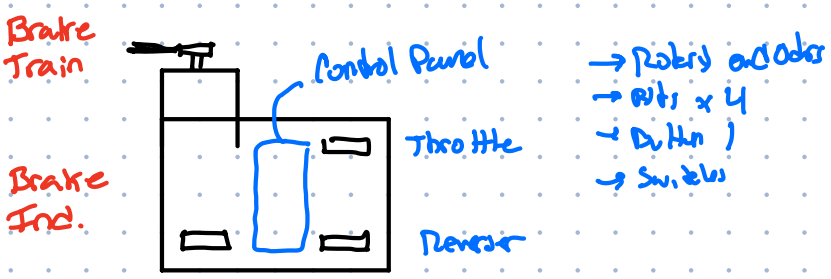
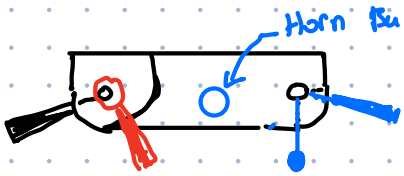
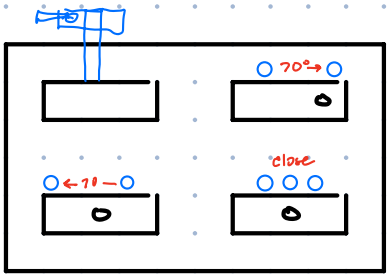


→ Rotary encoder
→ Bits x 4
→ Button
→ Switches



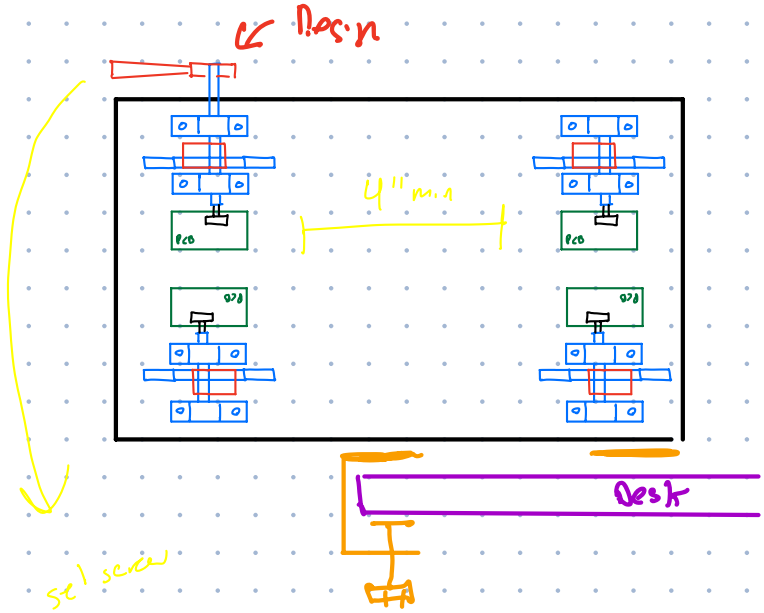
90+ or 70+ ?

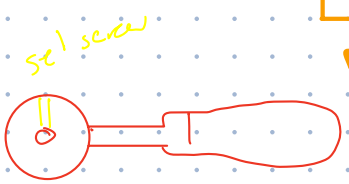


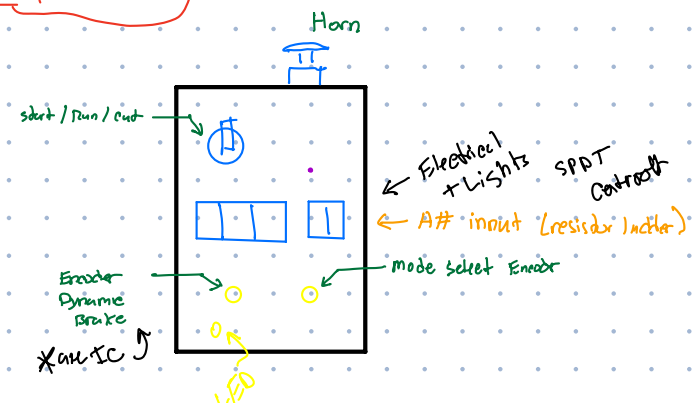
- ✓ Horn – momentary Push button (Momentary)
- ✓ Starter – momentary Rotary
- ✓ Fuel Cut – momentary Push button

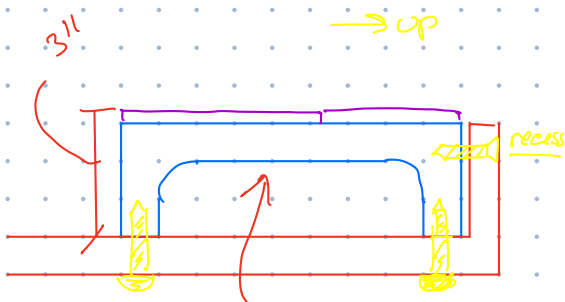
- ✓ Fuse – Starter double SPDT center-off - momentary
- ✓ Fuse – Electric toggle
- ✓ Fuse – Traction Motor toggle

- ✓ Lights – Front 2 down – 3 up
- Lights – Cab 2 Position or 2 buttons









= 3" – Panel thickness

~ 1/8" or 3/16"

Additional

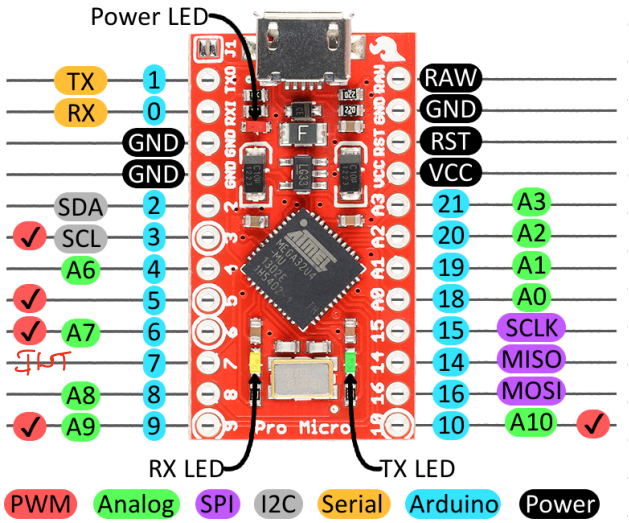
- I2C PWR + GND

Expander I/O

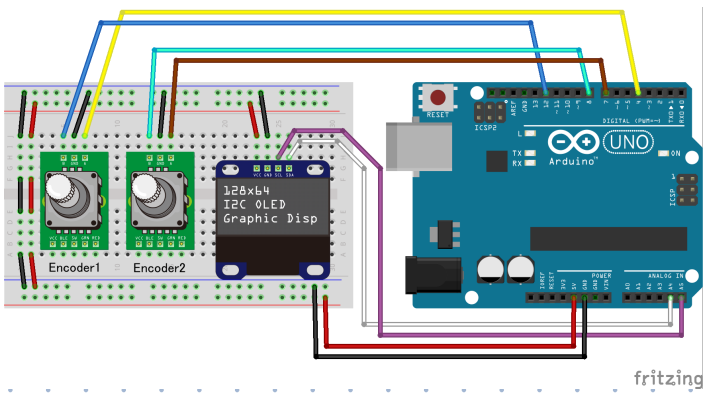
I²C
I²C

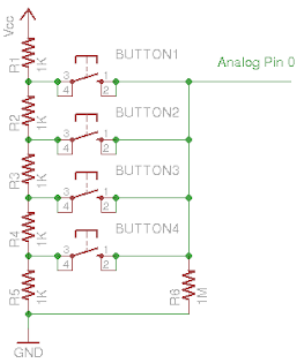
LED Blink

Btn Rotary Encoder

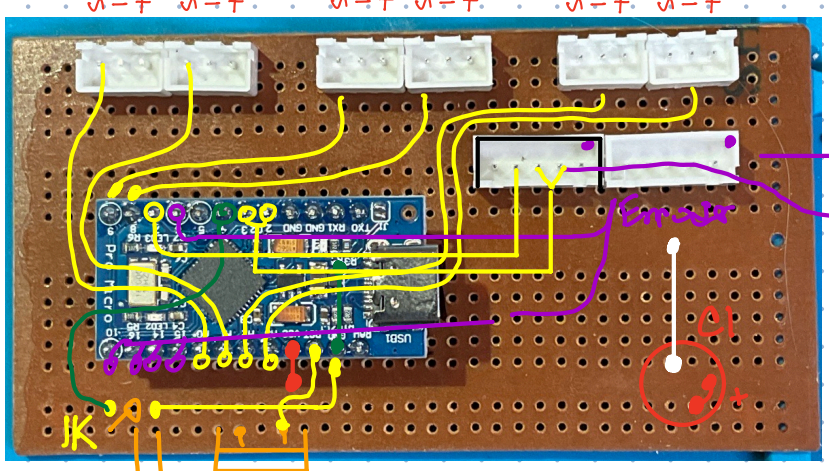


Train Brake
Ind Brake
Reverser
Throttle
Rotary encoder A





Ind. Brake
Train. Brake
A0
A1
Buttons
B
A
A2
A3
Reverser
Throttle

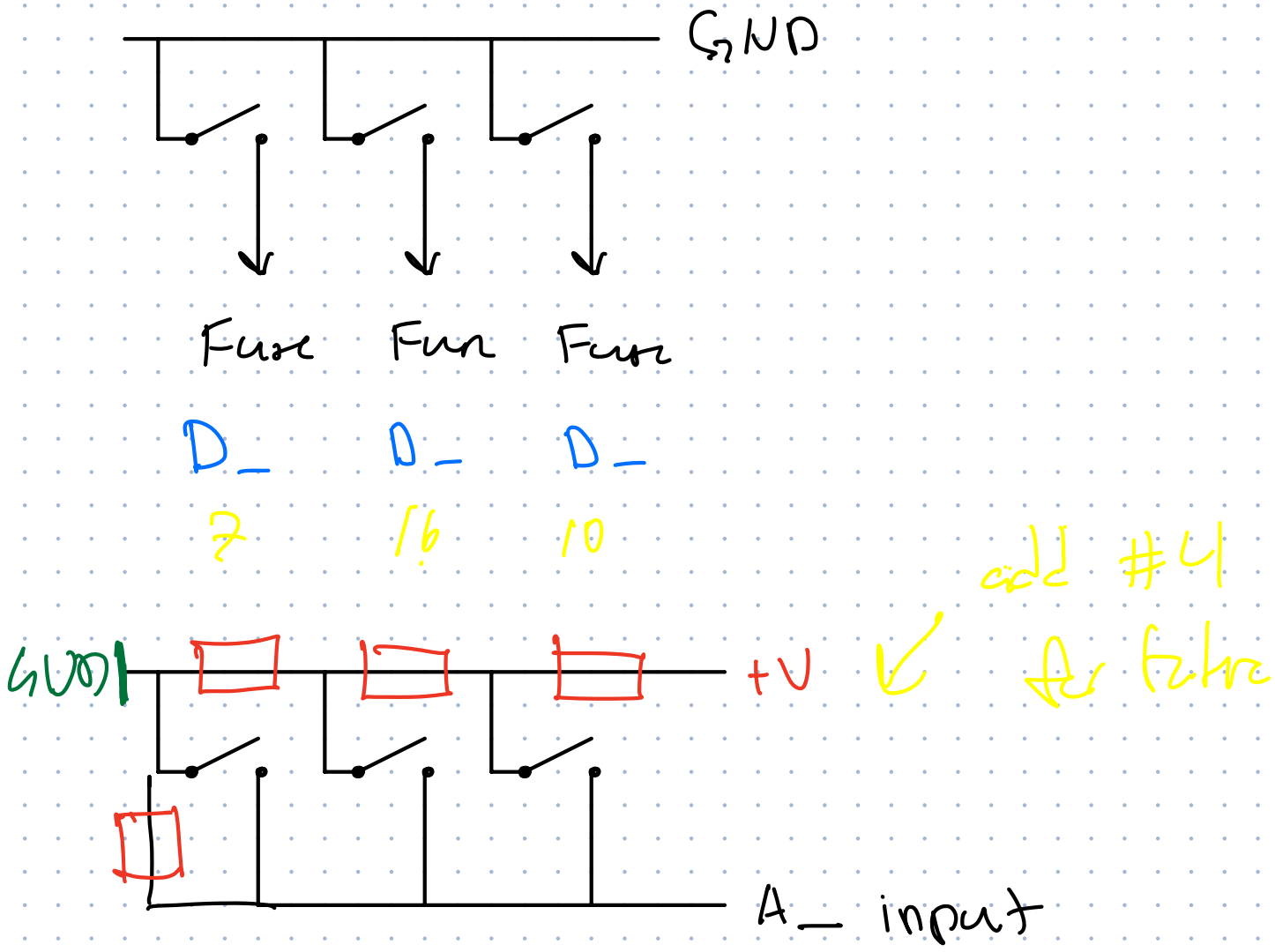


Pins
Encoder
I2C

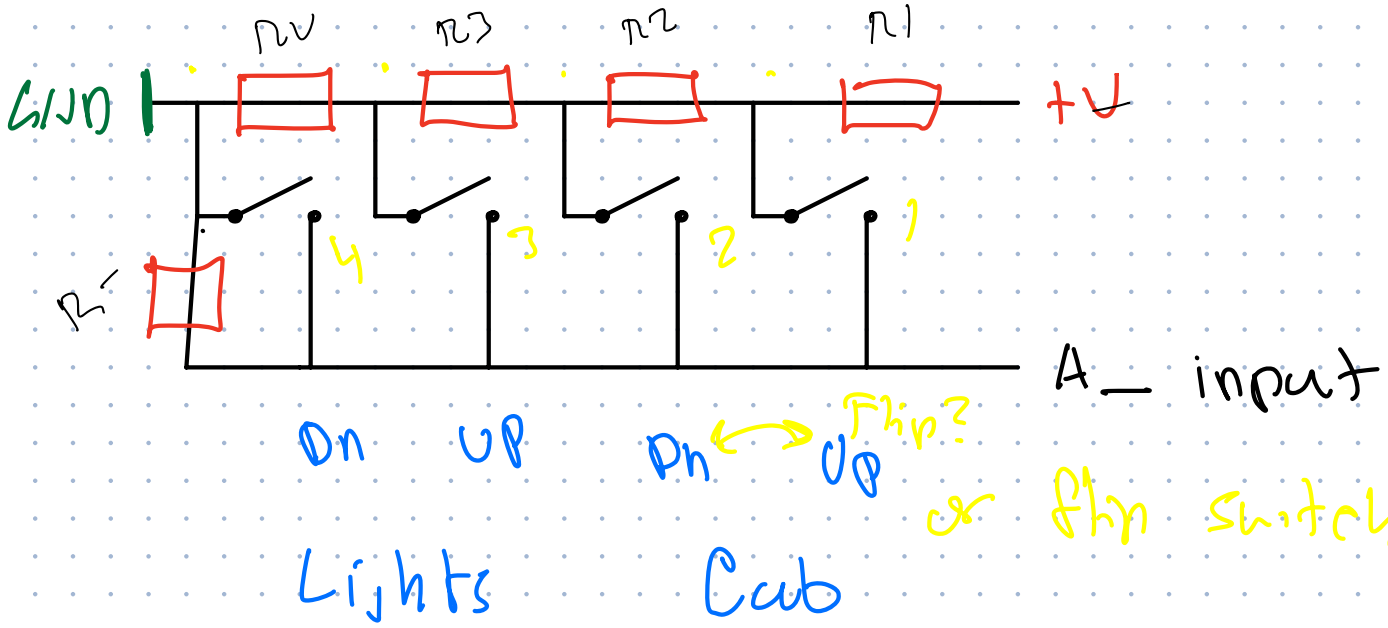
LED
Reset

* I2C
* reset
* CAP
* LED GND

x2

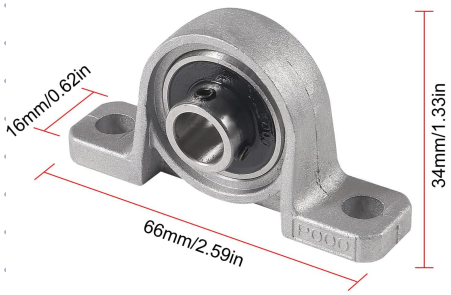


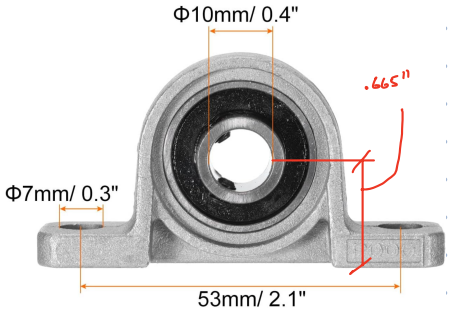
add #4 fuse

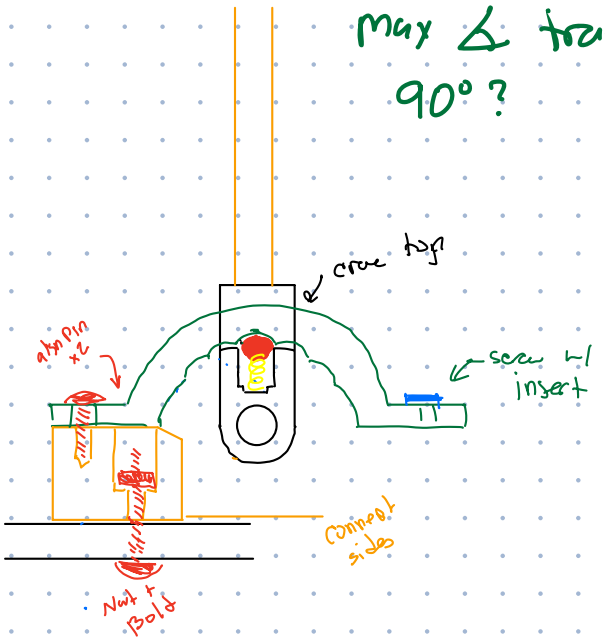


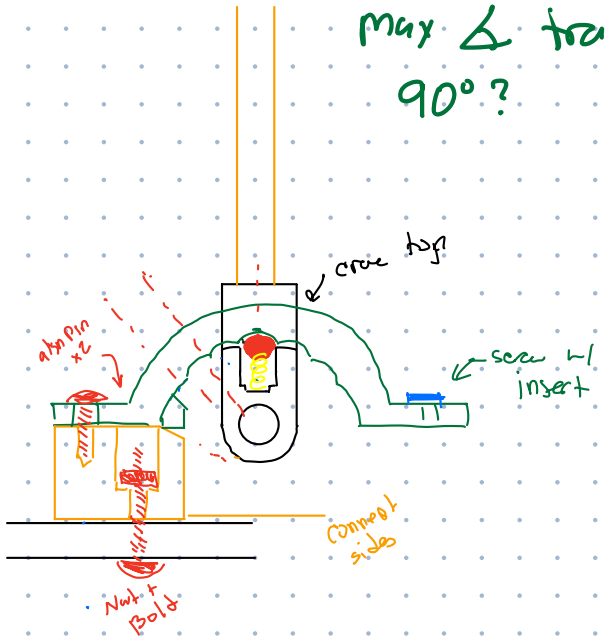
or flip switch

- 10mm Drill bit
- coll pins x 4
- Spring x 1
- screws x 2
- insert x 2

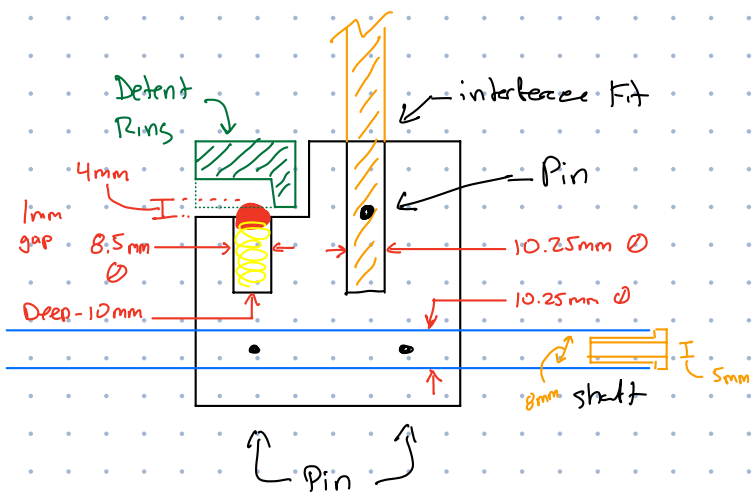


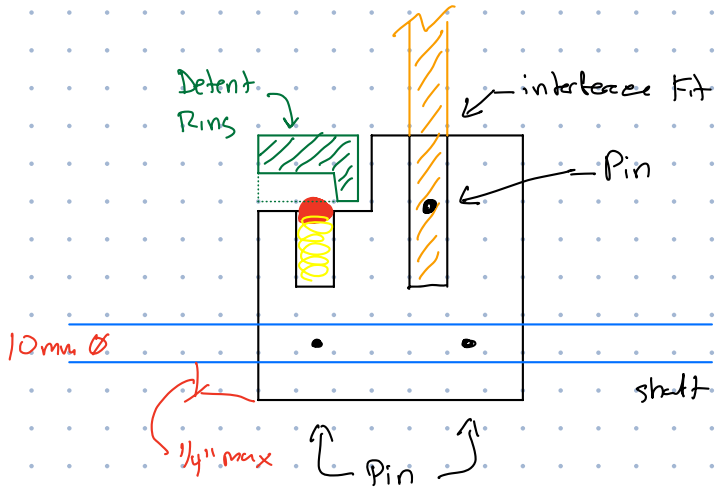


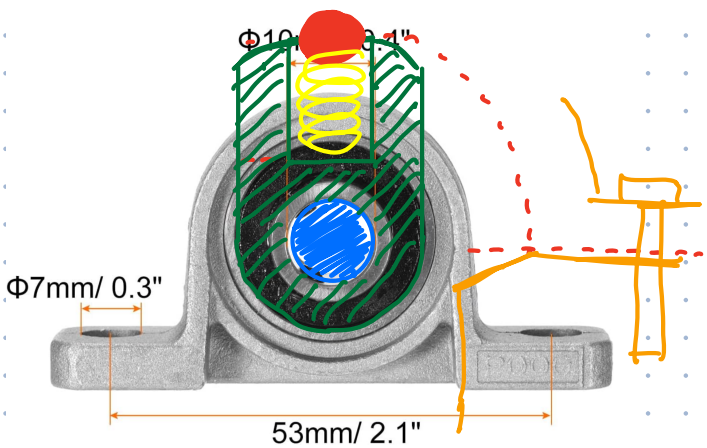


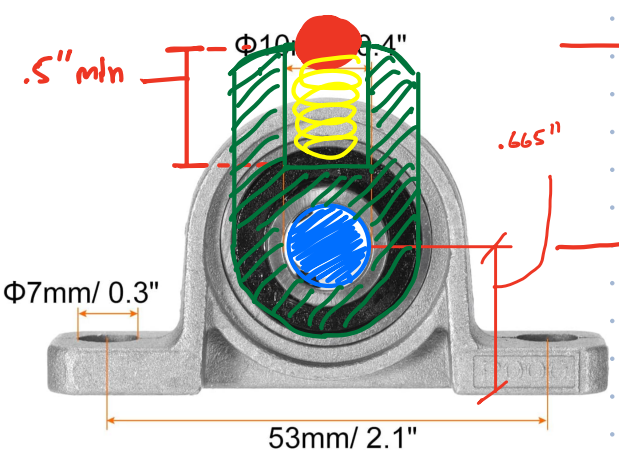


$\frac{0}{0}$ angle of travel by steps









match Bolt spacing

20 → 25mm

make taller for more holding force

12.5

8	12
0	0
	1
1	2
	3
2	4
	5
3	6
4	7
5	8
	9
6	10
7	11

Lever notches

Throttle = 0 - 7 8 total

Reverser = 3

Train. Brake = 0 - 10 11 total

Ind. Brake = 0 - 7 8 total

Throttle = 0 - 11 12 total

Dynamic

-1 0 1

add stop each side

45° 0 45°

Throttle

~ 1400 RPM or 2W notch range

11 ← 0

add stop

add stop or allow full motion + detent @ full 3 or will just not use full range. or add "prolite" Buttons

70°

45 0 45

make detent

Push

Train Brake

0 1 → 11

add stop

Detent

release ← LAP → slow → Fast

max back 45° range 70°

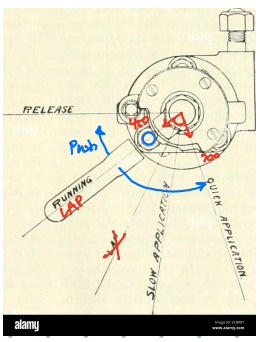
90°+

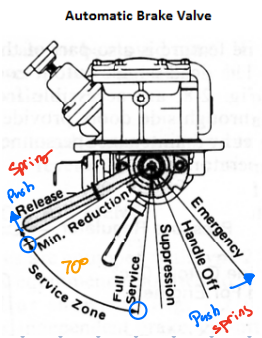
0 1 → 7

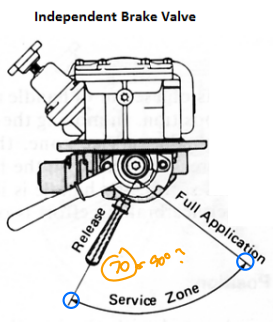
add stop

Ind Brake

45 0 45







1-5 V
0-1024 ADC
0-135°

27° / Volt
37mv / deg.

204.8 ADC / Volt
7.5 ADC / Deg.

Deg • .037 = volt range
Deg • 7.5 = ADC range

5mv / ADC? I need to check

0

Smith Trigger

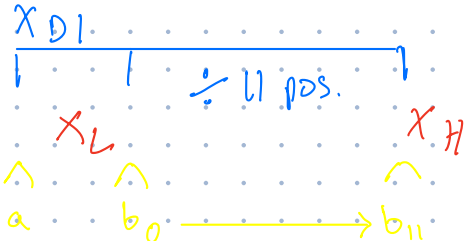
A-stable

	ADC	Volt	Zones	Range / zone (ADC)	Rev Buffer
50° =	375	1.85	3	125	(25) 20%
70° =	525	2.59	11	47 (405 usable range. 36 ADC / notch)	(~5) 10% 181mv / notch
90° =	675	3.33	11+	47 + 150	(~8) 10%

Dump position range

Increase on Dump Sw. H.

- .5V each side of detent for buffer
  - 13° or 100 ADC



$a = X_L - \frac{1}{2} X_{D1}$

$b_0 = X_L + \frac{1}{2} X_{D1}$

$b_x = X_L + \frac{1}{2} X_{D1} + (X \cdot \text{Notch width})$

$\text{Notch width ADC} = \frac{(X_H - X_L) + \frac{1}{2} X_{D1}}{11}$

X_P = Push > 45°
X_L = Low range
X_H = High range
X_{D1} = Dead Zone Detent
X_{D2} = Dead Zone Position

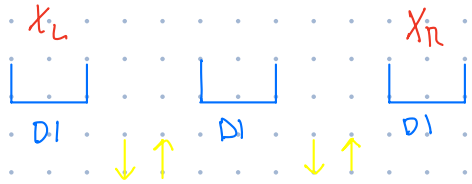
$X_{D1} = (X_H - X_L) \cdot 0.1$ 10%? Vary *

$X_{D2} =$

	R	IV	F
50°	0-100	125-250	275-375
70°	0-40 / zone w/ (7) between as dead zone		

Reverse

R N F

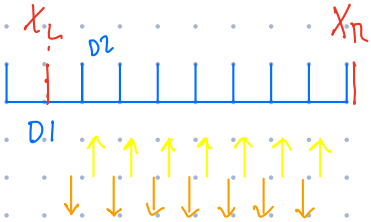


= Calibration measurment ADC

= Trigger points up / dn w/ smit trigger operation

Ind Brute

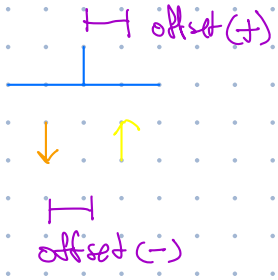
0 1 2 3 4 5 6 7



= Calibration measurment ADC

= Trigger points up / dn w/ smit trigger operation

* calculate levels, then apply offsets



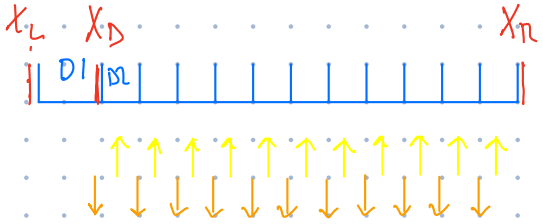
Throttle

$x_L = 360$ $D1 = 40$

$x_D = 400$

$x_R = 600$

0 1 2 3 4 5 6 7 8 9 10 11



$D1 = X_D - X_L$

$X_R - X_L = D1 + (D2 \cdot \text{Position})$ ← replaces

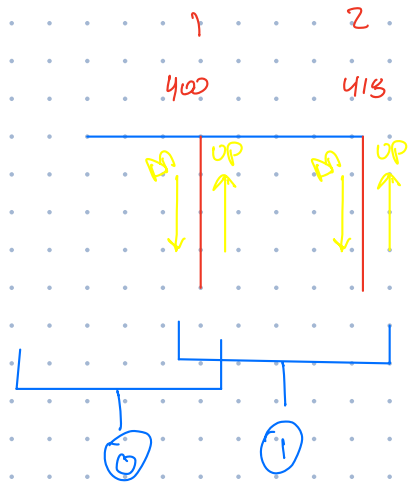
$(X_R - X_L) - D1 = D2 \cdot POS$

$\frac{(X_R - X_L) - D1}{POS} = D2$ 18.~

offset = overlap between up / Dn movement

up trigger $= X_L + D1 + ((D2 \cdot POS) - D2) + \text{offset}$ ← not req.

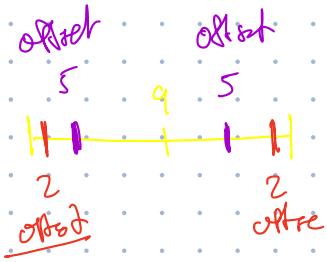
dn trigger $= X_L + D1 + ((D2 \cdot POS) - D2) - \text{offset}$



① up trigger UP
400 + 5

① up
$400 + ((1 \cdot 18) - 18) + 5$

① dn
$400 + ((1 \cdot 18) - 18) - 5$



M20 | 1 | 2 | TN | W | 01 | — | D | C

Poles

1	SPDT
2	DPDT SP3T
3	3PDT
4	4PDT DP3T

Mounting Frames

TN	.272" (6.9mm) Wide Flat Frame
TY	.504" (12.8mm) Wide Flat Frame

Circuits

2	ON	NONE	ON
3	ON	OFF	ON
5	ON	NONE	(ON)
8	(ON)	OFF	(ON)
9	ON	OFF	(ON)
*4	ON	ON	ON
*6	(ON)	ON	(ON)
*7	ON	ON	(ON)

( ) = Mom
*3-ON ci

Contact Materials & Ratings

W	Silver; Rated 6A @ 125V AC & 3A @ 250V AC
G	Gold; Rated 0.4VA max @ 28V AC/DC max
A	Gold over Silver; Rated 6A @ 125V AC & 0.4VA max @ 28V AC/DC max

Rockers & Paddles

Small Actuators (TN Frame)

D	.365" (9.27mm) Wide Rocker
E	.365" (9.27mm) Wide Paddle
F	.450" (11.43mm) Wide Rocker
G	.450" (11.43mm) Wide Paddle

Large Actuators (TY Frame)

J	.595" (15.11mm) Wide Rocker
H	.595" (15.11mm) Wide Paddle

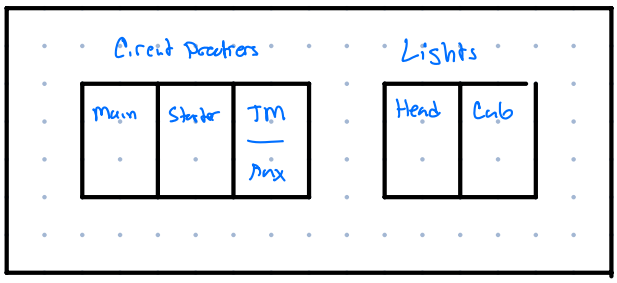
Terminals

01	Solder Lug

Rocker & Paddle Colors

A	Black

Mrockerc Done TY 15 of 28 Save...

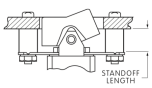


Series M

Flat Frame Mount Miniature Rockers

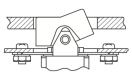
MOUNTING FRAMES (CONTINUED)

Face Panel Mounting



Flat frame devices may also be mounted to the face panel. Standoffs are used to recess the actuator and achieve an attractive front panel appearance.

Subpanel Mounting



These devices are especially designed for subpanel mounting. When installed on a mounting plate behind the panel, hardware is completely concealed and the front panel retains a clean, attractive appearance.

Optional Hardware Kits for Subpanel or Face Panel Mounting			
Frame	Panel Thickness	Standoff Length	Hardware Kit Number
TN Frame	.125" (3.175mm)	.233" (5.918mm)	ATHK-1
TY Frame	.125" (3.175mm)	.312" (7.925mm)	ATHK-2
Hardware kits include: 2 stainless steel screws, 2 hex nuts, 2 lockwashers, & 2 standoffs			

Optional Snap-in Panel Frames

AT064-1
AT064-2

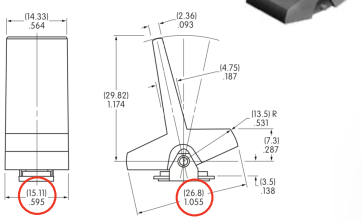
Further details are shown in the previous bracketed PC mount subsection.

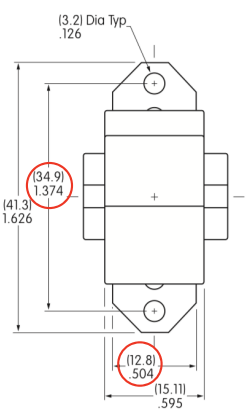
AT065-1
AT065-2

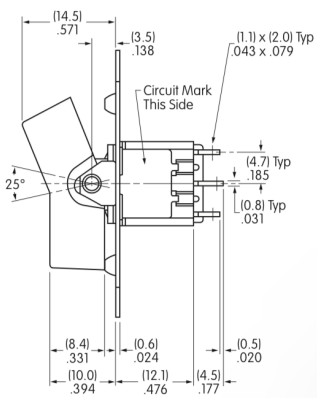
For TY Frame

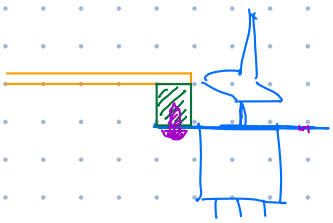
H **AT4157 .595" (15.11mm) Wide Paddle**

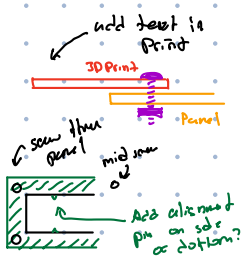
Material: Polyamide
Finish: Matte



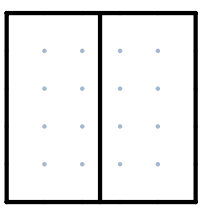






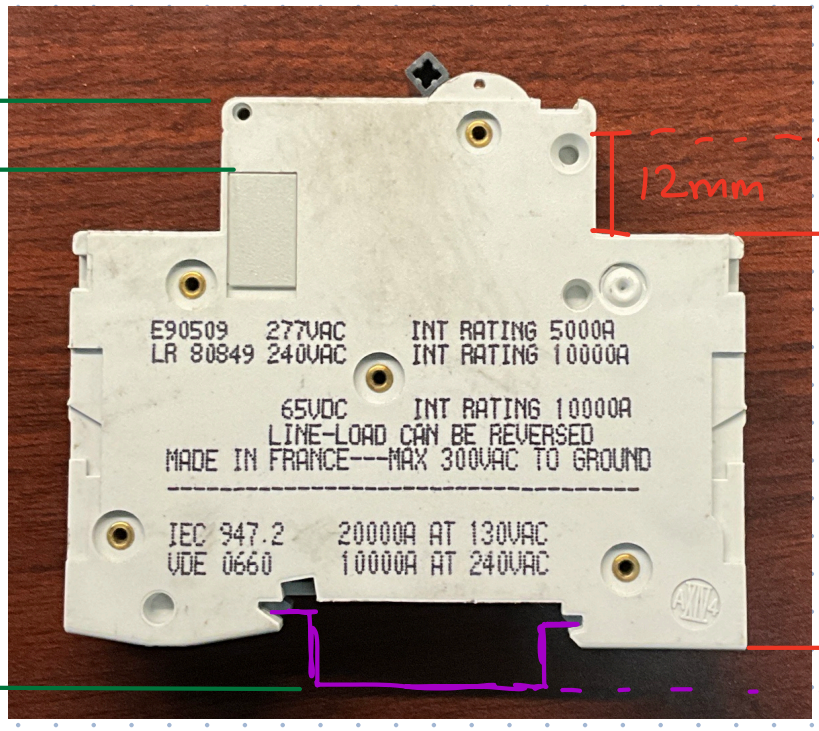


cutout ?



26.8mm 1.05"

16mm 0.63"

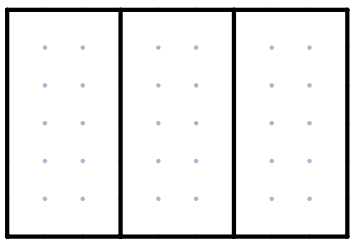


add 1/4" spacer

width = 18mm

|— 2.125" —|

18 18 18



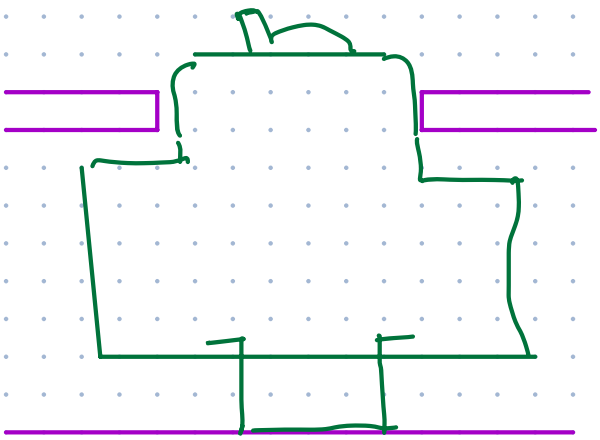
46

1.81

1/8"

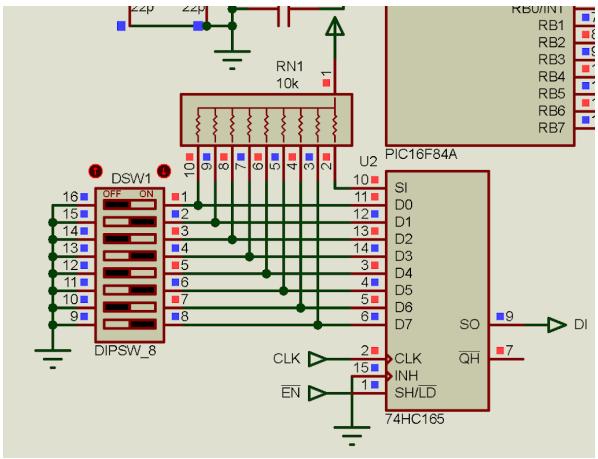
2 7/8

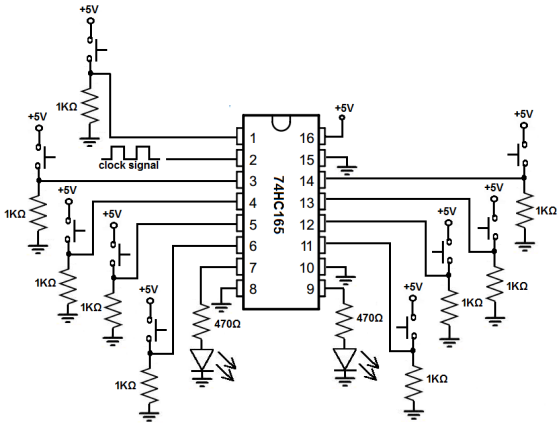
* add clearance

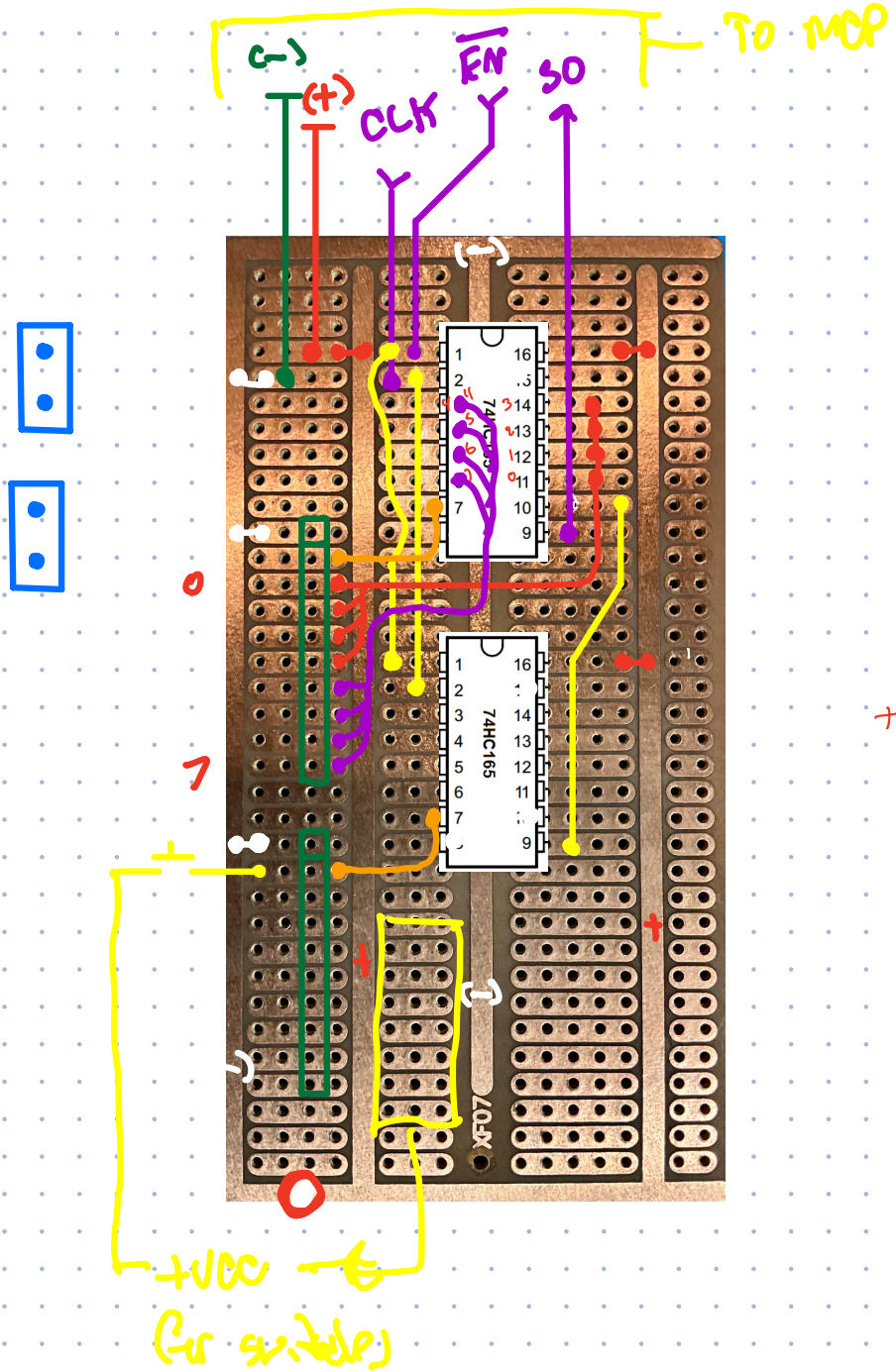


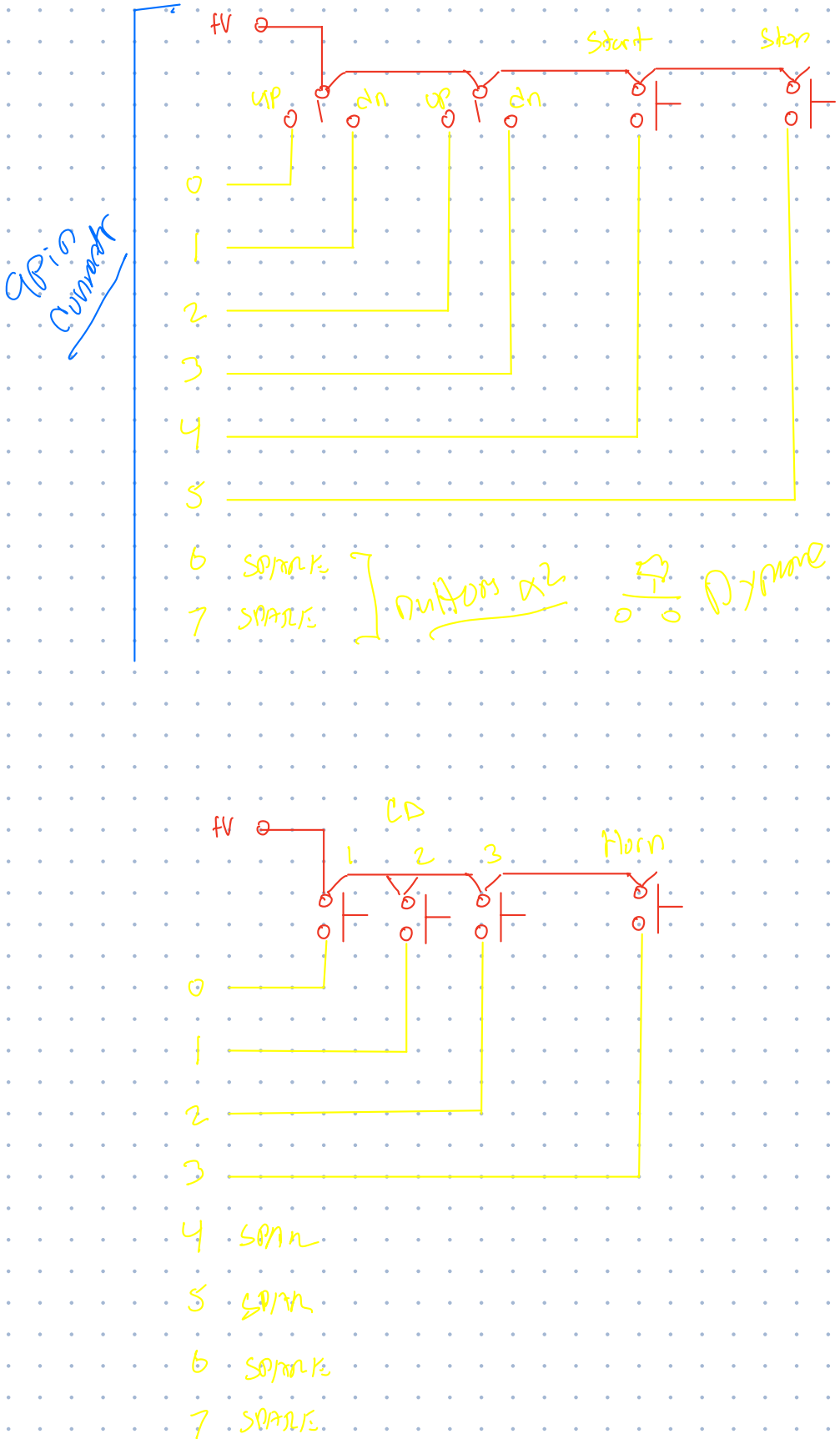
Code:

- Toggle for keyboard enable / Disable.
  - Define to debug keyboard w/ serial
- LED
- POT → ADC ✓
- 5 button R1/R2 module + 3 buttons
- Rotary encoder w/ button for settings w/
  - → Head Code
    - → Board config.
      - > set modes
      - > Blink LED to indicate mode
    - → Press will indicate current mode.
      - Press + hold will increment mode or double click


RN1
10k
PIC16F84A
RB0/INT
RB1
RB2
RB3
RB4
RB5
RB6
RB7
U2
DSW1
DIPSW_8
SI
D0
D1
D2
D3
D4
D5
D6
D7
SO
DI
CLK
INH
SH/LD
EN
QH
74HC165


+5V
1KΩ
clock signal
74HC595
470Ω


To MCP
(-)
(+)
CLK
EN
SO
74HC165
XFT07
+VCC



* add x2 Push buttons in upper panel

Start

I²C bus

0 Start
1 stop
2 up
3 dn
4 up
5 dn
6 SPARE
7 Horn

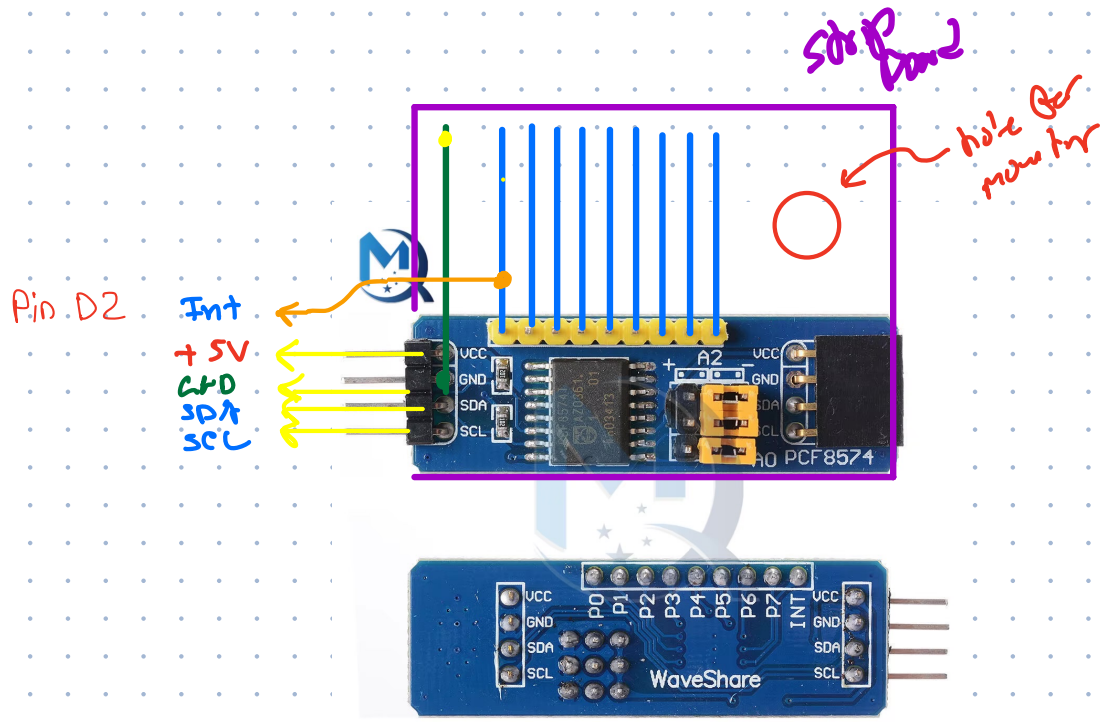
Voltage divider

CD1
CD2
GND

Ain ... V

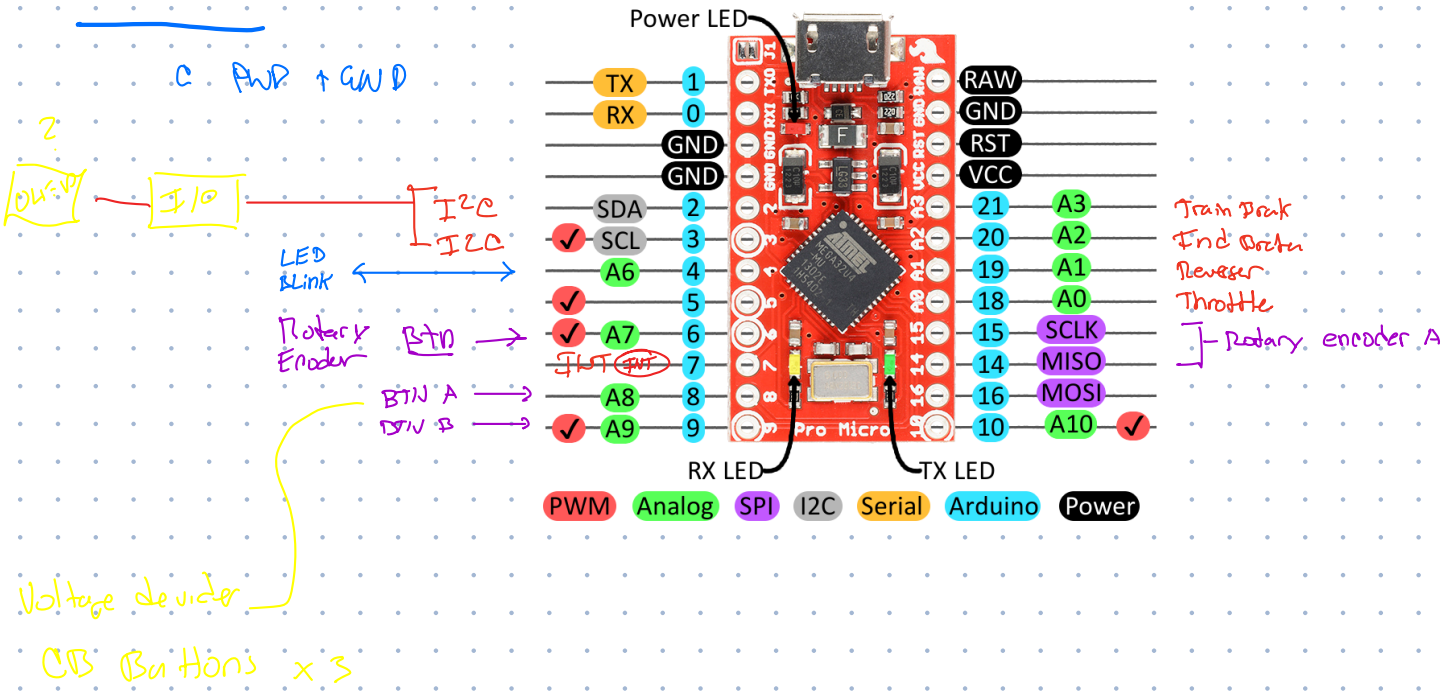
Stripboard

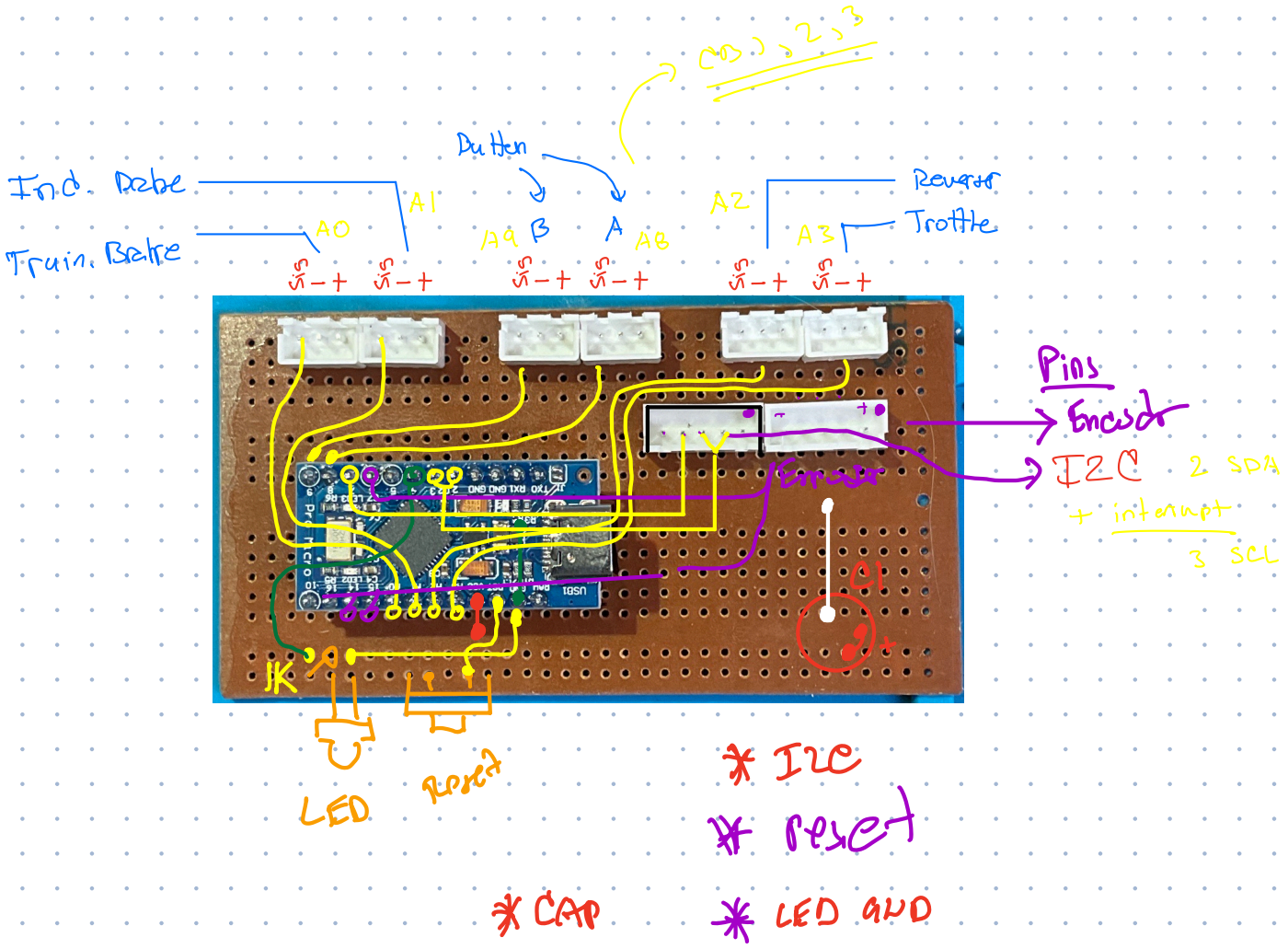
hole for mounting



Code Updates:

- Add Calibration Mode
  - Enable Raw ADC output for Levers and status of button presses
- Update LED Modes
  - Add Better indication of OFF position Long Pulse, and Cal rapid pulse
- Add new file for Levers
  - Add Variable to indicate detent ct
    - throttle(int detentCt)
    - TrnBrake(int detentCt)
    - Use detent Ct to select switch
      - need to calculate cal data for detent spacing in real time???? Or fixed variables
      - Remove delay in code and replace with Keyboard.write() for all steps
      - Replace hard coded keys with array to be global
      -
  - Add Train Brake Mode to Lapping type
- Add New file for Buttons
- Remove unused Flags and reorganize flags
-


Power LED
TX
RX
GND
GND
SDA
SCL
A6
A7
A8
A9
RAW
GND
RST
VCC
A3
A2
A1
A0
SCLK
MISO
MOSI
A10
Pro Micro
RX LED
TX LED
PWM
Analog
SPI
I2C
Serial
Arduino
Power
I2C
LED Blink
Rotary Encoder
BTN
BTN A
BTN B
Voltage devider
CB Buttons x3
Train Break
End Button
Reverser
Throttle
Rotary encoder A


End. Babe
Train. Brake
A0
A1
Button
A9
B
A
A8
A2
A3
Reverse
Trottle
Pins
Encoder
I2C
2 SDA
+ interrupt
3 SCL
LED
Reset
* I2C
* reset
* CAP
* LED GND