Rover Simple Remote

You can build a simple remote control for your Rover using a second micro:bit and the battery pack that came with it.

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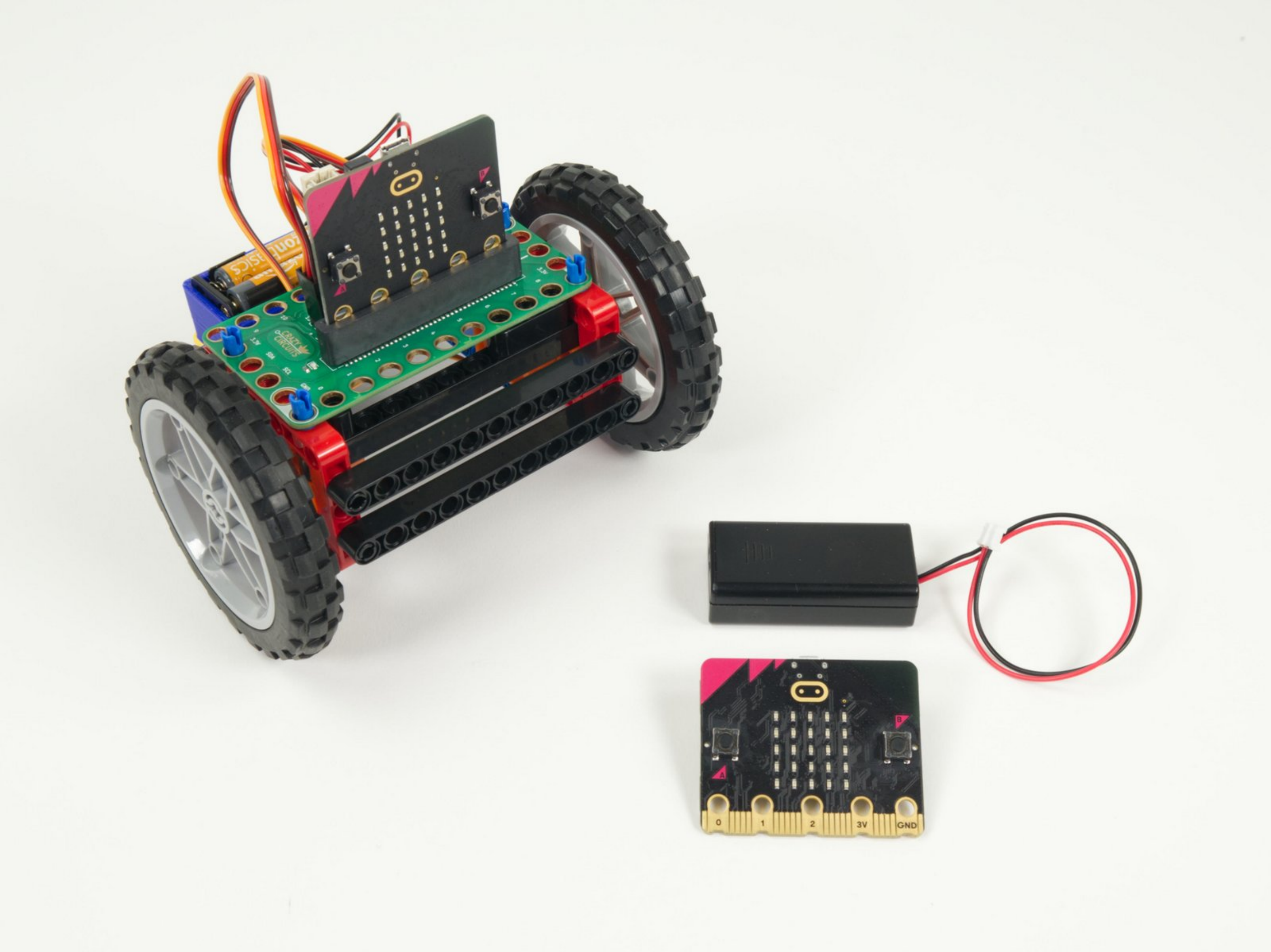

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INTRODUCTION

You can build a simple remote control for your Rover using a second micro:bit and the battery pack that came with it.

If you want a more robust remote check out our Rover Thumbstick Remote.

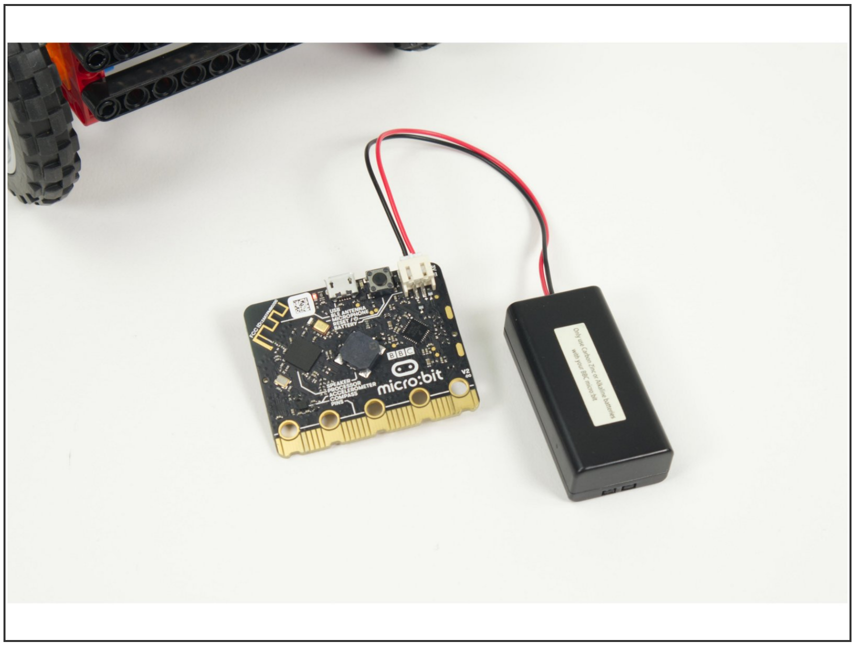
TOOLS:

- Computer (1)

PARTS:

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

Step 1 — Rover and Remote



- If you've built the [Rover Main Body](#) and you have another micro:bit handy it's easy to add remote control to your Rover.

- 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.

- This is going to be a very basic remote control, so besides a micro:bit all you'll need is the battery pack that was included with your micro:bit

  ⓘ Note that the battery pack used with the Bit Board will **not** plug directly into a micro:bit on its own - it will only plug into a Bit Board.

- We need to be able to make the Rover go forward, backwards, and turn left and right, so we need to send the corresponding commands for those four things.

- Since the micro:bit only has two buttons we'll instead use the built-in accelerometer to determine the [rotation](#) of the micro:bit and use that as our input.

- Our remote will make the Rover go *forward* when tilted *forward*, and go *backwards* when tilted *backwards*.

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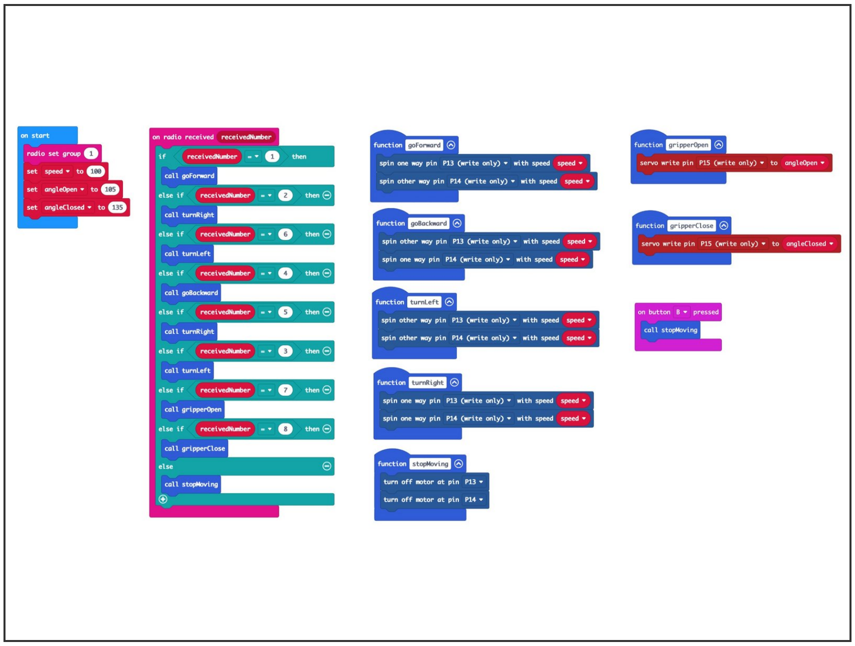
- We'll use the two buttons to turn left and turn right. (Turning will only take affect when the remote it tilted forward or backwards.)

Step 2 — Load the Code - Rover



```
on start
  radio set group 1
  set speed to 100
  set angleOpen to 105
  set angleClosed to 135

on radio received receivedNumber
  if receivedNumber = 1 then
    call goForward
  else if receivedNumber = 2 then
    call turnRight
  else if receivedNumber = 6 then
    call turnLeft
  else if receivedNumber = 4 then
    call goBackward
  else if receivedNumber = 5 then
    call turnRight
  else if receivedNumber = 3 then
    call turnLeft
  else if receivedNumber = 7 then
    call gripperOpen
  else if receivedNumber = 8 then
    call gripperClose
  else
    call stopMoving

function goForward
  spin one way pin P13 (write only) with speed speed
  spin other way pin P14 (write only) with speed speed

function goBackward
  spin other way pin P13 (write only) with speed speed
  spin one way pin P14 (write only) with speed speed

function turnLeft
  spin other way pin P13 (write only) with speed speed
  spin other way pin P14 (write only) with speed speed

function turnRight
  spin one way pin P13 (write only) with speed speed
  spin one way pin P14 (write only) with speed speed

function stopMoving
  turn off motor at pin P13
  turn off motor at pin P14

function gripperOpen
  servo write pin P15 (write only) to angleOpen

function gripperClose
  servo write pin P15 (write only) to angleClosed

on button B pressed
  call stopMoving
```

⚠ 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 Simple Remote RX** program: https://makecode.microbit.org/_LUR6P29A4...

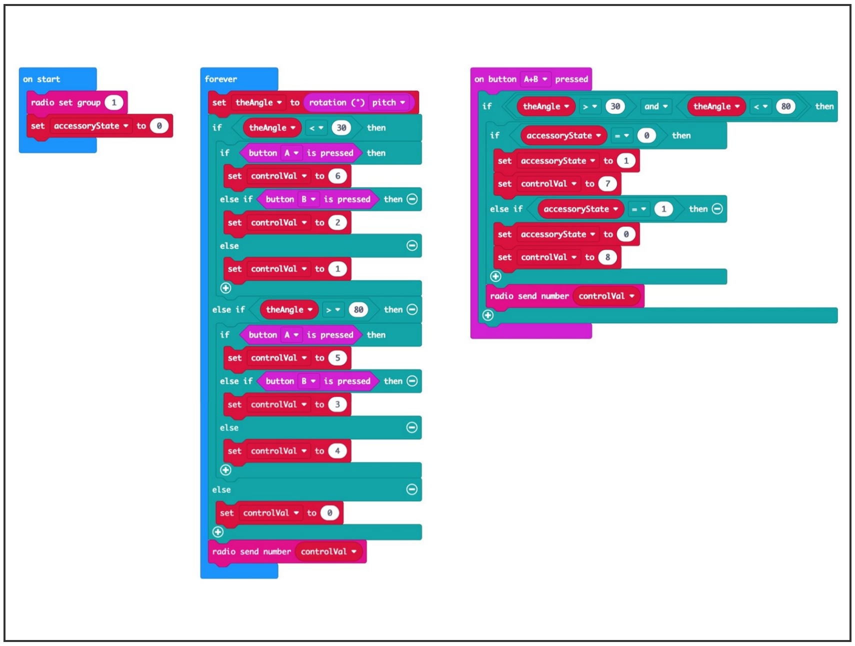
- Once you load the code it won't do anything. Since the code turns the micro:bit into a receiver it will wait until a transmitter sends data before it does anything.

- If you look at this code you'll see a number of **functions**; goForward, goBackward, turnLeft, turnRight, stopMoving, as well as two more, gripperOpen and GripperClose.

- Each function is called when the receiver gets a specific number sent from the transmitter.

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

Step 3 — Load the Code - Remote

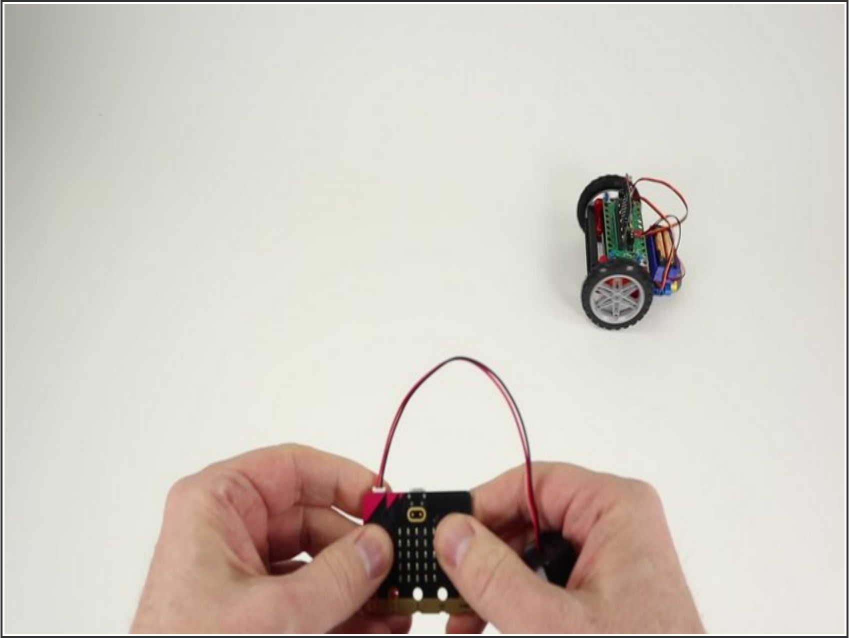


```
on start
  radio set group 1
  set accessoryState to 0

forever
  set theAngle to rotation (°) pitch
  if theAngle < 30 then
    if button A is pressed then
      set controlVal to 6
    else if button B is pressed then
      set controlVal to 2
    else
      set controlVal to 1
  else if theAngle > 80 then
    if button A is pressed then
      set controlVal to 5
    else if button B is pressed then
      set controlVal to 3
    else
      set controlVal to 4
  else
    set controlVal to 0
  radio send number controlVal

on button A+B pressed
  if theAngle > 30 and theAngle < 80 then
    if accessoryState = 0 then
      set accessoryState to 1
      set controlVal to 7
    else if accessoryState = 1 then
      set accessoryState to 0
      set controlVal to 8
    radio send number controlVal
```

- 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 Simple Remote TX** program: https://makecode.microbit.org/_Ago3tAVxR...

⚠ 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 unexpectedly!

Step 4 — Test it Out!



- Once you've got code loaded on both micro:bits you can test using the remote control with your Rover.
- Tilt the "Remote" micro:bit forward and your Rover should roll forward. Tilt it backwards and the Rover should roll backwards.

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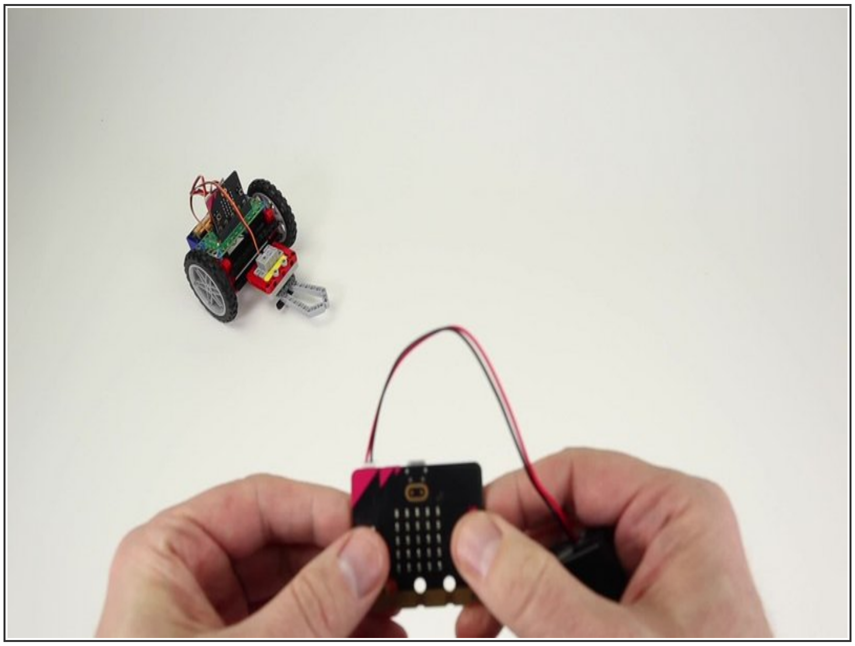
- To turn left, press the **A** button while tilting forward. To turn right press the **B** button while tilting forward. (You can also press A or B when tilting backwards!)

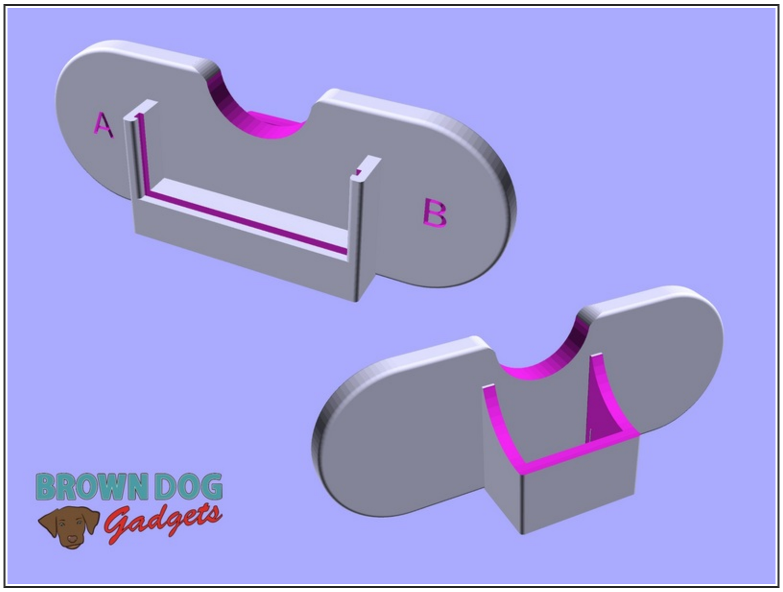
Step 5 — Get a Grip!

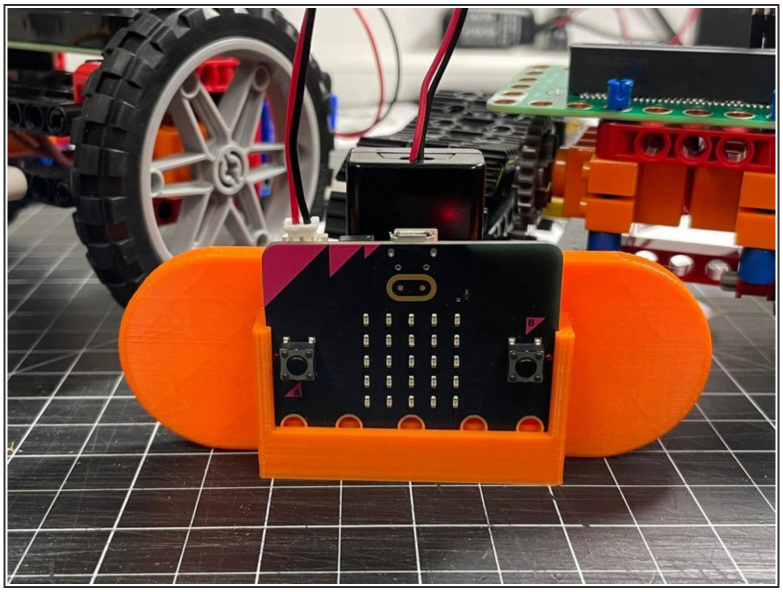


- We've added one more surprise to our remote. If you built the Rover Gripper you can control it with the remote by press the **A** and **B** buttons at the same time.
- The Gripper will toggle between opened and closed with each press of the **A** and **B** buttons. The code keeps track of the position of the gripper. (You should start with the Gripper in the **open** position.)
- Using the remote can take a bit practice, but it's a great minimal way to add remote control capabilities to the Rover.

ⓘ Note that the gripper will only be activated when the Rover is not moving.

Step 6 — Get a Better Grip





- If you find holding the micro:bit and battery pack a little awkward, we've designed a 3D printed holder for you. Check out the: micro:bit Holder

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