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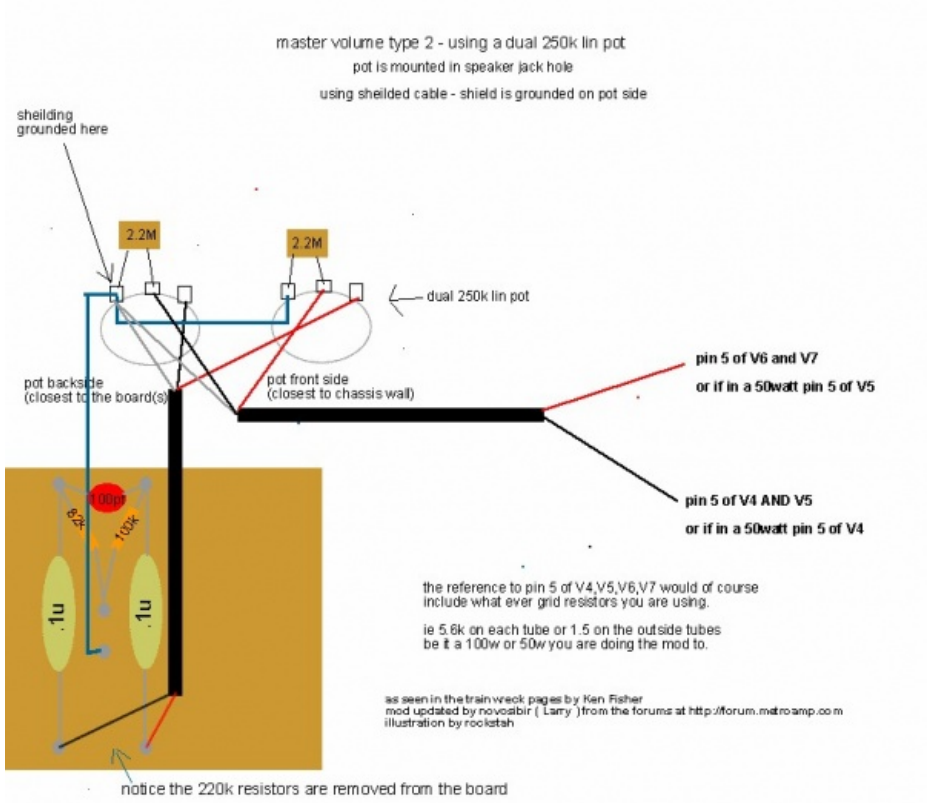
Lar/Mar PPI-MV

This unique version of a post phase inverter master volume mod is credited to Larry of Larry Amps (*novosibir* on the forum) and tested and approved by Mark Abrahamian (*rockstah* on the forum). Hense the name.

A 50+ page thread running on the Metroamp forum details the mod: Lar/Mar PPI-MV thread. A classic, for sure.

Contents [hide]

How to:



The shielding only needs to be connected at ONE END. The negative supply voltage is as good as ground but much easier to hook up directly on the pots lugs. The wires from the PI's coupling caps not must be shielded, they aren't very sensitive - but twist them!

Remember to remove the wires from the PI output couplers to the output valves.

Parts required

- (1) Dual 250k audio pot Log taper, although Linear will work fine. At least ¼W and High

quality (so as to ensure 220K matched sides)
- (2) 2.2M resistor 1/2W min (or any value between 1.5M and 2.2M).
- (2') 2 conductor shielded coax (Shielded 2-conductor cable (RG174/U). Rated for 300v, .22 gauge)
- (1') 22g 300V min hookup wire

- Cable ties and shrink tube for a clean professional installation.

Kit

Available here: LAR/MAR PPI MV KIT

The LarMar Type-II Post Phase Invertor Master Volume Modification

How Does it Work?

This modification is an 'improvement' on the established Ken Fisher Type-II 'Rich Mod' Master volume. The changes were identified and tested by Mark and Larry from the Metroamp Forum boards (RockStah and Novisbir). Although the LarMar PPIMV was designed independently, a similar PPIMV can be found in Kevin O'Conner's "Ultimate Tone Book" and Randall Aiken uses the same type in his Aiken amps. The changes succeed in:

- Lowering the sensitivity of the Master Volume to interference and noise. - Maintaining a Bias-Feed resistance of 220K, seen from the PI coupling caps - Keeping the resistance between the PI's coupling caps and the output tube grids as small as possible (preventing loss of high frequencies when master is set to low volume) - Preventing the output tubes failing if the pot suffers a wiper failure.

Many who have installed this Master Volume report that it is the best Master Volume modification they have ever used, achieving that 'dimed plexi' sound at 'non-pain' volume levels.

As mentioned, the mod is the same as the Ken fisher type II mod, but with a 250K audio pot (log taper) instead of a 100k linear and with the addition of 2.2M resistors soldered between the wipers and the outputs (bias voltage supply).

The benefit of the 250K PPIMV as opposed to a 500K PPIMV is that, when you've backed off the pot, you don't lose as much of the high frequencies. This is because the input capacitance of the output tubes is creating a low-pass/hi-cut filter with the entire resistance from the previous coupling cap to the grid.

This mod involves removing the two 220K bias-feed resistors on the board. The 2M2 resistors must be installed between the centre lugs (to grids) and the left lugs (from bias supply). The resistors make the pot = 220k when dimed - which means this PPIMV should sound the same when the amp is dimed as if you didn't have a master at all!

Where do I put the Pot? Recommended practice, to avoid excessive interference from the input stages of the amp, is to mount it in a speaker jack hole leaving yourself with a single speaker jack (you only ever use one of them anyway right?). In this way, you don't need shielded wires to the tube's grid resistors, (but you have to twist them).

Because the effect of a PPI Master Volume renders the Presence control almost redundant at low volumes, some people like to place the Master Volume pot in-place of the presence pot, and re-route the presence pot to one of the speaker jacks. Special care must be taken routing the wires to avoid interference. Shielded wires to the output tube's grid resistors are recommended when using this method.

FAQ

Where do I put the Pot?

Recommended practice, to avoid excessive interference from the input stages of the amp, is to mount it in a speaker jack hole leaving yourself with a single speaker jack (you only ever use one of them anyway right?). In this way, you don't need shielded wires to the tube's grid resistors, (but you have to twist them). Never put a PPIMV in an unused hole of a input jack! If you want to risk it, then use the lower Vol II input (Normal) for the pot and ensure that the pot's solder lugs are facing away from the other 3 input jacks as far as possible by turning the pot.

Because the effect of a PPI Master Volume renders the Presence control almost redundant at low volumes, some people like to place the Master Volume pot in-place of the presence pot, and re-route the presence pot to one of the speaker jacks. Special care must be taken routing the wires to avoid interference. Shielded wires to the output tube's grid resistors are recommended when using this method.

What is the minimum acceptable wattage for the 2.2M resistor? Carbon Film, Carbon Comp, Metal Film? How about the pot? .5, 1 or 2W?. Carbon tracking? There's nearly no current flowing through the pot and through the resistor, therefore: For the resistors, a power capability of 1/8W is already overkill. The type does not matter, you can use CC's CF's or MF's. For the pot, the usual Mouser's with a power capability of .25W (log) or .5W (linear) are fine.

Is it better to use shielded cable to connect from the pot to the two output coupling caps or I can use standard 22 gauge cable? If I can use standard cable, do I need to twist them? You can use standard stranded wire, but you have to twist them.

Same question as above, but for the connection between the pot and pin 5 of V5 and V6. If my pot is located between V3 and V4, can I use 2 twisted standard cable, or is the shielded cable really a much better option? When the pot is located on the back panel next to the output tubes, then they don't run a long way back and forth, so in this case you can simply use standard cables, but you must twist them.

Thoses cable going to V5 and V6 must pass in front of the power tube, between the board and the tube socket, and not between the back of the chassis and the tube socket, right ? Right! But don't run it directly along the screen grid resistors, because they are 'transmitters' for a possible unwanted feedback!

On the diagram, it's written to link one wire to pin 5 of v4 and v5 and another to pin 5 of v6 and v7. The link between v4-v5 is already made by the resistor (1.5k) that is already installed between pin 5 of those 2 socket, is that right? (idem for V6-V7) But I'd recommend to give each output tube its own independent grid stop resistor of at least 5.6K as it's been done on the later Marshall models. You won't have any audible disadvantage soundwise, but a much more stable operating of the output stage.

Do I need to link the pot to a ground lug on the chassis? No! The pot's housing already is grounded by mounting it to the chassis. And if you're using shielded wires, you may hook the shield to the negative bias supply voltage, which is already present on the pot's output lugs. The negative bias voltage is as good a shielding potential as ground!

Is there any concern that as the volume approaches zero, there is no grid leak resistors (220k's are gone)? I ask this because there has been several posts where people discuss using 220Ks or 470Ks. But this MV circuit takes then out altogether! In this respect by principle there's no difference to the rich mod with the double 500K pot and the 220K's or 470K's! When you turn the volume to zero/close the pot, then you shunt any resistor coming after this spot, no matter whether a 220K, a 470K or a 2.2M - then it is as though the resistors aren't there at all. But don't worry! The output tubes grids aren't sad about it, getting the negative bias voltage directly from the negative bias source instead through any resistor value. They only get upset when the resistor's value is too large - then they tend to answer this with blocking distortion.

On the diagram, the red wire goes to pin 5 of V6 and V7. Is it OK to just connect it directly to V6? As i have swamp resistors between V6 and V7, and also V4 and V5. Yes. You can just wire from the MV to the middle two tubes (V5 & V6) and then let the existing leads/resistors jump to the other tubes.

You may want to put grid stopper resistors on pin 5 of all the power tubes to help prevent oscillation.

Could it be changed so that the signal from the PI is applied to the wipers of the pots and the signal is taken from one end and the bias applied to the other end? Then you'd change the load to the PI's plates, which would be only a handful of K-ohms at low volumes - and this wouldn't change the amp's sound remarkably.

Do the leads under the board going to the powertubes get replaced by the leads going from the MV pot to the power tubes? Yes. The bias feed goes through the MV pots on to the tubes. Remove the wires that go from the 220k grid resistors to pin 5 of the output tubes. Also remove the 220k resistors. Then run your bias feed wire from the turret where the 220k's were joined together to the MV pot (blue wire in Mark's diagram below).

Category: Amp Mods