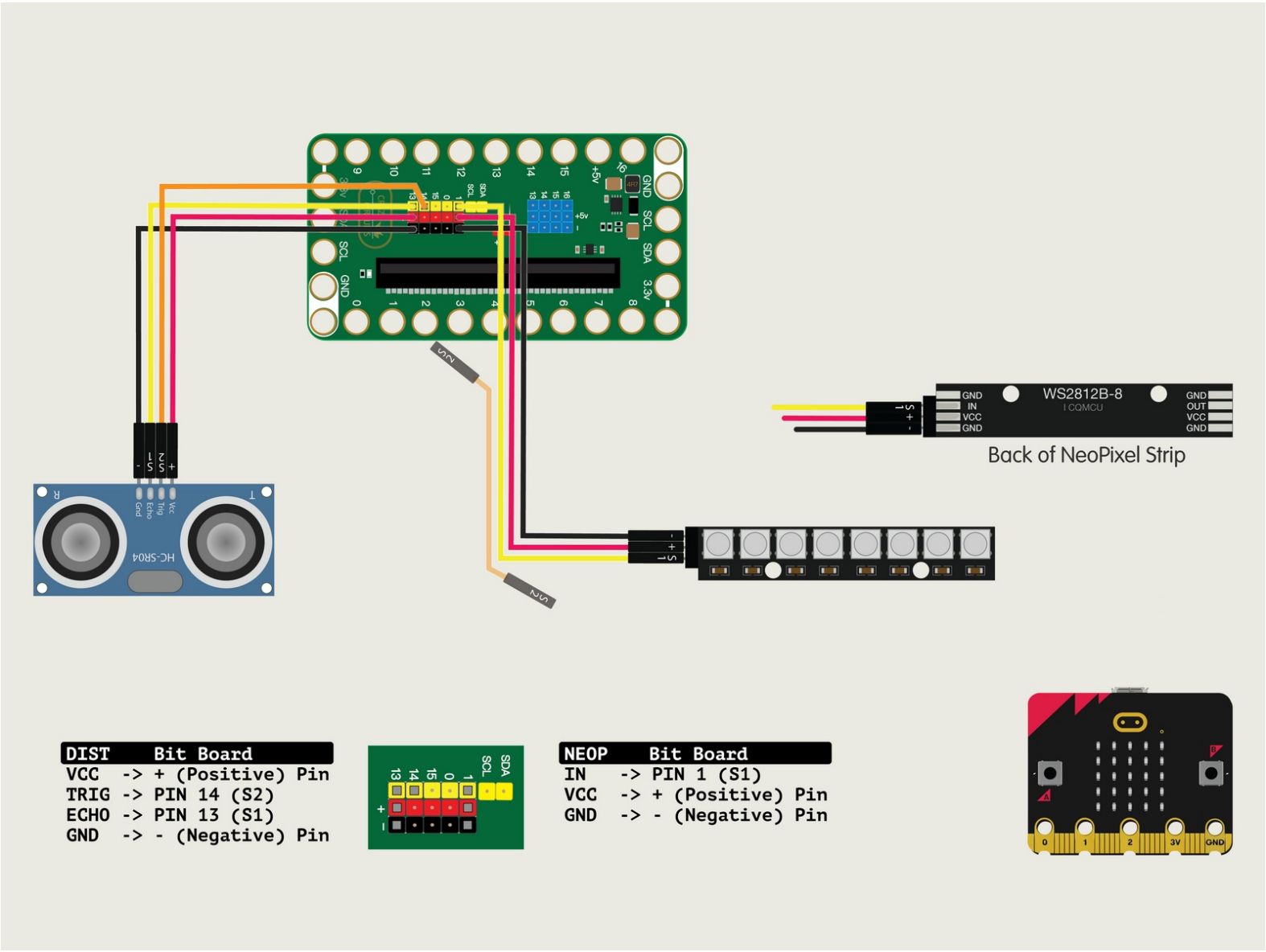
CH36-B - Distance Sensor NeoPixels Flashing

Connect a Distance Sensor to a Bit Board and view the output using a NeoPixel Strip.

Written By: Pete Prodoehl



INTRODUCTION

Connect a Distance Sensor to a Bit Board and view the output using a NeoPixel Strip.

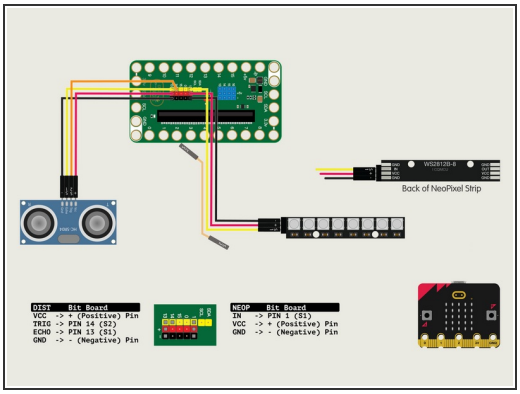
TOOLS:

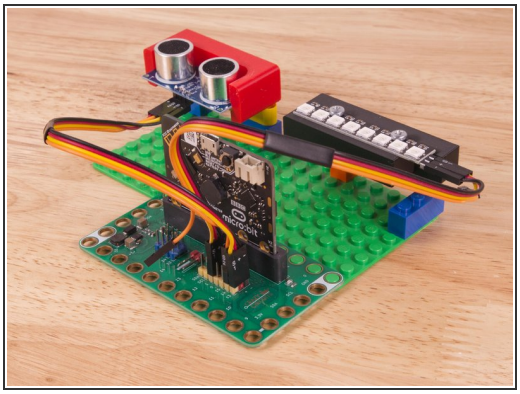
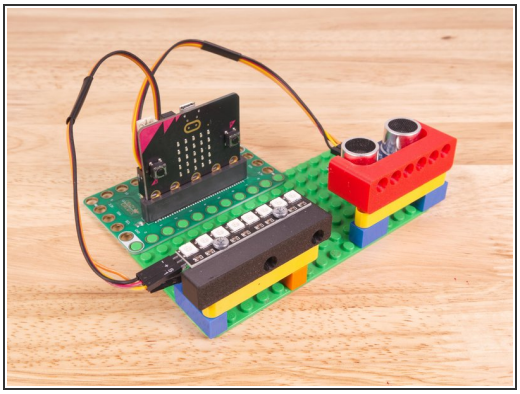
- Computer (1)

PARTS:

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

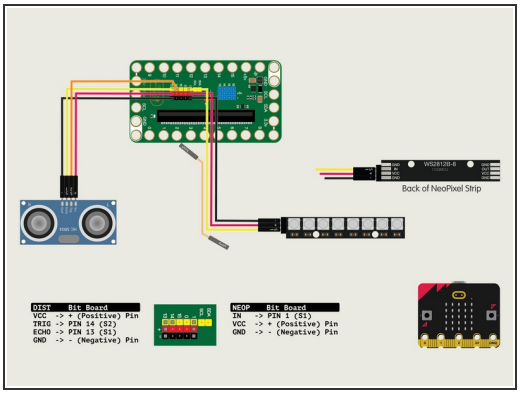
Step 1 — Connect the Distance Sensor

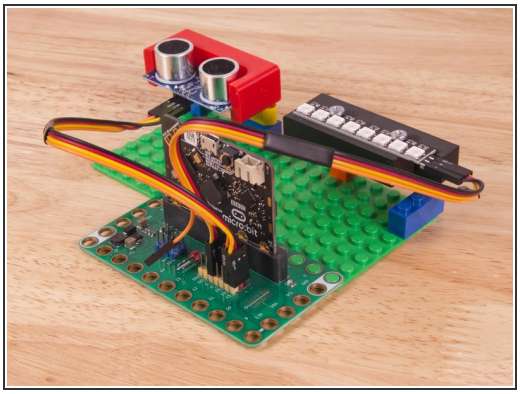
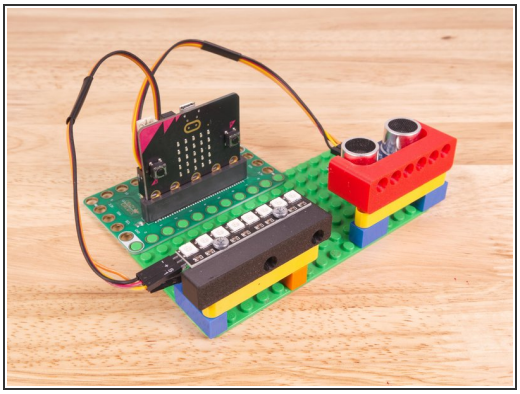


- We'll connect the **Distance Sensor** with a **Crazy Circuits Ribbon Cable** using all four wires.
- Plug the three-wire connector of the **Crazy Circuits Ribbon Cable** into the row with **Pin 13** on the Bit Board. The wire colors should match the pin header colors, with **S1** (yellow) going to the yellow pin.
- Next, plug **S2** (orange) into **Pin 14**. *(S2 is separated from the three-wire connector to allow you to plug it into another row.)*
- To the Distance Sensor plug **+** (red) into **VCC**; **S2** (orange) into **TRIG**; **S1** (yellow) into **ECHO**; and **-** (black) into **GND**.

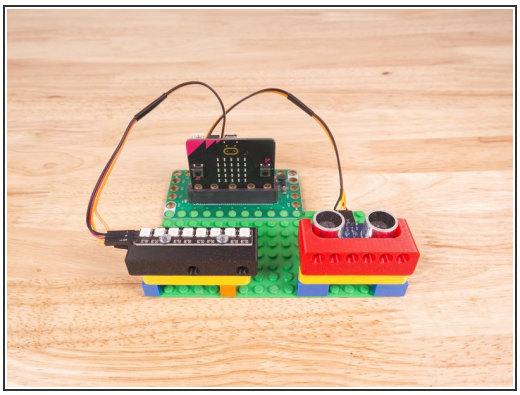
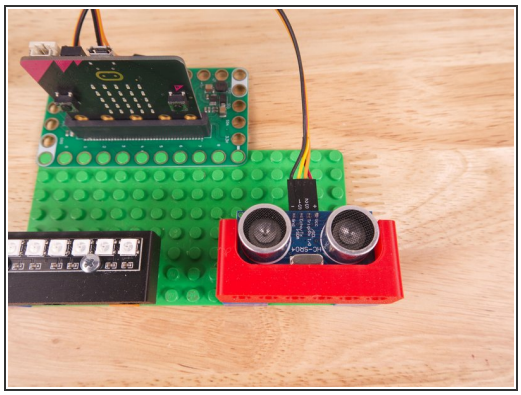
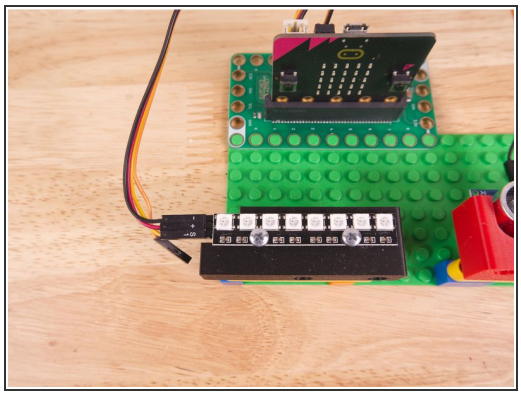
Step 2 — Connect the NeoPixel Strip



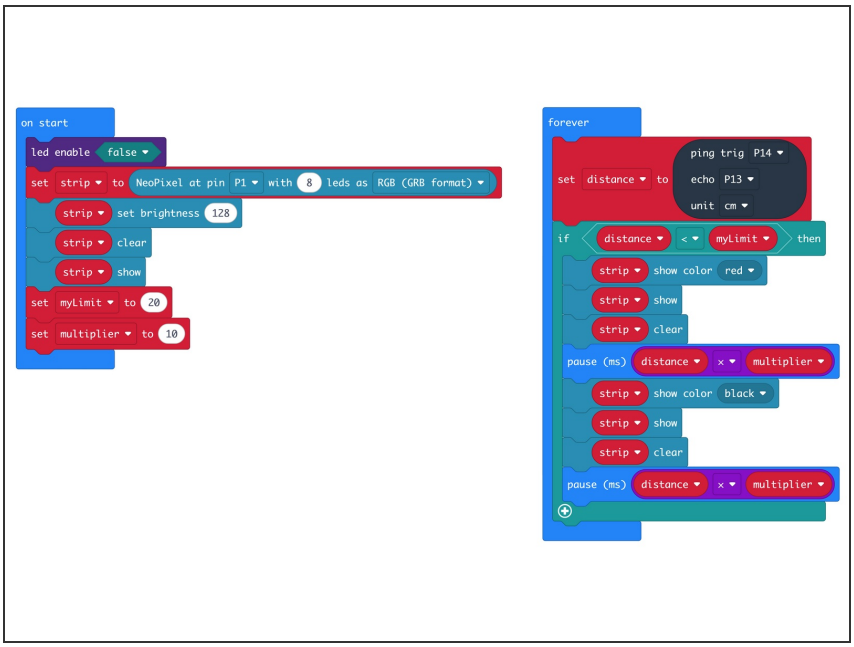
- We'll connect the **NeoPixel Strip** with a **Crazy Circuits Ribbon Cable** using just three of the wires.
- Plug the three-wire connector of the **Crazy Circuits Ribbon Cable** into the row with **Pin 1** on the Bit Board. The wire colors should match the pin header colors, with **S1** (yellow) going to the yellow pin.
  - We do not need to plug in the **S2** (orange) wire, so you can leave it disconnected.
- To the NeoPixel Strip plug **S1** (yellow) into **IN**; **+** (red) into **VCC**; and **-** (black) into **GND**.
  - (Again, we do not need to plug in the **S2** (orange) wire, so you can leave it disconnected.)
- You should now have the Distance Sensor and NeoPixel Strip connected to the Bit Board.

Step 3 — Mounting the Sensor and Strip

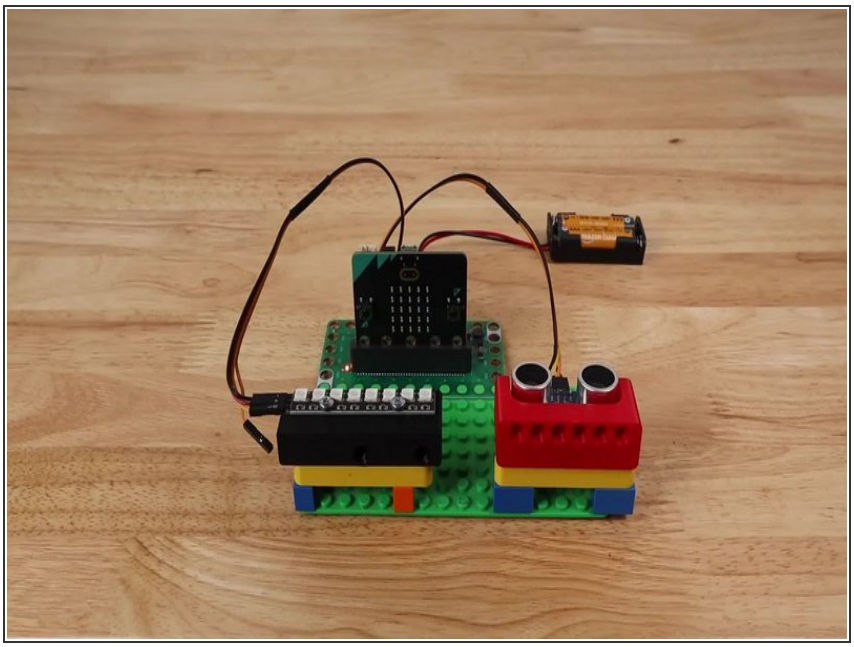
- We used a 3D printed part we designed to hold the Distance Sensor and NeoPixel Strip in place on the LEGO baseplate.
- A few Technic pins, a Technic beam, and some LEGO bricks are all that is needed.
- Alternately you can use some LEGO bricks and a rubber band or tape to hold the sensor in place. *(But don't use anything conductive!)*
- 3D print your own Distance Sensor Holder with Holes and Rover NeoPixel Beam Holder. (They're the same ones we use in our Bit Board Rover Kit).

Step 4 — Load the Code



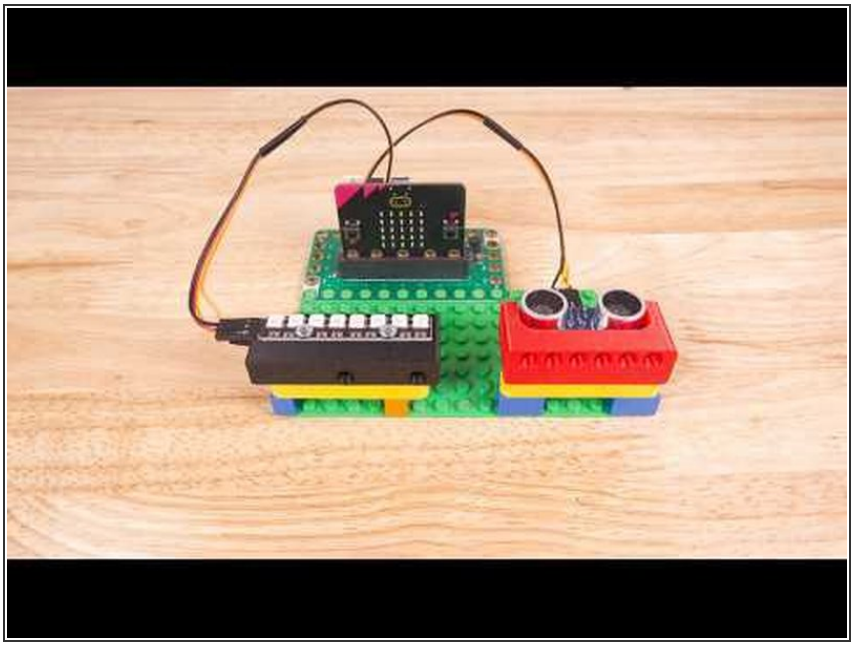
- If you've never used a micro:bit before you'll want to check out this guide: Bit Board V2 Setup and Use
- We're going to load the following code for our **Distance Sensor NeoPixel Flashing** program: https://makecode.microbit.org/_VPDbYeA2M...
- In the on start block we'll set up our NeoPixel Strip and a variable called **myLimit** with a value of **20**. We'll also create a variable named **multiplier** and set it to **10**.
- In our forever loop we'll check if the **distance** is lower than **myLimit** and if so we blink our NeoPixel Strip, first setting it to **red**, then setting it to **black** (or "off").
- We'll **pause** between the blinking on and off for an amount of time that is determined by multiplying the **distance** by our **multiplier**.
- This means as the distance becomes a *smaller number* (as you get closer) the rate of blinking will *increase* causing the NeoPixels to blink faster the closer you get to the sensor.

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 your hand (or a flat object) in front of the sensor. When you are within 20cm of the sensor the NeoPixel Strip should start blinking and blink at a faster rate as you get closer to the sensor.

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/watch?v=IF_zZFFZ...