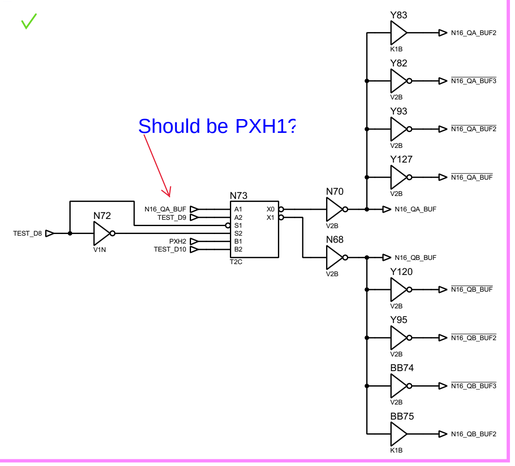
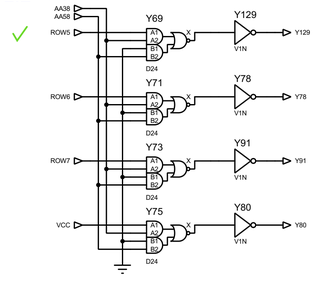
```
VRAM address (1 word per address)
FEDC BA98 7654 3210
0000 00xx xxxx xxxx Layer FIX tilemap
0000 01xx xxxx xxxx Layer A tilemap
0000 10xx xxxx xxxx Layer B tilemap
0000 1100 xxxx xxxx A Y scroll
0000 1101 xxxx xxxx A X scroll
0001 00xx xxxx xxxx Layer FIX codes
0001 01xx xxxx xxxx Layer A codes
0001 10xx xxxx xxxx Layer B codes
0001 1100 xxxx xxxx B Y scroll
0001 1101 xxxx xxxx B X scroll
            x xxxx x Tilemaps X
          xx xxx     Tilemaps Y
```

1.1



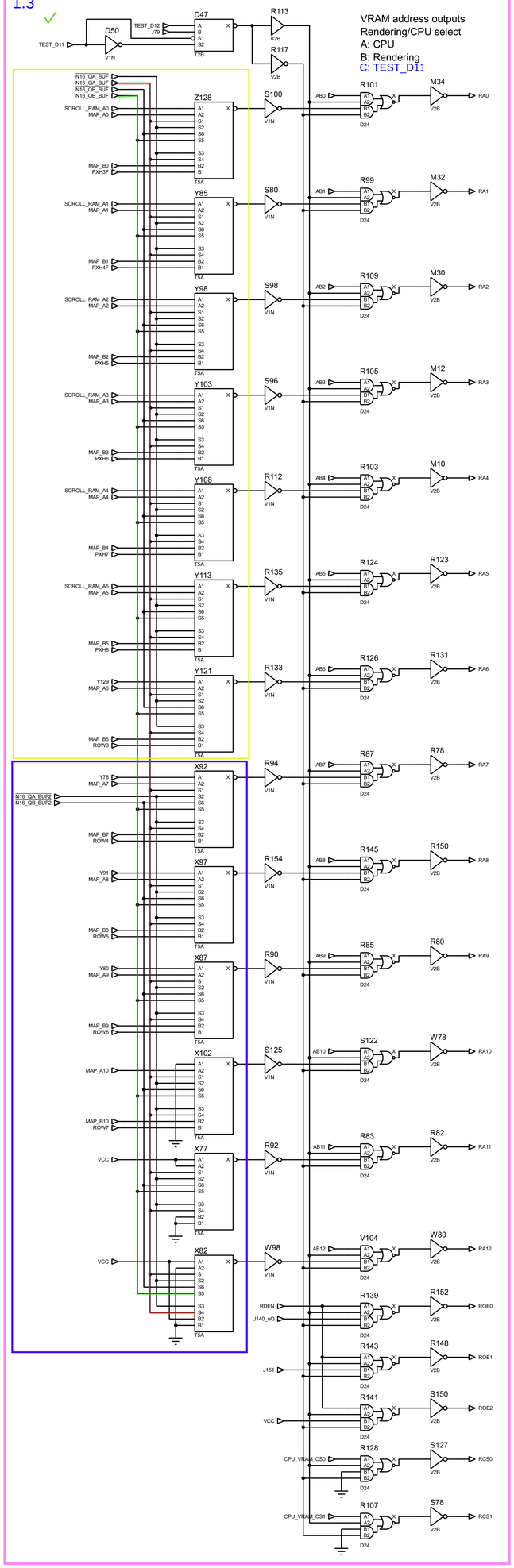
TEST_D13 Addresses Selector

1.2 From 4.3



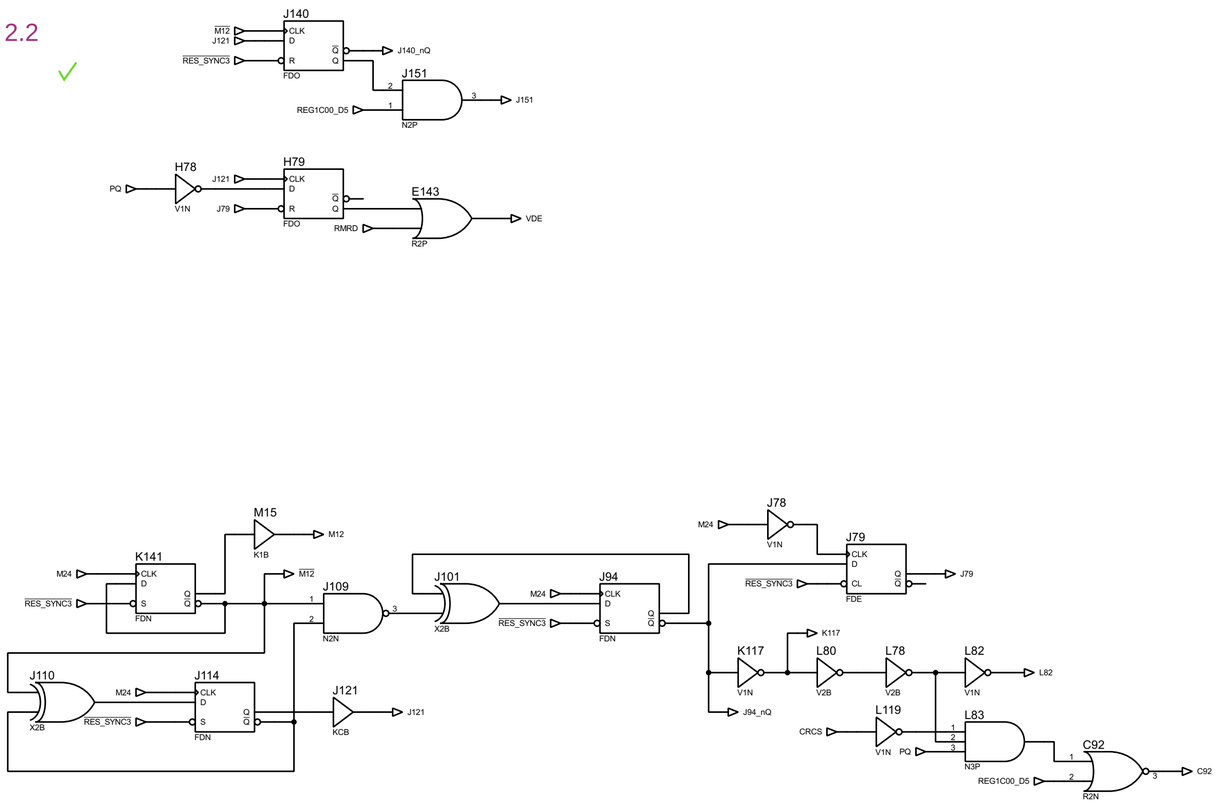
Selection can be simplified using AA38 (and AA38n) only, AA58 always selects 1'b0.

1.3

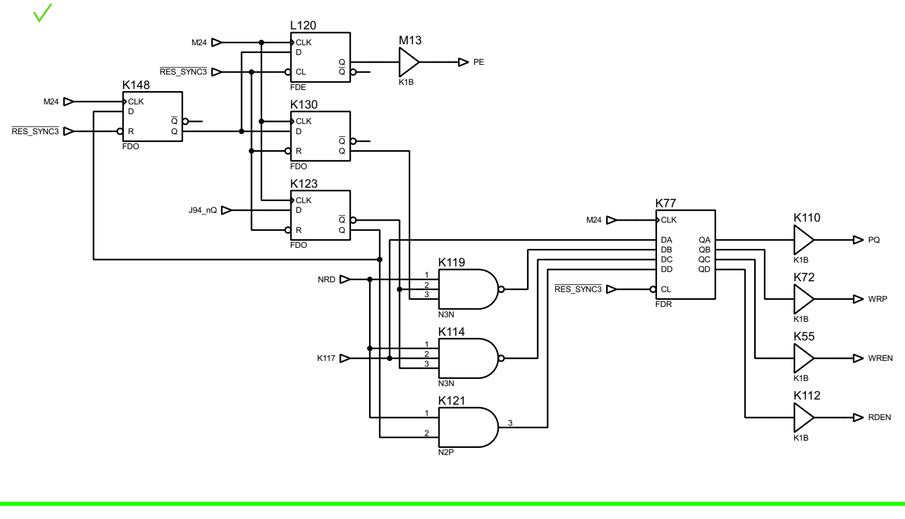


FILE NAME: k052109.pdsprj	DATE: 22/06/2021
DESIGN TITLE: Konami 052109 VRAM ADDRESS	PAGE: 1 of 8
BY: Sean Gonsalves REV: A	

2.2 ✓



2.1 ✓

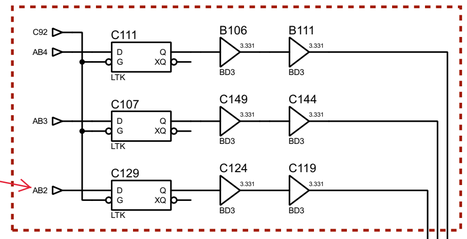


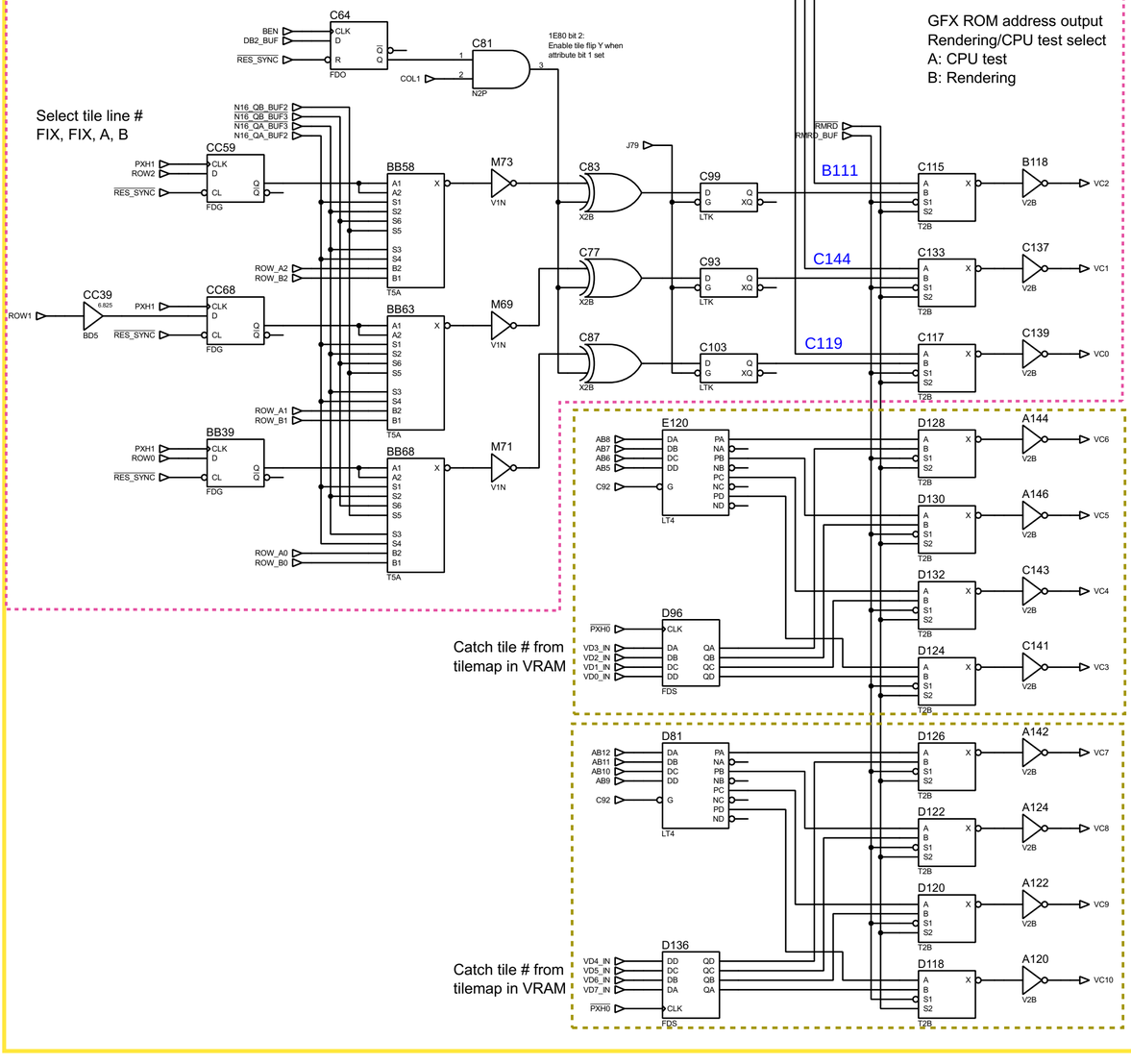
TIMING SIGNALS

2.3 ✓

CPU -> GFX ROM address lines are +2 because GFX ROM data is 32-bit

SKIP because AB[1:0] used to select byte

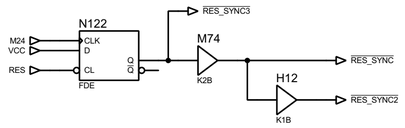




FILE NAME: k052109.pdsprj		DATE: 22/06/2021
DESIGN TITLE: Konami 052109 GFX ROM ADDRESS		PAGE: 2 of 8
BY: Sean Gonsalves	REV: A	

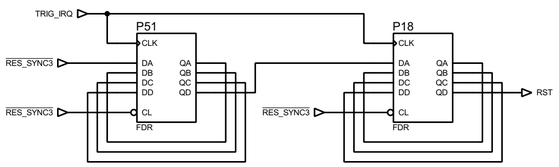
RES_SYNC signals generator

3.1 ✓

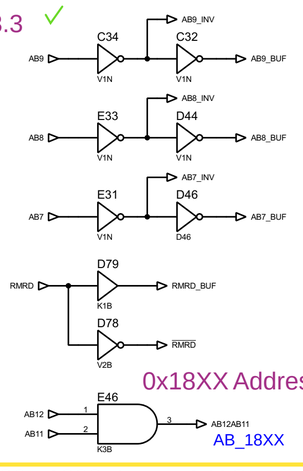


3.2 ✓

8-frame delay for
RES -> RST
Same in k051962 ?



3.3 ✓

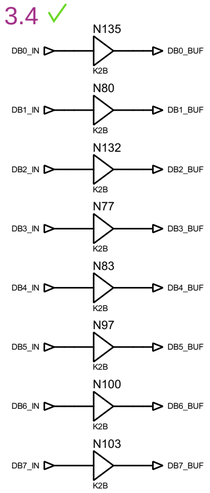


0x18XX Address

AB_18XX

180c-1833: Layer A Y Scroll

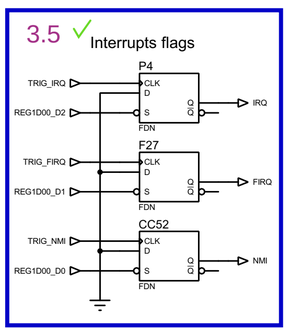
3.4 ✓



wire [7:0] DB_IN

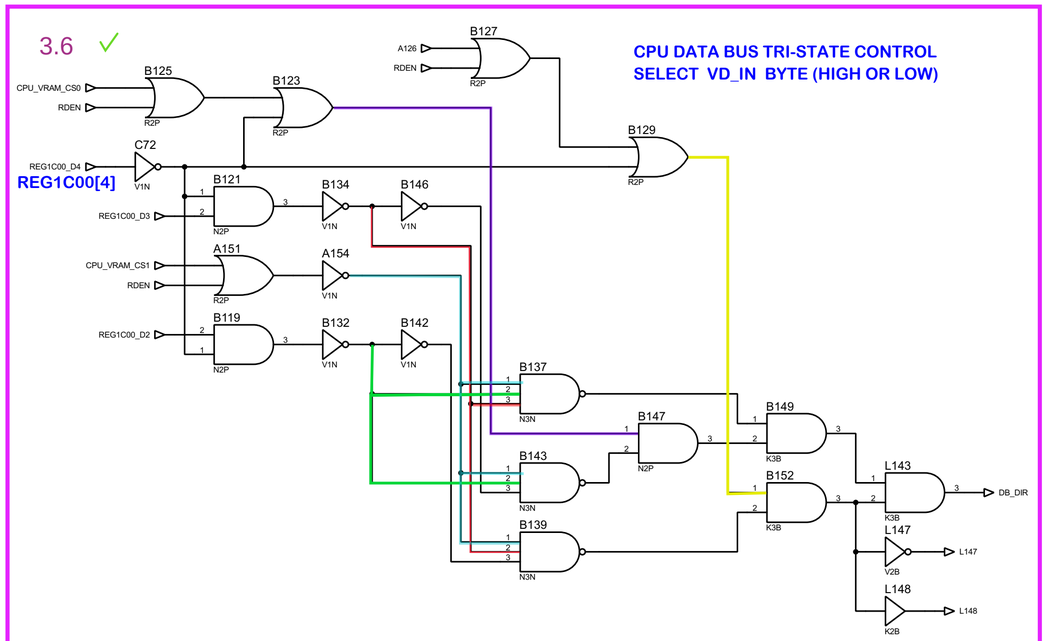
wire [7:0] DB_BUF

3.5 ✓ Interrupts flags



3.6 ✓

CPU DATA BUS TRI-STATE CONTROL
SELECT VD_IN BYTE (HIGH OR LOW)



3.7 ✓

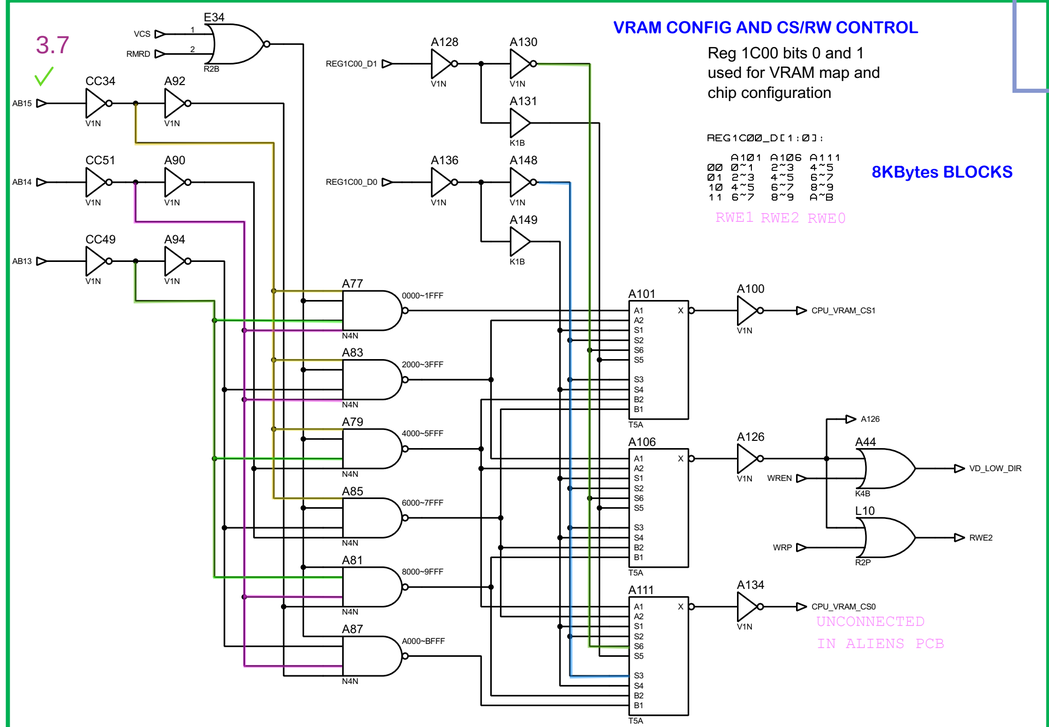
VRAM CONFIG AND CS/RW CONTROL

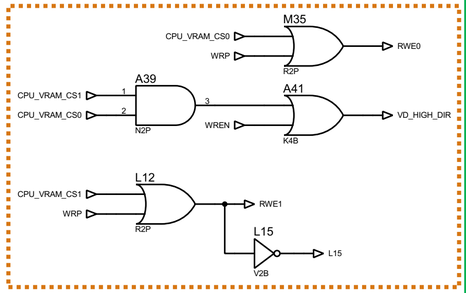
Reg 1C00 bits 0 and 1
used for VRAM map and
chip configuration

```
REG1C00_D[1:0]:
00  0~1  2~3  4~5
01  2~3  4~5  6~7
10  4~5  6~7  8~9
11  6~7  8~9  A~B
```

8KBytes BLOCKS

RWE1 RWE2 RWE0



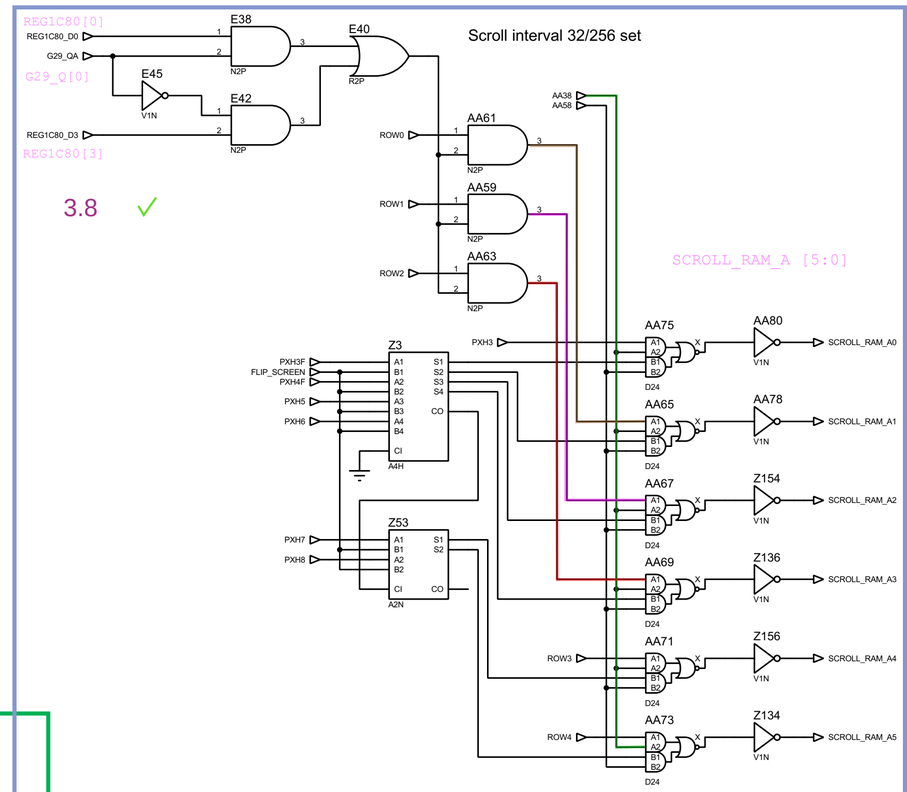


REG1C80[0]
REG1C80_D0
G29_QA
G29_Q[0]
REG1C80_D3
REG1C80[3]

3.8 ✓

Scroll interval 32/256 set

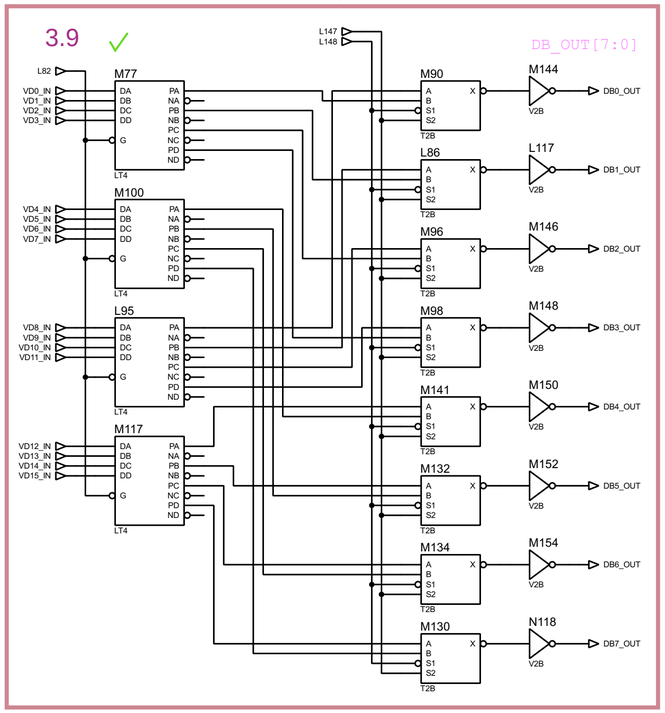
SCROLL_RAM_A [5:0]



VRAM read by CPU

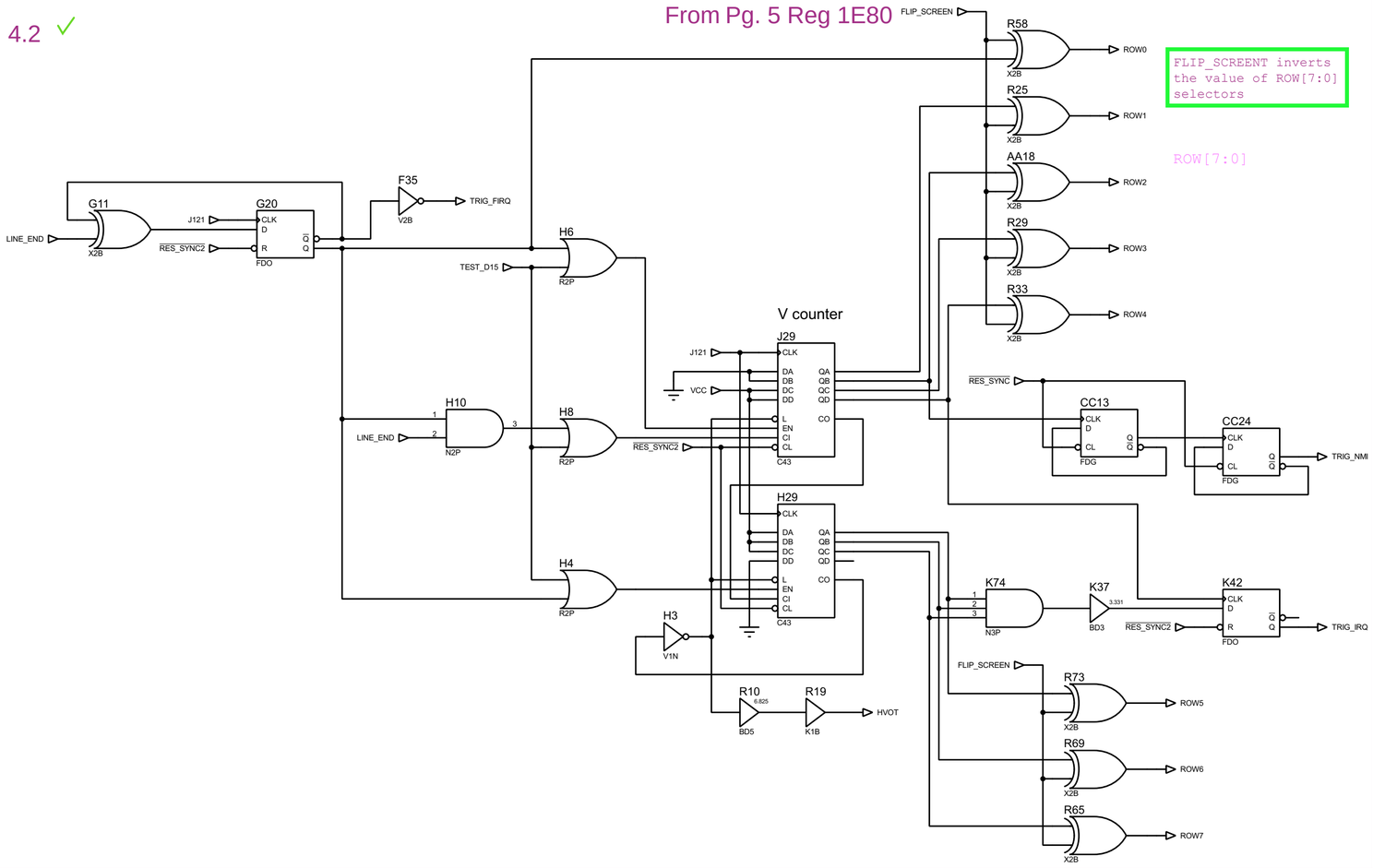
3.9 ✓

DB_OUT[7:0]

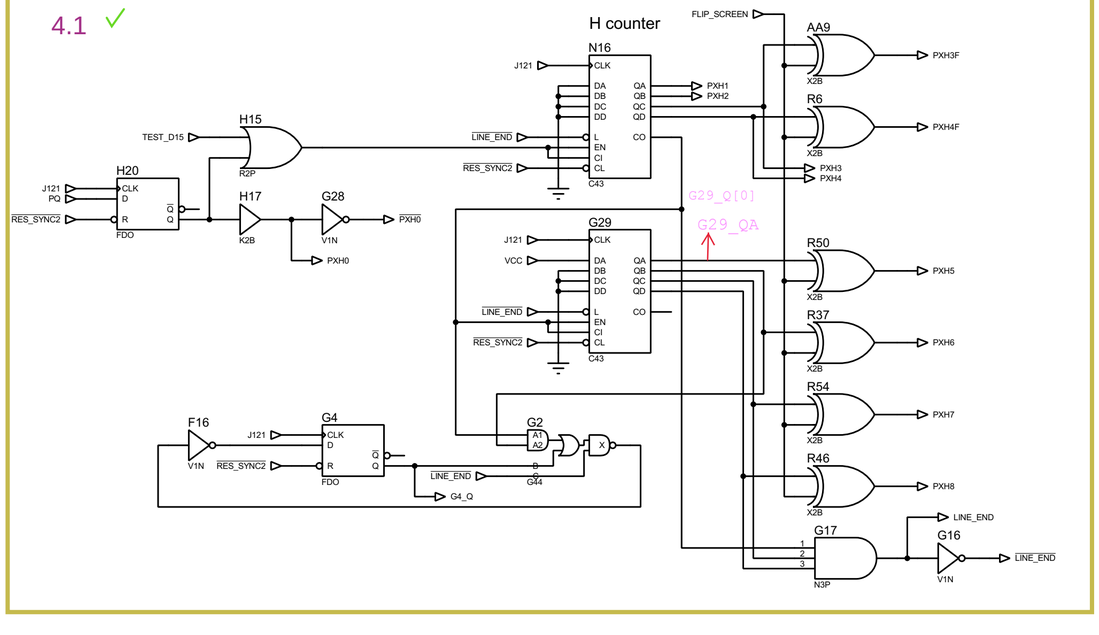


FILE NAME: k052109.pdsprj			DATE: 22/06/2021
DESIGN TITLE: Konami 052109 CPU STUFF			PAGE: 3 of 8
BY: Sean Gonsalves	REV: A		

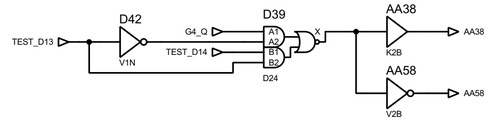
4.2 ✓



4.1 ✓

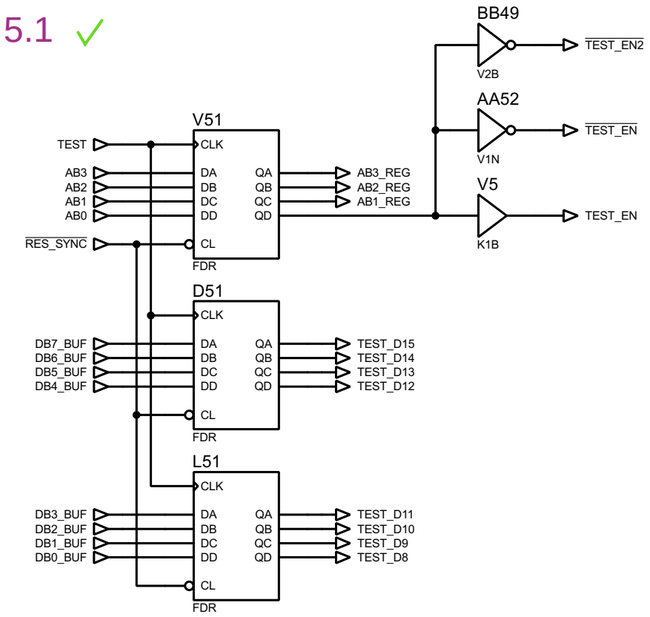


4.3 ✓

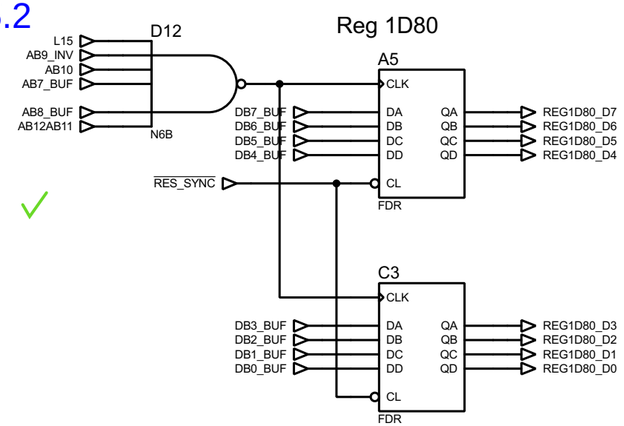


FILE NAME:	k052109.pdsprj	DATE:	22/06/2021
DESIGN TITLE:	Konami 052109 H/V COUNTERS	PAGE:	4 of 8
BY: Sean Gonsalves	REV: A		

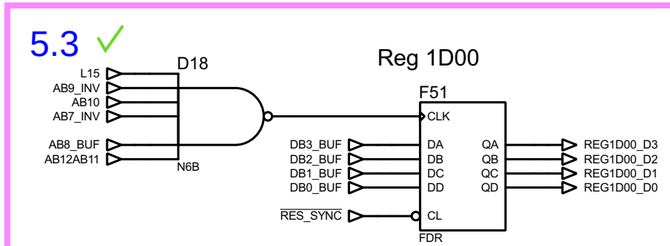
5.1 ✓



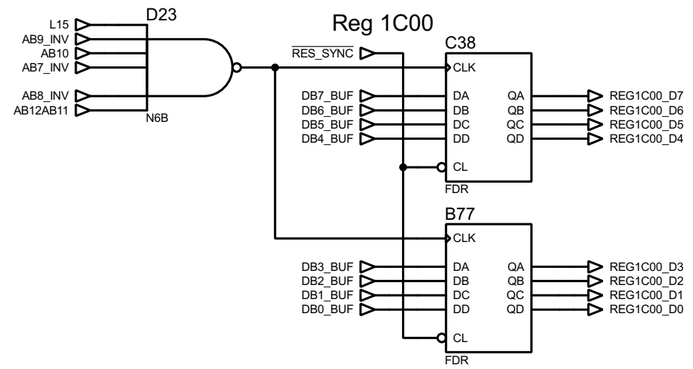
5.2



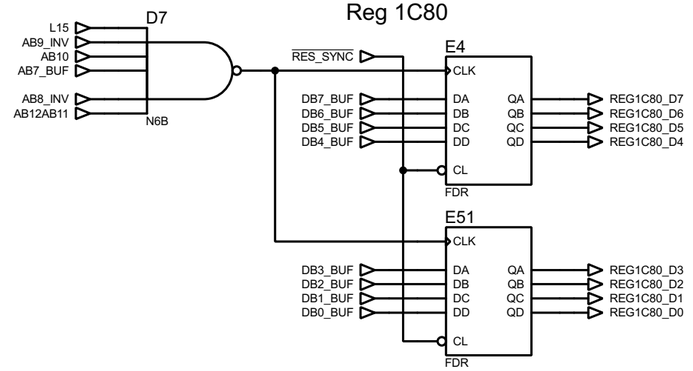
5.3 ✓



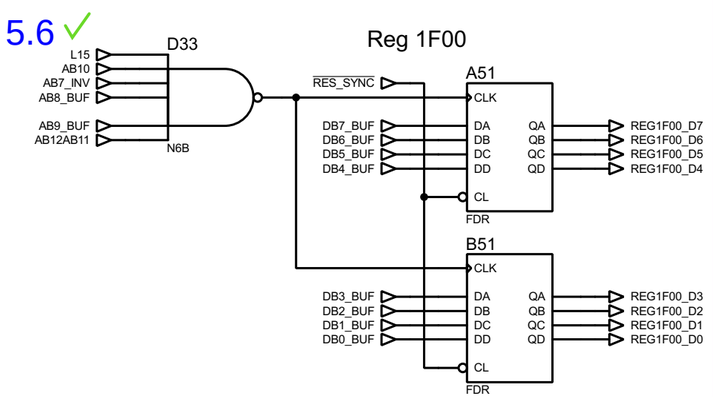
5.4 ✓



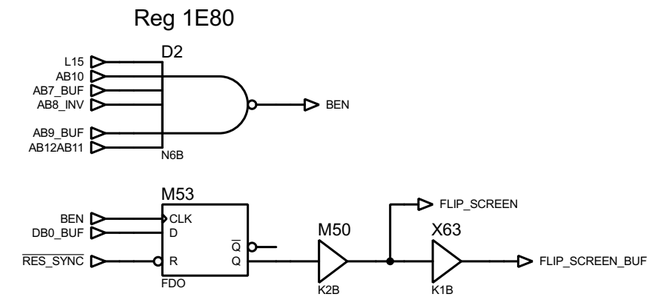
5.5 ✓



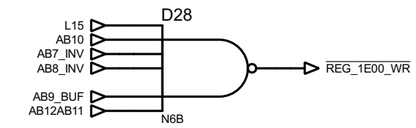
5.6 ✓



5.7 ✓



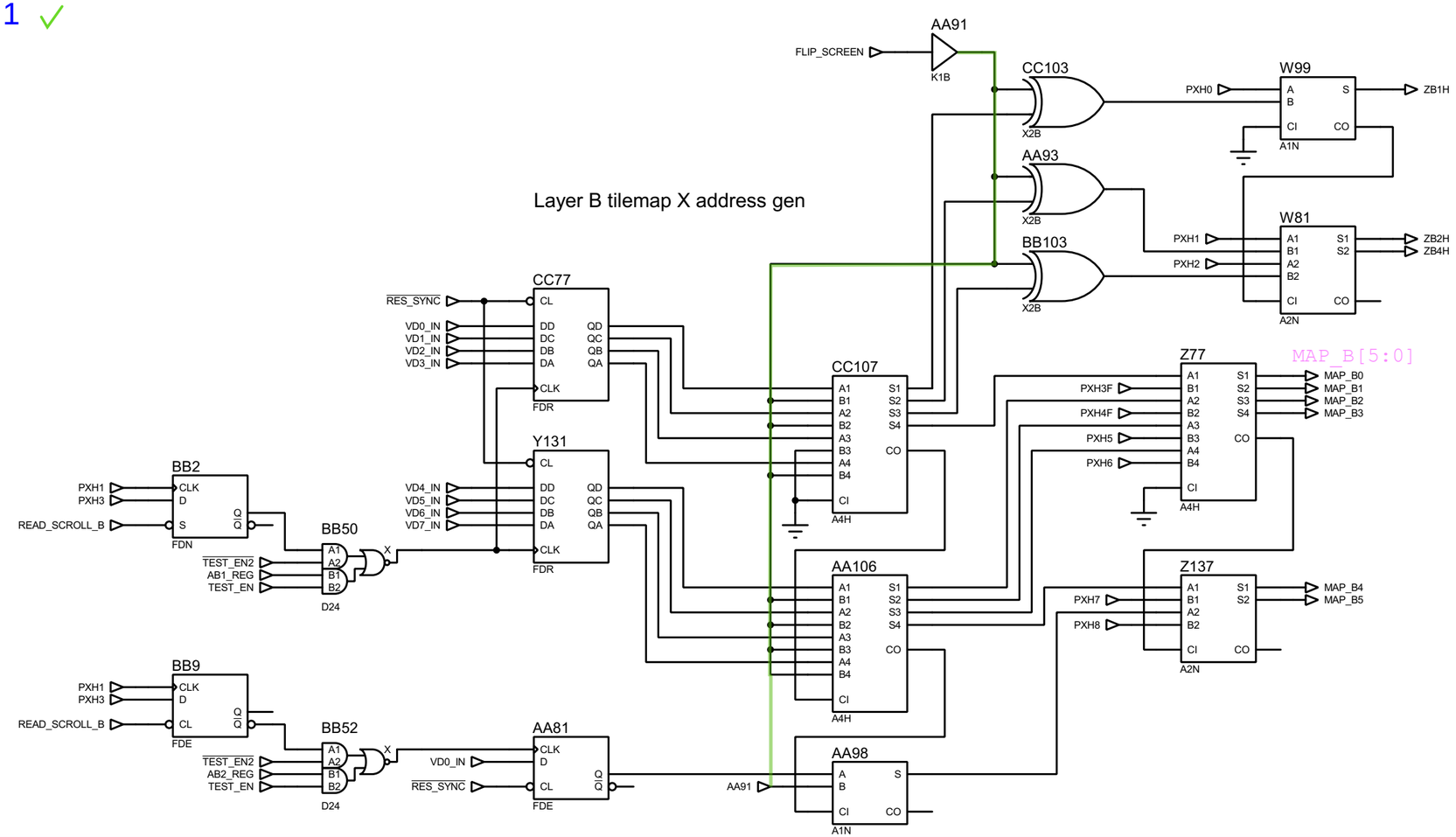
5.8 ✓



FILE NAME: **k052109.pdsprj**		DATE: **22/06/2021**
DESIGN TITLE: **Konami 052109** REGISTERS		PAGE: 5 of 8
BY: Sean Gonsalves	REV: A	

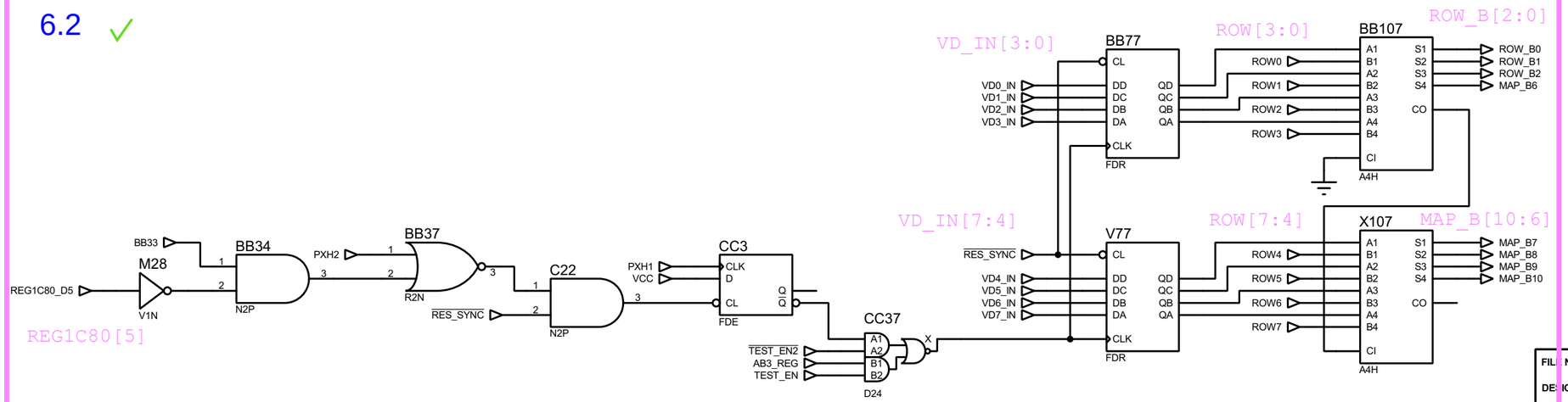
6.1 ✓

Layer B tilemap X address gen



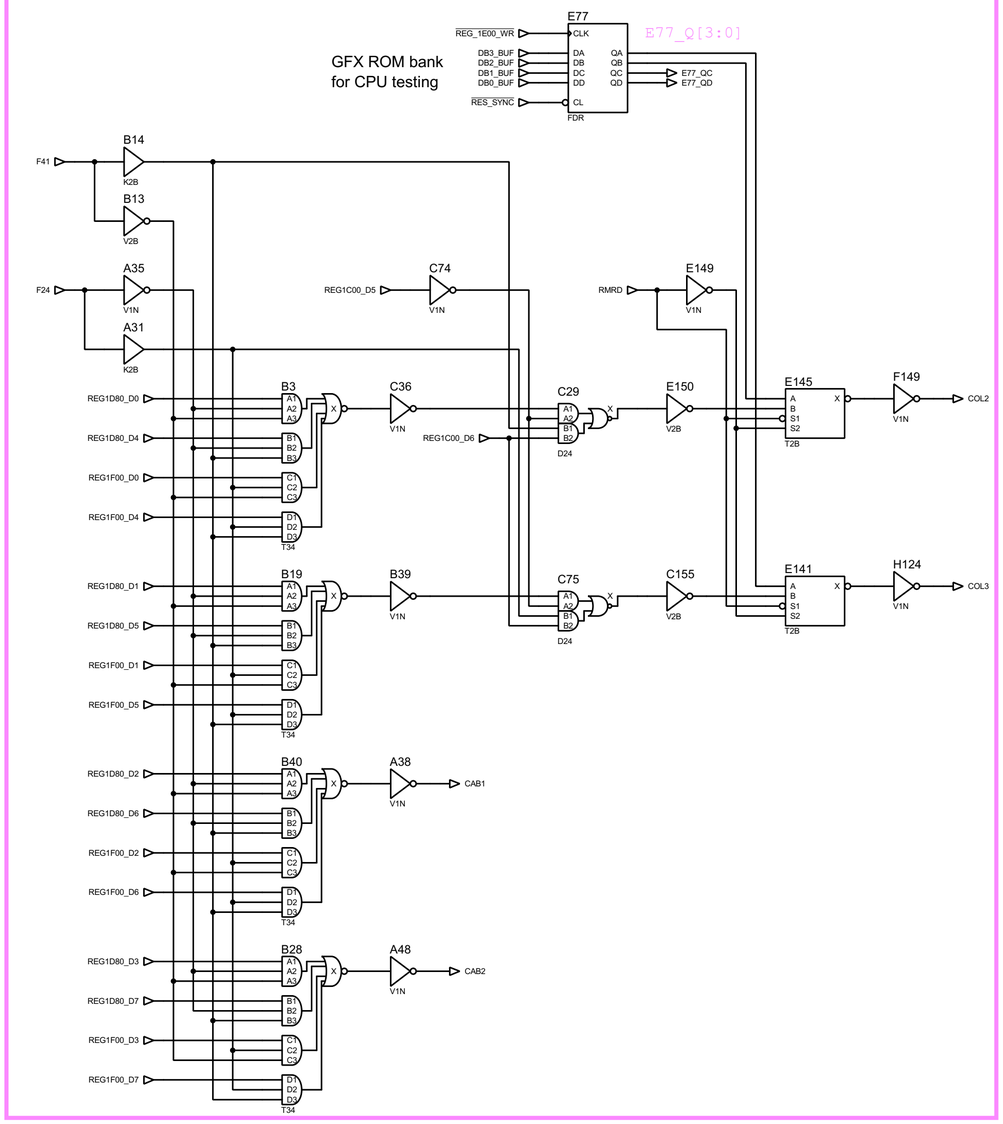
6.2 ✓

Layer B tilemap Y address gen

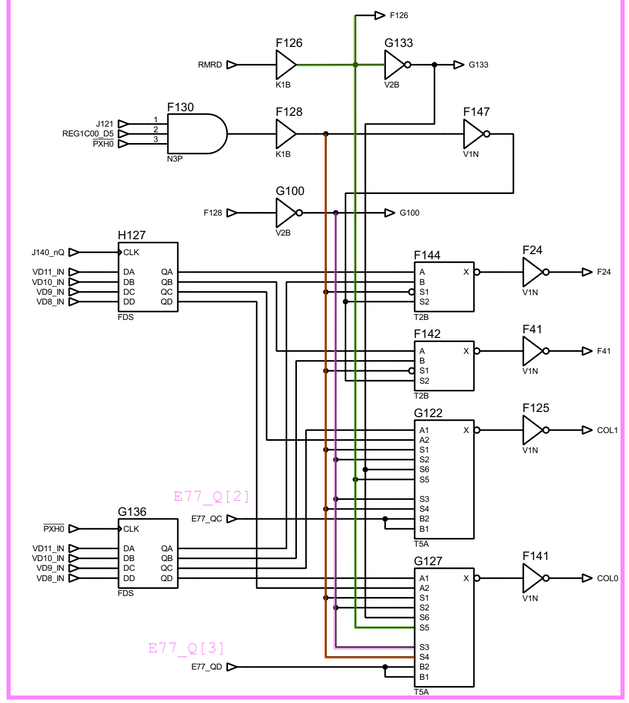


FILE NAME:	k052109.pdsprj	DATE:	22/06/2021
DESIGN TITLE:	Konami 052109 LAYER B SCROLL	PAGE:	6 of 8
BY:	Sean Gonsalves	REV:	A

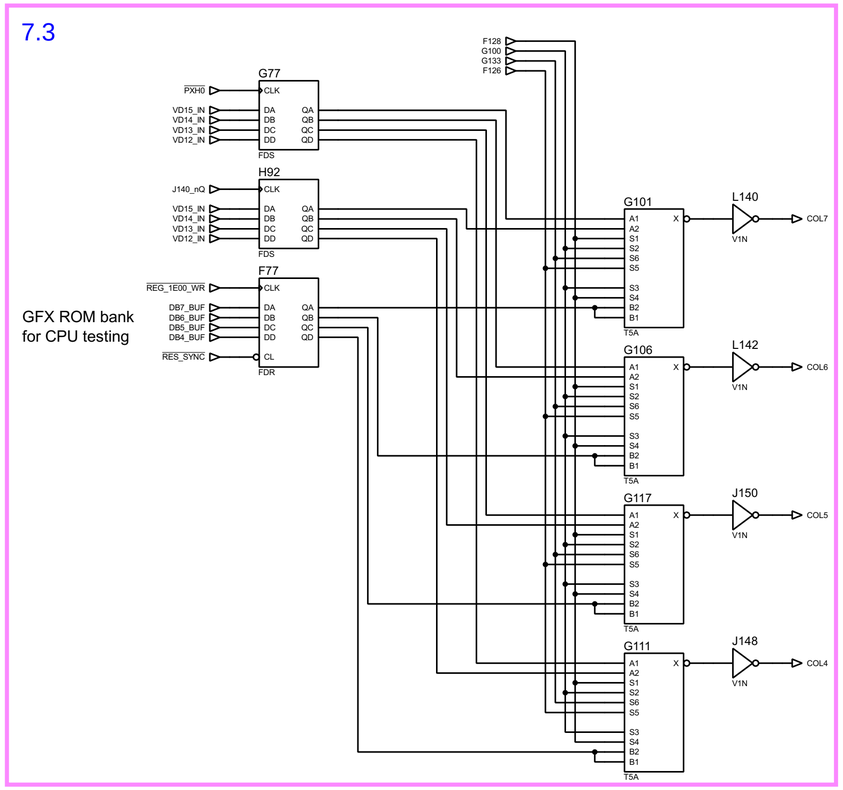
7.2



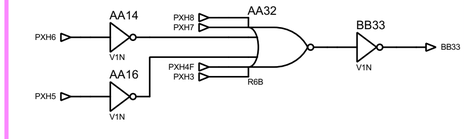
7.1



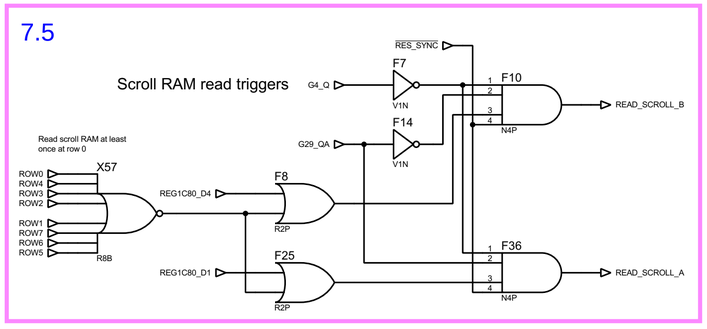
7.3



7.4



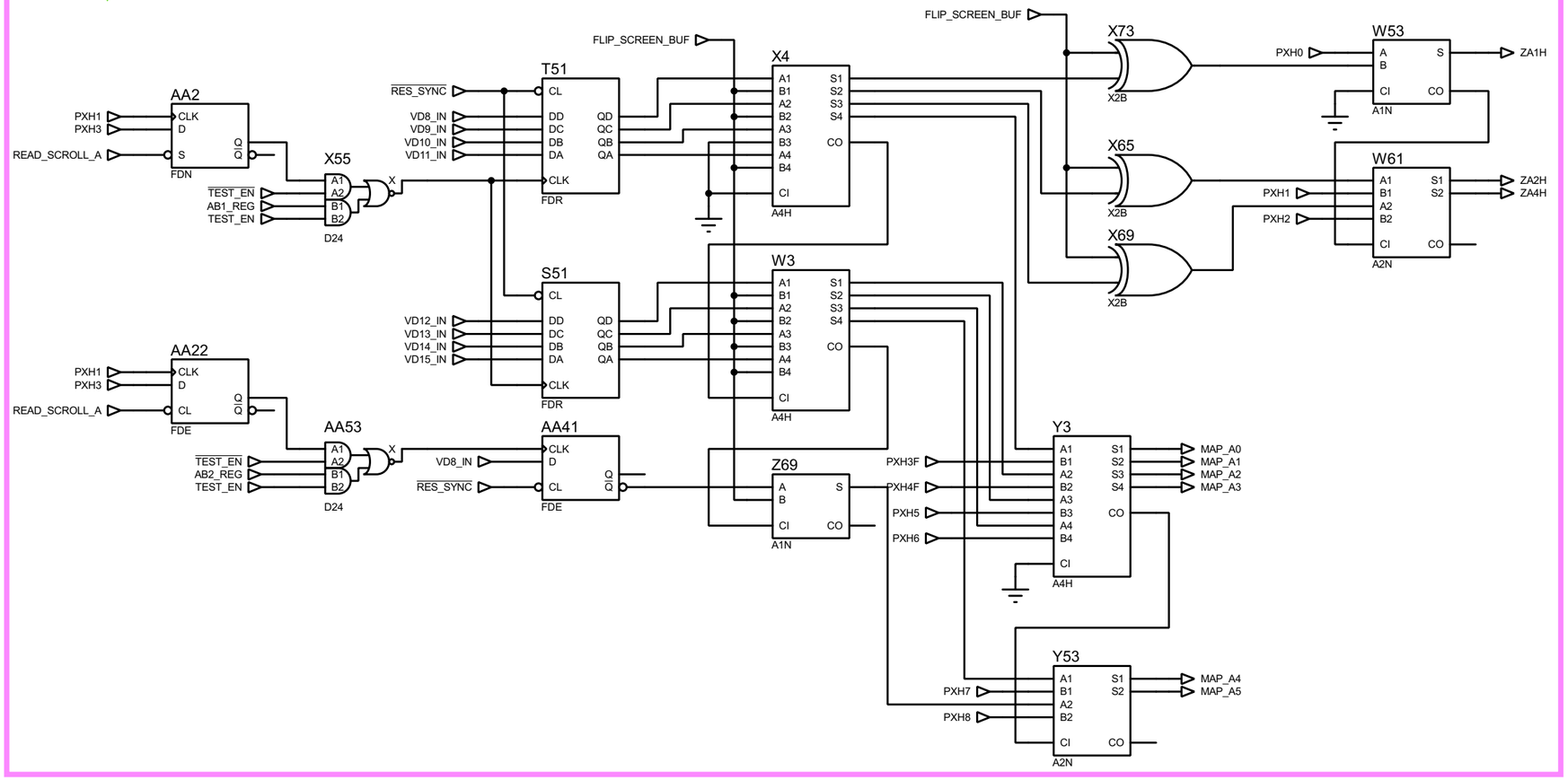
7.5



FILE NAME: k052109.pdsprj		DATE: 22/06/2021
DESIGN TITLE: Konami 052109 COL OUTPUTS		PAGE: 7 of 8
BY: Sean Gonsalves	REV: A	

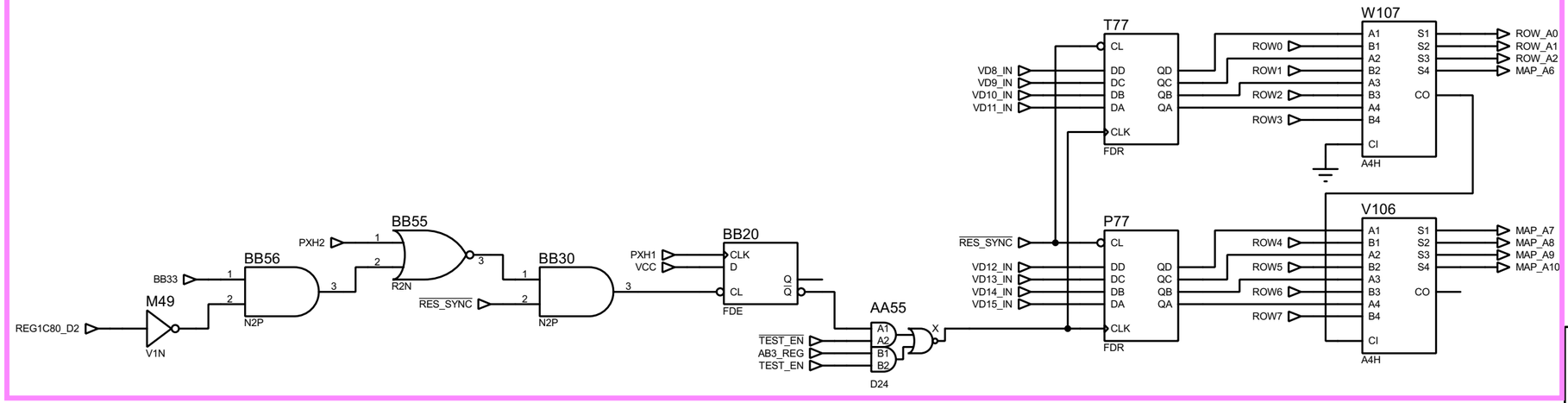
8.1 ✓

Layer A tilemap X address gen



8.2 ✓

Layer A tilemap Y address gen



FILE NAME: **k052109.pdsprj**			DATE: **22/06/2021**
DESIGN TITLE: **Konami 052109** LAYER A SCROLL			PAGE: **8 of 8**
BY: **Sean Gonsalves**	REV: **A**		