

RUNT2020

FX TYPE: Distortion

Based on the ProCo® Rat™

Enclosure Size: 1590A

"Softie" compatibility: none

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Overview

RAT: The greatest distortion of all time.

It is part of the “holy trinity” of dirt pedals that nearly every rock guitar player has owned or played through at some point (the others being the Tube Screamer™ and Big Muff™). But, unlike the smooth Tube Screamer™ or the ultra-heavy Muff™, the Rat™ is more like a distant uncle. You know, the one that always smells like stale cigars and bottom-of-the-well whiskey; rude, abrasive and sometimes just plain ol’ mean.

While the Rat™ lacks refinement (and pushes the boundaries on acceptable signal to noise ratio) it makes up for it with lots of character. It is a textured distortion; like putting a fine layer of gritty sand over your guitar tone. One can almost imagine ripping fat riffs while playing “Round and Round” at your local bar gig, flipping your long mane of hair while the ladies swoon over your tiger striped spandex. Well, maybe that’s just me.

New for 2020:

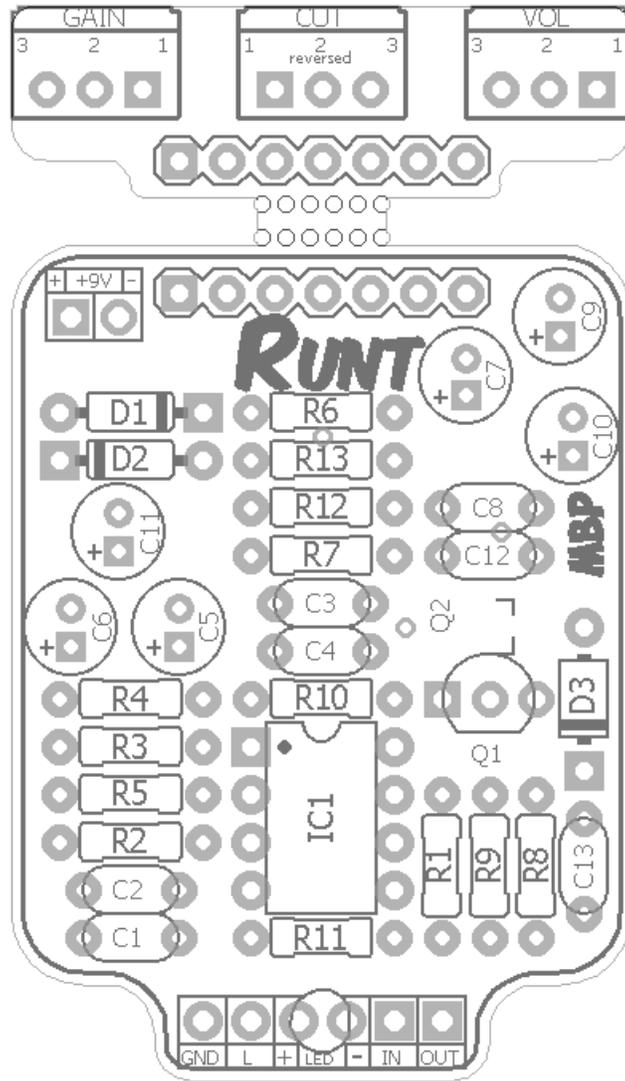
- Layout updated to conform to current style of 1590A projects.
- Added surface mount option for the JFET output buffer.

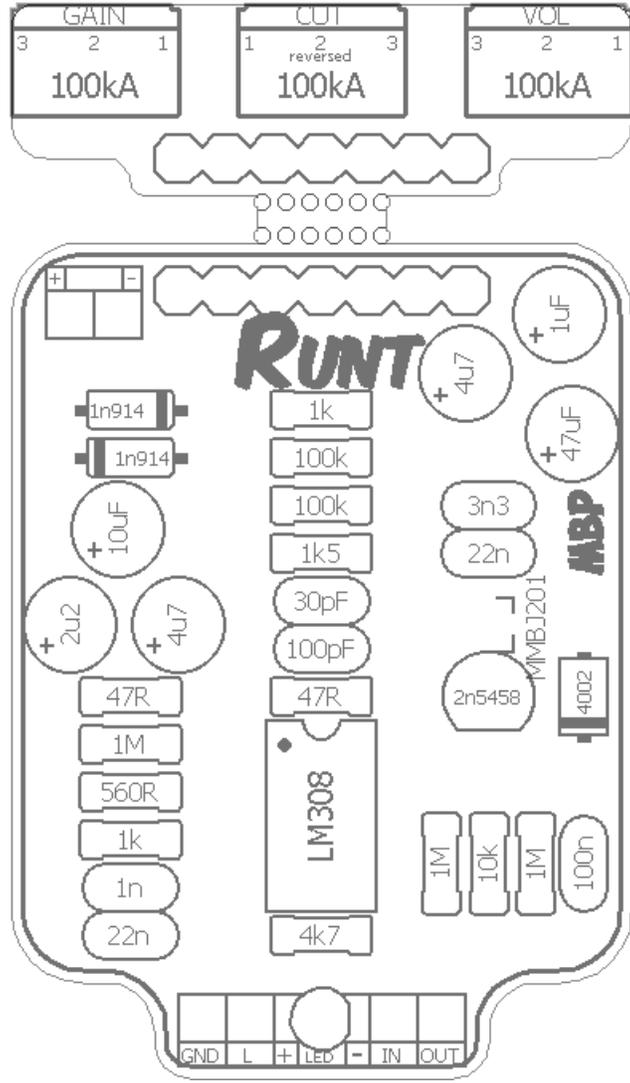
Controls

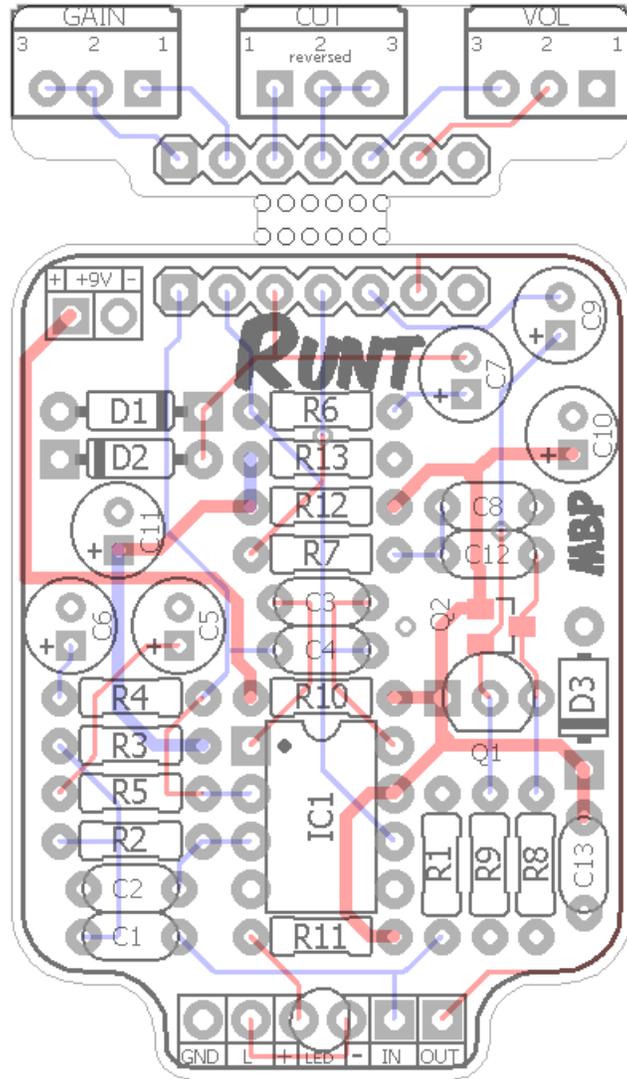
- **Self-explanatory**

Terms of Use: You are free to use purchased **Runt2020** circuit boards for both DIY and small commercial operations. You may not offer **Runt2020** PCBs for resale or as part of a “kit” in a commercial fashion. Peer to peer re-sale is fine, though.

Technical assistance for your build(s) is available via the [madbeanpedals forum](#). Please go there rather than emailing me for assistance on [builds](#). This is because (1) I’m not always available to respond via email in a timely and continuous manner, and (2) posting technical problems and solutions in the forum creates a record from which other members may benefit.







| Resistors | | Caps | | Diodes | |
|-----------|------|------|-------|-------------|--------|
| R1 | 1M | C1 | 22n | D1 | 1n914 |
| R2 | 1k | C2 | 1n | D2 | 1n914 |
| R3 | 1M | C3 | 30pF | D3 | 1N4002 |
| R4 | 47R | C4 | 100pF | Transistors | |
| R5 | 560R | C5 | 4u7 | Q1 | 2n5458 |
| R6 | 1k | C6 | 2u2 | IC | |
| R7 | 1k5 | C7 | 4u7 | IC1 | LM308 |
| R8 | 1M | C8 | 3n3 | Pots | |
| R9 | 10k | C9 | 1uF | CUT | 100kA |
| R10 | 47R | C10 | 47uF | GAIN | 100kA |
| R11 | 4k7 | C11 | 10uF | VOL | 100kA |
| R12 | 100k | C12 | 22n | | |
| R13 | 100k | C13 | 100n | | |

| Value | Qty | Type | Rating |
|--------|-----|--------------------------|----------|
| 47R | 2 | Metal / Carbon Film | 1/4W |
| 560R | 1 | Metal / Carbon Film | 1/4W |
| 1k | 2 | Metal / Carbon Film | 1/4W |
| 1k5 | 1 | Metal / Carbon Film | 1/4W |
| 4k7 | 1 | Metal / Carbon Film | 1/4W |
| 10k | 1 | Metal / Carbon Film | 1/4W |
| 100k | 2 | Metal / Carbon Film | 1/4W |
| 1M | 3 | Metal / Carbon Film | 1/4W |
| 30pF | 1 | Ceramic / MLCC | 16v min. |
| 100pF | 1 | Ceramic / MLCC | 16v min. |
| 1n | 1 | Film | 16v min. |
| 3n3 | 1 | Film | 16v min. |
| 22n | 2 | Film | 16v min. |
| 100n | 1 | Film | 16v min. |
| 1uF | 1 | Low-Profile Electrolytic | 16v min. |
| 2u2 | 1 | Low-Profile Electrolytic | 16v min. |
| 4u7 | 2 | Low-Profile Electrolytic | 16v min. |
| 10uF | 1 | Low-Profile Electrolytic | 16v min. |
| 47uF | 1 | Low-Profile Electrolytic | 16v min. |
| 1n914 | 2 | | |
| 1N4002 | 1 | | |
| 2n5458 | 1 | or, 2n5457, MMBFJ201 | |
| LM308 | 1 | or, OP07 | |
| 100kA | 3 | PC Mount | 9mm |

30pF MLCC:

<https://www.mouser.com/ProductDetail/80-C317C300J5G>

- You can sub a 33pF cap in place of the 30pF (MLCC, ceramic, etc).

Low-profile Electrolytic caps:

<http://smallbear-electronics.mybigcommerce.com/electrolytic-radial-low-profile-16v-1-f-100-f/>

2n5458:

<http://smallbear-electronics.mybigcommerce.com/transistor-fet-2n5458/>

MMBFJ201:

<https://www.mouser.com/ProductDetail/512-MMBFJ201>

LM308:

<http://smallbear-electronics.mybigcommerce.com/ic-lm308n/>

<http://smallbear-electronics.mybigcommerce.com/ic-ua308hc/>

OP07:

<https://www.mouser.com/ProductDetail/595-OP07CP>

Low-profile 8-pin socket (optional):

<https://www.mouser.com/ProductDetail/575-343308>

9mm PC Mount pots:

<http://smallbear-electronics.mybigcommerce.com/alpha-single-gang-9mm-pc-mount/>

Thinline DC Jack:

<http://smallbear-electronics.mybigcommerce.com/dc-power-jack-all-plastic-unswitched-2-1-mm/>

Enclosed Mono:

<http://smallbear-electronics.mybigcommerce.com/1-4-in-mono-enclosed-jack/>

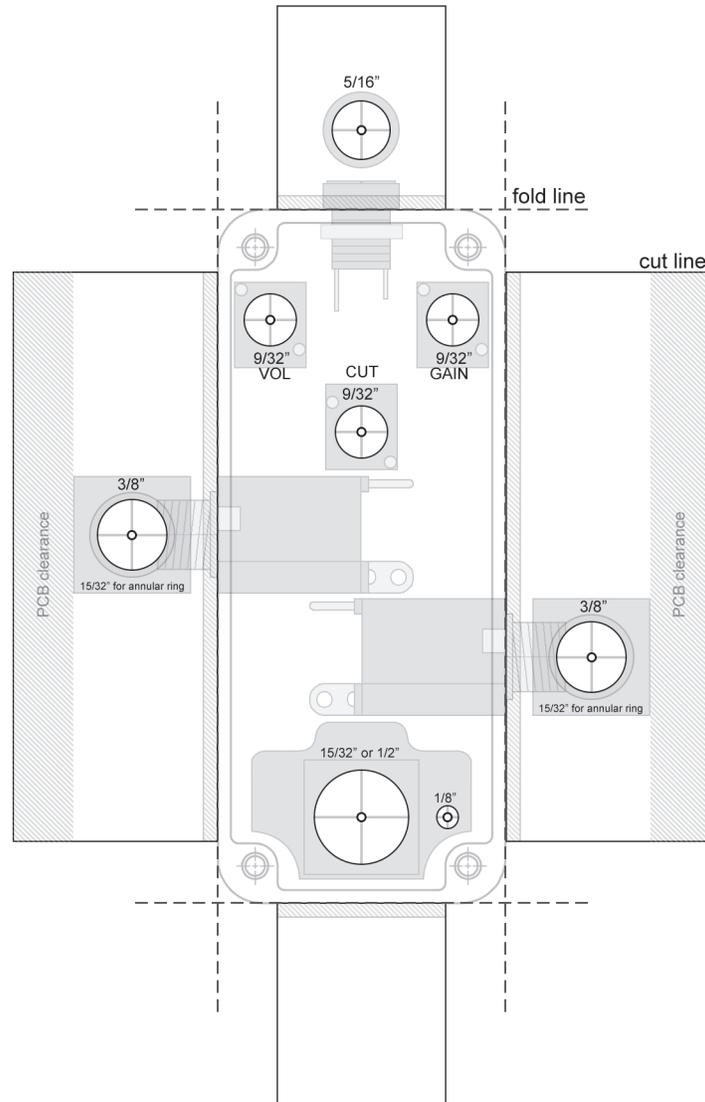
<http://smallbear-electronics.mybigcommerce.com/1-4-in-mono-enclosed-switchcraft-111x/>

Lumberg Mono:

<http://smallbear-electronics.mybigcommerce.com/lumberg-1-4-compact-shrouded-mono-jack/>

- Be sure to separate the two boards before you begin populating.
- The Cut pot is soldered to the bottom of the Pots board. Make sure you solder each pot on the appropriate side! The top of the board reads Gain - Cut (reversed) - Vol left to right.
- If you do not have a 2n5458, you can sub a 2n5457 or MPF102. If you have no through-hole JFETs, you can use the SMD equivalent: MMBFJ201. Only solder in one transistor!
- The OP07 is an excellent alternative to the LM308. Try it!

Note: Drill Guides are approximate and may require tweaking depending on the types of jacks, switches and pots you use.



- This template will work for either mono enclosed jacks or the “Lumberg” style.
- It uses the “Thinline” style DC Jack.
- Shown with an mbp 3PDT-02 bypass board (not required).

| IC1 | OP07 |
|-----|--------|
| 1 | 9.27 |
| 2 | 4.66 |
| 3 | 4.23 |
| 4 | 0 |
| 5 | ignore |
| 6 | 4.66 |
| 7 | 9.37 |
| 8 | 9.27 |

| Q1 | 2n5458 |
|----|--------|
| D | 9.33 |
| S | 1.61 |
| G | 0 |

- 9.42vDC One Spot
- Current Draw: ~ 2mA

