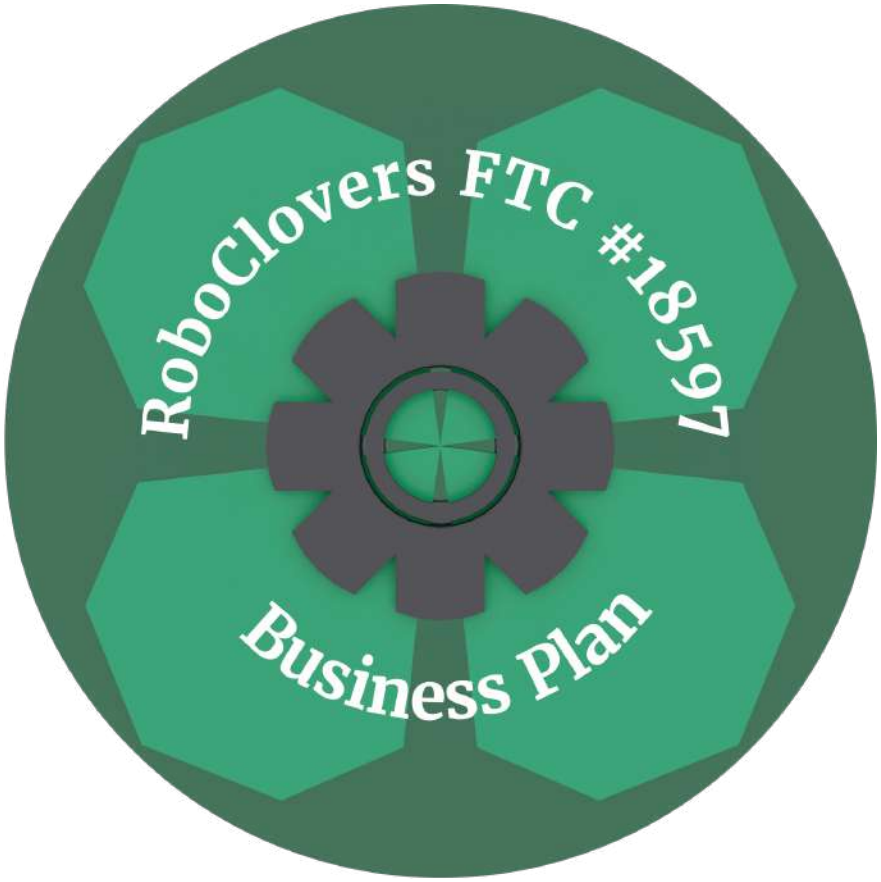
Barrow *FIRST* Robotics



This Page is Intentionally Left Blank.

(except for this message, which makes it not blank)

Contents

Executive Summary

Mission Statement:

Our mission is to learn computer science and engineering principles through participation in *FIRST* robotics programs, and to create a strong, sustainable, and active *FIRST* hub in our community utilizing a thriving network of teams, mentors, and volunteers to spread the benefits of *FIRST.*

Date Team Began:

The RoboClovers FTC Team #18597 rookie season was the 2020-2021 *ULTIMATE GOAL*, in which they participated remotely. However, the Barrow *FIRST* Robotics program began in the 2012-2013 school year, and has fielded multiple FLL, FTC, and FRC teams for every FIRST competitive season since that time.

Team & Program Summary:

Barrow *FIRST* Robotics is a collaborative program between the Barrow County School System and the Barrow County 4-H Office that provides multiple competitive robotics team opportunities to students throughout Barrow County, Georgia. The RoboClovers FTC Team #18597 is a second-year team of twelve high school students from the Barrow Arts & Sciences Academy and Winder-Barrow High School currently competing in the *FIRST* Tech Challenge *FREIGHT FRENZY* competition season.

Location of the Team and Current Team Sponsors:

FTC and FLL teams in the program currently practice and compete at the Center for Innovative Teaching campus in Winder, GA. The current sponsors of the program are Barrow County 4-H, Barrow County School System, Solvay Chemicals, Georgia Power Foundation, and MuddDog Trucking. We are very grateful to our sponsors for both their financial and in-kind support of all of our teams which helps provide for our registration fees, hardware and software components, tools and consumable materials, mentors, coaches, transportation expenses, and safety equipment.

Team Impact/Outreach:

As the varsity competition team of the Barrow *FIRST* Robotics Program, we see it as both a responsibility and privilege to help mentor younger teams competing in *FIRST* LEGO LEAGUE and ensure that they have a fun and successful season. We take time during every practice to visit the younger teams, take an interest in their projects, give them encouragement, and help set them up for success. This season our team members will be helping organize and run the Northeast Georgia Regional FLL Tournament as referees and judges, and hosting an FTC league meet for the other teams in our league. We also strive to inspire adult professionals in our community as we prepare ourselves and our fellow students with mechanical, technological, teamwork, and leadership skills that may otherwise remain underdeveloped.

Relationships & Information Regarding Current Sponsors:

For this season, we hope to be able to present this business plan along with updates on our season successes to the local Chamber of Commerce and Board of Education to not only thank them for their support, but to also communicate to them and their colleagues how vitally important the program is to our shared futures as productive members of our community.

Summary of Team Growth:

Currently, Barrow FIRST Robotics has one high school FTC team of twelve members, and two middle school FLL Teams of ten members each for a total of 32 members. We hope that the current middle school team members will continue in the program and generate the need for a second high school FTC team in the near future. One of our current FLL mentors is an elementary school teacher with an interest in starting an Elementary FLL Team next year. We look forward to soon being able to report the growing successes of five *FIRST* teams engaging elementary, middle, and high school students in Barrow County.

Summary of Future Team Plans:

Currently, nine out of twelve of our high school FTC team members are veteran *FIRST* members with previous experience on either FLL or FTC teams within the *FIRST* Robotics Program. This increasing level of returning team members provides us with more experience each year to help us meet more elevated goals. Improved recruiting strategies for developing a more well rounded team will be important in the future, as will finding additional qualified adult mentors willing to give of their time and talents as the current success of the teams in the program continue to draw more students.

Team Overview

FIRST®

FIRST® (For Inspiration and Recognition of Science and Technology) was founded by inventor Dean Kamen to inspire young people's interest and participation in science and technology. Based in Manchester, New Hampshire, *FIRST* is a 501(c)(3) not-for-profit public charity. The *FIRST* mission is to inspire young people to be science and technology leaders, by engaging them in exciting mentor-based programs that build science, engineering and technology skills, that inspire innovation, and that foster well-rounded life capabilities including self-confidence,communication, and leadership. As a volunteer-driven organization, *FIRST* is built on partnerships with individuals as well as businesses, educational institutions, and government.

FIRST TECH CHALLENGE

Officially launched in 2007, *FIRST* Tech Challenge (FTC) is a mid-level robotics program between *FIRST* LEGO League (FLL) and *FIRST* Robotics Competition (FRC) for students in grades 7 through 12. The *FIRST* Tech Challenge is a student-centered and mentor-supported competition focused on giving students a unique and engaging experience where they learn the values of teamwork and gracious professionalism. The *FIRST* Tech Challenge allows students to work hand-in-hand with technical professionals to develop robotic solutions to a new challenge every year.

For each season, students design and construct fully-customized robots which are autonomously programmed and operator-controlled to perform various tasks that are unique to that season's thematic game, which is revealed in a worldwide kickoff event in September. Once the game is revealed, teams have six to eight weeks before competition events begin. Each match of an FTC event features robotic alliances. An alliance is composed of two teams, each with one robot, two drivers, and a student or adult coach. In a single match, two alliances compete against one another on a single 12' x 12' playing field. This format packs a lot of action into a relatively small space with four robots and twelve players giving everything they've got for an intense two minutes thirty seconds.

RoboClovers FTC #18597

RoboClovers FTC Team #18597 is the first ever FTC team in the Barrow *FIRST* Robotics Program. The team was born out of a desire to continue offering high school varsity competitive robotics in Barrow County despite having to disband the program's FRC Team #5132 due to a lack of sustainable funding in the face of the COVID-19 Pandemic. So, in 2020, FTC Team #18597 was formed with mechatronics teacher and former FRC Coach Ben Manning at the helm as Lead Mentor/Coach. The remote *ULTIMATE GOAL* season that resulted from the pandemic served as our team's rookie year, and provided us with a scaled-down version of the traditional FTC platform, with no in-person matches, no alliance experience, and no in person judging from which to gain valuable rookie year experience. We look forward to the *FREIGHT FRENZY* season as our first real taste of the fully-intended FTC experience. This season we have more team members, a new robotics lab, more sponsors, and a new Lead Mentor/Coach.

Student Team Members:

Number of Students on Team	12 (100%)
Number of Female Students on Team	3 (25%)
Number of Male Students on Team	9 (75%)
Number of 8th Graders on Team	2 (17%)
Number of 9th Graders on Team	3 (25%)
Number of 10th Graders on Team	7 (58%)
Number of11th Graders on Team	0 (0%)
Number of 12th Graders on Team	0 (0%)
Number of Black Students on Team	0 (0%)
Number of Asian Students on Team	1 (8%)
Number of Hispanic Students on Team	1 (8%)
Number of White Students on Team	10 (83%)
Number of Returning FTC Members on Team	6 (50%)
Number of New FTC Members on Team	6 (50%)
Number of Former FLL Students on Team	5 (42%)

Team Mentors:

Lee Bane	Barrow County School System - Director of Innovative Learning
Tiffany Coles	Barrow County 4-H - Program Assistant

Team Sponsors:

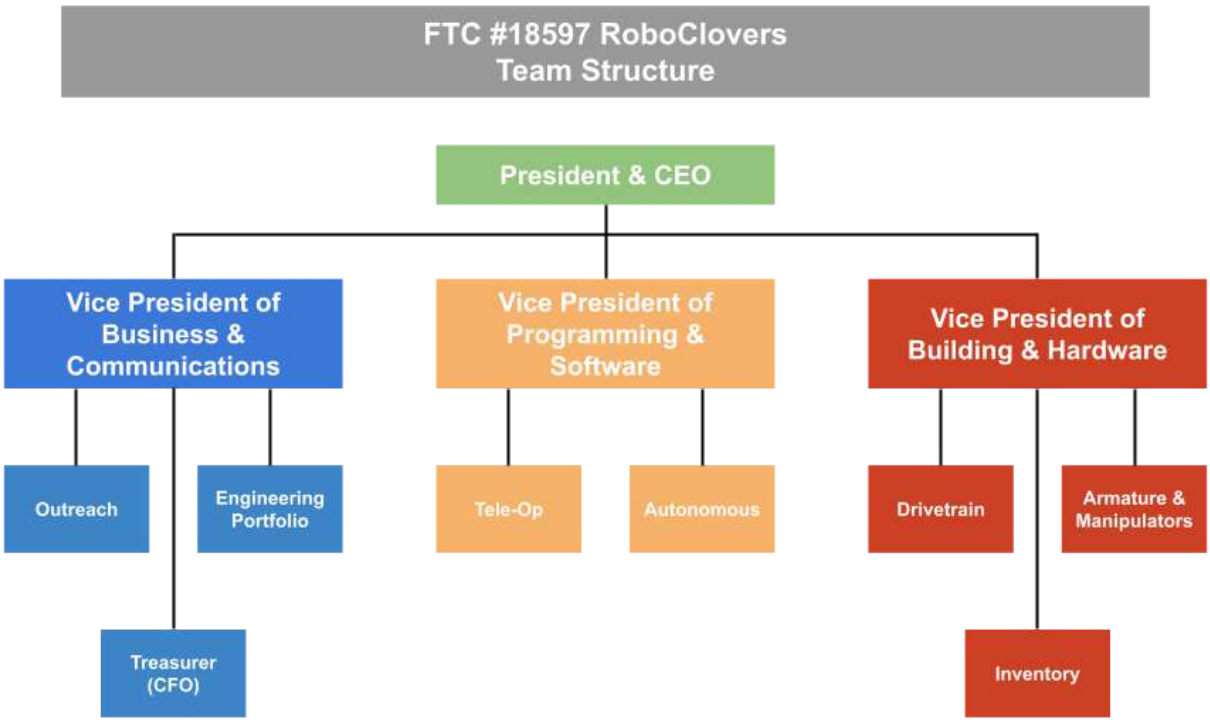
Barrow County 4-H	Registration Fees, Equipment, Transportation
Barrow County School System	Facilities, Mentors/Coaches, Equipment
Georgia Power Foundation	Equipment & Materials
Solvay Chemical	Personal Protective Equipment
MudDog Trucking	Equipment & Materials

Team Management

Team Membership:

Student members must complete an extensive application. Team members must be able to communicate the skills they will bring to the First Tech Challenge Team. Coaches use a rubric to score each application and look for evidence of building and coding skills as well as leadership and teamwork potential. Students are selected from the applications to try out to be on one of our sub teams. Team members must also commit for an entire season. Officers are elected each year with terms that last until the beginning of the next season.

Team Structure:



Subteam Descriptions:

Build Team	Helps design, document and implement the mechanisms needed to complete the desired tasks during a match. Sometimes operates as separate Drivetrain and Mechanism sub-teams. Helps organize and keep track of kit components and tools. Helps order/procure items needed for the season. Keeps track of changes to the game rules and makes sure that the team's robot and strategy complies with current rules.
Programming Team	Helps write, document and test the computer programs or "op modes" needed to complete the desired tasks during a match. Manage source code to keep track of versions and backup copies. Studies the game rules to help the team develop a strategy to be more successful during the season. Keeps track of changes to the game rules and makes sure that the team's robot and strategy complies with current rules.
Business Team	Helps track budgetary goals. Helps identify and approach potential sponsors. Helps develop a plan to raise money and resources for the season. Helps identify and recruit new mentors and team members. The business team must also help document team activity as part of the engineering notebook. Keep track of intermediate and long-term goals. Develops material to publicize the team to parents, the community and sponsors. Creates team promotional material. Helps plan the season schedule (when is the first competition, where will it be located, what do we need to bring?).

SWOT Analysis

Continual improvement is a goal of Team RoboClovers. To help meet that goal, we intend to conduct an open and honest SWOT Analysis to identify our Strengths, Weaknesses, Opportunities, and Threats. With the help of our mentors, we hope to create effective improvement plans using the SWOT Analysis data.. Once we analyze our situation we can build on our strengths, correct weaknesses, pursue opportunities, and avoid threats. Our SWOT Analysis data can also help guide our sponsors consider how they can best support our team and the overall program.

Strengths	Weaknesses
• Diversity among team members • Facilities • Time-Management Skills • Multi-Team Program • Improvisation and Problem Solving	• Lack of experience in FTC • Shortage of STEM industry partners • Communication issues • Still developing team member roles and jobs
Opportunities	**Threats**
• Recruitment of new members • Numerous years of growth possible with underclass members • More off-season outreach	• Loss of mentors/coaches • Loss of sponsors • Loss of members • Expenses of new equipment each season

Team Impact/Outreach

Our FTC team has a strong connection with the younger members of the two FLL teams in Barrow County and make a point to encourage and mentor those students whenever possible. All three teams' practices overlap at the Robotics Lab at CFIT, which gives our members the opportunity to serve as peer mentors in multiple ways.

- Showing an interest and asking questions about their projects
- Teaching them coding/programming techniques
- Advising them on engineering and building strategies
- Discussing high school robotics and engineering opportunities with them
- Refereeing their scrimmages and giving them feedback
- Judging their project presentations and providing feedback

Our FTC Team also served in a number of core volunteer roles for the Northeast Georgia Regional FLL Tournament in December at CFIT. Six of us were referees, two of us were project and robot design judges, two others were score runners, and two members ran a swag button booth. The team also made sure to exhibit gracious professionalism by fully investing in the FLL Tournament Dance Party with the FLL Teams while the scores were tallied and awards decided.

Future Plans

In the short term, the team is excited to complete its first ever in-person league season, and compete in an in-person league tournament. We plan to establish a strong long-term team plan through the development of this business plan and our Engineering Portfolio. At the league tournament, our goal for this year is to have established a reputation with the top three teams in the league that is so respected that we are chosen by their alliance captains in the elimination round of the tournament. We also hope to develop a strong enough engineering portfolio and judging presentation that we end the season with an Award trophy at the league meet.

In the long term, the team would like to pursue the idea of growing the Barrow *FIRST* Robotics Program to include two high school FTC Teams. We have seen how programs in other counties are able to gain great benefits from having two or more teams that can competitively collaborate and challenge each other so that the members of both teams get better. This goal goes along with the team's plans to increase the robotics program's overall number of student members and industry partners.

Action Plan

Our team's Action Plan is currently under development and will be a primary focus of our postseason practices. The plan will document what steps we will take to attain the goals already mentioned in the Future Plans section. It will include what needs to be done, why it needs to be done, who is responsible for doing it, and when we aim to have it done.

Goal	Action Step	Why?	Who?	When?
Update Business Plan				
Recruit New FLL Members				
Recruit New FTC Members				
Recruit New STEM Sponsors				
Register 2nd FTC Team				
Expand Community Awareness of Barrow FIRST Robotics				

Team Budget

The FTC Team Budget is a component of the overall Barrow *FIRST* Robotics Program Budget, whose fiscal agent is Barrow County 4-H. The robotics program budget not only encompasses the finances of the FTC Team, but also the finances of the FLL Teams in the program.

Team Income:

Sources of team/program income consists of a variety of sources including:

- Grants
- Partnership Appropriations
- Sponsorship Donations
- Membership Fees
- Fundraiser Profits
- Tournament Proceeds
- In-Kind Donations

Team Expenditures:

Typical expenditures for the team/program include the following:

- Annual Program Registration Fees to *FIRST*- North America
- Annual FLL Tournament Registration Fees to *FIRST*-Georgia
- Annual FTC League Registration Fees to *FIRST*-Georgia
- FLL Robotics Components
- FLL Innovation Project Materials
- FTC Mechanical Components
- FTC Electronic Components
- FTC Field & Scoring Elements
- Consumable Building Materials
- Tools
- Transportation
- Team Uniforms/T-shirts
- Food
- Misc. Parts & Supplies
- Personal Protection Equipment

Sponsor Benefits

Platinum Sponsor: $1,000 and above

Logo displayed on competition robot
Name/logo displayed on Team T-Shirt
Name/logo displayed on team banner displayed at events & tournaments
Name, logo, and hyperlink in the “Sponsors” section of team webpage

Gold Sponsor: $500 -$999

Name/logo displayed on Team T-Shirt
Name/logo displayed on team banner displayed at events & tournaments
Name, logo, and hyperlink in the “Sponsors” section of team webpage

Silver Sponsor: $100 -$499

Name & logo on team banner displayed at events & tournaments
Name, logo, and hyperlink in the “Sponsors” section of team webpage

Bronze Sponsor: $25-$99

Name listed in the “Sponsors” section of team webpage

For sponsorship gifts of $100 or more, members of the team will give a complimentary presentation to a small or large group of people about the program, and an optional interactive demonstration with a robot.

Sponsorship Information

Checks should be made payable to: Barrow County 4-H (memo: Barrow Robotics)
Donations may be tax deductible; please contact the team for more information.

Team Fundraising Opportunities

Current Team Fundraisers:

- We are selling swag buttons and concessions at *FIRST* events hosted in Barrow.
- Team members are accepting 4-H “Bingo” pledge card donations.

Future Team Fundraisers:

- Selling buttons at football games or other sporting events
- Selling concessions at football games and other sporting events
- Car wash

Final Statement

Our team is unique because we are made up of two different High schools: Winder Barrow and The Barrow Arts and Science Academy (BASA); BASA is made up of high school students and eighth grade students, and we are the only FTC robotics team in the county.

Team Contact Information

Website: https://www.barrow.k12.ga.us/schools/cfit/barrow-first-robotics
Team Email: barrow.ftc@gmail.com
Facebook: Barrow FTC
TikTok: barrow.ftc
Instagram: barrow.ftc

Lead Mentor 1: Lee Bane
BCSS Director of Innovative Learning
lee.bane@barrow.k12.ga.us
678-491-4937

Lead Mentor 2: Tiffany Coles
Barrow 4-H Program Assistant
tcoles@uga.edu
770-307-3029

Team Meeting Information

Location: Center for Innovative Teaching
Dates: Mondays & Wednesdays
Times: 3:30 PM- 6:00 PM