Project Summary

Music Box 3

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The original design problem that needed to be solved was to create a music box that has the ability to play two pre-programmed songs, as well as record and playback audio. In addition to this, it must also have a lights system with various brightness and color settings, and be aesthetically pleasing, with no visible non-drafted materials on the box. Additional requirements that the team set were to have an option for volume control, and to have a frequency spectrum analyzer.

The project was separated into two separate systems, one for the audio and one for the lights. The team decided to use Arduinos as the microcontrollers that would be controlling the two systems, because Arduino has built-in libraries for recording audio to an SD card as a WAV file and playing WAV files to a speaker from an SD card. The speakers were selected as two 4-ohm speakers with an adjustable amplifier included, and the lights system included an LED strip and a spectrum analyzer to fulfill our lighting requirements. Once the parts were selected, they were slowly integrated and tested together until the whole system was working correctly.

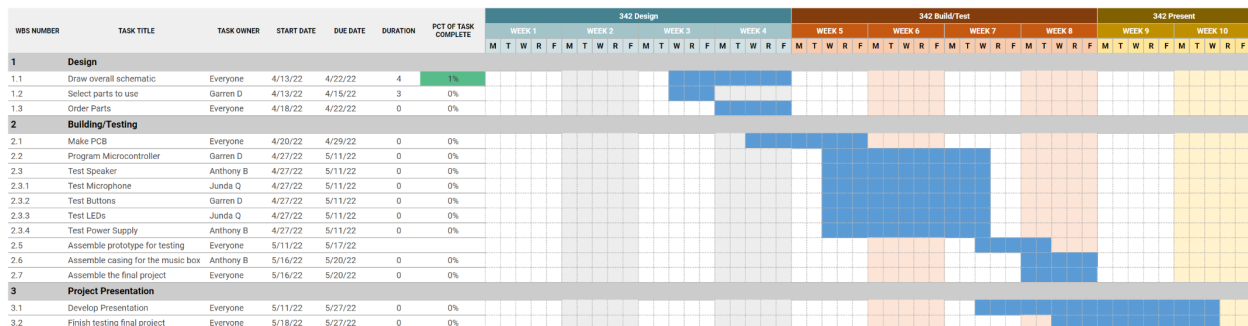| WBS NUMBER	TASK TITLE	TASK OWNER	START DATE	DUE DATE	DURATION	PCT OF TASK COMPLETE
1	Design					
1.1	Draw overall schematic	Everyone	4/13/22	4/22/22	4	1%
1.2	Select parts to use	Garren D	4/13/22	4/15/22	3	0%
1.3	Order Parts	Everyone	4/18/22	4/22/22	0	0%
2	Building/Testing					
2.1	Make PCB	Everyone	4/20/22	4/29/22	0	0%
2.2	Program Microcontroller	Garren D	4/27/22	5/11/22	0	0%
2.3	Test Speaker	Anthony B	4/27/22	5/11/22	0	0%
2.3.1	Test Microphone	Junda Q	4/27/22	5/11/22	0	0%
2.3.2	Test Buttons	Garren D	4/27/22	5/11/22	0	0%
2.3.3	Test LEDs	Junda Q	4/27/22	5/11/22	0	0%
2.3.4	Test Power Supply	Anthony B	4/27/22	5/11/22	0	0%
2.5	Assemble prototype for testing	Everyone	5/11/22	5/17/22		
2.6	Assemble casing for the music box	Anthony B	5/16/22	5/20/22	0	0%
2.7	Assemble the final project	Everyone	5/16/22	5/20/22	0	0%
3	Project Presentation					
3.1	Develop Presentation	Everyone	5/11/22	5/27/22	0	0%
3.2	Finish testing final project	Everyone	5/18/22	5/27/22	0	0%

Figure 1: Project timeline

Overall, the project went well, with the product being complete at the end of the term. The timeline that was set at the beginning of the term was followed pretty closely, with only a few changes. There are still some bugs that could be fixed, but the system fulfills the requirements that were set forth at the beginning of the term. It was definitely difficult to integrate the different parts together, with unexpected problems arising on each step. Some of the parts that we chose did not work the way we anticipated with each other, but they were able to be integrated with some work.