

# Manual



## Phonitor mini

Modell 1320

120 Volt Amplifier for Headphones



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- ▶ Version 1.2 – 06 / 2017
- ▶ Developer: Bastian Neu

This manual contains a description of the product SPL Phonitor mini, Model 1320. In no way it represents a guarantee of particular characteristics or results of use. The information in this document has been carefully compiled and verified and, unless otherwise stated or agreed upon, correctly describes the product. Sound Performance Lab (SPL) continuously strives to improve its products and reserves the right to modify the product described in this manual at any time without prior notice.

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# Scope of Delivery

## ▶ Scope of Delivery

Phonitor mini, Model 1320

Power cord

## ► Phonitor

When we brought out the first Phonitor — the first ever headphone amp with 120 Volt technology — back in 2008, the professional audio world seemed to have been eagerly awaiting it. The success of this unique headphone preamp was overwhelming. In hindsight, we also had to wonder how none of us had come to the idea of combining basic monitoring options, speaker simulation capabilities and a headphone preamp. Ever since we call this new species a „Headphone Monitoring Amp,“ which inspired the product name itself: Phonitor.

Interestingly enough, the Phonitor not only became best friends with thousand of professional users, it also won a lot of fans in the Hi-Fi market segment. But that was by no means a coincidence — ultimately, the Phonitor can be counted among the best headphone preamps in the world thanks to our unique 120-Volt technology.

## ► Phonitor 2

Many Phonitor users told us they wished they could also use the unmatched signal quality that the Phonitor provides to feed their speakers.

And so began to take form the idea of making its successor a full-fledged stereo preamp that could become the heart of modern professional and home systems alike where headphones have a pre-eminent importance.

We have further achieved new progress regarding the 120-Volt circuit technology, so the technical specifications of the Phonitor 2 have been improved in almost all areas, setting new standards.

Other improvements concern, particularly, the use of virtually any type of headphone with any impedance. The Phonitor 2 is completely indiscriminating with low-impedance headphones starting at 10 Ohm and balanced headphones with load impedances starting at 40 Ohms.

## ▶ Phonitor mini

The outstanding technical and sonic characteristics of the Phonitor 2 were translated into a more compact and less-expensive format to create the Phonitor mini.

Its ease-of-use, small and sturdy housing and affordable price, make the Phonitor mini the perfect headphone amp for home studios, hi-fi enthusiasts and mobile recording and mixing.

The Phonitor mini is our high-end/low-size version of a premium headphone amplifier. And it obviously features the Phonitor Matrix too, to recreate speaker-like working conditions, plus the developments of the second generation of our 120-Volt amplifier technology.

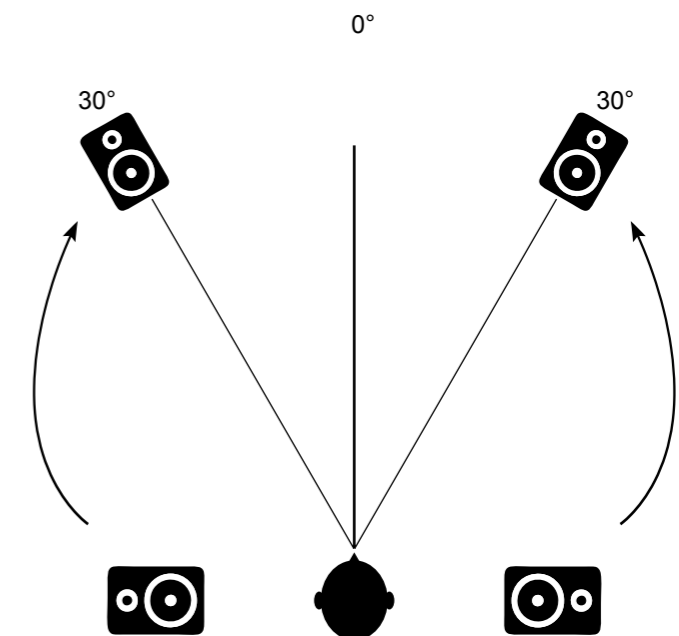


## ► Home Listening

Home users can now get — for an unheard-of value for money — a headphone amplifier to enjoy an authentic sound reproduction with headphones.

Headphones usually provide a 180-degree stereo image (the Super Stereo effect), and that's exactly where the problem is rooted. Generally speaking, music is mixed so that all instruments are reproduced correctly in their position when the loudspeakers form a stereo triangle.

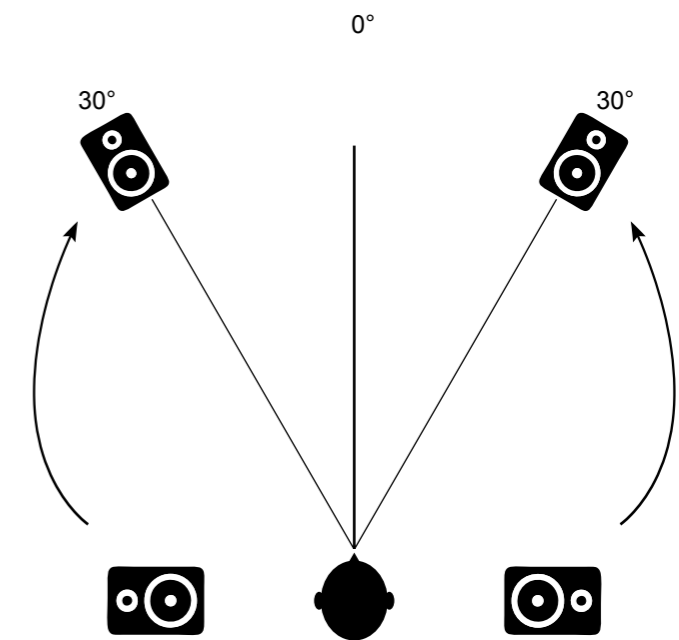
Thus, headphone reproduction is not the same as it was intended during recording. The side component becomes too important during playback, and effects like delay and reverb are reproduced in an exaggerated way. The position of instruments and vocals in the stereo image is pushed further apart. All in all, the sound is not authentic anymore. With our Phonitor Matrix, music playback with headphones becomes a real delight thanks to an authentic perception of the stereo width, a more precise localization of the sound sources and a correct balance between effects and other elements.



## ► Sound Engineers

Studio engineers will find in the Phonitor mini a high-quality headphones amplifier.

On the one side, there is the traditional, analytical work with headphones as with a magnifying glass, which can be done always bearing in mind the lack of room influence. Working with a magnifying glass has its advantages when it comes to discovering noises, clicks and crackles, assessing edits, or spotting problems of single tracks. On the other side, the Phonitor Matrix makes it possible to correctly determine the position of sound sources in the mix. Spatial information and effects are also more easily appraised, since the impression of the stereo width created is not the 180-degree one usually heard with headphones, but rather that of music being played back through monitoring speakers in the control room.



## ▶ The end of ear fatigue

The initially impressive „Super Stereo effect” with headphones can become tiring with time.

Besides the unnatural ambience impressions, other disadvantages also lead to an early ear fatigue when mixing or listening with headphones.

A cheap headphone amplifier can also be a good reason for early hearing fatigue.

Ordinary IC technology is used in almost all of today’s headphone amplifiers. In the best of cases, they work with a balanced voltage supply of +/-15V and up to +/-18V, otherwise, they work with an unbalanced voltage of 9V or 12V from external wall warts.

## ► Applications

- Headphone amplification for two sources
- Headphone amplifier for all headphone systems and impedances
- Loudspeaker-like reproduction with headphones
- Monitoring alternative in studios and mobile units
- Mobile reproduction of usual monitoring conditions
- Headphone monitoring live or during recording

## ► Special Features

- The Phonitor mini combines the new technical and sonic standards of the Phonitor 2 with a compact, competitively priced design
- Optimally suited for all dynamic headphones from 10 Ohm
- Mount-stand compatible with VESA adapter
- Ideal for mobile applications

## ▶ 120 Volt Technology

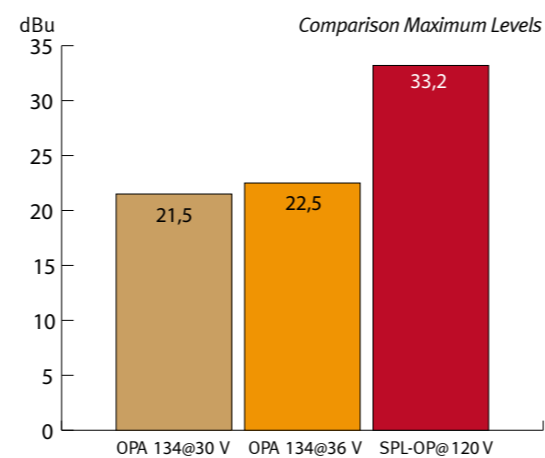
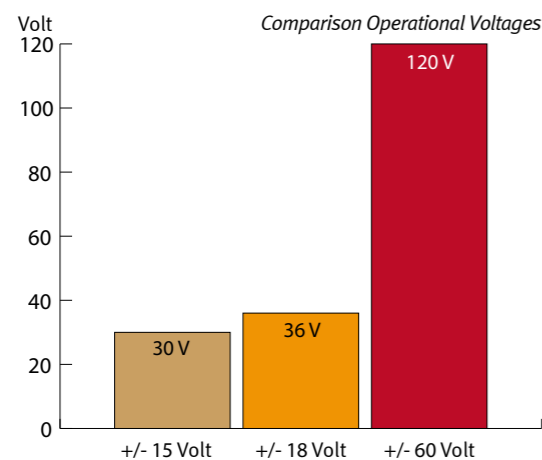
The foundations of this high-end-development is our 120 Volt reference technology: specially developed and manufactured op-amps that run on an operating voltage of 120 volts, which corresponds to approximately twice that of most modern analog audio semiconductor technologies.

Thanks to our 120-volt circuitry and processing we reach outstanding performance levels, especially in terms of dynamic range and headroom. As such, the technical specifications exceed all known analog and digital standards.

## ► The advantages of the 120-Volt operating voltage

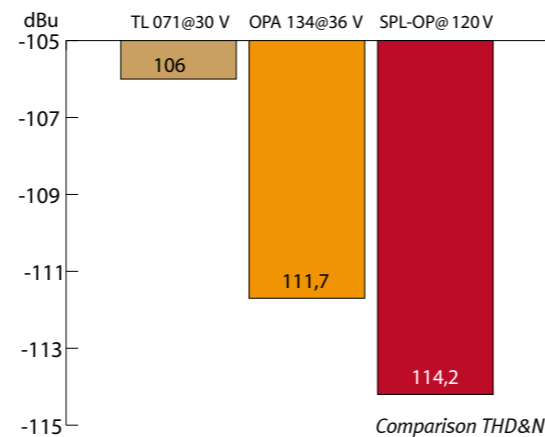
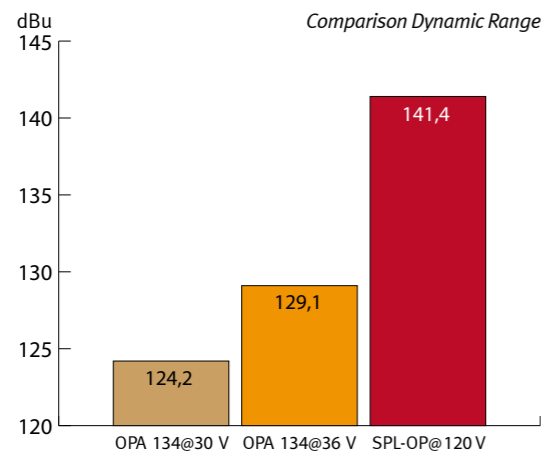
These diagrams clearly show how our 120-volt technology compares to other circuits with a lower operating voltage. The direct relation between operating level and maximum level is fundamental for the classification:

the higher the operating level, the higher the maximum level a circuit can handle.



## ► The advantages of the 120-Volt operating voltage

Since virtually all essential acoustic and musical parameters depend on this relation, a higher operating voltage also has a positive impact on the dynamic range, distortion limit and signal-to-noise ratio.





## ► The advantages of the 120-Volt operating voltage

Do bear in mind that dB scales do not represent linear but rather exponential increases. A 3dB increase corresponds to doubling the acoustic power, +6dB correspond to twice the sound pressure level, and +10dB correspond to twice the perceived loudness.

When it comes to volume, the 120-volt technology exhibits a performance, in regard to maximum level and dynamic range, that is twice that of common components and circuits given that its values are approximately 10dB higher.

THD measurements of the SPL op-amp show a difference of more than 3dB compared to the OPA134 at 36V — in terms of sound pressure level, that corresponds to an improvement of more than 50%.

The operating level most commonly used for audio equipment is 30 volts.

## ► Inputs

XLR connectors:

XLR connectors, electronically balanced

Impedance: bal. ca. 20 kΩ, unbal. ca. 10 kΩ

Max. Input Level: +32,5 dBu

RCA connectors:

RCA connectors, unbalanced

Impedance: ca. 10 kΩ

Max. Input Level: +20 dBu

Considering that the RCA input is raised from -10dBV to +4dBu (approx. 12.7dB), the input level is comparable to that of the XLR inputs: +20dB + 12.7dB = 32.7dB

odBu corresponds to 775mV. Subject to modifications.

# Specifications

## ▶ Headphone Output

6,3-mm TRS connector

Pin wiring: Tip = Left, Ring = Right, Sleeve = GND

Impedance: 0,18  $\Omega$

Attenuation Factor: 180 at 40 Ohm

Frequency Range: <10 Hz to >300 kHz (-3 dB)

CMR: -88 dB at 1 kHz

Crosstalk: -80 dB at 1 kHz

THD&N: 0,00052 % at 1 kHz

At +24 dBu input level and unity gain, 1 kHz, 100 kOhm load

Noise: Unweighted -100 dB

A-weighted: - 103 dB

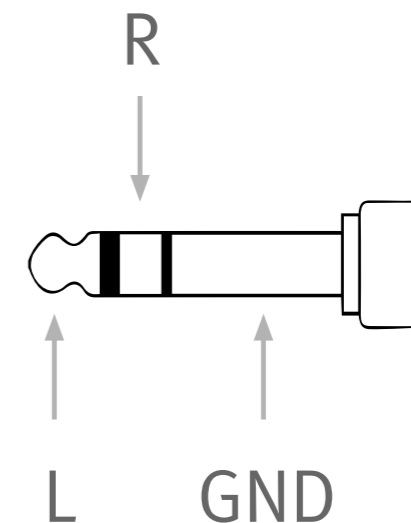
CCIR: -94 dB

Dynamic Range: Unweighted 133,62 dB

Power Amplifier:

2x 1W (+30dBu) at 1 kHz, 600 $\Omega$

2x 2W (+30dBu) at 1 kHz, 300 $\Omega$



# Specifications

## ▶ Power Supply

Voltages: 230 V AC, 50 Hz / 115 V AC, 60 Hz

Power Consumption: max. 15 W

Fuses: 100-120 V AC: T 500 mA / 220-240 V AC: T 315 mA

## ▶ Measurement & Weight

Height x Width x Depth: 44 mm x 144 mm x 257 mm

(1,72" x 5,76" x 10,12")

Weight: 2,03 kg / 4,48 lbs

## ▶ Connecting to the mains

Be very careful to check that the rear chassis power selection is set correctly before using the unit (230V/50 Hz = 220-240 V, 115V/60 Hz = 110-120 Volt).

When in doubt about a source, contact your dealer or a professional electrician.

Read page 35 for instructions on how to set the correct voltage.

Before connecting any equipment make sure that any machine to be connected is turned off. Follow all safety instructions from page 45.



## ► Placement

Place the unit on a level and stable surface. The unit's enclosure is EMC-safe and effectively shielded against HF interference. Nonetheless, you should carefully consider where you place the unit to avoid electrical disturbances. It should be positioned so that you can easily reach it, but there are other considerations.

Try not to place it near heat sources or in direct sunlight, and avoid exposure to vibrations, dust, heat, cold or moisture.

It should also be kept away from transformers, motors, power amplifiers and digital processors.

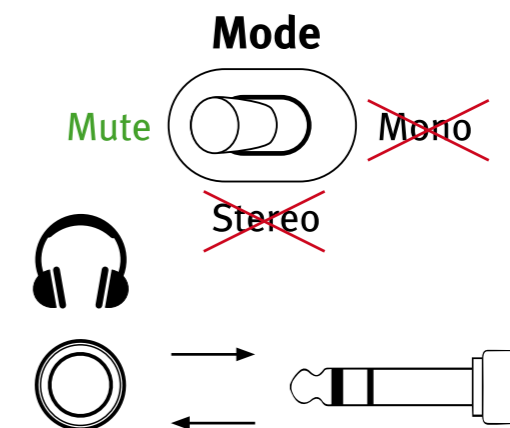
Always ensure sufficient air circulation by keeping a distance of 4-5 cm/2 inches to other units and to the sides of the unit.



## ► Before You Begin

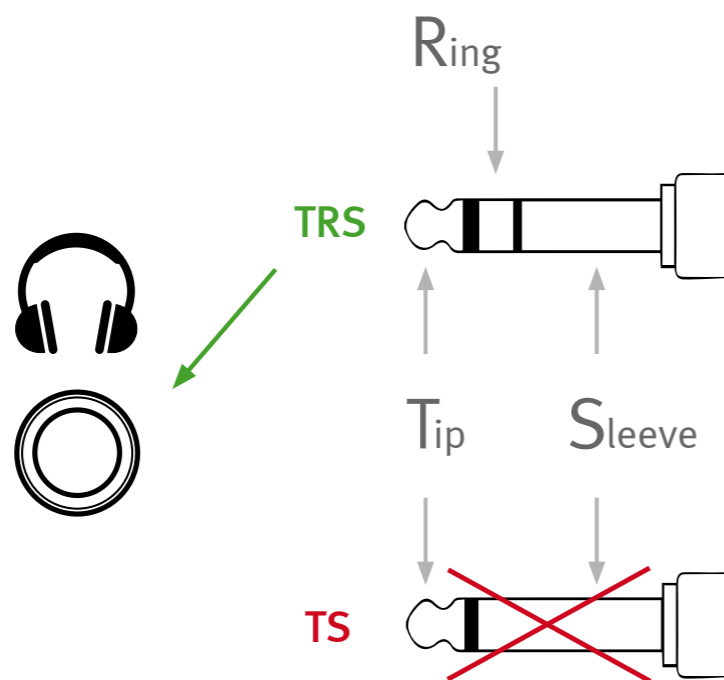
Make sure the Volume control is turned hard left before you power up the unit. Now control Volume. Note that too high levels can damage headphones and hearing!

Always MUTE the input before plugging in or unplugging a pair of headphones. Otherwise the power amplifier may be damaged by a short circuit.



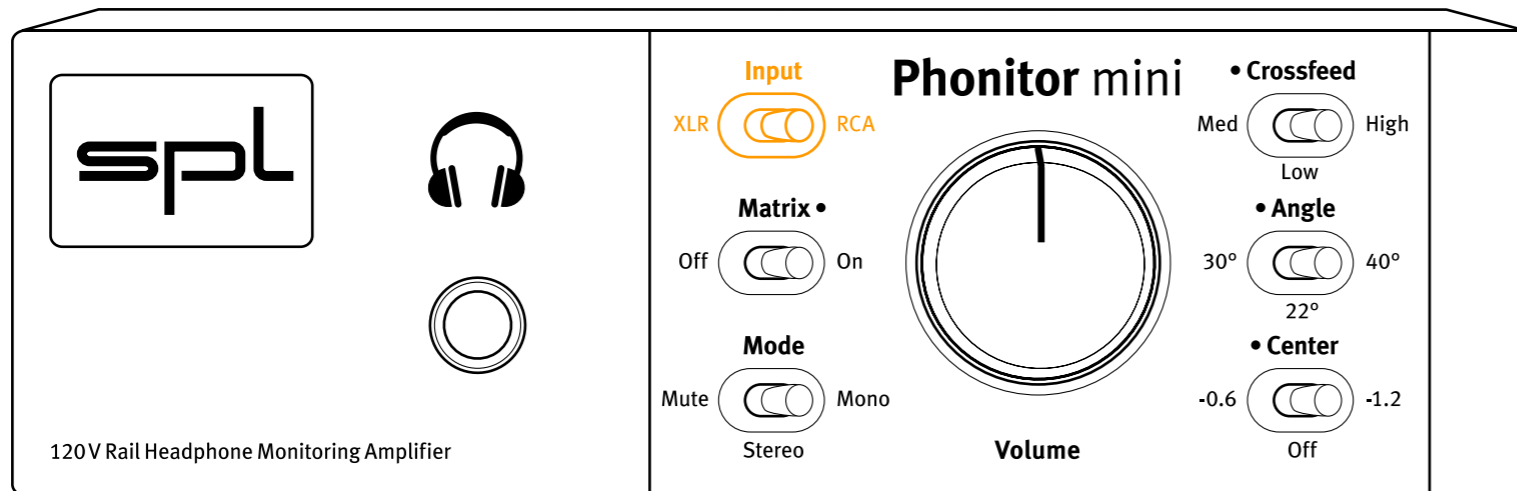
## ▶ Warning

Never connect mono plugs (TS) to the stereo jacks on the front panel.





# Control Elements

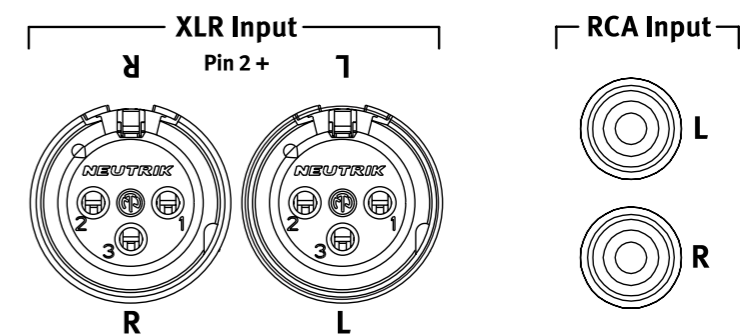
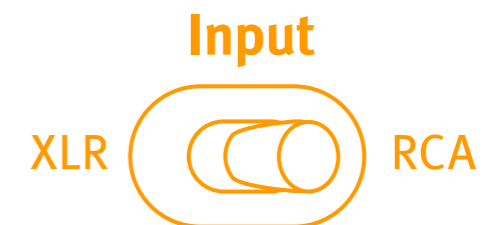


## ► Input: XLR or RCA

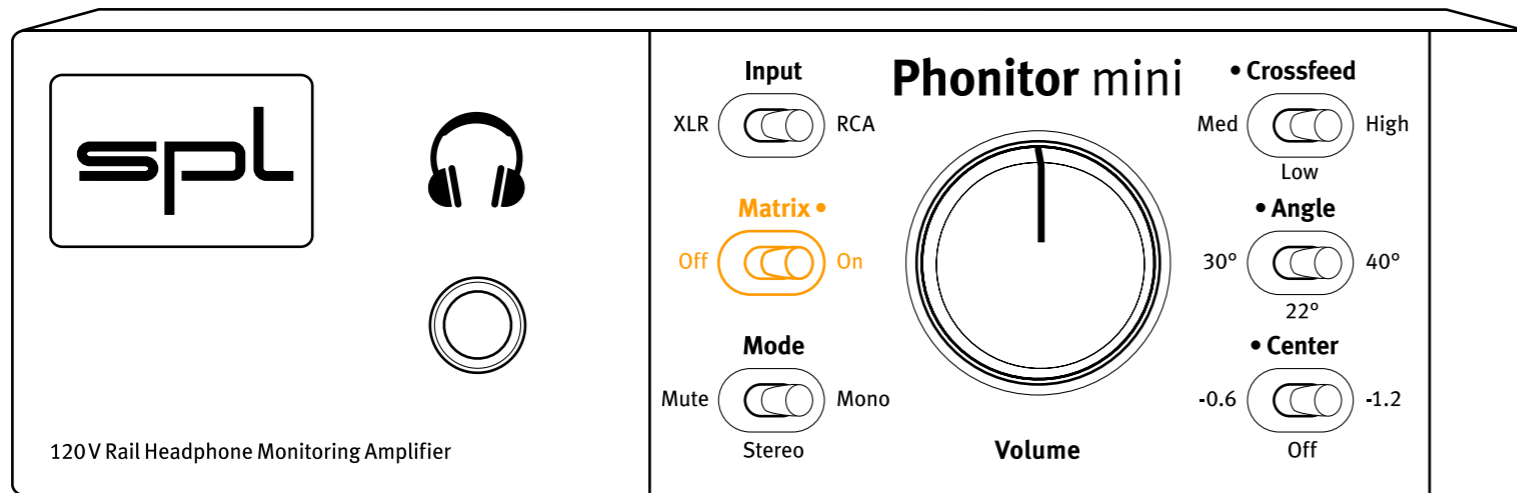
The Phonitor mini provides two different source connections. Use the Input switch to select one. Both switches are named after the inputs on the rear.

The RCA input is usually used to connect consumer products. Do note, however, that the XLR inputs can also be used to connect any unbalanced outputs.

Bear in mind that the level of the RCA input is raised from consumer level (-10 dBV) to studio level (+4 dBu).

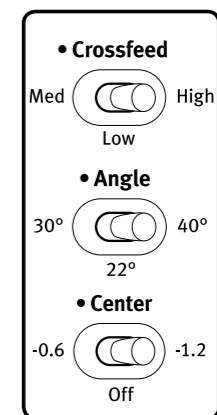
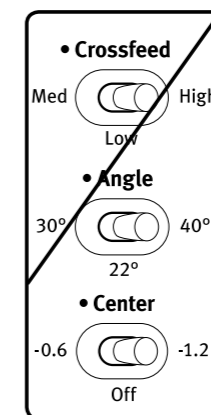


# Control Elements

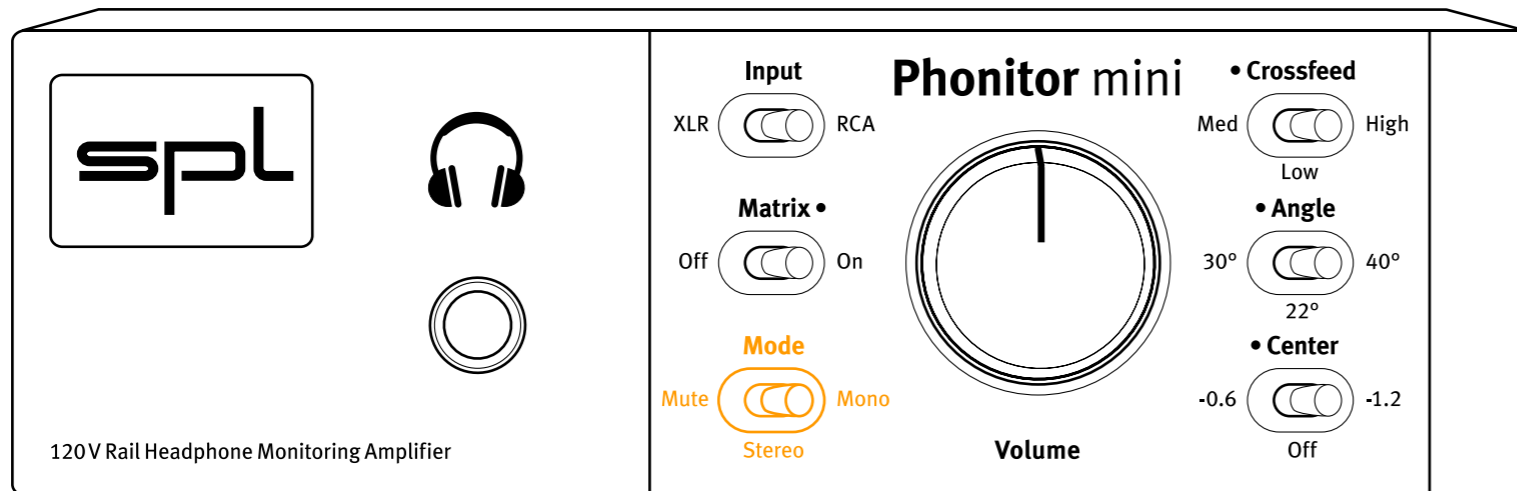


## ► Matrix: On or Off

With Matrix On/Off you switch on or off the Phonitor-Matrix globally. On activates Crossfeed and Angle, while Off deactivates them. A/B comparisons can be made directly.



# Control Elements



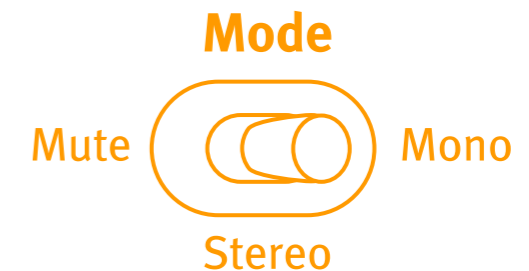
## ► Mode: Stereo, Mono or Mute

The standard setting of the switch is „Stereo,“ to play back stereo signals.

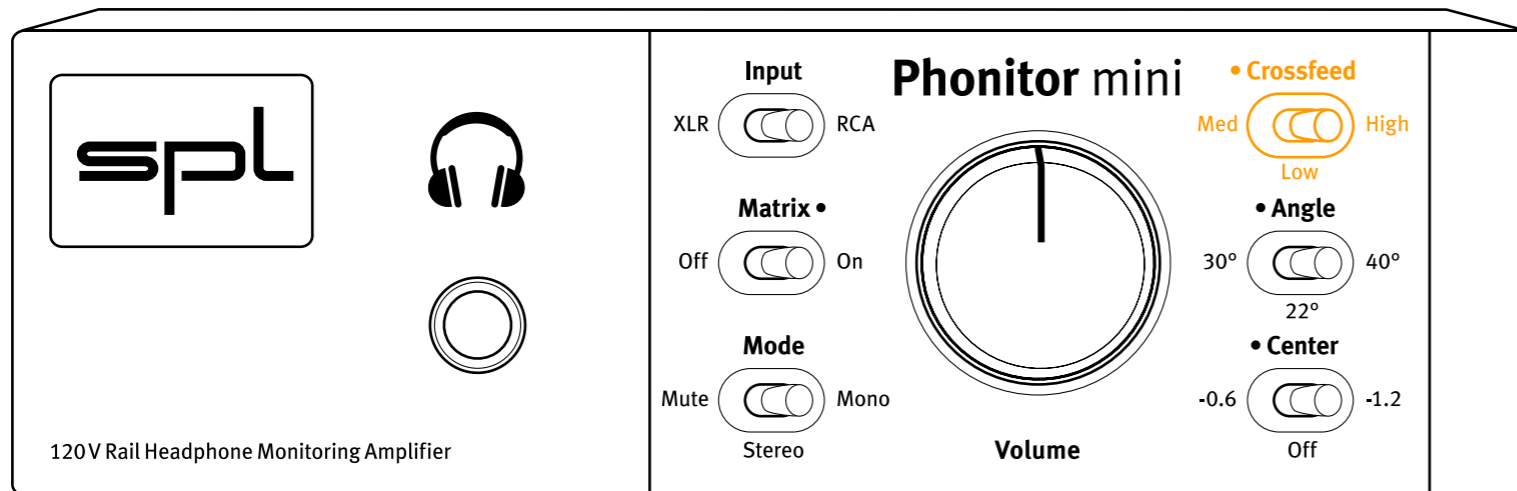
The mono switch sums the two channels that make up the stereo signal.

The mono switch is important to check the mono compatibility of the mix. Even if this mono compatibility test is not as important today as it used to be, it is still essential for radio mixes and vinyl productions.

In the „Mute“ position, the headphones output is silenced. This is indicated by the Volume control's color, which changes from yellow to red.



# Control Elements



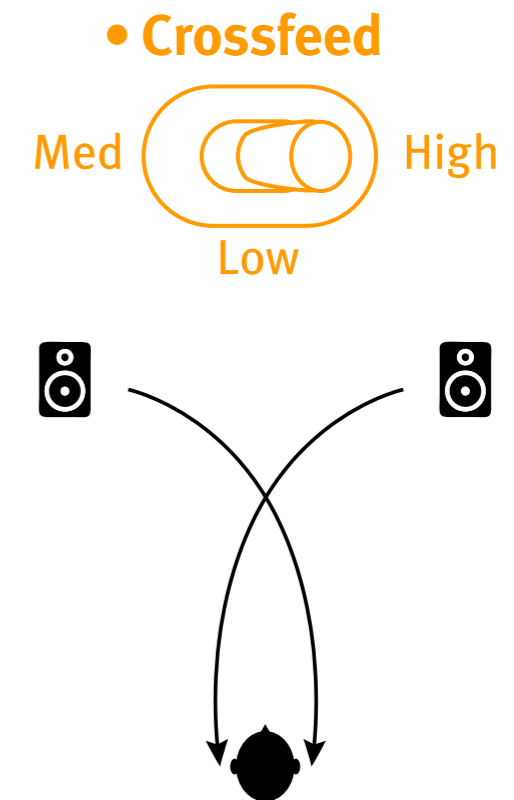
## ► Crossfeed: Low, Med or High

The Crossfeed switch determines the volume-dependent, frequency-corrected channel crosstalk, which is something that occurs naturally with speakers, due to their sound projection into a room. This is called „Interaural Level Difference“ (ILD).

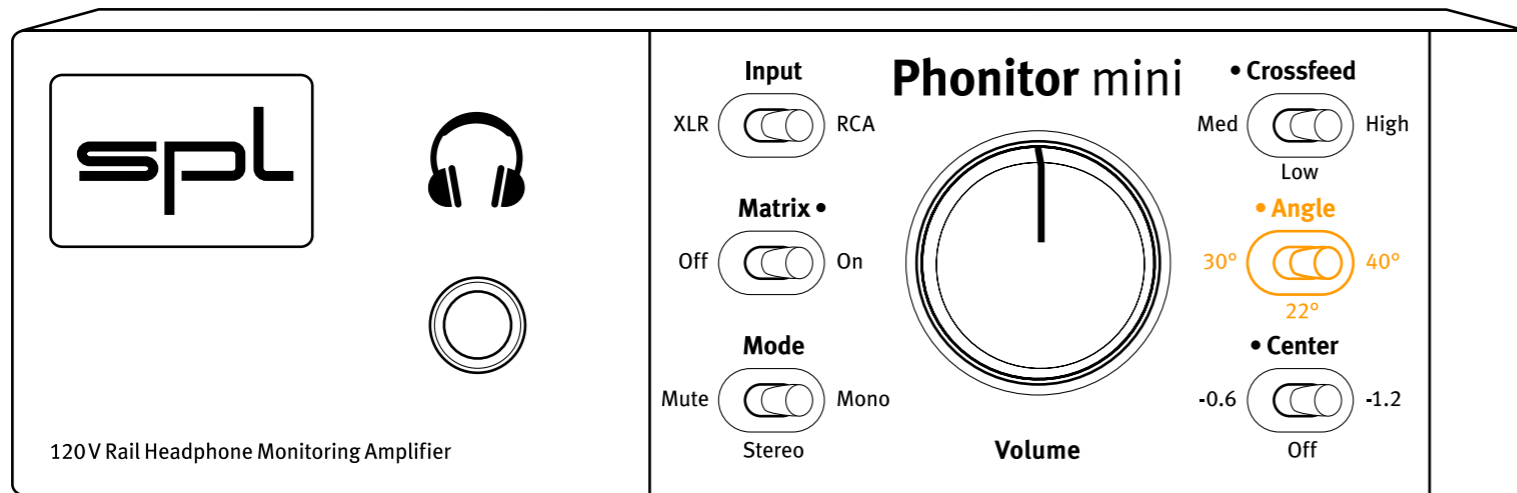
The different Crossfeed values could be compared to the influence of different room sizes and characteristics on the same loudspeaker settings.

The settings available are: „Low,“ „Med“ and „High.“

Crossfeed interacts with the Angle setting to determine the stereo image.



# Control Elements

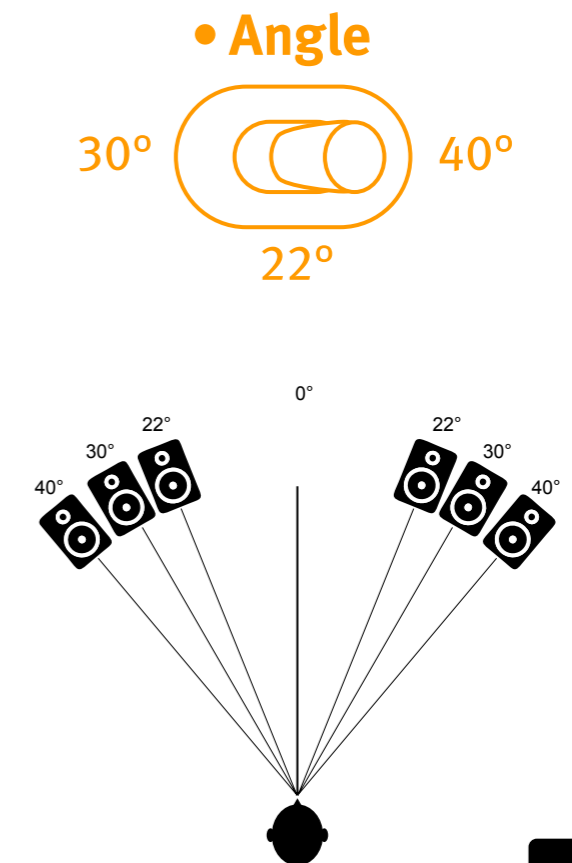


## ► Angle: 30°, 22° or 40°

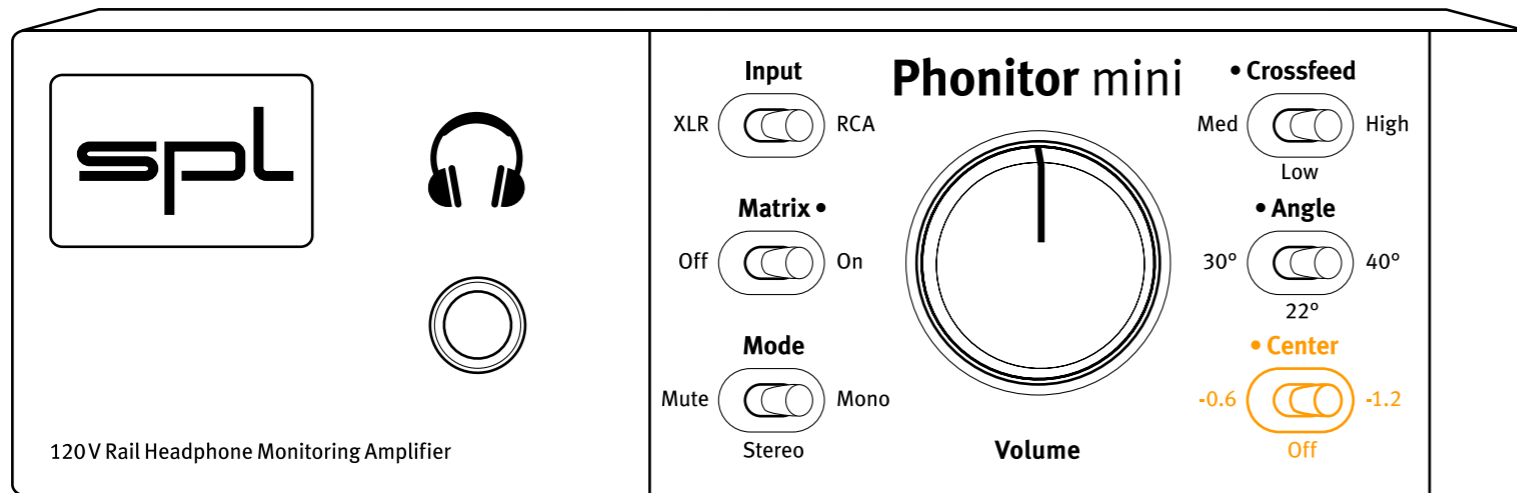
With the Angle switch you define the frequency-corrected channel crosstalk. In this case, we are dealing with „Interaural Time Difference“ (ITD). The influence of the point in time at which the signal reaches the opposite ear corresponds to the variation of the angle at which a real loudspeaker pair is placed.

You can select either 30°, 22° or 40° angles.

**Tip:** When you use headphones whose loudspeakers are slightly tilted forward (Ultrasone with S-Logic or Audeze), we recommend you not to use the 30° setting, but rather the 40° setting, to make up for the tilting.



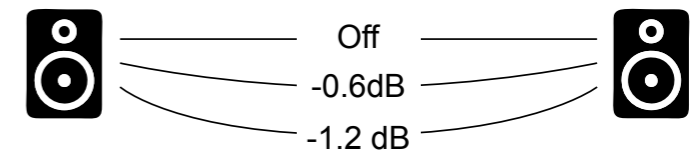
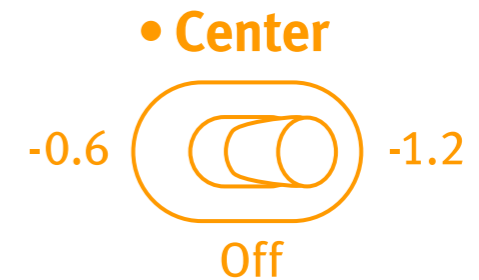
# Control Elements



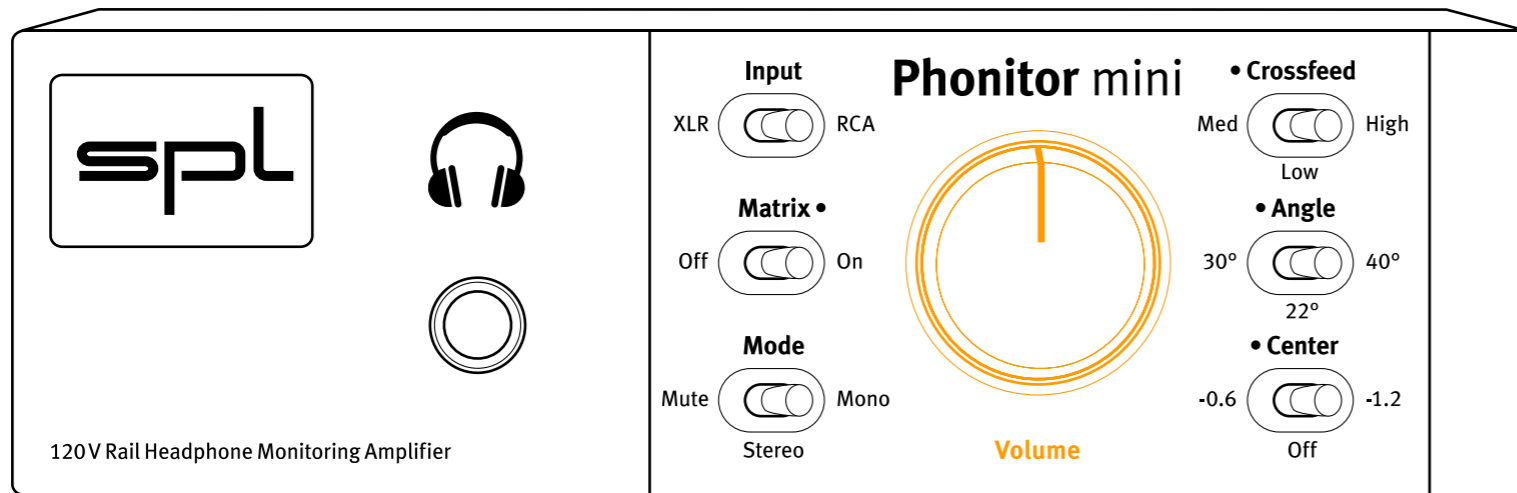
## ► Center: -0,6 dB, -1,2 dB or Off

Normally, when using headphones, the mid signal is lower than the side signals, which seem louder due to the Super Stereo effect. When you adjust the stereo image of the speakers with the Crossfeed and Angle settings, the mid component may drop quite intensively. During mixdown you would counteract this, so that the phantom image at the center seems lower when playing back through loudspeakers. Thanks to the damping of the center, the mid signal is once again in balance with the stereo signal.

You can choose between three different settings: -0.6 dB, -1.2 dB or Off. When playing back music that has been already mixed down, the Off position is the one that will render the most authentic result.



# Control Elements



## ► Volume

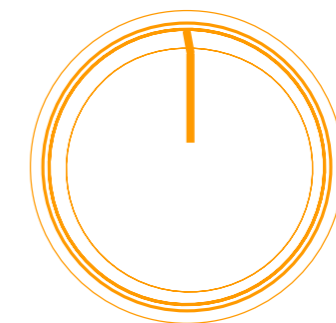
The Volume level control allows you to decrease the signal level from between 0 and -80 dB.

If the volume control is hard right, it is not set to 0 dB but rather to +7 dB.

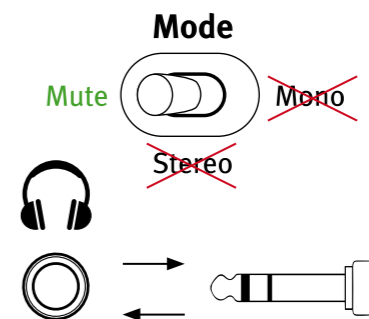


Always MUTE the input before plugging in or unplugging a pair of headphones. Otherwise, your headphones, ears or the power amplifier of the Phonitor may result damaged..

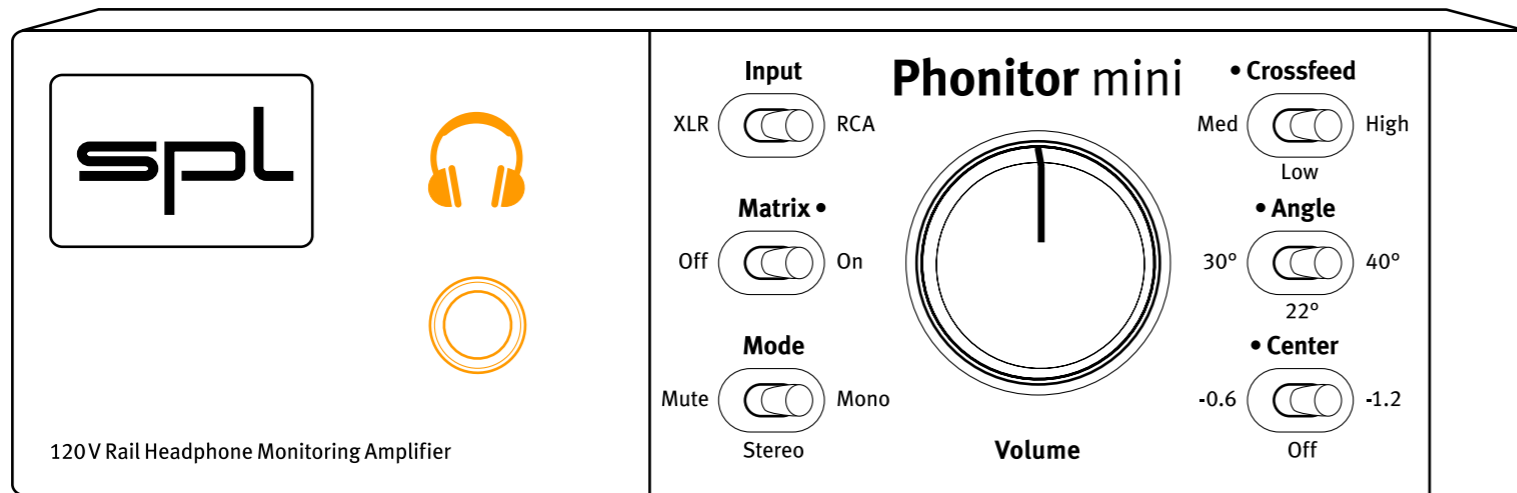
Phonitor mini



Volume



# Control Elements



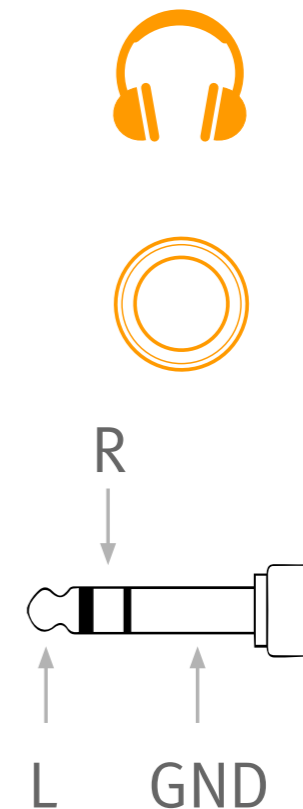
## ▶ Headphone Connection

Connect headphones to the standard 1/4" (TRS) stereo plug on the lower left front panel.

The layout is:

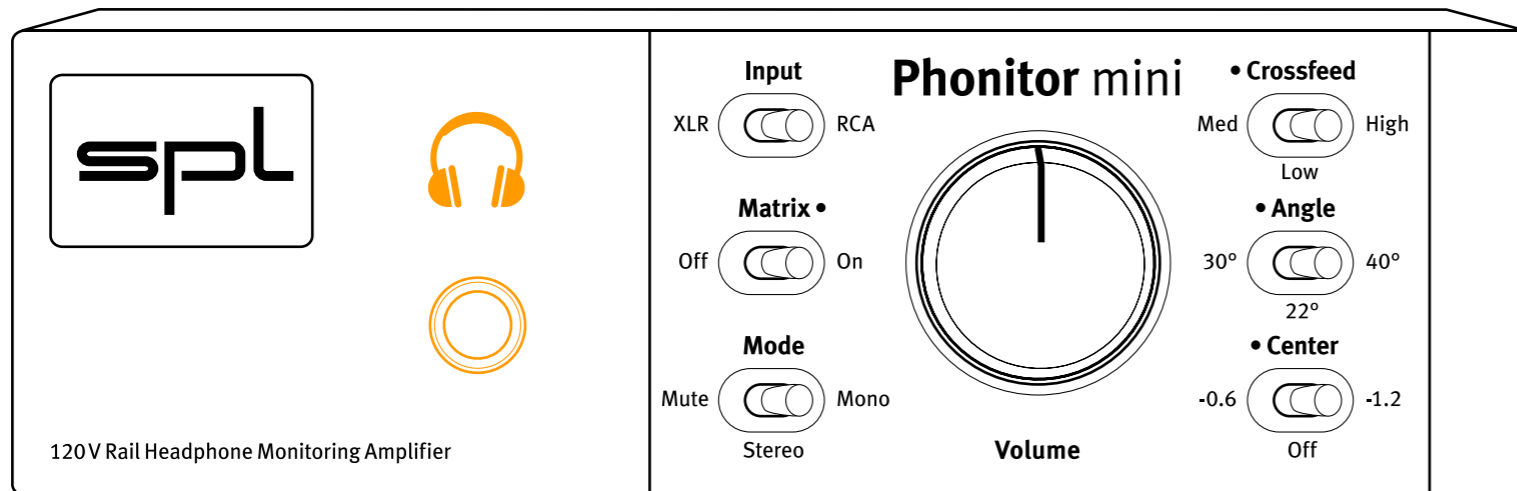
Tip = left channel, Ring = right Channel, Sleeve = ground

When connecting headphones, make sure that the plug is completely in and that it is firmly attached. If the plug is not correctly connected, it may cause a short circuit that could damage the power amplifier.





# Control Elements



## ▶ Headphone Connection

Reduce volume level before you remove or plug in the headphone (or when switching headphones).

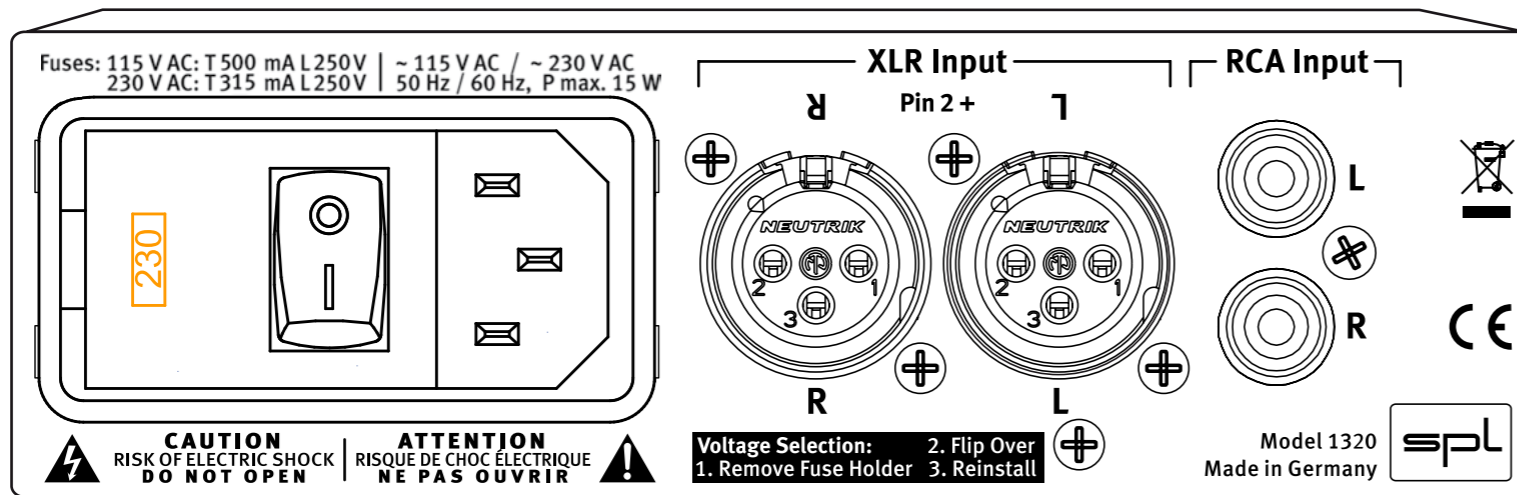
That way you avoid loud crackles from reaching your ears or the power amplifier of the Phonitor mini being damaged due to the brief short circuit when plugging in or unplugging.



### Warnung:

Never connect mono plugs (TS) to the stereo jacks on the front panel. Headphones always have stereo plugs, which is the reason why you should always connect them directly.

# Rear Panel: Power

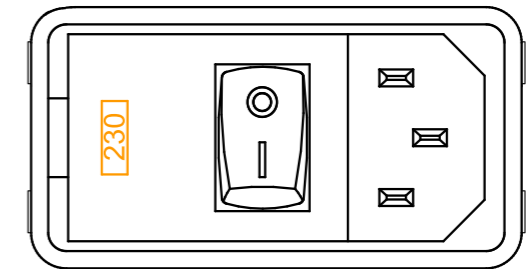


## ► Voltage Select

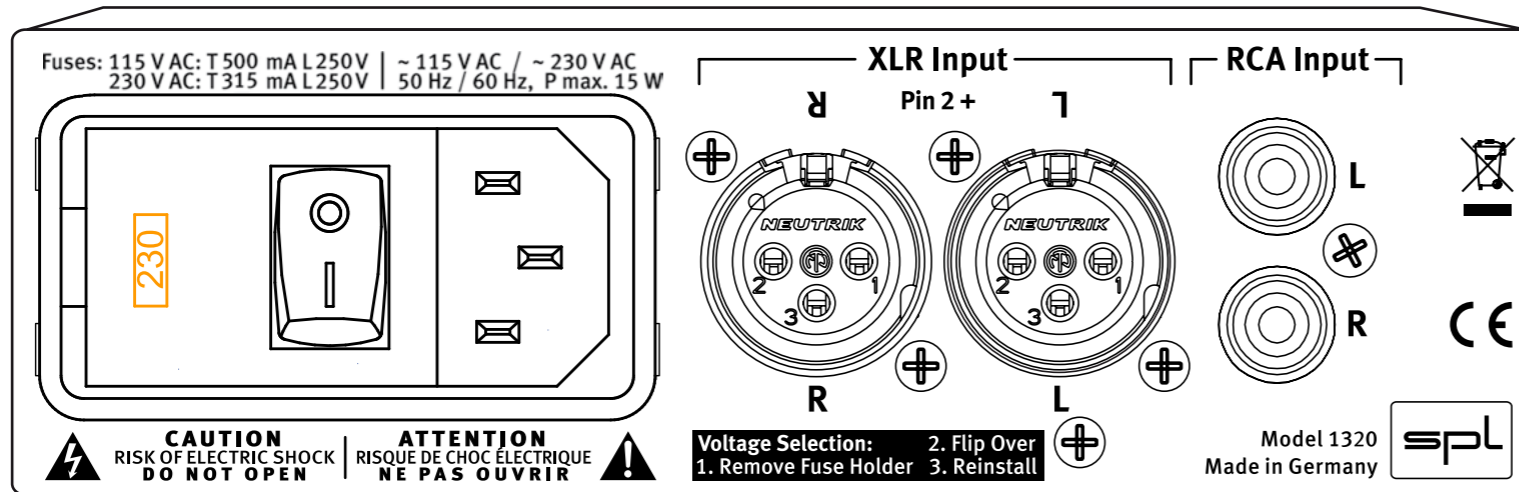
Before connecting the Phonitor mini to the mains, make sure that the voltage selection corresponds to the values of your local power grid (230 or 115 volts).

In German-speaking regions, it is usually 230V.

The mains connector on the rear panel integrates a fuse box that includes fuses for both voltage ranges. If the voltage indicated does not correspond to the one required, change it by following the procedure on the next page.

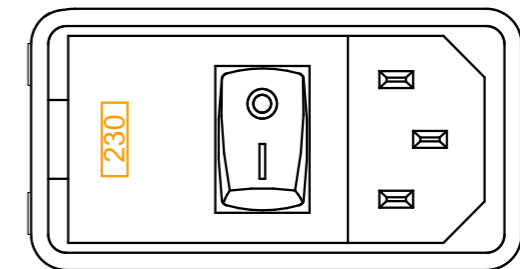


# Rear Panel: Power



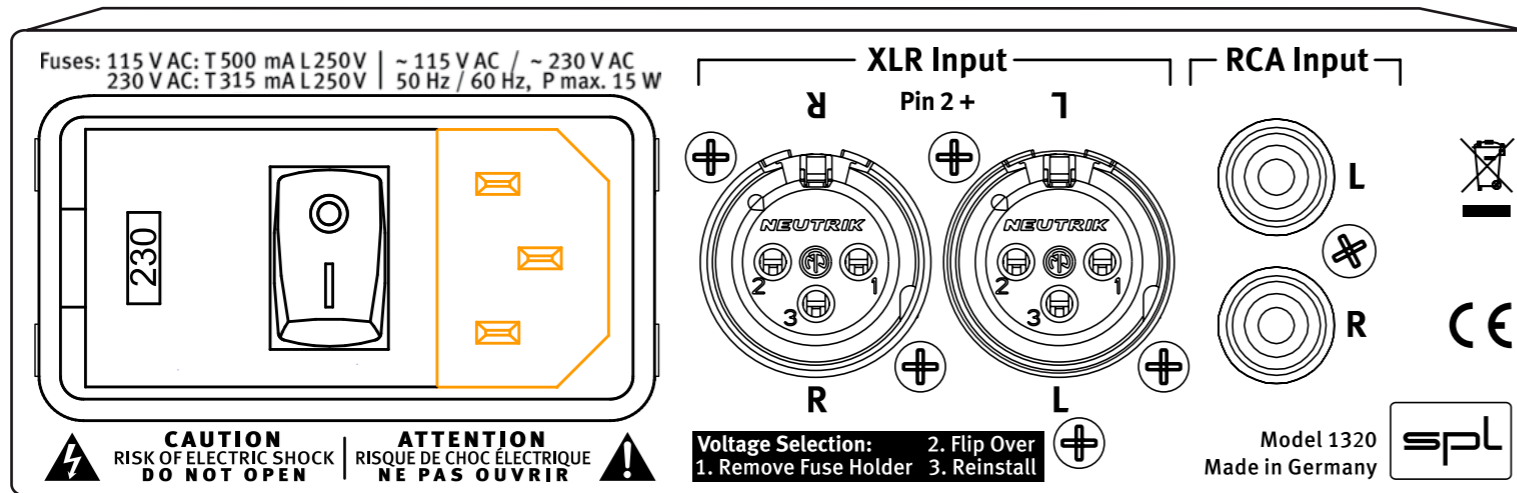
## ▶ Voltage Select

Open the power connector lid with a small screwdriver. There are two tiny slots on the outside. Use the screwdriver to lever the red fuse box from above until you can grab it. Take the fuse box out, turn it around 180 degrees and place it back again. When you close the lid again, you should see the correct voltage displayed in the opening.



**Voltage Selection:** 2. Flip Over  
1. Remove Fuse Holder 3. Reinstall

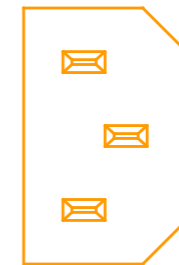
# Rear Panel: Power



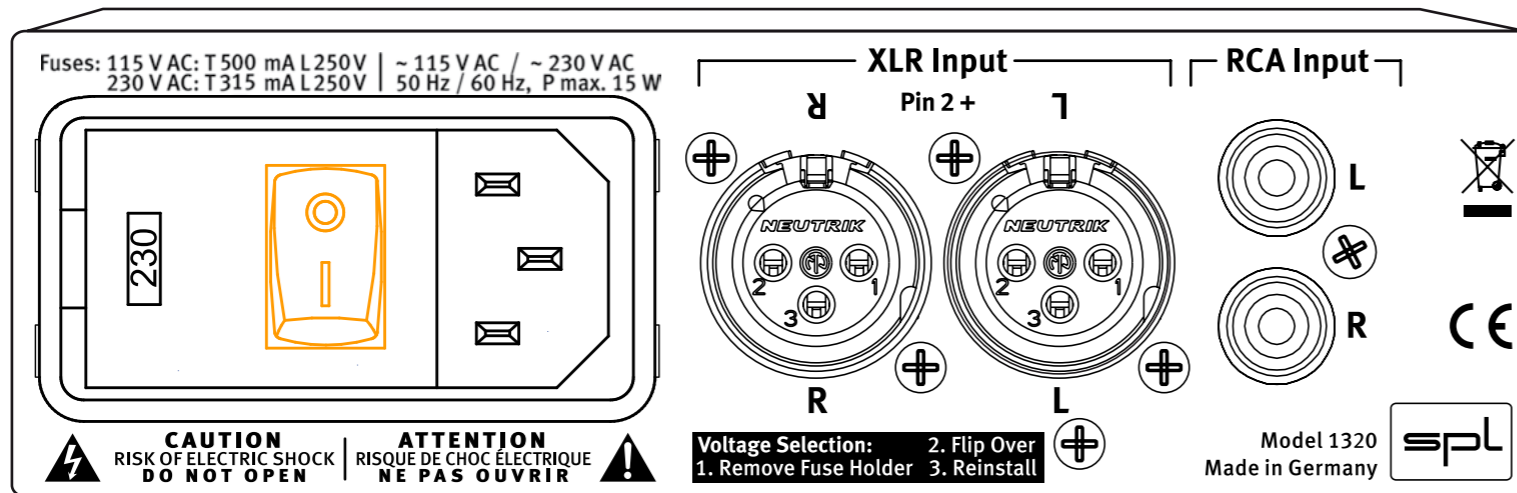
## ► Power Connection

Connect the included power cord to the rear, 3 pin power input.

The transformer, power cord and inlet of the appliance conform to VDE, UL and CSA requirements.



# Rear Panel: Power

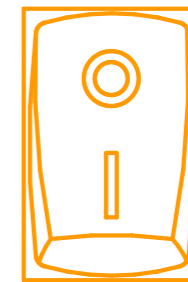


## ► On/Off Switch

Use the rear on/off switch to activate and deactivate the unit. The operational status is indicated by the illuminated Volume control on the front panel. We deliberately chose to place the switch on the rear panel in order to avoid interferences from power wiring through the unit to the front panel.

When switching on and off, you do not need to follow any particular sequence with connected devices in the periphery of the unit. There is, however, a general rule for audio devices connected together: always turn on power amplifiers last and turn them off first.

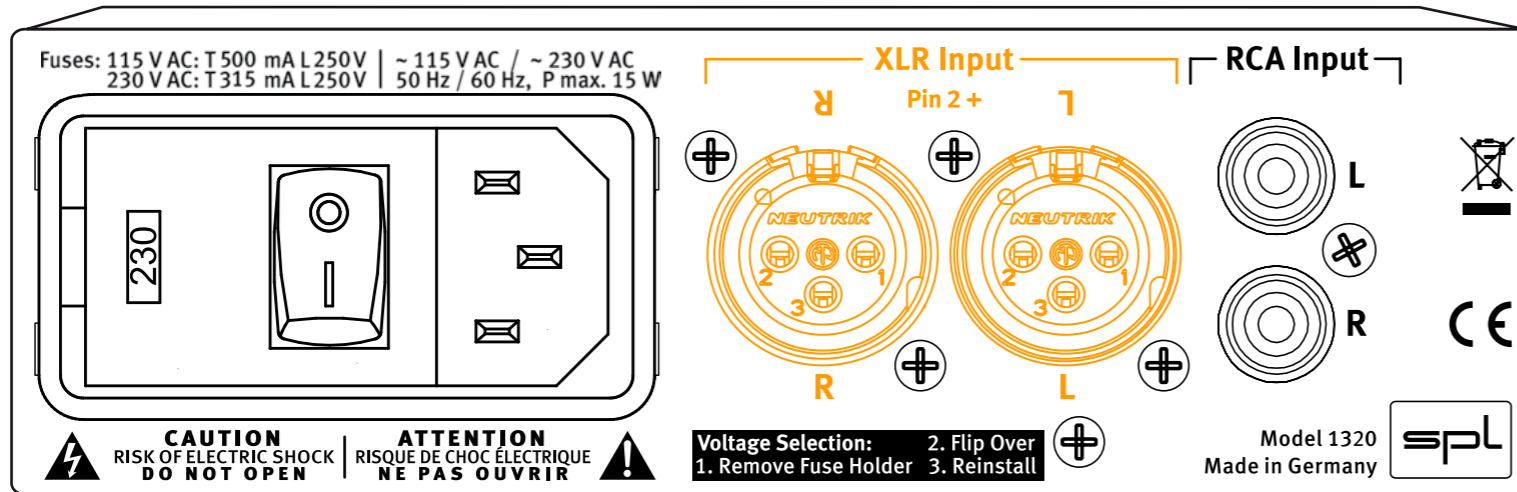
If sufficiently specified, you can also switch the unit on and off through a multiway connector or other main switches.



### Caution:

Before connecting any other equipment – and in all other cases where you are connecting cables with or from other sources – you should be sure to switch off the Phonitor mini and all other devices you want to connect it to. Otherwise you risk damaging the unit, other connected gear and/or your ears.

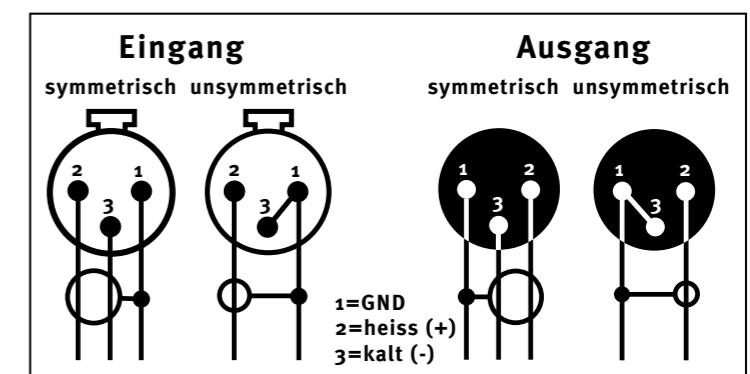
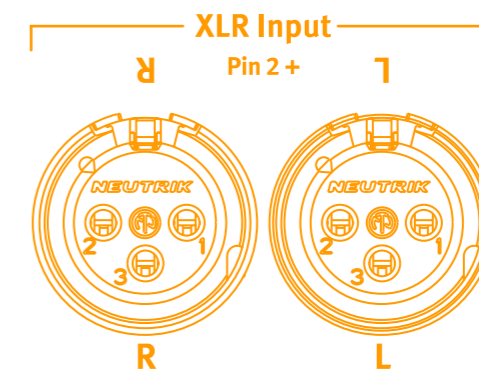
# Rear Panel: Signals



## ► XLR Sockets

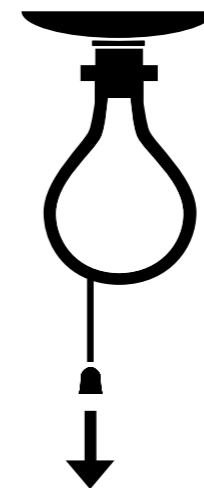
The image below shows the XLR connectors pinout. They are balanced and have three conductors or wires. Conductor 2 (Pin 2) corresponds to the (+) or hot Signal.

The diagram also shows how to wire the balanced XLR connections if unbalanced connections are required, for example to RCA or TS inputs and outputs



## ▶ Setting up the Phonitor Matrix in three steps

1. Initially choose your audio material from sources you know well, and in a first production, that which is similar to what you wish to mix. It is not sensible to listen to classic music while planning a Phonitor mini setup to mix a pop production. Classic music stereophony recording involves a much more restricted stereo width than pop or rock music, where artificial “panorama stereophony“ often provides for a much broader imaging.
2. Do notice, that the Phonitor mini can be easily and quickly operated to do listening comparisons.  
Use the following settings as a starting point:  
Crossfeed: Med, Angle: 30°, Center Level: Off

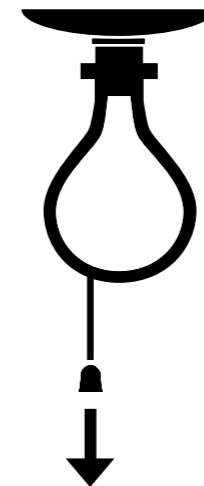


## ▶ Setting up the Phonitor Matrix in three steps

### 3. Activate Crossfeed, Angle and Center

In order to hear the same as with loudspeakers, the audio channels receive now precisely calculated time, level and frequency corrections.

First of all, you should check the correct stereo width. If the stereo image on your headphones seems too narrow or too wide, you can always apply two corrections: Angle or Crossfeed.





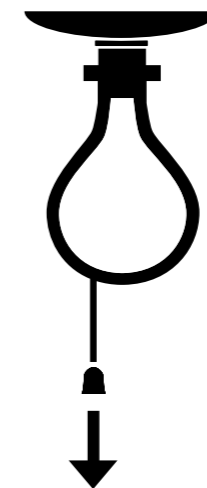
## ► Setting up the Phonitor Matrix in three steps

### Angle:

First of all, you should approximate the desired stereo width with the Angle control (which corresponds to the positioning angle of a real loudspeaker set), and then adjust the Crossfeed (which corresponds to the influence of the room size and damping on the loudspeaker).

An increase of the angle results in the signal needing more time to reach the opposite ear. This is called Interaural Time Difference (ITD).

Tip: When you use headphones whose loudspeakers are slightly tilted forward (Ultrasone with S-Logic or Audeze), we recommend you not to use the 30° setting, but rather the 40° setting, to make up for the tilting.

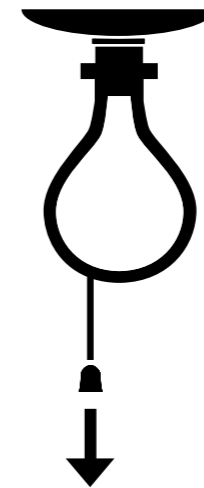


## ▶ Setting up the Phonitor Matrix in three steps

### Crossfeed:

If you increase the Crossfeed value, a higher amount of signal is added to the opposite side.

Which results in a smaller Interaural Level Difference.



## ▶ Setting up the Phonitor Matrix in three steps

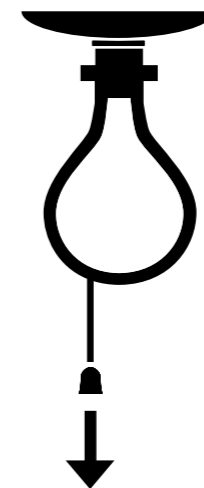
### Center:

After you have set up Crossfeed and Angle you can then determine your Center Level setting.

When simply playing back audio material (home use), the Center function can usually be set to Off.

When mixing, the phantom center is usually too low. However, it can become too loud after applying Crossfeed and Angle corrections.

If you were to disregard the Center, mid signals could be too low in the mix. Bring down the phantom center to avoid this effect.



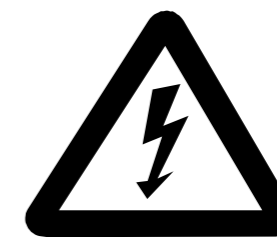
## ▶ Exclamation mark within a triangle

An exclamation mark within a triangle is intended to make you aware of important operational advice and/or warnings that must be followed. Be especially attentive to these and always follow the advice they give.



## ▶ Lightning symbol within a triangle

In this Manual a lightning symbol within a triangle warns you about the potential for dangerous electrical shocks – which can also occur even after the device has been disconnected from a power source



## ▶ Symbol of a lamp

The symbol of a lamp directs your attention to explanations of important functions or applications.



# Security Advices

## ▶ Connections

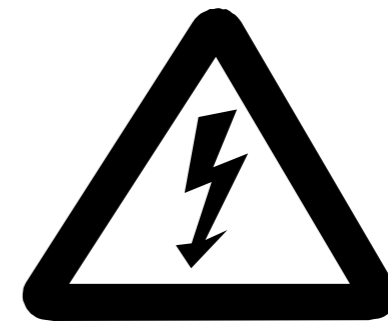
Only use the connections as described. Other connections can lead to health risks and damage the equipment.

## ▶ Water and humidity

Do not use this device anywhere near water (for example in a bath room, a damp cellar, near swimming pools, or similar environments). Otherwise you are dealing with an extremely high risk of fatal electrical shocks!

## ▶ Insertion of objects or fluids

Be careful to not insert any object into any of the chassis openings. You can otherwise easily come into contact with dangerous voltage or cause a damaging short circuit. Never allow any fluids to be spilled or sprayed on the device. Such actions can lead to dangerous electrical shocks or fire!



# Security Advices

## ▶ Air ventilation

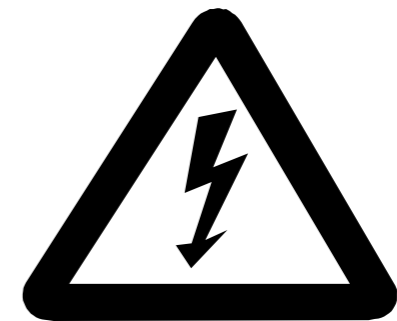
Chassis openings offer ventilation and serve to protect the device from overheating. Never cover or otherwise close off these openings. Never place the device on a soft surface (carpet, sofa, etc.).

## ▶ Electrical power

Operate the device only from power sources that can provide proper power. When in doubt about a source, contact your dealer or a professional electrician. To be certain you have isolated the device, disconnect all power and signal connections. Make sure that the power supply plug is always accessible. When not using the device for a longer period, make sure to unplug it from your wall power socket.

## ▶ Opening the unit

Simply put: DON'T, if you are not a certified SPL technician or engineer. Really: Do not open the device housing, as there is great risk you will damage the device, or – even after being disconnected – you may receive a dangerous electrical shock!



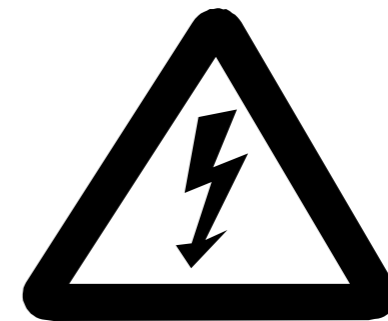
# Security Advices

## ▶ Power connection overloads

Avoid any kind of overload in connections to wall sockets, extension or splitter power cords, or signal inputs. Always keep manufacturer warnings and instructions in mind. Overloads create fire hazards and risk of dangerous shocks!

## ▶ Lightning

Before thunderstorms or other severe weather, disconnect the device from wall power; do not do this during a storm in order to avoid life threatening lightning strikes. Similarly, before any severe weather, disconnect all the power connections of other devices and antenna and phone/network cables which may be interconnected so that no lightning damage or overload results from such secondary connections.



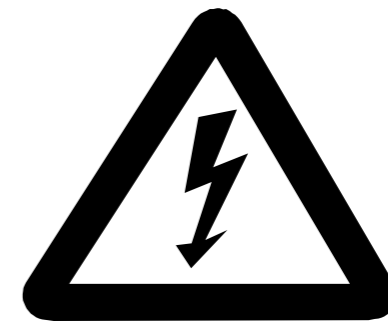
# Security Advices

## ▶ Controls and switches

Operate the controls and switches only as described in the manual. Incorrect adjustments outside safe parameters can lead to damage and unnecessary repair costs. Never use the switches or level controls to effect excessive or extreme changes.

## ▶ Repairs

Unplug the unit from all power and signal connections and immediately contact a qualified technician when you think repairs are needed – or when moisture or foreign objects may accidentally have reached inside the housing, or in cases when the device may have fallen and shows any sign of having been damaged. This also applies to any situation in which the unit has not been subjected to any of these unusual circumstances but still is not functioning normally or its performance is substantially altered. In cases of damage to the power supply and cord, first consider





# Security Advices

## ▶ Replacement/substitute parts

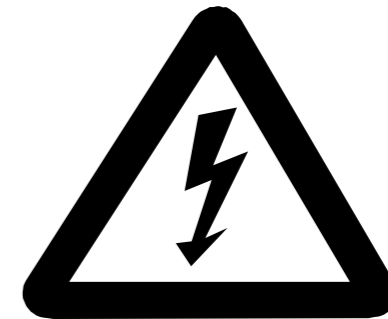
Be sure that any service technician uses original replacement parts or those with identical specifications as the originals. Incorrectly substituted parts can lead to fire, electrical shock or other dangers, including further equipment damage.

## ▶ Safety inspection

Be sure always to ask a service technician to conduct a thorough safety check and ensure that the state of the repaired device is in all respects up to factory standards.

## ▶ Cleaning

Do not use any solvents, as these can damage the chassis finish. Use a clean, dry cloth (if necessary, with an acid-free cleaning oil). Disconnect the device from your power source before cleaning.



## ► Declaration of CE Conformity

The construction of this unit is in compliance with the standards and regulations of the European Community.

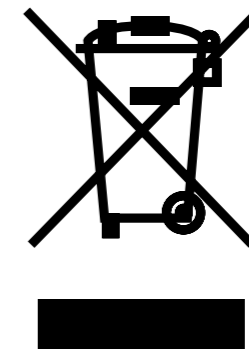


## ► Notes on Environmental Protection

At the end of its operating life, this product must not be disposed of with regular household waste but must be returned to a collection point for the recycling of electrical and electronic equipment. The wheelie bin symbol on the product, user's manual and packaging indicates that. The materials can be reused in accordance with their markings. Through reuse, recycling of raw materials, or other forms of recycling of old products, you are making an important contribution to the protection of our environment.

Your local administrative office can advise you of the responsible waste disposal point.

WEEE Registration: 973 349 88



## ► Contact

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Fax (0 21 63) 98 34 20  
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Website & Blog: [spl.info](http://spl.info)

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