User Manual



cassiopeia:rack

stereo tube saturation

Subtle tube saturation

You're about to explore the unique sound of tube saturation. Cassiopeia is composed around vacuum tubes to add that missing bit to your productions. In order to do so, the vacuum tubes are driven out of spec, which means in a mode of saturation or non–linear. The resulting effect is the creation of overtones and harmonics, which are different from transistor or digital approaches; they are less sharp but more pleasing. The saturated signal benefits from adding overtones and harmonic distortion in a way that its sound becomes richer, warmer, and fuller. A nice side effect is that the signal will be slightly compressed.

The inspiration for cassiopeia came from the fact that vacuum tubes tend to create a variety of pleasing overtones, especially when the tube is driven into saturation. This has been done by guitarists ever since the introduction of electric amplifiers in the 1950s, operating their amplifiers with a ton of gain. Especially these days, more than half a century later, a majority of productions run strictly "in the box" and are described as "cold" or without the analog feel that we all have come to enjoy. Cassiopeia will add that missing link, adding overtones and harmonic distortion in a subtle yet pleasing way, which in the mix will make these tracks shine more or give them the analog character they deserve.

Manufacturer:

klanghabitat GbR

Bergstraße 27

19370 Parchim

Germany

Contact:

info@klanghabitat.com

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2. Precautions



WARNING: High Voltage

- Risk of electric shock.
- Only use the specified fuse.
- Refer service to qualified service staff only.
- Do not expose this device to rain or moisture.
- Do not use this device near water, e.g. swimming pool, bathtub or wet basement.
- For safe operation, the device must be connected to a properly grounded mains socket. The socket outlet used shall be readily accessible.
    - DK: Apparatets stikprop skal tilsluttes en stikkontakt med jord som giver forbindelse til stikproppens jord.
    - FI: Laite on liitettävä suojakoskettimilla varustettuun pistorasiaan.
    - NO: Apparatet må tilkoples jordet stikkontakt.
    - SE: Apparaten skall anslutas till jordat uttag.



CAUTION: Infants

- Device for professional use only.
- This device is not suitable for use in places where infants may be present.



CAUTION: Temperature

- Surfaces of the device may become hot during operation.
- Do not install this device near any heat source such as radiators, stoves or other heat sources.
- Always allow enough ventilation space around the unit for air circulation.
- Do not cover circulation vents.



CAUTION: Connecting & Mounting

- Never connect the output of a power amplifier to this device.
- Place the unit on a rigid board or place it in an appropriate rack.
- Use the device according to this manual only.



CAUTION: Humidity

- If this device is moved from a cold place to a warm room, condensation can occur inside the device. To avoid damaging the unit, please allow it to reach room temperature before switching it on.

3. Controls

3.1 Front panel



1 in/out (bypass)

When the bypass is engaged (out), the clean (unprocessed) signal is heard. The tubes will light up green to indicate bypass mode is active. When the switch is up (in) the processed signal is heard.

2 input

Adjusts the input level. Turning the knob fully counterclockwise reduces the output by -12 dB, while turning it fully clockwise boosts the output by +12 dB. In the center position, the input is at unity gain.

3 high pass

High pass controls the amount of high pass filtering in the wet path. The control ranges from 15 Hz to 100 Hz with 6 dB/oct.

4 saturation

Controls the amount of saturation applied by the vacuum tubes. Turning the knob clockwise increases the saturation.

5 intensity

This control acts as a wet/dry blend, allowing you to determine how much of the processed (saturated) signal is mixed into the output. In the fully clockwise position, 100% of the saturated signal is sent to the output. In the fully counterclockwise position, only the input (dry) signal is heard at the output.

6 low pass

Low pass controls the amount of low pass filtering in the wet path. The control ranges from 5 kHz to 24 kHz with 6 dB/oct.

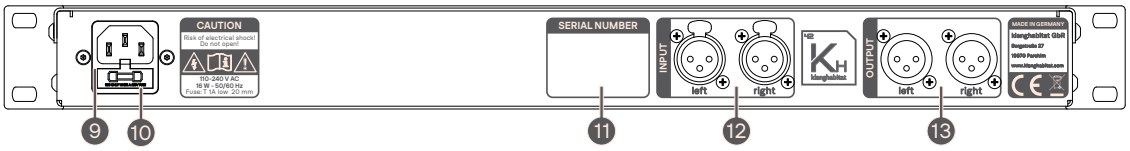
7 output

Adjusts the output level. Turning the knob fully counterclockwise reduces the output by -12 dB, while turning it fully clockwise boosts the output by +12 dB. In the center position, the output is at unity gain.

8 on/off

When the on/off switch is up the unit is powered. In off position the unit is cut from mains.

3.2 Back panel



9 **Power supply connector IEC 60320 C14**

10 **Fuse**

11 **Serial number**

12 **Audio in (XLR - left & right channel)**

13 **Audio out (XLR - left & right channel)**

4. How to use

4.1 Installation

Step 1: Check the fuse (10) for damage. The fuse is installed in the Power Inlet (9). If the fuse is damaged, replace it with a new fuse.

Step 2: (optional) Install the cassiopeia:rack in the 19” rack with four rack screws. Use the screws delivered with your 19” rack.

Step 3: Power the unit with 110-240 V AC, 50-60 Hz. The device is equipped with IEC 60320 C14. Use an IEC 60320 C13 power supply cable.

For safe operation, the device must be connected to a properly grounded mains socket. The socket outlet used shall be readily accessible.

Step 4: Install two male XLR cables (left & right channel) for the signal input (12).

Step 5: Install two female XLR cables (left & right channel) for the signal output (13).

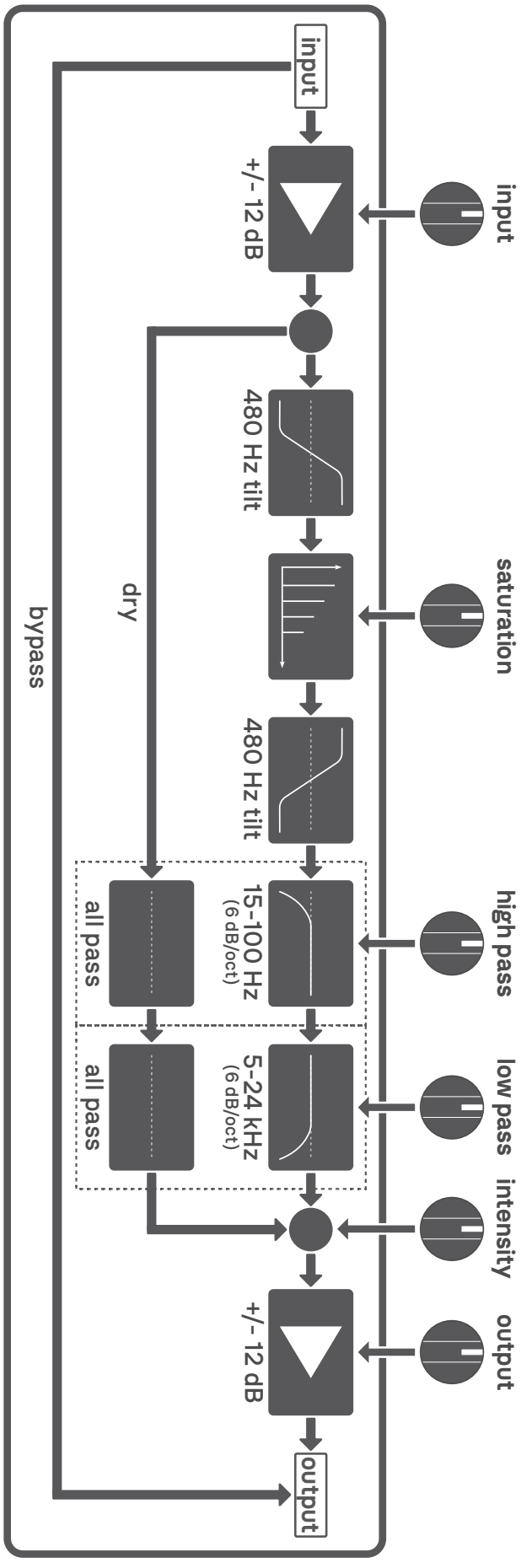
Step 6: Turn on the device by using the on/off switch (8) at the front.

If you need any help or further information for installation, please contact info@klanghabitat.com.

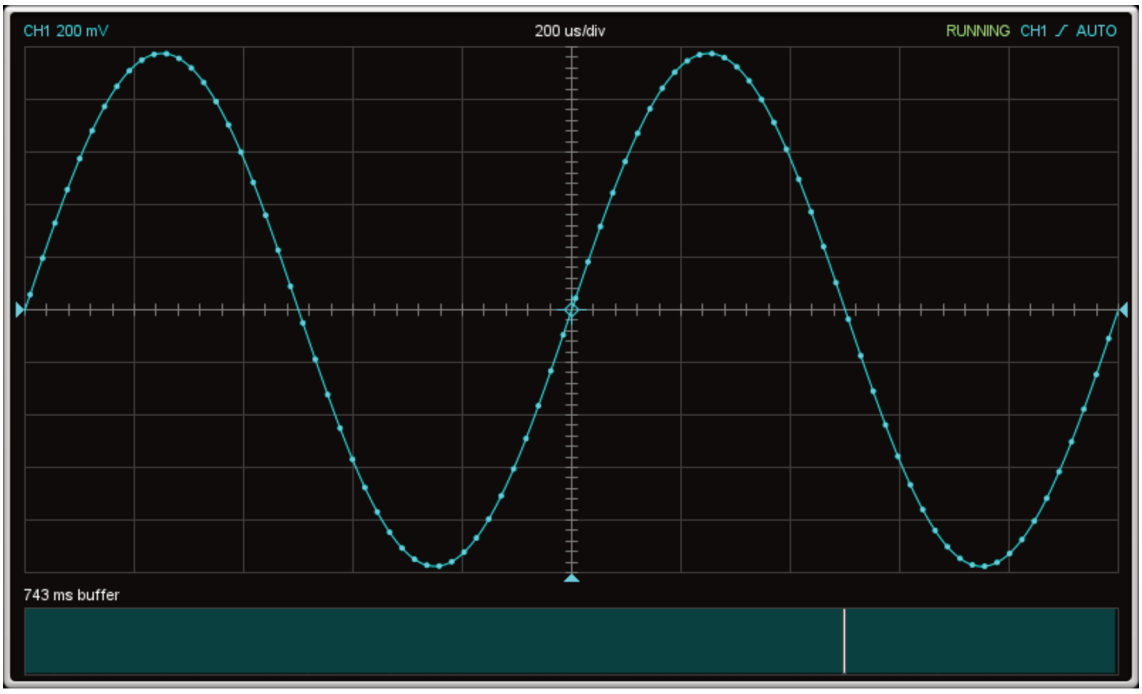
4.2 Preheat

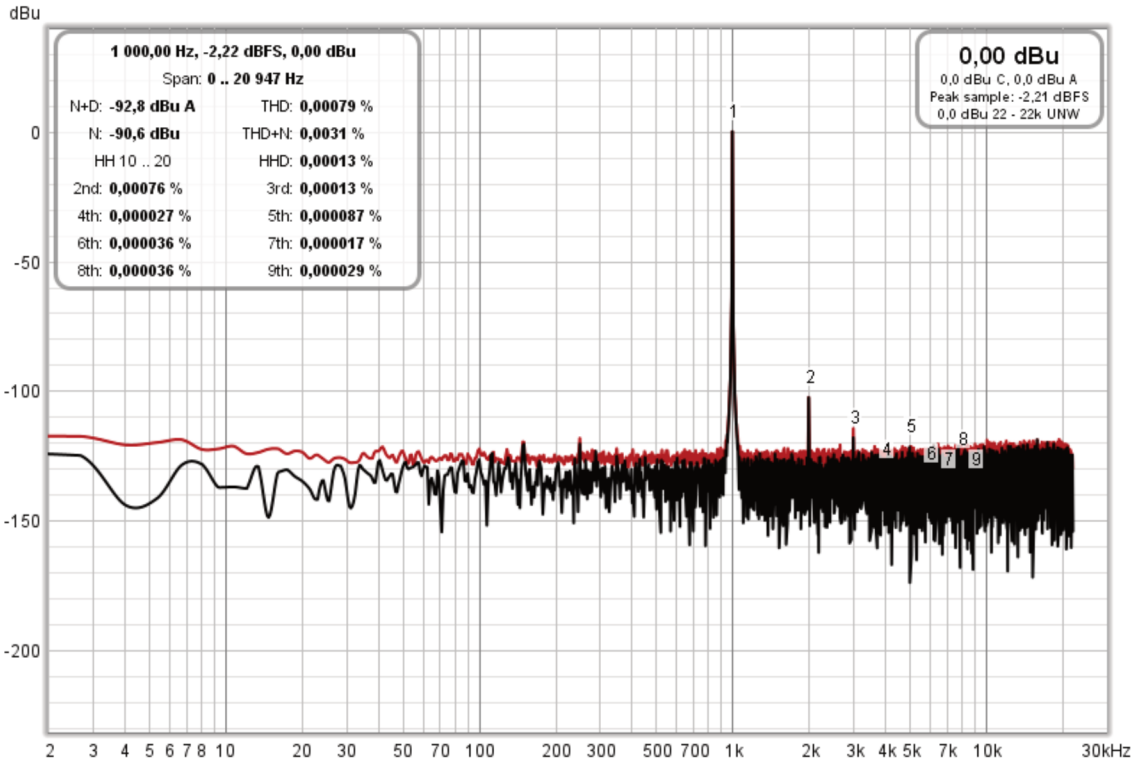
Before starting, the vacuum tubes need to preheat for approximately 15 minutes to achieve optimal performance. To preheat the vacuum tubes, the unit must be powered on.

4.3 Signal Flow

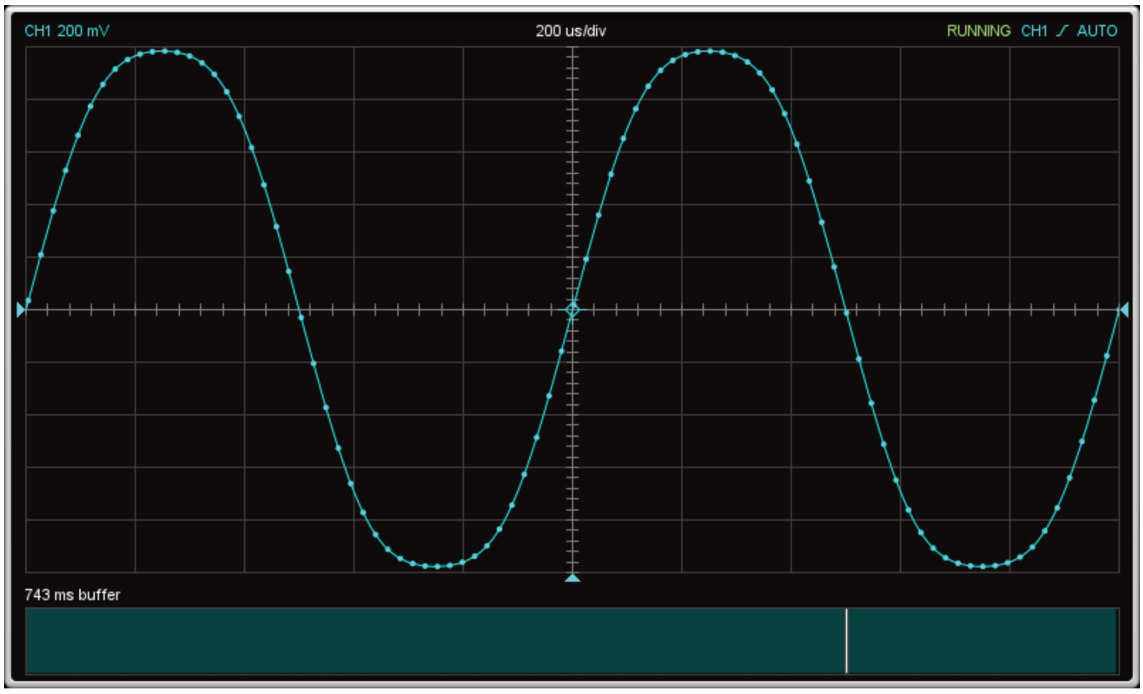


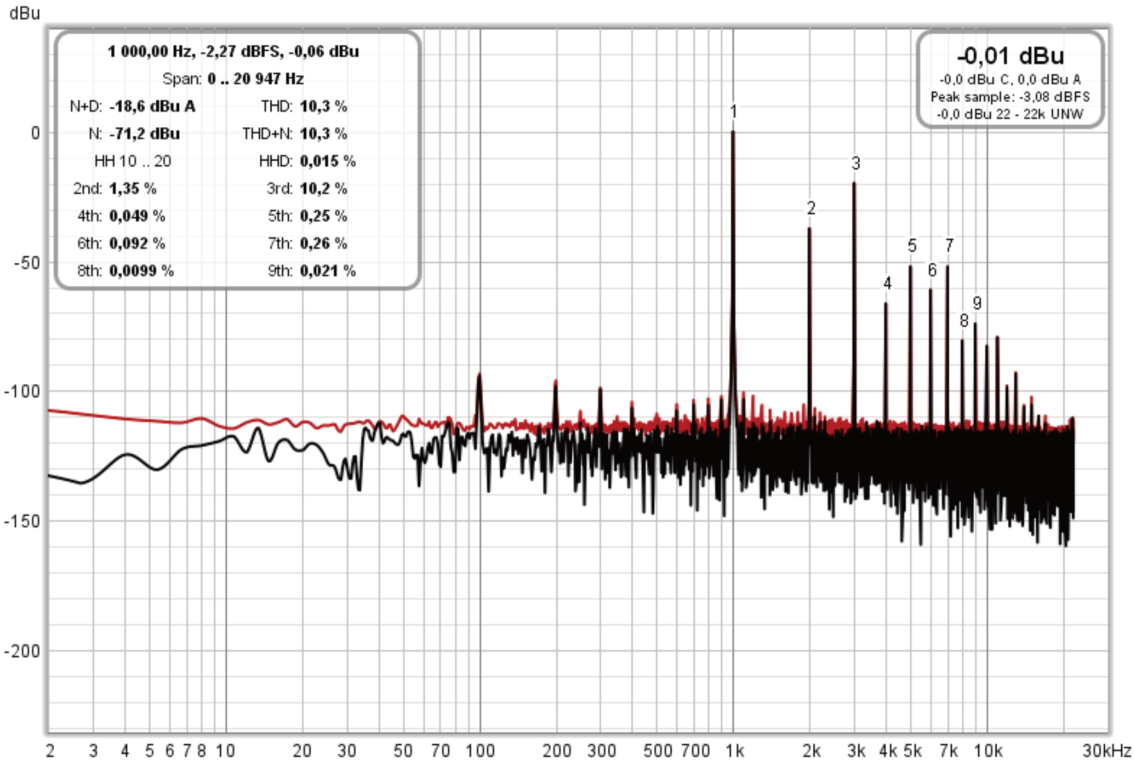
4.4 Signal at Saturation 0%



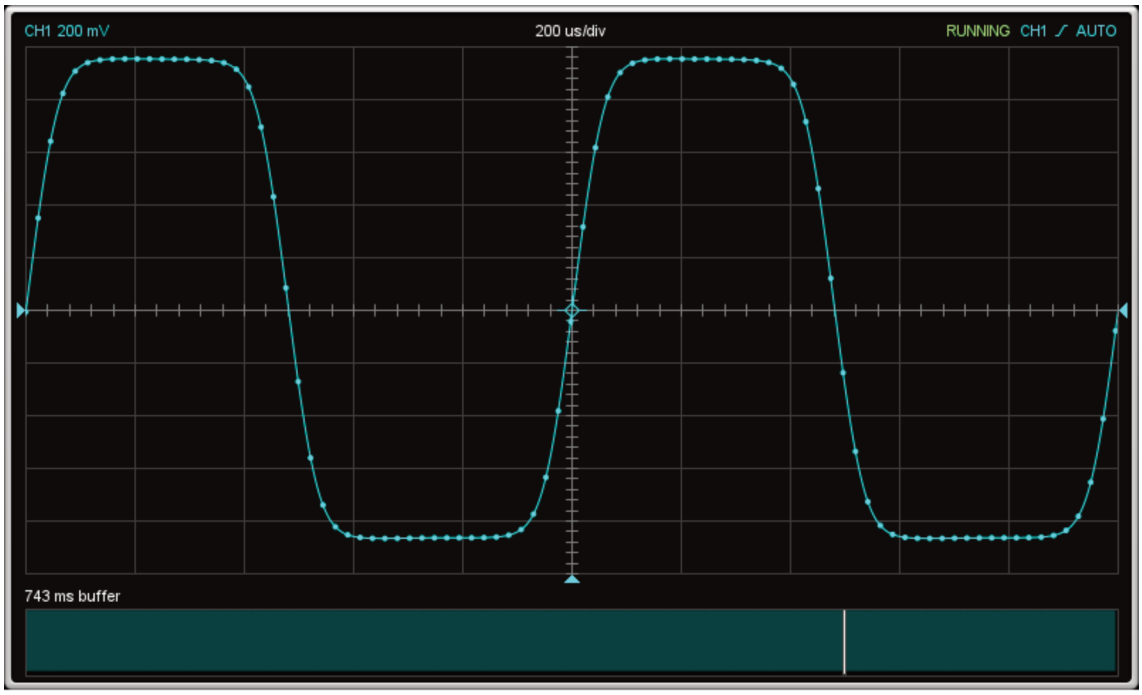


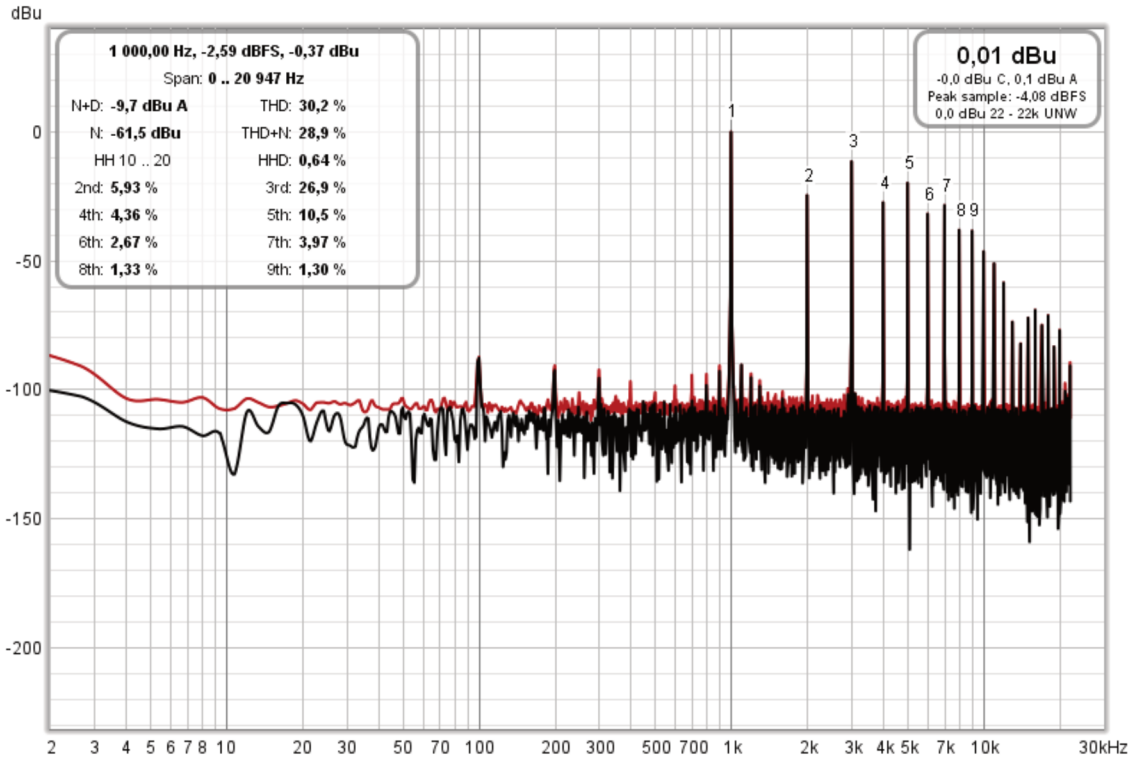
4.5 Signal at Saturation 50%





4.6 Signal at Saturation 90%





5. Maintenance

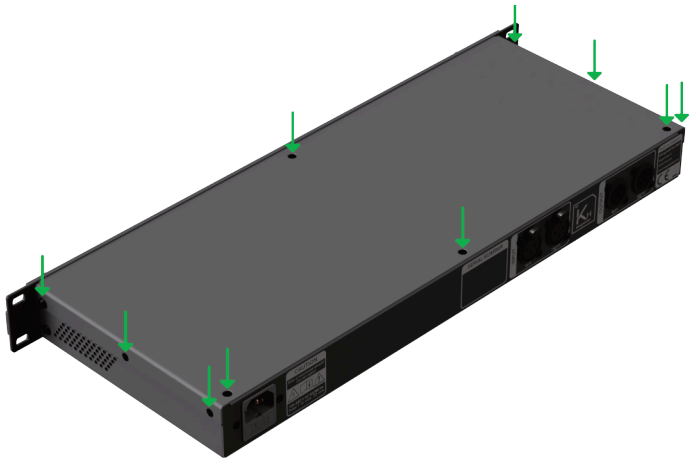
5.1 Maintenance

The tube itself is a critical component that will degrade over time due to heat and regular use. It is recommended to inspect the tube every 6 to 12 months, depending on the intensity of use. If signs of wear such as noise, loss of signal quality, or unusual distortion occur, the tube may need to be replaced. Always use manufacturer-recommended tubes for replacement to ensure compatibility and performance. Additionally, ensure that the device is ventilated properly to prevent overheating, and clean the contacts and connectors regularly to maintain clear signal paths.

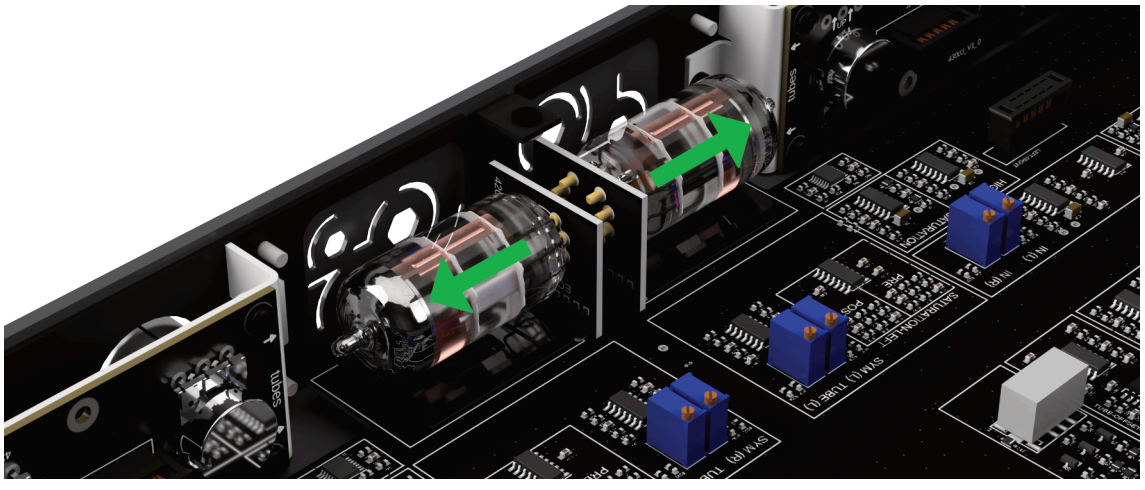
5.2 Tube replacement

The unit may only be opened for the purpose of replacing the tube. Before opening, disconnect the unit from the mains and allow it to cool down completely, as the tubes can become very hot during operation.

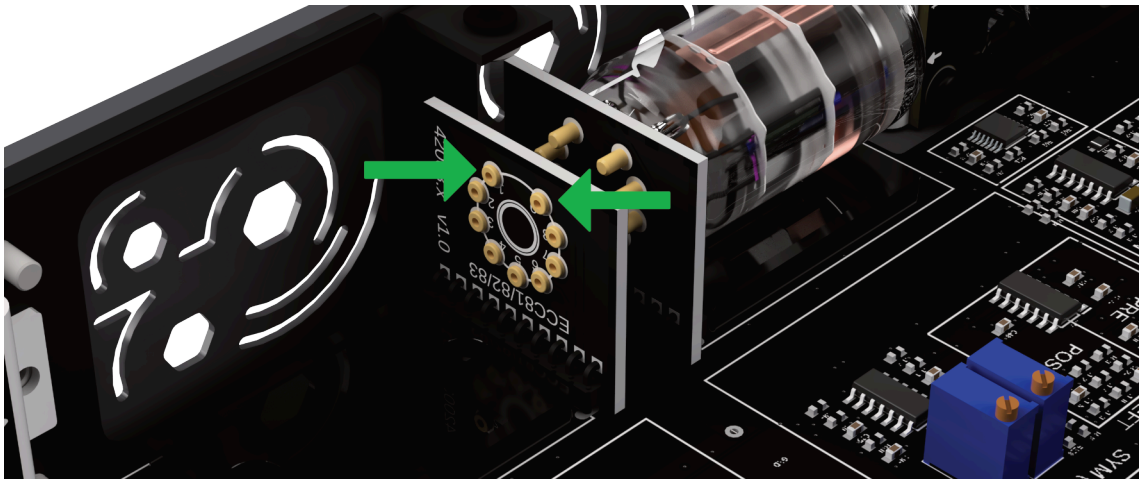
Open the unit from above. Lose the 10 screws as show below and take of the top part of the device.



Gently pull the defective tube out of its socket. The tube is not soldered, so it can be easily removed.



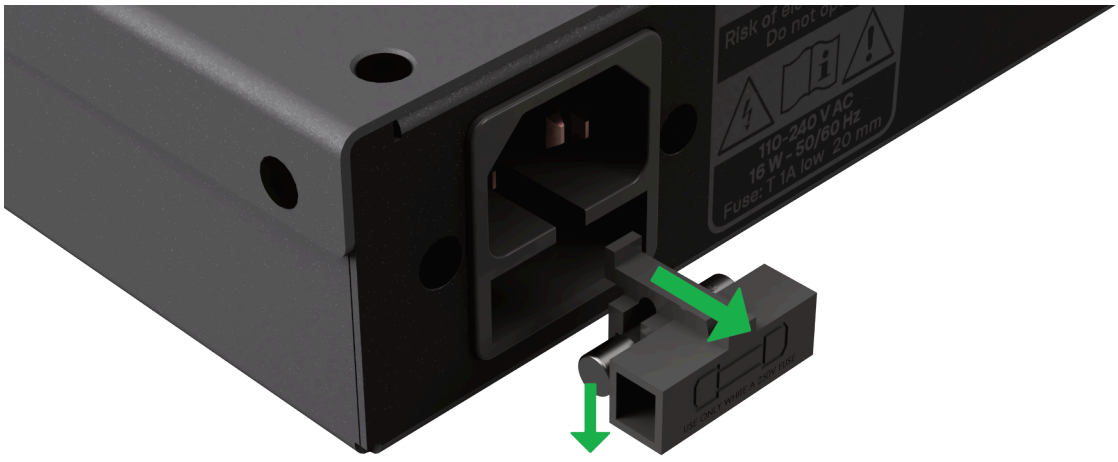
Take a new tube and carefully insert it into the socket, ensuring that the tube's pins are properly aligned with the socket connector.



After successful installation of the tube, reinstall the top cover and tighten the 10 screws.

5.3 Fuse replacment

Disconnec the power supply cable. Remove the fuse holder (10) from the power connector (9). No tool is needed. Remove the fuse from the holder and install a new fuse. Insert the fuse holder in the Power Connector (9). You will here a "click" when installed properly.



5.4 Spare parts

For spare parts, contact info@klanghabitat.com.

Order number	Article name	Pcs.
60001	Vacuum Tube ECC83s / 12AX7	1
60040	Fuse T 1A low, 250V 5x20 mm	1
60036	IEC 60320 C13 power supply cable EU	1
60034	IEC 60320 C13 power supply cable US/JP	1
60035	IEC 60320 C13 power supply cable UK	1

6. Troubleshooting

No power, no signal

- Check the power supply and confirm the unit is powered on.
- Inspect the fuse in the power supply.

Distorted or Noisy Audio:

- Verify the unit's gain settings to avoid clipping or distortion.
- Check for issues with the tube – replace if worn or damaged
- Ensure proper grounding to avoid hum or interference.

Unit Overheating:

- Verify proper ventilation around the unit and rack.
- Ensure the ambient temperature is within safe operating limits +5 bis 35 °C.

Uneven or Low Output Level:

- Test the output with a known good cable and different equipment to rule out external issues.

Noisy Tube:

- Test the tube by replacing it with a known working one.

Mechanical or Loose Components:

- Ensure all screws and components are securely fastened.
- Listen for any rattling noises that may indicate loose parts inside the module.

7. Technical specification

Frequency response:	10 Hz – 22 kHz
Dynamic range, 20 Hz – 22 kHz	
Maximum input level:	+20 dBu
Maximum output level:	+20 dBu
Input impedance:	10 kOhm
Output impedance:	68 Ohm
Intensity (0 %) THD+N	
@ 0 dBu	0.0031%
@ +10 dBu	0.01 %
Intensity (100 %) THD+N	
@ 0 dBu Saturation 0 %	0.024 %
@ 0 dBu Saturation 100 %	26.3 %
Filter	
Low pass filter:	5 kHz - 24 kHz
High pass filter:	15 Hz - 100 Hz
Noise floor 20 Hz - 22kHz:	
INTENSITY (0 %)	-90 dBu
INTENSITY (100 %)	-88 dBu
Power consumption:	16 watts
Power supply	
Voltage:	110-240 V - 50-60 Hz
Connector:	IEC-60320-C14
Tube pre-heating before use:	15 min
Steps per knob:	42 steps by 270 degrees
Environmental	
Operating temperature C°:	+5 to 35
Storage temperature C°:	-20 to 50
Device Dimensions	
Size (h x w x d) in cm:	4.4 x 48.3 x 19.6
Weight in kg:	2.6
Packaging Dimensions	
Size (h x w x d) in cm:	13.3 x 52.7 x 28.6
Weight in kg:	3.7

8. CE Conformity

Herewith klanghabitat GbR, located at Bergstraße 27, 19370 Parchim, Germany declares with sole responsibility that this product complies with the following norms and directives:

Product: cassiopeia:rack
SKU: 42200
Serial number: 42200-nnnnn

- 2023/988/EU General Product Safety Regulation
    - EN IEC 62368-1:2018-01 Audio/video, information and communication technology equipment
    - EN IEC 62368-1:2020+A11:2020 Audio/video, information and communication technology equipment
- 014/35/EU Low Voltage Directive
- 2014/30/EU EMC (Electromagnetic Compatibility) Directive
    - DIN EN 55032:2022-08 - Electromagnetic compatibility of multimedia equipment - Emission requirements
    - DIN EN 55035:2018-04 – Electromagnetic compatibility of multimedia equipment - Immunity requirements
- 2011/65/EU / 2015/863/EU Restriction of Certain Hazardous Substances (RoHS)

This declaration becomes invalid by any unapproved modification of the device.

Parchim, 03.08.2026 – Christian Sager (CTO) & Marvin Carbuhn (CEO)

9. Warranty information

The unit come with a limited warranty of 2 years, covering defects in parts and labor from the date of purchase. Normal wear and tear is not included in this warranty. Repairs or replacements do not extend the original warranty period.

This warranty applies solely to the original purchaser and is non-transferable. klanghabitat only honors warranties for products purchased through authorized klanghabitat dealers. The warranty is valid only in the country of the original purchase, unless pre-authorized by klanghabitat.

The warranty becomes void if the product has been damaged due to misuse, accident, neglect, modification, tampering, or unauthorized repairs by anyone other than authorized service personnel.

The warrantor is not liable for property damage or any incidental or consequential damages resulting from product failure. Any implied warranties of merchantability and fitness for a particular purpose are limited to the duration of the expressed warranty.

klanghabitat does not cover express or overnight shipping costs, nor does it cover shipments to locations outside of Germany. Any transport-related damages are not covered by this warranty.

This warranty grants you specific legal rights, and you may have additional rights depending on your location. Some of the above limitations may not apply to you.

10. Legal information

The information contained in this document is subject to change without prior notice and shall not be considered as an obligation or warranty of any kind from the manufacturer. No warranties, either express or implied, are provided regarding the quality, suitability, or accuracy of this document.

The manufacturer reserves the right to modify the contents of this document and/or the associated products at any time, without prior notice. The manufacturer shall not be held liable for any damages arising from the use, or inability to use, this product or its documentation.

This document is subject to copyright. All rights, including technical changes and corrections, are reserved. No part of this manual may be reproduced or transmitted in any form or by any means without the explicit written consent of the copyright holders.

This product is marked with the crossed-out wheeled bin symbol in accordance with the WEEE Directive 2012/19/EU. This indicates that this electronic device must not be disposed of in household waste. Please return defective devices to klanghabitat's address (klanghabitat GbR, Bergstraße 27, 19370 Parchim), to your distributor's address or take it to a designated collection point for the recycling of electrical and electronic equipment. By ensuring proper disposal of this product, you will help prevent potential negative environmental and human health impacts.





The **cardboard packaging** used for this product is recyclable. Please dispose of it in your local paper recycling bin. By recycling the packaging, you help to reduce waste and conserve natural resources.



Italian information:
Etichettatura ambientale degli imballaggi
Scatola esterna – cartone ondulato – PAP 20 – Raccolta differenziata: carta
Verificare le disposizioni del proprio comune per la raccolta differenziata.

Portuguese information:
Embalagem de cartão – ecoponto azul (papel e cartão)

The white (**LD)PE foam and film bag** used to protect this product can be recycled where facilities exist. Please check your local recycling guidelines for appropriate disposal.



Italien information:
Protezione interna – polietilene espanso – LDPE 4 – Raccolta differenziata: plastica
Sacchetto protettivo – polietilene a bassa densità – LDPE 4 – Raccolta differenziata: plastica
Verificare le disposizioni del proprio comune per la raccolta differenziata.

Portugisien information:
Espuma de polietileno (PE) – ecoponto amarelo (embalagens)
Saco de polietileno de baixa densidade (PE-LD) – ecoponto amarelo (embalagens)

WEEE-Registration-Number: DE40248717

RoHS
COMPLIANT
2011/65/EU
2015/863/EU

This product is manufactured in accordance with the 2011/65/EU & 2015/863/EU directive. The purpose of this directive of the European Union is the Restriction of Hazardous Substances (RoHS) in electronic equipment in order to protect health and nature.

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