A drawing of a machine

Description automatically generatedThe $20 PiWiBot

(Raspberry Pi Pico Wireless Robot)

John Pinto wanted to make his tethered mini sumo robots wireless… for $20 or less (batteries not included.) The $8.00 Raspberry Pi Pico W board made this possible!

**Contact: Jason Brett jbrett@bcit.ca**

**Give it a try!**

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| **PiWiBot Minimal Parts List** | Vendor | Price |
| Raspberry Pi Pico W | Canakit | $8.00 |
| L293D Motor driver | Amazon | $1.00 |
| 2 x TT Motor Gearbox | Amazon | $3.50 |
| 1 SPDT Slide Switch | Amazon | $0.13 |
| 3 x LEDs | Any | $0.30 |
| 2 x Rectifier Diodes | Any | $0.20 |
| 4 x resistors (2x100, 470,10K) | Any | $0.04 |
| 2 x 20pin header sockets | Lee’s | $0.90 |
| 2 x 40pin header pins | Lee’s | $1.00 |
| 1 x 180nF (approx.) cap | Any | $0.30 |
| 2 x Silicone Wrist Bands | Amazon | $1.00 |
| 113g PLA filament | Any | $2.60 |
| 1 x 4AA Battery Pack | Lee’s | $1.00 |
| 2 x Nut Inserts for 3D prints | Amazon | $0.25 |
| 2 x 3mm x 6mm screws | Any | $0.25 |
| 1 x Printed Circuit Board | PCBWAY | $1.80 |
|  |  |  |
| **Total Entry Level Price** |  | **$22.27** |

And, technically you could get rid of the headers, solder the Pico directly to the board, screw directly to the plastic and hit the $20 price point. (Batteries not included, of course!)

1. Turn the switch (by the green power LED) ON.
2. Connect to:
   1. “PiWiBotOne” for the Rainbow Robot
   2. “PiWiBotTwo” for the Black Robot
   3. Password is “123456789”
   4. Navigate your browser to 192.168.4.1
3. Drive robot with left hand joystick. Use red corner buttons to control LEDs.
   1. The slider is for servo control, and the other joystick is for extra motors.
      1. The PiWiBot supports up to four DC motors and two servo motors.
4. The Rainbow bot has a 120:1 gearbox, the Black Robot has a 48:1 gearbox.
5. Remember to **turn the robot off** when done, please!

**About the board:**

1. The Rainbow bot’s board was made in the shop… good for one-off and prototypes
   1. The Black bot’s board was made by PCBWAY… $1.80 each in quantity of 100.
      1. Want to build a PiWiBot? Ask me for a sample board!
2. The code is mostly MicroPython, with Javascript and HTML used to create the web page.
   1. I’m happy to share… it is plug and play. (Mostly… but PC/Mac/Linux compatible)
   2. Lots of development left to go for additional accessories.
      1. Line following / edge detecting
      2. Range finding with Ultrasonic or LIDAR rangefinders
      3. OLED display on board
      4. Speaker (apparently the Pico can play MP3 files… but I haven’t figured that out yet.)
      5. Multiple pushbuttons
      6. Anything you want because you can add an expansion board using headers!
         1. I do plan to have a series of Youtube videos and explanations… one day.
3. You can power the robot using any 5V-12V battery. (I’m using 4xAA… Alkaline or NiMh)
4. This robot uses the “TT Motor Gearbox” but the Tamiya gearboxes will work fine, too.

This board is fully compatible with the standard tethered mini sumo robot project. It simply replaces the control board. It has two wires for the battery and two wires for each motor, just like the tethered board!