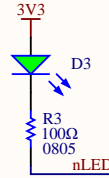
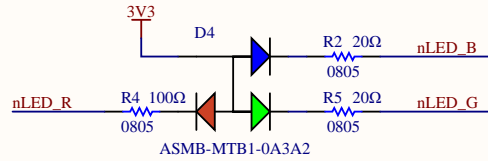


Test LEDs

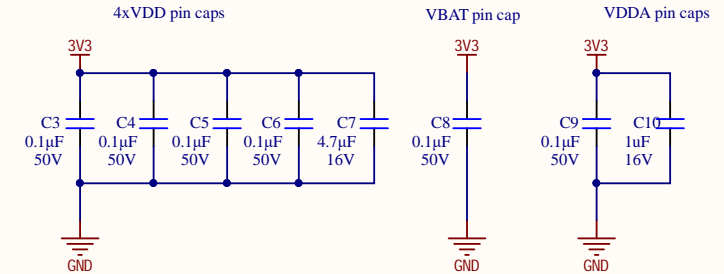


Current Calculations

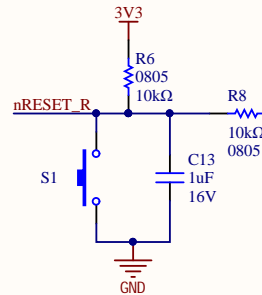
Green LED voltage drop: 2.2V
 $I = (3.3 - 2.2V) / 100 = 11mA$

RGB LED voltage drops:
 - Red: 2.1V: $I = (3.3 - 2.1V) / 100 = 12mA$
 - Blue: 3.1V: $I = (3.3 - 3.1V) / 20 = 10mA$
 - Green: 3.1V: $I = (3.3 - 3.1V) / 20 = 10mA$

Decoupling Caps



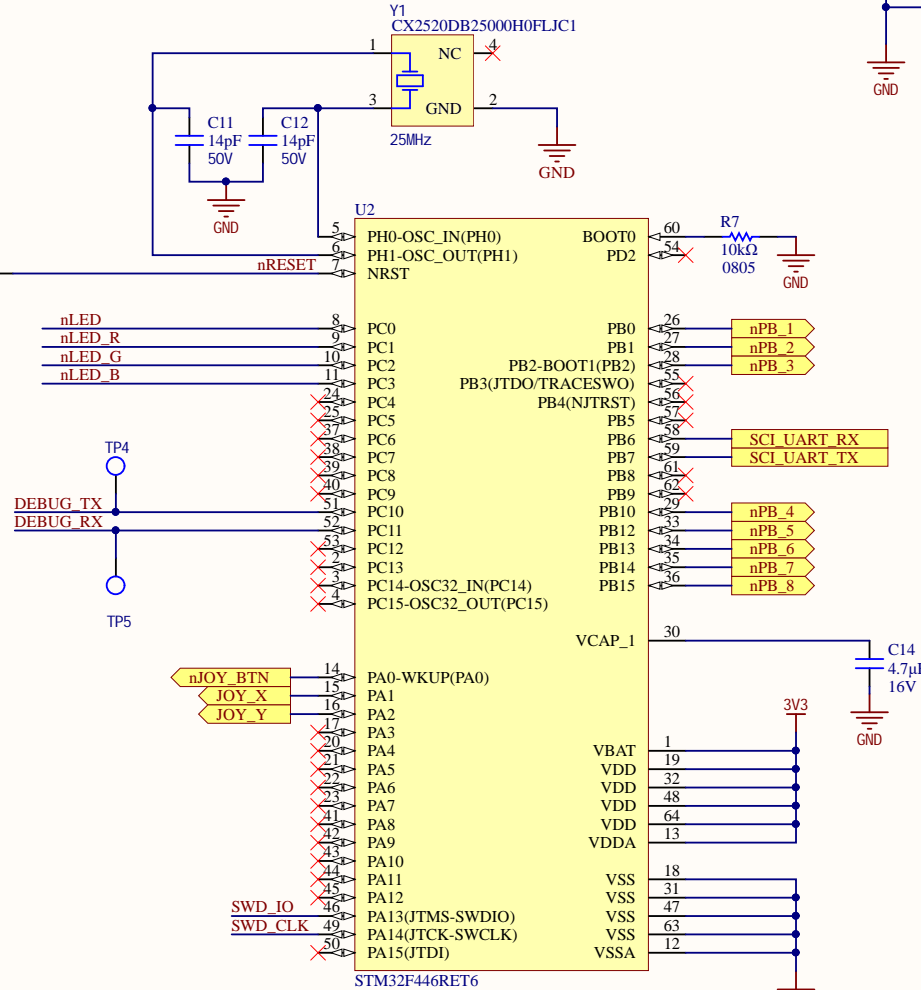
Reset Button



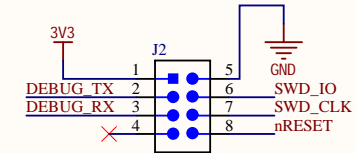
For Debounce Circuit:

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

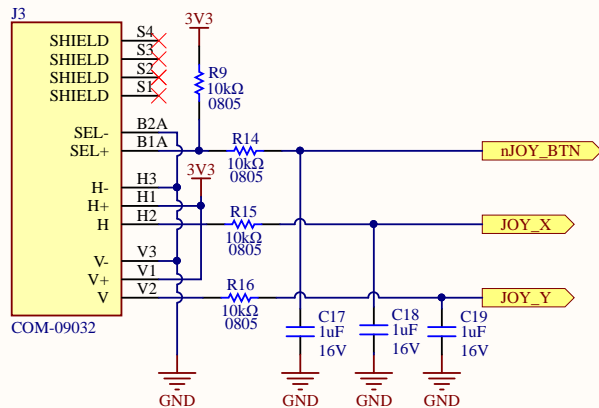
STM32F446RET6



Debug/Programming



2-Axis Joysticks



Controls

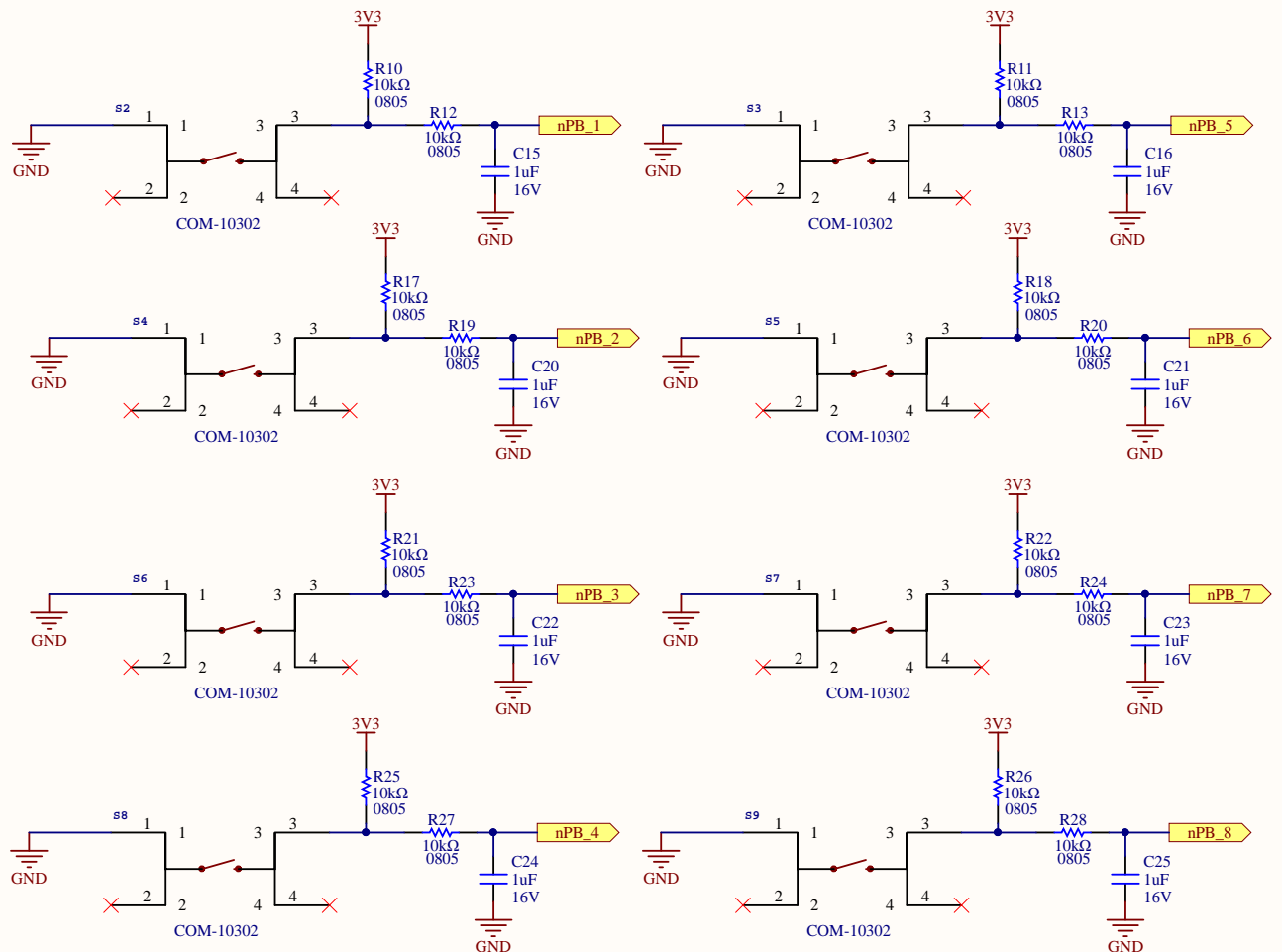
Joystick:

- 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

Pushbuttons



For Debounce Circuits:

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

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

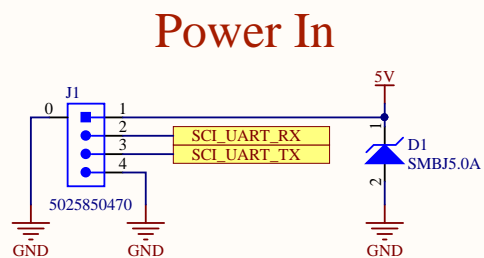
Title SH2-CONTROLS

Size: Letter Drawn By: Qi nyang Bao

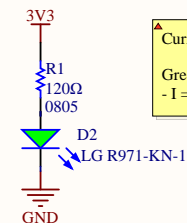
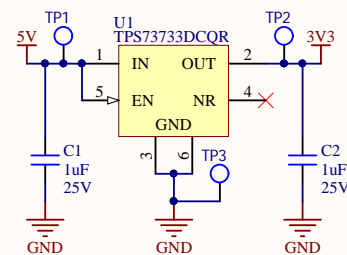
Date: 2020-11-08

Sheet2 of 4

File: C:\Users\pkmn0\Desktop\Document Archi ve\Other\El ectri cal Git Repo\MarsRover2020-PCB\Projects\Robot Control Ier\N



5V to 3V3 LDO



Current Calculations
 Green LED voltage drop: 2.2V
 $I = (3.3 - 2.2V) / 120 = 9mA$