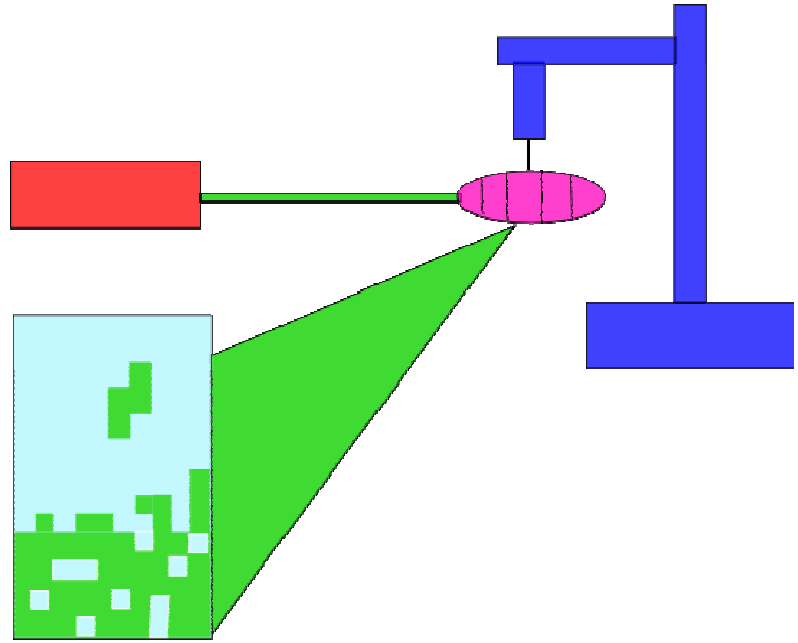
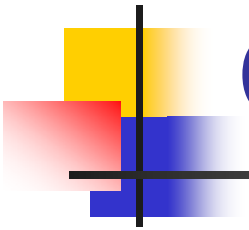


Audio Driven Laser Tetris

6.111 Final Project Presentation

Cameron Lewis and Xin Sun



Overview

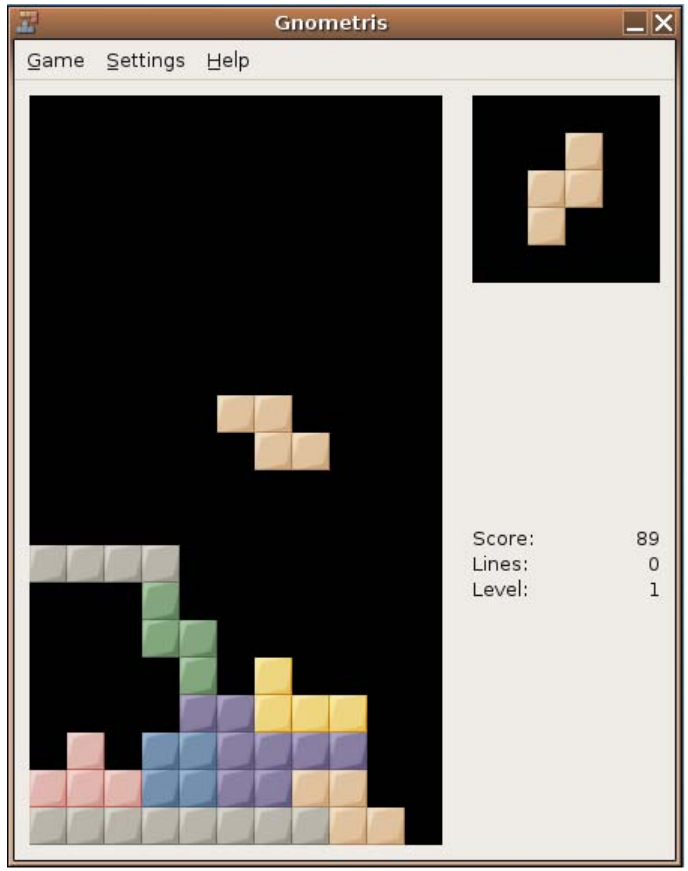
- Variant of the classic arcade game
- VGA display provides all game info
- Music drives the block movement
- Laser projects the playing field

Tetris Game Background

Please see any image of Tetris pieces, such as http://upload.wikimedia.org/wikipedia/commons/9/9a/Tetrominoes_letter_oriented.png

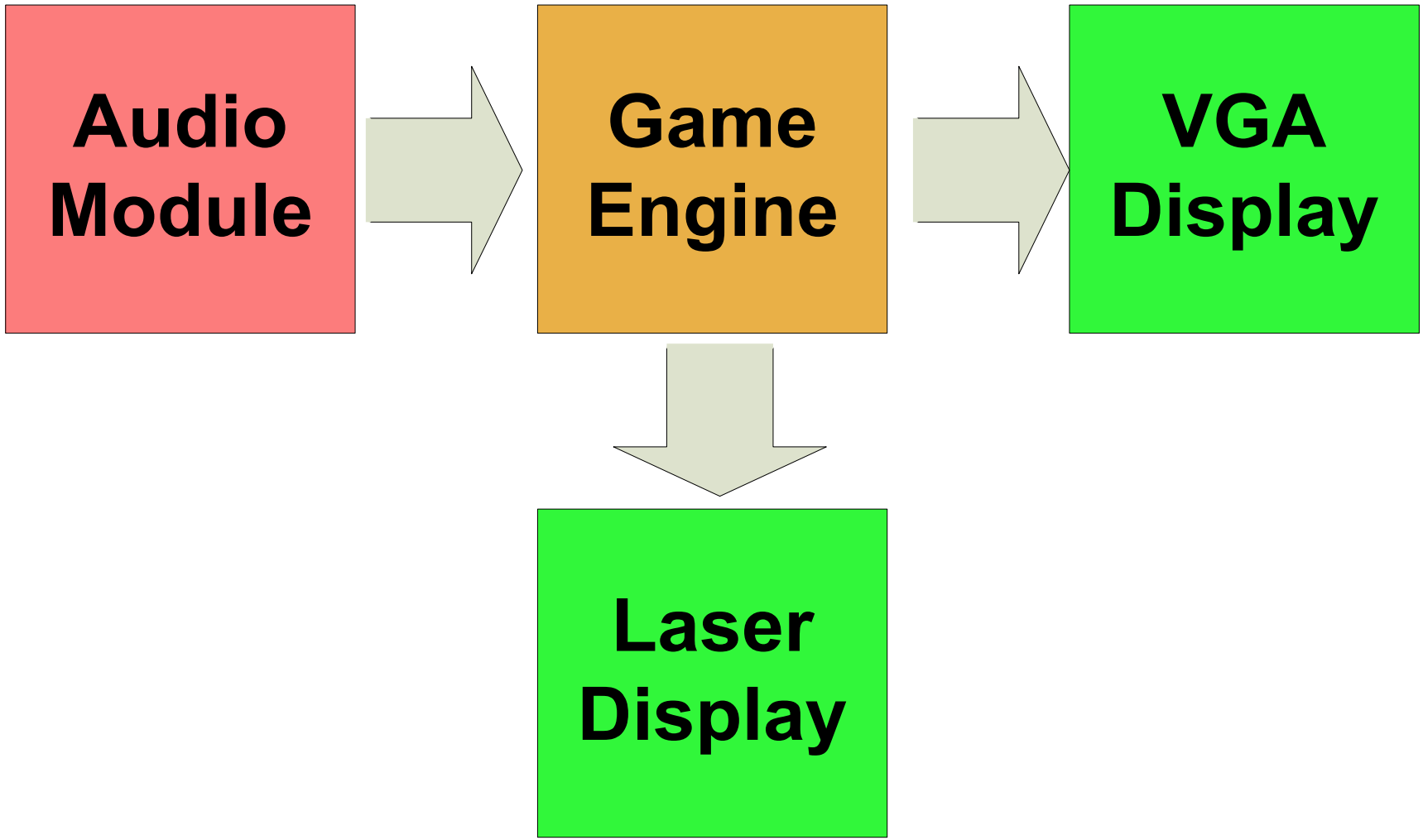
The seven possible *Tetris* pieces: *I, T, O, L, J, S,* and *Z*. (courtesy of Wikipedia)

Snapshot of a Tetris game on right

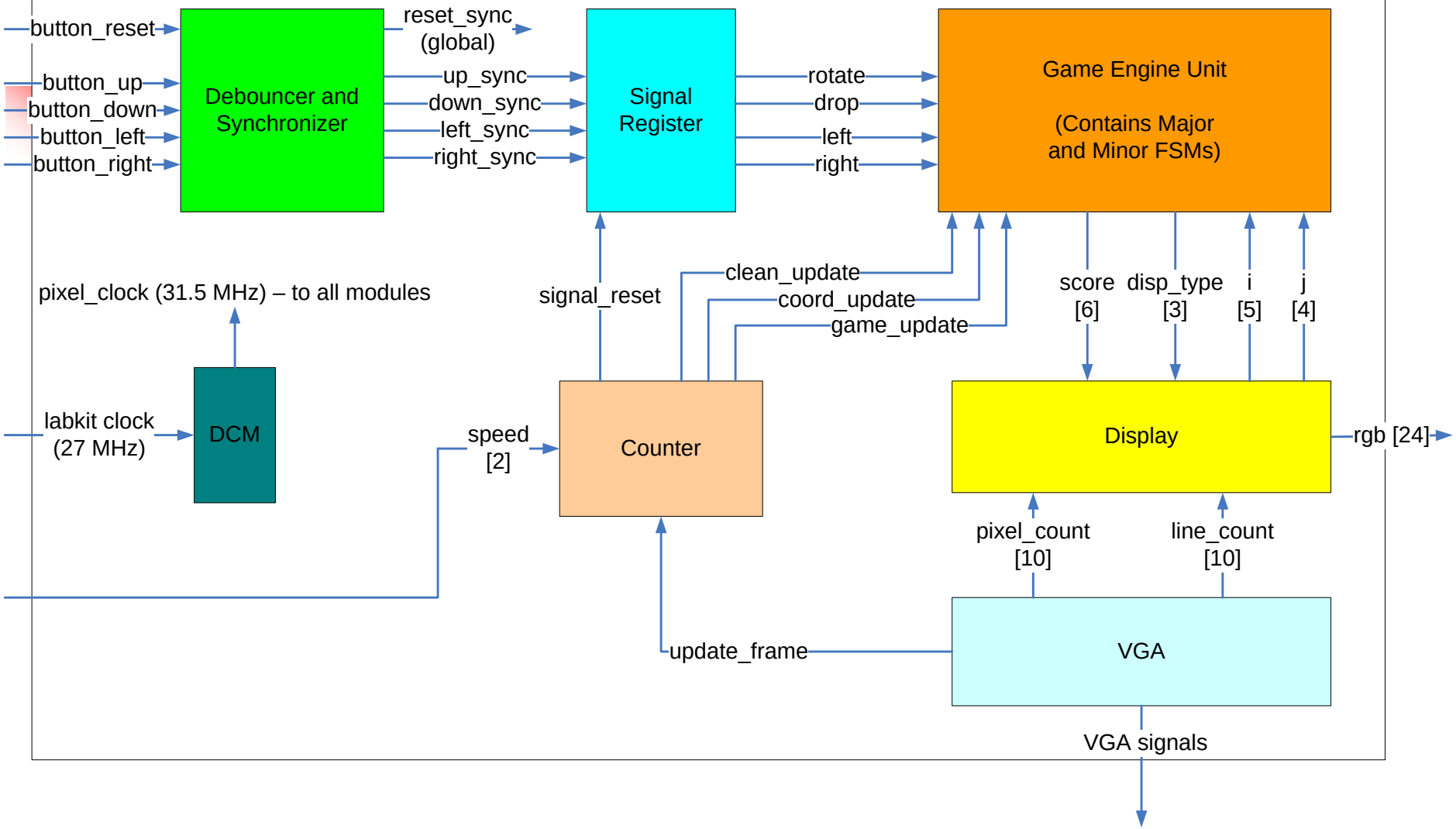


Courtesy Jason D. Clinton and Thomas H. P. Andersen. Used with permission.

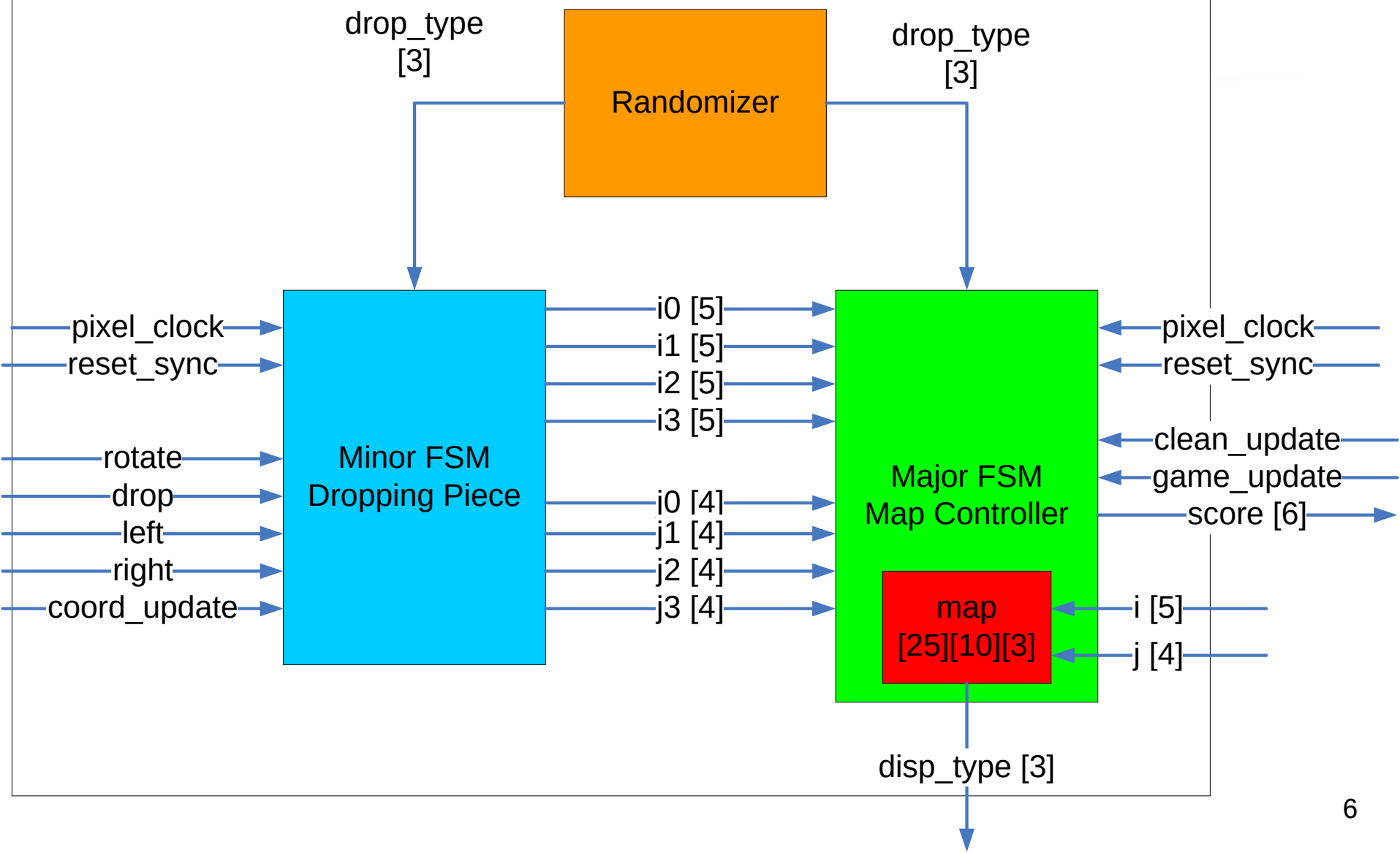
System Overview



Game Engine Unit & VGA Display Unit



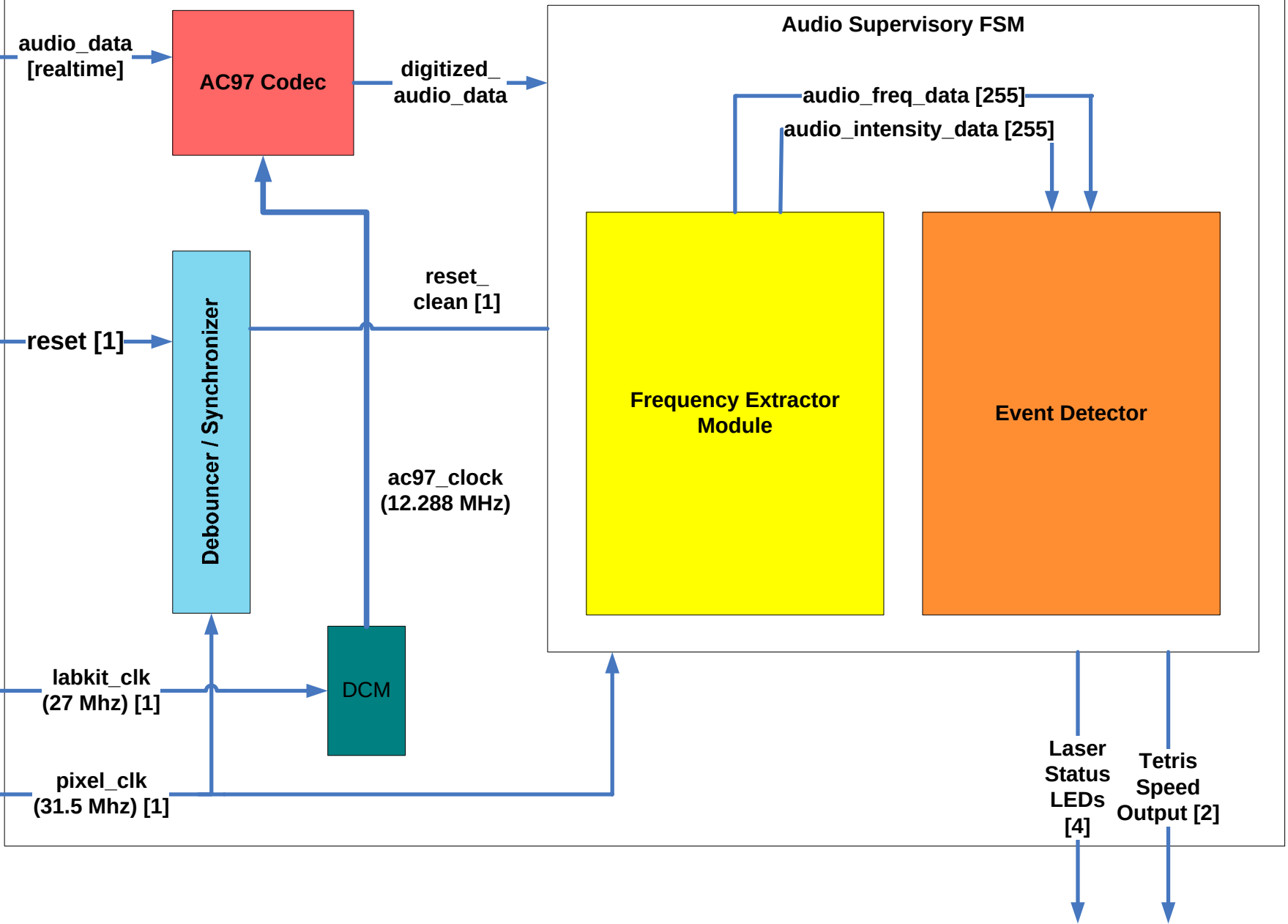
Game Engine Unit



Audio Processing Module

- Audio signal digitized by AC97 codec
  - Sampled at 48khz, 18 bit resolution
- Fed through FFT module
- Triggers changes in block speed upon detection of certain frequency intensities

Audio Module



Laser Projection Module

- Laser light shines onto a 10-sided spinning mirror head assembly
- Infrared pulses synchronize the display with the labkit
- Verilog code modulates the laser accordingly

Laser Module