Assemble the GoPiGo

dexterindustries.com/GoPiGo/getting-started-with-your-gopigo-raspberry-pi-robot-kit-2/1-assemble-the-gopigo-2/assemble-gopigo-raspberry-pi-robot/

THESE ARE OLD INSTRUCTIONS — please go here for the new one!

It's time to get going! Here you'll find step-by-step instructions on how to assembly your GoPiGo robot car. If you have any questions throughout the process, please don't hesitate to send us a message through the Forums.

Instructions for GoPiGo1 (for GoPiGo2, go here)

Tools and supplies required:

- small Phillips head screwdriver
- 8 AA batteries

Full Assembly Video – each step is broken out in the written steps below.

1. Unpack the Box.

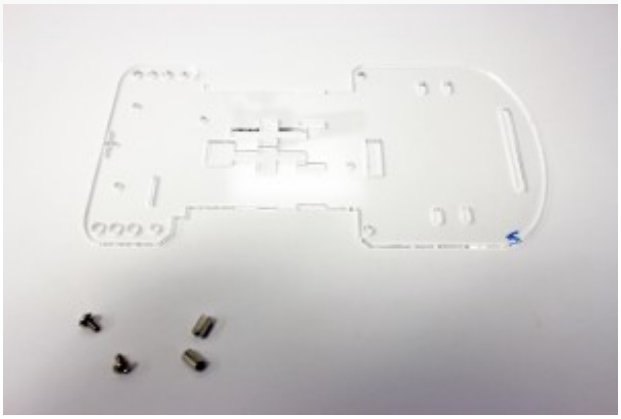
The first step is to unpack the box. In the box you should find the following:

- 2 wheels
- GoPiGo Board (red) in a bag with a power cable
- 2 motors
- 2 bags with acrylic parts (2 large body pieces; 4 t-shaped pieces, 1 long piece, 2 black encoder wheels)
- 2 bags of hardware (2 mini posts, 2 small posts, 2 medium posts and 4 long posts; 4 long bolts, 20 small screws, 8 small nuts, and a caster wheel)
- battery box (that fits 8 AA batteries)

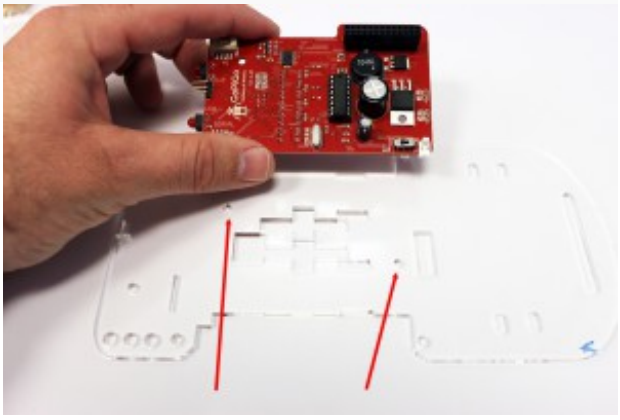
Your acrylic parts will come with a protective coating to prevent it from scratching. You can remove it, or leave it in place, whichever you prefer. Under the paper, the acrylic is clear plastic.

2. Which Way Is Up?

We'll start with the body plate of the GoPiGo. It's the largest acrylic part. The easiest way to figure out which way is up is to lay the acrylic board across the red GoPiGo circuit board. You should see two holes line up for attaching the circuit board. In this step, we'll find these holes, and place the two mini hex spacers (posts) into them to remind us which way is up.



The chassis and the hex spacers.



These two holes are now matched up to the GoPiGo Board. Click for a larger picture.

Attach the two short posts.

Attach the two short posts to the board. We'll leave these in place to remind us which way is up.

Double check that the GoPiGo mounting holes line up to the posts.

Last but not least, double check the posts properly connect the two holes on the GoPiGo board with the Acrylic. We will not attach the GoPiGo board in this step, we are just ensuring the acyrlic, posts, and board are properly aligned.

3. Attach the Motors

To attach the motors to the chassis, we'll first find the four long bolts, prepare them, and then use the acrylic "T"s in the kit to attach the motors. Be careful when screwing the motor in place: if you over-tighten the bolts you can crack the acrylic.

Find the long screws and corresponding nuts. These are located in the same bag as the caster wheel.

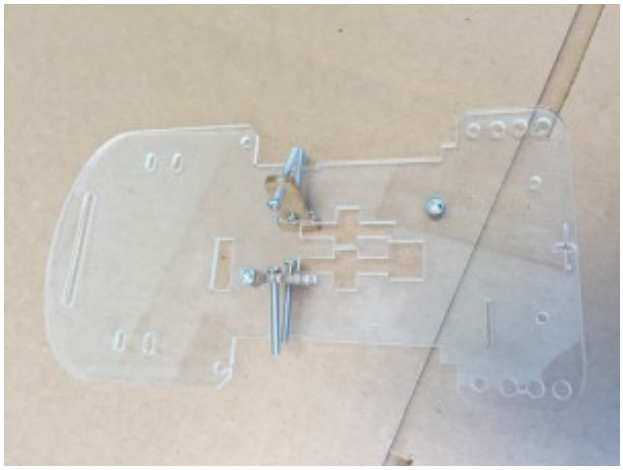
Prepare the bolts by attaching 1 nut to each bolt.

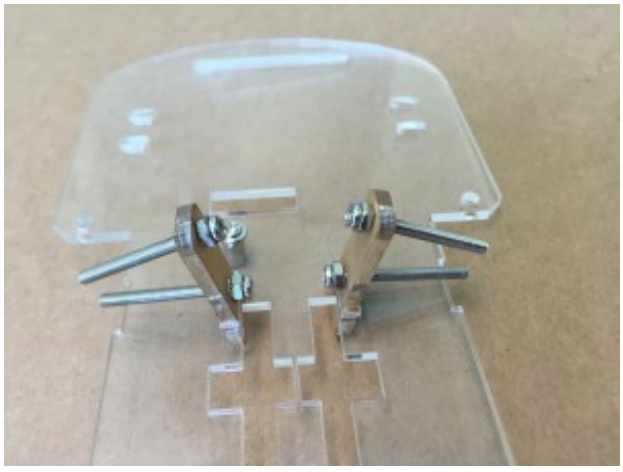
Prepare the bolts by screwing a single nut onto each bolt, all the way down to the screw head.

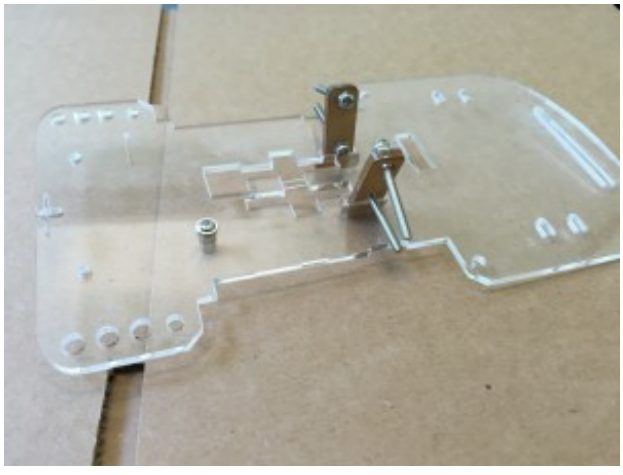
Next we find the acrylic "T"'s. There should be at least four. We have packaged a few extra as backup. Insert both T's from the top and flip over the acrylic body so the bottom part of the T's are now sticking up, like in the picture below. At this point, the mini posts you screwed in should be facing down, and you are working on the bottom side of the body (where you will attach the motors).

There are four “T”‘s with a few to spare. Find two of these and insert them into the chassis from the top down. This view is from the bottom.

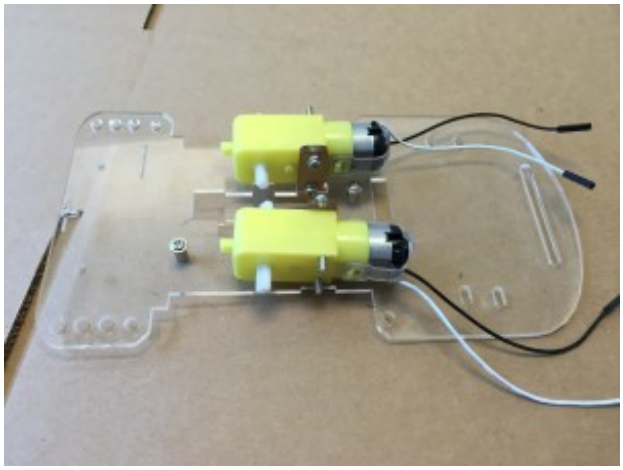
Then use the long bolts (that you prepared by screwing on the nuts) and slide them in both holes on each T. Insert them from the inside so they are sticking out as shown in the picture below.



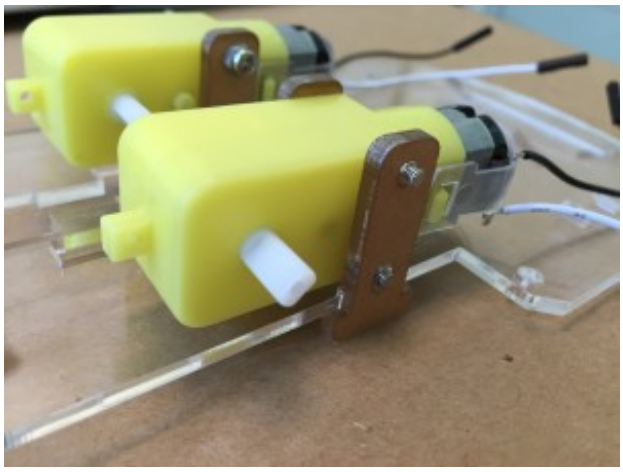


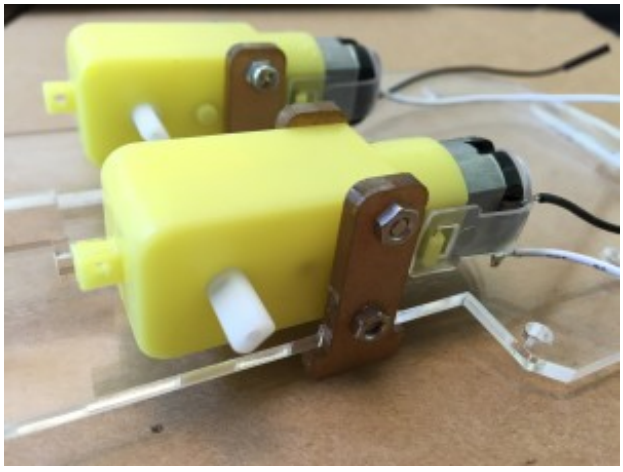


Slide the motors on to the bolts as shown in the picture below.



Slide another acrylic “T” through the bolts sticking through the motor to act as a brace and hold it in place. Fasten a nut onto each bolt to hold the T in place.



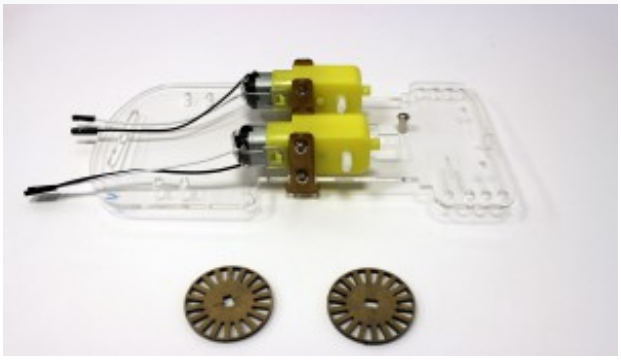


4. Attach Encoders

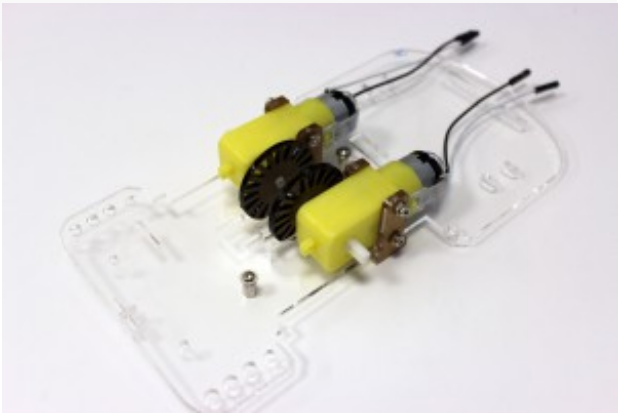
The encoders for the GoPiGo are cut in black and look like a little wheel. They fit on the inside of the motors, and poke through the GoPiGo acrylic chassis. They provide feedback on speed direction traveled to the motors. Most of the time the motors will work fine without them, but they can be used to control and refine the action of the motors.

Note: Some have found that these can fall off easily. You can secure them with a small piece of tinfoil, paper or blue ticky tacky.

If these keep falling off, just remove them for now, as they are not necessary.



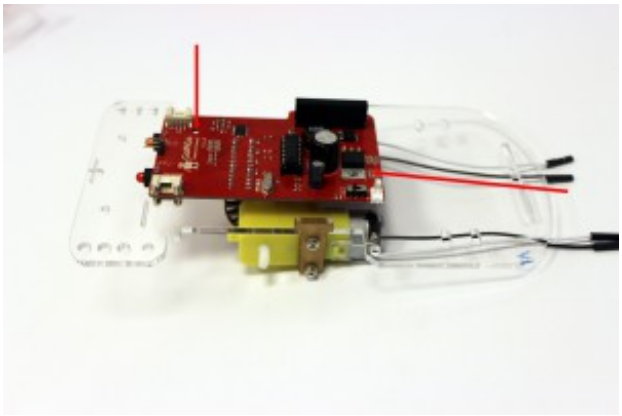
Encoders ready to be attached.

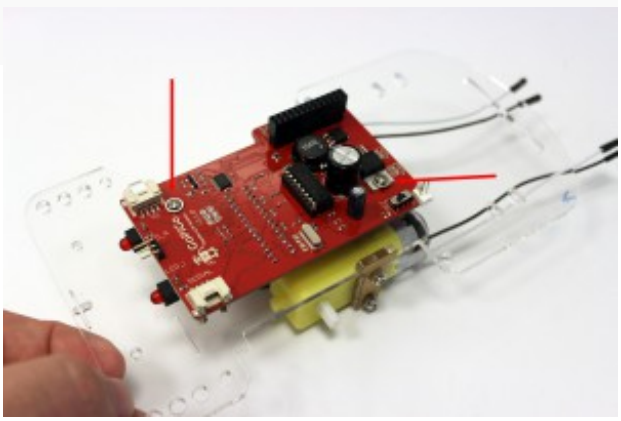


Encoders properly attached.

5. Attach the GoPiGo Board

We return to the mini metal posts we placed on the top of the chassis in step 1. First place the GoPiGo board onto the spacers and line them up with the holes in the board. Use the small screws to attach the red GoPiGo board to the mini posts.





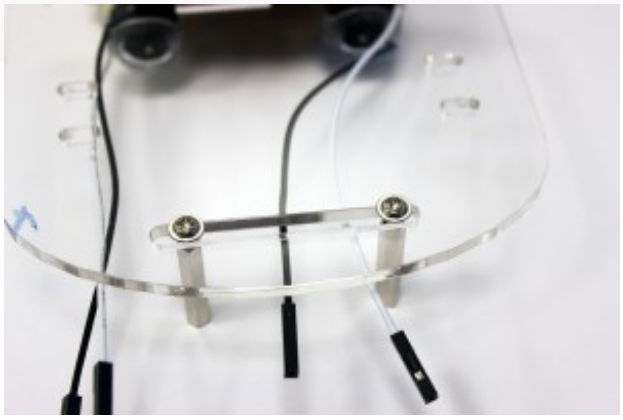
Align the spacers with the holes on the board.

6. Attach the Caster Wheel

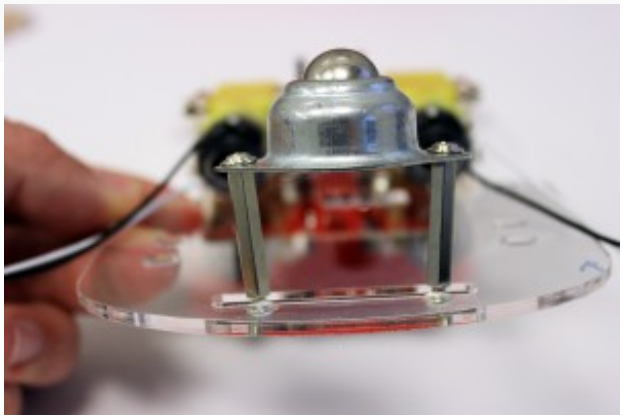
The GoPiGo comes with four types of hex (post) supports. We've already used the shortest of supports to mount the GoPiGo board. The longest of the supports are for the canopy (top) and there are four. The middle length is for the attaching the battery box. Finally the shortest ones you have left right now are for attaching the caster wheel.

Included hex supports.

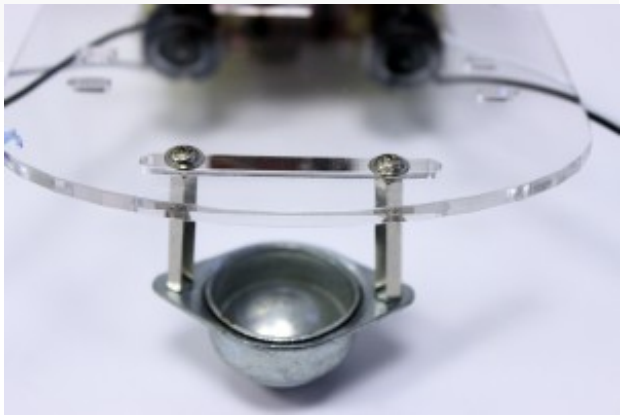
Double check your work. See how the two middle hex supports are about the size of the battery box?



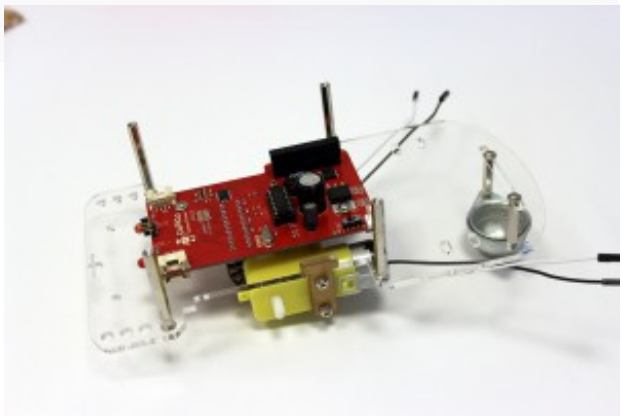
First, attach the two hex supports to the back of the GoPiGo.



Attach the Caster Wheel. The whole process should take four screws.



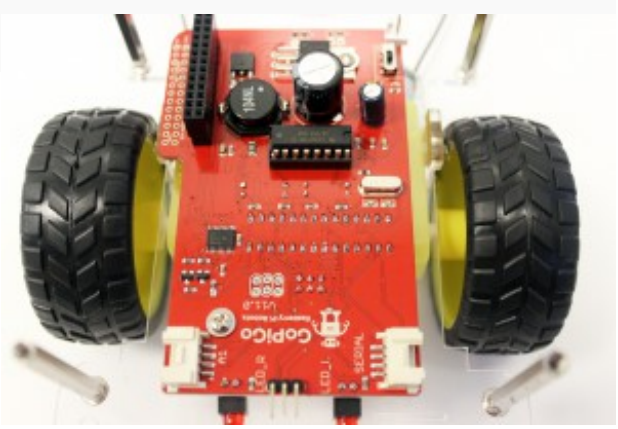
Another view of the caster wheel attached to the GoPiGo.



Another view of the caster wheel attached to the GoPiGo.

7. Attach the Wheels

Now we will attach the wheels. The only trick to this is to be gentle as you slide them on. After attaching, be sure to back the wheels off so they're not rubbing against the screws.



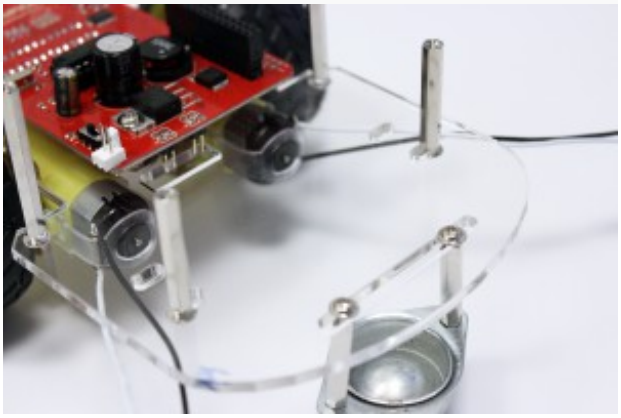
Attach the wheels to the GoPiGo.

Check the gap. The wheels should not rub against the screws.

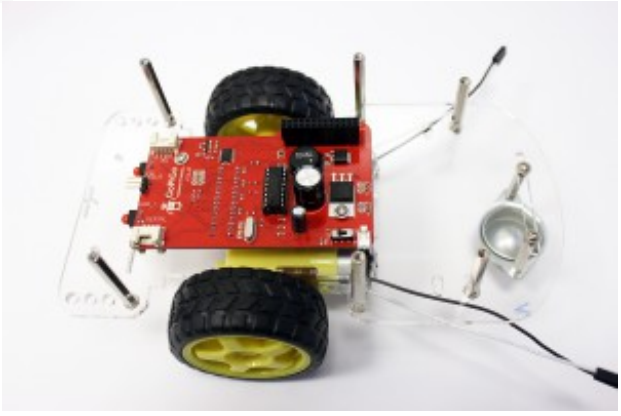
8. Attach the Battery Box

Next we will attach the battery box. Find the two hex spacers from Step 6 for the battery box. Screw them into the GoPiGo chassis.

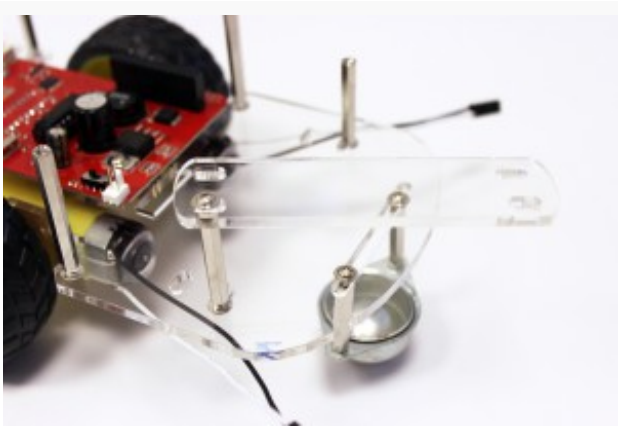
First, we'll attach these spacers to the GoPiGo.



Spacers attached to the GoPiGo.



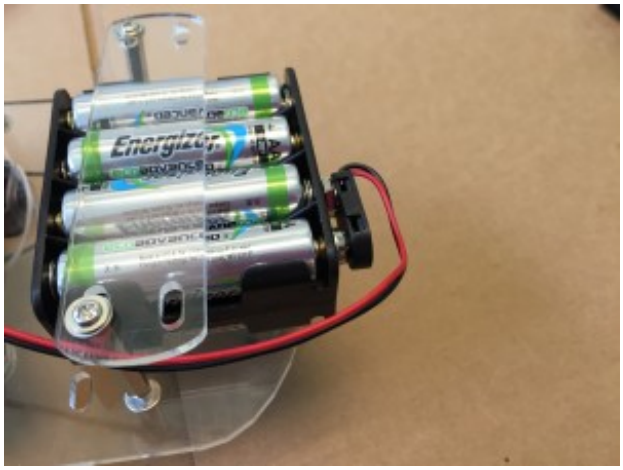
Next, attach the Battery Box Strap. This is a long piece of acrylic shown below attached to the battery box spacers. Attach one side first, leaving the screw loose.

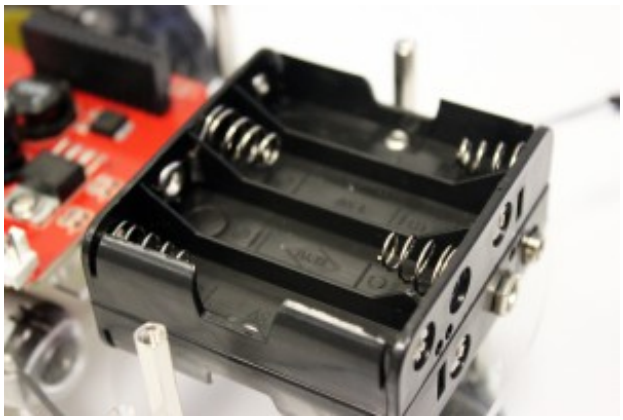


Attach one side of the battery box strap.

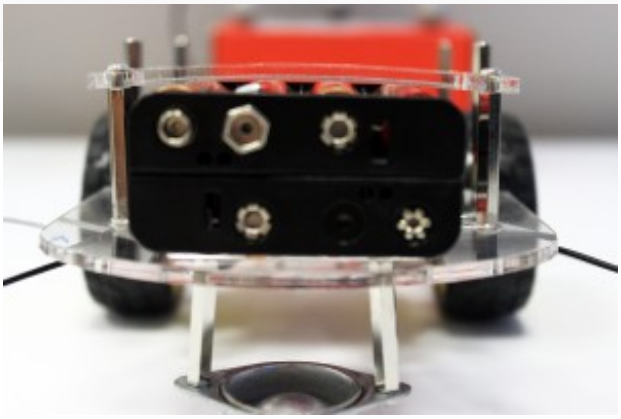
Put batteries in the battery box, and place the battery box within the spacers as shown below. Place the battery box as far back on the chassis as possible, especially if you are using a Model B (this will give you extra space and prevent the battery box from hitting the SD Card in later steps.)

This is what it will look like when you are done:

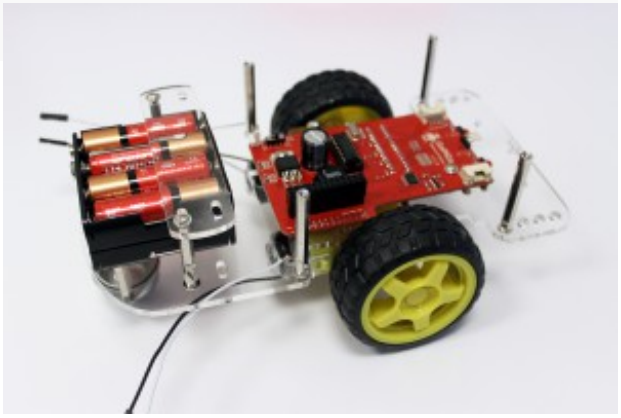




Tighten the other side of the battery box strap down to the spacer on the opposite side. Tighten both screws. The strap is designed to put pressure around the battery box and hold it in place.



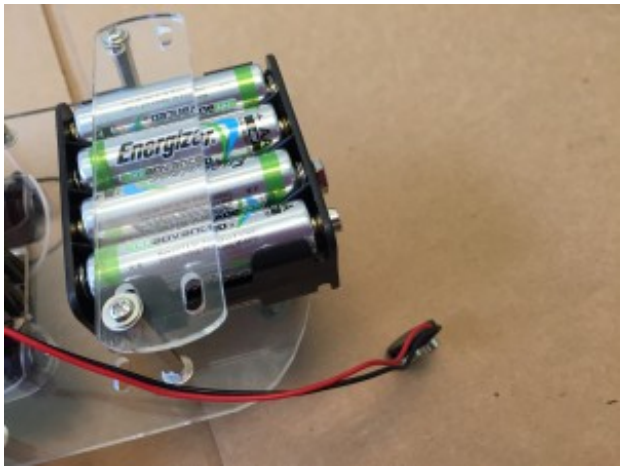
The battery box tightly secured to the chassis. We can see a little bit of tension on the battery box.

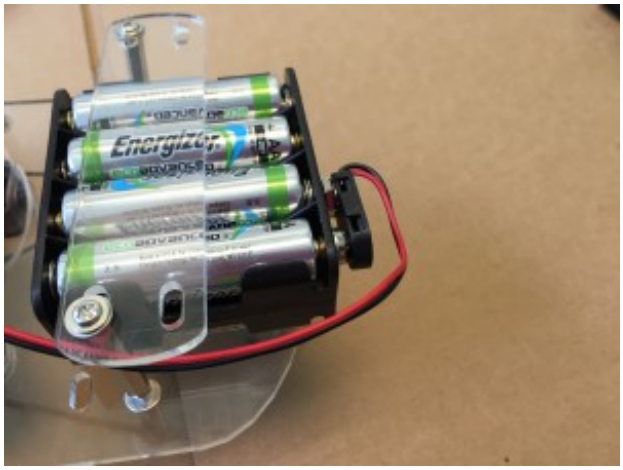


The battery box is placed with a little bit of space between it and the GoPiGo board.

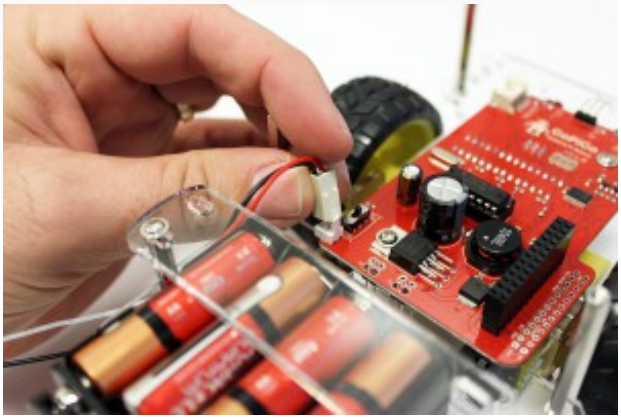
9. Attach Connect Power and Test

Connect the power cable to the battery pack.

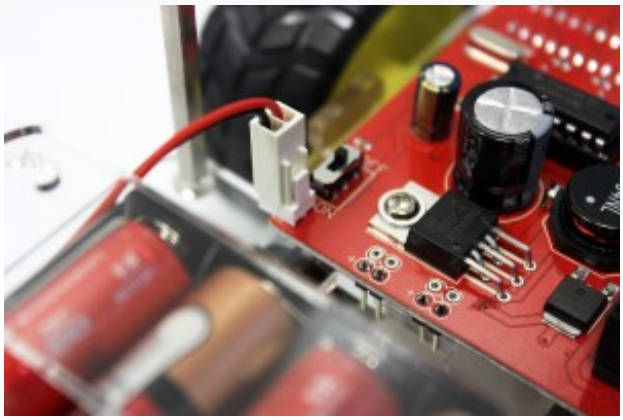




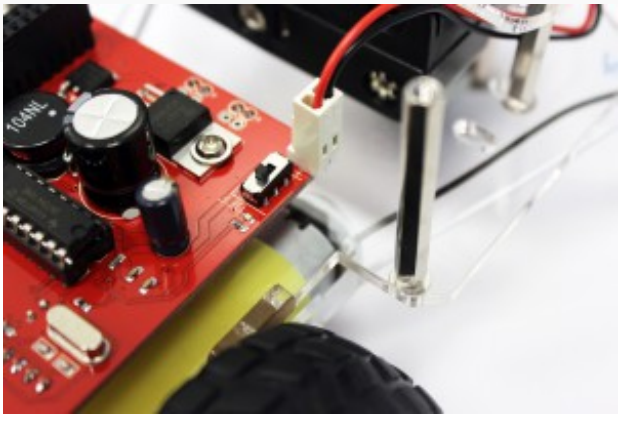
Attach the other side of the power cable to the red GoPiGo board.



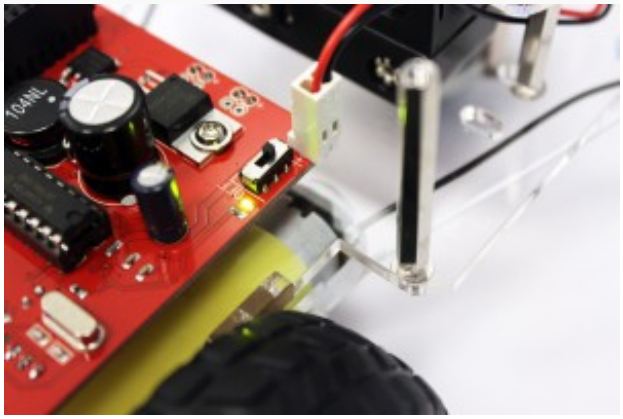
Attaching the power adapter to the GoPiGo board.



The power adapter properly attached to the GoPiGo. Notice the orientation of the colors of the wires.



The power adapter properly attached to the GoPiGo. Notice the orientation of the colors of the wires.



Power the board on and make sure the LED powers.

HELPFUL TIP: When you are programming your GoPiGo, it is best to unplug the motors, and use the microUSB power wall adapter for power rather than using your batteries. You will do this by attaching the power wall adapter directly into the Raspberry Pi while it is connected to the GoPiGo (which you will learn how to do in the next step). Please note: the motors and sensors will not work if you only have the wall power adapter powering the GoPiGo. In order to test and use the motors and sensors connected to the GoPiGo, the batteries have to be connected.

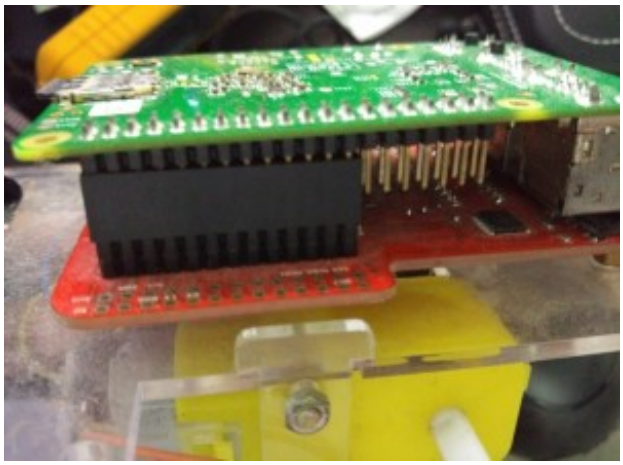
10. Attach the Raspberry Pi to the GoPiGo Robot

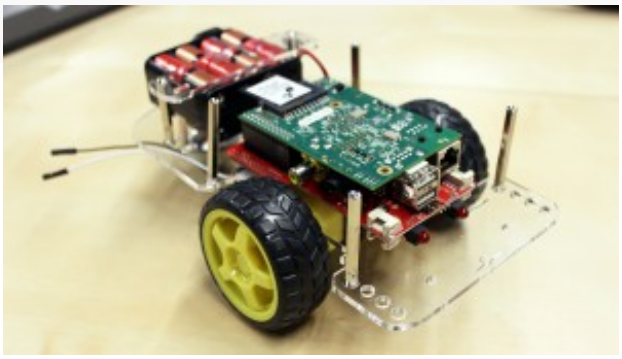
First, insert your SD card into the Raspberry Pi (green board).

If you're using a Raspberry Pi B+ or 2, you'll need to take the microSD card out of the larger SD card adapter as shown in the picture below.

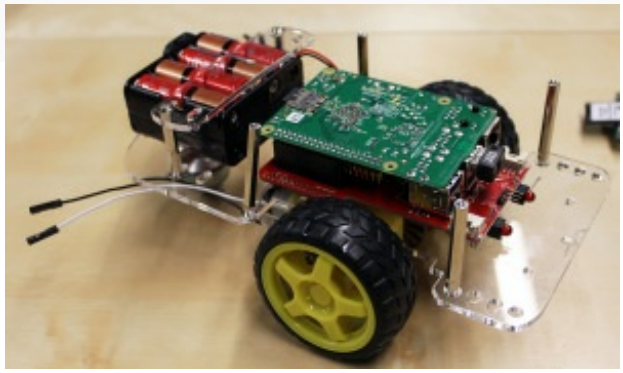
Insert the microSD card into the Raspberry Pi B+ as shown in the video below:

Then, make sure the power is off and then we'll be ready to attach the Raspberry Pi to the GoPiGo. Slide the Raspberry Pi over the GoPiGo by sliding the GPIO pins on the Raspberry Pi into the black plastic female connector on the GoPiGo.

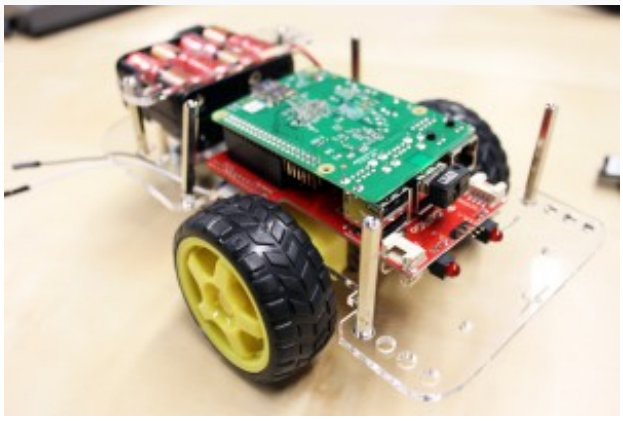




GoPiGo with a Raspberry Pi Model B attached.



GoPiGo with the Raspberry Pi Model B+ attached.

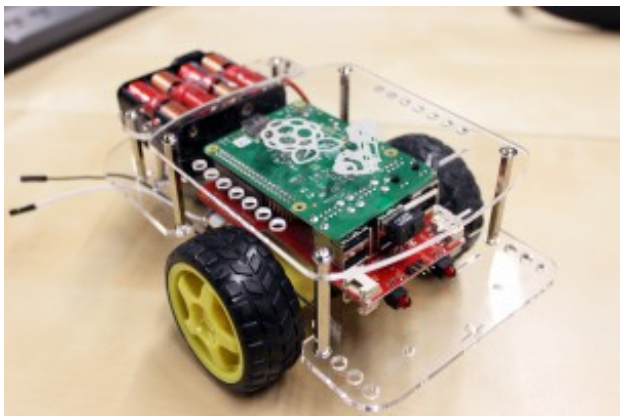


The GoPiGo with the Raspberry Pi Model B+ attached.

11. Attach the Top Plate

If you are just getting started and want to connect and start programming your GoPiGo, you can leave the top acrylic piece off for now. It is easier to access the sd card and power connection if the top is not on. However, if you want to assemble the whole things, go ahead and put the top on.

To attach the canopy, attach the four canopy hex spacers provided, screwing them to the chassis first, then the canopy.



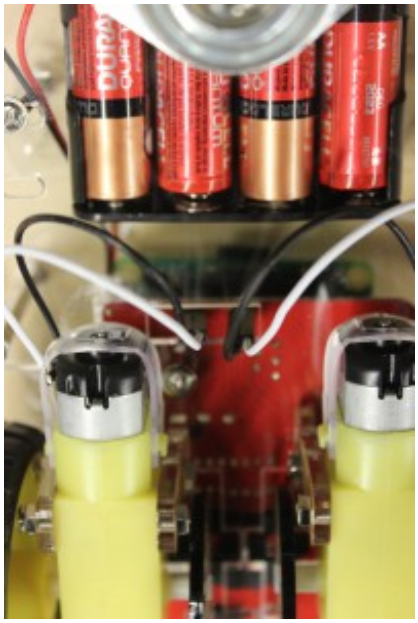
12. Connect the Motors

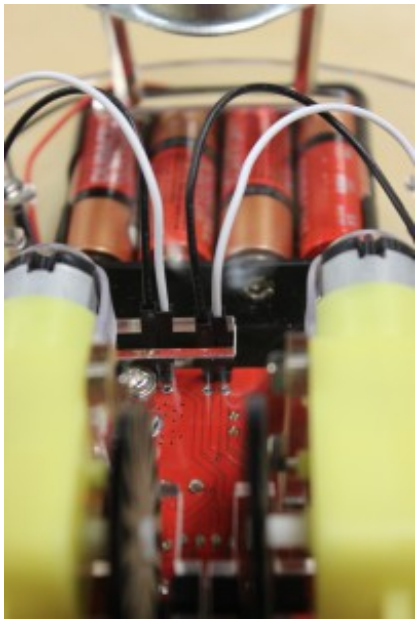
Finally, **with the power off,** we will connect the motors. Once again, if you plan to connect this right now and start programming it, you should probably wait to connect the motors until you have connect to the GoPiGo with your computer and run the update for the software and firmware.

An important note about the motors: You risk damaging the hardware if you update the GoPiGo software and firmware with the motors connected. To be safe, be sure to disconnect the motors before updating firmware or running any of the install scripts provided.

Connect the motors as shown. To connect at first, the colors should be placed in an alternating pattern. Notice that the color of the motor connectors runs black, white, black, white. After running the GoPiGo for the first time, if you find that the motors run backwards, just reverse both sets of motors. If the motors run in opposing

directions while trying to run straight, check that the connectors are in an alternating pattern.





NEXT STEP:

Now that you've just built the GoPiGo robot car, the next section will take you through the steps to connect to the GoPiGo and start programming it.

First, we have to make sure you have the correct software on your sd card (the little card that you inserted in the Raspberry Pi). The Raspberry Pi was designed and built by a UK Foundation, and they have developed their own software for it called "Raspbian". However, Dexter Industries has modified that software for the GoPiGo, and our version is called "Raspbian for Robots".

If you **already have the Dexter Industries sd card,** your next step is to connect to the GoPiGo, so go here.

If you **have your own sd card** an need to install the Dexter Industries software, go here.

Questions?

Please ask away on our forums!