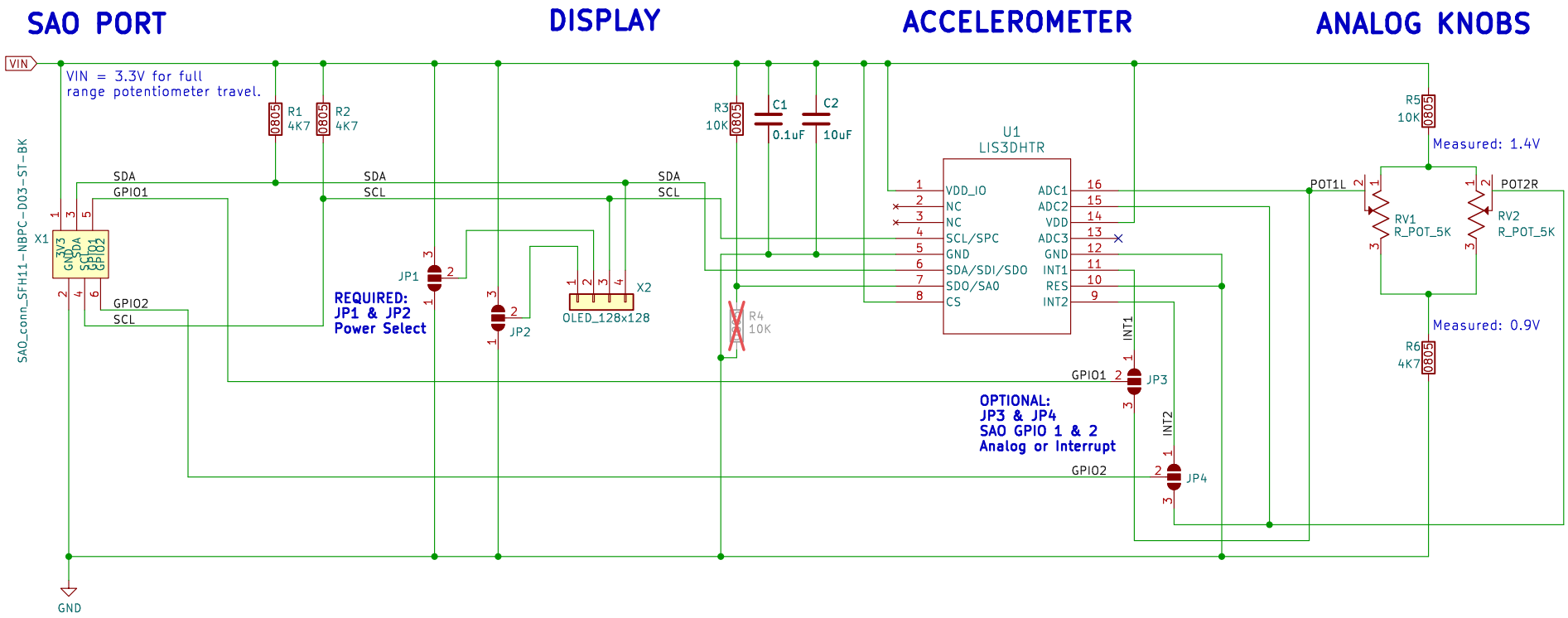
SAO SKETCH – OLED VERSION (V1.3) FOR HACKADAY EUROPE 2025



SAO PORT (6-pin, 2x3, 0.1 inch spacing, male pins)
- https://hackaday.io/project/175182-simple-add-ons-sao
- Adam Tech BHR-06-VUA male, polarized header
- https://www.digikey.com/en/products/detail/adam-tech/BHR-06-VUA/10414837

OLED DISPLAY (Address 0x3C, 128 x 128 pixel, 1.5 inch, 16 shade grayscale, SSD1327 controller)
- https://learn.adafruit.com/adafruit-grayscale-1-5-128x128-oled-display
- Optional address 0x3D selectable by moving resistor in upper left on the back of the blue OLED board.

ACCELEROMETER (Address 0x19, STM LIS3DHTR, 3-axis)
- https://learn.sparkfun.com/tutorials/lis3dh-hookup-guide/all
- CS is high for I2C mode.
- ADC theoretical input range is 0.8 to 1.6 V (aka 1.2 +/- .4)
- ADC 1 and 2 used for potentiometers. ADC3 for internal temperature.
- Optional address 0x18 if R3 (SA0 high) is moved to R4 position (SA0 low).

OPTIONAL JP3 & JP4 CONFIG
- Solder pads 1-2 to connect accelerometer interrupt output pins to SAO GPIO 1&2.
- Solder pads 2-3 to connect analog potentiometer outputs to SAO GPIO 1&2

POTENTIOMETERS/ANALOG KNOBS (Accessed through accelerometer)
- Left pot connected to accelerometer input ADC1.
- Right pot connected to accelerometer input ADC2.

ERRATA 2025-04-01

There is too much combined pull-up resistance with this board, the OLED board, the Hackaday Badge, and the Pico. This inhibits I2C hardware implementations from working with the OLED display.
SOLUTION A: Firmware workaround is to use software I2C.
See: https://github.com/ageppert/SAO_Etch_sAo_Sketch/pull/1
SOLUTION B: Hardware mods to remove interfering components.
See: https://github.com/ageppert/SAO_Etch_sAo_Sketch/issues/8

All non-polarized capacitors are X7R or X5R ceramic unless otherwise noted.

https://hackaday.io/project/197581-etch-sao-sketch

Concept and design by Andy Geppert @ www.MachineIdeas.com

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