

One-Octave Keyboard Project Proposal

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Functional Description

This keyboard is a simple one-octave keyboard with the capability to autoplay a song. When the keys are pressed, the appropriate notes are played through the speaker, and LEDs which correspond to the keys that are lit up.

Specifications

- Inputs:
 - 8 buttons mapped to all the keys in an octave
 - Considering including the additional 5 “black keys” (see “Unresolved Issues”)
 - Light disable switch - if disabled, keys/buttons don’t light up when pressed
- Outputs
 - 8 small LEDs which light up when their corresponding key is pressed.
 - A speaker which produces the tones of the keys currently pressed.

Instructions for use

- *To play notes:* Press the buttons which are mapped to keys in an octave
- *To disable light-up LEDs for keys:* turn on the light disable switch.
- *To have the keyboard play “Hot Cross Buns”:* Turn on the “Play Song” switch.

Resolved Issues

- The light logic simply outputs the button inputs if light_EN’ is 0, and outputs “00000000” if light_EN is 1.

Unresolved Issues

- We are considering including “black keys,” however we are concerned that it will make the keyboard less user-friendly as the FPGA hardware does not stagger the buttons in the expected fashion. For the additions we did include (metronome, play functionality), we are not sure if it is feasible or a smart idea within the time frame that we have.

Milestones

We have chosen to take a more incremental approach rather than a unit-by-unit approach.

- Determine what sound/logic hardware we have access to in order to narrow down feature/implementation specifications. Test this hardware, create simple button to sound output.
- Create basic button to sound logic (no lights, metronome, play, or volume)
- Connect light logic to buttons