Andover High School

FIRST Robotics Team Business Plan

Team # 2834

2009 Season

(version 2.1)

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EXECUTIVE SUMMARY

Mission Statement

In order to support the vision and mission of FIRST, the Andover High School FIRST Robotics Team will create a positive environment where mentors and students work side by side as equal partners. They will treat each other with respect as they work towards the common team goal with no personal agenda using the credo "FIRST Team, TEAM First". The mentors will find it rewarding to use their real world experience to lead and inspire the students to be science, technology and business leaders in the future. The students will acquire important skills that will serve them well in their college years and their future careers.

Here is a summary of our business plan. For more detailed information in each area, please refer to the section as outlined in the Table of Contents on the previous page.

- In December 2007, West Hills Middle School 8th grader, Jason Law, found out there was no robotics team at Andover High School where he planned to attend. With the support of his dad, Jason inquired about forming a new robotics team to pursue his interest in science and engineering. He founded the robotics team with 5 students in June 2008. In the fall the team grew to 10 members. Jason became the point of contact with the school assuming many of the administrative tasks. He also facilitated the team meetings. He is on the mechanical team, electrical team and contributed to the website design.
- The Andover High School is located in Bloomfield Hills, Michigan. We currently have three main sponsors: Chrysler Foundation, PTC and Oakland Community College.
- The Chrysler Foundation is the primary source of charitable grants made by Chrysler LLC. Chrysler LLC believes it is their duty to use their skills and resources to support programs emphasizing community growth and enrichment throughout the United States and the world. Dr. Steven Gaynor, Superintendent of the Bloomfield Hills School District, accepted the donation from Chrysler Foundation at the Bloomfield Hills Board of Education meeting on November 6, 2008. Furthermore, we issued press releases to all newspapers that cover our school district. An article to recognize Chrysler Foundation was also published in the fall issue of Community Connections which is a newsletter that is mailed to every household in the school district and all district staff members.
- PTC, one of the key sponsors of FIRST Programs, selected our school as one of the three teams in Michigan that they sponsor. To show our appreciation to PTC, we volunteered to co-host a free one day hands-on workshop to all Michigan FRC teams on how PTC software can help teams reduce the time to design their robot. We helped in promoting and organizing this event. Our school district IT staff spent hours installing all the necessary software on 30+ computers in the computer lab. A total of 35 people representing 11 teams from all over Michigan attended the workshop. A video was also made and sent to teams who were interested but could not attend the workshop.
- Oakland Community College was one of the few local higher education institutions that were not involved with FIRST. We targeted them for this reason. We approached them about setting up an account to accept donations on behalf of our team so it becomes tax deductible. After they learned more about what FIRST is about, they offered a large space in their Robotics Lab and a large conference room for us to use as our build site since our school does not have a workshop. We invited their faculty and students to mentor our team to get them more involved. We will continue to

nurture this relationship and we are working on getting OCC to offer scholarships to FIRST participants.

- Section 5 details our start up plan and plan for long term sustainability. This includes the recruiting and marketing plan. Some of the events that took place were:
  - In the spring of 2008, we invited all teachers and students to attend one of the local regionals to get them excited about FIRST
  - In May 2008 we had an information meeting and borrowed Team 469's robot which got plenty of attention
  - In June 2008 we competed in an off-season competition to get the new members excited about FIRST.
  - In September we posted flyers, made PA announcements and had a series of information meeting using Team 469's robot which generated a lot of interest.
- For long term sustainability, we plan to do the following.
  - Expand business partnerships in case our current sponsors are unable to support our future endeavors.
  - We will try to keep our existing sponsors as long as we can by showing appreciation, inviting them to our annual awards banquet, proudly showing their name and logo on our banner and robot. The details are described in Section 9.1. We will give back to our sponsors through participation in corporate events, volunteer activities, and student internships.
  - We will have sound financial management to manage the funds that we get each year.
  - It is important to retain mentors and engineers by showing appreciation of their time and effort and make sure they find it rewarding.
  - We will actively recruit mentors and engineers to continue to grow the team.
  - A very important tool to market our team is our team website www.team2834.com. It contains a lot of information about our team, sponsors, schedules as well as explain what FIRST is about to visitors who are not familiar with it.
  - We will invite all students, teachers and staff at the school to attend the State Championship. The atmosphere in the arena during the competition will spark interest among some students who might want to join our team the following year.
  - After the competition season is over in spring, we will recruit new members who are already at the high school. We will have a display booth at the Andover High School Open House. We will also take our robot to demo at the middle schools to generate interest among the students especially the 8th graders.
  - In the summer we will attend one off season competition event to let our new members get excited about FIRST Robotics Competition.
  - In the fall we will recruit students who are new to the high school and from incoming freshmen.
  - We will continue to nurture FLL teams and start and mentor FTC teams so we will maintain a consistent interest level to the robotics team from the incoming freshman class.
- Please review the Table of Contents page to see what other information is included in this Business Plan, including Goals, Challenges and Success Measures, Team Organization, Membership and Financial Plan information.

1.0 BACKGROUND OF FIRST ROBOTICS COMPETITION

FIRST stands for "For Inspiration and Recognition of Science and Technology". The background information on this entire page is taken from http://www.usfirst.org

Vision of FIRST

"To transform our culture by creating a world where science and technology are celebrated and where young people dream of becoming science and technology heroes." - Dean Kamen, Founder

Mission of FIRST

Our 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.

Gracious Professionalism

Dr. Woodie Flowers, FIRST National Advisor and Pappalardo Professor Emeritus of Mechanical Engineering, Massachusetts Institute of Technology, coined the term "Gracious Professionalism."

Gracious Professionalism is part of the ethos of FIRST. It's a way of doing things that encourages high-quality work, emphasizes the value of others, and respects individuals and the community.

With Gracious Professionalism, fierce competition and mutual gain are not separate notions. Gracious professionals learn and compete like crazy, but treat one another with respect and kindness in the process. They avoid treating anyone like losers. No chest thumping tough talk, but no sticky-sweet platitudes either. Knowledge, competition, and empathy are comfortably blended.

In the long run, Gracious Professionalism is part of pursuing a meaningful life. One can add to society and enjoy the satisfaction of knowing one has acted with integrity and sensitivity.

FIRST Robotics Competition

FIRST Robotics Competition (FRC) is a unique varsity sport of the mind designed to help high-school-aged young people discover how interesting and rewarding the life of engineers and researchers can be.

The FIRST Robotics Competition challenges teams of young people and their mentors to solve a common problem in a six-week timeframe using a standard "kit of parts" and a common set of rules. Teams build robots from the parts and enter them in competitions designed by Dean Kamen, Dr. Woodie Flowers, and a committee of engineers and other professionals.

FIRST redefines winning for these students because they are rewarded for excellence in design, demonstrated team spirit, gracious professionalism and maturity, and the ability to overcome obstacles. Scoring the most points is a secondary goal. Winning means building partnerships that last.

What is unique about the FRC program?

- It is a sport where the participants play with the pros and learn from them
- Designing and building a robot is a fascinating real-world professional experience
- Competing on stage brings participants as much excitement and adrenaline rush as conventional varsity tournaments
- The game rules are a surprise every year

In 2008 the FIRST Robotics Competition reaches over 37,000 high school students from over 1,500 teams from Brazil, Canada, Chile, Israel, Mexico, the Netherlands, the U.K., and every state in the U.S. There were 41 Regional events in Brazil, Canada, Israel and the U.S. with a world championship in the Georgia Dome in Atlanta, Georgia.

Most teams begin in the fall by securing funds to pay for the costs of a robot starter kit, competition fees, tools, robot parts, and travel expenses through corporate sponsorship, fundraising and member fees. They also provide training to new team members in different areas related to the robot. At the same time, returning team members further their knowledge of robotics design by experimenting with different designs and constructions to develop new ideas that may be incorporated into their future robots.

At a FIRST kick-off event in early January, the team learns the competition game scenario and the rules when they pick up their robotics kit. The teams have 6 weeks to design, build and program their robots before they are shipped to their first regional competition. Besides a common kit of parts provided by FIRST including motors, pneumatics, sensors and sophisticated electronics, the teams can also purchase certain additional parts and material as needed up to $3,500 to build a full-scale robot that weighs over 100 pounds. Some teams build a second robot for drive team practices after the 6 weeks.

A typical regional competition brings together 30 to 60 high school teams and their robots at a coliseum-type facility for 3 days. The facility holds spectators, an arena for the robot competition, and a “pit area.” The pit area provides each team with a station to fine-tune and repair their robot if needed between events. After some practice matches, teams compete with and against each other to earn seeding position that may qualify them for participation in the elimination matches. The top seeded teams will then choose their alliance partners to join them in their quest to become the regional champion. A team can enter more than one regional competition. Qualified teams can attend the world championship in Atlanta Georgia.

This Business Plan was put together partly from information of many teams who generously share their experiences in their Team Handbooks that they publish on their website or were given to us. The Team Handbooks that were reviewed were from Team 25, 45, 93, 254, 467, 469, 503, 829, 1124, 1249 and 1816. We also reviewed the Business Plan of Team 234. A lot of effort was put into creating this Business Plan to show the school and potential sponsors what we were trying to do and how we would go about implementing it. It increases their confidence in us and their enthusiasm to partner with us.

2.0 MISSION STATEMENT OF ANDOVER HIGH SCHOOL FIRST ROBOTICS TEAM

In order to support the vision and mission of FIRST, the Andover High School FIRST Robotics Team will create a positive environment where mentors and students work side by side as equal partners. They will treat each other with respect as they work towards the common team goal with no personal agenda using the credo “FIRST Team, TEAM First”. The mentors will find it rewarding to use their real world experience to lead and inspire the students to be science, technology and business leaders in the future. The students will acquire important skills that will serve them well in their college years and their future career.

The following are operating philosophies that this team will follow

- In case where the competition rules are unclear, we will go by the spirit of the rule rather than the letter of the rule, even though it may put us at a disadvantage. We will not try to win at all cost.

- We will not lose focus on our core purpose of designing and building robots. Other things can be purchased within the rules or outsourced.

- We measure success in how well and efficient the team works together within the constraint of rules, time, money and human resources.

- We encourage students to take on responsibility in a new area each year if they want to expand their horizon. It is good for the student and good for the team in the long run.

- We will have a no cut policy. We believe it is contrary to the philosophy of FIRST to encourage more students to see how rewarding science and technology is when a team limits who can be on the team. However, minimum time commitment is required to be on the team. See the Consent Form in Appendix B for details.

- The team will be managed by the consensus of all team members. Mentors are present to guide and inspire the students. They are there to explain the pros and cons of each action based on their professional experience. Decisions will be made as a team.

- We will prioritize our time and effort to treat the vision and mission of FIRST to create a positive impact on our community and promoting science and technology just as important as creating a competitive robot.

3.0 TEAM INFORMATION

3.1 HISTORY

The Andover High School robotics team was founded in 2008 by freshman Jason Law. Jason has always been interested in robotics and used to spend hours building with his Lego Mindstorm robotics set. He was first introduced to FIRST robotics competition in September 2007 when he was an 8th grader, and was looking forward to joining the robotics team when he goes to high school. However, in December 2007, Jason found out that Andover high school, where he was planning to attend the following year, did not have a robotics team. With the encouragement of his dad, he began looking into forming a team, to further pursue his interest in science, engineering and robotics. With the support of Gail Alpert of Team 469 and his dad, they began to also gain support of the school and the school district superintendent. They started writing the team handbook, recruiting brochures and fundraising.

In June 2008, the team was formed with 5 members. In fall of 2008, the team registered and was assigned the team number 2834. They also picked the nickname “Bionic Barons”. In their first season, there were a total of 8 students on the team.

3.2 IMPACT ON COMMUNITY

Within a week of forming the team, the team approached some middle and elementary schools in our district about forming FLL teams. We ran two free one-week summer robotics camps for about 20 Pine Lake Elementary students as a way to give back to the community. We introduced them to the LEGO Mindstorms NXT robotic set, and more importantly, showed them that science and technology can be fun. As part of our partnership with Pine Lake Elementary School, we helped them form two FIRST Lego League teams (#2392 and #2805) and we sponsored and mentored them in the fall. The teams were made up of students from both Pine Lake Elementary School and West Hills Middle School.

During the build season, we plan to host an open house and invite the community, the FLL students and sponsors to come in and learn about FIRST, inspect our practice robot, review the game challenge, tour our website, view our design process and our CAD model of the robot. After the competition season is over, we plan to take the robot to demo at the middle schools and elementary schools in our school district. We will also support the FIRST community and take our robot to events that promote FIRST.

Besides promoting science and technology, our team wants to be involved in community service opportunities in our area. We planned a work day at a local food bank to help them during the busy time from Thanksgiving to Christmas. We also planned to work with another school club to support them on their effort on a Habitat for Humanity project.

4.0 GOALS, CHALLENGES, AND SUCCESS MEASURES

Some of these are short term while others are long term. They will be reviewed annually and be updated.

4.1 GOALS

This can be separated into FIRST Goals, Award Goals and Team Goals

FIRST Goals

- Inspire students to seek careers in engineering, science, and technology fields as they make college choices.
- Continue to promote FIRST and science and technology in the community.
- Start new FRC teams in other high schools in Oakland County and help mentor rookie teams.
- Start and mentor new FTC teams in our school district as they start in Michigan.
- Start and mentor new and existing FLL teams in our school district.
- Continue to be involved in community services that are not related to robotics.
- Continue to cultivate strong partnerships with community, business and educational institutions.
- Be active on Chief Delphi and FIRST forum and contribute to the FIRST community.

Award Goals

- Win the Rookie All Star Award at the district, state or national competition in our first year.
- Win the Chairman's Award at the district, state or national competition in the future.
- Win a Technical Award at the district, state or national competition.
- Win a FRC Title at the district, state or national competition.
- Be recognized by other teams by winning peer awards.
- Have our seniors receive FIRST related College Scholarships.
- Achieve a 100% graduation rate and 100% college attendance rate.

Team Goals

- Train rookie members each year on the basics in all areas.
- Provide more in depth training of veteran members based on interest and needs.
- Follow the team design process each year to build a successful robot consistently.
- Gradually increase the complexity of the design to make it technically challenging for veteran members.
- Gradually increase design and manufacturing options by adopting technologies, machineries that are new to the team.
- Gradually shift responsibilities to the students in terms of leadership and design as they become ready. Engineering mentors will continue to work side by side with the students to provide inspiration and guidance.
- Gradually increase the size of team.
- Raise fund to get a team trailer to move the robot to district competitions and community events.
- Look for sponsors that give internship or coop programs to our students.

4.2 CHALLENGES

The Andover Robotics Team faces many of the same challenges as other school clubs and teams in addition to some unique challenges because of the nature of FRC.

- Competing with almost 50 other school clubs, activities and sports programs in a relatively small school to recruit new members and maintain interest of current members each year.
- The entry fee for events for district, state and national competitions are high comparing to other competitive sports.
- The team requires corporate sponsors and community support in fundraising to cover the entry fees and some other expenses. The team cannot expect the parents to pay for a majority of the cost to run the team.
- The team has to find a work site for the 6 weeks build season.
- The team needs to look for mentors and engineers to help with different areas.
- There are additional challenges for us as a first year team because our school does not have a shop and we do not have any tools. There are a lot of extra expenses to acquire the tools needed.
- There is a new robot controller in 2009 so we will have to learn it alongside other veteran teams.

4.3 SUCCESS MEASURES

There are many different ways to measure success in a FRC program. The most important is what positive impact this program has on the students that participated in it. Below are other measures that can gauge how well the team strives to reach its goals.

- Percentage of students attending college and percentage in science and technology field.
- Number of rookie teams we help start and number of rookie teams we mentor.
- Number of FTC and FLL teams we started and mentored.
- Number of freshmen joining as a result of FTC and FLL program we supported in the middle school and elementary schools.
- Number of judges and peer awards the team won in competitions.
- Number of FIRST Scholarship received by seniors.
- Percentage of students returning to the team each year excluding graduating seniors.
- Placement of students into internships and co-op programs with sponsors.
- Growth and diversity of team membership.
- Growth of number of mentors and engineers on the team.
- How well and efficient the team works together within the constraint of rules, time, money and human resources.
- How well the team follows gracious professionalism in all we do.

5.0 STARTUP PLAN AND LONG TERM SUSTAINABILITY

With the goals in mind and the challenges that we face as it was described in Section 4.1 and 4.2, here are some of the strategies we will use in our startup plan and for long term sustainability.

5.1 STARTUP PLAN

- Prepare a recruitment plan to attract students to join and encourage diversities.
- Prepare a budget with best and worst case scenario.
- Prepare a fundraising plan and work hard to get sponsors and donations.
- Create a team wish list of tools and supplies needed and ask for donations or borrow the tools instead of purchasing them.
- Prepare an expense reimbursement form and create an approval process for verifying expenses.
- Create a team handbook to clearly define roles and responsibilities of students, mentors and parents.
- Create a spreadsheet to keep track of work hours to monitor commitment of all students.
- Prepare training materials to teach students in all areas related to FRC robot design and build.
- Invite mentors from other successful local teams as guest speakers so students can learn from other teams.
- Stock up on materials and supplies before the build season starts so we do not waste time waiting for materials.

5.2 MARKETING FOR LONG TERM SUSTAINABILITY

- Expand business partnerships in case our current sponsors are unable to support our future endeavors.
- We will try to keep our existing sponsors as long as we can by showing appreciation, inviting them to our annual awards banquet, proudly showing their name and logo on our banner and robot. The details are described in Section 9.1. We will give back to our sponsors through participation in corporate events, volunteer activities, and student internships.
- We will have sound financial management to manage the funds that we get each year.
- It is important to retain mentors and engineers by showing appreciation of their time and effort and make sure they find it rewarding.
- We will actively recruit mentors and engineers to continue to grow the team.
- Besides issuing press release to local newspapers to recognize our sponsors, we will also try to get coverage by the student newspaper to increase our visibility, as well as coverage in school district newsletter.
- A very important tool to market our team is our team website www.team2834.com. It contains a lot of information about our team, sponsors, and schedules as well as explains what FIRST is about to visitors who are not familiar with it.
- We will invite all students, teachers and staff at the school to attend the State Championship. The atmosphere in the arena during the competition will spark interest among some students who might want to join our team the following year.

- After the competition season is over in spring, we will recruit new members who are already at the high school. We will have a display booth at the Andover High School Open House. We will also take our robot to demo at the middle schools to generate interest among the students especially the 8th graders.
- In the summer we will attend one off season competition event to let our new members get excited about FIRST Robotics Competition.
- In the fall we will recruit students who are new to the high school and from incoming freshmen.
- We will continue to nurture FLL teams and start and mentor FTC teams so we will maintain a consistent interest level to the robotics team from the incoming freshman class.

6.0 TEAM ORGANIZATION

There are many ways a FIRST team can be organized. We want an organization structure that will best support our mission statement and for long term sustainability of the robotics team.

A team based structure is used rather than a club based structure. There will be no student officer positions other than if the school requires a representative. All team members have specific responsibilities to help achieve the team goal. This is just like on a school sports team where each athlete has a specific responsibility based on their strength and interest and the coaches' decision. Students may need to participate in more than one role in order for the team to achieve its goal. They will have one major responsibility but is expected to help out in any other areas.

Seniority on the team is based on number of years on the team and knowledge in a particular area. Veteran team members may become a team leader in a subgroup and mentor rookie team members so the knowledge can be passed on, or they may desire to work in a new area.

The team is divided into two main groups – Program Management and Engineering with subgroups listed below.

Program Management

- Finance
- Administration
- Public Relations

Engineering

- Mechanical
- Electrical / Computer
- Competitive Game Play

Each subgroup will have an adult mentor. The responsibilities of each group, subgroup are listed in the following sections.

6.1 PROGRAM MANAGEMENT

This group handles all non robot engineering tasks to free the engineering group to concentrate on the design and build of the robot.

FINANCE

- Prepare and submit proposals to obtain grants and sponsors
- Create financial budget
- Fundraising, deposit into accounts and track incoming funds
- Track expense to make sure we are within budget
- Maintain Bill of Material of the robot

- Track cost and weight of robot

ADMINISTRATION

- Develop business plan
- Maintain team rosters
- Develop and maintain team handbook
- Publish calendar with all relevant dates and deadline
- Schedule and facilitate meetings, publish meeting agenda and meeting minutes
- Organize team building and training workshops
- Overall project management
- Kickoff registration
- Register for regional events
- Interface with FIRST organization, school and parents
- Organize parent volunteers for food, travel coordinator etc.
- Establish cooperative environments with other teams
- Look for suitable meeting space and work shop

PUBLIC RELATIONS

This subgroup is responsible for all matters that pertain to the image of the robotics team to the public.

Awards

- Research into which awards the team will pursue
- Work with other subgroups to prepare and submit for awards

Communications

- Plan team public events, presentations, and press releases
- Develop public relations brochure and other materials
- Plan outreach events to promote science and engineering
- Update website with latest information about team
- Represent team to speak to judges
- Send thank you cards to sponsors and supporters

Website

- Develop and maintain website

Photographer / Videographer

- Document team activities, public events through pictures and video for use on website and other media
- End of year team picture, individual pictures with robot

Team Image and Spirit

- Develop team image
- Coordinates team identity such as logos, nickname, appearance of robot and crate, uniforms (t-shirts), team promotion giveaways (optional), mascot (optional), and team spirit activities.
- Create display for competition pit area
- Improve the aesthetics of the robot for better appeal and consistent team image
- Organize and lead cheering for team at events, create a positive fun atmosphere
- Create awards to give to other teams (optional)

6.2 ENGINEERING

This group handles all robot engineering design and build, and also responsible for all matters related to competitive game play.

MECHANICAL

Chassis

- Design chassis based on engineering requirement
- Package all chassis components in CAD
- Build prototype to test concept
- Fabricate parts and assemble chassis

Mechanism

- Design mechanism based on engineering requirement
- Package all components in CAD
- Build prototype to test concept
- Fabricate parts and assemble mechanism

ELECTRICAL / COMPUTER

Electrical

- Wire the robot and sensors
- Build operator interface

Programming

- Develop code for autonomous mode
- Develop code to reduce driver/operator burden
- Develop code for rules conformance

Animation

- Write script with storyboard
- Develop animation for Autodesk Visualization Award

COMPETITIVE GAME PLAY

Rules / Game Strategy

- Lead the team in discussing what game strategy we will adopt, prepare playbook by anticipating what opponents may do
- Work with engineering teams to transfer game strategy into functional requirements of robot
- Monitor US FIRST website daily for updates to rules and documents
- Monitor US FIRST website daily in Questions and Answers Forum to clarify rules and interpretation
- Monitor Chief Delphi website daily on other teams' discussions of rules, strategies etc.
- Ensure the team stick to the plan once it is established in Week One unless a rule clarification requires a change to the game strategy.

Scouting

- Prepare scouting plan during pre-season
- Update scouting database with weekly regional results
- Gather information on teams which will be competing in the same regional competitions as our team
- Coordinate all available team members at the regional competition to talk to other teams and watch matches to gather information
- Report to the Drive Team Coach on other teams' strength, weakness and strategies before each match
- Maintain desired alliance partners list using the Excel spreadsheet in case we are ranked high enough to pick partners
- Update playbook after watching matches and report to Drive Team Coach and not the Drive Team members

Safety

- Develop safety policy
- Implement and enforce safety rules, e.g. safety glasses, machine training record
- Keep pit area clean, uncluttered and safe

Practice Field / Shipping Crate / Cart Construction

- Responsible for understanding the requirement
- Purchase material
- Build field / shipping crate / cart

- Maintenance of those items

Robot Shipping

- Responsible for understanding and adhering to the requirement
- Handle all paperwork with shipping
- Make sure the robot is packed safely
- Make sure the robot is shipped by deadline and track the whereabouts of the robot at all times until the end of season

Drive Team

- Practice driving and operating the practice robot for as many hours as possible before the competition using the situations created in the playbook
- Relay robot performance issues to engineering teams for improvement
- Drive and operate the robot in the competition, focus on our robot only during the match and listen to instructions from Drive Team Coach
- Arrive early and stay late for extra practice of different anticipated maneuvers
- Communicate robot performance issues to the pit crew if adjustments or maintenance is needed after matches
- Relax, watch matches and take time to reflect in between matches
- Exhibit good sportsmanship as you represent the team in battle
- Discuss with Drive Team Coach on strategies of upcoming match

Pit Crew

The pit crew should be from the mechanical and electrical subgroup after the build season

- Plan during pre-season how to setup the pit area
- Packing and unpacking of robot crates
- Packing and unpacking tools and spare parts for pit
- Keep pit area organized, clean and monitored at all times
- Preventive maintenance and repair of robot at competition
- Need runner to acquire tools, parts and help

7.0 MEMBERSHIP

Students who are willing to abide by the requirements as stated in Section 7.1 and signed the consent form are considered full members. The requirements are set up by the steering committee and can be modified each year as needed. All adult mentors will also be granted full membership based on their involvement. There will also be adult volunteers and team supporters which will be explained in more detail in Section 7.7.

7.1 STUDENT MEMBERSHIP APPLICATION

As stated in Section 2.0, we will have a no cut policy. We believe it is contrary to the philosophy of FIRST to encourage more students to see how rewarding science and technology is and then reject somebody who shows interest. It is demoralizing to a student who is interested in learning more about science and technology telling them they are not good enough. However, minimum time commitment is required to be on the team. We will not turn any students away as long as they are willing to put in the time to learn.

There will be an informational meeting for students and parents. The Team Handbook which contains the application form and consent form will be handed out at the parents meeting. After the students and their parents/guardian reviewed the Team Handbook carefully, they need to fill out the application form, sign the consent form in the handbook acknowledging that they will abide by all the rules as stated, and return them to the school office along with payment of the team fee. If financial assistance is needed, please contact the school office.

7.2 OPPORTUNITIES FOR STUDENTS

Active participation by students on the Andover High School FIRST Robotics Team can be very rewarding. Many colleges across the United States are familiar with FIRST Robotics Competition. Some mentors local high school teams and many have students who are alumni of high school robotics teams. These students are highly sought after by colleges because of the leadership skills and work ethics that they acquired. Some colleges even offer scholarships to attract these students.

In a similar way, many corporations around the country are interested in these FIRST students. Some of them provide scholarships or coop opportunities to FIRST students when they are in college. The FIRST experience is definitely a plus to have on one's résumé.

For 2008 there were 100 colleges and universities, professional associations, and corporations from the United States and Canada providing 500 individual scholarship opportunities, valued at nearly $9.6 million, to FIRST high school students. This is an official recognition of the knowledge and technical and life skills these students have gained from participating in a FIRST competition. FIRST scholarships enable students to pursue majors and careers in engineering, computer science, science, math, design, aeronautics, and many other technical fields. Information on scholarship opportunities can be obtained through the team mentors and from http://www.usfirst.org.

7.3 EXPECTATIONS OF STUDENTS

1. All students are expected to attend all mandatory meetings and public events unless excused by an adult mentor ahead of time. If a student is absent from school because of illness, he/she will be excused from team meetings also.
2. All students are expected to meet the required time commitment each week. This may change from year to year and will be stated in the Consent Form. This time commitment is during the full school year. From January to the last competition of the year, the minimum time commitment may be higher but not to exceed 10 hours. During finals week and holiday weeks, the time commitment required may be reduced. This will be communicated clearly through email and during team meetings.
3. Any time commitment each week that is not met can be carried over to the next week with a 50% penalty time added. Students who continue to fail to make the commitment will be invited to discuss with mentors about their circumstances and whether resigning from the team is warranted. Students who failed to make the time commitment will not be allowed to travel with the team to competitions.
4. All students must check in and check out at every meeting themselves so hours can be logged. Work assigned to you to be done at home will be logged with time allowance. The students should keep track of the times they worked in case there is a discrepancy.
5. All students are expected to maintain their school grades and class work. When you have to miss school to travel with the team to competitions, you are required to make arrangements with your teachers to make up the work.
6. Students who are experiencing difficulties in maintaining their grade may use up to 50% of weekly time commitment to work on their schoolwork at the request of their parents. The work will be done at our place of meeting. Parent volunteers and other mentors or students can help with the studying if needed.
7. All students are expected to keep current with team activities by attending meetings. Check email and Yahoo Group several times a day as this is our primary mode of communications outside of meetings.
8. All students are expected to behave appropriately in team meetings, team public events, and competition. It will be explained in more detail in the Student Code of Conduct in Section 7.4.
9. All students are expected to know the game rules in order to participate in meaningful discussions.

7.4 STUDENT CODE OF CONDUCT

1. Students will conduct themselves in a manner consistent with Andover High School's policy and procedure at all times.
2. Students will conduct all matters with "gracious professionalism" at all times and promote the ideals of FIRST. When telling others about their team, they show appreciation of the great work others on the team have done and not focus on what they have done for the team.
3. Students will act in the best interest of safety and health of everyone around them. They will follow all safety guidelines and direction of safety captain at all times.
4. Students will be dedicated to learning as much as possible while on the team.
5. Students will be respectful and show considerations to others. They will be careful in what they say and do so as not to hurt other people's feelings. This also means they will be careful with team and other people's properties while they are entrusted in their care. This also refers to keeping work area clean after they have used it.
6. Students will have a positive attitude and contribute to create a fun atmosphere in all team activities.

7. Students will put the team's goal over personal goal. Once a team decision is made, students will support it in their action whole heartedly even though they personally prefer a different way.
8. Students will take the initiative to offer help rather than waiting for somebody to give them work. They should approach an adult mentor to see if they need help in their area.
9. Students will have reasonable social interactions within the team to build team spirit but excessive socializing that disrupts work or showing of romantic affection is discouraged.
10. Students will finish a task that was assigned to them. If they doubt that they can finish it on time, they should communicate as quickly as possible to the adult mentors and ask for additional help or guidance. Refusal to perform an assigned task given by an adult mentor is considered that they do not want to remain on the team. The team can not allow students to pick only activities that they want to do. Refer to Section 7.6 below on Disciplinary Action.
11. Students returning as veteran members will mentor rookie members and teach them well. Failure to do so will be considered not acting in the best interest of the team.
12. Students will be mindful that what they say on online forums affects the image of the team. Information about our design, and proprietary tools we developed should not be freely shared without permission from the team.

7.5 STUDENT CONDUCT AT COMPETITION

Things We Do:

1. You are not expected to be cheering 100% of the time, however, when we are cheering all team members are expected to cheer to the best of their ability. Sitting in the stands looking bored or carrying on personal conversations while others are cheering is not good for the team image.
2. During the award ceremony we will applaud the teams that are winning awards. When we applaud we will stand to show our respect for what they have accomplished.
3. When there are visitors at our Pit, we should greet them warmly. Offer help and answer any questions they may have. Always have at least one person there who is not busy with other things.
4. If you see a mess (paper or trash) you should make an effort to pick it up. That goes for the area you are sitting as well as any other location in the arena.

Things We Do Not Do:

1. Wearing of personal music devices is forbidden while in uniform or at an event.
2. Uniforms may not be altered or worn in any manner not approved by the coaches.
3. Students may not play cards or any other games at the event.
4. Our team will not engage in negative behavior toward another team or team member.
5. Our team will not display displeasure over any decision by a referee or judge. Act positive.
6. Team members will not exchange negative remarks to each other in public, no matter what the situation.

7.6 DISCIPLINARY ACTION

If the action of a student is contrary to the expectations as described in Sections 7.3 through 7.5 and is witnessed by an adult mentor, the student will be asked to explain the events and circumstances surrounding the situation. After hearing the student's side of the story, the steering committee will make

a decision. They will consider the student's past contribution to the team and what is best for the team in making the decision. The decisions can range from no action, a verbal warning (requires over 50% approval), a temporary suspension (requires over 75% approval), or expulsion from the team (requires 100% approval) depending on the severity of the offense. The teachers and adult mentors have the right to discipline a team member as necessary for safety and the overall good of the team. The student and his/her parents will be informed of any disciplinary actions as soon as possible.

Disciplinary problems cannot be tolerated especially during the build season and competition when it is most stressful. Disciplinary actions may be more severe during these times. If the disciplinary decision occurs during a competition, the student's parent will be notified to pick up the student or arrange to have the student sent home at their own expense.

Although the team is an academic team with a focus on robotics, it will be operated similar to an athletic team. Decisions made by the adult mentors and agreed by the school sponsor will be considered final. Calling team leaders and questioning decisions will not be tolerated. (If an athletic coach had to explain every decision he/she makes, very little would be accomplished). If the student or his/her parents are not happy with the decision, the student is welcome to voluntarily withdraw from the team.

If a student voluntarily withdraws or is expelled from the team, they will get a 100% refund of the team fee if it is done before October 1, 50% refund if it is before December 31 and no refund after January 1.

7.7 OTHER MEMBERSHIP

Some parents and mentors will be granted team membership due to their involvement. Others will serve as team volunteers for special projects. This results in a team affiliation, but not team membership.

PARENT/ADULT TEAM MEMBER – parents who act as adult mentors, and attend most meetings will be given full team membership. They can also serve on the steering committee if desired. The purpose of the steering committee is to keep the team focused on its short term and long term goals, to set a direction for the team and to serve the interest of the whole team.

PARENT/ADULT TEAM VOLUNTEER – parents who assist the team on certain projects, but who do not meet team member requirements. Examples of projects may include the building of the competition field and shipping crate, obtaining sponsorship, food deliveries, be a runner to acquire materials, help students with academic work, public relations assistance, supporting the team during competition events, etc. Parent Team Volunteers do not enjoy full team membership and have no voting privileges. Volunteers can attend meetings when it is related to the projects that they volunteer to do.

TEAM SUPPORTER – parents and other family members who attend team events to show support for the team. Support can range from simply cheering for the team at competition events up to assisting in Team Volunteer activities. Team Supporters are allowed to purchase and wear team shirts when they are cheering in the stands.

7.8 EXPECTATIONS OF ADULT MENTORS

1. Mentors are responsible for inspiring students in science and technology.

2. Mentors are responsible for motivating and engaging students in meaningful activities in the designing, building, marketing, and operating of the robot.
3. Mentors are responsible for creating an atmosphere of open communications where students feel free to think independently, voice their opinions, and take risks as long as they do not impose a safety hazard.
4. Mentors are expected to be active listeners and they are expected to make sure that everyone understands what is being said or what is being decided.
5. Mentors are responsible for making sure that students are completing tasks on time. This includes providing a timeline for activities and trusting students to complete tasks while holding them accountable for their assignments.
6. Mentors are responsible for creating an atmosphere of trust and respect. Mentors are expected to show trust and respect to every student while fostering the same trust and respect in themselves. This may include being a confidant for students who are looking for a trustworthy, mature person to share personal information with.
7. Mentors are responsible for making sure that a safe environment is maintained and safety procedures are being followed. If there is an unsafe condition, mentors must step in and restore safety to the situation.
8. Mentors are expected to be positive examples to the students. This includes controlling offensive language as well as following safety procedures such as wearing safety glasses and using power equipment properly.
9. Mentors must strive to maintain a positive attitude and an optimistic outlook at all times.
10. Mentors are expected to facilitate instruction and have students do as much of the work as possible. They are to teach, coach, and observe students while remaining ready to step in as needed.
11. Mentors should only step in to perform the work if it is beyond the capabilities of the students. However students should be there to observe and learn if possible. Mentors can also be used as extra help if the project is behind schedule.
12. Mentors are encouraged to read the FIRST Mentoring Guide available at the FIRST website (www.usfirst.org).
13. Mentors must remain alert to vulnerable situations that they could be placed in. They are not to transport students in their own vehicles without written parental permission. They are not to be alone with a student in a vehicle or in a hotel room during team travel.
14. Mentors are also expected to put the team's goal over personal goal. Once a team decision is made, they will support it in their action whole heartedly even if they personally prefer a different way.

7.9 EXPECTATIONS OF PARENTS

1. Parents are expected to read the Team Handbook thoroughly before signing the Consent Form.
2. Parents are expected to support the team in one form or another with their time, talents and financial support.
3. Parents should provide transportation or arrange carpool for students to attend all team meetings and functions if needed.
4. Parents should allow students to keep their commitment to the team with the minimum number of work hours a week. Participation should not be used as a reward or punishment because it affects other members of the team.
5. Parents should help their students to stay disciplined and make sure they use every free moment to get their school work done. Being on the robotics team is a big time commitment. The more time they put in, the more rewarding it will be.

6. If a student needs to be picked up early from a work meeting, please let them know 15 minutes ahead of time so they can clean up their area and let others know where they left off on their work. If prior notification is not possible, then we will ask the parents to be patient and wait until those two tasks can be completed as quickly as possible.

8.0 SAFETY

1. Team members will act in a safe manner AT ALL TIMES. This includes during any team-related activity, traveling to team events, and during competitions.
2. Team members will follow all safety rules imposed by each facility that we use.
3. Team members will be respectful of the Safety Captain(s) and adhere to any requests made by the Safety Captain(s).
4. Team members will be expected to be trained on the use of specific tools and equipment and have a mentor sign a Safety Training Certification Form before using them. Power tools or equipment may only be used under the supervision of an adult mentor.
5. Team members will be expected to wear safety glasses at work sites and in the pit area at all competitions. In addition, team members may be asked to wear gloves, face masks, and ear protection during certain tasks.
6. Horseplay will not be tolerated at any time in the work areas.
7. Team members will focus on the work while using power tools and not be distracted by engaging in conversation or listening to music.
8. All work areas will be cleaned up at the end of every day including sweeping/vacuuming the floors and work surfaces, putting away tools and materials, and throwing away trash.
9. Team members will not directly or indirectly give out sensitive, personal information about themselves or other team members while using the online forums.

9.0 FINANCE

To have a successful FIRST Robotics Team, it is important to have a good financial system in place. This includes a fundraising plan, budgeting and financial tracking. Running the team finance like a business is a good learning opportunity for the students.

9.1 FUNDRAISING

Each year, the fundraising plan should start as soon as the competition season is over. Fundraising activities can start immediately following spring recruiting which is in May and it continues until December. The following is a list of sources of funds.

Start Date	Source
6/1	Team fee
7/1	Larger companies that parents work in
7/1	Donations from summer robotics camp participants
8/1	Larger companies in our community
10/1	Stores in our community
10/1	FIRST grants
11/1	Business that we patronize
11/1	Family and friends

There will be two categories of donations: sponsors and supporters. It is very important that we recognize them.

Donation	**Level**	**Benefits**
$5000 and over	Platinum Sponsor	Company name on our robot Company name as part of our team name Company name on our team t-shirts and banners (largest size) Receive tickets to our annual awards banquet and everything below
$2500 - $4999	Gold Sponsor	Recognition such as press release Company name on our team t-shirts and banners (larger size) Receive a team t-shirt and everything below
$1000 - $2499	Silver Sponsor	Company name on our team t-shirts and banners Recognition on our website with logo and link and everything below
$200 - $500	Bronze Supporter	Recognition on our website Receive team photo and everything below
$25 - $199	Blue Supporter	Recognition in our e-newsletter Receive e-newsletter Receive letter of thanks

9.2 BUDGET AND TRACKING

A preliminary budget should be prepared during the summer and reviewed with the team in early fall. Based on expected revenues and best and worst case scenario, we can see what expenses can be covered. This will determine the team's plan to go to which competitions and what special purchases we can make. The budget can also break down the expenses into different categories so we have better control and not overspend in one area over another.

As time progress, the budget needs to be adjusted to reflect the actual revenue and expense to make sure the team is financially solvent.

A process for expense reimbursement was developed. An expense reimbursement request form needs to be filled out and turned in with original receipts. It will be reviewed and approved by the team's mentor on finance and then submitted to the account administrator for disbursement of funds.

This system will also keep track of the cost of additional material and parts that goes on the robot to comply with FIRST rules.

10.0 CONTACT INFORMATION

Bloomfield Hills School District
4175 Andover Road
Bloomfield Hills, MI 48302
http://www.bloomfield.org/
(248)341-5400
Superintendent: Dr. Steven Gaynor

Andover High School
4200 Andover Road
Bloomfield Hills, MI 48302
http://andover.bloomfield.org/
(248)341-5500
Principal: Mr. Rob Durecka
Associate Principal (oversee clubs and activities): Mr. Louis Ruggirello

FIRST Robotics Competition Team 2834
www.team2834.com
Lead Mentor: Dr. Ed Law, sel2sel2@yahoo.com

APPENDIX A – CALENDAR

Kick-Off Weekend

FIRST Build Season Timeline

Kickoff meeting **Sat, Jan 3**

Study game and rules **Sat, Jan 3**

Team meeting **Sun, Jan 4**

- Review game & rules
- Establish common understanding
- Gather questions for clarification
- Brainstorm game strategy, play out game with props

Week One: Establish Engineering Requirement **Jan 5 – Jan 11**

Inventory parts from Kits of Parts

Team meeting

- Finalize game strategy and document rationale
- Map design need to engineering requirement using QFD

Subteams

- Connect all electrical components and OI and test
- Connect all pneumatic components and test
- Brainstorm on implementation of engineering requirement
- Package all chassis components in Pro/E
- Build main part of field for practice

Order parts as needed and include batteries and parts definitely needed for second robot.

Week Two: Create a Chassis Running Prototype **Jan 12 – Jan 18**

Team meeting

- Design review
- Update from subteams

Subteams

- Attach all electrical components to wood board for prototype
- Attach all pneumatic components to wood board for prototype
- Build chassis prototype using wood and mount all chassis components
- Design and build arm prototype and evaluate concept
- Start programming development
- Start scouting on the internet

Order parts and materials as needed

Week Three: Fabricate / Procure Components **Jan 19 – Jan 25**

Team meeting
- Design review
- Update from subteams

Subteams
- Finalize chassis design in Pro/E
- Finalize arm design in Pro/E
- Fabricate parts
- Continue software development, test sensors
- Build the full field if necessary
- Continue scouting on the internet

Order all remaining parts that go on robots.

Week Four: Assemble Robot **Jan 26 – Feb 1**

Team meeting
- Design review
- Update from subteams

Subteams
- Assemble robot
- Wire the robot
- Build robot crate if it was not done during preseason
- Start autonomous mode development
- Start programming to reduce driver/operator burden and rules conformance
- Continue scouting on the internet

Week Five: Develop and Test **Feb 2 – Feb 8**

Team meeting
- Design review
- Update from subteams

Subteams
- Tune chassis system
- Tune arm
- Simulate game play and debug, modify design if needed

- Build operator interface board
- Program autonomous mode
- Continue scouting on the internet

Week Six: Game Practice and Revisions **Feb 9 – Feb 15**

Team meeting
- Design review
- Update from subteams

Subteams
- Drive team practices and makes final robot/play revisions
- Program to reduce driver/operator burden and rules conformance
- Program autonomous mode
- Prepare robot for shipment
- Assemble second robot and build second operator interface board
- Continue scouting on the internet

Week Seven to first Competition: Prepare for District Competitions

Seal robot by deadline **Feb 17**

Team meeting
- Update from subteams
- Discuss next regional competition issues

Train drivers and driver selection

Fabricate spare parts for competition

All Michigan teams will participate in 2 district competition events out of 7 available this year

District Qualifier Week 1	**Feb 26 – Feb 28**
District Qualifier Week 2	**Mar 5 – Mar 7**
District Qualifier Week 3	**Mar 12 – Mar 14**
District Qualifier Week 4	**Mar 19 – Mar 21**
District Qualifier Week 5	**Mar 26 – Mar 28**
State Championship at Eastern Michigan University	**Apr 2 – Apr 4**

World Championship at Atlanta, Georgia **Apr 16 – Apr 18**

APPENDIX B – FORMS

ANDOVER HIGH SCHOOL FIRST ROBOTICS TEAM APPLICATION
2008-2009

Student Information

Name (first, last): _____ Preferred Name: _____

Full Address: _____

Email: _____ Grade in 08-09 school year: 9 10 11 12

Home Phone: _____ Gender: M F

Cell Phone: _____ Shirt size: S M L XL XXL

Parents/Guardians Information

Names: _____ _____

Email: _____ _____

Cell Phone: _____ _____

Work Phone: _____ _____

Employer: _____ _____

Position: _____ _____

From September through December, all meetings will be weekdays from 7pm to 9pm. To minimize conflict with your other activities, please indicate days that you are definitely not available and reason.

Conflict: _____

Please list other extra curricula activities throughout the year (clubs, classes, sports, and job) that may impact your involvement

_____

_____

_____

ANDOVER HIGH SCHOOL FIRST ROBOTICS TEAM APPLICATION
2008-2009

(page 2)

Areas of Interest (please put a '1' in the boxes for primary interests and a '2' for secondary interests)			
☐ Mechanical	☐ Strategy	☐ Awards Submission	☐ Finance
☐ Electrical	☐ Scouting	☐ Communications	☐ Fundraising
☐ Programming	☐ Safety	☐ Website	☐ Project Management
☐ Pneumatics	☐ Drive Team	☐ Artwork	☐ _____
☐ Animation	☐ Pit Crew	☐ Spirit	☐ _____
☐ CAD	☐ Fabrication	☐ Photographer/Videographer	

Experiences you have that can contribute to the team (check all that apply)		
☐ C Programming	☐ Machine Tools	☐ LEGO Mindstorms
☐ LabVIEW	☐ Aluminum Welding	☐ Video Production
☐ Excel Visual Basic	☐ Carpentry	☐ Digital Photography
☐ Webpage Design	☐ Pneumatics	☐ Graphic Design
☐ Computer Animation	☐ Fundraising	☐ Public Relations
☐ Pro/Engineer	☐ Budget/Finance	☐ _____

Is there anything else you would like to tell us: related classes, accomplishments, career plans etc.?

_____

_____

Parents/Guardians, please indicate what area you can help to make this experience a success.

_____

ANDOVER HIGH SCHOOL FIRST ROBOTICS TEAM
Student/Parent Consent Form

By signing this form, we acknowledge and consent to the following:

- We have received and read the Andover High School FIRST Robotics Team Handbook and agreed with all the terms and conditions.
- We will abide by all the Team Rules and meet all the Expectations of Students and Parents.
- We understand that there is a minimum time commitment at different times of the year that needs to be met for the student to be on the team.
    - For the entire school year, the minimum weekly time commitment is 6 hours.
    - From January to the last competition, the minimum weekly time commitment may be higher, but not to exceed 10 hours.
    - From the last competition to the end of school year, the minimum weekly time commitment may be reduced.
    - During the summer, students are expected to help in community service projects and fundraising.
    - Weeks with reduced time commitment due to finals and holidays will be communicated.
- We agree to pay the team fee of $100 which is due with the application for membership.
- We understand that due to the nature of robotics activities, even with proper instructions, precautions and supervisions, the risk of serious injury cannot be totally eliminated. We recognize this risk and choose to participate in the Robotics Team activities. We agree to release and forever discharge all the adult volunteers, mentors and sponsor companies from any and all claims, demands, damages, actions, causes of action, or suits of any kind or nature, and particularly on account of all injuries, both to person or property, at any time or any place relating to participation in Robotics Team activities.
- The student understands and will follow the safety rules in the Team Handbook as well as all safety rules at all the locations that our team meets.

_____	_____	_____
Student Name (Please print)	Student Signature	Date
_____	_____	_____
Parent/Guardian Name (Please print)	Parent/Guardian Signature	Date
_____	_____	_____
Parent/Guardian Name (Please print)	Parent/Guardian Signature	Date

Please return the Application Form, Consent Form and Team Fee (Make check payable to BHSD with Andover Robotics Team in memo field) to:

Mrs. Linda Robinson, Andover High School

Andover FIRST Robotics Team 2834

Expense Reimbursement Form

Approval Signature:

Account:

☐ BHSD

☐ OCC

Send form with original receipts to Stacie Rein for processing

Date:

You will get a check in the mail directly from one of our account administrators in about 3 weeks

Contact Information

Last Name		First Name			
Mailing Address		City		Zip	
Daytime Phone #		Email			

Expense Information

Date	Amount	Description
Total Request	$	

I certify that all of the above expenses for which I am requesting reimbursement were incurred for the Andover FIRST Robotics Team.

SIGNATURE:

DATE: