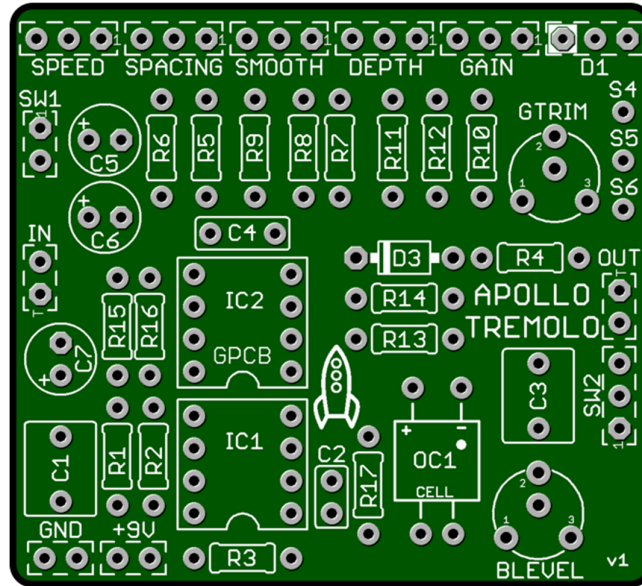
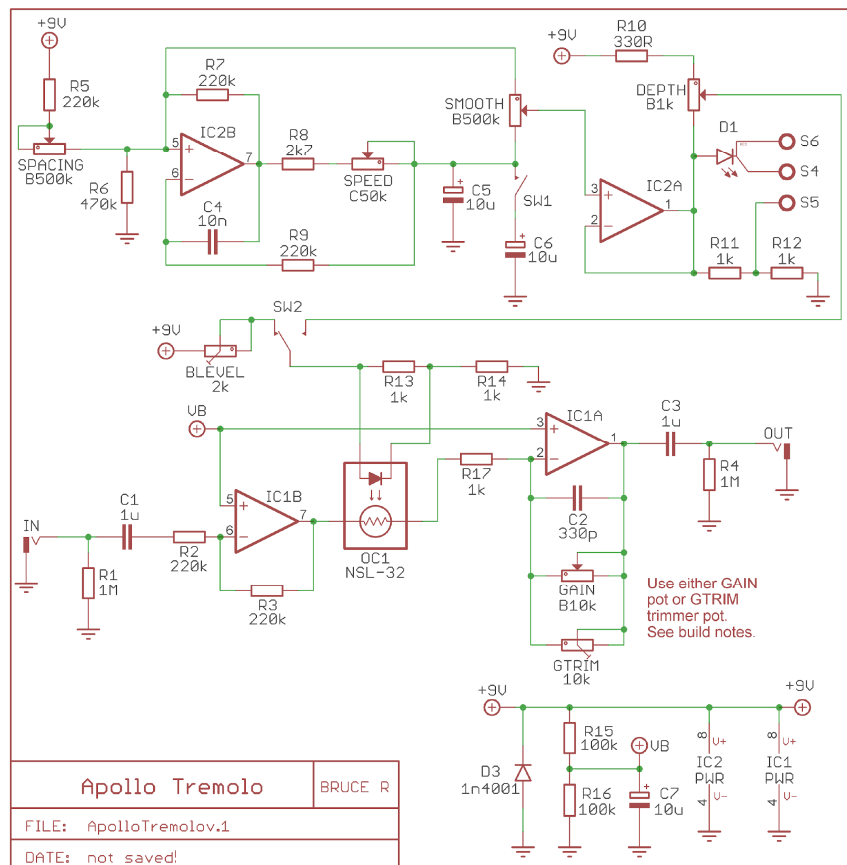


Apollo Tremolo

The Apollo Tremolo is a highly advanced version of one of the most popular music effects ever made! We took the original Tremulus Lune version to a new advanced level by adding several versatile features! It adds an instantaneous SPEED SHIFT for a dramatic change and a "KILL" switch to remove the effect while maintaining a high quality buffered throughput. The awesome buffer makes this a 2-1 pedal. Use footswitches for both SPEED SHIFT and the KILL Switch! True-Bypass is of course always an option.



Board Dimensions (W x H) 1.95" x 1.78" or 49.53mm x 45.21mm



Part	Value		Part	Value		Part	Value
R1	1M		R14	1k		BLEVEL	2k Trimpot
R2	220k		R15	100k		*GTRIM	10k Trimpot
R3	220k		R16	100k		IC1	TL072
R4	1M		R17	1k		IC2	TL072
R5	220k					SMOOTH	B500k
R6	470k		C1	1u		SPACING	B500k
R7	220k		C2	330p		SPEED	C50k
R8	2k7		C3	1u		DEPTH	B1k
R9	220k		C4	10n		*GAIN	B10k
R10	330R		C5	10u		D1	BiColor CA LED
R11	1k		C6	10u		**D3	1n4001
R12	1k		C7	10u		SW1	SPST
R13	1k		***OC1	NSL-32		SW2	SPDT ON-ON

Build Notes:

- * Use either a Gain Potentiometer or Trimmer (your choice – see below) **Do not use both!**
- ** There is no D2 in this build version. There is only D1 and D3.
- *** NSL-32 is the recommended Vactrol, you may also use a *VTL5C2 if you have access to one.

Controls:

Gain – You have two choices. Many will want adjustment of the overall level on the outside of the enclosure to keep the Tremolo at Unity Gain or otherwise. Those that are looking to make a **(4) knob Apollo** may use the convenient on-board Gain trimmer instead. **Do not use both!** You may then set and forget the master volume.

Speed – This adjusts the rate of speed of the Tremolo waves. Use this in conjunction with the Speed Shift!

Speed Shift - Switch [SW1] - The speed shift switch allows you the option of kicking an extra capacitor in parallel with C5, which has the effect of changing the speed range of the LFO circuit. This option adds more flexibility. I would also recommend using this as a footswitch for instant Speed Shifting on the fly, instead of a toggle switch.

Depth – Adjusts the overall strength of the Tremolo sounds.

Spacing – Adjusts spacing between volume pulses

Smooth – Blend between full on/off square wave "chop" to smooth buttery sine-tri-round wave

BLEVEL Trimmer: Adjust the Level of the Buffer in “Kill Mode” at [SW2]

Components:

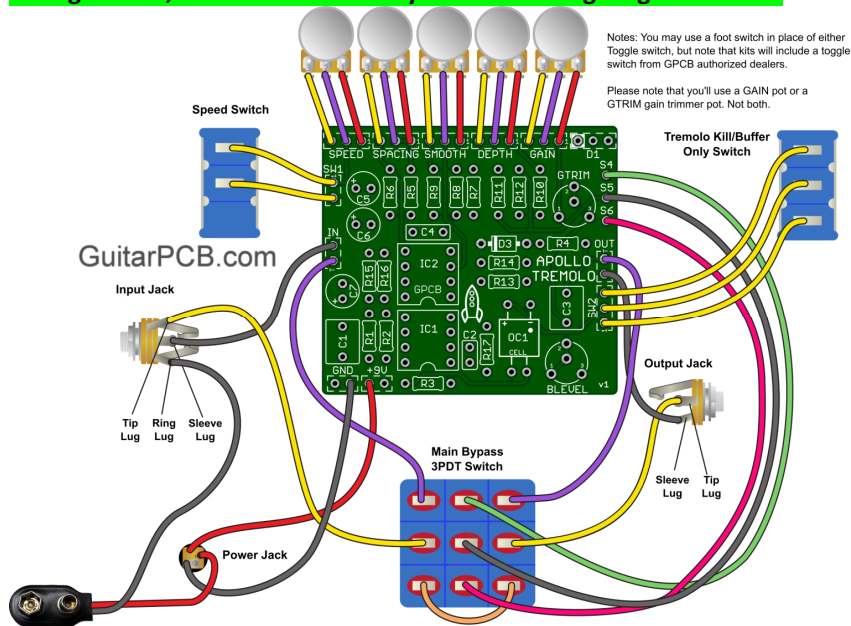
The **NSL-32 Vactrol** consists of an LED and a photoresistor. As the LED changes intensity, the photo resistor changes resistance. This change in resistance is what manipulates the audio signal to give us a tremolo effect.

Note you may also use a VTL5C2. If using the VTL5C2 Vactrol then make R17 a Jumper wire instead of 1k.

The **NSL-32** , **TL072 Opamps** and **BiColor LEDs for Mods** can usually be found at **GuitarPCB's Shop**.

It must be an NSL-32 with no additional numbers or letters attached to the product code!

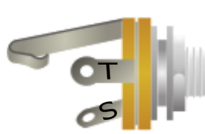
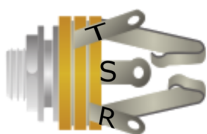
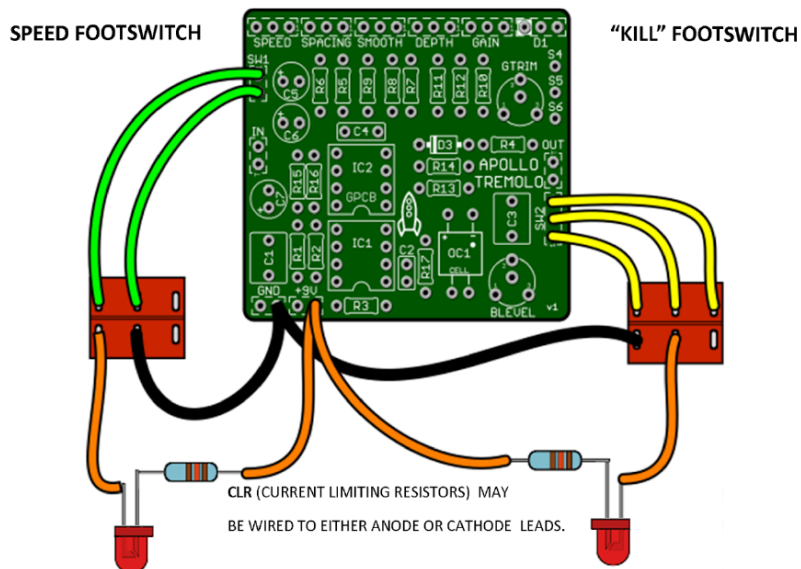
Because the Main Circuit Board Design (D1 acts as both a Rate LED and ON/Off status) using one of our handy 3PDT wiring boards, will not be necessary. See the wiring diagram below!



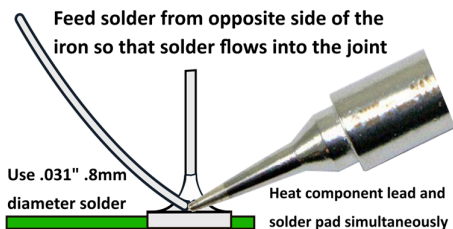
Here is an optional guide for wiring footswitches with LED indicators instead of toggles.

OPTIONAL WIRING FOR FOOTSWITCHES WITH STATUS LEDs

SPEED SWITCH AND "KILL" SWITCH



Be sure your In/Out Jack wiring is correct. A Stereo Jack (for battery use only) has a RING lug which is used to connect to the battery ground. If you do not intend to use a battery there is no need for a Stereo Jack. If using Stereo then only use the Tip and Sleeve lugs. S4, S5 & S6 is only needed when the LED is wired to the Main Board.



A good solder joint should be shiny and look like this:



* Carefully re-flow suspect solder joints.

* Clean and tin your Tip regularly.

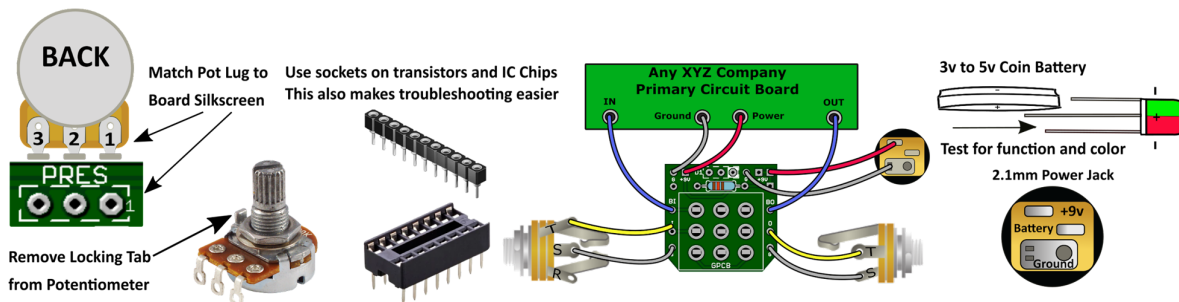
When soldering wire to the board push the protective PVC jacket flush with the board and pad.



Use the right tools for the job and be patient.

If you need help ask questions first at the GuitarPCB forum.

We are there to help and we know our products best.



Need a kit?

USA – Check out [PedalPartsAndKits](http://PedalPartsAndKits.com) for all your needs.

Europe – [Das Musikding](http://DasMusikding.com) carries both boards and kits as a service to our Europeans friends.

Australia - PedalPartsAustralia.com carries GuitarPCB Boards and Kits direct.

If they do not have a KIT listed, send them a note asking if they can help you out.



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