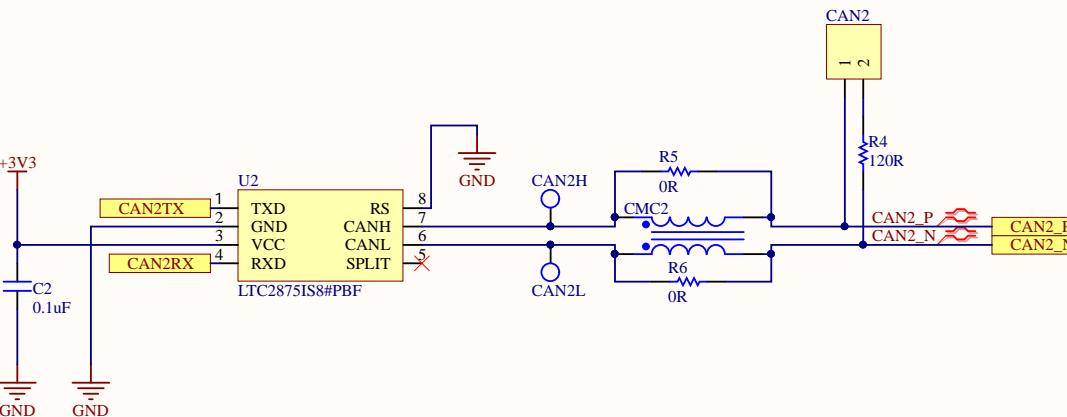
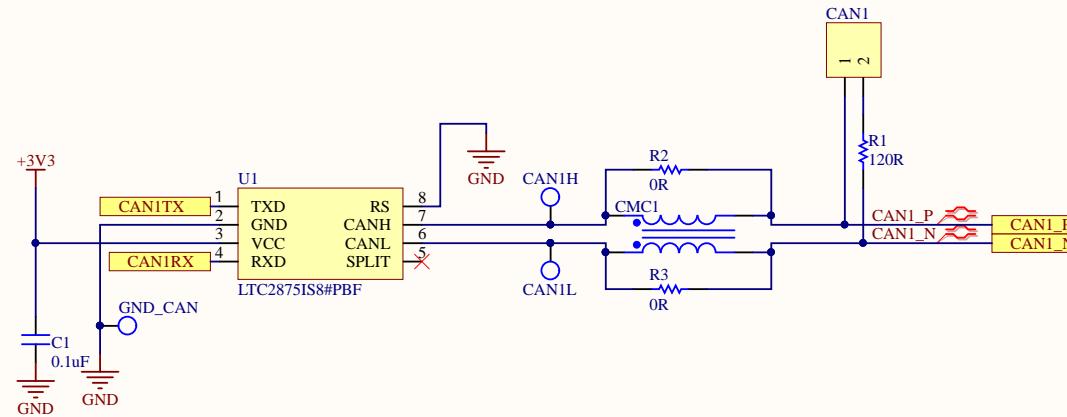
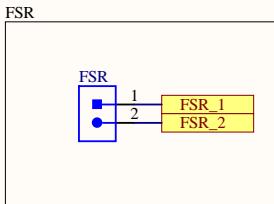
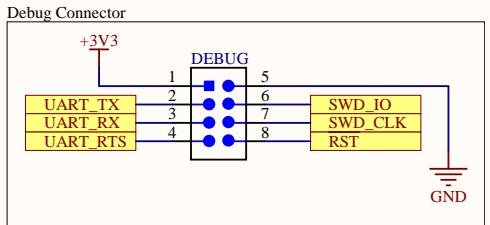
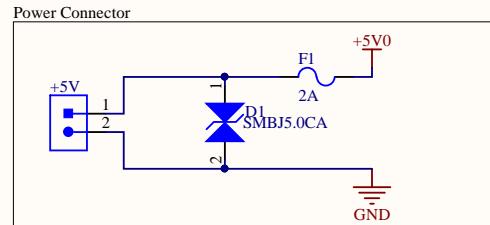


CAN Transceivers



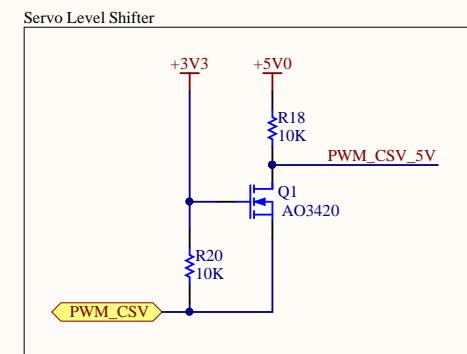
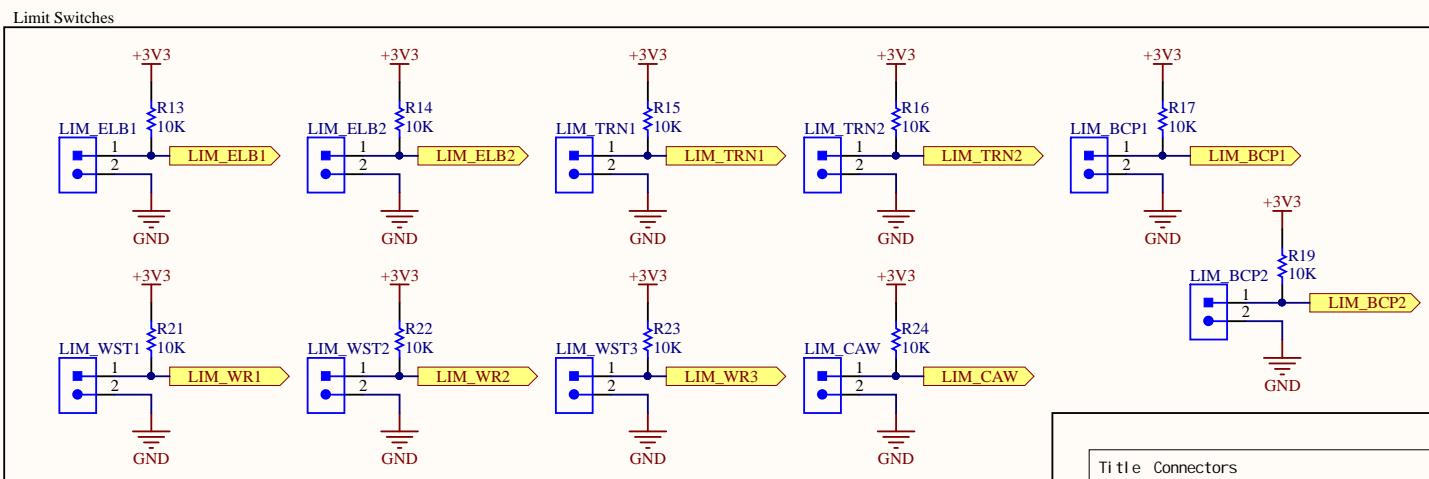
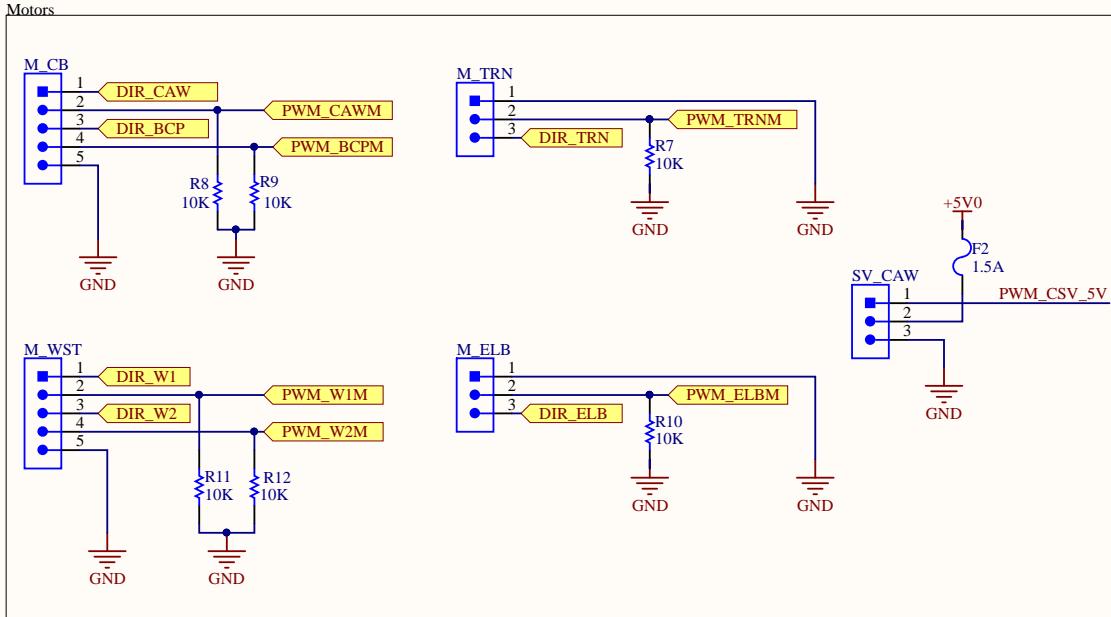
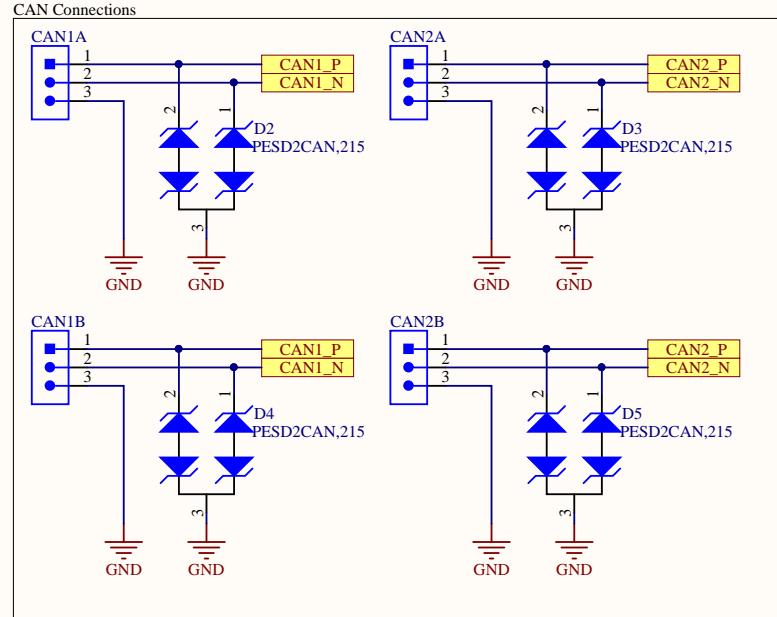
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Date: 2020-01-28		Sheet of	
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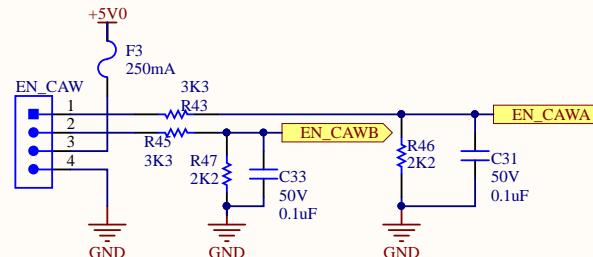
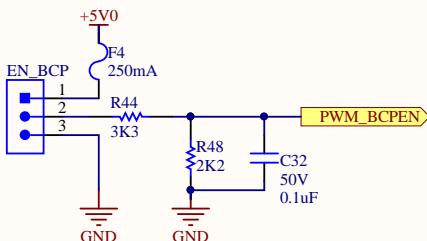
A 4 Acronyms Explained

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

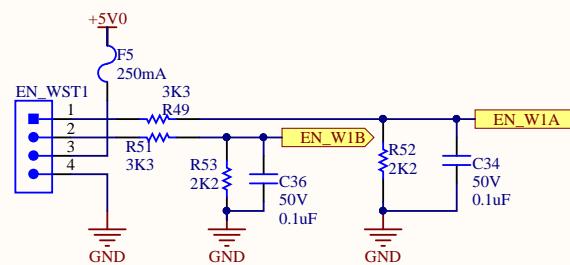
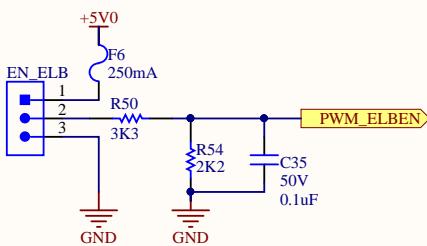


Encoders

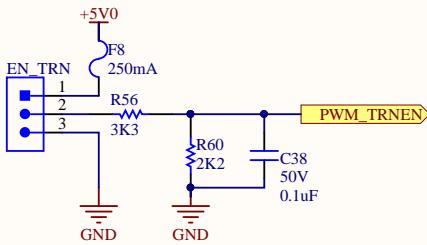
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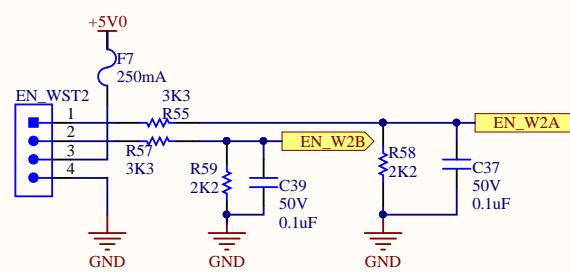
B



C



▲ Cut-off Frequency Calculation
 $f = 1/(2\pi \cdot 3.3k \cdot 0.1u) = 482.29 \text{ Hz}$



D

Title: Encoders	*	UW ROBOTICS TEAM
Size: Letter	Drawn By: Kyle Hong	
Date: 2020-01-28	Sheet* of *	
File: C:\Users\lance\Desktop\MarsRover2020-PCB\Projects\Arm\Rev1\sch\Encoders.SchDoc		

A

Force Sensitive Resistor

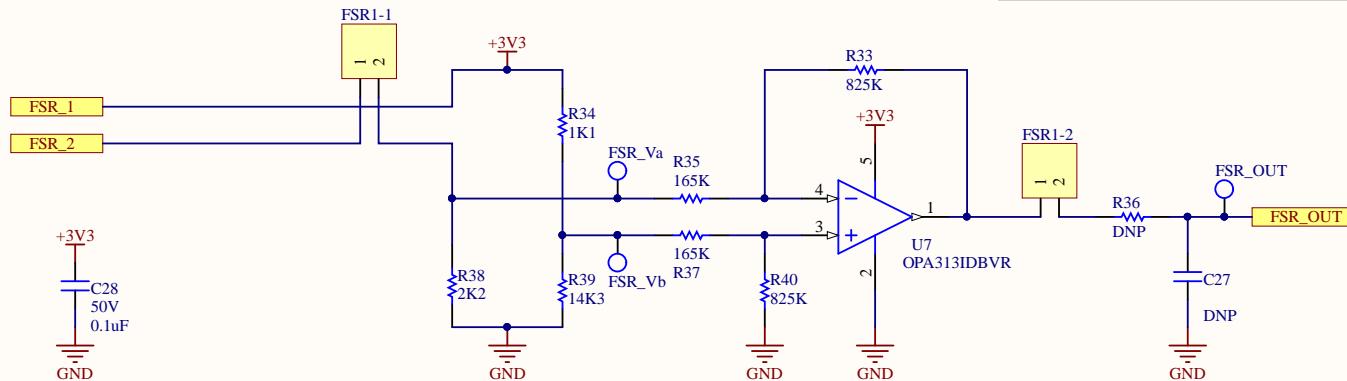
Links to calculations and documentation

<https://docs.google.com/document/d/1rw19DyF2suYmOmlnorCrfqnUpDln50-sqe5KjQKnCs/edit>

<https://docs.google.com/spreadsheets/d/1JzRwpCH-aMdlyAMP5zl6xFD8GluJzvmOR8Y5Kzd1RN0/edit#gid=0>

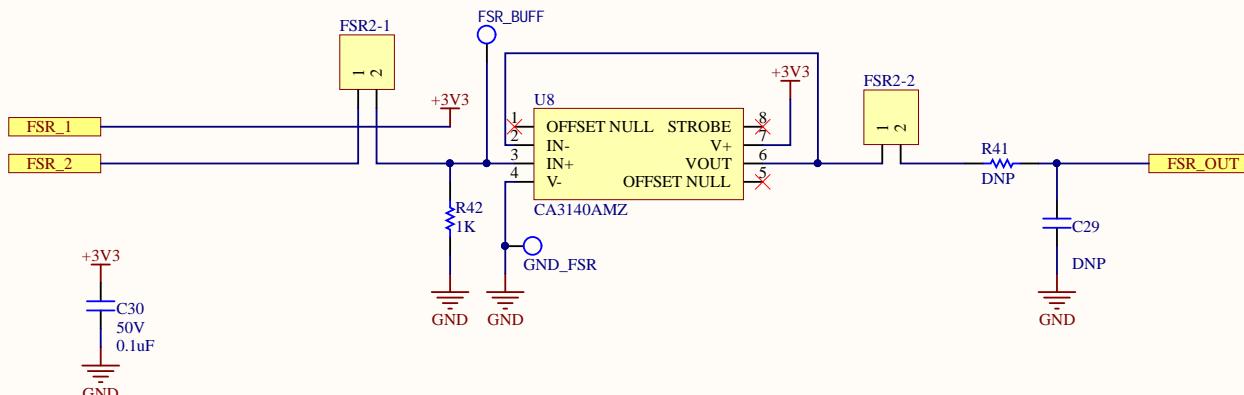
A

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C

D

Title: Claw Force Sensor

Size: Letter

Drawn By: K. Hong, N. Chapman, A. Ebrahim

Date: 2020-01-28

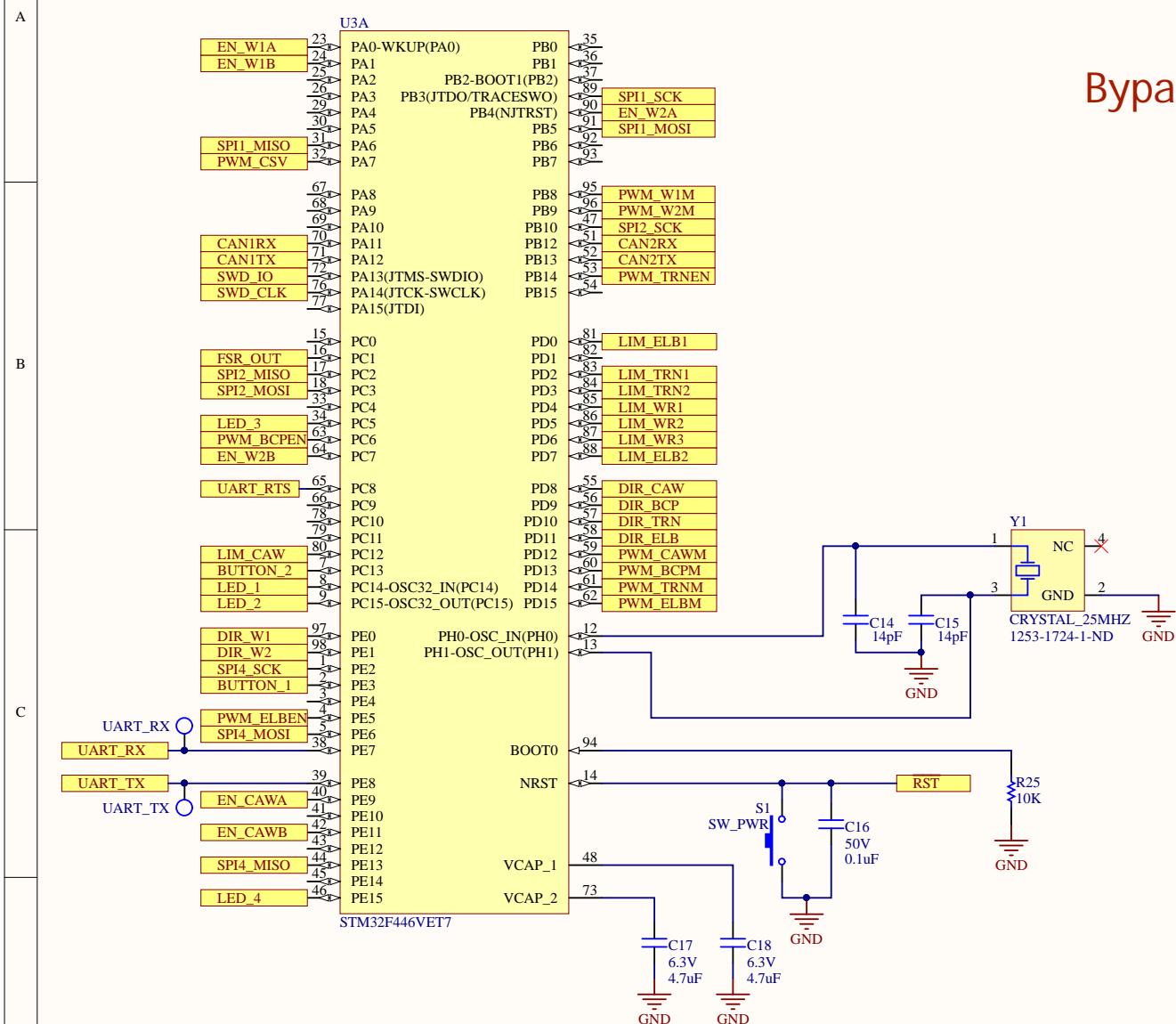
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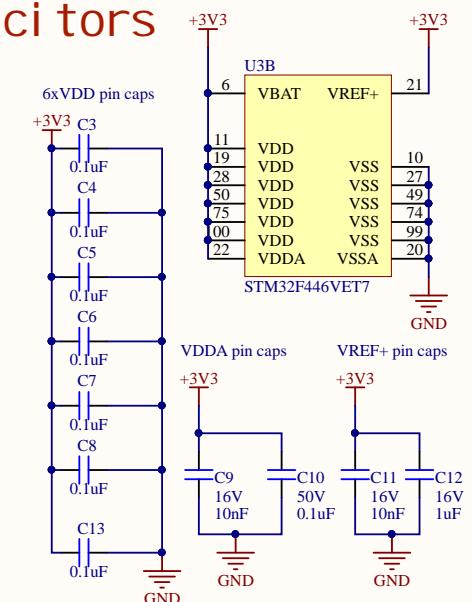
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Waterloo
Ontario
Canada N2L 3G6

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STM32F446VET7



Bypass Capacitors



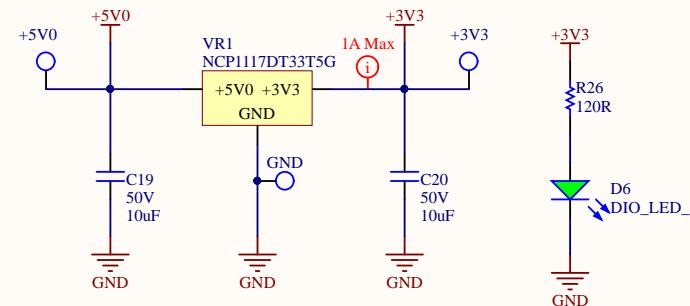
A

A

5V-3.3V LDO

B

B



▲ Current Calculations

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

C

C

D

D

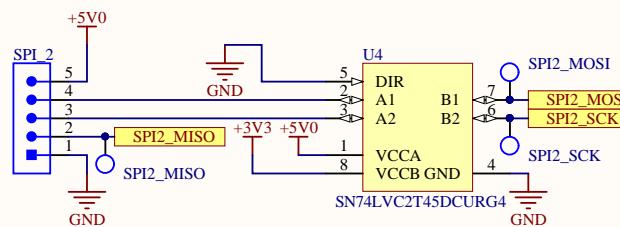
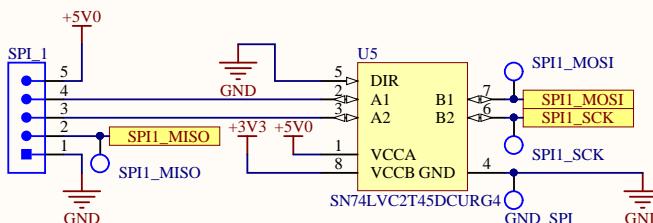
Title: Power		UW Robotics 200 University Avenue Waterloo Ontario Canada N2L 3G6	
Size: Letter	Drawn By: Kyle Hong		
Date: 2020-01-28		Sheet of	
File: C:\Users\lance\Desktop\MarsRover2020-PCB\Projects\Arm\Rev1\sch\POWER.SchDoc			



A

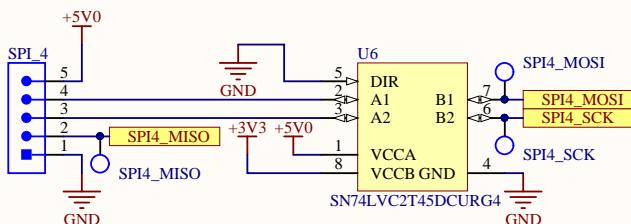
SPI Encoders

B



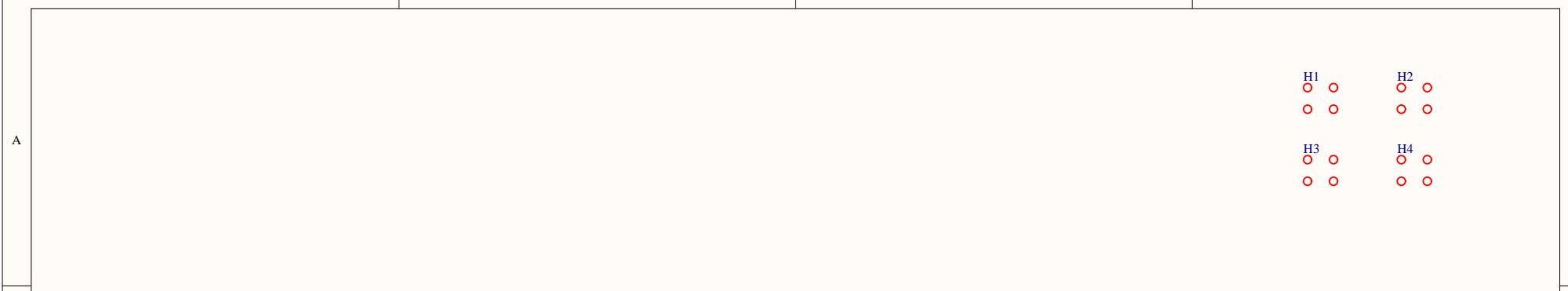
Used level shifter because
MCU SPI connectors are 5V
tolerant and registers voltages
greater than 3V3 as high.
Didn't shift MISO because SPI
can handle that level of input.

C

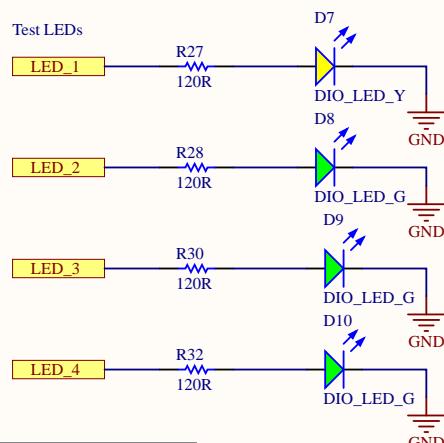


D

Title: Arm - SPI Encoders	*	*	*
Size: Letter	Drawn By: Noah Chapman	*	*
Date: 2020-01-28	Sheet*: of *	*	*
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Test LEDs

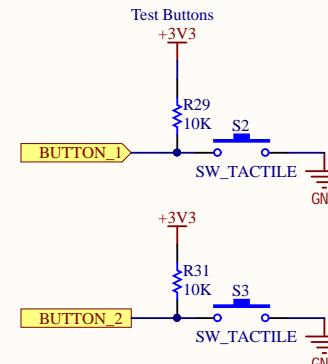


Current Calculations

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

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

Test Buttons



Title: Support		UW Robotics
Size: Letter	Drawn By: Noah Chapman	200 University Avenue Waterloo Ontario Canada N2L 3G6
Date: 2020-01-28	Sheet of	
File: C:\Users\lance\Desktop\MarsRover2020-PCB\Projects\Arm\Rev1\sch\Support.SchDoc		UW ROBOTICS TEAM

