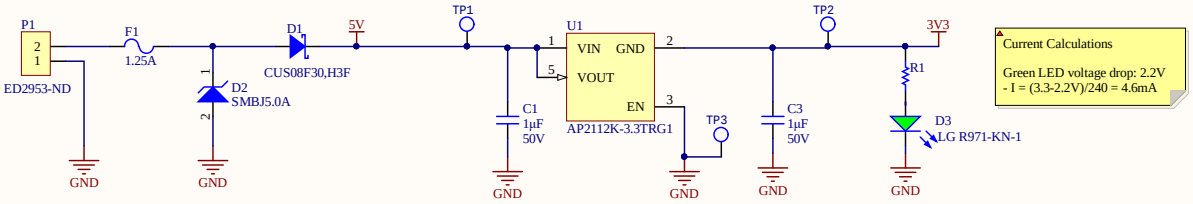
Power In

5V to 3V3 LDO



Title: Power		
Project: Robot Controller.PrjPcb		
Rev: 1	Checker: Lance Bantoto	
	Engineer: Christopher Arjune	
Date: 2020-12-27	Sheet: 1 of 6	

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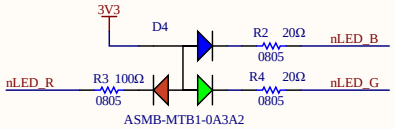
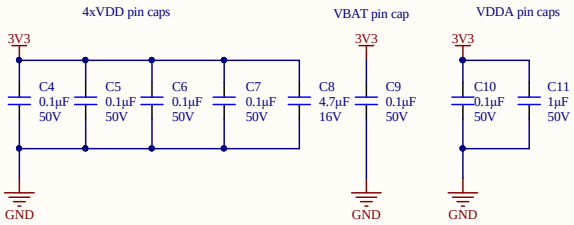
RGB LED



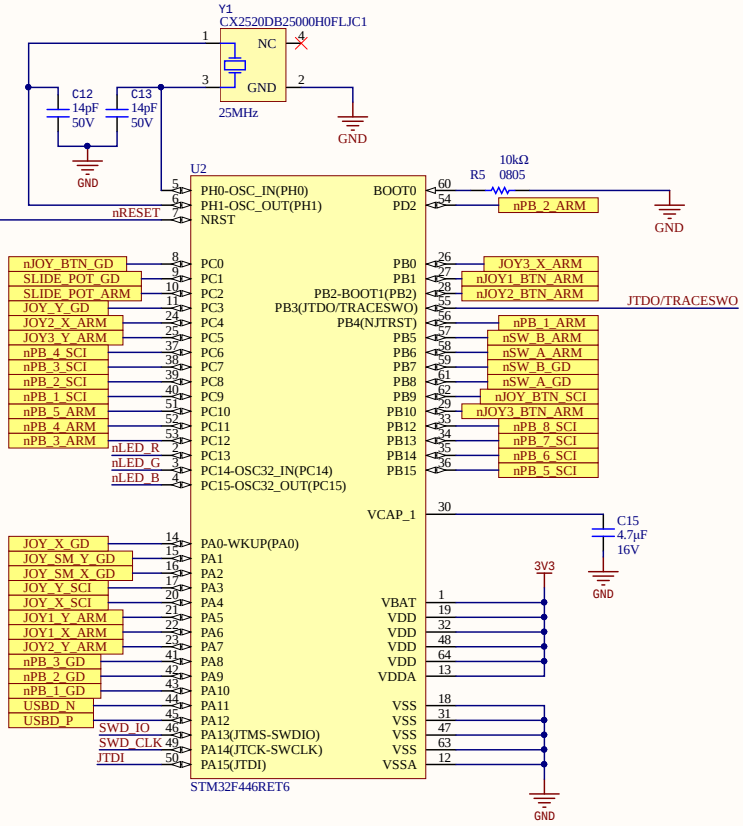
Current Calculations

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

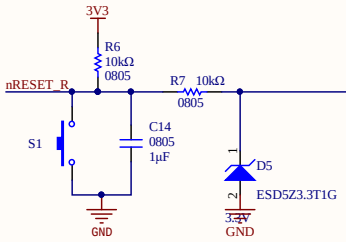
Decoupling Caps



STM32F446RET6



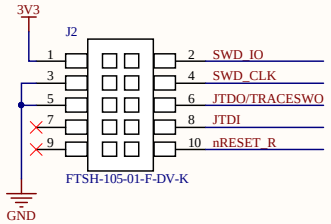
Reset Button



For Debounce Circuit:

T=RC -> C= T/R
C= 10ms/10kOhms= 1uF

Debug/Programming



Title: Microcontroller		
Project: Robot Controller.PrjPcb		
Rev: 1	Checker:	Lance Bantoto
	Engineer:	Christopher Arjune
Date: 2020-12-27	Sheet:	2 of 6

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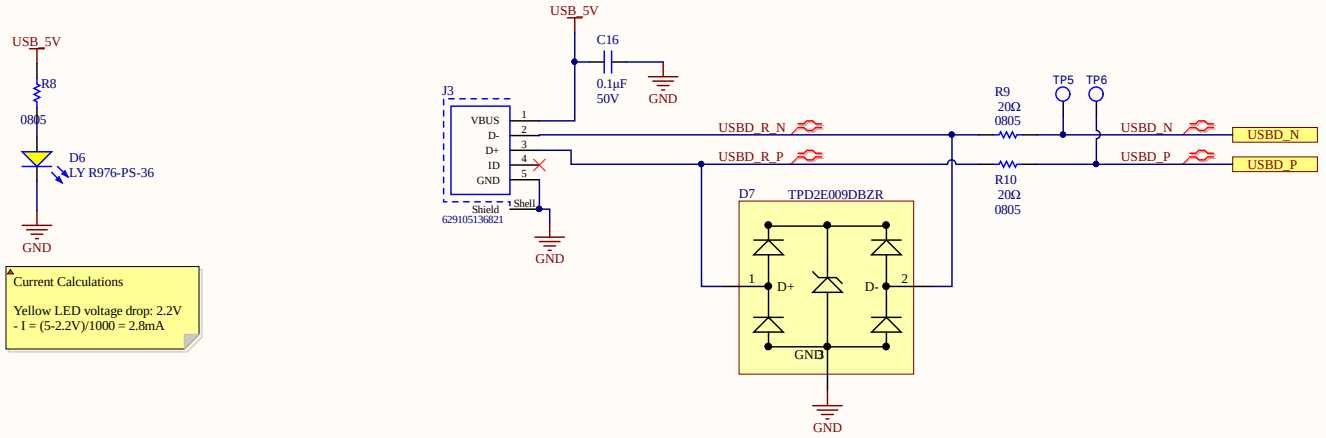
USB Connector



Title: USB		
Project: Robot Controller.PrjPcb		
Rev: 1	Checker: Lance Bantoto	
	Engineer: Christopher Arjune	
Date: 2020-12-27	Sheet: 3 of 6	

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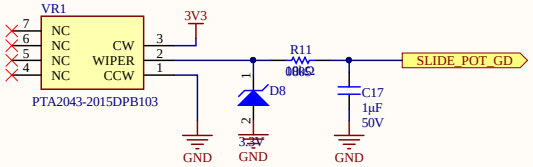
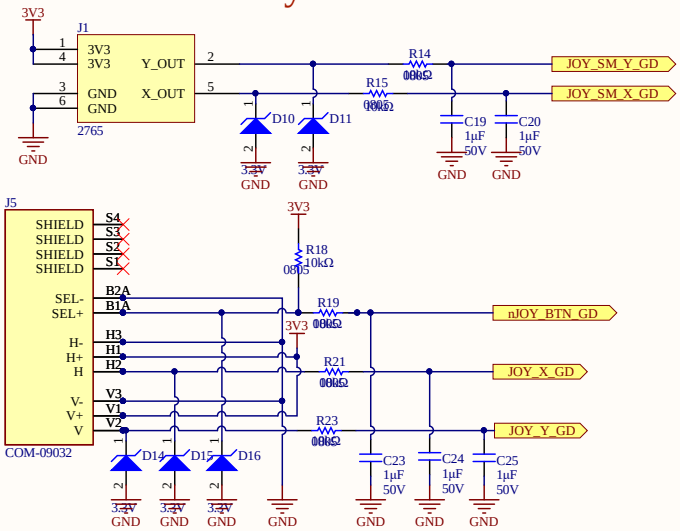
Slide Potentiometer



For Debounce Circuits:

T=RC -> C= T/R
C= 10ms/10kOhms= 1uF

2-Axis Joysticks



Controls (subject to change)

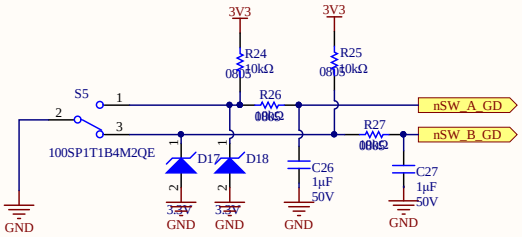
Joysticks:
- 1: Large joystick is used for driving
- 2: Small joystick is used for gimbal

Potentiometer:
- Used for driving speed control

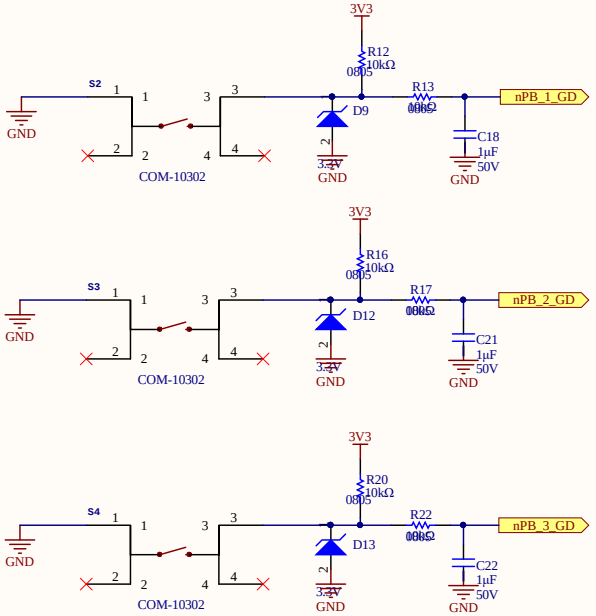
Switch:
- Used for reverse-mode toggle

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

SPDT Switch



Pushbuttons



Title: GimbDrive Controls		
Project: Robot Controller.PrjPcb		
Rev: 1	Checker: Lance Bantoto	
	Engineer: Christopher Arjune	
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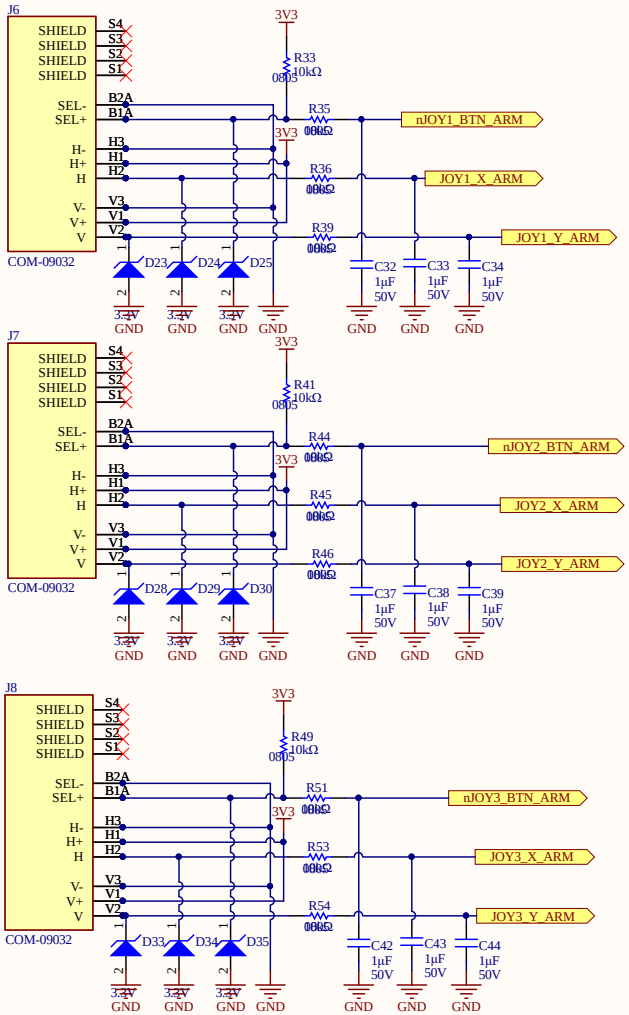
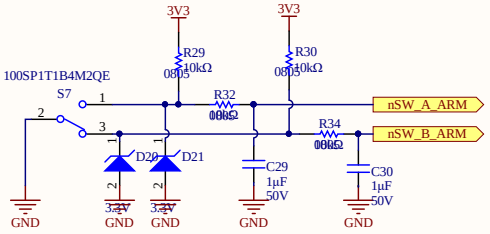
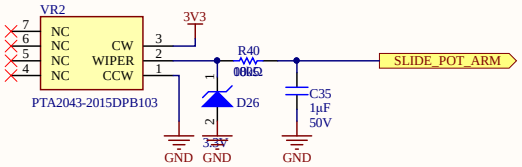
2-Axis Joysticks



SPDT Switch



Slide Potentiometer



For Debounce Circuits:

T=RC -> C= T/R
C= 10ms/10kOhms= 1uF

Controls

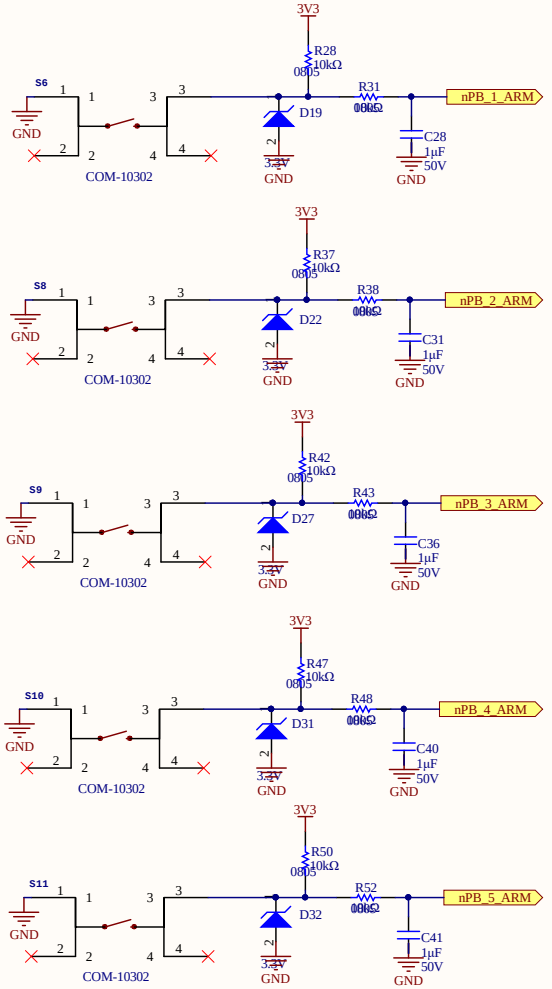
Joysticks: (in joint-control mode)
- 1: Up/Down is for shoulder, Left/Right is for turntable
- 2: Up/Down is for elbow
- 3: Up/Down is for wrist pitch, Left/Right is for wrist roll

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

Pushbuttons



Title: Arm Controls		
Project: Robot Controller.PrjPcb		
Rev: 1	Checker: Lance Bantoto	
	Engineer: Christopher Arjune	
Date: 2020-12-27	Sheet: 5 of 6	

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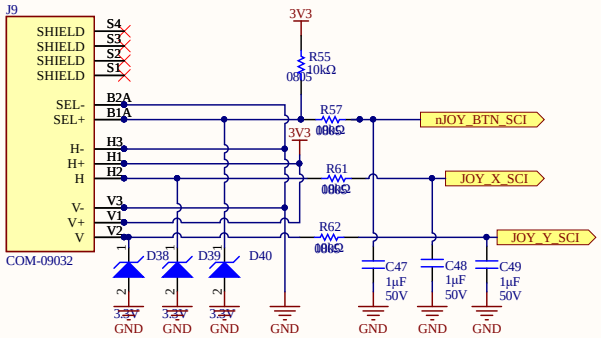
2-Axis Joystick



Controls

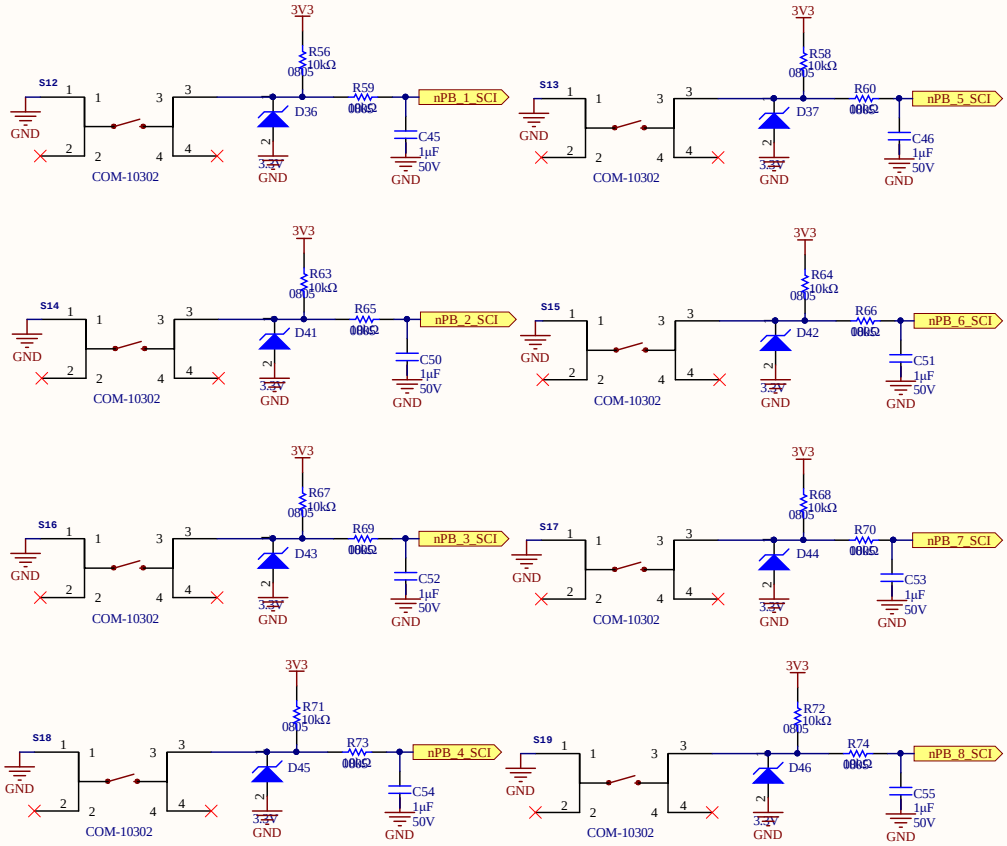
Joystick:
- Up/Down is for elevator, Left/Right is for opening/closing shovel
- Button should be used to choose between L/R and U/D, since the science mechanism may be damaged if too many things are moving at once

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 -> C= T/R
C= 10ms/10kOhms= 1uF



Title: Science Controls		
Project: Robot Controller.PrjPcb		
Rev: 1	Checker: Lance Bantoto	
	Engineer: Christopher Arjune	
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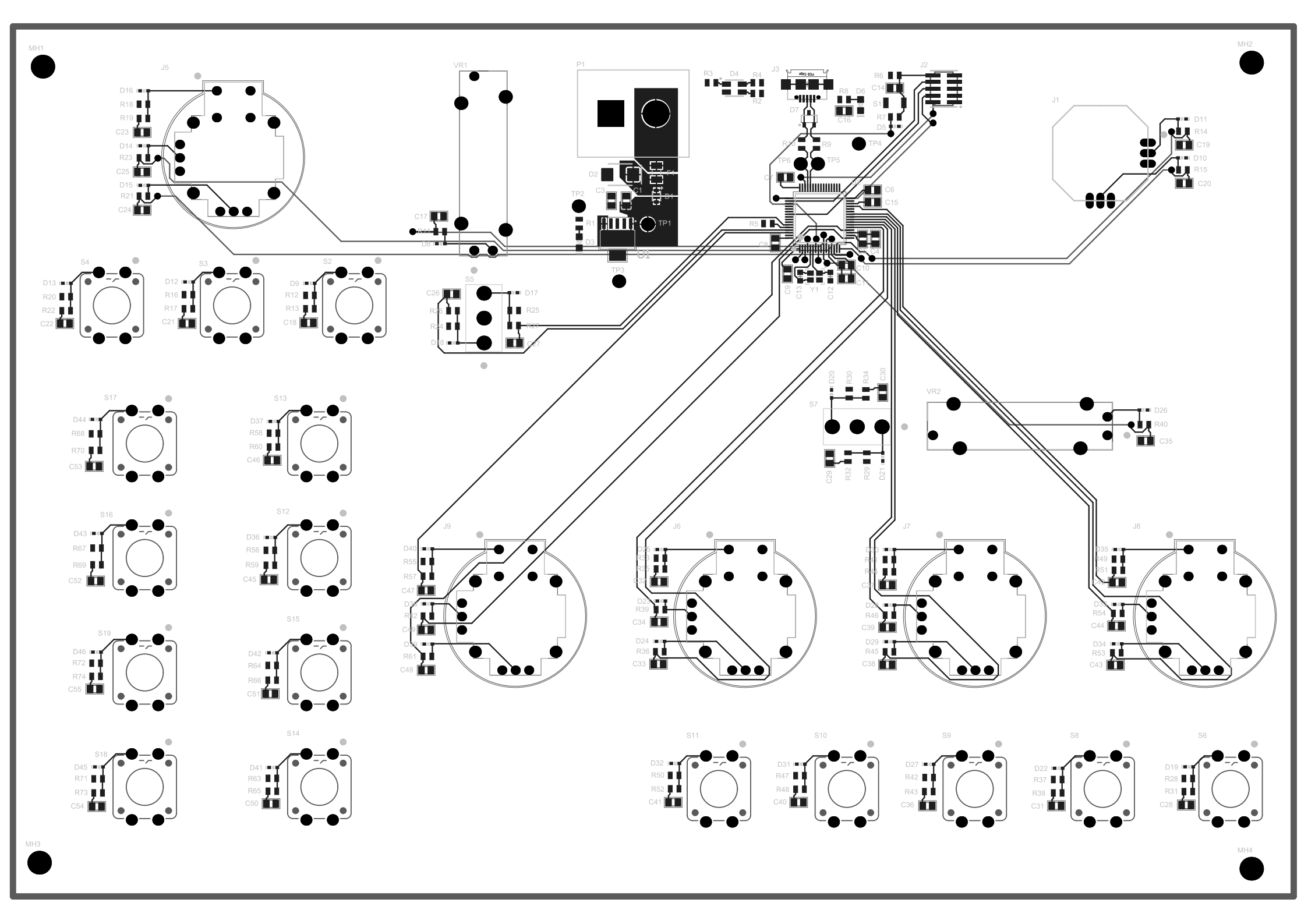
MH1
MH2
MH3
MH4
J5
VR1
P1
J3
J2
J1
S4
S3
S2
S5
S7
VR2
S17
S13
S16
S12
S19
S15
S18
S14
S11
S10
S9
S8
S6
J9
J6
J7
J8
TP1
TP2
TP3
TP4
TP5
TP6
Y1