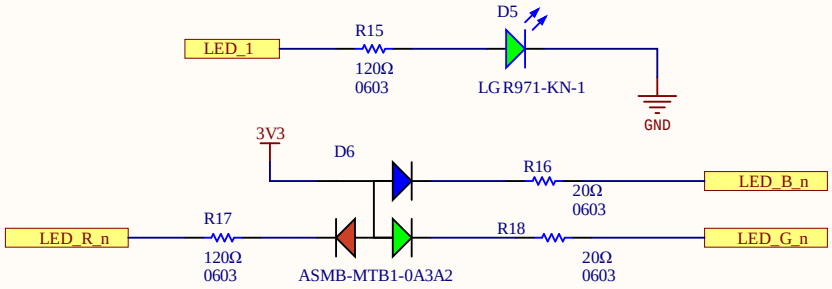
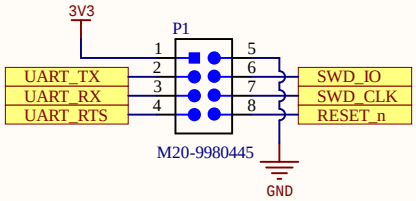
Debug/Programming



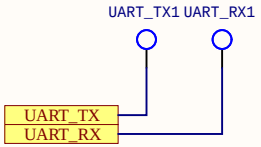
Current Calculations

Green LED voltage drop: 2.2V
- I = (3.3-2.2V)/120 = 10.83mA

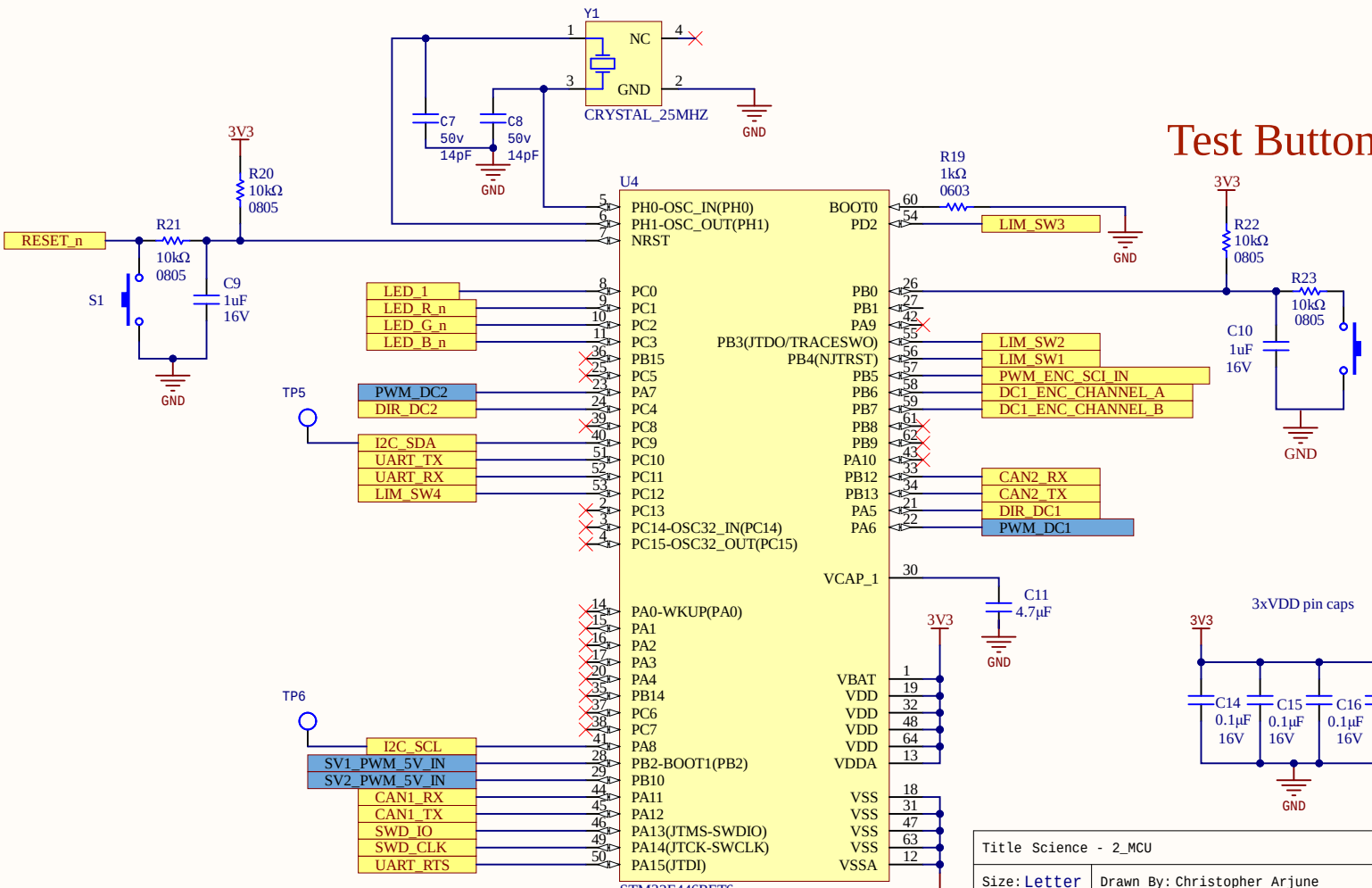
RGB LED voltage drops:
- Red: 2.1V: I = (3.3-2.1V)/120 = 10mA
- Blue: 3.1V: I = (3.3-3.1V)/20 = 10mA
- Green: 3.1V: I = (3.3-3.1V)/20 = 10mA



Testpoints

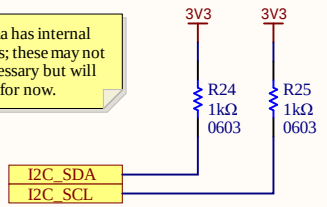


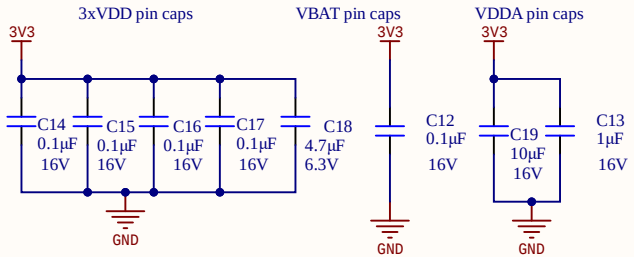
Test Button



I²C Pullups

Stemma has internal pullups; these may not be necessary but will be left for now.





Title Science - 2_MCU		UW Robotics 200 University Avenue Waterloo Ontario Canada N2L 3G6
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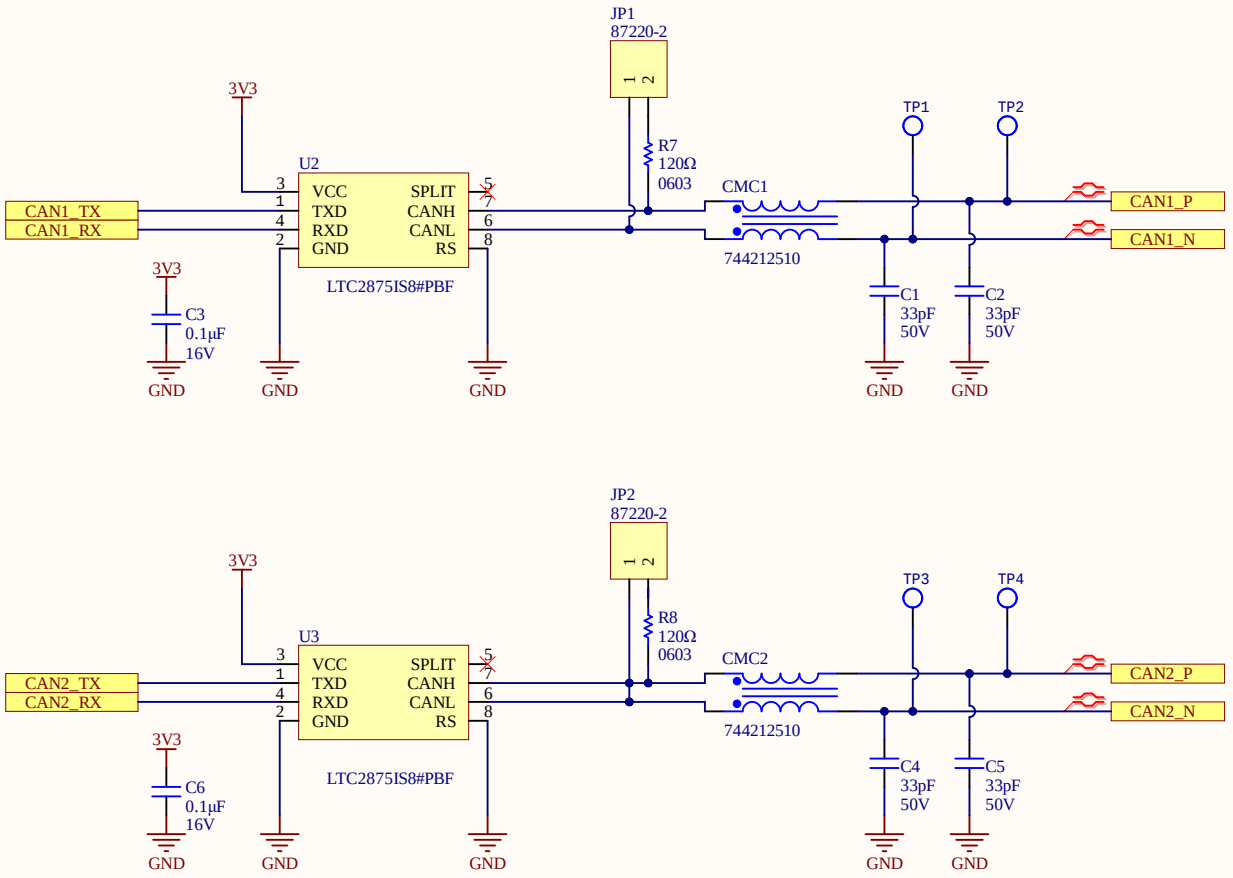
Date: 7/23/2020	Sheet 2 of 6	
File: C:\Users\badpr\altium_porjects\MarsRover2020-PCB\Projects\Science\Rev2\SH4 - MICROCONTROLLER.SchDoc		

CAN Transceivers



Title Science - 3_CAN		UW Robotics 200 University Avenue Waterloo Ontario Canada N2L 3G6
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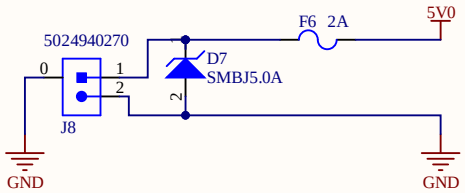
Date: 7/23/2020	Sheet 3 of 6	
File: C:\Users\badpr\altium_porjects\MarsRover2020-PCB\Projects\Science\Rev2\SH5 - CAN.SchDoc		

5V - 3.3V Buck Converter

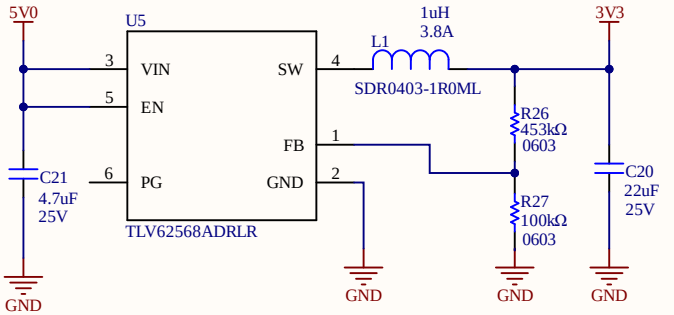


Designed for 3.3V - 5V input

Route for 1A in

Inductor: SDR0403-1R0ML
1uH, 20%, 33mOhm DCR (max)
3.8A (rms), 5.5A (sat), 3.2mm tall

Route for 3A out



Maximum output power = 6.6W
Expected efficiency at 1A = 94.3%

Title Science - 4_Power		UW Robotics 200 University Avenue Waterloo Ontario Canada N2L 3G6
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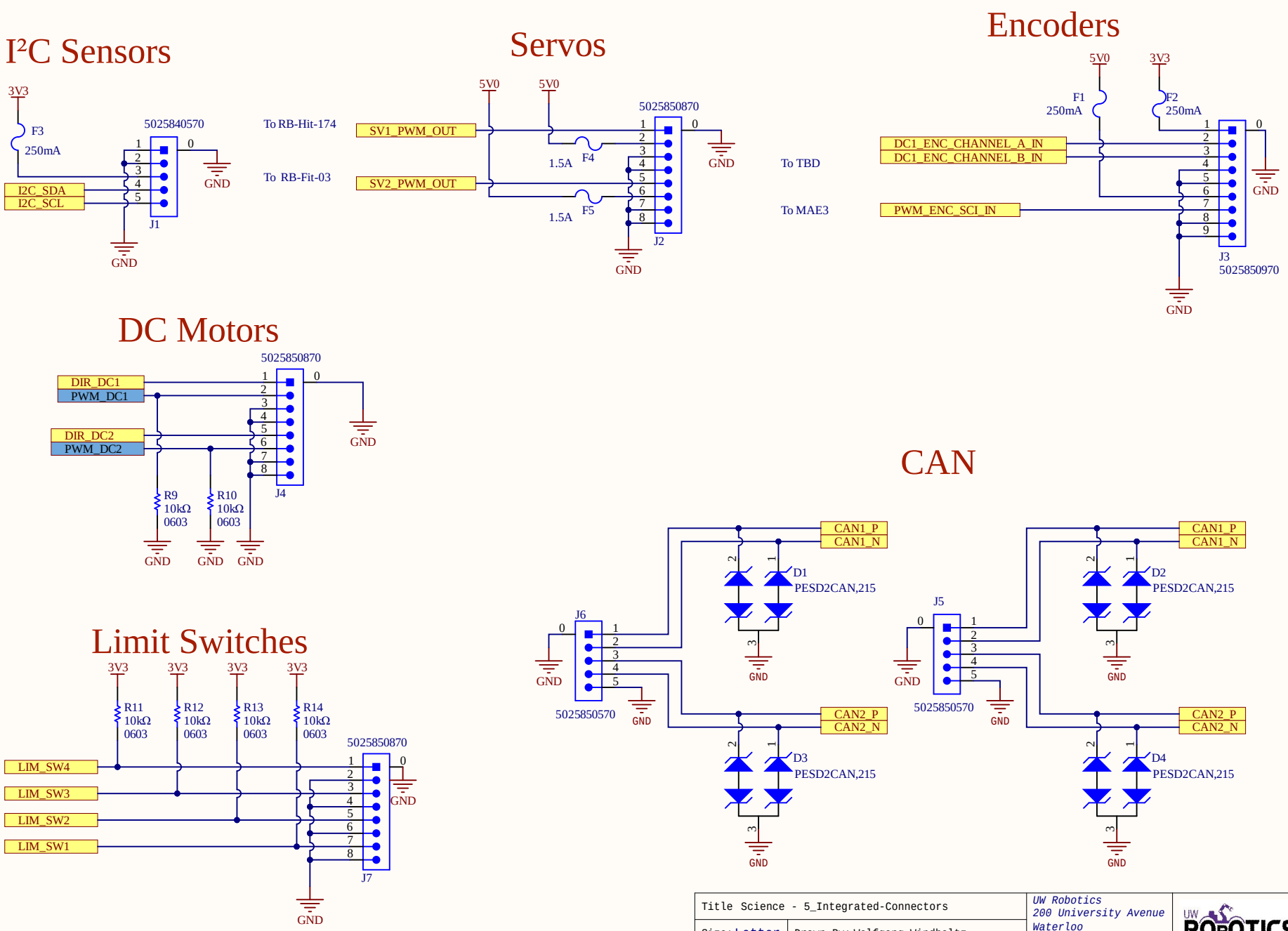
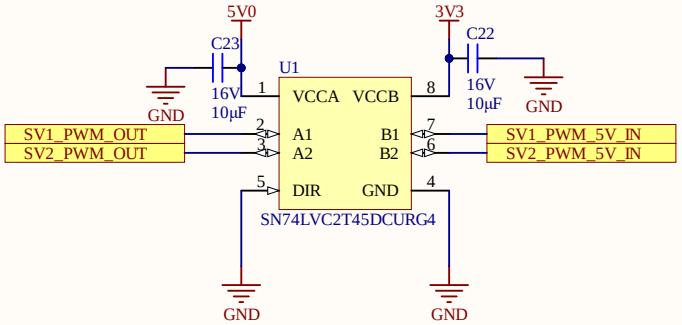
Date: 7/23/2020	Sheet 4 of 6	
File: C:\Users\badpr\altium_porjects\MarsRover2020-PCB\Projects\Science\Rev2\SH1 - POWER.SchDoc		


I²C Sensors
3V3
F3
250mA
5025840570
I2C_SDA
I2C_SCL
J1
GND
Servos
To RB-Hit-174
To RB-Fit-03
SV1_PWM_OUT
SV2_PWM_OUT
5V0
1.5A
F4
F5
5025850870
J2
To TBD
To MAE3
Encoders
F1
F2
DC1_ENC_CHANNEL_A_IN
DC1_ENC_CHANNEL_B_IN
PWM_ENC_SCI_IN
J3
5025850970
DC Motors
To TBD
DIR_DC1
PWM_DC1
DIR_DC2
PWM_DC2
J4
R9
R10
10kΩ
0603
Limit Switches
R11
R12
R13
R14
LIM_SW4
LIM_SW3
LIM_SW2
LIM_SW1
J7
CAN
CAN1_P
CAN1_N
CAN2_P
CAN2_N
D1
D2
D3
D4
PESD2CAN,215
J6
J5
5025850570
Title Science - 5_Integrated-Connectors
Size: Letter
Drawn By: Wolfgang Windholtz
Date: 7/23/2020
Sheet 5 of 6
File: C:\Users\badpr\altium_porjects\MarsRover2020-PCB\Projects\Science\Rev2\SH2 - CONNECTORS.SchDoc
UW Robotics
200 University Avenue
Waterloo
Ontario
Canada N2L 3G6
UW ROBOTICS TEAM

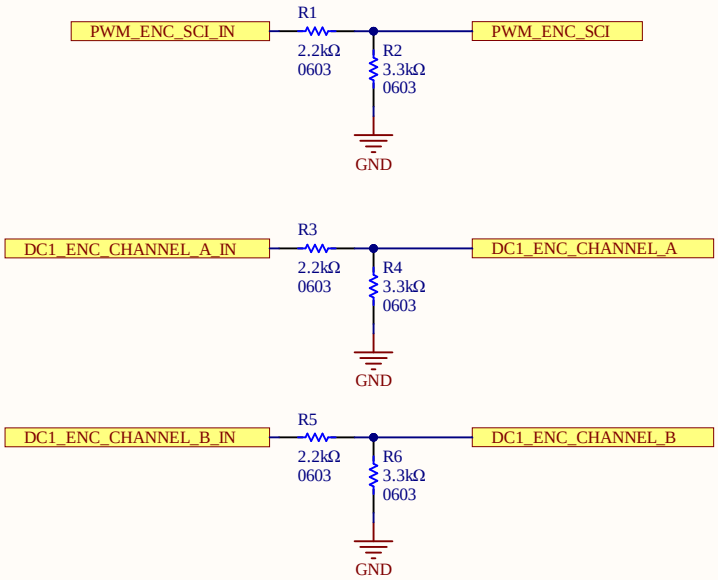
Servo Level Shifters



Decoupling values may need to be changed

Encoder Voltage Dividers

5V - 3V Conversion



Title Science - 6_Servo_and_Encoders		UW Robotics 200 University Avenue Waterloo Ontario Canada N2L 3G6
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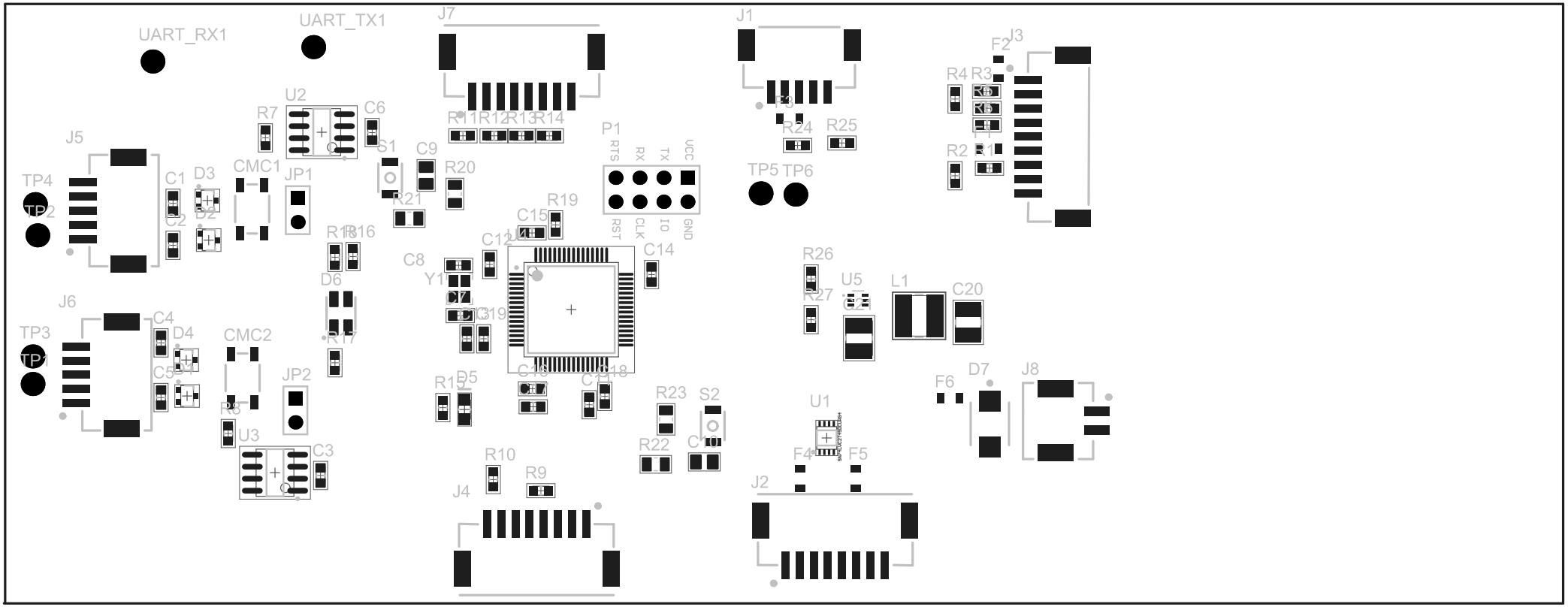
File: C:\Users\badpr\altium_porjects\MarsRover2020-PCB\Projects\Science\Rev2\SH3 - SIGNAL CONDITIONING.		


UART_RX1
UART_TX1
J7
J1
J3
F2
R4
R3
R2
U2
R7
C6
R11
R12
R13
R14
P1
RTS
RX
TX
VCC
RST
CLK
IO
GND
R24
R25
TP5
TP6
J5
TP4
TP2
C1
C2
D3
D2
CMC1
JP1
S1
C9
R20
R21
C15
R19
C12
C14
C8
Y1
R18
R16
D6
R17
R26
R27
U5
L1
C20
J6
TP3
TP1
C4
C5
D4
D1
CMC2
JP2
R8
U3
C3
R15
D5
C16
C17
C18
R23
R22
S2
C11
U1
F4
F5
F6
D7
J8
R10
R9
J4
J2