CH26-B - Servo Reverse Sweep

Connect a 270˚ Servo to a Bit Board and control it with a Potentiometer and code.

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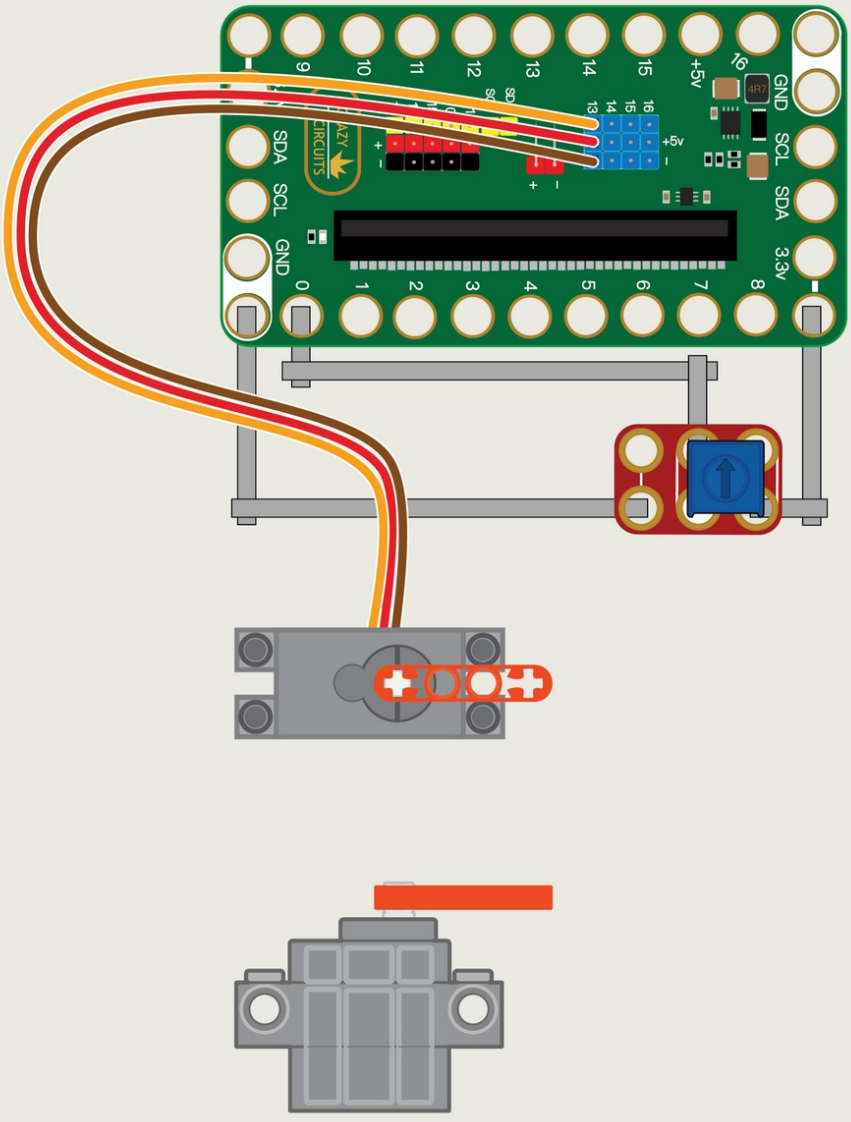

INTRODUCTION

Connect a 270˚ Servo to a Bit Board and control it with a Potentiometer and code.

We'll explore using a potentiometer (and some code) to control the movement of a servo motor.

TOOLS:

- Computer (1)
- Scissors (1)

PARTS:

- Crazy Circuits Bit Board (1)
- micro:bit (1)
- Brick Compatible 270 Degree Servo (1)
- Crazy Circuits Potentiometer Chip (1)
- Maker Tape (1)
  1/8" Wide

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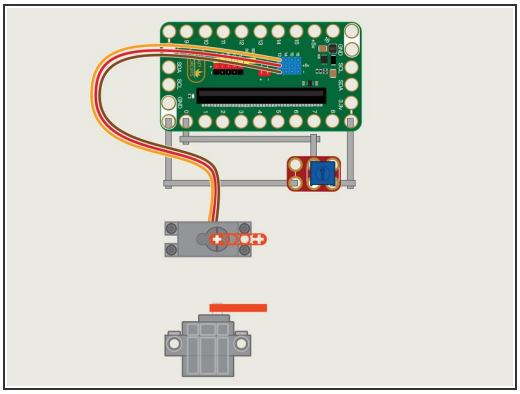
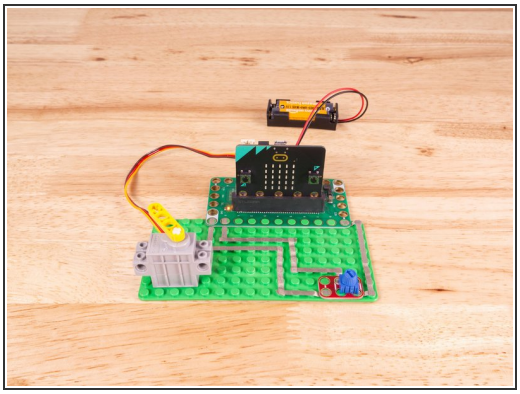
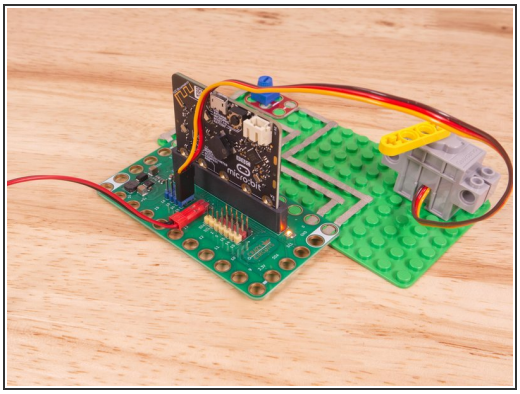
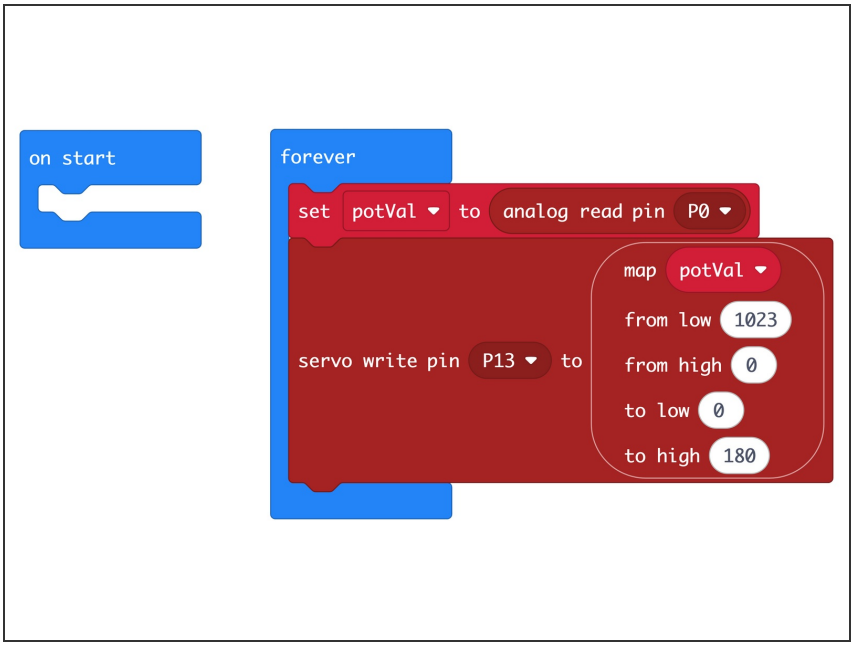
Step 1 — Connect the 270˚ Servo and Potentiometer

- The **270 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...

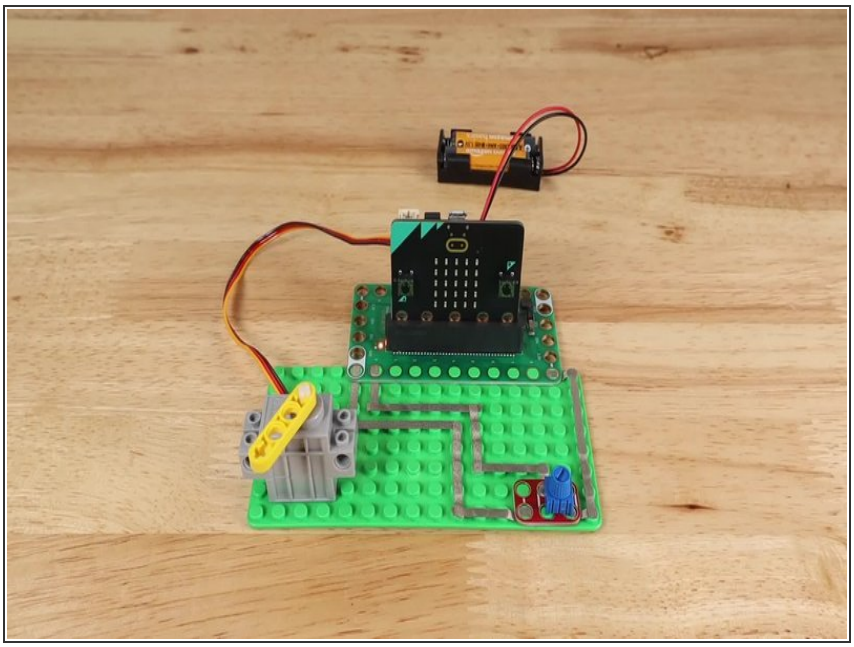
- [x] You'll notice the **Ground** on the Bit Board is color coded **White**.
- [x] The **3.3v** hole on the Bit Board is labeled and is actually two holes right next to each other on the Bit Board. (There is a small line showing the connection between them.)

Step 2 — Load the Code



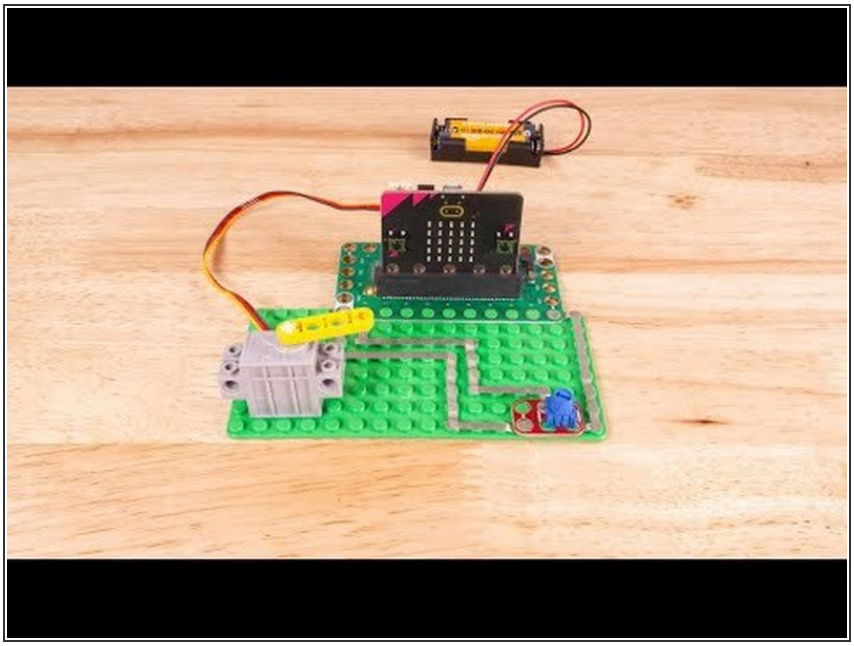
- If you've never used a micro:bit before you'll want to check out this guide: Bit Board V2 Setup and Use
- We're going to load the following code for our **Servo Reverse Sweep** program: https://makecode.microbit.org/_XkUWYx0sF...
- Once again we'll assign the input from the Potentiometer to a variable named potVal.
- This time we'll use the map function to take the value from the potentiometer (0 to 1023) and **map** it to the scale used to control the Servo (0 to 180) - **BUT!** We've reversed the order of the map...
- We are now mapping the Potentiometer values (**1023 to 0**) to the Servo movement (**0 to 180**). So we've effectively *reversed* the input values to the output values.
- It's the classic "Servo Sweep" using a Potentiometer to control the movement but with the mapping flipped.

Step 3 — Test it Out!



- Once the code is loaded it should start running immediately.
- ⓘ 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.
- The Servo will probably move right away, as the micro:bit will read the position of the Potentiometer and move the Servo appropriately.
- Turn the Potentiometer and you should see the Servo move.

Step 4 — Follow Along



- Follow along with our recorded Live Stream!

ⓘ You can watch the full video of us walking through this project, along with explaining and exploring the code: https://youtube.com/live/7ulebPcKk2A