Positioning Sensors for Running in a Maze

Ian Butterworth

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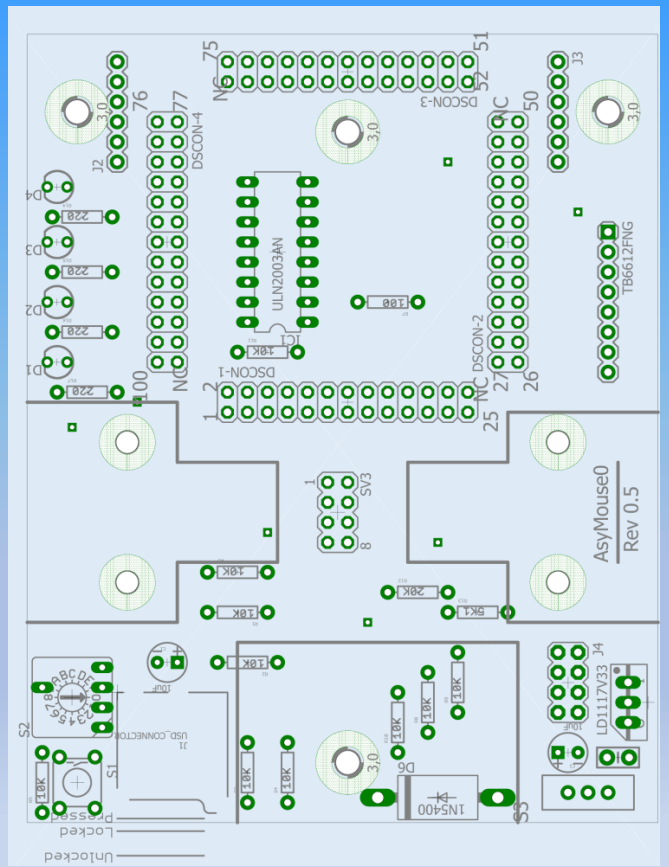
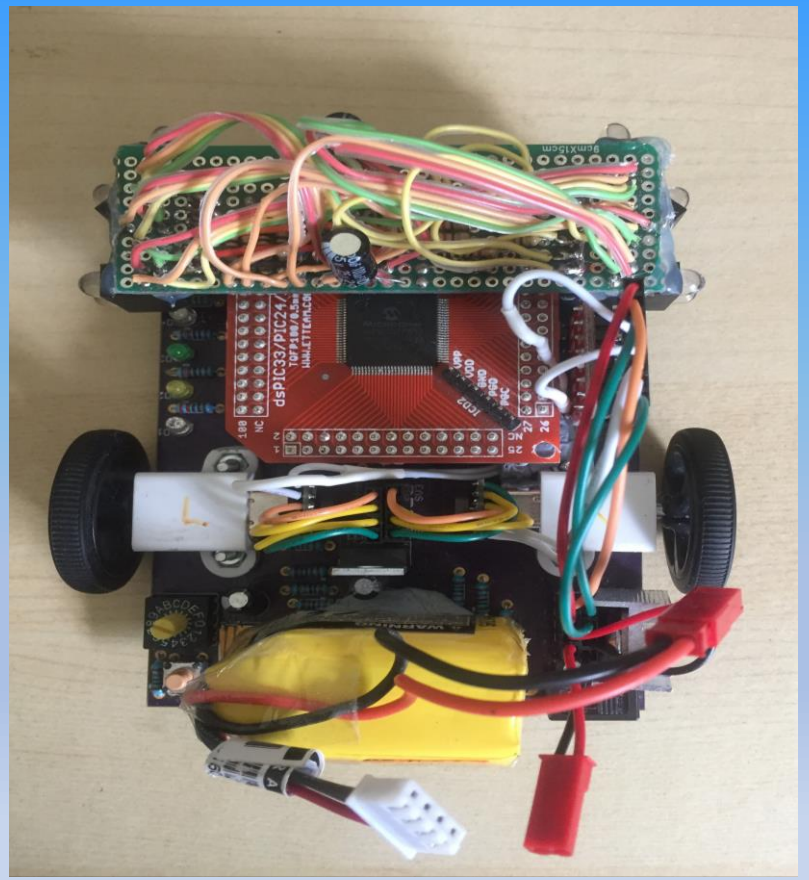
Positioning Sensors for Running in a Maze

Situation

- Asymouse is dimensionally challenged!
- Motherboard is 100 x 80mm





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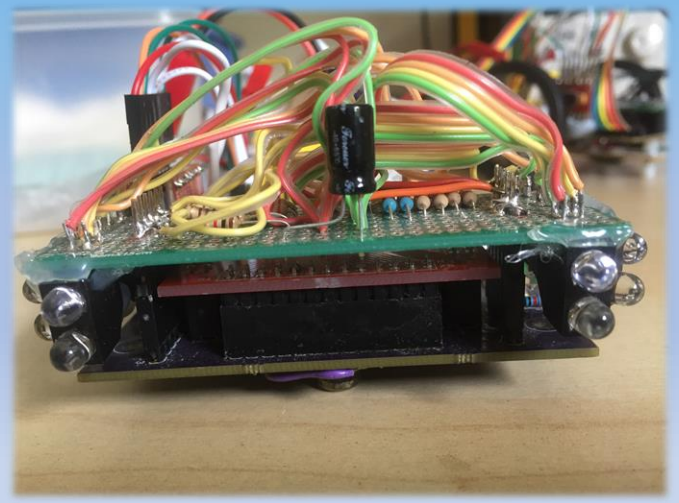
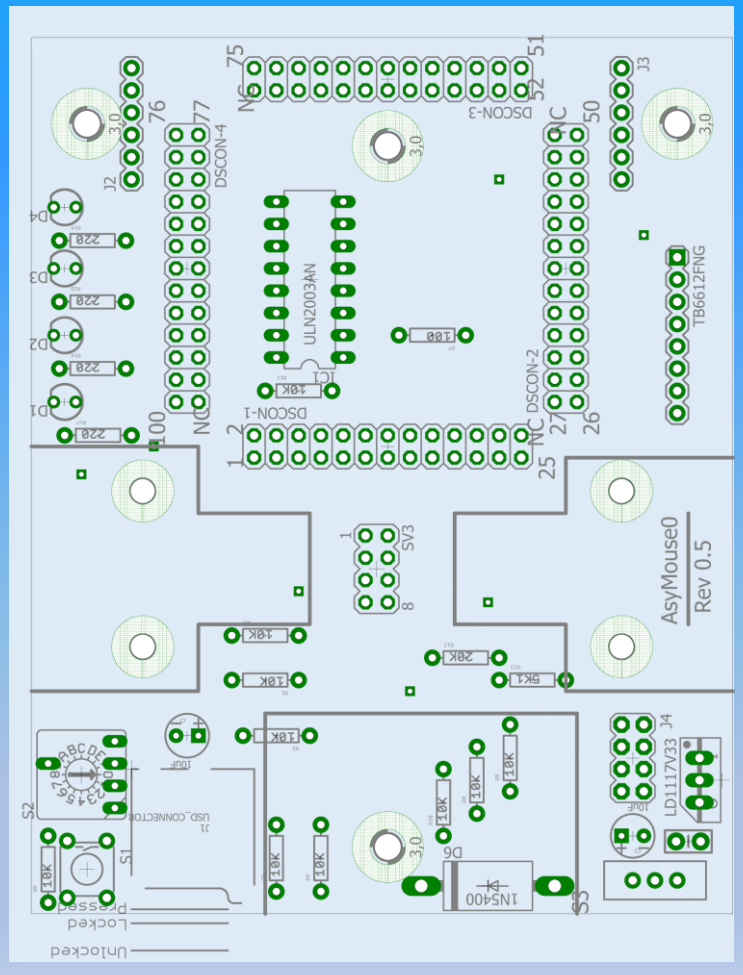
Situation

- Sensor board using proto-board
  - Components further overhang the motherboard
  - Sensor board has to sit on top of large PIM
  - Off centre axle position means only 5mm clearance for turn around
  - Poor reliability in the maze





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Task

- Improve reliability in the maze
- The sensors give good readings when not crashed
- 2 possible solutions:
  - Deliberately position off centre in a cell when preparing to turn around
  - Design and build a smaller sensor PCB
- Solution 1 improved reliability but not ideal
- Moved to solution 2

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Action

- Designed a new PCB with KiCad
- Fabricated in China

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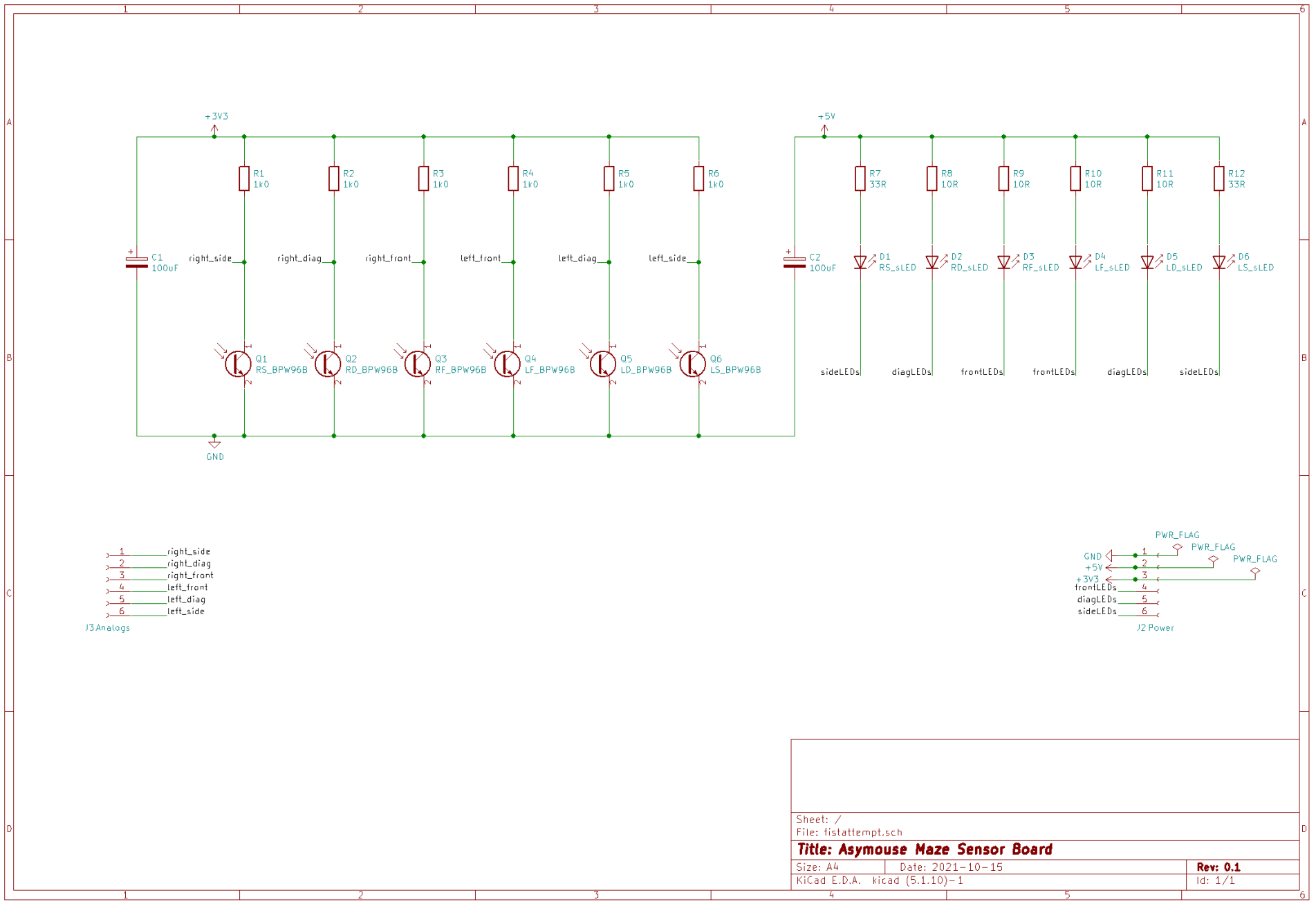

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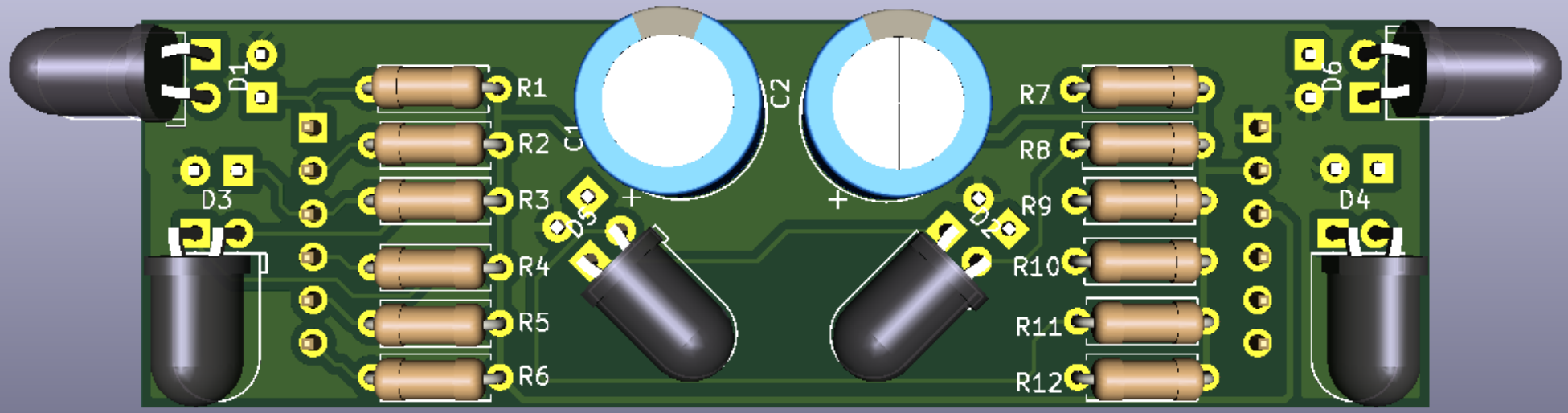
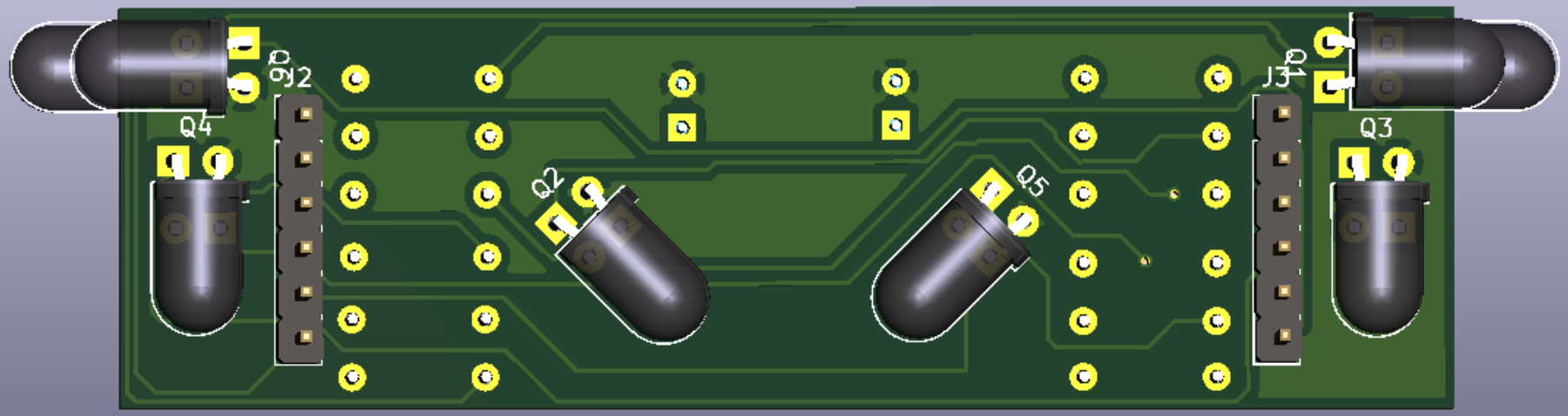

D1
R1
R2
R3
R4
R5
R6
C1
C2
D3
D2
R7
R8
R9
R10
R11
R12
D6
D3
D4


J2
Q4
Q2
Q5
J3
Q3

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Action

- New PCB
  - Board is 76mm wide
  - Overall width including sensors 89mm
  - Sensors within the front of the mother board
  - Distance from axle to front 65mm
  - Tolerance for centred turn around 19mm
- Old Board
  - Board is 81mm wide
  - Overall width including sensors 95mm
  - Sensors 13mm in front of the mother board
  - Distance from axle to front 78mm
  - Tolerance for centred turn around 5mm

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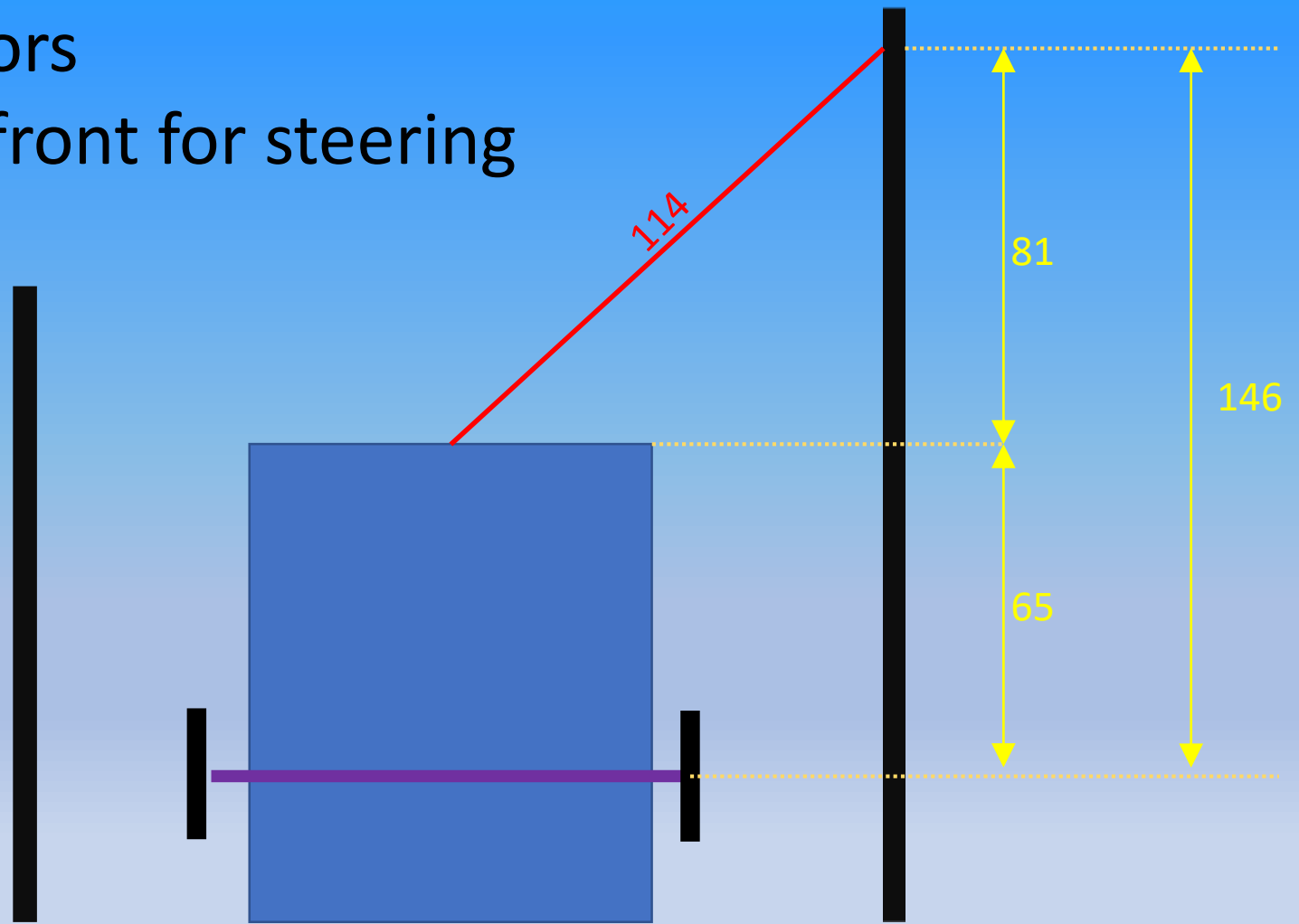
Results

- Foolishly I didn't think enough about the angle of the diagonal sensors
- 45º too far in front for steering



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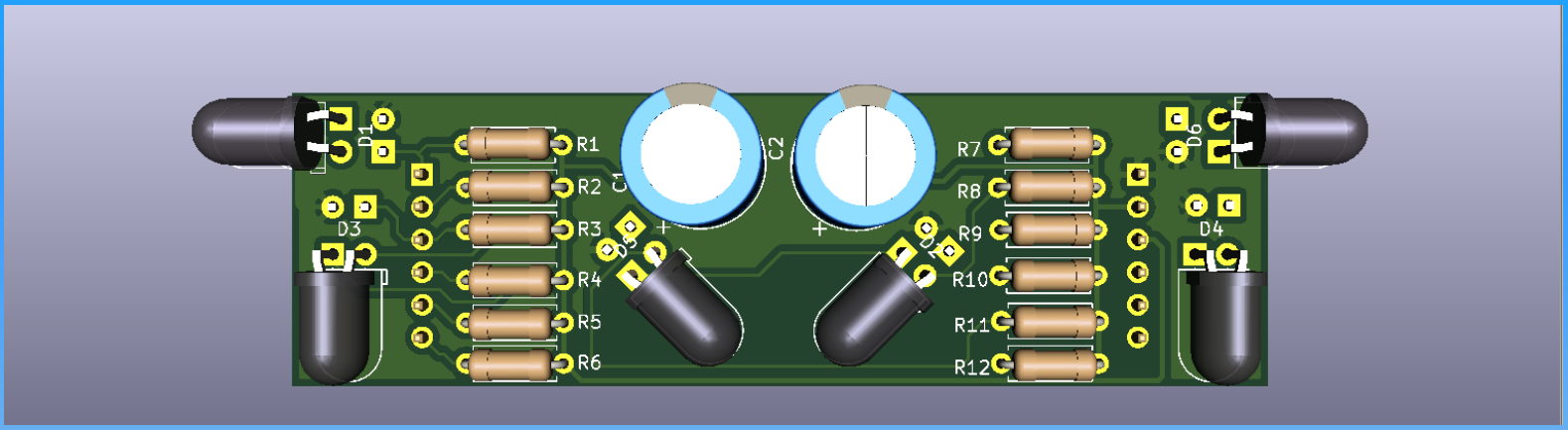
Results



- Reduce the forward reach of the diagonal sensors
  - Switch diagonal and forward sensors
  - Reduce angle of diagonal sensors

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Results

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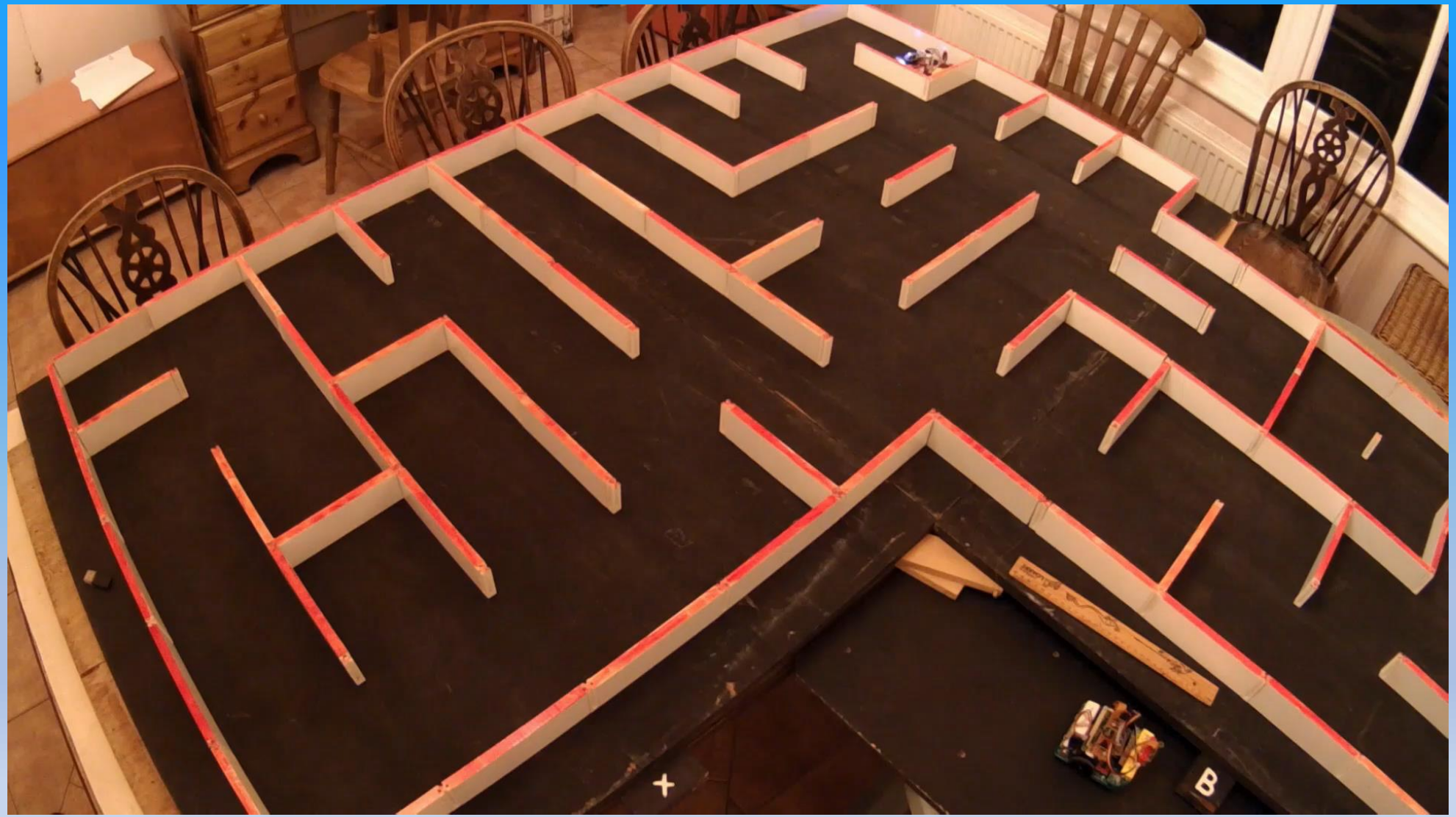
Results



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Results

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