DIGITAL RADIO AT NAB2007

Last week's NAB convention (NAB2007, Las Vegas, NV, www.nabshow.com) offered radio broadcast engineers plenty of new technology in the exhibit hall and new information in the conference rooms and certainly lived up to its billing as "Electronic Media's Essential Destination." Summarized below are just a few highlights relating to digital radio technology and to some interesting developments within the National Radio Systems Committee (NRSC) which met at the show on Saturday, April 14th.

NRSC leadership changes - Charles T. Morgan, former senior VP of engineering for Susquehanna Radio, announced his retirement as chairman of the NRSC, a technical standards-setting body co-sponsored by NAB and the Consumer Electronics Association (CEA). Shown in the picture is Morgan (second from left) as he receives a standing ovation from the Committee following his announcement.

Morgan was at the helm of the NRSC for over 20 years. During his tenure, the NRSC developed a series of AM broadcast standards to improve the quality of AM radio, the RBDS Standard currently used for displaying song title and artist on analog FM radio receivers, and the in-band/on-channel (IBOC) Digital Radio Broadcasting Standard, enabling the transition of AM and FM broadcasting in the U.S. from analog to digital. Although he will no longer serve as chair, Morgan will remain active in the committee and its subcommittees.

Replacing Morgan as chairman will be Milford K. Smith, Jr., vice president radio engineering for Greater Media, Inc. Smith will be leaving his position as co-chair of the NRSC's Digital Radio Broadcasting (DRB) Subcommittee, a position he held for the last decade, and from which he, along with co-chair Michael Bergman of Kenwood Americas Corporation, oversaw the development of the NRSC-5-A Digital Radio Broadcasting standard. Andy Laird, vice president and chief technology officer for Journal Broadcast Group, Inc., will be replacing Smith as co-chair of the DRB Subcommittee. Laird has been an active member of the NRSC for over a decade, and was previously the chairman of the DAB (now DRB) Subcommittee's Test Guidelines Working Group and Test Procedures Working Group which were responsible for developing the test procedures used in the NRSC's evaluation of IBOC digital radio. For additional information about the NRSC, visit the NRSC's web page at www.nrscstandards.org.

Electronic Program Guides – EPGs are one of the "future data services" that proponents of HD Radio[tm] have spoken of for awhile. On display in the exhibit hall were two implementations of EPG, one at the Harris booth and one at the BE booth (see picture). EPG information is transmitted to the receiver over the Advanced Application Service (AAS) portion of the HD Radio bit stream. The guide shown in the display lists each program stream in the first column, with the programming on each stream at a particular time listed in the subsequent columns.

The EPGs on display at the show are prototypes based on software that is still under development by iBiquity Digital Corporation (developers of the HD Radio system). iBiquity anticipates releasing this software to transmitter and receiver manufacturers later this year, and expects commercial rollout of this capability in 2008.

Conditional Access – NDS (Costa Mesa, CA, www.nds.com), a company specializing in "conditional access" (CA) systems, has been working with iBiquity Digital Corporation to develop a CA capability for the HD Radio system. At this year's show, NDS was demonstrating its "RadioGuard" system both in its own booth, using equipment developed by BE, as well as the booth of Harris.

With RadioGuard, a broadcaster can "entitle" individual receivers with the ability to receive the CA-portion of an HD Radio broadcast. So, for example, an HD Radio multicast might consist of the main channel signal (HD-1), available to all receivers (i.e. not CA), and CA multicast channels HD-2 and HD-3 which are only available to receivers that have been authorized to receive them.

The demonstration in the Harris booth (shown in the photo) included two Sangean HD Radio receivers where one had been authorized to receive the CA signal and one had not. The inset in the photo (at upper left) shows what the receiver display looks like when a receiver tunes to a CA channel (note the "CA" icon) but is not authorized to receive it. The NDS CA system is expected to be available for

purchase in the third quarter of 2007. A presentation on the NDS system, entitled "NDS RadioGuard HD Radio Conditional Access: What it is; how it fits in the broadcast station; and why it will succeed for HD Radio broadcasters" was given at the NAB Broadcast Engineering Conference (BEC, at the show) and is included in the BEC Proceedings available online at the NAB Store at www.nabstore.com.

FMeXtra – the FMeXtra digital radio system, which utilizes an FM subcarrier for transmission of digital audio and data, was on display at the BEXT booth (www.bext.com). FMeXtra was developed by Digital Radio Express (DRE, Milpitas, CA, www.dreinc.com) who have also developed technology which was licensed by iBiquity for use in the HD Radio system.

Shown for the first time at an NAB show was the "Aruba" receiver (in photo, available now from BEXT for $199) which has a 64 x 128 monochrome display, and which was being used to display simple graphics in the demo at the booth as shown in the photo (these graphics were included in the FMeXtra transmitted bit stream). Norman Miller, DRE President, said that plans are underway for an enhanced receiver utilizing a color display that will accommodate a video transmission using FMeXtra (however that mode of operation would require the analog portion of the FM broadcast to be mono-only).

Mr. Miller also said TCL (www.tcl.com/main_en/), China's largest consumer electronic products manufacturer and DRE have entered into a long term strategic alliance including a joint product development employing DRE's FMeXtra technology. He said that TCL is planning to deploy FMeXtra receivers in time for the 2008 Summer Olympics in Beijing that will make use of the multicasting capabilities of the FMeXtra system to provide information to visitors in multiple languages.