Overview

- Analog to Input
- Signal Processing
  - Peak Detector
  - Timing Module
- Video Display
  - Note Position
  - Note Display
  - Note Sprite

Signal Processing Block Diagram
Signal Processing

**Peak Detector**

- finds the 8 largest peaks by magnitude
- uses threshold to discriminate peaks from harmonics and noise
Signal Processing

Timing Module

- checks for changes in any of the 8 notes
- waits for all 8 note durations to be determined before sending them to video display
- keeps track of all incoming notes in registers to avoid missing notes while waiting for durations to be calculated
- uses tempo input to determine timing
Video Display Block Diagram

- **Notes**: notes [8][8]
- **Start**: start
- **Durations**: durations [8][4]
- **Pixel**: pixel [3]
- **Clocks**: 65MHz, 27MHz
- **XVGA**: 1024 x 768, 60 Hz
- **Monitor**
Video Display

Note Position

- determines where new notes should go
  - looks at whether a note already exists
  - all notes are spaced uniformly

http://www.teamtechnology.co.uk/conductor.gif
Video Display

- creates 65MHz clock for XVGA
- maintains frame buffer
  - updated with information given from Note Sprite module
- sends correct data to monitor
Video Display

Note Sprite

- database of all sprites
- comprised of three submodules:
  - rest display module
  - staff and clef display module
  - note generator module

http://thumbs.dreamstime.com/thumb_150/11798011756h6B95.jpg
Video Display

Note Sprite Submodules

note_x [8][10]
note_y [8][10]
notes [8][8]
durations [8][4]
hcount [10]
vcount [10]

Timing Sprites:
- Note Head
- Flag
- Stem
- Dot

Ledger Line
- Sharp

Accessory Sprites

Note Generator

Staff Generator
- Treble Clef Generator
- Bass Clef Generator
- Clef Generator

Staff & Clef Display

Rest Display

Note Sprite

OR
Projected Timeline

- **11/11** presentation and checklist
  - Analog to Input, Magnitude
- **11/18**
  - Note Sprites, Note Look-Up, Peak Detector
- **11/25**
  - Timing, Note Position, Note Display
- **12/2**
  - debugging
- **12/9** project checkoff, final report
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