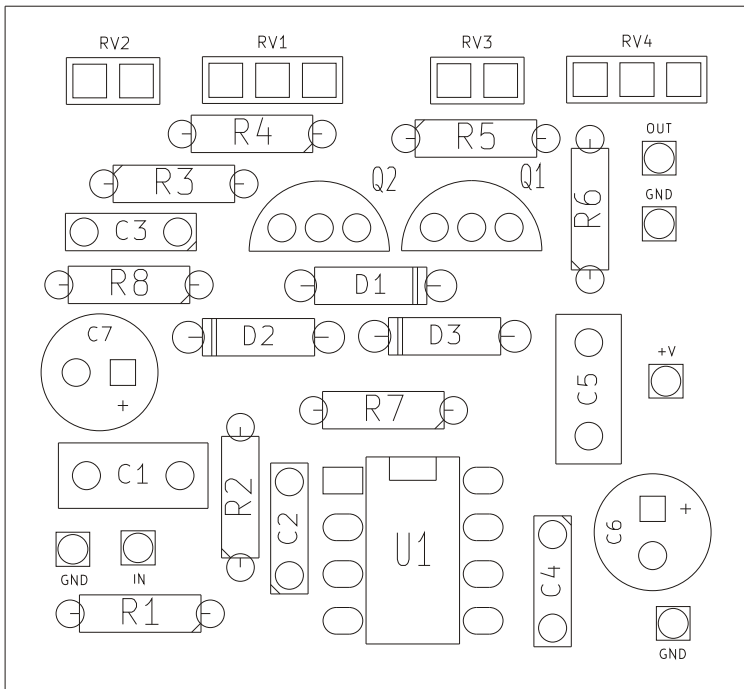
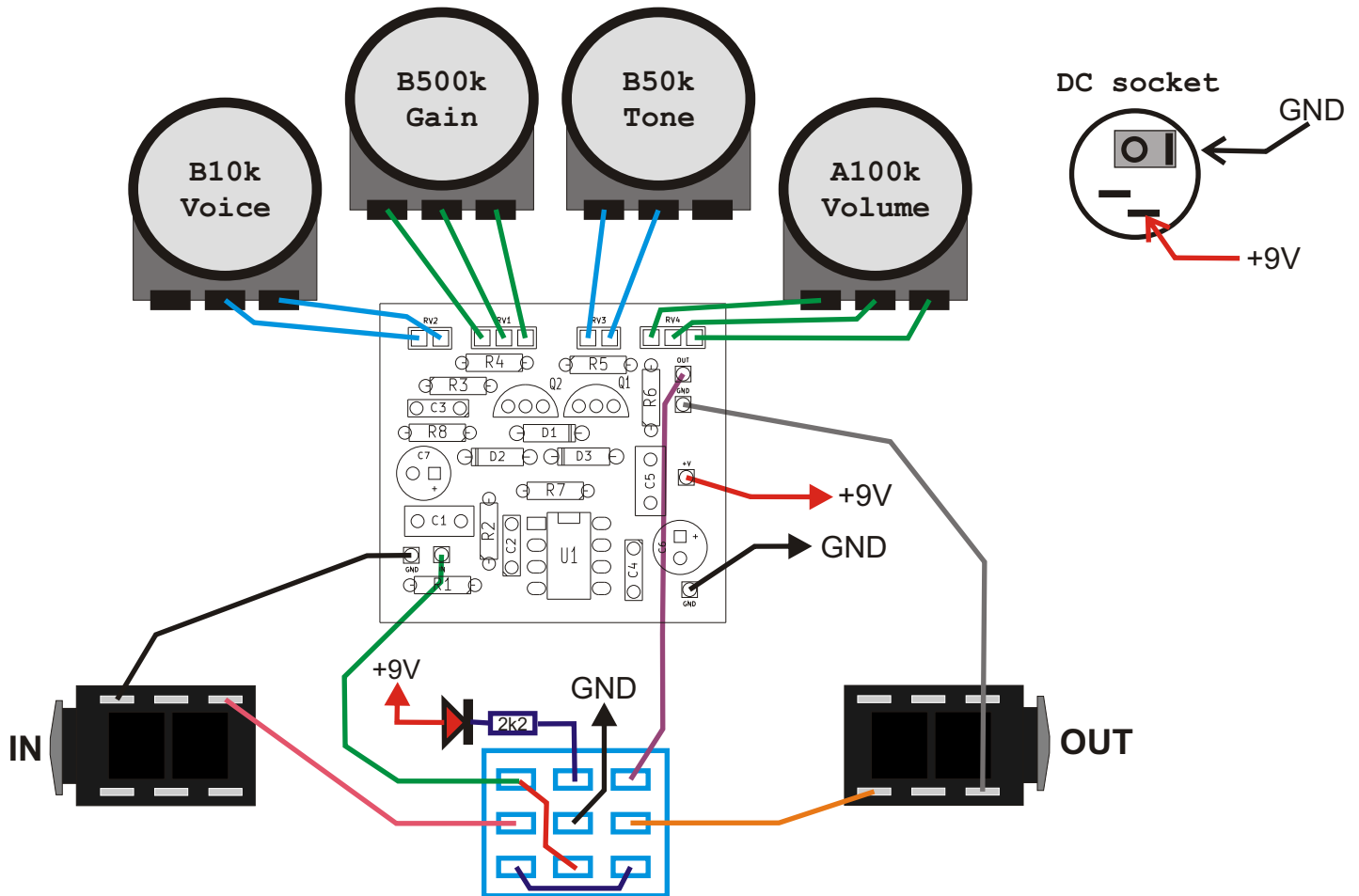


PCB parts placement diagram:



- |                  |                   |
|------------------|-------------------|
| <b>R1</b> 2M2    | <b>C1</b> 470n    |
| <b>R2</b> 470k   | <b>C2</b> 100p    |
| <b>R3</b> 1k     | <b>C3</b> 100n    |
| <b>R4</b> 1k     | <b>C4</b> 3n3     |
| <b>R5</b> 10k    | <b>C5</b> 470n    |
| <b>R6</b> 1k     | <b>C6</b> 100u    |
| <b>R7</b> 10k    | <b>C7</b> 47u     |
| <b>R8</b> 10k    |                   |
| <b>RV1</b> B500k | <b>D1</b> BAT41   |
| <b>RV2</b> B10k  | <b>D2</b> BAT41   |
| <b>RV3</b> B50k  | <b>D3</b> BAT41   |
| <b>RV4</b> A100k | <b>Q1</b> 2N7000  |
|                  | <b>Q2</b> 2N7000  |
|                  | <b>U1</b> OPA2604 |

Wiring (bottom view) :



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

Bill of materials:

Resistors:

2k2 1pcs. "LED"  
1k 3pcs. "R3 R4 R6"  
10k 3pcs. "R5 R7 R8"  
470k 1pcs. "R2"  
2M2 1pcs. "R1"

Capacitors:

100p 1pcs. "C2"  
3n3 1pcs. "C4"  
100n 1pcs. "C3"  
470n 2pcs. "C1 C5"

Potentiometers:

B500k 1pcs. "RV1"  
B10k 1pcs. "RV2"  
B50k 1pcs. "RV3"  
A100k 1pcs. "RV4"

Electrolytic capacitors:

47u 1pcs. "C7"  
100u 1pcs. "C6"

Semiconductors:

BAT41 3pcs. "D1 D2 D3"  
2N7000 2pcs. "Q1 Q2"  
OPA2604 1pcs. "U1"  
LED 1pcs.

Other:

Knobs 4pcs.  
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:

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

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