ENGINEERING PORTFOLIO

TEAM 33536 · ERROR 404: TEAM NAME NOT FOUND

DECODE presented by RTX · 2025–2026 Season



ERR-AA — our ARTIFACT-launching ROBOT

10	**1**	**1**
student members	only Dutch team at the Lisbon Scrimmage	new team started abroad, in Norway

Ter AA · Helmond, The Netherlands

www.ftc-error404.nl · linkedin.com/company/ftc-team-error404 · @ftc.teamerror404

Who We Are

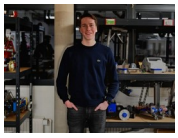
Team Intro

FTC Team Error 404: Team Name Not Found is a driven and enthusiastic robotics team from Ter AA in Helmond, made up of young technical talent with a passion for innovation and technology. This is our first season competing in the FIRST Tech Challenge, though a few members bring prior FTC experience, so knowledge and experience are actively shared across the team.

Together we design, build, and program a competitive ROBOT, with teamwork, creativity, and problem-solving at the center of everything we do.



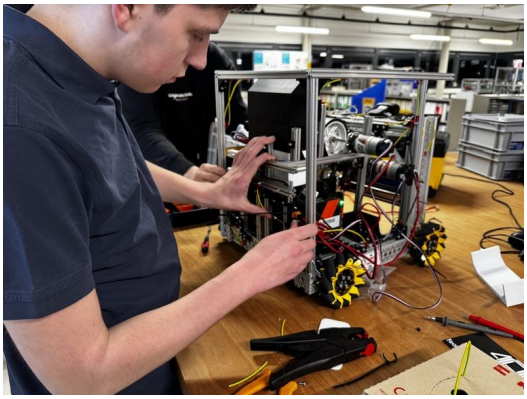
Team Error 404 at Ter AA, Helmond



Ruben Hendrikx
Tech Talent Team Leader — coordinates the team process and serves as a national MBO ambassador on behalf of Ter AA.



Kevin Nielen
Team Captain & First Driver — co-founded Ter AA's first FTC team.



Hands-on Engineering

Every team member gets real wrench-time on the ROBOT, not just a title. Thom Sniekers, our Lead Engineer for the ERR-AA, is introduced along with the rest of our team members on the next page.

Innovation & Technique

Combining creative thinking with technical knowledge for smart ROBOT solutions within DECODE.

Teamwork & Collaboration

One team where knowledge, experience, and ideas are shared to get the best out of each other.

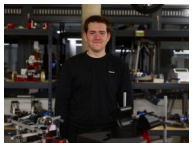
Learning & Growing

A first FTC season, but with prior experience on the team to learn from and build on.

Our Story So Far

We started the season as ten students who had never built a competition ROBOT together. By the time you finish reading this portfolio, you'll have seen us design a launcher from scratch, take that ROBOT to Eindhoven and Lisbon, and help spark new FTC teams in Norway, Deurne, Uden, and Boxmeer — all in one first season.

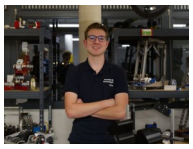
Members & Mentors

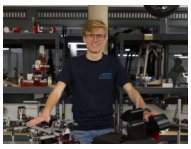

Sam Leenen


Kevin v.d. Broek


Kevin v. Gerwen


Jelle Manders


Floris Zweers


Tim Steijvers


Thom Sniekers



Sen (Norway)

Our team operates according to a clear team plan: we assign tasks, set goals, and plan our projects from conception to execution — so everyone can use their talents optimally despite our limited experience and resources.

Industry Mentors

We receive guidance from Industry Mentors — professionals who advise us on design, ROBOT construction, programming, and strategy, helping us avoid pitfalls and develop innovative solutions.

Cas Candel & Hidde van Erp

Cas: mechanical, electrical & CAD mentor, former FRC team Rembrandts participant. Hidde: technical business mentor who facilitates the team's setup, recruits new members, and provides technical support as a qualified MBO/HBO instructor.

Jenny van Waveren-Meijer

Communications and marketing strategist — helps us tell our story clearly, from our website to this portfolio.

How We Work Together

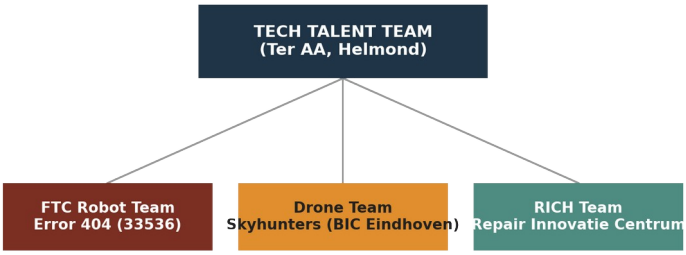
Weekly build sessions are split between mechanical, electrical, and software sub-teams, with a standing Friday check-in where every sub-team reports blockers before the weekend push.

Growing Our Own Bench

Several members joined this season with zero robotics background and are now confident running CAD assemblies, wiring subsystems, or driving in competition — the same growth mindset we now try to pass on to Deurne, Uden, Boxmeer, and our new Norwegian team.

Tech Talent Team & Our Sponsors

FTC Team Error 404 is one of three student teams under Ter AA's Tech Talent Team — a program that gives ambitious students room and support to grow beyond their study and work.



FTC Robot Team

Error 404 — our own team, building a strong first year of teamwork, planning, building, and programming.

Drone Team — Skyhunters

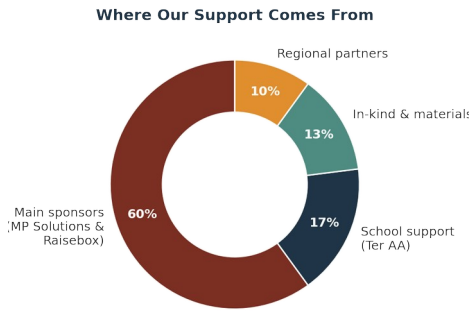
Travels weekly to BIC Eindhoven for the Drone Challenge with companies like KMWE, ASML, and Siemens.

RICH Team

Reparatie Innovatie Centrum Helmond — repairs equipment, connected to the international Repair Café network.

Our Sponsors

- Ter AA — our school and home base
- MP Solutions & Raisebox — main sponsors
- Foodtech Brainport · Trivisueel · Aldenzee
- Aluworkx · Willem van Oranje College



Where our support comes from

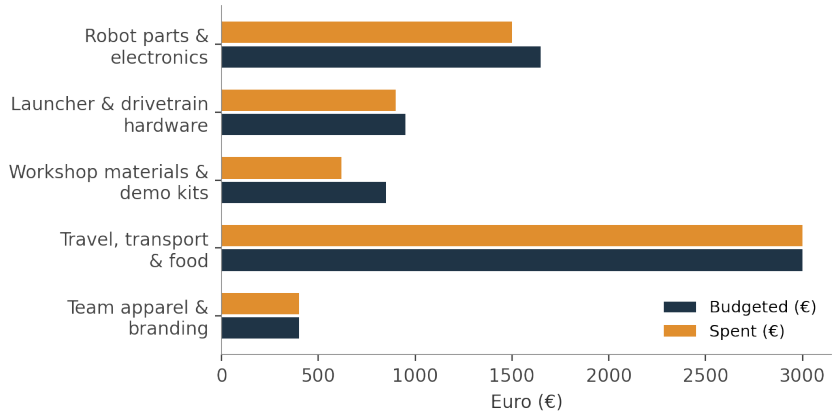
Our Budget

Our Budget

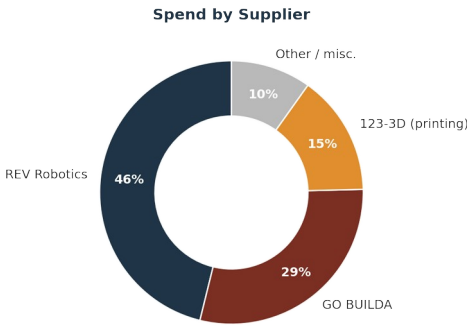
As a small school team, we have a limited budget, which makes it challenging to finance all the materials, parts, and tools needed for the ROBOT. This means we work creatively and efficiently, prioritize, and often improvise our own solutions.

No Challenge, No Solution

Limitations also create opportunities. By making smart use of the resources we have, team members develop technical skills as well as problem-solving, collaboration, and perseverance.



Budgeted vs. spent by category (€)



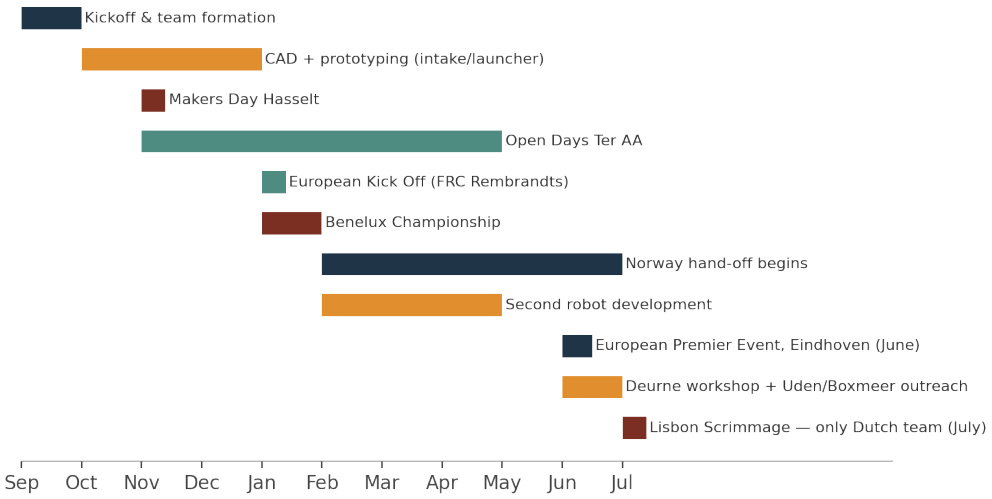
Spend by supplier

Where It Goes

Main purchases run through REV Robotics and GO BUILDA for ROBOT hardware, and 123-3D for rapid prototyping, supplemented by miscellaneous parts and consumables as needed.

From Kickoff to Lisbon

Our first FTC season packed in ROBOT development, outreach across two countries, three regional team-building efforts, a Premier Event appearance in Eindhoven, and an international scrimmage in Lisbon — all between September and July.



Team 33536 — 2025–2026 season timeline

~800
people met through outreach
open days, Makers Day Hasselt & regional workshops

1
only Dutch team
at the Lisbon Scrimmage, Portugal

1
new international team
kick-started in Norway

A Season That Never Really Slowed Down

From CAD sketches in September to a scrimmage in Lisbon in July, there was rarely a quiet month. Build season fed straight into competition season, and competition season fed straight into outreach — every event became a chance to test ERR-AA against new opponents and bring fresh ideas back to Helmond.

From Norway to Deurne, Uden & Boxmeer

A New Team Abroad: Norway

This season we welcomed Sen, an exchange student from Norway who joined us at Ter AA. What started as one student joining our build sessions grew into a plan to bring FIRST Tech Challenge home: we shared our onboarding materials, CAD files, and budgeting template, plus weekly calls to support the hand-off.

By season's end, Sen had recruited a small founding group in Oslo, Norway and registered interest with FIRST Scandinavia for next season.

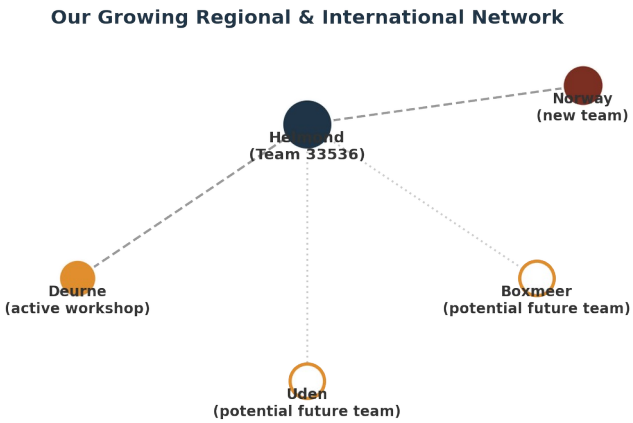


Sen (center) with Floris and Kevin, repping Ter AA

Sparking Interest Closer to Home

We also want Deurne, Uden, and Boxmeer to have their own FTC teams. We ran a hands-on workshop in Deurne, bringing a spare drivetrain so students could drive a ROBOT for the first time — teachers there are now coordinating a founding team for next season.

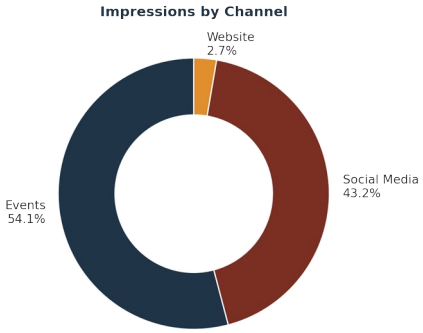
Uden and Boxmeer are potential future teams: we've made first contact with interested students and shared our CAD starter files and sponsorship approach, and we plan to follow up with dedicated workshops next season if interest holds.



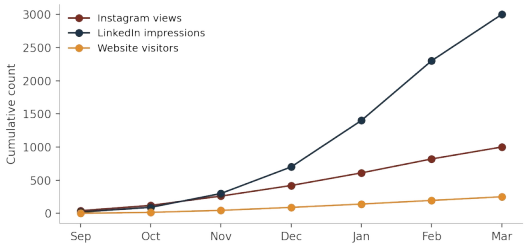
Our growing regional & international network

Rockstars of Ter AA

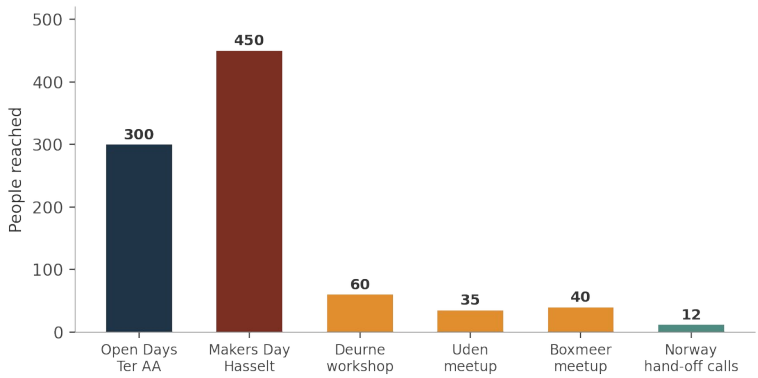
Team Error 404: the FTC rockstars of Ter AA. We are not just a school team — we live, breathe, and build ROBOTS. This season, DECODE presented by RTX gave us our first taste of FIRST Tech Challenge, and we made an impact within our school and at international events.



Impressions by channel



Social & web growth across the season



People reached, by activity

Events & Publicity This Season

- Open days at Ter AA · European Kick Off (FRC Rembrandts) · Knipping Gears
- Makers Day Hasselt & the Lisbon Scrimmage (next page)
- Deurne workshop, Uden & Boxmeer outreach, and our Norway hand-off

Makers Day Hasselt

Representing FIRST Abroad

On behalf of FIRST, Team Error 404 travelled to Belgium to help run Makers Day in Hasselt — a public maker and technology festival bringing together robotics teams, schools, and hobbyists from across the region.

We ran a hands-on demo stand where visitors of all ages could drive our ROBOT, launch foam ARTIFACTS into a practice GOAL, and ask us what FIRST Tech Challenge is about.



Our demo stand at Makers Day, Hasselt

What We Did

- Staffed a full-day interactive demo stand for FIRST
- Let hundreds of visitors drive-test our ROBOT
- Explained DECODE game rules to newcomers of every age
- Connected with FRC Team Rembrandts and other regional teams

What We Learned

Running a booth for a full festival day — under time pressure, in public, representing FIRST rather than only ourselves — taught us as much about communication and teamwork as any build session. It's also where the team friction described later in this portfolio happened.

Impact

Makers Day Hasselt gave us our largest single-day audience of the season and directly fed the momentum behind our Norway and Deurne/Uden/Boxmeer outreach.

Eindhoven & Lisbon

European Premier Event — Eindhoven (June)

Our biggest milestone was competing at the European Premier Event, hosted at the Indoor Sportcentrum in Eindhoven and organised by Stichting STEAMup, the FIRST Tech Challenge Benelux license holder. Sharing the field with teams from across Europe and beyond — from Greece to Kazakhstan to Hong Kong — was our first taste of FTC at this level.



Final adjustments before taking the field

Lisbon Scrimmage — The Only Dutch Team (July)

The following month we travelled to Portugal to take part in the Lisbon Scrimmage — and we were the only Dutch team on the field. Scrimmages are unofficial FTC events, giving teams a lower-pressure chance to test strategy, driving, and autonomous routines against unfamiliar opponents.

Being the sole Dutch team meant every match was also an outreach moment: explaining where we're from, how Tech Talent Team works, and what DECODE looks like through Dutch eyes, alongside Portuguese and international teams we'd never met before.

105
teams in Eindhoven
from across Europe and further afield

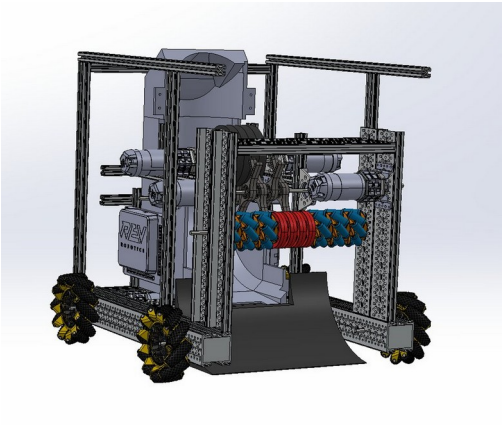
8
qualifier matches
played by our team in the qualifiers at Eindhoven

1
of 1 Dutch teams in Lisbon
we were the only Dutch team at the scrimmage

Why We Travel to Compete Abroad

Every international event is also a scouting trip for ideas: drivetrain choices, launcher geometry, pit organization, and driver-station habits we don't see at home. We bring what we learn straight back into ERR-AA and into how we mentor teams in Deurne, Uden, Boxmeer, and Norway.

ERR-AA V1



Our Robot Is in Full Development

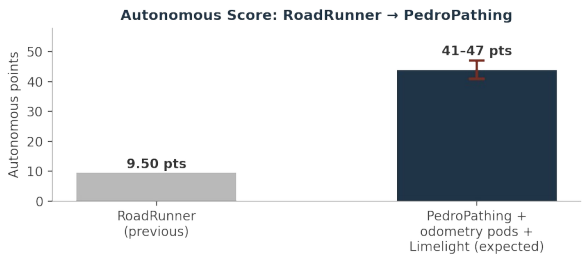
For our first season, we built ERR-AA — pronounced 'erra' — named after our team and our main partner, Ter AA.

ERR-AA was developed for DECODE presented by RTX through mistakes, trial and error, and continuous improvement, balancing launcher accuracy, intake capacity, and ARTIFACT throughput.

Autonomous: From RoadRunner to PedroPathing

Our autonomous routines originally ran on RoadRunner. This season we switched to PedroPathing, paired with new odometry pods and a Limelight camera for real-time vision-based localization. The combination gives ERR-AA far more precise and repeatable autonomous paths.

Based on our testing so far, we expect a massive increase in autonomous scoring — from 9.50 points on our old RoadRunner setup to an expected 41–47 points with PedroPathing.



Expected autonomous score improvement



Every frame piece wired together, with a resistive grounding strap to bleed off static charge

Solving Electrostatic Discharge (ESD)

Early in the season we ran into a problem we hadn't expected: electrostatic discharge building up in the frame was causing our electronics to reset and behave unpredictably mid-match. We traced it back to static charge accumulating across the metal frame with nowhere safe to go.

We fixed it by connecting every single frame piece to every other frame piece with wires, and adding one resistive grounding strap attached to the frame to bleed off the built-up charge safely. This kind of frame-wide ESD grounding wasn't something we'd seen used elsewhere in FTC, and it has since sparked real interest from FTAs, volunteers, and other teams across multiple events.

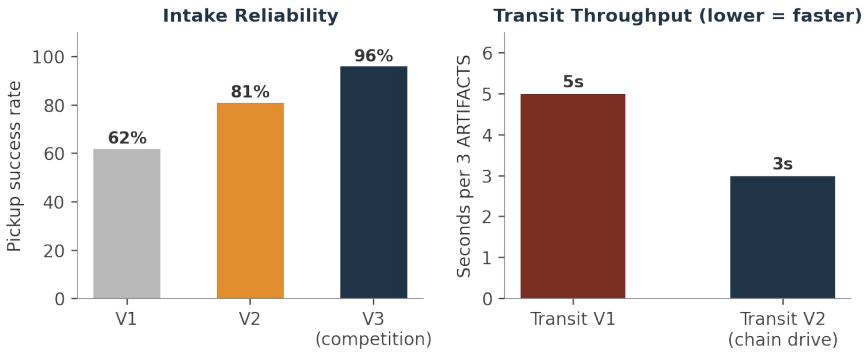
Getting the Artifact In & Moving

Intake

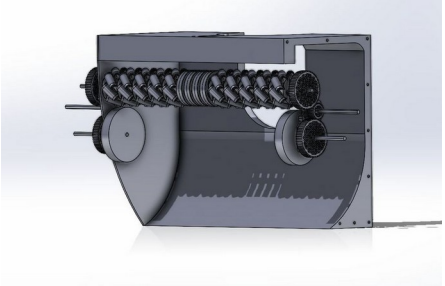
A precisely controlled servo motor drives our intake for reliable, repeatable operation. Elastic compliance lets the ROBOT pick up ARTIFACTS quickly and energy-efficiently, even with variation in position or approach speed. A centering roller then keeps every ARTIFACT consistently aligned before it reaches the launcher.

Transit: V1 → V2

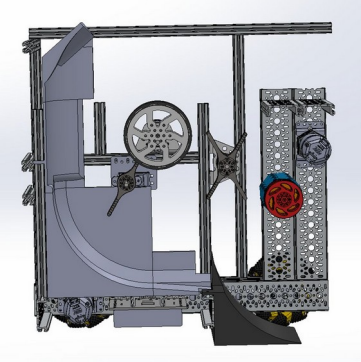
V1 fed ARTIFACTS with two servo motors; the weaker one struggled to move ARTIFACTS reliably, taking 5 seconds per 3 ARTIFACTS. V2 uses a single servo motor through a chain drive — no power or RPM lost, cutting that to 3 seconds per 3 ARTIFACTS.



Intake pickup reliability and transit throughput, by iteration



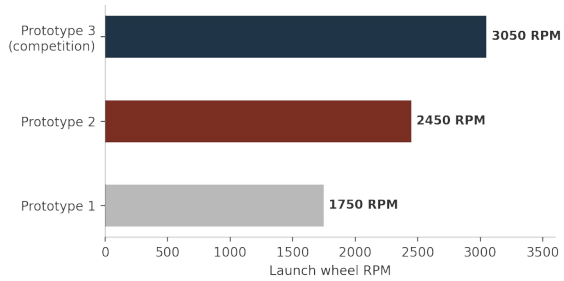
Our intake mechanism



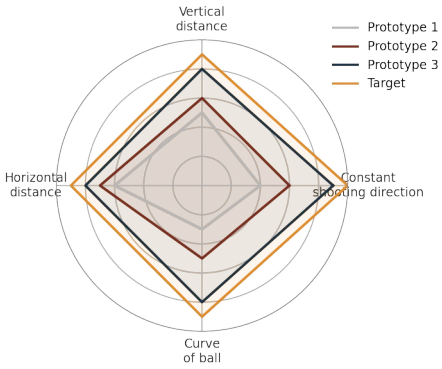
Transit V2 — chain-driven

The ERR-AA Launcher

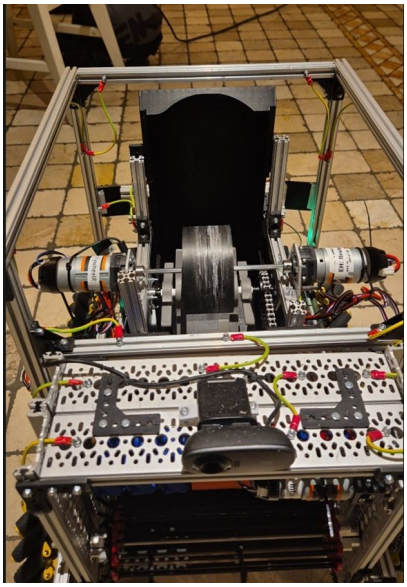
Our first launcher version was based on the DECODE starter ROBOT design, with many problems and few consistent elements. Version two narrowed the ARTIFACT's channel and reduced the distance between launch wheels for consistency. Version three optimizes ARTIFACT guidance into the launch wheel, giving us greater control and a consistent launch radius toward the GOAL.



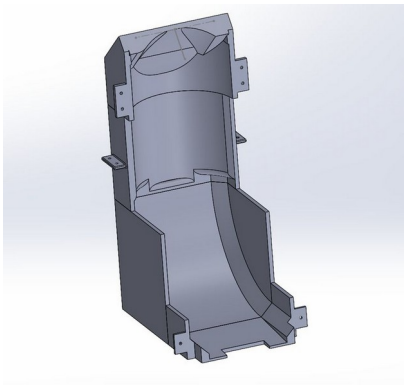
Launch wheel RPM by prototype



Shot consistency by prototype



Launcher — Version 2 test rig



Launcher — Version 3 CAD

Friction, Reflection & Growth

Friction Is the Engine of Improvement

At Makers Day Hasselt, friction arose between two team members after one suspected the other wasn't completing tasks with clear direction. Because this happened during a public event representing FIRST, it strained both team dynamics and our presentation. Open conversations afterwards revealed the conflict wasn't isolated — it came from an uneven division of labor. Revising that together prevented similar conflicts and created lasting clarity.

Learning by Doing, Improving by Reflecting

On an individual level, members learned to take responsibility for their own role and reflect critically on their choices. Mistakes were treated as learning opportunities, not failures. Feedback played a key role — team members actively sought it and stayed open to criticism, developing not only technically but in communication, collaboration, and self-confidence.



Team dinner after a long day of building, programming and testing

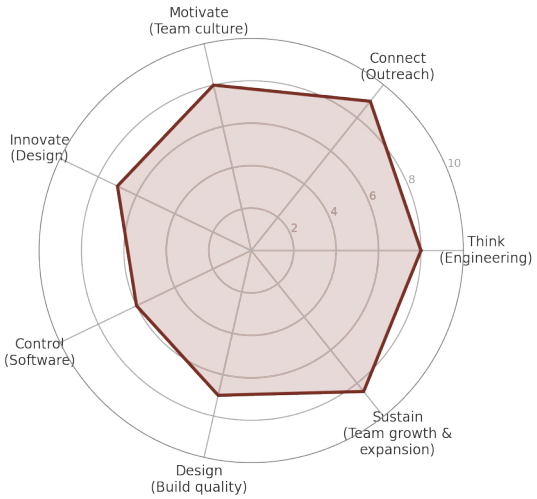
Stronger by Talking

This process made us noticeably stronger as a team. By listening to each other and making room for different opinions, we resolved misunderstandings faster and built real trust in each other's roles. What began as friction at Makers Day Hasselt became a turning point that carried through to how we mentored our new Norwegian team and reached out to Deurne, Uden, and Boxmeer — patiently, and by example.

What We'd Tell Next Season's Team

- Write down who owns what — even informally — before you're under public pressure
- Address friction the same day it happens, not weeks later
- A five-minute check-in before an event prevents a lot of misunderstandings during it

Looking Ahead



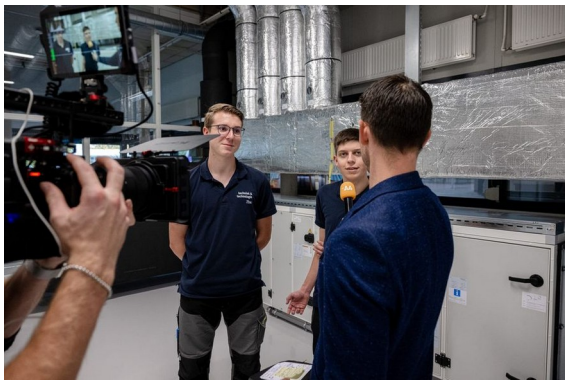
Our own self-assessment across FTC judging themes

Honest About Our Growth Areas

We rate ourselves strong on Connect and Think this season — outreach and engineering process were where we invested most. Control (autonomous software) and Design polish are where we have the most room to grow, and where our new team in Norway and our budding connections in Deurne, Uden, and Boxmeer will help us learn faster together.

Season One Was Never Just About Our Robot

It was about proving that a first-year team from Helmond could build a competitive launcher system, be the only Dutch team at the Lisbon Scrimmage, compete at the European Premier Event in Eindhoven — and still find time to help a student in Norway start a team from scratch and spark interest in three neighboring towns. We are Team Error 404 — and we are just getting started.



Sharing our story, one conversation at a time

Thank You

To Ter AA, our mentors Cas, Hidde, and Jenny, and our sponsors Ter AA, MP Solutions, Raisebox, Foodtech Brainport, Trivisueel, Aldenzee, Aluworkx, and Willem van Oranje College — thank you for believing in a first-year team before we had anything to show for it.