Batteries for Microcontroller

|  |  |  |
| --- | --- | --- |
| Item ID | Vendor | Description |
| B0027GEY3Y | Amazon | “When you want a powerful battery pack that you can depend on even when you push it to its limits, this is the battery for you. Whether you have a short course truck, an 8th scale buggy, a monster truck, heli, jet, airplane or quad, this battery pack delivers the results and run-time you have come to expect from all Venom batteries. With features like 20 AWG soft silicone wire leads this battery gives you the power you are looking for.”[] |
| B00DDTKYME | Amazon |  |
| B0073VCS0O | Amazon |  |

The following tables and justifications are the basis for the decision making process of selecting a suitable batteries for Roadie.

Decision Matrix

|  |  |  |  |
| --- | --- | --- | --- |
| Factor | Power | Cost | Safety |
| Weight |  |  |  |
| B0027GEY3Y |  |  |  |
| B00DDTKYME |  |  |  |
| B0073VCS0O |  |  |  |

Justifications

Cost

This values for cost of the batteries were obtained by giving the most expensive battery a score of one, and the least expensive battery a score of five. (more to come!!)

Cost was given a weight of % as the cost of items are a very important factor in any budget.

Power

The values for power of the batteries were obtained by a few factors being the voltage of the batteries, the discharge rate, and watts per hour. The voltage of the batteries are a key part so we do not fry our motors and microcontroller when using it with the batteries, and we must have enough voltage to power everything. The discharge rate and watts per hour are used to calculate how long the batteries will last given the max output of the batteries.

Power was given a weight of % as the power of the battery dictates how long Roadie can run without having to spawn or charge the batteries.

Safety

The values for safety of the batteries were obtained by factoring the risk of using each battery type and the environmental impact each type of battery will have. The risk of usage of a battery type rates to how the battery will react to mishaps happening. This could be dropping, shorting out, or overheating the batteries. The environmental impact of each type of battery depends on what the battery is made out of, since most batteries contain some type of heave metal in them that is harmful to humans and the environment. [1]

Safety was given a weight of % as the safety of the team and the environment when working on Roadie are important aspects of the project.

Batteries for Motors

|  |  |  |
| --- | --- | --- |
| Item ID | Vendor | Description |
|  |  |  |
|  |  |  |
|  |  |  |

Decision Matrix

|  |  |  |  |
| --- | --- | --- | --- |
| Factor | Power | Cost | Safety |
| Weight |  |  |  |
|  |  |  |  |
|  |  |  |  |
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Risk Analysis

Batteries

Lithium Polymer batteries (LiPo) are extremely energy dense for a chemical battery. However since LiPo batteries are energy dense it also means they are unstable under abuse. When a LiPo battery is damage in anyway the battery has a chance to ignite and catch on fire, this is known as thermal runaway. This could come from the battery being physically damage or if the battery is shorted out. But the chances of LiPo to have a thermal runaway is every small. [2]

Environment Impacts

All batteries contain some sort of heavy metal or toxic and hazardous chemicals. Each battery should be disposed of properly to reduce the environmental impact of batteries. LiPo batteries are one of the few battery types that environment friendly meaning as long as the proper procedure is used to discharge the battery it can throw away in the normal trash. [2]

<http://www.uwsa.edu/ehs/environmental-affairs/waste-management/batteries/>

http://oes.tamu.edu/web/guidelines/battery/LiPo%20Procedures.pdf