

Once you have completed soldering your circuit board, you are ready to mount the IR Add-On board to your robot. You should have Mr. La Favre check your board before you proceed. You will need the mounting kit which will be supplied by GEAR.

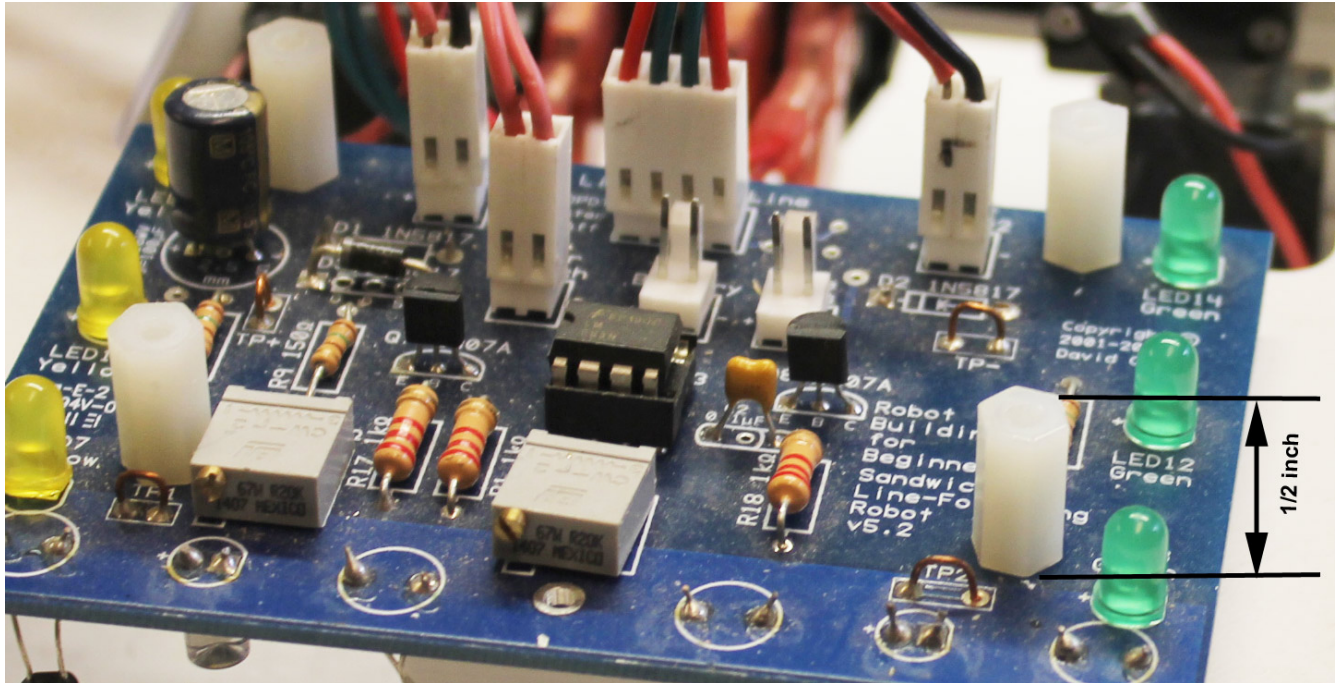


Figure 1: Line following robot main board

If your main robot circuit board is mounted with half inch hex standoffs, as seen in the above photo, you will need to remove these, but don't let the screws fall out of the bottom of the robot frame. There are four each mounting screws, spacers and hex standoffs. Remove only the standoffs. They will be replaced by longer standoffs.

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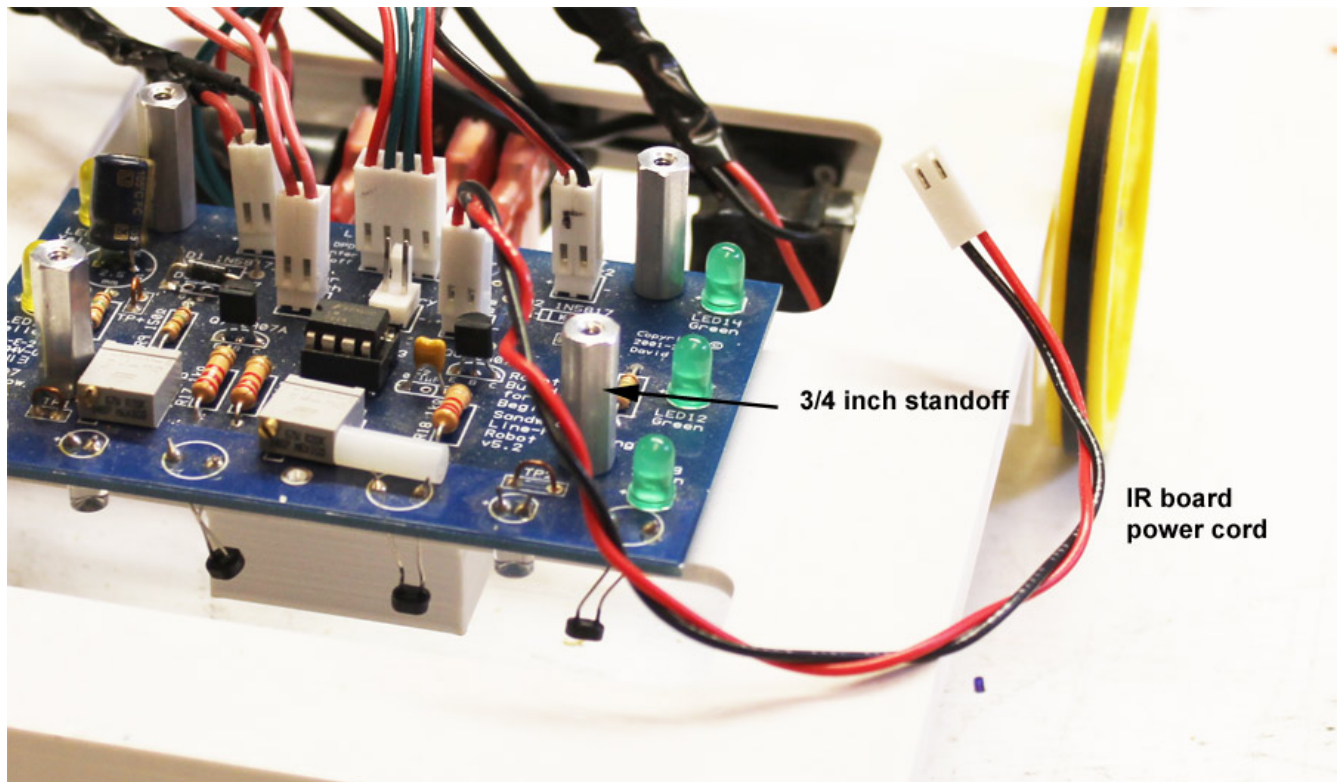


Figure 2: 3/4 inch standoffs installed

Install the $\frac{3}{4}$ inch hex standoffs from the mounting kit as seen in photo above.

Connect the IR board power cord (part of mounting kit) to the 2 pin header on the main robot board (the one labeled Tube LEDs).

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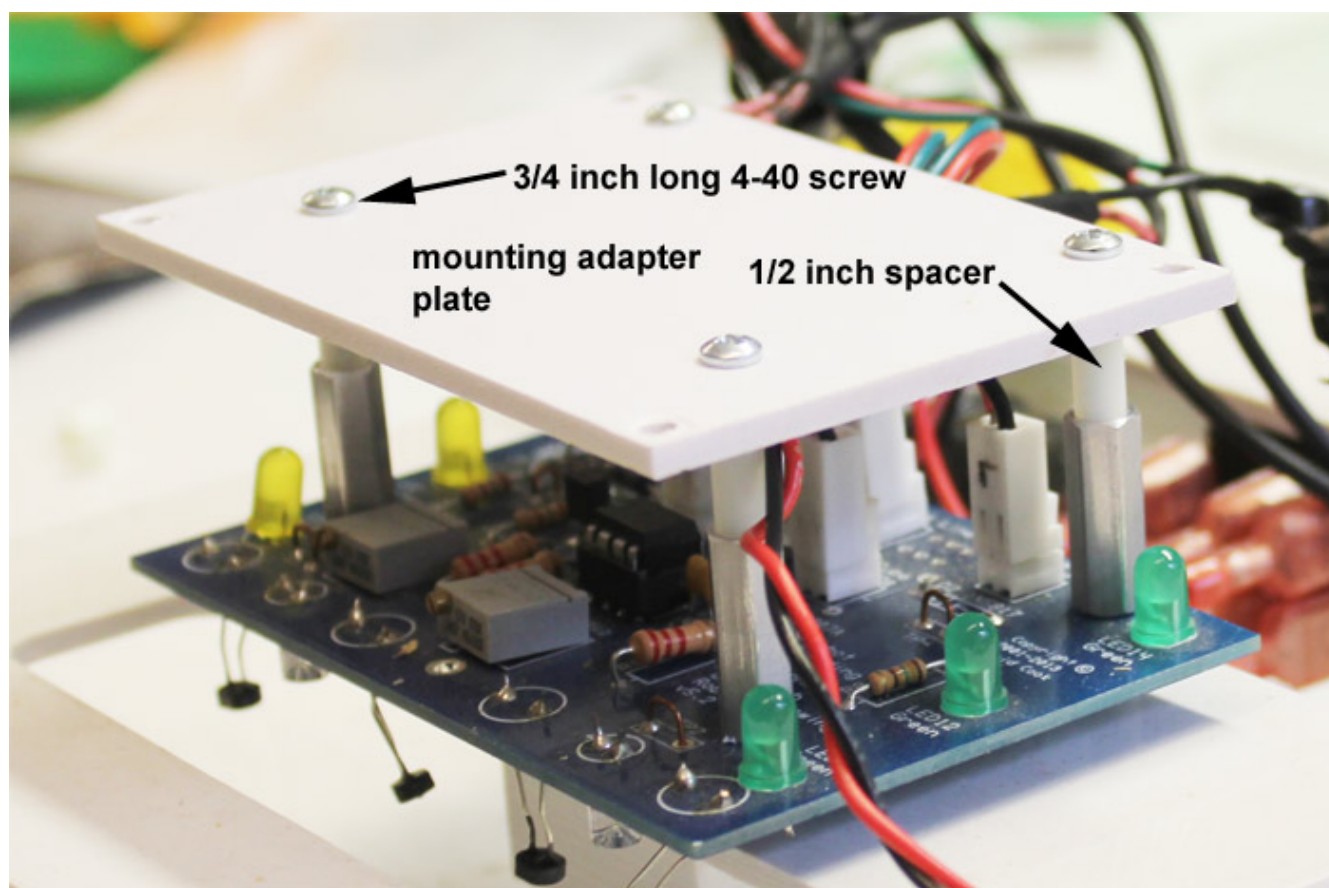


Figure 3: mounting the adapter plate

Attach the mounting plate adapter (part of kit). There are eight holes drilled into this plate. The four near the plate edges are for the IR board, the other four are for connection to main robot board. Using four $\frac{3}{4}$ inch long 4-40 machine screws and $\frac{1}{2}$ inch white plastic spacers, attach the mounting adapter plate to the main robot board.

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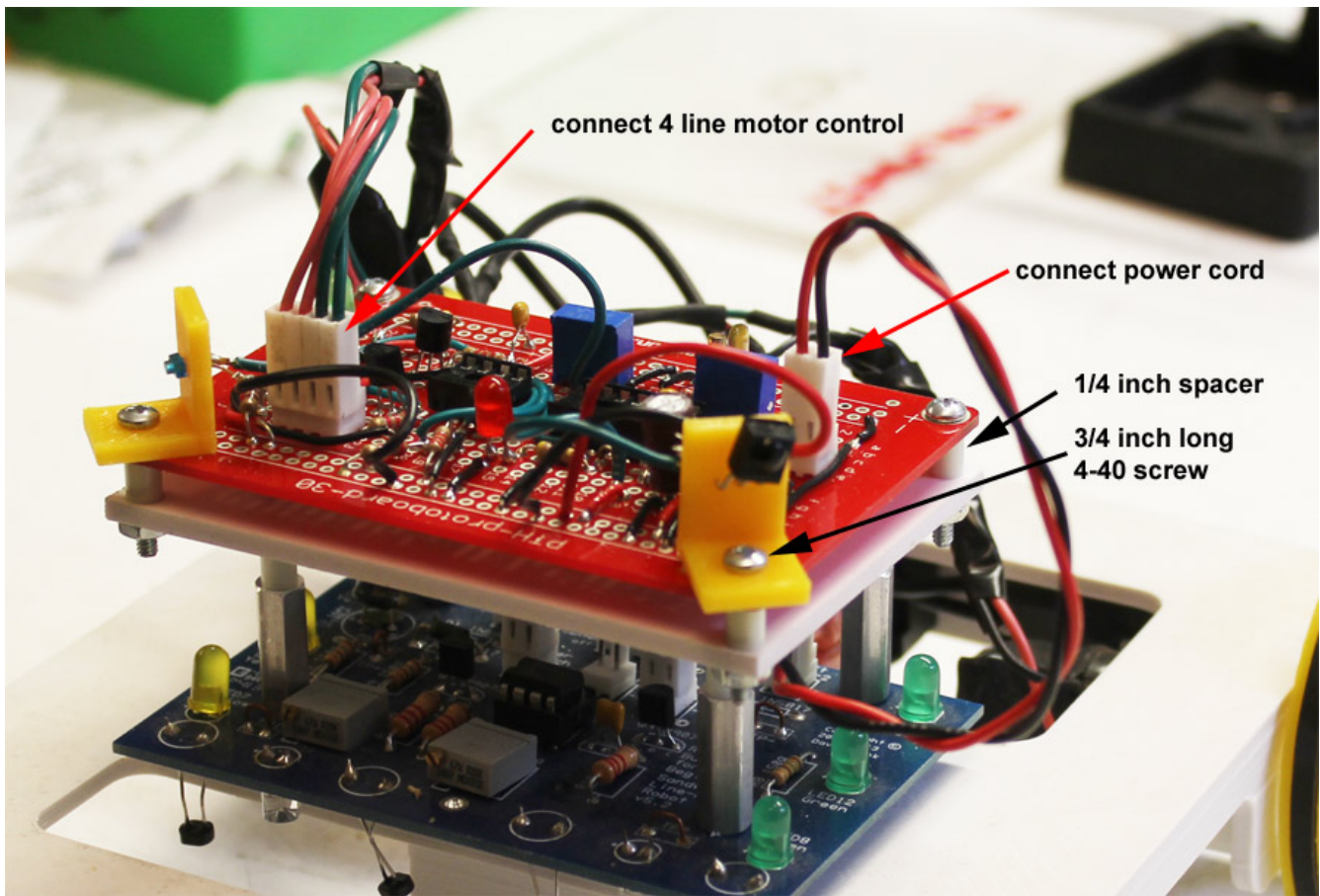


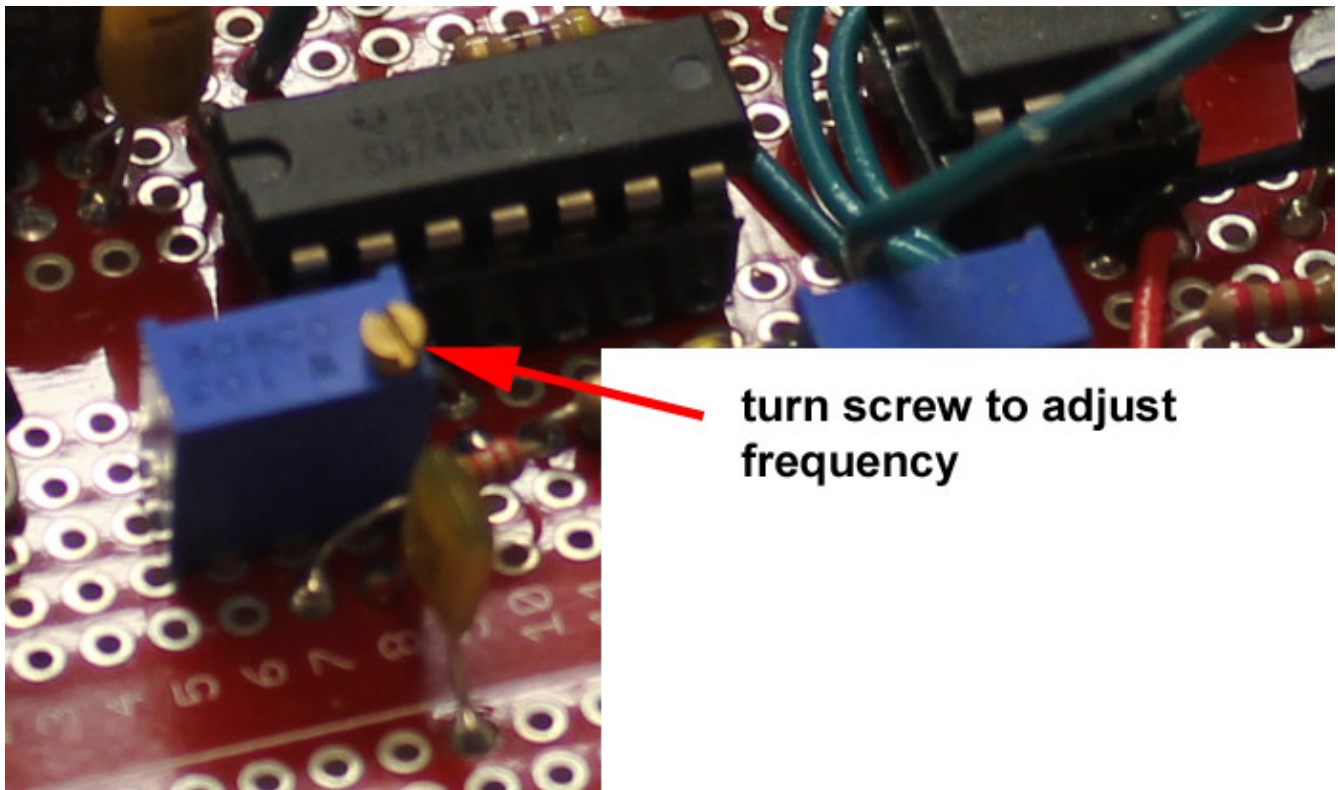
Figure 4: mounting IR board on robot

Using the remaining four $\frac{3}{4}$ inch machine screws in the kit and the $\frac{1}{4}$ inch plastic spacers, attach the IR board to the robot.

Connect the power cord to the 2 pin header on the IR board. **DO NOT** connect the 4 line motor control cord yet. You must **remove** the shunt plug that is in the 4 line motor control cord receptacle so that the motors will not operate as you make adjustment to the IR board.

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You must adjust the frequency (flashing rate) of the IR emitting diode. This is done by adjusting the screw on variable resistor R8.



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Before you adjust the screw, you must connect the probes of a GEAR Fluke meter to the positive and negative wires of the IR emitting diode. Then set the meter following example in photo below.

Power on your robot. Then adjust the R8 screw so that meter reads near 38.00 kHz. You don't have to have it exactly 38.00 but try to get it as close as you can. The number may drift a little while you are adjusting. Any number between 37.90 and 38.10 will be fine.



Now test your robot for proper function while still powered on. If you take a sheet of white paper, curve it slightly, and place it in front of the robot, it should trigger the IR board to cut power to motors (its red LED should light). The IR light from IR emitting diode will bounce off the paper and be reflected onto the IR receiver (IC2). When you take the white paper away, and there is nothing in front of the robot to reflect the IR light, the two green LEDs of the IR board should light. If you observe this behavior in the IR board, then it is probably working properly. If your board appears to not be working, it may be due to the adjustment of R11. This adjustable resistor controls the brightness of the IR emitting diode. When the screw is turned all the way counterclockwise, the IR emitting diode should shine brightly, in which case this could not be the problem (but remember you cannot see IR light, so you won't be able to judge the brightness of this LED). The final test requires connection of the four wire motor control wire to the IR board. Then, if you trigger a stop condition in the IR board both wheels should stop turning. When the green LEDs of the IR board on on, at least one wheel should turn. Then you have confirmed full, proper function of your IR board. CONGRATULATIONS!