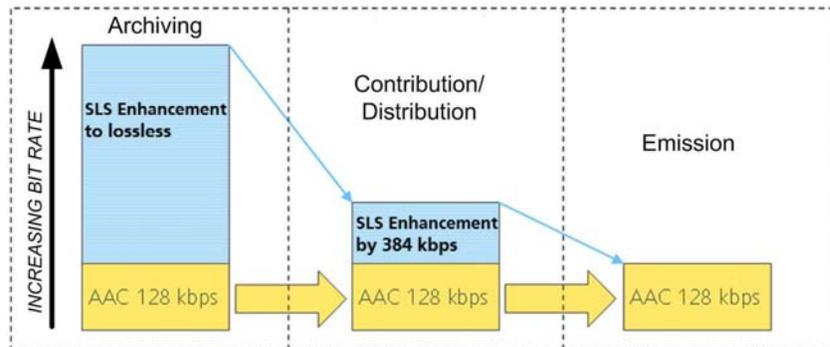**February 4, 2008**

Audio Coding Advancements Unveiled

Perceptual audio coding technology is the foundation upon which digital audio devices like MP3 players, satellite radios, and HD Radio receivers are built. Using perceptual audio coding techniques it becomes possible to reduce the digital bit rates required to store and/or transmit audio signals to the point where all of these devices become practical. Two new audio codecs were announced at last month's International Consumer Electronics Show (CES, www.cesweb.org) which represent further advances in this technology.

Fraunhofer IIS (Erlangen, Germany, www.iis.fraunhofer.de/EN/index.jsp) announced its new HD-AAC® codec which is a "fully scalable to lossless audio coding solution." This technology is designed to bridge the gap between the needs of portable consumer applications which require low bit rates and the needs of audio professionals who require very high quality approaching that of the original, uncompressed audio itself. To do this, HD-AAC utilizes two different technologies–MPEG-4 Advanced Audio Coding (AAC) and MPEG-4 Scalable Lossless Coding (SLS).

SOURCE: FRAUNHOFER IIS

AAC is a state-of-the-art perceptual codec which in HD-AAC is used to create a low bit rate audio signal for applications such as consumer devices. On top of this, the SLS scalable extension layer is utilized to increase the signal-to-noise-ratio, and according to Fraunhofer reaches losslessness at data rates comparable to that of current pure lossless audio codecs, that is, at average compression ratios of about 50% compared to the original audio material. The figure illustrates how HD-AAC can be used to create audio with archival (high bit rate), contribution/distribution (medium bit rate) or emission (low bit rate) quality by various usage of the SLS enhancement portion of the system.

The flexible scalability of the SLS extension makes this coding solution applicable to production environments, where the result is often transmitted to several recipients through channels of differing bandwidth. Also, for private and professional use in music archives, HD-AAC enables both storing of the original music data and transferring of highly compressed copies to portable devices without time-consuming recoding or re-encoding operations.

Fraunhofer IIS is offering HD-AAC software for both PC and embedded devices, including microprocessors or DSPs from ARM, MIPS, Texas Instruments, Analog Devices, Intel, AMD, and IBM. An HD-AAC white paper featuring use cases, further technology background information and contacts is available at http://www.hd-aac.com. Additional information about MPEG-4 SLS is available on the MPEG Web page at www.chiariglione.org/mpeg/technologies/mp04-sls/.

Also announced at CES by Neural Audio (Kirkland, WA, www.neuralaudio.com) and VoiceAge Corporation (Montreal, Canada, www.voiceage.com) was the release of Neural-AMR-WB+ upgraded with Neural-THX® Surround. Neural and VoiceAge indicate that Neural-AMR-WB+ is capable of delivering surround sound content at bit rates lower than 72 kbps, allowing next-generation mobile services and devices to deliver "...TV-like high quality surround sound content at remarkably low bit rates."

Neural-AMR-WB+ is a surround sound version of AMR-WB+ (Extended Adaptive Multi-Rate Wideband) which was developed jointly by Ericsson, Nokia and VoiceAge. According to VoiceAge, this speech and audio codec is

the 3GPP-recommended hi-fi audio codec for Multimedia Messaging Service (MMS), Server-based Streaming (PSS), and Multimedia Broadcast Multicast Service (MBMS) over GSM and WCDMA cellular telephone networks. It is also recommended for DVB-H applications.

AMR-WB+ Samples
Hi-Fi Audio Compression

Please make sure that your default player for .wav audio files is either Windows Media Player, RealPlayer or Apple QuickTime.

Content		Bit Rate per Audio Channel (kbps)												
Class	Item	Mono							Stereo					
		Orig	8.2	10.4	13.6	18	24	32	Orig	10.4	13.6	18	24	32	48
Music	Chorus	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶
	Classical	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶
	Jazz	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶
	Pop1	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶
	Pop2	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶
Speech	Conference	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶
	Sports	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶
Speech between music	Jingle & news	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶
	Television	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶
Speech over music	Advertisement	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶
	Trailer	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶

AMR-WB+ scales to cover the full audio spectrum and uses high-efficiency parametric stereo (HE-PS) to maintain high-fidelity stereo image reproduction at even the lowest bit rates and excellent quality at higher rates. VoiceAge reports that in characterization tests carried out by third parties for the ETSI/3GPP standards organizations, at bit rates of 14 and 24 kbps for mono and 18 and 24 kbps for stereo, AMR-WB+ outperformed MPEG-4 AAC in all tests and outperformed MPEG-4 HE-AAC in seven of eight tests. An array of audio recordings is offered on the VoiceAge Web site (shown in the figure above – go to www.voiceage.com/other.php) allowing for a comparison of original mono and stereo audio in a variety of formats (music, speech, etc.) with the AMR-WB+ encoded audio at bit rates ranging from 8.2 to 48 kbps. Additional information about AMR-WB+ is available on the VoiceAge Web page at http://www.voiceage.com/prodamrwbplus.php.

Is Your AM DA Ready for HD Radio?

AM DA
NAB AM DIRECTIONAL ANTENNA SEMINAR

NAB Science & Technology is hosting a two-day course at NAB headquarters on March 6-7, specially developed to instruct broadcast engineers on how to prepare their AM stations for HD Radio. There is no similar educational opportunity for engineers to learn the proper techniques to maintain complex AM antenna systems ensuring that their stations comply with the FCC rules and enjoy optimum coverage and fidelity. Ronald Rackley, a principal in the firm of du Treil, Lundin & Rackley, Inc. Consulting Engineers and Ben Dawson, President/Senior Electrical Engineer of Hatfield and Dawson of Hatfield and Dawson, will teach the course. Together they have collaborated to instruct the next generation of AM broadcast engineers and pass along the art of AM directional antenna system design and maintenance. They were awarded NAB's highest engineering honor in 2006, the NAB Engineering Achievement Award for Radio. For more information on how to register and housing go to AM DA Seminar information on the NAB Website or contact Sharon Devine sdevine@nab.org or (202) 429-5338.

NAB Provides Members with Energy Consulting to Lower Their Expenses

The APPI Savings Solution Program is a National Association of Broadcasters member-only benefit that manages and reduces member's rising energy costs. Members who utilize this program will benefit from APPI's extensive knowledge of and expertise in electricity and natural gas markets across the U.S. APPI analyzes, negotiates, and structures individual and aggregation supply solutions for NAB members in deregulated states. There are no upfront fees and compensation is results based. As energy costs continue to rise and decrease your bottom line, contacting APPI is a wise business decision. Contact APPI at (800) 520-6685 or e-mail info@appienergy.com and be sure to mention you are an NAB member or visit the APPI website at www.appienergy.com.

Welcome to the place where creativity originates,