Project Documentation

Commodore VIC-20 Diagnostic User Port PCB

Project number: 155

Revision: 0

Date: 15.09.2020

Commodore VIC-20 Diagnostic User Port PCB Rev. 0

Module Description

The VIC-20 Diagnostics User Port PCB provides most of the required feedbacks for the Commodore Diagnostic Software. Those are the feedbacks for the User Port, the IEC (serial) bus and the Cassette Port. Only the keyboard feedbacks are realized on the Diagnostic Keyboard PCB.

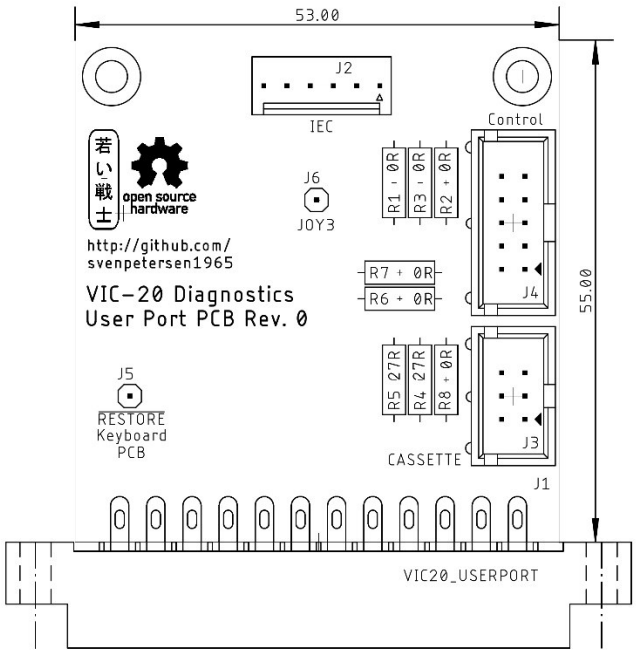


Figure 1: Dimensions of the User Port PCB

Connectors

User Port

J1- Edge Connector (2x12, 3.96mm pitch)

Pin	Signal	Pin	Signal
1	GND	A	GND
2	+5V	B	CB1
3	/RESET	C	PB0
4	JOY0	D	PB1
5	JOY1	E	PB2
6	JOY2	F	PB3
7	LIGHTPEN	H	PB4
8	CASSSW	J	PB5
9	ATN	K	PB6
10	9VAC(1)	L	PB7
11	9VAC(2)	M	CB2
12	GND	N	GND

IEC-Bus

J2 – KF2510, 6pin (compatible to Molex KK 254 series, 6p. - P/N 22272061)

Pin	Signal	DIN 6
1	SQR IN	1
2	GND	2
3	ATN	3
4	CLK	4
5	DATA	5
6	n.c	-

Cassette Port

J3 – 2x3 pin header for a ribbon cable connected to the cassette port PCB (project number 114, from the C64 Diagnostic Harness).

Pin	Signal	Pin	Signal
1	GND	2	n.c.
3	MOTOR	4	READ
5	WRITE	6	SENSE

Control Port

J4 – 2x5 pin header for a ribbon cable which connects via a D-SUB 9 (female) to the control port.

Pin	D-SUB	Signal	Pin	D-SUB	Signal
1	1	JOY0 (up)	2	6	LIGHTPEN
3	2	JOY1 (down)	4	7	+5VCTR1
5	3	JOY2 (left)	6	8	n.c. (GND)
7	4	JOY3 (right)	8	9	POTX
9	5	POTY	10	-	n.c.

Feedbacks

User Port (J1)

Pin	Signal		Signal	Pin
B	CB1	↔	IEC-Data	See J2
C	PB0	↔	PB1	D
E	PB2	↔	PB3	F
H	PB4	↔	PB5	J
K	PB6	↔	PB7	L
M	CB2	↔	IEC-Clk	See J2
9	ATN	↔	KB $\overline{\text{RESTORE}}$	See J5

IEC-Bus (J2)

Pin	Signal		Signal	Pin
1	SQR_IN	↔	*ATN*	3
4	IEC-Data	↔	CB1 (User Port)	See J1
5	IEC-Clk	↔	CB2 (User Port)	See J1

Cassette Port (J3)

Pin	Signal		Signal	Pin
1	GND		n/c	2
3	MOTOR	Volt.div.	SENSE	6
4	READ	↔	WRITE	5

Control Port (J4)

DSub	J4 Pin	Signal		Signal	J4 Pin	DSub
1	1	JOY0	↔	JOY1	3	2
6	2	LIGHTPEN/FIRE	↔	JOY2	5	3
9	8	POTX	↔	+5V (Control Port)	4	7
5	9	POTY	↔	+5V (Control Port)	4	7

The JOY3 signal is not tested by the original harness. It is connected to the solder pad J6 for experimental purposes.

Note

There are a couple of 0Ω resistors on the PCB. They are for leaving the option of inserting a resistor with an impedance >0Ω, in case it might be required in the future. They can be replaced with wire bridges.

3D-printed Case

A 3D-printed case for the User Port PCB is available from this repository. The recommended screws are C2.9 x 9.5mm.

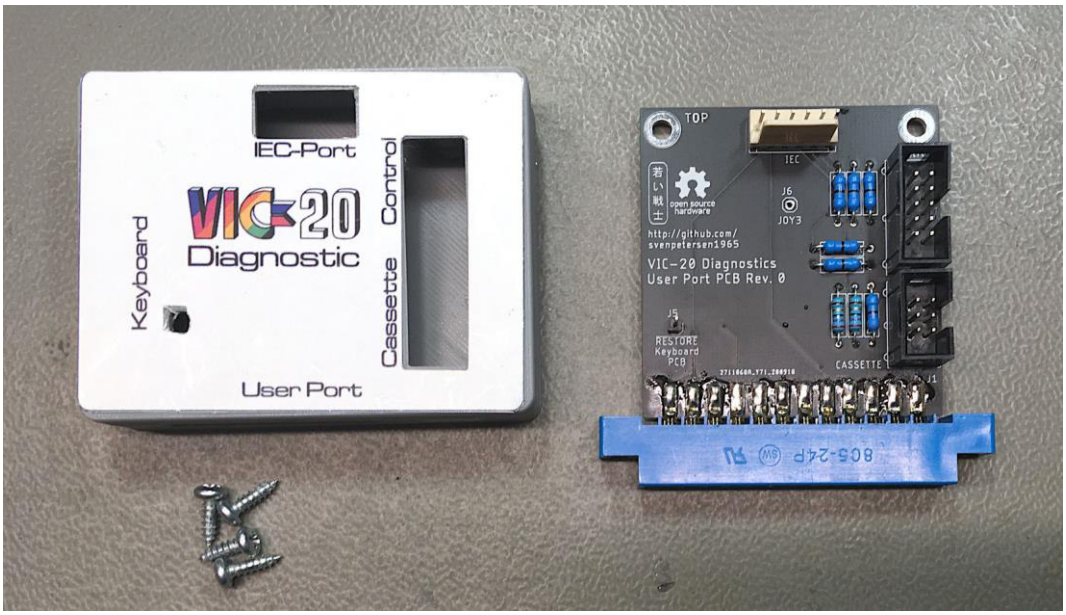
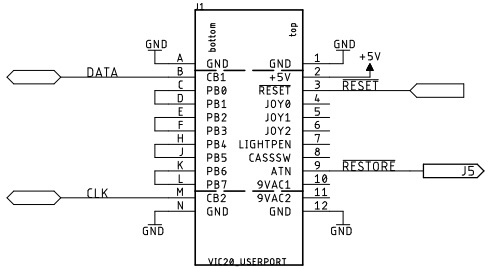
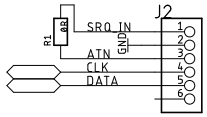
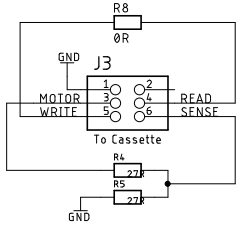


Figure 2: User Port PCB with 3D-printed case

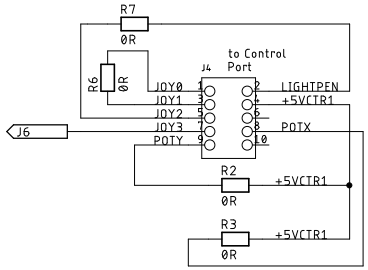




IEC-Bus



Cassette PCB

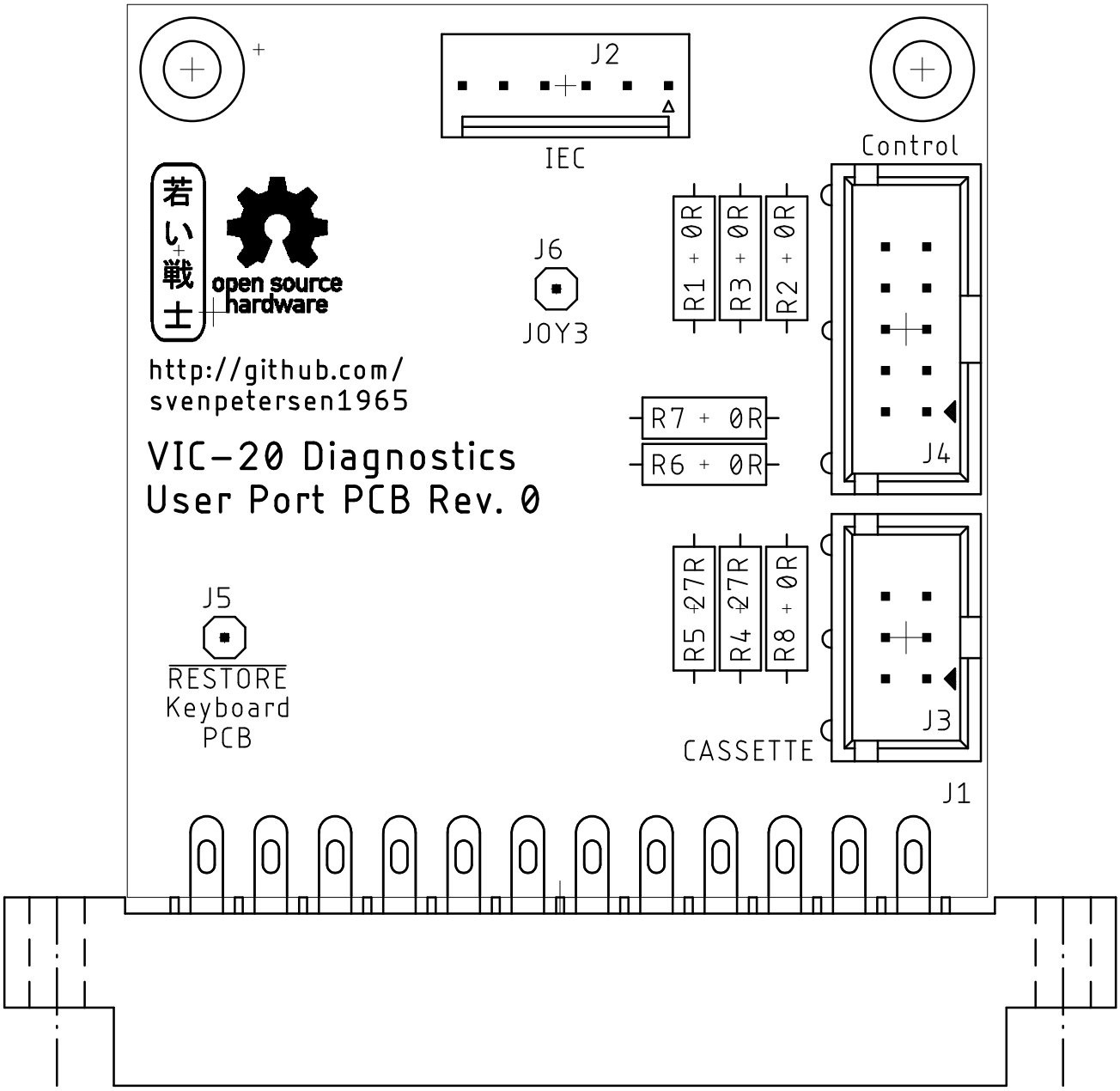


Control Port

open source hardware

Title:	VIC-20 Diagnostic Harness Userport PCB	Doc.-No.:	155-1-01-00
		Draft.:	Sven Petersen
Date:	17.09.2020 16:29	Rev.: 0	Page 1/1
File:	VIC20_Diag_UP		
	http://github.com/svenpetersen1965		A3

Sven Petersen 2020	Doc.-No.: 154-2-01-00	
	Cu: 35µm	Cu-Layers: 2
VIC20_Diag_UP		
17.09.2020 16:32		Rev.: 0
placement component side		



Sven Petersen 2020	Doc.-No.: 154-2-01-00	
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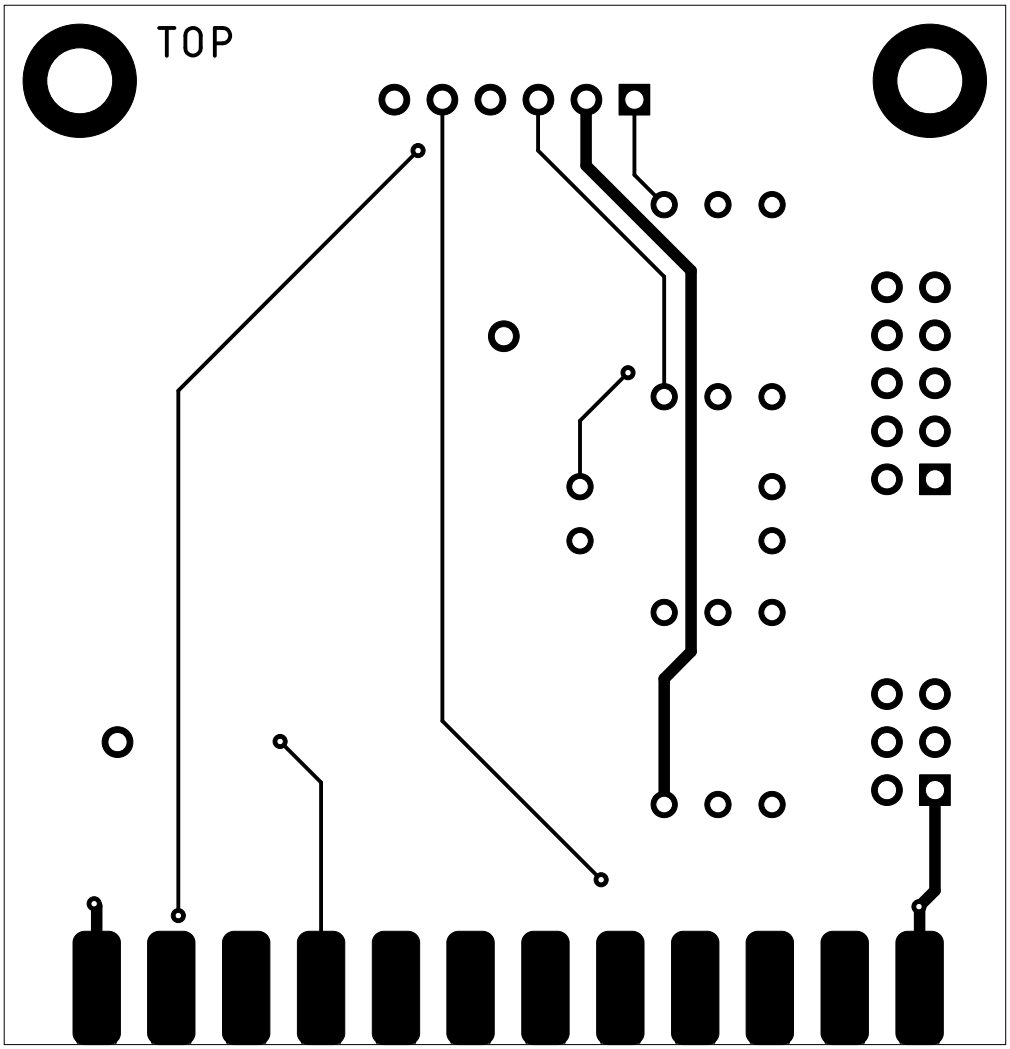
VIC20_Diag_UP		
17.09.2020 16:32		Rev.: 0
top		



Sven Petersen 2020	Doc.-No.: 154-2-01-00	
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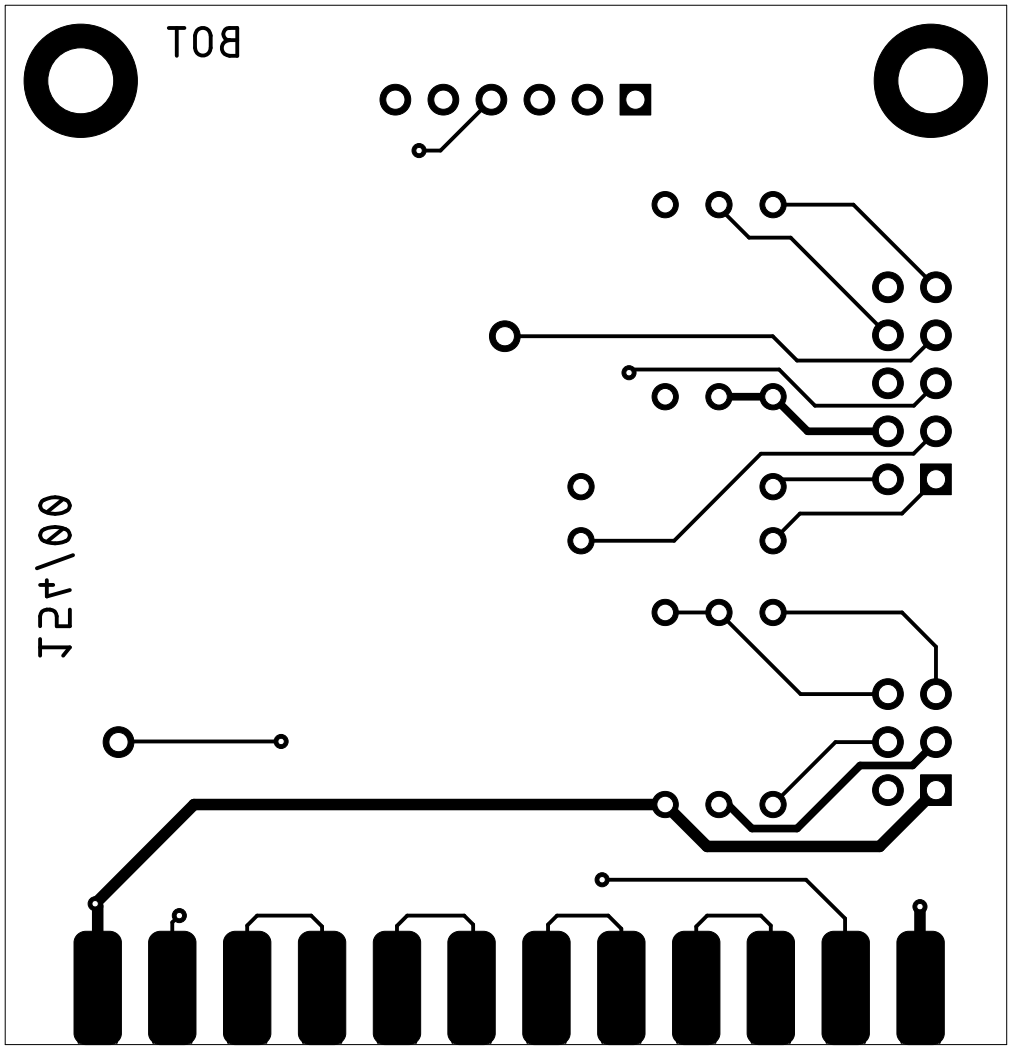
VIC20_Diag_UP		
17.09.2020 16:32		Rev.: 0
bottom		



Sven Petersen 2020	Doc.-No.: 154-2-01-00	
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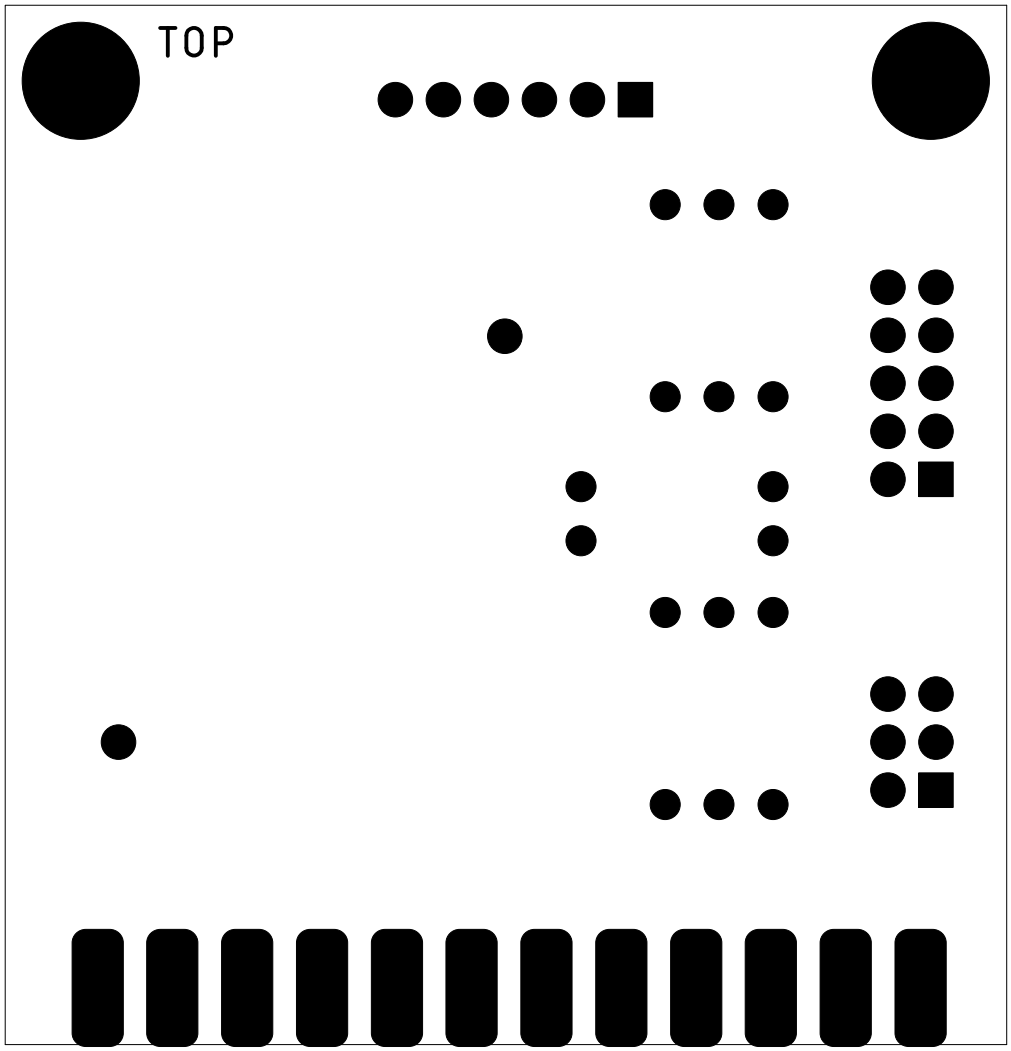
VIC20_Diag_UP		
nicht gespeichert!		Rev.: 0
stopmask component side		



Sven Petersen 2020	Doc.-No.: 154-2-01-00	
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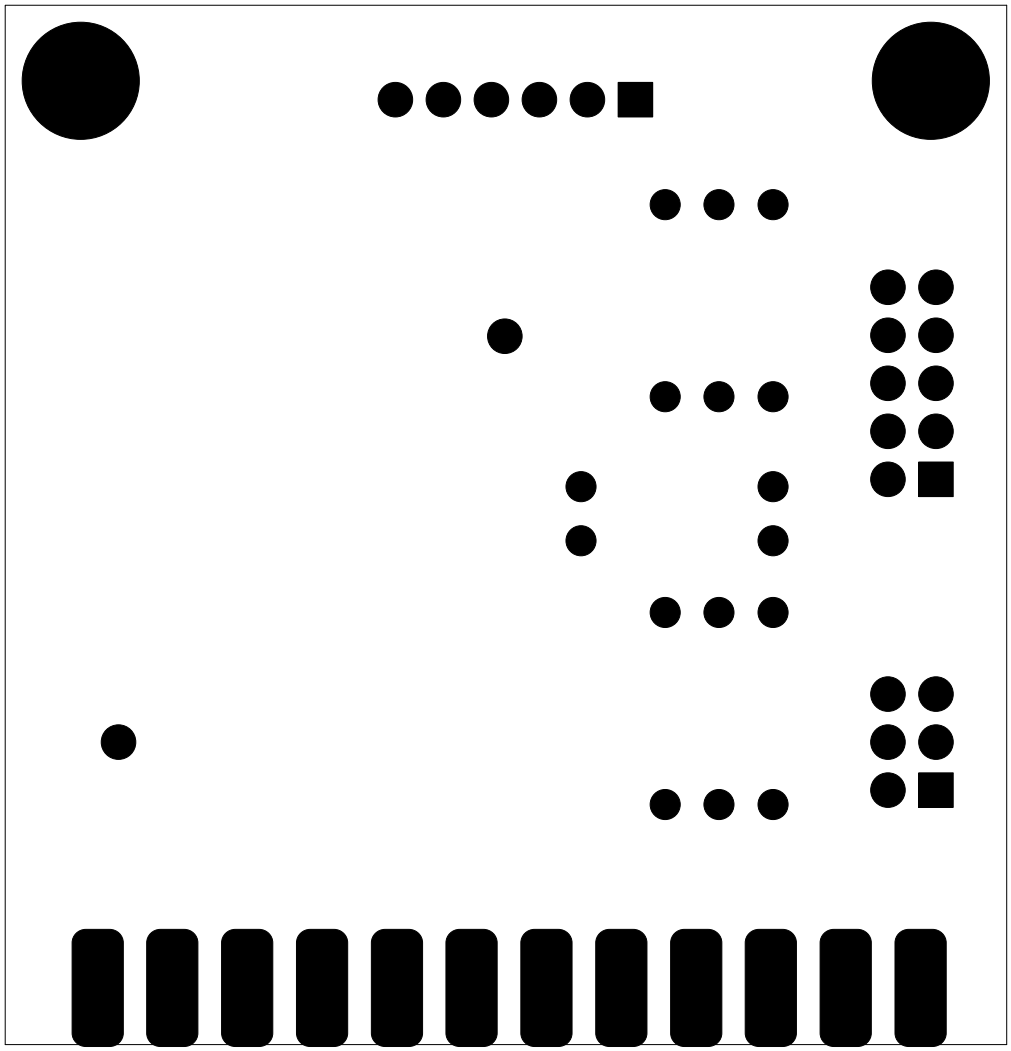
VIC20_Diag_UP		
nicht gespeichert!		Rev.: 0
stopmask solder side		



Sven Petersen 2020	Doc.-No.: 154-2-01-00	
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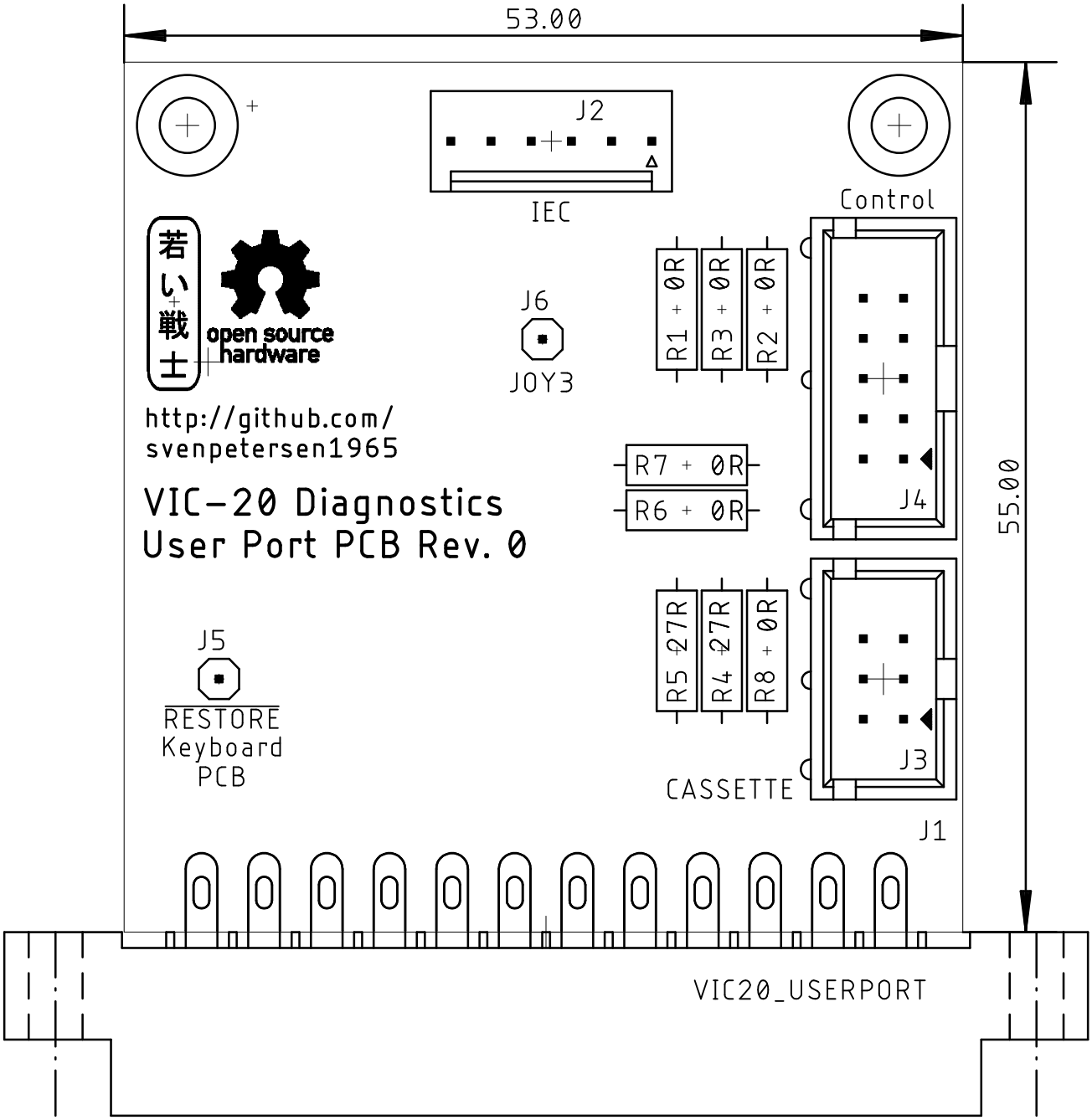
17.09.2020 16:32		Rev.: 0
placement component side measures		



VIC-20 Diagnostic User Port PCB Rev. 0
Bill of Material Rev. 0.0

Pos.	Qty	Value	Footprint	Ref.-No.	Comment
1	1	155-2-01-00	2 Layer	PCB Rev. 0	2 layer, Cu 35µ, HASL, 55.0mm x 53.0mm, 1.6mm FR4
2	1	2x3 box connector	2X03WV	J3	e.g. Reichelt WSL 6G
3	1	2x5 box connector	2X05WV	J4	e.g. Reichelt WSL 10G
4	1	KF2510-6P	6410-6P	J2	Reichelt (RND 205-00675), AliExpress or Molex 6410/22-27-2061 (Reichelt MOLEX 22272061)
5	1	Pin header, 1 pin	1X01	J5	Pin Header, e.g. Reichelt RND 205-00622
6	0	do not place	1X01	J6	do not place
7	6	0R	R-10	R1, R2, R3, R6, R7, R8	0 Ohm resistor, alternative: wire bridge
8	2	27R	R-10	R4, R5	Metal film resistor, 1/2 W, 5% or better
9	1	2x12, 3.96mm pitch	USERPORT	J1	edge connector, VIC-20 user port