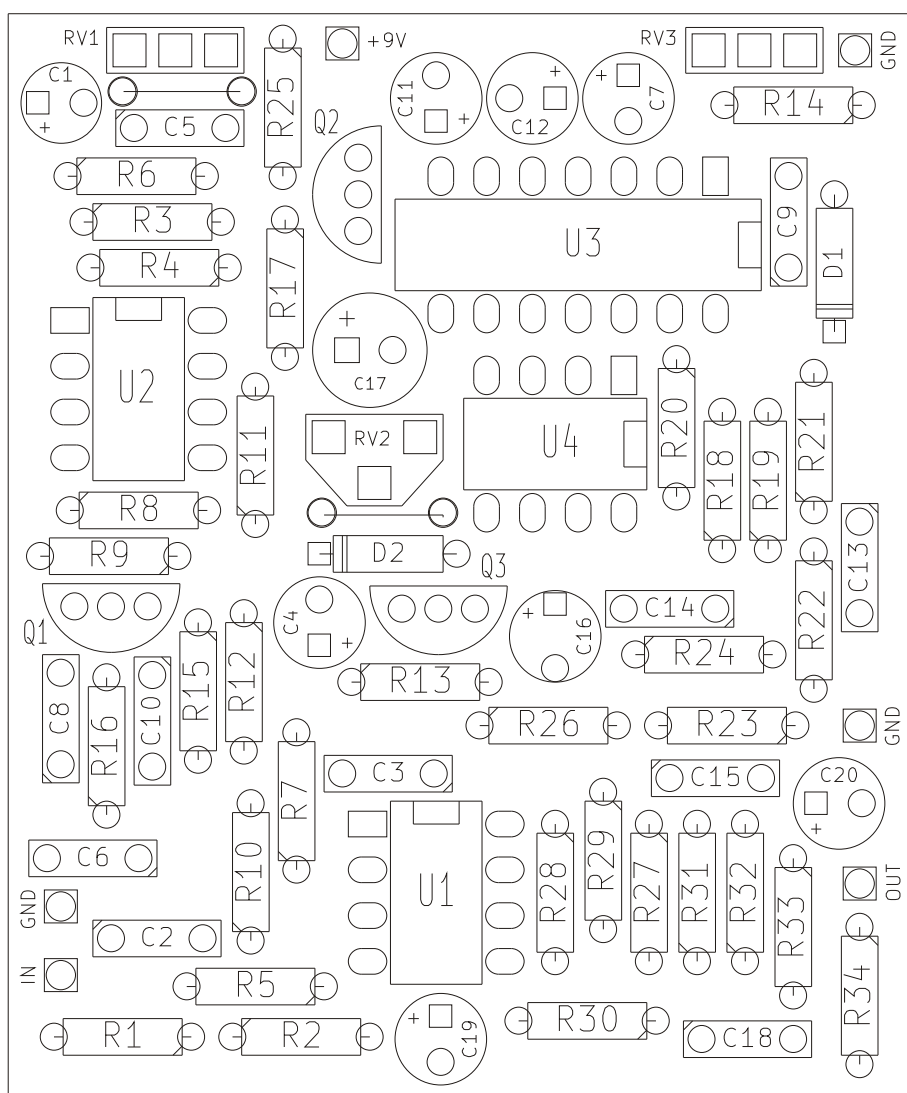
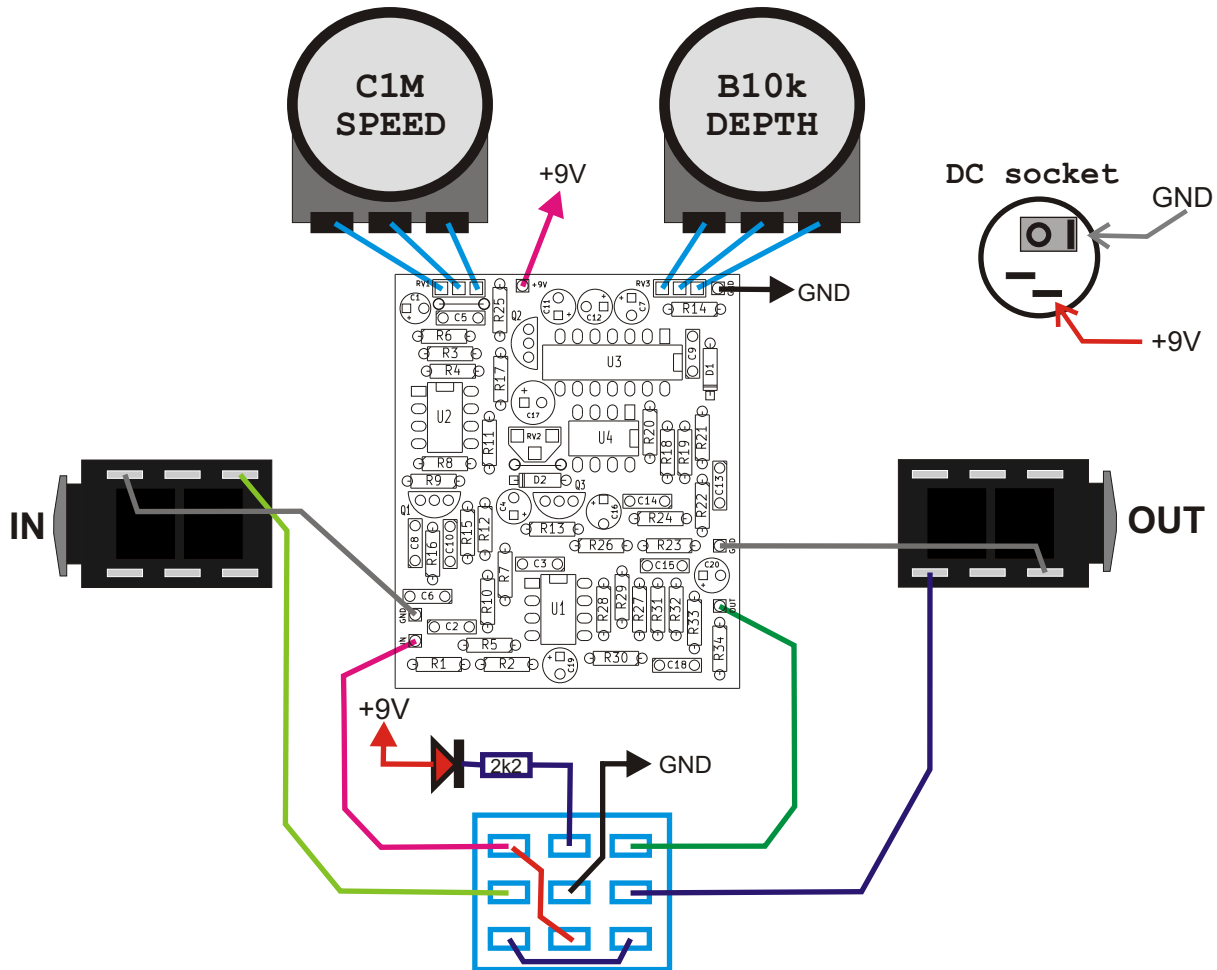


PCB parts placement diagram:



| | | | |
|-----|-------|-----|-----------|
| R1 | 1M | C1 | 2u2 Tant. |
| R2 | 220k | C2 | 33n |
| R3 | 47k | C3 | 10n |
| R4 | 180k | C4 | 1u |
| R5 | 1k | C5 | 47n |
| R6 | 120k | C6 | 3n3 |
| R7 | 6k8 | C7 | 10u |
| R8 | 68k | C8 | 15n |
| R9 | 82k | C9 | 150p |
| R10 | 33k | C10 | 470p |
| R11 | 470k | C11 | 10u |
| R12 | 3k3 | C12 | 10u |
| R13 | 22k | C13 | 4n7 |
| R14 | 39k | C14 | 2n7 |
| R15 | 10k | C15 | 180p |
| R16 | 10k | C16 | 1u |
| R17 | 10k | C17 | 100u |
| R18 | 12k | C18 | 10n |
| R19 | 33k | C19 | 10u |
| R20 | 39k | C20 | 1u |
| R21 | 10k | | |
| R22 | 39k | Q1 | 2N5087 |
| R23 | 39k | Q2 | 2N5088 |
| R24 | 10k | Q3 | 2N5088 |
| R25 | 47R | D1 | 1N914 |
| R26 | 20k | D2 | 1N914 |
| R27 | 220k | U1 | 4558 |
| R28 | 56k | U2 | LM358 |
| R29 | 10k | U3 | CD4047 |
| R30 | 56k | U4 | MN3007 |
| R31 | 33k | | |
| R32 | 6k8 | | |
| R33 | 1k | | |
| R34 | 100k | | |
| RV1 | C1M | | |
| RV2 | T100k | | |
| RV3 | B10k | | |

Wiring (bottom view):



Use metal enclosure connected to ground.
 Set trimpot to get modulation without distortion.
 Power supply: 9V DC

Bill of materials:

Resistors:

| | | |
|------|-------|------------------------------|
| 47R | 1pcs. | "R25" |
| 1k | 2pcs. | "R5 R33" |
| 2k2 | 1pcs. | "LED" |
| 3k3 | 1pcs. | "R12" |
| 6k8 | 2pcs. | "R7 R32" |
| 10k | 6pcs. | "R15 R16 R17 R21 R24 R29" |
| 12k | 1pcs. | "R18" |
| 20k | 1pcs. | "R26" |
| 22k | 1pcs. | "R13" |
| 33k | 3pcs. | "R10 R19 R31" |
| 39k | 4pcs. | "R14 R20 R22 R23" |
| 47k | 1pcs. | "R3" |
| 56k | 2pcs. | "R28 R30" |
| 68k | 1pcs. | "R8" |
| 82k | 1pcs. | "R9" |
| 100k | 1pcs. | "R34" |
| 120k | 1pcs. | "R6" |
| 180k | 1pcs. | "R4" |
| 220k | 2pcs. | "R2 R27" |
| 470k | 1pcs. | "R11" |
| 1M | 1pcs. | "R1" |

Potentiometers:

| | | |
|--------------|-------|-------|
| C1M | 1pcs. | "RV1" |
| B10k | 1pcs. | "RV3" |
| 100k Trimpot | 1pcs. | "RV2" |

Capacitors:

| | | |
|------|-------|----------|
| 150p | 1pcs. | "C9" |
| 180p | 1pcs. | "C15" |
| 470p | 1pcs. | "C10" |
| 2n7 | 1pcs. | "C14" |
| 3n3 | 1pcs. | "C6" |
| 4n7 | 1pcs. | "C13" |
| 10n | 2pcs. | "C3 C18" |
| 15n | 1pcs. | "C8" |
| 33n | 1pcs. | "C2" |
| 47n | 1pcs. | "C5" |

Electrolytic capacitors:

| | | |
|----------|-------|------------------|
| 1u | 3pcs. | "C4 C16 C20" |
| 2u2 Tant | 1pcs. | "C1" |
| 10u | 4pcs. | "C7 C11 C12 C19" |
| 100u | 1pcs. | "C17" |

Semiconductors:

| | | |
|--------|-------|---------|
| 1N914 | 2pcs. | "D1 D2" |
| 2N5087 | 1pcs. | "Q1" |
| 2N5088 | 2pcs. | "Q2 Q3" |
| 4558 | 1pcs. | "U1" |
| CD4047 | 1pcs. | "U3" |
| LM358 | 1pcs. | "U2" |
| MN3007 | 1pcs. | "U4" |
| LED | 1pcs. | |

Other:

| | | |
|-------------|-------|--|
| Footswitch | 1pcs. | |
| Jack socket | 2pcs. | |
| DC socket | 1pcs. | |
| Knobs | 2pcs. | |

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:

$$471 = 47 \times 10^1 \text{ pF} = 470 \text{ pF}$$

$$472 = 47 \times 10^2 \text{ pF} = 4700 \text{ pF} = 4,7 \text{ nF}$$

$$473 = 47 \times 10^3 \text{ pF} = 47000 \text{ pF} = 47 \text{ nF}$$

$$474 = 47 \times 10^4 \text{ pF} = 470000 \text{ pF} = 470 \text{ nF}$$

$$100 \text{ pF} = 100 \text{ p} = 100 = 101$$

$$220 \text{ pF} = 220 \text{ p} = 220 = 221$$

$$4,7 \text{ nF} = 4 \text{ n}7 = 0.0047 = 472$$

$$10 \text{ nF} = 10 \text{ n} = 0.01 = 103$$

$$100 \text{ nF} = 100 \text{ n} = 0.1 = 104$$

$$220 \text{ nF} = 220 \text{ n} = 0.22 = 224$$

$$470 \text{ nF} = 470 \text{ n} = 0.47 = 474$$

$$1000 \text{ nF} = 1 \mu\text{F} = 1 \mu = 105$$