Project Documentation

RhinoDevel: CBM Tape Pi

Project number: 182

Revision: 3

Date: 27.09.2021

CBM Tape Pi Rev. 3

Module Description

Introduction

This is the PCB hardware for RhinoDevel's CBM Tape Pi project. It is a slight enhancement of the schematic that can be found in his github repository http://github.com/RhinoDevel/

The PCB is suitable to hold a Raspberry Pi *A, *B and zero (three mounting holes on the baseboard).

The Reset button SW1 is connected to J5, a pin header/solder pad for being connected to the RUN connector (pin 1/square pad) on the Raspberry Pi. Since the position is not fix on every model, this can be accomplished with a cable/dupont connector. Alternatively, the Reset button connects to BCM4 (close solder bridge JP1).

The extras are the barrel connector J2 for a Raspberry Pi power supply (it can be used instead of the fragile USB micro-B connector on the Raspberry Pi itself). Alternatively, a pin header or KF2510/Molex kk 2.54 connector can be installed.

For future developments a rotary encoder and an I²C display (+3.3V supply voltage) can be installed. As of September 2021, both are not yet supported. Refer to RhinoDevel's repository.

Connectors

J1 – CBM Cassette Port

2x6 edge connector (3.96mm pitch)

Pin	Signal	Pin	Signal
1	GND	A	GND
2	n.c.	B	n.c.
3	n.c.	C	Motor
4	n.c.	D	Read
5	n.c.	E	Write
6	n.c.	F	Sense

n.c.: not connected

J2 – Raspberry Pi Power Supply

2.1/5.5mm barrel connector

Pin	Signal
inner	+5V
outer	GND

J3 – I²C Display

KF2510/Molex KK 2.54mm, 4 pins

Pin	Signal
1	+3.3V
2	GND
3	SCL
4	SDA

J4 – Rotary Encode

KF2510/Molex KK 2.54mm, 5 pins

The pin out is according to the wide spread rotary encoder module KY-040, which can be found on ebay, AliExpress and several online shops.

Pin	Signal
1	GND
2	+3.3V
3	Switch
4	Data
5	Clock

J5 – Reset Switch

Pin header, 1 pin

Pin	Signal
1	/RESET

To be connected to the RUN header on the Raspberry Pi.

J6 – Alternative Power Supply

KF2510/Molex KK 2.54mm, 2 pins

Pin	Signal
1	+5V
2	GND

M1 -Raspberry Pi Connector

A 2x20 Pin receptible, assembled on the solder side of the PCB.

Pin	GPIO	Signal	Comment
1	-	+3.3V	Supply voltage (output)
2	-	+5V	Supply voltage (input)
3	SDA	SDA (I²C)	I²C-Bus (display)
4	-	+5V	Supply voltage (input)
5	SCL	SCL (I²C)	I²C-Bus (display)
6	-	GND	Ground
7	4	BCM4	/Reset , Optional (close JP1)
8	-	n.c.	-
9	-	GND	Ground
10	-	n.c.	-
11	17	BCM17	Status LED (active HIGH)
12	18	n.c.	-
13	27	ROT_SW	Rotary Encoder Switch
14	-	GND	Ground
15	22	BCM22	Motor (input)
16	23	ROT_DATA	Rotary Encoder Data
17	-	+3.3V	Supply voltage (output)
18	24	ROT_CLK	Rotary Encoder Clock
19	10	BCM10	Read (output, active HIGH)

Pin	GPIO	Signal	Comment
20	-	GND	Ground
21	9	BCM9	Sense (ouput, inverted)
22	-	n.c.	-
23	11	BCM11	Write (input, active LOW)
24	-	n.c.	-
25	-	GND	Ground
26	-	n.c.	-
27	-	n.c.	-
28	-	n.c.	-
29	-	n.c.	-
30	-	GND	Ground
31	-	n.c.	-
32	-	n.c.	-
33	-	n.c.	-
34	-	GND	Ground
35	-	n.c.	-
36	-	n.c.	-
37	-	n.c.	-
38	-	n.c.	-
39	-	GND	Ground
40	-	n.c.	-

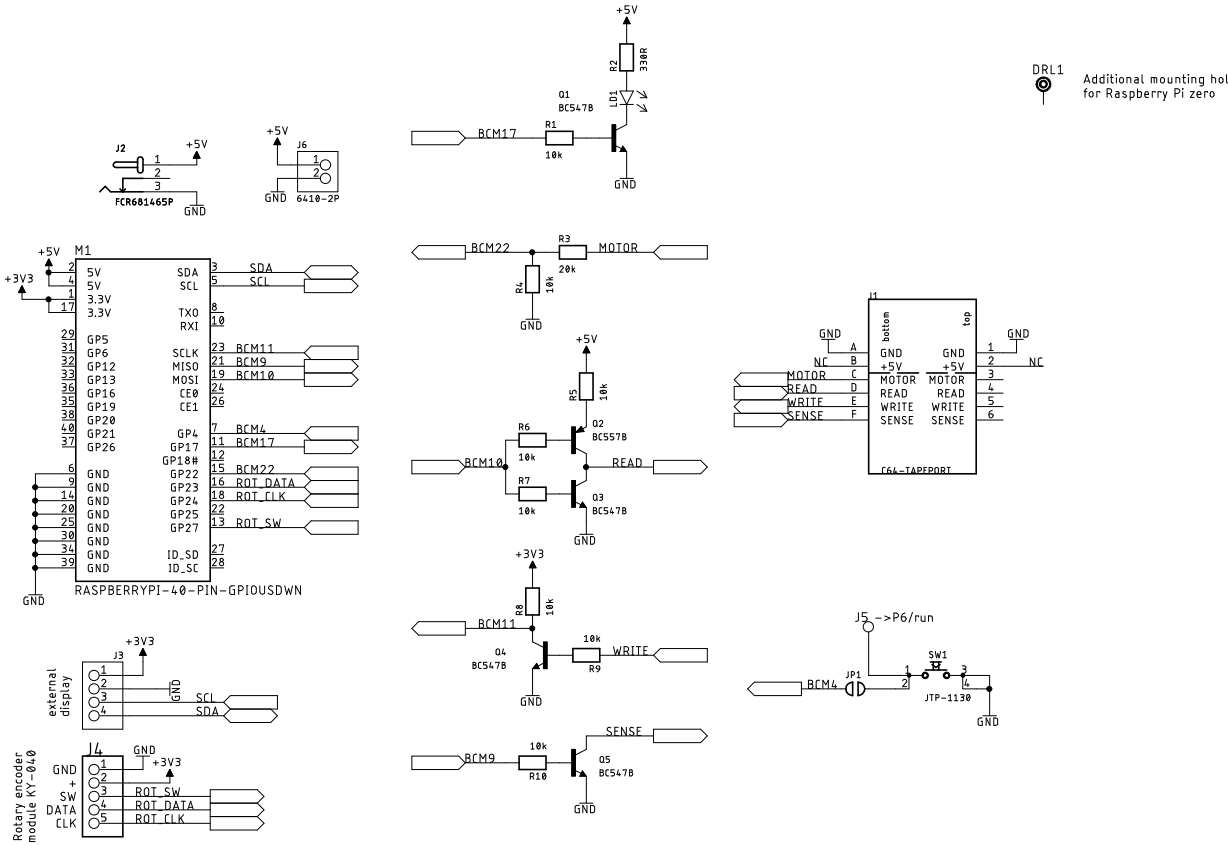
Revision History

Rev. 2

- Prototype with one botch wire

Rev. 3

- Botch wire for BCM11 fixed
- The Raspberry Pi has been moved 4mm away from the edge connector (collision on a VIC-20)
- One mounting hole for Raspberry Pi zero added
- J6 added



open source hardware

Title:	CBM Tape Pi	Doc.-No.:	182-1-01-03
	Marcel Timm	Draft.:	Sven Petersen
Date:	27.09.2021 11:29	Rev.: 3	Page 1/1
File:	CBM_TAPE_PI		
	http://github.com/RhinoDevel/		A3

Marcel Timm	Doc.-No.: 182-2-01-03	
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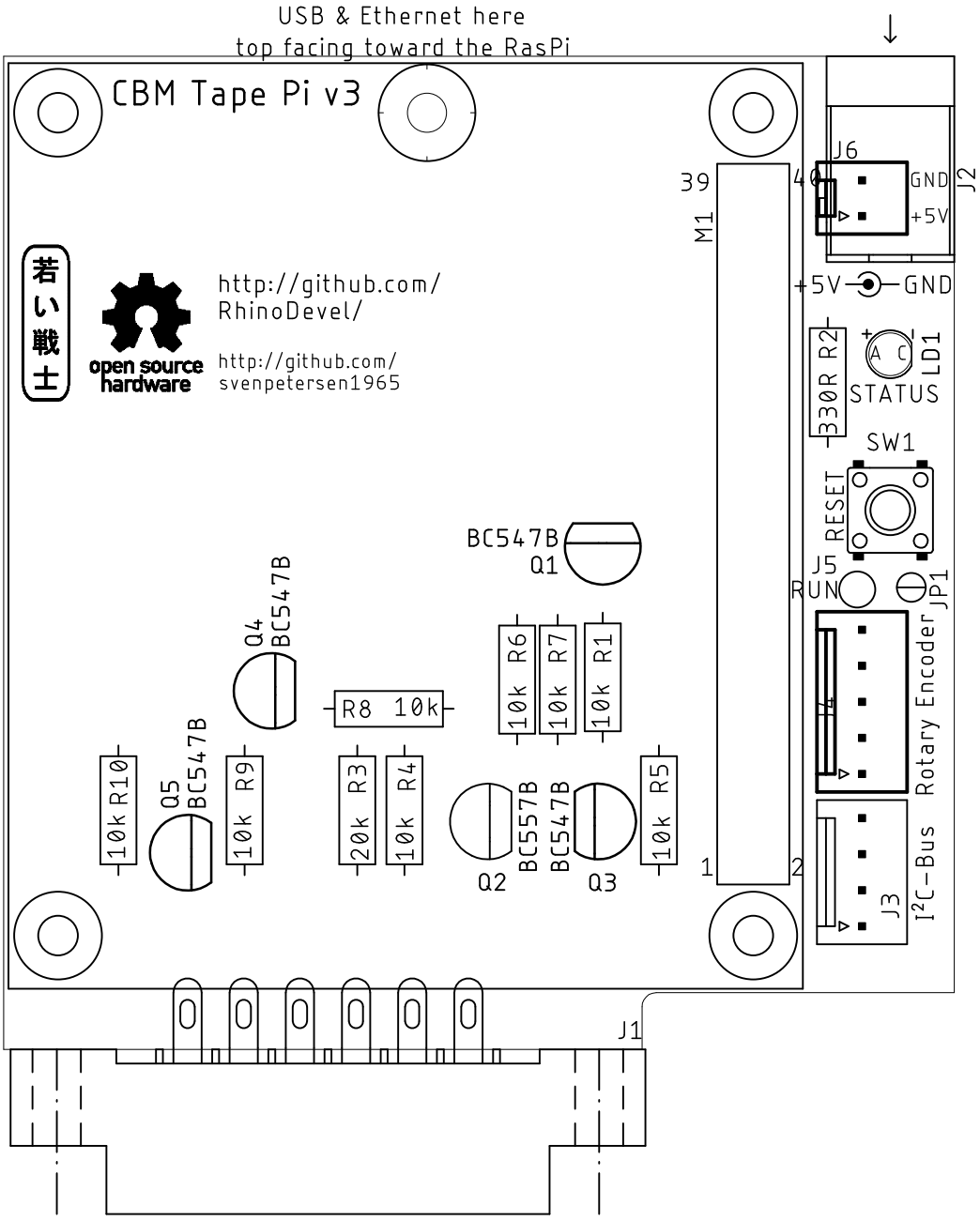
CBM_TAPE_PI		
27.09.2021 11:25		Rev.: 3
placement component side		



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27.09.2021 11:25		Rev.: 3
placement solder side		

Marcel Timm	Doc.-No.: 182-2-01-03	
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27.09.2021 11:25		Rev.: 3
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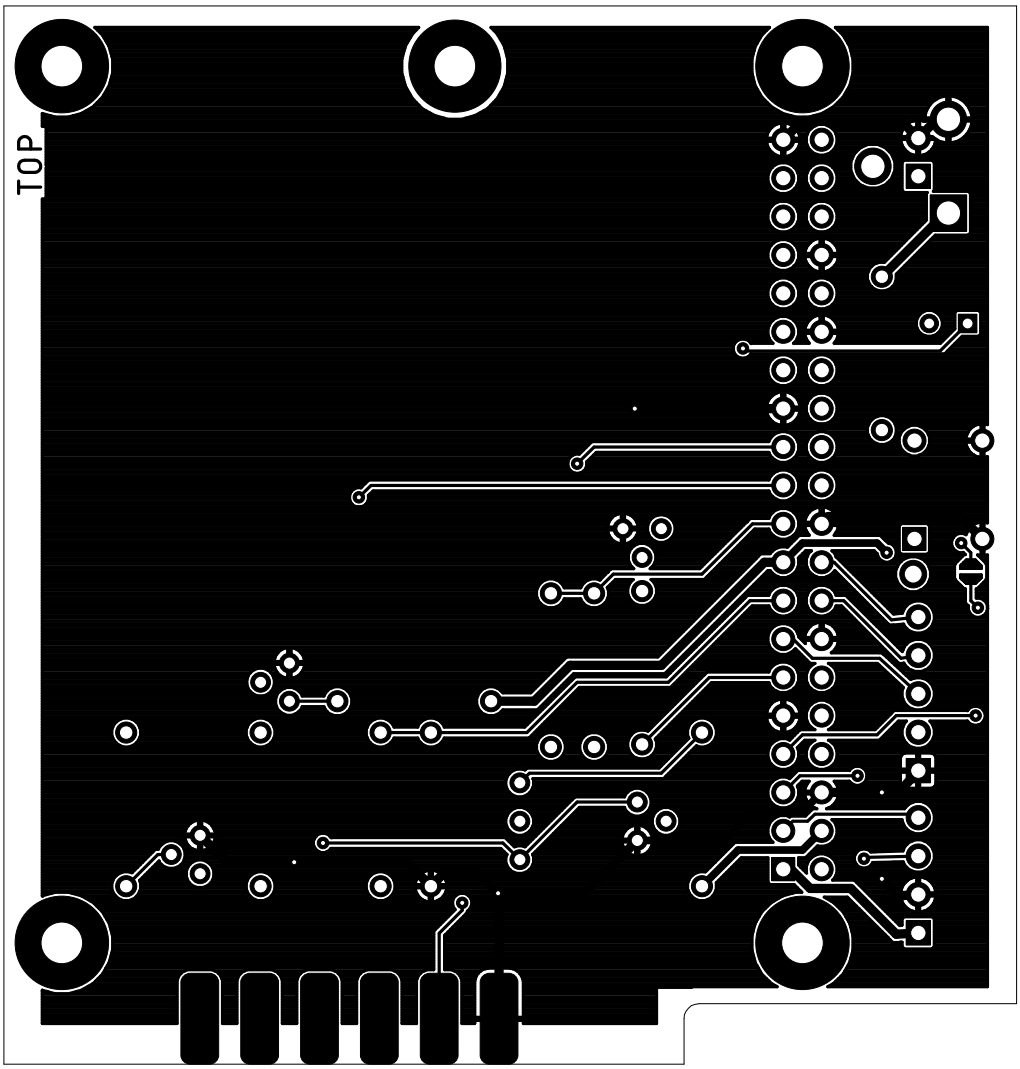

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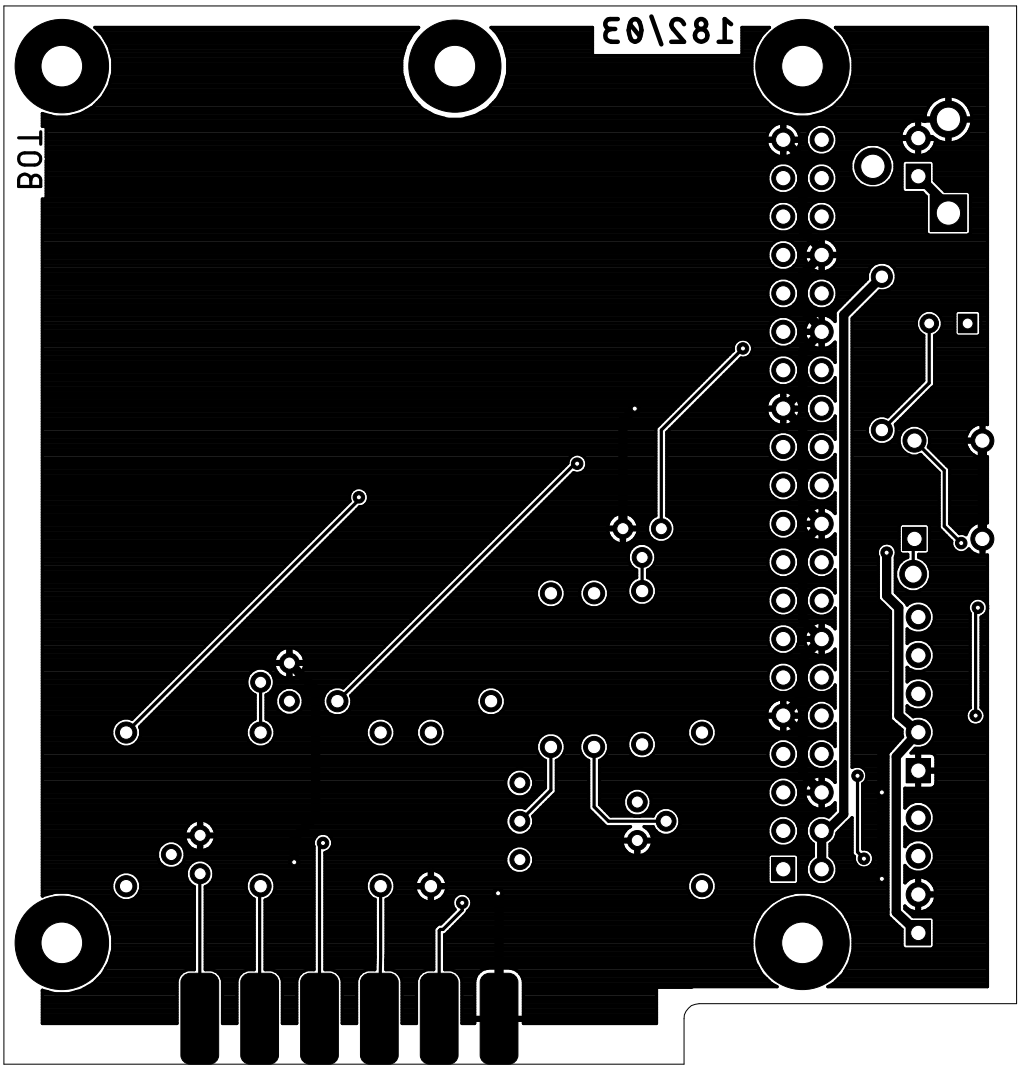
27.09.2021 11:25		Rev.: 3
bottom		



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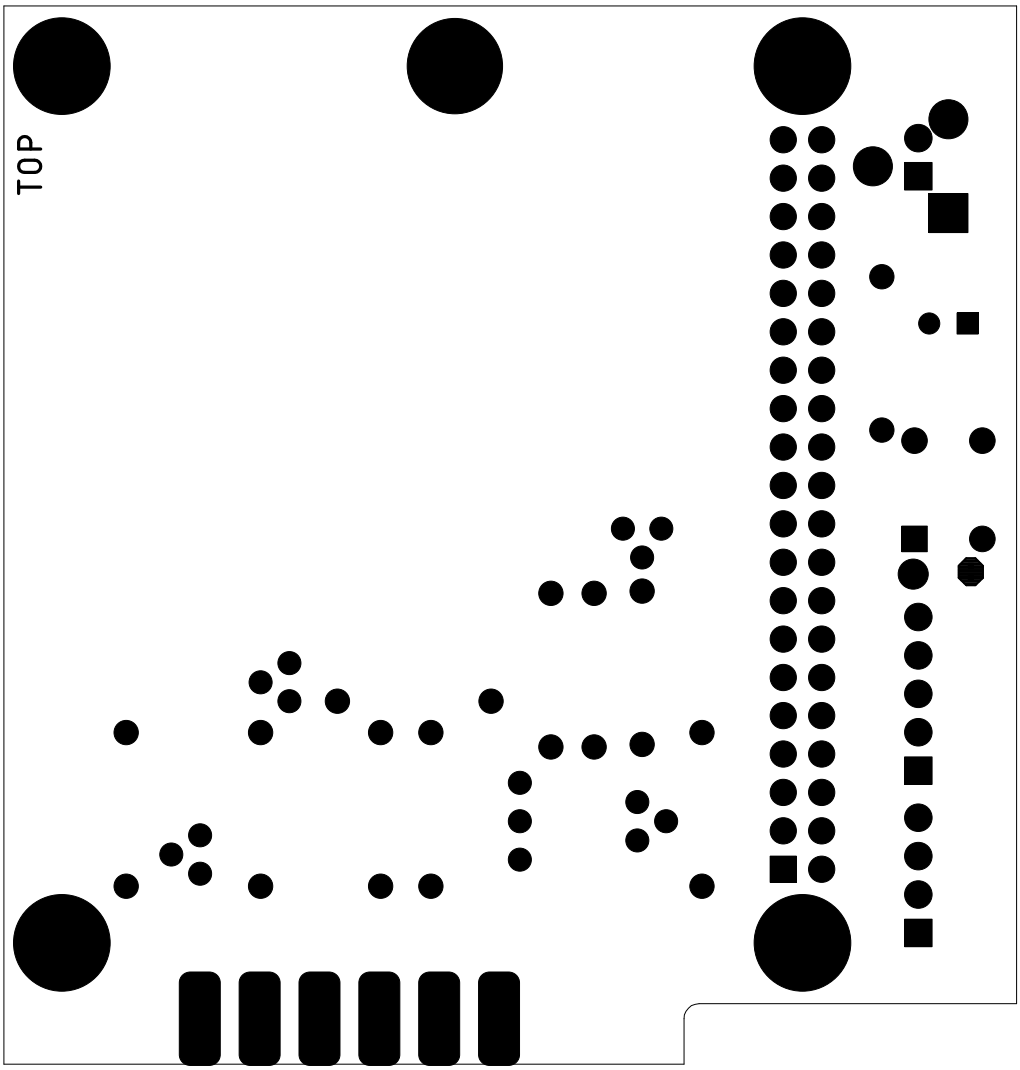
27.09.2021 11:25		Rev.: 3
stopmask component side		



Marcel Timm 2021	Doc.-No.: 182-2-01-03	
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27.09.2021 11:25		Rev.: 3
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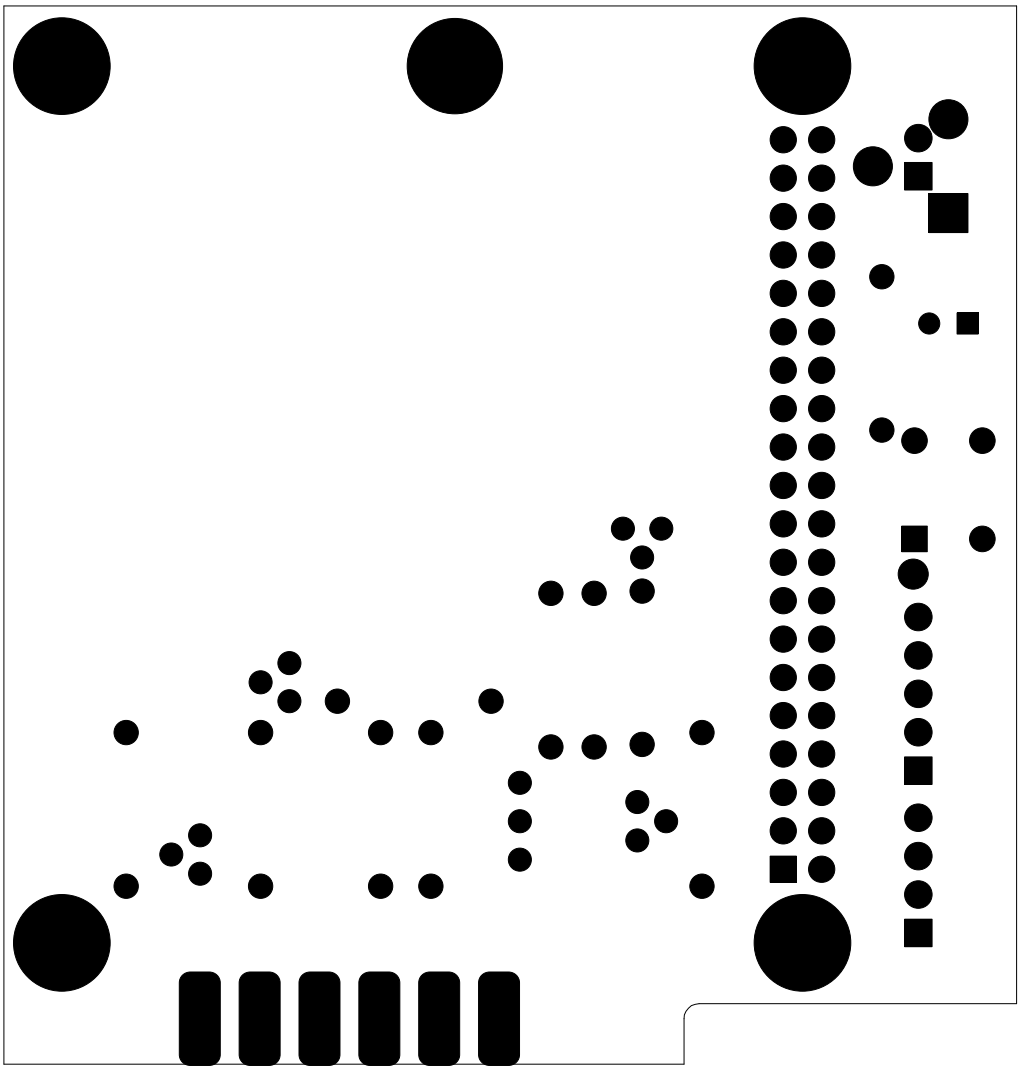

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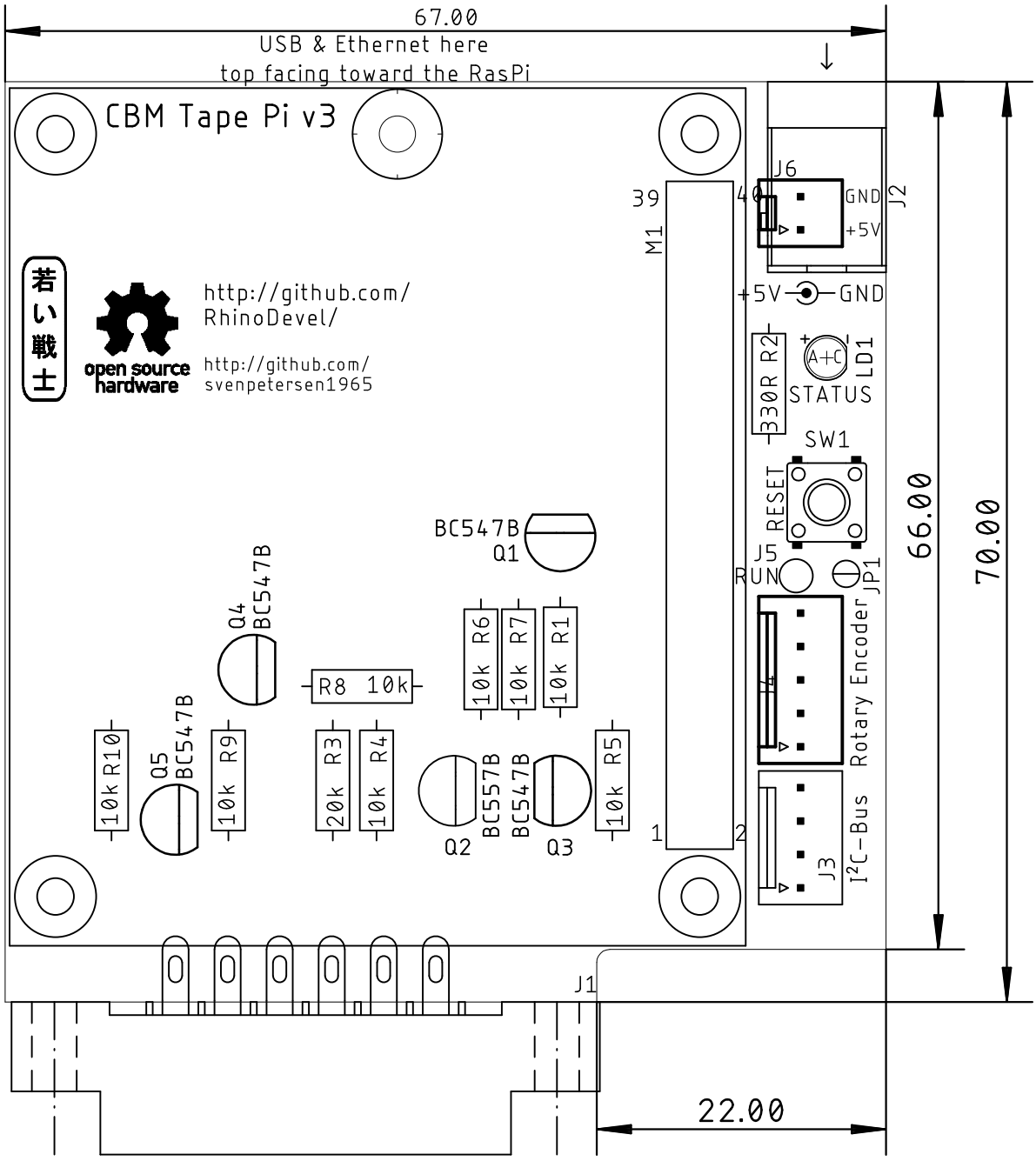
27.09.2021 11:25		Rev.: 3
placement component side measures		



RhinoDevel: CBM Tape Pi Rev. 3
Bill of Material Rev. 3.0

Pos.	Qty	Value	Footprint	Ref.-No.	Comment
1	1	182-2-01-03	2 Layer	PCB Rev. 3	2 layer, Cu 35µ, HASL, 70.0mm x 67.0mm, 1.6mm FR4
2	1	3mm/green	3MM	LD1	standard 3mm LED
3	1	KF2510/4p header	6410-4P	J3	option: KF2510 or MOLEX 6410/22-27-2041
4	1	KF2510/5p header	6410-5P	J4	option: KF2510 or MOLEX 6410/22-27-2051
5	8	10k	R-10	R1, R4, R5, R6, R7, R8, R9, R10	metal film resistor, 10% or better
6	1	20k	R-10	R3	metal film resistor, 10% or better
7	1	330R	R-10	R2	metal film resistor, 10% or better
8	1	KF2510/2p header	6410-2P	J6	option: KF2510 or MOLEX 6410/22-27-2021
9	4	BC547B	TO92	Q1, Q3, Q4, Q5	NPN Transistor
10	1	BC557B	TO92-EBC	Q2	PNP Transistror
11	1	2x6, pitch 3.96mm	TAPEPORT	J1	edge connector (e.g. 805 type), C64 cassette port
12	1	FCR681465P	FCR681465P	J2	Cliff, Reichelt: CLIFF FCR681465P, tme.eu: FCR681465P
13	1	JTP-1130	JTP-1130	SW1	6mm x 6mm tact switch, e.g. Namae Electronics, e.g. Reichelt TASTER 9303
14	1	1 pin header	1,2MM_R	J5	1 pin header (for dupont wire)
15	1	RASPBERRYPI	PI_HAT_40P_UP SIDEDOWN	M1	Raspberry Pi zero or other
16	1	MPE 094-2-040		(M1)	MPE, e.g. Reichelt MPE 094-2-040