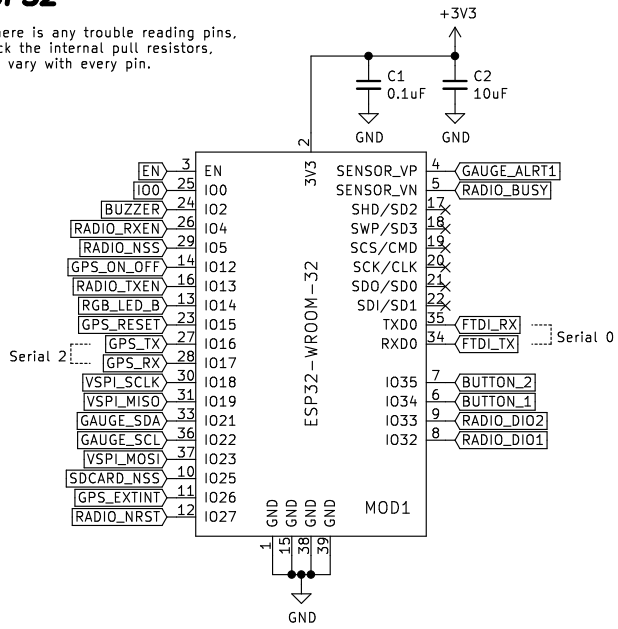
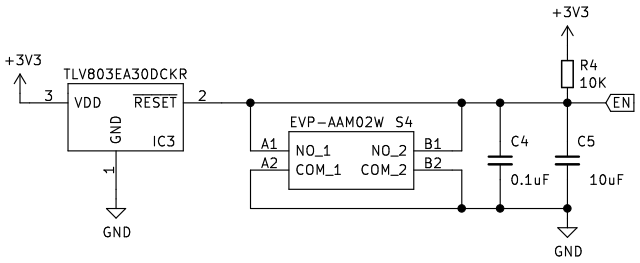
ESP32

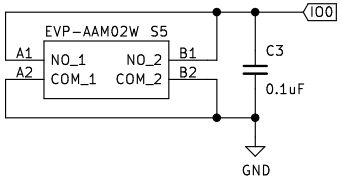
If there is any trouble reading pins, check the internal pull resistors, they vary with every pin.



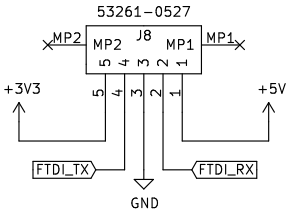
Reset Button



Boot Button



External Picoblade



ESP32 Flash Voltage Pin

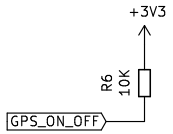
Pin 12 (GPS_ON_OFF) may need to have a pull-up or a pull-down ressitor depending on the ESP internal flash.
Note that the pull-down resistors are in the "Tecommunications" page on the gate of the Mosfet that actuates the GPS.

This is needed because pin 12 is a bootstrap pin, used to select the internal flash voltage:
1 -> 1.8V
0 -> 3.3V

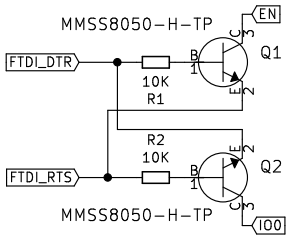
If a 3.3V flash is used (standard) use the Mosfet gate pulldown only.

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



Auto Upload

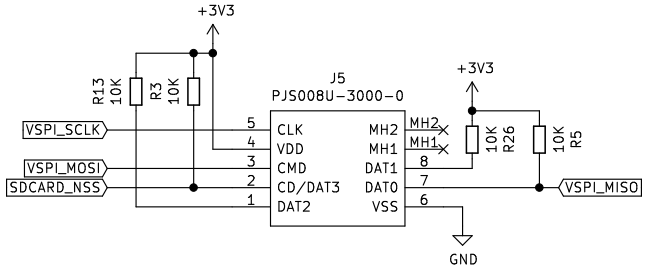


Auto Program Upload

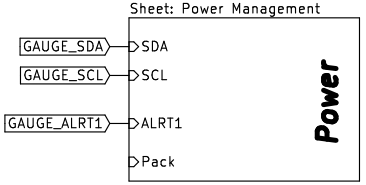
DTR	RTS	--> EN	IO0
1	1	1	1
0	0	1	1
1	0	0	1
0	1	1	0

SD Card

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

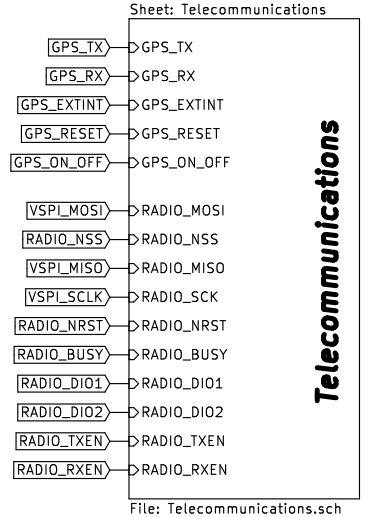


Sheet: Power Management



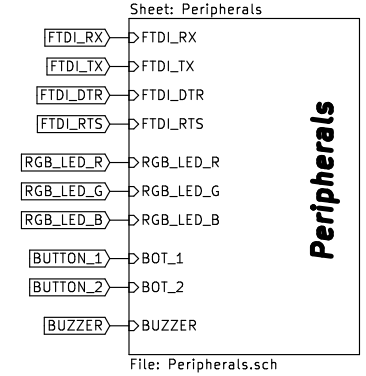
File: Power Management.sch

Sheet: Telecommunications



File: Telecommunications.sch

Sheet: Peripherals



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Zenith Aerospace

Sheet: /
File: Alcantara_v.1.0.sch

Title: Alcantara V.1.0

Size: A4	Date: 2022-01-17	**Rev: 1.0**
KiCad E.D.A. kicad (5.1.10)-1		Id: 1/4

Stand-alone Fuel Gauge

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

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

I didin't use the zenner on the gate because the Mosfet's maximum Vgs voltage is higher than what we will be applied by the battery.

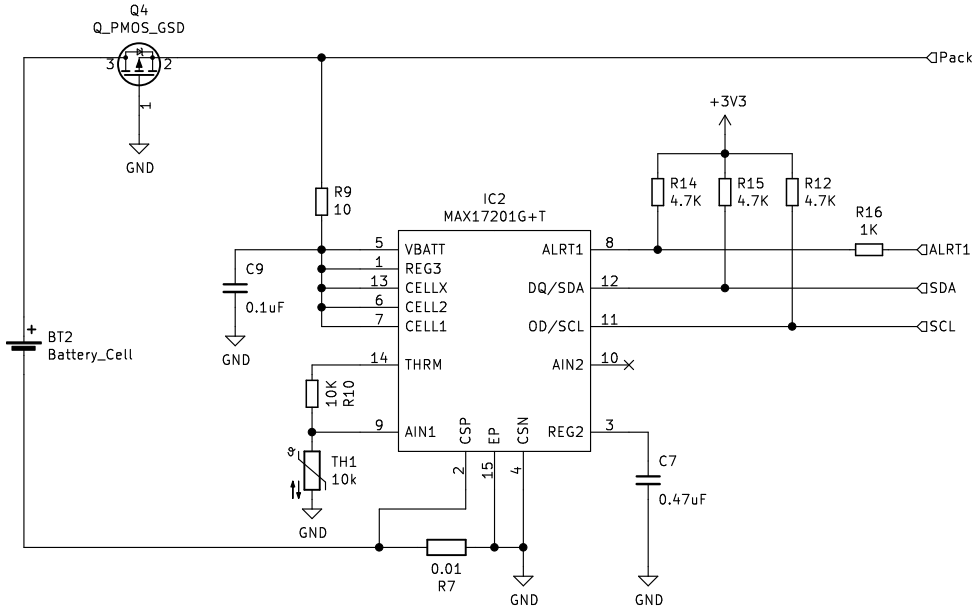
Also, I didin't use a resistor on the gate because the mosfet is constantly on, wich means ringing will not occur.

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

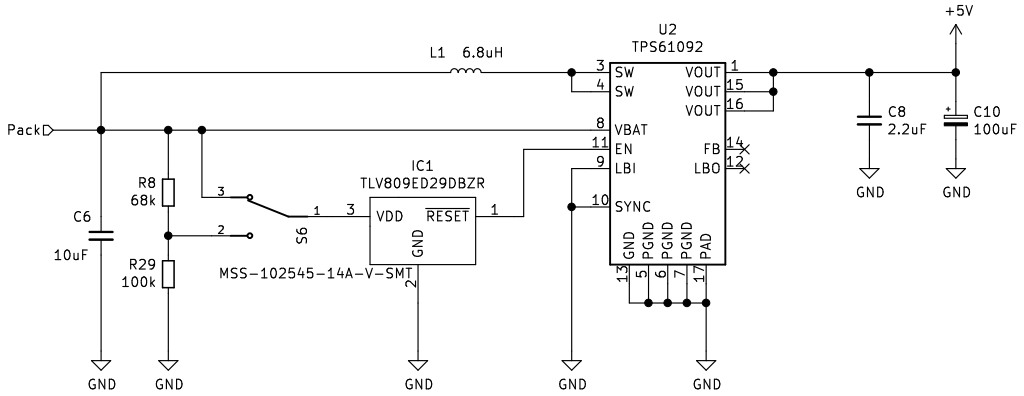
The MAX17201 is an I2C single cell battery monitor. Be aware of the differences of the MAX17211, wich uses the 1-Wire protocol.

This component will measure the battery volatge and with the 0.01 ohm shunt it will also measure the current.

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

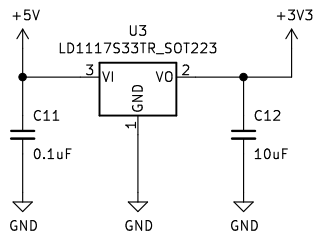


Synchronous Boost Converter



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 bellow the threshold its outut is pulled to 0V, turning the system off.
This protects the battery from undervoltting damage.

Linear Voltage Regulator



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

Title: Power Management

Size: A4	Date: 2022-01-17	**Rev: 1.0**
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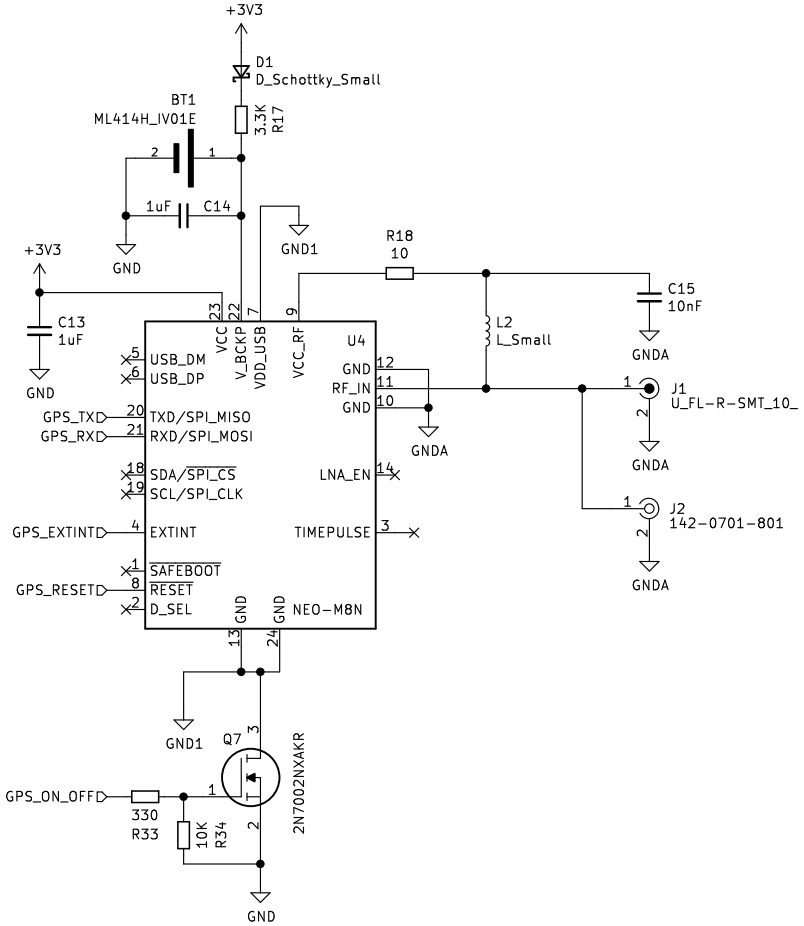
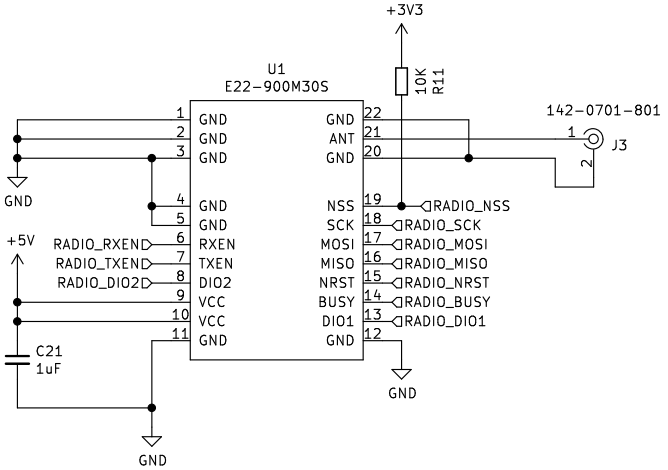
Geopositioning System



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



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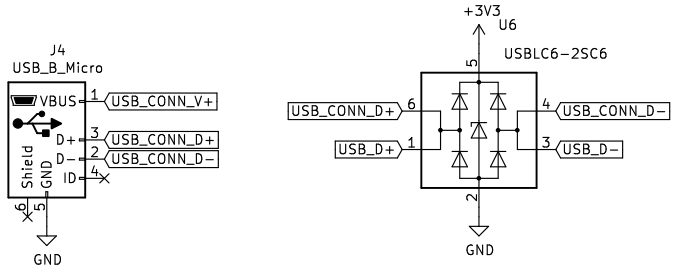
Sheet: /Telecommunications/
File: Telecommunications.sch

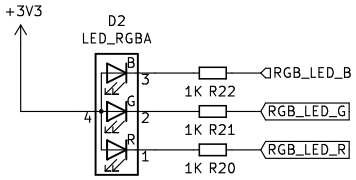
Title: Telecommunications

Size: A4	Date: 2022-01-17	**Rev: 1.0**
KiCad E.D.A. kicad (5.1.10)-1		Id: 3/4

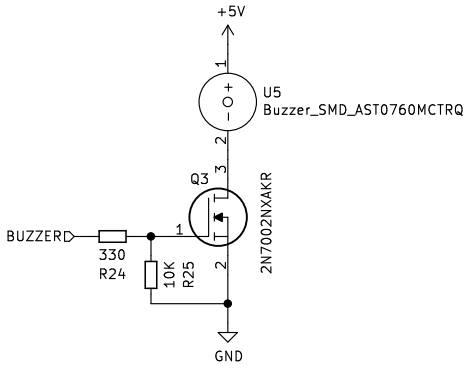
Micro USB Connector & ESD Protection



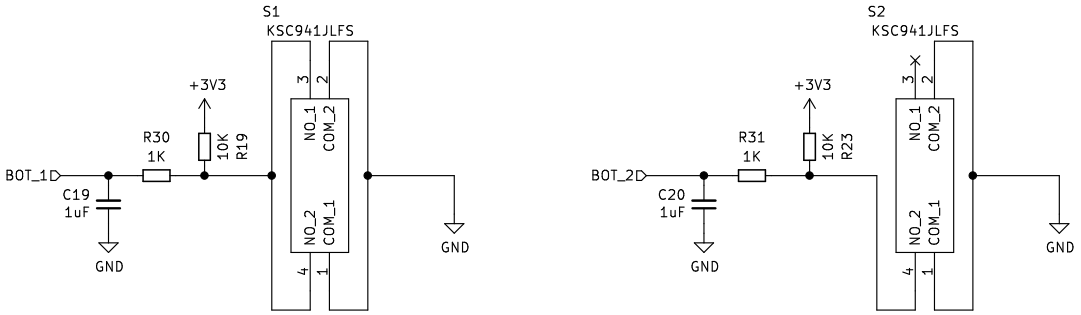
User Interface — RGB LED



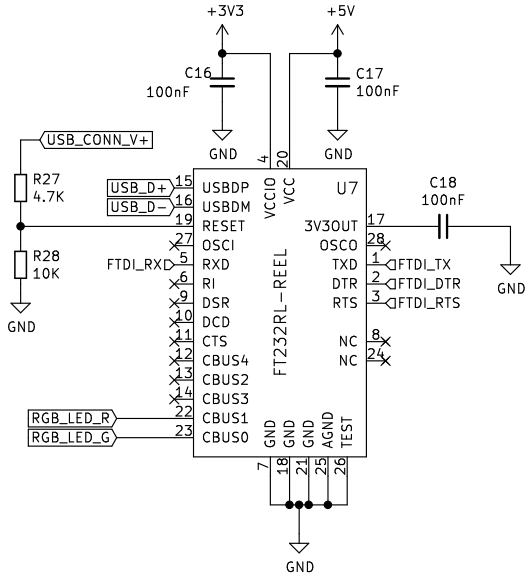
User Interface — Buzzer



User Interface — Buttons



USB to Serial Converter



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Sheet: /Peripherals/
File: Peripherals.sch

Title: Peripherals

Size: A4	Date: 2022−01−17	**Rev: 1.0**
KiCad E.D.A. kicad (5.1.10)−1		Id: 4/4