

Mobile Hardware Sampler

Product Requirements

SS 2022 – PAM PROJECT

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1 Requirements

1.1 Stage one

→ CW 14- CW 20

- MIDI in/out/host works → trigger samples through extern Midi device
- Line in/out + mic in work
- Samples from SD card can be loaded in RAM and used on device
- Selection of samples with rotary encoder
- Display shows sample names
- Master volume control works

1.2 Stage two

→ CW 21- CW 28

1.2.1 Obligatory

- Implementation of diverse digital effects and filters
- Extend menu to control effects

1.2.2 Optional

- Installation of 4x velocity sensitive Pads to play device live
- Record midi notes
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1.3 Stage three

→ CW 29- CW 32

- Design and build case and PCB
- Installation of the device in case assembly

2 Dependencies

- Teensy Audio Library
- C++
- development environment for teensy (Arduino)

3 Equipment:

Partname	Function	Quantity
Teensy 4.0 Development Board	Microcontroller	1 x 6
Audio Adaptor Board Rev. D	Audio Shield	1 x 6
14-Pin Header Double Insulator		2 x 6
EA OLEDM204	Display	1 x 6
AOM-6738P-R	Electret Condenser Mic	1 x 6
W25Q128JVSIM	128M-Bit Flash Memory	1 x 6
Adafruit 1134	Midi In/Out	2 x 6
6N138-000E	Optocoupler 100kBaud	1 x 6
Resistors	1x220, 1x470, 2x47	1 x 6
NMJ4HCD2	TS 1/4" Jack	4 x 6
P160KN-0FD18C10K	10k Poti linear	4 x 6
PEC11H-4220F-S0024	Rotary Encoder, 24 ppr, Button	1 x 6
74HC4051	8:1 Analog Multiplexer	1 x 6
ZW-MM-10	Jumper Wires	2 in total
340-015-1	Breadboard	5 in total

4 Risks

4.1 Time problems due to bad planning

Since the members of our team have never developed a device like this before, it may be hard for us to estimate the workload necessary, to fulfil our requirements.

Therefore, we divided our project goals into different stages and gave them deadlines that will allow us to identify problems soon enough and solve them quickly.

We added buffer periods, to ensure that we won't run out of time in the end.

Additionally, we defined some of the goals of stage two as optional, giving us the possibility to adjust them depending on the pace of our development.

4.2 Covid and Illnesses

There is also the possibility, that team members may be absent or drop out entirely due to illness.

5 Constraints

The project is to be developed with material costs, that we as a development team are willing to bear. Other than that, there will be no further costs for licenses or similar.

Due to the ongoing COVID-19 pandemic, the project needs to be done in a home office setting. Face-to-face meetings, especially as a group, may not be permitted.