

# AGV Documentation

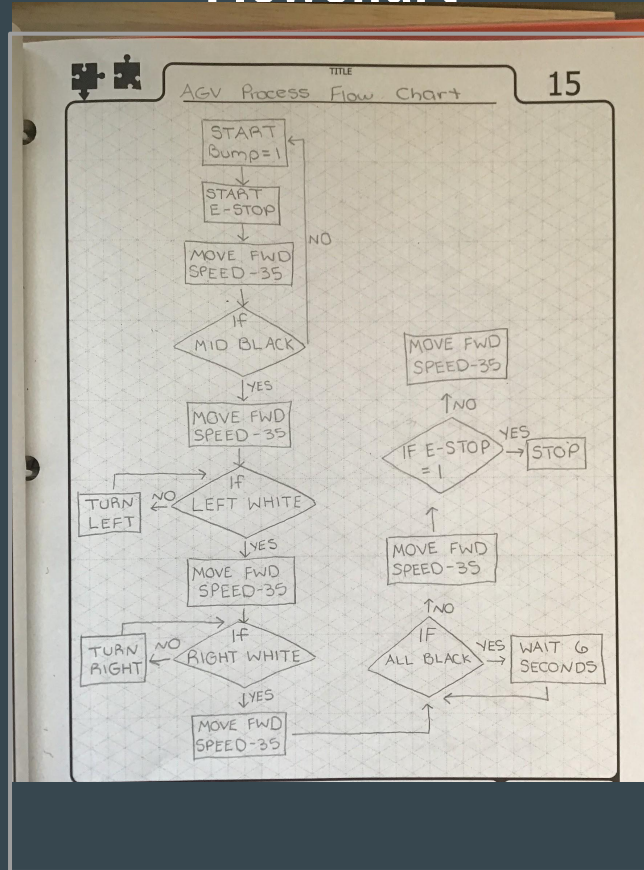
...

# Design Brief

Constraints:

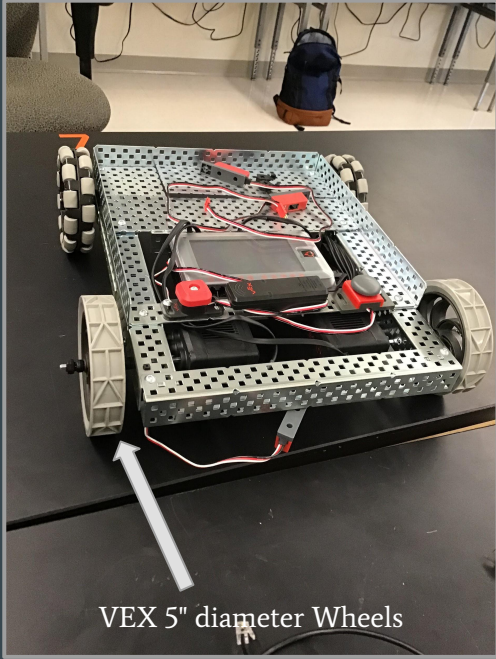
- a. The system must contain a manual start button.
- b. The system must be able to find and follow a black line.
- c. The system may use 1, 2, or 3 line following/infrared sensors.
- d. The system must stop at provided intersections for 6 seconds. Refer to the figure below.

# Flowchart



# Pictures of AGV Progress

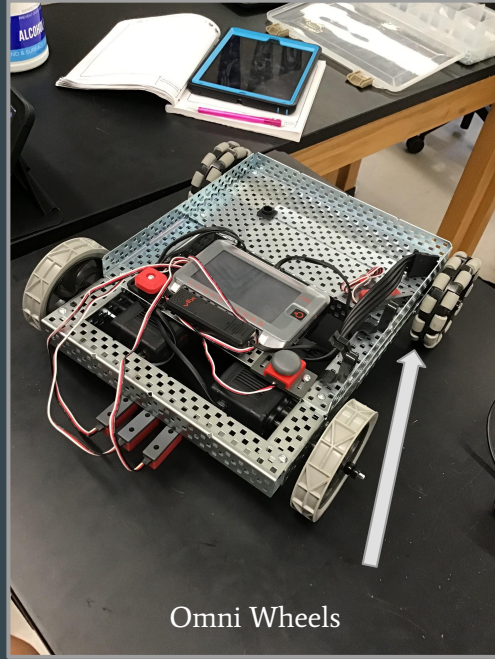
Top View



VEX 5" diameter Wheels

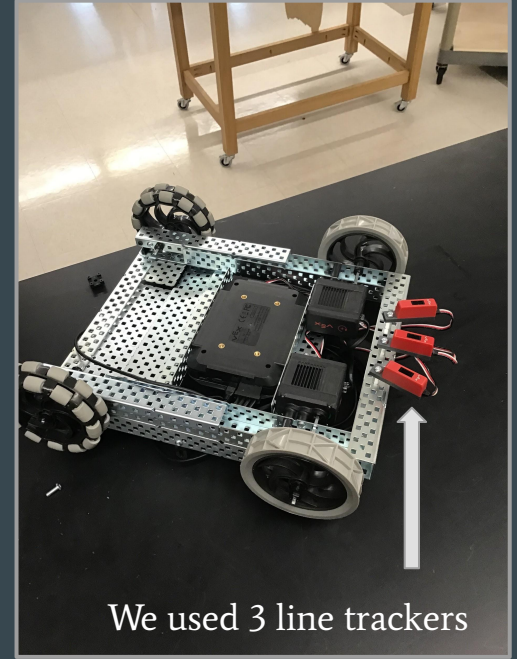
9/29/21

Bottom View



Omni Wheels

9/30/21



We used 3 line trackers

10/4/21

# Final AGV Design — 10/20/21



# AGV Progress

Progress on AGV 17

- found sources to support our design process
- Estop relocated to top of code
- Estop can now break during turning
- All sensor thresholds set to 50
- Set to stop if all sensors are negative
- reflection code reorganized
- to do - test code/make changes
- if design does not work then we will move sensors closer together
- turned down speeds, removed broken code
- code seems to be working
- Check line follower setup
- Left line follower is driving straight when sees black when should be turning left
- move "turn left" and "turn right" directly below if statements
- shorten distance between floor and line followers
- get rid of "else stop driving" from if statement for middle line follower ✓
- when all sensors see line (at intersection), stop for 6 seconds

TOC	✓	T&P	✓		
X's	✓	PGT	✓		
SIG	✓	CON	✓		
Grade	60	70	80	90	100

DESIGNED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

# Pictures of Code Progress — 10/18/21

This screenshot shows a Scratch script for a robot's control logic. The script begins with a 'when start pressed' event block. It then enters a 'forever' loop. Inside the loop, there is an 'if' block that checks 'Estop pressed?'. If true, it executes a 'break' block. Following this, the script sets 'drive velocity' to 15% and 'turn velocity' to 10%. It then enters a series of conditional blocks: an 'if' block for 'Mfollower reflectivity in % > 50' leading to 'drive forward'; an 'if' block for 'Rfollower reflectivity in % < 50' leading to 'turn right'; a 'repeat until' block for 'Mfollower reflectivity in % > 50'; an 'if' block for 'Estop pressed?' leading to 'break'; an 'if' block for 'Lfollower reflectivity in % < 50' leading to 'turn left'; and a final 'repeat until' block for 'Mfollower reflectivity in % > 50'. The script concludes with an 'if' block for 'Estop pressed?' leading to 'break'.

This screenshot shows a different state of the Scratch script. It starts with 'set turn velocity to 10%'. The 'forever' loop contains several conditional blocks: an 'if' block for 'Mfollower reflectivity in % > 50' leading to 'drive forward'; an 'if' block for 'Rfollower reflectivity in % < 50' leading to 'turn right'; a 'repeat until' block for 'Mfollower reflectivity in % > 50'; an 'if' block for 'Estop pressed?' leading to 'break'; an 'if' block for 'Lfollower reflectivity in % < 50' leading to 'turn left'; a 'repeat until' block for 'Mfollower reflectivity in % > 50'; an 'if' block for 'Estop pressed?' leading to 'break'; an 'if' block for 'Lfollower reflectivity in % > 50 and Rfollower reflectivity in % > 50' leading to 'stop driving'; and a 'wait 6 seconds' block. The script ends with a 'stop driving' block.

# Final Picture of Code — 10/20/21

The image shows a Scratch script for a robot's navigation. The script starts with a 'when start is pressed' event. It enters a 'forever' loop. Inside the loop, it checks if the 'Estop' button is pressed; if so, it breaks the loop. Otherwise, it sets the turn velocity to 10% and the drive velocity to 15%, then drives forward. It then checks for reflectivity: if the right reflector is below 50%, it turns right; if the left reflector is below 50%, it turns left. A combined condition checks if both left and right reflectors are below 35%; if true, it stops driving and waits 6 seconds. The script ends with a 'stop driving' block.

```
when start is pressed
  forever loop
    if Estop pressed? then
      break
    set turn velocity to 10 %
    set drive velocity to 15 %
    drive forward
    if Rreflector reflectivity in % < 50 then
      turn right
    if Lreflector reflectivity in % < 50 then
      turn left
    if Lreflector reflectivity in % < 35 and Rreflector reflectivity in % < 35 then
      stop driving
      wait 6 seconds
    stop driving
```



# Video of AGV Completing Track

- [https://drive.google.com/file/d/1eLbR2wPzcSG-Z7n\\_w\\_P-MJ2cv39JQGZh/view?usp=drivesdk](https://drive.google.com/file/d/1eLbR2wPzcSG-Z7n_w_P-MJ2cv39JQGZh/view?usp=drivesdk)

## Testing “>” in code

- [https://drive.google.com/file/d/1YWX7PFIIstanXSNFdBcSGmZW\\_qQPPKic/view?usp=drivesdk](https://drive.google.com/file/d/1YWX7PFIIstanXSNFdBcSGmZW_qQPPKic/view?usp=drivesdk)

## Link to Cost Analysis Spreadsheet

- [https://docs.google.com/spreadsheets/d/1ejM9qtoGEqvEITSGAy8BQBIbEXB1HWss\\_UsXqtZ70UM/edit](https://docs.google.com/spreadsheets/d/1ejM9qtoGEqvEITSGAy8BQBIbEXB1HWss_UsXqtZ70UM/edit)