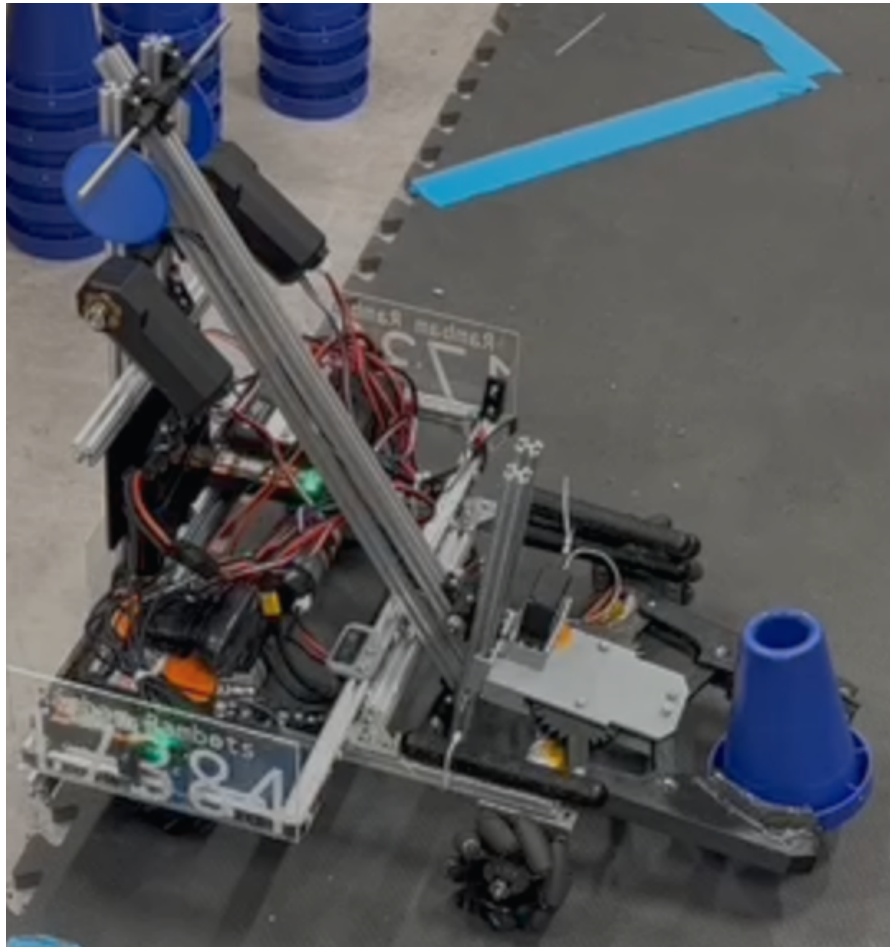


Rambam

*RAM*BOTS

Engineering

Portfolio



Team #17384

The RAMS BOTS

Our Team:

The Rambam Rambots is a 4th year FTC team operating as a program of Rambam Mesivta in Lawrence, Long Island, New York. Everyone one of our team members began their journey with FIRST when they joined the Rambots, thus our longest-standing members had 3 years of FIRST experience coming into this season.

Our team was founded as a way of helping grow the school's robotics program from its four-person RoboCup Junior team to a much larger FTC team.

This allowed for significantly more student involvement and made it an environment where less experienced students could learn.

The team's name originated with the RoboCup team. It used to be called the Rambam Ravens Robotics (the school's administration required it to match the school's athletics programs), Ravenotics, or simply the Rambam Robotics Team.

This changed however when a RoboCup announcer mispronounced the school as RamBahm and decided to call the team Rambam Rambots instead of its original name.

The name has stuck ever since. Unlike our name, which we've been told implies a level of violence, our work, especially our robots, is quite the opposite. For instance, this year's robot, Yo-yo, which we named in memory of one of our member's hamsters, can't hurt a fly (trust us we've tried).

Our team:



Menachem Lotwin
3rd Year FTC, Hardware,
Driver



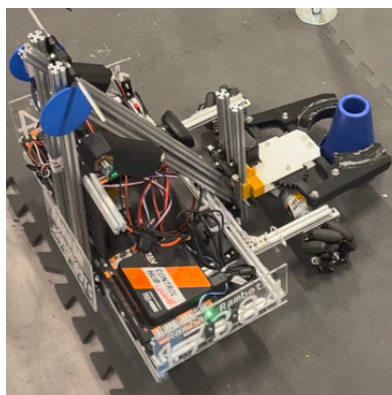
Shmuel Rabinow
2nd Year FTC, Coach



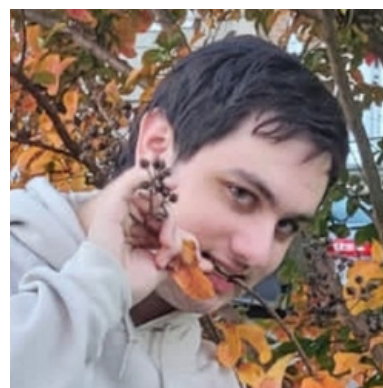
Shmuli Morgenstern
1st Year FTC, Hardware,
Human Player



Ari Meisels
2nd Year FTC, Software



Yo-Yo
1st Year FTC, Robot



Eitan Sonnenblick
1st Year FTC, Hardware



Siggy Orenbuch
3rd Year FTC, Hardware



Dani Roth
2nd Year FTC, Hardware



Dr. Bo Yuan
1st Year FTC, Mentor

Our Mentors

Our coach/mentor Dr. Yuan is in his first year as in his first year in FIRST as well as a first year STEM teacher at Rambam. He takes a fairly hands-off approach to our teams work. It allows us to explore, create and fail but makes sure there is someone there to ensure nothing goes horribly wrong.

Our Mission

Our team's mission from day one has been to be a place where students of all experience levels can learn, grow and have fun. We also work to embody our school's motto of "Torah · Midos · Excellence" throughout our work. We all so prioritize reuse and keeping team expenses to a minimum.

Our Outreach

Our school prefers for us not to host events with other teams and schools, but we try to collaborate through other means. We contact teams over discord, a platform with "servers" that essentially act as large groups for people with a similar interest in a subject. We are part of an active discord server with over 20 other teams from Long Island, where we discuss robot design, portfolio, outreach (how ironic!), and all things robotics. We are also in contact with teams from NYC via direct message (special thanks to our friends at 5361 Lionitics for lending us a control hub for this competition).

Our Funding

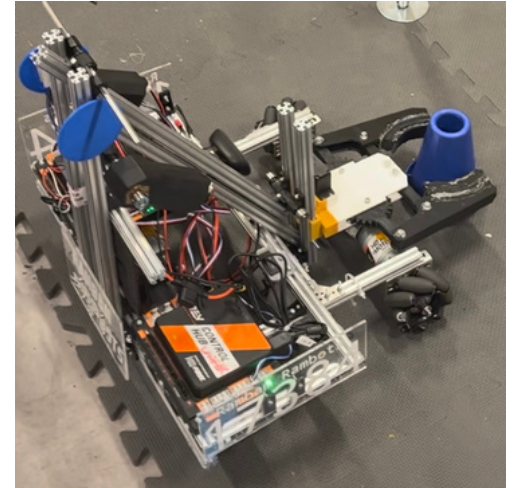
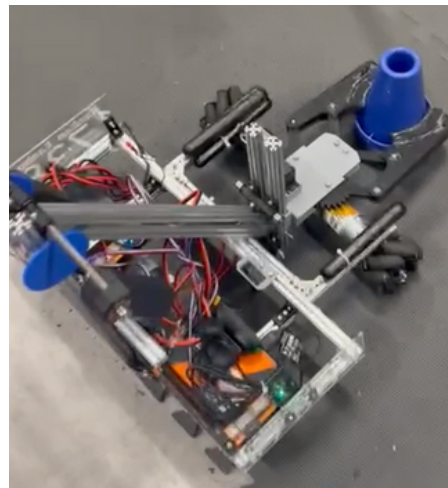
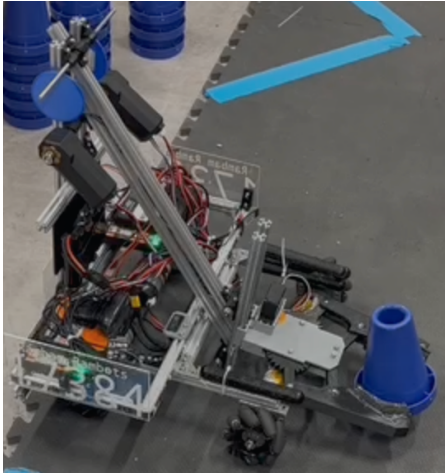
As a student team, we receive funding from two primary sources. We receive base funding for "student activities" from our school. This helps pay for registration fees, transportation, and other expenses. We additionally have in the past (though unfortunately not this year) received STEM grants specifically designated for the team.

Sustainability/Recruiting

Being closely affiliated with our school, our recruitment and team membership are tied exclusively to it. We recruit similarly to other teams in our school.

Our Robot:

Yo-yo



Due to the limited number of meets the team was able to have (the school's process of switching buildings made it such that the team was only able to meet starting early November), our robot design was simplified this year. This also helped us avoid things breaking at the least convenient times as they have in previous years. It was planned and designed in pieces with different people building different parts and putting it altogether in CAD.

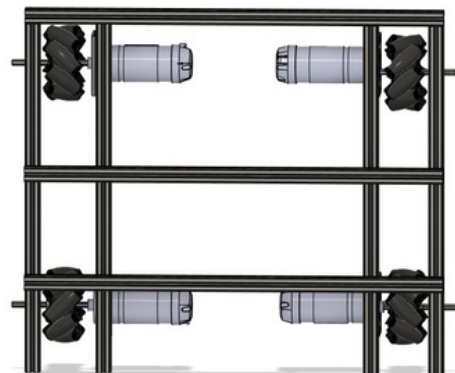
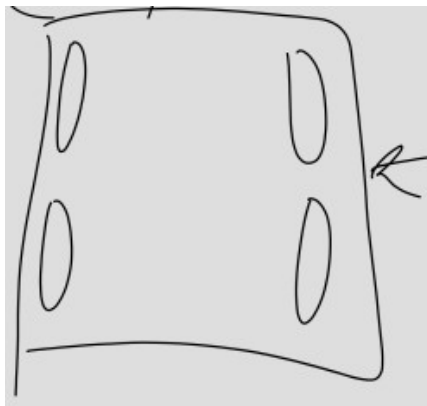
Sub Assemblies

Each of these sub-assemblies started with a drawing on the whiteboard. Ideas and designs were conceived and presented by different team members with everyone from programmers to human players. Team members then voiced concerns and requested things be explained or added notes to the design. The chosen designs were then designed more fully in CAD and built in the real world.



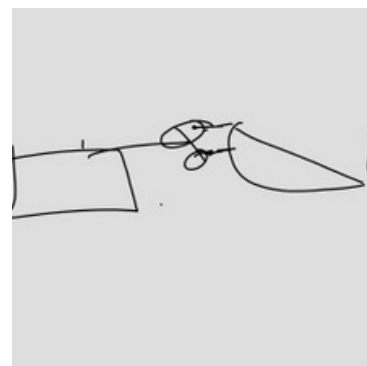
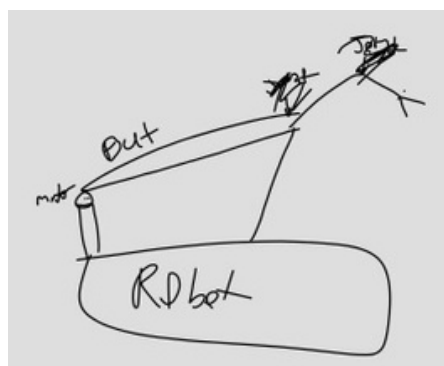
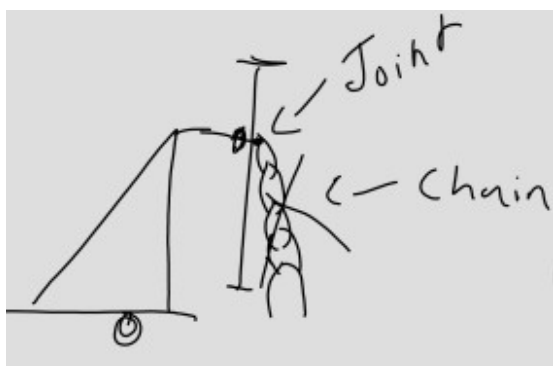
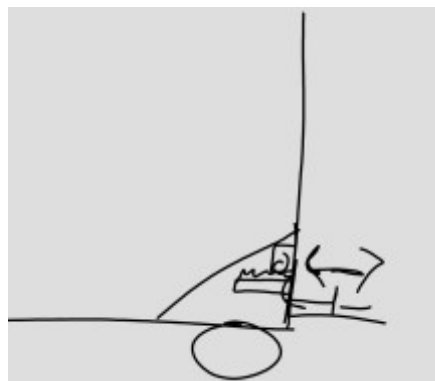
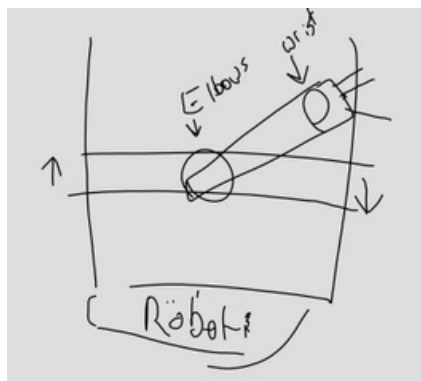
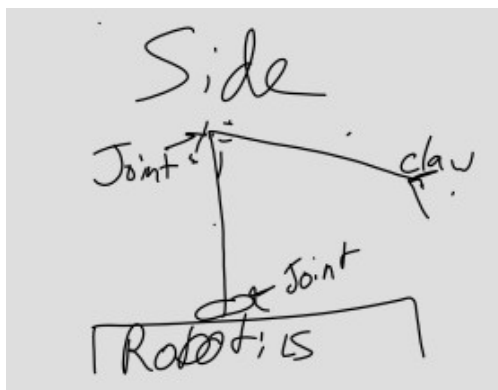
Mecanum Drive

Two years ago, we purchased a set of mecanum wheels in order to be able to do the 360-degree driving they enable. We decided to reuse the same wheels and motors (Rev HD Hex Motors w/40:1 Gearbox) on the four corners of the robot. See the sketch of mecanum (below left) and a CAD model of our implementation (below right).

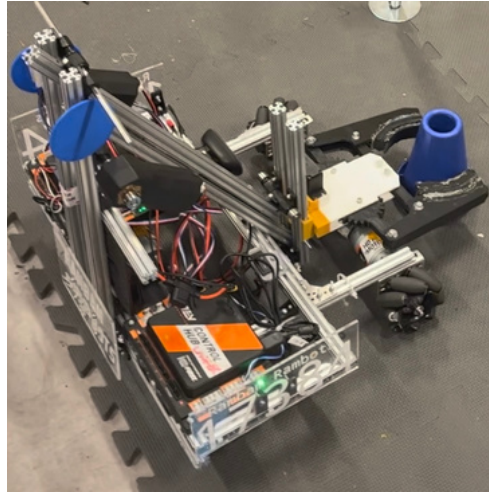


Arm and Claw

We went through a lot of design ideas for this one, a lot... of... ideas...



The claw uses a servo with a 1:1 gear ratio, which makes the claw open and close slowly but powerfully. Using this we can grip the cones and place them rather fast.

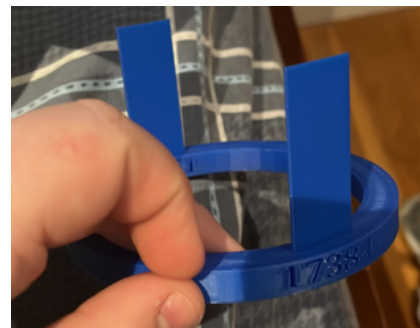
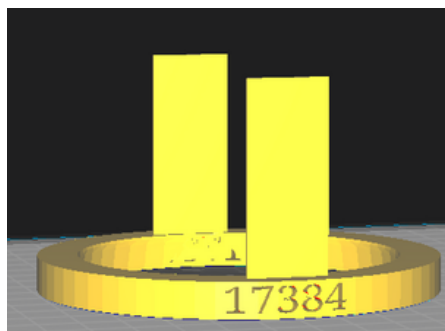
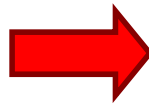
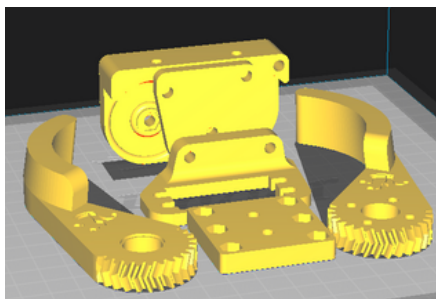


Miscellaneous

Some other parts that needed designing:

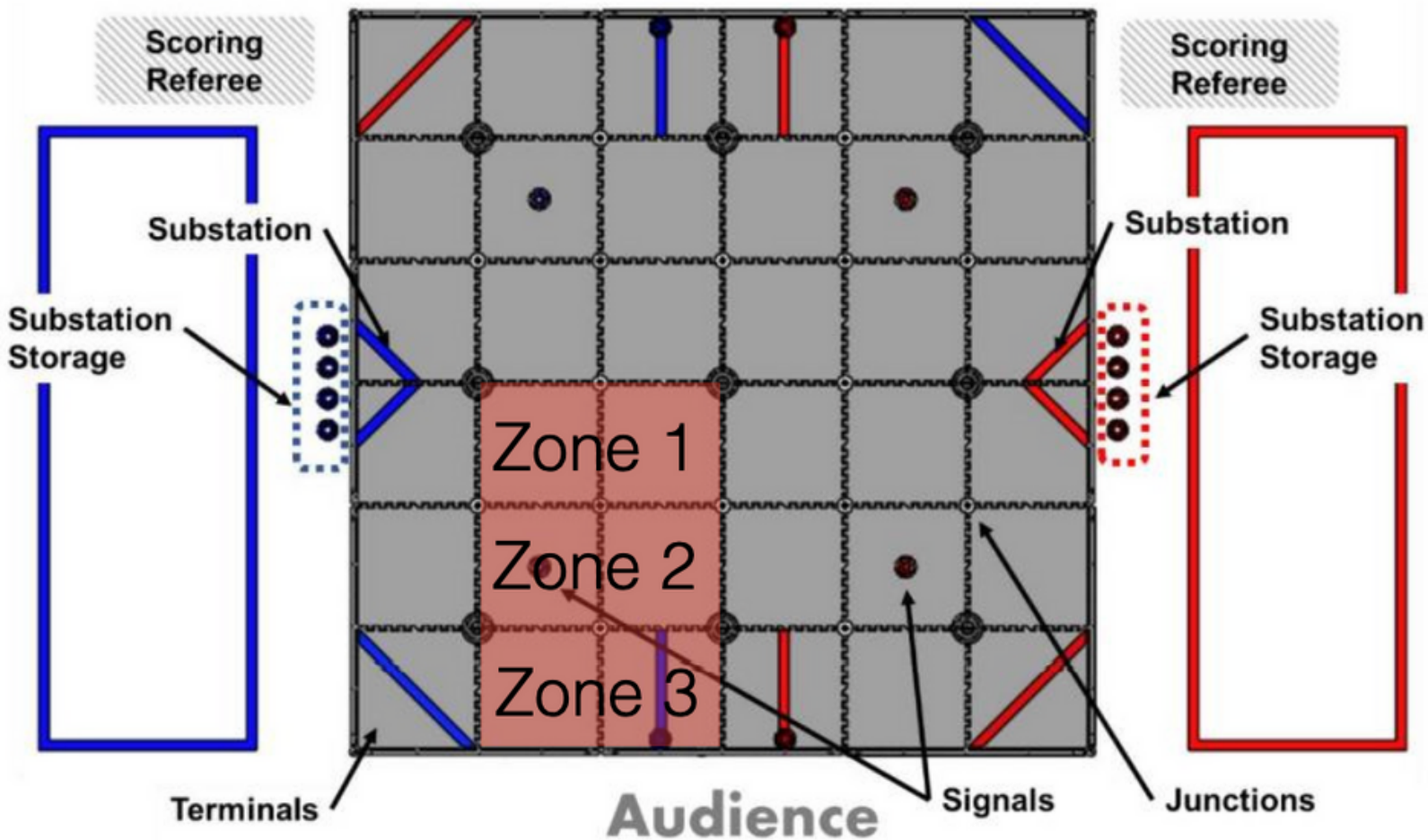
Scoring Element (bottom)

and the claw peice (had to mess around with looney claw for our setup)



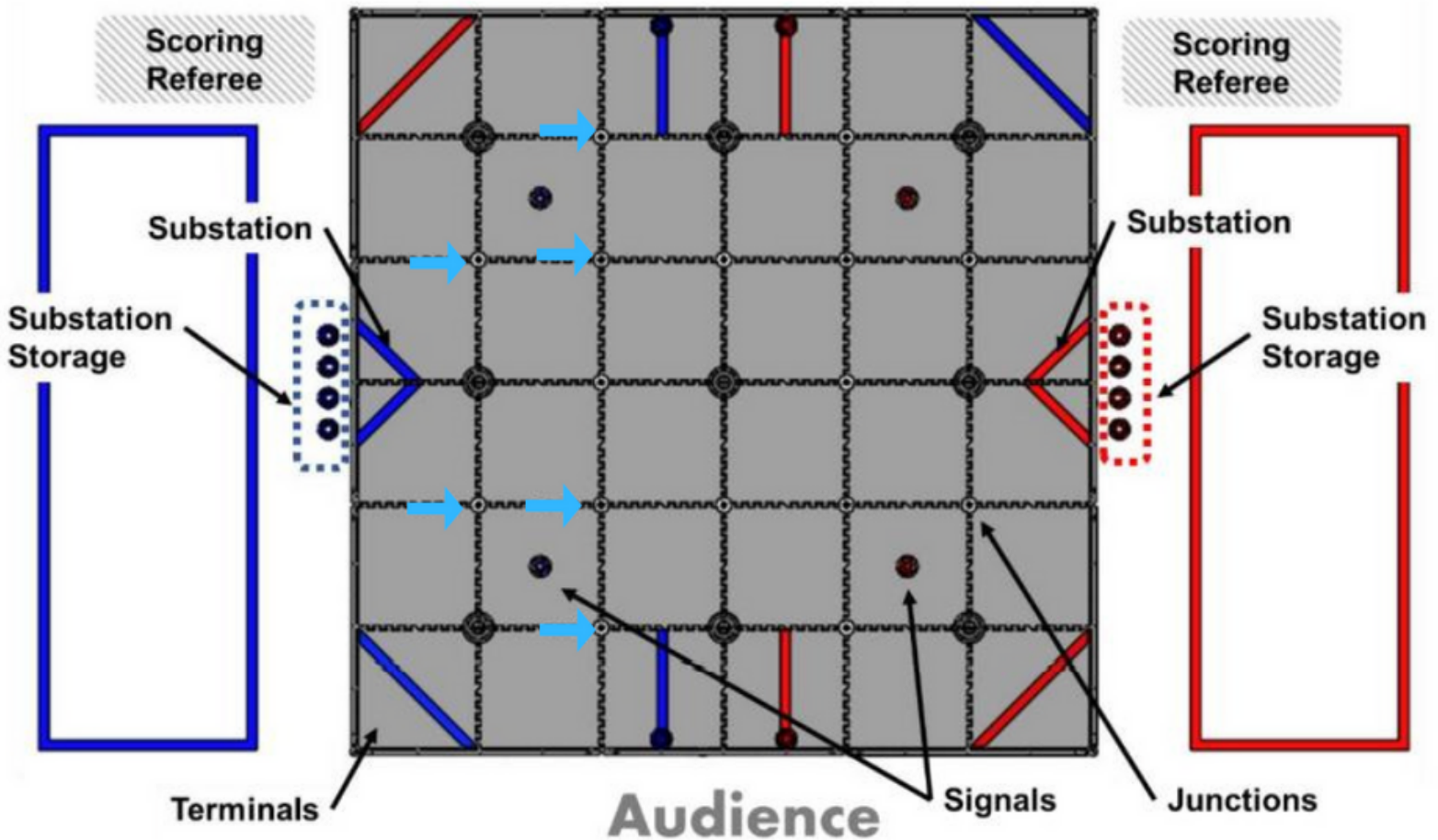
Autonomous Period Plan:

Our plan for the autonomous period (0:30) is to have the robot detect the randomized signal sleeve (custom printed), and drive to the corresponding zone.



Driver-Controlled Period Plan:

Our plan for the driver-controlled period (0:30 - 2:30) is to cycle about 8 - 10 total cones onto the two medium junctions that are closest to our alliance substation and to score once on each of the four closest low junctions to us for junction ownership points and circuit potential. This allows for a mix of junction ownership points, scoring points, and circuit potential with our alliance. The arrows below depict which junctions we would attempt to score.



Driver-Controlled Endgame Period Plan:

Our plan for the driver-controlled Endgame period (2:30 - 3:00) is to place the beacon on a medium junction (thus claiming it) and then place as many cones as possible on unclaimed medium and low junctions across the field to create a circuit. Below are blue arrows pointing to the medium junctions we plan on scoring our beacon on.

