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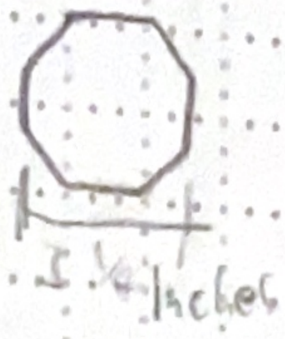
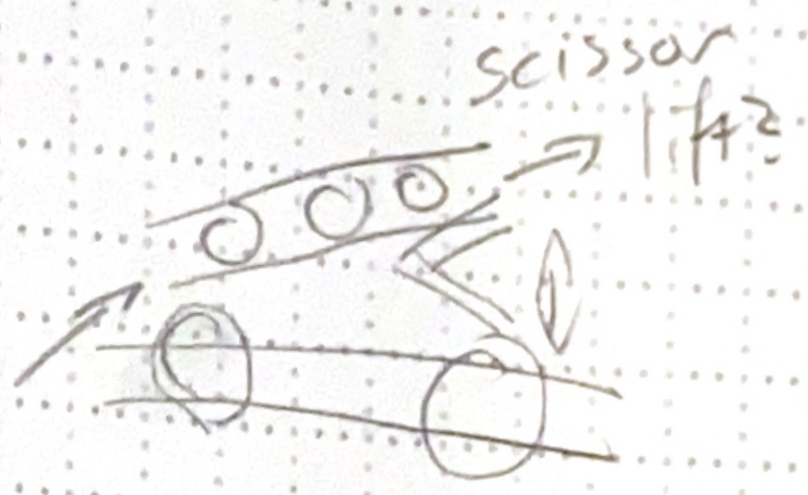
Scissor lift: (Idea 1)

NOT TO SCALE

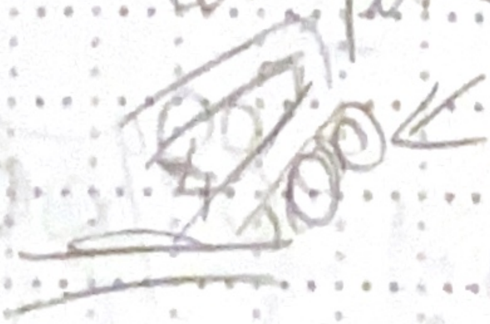
Inspired by hero bot





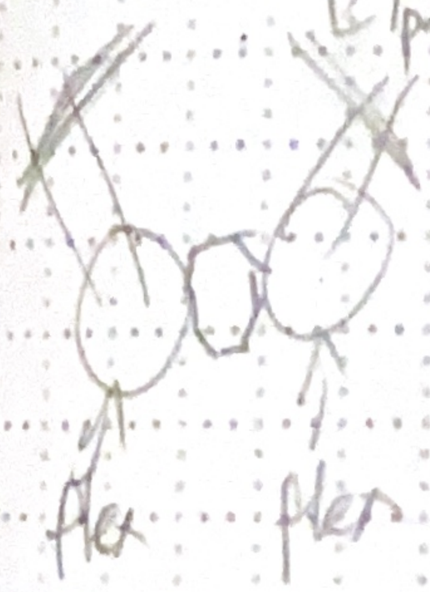
outtake:
can move up and down, sufficient power to push
reverse intake for bottom goal

Drivetrain: 66W, 200 rpm (green)
4in omni wheels to turn,
can park?



6x 11W drive
2x conveyor 5.5W
1x intake 5.5W
1x lift 5.5W

intake:
side rollers bended
flex
flex



Rubber band multiplcat once

A bot must have:
- Drivetrain
- Intake
- Storage
- Outtake (top, middle, bottom)
- transport

Project Scissor lift

Name

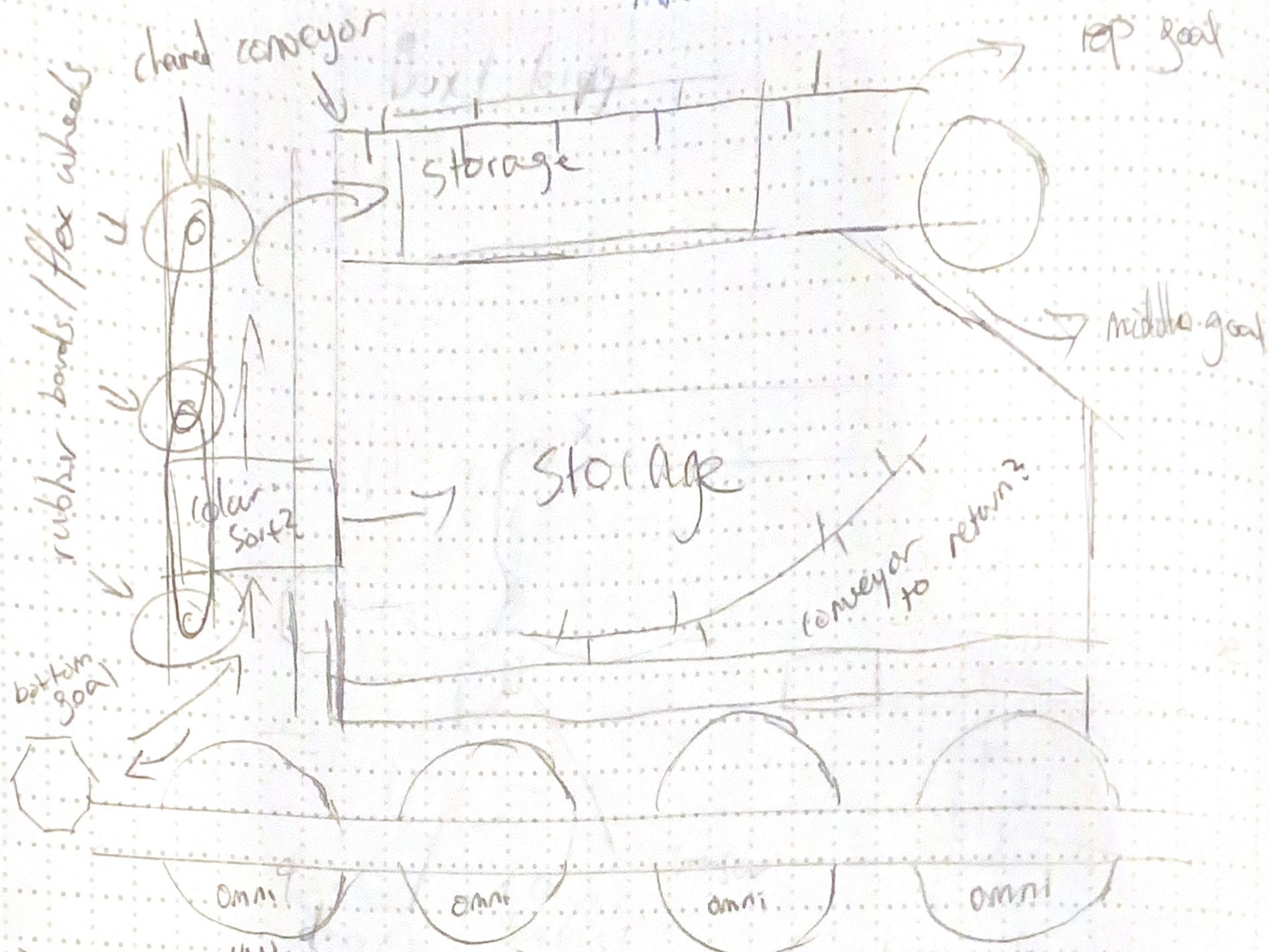
Date 11/6/25

VEX ROBOTICS

PROPRIETARY INFORMATION

Hoarder Ideas

NOT TO SCALE



Drivetrain:
66W (4x11W, 4x5.5W)
200rpm (no gears green cart)
8 omni wheels - turning

intake:
3.5W chained rubber band rollers/ flex wheels
~~no shaft for matchload tubes?~~

outtake:
Sorter for top/middle
bottom goal reverse intake

storage:
own color / opponent color?
limited top storage

Project Hoarder

Date 11/6/25

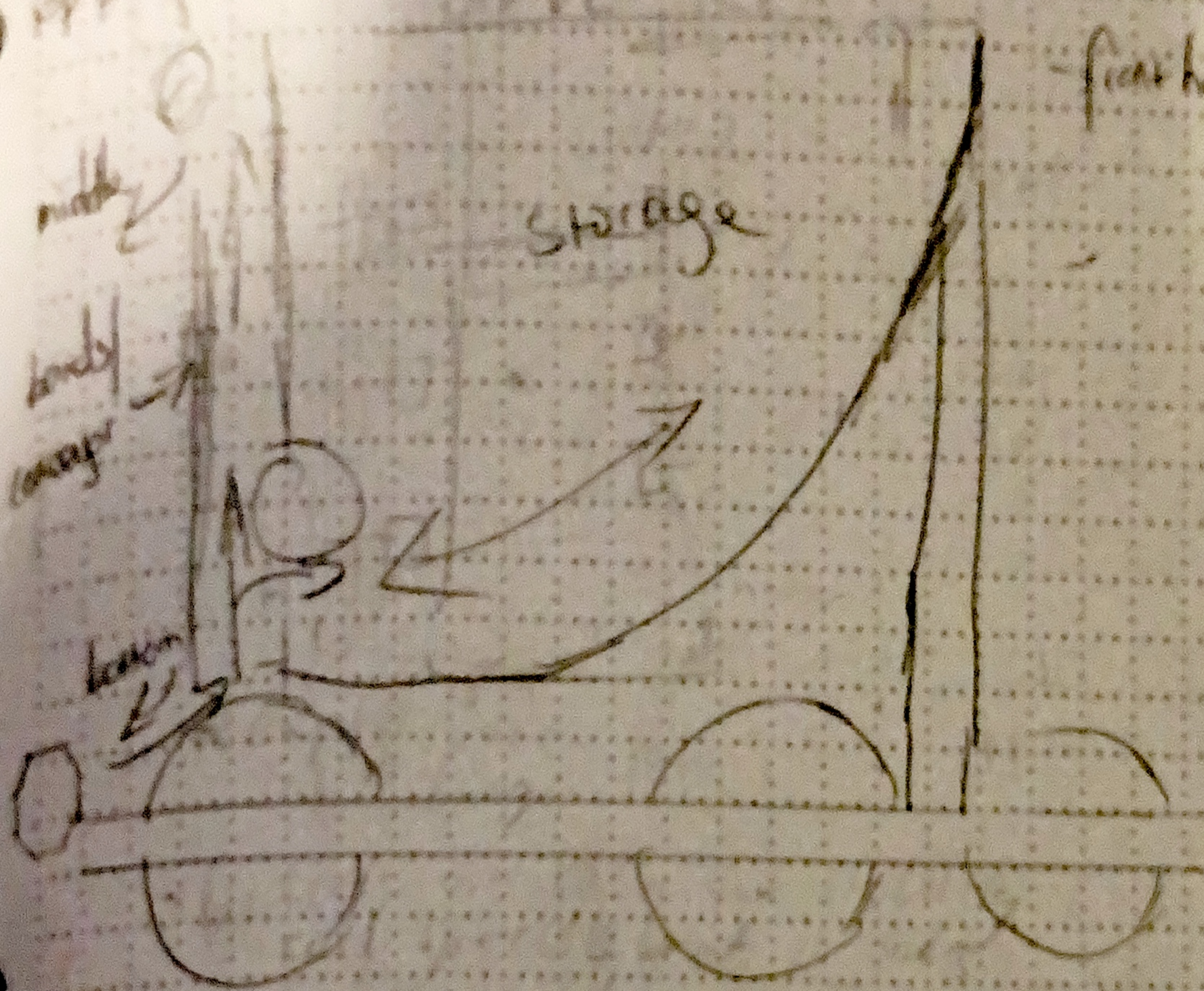
Name

vEx ROBOTICS

PROPRIETARY INFORMATION

Bucket Bot Ideation

NOT TO SCALE



- less versatile loader
- front heavy

Project Bucket Bot

Name

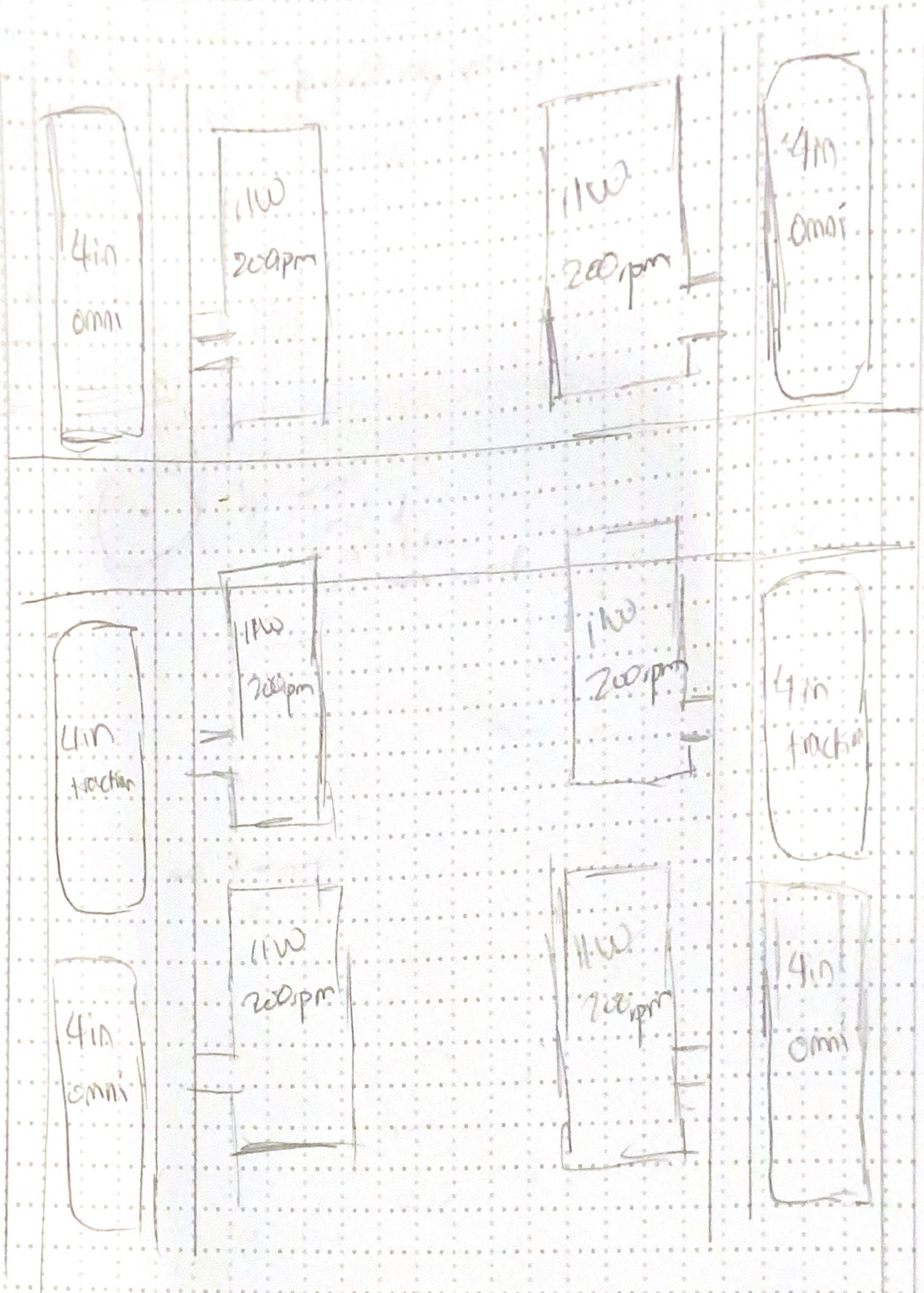
Date 11/6/25

VEX

PROPRIETARY INFORMATION

Subsystem: Drivetrain

Not to scale



Details: 200rpm: good speed/torque, no gears
66W — high power against other bots, still room for other systems.

Project Subsystem - Drivetrain

Name

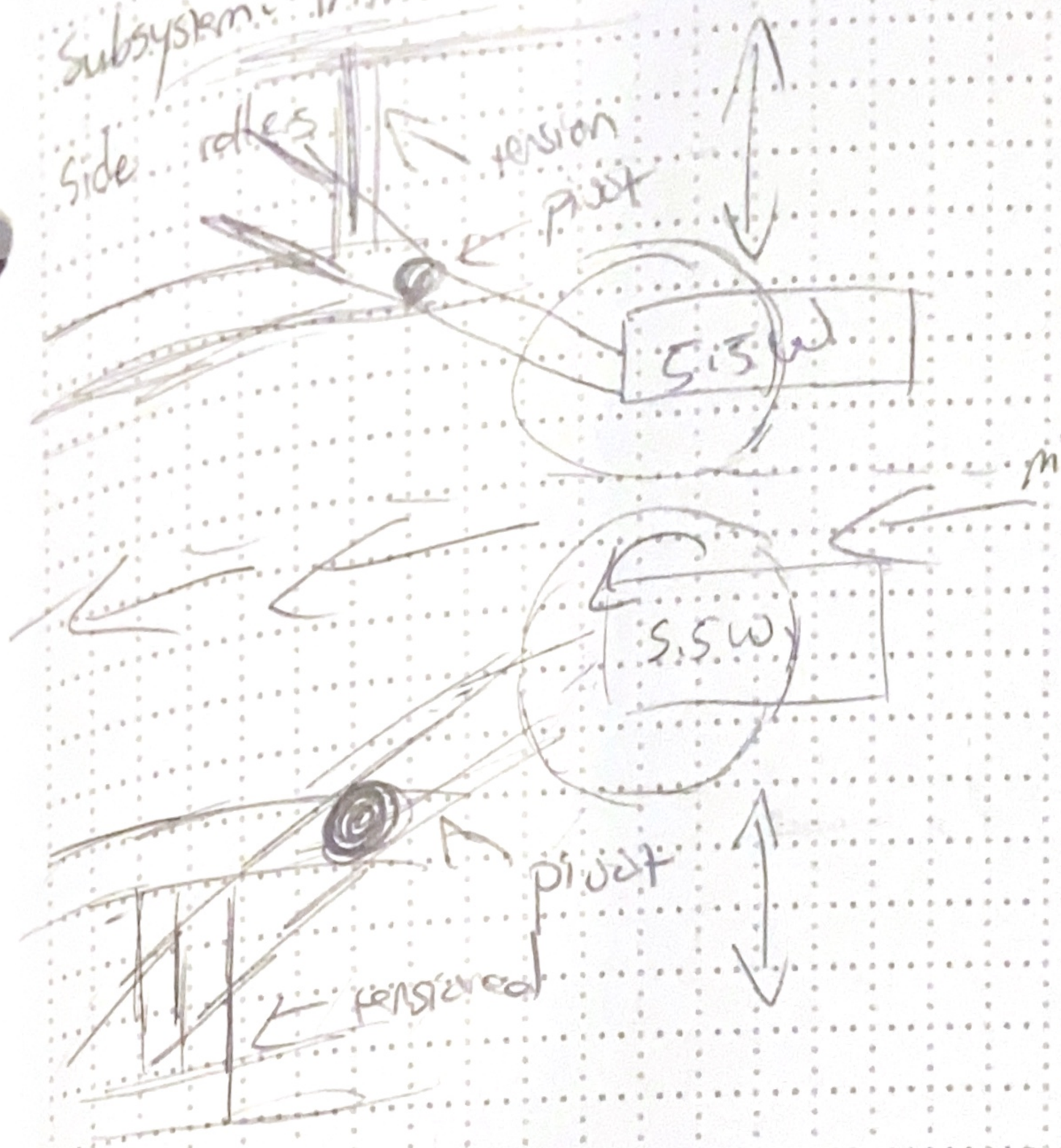
Date 12/6/24

VEX ROBOTICS

PROPRIETARY INFORMATION

Subsystem: Intake

Not to scale

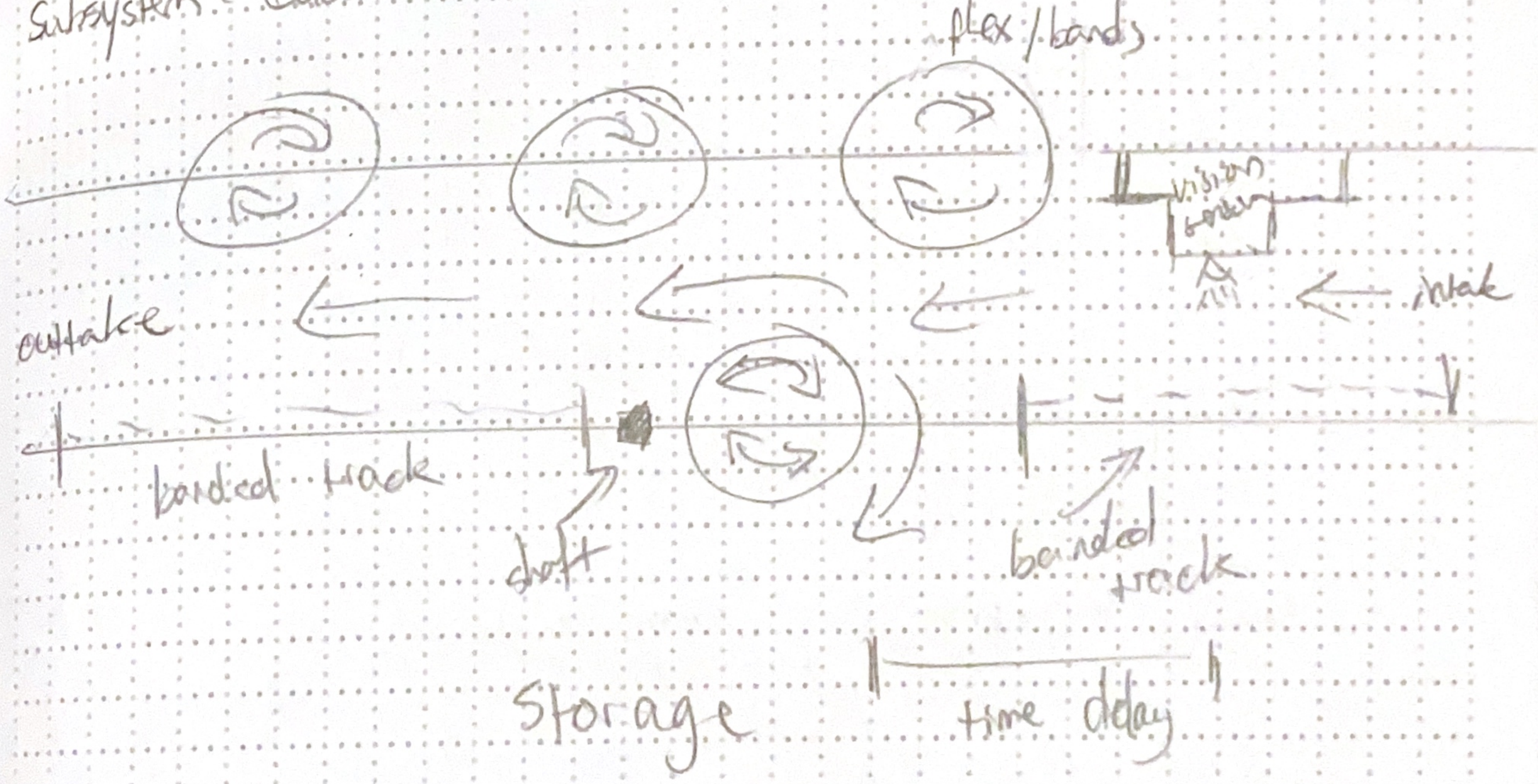


- side roller intake
- tensioned
- can remove from match-loads
- only 1 block at a time

Try: Chained (gear ratio for 300-600 rpm)

Subsystem: Colour Sorter

Not to Scale



Project Subsystem: Intake & Colour Sorter

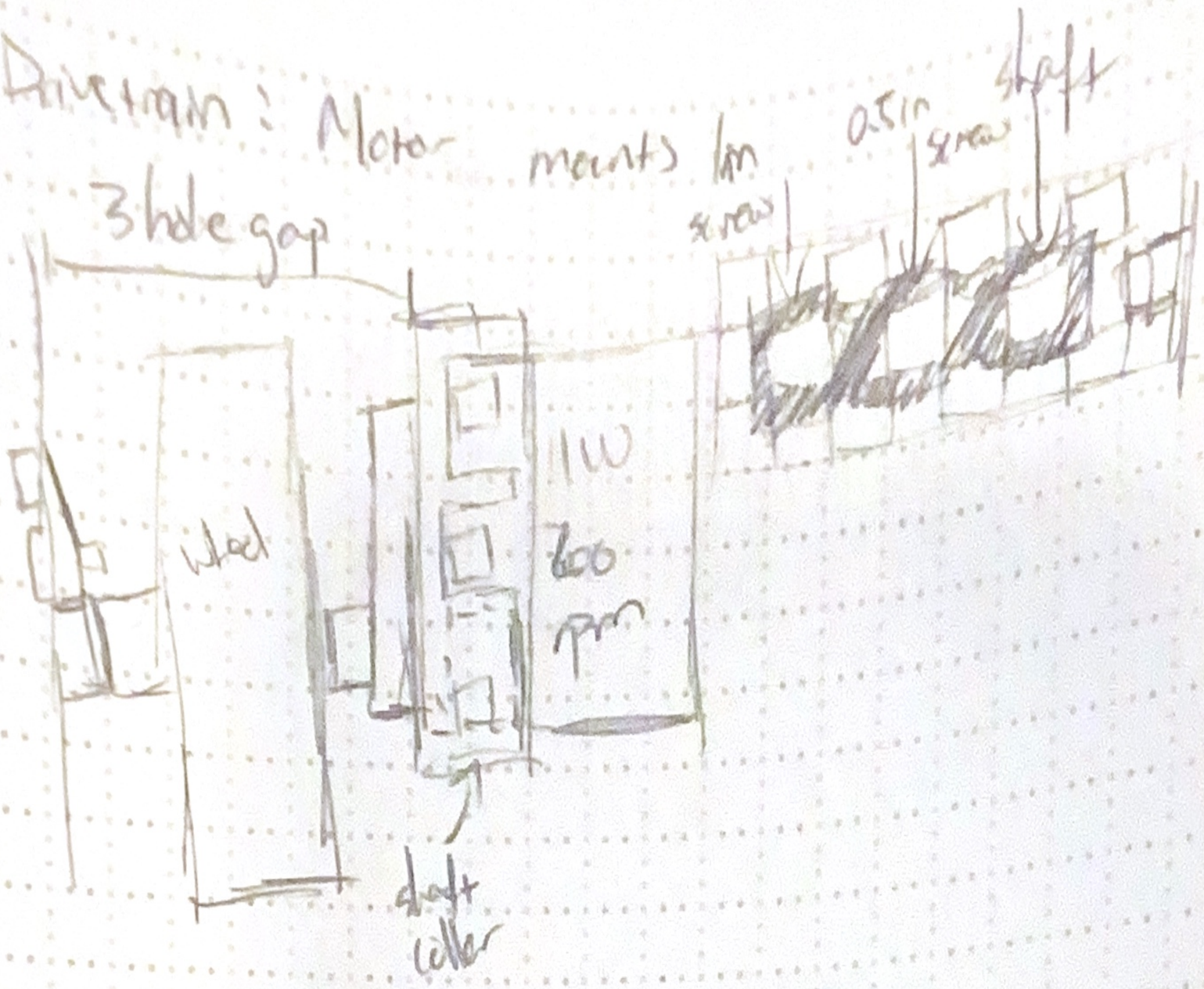
Name

Date 14/6/25

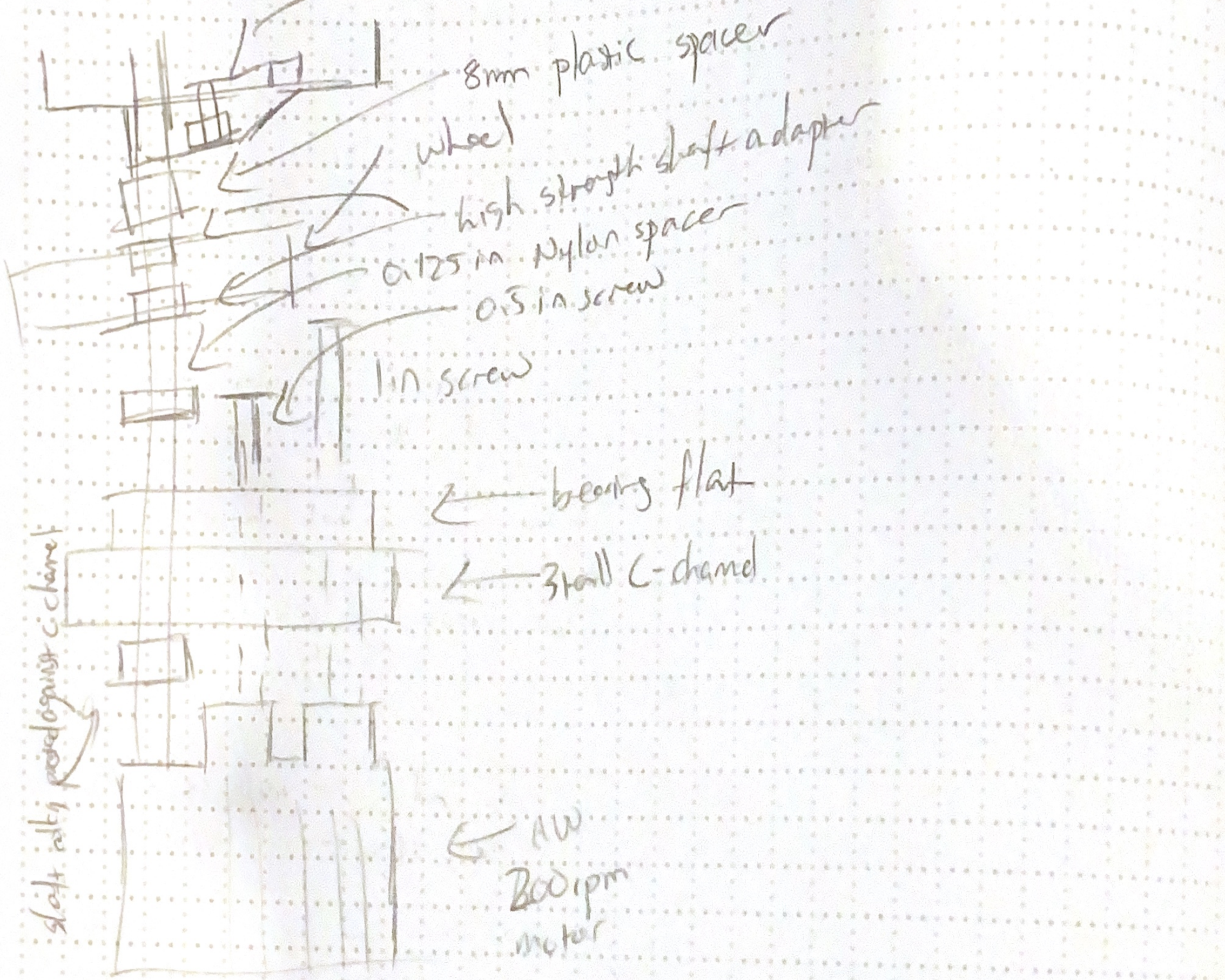
VEX ROBOTICS
PROPRIETARY INFORMATION

Not to Scale

Drivetrain: Motor mounts



Exploded view:



Project Drivetrain, Motor Mounts

Date 16/6/25

Name

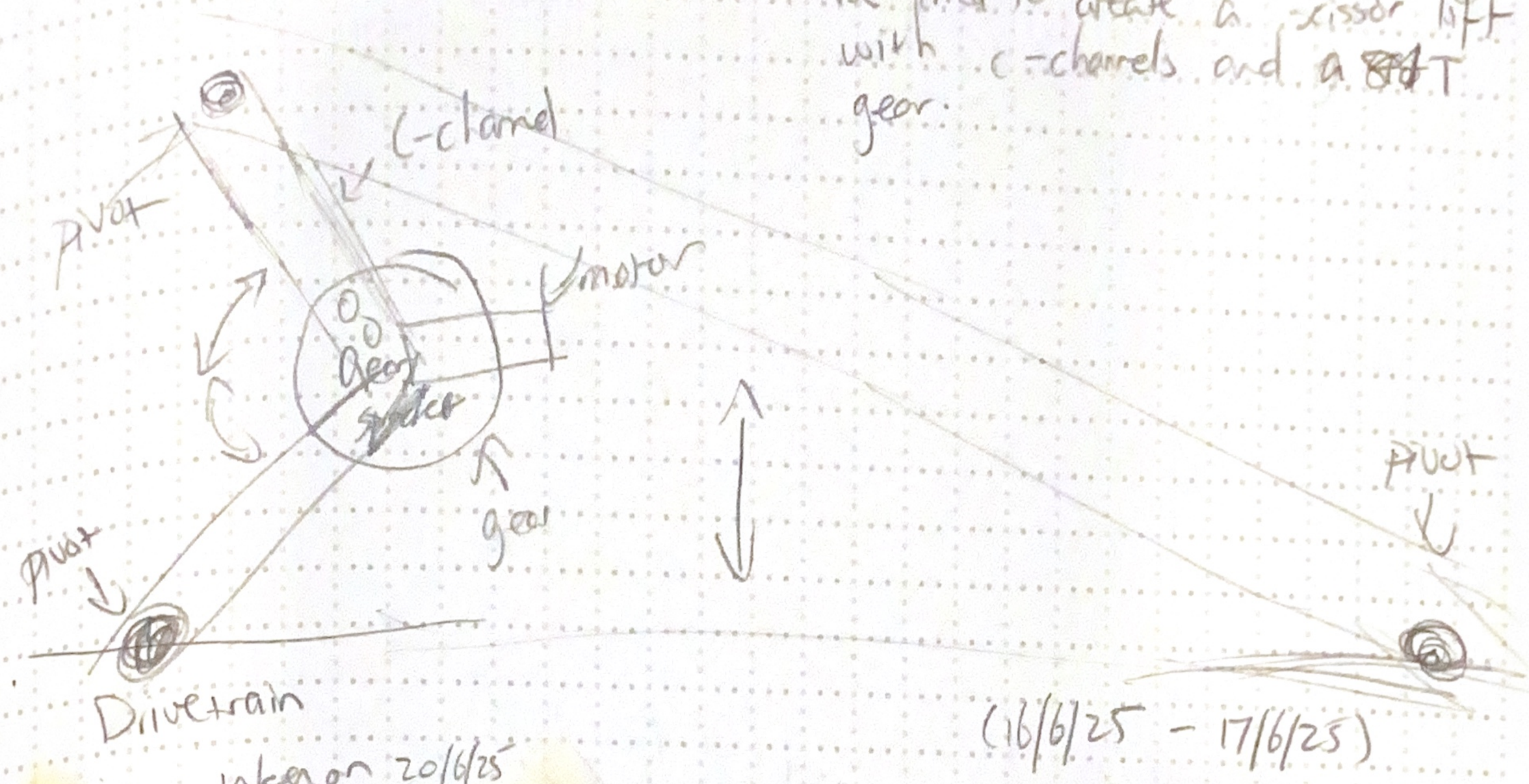
VEX ROBOTICS

PROPRIETARY INFORMATION

Getting Building - Scissor lift (Across ≈ 1 week)

The idea:

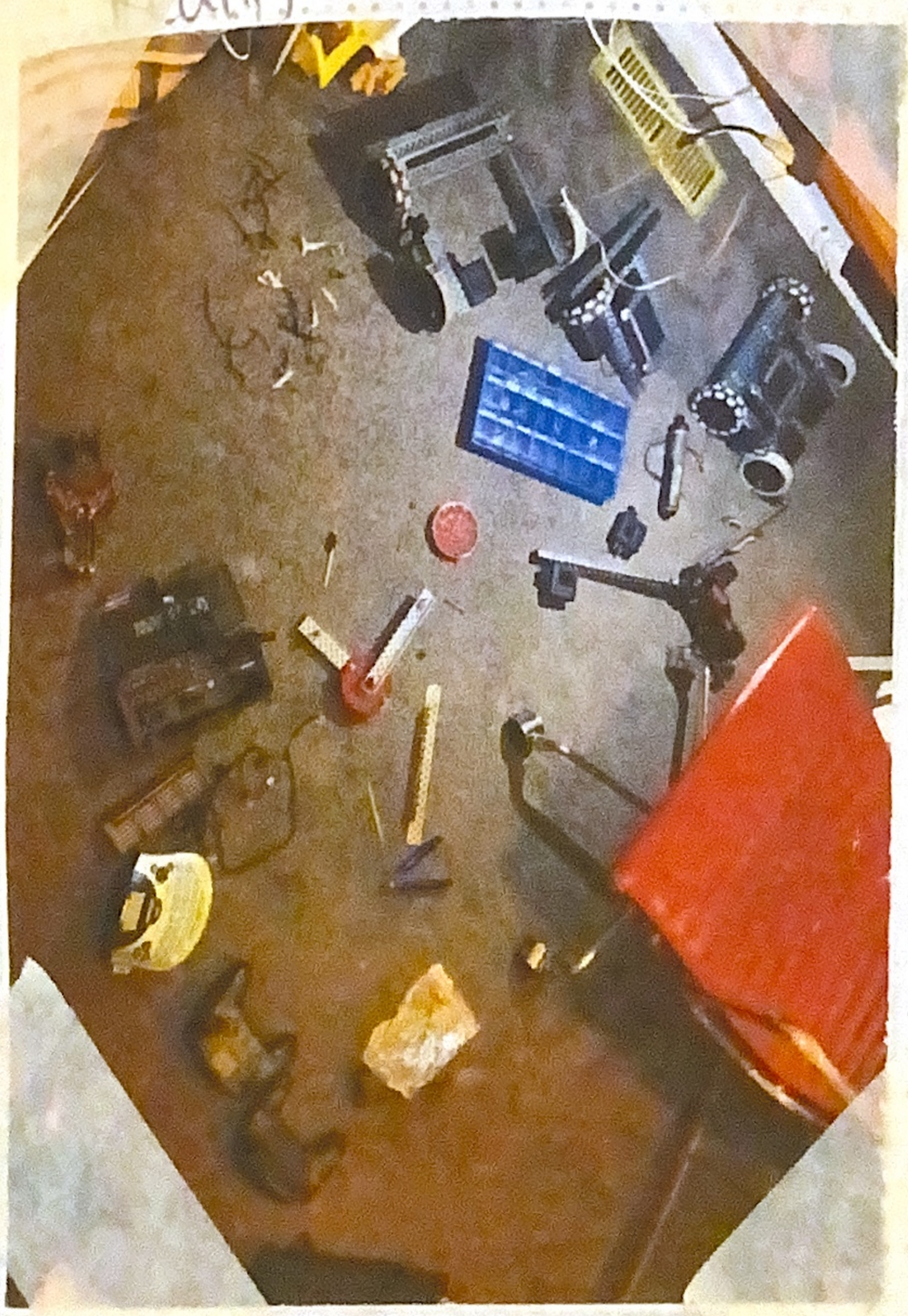
We lack pneumatics, therefore we tried to create a scissor lift with c-channels and a 84T gear.



(16/6/25 - 17/6/25)

taken on 20/6/25

Reality:



- We had 2 clawbots at our disposal at the time.

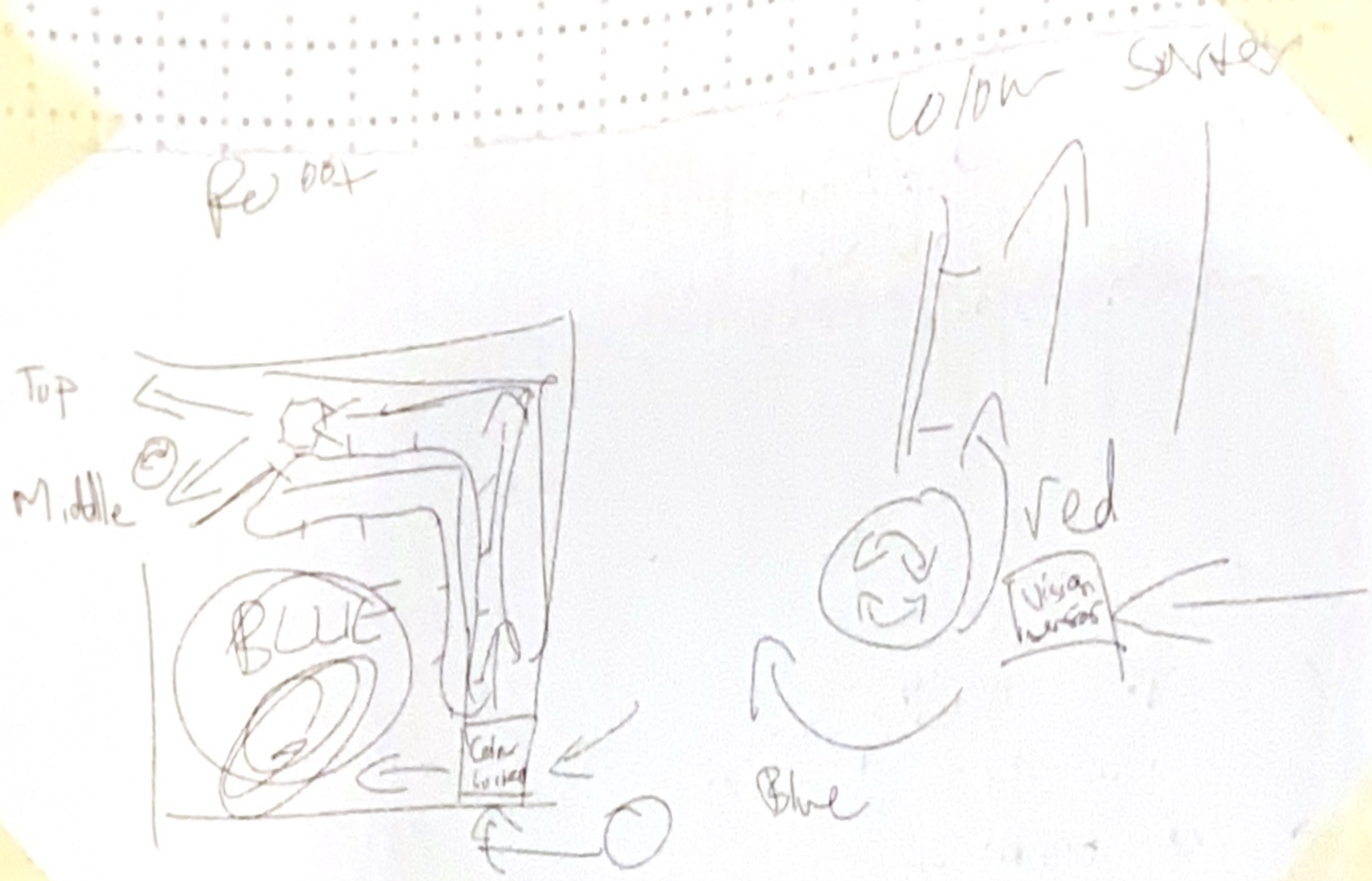
- With our limited resources, we could not build a stable and reliable scissor lift mechanism (22/6/25)

- We temporarily scrapped the idea and shifted our focus to the Hoarder. (23/6/25)

- Near the middle, an attempt at the pivot point can be seen.

New Idea - Hoarder

Due to being unable to build a proper scissor lift, we decided to flesh out our design of the Hoarder.



Our digital whiteboard sketch of the layout of our hoarder (23/6/25)

This design appealed to us for various reasons:
- Less moving parts
  - Less complexity
  - Less motors
  - Less things that could break
- Storage
  - Versatile, whether we would want to hoard opposing or own blocks
  - Ample "temporary" immediate storage for sorting
- Essentially a better bucket bot
- Room for expansion (Potentially pneumatics)

Project New Idea - Hoarder

Name

Date 23/6/25

VEX ROBOTICS

PROPRIETARY INFORMATION

Visit to Templestowe College

As this is our first experience with VEX, 3 of our members, Ethan Butler, Ethan Cox and Micheel Harding visited TC to spectate a tournament.

They brought back several takeaways:
- Few teams used match loaders
- Few teams participated in Autonomous Period
- The game is played very fast
- There is considerable rough play
- Some bots could not perform some functions
- Very few alliances could double-park

They were also heavily inspired by a hero-like bot, who emptied a matchload tube and scored 6 blocks solely in autonomous.

We also anticipated significant changes in the strategies, given it is still early season.

Project Visit to Templestowe College Name

Date 1/7/25

Getting building - Hoarder

Drivetrain.

We deviated from our original direction a bit. We are currently using 6 wheels and 4 11W 200 rpm motors, with one wheel not connected and are via a chain, per side. These decisions were made in response to concerns with motor limits and space for the intake.

Ryan Li testing our first drivetrain ever. (3/7/25)

After a short while, it became apparent that the chains were a point of failure. Any sharp changes in rotation for the wheel, or any pressure on it, would cause a link to snap, rendering a motor useless.

We tried to fix the issue of uneven steering through code, by disabling the opposing motor, however we ultimately decided to remove the chains altogether. (7/7/25)

We also tested various control methods for the bot, from single joystick to all the combinations of dual joystick. We ended up deciding to split driving and turning into 2 joysticks, allowing for familiar yet precise control (7/7/25)

Project Getting Building - Hoarder

Date 3/7/25 - 7/7/25

Name

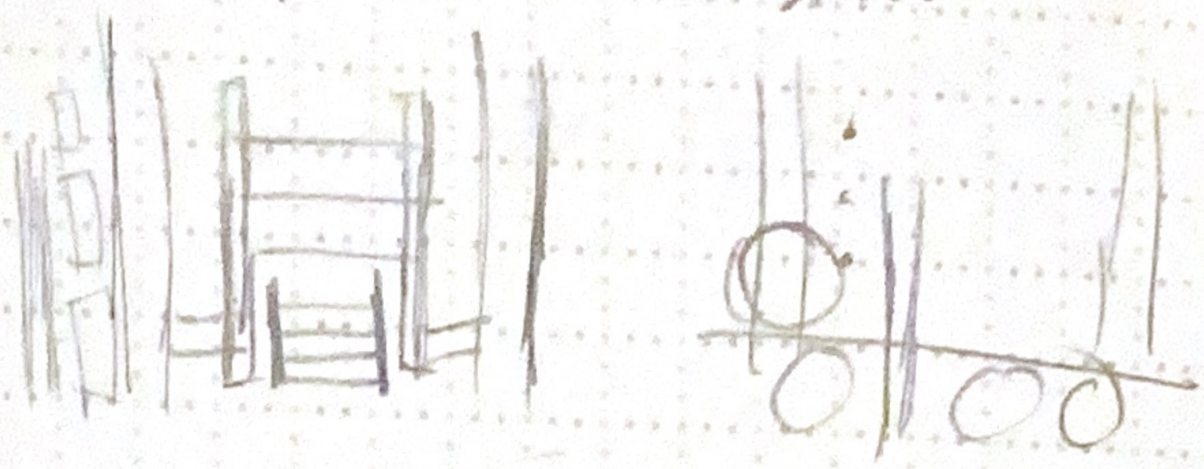
VEX

PROPRIETARY INFORMATION

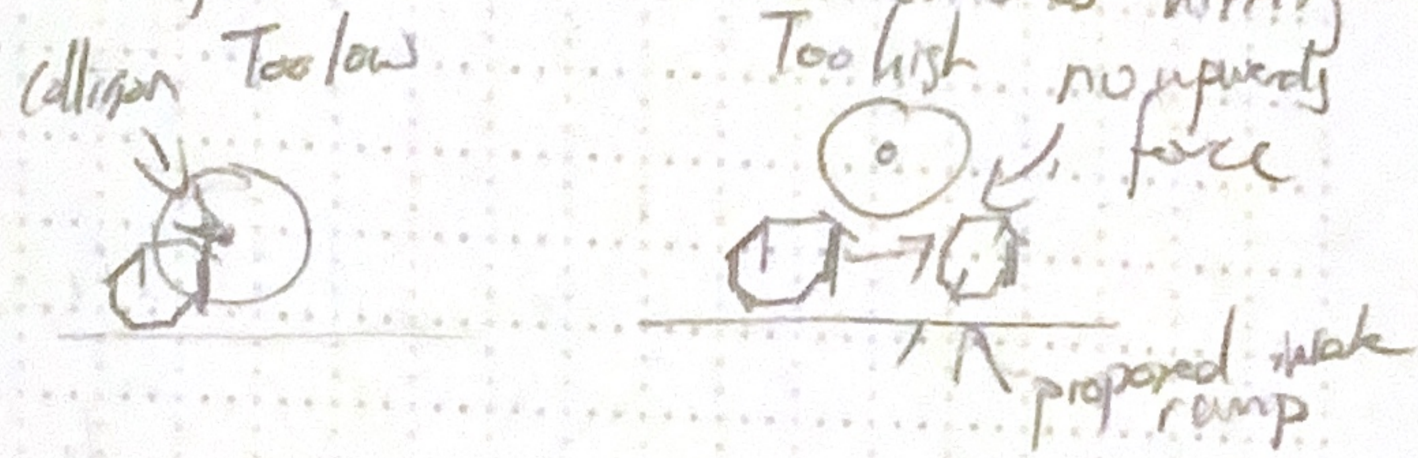
Images from here onwards are unavailable due to a corrupted software update and no backup. Diagrams & sketches will have to do.

9/7/25 - Tested intakes, decided on a rubber band roller due to consistency and simplicity. Constrained by shaft length, we started building an inner frame

Front: Side:



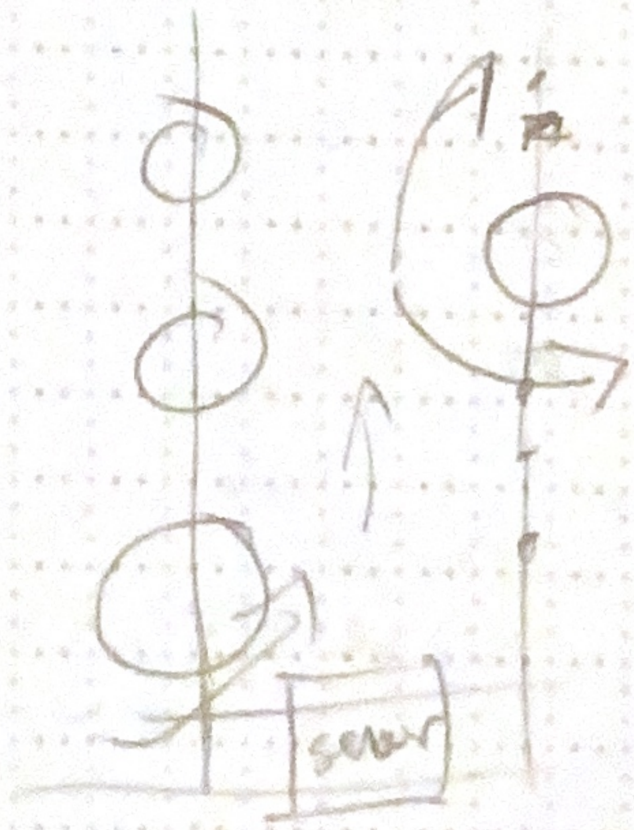
11/7/25 - Intake and secondary rollers built, however they are not strong enough to pull blocks up without the blocks hitting the shaft, waiting on gussets to mount on intake ramp.



12/7/25 - Got started on color sorter.
- Accurately drives blocks in/up
- Color detection is unreliable, AI Vision does not have a light

[See subsystem: Color Sorter]

14/7/25 - We used the wrong sensor, VEX Vision Sensor accurately detects colors & sorts them, thanks to inbuilt LED



Getting Building - Hoarder (cont 2)

Our team took a break from robotics to focus on campus schoolwork and the PrintACar challenges but now we're

18/8/25 - Tweaked intake, installed gussets.
Problems:
- Colour sensor accuracy / timing
- Intake ramp reliability.
Accomplishments:
- Intake works
- Ready for outtake

20/8/25 - Debug
- Colour sensor issue was caused by a bug where it only checked once per second, patched now.

22/8/25
- Built top storage using shafts, rubber bands, and a C-channel hanging on 2 shafts.

25/8/25.
- Secondary intake to top storage is unreliable, and storage to outtake is unreliable.
- Spent most of the day tweaking and adjusting heights and positions.

26/8/25
- Worked on outtake, we don't have more gears or sprockets so we stapped rubber bands around 2 4in wheels.

27/8/25
- Tweaking, adjusting and practice for Iowa Ranger on 2/9/25.

Project Getting Building - Hoarder
Date 18/8/25 - 27/8/25

Name

VEX ROBOTICS
PROPRIETARY INFORMATION

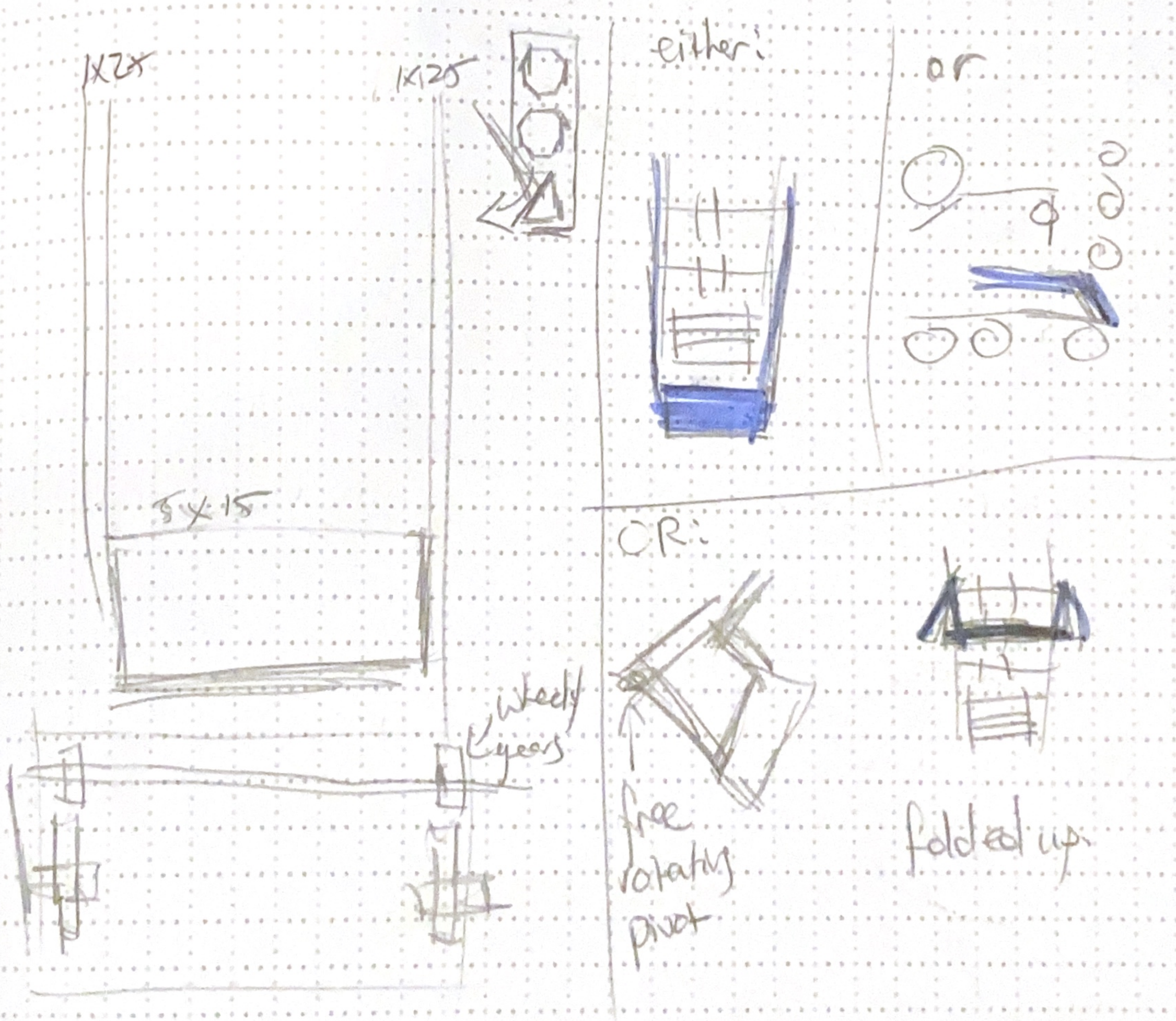
Design & experimenting - Little Will Mech

To be able to unload from the matchloads, we needed something to be able to go under the blocks and funnel them out.

Taking inspiration from Little Will of team 44252A, we decided to try and design our own spinoff with what we had.

Constraints
- No pneumatics
- no custom plastics.

NOT TO SCALE



We decided that we did not have time to perfect this before Sep 2nd.

Project Design & experimenting - Little Will

Date 28-29/8/25

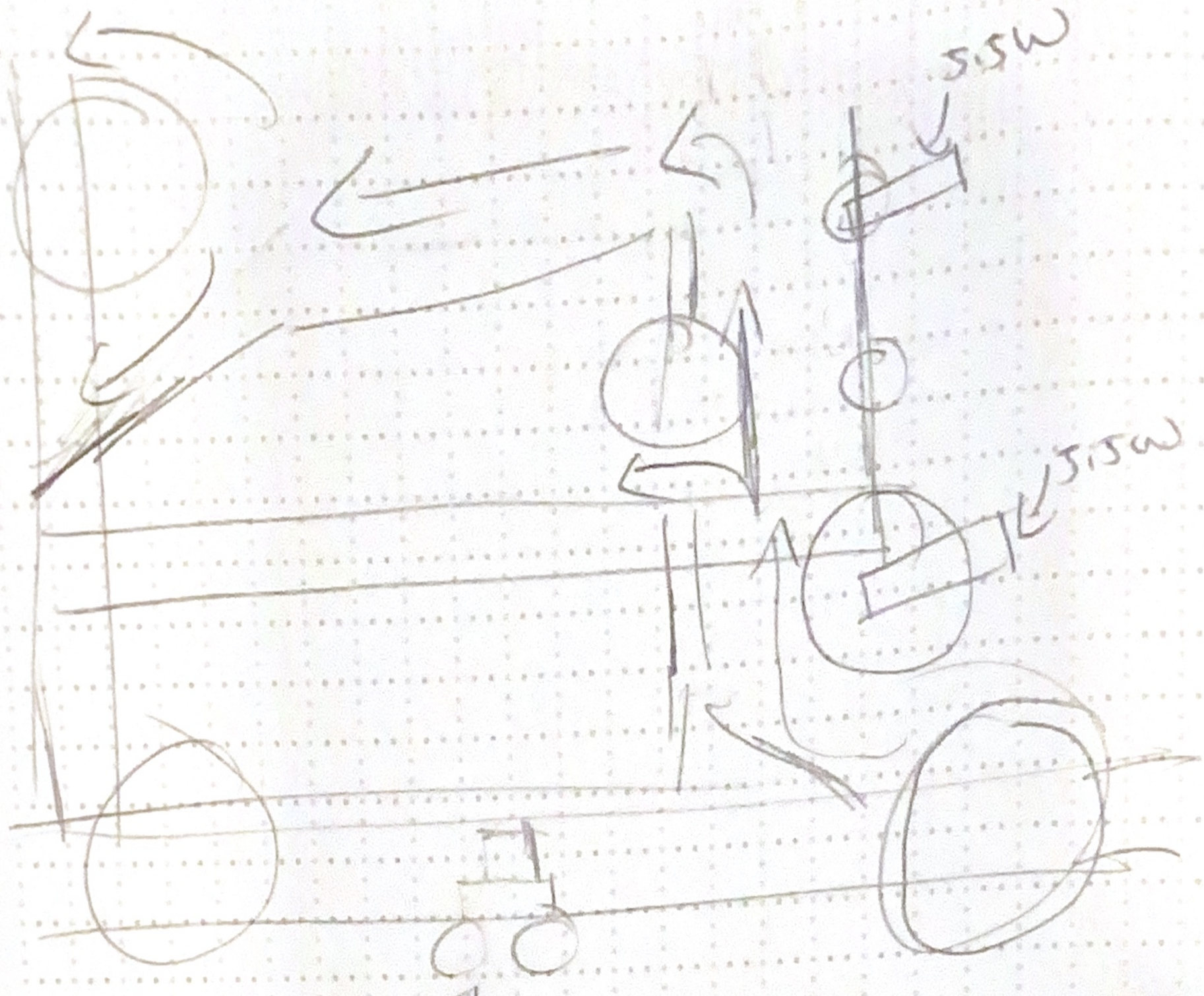
Name

VEX ROBOTICS
PROPRIETARY INFORMATION

September 2nd Bot.

NOT TO SCALE

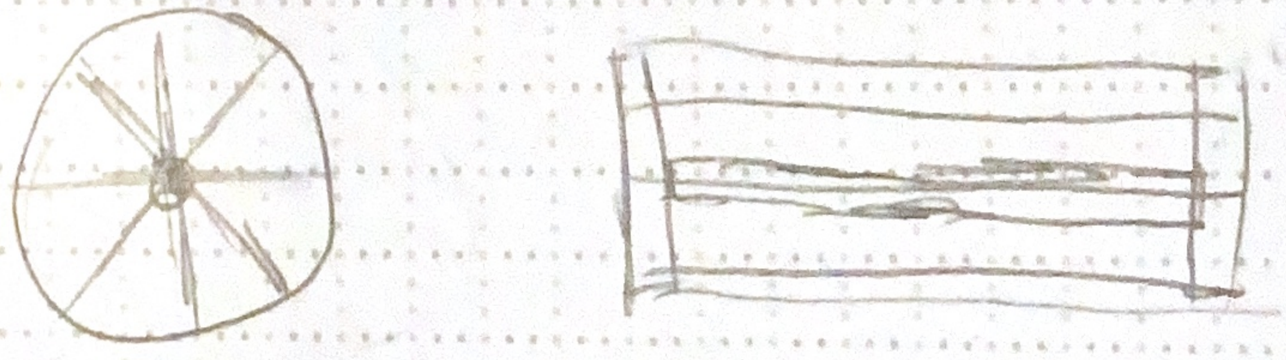
Overview



tank tread guide wheels, temporary.

Subsystem - Intake.

Intake is comprised of 8 rubber bands on an 84T gear. This is linked to an additional roller, both running at 200 RPM.

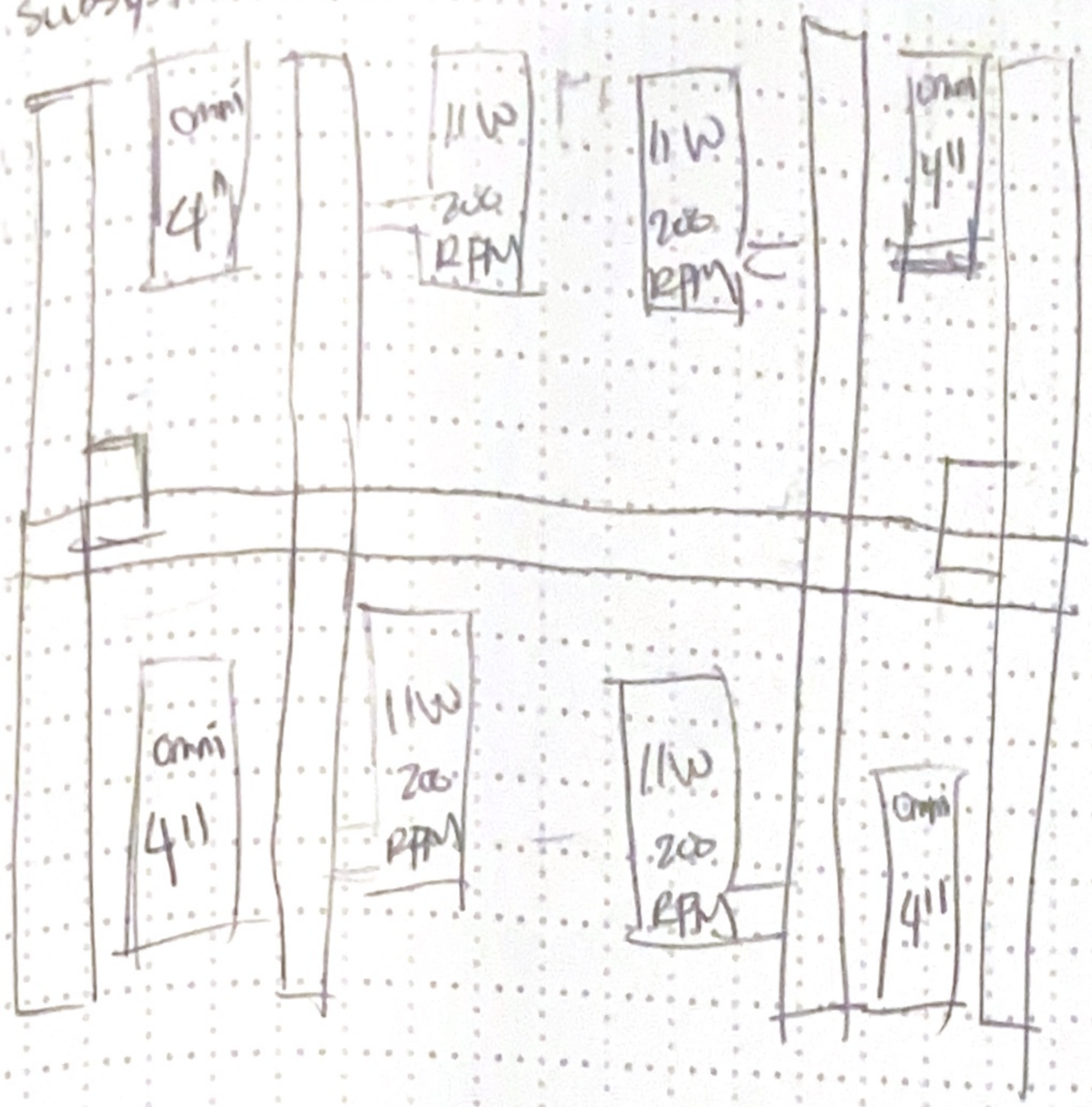


Subsystem - Colour Sorter:

[See Subsystem: Colour Sorter] → turned vertical

September 2nd Bot (cont)
Subsystem - Drivetrain.

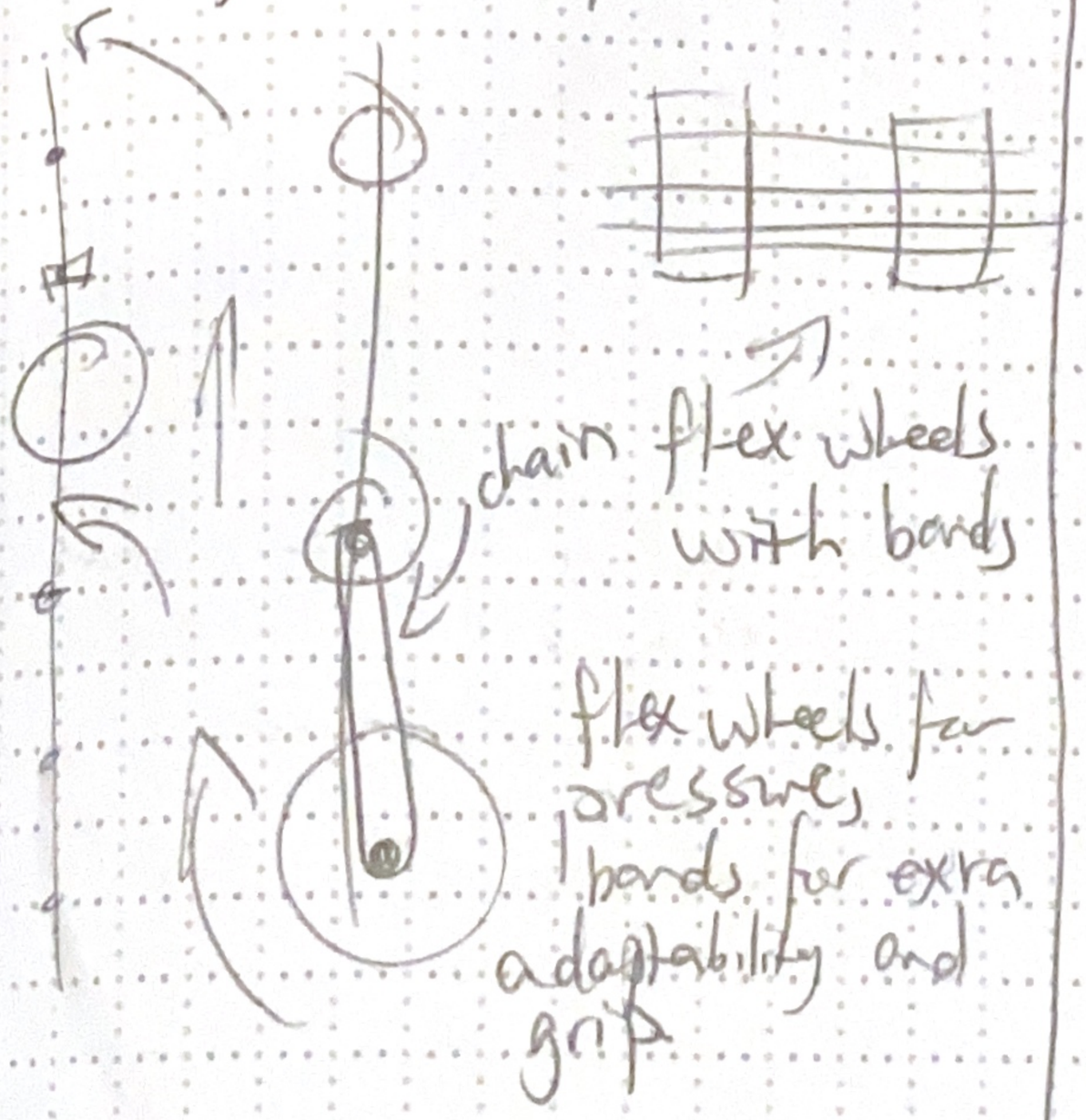
NOT TO SCALE



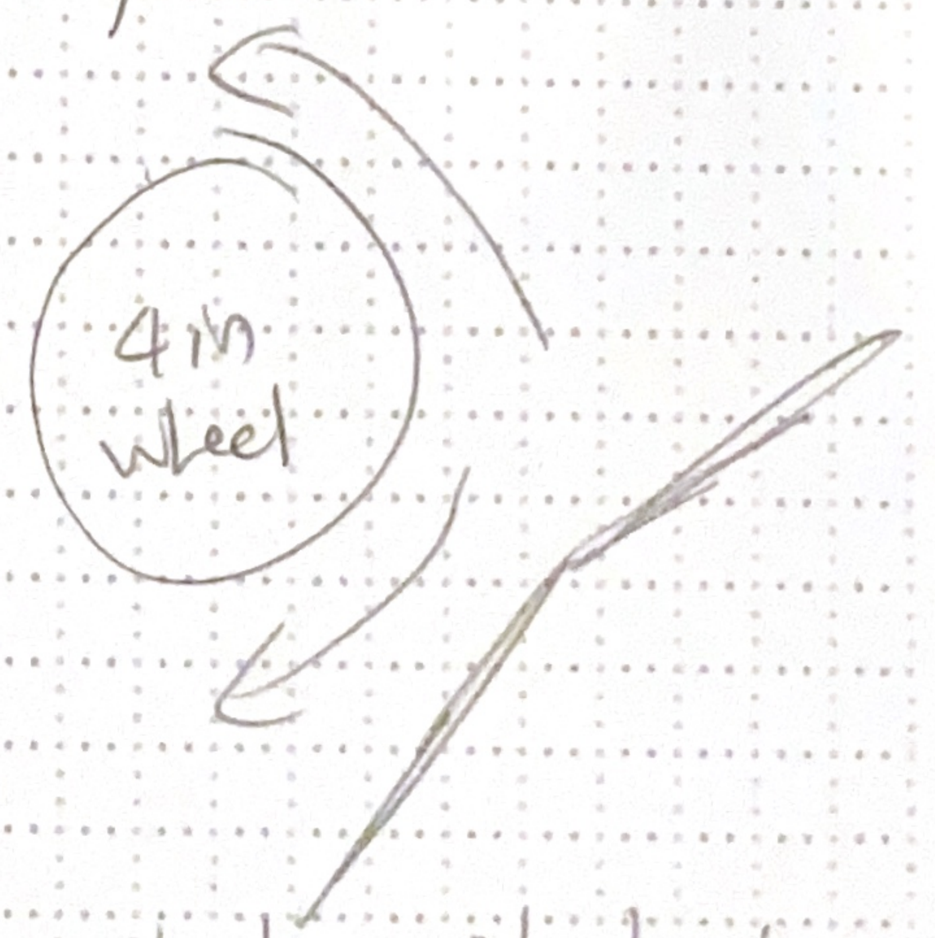
Specs: 44W
200 RPM
4x 4in omni wheels
No gears
Green Carts

[See Drivetrain: Motor Mounts]

Subsystem: Transport



Subsystem - Outtake



4 in wheel with bands sits between top/middle goal, connected to its own 5.5W motor.

Project September 2nd Bot
Date 1/9/25

Name

PROPRIETARY INFORMATION

Yarra Ranges Tech School

Once again, members of our team (this time, Esther Butler, Michael Harding and Ryan Li) visited Yarra Ranges Tech School, seeking inspiration & practice.

Once again, we did not compete.

Key takeaways:

- 60W drive important
- Proper traction wheels
- Improve top/outtake reliability
- Parking is not currently possible
- We should probably try Autonomous
- Re-budget motors

Project Yarra Ranges Tech School Name

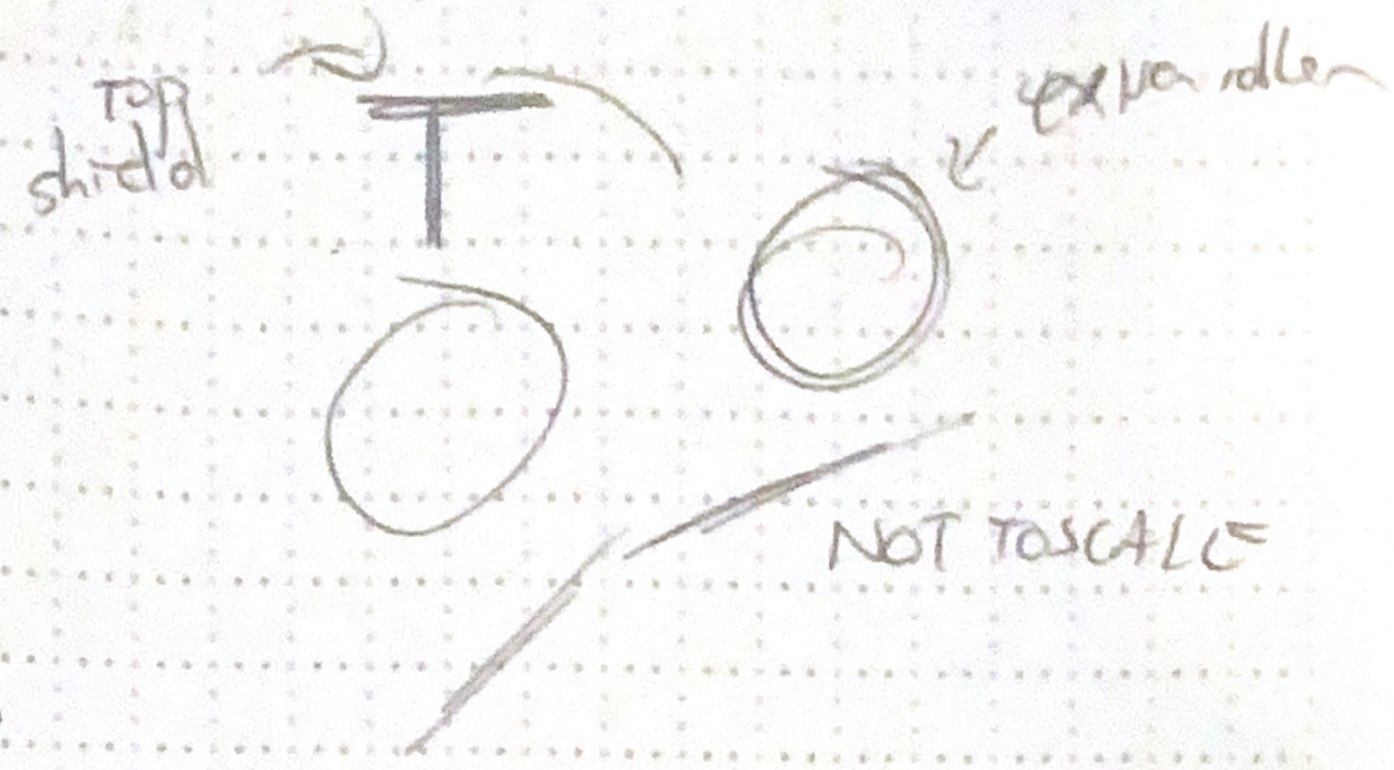
Date 21/9/25

Responding to feedback

- We immediately rebuilt the drivetrain to accomodate 1 extra traction wheel and 1 motor per side.

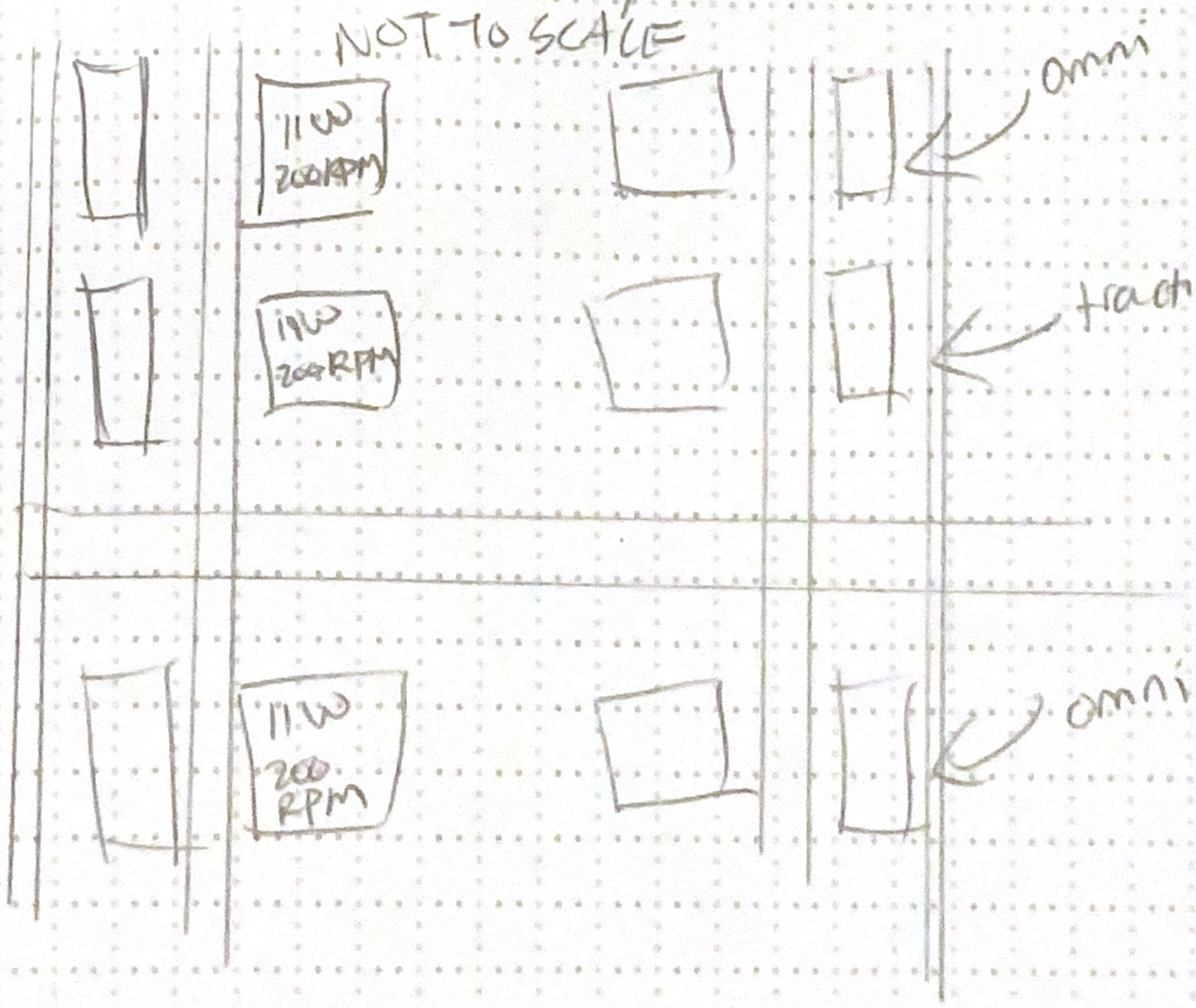
Outtake reliability

We added another outtake roller for the top section to push balls along as well as a top hood/shield to guide the blocks into goals.



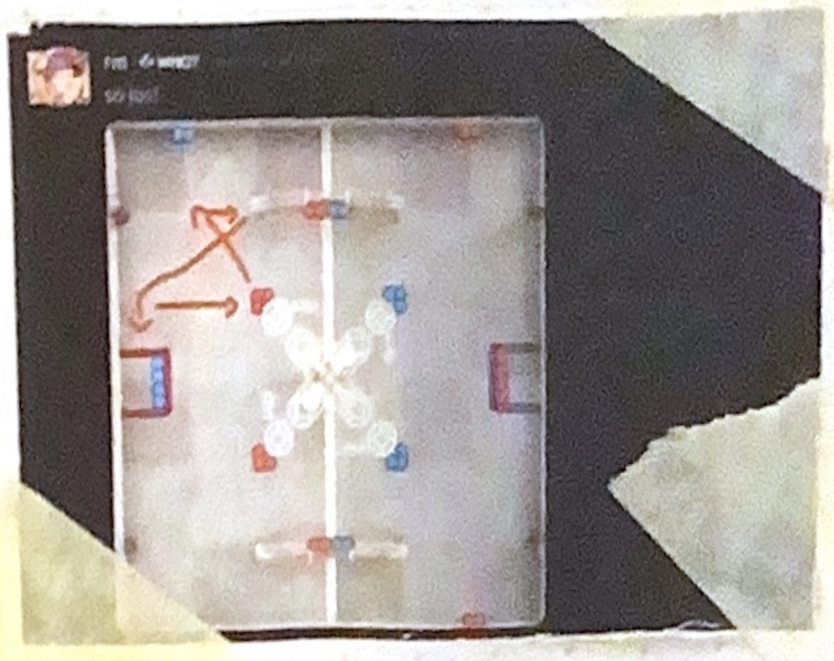
Key improvements:
- Reliable outtake & storage
- Possibly able to park?

Updated Drivetrain subsystem:

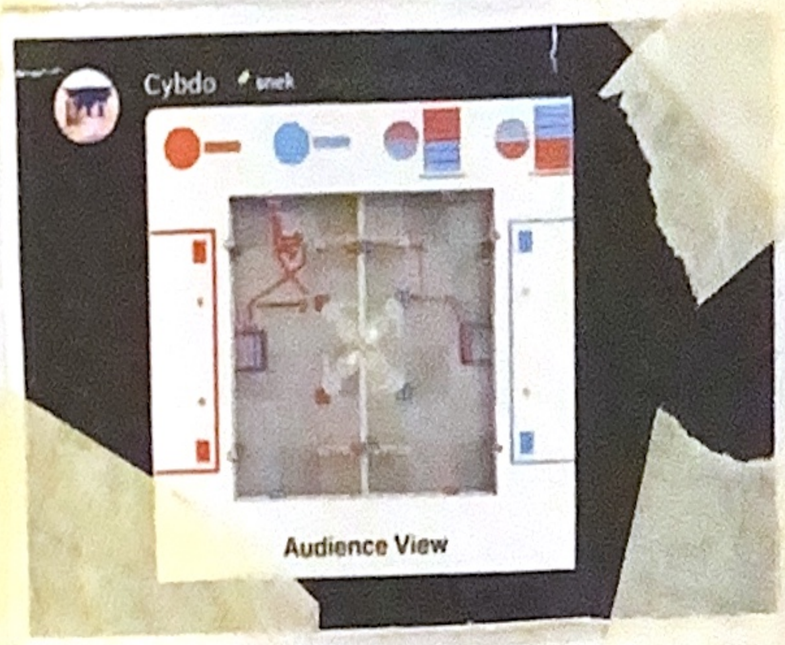


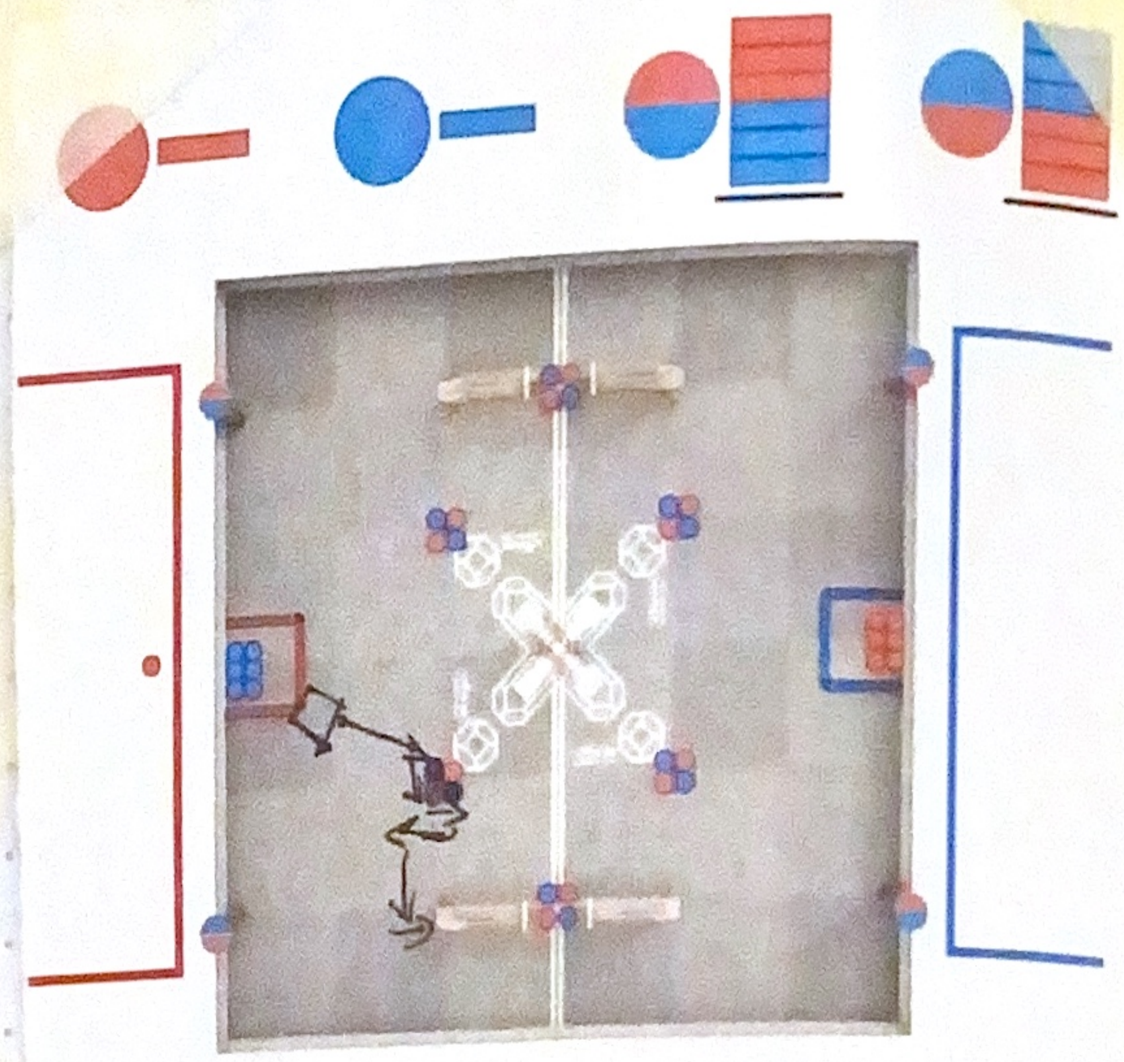
Autonomous period.

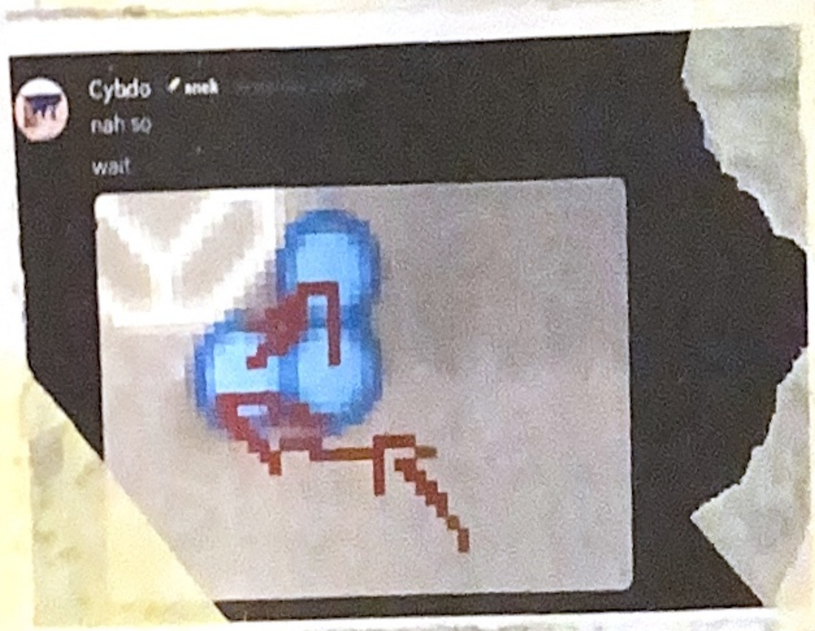
We decided we want to attempt to collect blocks and try to score them during autonomous, or at least arrange ourselves in a more favorable position.

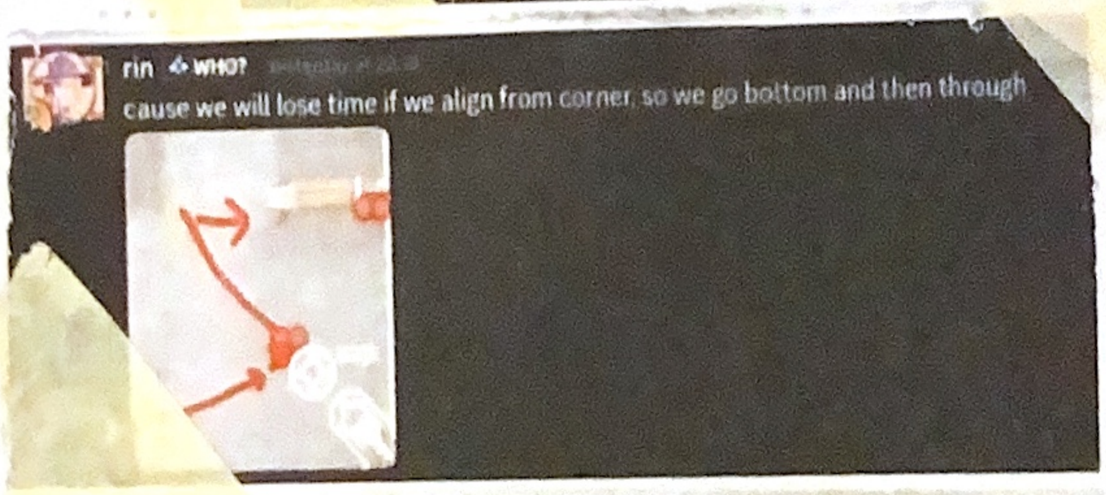


After much deliberation between Ryan (Cybdo) and Ciner (rin), we have come up with the following plan:









We aim to collect 3 blocks and score them into long goals.

Project Autonomous Period.

Date 11/9/25

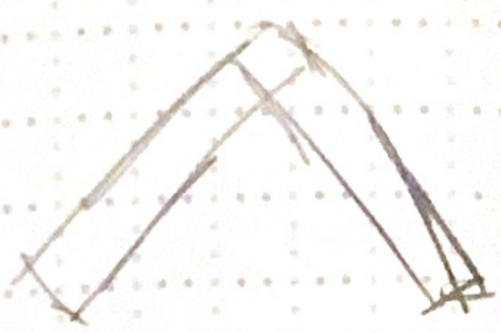
Name

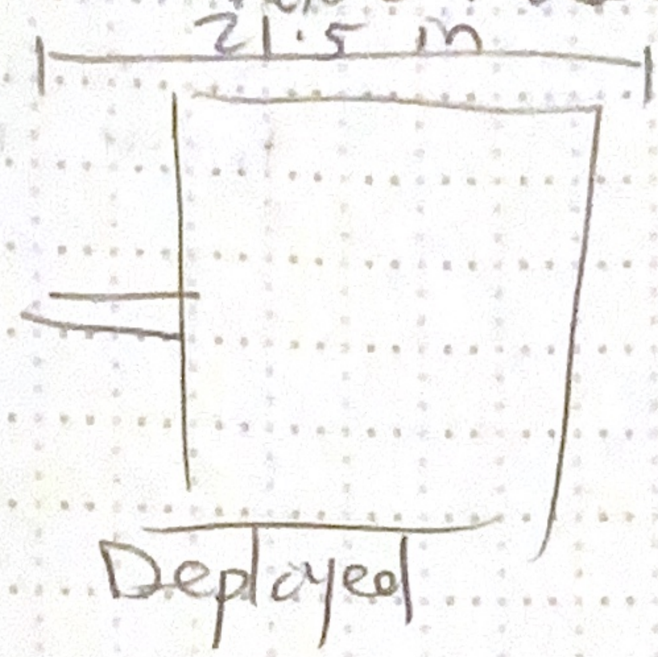
Aligner mech

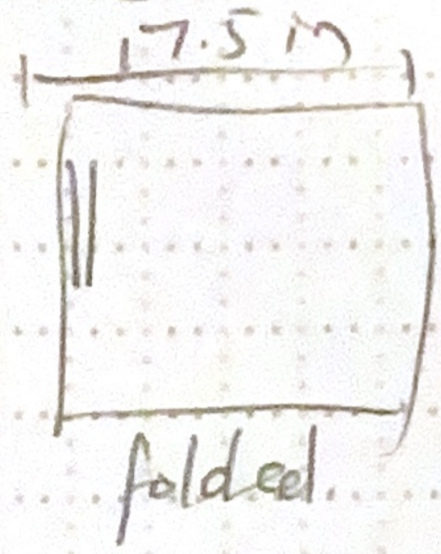
We also wanted an aligner for the long goals, to:
1. easily align
2. prevent driving too close and breaking rubber bands
3. prevent being knocked around

NOT TO SCALE

Our mech is a simple 90° structure made with C-channels







To remain within size limits, the mech was designed to be able to be folded up.

It is mounted with rubber bands and zip-ties, and uses standoffs for alignment. We tried various methods of holding the mech up, and we settled on using a zip-tie and shaft collar to hook onto the outtake.

Project Aligner Mech

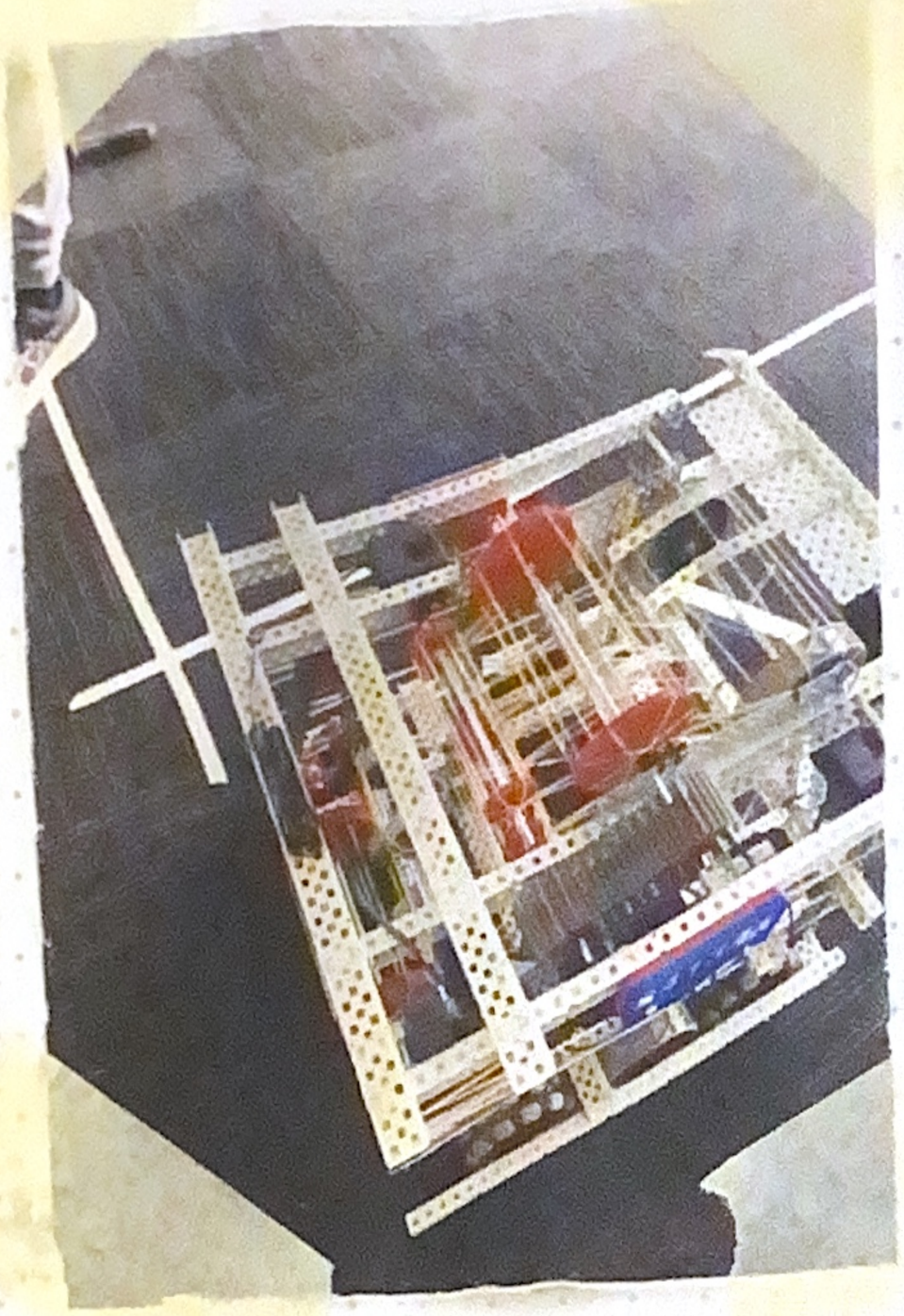
Date 11/9/25

Name

VEX ROBOTICS

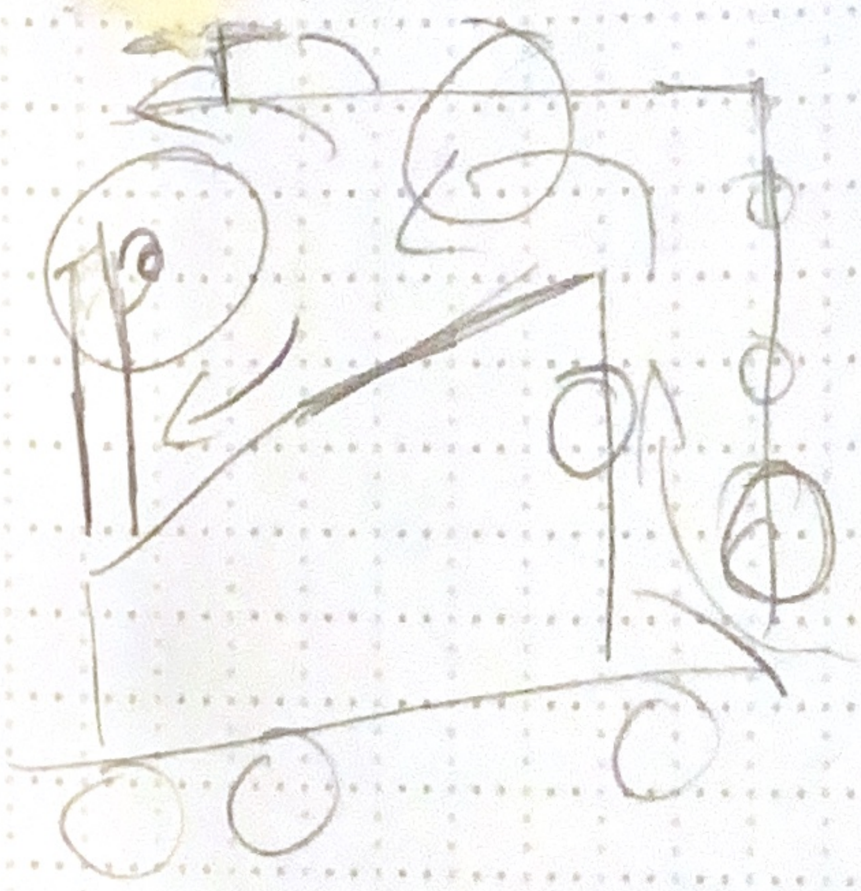
PROPRIETARY INFORMATION

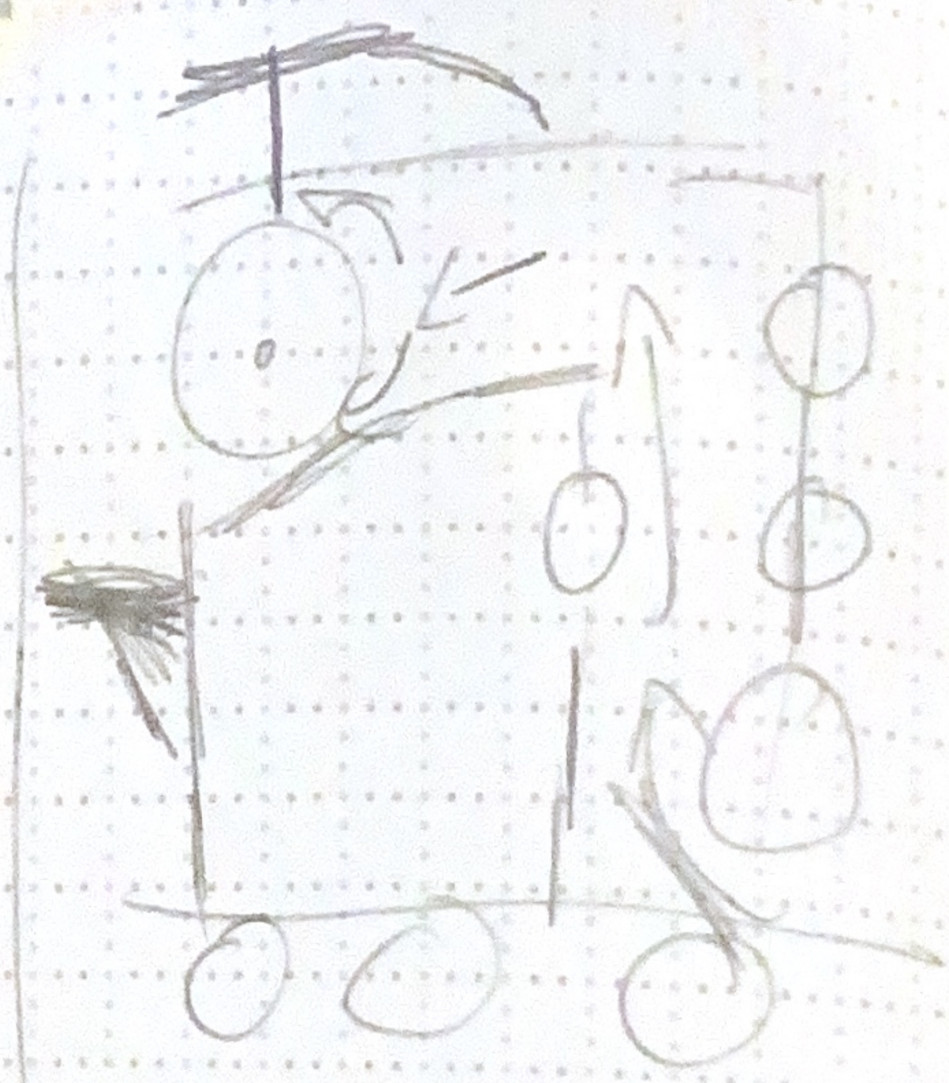
September 13th Bot



Our new bot is the same as the September 2nd Bot with the following modifications:

- Higher mech
- Motor re budget
- 6W, 6 wheel drive
- Additional outtake roller
- outtake shield





Project September 13th Bot

Date 12/9/25

Name

VEX ROBOTICS

PROPRIETARY INFORMATIO