FRIENDLY

RELIABLE

ENERGETIC

NERDY

CLASSY

HEROES

PROFESSIONAL

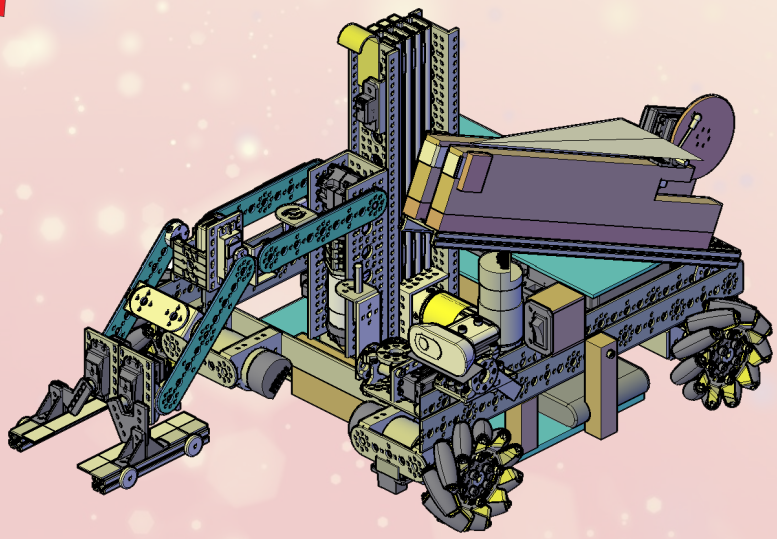
GRACIOUS

ENGINEERING

TEAMWORK

FIRST

TEAM 7341
Titusville, Florida
ENGINEERING PORTFOLIO



CENTERSTAGE℠

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FIRST® Tech Challenge

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What's Inside

TEAM 7341

F.R.E.N.C.H. F.R.I.E.S.

Our Team

We are Team 7341 - F.R.E.N.C.H. F.R.I.E.S. (**F**riendly, **R**eliable, **E**nergetic, **N**erdy, **C**lassy, **H**eros, pro**F**essional, g**R**acious, eng**I**neering, t**E**amwork, FIR**S**T). We are a Girl Scout team and this year we double the size of our team and we now have 6 members who attend different schools. This year we are celebrating our teams 11th year of FIRST Fun.

At Titusville High School, there is one team member.

At Space Coast Jr/Sr High, there are two team members.

At Jackson Middle School, there are two team members.

At Enterprise Elementary, there is one team member.

Team Members

All the girls are members of different troops within the Ohana Girl Scout Community. Two team members started their FIRST journey as members of the sister FIRST LEGO League Explorer B.E.E.s team, then progressed to the FIRST LEGO League Challenge C.A.K.E. B.A.T.T.E.R.S team, and now are part of the FIRST Tech Challenge Team F.R.EN.C.H. F.R.I.E.S.

Overcoming the fear of programming and driving the robot without running into other robots can be challenging, but with practice and perseverance, we will conquer our fears. We enjoy driving the robot, sharing our ideas, and working with other and together. Connecting with the technical community provides valuable opportunities for learning and growth. We keep fostering a positive and collaborative environment, and continue to embrace the fun aspects of your FIRST journey.

We had fun coming up with a t-shirt design for the State Championship 2024 and t-shirt design for competition we co-hosted with the PAC RATS on January 20, 2024.

We are looking forward to having members of the C.A.K.E. B.A.T.T.E.R.S. team move up to our team.

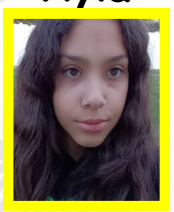
Signature : Vanessa and Eliana

Date: January 28, 2024

TEAM 7341

F.R.E.N.C.H. F.R.I.E.S.

Ayla



Ayla is in 8th grade at Jackson Middle School and has been involved in robotics for two years. She enjoys building and assembling robots. She also likes playing musical instruments and spending time with her best friend. Additionally, she enjoys playing with her dog Luna and cuddling with her cat Mimi. Ayla's future aspiration is to become a musician.

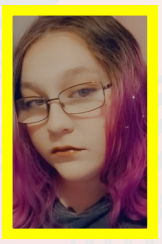
Builder, coach and driver 2 (all non-driving controls) and learning programming.

Renee

Renee is an 8th-grade student currently attending Space Coast Jr/Sr High School. She has been involved in robotics for 6 years, beginning with FIRST LEGO League Jr. and progressing through the FIRST program. Renee has a passion for animals, building, and spending time with her friends. In the future, she aspires to become either a veterinarian or an engineer.

Builder, driver 2 (all non-driving controls) and learning programming

Elle



Elle is a junior at Titusville High School and has been a member of the FIRST Family for 10 years. Her FIRST LEGO League Jr. team even had the opportunity to compete at the WORLD competition in St. Louis. Elle's interests include cooking, and she is aspiring to become a chef. Additionally, she enjoys working on cars and expanding her knowledge in that area.

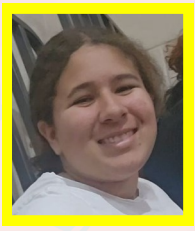
Builder, and driver 1 (all driving controls)

Eliana

Eliana is a 7th-grade student attending Jackson Middle School. She has been involved in robotics for 7 years, starting with FIRST LEGO League Jr. and continuing through the FIRST program. Apart from robotics, Eliana has an interest in cats, building, math, and computers.

Builder, tinker CAD, programmer, driver 1

Kenzie



Kenzie is currently in 8th grade and attends Space Coast Jr/Sr High School. She has been a member of the FIRST Family for 2 years.

Builder, programmer, coach, and driver 2(all non-driving controls)

Vanessa

Vanessa is a 6th-grade student at Enterprise Elementary. She has been a part of the FIRST Family for 6 years and started her robotics journey with FIRST LEGO League Jr. She has been involved in the FIRST program for all these years. Apart from robotics, Vanessa enjoys drawing, and her favorite animal is a fox.

Builder and human player

Signature : Ayla, and Renee

Date: January 28, 2024

Our Mentors

Miss Caroline—(coach) shared her programming and building talents with us

Miss Tracy—(coach) shared her organizational talents with us and keeps us on track

Mr. Louis—shared is CAD experience with us.

Miss Chelsea—shared her engineering experience with us

Miss Shavani—shared her FTC experience with us

Miss Wendy—Helps us find outreach activities in Orlando

Mr. Barry—Helps us with plenty of encouragement

Mr. David—Helps us with our 3-D printing

Mr. Eric—Helps us with building of specialty parts for our robot

Our Sponsors

Exploration Ground Systems

LOCKHEED MARTIN

girl scouts of citrus

FPL

Girl Scout of Citrus Council, Florida Power & Light, NASA, and Lockheed are the organizations that have provided grants for our team. We express our gratitude to them and all our supporters.

It's important to acknowledge the support and guidance we've received from our parents and mentors along the way. They played a significant role in helping us reach our current position.

Signature : Elle and Kenizie

Date: January 28, 2024

Team Plan

Strategy	Actions	Responsibility	Planned
Prepare the Team to learn JAVA	Teach the girls JAVA programming	Team Mentor	Continual
Plan and implement STEAM Activity day	Get girls interested in STEAM careers	Team	May 2024
Work with the B.E.E.s and C.A.K.E. B.A.T.T.E.R.S.	Keep the girl interest in robots so they would want to move up in the FIRST Program	Team	Continual

Introduction

We currently have three robotics teams which support each other. The girls start out participating on **Team B.E.E.s** (FIRST LEGO League Explorer Program) , then graduate to **Team C.A.K.E. B.A.T.T.E.R.S** (FIRST LEGO League Challenge Program) and finally moving up to **Team F.R.E.N.C.H. F.R.I.E.S.** (FIRST Tech Challenge Program). Note, you do not have to participate is all three, but are encouraged to continue once have joined a team.

We have participated in the FIRST® Tech Challenge program for the last 11 years, and our world is ever changing as the we progress through school and graduate with success. With the skills that we have learned as a team, our graduating seniors are ready to conquer any challenge they meet out in the world.

Our Mission Statement

We know that in **DISCOVERY** we learn new things, **INNOVATION** is when we improve on things that make an **IMPACT** on someone's everyday life. We strive for **INCLUSION** to make our **TEAMWORK** better. With this we will build a functional and sleek robot, create an educational engineering portfolio to share, and spread the word about FIRST. Most of all we want to have **FUN**

Recruiting New Team Members

We recruit new team members at all our outreach events using the following guidelines:

- Must be a or want to join Girl Scouts
- Must be interested in learning new things
- Must be willing to work hard
- Must want to have fun
- No previous robotics experience necessary

Blast from the past

F.R.E.N.C.H. F.R.I.E.S. Online Links

- Team Website: https://girlscouteverywhere.org/GSBasics/french-fries

Social Media

- Facebook: https://www.facebook.com/FTCTeam7341
- Twitter: https://twitter.com/ FTC_FRENCHFRIES
- Instagram: http://instagram.com/frenchfries


Elle as a FLL'ers

We have over 2.1K followers and growing on Instagram, 1,500 followers and growing on Twitter and our Facebook and webpage is open for anyone to view. We are happy to share with other team from all over the world.

Signature : Ayla, and Renee

Date: January 28, 2024

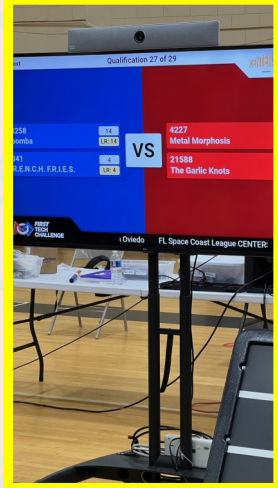
Team 7341 - F.R.E.N.C.H. F.R.I.E.S.		2023-2024 Budget
Category	Estimate	
	Income	Estimated Income Notes
Grants		
Lockheed Martin	$750.00	Grant
Florida Power & Light	$1000.00	Grant
Knights Armament	500.00	Grant
NASA GSDO	$3,766.12	Grant
Total	$5,016.12	

Thank you AJ for the great storage idea!

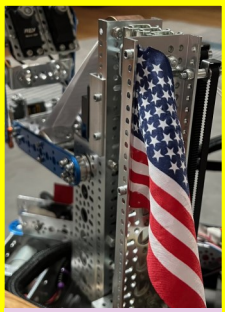
Fundraiser Idea	Projected Income	Category	Notes
Panda Express	$200.00	Fundraiser	One-time fundraiser
Hosting a Meet	$720.00	Fundraiser	One-time fundraiser/shared
STEAM Event	$100.00	Fundraiser	Set up to be an annual event for the Girl Scout in the area

Following is an estimated "Cost To Rebuild" for the Robot if there was a catastrophic accident where we could not repair the robot.

	Description	Total
1	Electronics Components	$1261.00
2	Hardware Components	$1111.00
3	Motors Components	$400.00
4	Servo Components	$400.00
5	Raw Materials to make in-house Components	$400.00
	Total	$3,572.00



December Competition



Veteran's Day

Changing the Lift motor

Battery clamp

Signature : Vanesa and Eliana

Date: January 28, 2024

Inspiring Others

The outreach events attended in the Titusville area include:

- Various Girl Scout Recruitment Events
- Girl Scout Council Annual Meeting
- Ohana Bridging and Awards Ceremony
- Dan's hobby shop visit (learning about different types of servos)
- Titusville's Trunk or Treat event
- Titusville's Veteran's Memorial Service
- Drupal Software Conference

The team shares our robot's journey on Facebook, Twitter, and Instagram, and our website page.

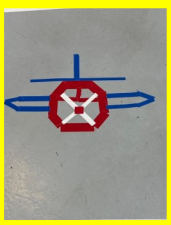
Delivering the Holiday Dinners

DRUPAL Conference

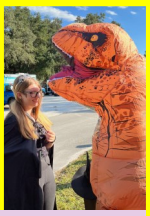
The team participated in the Ohana Girl Scout "Dinner in a Bag" project, which aimed to provide local veterans with a delicious meal during the Thanksgiving and Christmas holidays. They assisted in distributing food to 26 different families.

Our team co-hosted an epic competition on January 20th "**Amongst the Planes—Skyers**" at the Valiant Air Command, Inc. Warbird Museum in collaboration with team PAC RATS.

Co-hosted Competition at the Warbird Museum



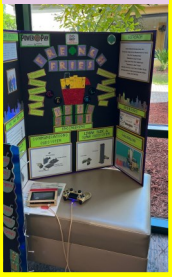
Girl Scout Annual Meeting



Trunk-Treat Community Event

Kite Day

Memorial Day Ceremony



Girl Scout Event

Dan's Shop

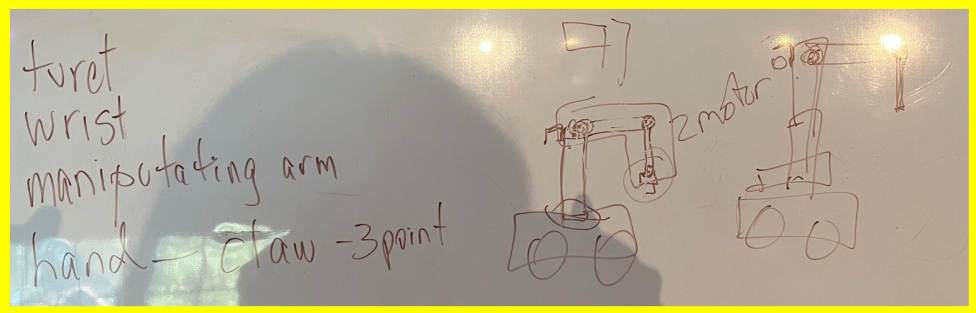
Signature : Elle and Kenzie

Date: January 28, 2024

TEAM 7341
T.R.E.N.C.H. F.R.I.E.S.

Engineering Design

The initial idea for the robot was to have a turret to move the mechanism from the front to the back, eliminating the need to turn around. The claw design was initially considered but later changed to bars for picking up multiple pixels simultaneously and easier placement on the backdrop.



Our robot has the following major elements:

- Seven (7) motors, where the 4 Motors are for drive which have encoders for running autonomous, 1 to raise and lower the linear slide for the end game pickup, 1 to move the turret and 1 to move the arm up and down. They all are uses the encoders during autonomous mode.
- Six (6) servos: 2 to grip or hold the cones, 1 to move the camera and 1 to move the wrist, 1 to release the drone during end game and 1to drop the purple pixel during the autonomous period.
- Three (4) touch sensor, 2 are used to determine the upper and lower limits of the arm mechanism and 2 are used on the turret to make sure it does not turn past the 180 degree range (from the front to the back)
- One (3) color sensors, 1 to detect the color alliance, 1 to detect starting position (right or left), 1 to detect the floor for passing over the tape .
- One (1) external camera, used to find our team game element for the autonomous mode to set the purple and yellow pixel on the spike line and proper placement on the backboard
- One (1) blinkin lights which are used for visual output of the robot's functions being performed

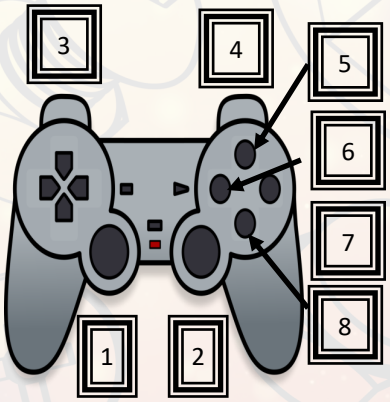
The team is pleased with the robot's performance this season, as there were no significant structural problems during any competition. The design was considered both straightforward and reliable.

We are using the blinkin lights to let us know which Spike Line the robot will travel to, the lights also indicate the alliance side, as well as where in the autonomous program the robot is processing. We are also using the blikin light during the teleop period to let drive 1 know what driver 2 is doing (opening or closing the hand), raising/lowering the wrist and the turret moving to the front/back of the robot).

Signature : Ayla, and Kenzie

Date: January 28, 2024

Driver 1 Control Function Layout



Driver 1 Control

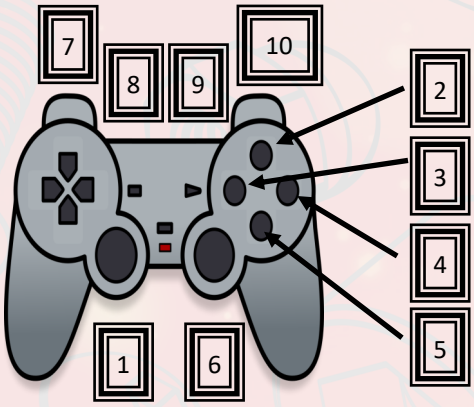
Function Definition

1. Turn right or left by using the Y-axis
2. Strafe right or left by using the Y-axis and move forward/ backwards using the X-axis
3. Move phone left (trigger)
4. Move phone right (trigger)
5. Launch the Drone
6. Drop the purple pixel
7. Reset the Drone Launcher
8. Raise pixel arm

The team determined the functions for the controllers before starting robot programming. They used two controllers to encourage team participation and separated the driving function from the game function. They moved some of the special non-driving functions to the Driver 1 controller due to an excess of these functions this year.

We defined the following major hardware functions that needed user interface: 1) A hand to pick up the pixel ; 2) An arm to raise and lower the wrist mechanism ; 3) A wrist mechanism to raise and lower the hand 4) a turret mechanism to rotate 5) Driving the robot 6) Raising and lower the linear lift to pickup the robot.

Driver 2 Control Function Layout



Driver 2 Control

Function Definition

1. Raise and lower arm
2. Open hand
3. Raise the wrist
4. Lower the wrist
5. Close hand
6. Raise and lower lift
7. Move Turret left (trigger)
8. Lower wrist to pickup pixel
9. Position to deploy the pixel
10. Move Turret right (trigger)

Wires are stored in the frame

Helping the FLL Team build their mission models

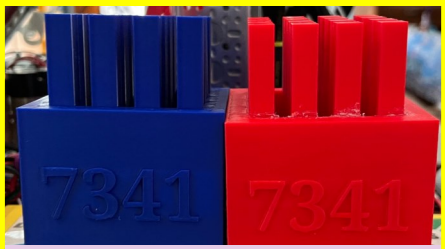
Signature : Elle and Renee

Date: January 28, 2024

Drive Chassis, Purple Pixel Dropper and Team Game Elements

The purpose of designing the chassis is to accommodate the turret in the center, enabling pixel manipulation from both the front and back of the robot. The chassis size of 16" x 17" allows for maneuverability without the risk of getting caught. By assembling the front and back wheels and motor as a single rigid unit, a stiffer robot body is achieved. The wires are stored in the side channels to prevent entanglement and maintains a clean and neat appearance.

The Purple Pixel Dropper is a more efficient method than pushing the pixel, as it avoids the risk of the pixel getting caught under the robot. It earns 20 points for placing the Purple Pixel on the Spike Mark.

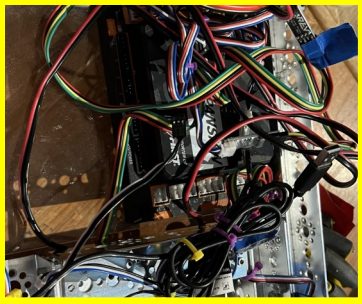


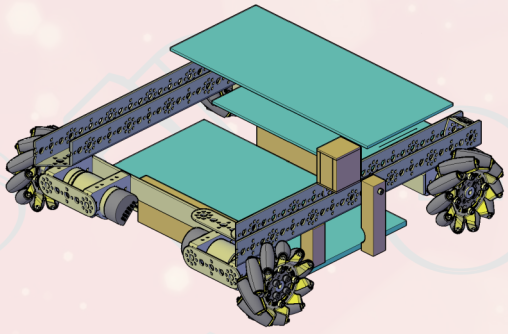
Team Game Elements

We are using 4 NeveRest Orbital 3.7 Gearmotors on our wheels for speed and the 4” mecanum wheels for maneuverability on the field.

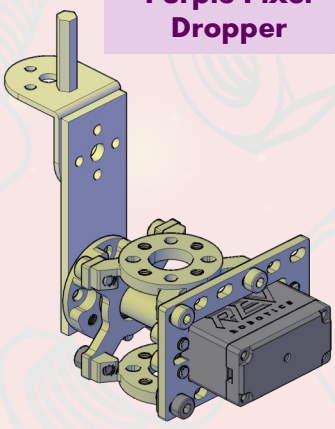
The team game element is a 3-D printed French fry box designed using Tinker CAD.

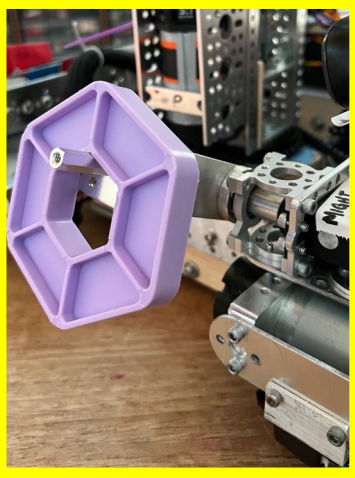
Test drone launcher

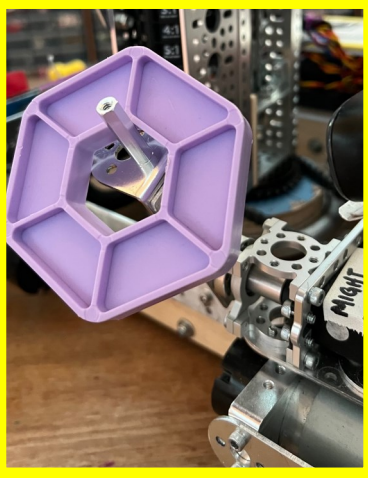


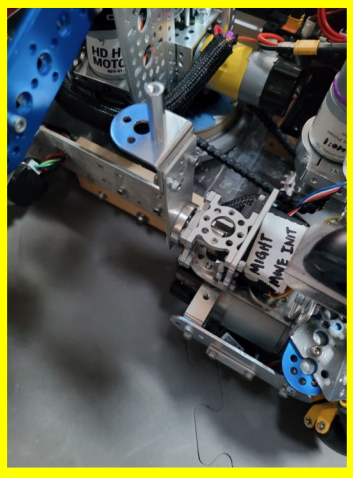


Purple Pixel Dropper







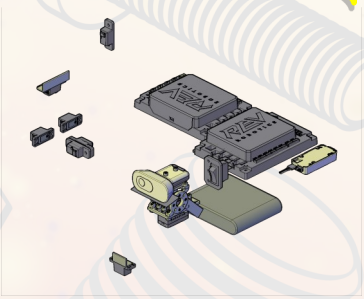


Signature : Vanesa and Eliana

Date: January 28, 2024

Electrical System

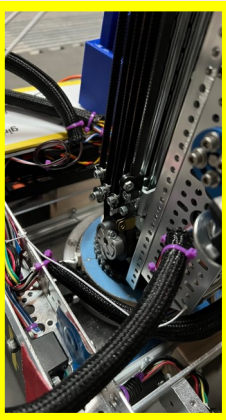
Our "**Electrical"** System consists of the following: Control Hub, Extension Hub, camera, battery, 3 color sensors, 4 touch sensors, blink'n for the lights. These function are used within all the mechanisms of the robot.



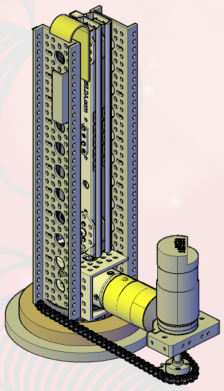
Lift and Turret Mechanism

Our "**Lift"** Mechanism or Linear Slide is a 2 stage system that will allows us to grab the rigging bar during endgame and pull the robot off the ground. Initially our team struggled with the concept of speed vs torque. The motors we had available could not pick up the robot because it was too heavy. Once we determined that if we had a motor that had more torque it would pick up the robot. We changed out the motor to a 203 Series Yellow Jacket Planetary Gear Motor -188:1 Ratio 30 RPM which was a longer motor. This modification did make it so that our turret will not turn all the way from the front to the back. A design issue to taken up later. We can raise the robot off the ground in 3.2 seconds.

Another design challenge was maintaining a height under 14" to fit under the yellow bars while also allowing a reach of 24" for hanging from the Blue or Red Rigging bars and not dragging the bottom of the robot on the mat. After three different configurations we now have the lift short enough and the base of the robot high enough to not drag on the mat.



The "**Turret**" mechanism on our robot enables the movement of the arm/wrist and hand mechanism to move from the front to the side of the robot. This feature allows us to pick up dropped-off pixels and place them on the backboard without the need for repositioning the robot.

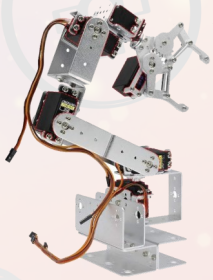


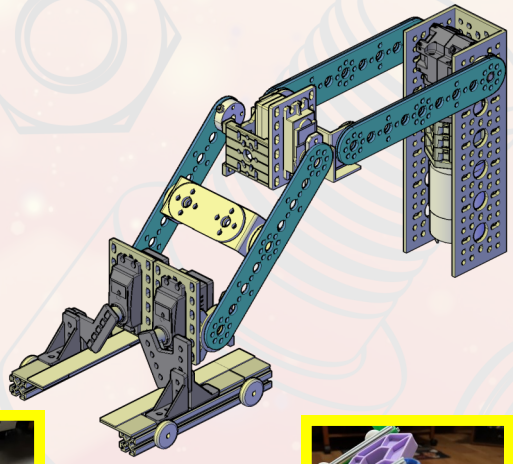
Signature : Ayla, and Elle

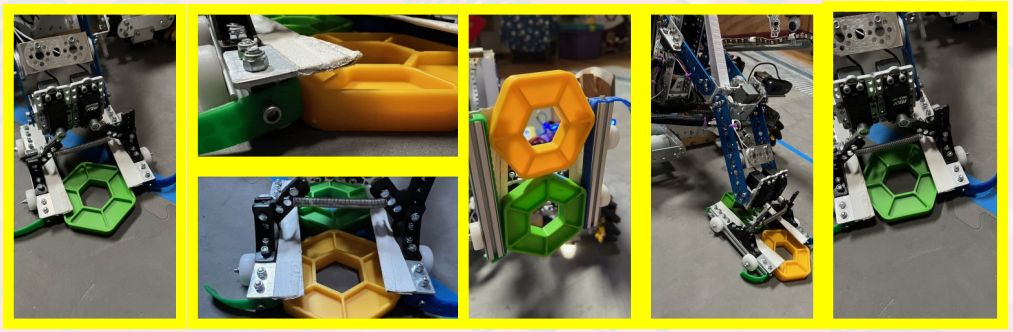
Date: January 28, 2024

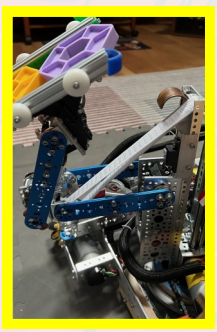
Arm, Wrist, and Hand Mechanism

The "**Pixel Gripping**" Mechanism, also known as the "**Hand**," is a reliable mechanism capable of picking up one or two pixels. Wrist bands were added to the gripping fingers to prevent the pixels from falling out during movement. The Hand Mechanism utilizes two Rev Servos to clamp and hold the pixels, while the Wrist Mechanism, connected to the Hand, uses a servo to raise and lower it from a pick-up off the floor position to a placing on the backdrop position. Additionally, the Arm Mechanism allows for placing the pixels slightly higher on the backdrop. The design idea for this mechanism was inspired by a robot arm commonly found in the manufacturing world. The arm movement up and down is controlled by a REV Hex motor.



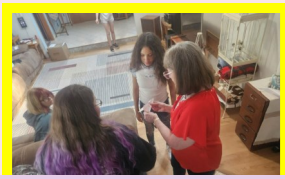




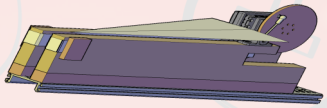


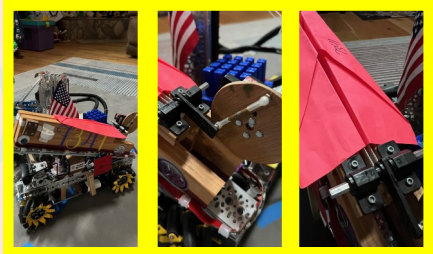
Drone Launcher Mechanism

The "**Drone Launcher**" Mechanism is a design that utilizes a servo to hold and release an elastic, launching the paper drone into the air. The wood side is used as a smooth surface for the paper drone to slide across. The launcher is set at a xx degree angle for a perfect launch trajectory of the drone to land in zone 1. We tried several different designs before choosing the drone that had extra weight in the nose area.



Trying drone designs





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Software

The Rev Control Hub is used to run two operational programs: "**CenterStageAuto2**" for autonomous and "**CenterStage**" for Teleop. The Android Studio platform is used to build these programs for more control over available functions. The autonomous program surveys the robot's color sensor to determine the alliance color (Red or Blue) and starting position (Backdrop or Audience side of the field). During the initialization phase, the camera can scans the field for the team's game element using the servo it is place on. Following is the algorithm used to move the servo smoothly back and forth.

```
if (count >= 2) {
  if ((robot.phone_position < 0.58 && !backing) ||
       (backing && robot.phone_position < 0.36)) {
       int move;
       if (pass == 0) {
         for (move = 0; move < 10; move++) {
             robot.phone_position += 0.01;
             robot.phone.setPosition
(robot.phone_position);
              sleep(250);
          }
     } else {
       robot.phone_position = robot.phone_position +
0.10;
     }
     if (robot.phone_position <= 0.46) ro-
bot.phone_position += 0.02;
    robot.phone.setPosition(robot.phone_position);
    telemetry.addData("phone position going up",
"%.2f and backing %s - retry %d",
     robot.phone_position, backing, retry);
     sleep(250);
} else if (robot.phone_position >= 0.58 || backing) {
    int move;
    if (pass == 0) {
      for (move = 0; move < 10; move++) {
          robot.phone_position -= 0.01;
          robot.phone.setPosition(robot.phone_position);
          sleep(250);
       }
     } else {
       robot.phone_position = robot.phone_position - 0.10;
     }
     if (robot.phone_position >= 0.48) ro-
bot.phone_position -= 0.02;
     robot.phone.setPosition(robot.phone_position);
     telemetry.addData("phone position going down",
"%.2f and backing %s - retry %d",
      robot.phone_position, backing, retry);
      sleep(250);
   if (robot.phone_position <= 0.36) {
        backing = false;
    } else {
        backing = true;
     }
}
 count = 0;
 retry++;
} else {
    count++;
telemetry.addData("phone position", "%.2f and back-
ing %s", robot.phone_position, backing);
telemetry.addData("skip check and moving the phone
count", "%d retry %d", count, retry);
 return(Foundtarget);
}
```

The robot's blink'n lights display different colors based on the placement of the purple pixel on the "**Spike Mark**." Yellow lights indicate the left "**Spike Mark**," sky-blue lights indicate the middle "**Spike Mark**," and hot-pink lights indicate the right "**Spike Mark**." The blink'n lights serve as a visual indicator of the robot's intended path. The autonomous program has several subfunctions: one for placing the purple pixel on the "**Spike Mark**" and another to place yellow pixel on the backdrop, stopping in the "**Backstage**". The other subfunction involves placing the purple pixel on the "**Spike Mark**" and parking in the "**Backstage**," unless it is meant to place the pixel on the middle "**Spike Mark**," in which case it will stay in place.

Following is the algorithm for our Drive subfunction:

The algorithm calculates the number of motor rotations based on the specified distance and the Ticks Per Revolution (TPR) specific to each type of motor.

```
static final double     DRIVE_GEAR_REDUCTION    = 1;        // This is < 1.0 if geared UP
static final double     WHEEL_DIAMETER_INCHES   = 4.0 ;     // For figuring circumference
        // Andymark 3.7 - 103.6   Andymark  40 - 1120    Andymaark 60 - 1680   Andymark 20  - 537.6
static final double  COUNTS_PER_MOTOR_REV    = 103.6   ;    // eg: AndyMark Motor Encoder
```

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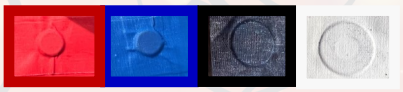
```
static final double  COUNTS_PER_INCH    = (COUNTS_PER_MOTOR_REV * DRIVE_GEAR_REDUCTION) /
                                          (WHEEL_DIAMETER_INCHES * 3.1415);
newLeftTarget =         robot.left_front.getCurrentPosition() +   ((int) (Inches * robot.COUNTS_PER_INCH)  * 1);
newleft_backTarget = robot.left_back.getCurrentPosition() +  ((int) (Inches * robot.COUNTS_PER_INCH) * -1);
newRightTarget =        robot.right_front.getCurrentPosition() +  ((int) (Inches * robot.COUNTS_PER_INCH) * 1);
newright_backTarget = robot.right_back.getCurrentPosition() + ((int) (Inches * robot.COUNTS_PER_INCH) * -1);

// keep looping while we are still active, and there is time left, and both motors are running.
      while ((runtime.seconds() < timeoutS) &&
             ( robot.left_front.isBusy() && robot.right_front.isBusy() &&
               robot.left_back.isBusy() && robot.right_back.isBusy())) {
          waitForTick (5);
      }
```

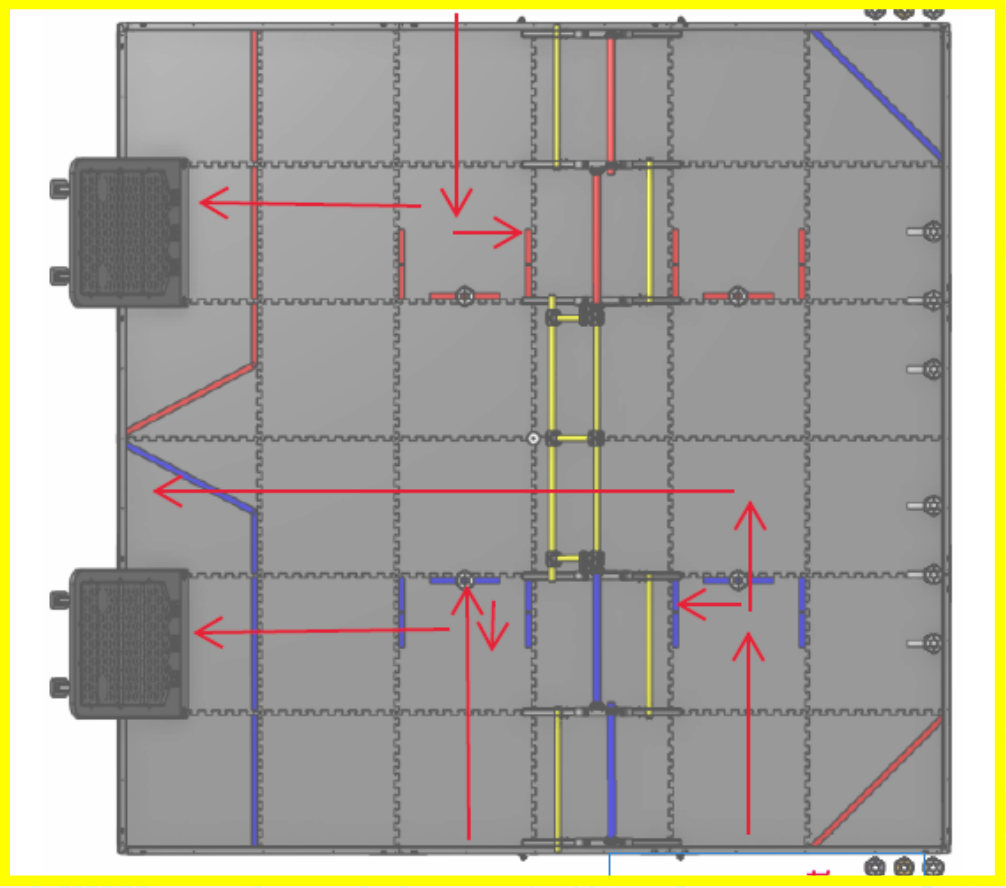
Following is the color sensor keys and blinkin light settings used during autonomous mode:

- Preset our alliance color (Red or Blue), starting position backdrop or audience (Black or White) .

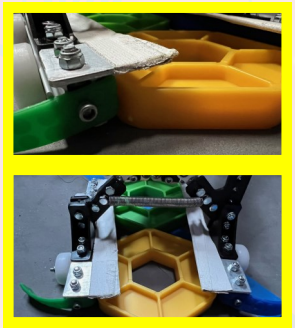


- After the Team Game Element is detected the appropriate Spike Line the lights will blink: Signal Spike Line 1— Yellow lights, Spike Line 2 Blue lights and Spike Line 3 Hot Pink lights.

Defined below shows 3 of the 12 possibilities that the robot could travel during the autonomous period.



During our Teleop function we use the blinkin lights to let the drive team know what is going on. If the Linear Slide going up or down (the lights are yellow or sky blue), that the hand is opening or closing (the lights are green or lime), and when you are in the end game (last 30 seconds) the lights will strobe your alliance color . While none of these actions are happening the lights will be doing a heart beat blinking the alliance color.



Signature : Kenzie and Eliana

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Strategy

Our **game strategy** involves assessing our alliance team's strengths and comparing them to our own strengths in order to establish a plan of action for the match. Some of our strengths are:

- Running our Autonomous which detects our Team Game Element and places the Purple Pixel on the spike line and the Yellow Pixel on the Backdrop.
- Putting Pixels on the Backdrop in a mosaic pattern for the artist bonus points
- End game, launching the drone and suspending the robot from the rigging

Autonomous Period:
Robots may place Pixels in their corresponding Backdrop or Backstage closest to their Alliance Station. They can park in several locations at the end of the period for different points. Robots that can read the location of the Randomized Pixel and place their Pixel onto the correct Backdrop location earn points. Using their Team Prop to accomplish these tasks earns additional points.

Driver-Controlled Period:
Alliances earn points by scoring Pixels on their Backdrops or in their Backstage Areas. Mosaics on the Backdrop earn Artist Bonus points. Pixels crossing Set Lines on the Backdrop also earn Set Bonus points.

End Game:
Alliances may continue to score Pixels on Backdrops or Backstage. They may also launch Drones from their Robots over the Truss into Landing Zones in front of the Playing Field. They may also suspend their Robots from the Rigging connected to the Truss or Park their Robots in the Backstage for various points.

Autonomous Period Scoring:
Navigating:
Parked In Alliance Backstage: .....5 points
Randomization Tasks based on white Pixel:
Purple Pixel in Spike Mark location: .....10 points
Yellow Pixel in correct column on Backdrop: 10 points
Randomization Tasks based on Team Art:
Purple Pixel in Spike Mark location: .....20 points
Yellow Pixel in correct column on Backdrop: 20 points
Pixels:
Placed in Backstage: .....3 points
Placed on Backdrop: .....5 points

Driver-Controlled Period Scoring:
Pixels:
Placed in Backstage: ..... 1 point
Placed on Backdrop: .....3 points
Artist Bonus: .....10 points
Set Bonus: .....10 points each

End Game Scoring:
Robot Parked In Backstage: .....5 points
Robot Suspended from Rigging: .....20 points
Drone Launching:
In Landing Zone 1 (closest to the field): .....30 points
In Landing Zone 2:.....20 points
In Landing Zone 3:.....10 points

Gracious Professionalism is a way of doing things that encourages high-quality work, emphasizes the value of others, the respect of individuals and their community. We learn and compete with respect and kindness in the process.

- We discover new things through the creation of our prototypes and trial and error. We learned more about how to use the OpenCV and the Machine Leaning Tool, and CAD functions, so we could create a model of Team Game Element
- Our innovative idea involves utilizing color sensors to enable the robot to autonomously learn and perform tasks. The blinking lights serve as indicators for different actions, such as whether the robot's hand is open or closed, or if the arm and wrist are moving up or down. Additionally, the lights signal when the two-minute driver-controlled period has elapsed. During autonomous execution, the lights modify to inform the team if the robot will accurately place the purple pixel.
- We make an impact on others by sharing our experiences through our Social media – Facebook, Instagram, Twitter and our Webpage. (All have over 2.2K followers on Instagram) Our previous Engineering Notebooks and Engineering portfolios available for all to view from our webpage.
- We make sure everyone on the team is included in our discussion and makes changes to the robot
- When we work as a team it makes us stronger
- We all enjoy driving our robot, working with others and sharing all the things FIRST
- We know that in DISCOVERY we learn new things, INNOVATION is when we improve on things that make an IMPACT on someone's everyday life. We strive for INCLUSION to make our TEAMWORK better. Most of all we want to have FUN.

Signature : Ayla and Renee

Date: January 28, 2024

TEAM 7341
F.R.E.N.C.H. F.R.I.E.S.

In Summary

Our robot design consists of a drive mechanism, lifting mechanism, a gripping mechanism to pick up the pixels, a drone launching mechanism, purple pixel mechanism. turret mechanism and vision mechanism to see our team game element. Our team has learned how to use the OpenCV so we can use our team game element to detect which spike to place the purple pixel for the extra points. We can pick up two pixels at a time allowing us to build mosaic designs on the backboard.

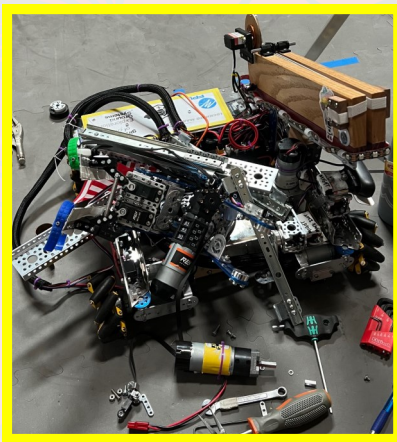
The biggest challenge to the robot design was sizing it down for easy movement under the yellow bars and around the rigging and finding a motor that would lift up our robot. Our color sensors and markers are used for task recognition during the autonomous period. The team communicates with the alliance team to compare strengths and set a plan of action for the match. The team's strengths include:

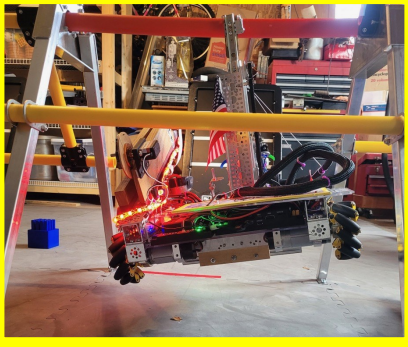
1. Picking up two pixels
2. Using the Team Game Element during autonomous
3. Placing a pixel on the spike and backdrop
4. Quickly maneuvering around the field
5. Lifting our robot off the mat during end game

We love to encouraging the FIRST LEGO Challenge team C.A.K.E. B.A.T.T.E.R.S. and FIRST LEGO Explorer team B.E.E.s members to continue and join the F.R.E.N.C.H. F.R.I.E.S. team when the reach the appropriate grade.

We have one closing note, which is to **Thank you** for this year's support and we are looking forward to next year!!

Portfolio Content was created by Team 7341 and enhanced by GPT for Word.





Signature : Elle and Vanessa

Date: January 28, 2024

Thank you for all your time and support for reviewing our Document!!

You can find a copy of our Engineering Portfolio at

http://girlscouteverywhere.org/sites/default/files/ftc/2024Portfolio/Team7341-2023-2024EngineeringPortfolio.pdf

Signature : Elle and Vanessa

Date: January 28, 2024

TEAM 7341
ENGINEERING PORTFOLIO

FRIENDLY

RELIABLE

ENERGETIC

NERDY

CLASSY

HEROES

PROFESSIONAL

GRACIOUS

ENGINEERING

TEAMWORK

FIRST

FTC
FIRST® Tech Challenge

FIRST IN SHOW
PRESENTED BY Qualcomm

Signature : _____

Date: January 28, 2024