2012-2013 Season

Operations Plan

Stuypulse Robotics

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Preamble

Despite winning the Northeast Utilities regional chairman's award for a third consecutive year, Stuypulse's twelfth year regrettably ended in disorganization — leaving us without effective communication, creating chaos that quickly escalated beyond our control. As, each year, the team develops and incorporates greater ideas into its operations, plenty of problems will inevitably arise. Thus, as we roll into our thirteenth year, we are eager to adapt our processes and tighten our interdepartmental bonds. With years of experience under our belt and the previous Operations Plan as our guide, we have constructed this document to serve our team through another year, and to help make us more efficient, adaptable, and powerful.

2013 will be yet another stepping stone for us to be one of the most elite teams among the FIRST community. Armed with our Plan, we hope that this year will run more smoothly and efficiently than past years. This document will be a guide on a week-to-week basis, leaving us more time for innovation and creation. This allows for ease and flexibility every day, preparing us for even the worst situations.

In the following years Stuypulse will undergo changes both physically and mentally, but the love of making awesome robots will remain a connection between our members. As personalities and the team change, the Plan will have to adapt to represent different visions of the future. While we keep this in mind, Stuypulse will continue to strive for excellence in robotics and everything that goes into the making of a robot.

Six Nine Foah!
Joanna, Doris, Eric, Ameya, Philipp, Justin

Team history*

Stuypulse made its FRC debut on the right foot (or should we say wheel?) in 2001 with Stuyle. As finalists at the NYC Regional and the highest scorers in the Galileo Division at the Championships, we set a strong precedent for future robots.

Subsequent years produced more impressive robots, along with countless hurdles for the team along the way. Since the fateful year of 2001, we have been recognized with the Engineering Inspiration Award in 2002 and 2008, the Entrepreneurship Award in 2004 and 2009, the Innovation in Control Award in 2005 and 2010, the Creativity Award in 2006, the Judges and Safety Awards in 2007, and countless Website Awards. We have been featured in books, in print, and on TV, even starring in our own documentary by the Wall Street Journal. Our proudest accomplishments, of course: being Regional Champions in 2003 and 2010 and Regional Chairman's Award winners in 2005, and 2010-2012 consecutively.

Over the years, we have consistently shown that when given opportunities and challenges, we possess the ability to step up to the plate. However, in recent years some of our successes have rung hollow, due to team members feeling separated from our victories and wondering what part they played, if any.

We have also experienced loss despite great potential. Notoriously, in 2009, we lost in the semifinals of Hartford, despite building the second highest scorer in the nation. Due to a lack of planning and poor communication, we were unable to recover from a small but catastrophic software error. Two years later, we failed to perform well in New York because we had neglected the design of a critical component, the "minibot deployer." Had we used proper time management and foresight, we could have built a functional deployment mechanism before the ship date. Last year, even with the newly created Operations Plan, we did not have a fully built "skeleton" robot by the middle of the build season. Because of this setback, our robot was not as tested as we would have liked it to be.

As we look back and see these mixed stories of success and disappointment, we realize that we are still not the great team we could be. Now, well past the stage of being a rookie team, we experience victories and losses, but we almost always recognize the numerous preventable faults in our robots that impede them from being true champions. We put our failures to use into a post-championship document, filled with a plethora of ideas of how to improve the team, both during and before competition. We have built a strong and respectable legacy, yet we still struggle annually with team spirit, organization, and production quality.

*Adapted from 2011-2012 Operations Plan originally written by Jason Potter, Doron Shapiro, Alejandro Carrillo, Joanna Zhu, and Doris Tsang.

Vision - Stuypulse 2015*

It is the year 2015, Stuypulse has become known as The Beast in the East. Ever since they first saw us on Einstein Field, the worldwide FIRST community anticipates the release of every robot we build, and our legendary robot videos have come to identify us not only because of their quality but because of the robots they describe. Our distinct style, which always incorporates thorough design, impeccable craftsmanship, and a "why didn't we think of that!" moment, is now slowly becoming evident in neighboring teams from the tri-state area, making us true innovators and leaders.

The degree to which we meet game challenges with well-engineered machines and organized teamwork is an inspiration to all of FIRST, and such skill has lent itself to clear use in the challenges of this year's inaugural water game. While many teams scramble to meet such surprises, Stuypulse has been developing strategies for flexible design for years, and finished the robot early. Not only is the quality of the mechanical engineering and design evident in our robot this year, but the ingenuity of our control system brings crowds to our pit, just as it does every year. Also anticipated yearly by the FRC community is the release of off-season produced software by the Software Engineering team. The work of our developers is used widely among FRC teams, from robot simulation software for optimizing autonomous routines to mobile technology that utilizes data mining and crowd sourcing for scouting and strategy purposes.

One of the most noticeable changes, however, is not in our own team, but rather on our home turf: New York City. With all of the time and resources that Stuypulse now has, we have been able to focus on our home regional, making it not only one of the biggest, but one of the most competitive. New York teams have unique challenges, but Stuypulse is a unique team, and we have worked to transform other teams with big visions and small resources into proud representatives of the city throughout the world. New York is the capital of the world in many ways, and now FIRST sees us as such.

*Adapted from 2011-2012 Operations Plan originally written by Jason Potter, Doron Shapiro, Alejandro Carrillo, Joanna Zhu, and Doris Tsang.

Goals

With respect to our vision, we see the following objectives as our primary targets for the coming seasons:

1. Increase member recruitment and retention, as well as parent participation

2. Connect and maintain a healthy relationship with the new administration

3. Establish better communication within the team, our community, and other FIRST teams

4. Facilitate knowledge-sharing between NY teams to increase the skill of NYC's FRC community

5. Make a more concerted effort for recognition of excellence across all aspects of FIRST.

6. Broaden our appeal to the entire Stuyvesant population

7. Strive to innovate and maximize all of our designs

Schedule

Pre-Season

September	Administer safety tests for veteran members
	Present the Operations Plan
	Organize the Lab
	Hold driver Try-outs
	Purchase Teensy kits
	Prepare for newbie projects
	Print magazine of the year
	Decorate hallway and display case
	Attend Maker Faire
October	Interest Meeting
	(Will host individual interest meeting if needed)
	Booksale
	Host safety lectures for new members
	Big Apple Rebound Rumble Off Season event
	Administer safety tests for new members
November	Ramp Riot
	Start newbie projects
	Train newbies on necessary skills
December	Complete departmental off-season projects
	Introduce newbies to the flow of lab
	Host beta-testing seminars
	Host workshops

Build Season

January (Week 1-3)	Kickoff (Jan 5)
	Start field construction
	Brainstorm for robot design
	Brainstorm for game strategy
	Build the prototype
	Design T-shirts and other items as deemed necessary

February (Week 4-6)	Test robot Practice driving Prepare spare parts Week 5 Dinner Submit all award applications

Competition Season

February	Prepare pit (test-construct before packing) Update press packets Prepare Engineering Inspiration packet Prepare for Chairman's presentation
March	Clean lab Host Parents' Night (before NY Regional) Pack for regionals Host team social with teams participating in the NY Regional Make final modification on robot design if necessary Arrange logistics for all trips
April	-World Championships -Pack for Championships -Modify code if necessary -Have a team-wide discussion on improvements that can be made -Tribeca Film Festival Arrange booksale

Off-Season

May	Publish reflections Complete off-season projects (Transition newbies to oldbies)
June	Arrange Booksale (if not in April) Arrange Bakesale (if applicable) Arrange Team Dinner

	Attend demo at World Science Festival
	694 Team Social
	Elect next year's EEC
	(EEC) Appoint EC
July	Look for Demo opportunities
	Draft next year's Operations Plan
August	Finalize the Operations Plan

*See Appendix A for FIRST calendar.

Operations

Drive/Operator Tryouts

The tryouts will be held in September. Potential drivers were emailed information packets to help them get ready for tryouts. Any veteran team members who signed up for the emailing list will be allowed to participate. Initial tryouts will be held at the third floor gym using Joebot and will be recorded. The drivers will be narrowed down to two based on performance, dedication to the team and enthusiasm. The selected drivers will then proceed to drive DESdroid with all the potential operators. Each driver will select his/her own operator that they believe works best for them. Each of these drive teams will participate at (an) off-season event(s) to determine which team will be the primary drive team and which one will be the backup drive team.

Field Construction

This year, we are altering our tradition of reading the rules and strategizing at kick-off. Instead, we will start our build season by first doing field construction. There are several directions we might go to achieve this goal. One possible solution is to partner with TechKnights (Team 334) along with a few other teams to construct a whole field at Brooklyn Technical HS. In the case that the Brooklyn Tech field is not an option, we will seek other available space, such as in universities or our own cafeteria. This will help us design the robot with consideration to the field elements. We will also be able to arrange practices once the robot has been built for more "real experiences" on the field.

Fundraising

The book-sale and bake sale have been one of our major fundraising method for the team. This year, we wish to donate some of our books to non-profit organizations after we have sorted out the books for the book-sale.

Interest Meeting

We have written an Interest Meeting Plan, dedicated to arrangement and logistics for the annual interest meeting, which will be improved and updated each year after the event upon reflection. (See Appendix B)

Interdepartmental Newbie Project - TeensyBots

This year, we have overhauled our "newbie project" and spread it across our two major departments - engineering and software engineering. We, the EEC, believe that this project will be far more effective in simulating the build season than VEX was, as it combines the aspects of programming, engineering, and electronics much more completely than previous iterations of the newbie project, forcing the new members to work together on the project. It has the dual advantages of simulating the build season effectively while planting the seeds of complete unity between divisions of the team.

The entire process begins in the engineering division, with some our newbies designing and prototyping their TeensyBots. Under the guidance of our senior members, they will then construct the bots, interfacing generously with their fellow programming newbies, who will be working on generic code for the TeensyBots. While some of our engineering newbies are working on the bodies of their TeensyBots, others will move on to electronics, where our newbies will learn the basic concepts of electricity and electronics and solder up their Teensy++2.0 boards and later, their bots. Of course, like in build season, the bot will finally be passed onto software engineering, who has been working in the background, and have life breathed into them. At the end of this "grueling" stimulation of the build season, all of these bots will compete against each other for the ultimate prize - glory.

Of course, most of the time, things do not go perfectly the first time so we have also decided on Plan B's. Engineering's Plan B will be to go back to the VEXbot games, while Software Engineering's Plan B will be to reinstate the Finches.

Details of the game will be discussed at the first few meetings.

Off Season Events

Big Apple (October 20) - As one of the older teams in NY, we will help Francis Lewis arrange the event if necessary, and participate in the competition.

Ramp Riot (November 10) - The team will go to Ms. Daisy (Team 341) at Wissahickon High School in Ambler, PA to attend.

Off Season Projects

- **Animation** - Projects include the 3D animation and safety animation. Depending on the active members on the animation team, we may enter the 3D design competition for the first time in our history.

- **Beta-testing seminars -** As we have spent the last few years doing Beta testing for FIRST, we hope that FIRST once again chooses us to undergo Beta testing. We plan to allocate our resources to do Beta testing more carefully, so then education is not starved of teachers. Beta testing will be used as an opportunity not just to test FIRST's new hardware and software, but also to train veterans with less-experience and confidence in programming, helping them get up to speed to be expert software engineers by Build Season. Like last year, we plan to hold Beta testing seminars, hopefully along with our other, general-purpose seminars and workshops. This is to allow other FIRST teams within the community to get a feel for new software and hardware that may be out during the Build Season.

- **Cart and Pit** - In the past we have always found our pit to be inconvenient to our "pit crew." This year, in collaboration with the engineers, we will design and construct a new pit to optimize usage of space, as well as cart, to more effectively transport the robot.

- **FIRSTthoughts** - Editing FIRSTthoughts videos will be the major project for newbies to familiarize themselves with video editing. They will then learn more techniques for media production by creating videos for FIRSTthoughts, and possibly The Lab series.

- **Post-season Meetings** - May and June are our least productive period during the year, not because it's off season, but because of the confusion of who should step up to the responsibilities that lie before younger members. To combat this, we are launching this program, where EC members will assume an assisting role to support one to three prospective EC members. It may be treated as an assessment period to who will be more suitable for the role, as well as giving younger members a little more experience higher up on the ladder.

- **Prototyping** - In a nutshell, engineering will spend the majority of the off-season period, to prototype and testing new designs. In this off season, we will primarily be directing our attention to optimizing tank drive, building a lift, and testing different types of pneumatic pistons.

- **Rebuild the JoeBot** - This is an optional project that ideally should be attempted before Ramp Riot or Big Apple Rebound Rumble. We will be overhauling JoeBot's acquirer by designing and implementing a drop down acquirer and fixing his bent frame by adding in reinforcements. We will also try to improve his current systems on a software level.
  In the event that this project cannot be completed in full, JoeBot must be maintained and restored to full working condition.

- **Robot Donation** - As years pass by, robots are taking more and more space in our storage closet. Donating old robots to museums will save up spaces for more robots to come, and make our team part of the history of New York.

- **Scrapbook** - Making a scrapbook not only provides extra promotional and award materials, but, more importantly, helps record competitions and events throughout the year.

- **StuyBeat** - Our web team strives to provide the most convenient way to connect between team members and between FIRST teams. The "StuyBeat" is an open-source web application that helps organize team contacts, enabling teams to categorize members into sponsors, parents, mentors, alumni, and team members, as well as keeping track of the member information for easy access.

- **Stuypulse Stuyle** - This will be an optional off season project. As a team stepping into the twelfth year, it would be interesting to create our own fonts and formats of our documents to create our unique style. Alongside, the frontside of our team shirt will also be redesigned, which will be used at least for the next seven years.

- **Stuypulse wall** - Beginning in September, we would like to redecorate our display case and our 4th floor hallway with team photos and framed t-shirts on the wall and on the display board.

- **Stuypulse Website Redesign** - The web team is working on overhauling and redesigning the official Stuypulse website to bring a fresh look and better experience to the users. The test site can be found bit.ly/alphastuy.

- **Team spirit materials design** - We would like to perfect our mascot design, create a new flag, tarps, and other materials that show our team spirits at competition.

Potluck Dinner

The team dinner is an annual celebration for our achievements and what we have learned through the season. Most importantly, we express our gratitude to sponsors, mentors, and parents for their support, as well as to our teammates for hanging on to us.

Subsystem-based Construction

Instead of building an entire robot, with all of the pieces coming together from whoever, we are revamping our construction methods. We will have small groups who specialize on certain parts, or *subsystems*, of the robot. For example, these groups could consist of one or two engineers and a software engineer or two working on the same subsystem. This allows engineering to work more closely with software engineering, making the division between the two departments less noticeable.

In addition to this, all of the gatherings that we conduct throughout the meetings will be transformed in order to support this new method of construction. Instead of talking things from a departmental perspective, members of each subsystem group will speak about the group's accomplishments, regardless of department.

The Week-5 Dinner

In the fifth week (or around that time) of the build season, we will invite parents and other NY teams to the Saturday potluck dinner. During that night, we will take turns to share our progress on the robot with our guests. As we have to show off the robot, it gives us a good deadline to have a fairly operational robot, so we do not hold that off until even later. This event also serves to inform parents about the competition season and basic logistics for the trips to regional events. Through the dinner, we would like to encourage the parents to get involved in these events and the team's operations. The dinner is also meant to give team members a well-deserved break so they do not burn out during the last week of the build season.

Workshops

Entering December, we will arrange meetings for discussion in strategy and design, as well as exchange of ideas of other team components, in collaboration with other New York teams. This will be one of our major projects of the year, in an effort to share our knowledge and experience with each other, and inspire more new ideas.

Budget Plans

Marketing Budget	**Cost**
Giveaway Items	$500
Magazine	$300
Chairman's/Outreach Initiatives	$300
Signage	$250
Office Supplies	$200
Mascot	$500*
Spirit Supply	$100
Button Materials	$50
Green Initiatives	$30
Team branded items	$30
Shirts	$20
Websites (Registration Fees)	$20
Incidentals	$200
Total:	**$2500**

***** The budget for mascot is generously sponsored by Joe Ricci.

Engineering Budget	**Cost**
Newbie Project	$500
Field Construction	$600
Pre-Season Projects	$400
Build Season	$6000
Incidentals	$500
Total:	**$8,000**

Software Engineering Budget	**Cost**
Cables To Go - 500ft 350Mhz Solid PVC Cmr Cable	$56.25
Crimp Connector solid, (100 Pcs Per Bag)	$4.45
Router (x3)	$276
Gamepad (x4)	$44.74
Wireless lavalier + handheld mic + receiver	$109
Miscellaneous Costs (Strategy items included?)	$1509.56
Total:	**$2,000**

How to Use the Operations Plan

The Operations Plan is used to help us identify our problems at hand while keeping us on an organized track. It is meant to provide a framework for our important operations — both old and new, and grease them to run more smoothly. The Plan provides us with an organizational guide and helps direct our attention to more difficult tasks.

We, as the writers of this document, recommend that the entire team read and familiarize themselves with the schedule and operations asked for by this manual of sorts. You may always refer to this plan throughout the year, but keep in mind it is only a guideline, not rules for the year's operations.

Preamble
The Plan starts with an introduction letter from the presidents, which is the manifesto for the coming year(s) by the authors of the plan It should be rewritten to set the tone for each year gives leaders the chance to offer their own voice, perspective, and opinions on the Plan.

Team History
This section tracks our progress toward our final goals. Each year has its own accomplishments, and each generation of team members is faced with unique challenges. It should be updated annually to contrast with the vision, and will therefore highlight areas of focus for the coming year.

Vision
We challenge subsequent leaders of Stuypulse to out-do the last vision if and when they revise it.

Goals
This section should be revised accordingly, based on the vision and what the team should accomplish to work toward our vision.

Schedule and Operations
The team needs a backbone. This backbone needs to be flexible enough to deal with problems years in the future, as well as rigid enough to keep one of the most diverse and ambitious high school teams in existence running. The schedule is meant to provide such structure, reminding us of the time frame. The Operations section elaborates on the year's (or the yearly) planned projects. This section can also be used as a "testing bed" for the introduction of new operations. These should be revised if necessary, based on previous experience with each project.

Budget Plans and Appendices
This section should be reevaluated and rewritten as necessary, based on the prior year's data and requirements.

Notes
Just remember that these are guidelines. Future Operations Plans do not need to strictly follow this order and organizational pattern. The Plan is allowed to develop and evolve as future Operations Plan writers feel is fit.

Appendix A

http://www.usfirst.org/roboticsprograms/frc/frc-season-calendar

Team Information for Judges	Opens	Closes
Team Profile Team Information including Team Name, Team Nickname, Robot Name, and Team Motto. This information is used for program books.	8/2/12 noon EDT	5/6/13 noon EDT **NOTE**: *Info for program books will be exported on 12/20/2012.*
Judges' Information Team essays and Robot photo. This information is used for Judge books.	8/2/12 noon EDT	5/6/13noon EDT **NOTE:** *Info for Judge books will be exported on 2/20/13.*
Kit & Kickoff	**Opens**	**Closes**
Kickoff Registration Event attendance & kit pick-up location	10/4/12 noon EDT	12/6/12 noon EST
2013 FRC Kickoff	1/5/13	
Surrogate Kit Pickup paperwork to *FIRST*		1/2/13 noon EST
Kit of Parts (Missing parts)	1/7/13 noon EST	1/11/13 noon EST
Robot Transportation	**Opens**	**Closes**

Request for Bag & Tag Exemption		TBD
Requests for Robot Removal from Championship		TBD
Stop Build Deadline		2/19/13
***FIRST* Awards Submission**	**Opens**	**Closes**
Safety Animation submissions	10/11/12 noon EDT	12/13/12 noon EST
***FIRST* Dean's List Award**	11/8/12 noon EST	2/21/13 noon EST
Chairman's Award	11/8/12 noon EST	2/21/13 noon EST
Woodie Flowers Award	11/8/12 noon EST	2/21/13 noon EST
Website Award	11/8/12 noon EST	2/21/13 noon EST
Entrepreneurship Award	11/8/12 noon EST	2/21/13 noon EST
Excellence in Design Award sponsored by Autodesk (Category 1-3D Design)	TBD	TBD
Excellence in Design Award sponsored by Autodesk (Category 2-Animation)	TBD	TBD

Scholarships		
Scholarship Applications	application dates vary	Deadlines on web
NASA Grants	**Opens**	**Closes**
NASA Grant Application Process	TBD	TBD
Grant winners published to Web Site	TBD	

Appendix B

Stuypulse Interest Meeting 2012 (Draft)

Pre-Meeting Campaign

In order to get a large number of people not only informed of but also interested in our team, our media campaign throughout the school must be well planned then aggressively executed. Through school-wide posters and an interesting information page, we will establish a memorable and distinctive graphic arts style associated with our team.

Posters

- Copy paper size**:** Strong color motifs, with simplistic images and short catchphrases.
- Poster size**:** Large high-quality photos, with enticing descriptions of our work.
- Include short urls (such as bit.ly/stuybots).

Information Web page: The website is created in convenience to the prospective members who cannot attend the interest meeting and to those who would like to learn about the team in advance. The page will contain a short description and images of different parts of the team. Like, share, and tweet buttons are within easy reach. The website will also have an entry field for the name and email for signup to our mailing list.

Interest Meeting

Once people take the time off to hear about our team, the main purpose of the interest meeting should be informative, while keeping them interested.

Setup period: The meeting should start as soon as possible. During the wait outside of the cafeteria, people should have the opportunity to glance at additional posters of ours. Display materials and music should be prepared first, such that when people come in to sit down, they can cycle around the tables while we get the projector ready. Michael 1 will also be ready for demo during setup.

Logistics: The equipments will be tested beforehand. The speeches will be prepared at least a week before the meeting, and at least one full rehearsal will be held.

Slideshow: The PowerPoint should attain a new level of graphic design with a style that's consistent with our posters and website. However, it should also be clear and minimalistic, directing the attention to the speaker. The slideshow should contain plenty of images to back up our claims. We should also show some Rebound Rumble footage during the presentation, perhaps ~30 secs of it during the waiting time. The slideshow should be sweet but short, to leave time and patience for the next part.

Booths: After the slideshow is done, interested people should have the opportunity to inquire further about a particular part of the team, and talk to some of the division leaders in person. Each division should have its own stand/booth, including animation. Each booth should be one or more tables large, with something to show off that is the individual leaders' choice. Each booth should also have one or more laptops, to an online minimalistic website with "Sign up for Stuypulse" at the top and an input field below (The data will be sent to the server using jQuery and then appended to a textfile or written into a database). This will greatly decrease the friction for signup.
(Note: If an Internet connection is not possible or unreliable, then XAMPP should be set up on all the laptops, and the signup run locally. In this case, a script should also be written that takes all the collected data and sends it off to the server.