NovaGlider – CanSat 2025/2026

System Schematic – Revision 1.1

Project Description:
NovaGlider is an integrated electronics system designed for the CanSat competition.
Its primary purpose is to collect environmental and inertial data, transmit telemetry, and log mission information during descent. The system is built around the STM32F103C8T6 ARM Cortex-M3 microcontroller.

Subsystem Overview:

Microcontroller: STM32F103C8T6

Sensors:

BME280 (temperature, humidity, pressure)
MPU9250 (IMU: accelerometer, gyroscope, magnetometer)
Communication: RFM69HCW sub-GHz radio module
Data Storage: Micro-SD card interface
Actuation: 3 × servo outputs
User Interface: 3 push buttons
Connectivity: UART header for programming/debug
Power / Charging: USB-C connector for programming the MCU and charging the Li-Po battery

Design Notes:

All modules operate from regulated 3.3V, except the servos, which operate from 5V.
Appropriate decoupling capacitors are placed near all ICs and sensors.
Power sequencing and protection components are included for safe Li-Po usage.
High-frequency modules (IMU, radio, SD) follow recommended layout constraints.

Purpose of This Document:
This schematic provides an overview of the electrical design for NovaGlider. It is intended to guide PCB development, allow peer review, and support verification during the competition's integration and testing phases.

Power

File: power.kicad_sch

MCU & peripherals

File: mcu_and_peripherals.kicad_sch

created by Sam Vandenabeele
part of Saint-Barbara college
NovaGlider

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File: novacan_can.kicad_sch

Title: NovaGlider

Size: A4	Date: 2025-12-03	**Rev: v1.1**
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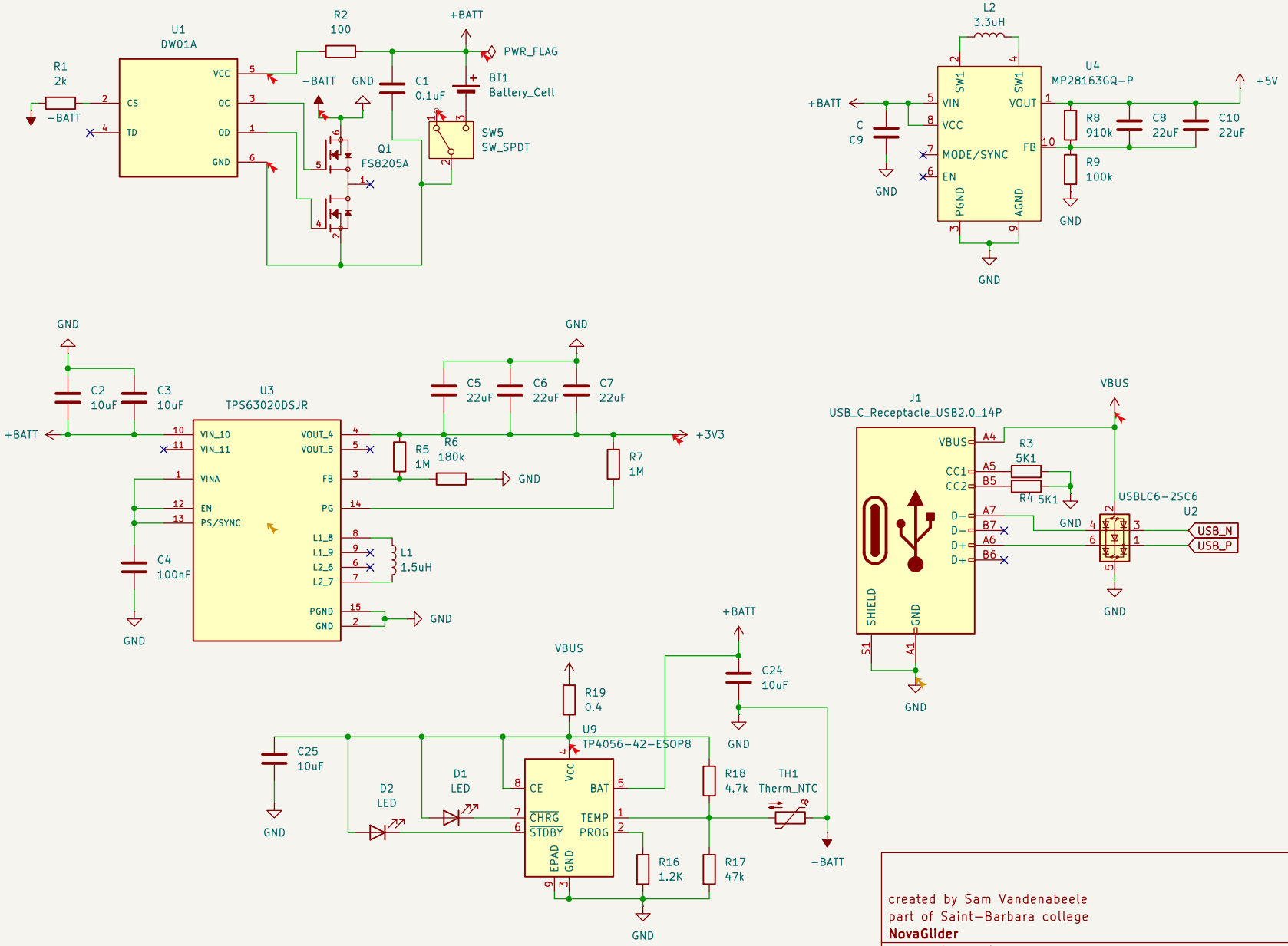

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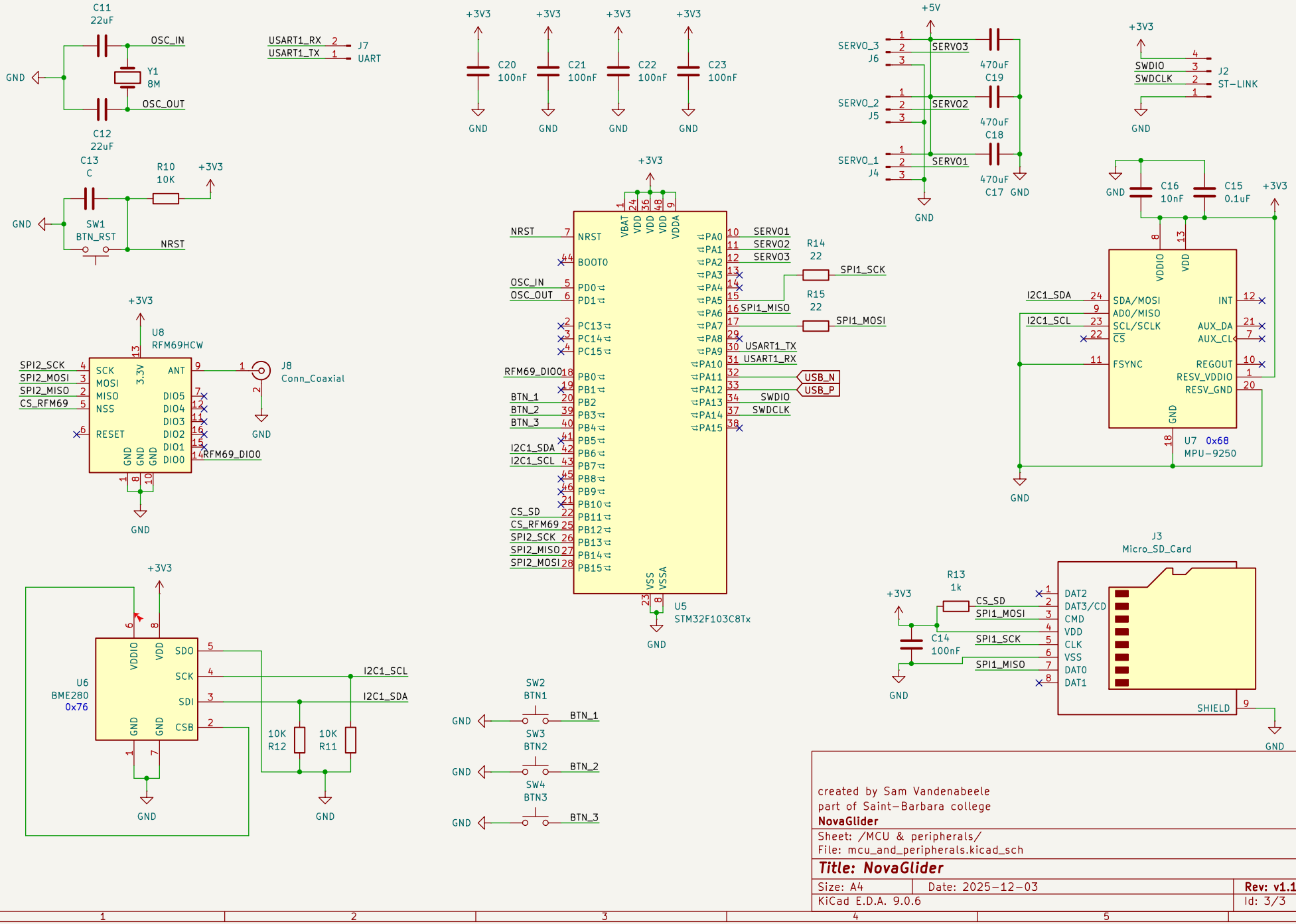
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22uF
OSC_IN
GND
Y1
8M
OSC_OUT
C12
22uF
C13
C
R10
10K
+3V3
GND
SW1
BTN_RST
NRST
USART1_RX 2
USART1_TX 1
J7
UART
+3V3
C20
100nF
C21
100nF
C22
100nF
C23
100nF
GND
+5V
SERVO_3
J6
SERVO3
470uF
C19
SERVO_2
J5
SERVO2
470uF
C18
SERVO_1
J4
SERVO1
470uF
C17
GND
+3V3
SWDIO
SWDCLK
J2
ST-LINK
GND
U8
RFM69HCW
SPI2_SCK
SPI2_MOSI
SPI2_MISO
CS_RFM69
SCK
MOSI
MISO
NSS
RESET
3.3V
ANT
DIO5
DIO4
DIO3
DIO2
DIO1
DIO0
RFM69_DIO0
J8
Conn_Coaxial
GND
+3V3
NRST
BOOT0
OSC_IN
OSC_OUT
PD0
PD1
PC13
PC14
PC15
RFM69_DIO0
BTN_1
BTN_2
BTN_3
I2C1_SDA
I2C1_SCL
CS_SD
CS_RFM69
SPI2_SCK
SPI2_MISO
SPI2_MOSI
PB0
PB1
PB2
PB3
PB4
PB5
PB6
PB7
PB8
PB9
PB10
PB11
PB12
PB13
PB14
PB15
VBAT
VDD
VDDA
VSS
VSSA
PA0
PA1
PA2
PA3
PA4
PA5
PA6
PA7
PA8
PA9
PA10
PA11
PA12
PA13
PA14
PA15
SERVO1
SERVO2
SERVO3
R14
22
SPI1_SCK
R15
22
SPI1_MISO
SPI1_MOSI
USART1_TX
USART1_RX
USB_N
USB_P
SWDIO
SWDCLK
U5
STM32F103C8Tx
GND
+3V3
C16
10nF
C15
0.1uF
GND
I2C1_SDA
I2C1_SCL
SDA/MOSI
AD0/MISO
SCL/SCLK
CS
FSYNC
VDDIO
VDD
INT
AUX_DA
AUX_CL
REGOUT
RESV_VDDIO
RESV_GND
U7 0x68
MPU-9250
GND
+3V3
U6
BME280
0x76
VDDIO
VDD
SDO
SCK
SDI
CSB
GND
I2C1_SCL
I2C1_SDA
10K
R12
10K
R11
GND
SW2
BTN1
SW3
BTN2
SW4
BTN3
BTN_1
BTN_2
BTN_3
GND
J3
Micro_SD_Card
+3V3
R13
1k
C14
100nF
CS_SD
SPI1_MOSI
SPI1_SCK
SPI1_MISO
DAT2
DAT3/CD
CMD
VDD
CLK
VSS
DAT0
DAT1
SHIELD
GND
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