Rover Thumbstick Remote
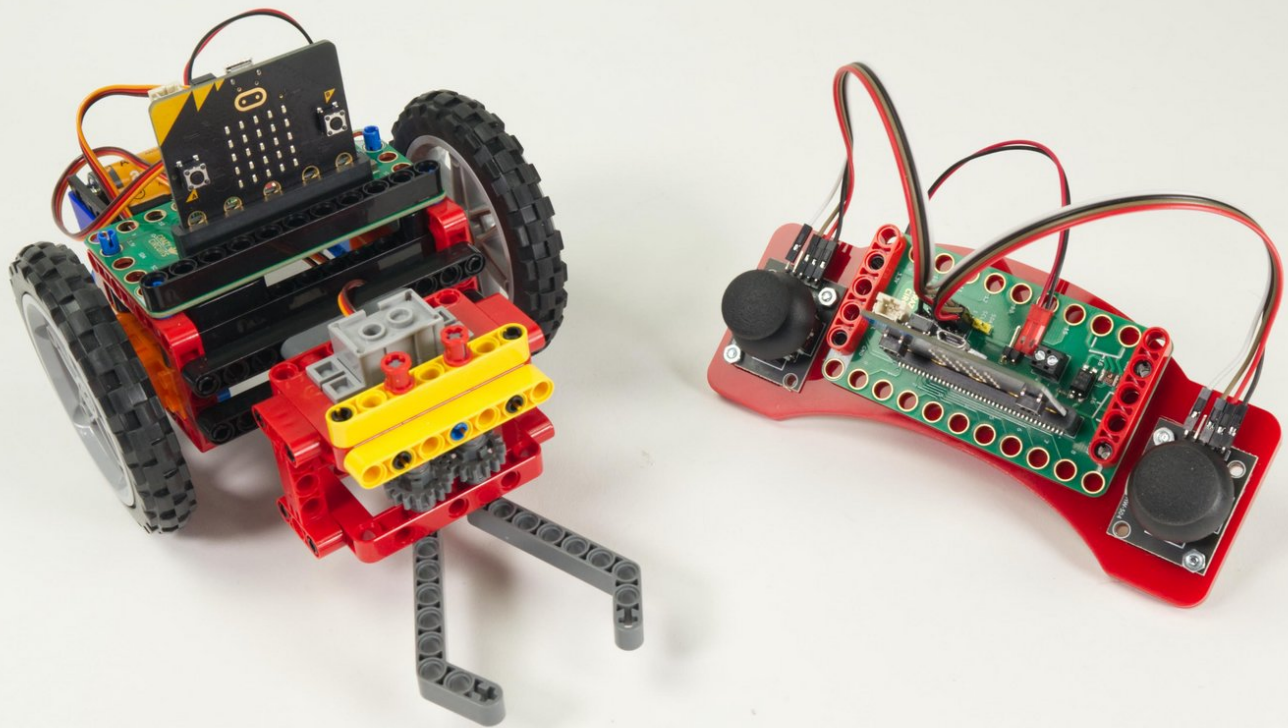
Build a remote control with two thumbsticks to control your Rover.

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INTRODUCTION

Build a remote control with two thumbsticks to control your Rover. The left thumbstick controls the left wheel (forward & backward) and the right thumbstick controls the right wheel. You can drive forward, reverse, or spin in either direction.

You can also manipulate the Gripper using the built-in buttons on each thumbstick to open and close the fingers. We've also made it easy to change the speed of the Rover using the A and B buttons on the micro:bit

If you want a more bare-bones remote check out our **Rover Simple Remote** or **Rover Bluetooth Control**
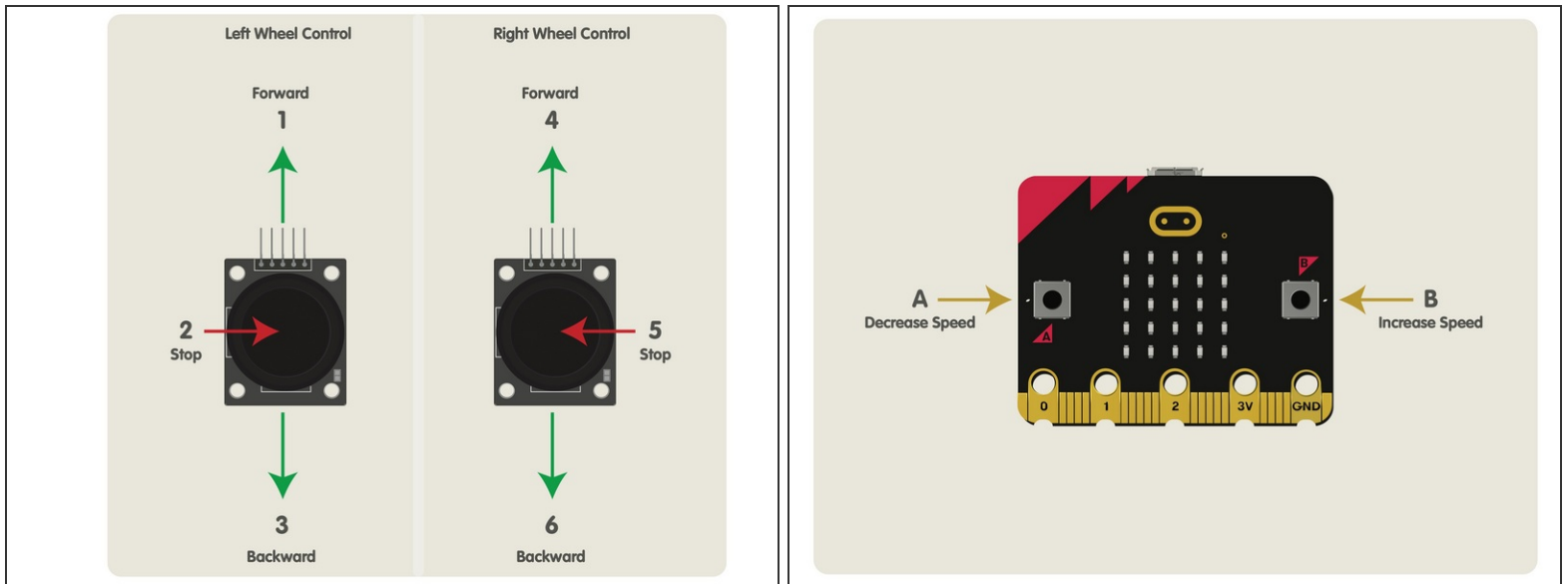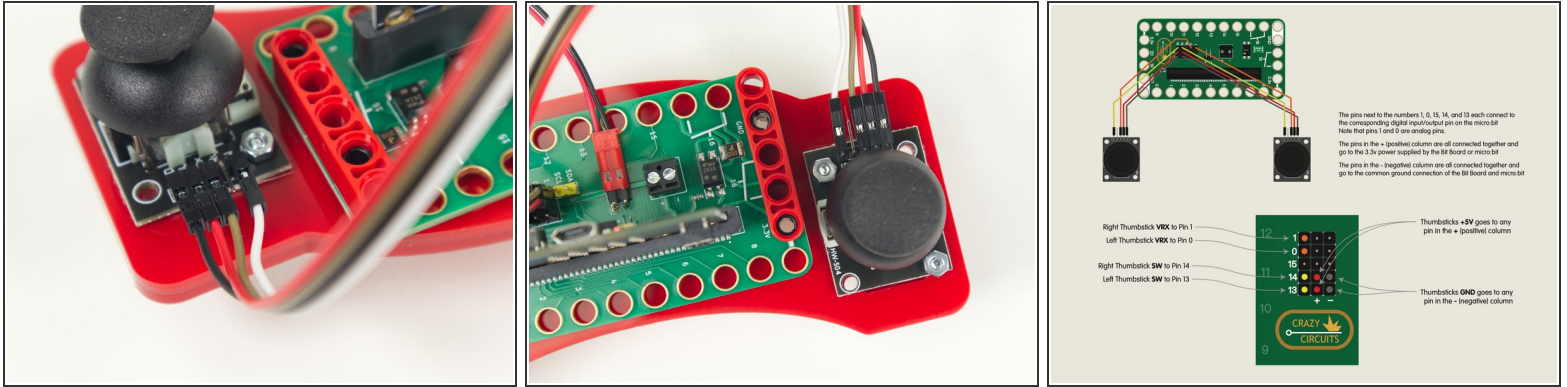
TOOLS:

- Computer (1)

PARTS:

- Bit Board Rover Kit (1)
- micro:bit (2)
- Rover Remote Kit (1)

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Step 1 — Rover and Remote

- If you've built the [Rover Main Body](#) and you want a full-featured remote control this guide will show you how to build one.

- We'll load new code onto the Rover's micro:bit so it can act as a receiver, and we'll load code onto the second micro:bit so it can work as a transmitter.

- Our remote will control the left and right wheels independently, which will allow the rover to move forward, backwards, and turn left and right. (And spin around in circles!)

- Since the thumbsticks have built-in buttons (that are activated when you press down) we'll use those to control the [Rover Gripper](#) if you have it attached.

- We've added one more feature. You can change the speed of the Rover by using the remote. By default it will start at 50% speed but you can decrease or increase this.

- Just press the **A** button on the Remote Control micro:bit to slow it down. (One press lowers 10% each time.)

- Pressing the **B** button will inversely increase the speed by 10% each time.

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Step 2 — Connect the Thumbsticks

⚠ Note: If your kit came with the Crazy Circuits Ribbon Cable check the next step before plugging anything in.

- Connect the two thumbsticks as shown.

- For the <u>Left</u> Thumbstick connect **VRX** to **Pin 0**, **SW** to **Pin 13**, and then **+5V** to any pin in the **+** (positive) column and **GND** to any pin in the **-** (negative) column.

- For the <u>Right</u> Thumbstick connect **VRX** to **Pin 1**, **SW** to **Pin 14**, and then **+5V** to any pin in the **+** (positive) column and **GND** to any pin in the **-** (negative) column.

Step 3 — Crazy Circuits Ribbon Cable
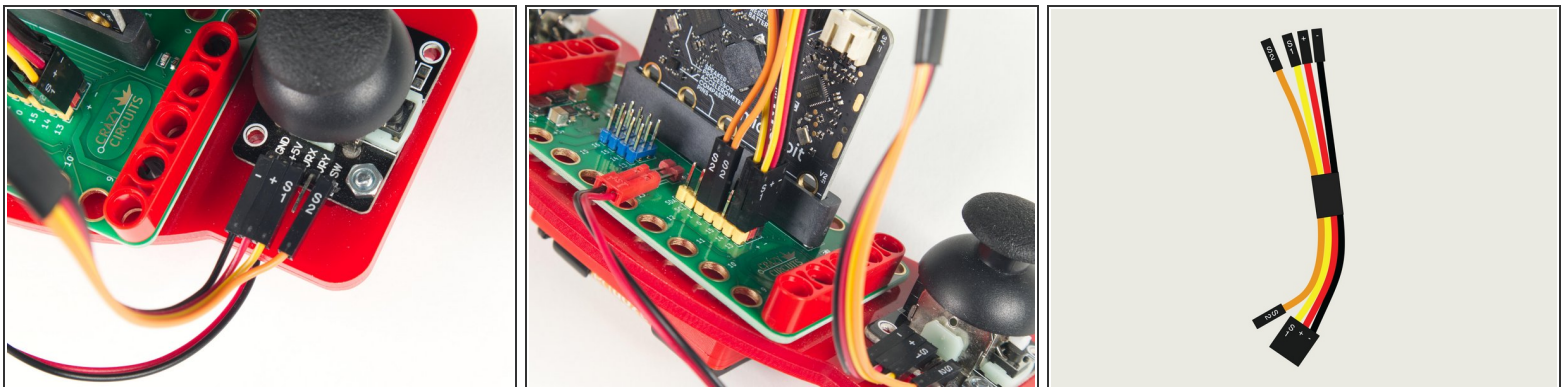
⚠ Note: In January 2024 we started to include the Crazy Circuits Ribbon Cable in our kits, which should make connecting things even easier.

- ⌖ Take a look at the [Crazy Circuits Ribbon Cable](link) guide for more info.

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Step 4 — Load the Code - Rover

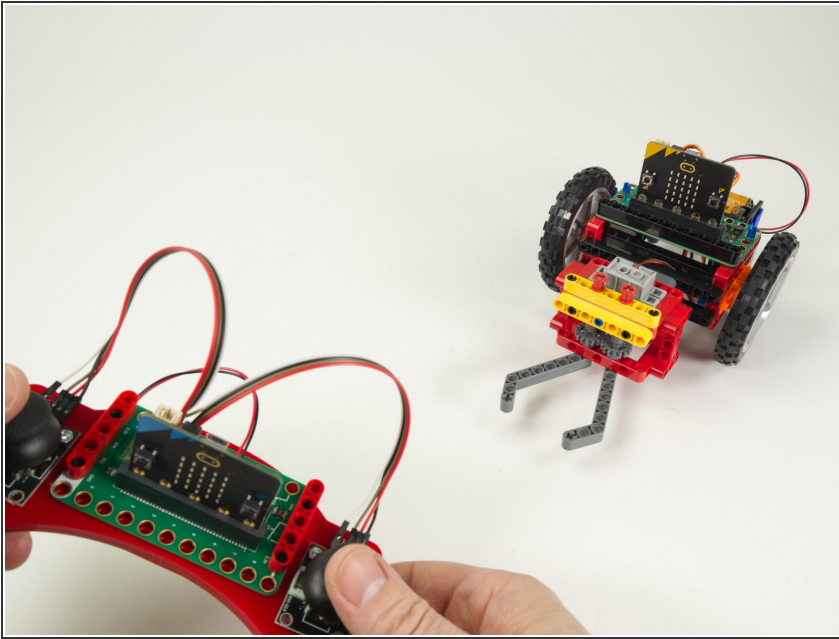⚠ If you've never used a micro:bit before you'll want to check out this guide: Bit Board V2 Setup and Use

● We're going to load the following code for our **Rover Thumb Remote RX** program: https://makecode.microbit.org/_T3bLW80qH...

● Once you load the code it won't do anything. Since the code turns the micro:bit into a receiver it will wait until a transmitter sends data before it does something.

● If you look at the code you'll notice the numbers 1 through 3, and 4 through 6, which we referenced in Step 1. Those are the numbers the transmitter will send to the receiver.

● You may also notice the numbers 7 and 8, which are used to control the Gripper if you have it attached to your Rover.

● Finally numbers 9 and 10 are used to change the speed of the Rover.

ⓘ The **RX** stands for "Receiver". For the code we'll load onto the second micro:bit you'll see **TX** which stands for "Transmitter".

Step 5 — Load the Code - Remote
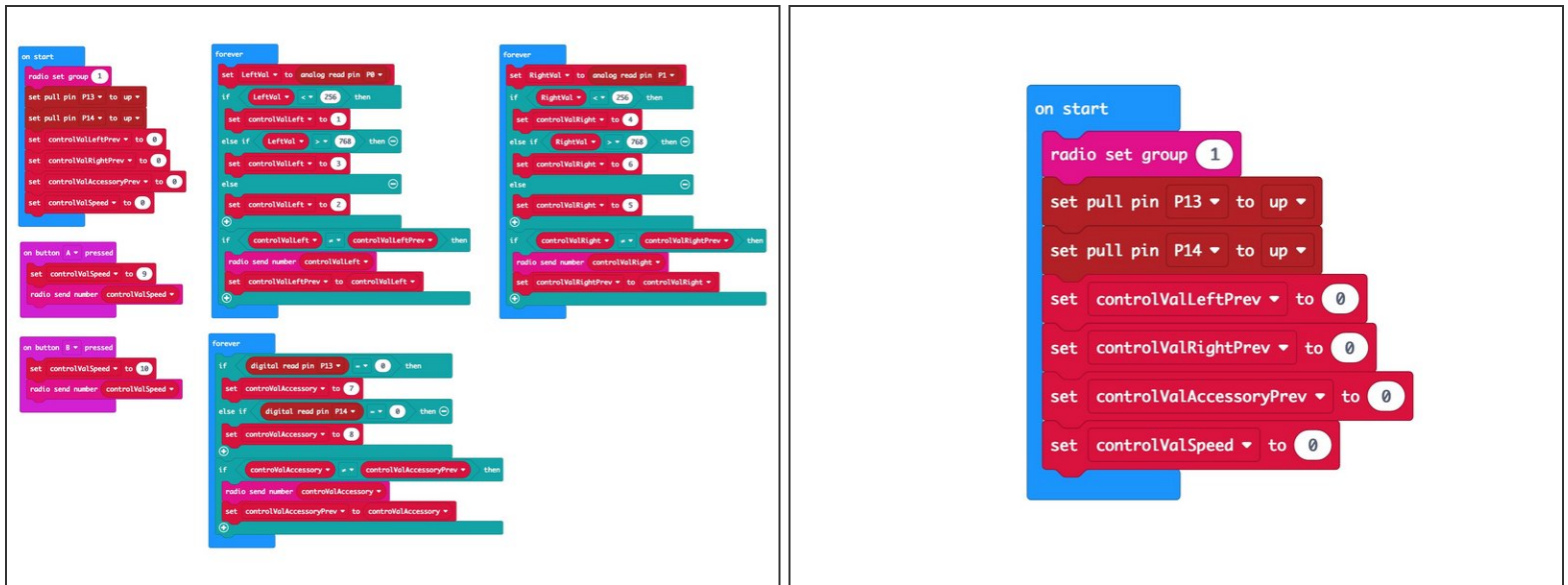
- Let's load the code onto the second micro:bit so it can function as a transmitter and send control signals to the micro:bit on the Rover.

- Load the following code: **Rover Thumb Remote TX** program: https://makecode.microbit.org/_afEWzu5TX...

- ⚠ If you've got the Rover you programmed in the previous step nearby make sure it isn't powered on when you load the code on your transmitter or it may roll away when you move a thumbstick!

- ⓘ Note that we've set the **radio group** to 1. You can choose any number you want as long as the two micro:bits use the same number. For a classroom setting with multiple pairs you'll want each to have a different number.

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Step 6 — Test it Out!

- Once you've got code loaded on both micro:bits you can test using the remote control with your Rover.

- The left thumbstick should make the left wheel turn, and the right joystick should make the right wheel turn.
  - Note that we consider the "left" wheel to be the one on your left side if you were standing **behind** the Rover, not facing the Rover.

- The thumbsticks are also buttons that can be pressed. Pressing each should open and close the fingers of the Gripper.

- If you want the Rover to move slower or faster press the **A** or **B** button on the micro:bit located on the Remote Control.