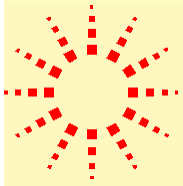


HD Radio Five Year Time Horizon – the Manufacturer's Perspective

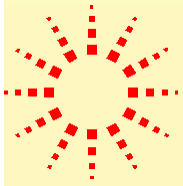
***NPR – Digital Transition
Advisory Committee Meeting
Washington, D.C.
February 10, 2003***





Topics

- **HD Radio Rollout Update**
- **Enabling Advanced Applications**
- **Next Generation Services**
- **What it could mean to NPR Member Stations**

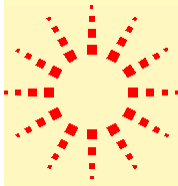


Where are We Today...

Major rollout milestones

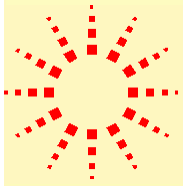
- **April, 2002** **Broadcast equipment launched at NAB and commercially available**
- **October, 2002** **FCC endorses iBiquity's IBOC system, HD Radio, as the US standard for terrestrial digital radio**
- **December, 2002** **130 HD Radio licensed stations in 40 markets across 26 states**
- **January, 2003** **HD Radio receivers launched at CES Show. Eight receiver partners introduced new after-market and OEM products**





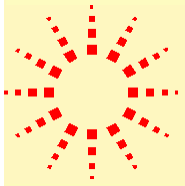
Building for the Future





Topics

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- **Enabling Advanced Applications**
- **Next Generation Services**
- **What it could mean to NPR Member Stations**

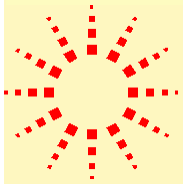


Advantages of AM/FM Wireless Data

- 1. Sufficient and Flexible Wireless Capacity***
- 2. Extremely Low Cost Pipe***
- 3. Great Spectrum***
- 4. Ubiquitous Consumer Use***
- 5. Connection to Existing Local Audio Content***
- 6. Low Cost Pipe for Any Wireless Device – Not Just Radios***

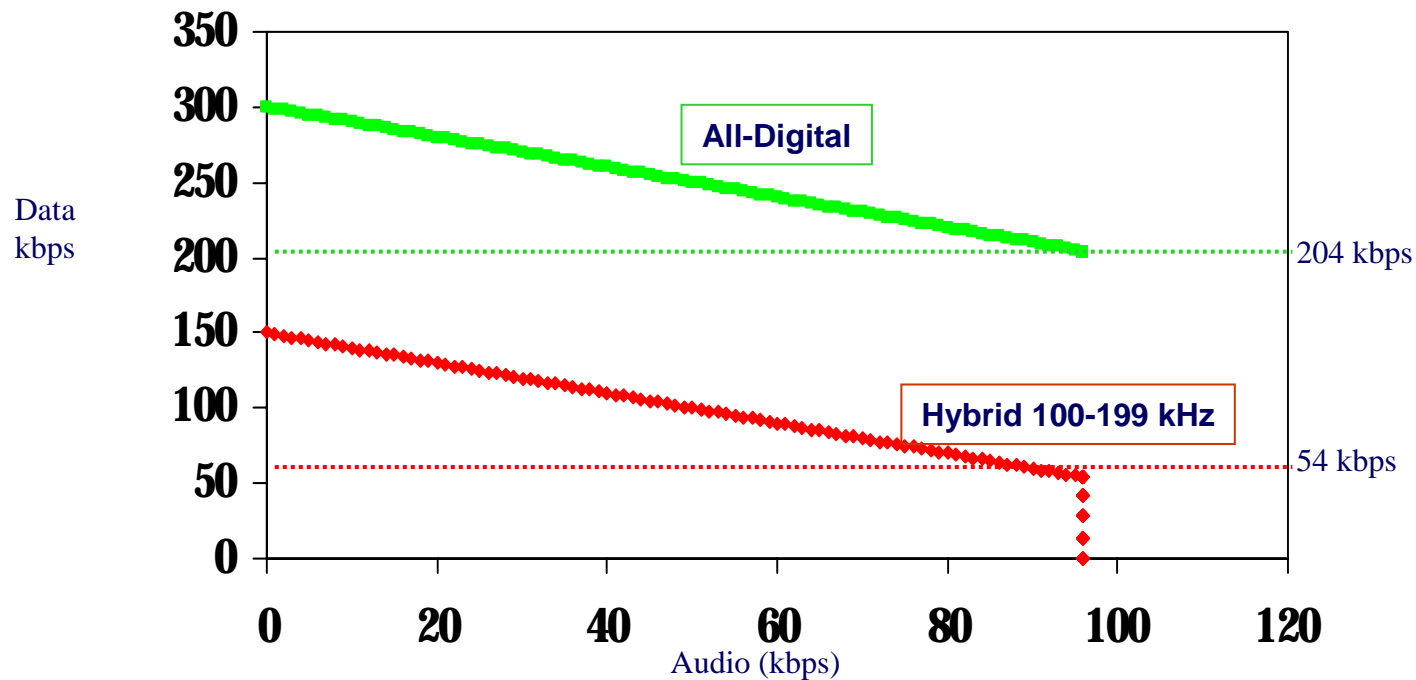


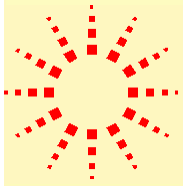
High Quality, Low Cost One-Way Wireless Datapipe



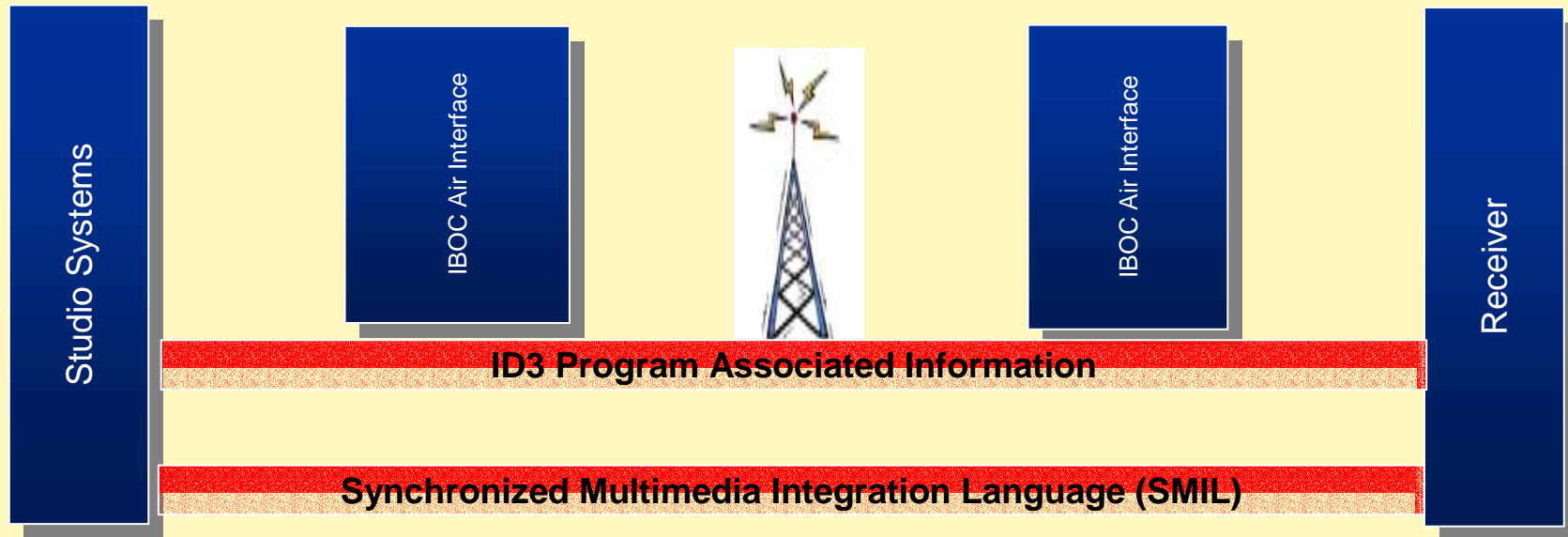
Digital Radio Will Provide Additional Wireless Bandwidth

FM Digital Radio Data and Audio Throughputs

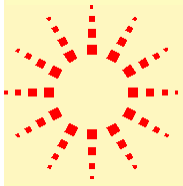




Building an Integrated Framework to Support Audio and Data Transmissions

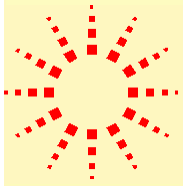


- ***First generation digital radios will be utilize ID3 protocol for data services.***
- ***Next generation digital radios will support the Advanced Application Architecture and deliver audio and data services utilizing the SMIL protocol.***



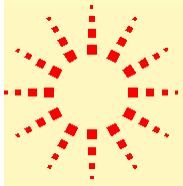
Why SMIL?

- **Tried, tested and wildly accepted**
 - V1 released as a W3C recommendation in June 1998. V2 released in Aug 2001.
 - Adopted by 3GPP as Multimedia Messaging Service (MMS) language
 - IBM, Microsoft, Panasonic, Intel, Philips all support protocol
- **Flexibility to grow with emerging HD Radio data services**
 - Supports the synchronization and transmission of audio, text, image, video and animation either independently or as a combined multimedia object
 - Easily modified through the addition of SMIL extensions



Topics

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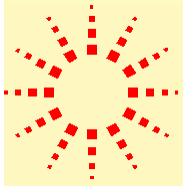


Where we are today.



Simple Text Services

- Program Associated Data
- Non-Program Associated Data



Target for the Future

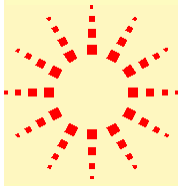
Together broadcasters and receiver manufacturers can deliver increased consumer control over and access to audio services.

- Time-shifting
- Access to secondary audio services
- Delivery of supplementary audio programming

*New
Features*



*Increased
Control*

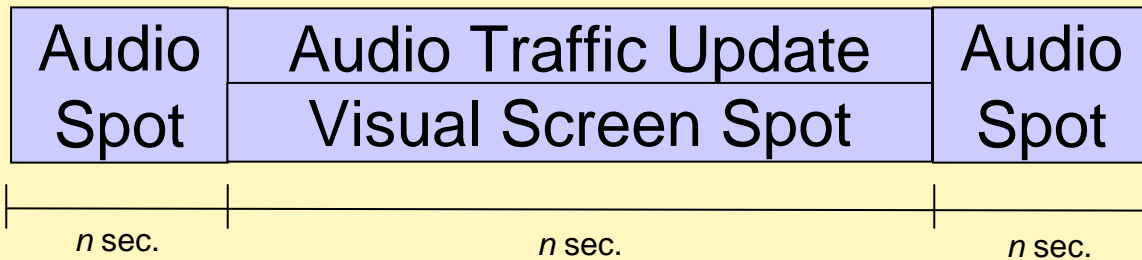


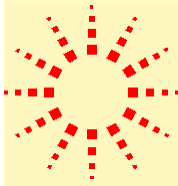
New Features Designed for Intuitive Consumer Use

User Control over supplementary audio services



Programming to Memory





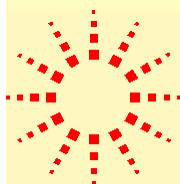
Some Services Can Have Visual Component



Integrated Data Solution

- Traffic updates delivered to navigation system

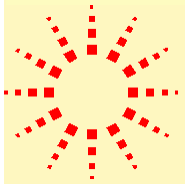




Early Services Will Extend the Audio Experience



*Integrated Controls for Audio Playback
and Navigation*



...Services will extend beyond traditional radios to new HD Radio enabled devices

PDA's

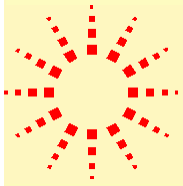


eTablets



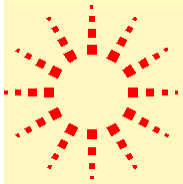
Automobile Devices





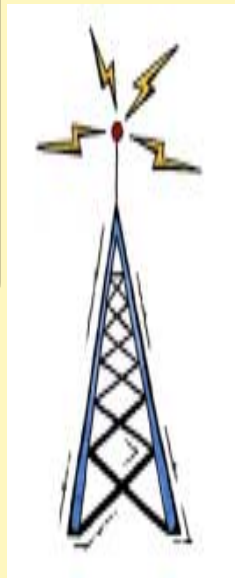
Topics

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Leveraging NPR Assets Through Datacasting

Program Sponsorship



Additional Program Information

Host profiles



Station Identification

Listener Response/Requests

Interactive Campaigns **Donations**

tapes & transcripts

npr shop

books, cds, apparel, & more



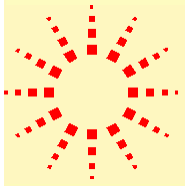
Sound News for 30 Years

"Tagged" Time Shifted Audio



Tales of the Next Millennium

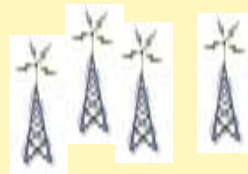
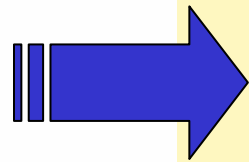




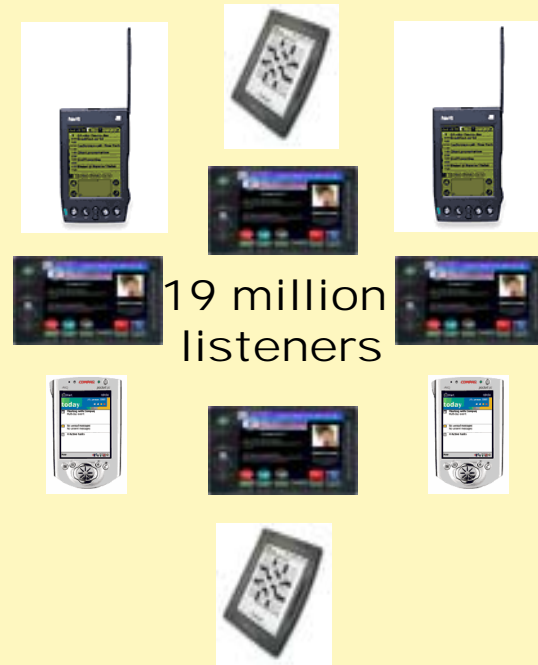
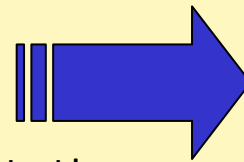
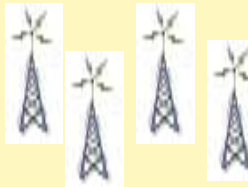
Commercial Market Opportunities

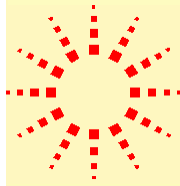
Commercial Market for Bandwidth

- Deliver Value to Member Stations with Additional Content
- Uniquely Positioned with Networking and Distribution Capabilities



650 Member Stations





For More Information...

- **Information regarding system technology and advanced data services www.ibiquity.com**
- **Information about SMIL (Synchronized Multimedia Integration Language)**
<http://www.w3.org/AudioVideo/>
<http://homepages.cwi.nl/~media/SMIL/>
- **Contact Information**
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