

Yaqin VK2100 maintenance

Be very careful with the leads; if one slips and shorts out something that should not be shorted, you blow the amp. Have a very calm hand doing this.

Performing this sort of thing in this amp in particular is a little more dangerous than usual, as there are **HIGH VOLTAGES** present not far away from where you will be doing this. The amp power rails themselves are only a couple dozen volts, but the power supply for the tubes is in the hundreds of volts. **BEWARE!**

Bias

The procedure is somewhat time/temperature dependent. You want to do it when the amp is fully warmed up. Have it idle (that is on, but not really doing anything) for about 1/2 hour with the cover on, but screws removed.

Measure here:



And adjust with the potentiometer to the right till you measure $\pm 15 \sim \pm 25 \text{mV}$, $\pm 15 \text{mV}$ will make it run cooler, and $\pm 25 \text{mV}$ will make it sound more class A. It shouldn't matter, but just to be save: If your first measurements are positive, keep it positive, if they're negative, keep them negative. More to the right of the board you will find the same kind of layout with again a potentiometer (the most to the right), do the same thing there and make sure your measurements are within 1~2mV of each other.

After you adjust and balance, replace the cover without replacing the screws and start playing some music. Make sure it sounds okay, and let it go at a medium-low volume for about half an hour. After that, stop the music and check the bias again. It should not have drifted or only drifted a little. Re-calibrate if needed, otherwise replace the cover and screws and your set.

DC offset

Checking for offset, just connect your MM to the speaker outputs, preferably with an 8Ω / >20 -watt resistor connected up across the + and -, and adjust the DC offset pot inside (the potentiometers you didn't use while adjusting bias) to get as close to 0mV as possible, though anything between -50mV and +50mV is acceptable. You will become frustrated, though- as soon as you put the cover on, the DC will drift somewhat, and after it warms up inside, it will drift a lot. So, you want to compensate for this when you have the cover off. If the DC drifts +20mV in one channel after the cover is replaced, and it has warmed up, adjust the DC offset for $xmV - 20mV$ when the cover is off: i.e. the best you can get is $\pm 15mV$ with the cover off, but it jumps to $\pm 35mV$ when the cover is replaced, adjust the bias to $15mV \pm 20mV$ in the appropriate direction so that the offset "drifts" towards 0.

One more little "gotcha", and perhaps a sign of its low-cost lineage is that the Yaqin was in rather desperate need of calibration. Although it has been more and more a standard procedure, I did not check for DC or bias alignment when the amp arrived- I presumed it was too new to need any such work, and besides, it sounds terrific. Well yesterday evening I decided just to test for DC at the speaker terminals, and was rather surprised to find 130mV+ in one channel and some 80mV in the other.

I popped the cover off and checked the bias current: 83mV in one channel, 27mV in the other! Way past the thermal specs for the heatsinks, and they were hot!

I decided to re-calibrate using my best judgement as a guide. It was quite apparent which pots were for bias and which were for DC offset. I decided that $\sim 15mV$ seemed about right for the bias, and set the pot for it- as an aside, the trims in the VK2100 are *very* sensitive. Only the slightest touch is enough to change the value by 10mV, and it is very tricky to get anything less than 5mV, though I did accomplish it. Anyways, the bias was set and holding through a power down-cool off- power up cycle, and was still within 1mV when I checked it again (cold) this morning.

The DC offset was a little harder. The difference in offset between a cold power up and 20+ minutes of warm-up time is over 200mV. If you were to check it right after the output relay clicks closed, you would think there is something seriously wrong, but some time later, it settles down to a much more reasonable level. After a couple hours up idle warm up, I calibrated to near 0mV, then replaced the lid. A minute later, the offset was up nearly 50mV- very strange. I took the lid off, and tested again, ready to reset it, but it had returned to a very good 3 or 4mV in either channel. So on when the cover, and when I checked after buttoning it up *yet again* I ground my teeth as I saw 38-48mV of offset! About this time, the lightbulb finally clicked on. I took the lid off again, reset the offset to about -40mV, and replaced the cover: 2mV! It would seem that the DC offset pot is rather sensitive to temperature fluctuations, but curiously, it does not fluctuate all that much after playing. I wonder if it could be some sort of strange capacitance problem when the cover is on or something... I don't know. I just know that after calibrating it for the opposite extreme, it settles to the happy medium and works.