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| **INTERCOM** |
| T-6 PRODUCT DESIGN SPECIFICATION |
| **10/25/2016** |



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# INTRODUCTION:

## BACKGROUND

This device will facilitate easy short range push-to-talk communication, where speech or cellphone interactions may be difficult or impossible. Device will be present in multiple locations throughout residence or workplace to allow for multiple simultaneous room to room communications.

## NEEDS INDENTIFICATION

* Interactive feedback mechanism to determine who’s sending or receiving data.
* Communicate to single or multiple devices simultaneously.
* Ease of use (i.e. time to learn how to use must be within a minute)
* Must provide clear voice-band data transfer.
* Final production cost per unit has to be under $20.

## OBJECTIVE

The objective of the project is to create a device that allows people to talk with each other while located in different rooms of the same building. The device should be modular to allow for ease of repair and user setup. User interface should be clear and straight forward.

# REQUIREMENTS

## **OPERATION**

* This product can operate in any office, room, factor floor, etc.
* The device must operate in temperatures between -30 °C to 70 °C.
* The device dimensions will not exceed 5” x 5” x 5”.

## FUNCTIONALITY

* User’s push room selectable buttons that enable to communicate in a point-to-point or broadcast state.
* All intercom units will house LED indicators to identify the end user it is communicating with.
* An external control knob is to be used to adjust the speaker volume on each intercom unit.
* Each intercom unit will communicate by wired connection.
* Transmit user voice will be audio displayed by a speaker in each intercom unit.

## PERFORMANCE

* A minimum of 8 kHz audio sampling rate with 8 bits of resolution.
* External communication, microphone, speakers and input buttons.
* The voice band ranges from 100 Hz to 3 kHz.

## ECONOMIC

* Cost of Design
  + - Preliminary development budget of $200
    - Price of components need to be evaluate for the following parts:
      * Processor, wireless adapter, audio codec, microphone, speaker, etc.
* Cost to Manufacture
  + Total parts and manufacturing cost cannot exceed $20 per unit.
* Cost of Ownership
  + No maintenance cost
  + No utilities
  + No accessories
* Cost for Marketing
  + - None

## CONSTRAINTS

* Project costs >$100 per unit
* Time constraint for design, simulating and manufacturing: only 10 weeks available.
* Intercom communication range
* Component constraints
  + Processor speed, bus transfer rate, i2s protocols, audio codec rates

## ENERGY

* Unit will be support being powered directly off 240/120 V line AC.
* Power consumption under 500 mW.

## USABILITY

* The device should be user friendly
  + Easy to read and use labels and buttons
  + No programming or customization

## SAFETY

* The device must not have any sharp edges.
* The device will not cause any possibility of shock.
* The speaker will be at the appropriate dB level.

## LEGAL

* Must comply U.S. patent regulations.
* Must comply with U.S. FCC emissions regulations.
* Must comply with product trademark and copyright regulations.

## ENVIRONMENT

* No special procedure is required for recycle or disposal of the system.

## DOCUMENTATION

* User’s manual
* Device installation instructions
* Service manual

# PRODUCT DESIGN SPECIFICATION APPROVAL

The undersigned acknowledge they have reviewed **the Intercom Product Design Specification** document and agree with the approach it presents. Any changes to this Requirements Definition will be coordinated with and approved by the undersigned or their designated representatives.

Signature: Date:

Print Name:

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