



## SIEMENS DRIVERLESS CAR CHALLENGE: ROUTE C

Radio is set to become an important part of driverless car technology. In the same way that you can listen to music travelling on radio waves, your driverless vehicle can send and receive important coded information in order to navigate the streets safely. Radio waves can also be used by vehicles to sense their surroundings.

## STUDENT ACTIVITY 1: ROUTE C – RADIO CONTROL DRIVE!

Using the micro:bit block editor (<https://makecode.microbit.org/>), copy the codes below onto two micro:bit controllers, with one acting as a receiver to control the buggy motors and the second as a transmitter to send instructions.

If you have your own buggy, test the code on your own printout of the Auto City map. You will have to adjust the speed of the motors for your own buggy.

If you have more than one buggy in operation, you will have to choose a different radio channel for each micro:bit pair.

## CONTROLLER INSTRUCTIONS:

Forward: A + B

Left: A

Right: B

Brake: Shake!



## CONTROLLER TRANSMITTER CODE

```

on start
  radio set group 255
  set received to 0
  on radio received receivedNumber
    set received to receivedNumber
  
```

```

forever
  if button A+B is pressed
    then radio send number 3
  else if button B is pressed
    then radio send number 2
  else if button A is pressed
    then radio send number 1
  else if acceleration (mg) strength > 1500
    then radio send number 4
  
```



## BUGGY RECEIVER CODE

```

on start
  radio set group 151
  set received to 0

  on radio received receivedNumber
    set received to receivedNumber

forever
  if received == 1
    then
      pause (ms) 400
      drive motor right speed 350
      drive motor left speed -350
      pause (ms) 70
      drive motor all speed 0
  else if received == 2
    then
      pause (ms) 400
      drive motor right speed -350
      drive motor left speed 350
      pause (ms) 70
      drive motor all speed 0
  else if received == 3
    then
      pause (ms) 400
      drive motor left speed 350
      drive motor right speed 350
  else if received == 4
    then
      drive motor all speed 0
  
```

## ACTIVITY 2: QUESTIONS

Answer the following in full sentences

- a) Radio is part of RADAR technology, and is used on sensors to detect obstacles. What does radar stand for?

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- b) RADAR uses radio waves to detect how far obstacles are away from the vehicle, by bouncing radio waves off an obstacle, and using the returning wave to calculate the vehicle's distance from the object. Why is this a better way of detecting obstacles than a touch sensor?

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- c) You can explore how obstacles such as pedestrians and other vehicles are detected by trying the Siemens Self-Driving Challenge Game [www.siemens.co.uk/gamesarcade](http://www.siemens.co.uk/gamesarcade) Suggest three ways that driverless car technology could improve the experience of road users.

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