

When trials are the next step

ABU Digital Broadcasting Symposium 2012

March 2012

Always Innovating. Always There.

Agenda



- Why a trial?
- Major system components
- Site selection – coverage planning
- Technical planning considerations
- Support and outcomes



Establish reason for and goals of a trial

GOOD

- Create awareness for the need of digital radio
- Consumer user trials
- Demonstration of capabilities and new business opportunities
- Supporting efforts to get spectrum and funding
- Springboard to full time launch of service

BAD

- Prove system technology works
- See if it works in your geography
- Be the first to run DAB in your country
- See if the actual coverage matches the planning
- I think it would be cool

DAB/DMB

AM



FM



VHF



UHF



L-Band



- Widely adopted in Europe, and rapid growth in Asia
 - Band III or L-Band
 - Band III leads in adoption
- Spectrum is available in almost all regions
 - New Spectrum available in band III from digital TV conversion
- Commercial transmission products exist and are deployed
- Receiver availability and performance should be a key criteria for selection

Commercial Activity

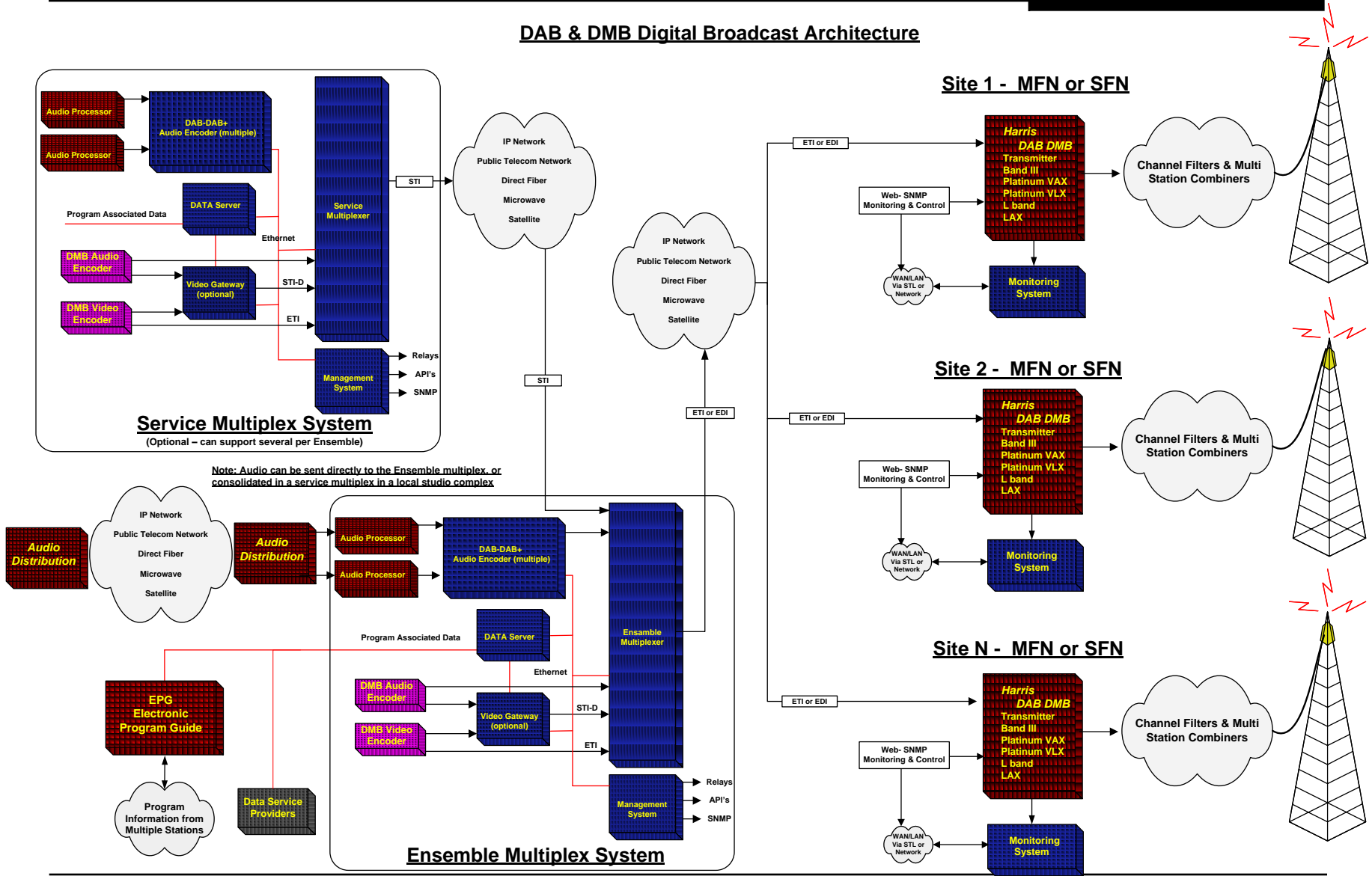
No Spectrum Planning

Harris Transmitters

Major System Components



DAB & DMB Digital Broadcast Architecture



Planning & Design Anomalies

– Impact on Business Case



- **Coverage Planning** \Rightarrow only a question of field strength?
 - DAB is a broadcast system with special parameters and conditions
 - Digital broadcast planning particularities
 - SFN and statistical Gain
 - Self interference
 - Guard Interval and delay optimization
 - Interference of digital and analogue Co & Adjacent channels

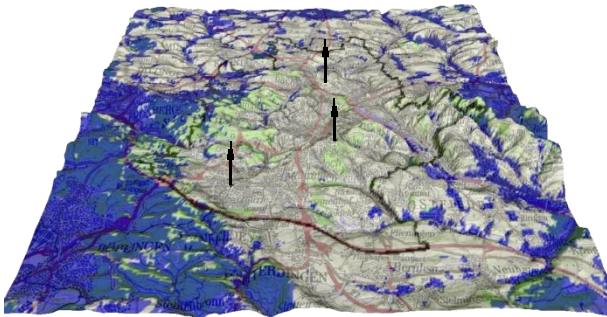


Planning & Design Anomalies – Impact on Business Case

■ Coverage conditions - Receiving Mode

Portable

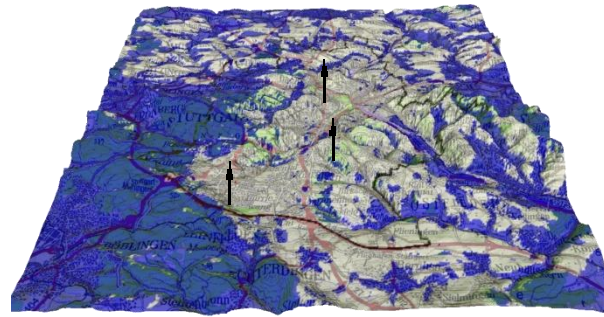
Light Indoor Coverage



- 3 transmitters covering 90 % of inhabitants

Portable

Deep Indoor Coverage



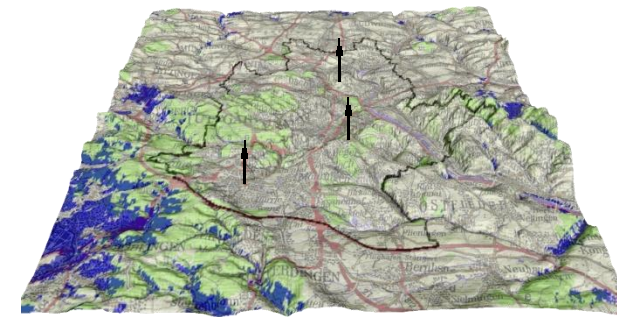
- 3 transmitters covering 69 % of inhabitants



- Adapted Portable Deep Indoor Coverage
- 12 transmitters covering 90 % of inhabitants

Portable

Outdoor Coverage



- 3 transmitters covering 99 % of inhabitants



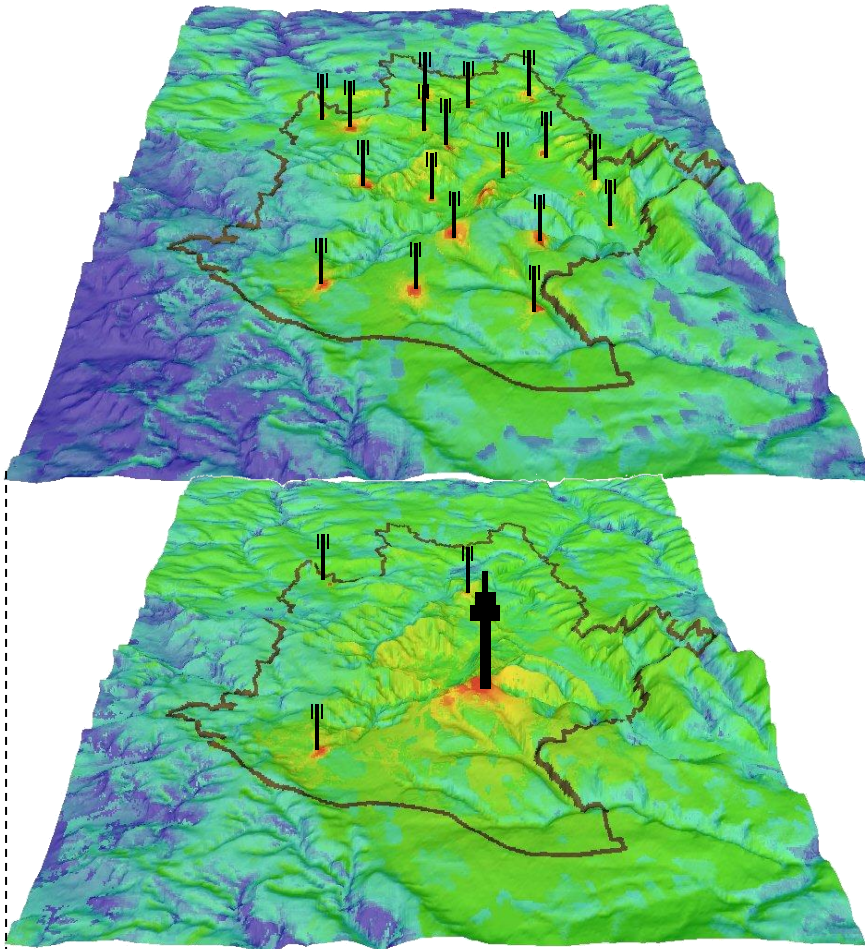
- Adapted Portable Outdoor Coverage
- 1 transmitters covering 97 % of inhabitants

Network Structure & Rollout

- Impact on Network Costs

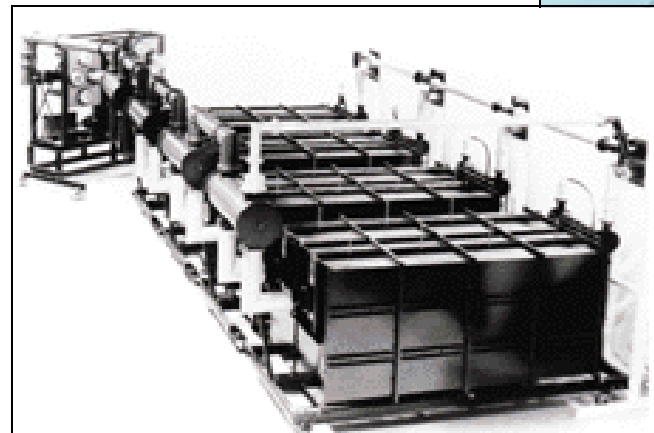
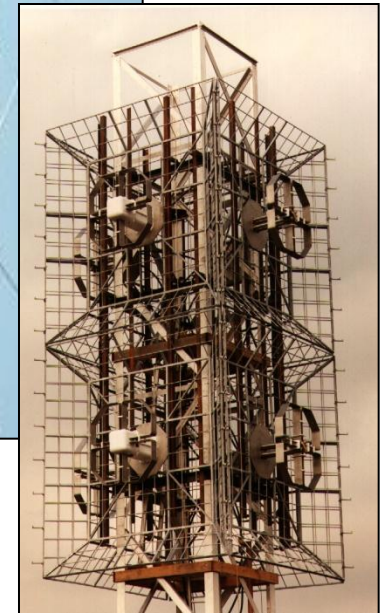


- Comparison of different **Network Structures**



- Network design with low power sites
 - Equal power distribution
 - 19 transmitter necessary to fulfil the requirements
 - Adapted power and transmitter height
- Mixed network concept
 - Usage of High and Low power sites
 - 4 transmitters are necessary to reach the coverage requirements
 - Optimal trade of transmitter number and coverage

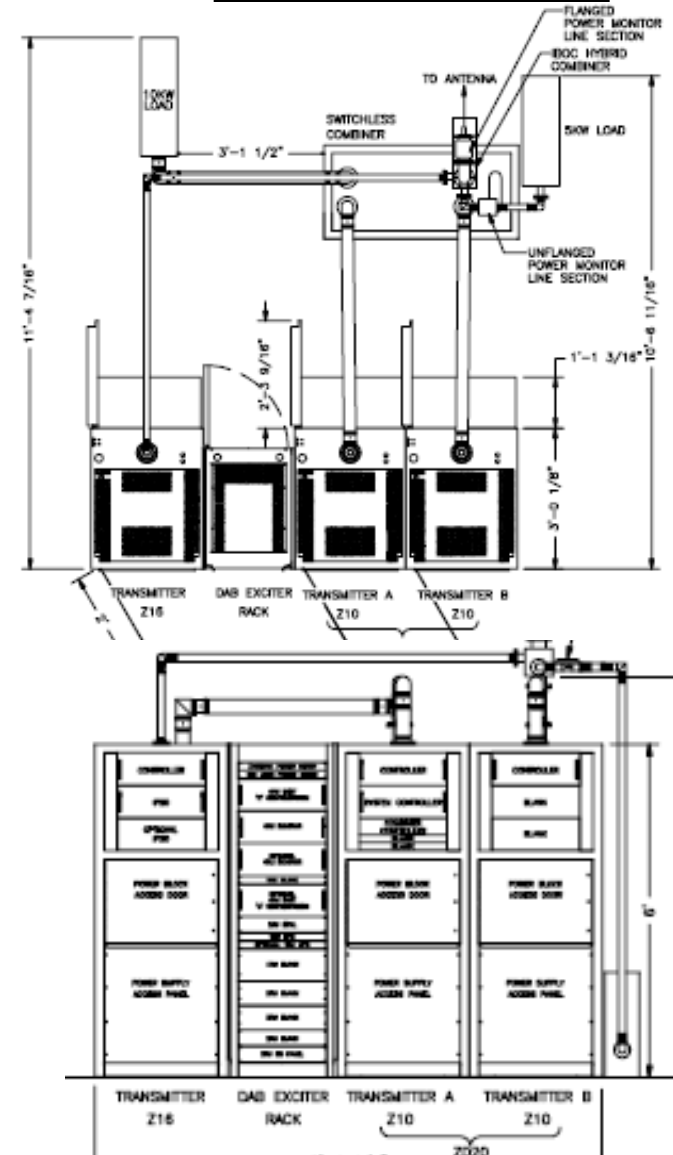
- DAB/DMB
 - Different requirements from AM/FM
 - Typically part of a Band III or L Band master antenna system
 - In some cases share with Band III TV possible
- If implementation does require antenna work
 - Space and loading available on the tower
 - Proximity to other antennas
 - Capacity in the Master Antenna and combiner



Space Planning



- AC Power consumption
- Cooling requirements
- All new transmitter require new space
 - Depending on power could be in an existing rack
- Combining equipment can be large
 - However single mux/antenna only needs a simple filter
- Multiplex approach reduces transmitters
 - One transmitter can deliver 25 channels/stations



Platinum™ DAB/DMB transmitters HARRIS

Air cooled

More networks operate Harris DAB/DMB transmitters than any others



VAX Compact Class (5-50W)



VAX (150-300W)



VAX (600W)



VAX (1kW to 10kW)

Platinum™ VAX 50W - 10kW (VHF)

Liquid Cooled



Platinum™ VLX 1.2kW – 28.8kW (VHF)



- highly efficient
- easy serviceable
- small footprint

Power Levels COFDM Before Filter



Apex M2X Exciter



Maxiva ULX UHF LC



Maxiva UAX UHF AC



Platinum VLX VHF LC



Platinum VAX VHF AC

Summary



- Set clear goals and measurement for success
- Secure Spectrum
- Evaluate tower , antenna and space planning
- Conduct coverage/network planning
- Select appropriate transmitter solutions
- World DMB and the members have experience that can be leveraged to help with your trial
- Harris has presence in all regions of the world to be able to support multiple trials and rolls outs



Thank You

Always Innovating. Always There.