**System Sections and Roles**

**Manual Hole Disk Player**

Version 1.02

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Team: Soundwaves

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**1 - Introduction**

This document is to track the different sections for the MHD-Player that need to be completed and the roles of team members for each section.

Section Lead/s: Team member/s that have final say on how to implement the section. Other members in the same section should be able to look to them for guidance or standards for completing the section.

Contributor/s: Team member/s that make any contribution to the section.

**2 – Power Supply**

Section Lead: Richard Atherton

Members: Richard Atherton

**2.1 Requirements**

Goal: The power supply should be a battery capable of powering the entire device. This section oversees picking suitable batteries/power supply components for the project. Completing this section requires project information gathering and some basic knowledge of power sources.

**2.2 Outputs**

Power supply lines for GND and VCC.

**2.3 Parts List**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Parts List | | | | |
| Part | Link | Quantity | Price | Total Price |
|  |  |  |  |  |

**3 – PCB Design**

Section Lead: (Alejandro Rios)

Members: Richard Atherton, Alejandro Rios, Aldo Zamora

**3.1 Requirements**

Goal: Design a PCB that holds the processor, Digital->Frequency Converter Module, and the Sound Control Module. With connections/ports to the power supply, disk motor, device controls, disk reader, and speaker. Completing this section requires the use of PCB CAD software with the knowledge of all components in the PCB and all inputs/outputs that connect to it.

**3.2 Parts/Programs List**

Software Used for Design: Eagle, KiCad, something else.

**4 – Coding and Digital Hardware Design**

Section Lead:

Members: Hector Soto, Aldo Zamora

**4.1 Requirements**

Goal: Program the processor (ATmega328P) to interface with the Digital->Frequency Converter Module, disk motor, device controls, and disk reader. Also must be able to design hardware solutions for interfacing the processor with other components/modules if necessary. Completing this section requires knowledge of the ATmega328P, AVR/RISC Assembly, digital hardware design, and knowledge of all components the processor will interface with.

**4.2 Inputs**

Power supply lines for GND and VCC.

**4.3 Outputs**

List outputs.

**4.5 Parts/Programs List**

Software Used for Design: An IDE or something.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Parts List | | | | |
| Part | Link | Quantity | Price | Total Price |
| ATmega328P-PU | [Link](https://www.microchip.com/wwwproducts/en/ATmega328p) | 1 | $2.08 | $2.08 |
|  |  |  |  |  |

**5 – Digital->Frequency Converter Design**

Section Lead:

Members: Richard Atherton

**5.1 Requirements**

Goal: Must design hardware that converts a 4-bit digital signal into a range of different frequencies (320 Hz – 4 kHz) for audio output. Completing this section requires…

**5.2 Inputs**

Power supply lines for GND and VCC.

4-bit Data Input for frequency selection.

**5.3 Outputs**

Audio signal output.

**5.4 Parts List**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Parts List | | | | |
| Part | Link | Quantity | Price | Total Price |
|  |  |  |  |  |

**6 – Sound Control Module Design**

Section Lead:

Members: Aldo Zamora

**6.1 Requirements**

Goal: Must design hardware that alters an audio signal for the speaker and interfaces with device controls for things like volume (gain). This section also in charge of the speaker itself. Completing this section requires knowledge of…

**6.2 Inputs**

Audio signal input.

**6.3 Outputs**

Audio signal output.

**6.4 Parts List**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Parts List | | | | |
| Part | Link | Quantity | Price | Total Price |
| Speaker | [Link](https://www.jameco.com/z/TR-050F-Jameco-Valuepro-Speaker-Round-Ferrite-2-Inch-8-Ohm-200mW-320Hz-4kHz-Paper-Cone_320362.html) | 1 | $2.55 | $2.55 |

**7 – Casing, Disk, and Disk Reader**

**Design / Production**

Section Lead: Hector Soto

Members: Hector Soto

**7.1 Requirements**

Goal: Design and produce the MHD-Player casing, the Manual Hole Disk and the Disk Reader. Completing this section requires knowledge of 3D modeling/printing, the project dimensions, digital hardware design, and stepper motors.

**7.2 Inputs**

Power supply lines for GND and VCC.

Manual Hole Disk.

**7.3 Outputs**

4-bit digital code from inserted MHD.

**7.4 Parts List**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Parts List | | | | |
| Part | Link | Quantity | Price | Total Price |
| Stepper Motor | [Link](https://www.jameco.com/z/35BY48L030-01-Jameco-Reliapro-Unipolar-Stepper-Motor-Step-7-Volt-DC-350-mA-7-5-Step-Angle-680-G-CM_2138812.html) | 1 | $7.49 | $7.49 |
| IR LEDs | [Link](https://www.jameco.com/z/LED-5mmIR-LED-IR-Emitter-Infrared-Clear-5mm-T-1-3-4-940nm-170mW_2275839.html) | 4 | $0.25 | $1.00 |
| Photodiodes | [Link](https://www.jameco.com/z/BPW34-OSRAM-Opto-Semiconductors-Photodiode-PIN-Full-Range-400-1100nm-2-65x2-65mm-Sense-Area_1621132.html) | 4 | $0.89 | $3.56 |