**Lightbulb Speaker – SONOS**

This project is in cooperation and partnership under a gift with SONOS located in Santa Barbara. SONOS Project Lead – (TBD).

This project is intended as a multi-disciplinary project that will include 1 ME team, 1 EE team, and 1 CE team of students. Students must also enroll in ME195 for 1 additional unit of credit each quarter.

**Sonos** is a local consumer electronics company founded in 2002 and is a world-wide leader and innovator with variety of wireless audio products. Sonos is a smart system of HiFi wireless speakers and audio components. It unites your digital music collection in one app that you control from any device.

![Sonos Speaker](image)

**Project Description**

It is desired to design and fabricate a working prototype of a speaker that may be paired with the SONOS systems and installed into a socket like a regular bulb.

There are existing lightbulb speakers that connect via bluetooth that while convenient offer inferior speaker performance and connectivity. These may be viewed at:

The desired SONOS Lightbulb speaker will:

- Work over 802.11 WIFI OR 802.3
- General purpose CPU
- Great sound (we won’t sweat that!).
- No need for Bluetooth.

The project team will start with an understanding of the existing SONOS speaker system:

- PLAY:1 MAIN PCB
- PS, AMP, CPU+WIFI card.
- Schematics and Layout to be provided (TBD)
It is desired that the project teams will follow these Project Steps:

1. Acquire largest lightbulb speaker in the market.
2. Perform teardown (Ifixit.com example to be provided) on all components.
3. Propose replacement of DSP, AMP with modified PLAY:1 MAIN PCB
   1. Contains AC power supply, CPU, WIFI and audio AMPs.
4. Design replacement PCB with review input from Sonos engineers. Use flex circuit if necessary. Sonos will provide manufacturing resources to help.
   1. Add modifications to support LED control.
5. Package into original product if possible. Otherwise design into 6” recessed ceiling cavity ie. http://www.bulbs.com/product/P87-AT?RefId=593
   1. Design will include necessary mechanical parts.
   2. Control of lighting function can be over network with uPnP (Sonos will provide firmware to effect such control).
6. Determine viability of product from a thermal POV.
7. Extra Credit: Replacement wired ethernet 802.3 with power line networking.

The following team skills are required:

1. Mechanical engineering: CAD, design+thermal
2. Electrical/Computer engineering: CAD, Digital, PS, audio amps, LED lighting, PCB design/layout
3. Acoustic/audio less important as we won’t worry about audio quality for the first iteration of this project.

Student Requirements

Students will be required to sign a Confidentiality Agreement and Invention Agreement

Student Qualifications

Students interested in the fast-paced and challenging consumer products electronics industry will find this project interesting and challenging. This is an opportunity to work with industry engineers, scientists and marketing executives.

Website: http://www.sonos.com/system