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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.

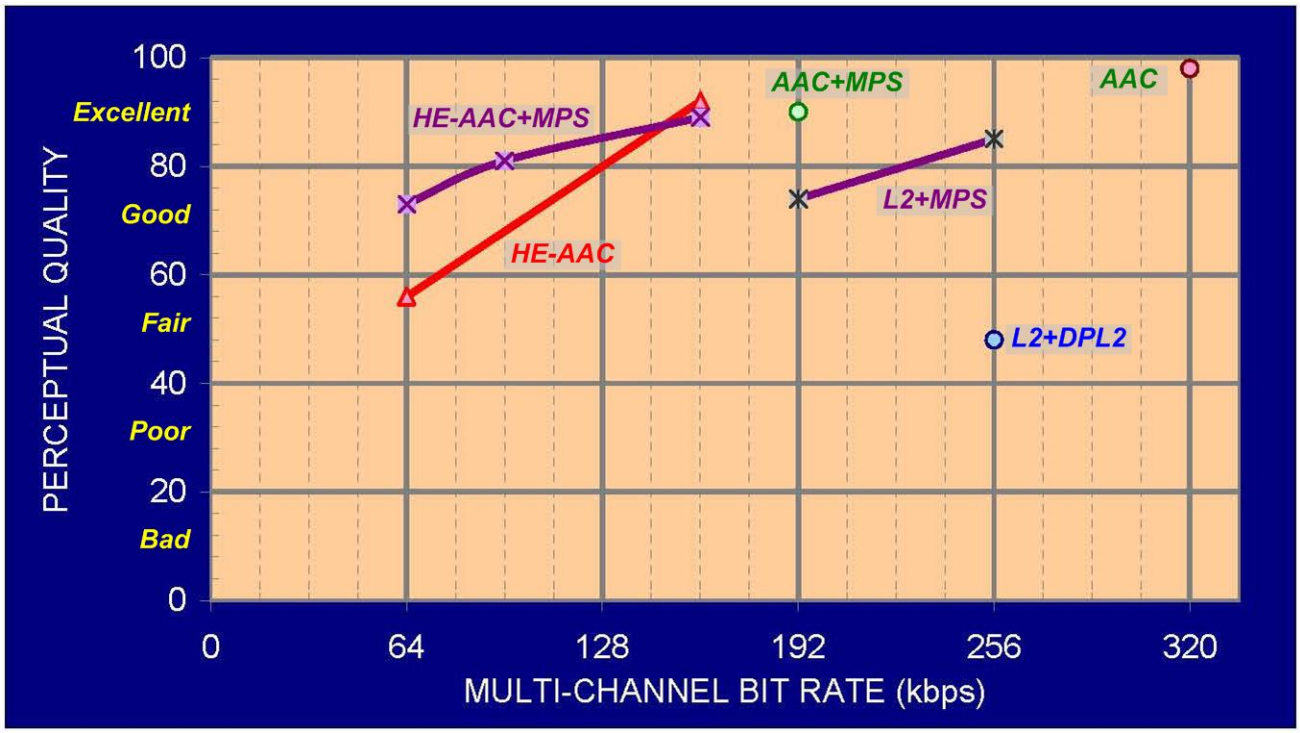
In addition to providing a good general overview of MPEG Surround technology, this paper presents the results of a listening test conducted using MUSHRA methodology ("Method for the Subjective Assessment of Intermediate Sound Quality," an ITU-R recommended approach for assessing audio quality) using 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/ and look for the link to the AES 123rd Convention, New York, NY, USA. Also, an informative report entitled "Broadcasting Surround Sound Audio over IBOC Digital Radio – Issues and Resources for FM Broadcasters" was published in January of this year by the National Radio Systems Committee (NRSC) and is available free-of-charge from the NRSC web page – go to http://nrscstandards.org/DRB/SSATG%20report%20final.pdf.

NAB AM ANTENNA COMPUTER MODELING SEMINAR

Don't Miss the New NAB
AM Antenna Computer Modeling Seminar
November 15-16, 2007
NAB Headquarters
Washington, DC

This two-day seminar is your opportunity as a broadcast engineer to learn the basics needed to utilize modeling software such as MININEC and nodal analysis for designing performance-optimized AM directional antenna phasing and coupling systems and proving the performance of directional antenna patterns.

You will learn about:

- Moment Method Modeling Basics
- DA Proofing Using Moment Method Modeling
- Overcoming Limitations of Using Field Strength Measurements for DA Proofs

- State of the Art in Phasing System Design Nodal Analysis of AM DA Phasing and Coupling Systems
- Pattern Design Considerations for Optimum Performance

AM antenna experts Ron Rackley and Ben Dawson, along with antenna modeling software specialist Jerry Westberg, will lead the seminar demonstrating how moment method modeling makes analysis of actual tower current distributions possible and how a model can be used to proof an array provided the proper criteria are considered. All are well known in the radio industry as experts in the field of directional antenna design and maintenance. Their decades of experience offer station engineers an opportunity to learn techniques, tips and tricks that can be immediately useful.

Seminar fee: $395.00 (NAB members) and $495.00 (non-members). For more information on the curriculum, how to register or housing go to AM DA Seminar on the NAB Web site or call Sharon Devine at (202)-429-5338. Register now for the NAB AM Antenna Computer Modeling Seminar!

Deadline *Extended* to October 19! Call for Proposals 62nd Annual NAB Broadcast Engineering Conference

Don't miss your chance to submit a proposal to present a technical paper at the NAB 62nd Annual NAB Broadcast Engineering Conference in Las Vegas, April 12- 17, 2008. We are seeking paper proposals on these specific topic areas:

Radio Engineering
Audio over IP
Digital Radio Opportunities
Digital Radio for Small Markets
New Technologies for Audience Measurement
Alternative STL Technologies
Radio Technology Advancements

Television Engineering
DTV Broadcasting for Mobile and Handheld
Lip Sync, Loudness and Multichannel
Digital Television Transition - 10 Months and Counting
HD News and Live Production

Radio and Television Engineering
Monitoring and Measurements in the Broadcast Plant
Engineering Management Panel (IT and Engineering, Recruiting and Training)
Bandwidth Management in the Broadcast Facility
Repurposing Content for Multiple Platforms
Next Generation Public Alerting
Emerging Broadcast Technologies

If you are interested in submitting a proposal, you may do so online at: http://www.nabshow.com/2008/forms/bec.asp. If you have any questions please call NAB Science & Technology at (202) 429-5346.