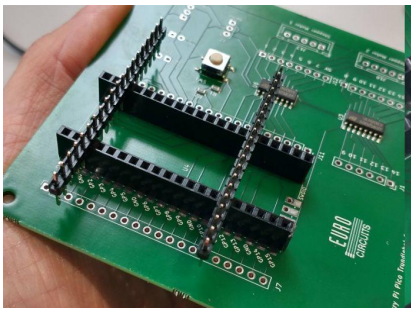

You will need the Trundlebot PCB, four 40-pin 2.54 mm pitch header socket strips, and a 40-pin 2.54 mm pitch header pin strip.

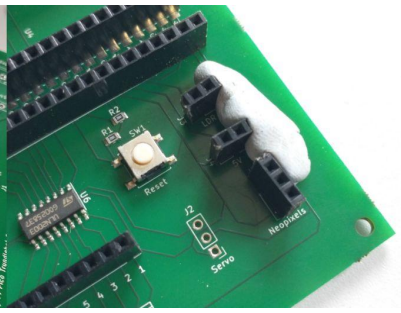
Now let's cut the headers into the lengths required. You will need 4 x 20 socket, 2 x 8 socket, 1 x 6 socket, 1 x 3 socket, and 2 x 2 socket. You will also need 2 X 5 pin header for the stepper motors and a single 3 pin header for the stepper motor.

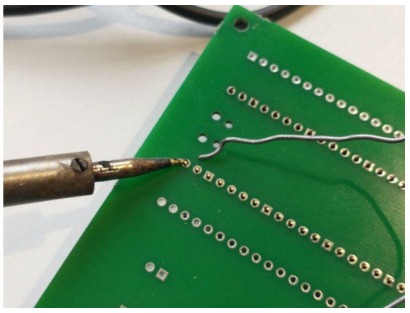




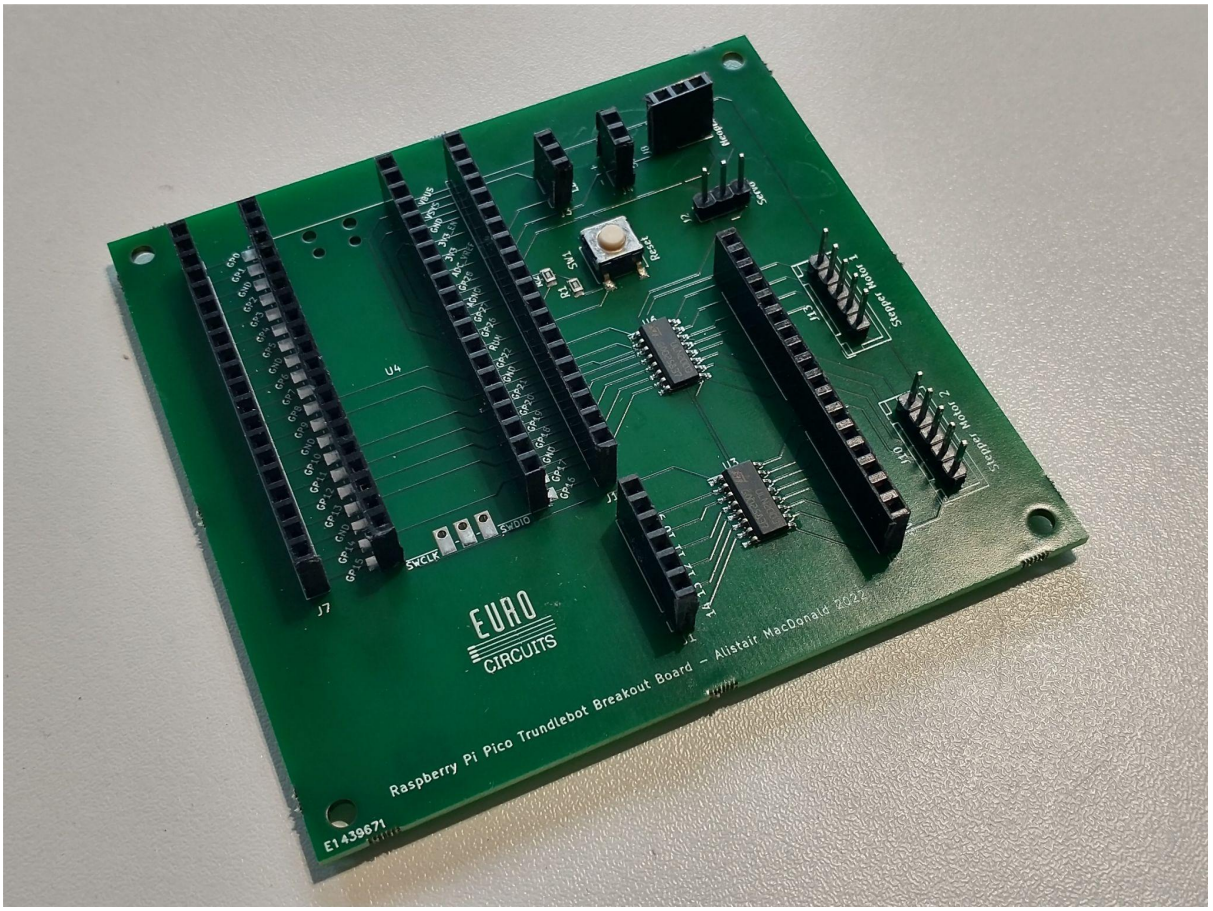
There are a couple of tricks you can use to make soldering the connectors easier. First is to use some header pins to hold the Pi Pico header sockets in place. Having some blue/Blu/white tack to hold the headers in place will also make things easier for the other connectors.





Finally when soldering long strips of headers it is good practice to solder the pins at either end, check they are straight, and solder all the pins in between.

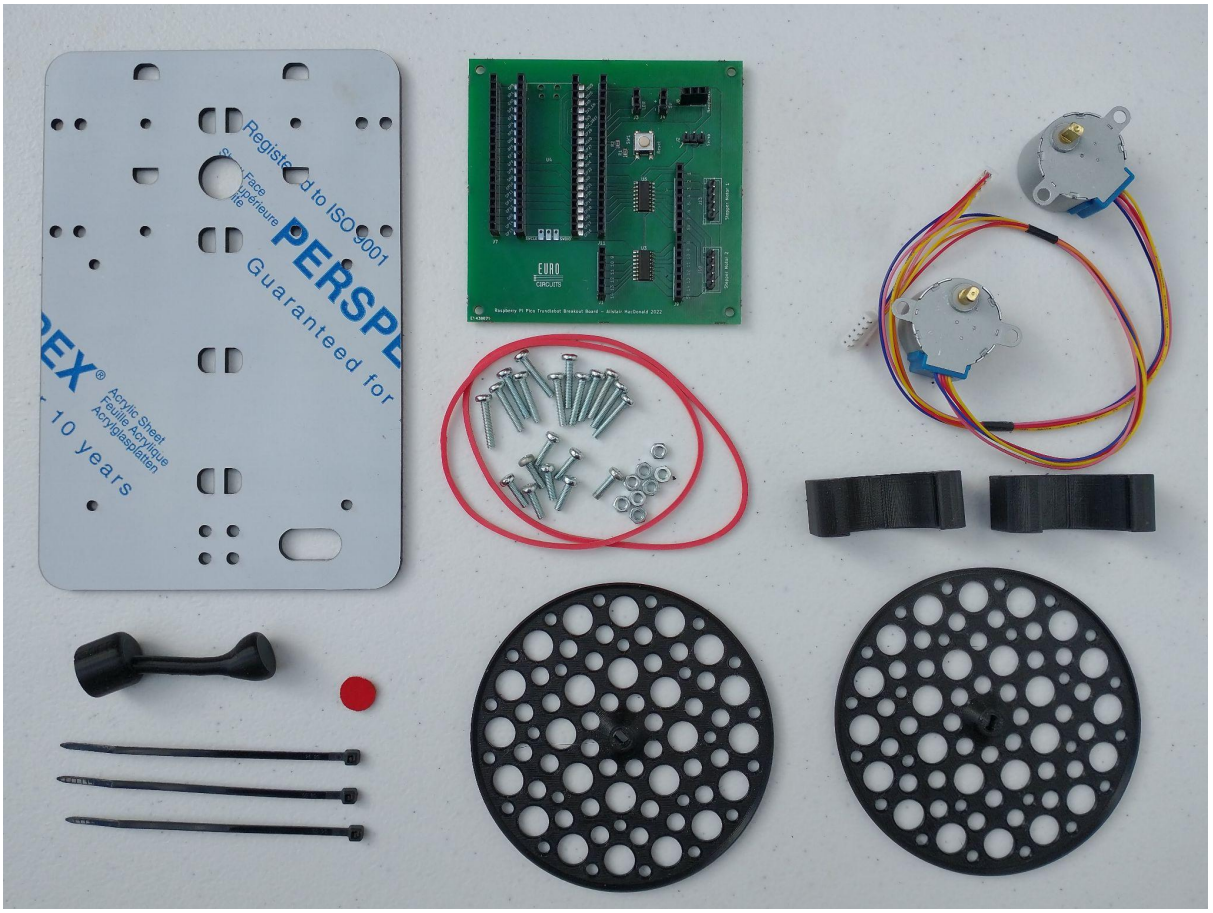



You should have something that looks like this when you are done.

Do not add the WizFi360-EVB-Pico yet. Fies let's assembly to the rest of the hardware.

## Assembling the Trundlebot

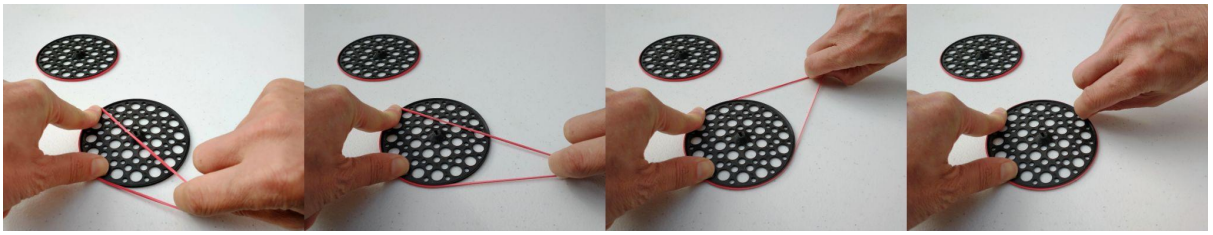
First gather all the parts you need.




The assembled Trundlebot PCB from above
WizFi360-EVB-Pico Pi Pico compatible microcontroller
2 X 28BYJ stepper motors
3D printed parts (2 X “Wheel”, 2 X “Motor Holder” and “Trundlepad”)
Optional 3D printed battery holder
2 X Rubber bands
20 X M3 screws (8 X 10mm and 12 X 16mm, although 20 X 12mm will suffice)
8 X M3 nuts
A Trundlebot chassis (Laser cut from the “Chassis” file)
Felt pad (either a self adhesive "Glider" or felt cut to size)
A cables tie

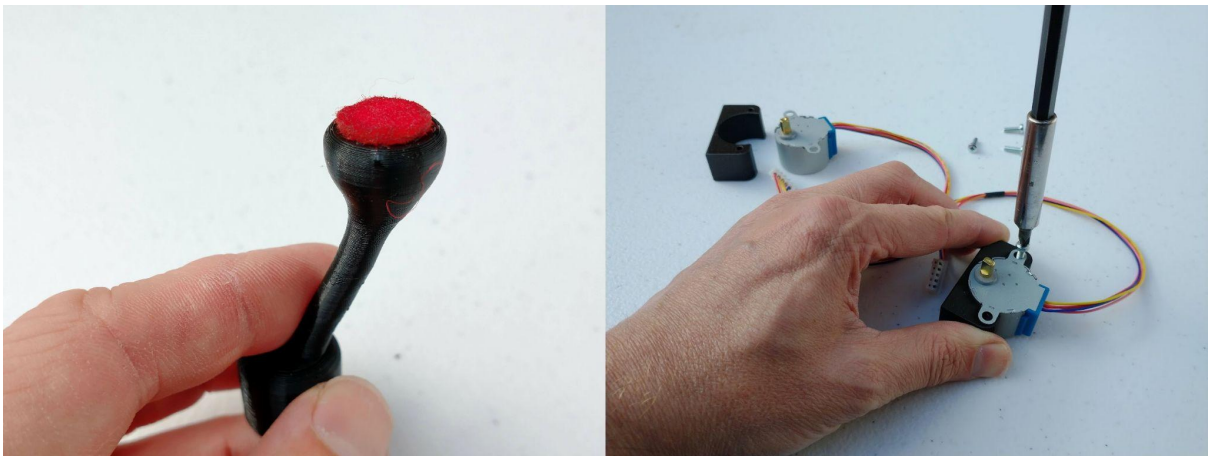
Before we start adding things to the chassis there are a few parts that are easy to assemble first. First are the wheels.

The wheels require a rubber band to be placed around the circumference to give the Trundlebot more grip. The easy way to do this is to place the wheel flat on a table and hold the band with two fingers along one side. Then pull the other side down, wrap it round, and then slowly let it draw in.



The bands will occasionally fall off, but if this happens frequently then they are probably too tight and you should try some larger ones. Flat rubber bands tend to be more reliable than square or round ones.

Next let's prepare the trundlepad. Stick on your felt or Glider. An offcut of felt stuck with Gorilla Glue Clear is photographed here. Be careful not to get the glue on the surface of the felt.

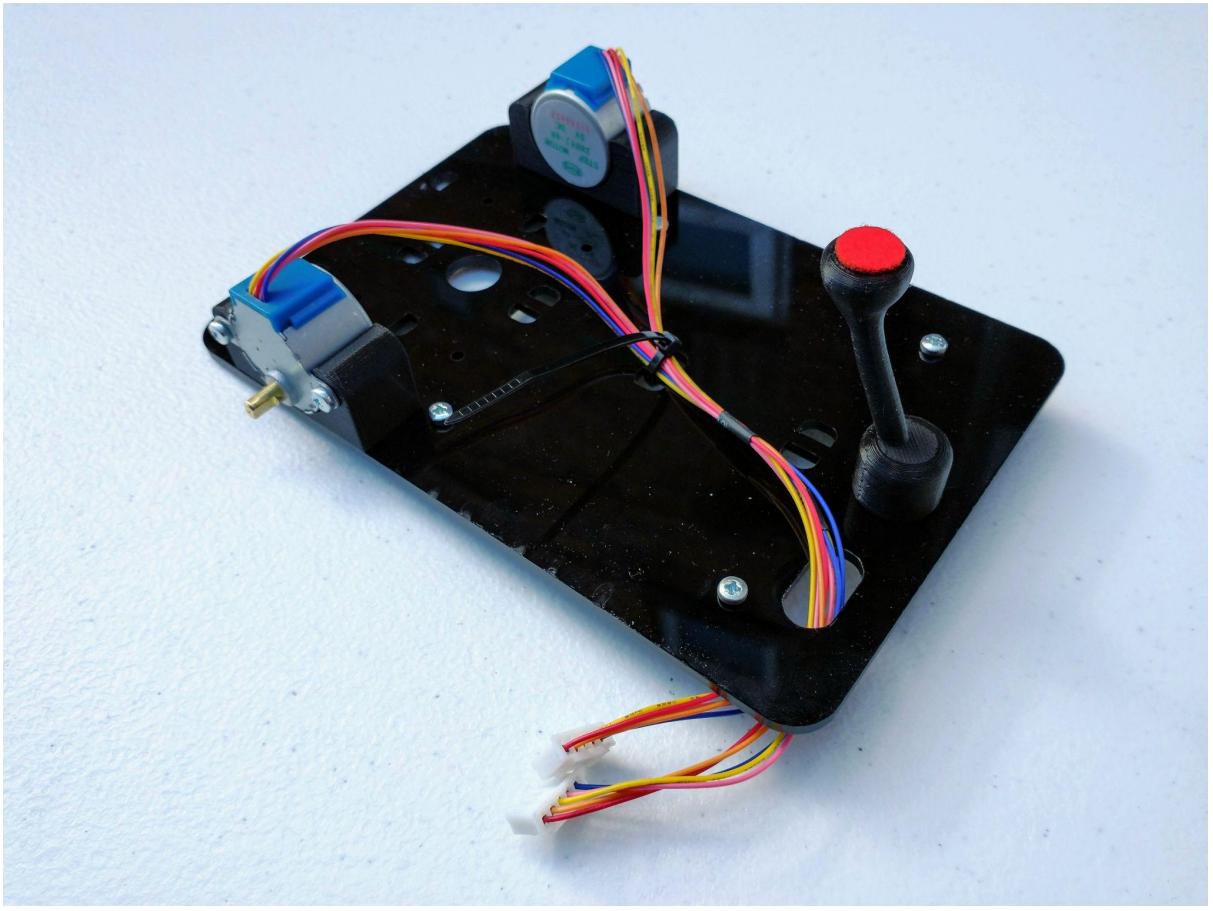


Next we need to attach the motors to the motor mounts. Simply place in the slot with the wires pointing away from the flat surface and screw in the shorter 10mm screws. The motor should not move, but be careful not to over tighten.

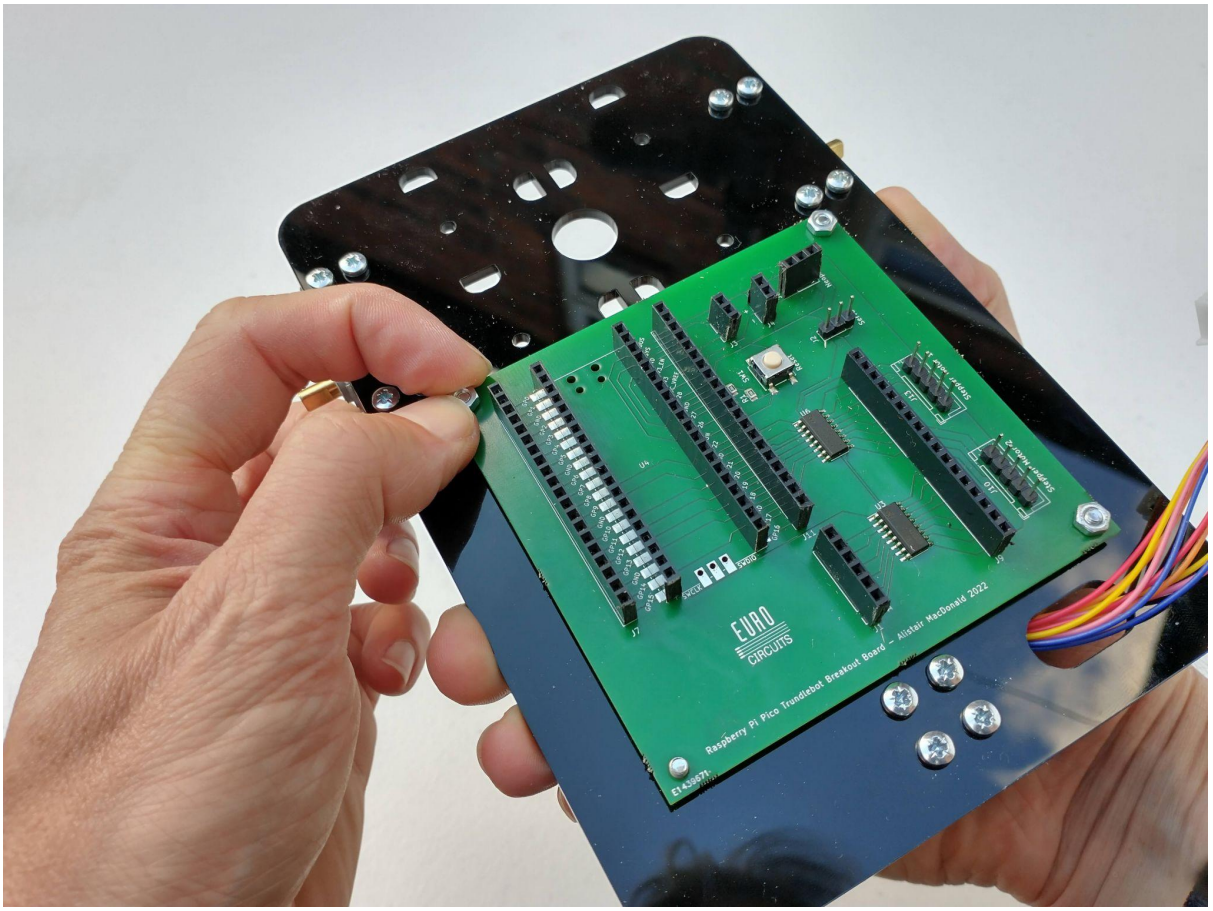
Now we need to attach everything to the chassis. First place a 10mm screw through a hole on the chassis for the PCB. You can hold the PCB over the chassis to confirm you have the right holes. Screw on a nut and tighten with your fingers, and then repeat for the other 3 holes. The side with the nut on is now the top of the Trundlebot.

Next screw on the motor mounts to the bottom of the chassis. Again, do not over tighten the screws. Do the same with the trundlepad. Check the following photo if you are not certain about the direction.

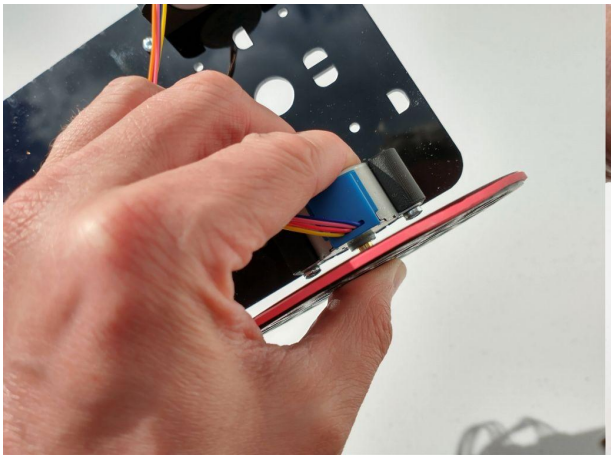
To finish off this step push a cable tie though the second set of slots from the trundlepad end secure the cables. You can also push the motor connectors though the pill shaped hole.

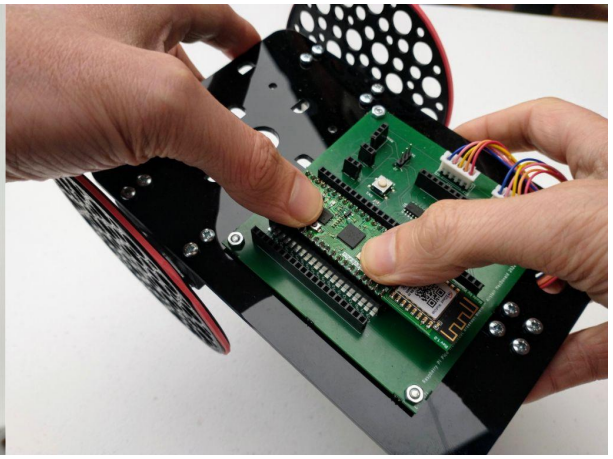


You should now have something that looks like this. You can cut off the excess cable tie.

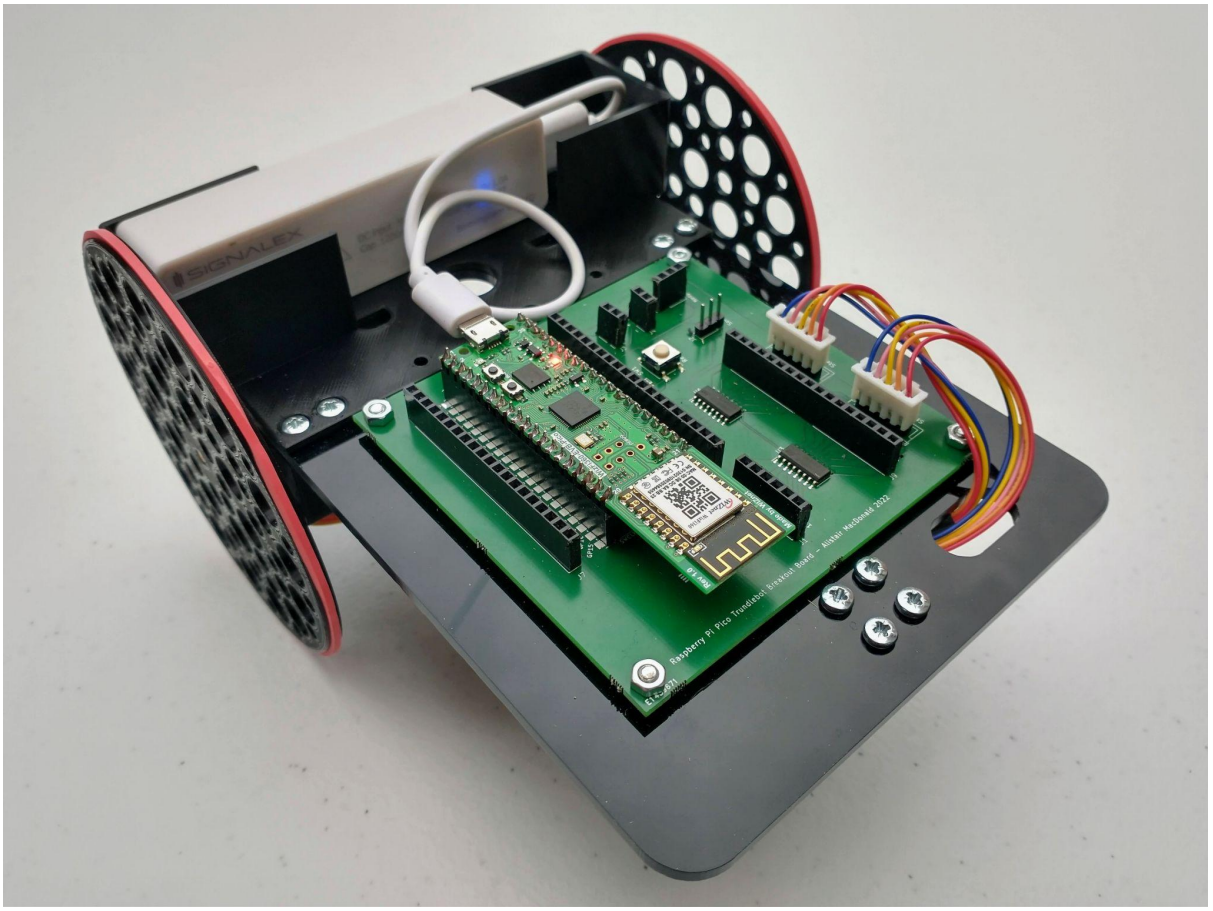



Now we can add the Trundlebot PCB we assembled before. Simply place over the screws in the orientation photographed. Screw on the remaining nuts and tighten fingertight. Connect the left stepper motor (the side of the connectors) to “Stepper Motor 1” and the right motor to “Stepper Motor 2”. The red wire should be to the bottom / front of the board.





We are almost done. Now slowly but firmly push on the wheels until they will not push on any further. Now it is safe to insert your WizFi360-EVB-Pico with the USB connector facing the top/back. Finally if you have the optional battery holder printed out you can slot it in place now. The rear screws will hold it in place.




Well done, you now have built your WizFi Trundlebot.