

Massachusetts Institute of Technology
Department of Electrical Engineering and Computer Science
6.111 Introductory Digital Systems Laboratory

Final Project Check-off Sheet

Project Title: A Music Transcriber

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TA Signature/Date:

Design

- Overall Block Diagram
- Block Diagrams and Code for Note Recognizer (Alessandro)
- Block Diagrams and Code for Video Display (Roberto)

Functionality

Note Recognizer (Alessandro)

- A Working FFT:

An FFT module that produces the correct transform for a given sine wave input.
The result of the FFT module will be displayed on the Logic Analyzer.

- A working Peak Detector:

Finds the maximum of a series of inputs specialized for frequency spectra like those output by the FFT module. To demonstrate functionality the output of the FFT is used as input to the peak detector and the output is displayed on the LEDs of the 6.111 labkit.

- A working Lookup Table:

Takes a frequency as input and outputs the note that has a peak at that frequency. Given a frequency as input, it will output the corresponding pitch name on the LEDs and/or Logic Analyzer.

- Working Rhythm:

Measures and outputs the duration of each note played. To demonstrate functionality, a musical note will be played and its duration will be displayed on the LEDs of the 6.111 labkit.

- Working Metronome

Outputs a beat at a certain tempo, which will be used for recognizing the note duration. The beat can be seen via flashing LEDs.

Video Display (Roberto)

Video Module

- Show that a color video signal is transformed to black and white, run through a video-ram and output to the monitor.
- Show correct displaying of the “background” stave sprite
- Show that the video output is non-erasable by moving a single object (i.e. note) to different places and see the instances of the object on screen. On reset all but the background stave will be erased.

Control Module

Demonstrate the functioning of the control module. When associating the newnote signal to a 0.5 Hz pulse, and manually changing the values for accrediting note, sharp and duration, the system will:

- Output the notes of correct shape (full, $\frac{3}{4}$, half, quarter) depending on duration
- Output the notes in the correct place on the staff depending on note, or output a pause if note = 0
- Eventually output a sharp next to each note depending on the value of sharp
- Once a staff is full, display the next note at the beginning of the next staff
- Once a page is full, reset

Discussion

- What are the limitations of the system?
- Given the time, which other features would you add? Why? And how?
- What makes your system expandible?