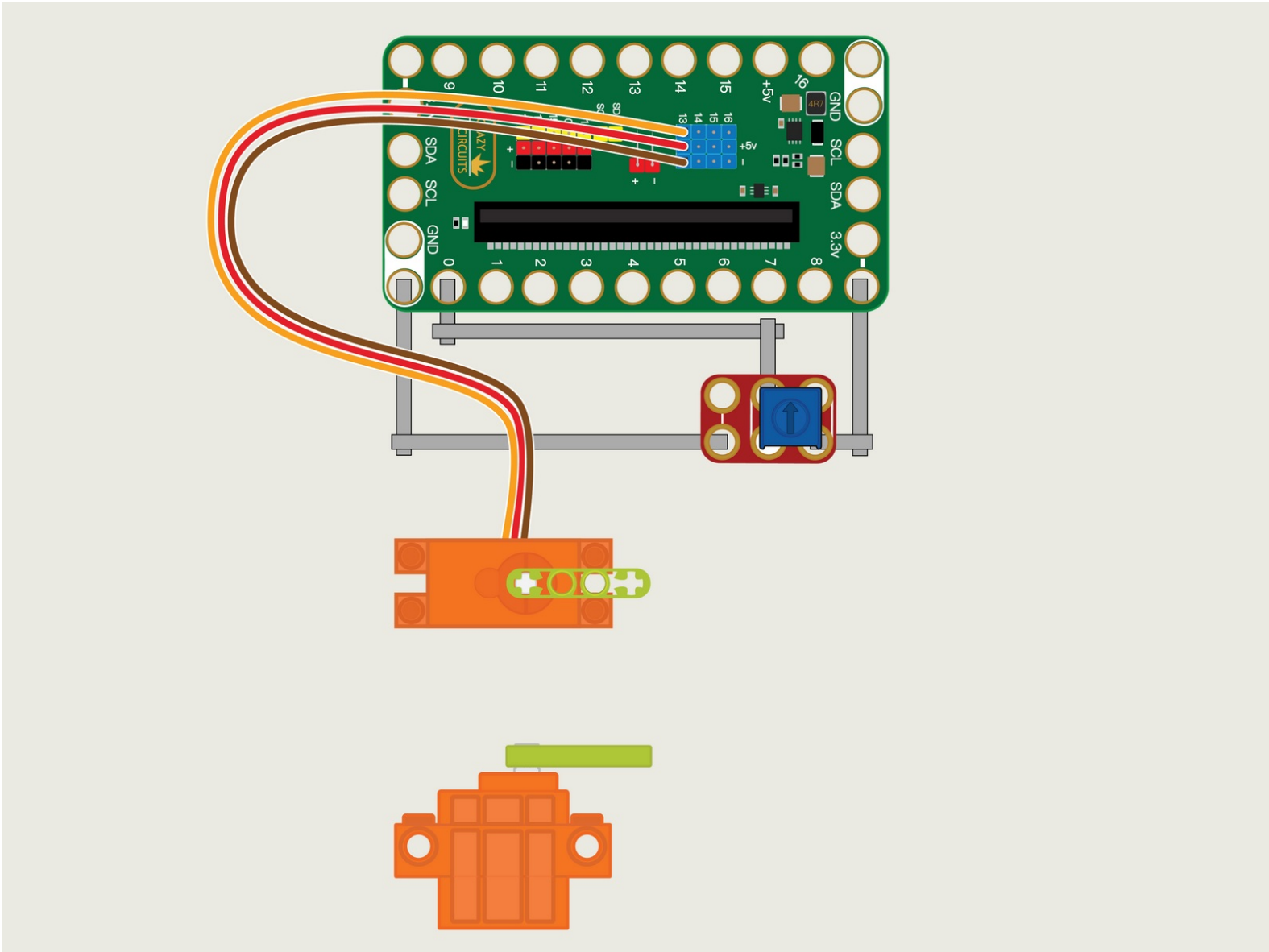




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INTRODUCTION

Connect a 360° Servo to a Bit Board and control it with a Potentiometer and code.

We'll explore code to control the movement of a continuous rotation (360 degree) servo motor using a potentiometer.



TOOLS:

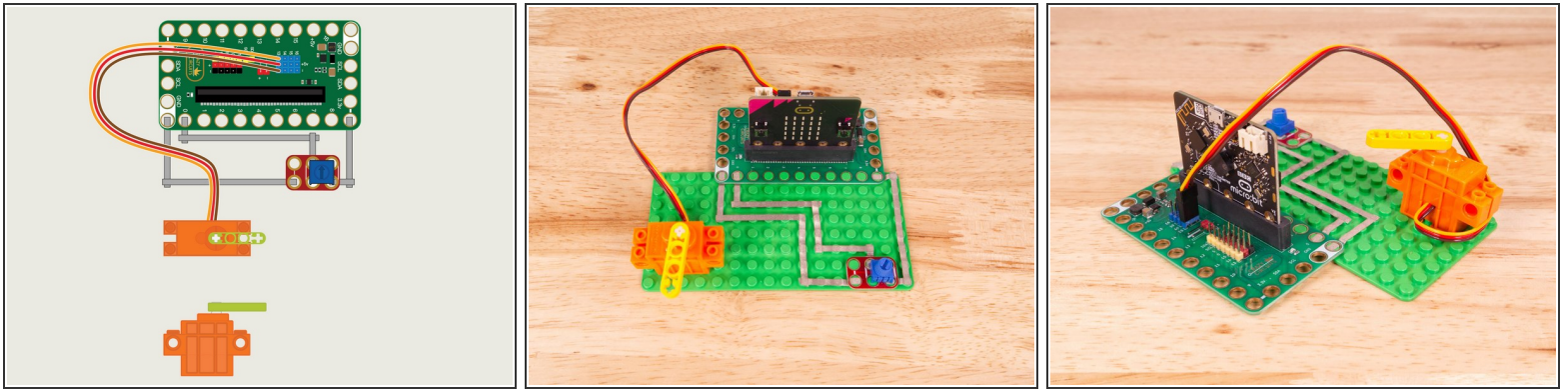
- [Computer](#) (1)
- [Scissors](#) (1)



PARTS:

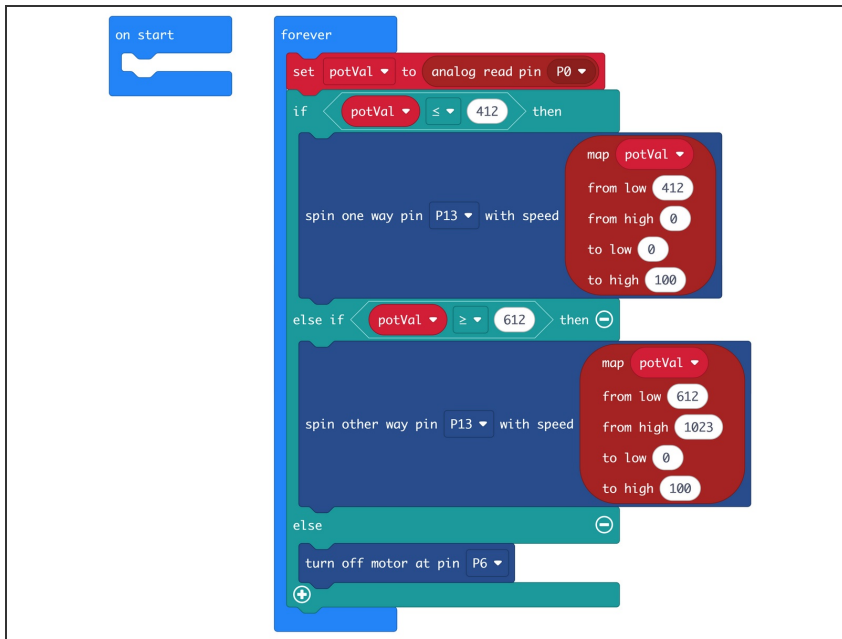
- [Crazy Circuits Bit Board](#) (1)
 - [micro:bit](#) (1)
 - [Brick Compatible 360 Degree Servo](#) (1)
 - [Crazy Circuits Potentiometer Chip](#) (1)
 - [Maker Tape](#) (1)
- 1/8" Wide

Step 1 — Connect the 360° Servo and Potentiometer



- The **360 Degree Servo Motor** has a 3-wire connector on the end that can plug directly into the pins on the back of the Bit Board.
- Make sure the **Orange Wire** is closest to the number **13** for the **Pin 13** column.
- Then the **Brown Wire** should be closest to the micro:bit (in the - row) and the **Red Wire** will be in the middle (the **+5v** row).
- We'll need to connect one side of the Potentiometer to **Ground** (GND) and the other side to **3.3v**
- We will then connect the center of the Potentiometer to **Pin 0**. (Note that **Pin 0** is an **analog** pin, which we'll need for the Potentiometer.)
 - The other analog pins are **1, 2, 3, 4, and 10**. See this chart for a pinout diagram: <https://makecode.microbit.org/device/pin...>
- ☑ You'll notice the **Ground** on the Bit Board is color coded **White**.
- ☑ The **3.3v** hole on the Bit Board is labeled and is actually two holes right next to each other on the Bit Board. (There is a small line showing the connection between them.)

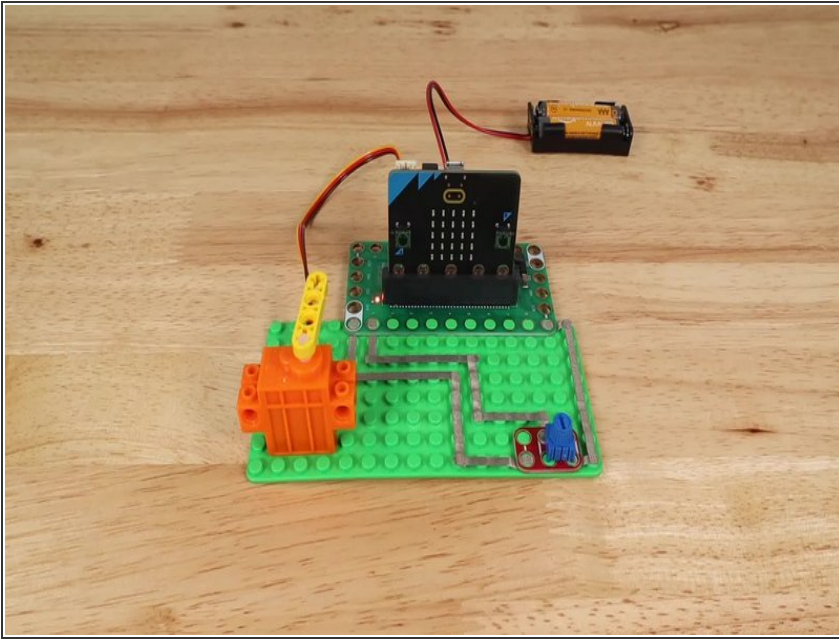
Step 2 — Load the Code



- If you've never used a micro:bit before you'll want to check out this guide: [Bit Board V2 Setup and Use](#)
- We're going to load the following code for our **360 Servo Potentiometer Both Ways** program:
https://makecode.microbit.org/_XC_MggoAK9...
- We'll run an analog read pin on **Pin 0** and assign that to a variable named **potVal**.
- They we can check if **potVal** is less than **412** or greater than **612**, or neither!
- If **potVal** is less than (or equal to) **412** we'll spin the motor one way, with the speed *increasing* the farther anti-clockwise we turn the Potentiometer knob.
- If **potVal** is greater than (or equal to) **612** we'll spin the motor the other way, with the speed *increasing* the farther clockwise we turn the Potentiometer knob.

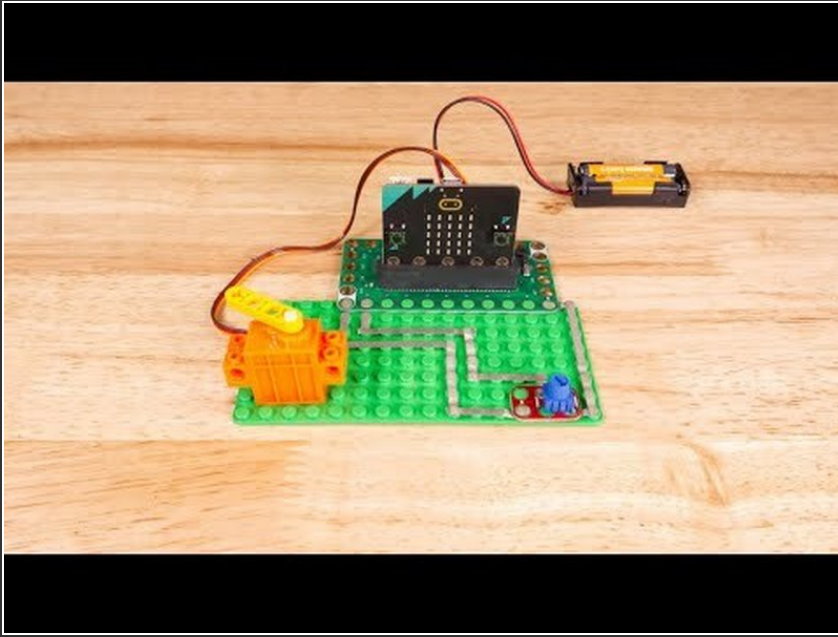
- If the value of **potVal** is in the "dead zone" (between 413 and 611) we'll stop the motor so it does not move. This allows us to have a *central position* where the motor is stopped, and then choose the **direction** of spin (and affect the **speed**) when we turn the knob either direction.

Step 3 — Test it Out!



- Once the code is loaded it should start running immediately, but the motor may or may not move depending on the position of the Potentiometer knob.
- ❗ You can power the micro:bit via the USB cable you used to load the code, but now that we are using servos we recommend using a battery pack plugged into the Bit Board.
- ★ The **Blue Pins** on the Bit Board provide extra power (5 volts instead of 3 volts) by **boosting the voltage** coming from the battery pack. This helps improve servo performance, especially with multiple servos.
- With the Potentiometer knob in the center the motor should not move.
- Turn the knob anti-clockwise slowly and you'll see the motor increase in speed the more you turn it.
- Turn the knob back to the center to make the motor stop moving, and then turn the knob clockwise slowly and you'll see the motor turn the other direction and increase in speed the more you turn it.

Step 4 — Follow Along



- Follow along with our recorded Live Stream!
- ① You can watch the full video of us walking through this project, along with explaining and exploring the code:
<https://youtube.com/live/1H9jjAUFHAI>