

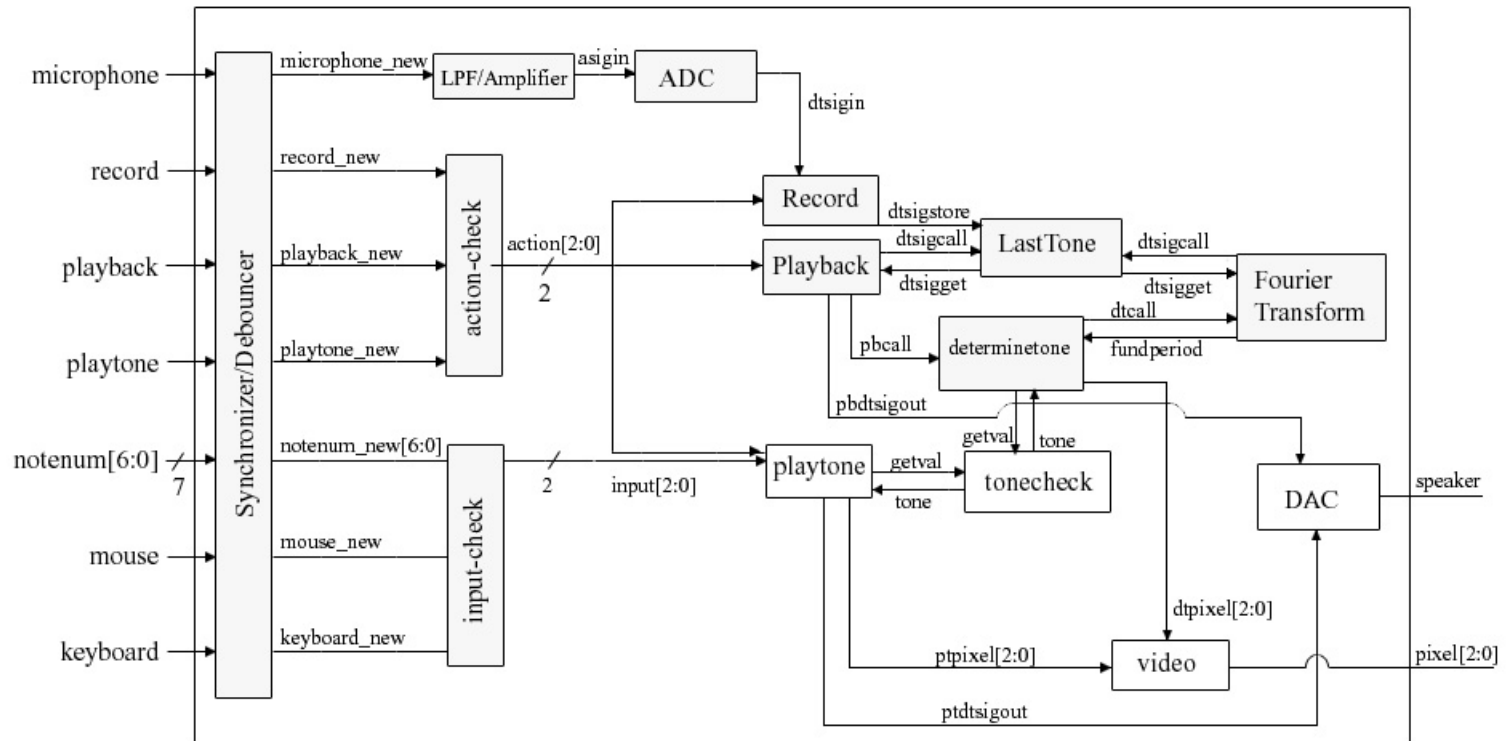
6.111 Project: Digital Tuner

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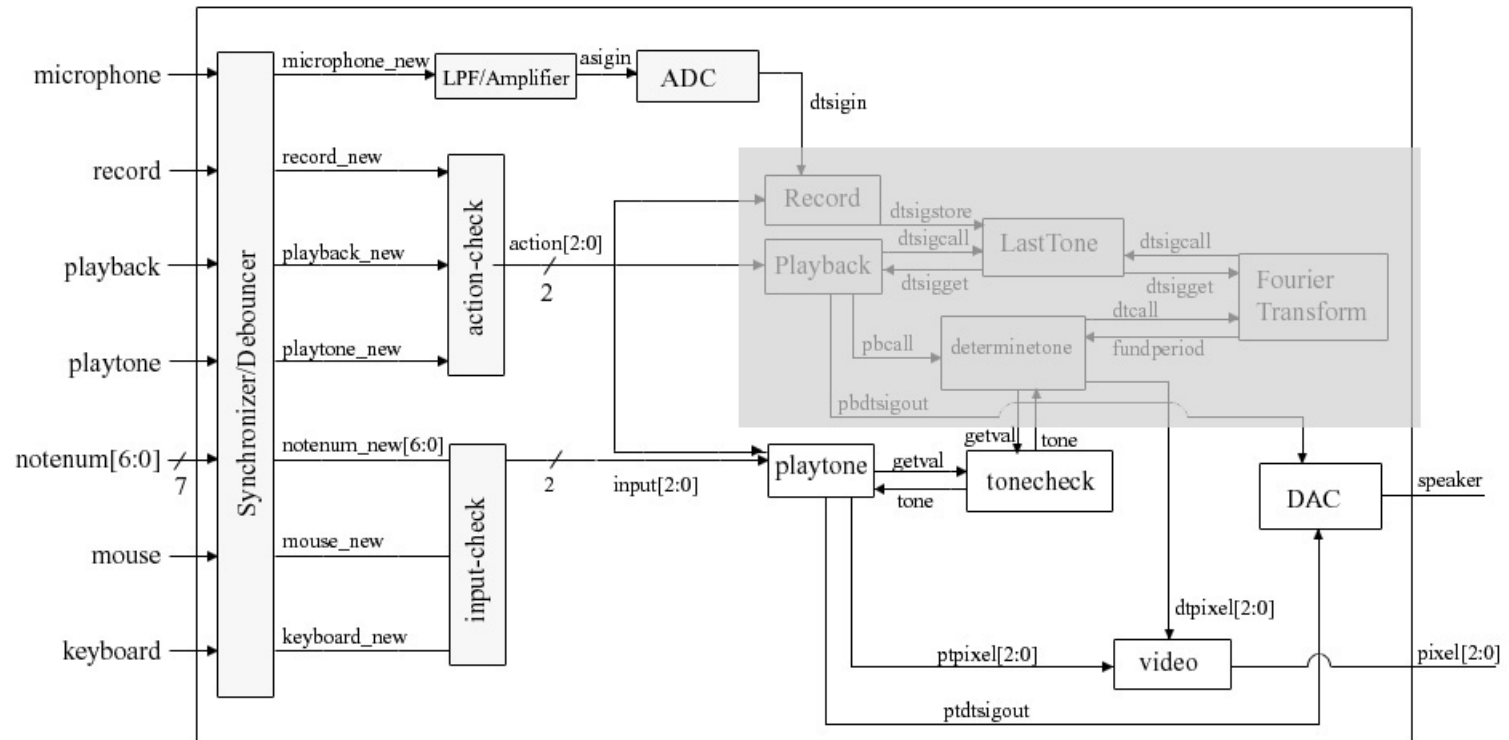
Introduction

- Three modules
 - Record
 - Records a tone from the microphone
 - Playback
 - Plays back the last recorded tone
 - Determines the frequency, note number, and music staff position
 - Playtone
 - Plays back a pre-recorded sample of a tone defined by the user, in one of three ways:
 - Switches
 - Mouse
 - Keyboard
- Cool because
 - Music is cool
 - Being in tune is cool.

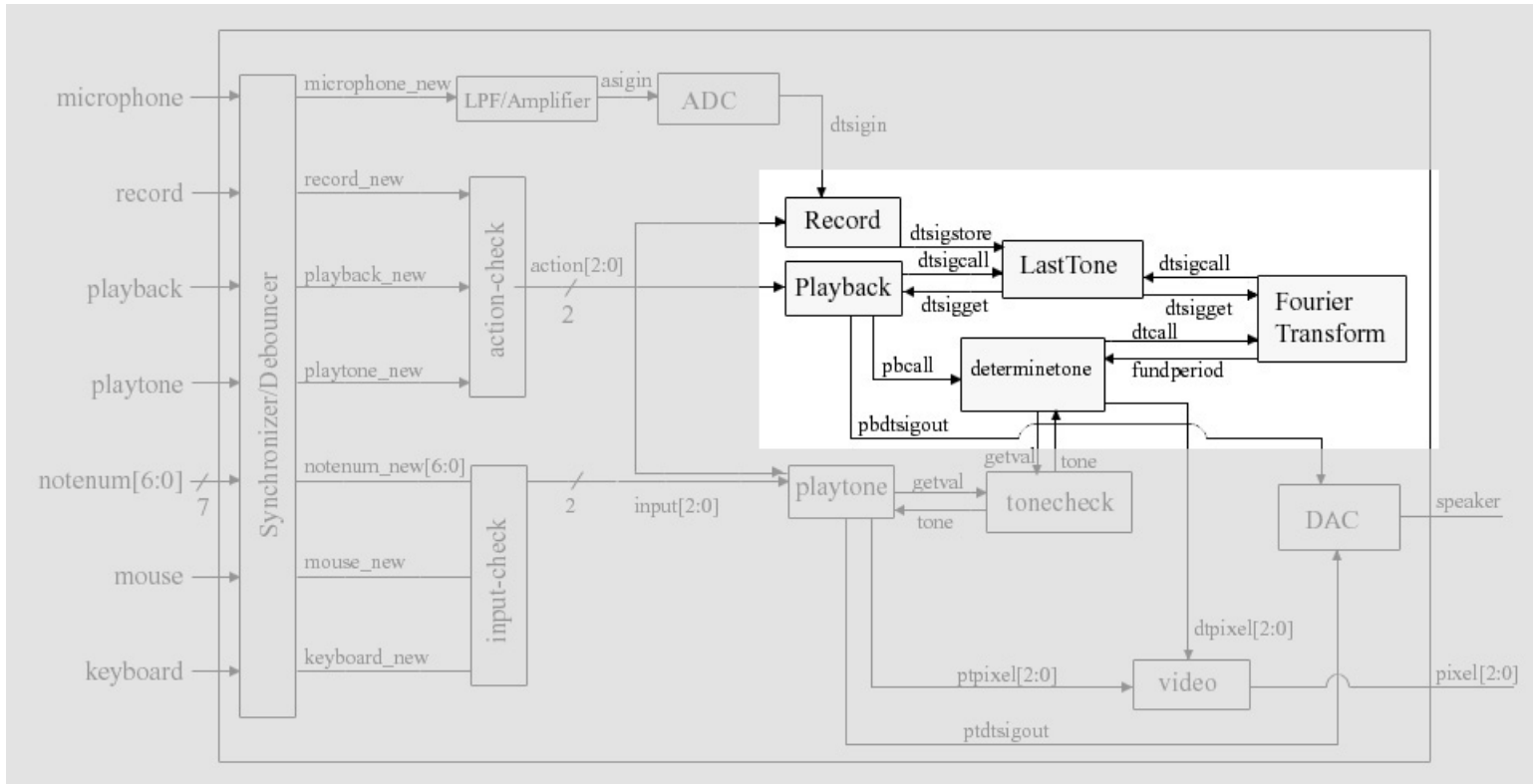
Block Diagram



Block Diagram: Roshni



Block Diagram: Linda



Important Designs

- Fourier Transform
 - Using the Xilinx Fast Fourier Transform
 - Calls for the last recorded tone
 - Finds the frequency of the tone
 - Used to determine the pitch of the note
- Additions
 - Simultaneous notes (chords)
 - Strings of notes
 - Tempo
 - User input: note they want, so we can filter out other noise
- Video
 - Displays:
 - Music staff
 - Mouse cursor for mouse inputs
 - Outputs:
 - Music note on the staff
 - Note number
 - Frequency of the tone
 - Used for playback and playtone

Testing and Debugging

- Tones
 - Simulations
 - Testing if the Fourier Transfers are working properly
 - Matlab
 - Using Matlab generated pure tones, see if the output actually corresponds to the input
 - Logic Analyzer
 - Using the logic analyzer to look at the output and see if we're getting the right output
- Video
 - Simulation
 - Playing around with it
 - Mouse input testing
 - Using Matlab to verify
 - Logic Analyzer
 - Using the logic analyzer to test that the video output corresponds to the note that is being played

Conclusion

- We should have a user-friendly tuner that helps users test their instruments for notes ranging from 27.5Hz to 4.186kHz.
 - It will determine frequencies of inputted tones (and play them back so you can hear yourself).
 - It will playback user selected tones so you can hear what you're supposed to sound like.
- Any Questions?