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Project Proposal for CSEE 4840

We plan to implement some Digital sound effects using the *AKM AK4565 Low Power 20 bit audio CODEC* ([specs](#))

We will implement at least 3 of the following effects (and try to do as many as we can), all of which will be controllable by either an on-screen interface, or flags when calling the program from the terminal interface.

- **Audio fade-in and fade-out** via the on-screen interface
(with a selectable period of 24, 32, 48, or 64 ms)
- **Echo** (delay plus feed-forward)
- **Reverb** (echo feedback with gain <1)
- **Flanging**
- **Pitch shifting/Tone control**
(with various simple high-pass, low-pass, bandpass, and bandstop filters)

Ideas taken from: <http://www.dspexperts.com/dsp/projects/305/305-presentation.zip>

We feel that this project is more than sufficient for 2 students, one of whom is a CS major and the other of whom is EE, given the timing diagrams that need to be worked out as well as the small size of the group.

While we will control the chip and the interface with a C program, most of the "hardware" implementation will be in VHDL, with the exception of the memory for the reverb, which will probably utilize memory on the boards, and fade control, which will control the chip's built-in circuitry.