CH41-D - Thumbstick LEDs Signals Lists

Connect a Thumbstick to a Bit Board and control a set of LEDs connected via Maker Tape.

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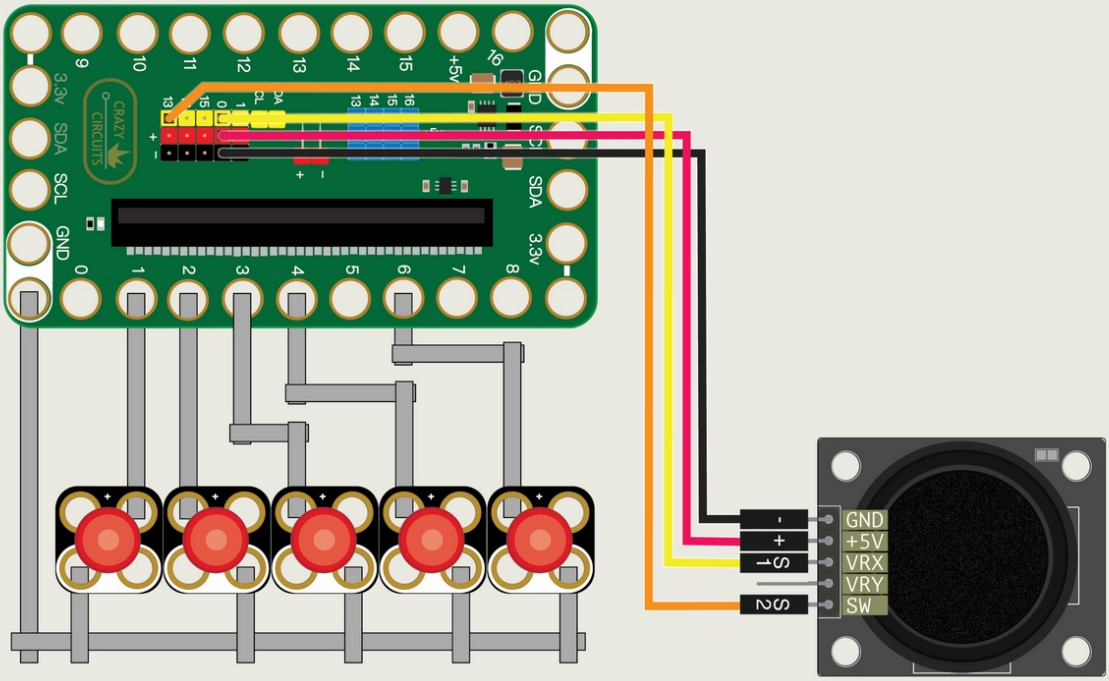
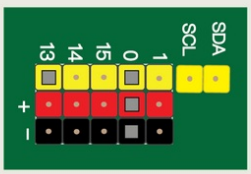


TSTK	Bit Board
GND	-> - (Negative) Pin
+5V	-> + (Positive) Pin
VRX	-> PIN 0 (S1)
VRY	-> (not used)
SW	-> PIN 13 (S2)



INTRODUCTION

Connect a Thumbstick to a Bit Board and control a set of LEDs connected via Maker Tape.

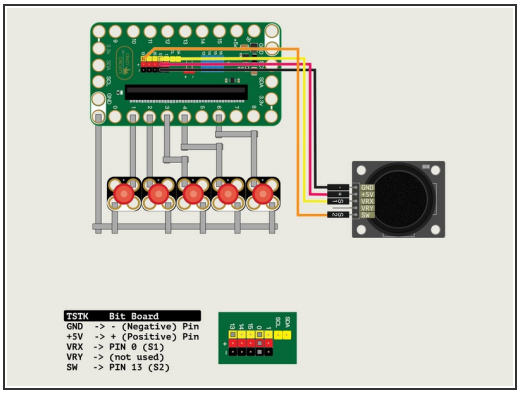
TOOLS:

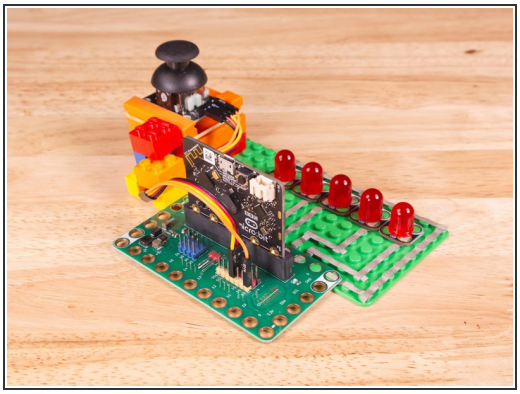
- Computer (1)
- Scissors (1)

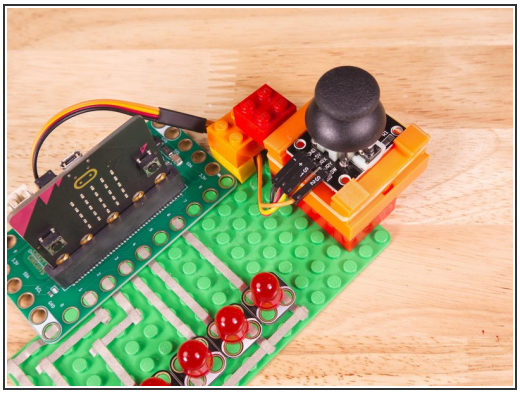
PARTS:

- Crazy Circuits Bit Board (1)
- micro:bit (1)
- Crazy Circuits Ribbon Cable (1)
- Thumbstick (1)
- Crazy Circuits LED Chip (5)
- Maker Tape (1)
  1/8" Wide

Step 1 — Connect the Thumbstick and LEDs





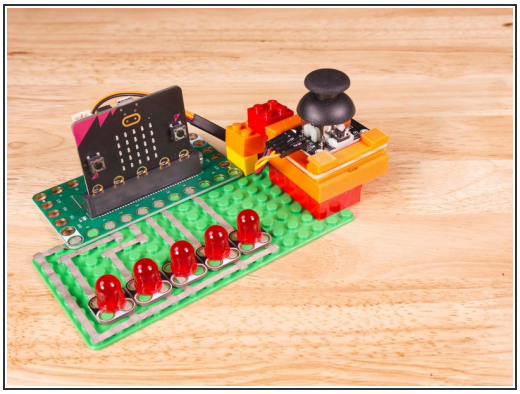
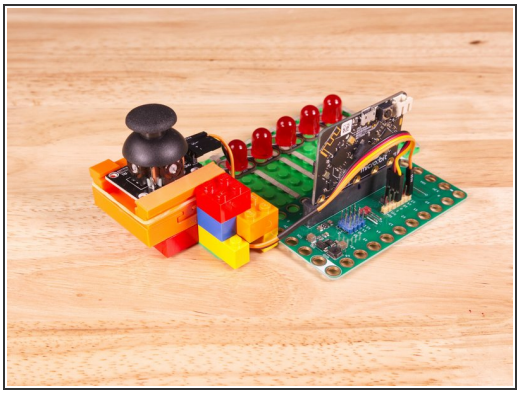
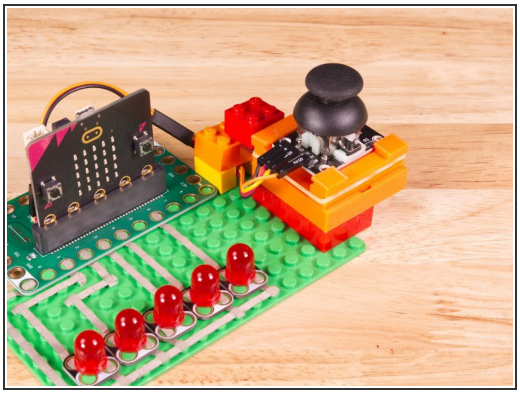


- We'll connect the **Thumbstick** with a **Crazy Circuits Ribbon Cable** using all four wires.
- Plug the three-wire connector of the **Crazy Circuits Ribbon Cable** into the row with **Pin 0** on the Bit Board. The wire colors should match the pin header colors, with **S1** (yellow) going to the yellow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

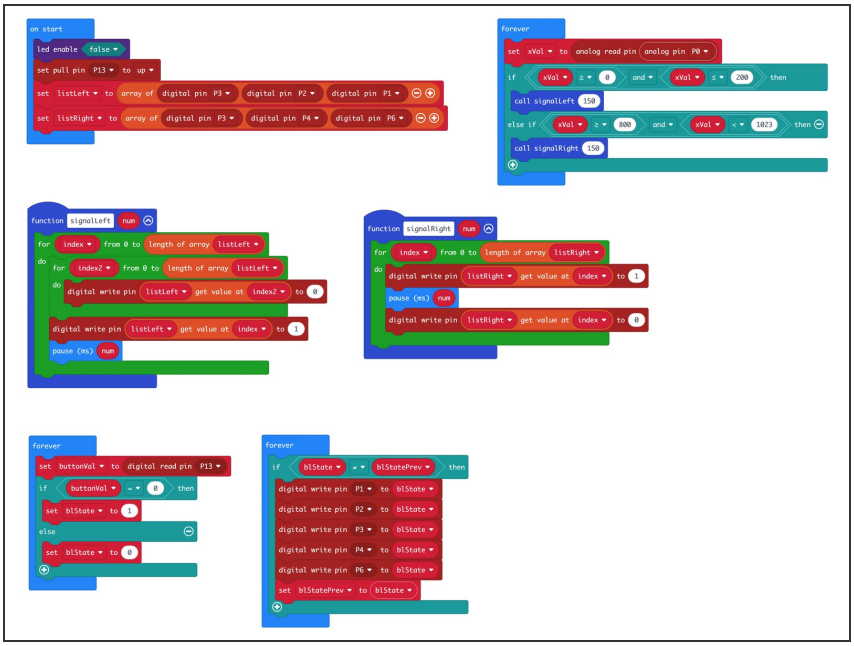
- Connect the Crazy Circuits LEDs using 1/8" Maker Tape as shown.

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. (We also added a few small bricks to hold the ribbon cable in place.)
- 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 LEDs Signals List** program: https://makecode.microbit.org/_VHVDHkFVy...

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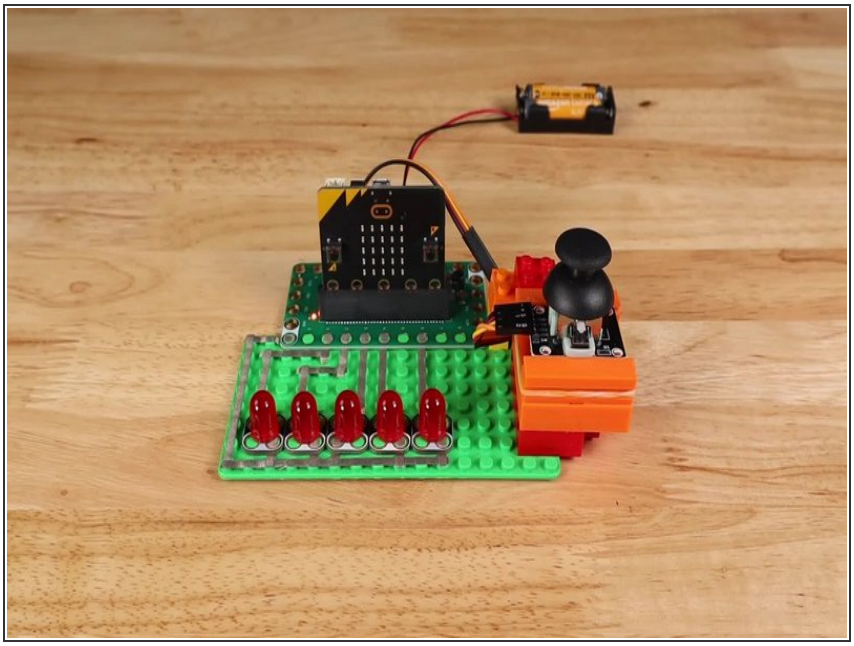
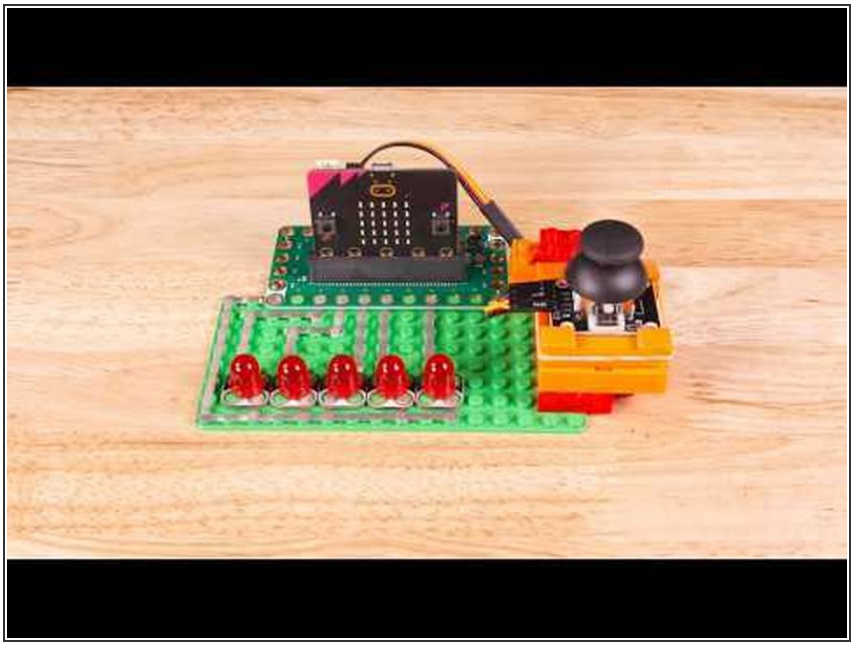
- In the on start block we'll disable the LED matrix, set **Pin 13** to **pull up**, and then create two **lists** containing two different sets of digital pins.
- In one forever loop we'll read the value of Pin 13, assigning it to **buttonVal**, and then set **blState** to either **1** or **0**.
- In a related forever block we'll check to see if **blState** and **blStatePrev** are different, and if so, set the LEDs to the value of **blState**, which will be **1** or **0**. And finally, we'll set **blStatePrev** to the value of **blState**.
- In the third forever loop we'll set **xVal** to the value from **Pin 0** and then check if the Thumbstick is pressed all the way to the left or all the way to the right, and call the appropriate **function**.
- The functions (**signalLeft** and **signalRight**) will display a short 3 pixel animation using the LEDs. We pass in the length of the pause we want after each step of the animation.
- The functions both do the same thing, but in slightly different ways.

Step 4 — 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 left and right and you should see two different "turn signal" animations, one for each direction.
- Press the button and the *down motion* will **turn on** the LEDs while the *up motion* will **turn off** the LEDs.

Step 5 — 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/B9hns5Rp3LY

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