

Auro 11.1

Immersive sound technology for cinema



Get ready for a truly immersive sound experience

Auro 11.1 is the next-generation immersive sound technology that creates the most impactful motion picture experience. The unique three-layer approach allows for an envelopment of sound unmatched by any other system. The result of years of research with our partner Auro Technologies, Auro 11.1 creates the most natural sound in a way that is cost-effective for content providers and exhibitors alike.

Auro 11.1 at a glance

- Unique three-layer sound technology
- Compatible with existing 5.1 installations
- Minimal hardware investment
- The most natural immersive sound system on the market
- The perfect complement to your premium branded experience
- Fully ready to support future immersive audio standards

Fully immersive 3D sound

Auro 11.1 uses a 3D sound reproduction speaker layout, based on three axes (x=width, y=depth, z=height), to reproduce a stunning sound experience. Ambient sounds are truly coming from all around and above, providing moviegoers with the most true-to-life reproduction of sound. In nature, listeners are surrounded by acoustic reflections: this acoustic information is essential in enabling the human brain to correctly position sound sources unconsciously. This is fundamentally different from (2D) surround sound, where speakers are positioned only in the horizontal plane – which does not allow sounds from objects or reflections to be reproduced in three-dimensional space. To offer the listener a completely natural sound experience, the height axes must be used in the front, sides and back. The unique three-layer approach allows for a level of immersion unmatched by any other immersive sound technology.

100% compatible with existing standards

Auro 11.1 improves the audio experience by making intelligent use of the headroom in today's audio standards. This means that the current formats and channels can still be used for content generation and distribution - no changes to SMPTE standards or the DCI specifications are required. As an exhibitor, you still receive one DCP containing the movie content. Your Auro 11.1 decoder will simply extract the extra sound information from the existing 5.1 or 7.1 track files, when present. And most importantly, as open standards become defined for immersive sound,

the Auro 11.1 technology is fully ready to support these evolving standards with an upgrade path built on the existing hardware's capabilities.

Easy, commercially viable installation

Auro 11.1 can easily be installed in new-built or existing theaters, in most cases utilizing components from your current audio system. According to your speaker layout, simply adding height speakers can bring real immersive sound to your theater. Moreover, Auro 11.1 sound processing is similar to, and compatible with, existing set-ups.



How to upgrade to Auro 11.1

Find out what it takes to smoothly upgrade your theater's 2D sound architecture to Barco's fully immersive sound technology on:

<http://www.barco.com/digitalcinema/Auro11-1Survey/>



Why Auro 11.1?

- Seamless integration and full compatibility with your current 5.1 sound system
- Auro 11.1 is the most cost-effective solution on the market for immersive sound
- Versatile production tool for authors to create all formats at once
- Upmixing capabilities for alternative content
- Ready to reproduce future immersive audio standards via an easy and cost-effective upgrade

For a premium experience

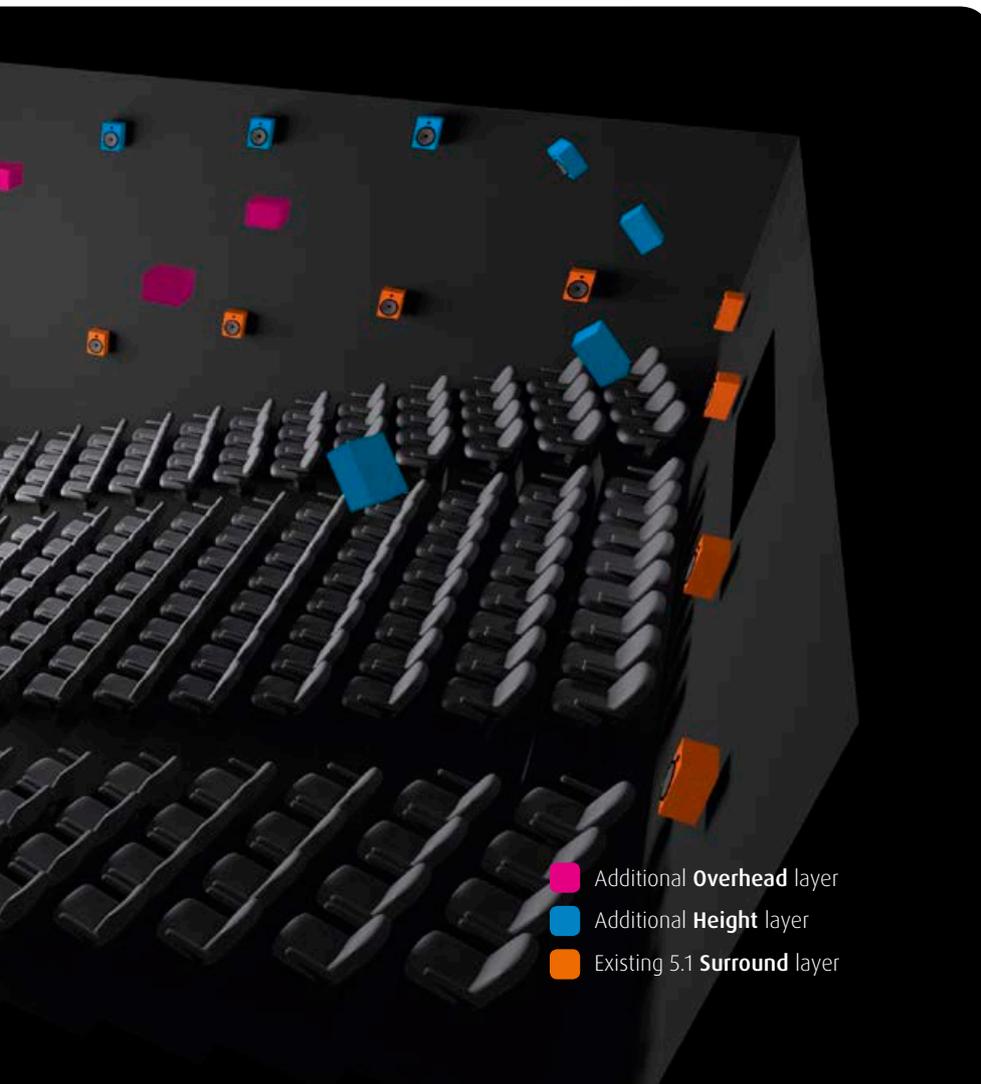
Since the introduction of two-dimensional surround sound in the early 90s with the 5.1 format, the audio evolution in movie theaters has been virtually at a standstill. In the meantime, visualization has gone digital, enabling immersive visual 3D and higher frame rates. However, audio has stayed the same. Barco's immersive sound not only allows for the next logical step in multichannel audio for cinemas but also offers a path to an open standard for immersive sound to enable a monumental evolution in the adoption of immersive cinema sound.

A unique differentiator for exhibitors

Sound accounts for 50% of the movie experience. As moviegoers become more demanding, they expect a truly unique experience when going to the movies. Auro 11.1 creates this unique differentiator – allowing you to maintain your premium box office revenues and differentiate yourself from the competition.

A unique differentiator for content creators

Postproduction and mixing facilities worldwide, including renowned facilities such as Skywalker Sound are supporting the adoption of Auro 11.1 as the format to create immersive sound. Check our website at www.barco.com/auro11-1 for a list of movie titles available in Auro 11.1. What's more, multiple directors and studios have embraced Auro 11.1.



- Additional **Overhead** layer
- Additional **Height** layer
- Existing 5.1 **Surround** layer

"After independently testing both commercially available immersive cinema sound solutions, it became abundantly clear that Auro 11.1 provides the best complement to the Cinemark XD experience. We firmly believe that the fullness and richness of Auro's height layer, coupled with the discreetness of the future and open standard object-based capabilities supported by Auro, will make for the best movie going experience possible."

Damian Wardle, Vice President of Worldwide Theatres Technology & Presentation at Cinemark

"Auro 11.1 offers the best cinematic experience available to envelop audiences with astonishingly lifelike sound. We believe that Barco is uniquely capable of providing a premium cinema experience."

Jeffrey Katzenberg, CEO of DreamWorks Animation

Auro 11.1 technical specifications



Auro 11.1 audio system at Wangfujing Cineplex, China

Auro 11.1 decoder

The Auro 11.1 decoder is a 100% firmware based solution that is compatible with the most commonly used media block technologies on the market today. Once loaded onto the media block, the Auro 11.1 decoder is only activated when an 11.1 codestream is present on the audio tracks of a DCP. If this is the case, the media block will automatically route the appropriate channels to the correct AES outputs and send them to the AP24^{3D} audio processor. If a given DCP does not contain the 11.1 metadata, the media block will simply play back the standard 5.1 tracks.

Auro 11.1 'AuroMatic' upmix engine

The Auro 11.1 upmix engine receives any audio source that has been identified by the user as alternative content and can be selectively upmixed to 11.1.

Auro 11.1 audio processor

Co-developed by industry leaders in cinema audio processing technology, the AP24^{3D} audio processor makes it possible to seamlessly switch from normal 5.1 playback to the 11.1 format, either automatically or at the push of a button. Due to the channel count and critical time alignment functions required for the calibrated playback of Auro 11.1, all existing eight-channel processors are not compatible with the Auro format. The AP24^{3D} supports all existing interfaces required for a modern digital cinema B-chain, including 16 channels of AES inputs, non sync and a variety of alternative content sources including HDMI and SPDIF.

Supports adoption of 'Open Standards' for immersive sound

The Barco AP24^{3D} audio processor was designed to be fully expandable according to the needs of the exhibition and production industry. As these are currently evolving towards an open standard for immersive sound, the AP24^{3D} audio processor is upgradable to support this open standards immersive sound backed by the standards community.

For a demo at a site near you
go to www.barco.com/Auro11-1

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The information and data given are typical for the equipment described. However any individual item is subject to change without any notice. The latest version of this brochure can be found on www.barco.com.

Leading exhibitors worldwide
have already successfully
installed Auro 11.1.

Barco

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