STM32 MIDI Piano Acceptance Testing Documentation

This document covers developer testing to ensure the STM32 MIDI piano is working properly. To build the project and load on to the STM32F Discovery board and custom ENEE 440 board follow the README.txt file located in the root directory of the project folder. Testing begins once the program (and DMA hex file) are loaded onto the board successfully. To begin running the program either disconnect and reconnect power to the microcontroller, or press the button **SW_B** located on the face of the custom ENEE 440 board. Plug headphones of your choice into the auxiliary jack on the Discovery board.

No lights, either on the LEDs or 7-segment display will be on at this point. The programmatic on/off switch of the piano is **SW13**. Once pressed for the first time you will see the 7-segment display light up. The two left digits represent the note being played, while the right two digits represent the volume. On initial turn-on there is no note being displayed, and so the 7-segment display will have "00". The default volume is 12 – the maximum.

Notes are bound to the following switches: **SW1**, **SW3**, **SW5**, and **SW7**. Once pressed, a note will continue to play unless pressed again, another note is played, or the piano is turned off. The notes played are **C5**, **E5**, **G5**, and **B6** respectively. When played the 7-segment display will display '**c5**', '**E5**', '**g5**', and '**b6**', respectively. To test thoroughly press these 4 switches as you see fit, possibly pressing the on/off switch as well to ensure that the piano is in fact reset between each on and off state.

The buttons **SW9** and **SW11** turn the volume of the device down and up, respectively. The minimum volume is 1, while the maximum is 12. This value will at all times (unless off) be displayed on the right two digits of the 7-segment display. Note that the volume is saved between note presses. For example, consider the following sequence of button presses:

SW13 (on) → **SW1** (turn C5 on) → **SW9** x 5 (volume down 5 times) → **SW1** (turn C5 off) → **SW9** x2 (volume down 2 times) → **SW3** (turn E5 on)

The note E5 will play with the correct volume level (5), as opposed to the incorrect one (10). You can also turn volume up or down when a note is not being played. Turning the MIDI piano on/off resets volume to 12. Volume cannot go higher than 12 or lower than 1.