

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

Final Project Check Off Sheet

Project Title: Voice Training Karaoke Machine

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TA Signature/Date:

Design

- State transition diagrams, Block Diagrams, Code (Top-level, Synthesizer, FFT, AC97 interface, Song reader, Display)

Functionality

MQ

- Digital loop-back from microphone to headphone to verify audio interface
- (Synthesizer) Demonstrate ability to specify notes to be synthesized
- Use of FFT (test with synthesizer output) to correctly detect note

ZZ

- Ability to read note sequence from memory in normal play mode (LED)
- Music reader in pause/rewind/fast forward mode
- Show that playback tempo can be modified
- VGA display of time series (voice and/or tone samples) and FFT

MQ + ZZ

- Demonstrate meaningful user experience through attempted sing-along with pre-set song
- Demonstrate single note tuning mode, in which user tunes his/her voice to a constantly held note with audio and visual feedback

Functionality

- How do you interpret a frequency spectrum into a single note?
- What are the considerations for synthesizing a “useful” vocal note?
- Describe timing and synchronization challenges with an AC97 codec.
- Discuss design choices for pause/ff/rewind functions and how it is implemented with respect to the tempo of the song.
- How do you time memory access of display data with pixel output?
- What features would you add to this project in the future?