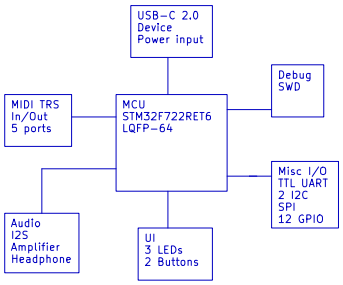

MCU

Page 2

File: MCU.kicad_sch

User Interface

Page 3

File: user_interface.kicad_sch

MIDI

Page 4

File: midi.kicad_sch

Audio Output

Page 5

File: audio_out.kicad_sch

Revision History

File: revisions.kicad_sch

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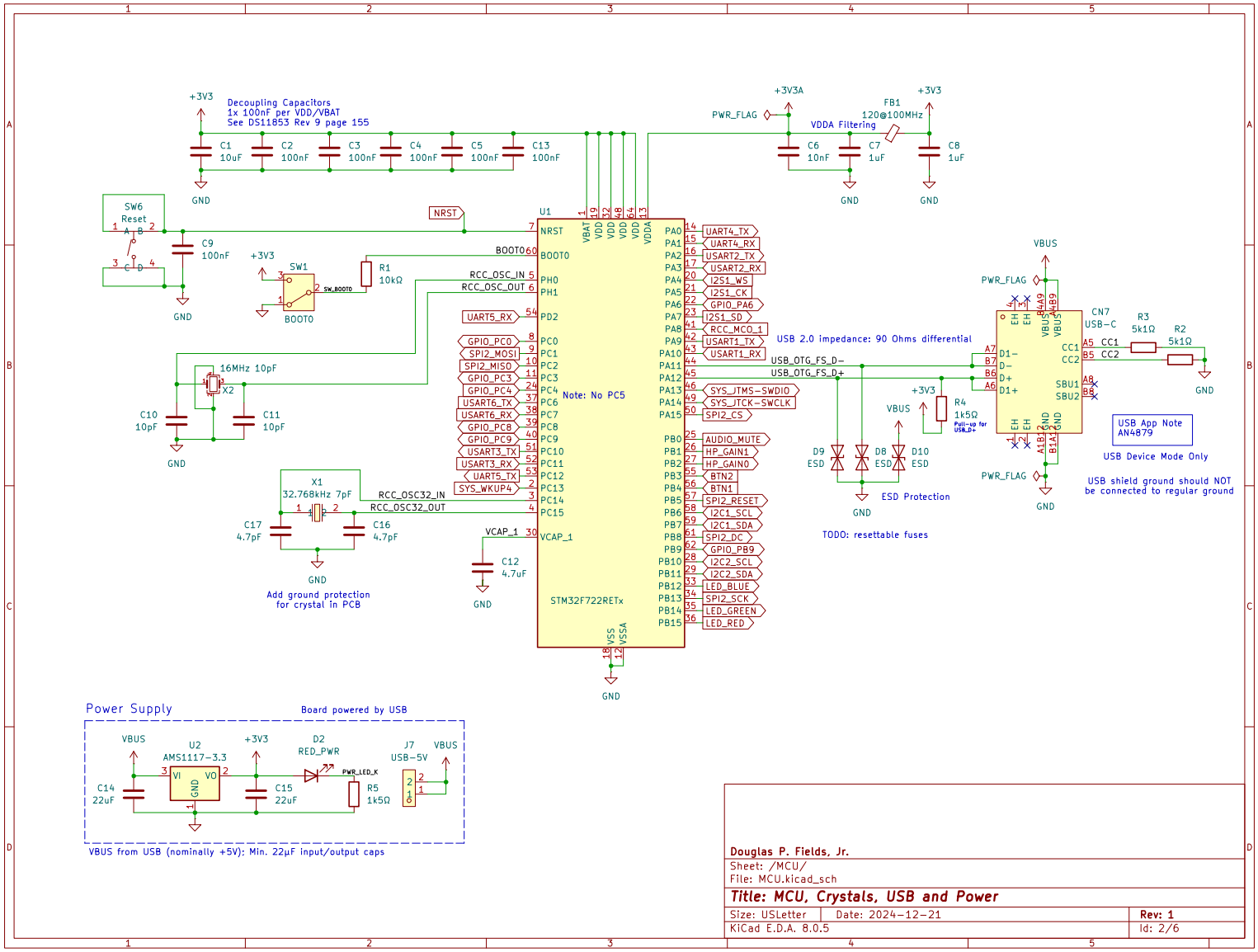
symbolics@lisp.engineer
Douglas P. Fields, Jr.

Sheet: /
File: stm-midi-poc1.kicad_sch

Title: Block Diagram

Size: USLetter	Date: 2024-12-21	**Rev: 2**
KiCad E.D.A. 8.0.5		Id: 1/6


Decoupling Capacitors
1x 100nF per VDD/VBAT
See DS11853 Rev 9 page 155
C1 10uF
C2 100nF
C3 100nF
C4 100nF
C5 100nF
C13 100nF
VDDA Filtering
FB1 120@100MHz
C6 10nF
C7 1uF
C8 1uF
SW6 Reset
C9 100nF
SW1
R1 10kΩ
BOOT0
NRST
RCC_OSC_IN
RCC_OSC_OUT
16MHz 10pF
X2
C10 10pF
C11 10pF
X1 32.768kHz 7pF
C17 4.7pF
C16 4.7pF
Add ground protection for crystal in PCB
C12 4.7uF
U1
STM32F722RETx
Note: No PC5
USB 2.0 impedance: 90 Ohms differential
USB_OTG_FS_D−
USB_OTG_FS_D+
CN7 USB−C
R3 5k1Ω
R2 5k1Ω
R4 1k5Ω
Pull-up for USB_D+
D9 ESD
D8 ESD
D10 ESD
ESD Protection
TODO: resettable fuses
USB App Note AN4879
USB Device Mode Only
USB shield ground should NOT be connected to regular ground
Power Supply
Board powered by USB
U2 AMS1117−3.3
C14 22uF
C15 22uF
D2 RED_PWR
R5 1k5Ω
J7 USB−5V
VBUS from USB (nominally +5V): Min. 22µF input/output caps
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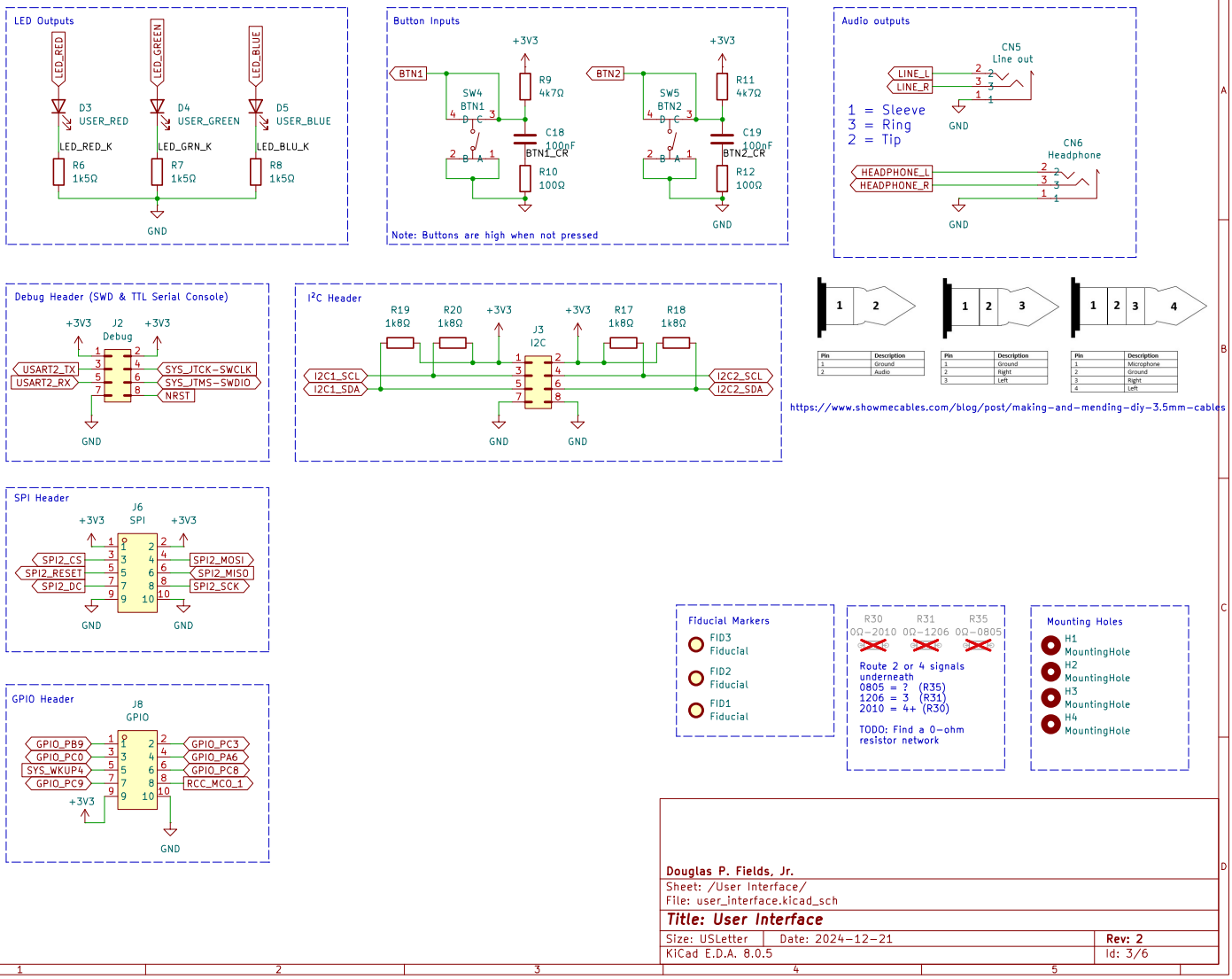
Sheet: /MCU/
File: MCU.kicad_sch
Title: MCU, Crystals, USB and Power
Size: USLetter
Date: 2024−12−21
Rev: 1
KiCad E.D.A. 8.0.5
Id: 2/6



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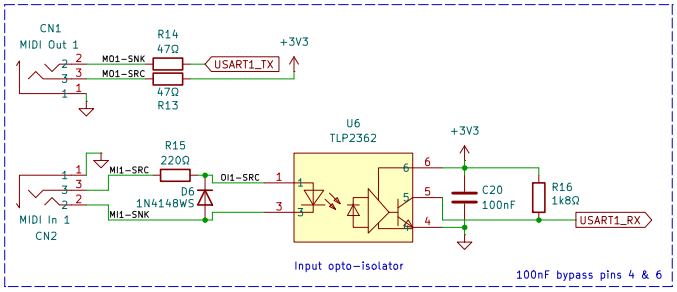
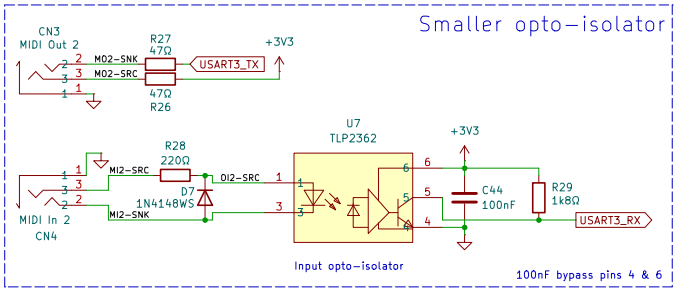
Sheet: /User Interface/

File: user_interface.kicad_sch

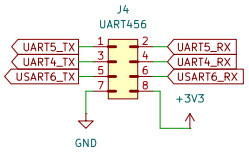
Title: User Interface

Size: USLetter	Date: 2024-12-21	**Rev: 2**
KiCad E.D.A. 8.0.5		Id: 3/6





TODO: Replicate for UART 4-6



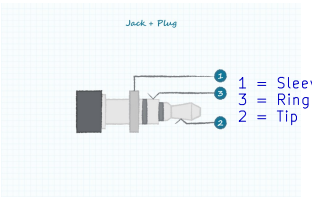


Image credit:
https://www.sameskydevices.com/blog/understanding-audio-jack-switches-and-schematics

TODO: Make this a sub-schematic and instantiate it 5x

MIDI TRS Type A
Tip: Sink (5-pin: 5)
Ring: Source (5-pin: 4)
Sleeve: n/c (5-pin: 2)
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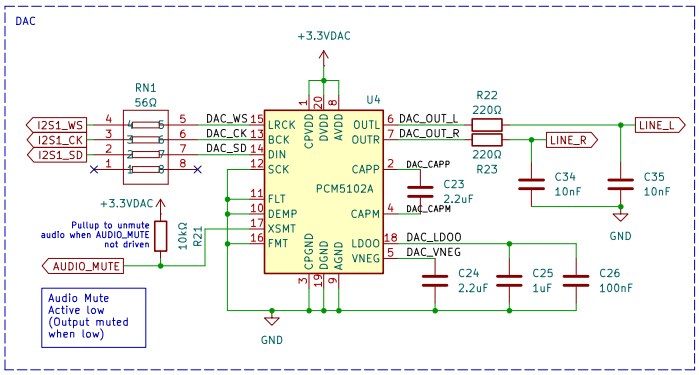
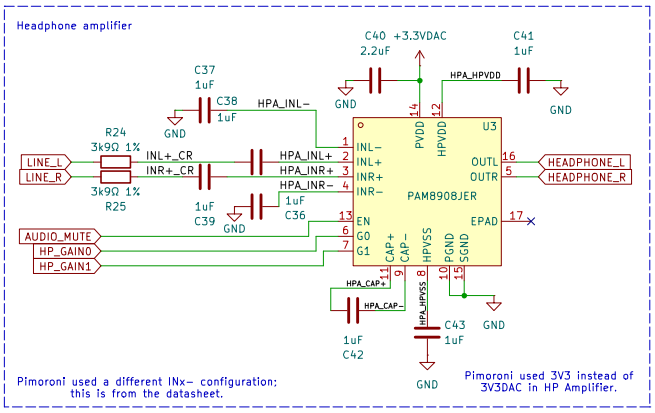
Sheet: /MIDI/
File: midi.kicad_sch

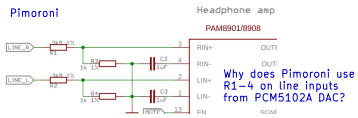
Title: MIDI

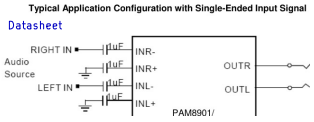
Size: USLetter	Date: 2024-12-21	**Rev: 2**
KiCad E.D.A. 8.0.5		Id: 4/6

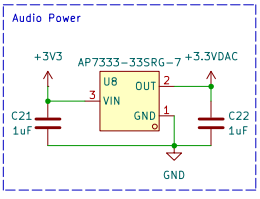


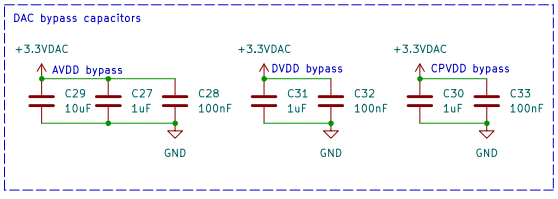
TODO: Should R21 AUDIO_MUTE pullup be on VDAC or +3.3?











EPAD (Exposed Pad) must be soldered but can float or be connected to PGND

Reference: Pimoroni Pico Audio Pack
https://shop.pimoroni.com/products/pico-audio-pack

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Sheet: /Audio Output/
File: audio_out.kicad_sch

Title: Audio Output

Size: USLetter	Date: 2024-12-21	**Rev: 1**
KiCad E.D.A. 8.0.5		Id: 5/6

Revision 1: EVT #1

* Initial version

Revision 2: EVT #2

* Fix connections for 3.5mm jacks (tip & sleeve were reversed)
* Revise MIDI in circuits with smaller opto-isolator
* Add USB 5V pin header
* Move Gain0/1 from switches to GPIO pins
* Revise SPI header with pins for ILI9341 SPI screen
* Consolidate SWD and Console USART2 to a single header
* Consolidate all unused MIDI into a single header

...

* Miscellaneous cleanups

TODO

* Revise DAC to HP Amp input with Pimoroni suggestion
* Add MIDI in/out LEDs
* Add test pins for:
  * Audio, MIDI
  * USB Gnd/5v/D+/D-
  * MIDI raw UART RX/TX

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Sheet: /Revision History/
File: revisions.kicad_sch

Title: Revision History

Size: USLetter	Date: 2024-12-21	**Rev: 2**
KiCad E.D.A. 8.0.5		Id: 6/6