

TABLE OF CONTENTS

PAGE	SUBJECT	BOOK	DATE
1	Team Introduction: Our Team	1	6/30/21
2	Team Introduction: Members		6/30/21
3	↓		↓
4			
5			
6			
7	Rules		6/30/21
8	↓		↓
9			
10			7/13/21
11			
12			
13			
14			
15	↓		↓
16	6/30 Meeting		6/30/21
17	7/13 Meeting		7/13/21
18	7/27 Meeting		7/27/21
19	8/11 Meeting		8/11/21
20	9/1 Meeting		9/1/21
21	9/8 Meeting		9/8/21
22	Base Design Matrix		9/11/21
23	Base Sketch		9/11/21
24	9/11 Meeting		9/11/21
25	↓		↓
26			
27	Mobile Goal Intake Design Matrix		9/15/21
28	Mobile goal Intake Sketch		9/15/21
29	9/15 Meeting		9/15/21
30	Conveyor Design Matrix		9/18/21
31	Conveyor Design Sketch		9/18/21
32	9/18 Meeting		9/18/21

TABLE OF CONTENTS

PAGE	SUBJECT	BOOK	
		DATE	
33	9/18 Meeting (con't.)	9/18/21	
34	9/22 Meeting	9/22/21	
35	9/25 Meeting	9/25/21	
36	10/2 Meeting	10/2/21	
37	↓	↓	
38	Electrical Diagram	10/6/21	
39	10/6 Meeting	10/6/21	
40	Calendar 2021 Oct/Nov	10/6/21	
41	↓	↓	
42	Initial Controls	10/9/21	
43	Poster Plan	10/9/21	
44	↓	↓	
45	10/9 Meeting	10/9/21	
46	Timeline 1st Comp	10/13/21	
47	10/13 Meeting	10/13/21	
48	↓	↓	
49	CAD Update 10/16	10/16/21	
50	Theme It Up Plans Plans	10/16/21	
51	New Mobile Goal Intake Sketch	10/16/21	
52	10/16 Meeting	10/16/21	
53	↓	↓	
54	Theme it Up Update #1	10/20/21	
55	Intake Design Process	10/20/21	
56	10/20 Meeting	10/20/21	
57	Theme it Up Update #2	10/23/21	
58	10/23 Meeting	10/23/21	
59	10/27 Meeting	10/27/21	
60	Recordable Auton Notes 10/30	10/30/21	
61	10/30 Meeting	10/30/21	
62	Cost Sheet	11/3/21	
63	11/3 Meeting	11/3/21	
64	11/5 Meeting	11/5/21	

TABLE OF CONTENTS

PAGE	SUBJECT	BOOK	
		DATE	
65	Competition Overview	11/10/21	
66	New Design Ideas	11/10/21	
67	New Design Idea - Tilter	11/10/21	
68	Refined Robot Design	11/10/21	
69	↓	↓	
70	11/10 Meeting	11/10/21	
71	Actual Base Sketch	11/13/21	
72	Base Sketch - Skills	11/13/21	
73	11/13 Meeting	11/13/21	
74	6 (4) Bar Specs	11/17/21	
75	Claw Sketch	11/17/21	
76	11/17 Meeting	11/17/21	
77	12/1 Meeting	12/1/21	
78	Online challenge Update	12/4/21	
79	12/4 Meeting	12/4/21	
80	Skills Claw Sketch	12/8/21	
81	↓	↓	
82	12/18 Meeting	12/18/21	
83	12/28 Meeting	12/28/21	
84	12/30 Meeting	12/30/21	
85	Calendar 2022 Jan/Feb	1/8/22	
86	↓	↓	
87	1/8 Meeting	1/8/22	
88	1/8 Meeting Pneumatics Information	1/12/22	
89	Electrical Diagram	1/12/22	
90	Driver Code	1/12/22	
91	↓	↓	
92	1/12 Meeting	1/12/22	
93	Girl Powered Update	1/14/22	
94	↓	↓	
95	Cost Sheet Sheet		
96	Theme It Up! Update	1/14/22	

TABLE OF CONTENTS

PAGE	SUBJECT	BOOK	DATE
97	Theme It Up Update (continued)	1	1/19/22
98	Electrical Diagram 2	1	↓
99	1/19 Meeting	1	1/19/22
100	Filter Issues	1	1/26/22
101	Skills Driver + Auton Plans	1	1/26/22
102	↓	1	↓
103		1	↓
104	CAD Update	1	1/26/22
105	1/26 Meeting	1	1/26/22
106	Skills Comp Overview	1	2/2/22
107	CAD Update 2	1	2/2/22
108	Poster Re-Design	1	2/2/22
109	2/2 Meeting	1	2/2/22
110	Competition Overview	1	2/9/22
111	2/9 Discussion Debrief	1	2/9/22
112	↓	1	↓
113	Base Design Changes	1	2/9/22
114	Double Mogo Brainstorm	1	2/9/22
115	Refined Robot Design Sketch	1	2/9/22
116	2 Mogo Matrix	1	2/9/22
117	Intake Improvements	1	2/9/22
118	Timeline	1	2/9/22
119	2/9 Meeting	1	2/9/22
120	Code Plan	1	2/12/22
121	Gyro Research and Testing	1	2/12/22
122	New Base sketch	1	2/12/22
123	2nd Mobile Goal Sketch	1	2/12/22
124	New Intake Design	1	2/12/22
125	4-Bar Changes	1	2/12/22
126	2/12 Leg	1	2/12/22
127	Auton Distance Calculations	1	2/16/22
128	Skills Auton Plans / Calculations	1	2/16/22

TABLE OF CONTENTS

PAGE	SUBJECT	BOOK	DATE
129	2/16 Meeting	1	2/16/22
130	↓	1	↓
131	Cost Sheet - Updated	1	2/19/22
132	2/19 CAD Update	1	2/19/22
133	2/19 Meeting	1	2/19/22
134	Driver Skills Run	1	2/23/22
135	2/23 Meeting	1	2/23/22
136	States Pre-Comp	1	2/28/22
137			
138			
139			
140			
141			
142			
143			
144			
145			
146			
147			
148			
149			
150			
151			
152			
153			
154			
155			
156			
157			
158			
159			
160			

TITLE Team Introduction : Our Team PROJECT

Continued from Page



We are team 3050A from ~~Palos~~^{Palos} Palos Verdes Peninsula High School in Rolling Hills Estates, California. We are a team composed of three freshmen, four sophomores, and three seniors. We meet on Wednesdays from 3-6pm and on Saturdays from 9am-12pm. We're looking forward to building and collaborating in-person this year, rather than our all-distanced last season.

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DATE 2/6/30

PROPRIETARY INFORMATION

TITLE Team Introduction: Members PROJECT

Continued from Page



Ryder Baez

A senior at Pen who's been a part of VEX for 5 years

Lead Mechanical for 3050A
3050 program admin

Ethan Becker



In 12th grade and has been on VEX for 7 years

Builder
Likes computers
Has a dog



Continued to Page 3

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DATE 21/6/30

DISCLOSED TO AND UNDERSTOOD BY *Mr. Min*

DATE 6/30/21

PROPRIETARY INFORMATION

TITLE Team Introduction: Members PROJECT

Continued from Page 2



Jackson Best

A sophomore at Pen and on VEX for 4 years

Builder
Plays golf on the school team
Plays drums on jazz band

Timothy Best



A senior who's been doing VEX for 6 years

Builder
Plays sousaphone in marching band
Plays golf with his brother



Continued to Page 4

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DATE 21/6/30

DISCLOSED TO AND UNDERSTOOD BY *Mr. Min*

DATE 6/30/21

PROPRIETARY INFORMATION

TITLE Team Introduction: Members PROJECT

Continued from Page 3



Ivana Bilicic

A sophomore on her 3rd year of VRC

Head of the notebook crew
Likes to dance and play the ukulele

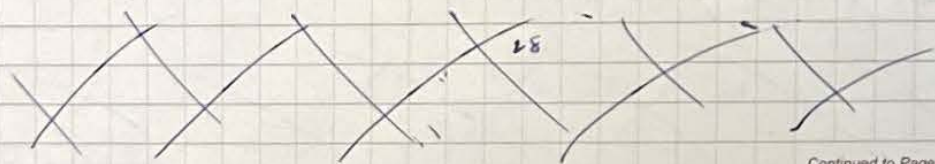
Zain Karu



A freshman in his 2nd year on VEX

Builder

Competes in archery and plays video games



Continued to Page 5

SIGNATURE J. Spragg

DATE 21/6/30

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DATE 6/30/21

PROPRIETARY INFORMATION

TITLE Team Introduction: Members PROJECT

Continued from Page 4



Vincent Lee

A freshman who's in his 2nd year of VRC

CAD designer

Chats online and plays video games

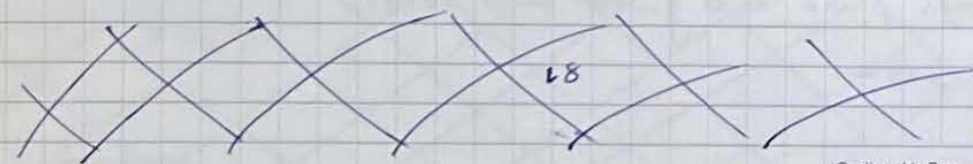
Cole Paolucci



A sophomore who's been doing VEX since 7th grade

Programmer

Plays on the school soccer team



Continued to Page 6

SIGNATURE J. Spragg

DATE 21/6/30

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DATE 6/30/21

PROPRIETARY INFORMATION

Continued from Page 5



Leia Spagnola

A sophomore on her 3rd year of VRC

Programmer

Member of the notebook crew

Plays guitar and does Academic Decathlon

Aarna Veera

A freshman at Pen who's done VEX since 7th grade

Builder

On AcaDec team

Plays piano and guitar and loves to cook



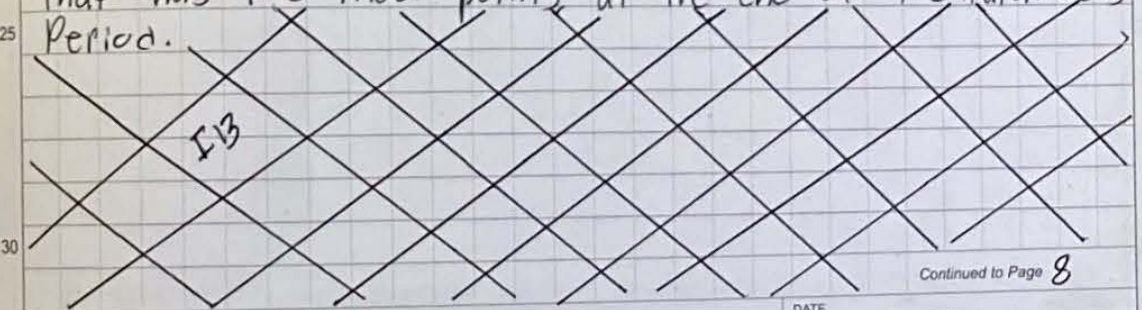
Continued to Page

SIGNATURE <i>J. Spagnola</i>	DATE 2/6/30
DISCLOSED TO AND UNDERSTOOD BY <i>Jim Min</i>	DATE 6/30/21
PROPRIETARY INFORMATION	

Continued from Page

VEX Robotics Competition Tipping Point is played on a 12' x 12' square field configured as seen below. Two (2) alliances - one (1) "red" and one (1) "blue" - composed of two (2) Teams each, compete in Matches consisting of a fifteen (15) second Autonomous Period, followed by a one minute and forty-five second (1:45) Driver Controlled Period. The object of the game is to attain a higher score than the opposing Alliance by Scoring Rings, moving Mobile Goals to Alliance Home Zones, and by Elevating on Platforms at the end of a Match.

Matches are played on a field set up as illustrated in the figures throughout. Two Alliances - one "red" and one "blue" - composed of two ~~te~~ Teams each, compete in each Match. The object of the game is to attain a higher score than the opposing Alliance by Scoring Rings moving Mobile Goals to Alliance Home Zones, and by climbing Platforms at the end of a Match. An Autonomous Win Point is awarded to any Alliance that has cleared their AWP Line and Scored at least one Ring on each Alliance Mobile Goal at the end of the Autonomous Period. An Autonomous Bonus is awarded to the Alliance that has the most points at the end of the Autonomous Period.

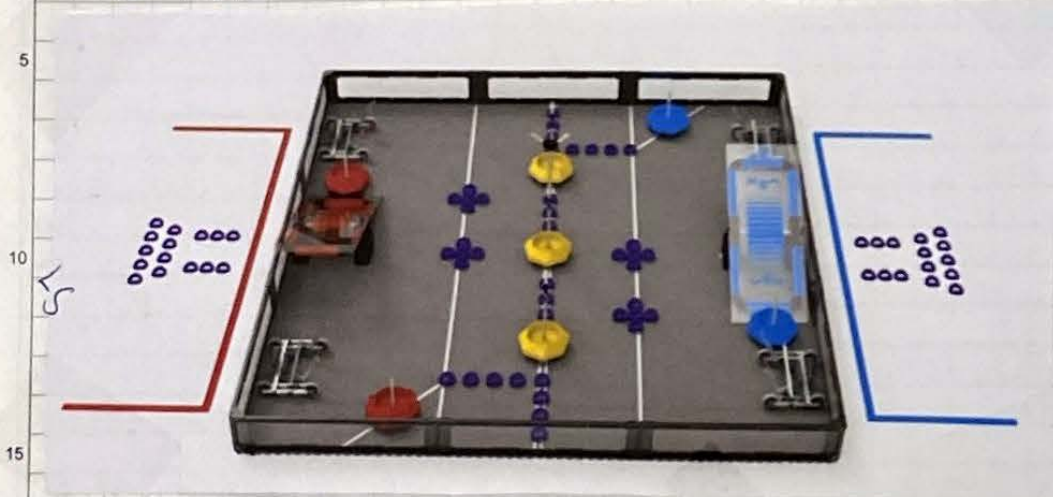


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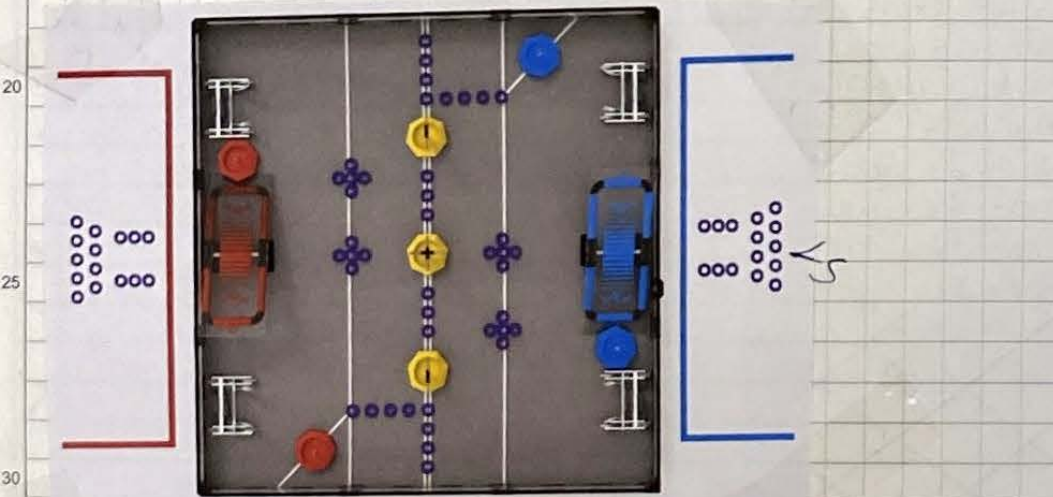
SIGNATURE <i>Jim Min</i>	DATE 6-30-21
DISCLOSED TO AND UNDERSTOOD BY <i>J. Spagnola</i>	DATE 2/6/30
PROPRIETARY INFORMATION	

Continued from Page 7

The Field



Bird's Eye View



Continued to Page 9

SIGNATURE *J. Spags*

DATE 2/6/30

DISCLOSED TO AND UNDERSTOOD BY *J. Spags*

DATE 6/30/21

PROPRIETARY INFORMATION

Continued from Page 8

Field Elements:

- Seventy-Two (72) Rings
 - Twelve (12) that begin as Preloads
 - Six (6) per alliance
 - Eighteen (18) that are used as Match Loads
 - Nine (9) per alliance
 - Forty-two (42) that begin on the field
- Four (4) Alliance Mobile Goals
 - Two (2) per alliance
- Three (3) Neutral Mobile Goals
- Two (2) Platforms
 - One (1) per alliance

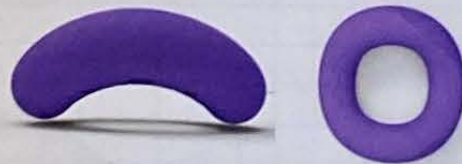


Figure 21: A Ring

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Figure 17: A Platform

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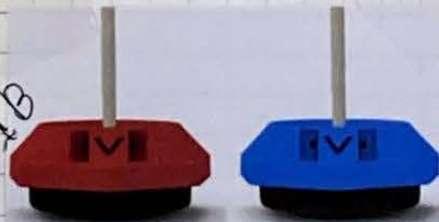


Figure 13: Alliance Mobile Goals

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Figure 14: Neutral Mobile Goals

Continued to Page 10

SIGNATURE *J. Spags*

DATE 6/30/21

DISCLOSED TO AND UNDERSTOOD BY *J. Spags*

DATE 2/6/30

PROPRIETARY INFORMATION

Continued from Page 9

Game Specific Definitions

AWP Line - the white tape line, one (1) per Alliance Home Zone, that starts the Match with one (1) Alliance Mobile Goal on it

Alliance Home Zone - one of the two (2) areas of gray foam tiles, one (1) for each Alliance, where Robots begin the Match and defines the location where Neutral Mobile Goals can be Scored

Balanced - a state of the Platform. The Platform is considered Balanced if it is parallel to the Field

Cleared - an Alliance Mobile Goal state. An Alliance Mobile Goal is considered "Cleared" if by the end of the Autonomous Period, it is not contacting the AWP Line or the Neutral Zone

Continued to Page 11

SIGNATURE <i>J. Spang</i>	DATE 21/7/13
DISCLOSED TO AND UNDERSTOOD BY <i>Simon White</i>	DATE 7/13/21
PROPRIETARY INFORMATION	

Continued from Page 10

Elevated - a Robot and/or Mobile Goal state. A Robot/Mobile Goal is considered Elevated if it is contacting a team's Alliance Platform and if it follows the definition of Balanced

Match Load Rings - the nine (9) rings per alliance that are kept in the Alliance Station at the start of the match and may be placed in during the match as per <SG8>

Mobile Goal - one of the seven (7) large scoring objects, may be Alliance Mobile Goals or Neutral Mobile Goals

Mobile Goal Base - the colored + black lower portions of a Mobile Goal

Mobile Goal Branch - the PVC pipes extending out from a Mobile Goal Base

Continued to Page 12

SIGNATURE <i>J. Spang</i>	DATE 21/7/13
DISCLOSED TO AND UNDERSTOOD BY <i>Simon White</i>	DATE 7/13/21
PROPRIETARY INFORMATION	

Continued from Page 11

Neutral Zone - the tiles within the inner wall of the field + the single tape lines that run the length of the field

Platform - the polycarbonate + PVC piping resting on a hinge in each Alliance Home Zone

Possession - a robot is in possession of a Mobile Goal if any of the following are true: any change in direction of the robot will change the direction of the Mobile Goal, the robot is actively preventing other robots from accessing the Mobile Goal, the robot is sharing possession with its allied robot by both blocking the other alliance's access to the Mobile Goal

Preload - the three (3) rings per robot placed before the start of the match as per <S61>

Continued to Page 13

SIGNATURE J. Spags

DATE 21/7/13

DISCLOSED TO AND UNDERSTOOD BY

DATE 7/13/21

PROPRIETARY INFORMATION

Continued from Page 12

<S1> Be safe out there.

<S2> Stay inside the field.

<S3> Wear safety glasses.

<S4> The platform is for robots strictly, not humans.

<G1> Treat everyone with respect.

<G2> VRC is a student-centered program.

<G3> Use common sense.

<G4> Robots begin the Match in the starting volume

<G5> Keep your Robots together

<G6> The Robot must represent the skill level of the Team.

<G7> Only Drivers, and only in the Alliance Station.

<G8> Controllers must stay connected to the field towers.

<G9> Hands out of the field

<G10> Autonomous means "no humans".

<G11> All rules still apply in the Autonomous Period.

<G12> Don't destroy other Robots. But, be prepared to encounter defense.

<G13> Offensive Robots get the "benefit of the doubt"

<G14> You can't force an opponent into a penalty.

<G15> No Trapping for more than five (5) seconds.

<G16> Don't clamp your Robot to the field.

<G17> Let go of Scoring Objects after the match.

<SG2> Robot expansion is limited once the Match begins

<SG3> Platforms are "safe" during the endgame. During the last thirty (30) seconds, Robots may not contact the opposing Alliance's Platform

<SG4> Stay out of the opponent's Home Zone during Autonomous

<SG5> Enter the neutral zone during Autonomous at your own risk. Any robot who engages with the neutral zone during the Autonomous period should be aware that opponent's robots may also choose to do the same

Continued to Page 14

SIGNATURE J. Spags

DATE 7/13/21

DISCLOSED TO AND UNDERSTOOD BY

DATE 21/7/13

PROPRIETARY INFORMATION

Continued from Page 13

<SG6> Rings on the Alliance Mobile Goal are "safe". Strategies intended to remove rings which are second on or in an opposing alliance mobile goal are ~~prohibited~~ prohibited.

<SG7> Hoarding of Mobile Goals is limited. Robots may not hoard more than one (1) Mobile Goal at once.

<SG8> Each Alliance may introduce their Match Load Rings at any point during the Match. This action must abide by the following criteria: Match Load Rings must be placed down gently, not contacting anything other than a tile directly in front of the Alliance Station, during the Autonomous or Driver Control ~~off~~ Period.

<SG9> Keep Scoring Objects in the field.

<SG10> Use scoring objects to play the game. Scoring objects may not be used to accomplish actions that would be otherwise illegal if they were attempted by robot mechanisms.

<R10> A limited amount of custom plastic is allowed.

<R11> A limited amount of tape is allowed.

<R15> New VEX Parts are legal.

Scoring

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 Alliance	Elevated on correct Alliance's Balanced Platform	30 points
	Wins Autonomous Bonus	6 points

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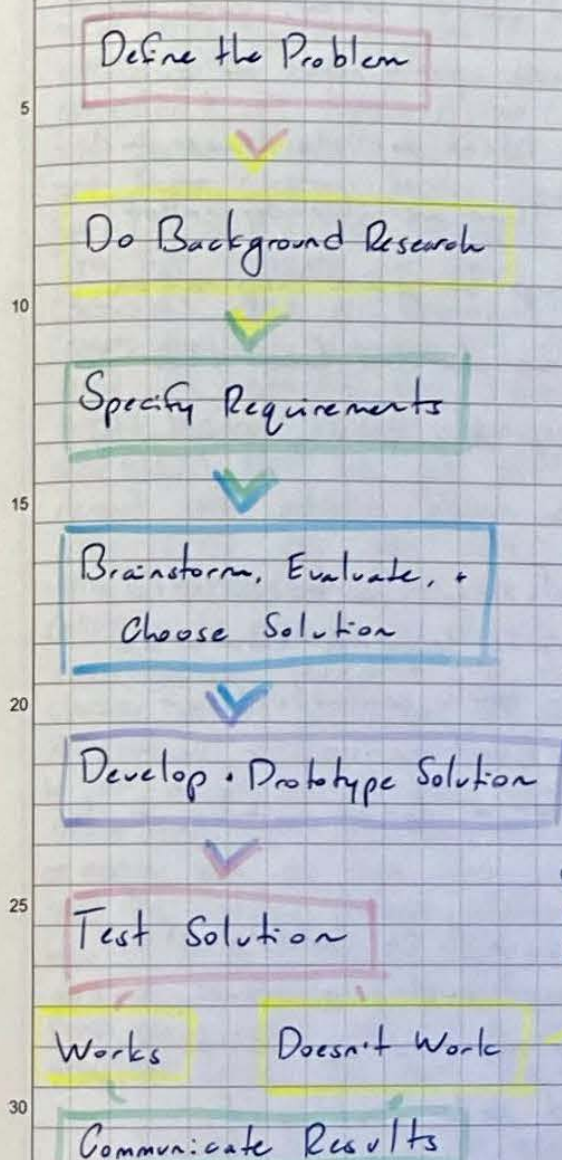
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DATE
7/17/21

DATE
2/7/13

PROPRIETARY INFORMATION

Continued from Page



This is the engineering design process. To properly design our robot, we utilized these steps to the best of our advantage. Once we defined our problem we began doing background research by watching reveal videos. Then, we specified our criteria and identified constraints. After brainstorming, we can begin creating a solution and testing.

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DATE
2/7/27

DATE
7/27/21

PROPRIETARY INFORMATION

Continued to Page

TITLE 6/30 Meeting

PROJECT

Continued from Page

We started our Tipping Point season today, June 30th, with a Discord voice call. We spent most of our time throwing around basic ideas for the base and donut game piece intake. There were already robot-in-3-days reveal videos up to gain inspiration from. We also watched some matches from the 2011 VRC game Round Up due to the similarly shaped pieces used there.

The first e-channel models on the base CAD have been put in place. We're leaning towards a 4-motor direct drive with tank controls (our drivers' preference). A vertical conveyor seems to be the best option for a donut intake, but the debate is ongoing.

On the programming front, we'll be starting off with a recordable auton. I and our other programmer are relatively new, so we won't be diving into more complicated code just yet.

Continued to Page

SIGNATURE *J. Spagnola*

DATE 2/16/20

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PROPRIETARY INFORMATION

TITLE 7/13 Meeting

PROJECT

Continued from Page

Before our team meeting today, we had a program wide meeting about elections for our program. Speeches were given and voting was complete. The candidates for president are Ryan Byrne (3050B), Ciaran Nimick (3050B), and Jason Niemels (also 3050B). For vice president, we've got Ryan, Ciaran, Jason, Deya Ahluwalia (3050B), and Tim Best (3050A). Our secretary candidates are Jason, Deya, and Tim. For treasurer we have Jason and Leica Spagnola (3050A), and our community outreach officer is Deya (she's the only candidate). Once this meeting was done and we started our team meeting, we began watching robot reveals. Through watching these videos, we have concluded that we will probably not be doing a passive donut ~~intake~~^{intake} because it simply doesn't seem as efficient as the other options that we saw. After much deliberation, we are most likely going to do a conveyor to pick up the donuts as well as a 4-bar contraption to pick up mobile goals. This plan may change in the future, but for now, it is what we are aiming to do. Once we finished watching over these videos, Vincent continued to work on our CAD. He ended up mostly finishing the CAD for our mobile goal intake, and began work on the conveyor. We also worked on making sure our base was within the spec limit and making sure the spacing between different parts was accurate enough to how it will be once we start building. By the end of the meeting, Vincent managed to nearly finish the conveyor and will be refining it sometime during our next meeting.



The QR code for the most helpful video

SIGNATURE *Dan Miller*

DATE 7/13/21

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PROPRIETARY INFORMATION

Continued from Page

Today's call began with more reveal watching. We discovered you can indeed fit 8 goals on the season.

In 3050 program-wide news, we're also still trying to secure permission to meet in-person at the school, as well as check on the progress of our big pre-season parts order.

Plus, election results are in! Ciaran N.nick of 3050B will be our program president. 3050A's Tim Best and 3050B's Ryan Byrne are co-vice presidents. Jason Wiemels of B team is secretary, Tim treasurer, and Deya Ahluwalia of B team is our community outreach officer.

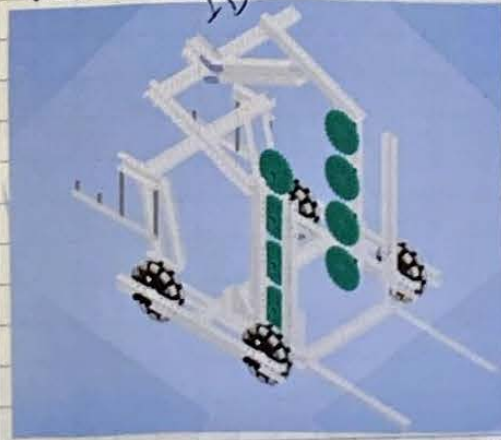
We hope to hold multiple mobile goals on our bot. We might also use pneumatics or have a 6-motor base. We'll be deciding whether to start a new CAD with these changes.

Continued to Page

SIGNATURE J. Spang	DATE 21/7/27
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PROPRIETARY INFORMATION	

Continued from Page

Today's meeting, once again, began with more reveal watching. Through these videos, we have come to the conclusion that collecting and placing a lot of donuts is significant to winning. We've also decided that this game definitely contains a great deal of shoving and pushing the other opponents (all within the rules, of course). Due to this discovery, we decided that it would be best to use torque motors on our ~~best~~^{FB} base. We will be slower compared to other robots, but will be able to withstand shoves better. Finally, Vincent finished his work on the CAD, mostly refining things and figuring out some measurements as well. Below is a picture of our CAD, which provides us most of the information that we need. Also below is the ~~QR code~~ ^{FB} code for a helpful video we found. ^{FB}



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Continued to Page

SIGNATURE Dun Viki	DATE 8/11/21
DISCLOSED TO AND UNDERSTOOD BY J. Spang	DATE 21/8/11
PROPRIETARY INFORMATION	

TITLE a/i Meeting

PROJECT

Continued from Page

This is our first in-person meeting of the season. We cleaned up the room enough to start preliminary work. Most of the building work done today involved taking apart last year's Charge Up robot to reuse the pieces. The current frontrunner for the name of this season's robot is Capricorn. We settled on a meeting schedule of Wednesdays 3-6pm and Saturdays 9-12pm (but not this upcoming Saturday due to Labor Day). We've confirmed who's on which team, and got mostly up and running for a successful season.

Continued to Page

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9/11/21

PROPRIETARY INFORMATION

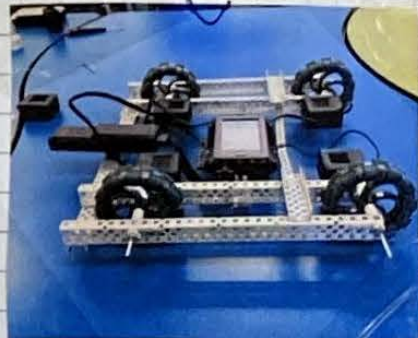
TITLE 9/8 Meeting

PROJECT

Continued from Page

At the start of today's meeting, we all started to organize the room and move FRC parts out of the room, and taking apart the robots from last year. We also started to organize the room, as it was a giant mess with all of the robot parts on the table. We also had a new member show up to her first meeting, Aafna Veera. I was on a robotics team with her when I was in 8th grade, and I really look forward to working with her again. I started base code for the robot, but I could not test it without a base, so Jackson and Tim built me an unofficial base while the other builders worked on finishing the drawing and CAD for the real base.

On the right is a photo of our unofficial base they built for me. However, when I tried to download the code, I kept getting a message saying "Error: make process closed with exit code 2." After doing some research with Fran and Leia, we found no other solution besides going into the firewall and allowing public and private wifi's to interact with the coding studio. This did not work, and I am at a loss of solutions. I am going to do more research at my house on Sat before Saturday so that we can test the code on Saturday.



Continued to Page

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DATE

9/8/21

PROPRIETARY INFORMATION

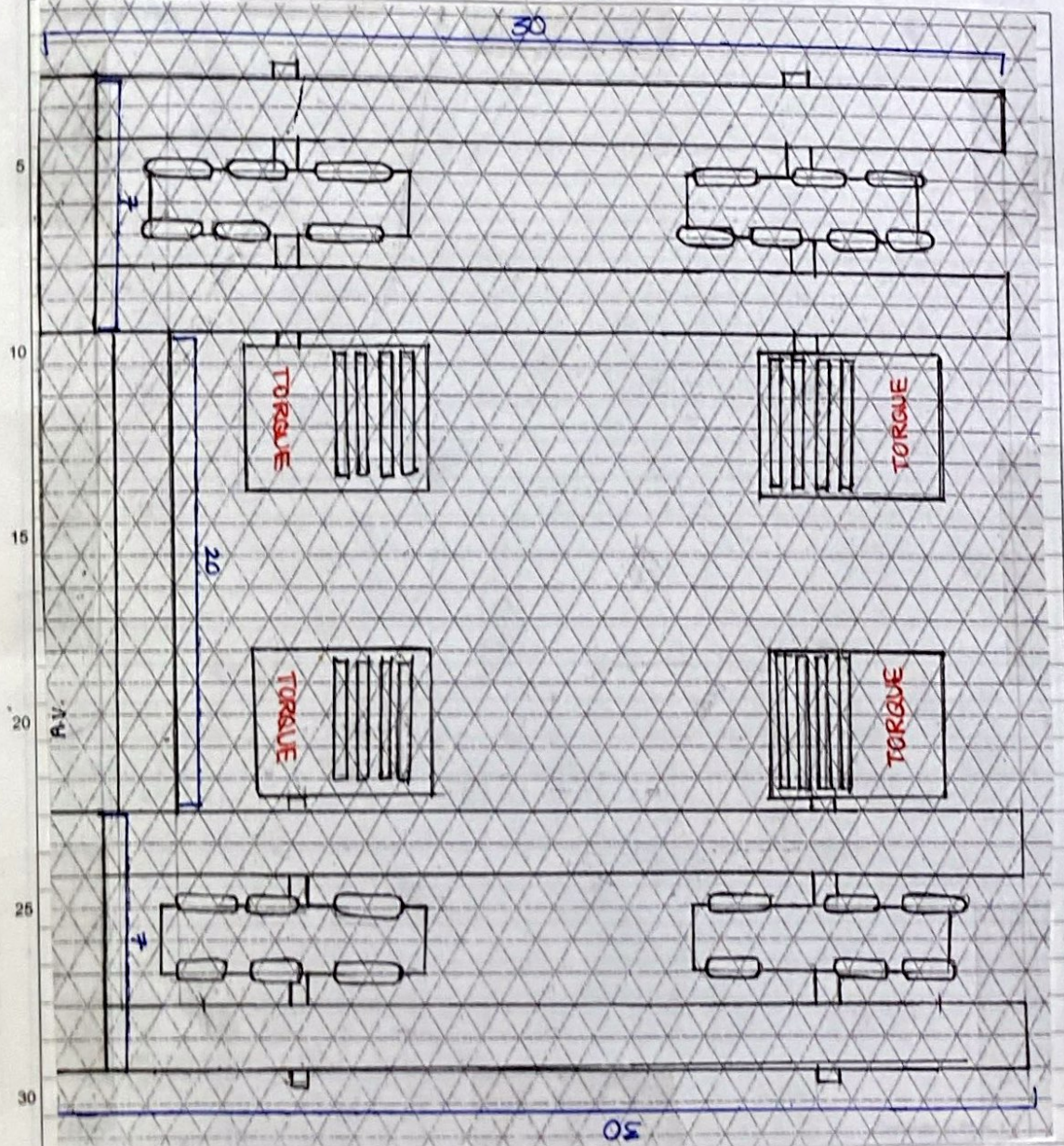
Base Design Matrix
PROJECT

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TOTAL	3	10	6
function	4	4	3
efficiency	5	3	2
Time needed	4	3	1
Ideas	H DIVE	Hologramic	X DIVE

SIGNATURE *[Signature]* DATE 9/11/21
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 PROPRIETARY INFORMATION

TITLE Base Sketch PROJECT



SIGNATURE *[Signature]* DATE 9/11/2021
 DISCLOSED TO AND UNDERSTOOD BY *[Signature]* DATE 9/11/21
 PROPRIETARY INFORMATION

2/2/2k

TITLE 9/11/21 Meeting

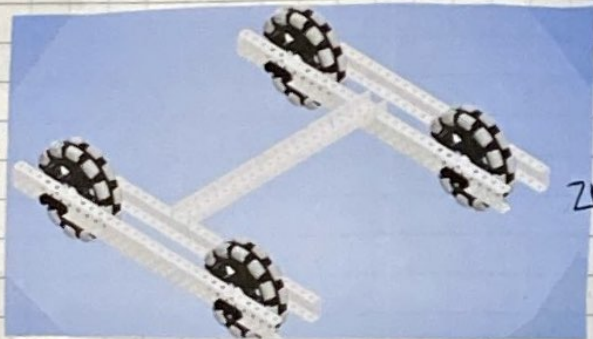
PROJECT

```

Continued from Page
LeftFront.spin(vex::directionType::fwd, Controller1.Axis3.value() + Controller1.Axis1.value(), vex::velocityUnits::pct);
RightFront.spin(vex::directionType::fwd, Controller1.Axis3.value() - Controller1.Axis1.value(), vex::velocityUnits::pct);
LeftBack.spin(vex::directionType::fwd, Controller1.Axis3.value() + Controller1.Axis1.value(), vex::velocityUnits::pct);
RightBack.spin(vex::directionType::fwd, Controller1.Axis3.value() - Controller1.Axis1.value(), vex::velocityUnits::pct);

```

5 This is the completed base code. We have set
 it up for tank control, so when our driver moves
 the left axis forward, the entire base will move
 forward, and when he moves the axis to the
 10 right or left, it will turn in the correct way.



15 Today was my 1st meeting with VEX this
 year. What I did today
 was help with the
 design matrix for the
 base, and I helped

20 Clean up the table and move stuff around in the
 room to have the optimal amount of space for
 us. Our team got a lot of stuff done today. For

25 the code, Cole and Leia got their returning error to
 go away by downloading the coding studio again
 and re-creating the code. They tested the base code

30 On the test base, and they created a successful
 tank drive code, as shown in the image above.

Continued to Page 25

SIGNATURE Zain Kohn

DATE 9/11/2021

DISCLOSED TO AND UNDERSTOOD BY Cole Kohn

DATE 9/11/21

PROPRIETARY INFORMATION

TITLE 9/11 meeting (continued) PROJECT

Continued from Page 24

We then had Tim fill out a form we created on
 what binds he wanted each controller to be, as shown
 here!

5 Ivana and Leia
 worked on writing
 important rules and
 the setup for our
 10 EV. Jackson, Tim,
 Ryder, Anna, and Vincent
 worked on the base.

Tank Control

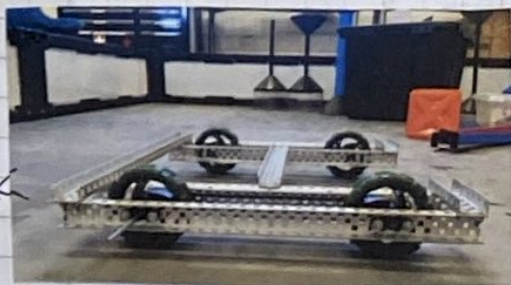
- Axis 3- Forward/Back
- Axis 4-
- Button L1- Grabber 1 In
- Button L2- Grabber 1 Out
- Button Up-
- Button Left-
- Button Right-
- Button Down-



- Axis 2-
- Axis 1- Left/Right
- Button R1- Intake
- Button R2- Outtake
- Button X- Grabber 2 In
- Button Y- Grabber 2 Out
- Button A-
- Button B-

2k

15 We got the main base done and then added the
 wheels for it. For the future, we have to add
 the cortex and battery, and then we are basically
 done. Since there are so many pillow blocks around the
 20 base, there was a lack of friction, and we have a
 very fast-moving, smooth base. Once we cut down the
 axles, to make the robot in spec, it will be officially
 completed.



~~2k~~

Continued to Page 26

SIGNATURE Zain Kohn

DATE 9/11/2021

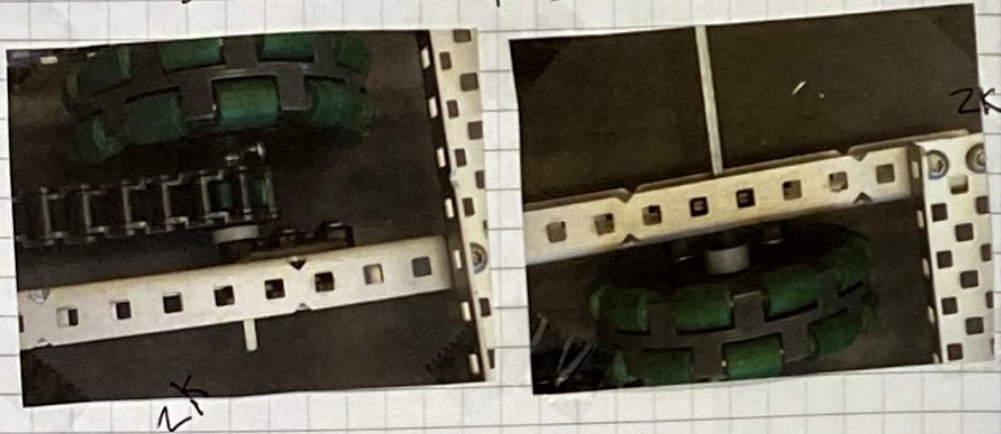
DISCLOSED TO AND UNDERSTOOD BY Cole Kohn

DATE 9/11/21

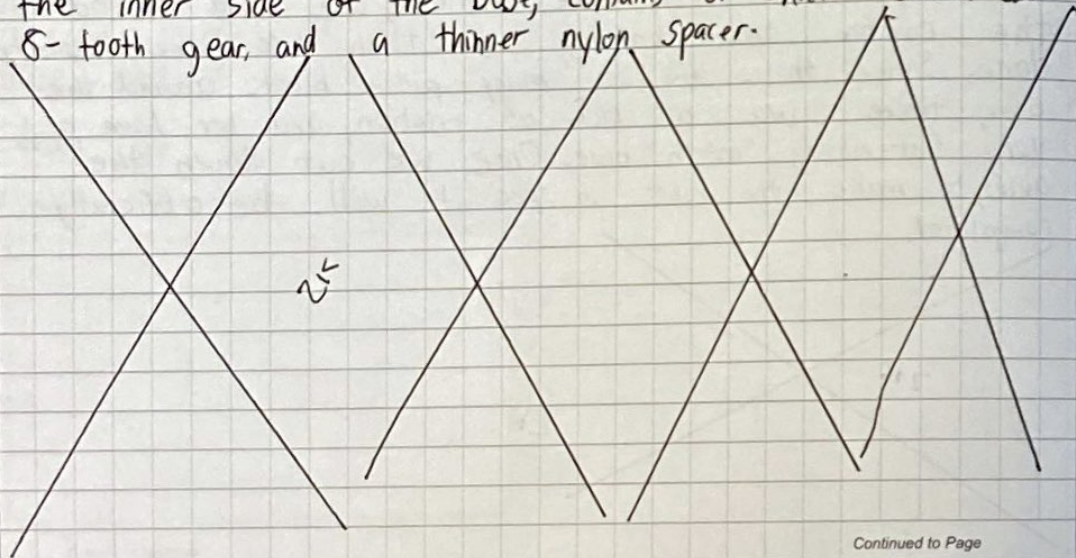
PROPRIETARY INFORMATION

Continued from Page 25

Below is the spacing of the wheels:



In the ~~left~~^{right} image, which is the outer side of the base, has one thicker nylon spacer. On the left image, located on the inner side of the base, contains a shaft collar, an 8-tooth gear, and a thinner nylon spacer.



Continued to Page

SIGNATURE Zaim Koch

DATE 9/11/2021

DISCLOSED TO AND UNDERSTOOD BY Cole Radwin

DATE 9/11/21

PROPRIETARY INFORMATION

5	Total	○	□	W
10	Function	□	□	
15	Efficiency	□	□	
20	Time needed	□	□	
25				
30	Ideas	Four Bar	Lifters	

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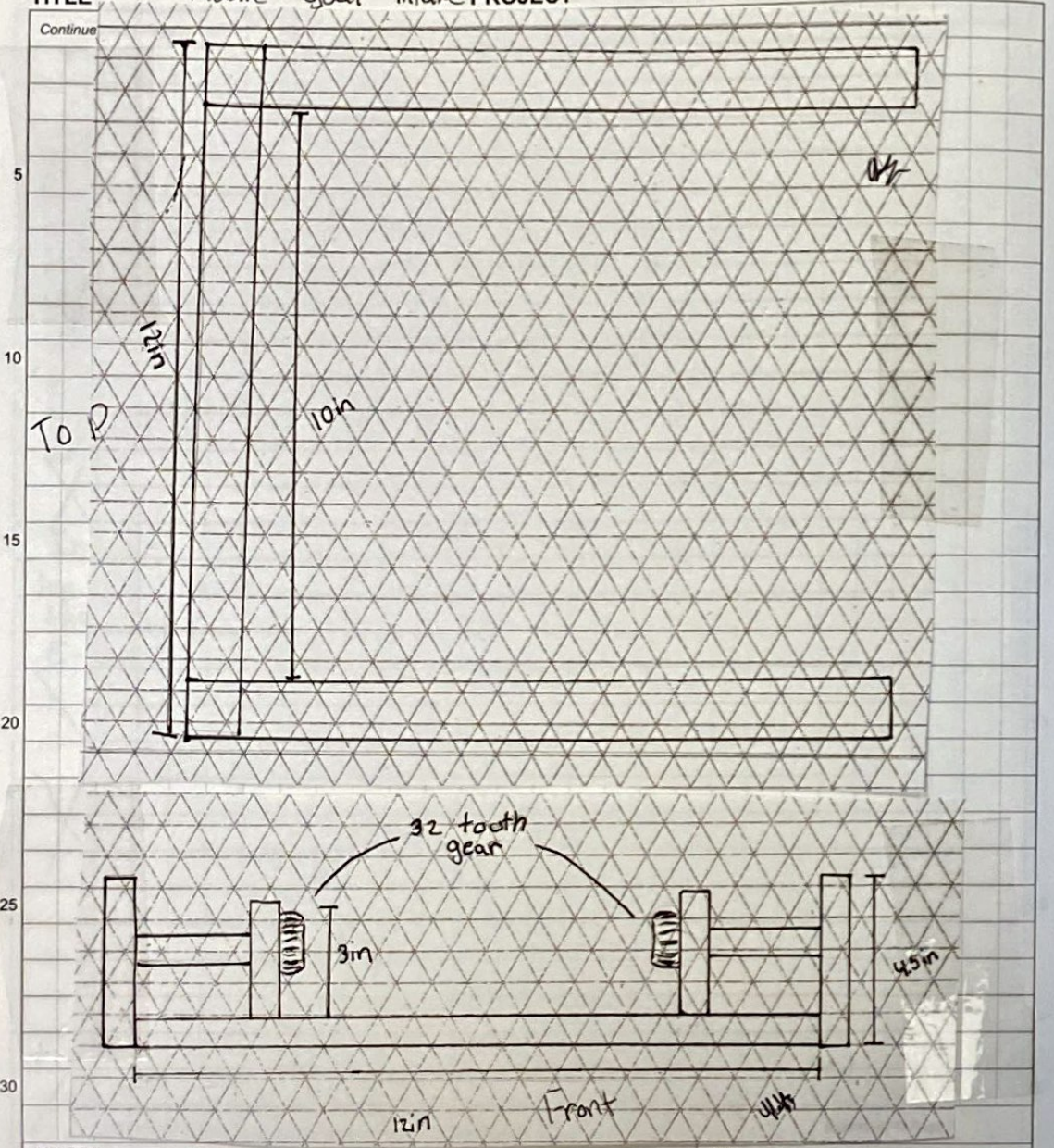
SIGNATURE [Signature]

DATE 9/15/21

DISCLOSED TO AND UNDERSTOOD BY [Signature]

DATE 9/15/21

PROPRIETARY INFORMATION



SIGNATURE *Ulysses Ulysses* DATE 9/15/21
 DISCLOSED TO AND UNDERSTOOD BY *Ulysses Ulysses* DATE 9/15/21 PROPRIETARY INFORMATION

Continued from Page

We started on the conveyor today. We're focusing on spacing to keep everything secured + sticking pretty close to our CAD design. The dismantling of last year's robots for parts continues.

The programmers currently don't have much more work they can do, though auton preparation is ongoing. Cole created some functions that can be used in the auton later.

~~28~~

Continued to Page

SIGNATURE *J. Sprague* DATE 9/15/21
 DISCLOSED TO AND UNDERSTOOD BY *Ulysses Ulysses* DATE 9/15/21 PROPRIETARY INFORMATION

TITLE Conveyor Design Matrix PROJECT

Cont

5	TOTAL			
10	function			
15	efficiency			
20	Time needed			
25	Ideas	Plunger	Stand-offs	Rollers

Continued to Page

SIGNATURE [Signature]

DATE 9/18/21

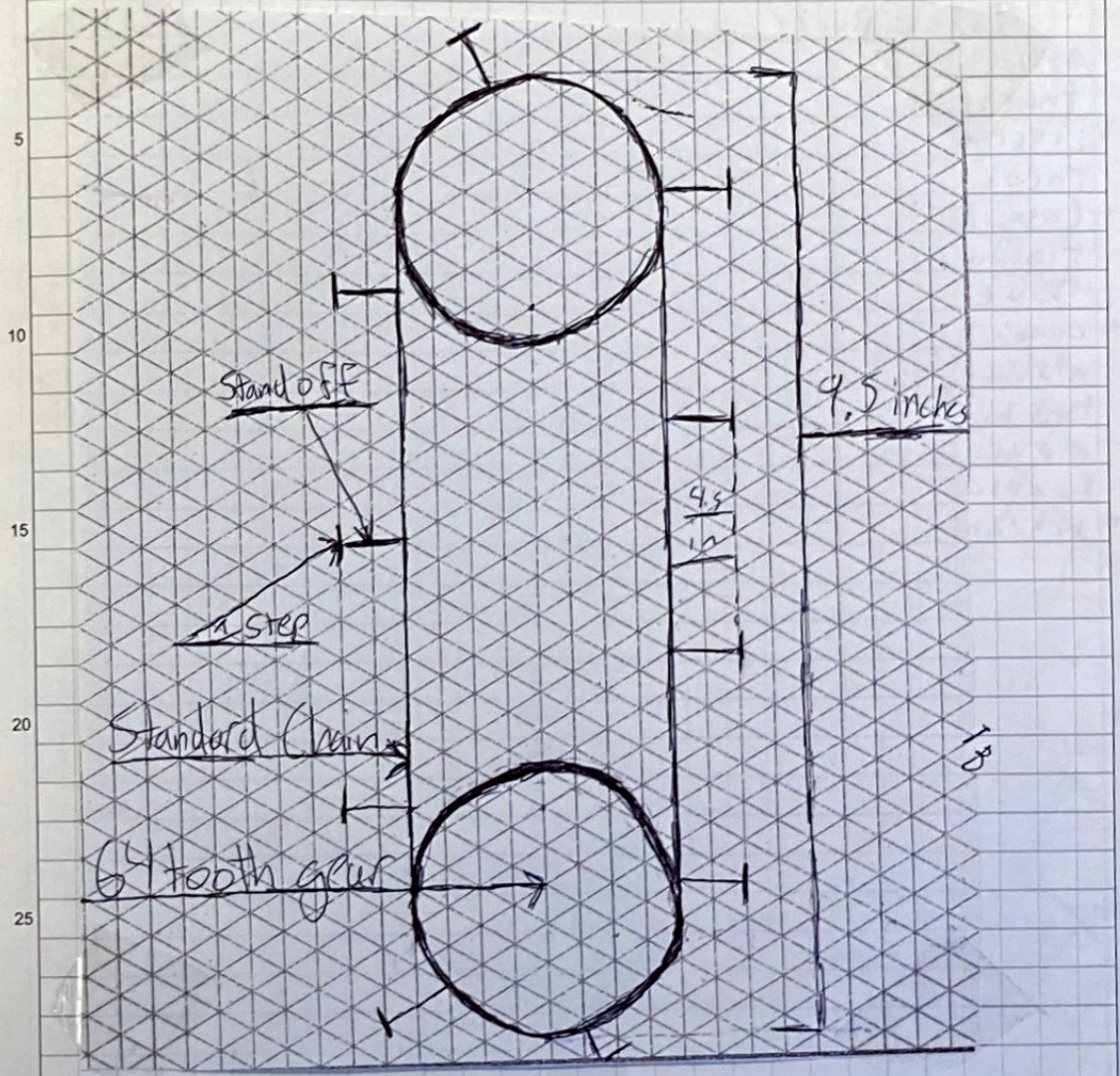
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DATE 9/18/21

PROPRIETARY INFORMATION

TITLE Conveyor Design PROJECT

Continued from Page



Original Design of Donut Conveyor

Continued to Page

SIGNATURE [Signature]

DATE 9/18/21

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DATE 9/18/21

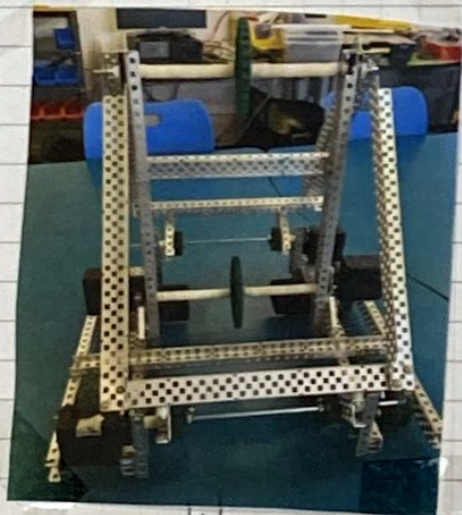
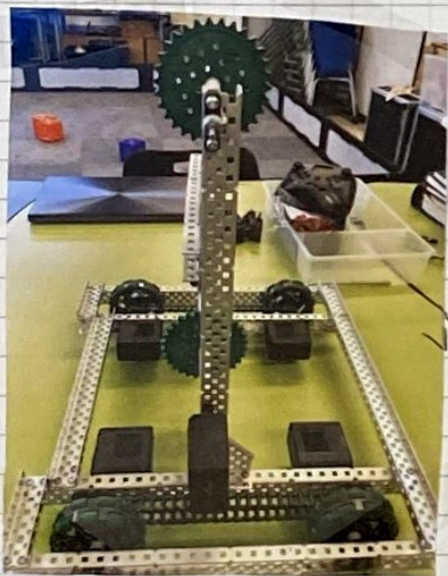
PROPRIETARY INFORMATION

TITLE 9/18/21 meeting

PROJECT

Continued from Page

Today, Ryder and Aarna started to attach the conveyor. At first, we ran into a problem where it was crooked but that problem was fixed by adding spacers to the bottom and leveling it every so often just to ensure it was straight. They ran into an issue once we started to engage motor which caused the structure to once again make it crooked, by tightening the screw on the side, we managed to fix the issue. Then, we realized that the center wheels that are connected by chain aren't lined up, so to fix this we adjusted the number of spacers on the bottom axle. We also had to cut the supporting pieces on either side of the conveyor to fit the motor, which they did. Ethan cut the pieces, they started to attach the conveyor structure and continued to add pieces w/ construct



Continued to Page 33

SIGNATURE

Vleen

DATE

9/18/21

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[Signatures]

DATE

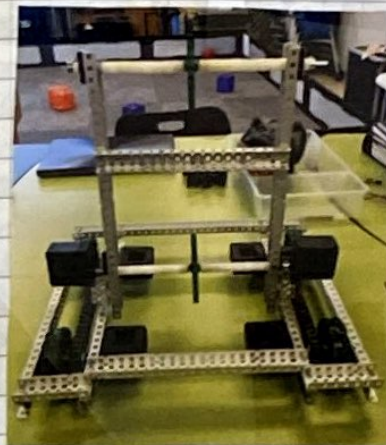
9/18/21

PROPRIETARY INFORMATION

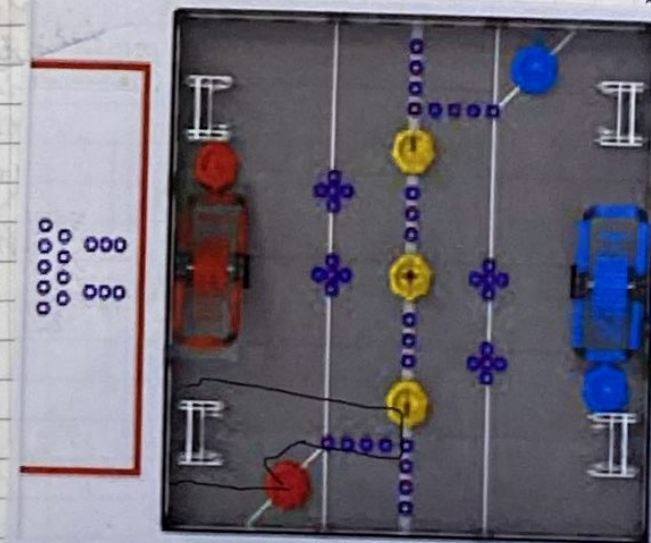
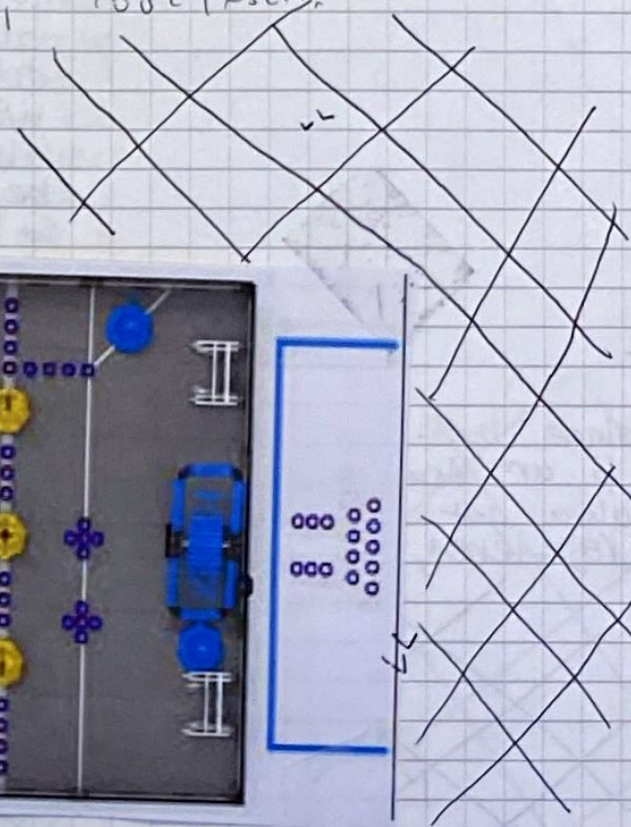
TITLE 9/18 meeting (cont.)

PROJECT

Continued from Page 32



Programming wise, Colt made a basic plan for the autonomous code (pictured below in the bottom left corner), and wrote down a few things for the physical code itself.



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[Signature]

DATE

9/18/21

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[Signatures]

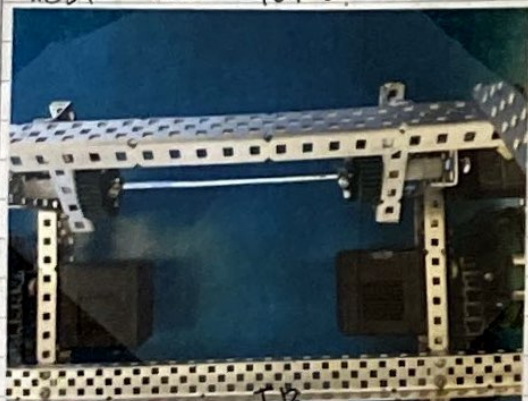
DATE

9/18/21

PROPRIETARY INFORMATION

Continued from Page

Today, Ethan and Tim began working on the mobile goal intake, with the help of Ryder and Aarna. Spacing was an issue, as expected, but after some trial and error, they managed to partly get the first of the intakes done. Below is a picture of the spacing that works best (so far).



FB

Other than this, we also looked at possible competitions and talked with our mentor, Mr. Twist, about which ones would be best for our program. So far, it is looking like a competition on November 13th in Santa Ana is our best option. This is unfortunate however

since both Leia and Aarna can not attend due to an Academic Decathlon scrimmage. Today, we also got both of the teams in our program registered, but we still have to pay.

FB

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SIGNATURE *[Signature]*

DATE 9/22/21

DISCLOSED TO AND UNDERSTOOD BY

[Signature]

DATE 2/1/22

PROPRIETARY INFORMATION

Continued from Page

Today, we are working on our mobile goal intakes, and adding our second mobile goal intake as we have planned in our design. Our programmer is continuing to refine his code, and is diligently preparing for the robot's completion. In addition to that, we also went over the autonomous period rules again. We did this because we wanted to make sure that the current plan that we have compiled and takes lots of advantage of all of the space on the field it is able to take advantage of. We also added a peninsula high school sticker to the front cover of our engineering notebook. We feel that it will help keep track of our engineering notebook, and will add some character to it!

Continued to Page

SIGNATURE *Aarna Veera*

DATE 9/25/2021

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[Signature]

DATE 9/25/21

PROPRIETARY INFORMATION

Continued from Page

We're focusing on getting logistical problems solved, such as securing donations + getting registered. Some new competitions have been posted since we last checked, including one in Long Beach, very near us. We'll be talking with our mentor about that one definitely.

The robot is coming along nicely, ever more so now that we have a more concrete deadline.

We want to be done well before November 6th in anticipation of getting registered for that Long Beach competition. Our CADers + mechanical engineers are working closely to ensure we're building a polished design.

Unfortunately, our game pieces are still backordered. Work on the bot is paused for now until we can finalize things with physical donuts + mobile goals. In the meantime, we've begun a wiring diagram + cost sheet.

Continued to Page 37

SIGNATURE *J. Spragg*

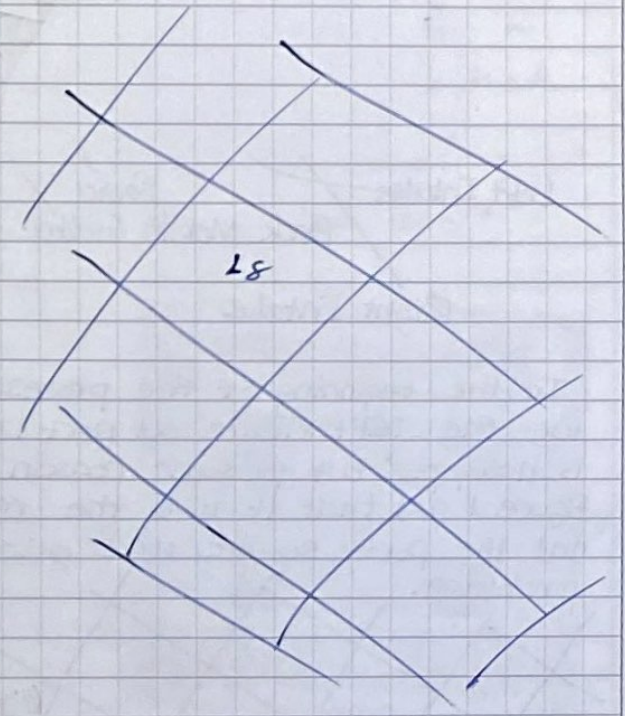
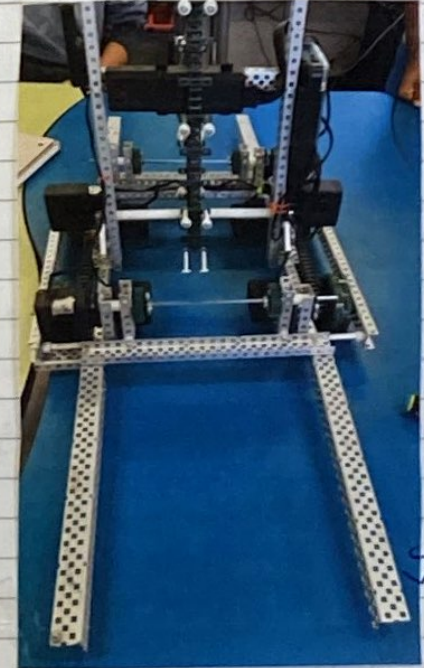
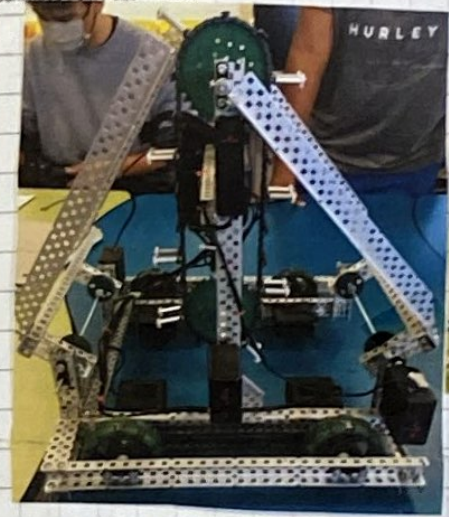
DATE 21/10/21

DISCLOSED TO AND UNDERSTOOD BY *Adama Veera*

DATE 10/2/2021

PROPRIETARY INFORMATION

Continued from Page 36



Continued to Page

SIGNATURE *J. Spragg*

DATE 21/10/21

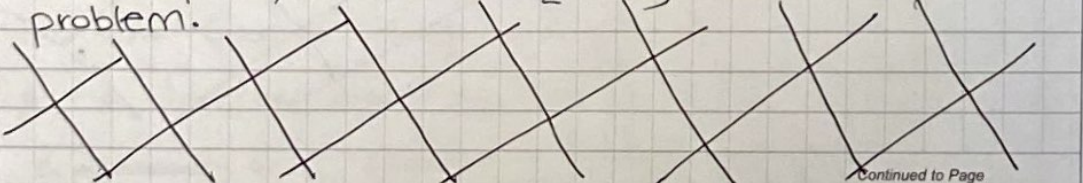
DISCLOSED TO AND UNDERSTOOD BY *Adama Veera*

DATE 10/2/2021

PROPRIETARY INFORMATION



In the beginning of the process, we had the wire for the left intake at port 13, which is where it is now, ~~13~~ but for some reason, it didn't work. We figured out that it was the motor that wasn't working, not the port, so we were quickly able to fix this problem.

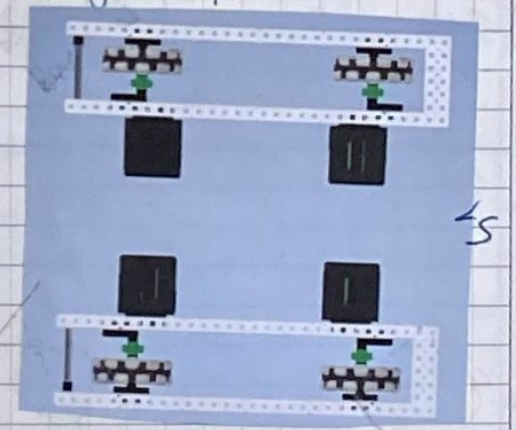


SIGNATURE *Damon Vececa* DATE 10/6/2021
 DISCLOSED TO AND UNDERSTOOD BY *[Signature]* DATE 10/6/21 PROPRIETARY INFORMATION

Our mechanical-programming team have been working in sync all day to refine wiring + controller maps. We've discovered that some ports and/or wires are broken, so we can't use them on the bot. Testing with controllers has led to more intuitive inputs for our drivers. We're also working on exact speed values for our motors. We're aiming for a balance between a speed advantage in matches + a stable bot.

Our robot is in spec, although it is close lengthwise. Since we're still refining, we don't see this as a pressing issue just yet.

We are signed up for a competition on Nov. 6th in Long Beach! The notebook crew are keeping an eye on such dates in the calendar that follows.



SIGNATURE *J. [Signature]* DATE 21/10/6
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Continued from Page

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
					1	2 Bot finalized until receive parts
3	4	5	6 Signed up for 11/6	7	8	9
10	11	12	13	14	15 online challenges released	16
17	18	19	20	21	22	23 Poster meeting
24	25	26	27	28	29	30
31						

October

Continued to Page 41

SIGNATURE <i>J. Spang</i>	DATE 21/10/6
DISCLOSED TO AND UNDERSTOOD BY <i>du mi</i>	DATE 10/6/21
PROPRIETARY INFORMATION	

Continued from Page 40

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	1	2	3	4	5	6 Long Beach comp
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30				

Meetings
Comps

November

Continued to Page

SIGNATURE <i>J. Spang</i>	DATE 21/10/6
DISCLOSED TO AND UNDERSTOOD BY <i>du mi</i>	DATE 10/6/21
PROPRIETARY INFORMATION	

Continued from Page

Tank Control

- Axis 3- Forward/Back
- Axis 4-
- Button L1- Grabber 1 In
- Button L2- Grabber 1 Out
- Button Up-
- Button Left-
- Button Right-
- Button Down-



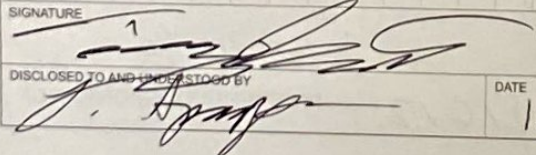
- Axis 2-
- Axis 1- Left/Right
- Button R1- Grabber 2 In
- Button R2- Grabber 2 Out
- Button X-
- Button Y- Intake
- Button A-
- Button B- Outtake

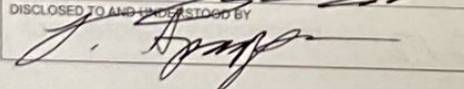
The standard tank drive ~~control~~ controller setup has proven to be the most effective joystick setup numerous times. In the past, our program has rarely used this type of setup, but we thought that with a double-sided mobile goal grabber, we would need joysticks that made it easy to drive in multiple different directions. However, after some testing, we decided that tank drive still reigns supreme.

As for the button layout, we decided on a symmetrical trigger layout to match our symmetrical robot, and use the sub-buttons for the conveyor. The issue with this layout came with the fact that I couldn't move the left joystick and move the conveyor at the same time, which is pretty much a necessity in this game. We will do some additional testing to find the optimal controller layout.

Refer to page _____ for updated controls

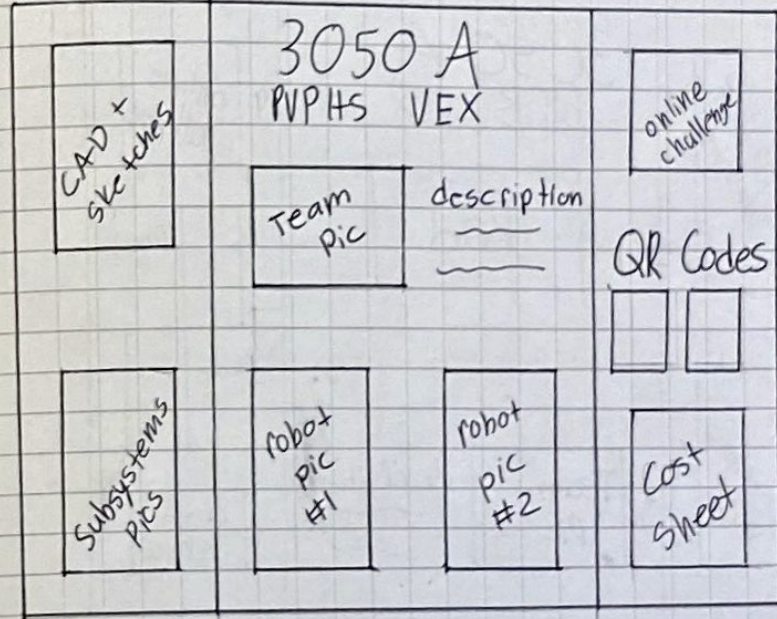
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SIGNATURE  DATE 10/9/21

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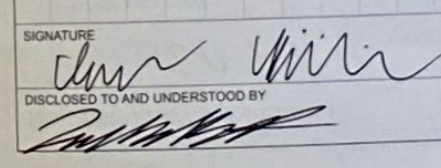
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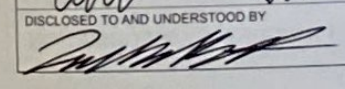
~~Without iPad~~



Here is our first design for our poster board for competitions. This design is just your standard poster, without an iPad. Our poster will include important details, such as pictures of the robots, subsystems, cost sheet, as well as CAD and sketches. With the QR codes which contain robot examples that we used and a debrief of our team, ~~and~~ our entire team agrees that this is a good design.

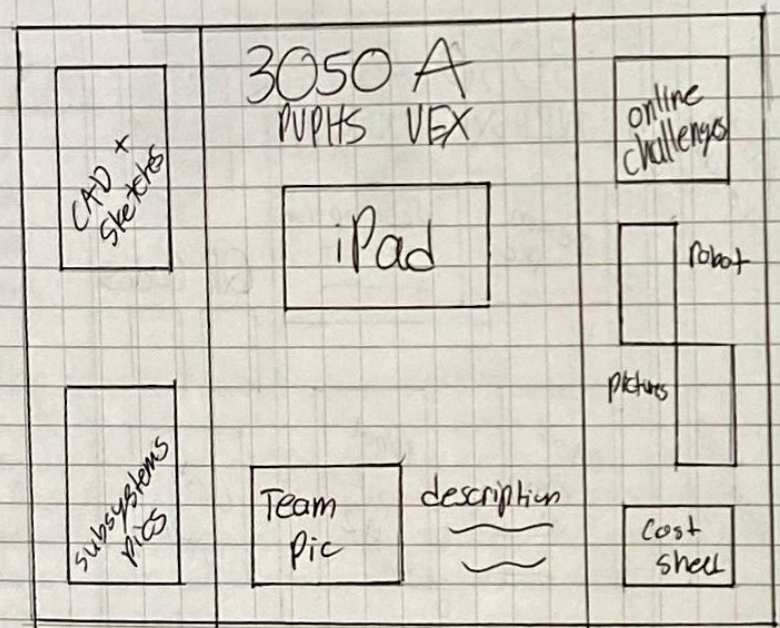
Continued to Page 44

SIGNATURE  DATE 10/9/21

DISCLOSED TO AND UNDERSTOOD BY  DATE 10/9/21 PROPRIETARY INFORMATION

Continued from Page 43

With iPad



Here is our second design for our posterboard. Unlike our first poster design, this poster is drafted out of wood and contains an iPad implemented into it. It contains the same items, just is just an iPad included as well which contains some more information. Our team is still deciding which poster idea to go with, but its nice to know our options.

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SIGNATURE *[Signature]* DATE 10/9/21

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PROPRIETARY INFORMATION

Continued from Page

Today, our programmers fixed the driving code for our robot. One problem was that the motors were not moving fast enough, but we solved this partially by changing the motor to be torque in the code, as this wasn't updated. It still moves relatively slow, however, so we are going to do more research soon to fix this.

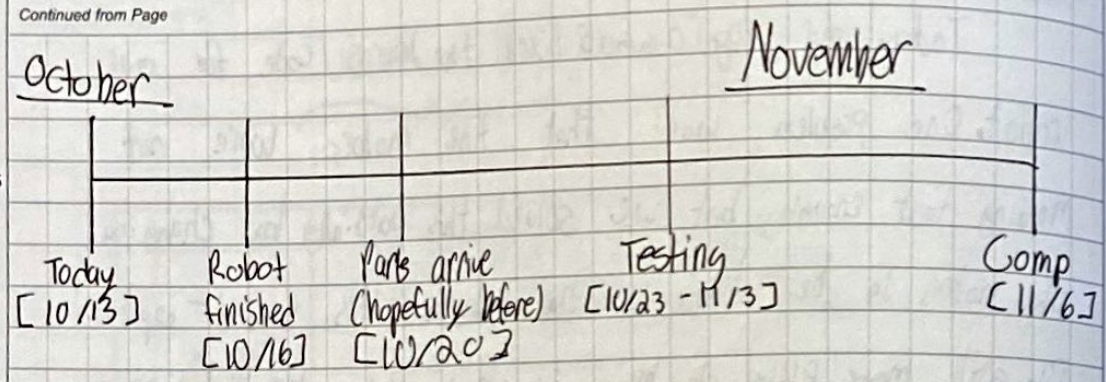
For the mechanical side of our robot, our engineers added stoppers so the mobile goal intakes don't interfere with the donut intake. We also made some small mechanical adjustments to make our robot more efficient. However, our parts have not been delivered yet, so we can't test our robot with parts. To solve this, we use 3D printing a donut. Finally, we created posterboard designs for our competition. We created one with an iPad and one without an iPad, and look forward to constructing those in the near future.

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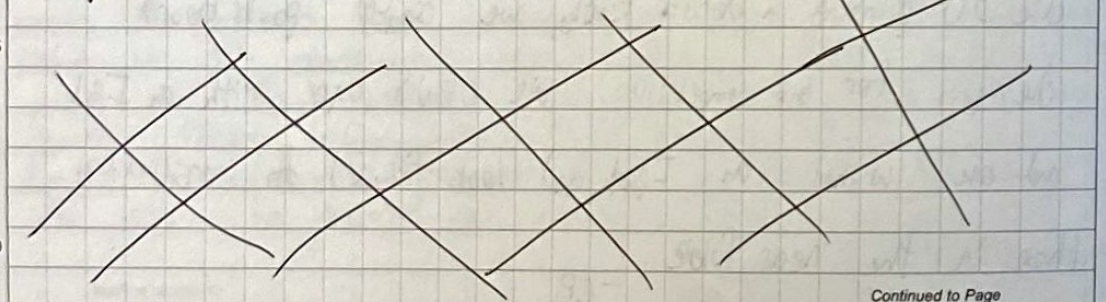
SIGNATURE *[Signature]* DATE 10/9/21

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PROPRIETARY INFORMATION



Here is a basic timeline that we have created for the next couple of weeks leading up to our first competition in Long Beach. Although these are hard set deadlines, we are still keeping a flexible mindset going into this. Random ~~tasks~~ problems can occur; whether it be a mechanical, programming, or design issue, these faults cause setbacks. Also, assuming the game pieces arrive early, then we set more testing in. But if they come in later, then everything will be set back a few days. Overall, we hope seeing our deadlines printed in ink will help us work better and efficiently.



Continued from Page

Today we discussed as a group a set of points of focus for the rest of the meeting

- Protect the motors from harm during intake
- Finalise wiring
- Test chain tension/strength
- Calibrate base motors for turning & driving
- Configure Remote controls
- Create & test a prototype plunger

To protect our motors from damage while intaking, we designed guards that bent around motors that double as funnels in donuts.

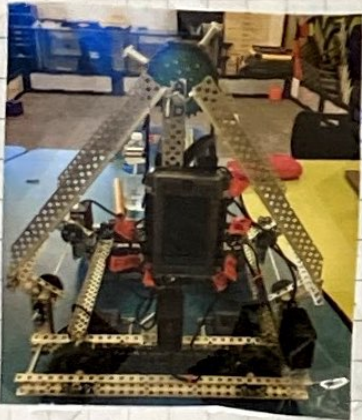
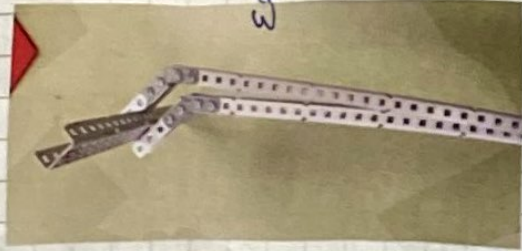
We tested optimal chain length and tension by running the motors.

We also had our driver practice driving the bot for input on how we could change controls for the most efficient driving

Timmy also designed a proto type plunger to pick up donuts. We concluded that the current design doesn't fit the size parameters of the game.

In addition to the rest of the progress made during the meeting we began to 3D print some game pieces because our pieces have been on back order.

Continued from Page 47



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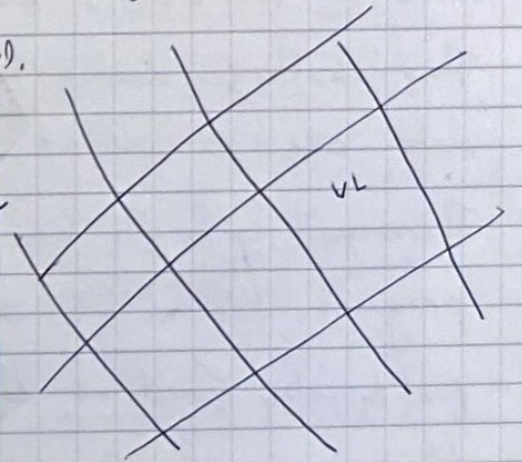
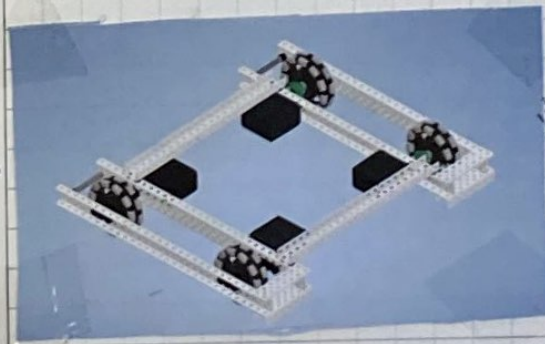
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DATE 10/13

PROPRIETARY INFORMATION

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We continue to work on the CAD for the robot, and we completed the CAD for base today. However, we cannot progress with any other parts of the CAD as the robot is constantly changing so we continue on excellent robot on the day of the competition. One part that has been completed is the base, which is the reason we CADed it first. Another issue we had was finding the exact measurements for some of the smaller parts, such as spacers and stand offs. To solve this, we measured the pieces and found the closest piece in the part library. Next, we plan on CADing the the mobile goal intake, as they are closer to being finished.



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SIGNATURE *[Signature]*

DATE 10/16/21

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DATE 10/16/21

PROPRIETARY INFORMATION

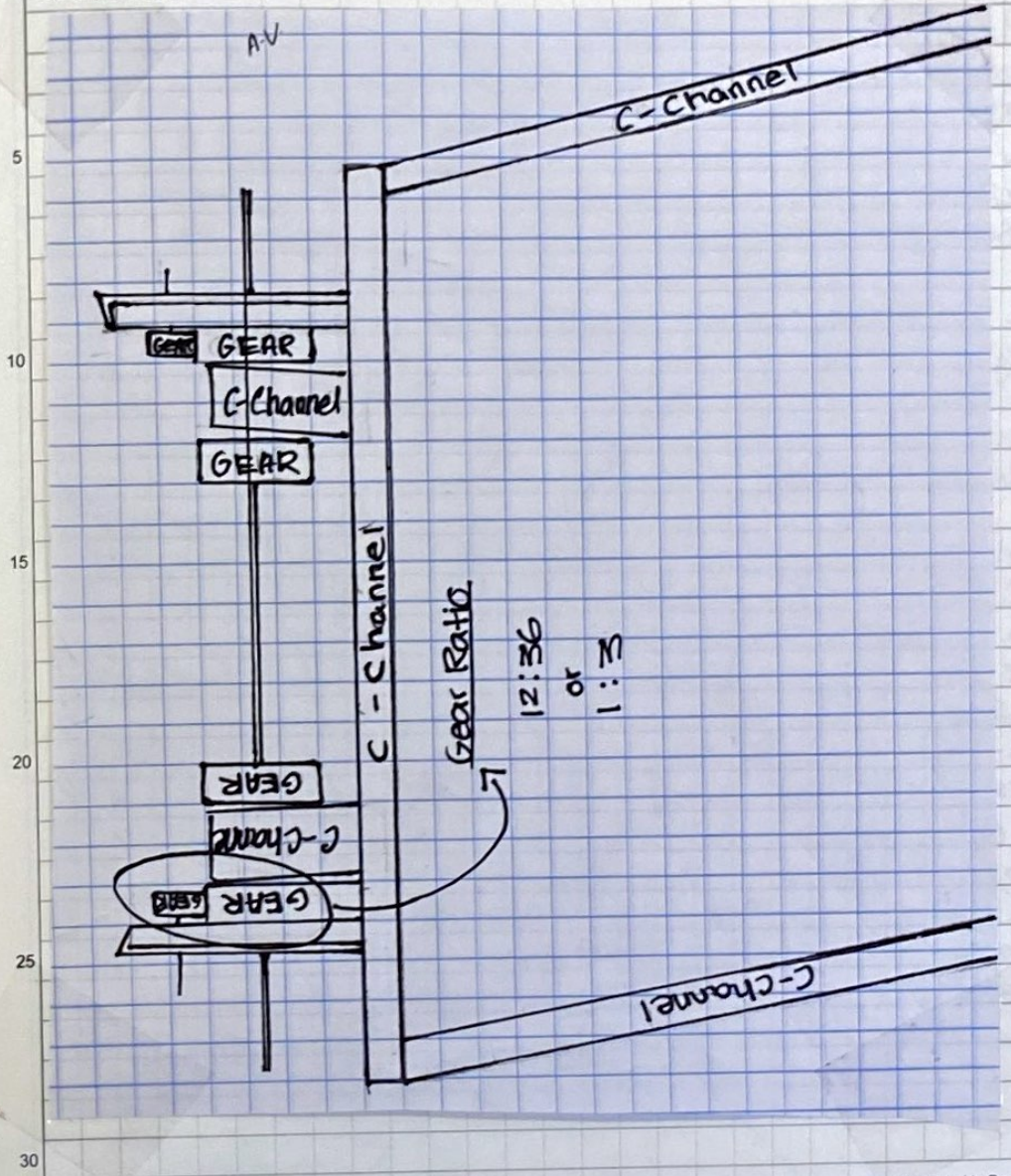
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Online challenges were released 1 day ago, and we've already started on Theme it Up. Brainstorming is done for the basis of our fantasy plot, concept art is well underway, and I'm editing down a rough draft of the essay to reach under the 1000 word limit. Almost the whole team is involved in this project, be they actors, musicians (we're composing an original score for the video), artists, or cinematographers. This challenge seems to be popular as a more creative outlet for many team members. There will certainly be updates here on our progress. We're confident we can make a quality entry (and we double-checked, Theme it Up can qualify for Worlds!)

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SIGNATURE <i>[Signature]</i>	DATE 10/13/21	DATE 10/16/21	PROPRIETARY INFORMATION
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SIGNATURE <i>Anna Keena</i>	DATE 10/16/2021	DATE 10/16/21	PROPRIETARY INFORMATION
DISCLOSED TO AND UNDERSTOOD BY <i>[Signature]</i>		DATE 10/16/21	PROPRIETARY INFORMATION

Continued from Page

The new game elements arrived and our two teams worked together to set up the new pieces. However, a few of their specifications were slightly off of our research.

The alliance mobile goals have a shorter height meaning we need to be able to bring the mobile goal closer to the conveyor. The alliance mobile goal is also heavier than we expected as it has a weighted plate in the base. Our mobile goal intake was unable to lift them. Therefore we need to increase the gear ratio and add rubber bands to be able to make use of our design.

Conveyor:

- Was too high to lift donuts
- First tried to increase standoff length. However, this change made the chain more flimsy allowing the donuts to fall off as they rose.
- In order to alleviate this issue we moved the bottom sprocket of the conveyor down
- Speed of conveyor caused donuts to bounce while being picked up leading to inconsistencies

Continued to Page 53

SIGNATURE *Wade Gray*

DATE 10/16

DISCLOSED TO AND UNDERSTOOD BY

Wade Gray

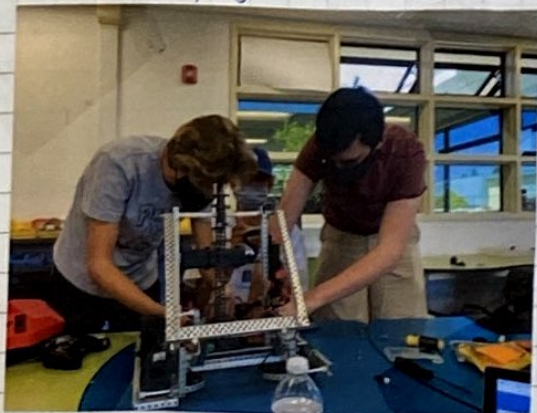
DATE 10/16

PROPRIETARY INFORMATION

Continued from Page 52

- We determined the point of failure to be the vertical surface area was unable to hold on to the donuts effectively
- This led us to replace the spacer with a two long by which was able to hold the donuts at the bottom curve of the conveyor

We also began working on one of our online challenges, Theme It Up (see page 50 for more details)



Continued to Page

SIGNATURE *Wade Gray*

DATE 10/16

DISCLOSED TO AND UNDERSTOOD BY

Wade Gray

DATE 10/16

PROPRIETARY INFORMATION

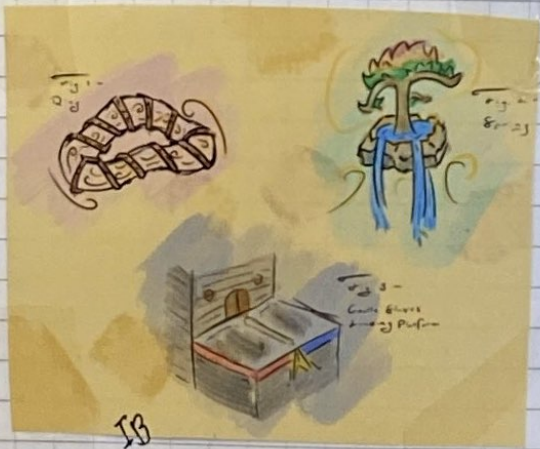
TITLE Theme it Up Update #1 PROJECT

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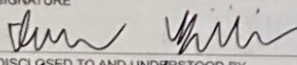
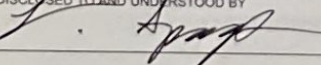
In regards to Theme it Up, we managed to:

- Plan out a good portion of the plot and began writing down the story itself
- We drew out some designs for our world as well, located below
- We also planned out the size of our dragon heads and we've decided to make them out of cardboard.

Music wise, we decided to create our own score. After rounding up all of us who play music we began composing a score for our video. Since we ran into a bunch of robotic problems today, we didn't have much time to write the story itself, so it is our goal our next meeting.



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DATE 10/20/21

DATE 21/10/20

PROPRIETARY INFORMATION

TITLE Intake design process PROJECT

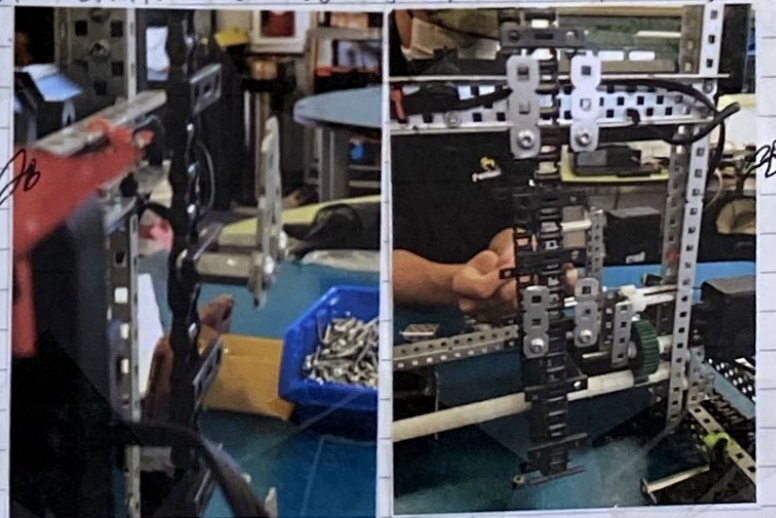
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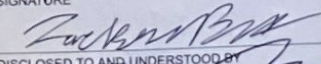
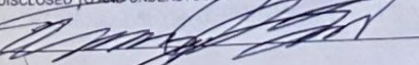
We spent many days testing and designing our intake.

- First, we had 1-inch standoffs with one step spacers on the end.

- Then after thorough testing we concluded that this design was insufficient.
- We needed something that could scoop the donuts up more efficiently,
- After some thinking we came up with the idea of using 1 by 3's attached to the 1-inch standoffs.
- This proved to be too long and would hit the motor when rotating. Preventing us from picking up the donuts
- The design we landed on was 1-inch standoffs with 1/2 step spacers with the 1 by 3's.
- However, this design allows us to only put the donuts on one side of our mobile goal lifts.
- All in all we are happy with this design and hope it brings us success in this upcoming season.

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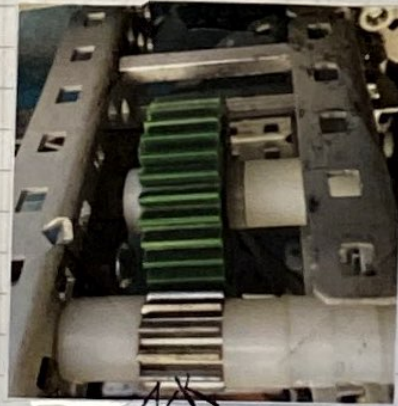
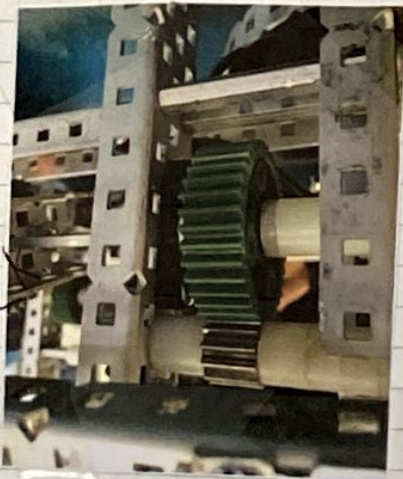
DATE 10/20/21

PROPRIETARY INFORMATION

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Today at our meeting, we did a variety of things. First, we made two gearboxes, both of them being for our mobile goals. For the gearbox, we used a 1:3 gear ratio.

We also made an intake mechanism to help us pick up the donuts more easily. For the intake mechanism, or "scoopers", we attached standoffs (1/2 inch) to our intakes then put a 1-step spacer after the standoff, and put a 3x1 flat piece to act as the scooper. We then finished it off by screwing everything together.



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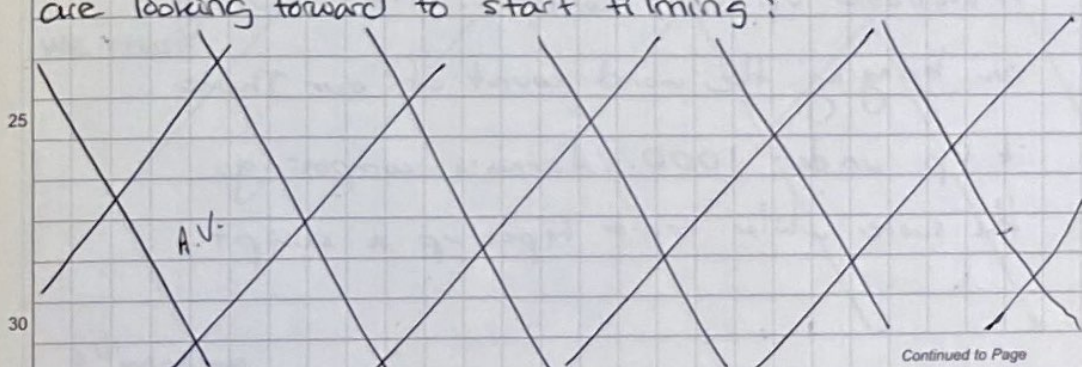
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DATE 10/20/21

PROPRIETARY INFORMATION

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So far, our script has been rough drafted, & is currently going through the editing process, such as making our word count no more than 1000 words. Our cast & crew have been picked. The music composition is progressing very well. We have finalized the instruments that will be included (piano, drums, tuba, electric guitar, & ukelele). Members of our team, 3050A, do fluently play these instruments, which is great! We have tried at the best of our abilities to compose the music to elaborate the intensity of this year's game & our story. We are looking forward to start filming!



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DATE 10/23/2021

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DATE 10/23/21

PROPRIETARY INFORMATION

TITLE 10/23 Meeting

PROJECT

Continued from Page

Today involved much Online Challenge work and continuation of engineering refinements.

The same gearbox as was tested on one side has been implemented on the second mobile goal intake. This is so we can increase torque to lift the quite heavy goals.

We're also building a second base so our driver can practice while we're still refining subsystems on the main bot.

Notebook updates continue. I'm focusing on bringing the word count of our Theme it up under 1000. Aarna's composing the score while Ivana types up a script.

Continued to Page

SIGNATURE *J. Spang*

DATE 21/10/23

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Juan An

DATE 10/23/21

PROPRIETARY INFORMATION

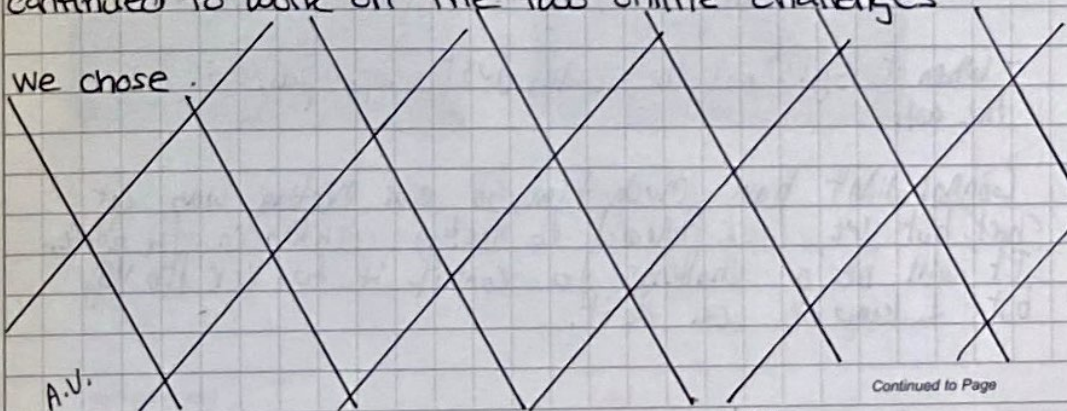
TITLE 10/27 Meeting

PROJECT

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Today, we mostly worked on improving the mechanical engineering for the "arms" of the robot. Our mobile goals weren't staying up, so we (our mechanical engineers) decided to add rubber bands to it. They did that in order to make our robot sturdier & able to hold up the mobile goal's weight. However, this action unfortunately bent the axles. To fix this, we inserted high strength axles, because they have a very small chance of bending with the mobile goal's weight. We also continued to work on the two online challenges

We chose



A.V.

Continued to Page

SIGNATURE *Aarna Veera*

DATE 10/27/2021

DISCLOSED TO AND UNDERSTOOD BY

Ethan

DATE 10/27/21

PROPRIETARY INFORMATION

Continued from Page

Today, I reached out to an old coder for our school named Connor Gotsuch. He was a brilliant coder for our school, and we needed help with recordable autonomos. He set up a zoom meeting for us, and shared his old RobotC code for us to convert. Here are some notes we took:

- Recordable auton constants sets the velocities of each different subsystems into a copy paste code
- To increase performance, don't use delay timing because then each timing will differ and it will be inconsistent.
- The record function is a separate task and goes into the driver control section.
- All of the other voids go in the pre-auton function.
- When it spits out the code, just copy paste it into the auton!

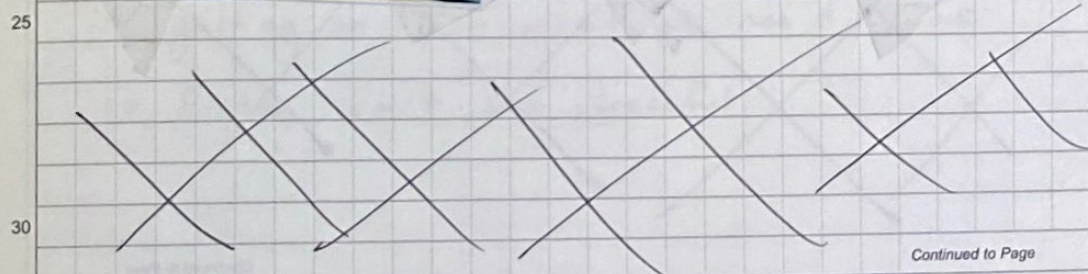
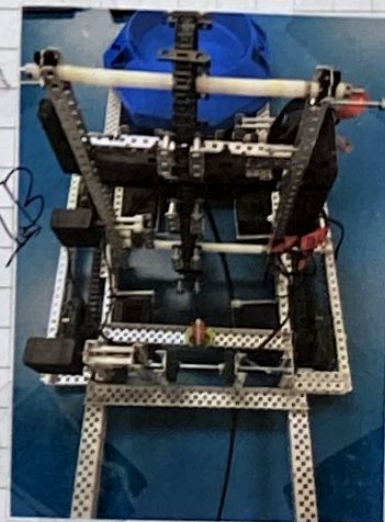
Connor didn't have much time, so our meeting was cut short, but we look forward to meeting with him in the future. It will be a challenge to convert it to VEX Pro VS, but I know we can do it.

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SIGNATURE Cole Padden	DATE 10/30/21
DISCLOSED TO AND UNDERSTOOD BY <i>[Signature]</i>	DATE 10/30/21
PROPRIETARY INFORMATION	

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Today, we switched out our regular axes for high-strength ones and figured out the proper spacing for them. We also added rubber bands, and our programmer worked hard on our auton and learned about recordable auton. We also did some more work on our poster and plan to finish it by our next meeting. Below are some images of our robot without rubber bands.

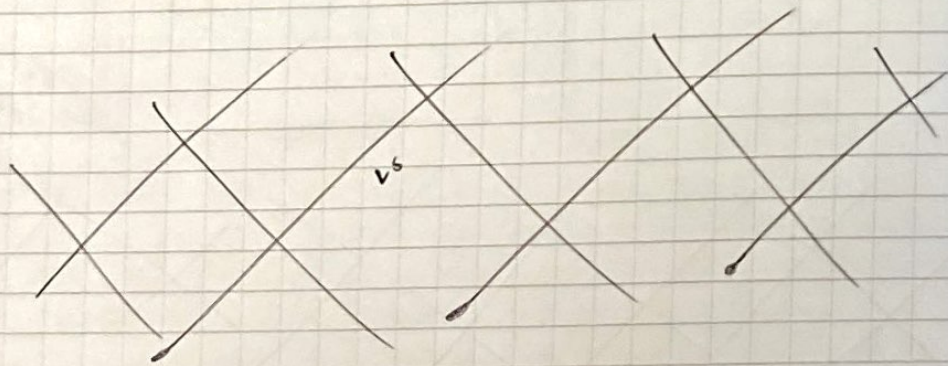


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SIGNATURE Shun Min	DATE 10/30/21
DISCLOSED TO AND UNDERSTOOD BY <i>[Signature]</i>	DATE 10/30/21
PROPRIETARY INFORMATION	

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Part Name	Unit Cost	Quantity	Total Cost
Vex Cortex	\$274.99	1	\$274.99
Vex Motors	\$39.99	8	\$319.92
3.25 In. Omni Wheels	\$17.99	4	\$71.96
#25 Standard Roller Chain (10')	\$11.99	1	\$11.99
High Strength Sprockets	\$43.99	1	\$43.99
Gear Set	\$14.49	1	\$14.49
#8-32 Keys Nuts	\$3.29	50	\$164.50
#8-32 Nylock Nuts	\$4.39	50	\$219.50
1x2x1x25 C-Channels (6 pack)	\$32.99	1	\$32.99
1x2x1x35 C-Channels (6 pack)	\$39.99	1	\$39.99
1x2x1x25 L-Channels (4-pack)	\$16.99	1	\$16.99
V5 Robot Radio	\$43.99	1	\$43.99
Angle Corner Gusset (4-pack)	\$21.99	1	\$21.99
2" and 3" Drive Shafts Pack	\$5.99	1	\$5.99
12" Drive Shaft Pack	\$9.99	1	\$9.99
Spacers and Washers	\$3.29	50	\$164.50
Bearings/Pillow Blocks	\$5.49	20	\$109.80
Standoff Pack	\$17.49	1	\$17.49
Vex Cables (8 pack)	\$14.99	1	\$14.99
Vex Battery	\$54.99	2	\$109.98
High Strength Sprockets	\$14.99	1	\$14.99
Overall Cost			\$1,725.02



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SIGNATURE *J. Spragg*

DATE 21/11/3

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DATE 11/3/01

PROPRIETARY INFORMATION

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Today was heavy on competition prep. Auto n code is rapidly finishing up, and will be done Friday. We added rubber bands to our mobile goal lifts to take some pressure off the motors (already geared torque). We also added aluminum l-brgs as triangles to prevent the arms of the lifts bending in.

The poster is all but complete, with video and spray paint. The notebook is remarkably well caught up. Today's meeting succeeded in getting most of what we need done, so Friday isn't too stressful.

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SIGNATURE *J. Spragg*

DATE 21/11/3

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DATE 11/3/01

PROPRIETARY INFORMATION

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T - 12 hours. Autonomous findings are being perfected. Toolboxes are packed. Poster is prepped for batteries and final pictures brought tomorrow. Notebook is, as of writing, 2/3 of a page from done.

During practice, we discovered a slight stability problem with the mobile goal lifters. This was fixed with extra tightening and screws. Consistency issues are the main source of such on the auton. Placement has to be perfect in order for the preloads to fall on the goal's post. We're still working, and we're optimistic about our chances.

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SIGNATURE *J. Arago*

DATE 21/11/5

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DATE 11/5/21

PROPRIETARY INFORMATION

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Overall Rank: 24th out of 25 teams

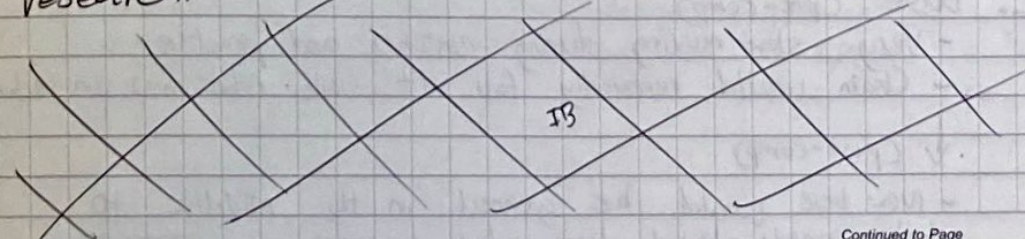
Wins to Losses to Ties: 1-5-0 WP: 2 AP: 80
OPR: 29.4 DPR: 37.5 SP: 408 CCWM: -8.2

We made it to the Round of 16 before being eliminated.

6870	<u>35</u>	<u>120</u>	11382	R16	2-1
3050A			40971A		

Overall, we all agreed that we could improve our robot itself. Our autonomous worked for all of the first two matches. We finished with a skills score of 69, which is okay considering it was our first run. However, we did agree that we can improve the score.

We also got many new ideas for our robot by looking at our fellow competitors. Our next plan at events is to begin creating a new design as well as performing research.



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DATE 11/10/21

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DATE 11/10/21

PROPRIETARY INFORMATION

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A. Intake (versus pre-comp)

- Unreliably picked up donuts from the field
- hard to deposit donuts into mobile goal

↓ (post-comp)

- New design would use a gear surrounded by flaps that would pull cubes into robot.

B. Mobile Goal lifter (pre-comp)

- Hard to pick up mobile goals from the floor
- When lifting mobile goals, they would get pushed down by the weight of the mobile goal, therefore making it very hard to score donut on mobile goals.

↓ (post-comp)

- New design would be a claw attached to a 4-bar lift that could simply pick up mobile goals by the rim.

C. Base (pre-comp)

- Very slow-moving during matches and practice
- Chain would repeatedly fall off while robot was in action.

↓ (post-comp)

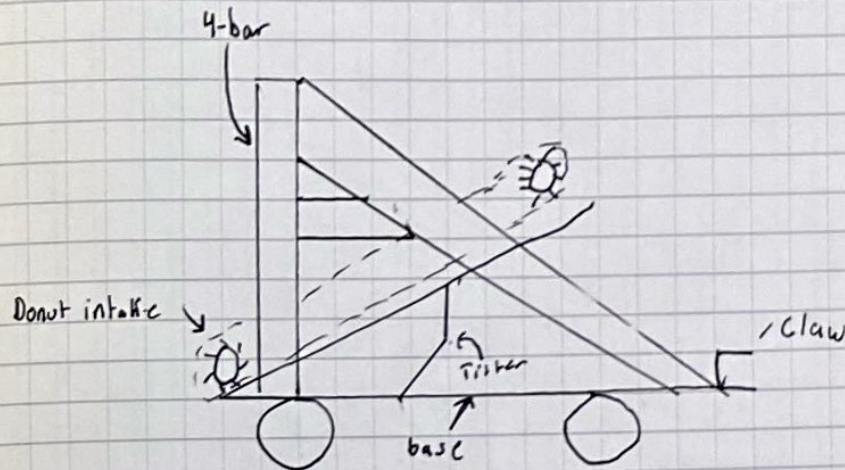
- New base would be geared in the middle to help speed (chain from wheel to gear)

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PROPRIETARY INFORMATION	

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Tilter Design

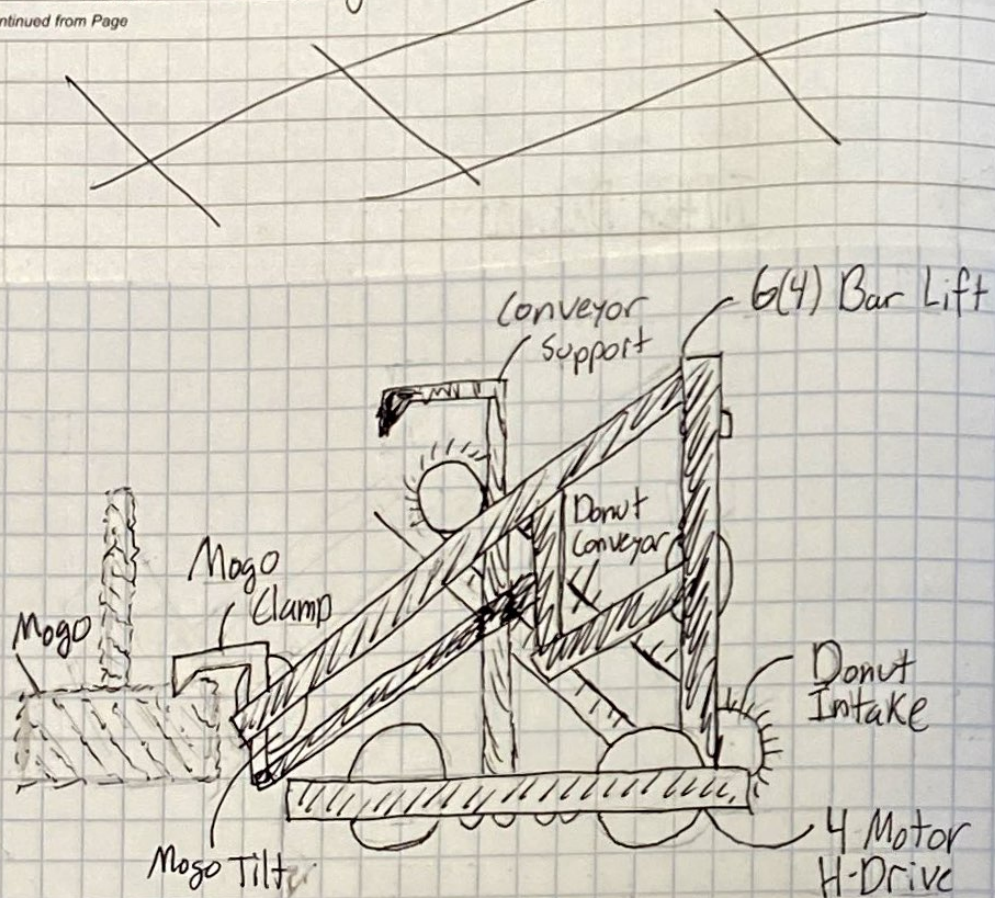


Pictured above is our 1st design after our competition. The idea behind this robot was to be able to pick donuts up efficiently and put them on both the alliance tower and the shorter neutral towers. This design is good in theory. However, I don't believe we have the space or motors to build it.

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PROPRIETARY INFORMATION	

Continued from Page



Continued to Page 69

SIGNATURE <i>Timmy [Signature]</i>	DATE 11/10/21
DISCLOSED TO AND UNDERSTOOD BY <i>[Signatures]</i>	DATE 11/10/21
PROPRIETARY INFORMATION	

Continued from Page 68

On the left, there is a rough sketch of our more refined design. We came up with this design by taking inspiration from robots we saw online and at our first competition, using a combination of the design elements we saw to create this beast of a bot. We've implemented our original H-Drive base, the mogo clamp that we saw many teams use at the competition, a donut conveyor that we took notice of while watching competition replays online, and of course, the 6(4)-Bar lift that is of our own design.

4 Motor H-Drive - This design comes out of our old bot, as there were virtually no problems with it during competition. We did have to make some slight adjustments to accommodate for every thing else that we've added, but nothing too significant.

Mogo (Mobile-Goal) Clamp - At the competition that we participated in with our old design, we saw a lot of this clamp. It utilizes pneumatic pistons to apply pressure to the inside of the mogo to lift it with surprisingly good consistency.

Donut conveyor/intake - The conveyor works by using ~~flapped~~ flapped chain running from the top to the bottom, with a sheet of plexiglass underneath it to bring the donuts up from the intake to the Mogo pole.

6(4)-Bar lift - this lift is a super-up 4-Bar, using 6 bars instead of 4. These extra bars provide much more support & consistency.

Mogo Tilter - This feature tilts the mobile goal to align with the exit ramp of the conveyor. It makes it possible to actually score the donuts

SIGNATURE <i>Timmy [Signature]</i>	DATE 11/10/21
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PROPRIETARY INFORMATION	

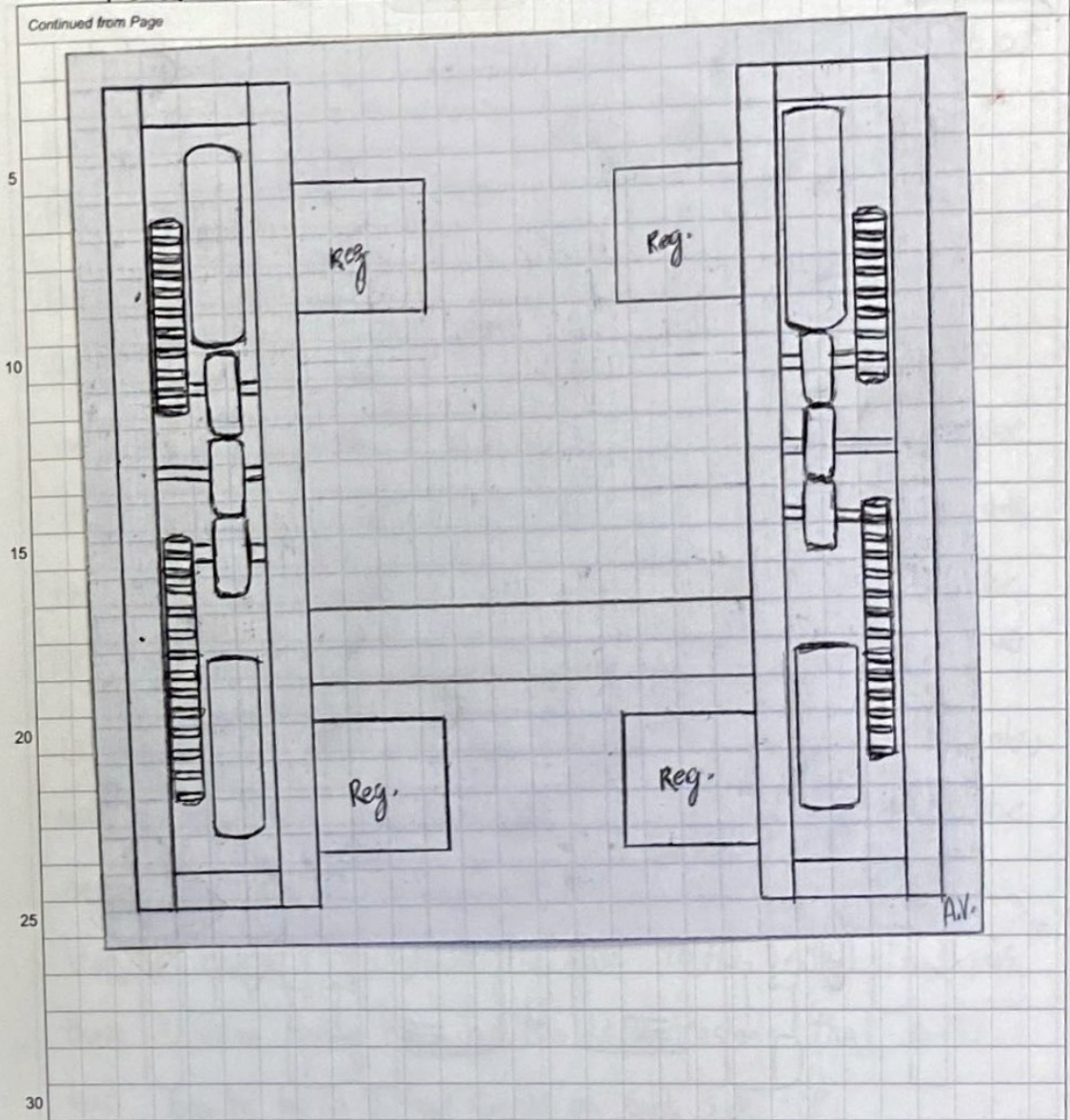
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Due to the limited competitions remaining on the calendar before the end of the season, our team agreed that we needed to sign up for the comp on 1/29. Since our next comp was not until January, we believe it would be optimal to divide the building talent to simultaneously construct two robots, one for skills and one for standard competition. We believe with the extended break between competition and the few remaining chances to qualify in the season, it would be in our best interests to have slightly varied robots depending on what type of competition.

Our Programmer, Cole, decided, with the increased complexity of our design, switching to pros, a new coding design studio, would allow him to run the robot more efficiently and precisely. Although this decision forces him to start over from scratch, he believes it is the best choice for the team and the program moving forward.

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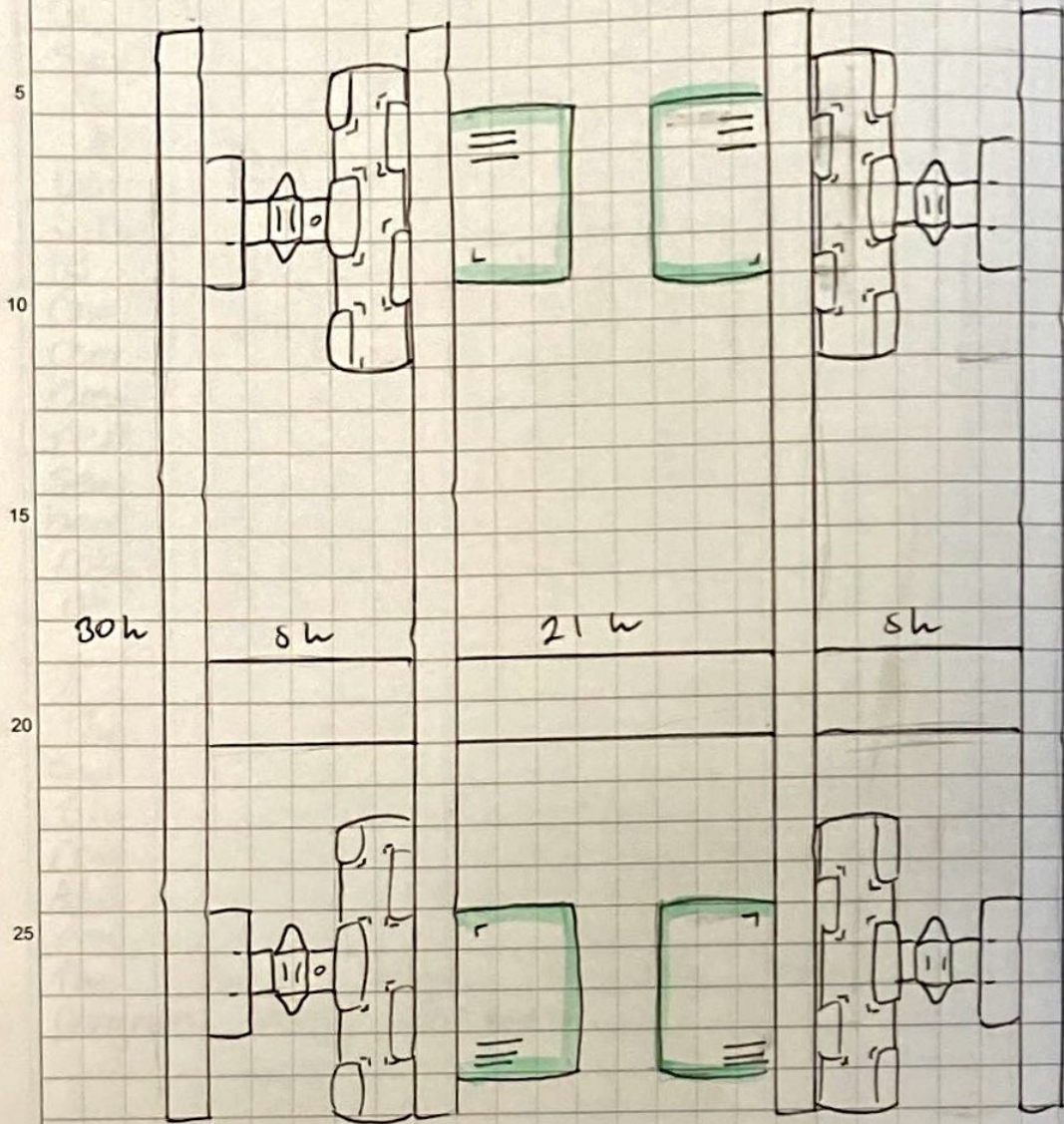
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PROPRIETARY INFORMATION	



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SIGNATURE <i>Adama Vevece</i>	DATE 11/15/2021
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PROPRIETARY INFORMATION	

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SIGNATURE *J. Spragg*
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DATE 21/11/13

DATE 11/13/21

PROPRIETARY INFORMATION

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Today, we made great progress on ~~our~~ our new robot and code. I learned how to create driver control on PROS, and I am starting to get the hang of it. For our base, we decided to change it from 30 to 31 holes to provide extra space for our lift. We also added in gears on the middle of the drive train so the motors could be closer together to give more space for our intake. For the intake, we made the very first intake piece that serves as a funnel. For the lift, we created 2 four-bars (one for each side) with the correct spacing to fit on our robot. They move very cleanly, and we are proud of them. One problem we have with the new base design, however, is that it is hard to get the varying chains throughout the base to the perfect length, as there is some extra tension or too little tension that causes our base to be at different speeds on each side. -CP

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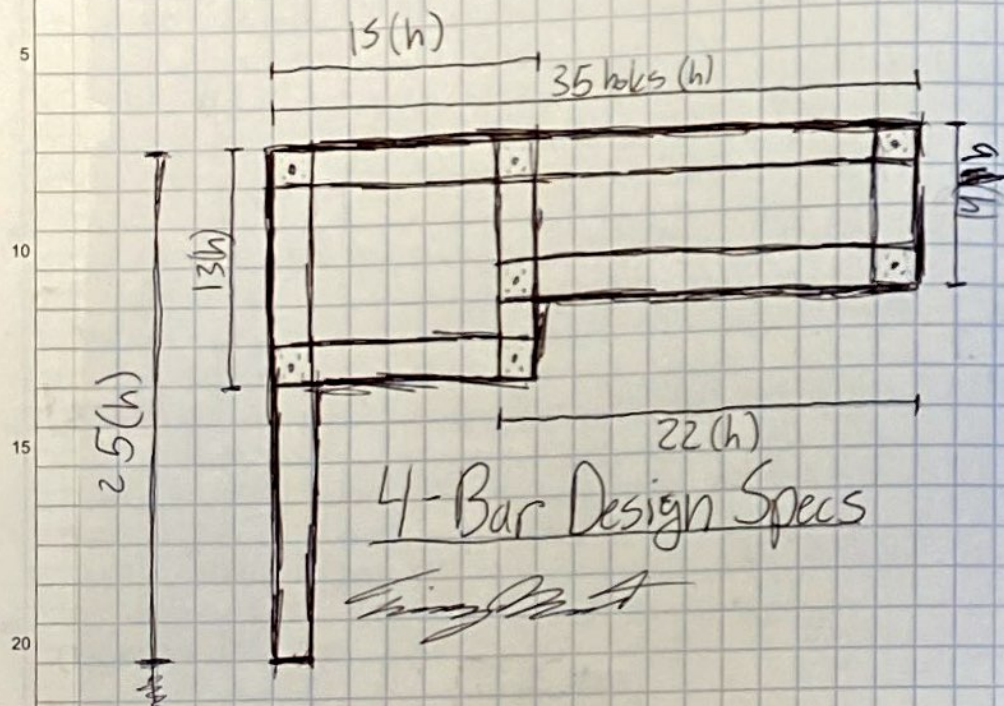
SIGNATURE *Cole Paulucci*
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DATE 11/13/21

DATE 11/13/21

PROPRIETARY INFORMATION

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These are the specs for the 4-bar design. We took rigorous measurements to make sure the arm was long enough to reach all the way from the front of the base to the back of the base. The extra support bars are to help lift the entire weight of the mobile goals, and provide a structure that we can add rubber bands to later.

SIGNATURE *Vignette*

DATE 11/17/21

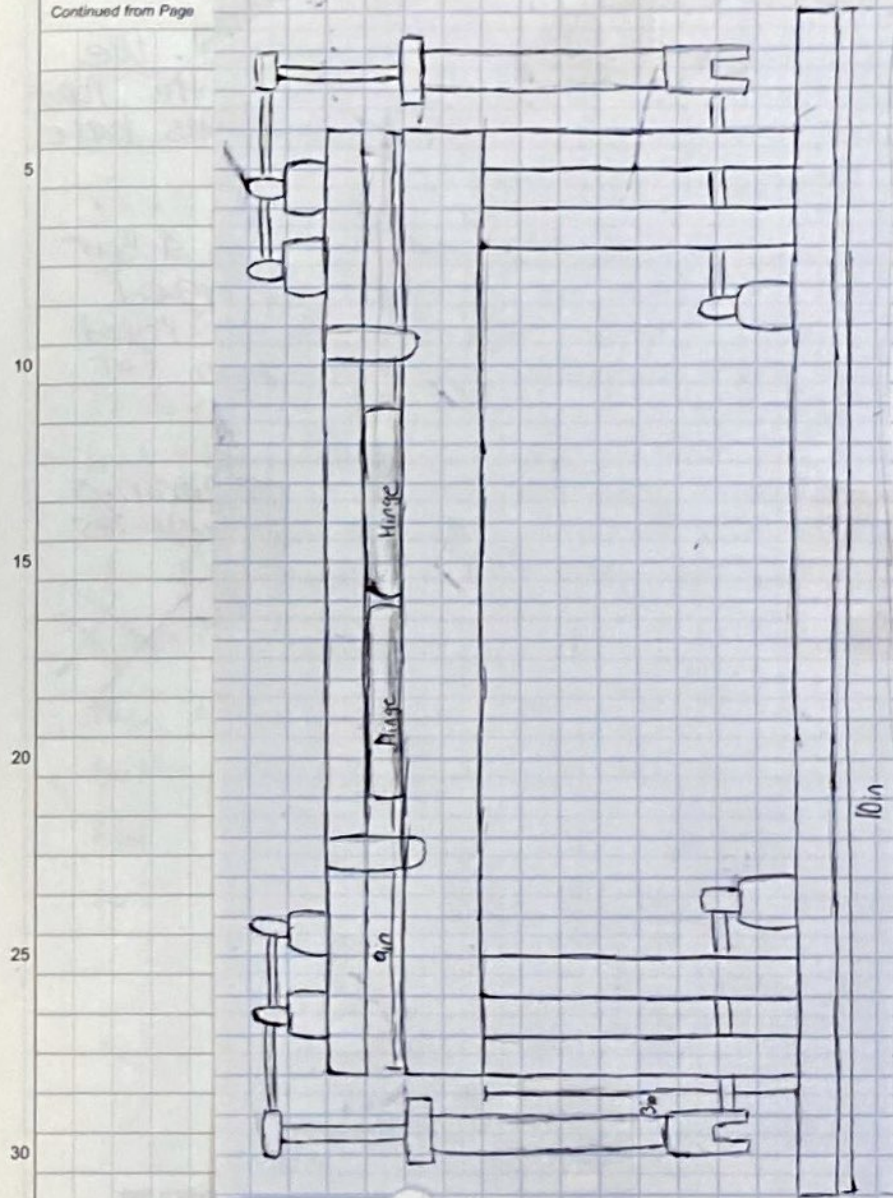
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DATE 11/17/2021

PROPRIETARY INFORMATION

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SIGNATURE *Adrian Vesce* *Y'all*

DATE 11/17/21

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DATE 11/17/2021

PROPRIETARY INFORMATION

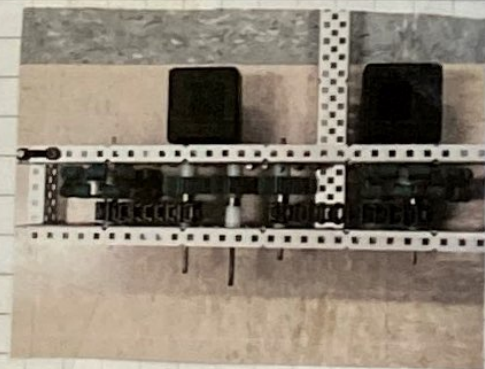
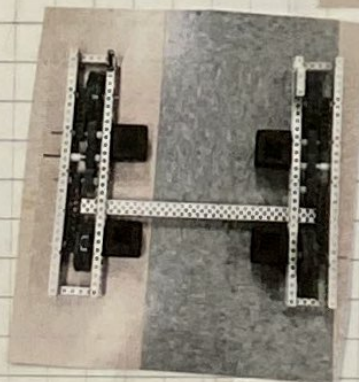
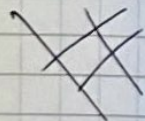
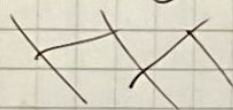
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Today, we accomplished a great deal. We managed to finish our new base for the robot as well as completing the ~~sketch~~ ^{skills} base for our skills robot.

We also designed and sketched out our 4-Bar design. On top of this, we ~~managed~~ managed to complete both 4-bars for the main robot and have almost completed one of them for the skills bot.

Finally, we began planning for the beginnings of our ~~Girls~~ Girl Powered essay as well as searching for new competitions.



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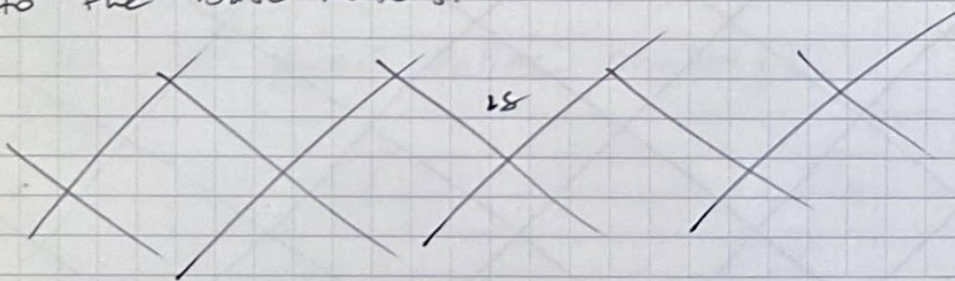
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DISCLOSED TO AND UNDERSTOOD BY <i>J. Spray</i>	DATE 2/11/17
PROPRIETARY INFORMATION	

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Team 3050A are back from Thanksgiving break. We still have two robots to finish, although we will be meeting over winter break. Theme It Up is prepped for filming then.

Today we fixed an issue with the skills bot base wherein the chain on the base would contact the crossbracing below it. We spaced down the crossbrace and added longer screws to accommodate it.

The 4-bars are attached, though not both finished. So that they don't impact the motors at rest, we added cushioning to the base motors.



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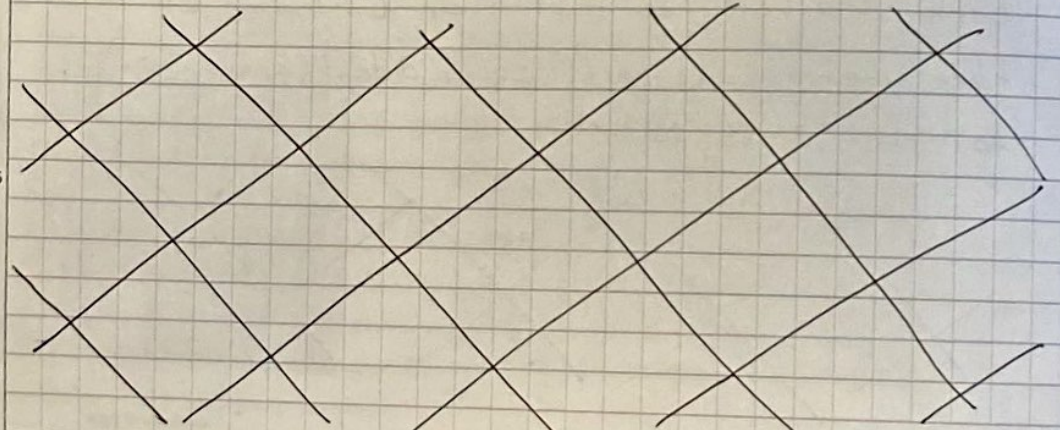
SIGNATURE <i>J. Spray</i>	DATE 2/12/1
DISCLOSED TO AND UNDERSTOOD BY <i>dm</i>	DATE 12/1/21
PROPRIETARY INFORMATION	

TITLE Online Challenge Update PROJECT

Continued from Page

There It Up's shooting script, adapted from the essay, is ready for our actors to learn their parts. The score will be individually recorded by our musicians, then put together during editing.

Filming should take place during December, although we don't have many meetings before winter break. Then the footage still needs to be edited in time to meet the submission deadline.



Continued to Page

SIGNATURE <i>J. Spang</i>	DATE 21/12/19
DISCLOSED TO AND UNDERSTOOD BY <i>Vyler Carl</i>	DATE 12/4/21
PROPRIETARY INFORMATION	

TITLE December 4th Meeting PROJECT

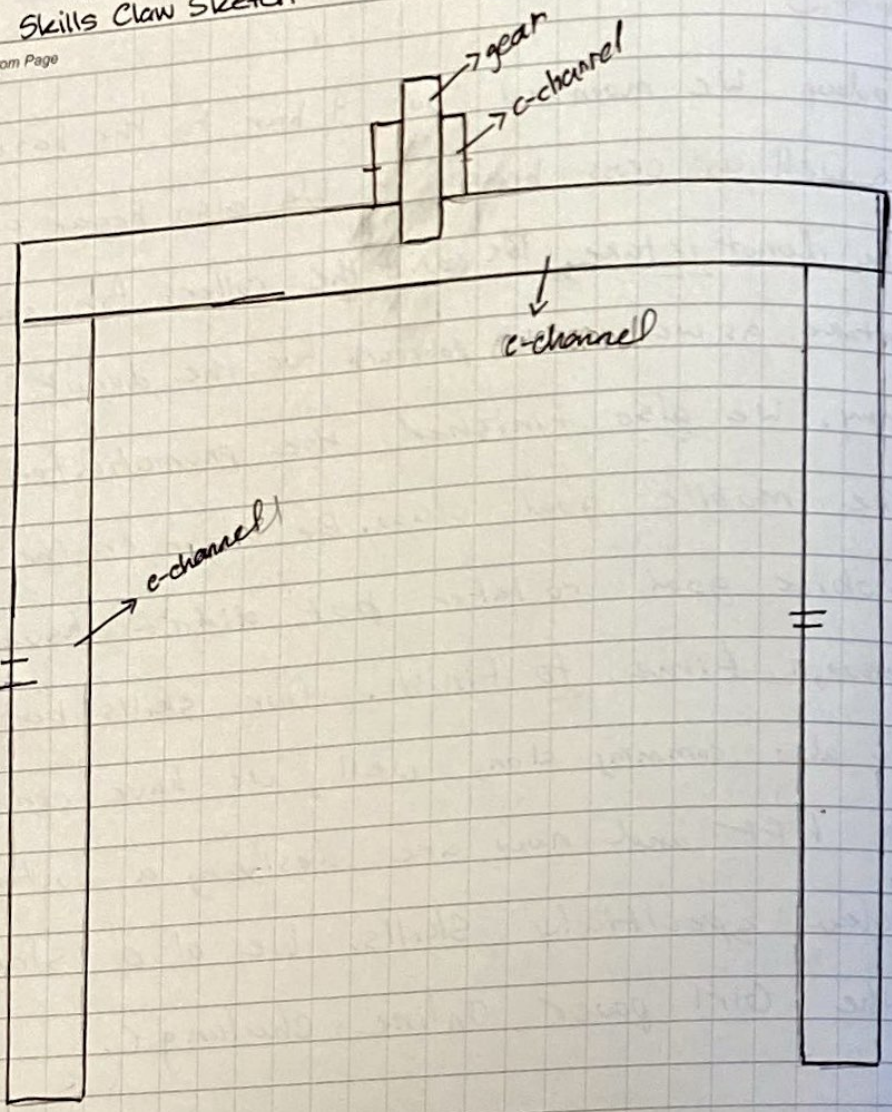
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Today we mounted our 4 bar to the base as well as cross bracing it. We also began on the donut intake. We built the rollers for said intake as well as cut polycarb for the donut tray. We also finished the pneumatics for the mobile goal claw. We began on the mobile goal rotator but didn't have enough time to finish. Our skills bot is also coming along well, we have constructed a HPT and now are designing a custom claw specifically skills. We also started the Girl power Online Challenge.

Continued to Page 80

SIGNATURE <i>G. Shur Brent</i>	DATE 12/04/21
DISCLOSED TO AND UNDERSTOOD BY <i>Casey Veeva</i>	DATE 12/04/2021
PROPRIETARY INFORMATION	

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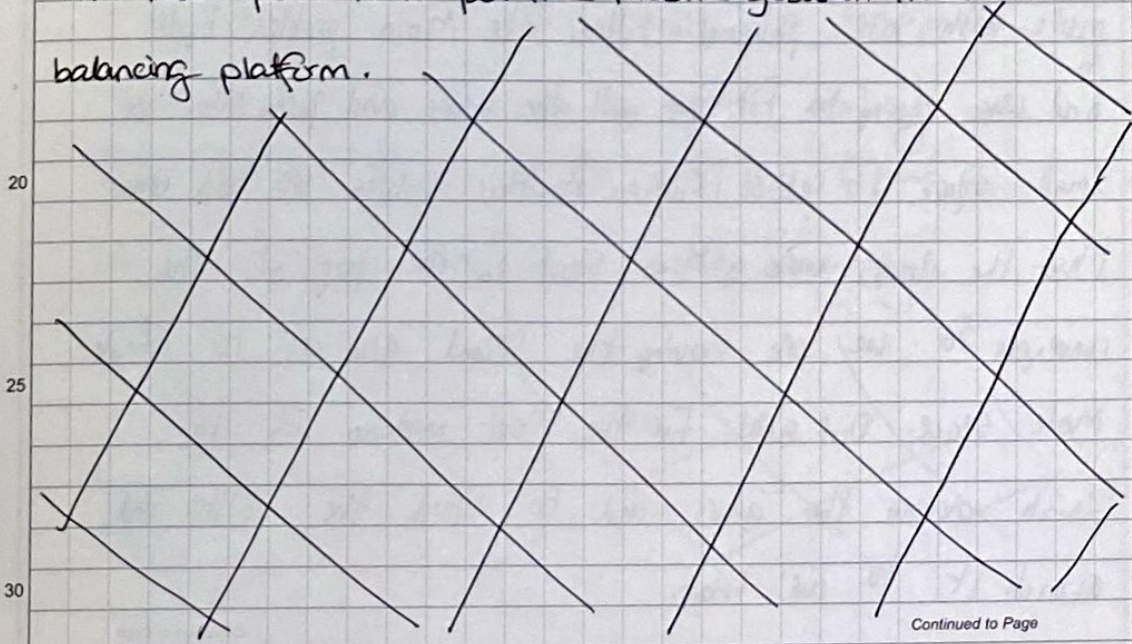


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SIGNATURE Aarona Veeva	DATE 12/8/2021	PROPRIETARY INFORMATION
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For our skills claw, we decided to design it similar to our first claw sketch design. It has 1 c-channel with 2 c-channels screwed onto it as the basis of the claw. It's main function is to pick up the mobile goal & place it on the balancing platform. We want to keep it simple since after observing other skills runs, the most efficient way to get the most points is to put the mobile goals on the balancing platform.



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SIGNATURE Aarona Veeva	DATE 12/8/2021	PROPRIETARY INFORMATION
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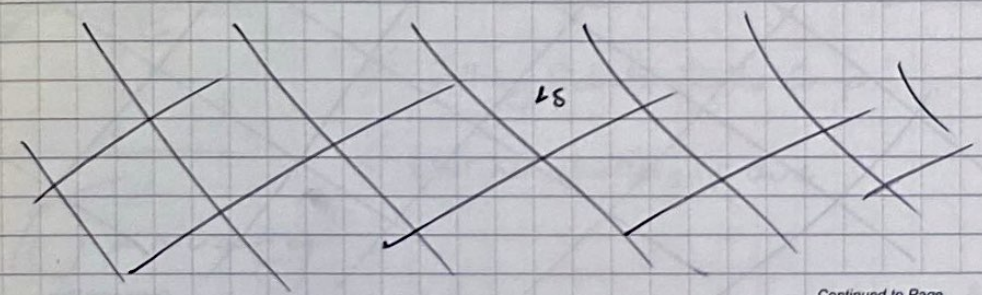
Today, I continued to learn Plios Editor to code our robot. Today, I learned about gyrosopic code, and inserted that code into our program. We are still deciding if we are going to use a gyro sensor or not, but I hope we do as it is really good for auton. We also did a table read of our theme it up script, and acted out scene 1 a few times to test positioning and sound quality. Ryder progressed more with our pneumatic tilter. The main problem Ryder had was trying to fit ~~the~~ all the gears and parts into a small space to reduce friction. Another problem we had was that the clowns were getting stuck in the top of the conveyor so we are moving the second gear up to create more space. Our goal for the next meeting is to finish moving the gears and to finish the tilter and attach it to our robot.

Continued to Page

SIGNATURE <i>W. Spang</i>	DATE 12/18/21
DISCLOSED TO AND UNDERSTOOD BY <i>W. Spang</i>	DATE 21/12/18
PROPRIETARY INFORMATION	

Continued from Page

Most of the work now being done on the bot is attachment. The axles holding the left onto the base need spacers added. The claws are near ready to be put on. Once the competition bot has its claw, we can decide where to put the cortex and battery and begin wiring. The motors are now all on for that to happen. The code is all ready for testing on the bots. Theme It Up will be filmed in two days, at our next meeting.

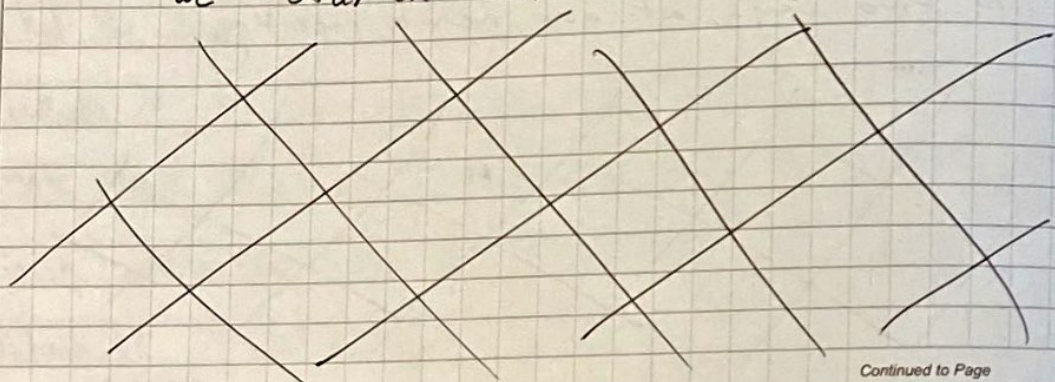


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SIGNATURE <i>T. Spang</i>	DATE 21/12/28
DISCLOSED TO AND UNDERSTOOD BY <i>W. Spang</i>	DATE 12/28/21
PROPRIETARY INFORMATION	

Continued from Page

On our 12/30/21 meeting we worked on our cross bracing for our lift so that both arms would go up at the same time. We also worked on our skills robot which had some base alignment issues. We finally attached our claw which so far has been working well. However, our intane has been having some problems so we started on a redesign.



Continued to Page

SIGNATURE *Patrick Becht* DATE 12/30/21
 DISCLOSED TO AND UNDERSTOOD BY *Patrick Becht* DATE 12/30/21 PROPRIETARY INFORMATION

Continued from Page

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

Rolling Robots Skills Comp
 Online challenges due

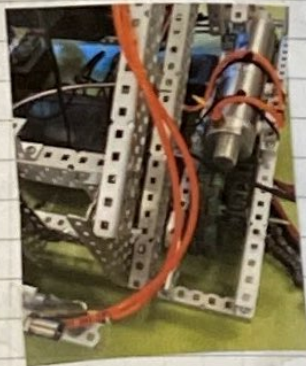
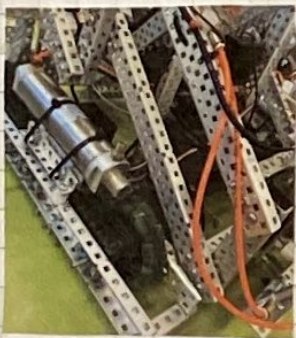
January

Continued to Page 86

SIGNATURE *J. Sprague* DATE 1/8/22
 DISCLOSED TO AND UNDERSTOOD BY *Patrick Becht* DATE 1/6/22 PROPRIETARY INFORMATION

Continued from Page

Today we began Pneumatics on our robot.
 We are using double acting piston to grab and
 release the mobile goals. Retracting the ~~pro~~ piston
 locks a clamp around the edge of the mobile
 goal allowing us to pick up & drive around.
 We also are using 2 tanks chained to gether
 with tube to increase capacity of air. We
 Discovered that one of our tanks had an air leak
 and we had to replace one of the air ports
 on the tank so it wouldn't leak.



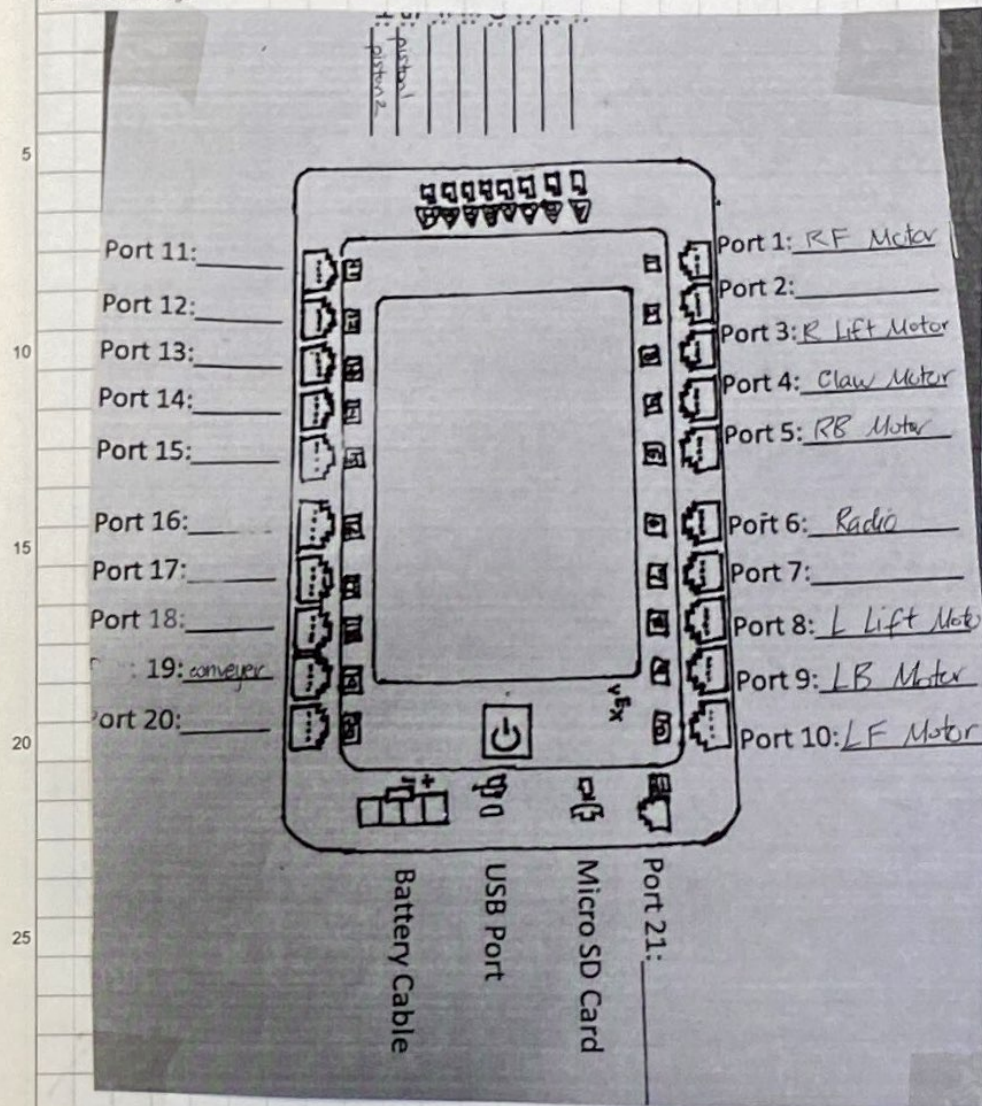
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 DISCLOSED TO AND UNDERSTOOD BY *[Signature]*

DATE 1/12/22

DATE 1/12/22
 PROPRIETARY INFORMATION

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SIGNATURE *[Signature]*
 DISCLOSED TO AND UNDERSTOOD BY *[Signature]*

DATE 1/12/22

DATE 1/12/22
 PROPRIETARY INFORMATION

Continued from Page

```

#include "vex.h"

using namespace vex;

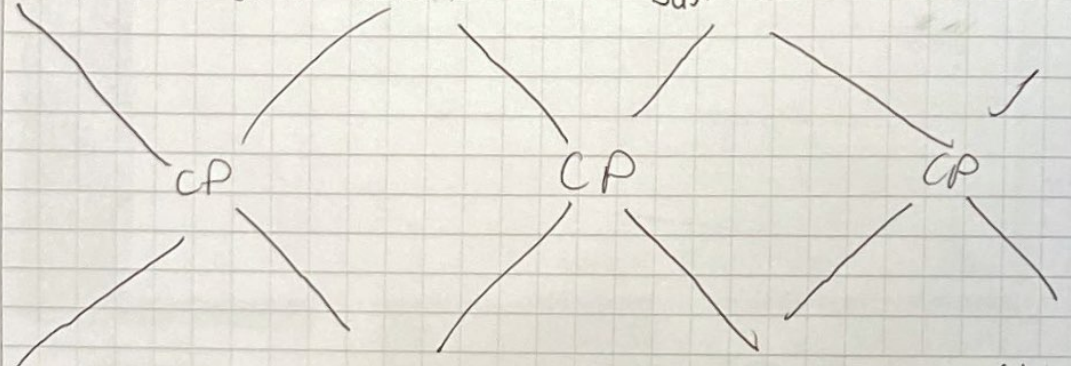
5 int main() {
  // Initializing Robot Configuration. DO NOT REMOVE!
  vexcodeInit();

  LeftFront.spin(vex::directionType::fwd, Controller1.Axis3.value(), vex::velocityUnits::rpm);
  RightFront.spin(vex::directionType::fwd, Controller1.Axis2.value(), vex::velocityUnits::rpm);
  LeftBack.spin(vex::directionType::fwd, Controller1.Axis3.value(), vex::velocityUnits::rpm);
10 RightBack.spin(vex::directionType::fwd, Controller1.Axis2.value(), vex::velocityUnits::rpm);

  if (Controller1.ButtonR2.pressing()) {
    Lift1.spin(vex::directionType::fwd, 40, vex::velocityUnits::pct);
    Lift2.spin(vex::directionType::fwd, 40, vex::velocityUnits::pct);
  }
  else if (Controller1.ButtonR1.pressing()){
15 Lift1.spin(vex::directionType::rev, 70, vex::velocityUnits::pct);
    Lift2.spin(vex::directionType::rev, 70, vex::velocityUnits::pct);
  }
  else{
    Lift1.stop();
    Lift2.stop();
  }
20
}

```

This is the driver code for the base and Lift motors



Continued to Page 91

SIGNATURE <i>Colin Rauer</i>	DATE 11/12/22
DISCLOSED TO AND UNDERSTOOD BY <i>R. Spang</i>	DATE 11/12/22
PROPRIETARY INFORMATION	

Continued from Page 90

```

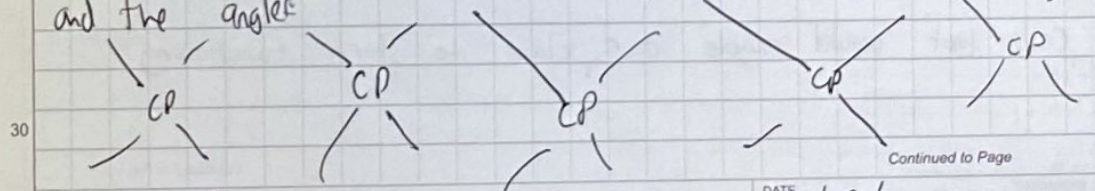
if (Controller2.ButtonL1.pressing()){
  Conveyer.spin(vex::directionType::fwd, 70, vex::velocityUnits::pct);
}
5 else if (Controller2.ButtonL2.pressing()){
  Conveyer.spin(vex::directionType::rev, 70, vex::velocityUnits::pct);
}
else{
  Conveyer.stop(vex::brakeType::brake);
}

10 if (Controller2.ButtonUp.pressing()){
  Angler.spin(vex::directionType::fwd, 60, vex::velocityUnits::pct);
}
else if (Controller2.ButtonDown.pressing()){
  Angler.spin(vex::directionType::rev, 60, vex::velocityUnits::pct);
}
else{
15 Angler.stop(vex::brakeType::brake);
}

{
  if (Controller1.ButtonL1.pressing()){
    piston1.set(true);
    piston2.set(true);
  }
20 else if (Controller1.ButtonL2.pressing()){
    piston1.set(false);
    piston2.set(false);
  }
}
}

```

This is the driver code for pneumatics, the conveyer, and the angles



Continued to Page

SIGNATURE <i>Colin Rauer</i>	DATE 11/12/22
DISCLOSED TO AND UNDERSTOOD BY <i>R. Spang</i>	DATE 11/12/22
PROPRIETARY INFORMATION	

TITLE 1/12 Meeting

PROJECT

Continued from Page

Today at our meeting, we continued to make more progress on our "Theme It Up" online challenge, which took up a lot of our meeting. We also started to wire up our robot to the brain so we could commence testing of the robot. We also had begun to place tubing on the robot which would provide air for our claw, which is being powered by pneumatics. However, we quickly ran into cable management problems, as the lift would encounter difficulties going up, because the pneumatic wires are being zip-tied to it. We also ran into more faulty wires & ports on the electrical side of the robot, and it took some time to find the right sequence of ports that would work. We also started to work on code that would enable our claw to start functioning

Continued to Page

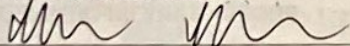
SIGNATURE

Zaim Kozu

DATE

1/12/22

DISCLOSED TO AND UNDERSTOOD BY



DATE

1/12/22

PROPRIETARY INFORMATION

TITLE Girl Powered Update PROJECT

Continued from Page

We've submitted the Girl Powered essay. Ours is titled Girl Power Overcomes. We started out focusing on impostor syndrome, easy to expound upon as girls on our team have experience with it. We transitioned into the main requirements of the prompt. Role model was an easy choice; we picked our middle school STEM teacher, who still sometimes mentors us now. He brought us out of our comfort zones in engineering and never let girls be sidelined. We touched on our own team's efforts to create an equal and diverse team. We're quite proud of our essay!

Continued to Page 94

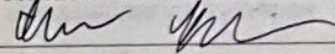
SIGNATURE

Z. Spang

DATE

1/10/22

DISCLOSED TO AND UNDERSTOOD BY



DATE

1/19/22

PROPRIETARY INFORMATION

TITLE Girl Powered Essay PROJECT

Continued from Page 93



This is a QR code to our Girl Powered essay. We are very proud of the way it turned out. From our writing itself to the pictures we found,

we believe that our work is to some of our best potential. It is something that we are proud of, and we hope that others like it as well.

EVB

Continued to Page 95

SIGNATURE <i>Sam Veem</i>	DATE 1/19/22
DISCLOSED TO AND UNDERSTOOD BY <i>Sam Veem</i>	DATE 1/19/22
PROPRIETARY INFORMATION	

TITLE Cost Sheet PROJECT

Continued from Page 93

Part Name	Unit Cost	Quantity	Total Cost
Vex Cortex	\$274.99	1	\$274.99
Vex Motors	\$39.99	8	\$319.92
3.25 In. Omni Wheels	\$17.99	4	\$71.96
#25 Standard Roller Chain (10')	\$11.99	1	\$11.99
High Strength Sprockets	\$43.99	1	\$43.99
Gear Set	\$14.49	1	\$14.49
#8-32 Keps Nuts	\$3.29	50	\$164.50
#8-32 Nylock Nuts	\$4.39	50	\$219.50
1x2x1x25 C-Channels (6 pack)	\$32.99	1	\$32.99
1x2x1x35 C-Channels (6 pack)	\$39.99	1	\$39.99
1x2x1x25 L-Channels (4-pack)	\$16.99	1	\$16.99
V5 Robot Radio	\$43.99	1	\$43.99
Angle Corner Gusset (4-pack)	\$21.99	1	\$21.99
2" and 3" Drive Shafts Pack	\$5.99	1	\$5.99
12" Drive Shaft Pack	\$9.99	1	\$9.99
Spacers and Washers	\$3.29	50	\$164.50
Bearings/Pillow Blocks	\$5.49	20	\$109.80
Standoff Pack	\$17.49	1	\$17.49
Vex Cables (8 pack)	\$14.99	1	\$14.99
Vex Battery	\$54.99	2	\$109.98
High Strength Sprockets	\$14.99	1	\$14.99
0.50" OD Nylon Spacer Variety Pack	\$5.49	2	\$10.98
Pneumatics Tubing (5')	\$5.49	1	\$5.49
Solenoid Driver Cable (2-pack)	\$32.99	1	\$32.99
Pneumatics Kit 2 - Double Acting Cylinders	\$249.99	1	\$249.99
Overall Total			\$2,024.47

Our robot is very expensive and we are appreciative of that. We try to take the best care of it.

Continued to Page

SIGNATURE <i>Sam Veem</i>	DATE 1/19/22
DISCLOSED TO AND UNDERSTOOD BY <i>Sam Veem</i>	DATE 1/19/2022
PROPRIETARY INFORMATION	

Continued from Page

Theme It Up has also been submitted. Our video and PDF have been titled Race to the Death. We're quite proud of our work, since we've put weeks of effort into both projects. The essay is written as a short story, with both the storyboard (a digitally-drawn comic strip) and the shooting script adapted from it. The video is thus mainly acted in character. Of course, to satisfy requirements, we wove in the adapted timeframe and scoring role explanations. We also ensured our in-house composed music was free in the public domain. No matter the success we achieve, we are proud of our entry!

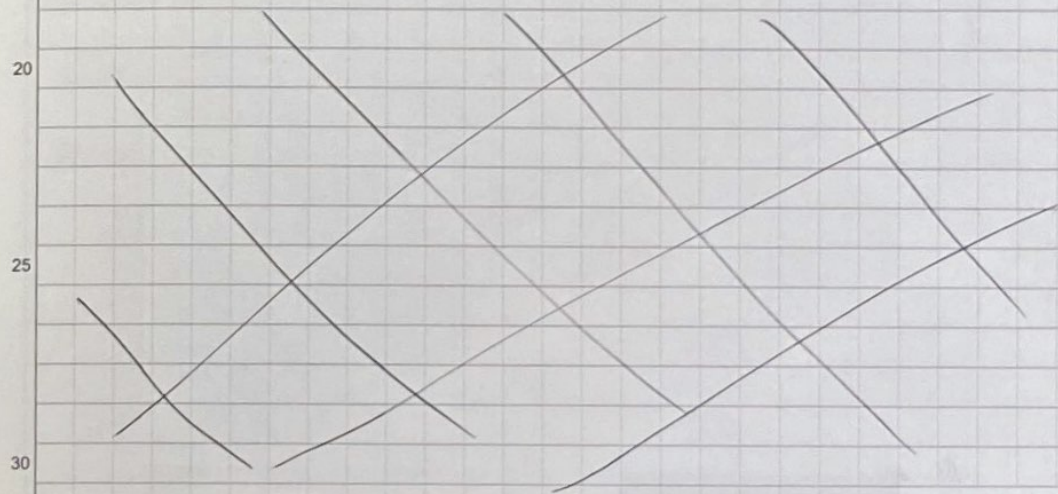
Continued to Page 97

SIGNATURE <i>L. Hoag</i>	DATE 1/12/22
DISCLOSED TO AND UNDERSTOOD BY <i>Mr. Min</i>	DATE 1/12/22
PROPRIETARY INFORMATION	

Continued from Page 96



Here is a QR code to both our Theme It Up essay and video. As said before, we are proud of our hard work. Along with working on the physical robot and the notebook, we still managed to produce what we believe to be as a solid entry.

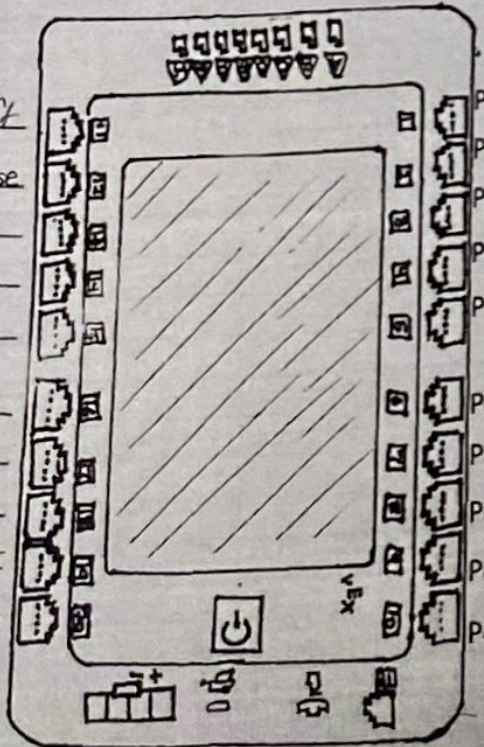


Continued to Page 98

SIGNATURE <i>Mr. Min</i>	DATE 1/19/22
DISCLOSED TO AND UNDERSTOOD BY <i>Mr. Min</i>	DATE 1/19/22
PROPRIETARY INFORMATION	

Continued from Page 48

- A: _____
- B: _____
- C: _____
- D: _____
- E: _____
- F: _____
- G: Port 1
- H: Port 2



- x Port 11: R Lift
- Port 12: RF Base
- x Port 13: _____
- x Port 14: _____
- x Port 15: _____
- x Port 16: _____
- Port 17: Angler
- x Port 18: _____
- Port 19: Omnipec
- Port 20: _____
- Port 1: _____
- Port 2: _____
- Port 3: _____
- Port 4: LB Base
- Port 5: RB Base
- Port 6: Radio
- Port 7: Angle x
- Port 8: L Lift
- Port 9: _____ x
- Port 10: LF Base

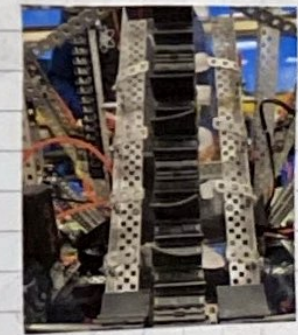
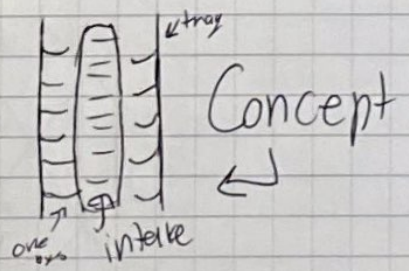
- Battery Cable
- USB Port
- Micro SD Card
- Port 21: _____

Continued to Page

SIGNATURE 	DATE 1/19/22
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PROPRIETARY INFORMATION	

Continued from Page

Today, a good amount of robot testing ensued. We began practicing on the field and with a good amount of testing we realized that we could find a better way to intake donuts. With some thought we decided on adding one ~~two~~ ^{two} buys to the side of the tray to keep the donuts from flying out, with some slight moderation and lots of testing, we concluded that this idea works. An image and rough sketch is pictured below. While today was mainly focused on driver practice, we also got some CAD work done.



Actual

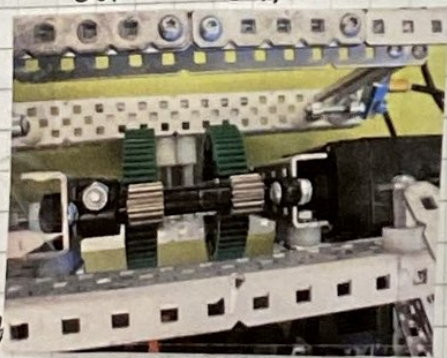
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SIGNATURE 	DATE 1/19/22
DISCLOSED TO AND UNDERSTOOD BY 	DATE 1/19/22
PROPRIETARY INFORMATION	

TITLE *Tilter issues* PROJECT

Continued from Page

One of the main challenges to successfully implement the tilter into our design was being able to fit so much functionality into a small space. Due to the limited size of a robot and the height of the platform there is little space remaining to create vital systems to maximize points. We struggled with connecting the bar at its perfect center. Slight offsets of this connection point would, misalignment our claw and conveyor, severely limiting our abilities during a match.



Continued to Page

SIGNATURE *Yashar Yal*

DATE 1/26/22

DISCLOSED TO AND UNDERSTOOD BY *[Signature]*

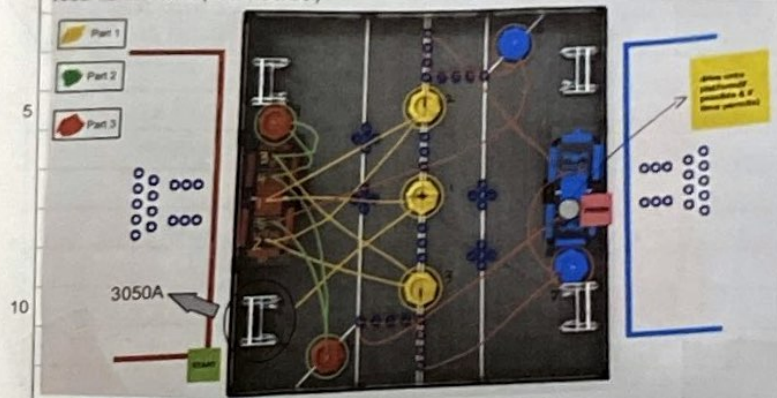
DATE 1/26/22

PROPRIETARY INFORMATION

TITLE *Skills Driver Route* PROJECT

Continued from Page

3050A Skills Route (Driver Control)



For our driver skills route, we did a lot of research on many other routes that other teams have posted. So, overall, we came up with the picture above. Our main goal would be to go for the yellow neutral goals. Then, we thought that we should go for the two red goals on the opposite side of the field, and place them on the red platform (so now there are 5 ~~red~~ goals on the red platform. Next we decided to put the blue goal on the blue platform, & then drive up ~~over~~ onto it and finish. We decided not to prioritize on obstacles.

Continued to Page 102

SIGNATURE *Aashu Veera*

DATE 1/26/2022

DISCLOSED TO AND UNDERSTOOD BY *Yashu Yal*

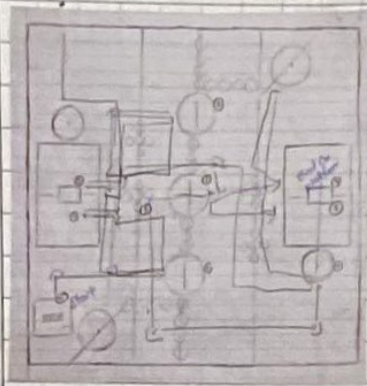
DATE 1/26/22

PROPRIETARY INFORMATION

PROJECT Skills Plan (Driver)

TITLE

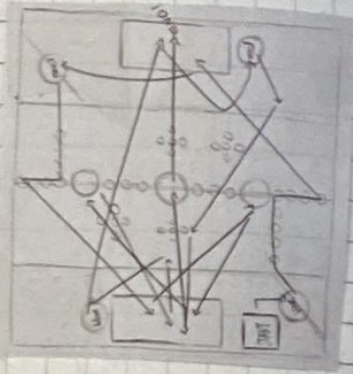
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We made a couple different drivers skills routes, but the 2 on this page are a couple of the ones that we thought are our best plans. The one on the left is a route that basically

collects the mobile goals on the ~~platform~~ platforms, and then we drive up onto the platform with a mobile goal. This would get us over

350 points in driver, & when combined with our autonomous route, would definitely get us over 400. The second route on the right is



basically the same, except this time, we are also considering the donuts, because if we score them on the goal and then on the platform, can amount to quite a few points.

Continued to Page

SIGNATURE Aasim Veere DATE 1/26/2022

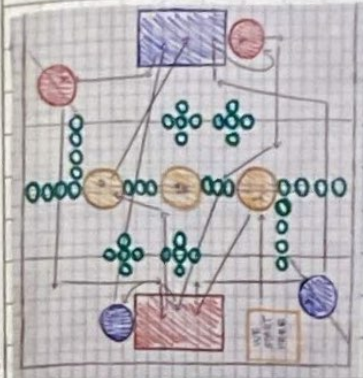
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PROPRIETARY INFORMATION

TITLE Skills Plan (Auton)

PROJECT

Continued from Page

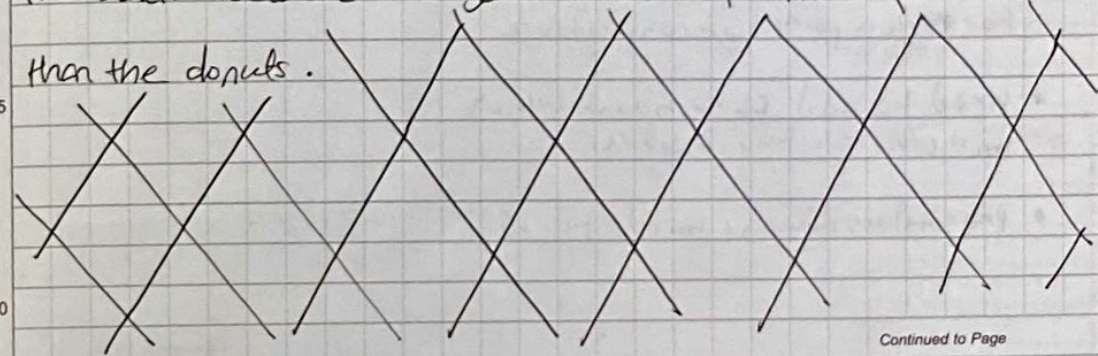


The picture on the left is a sketch of our autonomous skills run. First, we go for the neutral goal in front of our robot. Next, we pick up the blue mobile goal & score the goal on the blue side

platform. Then we score the red goal on the red platform. This, we repeat again with the remaining 2 red & blue goals.

We end the route by putting the shorter neutral mobile goal on the right onto the blue platform. on this route, we decided to prioritize the goals, but not the donuts because the goals amount for more points

than the donuts.



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SIGNATURE Aasim Veere DATE 1/26/2022

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PROPRIETARY INFORMATION

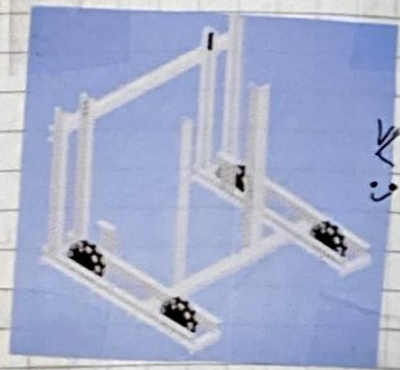
TITLE CAD update

PROJECT

Continued from Page

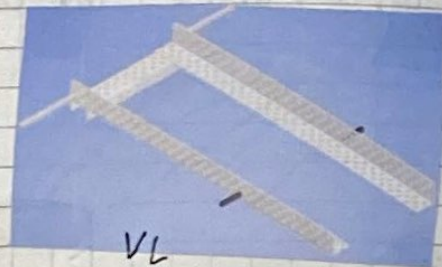
Base:

- mostly complete, although certain pieces are outdated.
- add pneumatics reservoirs, other ~~expensive~~ supports.



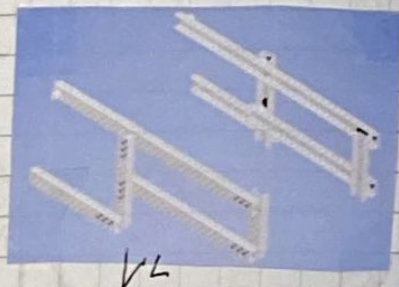
Conveyor:

- completely done, although certain pieces such as the "rib cage" cannot be added due to ~~the~~ technological restraints.



4-bar

- two sides complete, may need rework for certain points of connection.
- need to add flow mount which will connect the 2 sides.
- pneumatics may be hard to add.



Continued to Page

SIGNATURE

DATE

1/26/22

DISCLOSED TO AND UNDERSTOOD BY

DATE

1/26/22

PROPRIETARY INFORMATION

TITLE 1/26 Meeting

PROJECT

Continued from Page

Today we continued to polish our code for the upcoming skills comp. While working on the code and testing we ran into an issue with the mobile goal filter. The motor burnt out due to it having the wrong insert and the code being incorrect. After replacing the motor for one with the proper insert we changed the code so the motor was not always trying to turn even when it was at the stopper. We also finished the second bot to test against. The last problem that arose during the meeting was the donut don't intake. We made new funnels to better intake the donouts.

Continued to Page

SIGNATURE

DATE

1/26/22

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DATE

1/26/22

PROPRIETARY INFORMATION

Continued from Page

On Saturday, January 29th, we went to a Skills event hosted by Rolling Robots. We managed to score 4th overall with a combined driver and programming

score of 300. Here is how our runs went:

1st Driver - 220	1st Programming - 0
2nd Driver - 80	2nd Programming - 60
3rd Driver - 220	3rd Programming - 80

Overall, we are proud of our score. We do think that we can do better and intend to do so during our competition ~~next~~ this coming Sunday. We learned that we need to make our intake more consistent and that more auto and driver practice truly is essential.

Continued to Page

SIGNATURE *Anna Vece*

DATE 2/2/22

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Anna Vece

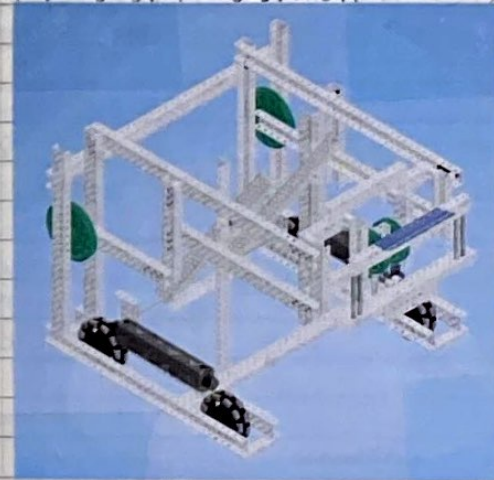
DATE

2/2/2022

PROPRIETARY INFORMATION

Continued from Page

Our CAD for the robot is completed. Between the previous update the claw has been added, along with a few gears on the 4-bar. We were able to add the reservoir but unable to add the cylinders as they are too complex to add. We've also connected the "arms" of the 4-bar along with the claw mount. We also connected the chunks of the bot together and orientated them correctly. One issue I had was pieces not fitting flushly. I got around this issue by connecting them via flange holes, then manually orientating them. We are proud of the work on the CAD and are proud to see it shine soon.



SIGNATURE *Anna Vece*

DATE 2/2/22

DISCLOSED TO AND UNDERSTOOD BY

Anna Vece

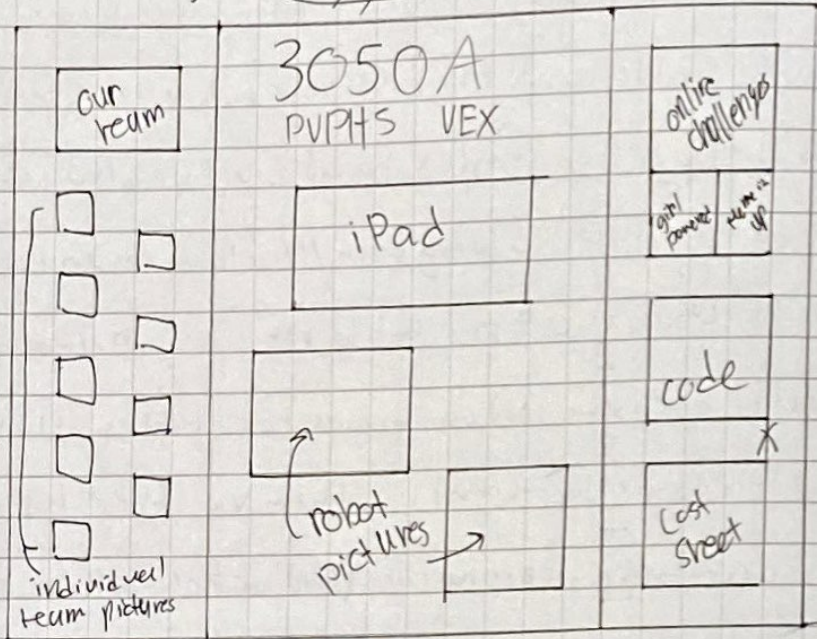
DATE

2/2/22

PROPRIETARY INFORMATION

Continued from Page

With iPad



Here is our new design for our posterboard. Most things have stayed the same, but some has changed. For example, most of our robot pictures will be featured on the powerpoint now. To replace that side, we will put pictures of each of our team members. While we liked our previous design as well, we are happier with how this one came out

Continued to Page

SIGNATURE *Alan Yin*

DATE 2/2/22

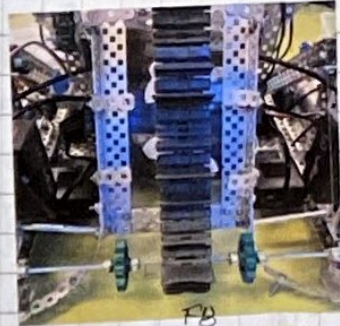
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DATE 2/2/2022

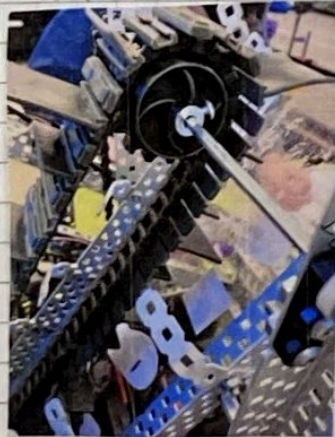
PROPRIETARY INFORMATION

Continued from Page

Today, our main focus was working on our auton and fixing the conveyor. To solve our intake issues and make it



More consistent, we made the gears on the bottom smaller to help the rings along. We also changed the top gear (see below) as well as adjusting the hood size and angle. We found that ~~it~~ this does help the robot intake the rings. Once this problem was worked on, we moved onto auton. So far, it can



Score around 90-99 points by picking up the neutral mobile goal and placing 20 dots on our alliance goal. We also managed to get driver practice in, and we hope it all goes well on Sunday!

Continued to Page

SIGNATURE *Alan Yin*

DATE 2/2/22

DISCLOSED TO AND UNDERSTOOD BY *Alan Yin*

DATE 2/2/22

PROPRIETARY INFORMATION

TITLE Competition Overview PROJECT

Continued from Page

Overall, we did pretty well in this competition. In the qualification rounds, we placed 13th out of 22 teams.

Wins to Losses to Ties: 3-3-0 ~~WP~~ WP: 7 AP: 12
OPR: 44.1 DPR: 9.3 CCWM: -20.3 SP: 536

We made it to the quarterfinals before being eliminated.

3050A	90	126	7700R	QF 1-1
96190A			7700E	

We ended up with a fairly low skills score of 100, ending up in 16th place for skills.

To end the day, we managed to win the Design Award, qualifying us for the State Championships! We are proud of our hard work and are thrilled it paid off.

Although we are qualified and our robot worked pretty well, we still have lots that we want to improve. We saw lots of interesting robot ideas and have gained a better scope of the competition. With all of the information we gained, we plan to discuss and sketch out our new ideas.

Continued to Page

SIGNATURE <i>Don Min</i>	DATE 2/9/22
DISCLOSED TO AND UNDERSTOOD BY <i>T. Spatz</i>	DATE 2/9/22
PROPRIETARY INFORMATION	

TITLE 2/9 Discussion Debrief PROJECT

Continued from Page

This meeting began with a structure. We needed to decide exactly what we were changing.

It's cause for celebration we qualified, but it's time to sit down and go through the design process, in one meeting.

The non-negotiables emerged as fixing the angle of the conveyor, giving us more of a spec buffer, and improving platform capability. The group was later convinced to go along with increasing the size of the wheels. Though it necessitates a base rebuild and conveyor changes (already being done, as above), the increased speed and parking ability are worth it. Our skills robot gets updated for accurate code testing.

Continued to Page 112

SIGNATURE <i>T. Spatz</i>	DATE 2/9/22
DISCLOSED TO AND UNDERSTOOD BY <i>Don Min</i>	DATE 2/9/22
PROPRIETARY INFORMATION	

Continued from Page 111

The discussion came to a head at mention of a second mobile-goal claw or intake. We balked at the time and motors or pneumatics required. Passive was ruled out due to an inability to disengage, as well as through research when no consistent ideas were found. But, as we found more reveals, we decided to be competitive at state we do need a second claw. The frontrunners all involve the current pneumatic system on the bot. They are small, so as not to conflict with spec. They can all get done in the few weeks we have. It was a remarkably productive afternoon, by necessity.

Continued to Page

SIGNATURE <i>T. Dwyer</i>	DATE 2/9/22
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PROPRIETARY INFORMATION	

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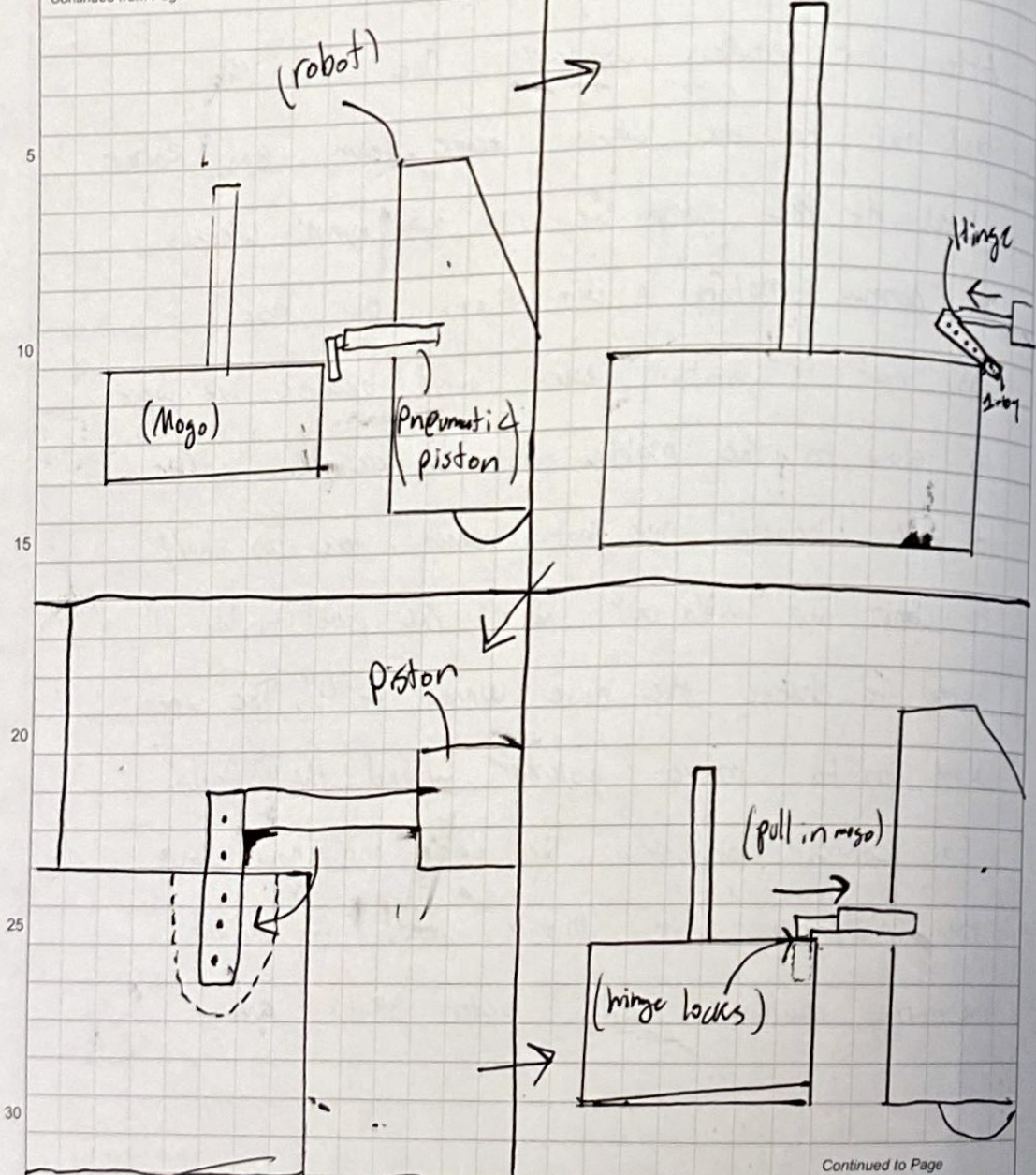
After our previous competition one change that stood out to the whole team was Robot Speed. At the comp we ran 3.5" omni wheels on normal motors. In eliminations our bot was beat in action every round because we were too slow to the mobile goals. We were also unable to park because our bot's wheels were too short to climb up with our hitting the plastic. We all agreed to change the base wheels to 4". The wheels allow us to move quicker around the field to contest objectives. We also can now climb the platforms with mobile goals for higher scoring matches and better skills runs.

Continued to Page 113

SIGNATURE <i>[Signature]</i>	DATE 2/9/22
DISCLOSED TO AND UNDERSTOOD BY <i>[Signature]</i>	DATE 2/9/22
PROPRIETARY INFORMATION	

TITLE Double Mogo Brainstorm PROJECT

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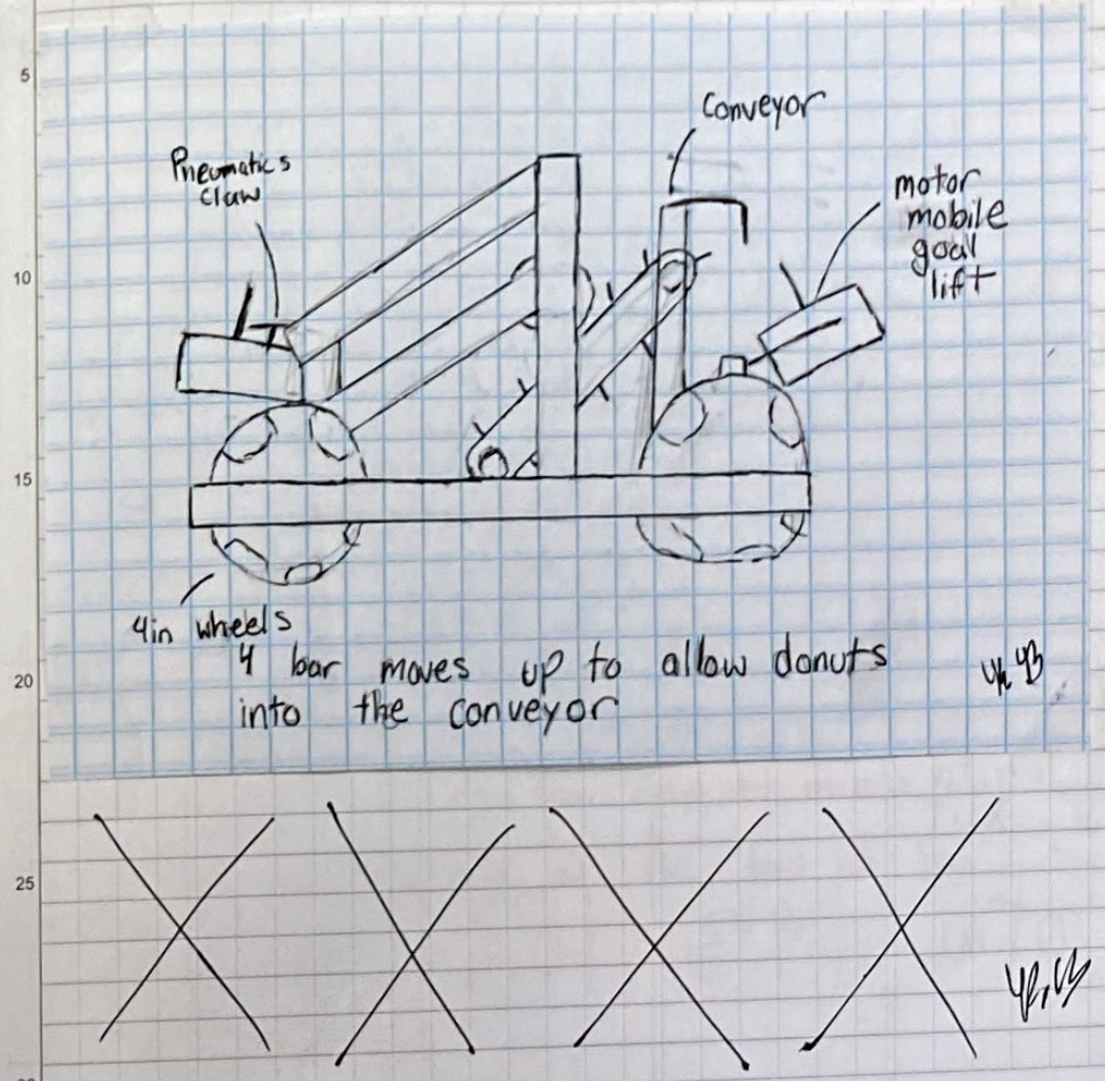
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DATE 2/9/2022

PROPRIETARY INFORMATION

TITLE refined robot design sketch PROJECT

Continued from Page



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DATE 2/9/22

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DATE 2/9/2022

PROPRIETARY INFORMATION

Continued from Page			
Idea → score ↓	4	3	5
Time to Build x1.5	4 6	3 1.5	5 7.5
Effectiveness x1.5	3 4.5	5 7.5	4 6
Complexity x1.1	4 4.4	3 3.3	4 4.4
Risk Factor x1.1	4 4.4	3 3.3	3 3.3
Total	19.3	18.6	21.2

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DATE 2/9/22

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DATE 2/9/22

PROPRIETARY INFORMATION

TITLE Intake improvements PROJECT

Continued from Page

For the intake we decided to switch up our design for the State Championship. For our new design we switched the front part of the intake from 2 rollers to one. This will allow us to intake donuts more consistently. We will also change our hood design. For this we plan on adding stand-offs to the hood and cut out the top part of the tray. This will provide a softer delivery from donut to mobile goal and prevent jamming at the top of the shooter.

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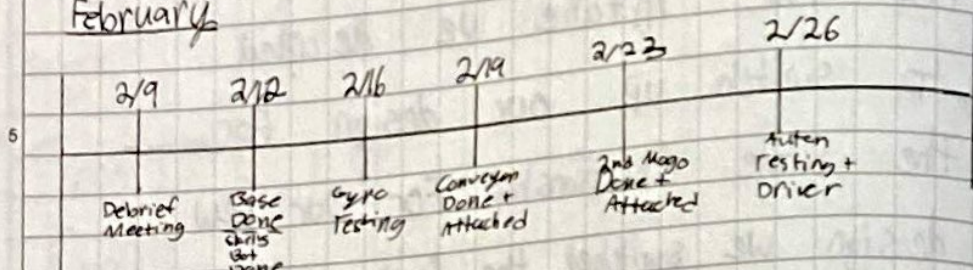
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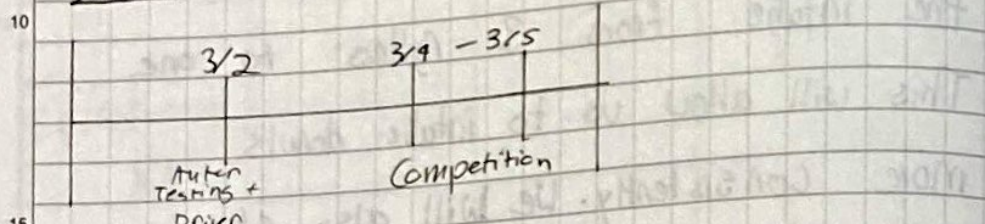
TITLE Timeline

Continued from Page

February



March



Here is our timeline for the next 3 weeks leading up to States in three weeks. Obviously, there will be some unexpected factors that will interfere, but we hope to stick to it as close as possible. While planning this out, we also realized how short our time frame is to get our robot to a competitive state. We will put full effort into these next couple weeks and work harder than ever to succeed.

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DATE 2/19/22

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DATE 2/9/22

PROPRIETARY INFORMATION

TITLE 2/9 Meeting

Continued from Page

Our first meeting after the comp's main discussion has already been covered in the debrief. That material took up most of the time, but we also began making changes. Getting the large wheels on the base is top priority, since working on other subsystems will be difficult until the base is nailed down. We hope to have that done before the Saturday meeting. The notebook also got its necessary pages on comp recap and timeline until state. We have plenty of matrices and sketches for the notebook crew as a result of our discussion today!

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DATE 2/9/22

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DATE 2/9/22

PROPRIETARY INFORMATION

Continued from Page

February

2/9 2/12 2/16 2/19 2/23 2/26

Debrief Meeting Base Done (skis not done) gyro testing Conveyor Done + Attached 2nd Mega Done + Attached Auten Testing + Driver

March

3/2 3/4 - 3/5

Auten Testing + Driver Competition

Here is our timeline for the next 3 weeks leading up to Statz in three weeks. Obviously, there will be some unexpected factors that will interfere, but we hope to stick to it as close as possible. While planning this out, we also realized how short our time frame is to get our robot to a competitive state. We will put full effort into these next couple weeks and work harder than ever to succeed.

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DATE 2/9/22

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DATE 2/9/22

PROPRIETARY INFORMATION

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That material took up most of the time, but we also began making changes. Getting the large wheels on the base is top priority, since working on other subsystems will be difficult until the base is nailed down. We hope to have that done before the Saturday meeting. The notebook also got its necessary pages on comp recap and timeline until state. We have plenty of matrices and sketches for the notebook crew as a result of our discussion today!

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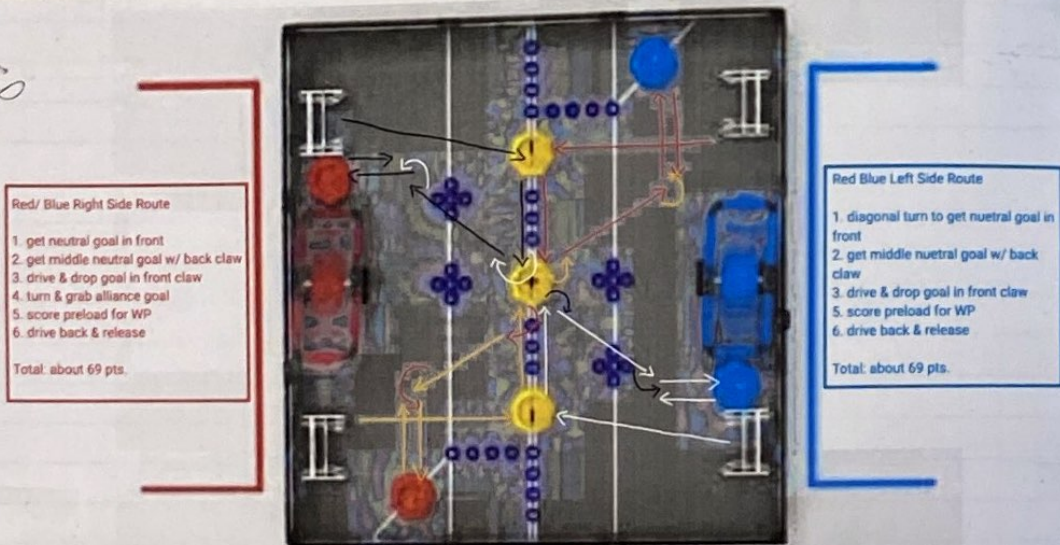
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DATE 2/9/22

PROPRIETARY INFORMATION

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At our latest competition, we realized that some of our code was not up to par. To counter this, Aarna and I have a lot of changes we plan on making. The main thing we are changing is the addition of the gyroscopic sensor to help our turns be more precise. The other thing we are doing is revamping our auton plan, as shown below. This will get a lot more points and hopefully an uncontested neutral goal.



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SIGNATURE
Aarna Veera

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2/12/22

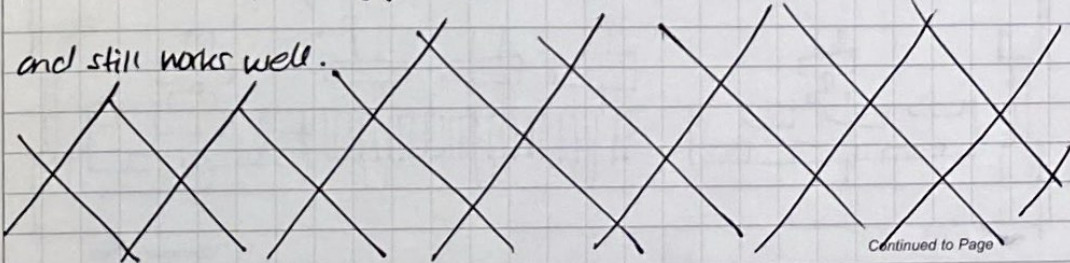
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PROPRIETARY INFORMATION

Continued from Page

Today, we did a lot of gyro research, as we want to add the gyroscope sensor to our robot, as it will help our autonomous route in more accurate turns. We don't want to have the accuracy of turns in auton blocking us from having our ≈ 69 point planned auton a success. After a bit of research, we were able to get our right gyroscope turn working, & we were able to make it almost flawless. However, we had some difficulty coding our gyroscope left turn for our robot. Our robot would infinitely spin to the left and never stop. In order to fix this, we made the degrees that the inertial sensor is facing a negative number. After making this change in the code, our gyroscope sensor & code worked well, and still works well.



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Aarna Veera

DATE
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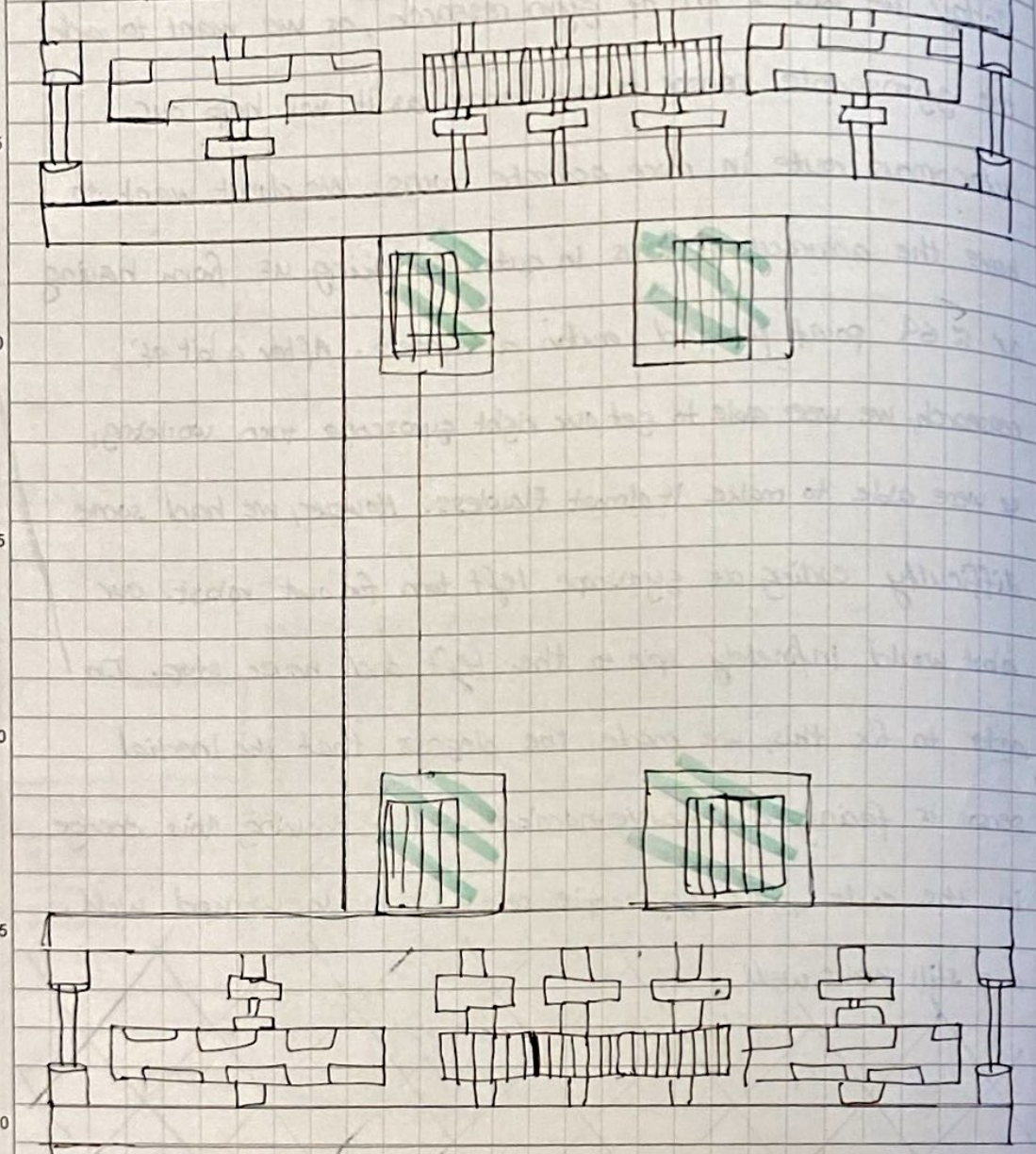
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PROPRIETARY INFORMATION

TITLE *New Base sketch*

PROJECT

Continued from Page 1



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DATE *2/12/22*

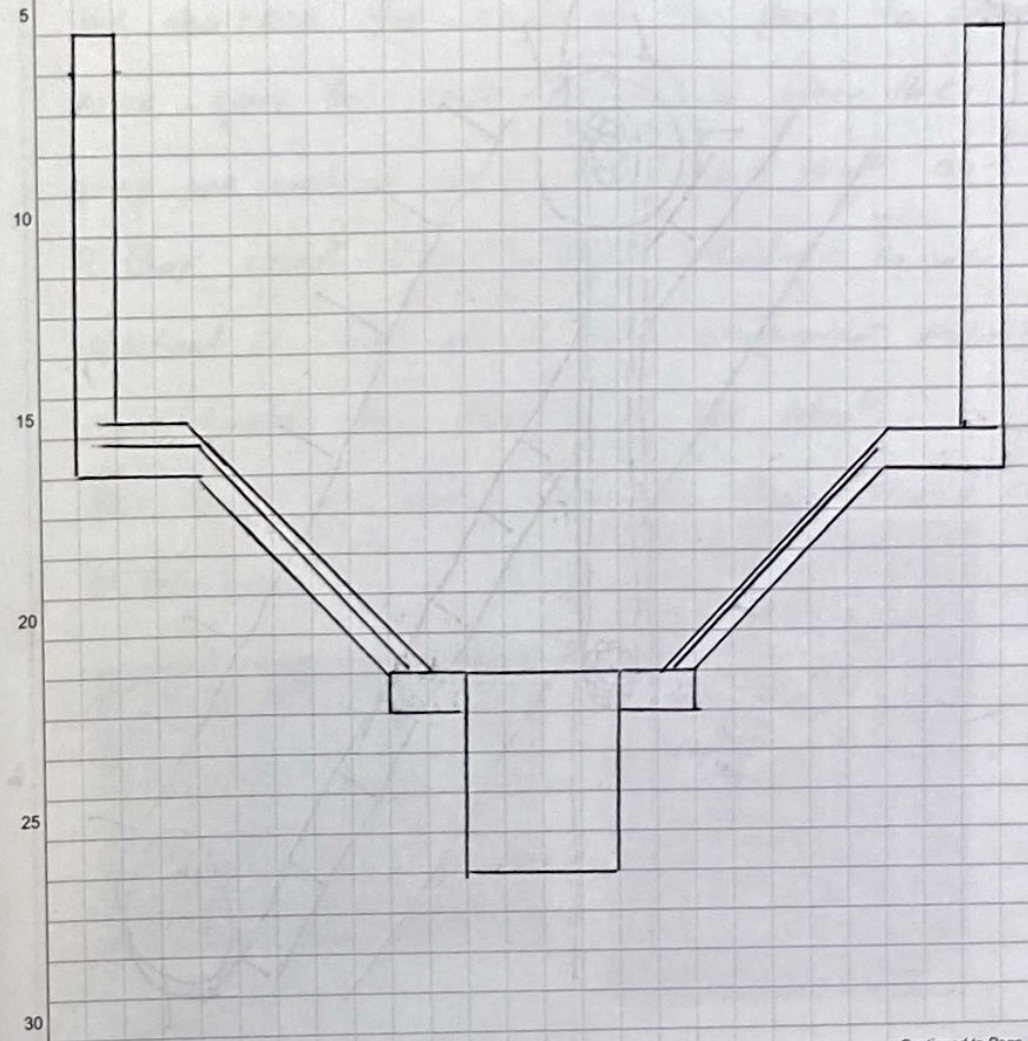
PROPRIETARY INFORMATION

TITLE

PROJECT *2nd mobile goal sketch*

Continued from Page 1

We built a second mobile goal lifter because we wanted to increase our points-scoring potential.



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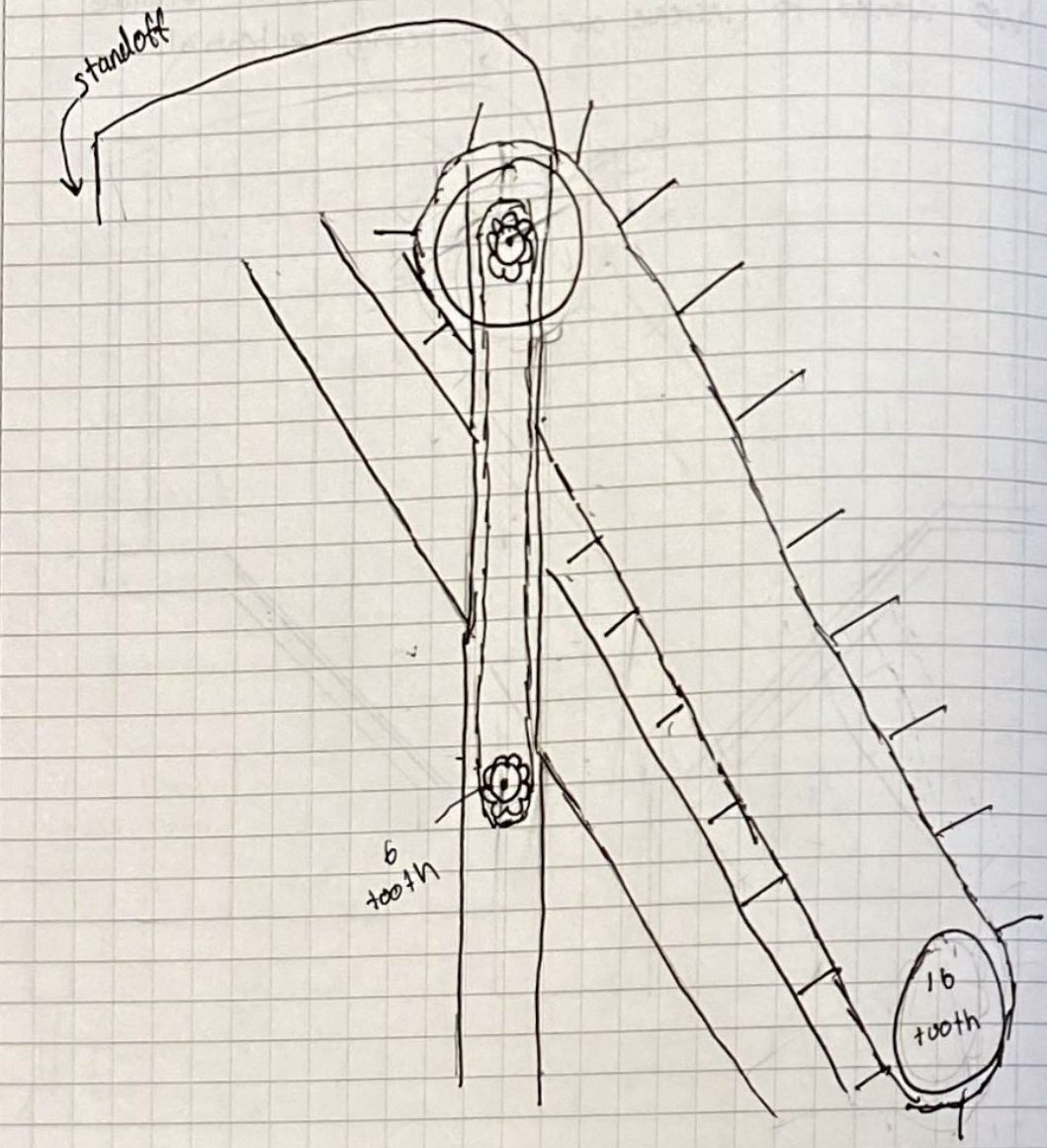
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PROPRIETARY INFORMATION

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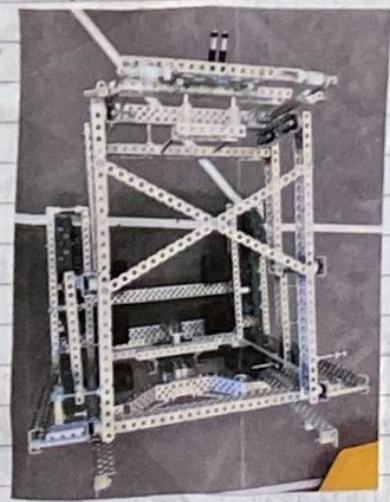
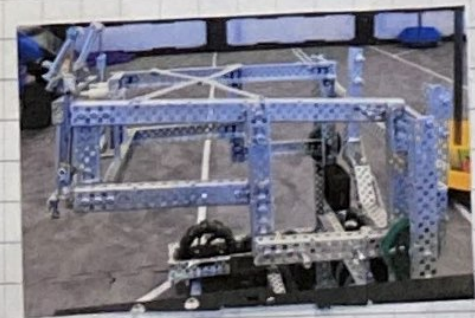
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Wilson Best
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Wilson Best

DATE
 2/12/22
 PROPRIETARY INFORMATION

DATE
 2/12/22

Continued from Page

We have finished updating our 4-Bar. We shortened the length of the bars to create more space for other components. After the comp we realised that the height that our 4-Bar could lift to was redundant so we shortened it and moved the attachment points more towards the middle of the robot. This leaves us more room to attach a second claw on the back.



Continued to Page

SIGNATURE
Edwin Beck
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Adama Veas

DATE
 2/12/22
 PROPRIETARY INFORMATION

DATE
 2/12/2022

Continued from Page

After deciding on the plan for modifications on our robot, our team began to split and do our delegated tasks. After separating the robot into more manageable chunks, we were able to make the adjustments required to the claw, 4-bar, and base to be prepared to reattach to the final robot. A second claw and tilter was created to allow the new design to hold two mobile goals which is vital to being competitive at a higher level. Concurrently, Cole used the skills robot in order to increase precision on gyro code and pre-plan the new auton to maximize the potential of the robot.

Continued to Page

SIGNATURE *[Signature]*

DATE 2/12/22

DISCLOSED TO AND UNDERSTOOD BY

DATE 2/12/22

PROPRIETARY INFORMATION

Continued from Page

Auton Right Side (R/B)

Auton Left Side (L/B)

Forwards:

*there are turns,

Forwards:

$(x-18)$

claws up/down, &

$(x-18)$

$D = 12.56$

lift up/down between

$D = 12.56$

$(66-18)$

the distances as well,

$(65-18)$

$D = 12.56$

they're just not

$D = 12.56$

$D \approx 3.82$

recorded on this page

$D \approx 3.74$

as we still need to add

them in our code

Backwards:

$(45-18)$

$D = 12.56$

Backwards:

$(45-18)$

$D = 12.56$

$D \approx 2.15$

$D \approx 2.15$

Forwards:

*we derived the

Backwards:

$(44-18)$

formula by finding the

$(63-18)$

$D = 12.56$

amount of inches we need

$D = 12.56$

$(32-18)$

$D = 12.56$

$D \approx 2.07$

to go forward. Then we

$D \approx 3.58$

$D \approx 1.19$

subtracted that distance

by 18 inches, which is the

Forwards:

length of our robot. Finally,

Forwards:

$(50-18)$

we divide that by 12.56,

$(69-18)$

$D = 12.56$

which is the circumference

$D = 12.56$

of the wheels on our

$D \approx 2.55$

robot. Therefore, we got

$D \approx 4.06$

the formula: $(x-18)$

$D = 12.56$

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DATE 2/16/2022

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DATE 2/16/22

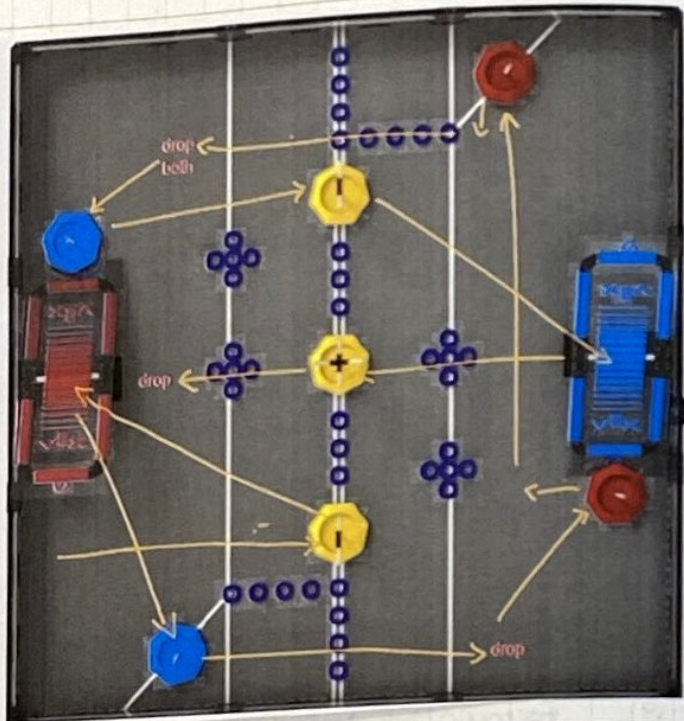
PROPRIETARY INFORMATION

Continued from Page

Autonomous Skills Route

1. grab the neutral goal in front and place it on the platform
2. grab the blue mobile goal and push it into the blue zone
3. grab the red mobile goal holding down the blue platform
4. grab the other red mobile goal in the filter claw
5. run through 5 donuts & unload the preload of 3 donuts to score in that red mobile goal
6. drop both red mobile goals in the red zone
7. grab the other blue mobile goal
8. drive forward and drive forward to grab the other medium height neutral goal
9. put that neutral goal the robot just picked up on the blue platform
10. push the middle tallest neutral goal onto the red side

Total points: about 204



Some of the distance calculations

* we derived the same formula $D = \frac{(x-18)}{12.56}$ as the other auton*

Forwards:	Backwards:	Forwards:	Backwards:
$\frac{(66-18)}{12.56}$	$\frac{(24-18)}{12.56}$	$\frac{(108-18)}{12.56}$	$\frac{(84-18)}{12.56}$
$D \approx 3.82$	$D \approx 0.48$	$D \approx 7.17$	$D \approx 5.25$

Continued to Page

SIGNATURE *Alexia Vecera*

DATE 2/16/2022

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DATE 2/16/22

PROPRIETARY INFORMATION

Continued from Page

Most subsystems are on the bot excepting the pneumatic claw and donut conveyor.

The right side base auton code is complete. Plenty of work was put into calculations for it. Spec has also been checked on the robot. One side needs minor adjustments, but those will be done soon. Planning for the states poster has been started and work divided up.

It seems like we're almost done with preparation, but no doubt subsystems will need to be changed as assembly is finalized. Pictures follow of the mechanical work completed today.

Continued to Page 130

SIGNATURE *J. Sprague*

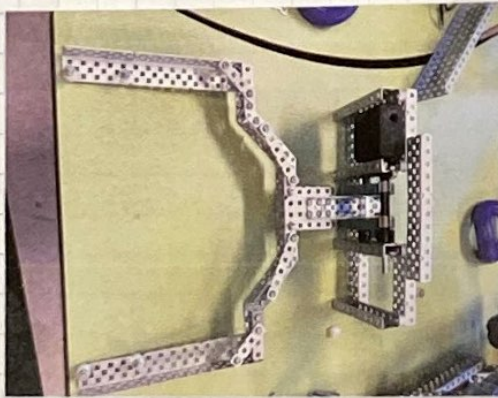
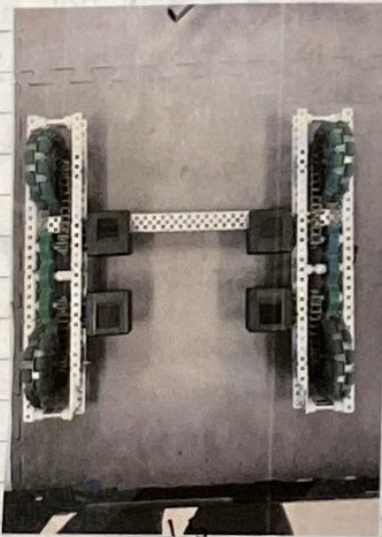
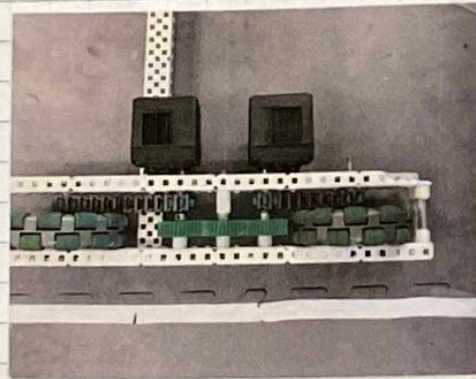
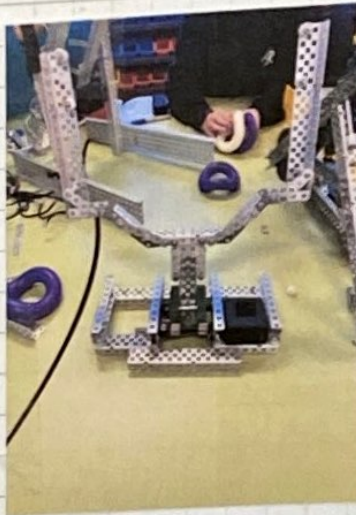
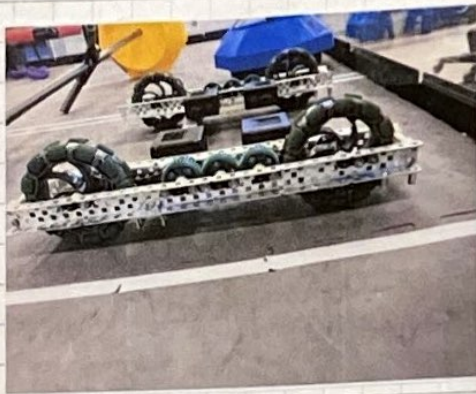
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DATE 2/16/22

PROPRIETARY INFORMATION

Continued from Page 129



Continued to Page

SIGNATURE *T. Spagy* DATE 2/16/22
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Continued from Page

Part Name	Unit Cost	Quantity	Total Cost
Vex Cortex	\$274.99	1	\$274.99
Vex Motors	\$39.99	8	\$319.92
3.25 In. Omni Wheels	\$17.99	4	\$71.96
#25 Standard Rolller Chain (10')	\$11.99	1	\$11.99
High Strength Sprockets	\$43.99	1	\$43.99
Gear Set	\$14.49	1	\$14.49
#8-32 Keps Nuts	\$3.29	50	\$164.50
#8-32 Nylock Nuts	\$4.39	50	\$219.50
1x2x1x25 C-Channels (6 pack)	\$32.99	1	\$32.99
1x2x1x35 C-Channels (6 pack)	\$39.99	2	\$79.98
1x2x1x25 L-Channels (4-pack)	\$16.99	2	\$33.98
V5 Robot Radio	\$43.99	1	\$43.99
Angle Corner Gusset (4-pack)	\$21.99	1	\$21.99
2" and 3" Drive Shafts Pack	\$5.99	1	\$5.99
12" Drive Shaft Pack	\$9.99	1	\$9.99
Spacers and Washers	\$3.29	50	\$164.50
Bearings/Pillow Blocks	\$5.49	20	\$109.80
Standoff Pack	\$17.49	1	\$17.49
Vex Cables(8 pack)	\$14.99	1	\$14.99
Vex Battery	\$54.99	2	\$109.98
High Strength Sprockets	\$14.99	1	\$14.99
0.50" OD Nylon Spacer Variety Pack	\$5.49	2	\$10.98
Pneumatics Tubing (5')	\$5.49	1	\$5.49
Solenoid Driver Cable (2-pack)	\$32.99	1	\$32.99
Pneumatics Kit 2 - Double Acting Cylinders	\$249.99	1	\$249.99
Overall Total			\$2,081.45

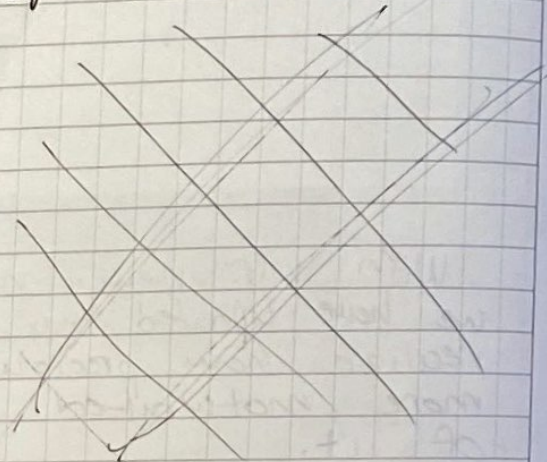
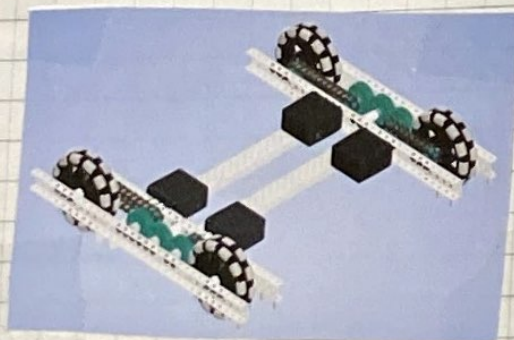
With our new improvements to our robot, we have updated our cost sheet. We once again realize how precious our robot is and are more motivated than ever to take care of it.

Continued to Page

SIGNATURE *dm Min* DATE 2/19/22
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Continued from Page

As of today, we have completed the CAD for the base. There were several technical issues we ran into which makes the base online. First, due to a miss in bit map file, the gearbot couldn't be mirrored to the other side. Secondly, due to technical constraints within the software, we could not fully attach the spacers flush to the second c-channel. Now that the main challenging part of the CAD is over, progress should continue smoothly.



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DATE 2/19/22

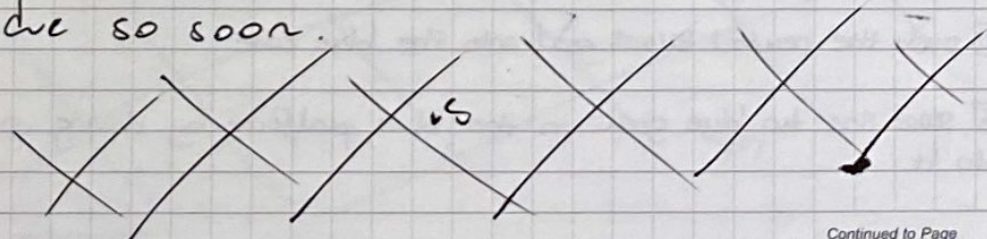
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DATE 2/19/22

PROPRIETARY INFORMATION

Continued from Page

The robot is all but complete! The last things to do are bring in the claws to comply with spec and attach the conveyor. It's a large subsystem, but we can slot it onto the base between the claw apparatuses. With the skills bot we are working on driver skills plans and the skills auton. We'll need to refine it once we can test with the main bot with intake fully functional. We're prioritizing the notebook while keeping a steady pace on mechanical since the notebook is due so soon.



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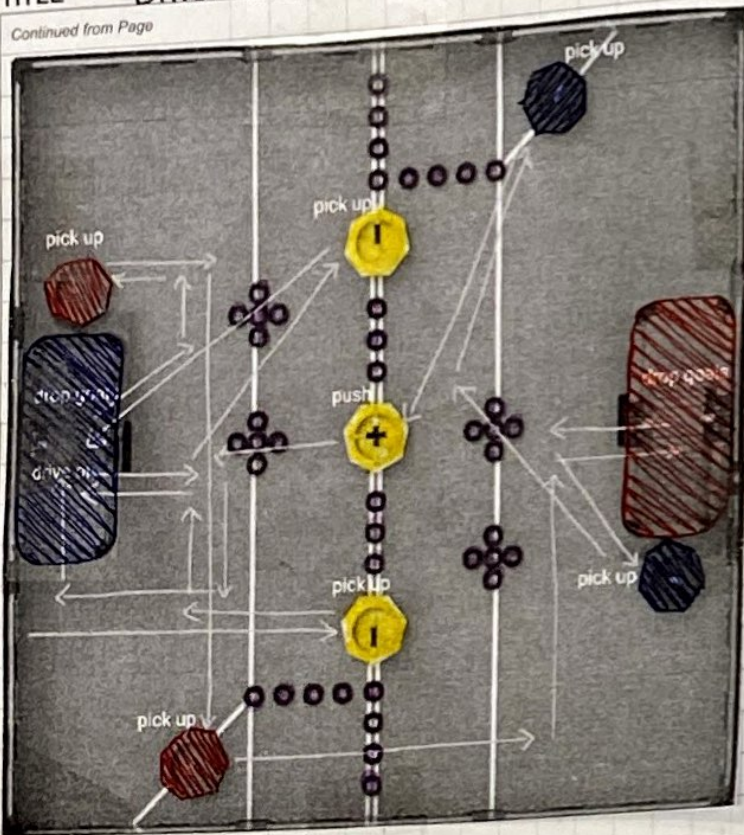
DATE 2/19/22

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DATE 2/19/22

PROPRIETARY INFORMATION

Continued from Page



- ① grab neutral goal in front of robot starting position
- ② place on platform & put the other medium height neutral goal on the platform as well
- ③ pick up both red mobile goals & place it on the red platform

- ④ pick up both blue goals & drive through the donuts to pick them up & score them on one mobile goal
- ⑤ push the neutral tallest goal onto the blue zone
- ⑥ score the two blue goals on the blue platform by driving up onto it

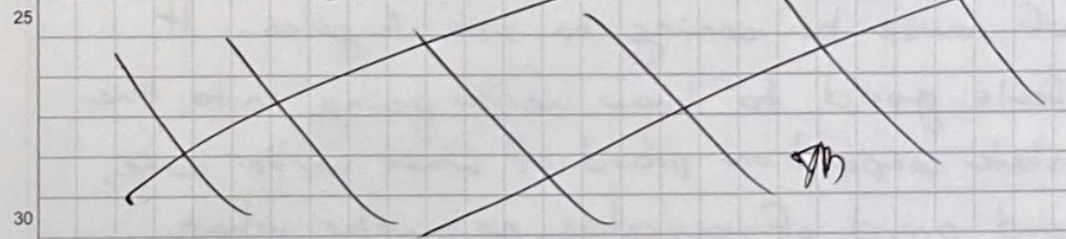
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SIGNATURE *Alexis Vega* DATE 2/23/2022

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Continued from Page

Today, we focused on finishing and attaching the conveyor to the robot. While going to attach it, we realized that our spacing was wrong. It was a bit too wide, and it couldn't properly fit. To fix this, we took apart the spacing and replaced it. This also meant that we had to shave our polycarb to properly fix. Once we reconstructed it, we attached it back, we tested it and it worked successfully! Now our robot is completed and we can focus on testing.



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SIGNATURE *[Signature]* DATE 2/23/22

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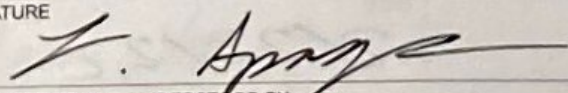
This is a pre-comp report, albeit a week out since this notebook will be scanned in complete by tomorrow. The robot is ready to roll.

We feel confident, as we were happy with it a month ago and have only improved it with ever better late-season ideas.

Drivers and autonomous alicia are well-practiced. We still have time to get them even further prepared. The interview, poster, and similar are looking good to be polished in the coming days. The notebook will be updated slightly and of course be coming to Los Angeles. It feels good to know we're going into the state competition proud of what we've done, and proud of ourselves, no matter what.

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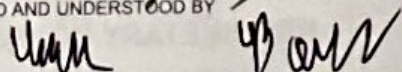
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2/23/22

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