Music Visualization with Audio Beat-matching

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Concept and Motivation

Music visualization only commercial available in software implementation
> Wanted hardware implementation
> Wanted more interesting visualization

Beat-matching visualization more interesting and challenging than audio spectrum analyzer
> Would have to implement beat detection algorithm to find tempo and phase of music
> Would have to create moving image that updates in real-time and changes with music

Visualization can be used for parties, hanging out, or other social events

Pre-existing Software Visualization
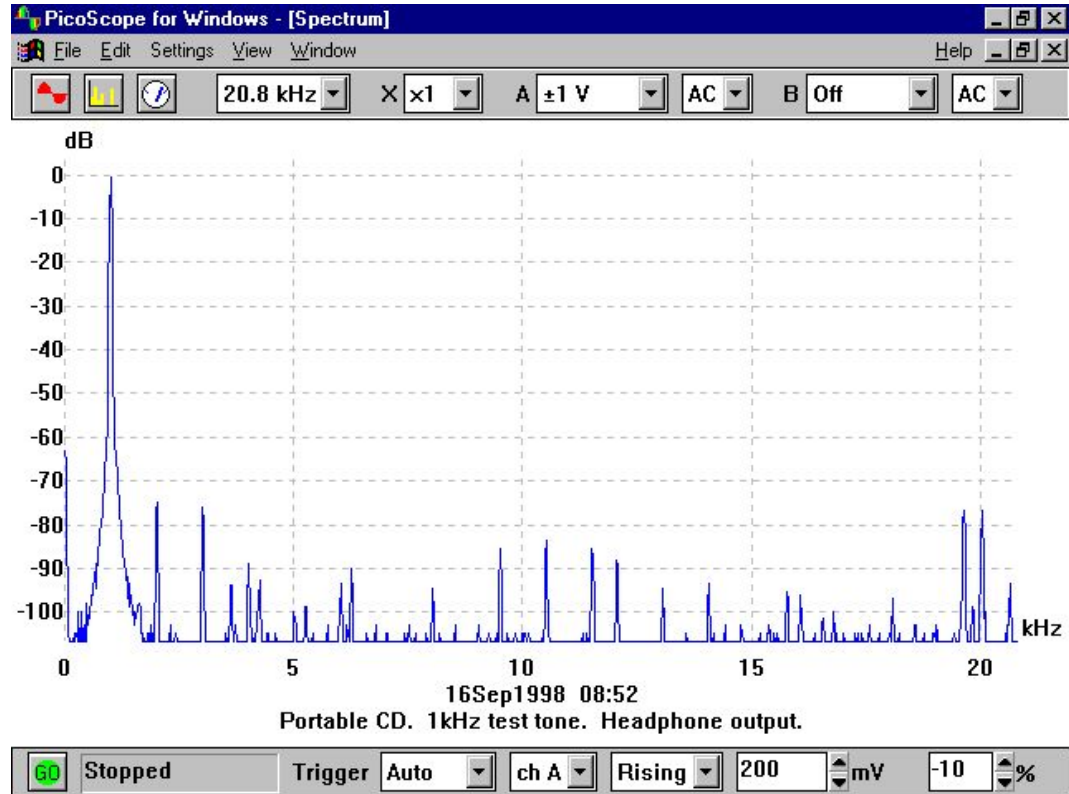
Software from Pico Technology

Audio Glow
Music Visualizer,
Android App

Implementation

Pre-existing beat-matching algorithm
> Create implementation in Verilog
> Provides tempo and phase, or time until next beat

Two part visualization
> Color changing and rotating nested shapes that update in real-time
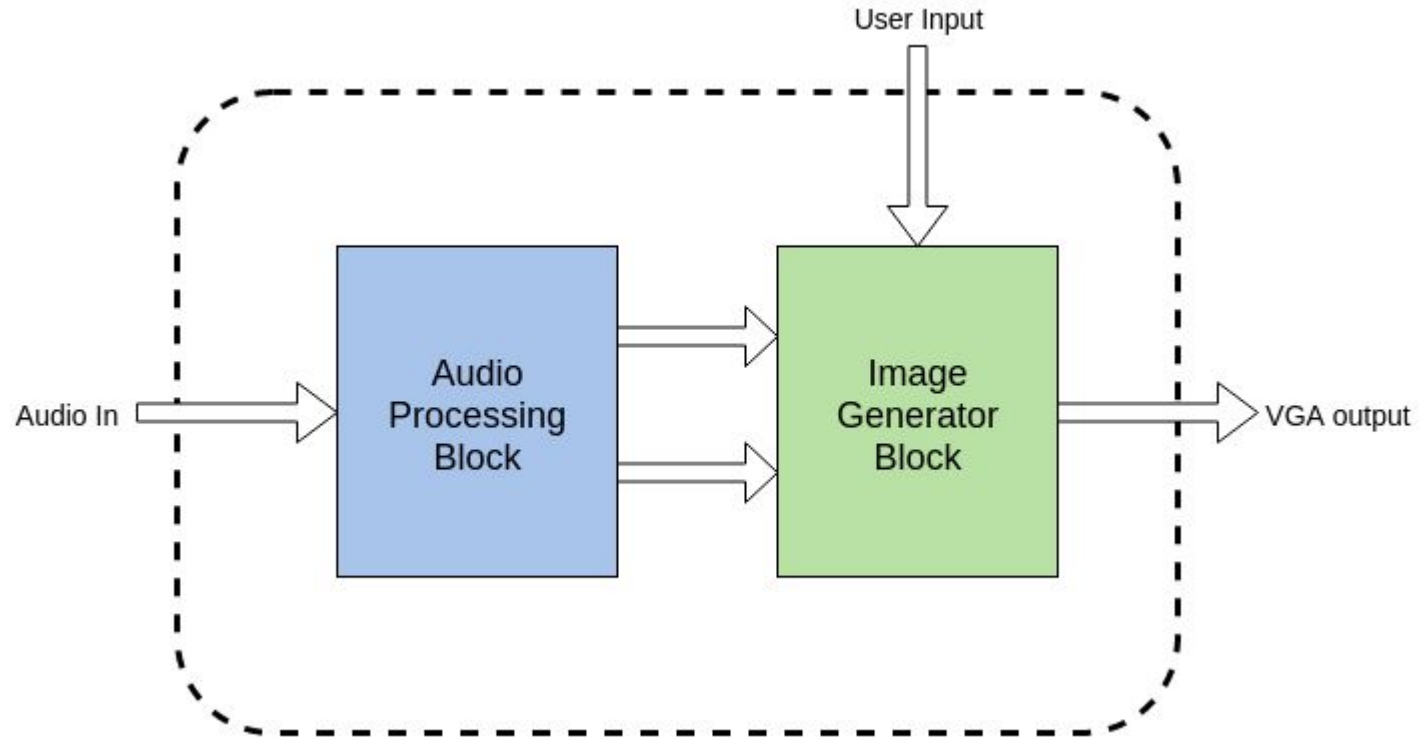> Stretch goal: background Mandelbrot fractal visualization and alpha-blending with moving image

Color-changing and rotating nested shapes
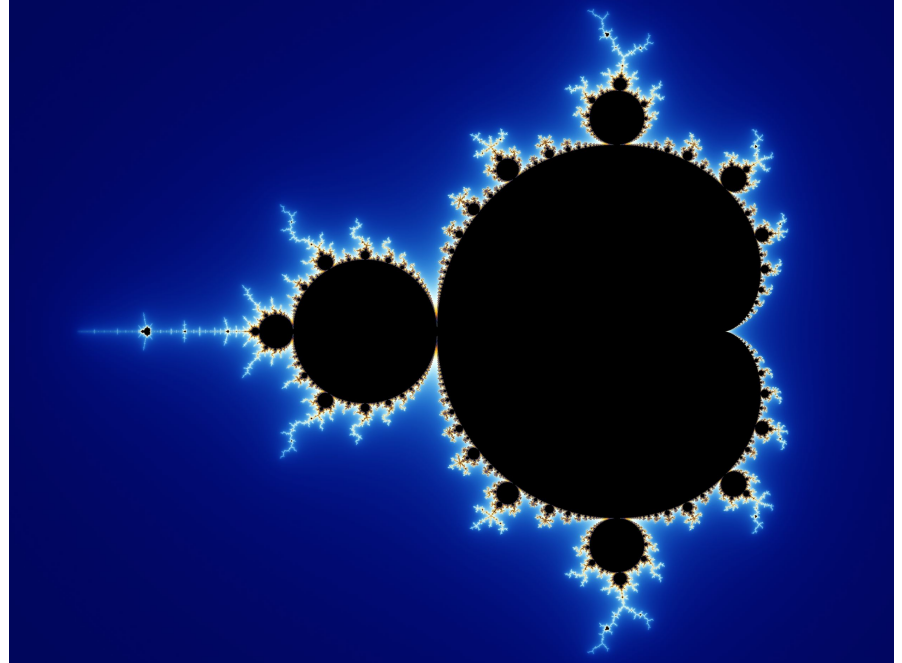
Mandelbrot fractal background

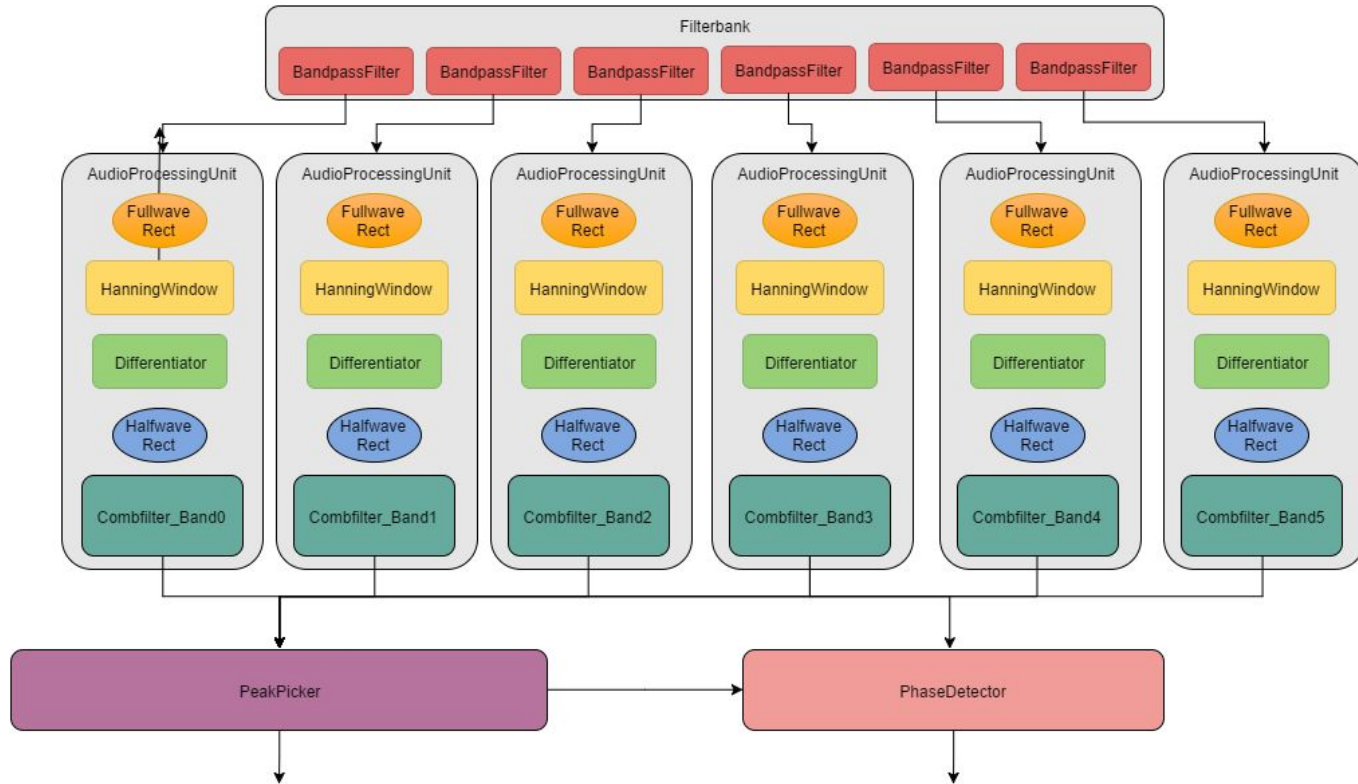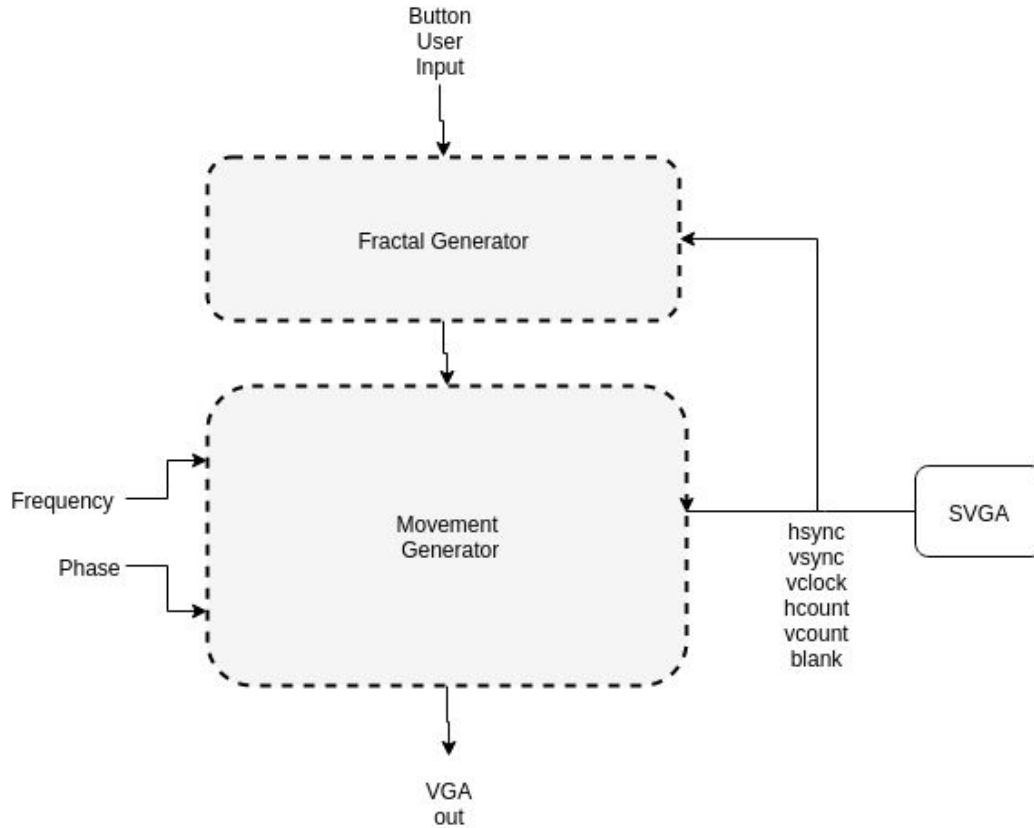# Overall Block Diagram

Audio Block

Image Generator Block

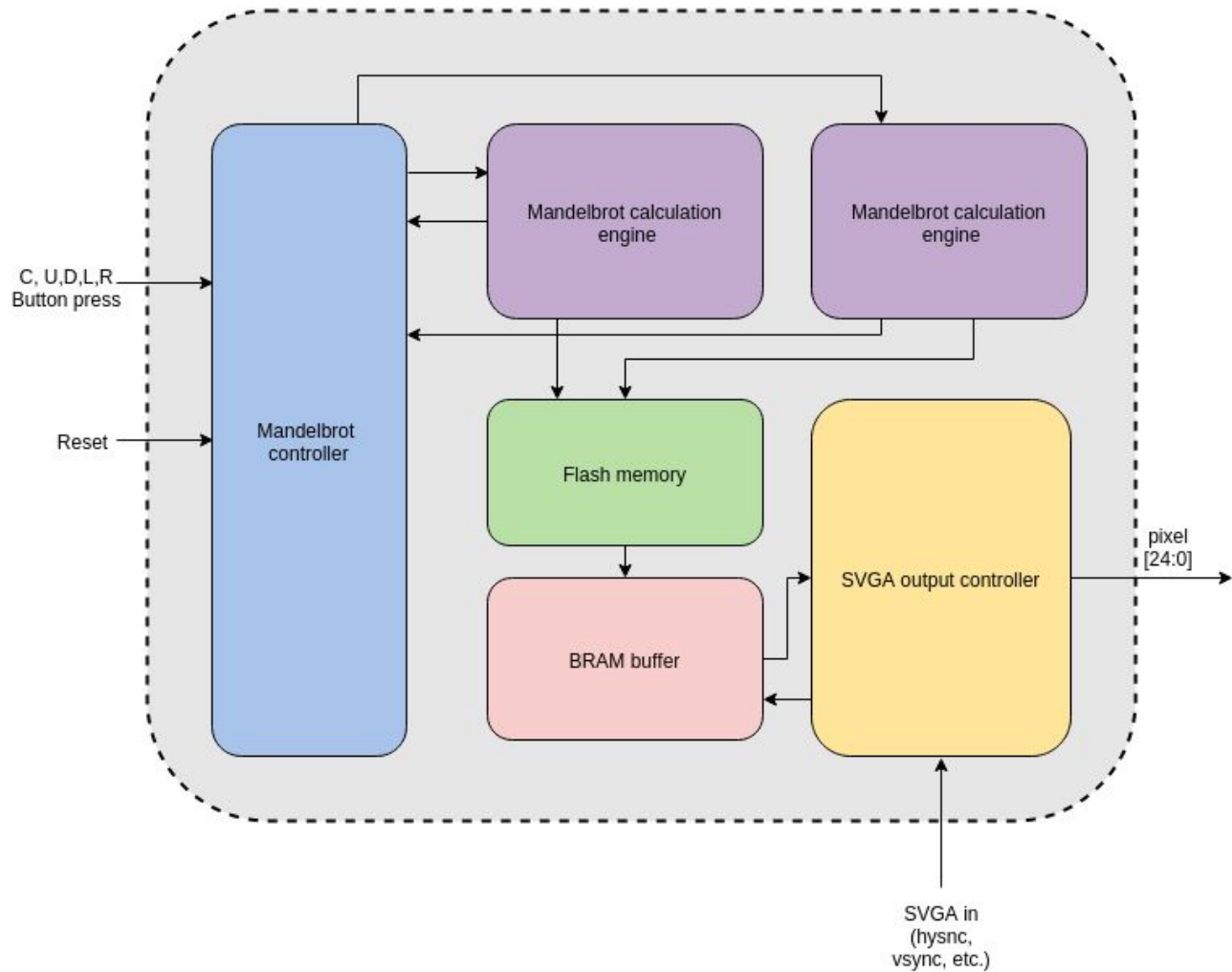# Movement Generator
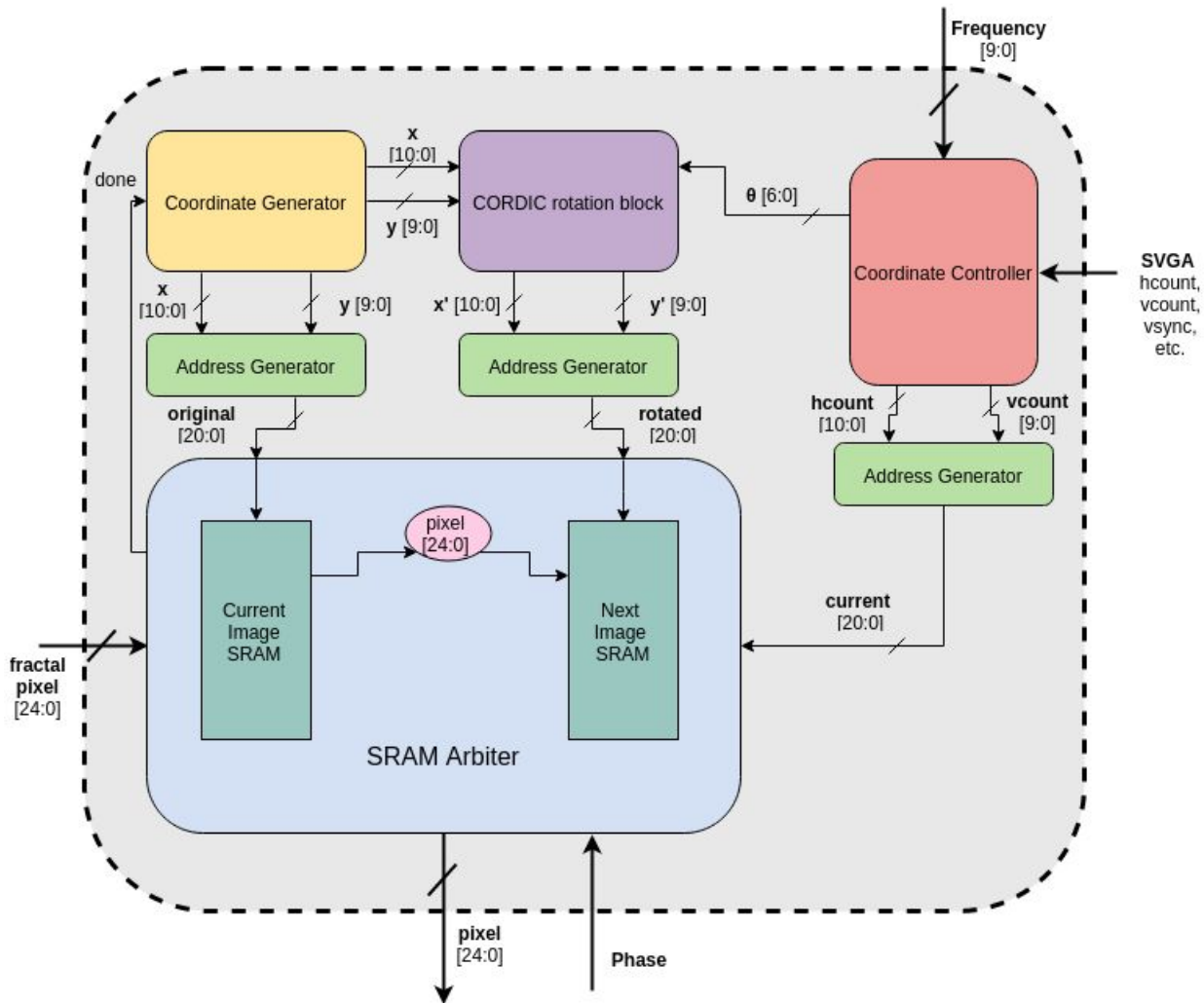
Fractal Generator Block

Timeline

	11/2	11/9	11/16	11/23	11/30	12/7
Finalize block diagram and shared signals						
Writing low level modules of visual/audio blocks						
Testing and integrating low level modules						
Testing and integration of visual and audio blocks, working on stretch goals						
Debugging and stretch goals						
Checkoff, demo, report						