

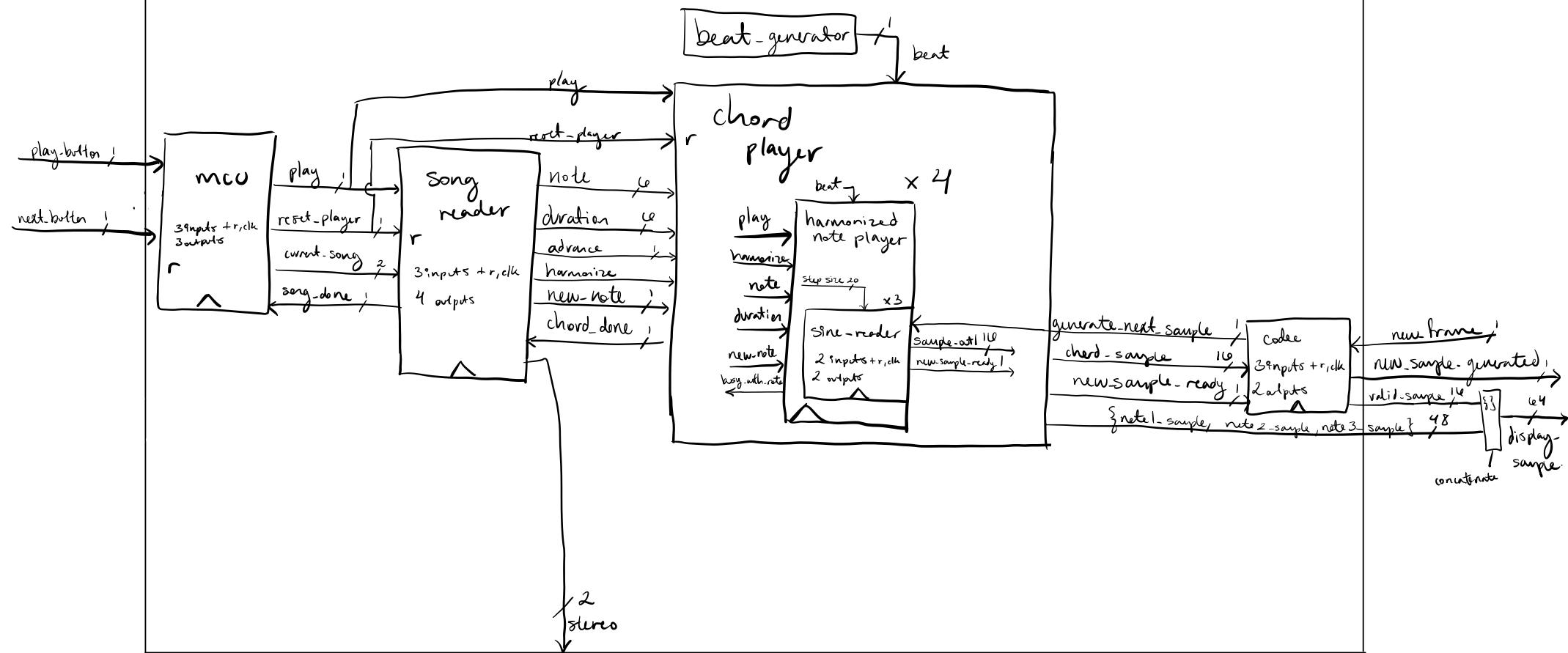
music-player

input

- clk
- reset
- play-button
- next-button
- new-frame

output

- new sample generated
- sample display
- stereo



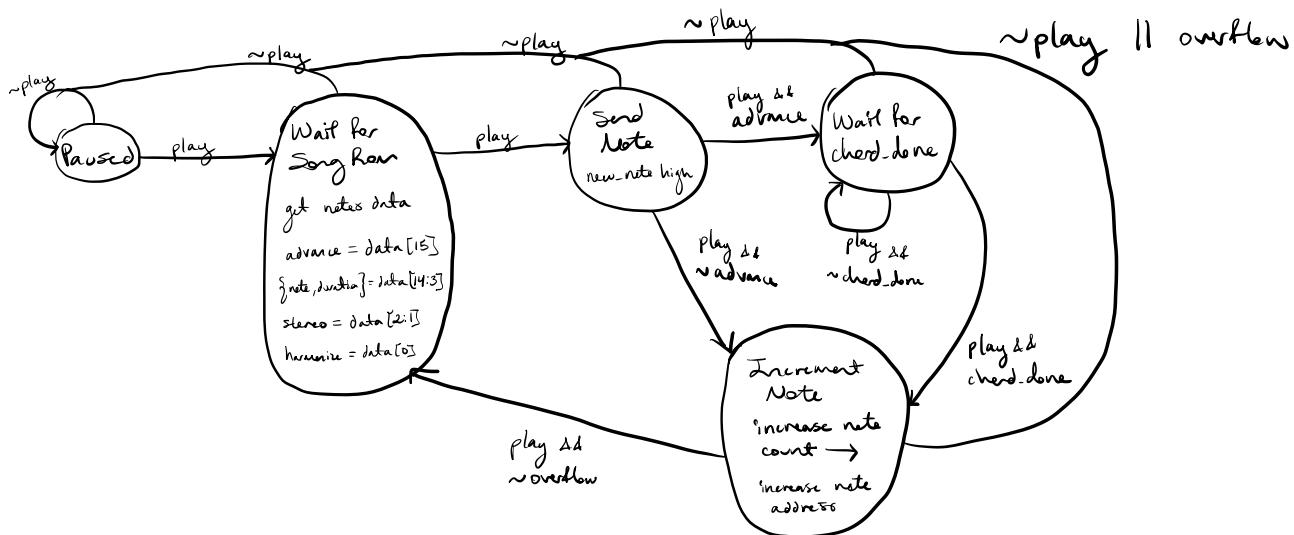
Song Reader

input

- clk
- reset
- play
- song [1:0]
- chord-done

output

- song-done
- advance
- harmonize
- note [5:0]
- duration [5:0]
- new-note
- stereo [1:0]



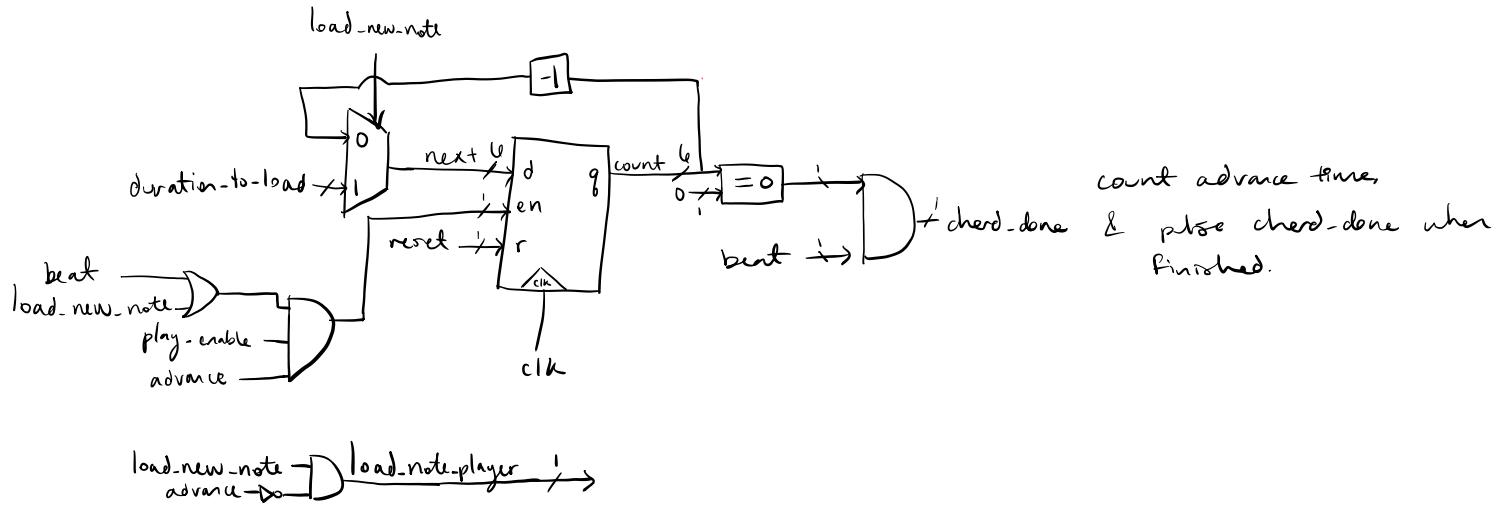
Chords Player

input

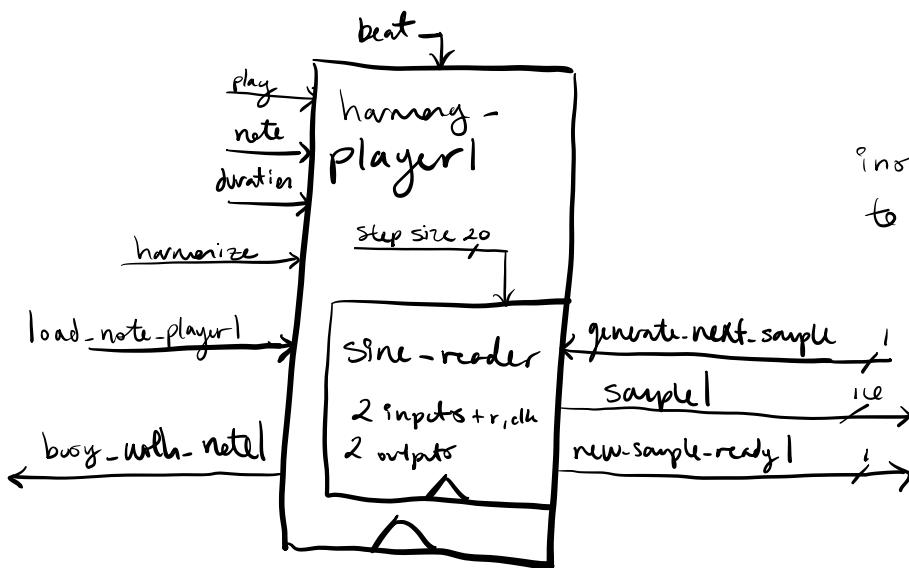
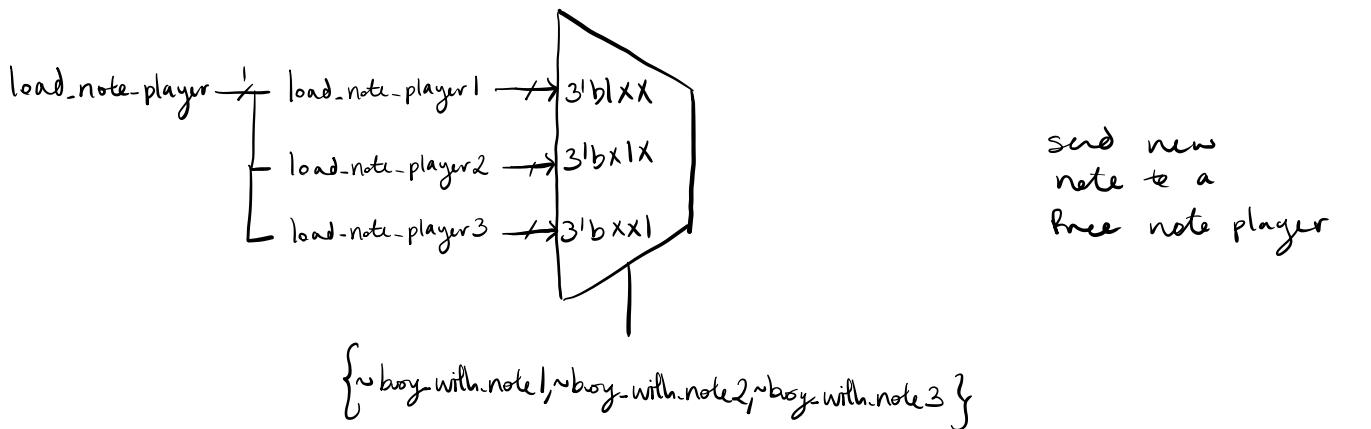
- clk
- reset
- play
- advance * new
- harmonize * new
- note_6_load [5:0]
- duration_6_load [5:0]
- load_new_note
- beat
- generate_next_sample

output

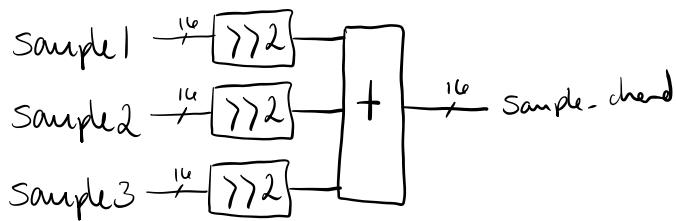
- chord_done * new
- display_sample * new
- new_sample_ready



count advance time,
& pulse chord-done when
finished.

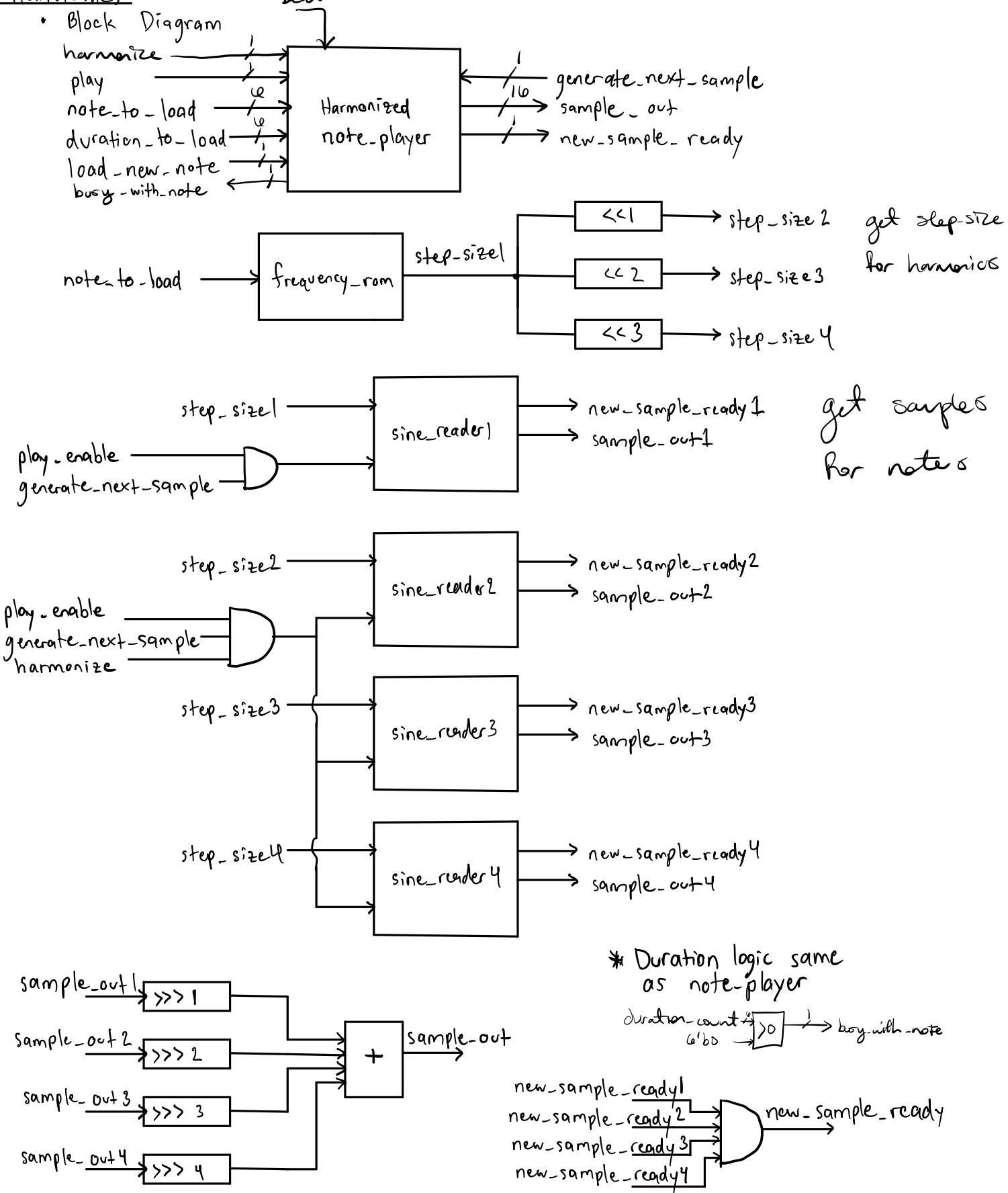


instantiate 3 harmony-players
to play note1, note2, and note3
and form the chord.

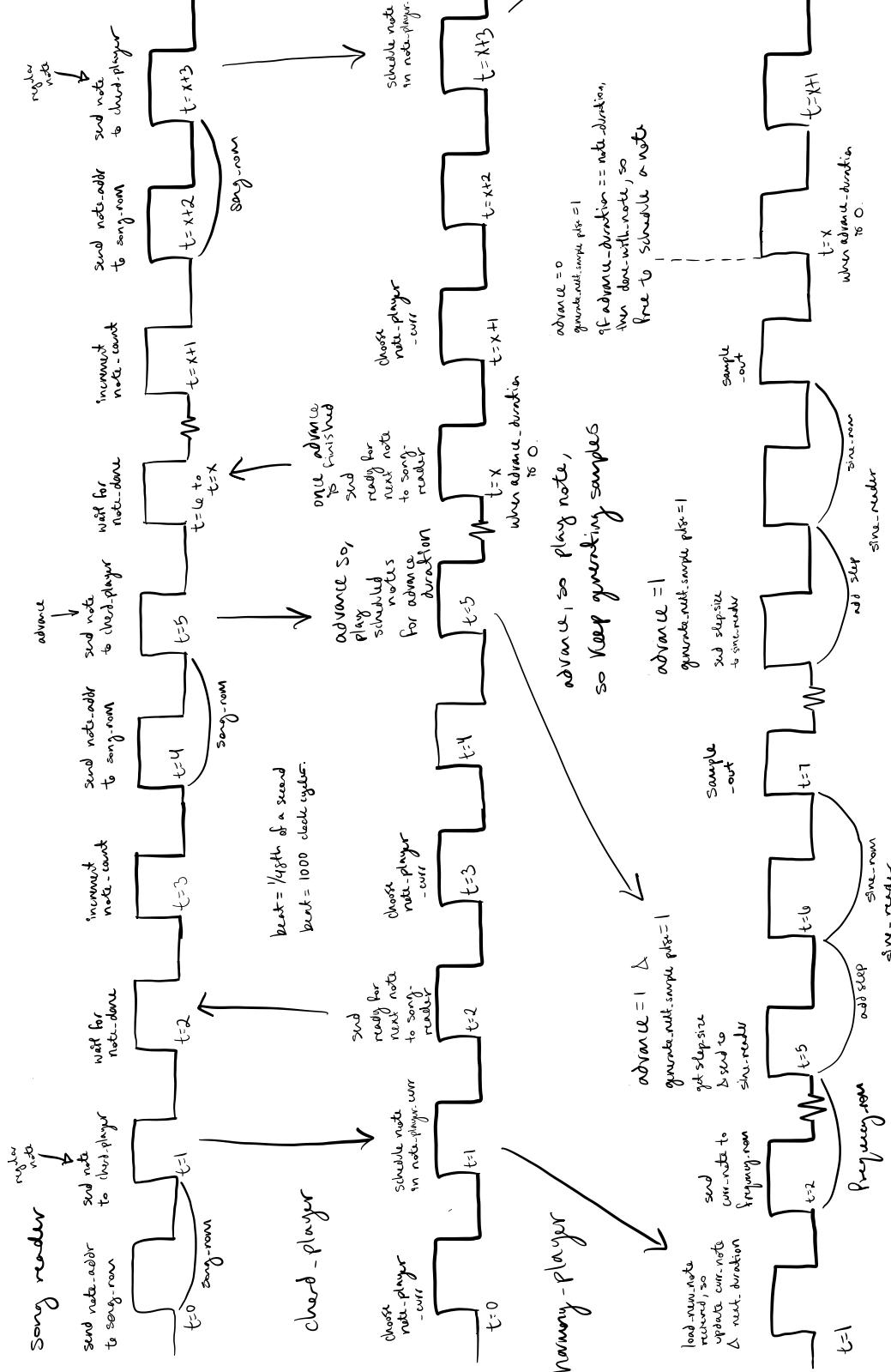


Harmony Player

Harmonics



Training blues song reader, chord player, note player



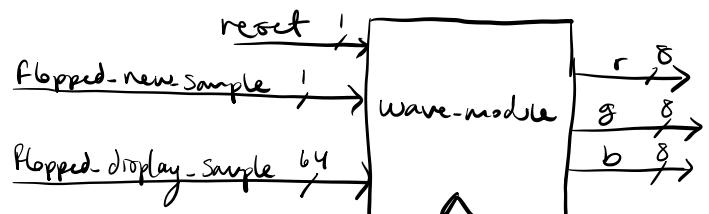
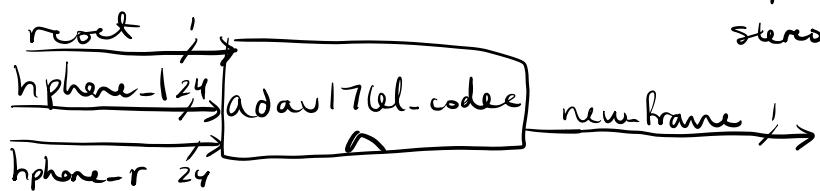
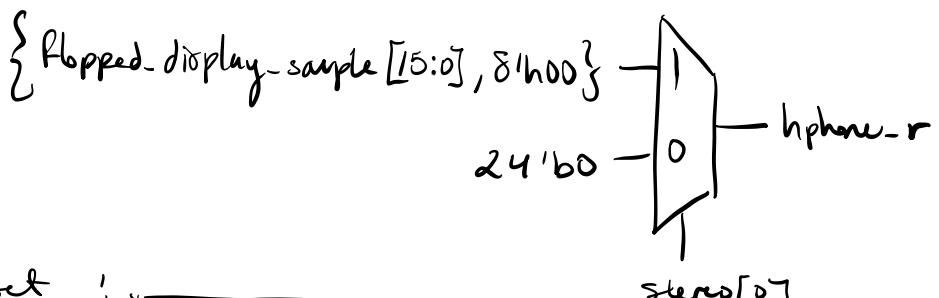
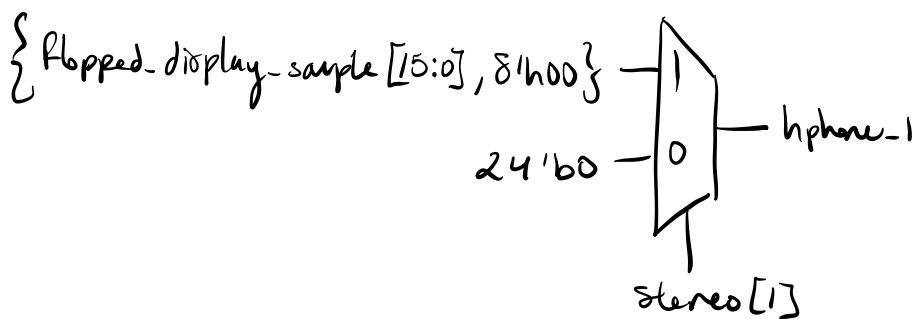
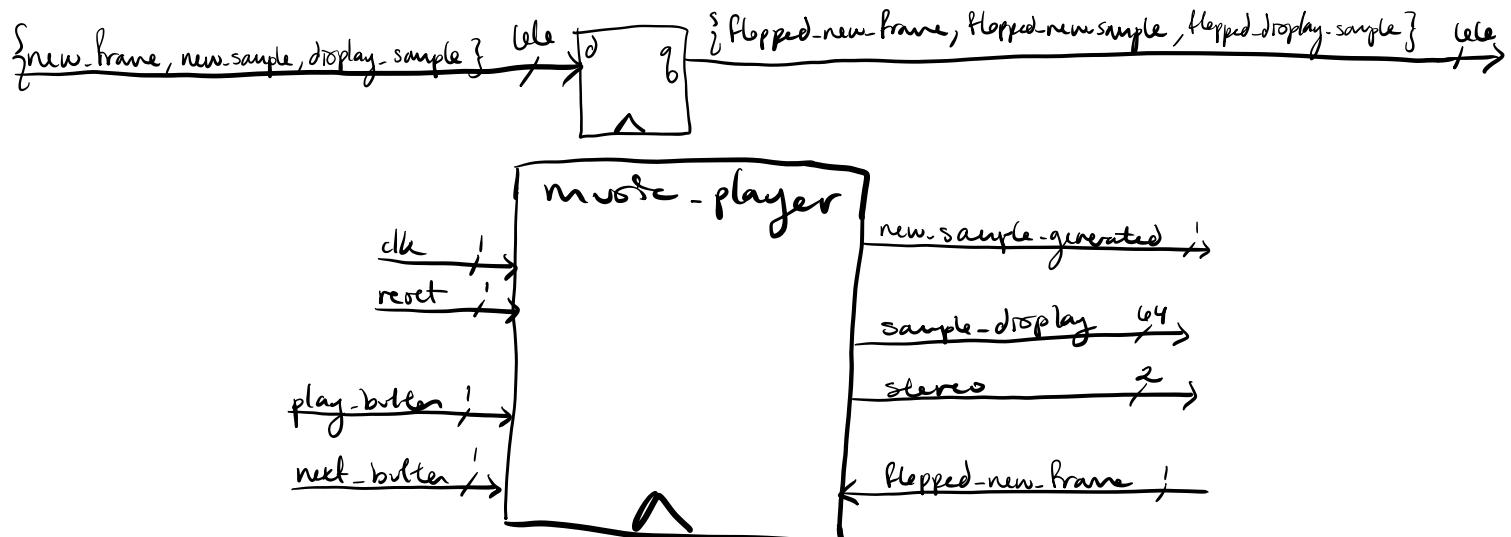
Final_top.v

input

- sydck
- btn
- adaw176el interface

output

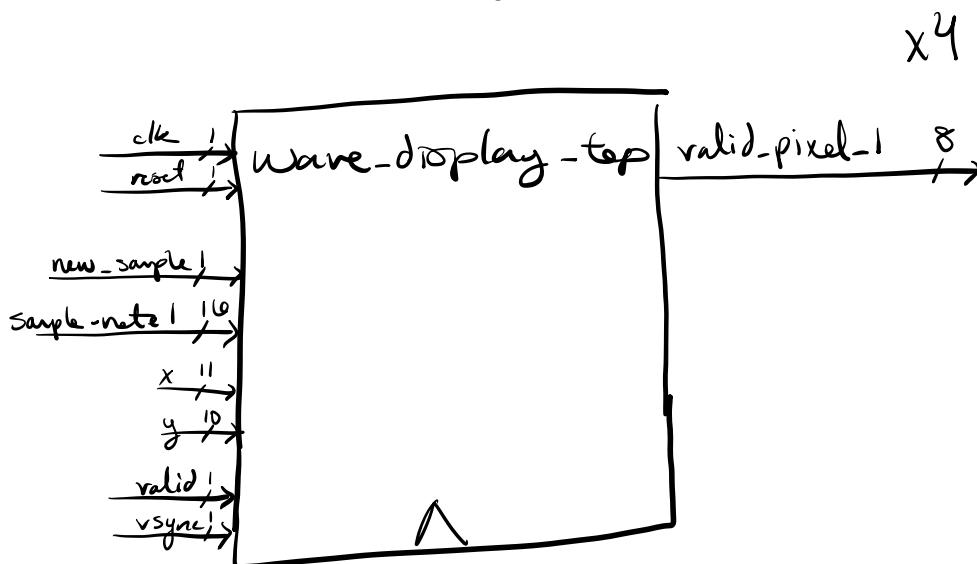
- adaw176el interface
- LEDs
- HDMI output



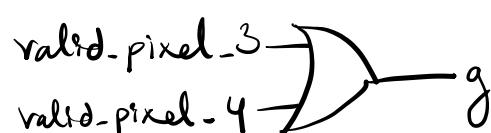
Wave-module

| <u>input</u> | <u>output</u> |
|------------------------|----------------------------------|
| .clk | |
| .reset | |
| .new_sample | |
| .display-sample [w3:0] | .r [7:0] .g [7:0] .b [7:0] |
| .x [10:0] | |
| .y [9:0] | |
| .valid | |
| .vsync | |

display-sample $\xrightarrow{64}$ { sample-note1, sample-note2, sample-note3, sample-chord }



Instantiate 4 wave-display-top
For note1, note2, note3, & chord



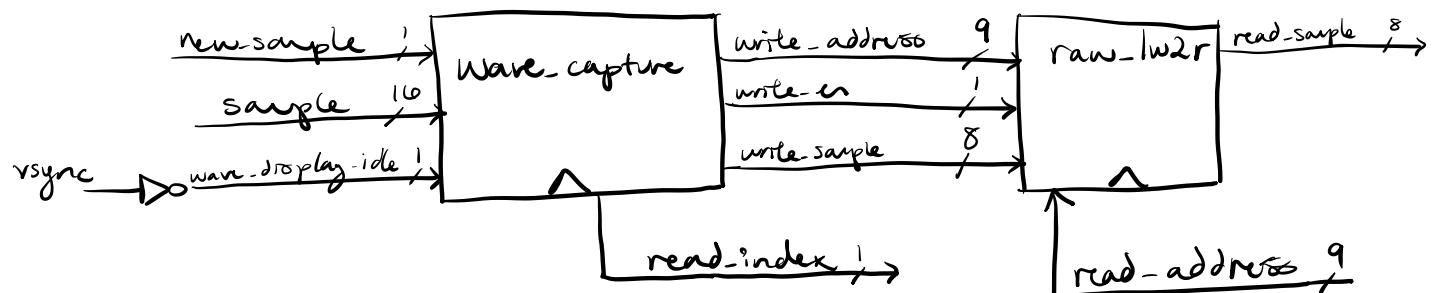
Wave Doplay Top

input

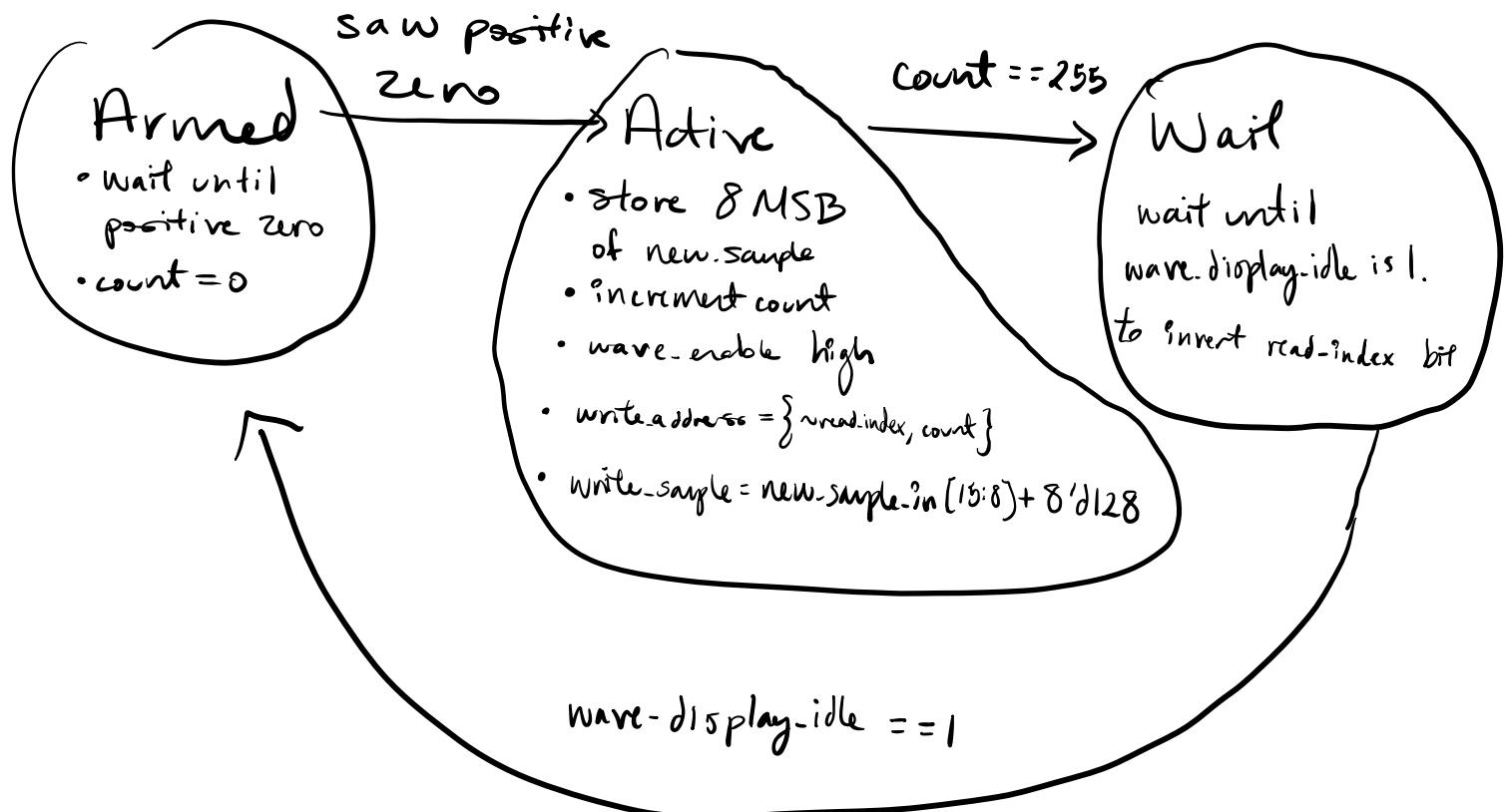
- dtk
- reset
- new-sample
- sample [16:0]
- x [10:0]
- y [9:0]
- valid
- vsync

outpt

valid-pixel [7:0]



FSM wave capture



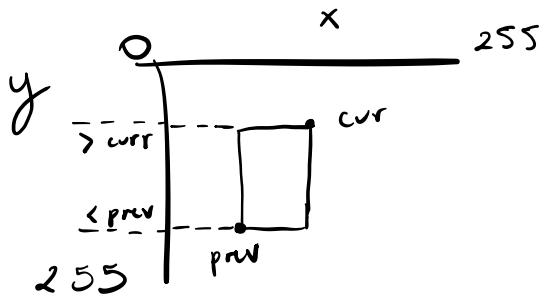
Wave-Display

input

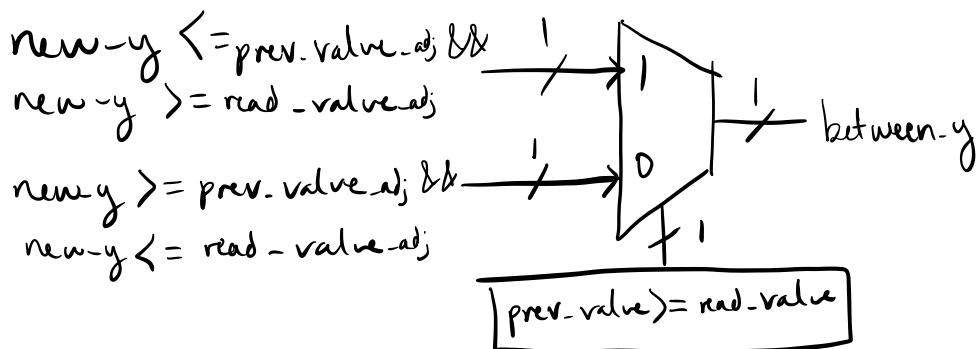
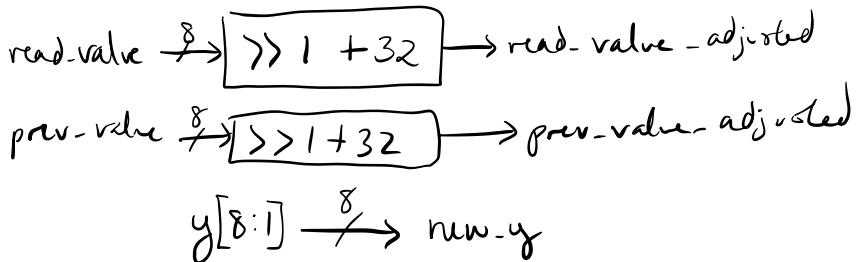
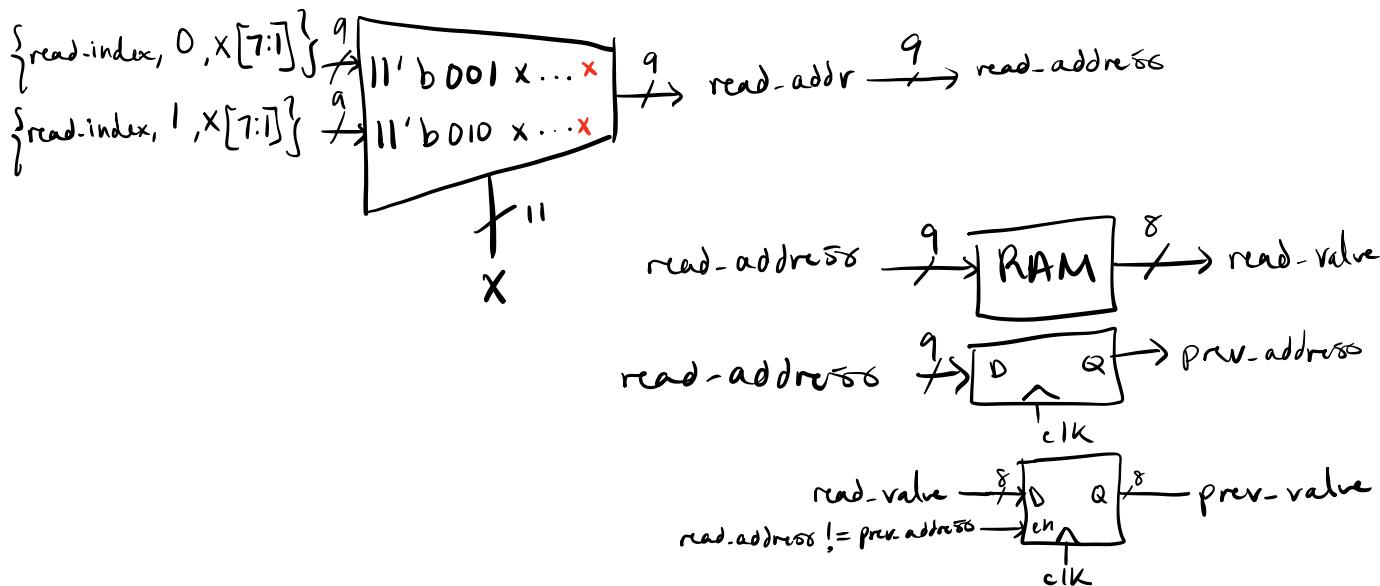
- clk
- reset
- $x[10:0]$
- $y[9:0]$
- valid
- read-index (RAM)
- read-value[7:0] (RAM)

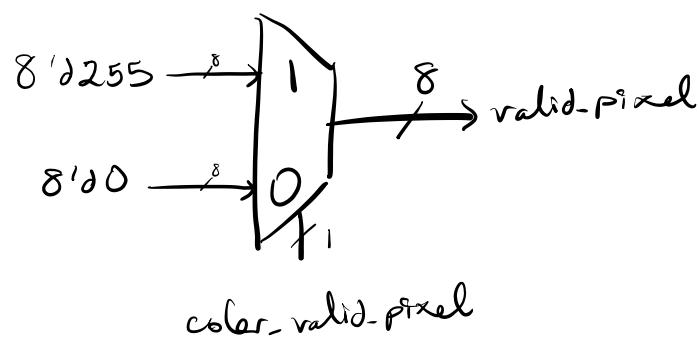
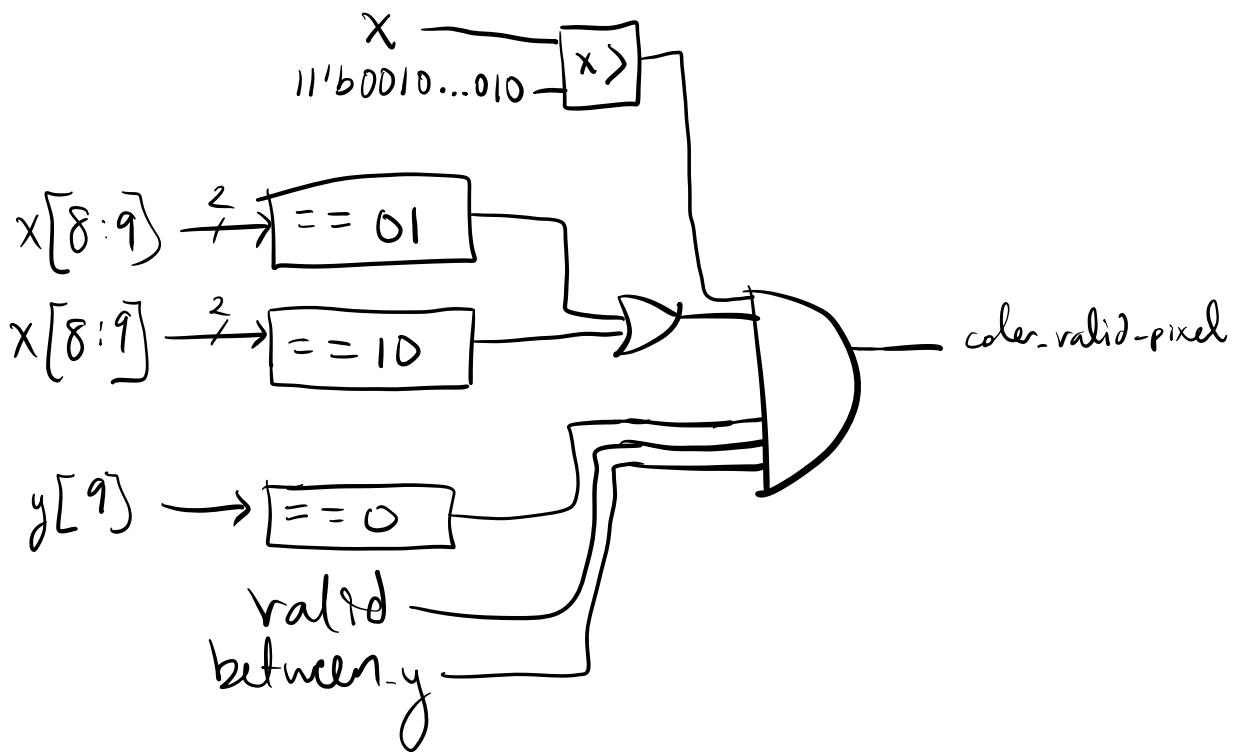
output

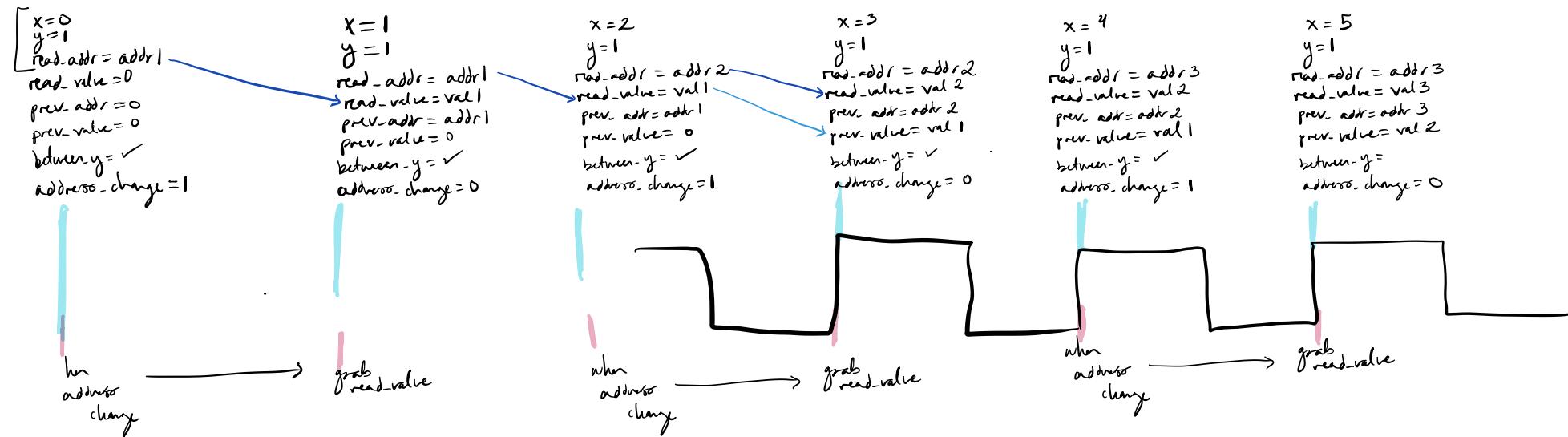
- read-address [8:0] (RAM)
- valid, pixel [7:0]



$$\text{read-address} = \{\text{read-index}, x[9], x[7:1]\}$$







Terminating
 Wave
 Display