DAB+ Workshop

DAB Global Developments

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Overview

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DAB+ Technology Overview

World DAB+ progress update

Business case for DAB+

Receiver profiles & types

Next Steps

S-Comm Technologies acknowledges input to this presentation from previous presentations and sources including WorldDMB, CRA and S-Comm Technologies
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DAB+ Technology Overview - Part 1

Core Technology
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Welcome to the DAB Family of Standards

One family provides the most cost effective delivery of digital radio and mobile TV.
The DAB Family of Standards

The Eureka Family of Standards

• **DAB** : 1995  
  Original audio with PAD and data services standard

• **T-DMB** : 2006  
  Added video services for Mobile TV and enhanced data streaming

• **DAB+** : 2007  
  Enhanced audio service efficiency

Why DAB+?

• 2.5 times more audio services than DAB due to the use of HE AAC+ v2
• Slightly better coverage – 1 to 2dB better than DAB – better FEC coding
• More flexibility for Programme Associated Data delivery
• PAD content has much stronger error protection

One family provides the most cost effective delivery of digital radio and mobile TV

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DAB Standards

For detailed description of the DAB+ system refer to the following ETSI standards documents

• EN 300 401 Main document
• TR 101 496-1, -2, -3 Guidelines of use and operation
• TS 102 563 Transport of AAC audio

See [http://www.worlddab.org](http://www.worlddab.org) or [http://www.etsi.org/standards](http://www.etsi.org/standards)
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DAB+ Features
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DAB+ Features – Audio - Room for Lots of Services
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Choose the station from a list

No more need to remember the station’s frequency!!!
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PAD – Scrolling Text (Dynamic Label Segment)

- Straight forward, effective
- Limited to 128 characters per text segment
- All DAB+ receivers have DLS
- Good receivers should have options to vary scroll speed
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PAD – SlideShow (SLS)

- Further strengthens the audio message
- Standalone advertising during song items
- Promotion of station activities, e.g. OB’s
- Traffic and weather reports
- Race / betting and stock market information
- Local news, happenings, community events
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Data Services

Electronic Programme Guide (EPG)
Now called : Service and Programme Information (SPI)

- Very useful tool for promotion of programs, talent, competitions
- Especially useful for multilingual national broadcasters with scheduled programme slots
- Is flexible, can be station, network or ensemble based
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Data Services - Other

Traffic e.g. TMC and TPEG can provide up to the moment information on:
• current traffic flow and congestion
• fuel locations and prices
• parking

Journaline
• Hierarchical categorised text service

Custom Applications
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Broadcast Features

Announcement Support
• Ability to command the receiver to deliver a different service
  • Traffic Announcements
  • News and Weather announcements
• User controlled / enabled

Emergency Warning System
• Ability to wake up receivers which are in standby
• Uses Announcements to force the receiver onto the Emergency Warning Channel
• Increasing activity to implement a common system

Service Linking and Following
• Provides link information between services and ensembles
• Receiver changes services under predefined reception conditions
• User controlled / enabled
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DAB+ Technology Overview – Part 2

Hybrid DAB+ Digital Radio
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Broadcasters have invested in streamed radio services...
Hybrid Radio was very well received overall, especially by the younger and more tech savvy users.

64% find it appealing

“I like to listen to music and usually have music loaded onto the smartphone. This gives further variety.” (Male, 16-18, non-listener interested)

67% would be likely to use

“I would be able to listen more when out and about. I currently have to listen to purchased music when doing sport but would quite like listening to the radio to prevent getting bored of the same playlists.” (Female, 19-24, non-listener interested)

Base: All survey respondents: UK 16-64 Internet users, smartphone owners, weekly radio listeners (1,009)
Hybrid Radio has also the potential to increase general radio listening among all listeners.

38% would listen to more radio if it was pre-installed on their phone. This rises to 51% among young women aged 16-24.
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DAB+ Hybrid Radio

Transmission Information from Broadcaster

Free to Air DAB+ broadcast with PAD

Telco network

Broadcast interaction

WiFi connection

3rd Party services

Hybrid Radio

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DAB+ Hybrid Radio

Transmission Information from Broadcaster

Mobile network

Broadcast interaction

Free to Air DAB+ broadcast with PAD

Mobile internet

DAB+ capable mobile phone

3rd party services
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DAB+ Hybrid Radio – Service Discovery

Explore new content and services through hyperlinks
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DAB+ Hybrid Radio – Instant shopping!
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DAB+ Hybrid Radio – Engagement and measurement
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DAB+ Hybrid Radio – More information

Accessing a website from a URL delivered associated with the information provided

Button press
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DAB+ Hybrid Radio – Alternative content

Transmission Information from Broadcaster

Primary audio and PAD

Mobile network

Broadcasting interaction

Mobile internet

Alternative images

Free to Air DAB+ broadcast with PAD

DAB+ capable car radio

3rd party services

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DAB+ Hybrid Radio – Categorisation

CAT-SLS

- Station Information
  - Current Program
  - Contact
  - Politics 1
  - Politics 2
  - Football results
  - Cricket results
  - Basketball fixtures
  - Forecast
  - Rain Radar
  - Station music purchase

- News

- Sport

- Weather

- Music

- Emergency

- Station Logo

Current warnings
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World DAB+ progress update
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Europe: Several potential markets

Established markets: UK, Norway, Sweden, Germany, France, Spain, Italy, Switzerland, Portugal, Netherlands, Belgium, Denmark, Poland, Czech, Austria.

Potential markets: Ireland, Slovakia, Hungary, Slovenia, Belgium.

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In Asia Pacific, a similar process is rapidly under way

Vietnam: DAB+ trial in 2013, workshops 2014

Thailand: DAB+ trial planned for 2015

Malaysia: DAB+ trials on air

Indonesia: DAB+ trial on air in Jakarta, Workshop 2014

China: DAB in Beijing & Shanghai

South Korea: DAB/DMB 60m considering DAB+

Hong Kong: DAB+ launch 2011

NZ: DAB+ trial on air Auckland

Australia: DAB+ launched July 2009

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DAB+ Digital Radio in Australia

DAB+ launched 2009

- five major cities + 2 trial cities
- 64% population coverage

1.9m devices sold (400k p.a.)

Radio listening on digital device

- Over 3 million people each week
- Over 24% of all listening
- 1.3m DAB+ listeners more than on internet
- 400 plus different DAB+ receivers on sale – from $29
- Text, Graphics on all stations – inc 37 DAB+ Only Stations
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Automotive Industry in Australia

• 20 major vehicle manufacturers now offer DAB+ in vehicles

• Other brands expected to launch in coming months

• CRA best practice paper for automotive task force and manufacturers/OEMs

• 125,000 new cars sold with DAB+

Make sure your next vehicle has a DAB+ digital Radio.

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Business Case
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The competitive landscape for radio is changing

Online music services

- Digital music services
- Smart devices
- Competition for FM radio

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Younger audiences are listening less??

Changes in youth per capita listening hours, 2010-14

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In many markets, FM spectrum is full

- Overloaded airwaves
- No capacity for new services
- Difficult to innovate
- DAB+ on Band III a fresh new start
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**FM v DAB+ costs**

DAB+ offers significant efficiency savings

---

**Based on:**

- **18 DAB+ services** per ensemble
  - **2.5kW** transmitter / **25kW ERP**

- **9 FM (or AM) services**
  - **10kW peak transmitter / 100kW ERP**

**Excludes costs for telco, insurance, legal, operations**

<table>
<thead>
<tr>
<th></th>
<th>Transmitter</th>
<th>FM</th>
<th>DAB+</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Situation</strong></td>
<td></td>
<td><strong>Owned</strong></td>
<td><strong>Regional site</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Owned</strong></td>
<td><strong>Regional site</strong></td>
</tr>
<tr>
<td><strong>Number of transmitters</strong></td>
<td></td>
<td><strong>9</strong></td>
<td><strong>1</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>,000 USD</strong></th>
<th>Capex: Cost of transmitters</th>
<th><strong>450</strong></th>
<th><strong>80</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>,000 USD pa</strong></td>
<td>Opex</td>
<td><strong>9 FM services</strong></td>
<td><strong>18 DAB+ services</strong></td>
</tr>
<tr>
<td><strong>Power</strong></td>
<td></td>
<td><strong>81.5</strong></td>
<td><strong>8</strong></td>
</tr>
<tr>
<td><strong>Cooling</strong></td>
<td></td>
<td><strong>22.5</strong></td>
<td><strong>5</strong></td>
</tr>
<tr>
<td><strong>Space</strong></td>
<td></td>
<td><strong>45</strong></td>
<td><strong>315</strong></td>
</tr>
<tr>
<td><strong>Maintenance</strong></td>
<td></td>
<td><strong>45</strong></td>
<td><strong>50</strong></td>
</tr>
<tr>
<td><strong>Total Opex all sites</strong></td>
<td></td>
<td><strong>192.5</strong></td>
<td><strong>462.5</strong></td>
</tr>
</tbody>
</table>

**Annual cost per FM site**

<p>| | | | |</p>
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<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td><strong>21.4</strong></td>
<td><strong>51.4</strong></td>
<td><strong>91.4</strong></td>
<td></td>
</tr>
</tbody>
</table>

**Ratio one FM / 2 DAB+**

<p>| | | | |</p>
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<tr>
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<th></th>
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</thead>
<tbody>
<tr>
<td><strong>2.83</strong></td>
<td><strong>4.72</strong></td>
<td><strong>6.43</strong></td>
<td></td>
</tr>
</tbody>
</table>
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Digital radio offers solutions

User Benefits of DAB / DAB+

- Sound quality
  - Quality based on content type
  - Robust and efficient delivery

- Choice
  - 18 to 24 services per ensemble
  - Spectrally efficient

- Additional features
  - Multimedia and data services
  - Hybrid

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DAB+ Receivers
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The market is ready

over 400 consumer devices available

Prices from $25
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The market is ready

All varieties of receivers
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The automotive sector is ready
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DAB in new cars becoming the norm

% of new cars with DAB digital radio

Norway: 63%
UK: 55%
Switzerland: 29%

Source: Digitalradio Norge, DRUK, MCDT

Technology - tried & tested
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DAB+ and Smartphones

• An Australian study into the ability of mobile networks to cope with radio audiences streaming has shown
  – If all radio was listened to on 3G or 4G networks – the capacity for other uses would be severely impacted
  – Even 4G in broadcast mode would not provide the solution
  – The cost of building out every telco network is prohibitive – people would not want to pay for radio
• This study supports the Swedish and German studies
• CRA works with broadcasters in Europe to encourage handset makers to incorporate DAB+
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## DAB+ Receiver Profiles

<table>
<thead>
<tr>
<th>Profile 1: Standard Radio Receiver</th>
<th>Portable</th>
<th>Vehicle</th>
</tr>
</thead>
<tbody>
<tr>
<td>Band III</td>
<td>DAB+</td>
<td>TPEG</td>
</tr>
<tr>
<td>1 Service decoding</td>
<td>DLS</td>
<td>TMC</td>
</tr>
<tr>
<td>Basic display</td>
<td></td>
<td>FM Service Following</td>
</tr>
<tr>
<td>DLS</td>
<td></td>
<td>DAB Service Following</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Profile 2: Rich Media Radio Receiver</th>
<th>Portable</th>
<th>Vehicle</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 service decoding</td>
<td>Colour screen and SLS</td>
<td>TPEG</td>
</tr>
<tr>
<td>DL+</td>
<td>SPI</td>
<td>TMC</td>
</tr>
<tr>
<td>SPI</td>
<td>Journaline</td>
<td>FM Service Following</td>
</tr>
<tr>
<td>Journaline</td>
<td>BWS</td>
<td>DAB Service Following</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Profile 3: Multimedia Receiver</th>
<th>Portable</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>H.264 video decoding</td>
<td>BSAC audio</td>
<td></td>
</tr>
<tr>
<td>BSAC audio</td>
<td>SLS+</td>
<td></td>
</tr>
<tr>
<td>SLS+</td>
<td>Packet data</td>
<td></td>
</tr>
</tbody>
</table>
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The road is long.....
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Broadcasting Unions calling for international approach

EBU

**EBU recommendations**

- Digital broadcast backbone
- Devices to offer analogue & digital
  - consumer
  - automotive
  - smartphones
- Harmonisation across Europe

• Harmonisation: create scale / accelerate market development

• Key requirement of manufacturers
  - automotive
  - consumer receivers

• Digital broadcast the best way to make radio “fit for purpose” in 21st Century

Note: (1) Recommendation R138 [https://tech.ebu.ch/docs/r/r138.pdf](https://tech.ebu.ch/docs/r/r138.pdf)
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DAB+ Next Steps – Engagement

Government and Regulators

Suppliers

Advertisers

Retailers

Automotive

Thailand Automotive
Production 2004-2013

Source: FTI, Thai Autobook Research

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The future
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Thank You

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