

A

A

B

B

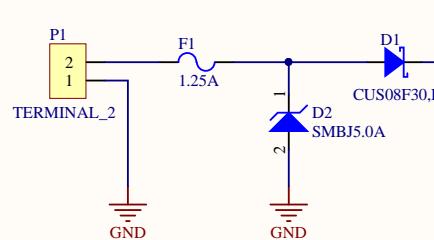
C

C

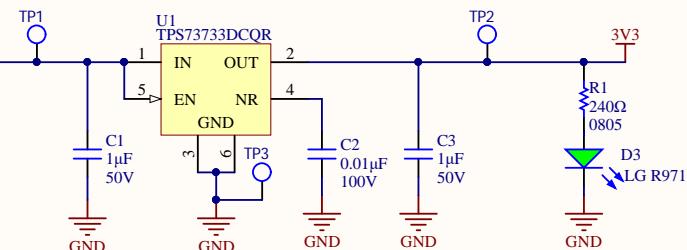
D

D

Power In



5V to 3V3 LDO



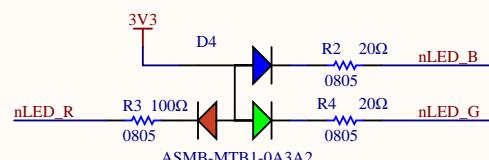
Current Calculations

Green LED voltage drop: 2.2V
 $- I = (3.3 - 2.2V) / 240 = 4.6mA$

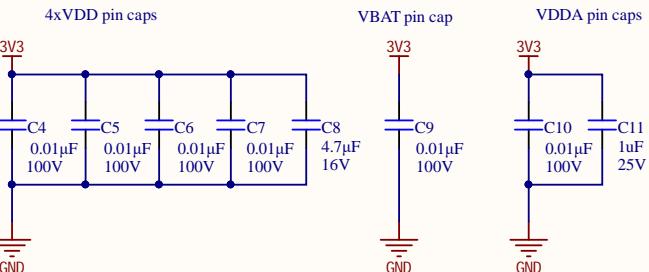
Title	UW Robotics	
Size: Letter	Drawn By: *	200 University Avenue
Date: 2020-12-02		Waterloo
File: C:\Users\pkmn0\Desktop\Document Archive\Other\Electrical Git Repo\MarsRover2020-PCB\Projects\Robot Controller\		Ontario Canada N2L 3G6



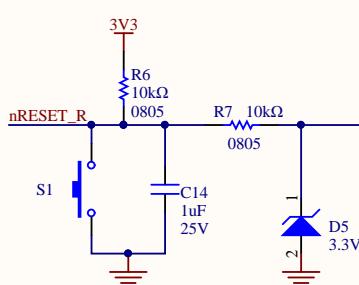
RGB LED



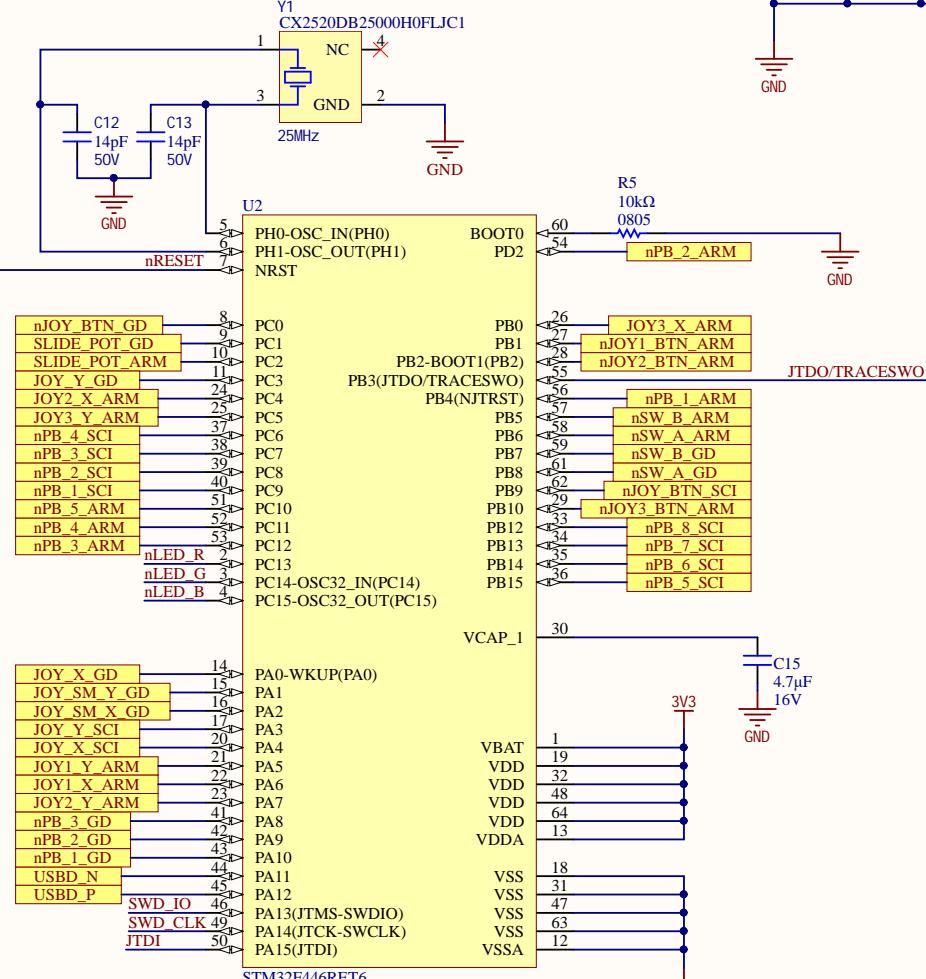
Decoupling Caps



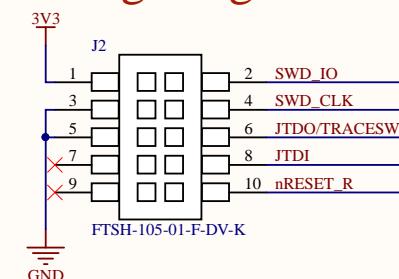
Reset Button



STM32F446RET6



Debug/Programming



A

A

B

B

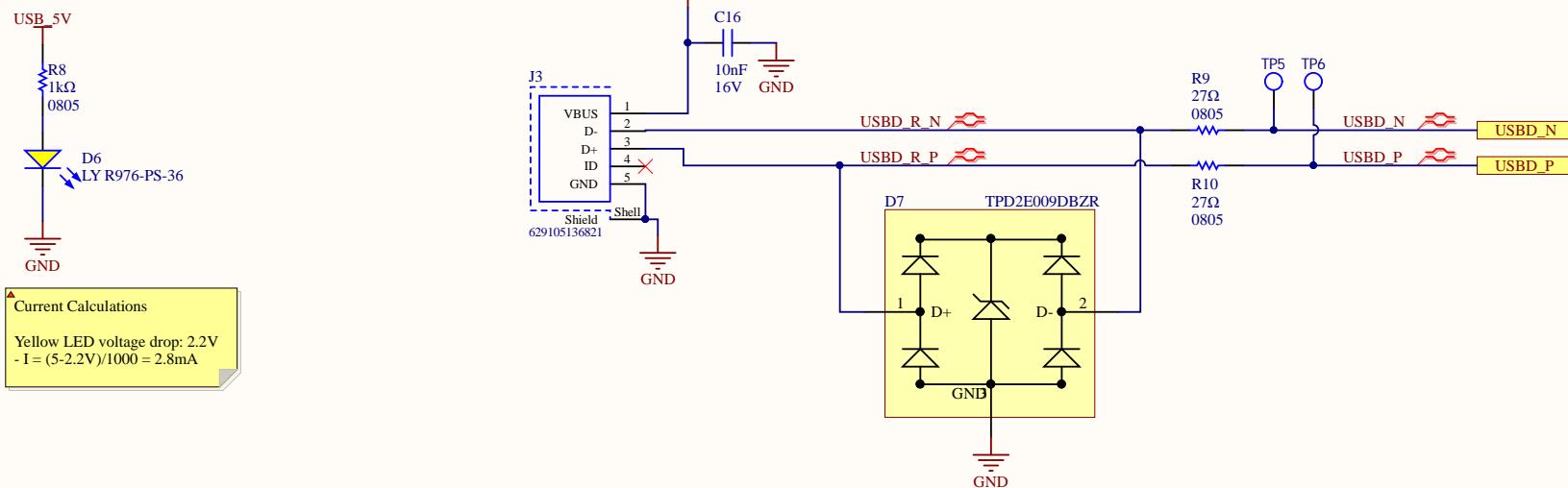
C

C

D

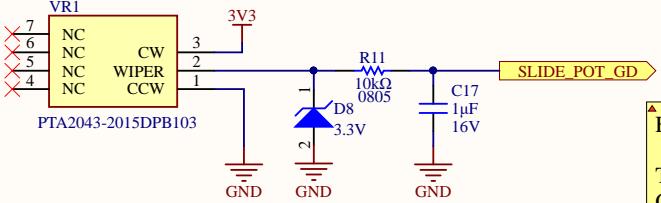
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USB Connector



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File: C:\Users\pkmn\Desktop\Document Archive\Other\Electrical Git Repo\MarsRover2020-PCB\Projects\Robot Controller\			

Slide Potentiometer

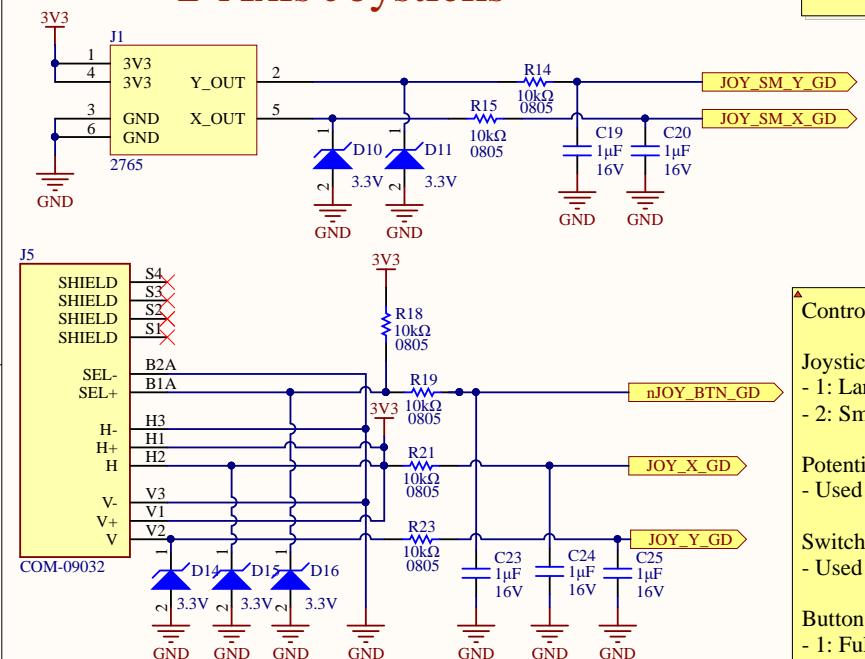


For Debounce Circuits:

$$T=RC \rightarrow C = T/R$$

$$C = 10\text{ms}/10\text{kOhms} = 1\mu\text{F}$$

2-Axis Joysticks



Controls (subject to change)

- Joysticks:
 - 1: Large joystick is used for driving
 - 2: Small joystick is used for gimbal

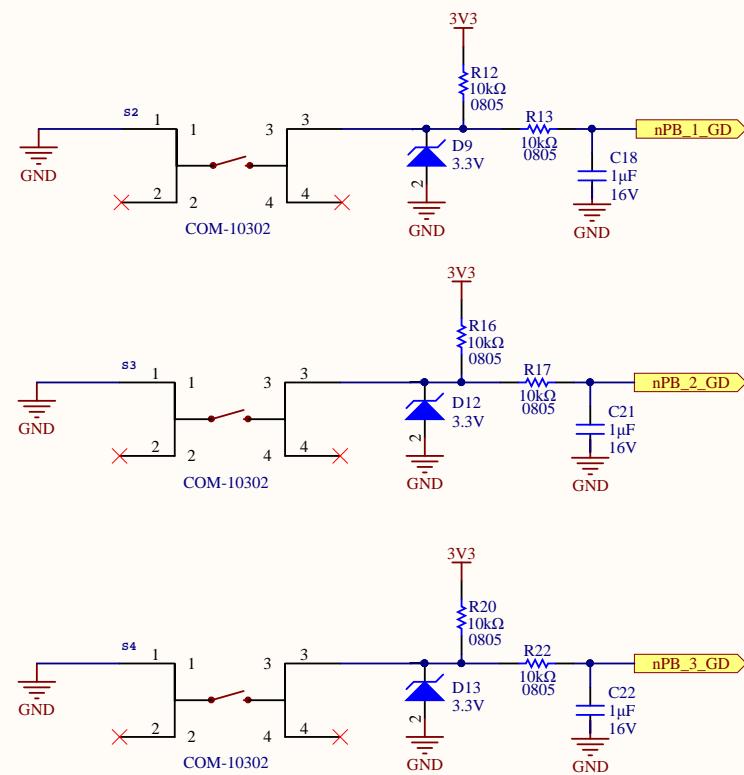
Potentiometer:

- Used for driving speed control
- Switch:
 - Used for reverse-mode toggle

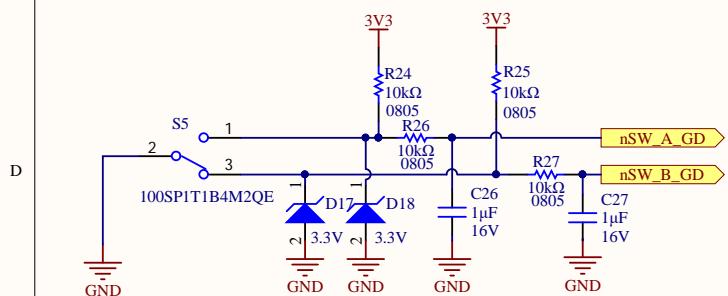
Buttons:

- 1: Full-stop (halt all movement immediately)
- 2-3: Extra, in case additional functionality is requested

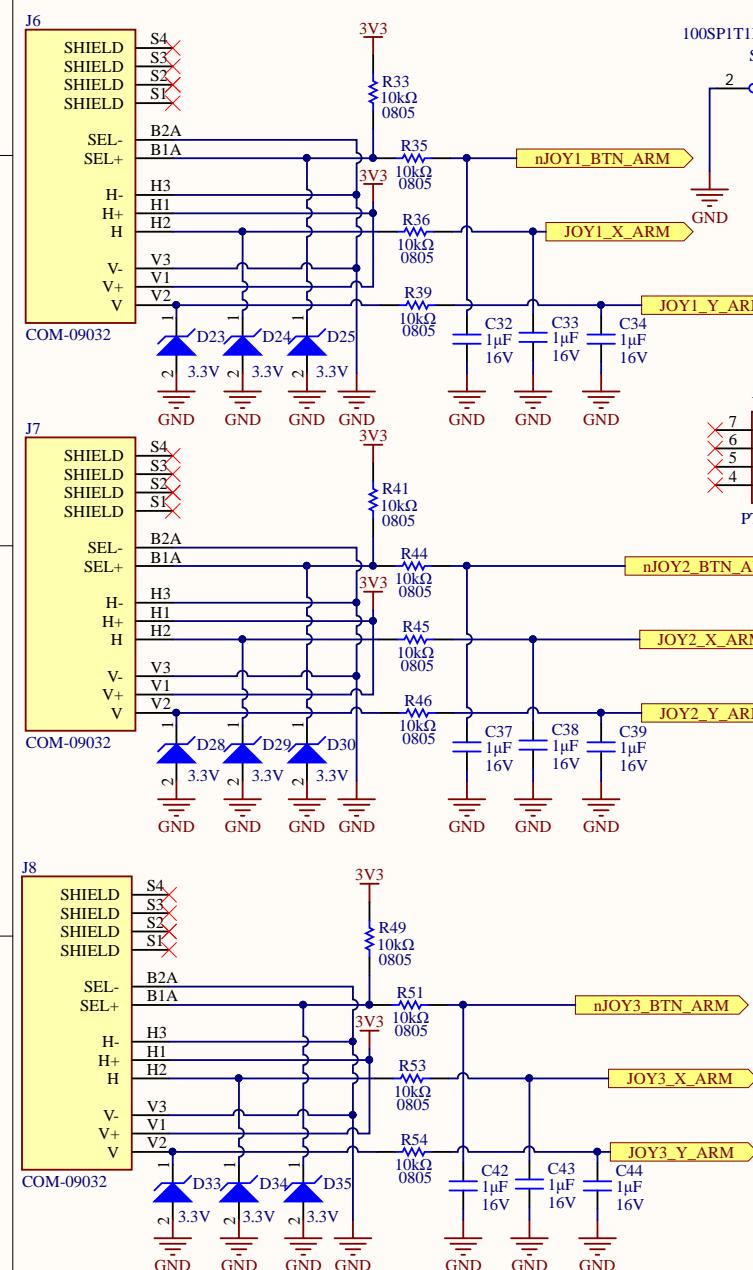
Pushbuttons



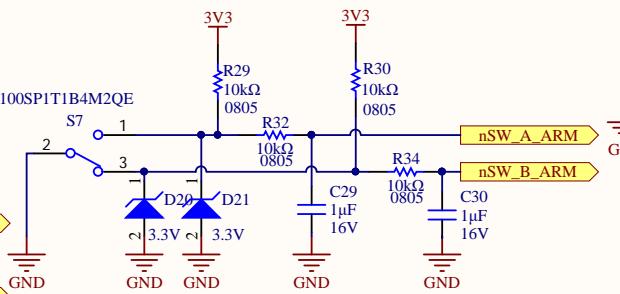
SPDT Switch



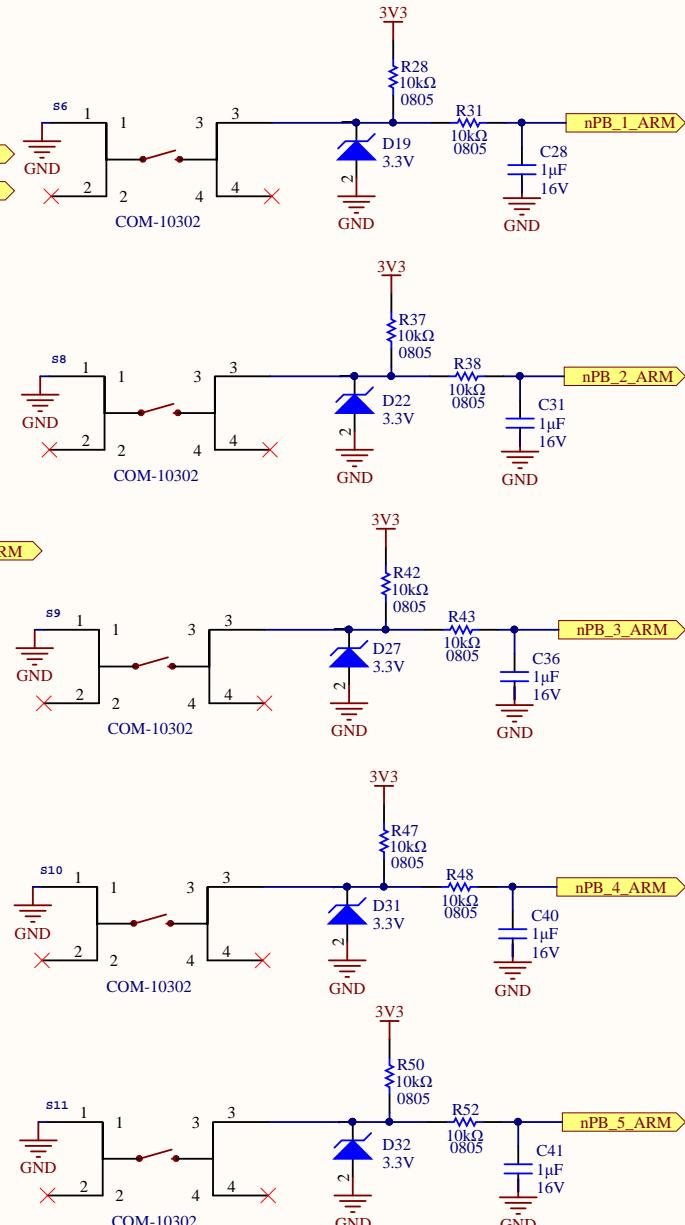
2-Axis Joysticks



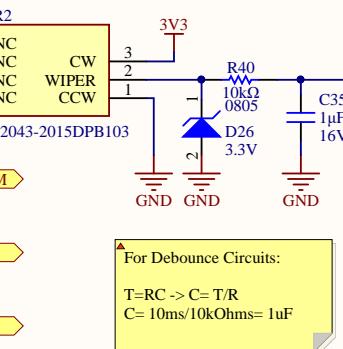
SPDT Switch



Pushbuttons

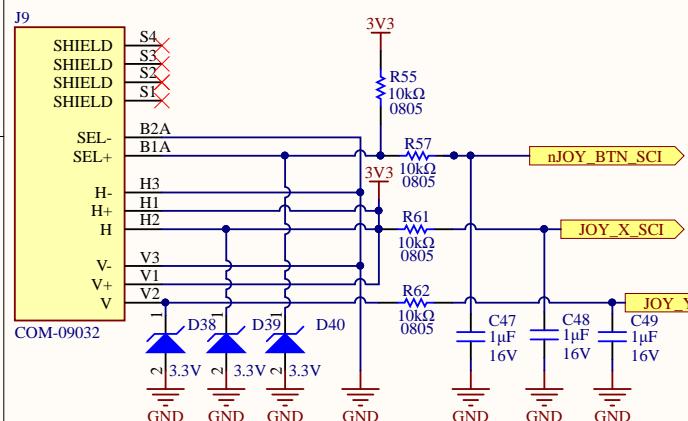


Slide Potentiometer



Controls
 Joysticks: (in joint-control mode)
 - 1: Up/Down is for shoulder, Left/Right is for turntable
 - 2: Up/Down is for elbow
 - 3: Up/Down is for wrist pitch, Left/Right is for wrist roll
Switch:
 - Used to toggle between joint-control and inverse-kinematics
Potentiometer:
 - Used to adjust movement speed of joints/arm (depending on control mode)
Buttons:
 - 1/2: Open/close claw
 - 3/4: Set/Go to home position
 - 5: Extra, in case extra functionality is requested later

2-Axis Joystick



Pushbuttons

For Debounce Circuits:

$$T = RC \rightarrow C = T/R$$

$$C = 10\text{ms}/10\text{kOhms} = 1\mu\text{F}$$

Controls

Joystick:

- Up/Down is for elevator, Left/Right is for opening/closing shovel
 - Button should be used to choose between L/R and U/D, since the science mechanism may be damaged if too many things are moving at once

Buttons:

- 1/2: Move left/right 1 index
 - 3/4: Move to leftmost/rightmost index
 - 5/6: Open/close lid
 - 7: Pre-programmed mixing sequence
 - 8: Extra, in case additional functionality is requested later

UW R

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