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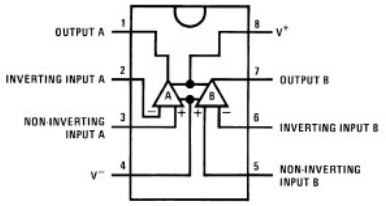
Manual for the Tap Tremolo Rev. 2.0
Based on TAPLFO from Tom Wiltshire (www.electricdruid.com)

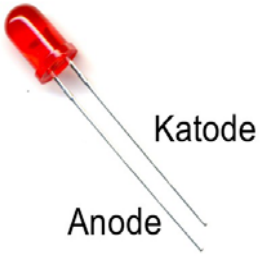
Basics of components

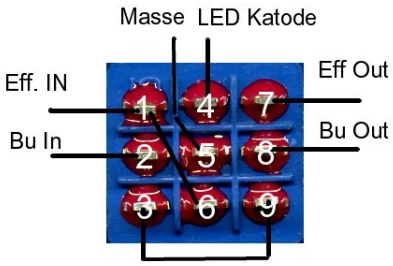


TL072

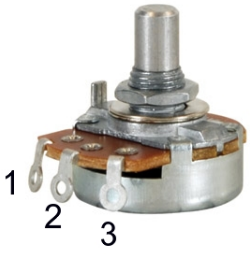
BC 549

Leuchtdiode (LED)

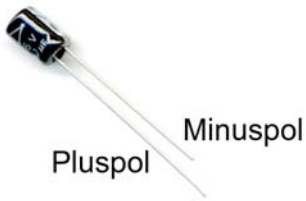


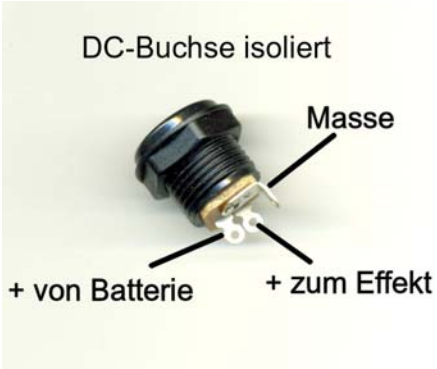


Standard Potentiometer

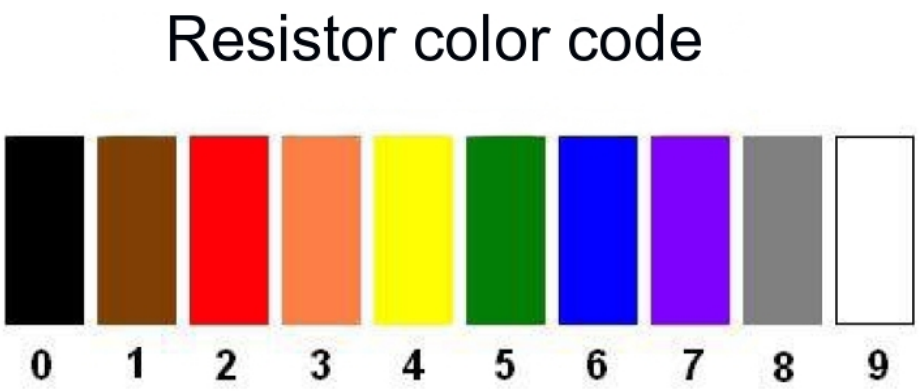


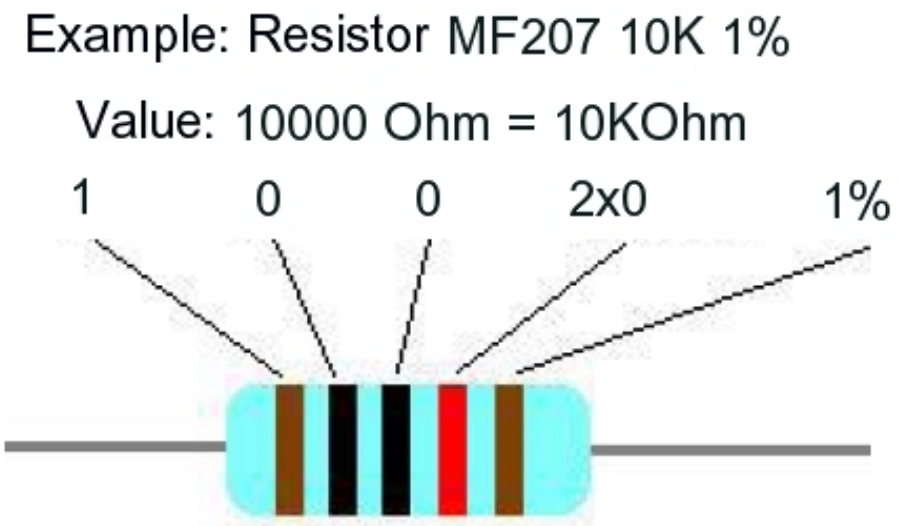
Elektrolytkondensator



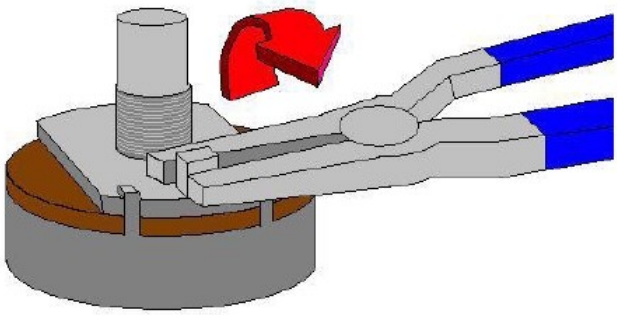


Color table for resistors MF207 FTE52 1% and a example





Breaking nose at the potentiometer
Nase am Poti mit einer Flachzange abbrechen



Short Circuit description

The TAP LFO Circuit makes 8 Waveforms fort he modulation, which are adjusted with the control waveform.

1. Ramp up
2. Ramp down
3. Pulse (rectangle)
4. Triangle
5. Sine
6. Hypertriangle (the top is a triangle, the bottom a sine)
7. Inverted hypertriangle (the top is a sine, the bottom a triangle)
8. Random steps

Function of the pot:
Depth: Deep of the modulation
Tempo: Frequency of the modulation frequency approx. (0.025Hz bis 50Hz)
Mutipler: once you tap in a tempo using the tap switch, the multipler pot selects what division of time is used for trem. For example, you can tap on a quarter notes, then use the multipler pot to change the speed of the tremolo from half notes, quarter notes, triplet nortes, eight notes, triplet eighth notes, or sixteenth notes. Using the sixteenth note multipler allows you to get much faster speeds than it's possible to tap, while still allowing tap tempo control.

Multiplier	Musical symbol	Note name
0.5		1/2 note, minim
1		1/4 note, crotchet
1.5		Triplet 1/4 note, triplet crotchet
2		1/8th note, quaver
3		Triplet 1/8th note, triplet quaver
4		1/16th note, semiquaver

Wavedistortion: distort each waveform. Setting to center gives the standard waveform. Left or right change the pulse with (on-to-off-ratio).

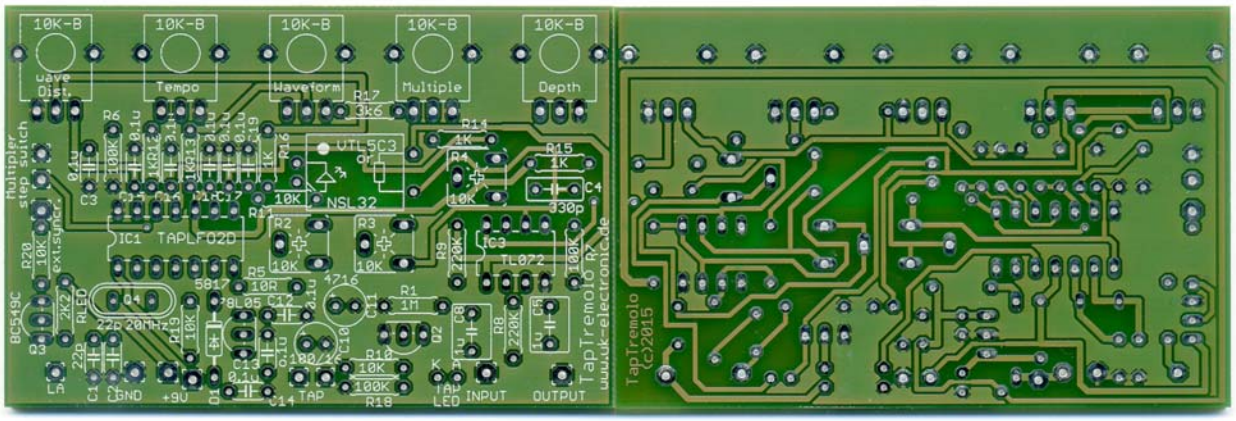
There is further information on the side of Tom Wiltshire.
http://www.electricdruid.com/index.php?page=projects.taplfo

The PCB was executed to achieve as little as possible external wiring compact as a double-sided through-hole.

Bill of material

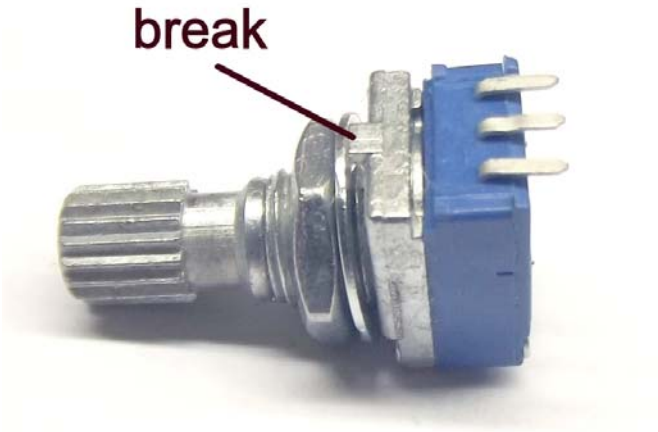
Quantitiy	Description
1	Mono jack ¼“
1	Stereo jack ¼“
1	3PDT Switch
1	SPST momentary switch (Tap Tempo)
2	LED bezel 3mm + LED 3mm red and green Low Current
5	Potentiometer 10K B (linear)
1	DC-jack isolated
1	Battery connector 9V HQ-T
1	Pre-programmed PIC16F684 –TAPLFO Ver.2D
1	IC TL072
1	socket LC14
1	socket LC8
1	Optocoupler NSL32 or VTL5C3 **(**Depending what it availability**!)**
1	Crystal HC49/U 20.000 Mhz
1	78L05
2	BC549C
1	1N5817
	Resistors
1	Resistor 10R (brown/black/black/gold/brown/(red))
5	Resistor 1K (brown/black/black/brown/brown)
1	Resistor 2K2 (red/red/black/brown/brown)
1	Resistor 3K6 (orange/blue/black/brown/brown)
4	Resistor 10K (brown/black/black/red/brown)
3	Resistor 100K (brown/red/black/orange/brown)
2	Resistor 220K (red/red/black/orange/brown)
1	Resistor 1M (brown/black/black/yellow/brown)
3	Trimpot 10K CA6V
	Capacitors
2	Ceramic cap 22p = 22
9	Multilayer cap 100nF= 0.1µF= 104
1	FKP2 330pF
2	MKT 1µF
1	RASM 47µF/16V
1	RASM 100µF/16V

Picture from the pcb top/ bottom

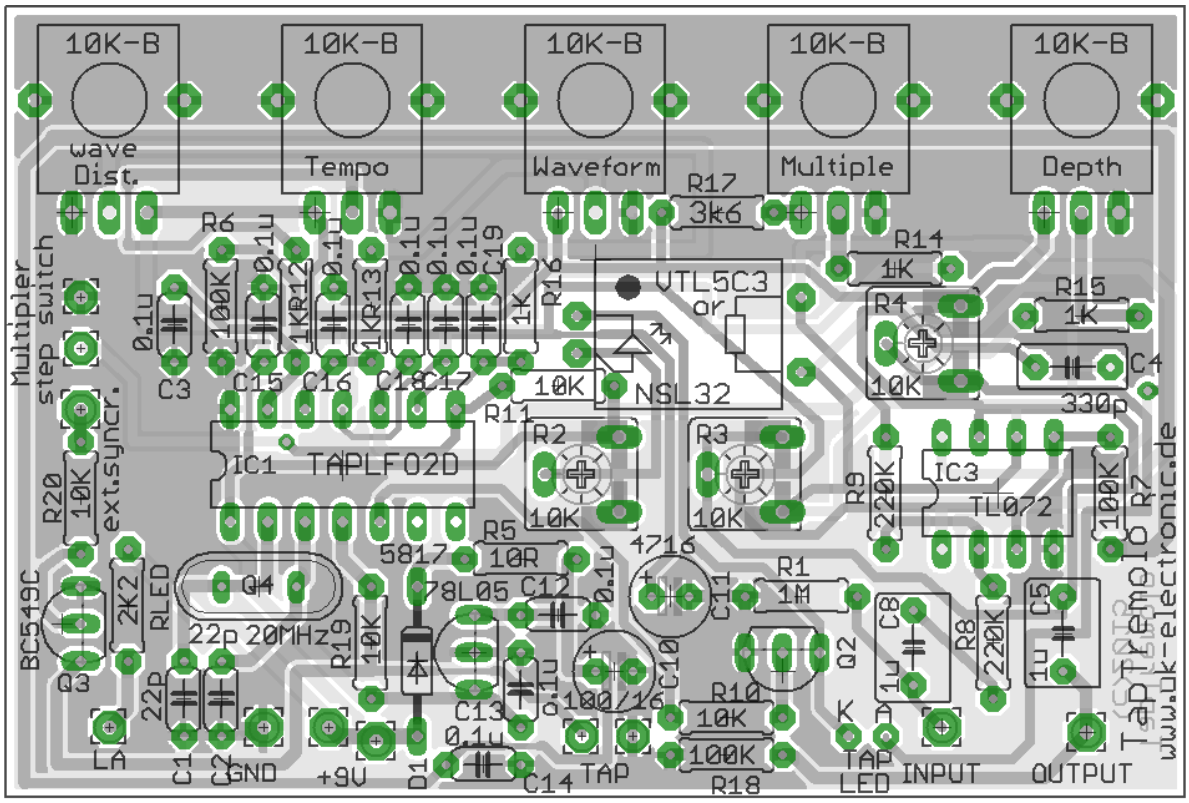


Soldering the pcb

First, the printed circuit board based on the below of illustrated Assembly plan is assembled. You should start with the lowest components of construction equip, i.e. Firstly the resistors, diodes, the sockets and finally the voltage regulator, crystal, transistors, capacitors and lastly the opto-coupler and the potentiometer.
The Potentiometer pins must be bent to 90 °, and then soldering of the bottom off the pcb.

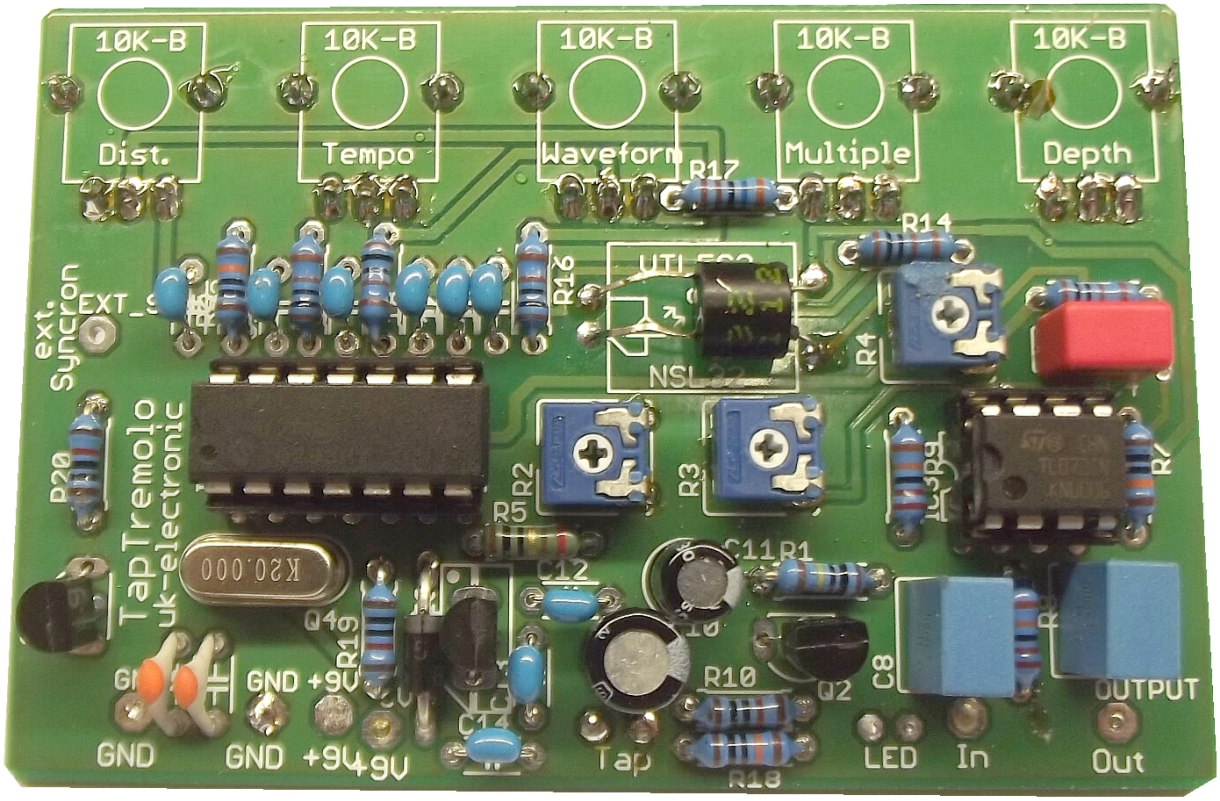


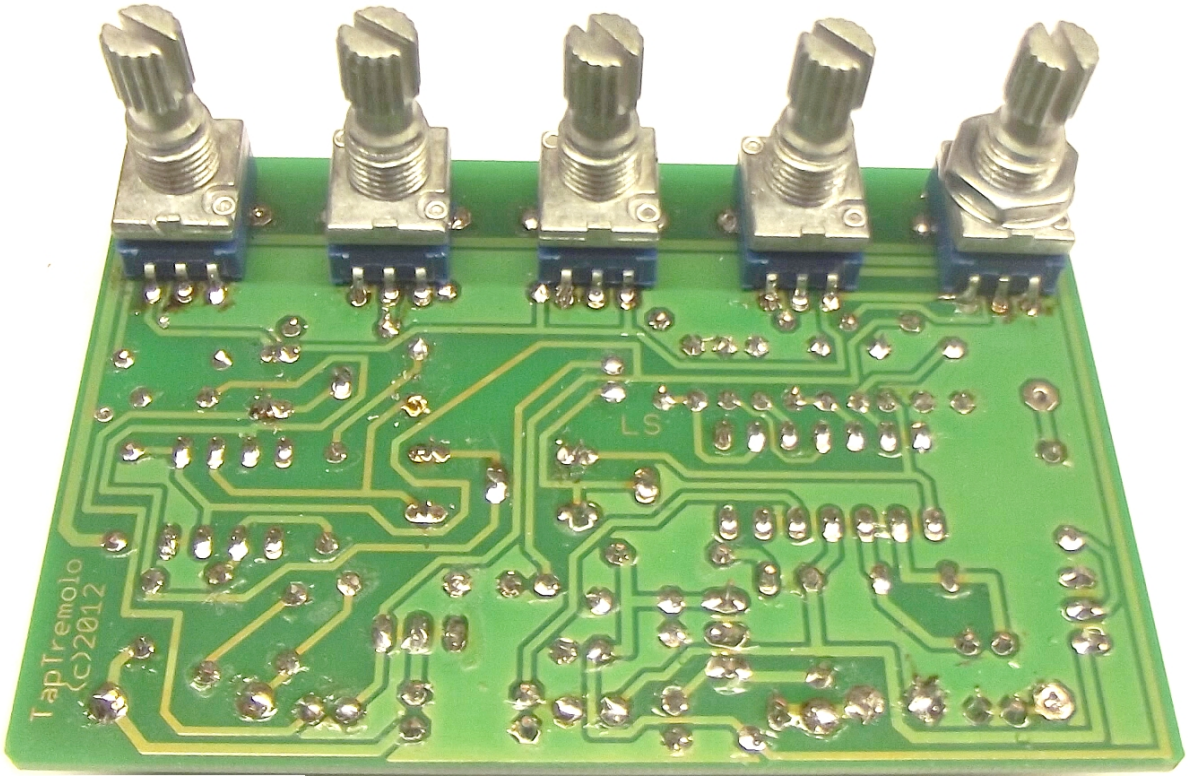
Clean work, in particular the execution of the solder joints should have top priority, to exclude from the outset in General Assembly and soldering errors. **By running as a DKL PCB it is in Multipole components for an inexperienced difficult incorrectly stocked construction element without violation of the vias.**



So, done

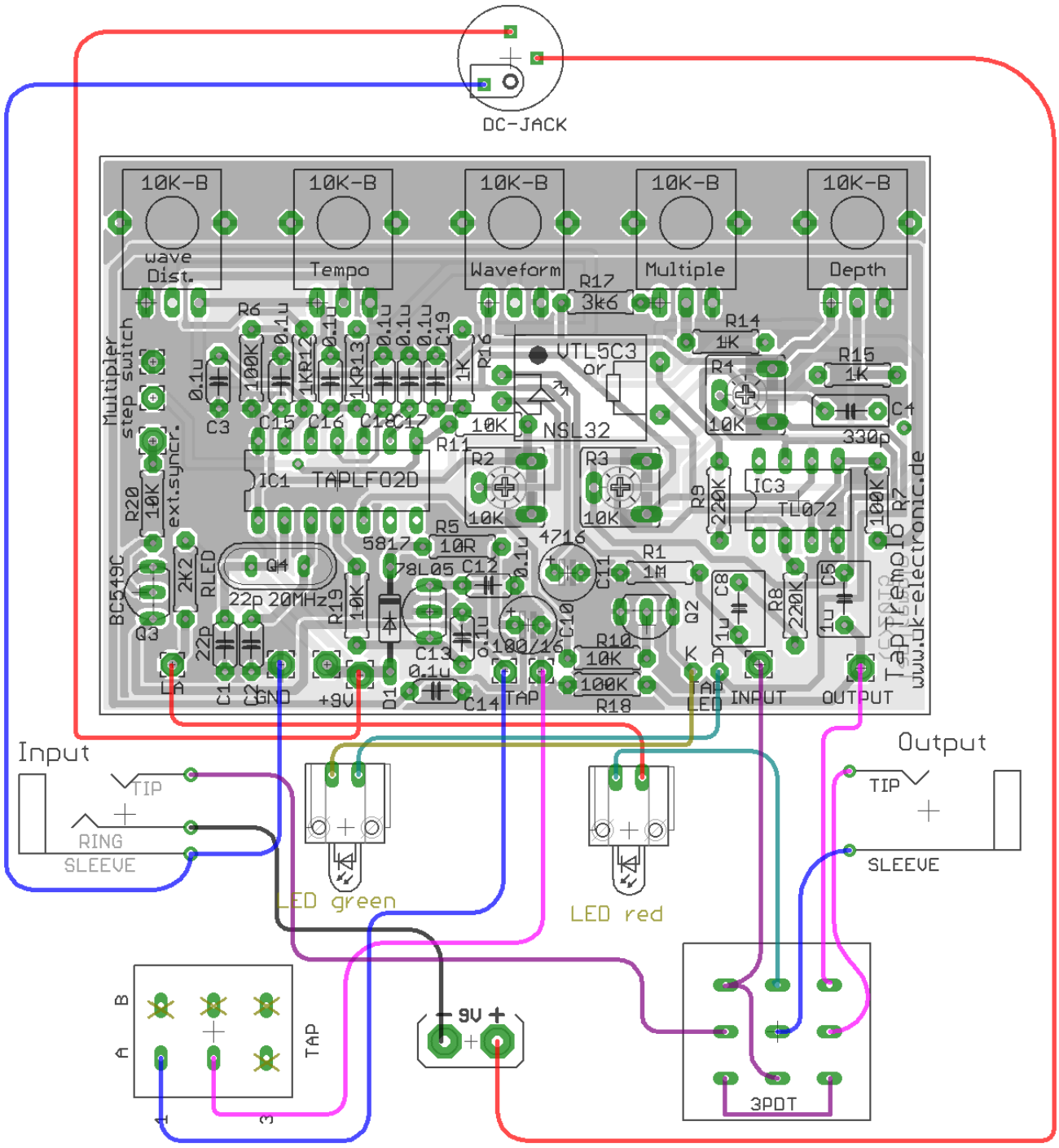
Attention! Picture from the PCB V1.1.





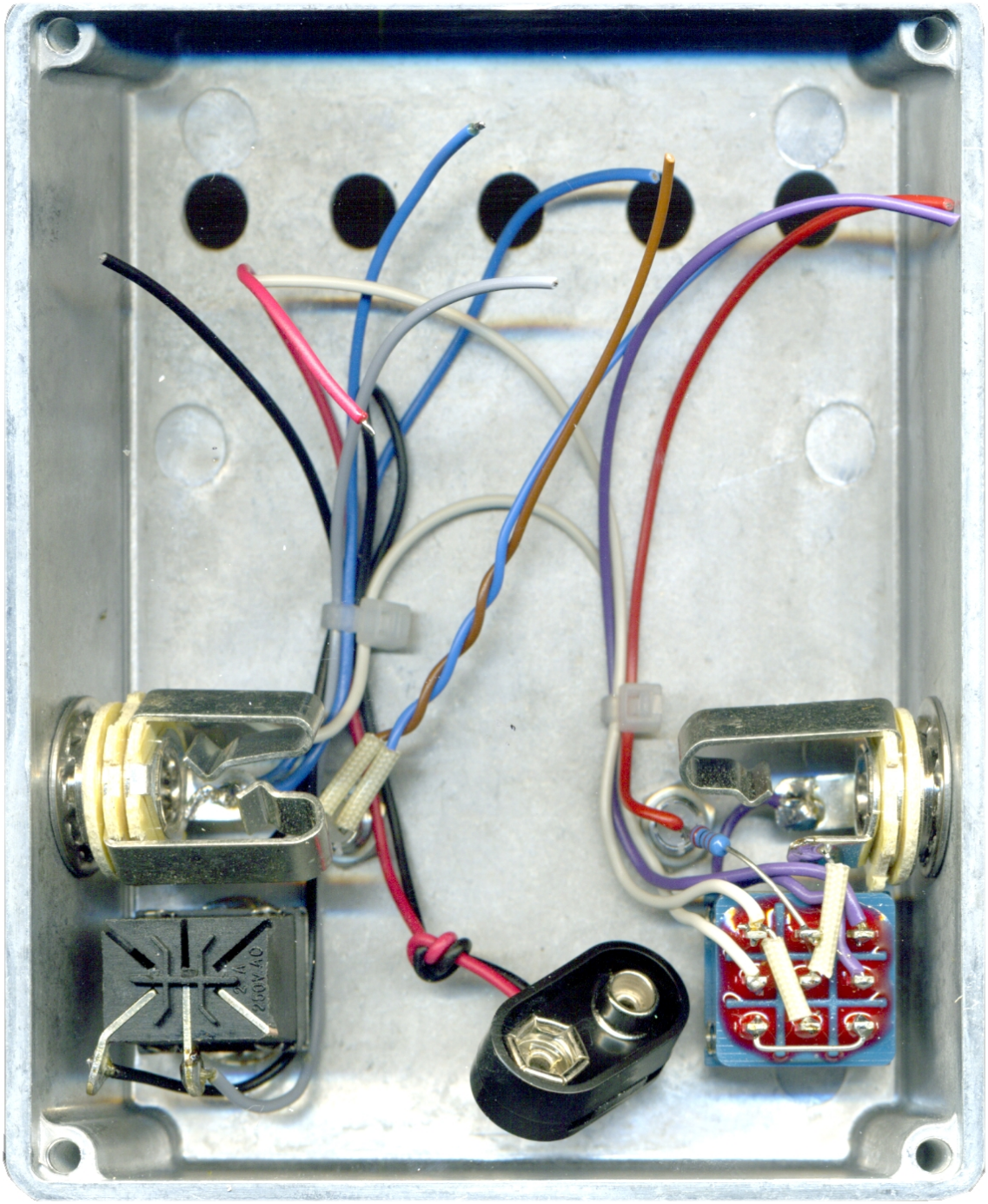
Wiring

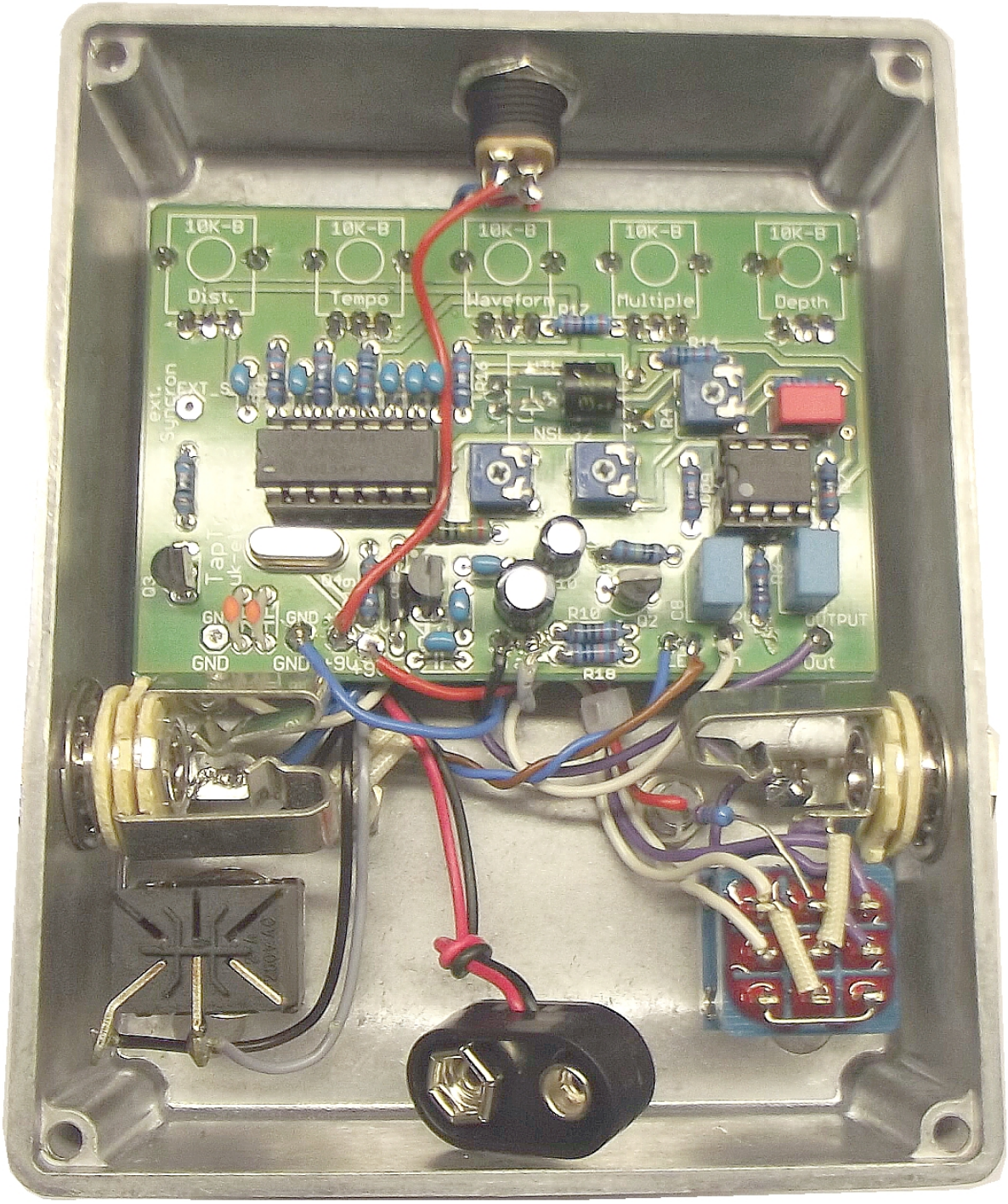
The wiring according to the below wiring diagram after the PCB is fully soldering. You should make the wiring in the enclosure before. Thus, you need then to conclude the intended to connect the wires only points of the circuit board. A few pictures are shown for a better overview. The wiring is shown as it takes place in the enclosure.



Previously, however should the predrilled enclosure with all passive components (switches, jacks, sockets for the LED's be fitted. The two LED's (speed and ON) is shortened and extended with 2 wires and insulated with a little fabric hose against the metal shaft of the led bezel. It remembers which wire is the anode or cathode, or in case of doubt, you must swap the two wires to the circuit board at any function. **The DC power Jack will mounting after the PCB is installed!**

Wiring at the enclosure





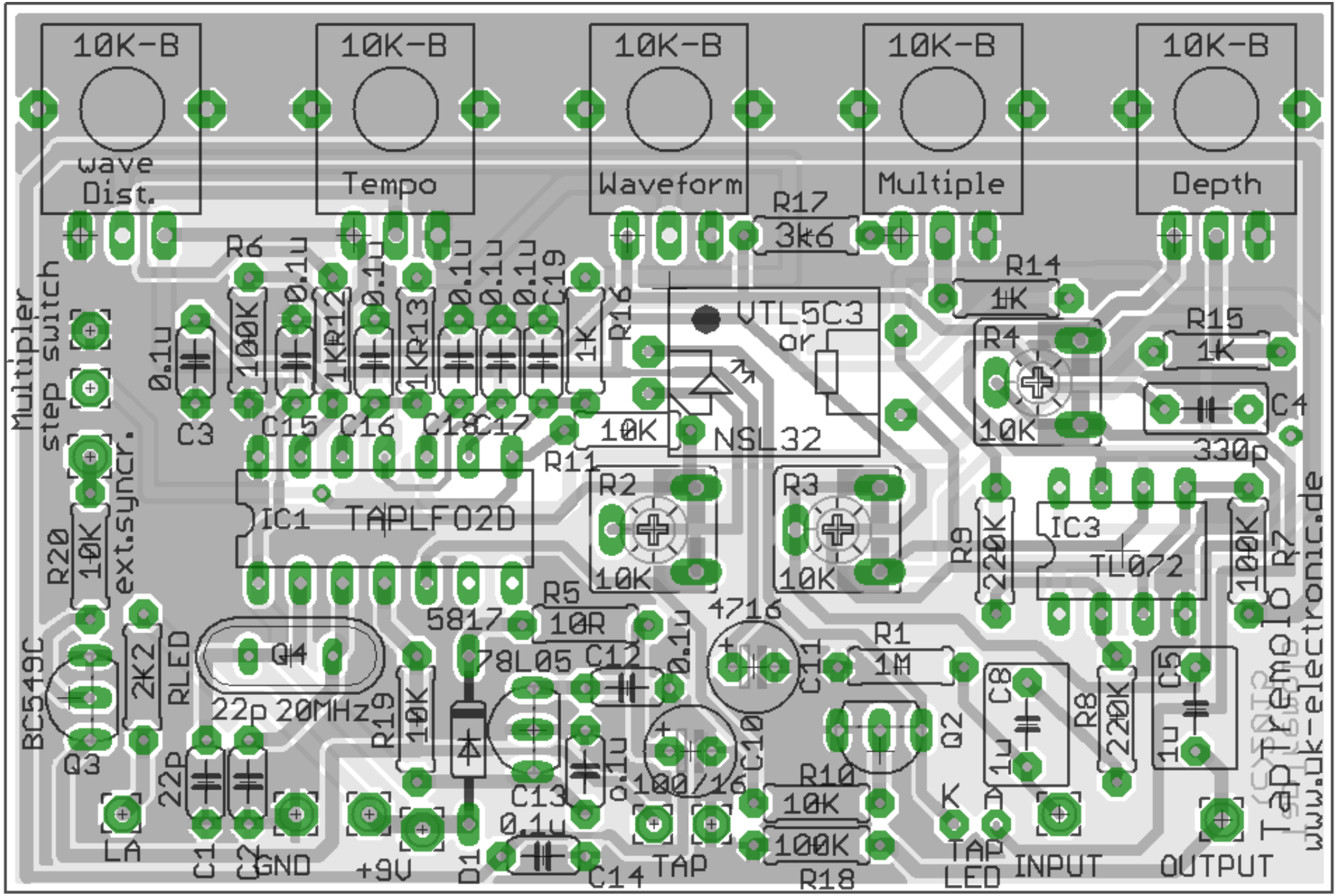
The circuit board in the enclosure is fastened through the nuts of the 5 potentiometer with the enclosure.
For building an enclosure should be e.g. GEH090 (equivalent to a 1590BB) be used.
Who drilled his enclosure itself should use the following diameter.

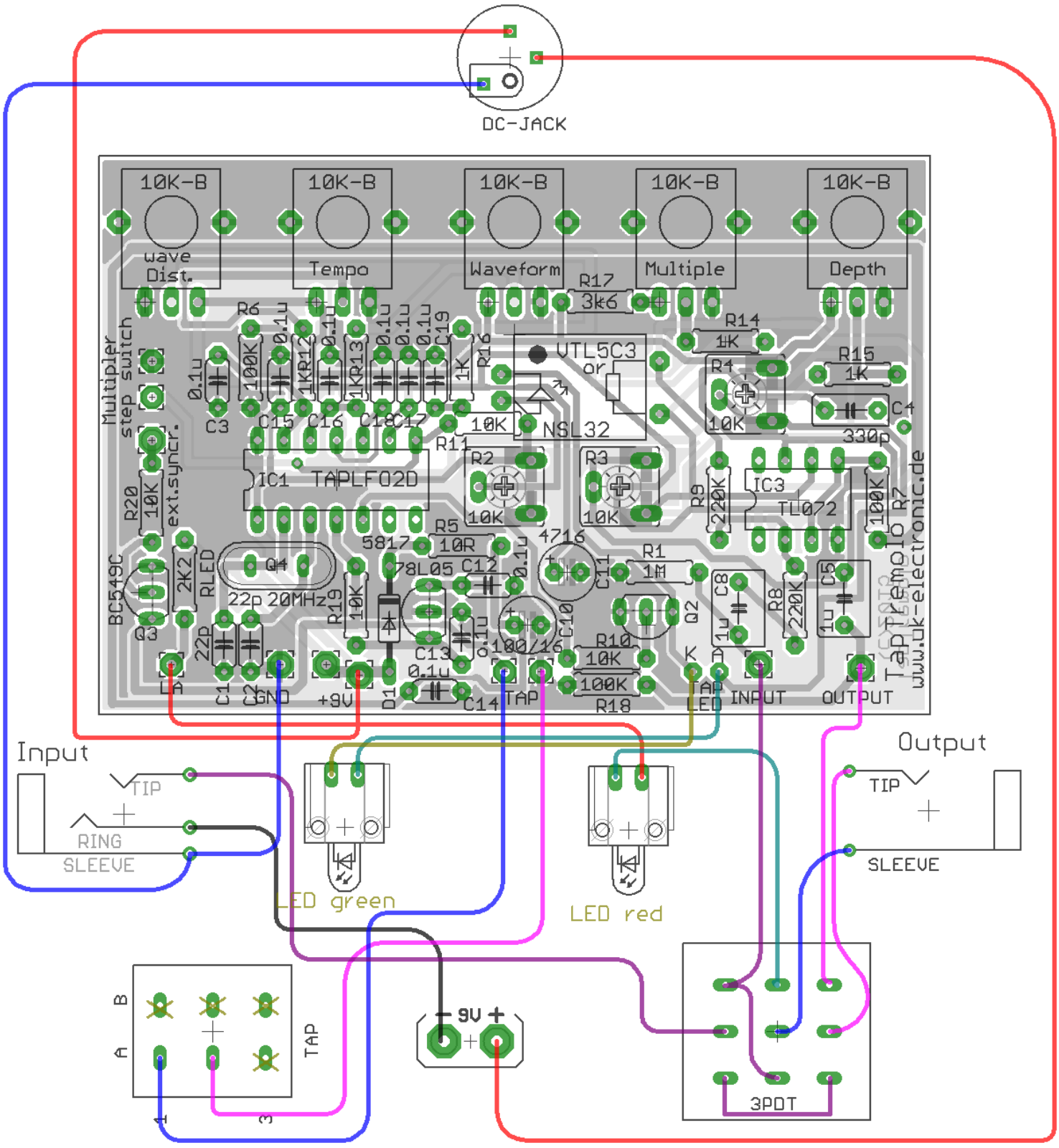
Potentiometer : 7.5 or 8mm
Audio jacks : 9.3mm
3PDT-Switch/ SPST momentary switch: 12mm
DC-jack: 12mm
LED bezel: 6mm

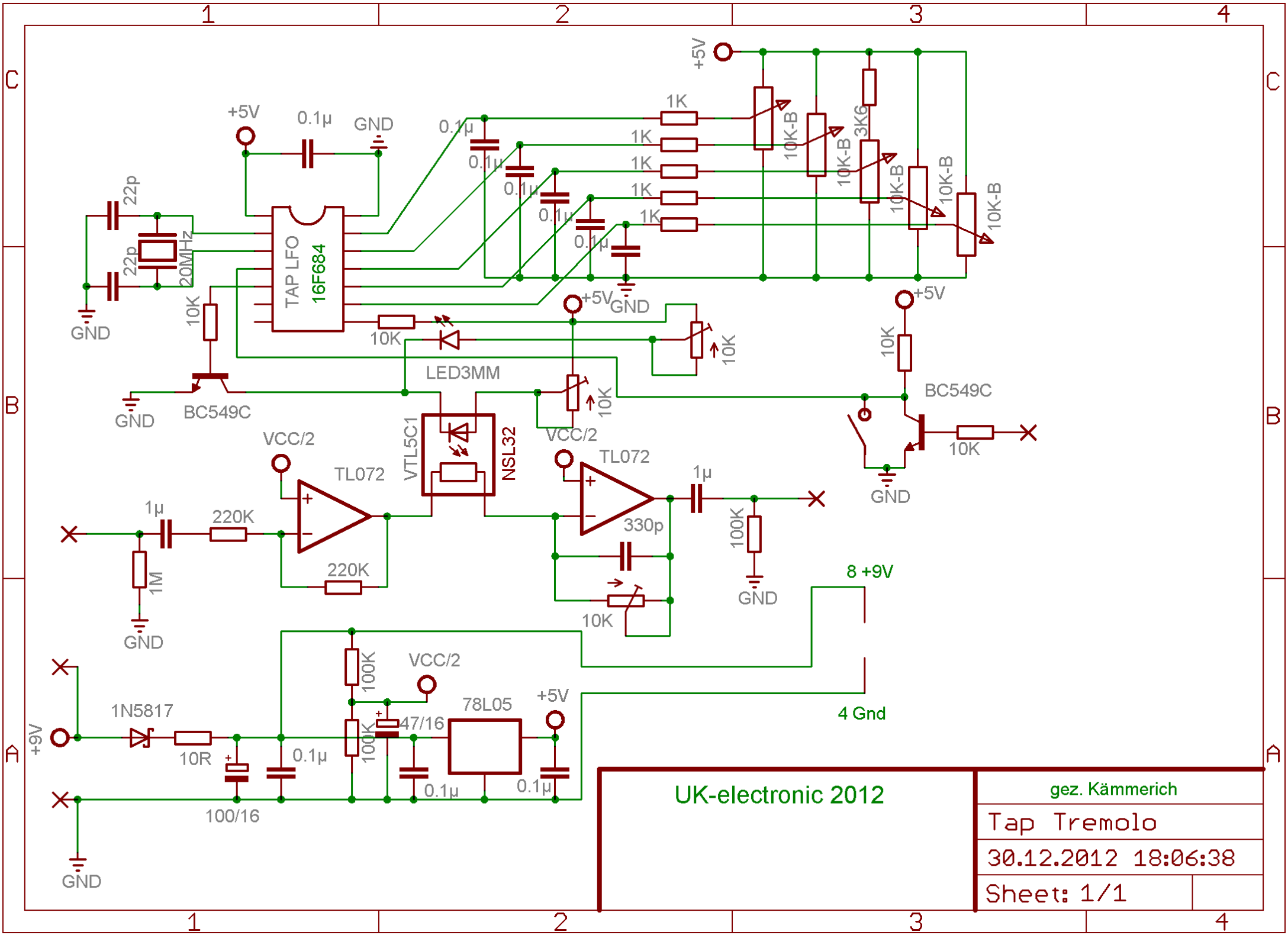
Function of the trimpots TR1 tos TR3.

TR1= Set the brightness of the led to indicated the modulation frequency
TR2= Set the gain of the circuit (Level between Original –und Effectsignal)
TR3= set the brightness of the led at the optocoupler. This made the deep from the modulation
With clean design, the device should work immediately. For any questions, we are of course available, or you also look at the forum
(www.uk-electronic.de/forum).

Assembly, wiring, and wiring diagram are in the appendix to the print available!
Credits to, Tom Wiltshire (www.electricdruid.com) and Chris Safi.


10K-B
Wave Dist.
10K-B
Tempo
10K-B
Waveform
10K-B
Multiple
10K-B
Depth
Multipler step switch
ext.syncr.
R6
100K
0.1u
1KR12
1KR13
C3
C15
C16
C18
C17
C19
R16
1K
R17
3k6
VTL5C3
or
NSL32
10K
R11
R2
R3
10K
R14
1K
R4
10K
R15
1K
330p
C4
IC1 TAPLF02D
R20
10K
R5
10R
5817
78L05
C12
0.1u
4716
C11
R1
1M
R9
220K
IC3
TL072
R7
100K
BC549C
Q3
2K2
RLED
Q4
22p 20MHz
22p
C1
C2
R19
10K
D1
C13
0.1u
C14
C10
100/16
Q2
C8
1u
R8
220K
C5
1u
R10
10K
100K
R18
LA
GND
+9V
TAP
K
A
TAP LED
INPUT
OUTPUT
Tap Tremolo
www.ok-electronic.de


DC-JACK
10K-B
Wave Dist.
Tempo
Waveform
Multiple
Depth
Multipler step switch
ext.sync
IC1 TAPLF02D
VTL5C3 or NSL32
IC3 TL072
78L05
5817
4716
BC549C
RLED
22p 20MHz
330p
www.uk-electronic.de
GND
+9V
TAP
TAP LED
INPUT
OUTPUT
Input
TIP
RING
SLEEVE
LED green
LED red
Output
TIP
SLEEVE
9V
3PDT
A
B
TAP


1
2
3
4
A
B
C
+5V
GND
0.1µ
22p
20MHz
TAP LFO
16F684
1K
10K-B
3K6
10K
LED3MM
BC549C
VCC/2
TL072
VTL5C1
NSL32
1µ
220K
1M
330p
100K
8 +9V
4 Gnd
+9V
1N5817
10R
100/16
47/16
78L05
UK-electronic 2012
gez. Kämmerich
Tap Tremolo
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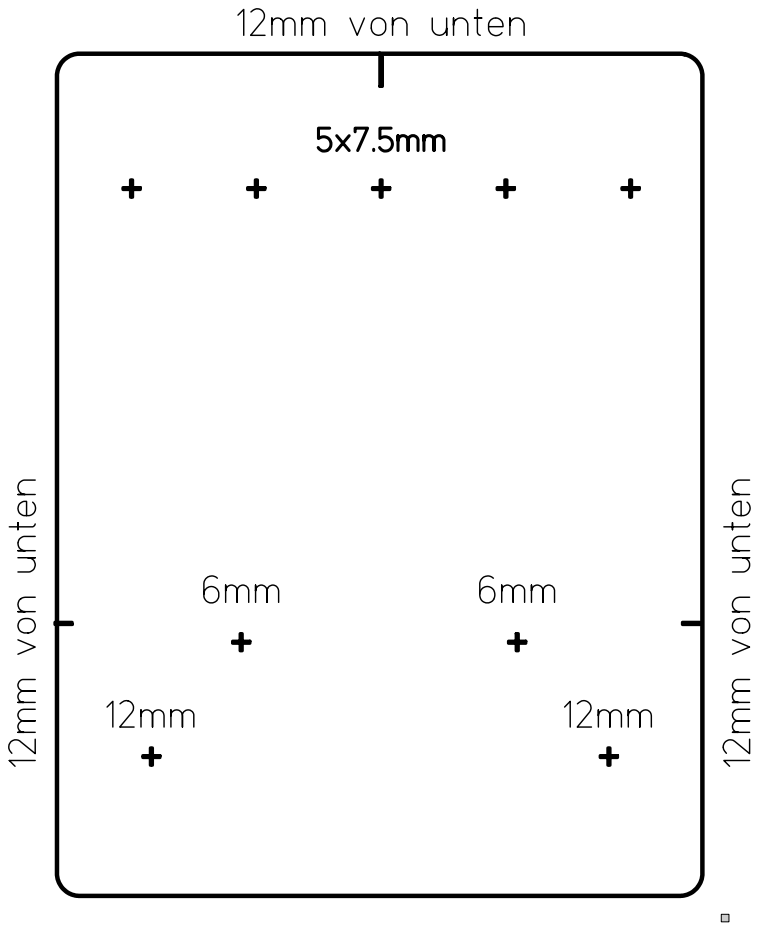
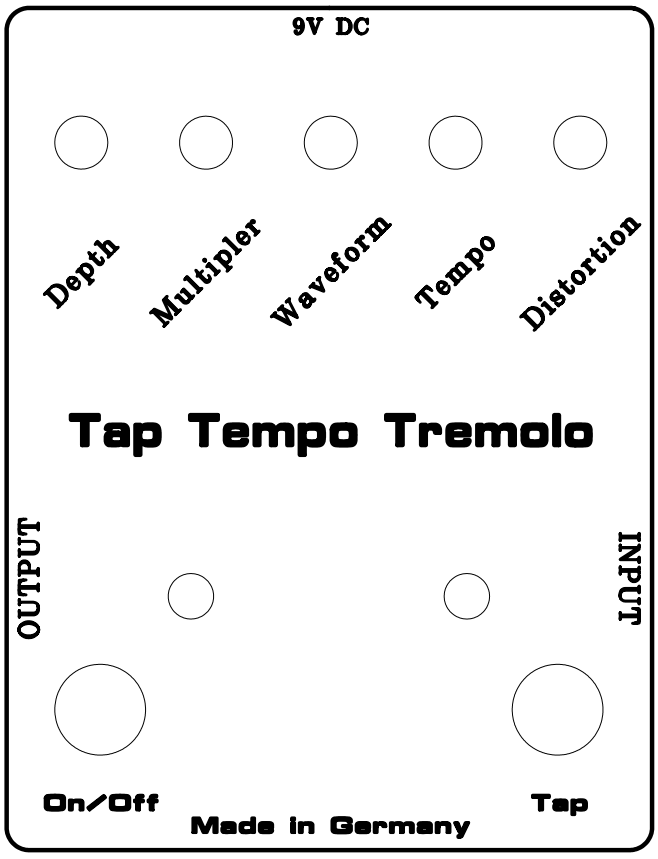
Sheet: 1/1


12mm von unten
5x7.5mm
12mm von unten
6mm
6mm
12mm
12mm
12mm von unten


9V DC
Depth
Multipler
Waveform
Tempo
Distortion
Tap Tempo Tremolo
OUTPUT
INPUT
On/Off
Tap
Made in Germany