

1

2

3

4

5

6

A

B

C

D

Power and USB

File: power_and_usb.kicad_sch

MCU

File: MCU.kicad_sch

Screen

File: screen.kicad_sch

LoRa

File: LoRa.kicad_sch

Peripherals

File: peripherals.kicad_sch

LEDs

File: LEDs.kicad_sch

More LEDs

File: More_LEDs.kicad_sch

LED Controller

File: led_controller.kicad_sch

H5 MountingHole

H6 MountingHole

H7 MountingHole

H8 MountingHole

Sheet: /

File: Exploiteers_Hacker_Pager.kicad_sch

Title:

Size: A4

KiCad E.D.A. 9.0.2

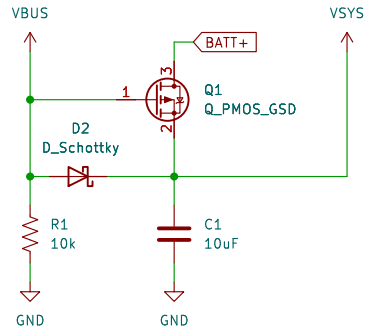
Date:

Rev:

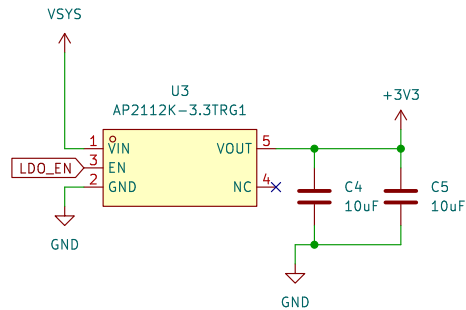
Id: 1/9

Power path selector gizmo

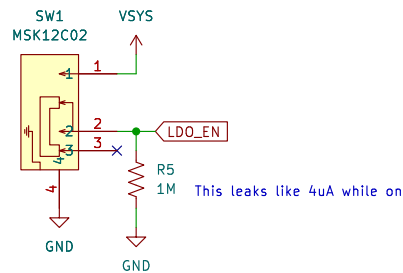
From Adafruit boards. Thanks friends!



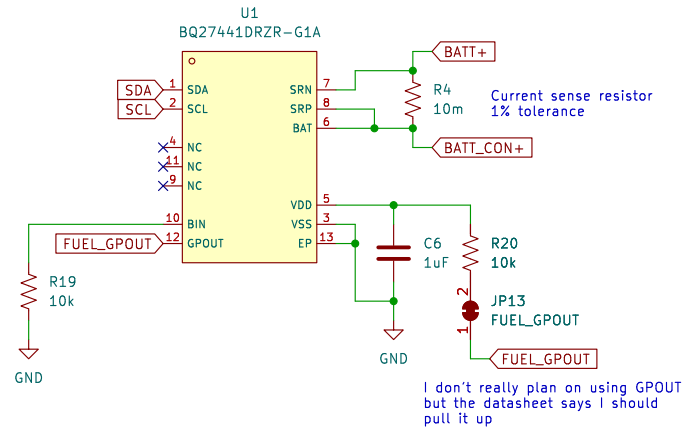
LDO



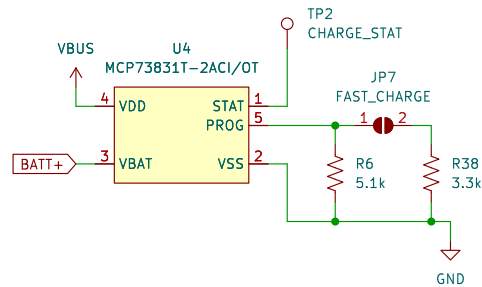
Power Switch



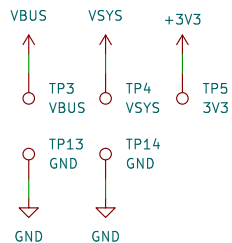
Fuel Gauge



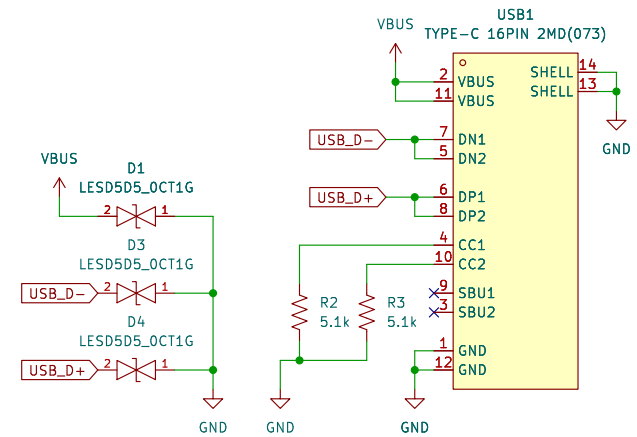
Battery Charger



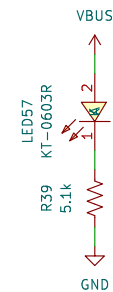
Test Points



USB-C Connector

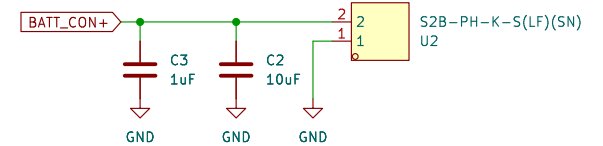


VBUS Indicator



Battery Connector

This is NOT the Adafruit polarity, it's positive on the right which is generally more common.



Sheet: /Power and USB/
File: power_and_usb.kicad_sch

Title:

Size: A4

Date:

KiCad E.D.A. 9.0.2

Rev:

Id: 2/9

10k is probably enough for 400kHz?

So we have a couple devices that will remain on during standby, but the pullups for these inputs require either 3V3 power or an MCU pullup. To keep these from floating during standby we weakly pull them to ground.

This technically leaks like 10uA of current the whole time the device is on.

Enable and reset

3V3

R12 10k

MCU_EN

C11 1uF

GND

Download mode

3V3

R13 10k

MCU_BOOT

SW3 BOOT

4 3 2 1

2 1

GND

Main Microcontroller

U12
ESP32-S3-WROOM-1(N8R2)

3V3

GND

C10 10uF

C9 0.1uF

MCU_EN

LCD_DB0

LCD_DB1

LCD_DB2

LCD_DB3

LCD_DB4

LCD_DB5

LCD_DB6

LCD_DB7

LORA_NSS

USB_D-

USB_D+

LCD_EN

LCD_CS

LORA_CS

LORA_MISO

LORA_MOSI

LORA_RST

LORA_BUST

LORA_DIO1

IO_nINT

SDA

SCL

LCD_CS

LCD_BACKLIGHT

LCD_CONTRAST_PWM

UART_TX

UART_RX

LCD_nCOMMAND

SD_SCK

SD_MOSI

SD_MISO

SD_CS

SD_CD

MOTOR_PWM

BUZZER_PWM

MCU_BOOT

Test points and debug headers

TP11
SDA

TP12
SCL

J22 UART

J23 I2C

FTDI cable pinout

1 2 3 4 5 6

UART_RX

UART_TX

SDA

SCL

Title:	
Size: A4	Date:
KiCad E.D.A. 9.0.2	
Rev: 3/9	

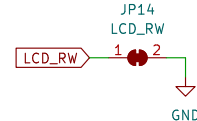
Title:		
Size: A4	Date:	Rev:
KiCad E.D.A. 9.0.2		Id: 3/9

LCD Backlight

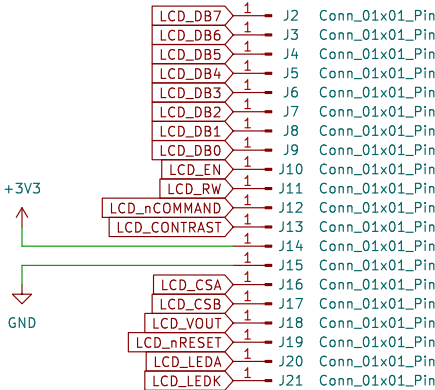
I'm not sure which rail we should power the LCD backlight from. It seems kinda silly to pay the efficiency penalty of the 3V3 rail for something that's kinda high current, but maybe the variance in brightness is going to be super noticeable on VSYS



We never need to read from the LCD keep it in write mode

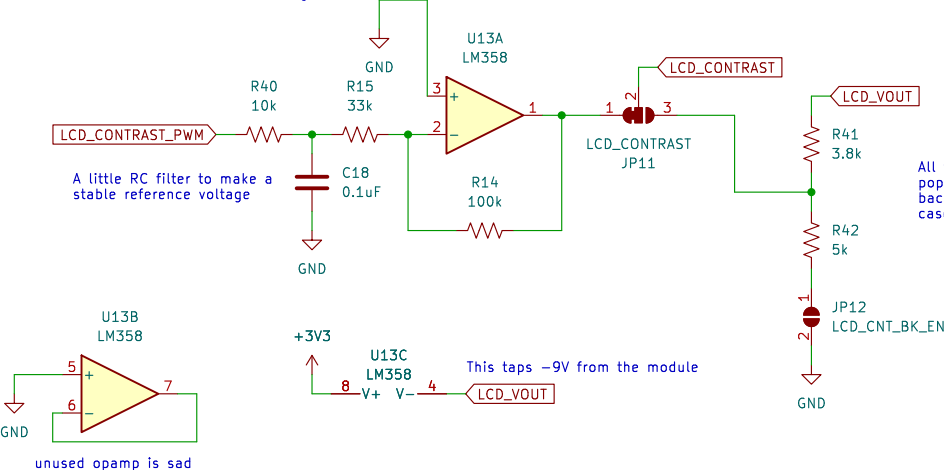


LCD Spring Contacts

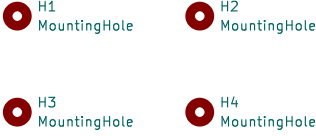


LCD Contrast

So this LCD module needs a contrast voltage between about -3V and -6V. They expect you to use a pot but that's too retro even for a pager. We're using an op amp in an inverting configuration to adjust this voltage.

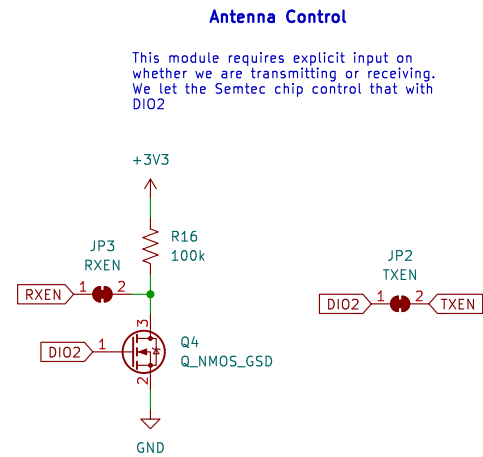


All this stuff is so spicy I'm populating a resistor divider backup on the board. Just in case...

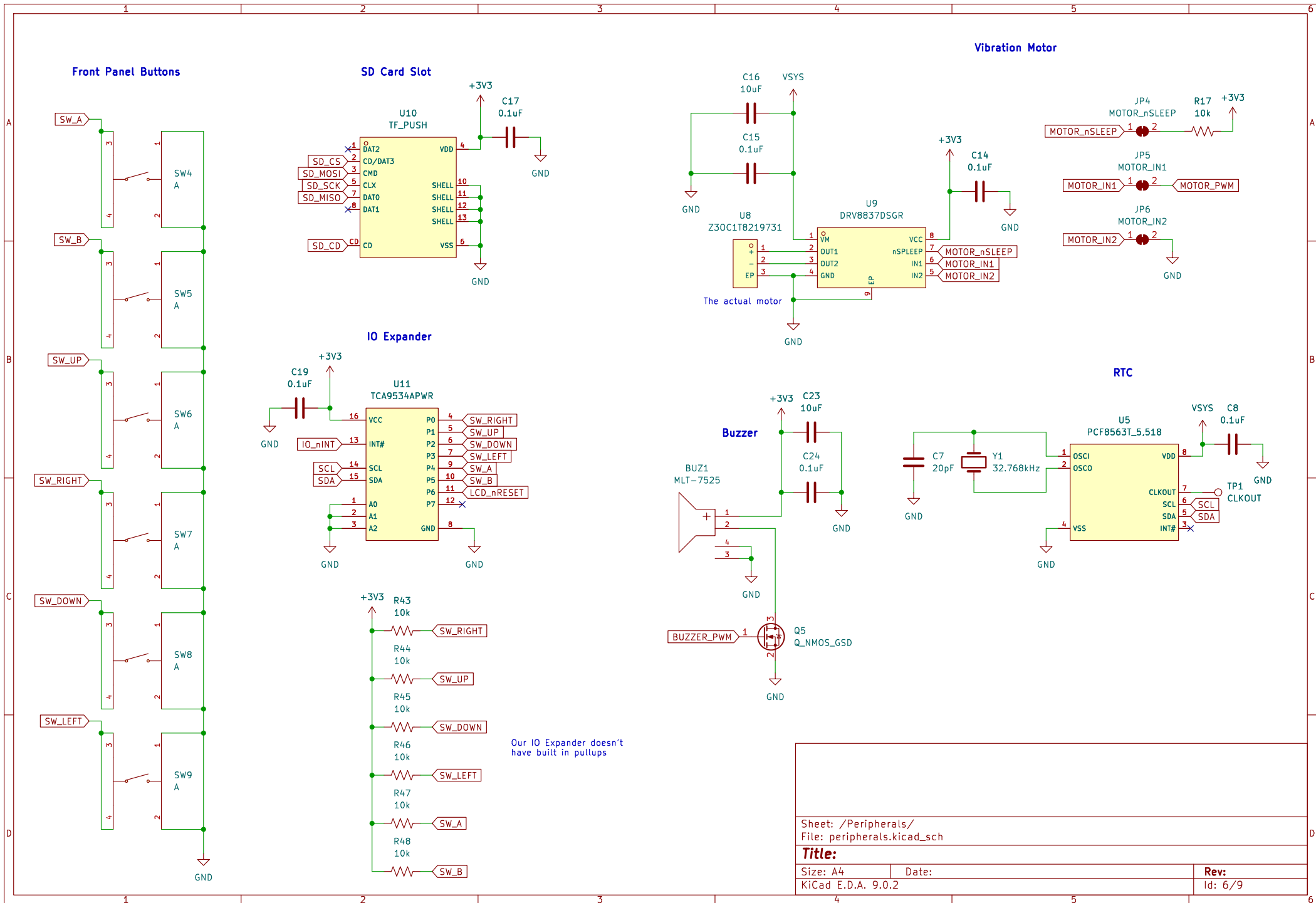


(The LM358 renders as 3 symbols in the schematic, but it's just one chip on the board)

Sheet: /Screen/ File: screen.kicad_sch		
Title:		
Size: A4	Date:	Rev:
KiCad E.D.A. 9.0.2	Id: 4/9	



Rev:
Id: 5/9



Sheet: /Peripherals/
File: peripherals.kicad_sch

Title:

Size: A4

Date:

KiCad E.D.A. 9.0.2

Rev:

Id: 6/9

