The Forum-Vibe Project

By: Brad Burt - (*aka; RedHouse*)

About The Forum-Vibe Project

(circa 2002)

What it is...

This layout is an effort to make a multi-use vibe PCB which supports vintage or higher performance builds, allowing layout space for alternative component choices and supporting most of the common mods that have been contributed in the NewsGroups (ya, that's how old!) and Forums over the years. This board is also a bit more user-friendly than software generated boards going around on the internet, traces and pads are wider so the experimenter can solder/un-solder more times before permanent damage occurs to the board (YMMV). The Forum-Vibe uses 70's style stand-up components where possible ie; resistors stand up on one leg saving board space. Supported mod's include JC Maillet's waveform Offset-Adj mod (the single most useful vibe-mod IMHO) which allows nearly any small lamp to be dialed-in and find the sweet spotfor the LDR's. This pretty much negates the age old problem of finding the "right" LDR's or Lamps for a vibe build. This Forum-Vibe board supports vintage or modern builds in any combination.

Kudos

The Forum-Vibe PCB (2002) was based on JC Maillet's (1996) vibe board he contributed to the forums which was single-sided self-etch board with copper traces and components all on the same side!. The top-3 mods supported are JC's bulb bias Offset-Adj mod, my input pad mod, and the *output mix* mod (by RG Keen) is supported.

About this Project

This is not an *entry level* project, it is for those fairly skilled DIY effects builder who have already had experience with other projects, if you build this project and it doesn't work, you have simply made a mistake, or have a bad component, or solder joint. Mis-orientation of components is the number 1 cause of malfunctional and non-functional units. So many people have built this project successfully and they just work. This documentation mostly uses graphics to explain the build, part locations, and orientations.

Transistor package pin-outs vary depending on manufacturer, so download the datasheet for your transistors. This PCB supports CBE pinout's (and EBC) but does not support the 2SC style ECB. The silk screen legend on the PCB's show a white band on one end of each transistor graphic that indicates where the Emitter pin goes. The option to replace the 1uF Electrolytic caps was high on my list of
ries stacked film capacitors for that mod.

Circa 2024...

The graphics on the following pages have been updated to show the latest PCB

The Forum-Vibe PCB has evolved over the 22 years since it's start, it is now on version five revision four (FV-5 rev4). This is an *oldy-but-goody* project and sparked many builders to have a go at building a vibe for themselves, and helped many into the PCB and DIY pedal business with this projects information.

There has been a lot of other good DIY work done on vibe projects, *MadBean*, *GuitarPCB*, and *PedalPCB* just to name a few have some great boards available too, and many have their own forums for you to get peer-to-peer support, so check them out too. Also check out *www.musikding.de* for DIY vibe kits they also have a *Forum-Vibe* Vintage kit for sale if you want a kit.

- Brad Burt (*RedHouse*)

THE Forum-Vibe PROJECT

By: Brad Burt - *RedHouse*

The Vintage Build

Doing a "vintage" style Forum-Vibe build is fairly straight-forward, you just need to stuff the board closely following the diagrams on the next few pages. Be aware that if you want a true vintage style build try to get proper Photocells (LDR's) and Lamp/Bulb if you expect it to sound like an original Uni-Vibe. Much of the *character* of the "throb" comes from them. You likely will not have access to original parts so I suggest you should use the JC *bias-offset mod* in your "vintage" build because it can help you dial-in your Bulb/LDR combination when using whatever parts you can get ahold of.

Refer to the schematic and layout diagrams and the "vintage" build will be fairly easy (as vibe builds go), there are two layout graphics one shows the *Reference Designations*, the other shows the *Values* of the parts so make sure you get them in the right locations. Make sure you get your polarity's correct on your electrolytic caps, you can have issues with your build if you goof that up. Reference the "Parts Values" graphic and the "RefDes" (reference designations) graphic.

There are a few of things to be said when doing a vintage style build, there are some discrepancies in the original OEM schematic and part changes/substitutions. It's unknown if the part changes were due to production-run substitutions because of supply chain isues or design revisions that drove the changes but there are a few different things to note about OEM vibes.

For instance the C14-Q10 discrepancy, the original OEM schematic shows the .0047 cap connected to the emitter of Q10 at the junction of R31-R32-C16 ...but... most production vibe PCB's have that cap connected to the base of Q10. Only one source to my knowlege has said his was in fact as the OEM schematic shows but it was never confirm/validated.

Another on the list is the R46 discrepancy, where the OEM schematic shows a 47k resistor, most production vibes actually have a 4k7 resitor in that position.

Also on the list is the R43-R44 discrepancy, the OEM schematic show 4k7 resistors, but many production vibes actually have 3k3, 2k2 in those positions. The smaller value resistors give a faster top-speed but also be aware you can stall/lock-up the LFO if you go too low there and only a power-off/on cycle will restart the LFO.

Finally the R36 discrepancy, the OEM schematic shows 47k resistor, many production vibes have a 100k resistor in that position. There is also the infrequent substitution of the normally used 2SC828 transistors with 2SC945 and 2SC536 types which I've documented elsewhere on my website.

These things have been noted and debated on the internet for years, the deciding factor (for me) regarding actual components is seeing/servicing/documenting so many real vintage Uni-Vibe’s in my own shop, on my workbench.

BTW! don't forget to install your jumpers!

The

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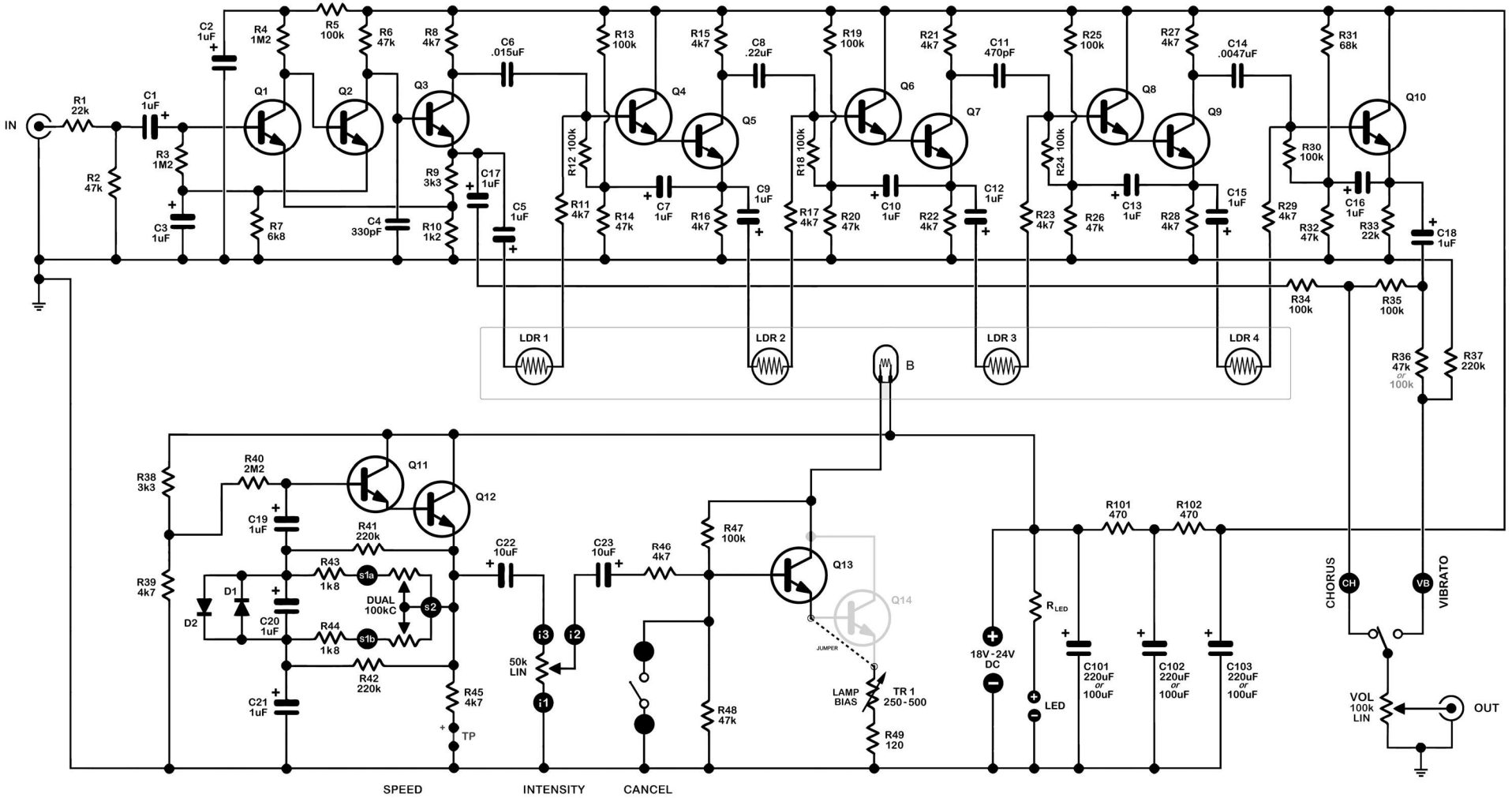
FV-5 SCHEMATIC

(*Vintage Build*)



NOTE 1: R_{LED} *is calculated by your power supply voltage and the LED you select to use.*

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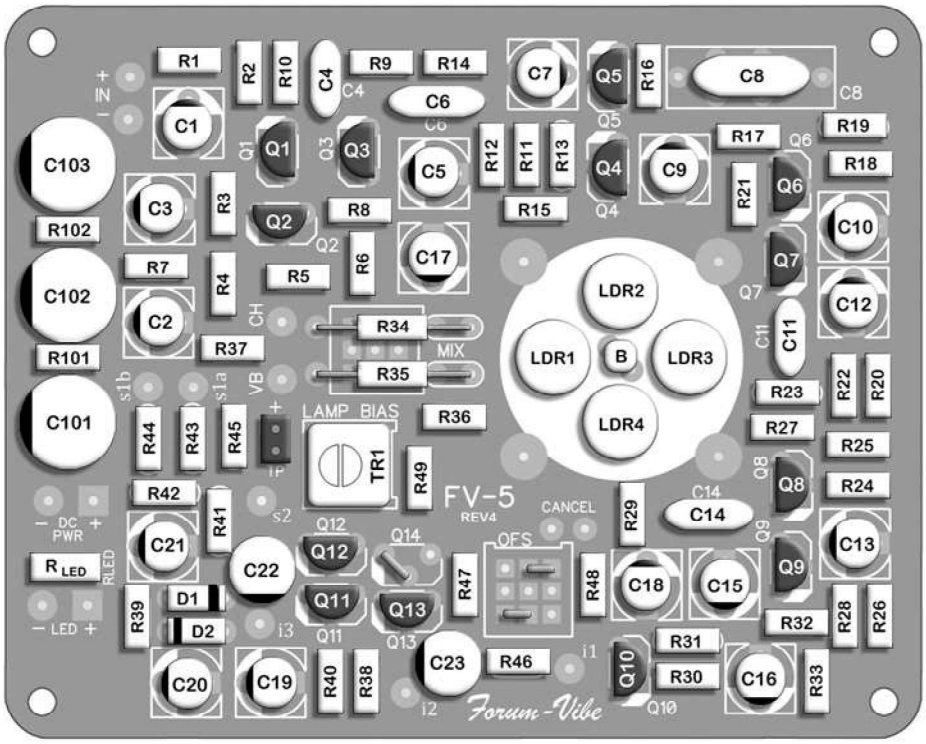
(Vintage Build)

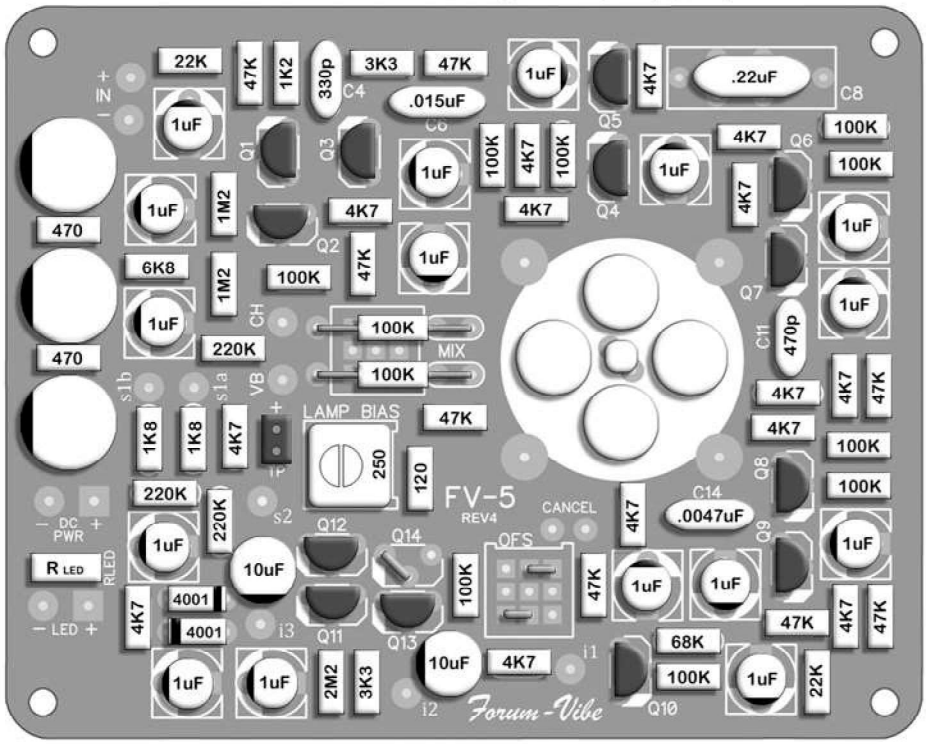
Part Reference Designations

Note: the Rev4 board has a single C4 cap, the Rev4B has a C4a and C4b



Part Values

Note: the Rev4B board has an optional 47pF cap (C4b)



The Forum-Vibe Project

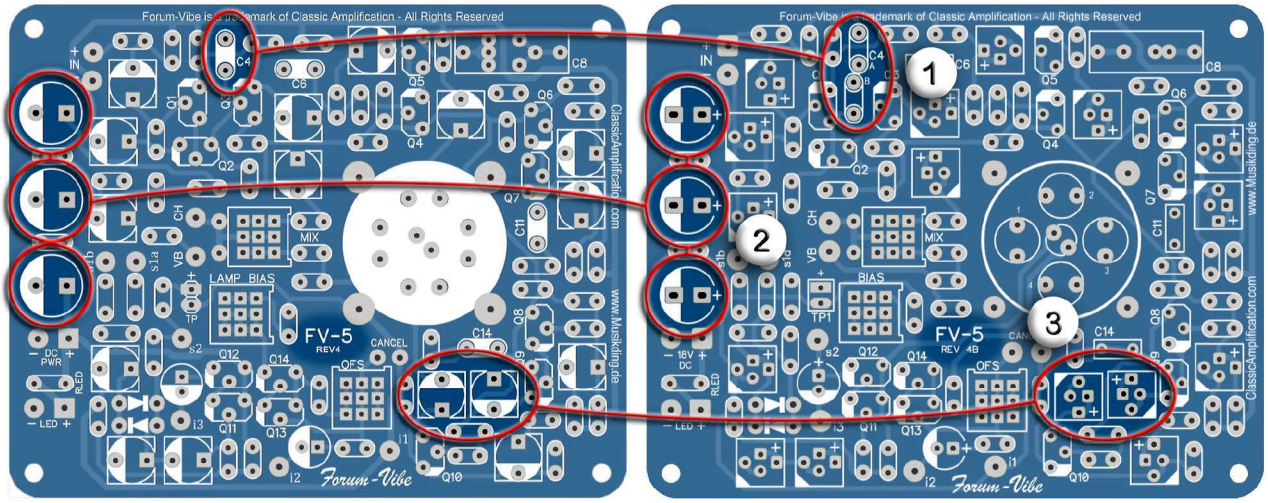
Vintage Parts List

Part Value	Qty	Part *(Part Reference Designation)*	Notes
BC549C	1	Q1	can also use 2N5210
BC549B	12	Q2, Q3, Q4, Q5, Q6, Q7, Q8, Q9, Q10, Q11, Q12	can also use 2N5210
1N4001	2	D1, D2	or 1N4148, or 1N914
120	1	R49	(originally 150 Ohm)
470	1	R101, 102	
1k2	1	R10	
1k8	2	R43, 44	
3k3	2	R9, 38	
4k7	14	R8, 11, 15, 16, 17, 21, 22, 23, 27, 28, 29, 39, 45, 46	
6k8	1	R7	
22k	2	R1, 33	
47k	7	R2, 14, 20, 26, 32, 36, 48	
68k	1	R31	
100k	11	R5, 12, 13, 18, 19, 24, 25, 30, 34, 35, 47	
220k	3	R37, 41, 42	
1M2	2	R3, 4	
2M2	1	R40	
220uF *or* 100uF	3	C101, C102, C103	Electrolytic
1 uF - 25V	16	C1, 2, 3, 5, 7, 9, 10, 12, 13, 15, 16, 18, 19, 20, 21	Electrolytic
10 uF - 25V	2	C22, 23	Electrolytic
330pF (n33)	1	C4	Ceramic
470pF (n47)	1	C11	Ceramic
.0047uF (4n7)	1	C14	Polyester (Greenie)
.015uF (15n)	1	C6	Polyester (Greenie)
.22uF (220n)	1	C8	Polyester (Greenie)
200 Ohm Trimmer	1	TR 1 Bourns type 3362P or 3386F can use 500 Ohm	(originally was 300 Ohm)
50k Lin	1	Linear Taper - Intensity control	
100k Lin	1	Linear Taper - Volume	
Dual 100kC	1	Reverse Log Taper - Stompbox Speed control (not for Wah shell)	Can use 220kC
SPDT Switch	1	Chorus/Vibrato switch	
1/4" (6.5mm) Jacks	2	Input and Output Jacks	
LDR's	4	Fast Response (1k-40k Light, 1M-20M Dark) LDR / Photocells	Search The Forums
Lamp Bulb	1	Any 1.2v to 24v DC lamp of less than 100mA will do	Can use lamp >100mA if you do the *Darlington Lamp Driver* mod (see Forums)

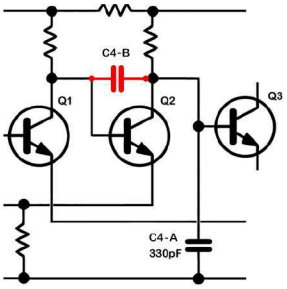
The final *Forum-Vibe* update: Rev 4B

(*same circuit, some minor board alterations*)

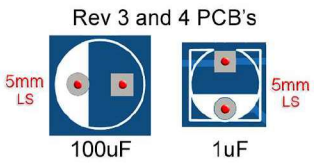
FV-5 Rev4 FV-5 Rev4B

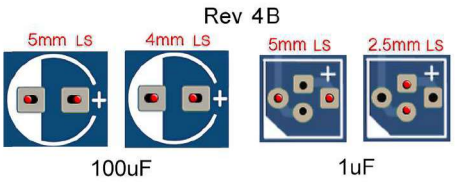


1: I've added a place for an additional HF feedback capacitor placed on across Q2's collector and base which is often needed to help manage HF oscillation/hetrodyning of noise a problem that can occur with modern transistors used in the Q2 position of the old Uni-Vibe circuit, now there is a C4A and C4B.
(*see item 1 in picture above*)



2 & **3:** When updating the Forum Vibe PCB recently, a few things came up that would be good time to resolve and make the FV-5 board easier to populate with modern lead-spacing (LS) components. Twenty years ago when this project took-off, the "industry standard" LS for most small PCB capacitors was 5mm and 7.5mm, but now-days it's getting harder to find 5mm LS capacitors. Often now the 1uF Electrolytic capacitors which a vibe uses are found in 2.5mm LS so I re-designed some component (pads) on the PCB with multi-LS options for the 1uF caps (5mm and 2.5mm LS) and the 100uF Electrolytics with 5mm and 4mm LS.
(*see items 2 and 3 in picture above*)





I also changed/updated a few of the silk-screen patterns, for instance the LDR+Lamp (light chamber area) where I removed the white circular shape and added the LDR numbers in that space to help the builder associate which LDR on the schematic is relative to the location on PCB. All other aspects of the FV-5 project are the same.

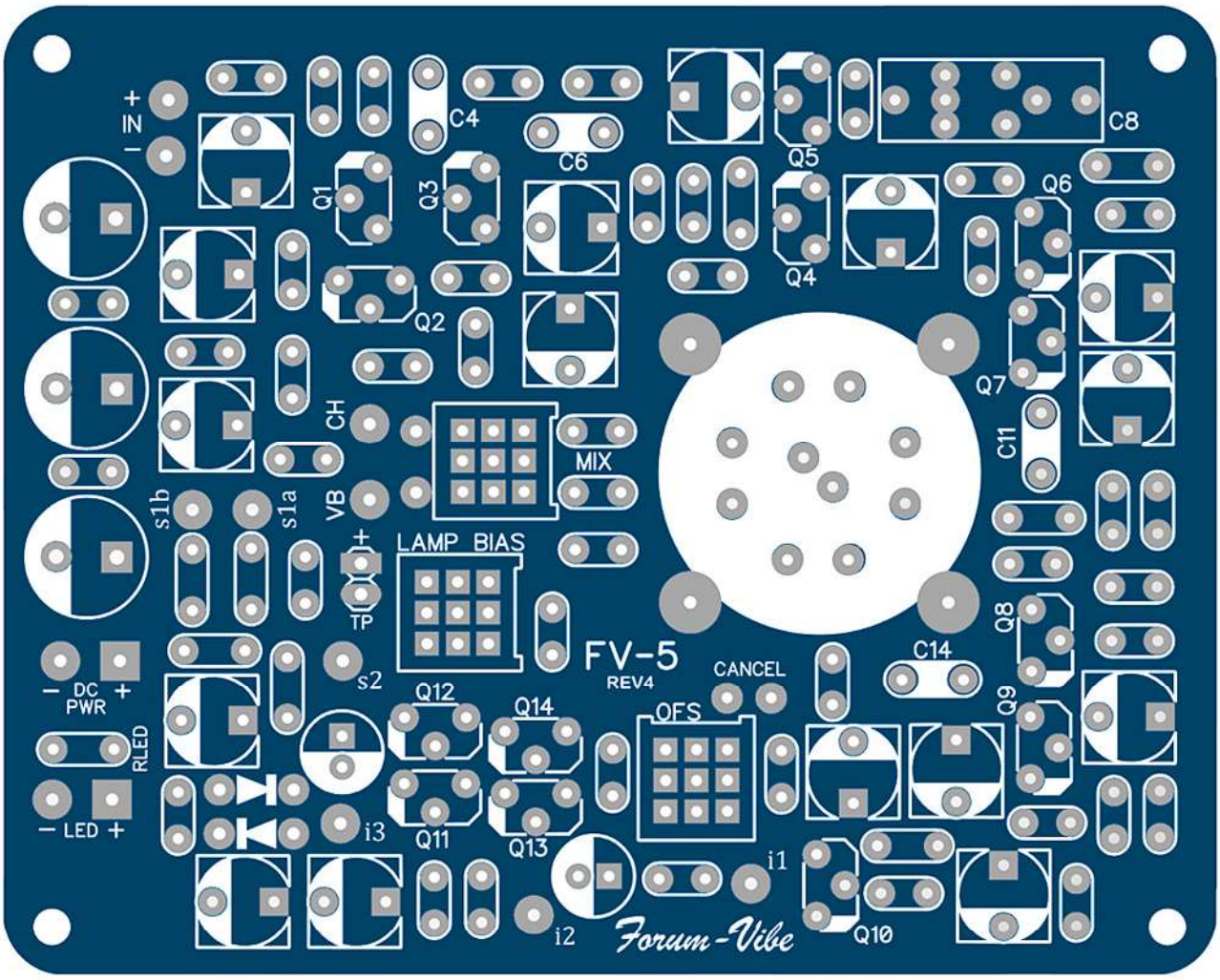
This will be the last and final update I make for the Forum Vibe Project, I am now retired.

- RedHouse

THE Forum-Vibe PROJECT

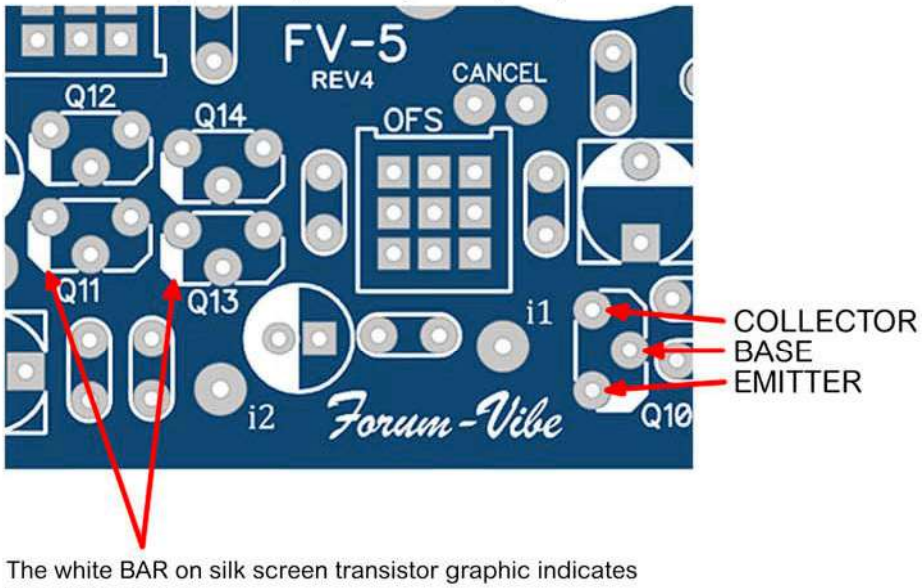
The Forum-Vibe Project

Transistor Pin Orientation



The FV-5 rev4 PCB supports transistors with C-B-E (or E-B-C) pinout

(*does not support 2SC style B-C-E pinout*)



The white BAR on silk screen transistor graphic indicates the EMITTER pin

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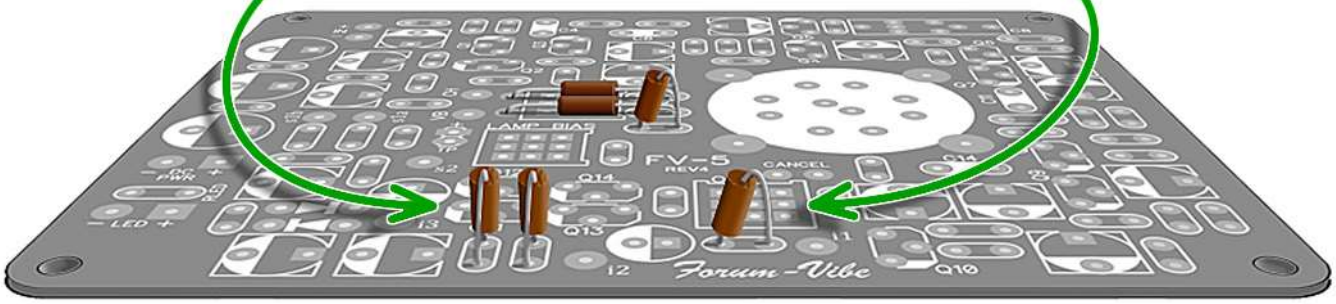
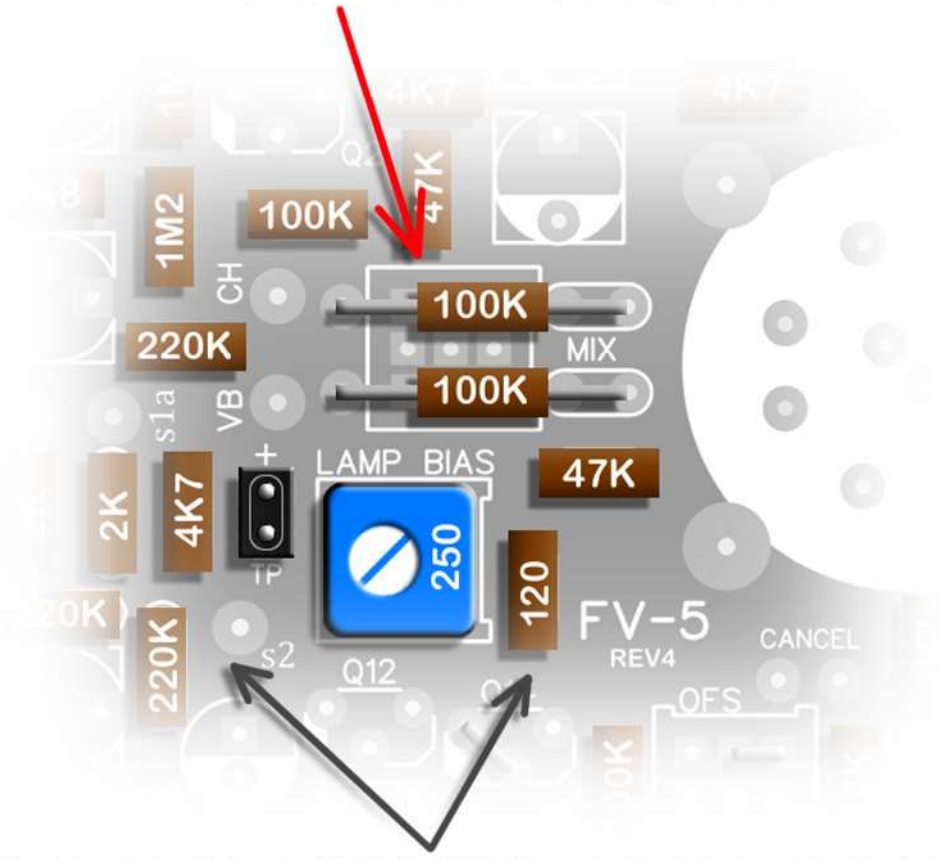
Resistors are installed "stand-up" style



Except R34, R35 when doing a *Vintage* build

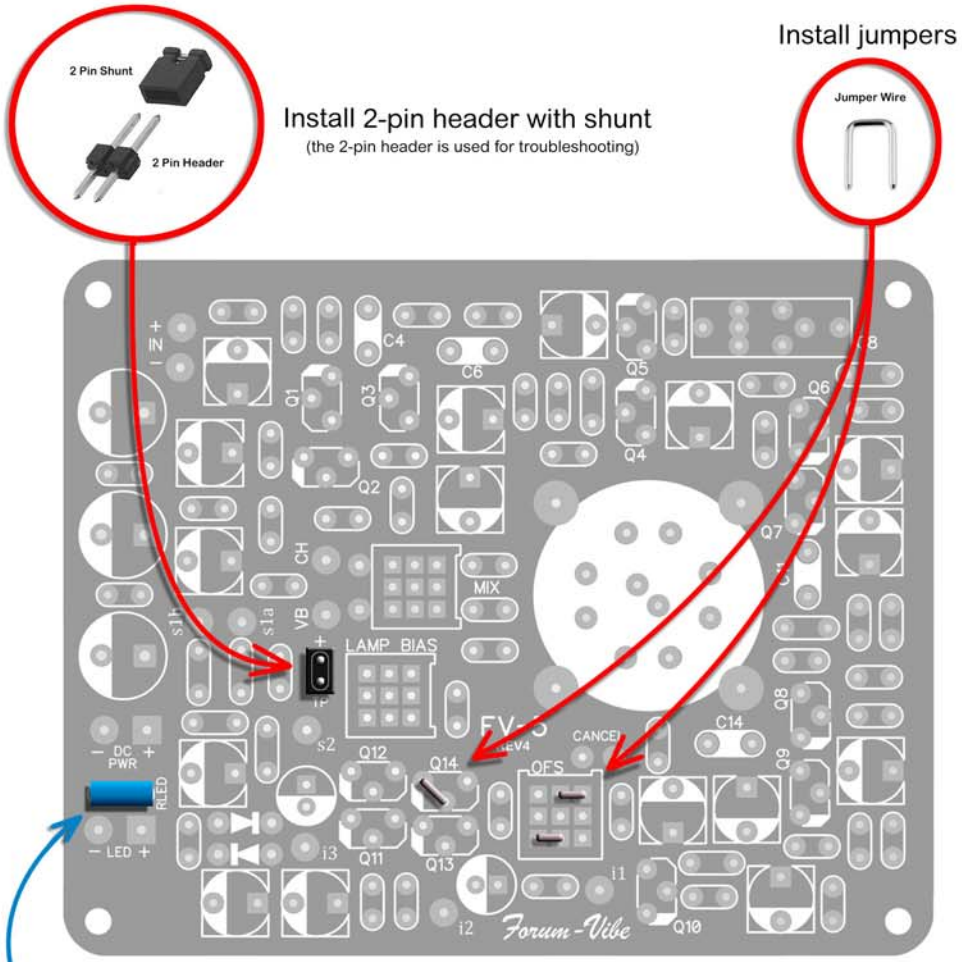


In the layout graphics, resistors look like they are laying down horizontal
this is only so their labels can be read easy when doing your build

The Forum-Vibe Project

FV-5 rev4 Board
(Vintage Build)

Most of the following graphics will show the PCB in gray so the parts stand out, and the build information is more clearly communicated



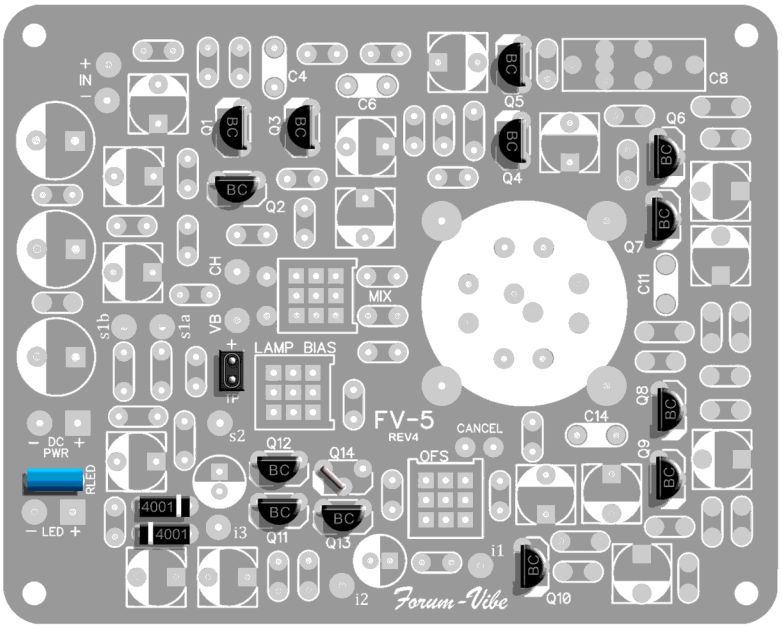
Link to LED Resistor Calculator:
https://uk.rs-online.com/web/content/discovery/tools-and-calculators/led-resistor-calculator

The Forum-Vibe Project

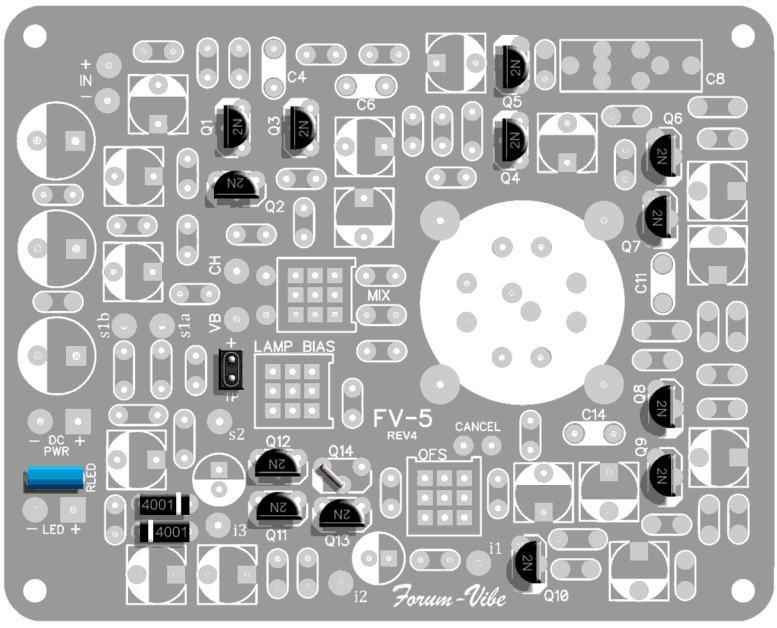
Install your transistors and diodes

The FV-5 PCB supports transistors with C-B-E pinout
(does not support the 2SC type B-C-E pinout)

BC549 Transistors



2N5210 Transistors



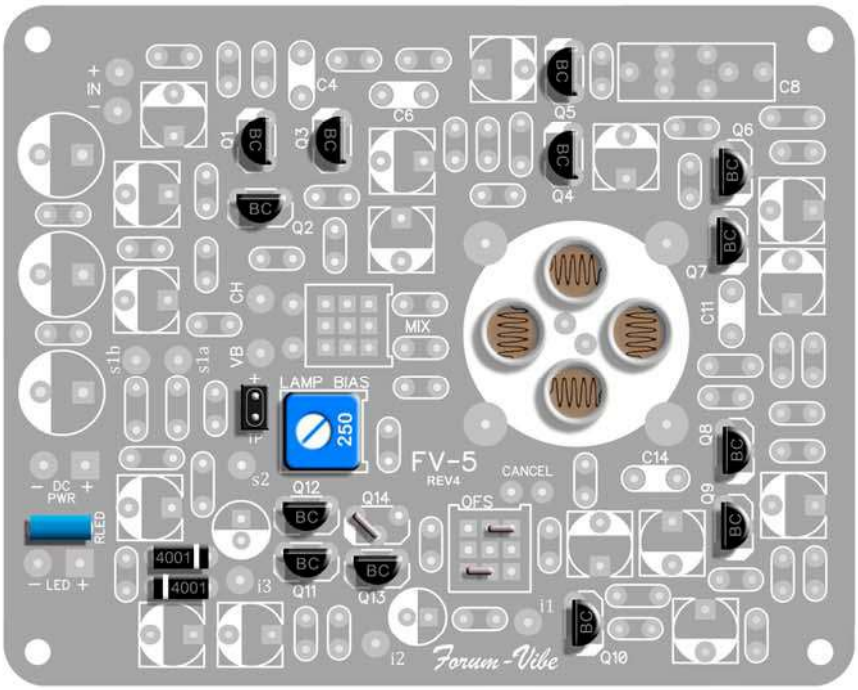
The

Forum-Vibe

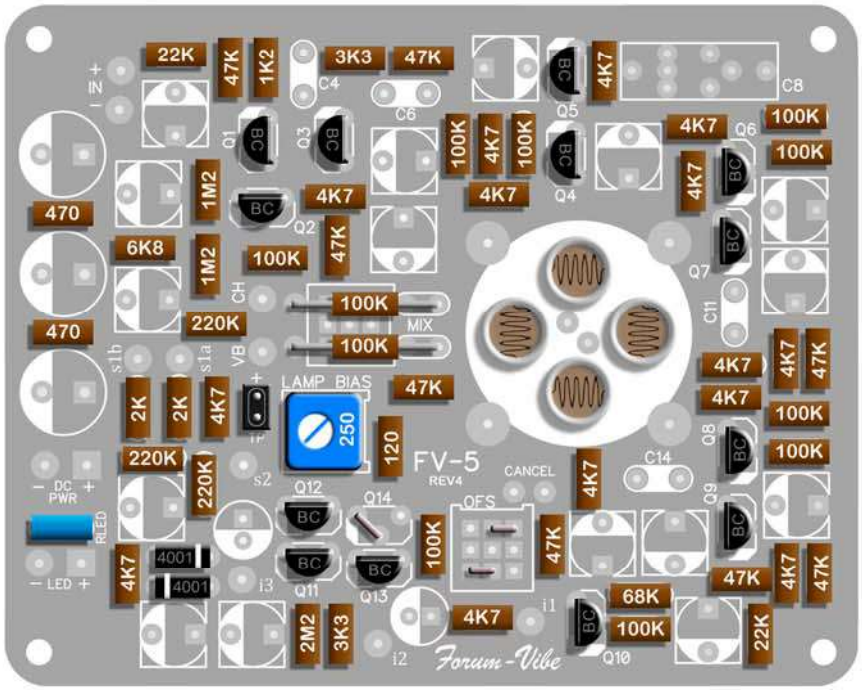
Project

(Vintage Build)

Install trimmer pot and LDR's (photocells)



Install resistors



The

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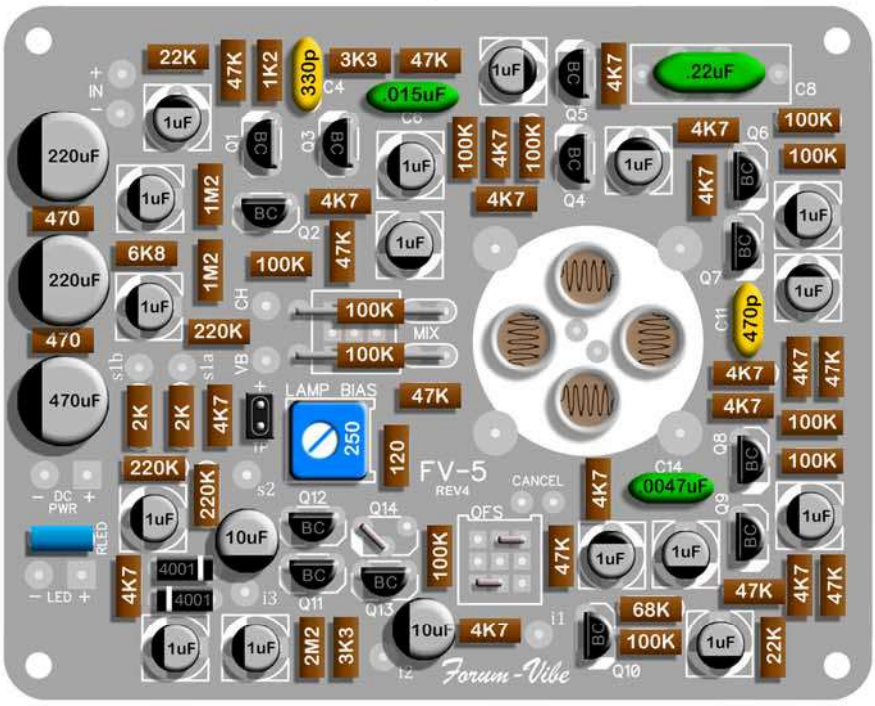
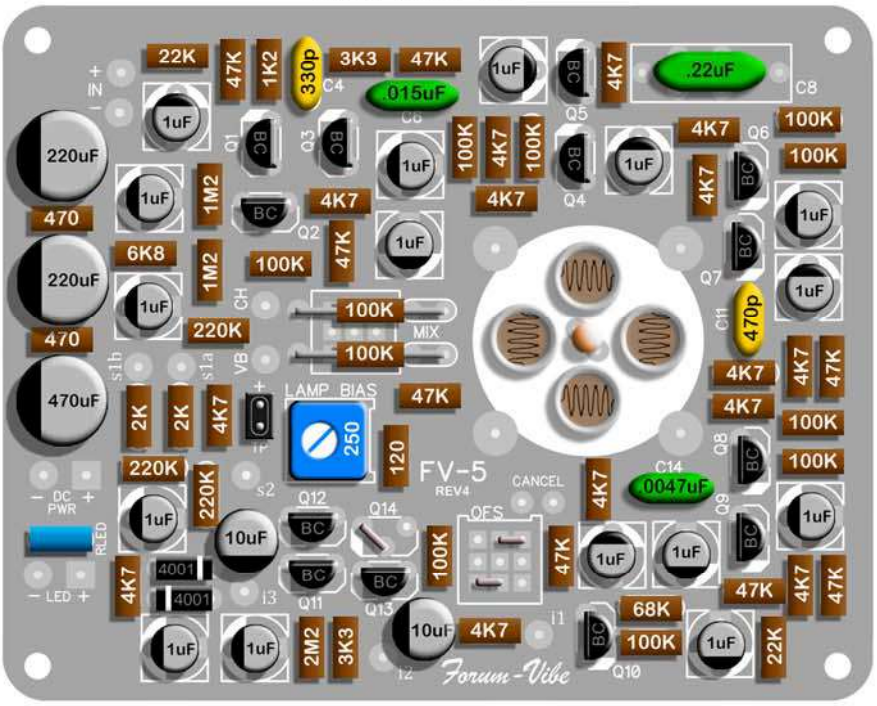
Project

(Vintage Build)

Install capacitors



Install lamp / bulb



The

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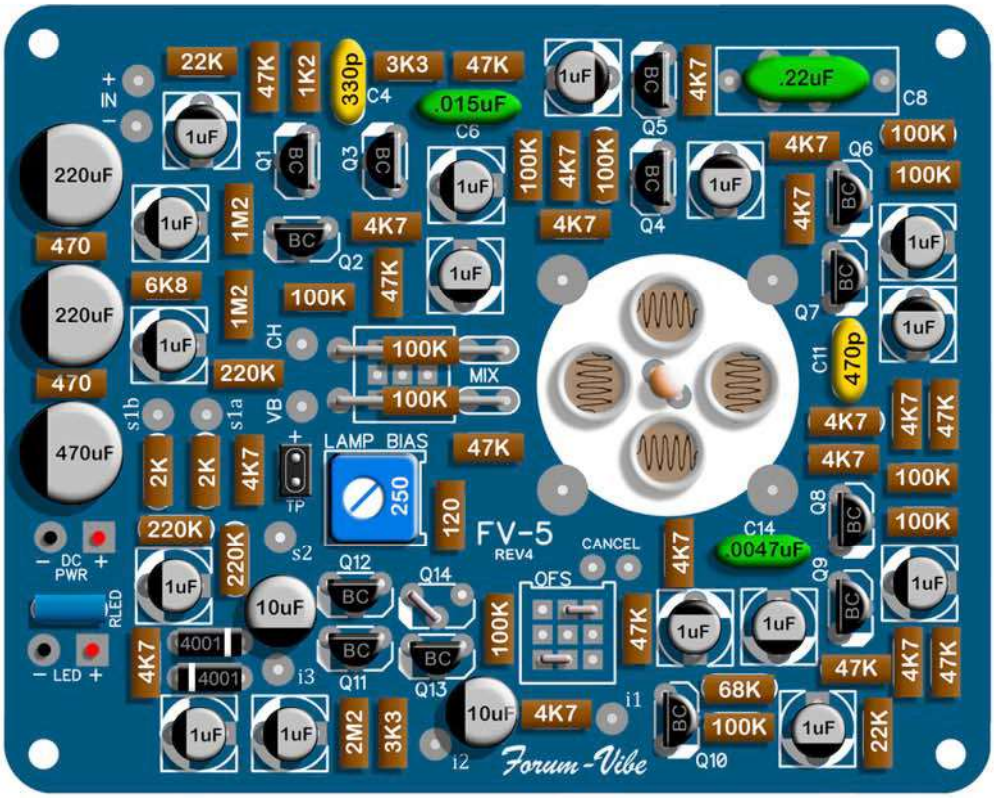
Project

(Vintage Build)

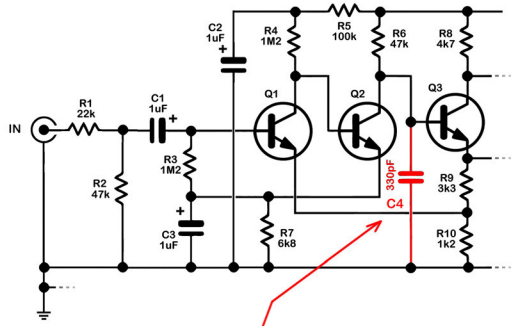
Finished Vintage Build

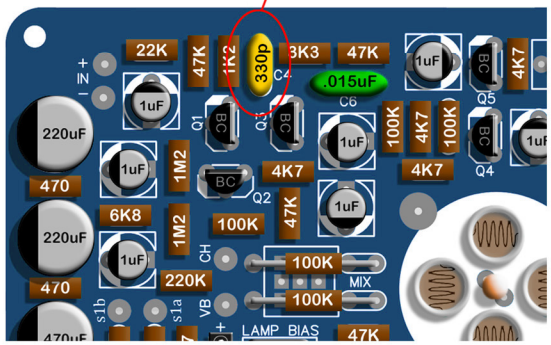


The Forum-Vibe Project

Dealing with oscillation problems in the pre-amp

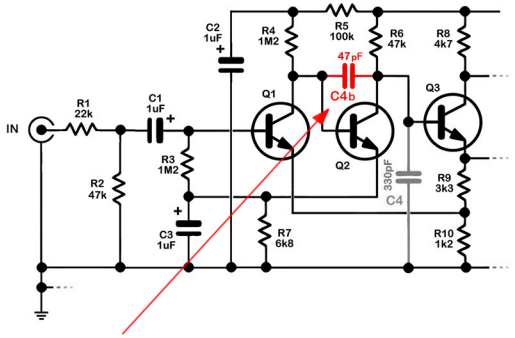
Oscillation problems can arise in the pre-amp section when using modern transistors for your build. The original 2SC828 transistors used in Uni-Vibe's were "Q" type normally fell in the 160-200 hfe range, modern equivalent transistors are usually in the 325-475 hfe range 2x and 3x the design of the old vintage circuit, so oscillation problems can arise. The frequencies (well above 20KHz) can effectively hetrodyne into the audio spectrum of the circuit and show up as unwanted "noise" and "high frequency hiss" like sounds. If you can't find/use transistors with the 160-200 hfe range the "cure" for having oscillations is to remove the 330pF (C4) capacitor, add a new 47pF (C4) capacitor connected as a high frequency shunt across Q2's Base and Emitter. The easiest way to do this is shown below...



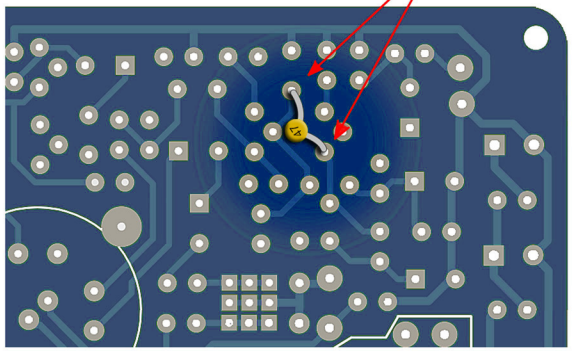


Forum-Vibe PCB's up to rev4

(not for rev4B see page 6)



Add a 47pF (C4b) capacitor to bottom of PCB across these pads:

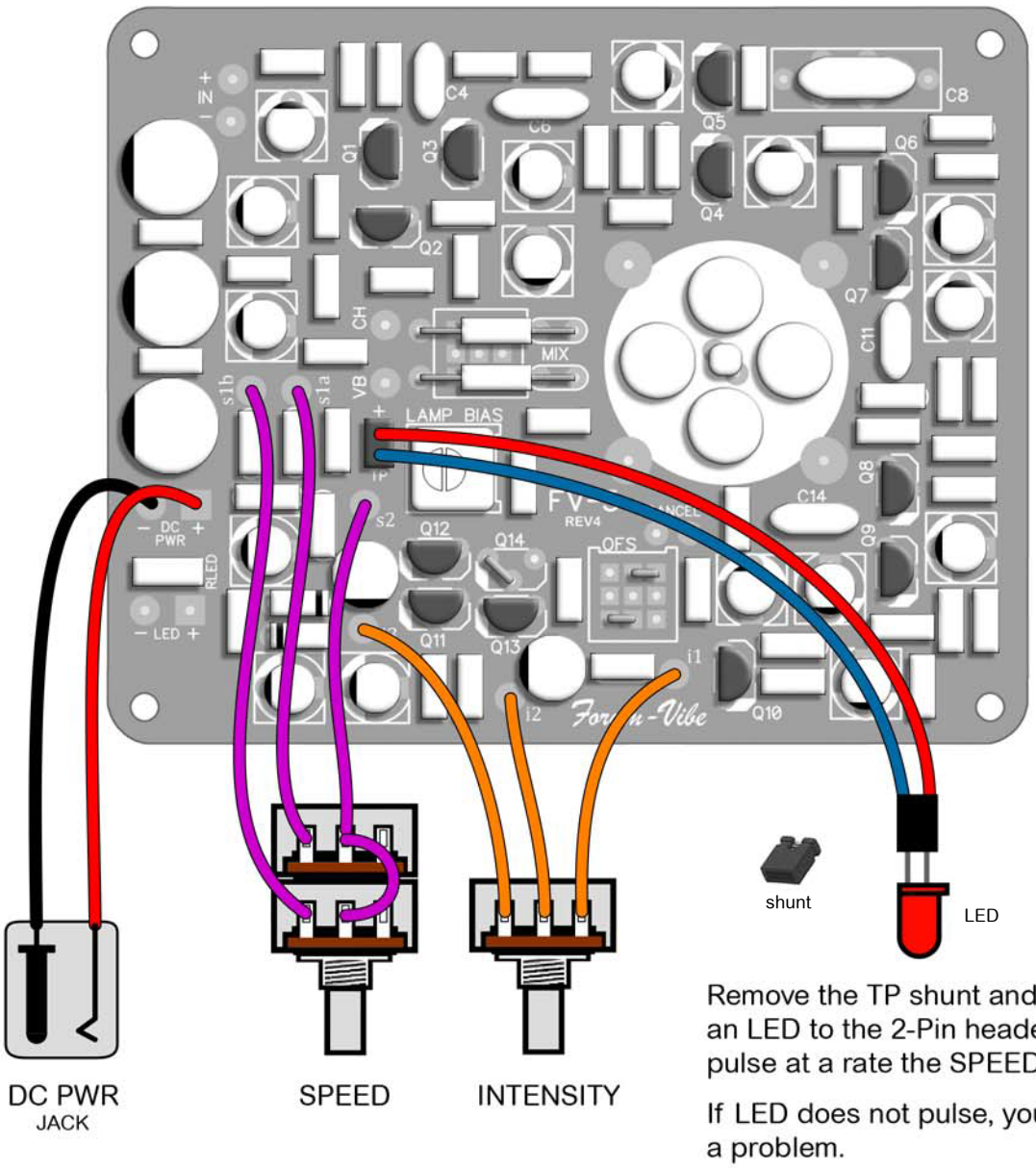


You can remove the 330pF cap if you wish

The Forum-Vibe Project

Using an LED to Trouble-shoot LFO and Lamp problems

Ensure LED polarity matches test point (TP +) polarity silk screened on the PCB



Remove the TP shunt and connect an LED to the 2-Pin header, it should pulse at a rate the SPEED pot is set

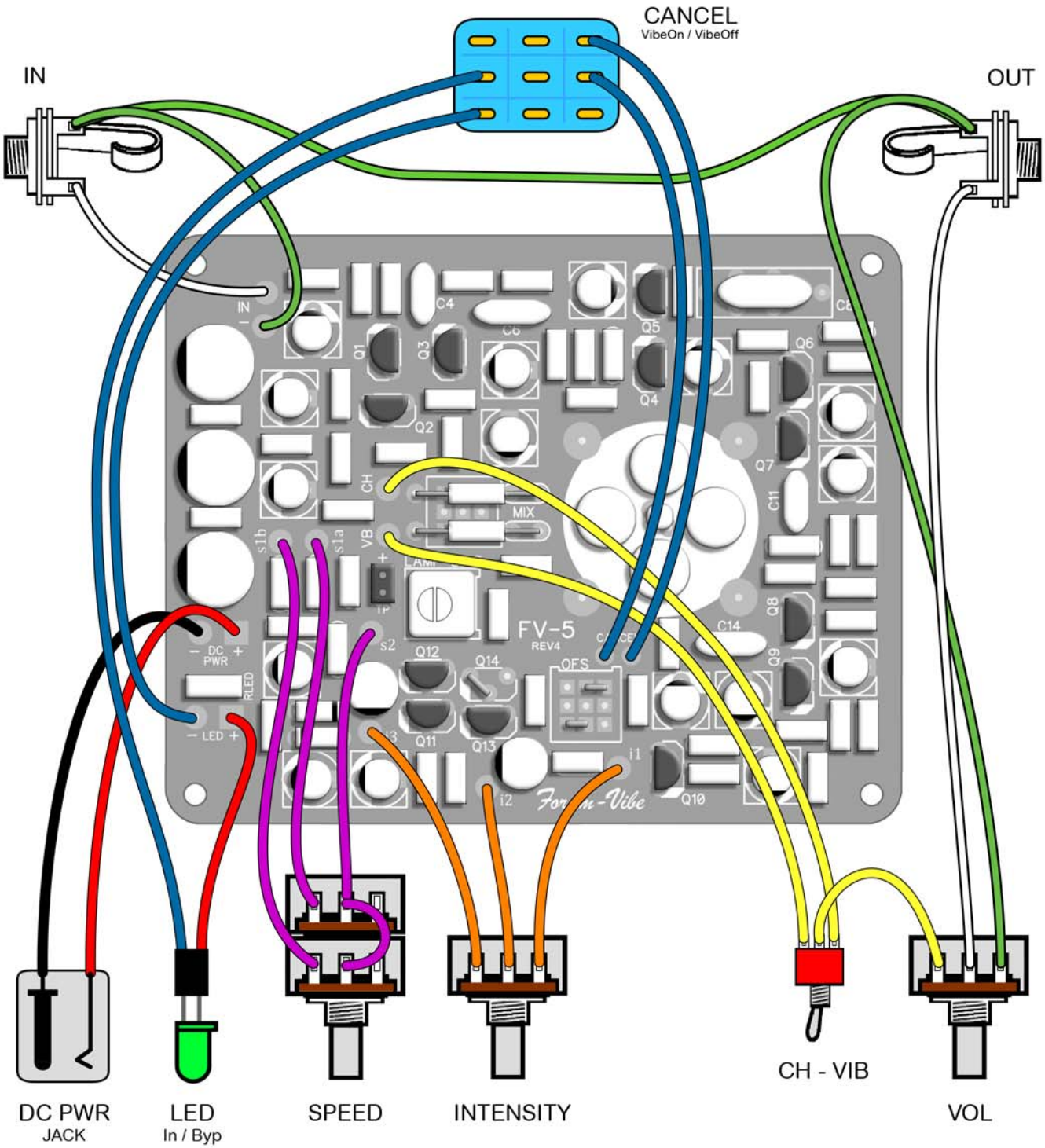
If LED does not pulse, your LFO has a problem.

If LED pulses but your Lamp does not, the lamp driver has a problem.

(or your INTENSITY pot is off)

The Forum-Vibe Project

BASIC HOOKUP



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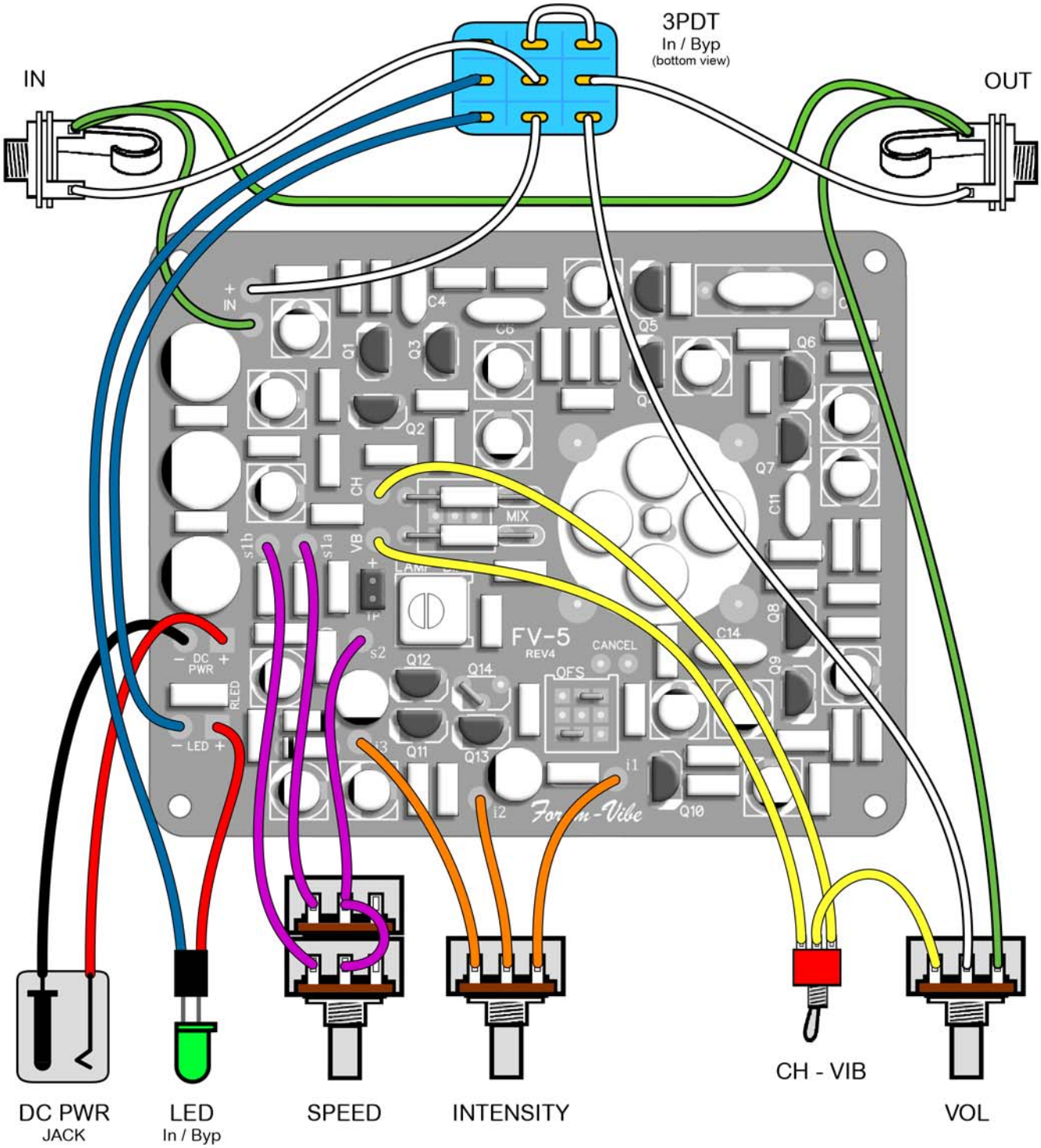
BASIC HOOKUP
True-Bypass



The

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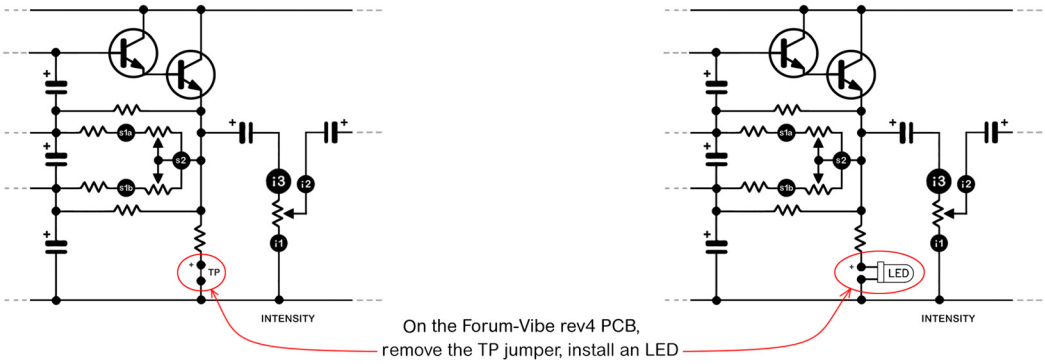
FV-5 rev4
(*Vintage Build*)
(*MOD Build*)

The easiest way to add an LED that flashes in sync with the LFO speed, was developed by a guy named **Bob Sweet** (RIP), his mod was to insert the LED between the 4K7 (R45) and the ground.
(*where the Test Point jumper is on the Forum-Vibe rev4 PCB*)

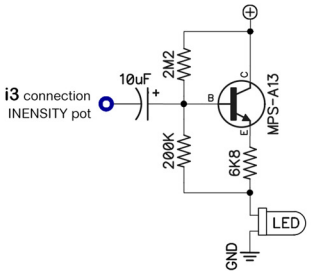


On the Forum-Vibe rev4 PCB,
remove the TP jumper, install an LED

While that method of adding an LED works fine for testing, (IMHO) it lacks enough energy to be bright enough to see very well on a stage setting so I came up with the following small add-on circuit that (can be) much brighter and easier to see the flashing of the LED on stage.

Note that this method also does not load down the LFO circuit, it has a very high impedance so the LFO cant really see it hanging on to it.

All of the more common methods of attaching an LED for a speed indicator can load the oscillator sometimes affecting it's function and wave shape.

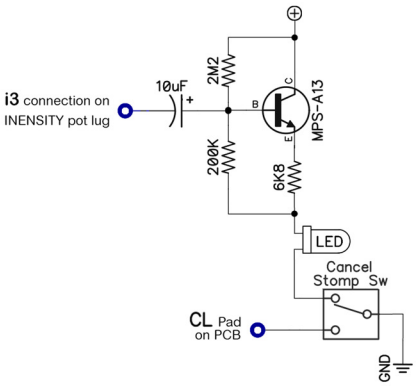


Basic flashing LED circuit that does not load down the LFO oscillator

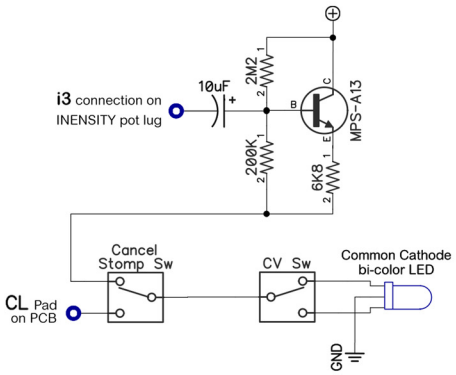
This small circuit can be made using a small bit of Proto-board or Veroboard and tucked away inside the box connected with sone fly-leads.

The "basic" circuit shown at Left is connected with only 3 wires, one from the i3 lug on the INTENSITY pot, and two wires for power from the main PCB.

Note also that no matter what form of connections you make to add an LED to the LFO, the flashing will always look odd because the light pulses are made from the peaks of the LFO waveform, but the vibe "sound" is created in the fall-and-rise parts of the waveform so it can look "odd" to those of us with minor OCD enhancements (LOL).



Flashing LED integrated with vintage style Cancel switch



Flashing Bi-Color LED integrated with Chorus-Vibrato and Cancel switches

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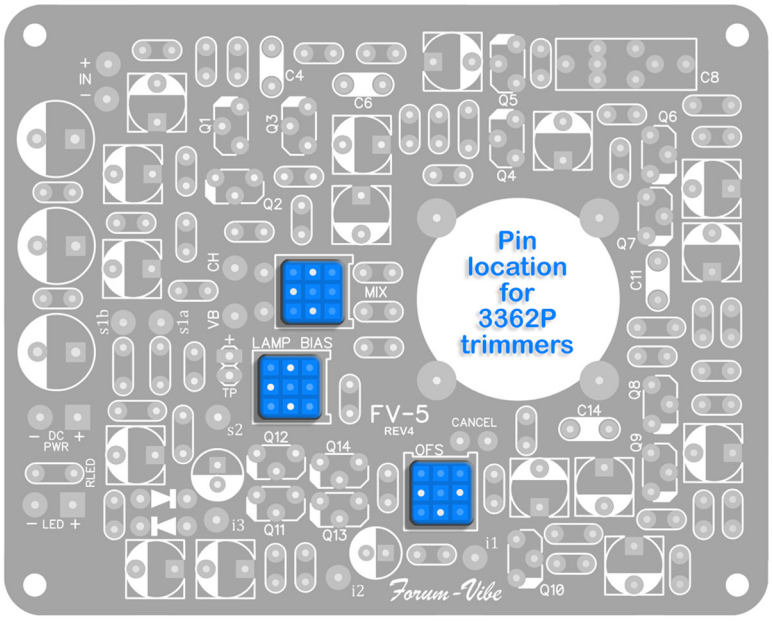
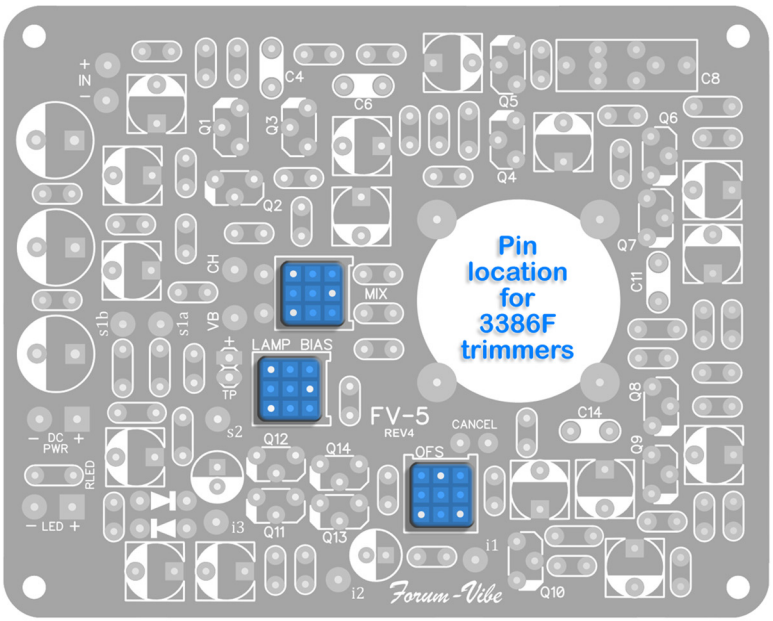
FV-5 rev4

Orienting the Bourns trimmer pot pins on the PCB so they rotate relatitive to their effective functions.

- **Turning the LAMP trimmer CW turns the lamp UP (brighter)**
- **Turning the OFS trimmer CW raises the offset higher**
- **Turning the MIX trimmer toward CH pad increases CH, and turning it toward the VB pad increases VB in the mix**

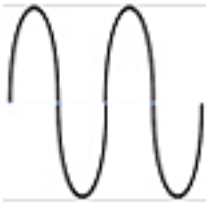




The Forum-Vibe Project

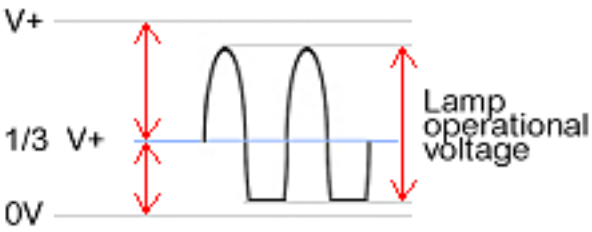
Understanding lamp BIAS adjustment -vs- waveform Offset adjustment

Uni-Vibe LFO waveform

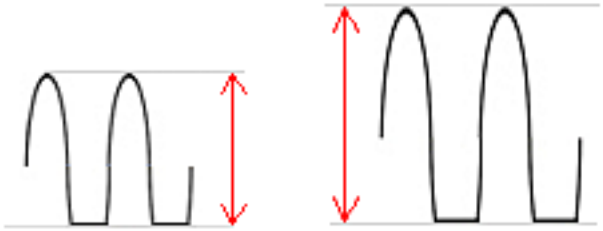


AC coupled

Uni-Vibe Lamp Driver (DC) **BIAS** point



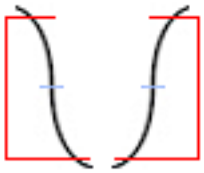
Turning the **BIAS** trimmer adjustment



DOWN UP

Notice there is still a flat section on the Down / Off part of the waveform

WHY DOES THIS MATTER?
because this is where the sound happens:



on the slopes

The **Offset Adjustment** allows us to recover some of the bottom waveform where the desirable sound is happening