

Ulf Skutnabba, twitter: @skutis77

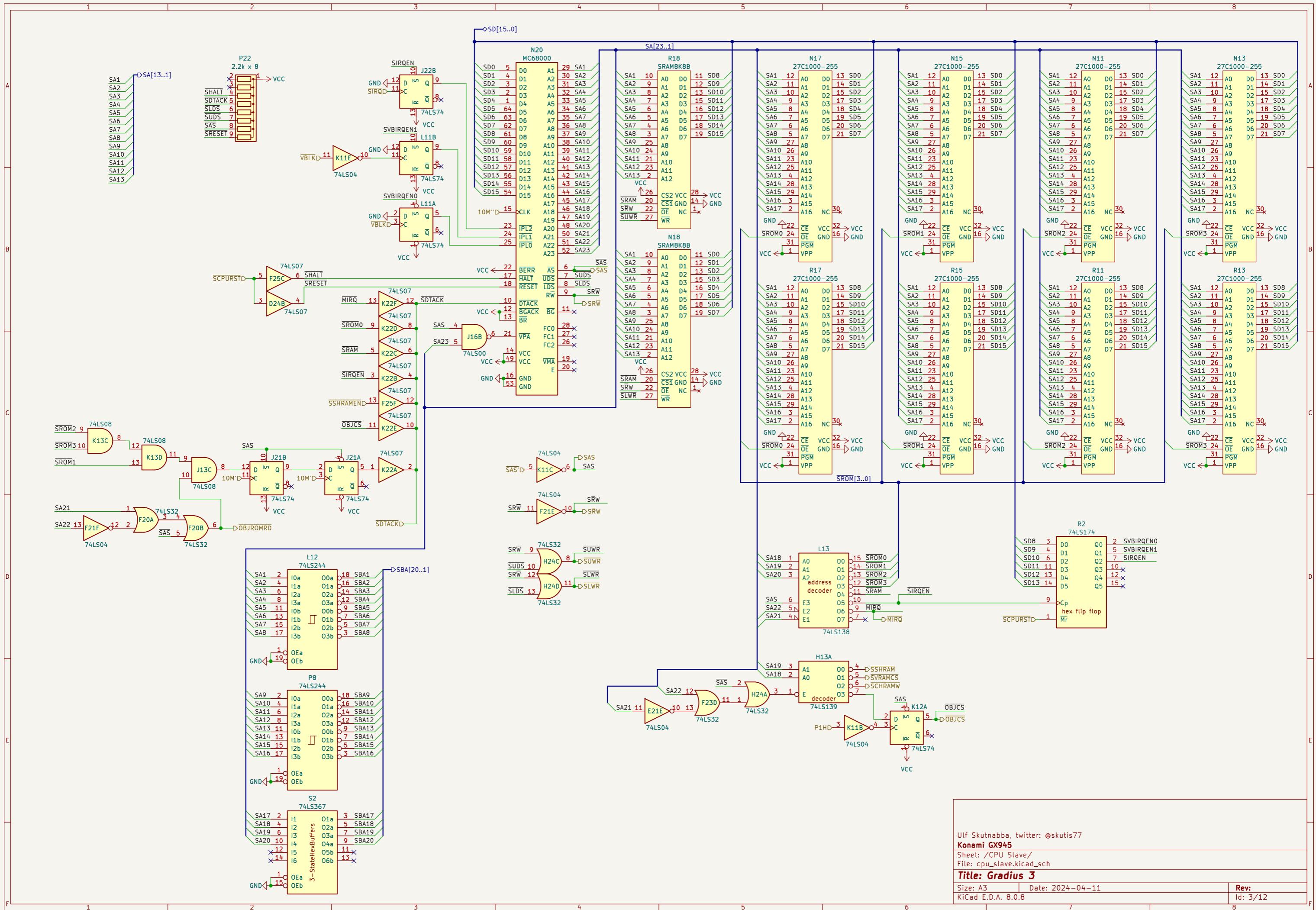
Konami GX945

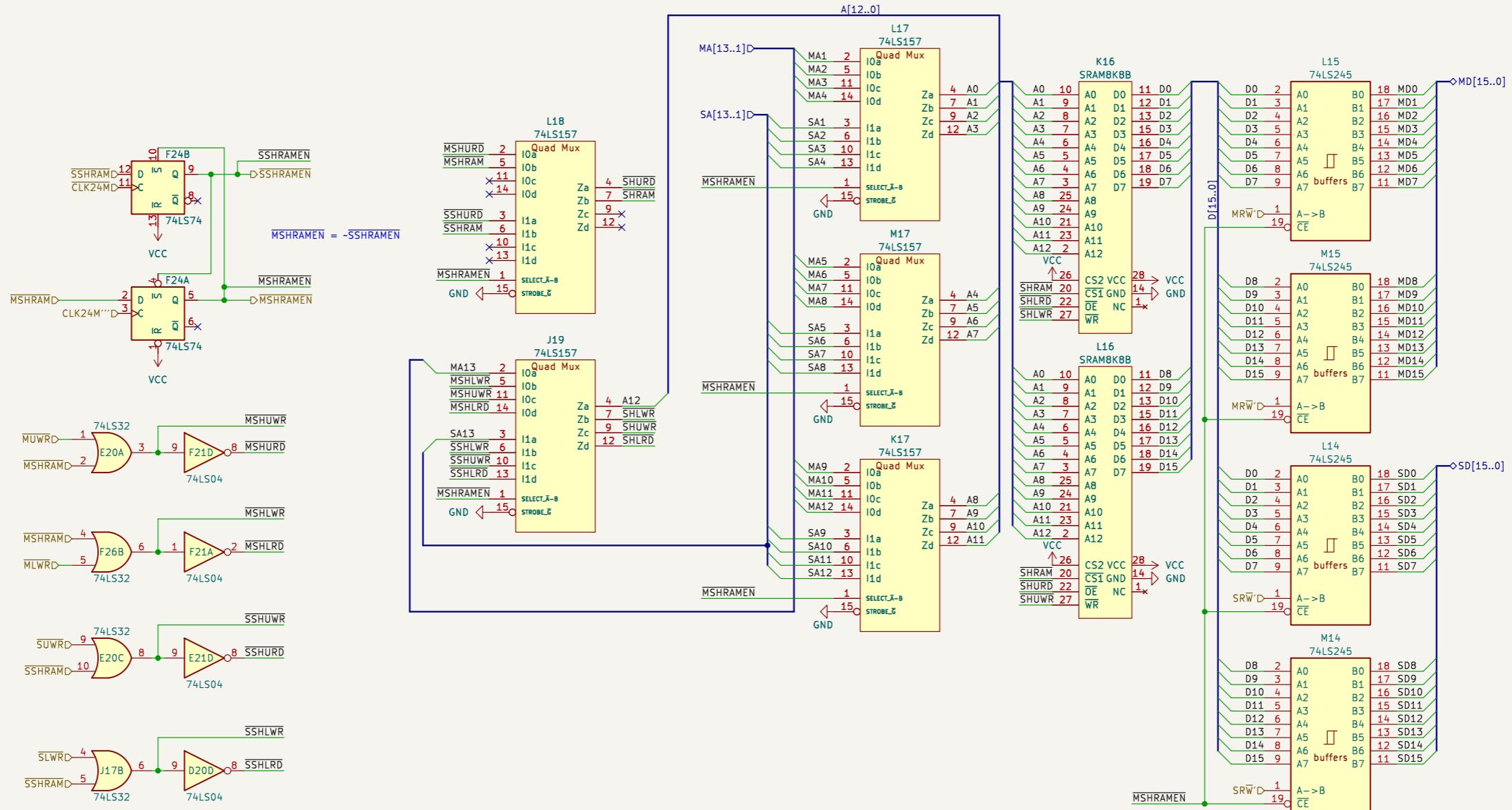
Sheet: /CPU Master/  
File: cpu\_master.kicad\_sch

Title: Gradius 3

Size: A3 Date: 2024-04-11  
KiCad E.D.A. 8.0.8

Rev: 2/12





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Sheet: /Shared RAM/

File: shram.kicad\_sch

**Title: Gradius 3**

Size: A3 Date: 2024-04-11

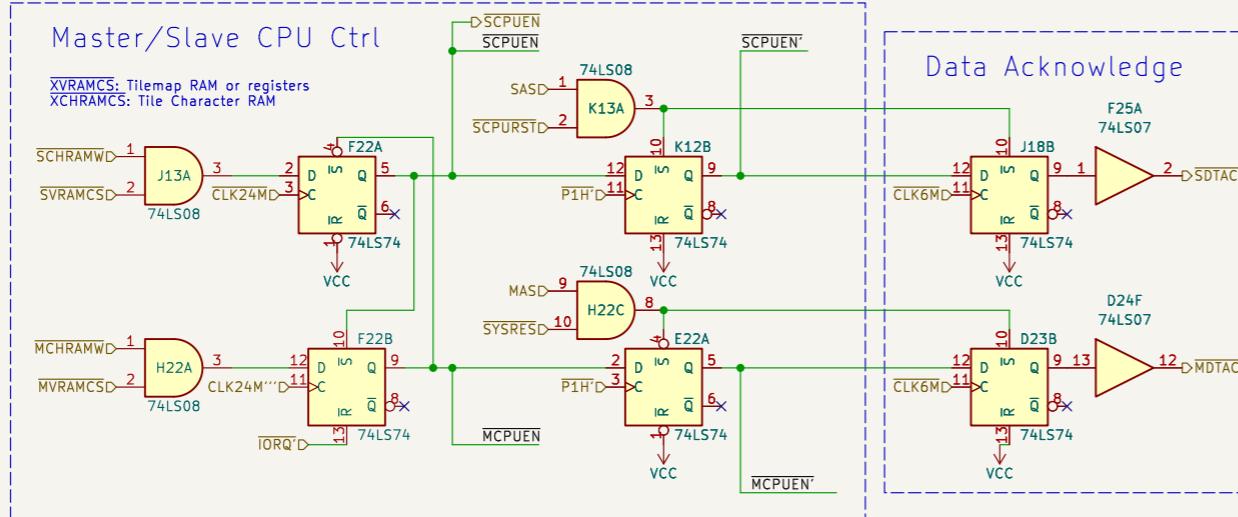
KiCad E.D.A. 8.0.8

Rev:

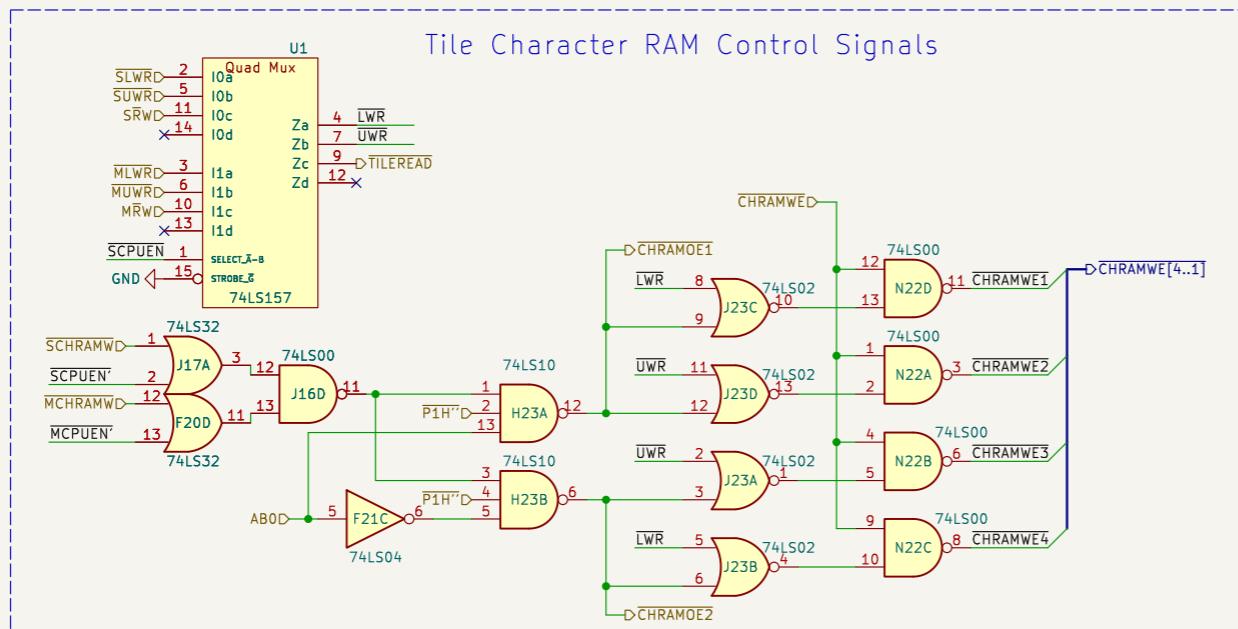
Id: 4/12

1 2 3 4 5 6 7 8

A



B



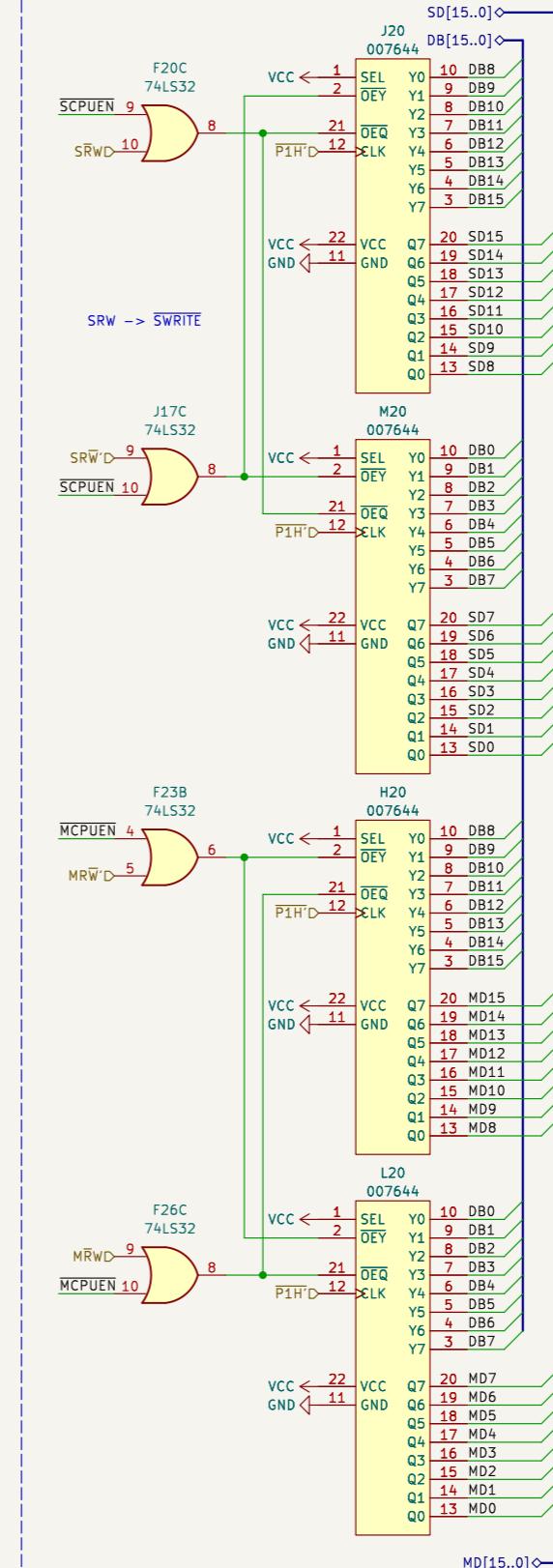
C

D

E

F

### Tile Layers – Shared Data Bus



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**Konami GX945**

Sheet: /Tile Logic/

File: tile\_logic.kicad\_sch

**Title: Gradius 3**

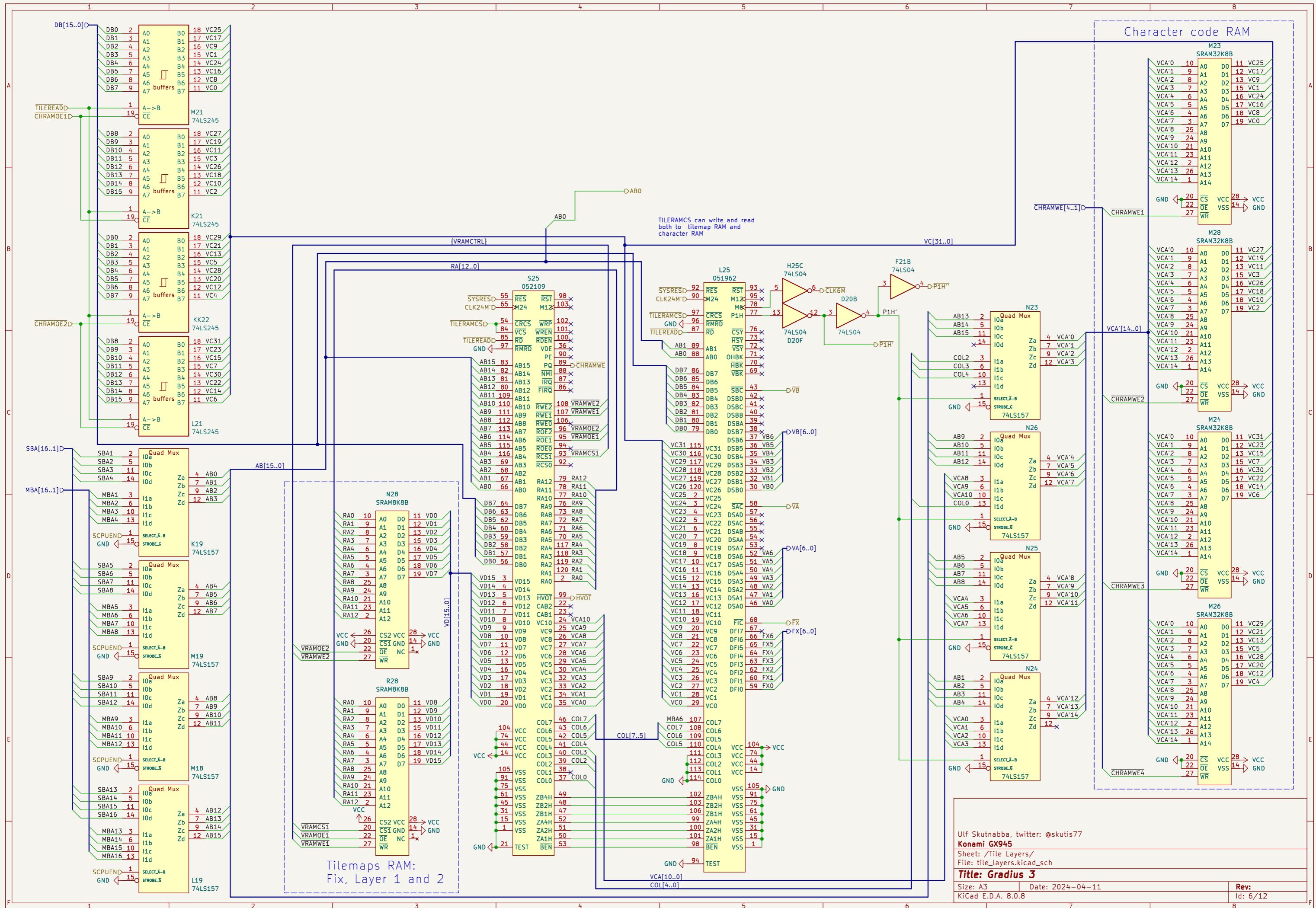
Size: A3 Date: 2024-04-11

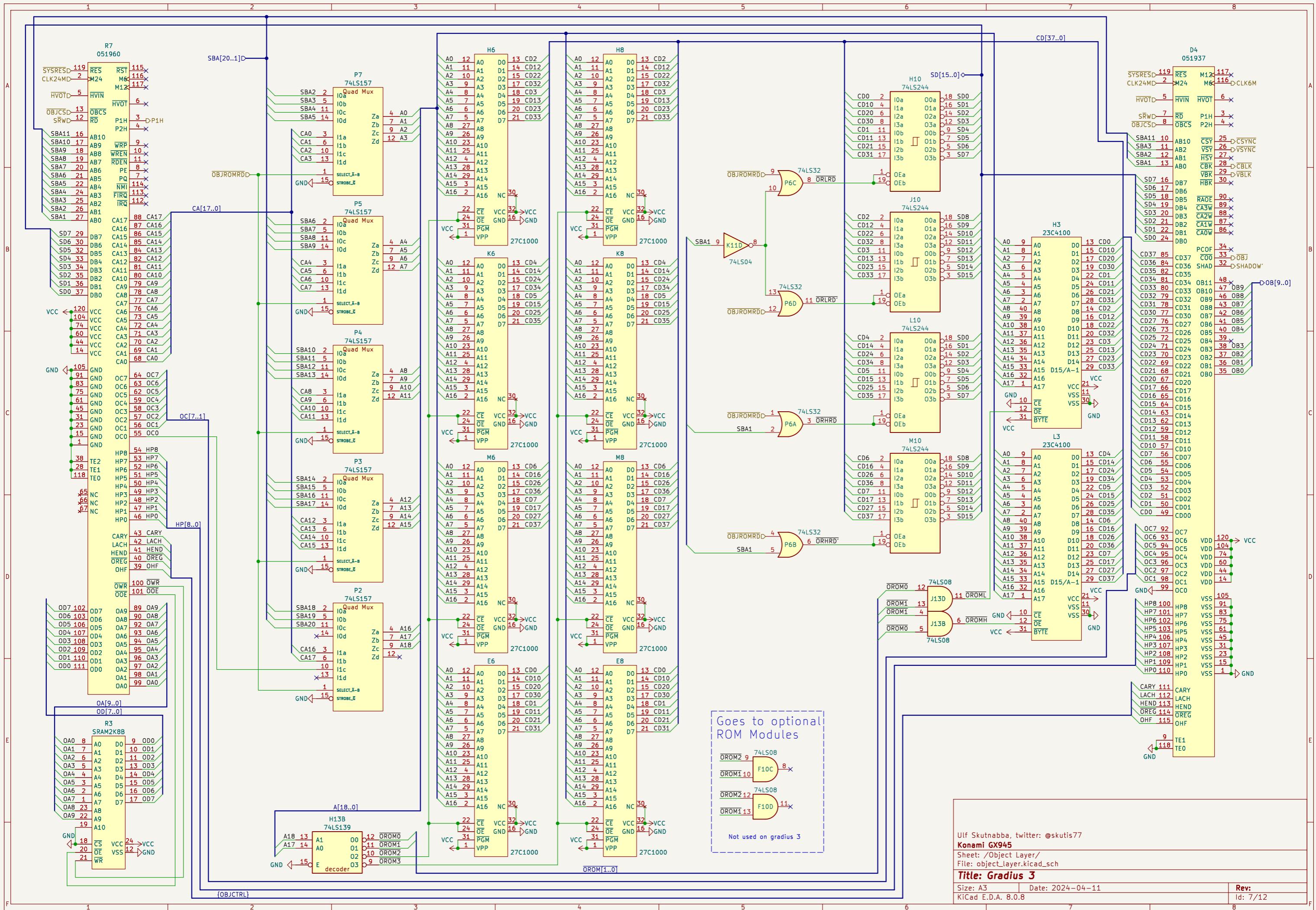
KiCad E.D.A. 8.0.8

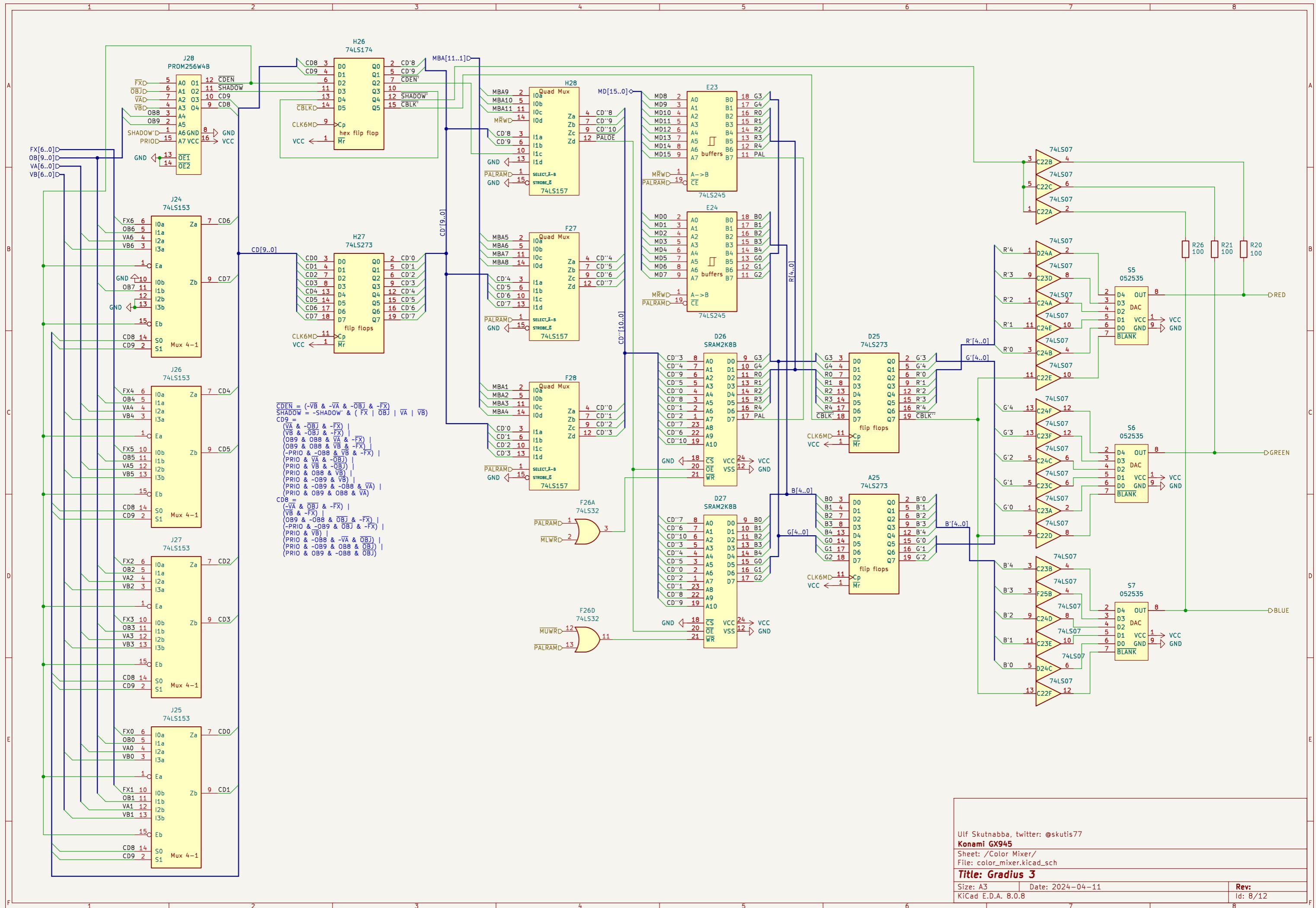
Rev:

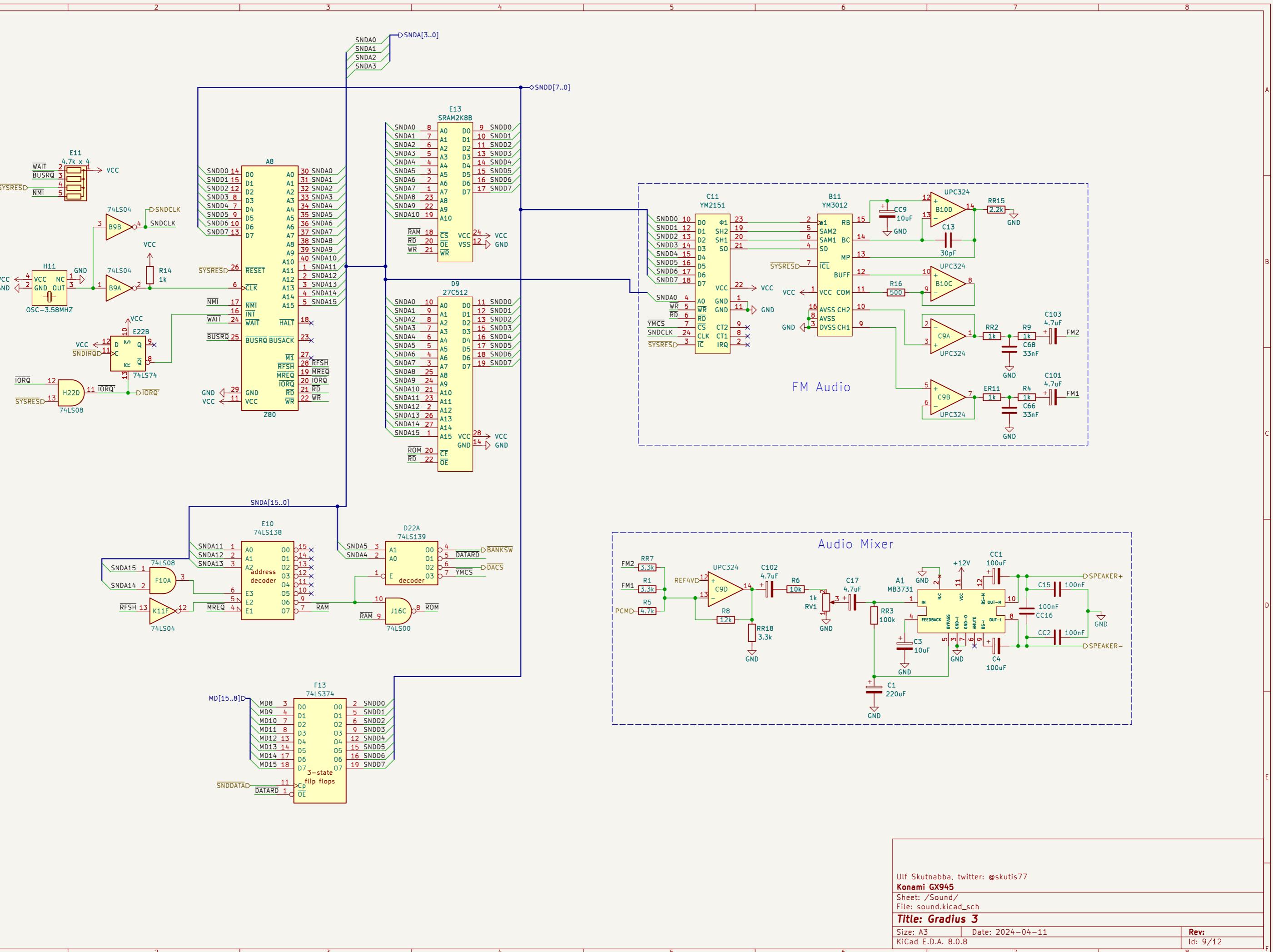
Id: 5/12

1 2 3 4 5 6 7 8

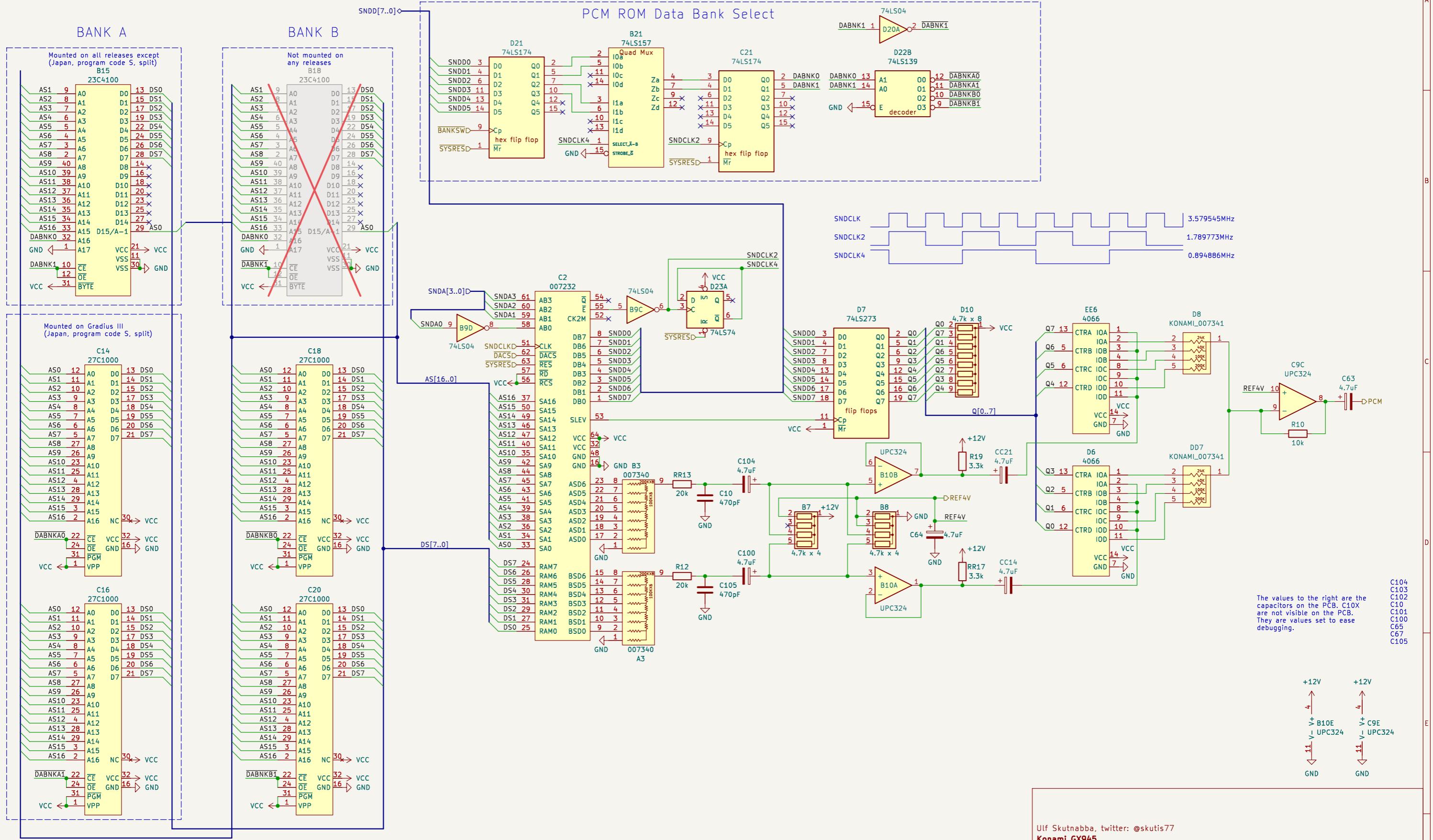








B15 and B18 do not follow the standard Mask ROM behaviour. The BYTE mode select must be selected from factory and pin 31 is probably not connected.



The values to the right are the capacitors on the PCB. C10X are not visible on the PCB. They are values set to ease debugging.

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Sheet: /PCM/  
File: .dxf

File: pcm.kicad\_sch

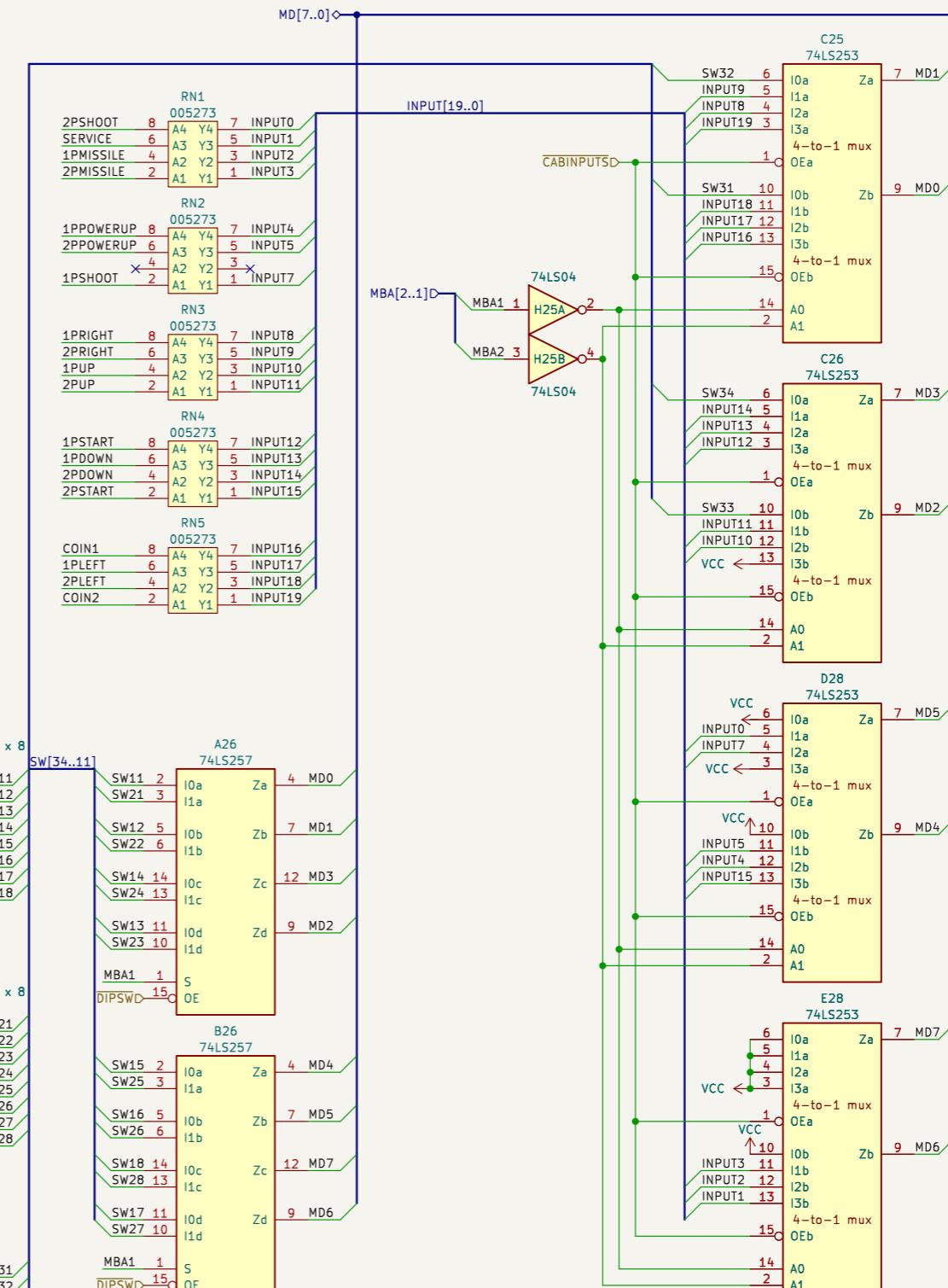
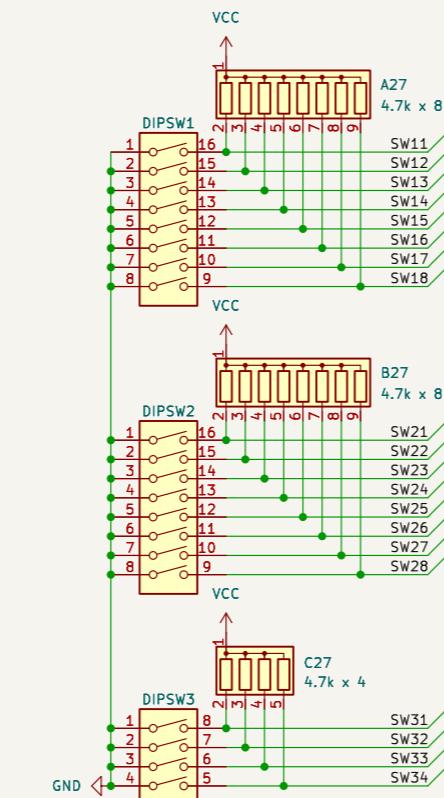
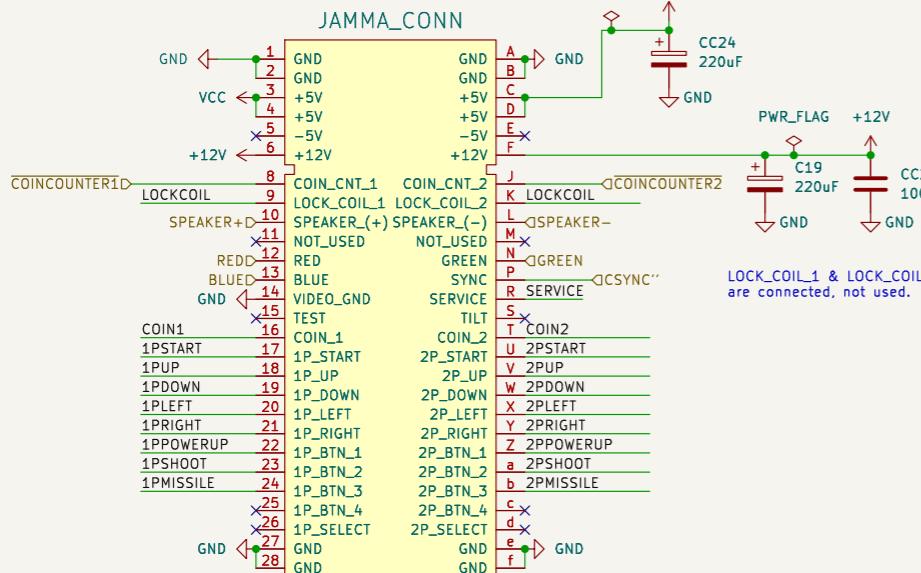
## Title: Gradius

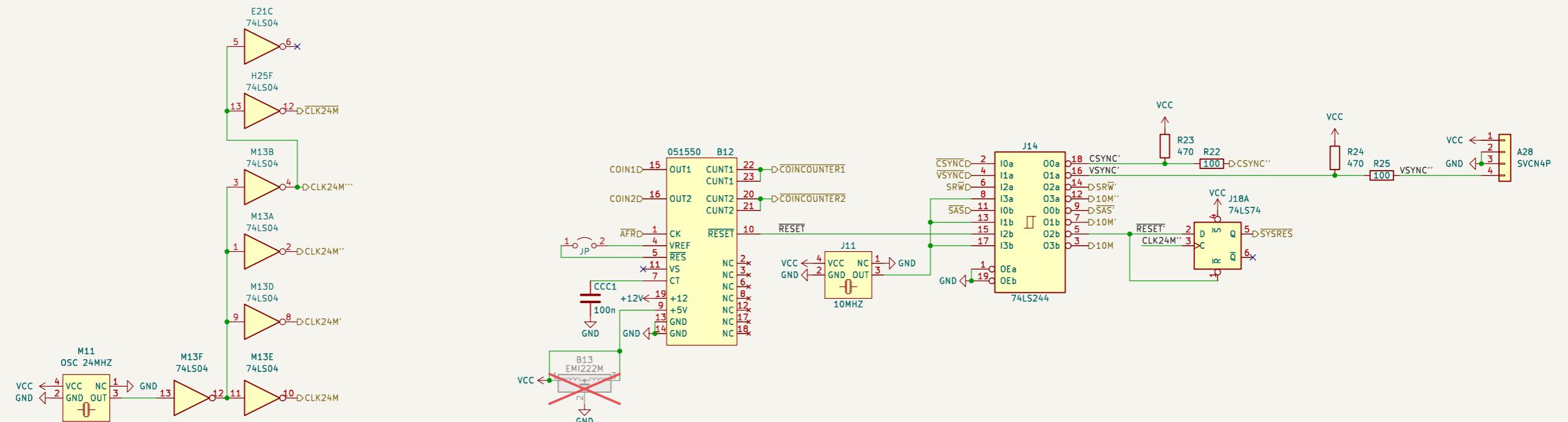
KiCad EDA 8.0.8

KICad E.D.A. 6.0.8

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C104  
C103  
C102  
C10  
C101  
C100  
C65  
C67  
C65





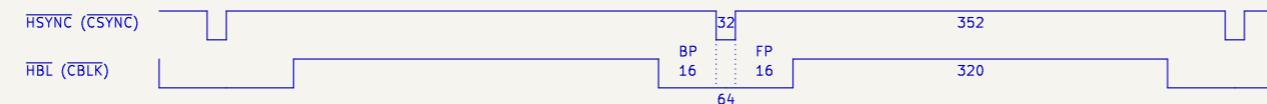
### Horizontal and vertical synch timing diagrams

The pixel clock is derived from the 24MHz oscillator.  
Pixel clock OVCK:  $f = 24\text{MHz} / 4 = 6\text{MHz}$

The numbers in the HSYNC and HBL diagram are pixel clock cycles.  
All edges are synchronised to the rising edge of the pixel clock.

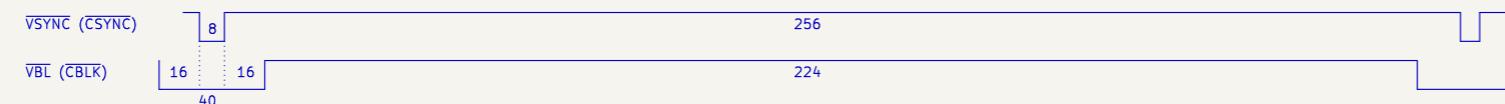
The signals have been measured at the output of the  
graphic chips.

If horizontal blanking is measured at the RGB DACs, the blanking  
is delayed 2 pixel clocks relative to composite sync. This  
gives BP = 14 and FP = 18.



HSYNC and HBL  
Frequency  $f = 6\text{MHz} / 384 = 15.625\text{kHz}$ .  
Period  $T = 1/f = 64\text{us}$ .

The numbers in the VSYNC and VBL diagram are HSYNC cycles.  
All edges are synchronised to the falling edge of HSYNC.



VSYNC and VBL:  
Frequency  $f = 15.625\text{kHz} / 264 = 59.1856\text{Hz}$   
Period  $T = 1/f = 1 / 59.1856\text{Hz} = 16.896\text{ms}$

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Sheet: /Misc/

File: misc.kicad\_sch

Title: Gradius 3

Size: A3 Date: 2024-04-11

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Rev:

Id: 12/12