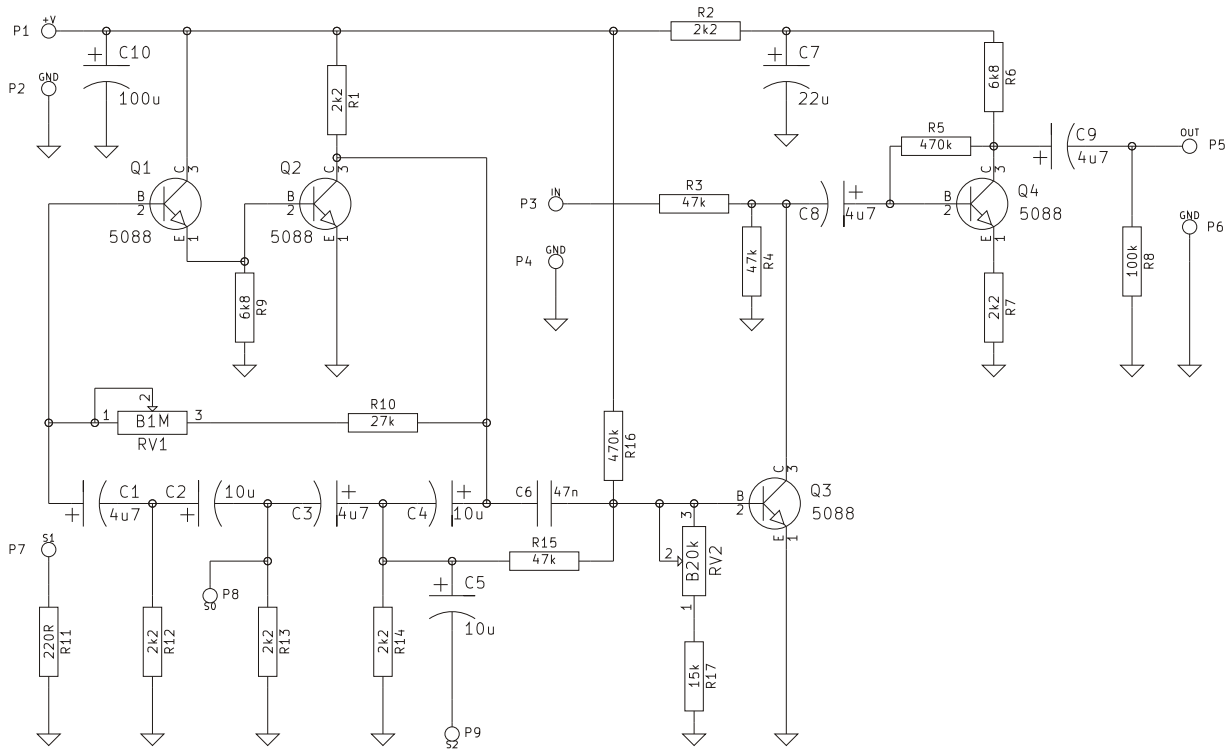
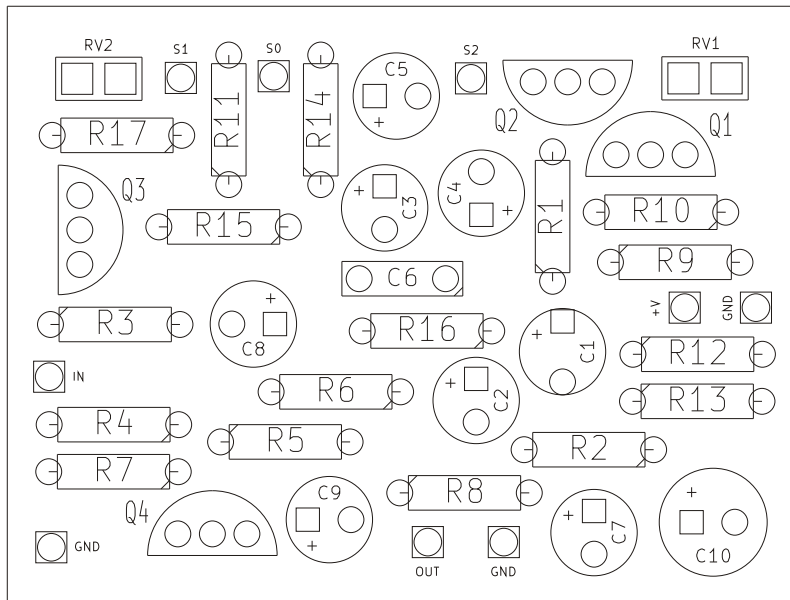


Heartthrob Tremolo schematic:

22.02.2019

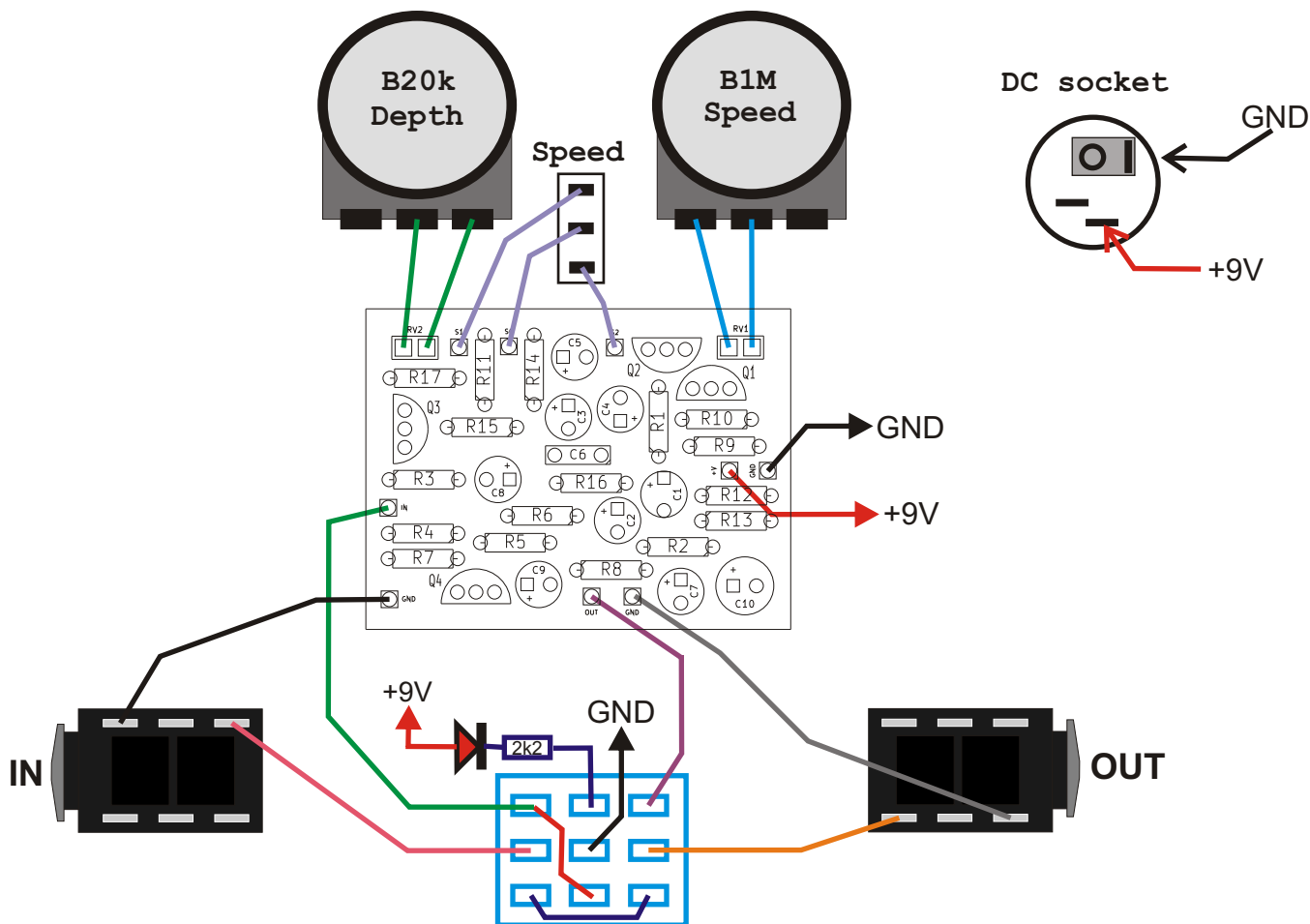


PCB parts placement diagram:



- | | | | |
|------------|-------------|------------|-------------|
| R1 | 2k2 | C1 | 4u7 |
| R2 | 2k2 | C2 | 10u |
| R3 | 47k | C3 | 4u7 |
| R4 | 47k | C4 | 10u |
| R5 | 470k | C5 | 10u |
| R6 | 6k8 | C6 | 47n |
| R7 | 2k2 | C7 | 22u |
| R8 | 100k | C8 | 4u7 |
| R9 | 6k8 | C9 | 4u7 |
| R10 | 27k | C10 | 100u |
| R11 | 220R | | |
| R12 | 2k2 | Q1 | 5088 |
| R13 | 2k2 | Q2 | 5088 |
| R14 | 2k2 | Q3 | 5088 |
| R15 | 47k | Q4 | 5088 |
| R16 | 470k | | |
| R17 | 15k | | |
| RV1 | B1M | | |
| RV2 | B20k | | |

Wiring (bottom view):



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

Bill of materials:

Resistors:

- 2k2 1pcs. "LED"
- 220R 1pcs. "R11"
- 2k2 6pcs. "R1 R2 R7 R12 R13 R14"
- 6k8 2pcs. "R6 R9"
- 15k 1pcs. "R17"
- 27k 1pcs. "R10"
- 47k 3pcs. "R3 R4 R15"
- 100k 1pcs. "R8"
- 470k 2pcs. "R5 R16"

Capacitors:

- 47n 1pcs. "C6"
- Electrolytic capacitors:
- 4u7 4pcs. "C1 C3 C8 C9"
 - 10u 3pcs. "C2 C4 C5"
 - 22u 1pcs. "C7"
 - 100u 1pcs. "C10"

Semiconductors:

- 2N5088 4pcs. "Q1 Q2 Q3 Q4"

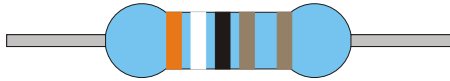
Potentiometers:

- B1M 1pcs. "RV1"
- B20k 1pcs. "RV2"

Other:

- Knob 2pcs.
- Footswitch 3PDT 1pcs.
- Jack socket 2pcs.
- DC socket 1pcs.
- Switch MTS102 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:

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

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