ECE 411  
Title: Intercom  
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October 11, 2016

1. **Problem Statement and Objective:**

* Generally cellphones can be used to communicate quickly over both long and short distances. However, there are times in which someone may not wish to or be able to use their cellphone to facilitate communication.
* 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.
  + *Design Phase:*
    - We will design a modular intercom system. Each intercom will have buttons which will enable the user to select which rooms they wish to speak to, in addition to a microphone, speaker and volume control knob (see figure below). We will begin by implementing a two unit wired half-duplex intercom and try to progress towards multiple units, full-duplex and a ZigBee (or similar protocol) wireless implementation.

**Room 3**

**Room 2**

**Room 1**

**Room 3**



**All**

**Room 1**

**Room 2**

* + *Implementation Phase:*
    - This phase contains simulations, prototype assembly, bill of material generation and component ordering. Once we are comfortable with our simulations we will generate a refined set of schematics and a BOM, from which we will order parts. Once the components are received we will start the assembly process for our prototype/debugging board.
  + *Testing Phase:*
    - Although testing will be occurring throughout the entirety of this project there are some critical aspects of the design which will need to be verified more depth once we have completed multiple prototypes. These include: DC characteristics, power supply stability, processor programming capability, Tx/Rx data rates and so forth.
  + *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. During this phase we will be tweaking values on the schematic and making revisions to the code base to ensure there are no lock up states and we have minimal audio distortion.

1. **Rough 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
* Schematic and PCB creation One week
* Building hardware board One week
* Testing the code with hardware board Two weeks
* Final Write-up One week