



 *Sound Analyzer 4.1*


# QUICK SUMMARY


Acustica Applicata products: **DAAD, SOUND ANALYZER, POLIFEMO.**


## DAAD


- **What they are:** DaaD are passive acoustic device, they work both in absorbing and diffusing mode on wide range of frequencies, starting from each lower limit frequency, up to over 20KHz:  
DaaD4 from 60Hz, DaaD3 from 80Hz, DaaD2 from 120Hz.
- **What they do:** DaaD decrease the listening room reverb time that normally is too much for an high performance music listening.  
They are **TOTALLY NEUTRAL**.  
They work **MAINLY** on room **ARTICULATION** and then on tonal balance.  
Their rotation help us to tune the soundstage energy distribution.  
A correct DaaD positioning it's very useful to correct the frequent problem of asymmetric HiFi system position, inside listening rooms.

- **Where we have to put DaaD:** (see picture next page)

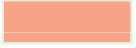
 **First:** in room corners where all the resonance frequencies match in.  
Preferred: DaaD4 and DaaD3.

 **Second:** in the first reflections along the walls; giving priority at those that are the closest to direct sound path.  
Preferred: DaaD3, DaaD2, Studio DaaD, Eco DaaD.

 **Third:** in the middle of soundstage.  
Preferred: DaaD3, DaaD2, Studio DaaD.

 **Fourth:** in the middle of lateral wall, if we have understood/measured that first mode of that length is strong.  
Preferred: DaaD4 and DaaD3.

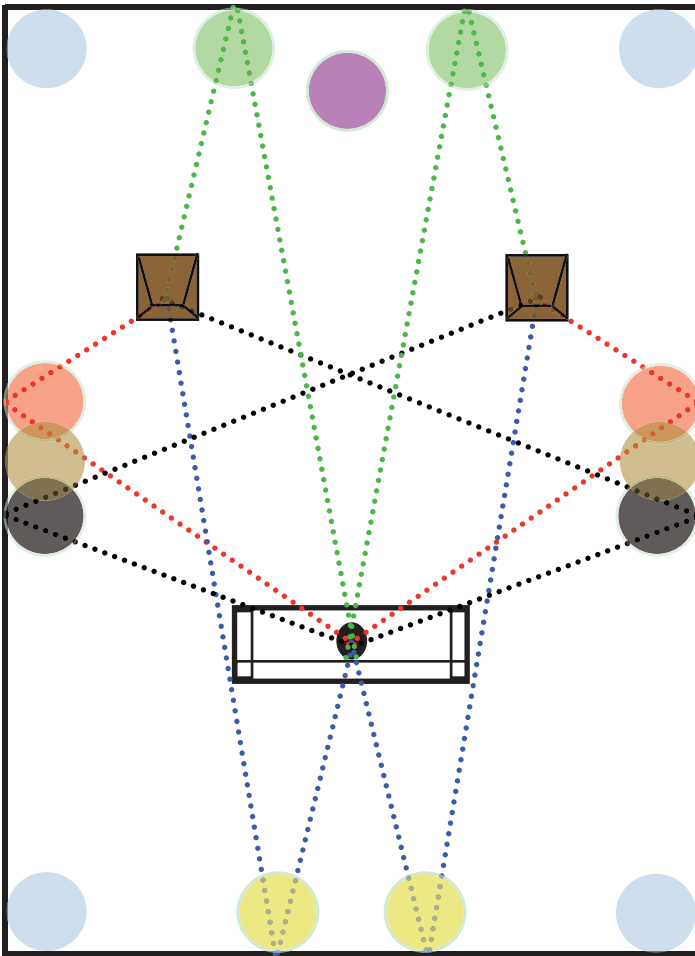
 **Fifth:** in the corner between lateral wall and ceiling, especially from loudspeakers to listening position.  
Preferred: Eco DaaD and DaaD2.

 **Sixth:** in the first reflection on the ceiling, especially when room height is lower than 250 cm.  
Preferred: DaaD2 and Eco DaaD.

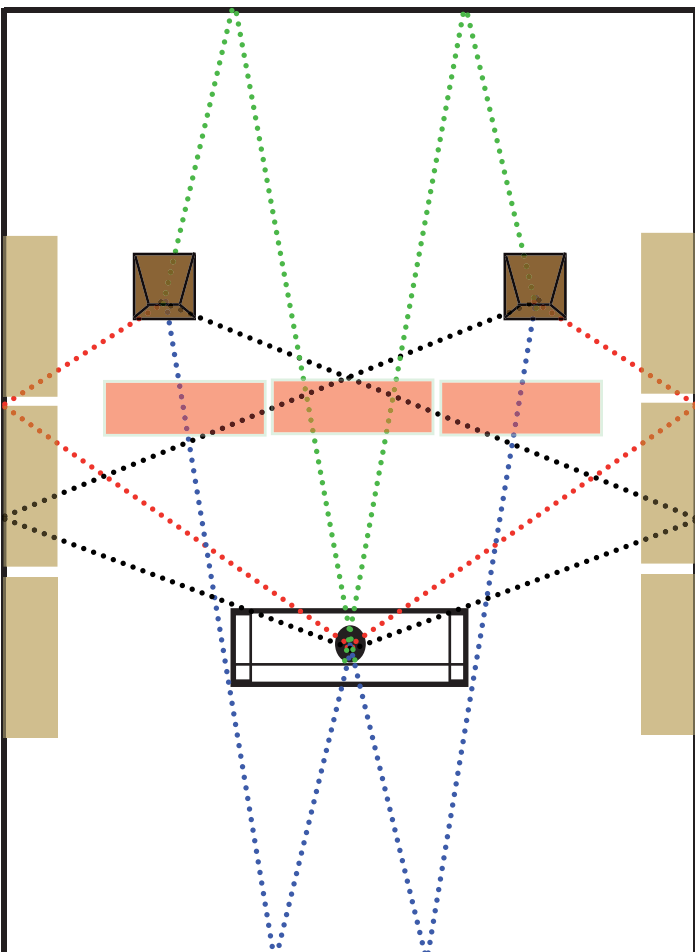
Remember the **FREE consulting service** and acoustic treatment plan drawing, guaranteed by Acustica Applicata.

- **How many DaaD ?:** In a standard listening room (about 20 m<sup>2</sup>), we need 6/8 DaaD to have an evident improvement of sound performances.
- **What they can't do:** DaaD can't work (or very little) under each lower limit frequency; can't worsen articulation or tonal balance; if DaaD are positioned in wrong positions, simply they can't work at 100% of their performances.  
In the worst case they can increase the soundstage asymmetry.

# DAAD suggested positions



- Room corners.
- First lateral reflections.
- First reflections behind loudspeakers.
- First reflections behind listening position.
- First contralateral reflections.
- Middle of soundstage.
- Middle of lateral wall.



- Corner between lateral wall and ceiling.
- First reflection on the ceiling.



# Sound Analyzer 4.1

## - What is Sound Analyzer:

It's a software that transform your personal computer into a graphic recorder that allows recording and visualization of any type of audio signal.

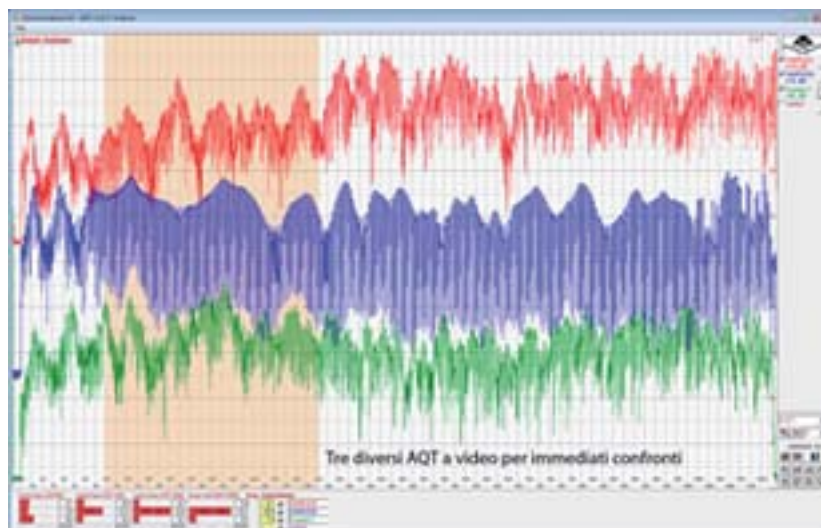
## - What Sound Analyzer do:

Sound Analyzer was built to use Audio Quality Test measurement method. With Audio Quality Test (AQT), developed by Acustica Applicata, you can analyze the real acoustic performance of a listening room. The results of this measurement method are totally coherent with the human listening feeling.

- Sound Analyzer is the best to determine the best loudspeakers and listening position.
- Sound Analyzer is the best tool to investigate about musical articulation, tonal balance and sound focusing.
- Specify your room sizes and the software calculate and draw the distribution of fundamental room modes and following harmonics.
- Essential for a correct positioning and tuning of subwoofer and an accurate levels setting of an Home Theater system.
- Immediate RT60 measurement.

## - What Sound Analyzer need to work:

- A standard PC with Windows 98, NT, 2000, XP, Vista.
- Sound Analyzer need the computer sound card to record the audio signal; on the laptop, due the very simplify and cheap audio chip installed, it's strongly suggested to use an external usb sound card.
- A standard Class 2 sound level meter.



# POLIFEMO, your personal Room Tuner.



Polifemo is a pressure/resonance device with a variable system to fine tune its resonant frequency. Designed for the world of Hi-Fidelity and the Studio, it is a modern way to apply Helmholtz's physical principles in a listening room. Refined and unique technical solutions make it possible to adjust the resonant frequency and tune it to the corresponding resonance of a specific room. A mechanical iris diaphragm is Polifemo's eye and together with the port in the base (with its adjustable opening system) tune the resonator to the room. It is an infallible and quick process. Polifemo's adaptability is unlimited. Furthermore, whether changing your listening room or loudspeakers, its effectiveness will be maintained and never be redundant. The effective range of Polifemo begins at 26Hz, and is effective up to over 60 Hz, working with powerful effect on either a narrow frequency window or a broader and smoother wide frequency window range. Polifemo clearly improves low frequency resolution and gives the medium and high frequencies a much better sense of "floating" over the bass (rather than sinking into and being overwhelmed by it), the soundstage becomes wider while maintaining perfect instrument focus with gains in realism and micro detailing, a performance with extraordinary dynamic contrast without any listening stress.

## How to use Polifemo's adjustment features:

- With the variable port in the base the main resonant frequency can be set between 25 and 60Hz.
- With the adjustable Iris port the Q value and the amount of energy that comes back into the listening room can be adjusted.
  - With the internal membrane, adjustment of the internal dampening of Polifemo is made possible.

## Placement of Polifemo (see next page):

- In the loudspeaker projection area on the walls.
- In the area between the first lateral reflection and the corner behind the loudspeaker.
- In the area between the first rear reflection and the corner behind the loudspeaker.
- In certain cases in the middle of lateral wall.



# **POLIFEMO and PHEMO POSITIONING and SET-UP**

All the following suggestions and instructions about Polifemo, apart those concerning the adjustment and orientation of iris port and internal paddle damper, are valid for Pheмо also.

## **Positioning**

**1)** In most installations Polifemo has shown the best general performance (effectiveness at low frequencies, Improvement in tonal balance, width and depth of soundstage, and focusing) positioned along the lateral walls in close proximity to the loudspeakers (with a minimum distance of about 30 cm). So two Polifemos are necessary in rectangular shaped rooms and one or two in irregular rooms.

**2)** Positions along the wall behind the loudspeakers (area of the first rear reflections) have also offered very good results. In comparison to the lateral wall position a more interesting dynamic result is frequently observed, along with a more complex control of tonal balance. In both of the previous two cases, Polifemo will return energy to the under-powered frequency areas, effectively “filling in the valleys” in a wide bandwidth (well over 300 Hz), draining the excess energy from the “peaks”.

**3)** Polifemo placed in the corners produces more powerful control of the resonant “peaks” and “boom” but with a less effective “redistribution” of energy. Therefore “equalization” action is reduced and adjustment becomes more critical.

**4)** Positioned in the middle of the wall behind the loudspeakers, Polifemo can offer excellent or quite poor results depending on the distribution of acoustic energy in the listening room and from the typology and positioning of the loudspeakers. (See point 6 below)

**5)** Positioned in the middle of lateral walls Polifemo has a positive effect on low frequencies, increasing both control and dynamics.

**6)** **IMPORTANT:** both in regular rooms, but especially in irregular ones, the **BEST** place to put a Polifemo is **ALWAYS** where it is evident that through normal listening a strong excess of low frequencies is evident in a general location within the room. Turbulent and confused energy clearly perceptible in one or more points of the room that dramatically disappears when we move only a few centimeters outside the zone is a clear sign of the confluence of standing waves that are combining to create a “peak” that quickly becomes a “trough” a short distance away. By placing a Polifemo within the “peak” area the excess energy is smoothed out and most importantly the “phase” of each low frequency transient will be corrected lending the presentation a transparent and lively feel. Very often there are circumscribed areas that can easily be discovered walking around the room while listening carefully and playing a track rich in low frequencies. Of course an SPL meter can always be utilized to precisely locate areas of excessive energy but this is often self evident with a brief walk around the room.

## **Adjustment of Polifemo**

This consists of 4 phases:

- 1)** adjustment of the opening in the base; center frequency of absorption
- 2)** adjustment of the iris opening; level of attenuation and dispersion
- 3)** adjustment of the internal membrane inclination; damping and bandwidth
- 4)** orientation of the Polifemo; fine tuning of staging information

## **1) Adjustment of the opening in the base (setting by ear)**

Start by rotating the Plexiglas disk, after having loosened the two transparent screw knobs that hold it rigid, making it coincide with the port. This will begin the center frequency tuning process at the lowest note. BE SURE that the iris on the front of Polifemo is completely open during this process!

Play a track on the system that is rich in low frequencies (electric bass, etc.) or a test track containing frequencies between 20 and 300 Hz. Slowly rotate the Plexiglas disk in the base decreasing its open cross section until you hear less strength or boom in the low frequencies with cleaner articulation. If you don't hear distinctive variation in the quantity and quality of bass energy repeat this exercise with the iris port closed. If you still don't discern variations, leave the port in the base fully open and gently lock the Plexiglas disk using the two transparent knobs and go on to the next adjustment. If two Polifemo are placed along the lateral walls in symmetry with the left and right loudspeakers it is not a hard and fast rule that both devices must be tuned identically; on the contrary often due to intrinsic asymmetries in the room or system a different set-up for each Polifemo is required. Obviously it is possible for one to perform a fine tuning of the base port by instrumental measurement using a sound level meter instead of doing so by ear.

## **2) Iris port adjustment**

Consider Polifemo's iris as a passive loudspeaker and the knob that controls its opening size as a volume control. With the iris fully open the Polifemo processes more energy across a wider bandwidth making the presentation more open and clear. With the iris fully closed Polifemo exclusively works on the lowest note of the bass frequency transient with little effect on higher frequencies. Changing the iris opening will alter the spatial dimension of the soundstage and the tonality of voices. Carefully adjusting the iris opening of two Polifemos placed on the wall behind the loudspeakers or along left and right lateral walls it is possible to correct soundstage asymmetries and phase shifting between the right and left sides of the listening room thus creating a more solid and "fast" sound. Obviously the tuning of the iris also influences the presentation of low frequencies but their main regulation is through the opening or closing of the base port. So first choose the size of the base port opening with the iris fully opened or fully closed and with "Polifemo's eye" oriented toward the listener. Rotate the knob controlling each Polifemo iris to get the tonality and energy that is desired from that side of the soundstage. We suggest making adjustments gradually from the optimum listening position utilizing a well known recording with a focused central voice.

### **3) Adjustment of paddle damper**

While the iris setting has an influence over a wide frequency range, the internal paddle membrane inclination angle affects only the area between 150 and 250 Hz. Adjustment of the paddle allows either more or less freedom of constantly oscillating vertical air motion within the body of Polifemo. With the paddle in a horizontal position (parallel to the floor) the sound will be fast and dry, while in a vertical position (perpendicular to the floor) the sound will be smoother and more reverberant. Any position between these two extremes is acceptable depending upon the overall presentation and taste of the listener. It is best to start fine tuning with the paddle in the vertical position (perpendicular to the floor).

### **4) Orientation**

After the correct opening of the base port and iris are decided and the preferred membrane inclination settled, an important step in the Polifemo set-up is its rotation relative to the listening point and to the surrounding walls. Where the eye of the iris points determines the speed of the low frequencies and this in turn influences soundstaging and focusing. Let's discuss only the case of a Polifemo placed along the side wall. Generally with the iris oriented toward the neighboring wall timing will improve, low frequencies will become drier and the soundstage will become wider. With the iris oriented toward the listener energy will increase, but with a rounder and less dry bass; the soundstage will be more forward and "in your face". With the iris oriented toward the loudspeakers energy is more focused but rounder and more forward, as in the previous case. With the iris oriented toward the corners behind the loudspeakers the soundstage will gain more "breath" and there will be a clear increase in stage depth. This orientation generally produces better timing of low frequencies and a well controlled energy balance.



# POLIFEMO suggested positions

