Team Paradox 2102 San Dieguito High School Academy

Business Plan 2015-2016



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1. Executive Summary

1.1 Mission Statement

Team Paradox aims to provide an outlet for students of all ages to discover and explore their passions for science, technology, engineering, art, and math ("STEAM"), by maintaining a student-run, community-supported FIRST® Robotics team at San Dieguito High School Academy (SDA).

1.2 Team Origins

Team 2102, also known as Team Paradox, was founded in 2006 by three students inspired by Engineering and all things STEM. The team first competed in the Rack 'N' Roll competition of 2007, and in 2008 returned as a semifinalist from San Diego Regional of Overdrive. As the Team grew in numbers and in influence, it continued to participate regularly in the San Diego Regional as well as traveling to various other regionals. No matter where the team went it was always spreading its spirit and dedication to STEAM to everyone. Team Paradox's symbol, the Parrot-ox which was coined early on in the team's career, can always be seen dancing spiritedly at any competition the team attends.

1.3 Team Summary

Currently, on Team Paradox, we best a hearty 55 student team whom are supported by 25 mentors. Many of the mentors come from sponsors and often supervise and help with design, marketing and business processes. Many former members of the team have also returned as alumni mentors.

FIRST® Team Paradox is a student-run program. We often create our own activities and tasks in addition to working with assigned projects. While in school, our members sit in desks and learn about the world, but in robotics, we apply this new knowledge for real world application. Team Paradox provides the tools and education needed for all passionate individuals to apply themselves to a larger goal. The inclusion of Art in STEAM education reiterates this attitude, as Team Paradox members learn about a broader perspective of engineering and education. This all-encompassing perspective leads to an environment where individuals whose interests lie outside of science and technology are able to apply their passions, and shows how integrated the seemingly different disciplines truly are. Team Paradox is a home for all to grow into successful individuals regardless of their original field.

Team Paradox is creating a STEAM world, one individual at a time. Being a part of FIRST® empowers members to extend their interests and passions into successful careers. Their affinity for communication and collaboration developed by working on a 55+ person team enables them to become successful leaders in their respective fields. As a program that has been running seven years strong, Team Paradox has had its many founders assume leadership positions in their industries. This in turn inspires the current team to not be afraid of dreaming big.

The partnerships that Team Paradox forms with the school (SDA), the other FIRST® teams, and the community are continually fostered by the students who make up the team, acting as an engine driving the STEAM education forward in their respective spheres. As a starter of teams, programs, and events within our school, district, and community, Team Paradox can be likened to the hub of a wheel, whose spokes are just as important as the wheel itself to advancing the group forward.

Externally, everyone from sponsors to students to school district personnels and community members receive quarterly reports which provide broad-based updates. Internally, robotics weekly meetings followed by summary emails and online communications regularly inform and engage active members, mentors, parents, and alumni. Team Paradox has also started utilizing cloud networking for universal access to common documents including logo designs and robot part drawings. In all cases, students initiate the contact, whether it be with a group of parents or a government dignitary

1.4 FIRST® Summary

FIRST® was founded in 1989 to inspire young people's interest and participation in science and technology. FIRST® designs accessible, innovative programs that motivate young people to pursue education and career opportunities in science, technology, engineering, and math, while building self-confidence, knowledge, and life skills.

The mission of FIRST® 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.

1.5 Team Impact and Outreach

We're proud of our work to promote FIRST and its ideals in many ways, including community events, working with other FRC teams, as well as FLL work as we mentor teams and host events.

Community events we support include the Encinitas Street Fair, Encinitas City Parade, beach and park clean ups, Relay for Life, as well as demonstrations at local libraries. We also support STEM- and STEAM-related events in the San Diego area, including Innovation Economy Expo, Full STEAM Ahead, Celebrate STEM, Celebrate Tech Treck, Mini Maker Fair, San Diego Science Alliance, RoboExpo, the Women, Technology and Innovation Event, NDIA Gold Coast Conference, and STEAM Maker Fest. We even have reached outside the USA, working with the Puebla Elementary Schools in Mexico to establish a STEM curriculum based on the FIRST ideals and consulted with FRC teams in Israel.

We're especially proud of the FLL work as we mentor teams and host events. Team Paradox members who are interested in education lead these efforts, working with the FLL teams and running the FLL Qualifying Tournament we host at our school.

- We have hosted unofficial FLL scrimmages, and since 2011 we have been proud to host an official FLL Qualifying Tournament (QT). In 2014, we expanded our capacity to 16 teams to fill up a full round robin. We model the QT after the FRC events we attend, we focus on having a light, non-stressful, fun, yet competitive atmosphere. We encourage teams to cheer themselves and others on, showcasing their core values while adding to the positive environment. This helps ensure that above all else they remember their participation in an FLL QT as fun, to show them the excitement of STEM fields. Since 2011, a total of 38 teams have competed for a chance to continue their competition season at Legoland.
- We hold workshops to encourage younger students to join FLL teams at their schools.
- We've helped launch 10 new teams, helped some to win grants and provided mentorship to the students on those teams, and have plans in motion to relaunch the FLL program at the only elementary school in our district that does not have one, and to start an FLL program at the local middle school.
- We do not walk away once the FLL teams have been launched. We continue to work with these fledgling teams for as long as they want our support.
- As we have done for the other two schools in our district (Canyon Crest Academy FRC team 3128 The Aluminum Narwhals and Torrey Pines High School FRC team 3647 Millennium Falcons), the LCC MavBots 5514, have full use of our machine shop, access to all of our mentors, share in our meals and our kickoff activities, joined our efforts when competing at a local event Battle at the Border, and have been learning from our team infrastructure. Because of space limitations at their school, they are an integral part of our day-to-day dynamics. We are so excited to see the MavBots grow!
- We have instituted a formal program available to all area teams to access our machine shop, and have extended the help of one of our fully trained machinists.
- This is Gracious Professionalism® and Coopertition® demonstrated at its best. One hundred percent support, one hundred percent competition.

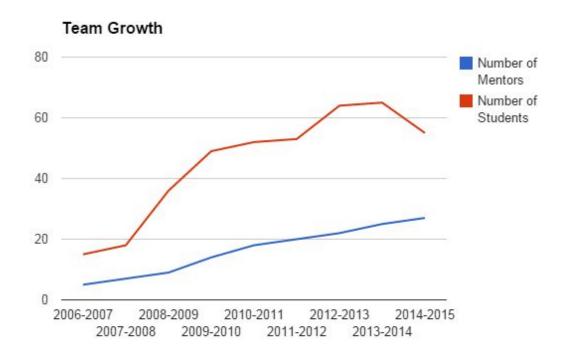
1.6 Relationships & Information Regarding Current Sponsors

Team Paradox has a number of corporate sponsors that have consistently support the team since 2007. Many of these sponsors contribute funds as well as other resources and support to the team, in the form of mentors, machinery and software.

- AFCEA San Diego from 2009 to 2014: provided funding
- GoEngineer from 2007 to present: provide design software
- Nordson-Asymtek from 2007 to present: provides funding and key mentors
- Qualcomm from 2007 to present: funds Team San Diego teams
- ROP from 2010 to present: provides funding
- SAIC from 2010 to present: provides funding and key mentors
- SDA Foundation from 2007 to present: provides funding and facilities
- ViaSat from 2008 to present: provides funding and key mentors

1.7 Summary of Team Growth

After starting with only 15 students in its first year in 2006, Team Paradox grew rapidly to include 65 students in 2013-2014, the team's eighth year. Mentors were introduced through fundraisers, and parents and sponsors assist and teach students about engineering, technology, as well as marketing and grant writing.



1.8 Summary of Future Team Plans

To insure the long term financial sustainability of our team, we had students attend an extensive course in which they learned more about grant writing as well as the importance of networking, and overall team organization. We seek the support from all previous sponsors as well as to identify new sponsors, some of whom are new the FIRST community.

In order to spread our image and the values of FIRST more significantly we plan to participate in more community outreach programs as well solidifying our presence on the widely used business front, LinkedIn.

Within our team we are working on increasing the organization of our branches, improving the educational opportunities including leadership training classes, and making the positions inside of each branch more clearly defined. In addition, upperclassman students are working hard to train rookie team members and engage them in a meaningful way to increase the retention of students on the team.

2. Team Overview

2.1 Team History

Founded in 2006, Team Paradox Robotics 2102 competed in the San Diego Regional for the first time in 2007. When Matt Golman and Asa Puckette saw the 2006 Los Angeles Regional, they were inspired to bring FIRST® to San Dieguito High School Academy. Since then, Team 2102 has been growing rapidly. In 2008, it was a Semifinalist at the San Diego Regional and has been a winning team every year since. In 2010, Team Paradox won the Engineering Inspiration Award and attended the Atlanta, Georgia World Championships, a first since 2006. In 2011, it was a Semifinalist at the San Diego Regional, once more won the Engineering Inspiration Award, and returned to the World Championships, this time in St. Louis. The year 2012 marked Team Paradox's first regional win at the Central Valley Regional while on an alliance with Team 330 and Team 1717; this win led to the team's third time to World Championships. In the Sacramento Regional of 2013, Team Paradox was awarded its first Gracious Professionalism Award and Hard Hat Award, an honorable mention for safety.

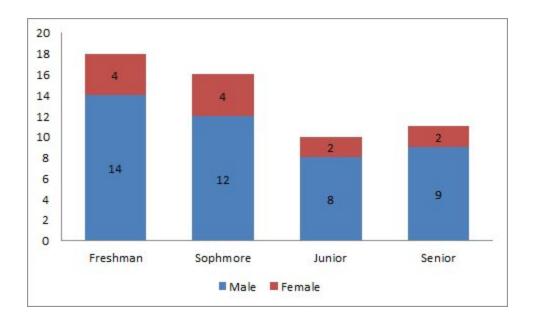
2015	Central Valley	Finalists Judge's Award Dean's List Finalist
	San Diego Regional	Alliance Captain Semifinalists Quality Award Woodie Flowers Award
2014	Las Vegas Regional	Alliance Captain Quarterfinalist Quarterfinalist
2013	San Diego Regional San Diego Regional Sacramento Regional	Spirit Award Gracious Professionalism Award Hard Hat Award
2012	San Diego Regional Central Valley Regional	Spirit Award Regional Winners with Invitation to World Championships
2011	San Diego Regional	Engineering Inspiration Award with an Invitation to World Championships Spirit Award
2010	San Diego Regional Las Vegas Regional	Engineering Inspiration Award with an Invitation to World Championships Spirit Award Spirit Award
2009	San Diego Regional	Spirit Award Finalist

	Phoenix Regional	Spirit Award
2008	San Diego Regional	Semifinalist
	Los Angeles Regional	Quarterfinalist

2.2 Student Team Members

Our team currently consists of 55 students, 21% of which are female. By bringing their own specialties and personalities to the team, students create a diverse team dynamic. The position of team president has been held by a female student for the past four years.

We appreciate all levels of commitment, but members are expected to log at least 30 hours of participation to travel with the team to competitions. Our team encourages dedication, but to ensure academics come first, team members are required to hold a C or higher grade in all of their classes.



2.3 Team Sponsors

Nordson-Asymtek (2007-2015)



Nordson ASYMTEK is an industry leader in automated fluid dispensing, jetting, and conformal coating throughout the world. Asymtek started sponsoring Team Paradox in 2007 and continues to be a big sponsor. Stephen des Jardins, one of the lead mentors, and Roberta Foster-Smith, both employees of Asymtek, have spent hours working with the team. As

well as sponsoring Team 2102, Asymtek sponsors eleven other FIRST© Robotics teams.





SAIC is a global-wide cooperation that is known for it ethics, integrity, focus on customers, innovation, and customer service. It provides service in technical, engineering, and enterprise information technology markets. Mentor Wayne Knorek, employed at SAIC, has worked with the team in many areas including robot cart and pit design

ViaSat (2008-2015)



ViaSat produces satellites and other digital communication devices for companies and organizations. It works with consumers, businesses, and government customers by providing commercial ships, cars, aircrafts, satellite internet access, and global mobile satellite services, ViaSat has impacted the team by providing mentors including Dan Strich and Conner Pozdolski.

Qualcomm (2007-2015)



Began in 1985 in San Diego, Qualcomm designs, manufactures, and markets telecommunication devices. It also has facilities for aerospace, biotech, computer peripherals, multimedia, and software. Qualcomm has provided financial support to all of the San Diego teams.

SDA Associated Student Body (2007-2015)

The SDA Associated Student Body is a student-run fundraising organization from the school, San Dieguito High School Academy. It sets up fundraisers for not only the Robotics team, Team Paradox, but also other academic teams such as Speech and Debate and the Academic Team.

ROP (2010-2015)



Regional Occupation Program provides leadership into helping students develop school to career comprehension. ROP's main goal is to prepare students to be ready for their future ambitions such as jobs and college. ROP has helped Team Paradox to obtain many supplies for the "Robotics and Engineering" class and other technology-based classes; doing so has also increased the availability of supplies for the development of robots.

SDA teacher and mentor, Jason Berend, is the team's link to ROP.



AFCEA San Diego (2009-2014)

The Armed Forces Communications and Electronics Association is a non-profit organization helping military, government, industry, and academia by providing a forum to exchange information. AFCEA supports several robotics organizations.

GoEngineer/ Solidworks (2007-2015)

GoEngineer is a company that created a program in which one can make parts and assemble them into mechanisms. This software has helped the team to design robots of all shapes and sizes.



2.4 Team Mentors

We have many dedicated mentors that support all aspects of the team. SDA teacher George Stimson has been involved with the team from the start. Another teacher, Linda Park, has been coaching the competition team. John Gaby of GabySoft is the programing mentor extraordinaire, and Kim Richards is the newest marketing mentor. Mentor Darrahl Walton can be found in the machine shop supporting build throughout the busy season, and Bobbie Walton serves as a team manager and liaison with FIRST®. Myron Dalager, a mechanic and former machine shop owner, mentors the build team as does Fred Zerault. Marla Strich, a school board member and former team parent, helps with fundraising and organizing FLL Outreach. Sandy Dalager works closely with the corporate branch to account for all of the funds while Diana Hendricks coordinates travel plans. Karen des Jardins and Lisa Hannan are vital mentors who helps with team organization and business strategy and implementation.

3. Team Management

3.1 Team Membership

Our application process is simple; students may apply for membership through registering on STIMS, joining the school club, and enrolling in the ROP class. Students can join at any time during the school year and receive class credit for joining the team. The team's flexibility allows for the maintenance of a significant following after the end of the school year when seniors graduate and the team continues to work throughout the summer. Recently, Team Paradox has started a program called Geared Learning which educates potential team members on the task that they will undertake. Students rotate through the different branches and execute last year's challenge to learn first-hand how to become a functioning team

member.

3.2 Team Structure

Our team is rooted with a simple three branch system with the executive command on the treetop. The branches, Build, Marketing, and Corporate are all led by the Team President. Leaders of the branches are elected after build season and season end, usually in May. Build focuses on design, machining, programing and all other aspects of the engineering process. Build also boasts the strongest member involvement and can be considered the heart of the team, in addition to being the most populous branch. Marketing functions to promote the team's community influence, provide mentorship to FLL teams, design and make the team merchandise and gifts, collaborate with other school clubs, and maintain a presence in community events. Money doesn't grow on trees and for this, the Corporate branch works to fund the team. Corporate is in charge of team operations, focusing mainly on sponsor relations and grant writing skills which provide a chance for students to learn how to write grants, while simultaneously working on awards and managing the team via procuring supervision and meals. Last year, all of the branch leaders collaborated to construct bylaws for the team.



4. Strategic Planning Process

Strengths

- Maintain facilities
- Expand school awareness
- Expand school programs
- Team documentation (bylaws, archive, continuity)
- Wood shop, metal shop and screen

Weaknesses

- Funding
- Involvement of all team members
- School renovations (buildings important to the team destroyed)

printing facility	
OpportunitiesGetting more sponsorsGaining more mentors	Threats Loss of sponsors Loss of metal shop Loss of interest

5. Team Impact and Outreach

5.1 Impact on Community

Team Paradox has impacted its community throughout scheduled activities. These activities aim to promote interest in robotics and STEAM while simultaneously help out local communities. For example, Team 2102 has participated in beach cleanups and park cleanups which not only benefit the environment, but also gains the team more recognition throughout the community. Furthermore, it mentors several FIRST® Lego League (FLL) teams throughout the local area, and hosts tournaments for these FLL teams. Last year was the first time that the team assisted FTC teams in its competition. The teams are named "Paradox cubed" and "Paradox squared" to pay homage to their FRC supporte. As the first FRC team in the San Dieguito Union High School District, Team Paradox has also sparked the birth of three other teams in the district that may use SDA's facilities for fabrication.

5.2 Future Members

Through FLL mentoring, Our student mentors have encouraged younger children to continue participating in FIRST® programs and celebrating STEAM. Several current team members participated in FLL programs or were mentored by Team Paradox.

5.3 Alumni

As a team that prepares students for nearly every field, We have had many students develop unique talents and skills due to their experiences on the team. By getting involved with the FIRST® program, students gain bright and shining possibilities for their future, including potential internships with corporate sponsors.

We have alumni who have or are attending:

UC Berkeley

UC San Diego

UC Los Angeles

UC Irvine

UC Davis

Purdue University

California Institute of Technology

Bennington University

Layette University

Massachusetts Institute of Technology

The team has alumni working at:

Asymtek

Honeywell Aerospace

General Atomics

Qualcomm

SeaBotix

Autodesk –machine learning and data analysis internship working on the cloud platform

Moog Components Group –DARPA Project HUBO robot Project Internship

Pratt & Whitney –engine airflow and heat transfer/management

FedSolutions –IT Systems Analyst

6. Action/Implementation Plan

Strategy	Actions	Group Responsible	Planned Completion
Train inexperienced members before competition	Teach new students by fixing 2014 competition robot together	Build	August 2014
Show new members the ropes	Apply the Geared Learning program to teach basic team functions	Executive	Fall 2014
Strengthen the ideals of STEAM in the community	Attend and participate in STEAM events in the community	Marketing	Summer/Fall 2014
Support FLL	Mentor FLL teams Host FLL QT Judge at FLL competitions	Marketing	Fall/Winter 2014-15
Gain new corporate sponsors	Design and send letters of intent to	Corporate	Fall 2014

	STEM companies		
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7. Team Budget

7.1 Team Income and Expenditure

We have an anticipated budget of \$101,942 all of which are funded by parent donations, sponsors, and the selling of team merchandise. Approximately 23% of the income is spent on the manufacturing of the robot and 15% on registration fees. Because our team is active even when build season is over, 31% of the budget covers post-season expenses.

Robotics Team Budget 2014-2015	
Carry forward from 2013-2014	\$54,000
Income	
Grants & Corporate Sponsorship	
Donations	
FLL Tournament Fees	
Travel Fees Collected	
Spiritwear/Merchandise Sales	,
Total Income:	
Total moone.	ΨΟ1,000
Expenses	
Previous Years Expense	\$1,000
Robot Build Cost	\$13,000
Purchase New Laptops(2)	\$1,500
Purchase New Controllers (4)	\$4,000
Robot Maintenance and Repair Cost	\$1,000
Tools/Equipment	\$1,000
TIG Welding Supplies	\$300
FTC Cost	\$4,000
Corporate Expenses	\$750
Marketing/Promotion	\$3,000
FLL/Outreach	\$1,500
Misc Office Supplies	\$300
Supervision(Screening and stipend)	\$3,450
Teacher Stipends	\$4,542
Registration Fees-Regional Competitions	\$9,500
Travel-Scholarships	\$1,600
Travel-Student	\$10,000
Travel-Teacher/Mentors	\$3,000
Total Regular Season Expenses:	\$63,442
Championship Expenses	
Build and Maintenance	\$1,500
Registration	\$5,000
Marketing	\$1,000
Shipping	\$1,000
Rental Van	\$1,000
Teacher/Mentor Travel Expenses	\$6,000
Student Travel Expenses	\$18,000
Supervisors Travel Expenses	\$4,000
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Total Championship Expenses	\$37,500
Total Expenses:	\$100,942
Expected End of Year Balance	\$4,143

7.2 Additional Opportunities for Support: Mentors

Mentor Roles	Role Description
Programming	Assists and teaches students how to program
Mechanical	Assists and teaches the students in designing and machining for the robot
Writing	Helps students write the business plan, bylaws, Woodie Flowers Finalist Award essay, and Chairman's Award essay submissions
Social Media	Helps to promote online presence of the team including Facebook, LinkedIn, Team website
Travel Logistics	Helps to prepare and organize for travel
Finance	Works with students to manage funds and budget
Marketing	Assists with press releases, event planning, publicity, editing, and connecting paradox to community
Business Processes	Works with students on effective team management and communications

8. Sponsor Benefits

	\$100.00	\$250.00	\$500.00	\$1,000.00	\$5,000.00	\$10,000.00
Invite to San Diego Regional		х	х	х	х	х
Invite to Sponsor Appreciation Event	х	х	х	х	х	х

Website Recognition: Logo Website Recognition: Link to Website T-Shirt Recognition: Listed X X X X T-Shirt Recognition: Logo X X X X X X X X X X X X X	Website Recognition: Listing	х	х	х	х	х
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Logo Recognition at Events, includes Encinitas Street Fair (10,000 people), Robotics Regionals (5,000+) people, and	-			х	х	Х
Events, includes Encinitas Street Fair (10,000 people), Robotics Regionals (5,000+) people, and	Logo on Robot				х	х
other community events in San Diego x	Events, includes Encinitas Street Fair (10,000 people), Robotics Regionals (5,000+) people, and other community					Y

9. Team Fundraising Opportunities

9.1 Current Team Fundraisers

Encinitas Street Fair- Our team is a regular to the Encinitas Street Fair. In 2014, the team put up a donation box and then proceeded not only to fundraise for the team, but also to increase awareness of the team and of FIRST® and STEM principles. We made money with the team's patented cheering. The team displayed so much spirit that it was mistaken for a cheer team.

Souplantation- We collaborated with a local Souplantation restaurant and gained 15% of the profits, provided that patrons mentioned that they were there to support the team.

Cal State San Marcos STEM Fair- Our team has worked with ViaSat, a key sponsor, in the past during the Cal State San Marcos STEM Fair. We participated by using a booth maintained by team representatives and spoke to community members about STEM involvement.

9.2 Future Team Fundraisers

Our team plans to expand our horizons in the future through more community outreach, while maintaining a steady flow of team merchandise sales. We are looking into hosting team

fundraisers at Chipotle and Souplantation after competitions in order to encourage financial growth and team comradery. We hope these events will be successful endeavours.

10. Unique Team Qualities

Our team is situated in San Dieguito High School Academy (SDA), a public choice high school dedicated to arts and creativity. Unlike a traditional high school, SDA lacks a football team and cheerleading squad, and instead, fills the void with a spirited robotics team. Robotics is an integral part to the school culture and thus sees great emphasis in school wide events. Our team prides itself in being a student-run team where the leaders of the team are all students (versus adults). Students on the team recently constructed team bylaws to provide structure and a sense of order. Our team is well known for its spirit and the combination of marigold, red and blue cheering in competition, is a spectacle that most will remember.

11. Team Contact Information

Website: sdarobotics.org

Team Email: paradox@sdarobotics.org

Facebook: FIRST®Robotics Team Paradox 2102

Team Meeting Information:

Location: San Dieguito Academy

Facilities: Room 111 (Metal Shop), Room 100 (Computer Lab), Room 110 (Screen Printing

Room)

Sponsorship Information:

We welcome community members to contact us if interested in sponsorship opportunities.

Thank you!

Mailing Address:

800 Santa Fe Drive, Encinitas, CA 92024