ANTARES

2493S

TEAM MEMBERS!

Balym
Handbook eng.

Daulet
Captain

Ernar
Programmer

Turan
Head engineer

Karakat
Haandbook eng.

Alinur
CADer

Erasyl
Builder

Ayazhan
Designer

Inkar
Outreach Manager

Gulsim
Manager

Abdimurat
Driver

Karakat
SMM

Balnur
Designer

Akmaral
Mentor

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GOALS AND ACHIEVMENTS OUR STORY

Antares is a team created by talented students from the Abai National School, one of Kazakhstan's leading national schools. We began our journey in 2023, and for three seasons now, the team has been developing, growing, and expanding the influence of the STEM movement. Antares is the brightest star in the sky

- 800+ followers on social medis
- Exist 3 years
- 3.500.000 TG FROM SPONSORS
- Team anthem
- 350 outreach hours
- Mentors 2 teams
- Online and offline seminars 20+
- START UP PROJECTS

OUR PATH:

- INNOVATOR AWARD
- ALMATY SCRIMMAGE
- ALMATY REGIONAL
- BISHKEK REGIONAL
- FGC

WAY TO HOUSTON!

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OUR MISSION

We believe that high-quality STEM education should be accessible to every child. Our key mission is to create technological and engineering learning materials in the Kazakh language

WHAT WE CREATE FOR THE COMMUNITY

— We wrote and released the first-ever FIRST anthem, inspiring participants across Kazakhstan.
— We published "Qadam", an online/offline beginner's magazine for FCC and FLL teams.
— Our initiative "FIRST TO EVERY SCHOOL" has already reached 30+ schools, where we led workshops, demonstrations, and STEM lessons.
— Our efforts resulted in the creation of 1 new FTC team and 2 new FLL teams — and this is only the beginning.
— Our social media community continues to grow and has already passed 800 followers.

INSTAGRAMM

TIK TOK

YOUTUBE

INFACT debate club

COLLABORATION WITH INFACT DEBATE CLUB

DEBATE RELATED WITH ARCHEOLOGY AND ROBOTICS

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OUTREACH/CONNECT

CONNECT ROBOTICS TO ARCHEOLOGY

We visited the Margulan Archaeological Institute, where we presented FIRST .The researchers shared key challenges: inaccurate manual measurements, slow cleaning processes, and outdated tools. we began developing startup ideas such as:
— a precision artifact-measurement robot,
— a cleaning robot for delicate items,
— tools to improve documentation workflow.

VOLUNTEERING

Team Antares founded a new school branch of the major Almaty volunteer organization “Ashyk Zhurek.”

Our next goal is to visit a local orphanage, introduce children to LEGO

WHY THIS NEED FOR US?

Show the opportunities of robotics and inspire teens to pursue technology.

ABAI BRANCH

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INTERVIEW

CHANNELS, KHABAR 24, QAZAQSTAN

Antares was featured on major national television channels — Khabar 24 and Qazaqstan. During these interviews, we presented our teams, introduced the FIRST program, and explained how robotics is creating new opportunities in education for young innovators.

Additionally, over 60 teachers, along with ministers and members of parliament, visited our school to learn about Team Antares' activities.

60+ TEACHERS AND GUESTS

GANI BEYSEMBAYEV

Team Antares had the honor of presenting our activities to Gani Beysembayev, Minister of the Republic of Kazakhstan. We introduced him to the FIRST program, showcased our projects, and presented our team.

DEVELOP INDUSTRY

Antares visited the Temirzhol College, where we learned about railway operations and the different control systems used on a railway line.

We Think We can develop this industrial with ROBOTICS

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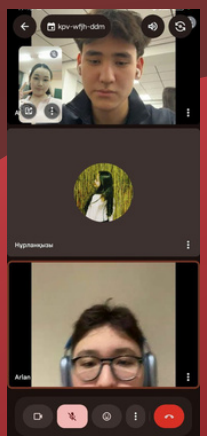
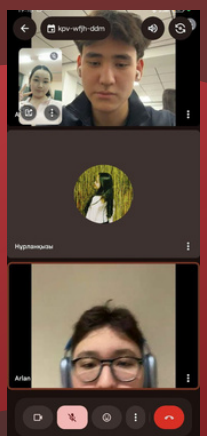
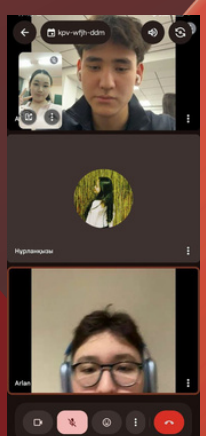
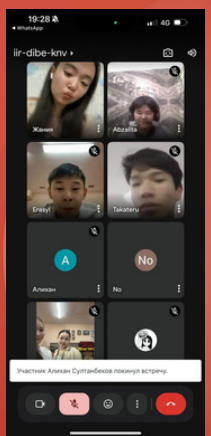
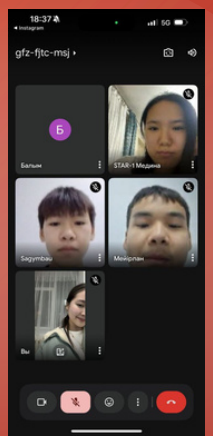
COLLABORATION CONNECT

5000+ MINUTES

6 FOREIGN TEAMS

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FAIL CONFERENCE

Kuralay Baitazhikova

She is:
- **the organizer of the “Fail Conf” ped-hackathon,**
- **a mentor of the @auylpedacademy project,**
- **the head of @ustart.academy.**

Kuralay initiated a new format designed specifically for teachers — the Fail Conference — aiming to build a culture where educators openly share their mistakes and learn from them.

Fail Conference: From Teachers to Robotics

Originally, this project was created as a platform for teachers to openly share their mistakes and learn from each other. The format quickly proved its effectiveness in education.
As the Antares team, we took Kuralay’s idea and adapted it to the world of robotics.

Why is the Fail Conference important in robotics?
Mistakes are unavoidable in robotics — from broken motors to malfunctioning code or unresponsive sensors.
That’s why the Fail Conference helps us to:
- **overcome the fear of making mistakes**
- **learn from other teams’ experiences**
- **strengthen team trust**
- **generate new engineering ideas**
- **build technical thinking and resilience**

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TELEGRAMM BOT BY USS!!

We developed a Telegram bot that answers any questions related to robotics. This tool is especially useful for beginners

The bot serves as an accessible and interactive learning platform, enabling teams to save time

Challenge: "Common Mistakes and How to Fix Them!"
We organized a challenge to identify the most common mistakes in robotics and demonstrate the correct ways to fix them.
🎯 Goals:

- **Identify the most common mistakes in robotics**
- **Show how to correctly fix these mistakes**
- **Share useful experiences with other teams**
- **Develop engineering thinking and analytical skills**

Result: Participants share their experiences, learn how to correct mistakes, exchange knowledge between teams, and strengthen their engineering thinking and practical skills.

INDRIVE APP OWNER ARSEN TOMSKYI

Antares met with Arsen Tomsky, the creator of the app InDrive

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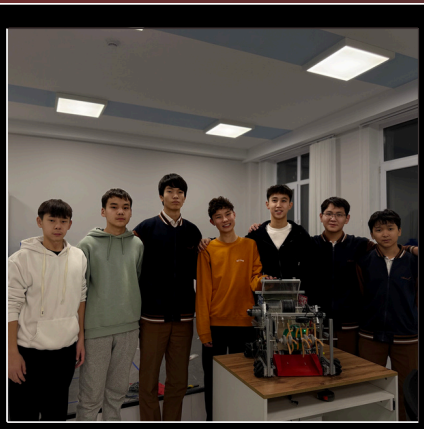
We, the Antares team, have launched the “Antares-talk” podcast project.
Main goal: through the podcast, to get to know other teams in the field of robotics better, share experiences, discuss challenges, and gain new ideas.

First podcast: Started with the mentor of Team Antares.
Childhood: shared their interests and how they got into robotics.
Life journey: discussed challenges faced and educational experiences.
Idea of starting Team Antares: explained how the team was formed, its goals, and mission.
History: presented the team’s first projects and achievements to the students.
Interesting moments: motivated students through Q&A and practical examples.

COLLAB W/ULY DALA

Second podcast: Conducted with Team Uludala.
Inspire part: discussed their project’s Inspire section, its goals, and execution.
Robot part: analyzed the Robot section, including design, functionality, and performance.
Mistakes and lessons: examined the errors they faced and how to prevent them in the future.
Interesting moments: shared practical examples and experiences to motivate and inspire listeners.



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Vebinar

We organized an online meeting with 15 teams to discuss challenges in building robots. Teams shared their experiences on programming, construction improvements, sensors, and robot stability and speed.

The second webinar was held offline for 7th and 8th graders. Students operated the robot themselves and gained hands-on experience.

The third webinar was held at School No. 34 in Talgar. Students from grades 1 to 11 operated the robot themselves and were introduced to the FIRST program. The webinar increased interest in STEM, and hopefully, we plan to start a new robotics team at the school.

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ROBOT EVOLUTION

VERSION 1

SHOOTERS DEGREE CHANGED FROM 90 TO 75 DEGREE

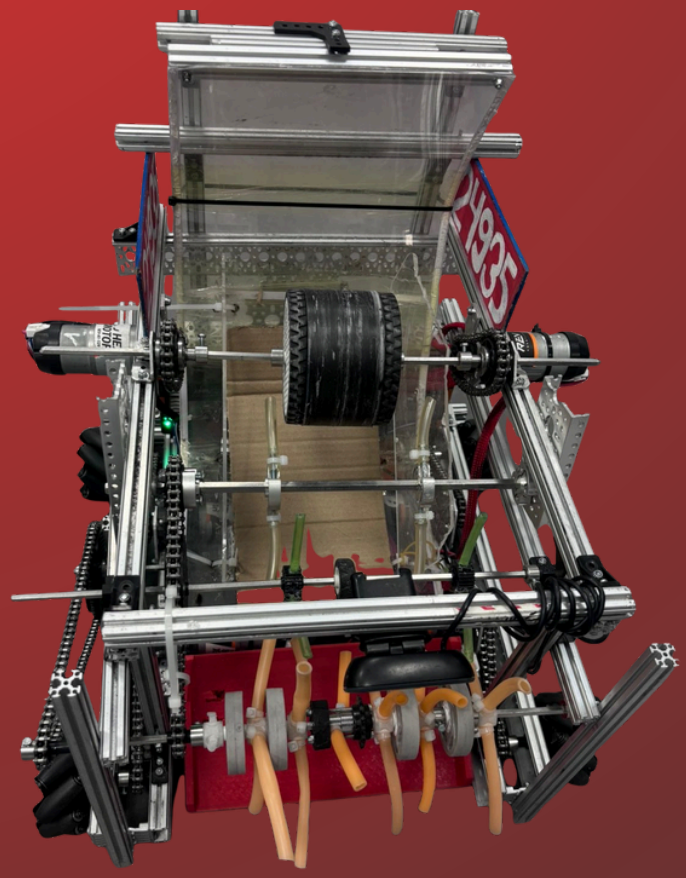
VERSION 2

INTAKE MADE WITH MEDICINE TUBE AND SECOND STAGE WITH REV WHEELS, ALSO WE CHANGED PUR DETAILS FROM BOX TO 3D CAD THANKS TO 3D PRINTER

ROBOT BASE

Our robot is fully built using components from REV Robotics, ensuring reliability and competition-level performance

- **Total Motors: 7**



- **Length: 45 cm**
- **Height: 44 cm**
- **Width: 45 cm**

This compact and stable configuration allows precise control, balance, and efficient integration of all subsystems

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MECHANUM DRIVE

The robot uses a 4-wheel mecanum drive system, each wheel spinning at 850 RPM.
Gear system:

- **20-tooth gear**
- **10-tooth gear**
- **Chain-driven mechanism**

This setup gives our robot:

- **Diagonal movement**
- **Strafing**
- **Smooth rotation**
- **High agility in tight spaces**

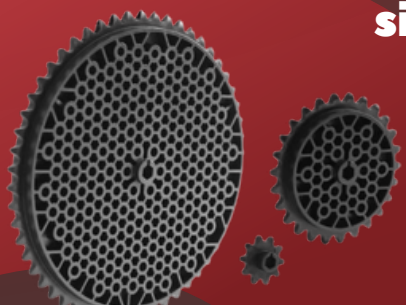
All movements are controlled through the joystick, giving drivers full dynamic control

INTAKE – TRIPLE-STAGE COLLECTION SYSTEM

Our intake features a 3-stage modular mechanism designed for fast and consistent artifact collection.
Gear system:

- **40-tooth gear**
- **10-tooth gear**
- **Speed: 1600 RPM**

High RPM allows rapid and reliable intake performance during high-pressure match situations



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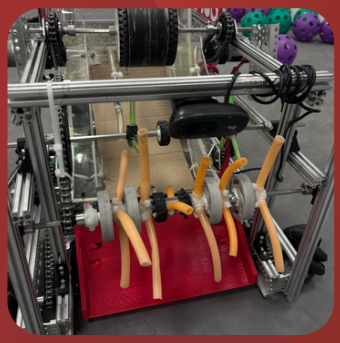
SHOOTER – DUAL HIGH-SPEED MOTOR SYSTEM

The shooter uses two high-speed motors for maximum precision and power.
Gear system:

- **20-tooth gear**
- **30-tooth gear**
- **Speed per motor: 4000 RPM**



This mechanism provides consistent and accurate artifact launching across various field distances

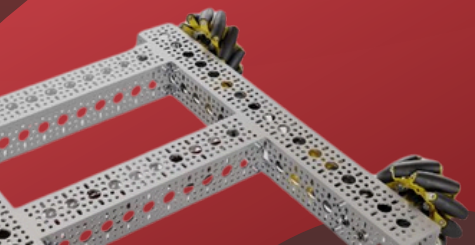
CAMERA – OUR KEY INNOVATION

We integrated a Logi camera, which is one of our strongest innovations this season.
The camera allows the robot to:

- **Detect the color of artifacts**
- **Identify the shape of artifacts**
- **Automatically approach and collect them with precision**

Activation: Y button
This vision system aligns perfectly with the season's archaeological theme, enabling the robot to "recognize" artifacts just like real scientific equipment

- **RB: Activate shooter**
- **RT: Deactivate shooter**
- **LT: Collect artifacts**
- **LB: Release artifacts**



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PROGRAMMING

```
// ===== NORMALIZE =====
double max = Math.max(
        Math.max(Math.abs(frontLeftPower), Math.abs(backLeftPower)),
        Math.max(Math.abs(frontRightPower), Math.abs(backRightPower))
);

if (max > 1.0) {
    frontLeftPower  /= max;
    backLeftPower   /= max;
    frontRightPower /= max;
    backRightPower  /= max;
}

// ===== APPLY MOTOR POWER =====
frontLeft.setPower(frontLeftPower);
backLeft.setPower(backLeftPower);
frontRight.setPower(frontRightPower);
backRight.setPower(backRightPower);
```

MOTOR POWER ROBOT BASE

```
// ===== SHOOTER =====
if (gamepad1.right_trigger > 0.1) {
    leftshoot.setPower(0.0);
    rightshoot.setPower(0.0);
} else if (gamepad1.right_bumper) {
    leftshoot.setPower(-1.0);
    rightshoot.setPower(-1.0);
}

if (gamepad1.a) {
    leftshoot.setPower(1.0);
    rightshoot.setPower(1.0);
    sleep(100);
    leftshoot.setPower(0);
    rightshoot.setPower(0);
}
```

SHOOTER


```
// ===== NORMALIZE =====
double max = Math.max(
        Math.max(Math.abs(frontLeftPower), Math.abs(backLeftPower)),
        Math.max(Math.abs(frontRightPower), Math.abs(backRightPower))
);

if (max > 1.0) {
    frontLeftPower  /= max;
    backLeftPower   /= max;
    frontRightPower /= max;
    backRightPower  /= max;
}

// ===== APPLY MOTOR POWER =====
frontLeft.setPower(frontLeftPower);
backLeft.setPower(backLeftPower);
frontRight.setPower(frontRightPower);
backRight.setPower(backRightPower);
```


```
    // механо-формулы
    frontLeftPower  = -forward + strafe + turn;
    backLeftPower   = forward - strafe + turn;
    frontRightPower = -forward - strafe - turn;
    backRightPower  = forward + strafe - turn;

}
// ================================================
// ========== NORMAL JOYSTICK DRIVING ============
// ================================================
else {

    double x = -gamepad1.left_stick_y;     // вперед/назад
    double y = -gamepad1.left_stick_x * 1.1; // страф
    double rx = -gamepad1.right_stick_x;  // поворот

    frontLeftPower  = -x + y + rx;
    backLeftPower   = x - y + rx;
    frontRightPower = -x - y - rx;
    backRightPower  = x + y - rx;
}
```

CONTROL

```
// ===== CAMERA =====
pipeline = new BallPipeline();

portal = new VisionPortal.Builder()
        .setCamera(hardwareMap.get(CameraName.class, "Webcam 1"))
        .addProcessor(pipeline)
        .build();

// ===== MOTOR DIRECTIONS =====
frontLeft.setDirection(DcMotor.Direction.FORWARD);
backLeft.setDirection(DcMotor.Direction.FORWARD);
frontRight.setDirection(DcMotor.Direction.REVERSE);
backRight.setDirection(DcMotor.Direction.REVERSE);

rightshoot.setDirection(DcMotor.Direction.REVERSE);

telemetry.addData("Status", "Initialized");
telemetry.update();

waitForStart();

while (opModeIsActive()) {
```

MOTOR DIRECTIONS

```
// ================================================
// ============== AUTO CAMERA MODE ================
// ================================================
if (autoAim) {

    double cx = pipeline.centerX;
    double error = 320 - cx; // центр 640×480

    double turn = error / 320.0;
    double strafe = error / 320.0;

    double forward = (pipeline.pixelDiameter < 450) ? 0.7 : 0;
    intake.setPower(0.7);
    turn = Math.max(-0.6, Math.min(0.6, turn));
    strafe = Math.max(-0.4, Math.min(0.4, strafe));
```

LOGI TECH CAMERA'S CODE