

# Lab 3: Sound

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## Objective

During this lab, you will learn about the audio generating circuitry on your FPGA board and use it to make noises.

Teams whose project does not include sound should contact course staff with a proposal for an alternate lab project.

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## Theory

Your FPGA board has some hardware to make sound, which varies by the board:

ZedBoard: ADAU1761 Codec

Nexys4: PWM Mono amplifier. Alternatives available via PMOD cards.

ZC706: HDMI (ouch!) or via PMOD card.

KC705: HDMI only (??)

VC707: HDMI only (??)

If you are using one of the high-end boards, hopefully you've already considered the low level of audio support on them.

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## Procedures

This lab is a simple experiment to get two different sounds from your FPGA board.

1. Build on the Lab1 infrastructure you developed.
2. Find two sound files of your choice. Do any conversions on those files that you need. Be able to play them with some software application on your workstation.
3. Generate a system that will take user input and generate the different sounds based on the user choice. For instance, you can specify that when the user pushes pushbutton 1 the first sound file will be played. Pushbutton 2 would play the other file. Or, if your lab1 used serial/USB input, you can assign keys on the attached laptop to the sounds.
4. Investigate and make intelligent choices about what should happen if the user input is pressed while a sound is already being played.

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## Report

Document what has occurred in a simple lab writeup, one per team. Demo your system to the professor or a TA.