



## ***MLP mandatory for DVD-Audio players***

### **For Immediate Release**

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### **DVD-Audio specification finalised**

February 8, 1999 in Tokyo, the Steering Committee of the DVD Forum gave their approval to the specification for DVD-Audio. DVD-Audio is the latest and most exciting of the DVD family which includes DVD-Video, DVD-ROM, DVD-RAM and DVD-R.

The DVD-Audio specification is the product of an extraordinary process of international technical co-operation in Working Group 4 (WG-4) of the DVD Forum ([www.dvdforum.org](http://www.dvdforum.org)) under the chairmanship of Mike Suzuki of Victor Company of Japan, Limited (JVC). WG-4 has 40 member companies from the US, Europe and Asia and includes industrial giants like IBM, Intel, Matsushita, Sony and Philips as well as music providers like Warner Music, EMI, Nimbus and audio specialist Meridian Audio from the UK. Through extraordinary cooperation with the International Steering Committee (ISC) representing the worldwide recording industry, WG-4 was able to meet the requirements of the music industry and at the same time include many technical innovations fitting for the next generation audio disc.

DVD-Audio exploits a data capacity seven times larger than CD to provide music in surround sound and with much higher resolution and dynamic range.

The ISC's 13-point list of requirements included the ability to offer playing times of at least 74 minutes of the highest quality surround sound on the disc. To achieve this, a method of benignly compressing the audio data on the disc was needed and Meridian Lossless Packing (MLP) was selected amid fierce international competition.

### **MLP background**

MLP is an audio coding scheme using proprietary technology, which has been developed over three years by Meridian Audio and its associates.

There are already several well known perceptual or lossy data reduction coding methods like MPEG and Dolby Digital, both of which are used on the DVD-Video disc to provide 135 minutes of movie per layer. These schemes operate by discarding information that is less important to the listener.

MLP does not do this: MLP is lossless. MLP coding does not alter the final decoded signal in any way; it 'packs' the audio data more efficiently into a smaller data rate for transmission and carries it in a protected environment along with associated data.

MLP is a simple-to-decode method optimized for the demands of the very highest quality sound needed for the coming decades and which are reflected in new applications like DVD Audio. MLP has been optimized to open new opportunities for multichannel and for audio at high sample rates with very high precision. Now that it is mandated for DVD-Audio, Meridian are sure that MLP will find many other applications. Examples include in movie studios for storing and transmitting sound, for holding the original location recordings for music, in news gathering, for archiving and anywhere else that audio data is stored – including of course the rapidly growing applications on personal computers and the internet.

Soon every PC will need to decode MLP.

Previously the highest quality sound came with Linear PCM coding. Unfortunately, PCM distribution formats do not require the mastering or playback process to be lossless – so data can be subtly changed on the way through the production chain.

MLP is a *true lossless* system. The original data is delivered bit-for-bit at playback. It even has a method of confirming that the whole chain is lossless. This means that for the first time the listener can be sure of hearing exactly what the producer intended – bit-for-bit, note-for-note.

There is no need for elaborate listening tests to qualify this coding system – it guarantees delivery of the original recording, efficiently, over a number of carriers, archive and computing platforms.

## **How did a small UK company get selected?**

Although a minnow by the standards of other members of WG-4, Meridian Audio has a superior reputation in the world of high-end audio, earned through making leading-edge no-compromise digital audio products for the home music lover. Meridian is also the only high-end audio manufacturer represented in WG-4. Meridian's chairman, Robert Stuart, is reknowned in audio circles for his expertise in the fields of audio coding and psychoacoustics. Mr Stuart also chairs a surround sound advocacy group *Acoustic Renaissance for Audio* (ARA) which made a proposal to DVD Forum members in 1994 on how a high-quality audio disc could be designed. <http://www.meridian-audio.com/ara>

The competition to select a lossless coding system for DVD-Audio took place during 1998 and was a fiercely fought battle between proponents from Japan, Korea, the UK and the USA.

MLP was selected because it was the best performer technically, showing particular strengths in the amount and reliability of compression, on control of data rate and on having unique features that were able to enhance DVD-Audio's ability to handle multichannel and stereo simultaneously. MLP was also the most mature technology, having been speculatively developed over three years by Meridian.

MLP was particularly championed by the music industry because it offered such a wide range of production features and high-quality protection features that appealed directly to content providers.

## Meridian background

The Meridian Audio Group <http://www.meridian-audio.com> is a privately held Company based in the UK. The Group consists of four companies, Meridian Audio Ltd, Meridian America Inc. (Atlanta GA), Digital Gramophone and Wireless Ltd and MLP Ltd.

Meridian's products are cutting edge and of extremely high quality and include a unique range of digital loudspeakers as well as CD and DVD players. More than 70% of Meridian's products are exported from the UK.

Meridian specializes in advanced audio and signal-processing technologies and makes some of the very finest CD, DVD, multichannel and DSP products available today.

MLP was developed as part of Meridian's efforts to advance the state of the art for new formats like DVD.

## MLP and Dolby

In an historic agreement announced in June 1998, Dolby Laboratories (San Francisco CA) [www.dolby.com](http://www.dolby.com), agreed to handle the licensing of MLP.

MLP is being offered to makers of integrated circuits, recording equipment, CD and DVD players, audio decoders and also for use in transmission, storage and archive. At this point ten major chipmakers are working on MLP implementations.

Dolby Laboratories is a privately held company based in the USA. Dolby has become the pre-eminent audio technology and licensing company. Dolby is also a member of WG-4 and was able to offer significant support to Meridian during the selection and specification process.

## DVD-Audio highlights

DVD-Audio supports a wide range of digital audio options:

- PCM and MLP decoding are mandatory for all players. Discs may use either on a track-by-track basis.
- Sampling frequencies: 48 kHz, 96 kHz, 192 kHz, and 44.1 kHz, 88.2 kHz, 176.4 kHz.
- Bit resolution: 16 bit, 20 bit and 24 bit. With MLP the precision may be selected between 16 and 24 bits in 1-bit steps.
- Up to six channels are available for multichannel recording, with a transfer rate of 9.6 Mbps.
- Many provisions for providing 2-channel and multichannel mixes.
- High compatibility with the DVD-Video and DVD-ROM formats.
- In 2-channel stereo, more than 74 minutes (PCM) or 120 minutes (MLP) playing time is possible on a single-sided/single-layer disc at the highest quality mode at 192 kHz/24 bit.
- Multichannel: a 96-kHz 24-bit 6-channel recording can be included with more than 80 minutes of playback time. The signal has an immediate presence, like that of an actual concert hall or an entirely new, high-quality 3-dimensional surround-sound environment.

- DVD-Audio content recorded in multichannel mode can also be played back properly on 2-channel stereo systems as intended by studio producers thanks to the dedicated content producer directed fold-down capability.
- DVD-Audio supports playback of video clips with the quality of the DVD-Video format.
- Video slide shows can also be included for viewing while listening to the high-quality music.
- Discs can contain information of interest to music fans, including visual display of liner notes, score, album title, song titles, discography and a URL for access to bonus contents on the Web.

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