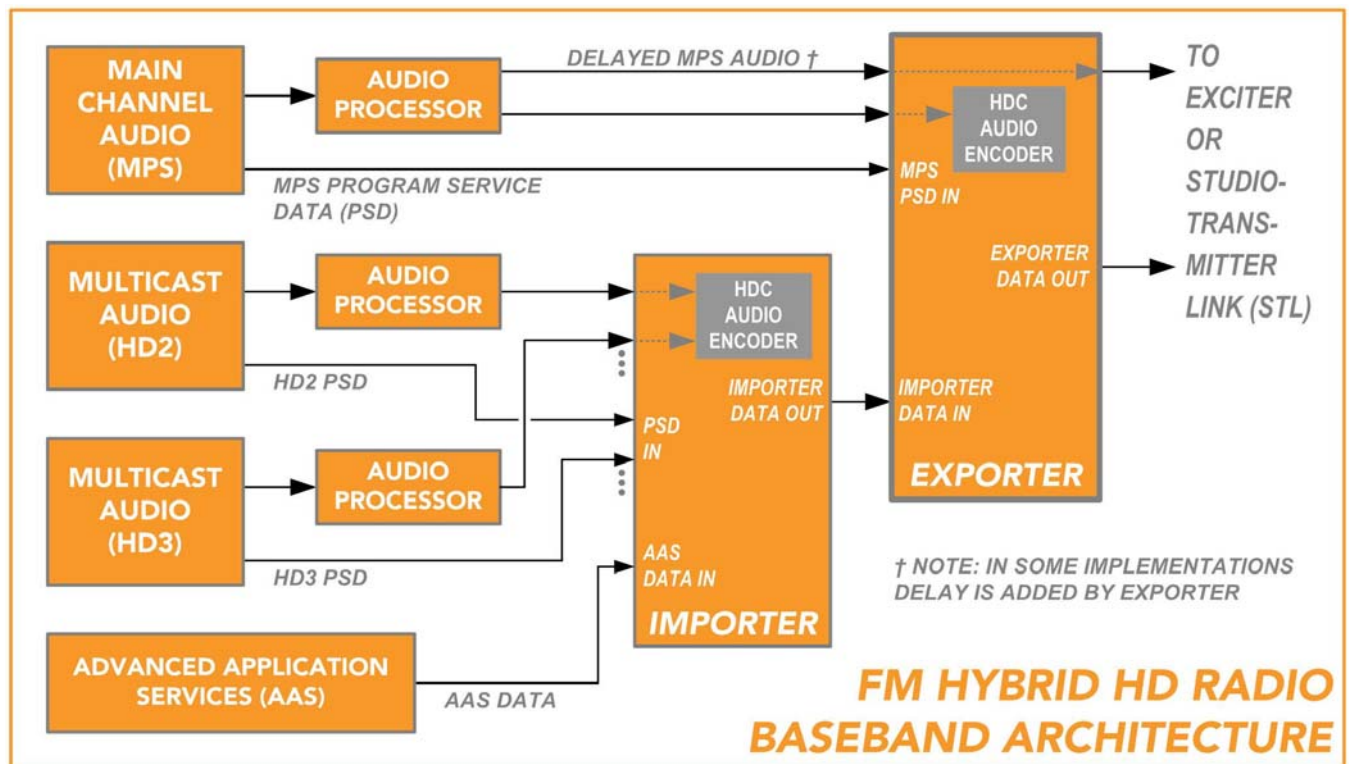




HD Radio “Exporter” Session at The NAB Radio Show

One of the most important parts of an FM IBOC digital radio installation is the “Exporter.” It is the Exporter that brings together all of the various pieces of the HD Radio signal—main channel audio, multicast audio, program service data (PSD) like song title and artist, and more—and combines them into a form suitable for transmission over the RF channel. The block diagram below shows the Exporter (on right) and (at a high level) how it interconnects with other parts of the broadcast facility.



Some of the specific functions of the Exporter include:

- **HDC encoding of the main channel audio** – HDC is the proprietary perceptual audio coding algorithm developed by iBiquity and is used for encoding of program audio within the HD Radio system. While perceptual coding of multicast channels is accomplished elsewhere (usually the “Importer,” also shown in the block diagram) the main channel audio signal is encoded here;
- **Multiplexing** – the Exporter accepts as inputs all of the various signals which can be included in an HD Radio transmission and combines them, adding various formatting and overhead information so that the resulting bit stream is ready for orthogonal frequency division multiplexing (OFDM) modulation onto the multiple RF carriers used in the HD Radio broadcast signal;
- **Diversity delay of analog FM signal** – the HD Radio system incorporates “time diversity” by introducing a delay of approximately 8 seconds between the main channel audio analog and digital signals. Time diversity, combined with the “blend to analog” feature of HD Radio receivers, adds robustness to the transmission since brief interruptions in the signal (due to blockage or interference) can be eliminated (at the receiver) by switching (“blending”) between the analog and digital versions of the signal (note that time diversity protection is available for the main channel audio signal only). While some installations introduce

this time delay in the audio processor preceding the Exporter (as shown in the block diagram), it is also possible to introduce this delay within the Exporter itself.

NAB, along with partners iBiquity Digital Corporation (developers of HD Radio digital broadcasting) and four broadcast equipment manufacturers—Broadcast Electronics, Continental, Harris and Nautel—earlier this year announced the completion of an NAB-funded project resulting in an advancement in HD Radio Exporter technology. The project, started in 2006, was overseen by the NAB HD Radio Technology Advancement Task Force. The Task Force is focused on accelerating the transition to digital radio.

This new technology, called the "Embedded Exporter," reduces the size and cost of HD Radio transmission facilities by eliminating the PC-based design of earlier-generation Exporters and replacing it with a firmware-based "embedded" implementation. In addition to the lower cost and size, the Embedded Exporter is significantly more reliable and stable than its predecessors, and it now becomes possible for manufacturers to incorporate Exporter functionality in other products such as exciters. Further, because of NAB's contribution to this effort, NAB members receive an additional discount on these already cost-reduced products.

A panel at the upcoming NAB Radio Show (September 17-19, 2008, Austin, TX, www.nabradioshow.com) will focus on these new Embedded Exporter products and highlight for broadcasters the advantages of this new implementation. Moderated by NAB Director, Advanced Engineering David Layer, representatives from each of the four Embedded Exporter manufacturers will be on hand to talk about the Exporter in general, and about their first wave of Embedded Exporter products in particular (shown in the pictures below). While each design is based upon the iBiquity "reference," significant product differentiation is possible and already evident in these initial product offerings.

The "Embedded Exporter Technical Panel" will include participation by Tim Anderson, FM/Digital Radio Product Line Manager, Harris Broadcast Communications; Daniel Dickey, Vice President, Engineering, Continental Electronics Corp.; Ted Lantz, HD Radio Product Manager, Broadcast Electronics, Inc. and Scott Martin, Head of Digital Research, Nautel, Inc. It will be held Thursday, September 18, 2008 from 2PM-3:30PM in room 17A (on level 4) of the Austin Convention Center. Additional information about The NAB Radio Show engineering sessions is available online at www.nabradioshow.com/2008/conferences/EngineeringProgram.asp.





**NAB AM Antenna
Computer Modeling Seminar
November 20-21, 2008
NAB Headquarters
Washington, DC
Computer Modeling Seminar**

Don't miss this opportunity for broadcast engineers 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 instructors 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!

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An advertisement for "The NAB Radio Show" and "AustIncredible!". On the left, it says "THE NAB RADIO SHOW" with a microphone icon. In the center is a photo of a person holding a microphone. On the right, it says "AustIncredible!" in large orange letters, with the tagline "Radio's Best Information and Innovations = One Incredible Investment" below it.

An advertisement for "NAB STORE" featuring a book titled "Broadcast Towers: A Step-by-Step Guide to Making Money on Vertical Real Estate". The ad includes the text "Expert advice on tower ownership, tower leasing, creating a new profit center" and "Buy at NABStore.com". A "NEW!" sticker is on the book cover. The NAB Store logo includes "Publications Research".