

# AES Information Document for audio-file transfer and exchange - Screen-less navigation for high-resolution audio on Blu-ray Disc™

Published by  
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## Abstract

High-resolution audio, presented as uncompressed LPCM, has been waiting for a suitable transport format for some time. The Blu-ray Disc (BD) format offers such a transport and supports the necessary linear and lossless codecs as part of its basic specification. While many BD players can be found in home theatre and games environments, there are some issues that need to be addressed before they can be introduced into a hi-fi environment that does not have a screen to present visual menus for audio stream setup and track selection. This recommended method specifies a structure for authoring a BD ROM to enable playback in screen-less consumer systems, and to provide simple track selection from the remote control.

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### Foreword

This foreword is not part of AES-21id-2011 *AES Information document for audio-file transfer and exchange - Screen-less navigation for high-resolution audio on Blu-ray Disc™*.

This document was instigated by AES President Jim Anderson in the spring of 2009 with the intent to harmonise a simple technique for distributing high-resolution audio in a way that did not require changes to existing consumer electronics and that could be used with a wide range of existing hardware in the field. A proposal from Stefan Bock was accepted by the AESSC as project AES-X188, *Screen-less navigation for high-resolution audio on Blu-ray Discs* and was assigned to working group SC-02-08 on Audio-File Transfer and Exchange who contributed to the development of the draft.

Mark Yonge

Chair, working group SC-02-08 on Audio-File Transfer and Exchange

NOTE This document was published as a Call for Comment identified as AES-17id-xxxx. Following a comment pointing out the risk of confusion between its assigned number and an established document (AES17, Measurement of digital audio equipment), this document was re-numbered AES-21id.

### Note on normative language

In AES standards documents, sentences containing the word “shall” are requirements for compliance with the document. Sentences containing the verb “should” are strong suggestions (recommendations). Sentences giving permission use the verb “may”. Sentences expressing a possibility use the verb “can”.

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## 0 Introduction

### 0.1 Background

From the time of its general introduction in 1983, Compact Discs and CD players have become a familiar part of consumer hi-fi systems. The method of operation has been consistent during that period: put a disc in the tray; accept track 1 by default or select another; press Play. No other setup was expected or available.

The DVD was introduced in the late 1990s primarily to carry movies as a replacement for consumer videotape formats. All user interaction was intended to be directed by a remote control, with visual feedback from the screen that was automatically available in a home-video system. High-resolution audio was not a primary factor in the initial design of DVD, in part because the data capacity of a DVD, although considered large at the time, was insufficient to carry multi-channel uncompressed LPCM (for example).

The introduction of the Blu-ray disc (BD) format in 2006 offered sufficient data capacity for high-resolution audio to be considered practically and without compromise. More importantly, the basic specification of the BD included a wider range of lossless audio coding options, including up to 8 channels of high-resolution LPCM, as shown in table 1.

**Table 1 - Supported audio formats**

Codec	Sampling frequency (kHz)	Max. channels
Linear pulse code modulation (LPCM)	48, 96, [192]	8 [6]
Dolby True HD	48, 96, [192]	8 [6]
DTS-HD	48, 96, [192]	8 [6]

### 0.2 Obstacle to progress

Like their DVD precursors, BD players are designed to be used in conjunction with a video screen, and so screen-based visual feedback was again assumed for operational control. While this will be satisfactory for some users, many audio users will still prefer the simplicity of CD operations. Additionally, in many consumer hi-fi systems, there will be no existing screen and the extra cost of providing a screen just to see the menu could make the high-resolution audio proposition impractical.

### 0.3 Proposed solution

It is possible, without making any changes to the BD player, to provide the necessary functionality for screen-less playback of high-resolution audio. The necessary functionality can be provided using programming that is included at the authoring stage of the disc.

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The screen-less modes described here are a function of programming during the disc mastering stage. They use the standard BD capabilities and do not seek to limit them in any way.

#### 0.4 Patent statement

The Audio Engineering Society draws attention to the fact that it is claimed that implementation of this AES information document may involve the use of a German patent, Gebrauchsmusterschutz Nr. 20 2009 003 969.2.

The AES holds no position concerning the evidence, validity and scope of this patent right.

The holder of this patent right has assured the AES that it is willing to negotiate licenses under reasonable and non-discriminatory terms and conditions with applicants throughout the world. In this respect, the statement of the holder of this patent right is archived with the AES.

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Attention is drawn to the possibility that some of the elements of this AES information document may be the subject of patent rights other than those identified above. AES shall not be held responsible for identifying any or all such patent rights.

## 1 Scope

This information document recommends a method for authoring a BD ROM to enable playback in consumer systems without a video screen, and to provide simple track selection from the remote control.

## 2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

There are no normative references

## 3 Terms and abbreviations

### 3.1 Blu-ray Disc

#### BD

optical disc format specified by BDA. See annex D

### 3.2 Blu-ray disc player

#### BDP

playback reproducer for Blu-ray Discs

NOTE Blu-ray Disc™ and Blu-ray™ are trademarks of the Blu-ray Disc Association (see also annex D)