KAP:TEAM OVERVIEW

We are team KAP #27674 from Almaty, Kazakhstan, competing in the FTC season **DECODE 2025-2026**. Our team consists of 12 passionate members with diverse interests, united by a shared goal: to grow the global STEM and robotics community. The team was formed in 2025 due to the fact that some members of the **PID** (FTC 2024-2025) and **KIROSHI** (FTC 2024-2025) teams joined together. Building on our past experiences, we strive to innovate! dffd

PAST EXPERIENCE

PID *24670

The team that became CA Kazakhstan champions was formed in 2023. After reaching the finals and receiving the Motivate Award in Houston, the team disformed, and three of its members joined KAP.

INSPIRE

KIROSHI *27674

The record-holding Central Asia Kazakhstan team was formed in 2024. They showed strong results at the Michigan Premier Event, disformed after and played key role in the creation of KAP.

ROBOGAME

TEAM GOALS

ENGINEERING	PROGRAMMING	INSPIRE
Goal: Design and build a durable, high-performance robot capable of completing all game tasks. **Strategy:**Use rapid prototyping improve each subsystem through multiple iterations.	**Goal:** Develop stable control systems, including autonomous and driver-controlled modes. **Strategy:** Write modular, optimized code with sensor integration and regular debugging	**Goal:** Spread awareness of STEM and FIRST values within and beyond our school community. **Strategy:** Lead outreach projects, workshops, and partnerships

RAMAZAN-CAPTAIN

Goal: Road to Houston! Build an effective and functional robot

Contribution: Structures and controls team work

RADMIR-BUILDER

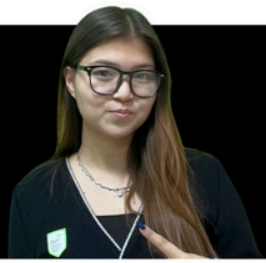
Goal: Improve structural integrity using lighter, more durable materials

Contribution: Creates and tests prototype mechanisms

DAVID-CODER

Goal: Develop and deploy real-time telemetry to FTC Dashboard

Contribution: Optimizes algorithms for speed and accuracy



AIS-INSPIRE

Goal: Develop interactive materials for judging and outreach

Contribution: Prepares documents for judge evaluation

DIANKA-INSPIRE

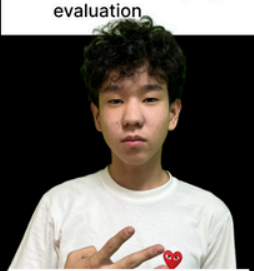
Goal: Collaborate with NGOs to run a tech-for-good initiative

Contribution: Organizes team events and presentations

ARMAN-BUILDER

Goal: Reduce mechanical failures by 50% through better testing

Contribution: Creates and tests prototype mechanisms



YERNAR-BUILDER

Goal: Analyze top teams' gameplay to optimize our tactics

Contribution: Manages the robot's cable management

RAVIL-BUILDER

Goal: Reduce mechanical failures by 50% through better testing

Contribution: Creates and tests prototype mechanisms

VITALYA-CAD

Goal: Improve structural integrity using lighter, more durable materials

Contribution: Develops mechanical parts of the robot in CAD

ANSAR-BUILDER

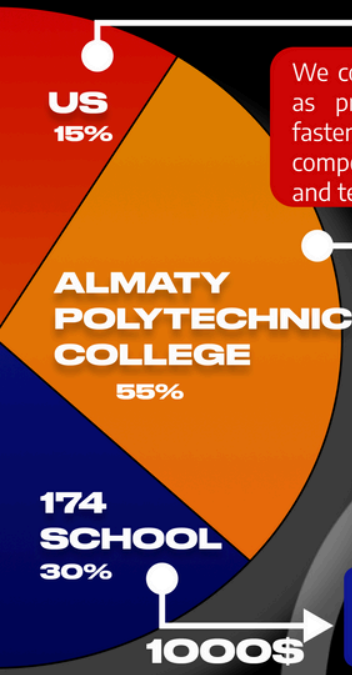
Goal: Complete robot assembly two weeks before regional

Contribution: Ensures the strength and reliability of the design

KEMAL ALEMZHANOVICH

head of the Polytechnic College laboratory, mentors our team by promoting FIRST values, supporting outreach, and maintaining the team's structure and workflow. He provides access to lab resources and guides us in organization, discipline, and long-term development.

FINANCIAL SUSTAINABILITY PLAN 3



500$

We cover small but frequent expenses such as printed materials, laser-cut elements, fasteners, adapters, and various minor components needed during the prototyping and testing phases.

1800$

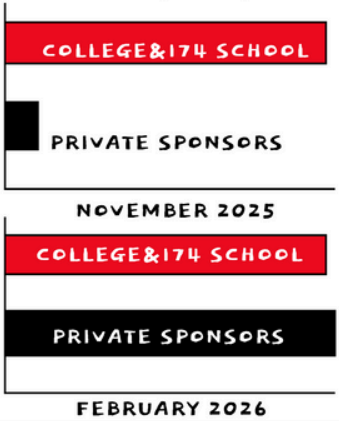
The college provides the largest share of our resources. They handle the procurement of major robot parts, electronics, tools, and structural components. In addition, they provide us with access to a fully equipped laboratory, complete with workbenches, machinery, and storage.

1000$

School 174 supports us by supplying an official FIRST field, along with several essential field elements.

FUNDRAISING

For now, we do not have any stable financial source except for our educational centres. However, every team member actively spends time seeking out, calling, and meeting with potential sponsors. We plan to fundraise 5000$ by february.



season cost breakdown

*4000$ Regular season
-transportation
-registration
-print&pit zone
*5000$ Robot
-Raw materials
-electronic components

9000$ needed
3300$ Raised
6700$ remaining

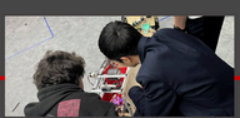
our sponsorship strategy

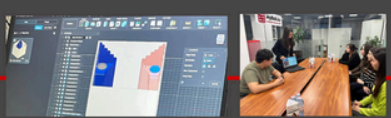
1. Call/Email potential sponsor
2. Meet in person, showcase robot, and discuss FIRST
3. Ask sponsor for more active involvement through mentorship
4. Follow up with sponsor to share season results, what we learned, and to thank them.
5. Retain sponsor for next year and seek greater engagement

PLAN → PROGRESS


august-recruiting


september-outreach+mentoring/opening ftc teams


october-first prototype of robot


november-second prototype+inspire efforts

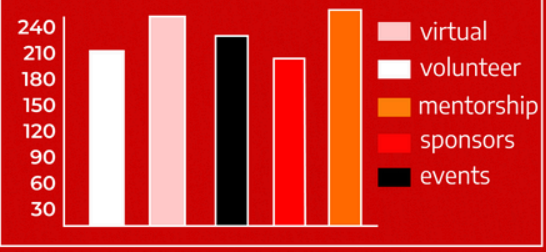
Sustainability plans

Our Team

- Develop new team members for long-term sustainability.
- Build excitement in the community for FIRST through outreach, workshops, and publicity.
- Maintain strong personal relationships with our mentors and sponsors.

SEASON PROJECT PLANNING 4

10 months of work 1056 hours TOTAL



RESULTS & STATISTICS

1)100 000 people inspired through **SOCIAL MEDIA**

2)40+ professionals in STEM connected

3)40 schools in Kazakhstan+3abroad

4)1056 outreach hours

During our outreach efforts, we aim to maintain a strong balance between sharing knowledge and gaining new insights.

date	Key outreach events
12/01	Outreach in 178 lyceum
12/01	Outreach in 208 school
05/02	Outreach in 101 school
09/02	Outreach in Almaty NOVA School
28/03	TEDX event in NIS NAYRYZBAY
26/04	Meeting with deputy Dulat Tastekeev
25/07	Recruiting at the club fair
08/09	Collaboration with a volunteering group
17/09	Outreach at 140 school
15/10	Outreach at 173 school
19/10	Charitable intiative
05/11	Outreach at 182 school
20/11	Outreach at PRIME school
20/11	Meeting with Chinese delegates

KEY HIGHLIGHTS

- Launched 5+ new robotics teams across Kazakhstan.
- Partnered with KazMunayGas to sponsor teams and engage industry professionals.
- Worked with the Ministry of Education to integrate robotics into the national curriculum.
- Helped Kazakhstan teams participate in international robotics competitions.

> "It's Really impressive to see these young people in action and it makes me really optimistic for the future"

MENTORING 12 FTC teams
5 international+7 local

Black Tigers #11192-Israel
2FTC teams- Kyrgyzstan
Passion2030 #19308-SaudiArabia
RoboTech #19313-SaudiArabia

SUNRISE **NEURA**
THUNDERBOLTS **SLAPSEALS**
TUGAN JER **REDLOTUS**

STARTED 2 NEW FTC TEAMS

GAMMASHARKS **TUGANJER**

ASSISTED 124 TEAMS

We actively participated in networking sessions with various Kazakhstani and international teams, enabling a valuable exchange of experiences and knowledge.These connections helped us grow and improve our strategies.

CONNECTING WITH STEM EXPERTS 5

Our team has developed relationships with a growing number of stem experts, who have helped us over the years and have also leaned into supporting FIRST on a broader scale.

This Year's Mentors (And what they taught us)

Alexandra Maratovna

- HARVARD alumni
- Helped to organize marketing robotics meet
- gave advice on finding dponsors in Almaty region

Ruslanbek Korganov

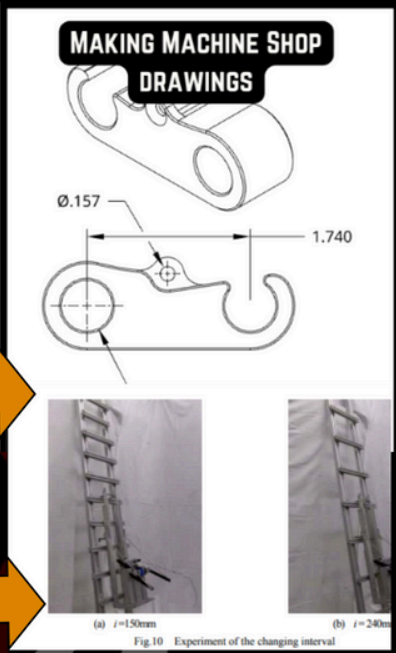
- Advice on battery draw issues, best material for slide strings, and mitigating electrostatic buildup
- Wiring Documentation Advice

Aruzhan Nurmakhanova

- Reviewed CAD Models & Provided General Design Advice
- Established a feedback loop

Amina Rakhim

- Walked us through her ladder-climbing robot design
- Helped us to brainstorm Hang-parking
- Reached out Online after Watching YouTube



COMMUNITY CONNECTIONS

150 TEAMS REACHED OUT

17 COUNTRIES COVERED

10 000 PEOPLE INSPIRED

OUR MENTORS

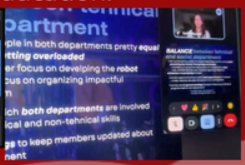
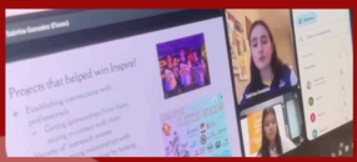
We are grateful to mention that Electric Quahogs (FTC Team 252) from Providence, Rhode Island, kindly mentored our team and provided essential support during our collaboration with FTC Rivals. Their guidance covered organizing the meeting and preparing for interviews, and we deeply appreciate their expertise and partnership.

9 YEARS IN FTC
5 TIMES IN HOUSTON

CONNECT EVENTS 6

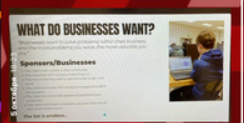
INSPIRE SUMMIT

The Inspire Summit gathered top teams from the Worlds Inspire category, where they shared outreach initiatives, exchanged strategies, and built global partnerships. The event featured workshops, networking, and recognition of outstanding outreach efforts, inspiring teams to expand their impact in STEM education.

MARKETING ROBOTS

A meeting with Marketing Robots focused on finding sponsors for the robotics program. The discussion centered on identifying potential sponsors, highlighting the program's value, and developing strategies to secure long-term support.



FTCRIVALS

A meeting with FTC Rivals was held where we reviewed the Top 10 robots of the season. We discussed their strengths and innovations, providing inspiration to other teams for future improvements and strategies.

150 PEOPLE COVERED

COLLABORATION WITH FUN FTC

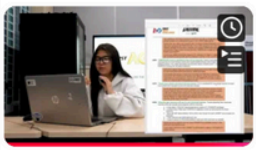
We are excited about our upcoming collaboration with FUNFTC. They've invited us to speak at their conference focused on season mechanisms. We'll be one of 21 teams presenting, and we've also been offered the opportunity to co-author a paper on our contributions. We're currently waiting for the official announcement with further details.

JUDGING SESSION CONSULTATIONS

Leading up to the regionals, we are conducting judging consultations to ensure teams are well-prepared for the competition.Over the last two days, FOUR teams have already participated, gaining feedback to strengthen their approach.

REACH

KAP SERIES



ВСЁ О НАГРАДАХ | KAP SERIES #1

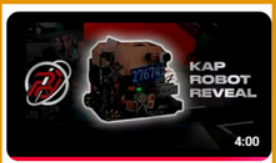
144 просмотра • 2 месяца назад

ИНТЕРВЬЮ С НАШИМ МЕНТОРОМ | KAP SERIES #2

162 просмотра • 3 недели назад

150 points Solo FTC Decode KAP | 27674

2,3 тыс. просмотров • 1 месяц назад



Robot Reveal | KAP SERIES #3

338 просмотров • 4 дня назад

Interview explanation and tips | KAP SERIES #4

43 просмотра • 2 дня назад

3k people are inspired
10+ episodes filmed
5 episodes announced
6+ topics are covered

KAP Series is an educational video series designed to provide teams with in-depth knowledge and guidance on various aspects of FTC (FIRST Tech Challenge). The series covers key topics such as robot design, game strategy, judging criteria, and competition preparation.

VOLUNTEERING

FGC CA 29-30.08
25 VOLUNTEERS

ALMATY REGIONAL
40 VOLUNTEERS

FIRST SCRIMMAGE
5 VOLUNTEERS

ROBOTICS RECOGNITION WEEK

This summer, we organized Robotics Recognition Week and visited over 30 educational institutions in just two weeks. We introduced students and educators to the world of robotics, shared insights about STEM opportunities, and inspired the next generation to get involved in robotics and the FIRST Tech Challenge.

+700 people

CHARITY WEEK

We strive to develop **robotics** and **FIRST** for everyone, especially children with disabilities.To achieve this, we visited **more than 3** orphanages in Kazakhstan and conducted a small demonstration in a **playful format** for the kids, allowing them to **interact with robots, try basic programming, and explore the exciting world of STEAM** through experiments and hands-on activities.

INTERNATIONAL COLLABORATION

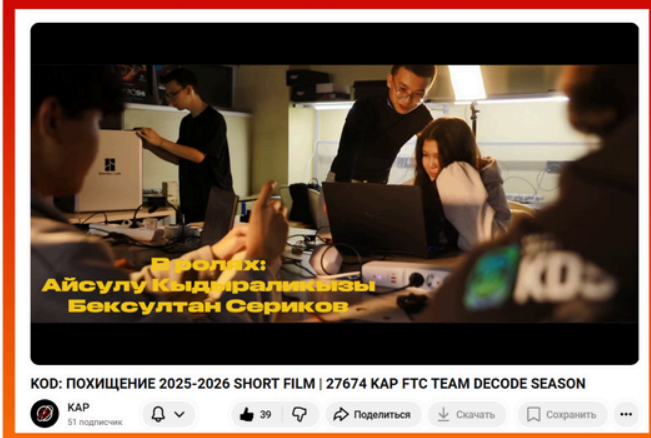
BISHKEK-KYRGYZSTAN

Currently, we are mentoring beginner teams from Bishkek, providing weekly calls to explain the basics of FLL and FTC. During these sessions, we guide them through the fundamentals of robot design, strategy, and competition preparation.

Each week, we spend approximately 10-12 outreach hours dedicated to helping these teams develop their skills, ensuring they are well-prepared for upcoming competitions.

40+ HOURS

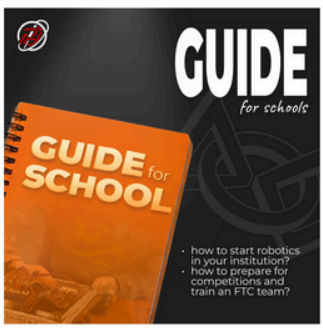
REACH PROJECTS 8



For the first time in history, we have produced a short film about our team, its values, and our robot. The film introduces our team members and interprets teamwork through the lens of an investigative case. This approach not only captivates the community but also increases interest in us, not only for our technical work but also for our social impact. It's a unique way to engage with a broader audience.

FIRST SHORTFILM IN KAZAKHSTAN

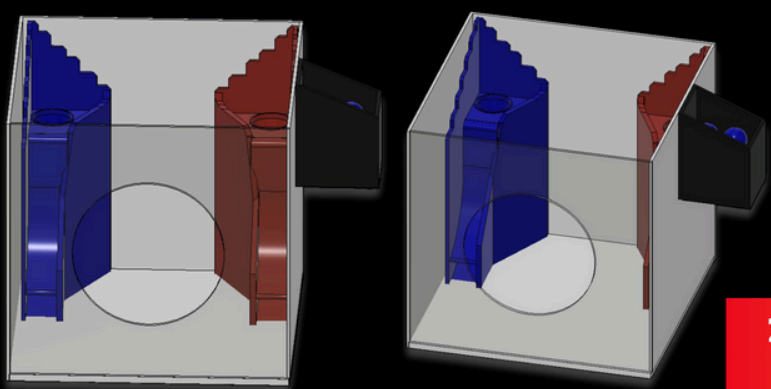
KAP PUBLICATIONS



We've created an alphabet book designed specifically for children, introducing them to the world of FIRST and robotics. Each letter of the alphabet is associated with key concepts, terms, and values from the FIRST community, making learning both educational and fun.

We have also developed a guide for schools on how to start FTC teams, under the leadership of KemalaAlimzhanovich. This guide provides step-by-step instructions for schools interested in establishing their own teams

FTC TOY SET FOR KIDS

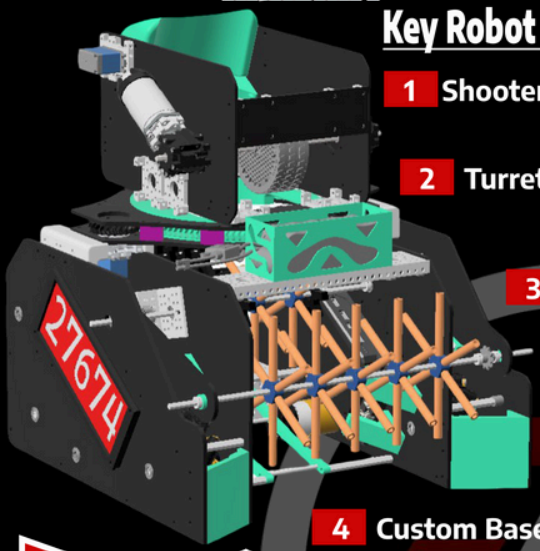


We have created a children's construction toy in the form of a field to spark interest among younger kids. The toy allows them to build, aim, and throw artifacts into gates, mimicking elements of a robotics competition. Currently, the prototype is being tested in two kindergartens.

2 KINDERGARTENS
60+ KIDS

ROBOT DESIGN 9

Presenting **ARASAKA** our sleekest, smartest, and most powerful robot



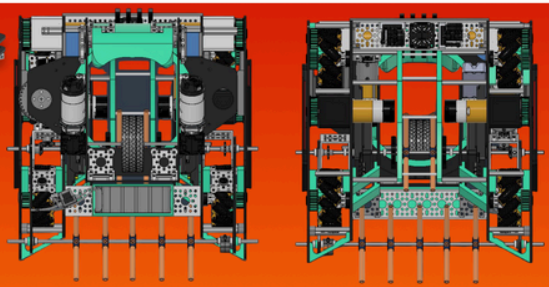
Key Robot Parts

1. Shooter mechanism
2. Turret mechanism
3. Three-Stage Intake Mechanism
4. Custom Base

Collaborative CAD Design

- Our team uses fusion to design our robot.
- Cloud-Based Software allowing online collaboration
- Ensures everyone is included in CAD

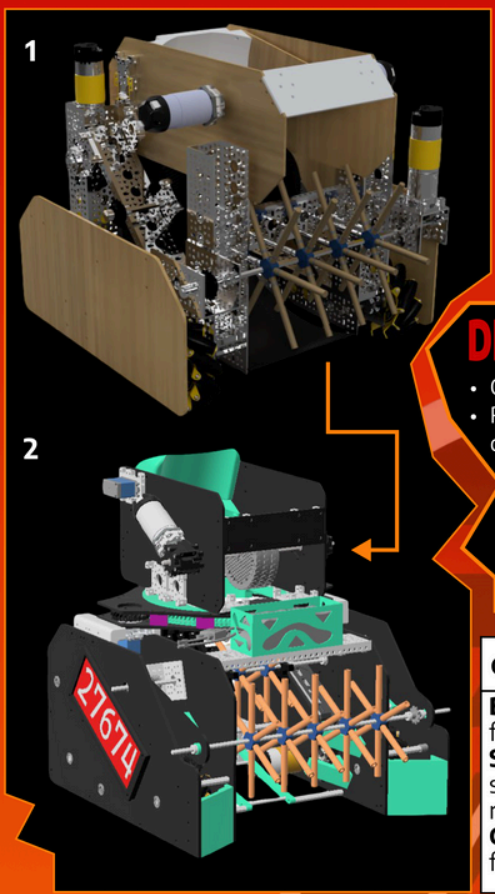
We have developed an efficient design process. Every aspect of our robot has been carefully considered and tested. We pride ourselves on our professional design that seamlessly joins function and form.



Victory = (Speed × Cycle) + (Precision × Reliability)

Our robot is designed as a fast, precise, and highly efficient scoring machine. The chassis provides stable and responsive movement, allowing quick navigation across the field. The three-stage intake system enables rapid collection and smooth transfer of artifacts, while the shooter delivers consistent, controllable shots across multiple ranges. A servo-controlled turret adds flexible horizontal aiming, and advanced localization with Pedro Pathing ensures accurate autonomous performance. Together, these systems create a robot optimized for reliability, speed, and competitive scoring.

SEASON DESIGN JOURNEY 10



PROTOTYPE 1 DESIGN	LESSONS LEARNED
Base: Standard "gobilda" frame with gear reducers, cardboard ramp. **Intake**: Static first stage, flexible for fast ball capture. **Shooting**: Two hex motors, adjustable trajectory with servos.	1. Flexibility in intake was essential for ball capture. 2. Shooter speed needed adjustment for consistent performance

DESIGN GOALS

- Complete every task on the board
- Reasonably small footprint, fast driving
  - Active intake, fast reliable transfer
  - Fully custom design
  - Simple as possible to program, remove points of failure

ACHIEVEMENT

"Our current robot prototype is the closest version of how we envision our future robot. We aim to achieve these goals through the automation of the cycle in the future."

Radmir-builder

CRUCIAL CHANGES MADE	FUTURE IMPROVEMENTS
Base: Custom base with belts for stability. **Shooter**: Improved for better stability and longer shooting range. **Guides**: Adjustable top rail for changing trajectory.	1. Full automation based on camera input. 2. Dual intake for better ball handling.

FIRST SCRIMMAGE

The team noticed that the robot couldn't consistently capture balls moving at high speed and often missed the last ball before shooting.

Shooting from long distances was also problematic as the robot wasn't able to accurately aim at the target.

In some situations, the robot lacked speed to quickly return to base or position itself for another shot.

CHANGES MADE

SHOOTER MODIFICATION	IMPROVED INTAKE
CUSTOM BASE +SPEED	TURRET

ANALYSIS

Worked Well:
- Basic functionality for shooting and ball intake.
- Modular, allowing easy adjustments.

Needs Improvement:
- Shooting stability and accuracy.
- Faster, more adaptive ball intake.
- Increased maneuverability.

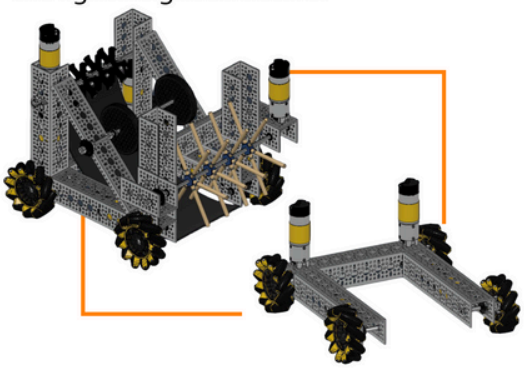
The first prototype allowed the team to get hands-on experience and make adjustments based on real-world conditions, making it easier to understand the performance bottlenecks and areas of improvement.

DRIVE TRAIN

The base of the robot is currently constructed using plywood. However, we plan to replace it with a stronger and lighter material in the future, such as aluminum or carbon fiber, to improve stability and reduce weight, ensuring smoother movement and better precision.

FIRST PROTOTYPE

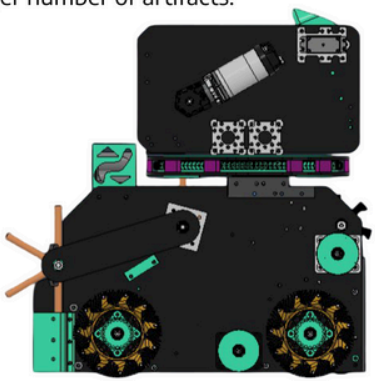
Base: The first prototype had a standard "gobilda" frame with gear reducers for power transmission. This setup was simple and modular but lacked precision in movement due to the lightweight structure.



Ramp: The ramp in the first prototype was made from cardboard, which worked as a basic guide for the balls but lacked the durability and stability needed for consistent performance during matches.

CURRENT VERSION

Motors: The second prototype uses 435 motors linked to mecanums by belt system with a gear ratio of 1:1.3333. This setup allows for a speed increase, with an output RPM ranging from 435 RPM to 600 RPM, providing better acceleration and speed for scoring a larger number of artifacts.



Ramp: The ramp serves as both a guide for balls entering the robot and a crossbar providing additional structural support for the base.

WHATS INNOVATIVE

Our team stands out as the only team that has successfully increased the robot's speed to 600 RPM. This innovation has allowed us to significantly improve the robot's ability to score a larger number of artifacts in a shorter time, giving us a competitive edge.

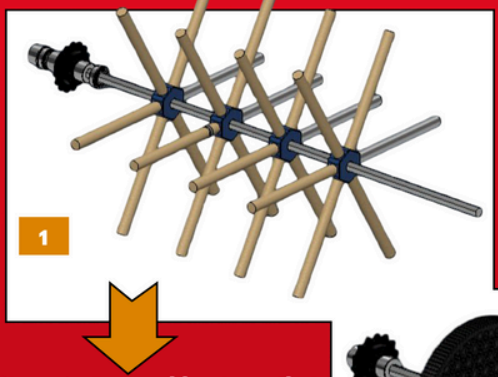
$$\text{OUTPUT RPM} = \text{MOTOR RPM} * \frac{\text{gear ratio output}}{\text{gear ratio input}}$$

$$\text{Output RPM} = 435\text{RPM} \times 1/1.3333 = 600\text{RPM}$$

By using this optimized gear ratio, we were able to increase the output RPM to 600 RPM, thus improving the robot's speed and performance.

Our ramp design is another example of innovation. It acts as both a guide for ball intake and a structural support for the robot. The ramp has been carefully designed to ensure smooth and efficient ball capture, reducing the risk of missed or dropped balls, especially at higher speeds.

MULTI-STAGE INTAKE SYSTEM 12



The intake system in our robot plays a crucial role in its overall performance. It's responsible for capturing and feeding artifacts (such as balls) into the shooting mechanism, and its design is optimized for speed and precision. Unlike many teams that rely on static intake designs, we've got a dynamic intake.

Stage 1: A movable stage that adjusts to the ball's position to ensure faster and more accurate capture.

Function: Covers the entire robot width for quick ball collection.

Movement: Movable to retain the last ball in the robot.

Stage 2: A semi-static stage that helps guide the ball toward the final intake position.

Function: This stage connects the ball collection system to the shooter feeding mechanism.

Drive: The motion is transferred from the second intake shaft through a chain, which powers this stage.

Purpose: It serves as the transition stage, ensuring that balls are moved smoothly from the collection system to the shooter.

the gear ratio between the second and first stage is 1:2

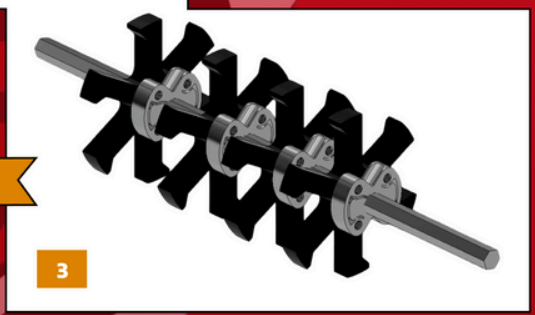
Output RPM=1150RPM×1/2=575RPM

Stage 3: A high-speed intake stage that rapidly feeds the ball into the shooter.

Function: This stage is responsible for properly positioning and feeding balls into the shooter.

Movement: The third stage rotates in the opposite direction of the first two stages to hold the balls inside the robot. When it rotates in the opposite direction, it begins the feeding process, sending balls to the shooter.

Purpose: This stage ensures that only the correct number of balls is fed into the shooter at the right time, improving accuracy and consistency in scoring.



The whole system uses two 1150 RPM Gobilda motors for efficient performance.

In the first prototype, the first stage of the intake system was static (not movable), which caused a problem: the robot could not capture the last ball effectively.

SOLUTION

To solve this issue, we made the first stage movable in the updated design. This allowed the intake system to adjust dynamically to the position of the last ball, ensuring that it could hold onto and capture the final ball efficiently. The moveable first stage enabled the robot to retain the last ball inside the system, allowing it to complete the collection process before feeding the balls into the shooter.