

IBiB Mini Sumo project notes. 1/21/2024. Bill Ball

The bots will meet standard specifications: 10cm x 10cm x unlimited, 500 grams max.

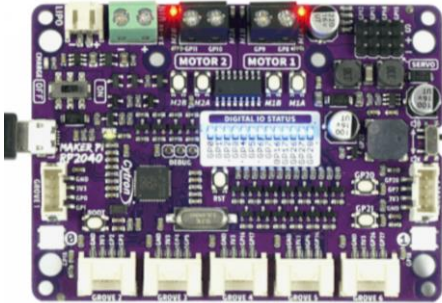
The bots will have the following components:

1. 4xaa battery holder. \$0.5-\$1. Is the 1x4 or 2x2 layout better? Builders supply their own batteries.



2. Maker Pi RP2040 main board with OEM Circuitpython 7 and accompanying 4 x grove to header pin wire sets. Cheapest source in bulk @\$10: Newark. Manufacturer reference: <https://www.cytron.io/p-maker-pi-rp2040-simplifying-robotics-with-raspberry-pi-rp2040>

The adafruit_vl5310x.mpy library will be installed by us. The default code.py will be renamed and a basic sumo bot program will be added as code.py.



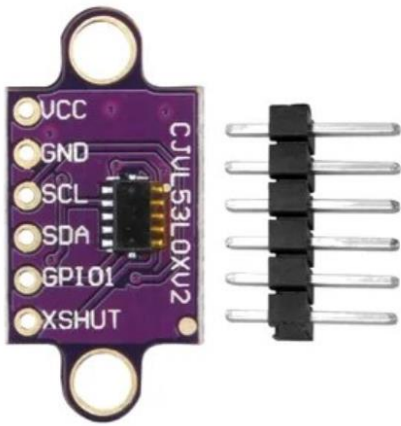
3. N20 6V motors (2). What rpm/torque trade off is best? We will start at 150rpm. \$4.20 per pair from Aliexpress. We will need to solder on leads. Mounting brackets will be 3D printed (standard ones are too short for the wheels).



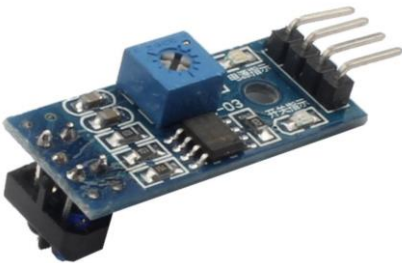
4. K346 43*19*3mm D-hole Rubber Wheel (2). \$1.5 per pair from Aliexpress



5. VL53L0X Time-of-Flight Ranging Sensor (2). \$2.60 per pair from Aliexpress. We will need solder the header pins. We will use the VCC, GND, SCL, SDA, and XSHUT pins. XSHUT is required to change the I2C address in software. We are not planning to use the GPIO1 (data ready) pin (it would require an additional grove wire set if we do). If two sensors doesn't work well we may need to go to three, which would require 2 additional grove wire sets and may not all fit on the same I2C bus as exposed by the Maker pi.



6. TCRT5000 Infrared Reflective Sensor Module (2). \$1.5 per pair from Aliexpress.



7. USB A to micro USB cable for programing. We may want to offer other formats to micro options. \$1 from Aliexpress. People don't otherwise acquire micro USB cables anymore.

8. Chassis. etc. The chassis can be user designed/built. We will need to develop a design for 3D printing, maybe laser cut or even milled. We also need to decide on ballast and fasteners. The basic bot only weighs about 250 grams. We should supply enough repositionable ballast to reach 500 grams. I use steel BBs but they need to be contained. We can do this project with m2 Philips head fasteners throughout. It would be incredibly kind to builders if fasteners are all the same length. 14mm? As a supplied kit let's plan on \$5 total cost of supplies.

Total delivered cost is currently about \$27 for supplies when items are purchase qty 10 or greater using mostly Aliexpress.