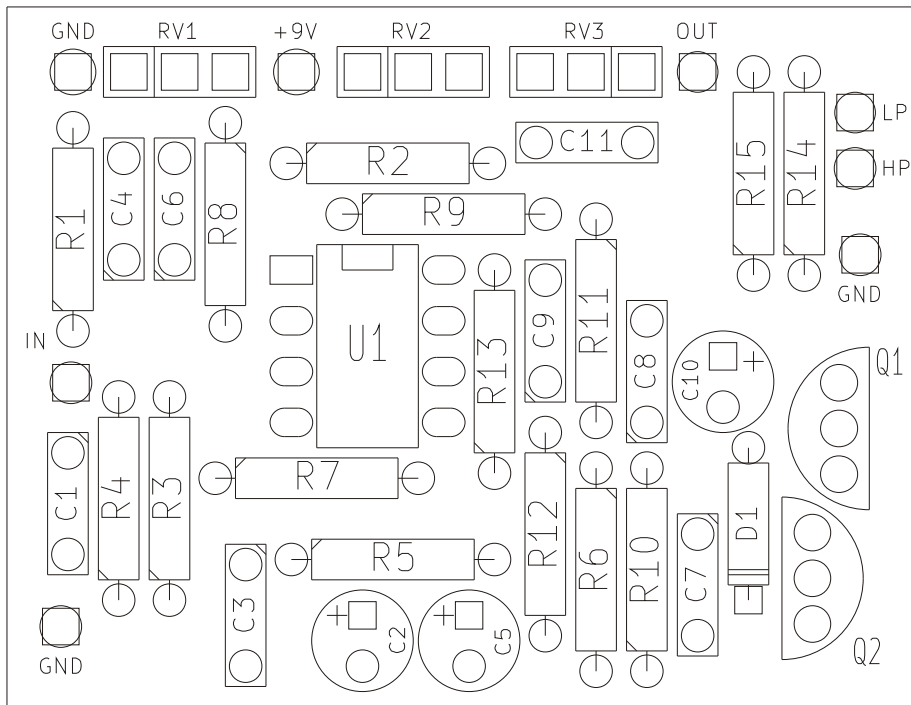
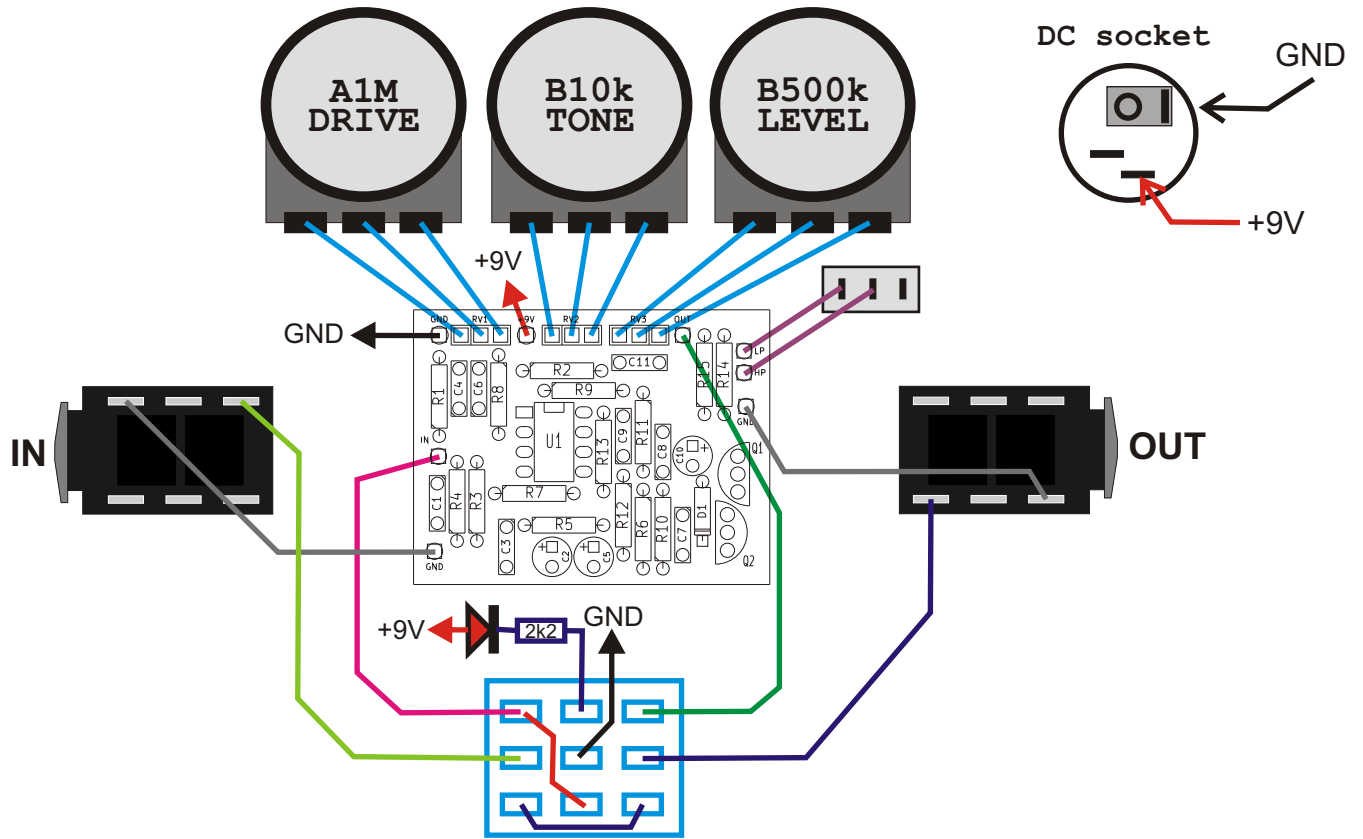


PCB parts placement diagram:



R1	1M	C1	22n
R2	100R	C2	10u
R3	2k2	C3	100n
R4	10k	C4	68n
R5	10k	C5	10u
R6	10k	C6	220p
R7	470k	C7	1n
R8	18k	C8	100n
R9	10k	C9	220p
R10	39k	C10	10u
R11	10k	C11	47n
R12	220k	Q1	2N7000
R13	150k	Q2	2N7000
R14	22k	D1	1N34A
R15	33k	U1	TL082
RV1	A1M		
RV2	B10k		
RV3	500k		

Wiring (bottom view):



Use metal enclosure connected to ground.
Power supply: 9V DC

Bill of materials:

Resistors:

100R 1pcs. "R2"
 2k2 2pcs. "R3 LED"
 10k 5pcs. "R4 R5 R6 R9 R11"
 18k 1pcs. "R8"
 22k 1pcs. "R14"
 33k 1pcs. "R15"
 39k 1pcs. "R10"
 150k 1pcs. "R13"
 220k 1pcs. "R12"
 470k 1pcs. "R7"
 1M 1pcs. "R1"

Capacitors:

220p 2pcs. "C6 C9"
 1n 1pcs. "C7"
 22n 1pcs. "C1"
 47n 1pcs. "C11"
 68n 1pcs. "C4"
 100n 2pcs. "C3 C8"

Semiconductors:

TL082 1pcs. "U1"
 2N7000 2pcs. "Q1 Q2"
 1M34A 1pcs. "D1"
 LED 1pcs.

Electrolytic capacitors:

10u 3pcs. "C2 C5 C10"

Other:

Knobs 3pcs.
 Footswitch 3PDT 1pcs.
 Switch MTS102 1pcs.
 JACK socket 2pcs.
 DC socket 5.5./2.1 1pcs.

Potentiometer:

A1M 1pcs.
 B10k 1pcs.
 B500k 1pcs.

Resistor color code:



$$390 \times 10\Omega = 3,9k\Omega$$

Color	Band 1	Band 2	Band 3	Multiplier	Tolerance
Black	0	0	0	1 Ω	
Brown	1	1	1	10 Ω	1%
Red	2	2	2	100 Ω	2%
Orange	3	3	3	1k Ω	
Yellow	4	4	4	10 k Ω	
Green	5	5	5	100 k Ω	0,5%
Blue	6	6	6	1 M Ω	0,25%
Purple	7	7	7	10 M Ω	0,1%
Gray	8	8	8	100 M Ω	0,05%
White	9	9	9	1 G Ω	
Gold				0,1 Ω	5%
Silver				0,01 Ω	10%

Capacitors markings:

$$\begin{aligned}
 471 &= 47 \times 10^1 \text{ pF} = 470\text{pF} \\
 472 &= 47 \times 10^2 \text{ pF} = 4700\text{pF} = 4,7\text{nF} \\
 473 &= 47 \times 10^3 \text{ pF} = 47000\text{pF} = 47\text{nF} \\
 474 &= 47 \times 10^4 \text{ pF} = 470000\text{pF} = 470\text{nF}
 \end{aligned}$$

$$\begin{aligned}
 100\text{pF} &= 100\text{p} = 100 = 101 \\
 220\text{pF} &= 220\text{p} = 220 = 221 \\
 4,7\text{nF} &= 4\text{n}7 = 0.0047 = 472 \\
 10\text{nF} &= 10\text{n} = 0.01 = 103 \\
 100\text{nF} &= 100\text{n} = 0.1 = 104 \\
 220\text{nF} &= 220\text{n} = 0.22 = 224 \\
 470\text{nF} &= 470\text{n} = 0.47 = 474 \\
 1000\text{nF} &= 1\mu\text{F} = 1\mu = 105
 \end{aligned}$$