

A

A

B

B

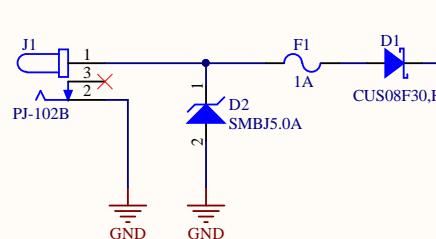
C

C

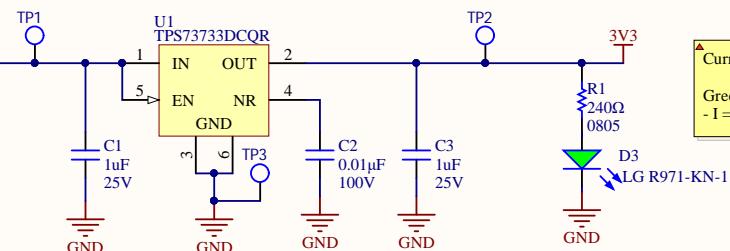
D

D

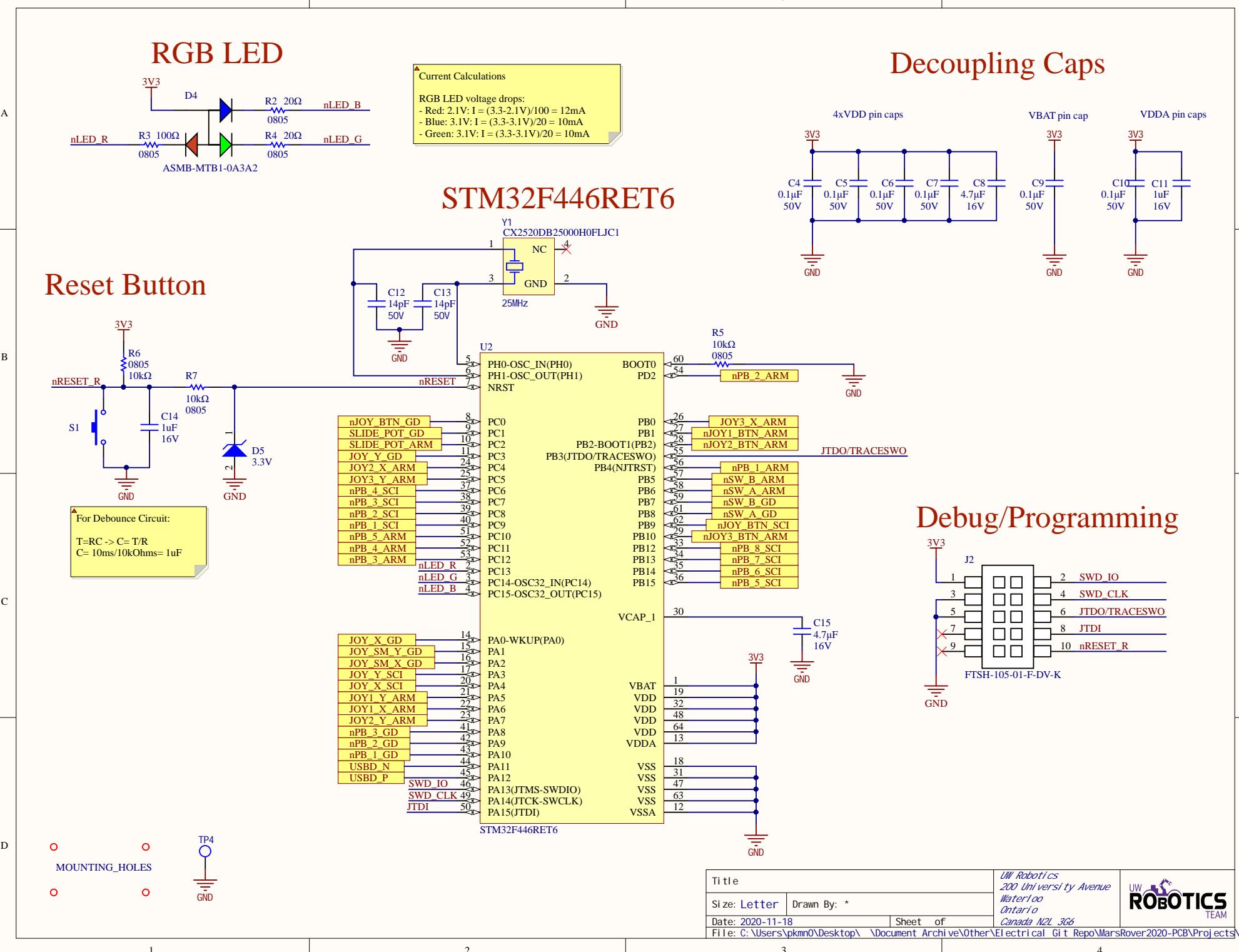
## Power In



## 5V to 3V3 LDO



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



A

A

B

B

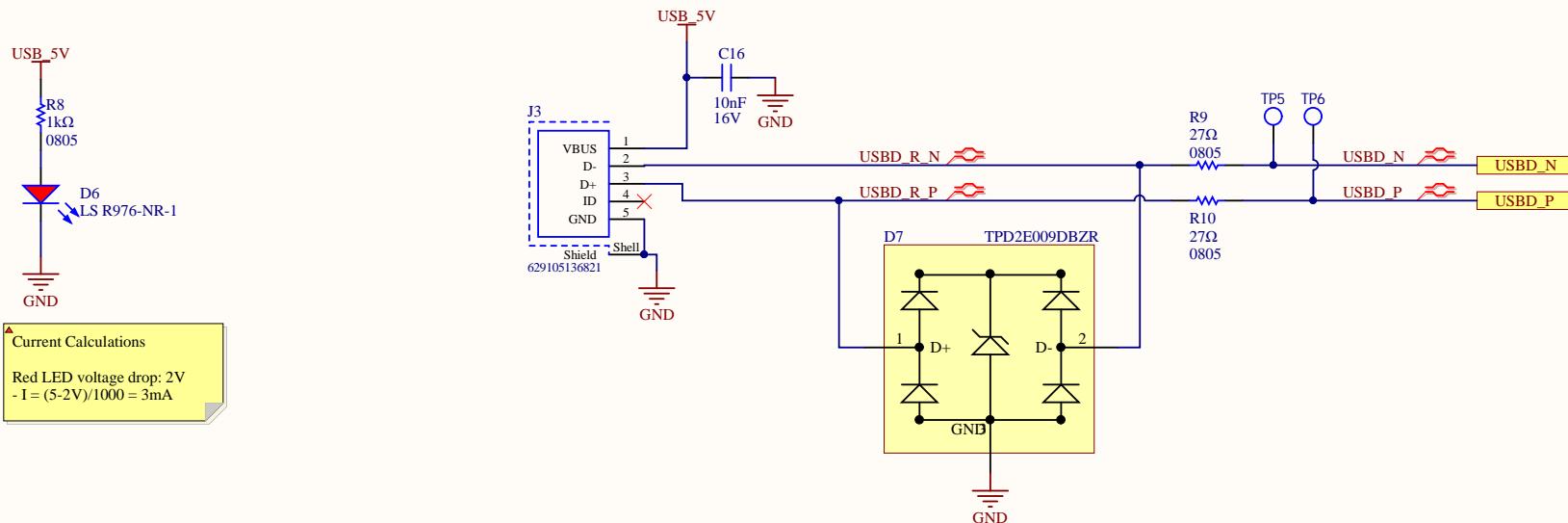
C

C

D

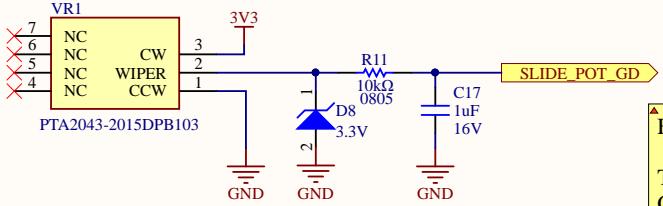
D

## USB Connector

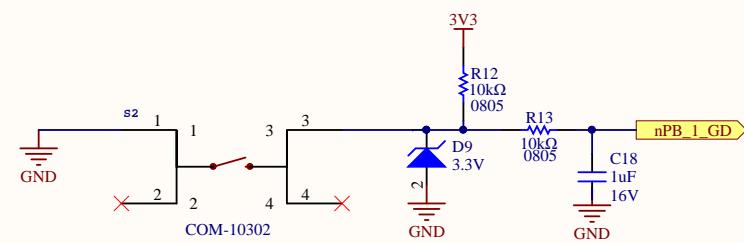


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Size: Letter	Drawn By: *	<i>200 University Avenue Waterloo Ontario Canada N2L 3G6</i>
Date: 2020-11-18	Sheet of	<i>1</i>
File: C:\Users\pkmn\Desktop\Document Archive\Other\Electrical Git Repo\MarsRover2020-PCB\Projects\Robot Controller\		<b>ROBOTICS TEAM</b>

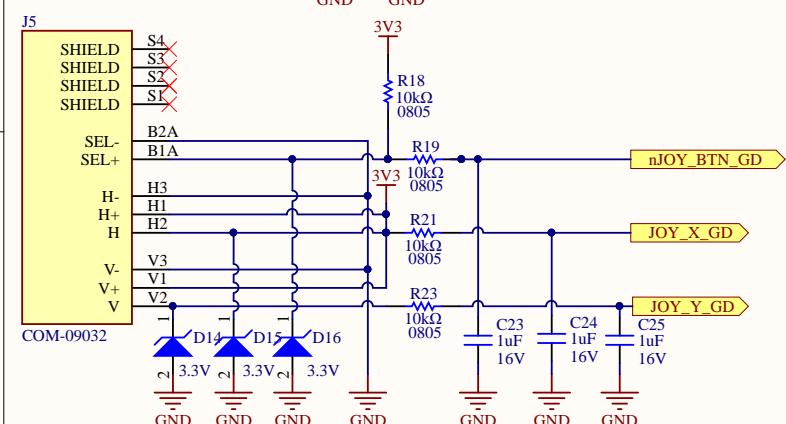
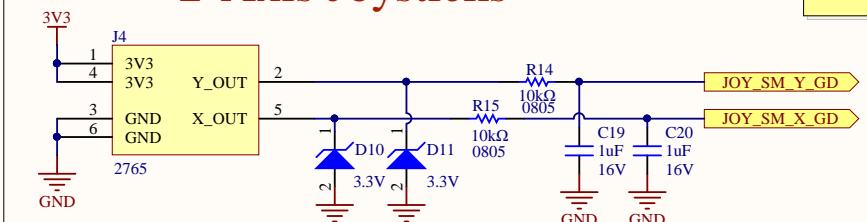
# Slide Potentiometer



# Pushbuttons



# 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

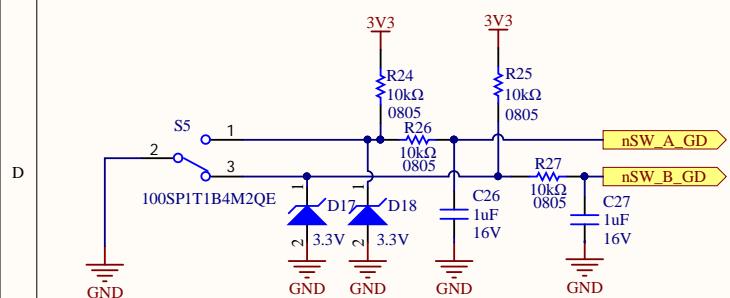
## Switch:

- Used for reverse-mode toggle

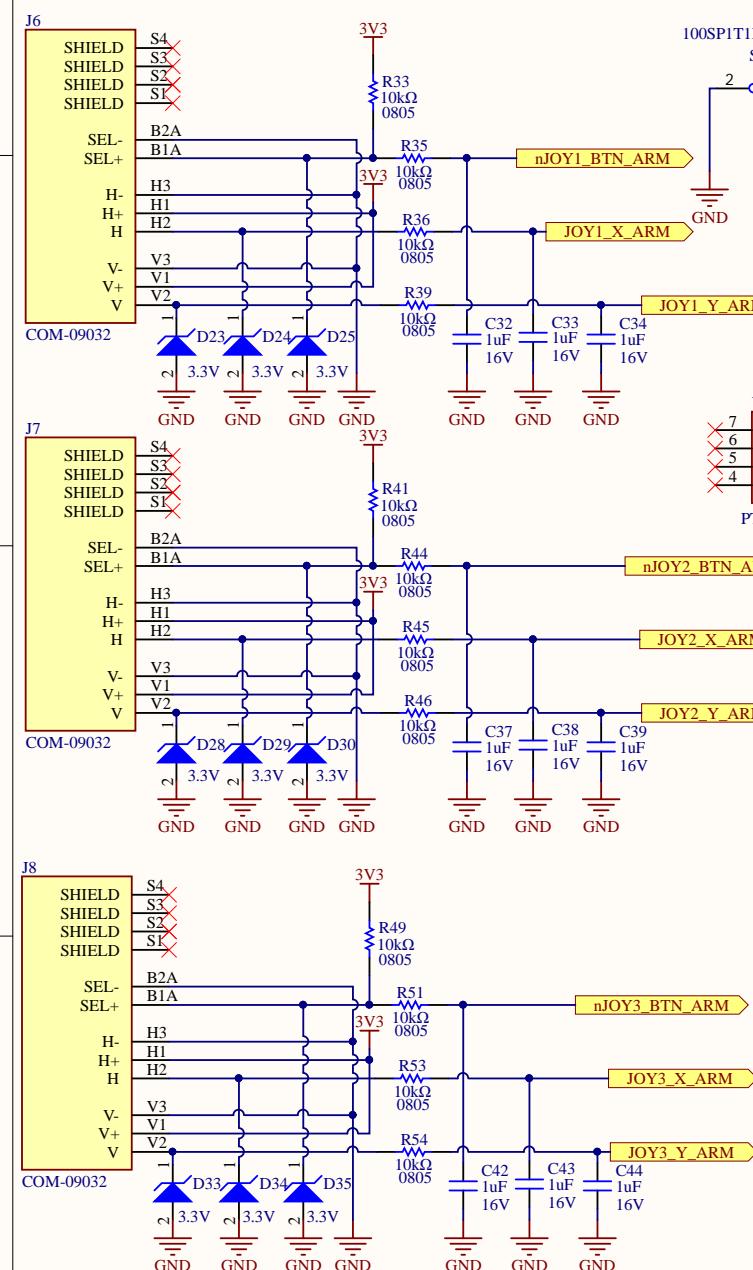
## Buttons:

- 1: Full-stop (halt all movement immediately)
- 2-4: Extra, in case additional functionality is requested

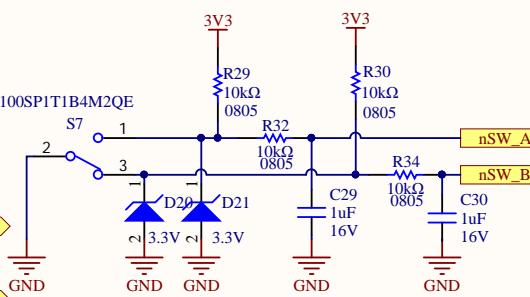
# SPDT Switch



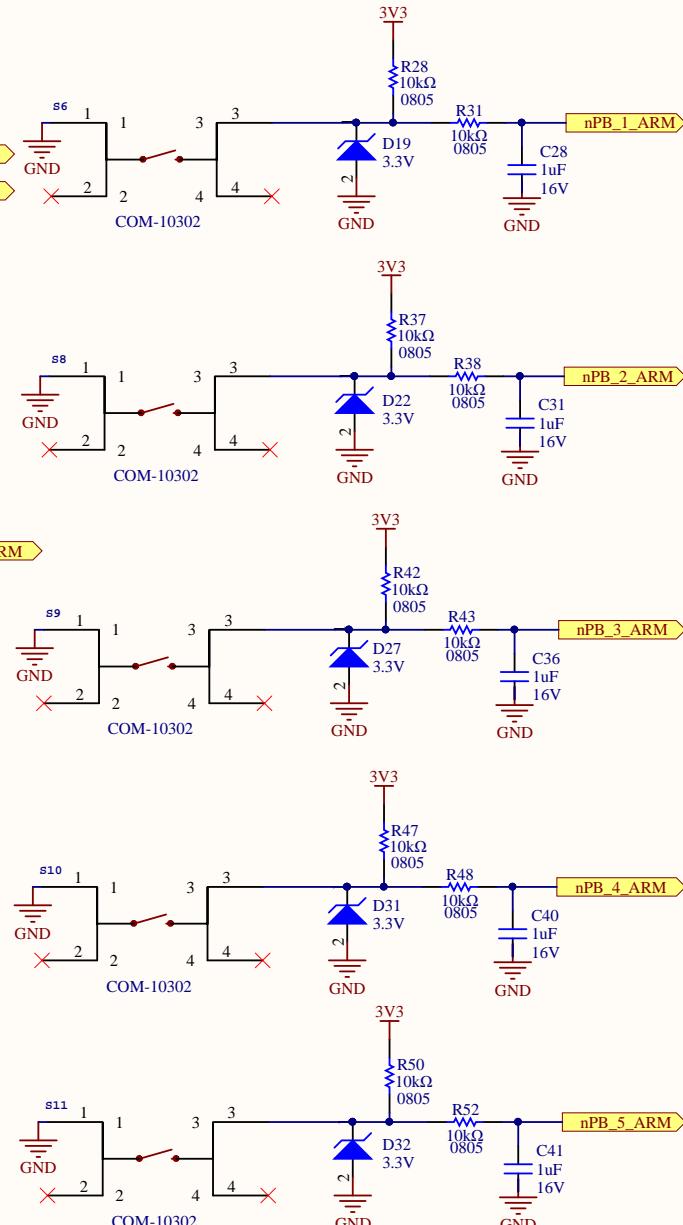
## 2-Axis Joysticks



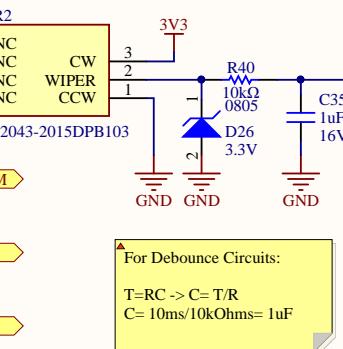
## SPDT Switch



## Pushbuttons

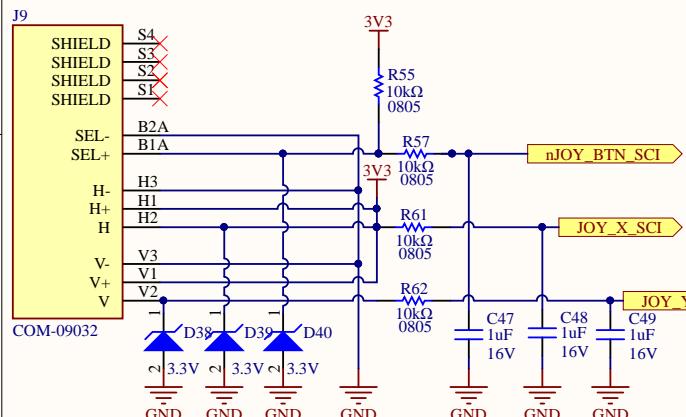


## Slide Potentiometer



**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:

$$T=RC \rightarrow C= T/R \\ C= 10\text{ms}/10\text{k}\Omega = 1\mu\text{F}$$

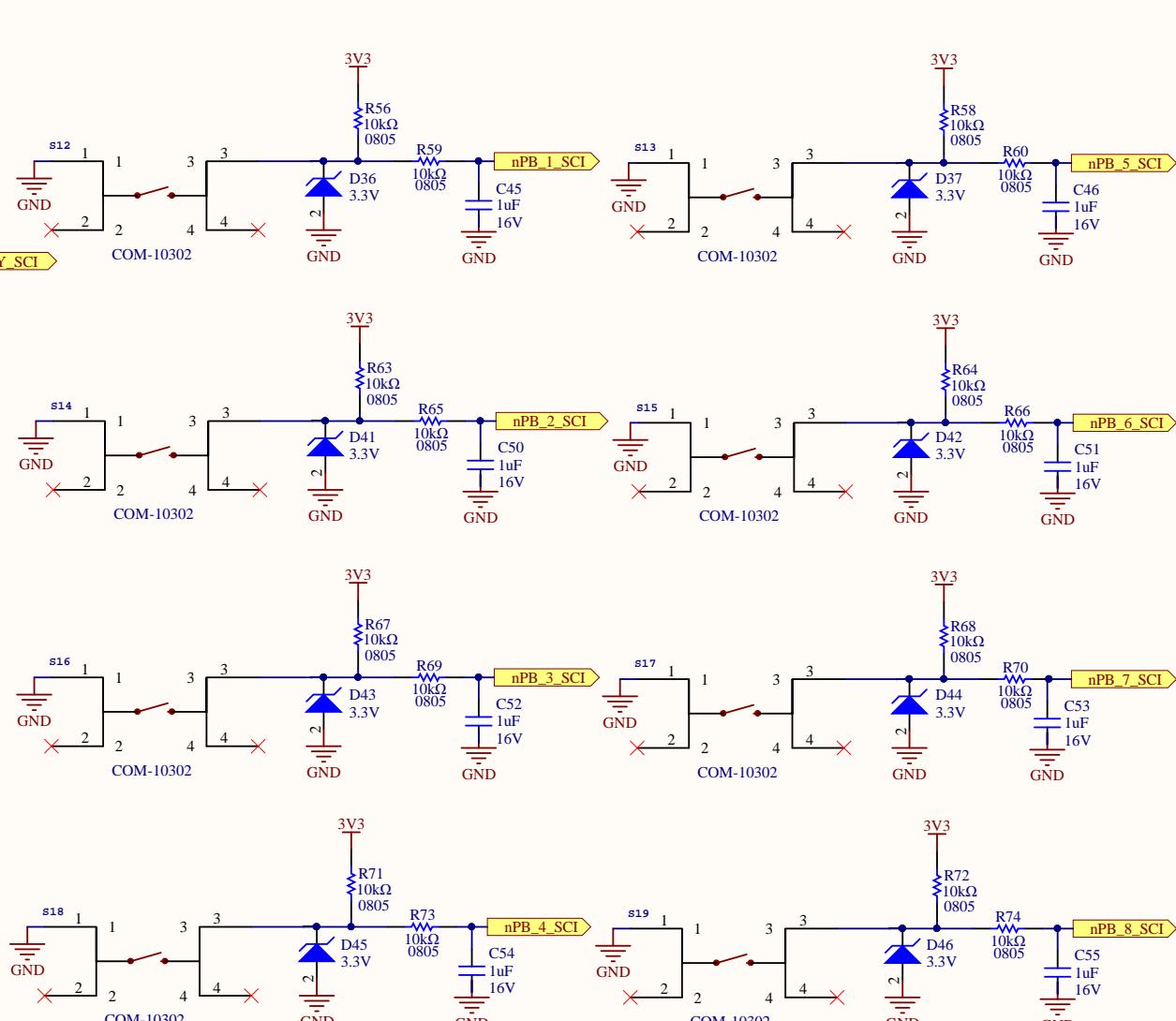
### Controls

#### 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



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