

The Blue Guitar

Peavy Classic 30 Advanced Mods **Boost Switch Relay Board (revised)**

Overview

Perhaps the most requested feature for the Peavy Classic 30 is that the Boost switch be connected to the footswitch instead of the reverb. Running the audio signal itself through perhaps 12 feet of cable is not an option for the boost circuit which as redesigned in my current mods uses a 390pf mica cap instead of the stock .047uf cap. For the Boost circuit to be footswitchable involves adding a second relay on its own mini-circuit board. To add this second relay to the Classic 30 without adding a separate power transformer, voltage regulator and filter capacitor, I choose to duplicate the circuitry for the channel switching relay.

The stock channel switching relay derives its coil voltage from the same tap that supplies the bias voltage to the output tubes so when the stock relay is engaged for the OD mode, the tube bias current is increased approximately 0.6mA per tube. With the second add-on relay engaged as well for the boost circuit, the bias current is increased approximately 1.2mA per tube. The advantage with this arrangement is that the bias current can be at a lower setting for the clean sounds from the Normal channel, and at progressively hotter settings for OD and boosted OD sounds.

Important note: this mod has been revised June 1999 to simplify the design by eliminating the switching circuitry for the bass cap and to reflect my current choice of tone stack components (330pF treble cap, 390pF boost cap and 56k slope resistor).

Constructing the Relay Board

Because it is readily available, I chose to use the Radio Shack #276-159B mini-board designed for DIP ics. These boards come 2 to a pack and must be snapped in half; be advised that these boards are not symmetrical vertically. With the Radio Shack logo at the bottom, the top half has 3 sets of traces aligned vertically; the bottom half has only 2 sets of traces.

I had originally mounted the relay board on the bottom of the chassis between the transformers but felt that the 12"+ of cabling muddied up the sound of the amp so I decided instead to mount the relay board directly under the tone stack, secured to the main board with a pair of 11/16" long insulated standoffs using 4x40 screws.

Rather than solder the ECG # RLY 5142 dpdt relay directly to the mini-board I used a 16 pin DIP socket to allow for easy replacement later and to avoid exposing the relay to excessive temperatures when soldering. Incidentally, the mini-board is to be mounted upside down (with the copper traces facing up) so that it can be easily removed.

While the following diagrams should be self-explanatory, I should point out that the uncut leads from the 1N4148 diode are used as jumpers to the coil-end set of contacts from the DIP socket. The pins of the relay are arranged so that the coil is on the end with the notch. There are then 2 blank DIP spaces before we get to the two relay Common terminals, roughly in the middle of the relay. The NO pair of contacts are on the end of the relay without the notch, and the NC contacts are between the C and NO pins. All of this is printed on the relay box from ECG. To simplify matters, you can remove the unused pins from the 16-pin DIP socket.

With a single set of contacts switching in the 390pf Boost cap (in parallel with the 330pF Treble cap), there are an extra set of contacts to use for other purposes. That other set of contacts could be used to switch the value of the bass cap or slope resistor for the tone stack, or to select between two values of Ck for V1A. However, to keep this mod simple we will only be concerned with the single set of contacts used to switch in the boost cap.

To mount the relay board directly under the tone stack you need to cut off about 1/4" from the top of the mini-board (the top is the side that doesn't say "Radio Shack"). As mentioned earlier, these boards are not symmetrical vertically so make sure you get it right or the circuit will NOT work. You need to run 5 leads from the main circuit board up to the mini-board. You can use a pin vise to drill some holes (like .039"/61 ga) for these leads. I generally do not try to drill a hole through a small trace, but drill the hole immediately adjacent to the trace and bend the component lead over to solder it to the pad. For the leads in parallel to the 330pf mica Treble cap, if you follow the modifications to the tone stack of the main board carefully you can run them through the holes vacated by the stock Boost cap, C14, bending over the lead I've marked "R" over to the adjacent pad from the Treble cap, C11.

At this point I should explain my preference for the flying leads. If the cap lead isn't long and/or strong enough, I use pre-tinned 22 ga bus wire with color-coded 1/16" heat shrink tubing. 3 foot lengths of 1/16" heat shrink tubing are generally under \$2 apiece at electronics supply houses so I consider it a good investment for your sanity to buy all of the colors available in this size to handle many of your wiring needs with guitars and amps. (Rather than stock and strip insulated wires in various colors, I will use the 22 ga bus wire along with heat shrink tubing when the application doesn't call for shielded cable or stranded wire.)

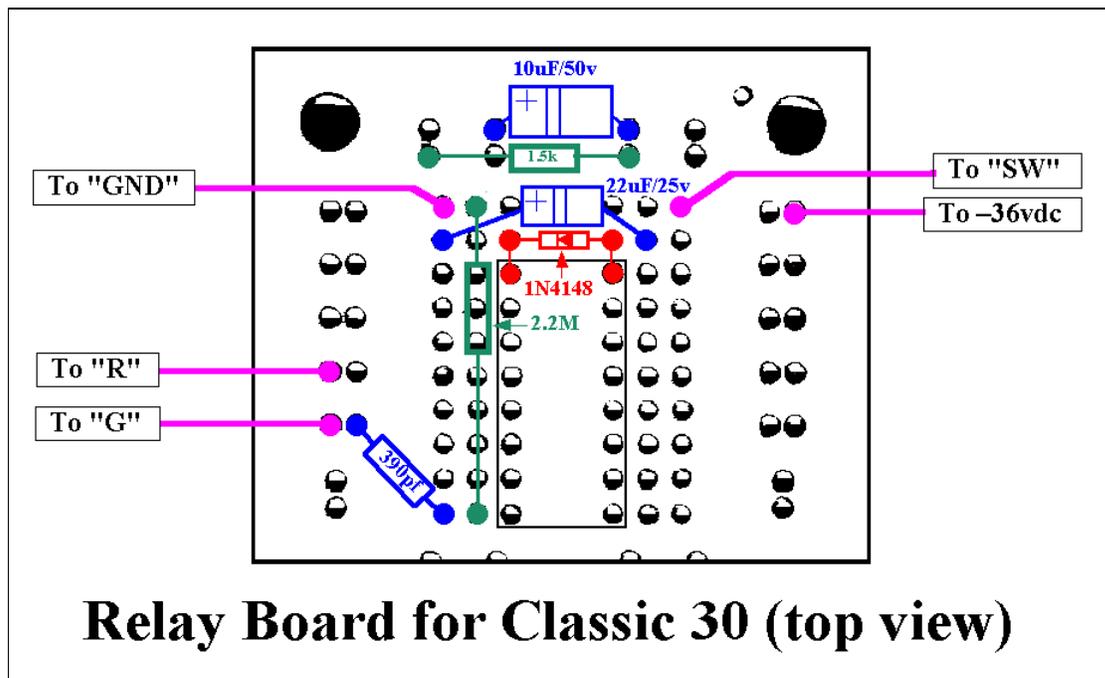
Getting back to the circuit, there are 3 other flying leads to connect. For the terminals marked "SW" on both the main board and relay board, I used the bus wire with

blue heat shrink tubing, and for "GND" I used green heat shrink tubing. Incidentally, the location for the GND wire on the main circuit was rather arbitrary as long as you solder it to the ground plane indicated on the diagram. To make the solder joint more secure, I drilled a small hole with a pin vise and ran the bus wire through backwards (so that the end pokes through to the component side). For the terminal marked "-36vdc", I tapped the voltage supply from R33, with a small hole drilled next to end closest to the middle board and color coded it yellow (you may want to use stranded wire for this application).

For the 11/16" long insulated stand-offs securing the relay board to the main board I used some nylon stock I had around and cut it to length using a cut-off wheel with my Dremel Moto-tool. The hole nearest the FX jacks was actually under the C39 filter cap a bit. For wiring up the flying leads, I pulled the "GND" and "SW" leads through first, and then the "R" and "G" and "-36vdc" leads. Once all 5 leads were inserted in the proper holes, I pulled them tight and bent them over, leaving about a 1/4" on all of the outer leads (you need that slack if you ever need to remove and reinstall the relay board later).

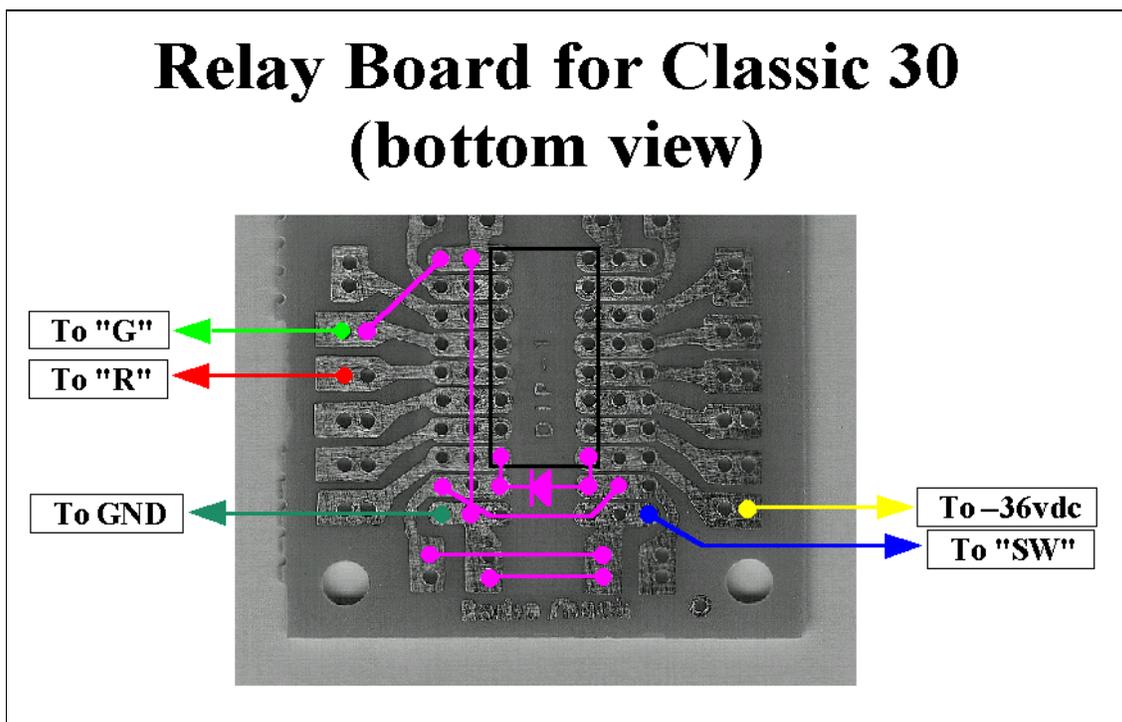
Incidentally, if you'd prefer to mount the relay board directly on the metal chassis, the mini-board is wired up essentially the same only you wouldn't cut 1/4" off the board. You can use 2 conductor shielded cable to connect the 2 leads from the treble cap, and separate leads for the -36vdc, GND and SW terminals.

And now we get to the diagrams for the add-on relay board:



Just a few notes on that diagram. As mentioned before the leads for the 1N4148 are bent over and soldered to the coil terminals for the relay. The 2.2M 1/4 watt resistor is used to reduce "pops" when switching modes by bleeding off any charge that is building up on the 390pf caps. That value seems to work for me but you are welcome to try other values. (Go too low and it will affect the tone; go too high and there will be more noise when switching.)

Here is the copper side of the same board:



Modifications to Main Circuit Board

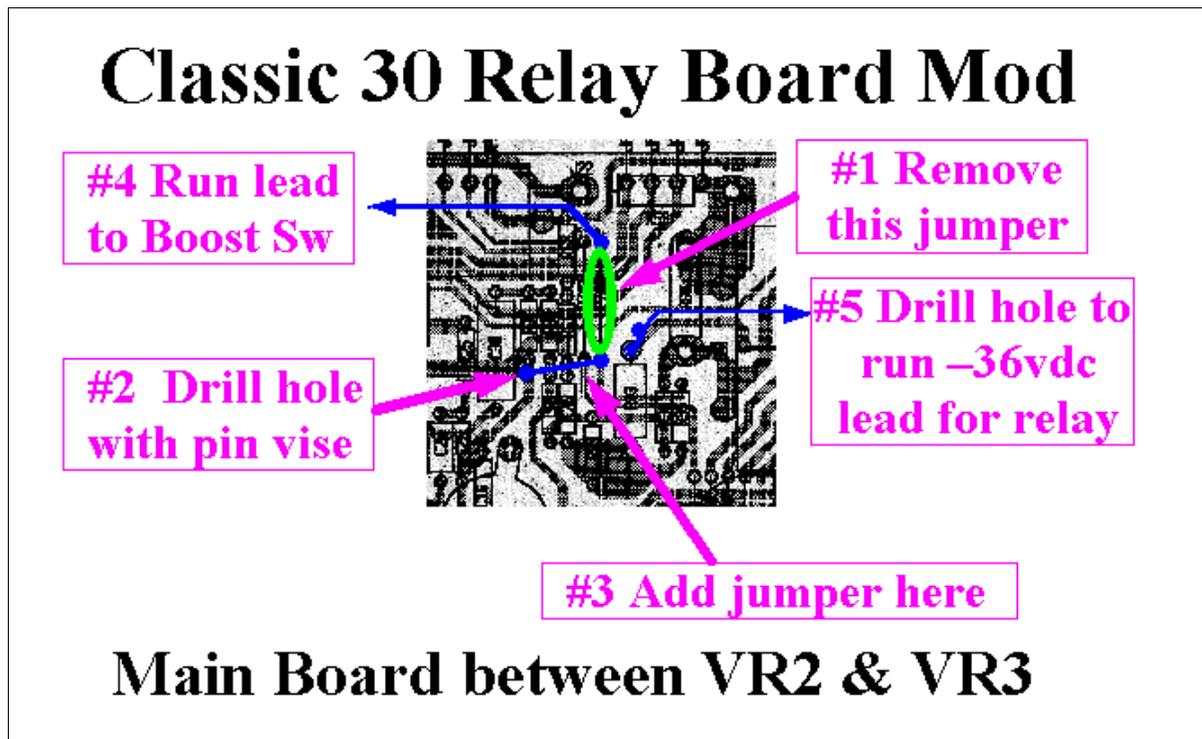
If you followed these instructions so far, you are now ready to perform some unreversible alterations to the main circuit board so the faint-hearted may wish to leave. The first step is to alter the stock circuit for the reverb and footswitch, and since it is located in the same part of the board, add your -36vdc tap for the relay.

To switch the reverb on through the footswitch, R35 is grounded through a maze of jumper wires and traces that eventually end up at the footswitch jack (which is

normally closed unless a plug is inserted). We can ignore the maze of wires and just make our connections at the pads for the JP700 jumper. After removing this jumper, use a pin vise to auger a small hole in the larger copper pad that R37 is soldered to. This hole will be the ground connection that switches on the reverb circuit. You will need to run a short insulated jumper wire from this new hole over to pad from JP700 that is closer to the pots. To insure a good ground connection, polish a small area of the ground plane using desolder braid and a dab of solder to remove the insulated coating. When the solder adheres to the copper, it is ready to accept the jumper wire.

To connect the on-board Boost switch (soon to be modified) to the footswitch you need to run a ~15" length of stranded wire from the pad vacated by JP700 over to the Boost switch. The last modification to be done on this section of the board is to add the -36vdc tap to the pad from R33 closer to the middle circuit board. A length of wire approximately 12" long is to be added on the copper side of the circuit board. While you can just solder the wire to the existing copper pad, the wire will be more secure if you drill a small hole with a pin vise adjacent to the copper trace and insert the wire in backwards (so that the end is poking through to the component side).

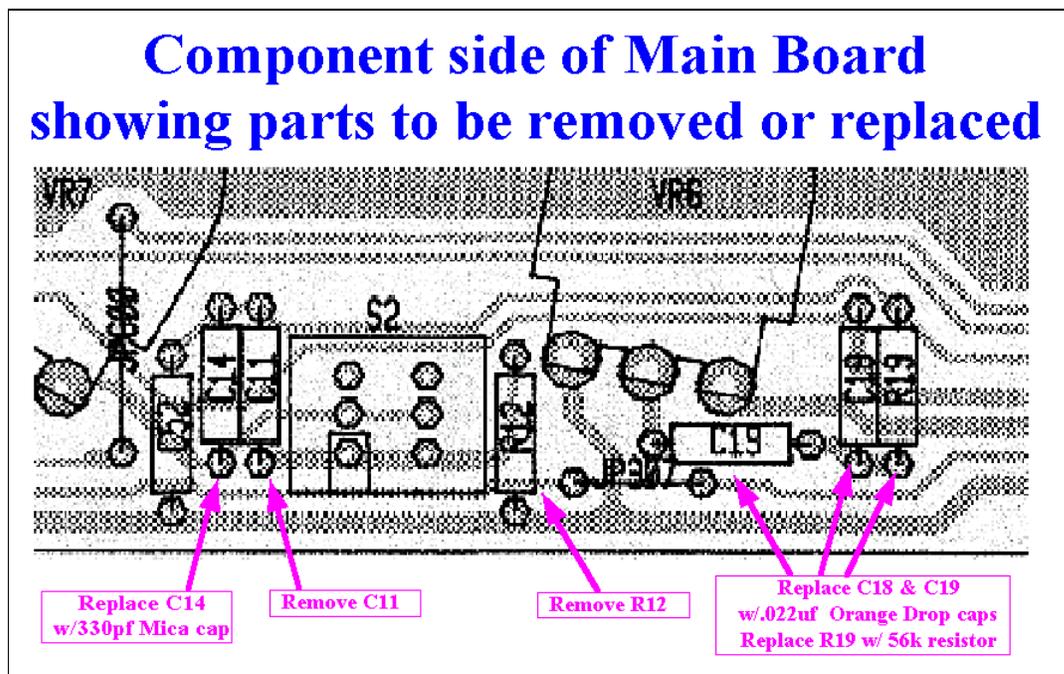
Circuit board modifications for reverb/footswitch:



Further Modifications to the Main Board

If you made it through the last section, we will now proceed to perform some downright vandalism on the Tone Stack/Boost Switch section of the main circuit board. The game plan here is to remove the Boost switch from the audio signal entirely and convert it over to switch dc voltages for the Boost relay board. I found the best way to remove copper traces is to work them over with a used piece of desolder braid (something that you'd normally cut off and throw away). With the braid you first remove the protective coating and then make sure the trace gets very hot and well-tinned. If it doesn't disintegrate entirely, it should flake off after a minute or so of this mistreatment. At this point, I will explain how to reconnect these traces if you decide you want to go back to the stock circuit: using the layout drawing as a guide, reconstruct the traces with 24 ga bus wire, essentially going from point to point. (If you are putting in any new components, the excess leads may be long enough so that you don't need to use the 24 ga bus wire.)

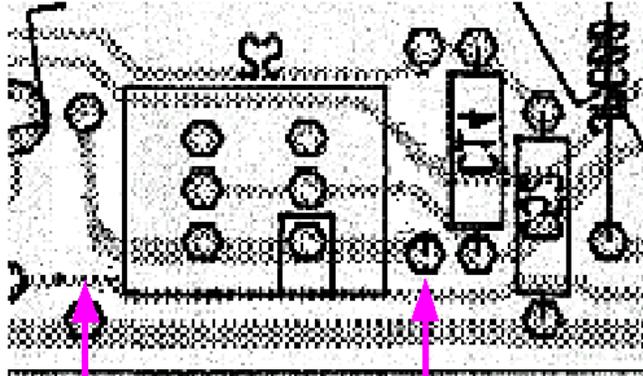
And now for the step-by-step illustrated instructions on how perform mayhem on your Classic 30:



As the diagram indicates, you need to remove C11 and R12. If you haven't done so already, you should replace the C14 Treble cap with a 330pf/500V mica cap, and both C18 and C19 with high quality .022uf caps. While I used Sprague Type 418P 600V Orange Drop caps, you might like to try 630v metallized polyester caps for a brighter, clearer sound.

The drawings below are followed by short text comments as needed:

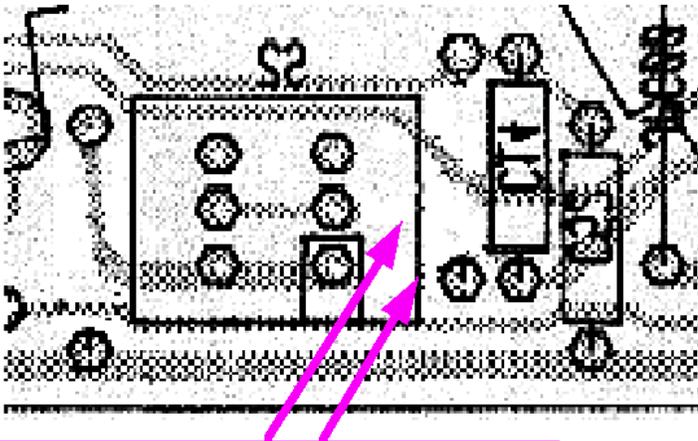
Copper side of board with C11 & R12 removed



R12- gone!

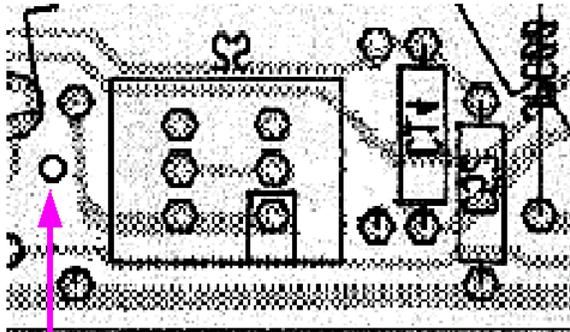
C11- gone!

Copper side of board after two traces cut



Note two traces cut

Copper side of board Use pin vise to drill hole

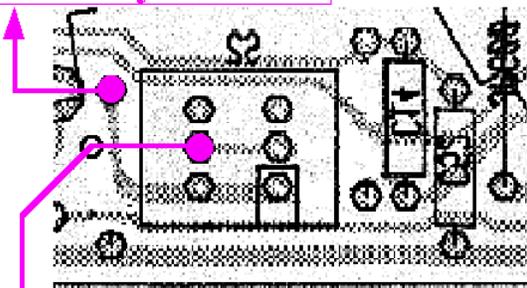


Drill hole to run lead
from Foot Sw to Boost Sw

This diagram shows where to drill a small hole with a pin vise to run the lead from the Foot Switch pad.

Wiring up the Boost Switch

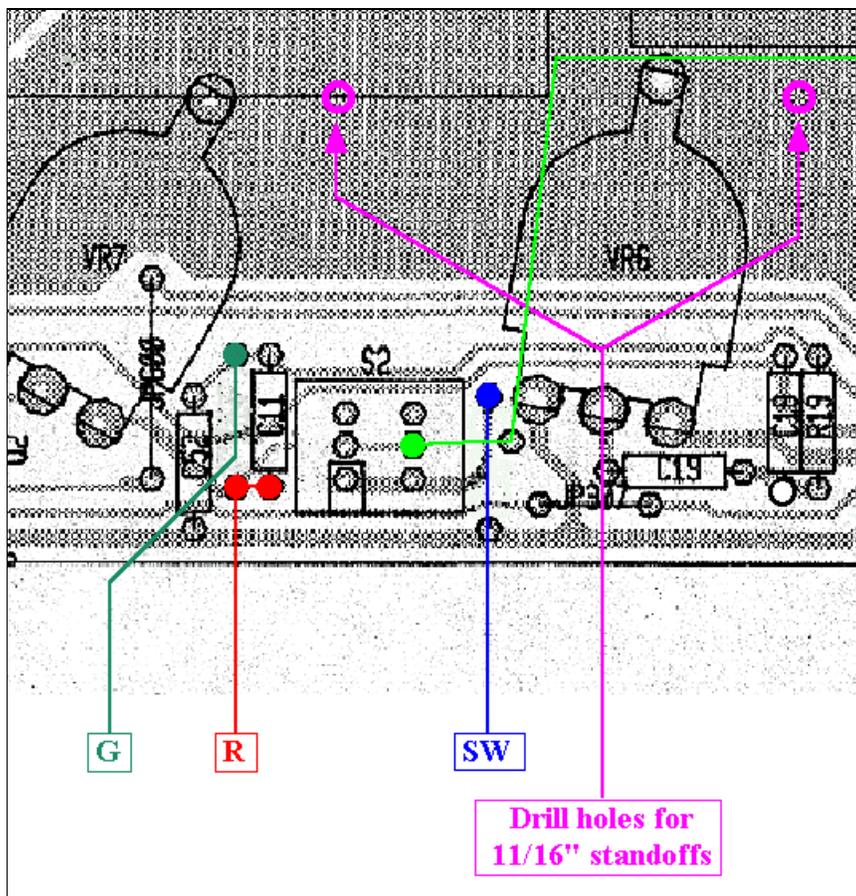
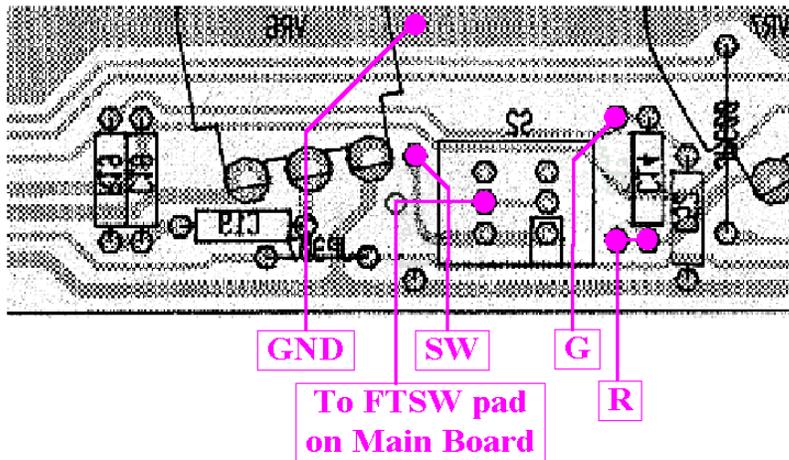
To "SW" terminal
on relay board



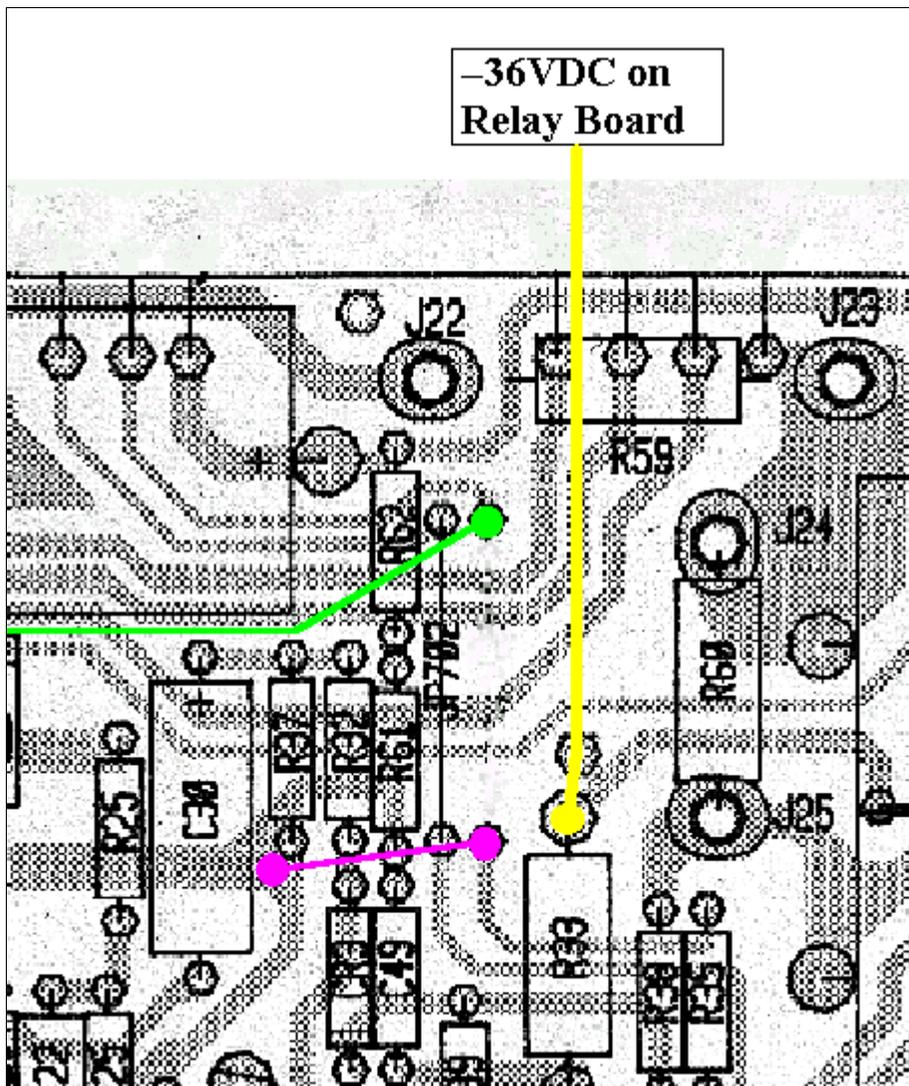
Run lead to pad
from JP700
(removed previously)

This diagram shows how to hook up the 2 new leads to the Boost switch.

Copper side of Main Board: Connections to Relay Bd



These drawings show the Tone Stack/Boost Switch section of Main Board (copper and component sides).



This drawing shows the connections for the relay board and footswitch on the main board (component side).

Final Notes on these mods:

Adding the relay board for the redesigned boost circuit does require a lot of work but it makes the Classic 30 a lot more versatile. If you have any questions or suggestions, send them to me at the e-mail address listed below.

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March 21, 1998

(Revised 6/12/99)

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<http://www.blueguitar.org/>