

Charging Bicycle Station Second Gen

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Mid-Point Report

Document

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2 OVERVIEW

To have an overall idea of what has been done so far in terms of working on the project. Items of the project will be analyzed and they include:

- Generator
 - Coupler
 - Testing
 - Potentiometer
- Power Cable
- Display
 - Raspberry pi
 - Programming
 - Resistive Touch Screen
 - Frames & Games
- Project Plan

3 GENERATOR

The first step of ordering the generator was achieved. However, since the super capacitor dimensions and capacity will be determined by how much power, volts, and current, a testing procedure had to be done. For that matter, the mechanical team created a coupler that perfectly fit the synchronous MotorSolver Dyno-Kit Dr. Kipple has. The coupler was then used to some testing using the synchronous Motor, a dSPACE CP1104 connector / LED panel, and HiRel / Vishay electric drives inverter board as shown in Figure 2.

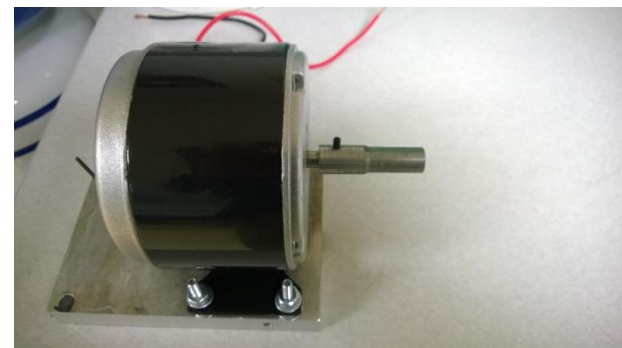


Figure 1: Generator and Coupler

The testing procedure was done and the team was able to get up to a speed of 1000 RPM's.

Unfortunately, the readings the team obtained were not enough to determine the size of the super capacity. This problem was due to the fact that the readings of the voltage were not accurate enough when hitting the desired speed. On the other side, the team was not able to attain the current readings. This was due to the fact that current is always measured in series and the board provided to us was in parallel which made measuring

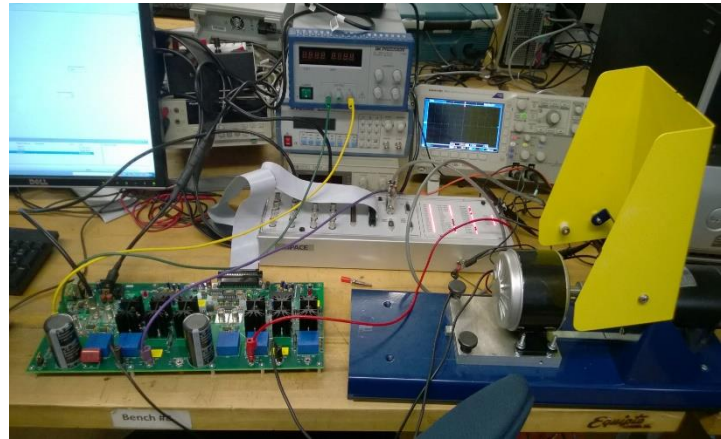


Figure 2: Testing Equipment's

the current is impossible without a load. This issue will be solved in the coming days by using a potentiometer to act as a load. A potentiometer is a three terminal resistor that act as a variable resistor or rheostat. The potentiometer is usually used to measure electrical potential. Figure 3 shows a potentiometer picture that is similar to what we are going to use.

4 POWER CABLE

Since the ordered display kit did not come with a power cable, the team decided to create our own power cable that will use 5-volts which is just enough to power the display off the raspberry pi. The team used a USB cable with a purchased power connector pin to create the cable. Figure 3 shows the power cable the team used to power the display.



Figure 3: Power Cable

5 DISPLAY

The work on the display began since the display kit arrived. At this point of the term, the display connections and programming have been the main focus of the team. A demo of the display boosting was done on one of the joint mechanical- electrical meetings and the timing for the full boost was around 38 seconds. Figure 4 shows the display kit.



Figure 4: Display Kit



Figure 5: Stylus Pen

On the other hand, the programming of the raspberry pi has almost finished with some modifications to be done (e.g. getting the display to fit the whole screen). In addition, some ideas of the frames and games were discussed among the team. Frames will be used to give the user a better riding experience with some fancy ways to show information on the screen. The games will be programmed and used so the user of the bike would have some entertainments as well.

Besides the programming, the team found out that the touch screen was a resistive touch screen which requires a resistive pen to control the screen. A picture of the required pen is shown in Figure 5.

6 PROJECT PLAN

As far as the project work is concerned, the finalization of the generator testing will be done as soon as the team obtains the potentiometer. The calibration of touch screen will also be finished to give the mechanical team more time for casing the items together. Moreover, there will be more ideas and sketches of the frames and games before the team start programming these into the raspberry pi. Consequently, once the generator testing is done, the super capacitor will be ordered to start working towards finishing the final display touches. Lastly, the team will be able to finish completing the circuit and therefore give the mechanical team more time to mount the generator on the bike.

7 REFERENCES

- [Potentiometer](#)
- [Display Kit](#)
- [Stylus Pen](#)