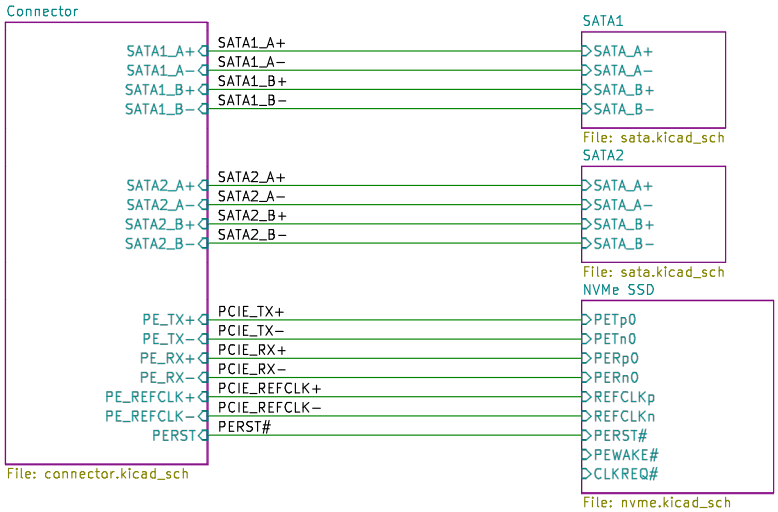
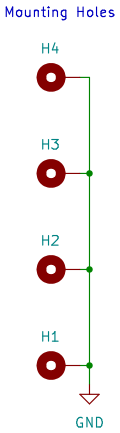
F3 Backplane





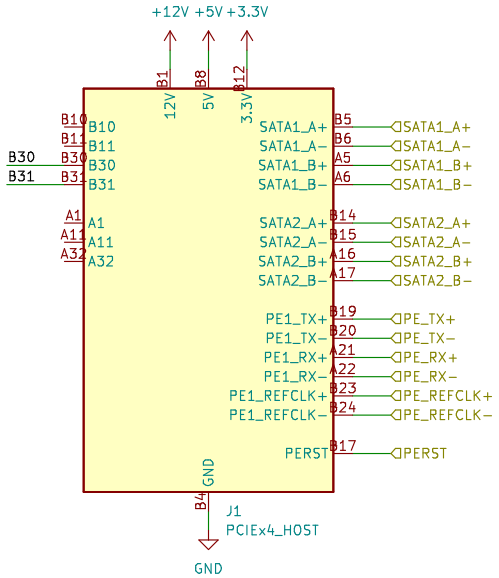
Sheet: /
File: f3_backplane.kicad_sch

Title: F3 Backplane

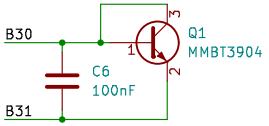
Size: A4	Date:	**Rev: 1.0**
KiCad E.D.A. kicad 7.0.11		Id: 1/5

The Terramaster F2 motherboard has a PCIe x4 connector with non-standard pinout.
It provides 12V, 5V and 3.3V power rails, 2xSATA and 2xPCIe (gen 2) 1-lane.

The purpose of pins A1, A11, A32, B10, B11, B30 and B31 are unknown to me but leaving them unconnected result in a working backplane. ¯_(ツ)_/¯

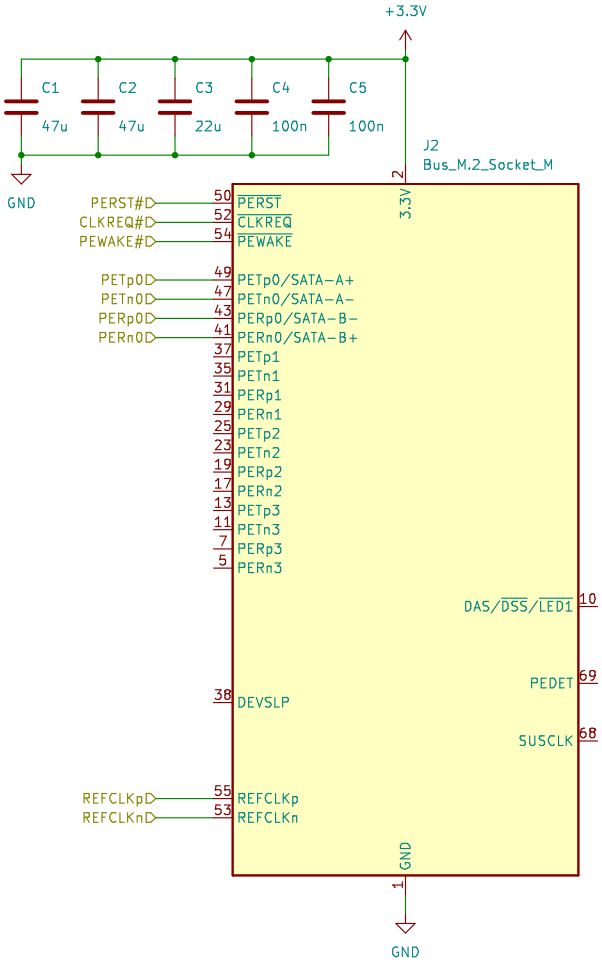


This little circuit was on my existing F2-221's backplane PCB. I added it here just in case but leaving it unpopulated seems to be fine.



Sheet: /Connector/		
File: connector.kicad_sch		
Title: F3 Backplane Connector		
Size: A4	Date:	**Rev: 1.0**
KiCad E.D.A. kicad 7.0.11		Id: 2/5

M.2 SSD M-Key connector

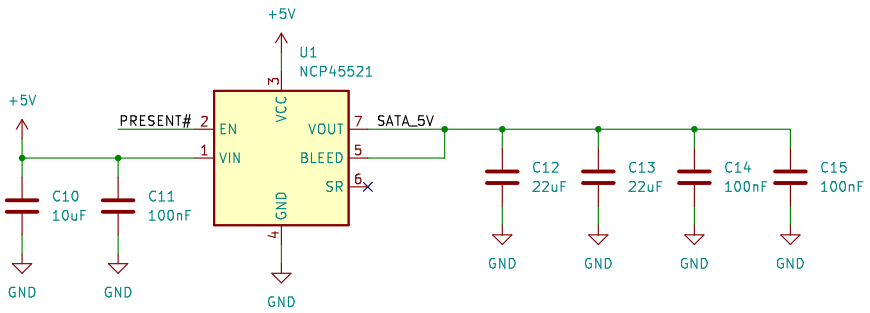


Sheet: /NVMe SSD/		
File: nvme.kicad_sch		
Title: F3 Backplane NVMe SSD		
Size: A4	Date:	**Rev: 1.0**
KiCad E.D.A. kicad 7.0.11		Id: 3/5

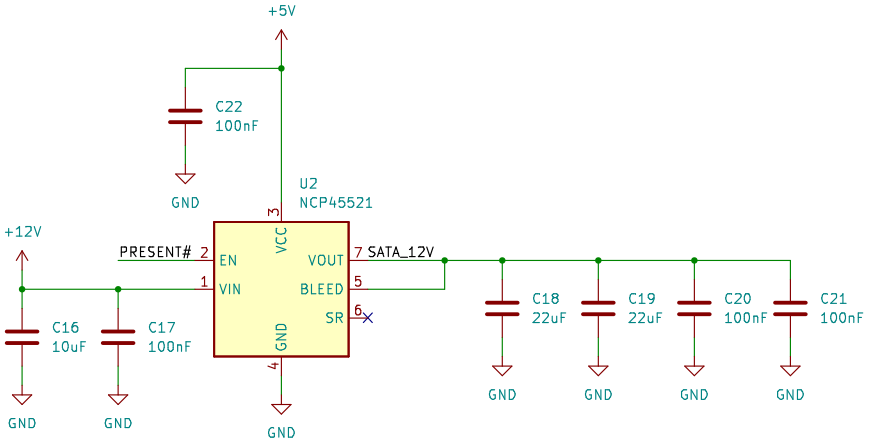
SATA connector with power circuitry

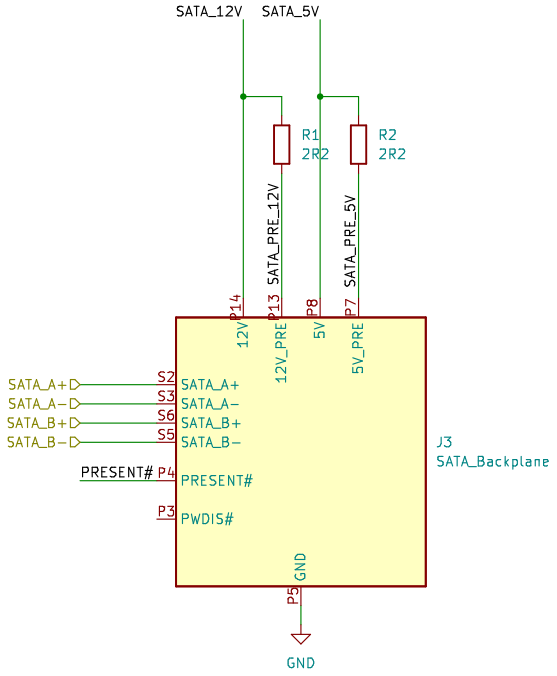
The power circuit I reverse engineered on the existing backplane PCB ended up being a discreet load switch for each power rail (5V and 12V, per drive) with a slow starter. Pin P4 on the SATA connector is used as a detect pin as it's shorted to ground when a drive is connected, enabling the load switch.
Instead of re-creating this discrete circuit I used NCP45521-L to handle this for me. The default slew rate ended up being good so NCP45520-L would also be fine.

5V Load Switch



12V Load Switch



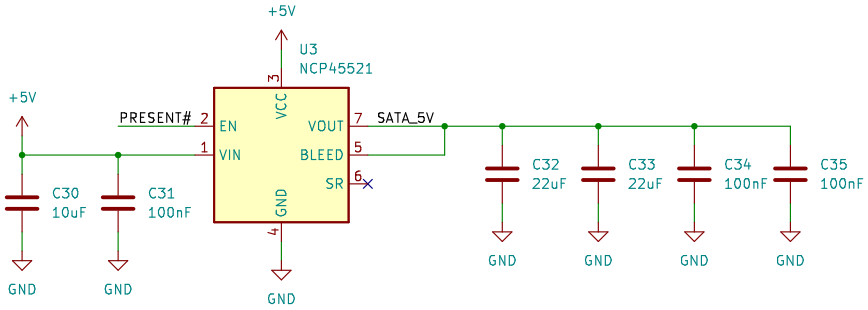


Sheet: /SATA1/		
File: sata.kicad_sch		
Title: F3 Backplane SATA		
Size: A4	Date:	**Rev: 1.0**
KiCad E.D.A. kicad 7.0.11		Id: 4/5

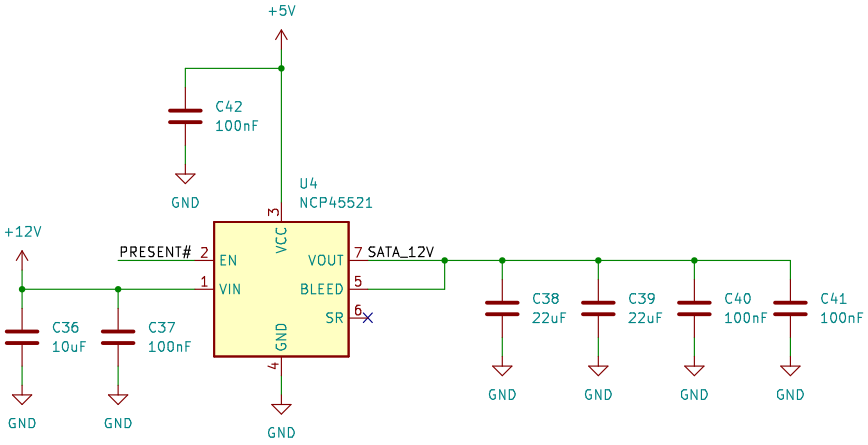
SATA connector with power circuitry

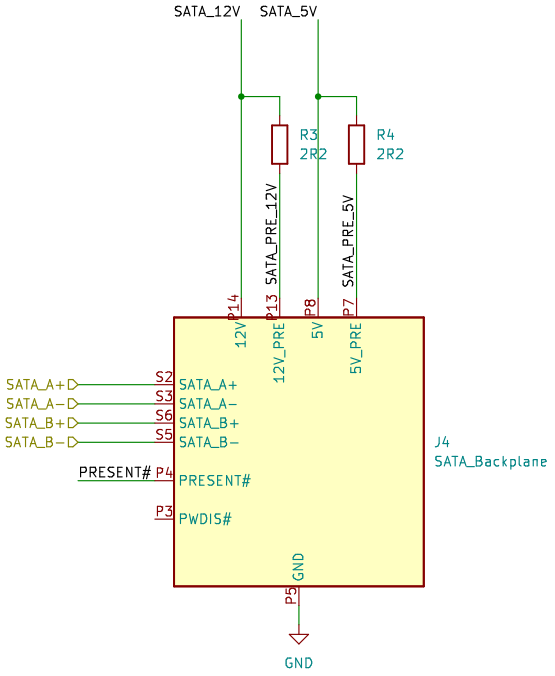
The power circuit I reverse engineered on the existing backplane PCB ended up being a discreet load switch for each power rail (5V and 12V, per drive) with a slow starter. Pin P4 on the SATA connector is used as a detect pin as it's shorted to ground when a drive is connected, enabling the load switch.
Instead of re-creating this discrete circuit I used NCP45521-L to handle this for me. The default slew rate ended up being good so NCP45520-L would also be fine.

5V Load Switch



12V Load Switch





Sheet: /SATA2/		
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Title: F3 Backplane SATA		
Size: A4	Date:	**Rev: 1.0**
KiCad E.D.A. kicad 7.0.11		Id: 5/5