Project Proposal

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21 February 2011

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Project Abstract

WAZ is a portable plug-in for MIDI devices to output sound. The device will read in the MIDI input and output through an audio jack or speaker, and has the ability to record and playback. The user interface for WAZ will be an infrared remote control. The remote control will be able to mute/unmute, control volume, adjust pitch, and start recording or playback. In addition, an LCD screen will display the note(s) that are currently being played and other status information such as volume when it is being toggled by the remote.

Strategy

Description of the overall design: Above

Platform: ZiLOG ZNEO Z16F Flash Microcontroller

Capabilities: GPIO, timers, interrupts, infrared

External: MIDI input, audio jack, switches, LCD screen, infrared modules

Evaluations: user interface design, MIDI support

Software Modules: MIDI interface and decoder, display handling, infrared interface, volume control etc. handling

Unknowns

I am unfamiliar with some of the components required (MIDI, infrared), so I'll need to familiarize myself. I also need to look at how infrared communication is handled – the data rate should obviously handle simple remote commands.

I'm not sure how to decode the MIDI format, but preliminary investigation suggests it shouldn't be too difficult a task. Also I'm not sure how to output sound through a 3.5mm audio jack. Memory requirements for recording a tune may also be an issue.

Implementation Plan

Development is based on the ZiLOG ZNEO Z16F Flash Microcontroller Contest Kit using the ZiLOG Development Studio. The first step is researching and acquiring all necessary components: LCD display, infrared and remote, and audio and MIDI jacks. The second step will be interfacing the MIDI jack, and establishing simple playback with the included speaker. The next step will be implementing playback through the audio jack for speakers. Next will be the interfacing of the infrared module and the remote control. Establishing a protocol for communication will need to be established for the defined controls: mute/unmute, adjust volume, adjust pitch, start/stop recording, and start/stop playback. The last step, which for debugging purposes may be in conjunction with previous steps, will be the development of the LCD display driver.

Resources

Zilog ZNEO Z16F Flash Microcontroller Contest Kit – provided

LCD display – provided, or need to buy

Infrared module – provided, or need to buy

Universal remote – need to buy

Audio jack – need to buy

MIDI jack – need to buy

MIDI Device (keyboard) – already own