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*)

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NOTE this current document, distilled from the over 200-odd pages of the old Forum-Vibe website, I am only describing the most valuable mods (IMHO), many other mods, and versions of these mods can be found on the forums when you search. This just represents the state-of-the-project from 2002.

The Waveform Offset Adjustment Mod

The Offset Adjustment mod (OFS) originally by JC Maillet allows the LFO waveform to be off set in adjustment, which is not to be confused with the lamp/bulb driver bias adjustment. The OFS mod is (IMO) the most valuable of all the mod's one can do to with a Uni-Vibe circuit, thanks to JC for contributing this JC.

JC's mod originally used a 250k trimpot to replace the 100k/47k voltage divider used to feed the (Q13) lamp driver transistor in the original univibe circuit. This trimpot allows the sine wave of the LFO to be adjusted finding the *sweet spot* for it and the LDRs you use. I re-aligned the implementation of this mod to allow the fully CCW position to sound as the standard uni-vibe circuit would, and when you rotate it CW it offsets the sine wave upwards allowing you to find *the sweet spot*. I also implemented a safety feature of a 4k7 resistor limiting the top of the range to keep one from turning it all-the-way-up and burning out the lamp/bulb by accident.

The Input Padding Mod

This is a mod of the input to help remedy the volume drop (suck) which a vintage uni-vibe circuit does most noticable when using true bypass switching. The R1 (22k) and R2 (47k) resistors reduce the incomming signal to about 1/3 of what it was, which is weird, and (usually) people who use uni-vibe's regularly tend to compensate for this by driving the input with some kind of boost pedal to make up for this loss. By increasing R2 value we can gain back much of the lost input signal, I recommend starting with 100k resistor and anything up to about 470k can work, but as you get higher in value (>470k) guitars with humbuckers can sound too "woofy". Also changing R9 to 3K6 will allow for a little "boost" in the VOL knob, and brings back proper balance to the Q3 "phase splitter" section.

The Output Mix Mod

This *Output Mix* mod which (I believe) was originally contributed by RG, allows tweaking the wet/dry mix of the output. The original mod called for a 200k pot replacing the two 100k mix resistors (R34 and R35) the standard uni-vibe circuit uses. While this does work, in practice the 200k pot turns out to be much too coarse of an adjustment to dial-in.

So to fix this, the Forum-Vibe implementation uses two 47k resistors which feed a 100k trimmer with the wiper as the output, we still maintain our 200k total mix value but narrows the fine-tune adjustment range to a more usefull area. This mod can let you fine-tune the amount of whoop-dee sound (vibrato) the chorus effect contains while not changing the sound of the vibrato mode. Some people really like the over-the-top whoop-dee sound on the end of the sweep but please note that genuine vintage uni-vibe's didn't normally sound this way in chorus mode.

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The Poly Caps Mod

Also high on the list of desirable mods is changing the 1uF electrolytic caps for stacked poly caps like the Panasonic EQV type, this IMHO lets the vibe sound better. One could also change the 470pF Ceramic (C11) to a polyester greenie cap for a little better fidelity.

The Power Rail Mod

Because we are now using a DC power supply (usually) filtered fairly well, we can make changes to the vintage power smoothing section by replacing the big vintage 1000uF(or 470uF)+220uF+220uF electrolytic caps and 470 Ohm decoupling resistors with lower values, we can drop these to 100uF and 240 Ohm decoupling resistors and get the desired voltages and smoothing.

Darlington's

If you have trouble finding a lamp/bulb with under 100mA current draw, the *Darlington Lamp Driver* mod (JC Maillet) is supported here by removing the jumper installed in Q14 base-to-emiter pads and install another transistor in the Q14 position, this increases the current drive.

(or you could just install a single MPS-A13 in the Q13 position, your choice)

Installing an MPS-A13 Darlington in place of the LFO's Q11-Q12 pair works well, and replacing the Q10 transistor with a Darlington does a fine job of increasing that stage's input impedance closer to the way the rest the phase stages work, it adds some clairity.

Dual Speed Mod

It is a simple thing to add a 2nd speed pot and a DPDT switch to allow Slow/Fast speed switching, you simply switch the connections (s1a ans s1b) from one pot to the other, or you can use the switch to shunt the 2nd speed pot either way works, see the diagrams in the build notes.

NOTE:

As I was updating the Forum-Vibe doc's in 2024 a friend pointed me to another person on the forums who has ***re-invented*** *several of the these mods, a person who goes by the internet moniker Big Monk.*

https://forum.pedalpcb.com/threads/electrovibe-modifications-thread.8703/

I'm asuming Big Monk hasn't seen this 'ol Forum-Vibe project, so what comes to mind is that age-old addage "Like minds think alike", I guess me and Big Monk would be getting along quite fine in the work shop together LOL!.

About the R-LED Resistor

You might have noticed that R_{LED} is not specified in the parts tables and graphics, this is because you will need to calculate it's value according the LED you have chosen to use, and the brightness you want to have. You can find LED resistor calculators out on the internet, like this one...

https://uk.rs-online.com/web/content/discovery/tools-and-calculators/led-resistor-calculator

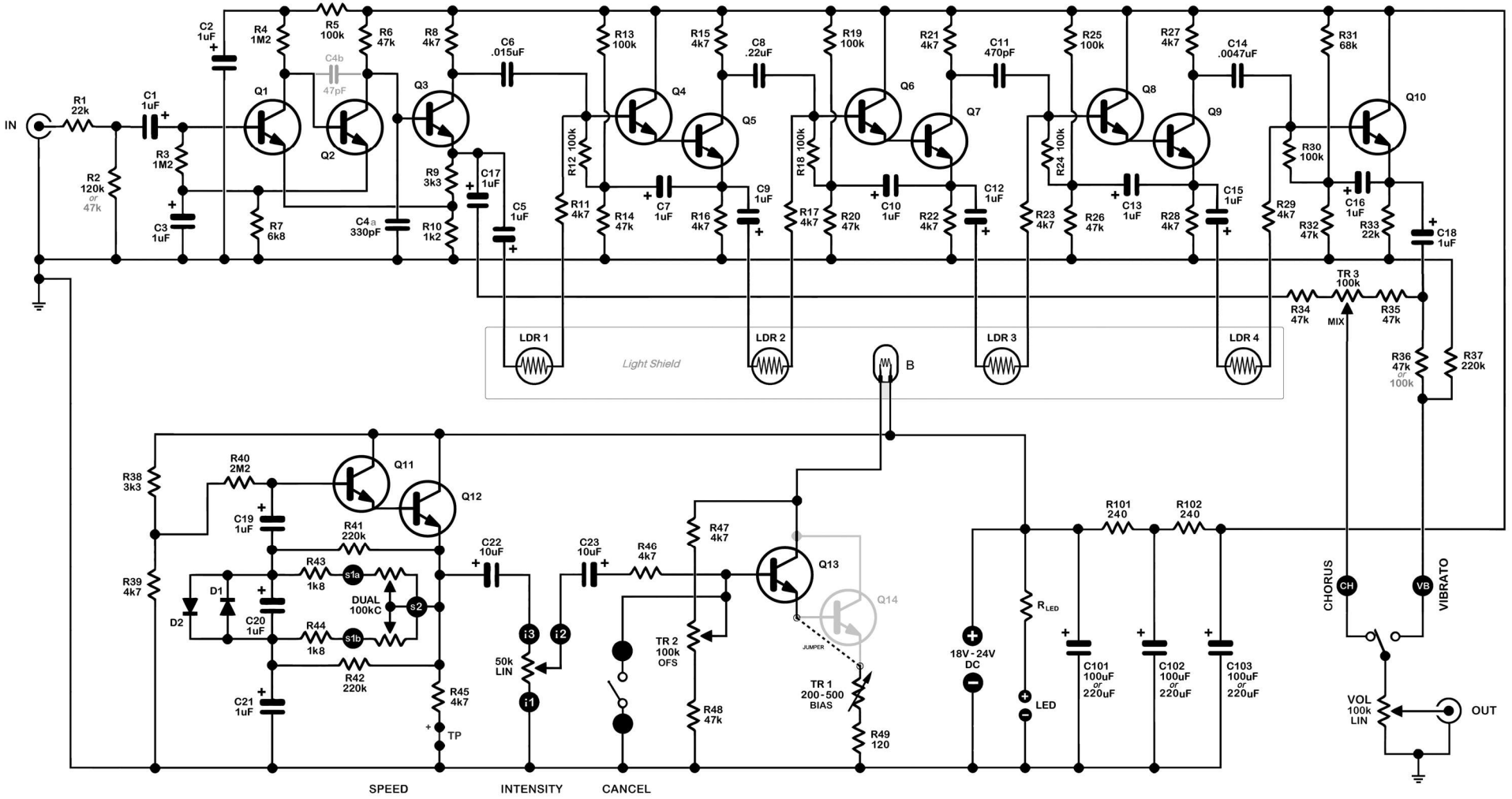
The

Forum-Vibe

Project

FV-5 SCHEMATIC

(*MOD Build*)



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

The

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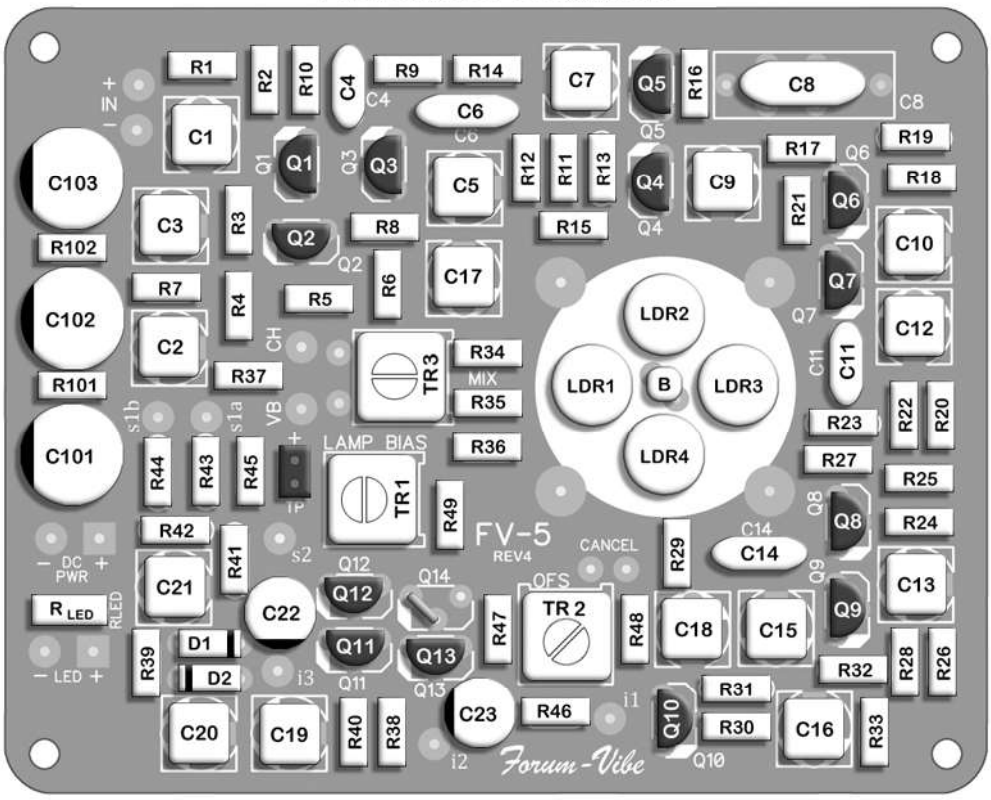
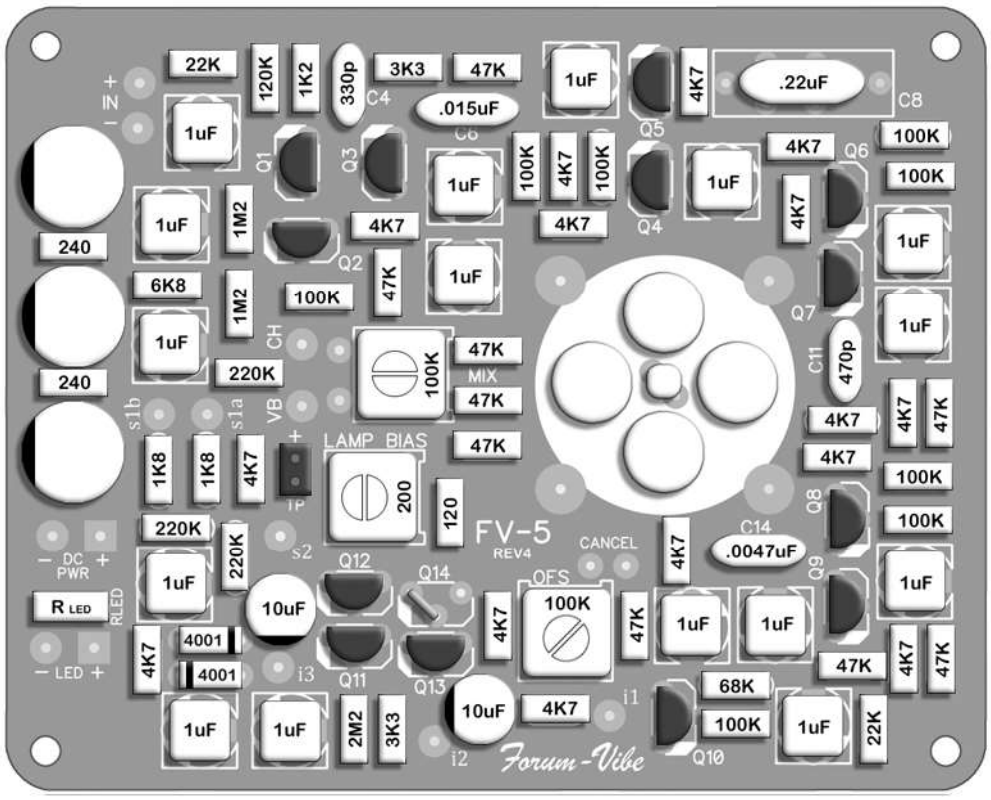
FV-5 PCB

Mod Build

Part Reference Designations



Part Values



The Forum-Vibe Project

Mod Parts List

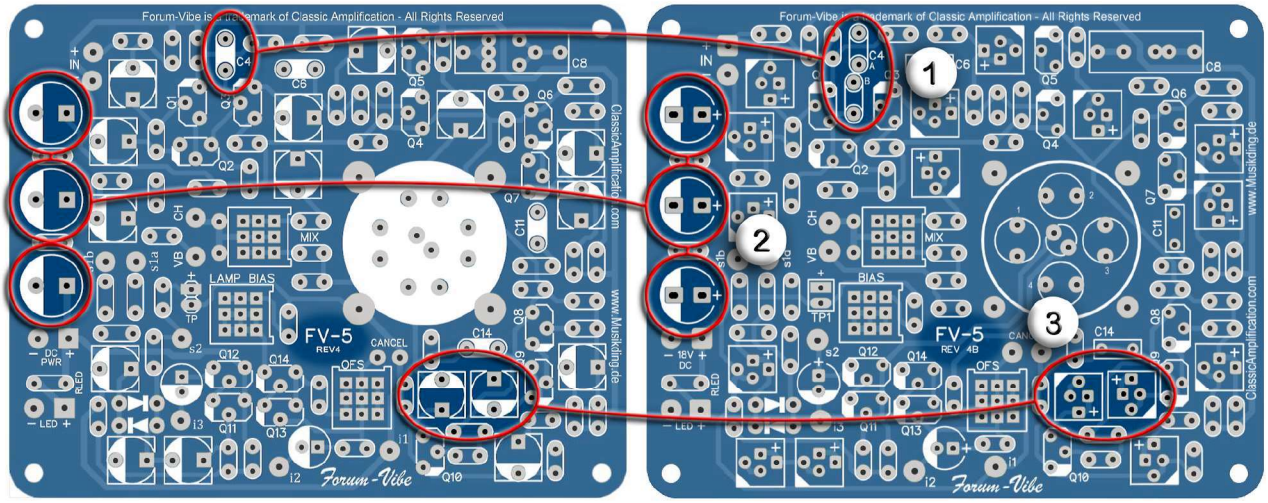
Part Value	Qty	Part Reference Designation	Notes
BC549C	1	Q1	or 2N5210
BC549B	12	Q2, Q3, Q4, Q5, Q6, Q7, Q8, Q9, Q10, Q11, Q12	or 2N5210
1N4001	2	D1, D2	or 1N4148, or 1N914
120	1	R49	(originally 150 Ohm)
240	1	R101, 102	
1k2	1	R10	
1k8	2	R43, 44	(can use 1k5 to 2k Ohm)
3k3	2	R9, 38	
4k7	15	R8, 11, 15, 16, 17, 21, 22, 23, 27, 28, 29, 39, 45, 46, 47	
6k8	1	R7	
22k	2	R1, 33	
47k	9	R2, 14, 20, 26, 32, 34, 35, 36, 48	
68k	1	R31	
100k	8	R5, 12, 13, 18, 19, 24, 25, 30	
120k	1	R2	
220k	3	R37, 41, 42	
1M2	2	R3, 4	
2M2	1	R40	
100uF *or* 220uF	3	C101, 102, 103	Electrolytic
1 uF - 50V	16	C1, 2, 3, 5, 7, 9, 10, 12, 13, 15, 16, 18, 19, 20, 21	Panasonic EQV or WIMA
10 uF - 35V	2	C22, 23	Electrolytic
330pF (n33)	1	C4	Ceramic
470pF (n47)	1	C11	Polyester (Greenie)
.0047uF (4n7)	1	C14	Polyester (Greenie)
.015uF (15n)	1	C6	Polyester (Greenie)
.22uF (220n)	1	C8	Polyester (Greenie)
200 Ohm	1	TR 1 Bourns type: 3362P or 3386F	(can use 500 ohm)
50k Lin	1	Linear Taper - Intensity control	
100k Lin	1	Linear Taper - Volume control	
Dual 100kC	1	Reverse Log Taper - for stomp-box speed control	(can use 220kC)
		(Log Taper for Wah-shell speed control)	
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	
Lamp Bulb	1	Any 1.2v to 24v DC lamp of less than 100mA will do	

Normally a 30-60mA lamp is used, if you cant find one under 80mA, you can do the *Darlington Lamp Driver* mod removing the jumper and adding transistor Q14 (see the Forums)

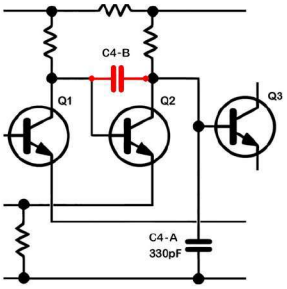
The final *Forum-Vibe* update: Rev 4B

(*same circuit, some minor board alterations*)

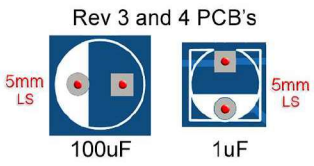
FV-5 Rev4 FV-5 Rev4B

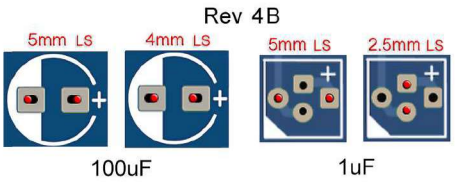


1: I've added a place for an additional HF feedback capacitor placed on across Q2's collector and base which is often needed to help manage HF oscillation/hetrodyning of noise a problem that can occur with modern transistors used in the Q2 position of the old Uni-Vibe circuit, now there is a C4A and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

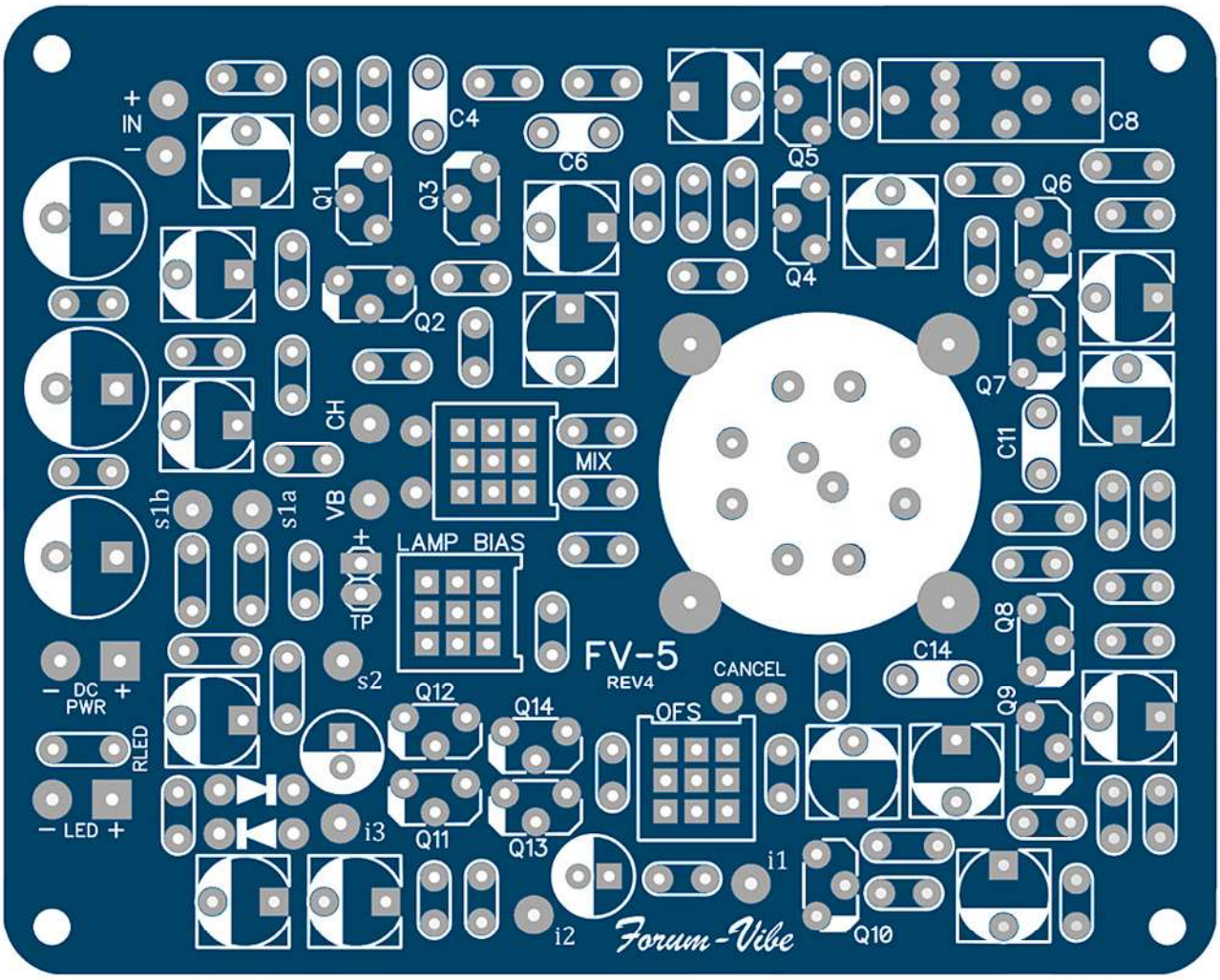
This will be the last and final update I make for the Forum Vibe Project, I am now retired.

- RedHouse

THE Forum-Vibe PROJECT

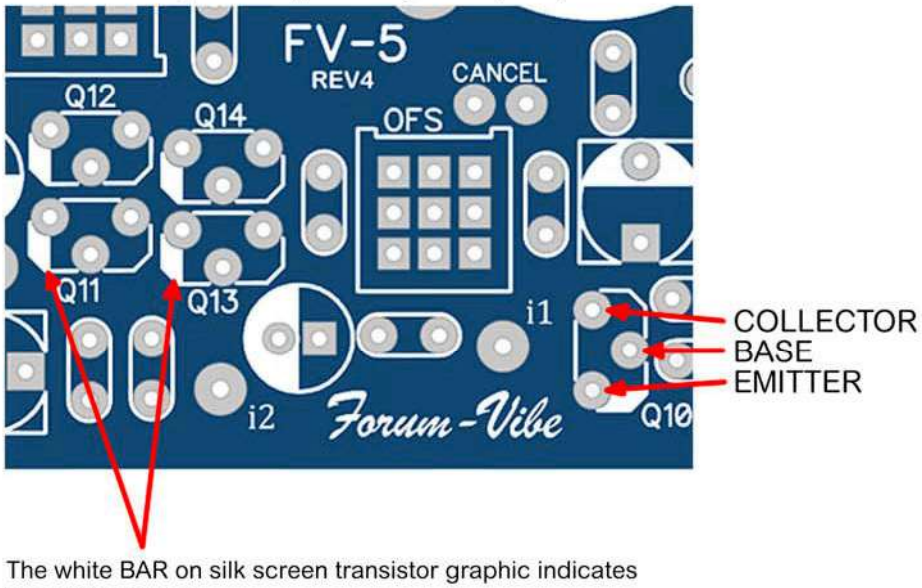
The Forum-Vibe Project

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

The
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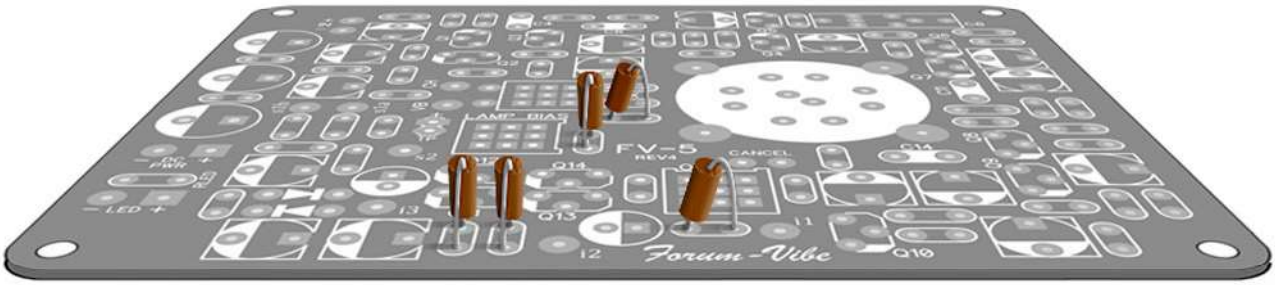
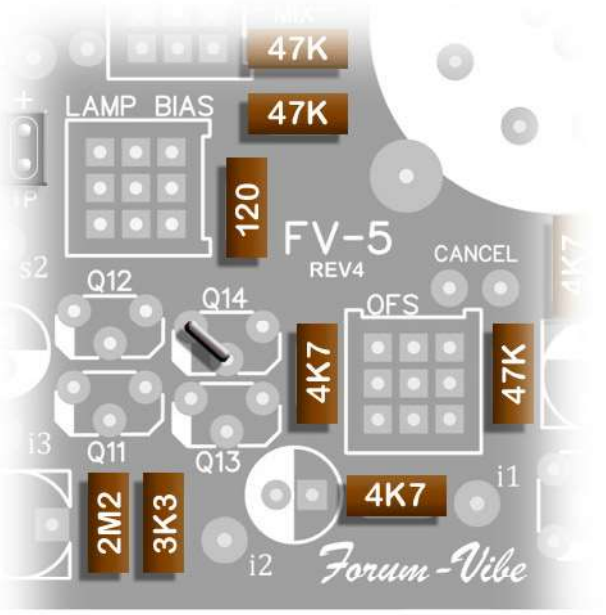
Project

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

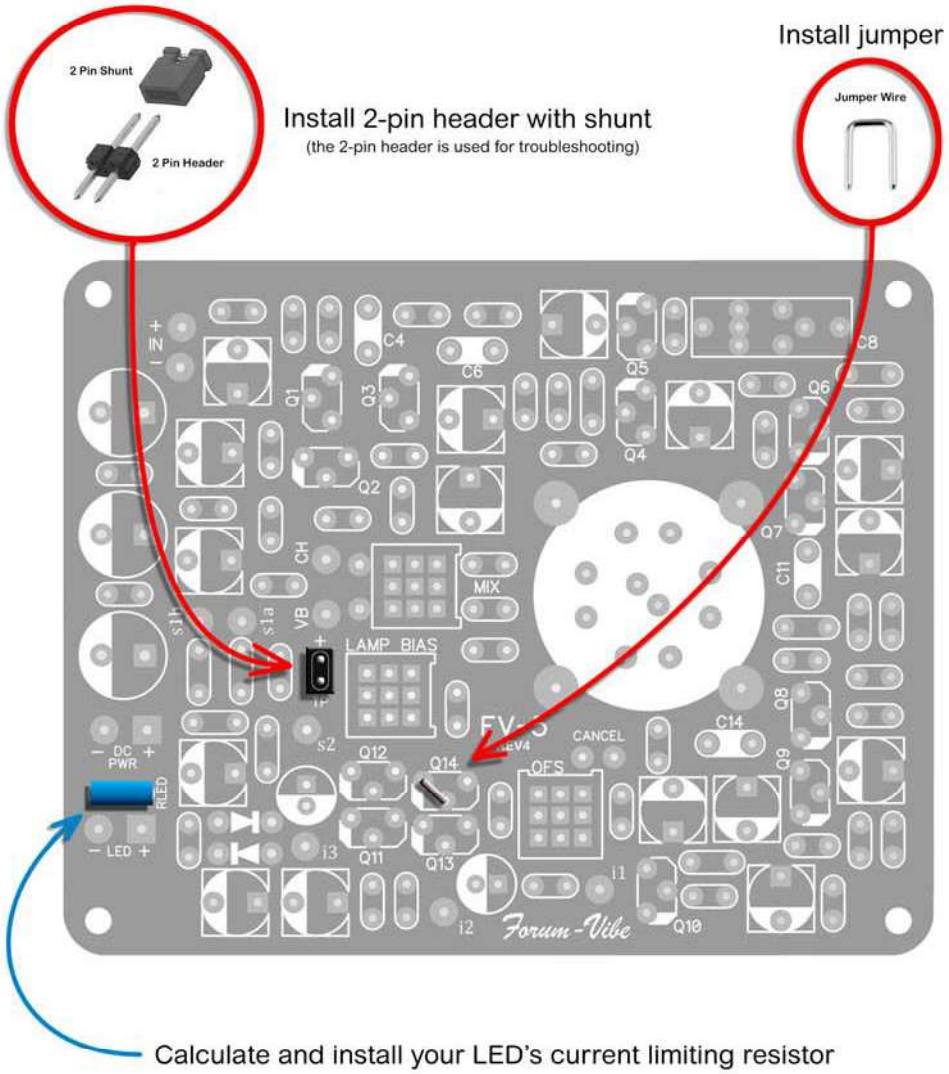
Resistors are installed "stand-up" style





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



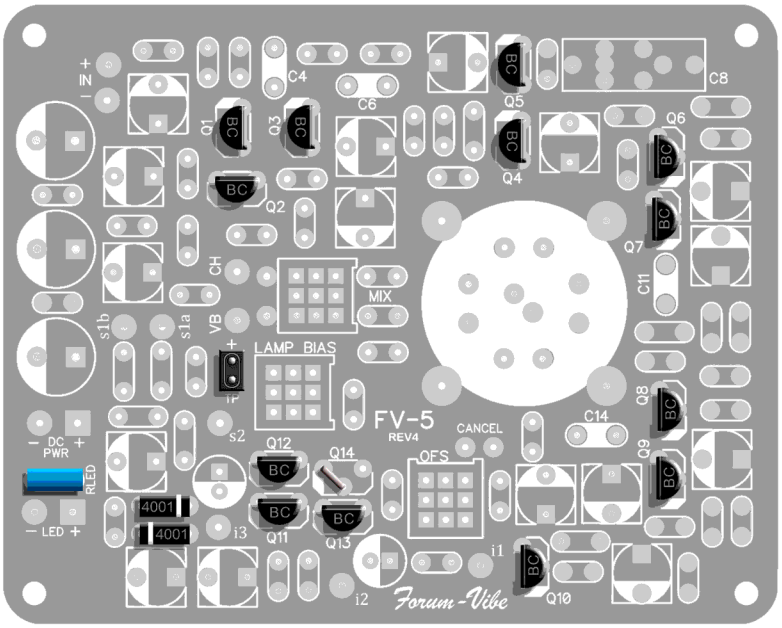
Link to LED Resistor Calculator:
https://uk.rs-online.com/web/content/discovery/tools-and-calculators/led-resistor-calculator

The Forum-Vibe Project

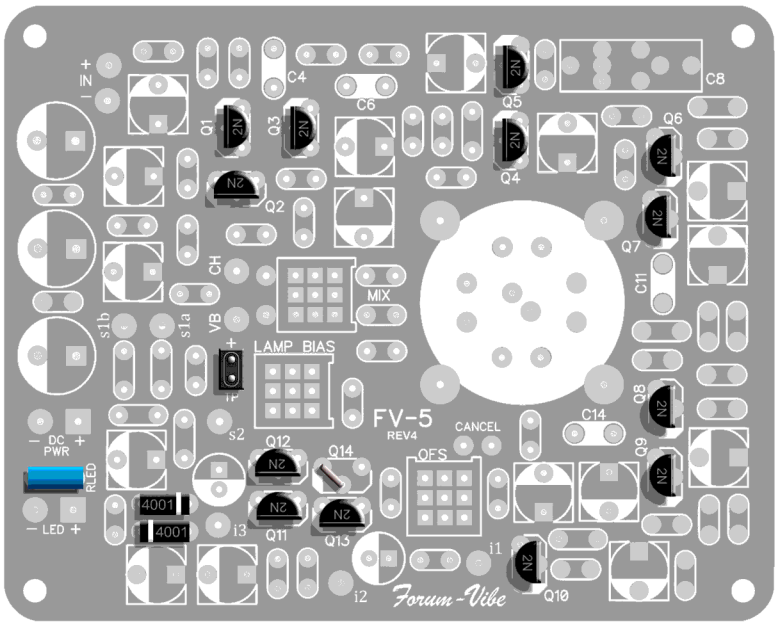
Install your transistors and diodes

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

BC549 Transistors

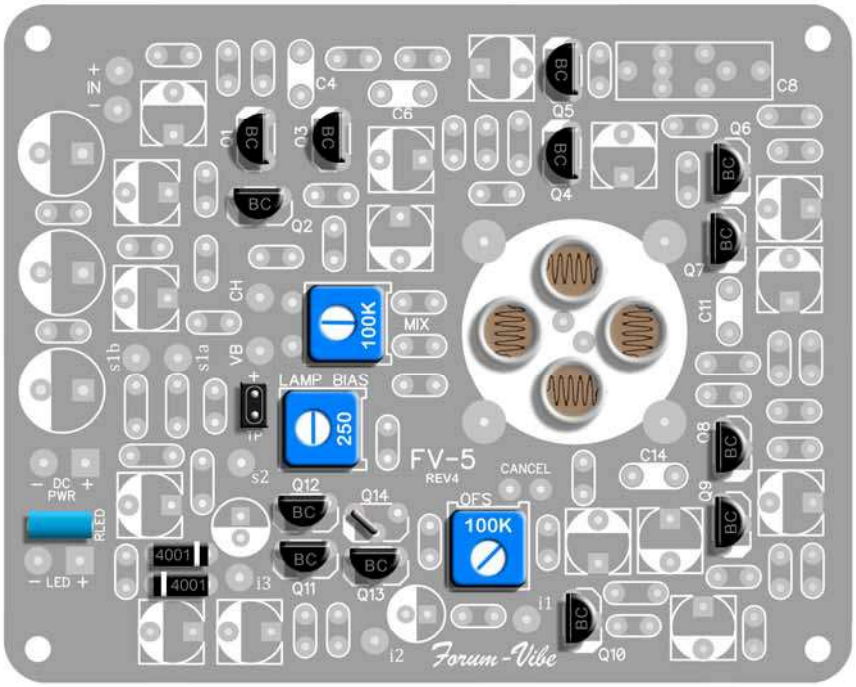


2N5210 Transistors

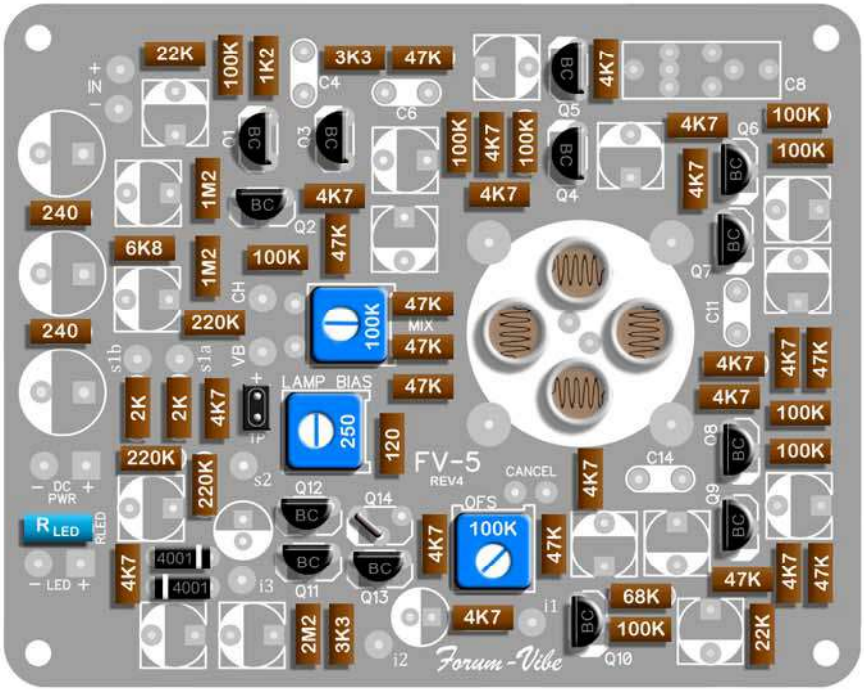


The
Forum-Vibe
Project

Install trimmer pots and LDR's (photocells)



Install resistors



The
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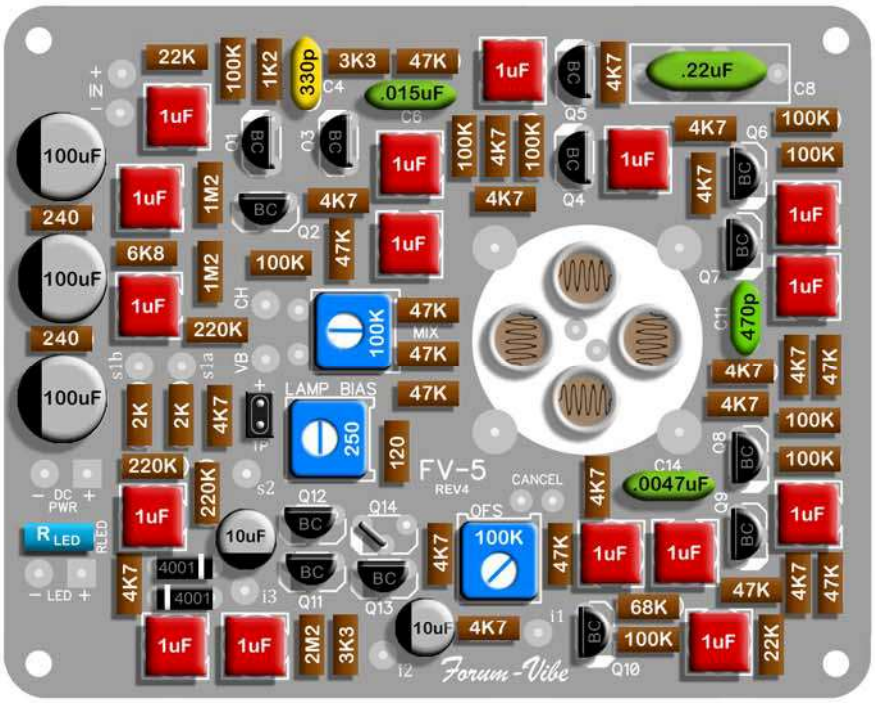
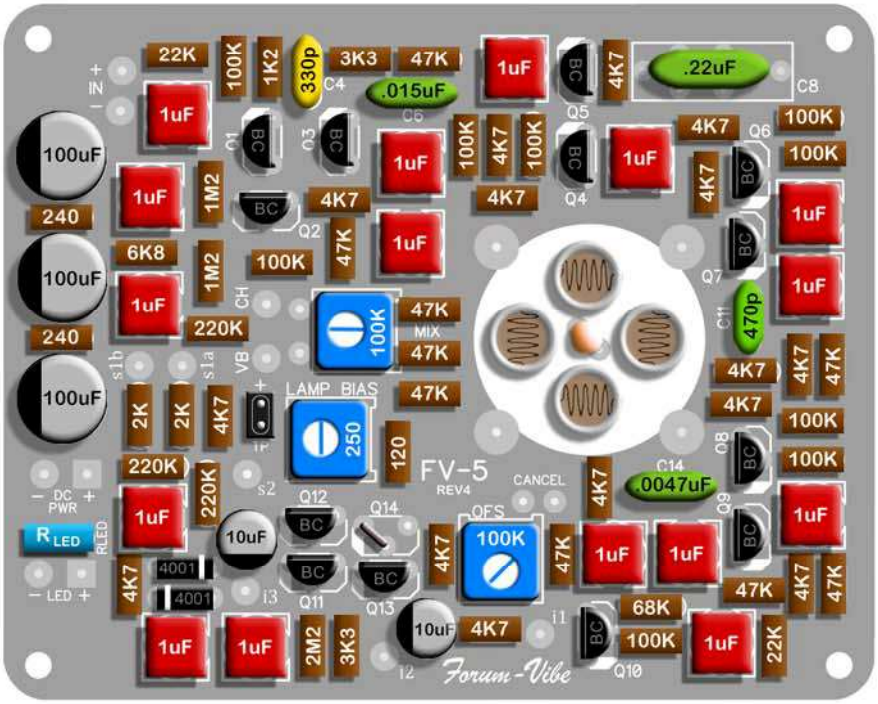
Project

Install capacitors



Install lamp / bulb



The
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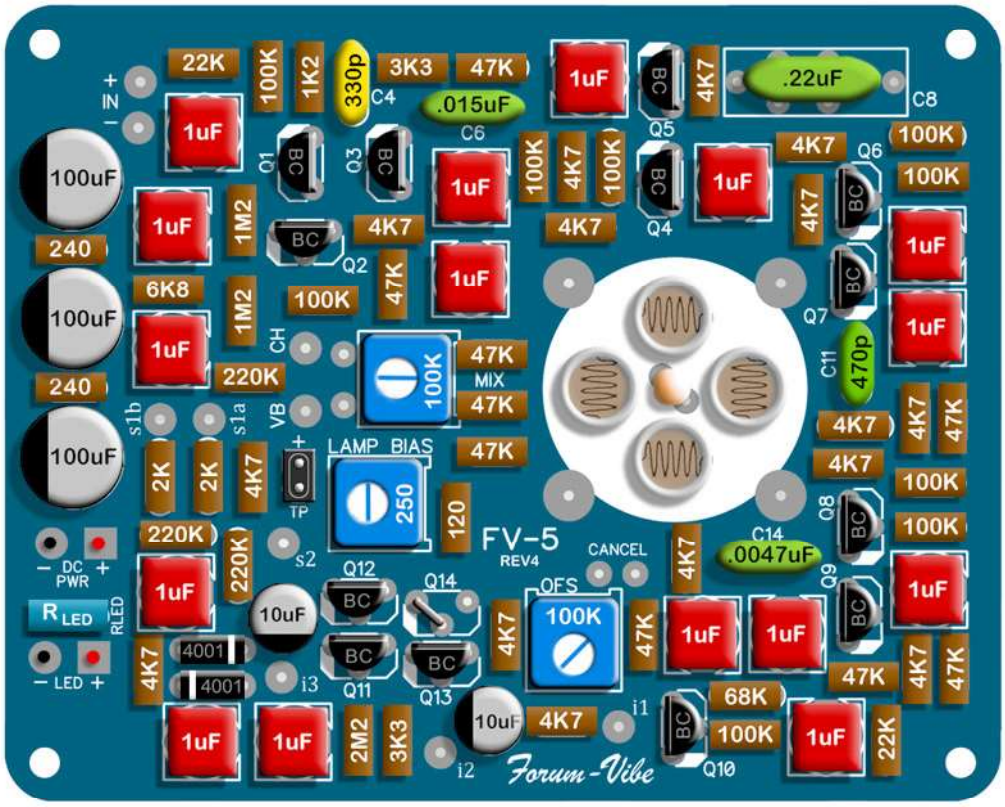
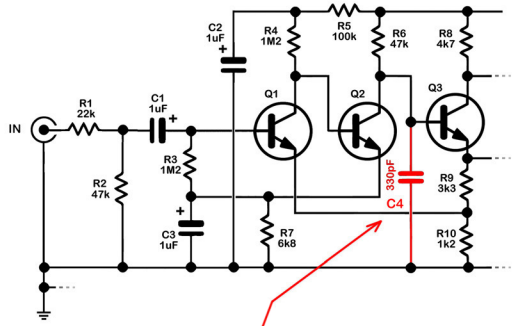
Finished Build

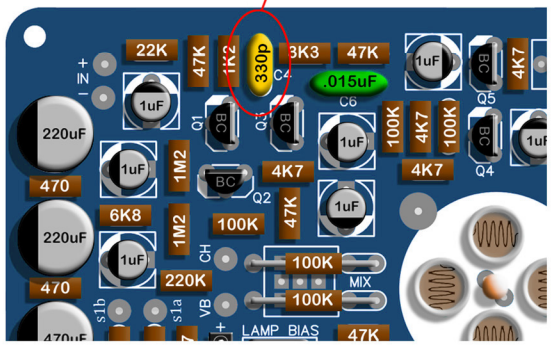


The Forum-Vibe Project

Dealing with oscillation problems in the pre-amp

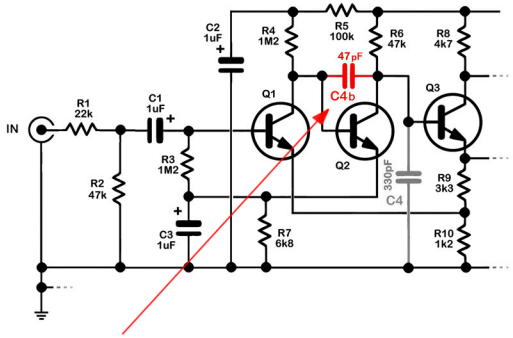
Oscillation problems can arise in the pre-amp section when using modern transistors for your build. The original 2SC828 transistors used in Uni-Vibe's were "Q" type normally fell in the 160-200 hfe range, modern equivalent transistors are usually in the 325-475 hfe range 2x and 3x the design of the old 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...



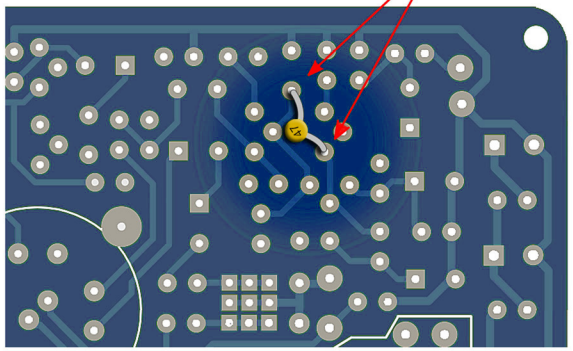


Forum-Vibe PCB's up to rev4

(not for rev4B see page 7)



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

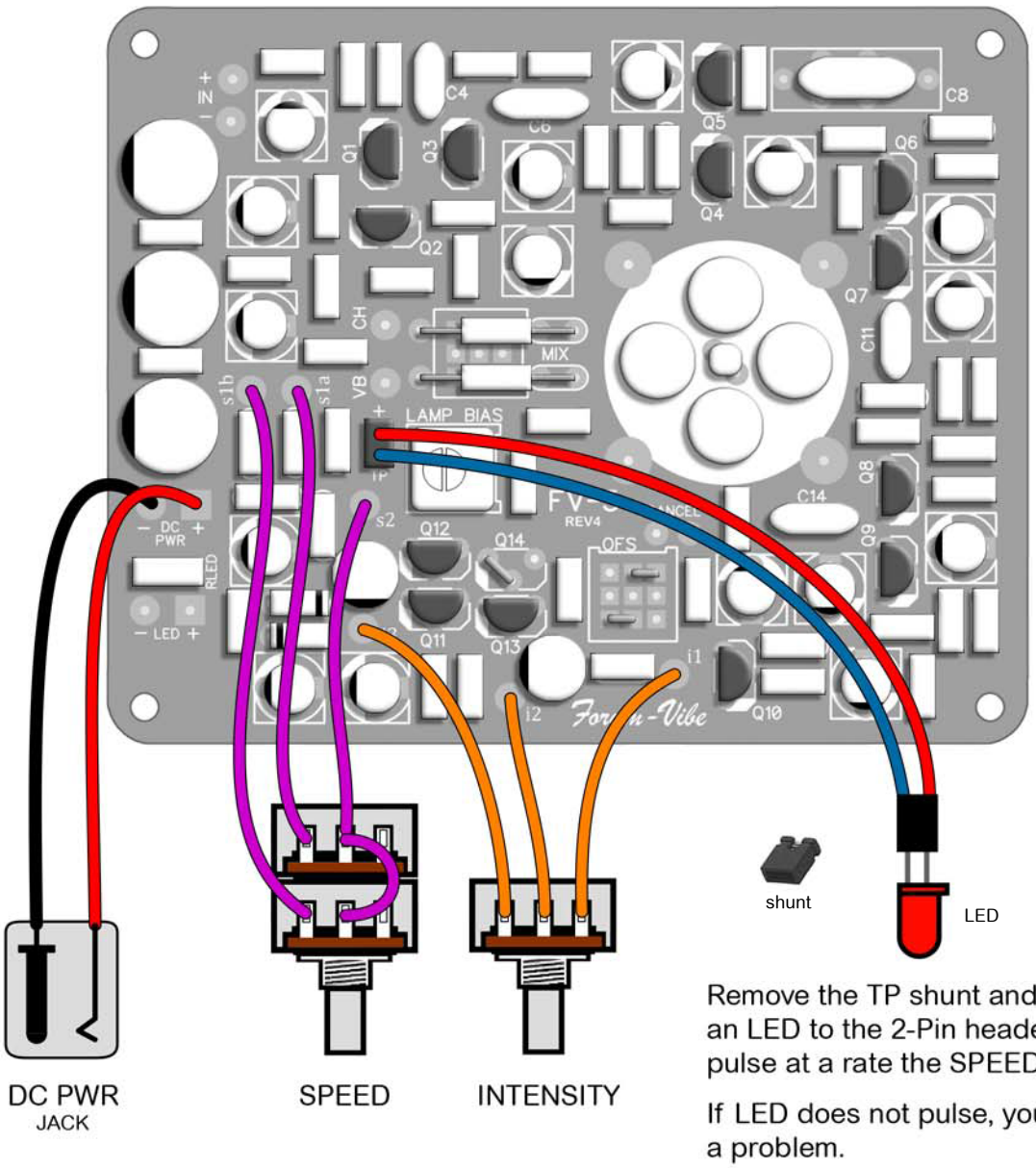


You can remove the 330pF cap if you wish

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

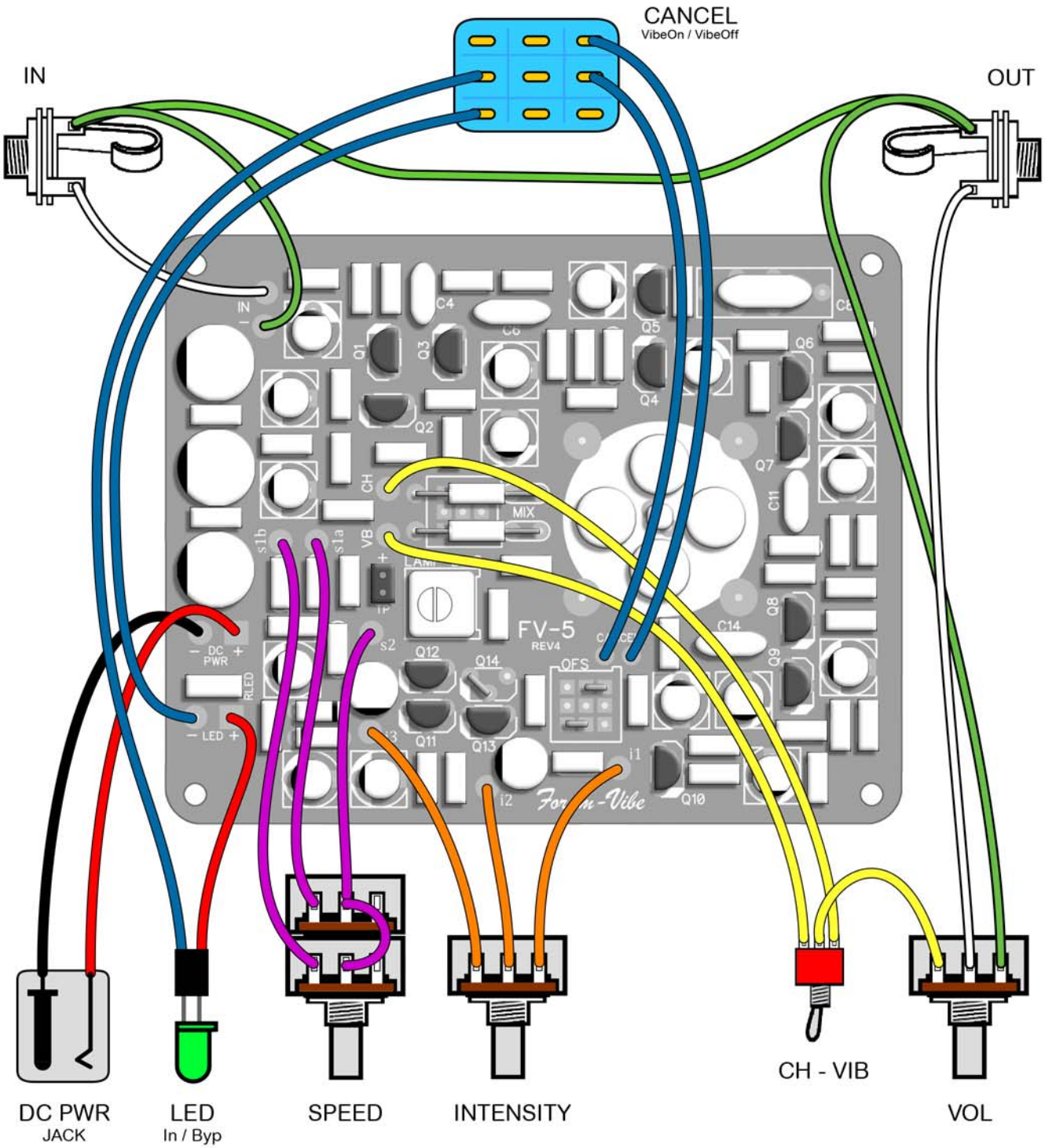
If LED does not pulse, your LFO has a problem.

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



The
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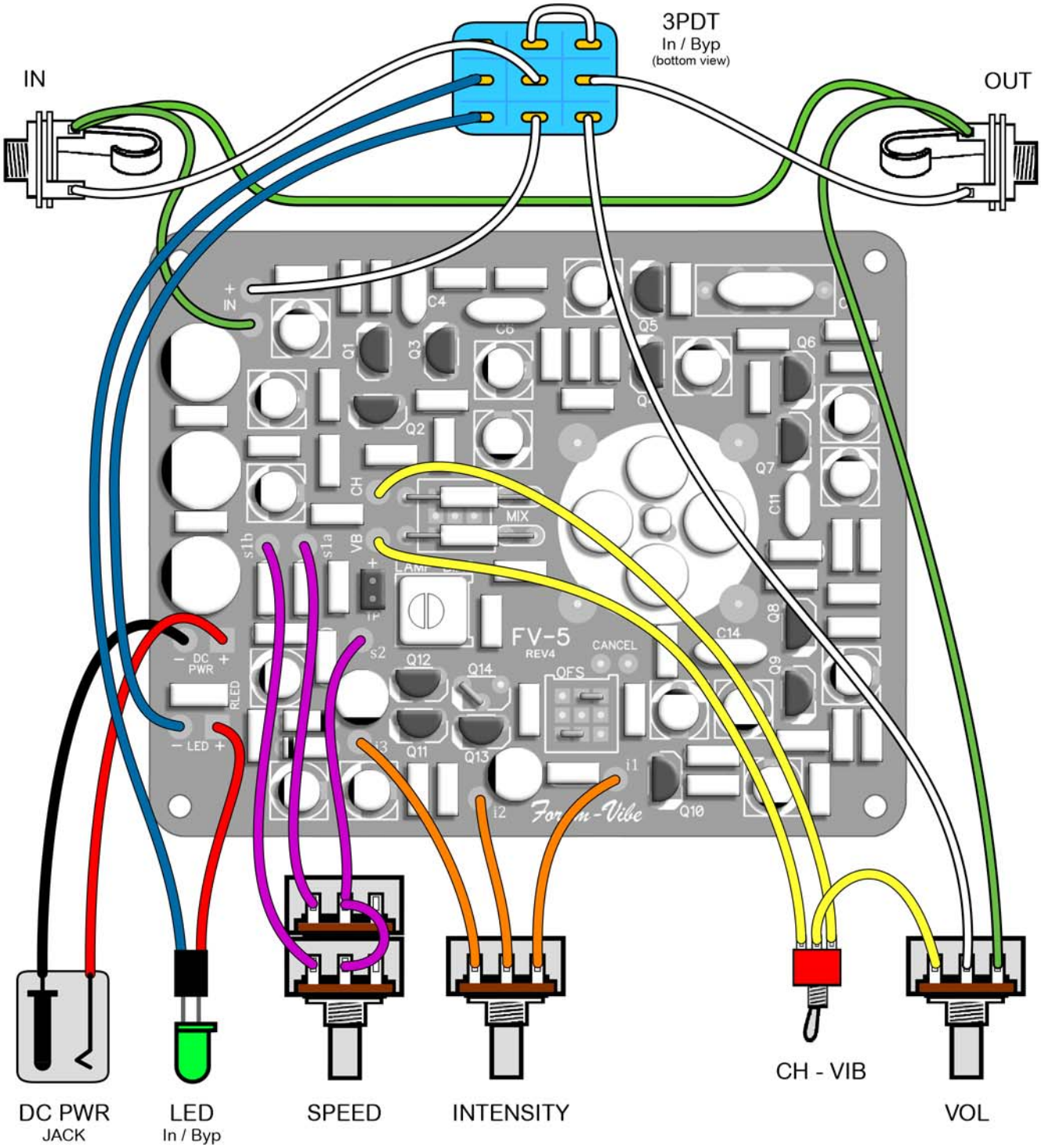
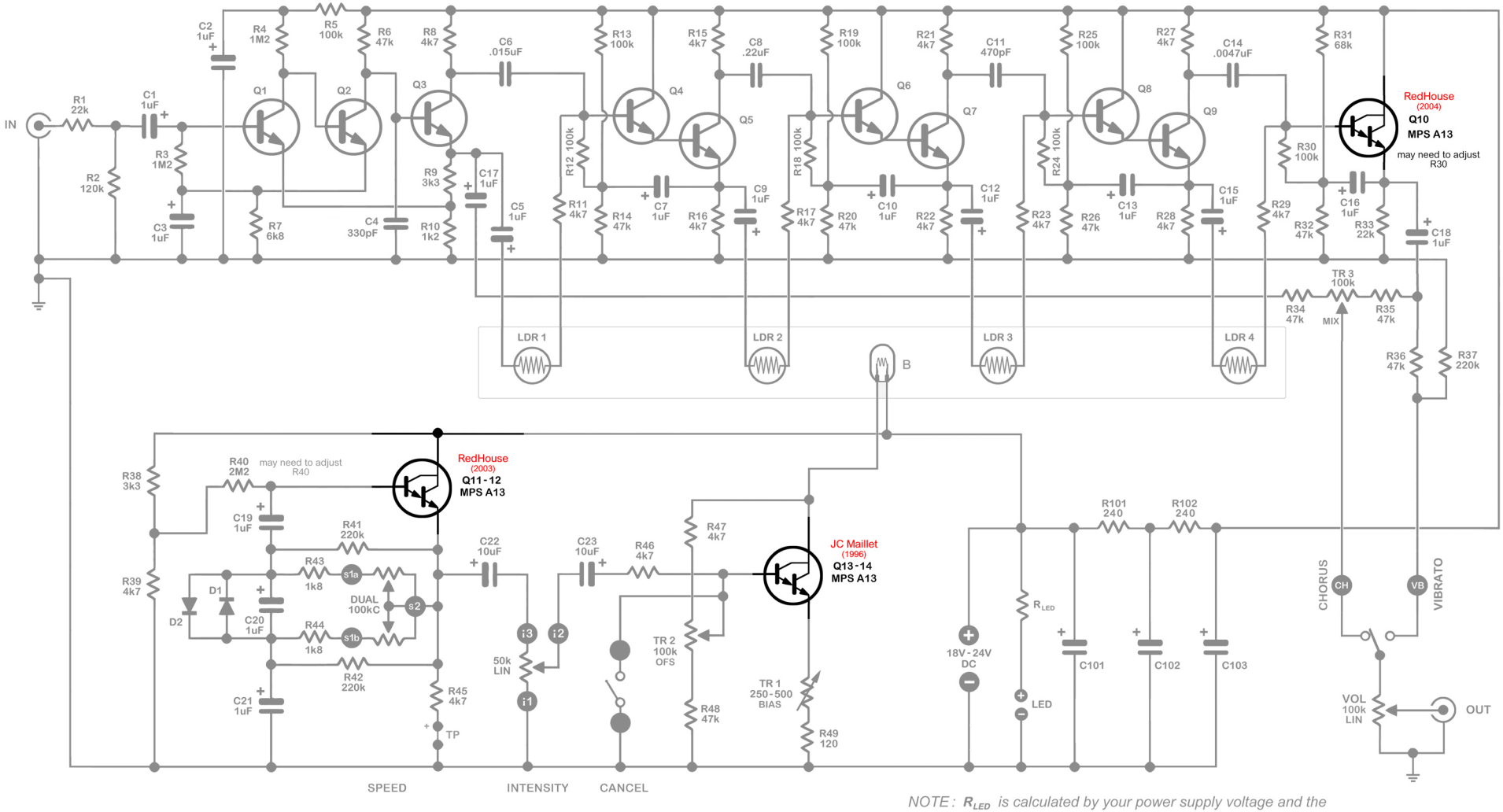
BASIC HOOKUP
True-Bypass



The Forum-Vibe Project

The Darlington Mods



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

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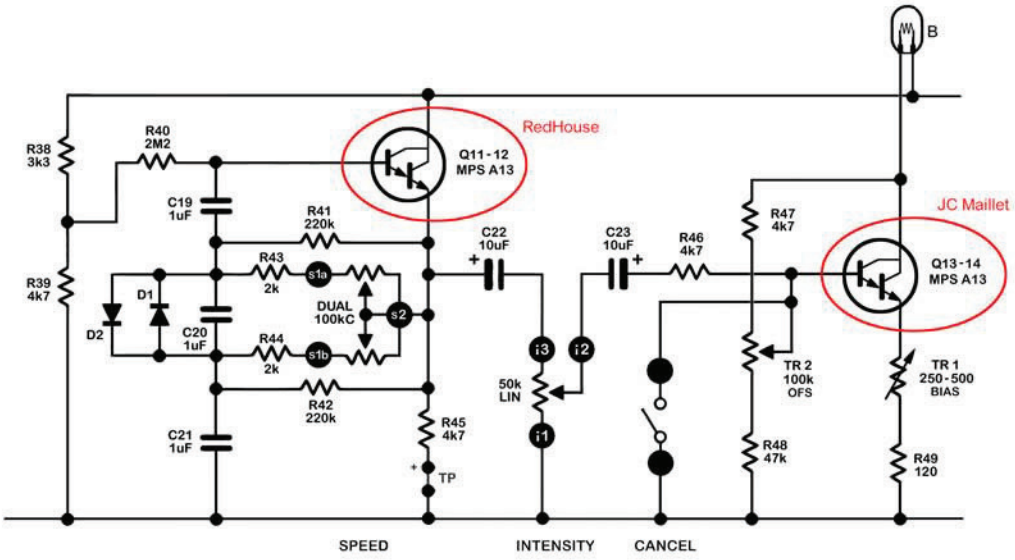
By: Brad Burt - (aka; RedHouse)

The Double-Darlington LFO MODs

(*circa 2003*)

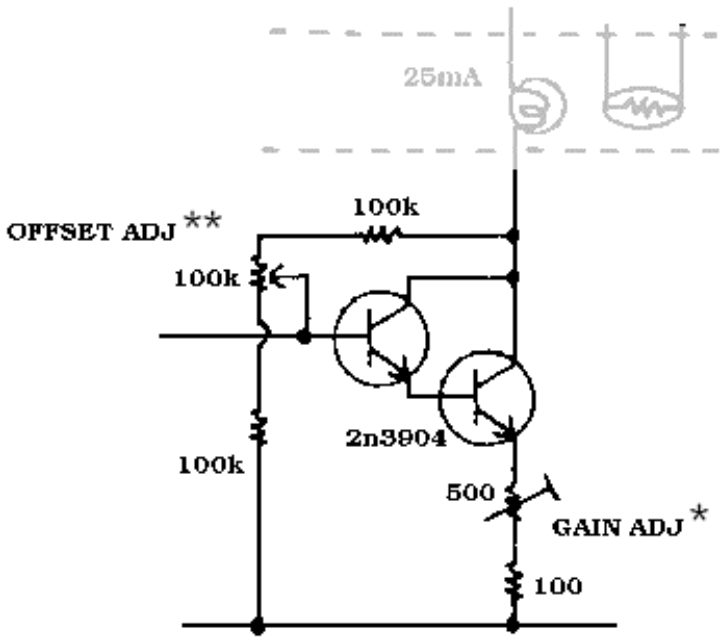


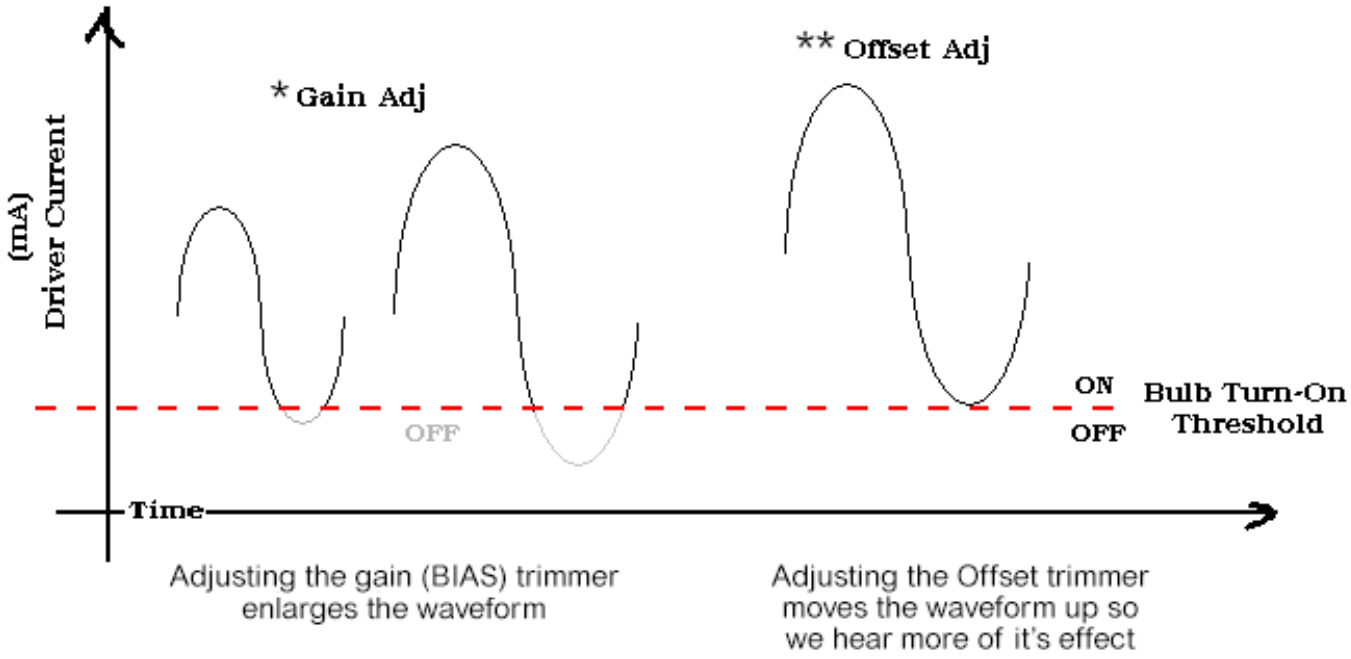
Install JUMPERS in the Q12 and Q14 base-to-emitter pads,
and install MPS-A13 transistors in Q11 and Q13 positions

NOTE: These mods are something that "can be done", they do not actually contribute to a better vibe, just sayin'.

JC Maillet's original waveform Offset Adjustment and Darlington lamp driver:

(circa 1996)





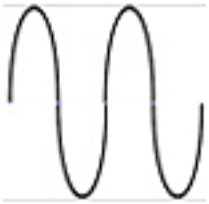
Adjusting the gain (BIAS) trimmer enlarges the waveform

Adjusting the Offset trimmer moves the waveform up so we hear more of it's effect

The Forum-Vibe Project

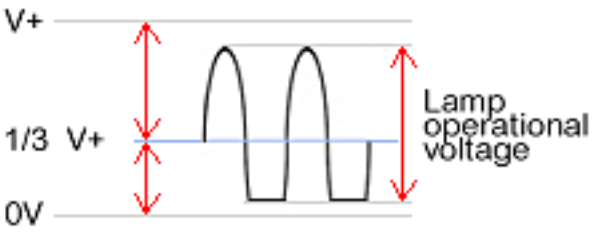
Understanding lamp BIAS adjustment -vs- waveform Offset adjustment

Uni-Vibe LFO waveform

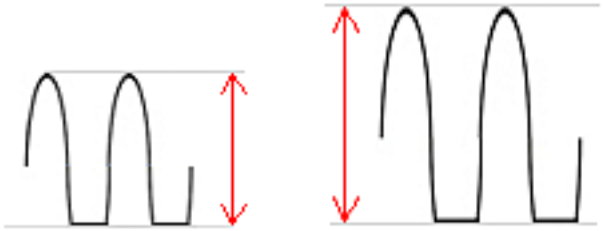


AC coupled

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



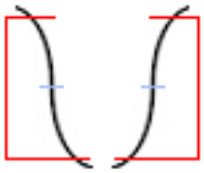
Turning the **BIAS** trimmer adjustment



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

The

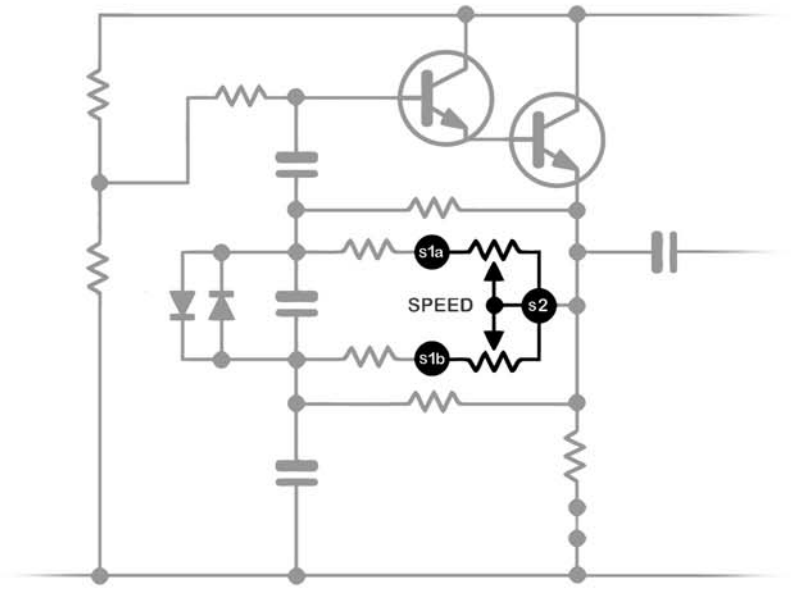
Forum-Vibe

Project

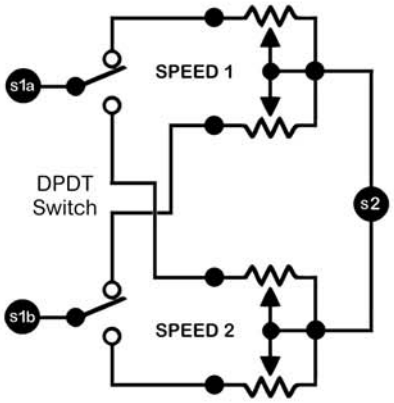
By: Brad Burt - (*aka; RedHouse*)

Dual Speed Control Mod

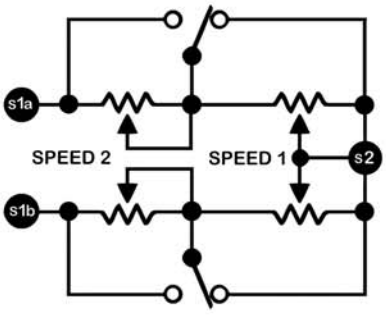
(*circa 2004*)



Parallel Switching



Series/Shunt Switching

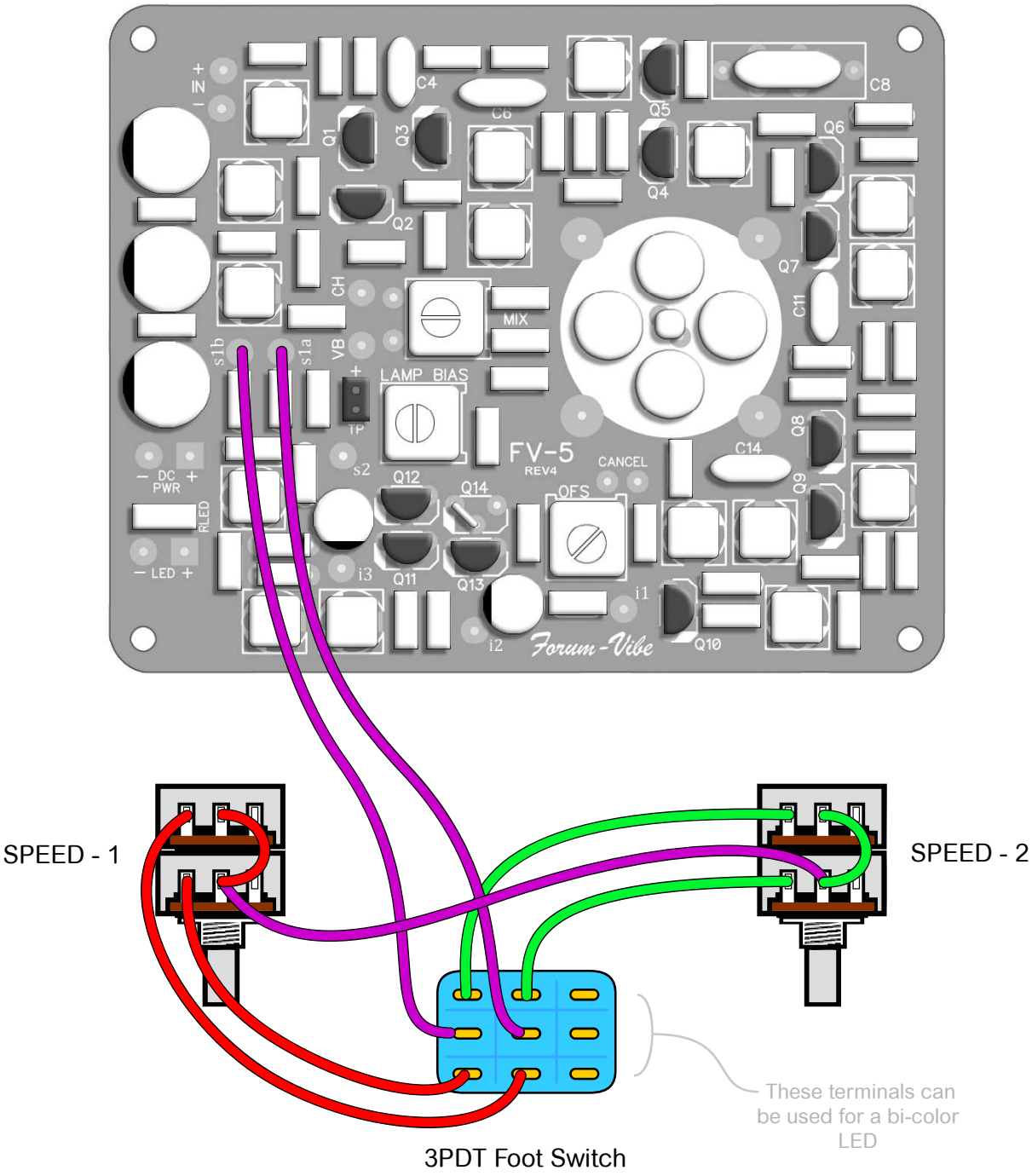


DPDT Switch

Wiring diagrams on the following pages

The Forum-Vibe Project

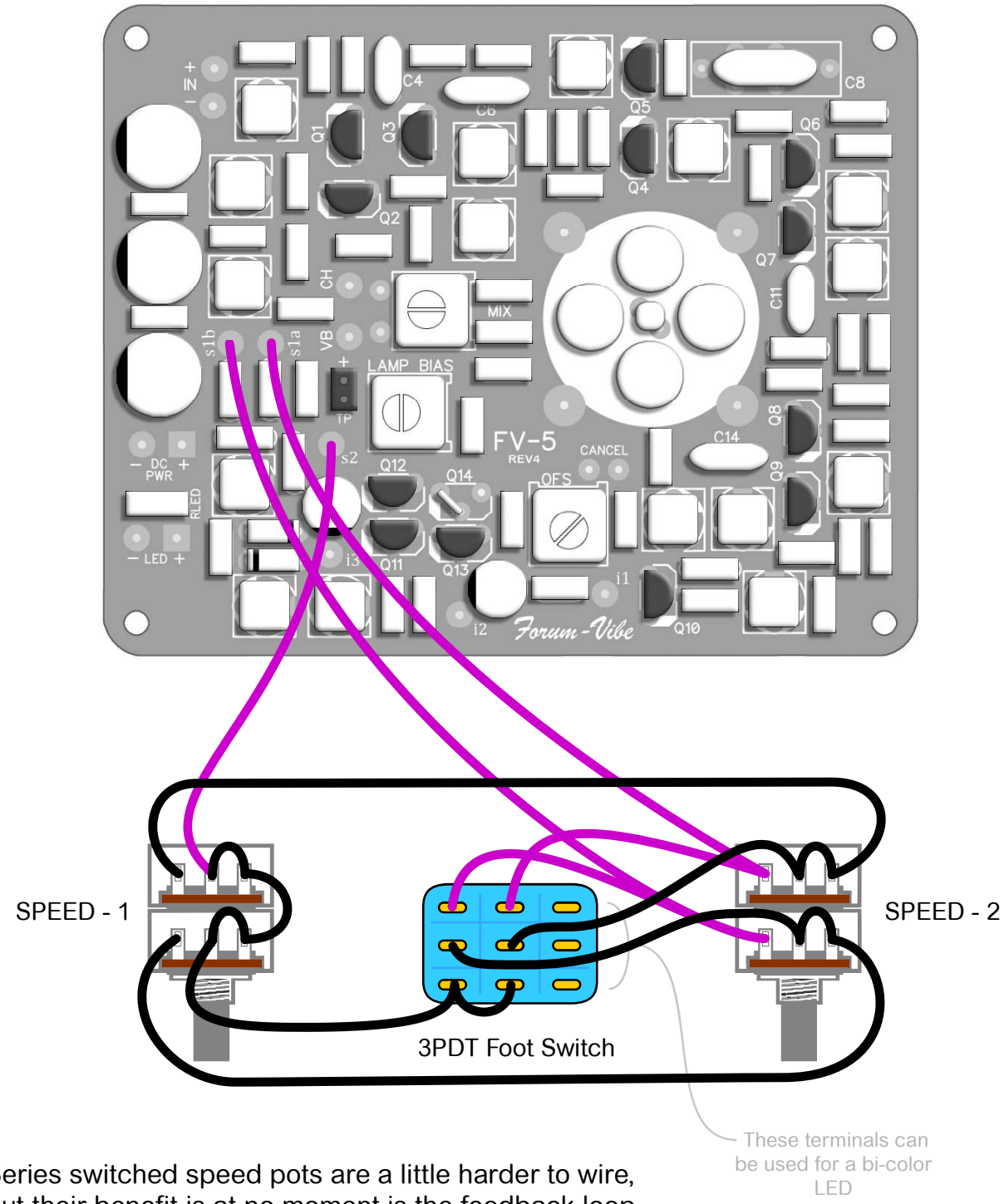
DUAL SPEED CONTROLS
(parallel switching)



Parallel switched speed pots are easiest to wire, but they can be problematic, when the switch is toggled, the feedback loop of the oscillator is broken for a brief time. Normally this wont matter but it can lead to oscillator instability.

The
Forum-Vibe
Project

DUAL SPEED CONTROLS
(series switching)



Series switched speed pots are a little harder to wire, but their benefit is at no moment is the feedback loop of the oscillator being broken. When the switch is toggled one way speed pot 1 is bypassed, the other way speed pot 2 is bypassed.

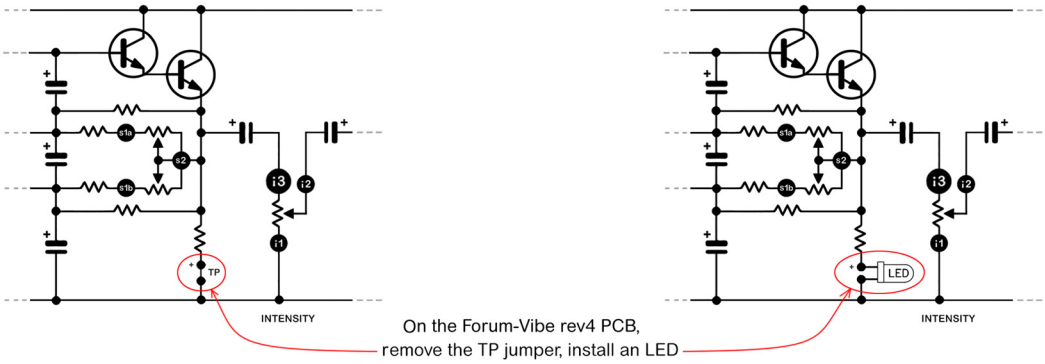
The

Forum-Vibe

Project

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*)

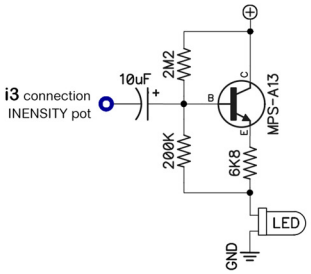


On the Forum-Vibe rev4 PCB,
remove the TP jumper, install an LED

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.

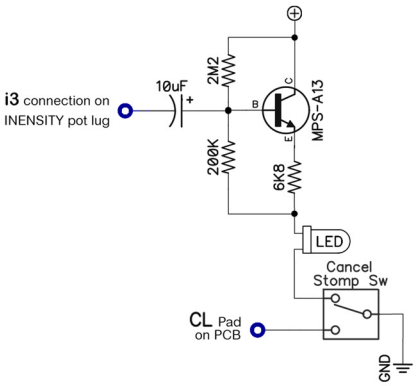


Basic flashing LED circuit that does not load down the LFO oscillator

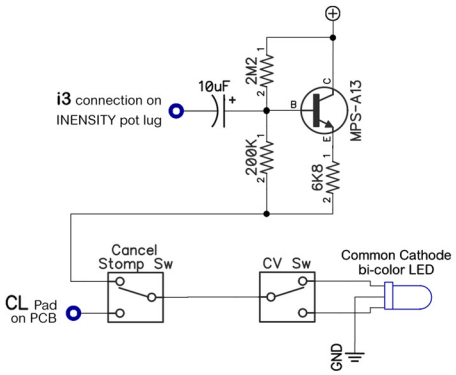
This small circuit can be made using a small bit of Proto-board or Veroboard and tucked away inside the box connected with sone fly-leads.

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

The

Forum-Vibe

Project

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**