

The Blue Guitar

Pignose G40V 40w Tube Amp: Various Mods

Overview

After having to jump through hoops to get decent overdrive sounds from my Peavy Classic 30 and 50 amps, it was very refreshing to just plug into the Pignose G40V and immediately get some righteous sounds. The G40V is a "bare bones" 40 watt all-tube amp with none of modern features we have come to expect in a guitar amp: no reverb, no channel switching, no fx loop, no headphone jack. Nonetheless, this amp delivers a wide range of killer sounds by dialing in the gain with the volume and master volume controls, and tweaking the sound with the 3 tone and presence controls. With the MV set high and the room volume set by the Volume control you can get some nice clean Fender-like sounds (more tweed than BF). As you turn the MV back and increase the Volume control you can get the cranked Fender tones. With the Volume all of the way up and the room volume set by the MV you enter Marshall/Mesa high-gain territory. Unlike many of the modern amps from Fender or Peavy (with their wimpy and/or harsh sounding OD channels), the Pignose G40V gets some very excellent overdriven and distorted tones, which isn't surprising as the circuit is based on the '59 tweed Bassman circuit with an added tube gain stage and finely tuned to perfection by Dennis Kager. One drawback is the single 10" speaker (which of course can't deliver much bottom end), but the amp can drive up a to 4 x 12" cabinet. For the sound, the amp is about as good as they get; for the price, the amp is a real deal: \$399 MSRP (or \$229.40 plus s/h/tax direct from Pignose).

Pentode/Triode and Fixed/Cathode Bias Switches

Rather than try to improve upon the circuit, I decided to first add some basic mode switches as detailed in Dan Torres' "Inside Tube Amps" book. These mods are ones that he has done to countless Fender amps to increase their versatility. The Pentode/Triode switch allows you to select between the normal pentode wiring of the power tubes (40w) and triode wiring which reduces the power to approximately 17 watts. The triode mode is also a bit darker sounding, perhaps because it emphasizes even harmonics rather than odd harmonics. Cathode bias gives the amp a vintage sound similar to a tweed Deluxe amp. Fixed bias tends to be a bit brighter and cleaner; cathode bias has a warmer tone that overdrives more easily with increased sustain. The drawings below shows where the components and wires go. Replace the 470 ohm resistors between pins 1 & 4 with 1.0k / 5 watt resistors, and solder leads to pins 1 & 3 to run to the Pentode/Triode switch. Add 1.0 ohm 1 watt resistors to pins #8 of each output tube and solder the other ends together and to a lead running to the Fixed/Cathode bias switch. (Note: if you plan to use EL34 output tubes with the amp, connect pin #1 to pin #8 and do **not** solder the 1.0k / 5 watt

resistor to pin #1. Be sure to add the Bias Adjustment pot as outlined below and set the bias for something like 34mA. EL34's require a higher filament current than 6L6's so you should skip the DC filament mod if you want to use EL34's. I do not know if the filament windings will handle the higher current so you are on your own here.)

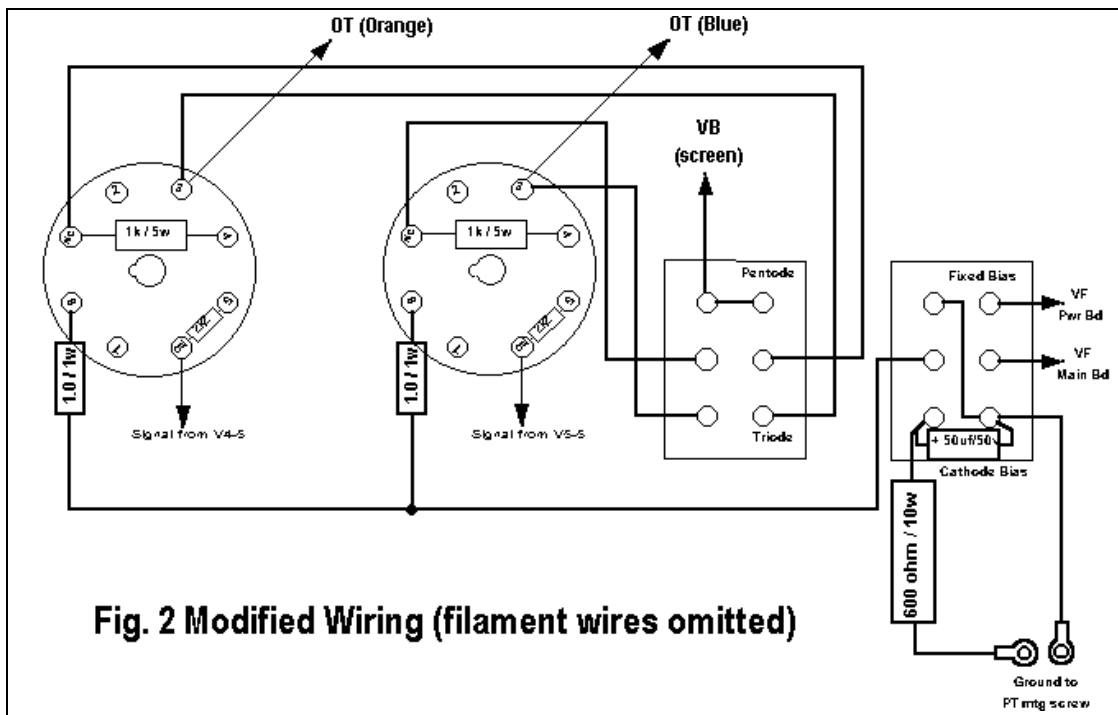
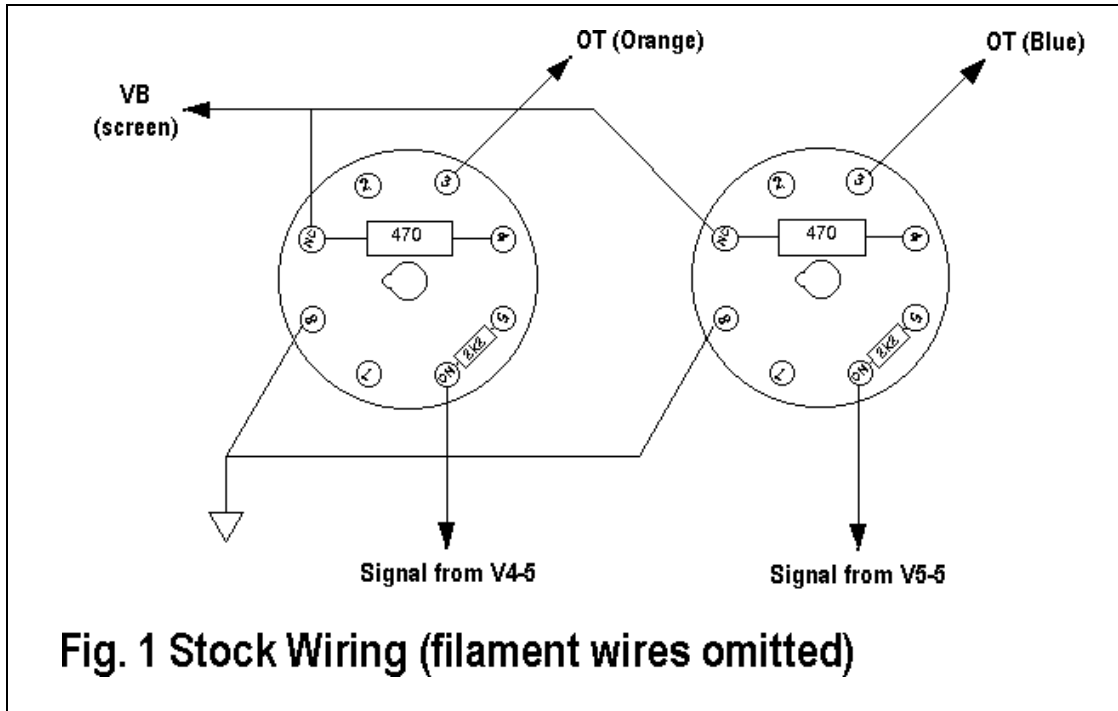
For the Pentode/Triode switch you need to remove the VB lead from the power supply board which normally goes to the #1 pins of V4 & 5 and run VB directly to the switch. For the Fixed/Cathode bias switch you need to remove the VF lead that goes between the power supply board and the main board and run 2 leads from these points to the switch as indicated below (VF on Main Board goes to the common terminal). The cathode resistor I used is 600 ohms at 10 watts, with one lead soldered to the switch and the other lead soldered to a ring terminal that goes under the power transformer mounting nut (along with the other ground wire from the switch, the ground wire from the ac power cord and the black ground wire from the power supply board). You can use a higher valued resistor (like 750 ohms) for lower bias current (softer, cleaner sound), or a lower valued resistor (like 560 ohms) for higher bias current (louder, more distorted sound). I added the 1.0 ohm precision resistors at the cathode of the power tubes (pins #8) so that bias current can be measured directly from the dc millivoltage across the resistors. The 50uf / 50v cathode resistor bypass cap is mounted on the bottom two terminals of the switch as per the drawing. With a 600 ohm cathode resistor, I measured a bias current of approximately 34mA, which was roughly the same as the fixed bias current.

In adding the switches you need to remove the extra fuse and fusible link directly behind the panel mount fuse. You can relocate this mini-board further back, or take your chances and eliminate it altogether (the 5 amp fuse is in line with the 1.5 amp panel mount fuse and the fusible link for the neutrals evidently kills the power in case the amp catches fire). You might try drilling the holes 3/4" and 1 3/4" in from the side edge of the chassis and maybe 1 3/8" to 1 1/2" in from the folded back edge. When mounted per the drawing the switch handles are to be towards the PT for the stock sounds and flipped towards the rear panel for the alternate modes. (Note: the GC toggle switches I purchased recently were wired backwards.)

IMPORTANT NOTE: TURN OFF THE AMP BEFORE TOGGLING EITHER SWITCH! (To be honest, I never tried toggling either of these switches with the power on, but was advised to always turn the power off first by Dan Torres.)

UPDATE: (10/21/98) I have since tried toggling the Cathode/Fixed bias switch with the amp on and it does seem to be perfectly safe and surprisingly quiet. However, make sure that you don't toggle the Pentode/Triode switch by mistake with the amp on because of the high voltages involved!

Diagrams for Pentode/Triode & Cathode/Fixed Bias Switches:



More switch mods

There is not a lot of room to add switches to the G40V but there are two switches that I believe are indispensable. Both of the switches are center-off DPDT mini-toggles mounted on the rear panel behind V1 and V2. The first switch determines the value of

Ck for V1A. The stock value here is a very high 220uF @ 50v electrolytic cap (aka "e-cap") for plenty of gain and low frequency response. The alternate values used are 0.68uF (for a Marshall-like tone with plenty of midrange response) and 0uF (for an unboosted sound with plenty of clean headroom). I've done this mod to practically all of my amps with great results, although the "big" cap is usually 22uF/50v. (See the Advanced Switch section for details on using a 6 position rotary switch for even more tone options: [click here](#) .)

The first step to add the Ck switch for V1A is to locate and remove the stock 220uF/50V e-cap. It is located on the input end/tube side of the main circuit board between the yellow and blue leads to V1. To remove the board, pop out the two standoffs from the chassis and desolder the black ground wire from the preamp star ground point (next to the input jack). When drilling the holes in the back panel, I covered all of the tube sockets wiring and boards with 2" masking tape, and wiped down any stray metal dust when I was done.

I then ran a wire from pin #3 of V1 to one of the common terminals of a center-off DPDT mini-toggle switch ([click here](#)). I soldered a 220uF/50v and a 0.68uF/50v e-cap to either outside terminal of that switch section, with two 470k 1/4w bleed resistors running from the caps to the common terminal. The positive (+) leads from the caps are soldered to the switch; the negative (-) leads are both soldered to a wire which I chose to run to the preamp star ground point. I could have alternately run the wire to the ground pad on the circuit board or added a solder terminal to a 4x40 screw and nut that would replace the sheet metal screw holding down one end of the tube socket. I dabbed some clear silicone on the caps to keep them from moving or vibrating.

The other switch I added was to allow for 3 choices to replace the stock .001uF treble cap C12. I mounted a 250pF mica on the board, with 250pF and 750pF caps on the switch to allow me to choose between 250pF, 500pF and 1000pF (~.001uF). The 250pF value produces a brighter and softer sound which goes great with the unboosted position of the Ck switch on V1A described above. The 500pF value was used on many Marshall amps, and is the cap usually used when modding Marshalls; it is a lot stronger, with a nice mix of highs and lows. The stock 1000pF value almost acts as a midrange boost, and is very effective with high-gain overdrive sounds. (See the section on Advanced Switches ([click here](#)) for a circuit that switches the slope resistor as well as the treble cap for a more effective recreation of the classic tone stacks from Fender and Marshall.)

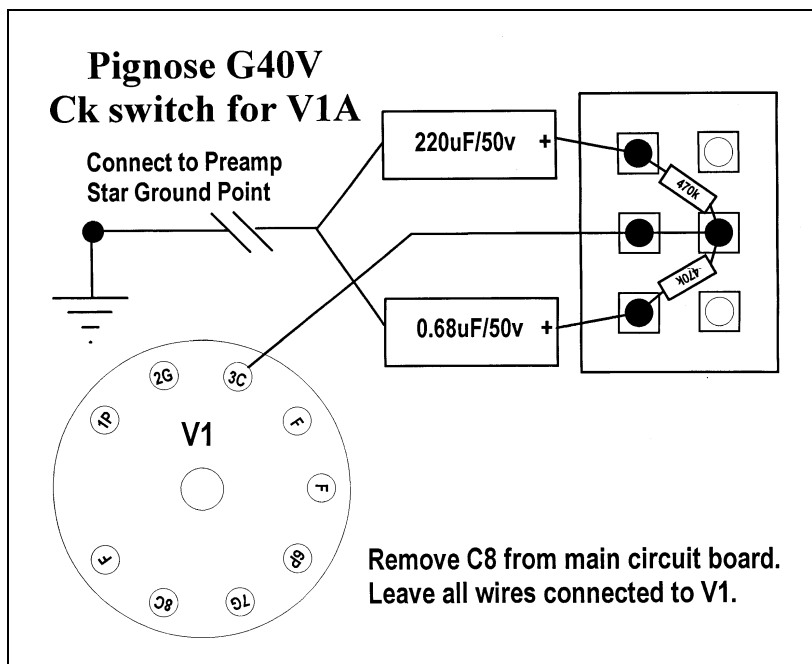
The first step to adding this switch is to locate and remove the stock .001uF treble cap (C12). This cap is located between the yellow and blue wires going to V2. With the leads to the tubes up, C12 is located between the .022uF mid cap (C15) on its left and the .022uF bass cap (C14) on its right. (The 33k slope resistor (R19) is actually between the C12 treble cap and the C14 bass cap.) When you desolder the C12 cap, you will see that one end is connected to the yellow wire on the control side of the main board (which goes to the long skinny control board).

Once you have removed C12, form the leads of a 250pF/500v mica cap to fit the holes on the board. The game plan here is to add 2 lengths of ~22ga solid wire to the legs of the cap before you solder it onto the board, using heat shrink tubing to insure that the

added leads don't short out against anything. To prepare the center-off DPDT mini-toggle switch, solder the 750pF mica cap to the two terminals on one end and the 250pF cap to the opposite terminals. To eliminate "pops" when toggling the switch, I ran four 3.3M 1/2w resistors from the 4 outside terminals to the 2 common terminals in the middle. The two leads you added to the 250pF cap on the circuit board are then soldered to the common (middle) terminals. Since these caps are not polarized, either wire can be connected to either terminal. Keep the leads as short as possible, but leave enough slack so that the switch can be removed later if necessary.

I like to orient the switch positions so that I can remember them later. To keep it simple, with the handles down I get the stock G40V voicings; with the handles up I get a more Marshall-like voicing, and with the handles in the middle I get a more traditional unboosted Fender sound. You can mix and match the two switch settings to create an even wider variety of tones.

Diagram for basic Ck Switch:



Advanced versions of these two switches

After adding these two switches and being very pleased with the results, I decided to try out more advanced versions. For the Ck switch I used a 6 position rotary switch to offer more tonal variations ([click here](#)). For the treble cap switch, I used a center-off 4PDT mini-toggle switch to allow the slope resistor to be switched as well as the treble cap for a more accurate simulation of different tone stacks ([click here](#)).

The rotary selector switch offers 6 choices for Ck ranging from 0uF to 22uF. The specific values I chose are 0uF, 0.047uF, 0.47uF, 0.68uF, 2.2uF and 22uF. The cathode resistor bypass cap, when used, both adds a 3 dB boost to the signal and acts as a high-pass filter in a parallel RC network with the 2k7 cathode resistor. With a 0.47uF cap the low frequency roll-off starts around 1250hz; with a 0.68uF cap it starts at maybe 850hz.

The other approximate values are as follows: 1.0uF=600hz; 4.7uF=140hz; 10uF=60hz; 22uF=30hz; 220uF less than 3hz. The 0.047uF/250+v polyester cap used gives an interesting twist to the 0uF unboosted sound: it adds a bit of gain and presence to the signal, as well as brightening it up.

To eliminate "pops" when using the switch, the 5 caps were bypassed with 1/4w resistors that ranged from 100k for the 22uF cap to 680k for the 0.047uF cap. These resistor values eliminate switching noises and do not seem to have any noticeable effects on the sounds.

The advanced treble cap/slope resistor mod requires a center-off 4PDT mini-toggle switch. The stock 33k slope resistor R19 is removed and replaced with a 68k 1/2 w resistor. As explained in the previous section for the treble cap, a wire is soldered to the leg of the resistor closest to the controls board before the resistor is soldered to the main board. R19 is the resistor immediately to the right of the treble cap C12, which has wires soldered to both leads for the switch.

The on-board values I chose are a 250pF mica treble cap and a 68k slope resistor, which produces some very Fender-like bright tones, particularly well-suited for clean settings. In one alternate position, the treble cap is bypassed with an 82pF mica cap for a total capacitance value of 332pF, and the slope resistor is bypassed with a 330k 1/2w resistor which results in a total resistance value of 56k. These values produce some very nice sounds for both clean and OD tones. The other switch position recreates the original stock values of 1000pF and 33k, bypassing the 250pF cap with a 750pF mica cap and bypassing the 68k resistor with a second 68k 1/2w resistor. This tonality has more gain than the other positions, with mids boosted and trebles cut a bit. While it is very effective for OD tones, it doesn't have the clarity of the other positions for Fender-like clean tones.

In adding these two switches I encountered some problems because I had first mounted these two switches too close together. I solved that by separating the switches, with the rotary switch directly behind V1 and the 4PDT treble cap/slope resistor located directly under the captive mounting nut for the chassis (be sure to measure how far the mounting screw penetrates the chassis so that it doesn't hit the switch.)

UPDATE: (10/21/98) I have since revised the circuitry of the rotary Ck switch because the tonal differences between some of the different settings are quite subtle. For a wider variety of different tones the switch now toggles between different Ck values for both V1A and V1B. V1A is switched between 0uF, 0.68uF and 22uF while V1B is toggled between the rather unorthodox stock value of 0.047uF (for a brighter sound) and a 1.0uF cap with a 3k3 series resistor to ground (for a fuller sound). To keep the switching simple, the 3 ccw positions use the stock Ck for V1B and the 3 cw positions use the alternate V1B Ck circuit. Ck for V1A is arranged from 0uF to 0.68uF to 22uF (going from ccw to cw). With this revised switch there is quite a range of tones as well as gain levels from the preamp. Alternately two separate mini-toggle switches could have been used to switch the Ck caps for V1A and V1B independently but I'd already drilled out a large hole for the rotary switch. There would be plenty room on the back panel behind V1 and V2 for 3 mini-toggle switches for Ck and the treble cap/slope resistor switch.

Diagram 1 for rotary Ck switch mod:

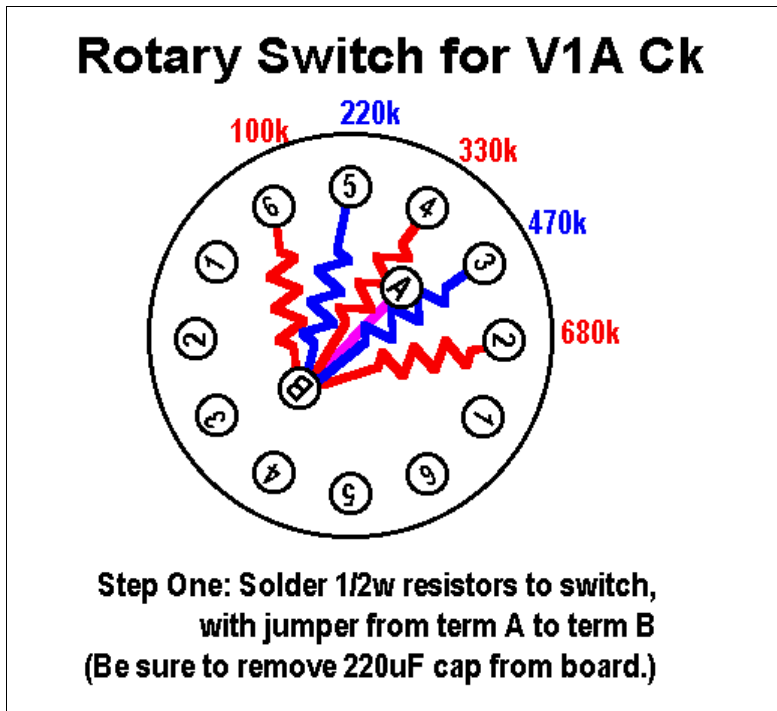


Diagram 2 for rotary Ck switch mod:

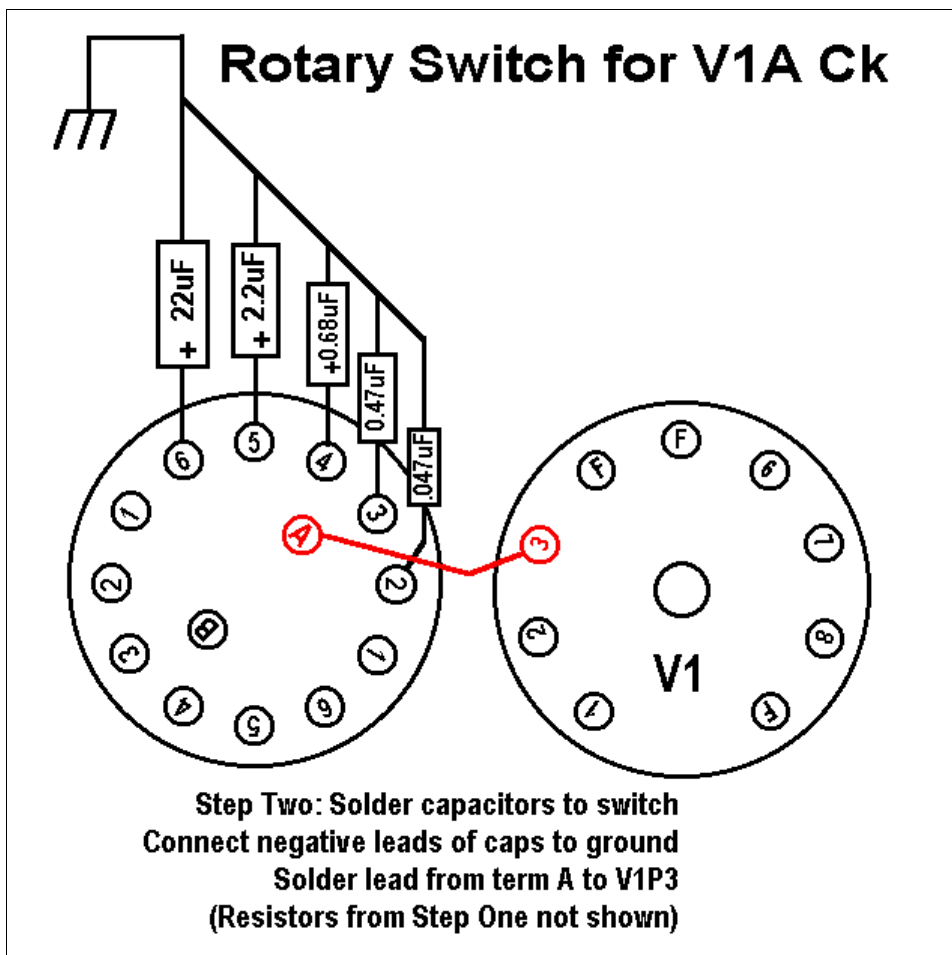


Diagram 1 for advanced treble cap/slope resistor mod:

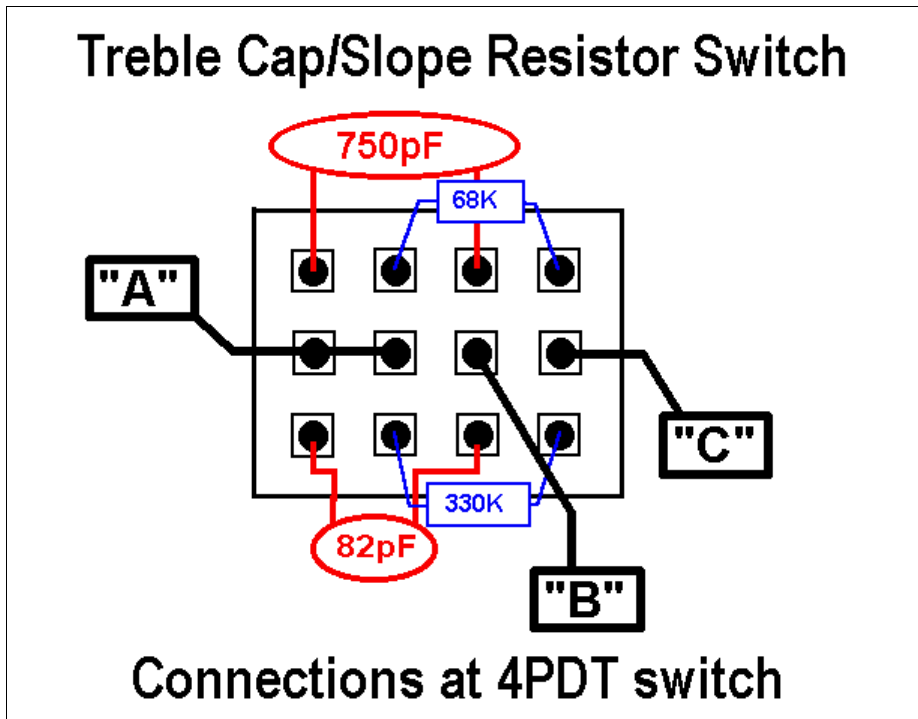
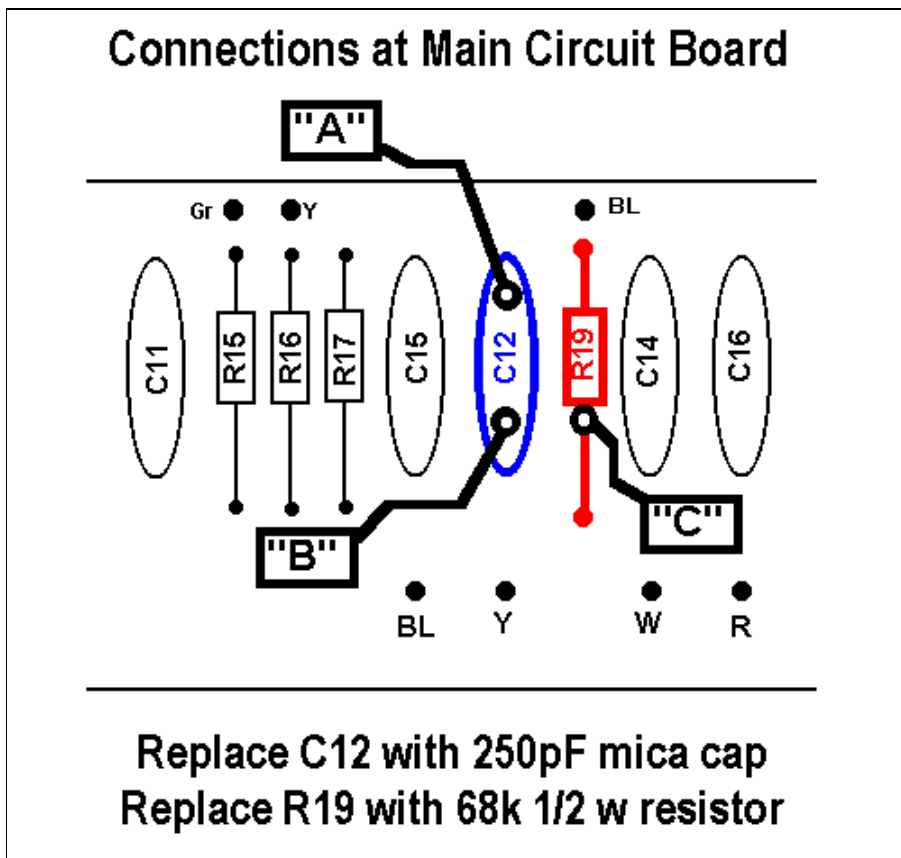


Diagram 2 for advanced treble cap/slope resistor mod:



"Quick and Dirty" FX loop mod

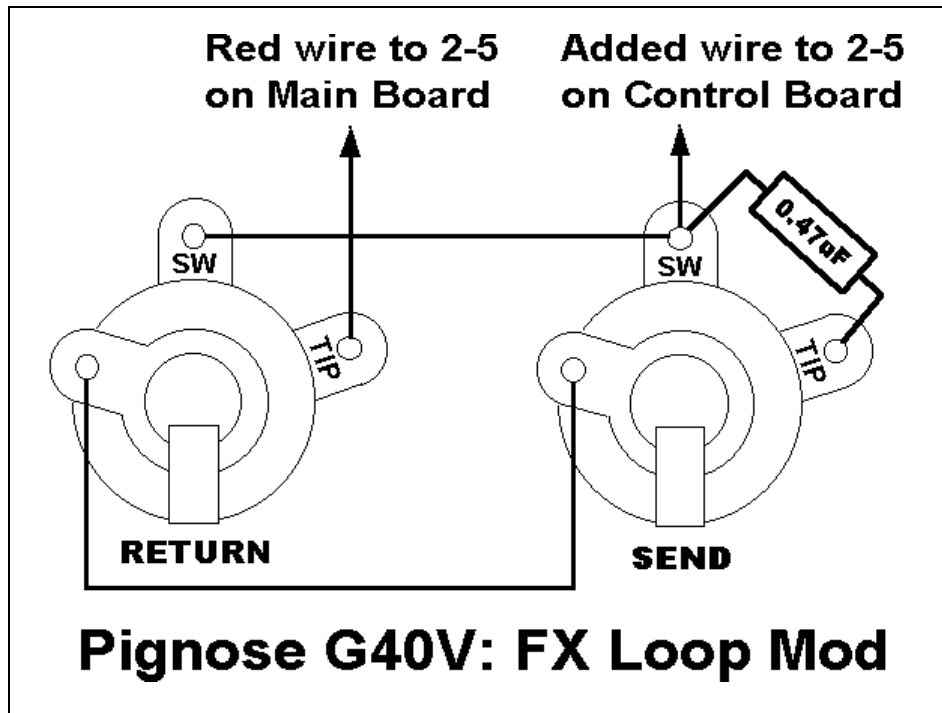
Several G40V users have wondered about adding some sort of FX loop so that reverb or other FX could be added. It should be noted that this mod is more like an unbuffered insert jack added to the line level signal of a mixer than a buffered FX loop as used on most modern amps. But it is simple to add and will work with any modern fx processor that has a buffered input (most do). If your fx processor can be switched over to +4dB input/output levels I would use that setting with this loop; a -10dB level output will not drive the power amp section to the rated 40 watts. (If your fx processor is -10dB, you could use a mixer to increase its output; with a Y-cable you could mix in the unprocessed sound for a quasi-parallel loop setup.)

The first step to adding the FX loop is to locate the red wire labeled "2-5" on the control board right behind the Master volume control. Remove this wire from the control circuit board. Take off the knobs, unscrew the nuts and desolder the ground lead from the preamp star ground point to be able to pull the board out enough to do this work. If this seems like too much of a hassle, you can alternately cut the red lead close to the control board and solder the wire to the stub coming from the board and slip some heat shrink tubing over the joint. (I'd avoid that unless you are very lazy because it is my opinion that a solder joint will transmit and receive more interference and noise than an unspliced lead.)

In any case the game plan here is to run a new lead from the control board (point 2-5) to the switching terminal of a normally-closed 1/4" mono Send jack and the existing red wire to the hot terminal of a similar closed-circuit Return jack ([click here](#)). You need to run a jumper wire between the switching terminals of both jacks. To buffer the signal going to the line level FX processor, I soldered a 0.47uF/250+v cap on the Send jack between the hot and the switching terminals. With this arrangement, the audio signal does not pass through the 0.47uF cap unless the FX loop is being used. The cap also offers some limited buffering if you want to use the FX send jack as a pre-amp out jack (to run into a board or to run into the FX return of a second amp). You may want to try other values for the coupling cap, such as 0.1uF for a less powerful FX send signal. If you are using just one fx processor with the G40V you might want to fine-tune the FX send signal to optimize its response, by changing the coupling cap or adding a series resistor to attenuate the signal.

As mentioned above, this "quick and dirty" fx loop is to be used only with line-level fx processors that have a buffered input. If the processor has a level pot right at its input, it will affect the sound of the amp with the unbuffered level pot acting as treble-cut tone control in conjunction with the 0.47uF cap. Another problem could arise if the fx processor input had a low resistance to ground (like under 1 Meg); in that case, some of the trebles would be bled to ground through the 0.47uF cap. One good thing about the loop is that it doesn't alter the circuit at all when it is not being used (other than adding maybe 6" of unshielded wire). If you are very industrious, you might want to replace all of the unshielded leads carrying an audio signal with properly prepared shielded cable (ground only one end and use heat shrink tubing to prevent shorts at the ungrounded end of the cable).

Diagram for Unbuffered FX Loop:



There is one variation on this loop that you might want to try out, with the jacks and extra cap added before the Master volume control rather than after it. The advantage to that arrangement is mainly if you plan to slave the power amp of the G40V to another guitar amp; you could adjust the relative volumes of the two amps using the G40V Master volume control. With the FX loop described above, the MV control is before the loop and acts as an FX send level control and not an FX return level control. To wire up this variation you would locate and remove the 510k resistor R36 from the control circuit board. It is between the Master and Treble controls, running parallel to the long edge of the board. Leaving the Red wire ("2-5") connected, you would run a wire from the vacated resistor pad nearer to the Treble control to the Send jack. For the vacated pad nearer to the Master volume control, solder a 510k resistor to a wire and then solder the resistor to the board. Run the other end of the wire to the FX Return jack.

DC filament supply mod

The G40V is a very simple amp with a few quirks. If I turn the Master volume control up higher than 4 or 5 there is quite a lot of 60hz hum, even with the Volume control set to 0 and nothing plugged into the input jack. For starters, I reamed out the input jack hole and added insulating washers to isolate the jack from the chassis. There was already a lead from the jack ground lug to the preamp star ground point so I didn't have to add one. While that didn't really help the noise problem described above, it is a worthwhile improvement to practically any amp.

The amp was still picking up a lot of 60hz noise so my next step was to rewire the filament supply for DC by adding a 25 amp bridge rectifier bolted to the chassis. I cut the

two brown leads from the power transformer (aka PT) and ran them to the "ac" terminals on the bridge rectifier ([click here](#)). If you are doing the bias and pentode/triode mods at the same time, remove the brown leads from the V5 tube socket and solder on leads long enough to reach the bridge rectifier. Otherwise, you can just solder extensions to the brown leads as needed, slipping some heat shrink tubing over the solder joints.

The negative (-) terminal of the bridge rectifier goes to chassis ground through a 0.1uF/600v cap. To smooth out the ripples, I added a 4,700uF/50v e-cap between the positive and negative terminals (a 10,000 to 15,000uF cap would work even better if you can find one at a good price). The positive terminal of the bridge rectifier is to be connected to pins 4 & 5 of the V1-3 and pin #2 of V4 & 5; the negative terminal is to be connected to pin #9 of V1-3 and pin #7 of V4 & 5. Depending on the voltage measured under load at the tube filaments you may need to add a small valued 2 watt series resistor to the positive supply.

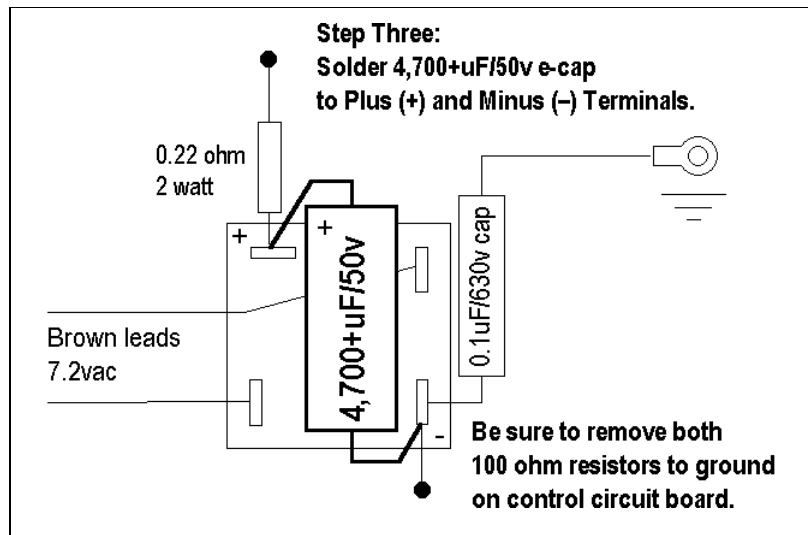
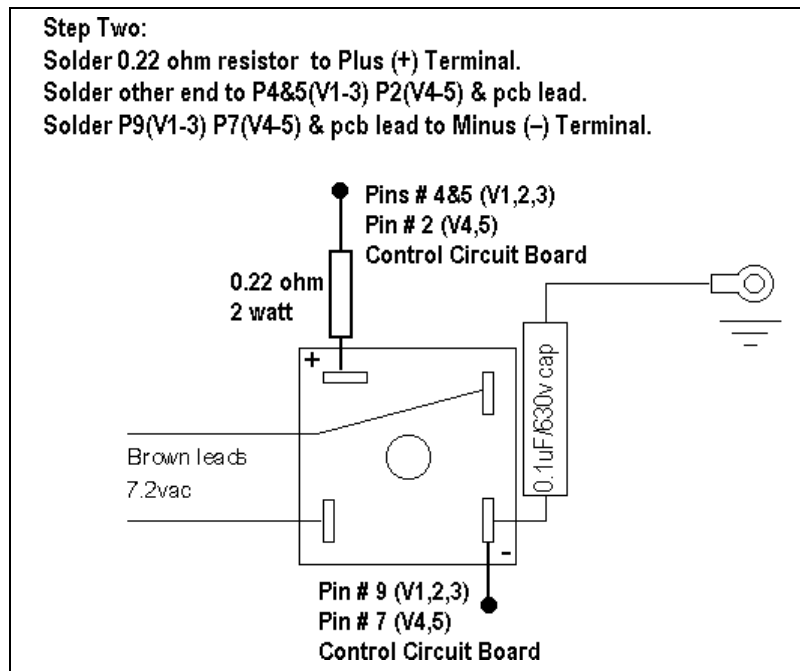
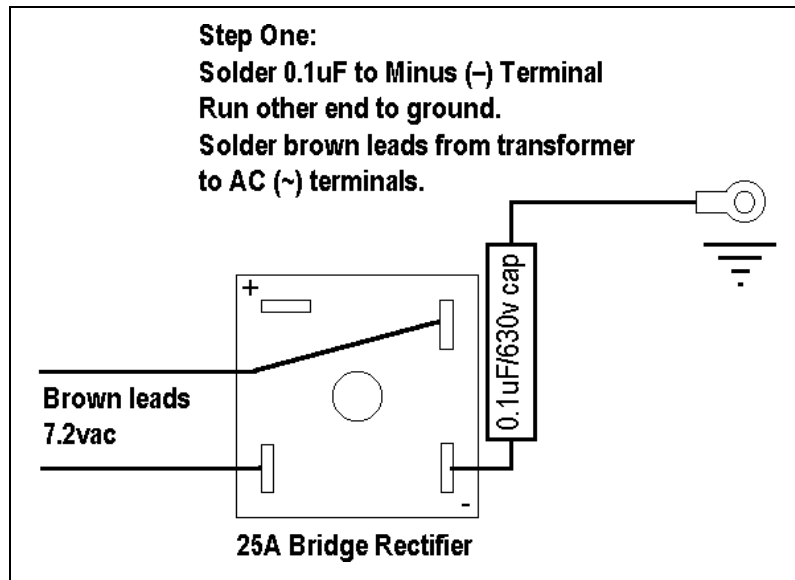
There is one more thing to be done before turning on the amp to measure the actual heater voltage under a load: remove the two 100 ohm / 1 watt resistors (labeled R7 & R8) from the LED end of the control circuit board. Unless you still have the circuit board out from the previous mods, you may elect to just snip off these two resistors from the component side of the board instead of actually desoldering them. (These resistors effectively add a center tap to the AC filament supply which is not used with the dc filament mod, so be sure to remove them one way or another.)

You are now ready to turn the amp on to measure the actual dc filament voltage under load. Make sure your test clips are well away from the high B+ voltages at the tubes; you can measure the voltage right at the bridge rectifier if the filter cap isn't in the way. Before I started on this mod, I measured the filament supply at almost 7.2vac; after rectification it resulted in a dc voltage of approximately 6.8vdc which had to be brought down with a series resistor. I ended up using a 0.22 ohm /2 watt resistor which brought the voltage down to 6.1vdc (which is within the range recommended by Dan Torres: 6.0 - 6.1vdc). A smaller resistor such as 0.18 ohm would bring the filament voltage closer to 6.3vdc. In trying to reach the desired ohm value, remember that identical resistors added in parallel will result in half the ohms and twice the power rating.

When I first wired up the dc filament supply, I had no low-valued 2 watt resistors so I tried a 1N4007 rectifier instead of the resistor. It dropped the voltage a bit too far to 6.0vdc and was running at almost 2 watts which exceeded the rating of the rectifier so I had to pull it out. One other option is to build an adjustable or fixed voltage regulator. If anyone out there works out a regulated dc filament supply for the G40V, let me know.

UPDATE: (11/16/98) I have since run across a power supply circuit used in the Mesa Boogie Mark III which runs the initial preamp tube filaments (and channel switching relay) on 6VDC, while the other tube filaments run on 6.3VAC. Both of these circuits are connected to the same 6.3VAC tap on the PT. The trick is that both dc outputs from the rectifier bridge are referenced to ground through 39 ohm resistors (the two 6.3VAC taps are referenced to ground through 100 ohm resistors). If you choose to adopt this circuit to add a channel switching relay with a footswitch, you need to use a jack that is isolated from the chassis.

Diagrams for DC filament mod:



Adding fuses for more protection

To help protect the amp from production problems noted below I added 2 fuses to power transformer red leads and another fuse to the output transformer HV input. For the PT fuses I used 400mA 5x20mm slow-blow fuses, with panel mount fuseholders on the front next to the power switch. A problem with that location is that if you are holding your guitar and touch the insulated cap of the fuseholder a hum is picked up. You may want to use in-line fuseholders secured inside the chassis with cable ties. For the output transformer I used a panel mount fuseholder on the bottom of the chassis with a 315mA 5x20mm fast-blow fuse; a 250mA fuse would give you even more protection but it is liable to blow at high playing volumes.

Adding a Bias Adjustment Pot

To add a simple bias adjustment pot to the G40V requires replacing the 56k resistor R2 on the power supply board with a 47k resistor in series with a 20k 20-turn cermet trimpot (such as a Caltronics/Beckman # P89PR20K). There is another 56k resistor (R1) on the board that should be replaced with a 68k resistor to increase the bias voltage available (which will allow for lower bias current settings). To remove the board you need to desolder all of the flying leads; be sure to label the leads as necessary so that you can solder them back to the proper pins. With the adjustment screw of the pot facing up, solder the lower terminal to the trace closest to the VF terminal (see drawing of board below). Solder the 47k resistor to the other trace and solder the other end of the resistor to the middle terminal of the trim pot. Before soldering in the resistor, adjust the trim pot so that there is 10k resistance between the middle and lower terminals to place it in the middle of the adjustment range. To secure the trimpot, glue it to the adjacent 100uF/400v filter cap with silicon, epoxy, or hot melt glue. (I prefer hot melt glue because it sets in a minute or two and can be easily removed later.)

To set the bias adjustment pot you will need to measure the idle bias current. If you added the 1.0 ohm resistors in series with the output tube cathodes, you will measure the bias current (in milliamps) by using the dc millivolt scale of your DMM and measuring the voltage drop across the 1.0 ohm resistors. If you did not add the 1.0 ohm resistors, you can alternately use the transformer shunt method, but you need to be careful as the voltages to ground will exceed 400vdc. Use insulated alligator clip adapters on your test probes and connect the red lead to the center tap of the output transformer. This is the white wire that connects to the unmarked VA terminal on the power supply board. This terminal is the ONLY terminal along the side parallel to the front of the chassis (see the drawing below). The black lead is to be connected to pin #3 of each output tube in turn; on V4 this is the orange wire, on V5 this is the blue wire.

A third method of measuring the bias current involves use of a "bias probe" which plugs in between the tube and the tube socket. Whichever method you choose to use, when you first turn the amp on, carefully watch your meter and turn the slotted screw ccw if the readings exceed 40mA. After the readings have stabilized, set to the bias current to the stock value of 33 to 34mA and then try it out with your favorite guitar. You can adjust the bias current to your own taste as long as it falls within the generally accepted

Other mods

The stock circuit uses no series resistor between the input jack and the initial gain stage. While this arrangement will produce more gain than the normal Fender input circuitry, it can also create noise and oscillation problems. If you wish to "Fenderize" the input, remove the shielded cable from pin #2 of the first preamp tube V1, solder a 33k 1/2 watt resistor to the center conductor, insulate it with heat shrink tubing and solder the other end of the resistor back on to the tube pin.

Before doing this modification, I was getting a lot of hum if I put my hand anywhere near the B+ fuses I mounted on the front panel. After modifying the input circuitry that hum is completely gone unless I actually touch the fuseholder. There is a loss of gain through the initial preamp stage so that you don't get quite as much distortion when the Volume control is set to 10. If you normally use the full-distortion setting you could try replacing the 100k anode resistor R13 for V1A with a higher value such as 120k for more gain through the initial preamp stage. The 100k anode resistor is the left-most resistor on the main circuit board, and is connected by a trace to the left-most white wire which goes to Pin #1 of V1.

In experimenting with adding this circuit as the "Abnormal" channel for a Fender ProReverb amp, I found the voicing to be a bit sharp so there are a few mods I did to tone down the sound a bit. Ck for V1B is a 0.047uF cap which acts like a bright switch; I added a switch to select between 0.047uf, and 1.0uF values for this cathode resistor bypass cap (I added a 3k3 series resistor in series with the lead to ground from the 1.0uF to keep the gain down to a reasonable level). To reduce the gain and distortion a bit I also added a 470k series resistor at the grid (input) of V2A (connected to the junction of C11 and R15. Marshall will typically bypass (i.e., parallel) this resistor with a 470pF cap to add some hi-freq definition to the signal. Some posts indicate that a 560pF cap here can have an almost magical effect; I wired both ends of the resistor to a center-off DPDT mini-toggle switch so that I can select between 0pF, 390pF and 560pF as the value of this cap. Both of these mods were added to my ProManiac amp mod.

One other mod I haven't tried yet involves the screen load resistors (R24 & 25) for the V3, the driver/phase inverter. Many people feel that the best sound is produced from a typical driver/PI by using an 82K resistor on the top (inverted) stage and a 100K resistor on the bottom (non-inverted) stage. The G40V uses a 68K resistor for R25, possibly to unbalance the two signals for a more raw and distorted sound. In any case I plan to try changing R25 to an 82K resistor just to see how it sounds.

Important Note

While my G40V was apart I had the opportunity to examine the wiring and circuit boards and found several flaws that could cause the amp to fail prematurely. If you choose to void your warranty by doing these mods you need to inspect the copper side of the circuit boards for any copper between the traces that wasn't properly removed during the etching process. Look for signs of arcing (black smoky deposits); if in doubt try scratching the etched-out area to see if there is any copper under the protective coating. Another problem I found was with the ends of soldered leads and components not

trimmed and dressed properly; with voltages in excess of 400 volts present the soldered ends should be as far apart as possible.

If your G40V is still under warranty you may want to leave it on overnight to make sure that its not on the verge of an imminent breakdown. When I got my amp the power transformer ran very hot causing "crinkling" noises and an unusual smell which turned out to be the plastic tape on the windings overheating. While the amp was designed very well by Dennis Kager, I suspect that the production techniques and quality control in the Chinese factory leaves much to be desired, and I predict that these amps will have a higher than normal failure rate. However, by carefully inspecting the circuit boards for flaws and redressing the leads as necessary, you can greatly improve the odds of your G40V living to a ripe old age. The sales literature indicates that the amp was "club-tested" for several months before being put into production. If that is indeed true my conclusion is that the prototypes were assembled with a much higher level of quality control. If you do the "quality control" yourself your amp will hopefully have the longevity of the original prototypes.

Although not absolutely necessary to do most of these mods, I strongly recommend that you label and desolder enough of the leads going to the power supply board so that you can inspect the copper side for any flaws as described above.

Good luck!

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<http://www.techaccessinc.com/blueguitar>

G40V Drawings (available from my site):

Full schematics: [g40_full.gif](#)

Main board layout: [g40_mnbd.gif](#)

Control board layout: [g40_ctbd.gif](#)

Power supply bd layout: [g40_psb.gif](#)

http://www.techaccessinc.com/blueguitar/g40v_mod.pdf