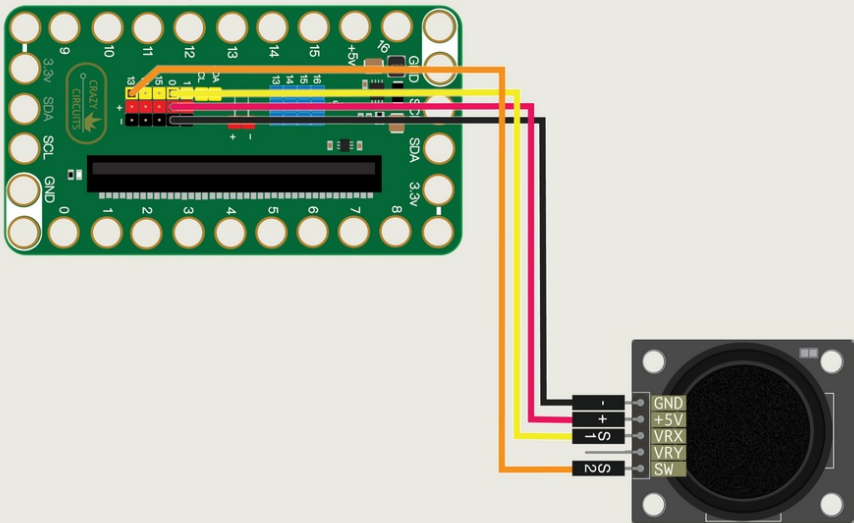




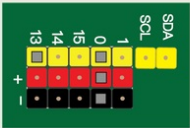
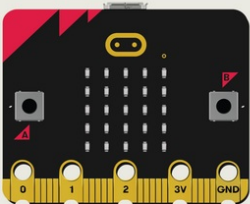
CH40-B - Thumbstick LED Matrix Plot

Connect a Thumbstick to a Bit Board and control the built-in LED Matrix on the micro:bit.

Written By: Pete Prodoehl



TSTK	Bit Board
GND	-> - (Negative) Pin
+5V	-> + (Positive) Pin
VRX	-> PIN 0 (S1)
VRY	-> (not used)
SW	-> PIN 13 (S2)



INTRODUCTION

Connect a Thumbstick to a Bit Board and control the built-in LED Matrix on the micro:bit.



TOOLS:

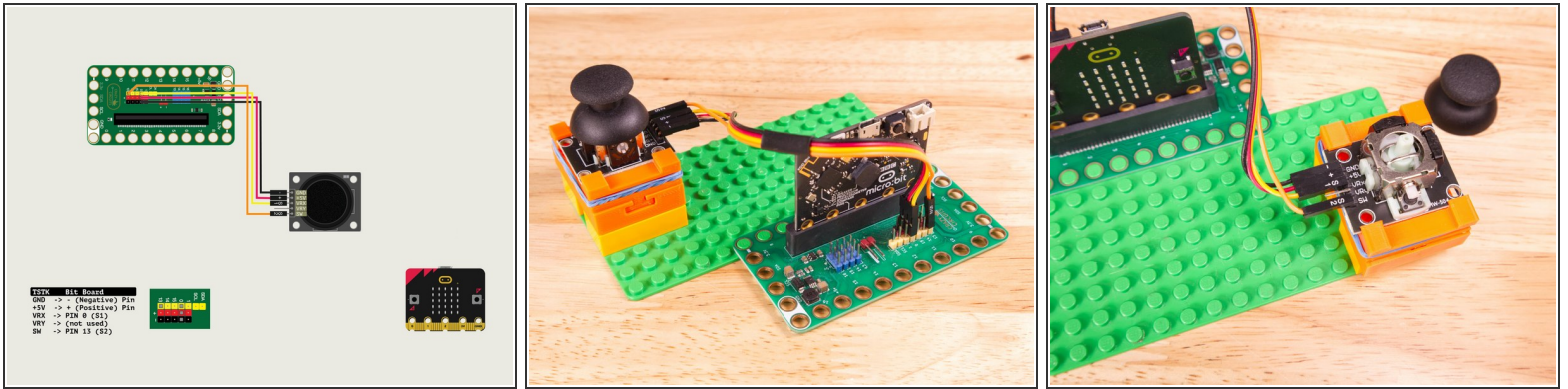
- [Computer](#) (1)



PARTS:

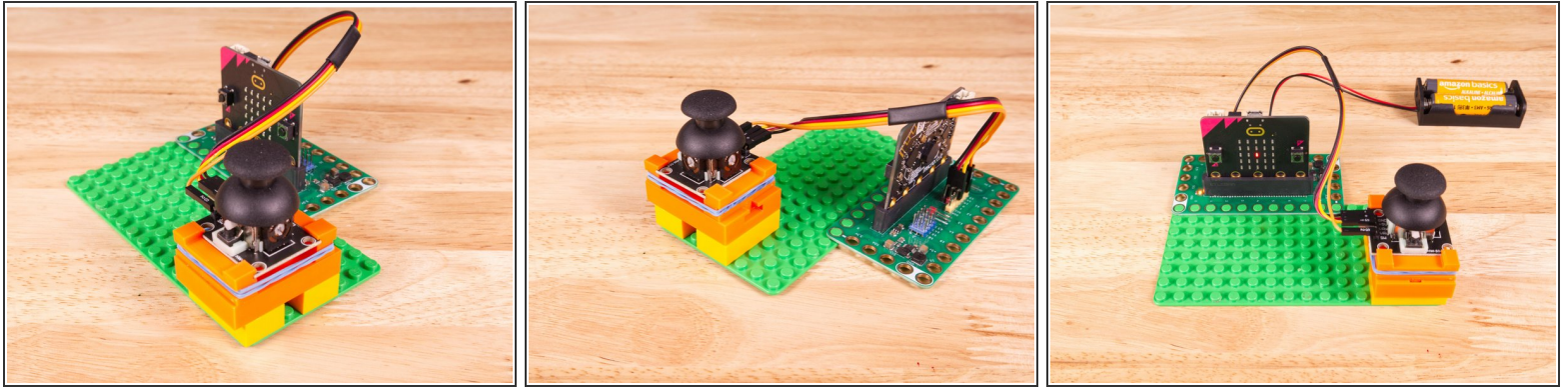
- [Crazy Circuits Bit Board](#) (1)
- [micro:bit](#) (1)
- [Crazy Circuits Ribbon Cable](#) (1)
- [Thumbstick](#) (1)

Step 1 — Connect the Thumbstick



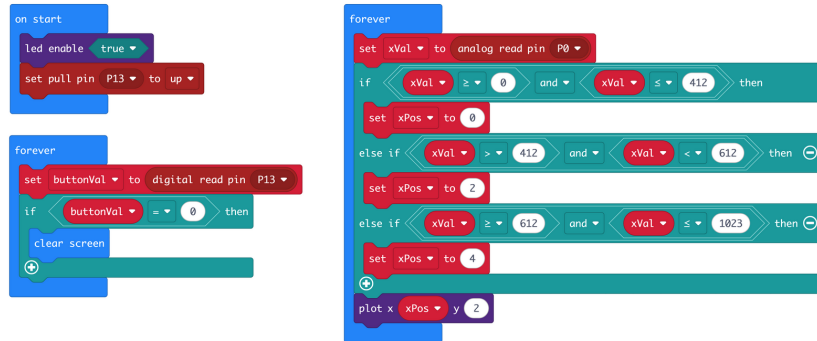
- We'll connect the **Thumbstick** with a **Crazy Circuits Ribbon Cable** using all four wires.
 - Plug the three-wire connector of the **Crazy Circuits Ribbon Cable** into the row with **Pin 0** on the Bit Board. The wire colors should match the pin header colors, with **S1** (yellow) going to the yellow 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 — Mounting the Thumbstick



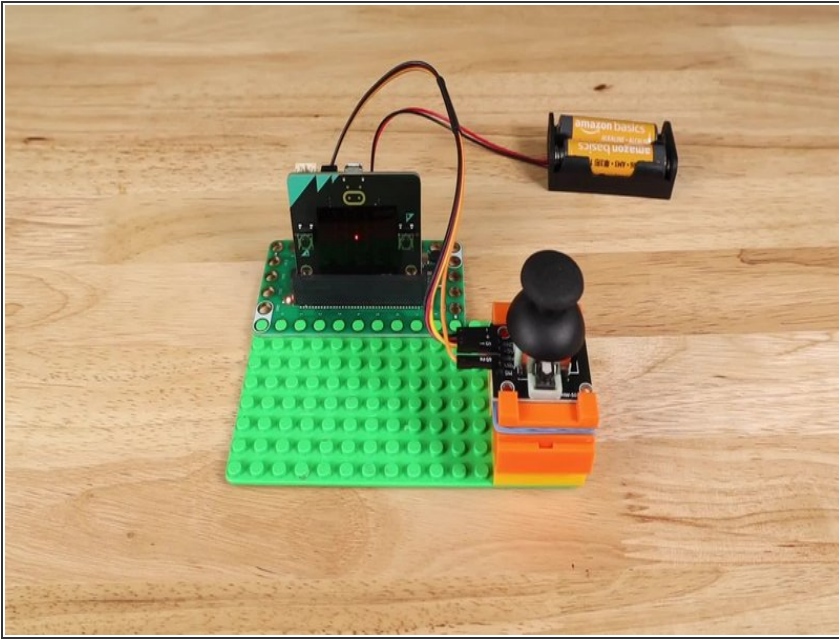
- We used a 3D printed part we designed to hold the Thumbstick in place on a LEGO baseplate.
- We attached two 2x4 LEGO Bricks to the bottom of the 3D printed holder to allow it to snap onto the LEGO Baseplate a bit easier.
- Alternately you can try to use some LEGO bricks and some rubber bands to hold the sensor in place, or just hold it in your hand.
- 3D print your own [Thumbstick Sensor Holder](#).

Step 3 — Load the Code



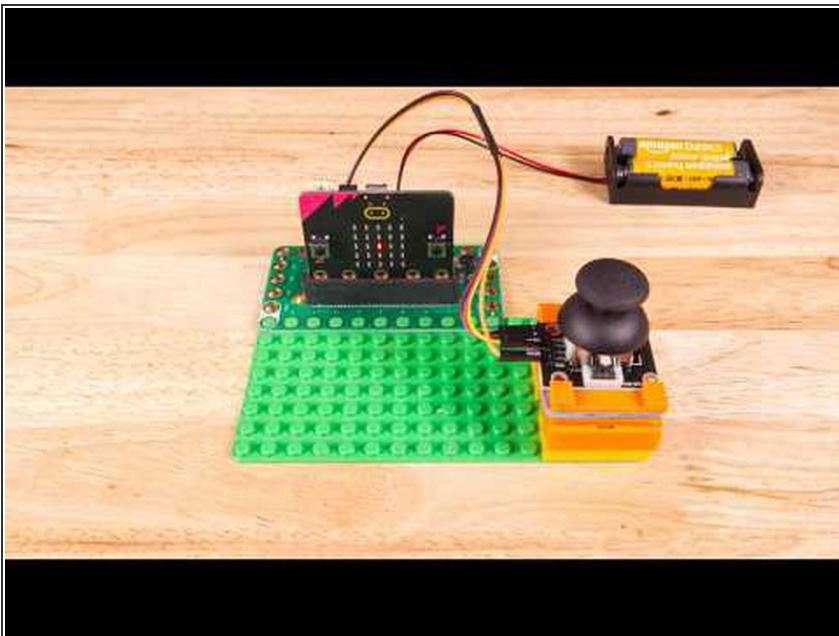
- If you've never used a micro:bit before you'll want to check out this guide: [Bit Board V2 Setup and Use](#)
- We're going to load the following code for our **Thumbstick LED Matrix Plot** program: https://makecode.microbit.org/_Tsw34dPu0...
- In the on start block we'll enable the LED matrix and set **Pin 13** to **pull up**.
- In one forever loop we'll set **buttonVal** to read **Pin 13** (which is connected to the button/switch on the Thumbstick) and if it's pressed we'll clear the screen.
- In the other forever loop we'll set **xVal** to the value from **Pin 0** (which is connected to **VRx**, the X-axis of the Thumbstick) and then check if the value is between a number of ranges.
- This time we'll set **xPos** to a value (0, 2, or 4) and then use plot to *turn on* the specified pixel.

Step 4 — Test it Out!



- Once the code is loaded it should start running immediately.
- ① 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 left and right and you should see more pixels light up. Note that they do not turn off, though pressing the button will clear the screen.

Step 5 — 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://www.youtube.com/live/itzcDaRW9Q>