2025 REEFSCAPE Season

SPONSOR IMPACT REPORT

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Gold

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A MESSAGE OF APPRECIATION

“ENIGMA 9080 would not be the team we are without the support of our sponsors. Your investment does far more than help us buy robot parts, tools, registration, and travel support. It gives students the opportunity to discover engineering, programming, design, leadership, communication, and problem-solving in a real-world environment.

Because of your support, our students are able to build competitive robots, mentor younger teams, volunteer in the community, represent New Mexico at regional events, and grow into confident leaders. You help make it possible for students to take an idea from a sketch, to CAD, to fabrication, to competition, and along the way learn lessons that will stay with them far beyond robotics.

This season, your support helped ENIGMA continue building a stronger foundation for the future through new equipment, improved pit organization, outreach events, team mentorship, and hands-on STEM opportunities for students across multiple FIRST programs. Every match we play, every student we mentor, every robot we demo, and every problem we solve is connected to the generosity of people and organizations who believe in our mission.

Thank you for believing in our students, our team, and the future of STEM in New Mexico. Your partnership helps us build more than robots; it helps us build confidence, character, community, and the next generation of innovators.”

Anirudh N. Cody S. Jett S. Luke C. Phillip M. Sammy G. Zacheriah J. Zelda S. Russell M.

Rey J. Gray S. Noah S. Renzo D. Isabel M. Travis S. Madelene C.

About FRC ENIGMA 9080

Enigma's first FRC season was Charged Up 2023. We are a community team located in Albuquerque, New Mexico. We are currently growing our team and actively recruiting new members from grades 8-12. Our goal is to establish ourselves as helpful alliance members. We work hard at having fun and learning the concepts of STEAM education as we build really cool and effective robots. We are FRC Team 9080 ENIGMA

By the Numbers

2025
Third FRC Season

10–18
Official Season Record

1st Pick
7th Alliance - Belton

2–1–1
Belton Playoff Results

1
Quality Award

Countless
Repairs and Lessons

Connect with the team

Instagram: https://instagram.com/enigma.robotics
YouTube: https://www.youtube.com/channel/UCziMRJj5j_hRYlwlJgXOjoQ
Facebook: https://www.facebook.com/enigma.robotics.program
Team Website: https://enigmafrc.com

Students

Anirudh N.

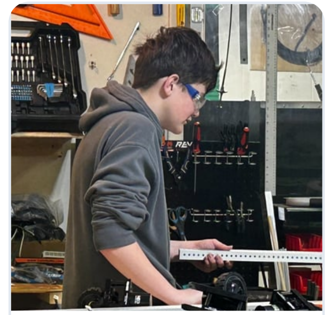
- Team Captain
- Builder
- Fabricator
- Driver Mechanisms
- Drive Team
- Skilled 3D Prints
- Driver Chassis
- CAD Designer
- Electronics
- Outreach
- Fundraising
- Learning Java Code
- Assembly
- Team Media
- Team Spirit

Cody S.

- Graphic Designer
- Outreach
- Social Media
- Fundraising
- Assembly
- Team Spirit
- Team Media

Jett S.

- CAD Designer
- Builder
- Fabricator
- Drive Team
- Technician
- Electronics
- Skilled CNC Mill
- Learning Java Code
- Outreach
- Fundraising
- Skilled Bandsaw



Luke C.

- CAD Designer
- Builder
- Fabricator
- Drive Team
- Technician
- Assembly
- Fundraising
- Design & Prototype
- Game Manual Expert
- Judging Awards
- Founding Member
- Team Spirit
- Outreach
- Skilled CNC Mill
- Skilled Bandsaw
- Driver Chassis
- Skilled 3D Prints
- Team Co-Captain
- Wiring & Soldering
- Electronics

Phillip M.

- Builder
- Assembly
- Skilled CNC Mill
- Outreach
- Fundraising
- Fabricator

Sammy G.

- Outreach
- Fundraising
- Learning Java Code
- Team Spirit
- Technician
- Builder
- Assembly

Zacheriah J.

- Skilled Java Coder
- Skilled Vision Coder
- Skilled Autonomous Pathing
- Electronics
- Drive Team
- Technician
- Outreach
- Fundraising
- Learning Java Code

Zelda S.

- Builder
- Drive Team
- Technician
- Fabricator
- Assembly
- Skilled 3D Prints
- Outreach
- Fundraising
- Learning Java Code
- Skilled CNC Mill
- Skilled Bandsaw
- Rookie Year

Coaches and mentors

VBS MANUFACTURING, INC.

B

Billy M.
Owner

FRC ENIGMA 9080

Russell M.
Coach #1

- Shop Admin
- Build & Fabrication
- Java Programming
- Wiring and Electronics
- Quality Control
- Machine Training
- Systems Mentor
- Design
- Game Strategy
- 3D Prints Mentor
- Robotics Control Systems
- Robotics Ambassador
- CAD Training
- Mechanical Engineering

Rey J.
Mentor

- Java Programming
- FRC WPI Programming
- Game Strategy
- Quality Control
- Robotics Control Systems
- Systems Mentor

Gray S.
Mentor

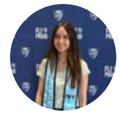
- FIRST Alumni
- Build & Fabrication
- Robot Driving
- Wiring and Electronics
- CAD Training
- Electrical Engineering
- Quality Control
- Game Strategy
- Design
- Mechanical Engineering
- Systems Mentor
- Robotics Ambassador
- 3D Prints Mentor
- Robotics Control Systems

Noah S.
Mentor

- FIRST Alumni
- Media Production
- Design
- Wiring and Electronics
- Quality Control
- Robotics Ambassador
- Game Strategy
- Robotics Control Systems
- Mechanical Engineering
- Build & Fabrication
- Systems Mentor

Renzo D.
Mentor

- Systems Mentor
- Electrical Engineering
- Build & Fabrication
- Wiring and Electronics
- Quality Control
- Robotics Ambassador
- Game Strategy
- Mechanical Engineering
- Design
- Robotics Control Systems



Isabel M.
Mentor

- Robot Driving
- Build & Fabrication
- Java Programming
- Quality Control
- Game Strategy
- Robotics Ambassador
- Robotics Control Systems
- Applied Mathematics
- Computer Science
- Systems Mentor
- Design
- FIRST Alumni
- FRC WPI Programming

Travis S.
Mentor

- Build & Fabrication
- Quality Control
- CAD Training
- Systems Mentor
- 3D Prints Mentor
- Game Strategy
- Mechanical Engineering
- Design

Madelene C.
Mentor

- Team Administrator
- Safety Coordinator
- Build & Fabrication
- Wiring and Electronics
- Quality Control
- Machine Training
- FIRST Alumni
- Systems Mentor
- Design
- Media Production

Robot showcase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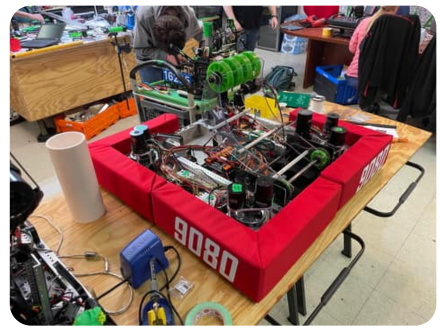

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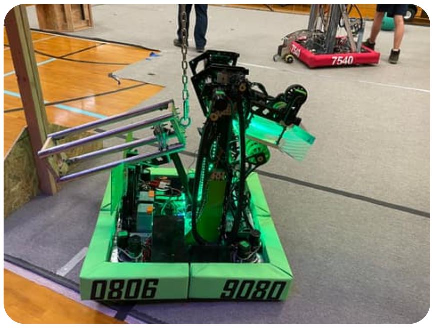

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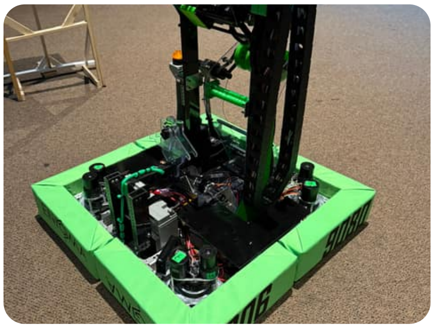

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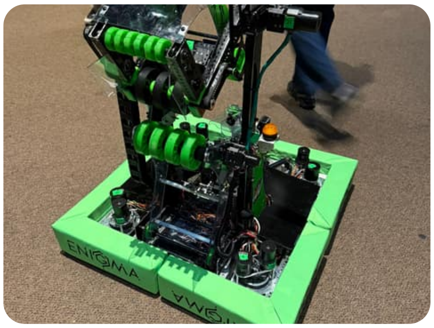

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Year in review

REEFSCAPE · Robot: J.P. Jones

Total hours invested: 2,560

OUR SEASON

ENIGMA continued its practice of creating meaningful sponsor relationships by allowing one of the team's supporters to choose the name of the season's robot.

The REEFSCAPE robot became J.P. Jones.

The name was more than a label placed on the frame. It gave the sponsor a personal connection to the season and gave students, volunteers, judges, and other teams an easy way to remember the robot.

Sponsor-selected robot names became part of ENIGMA's larger effort to offer recognition beyond a logo on a shirt or banner. A robot name follows the team throughout the season—in the shop, at competitions, in photographs, in match discussions, and in the team's historical record.

For the students, the name also reinforced an important truth: major supporters do not merely fund parts. They become part of the story those parts help create.
Moving From REV Swerve to MK4CRESCENDO proved that ENIGMA could build, program, and drive a swerve robot.

For REEFSCAPE, the students decided to move from REV MAXSwerve to Swerve Drive Specialties MK4 modules.

The change was intended to give J.P. Jones a stronger and more established drivetrain platform. The MK4 architecture was widely used across FRC and offered robust construction, flexible gearing options, and a substantial base of community knowledge.

The students believed the lessons learned during their first swerve season would make the transition manageable.

Mechanically, each module included a drive system, steering system, absolute encoder, and magnet used to determine the wheel's steering position. J.P. Jones needed all four modules to report accurate angles before the software could control them together.

The modules were assembled, installed, wired, and prepared for calibration.

Then the tuning problems began.
The Missing Encoder MagnetsSome of the steering-encoder magnets had not been glued securely into place.

The mistake was small enough to escape visual inspection but significant enough to prevent the affected modules from reporting stable steering positions. The programming team struggled to understand why offsets changed, why modules appeared inconsistent, and why J.P. Jones could not be tuned reliably.

Because the students initially assumed the problem was software, they spent valuable time checking code, calibration values, motor direction, encoder configuration, and control loops.

The actual failure was mechanical assembly.

The season taught the team a painful lesson: when a mechanism depends on a tiny component, that component is not minor.

A missing drop of adhesive could compromise an entire drivetrain.

The problem also raised a larger organizational question. Swerve modules are precise systems with many repeated assembly steps. Allowing too many students to work on them without a documented process made it harder to know who completed each step and whether it had been verified.

ENIGMA concluded that future swerve assembly should be handled by a smaller, specifically trained group using clear checklists and independent inspection.

This did not mean excluding students from learning. It meant separating training from final competition assembly and ensuring that critical components were built under controlled procedures.
A Robot Built Around CORAL PlacementREEFSCAPE rewarded alliances for placing CORAL on the branches of the Reef.

ENIGMA built J.P. Jones's primary scoring system around raising CORAL vertically and positioning it against the scoring branches.

A pair of SWYFT slide assemblies ran along opposite sides of the mechanism. Between them sat the CORAL manipulator.

The dual-sided lift created a wide and relatively stable support structure. The slides worked well mechanically and provided the vertical reach needed to access multiple Reef levels.

However, each side was driven independently.

That decision created a synchronization problem.
Two Elevator Motors, One MechanismThe left and right SWYFT slide systems each had their own motor.

In theory, commanding both motors identically should have raised the mechanism evenly. In reality, small differences appeared because of motor performance, friction, slide alignment, load distribution, voltage, mechanical resistance, encoder error, and starting position.

Even a slight difference between the two sides could cause the lift to rack, twist, or bind.

The team learned that mechanically linking both sides with a shaft would have forced them to move together. One motor or a synchronized transmission could then raise both slide assemblies in unison.

Independent motors can work when sophisticated feedback keeps both sides synchronized, but that increases programming complexity and leaves more opportunities for one side to drift.

The SWYFT slides themselves were not the problem. The lesson was in how the team chose to drive them.
One Mechanism or Two?Early in the design process, the students hoped to create one mechanism capable of manipulating both CORAL and ALGAE.

A universal mechanism seemed attractive. It could reduce weight, use fewer actuators, simplify packaging, and avoid placing two separate systems on J.P. Jones.

The team explored ideas including a round carbon-fiber slide and a concept called the X-Claw.

The X-Claw was imagined as a manipulator that could adapt to the long cylindrical CORAL and the large spherical ALGAE. The carbon-fiber extension concept could provide reach while remaining relatively light.

As the students examined the geometry and forces involved, the challenge became clearer.

CORAL needed controlled orientation and accurate placement onto narrow branches. ALGAE needed to be removed from the Reef, retained, and delivered to a different scoring target.

The objects differed in shape, diameter, rigidity, contact area, required grip, scoring orientation, and scoring location.

The team ultimately separated the tasks into two mechanisms.

That made each mechanism easier to understand and tune, but it increased robot weight, complexity, wiring, and packaging demands.

The experience reinforced an important design principle: a universal mechanism is valuable only when it can perform both tasks reliably. Combining functions merely to reduce mechanism count can produce a complicated system that performs neither task well.
ALGAE and the ProcessorJ.P. Jones's ALGAE mechanism could remove ALGAE from the Reef and deliver it to the Processor, the lower field-level scoring location.

The robot could not score ALGAE into the elevated Net.

This limited ENIGMA's ALGAE scoring potential but still gave the team a useful secondary role. Removing ALGAE opened Reef locations for CORAL, while delivering it to the Processor contributed points without requiring the reach and launch capability needed for the Net.

The decision also reflected the season's practical limits.

A Net-capable ALGAE launcher would have required more development time, space, weight, control, and testing. With the CORAL elevator, drivetrain, autonomous, and climbing system already demanding attention, the team could not reliably add every possible capability.

Coming Up Short at the TopAt the first competition, ENIGMA discovered that J.P. Jones's CORAL mechanism was slightly too short for comfortable placement on the highest Reef branches.

The robot could technically reach the top level, but the margin for error was extremely small.

The drive team needed near-perfect alignment, and minor differences in robot position, slide height, branch angle, or CORAL orientation made scoring difficult.

The experience showed the difference between being able to reach and being able to score reliably.

A mechanism that reaches a target by a fraction of an inch in the shop may not provide enough tolerance at competition. Real matches introduce carpet variation, bumper compression, frame movement, defense, driver perspective, mechanism flex, and field assembly tolerances.

J.P. Jones performed more consistently on the middle Reef levels, where the geometry gave the drive team a larger window for success.

Flipping the MechanismThe students reconfigured the CORAL mechanism by flipping it over.

The new orientation made middle-level placement more consistent and gave the drive team a more forgiving approach to the Reef.

This was a practical adaptation. Rather than continuing to chase unreliable top-level scoring, the team improved the task J.P. Jones could perform repeatedly.

The new orientation, however, introduced an unintended side effect.

The mechanism occasionally contacted ALGAE in a way that caused the inflatable game pieces to rupture.

The students had improved one part of the robot's performance while creating a new interaction problem.

This became another reminder that every mechanism operates within the complete field environment. Changing the orientation of a CORAL manipulator also changes its clearances, contact points, and relationship with nearby ALGAE.

Hanging From the CageREEFSCAPE's endgame required robots to interact with hanging Cages.

ENIGMA created a winch-based climbing system for J.P. Jones and initially used Kevlar kite string.

Kevlar appeared to offer several advantages:

High tensile strength

Low stretch

Light weight

Small diameter

Familiarity from prior string-driven mechanisms

But climbing an FRC robot introduces substantial static and dynamic loads. The string experienced tension, bending around guides, repeated loading, abrasion, and possible shock when the robot's weight transferred onto the system.

The Kevlar string eventually broke.

The failure taught the team that published tensile strength does not fully describe how a cord will perform in a real mechanism. Knots, small-radius turns, abrasion, uneven loading, attachment methods, and impact can dramatically reduce effective strength.

The team replaced or supplemented the string with a tow strap, providing a wider and more durable load path.
Guiding the CageAligning J.P. Jones with the Cage was another challenge.

The driver needed to position the climbing mechanism precisely while viewing the field from a distance and dealing with traffic during the final seconds of the match.

ENIGMA added guides that helped funnel the Cage into the desired position.

The guides reduced the alignment precision demanded from the driver and made the climbing process more repeatable.

This reflected a broader principle the team had encountered across several seasons: whenever possible, use geometry to make the correct action easier.

A mechanism should not rely on perfect driving when a guide, funnel, hard stop, or alignment feature can create mechanical forgiveness.
Autonomous StrugglesReliable autonomous operation remained a major weakness for J.P. Jones.

The team struggled to establish routines that could consistently leave the starting area, navigate to game pieces or scoring locations, and operate mechanisms without failure.

Several factors contributed:
Swerve calibration problems
Encoder issues
Mechanical breakdowns
Limited full-field testing
Mechanism inconsistency
Repeated robot changes
Insufficient programming time
Difficulty reproducing competition conditions
Position-control challenges
Every mechanical redesign created additional programming work. Every drivetrain problem reduced the time available for autonomous development.

The season reinforced that autonomous cannot be left until the robot is mechanically "finished." In FRC, the robot is rarely finished early enough.

Programming needs a stable drivetrain, representative mechanisms, test time, and clear priorities well before the first event.

Twelve Quarter BumpersNew bumper rules gave the team an opportunity to rethink how J.P. Jones's bumpers were constructed and changed.

ENIGMA built quarter bumpers—individual sections covering each corner or side segment rather than relying on one large bumper assembly.

The team produced twelve sections:
Four red
Four blue
Four green for outreach
The quarter-bumper approach made individual pieces easier to handle, repair, store, and replace.

The green set created a distinctive outreach appearance without requiring competition alliance colors.

Building twelve separate pieces required attention to consistency. Each section needed correct dimensions, backing, padding, fabric tension, mounting, numbers, and corner relationships.

The bumper project became a manufacturing exercise of its own.

Belton: A Difficult Robot That Kept FightingJ.P. Jones's first official competition was the FIRST in Texas Belton District Event.

The robot experienced frequent breakdowns, and the qualification results reflected the team's difficulty maintaining consistent performance.

ENIGMA finished qualifications ranked 30th.

Despite the ranking, Team 9080 was selected as the second pick of Alliance 7 by captain Team 6243 and first selection Team 5892.

The alliance won its first playoff match, lost in the upper bracket, recovered with a lower-bracket victory, and survived a tied match before being eliminated in Round 4 of the double-elimination bracket.

ENIGMA finished the event with a 7–9 record.

The team also earned the Quality Award.

At first, that award might seem surprising during a season marked by failures. Yet quality in FRC is not synonymous with never breaking. It includes thoughtful construction, maintainability, workmanship, organization, and the ability to recover.

J.P. Jones's SWYFT slide structure, modular systems, bumper work, drivetrain architecture, and continued repair effort demonstrated substantial engineering growth.

Amarillo and a Season of Bad BreaksThe Amarillo District Event was difficult from the beginning.

ENIGMA finished qualifications ranked 33rd with a 3–9 record and was not selected for the playoffs.

The event included several incidents that tested the team's patience and professionalism.

During one match, ENIGMA received a yellow card for a foul involving another team. The students believed J.P. Jones had not been near the cited incident because the robot was attempting to climb elsewhere on the field.

Alliance partners and members of the opposing alliance also stated that ENIGMA could not have caused the contact.

The team protested, but the original call stood during the event.

The following day, officials acknowledged that the initial attribution had been mistaken. However, the yellow card remained associated with a separate incident in which J.P. Jones had ruptured an ALGAE game piece.

The experience was frustrating. Even after part of the decision was corrected, the competitive consequence could not be fully erased.
The Loose TurnbuckleA second incident occurred during another hanging attempt.

A field turnbuckle had not been fully tightened during field reset. The loose component became caught on J.P. Jones.

The team was initially assessed a foul.

ENIGMA's students and mentors believed the problem resulted from field setup rather than an illegal robot action. They calmly explained what had happened and continued the discussion through the appropriate event channels.

The issue eventually required consultation with FIRST headquarters.

Officials determined that the turnbuckle condition was a field fault, and the call was corrected.

The process taught the students that advocacy matters, but how a team advocates matters just as much.

They needed to remain calm, describe observable facts, avoid attacking volunteers, use the proper question process, gather supporting information, allow officials time to investigate, and accept the final decision.
Rough Competitions HappenBy the end of Amarillo, the team understood that every program eventually experiences an event where many things go wrong at once.

Mechanical failures, unfavorable schedules, disputed calls, field problems, damaged game pieces, and missed opportunities can accumulate quickly.

A team cannot control all of those events.

It can control whether members blame one another, mistreat volunteers, abandon their alliance partners, or stop trying to improve.

REEFSCAPE taught ENIGMA that adversity does not automatically build character. It reveals the character and habits already present.

The team left Amarillo disappointed, but together.
Four Juniors and the Question of LegacyFollowing the season, ENIGMA surveyed its students.

Four juniors were approaching their final year in the program. They were asked what they wanted to leave behind and what they would change during the next season.

The conversation shifted the focus from one difficult competition to the future of the team.

The students discussed the importance of:
Better build documentation
Tighter quality control
Trained subsystem leads
Earlier programming access
More autonomous testing
Clearer design priorities
Better mechanical synchronization
Improved inspection checklists
Sharing drive-team knowledge
Teaching younger members
Building for serviceability
Preserving team culture
Legacy was not defined as building one impressive senior-year robot.

It meant leaving behind systems that would allow the next group of students to succeed after the current leaders graduated.

GOALS

Give J.P. Jones a Distinct IdentityThe sponsor-selected name gave the season's robot a personal identity and gave one of ENIGMA's supporters a meaningful connection to the team's work.

The team wanted sponsor recognition to feel memorable rather than transactional.
Build a More Robust Swerve DrivetrainThe move to MK4 modules was intended to build on the previous year's swerve experience.

The team wanted greater mechanical robustness, strong community support, and a drivetrain that could remain competitive over multiple seasons.
Improve Quality ControlAfter the encoder-magnet issue, ENIGMA recognized that assembly quality needed to become a formal goal.

Critical mechanisms would need:
Defined builders
Step-by-step checklists
Torque and adhesive verification
Second-person inspection
Module identification
Calibration records
Pre-event checks
Score CORAL at Multiple Reef LevelsThe team wanted J.P. Jones to place CORAL at the middle and highest levels of the Reef.

Although the robot could reach the upper branches, middle-level scoring became the more reliable strategy.
Manipulate ALGAEENIGMA wanted J.P. Jones to remove ALGAE from the Reef and contribute to ALGAE scoring.

The final system could deliver ALGAE to the Processor but not launch it into the Net.
Explore a Universal ManipulatorThe round carbon-fiber slide and X-Claw concepts represented an early goal of handling both game pieces with one mechanism.

The team later separated the systems after concluding that the tasks required different geometry.
Develop a Reliable ElevatorThe SWYFT slides needed to raise the CORAL mechanism smoothly and remain synchronized.

Future designs would mechanically link the sides or use more deliberate closed-loop synchronization.
Climb ReliablyJ.P. Jones needed a hanging mechanism capable of lifting the robot onto a Cage.

The Kevlar failure led to the stronger tow-strap solution and improved Cage guides.
Establish Functional Autonomous RoutinesAutonomous needed to become a season-long development priority rather than a late-stage addition.
Improve MaintainabilityFrequent breakdowns reinforced the need for better access, standard hardware, spare parts, modular wiring, inspection routines, faster diagnosis, and clear subsystem ownership.
Develop the Next GenerationWith four juniors becoming seniors, the team wanted to transfer knowledge before graduation.
Respond Professionally to AdversityThe team wanted students to advocate for themselves while continuing to respect referees, field crews, inspectors, and volunteers.

Lessons learned

Quality Control Must Be DesignedQuality does not happen because students care or work hard.

It requires repeatable procedures.

The missing encoder adhesive showed that even skilled and motivated students can overlook a small step when responsibility is unclear.
Fewer Builders Can Produce More ConsistencyCritical repeated assemblies should be completed by a focused group trained to follow one process.

Other students can learn through practice modules, supervised work, and inspection roles without creating uncertainty in final competition hardware.

Check Hardware Before Rewriting SoftwareWhen sensors behave inconsistently, the problem may be physical.

The team spent time investigating code before discovering the encoder-magnet problem.

Future troubleshooting would begin with power, wiring, mounting, mechanical connection, and sensor integrity before assuming a software defect.

Independent Motors Do Not Move IdenticallyTwo motors receiving the same command can still produce different movement.

Mechanically connecting both elevator sides would have reduced synchronization problems.

Design for Tolerance, Not Barely Enough ReachJ.P. Jones's CORAL mechanism could technically reach the upper branches but lacked a comfortable scoring margin.

A competitive mechanism needs room for driver and field variation.

Improving One Task Can Harm AnotherFlipping the CORAL mechanism improved middle scoring but increased unwanted ALGAE contact.

Every change needs complete-system testing.

Game Pieces Are Part of the Design EnvironmentMechanisms must avoid damaging game pieces even when the contact is accidental.

The team needed better geometry, limits, and awareness around inflated ALGAE.

Published Cord Strength Is Not the Whole StoryKevlar can be extremely strong, but abrasion, knots, bending radius, and shock loads change real-world performance.

Use Wide Load Paths for ClimbingThe tow strap distributed load more effectively and resisted abrasion better than thin string.

Guides Reduce Driver PrecisionThe Cage guides made alignment easier and more repeatable.

Autonomous Needs Early StabilityProgrammers cannot develop reliable routines while drivetrain calibration and scoring geometry are constantly changing.

Build for RepairA robot that breaks repeatedly must be easy to access and diagnose.

Referees Can Make MistakesHuman judgment is part of competition.

Teams need to know how to raise questions appropriately without allowing anger to define their behavior.

Field Faults Require EvidenceThe turnbuckle issue was corrected because the team could explain the physical condition and follow the escalation process.

Correcting a Call May Not Undo Every ConsequenceThe yellow-card experience showed that event decisions can remain complicated even after an error is acknowledged.

Rough Events Are TemporaryOne competition does not define an entire team or season.

Sponsor Relationships Should Feel PersonalNaming J.P. Jones gave a supporter a visible and lasting connection to the season.

The team learned that creative sponsor recognition can make community members feel like genuine participants in the program rather than outside donors.
Legacy Requires SystemsPassing knowledge through conversation alone is not enough.

The team needed documentation, training, checklists, code organization, spare-parts plans, and opportunities for younger students to lead.

Skills and growth

MK4 Swerve AssemblyStudents learned the mechanical construction and maintenance of Swerve Drive Specialties MK4 modules.
Absolute Encoder InstallationThe team gained direct experience with encoder magnets, mounting, calibration, and the importance of mechanical retention.
Quality-Control ChecklistsThe swerve problems provided the foundation for more formal assembly and inspection procedures.
SWYFT Slide IntegrationStudents learned how to package long vertical motion on both sides of a manipulator.
Elevator SynchronizationThe independently powered slides taught the team why matched commands do not guarantee matched movement.
Mechanical LinkingStudents recognized the value of a shaft or common transmission for keeping elevator sides synchronized.
CORAL ManipulationThe team learned about controlling a long, hollow game piece while positioning it accurately on narrow branches.
ALGAE ManipulationStudents developed mechanisms for removing and transporting a large inflatable game piece.
Processor ScoringJ.P. Jones contributed ALGAE at the lower Processor target.
Multi-Mechanism DesignThe team evaluated whether one system or two specialized systems offered the best performance.
Carbon-Fiber ConceptsThe round carbon-fiber slide concept introduced discussions about stiffness, weight, bearing surfaces, attachment methods, and nontraditional linear motion.
X-Claw DevelopmentThe X-Claw idea encouraged students to think about adaptive geometry and gripping unlike objects.
Climbing LoadsThe Cage system taught students about full-robot weight, winch forces, attachment points, shock loading, and safety factors.
Cord and Strap SelectionStudents compared thin high-strength line with wider webbing under real mechanical conditions.
Bumper ManufacturingThe twelve quarter bumpers required repeatable cutting, padding, wrapping, numbering, and mounting.
Sponsor Recognition and StorytellingThe J.P. Jones name gave students another example of turning sponsor support into a memorable story connected directly to the robot.

They learned that fundraising, branding, and engineering history can reinforce one another.
Field-Fault AdvocacyStudents learned how to communicate with event officials using facts and proper procedures.
Failure AnalysisFrequent breakdowns developed the team’s ability to identify root causes rather than only replace damaged parts.
Team Survey and ReflectionThe postseason survey gave students practice evaluating not just the robot, but team structure, culture, and future priorities.

Legacy PlanningThe four juniors began identifying the knowledge and responsibilities they needed to transfer during their senior year.

Growth Beyond J.P. JonesREEFSCAPE taught ENIGMA to ask more disciplined questions:

Who is responsible for this assembly?

How will we verify every critical step?

Is this problem mechanical, electrical, or software?

Are two motors actually synchronized?

Do we have enough tolerance to score under match conditions?

What else can this mechanism contact?

Has the climbing system been tested at full load?

Can programmers begin before the robot is complete?

How will we respond when an official decision seems wrong?

How do we make sponsors feel connected to the students?

What systems will remain after current leaders graduate?

Those questions represented a team moving beyond experimentation toward sustainable engineering practice.

Competitions

FIRST in Texas District Belton Event

Mar 8, 2025 · Candence Bank Center - Belton Texas

Quality Award, 7th Alliance 1st Pick

The Belton District Event was J.P. Jones's first official competition and the first full test of ENIGMA's MK4 swerve drivetrain, dual-SWYFT-slide CORAL mechanism, ALGAE system, and Cage-climbing design.

The event quickly revealed that the robot's reach and alignment margins were tighter than expected. J.P. Jones could place CORAL on the highest Reef branches, but doing so required extremely precise positioning. The drive team found greater consistency on the middle levels, where the scoring window was more forgiving.

Mechanical and programming issues continued throughout qualifications. The team was still dealing with swerve calibration, elevator synchronization, autonomous development, and repeated subsystem failures.

ENIGMA completed qualification matches ranked 30th.

Despite the low ranking, Alliance 7 captain Team 6243 and first selection Team 5892 recognized value in Team 9080 and selected J.P. Jones as their third robot.

The alliance opened the playoffs with a 131–94 victory. After a 62–49 upper-bracket loss, the teams recovered with a 91–86 lower-bracket victory. Their next match ended in a 78–78 tie, after which the alliance was eliminated from the tournament in Round 4.

ENIGMA finished Belton with a 7–9 record.

The team also earned the Quality Award.

That recognition reflected the students' design growth, custom mechanism work, maintainability, and determination to keep repairing J.P. Jones despite a difficult event.

Belton gave ENIGMA a clear direction for the remainder of the season. The team needed to improve CORAL-scoring tolerance, protect ALGAE from accidental contact, synchronize the elevator, strengthen the climbing system, and devote substantially more time to autonomous reliability.

FIRST in Texas District Amarillo Event

Mar 29, 2025 · Amarillo Civic Arena

3–9 record, Ranked 33rd

The Amarillo District Event became one of the most difficult competitions ENIGMA had experienced.

The team arrived with changes intended to improve J.P. Jones's middle-level CORAL placement and climbing reliability. The CORAL mechanism had been reoriented, and the climbing system incorporated a tow strap and guides to make alignment with the Cage easier.

However, the robot continued to experience breakdowns, autonomous inconsistency, and difficult match results.

ENIGMA completed qualifications with a 3–9 record and ranked 33rd. The team was not selected for the playoffs.

The event also included two challenging officiating and field incidents.

In one match, ENIGMA received a yellow card associated with a foul involving another robot. Team members believed J.P. Jones had not been near the incident because the robot was attempting to climb elsewhere on the field. Alliance partners and members of the opposing alliance also stated that ENIGMA could not have caused the cited interaction.

Officials later acknowledged that the original attribution had been mistaken. However, the yellow card remained associated with a separate incident involving a ruptured ALGAE game piece.

In another match, a field turnbuckle that had not been tightened fully during reset became caught on J.P. Jones during a hanging attempt. The team was initially assessed a foul.

ENIGMA calmly presented the physical evidence and continued the discussion through the event's official process. After consultation with FIRST headquarters, the incident was recognized as a field fault and the call was corrected.

Neither situation was easy for the students.

They learned that teams sometimes experience events where mechanical trouble, unfavorable outcomes, field conditions, and disputed decisions all accumulate.

The defining question was not whether every call went ENIGMA's way. It was whether the students remained respectful, supported their partners, continued repairing J.P. Jones, and represented their team well.

Amarillo ended without playoffs or awards, but it produced lessons that would influence the team's next season: stronger quality control, clearer subsystem ownership, mechanically synchronized lifts, earlier autonomous development, greater scoring tolerance, full-load climb testing, and more disciplined legacy planning.

Outreach

The J.P. Jones SponsorshipNaming the robot J.P. Jones gave ENIGMA another example of how sponsorship can become part of a team's story.

The name appeared in conversations about the robot, competition recaps, photographs, demonstrations, and the historical record of the season.

This gave the sponsor recognition that was more personal than standard logo placement and gave students an opportunity to explain how community support makes FRC participation possible.
Green Outreach BumpersThe green quarter-bumper set gave J.P. Jones a distinct ENIGMA identity during demonstrations.

Without competition requirements for red or blue alliance colors, the outreach bumpers connected the robot visually with the team's established green branding.

They also made it easier to explain bumper construction, modularity, and the differences between competition and demonstration configurations.
Demonstrating Multiple Game TasksJ.P. Jones could demonstrate:
Swerve movement
CORAL placement
ALGAE removal
Elevator motion
Climbing concepts
Vision and autonomous development
Bumper construction
Even where systems had struggled in competition, they provided useful teaching examples.

Students could explain not only what worked, but why mechanisms failed and how they would redesign them.
Sharing Lessons HonestlyThe encoder magnets, asynchronous elevator, broken Kevlar line, and difficult autonomous development became valuable outreach stories.

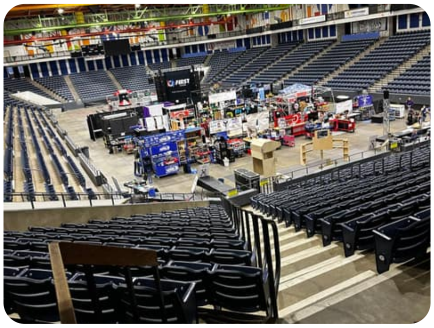
Young students often see only finished robots. ENIGMA could show that engineering includes mistakes, investigation, repair, and revision.
Supporting Volunteers Through Respectful AdvocacyThe Amarillo incidents reinforced that referees and field crews are volunteers working in a difficult environment.

ENIGMA learned that teams can question a call firmly while still treating the people involved with respect.

That lesson became part of the team's broader culture of Gracious Professionalism.
Preparing Future Alumni MentorsThe four juniors began thinking about how they would support ENIGMA after their final student season.

Legacy planning created a bridge between student leadership and eventual alumni mentorship.

Season highlights



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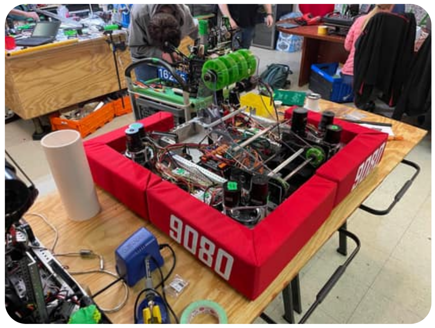

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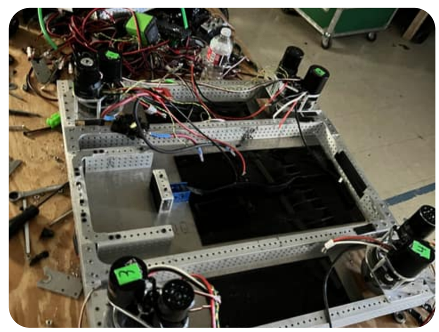

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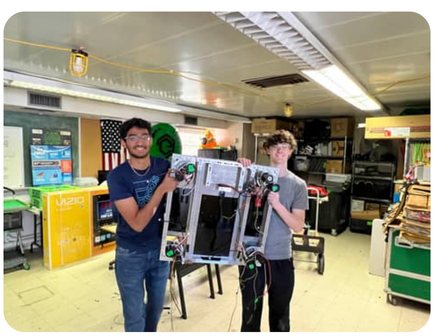

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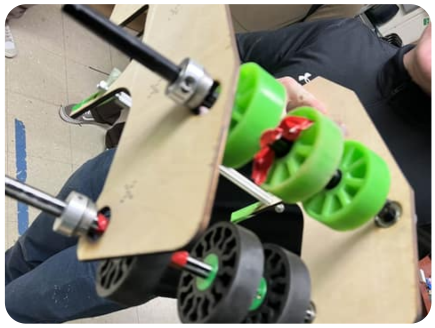
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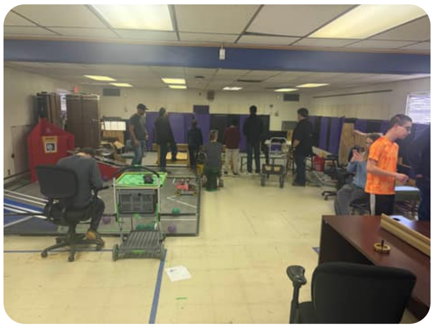
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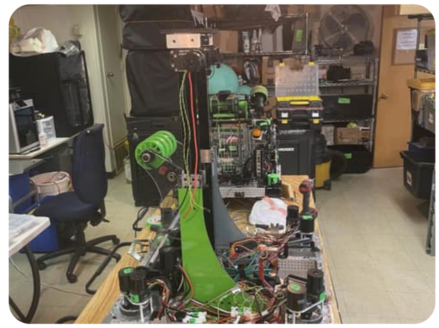
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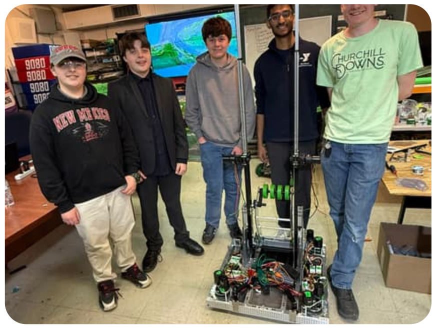

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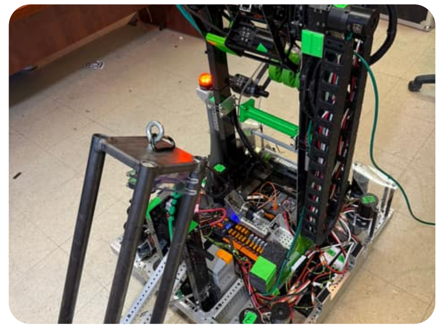

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