TEAM 1538 / THE HOLY COWS

2026
TECH
SHEET

DAISY SAURUS

SHOOTER

- **Turret-Style Shooter –** Rotates up to 360° independently of the drivetrain, allowing the robot to aim and shoot from any orientation.
- **Variable-Angle Hood –** Adjusts the shot angle to support accurate scoring from multiple field distances.
- **Vision Auto-Aiming –** Uses vision targeting to automatically detect goals and align the turret for accurate scoring.
- **Dual-Wheel Flywheel System –** Uses two 1.625-inch Colson wheels and two Banebots wheels powered by 2 Kraken X60 motors and 2 Kraken X44 motors, with 2 4-inch brass flywheels added to increase rotational inertia for more consistent shot velocity.

INTAKE

- **Four-Bar Hopper Expansion –** Uses a four-bar linkage to expand the hopper and increase fuel storage capacity during operation.
- **Intake –** Uses two Kraken X60 motors driving a 2-inch roller to capture and move fuel into the hopper.
- **High-Speed Collection –** Collects up to 10 fuel per second to support rapid scoring cycles.

FEEDER AND HOPPER FLOOR

- **Kraken X60 Drive –** Uses Kraken X60 motors to power the feeder and hopper mechanisms for reliable fuel transfer.
- **High-Speed Roller System –** Uses seven 1.5-inch rollers with a surface speed of 43 ft/s to move fuel efficiently toward the feeder.
- **Active Tunnel Feeder –** Uses a belt-driven tunnel system to serialize and shuttle fuel efficiently into the shooter for consistent feeding.
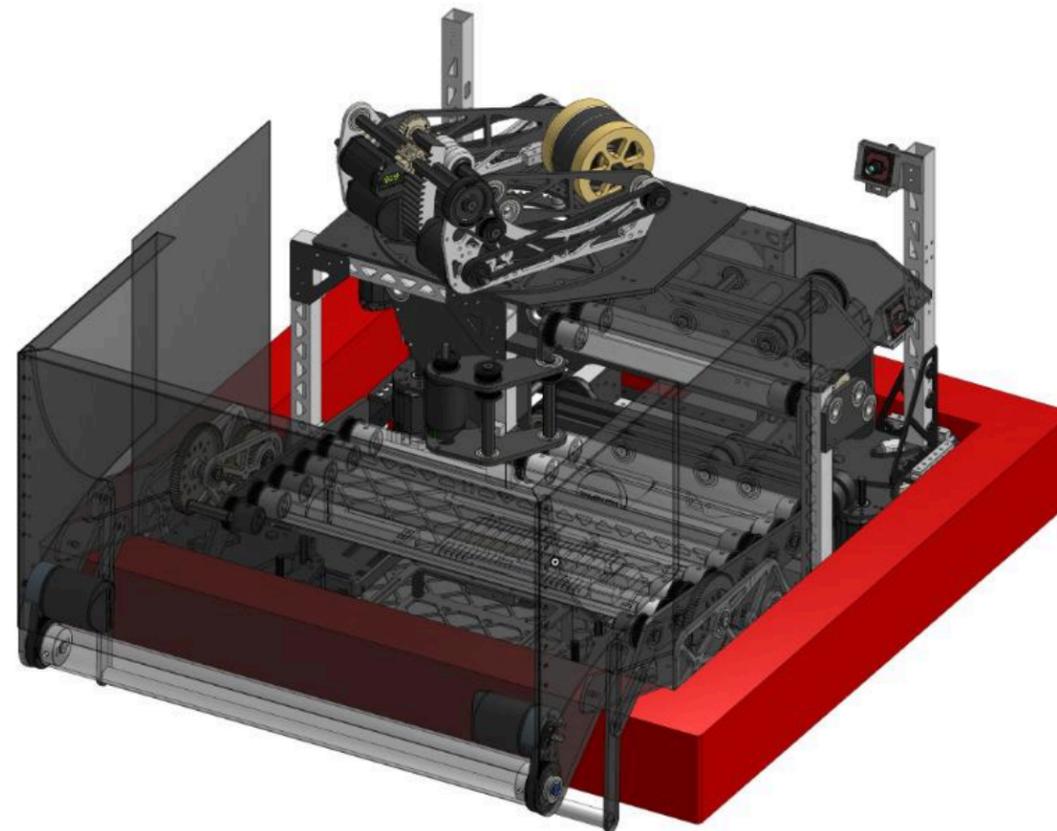
DRIVETRAIN

- **Swerve Drive System –** Uses an omnidirectional swerve drivetrain to enable precise movement in any direction without rotating the robot.
- **X2C Swerve Modules –** Operates on WestCoast Products X2C modules, designed for high performance, simplified assembly, and improved drivetrain versatility.
- **High-Traction Wheels –** Uses wider swerve wheels to improve traction and acceleration during fast maneuvers.
- **High-Speed Drive –** Reaches a top speed of 16.1 ft/s using a 6.48:1 gear ratio.

SOFTWARE

- **C++ Control Software –** Uses C++ as the primary programming language for robot control and subsystem coordination.
- **Multi-Camera Vision System –** Uses multiple cameras and custom computer vision software running on an onboard LattePanda single-board computer for real-time vision processing and field pose estimation.
- **Adaptive Shot Control –** Uses vision-based pose estimation and a physics-based model to automatically adjust shooter velocity and hood angle while compensating for robot motion.

LIFECYCLE MANAGEMENT

- **Failure Tracking System –** Tracks component failures to calculate mean time between failures (MTBF) and improve system reliability.
- **Predictive Maintenance –** Uses failure data to generate maintenance schedules for critical robot systems.
- **Cycle & Runtime Monitoring –** Tracks maximum part and assembly cycles along with subsystem runtime to guide preventative maintenance and replacements.