



Skunkworks Robotics



Business Plan

2009-2010



Aviation High School Team 1983

www.ahsrobotics.us

Created By: Systems Integration Team

Prepared By:

Danny Zaballos
Andrew Reece
Lydia Johnston
Kyle Edwards
Sydney Miller
Drew Wall

Mentors:

Gary Miller
Steven Wright
Connie Wood

Table of Contents

Executive Summary	iii-iv
Abstract	v
1 Introduction	1
1.1 Vision	1
1.2 Team 1983	2
1.2.1 Past	2
1.2.2 Present	3
1.2.3 Future	5
1.3 Objective	6
1.3.1 Mission	6
1.3.2 Member Benefit	6
1.3.3 Community Benefit	7
2 Implementation	8
2.1 Program Organization	8
2.2 Program Execution	9
2.3 Resources	10
3 Funding	11
3.1 Annual Budget	11
3.2 Income Goals and Current Status	12
3.3 Sponsorship Levels	13

Executive Summary

- **Mission Statement**

Skunkworks Robotics Team 1983 has been pursuing the goal of being a premier *FIRST* participant. The team has grown significantly since winning the Las Vegas Regional in our rookie year. Along the way we have created many inventive and creative robot designs and developed several sub groups to better manage the team.

Thanks to our mentors, parent volunteers and the vision of our coach, the *FIRST* Robotics Competition and Vex competition (a non-*FIRST* organization), give our students a learning experience that is like no other. The relationship between students and mentors creates an atmosphere that immerses their minds in new ideas, work ethics, and connections to the professional world.

Skunkworks team members actively reach out to our community as much as possible to promote interest in *FIRST*, science, math, engineering, and our unique school. Throughout the school year, we generate hundreds of work hours in workshops, elementary school outreach, and presentations to schools and businesses.

Engaging mentors from industry and incorporating them into the team brings an entirely new perspective to our team members. Mentors provide insight from their experience in the real world, and this enhances all aspects of our program. They also have access to resources that would otherwise be unavailable to the team, such as machining and fabrication facilities.

The last and most important component of the criteria is preparing the teams' students for college. By holding each team member to rigorous academic standards, during a demanding robotics program challenge, our students learn to manage their time in a similar fashion to their counterparts in college. Students must attend a team study hall during the build season in order to ensure that they have time to complete homework and study before meetings.

All of the goals and the procedures taken to achieve them, as well as a more in depth description of the elements described here, can be found in the Skunkworks Management Plan. This business plan is designed to provide an overview of our mission and approach for prospective sponsors and participants.

- **Date Team Started:** September 2006
- **Founder:** Robert Steele
- **Number of Students:** 41
- **Team Location:** Des Moines, WA.
- **Major Sponsors:** Boeing, OSPI, AHS PTSA
- **What we do/services rendered:** For the past three years we've had many outreach programs, which can be reviewed in more detail in our Systems Integration Notebook. The major ones that we repeat each year are Challenge Air at Paine Field in July, the Burien Fourth of July Parade, a fundraising dinner and auction in the fall, an off season competition event, and several school-related functions such as presentations and after

school sessions. In 2009, we mentored the Evergreen Robotics team “ER” and hosted an FTC regional in February. For the past three years we’ve also held the Des Moines FLL Regional in the fall, and for the last two years we’ve had Robotics workshops in the fall, and a pre-ship team practice on our mock-up field.

- **Relationships and information about current sponsors:** Team 1983 is established under the non-profit organization Aviation High School PTSA. AHS PTSA helps by providing funding and the structure to do our fundraising. In 2009, Boeing became a major sponsor of our team, contributing \$5000. OSPI has been a sponsor since 2007; they have donated \$1775 for this year’s build season.
- **Team Growth:** The team has grown from a handful of people to around 40 members, including 12 girls, which has doubled last year’s, in the 2010 build season. In the previous three years, Team 1983 has maintained their commitment to the team through late nights working in our various sub-teams that include mechanical design, website development, CAD, systems integration, programming, strategy development and team management. Commitment to the team and the FRC culture is strong with over 95% of team members continuing on the team from year to year. We also have a Vex team during our off-season that includes our sophomores and freshmen.

Abstract

This document contains a summary of the operations of *FIRST* Team 1983 Skunkworks Robotics at Aviation High School. This document contains, but is not limited to, team organization, budget, history, and mission. *FIRST* is a non-profit foundation formed for the purpose of stimulating interest in math, science, engineering and technology in the youth of the world. This business plan is for the benefit of the team, mentors, and sponsors in order to summarize the purpose of Team 1983. With this document, Team 1983 demonstrates its commitment to the purpose of *FIRST*.

1 Introduction

Aviation High School (AHS) is a small school focused on science, technology, engineering, and math (STEM). Skunkworks Robotics is a team of AHS students affiliated with the AHS Parent Teacher Student association (PTSA) of Washington State. Unlike other public schools within the Highline School District, Aviation High School requires their students to go through an application and interview process. The administration reviews each application and chooses approximately one hundred students each year for the freshman class. This results in the total student population remaining at approximately four hundred students. The process of an application and interview with the principal is similar to applying for college.



Figure 1.1-1, The AHS logo is a phoenix and a fighter jet.

Aviation High School is currently raising money for a new school building at the Museum of Flight, opening in January of 2012. You can find designs on our school’s website, at http://www.aviationhs.org/school_design.htm. Our coach is on the design team for the new school.

1.1 Vision

Aviation High School was created in order for students interested in STEM careers to excel in their fields with a project-based, high intensity work environment that is facilitated in the context of aviation. Our vision at AHS is, “To be the premier public high school of choice for students in King County and the region who wish to pursue their passion for aviation and aerospace in a learning environment that prepares them for higher education, citizenship, and work.”¹ The school works closely with the aviation community, which provides many opportunities for students to get involved in many different fields of work.

FIRST and Aviation High School share a common vision

- Focus on Science, Technology, Engineering , and Math
- Utilization of industry mentors
- Student potential is limitless

The *FIRST* Robotics program works similarly, by providing students with a chance to work with professionals in several fields, many of which are engineers. Since its inception in 1992, *FIRST* has grown into a nationally renowned, prestigious competition. The experiences that students have are unmatched by any other program in the world. *FIRST* founders are convinced that “the probability that one of [these students] is going to do something spectacular that they would not have done without *FIRST* is almost a guarantee.”²

¹ www.aviationhs.org

² *FIRST* Promotional Video, www.usFIRST.org

Skunkworks Robotics seeks to be a premier team in Washington

- Team Number 1983, founded 2006
- Mentor FLL and FRC teams
- Lead workshops for Puget Sound teams on starting and running a team as well as student skills
- Community outreach continues to be more effective

By participating in the FIRST Robotics Competition (FRC) students experience a real life engineering challenge: to build a robot in six weeks to play a complex game. It is not about the robot: it is about a very difficult challenge and teamwork and being mentored by professionals that know how to work in this type of timetable.

1.2 Team 1983

1.2.1 Past

Team 1983 started in 2006 with 18 students and a couple of mentors. In our early years, our coach, Robert Steele, had the many years of experience in the world of *FIRST* that we needed. With that experience under our belt, our members have looked to our coach for guidance to be a premier *FIRST* team. Stephanie Hoag, one of the first members on the robotics team and now attending Worcester Polytechnic Institute has stated *“I entered the world of FIRST expecting it to be the same as a math team, or Science Olympiad, but I was in for a big surprise.”* During that first year we had many late nights, but with dedication we learned the new skills involved in *FIRST*. We packed an un-finished robot into a crate and sent it on its way to the Portland Regional. The team had realized that *FIRST* was truly different than any sporting



Figure 1.2-2 Skunkworks has become well known in the community because of its recognizable Skunk, which we created in 2007.

event any of us had participated in before. Out of our first year, we won the Imagery Award from the Portland Regional, and the Rookie All Star award along with being part of the winning alliance from the competition in the Las Vegas Regional. Our parents worked hard in order to send all of our team members

and 12 parents to Atlanta, GA for the championship. Although we didn't win any awards, the pride our team gained in being able to travel to the Championship our first year meant more than any award could have.

Fifteen out of eighteen students returned in the 2008 season for another year of robotics. We had no



Figure 1.2-1 The team started out small, 18 students, but we created a winning robot, and won many awards for our dedicated members

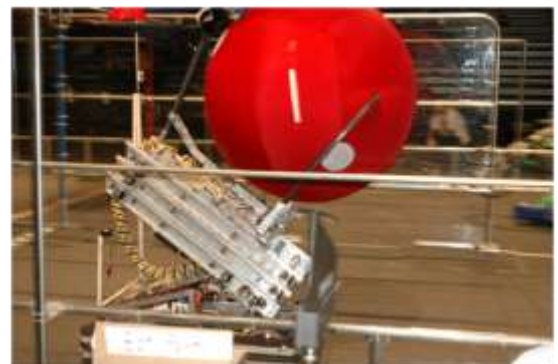


Figure 1.2-33 During our second year we focused on organization, robot strategy, and sponsors. We matured as a team and created a team that ran like a business.

difficulty finding mentors that were willing to spend their time with students on various engineering and business techniques. Each year, we have acquired more mentors in order to guide our students during the entire season as the team starts building the robot for this year's challenge. During our second year, our team went to the Portland Regional and proudly accepted the Safety Award and the Kleiner Perkins Caufield & Byers Entrepreneurship Award. At Seattle we won the Regional Champion and Engineering Inspiration Award. We once again advanced to the Championship held in Atlanta, Georgia, and although we didn't win any awards, our team was proud to rank 20th out of more than 300 teams as a second-year team.



Figure 1.2-4 This is the six wheel drive base that we constructed during the 2008 off season.

Although we are still a developing team, we have reached out to many local elementary and middle schools. Team 1983 started FLL teams at Chinook Middle School, St. Francis of Assisi School, several other elementary schools, and influenced Evergreen High School within the Highline School district to start their own FRC team. Our team sent out student members to aid and encourage the development of these young students and promote *FIRST*. In 2009, we housed members of the Monroe team after kickoff, helped them become familiar with the rules and get a head start. We also assisted other teams with building their kit bots at the start of the season. Our mentors have continued to act

as advisors in mechanical and programming issues. In April of 2009, we went to the FRC Championship in Atlanta; we played on the Curie Field, and did well. The team has hosted three FLL regionals, two FRC rookie workshops, two pre-ship events, and hosted last year's FTC championship.

1.2.2 Present

The team is now looking in many directions. With more people on the team we can increase the quality of every department. The Build and CAD teams focused on building an arm in anticipation of this year's game. The marketing team updates the website and helping with the 3DS Max Animation team. Skunkworks hosted a scrimmage in the Aviation High School gym for local teams, to play our version of last year's game, *Lunacy*. This was a great event that other teams have facilitated in other regions, and we're hoping to extend the opportunity to the Puget Sound area. We hope to help it grow in the years to come as an opportunity for outreach among our fellow robotics teams. This new season is very exciting for the team, with hopes for increased visibility.



Figure 1.2-5 This is the arm we constructed during the 2009 off season.

Due to the increasing amount of mentor support, the structure and organization of our team has increased tremendously. We currently operate in a number of sub-teams including Computer-Aided Design, marketing, electrical, drive base, collection system, shooting mechanism, systems integration. Systems integration is dedicated to insuring that our robot abides by every *FIRST*

regulation; managing weight, center of gravity. Systems integration also creates plans for all aspects of the team such as management, business and fundraising, engineering, scouting and safety. This year, our systems integration team and their mentors have created a Systems Requirements Document (SRD) for the robot to ensure that each subsystem team follows all *FIRST* regulations and meets key performance parameters defined by the team during prototyping.



Figure 1.2-6 This is the Scrimmage that we held at our school in fall 2009. We hope that as the years go on the event will grow in popularity.

Community and school involvement is important to Team 1983 and *FIRST*. AHS does not have any athletic programs: therefore, *FIRST* Robotics is one of the few competitive “sports of the mind” available to students. The school holds assemblies and pep rallies for the team before the Microsoft Seattle Regional competition in March. Since 2008, the entire AHS student body has attended the Microsoft Seattle Regional. Team 1983 is a source of spirit and school pride for Aviation High School. Our team strongly encourages new students to join Skunkworks by recruiting during 8th grade nights held at Aviation High School and helping other schools outside our

area. Last year, we helped Evergreen High School start a *FIRST* Robotics team. This year, we have continued to support the Evergreen team by inviting them to brainstorming sessions, and sharing our new drive base design. In October 2008 and 2009, Team 1983 hosted a rookie workshop in order to help other rookie teams have a good sense of *FIRST*. The Rookie workshop helped many teams at once and allowed teams to interact with each other and enhance their abilities. Last year we started an FRC workshop for all teams and this year we participated by providing two mentors for this workshop. Our programming mentor has also spent a number of hours working with other teams as the one of the regional “experts” in the new control system.

Through the reputation of our school and word of mouth, we have attracted many local engineers to support our team. We have dedicated mentors who are willing to spend their time coaching students on engineering techniques. We now have sufficient support to create a competitive robot with progressively higher educational benefits each year. Skunkworks mentors have offered consulting, materials, and opened our doors to any team that would like help.

After observing a slight downward trend of students’ grades during Team 1983’s rookie season, a team study hall was established by the parent team. Students are required to attend a predetermined percentage of these study group meetings in correlation with their current grade. If a student is failing any classes, they are required to attend study group before each team meeting. Students whose grades do not improve are only allowed to attend the weekend meetings and must study at home during the team meetings until their grades have been brought up to passing at the C level³. Grades are checked every week, and students with a failing grade before a competition are not allowed to travel with the team. Academics comes first on Team 1983, and therefore, it is the primary focus of everything we do. Students with higher grades are encouraged, and expected, to help the other members during these study times.

³ Aviation High School does not give D grades. Students receive an A, B, C or F.

1.2.3 Future

In the coming years, using our continuous improvement strategy, we will continue to revise and improve the safety program. Safety training will be conducted during the off-season and future robots will be designed with more safety in mind. Newly instituted procedures will become more detailed and routine as we learn the value of team communication and building student confidence. Our infrastructure continues to grow which is essential for working together more efficiently and to greater effect.

We will continue to encourage more student-to-student tutoring ensuring that a team member's participation does not have a negative effect on their scholastic education. We continue to improve the dedication of students to Team 1983 while maintaining academic excellence, through our study halls and grade checks. We are also maintaining our study halls during build season in the coming years. Educational projects will be developed by mentors and veteran team members to familiarize students with tools and jobs before the build season.

In past years, our team struggled to teach new team members the skills necessary for build season after the seniors graduated. To solve this problem, we have created a system of student mentoring throughout the year to build capacity for the following season. As more people graduate from the team, the current members will train those who are new to take over for them. This plan is being put into place in order to maintain a structure with team members that have prior knowledge for each sub-team. In this way, the team will cease to be completely dependent on the knowledge and experience of the seniors. Rather, we will all be responsible for important components of the program.

The team has many group activities throughout the year. Every Tuesday during build season, a parent hosts a team dinner at her house. We also have team meals provided by parents every Wednesday and Saturday during build season at the school featuring different foods each week. The Spaghetti Dinner and Dessert Auction is another group activity which we hold every fall. It's a lot of fun and we raise money towards having a successful season. The list goes on, but this is just a sampling of our fun group activities.

Team 1983 wants to increase the number of FLL and FRC teams that we mentor in our community. We have found tremendous enjoyment in the outreach that we have done in the past. Last year and this year we mentored Team 2942 from Evergreen High School, and we hope to continue to support this team. This year we have had much influence on neighboring elementary schools, and will mentor two or possibly three new FLL teams.

For the past two years, Skunkworks has hosted the Des Moines regional FLL competition. In 2008, five of the judges were outside of the *FIRST* organization; this number grew in 2009 and also included three Skunkworks alumni. We hope to include more alumni and people outside of *FIRST* in the FLL judging process to spread visibility of *FIRST* through participation and bring new perspectives into the program.

Skunkworks has sustained support of *FIRST* programs since our second year as a team. Now, we see opportunity for growth in community outreach both in the context of *FIRST* and community service. In 2009, mentors brought 50 fifth graders to the Seattle Regional, and in 2010 we have expanded this effort to reach out to over 200 fifth and sixth graders. We hope to continue to spread visibility of *FIRST* for students outside of the program by expanding community participation in *FIRST* regional events. We have also been involved in Challenge Air for the past three years, and in 2009 we helped team 1425 get involved with the Challenge Air event in the Portland area. We plan to sustain support for Challenge Air and pursue similar opportunities for community service off season. During the Spring, the team helps Midway Elementary School by interacting with them through K'Nex robots, therefore increasing their interest in math and science.

Over the past two years our team has learned that we must have several people responsible for each part of the team, especially where parent volunteers are concerned. Our team seeks to spread responsibility around so that a project like facilitating travel accommodations for a regional is a multi-person undertaking, not all placed on the shoulders of one individual.

Skunkworks, at present, must execute massive fundraising events and activities so that we have enough money to function each year. In the future we would like to work on recruiting more “stable” sponsors that assume consistent support. It is also important for our team members to do their own fundraising. Fundraising is a team building experience and will continue to be in the future.

1.3 Objective

1.3.1 Mission

Team 1983 seeks to create student interest in science and engineering while expanding math and science skills and encourages students to pursue a rigorous college experience. Through mentor, parent and teacher support from both Aviation High School and Team 1983, the students of the AHS Skunkworks Robotics team are encouraged to pursue a rewarding and demanding career. The students are then inspired to continue the mission and spread this inspiration to younger students, so that they may experience even greater motivation and academic opportunities.

1.3.2 Member Benefit

For many of the team members, the experience of *FIRST* has been described as ‘life-changing.’ It made them feel a part of a team, and gave them a new direction in their lives. Most started the

The message of FIRST in Team 1983

- Members of the team learn from experience and by interacting with professional engineers
- Team members participate in community service during the off season
- Team 1983 has talked with legislators about the message of FIRST in our schools and communities

program skeptical of what was to be and came away with great anticipation for the next year. Sebastian Hill, one of the team alumni, said, “*It gives me a head start on a college experience.*”

Students are inspired through participation in *FIRST* to pursue their education. The emphasis placed on going to college is greater than any other student program offered in high school today. By allowing students to work side by side with real engineers, they can get a firsthand glimpse of what the real world of engineering is like. This allows students to explore their career options before they are required to make a decision about the path for their future.

Great emphasis is placed on sportsmanship, safety and fun. The lure of the competition comes in the amount of joy that students experience when they have completed a robot. What keeps them in the competition is the level of excitement and other aspects, such as sportsmanship, safety, and education. The students that participate in *FIRST* graduate from high school more mature, ready, and enthusiastic about college. *FIRST* is creating the future and making it exciting in the process.

All of this fits very well with the goals of Aviation High School. Students that have participated in *FIRST* Robotics and have attended AHS seem to get a ‘double-dose’ of this education inspiration. Students leaving both of these programs seem to have a much stronger interest in engineering and a much better idea of exactly what they wish to do with their future than graduates of just one of these programs. AHS and *FIRST* Robotics complement each other through their inspiration of students very well.

1.3.3 Community Benefit

During our rookie year, our concentration was on building a robot before building our team. But by the time we returned from Atlanta, we were extremely excited about *FIRST* and our success. We wanted to continue the growth we had begun as a team and sought ways to stay involved even though the school year was quickly coming to an end. We brainstormed some ideas and soon found it quite easy and fun to become involved with the community. Here are some of our highlights so far:

For the past three consecutive years we have taken our robot and two VEX robots to Paine Field for *Challenge Air*, (<http://www.challengeair.com/>) an event where pilots volunteer their time and planes to take children with disabilities and life-threatening illnesses for a short ride as co-pilot. While children were waiting their turns, they were able to operate our small FTC robots, as well as drive our large FRC robot. We also helped the children in and out of the planes. We had a great time and the smiles told us that the children did, too. We are looking forward to going back every year and also looking for more opportunities to serve the community like this.

Many of us spent the Fourth of July with our robot in the Burien Parade which gave us exposure to our local community. Each year, we have invited the public to our Spaghetti Dinner and Dessert Auction where we have spread the news of *FIRST* and have gotten to know new people and become more familiar with the community.

We have hosted the Des Moines Regional for *FIRST* Lego League for three years as well as mentored local FLL teams. We hosted an FRC rookie workshop for new teams to become familiar with *FIRST*. We also volunteered at the State *FIRST* Lego League Tournament last year. We have sponsored a joint practice field for FRC teams for the past three years at our school.

At local elementary schools, Skunkworks has been helping since our second year to introduce the students to science and technology. The upper grades worked with K'Nex while the lower grades explored and built with Tinker Toys. During this past year, our coach found that one of our district elementary schools, Midway, was trying desperately to increase their student interest in science. This program is active during April and May, so as not to conflict with build season. The students put together complex K'Nex apparatus'. We are hoping to help the school raise their WASL scores in math and science. They're in the bottom 1% in WASL scores in the state. But the kids show potential, and they look forward to the activity every time we come. This year we are bringing them to this year's Seattle Regional.

Our robots have had the great pleasure of visiting many of our sponsors and other interested groups. During previous years, students presented to three of our sponsors, as well as several Rotary clubs. We also went to speak with our legislators in Olympia. All of these experiences have given us the opportunity to not only talk about our robotics team, but to inform our audiences and community about *FIRST*. We hope to continue that this year.

Dignitaries, such as Washington's governor, legislators, the president of Embry-Riddle and several corporate heads, have come to Aviation High School and met our robot and team members. Recently, Charles Rose, Counsel General of the U.S. Department of Education came to our school and visited our team. He was interested in what we had learned and what impact the experience from *FIRST* has had on us. We were happy to tell him and share some of our stories and aspirations for the future. We have also toured several companies and spoke with some of the workers who found what we were doing exciting and wished us luck.

2 Implementation

2.1 Program Organization

Our team is very well organized. All tasks are delegated to sub-teams whose sole job is to build or develop a specific component or document. Everything the team undertakes is delegated and coordinated within the team. All of our mentors are professionals who have extensive experience in their respective fields, and work to inform students about what they are working on and other real life experiences.

Skunkworks is mentored by professionals that know the value and volunteer their time

- Skilled mentors have helped organize the team to implement our coach and the FIRST mission

The team leader and the coach finalize all primary decisions. The coach is informed of the actions of the team, sub-teams, mentors, parents, and anything else that may be within the range

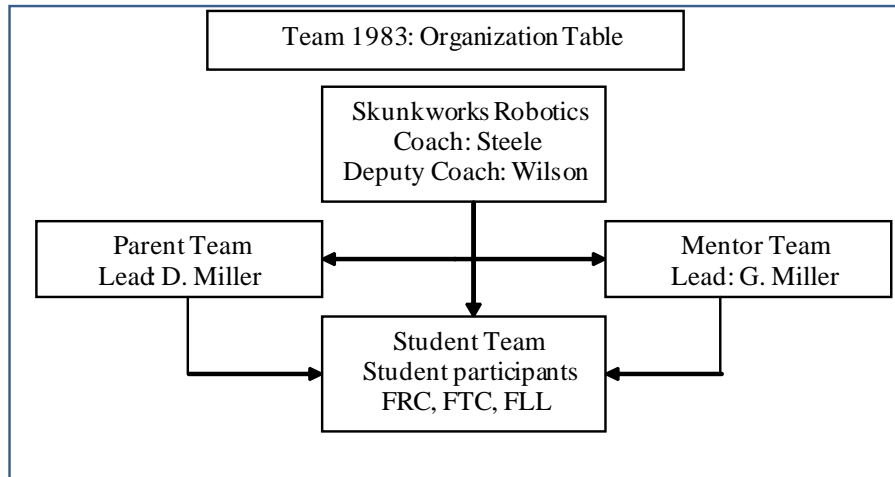


Figure 2.1-1 This is the organization of our team.

of concern for the good of the team. He has the authority to make the final decision in any circumstance, and does so at his own discretion for the primary purpose of overseeing the big picture and ensuring the safety of every team member. Each of the sub-teams communicates between the coach and the mentors, parents, and students. It is through this model that each person

involved with the team stays informed at all times. The parent/mentor executive committee sends email updates to all mentors, parents and students at least once a week regarding schedules, event plans, or any other information pertinent to the team. We also have several Google sites through which we communicate, which include parents, mentors, and students.

In the fall of 2007, a new sub-team was added to Team 1983. The Systems Integration team is responsible for the overall management of the team itself as well as the sub-teams within Team 1983. This team maintains order within the team and ensures that all students within the other sub teams are on task and understand their jobs. Even with Systems Integration, each member within Team 1983 will take on the responsibility of training another student to take over their duties to ensure that there will be no gaps within the organization of the team once students have graduated. Mentors will be assigned to different sub-teams, and each mentor will take on the responsibility of offering advice to each student and provide guidance throughout the school year. The head parent will take on the responsibility of maintaining communication between all mentors and parents within Team 1983. The parent/mentor executive committee organizes the parent support for the team by assigning each of the parents to be responsible for activities such as team dinners, transportation, apparel, etc. The primary reason for this organization is to emulate the structure of a business so that students can receive experience in a work-like environment.

Our team is organized like a business

- Sub-teams allows for maximum productivity
- Gives everyone a place to work in an area they specialize in
- Systems Integration oversees the other sub-teams

2.2 Program Execution

The first week of the build season, following the kick-off, is designated for robot design and strategy development. The team is dispersed into six equal design groups, in no particular arrangement, and each group is expected to develop a concept for a successful

strategy and robot concept for the new game, all in about two days. The meeting following this idea development time is reserved for presentations by each group. During the next meeting, design and strategy is discussed and decided on, after which the team is dispersed into the sub-teams which will remain for the rest of the build season and into the competitions.

There is a sub-team for each major function of the robot, as well as each major area of the team. These teams vary slightly each year, but generally include a drive base team, electrical team, scoring unit manipulation device, gripper/actuator team, and media team. Systems Integration is a team that works on the overall management of the team and logistics and will also be working on strategies for the robot along with scouting and awards.

Each day, sub-teams are required to document their progress, struggles, and plans for the next day. This ensures that progress is being made and that everything will be up to date and if information is needed from team members, the information will be located easily. These sub-team leaders are also responsible for training younger members to be sub-team leaders next year. This ensures that even as students graduate and move on, the team will continue to grow and mature. Each sub-team is also supervised by a mentor who aids in ensuring the safety of all sub-team members when using power tools and acts as a guide and source of information for education of the concepts being used.

Mentors and sponsors help us be productive

- Parents and mentors help the team in the use of professional machine shops like OMAX
- Many sponsors support the team with economic and mechanical benefits
- Each year the team tries to stretch its reach in the Puget Sound community

2.3 Resources

Team 1983 includes sub-teams which are made up of our parents, mentors, and of course, the students. The parents help manage our sub-teams, our overall organization and handle affairs such as travel preparations, money acquisition, and team activities. Many engineers from our local community donate their time and expertise to our team. We also are granted access to their machine shops and materials, including assistance from professional machinists in the fabrication of parts for our robot.

Many local businesses are generous enough to support us, an up and coming team from Seattle, WA. They help us go to the Championships in Atlanta, and help us with machining parts, and sometimes provide mentors. We acquire these sponsors by contacting them through email or letters, offering a demonstration and/or presentation at their location, and ask if they would be interested in sponsoring our team. Each year we expand our horizons further to larger companies. With experience, we hope a number of large corporations will want to sponsor our team through a long-term arrangement.

3.0 Funding

3.1 Annual Budget

Table 3.1-1 shows the 2009-10 Budget vs. Expenditures for Skunkworks Robotics. Our primary expenses are “Registration” and “Travel.” *FIRST* requires registration for each regional and championship (approx. \$5000 each), plus we provide lodging for 20-30 students at both Portland and Atlanta competitions. With material donations from our industry sponsors, our “Robot” material

The team’s budget allows strict management and Accountability

- 100% of our income is spent on team expenses
- Expense is directly related to number of students

Budget vs. Expenditures

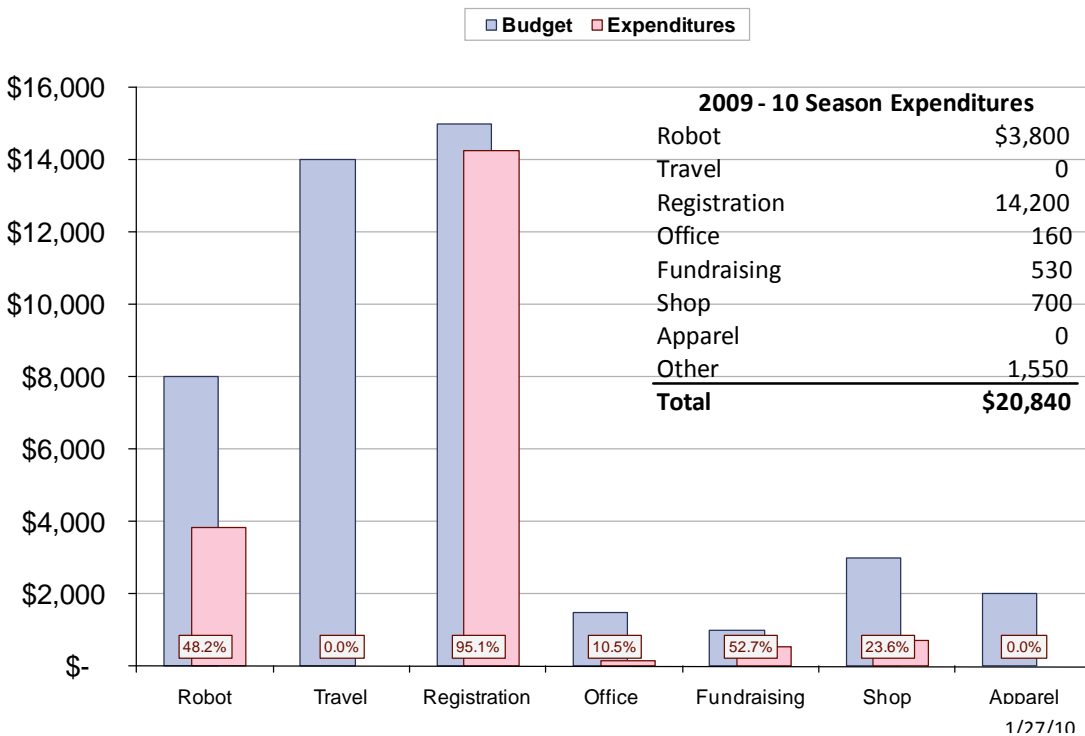


Table 3.1-1, Budget vs. Expenditures for 2008-09 season.

expense can be significantly reduced. “Other” expenses include apparel with logos, which are largely reimbursed through concessions and student fees.

Corporate sponsorship is critical to helping students from all demographics participate

- On average students must raise from personal sources \$200 to \$500 each
- Corporate grants are our only source of outside income

3.2 Income Goals and Current Status

Table 3.2-1 shows the fundraising targets and expenses for the 2009-10 season. Our primary fundraising comes from our student letter writing campaign. However we try to minimize this through other fundraising activities. “Corporate Grants” is our second primary source of funds provided by Boeing, SPEEA, and others. “Fund A Skunk” are direct donations from non-corporate supporters. “Other” funding includes sales from apparel and concessions.

1/27/10

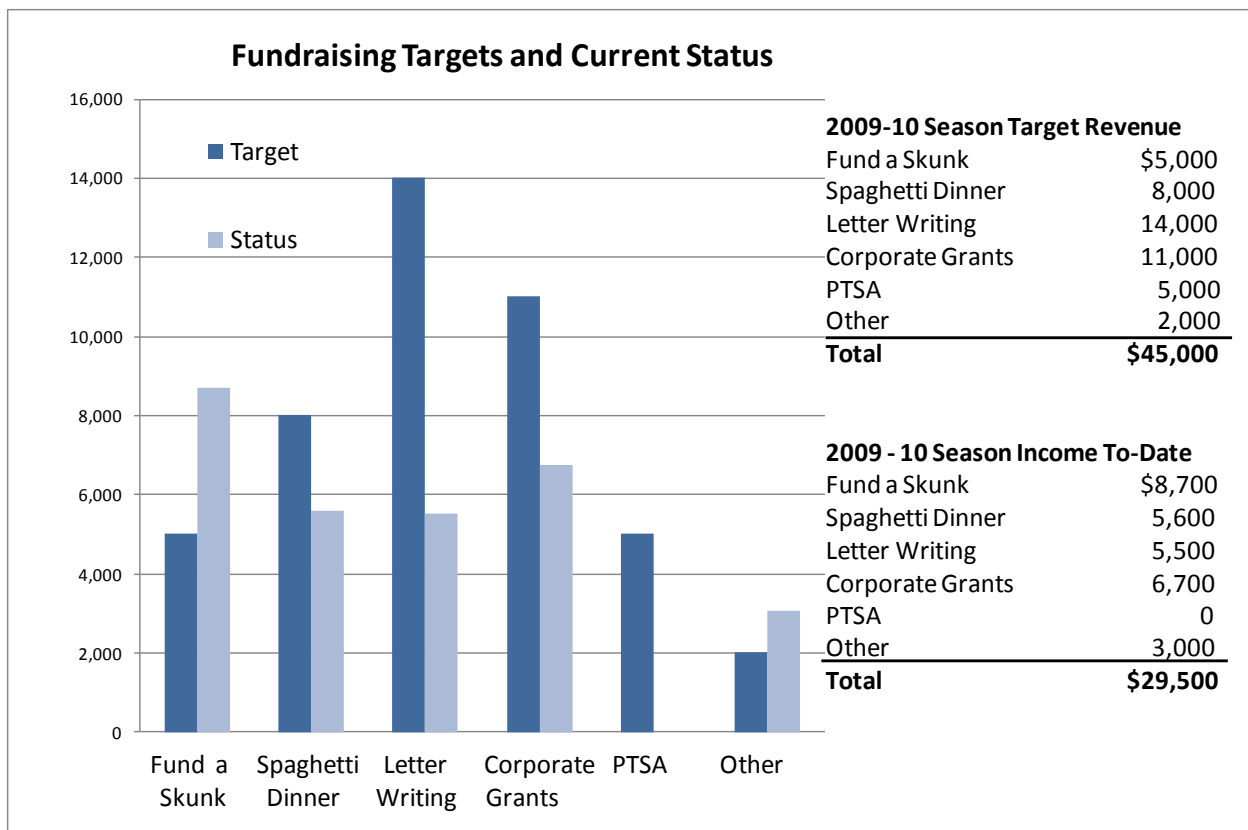


Table 3.2-1, 2009-2010 Season Target Revenue vs. Status to date.

Sponsor Level	Donation Amount**	Benefits
Commander*	\$5000 and above	Pilot + your organization will be part of the name we use at events. This name is announced when we are on the field.
Pilot*	\$1000 to \$4999	Flight Engineer + the name of your organization on our competition ROBOT!!
Flight Engineer*	\$500 to \$999	Ensign + the name of your organization on our Team Banner
Ensign*	\$250 to \$499	The name of your organization on the back of our Team Practice shirts.

3.3 Sponsorship Levels:

<p><i>Skunkworks acknowledges our sponsors</i></p>
<ul style="list-style-type: none"> • Sponsors names are displayed on visibility items • Student exposure to gift giving demonstrates interest and support of their future and good citizenship

*Along with other benefits, all donors will receive a summary of the team’s accomplishments at the end of the season and the deep gratitude of the entire team for the help.

**Combined, all methods of donations.

Table 3.3-1, Sponsor Levels

Sponsors are our primary source of funding. To acknowledge the support of our sponsors their name is displayed on many of our team visibility items. Table 3.3-1 shows the sponsorship levels and the benefits pertaining to the donation amount.