

Design Team Members

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NMT Battle Bot Team #2

Background and Objective

BattleBot competitions consist of two or more weaponized and motorized bots battling for victory. To win, the rival bot(s) must be immobilized or the bot that is able to inflict more damage in the 3 to 5 minute rounds will win. We were tasked with designing a bot that is durable, lightweight, agile, can take a beating and is capable of inflicting significant damage on the opposition's bot.

Design Specifications

- Overall weight has to be less than 3 lbs.
- Design and create with a budget of \$700.
- The overall bot design must be up to Dallas Area Robot Combat (DARC) Competition guidelines which include weight class and safety requirements.
- The bot must be ready for competition during the 2021 Spring Fling.

Semester Progress

- Designed a new battlebot design.
- Began bot body prototyping on 3D printer and adjusted to maximize weight reduction.
- Coded and wired Electrical components to begin testing.
- Designed armor wheel covers if weight allows for implementation.

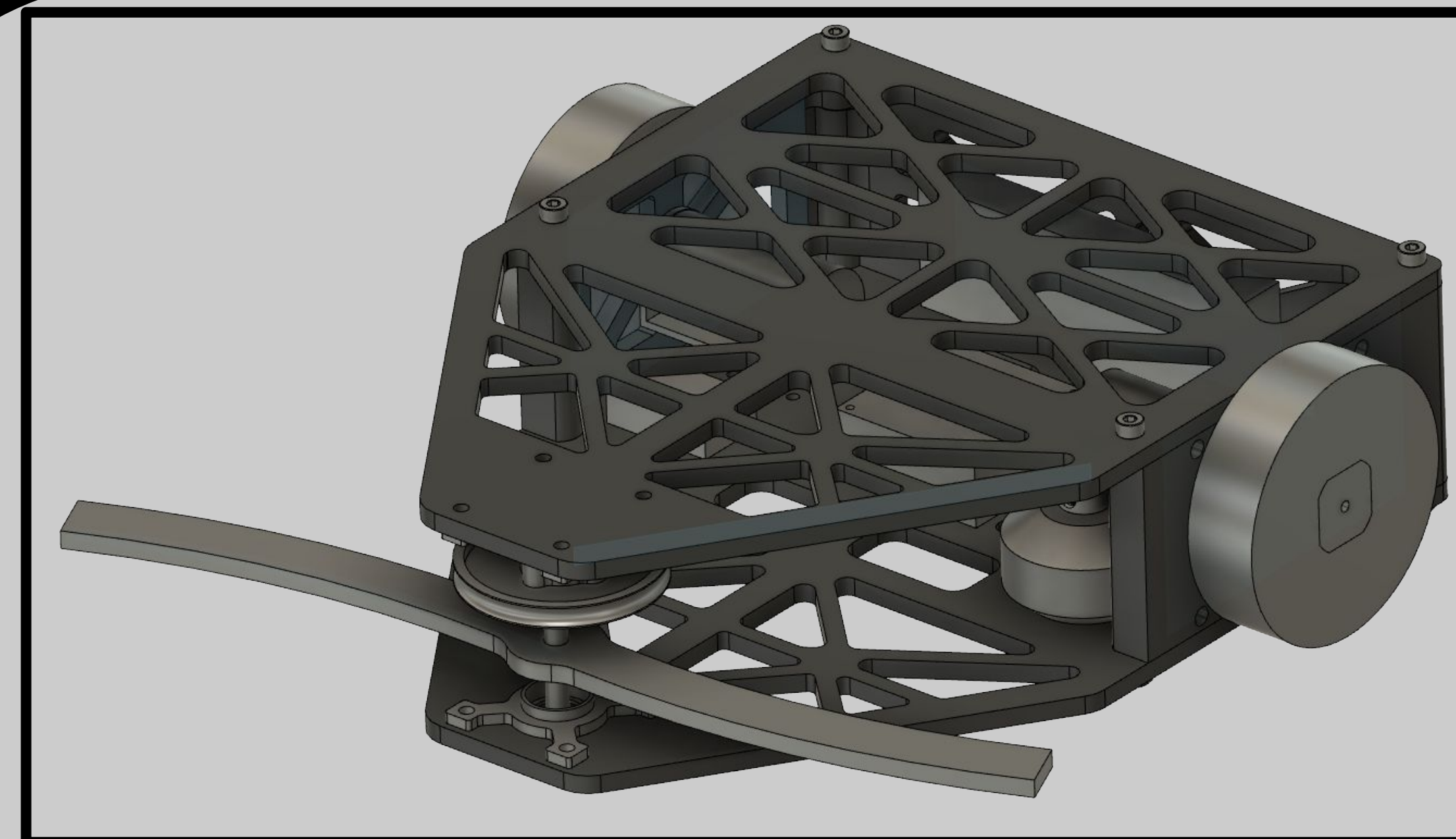
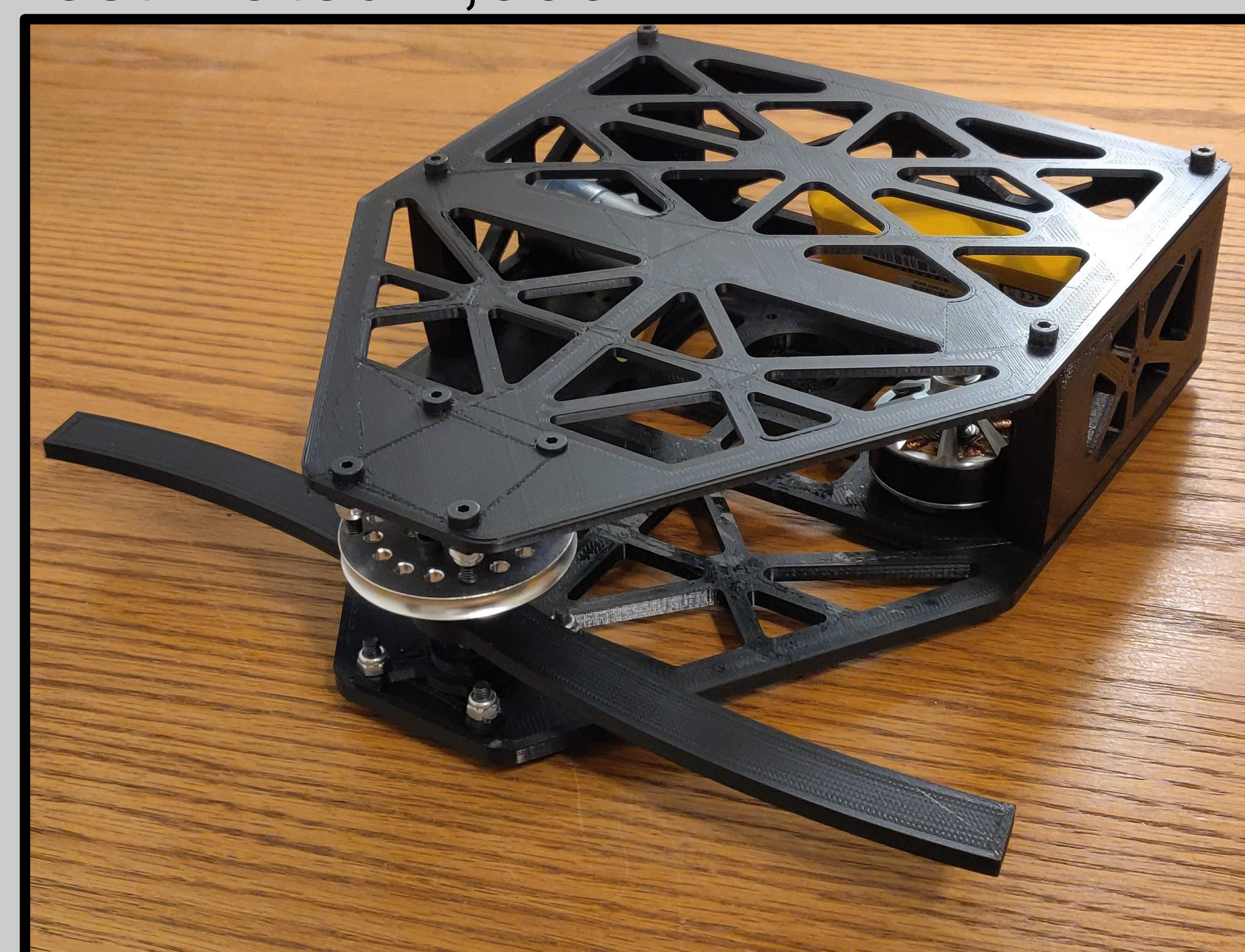


Figure 1 (above) demonstrates the current CAD prototype assembly with a large weapon blade to attack opponents, and a light, nimble frame to move quickly around the arena.

Design

- Our design process began by determining the strengths of each bot concept with a QFD diagram with categories like weapon effectiveness, agility, battery usage, and others.
- A horizontal spinner was chosen for inflicting devastating attacks while remaining balanced.
- An impact resistant 3D printed chassis for maximum strength to weight ratio.
- Pololu 25D metal gear motors to provide reliable torque for drivetrain power.
- Gatt ML3508 brushless motor to power the weapon blade capable of spinning the weapon at an estimated 1,000 RPM.



Figures 2 (above) demonstrates the current physical assembly with the weapon pulley, weapon motor, weapon blade, battery and drive motors.

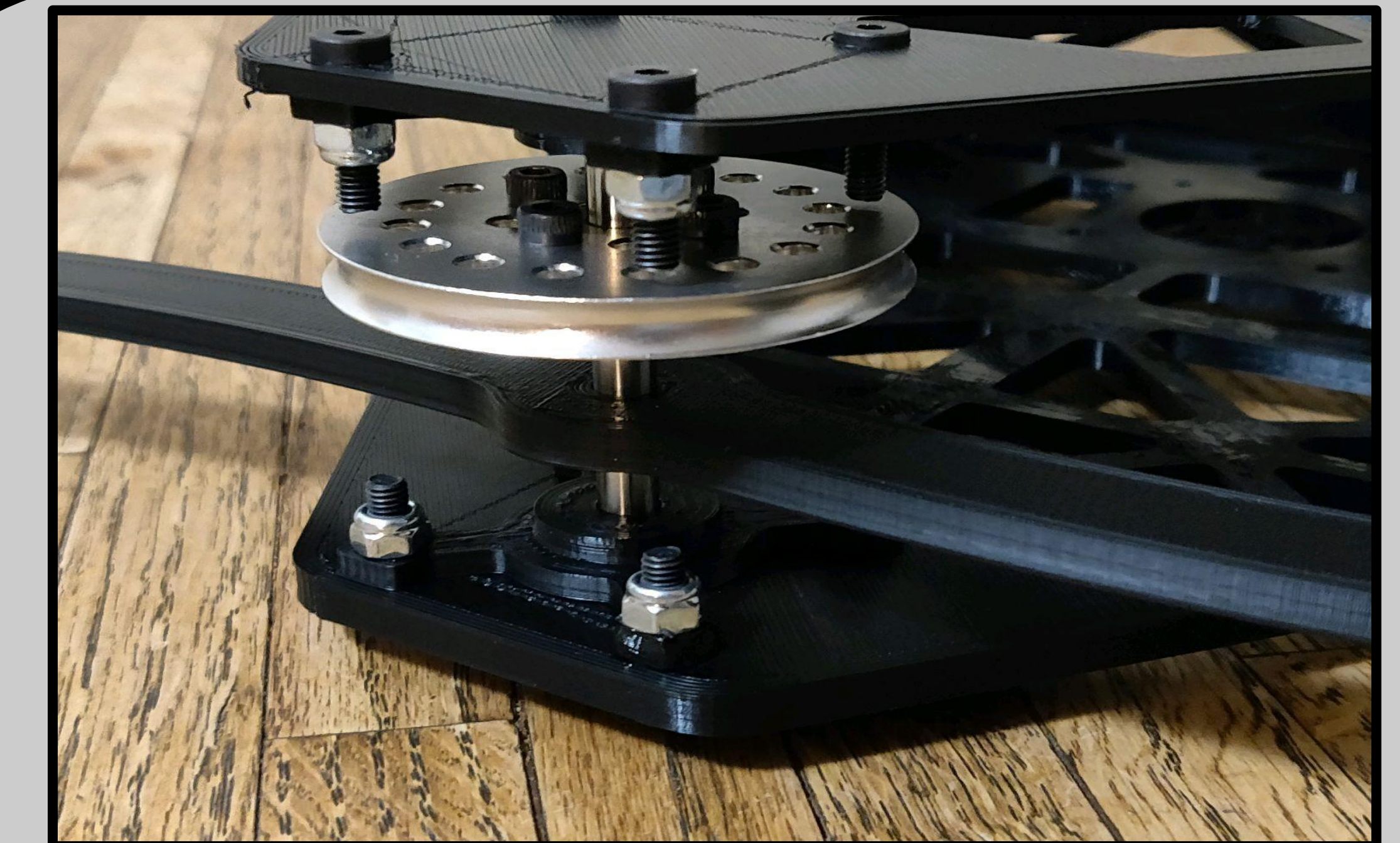


Figure 3 (above) showcases our weapon blade prototype and the 5:1 pulley ratio which will allow the blade to spin up quickly during a match, while maintaining a high top speed.

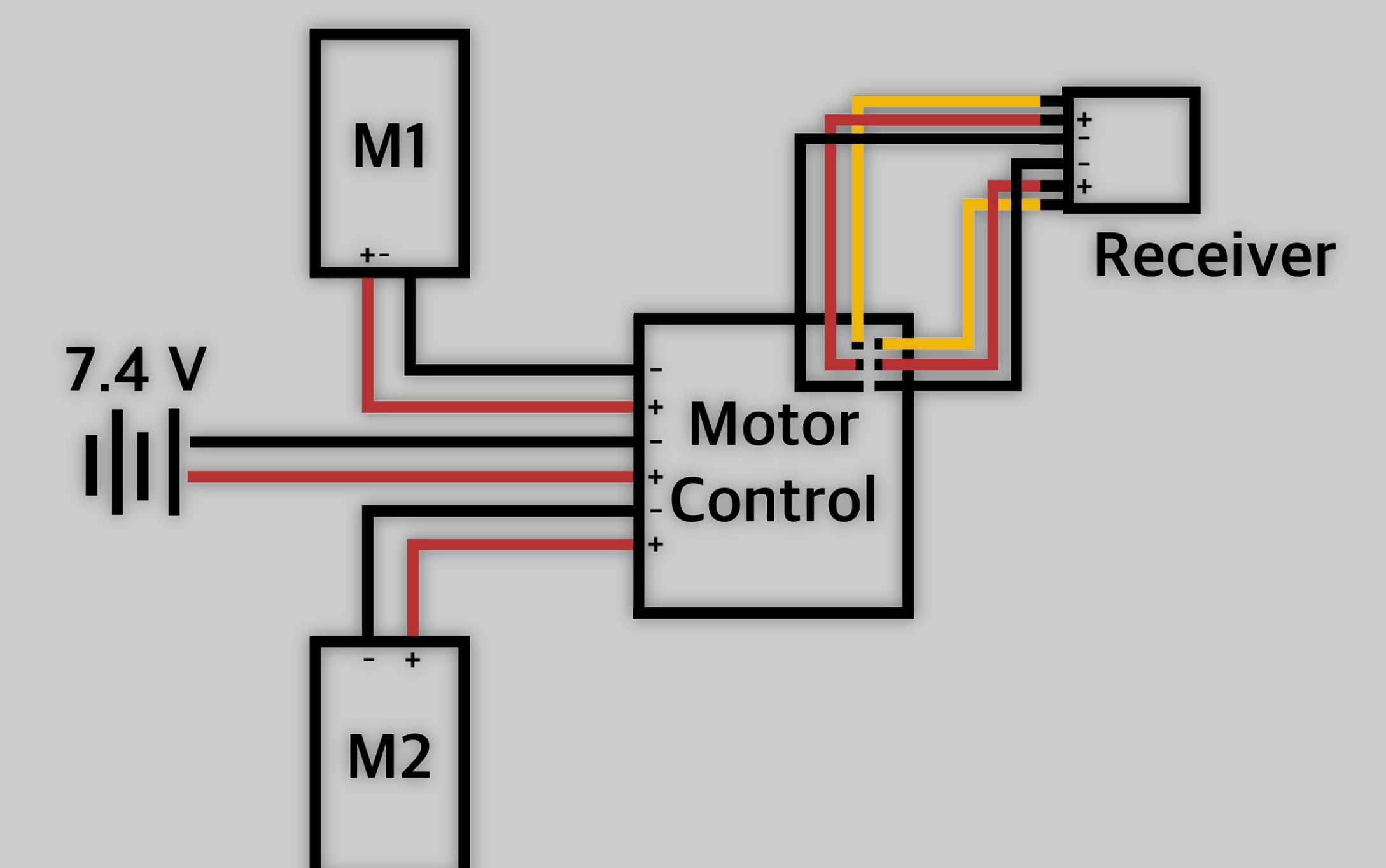


Figure 4 (above) demonstrates the wiring diagram that is used to power and control the drive motors and weapon motor.

Future Work

- Finalize and construct weapon blade design and mount to bot
- Bot testing and upgrading
- Driver training

References

- DARC Rule Book

Acknowledgements

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