

1. **Customer Requirement:** The system should play pre-programmed songs.
Engineering Requirement: The user should be able to select from at least two pre-programmed songs to be played with the project. The songs should be at least 20 seconds long.
2. **Customer Requirement:** The system should be able to playback recorded songs.
Engineering Requirement: The system will record audio data of 100 Hz to 5 KHz. It will play back a tone that locks to the correct note of a piano, with less than 4% error on frequency. The duration of the played back note will be accurate within .02 seconds. Total song length will be at least 20 seconds.
3. **Customer Requirement:** The system must be aesthetically pleasing.
Engineering Requirement: There will be no visible tape, cardboard, or other non-drafted materials on the final prototype.
4. **Customer Requirement:** The system must be easy to use.
Engineering Requirement: 9 of 10 people should be able to easily read documentation on the project to understand how to change the lights, select a song to be played, and record their own song to be played back.
5. **Customer Requirement:** The system must control lights.
Engineering Requirement: An RGB LED must have at least 10 different colors and 10 different brightness levels for the system lighting.
6. **Customer Requirement:** The system must be battery powered.
Engineering Requirement: The system can operate for at least 1 hour while being powered by an internal rechargeable battery pack. Batteries should be placed in a 3d-printed case in order to remain secured inside the device.
7. **Customer Requirement:** The system should include a volume knob for playback.
Engineering Requirement: The system should allow the user to use a knob or dial which can control the output voltage to increase or decrease the volume of the output audio. The value should range from muted audio, to a level that does not damage the speaker or become uncomfortably loud, from 0-65dB.