Unpacking

Congratulations on your new Lil'Bot kit. The main board has been assembled, loaded with batteries, and tested. Only mechanical parts and a few wires remain before Lil'Bot comes to life. First, please make sure you have all the parts correctly identified:

Quantity	Description	Supplier	Part number	Where used
1	Lil'Bot main board	Stellar Robotics	n/a	Main chassis
1	Wire and connector assembly	Stellar Robotics	n/a	Board to motor
2	Motor	microcontrollershop.com	MG-6-48	Drive train
2	Wheel	microcontrollershop.com	MG-WHEEL	Drive train
2	Mount kit	microcontrollershop.com	MG-ACC	Motor mount
12	Washer M3 0.5 mm	Zoro	G3068694	Motor mount Wheel encoder
2	Encoder wheel	Stellar Robotics	n/a	Wheel encoder
2	Screw M3-0.5 5 mm	Zoro	G0718487	Wheel encoder

Tools needed

In order to assemble Lil'Bot, you will need the following tools:

- Medium Philips screwdriver
- Small Philips screwdriver
- Soldering iron with solder
- Fine felt-tip marker

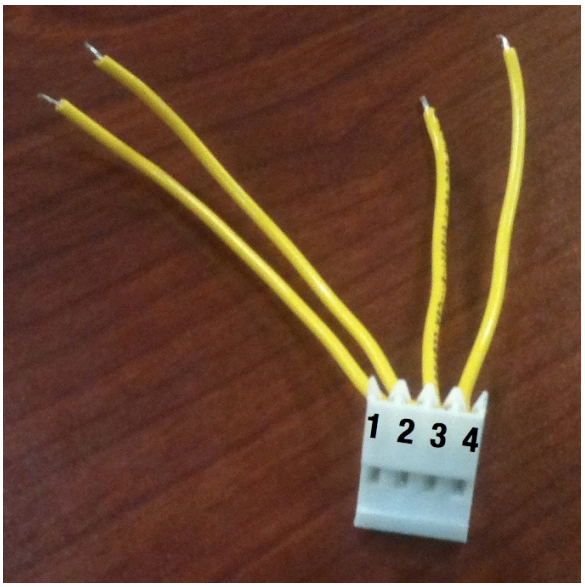
Assembly

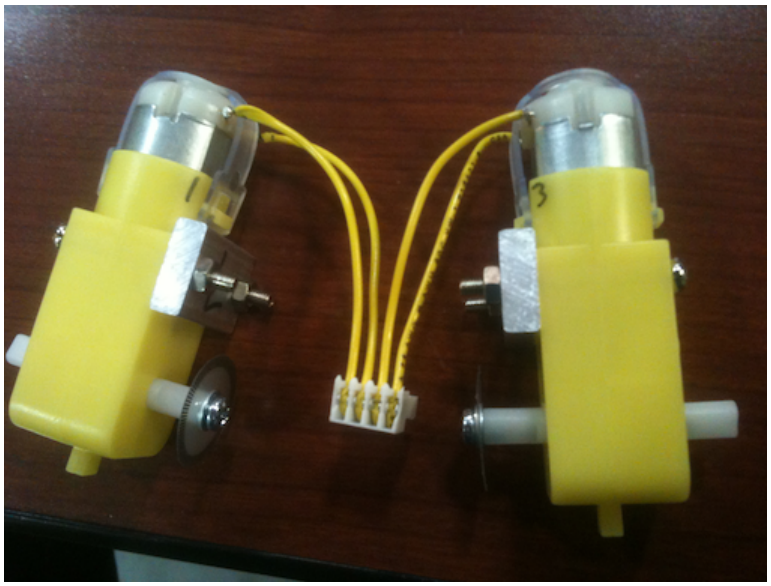
1. Mark the right and left motor assemblies (L, R, 1, 2, 3 and 4) as shown in the picture below. The motor electrical contacts are on the same side as the markings.

2. Assemble the motor mounts, noting the position of the threaded holes and electrical contacts as shown:

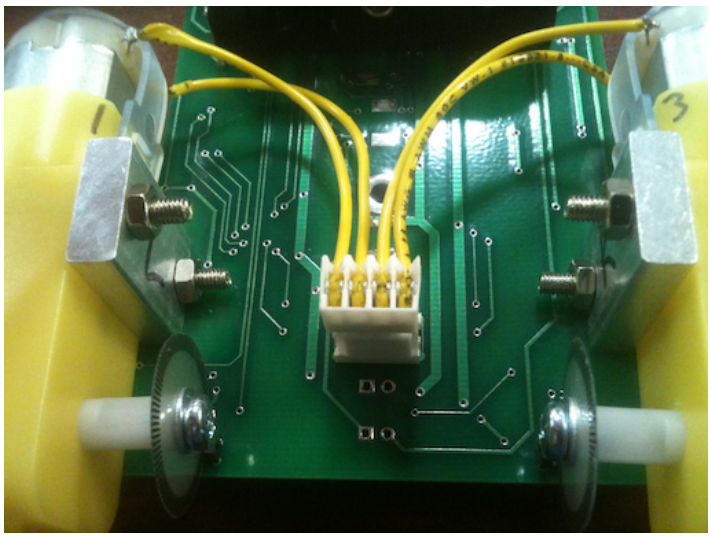
3. Mount the wheel encoder for each side in this order: screw, washer, encoder wheel, washer, motor axle. The pictures below show the order of assembly and the completed assemblies:

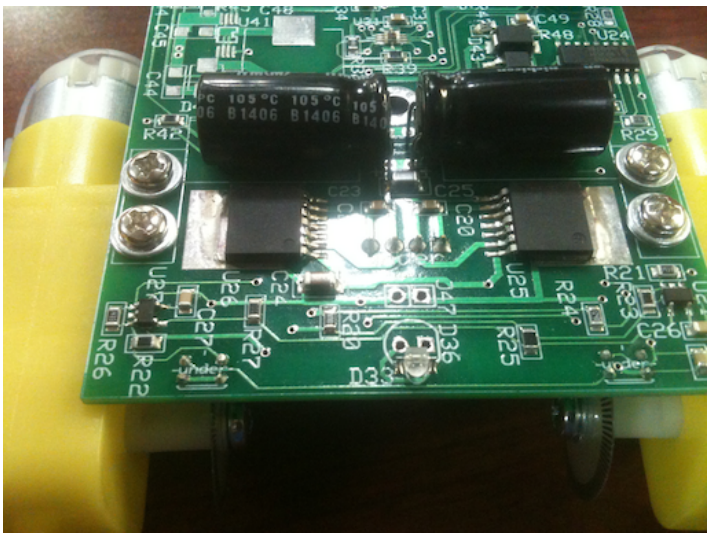
4. Locate the contact numbers on the wire and connector assembly. Solder each wire end to the corresponding motor contact, as marked previously.





5. Install the motor assemblies onto the robot main board, noting the order of parts: screw, two washers, circuit board, motor mount, as in the picture below. Make sure each encoder wheel is properly inside the gap of its corresponding slot switch. If necessary, tilt the motors slightly toward the wheel encoders, so that the encoder wheels are as far down as possible into the slot switches. Insert the wire connector onto the board's header.





6. Add the wheels. Lil'Bot's assembly is now complete.

Powering up Lil'Bot — calibration

It is time to bring Lil'Bot to life! First you must calibrate your robot by following this simple procedure. It only needs to be performed once at the beginning, and also every time the balance point changes significantly, for instance if you add or remove shields or accessories.

Please read the entire sequence before starting calibration. Once the calibration procedure has begun, it must be completed in a timely manner. It is very important to perform this step as precisely as possible, since that will affect the robot's balance and precise rotations.

1. Start with Lil'Bot powered down and lying on a stable, horizontal surface.
2. Power the robot up while holding the CAL button down. Hold the CAL button down until two low beeps are heard. Those indicate calibration mode.
3. Lift the robot up and rotate it along its vertical axis (along the main board's length), and put it down in the same resting position gently. The rotation direction may be in either direction. This must be completed with the robot back at rest before three low beeps are heard. Repeat the procedure if you ran out of time. This calibrates the gyroscope for precise robot rotations.
4. Bring Lil'Bot vertically onto its wheels and feel its balance point between your fingers. You must be able to hold it in balance gently, feeling no force forward or backward between your fingers. Holding this balance point must be achieved before two high beeps are heard.
5. Hold the balance as gently and precisely as possible until three high beeps are heard. If the robot was not balanced properly the entire time between the two high beeps and the three high beeps, repeat the entire procedure.
6. You can then let Lil'Bot go. It now can balance and will go on running the user program. Let Lil'Bot run at least until it plays four musical tones.

Normal power-up sequence

1. With the robot lying down, turn the power switch on.
2. Leave the robot undisturbed for a few seconds. Lil'Bot will beep once to indicate it has performed its internal housekeeping.
3. Lift Lil'Bot in the upright position and see him come to life. After a few seconds of self-calibration, it will run whatever Arduino user commands were programmed.