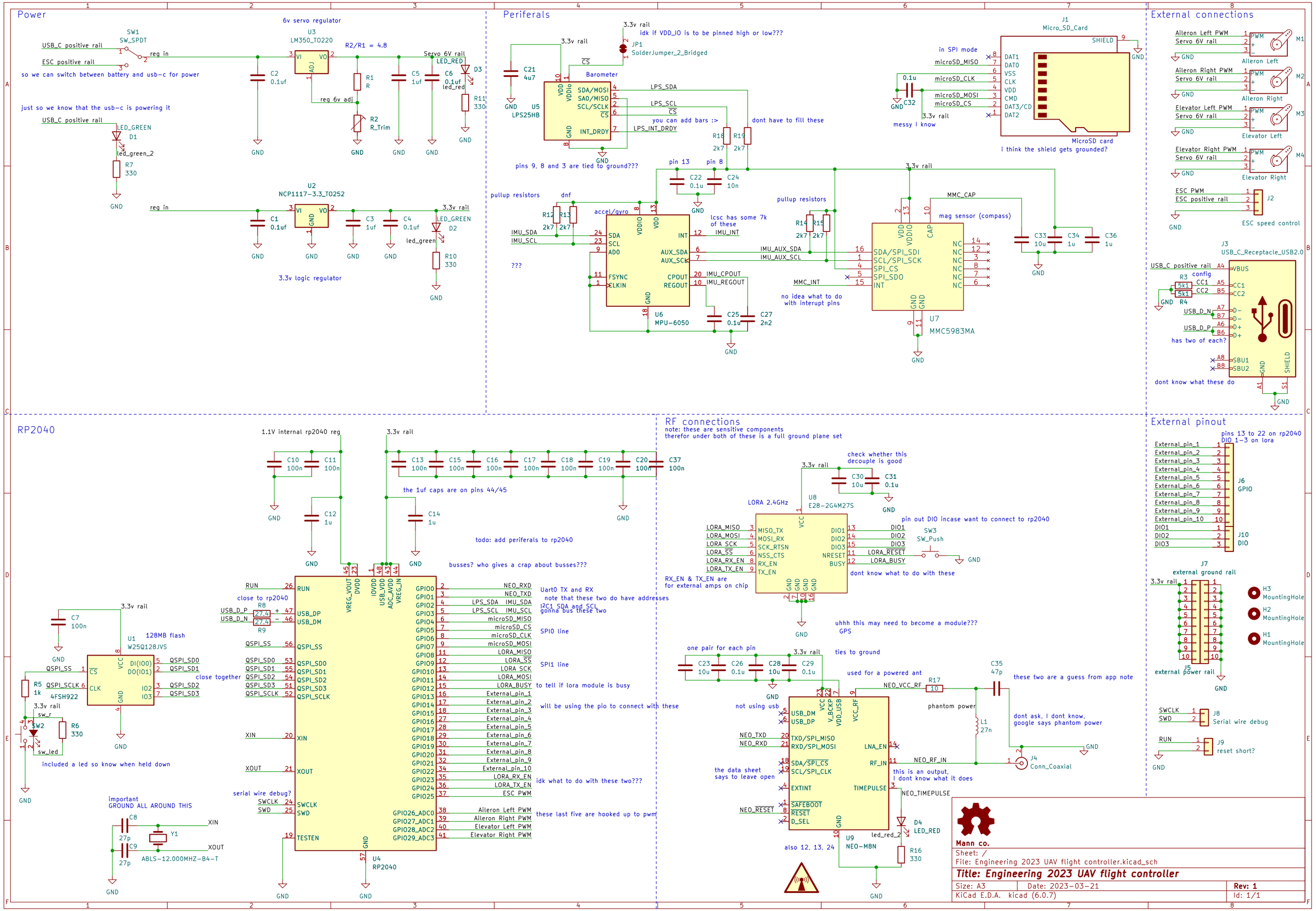
Power
6v servo regulator
SW1
SW_SPDT
USB_C positive rail
ESC positive rail
reg in
so we can switch between battery and usb-c for power
U3
LM350_TO220
R2/R1 = 4.8
Servo 6V rail
LED_RED
D3
R11
330
C2
0.1uf
R1
R
C5
1uf
C6
0.1uf
led_red
R2
R_Trim
reg 6v adj
GND
just so we know that the usb-c is powering it
USB_C positive rail
LED_GREEN
D1
led_green_2
R7
330
U2
NCP1117-3.3_TO252
reg in
3.3v rail
C1
0.1uf
C3
1uf
C4
0.1uf
LED_GREEN
D2
led_green
R10
330
3.3v logic regulator
Periferals
3.3v rail
idk if VDD_IO is to be pinned high or low???
JP1
SolderJumper_2_Bridged
C21
4u7
U5
LPS25HB
Barometer
SDA/MOSI
SA0/MISO
SCL/SCLK
CS
INT_DRDY
LPS_SDA
LPS_SCL
LPS_INT_DRDY
you can add bars :>
dont have to fill these
R18
2k7
R19
2k7
pins 9, 8 and 3 are tied to ground???
pin 13
pin 8
C22
0.1u
C24
10n
pullup resistors
dnf
R12
2k7
R13
2k7
accel/gyro
IMU_SDA
IMU_SCL
???
SDA
SCL
ADO
FSYNC
CLKIN
INT
AUX_SDA
AUX_SCL
CPOUT
REGOUT
IMU_INT
lcsc has some 7k of these
IMU_AUX_SDA
IMU_AUX_SCL
IMU_CPOUT
IMU_REGOUT
U6
MPU-6050
C25
0.1u
C27
2n2
pullup resistors
R14
2k7
R15
2k7
MMC_INT
no idea what to do with interupt pins
MMC_CAP
mag sensor (compass)
SDA/SPI_SDI
SCL/SPI_SCK
SPI_CS
SPI_SDO
INT
U7
MMC5983MA
C33
10u
C34
1u
C36
1u
J1
Micro_SD_Card
SHIELD
in SPI mode
microSD_MISO
microSD_CLK
microSD_MOSI
microSD_CS
DAT1
DAT0
VSS
CLK
VDD
CMD
DAT3/CD
DAT2
0.1u
C32
3.3v rail
messy I know
MicroSD card
i think the shield gets grounded?
External connections
Aileron Left PWM
Servo 6V rail
Aileron Left
M1
Aileron Right PWM
Aileron Right
M2
Elevator Left PWM
Elevator Left
M3
Elevator Right PWM
Elevator Right
M4
ESC PWM
ESC positive rail
J2
ESC speed control
J3
USB_C_Receptacle_USB2.0
USB_C positive rail
VBUS
config
R3
5k1
CC1
CC2
R4
USB_D_N
USB_D_P
D-
D+
has two of each?
SBU1
SBU2
GND
SHIELD
dont know what these do
RP2040
1.1V internal rp2040 reg
3.3v rail
C10
100n
C11
100n
C12
1u
C13
C15
C16
C17
C18
C19
C20
C37
100n
the 1uf caps are on pins 44/45
C14
1u
todo: add periferals to rp2040
busses? who gives a crap about busses???
C7
100n
U1
W25Q128JVS
128MB flash
QSPI_SS
QSPI_SCLK
QSPI_SD0
QSPI_SD1
QSPI_SD2
QSPI_SD3
close together
4FSH922
R5
1k
R6
330
SW2
sw_r
sw_led
included a led so know when held down
important
GROUND ALL AROUND THIS
C8
27p
C9
27p
Y1
ABLS-12.000MHZ-B4-T
XIN
XOUT
close to rp2040
USB_D_P
USB_D_N
R8
27.4
R9
27.4
RUN
USB_DP
USB_DM
QSPI_SS
QSPI_SD0
QSPI_SD1
QSPI_SD2
QSPI_SD3
QSPI_SCLK
XIN
XOUT
serial wire debug?
SWCLK
SWD
TESTEN
U4
RP2040
GPIO0 NEO_RXD
GPIO1 NEO_TXD
GPIO2 LPS_SDA IMU_SDA
GPIO3 LPS_SCL IMU_SCL
GPIO4 microSD_MISO
GPIO5 microSD_CS
GPIO6 microSD_CLK
GPIO7 microSD_MOSI
GPIO8 LORA_MISO
GPIO9 LORA_SS
GPIO10 LORA_SCK
GPIO11 LORA_MOSI
GPIO12 LORA_BUSY
GPIO13 External_pin_1
GPIO14 External_pin_2
GPIO15 External_pin_3
GPIO16 External_pin_4
GPIO17 External_pin_5
GPIO18 External_pin_6
GPIO19 External_pin_7
GPIO20 External_pin_8
GPIO21 External_pin_9
GPIO22 External_pin_10
GPIO23 LORA_RX_EN
GPIO24 LORA_TX_EN
GPIO25 ESC PWM
GPIO26_ADC0 Aileron Left PWM
GPIO27_ADC1 Aileron Right PWM
GPIO28_ADC2 Elevator Left PWM
GPIO29_ADC3 Elevator Right PWM
Uart0 TX and RX
note that these two do have addresses
I2C1 SDA and SCL
gonna bus these two
SPI0 line
SPI1 line
to tell if lora module is busy
will be using the pio to connect with these
idk what to do with these two???
these last five are hooked up to pwm
RF connections
note: these are sensitive components
therefor under both of these is a full ground plane set
check whether this decouple is good
3.3v rail
C30
10u
C31
0.1u
U8
E28-2G4M27S
LORA 2.4GHz
MISO_TX
MOSI_RX
SCK_RTSN
NSS_CTS
RX_EN
TX_EN
LORA_MISO
LORA_MOSI
LORA_SCK
LORA_SS
LORA_RX_EN
LORA_TX_EN
DIO1
DIO2
DIO3
NRESET
BUSY
LORA_RESET
LORA_BUSY
pin out DIO incase want to connect to rp2040
SW3
SW_Push
dont know what to do with these
RX_EN & TX_EN are for external amps on chip
uhhh this may need to become a module???
GPS
one pair for each pin
C23
10u
C26
0.1u
C28
10u
C29
0.1u
ties to ground
used for a powered ant
NEO_VCC_RF
R17
10
C35
47p
these two are a guess from app note
not using usb
USB_DM
USB_DP
NEO_TXD
NEO_RXD
TXD/SPI_MISO
RXD/SPI_MOSI
SDA/SPI_CS
SCL/SPI_CLK
EXTINT
SAFEBOOT
RESET
D_SEL
NEO_RESET
the data sheet says to leave open
VCC
V_BCKP
VDD_USB
VCC_RF
LNA_EN
RF_IN
TIMEPULSE
NEO_RF_IN
NEO_TIMEPULSE
this is an output, I dont know what it does
phantom power
L1
27n
dont ask, I dont know, google says phantom power
J4
Conn_Coaxial
D4
LED_RED
R16
330
U9
NEO-M8N
also 12, 13, 24
External pinout
pins 13 to 22 on rp2040
DIO 1-3 on lora
External_pin_1
External_pin_2
External_pin_3
External_pin_4
External_pin_5
External_pin_6
External_pin_7
External_pin_8
External_pin_9
External_pin_10
J6
GPIO
DIO1
DIO2
DIO3
J10
DIO
J7
external ground rail
3.3v rail
J5
external power rail
H3
MountingHole
H2
MountingHole
H1
MountingHole
SWCLK
SWD
J8
Serial wire debug
RUN
J9
reset short?
Mann co.
Sheet: /
File: Engineering 2023 UAV flight controller.kicad_sch
Title: Engineering 2023 UAV flight controller
Size: A3
Date: 2023-03-21
Rev: 1
KiCad E.D.A. kicad (6.0.7)
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