Theatre Lighting Board

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6.111 Design Presentation

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lighting board console in a minute

- Purpose: program lighting cues for theatre performances

- How do I use a lighting board?

- Terminology: cue, show, dimmer, channel, intensity, "current cue", live mode, blind mode, wait, link, follow, "look", up time, down time

DMX

Power Cable

Design Overview

- For our lighting board we will be using the keyboard and computer screen for the console

- The processor will be used to handle interactions between the user and the DMX module

- The DMX module will be used to control the dimmer box which will control the lighting instruments

Screen Module

Static Sprites

- Consists of the headings and labels on the screen
- Possibly buffered (currently just combinational logic)

Dynamic Sprites

- Obtains information from the registers
- Changes whenever the information changes
- Displayed using combinational logic
- Color tracking of data

Screen Display

Mode: (live or blind)   Cue: #

Ch 1	Ch 2	Ch 3	Ch 4
%	%	%	%
Ch 5	Ch 6	Ch 7	Ch 8
%	%	%	%

Cue Number: #

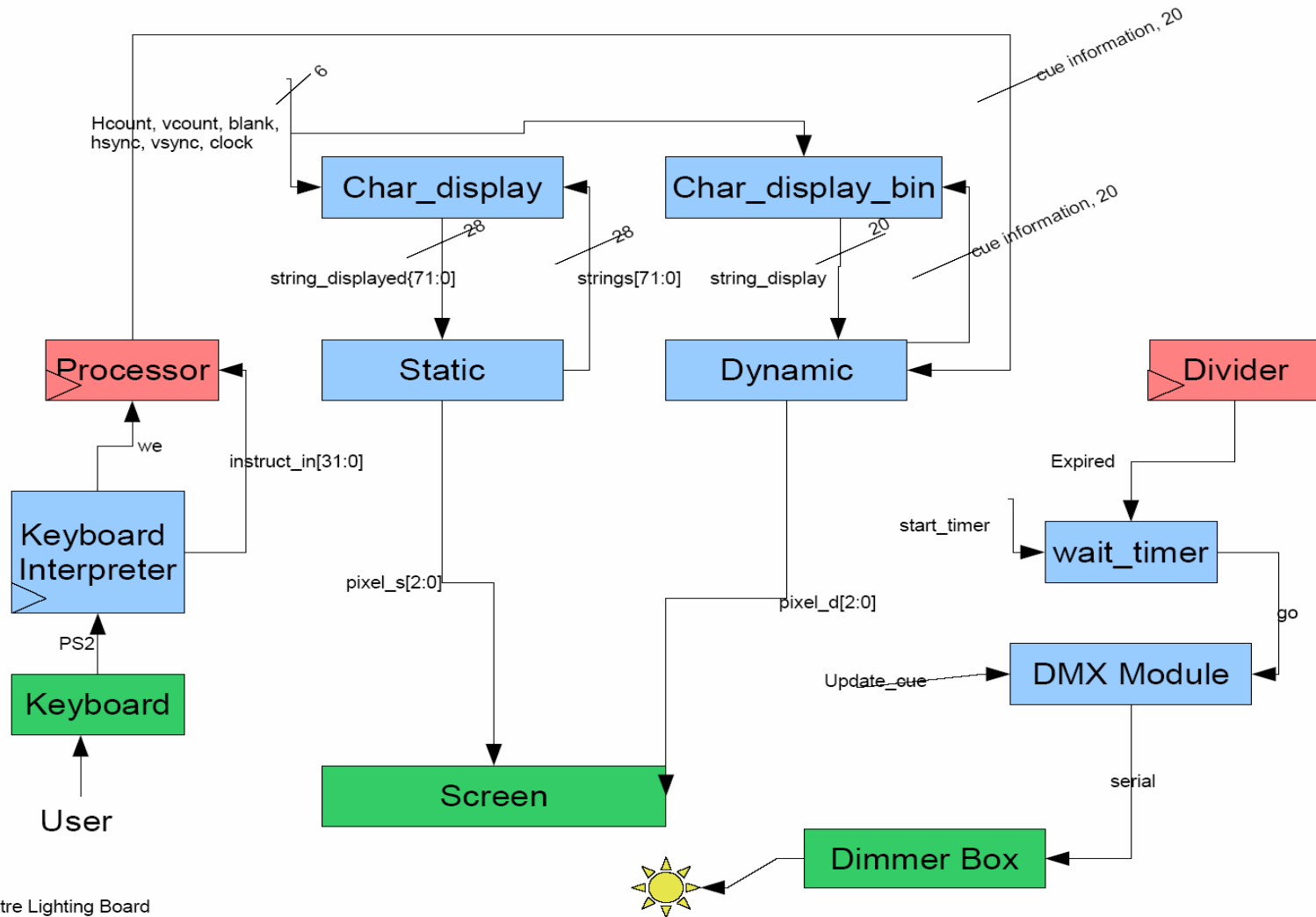|	Cue	Up time	Down time
Up time: #	(past)	#	#
Down time: #	(current)	#	#
Wait: #	(future)	#	#
Follow: #			
Link: #			

Keyboard Module

- The user interface to program a show
- The keys will be given new assignments based on the functions needed to be performed by the processor
- Sends appropriate instructions to the processor depending on the user input
- Combining multiple keystrokes into a single instruction

Body Diagram

Hcount, vcount, blank, hsync, vsync, clock

6

cue information, 20

Char_display

Char_display_bin

28

28

20

cue information, 20

string_displayed{71:0]

strings[71:0]

string_display

Processor

Static

Dynamic

Divider

we

instruct_in[31:0]

Expired

start_timer

wait_timer

Keyboard Interpreter

go

PS2

pixel_s[2:0]

pixel_d[2:0]

Update_cue

DMX Module

Keyboard

serial

User

Screen

Dimmer Box

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Processor

- no instruction memory (instruction buffer and macros instead)

- reduced instruction set (no comparison or branch ops)

- 2 DMX control signals (load cue, update cue)

- registers used for sharing data between screen, DMX module, and cue memory

Processor Block Diagram
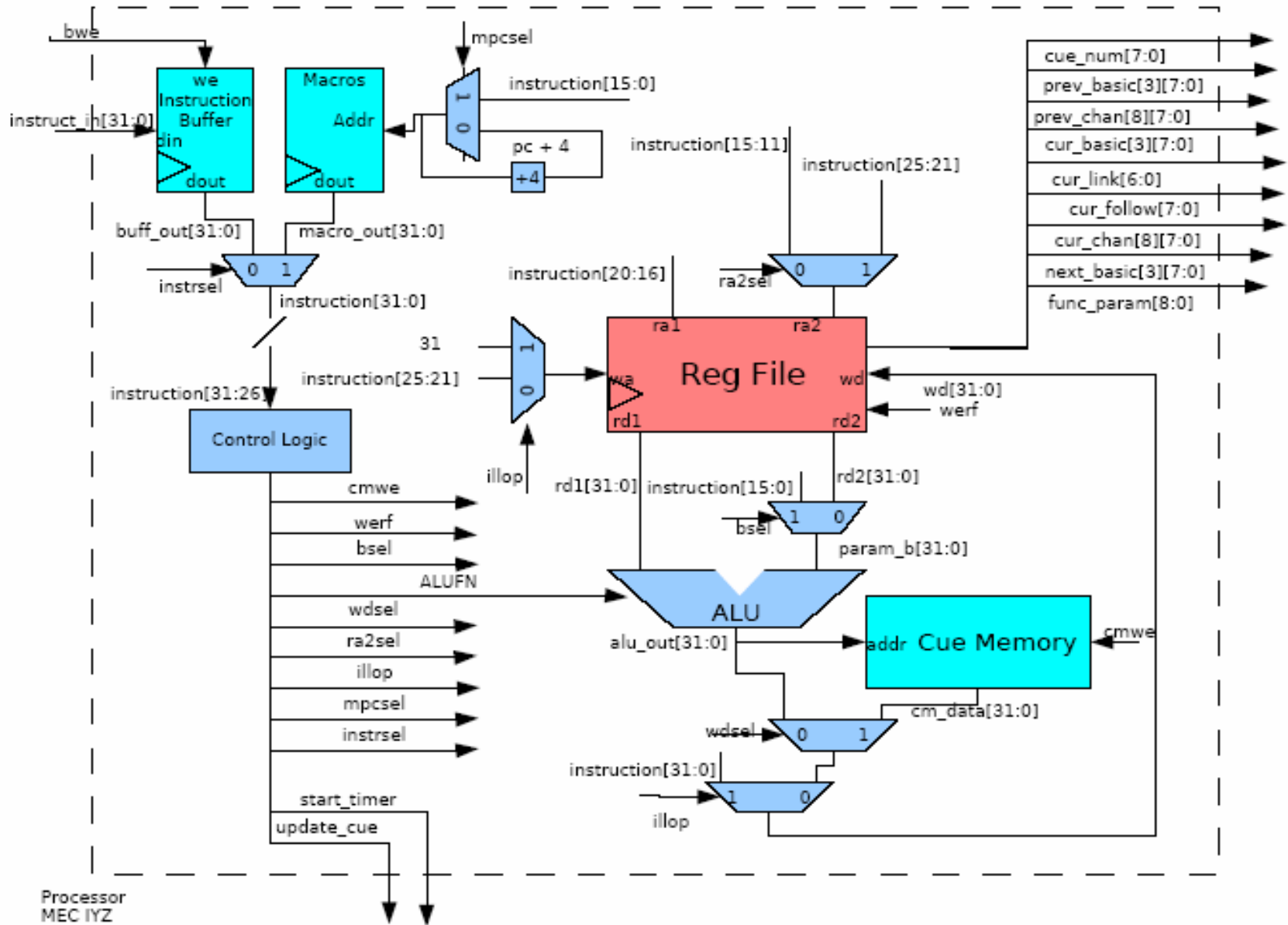
DMX Module

- sends channels intensities to the dimmer box using DMX 512 protocol via the RS-232 serial port

- holds channel intensities for the duration of a cue, changing a channel when edits are made in live mode

- gradually changes channel intensities for bringing a cue up or down

Timeline

- Static Sprites - completed
- Dynamic Sprites – before Thanksgiving
- Keyboard Module – before Thanksgiving
- DMX Module – December 1st
- Processor – before Thanksgiving

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Processor
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