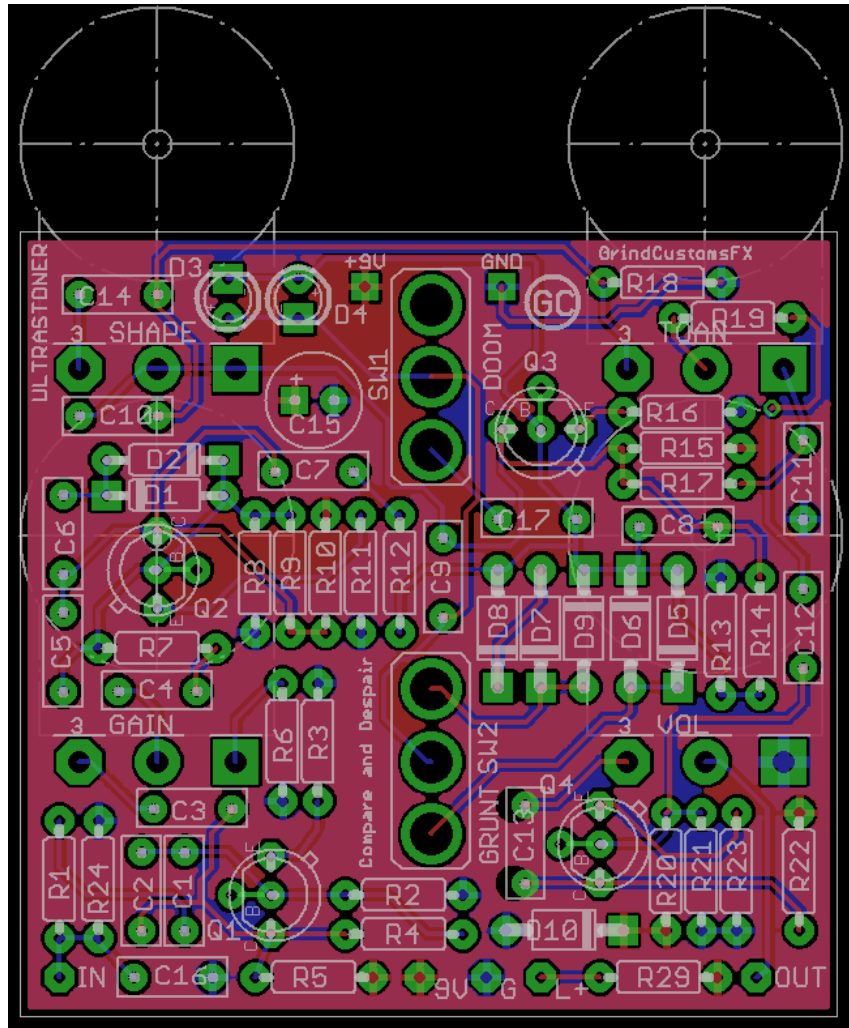


# GRIND CUSTOMS FX

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## ULTRASTONER



### GROUP HUG

This project is the result of an unholy alliance of four people in three different countries. Firstly there's the PCB elf Forrest (CultureJam) who designed the PCB and put up with the many changes we kept requesting (can I have the quote pleasee?). Next Rej brings the doom from the ice-cold north. Finally Cleggy and myself (Juansolo) in the land of fog, swore a bit and did some stuff with calculators.

### OVERVIEW

The UltraStoner Mk2 is the 'standard' build on this PCB. Its brief was to be ball-shakingly awesome, which it is. But being a muff you can build other slightly less awesome variants on it too. So it was only right to make sure you can build all the old favorites on there, along with some funky mods.

Henceforth cometh the table of muffage...

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## TABLE OF MUFFAGE

The table on page 3 contains a variety of Muff recipes can be created on this board. The values in purple are suggestions should you wish to add the shape pot and doom switch to some older designs that don't have them as standard. With the recommended values the idea is that the shape pot all the way counter clockwise will be stock and all the way clockwise it should be flat or something like. It might seem quite subtle on some builds, but it could help cut through the mix. If you want to stay stock, just omit the shape pot and cap.

We've found that values between 1nF and 2n2 seem to be the sweet spot for the doom switch on other builds. Socket and see, as we say in the DIY world. Otherwise again, just omit the switch and cap if you don't want it.

The second stage clippers are switchable to your taste. If you don't want to do that however, omit the switch and just fit the stock diodes in place of the LEDs (D3-4).

R19 is only used in the Ultrastoner layout and on all other layouts it needs to be a jumper or OR resistor. This is a throwback to the muff on which it was originally based. Essentially it reduces the signal by about 25% before Q4 to stop it compressing as much with the gain up. It's another place you can experiment if you wish.

Cx and Cy are not catered for on this layout so these need adding as stated.

Due to the tightness of layout, for the caps greater than 220nf, MLCC are recommended.

Doom is an SPDT on/on. Grunt is a SPDT on/off/on. Omit the LEDs in D3-D4 if you want the centre position to be a diode lift (not really recommended).

## TRANSISTOR CHOICES

The original EHX muffs used a selection of transistors, usually with a quite high hfe, that are unobtainable now in those sorts of ranges. So you'll want to use an alternative. For some builds we've put in suggestions (rcmnd) for you to try.

The new funky generic transistor layout means you can use a regular style or 'can' in this PCB. Also it makes using Japanese transistors that require a leg twist, much easier to fit. Just check the datasheet for the transistor you plan to use and make sure the Emitter Base and Collector tally up with the pads (labeled E, B & C).



As for hfe; aim for somewhere in the 400-700 range. Saying that the circuit is very tolerant so don't be afraid to experiment. Here are some transistors you might want to try: 2SC1570, BC549C, BC550C, BC109C, 2N2222A, 2N5088, MPSA18. Again, socket and see what you like.

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	Part Number	Ultra-stoner Mk2	TSM680 Mk2	DGM 3	Skreddy Mayo	1971 Triangle	Civil War Russian	Green Russian	Third Edition	Ram's Head	Violet Ram's Head
<b>input</b>	<b>R1</b>	33k	33k	33k	33k	33k	39k	39k	39k	39k	39k
<b>base-gr Q1</b>	<b>R2</b>	100k	100k	100k	100k	100k	100k	100k	100k	47k	100k
<b>emmitter-gr Q1</b>	<b>R3</b>	100R	150R	100R	100R	100R	390R	390R	100R	120R	100R
<b>C-B Q1</b>	<b>R4</b>	470k	470k	470k	470k	470k	470k	470k	470k	470k	470k
<b>9v Q1</b>	<b>R5</b>	18k	15k	12k	18k	18k	12k	12k	15k	10k	15k
<b>sustain1</b>	<b>R6</b>	820R	470R	560R	820R	1k	1k	1k	1k	1k	1k
<b>in Q2</b>	<b>R7</b>	8k2	7k5	8k2	8k2	8k2	10k	10k	8k2	10k	8k2
<b>base-gr Q2</b>	<b>R8</b>	56k	56k	100k	56k	100k	100k	100k	100k	100k	100k
<b>C-B Q2</b>	<b>R9</b>	470k	470k	470k	470k	470k	470k	470k	470k	470k	470k
<b>9v Q2</b>	<b>R10</b>	10k	22k	12k	10k	10k	12k	12k	15k	10k	10k
<b>emmitter-gr Q2</b>	<b>R11</b>	100R	100R	100R	100R	100R	390R	390R	100R	150R	100R
<b>in Q3</b>	<b>R12</b>	8k2	7k5	8k2	8k2	8k2	10k	10k	8k2	10k	8k2
<b>base-gr Q3</b>	<b>R13</b>	100k	100k	100k	100k	100k	100k	100k	100k	100k	100k
<b>C-B Q3</b>	<b>R14</b>	470k	470k	470k	470k	470k	470k	470k	470k	470k	470k
<b>9v Q3</b>	<b>R15</b>	18k	22k	12k	18k	18k	12k	12k	15k	15k	15k
<b>emmitter-gr Q3</b>	<b>R16</b>	100R	100R	100R	100R	100R	390R	390R	100R	150R	100R
<b>tone down</b>	<b>R17</b>	33k	33k	33k	33k	33k	20k	20k	39k	22k	39k
<b>tone up</b>	<b>R18</b>	33k	33k	33k	33k	33k	22k	22k	100k	39k	39k
<b>tone out</b>	<b>R19</b>	8k2	Jumper	Jumper	Jumper	Jumper	Jumper	Jumper	Jumper	Jumper	Jumper
<b>9v base Q4</b>	<b>R20</b>	390k	422k	470k	390k	390k	470k	470k	390k	430k	390k
<b>base-gr Q4</b>	<b>R21</b>	100k	100k	100k	100k	100k	100k	100k	100k	100k	100k
<b>9v Q4</b>	<b>R22</b>	10k	10k	12k	10k	10k	10k	10k	10k	15k	10k
<b>emmitter-gr Q4</b>	<b>R23</b>	2k7	2k7	2k7	2k7	2k7	2k7	2k	2k2	3k3	2k7
<b>pulldown</b>	<b>R24</b>	1M	1M	1M	1M	1M	1M	1M	1M	1M	1M
<b>LED CLR</b>	<b>R29</b>										
<b>volume Pot</b>		A100K	A100K	A100K	A100K	A100K	A100K	A100K	A100K	A100K	A100K
<b>sustain Pot</b>		B100K	B100K	B100K	B100K	B100K	B100K	B100K	B100K	B100K	B100K
<b>tone Pot</b>		B100K	B100K	B100K	B100K	B100K	B100K	B100K	B100K	B100K	B100K
<b>shape Pot</b>		C500K	C500K	C500K	C500K	C500K	C500K	C500K	C500K	C500K	C500K
<b>input</b>	<b>C1</b>	1uF	470nF	100nF	100nF	100nF	100nF	100nF	1uF	10uF	100nF
<b>C-B Q1</b>	<b>C2</b>	470pF	470pF	470pF	470pF	470pF	430pF	470pF	500pF	560pF	470pF
<b>sustain3</b>	<b>C3</b>	220nF	100nF	100nF	100nF	100nF	100nF	100nF	1uF	100nF	100nF
<b>in Q2</b>	<b>C4</b>	220nF	100nF	100nF	220nF	100nF	100nF	100nF	1uF	100nF	100nF
<b>C-B Q2</b>	<b>C5</b>	470pF	680pF	470pF	470pF	470pF	430pF	470pF	500pF	560pF	470pF
<b>diodes Q2</b>	<b>C6</b>	1uF	680nF	100nF	220nF	100nF	47nF	47nF	100nF	100nF	100nF
<b>in Q3</b>	<b>C7</b>	330nF	220nF	100nF	220nF	100nF	100nF	100nF	1uF	100nF	100nF
<b>C-B Q3</b>	<b>C8</b>	470pF	680pF	470pF	470pF	470pF	430pF	470pF	500pF	560pF	470pF
<b>diodes Q3</b>	<b>C9</b>	100nF	680nF	100nF	220nF	100nF	47nF	47nF	100nF	1uF	100nF
<b>tone up</b>	<b>C10</b>	1.5nF	3.3nF	3.9nF	4.7nF	4nF	3.9nF	3.9nF	3.9nF	4.7nF	3.9nF
<b>tone down</b>	<b>C11</b>	15nF	10nF	10nF	10nF	10nF	10nF	10nF	10nF	10nF	10nF
<b>in Q4</b>	<b>C12</b>	100nF	220nF	100nF	100nF	100nF	100nF	100nF	100nF	100nF	100nF
<b>out</b>	<b>C13</b>	100nF	100nF	100nF	100nF	100nF	100nF	100nF	1uF	1uF	100nF
<b>shape</b>	<b>C14</b>	8.2nF	6.8nF	12nF	4.7nF	4.7nF	4.7nF	4.7nF	3.9nF	2.2nF	5.6nF
<b>power filter</b>	<b>C15</b>	100uF	100uF	100uF	100uF	100uF	100uF	100uF	100uF	100uF	100uF
<b>anti-RFI (optional)</b>	<b>C16</b>	100p	100p	100pF	100p	100p	100p	100p	100p	100p	100p
<b>doom</b>	<b>C17</b>	1nF	2.2nF		1.5nF	1.5nF	1.5nF	1.5nF	1.5nF	1.5nF	1.5nF
<b>tone pin 2&amp;GND</b>	<b>Cx</b>				47pF						
<b>sustain pins 2&amp;3</b>	<b>Cy</b>		2.2nF								
<b>clipping</b>	<b>D1-2</b>	1N914 / 1N4148	1N914 / 1N4148	1N914 / 1N4148	1N914 / 1N4148	1N914 / 1N4148	1N914 / 1N4148	1N914 / 1N4148	1N914 / 1N4148	1N914 / 1N4148	1N914 / 1N4148
<b>clipping</b>	<b>D3-4</b>	LED	LED	1N914 / 1N4148	LED	LED	LED	LED	LED	LED	LED
<b>clipping</b>	<b>D5-9</b>	1N914 / 1N4148	1N914 / 1N4148		1N914 / 1N4148	1N914 / 1N4148	1N914 / 1N4148	1N914 / 1N4148	1N914 / 1N4148	1N914 / 1N4148	1N914 / 1N4148
<b>polarity</b>	<b>D10</b>	1N4001	1N4001	1N4001	1N4001	1N4001	1N4001	1N4001	1N4001	1N4001	1N4001
<b>transistors</b>	<b>Q1-4</b>	BC109C	Q1&4 MPSA18 Q2&3 BC109C	2N5088	2N5133	2N5133/ FS36999	Equivs: 2N5089/ 2N5210	Equivs: 2N5089/ 2N5210	BC239/ MPSA18	FS36999 /BC239C	2N5133 rcmd: BC549C

