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Subject: K200 issue

Posted by [cassent5150](#) on Mon, 11 Jul 2011 11:40:44 GMT

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I'm working on a K200 frank (6 transistor with reverb/tremolo).

I've gone through the output section and its working fine. I went through the pre amp board and independently they both work great. Here's my dilemma, I get a distorted signal if I run the 2 output wires of the pre amps together. I have another amp (595 with no effects) and using it as a clone I add in the resistor R146 on PC 101 to connect the 2 pre amp signals together and the output at the gray wire is distorted. Again I have a clean signal from both channels seperatly but they distort if I combine them? Anyone got any clues as to what to do?

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Subject: Re: K200 issue

Posted by [chicagobill](#) on Mon, 11 Jul 2011 15:58:49 GMT

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Is there any dc voltage on either preamp output?

The left preamp signal comes out of the RV board, and it should already have the isolation resistor at the output (R313). R146 would be used if there were no FX board.

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Subject: Re: K200 issue

Posted by [cassent5150](#) on Mon, 11 Jul 2011 22:36:00 GMT

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Yes, but very little (+.07 VDC left channel and +.01 VDC). It started out like over 3 volts and went down to those values within 30 seconds. I do not have the effects board in the amp yet as I find it easier to restore these one section at a time. Everything but the transformer, rectifier and power filter caps have been removed tested and reinstalled. I installed the regulator board and output transistors and have good clean output to speakers and the regulator is pushing +25.6 VDC. I had some bad caps so I replaced all the White mallory with electrolytic type (10 uf caps with 10-50V and all the 90 uf with 80uf-160V and the 100uf with 100uf 100V. The left channel had a problem after the recap. It had a fast ticking ,almost a buzz sound with the signal so I replaced all the se4002 transistors with nte123AP and all the remaining tantalum caps with tantalum type on that channel and left the one 2N3567. I then had good, no great, no, heavens no, IT IS AWESOMELY WARM RICH AND ROBUST!! I was testing these channels out seperately and decided to use the 595 frank I have to clone the channel connection like the no effect model when I noticed right away it got all distorted the minite I added the resistor (R146. I checked the schematic to make sure the 4700 ohm resistor was correct and it is. The effects board isnt ready yet I still need to get a #48 bulb for the tremolo circuit but the reverb is working so I installed the effects board to see if that would change things. I pulled the resistor R146 out and connected the effects board and have a beautiful sounding effects channel. The same thing happens if I try to connect the gray (right output) and the blue (left output) wires together into the bottom left input of the PC101. Do these 2 wire (Gray and Blue go to 2 different places?

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Subject: Re: K200 issue  
Posted by [steve](#) on Mon, 11 Jul 2011 23:20:33 GMT  
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What do those two dc voltages do/change to when the channel outputs are connected to each other?

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Subject: Re: K200 issue  
Posted by [cassent5150](#) on Mon, 11 Jul 2011 23:49:06 GMT  
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+18VDC and falling to +.01VDC connected and then tested seperately again after being connected and they were equal at .08VDC and falling to .02VDC.

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Subject: Re: K200 issue  
Posted by [chicagobill](#) on Tue, 12 Jul 2011 16:14:49 GMT  
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Thanks for the additional information, that helps me to understand what you are doing.

What is the voltage at the base of Q201 when both channels are hooked up?

Can you describe the distortion?

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Subject: Re: K200 issue  
Posted by [cassent5150](#) on Wed, 13 Jul 2011 00:21:27 GMT  
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I have + 3.68 VDC at the base of Q201 on the regulator board with nothing connected, 3.68 Left channel only, 3.68 right channel only, combine its still 3.68. I remember trying to hook up the left channel without the effects board and 4700 resistor and the signal was clipping like a cap (Ticking real fast) as soon as you tried to push the signal over a wisper. I thought maybe the signal was a little much for Q201 so I combined the 2 channels like the no effects model exactly. I then put a 4700 ohm resistor in the gray output wire and bingo we have a clean signal again. My next question would be, does the gray wire on the effects model go into the effects board somewhere and only the blue output wire go from the effects board to the input on the regulator board. I may have to consult the schematic cause I cant remember exactly where I unsoldered the gray wire from. Do ya think I may have a problem with the regulator board?

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Subject: Re: K200 issue  
Posted by [chicagobill](#) on Wed, 13 Jul 2011 21:24:23 GMT  
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The FX board is in series with the preamp board output. The output from the preamp goes to the input of the FX board and then the output of the FX board goes to the driver board.

Sometimes the output caps from the preamps get leaky and they will allow dc to pass through them and that will screw up the bias on the driver input transistor. Your voltage readings show that this is not your problem.

Did you recap the driver section yet?

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Subject: Re: K200 issue

Posted by [cassent5150](#) on Wed, 13 Jul 2011 22:14:23 GMT

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I didn't do anything to the regulator PC201 board yet. The transistor you had me check voltages Q201 is in the regulator board. I overlooked the fact that its also the driver board. When I got this amp it had 3 of the output transistors fried and 2 of the 1 ohm 5W resistors burned open. I popped in new 3055's and replaced all the 1 ohm 5W with 1 ohm 10W ceramic resistors. (These resistors wont hurt anything will they?) Those two 820 ohm 2W resistors stay pretty warm I've noticed. At that point I ran a test and had good supply output for the pre amps so I left the regulator like it was. I need to pick up some of the 500uf caps to replenish my supply. I'm out at the moment, but I'll recap that PC201 and I have those transistors so I may just put new ones in and see what that does for it. I haven't got the effects board completed yet so it hasn't been installed into the chassis yet. I have it passing good signal and reverb up and running, but I am trying to find a #48 bulb so I can get the tremolo working. Once I get it tested out and fully working on the bench, I'll install that section. At the moment its set up like a 595 no effects unit. I got to playing it last night and couldn't get over how warm sounding these old things are. I almost cant wait to see what she'll sound like on a real speaker cabinet instead of this little 8 ohm one foot square Kicker box I use for a test speaker. Makes it pretty hard to believe its solid state!! Steve C

PS Thanks for all the help so far ya'll, I got a feeling the tremolo circuit wont be easy !!!

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Subject: Re: K200 issue

Posted by [cassent5150](#) on Thu, 14 Jul 2011 03:26:10 GMT

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Well we done got it now!!!! Thanks guys again. I'll learn to study the schematic a little better next time around. The problem was one of the driver transistors. I didn't have but one cap available to replace (the 90uf-35V) so I popped it in and I changed out both 2N3567's and the SE4002. I reset the wiring like the 595 model with no effects and it sounds fantastic on both channels. The left one seems to have a slight bit more gain, but I think that may change when I get the effects board completed and installed.

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Subject: Re: K200 issue

Posted by [chicagobill](#) on Thu, 14 Jul 2011 15:02:30 GMT

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Glad to hear you got it figured out. The Frank heads, well at least the 6 transistor ones, are my favorite sounding amps. The FX are ok, but with the lack of any switching it makes them harder to use. There's something about the output stage and the driver/phase inverter transformer that seems to really warm up the sound.

The 10 watt emitter resistors will not hurt anything, but these resistors will sometimes act like fuses when the transistor shorts out. Doubling the wattage will reduce any chance of them protecting the circuit in the case of a major output failure.

There is something like a 30-35 volt drop across each of the 820 ohm resistors in the output stage, that's why they are rated at 2 Watts. They will get warm.

Be sure to replace that 500mf cap on the driver board, if it weakens or opens up it will kill the drive to the power transistors and you will lose signal.

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Subject: Re: K200 issue

Posted by [cassent5150](#) on Thu, 14 Jul 2011 15:17:14 GMT

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Sure thing as soon as I can get by my supply store. I gotta get back on the K200A-2 I'm restoring now. I think that one sat in some salt water or something cause it sure was a mess inside. Shes looking good now. I have the new bottom chassis plate in and the power supply and output transistors installed. I got the driver board and regulator boards cleaned up and ready for rebuilding. You can check out the progress and see before and after pictures in this section of the web board under the title K200A-2 Restoration. I think stevem was pretty close when he said it was buried with Jimmy Hoffa for a spell.

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