

EE/CprE/SE 492 GROUP PROGRESS REPORT #4

Group number: 01

Project title: Hybrid solar/battery for electronic derailleur

Client: Dr. Raj Raman

Advisor: Dr. Raj Raman

Team Members: Aydin Bashich, Elba Estarellas, Connor Davison, Mohamed Mohammad, Seth Pierre, Rachel Vallier, and Jack Waskow

- **Project Summary:** The client requested a solar/hybrid battery to provide power to an electronic derailleur. The derailleur is currently powered by a battery that is charged through a wall outlet. The benefit of having the solar/hybrid battery is that the battery will never need to be taken off the derailleur to charge and, therefore, will hypothetically never die because the sun will be able to charge the battery since the bike is outside. For the project, the team determined the components needed to accomplish a set of criteria the client provided for the project. Key constraints include a dark-run time of 10 hours, a charge time of 6 hours in direct sunlight, a weather-proof system that adheres to IP58 standards, and a detachable and compact design.

- **Accomplishments**

Below is the breakdown of large tasks with subtasks and the people involved.

	A	B	C	D	E	F	G
1	Big Tasks	Sub Task	Person(s)	Sub Task	Person(s)	Sub Task	Person(s)
2	Verification	Cross-checks	Mohamed				
3	Testing Circuit	Programming Arduino	Aydin	Building Arduino	Connor	Watching	Connor
4	Battery Assembly	Test Battery on breadboard	Jack	Electrical Assembly	Jack (Seth backup)		
5	Case Design	Model	Seth	Electical Connections (battery to derailleur)	Mohamed	Weather Proofing	Seth
6	Documentation	Biweekly Report	Rachel and Elba	Correct/Update Design Document	Rachel and Elba	Update website	Seth

Group 1: Aydin, Connor, and Mohamed

1. Conducted water testing, dust testing, and shock testing.
2. Water testing was conducted over a 12 hours period of submersion to determine if water was able to get into the system, it did not.
3. Dust testing was conducted by putting sand over the system and shaking it around to see if dust was able to get into the system, it did not.
4. Documented results from testing and determined through water and dust testing that the system met IP58 standards.
5. Attached the solar cell and system to the bike as seen in *Figure 1*.



Figure 1

Group 2: Jack and Seth

1. Troubleshot charge circuit and determined a current-limited resistor was required. Created a new and final schematic of the system which can be seen in *Figure 2*.
2. Completed a full charge and discharge test of the system and verified that everything worked.

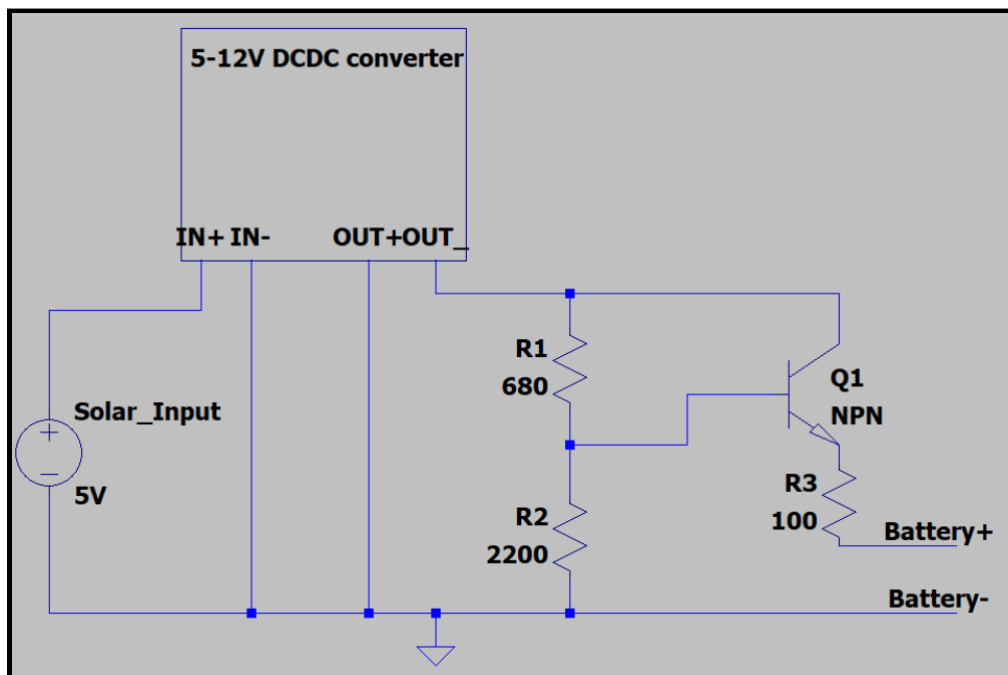


Figure 2

Group 3: Rachel and Elba

1. Completed the design document and reviewed the information to ensure the information was comprehensive and accurate.
2. Completed the poster and verified the size of the font was appropriate for display.

○ **Pending issues:** None

○ **Advisor Input/Signature:** It is very important that you meet regularly with your advisor. Please have your advisor select one of the options below.

_____ I am pleased with the progress the team is making.

_____ The team's progress could use some minor improvements.

_____ The team's progress has some major concerns.

Your advisor's selection must be confirmed by either an email attached to this report (merge files into a single pdf) or a physical signature obtained from an in-person meeting. Please provide this report to your advisor at least 1 week before the due date so that they have time to respond.

Signature: _____