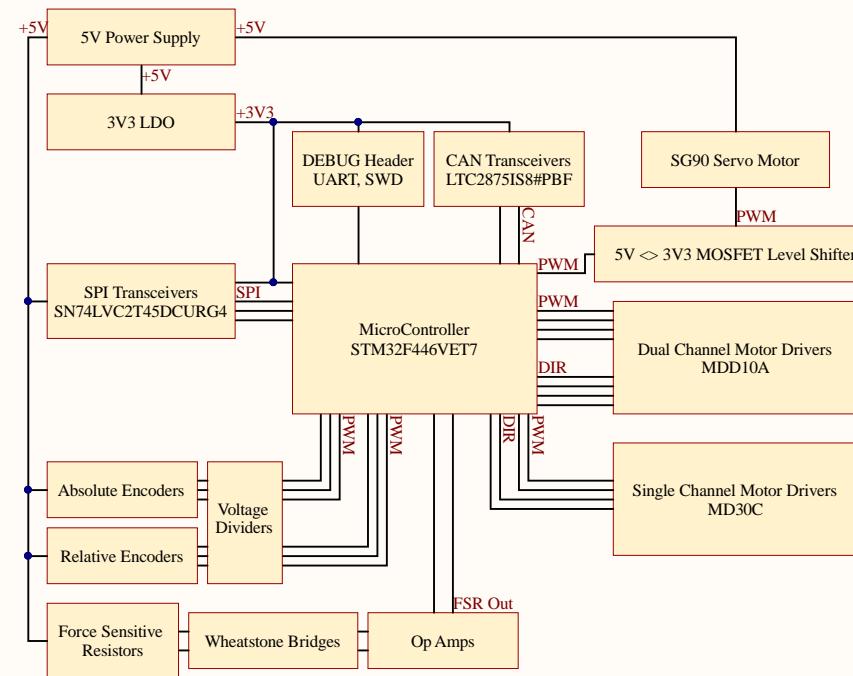
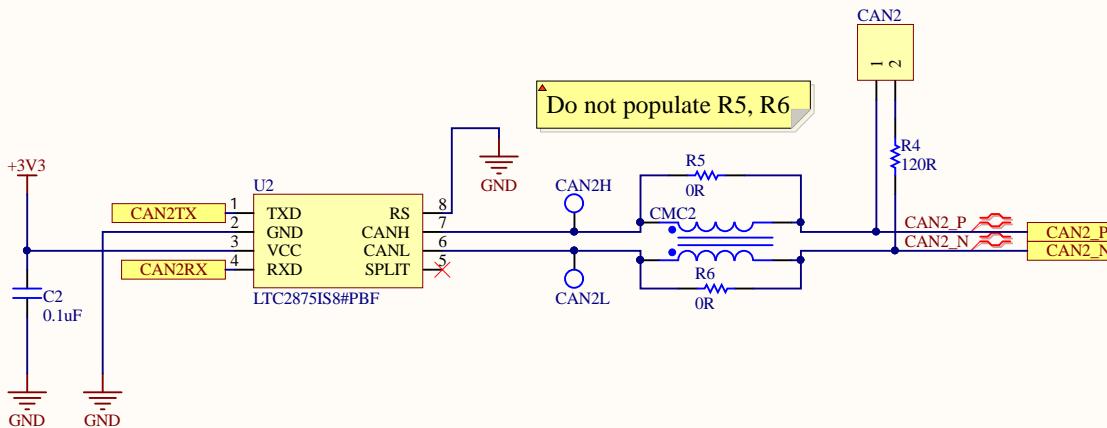
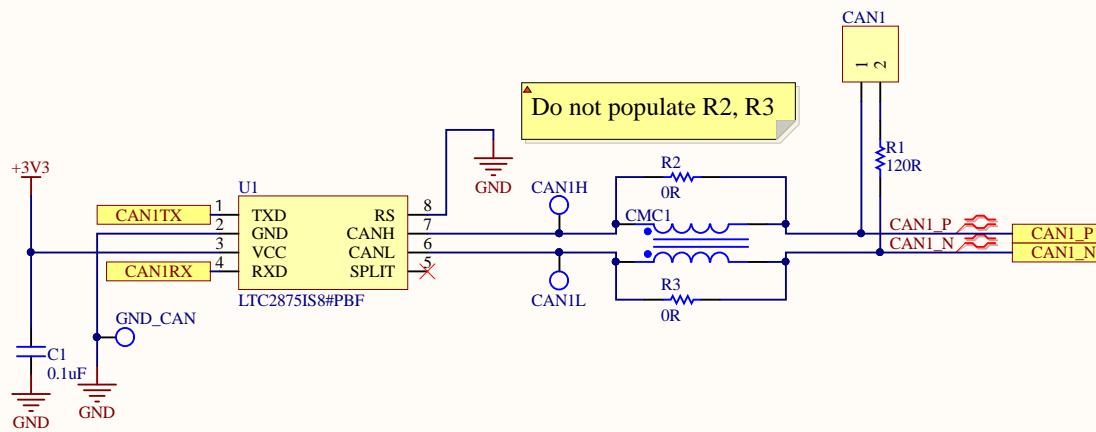


Arm Block Diagram

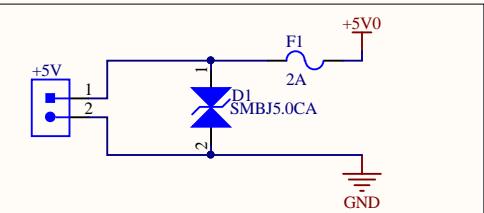


CAN Transceivers

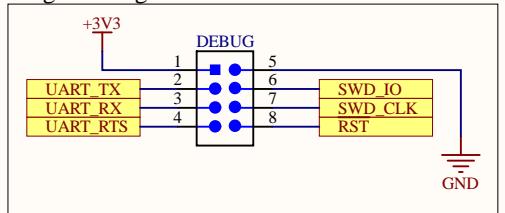


Title: Arm - CAN Transceivers		UW Robotics 200 University Avenue Waterloo Ontario Canada N2L 3G6
Size: Letter	Drawn By: P. Onaifo, K. Hong	
Date: 1/28/2020	Sheet 2 of 9	
File: C:\Users\kyleh\Desktop\Works\UWRT\MarsRover2020-PCB\Projects\Arm\Rev1\sch\CAN.SchDoc		UW ROBOTICS TEAM

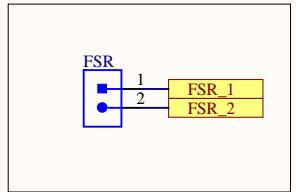
Power Connector



Programming Connector



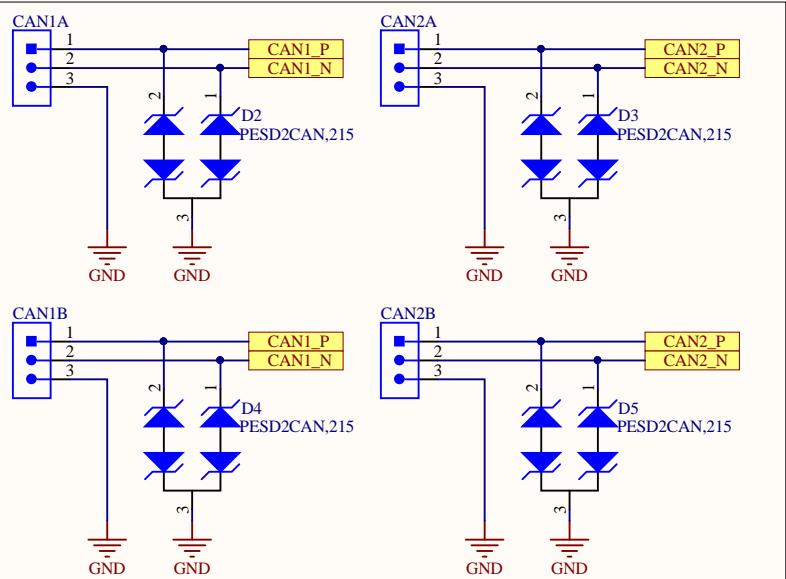
Force Sensitive Resistor



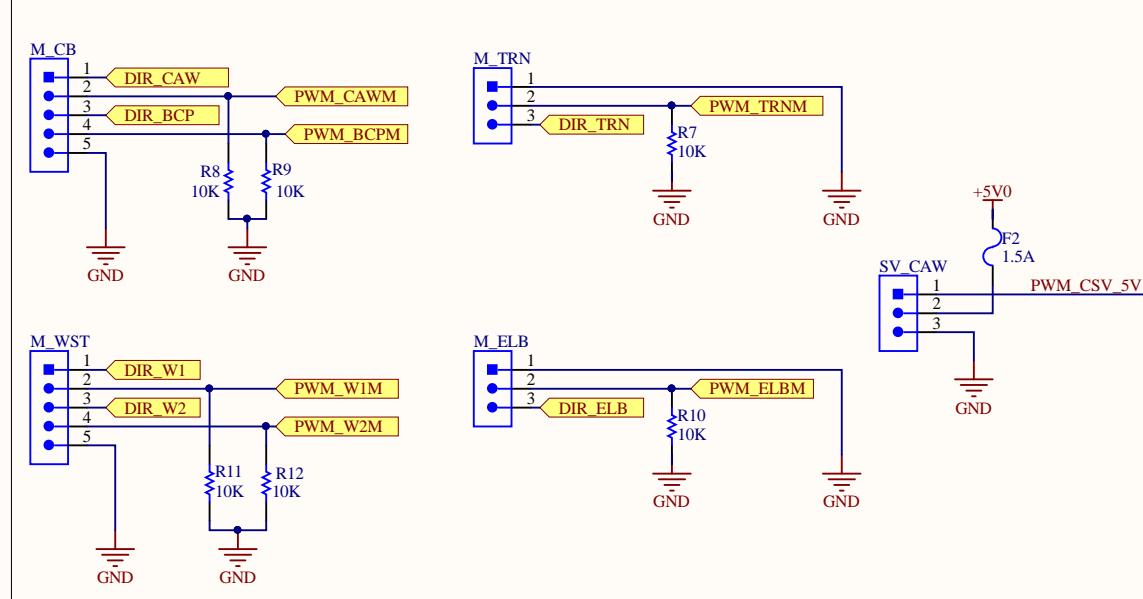
Acronyms Explained

FSR: Force Sensitive Resistor
CAW: Claw
WST: Wrist
BCP: Bicep (Shoulder)
ELB: Elbow
TRN: Turntable
DIR: Direction for motors

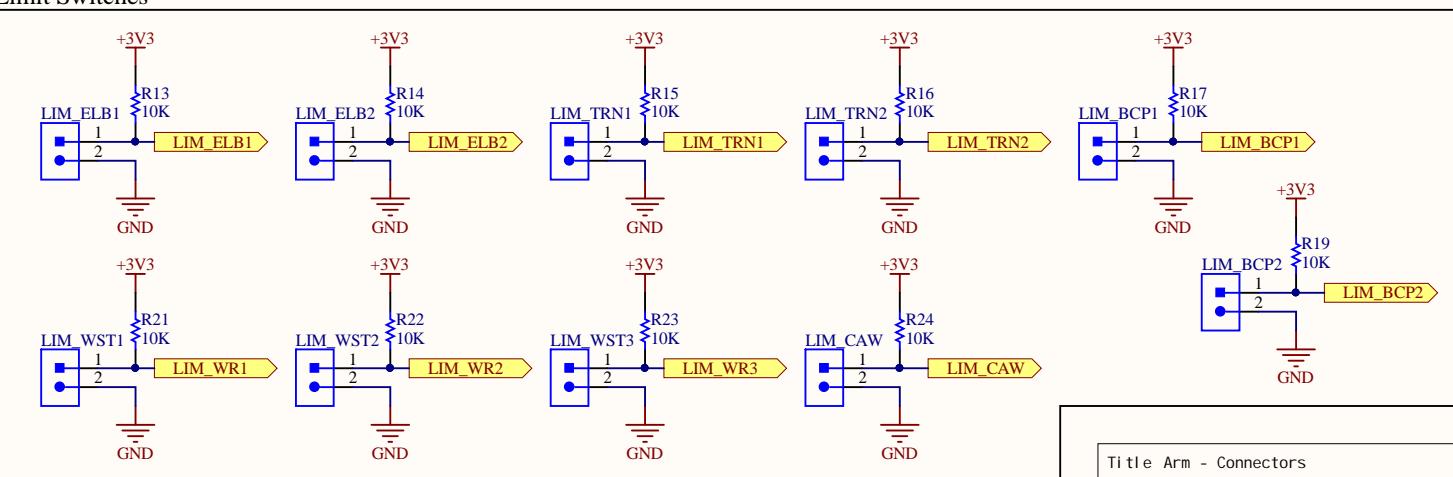
CAN Connections



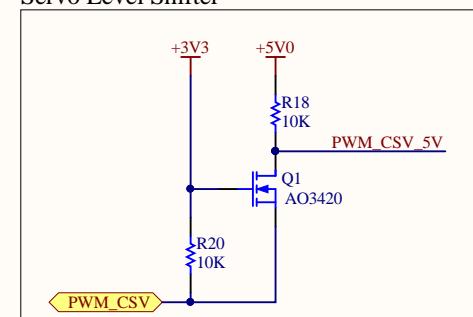
Motors



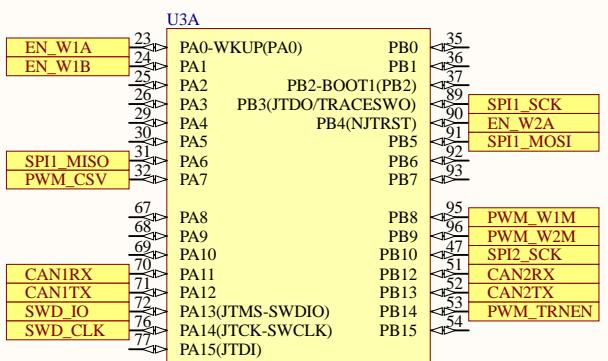
Limit Switches



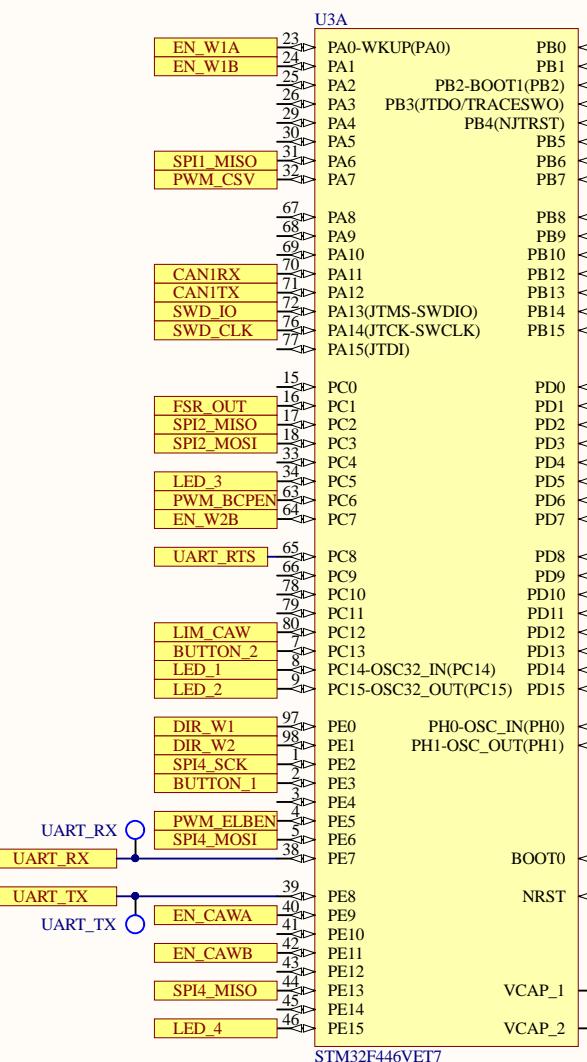
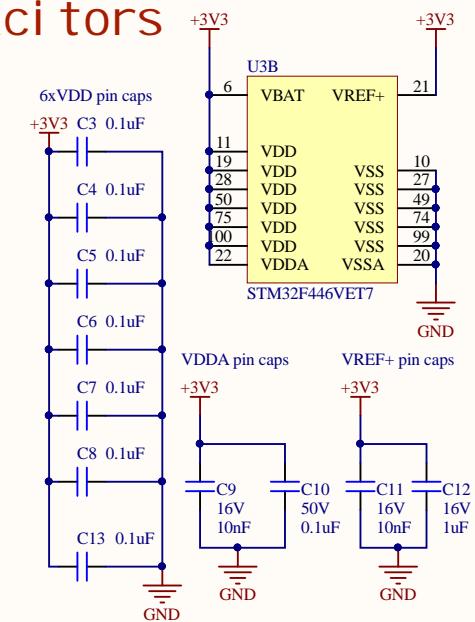
Servo Level Shifter



STM32F446VET7



Bypass Capacitors



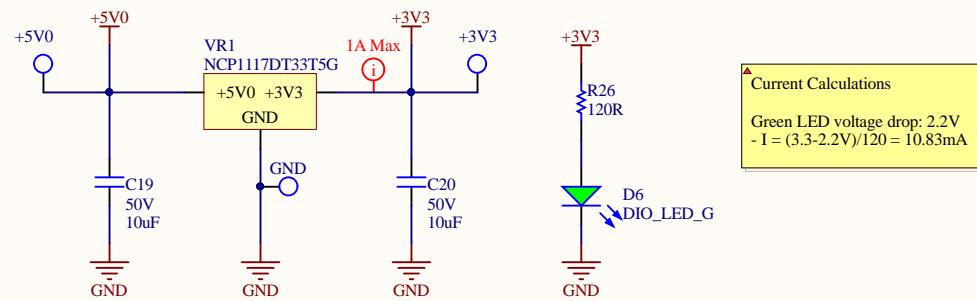
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5V-3.3V LDO

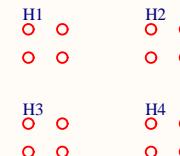
I

6

I



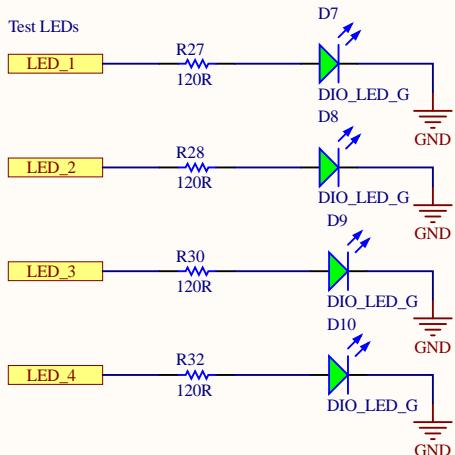
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Size: Letter	Drawn By: K. Hong		
Date: 1/28/2020	Sheet 5 of 9		
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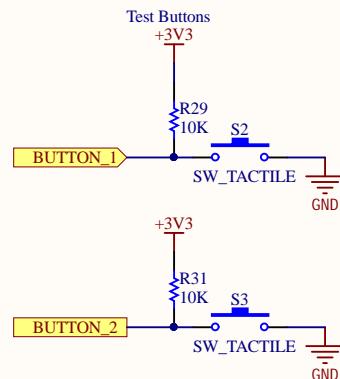
A

A

Test LEDs



Test Buttons



B

B

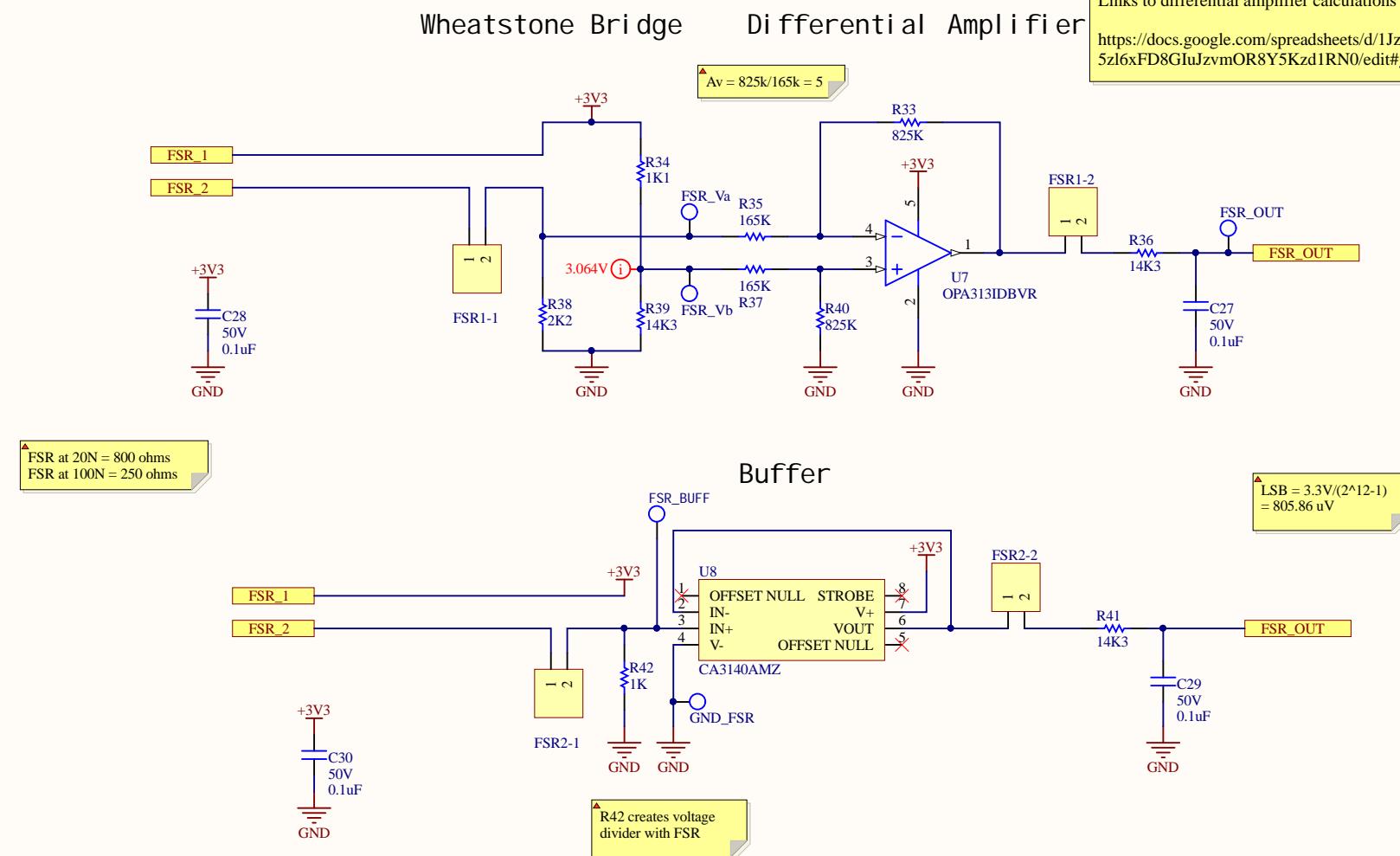
C

C

D

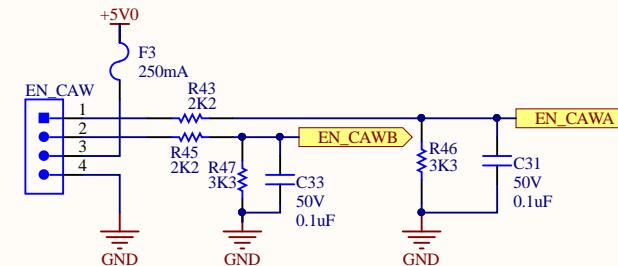
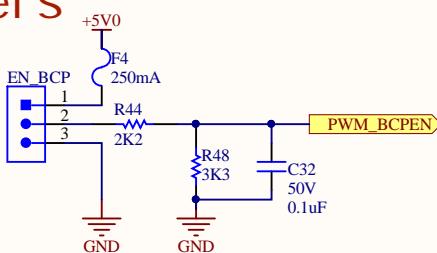
D

Force Sensitive Resistor

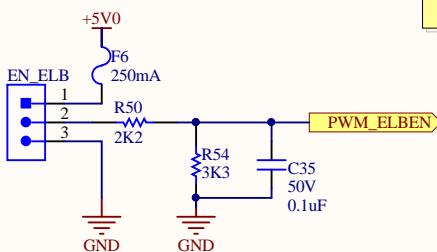


PWM Encoders

A

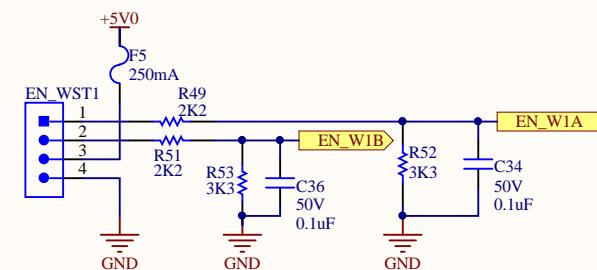


B

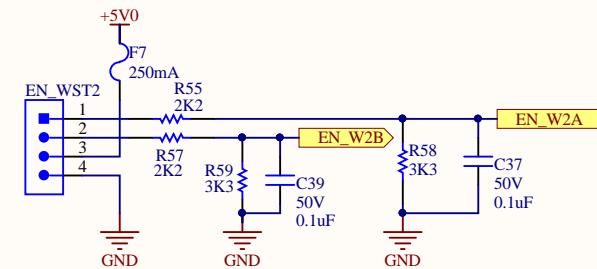
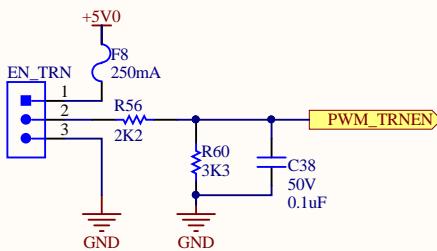


Low pass filter cut-off frequency:
 $f_c = 1/(2\pi \cdot 3.3k \cdot 0.1\mu F) = 482.29 \text{ Hz}$

Voltage divider:
 $V_{out} = 5(3.3k/(2.2k+3.3k)) = 3V$



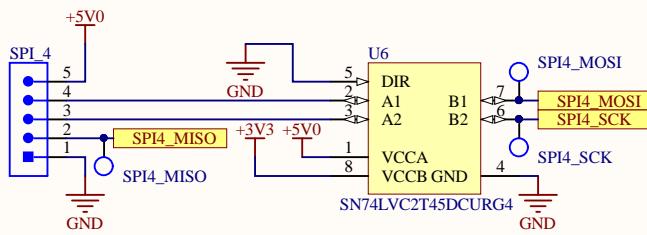
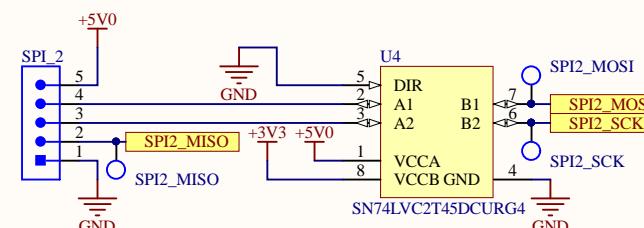
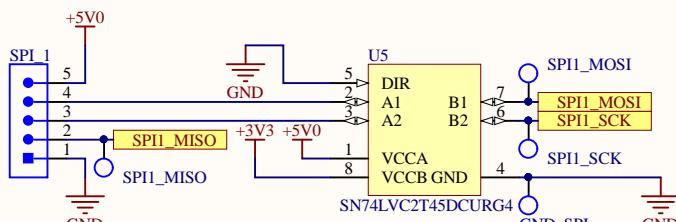
C



D

Title: Arm - PWM Encoders		UW Robotics 200 University Avenue Waterloo Ontario Canada N2L 3G6
Size: Letter	Drawn By: K. Hong	
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SPI Encoders



Encoder manufacturer: Broadcom
Encoder part number: AEAT-6012-A06

Did not level shift MISO signals since the STM32 SPI peripheral is 5V tolerant

