To our valued customer and music enthusiast,

with the purchase of your new **ACCUSTIC ARTS® TUBE PREAMP II – MK 2** you have opted for a product which incorporates the most modern technology to achieve excellent sound and quality. To make sure that you have pleasure for as long as possible with your unit we kindly ask you to thoroughly read this instruction manual through to the end.

We wish you many enjoyable hours of listening to music with your new unit.

ACCUSTIC ARTS® / Lauffen (Germany)

Content

1 TUBE PREAMP II – MK 2 highlights

- Audiophile reference preamplifier with a so called "tube hybrid" concept and 4 military tubes (2 tubes per channel)
- Fully balanced circuit design from input to output
- Advantages of this "tube hybrid" technology:
  - very high impedance
  - very high bandwidth
  - very low distortion factors and a "good-natured" distortion spectrum
  - "analog" and very precise sound performance
  - 4 separated amplification paths, which are not influencing each other

- Easy change of tubes without any adjustments just ''plug and play''
- Professional Class A output stage using technology derived from studio engineering
- All used components are of outstanding quality (e.g. Burr Brown® OPA 627) and additionally selected; all relays have high quality gold-plated contacts
- 4 high precision military tubes; 4-times selected
- 4-channel volume potentiometer for best crosstalk
- 3 x fully balanced high level inputs (XLR) and 2 x unbalanced high level inputs (RCA)
- 1 x unbalanced input (RCA) configured as ''SURROUND-BYPASS''
- 2 x fully balanced outputs (XLR) – 1 x AC coupled, 1 x DC coupled
- 2 x unbalanced outputs (RCA) – 1 x AC coupled, 1 x DC coupled
- 1 x headphone output, switchable (1/4'' stereo female jack)
- 1 x unregulated, switchable output for the connection of an external headphone amplifier (RCA)
- Phase switch for 0° and 180°
- 2 magnetically shielded, encapsulated 75 VA toroidal core transformer („Made in Germany'') of premium quality for high output reserves
- Front panel, cover and remote control are made of massive and solid aluminium
- ACCUSTIC ARTS® TUBE PREAMP II – MK 2 is ''Handmade in Germany''

► **For further information and details on the function principle of the TUBE PREAMP II – MK 2, please check our website: www.accusticarts.com**

2 Important safety instructions

- Read these instructions.
- Keep these instructions.
- Follow all instructions.
- **Do not** use this appliance near water.
- **Never** use this appliance near hot surfaces.
- **Never** use this appliance outside and always place it in a dry environment.
- Check that your mains voltage corresponds to that stated on the appliance.
- **Never** leave the appliance unsupervised when in use. Always keep electrical equipment out of the reach of children.
- **Never** pour or spill liquids directly onto this appliance.
- **Never** operate this apparatus in an explosive atmosphere.
- **Do not** put any vases or similar objects containing water or liquids on top of this appliance.
- Unplug this appliance during lightning storms or when unused for long periods of time.
- Ensure that the appliance has sufficient air around it and avoid extreme temperature influences on the unit, especially direct sunshine and high humidity.
- The mains cable of this appliance is equipped with an equipment grounding conductor. This equipment grounding conductor must **never** be disconnected or taped over. In case any humming occurs, please contact your authorized dealer.
- **Always** disconnect the appliance from the mains power before carrying out any changes to the cables or when cleaning the appliance.
- Protect the mains cable from being walked on or pinched particularly at plugs and the point where they exit from the appliance.

- From time to time check the mains cable and the appliance for damages. Take care that the mains cable is not buckled or damaged by any house pets.
- **Never** move the appliance by pulling the mains cable. Make sure the mains cable cannot get caught in any way. **Do not** wind the mains cable around the appliance and do not bend it.
- **Never** use accessories which are not recommended by the manufacturer. They could constitute a danger to the user and risk to damage the appliance.
- **Never** operate the appliance with the housing open.
- To clean the aluminium housing, please only use a cloth moistened with water and some detergent. **Never** use inflammable or chemically aggressive cleaning agents.
- In the event of a defect, please **never** attempt to repair it yourself. Any tampering with the appliance by an unauthorised person will make the warranty void. Please get in contact with your authorized dealer.
- Refer all servicing to qualified service person. Servicing is required when the appliance has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the appliance, the appliance has been exposed to rain or moisture, does not operate normally or has been dropped.
- Replace fuses only with original types having the same ampere value, the same voltage endurance and the same time-lag. You can find the corresponding value in chapter 6.2 of this instruction manual.
- **Never** bypass a fuse.
- No user-serviceable parts inside.
- **WARNING – DANGER TO LIFE! 330 Volts of high voltage in the inside of the unit. Never operate the unit with removed top cover and do never touch the board while the unit is switched on!**

The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operation and maintenance (servicing) instructions in the literature accompanying the appliance.

CE

Marking by the "CE" symbol indicates compliance of this device with the EMC (Electromagnetic Compatibility) and LVD (Low Voltage Directive) standards of the European Community.

Remarks in the manual:

WARNING!	**Calls attention to a procedure, practice, condition or the like that, if not correctly performed or adhered to, could result in personal injury or death.**
CAUTION!	**Calls attention to a procedure, practice, condition or the like that, if not correctly performed or adhered to, could result in a damage or destruction to part or the entire component.**

To guarantee a reliable function of this unit over the long-term we kindly ask you to thoroughly **read this instruction manual** before connecting this unit and to observe the following instructions. This is also necessary for your own safety when dealing with the unit.

3 Unpacking and positioning

Great care must be exercised when unpacking the unit. Carefully store the transportation packaging for the possibility of further use. If you have a claim on the warranty, always use the original packaging for any necessary transportation. Transportation without this packaging can lead to damage of the housing.

Please check, if the following items are included:

1 x AC mains cable (type depends on your country)
1 x remote control RC III
2 x batteries (type AAA)
2 x replacement fuses (types depend on your mains voltage)

The TUBE PREAMP II – MK 2 has to be positioned on stable, even and horizontal surface. You can put the unit in a stable cupboard but for reasons of better access to the various input and output sockets we recommend you position the unit in an audio rack. Professionally designed audio racks can have a positive effect on the music reproduction of your audio system.

CAUTION! **Please observe at all times**

Before you connect the unit with some other unit using a cable, please never forget that both units must first be switched off and disconnected from the mains power.

4 Connections and operation controls

4.1 General information

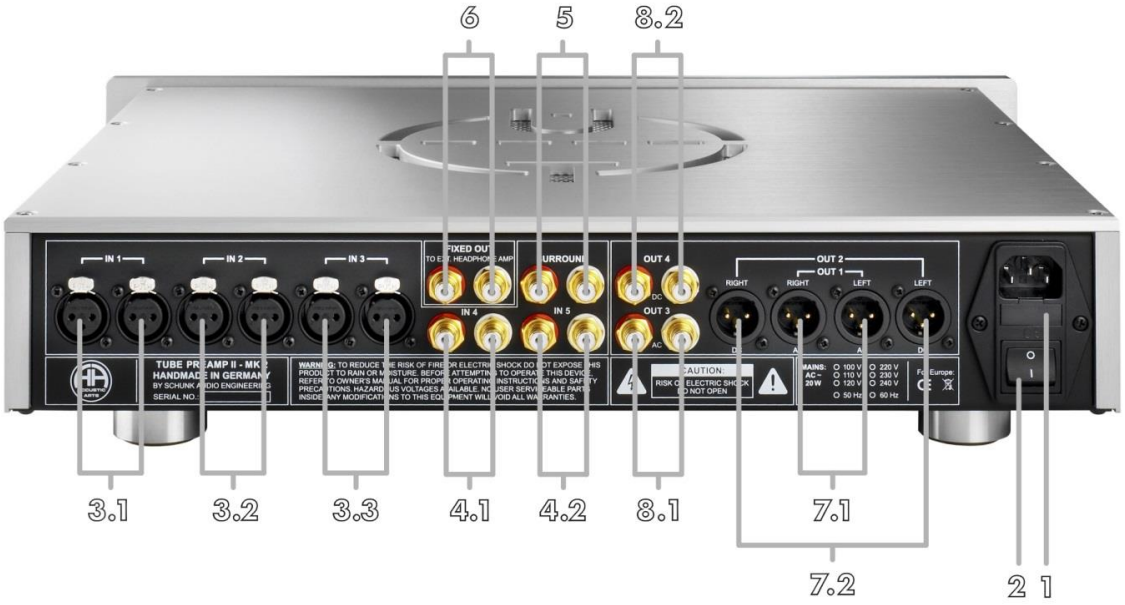
The TUBE PREAMP II – MK 2 is an audiophile high precision preamplifier with a so called **"tube hybrid"** concept for maximum sound performance. Tubes are generally sensitive components and therefore to be treated with utmost care. Generally speaking tubes have characteristically required a certain time after powering up to be ready for operation. During this heating up **no music signal** can be transmitted. The tubes used in the TUBE PREAMP II – MK 2 have a heating period of approx. 2½ to 3 minutes. You may find further information in the following chapters.

The TUBE PREAMP II – MK 2 is designed to work with a power amplifier, e.g. AMP II – MK 2 or AMP III from ACCUSTIC ARTS®. Of course you can use this ACCUSTIC ARTS® unit with units from other premium quality brands.

Please read them very carefully to prevent any kind of malfunction.

4.2 Connections on the rear panel

Fig. 1: Rear view



1 **No fuse holder!** All main fuses located **inside** the housing (see chapter 6.2)

2 Mains power – on / off switch

3.1 **IN 1:** Fully balanced input (XLR) for connection of a reproduction device 1

3.2 **IN 2:** Fully balanced input (XLR) for connection of a reproduction device 2

3.3 **IN 3:** Fully balanced input (XLR) for connection of a reproduction device 3

4.1 **IN 4:** Unbalanced input (RCA) for connection of a reproduction device 4

4.2 **IN 5:** Unbalanced input (RCA) for connection of a reproduction device 5

5 **SURROUND:** Unbalanced input (RCA) configured as "SURROUND BYPASS" (before use, please see chapter 5.2)

6 **FIXED OUT:** Uncontrolled output for connection of an external headphone amplifier; this output is also switched via the "**PHONES ON**" button on the front panel

7.1 **OUT 1:** Fully balanced output (XLR) for connection to a power amplifier; AC coupled

7.2 **OUT 2:** Fully balanced output (XLR) for connection to a power amplifier; DC coupled

8.1 **OUT 3:** Unbalanced output (RCA) for connection to an amplifier; AC coupled

8.2 **OUT 4:** Unbalanced output (RCA) for connection to an amplifier; DC coupled

4.3 Operation controls on the front panel

Fig. 2: Front view

9 Rotary switch **IN 1 – IN 2 – IN 3 – IN 4 – IN 5 – SURR (SURR = SURROUND BYPASS)**
The individual reproduction devices can be selected using this rotary switch.

10 **PHONES ON:** Push-button to activate the headphone output **PHONES** and the **FIXED OUT** 6 (rear)

11/12 **TUBES OFF:** This push-button is exclusively responsible for the tube section of this preamplifier. Push the button and the complete tube section is switched off completely. Push again and the tube section will be switched on. During the following heating period the LED 13 in the middle glows red for approx. 2½ to 3 minutes and then changes its colour into blue, indicating that the unit is now fully ready for operation again.

IMPORTANT: This push-button is no replacement for the power switch. It is only intended for short operational breaks and also to extend the lifetime of the tubes.

13 **ON:** LED indicates unit is ready for operation

1. LED red = unit is in "warm-up" mode
This LED lights up **red** when the mains power switch 2 on the rear panel is switched on and the switch 11 **TUBES OFF** isn't activated. It indicates that the unit is in the warm-up mode. The warm-up mode takes approx. 2 to 3 minutes.

2. LED blue = unit is ready
After the warm-up mode the tubes are ready for operation and the colour of the LED turns **blue**. When the tubes are ready the unit is also completely ready for operation

14/15 **PHASE 180°:** Push-button of phase reversal of the music signal

16 **PHONES:** Headphone output (6.3 mm), covered by a removable plug made of chromed brass; the plus is hold in position by an integrated magnet

17 **VOLUME:** Rotary potentiometer for volume setting

4.4 Connection to mains power

Only connect the unit to the mains power when all the other cable connections have already been carried out. Plug in the mains cable firstly in the inlet connector sockets of the unit and only then the earthing pin-plug in the mains socket.
By actuating switch 2 you can switch your unit on or off.

5 Installation and getting started

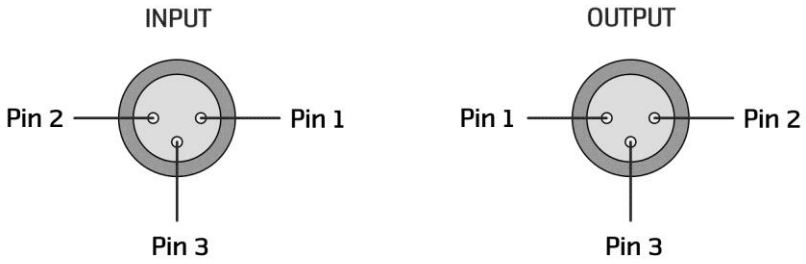
5.1 Use of the line inputs **IN 1 to IN 5**

The TUBE PREAMP II – MK 2 has three fully balanced high level inputs **IN 1** – **IN 2** – **IN 3** and two unbalanced high level inputs **IN 4** – **IN 5**. This means in total you can connect 5 various reproduction devices via their analog outputs.

If you have an analog record player (turntable, phono), then do not connect it directly to one of the inputs. To connect the record player you need a phono-preamplifier which you must wire between the record player and the TUBE PREAMP II – MK 2.

Please use only high quality interconnect cables. This is the only way to ensure that the sound quality of the TUBE PREAMP II – MK 2 is fully exploited.

Fig. 2: Pin declaration of the balanced input / output (XLR)



Pin 1: Ground (shield)
Pin 2: Non-inverting (hot; 0°)
Pin 3: Inverting (cold; 180°)

These pin assignments comply with the standard adopted by the Audio Engineering Society. Refer to the operating manual of your other units to verify that the pin assignments of their connectors correspond to your ACCUSTIC ARTS® unit.

IMPORTANT! **Always switch off the preamplifier before connecting an additional unit.**

5.2 Use of the line input **SURROUND**

The **SURROUND** input is a special input configuration that allows the signal from a surround processor to pass through the TUBE PREAMP II – MK 2 with **no gain**. The volume will be controlled by the surround processor.

WARNING! **You <u>can not</u> connect "standard" units like for example a CD-Player to this input. In the SURROUND configuration the volume of this input is not controlled, this means that the incoming signal is transferred unchanged to the speaker outputs. This could otherwise lead to very high volume levels and do serious harm to your connected loudspeakers.**

The **SURROUND** input will be activated by turning the rotary switch ⑨ into position **SURR**.

5.3 Use of the line outputs **OUT 1** to **OUT 4**

5.3.1 Volume control

Using the rotary control **VOLUME** you can set the volume of the reproduction device connected to the TUBE – PREAMP II.
The volume can also be changed using the separate infrared ACCUSTIC ARTS® **remote control** type RC III.

Fig. 3: Volume setting on the rotary control **VOLUME**

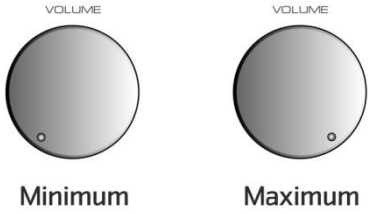


Fig. 4: ACCUSTIC ARTS® remote control RC II with aluminum housing

– Increasing volume
+ Decreasing volume

5.3.2 Balanced outputs **OUT 1** and **OUT 2**

Connect the preamplifier balanced outputs **OUT 1** or **OUT 2** to the respective input of your balanced power amplifier. Please check, if the pins of the XLR sockets have the same configuration (see chapter 5.1).

OUT 1 is "AC coupled", OUT 2 is "DC coupled". Please see details in chapter 5.3.4.

<u>Notice:</u> **"Bi-Amping"**
To use two stereo power amplifier (or 4 mono power amplifier) in a **"Bi-Amping"** configuration, both balanced line outputs **OUT 1** and **OUT 2** of the TUBE PREAMP II – MK 2 are necessary.

Even if you use the two balanced outputs of the TUBE PREAMP II – MK 2 for such a "Bi-Amping" configuration, you still have the possibility to use an unbalanced line output (e.g. **OUT 3**) for connecting a separate subwoofer. Subwoofers often have only unbalanced high level inputs.

5.3.3 Unbalanced outputs **OUT 3** and **OUT 4**

If you don't own a power amplifier with balanced inputs, you can of course also connect a power amplifier equipped with unbalanced inputs. Therefore please use the unbalanced line output **OUT 3 or OUT 4**.

OUT 3 is "AC coupled", OUT 4 is "DC coupled". Please see details in chapter 5.3.4.

5.3.4 Details for AC coupled / DC coupled

Preamplifier outputs can generally be done AC-coupled or DC-coupled. The TUBE PREAMP II – MK 2 integrates both variations so that each customer has the total freedom to make his own choice.
The question of which variation sounds "better" mainly depends on the design of the connected power amplifier. There are some power amplifiers which are better connected via AC-coupled preamplifier outputs and other power amplifiers which achieve their full sound spectrum via DC-coupled preamplifier outputs. The question is ultimately also one of personal taste. We do not intend to enter into such "philosophical" discussions, but would prefer to let the listening impressions of the customer make the decision.

a. What does AC-coupling of the preamplifier outputs mean?
The AC-coupling of a preamplifier output is made using a capacitor and a resistor. The selection and the size of the capacitor are important factors for a perfect result. The TUBE PREAMP II – MK 2 is equipped with high quality, very rare 5% MKH capacitors, i.e. no wound film capacitors. This ensures the best possible low inductance.

b. Advantages of AC-coupling
1. Avoids operating point adjustments caused by undesired, but often unavoidable DC components in the signal.
2. Reduction of high frequencies which can be efficiently filtered out by the integrated capacitor.
3. Greater security (protection of DC components) in the case of defects, in particular with the connection to third party equipment or connection of tube power amplifiers.

c. What sounds better?
There is no general answer to this question. With an **unbalanced device connection**, i.e. via the outputs **OUT 3** and **OUT 4,** the result with AC-coupling and the used types of capacitors is usually a more delicate, spatial, slightly softer and more musical acoustic pattern. The DC-coupling, on the other hand, sounds slightly more "direct", "more overt" and perhaps slightly "more analytical".
For a **symmetrical device connection** there is **no general answer,** whereby the result depends largely on the connected power amplifier.

d. Suggestions for OUT 1 to OUT 4:

OUT 1 = AC-coupled balanced output (XLR)
OUT 2 = DC-coupled balanced output (XLR)
OUT 3 = AC-coupled unbalanced output (RCA/Cinch)
OUT 4 = DC-coupled unbalanced output (RCA/Cinch)

Case 1 : Power amplifier connection via balanced single output (= "usual case", i.e. NO bi-amping).

1. Balanced connection of the TUBE PREAMP II – MK 2 to ACCUSTIC ARTS AMP II: use **OUT 1** (AC)
2. Balanced connection of the TUBE PREAMP II – MK 2 to a third-party power amplifier: use **OUT 1** (AC).

Case 2 : Power amplifier connection via unbalanced single output (= "usual case", i.e. NO bi-amping).

1. Unbalanced connection of the TUBE PREAMP II – MK 2 to ACCUSTIC ARTS AMP II: use **OUT 4** (DC)
2. Unbalanced connection of the TUBE PREAMP II – MK 2 to a third-party power amplifier: use **OUT 3** (AC).

Case 3 : Connection of power amplifier via two outputs (bi-amping).

If two power amplifiers are connected to the TUBE PREAMP II – MK 2 (bi-amping), the recommendation is to control the bass range of the connected loudspeakers via the DC-coupled outputs **OUT 2** and **OUT 4** and to connect the mid and high range via the AC-coupled outputs **OUT 1** and **OUT 3**.

5.4 Use of the output FIXED OUT

A number of audiophile customers already possess a high quality headphone amplifier and wish to continue using it. To enable the best connection to the TUBE PREAMP II – MK 2, we have integrated a switchable, uncontrolled output designed especially for this purpose. This output is also switched via the "**PHONES ON**" button. **If this output is activated, no signal will be transferred via OUT 1 to OUT 4.**

5.5 Use of the headphone output PHONES

The front plate of the TUBE PREAMP II – MK 2 contains the headphones jack (6,3mm phone jack) which is marked with **PHONES**.
The headphones jack is covered by a chromed knob which is fixed in the front plate by a magnet.
This cover does not only look nice but also prevents the collecting of dust when headphones are not in use.

The push button switch **PHONES ON** activates the inserted headphones and cuts off the loudspeaker outputs.

5.6 Use of push-button TUBES OFF

The push-button **TUBES OFF** is exclusively responsible for the tube section of this preamplifier. Push the button and the complete tube section is switched off completely. Push again and the tube section will be switched on. During the following heating period the LED 13 in the middle glows red for approx. 2 to 3 minutes and then changes its colour into blue, indicating that the unit is now fully ready for operation again.

CAUTION!

This push-button is no replacement for the power switch. It is only intended for short operational breaks and also to extend the lifetime of the tubes.

5.7 Use of push-button PHASE 180°

The push-button **PHASE 180°** is a special phase reversal for the music signal.

5.8 Getting started

First of all you must switch the unit on by pressing the mains power switch 2 on the rear of the unit. The LED 13 initially starts glowing red (red = warm-up), as the tubes are in the heating up phase. After the heating up the LED colour changes to blue (blue = unit ready). The unit is now fully ready for operation.

6 Information about the used tubes and mains fuses

6.1 Important details about the used tubes

The TUBE PREAMP II – MK 2 contains 4 tubes – one for the left and one for the right channel.

The tube type used is: E83CC dual triode 12 AX 7

We use only tested and additionally hand selected tubes. The tubes are run in 100 hours in a special lab test prior to delivery. After completion of this lab test the unit is tested again.

In principle every tube with exactly this type designation may be used. However we want to point out that there are faulty tubes or tubes of minor quality available on the market which may cause big harm to the TUBE PREAMP II – MK 2.

There are also countless copies of well known brands on the market, which however neither have the characteristic value, nor the quality of the copied brands.
In any case only use quality branded products!

WARNING! **DANGER TO LIFE!**

High voltage inside! Opening of the housing may only be done by an authorized ACCUSTIC ARTS® service or distributor.

Therefore please note that:

- **You will void all warranties when using other tubes than those tested and recommended by ACCUSTIC ARTS®.**
- **Changing of tubes may only be done by an authorized ACCUSTIC ARTS® service or distributor.**
- **Switch the unit off with the mains power switch ② and then wait for at least 1 minute until the capacitors are fully discharged before removing the top cover.**
- **WARNING – DANGER TO LIFE! 330 Volts of high voltage in the inside of the unit. Never operate the unit with removed top cover and do never touch the board while the unit is switched on!**
- **After an exchange of tubes the TUBE PREAMP II – MK 2 automatically adjusts to the new tubes ("plug and play"), provided that the right type is used.**

6.2 Replacing damaged mains fuses

If a fuse is damaged only replace the fuse with original types having the same ampere value, the same voltage endurance and the same time-lag. Never use fuses with other ampere classes or time-lag classes.

WARNING! **DANGER TO LIFE! Pull out the mains plug!**

High voltage inside! Opening of the housing may only be done by an authorized ACCUSTIC ARTS® service or distributor.
Always disconnect the unit from the mains power before replacing a fuse.

The two mains fuses of the TUBE PREAMP II – MK 2 are located in the inside of the unit on the board. On the board the fuses are marked with:

FSE 001 TUBE (fuse for the tube section)
FSE 002 TRANS (fuse for the analog section)

Please use the included fuse for replacement!

For countries with **220- 240 V / 50- 60 Hz** please use the following fuse types:

FSE 001: 400 mA – time lag

FSE 002: 400 mA – time lag

For countries with **100-120 V / 50- 60 Hz** please use the following fuse types:

FSE 001: 800 mA – time lag

FSE 002: 800 mA – time lag

7 Looking after your equipment

The TUBE PREAMP II – MK 2 from ACCUSTIC ARTS® does not require special treatment in excess of the usual care taken with high quality devices. Clean the housing with a dry or slightly moistened cloth. Please do not use any aggressive detergents or detergents which contain silicon.

The best way to clean the chromed inlay and knobs is with a mild, non-aggressive fat-dissolving detergent (e.g. glass cleaner). Use a very soft clean cloth and wipe the front plate with same without exerting strong pressure. **Never** use abrasive agents or polishing agents with abrasive particles.

CAUTION!

Do not place the unit in direct sunshine and avoid extreme changes in temperature.

8 Troubleshooting

Malfunctions are mostly caused by something simple which can be put right quickly.
In the next section some possible malfunctions are described together with their corrective action. However, if it is not possible to remove the malfunction please contact your authorized ACCUSTIC ARTS® dealer.

Malfunction **The unit is switched on but all LEDs remain dark.**

Cause 1 The mains cable is not properly connected.
Solution Check mains cable and push in firmly.

Cause 2 The fuse **FSE 002 TRANS** is damaged.
Solution Pull out the mains plug and replace the corresponding fuse (see chapter 6.2). Restart the unit. If the LED still remains dark please contact your authorized ACCUSTIC ARTS® dealer.

Cause 3 Both fuses are damaged.
Solution Pull out the mains plug and replace the corresponding fuses **FSE 002 TRANS** and **FSE 001 TUBE** (see chapter 6.2). Restart the unit. If the LEDs still remain dark please contact your authorized ACCUSTIC ARTS® dealer.

Malfunction **The unit was switched on but LED 13 remains dark.**

Cause The fuse **FSE 001 TUBE** is damaged.
Solution Pull out the mains plug and replace the corresponding fuse (see chapter 6.2). Restart the unit. If the LED still remains dark please contact your authorized ACCUSTIC ARTS® dealer.

Malfunction **The music sounds distorted.**

Cause 1 Maybe a tube is damaged.
Solution Pull out the mains plug contact your authorized ACCUSTIC ARTS® dealer.

Cause 2 The connections between your units are not correct.
Solution Please check out if the pin declaration of this unit fits to your other units.

Malfunction	**The volume control does not react to the remote control.**
Cause 1	The remote control transmitter does not send the right signal.
Solution	Check batteries and change if necessary.
Cause 2	The infrared receiver cannot receive the transmitted signal.
Solution	Always point the remote control transmitter directly towards the receiver diode and remove any barriers which might possibly interfere.

For malfunctions which affect the reproduction of individual devices first of all make sure that all connections are correctly and thoroughly carried out. In general errors which arise are often a result of an unsatisfactory or wrongly-made connection.

9 Specifications (selection)

Inputs:	3 x fully balanced high level inputs (XLR) 2 x unbalanced high level input (RCA) 1 x surround bypass (RCA)
Outputs:	2 x fully balanced line-out (XLR) 2 x unbalanced line-out (RCA) 1 x unbalanced fixed out (RCA) 1 x headphone output (1/4'' stereo female jack)
Maximum gain:	4-times / 12 dB (balanced to balanced) 8-times / 18 dB (unbalanced to balanced)
Signal difference left/right:	0.2 dB (from 0 dB to –40 dB)
Input resistance:	balanced: 2 x 50 kΩ unbalanced: 50 kΩ
Output resistance:	balanced: 2 x 34 Ω unbalanced: 34 Ω AC coupled with 2.2 µF
Max. output voltage:	balanced: 19.8 Veff on 10 kΩ unbalanced: 9.9 Veff on 10 kΩ
Signal-to-noise-ratio:	-90 dB (A weighted)
Intermodulation distortion:	0.006 % with 4.0 Veff on 10 kΩ
Distortion (THD+N):	0.002 % with 4.0 Veff on 10 kΩ (22 Hz – 30 kHz)
Tube type:	Dual triode E83CC / 12 AX 7 – selected and matched
Power consumption:	approx. 20 watts (unit totally on) approx. 3.5 watts (tube section in ''standby'' mode)
Dimensions (H x W x D):	100 x 482 x 375 mm / 3.9 x 19 x 14.8 inches
Weight:	12 kg / 26.4 lbs.

10 Copyright, trademarks, warranty

Copyright:

This instruction manual was correct at the time of going to press. The manufacturer reserves the right to make changes to the technical specification without prior notice as deemed necessary to uphold the ongoing process of technical development.
This manual is done by ACCUSTIC ARTS Audio GmbH.

Trademarks:

ACCUSTIC ARTS® is a registered trademark of ACCUSTIC ARTS Audio GmbH.

Warranty:

The manufacturer accepts no responsibility for damage caused by not adhering to these instruction manual. Modification or change to any part of the product by unauthorized persons releases the manufacturer from any liability over and above the lawful rights of the customer.