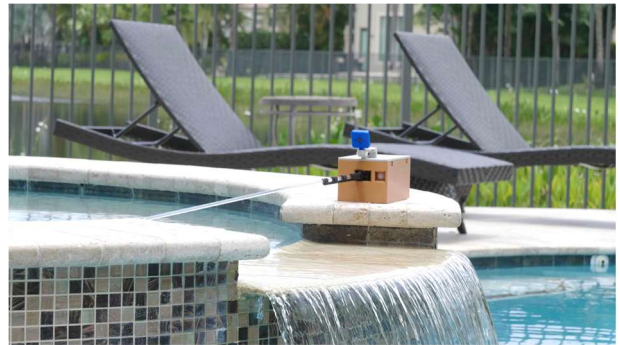# Bird Sweeper Instructions

The Bird Sweeper chases birds away but does not hurt them. Birds quickly learn that they do not want to be within reach of the Bird Sweeper and the mission is accomplished. When birds become a nuisance, the Bird Sweeper provides the solution. It is an effective and humane bird deterrent.

Watch a video demo of the Bird Sweeper here: https://youtu.be/f1LiP86JUfA

The Bird Sweeper uses a motion sensor to activate a servo that sweeps a dowel across the protected area when movement is detected. It uses a Raspberry Pi microcontroller that runs a simple Python program to detect the motion and activate the sweep function. It uses a power bank to power the Raspberry Pi and a separate battery back to power the servo. A relay switch prevents the servo from draining the batteries while the servo is inactive. All the parts fit into a 3d printed case that protects them from the elements.

Parts List

Raspberry Pi Model 3 A+ - Raspberry Pi Model 3 A+

25KG Digital Servo- ANNIMOS 25KG Digital Servo Full Metal Gear High Torque Waterproof

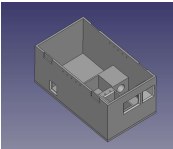5V One Channel Relay Module - 5V One Channel Relay Module Board

PIR Motion Sensor - Mini Basic PIR Sensor
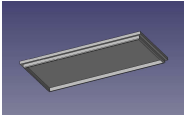
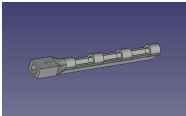Power Bank - 24800mAh Power Bank Dual Ports with LCD Display

2x2 AA Battery Holder - 2x2 AA Battery Holder with Jumper Header Wires

Bird Sweeper Case – the STL file for 3D printing it is on this GitHub

Lid for the Case – The lid will keep the inside of the case dry even in a heavy rain – the STL file for 3D printing it is on this GitHub repository


Servo Arm Extension – this extension attaches to the servo arm with the screws included with the servo – the STL file for 3D printing it is on this GitHub repository


Dowel – use a wooden or plexiglass dowel with a ¼ inch diameter or 6.35mm and slide it into the Servo Arm Extension - 1/4" Diameter x 24" Long Clear Acrylic Plexiglass Plastic Rod
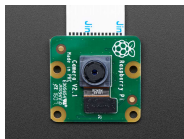
Raspberry Pi Camera Module V2 (Optional) – Raspberry Pi Camera Board v2 – you do not need to use a camera unless you want to capture video of the Bird Sweeper in action
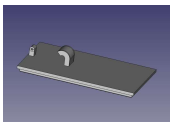
Lid with Camera Mount (Optional) – if you want to mount a camera on your Bird Sweeper, the STL file for 3D printing an alternative lid with a camera mount is on this GitHub repository
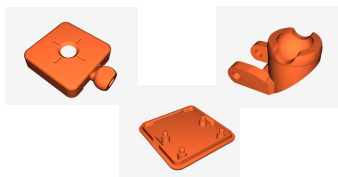
Camera Case and Connector (Optional) – if you want to mount a camera, download the STL files for 3D printing the camera case front, back and connector here: Prusa Mini Raspberry Pi Camera Mount

The case has mounting areas for each of the parts as shown in Figure 1. Use double sided tape to mount the 5V relay module and the Raspberry Pi. Use the screws that come with the servo to mount the servo. Glue the motion sensor into place. See Figure 2 for the wiring diagram (if you prefer, you can wire the parts together directly instead of using the breadboard shown).
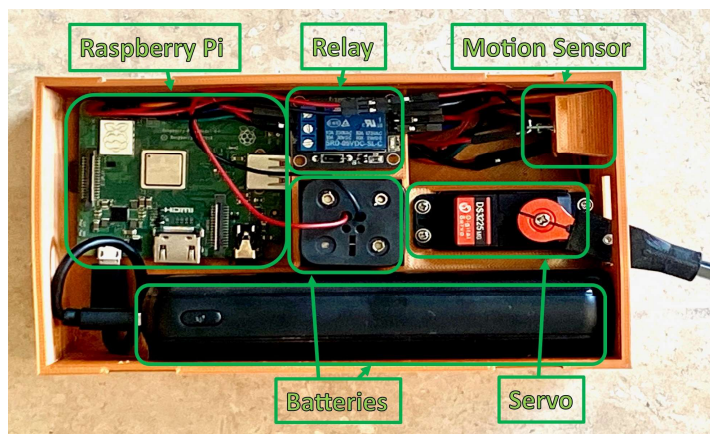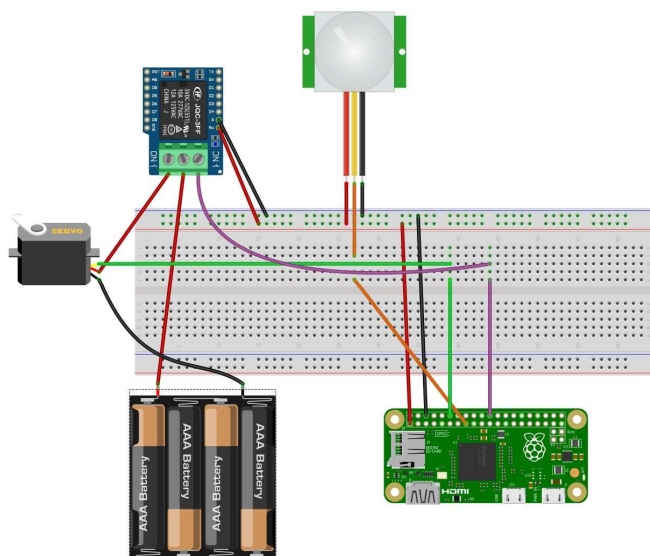

Figure 1

Figure 2

GPIO Pin Nos.:
sensor_pin = 22
servo_pin = 18
relay_pin = 25

If you have not used a Raspberry Pi before, basic setup instructions can be found here: https://www.raspberrypi.com/tutorials/how-to-set-up-raspberry-pi/

After the parts are assembled, copy the python program BirdSweeper.py from this GitHub repository and run it on your Raspberry Pi.

Adding an Optional Camera

If you want to add a camera to the Bird Sweeper to capture the action, do the following:

Connect the camera module to your Raspberry Pi by following the instructions here: [Getting started with the Camera Module | Python |](#)

3D print the Lid with Camera Mount and the Camera Case and Connector from the STLs on this GitHub Site. Attach the Connector to the Lid with a M3x20 screw and bolt. Snake the Camera Module ribbon cable through the opening on the top of the lid (which is shape in away to avoid water entering the opening if it rains).

After the parts are assembled, copy the python program BirdSweeperWithCamera.py from this GitHub repository and run it on your Raspberry Pi.