BotsIQ
Documentation Evaluation Rubric

SCHOOL NAME: _____

BOT NAME: _____

Documentation Evaluation Criteria:	**Points Possible**	**Points Earned**
Pit Binder	15 pts.	
Executive Summary	15 pts.	
Composition		
- Cover Letters	25 pts.	
- Resumes	25 pts.	
- Industry Tour	20 pts.	
- Advisor Interview	20 pts.	
Team Procedure		
- Project Schedule	15 pts.	
- Safety Plan	20 pts.	
Accounting / Fundraising	15 pts.	
- Promotional/Marketing	15 pts.	
Design Motivation and Process		
- Weapon System Details	35 pts.	
- Frame and Armor Details	35 pts.	
- Drive System Details	35 pts.	
- Power System Details	35 pts.	
- Bill of Materials	30 pts.	
- Engineering Drawing Set and Assembly	55 pts.	
- Wiring Schematics	20 pts.	
Total Documentation Points:	**430 pts.**	

*Items highlighted in YELLOW must have a second copy for the Pit Binder.

NOTES:

Overview Section

Due: Finals	Pit Binder	Due: 2/1	Executive Summary
/5	Cover page in View Panel on Front of Binder. Includes: - School Name - Bot Name - School Advisor - Industry Advisor - Team Members Names (identify three (3) core team members)		This summary should be a maximum of one (1) page
/4	Binder Index Page includes a list of tabs with labels to correspond with the Pit Binder sections (see below)	/5	General Team Information - School Name - Bot Name - School Advisor - Industry Advisor - Team Member Names with task assignments for each member (identify three (3) core team members)
/2	Both the tabs and index page follow the same order as found below.	/10	Questions to be answered: - Is your team part of a class, club or both? - How often did your team meet? - Anything "special" about the team process (two (2) sentences max) - Clear, color photo of your bot - Provide a short description of your bot (five (5) sentences max) - Include: weapon system, power system, frame & armor, drive system
/2	Presentation of Pit Binder (i.e. pages are inserted using 3 hole punches, pages are not sticking out of the binder, wrinkled, ripped, etc.)		
/2	Each content page (not dividers) has a footer that includes a page number and the section title		
	Required Pit Binder Sections, In Order: - *Safety Plan* - *Bill of Materials*		
/15	**Total Points Earned**	**/15**	**Total Points Earned**

Composition Section Part One

Due: 2/1	Cover Letters	Due: 2/1	Resumes
/3	Cover letters from the **3 core team members.**	/3	Resumes from the **3 core team members.**
/6	Each letter must include the following: - The core team member's name with their contact information. - Current date. - Company address (use Industry Advisor's address) - Greeting (I.e. Dear Mr./Ms. Industry Advisor's name) - A closing with core team member's signature (I.e. Sincerely, Thank you)	/3	The core team member's name with their contact information is present
/6	Statement of which one of the 5 fictional employment opportunities the core team member is applying for and why they are qualified for this position *(see list at the end of rubric)*	/9	Education level to date, including: - High School(s) name and address - CTC name, address, and program of study, if applicable. - Classes and skills related to career interest. - Honors and/or recognitions - Skills developed during BotsIQ.
/3	Reference is made to the skills the student has learned through BotsIQ	/6	Activities involved in during high school (i.e. employment, internships, co-ops, volunteer, extracurricular activities, etc). Include skill(s) gained, leadership positions held, etc.
/1	Cover letter is presented well and flows easily	/3	Clear presentation of information - Dated from most recent activities and/or employment to oldest
	There are no spelling or grammar errors	/1	There are no spelling or grammar errors
	*Please note each cover letter is to be independently written to reflect the qualifications of each specific team member.		*Please note each resume is to be independently written to reflect the qualifications of each specific team member.
/25	**Total Points Earned**	**/25**	**Total Points Earned**

Composition Section Part Two

Due: 3/1	Industry Tour	Due: 3/1	Advisor Interview
/2	Proof of industry tour (group photo inside or outside the facility) *Additional photos can be added to an appendix. (No photo means -10 points)	/3	Ask your Advisor the following three questions and provide their detailed response: - What is the Advisor's current position, and what responsibilities do they have? - What was the Advisor's career pathway, and how did they advance in their career? - What are the benefits of pursuing a career in manufacturing?
/5	Provide an introduction of the company that you toured - describe its location, employees, the product(s) made, service(s) provided, and detail its mission and goals.	/10	Come up with **five** original questions related to the Advisor's career path. Provide the questions and a detailed response for each.
/7	Relate the manufacturing process demonstrated on your tour to the experience of designing, building, and documenting a robot for BotsIQ.	/3	What did you learn from the Advisor Interview that may help someone interested in pursuing a career in manufacturing? Provide **three** pieces of advice.
/2	How did the Industry Tour affect the team's opinion of manufacturing? Please explain your answer.	/3	Organized and presented in a clear manner.
/3	Organized and presented in a clear manner.	/1	No grammar or spelling mistakes. Maximum of one (1) page.
/1	No grammar or spelling mistakes. Maximum of one (1) page.		
/20	**Total Points Earned**	**/20**	**Total Points Earned**

Team Procedure Section Part One

Due: 2/15	Project Schedule	Due: 2/15	Safety Plan
/15	Bot building timeline is provided and includes scheduled start and end dates of listed activities (See examples of Gantt Charts. An easy way to create a Gantt Chart is to use Excel. Open a "New" file and search for "Gantt charts.")	/6	The Safety Plan includes specific safety actions for building the bot, including each tool/machine used.
		/5	The Safety Plan provides a clear description of how the team plans to stay safe during the testing and operation of the Bot. *Battery storage safety must be indicated.
		/5	A specific part of the plan must address <u>what</u> to do <u>when</u> an injury occurs
		/2	A blank copy of the necessary reports for injury follow-up must be included. This "Incident Report" can be obtained from the school office.
		/2	The Safety Plan is presented in an organized manner
		-10	Team MAY NOT use the Pennsylvania Department of Education's Safety Plan in lieu of developing their own plan
			This section is required for the Pit Binder.
/15	**Total Points Earned**	**/20**	**Total Points Earned**

Team Procedure Section Part Two

Due: 3/1	Accounting / Fundraising	Due: 2/15	Promotional / Marketing
/9	The Accounting Budget provides a clear picture of how the team managed their income and expenses. All income and expenses are well documented in a spreadsheet. Receipts and purchase orders should NOT be included. How did the team fundraise for the BotsIQ activities? (I.e. Did the team have a bake sale to raise funds? Did you call companies to solicit resources?)	/11	How did the team promote/market BotsIQ to fellow students, school administrators, and the community in order to gain more team members and increase the program awareness? What were the results of these efforts? Did the team use any promotional items? (Examples of these items can be shared in this section and do not count towards the one-page restriction.) Did the team use digital media? If so, what platform(s). How often did you post? What were the results? (Examples of these posts can be shared in this section and do not count towards the one-page restriction.) *Teams should still submit a marketing plan and promotional materials for this section even if they are unable to post on their district's social media platforms.*
/2	How was the accounting and fundraising data managed by the team? (i.e. Who managed the data? What software program was used? How often was it updated?)		
/3	The Fundraising Plan is presented in a clear, detailed and organized fashion and is a maximum of one (1) page	/3	The Promotional and Marketing Plan is presented in a clear, detailed and organized fashion and is a maximum of one (1) page.
/1	No spelling and grammar mistakes.	/1	No spelling and grammar mistakes.
/15	**Total Points Earned**	**/15**	**Total Points Earned**

Design Motivation & Process Section Part One

Due: 4/12	Weapon System Details	Due: 4/12	Frame and Armor Details
/4	Provide a one-page **overview** of the weapon system (maximum of one (1) page). Include: - What type of weapon does the Bot have? If it doesn't have a weapon, what type of Bot is it? - Explain the team's competition strategy behind the selection of this weapon system (or lack of a weapon system). - How did the team gather/make the parts to build the weapon system? Please give an overview description; more details will go below. (For example: an explanation of where parts were purchased, which parts were fabricated and by whom, if they were modified, etc.) - How does the weapon system work?	/4	Provide a one-page **overview** of the frame and armor (maximum of one (1) page). Include: - Explain the team's competition strategy behind the selection of the bot's frame and armor. - How did the team gather/make the parts to build the frame and armor? Please give an overview description; more details will go below. (For example: an explanation of where parts were purchased, which parts were fabricated and by whom, if they were modified, etc.)
	Following the one-page overview, include detailed descriptions of:		Following the one-page overview, include detailed descriptions of:
/7	- The **research** your team conducted when designing the bot's weapon system. Include other systems considered and why they were not selected. Also include any changes made to your weapon's design, build, and/or assembly as a result of the research.	/7	- The **research** your team conducted when designing the bot's frame and armor. Include other designs that were considered and why they were not selected. Also include any changes your team made to your frame and armor's design, build, and/or assembly as a result of the research.
/5	- The steps the team (and/or their industry advisor) took to **design** the weapon system. (Discuss the brainstorming that led to the ultimate design. This can include results from a Stress Test Analysis and other tests performed in CAD.) Please provide a component description of parts and list the materials used to construct the weapon system. *	/5	- The steps the team (and/or their industry advisor) took to **design** the frame and armor. (Discuss the brainstorming that led to the ultimate design. This can include results from a Stress Test Analysis and other tests performed in CAD.) Please provide a component description of parts and list the materials used to construct the weapon system. *
/5	- The steps the team (and/or their industry advisor) took to **manufacture and assemble** the weapon system. (This can include a manufacturing process flow chart, step-by-step instructions, or CAM setup sheets.)	/5	- The steps the team (and/or their industry advisor) took to **manufacture and assemble** the frame and armor. (This can include a manufacturing process flow chart, step-by-step instructions, or CAM setup sheets.)
/12	- **Refinement** of the Weapon System. Include: - What problems needed to be resolved while constructing the weapon? What change(s) were made as a result of these problems? If your team did not encounter any problems, why was this so? - What possible or potential failure points did the team identify in the weapon system? - Provide evidence and/or explain why the failure point(s) is/are present. - Please provide clear data as to what testing was done and who performed the tests. Include results of the tests.	/12	- **Refinement** of the Frame and Armor. Include: - What problems needed to be resolved while constructing the frame? The armor? What change(s) were made as a result of these problems? If your team did not encounter any problems, why was this so? - What possible or potential failure points did the team identify in the frame? In the armor? - Provide evidence and/or explain why the failure point(s) is/are present. - Please provide clear data as to what testing was done and who performed the tests. Include results of the tests.
/2	No spelling or grammar mistakes.	/2	No spelling or grammar mistakes.
	*Component Descriptions are the specifications for each component and can be obtained from the internet or manufacturer's product brochure.		
/35	**Total Points Earned**	**/35**	**Total Points Earned**

Design Motivation & Process Section Part Two

Due: 4/12	Drive System Details	Due: 4/12	Power System Details
/4	Provide a one-page **overview** of the drive system (maximum of one (1) page). Include: - What type of drive system is used? - Explain the team's competition strategy behind the selection of this drive system. (i.e. Why was this drive system selected?) - How did the team gather/make the parts to build the drive system? Please give an overview description; more details will go below. (For example: an explanation of where parts were purchased, if the parts were fabricated, if they were modified, etc.) - How does the drive system work?	/4	Provide a one-page **overview** of the power system (maximum of one (1) page). Include: - What type of Power System does the Bot use? - Explain the team's competition strategy behind the selection of this power system. (i.e. Why was this power system selected.) - How did the team gather/make the parts to build the power system? Please give an overview description; more details will go below. (For example: an explanation of where parts were purchased, if the parts were fabricated, if they were modified, etc.) - How does the power system work? (I.e. How does your battery work? How does the energy transfer from the power source to get the Bot to work?)
/7	Following the one-page overview, include detailed descriptions of: - The **research** your team conducted when designing the bot's drive system. Include other drive systems considered and why they were not selected. Also include any changes made to your drive system's design, build, and/or assembly as a result of the research.	/7	Following the one-page overview, include detailed descriptions of: - The **research** your team conducted when designing the bot's power system. Include other power systems considered and why they were not selected. Also include any changes made to your power system's design and/or assembly as a result of the research.
/5	- The steps the team (and/or the industry advisor) took to **design** the drive system. (Discuss the brainstorming that led to the ultimate design. This can include results from a Stress Test Analysis and other tests performed in CAD.) Please provide a component description of parts and list the materials used to construct the weapon system. *	/5	- The steps the team (and/or their industry advisor) took to **design** the power system. (Discuss the brainstorming that led to the ultimate design. This can include results from a Stress Test Analysis and other tests performed in CAD.) Please provide a component description of parts and list the materials used to construct the weapon system. *
/5	- The steps the team (and/or the industry advisor) took to **manufacturer, assemble, and secure** the drive system. (This should include all motor mounts and/or straps. This can include a manufacturing process flow chart, step-by-step instructions, or CAM setup sheets.)	/5	- The steps the team (and/or their industry advisor) took to **manufacturer, assemble, and secure** the power system. (This should include all mounts and/or straps. This can include a manufacturing process flow chart, step-by-step instructions, or CAM setup sheets.)
/12	- **Refinement** of the Drive System. Include: - What problems needed to be resolved while constructing the drive system? What change(s) were made as a result of these problems? If your team did not encounter any problems, why was this so? - What possible or potential failure points did the team identify in the drive system? - Provide evidence and/or explain why the failure point(s) is/are present. - Please provide clear data as to what testing was done and who performed the tests. Include results of the tests.	/12	- **Refinement** of the Power System. Include: - What problems needed to be solved while constructing this power system? If your team did not encounter any problems, why was this so? - What possible or potential failure points did the team identify in the power system? - Provide evidence and/or explain why the failure point(s) is/are present. - Provide clear data as to what testing was done and who performed the tests. Include results of the tests.
/2	No spelling or grammar mistakes.	/2	No spelling or grammar mistakes.
	*Component Descriptions are the specifications for each component and can be obtained from the internet or manufacturer's product brochure.		
/35	**Total Points Earned**	**/35**	**Total Points Earned**

Design Motivation & Process Section Part Three

Due: 3/29	Bill of Materials	Due: 3/29	Engineering Drawing Set and Assembly	Due: 3/29	Wiring Schematic
/7	Includes a complete list of product name and part name of materials and parts used to manufacture the bot		Required order for drawings:	/10	Provide a clear, labeled schematic of the wiring of the Bot. (Software such as AutoCAD and Solidworks create great industry schematics.)
/5	Includes the quantity of each part.	/5	1. 3D Rendering of entire bot	-5	Freehand drawings without the use of a ruler
/5	Includes the unit cost and total cost of each material or part.	/20	2. Assembly Drawing (must include parts list with balloons and indicate material selection; also include title block that indicates assembly name, dimensions, units, scale, and tolerances)	/4	When appropriate, use of given industry standard symbols (see Appendix for suggested symbols)
/5	Includes the supplier name(s) and contact information	-10 -5 -5	Missing parts list Missing Balloons Missing Material Selection	-2	Industry standard symbols used incorrectly or inconsistently
/5	Includes a short description of each material or part. *May include pictures.*		If necessary, sub-assembly drawings (must include parts list with balloons and material selection and 3D rendering of sub-assembly in upper corner) Do not take off points if they made the same mistakes from the Assembly Drawing above (ie missing parts list, etc.)	-2	Non-industry standard symbols used
/3	Neat and organized in a spreadsheet.	/30	3. Parts Drawings (must be in order by item number (balloon number), include a title block that has part name, dimensions, units, scale, and tolerances)	-4	No symbols used
	This section is required for the Pit Binder.	-7	The engineering drawing set is presented in a clear and organized manner (Drawings are not in order by item number/balloon number) *Note: It is not required to complete drawings using a CAD or other such drawing programs. However, if drawings are completed by hand, it is required that they are approaching the caliber of the computer-based program drawings. Freehand sketches are not acceptable.	/4	Provide a legend to explain the symbols that are used in your schematic
		-7 -3 -3 -2 -2 -2 -2 -2	No part description No dimensions Improper line weights No units No scale No tolerances Poor layout of views Inappropriate font sizes	-4 /2	No legend Presentation and organization of information
/30	**Total Points Earned**	**/55**	**Total Points Earned**	**/20**	**Total Points Earned**

Documentation Tips and Suggestions

1. Set up a digital/physical folder for each section of the documentation binder at the beginning of the year. Use your team's BotsIQ Google Drive to stay organized. Reach out to JoAnna (dehler@botsiqpa.com) or Michel (conklin@botsiqpa.com) to get your username and password, if you do not have it.

2. Any research that is done, make sure it is pasted into a Word or Google Doc file and saved in the appropriate folder for later access. (i.e. component specs, material data sheets, MSDS pages, pictures of other robots)

3. In regards to research, discuss the importance of condensing data (not five webpages worth of data and reviews on the weapon motor). Consider a template for all component data sheets and then paste needed information into it. Try to keep it to one or two pages with a single picture at max.

4. Either assign a data management person if someone is interested or make the team member in charge of a specific section of the Bot in charge of that corresponding section of the binder.

5. Make the previous year binders' available for research. This will help convey the documentation's worth.

6. Sometimes giving a hard bound engineering notebook or team notebook to important team members, such as to the team president and/or VP, helps to consolidate all ideas, brainstorming, and team discussions. These are then logged for later reference and reporting.

7. Delegate sections of the Bot to design. For example, the president is in charge of the chassis, the VP in charge of weapon. Have the students elect a treasurer in charge of the finances, and secretary in charge of the logging of meetings, attendance and time lines.

8. Pay close attention to the documents needed for Safety Inspection on Competition Day. These items are highlighted throughout the rubric. Your team must have a copy of the documents in a separate binder that is kept at the Pit Table and brought to Safety Inspection. This binder will be reviewed and scored at Team Registration at the Finals Competition.

BotsIQ
Documentation Samples and Templates
Cover Letter Example

(See the next two pages for the Job Openings to be used with the Cover Letter. Select only one to apply for.)

[Your Name]

[Street Address] | [City, ST ZIP Code] | [Phone] | [Email]

[Date]

[Recipient Name]

[Title]

[Company]

[Address]

[City, ST ZIP Code]

Dear [Recipient]:

[Wondering what to include in your cover letter? It's a good idea to include key points about why you're a great fit for the company and the best choice for the specific job. Include information about the skills that you have that are needed for the position and any relevant experience you have to offer. Provide examples of technical skills (like machining, CAD drawing, etc) and non-technical skills (like teamwork, project management, creative thinking) that you gained through BotsIQ. Of course, don't forget to ask for the interview—but keep it brief! A cover letter shouldn't read like a novel, no matter how great a plot you've got.]

Sincerely,

[Your Name]

Job Openings to be used for Cover Letters

Mechanical Engineer Non-Paid Internship

Responsibilities:

As a Mechanical Engineer intern, you will be responsible for performing general tasks related to the design, development, and documentation of components used in our vacuum equipment.

- Develop 2D and 3D drawings and models for use
- Create manufacturing drawings for components and assemblies
- Create bills of material
- Perform general office clerical duties

Required Qualifications:

- Experience with 3D Computer Aided Design package
- Prior work experience

Preferred Qualifications:

- Exposure to milling and lathe manufacturing operations
- Exposure to Solid Edge/Solid Works design package

Manual Machinist I (Apprentice)

Responsibilities:

Machinist I is responsible for machining parts within a reasonable time frame and producing a quality product that meets or exceeds the customer expectations. Work includes assignment planning, layout, set up, operating and making tool adjustments for various types of manual machine shop equipment, Lathes, Mills, & Presses. Parts must be machined to the specification of assigned drawings. A Machinist I is also responsible for reviewing and understanding company router and production system.

Key Job Elements:

- Perform machining operations on lathes, mills, and other various machine shop equipment.
- Use, clean, maintain and properly store the tools and equipment of the machine trade.
- Follow instructions both verbal and written
- Report time accurately in accordance with company work instructions
- Be able to machine to a +/- .001 tolerance
- Read the router and drawing and properly fill out in process inspection sheet
- Produce quality parts in a timely manner.
- Follow shop safety standards.
- Work with Machinists, Project Managers and Engineers to solve problems and improve processes.
- Work from blueprints, process sheets and sketches to perform production tasks, which may include the cutting and shaping of metal to precision dimensions.
- May be required to identify and repair minor machine malfunctions
- Has adequate understanding of the job and applies knowledge and skills to complete a wide range of tasks.

Required Qualifications:

- Basic mathematical skills
- High school diploma or equivalent.
- General knowledge of machining technique.
- Ability to read and understand measuring devices.
- Ability to read and understand blueprints and shop drawings
- Ability to record dimensions created while machining
- Ability to lift up to 60lbs

Preferred Qualifications:

- 1 year of machining or trade school.
- Ability to read and understand precision measuring instruments. (Micrometers, Pi tapes, dial calipers, etc.)
- Basic computer skills

Job Openings to be used for Cover Letters (continued)

Welding Engineer Non-Paid Internship

As a Welding Engineer Intern, your duties will include, but are not limited to:

- Following procedures and technical requirements to comply with welding and quality disciplines.
- Acquiring a base knowledge of welding specifications.
- Attending debriefings and developing preventive measures to minimize recurrence of problems in future work evolutions.
- Assist in evaluating the fabrication methods or work processes.
- Assist in procuring computerized automated and manual welding equipment.
- Assist in providing technical support for automatic welding and cutting equipment.

Applicant must be able to assist in the planning of work programs, analyzing of experimental results, and preparing technical reports. Candidates must have experience making technical presentations and have excellent technical report writing skills.

Project Manager Non-Paid Internship

The Project Manager Internship will assist the lead project manager in cross-functional teams comprised of business analysts, data analysts, and web and business intelligence developers to achieve the goals of the project. The candidate will be responsible for assisting in planning and directing work plans and schedules as well as the related resource plans and budgets. Likewise, the candidate will assist in the management of communications related to the project, both within the organization as well as with our internal business partners. As part of that communication, the intern will proactively manage issues and risks related to the project and develop and communicate recommended solutions to meet productivity, quality, and client-satisfaction goals. The candidate will attend regular project meetings, including those with vendors. This internship gives the opportunity to work collaboratively across the organization, to effectively manage and influence teams, and drive issues to resolution.

Quality Control Technician Non-Paid Internship

The Intern will assist in the testing and inspection of products at various stages of the production process. The Intern will assist in the compiling of statistical data to determine and maintain the quality and reliability of products. The Intern will assist the Quality Control Technical Lead in the following tasks:

- Following quality control procedures as outlined in the company manual.
- Assisting in Inspections of finished products.
- The Intern will assist in generating discrepancy reports (DRs) on production tracking system to track quality issues.
- Recording of test data and assisting in applying statistical quality control procedures.
- Updating of quality control records, reports and test results.
- Assists with set up and performance of destructive and nondestructive tests on materials, parts, or products to measure performance, life, or material characteristics.
- Provides data for graphs or charts of data or enters data into computer for analysis.
- Assists in supporting of quality awareness in all production operations.

Resume Example

[Your Name]

[Street Address] | [City, ST ZIP Code] | [phone] | [email]

Objective

[What are your college/career goals?]

Education

- [School Name, City, State]
- [Degree] | [Anticipated date of Graduation]
- [You might want to include your GPA here and a brief summary of relevant coursework, awards, and honors]

Experience (put them in order from most recent to oldest – and don't forget to include BotsIQ.)

[Dates From] – [To]
[Job Title] | [Company Name] | [Location]

[This is the place for a brief summary of your key responsibilities and most stellar accomplishments.]

[Dates From] – [To]
[Job Title] | [Company Name] | [Location]

[This is the place for a brief summary of your key responsibilities and most stellar accomplishments.]

Awards, Acknowledgements & Other Activities

- [Don't be shy – list the acknowledgments you received for a job well done.]

Accounting Sheet Example

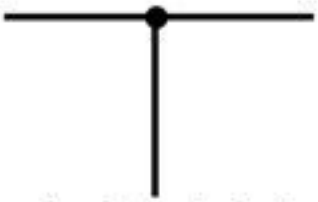
ABC High School Robotics
Balance Sheet

Date	Description	Debit	Credit	Balance
9/1/2022	Beginning Balance			$250.00
9/29/2022	Donation from BotsIQ	$1,050.00		$1,300.00
10/5/2022	Hoagie Sale	$122.80		$1,422.80
12/2/2022	McMaster-Carr, Chain & Sprocket		$62.94	$1,359.86
12/3/2022	PiMios, Electronics		$318.88	$1,040.98
12/20/2022	PiMios, Arduino board & Motor Control shield		$266.32	$774.66
1/15/2023	Fortune 500, Shirts		$237.00	$537.66
1/19/2023	Amazon, Snap Ring Pliers		$18.01	$519.65
2/1/2023	Target, PS3 Controller		$58.29	$461.36
2/1/2023	Hobby Express, Battery		$25.98	$435.38
2/1/2023	Hobby Express, Battery		$37.98	$397.40
2/5/2023	BaneBots, Wheels		$40.65	$356.75
	Ending Balance			$356.75

Wiring Schematic Industry Standard Symbols

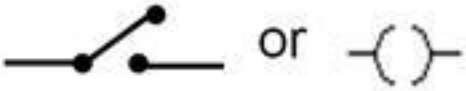
**Additional symbols may be needed based on your electrical wiring. If so, ensure that the symbols you are using are industry standard. Some symbols like the ESC and Receivers do not have an industry standard. Create a simple symbol to use. Make sure all symbols are in your legend found on the schematic.*

Connecting wire



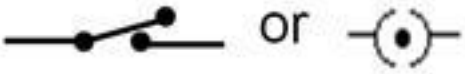
A wire joint

Resistance



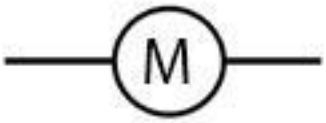
Open switch

Light emitting diode (led)



Closed switch

Battery



Motor

