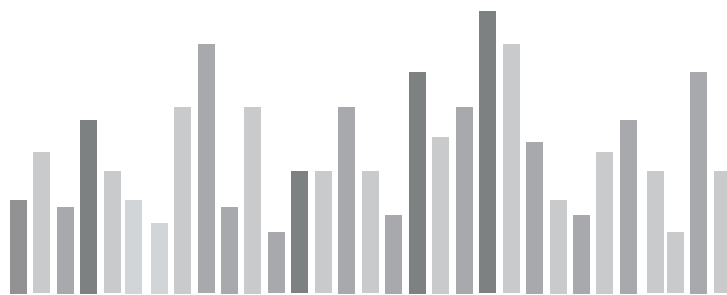
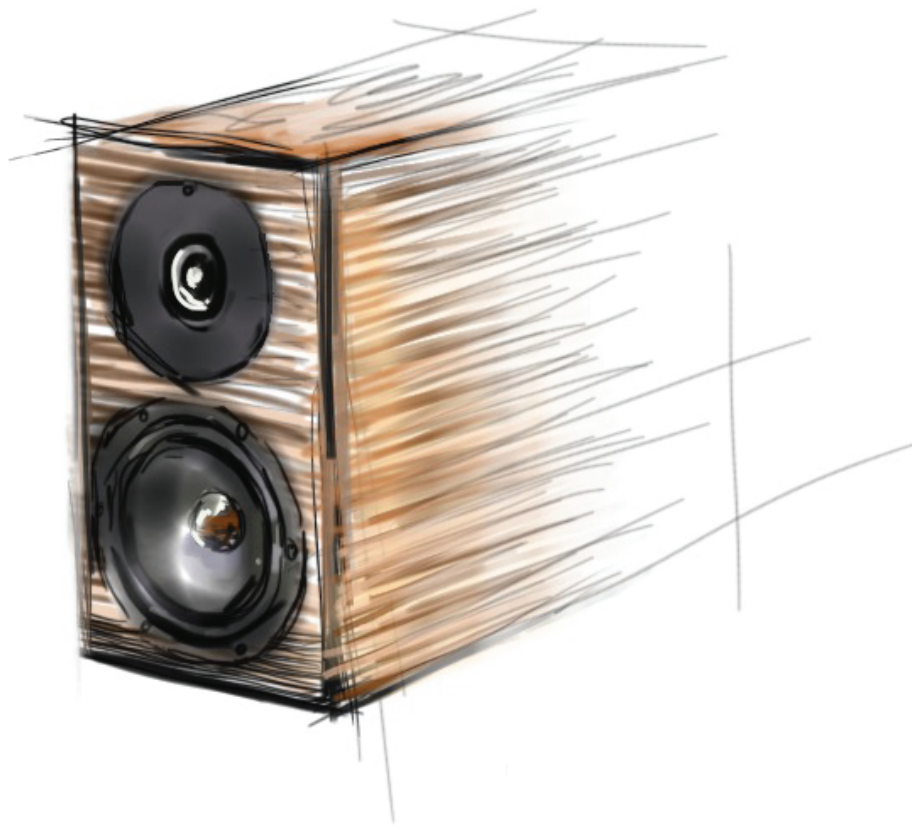


PENAUDIO[®]

auditional wellbeing™



User's manual

PENAUDIO Ltd.

Penaudio Ltd is a Finnish based company that has manufactured loudspeakers since 1999 from the best and highest quality materials available. PENAUDIO loudspeakers are made without compromising the quality of sound. The loudspeakers are designed based on listening impressions in the actual listening environment. All components are hand picked after several hours of listening. Measurements and simulations are used to support the listening impressions or to resolve disharmony. Listening tests are conducted in several environments with different kinds of rooms, acoustics, and equipment. For example, we use all types of amplifiers (solid state, tubes and D-class) during listening tests.

PLACEMENT



WALLS: PENAUDIO loudspeakers should not be placed too close to the corners of a room or the back wall because each boundary boosts the output of the speaker +1-3dB.

Due to physics laws a boost in sound will usually affect the bass frequencies (40-200Hz). This results in base distortion and an overall inaccurate experience. Therefore, more space around PENAUDIO loudspeakers will increase the sound quality and listening experience.

We recommend 50cm measured from back of the speaker to the side wall/back wall to avoid these room effects. Still, it is useful to experiment with different positions until you find the perfect 'stereo image' for yourself. Every person hears sound differently - therefore, your personal setting may differ from others - go ahead - experiment.

POSITIONING



MONITORS



FLOORSTANDERS

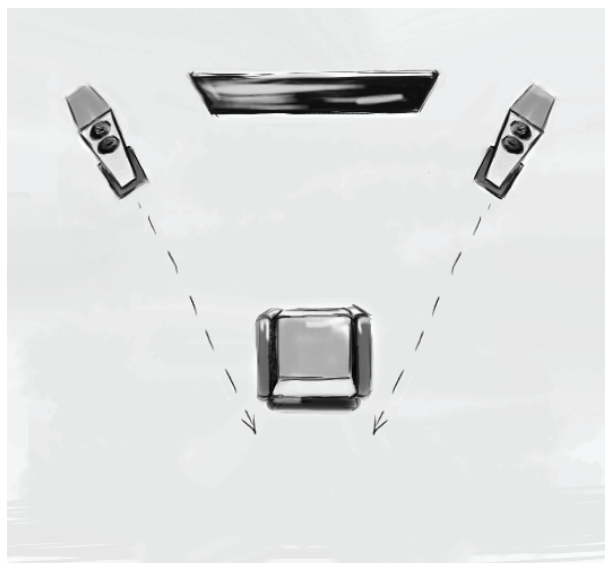
ADDITIONAL KEY DISTANCES:

The optimum listening distance of the PENAUDIO loudspeakers is from 2.0 to 3.5 meters, the distance between the loudspeakers being 1,6 - 3,4 meters. "Stereo image" is best achieved when there is an equilateral triangle between the PENAUDIO loudspeakers and the listener. If possible, we recommend this to achieve the best result. Widening the "listening triangle" creates a wider, but not such a pin-point "stereo image". Conversely, narrowing the "listening triangle" makes the "stereo image" more accurate but also more narrow.



TOEING IN

PENAUDIO speakers are designed to create the best performance when they are facing you while sitting comfortably in your listening location. You can also tune the sound more suitable for your taste by turning the loudspeakers slightly inward more – this will result in a more accurate sound – at the possible expense of losing some 3D imaging. The PENAUDIO founder and designing engineer prefers a more “open” setting rather than a too accurate sound obtained with slightly inward facing loudspeakers.



REFLECTIONS



ABSORPTION/DIFFUSIVE MATERIAL



Your listening spot shouldn't be too close to the back wall as it will also have a negative effect on the sound quality due to early sound wave reflections. If the physical constraints of the room limit the location of your listening location, then we recommend treating the space with acoustic materials to minimize or remove wave reflection.

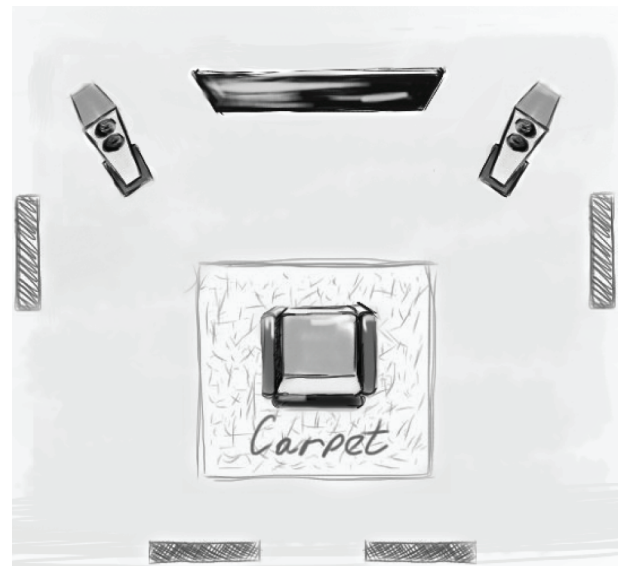
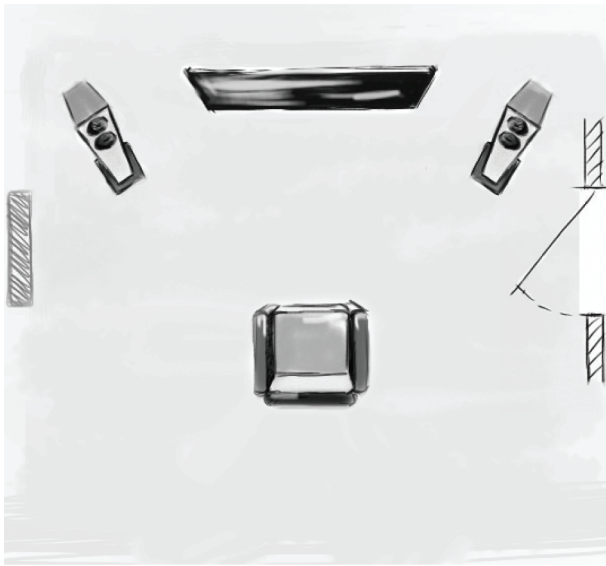
In summary - regarding PENAUDIO loudspeaker placement, it is worth taking the time to locate the best positioning for your loudspeakers and your listening spot. Correctly placed, PENAUDIO loudspeakers produce an authentic and astounding impression of an orchestra, a recording studio, or any other space where instruments have been recorded.

Enjoy your experience.

ROOM ACOUSTICS



Sound which reaches your ear, emitted from any loudspeaker, is affected by existing sound reflections within rooms. At worst, the reflections can make the sound shrill and inaccurate. This can be easily minimized with the help of furniture to absorb and minimize reflection. For example, you could place a bookshelf full of books or thick curtains behind the loudspeakers. The walls surrounding the loudspeakers could be also be adorned with bookshelves or paintings - each of which create audio diffusion and decreases reflections.



ABSORPTION MATERIAL



DIFFUSIVE MATERIAL



ABSORPTION MATERIAL

If one of your speakers is close to a hallway or open space that connects your listening room to another space and the other speaker is next to a sidewall you should treat the sidewall heavily with acoustical material to obtain the same kind of acoustical environment.

The same treatment can be applied to the listener. If the space behind the listener is also next to a hallway or open space it is useful to place a heavy rug on the floor between the listener and the loudspeaker. The acoustics of the rug can be enhanced by placing beneath it, for example, a thin layer of cell-foam. The rug prevents most of the reflection coming from the loudspeakers and the floor. It may also be worthwhile to move aside the coffee-table. It is desirable to leave enough space between your listening location and back wall to decrease echoes reflected from there. You could consider applying acoustic treatment behind you even if the back wall is far away.

CABLES AND CONNECTING THE LOUDSPEAKERS



Use proper cables with your loudspeakers because poor cables contain much resistance and inductance which will have a negative effect on the sound. Thickness is usually a good sign of cable quality as thicker cables retain the audio signal at a higher rate. We recommend keeping cables as short as possible for best results. This is because longer cables have more resistance and thus, ultimately delivering a lower signal quality to the loudspeaker. Ensure a full, complete, and tight connection of the cable to the speaker. It is beneficial to clean the contact areas of the cables - as well as loudspeakers pole screws - once a year.

Loudspeaker cables should be connected as follows:

Connect **(+)** to the red marked binding post and **(-)** to the black/white marked binding post.

AMPLIFIER

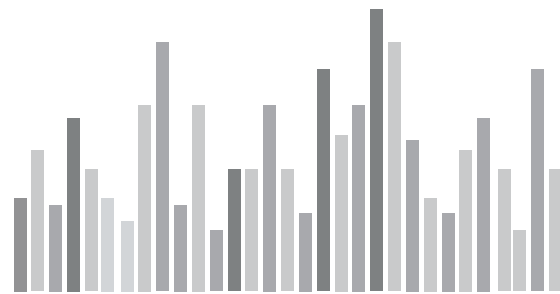


PENAUDIO loudspeakers have a nominal impedance of 4-8 ohms and their sensitivity varies between 85dB to 89dB – this allows an easy load for amplifiers. The sensitivity of the loudspeakers is quite moderate, therefore it is possible to have more power - especially in wooden structures, spacious rooms, and acoustically treated rooms. We recommend power amplifiers in the 50 – 300 W range for PENAUDIO loudspeakers.

LOUDSPEAKER FAILURE PREVENTION:

When amplifiers with low power seem inadequate to the listener, the usual mistake is to increase the bass and treble. This magnifies the amplification ten times higher forcing the over-strained amplifier to feed distorted signals into the loudspeakers, and ultimately burning the loudspeakers. Another mistake is to adjust the power too high when the source of the music is a CD player. CD players usually reach their peak at the halfway point of the amplifier power density. If the power is raised beyond that point, the drivers (most likely the tweeter) of the loudspeakers could become damaged. We therefore recommend caution when encountering such situations.





www.penaudio.fi

Manufacturer: PENAUDIO Ltd., Lappeenranta, Finland