

CPR Compensated Phase Response System by PSI Audio

Technical description

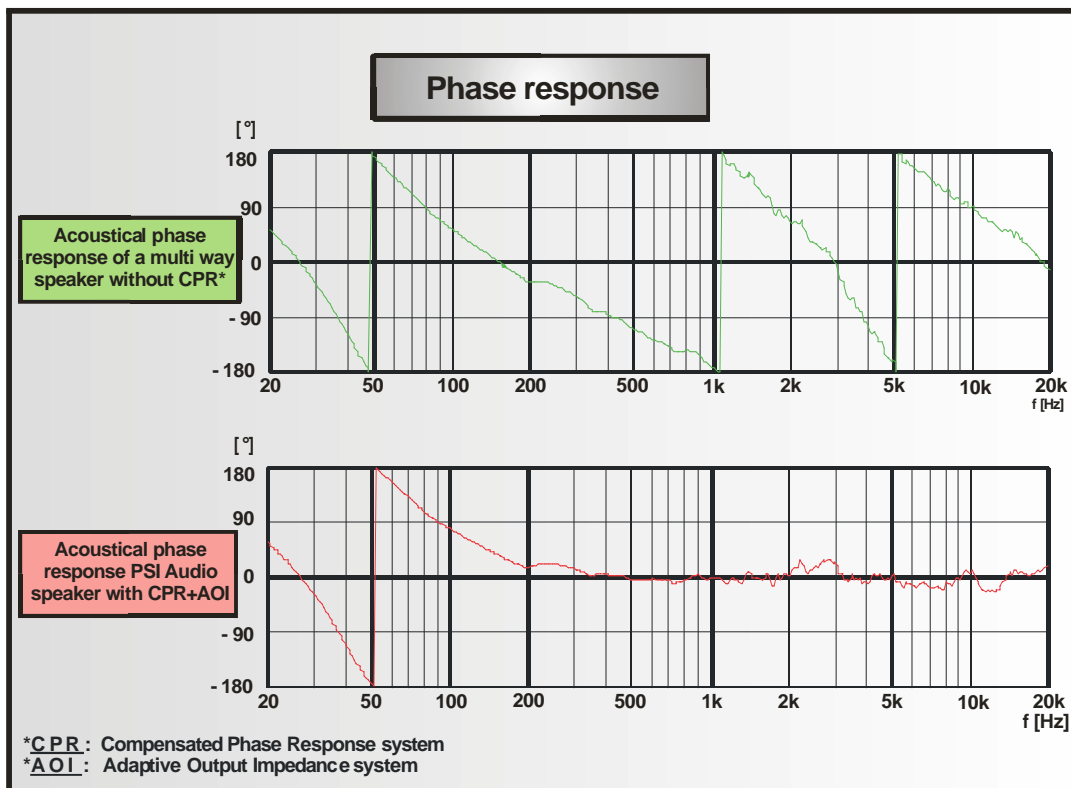
In a multi-way speaker system, the crossover filters as well as the transducers introduce distortion of phase and by consequence of the variations of group delays.

The group delays in low frequencies are more important than in high frequency's. They provoke a time related separation of the low and high frequencies which then is responsible for the hollow sound of multi-way speaker systems.

In a limited frequency range, an all pass filter allows to intervene on the phase without influencing the amplitude.

The CPR system consists of several all pass filters who each act in a specific range of frequency in order to obtain a wide area of Compensated Phase Response. This then provides a constant group delay.

Thanks to the CPR system the placement of sound in the actual sound space is highly accurate. This technology allows designing of surround sound systems with different types of PSI Audio speakers while maintaining an accurate phase response.



Practical advantage of CPR and impact on stereo application

The human ear is very sensitive to group delays or phase irregularities of sounds. The human brain detects such irregularities easily and processes them in to space related information's like the positioning of a sound source.

All traditionally designed speaker systems suffer to a certain degree of such irregularities.

These irregularities are the reason why some speakers produce a wider and deeper room perception hence a better-weaker reproduction of the sound image.

Such phase irregularities are desirable on creative tools like equalizers, compressors, reverbs and delay units when creating a certain desired sound, whilst being an important part of the creative process of sound engineering.

But as the speaker system represents the reference tool of every sound engineer, these irregularities represent a highly disturbing factor and should certainly not be present in the reference tool when trying to design specific sound or its positioning in the sound image.

As a sound recording tends go through various processes (recording, mixing and mastering) in which maybe various people, locations and therefore speaker systems will be involved, it may well occur that corrections will be applied, due to phase irregularities, that may not even be present on the actual recording.

The PSI Audio speakers feature the unique CPR system that provides a Compensated Phase Response that removes such irregularities and therefore provides a much more accurate reference tool to the sound engineer. The stereo image and the projected room are of an extreme accuracy and therefore provide a more precise working tool.

CPR impact on surround sound applications

Unfortunately every traditional speaker design has a different phase response and therefore the phase inaccuracy phenomenon tends to get worse in surround sound applications, where the role of room information and positioning becomes an even higher priority and critical part of the sound engineering process. This is one of the reasons why speaker manufacturers strongly recommend using speakers of the same type when creating a surround sound system.

The CPR system by PSI Audio will feature an extremely accurate and superior surround sound image and therefore a much improved working environment. One of the big advantages of the CPR system is also that for the first time a user can mix different types of speakers from one manufacturer (PSI Audio) in a surround sound system, whilst maintaining perfectly accurate phase response. Not only will the PSI Audio surround system sound much more accurate and therefore provide a superior working tool, but it can also introduce significant cost and space savings when investing in a new monitoring system.