

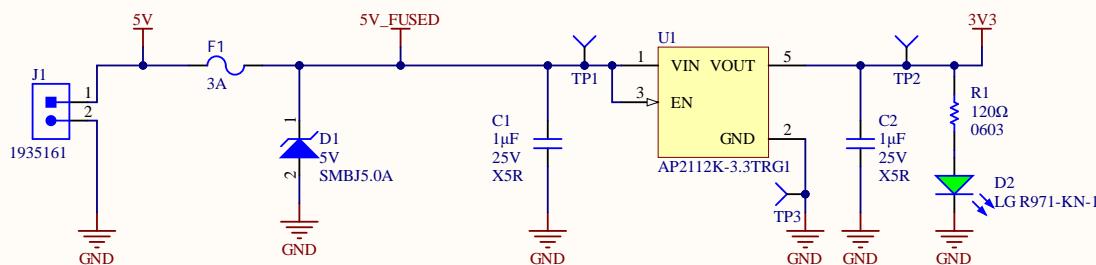
Mounting Holes

H¹ H²
H³ H⁴

Need to make new mounting hole part depending on Andrew's fastener choice

Add eFuse for Rev 3

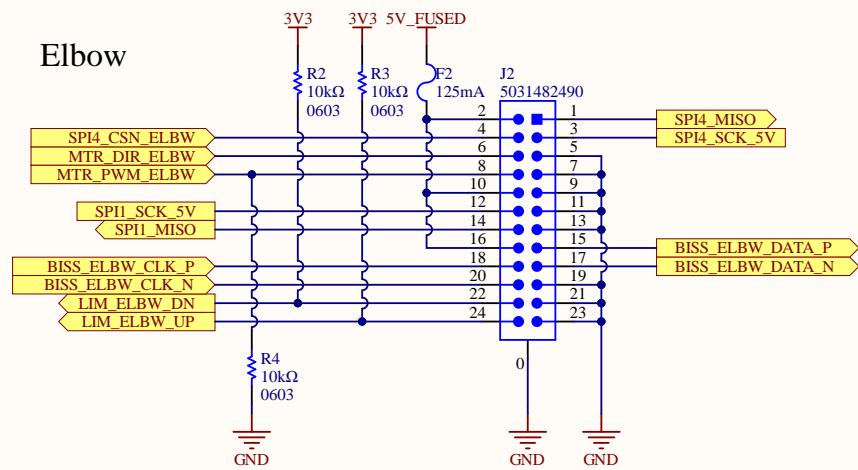
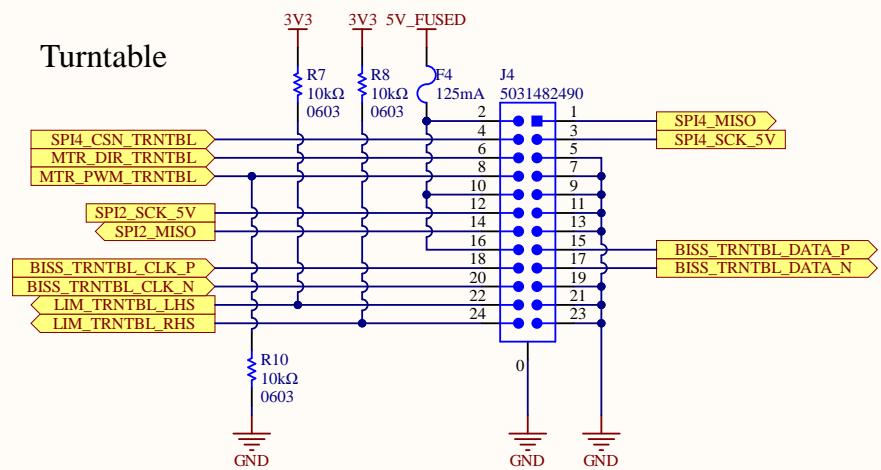
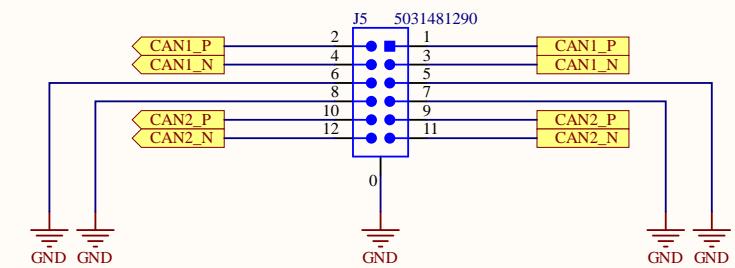
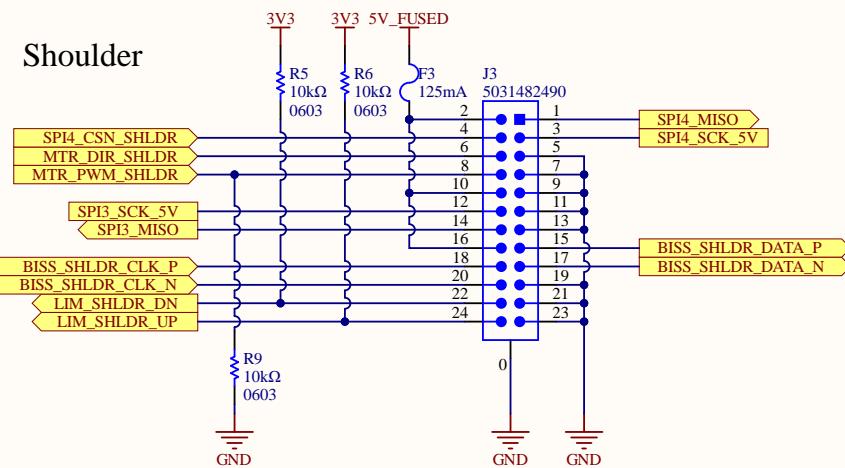
5V to 3.3V LDO (Max 600mA)



Current Calculations

Green LED voltage drop: 2.2V
 $- I = (3.3 - 2.2V)/120 = 9.17mA$

Title Arm - Power		UW Robotics 200 University Avenue Waterloo Ontario Canada N2L 3G6	UW ROBOTICS TEAM
Size: Letter	Drawn By: Kyle Hong		
Date: 2020-11-21		Sheet 1 of 8	
File: C:\Users\lance\GitHub\MarsRover2020-PCB\Projects\Arm\Rev2\SH1 - POWER.SchDoc			

Elbow**Turtable****CAN Connections****Shoulder**

Acronyms

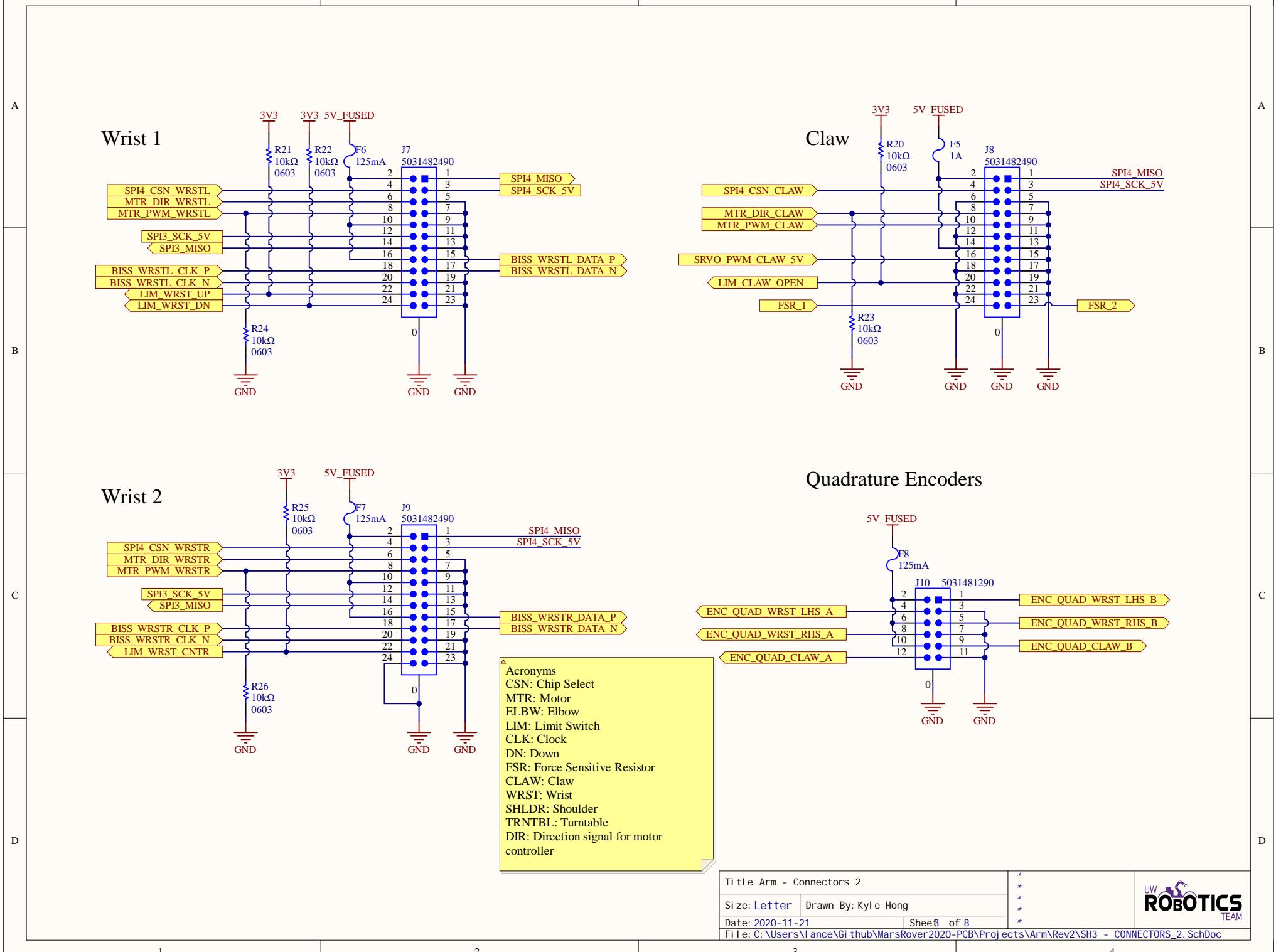
CSN: Chip Select
MTR: Motor
ELBW: Elbow
LIM: Limit Switch
CLK: Clock
DN: Down
FSR: Force Sensitive Resistor
CLAW: Claw
WRST: Wrist
SHLDR: Shoulder
TRNTBL: Turntable
DIR: Direction signal for motor controller

Title Arm - Connectors

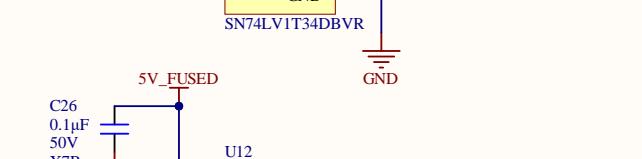
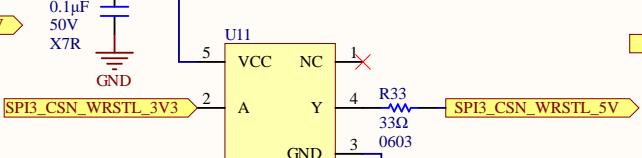
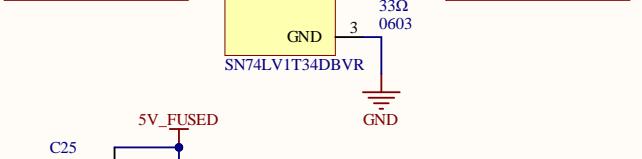
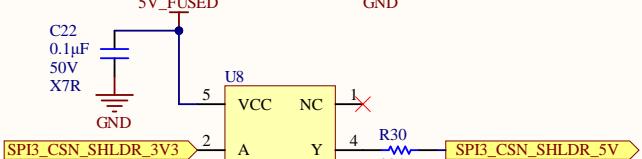
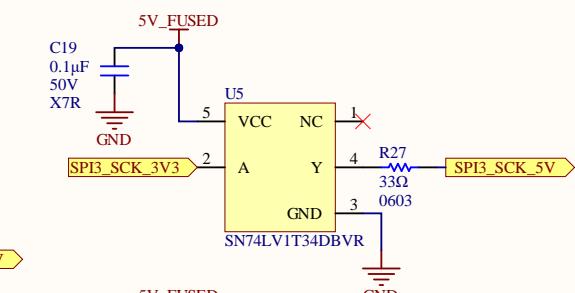
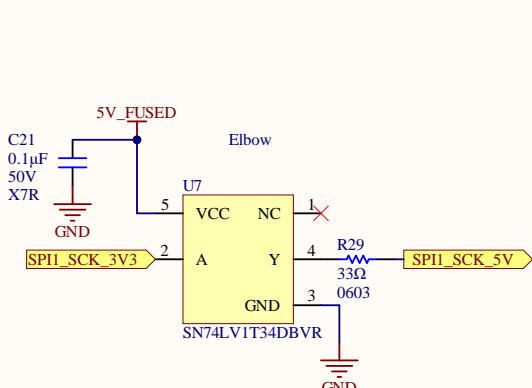
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Date: 2020-11-21	Sheet 2 of 8
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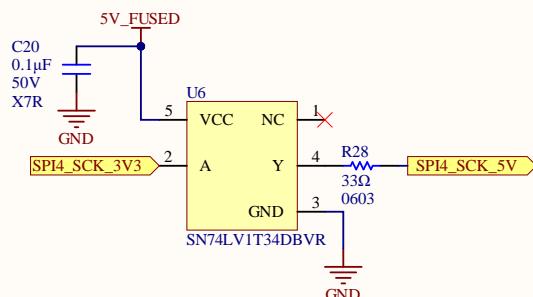
Encoder Level Shifters



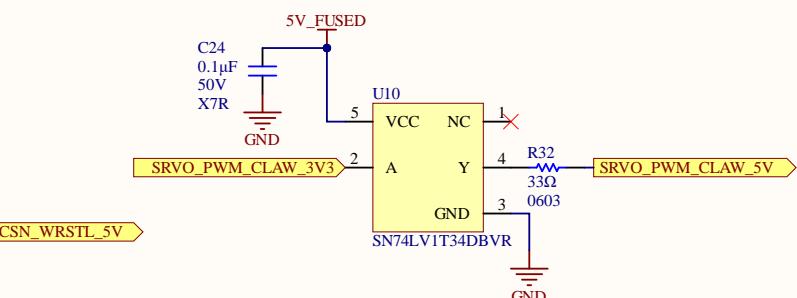
Encoder manufacturer: Broadcom
Encoder part number: AEAT-6012-A06

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

Current Sensor Level Shifter



Servo Level Shifter

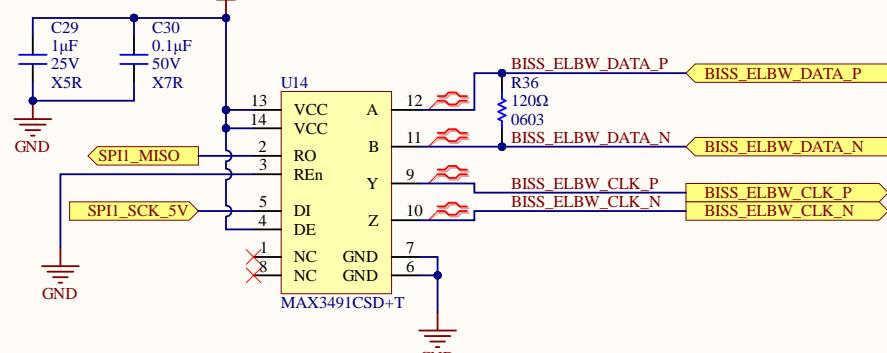


Title	Arm - Level Shifters	*
Size:	Letter	Drawn By: Kyle Hong
Date:	2020-11-21	Sheet 1 of 8
File:	C:\Users\lance\GitHub\MarsRover2020-PCB\Projects\Arm\Rev2\SH4 - LEVEL SHIFTERS.SchDoc	*

A

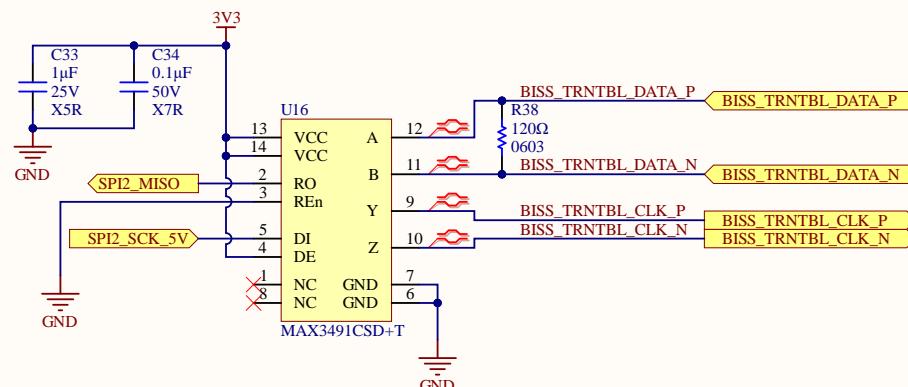
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RS-485 Transceivers for Netzer DS-25 Encoders



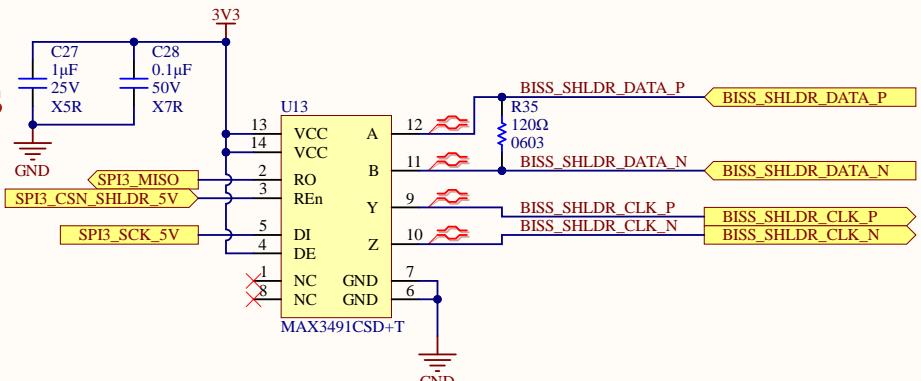
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B



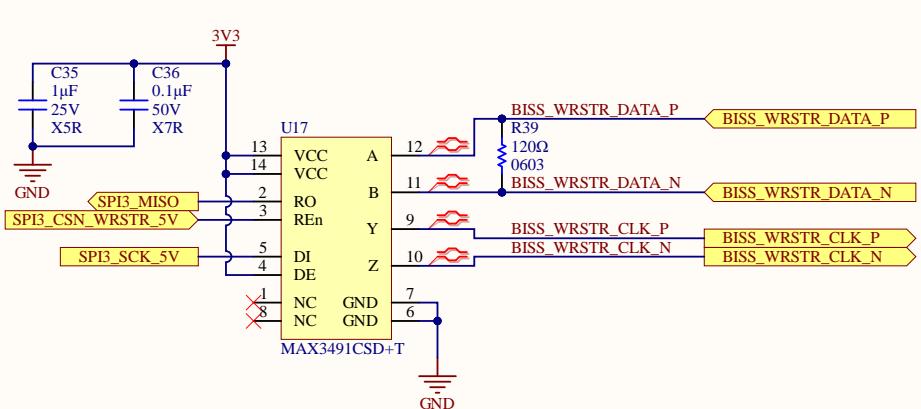
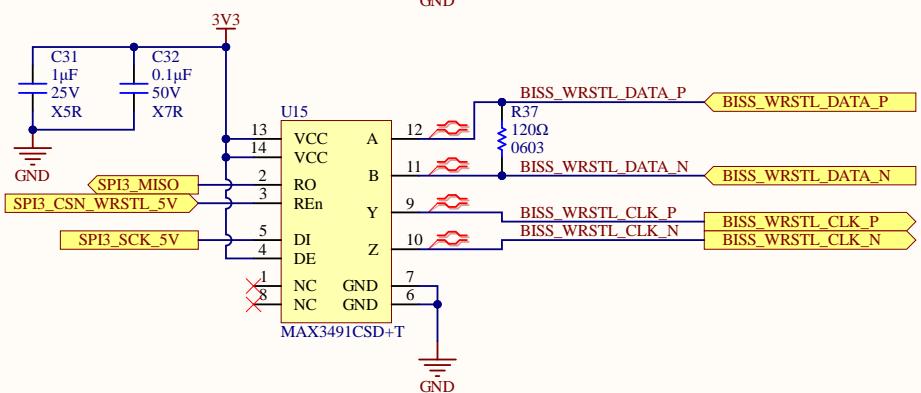
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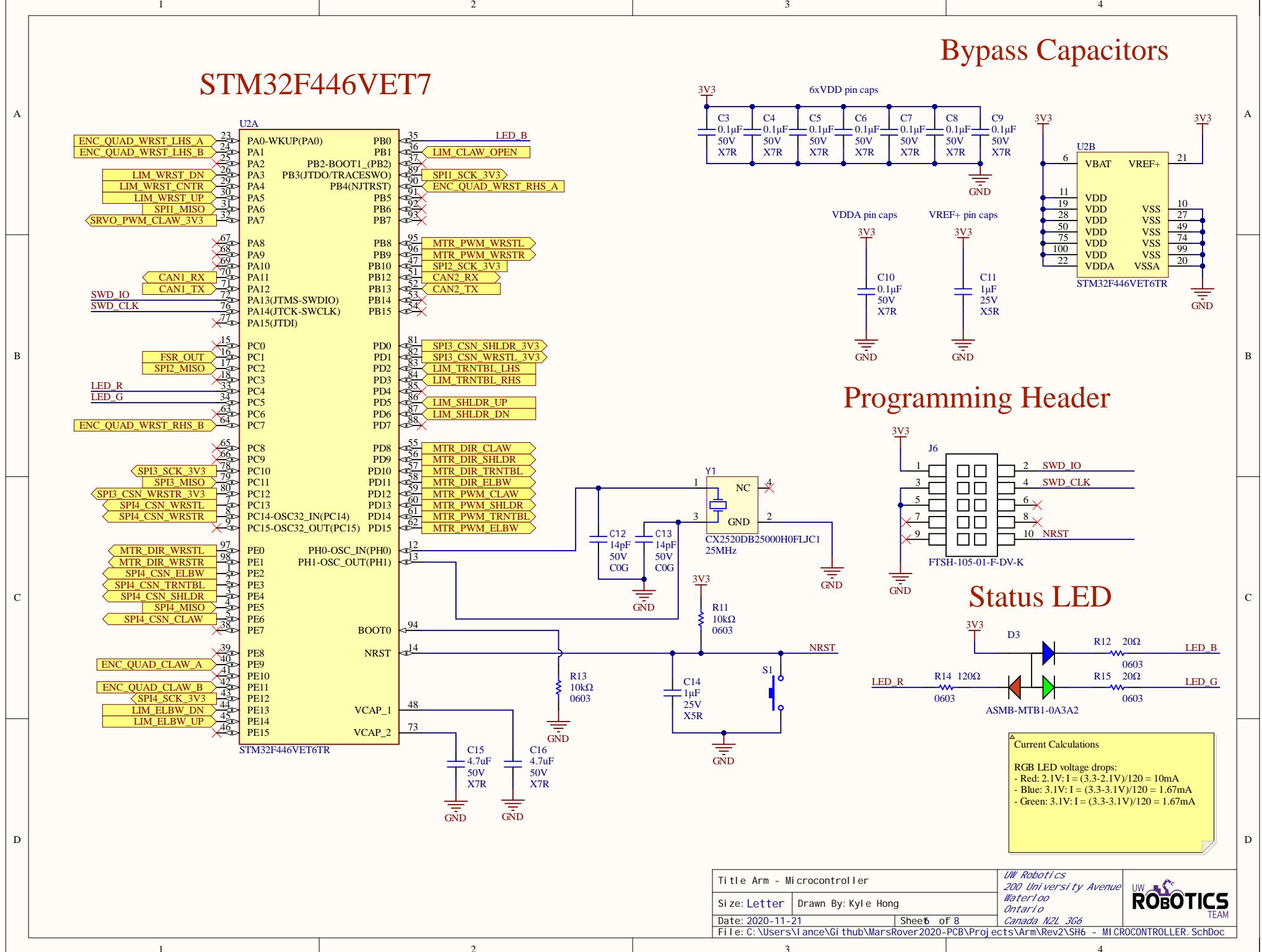
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D

D





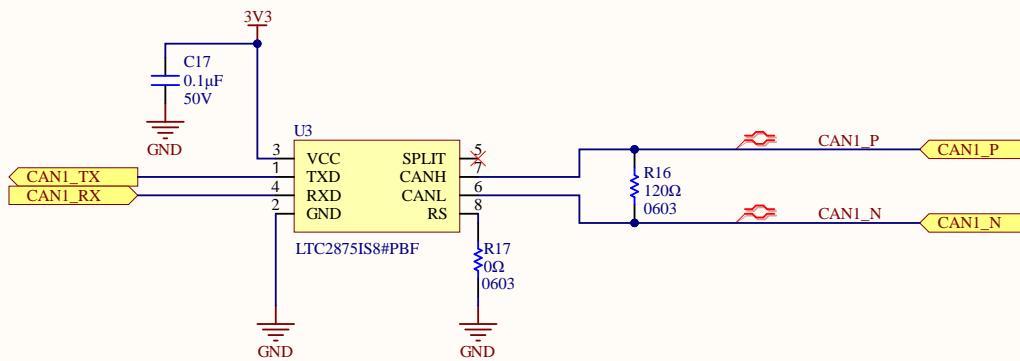
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A

CAN Transceivers

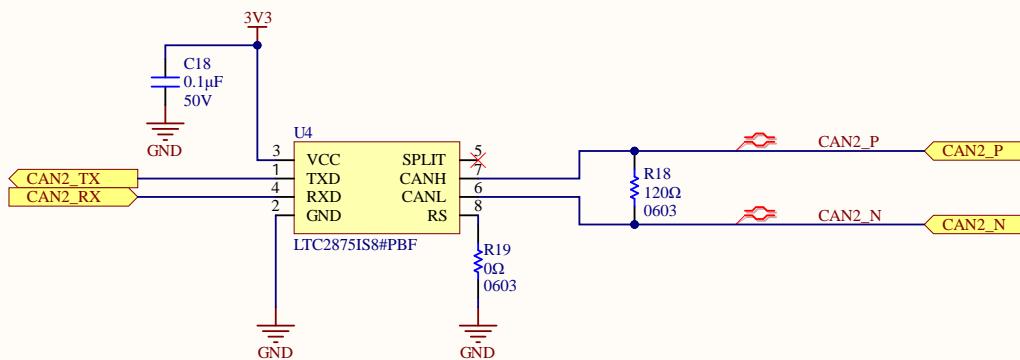
B

B



C

C



D

D

Title Arm - CAN Transceivers

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Date: 2020-11-21 Sheet of 8

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Waterloo
Ontario
Canada N2L 3G6



Force Sensitive Resistor

A

Sensor Manufacturer: Interlink Electronics
 Manufacturer Part Number: 30-81794
 Supplier: Digi-Key
 Supplier Part Number: 1027-1001-ND
<https://cdn.sparkfun.com/assets/8/a/1/2/0/2010-10-26-Datasheet-FSR402-Layout2.pdf>
 Resistance at 20N = 800 ohms
 Resistance at 100N = 250 ohms

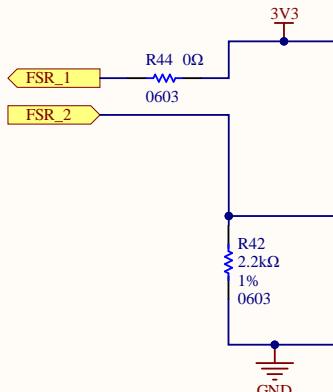
A

Wheatstone bridge voltage output values:
 At 20N, Vout = 3.2V
 At 100N, Vout = 0.5V

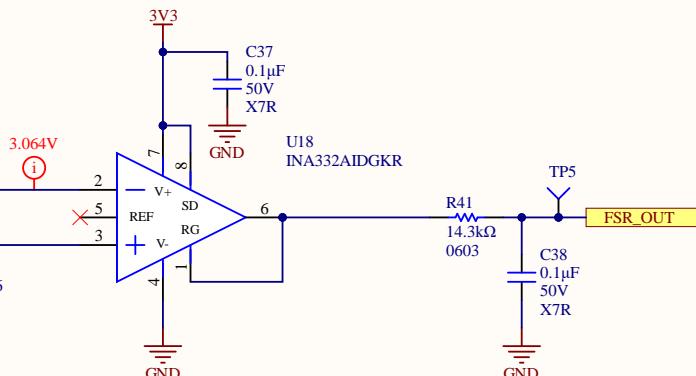
Low pass filter cutoff frequency:
 $f_c = 1/(2\pi \cdot 14.3k \cdot 0.1\mu F) = 111.30 \text{ Hz}$

B

Wheatstone Bridge



Instrumentation Amplifier (Gain = 5)



C

D

Title: Arm - Force Sensitive Resistor

Size: Letter | Drawn By: Kyle Hong

Date: 2020-11-21 | Sheet 8 of 8

File: C:\Users\lance\GitHub\MarsRover2020-PCB\Projects\Arm\Rev2\SH8 - FORCE SENSITIVE RESISTOR.schDoc

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