

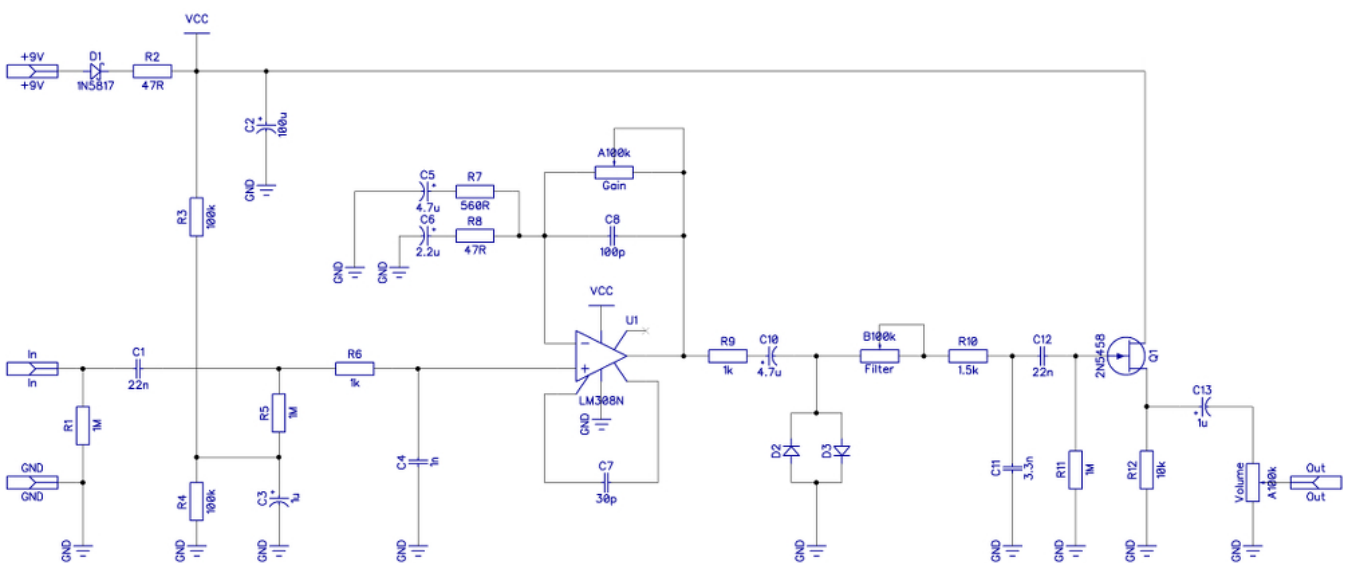


# The Ugly

Based on Pro-Co Rat  
 PCB artwork ©2015 drdFX  
 Release date: 2015.10.01.

**The Ugly is a clone of the iconic Rat distortion pedal of the company Pro-Co.**

## SCHEMATIC

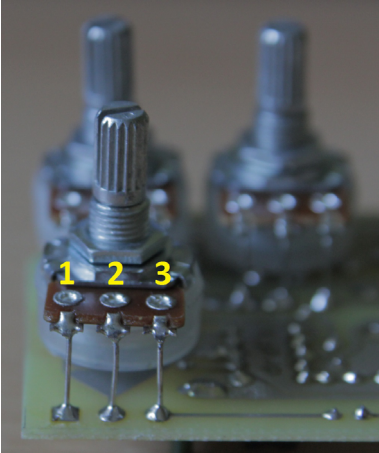


## BOM

Resistors		Capacitors		Semiconductors		Others	
R1	1M	C1	22n	D1	1N5817	Filter	B100k
R2	47R	C2	100u	D2	Diode*	Gain	A100k
R3	100k	C3	1u	D3	Diode*	Volume	A100k
R4	100k	C4	1n	U1	LM308N		
R5	1M	C5	4.7u	Q1	2N5458		
R6	1k	C6	2.2u				
R7	560R	C7	30p				
R8	47R	C8	100p				
R9	1k	C9	4.7u				
R10	1.5k	C10	3.3n				
R11	1M	C11	22n				
R12	10k	C12	1u				

\*For diode selection see the Notes

## NOTES



The pots are board mounted to the bottom of the board. The square pads mark the lug 1, for the numbering of the lugs see the picture. Since the part number is quite low it is possible to build the effect into a 1590A box too. That version however has simple pads for connecting the pots with wires.

The numbering is the same as on the picture.

One of the most important parts of the Rat is the opamp: the original used the LM308N and later the OP07.

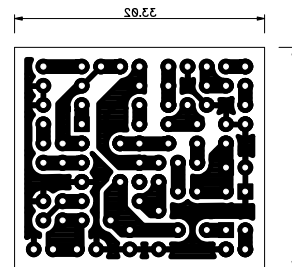
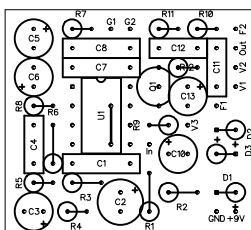
The LM308N is out of production, still available though in some stores or on ebay. OP07 is still in production, widely available and also cheaper. I have tried both and could hear little to no difference. You can try other single opamps as well, but then

in most cases you don't need the C7 30pF compensation cap. I tried TL071, but was quite disappointed: the sound was harsh and thin. Also the type of D2 and D3 are not marked. The original used 1N914, then later 3mm red LEDs in the Rat2 and Ge diodes in the Turbo Rat. I suggest you socket them and experiment, you could even try asymmetric configurations (e.g.: LED + 1N4148 gave me nice results). C11 can be lowered to get a bit more highs, I usually choose 2.2nF. You could go lower too, but then the effect becomes too harsh for my taste. Q1 is the JFET for the output buffer. The original had 2N5458 in it, but since JFETs are becoming more and more rare you might not find this particular part. Don't worry, actually any type of JFET will fit here. I tried J113, J202 and 2N5457, they all worked fine. Just mind the pinout as that might be different. I guess even BJTs would fit without any modifications if you want to save your precious JFETs. Socket and try it.

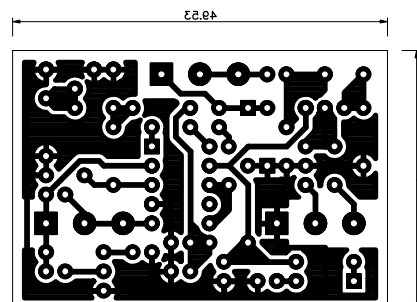
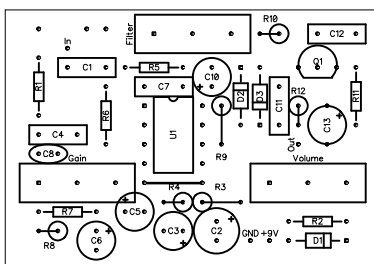
## LAYOUT

This effect can be built in both the 1590B and the 1590A size.

1590A layout

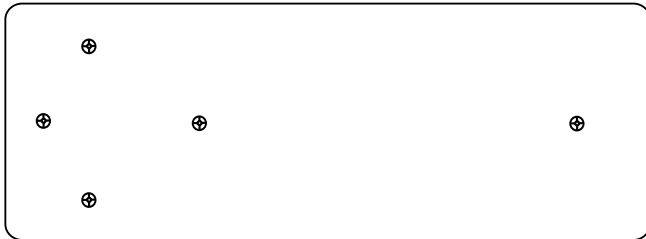


1590B/125B layout

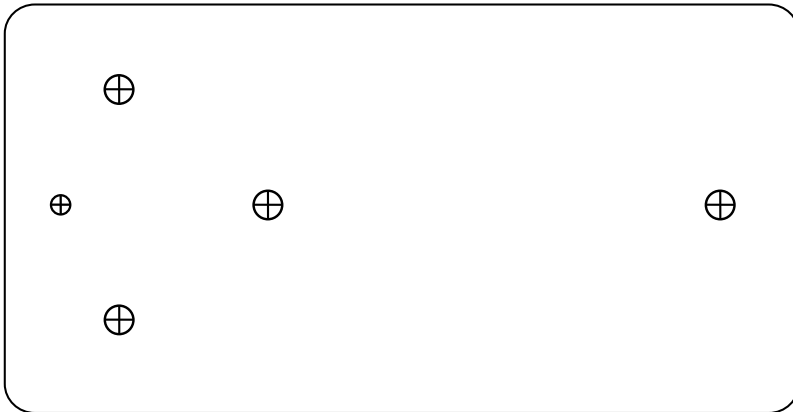


## DRILLING TEMPLATES

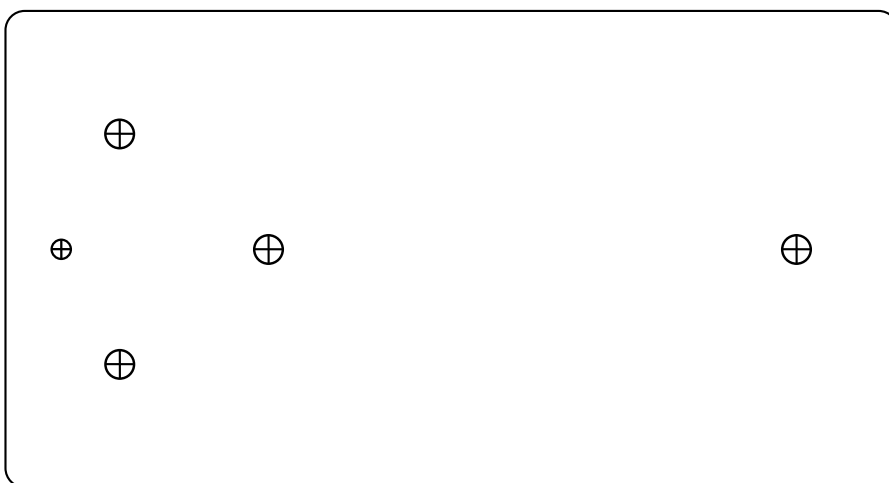
This effect has a smaller version that fits 1590A and a larger version that is meant for 1590B/125B. Here are the drilling templates for them:



1590A



1590B



125B