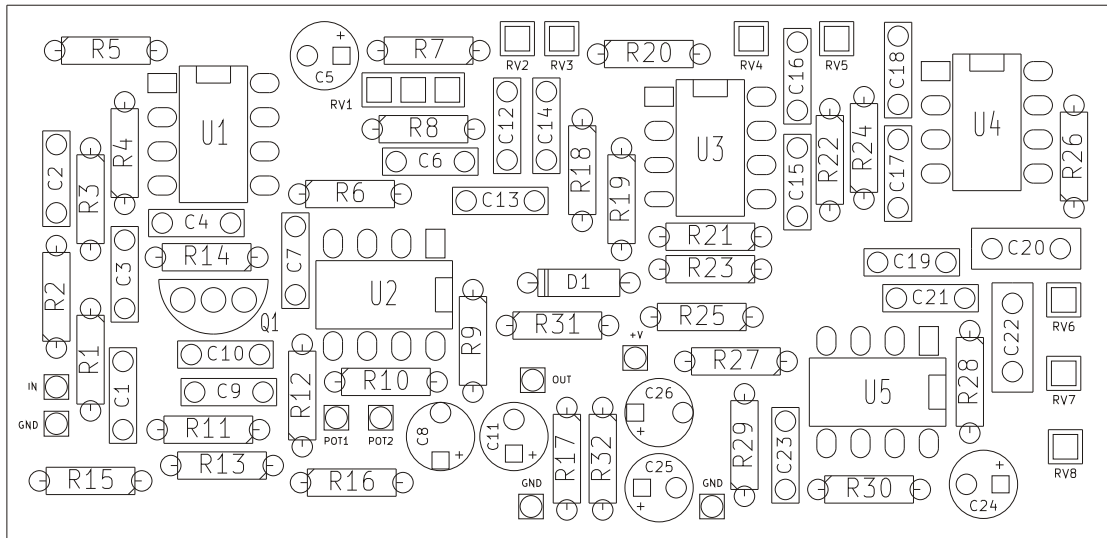


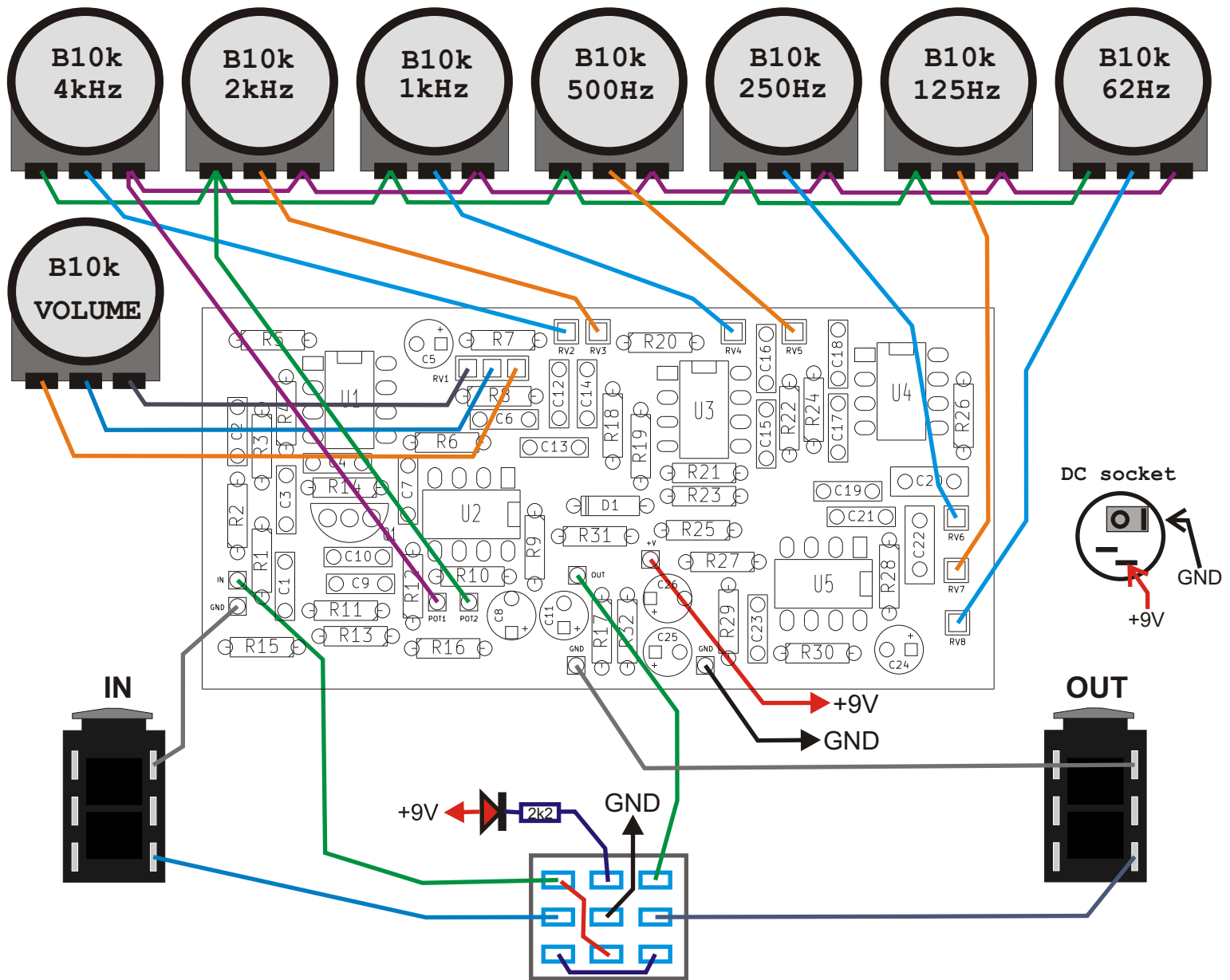
PCB parts placement diagram:



- R1 1M
- R2 10k
- R3 470k
- R4 470R
- R5 4k7
- R6 10k
- R7 2k2
- R8 10k
- R9 3k3
- R10 3k3
- R11 1M
- R12 4k7
- R13 470R
- R14 1M
- R15 10k
- R16 1k
- R17 100k
- R18 560R
- R19 82k
- R20 330R
- R21 82k
- R22 330R
- R23 100k
- R24 330R
- R25 100k
- R26 330R
- R27 82k
- R28 330R
- R29 100k
- R30 330R
- R31 33k
- R32 33k
- RV1 B10k
- RV2 B10k
- RV3 B10k
- RV4 B10k
- RV5 B10k
- RV6 B10k
- RV7 B10k
- RV8 B10k

- C1 10p
- C2 47n
- C3 15n
- C4 100n
- C5 10u
- C6 220p
- C7 100n
- C8 1u
- C9 15n
- C10 47n
- C11 1u
- C12 68n
- C13 3n3
- C14 68n
- C15 5n6
- C16 150n
- C17 12n
- C18 220n
- C19 22n
- C20 470n
- C21 33n
- C22 1u5
- C23 56n
- C24 2u2
- C25 47u
- C26 100u
- D1 1N400X
- Q1 BC550
- U1 NE5534
- U2 4558
- U3 TL072
- U4 TL072
- U5 TL072

Wiring (bottom view):



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

## Bill of materials:

### Resistors:

330R 6pcs. "R20 R22 R24 R26 R28 R30"  
470R 2pcs. "R4 R13"  
560R 1pcs. "R18"  
1k 1pcs. "R16"  
2k2 2pcs. "R7 LED"  
3k3 2pcs. "R9 R10"  
4k7 2pcs. "R5 R12"  
10k 4pcs. "R2 R6 R8 R15"  
33k 2pcs. "R31 R32"  
82k 3pcs. "R19 R21 R27"  
100k 4pcs. "R17 R23 R25 R29"  
470k 1pcs. "R3"  
1M 3pcs. "R1 R11 R14"

### Potentiometers:

B10k 8pcs. "RV1 RV2 RV3 RV4 RV5 RV6 RV7 RV8"

### Capacitors:

10p 1pcs. "C1"  
220p 1pcs. "C6"  
3n3 1pcs. "C13"  
5n6 1pcs. "C15"  
12n 1pcs. "C17"  
15n 2pcs. "C3 C9"  
22n 1pcs. "C19"  
33n 1pcs. "C21"  
47n 2pcs. "C2 C10"  
56n 1pcs. "C23"  
68n 2pcs. "C12 C14"  
100n 2pcs. "C4 C7"  
150n 1pcs. "C16"  
220n 1pcs. "C18"  
470n 1pcs. "C20"

### Electrolytic capacitors:

1u 2pcs. "C8 C11"  
1u5 1pcs. "C22"  
2u2 1pcs. "C24"  
10u 1pcs. "C5"  
47u 1pcs. "C25"  
100u 1pcs. "C26"

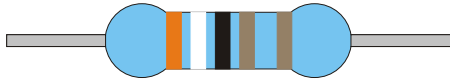
### Semiconductors:

1N400X 1pcs. "D1"  
BC550 1pcs. "Q1"  
4558 1pcs. "U2"  
NE5534 1pcs. "U1"  
TL072 3pcs. "U3 U4 U5"  
LED 1pcs.

### Other:

Knobs 8pcs.  
Footswitch 3PDT 1pcs.  
Jack socket 2pcs.  
DC socket 5.5/2.1 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 $\Omega$	
Brown	1	1	1	10 $\Omega$	1%
Red	2	2	2	100 $\Omega$	2%
Orange	3	3	3	1k $\Omega$	
Yellow	4	4	4	10 k $\Omega$	
Green	5	5	5	100 k $\Omega$	0,5%
Blue	6	6	6	1 M $\Omega$	0,25%
Purple	7	7	7	10 M $\Omega$	0,1%
Gray	8	8	8	100 M $\Omega$	0,05%
White	9	9	9	1 G $\Omega$	
Gold				0,1 $\Omega$	5%
Silver				0,01 $\Omega$	10%

## Capacitors markings:

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

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