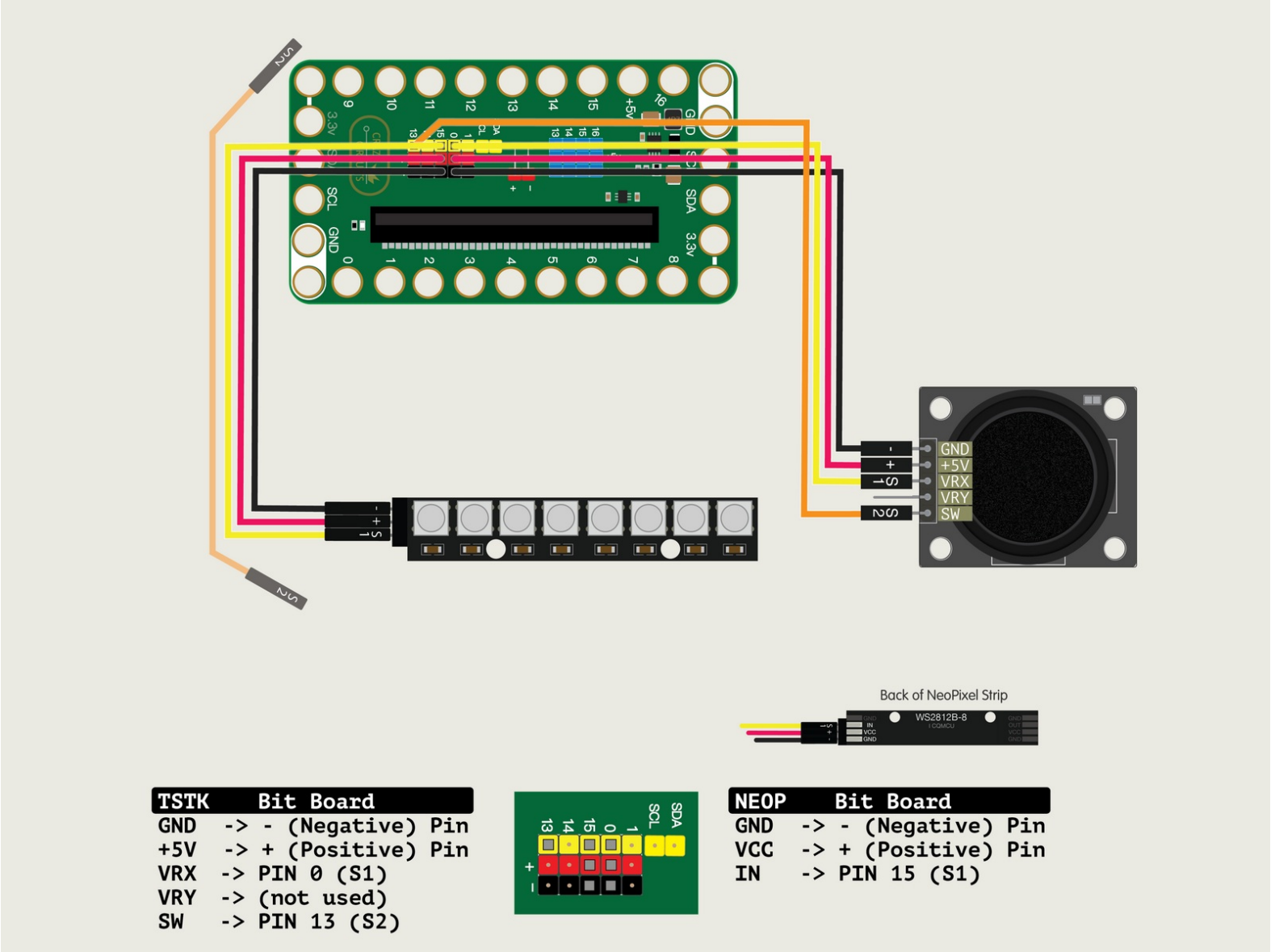
CH42-D - Thumbstick NeoPixel Graph

Connect a Thumbstick to a Bit Board and control a NeoPixel Strip.

Written By: Pete Prodoehl



INTRODUCTION

Connect a Thumbstick to a Bit Board and control a NeoPixel Strip.

TOOLS:

- Computer (1)

PARTS:

- Crazy Circuits Bit Board (1)
- micro:bit (1)
- Crazy Circuits Ribbon Cable (2)
- Thumbstick (1)
- Addressable RGB LED Strip (1)

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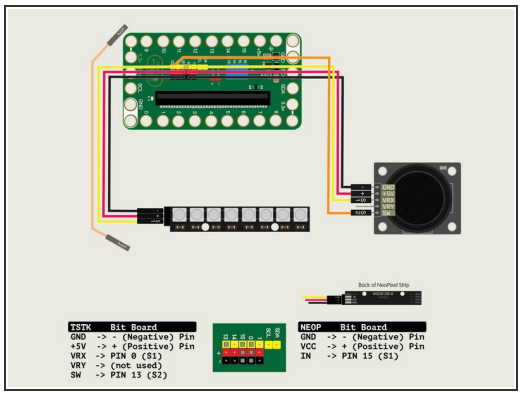
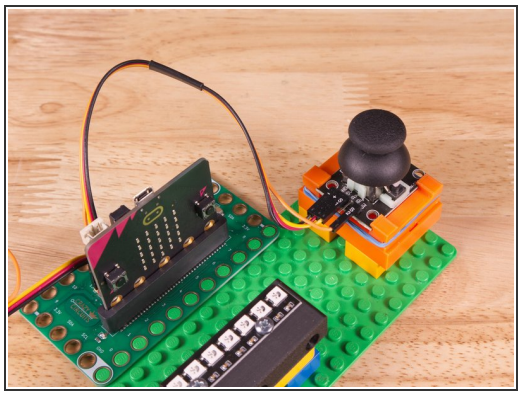
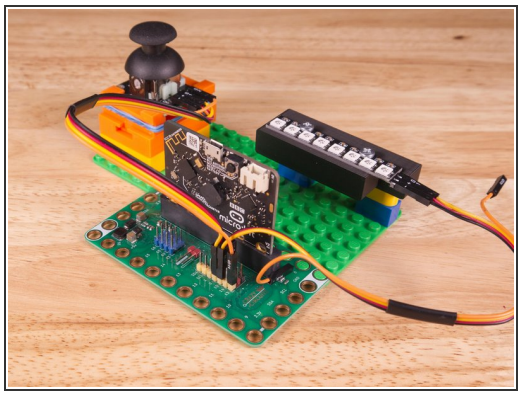
Step 1 — Connect the Thumbstick



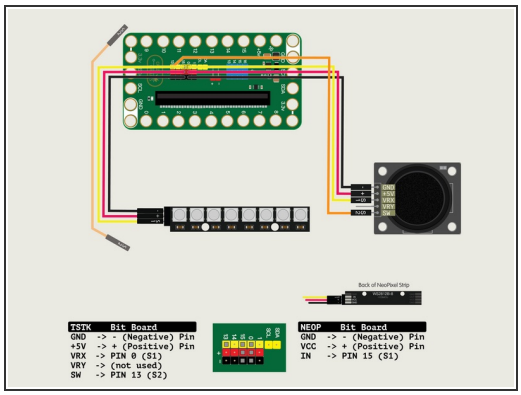


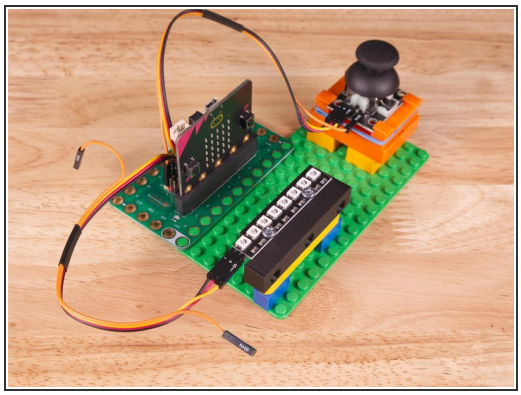


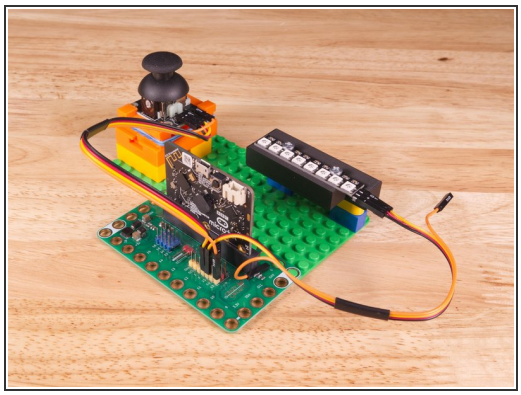
- We'll connect the **Thumbstick** with a **Crazy Circuits Ribbon Cable** using all four wires.
- Plug the three-wire connector of the **Crazy Circuits Ribbon Cable** into the row with **Pin 0** on the Bit Board. The wire colors should match the pin header colors, with **S1** (yellow) going to the yellow pin.
- Next, plug **S2** (orange) into **Pin 13**. *(S2 is separated from the three-wire connector to allow you to plug it into another row.)*
- To the Thumbstick plug **-** (black) into **GND**, **+** (red) into **+5V**; **S1** (yellow) into **VRx**; **S2** (orange) into **SW**.

We won't plug anything into **VRy** pin for this example.

Step 2 — Connect the NeoPixel Strip

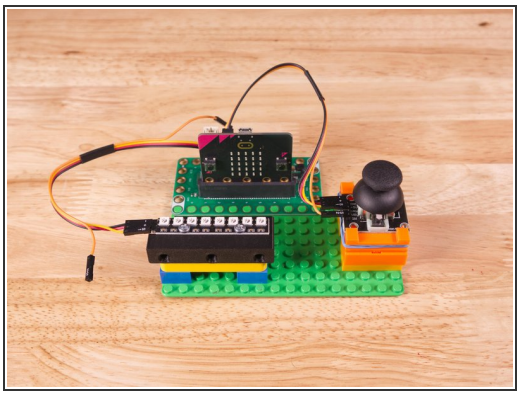
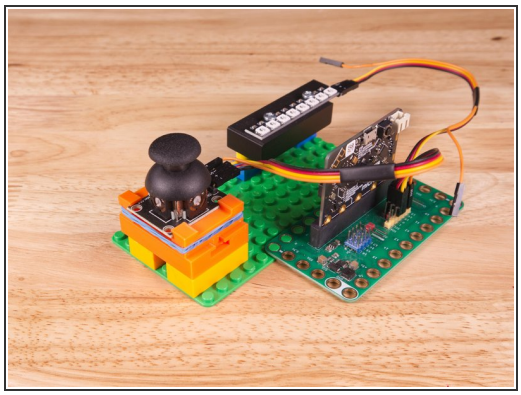
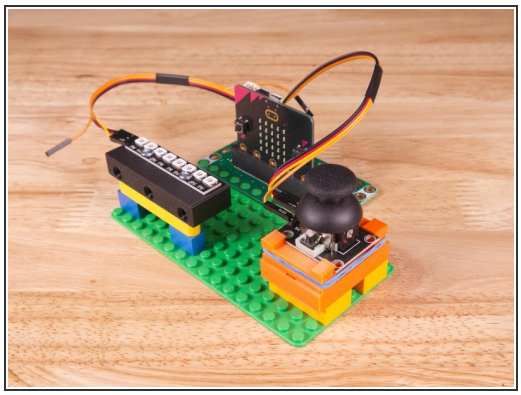






- The magical thing about these “Individually Addressable” LEDs is that you don’t have to connect each LED to an individual pin on your micro:bit, you just need **one signal wire** along with power (**Positive** and **Negative**) to light things up.
- So let's get connected! If you turn the **NeoPixel Strip** over you'll see labels for the three pins. You should see **IN**, **VCC**, and **GND**.
- Use the Crazy Circuits Ribbon Cable to connect the **NeoPixel Strip** to the **Bit Board**.
- The end with **S1**, **+**, and **-** can plug directly into the **Pin 15** row (make sure S1 goes into 15) and the other end should plug into the **NeoPixel Strip** as shown.
- We only need three wires for the **NeoPixel Strip** so you can leave **S2** (the Orange wire) unconnected.

Step 3 — Mounting the Thumbstick and NeoPixel Strip

- We used a 3D printed part we designed to hold the Thumbstick in place on a LEGO baseplate.
- We attached two 2x4 LEGO Bricks to the bottom of the 3D printed holder to allow it to snap onto the LEGO Baseplate a bit easier.
- Alternately you can try to use some LEGO bricks and some rubber bands to hold the sensor in place, or just hold it in your hand.
- You can always 3D print your own Thumbstick Sensor Holder if you need one.
- Our NeoPixel Strips come pre-attached to our Rover NeoPixel Beam Holder, so a few Technic pins, a Technic beam, and some LEGO bricks are all that is needed.

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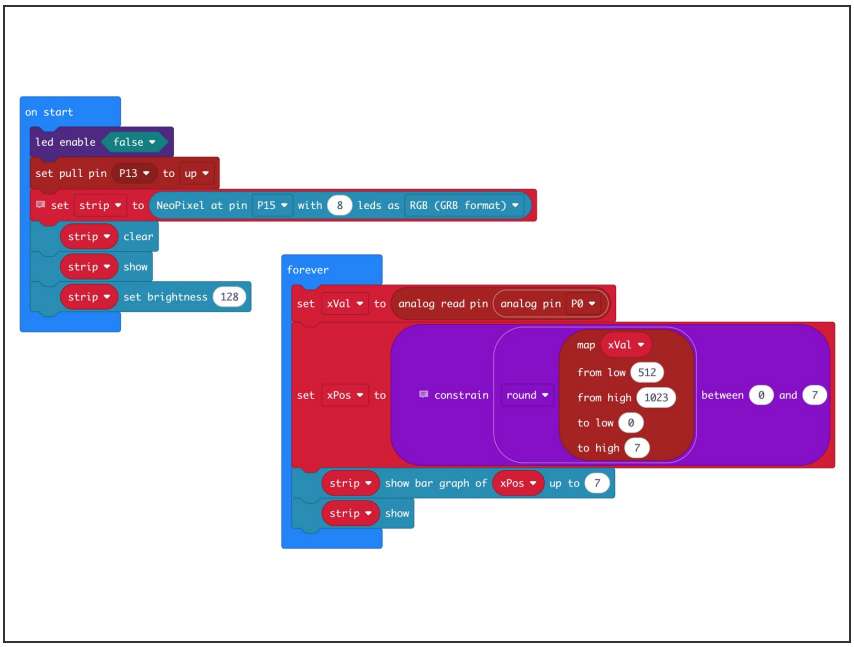
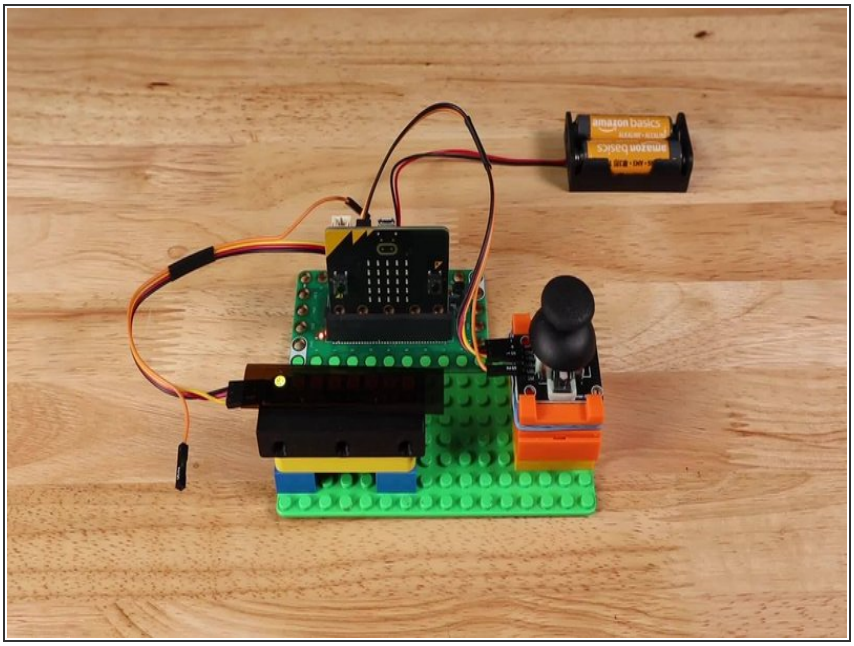
Step 4 — Load the Code



- 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 **Thumbstick NeoPixel Graph** program: [https://makecode.microbit.org/_4wJRDD6FU...]
- In the on start block we'll disable the LED matrix and set **Pin 13** to **pull up**. (In previous chapters we've used **Pin 13** to read the button on the Thumbstick but for this example we're going to ignore it.)
- We'll also set up our NeoPixel Strip connected to **Pin 15** with **8** LEDs. (Remember that even though we have 8 LEDs they are addressed as **0 through 7**.) We also call strip clear, strip show, and then set brightness when we get started.
- In the forever loop we'll read the thumbstick and store the value in **xVal**, then map that value on a scale from **0 to 7** and assign it to **xPos**. Note that we are using **512 to 1023** for our input range... we use round to ensure **integers** and constrain to prevent negative numbers.

- We then show bar graph using **xPos** with a value from **0 to 7**.

Step 5 — Test it Out!

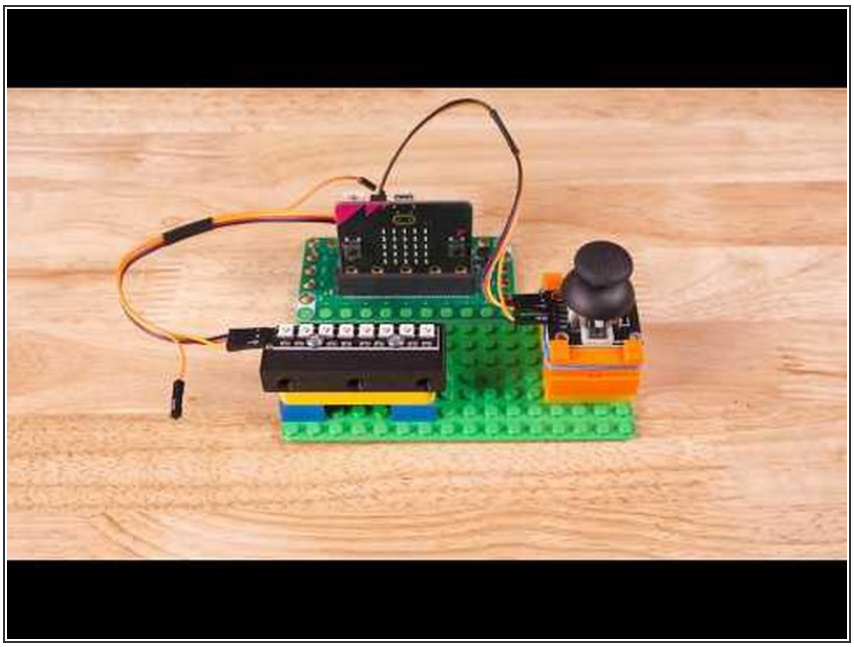


- Once the code is loaded it should start running immediately.

ⓘ You can power the micro:bit via the USB cable you used to load the code or you can use a battery pack plugged into the Bit Board.

- Move the Thumbstick to the right and you'll see a "graph" increase from one NeoPixel to all eight NeoPixels.

Step 6 — 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://www.youtube.com/live/-m3Rf60AolA