# Daughterboards V4

by David Viberg. Aug 6, 2020
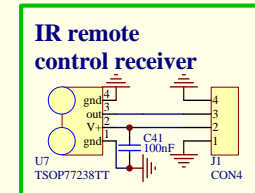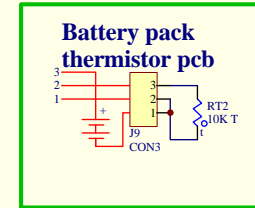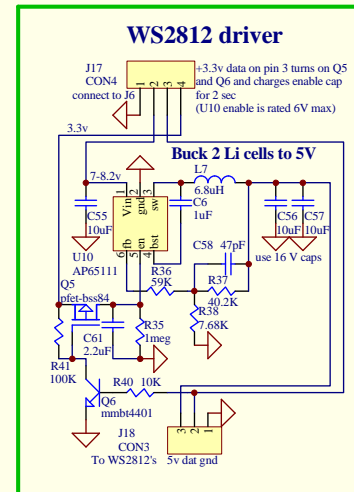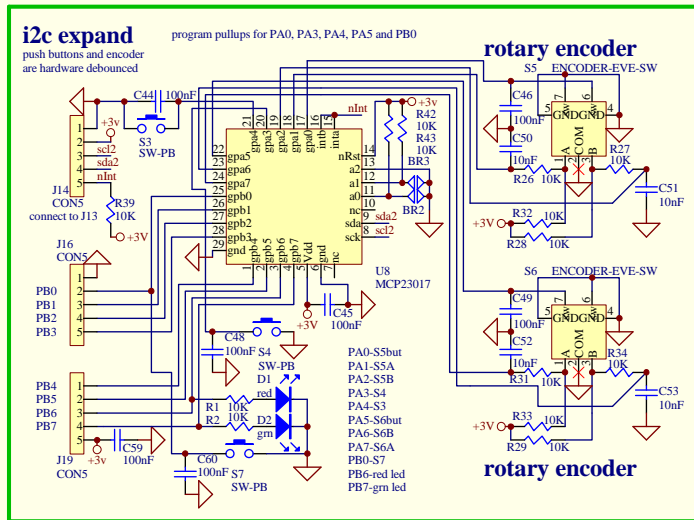MIT License
In collaboration with Chuck Rohs / Zethus Information Systems

### Same as V3 but with a different layout

V2 adds optional encoder and buttons (manual volume is important imho) and a board that bucks battery to 5V to drive WS2812 vu meter light show

V2 adds battery pack thermistor board for safety at 1-2A charge rates (also the charger generates enough heat that it affects a local thermistor)

## i2c expand

push buttons and encoder are hardware debounced

program pullups for PA0, PA3, PA4, PA5 and PB0

C44 100nF

+3v

S3 SW-PB

J14 CON5 connect to J13

R39 10K

+3V

J16 CON5

PB0
PB1
PB2
PB3

C48 100nF S4 SW-PB

D1 red

R1 10K
R2 10K

D2 grn

PB4
PB5
PB6
PB7

J19 CON5

+3v C59 100nF

C60 100nF S7 SW-PB

gpa4 21
gpa3 20
gpa2 19
gpa1 18
gpa0 17
inta 16
intb 15
nRst 14
a2 13
a1 12
a0 11
nc 10
sda 9
sck 8

gpa5 22
gpa6 23
gpa7 24
gpb0 25
gpb1 26
gpb2 27
gpb3 28
gnd 29

U8 MCP23017

nInt

R42 10K
R43 10K
BR3

+3v

sda2
scl2

BR2

+3V C45 100nF

PA0-S5but
PA1-S5A
PA2-S5B
PA3-S4
PA4-S3
PA5-S6but
PA6-S6B
PA7-S6A
PB0-S7
PB6-red led
PB7-grn led

## rotary encoder

S5 ENCODER-EVE-SW

C46 100nF

C50 10nF

GND GND
COM
A B

R26 10K

R27 10K

C51 10nF

R32 10K

+3V R28 10K

S6 ENCODER-EVE-SW

C49 100nF

C52 10nF

GND GND
COM
A B

R31 10K

R34 10K

C53 10nF

R33 10K

+3V R29 10K

## rotary encoder

## WS2812 driver

J17 CON4 connect to J6

+3.3v data on pin 3 turns on Q5 and Q6 and charges enable cap for 2 sec
(U10 enable is rated 6V max)

3.3v

### Buck 2 Li cells to 5V

7-8.2v

L7 6.8uH

C6 1uF

C56 10uF C57 10uF

use 16 V caps

Vin
gnd
sw
bst

C55 10uF

fb
en

R36 59K

C58 47pF

U10 AP65111

Q5 pfet-bss84

R35 1meg

R37 40.2K

R38 7.68K

R41 100K

C61 2.2uF

Q6 mmbt4401

R40 10K

J18 CON3 To WS2812's

5v dat gnd

## Battery pack thermistor pcb

RT2 10K T

J9 CON3

## IR remote control receiver

gnd
out
V+
gnd

U7 TSOP77238TT

C41 100nF

J1 CON4

3453 (mil)
2953 (mil)
2298 (mil)
1575 (mil)
2802 (mil)
1772 (mil)
1210 (mil)
649 (mil)
1039 (mil)
623 (mil)
1708 (mil)

J17 L7 C55
C6
U10
Q5
C61
D6 C56 R37 R35
C57 C58 R38

U7

therm
R12
J9

C53 R30 J14 J19
int gnd
R42 BR3 C59 C50
C44 R43 R27
R33 R29 C45
R32 U8
S3 Q20 C48 R22
C52 R31 S7 S40 gnd D2 D1
S6 C46

J17  L7  C55
C6
U10
Q5
C61
R35
R41
Q6
C56  R37  R36
R40  C57  C58  R38

U7
C41  U1

therm
RT2
J9

C53
R34  R29
C44
R33  R31
C52
C49  S6

int  J14  gnd
J19
C59
BR3  BR2
R42  R43  C50
R26R32R28  C45
R39  R1  R2  R27
C48  S4  D1
gnd  U8  D2
J16

C60  S7
S3

C51  C46
S5