

# Vutron V

**Based on:**  
Mutron Micro V  
**Effect type:**  
Envelope Filter  
**Build difficult:**  
Average

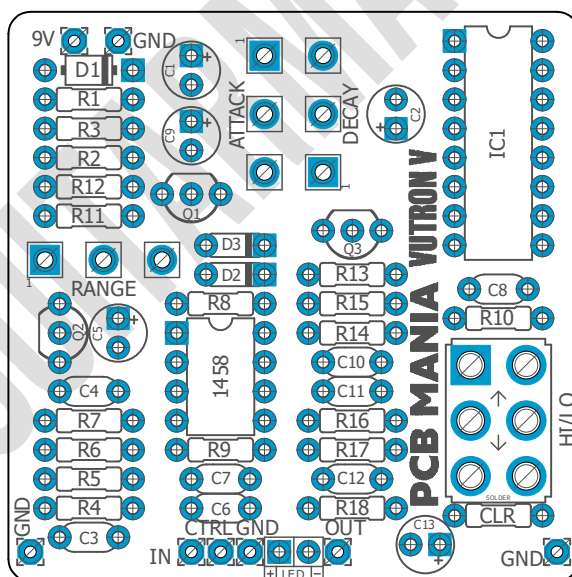
**Amount of parts:**  
Average, total 44 components  
**Technology:**  
LM13700  
**Power consumption:**  
9V

**Enclosure type:**  
1590b/125b  
**Get your board at:**  
[Vutron V](#)  
**Get your kit at:**  
[Das Musikding \(Europe\)](#)

## Project overview:

Envelope filter based on Mutron Micro V fully moded into a more versatile and easy to build pedal.  
Fully responsive to your pick attack.

Including additional Attack and Decay controls for the envelope response. Featuring an LM13700 in replace of the unobtainable CA3080 in the original circuit.



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## Introduction

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The Vutron V is a modern take on the envelope-controlled filter device designed combining the simplicity of the Mu-tron V with the capability and versatility of the Mu-tron III.

For this circuit we have included Decay and Attack control to allow a wide range of effects suitable for a funky bass guitar, a screaming lead guitar, or anything in between – including electric keyboards and electrified wind instruments.

Also we have replaced the unobtainable CA3080 for a much easier to source LM13700 (the same one you might have used for compressors such as Sea Lion, or the Master Phaser) without any tonal impact.

This compact design is suitable for 1590b or a 125b enclosure.

Without a doubt this pedal will deliver all touch-controlled wah effect (autowah) you always wanted and more! This is definitely a must try if you are interested in getting crazy psychedelic sounds out of your amp!

## Controls

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- **Range:** Controls the intensity of the envelope dynamics generated by your pick attack. Fully clockwise, the greatest the sensitivity.
- **Attack:** This pot works in direct relation with the Range knob, allowing you to set the fine adjustments on the attack of your pick.
- **Decay:** With this knob you can control how long it takes to the envelope to sweep the filter. Higher settings will give you a longer decay time.
- **HI/LO:** This toggle controls the range of the filter that's swept.

# Bill of materials

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Resistors	
Part	Value
CLR	4k7
R1	22k
R2	33k
R3	100k
R4	1M
R5	100k
R6	100k
R7	10k
R8	15k
R9	330R
R10	330R
R11	22k
R12	220R
R13	10k
R14	1M
R15	4k7
R16	47k
R17	6K8
R18	22k

Capacitors	
Part	Value
C3	100nf
C4	100pf
C6	33nf
C7	47nf
C8	68nf
C10	2n2
C11	1n8
C12	2n2

Electrolytics Capacitors	
Part	Value
C1	100u
C2	100u
C5	4.7u
C9	4.7u
C13	10u

Potentiometers	
Part	Value
ATTACK	B2k
DECAY**	B100k
RANGE	B1M

IC	
Part	Value
IC1	LM13700N
IC2	LM1458

Transistors	
Part	Value
Q1	2N5089
Q2	2N5089
Q3	2N5087

Switches	
Part	Value
HI/LO	DPDT ON-ON

Diodes	
Part	Value
D1	1N5817
D2	1N914*
D3	1N914*
LED	3mm LED

# Shopping list

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Resistors		
Qty	Value	Parts
3	100k	R3, R5, R6
2	10k	R7, R13
1	15k	R8
2	1M	R4, R14
1	220R	R12
3	22k	R1, R11, R18
2	330R	R9, R10
1	33k	R2
1	47k	R16
2	4k7	CLR, R15
1	6K8	R17

Capacitors		
Qty	Value	Parts
1	100nf	C3
1	100pf	C4
1	1n8	C11
2	2n2	C10, C12
1	33nf	C6
1	47nf	C7
1	68nf	C8

Electrolytics Capacitors		
Qty	Value	Parts
2	100u	C1, C2
2	4.7u	C5, C9
1	10u	C13

Potentiometers		
Qty	Value	Parts
1	B100k	DECAY
1	B1M	RANGE
1	B2k	ATTACK

IC		
Qty	Value	Parts
1	LM13700N	IC1
1	LM1458	IC2

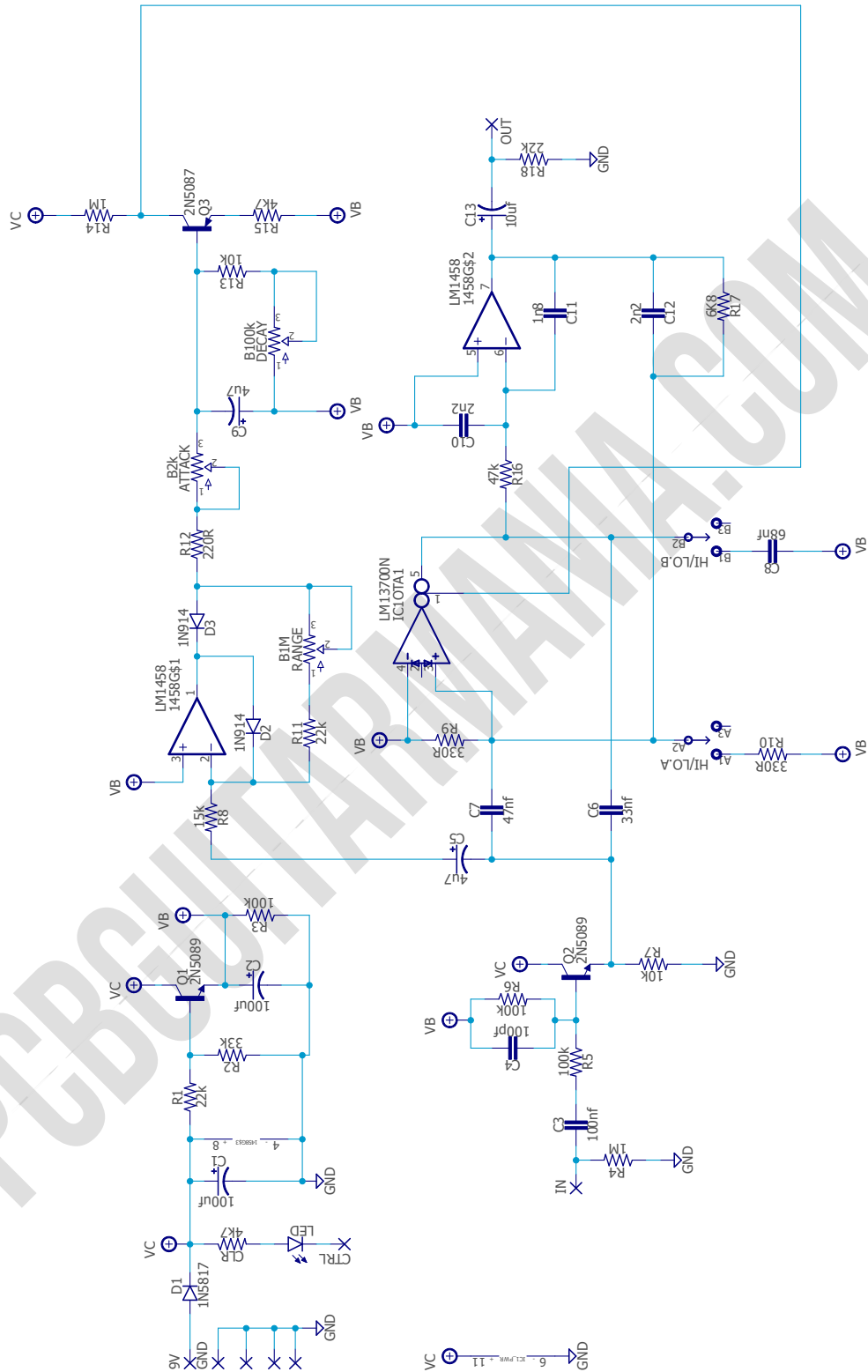
Transistors		
Qty	Value	Parts
1	2N5087	Q3
2	2N5089	Q1, Q2

Switches		
Qty	Value	Parts
1	DPDT ON-ON	HI/LO

Diodes		
Qty	Value	Parts
1	1N5817	D1
2	1N914	D2, D3
1	5mm	LED

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# Schematic



# Components Recommendations

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As many people like to experiment some pedals with higher voltage, always ensure the max tolerance of your **electrolytic capacitors** is over 25v.

This board has been tested using Film box capacitors for most of the values over 1nf, and ceramics discs for the ones under 1nf. However, high quality components such as Wima's Capacitors and Panasonic's electrolytics can deliver a better performance.

All the resistors used for testing this project are 1/4W Metal Film.

The BOM and Shopping list are exclusively regarding this project. It doesn't include all the hardware like the 3PDT bypass switch, audio/dc jacks, enclosure, etc.

## MODS

**Diodes\*** You can experiment with diodes with lower voltage forward for improving the sensitivity of pick dynamics. Some possible candidates could be BAT41, BAT46 1n34A and germanium ones.

**Decay\*\*** Feel free to experiment with higher values for the decay pot. The higher the value, the longest the decay times.

## Build Notes

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If this is one of your first projects I recommend you to take a look on our [Pedal Building Guide](#)

For a successful and tidy build it's recommended the following order:

1. Resistors & diodes
2. Capacitors, starting with the smaller ones and the ceramic ones.
3. Electrolytic capacitors (always check the polarity)
4. Transistors
5. Wires
6. Potentiometers and switches
7. Off board wiring

# Wiring Diagram

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All our projects include a free 3PDT Board to make the wiring easier and tidier. Also all of our PCBs feature the status LED on board.

The pad named “Ctrl” or “LED” is the one that controls the status of the led, wire it to the “LED” pad on the 3PDT board, or in control slug of your 3PDT.

This board has been designed to match our EZ 3PDT PCB check it [here](#) to access to our [Pedal Wiring Guide](#). **The booster goes after the main drive!**

# Drill Template

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This Project has been planned to fit into a 1590b / 125b enclosure type.

Check the Attached “Drilling templates” to drill the box properly. The files are on Scale 1:1, ready to print in an A4 page.

# Licensing and Usage

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We really appreciate your trust and support buying this PCB, as well as your will to dive into the DIY electronics world. That’s why for us is really important that you can make this project work properly and to enjoy not only the building process, but also to experiment and play with it on your rig.

We try to reply to every question we receive on our email or in our social media, but we try to encourage all our customers to join our [PCB Guitar Mania – Builders Group](#) on Facebook, in order to post all your doubts, issues, suggestions or request, as well to share your builds and have some feedback from us and other fellow builders!

All of our projects have been tested following this same guide on their standard configurations. Although, not all of the variations and mods have necessarily been tested. These are suggestions based on the schematic analysis, and on the experiences and opinions of others. Feel free to share with us your opinions and suggestions regarding the mods your own personal experimentation.

These boards may be used for commercial endeavors in any quantity unless specifically noted. No attribution is necessary, though accreditation or a link back is always greatly appreciated.

If you are a builder planning to make your own run of pedals we also offer the service of custom made boards with your brand and logo, design according your specifications.

The only usage restrictions are that, first, you cannot resell the PCB as part of a kit without prior arrangement with us, and second, you cannot scratch off the silk screen, or other way of trying to hide our logos and the source of the PCBs. Like it’s written above, if you want to have your own designs, with your brand and logo we could certainly reach an agreement.

Follow us on [Instagram](#) and [Facebook](#) to stay in tune with the latest projects!