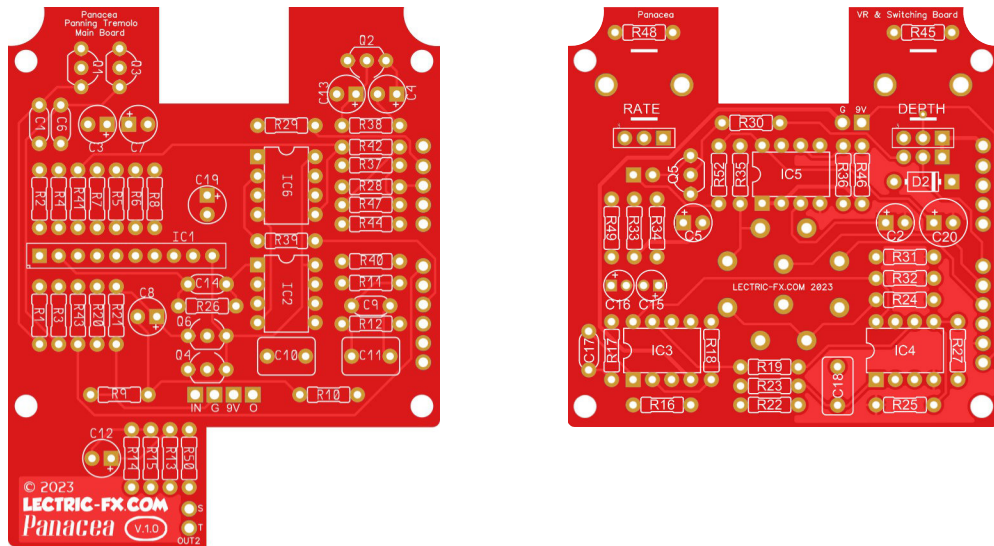


# Panacea

Tremolo/Panner. Compare to Boss PN-2

**LECTRIC-FX.COM**



The Panacea panning tremolo is Lectric FX's take on the BOSS PN-2, converted to TBP, and meant to fit inside a 125B enclosure. This effect used the now defunct M5207L01 dual VCA chip that can still be found if you know where to look. I will try to keep some verified chips in stock at the store that could save you a few bucks in shipping.

The project is designed as a dual, or "stacked" pcb setup, with the pots and switch selector (and some other components) on 1 pcb and the rest of the components residing on the larger "main" pcb.

The 2 inputs of the original have been replaced with a single input. I suppose it can be built as a regular non panning, non stereo tremolo, but I would consider building it with both output jacks, as the pan out to 2 different amps is a large part of what makes this effect somewhat unique. I've read BOSS was shooting for a tremolo sound similar to that which was built into certain tube amps, and the stereo panning was meant to emulate a Leslie sound. I've also heard of people using this pedal as the basis for a stereo rig; just dial the depth and rate back and go.

## **CONTROLS:**

There are depth and rate controls. The rate has a dedicated rate LED whose blinking persists in bypass. Also featured is a 2p4t rotary "mode" control with 4 positions: 2 positions on the left for triangle or square wave tremolo, and then 2 more positions towards the clockwise end for triangle or square wave that pans left & right when connected to 2 amps, 2 channels of an interface, etc.

In the 2 most CCW "Tremolo" positions (triangle and square waves, in that order): Rate control adjusts the speed at which the level of the output will increase and decrease.

Depth control adjusts the amount of change in the level of the output.

In the 2 most CW "Pan" positions (triangle and square waves [requires 2 outputs]):  
Rate control adjusts the speed at which the output is panned from left to right.  
Depth control adjusts the amount the output will be panned from left to right.

### **BUILD NOTES:**

The PCBs can be joined together by single row male/female pin header connectors in two areas along the right edge of the pcbs (2.54 spaced holes, one group of 5 and one of 6). 11 wires could also be used to connect the boards, but might not be as stable, and would lack the obvious advantage of easy separation of the two halves.

There are also holes in 4 of the corners to accommodate M3 10mm nylon standoffs (recommended), M3 20mm screws & a bunch of nuts (4 nuts together equal 10mm), or even something like very lightly tightened zip ties if you have to use them. Using these simply ensures the boards don't separate when using those male/female connectors. I recommend the option of m/f pin headers for connectors, and the standoffs for stable and consistent spacing as previously mentioned.

The male/female pin header combo, when pressed together creates 11mm between the PCBs, and the standoffs are only 10. Since Tayda doesn't carry them, I'll be throwing 1mm nylon washers in with every order so everything sits nice & flush.

I think it's necessary to solder the M5207L01 chip directly to the pcb, as an inline socket under it will likely make it too tall to close the lid, although the 9mm pots used in this project means it's a little easier to fit in the enclosure than the FAT32. Make sure you solder it in oriented correctly! The stripe (pin 1) goes on the left when viewing the top side! The tiny square in the corner of that chip's silkscreen is pin 1.

Q2 is in the power section. I'm not experiencing excess noise when using 2N3906, but feel free to use another type PNP of similar pinout if you want something else. Q5 is for the rate LED, so its type isn't important. Any gen purpose NPN BJT with EBC pinout will do. If you don't want the rate light, simply omit Q5, R30,, R33, R34, R51, and the LED itself (no jumpers, please). And of course, don't drill the LED hole.

The IC/JFET/Transistor choices are mine and just what I imagined would work well from looking at the schematic. They're not written in stone, so if you have a better idea, don't let me stop you. :)

Between the pcb's, there is a grand total of 11mm in space, but due to solder joints and such it's probably more like 9.5mm. A similar amount of space probably exists between the main pcb and the enclosure lid. Therefore, low profile electrolytic, film, tantalum, or MLCC caps should be used throughout due to the limited vertical space. Every effort was made to leave room on all polarized cap locations to fold 11mm caps over if that's all you've got handy. 16V electros should suffice everywhere. On these stacked pcb's low profile-ish parts are the name of the game. Stick to that advice and your pcb sandwich should fit inside the 125B with the lid closed!

The M5207L01 can be purchased NEW at UTSource (DO NOT buy the used ones there, ask me how I know) or from ebay. There's a seller I bought one from for 10 bucks + tax and shipping. It was a good chip but all-told ended up being kind of expensive. I will try to keep good verified ones in stock at the store for a more reasonable cost.

## **B.O.M.**

<b>1/4W RESISTORS</b>	
R1	1M
R2	10k
R3	1M
R4	10k
R5	10k
R6	10k
R7	10k
R8	10k
R9	100k
R10	1k
R11	22k
R12	330k
R13	10k
R14	100k
R15	1k
R16	47k
R17	33k
R18	100k
R19	100k
R20	330k
R21	10k
R22	100k
R23	18k
R24	27k
R25	56k
R26	22k
R27	1k
R28	10k
R29	10k
R30	100k
R31	47k
R32	47k
R33	10k
R34	1k
R35	10k

R36	10k
R37	4k7
R38	5k6
R39	10k
R40	10k
R41	10k
R42	27k
R43	220R
R44	220R
R45	100k
R46	100k
R47	4k7
R48	10k
R49	82k
R50	1M
R52	1k
<b>CAPS</b>	
C1	47n
C2	10u
C3	10u
C4	47u
C5	47u
C6	47n
C7	10u
C8	10u
C9	10p
C10	1u
C11	1u
C12	10u
C13	47u
C14	10p
C15	1uF
C16	1uF
C17	10n
C18	470n
C19	10u

C20	100u
<b>DIODES</b>	
D1	3mm LED
D2	1n5817
<b>TRANSISTORS</b>	
Q1	2N5457
Q2	2N3906 PNP
Q3	2N5457
Q4	2N5088
Q5	2N3904 NPN
Q6	2N5088
<b>IC's</b>	
IC1	M5207L01
IC2	NE5532
IC3	LM358
IC4	JRC4558
IC5	TL072
IC6	JRC4558
<b>SWITCHES</b>	
ROTARY	2P4T mini
<b>POTS</b>	
DEPTH	10KB 9mm DUAL GANG
RATE	1MC 9mm

## QTY's

RESISTORS	
2	220R
5	1k
2	4k7
1	5k6
17	10k
1	18k
2	22k
2	27k
1	33k
3	47k
1	56k
1	82k
8	100k
2	330k
3	1M

CAPS	
2	10p
1	10n
2	47n
1	470n
2	1uF film
2	1uF electro
6	10uF
3	47uF
1	100uF

DIODES	
1	1n5817
1	3mm
TRANSISTORS	
1	2N3904 NPN
1	2N3906 PNP
1	2N5088
2	22N5457
2	LT1054
IC's	
1	M5207L01
1	NE5532
1	TL072
2	NJM4558
1	LM358
SWITCHES	
1	2P4T mini
POTS	
1	10KB DUAL GANG
1	1MC

### **OTHER PARTS/INFO:**

- This has been designed for use with 3x mono enclosed jacks but Lumberg may fit.
- Strip of 40 male pin header (easy to break apart) Tayda # A-197
- Strip of 40 female pin header (must be cut with a razor blade) Tayda # A-196
- Re the m/f pin headers, it may be possible to find pre-cut individual pieces of the required lengths (units of 5 & 6). It's kind of a pain to cut the female ones so it's probably worth it!
- M3x10mm nylon standoff: Tayda # A-6589, QTY needed = 4
- M3 nylon nuts: Tayda # A-6598, QTY needed = 4
- M3x6mm nylon screw: Tayda # A-6599, QTY needed = 4
- 9mm 10KB dual gang depth pot: Tayda # A-6433
- I used 1MC 9mm for the Rate: Tayda # A-1697, but you can use 1MB. BOSS did!

1 2 3 4 5

A

A

B

B

C

C

D

D

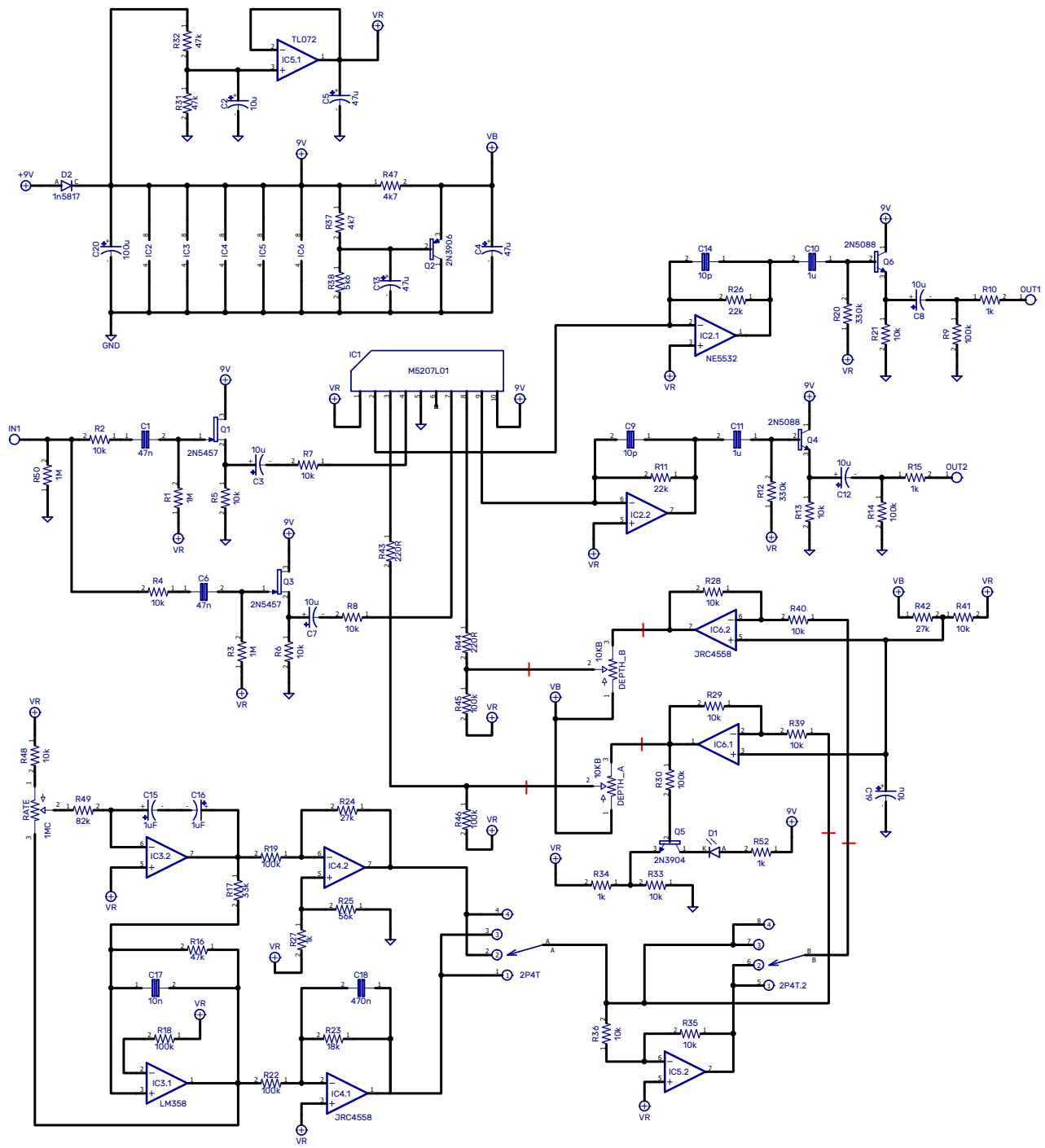
E

E

F

F

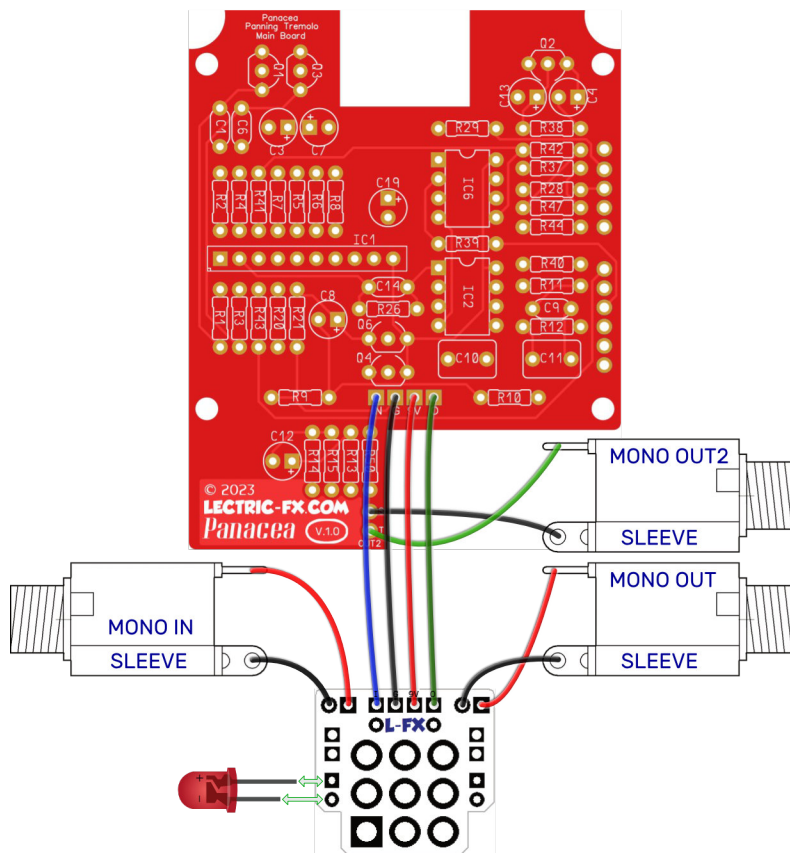
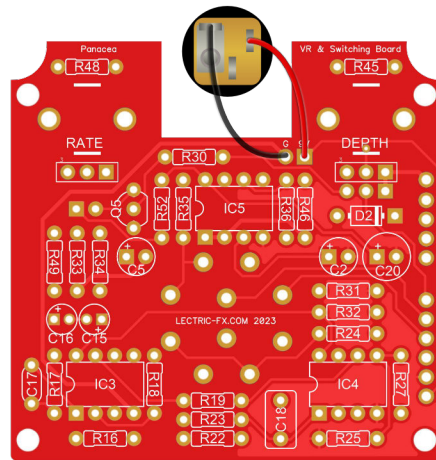
RedLines indicate Path to the Other PCB



Title		
Panacea Panning Stereo Tremolo		
Size	Number	Rev
A4	000001	1.0
Date 09/20/2023		Drawn by Haberdasher
<b>LECTRIC-FX</b>		Sheet 1 of 1

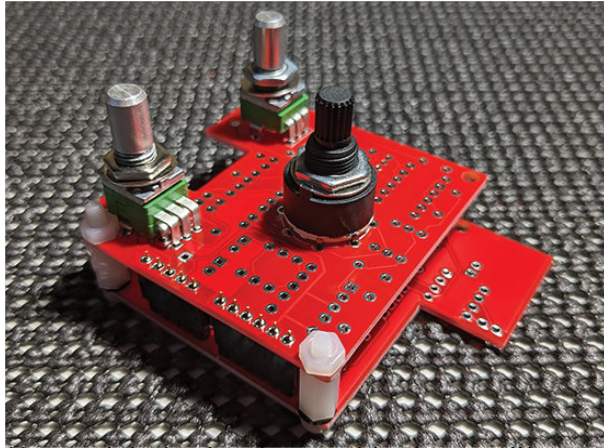
1 2 3 4 5

# Panacea Wiring

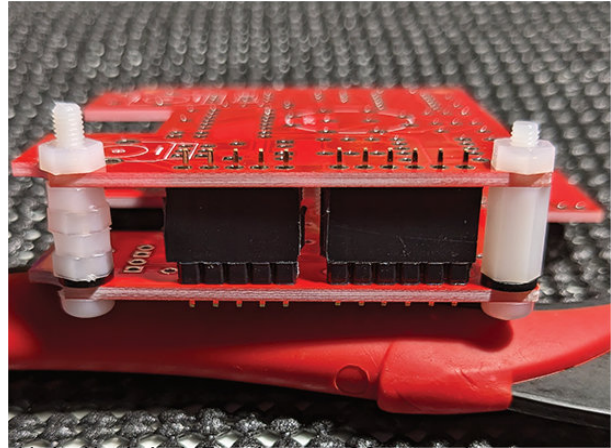


Don't forget to install a current limiting resistor on the mini pcb.





Unpopulated pcb set assembly shown with 9mm pots and mini 2p4t rotary.



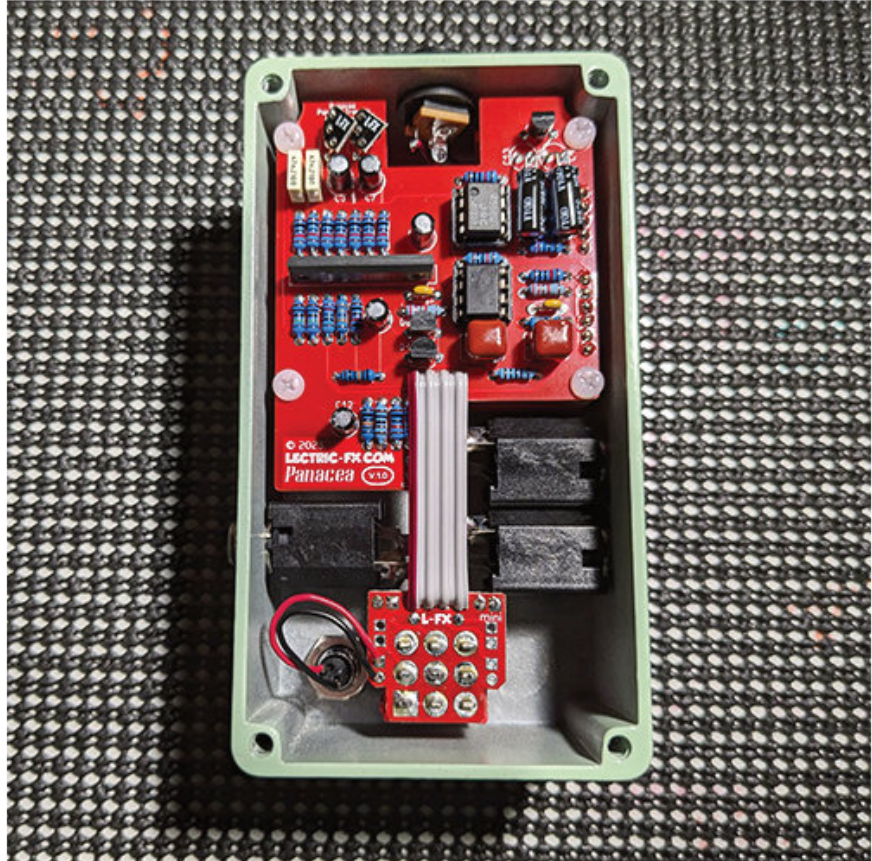
Note that 4x M3 nuts on a 20mm nylon screw = same height as the 10mm standoff. If one option is out of stock you can do it the other way.



You can source these hardware pieces any place you know of that carries them. Mine came from tyda since I was ordering from them anyway. I'm only showing these because they're what I have. I am not affiliated with them in any way. However, I'm pretty sure they do ship most everywhere, and AFAIK their sku #'s don't change (unlike website URLs), so it's convenient for the purposes of the document.

If you're using the 10mm standoffs, you need one M3 nut & one 6mm M3 screw for each one. They don't carry the small black 1mm nylon spacers in the pics so I'm throwing them into each order.







# Panacea Drill Guide Suggestion

