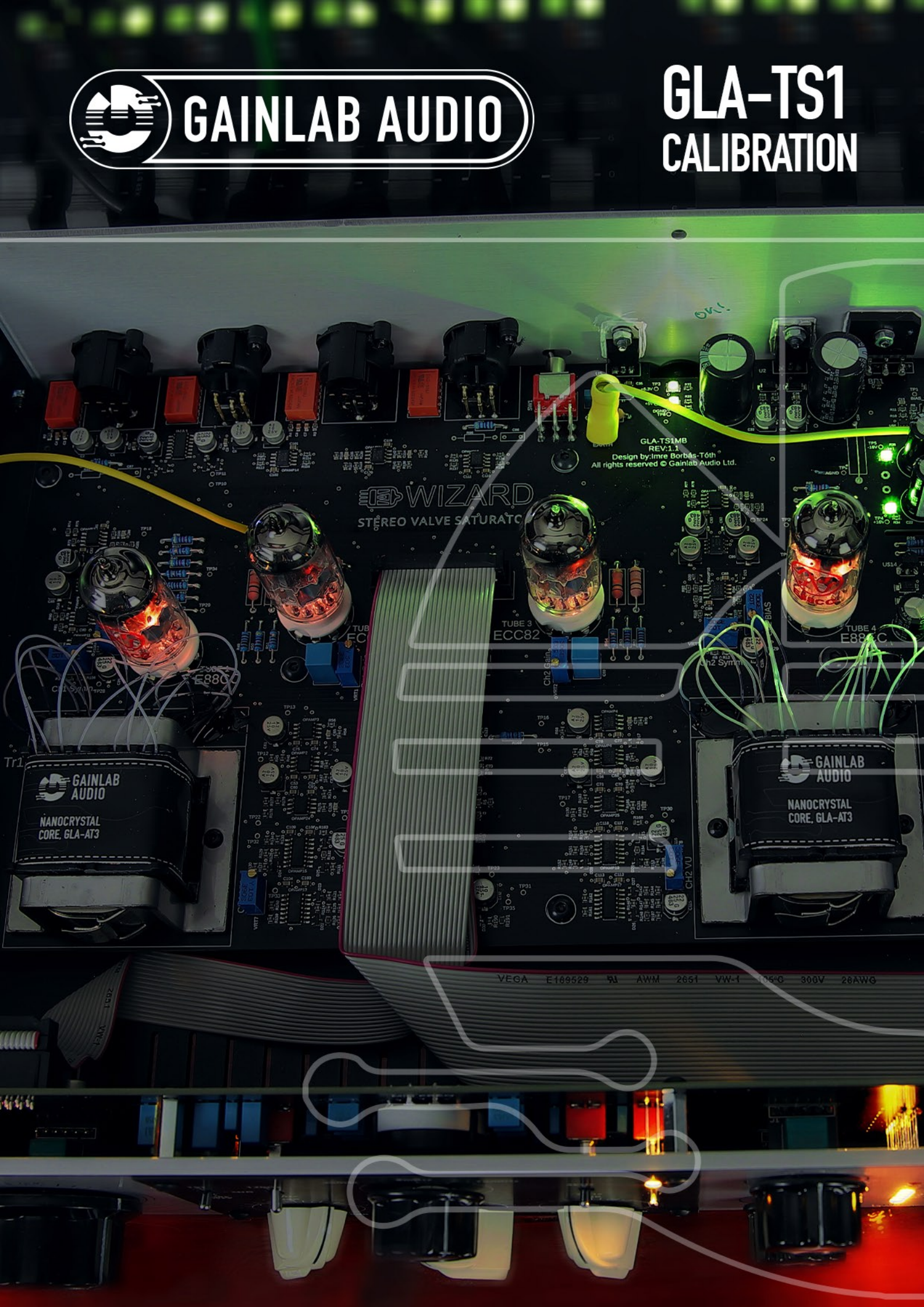
GAINLAB AUDIO

GLA-TS1
CALIBRATION



WARNING!

Each element of the procedure that we described in this document assumes a user with professional qualifications or equivalent knowledge. If you do not have the necessary knowledge to carry out all of the operations properly, please do not attempt any modification inside the device, as you may be exposed to the risk of electric shock or damage of the equipment.

GAINLAB AUDIO WILL NOT BE LIABLE FOR ANY PERSONAL INJURY RESULTING FROM IMPROPER HANDLING!

REQUIRED TOOLS

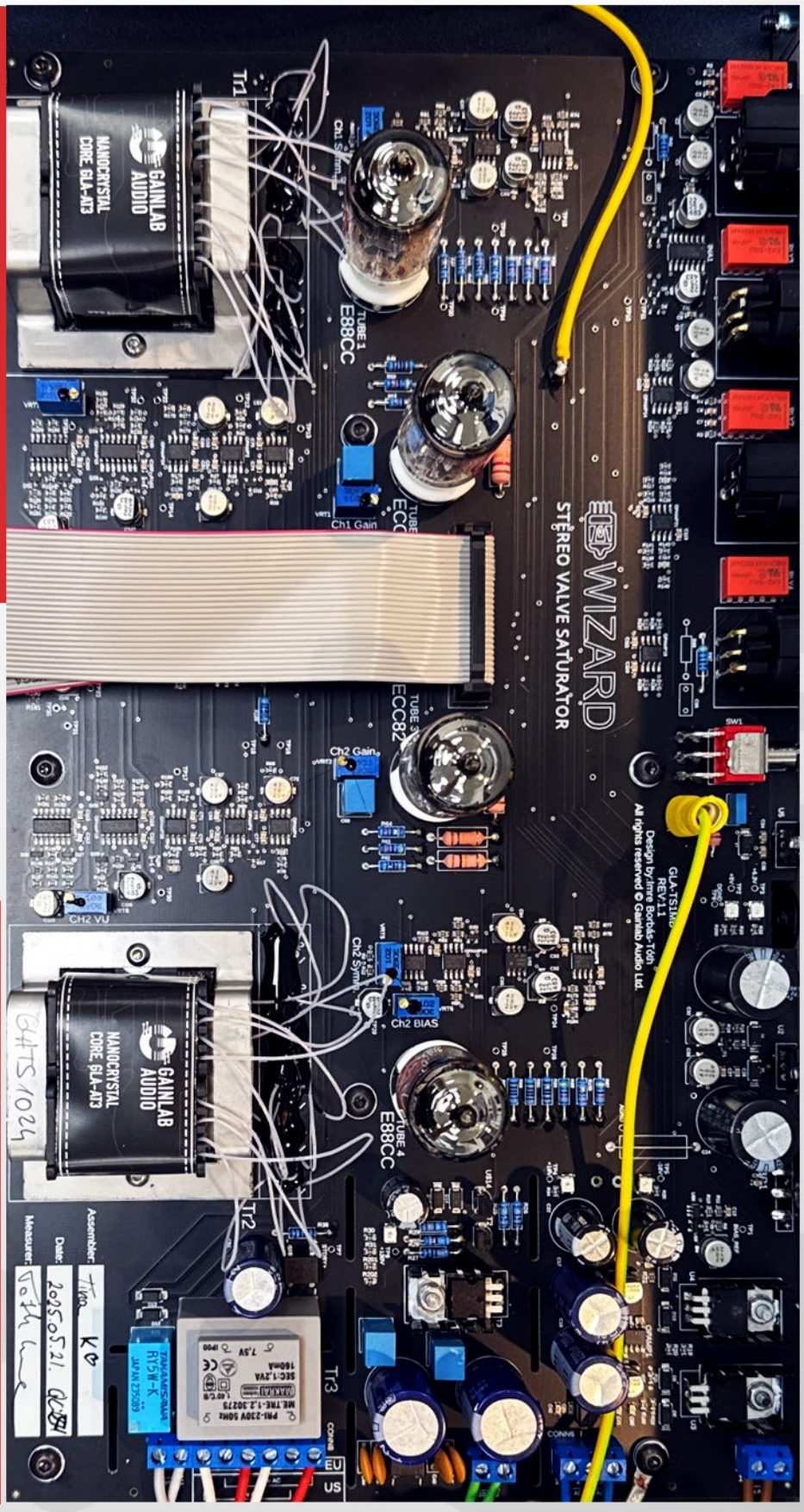
1. FOR DISASSEMBLY: 2MM ALLEN KEY (HEX KEY) SCREWDRIVER AND 2.5MM ALLEN KEY (HEX KEY) SCREWDRIVER. FOR TRIMMING: 2-3MM FLAT HEAD SCREWDRIVER.
2. SIGNAL GENERATOR OR OTHER SIGNAL SOURCE WITH A MAXIMUM OUTPUT POWER OF + 12DBU.
3. DC VOLTAGE METER, WITH EXPECTED ACCURACY: MINIMUM 4 ½ DIGIT ± (1% +2)
4. A DEVICE FOR MEASURING THE ROOT MEAN SQUARE (RMS) VALUE OF AC VOLTAGE.

DISASSEMBLY

- 2mm ALLEN KEY (HEX KEY) SCREW
- 2.5mm ALLEN KEY (HEX KEY) SCREW

RESOURCES

WIZARD MAINBOARD



dBu – V RMS

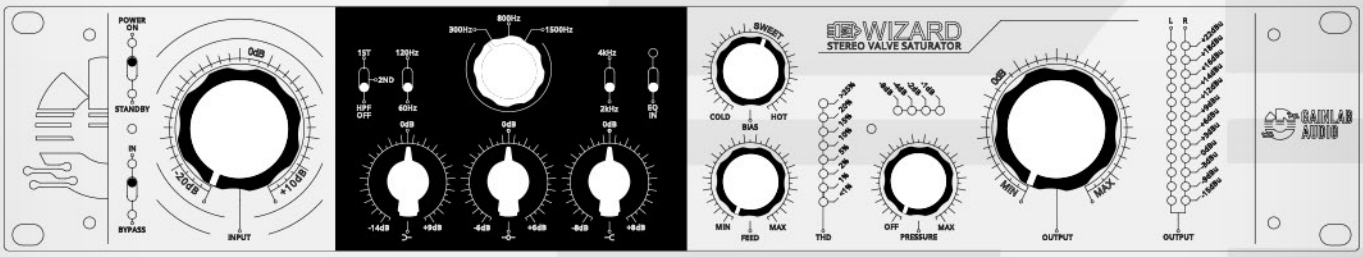
dBu	Volt RMS
0dBu	0.774V
+4dBu	1.227V
+6dBu	1.551V
+8.5dBu	2.061V
+12dBu	3.083V

1. SET UP AND OUTPUT BIAS SET

AFTER POWERING ON, ALLOW THE DEVICE TO WARM UP FOR AT LEAST 15 MINUTES BEFORE STARTING THE CALIBRATION.

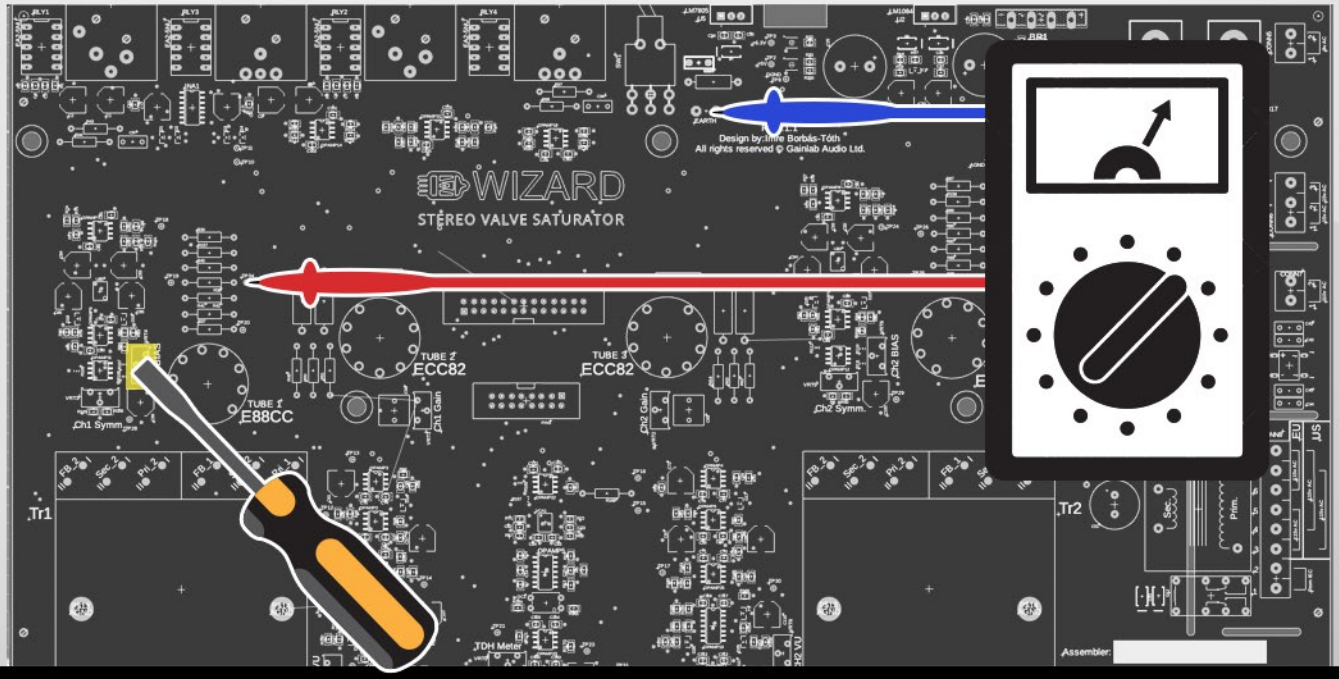
BEFORE STARTING THE CALIBRATION PROCEDURE, SET THE CONTROLS AS FOLLOWS:

INPUT: FULLY CCW
HPF: OFF
EQ: OFF
LOW,MID,HIGH EQ POTS: 0DB
BIAS: SWEET
FEED: FULLY CCW
PRESSURE: FULLY CCW
OUTPUT: FULLY CCW

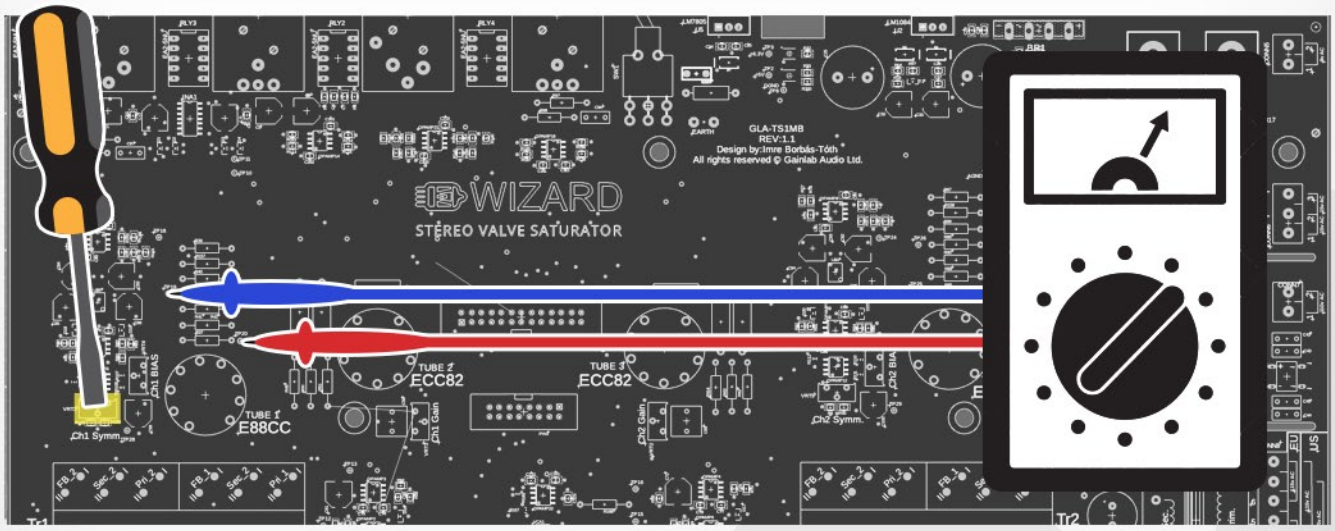


OUTPUT BIAS SET:

MEASURE THE DC VOLTAGE BETWEEN **AGND** AND **TP34**, AND **ADJUST THE "CH1 BIAS" TRIMMER** SO THAT YOU MEASURE **440mV**.

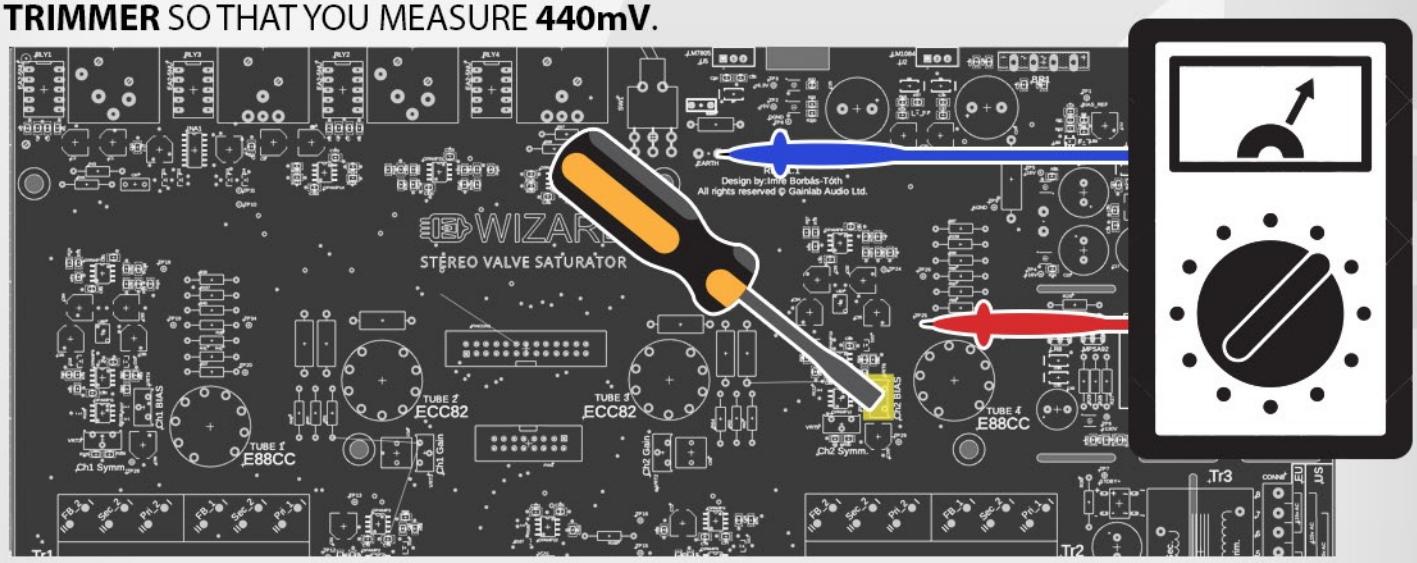


MEASURE THE **DC VOLTAGE** BETWEEN **TP19** AND **TP20**, AND **ADJUST THE CH1 SYMM TRIMMER** TO ACHIEVE THE VALUE **CLOSEST TO 0V**. ***IF THE MEASURED VALUE EXCEEDS 100MV, THE TUBE IS EITHER WORN OUT OR DEFECTIVE. REPLACE THE TUBE!***

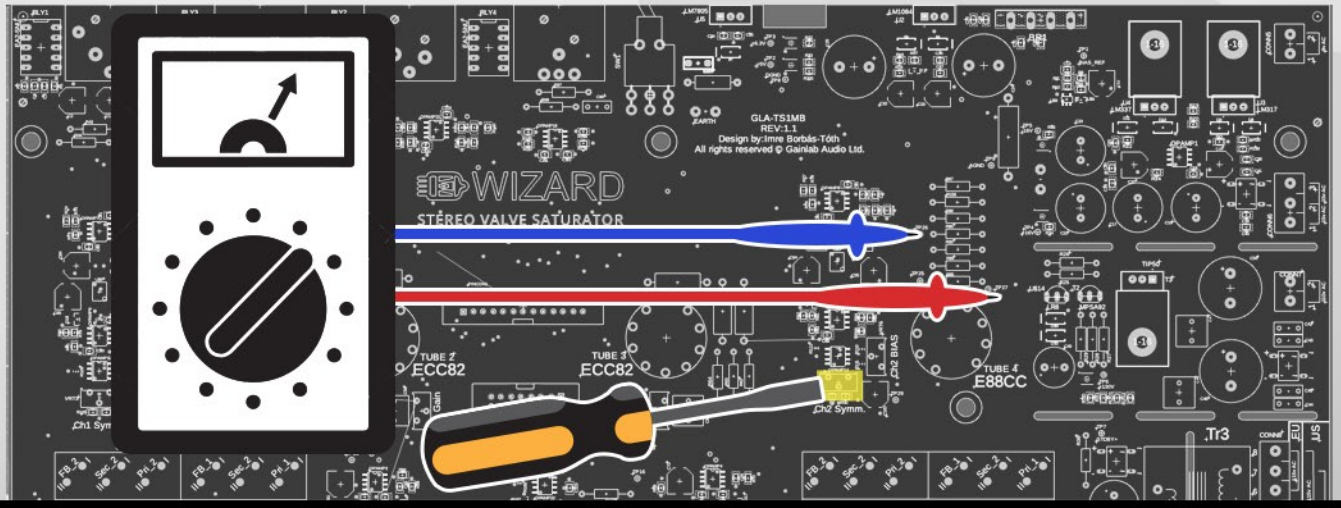


NEXT, REPEAT THE ***MEASUREMENT*** BETWEEN **AGND** AND **TP34**. IF NECESSARY, READJUST THE CH1 BIAS TRIMMER TO ACHIEVE **440mV** AGAIN.

MEASURE THE DC VOLTAGE BETWEEN **AGND** AND **TP25**, AND ADJUST THE **CH2 BIAS TRIMMER** SO THAT YOU MEASURE **440mV**.



MEASURE THE DC VOLTAGE BETWEEN **TP26** AND **TP27**, AND ADJUST THE **CH2 SYMM TRIMMER** TO ACHIEVE THE VALUE CLOSEST TO **0V**. ***IF THE MEASURED VALUE EXCEEDS 100mV, THE TUBE IS EITHER WORN OUT OR DEFECTIVE. REPLACE THE TUBE!***

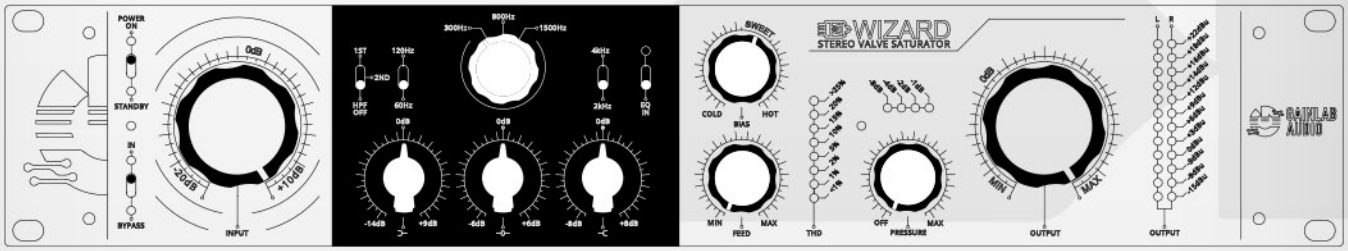


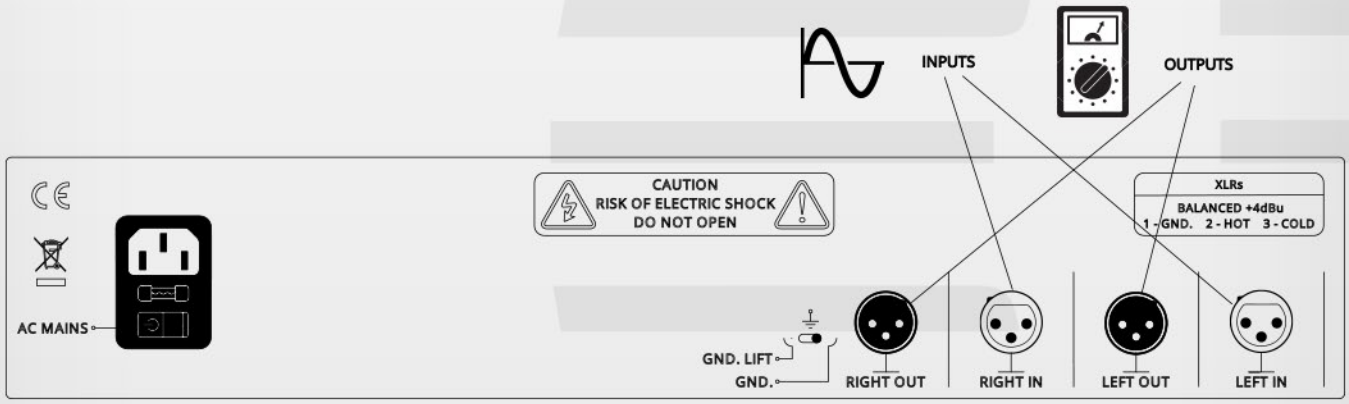
NEXT, REPEAT THE ***MEASUREMENT*** BETWEEN **AGND** AND **TP25**. IF NECESSARY, READJUST THE CH1 BIAS TRIMMER TO ACHIEVE **440mV** AGAIN.

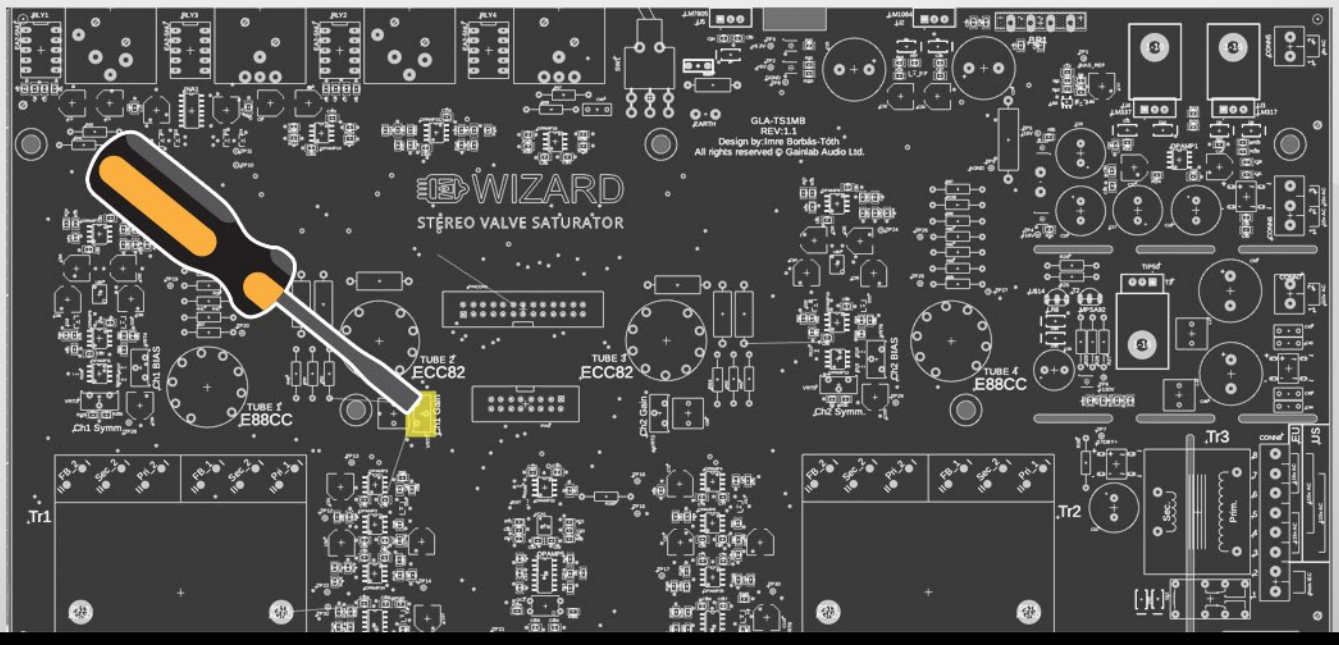
2. OUTPUT LEVEL CALIBRATION

*IF USING AN AUDIO INTERFACE, MAKE SURE TO **VERIFY WHERE 0 dBFS** IS CALIBRATED. MORE DETAILED INSTRUCTIONS ON THIS WILL BE AVAILABLE IN THE UPCOMING GAINLAB AUDIO OUT OF THE BOX BROCHURE.*

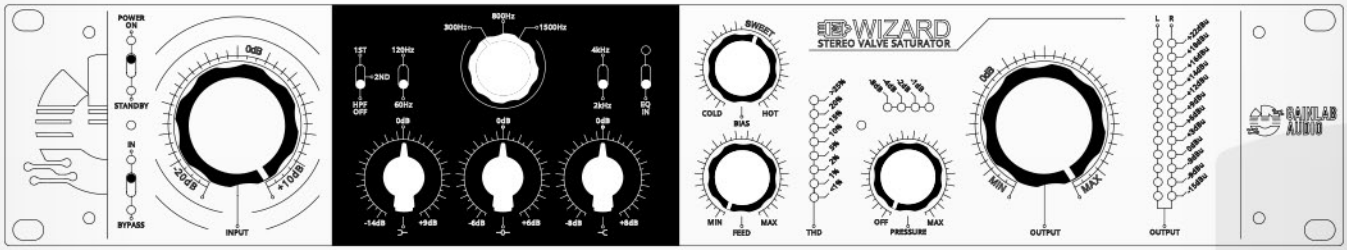
TURN BOTH THE **INPUT AND OUTPUT POTENTIOMETERS FULLY CLOCKWISE**. A**PPLY A -20dBu, 1KHZ SINE WAVE** TO THE INPUT. MEASURE THE OUTPUT USING A BALANCED-INPUT INSTRUMENT OR AUDIO INTERFACE. **ADJUST THE CH1 GAIN TRIMMER** UNTIL YOU MEASURE A **+14dBu OUTPUT** SIGNAL.

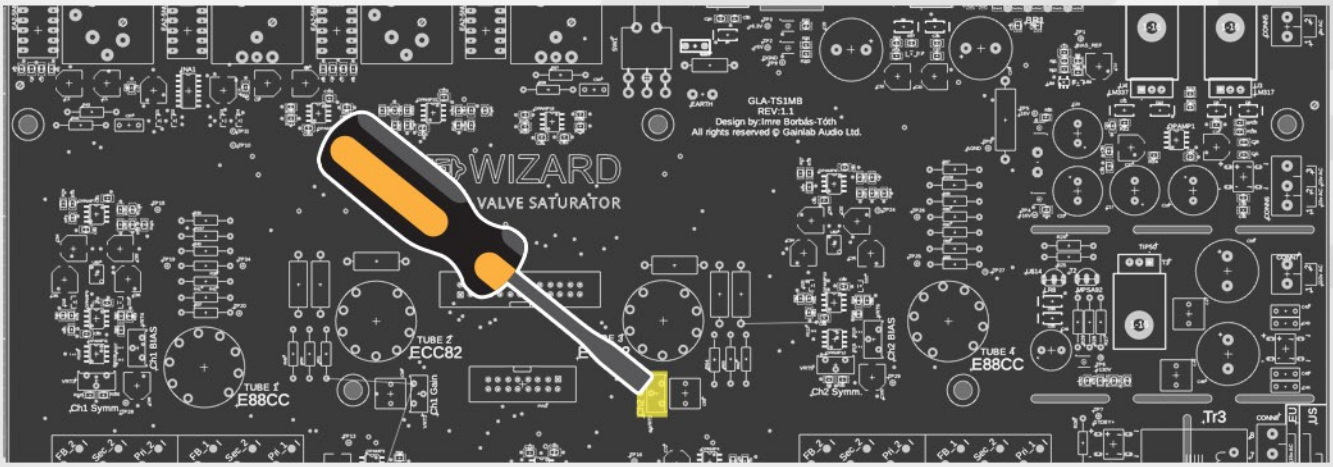




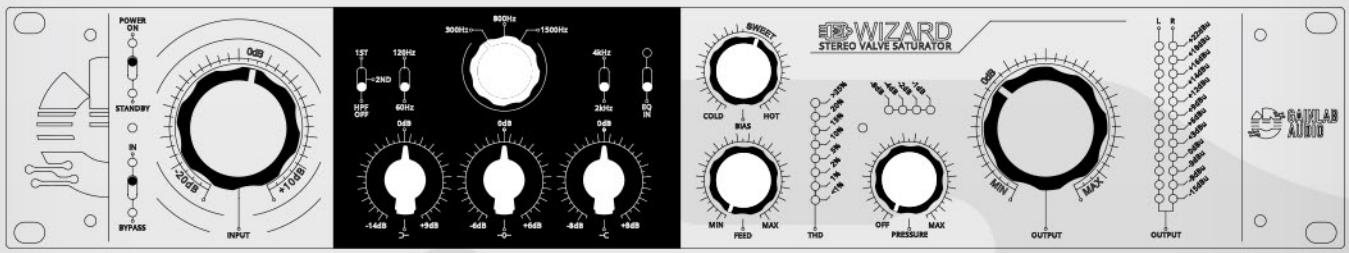


TURN BOTH THE **INPUT AND OUTPUT POTENTIOMETERS FULLY CLOCKWISE. APPLY A -20dBu, 1KHZ SINE WAVE** TO THE INPUT. MEASURE THE OUTPUT USING A BALANCED-INPUT INSTRUMENT OR AUDIO INTERFACE. **ADJUST THE CH2 GAIN TRIMMER** UNTIL YOU MEASURE A **+14dBu OUTPUT** SIGNAL.





OUTPUT FINE TUNING

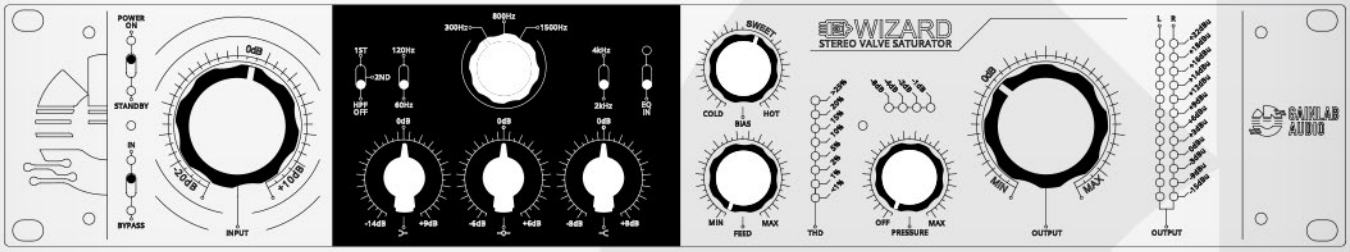


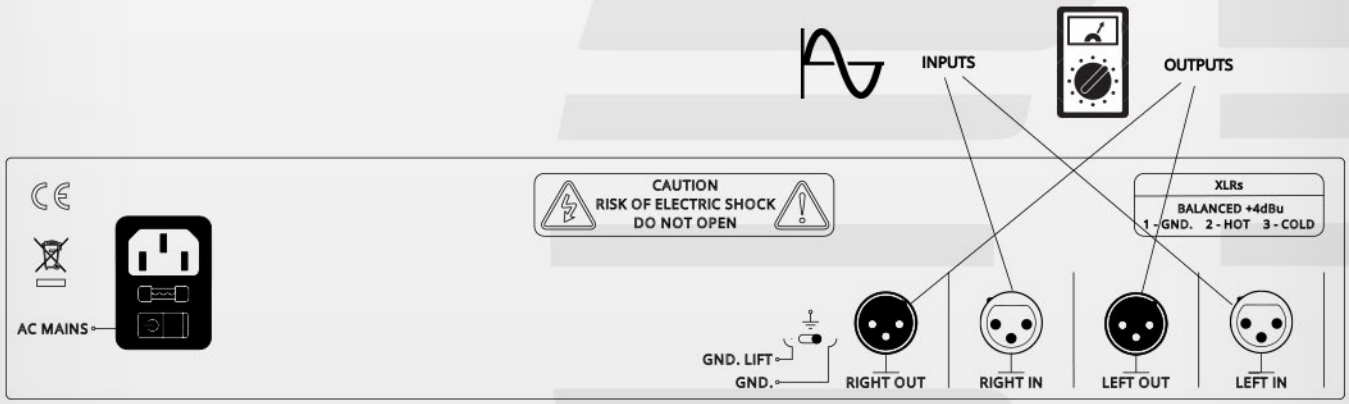
APPLY A 0dBu, 1KHZ SINE WAVE TO THE **INPUT**, THEN **SET THE INPUT AND OUTPUT POTENTIOMETERS** TO AROUND THE **0dB POSITION** SO THAT THE OUTPUT OF **CH1** READS EXACTLY **0dBu**. NEXT, MEASURE THE OUTPUT OF **CH2**. DUE TO POTENTIOMETER TOLERANCES, THERE WILL BE A SLIGHT DIFFERENCE. TAKE THE DIFFERENCE BETWEEN THE TWO MEASURED VALUES, DIVIDE IT BY TWO, AND **ADJUST THE CH2 TRIMMER ACCORDINGLY INCREASING OR DECREASING THE SIGNAL** TO REDUCE THE ERROR BY THAT AMOUNT.

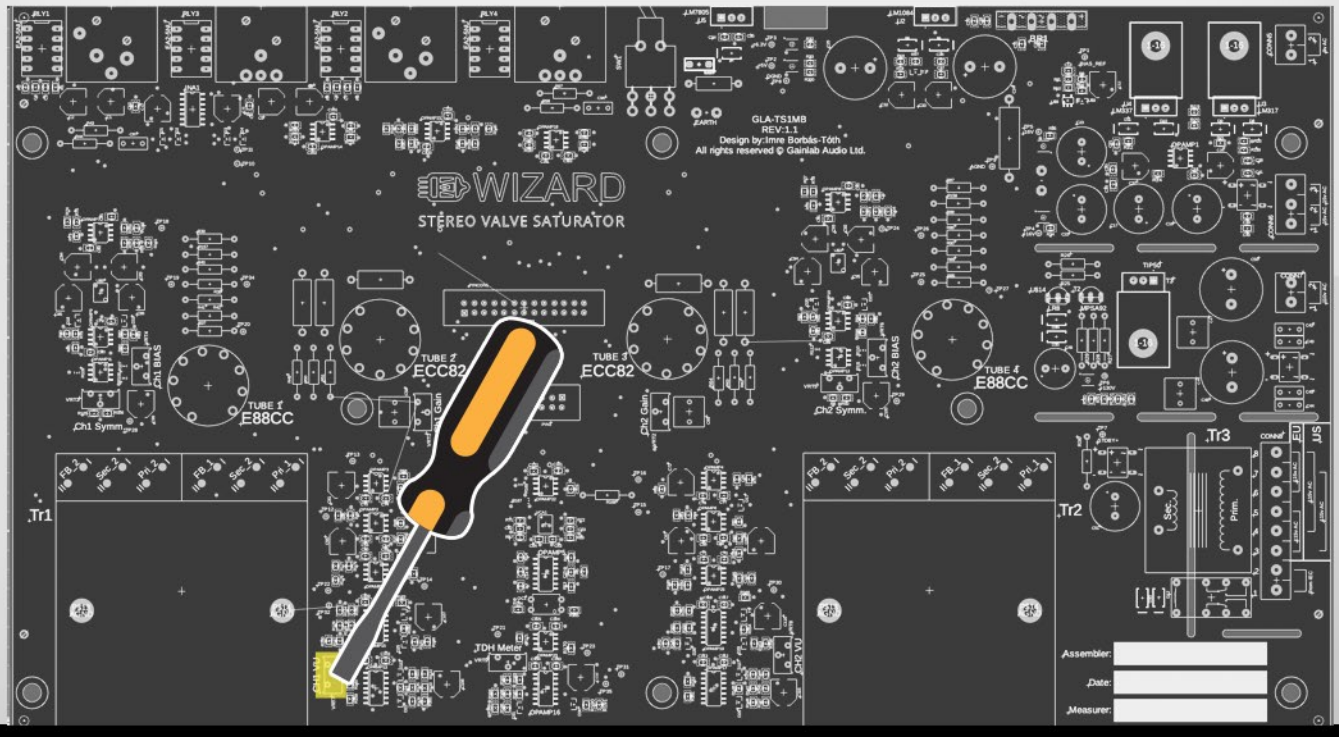
3. OUTPUT METER CALIBRATION

IF YOU ONLY WISH TO CALIBRATE THE OUTPUT LEVEL METER, IT IS RECOMMENDED TO VERIFY THE DEVICE'S SETTINGS STARTING FROM CALIBRATION POINT 2. MAKE ANY NECESSARY CORRECTIONS BEFORE PROCEEDING!

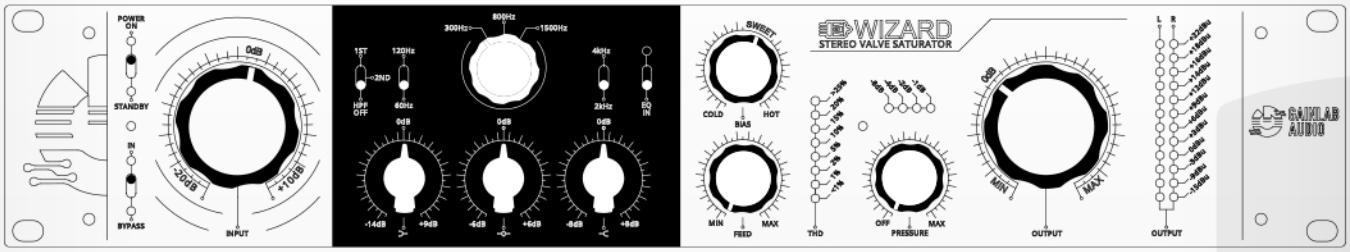
APPLY A 0dBu, 1KHZ SINE SIGNAL TO THE INPUTS. MEASURE THE OUTPUT LEVEL, AND S**ET THE INPUT AND OUTPUT POTENTIOMETERS AROUND THE 0dB** POSITION SO THAT THE OUTPUT READS EXACTLY 0dBu. THEN **TURN THE CH1 VU TRIMMER CLOCKWISE UNTIL THE L LED METER ON THE UNIT INDICATES -3dBu**. NEXT, SLOWLY **TURN THE TRIMMER COUNTERCLOCKWISE UNTIL THE 0dBu LED LIGHTS UP.**

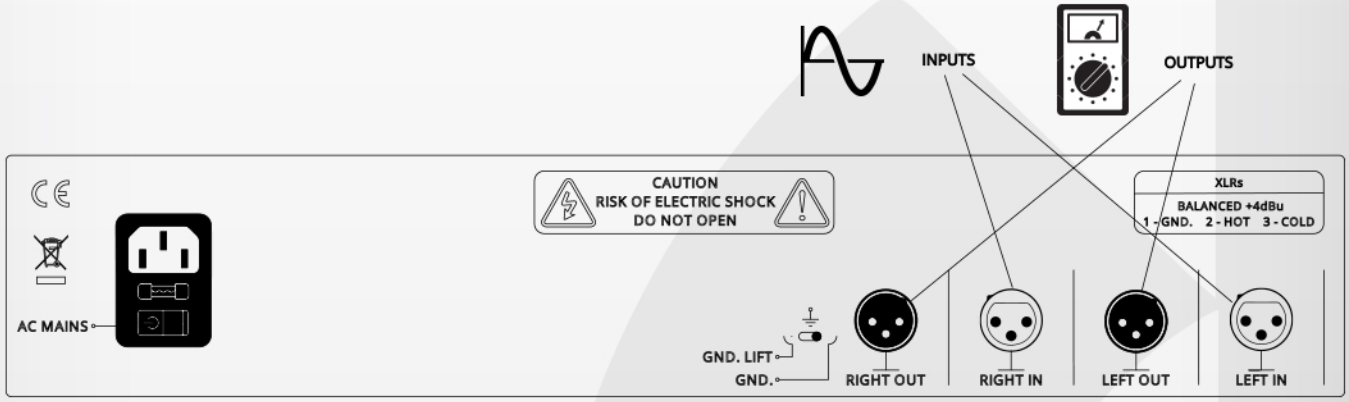


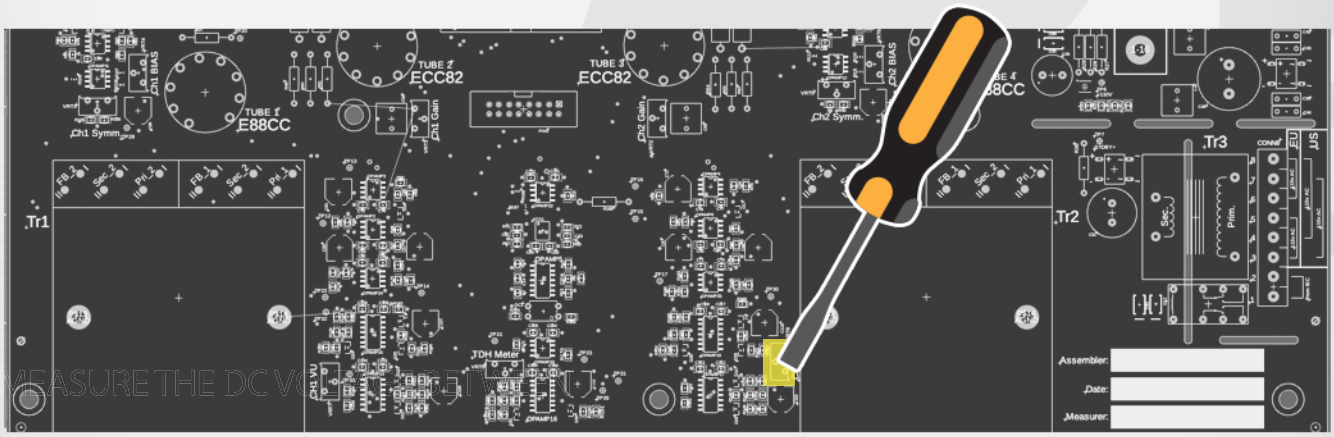




APPLY A 0dBu, 1 KHZ SINE SIGNAL TO THE INPUTS. MEASURE THE OUTPUT LEVEL, AND **SET THE INPUT AND OUTPUT POTENTIOMETERS AROUND THE 0dB** POSITION SO THAT THE OUTPUT READS EXACTLY 0dBu. THEN **TURN THE CH2 VU TRIMMER CLOCKWISE UNTIL THE R LED METER ON THE UNIT INDICATES -3dBu**. NEXT, SLOWLY **TURN THE TRIMMER COUNTERCLOCKWISE UNTIL THE 0dBu LED LIGHTS UP.**

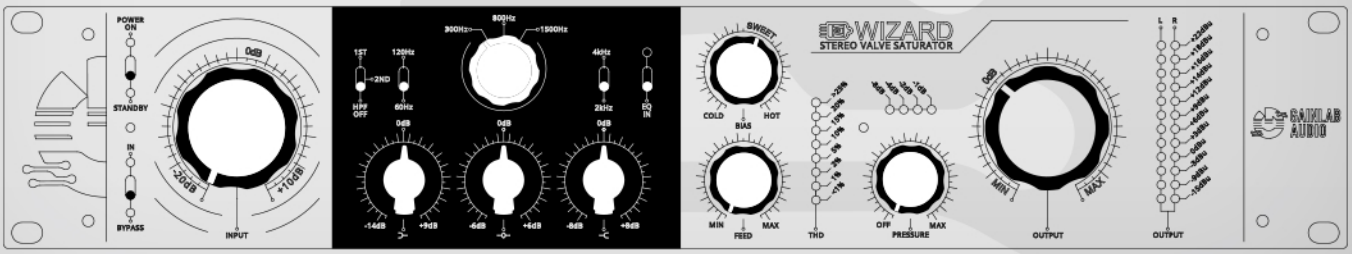




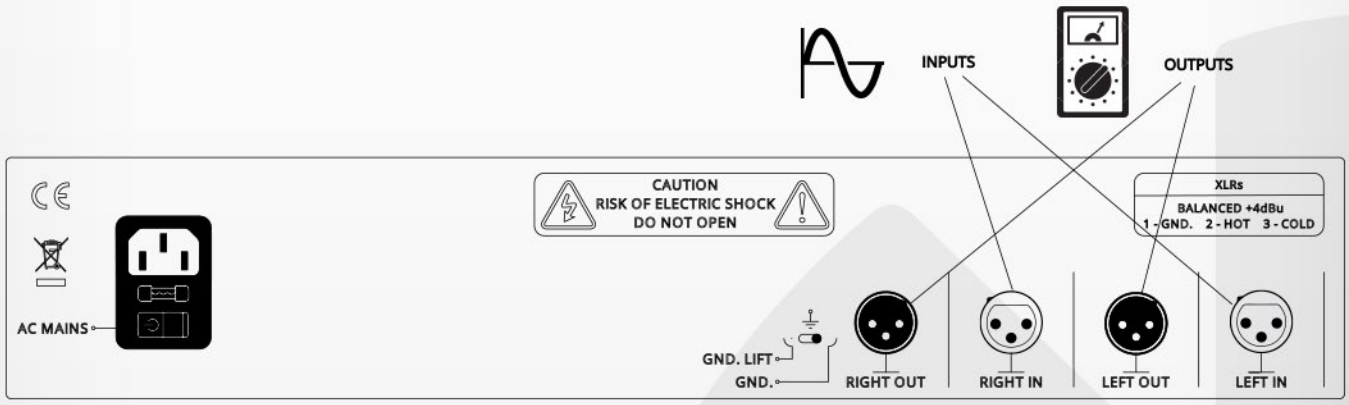


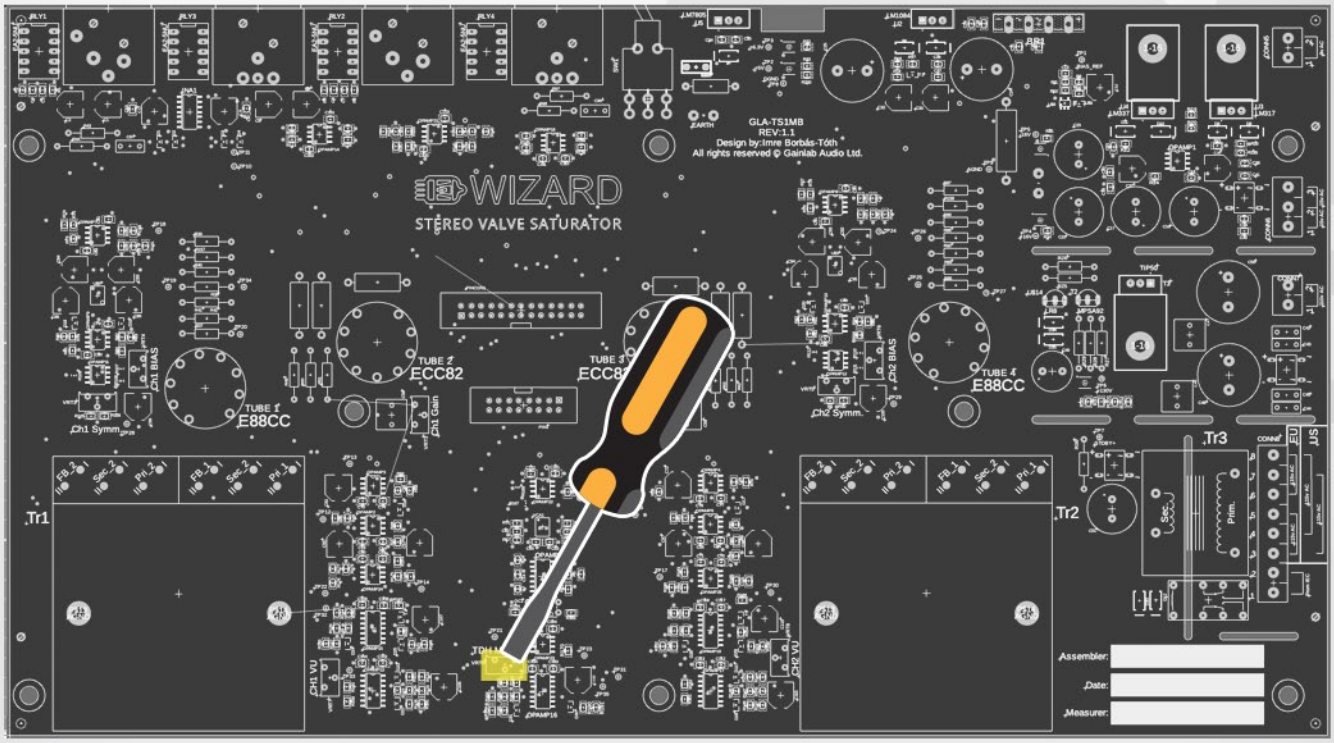
4. THD METER CALIBRATION

SET THE **INPUT POTENTIOMETER FULLY COUNTERCLOCKWISE**, AND SET THE **OUTPUT POTENTIOMETER TO THE 0dB** POSITION.



APPLY A +12dBu, 1KHZ SINE SIGNAL TO THE INPUT. WHILE **MONITORING THE OUTPUT OF CH1 OR CH2**, MEASURE THE DISTORTION (THD). SLOWLY INCREASE THE INPUT POTENTIOMETER UNTIL THE **OUTPUT SHOWS APPROXIMATELY 5% THD ON AN EXTERAL THD METER**. THEN **USE THE THD METER TRIMMER TO ADJUST THE FRONT PANEL INDICATOR SO THAT IT DISPLAYS 5% THD**. AFTERWARDS, VARY THE INPUT POTENTIOMETER AND OBSERVE WHETHER THE DISTORTION LEVELS FOLLOW THE LED INDICATOR CONSISTENTLY.





NOTE: THIS IS A RELATIVELY IMPRECISE INDICATOR, SO A LARGE TOLERANCE IS ACCEPTABLE. THE RESULTS MAY VARY SIGNIFICANTLY DEPENDING ON THE MANUFACTURER AND WEAR LEVEL OF THE ECC82 TUBES

NOTES

- THE PROCEDURE WE DESCRIBED ABOVE PROVIDES THE EXPECTED VALUES FOR A DEVICE EQUIPPED WITH VACUUM TUBES PROVIDED BY GAINLAB AUDIO.
- IF YOU STILL WANT TO USE YOUR EQUIPMENT WITH 3RD PARTY TUBES, MAKE SURE THAT THE TECHNICAL PARAMETERS OF THE VACUUM TUBES THAT YOU PLACED IN THE TUBE1, TUBE2 SOCKET AND THE TUBE3, TUBE4 SOCKET ARE APPROXIMATELY THE SAME. MATCHED PAIR TUBES ARE SUGGESTED TO USE.
- IF YOU DO NOT USE VACUUM TUBES WITH THE SAME TECHNICAL PARAMETERS, THE CALIBRATION PROCESS WILL NOT BE PERFORMED CORRECTLY!
- THE TECHNICAL PARAMETERS OF THE VACUUM TUBES CAN CHANGE SIGNIFICANTLY IN THE FIRST 24-48 HOURS. IT IS RECOMMENDED TO REPEAT THE CALIBRATION PROCESS AFTER THIS "BURN-IN" PERIOD.
- THE VACUUM TUBES PROVIDED BY GAINLAB AUDIO HAVE ALREADY UNDERGONE THIS "BURN-IN" PROCESS.