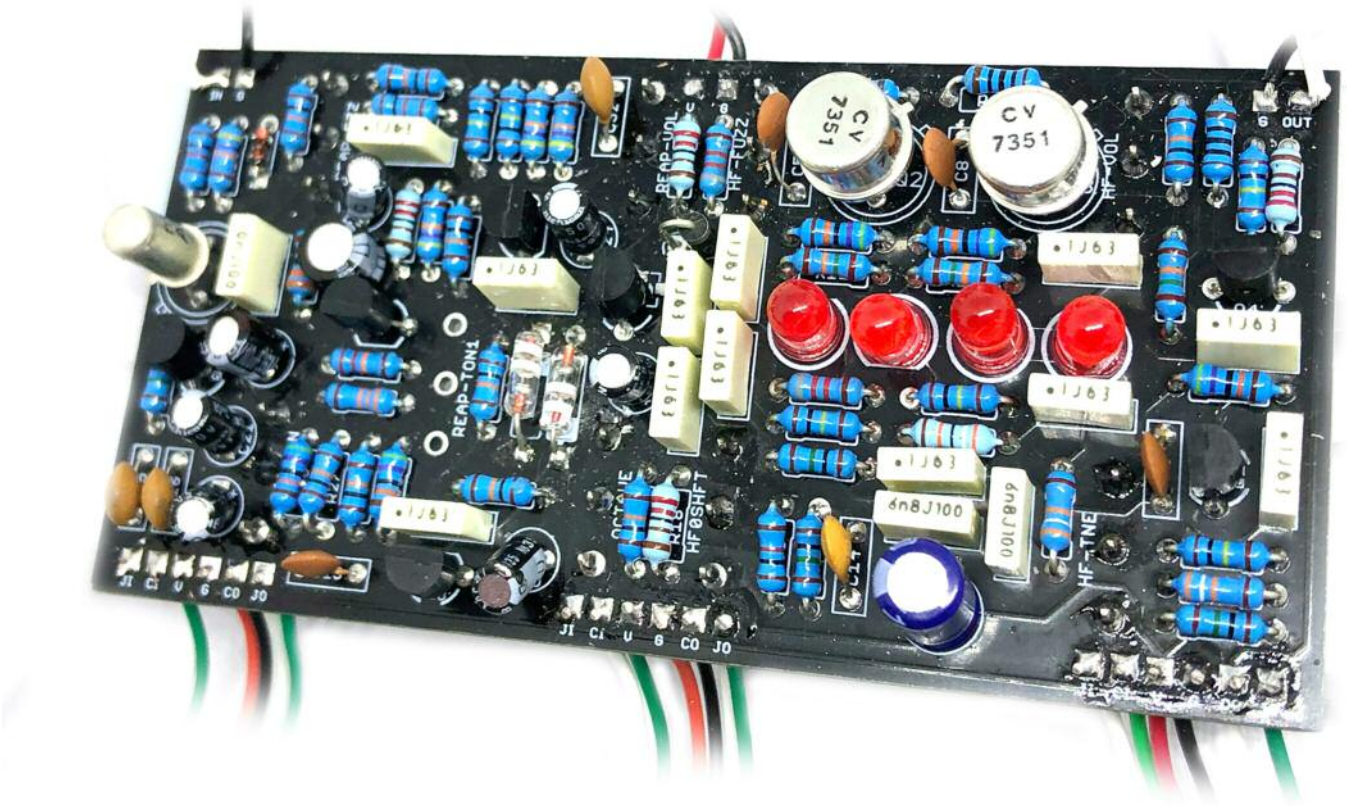
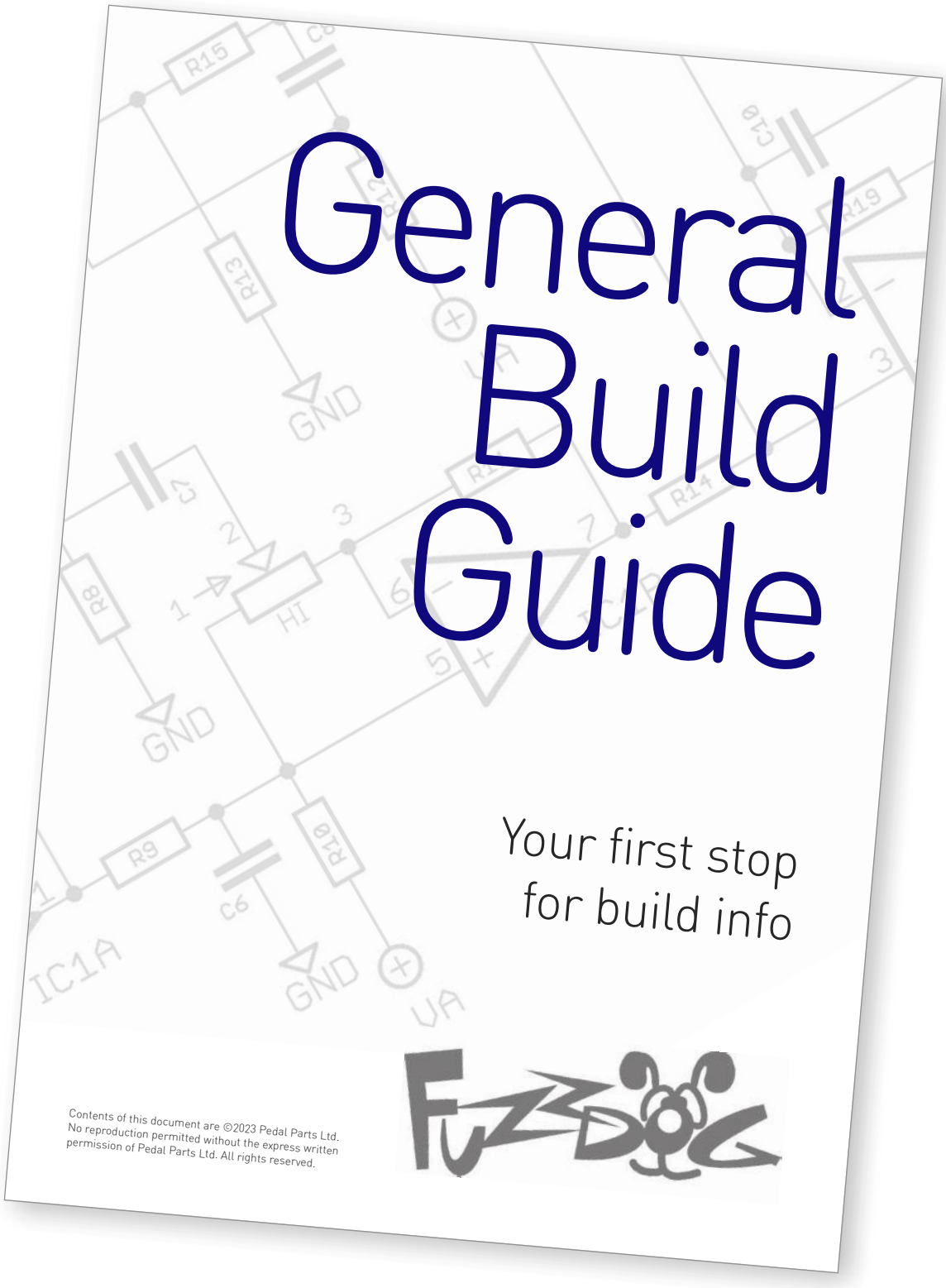



# Cloven Ripper

## Insane fuzz action with screaming octave-up

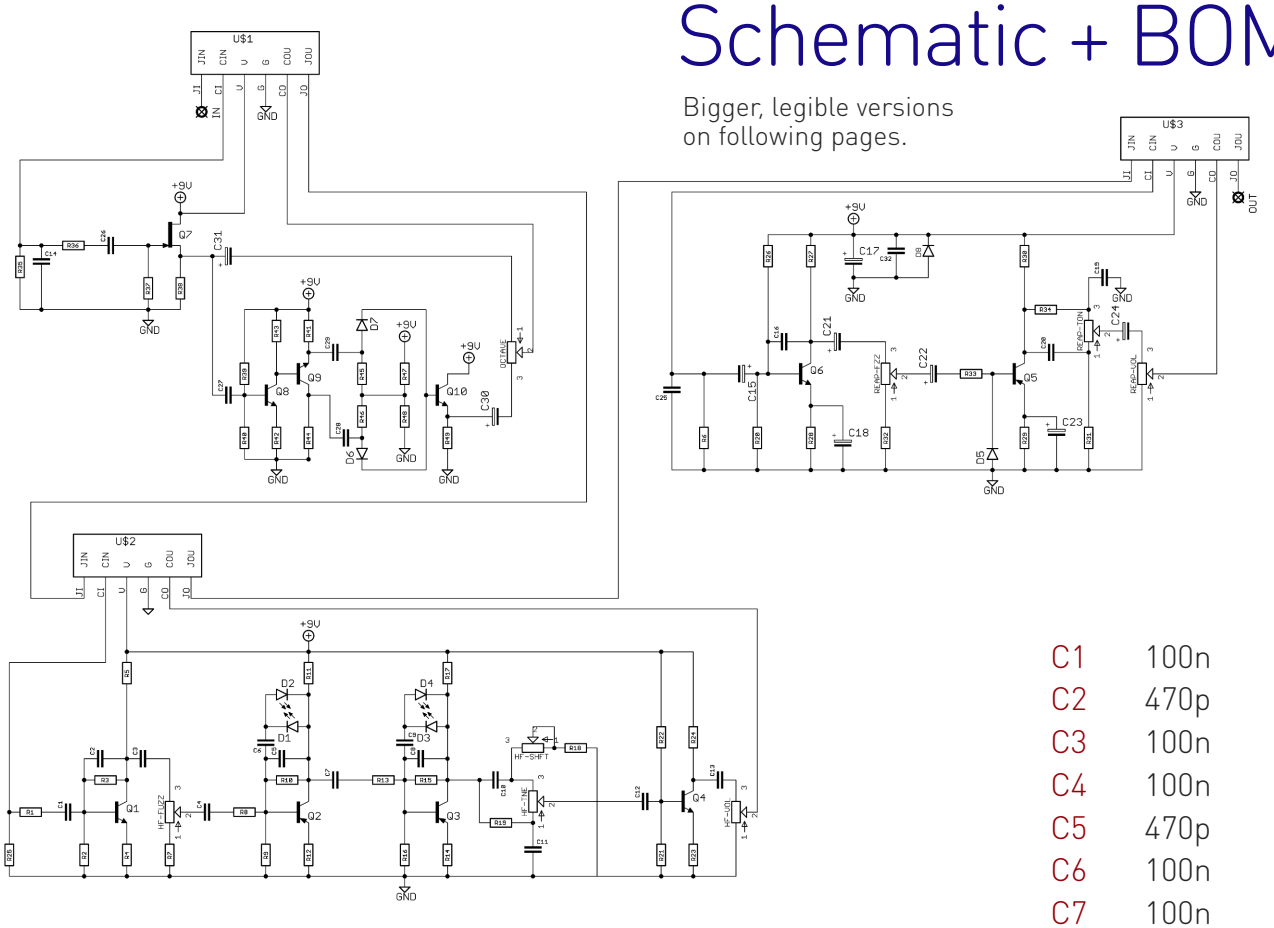
Before you dig in, ensure you download and read the **General Build Guide**.

It contains all the information you need for a successful outcome.



# Schematic + BOM

Bigger, legible versions
on following pages.



**See notes on next page.**

| | |
|---|---|
| R1 | 39K |
| R2 | 100K |
| R3 | 470K |
| R4 | 100R |
| R5 | 15K |
| R6 | 1M |
| R7 | 2K2 |
| R8 | 8K2 |
| R9 | 100K |
| R10 | 470K |
| R11 | 15K |
| R12 | 100R |
| R13 | 8K2 |
| R14 | 100R |
| R15 | 470K |
| R16 | 100K |
| R17 | 15K |
| R18 | 2K2 |
| R19 | 39K |
| R20 | 47K |
| R21 | 100K |
| R22 | 390K |
| R23 | 2K2 |
| R24 | 10K |
| R25 | 1M |
| R26 | 470K |
| R27 | 10K |
| R28 | 330R |
| R29 | 1K |
| R30 | 10K |
| R31 | 10K |
| R32 | 10K |
| R33 | 1K |
| R34 | 33K |
| R35 | 1M |
| R36 | 1K |
| R37 | 1M |
| R38 | 10K |
| R39 | 470K |
| R40 | 47K |
| R41 | 10K |
| R42 | 2K2 |
| R43 | 22K |
| R44 | 10K |
| R45 | 100K |
| R46 | 100K |
| R47 | 47K |
| R48 | 47K |
| R49 | 10K |

| | |
|---|---|
| Q1 | 2N3904 |
| Q2-3 | 2N1308 / CV7351[i] |
| Q4 | 2N3904 |
| Q5 | 2N1302 / AC176[ii] |
| Q6 | MPSA18 |
| Q7 | PF5102 / 2N5457[iii] |
| Q8 | 2N5089 |
| Q9 | 2N5087 |
| Q10 | 2N5089 |
| D1-4 | 5mm Red LED |
| D5 | 1N4148 |
| D6-7 | Ge / 1N4148[iv] |
| D8 | 1N4001 |
| HF-FUZZ | 50KB |
| HF-TONE | 100KB |
| HF-VOL | 1MA |
| HF-SHIFT | 25KB |
| RP-FUZZ | 250KB |
| RP-TONE | 100KB |
| RP-VOL | 100KA |
| OCTAVE | 50KB |

| | |
|---|---|
| C1 | 100n |
| C2 | 470p |
| C3 | 100n |
| C4 | 100n |
| C5 | 470p |
| C6 | 100n |
| C7 | 100n |
| C8 | 470p |
| C9 | 100n |
| C10 | 6n8 |
| C11 | 6n8 |
| C12 | 100n |
| C13 | 100n |
| C14 | 100p |
| C15 | 1u elec |
| C16 | 47p |
| C17 | 100u elec |
| C18 | 10u elec |
| C19 | 470p |
| C20 | 10n |
| C21 | 1u elec |
| C22 | 1u elec |
| C23 | 22u elec |
| C24 | 1u elec |
| C25 | 100p |
| C26 | 100n |
| C27 | 100n |
| C28 | 100n |
| C29 | 100n |
| C30 | 1u elec |
| C31 | 1u elec |
| C32 | 100n |

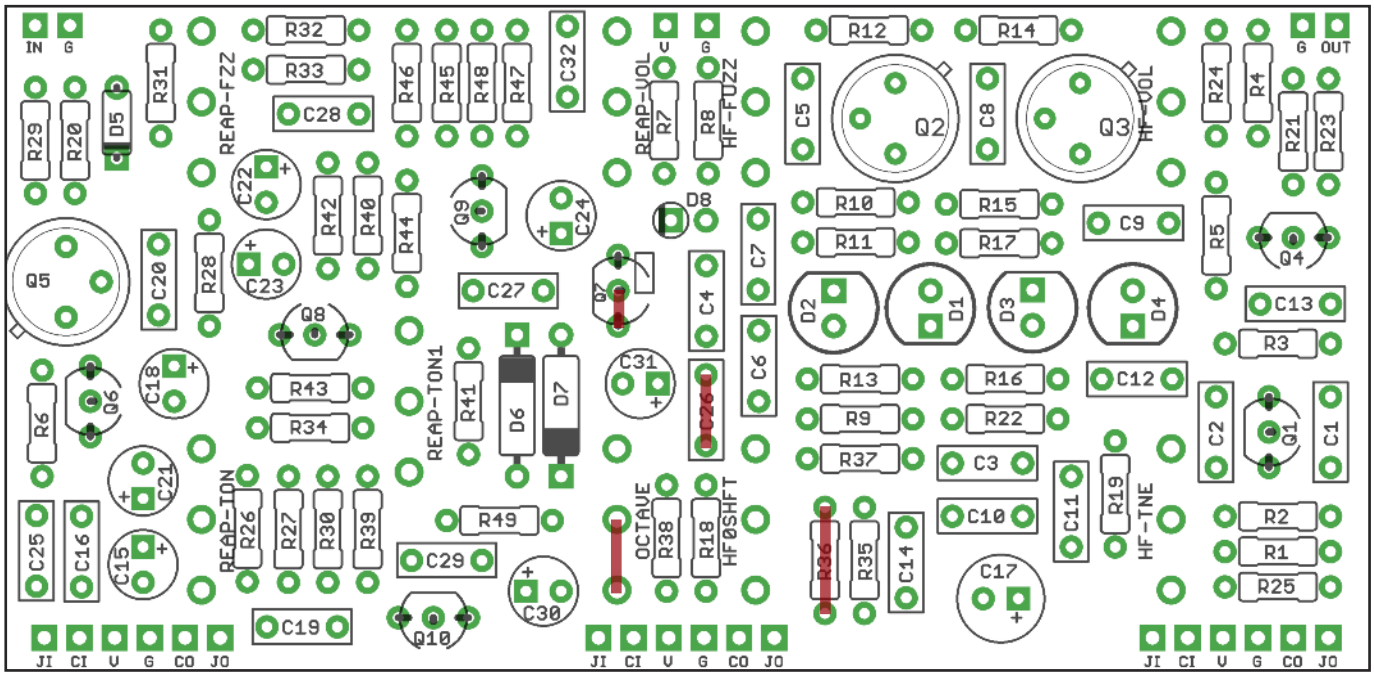
# Notes to the BOM

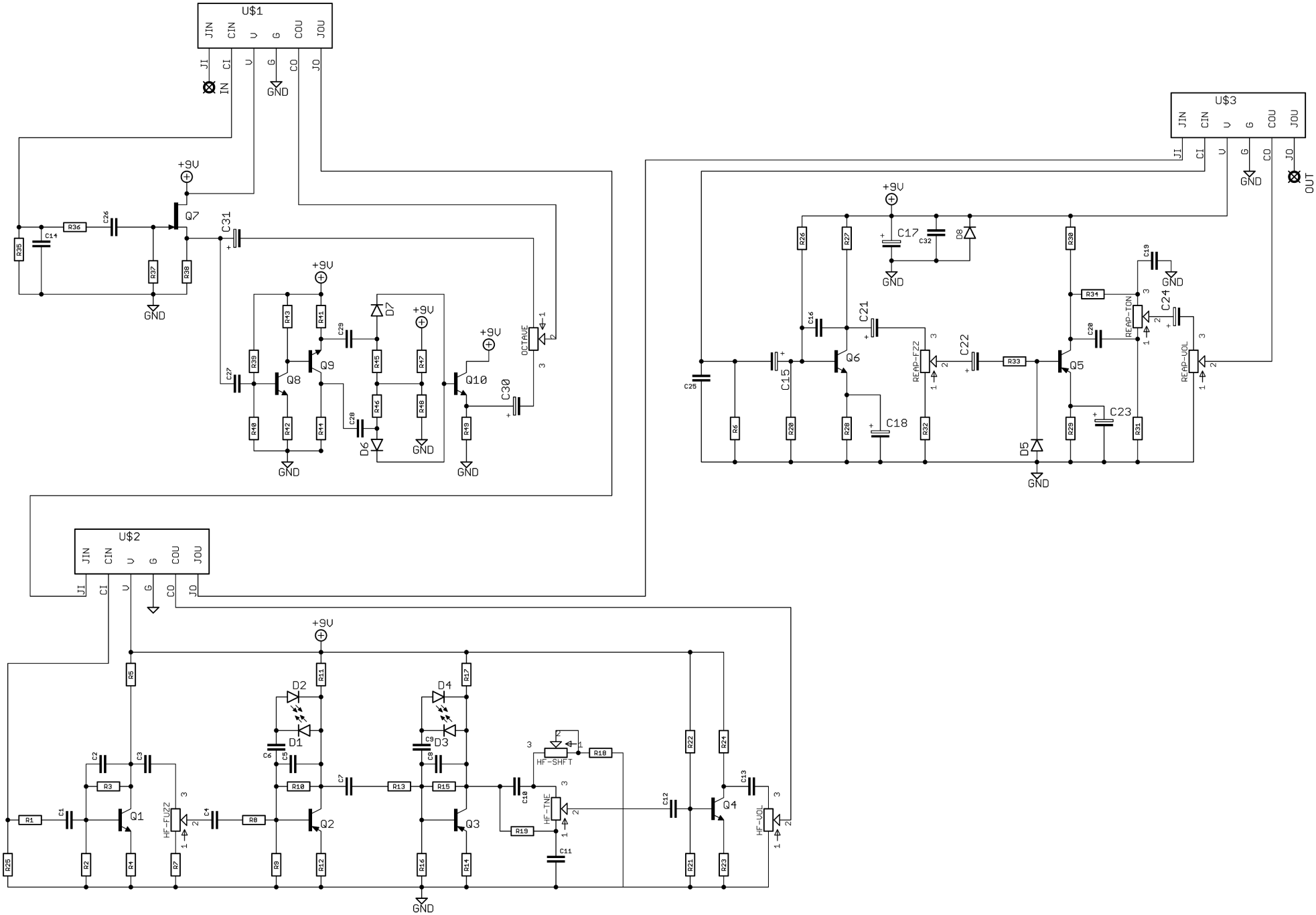
(i) CV7351 is the military equivalent of 2N1380. You could try other NPN germaniums in their place. You're looking for hFE between 150-200.

(ii) Again, other NPN germaniums could be used and it's unikely you'll hear a difference. Target gain range - 70-100hFE.

(iii) We've added a buffered input stage to the Octave section of the circuit so you can add an octave blend control. You can omit this section if you want to have the octave simply switched on or off with the footswitch with no control.
**To omit the buffer and octabe blend control leave out the parts marked green in the BOM and add jumpers as shown below.**

(iv) **We made an error laying out the PCB, and the parts for D6-7 were the wrong way around in the schematic (fixed on the schematic in this doc though)**. As such, 'normal' diodes such as 1N4148 should be reversed, i.e. striped end (cathode) to round pad. The Russian D9K we provide have the anode indicated by the double stripes, so these should be placed with the striped leg to the square pad. You can use silicon 1N4148 and get good results without matching. Germaniums need to be tested and matched closely for forward voltage to ensure a good octave-up effect. None of the other diodes on the PCB are affected, just D6-7.




U$1
JIN
CIN
U
G
COU
JOU
JI
CI
IN
GND
CO
JO
+9V
Q7
C31
R36
C26
C14
R35
R37
R38
Q8
Q9
Q10
D7
D6
C27
C28
C29
C30
R39
R40
R41
R42
R43
R44
R45
R46
R47
R48
R49
OCTAVE
U$2
U$3
OUT
Q1
Q2
Q3
Q4
Q5
Q6
D1
D2
D3
D4
D5
D8
C1
C2
C3
C4
C5
C6
C7
C8
C9
C10
C11
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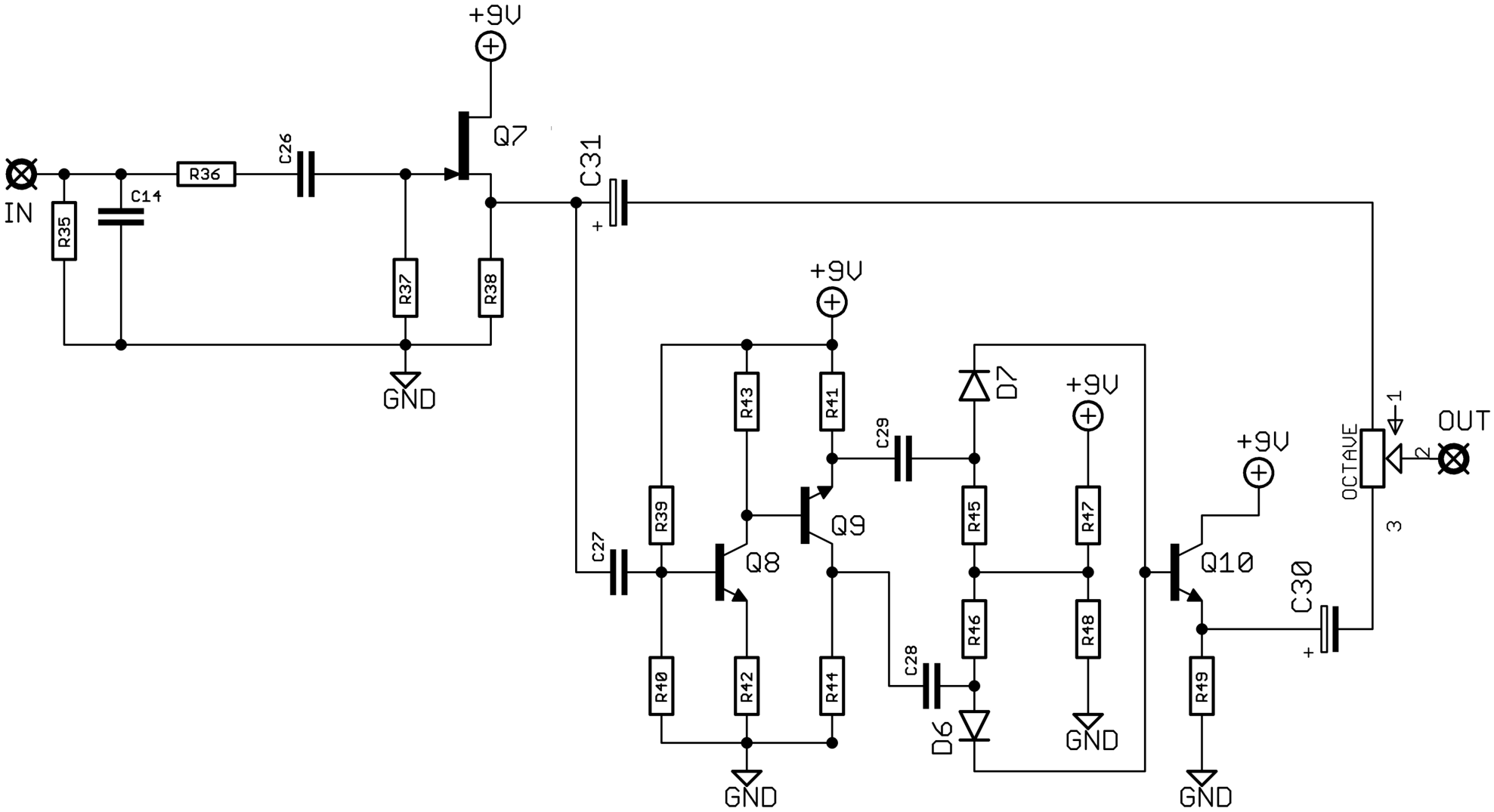
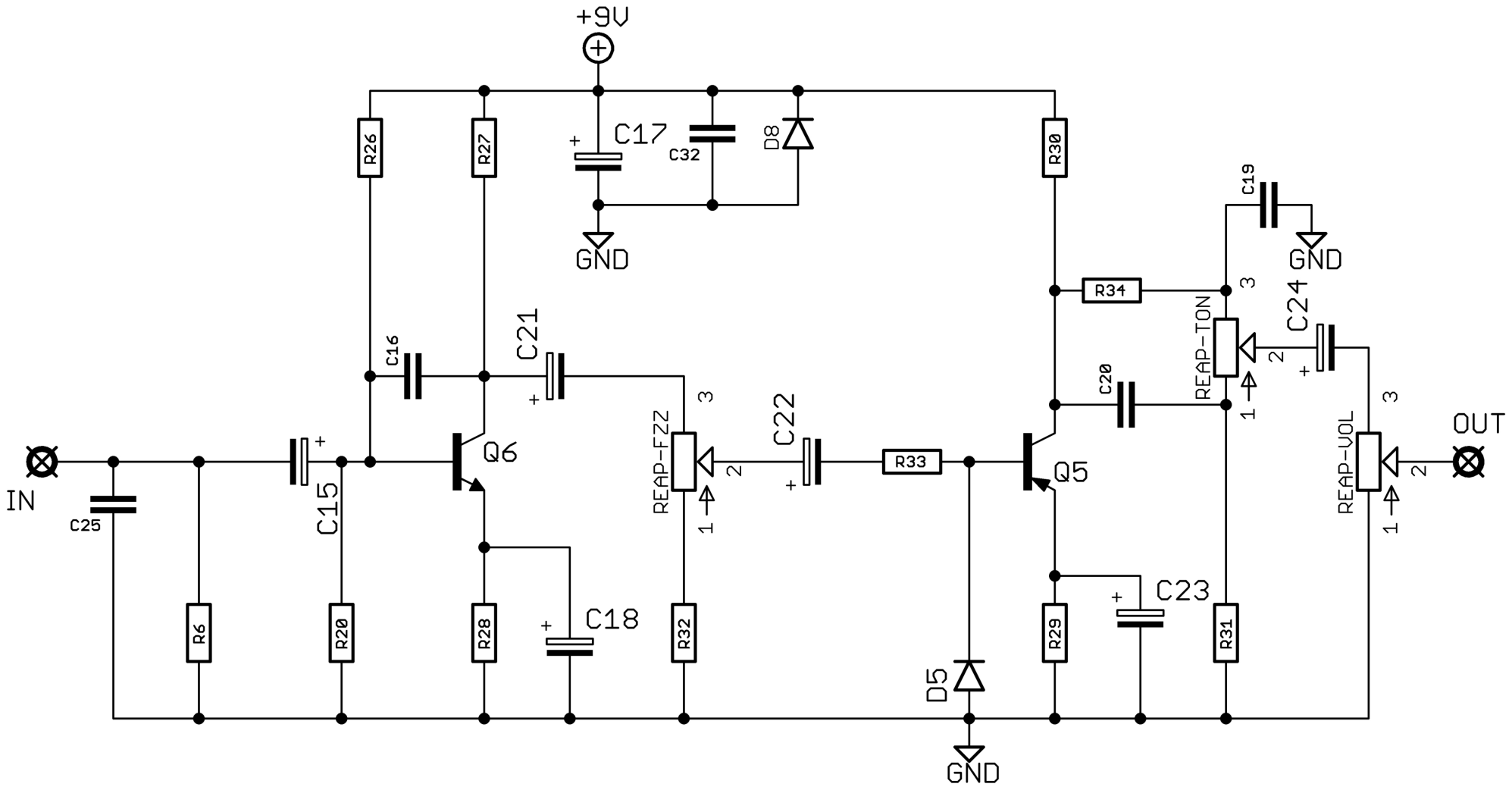
C24
C25
C32
R1
R2
R3
R4
R5
R6
R7
R8
R9
R10
R11
R12
R13
R14
R15
R16
R17
R18
R19
R20
R21
R22
R23
R24
R25
R26
R27
R28
R29
R30
R31
R32
R33
R34
HF-FUZZ
HF-SHFT
HF-TNE
HF-VOL
REAP-FZZ
REAP-TON
REAP-VOL

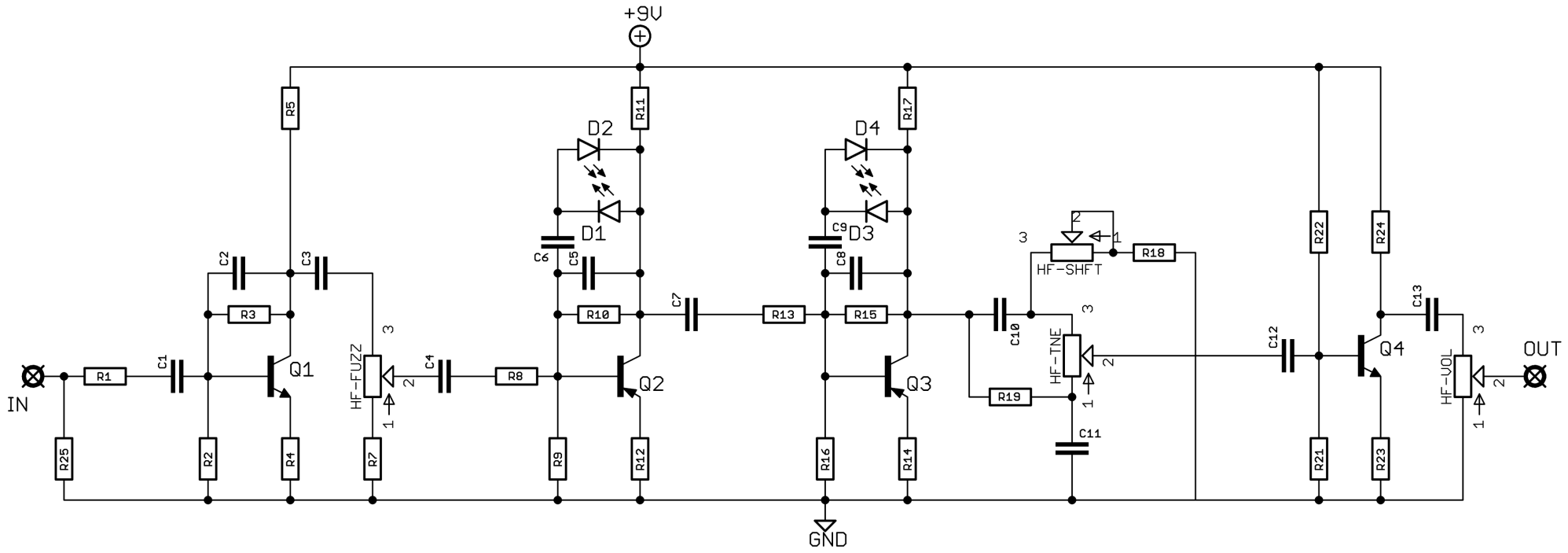
# Schematic - Octave Up Section

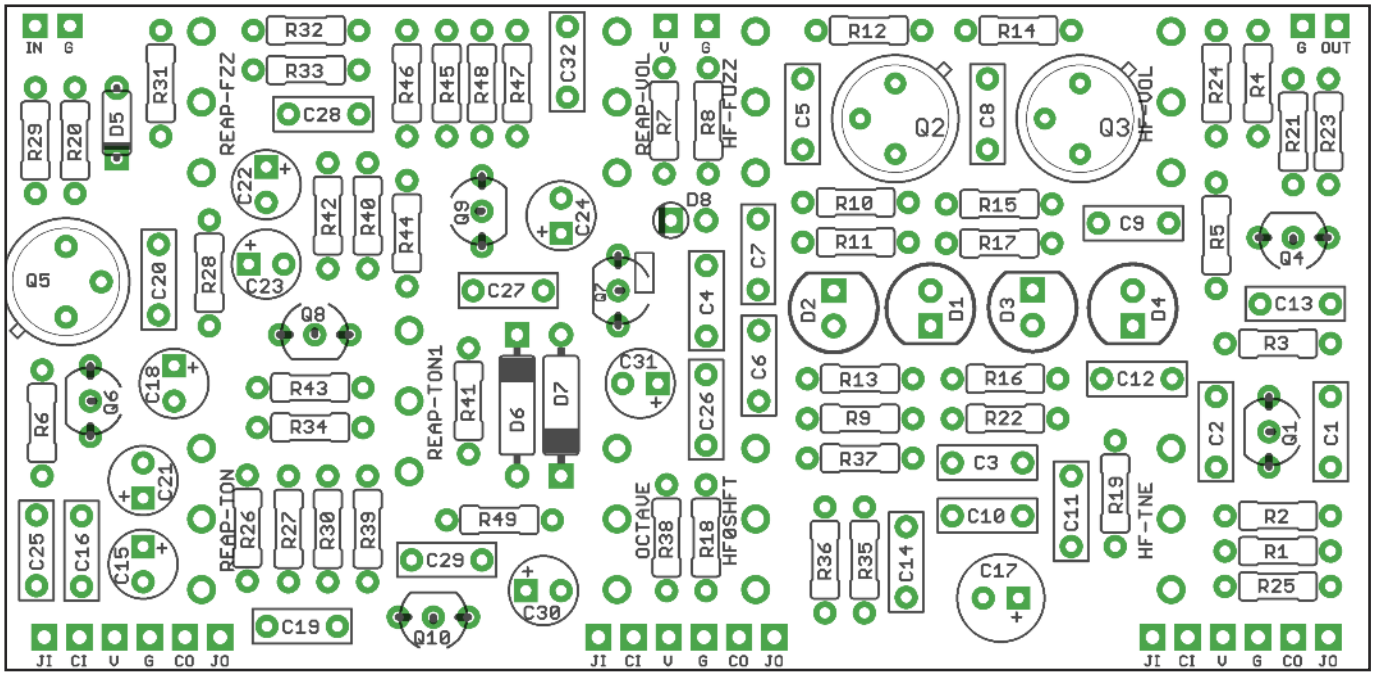


# Schematic - Ripper Section



# Schematic - Cloven Muff Section






PCB layout ©2020 Pedal Parts Ltd.

The power and signal pads on the PCB conform to the FuzzDog Direct Connection format, so can be paired with the appropriate daughterboards for quick and easy offboard wiring. Check the separate daughterboard document for details

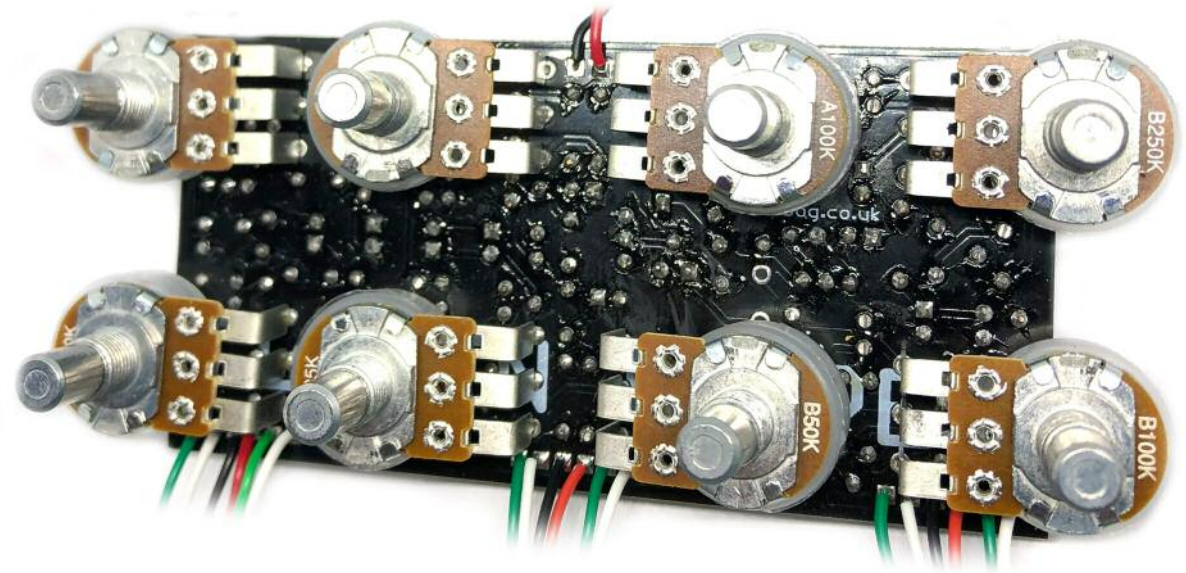
Be very careful when soldering the transistors and diodes. They're very sensitive to heat. Keep exposure to heat to a minimum (under 2 seconds) and leave a few seconds between soldering each leg.

The glass case on the Ge transistors is very delicate. Take care when bending the legs. Hold a the leg right up against the body with some small needle-nosed pliers to take the strain, and bend the leg with your finger.

You should solder all other board-mounted components before you solder the pots. Once they're in place you'll have no access to much of the board. Make sure your pots all line up nicely.

The best way to do that is to solder a single pin of each pot in place then melt and adjust if necessary before soldering in the other two pins. Same for the toggle switch. If your pots don't have protective plastic jackets ensure you leave a decent gap between the pot body and the PCB otherwise you risk shorting out the circuit.

Snap the small metal tag off the pots so they can be mounted flush in the box.

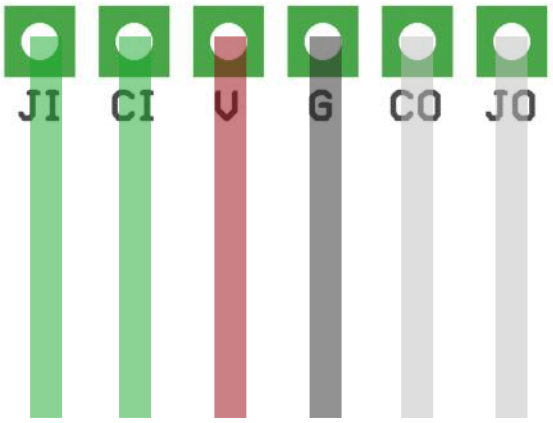


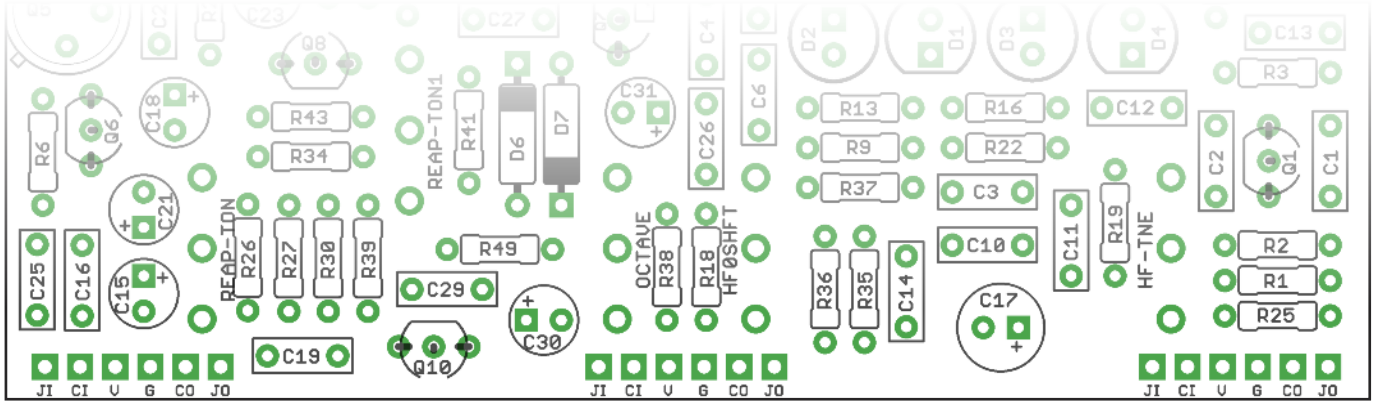
# Initial wiring

**USE WIRES! Our ribbon cables are unlikely to be of any use unless you've compromised your enclosure layout to line up the pads to daughterboards.**

Add long wires to the three sets of pads for offboard wiring, slightly longer than you'll need to wire them to the footswitch daughterboards for final assembly.

Use these to connect to your test rig, or wire them up as shown on the next page. ou should test each of the three circuits individually.



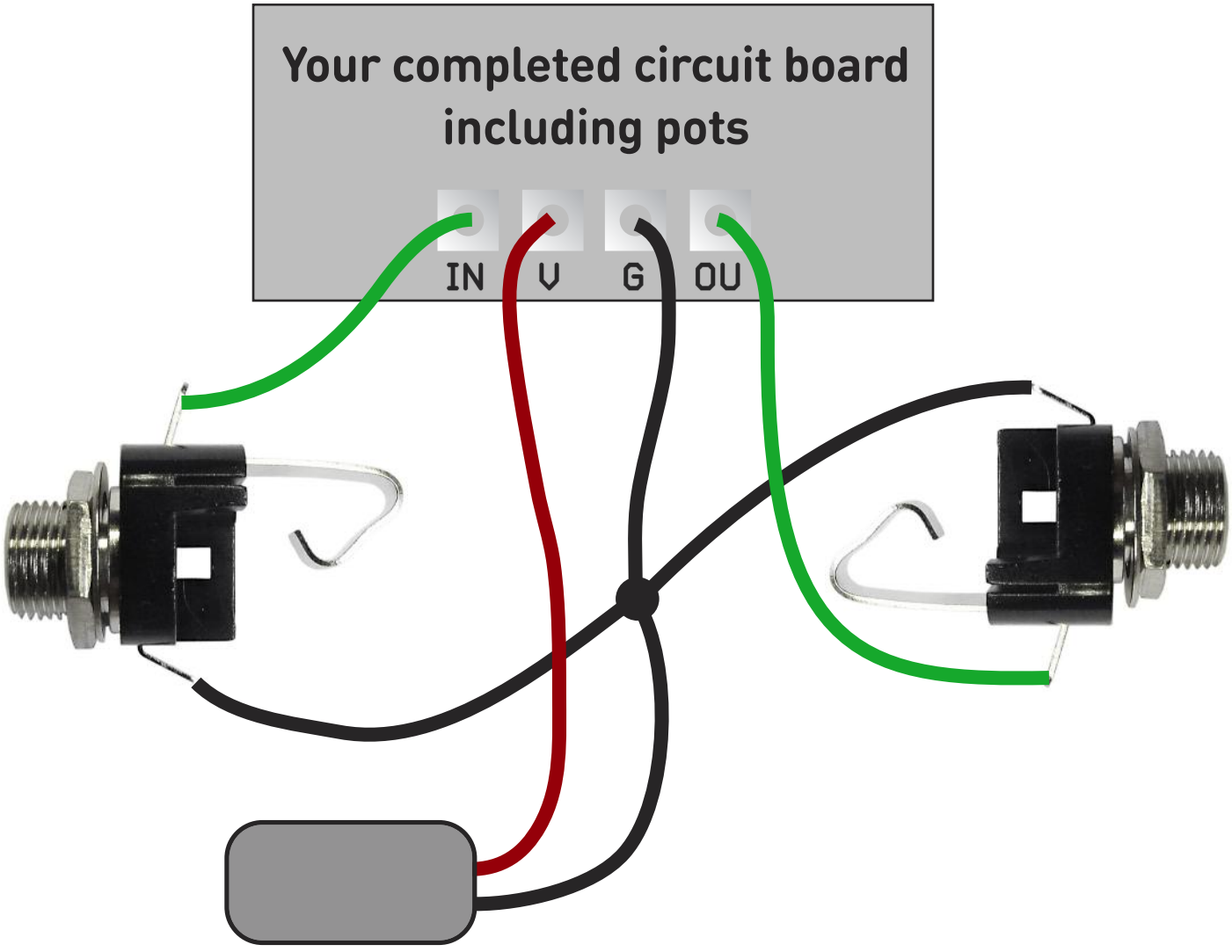

**RIPPER** **OCTAVE** **MUFF**

# Testing

## UNDER NO CIRCUMSTANCES will troubleshooting help be offered if you have skipped this stage. No exceptions.

Solder some nice, long lengths of wire to the board connections for 9V, GND, IN and OUT. Connect IN and OUT to the jacks as shown. Connect all the GNDs together (twist them up and add a small amount of solder to tack it). Connect the battery + lead to the 9V wire, same method. Plug in. Go!

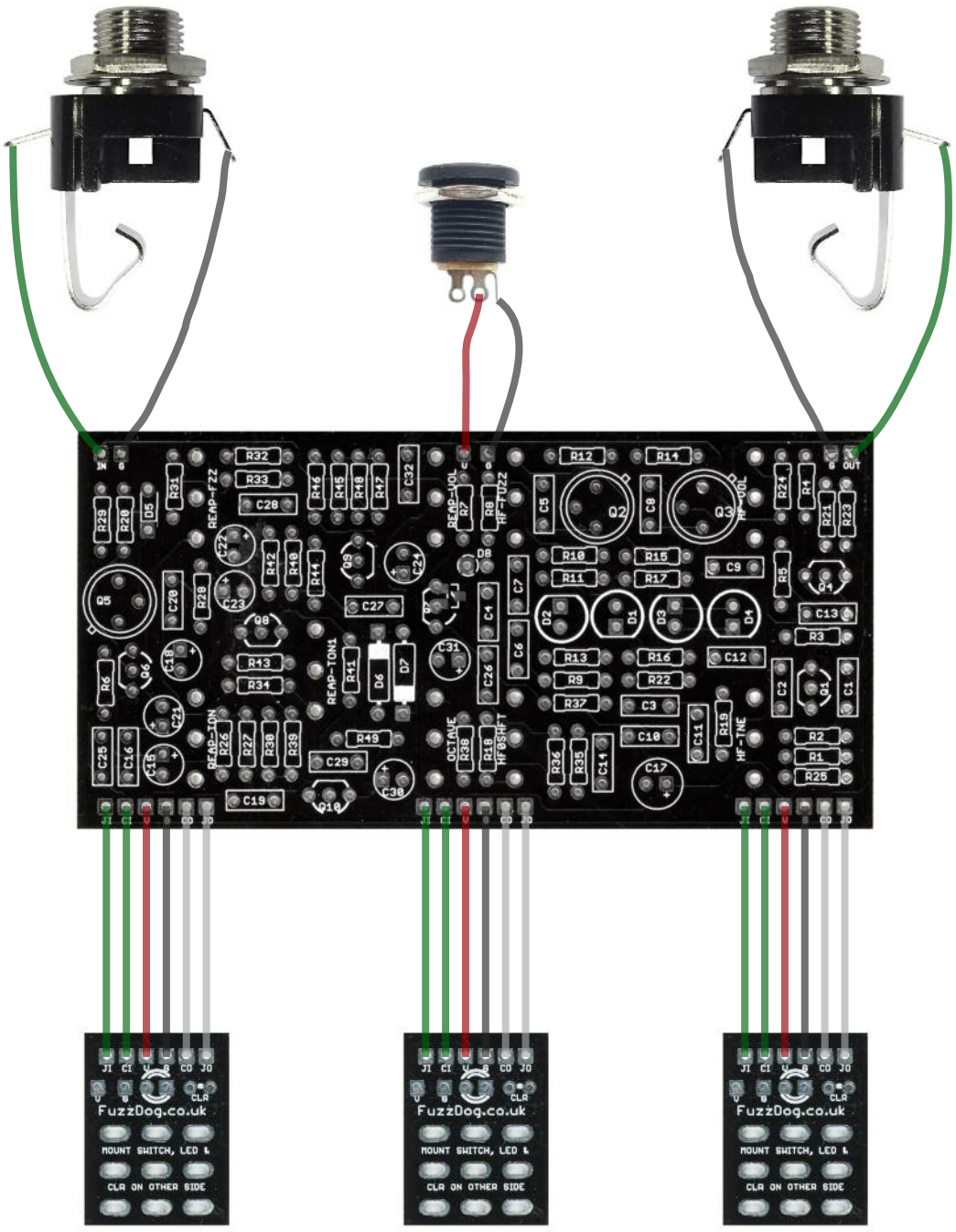
If you have a circuit tester (we sell a few!) just use that as normal.



# Wire it all up

## Not a lot to it really...

The pads for connecting the jacks and DC socket are at the top of the main pcb. Connect up the daughterboards as shown. Pads are named the same on both. There's a current limiting resistor (CLR)  for the LED on each daughterboard.



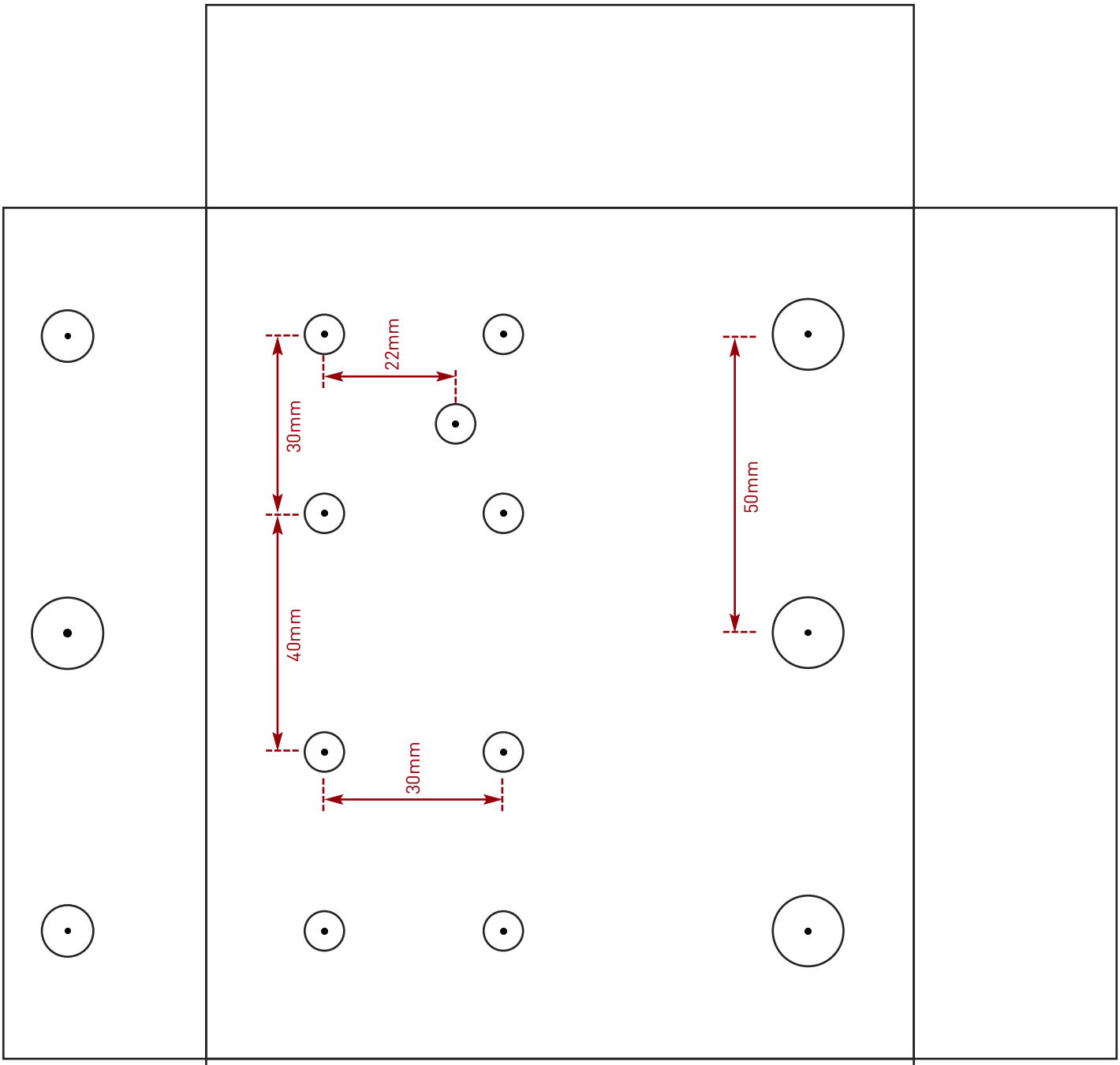
# Drilling template

## Hammond 1590XX

It's a good idea to drill the pot and toggle switch holes 1mm bigger if you're board-mounting them.

Recommended drill sizes:

| | |
|---|---|
| Pots | 7mm |
| Jacks | 10mm |
| Footswitch | 12mm |
| DC Socket | 8/12mm |
| Toggle switches | 6mm |




For 1590DD, only the pot positions are critical. Just check your other components will fit where you want them. Original Hammond enclosures have an extra screw in the middle of the longest side so allow for that.