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

1. **Problem Statement and Objective:**

* In general, cellphones are devices which help people communicate with each other all the time and in different places. However, the signal of a cellphone is not covered in some buildings or some constructions, so people cannot use cellphones to connect. Moreover, cellphones are not allowed in some areas because of security. This is the reason why intercoms will be considered as the solution for this problem, and this will be used as the device to replace cellphones so that people can connect with each other in certain areas.
* The objective of the project is to create a device that allows people to talk with each other when located in different rooms of the same building.

1. **Methodology for Implementation of Project**

* There are 4 phases within our project: Design, Implementation, Testing and Evaluation phase.
  + Design Phase:
    - We will have a main intercom and 2 auxiliary intercoms. The main intercom will house the control unit, which will act as the central hub of all intercoms. Each intercom will have a 4 buttons: All, Main, Room 1 and Room 2. There will be a microphone, speaker and a volume control knob (see figure below). There are more complicated versions, but we decided to go with simplicity.

**Main**

**Room 2**

**Room 1**

**Room 2**



**All**

**Main**

**Room 1**

* + Implementation Phase:
    - This phase contains simulations, components and assembly. After the design phase we will need to simulate the product. Once simulated and everything checks out we will create a bill of materials (BOM), then buy the components. Once the components are received we will start the assembly process using a protoboard.
  + Testing Phase:
    - Testing will be ongoing throughout the building of the component. We will first test the DC characteristics, and then move to the AC characteristics. This is to ensure proper functioning of the product.
    - Once the product is built we will begin testing the gains, distortions, power dissipations and overall making sure the product doesn’t malfunction.
  + Evaluations Phase:
    - This phase is to make sure we will have a quality and working product. We will evaluate our product by functionality, clarity and response of the system. This entails using graphs, timing diagrams and demonstrations.

1. **Project Schedule Plan**

* Buying all necessary materials One Week
* Reading and understanding datasheet of components One week
* Writing sample codes Two weeks
* Combine codes and testing Two weeks
* Building hardware board One week
* Testing the code with hardware board Two weeks
* Final Write-up Two weeks.