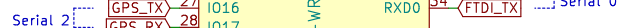
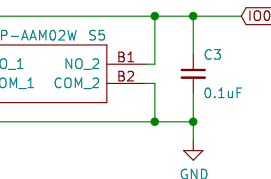


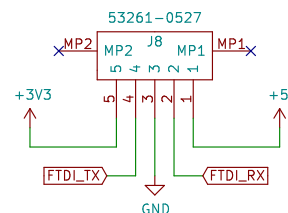
If there is any trouble reading pins, check the internal pull resistors, they vary with every pin.



## Boot Button



## Auto Program Upload



Pin 12 (GPS\_ON\_OFF) may need to have a pull-up or a pull-down resistor depending on the ESP internal flash.  
Note that the pull-down resistors are in the "Telecommunications" page on the date of the Mosfet that actuates the GPS.

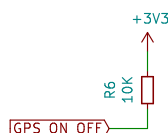
This is needed because pin 12 is a bootstrap pin, used to select the internal flash voltage:

```
1 -> 1.8V
0 -> 3.3V
```

If a 3.3V flash is used (standard) use the Mosfet gate pulldown only.

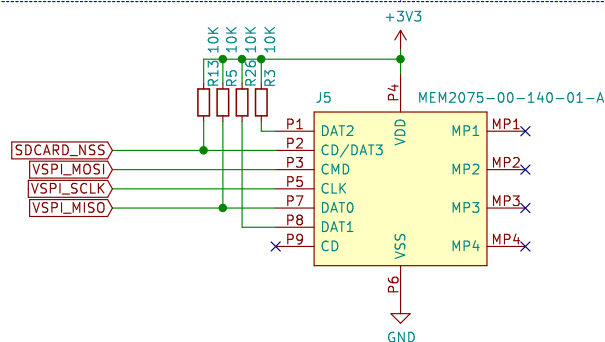
If a 1.8V flash is used you must remove the Mosfet gate pull-down, but the GPS on-off signal must not float (force ground when turning off).

Read more about this here:  
[https://docs.espressif.com/projects/esp-idf/en/latest/esp32/api-reference/peripherals/sd\\_pullup\\_requirements.html#no-pull-up-on-gpio12](https://docs.espressif.com/projects/esp-idf/en/latest/esp32/api-reference/peripherals/sd_pullup_requirements.html#no-pull-up-on-gpio12)



Auto	Program	Upload
DTR	RTS	--> EN 100
1	1	1
0	0	1
1	0	0
0	1	0

Read about the pull-up resistors for SD cards here:  
<https://electronics.stackexchange.com/questions/39571/how-to-do-pulling-up-or-down-correctly-when-interfacing-a-microsd-card>



GAUGE\_SDA → SDA  
GAUGE\_SCL → SCL  
GAUGE\_ALRT1 → ALRT1

## Power

File: Power Management.sch

Diagram showing the connection of the GPS module pins to the Raspberry Pi pins:

- GPS\_TX → GPIO17
- GPS\_RX → GPIO18
- GPS\_EXTINT → GPIO19
- GPS\_RESET → GPIO20
- GPS\_ON/OFF → GPIO21

## Telecommunications

File: Telecommunications.sch

1	FTDI_RX	→ FTDI_RX
2	FTDI_TX	→ FTDI_TX
3	FTDI_DTR	→ FTDI_DTR
4	FTDI_RTS	→ FTDI_RTS
5	RGB_LED_R	→ RGB_LED_R
6	RGB_LED_G	→ RGB_LED_G
7	RGB_LED_B	→ RGB_LED_B
8	BUTTON_1	→ BOT_1
9	BUTTON_2	→ BOT_2
10	BUZZER	→ BUZZER

File: Peripherals.sch

## Zenith Aerospace

Sheet: /  
File: Alcantara\_v.1.0.sch

**Title: Alcantara V.1.0**

Size: A4	Date: 2022-01-17
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Size: 7.1	Date: 2022
KiCad E.D.A.	kicad (5.1.10)-1

Rev: 1.0

Id: 1/4

### Stand-alone Fuel Gauge

The P channel Mosfet in series with the battery works as a simple reverse polarity protection circuit.

If the battery is reversed it will not conduct, hence not turning the circuit on.

I didn't use the zenner on the gate because the Mosfet's maximum  $V_{gs}$  voltage is higher than what will be applied by the battery.

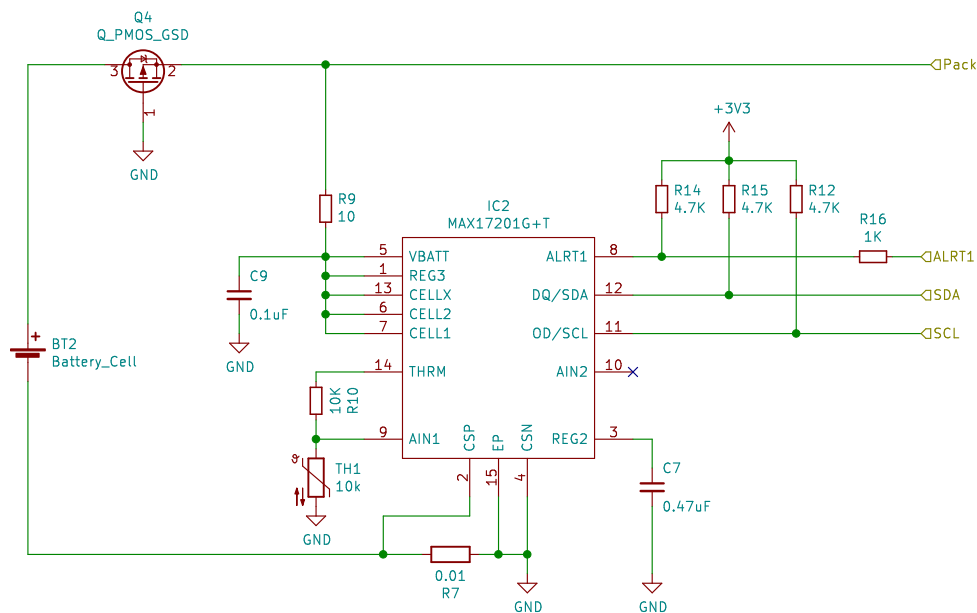
Also, I didn't use a resistor on the gate because the mosfet is constantly on, wich means ringing will not occur.

Watch this to learn more:  
<https://www.youtube.com/watch?v=lrB-FPcv1Dc>

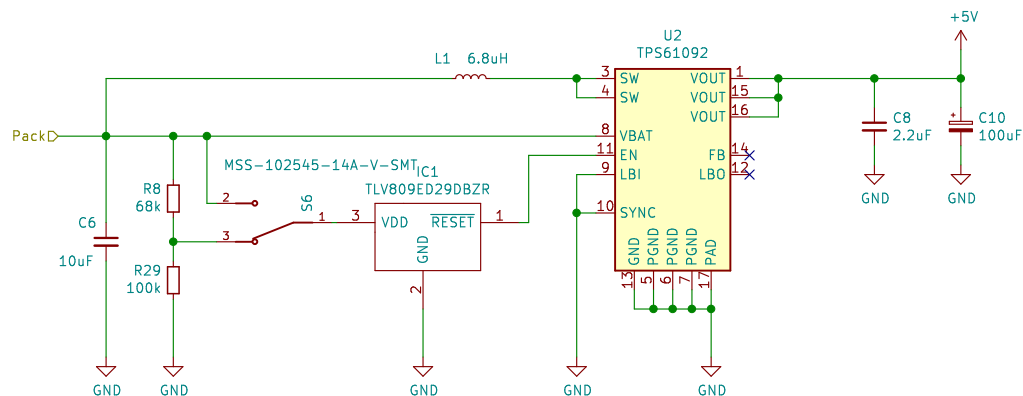
The MAX17201 is an I2C single cell battery monitor. Be aware of the differences of the MAX17211, wich uses the 1-Wire protocol.

This component will measure the battery voltage and using a 0.01 ohm shunt it will also measure the current.

Also be aware of the MAX17205, wich is a multiple cell monitor.

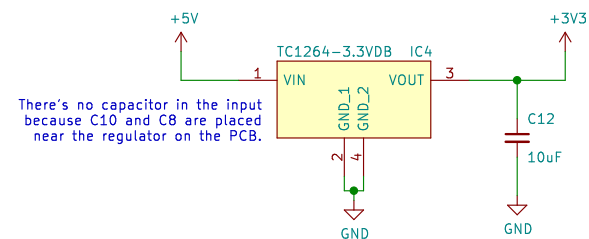


## Synchronous Boost Converter



The TLV809ED29DBZR is a voltage supervisor with a push-pull output. When its input voltage goes above the threshold of 2.93V it takes its output to VCC, enabling the Boost Converter. When VDD falls below the threshold its output is pulled to 0V, turning the system off. This protects the battery from undervolting damage.

## Linear Voltage Regulator



There's no capacitor in the input because C10 and C8 are placed near the regulator on the PCB.

## Zenith Aerospace

Sheet: /Power Management/  
File: Power Management.sch

**Title: Power Management**

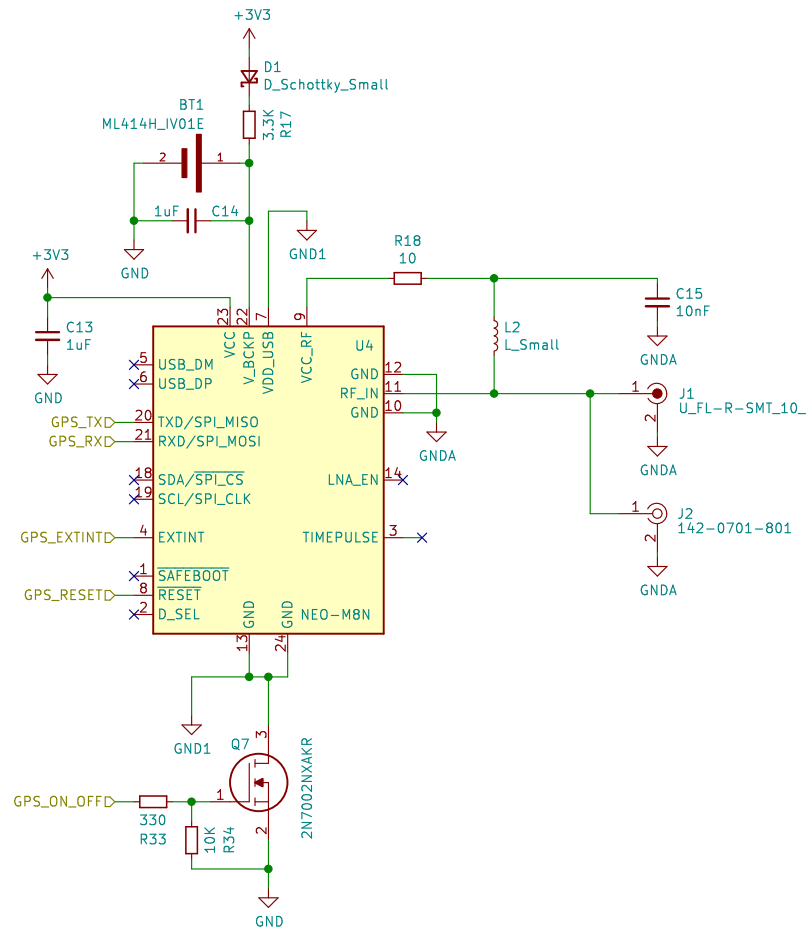
Size: A4	Date: 2022-01-17
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Size: A1	Date: 2022
KiCad E.D.A.	kicad (5.1.10)-1

Rev: 1.0

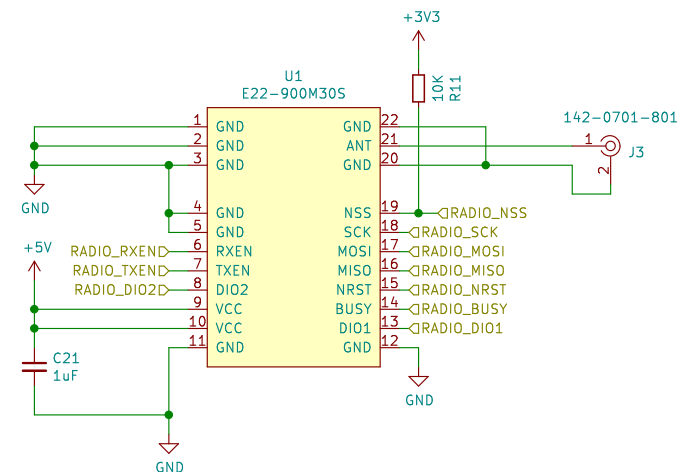
Id: 2/4

## Geopositioning System



The Mosfet is used for turning the Neo-M8N on or off completely, enabling a low power mode for the board. The module offers alternatives for low power modes via commands, but the documentation is rubbish. SHAME on u-blox for not making an enable pin, SHAME >:C

## LoRa & (G)FSK 30dBm Radio



Zenith Aerospace

Sheet: /Telecommunications/  
File: Telecommunications.sch

**Title: Telecommunications**

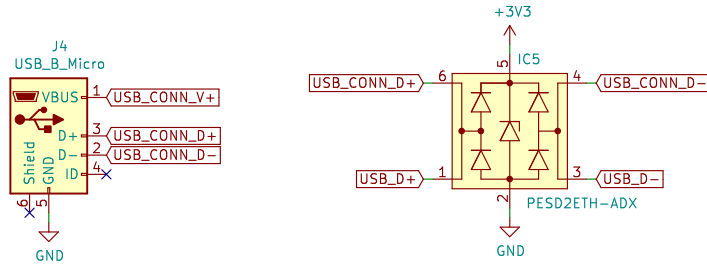
Size: A4 Date: 2022-01-17

KiCad E.D.A. kicad (5.1.10)-1

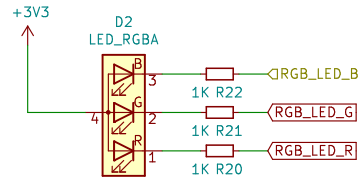
**Rev: 1.0**

Id: 3/4

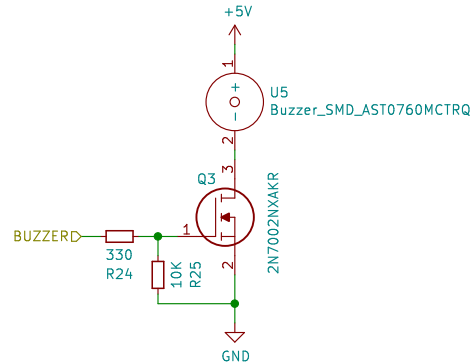
## Micro USB Connector & ESD Protection



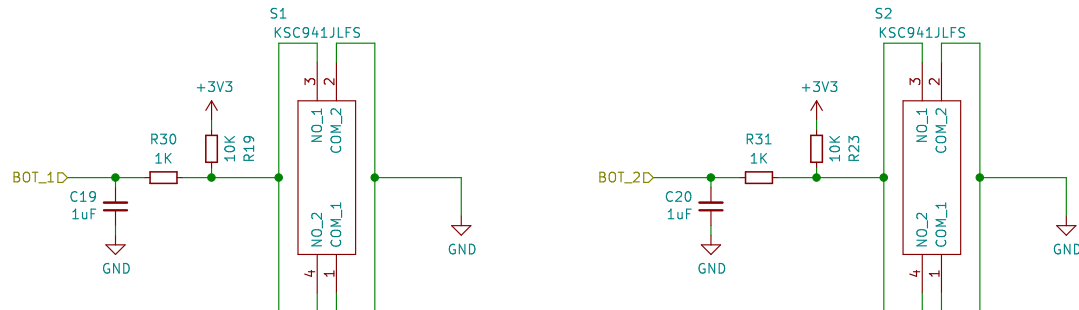
## User Interface – RGB LED



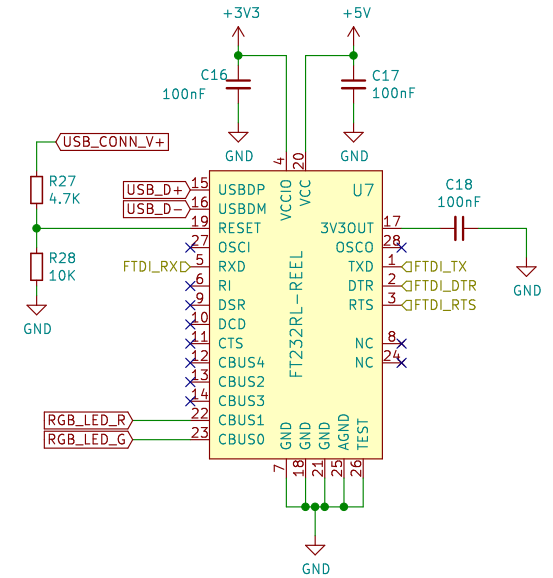
## User Interface – Buzzer



## User Interface – Buttons



## USB to Serial Converter



**Zenith Aerospace**

Sheet: /Peripherals/  
File: Peripherals.sch

**Title: Peripherals**

Size: A4 Date: 2022-01-17

KiCad E.D.A. kicad (5.1.10)-1

**Rev: 1.0**

Id: 4/4