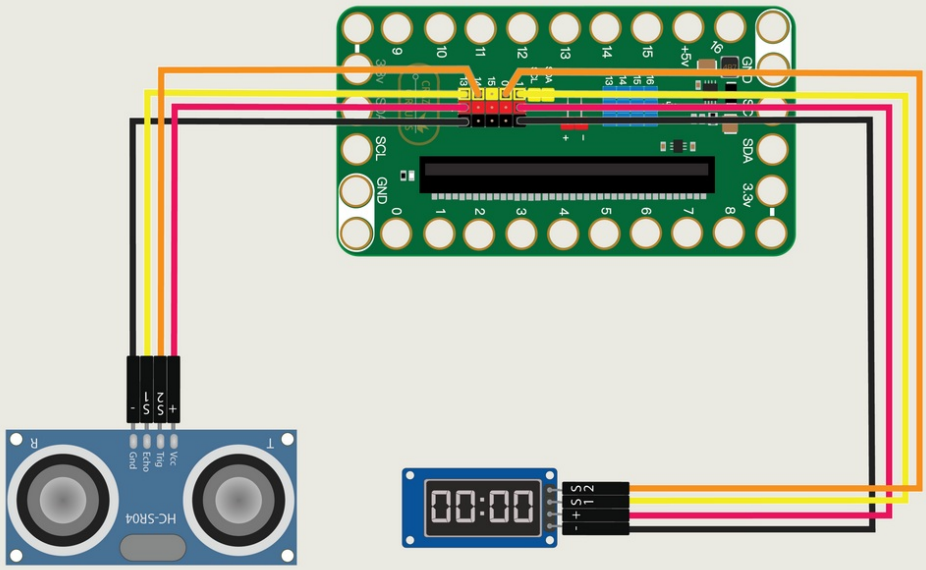
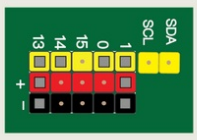
CH37-A - Distance Display

Connect a Distance Sensor to a Bit Board and view the output using a 7 Segment Display.

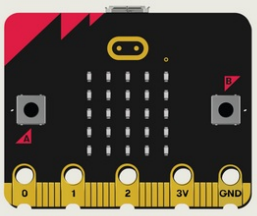
Written By: Pete Prodoehl



DIST	Bit Board
VCC	-> + (Positive) Pin
TRIG	-> PIN 14 (S2)
ECHO	-> PIN 13 (S1)
GND	-> - (Negative) Pin



7SEG	Bit Board
CLK	-> Pin 0 (S2)
DIO	-> Pin 1 (S1)
VCC	-> + (Positive) Pin
GND	-> - (Negative) Pin



INTRODUCTION

Connect a Distance Sensor to a Bit Board and view the output using a 7 Segment Display.

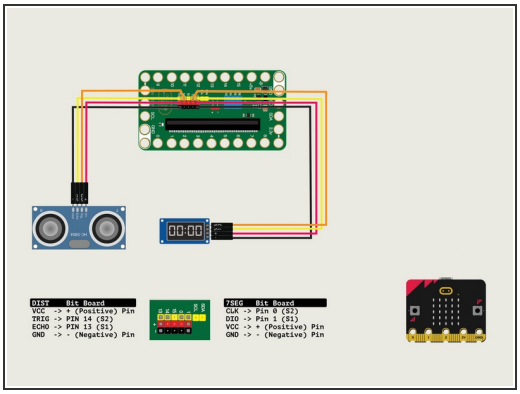
TOOLS:

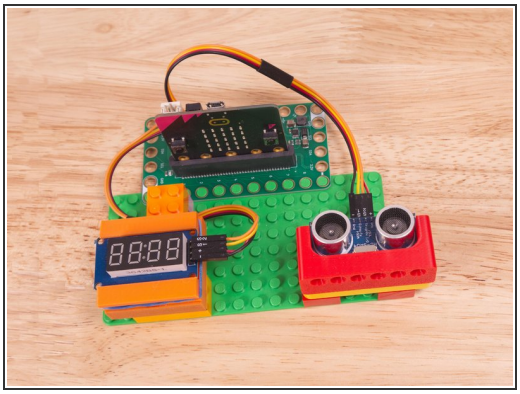
- Computer (1)

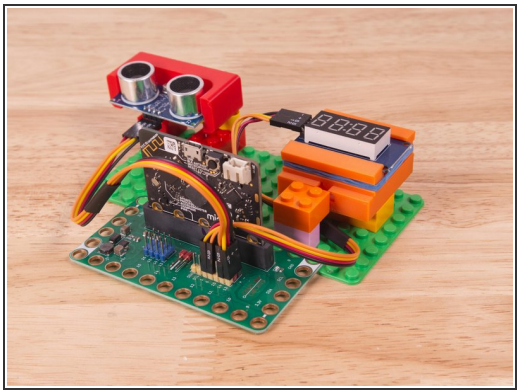
PARTS:

- Crazy Circuits Bit Board (1)
- micro:bit (1)
- Crazy Circuits Ribbon Cable (2)
- Distance Sensor (1)
- 7 Segment Display (1)

Step 1 — Connect the Distance Sensor

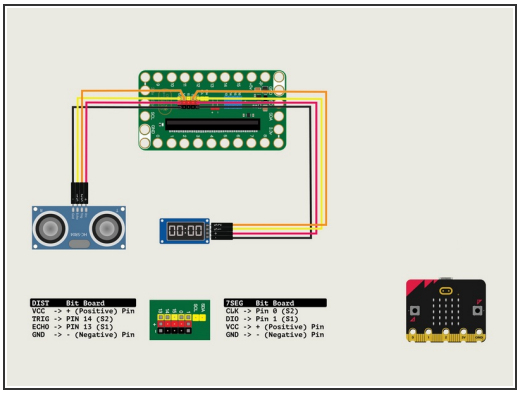


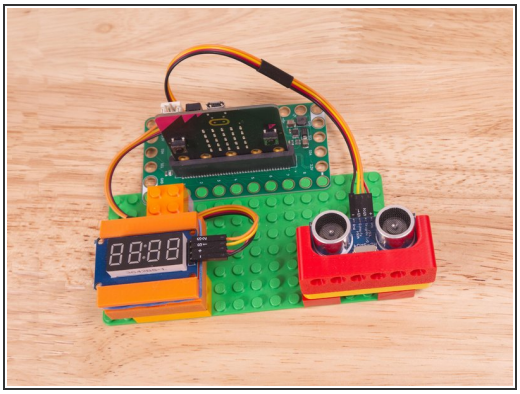


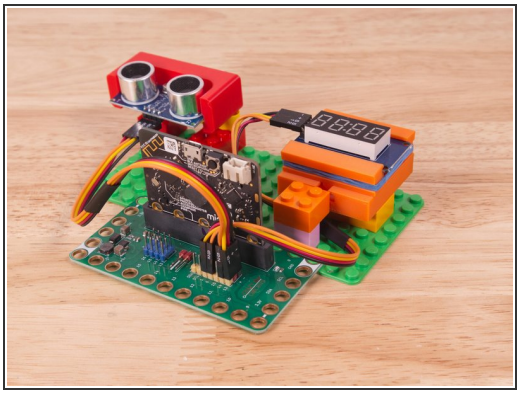


- We'll connect the **Distance Sensor** with a **Crazy Circuits Ribbon Cable** using all four wires.
- Plug the three-wire connector of the **Crazy Circuits Ribbon Cable** into the row with **Pin 13** on the Bit Board. The wire colors should match the pin header colors, with **S1** (yellow) going to 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 7 Segment Display

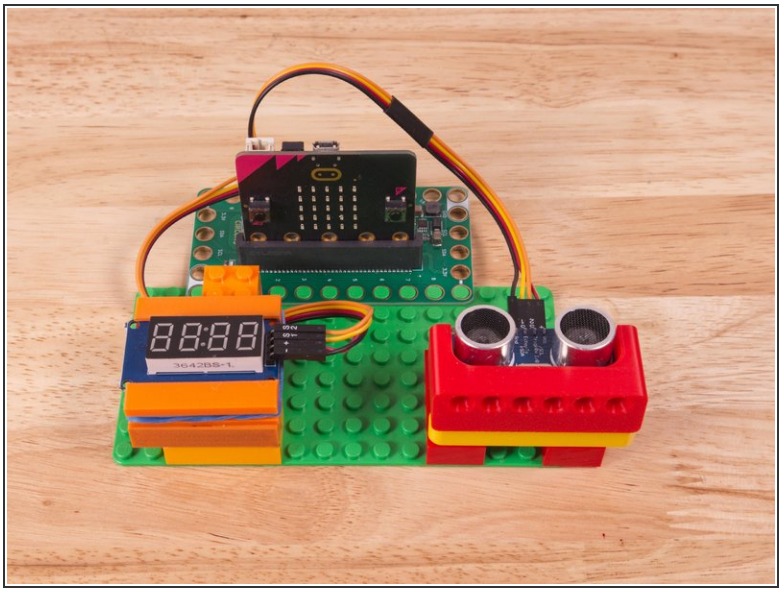


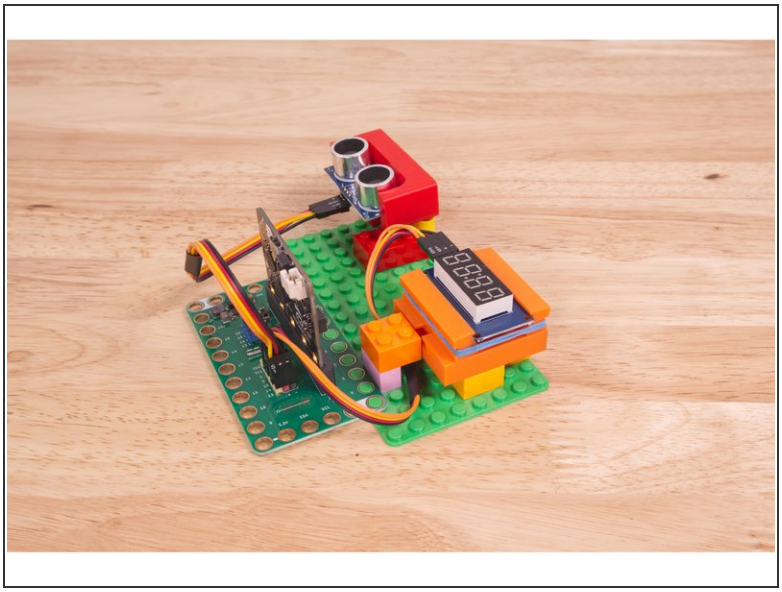




- We'll connect the **7 Segment Display** with a **Crazy Circuits Ribbon Cable** using all four wires.
- Start by plugging the connector with the three wires in it (Black, Red, Yellow) into the **Pin 1** row of the Bit Board. (Make sure the Black wire is in **-** and the Yellow wire labeled **S1** is closest to the number **1** on the Bit Board.)
- We can then plug the Orange wire labeled **S2** into **Pin 0** on the Bit Board.
- Now we'll connect the other end of the Ribbon Cable to the **7 Segment Display**.
- The pin labels are on the back of the 7 Segment Display PCB. From top to bottom it's **CLK**, **DIO**, **VCC**, **GND**.
  - **CLK** stands for **Clock** and **DIO** stands for **Data Input/Output**. **VCC** is the **Positive** (+) and **GND** is the **Ground** (-) or **Negative**.
- **S2** (Orange) goes to **CLK**, **S1** (Yellow) goes to **DIO**, and then **+** (Positive) goes to **VCC** and **-** (Ground or Negative) goes to **GND**.
- Make sure every wire is connected in the correct place, or our display will not work!

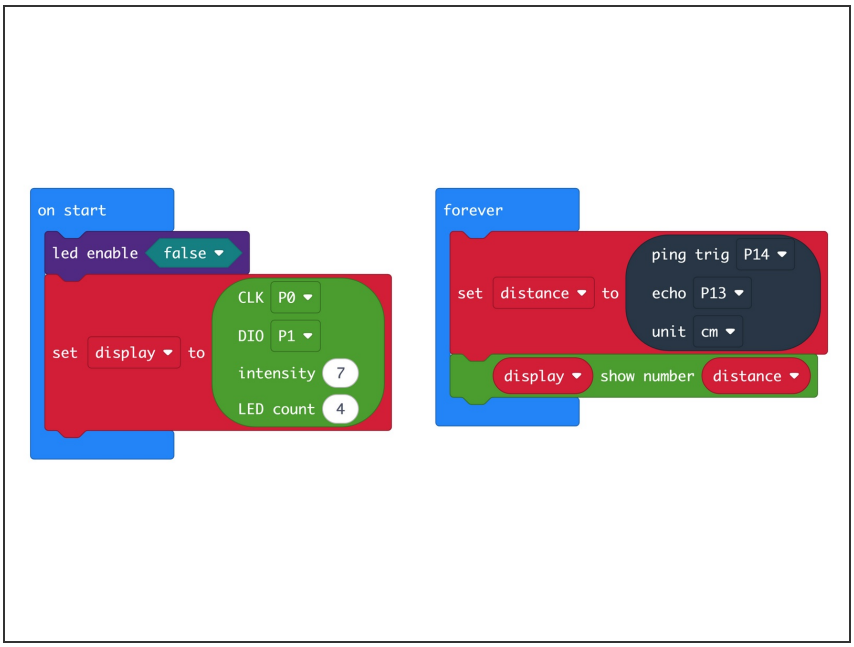
Step 3 — Mounting the Sensor and Display





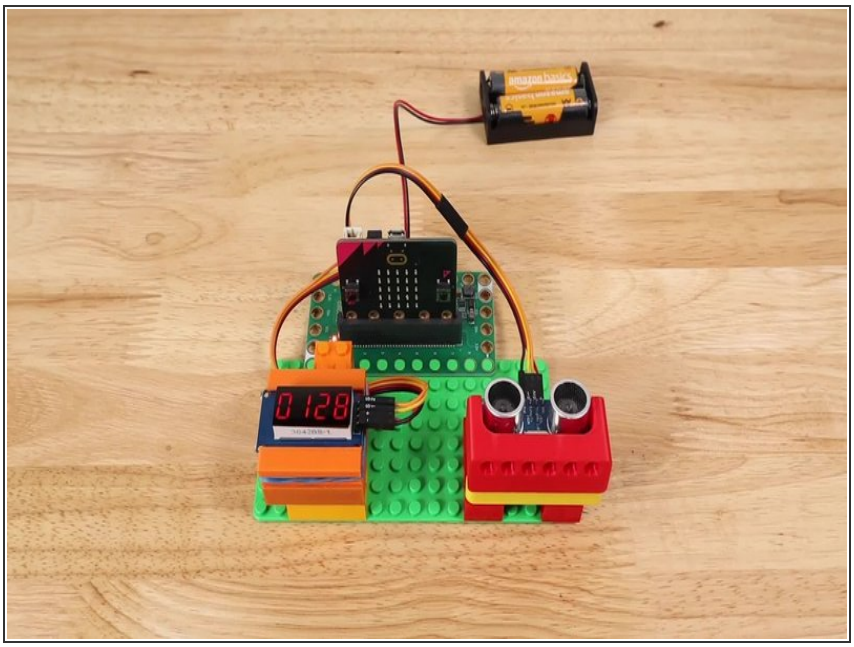
- We used a 3D printed part we designed to hold the Distance Sensor in place on the LEGO baseplate.
- A few Technic pins, a Technic beam, and some LEGO bricks are all that is needed.
- Alternately you can use some LEGO bricks and a rubber band or tape to hold the sensor in place. *(But don't use anything conductive!)*
- We also used a custom holder to hold the display in place.
- 3D print your own Distance Sensor Holder with Holes and 7 Segment Display Holder.

Step 4 — Load the Code



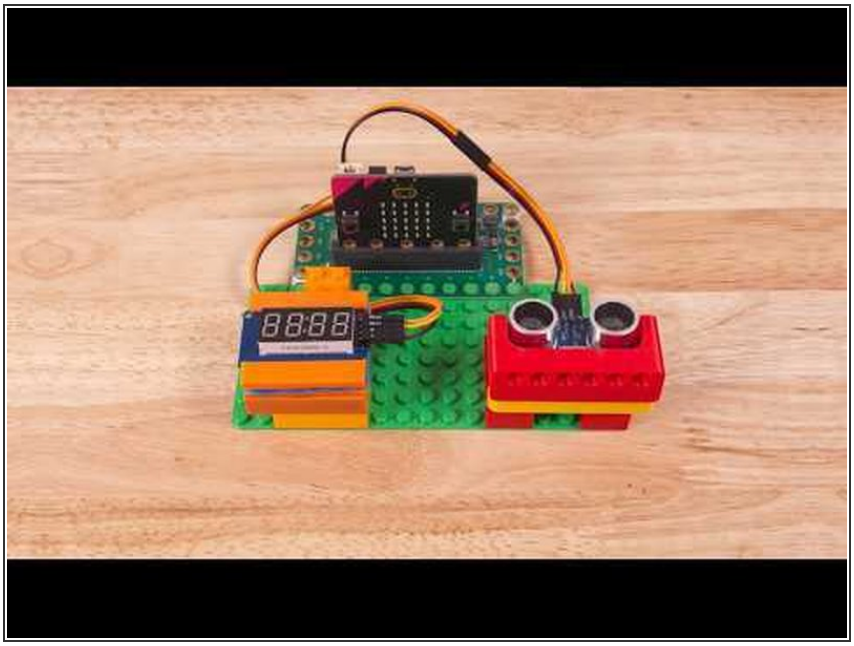
- If you've never used a micro:bit before you'll want to check out this guide: Bit Board V2 Setup and Use
- We're going to load the following code for our **Display Distance** program: https://makecode.microbit.org/_RRV5bYXhg...
- In the on start block we'll set up our 7 Segment Display.
- In our forever loop we'll assign the reading from the Distance Sensor to a variable named **distance** and then display the value on the 7 Segment Display.
- It really is that simple! This is the most basic example of capturing the value from the **Distance Sensor** and then showing it with the **7 Segment Display**.

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. The display will show the number changing to reflect the distance between the object and 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://youtube.com/live/ZXkvNJzMMh8