

FIRST Robotics Team 1756 Argos

Celebrating 20 Years of Engineering Our Future

Student Impact:

Majority pursuing engineering, manufacturing or technical careers

33% Female Students (tripling from 2022 season) due to student led outreach demos

In house robot manufacturing builds confidence and develops technical skills for entry level jobs (welding, CNC machining, plasma operation)

Community Outreach:

Go Baby Go! – adapt remote control cars for children with spina bifida, cerebral palsy, and osteogenesis imperfecta

Caterpillar Demo Bot - to support corporate sponsor

LCHS technology support – plasma cutter repair and upgrade

High School Demos – LCHS and Illini Bluffs to promote *FIRST*

LCHS polycarb shields for Covid mitigation

Changing Lives

Transforming Our Community

Celebrating Engineering

Growing *FIRST*

Hosted FLL qualifier in 2022, 2023, & 2024 and assisted with judging and team queuing. Robot demo during awards to show progression of *FIRST* programs

Assisted new FLL team of homeschool students in 2022

Helped start 5 *FIRST* Lego League teams in the Chicago suburbs in 2021

Reached 50 students in a school that previously did not have a *FIRST* program

Machine Attribute Awards:

2024 Innovation in Control x2

2023 Quality

2023 Creativity

2022 Excellence in Engineering

2022 Industrial Design

2021 Excellence in Engineering

2020 Autonomous

2019 Industrial Design

2018 Industrial Design

2018 Quality

2016 Industrial Design

2015 Championship Quality

2015 Excellence in Engineering

2015 Creativity

2014 Industrial Design

2013 Excellence in Engineering

2012 Quality



Acknowledgement:

In 2018, Argos received the Championship Imagery Award

“The team is the full representation of the inspiration: engineering, impacting community, and corporate sponsorship” – Don Bossi (former president of *FIRST*)

Sponsor Support:

A 20 year partnership with Caterpillar:

Branding identifies us as the Caterpillar team

Majority of mentors are Caterpillar employees

2022 Robot demo at Caterpillar Family Day with >1k visitors

Two student trainees from in 2022 now college interns

2018 Robot on display at the Caterpillar Visitors Center

Featured in multiple Caterpillar recruitment videos

FIRST Robotics Team 1756 Argos

Elevator:

- Two stage continuous rigged elevator to reach reef L1-L4 and allows for algae scoring in the net
- Shoulder to allow for intake and placement on both sides
- Wrist rotates intake / placer for coral

Climber:

- Deep cage for maximum points
- Geared deployment motor
- Full width with polycarb alignment mechanical assist
- Winch motor adding lift power

Intake / Placer:

- Floor and coral station capable for coral
- Centering 'wings' for coral alignment
- Central wheels power both coral and algae intake
- Mechanical auto-retracting algae 'jaw'

Drivetrain:

- Swerve drive used for increased mobility



Controls – Pre-sets:

Coral:

- Floor and Coral Station
- L1, L2, L3, L4 placement

Algae:

- Reef L2 and L3 algae removal
- Processor and Net for algae scoring

Both:

- Mirrored for left and right intake/placement

Controls – Features:

- Alignment to reef with support for left/right pole on left/right side of robot with vibration feedback for vision alignment to the reef
- Absolute encoders for positioning of swerve modules, shoulder, wrist, and climber

Vision Processing:

- Auto alignment to the left/right reef poles for coral placement that can blend in with the driver's manual movement which eliminates the need for stopping the robot in order to align.
- The robot does this irrespective of its left/right side closer to the reef.

Controls – LED Signaling:

- LEDs used as sensor driven feedback loop to driver/operator for AprilTag detection on the reef



Automation:

- 200Hz latency-compensated odometry running in a background thread for accurate autonomous path exec

Safety Features:

- Safe motion regions to prevent collisions between arm/coral/algae and elevator