

## NEW DATA RELEASED ON MPEG SURROUND QUALITY

Earlier this year a new surround sound technology called "MPEG Surround" was standardized by the international organization ISO/IEC (parent of the Moving Pictures Expert Group otherwise known as MPEG - see the [March 19, 2007 issue](#) of Radio TechCheck for information on the MPEG Surround standard). A technical paper presented earlier this month at the 123rd annual Audio Engineering Society (AES) convention in New York City provides new information on the performance of MPEG Surround versus bit rate and with different "core" codecs.

MPEG Surround captures the spatial image of a multi-channel audio signal into a compact set of parameters which are transported in a data "side channel" along with a normal, two-channel digital audio signal. This side channel information is used (in the decoder) along with the two-channel signal to synthesize a high quality multi-channel representation. MPEG Surround is perceptual codec agnostic, that is, it is compatible with "virtually any" legacy coding scheme including MPEG2, MPEG AAC, and HDC (the perceptual codec for the iBiquity HD Radio system). Typically the side channel information rate is very small compared to the bit rate required by the perceptual encoder (on the order of 10 %).



MPEG Surround has potential applications in the U.S. for both digital radio and digital TV. The HD Radio in-band/on-channel (IBOC) digital radio system is capable of supporting the MPEG Surround side channel through the advanced application services (AAS) data broadcasting portion of the system. And, MPEG Surround would offer a low bit rate method for providing surround sound in a mobile/handheld digital video extension to the Advanced Television Systems Committee (ATSC) DTV standards now under development.

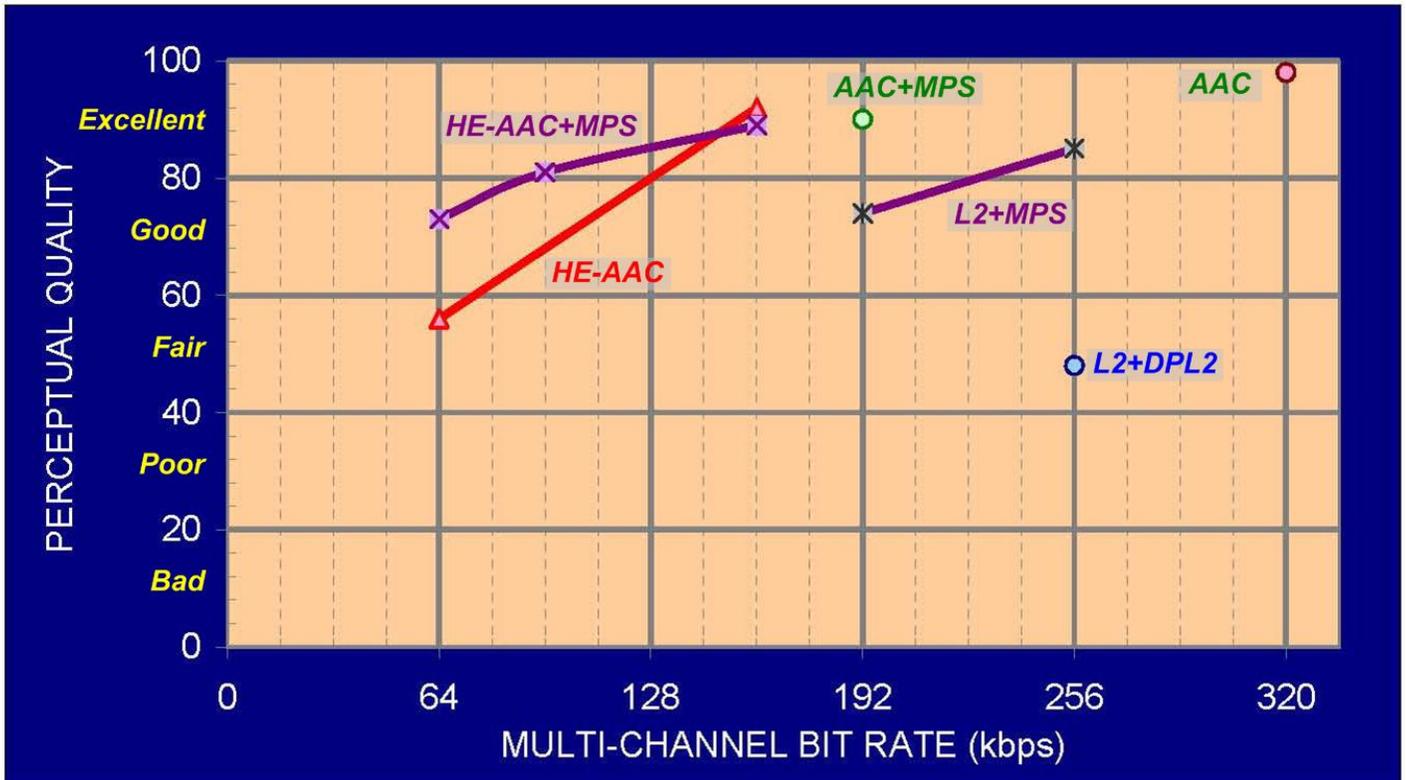
The paper presented at the recent AES convention is entitled "A study of the MPEG Surround quality versus bit rate curve," and is co-authored by Jonas Röden and Heiko Purnhagen of Coding Technologies, Sweden, Jeroen Breebaart of Philips Research, The Netherlands, Johannes Hilpert, Karsten Linzmeier and Andreas Hölzer, Fraunhofer Institute for Integrated Circuits, Germany, and Erik Schuijers, Philips Applied Technology, The Netherlands.

In addition to providing a good general overview of MPEG Surround technology, this paper presents the results of a listening test conducted using MUSHRA methodology ("Method for the Subjective Assessment of Intermediate Sound Quality," an ITU-R recommended approach for assessing audio quality) using high quality 5.1 channel loudspeaker setups. The results from the following codec/surround sound configurations are presented in the figure, at various bit rates (the bit rates shown represent the total bit rate used which is the sum of the core codec bit rate and the MPEG Surround side channel bit rate):

- **MPEG-1 Layer 2** - the MPEG-1 Layer 2 codec is the standard codec for the Eureka-147 DAB system. Two configurations were tested here, as well, with Dolby Pro-logic 2 ("L2+DPL2"), and with MPEG Surround ("L2+MPS");
- **MPEG-4 AAC** - two configurations were tested, one with discrete multichannel at 320 kbps ("AAC"), and one with MPEG Surround at 192 kbps ("AAC+MPS");

- MPEG-4 HE-AAC** – this is considered to be a state-of-the-art codec which makes use of “spectral band replication” in the high-frequency range, and as such is a “non-waveform preserving” codec. The data presented in this report provides an interesting comparison between multi-channel HE-AAC with discrete surround channel coding (“HE-AAC”) on the one hand, and HE-AAC with MPEG Surround coding (“HE-AAC+MPS”) on the other.

The authors conclude from these results that “MPEG Surround provides a significant increase in compression efficiency for a wide range of audio codecs and operating points, while at the same time ensures backward compatibility with legacy codecs.”



A copy of the complete AES paper will be available for purchase on the AES web page soon – go to [www.aes.org/publications/preprints/](http://www.aes.org/publications/preprints/) and look for the link to the AES 123rd Convention, New York, NY, USA.

## The Shift from Daylight Saving Time Nears

**Reminder:** All DTV broadcasts should now be announcing in their PSIP that daylight saving time will end on November 4, 2007.

The ATSC Standard A/65 requires that one month before the shift from daylight saving time that data announcing the shift be sent. As A/65 is part of the FCC regulations, this is required for all DTV transmissions. Specifically; the following are the proper settings for the following STT fields (as of 2 AM, October 4, 2007):

**DS\_Status = 1**

**DS\_Day\_of\_month=4**

**DS\_Hour=2**

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The original 1-day VSB Fundamentals course contains all the basics of data communication in general as well as the VSB System in particular, and is a pre-requisite to the 1-day VSB Measurements seminar. For additional information contact the instructor Gary Sgrignoli, Meintel, Sgrignoli & Wallace at (847) 259-3352 or [Gary.Sgrignoli@IEEE.org](mailto:Gary.Sgrignoli@IEEE.org) or Chuck Britt, (919) 676-8611, [cbritt@vnet.net](mailto:cbritt@vnet.net).

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