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Subject: dc voltage at the output

Posted by [smackoj](#) on Wed, 04 Feb 2015 15:35:39 GMT

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hi gents; I have a K200B4 that I have been running with the PC403 preamp board disconnected because it was inop when I got the amp. I took a look at it lately and found the transistors Q400 and 401 had been replaced by someone who did the job bass-ackwards. I replaced these two trans. with suitable replacements installed correctly and the channel is now working but there is a bad buzz in it. I measured the dc at the output and found .033 vdc there. Is that too much, not too much or ???

thanks, jack

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Subject: Re: dc voltage at the output

Posted by [chicagobill](#) on Wed, 04 Feb 2015 17:42:12 GMT

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Not sure I understand what you mean. Where are you measuring the voltage at the output?

As for the buzz, try and isolate the source by testing a few things. Does the buzz change volume when you adjust the volume control? Do the tone controls change the sound of the buzz? What about the clipper, does the clipper control change the buzz?

You see what I'm saying, try and see if you can find out where in the circuit the buzz is coming from.

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Subject: Re: dc voltage at the output

Posted by [smackoj](#) on Wed, 04 Feb 2015 18:41:46 GMT

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I am measuring the dc at the speaker jack. The buzz changes pitch a little bit when I turn the treble pot. I don't notice a change with the bass pot. The vol. pot makes the buzz get louder and then at the least resistance, furthest right, it changes tone as it gets louder. I noticed no chg. when I engage the Harm. Clipping.

thanks bill

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Subject: Re: dc voltage at the output

Posted by [chicagobill](#) on Wed, 04 Feb 2015 20:06:56 GMT

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Having 0.033vdc on the output isn't too bad. If you had 0.33 I'd be a little concerned, but even that level is fairly normal.

Now for your buzz, what happens with a guitar plugged in? Now try turning the guitar's volume control all the way down.

If the amp's volume control changes the buzz, then the problem is located at the input jacks and wiring or in the first stage of the preamp, where you changed the two transistors.

What transistors did you use to replace Q400 and Q401?

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Subject: Re: dc voltage at the output  
Posted by [smackoj](#) on Wed, 04 Feb 2015 21:18:40 GMT  
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ans. I don't hear a change when I change the vol. on the guitar.  
I used 2n3904 for Q400 and 2n3906 for 401.

thanks, jack

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Subject: Re: dc voltage at the output  
Posted by [chicagobill](#) on Wed, 04 Feb 2015 21:39:18 GMT  
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Those transistors should work as replacements. If you have another 2N3904 you can try replacing Q402 as well.

Does your meter measure capacitance? Resistance?

I would start by checking the resistances of all of the resistors around Q400-Q402 and if your meter can test them, C403 and C404.

There are many multiple resistance paths in the circuit, so don't expect to get exact readings that match the schematic, but look for opens or dead shorts. When somebody else has been in there, you can't assume that everything is the way that it should be. You may find broken pc traces or traces with solder bridges, etc.

And just to be certain that you know this, these tests should be done with the amp unplugged from the wall and the filter caps discharged.

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Subject: Re: dc voltage at the output  
Posted by [smackoj](#) on Wed, 04 Feb 2015 22:47:56 GMT  
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ans: I have a Fluke meter and I'm sure it does R but not sure on C? I will do some probing around with the meter and see what I can find. I have some more 3904s so I'll replace Q402 also.

thanks, jack

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Subject: Re: dc voltage at the output  
Posted by [smackoj](#) on Thu, 05 Feb 2015 00:40:23 GMT  
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I tested resistors around the first three transistors and replaced Q402 (orig. tested good but replaced anyway). No shorts or dead resistors but a couple are a ways off the stated value. I pulled C403 and 404, they were iffy on my capacitor tester so I replaced them. Plugged her in and still the same buzz at the same volume.

I think I will spend some time with the two input jacks on the front of the amp. They have been tampered with so I better double check the wiring on them.

jack

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Subject: Re: dc voltage at the output  
Posted by [smackoj](#) on Thu, 05 Feb 2015 14:49:31 GMT  
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ok; more searching completed and pretty sure the input jacks are not wired correctly? I searched the technical stuff but could not find a good readable picture of the input jacks. Does anyone have a blown up picture, schematic, layout etc. so I can see the exact input wiring for both channels (the trem, reverb ch. and the harmonic clipper, select boost ch.)? I sure would appreciate it.

thanks, jack

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Subject: Re: dc voltage at the output  
Posted by [steven](#) on Thu, 05 Feb 2015 16:10:47 GMT  
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Since the volume control is right after the channels first gain stage if turning it down does not kill the hum then you are chasing down the wrong trail.

This does not mean that the jacks may not be wired wrong, but you have the other channel to compare that to!

Use your voltmeter to step back thru the signal chain from Q416 and look for dc voltage where there should be none.

Resistors are not a likely cause, more likely would be a leaky electrolytic coupling cap, or a leaky transistor, and also take note that all dc voltages are taken with all the controls full up and with no speaker load or test load on the amp as noted on the schematic!

Also just for kicks just check the two 8 volt preamp voltage readings as if they are not pretty close two each other then that can make for hum also!

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Subject: Re: dc voltage at the output  
Posted by [chicagobill](#) on Thu, 05 Feb 2015 17:32:10 GMT  
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Jack, if you go to the technical section and look at any of the schematics for the K200B series amps and not the individual pc boards you will find the schematics for the input jacks as well as the power supply and footswitch jacks, etc. Go to the schematics by amp model list and then click on the link for the model number.

I would think that any problem with the power supplies would show up in both preamps.

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Subject: Re: dc voltage at the output  
Posted by [smackoj](#) on Thu, 05 Feb 2015 22:24:15 GMT  
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I have trouble reading the schematic of the input on it's side (PC403) and it won't let me print it so I'll do what I can to read it. A weird finding re: the input signal wire. The reverb channel only has a blue wire from the input to the pcb. The Sel. Boost channel has a blue wire connected to the pcb and a black wire from the input jack to the pcb. It is soldered in about one inch directly below the blue input wire. I don't see a black wire connection on either of the schematics, the PC403 or the K200B4 amp schemo with the power supply and boards shown without any values. Is that just a rogue wire that found a solder pad on the pcb?

My best guess is that somebody tried to 'hotrod' this amp at one point. The transistor I took out of Q400 was a darlington pair and the one in Q401 was soldered in upside down and was a Si trans rated a hfe min. 5. Weird stuff.

thanks for the guidance amigos.

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Subject: Re: dc voltage at the output  
Posted by [chicagobill](#) on Thu, 05 Feb 2015 22:35:27 GMT  
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Both sets of inputs should be wired the same way. What does the black wire connect to at the jacks and at the board side?

If it's an additional ground wire, it might be creating a ground loop.

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Subject: Re: dc voltage at the output  
Posted by [smackoj](#) on Thu, 05 Feb 2015 22:57:35 GMT  
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I removed the black wire and made sure both sets of input jacks are wired the same. The buzz completely stopped but it's still not acting quite right. The black wire was on the shaft ground lug of

the input jack and up to a solder pad about an inch directly below the solder pad for the blue signal wire.

revised 30 mins. later.

OK, It is working better but now the buzz is still there although quite a bit less at low volume but increases as I turn up the volume.

thanks friends.

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Subject: Re: dc voltage at the output  
Posted by [chicagobill](#) on Fri, 06 Feb 2015 04:52:02 GMT  
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Well, it sounds like the wrong person was working on your amp. Does it look like there have been any other changes done to the board? You may need to check the board against the schematic and see if anything else has been messed with.

I think that the board itself is grounded by the pot mounting nuts on certain pots. Have you cleaned the chassis and star washers at the mounting points? How about the where the pot mounts to the pc board?

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Subject: Re: dc voltage at the output  
Posted by [steven](#) on Fri, 06 Feb 2015 11:18:42 GMT  
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With nothing plugged into that channel are both input jacks shorting closed hot to ground as they should?

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Subject: Re: dc voltage at the output  
Posted by [smackoj](#) on Fri, 06 Feb 2015 13:47:13 GMT  
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I will check all the ground points and post an update. I believe that all 4 input jacks are shorting hot to ground. Maybe cleaning up the contact areas will quiet it down? I don't see any other spots on PC403 that look tampered with. All components and solder joints look orig.

thanks, jack

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Subject: Re: dc voltage at the output  
Posted by [smackoj](#) on Fri, 06 Feb 2015 15:08:10 GMT  
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update; one step forward and two steps back right now. I tried cleaning contact points on the jacks and tightening the mounting points for the board. It made the buzz louder again. I am pretty confident that it is a grounding issue now. I'll have to tear it pretty much all the way down and re-do all the contact and ground points. I'll report later today.

thanks

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Subject: Re: dc voltage at the output  
Posted by [chicagobill](#) on Fri, 06 Feb 2015 17:49:37 GMT  
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It sounds like you are on the right track now. The added black wire was probably the other guy's attempt to fix the grounding issue.

Also don't forget to look for cold solder joints on the board.

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Subject: Re: dc voltage at the output  
Posted by [smackoj](#) on Fri, 06 Feb 2015 22:42:02 GMT  
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update friday afternoon. No luck so far. removed the board, went over solder joints again. sprayed d-oxit on the areas between the pot nuts and the pcb. checked all wiring around the input jacks again. It is wired identical to the other channel's two inputs. Buzz still remains but, to give all avail. info., now the treble pot changes tone and loudness when rotated, the vol. pot sounds the same no matter what position, and the bass sounds the same except for the last 1/4 inch of travel towards 10 where the tone changes. I still think it's a ground issue but that's just a SWAG guess.

thanks, jack

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Subject: Re: dc voltage at the output  
Posted by [pleat](#) on Sat, 07 Feb 2015 00:27:29 GMT  
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Just tossing out I have a K200B-2 amp and the normal PC105 pre amp does have a black wire from the PCB to the low input jack of that channel. The effects channel has the blue wire from the low input to the circuit board without a black ground wire. So I'd guess the black ground wire on the clipper channel is factory correct.

pleat

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Subject: Re: dc voltage at the output  
Posted by [chicagobill](#) on Sat, 07 Feb 2015 05:39:39 GMT

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The only 200B head I have open right now is a B-1, but I'll take a look at how things are grounded. Later on if I get a chance, I'll pull out my B-4 and check that.

Edit: I checked and one channel has a black wire twisted with the blue input wire that grounds the board to the input jacks.

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Subject: Re: dc voltage at the output  
Posted by [smackoj](#) on Sat, 07 Feb 2015 09:52:20 GMT  
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I will install the black wire again and see what happens. I can tell the blue wire for that channel was obviously twisted at one time.

I am suspicious of the on-off switch wiring. I see both black wires from the thermostat to the on-off switch. I see one wire shown on the diagram in "technical" but are both supposed to go to the switch?

results later today. thanks

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Subject: Re: dc voltage at the output  
Posted by [steven](#) on Sat, 07 Feb 2015 12:39:36 GMT  
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That thermal breaker must of been played with also as Kustom always used a white and a white/black wire as shown in the circuit layouts and it must be wired as such if it's to work, that is if it's still good!

You can test it by holding a soldering iron to it and listening for a click or checking with a meter that it opens.

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Subject: Re: dc voltage at the output  
Posted by [smackoj](#) on Sat, 07 Feb 2015 15:28:43 GMT  
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where are you seeing the wht and wht/blk wires Steve? I don't see that on the circuit diagrams.

thanks

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Subject: Re: dc voltage at the output  
Posted by [chicagobill](#) on Sat, 07 Feb 2015 16:56:47 GMT  
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The thermoswitch is wired in series with the power transformer. One wire goes to the ac/polarity switch and the other goes directly to one end of the transformer primary winding. That's the way it's supposed to be wired in any case.

I've seen black/black wires as well as black/white and white/white-black stripe wires depending on the era of the amp. They are always twisted pairs.

Double check the wiring that you have, maybe it just looks like both wires go to the power switch.

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Subject: Re: dc voltage at the output

Posted by [smackoj](#) on Sat, 07 Feb 2015 17:57:13 GMT

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ok; finally moving towards the goal. The power switch was wired wrong and I got that put back to correct. I added the black grounding wire back from PC403 brd to the ground lug on the input jack. It sounds 80 percent better. Still has some buzz that changes with the position of the Bass and Treble pots on the PC403 side but there is a 'sweet' spot on the pots that gets the amp to a buzz level I can ignore it's so minimal. When I try the PC303 side it is a little quieter but the Treble pot does effect the buzz, the Bass pot does not and the vol. pot is quiet until around 8-9 on the dial.

thanks, jack d

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