ECE 411  
Project Ideas and Decision Rubric  
Project Manager: Andrew Greenberg  
Team Members: Lionel Diaz, Noah Harvey, Bihn Phan, Tyler Seitz and Matthew Walters  
October 11, 2016

**Refrigerator/Freezer Thermostat (Kegerator)**

Premade keg refrigerators, commonly called kegerators, are expensive and impractical for most home brewers. Mini-fridges and chest freezers are very affordable but offer little in the realm of good temperature circulation and control. A microprocessor would monitor an onboard thermistor and compare it to a temperature input from the user via buttons and LCD or potentiometer. Using a control loop the processor would decide to turn on or off a relay which would control power to the refrigerator. Power would be drawn from an AC/DC convertor, and would also be used to drive a circulating fan.

**Intercom System**

Talking to each other via cellphones when both parties are at home seems ridiculous and is a waste of calling time and or text messages. By creating a simple intercom system we could allow communication to be quick and always available while at home. Create a wired or wireless multipoint full-duplex intercom system that can run directly off of 120V or 240V AC. Units would hopefully be modular (or may be master, slave set up) and have addresses set via DIP switches as well as toggle buttons to choose which room the user wants to communicate with. Ideally the unit would be small enough to fit into a 1 gang box, allowing ease of install for the user.

**Bluetooth Cassette Tape**

Many people drive cars that cannot wirelessly stream audio from their phones. While it is possible for people to buy a new car stereo system they may cost more than people are willing to spend. Some cars still have cassette tape players built into them, and while it is possible to buy a 3.5mm stereo jack adapter to allow users to play music through the cars tape player it requires the 3.5mm jack to be present on their phone. We propose building a Bluetooth cassette player that would be powered solely off of energy generated from back-driving a small planetary gear motor inside a cassette tape. The power from the motor would hopefully generate enough energy to power a low power Bluetooth device and audio amplifier to communicate with a phone and send audio to the magnet head of the cassette tape.

**RFID Motorized Lock**

Design a microprocessor with an RFID reader that can decide when to unlock and lock a door based on the presence of an RFID tag. This would involve designing a PCB antenna, driving a high torque motor/actuator, and fitting the product into a standard deadbolt lock size in a door. The design could be expanded to allow the user to add multiple RFID tags that could each unlock the door, as well as require an RFID tag to be able to lock the door.