Wireless SleepPhones

Overview
Our sponsor asked us to adapt their current SleepPhone design, a wired headband apparatus, which provided sound to the user while they slept, to provide a wireless version. They told us that their current demographic was 50+ year olds and they felt that the wireless version could help them to appeal to younger generations.

Objectives
Our objective was to provide a compact design, which was entirely self contained. Our sponsor asked us to create a model, which fit into the sponsor’s specifications. They asked us to operate on the FM band, be small, cheap, and comfortable enough to sleep in. They also requested that we make a user interface which was “simple enough for your grandmother to use”.

Approach
• We first met with our clients to get a detailed list of requirements.
• We then summarized our concepts and gave them to our sponsor to confirm that they met their needs.
• As per their specifications, we chose the FM band to receive our audio.
• We then researched the various ways we could receive FM, finally setting on a digitally tuned chip.
• We then selected the popular Arduino development software to develop our microcontroller code.
• We also had to develop an amplifier, an LCD, a charging circuit, and program the microcontroller.
• We created a PCB in the EAGLE software, which was within the size requirements provided to us.
• We contracted an company to create the PCB and soldered the components.
• We then tested that our prototype was comfortable and fit inside of the headband.

Outcomes
Our outcome was a working design on the breadboard.
• The sponsor currently has a PCB design which fits inside of their requested specifications.
• The sponsor will be able to market the product at a price which improves profits over their current model.
• The sponsor will be able to reach a new demographic of 18-50 year olds.
• The user interface is something we have not found on the market, which gives the sponsor a competitive edge.