ENGINEERING NOTEBOOK SUBMISSION

1022B

Tim Mellings

Ian Downman

Mason Nabozniak

Simone Cutrona

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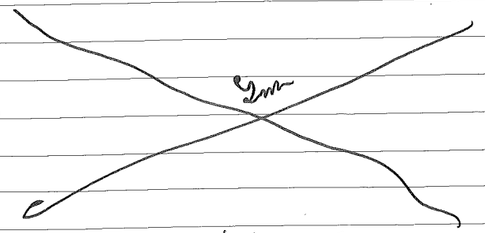

1. Define the problem
2. Do background research
3. Specify the requirements
4. Brainstorm, evaluate and pick a solution
5. Developed and prototype solution
6. Test solution
7. solution meets all requirements
8. Solution doesn't fully meet requirements
9. communicate results
10. Based on results, make changes at the proper level

1. Look at the task you need to complete, and identify parameters.
2. Observe similar projects and designs, and figure out what works.
3. Read over rules and parameters to figure out possibilities.
4. consider and discuss ideas for the project and pick a solution
5. start building a first draft, it needs to be disassembled, easily
6. Test the prototype to see if the idea would work.
7. The prototype meets all requirements and is ready for use.
8. The prototype did not meet requirements and needs to be fixed.
9. Tell those applicable what your have accomplished.
10. If you failed, look back to where the error could have occured and restart from that step

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SIGNATURE Jim Mellinger DATE Sep 4, 2021
WITNESSED BY Ian Dawson DATE Sept 4 2021
BOOK NO. 1

- Field control is very important, the balance beam is how you win games.

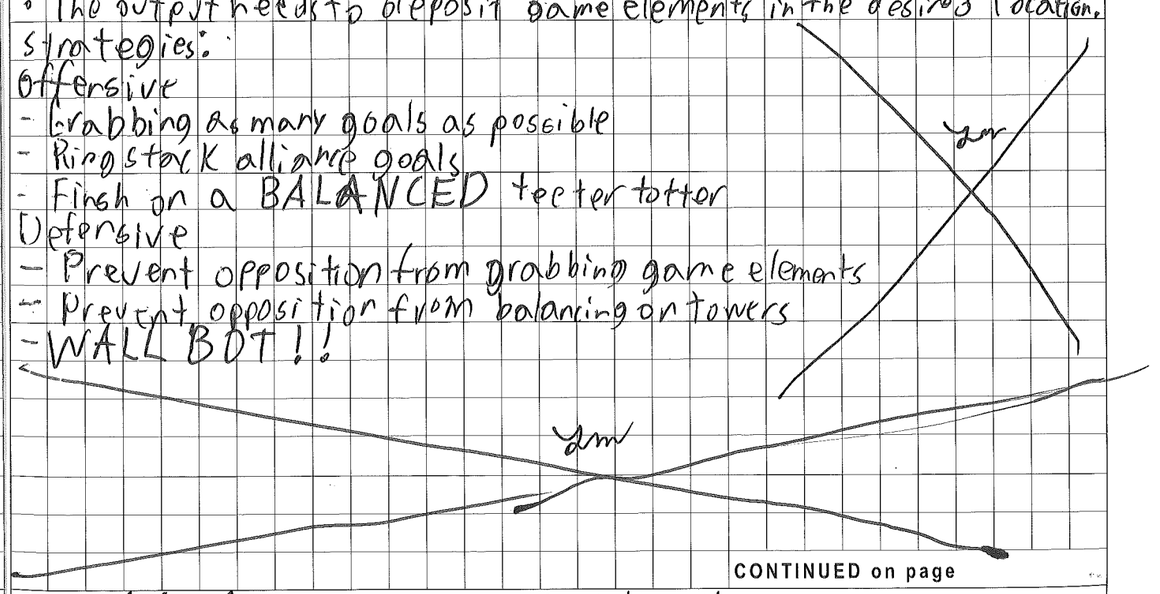
- Autonomous is again, very important. A win point is huge for major tournements. Other than the win point, 6 points is not a lot, in a game where a goal is 40 points

- Controlling goals is the name of the game, therefore wall bots might be viable. Regardless, we want a stable compact design

Design brief
- The starting robot must fit within 18" by 18" by 18"
- The robot can have no more than 8 motors
- The robot can only use Vex parts (with exception of non-shattering plastic.)
- The robot needs certain parts, such as a chassis and intakes
  - The chassis allows the bot to move
  - The input needs to intake the game elements.
  - The output needs to deposit game elements in the desired location.

strategies:
Offensive
- Grabbing as many goals as possible
- Ring stack alliance goals
- Finish on a BALANCED teeter totter

Defensive
- Prevent opposition from grabbing game elements
- Prevent opposition from balancing on towers
- WALL BOT!!



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SIGNATURE Jim Mellinger DATE Sept, 16, 2021
WITNESSED BY Thomas DATE Sept. 16. 2021
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Autonomous: 15 s.
Driver control: 1:45 m

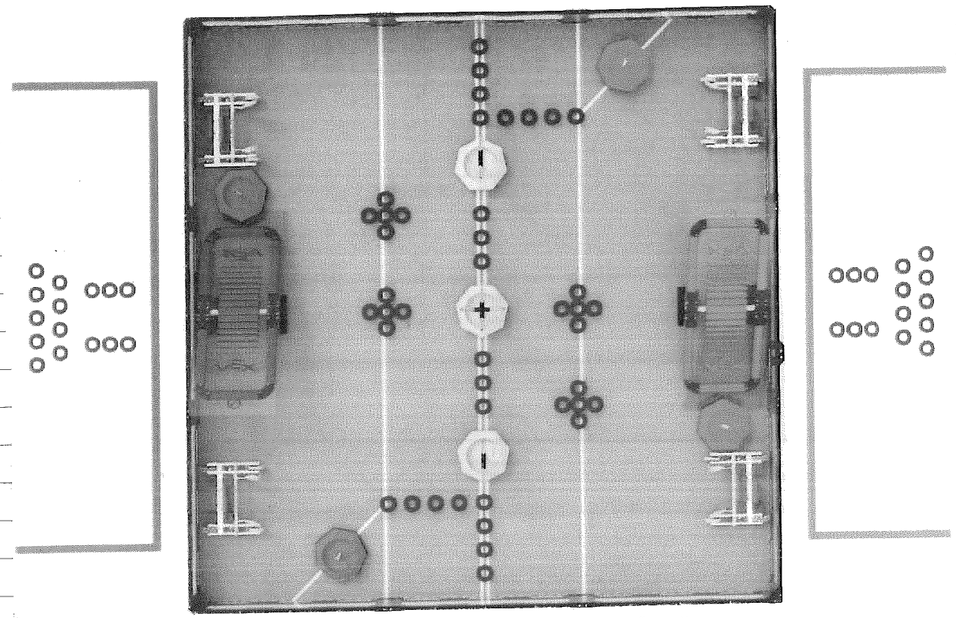

Figure 1: Top view of the field in its initial setup configuration.

Rings	Amount	Per team	Size	Weight
Rings	72	15	4.125 in	N/A
Towels	7	2	13 in	1500g - 1810g
Platforms	2	1	53"x20.1"	N/A

Ring on / in a Scored *Mobile Goal*	*Mobile Goal* High Branch	10 Points
	Any other *Mobile Goal Branch*	3 Points
	Mobile Goal Base	1 Point
Neutral Mobile Goal	Either *Alliance's* Home Zone	20 Points
	Elevated on a *Balanced Platform*	40 Points
Alliance Mobile Goal	Correct *Alliance's* Home Zone	20 Points
	Elevated on correct *Alliance's Balanced Platform*	40 Points
Robot	*Elevated* on correct *Alliance's Balanced Platform*	30 Points
Alliance	Wins *Autonomous Bonus*	6 Points

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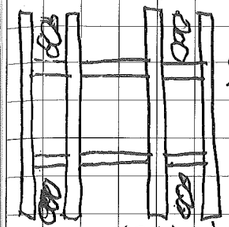
BOOK NO. 1

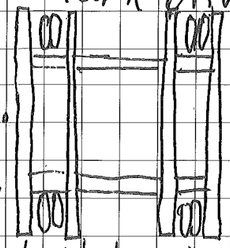
Base

There are a few different Base options to consider

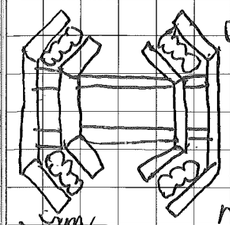
Mecanum: Mecanum wheels allow the robot to move sideways, as well as forward and backward. It has strength the X-drive does not, and has served me well in previous years. This is a good middle ground, between strength and mobility.



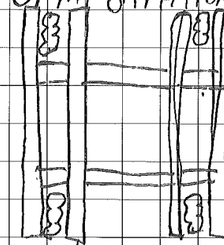
Tank Drive: Tank drive is the simplest base design with the most strength, but the least mobile. The most strong but least versatile base



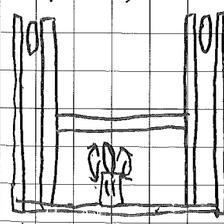
X-drive: X-drive is the most difficult base to build and function, but it is also the most mobile and fastest, however, this is not what we need ~~is not~~ for this style of competition.

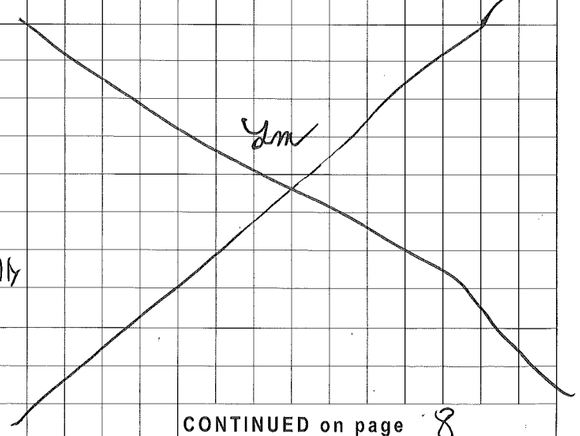


Omni directional wheels: Omni directional wheels are a similar build to tank drive, with the exception of that it can go sideways. I think it will be a less effective drive system, because it can be pushed around.



2 speed gearbox: The three wheel 2 speed gearbox is a base idea my friend Mason concocted. it is a purely theoretical design, that I personally do not see working for this competition, but it is a design that is functional.





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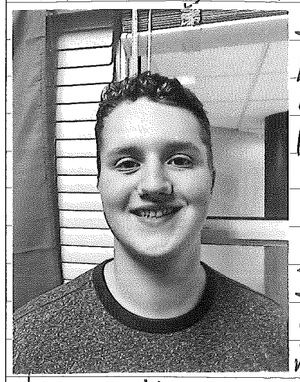
Team Profile Sep, 16, 2021 5

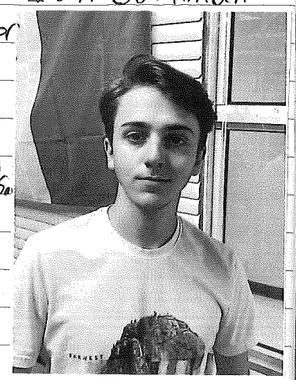
Tim Mellings : Driver, Designer, Builder



I have been building with vex robotics for 4 years now. I have a lot of practical experince, and am ready for the tipping point competition. My personal goal is to go to an in person worlds.

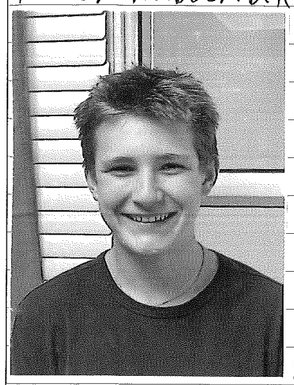
Ian Downman

:Builder, Designer



Ian has been on the team for 4 years as well. He has been by my side through all the ups and downs. His goal is ~~the~~ ~~year~~ this to also go to the worlds.

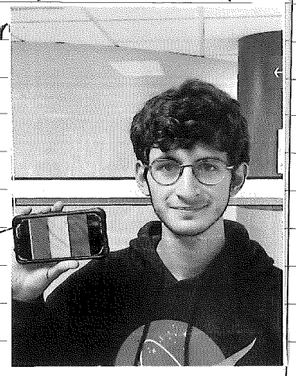
Mason Nabosniak: Designer



Mason is on his second year of Robotics, with the 2021-2022 season being his first competitive season. Mason bring a lot of Ingenuitive ideas and eagerness to the table. Mason wishes to have a creative bot to win the design award.

Simone Cutrona

:Coder, Designer



Simone is joining us from Italy for his first year of robotics. He brings us a rare opportunity with his coding skills. Simone's goal is to do the best he can do, which is very admirable.

Team goal:

I believe our goal overall ~~with~~ is to get to the Vex world championships.

Tim

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SIGNATURE Tim Mellings DATE Sept 16 2021

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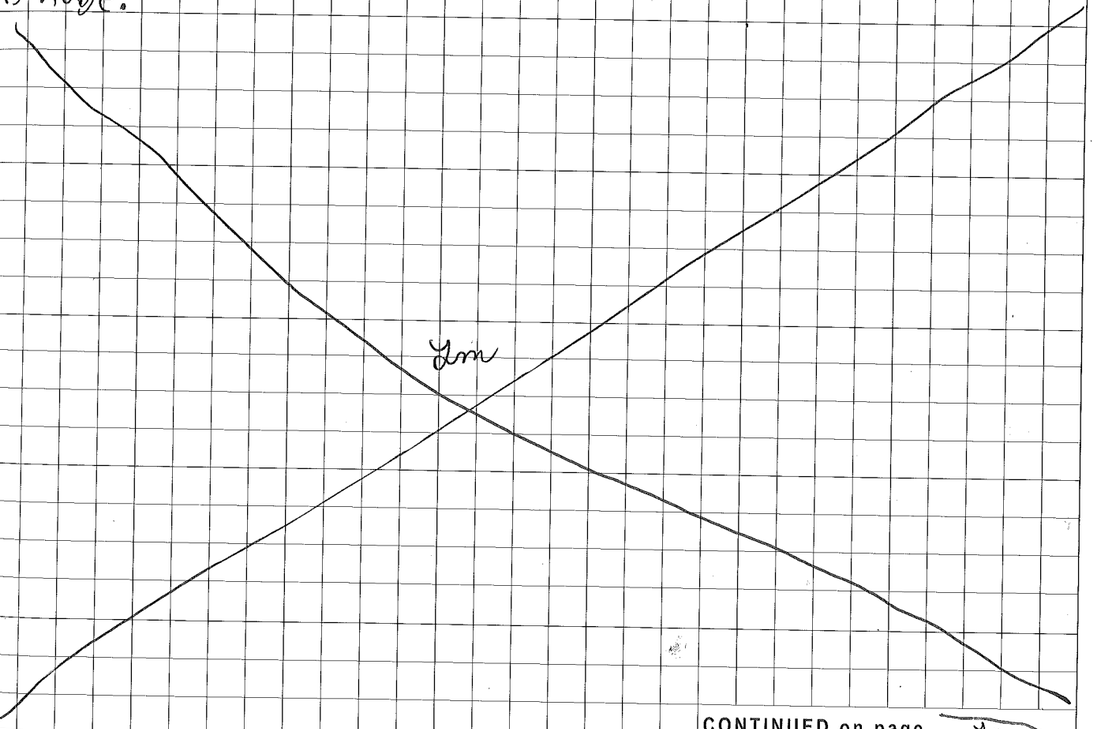
Game Outline Pt. 2 Sep, 16, 2021 6

Game breakdown:

The goal of the tipping point game is to score as many points as possible. This can be done in many different methods. A robot can move goals, score rings, or sit on balanced towers. The most points is getting a goals on a balanced tower, with the least being scoring a single ring. We need to be able to take goals, score rings and get on the tower.

Autonomous breakdown:

For the autonomous period, the goal is to score as many points in the allotted 15 seconds as possible. A win point can be earned if a ring is scored in both allied mobile goals, and the goal on the AWP line (Autonomous win point) is removed. I believe the win point is more important than a 6 point bonus to a match. In a tournement format, the possibility of an extra win point is huge.



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SIGNATURE Tim Mellings DATE Sept, 16, 2021

WITNESSED BY Cutrona Simone DATE Sept 16 2021 BOOK NO. 1

Discussing with the team, in terms of scoring, we decided that moving towers are the most worthwhile. Being 20 points for each finishing tower, and 40 each for a balanced beam, is where the points are going to stack up. The least effective method is trying to get rings on the top tower. A specially designed robot would be required to complete this material task, which could be stolen.

The build:

This list is the most important to less important things on our bot

- A moving drive chassis
- A functioning primary lift
- A functioning secondary lift
- A consistent autonomous
- A consistant strategy
- A tournement ready bot

Point benefit analysis:

Ring on / in a Scored *Mobile Goal*	A	*Mobile Goal* High Branch	10 Points
	B	Any other *Mobile Goal* Branch	3 Points
	C	*Mobile Goal* Base	1 Point
Neutral Mobile Goal	D	Either *Alliance's* Home Zone	20 Points
	E	*Elevated* on a *Balanced Platform*	40 Points
Alliance Mobile Goal	F	Correct *Alliance's* Home Zone	20 Points
	G	*Elevated* on correct *Alliance's Balanced Platform*	40 Points
Robot	H	*Elevated* on correct *Alliance's Balanced Platform*	30 Points
Alliance	I	Wins *Autonomous Bonus*	6 Points

A	1/10	The least effective way of gaining points, it requires to much effort
B	4/10	A simple mechanism can make this work, but not many points
C	3/10	Easy enough to do, but with minimal gain
D	10/10	Simply and easily the best method, because it gives points for little work
E	9/10	Yields the most points but tricky to do.
F	10/10	("D")
G	9/10	("E")
H	8/10	Tricky to pull off, but simple enough to conceptualize
I	5/10	Most effective to go for the win point

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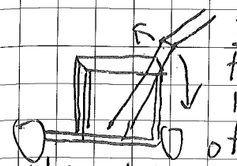
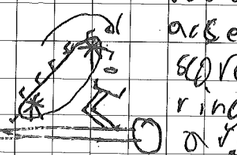
SIGNATURE Zinn Messinger DATE Sept, 17, 2021
WITNESSED BY Ian Daumen DATE Sept. 17, 2021
BOOK NO. 1

Upper mechanisms

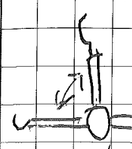
Fork lift & lift: This is one of the original systems I brainstormed, this fork lift would lift a tower on top of a balance beam without having to go on it. this system is one we are really considering



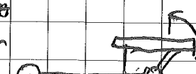
Ring conveyor belt: This system would allow ease of access to grab and score a number of rings, the rings are not as important as towers but still a useful system that could potentially work with another system

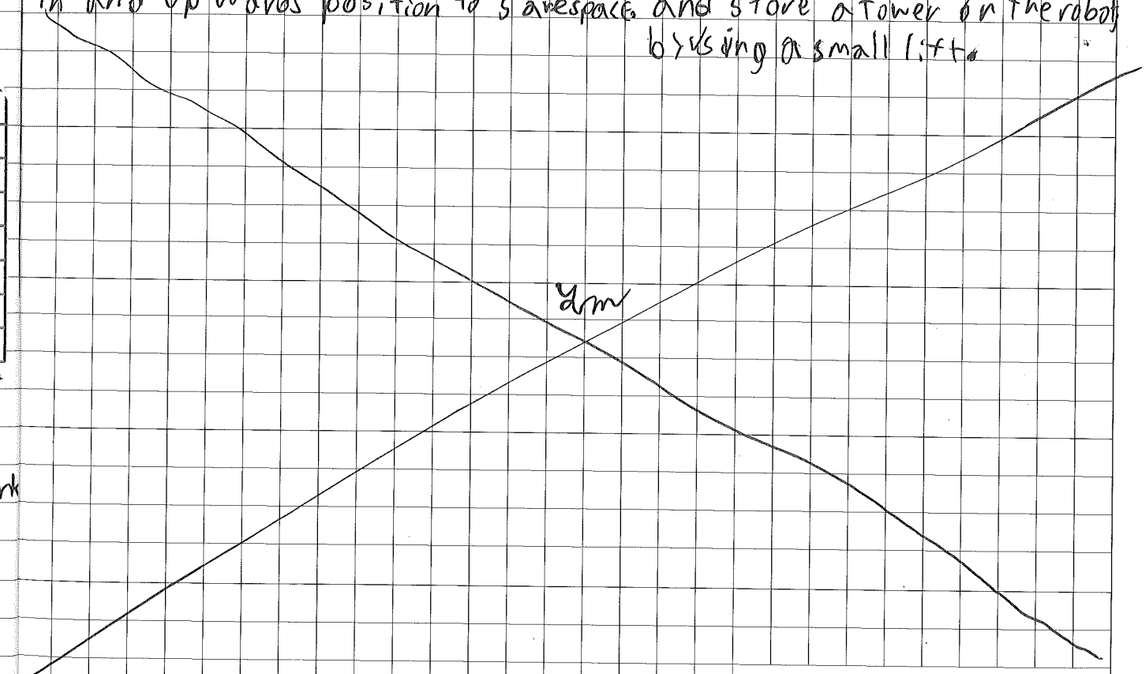


Tail spike: This would be a secondary system to potential primary this system could function as ring collection, or to potentially grab a tower and drag it behind, it would start in and upwards position to save space and store a tower on the robot by using a small lift.



Frontal lift: This system is a secondary system to complement the ring system, this system could grab





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SIGNATURE Zinn Messinger DATE Sept 20, 2021
WITNESSED BY 沈宇 DATE Sep 20, 2021
BOOK NO. 1

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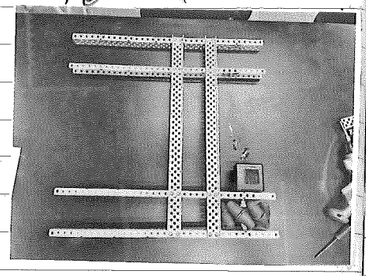
Build Days #1

Sep 14: First build day! We started on a basic base and mecanum drive. We decided to scrap that idea as it would not be stable enough.

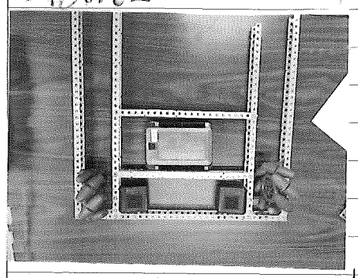
Figure 1



Sep 15: Started more stable and stronger base took all class to start basic frame

Sep 16: Finished all the metal pieces and installed the brain to look something like figure 2.

Figure 2

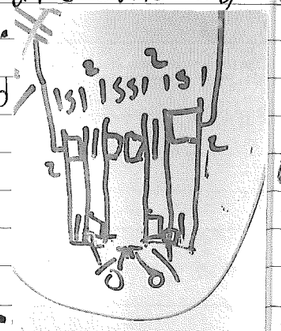


~~Sep 17~~ Sep 20th: Finished the base and wired everything for a test drive. We realized that our base was out of size, being to wide. We also figured out that we want more room for an interior system, so we have decided to do an entire rebuild.

Sep 22: Took our second base apart to discuss ideas. Come up with a neat lift design and discussed using gears to centralize the motors on our next one.

Sep 23: Worked with gear ratios to try and make a base work. Nothing has come with it, so we are building a similar base to the old one, but in size.

Sep 24: Came up with a brilliant design that would include all our possible functions with 8 motors, and be in size. Credit to Ian Downman for the idea, and Mason Naboshniak for the drawing and expanding it. We started prototyping this design with some great results.



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SIGNATURE Jim Mellinger

WITNESSED BY [illegible]

DATE Sept 25, 2021

DATE Sept 25, 2021

BOOK NO. 1

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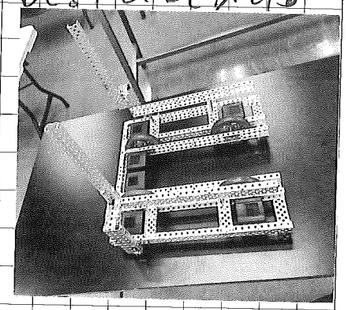
Build days #2

Sep 28: Worked on our brilliant base design, everything fits smoothly so far

Oct 1: Ran into small problem regarding space. It took cutting a bearing flat to get to our best base yet. Pt. 2 went back to build after school and finished our basic idea for the robot → it turned out very well. We attached the wheels so they did not make contact, all our measurements were to plan. The goal now is to have a functioning robot by the mini comp on tuesday.



Oct 4: Continued working on lift system, we also built on anti ring system.

Oct 6: Hurriedly worked on a basic bot for the competition tomorrow, we made a basic tank drive bot with a lot of power, and a set of arms to attempt to grab or guide towers, and bring down the balance beam.

Oct 6: See in class tourny pt. 1 on Pg. 11

Oct 7th: After surprising success in the in class tournament we were not happy with our robots functionality, so we are completely redesigning are lift system, and using 4 locked omni drive systems.

Oct 8th: The team split into groups of two; Mason and Ian went and created some locked omni-directional wheels to increase grip, and brainstormed a potential base. Simone and I utilised his idea of a piston lift to the test, we built a simply prototype and although it did not work, we have high hopes for a more structurally sound build.

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SIGNATURE Jim Mellinger

WITNESSED BY [illegible]

DATE Oct 12 2021

DATE October 12, 2021

BOOK NO. 1

In Class tourny Pt.1 Oct 6, 2021

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We went into our first in-class tournement, we were unsure of our robot. It could drive, but it's only mechanism (a fork lift) was not working properly, and could only score preloaded rings. We went into our first match without much hope, but were surprised when.

Match	Color	Score	Team
1	Red	65	1022Z
			1022X
	Blue	114	1022W
			1022B

We absolutely dominated the match, this was in part due to our partners getting on the balance beam early. We did our part to grab towers, and score our preloaded ring. We were isolated that we filled in for match 2.

2	Red	133	1022B
			1022E
	Blue	63	1022A
			1022C

Our partners did the same move and got up on the balance beam, but because they were more helpful in controlling the field. We took a break between matches and came back for match 4.

4	Red	43	1022W
			1022B
	Blue	153	1022E
			1022C

This match did not go very well for us, because we got stuck on a ring, and our platform got disrupted. The reason we had been surpassing teams, is because we had ring guards. This mostly prevented our bot from getting caught on rings. It turns out that was not enough for this match because our strategy, we were scheduled for the next match, so we went on

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SIGNATURE Kim Messinger DATE Oct 15, 2021

WITNESSED BY [illegible] DATE Oct 15, 2021

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10 Build days #3 Oct 12

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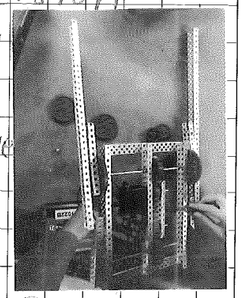
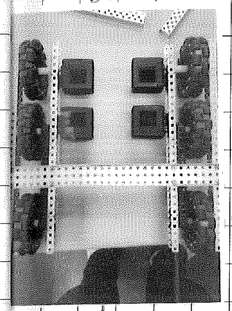
Oct 12: I worked on a more structually sound version of Simones piston arm idea with some success, we decided to figure out a top system for his idea.



Oct 13: We have no ideas, our lift system is ineffective and our base idea got nowhere. We are looking for inspiration from the internet.

Oct 14: Found an idea that could work for us. A forebar that would pick up towers by the pole. We decided to put the forebar on a rotating gear system, that would allow our forebar to turn. The secondary system has not been decided yet. I stayed late working on a base. This base involved a 4 wheel drive with chains attaching to 2 more wheels for a total of 6.



Oct 15: Started working on our rotating forebar system. We spent 9 hours working to complete the turret system. We attached the turret, made a working forebar from scratch, and tested it until it functioned properly. We were in the school until 11pm, and left ready to improve.

Oct 18: Put our new turret to the test, we drove the robot for the first time and noticed a few flaws. Primarily, the system was not stable and did not turn well. Our idea for a 6 wheel base also proved ineffective, and our base did not turn.

Oct 19: We set out to resolve the previously mentioned issues, and started on a mecanum base. We decided to try mecanum, because it would work well with being able to pick up goals from the side

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SIGNATURE Kim Messinger DATE Oct 26, 2021

WITNESSED BY [illegible] DATE Oct 26, 2021

BOOK NO. _____

In class tourny Pt. 2

This is our 4th match

5	Red	103	1022B
			1022W
	Blue	73	1022X
			1022E

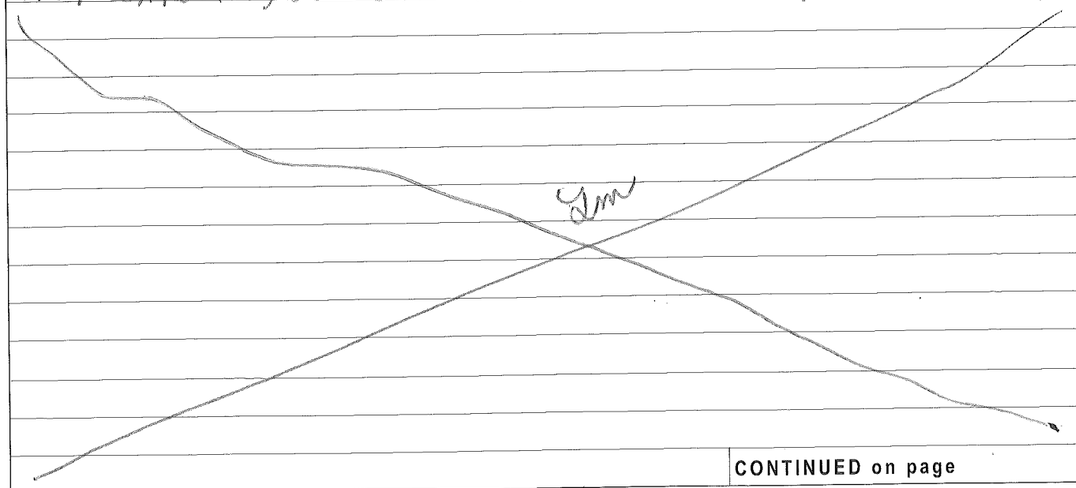
This match was very close, but we had control of most towers at the end. We reviewed the rules afterwards and determined blue would have one if the balance beam touches in the last 30 seconds were accounted for. Out of elation we filled in for the 6th match as well

6	Red	105	1022C
			1022B
	Blue	93	1022W
			1022Z

This match was closer, due to the opposing team elevating a robot ~~early~~ with a tower early. This ~~was~~ backfired for them because it allowed us to control more towers.

Summary:

Our robot did a lot better than expected, going 4-1 throughout the day. We can definitely improve our bot with a working mechanism. Overall we did much better than expected, but still have room for improvement



CONTINUED on page

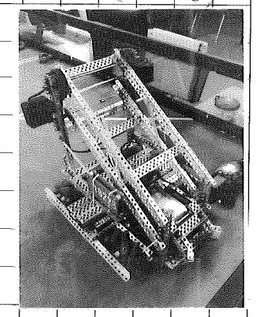
SIGNATURE Jim Messinger DATE Oct 15, 2021

WITNESSED BY [illegible] DATE Oct 15/21

BOOK NO. _____

Build days #4

Oct 20th: Finished up our mecanum base for skills tomorrow. We feared that the turret would not be functional, and decided to just attach the fore bar directly to the robot. This was so we could have a more stable robot that would be ready for skills.



Oct 21st: Completed 2 skills runs today, during class time. The first run scored 80 points, the second run scored 130 points. The improvement came mostly in watching other teams complete runs. After the skills period, we got to reattaching the turret and increasing overall build quality.

Oct 22: I came in on the prod day to fix the wiring and lost few problems. We now have a functional robot.

Oct 25: Skills day part 2, we completed an additional run of 120 points. This run was notable because we were able to lift a tower onto the platform, however we did not make it onto the platform ourselves this time.

Oct 26: During our skills runs, we realized that our lift system, particularly our claw, was not super effective. We fixed the issue by changing around some parts. Simone also got a 3-d model of the robot designed.

Oct 27: We completed our new claw system, with great results. The robot can now consistently grab towers and lift them to where they are needed.

Oct 28: we started on our secondary system, which is a fold down trailer, as Simone is busy working on an acceleration system and anti tip code.

CONTINUED on page 15

SIGNATURE Jim Messinger DATE Oct 28

WITNESSED BY [illegible] DATE Oct 28/21

BOOK NO. _____

CONTINUED from page 14 Build days #5 Oct 29

Oct 29: Continued working on the tray system for our robot. I fixed the issues with our claw bending and putting us out of size. Simone created some code to slow down our robot for getting up of the platform and continued on our autonomous program

Nov 1: Created our final design before the inclass tourny the next day, can't wait!

Nov 3: See Inclass tournament #2 (pg 16.)

Nov 4: Did a number of skills runs with the robot in its turreted state. The team got a score of 80 points. I broke my previous record and scored 140 points, which leads the class.

Nov 5: Deconstructed the meticulously crafted turret in order to implement a more viable design. Our turret was a very brilliant, one of a kind idea, but it was not a good use of motors. For more versatility, we decided to change to a ring system with 2 lifts.

Nov 8: Started on the new system by building a smaller more efficient primary forebar, which can be more compact.

Nov 9: Finished primary forebar, which works splendidly started on modifying the base by moving motors to incorporate the ring system. Mason decided to go off and test the functionality of 6 motor drive. He built and coded it in 1 class. Doing a test drive, the system works very well.

CONTINUED on page 18

SIGNATURE [illegible] DATE Nov 9 2021

WITNESSED BY [illegible] DATE Nov 9 2021

BOOK NO. ____

CONTINUED from page In class tournament 2 Nov 3

For our second inclass tournament we went in very confidently with our robot. We had the ablity to lift towers onto the platform, which no other team had the ability to do. We participated in 8 matches

Match #1

1022Z	1022E	83	104	1022B	1022C

We decided to test a tray system to attach to the back our robot, this system did not as well as we had hoped, so we decided to scrap the tray.

For most of these matches, we had decided to not take things to seriously. Match #2

022B	1022E	124	58	1022A	1022Q

This match went much better without the tray. 1022A was a team we were considering to be a contender for winning the tournament, however they would prove themselves to not be. Match #3

022X	1022C	67	103	1022Z	1022B

A win over two of the strongest teams was a huge morale boost. The game ~~was~~ was relatively close, but our tower stacking capabilities won in the end.

Match #4

1022X	1022B	73	173	1022Z	1022Q

This match was driven by Ian, as we wanted to give everyone a chance to drive. It was this that ended up in our downfall. It was Ian's lack of Driving knowledge and 1022X's bot malfunctioning that cost us the game to this magnitude. Match #5

22B	1022E	143	42	1022X	1022Q

This match, I picked up again and we picked another win, the turret came in handy this match, as it allowed us to score a tower while being pinned.

CONTINUED on page 17

SIGNATURE [illegible] DATE Nov 4th 2021

WITNESSED BY [illegible] DATE Nov 5th 2021

BOOK NO. ____

CONTINUED from page 16 In class tournament 2 pt2 Nov 6th

Match #6

1022A	1022C	82	83	1022Z	1022B

This match was Driven by Simone, and nearly lost, due to a ring violation. However Simone's clever use of our mecanum drive, and 1022Z's maneuverability, scraped the match by. Match #7

1022B	1022E	43	83	1022Q	1022Z

This match was driven by Mason. Mason managed to get the robot so stuck, that the robot flipped after becoming unstuck, rendering us useless for the match. Sadly, our teammates could not handle the 2v1. Match #8

1022C	1022E	113	99	1022X	1022B

I decided to drive in our final match, however, quite a surprise was in store for me, because after autonomous our claw stopped functioning. This was too much of a handicap and ended up losing us the match.

Overview:

Overall, I am impressed with what the team has pulled off in the building, driving, and coding of the robot. It looks like I will be staying as the primary driver for the time being. One thing we have learned from this tornament, is that the turret is not viable. It does not have the multi functionality needed for this challenge.

Tim

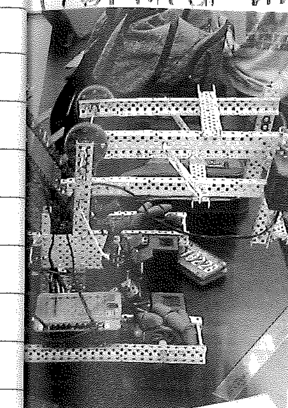
CONTINUED on page

SIGNATURE Tim Mellinger DATE Nov 6th
WITNESSED BY Ian Dawson DATE NOV 6 2021 BOOK NO.

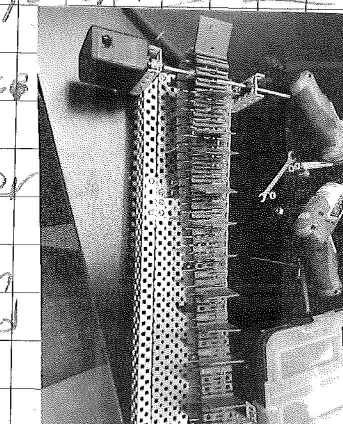
CONTINUED from page 15 Build days #6 Nov 10th

Nov 12: Disassembled the turret and forebar. Kept the base, just in case we wanted to reuse it.

Nov 15: Came up with a great idea for a new robot (partially inspired by 1022X). This would incorperate all the different ideas of the past. This would include a ring system. Finally a good use for the new forebar.



Nov 16: Built a basic ring system to incorperate into our design. We managed to build it in one class. However, it has run into some problems in taking rings. After some tests, we realized that we simply needed to flip some screws. The bigger problem was that in order to have a good angle, we had to move our motors.



Nov 17: We moved the motors to incorperate the ring system, and started on a back lift. While most of the team was working on ~~his 6 wheel bot~~ the main robot, Mason was drive testing with the 6 wheeler. He managed to pull off a skill score of 180, which is the new class record.

Nov 18: Designed a basic back bar to start a back clamp. After school I rebuilt the ring system to be the correct size for what we needed.

Nov 19: After putting in not much work over the week, the team buckled down to make a working robot for the following days. We started by making the base wider, so that we could fit our ring system. We then attached the ring system to be in line with the back clamp. ~~We~~ By this point, it was 9 p.m. We decided to simply attach our prebuilt forebar and secure it as much as we could.

CONTINUED on page 20

SIGNATURE Tim Mellinger DATE Nov 19th
WITNESSED BY [illegible] DATE Nov 19th BOOK NO.

In class tournament #5 Nov 21

For this tournament, we were worried about the build quality of our robot. To make matters worse, we were recursed to play against 1022X For most of our matches. So for this tournament we were hoping to get near the top of the class.

Match #1 | 1022B | Blue 106 | 76 Red |
We managed to overtake 1022x for the first time, by using our better quality forebars. Our teammates 1022 were also very helpful in stealing towers.

Match #2 1022B | Blue 103 | 63 red |
We managed to outmaneuver the enemy, this game for the win.

Match #3 1022B | Red 80 | 56 Blue |
We beat 1022X for the second match. This was because we focused on getting towers, while they worked on rings.

Match #4 1022B | Red 89 | 87 Blue |
This was the closest match in the entire tournament. We won this match because 1022x lost out on ring, and we won auton after a tug of war with their robot.

Match #5 1022B | Blue 66 | 63 Red |
This match was almost won by the other team. This is because 1022E pushed over 2 towers last minute, our autonomous cababilities saved us again.

Match #6 1022B | Red 92 | 61 Blue |
We played our final match with 1022X. We managed to beat the other teams even after taking a penalty.

Semi-finals: our semi finals match was played with 1022X V.S. 1022C and 1022W. We won handily, but the score has been lost.

Finals: For our last match we lost our first match. 1022X had their ring system malfunction mid match, which cost us the match.

Overall, I am pleased with the performance of our robot and cannot wait to make improvements.

CONTINUED on page

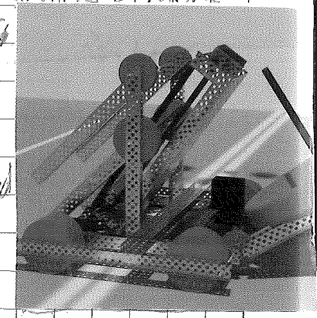
SIGNATURE Jim Mellinger DATE Nov 24
WITNESSED BY Evan Damron DATE Nov 24

BOOK NO. —

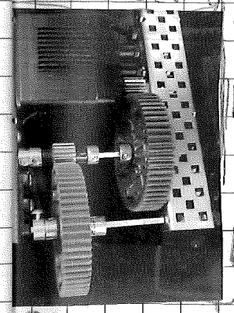
Build days #7 Nov 25

Nov 25: For the 5th or 6th time, we stripped all of the mechanisms off of our base. We kept the ring system for later use, but disassembled our forebar and back lift to rebuild.

Nov 26: I started working on the new forebar, while Simone started working on a 3-d model in blender. The model turned out really well, and we started working. The model incorperated the forebar and ring system we had planned, but it incorperated a gear box-like system attached to our ~~back lift~~ a fork lift. We stayed until 11 pm. working on our adjusted forebar and prototyping our back lift.



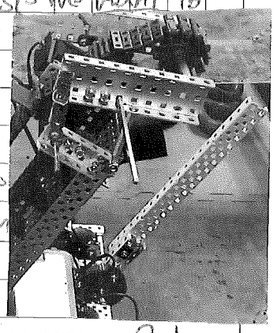
Nov 29: We rebuilt the gear box portion of our base to increase the torque. The new system worked beautifully, even being fast enough to lift the base while having enough torque to rotate it.



Nov 30: fitted our forebar to be the right length. We also did some minor adjustments to the ~~forebar~~ backlift.

Dec 1: Mounted the fore bar to our robot. Took a long time securing, because we want to ensure quality.

Dec 2: Mounted the ring system to our robot. We then had to take on the problem of what we were to do with the ~~fore bar~~ top of the ring system. We decided to take inspiration from some other teams and created an outlet system, which we tentatively mounted to the robot.



CONTINUED on page 21

SIGNATURE Jim Mellinger DATE Dec 2, 2021
WITNESSED BY Advisor DATE Dec 2, 2021

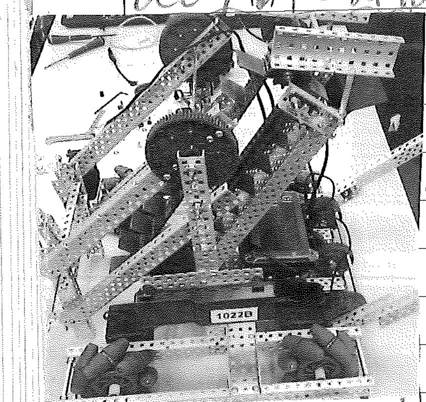
BOOK NO. 1

CONTINUED from page 20 | Build days #8 | Dec 3rd |

Dec 3: Mounted the electronics to our robot. We took a final measurement and found we are in size this time. We run a few drive tests and find some errors. For example rings were getting stuck at the top of the ring system and in the outake. Even those that made it through were having issues making it on the pole, due to our forklift bouncing.

Dec 6: We took the ring system off of the robot to make some minor design changes. These included swapping some bearing flats, changing the motor placement, and removing the out take system.

Dec 7: Reattached the ring system and worked on a quick design for an outake. We settled on some simple bars, and to increase the speed of the system. Surprisingly, this simple fix worked very well. We also started on a ring guard system for the front of the robot, to guide the rings in to our intake.



Dec 8: Fixed our back fork lift system. The movement is now much more percise and the unwanted jiggling is all but gone.

Dec 9: Finished attaching our ring guard system for the rest of the wheels. Edited our back lift to make it more

Dec 10: Fixed the recording ~~software~~ program and started ~~re~~ recording our autonomous for the tournament. Packed up the bus for our tournament tomorrow!

Lm

CONTINUED on page 24

SIGNATURE Liam Mellinger DATE Dec 10
WITNESSED BY [signature] DATE Dec 11
BOOK NO. ______

CONTINUED from page X | Shawnigan lake Tournament | Dec 11 |

The shawnigan lake tournament was an interesting event. In some aspects, we did really well, in fact, a lot better than we thought we would do. However, in others we failed spectacularly. I will be spliting this tournament into the different sections of ~~our robot~~ bot what happened.

- Before

Before the tournament started, we were given and opportunity to do skills, however, we did not use the time for that. Instead, we decided to create our autonomous and Iron out the kinks in the system.

- Matches

~~Matche~~ Our matches went shockingly well. We ended up going 7-0-0 for a perfect qualifier. We did get very lucky during some of them. Going forward, we need to set our robot up with a better autonomous, and have a more fluid plan, for when things go awry.

- Judging

The judging portion of the event went mostly as expected with the judges being very insightful. Their was one moment where ~~the~~ the judge asked us a sem, unfair question, and deducted points based on our answer.

- Skills

We only managed to get a singular skills run in due to the afformentioned morning, that run however, was a 100, which turned out to be ~~a 100~~ the second best run throughout the entire tournament. However, our autonomous skills malfunctioned and we ~~were~~ were unable to retry. We still ended up 3rd overall despite this.

- Alliance selection

We ended up second overall, meaning we got second pick unfortunately the first placed team picked our other possible alliance putting us up the creek. We decided on a brentwood team on a whim, which turned out to be a mistake.

CONTINUED on page 23

SIGNATURE Liam Mellinger DATE Dec 12
WITNESSED BY Ian Dawman DATE Dec 13 2021
BOOK NO. ______

CONTINUED from page 22 Shawnigan Lake tournament pt2 Dec 12

-Finals-
For our first match we played against the 7th place alliance, however, we lost the match by 8 points. Our teamates maded 2 errors, that if one had not been made, we would have won. Unfortunately we also not even win any awards.

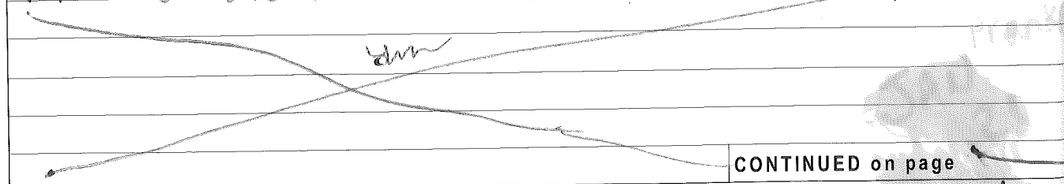
-Overview
For a first tournament of the year, I am very happy with the results. We have a very good robot for both the meta and built well. There are a number of things we need to improve upon, mostly in terms of tournament strategy.

-Improvements:
1. To improve our time management, we need to make sure everything we can do in advance is done. The big thing for this tournament was not having the autonomous read

2. The big piece of feedback we got from judges was to incorporate more data into the notebook, as it would help us make decisions.

3. The key thing that prevented us from doing well in the tournament was our bracket alliance. We need to be much more tactical about our alliance picks during the last phase.

All in all, ~~we~~ Our robot and team performed very well, however, we have a few things to work on. I believe if we can work out these problems we will be able to win many awards.



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SIGNATURE Shawn Mellmer DATE Dec 12
WITNESSED BY Matthew DATE Dec 12/21 BOOK NO. 1

CONTINUED from page 24 Build Days # 9 Dec 14

Dec 14: Addressed the ~~p~~ issues from the tournament at shawnigan, discussed potential solutions and changes.

Dec 15-17: Ended 2021 with a fun "Vexmas competition" we ended up winning due to an impressive run of 50 seconds, which is over twice as fast as the second place run.

Jan 10: Back After a long winter break to find 2 parts burnt out on our brain. We switched some parts around in order to fix the burnt out parts

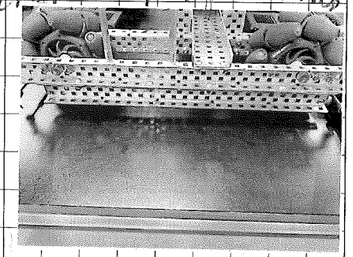
Jan 11: Completed some drive testing in order for Simone to improve his recording code.

Jan 12: Added side skirts and a front blocker to prevent rings from getting stuck. They really worked while scoring. Also added rubberized back rings and ring guards. This single change allows us to drive up the balance beam.

Jan 13: Made some adjustments to the front claw, as it was not able to consistently grab goals. The fix simply involved adjusting the mounting points in order to lower the bottom bar

Jan 15-16: Practiced driving and getting comfortable with the controls for the upcoming tournaments.

Jan 19: Driving skills went very well, we placed 2nd overall and had the highest drive score by 20 points. We can definetely improve on our autonomous, which just involves some tweaking the code



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SIGNATURE Shawn Mellmer DATE Jan 29
WITNESSED BY Matthew DATE Jan 29/22 BOOK NO. 1

CONTINUED from page 24

Build days #10 Feb 7

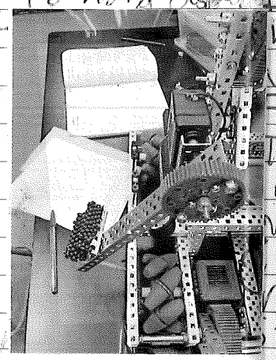
Feb 7: In preperation for the next tournament, we decided to make some changes to the robot, but first, we collected data on the ring system. the rings were placed in various orientations.

	Not moving	Slow moving	Fast moving	Simulated run
On the side	20%	20%	10%	40%
in the base	70%	65%	70%	30%
missed	10%	15%	20%	30%

After running 100 tests we decided that a less than 50% consistency was not very sufficient, so we removed the ring system in order to take on third tower.

Feb 8: Moved the brain to a more central location and attached a bar in the front of the robot to prevent rings getting stuck under the wheels. We also brainstormed a couple ideas.

Feb 9: started building a new side mounted clamp to hold a cone on tower on the back. We later discovered that this system can double for ring preloads.



Feb 10: Finished the new system and it works brilliantly. We continued to do a check for build errors, which was a blessing because we found two damaged wheels that could potentially damage our runs.

Feb 11: Made some finishing touches on the build, updated the code and recorded the autonomous runs for the upcoming tournaments.

CONTINUED on page 27

SIGNATURE Liam Mellmer DATE Feb 12

WITNESSED BY [illegible] DATE Feb 12/22

BOOK NO.

CONTINUED from page

Comox tournament Feb 12

Ah the irony, history is often doomed to repeat itself as they say.

The skills part of the tournament went very well for us, we ended up getting a clean 500 points. This was the second highest combined skills in the entire tournament. This margin was also 7 points, which is very attainable.

Matches:

Our matches went less well than I would have hoped. Our hopes were high, as in our previous tournament, we had gone undefeated. However, this would not be the case for this tournament, as we lost our first 3 matches. It was a combination of bad matchmaking and claw malfunctions. After fixing our claw making us useless, we won the remaining 6 matches of the day.

Judging:

I believe our judging went very well, as the judges did not have much constructive critisism for us, and seemed to take well to our robot.

Finals:

This is where things started plummitting. We placed 10th in the tournament. We decided ahead of time that we would accept whoever picked us. We ended up getting picked by 2902, who we had worked well with in the past. Their robot was very basic without much on it. We were the 4th place alliance, meaning we would be playing an extra match. Our first match against the 12th place alliance goes well, and then, the match against the 4th place alliance happens. We started off strong, and it looks like the referee [illegible] We have won the game. That is until, the referee steps up and awards the other alliance 2 elevated robots for our teamates smashing into the opponents goal after 30 seconds. Even though we had a disappointing finals run, we walked out of the gym with 3 awards after 2 tournaments, so I can't complain.

CONTINUED on page

SIGNATURE Liam Mellmer DATE Feb 14

WITNESSED BY Ron Dumas DATE Feb 14

BOOK NO.

Feb 14: Fixed the basic errors we had with the bot during the comp tournament. We have made a decision to not make any major changes to give us a better chance at doing well for skills, and giving me driver practice.

Feb 16: Have done a lot of driving practice and found a skills route that could get us a 510 driver. which is huge

Feb 17: Well, ~~yay~~ one of our ports died, which means I cannot practice driving until I get Simone to fix it.

Feb 21: This new port also decided to fry on us, which means it might be a problem with the claw. However, I will ask Simone

Feb 22: While we were coding a new port, the one connected to our back wheels died, which makes us think it isn't a claw thing

Feb 24: Our claws port burnt out for the third time, when I talked to Simone about it, he suggested to move the claw upward slightly to not force the motor.

Mar 1 B-day!

Mar 2: Simone was right, it was the claw overturning which caused the port to stop working. We have much improved in my driving, I have pulled off a 310 run, and have recorded a hopeful 220 skills auton, as well as all the other autonomous programs.

Mar 4: I have stepped up my driving, and als fried another port as a result. I doesn't matter, because everything is ready to go for tomorrows tournament.

CONTINUED on page

SIGNATURE Jim Mellinger
WITNESSED BY Ian Downman
DATE Mar 4
DATE March 4th
BOOK NO.

If their is a tournament that we needed our luck to come through, this ~~was~~ was the one. Lets just say, we were saving our luck.

This was our best skills yet, as we piled in a run total of 360 by the end of the day. 260 driver, which was 2nd best at the tournament, and 100 auton, which was less than perfect, but our best showing thus far. Ther is definite room for improvement, however, I can be nothing but happy with our performance.

Matches: History has seemed to repeat itself, however, this time, its a good repeat. ~~However~~, We managed to go undefeated, 7-0 for all of our round robin matches. We also managed to place second, behind 1022X, due to auton scores.

Judging: This judging was one of our better ones, Tew said his standard piece and we blew the other judges away.

Finals: We placed second overall, however, things were different this time, because we made a pre arranged alliance in 1022A. Even though they were twentieth, we picked them regardless, because they are a strong team. Because there were 16 alliances we had 5 matches to play, to get to finals. We won all of them, some by the skin of our teeth, some by much more. We made it to the finals, however, our opponents weren't who we thought. The first place alliance had been upset by the 4th place alliance, in 7842B and 7842C. This was less than ideal because we had no safety net to world's if we lost. That was not a worry. We won both games, same our most crushing wins. words cannot describe what winning that second match felt like. The euphoric sense that was achieving my goal of getting to worlds was overwhelming.

CONTINUED on page

SIGNATURE Jim Mellinger
WITNESSED BY
DATE Mar 14 2022
DATE March 14, 2022
BOOK NO. 1