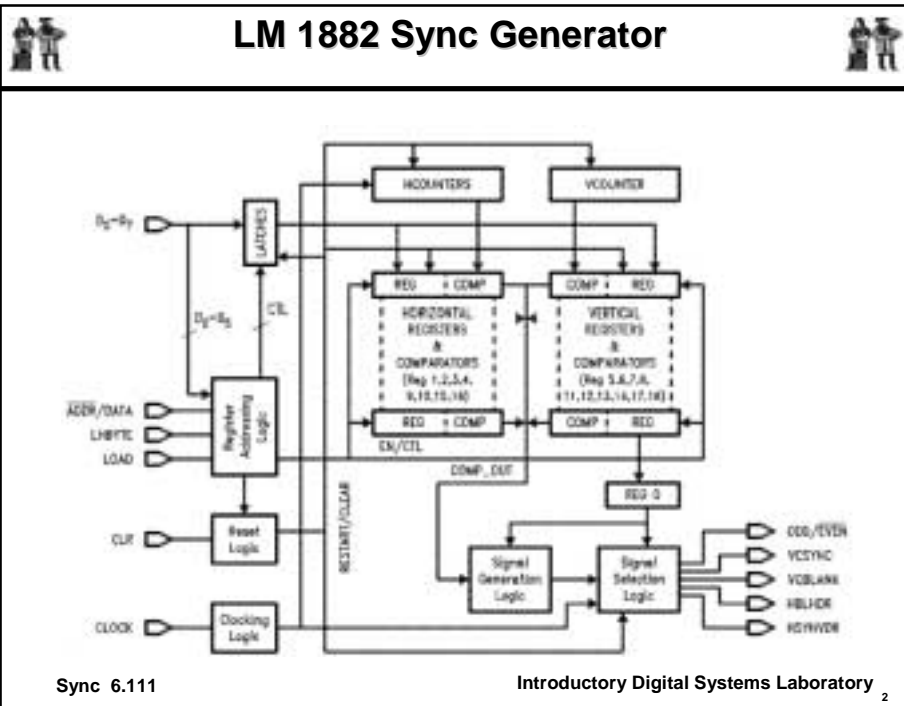


Video Sync

Sync 6.111 Introductory Digital Systems Laboratory 1

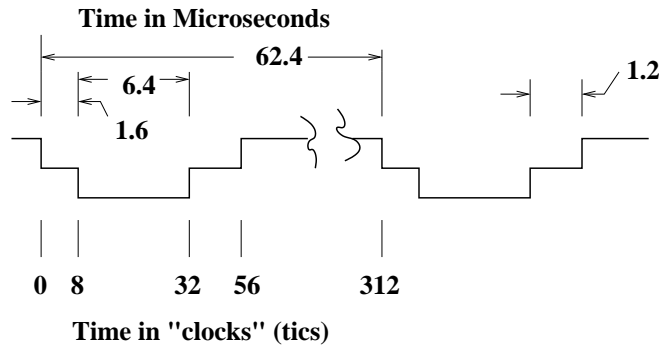




Example Timing



- LM1882 is flexible: timing information is stored in registers.
- See data sheet no. 95 for particulars.
- One example is:
 - 256 pixels wide
 - 256 lines
 - 5 MHz clock (probably not typical)



Sync 6.111

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Sync Generator: Register Contents



Register Contents:

Horizontal (Line) Control

R1	9	Horizontal Front Porch	} Time in "clocks"
R2	33	Horizontal Sync Pulse End	
R3	57	Horizontal Blanking	
R4	312	Line Width – must be even	

Vertical (Frame) Control

R5	4	Vertical Front Porch	} Lines
R6	7	Vertical Sync Pulse End	
R7	21	Vertical Blanking	
R8	276	Frame: 256 lines + 20 lines blanking	

Register 0: Contents 0110 0001 1000

Bit 10: Enable System Clock	1
Bit 9: Disable Equalization	1
Bits 8:5 Sync Pulses Active Low	0000
Bits 4:3 Non-Interlaced	11
Bits 2:0 Default Output Config:	000

Pin 12 CBLANK, Pin 13 HGATE, Pin14 CSYNC, Pin 15 VGATE

Sync 6.111

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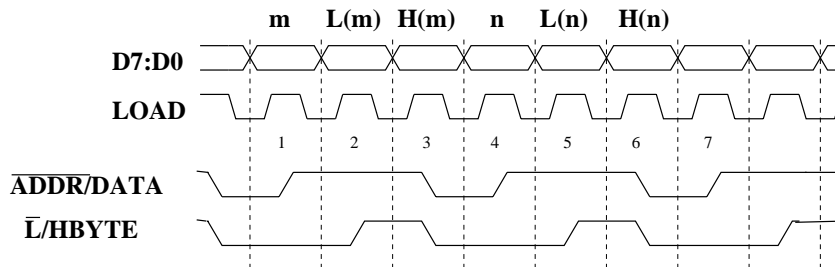


Sync Generator – Manual Mode



- LM1882 must be loaded on power up.

Cycle No.	Load Falling Edge	Load rising edge
1	Enable Manual Addressing	Load address m
2	Enable Lbyte Data Mode	Load Lbyte m
3	Enable Hbyte Data Mode	Load Hbyte m
4	Enable Manual Addressing	Load address n
5	Enable Lbyte Data Mode	Load Lbyte n
6	Enable Hbyte Data Mode	Load Hbyte n



Sync 6.111

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Sync Generator – Automatic Mode

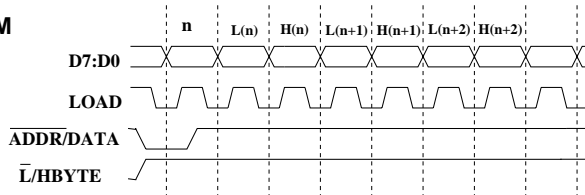
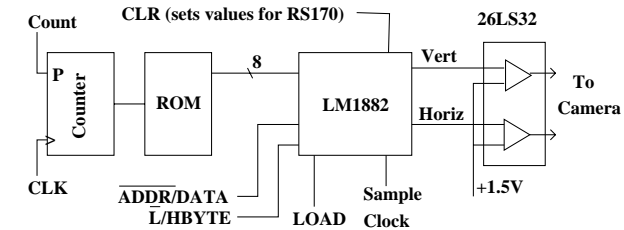


LM 1882 must be loaded on power up.

Use a ROM \ (or PROM) to hold configuration values.

Instantiate the ROM from LPM (FPGA).

Design a (minor) FSM to do the programming of the LM1882 registers.



Sync 6.111

Introductory Digital Systems Laboratory 6



Sync Separator



- A sync separator operates in the reverse direction.
 - GS4981 generates composite sync from video.
 - It also generates separated sync signals.
- However, your pixel clock must be synchronized with the recovered horizontal sync.
 - If you do this synchronization with the pixel clock signal directly, then the pixel clock used will “crawl” a whole pixel time.
 - It is better to use a faster clock, say 4 times, to do the synchronization and then the “crawl” will only be $\frac{1}{4}$ of a pixel time (distance).

