

ENIGMA

16265

"Enigma Green Everywhere"



We are a proud community team.

Located at the Monzano Teen tech center in Albuquerque, NM



TABLE OF CONTENTS

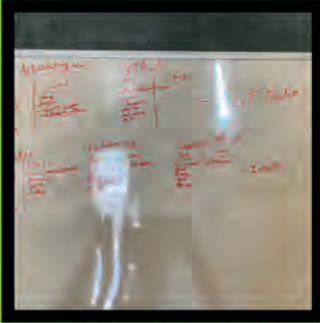
THINK AWARD	3-5
• Examples of engineering content (includes entries describing underlying science, mathematics, and game strategies) • Engineering design process, with images, pictures or drawings and details documenting all stages of robot design • Examples of the team's journey, experience and lessons learned throughout the season in team bios	
CONNECT AWARD	6-8
• Team plan: goals for the development of team member skills, and the steps the team has taken or will take to reach those goals. • How the team acquired new mentors or acquired new knowledge and expertise from a mentor. • Team actively engages with the engineering community to help them understand FIRST, the FIRST Tech Challenge, and the team itself	
INNOVATE AWARD	9-10
• Examples of engineering content that document the design process and how the team arrived at their design solution • Robot or robot sub-assembly must be elegant and unique in its design • Creative component must be stable, robust, and work reliably • Robot design is effective and consistent with team plan and strategy	
CONTROL AWARD	11-12
• Control Components must enhance the functionality of the robot on the field • Advanced software techniques and algorithms are encouraged • Control Components should work reliably	
MOTIVATE AWARD	13-15
• Team plan that identifies their future goals and the steps they will take to reach those goals.....6 • The plan could include fundraising goals, sustainability goals, timelines, outreach, and community service goals • The team is an ambassador for FIRST programs • Team can clearly demonstrate the successful recruitment of new teams, mentors, coaches, and volunteers who are not otherwise active within the STEM community • Team can explain the individual contributions of each team member, and how these connect to the overall success of the team • All team members participate in their presentation, and actively engage with the judges • Team can show a creative approach to materials that market the team and FIRST	
DESIGN AWARD	16
• Examples of engineering content that include detailed robot design drawings • Robot differentiates itself from others by its aesthetic and functional design • Basis for the design is well considered (i.e., inspiration, function, etc.)	

OUR PORTFOLIO WAS CREATED WITH THESE GUIDELINES

- Game Manual Part 1 pg 51 suggested connecting the award criteria to the portfolio
- Game Manual Part 1 pg 55 gave a link to the Judge and Judge Advisor Manuals for insight
- Judge Manual pg 40-42 Appendix C: Judge Summary Sheet



THINK AWARD



WHITE BOARD

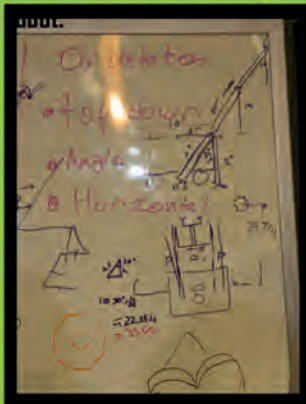


PROTOTYPE



FINAL DESIGN

At the beginning of our design processes we drafted up ideas of our possible outtake and then considered the pros and cons, next we voted for our new prototype. At one of our first meetings we created a pro and con list of all the different in and out takes that our members had been talking/thinking about. At the end of that meeting we decided that we were going to try a Virtual Four Bar for our outtake and sweepers/rollers for our intake. At the next meeting one of our members brought a cardboard mockup of the robot we were thinking about making. Slowly through prototyping and testing as we built we ended up with our competition



CONCEPT WHITE BOARD



MATH TECH INFO



CAD

Matt and Callahan studied the SAR330 slide and designed the CAD layout. To explain the image, the 16" robot base is sitting close to the backdrop. The base length of the SAR330 is 300 mm (11.8") and it has a stroke of 345 mm (13.6") and is angled at 30 degrees, equal to the backdrop. The rotating arm is proportional to the other dimensions. In conclusion, although the total height of the configuration exceeds 29.75" (the highest row of pixels). When making contact with the backdrop we reach just over the second line. Currently we can reach the bottom of the third row consistently



Jett



Lesson Learned This Season

We have to focus on what's important and not get distracted by the little things

Personal Goal

To get better at Java Code and Development

Motivate Award Contribution

Went to Albuquerque Computer and Electronics Recycling Co. and talked to the CEO, Sandia Labs outreach



THINK AWARD

ITERATIONS



We tested a conveyor vs ramp for data and analytics, could potentially be a little back heavy, make a guide on the conveyor so that the pixels have 0 risk of hitting the linkages, and extend the pixel sleeve so that it has a smooth funnel so that there is more room for error when the pixels are being transferred.



Moved the crossbeam to the back, shortened the top arms to be able to pass through the back, reconfigured removing the conveyor ramp for a single conveyor to popup the pixel into the sleeve, added guide rails, moved the intake drive motors to side drive, added a passive hanging system, we just need something to release them and then drive up on the cross beam with a short running start the friction should stop the swinging pretty fast.



We get the height we need with the only the first two parts of the arm

Gray

Lesson Learned This Season

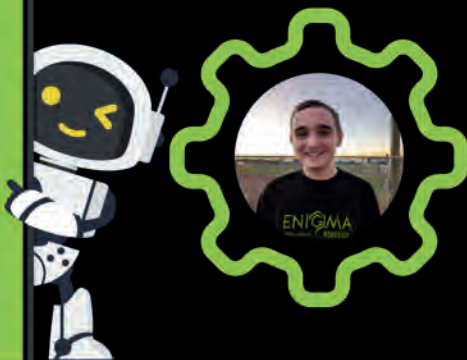
We need to start fundraising early

Personal Goal

Set up the team for future success

Motivate Award Contribution

FLL Class-22 hours, Camp-9 hours, American Heritage Girls-2, LADE STEM fair



THINK AWARD



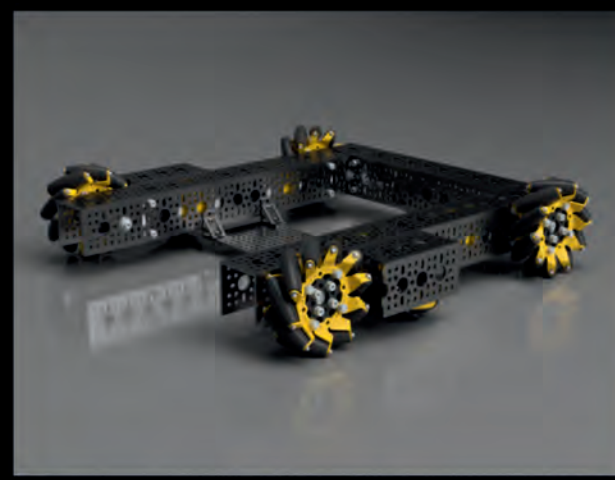
CAD-INTAKE



CAD-AIRPLANE LAUNCHER

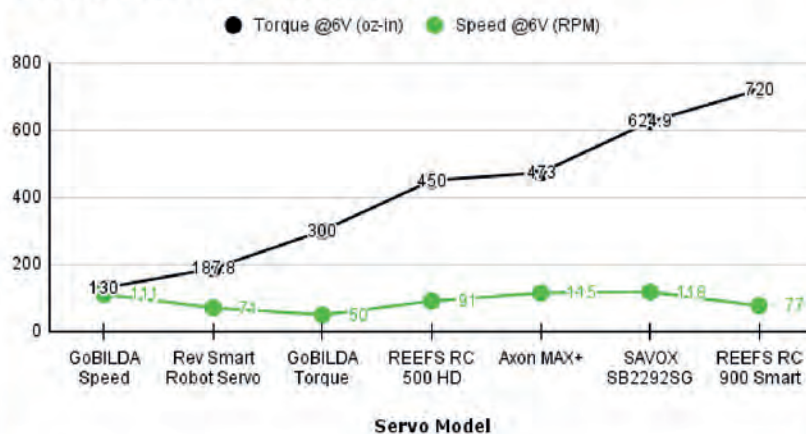


CAD-OUT TAKE



CAD-CHASSIS

Servo Performance Chart



We compared servo motors from several companies. This way we know what kind to purchase for the result we want. (Not all servos are the same!!)



CONNECT & MOTIVATE AWARDS

TEAM PLAN

FUNDRAISING GOALS

- Applying for Grants
- T-shirt sales
- Cold Calls
- Robot Demos
- Robot Camps for FLL
- Robot Camps for Battle Bots

FUTURE GOALS

Growing FIRST in NM

- help fund more teams
 - write grants
- Open shared space for teams without fields
- Hosting FLL Qualifiers
 - 2023 first qualifier in ABQ

COMMUNITY SERVICE

- Ongoing FLL class in Rio Rancho, NM (5 years)
- 4-22-23 Super STEM Saturday (1 year)
- 4-10-23 Robotics Demonstration - American Heritage Girls
- 5-6-23 Homeschool Fair (1 year)
- 5-18-23 FTC/FLL demo at Desert Ridge Elem.
- 6- 7,8-23 Artrageous Camp Battle Bots
- 4-27-23 Sandia Labs
- 12-2-23 ENIGMA host FLL qualifier

OUTREACH GOALS

- Mentored 6 FLL Teams
- Artrageous Camp-Battle Bots
- Summer Camp- FLL
- Hosted FTC Live Stream on Twitch for all NM qualifiers and championship for past 3 seasons

SUSTAINABILITY GOALS

- Host camps and Qualifiers for FLL/FTC to recruitment
- FRC team option to move into
- Alumni come back as mentors

DEVELOPING SKILLS

- First Year-Shadow a third-year team member to learn about the various roles in FTC.
- Second Year-Specialize in a role that interests you, while shadowing a teammate who is now in their fourth year.
- Third Year-Mentor a first-year team member, delve deeper into your chosen role, or consider switching roles.
- Fourth Year- Mentor your now second-year teammate, take on leadership responsibilities, and - master your chosen role.



Callahan



Lesson Learned This Season

We have to be adaptable because there's always going to be something that changes

Personal Goal

For our team to be more organized and productive

Motivate Award Contribution

Sandia Labs-5, Desert Ridge Teams-every Monday, Desert Ridge showcase-3, Church-2, Super STEM Saturday-5
I've spent 10 hours total within the span of five classes teaching robotics and STEM to young kids.



CONNECT AWARD STEM COMMUNITY OUTREACH

ONGOING-LEGO CLASS- RIO RANCHO

- Enigma has been coaching this class for 5 years
- Current team members have been coaching for 3 years
- 10-15 kids per session, several returning kids each year



2023-2024 SEASON MENTORING 4 NEW FLL TEAMS

- Desert Ridge Elementary started 4 brand new teams after our demo.
- Enigma team members attend weekly meeting of all 4 teams



4-22-23 ENIGMA PARTICIPATED IN SUPER STEM SATURDAY

- Recruited mentor Noah from NMT and FIRST alumni
- Showcase our robot to 500 people



APRIL 27, 23 ENIGMA TOURED SANDIA NATIONAL LABS (KIDS TOUR DAY)

- Special tour of Robotics Lab exclusive to our team
- The team was able to Drive Boston Dynamics Dog Robot
- Created Engineering Connections



JUNE 7-8, 2023 ENIGMA PARTNERED WITH OTHER FTC GROUPS AND NON PROFITS TO PUT ON THIS CAMP

- Partnered with the famous traveling ARTRAGEDUS SHOW and PNM to bring robots into an art camp. Teaching design and durability in a Battle Bots Camp!
- Several members and mentors attended.
- 20 kids reached-8 teams formed



SEPTEMBER 9, 2023 PROJECT Y- FLL INFORMATIONAL DAY

- FRC team Project Y in Los Alamos held an information day about FLL
- Team Members and Mentors spoke in person and on live stream
- Answered questions about FLL and the journey to FTC then on to FRC
- Training to be posted on YouTube where they have 69 subscribers



DECEMBER 2, 2023 ENIGMA HOSTS FLL QUALIFIER

- NM FLL Operational Partners and 6 FLL Teams Requested Help
- Would Not Travel
- Would Not Compete
- 5 years without ABQ Qualifier
- ~80 kids-8 teams!



CONNECT OUTREACH

STEM ENGINEERING COMMUNITY

ALUMI MENTORS- MADELENE, ISABELLE, FELIX, IXCHEL

- Madelene, Isabelle and Felix started Enigma in 2019
- Ixchel has been a part of FIRST since 2010



GWEN VALENTINO

- Gained-New Mentor for Business Team-taught us about the portfolio and presentation
- Volunteer for FIRST 15 years
- Coached FLL jr, FLL, FTC



Samuel Laing, VP & General Manager

- Went to Albuquerque Computer and Electronics Recycling Co.
- Looked inside computers and how to recycle them
- Society of Cable Telecommunication Engineers (S.C.T.E), National Cable Television Institute (N.C.T.I), Broadband Cable Telecommunication Engineers (B.C.T.E), Basic Electronics (B.E), and Satellite Broadcasting & Communications Association (S.B.C.A).



Jen, Ivan, Spencer

- Sun Country Industries, LLC
- Gave a presentation about FIRST and FTC
- Toured facility and are working on a partnership in the future
- They want to mentor us and help us manufacture robot parts



Kinsley



Lesson Learned This Season

Put yourself out there, and never doubt your abilities! If you don't broaden your horizon, you'll never know what you like. :)

Personal Goal

I strive to step outside of my comfort zone with new opportunities and taking on responsibilities to help out the team

Motivate Award Contribution

FLL Class-22 hours, Camp-9 hours, American Heritage Girls-2, LADE STEM fair



ROCKWELL COLLINS INNOVATE AWARD



Sketch



Prototype



CAD



Implement

Our hanging mechanism is unique because it allows us to hang while remaining under 12 inches. We were able to do this by having a lead screw mechanism, which as it goes up, pulls a spring forcing the hook to reach the upright position



This design is a creative component that is stable, robust, and work reliably ALL of the time



Luke



Lesson Learned This Season

I learned how to understand the design and build process

Personal Goal

Learn more about the build process and CAD

Motivate Award Contribution

Attended outreach events (Stem Saturday, Desert Ridge, LADE), Sandia Labs outreach



ROCKWELL COLLINS INNOVATE AWARD

STRATEGY

Our Team plan and strategy is to stay under 12in, be able to complete all scoring tasks, and be able to cycle pixels effectively.



By Intaking against the wall we are able to save on time.



Allow us to extend to reach the height necessary for hanging in end game hanger is sturdy



Airplane launcher in scoring zones allows us to consistently score in the primary zone.

Our main goal is to be to stack to the third line. We prioritize stacking pixels over mosaics and maximizing points in end game



We can complete all end games tasks consistently

Iriana

Lesson Learned This Season

It is vital to delegate tasks, i need to rely on my team and mentors to achieve our goals.

Personal Goal

Inspire my team to make a impact at our competitions and enjoy my final year in FIRST.

Motivate Award Contribution

I have talked to earth native wilderness school about my experience in FIRST, Project Y live broadcast to inspire others to join FIRST, Sandia Labs tour, BattleBot Camp with Artrageous, FLL Camp for Enigma,



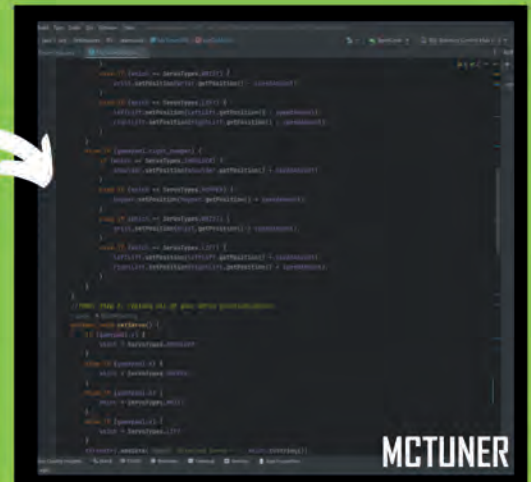
CONTROL AWARD

CODE SAMPLES



Elliott was showing Dimitri how to code in Java. Creating a function to detect button pushes on the controller

Mc Tuner was created by Elliott to tune the different positions of the servos to drive or intake position and everything in between making it easier for the drive team to communicate micro adjustments to the code.



Gobilda Odometry Pod- Allows us to track our movement in autonomous and allows for a more consistent auto



REV Magnetic Limit Switch - Detects when our hanging mechanism has reached it's highest and lowest point, and prevents the motor from running any further



Elliott



Lesson Learned This Season

I refined my usage of Java, and learned how to effectively use Android Studio

Personal Goal

My Goal was to be more engaged with the team and take a larger responsibility in the programming of the robot

Motivate Award Contribution

Sandia Labs outreach



CONTROL AWARD



CHECK BACK AT THE ALBUQUERQUE
COMPETITION FOR UPDATES :)



Gabriel



Lesson Learned This Season

I learned a lot more about coding in Java.

Personal Goal

Continue learning more about coding in Java

Motivate Award Contribution

I came to the team from one of the camps
Enigma hosted!



MOTIVATE AWARD



Buttons

GIVE AWAYS!!!



**Stickers and Temp
Tattoos**



**Tape Measurers &
Tool Set**



We give away bookmarks, stickers, business cards, and buttons with our/FIRST's logos on them to help promote ourselves and the first community. We also use Instagram, facebook, twitter and tiktok to help get ourselves out to people outside of our direct area. Along with many outreach events.

Dimitri



Lesson Learned This Season

I learned the importance of showing initiative, which allowed me to take a larger role in the team

Personal Goal

To take a leading role and be on the drive team.

Motivate Award Contribution

Sent Emails, Set up meeting with Sun Country Industries LLC., Sandia Labs outreach



MOTIVATE OUTREACH

NON STEM COMMUNITIY

4-10-23 CALVARY RID RANCHO

- We helped an American Heritage Girls learn their robotics badge
- Helped their mentor understand STEM better



5-12-23 AFRL OUTREACH

- Outreach to the non STEM community on base for middle school age kids



5-18-23 ENIGMA GAVE FTC/FLL DEMO AT DESERT RIDGE MIDDLE SCHOOL

- 4 Teams formed that were not involved with FIRST or other STEM programs
- Enigma mentors these teams weekly



5-5-23 SPRING MAKER FIESTA

- Several FTC teams came together to showcase FIRST and robotics
- Recruiting event for mentors and teammates



7-12, 13, 14, 2023 FLL CAMP/BATTLE BOTS

- Enigma introduced 10 kids to FIRST FLL
- Referred interested kids to FLL teams and got new members for our team



DECEMBER 2, 2023 ENIGMA HOSTS FLL QUALIFIER

- Many volunteers recruited that were not exposed to STEM before!



OUR ROBOT APPEARS ON AMERICAN NINJA WARRIOR

- Ixchel Valentino, a FIRST alumni, & Varoomba will be on Season 16 of American Ninja Warrior. They will be on episode 3 on NBC which averages 2.86 million viewers per episode.



CONNECT & MOTIVATE AWARD

RUSS MCCABE

COACHES

DAN CONWAY

ORGANIZATION CHART

PROGRAMMING

AUTONOMOUS

ELLIOT JET

TELE-OP

JET DIMITRI

SENSORS

ELLIOT JET

CO-CAPTAINS

SAFETY

KINSLEY

DESIGN

GRAY

BUSINESS

IRIANA

MENTORS

PROGRAMMING

DAVE

MECHANICAL/MATH

MATT

BUSINESS

GWEN

ELECTRIC

RENZO

BUILDING

CAD MODELING

GRAY LUKE

CHASSIS

LUKE MONTE

INTAKE

MONTE LUKE

OUTTAKE

MONTE GRAY

ARM

GRAY LUKE

EVENTS

PRESENTATION

FULL TEAM

PHOTOGRAPHY

KINSLEY DIMITRI

DRIVE TEAM**STRATEGY TEAM**

IRIANA DIMITRI

SCOUTING TEAM

LUKE DIMITRI

OPERATIONS

PORTFOLIO

KINSLEY IRIANA CALLAHAN

OUTREACH

FULL TEAM

MENTORING

GRAY KINSLEY CALLAHAN

SOCIAL MEDIA

KINSLEY

MARKETING

KINSLEY IRIANA CALLAHAN

2023-2024 ENIGMA FTC TIMELINE

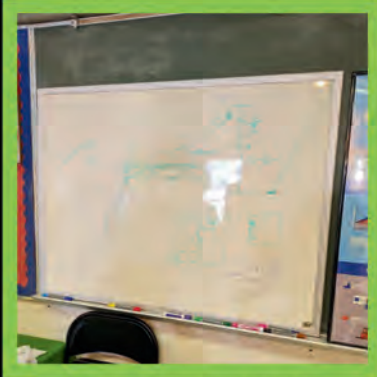
9-9-23

FTC
KICKOFF

9-23-23

BUILD
FIELDCAD
DESIGNPROGRAM
ROBOTPROFESSIONAL
ENGINEER
REVIEWREVISE
AND
TEST
ROBOT12-16-23
FTC
QUALIFIER1-20-23
FTC
CHAMPIONSHIP9-16-23
BRAINSTORM9-30-23
DESIGN
FINALBUILD
CHASSIS
& ROBOT12--18-23
FTC
QUALIFIERHOST
12-2-23
FLL
QUALIFIERREVISE
AND
TEST
ROBOT

DESIGN AWARD

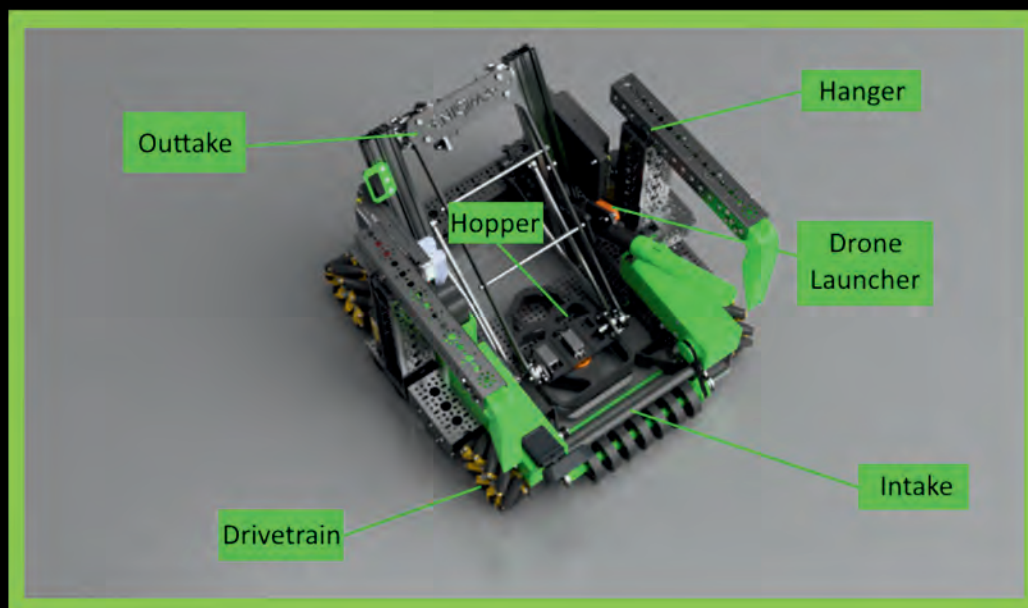


INITIAL CONCEPT

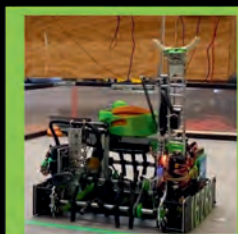
Our Robot demonstrates industrial design principles by using materials efficiently, standing out from the competition and looking good while doing it.



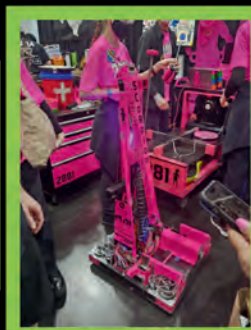
EFFICIENT -> 12"



INITIAL TINKERCAD DESIGN



Huubrester 2020-2021



DarthFreighter 2021-2022



FINAL CAD DESIGN- FUSION 360

Inspirations for Our Design:

Our Hanger mechanism is inspired by the lead screw mechanism we saw FRC 2881 The Lady Cans use. Our Intake design is inspired by past robotics, especially our Freight Frenzy robot.

