





daveho hacks

Sheet: /VCount/

File: VCount.kicad\_sch

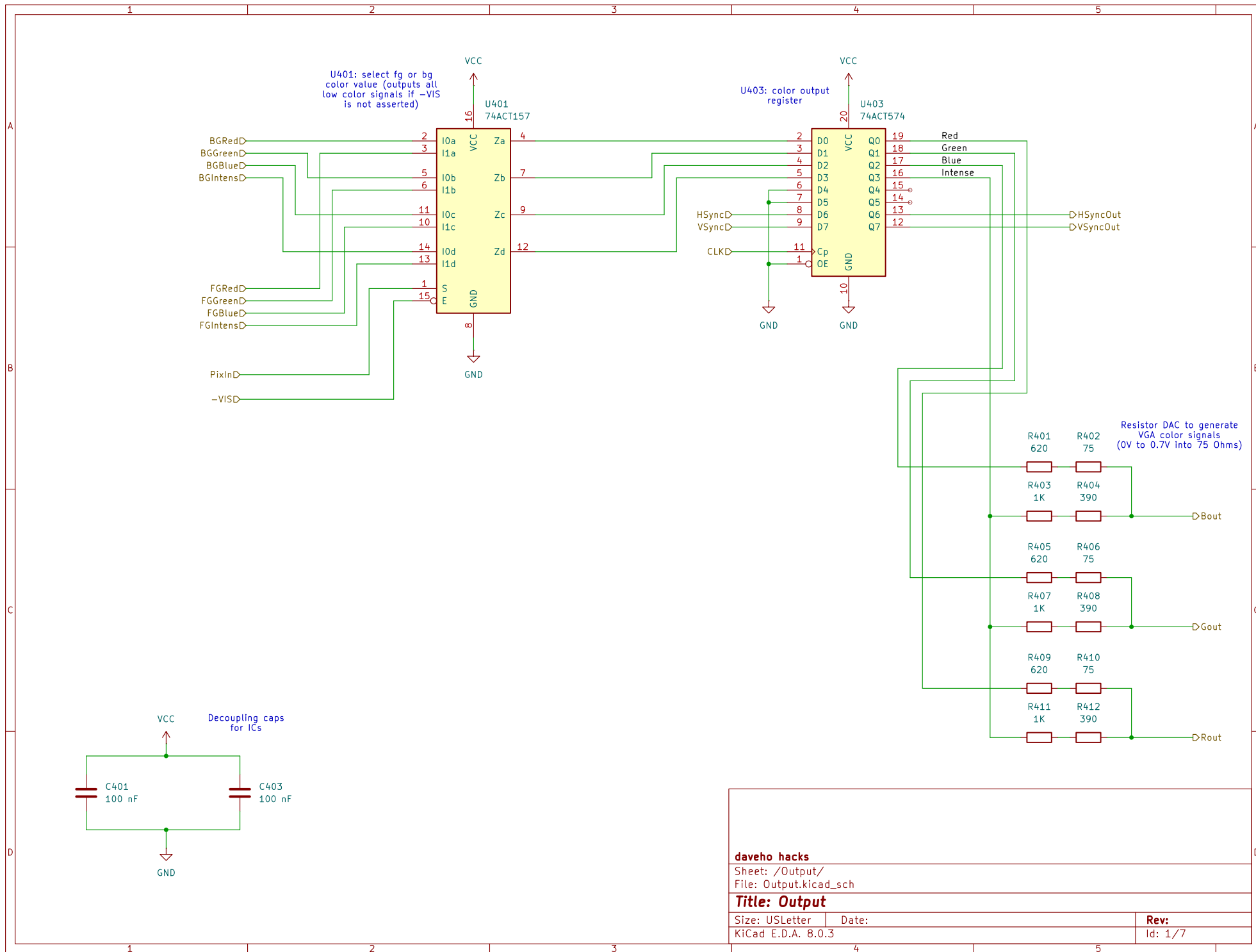
**Title: Vertical count**

Size: USLetter Date:

KiCad E.D.A. 8.0.3

Rev:

Id: 1/7



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Sheet: /Output/

File: Output.kicad\_sch

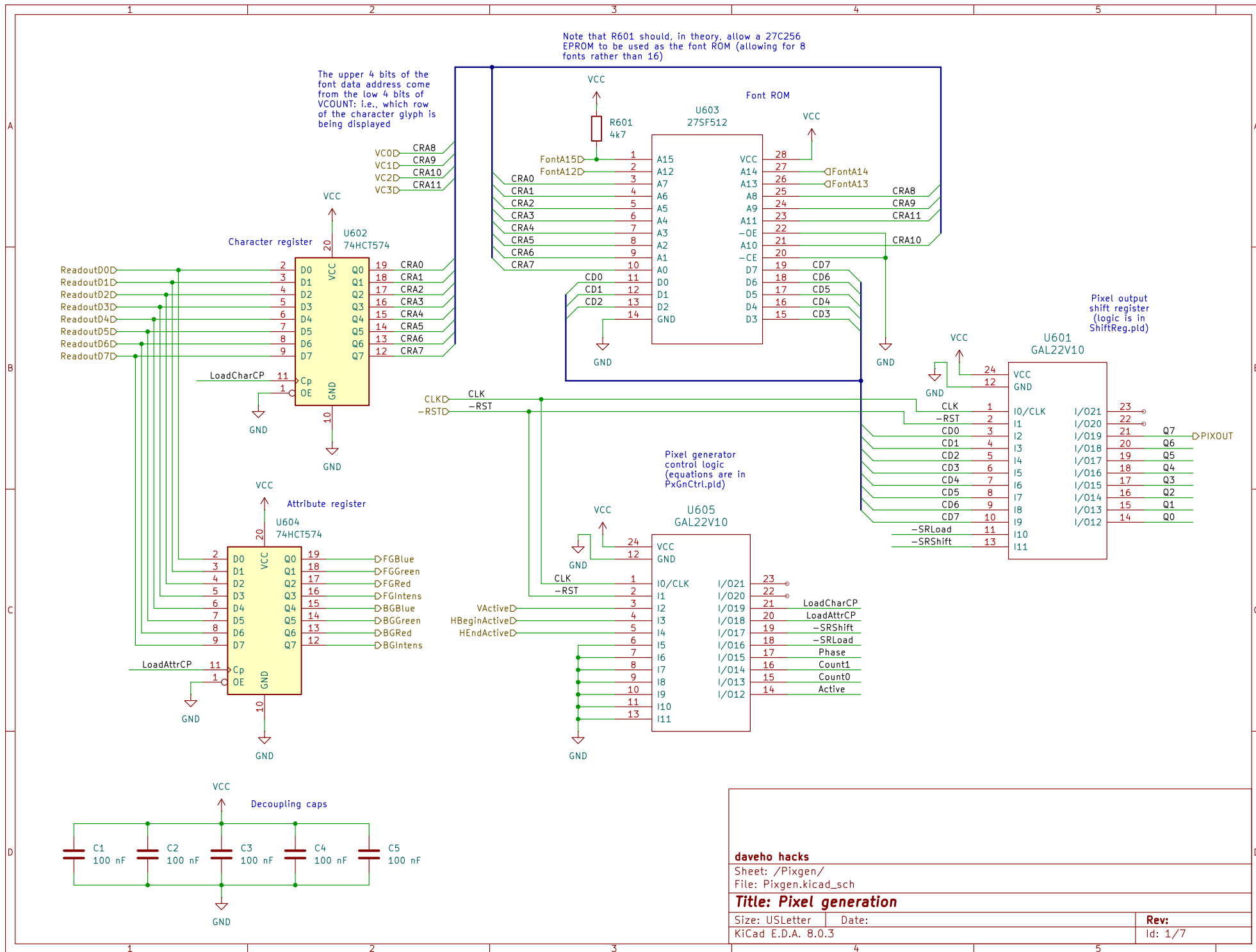
**Title: Output**

Size: USLetter Date:

KiCad E.D.A. 8.0.3

**Rev:**

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Sheet: /Pixgen/

File: Pixgen.kicad\_sch

**Title: Pixel generation**

Size: USLetter Date:

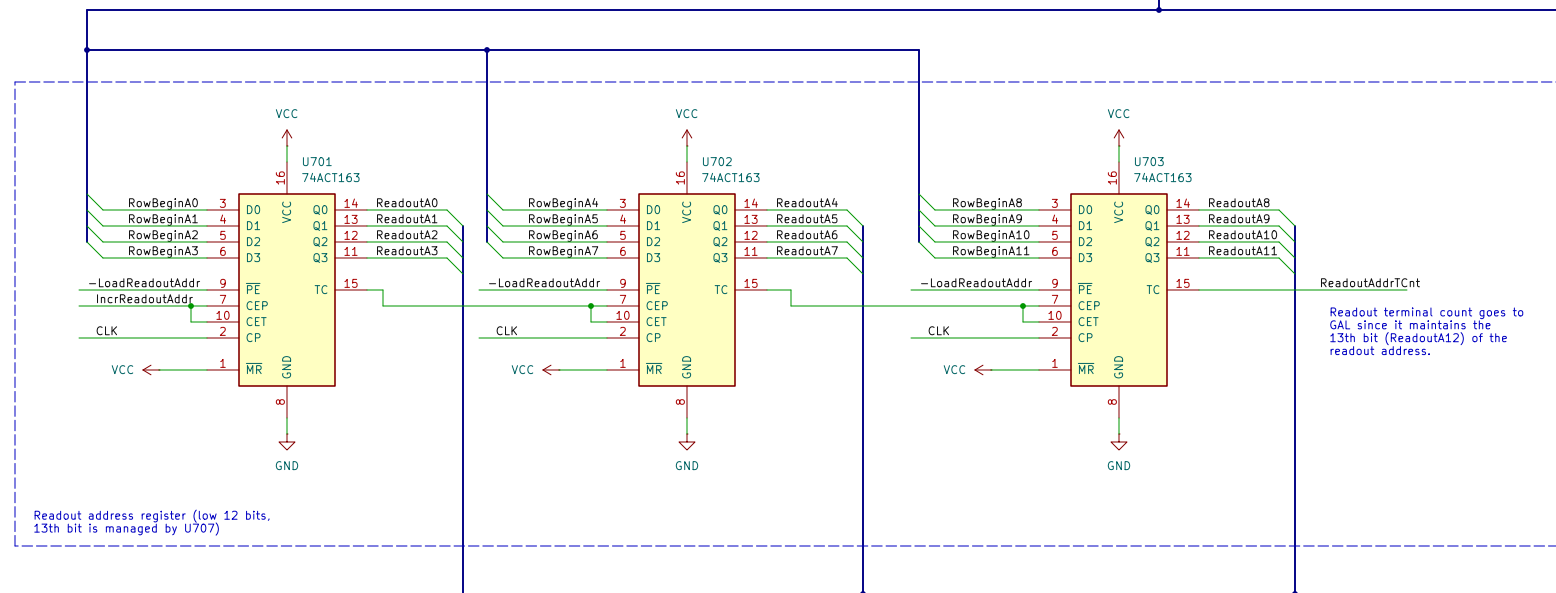
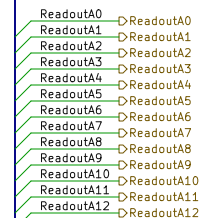
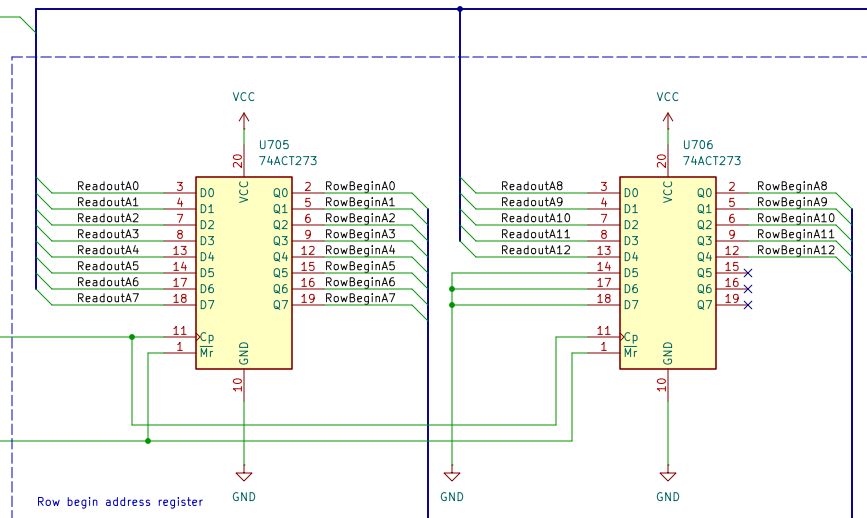
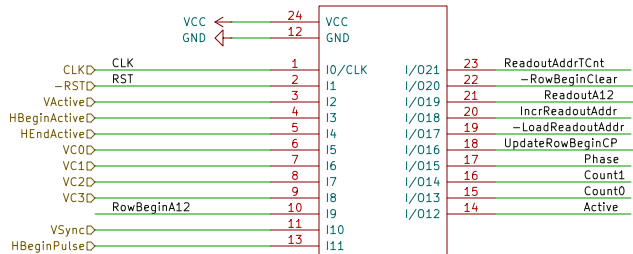
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Rev:

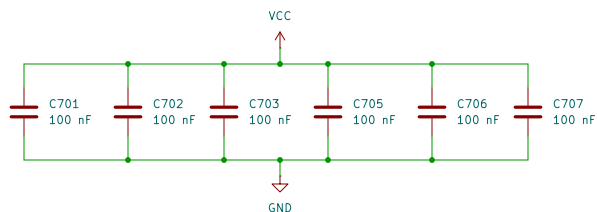
Id: 1/7

Logic is defined in  
R0utCtrl.pld

U707  
GAL22V10



Readout terminal count goes to  
GAL since it maintains the  
13th bit (ReadoutA12) of the  
readout address.



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Sheet: /Readout/  
File: Readout.kicad\_sch

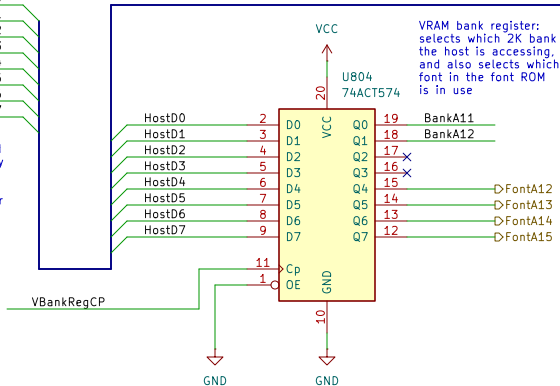
Title: Readout

Size: User Date:  
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Rev:  
Id: 7/7

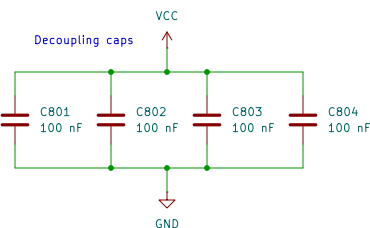
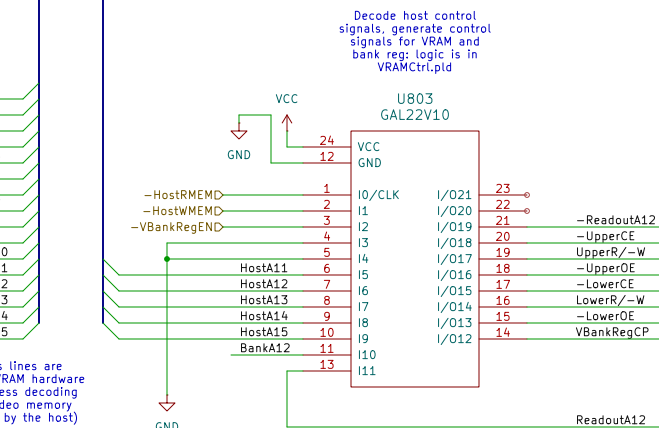
HostD0  
HostD1  
HostD2  
HostD3  
HostD4  
HostD5  
HostD6  
HostD7

Host can read and write video memory and can write the contents of the VRAM bank register



HostA0D  
HostA1D  
HostA2D  
HostA3D  
HostA4D  
HostA5D  
HostA6D  
HostA7D  
HostA8D  
HostA9D  
HostA10D  
HostA11D  
HostA12D  
HostA13D  
HostA14D  
HostA15D

All host address lines are used because the VRAM hardware does its own address decoding (to know when video memory is being accessed by the host)

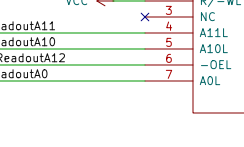
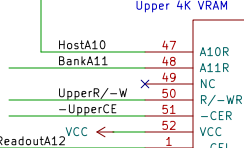
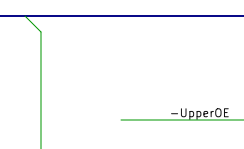
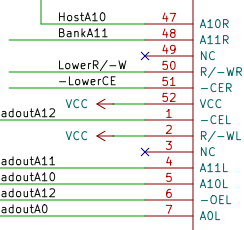


The readout address signals select which byte of video memory the memory fetch hardware wants to access. ReadoutA12 (the highest address line) is used to select the lower or upper VRAM chip.

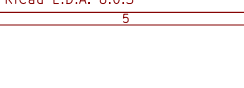
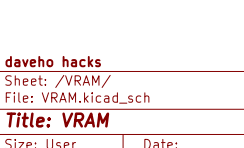
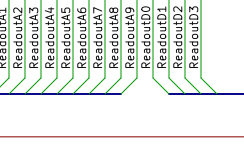
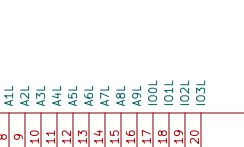
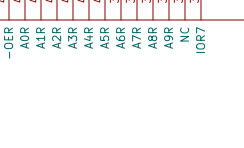
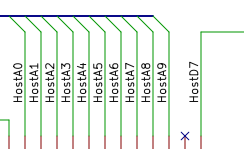
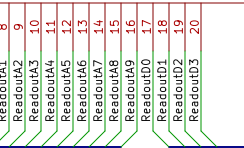
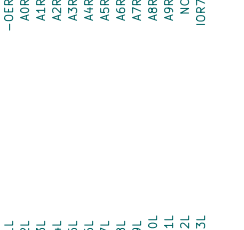
ReadoutA0D ReadoutA0  
ReadoutA1D ReadoutA1  
ReadoutA2D ReadoutA2  
ReadoutA3D ReadoutA3  
ReadoutA4D ReadoutA4  
ReadoutA5D ReadoutA5  
ReadoutA6D ReadoutA6  
ReadoutA7D ReadoutA7  
ReadoutA8D ReadoutA8  
ReadoutA9D ReadoutA9  
ReadoutA10D ReadoutA10  
ReadoutA11D ReadoutA11  
ReadoutA12D ReadoutA12

Note that the "inversion" of ReadoutA12 (generated by the control signal GAL) is used to select the high VRAM chip and enable its output.

Lower 4K VRAM

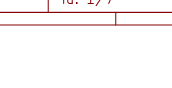


Upper 4K VRAM



Data values read from VRAM (to be used for rasterization)

ReadoutD0  
ReadoutD1  
ReadoutD2  
ReadoutD3  
ReadoutD4  
ReadoutD5  
ReadoutD6  
ReadoutD7



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Sheet: /VRAM/  
File: VRAM.kicad\_sch

Title: VRAM

Size: User Date:  
KiCad E.D.A. 8.0.3

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Id: 1/7