EQ250 Setup guide

Follow the testing procedure in the shown order. If one test fails, find out the problem, correct it then resume.

Always unplug power between steps because it is very easy to create a short circuit when moving a DMM probe. And most of the time, shortcuts are fatal to the circuits.

Step		Description
1.	Setting up	The EQ250 settings consist of checking the power supply voltages and then setting two offsets on the right and left cards to zero. **Case #1**: If you have 2 XT500s, easy, you will make the offset settings outside your rack/Lunchbox. **Case #2**: If you have one XT500, you can make the adjustment of the left card outside your rack/Lunchbox. But the adjustment of the right card will have to be done inside the rack/Lunchbox because both cards must be powered for this adjustment. **Case #3**: If you do not have an XT500, you will have to make the 4 adjustments inside your rack/Lunchbox. The adjustment of the left card can be done without powering the right channel. The adjustment of the right card requires powering both channels. Press the red button to activate the EQ. Set all gain pots to 0.
2.	Left channel power voltages check	Set your DMM to DC Volts on a 20 V scale. Connect the black probe to test point **0V** and power up. Connect the red probe to test point **V+**. Check that you get a value between 15 and 16 Volts. Connect the red probe to test point **V-**. Check that you get a value between -15 and -16 Volts. Power off.
3.	Zeroing the left channel offsets	Set your multimeter to DC Volts on a millivolt scale. Connect the black probe to the **0V** test point. Connect the red probe to the **TP1** test point. Turn on the power and adjust the **TR1** trimmer (through the hole on the right channel PCB if you are doing this with both boards mounted) until you get the lowest possible voltage on the multimeter. It should be **less than 1mV**. Turn off power. Connect the red probe to the **TP2** test point. Turn on the power and adjust the **TR2** trimmer in the same way.
4.	Right channel power voltages check	Set your multimeter to DC Volts on a 20V scale. Connect the black probe to the **0V** test point and turn on the power. Connect the red probe to the **V+** test point. Verify that you get a reading between 15 and 16 volts. Connect the red probe to the **V-** test point. Verify that you get a reading between -15 and -16 volts. Turn off the power.

Step		Description
	Zeroing the right channel offsets	Set your multimeter to DC Volts on a millivolt scale. Connect the black probe to the 0V test point. Connect the red probe to the **TP8** test point. Turn on the power and adjust trimmer **TR3** until you get the lowest possible voltage on the multimeter. It should be **less than 1mV**. Turn off the power. Connect the red probe to the **TP9** test point. Turn on the power and adjust trimmer **TR4** in the same way.
5.	Sound check	Check that you don't have any level variation by turning the EQ on and off. Then check that all the EQ controls work as expected.
6.	Congratulations!	You're done!

Frequency difference between right and left channels.

Due to the tolerances on the component values it can happen that there is too great a difference between the frequencies of the right and left channels. As long as this difference remains less than or equal to about 10% it will generally not be a problem. If this difference becomes too great, it is possible to correct it.

Do the test with the frequency adjustment potentiometer in the middle of the band, at about 12 o'clock. Measure the central frequencies of the two channels. you get fmin and fmax.

Calculate k = (fmax - fmin) / fmax
This value gives you the value of the capacitors to add to the two capacitors of the channel with the highest frequency in the band considered.
C' = C * k

Channel / Band	Low	Low-Mid	Mid	High-Mid	High
Left	C15*, C16*	C17*, C18*	C19*, C20*	C21*, C22*	C23*, C24*
Right	C55*, C56*	C57*, C58*	C59*, C60*	C61*, C62*	C63*, C64*

Example:
Mid band frequencies, frequency potentiometer around 12 o'clock:
Left channel: 580Hz
Right channel: 510Hz
k = (580 – 510) / 580 = 0.12
You need to add 2 capacitors to the left channel, the highest frequency.
C19* = 330nF * 0.12 = 39.6 nF or the closest value 39nF
C20* = 1000pF * 0.12 = 120pF
Preferably use polypropylene capacitors or COG ceramics.
Please note: C15 is in parallel with C14 (and C55 with C54) so the value is 2uF.