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DRM Digital Radio

- A broadcasters view of the future

John Sykes
Project Director, Digital Radio
BBC World Service



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Radio Standards:

- DRM+
- AMSS

Digital Radios:

- Form & Function?

World Service plans



Marconi at Signal Hill, St John's,
Newfoundland, from *Scientific American*

UK and Europe today: DAB & DRM

DRM is a perfect adjunct to DAB in many markets

- Old AM/FM bands replicated in digital format
- DAB/DRM chip-sets planned by major players
- Once conjoined, DRM's audio coding available to DAB system
- DRM can address market requirements not served by DAB
 - Wide-area rural coverage
 - Local coverage on 26MHz
- 64Mb memory card allows typically 6 hours of DRM recording !



Rural example



VTC DRM transmissions into
UK from Moosbrunn in
Austria

e.g.

- 0900 – 1100 BST
- 9720 kHz
- Good coverage from c.
60kW !



DRM +

- What is it?
 - An “extended” version of the current DRM standard
 - Designed to work at all frequencies below 120MHz
- Why is it needed?
 - Broadcasters in some countries demanding a coherent migration path for **both** AM and FM to digital
 - Low cost receivers
 - DRM currently specified only for use below 30MHz
 - Spectrum efficient use of especially FM bands
 - Fills “Hole” in current digital radio offerings



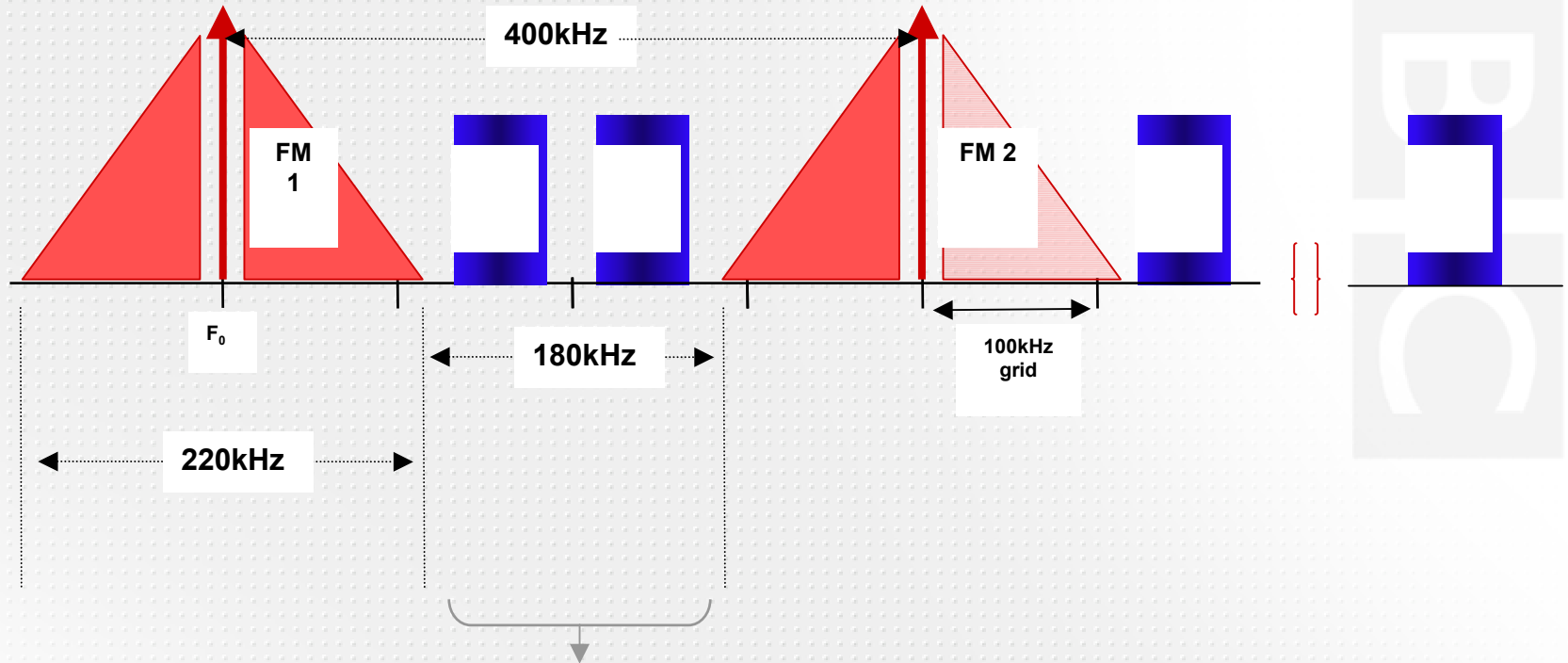
DRM: the future



	Eureka DAB	ISDB-T (Japan)	HD Radio (USA)	DRM
System Status	Open standard	Open Standard?	Proprietary /closed	Open standard
Spectrum required	1700kHz	Variable: 430kHz minimum	30kHz (MF) 400kHz (FM)	Variable 5/10/20kHz
No of digital services supported	5 to 8 stereo	1 -2 stereo very high quality	MF: one stereo FM: 1 to 2 stereo	LF/MF/HF: one stereo
Net bit-rate	Variable c. 1Mb/s	c. 280-650kb/s	?	Variable c. 18kb/s to 48kb/s

“DRM +” : exploiting unused spectrum

How DRM + transmissions could be introduced

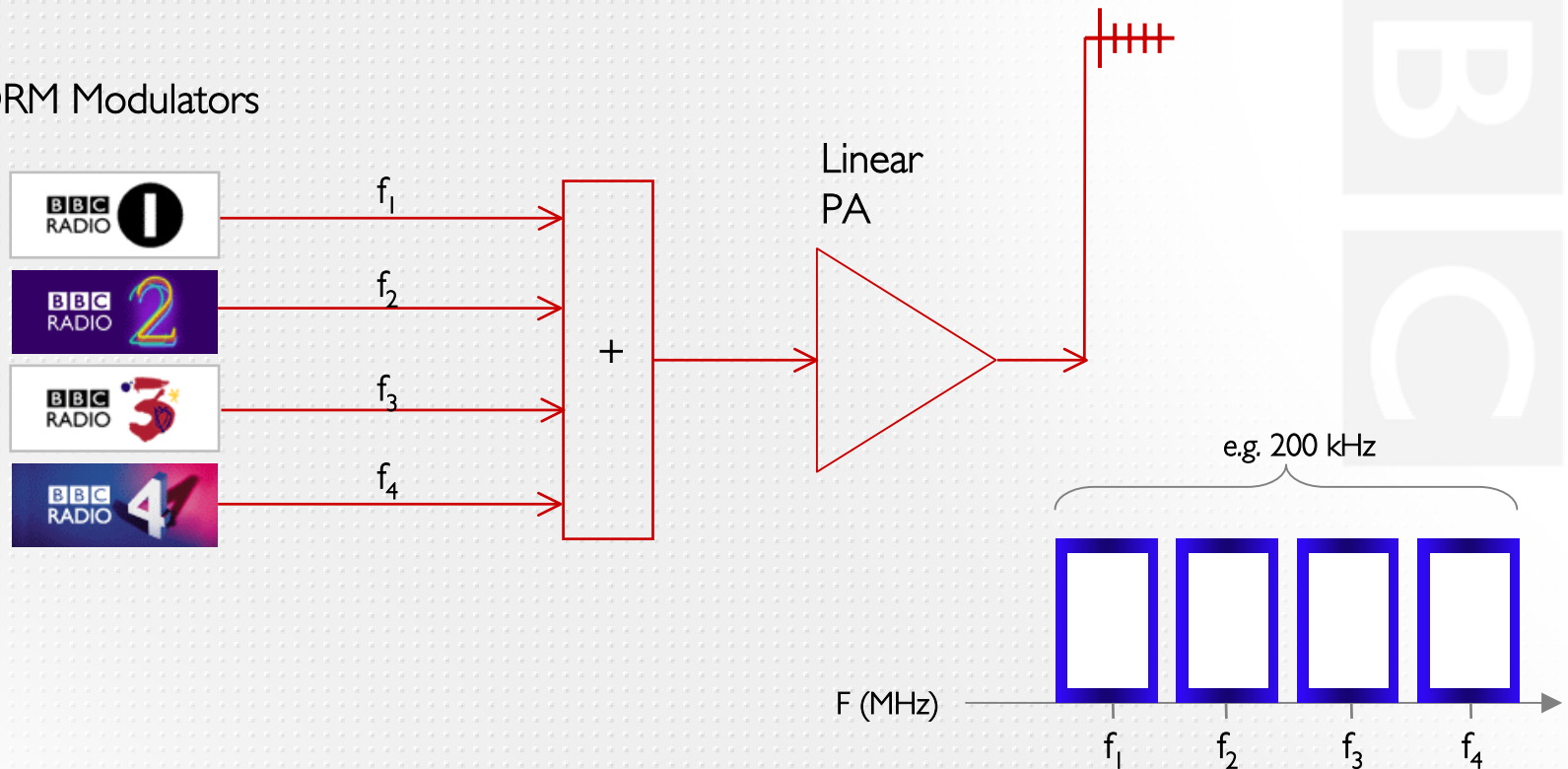


Note: one, two or three DRM blocks could be broadcast in the 180kHz gap, depending on the final 120 system bandwidths.

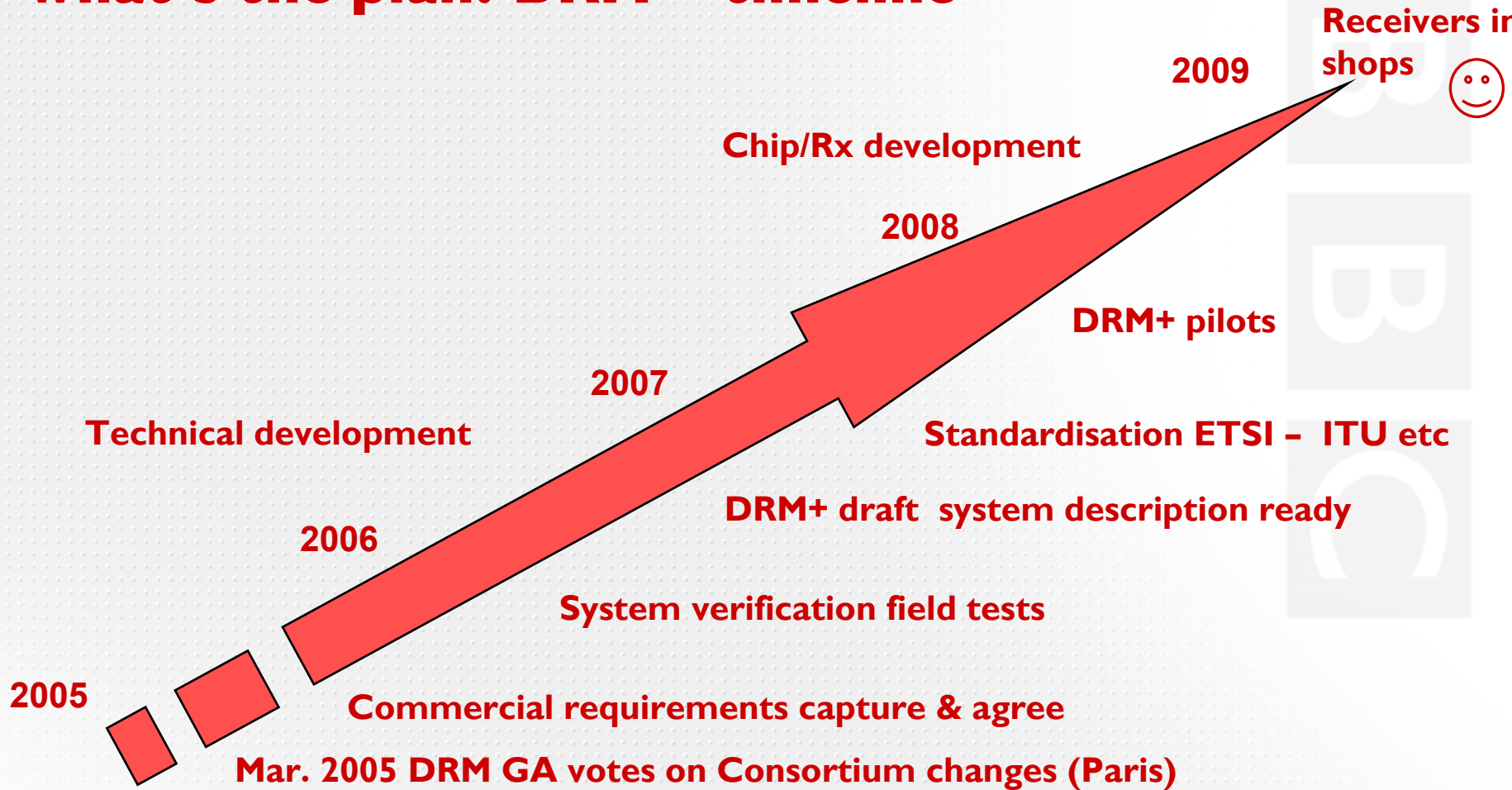
DRM+ : Common amplification of multiple services

- Example: broadcaster with four services and one spare FM “slot”

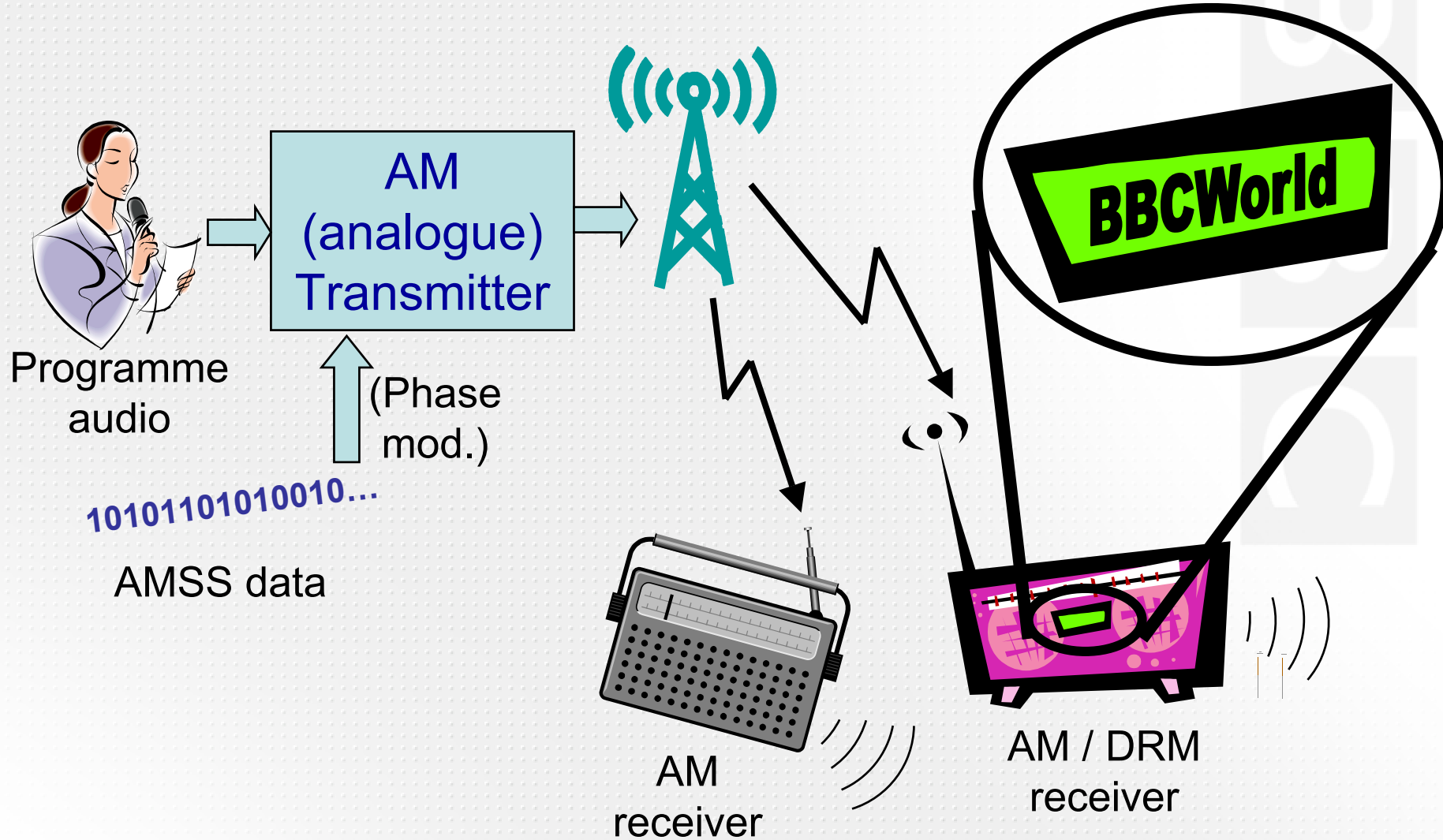
DRM Modulators



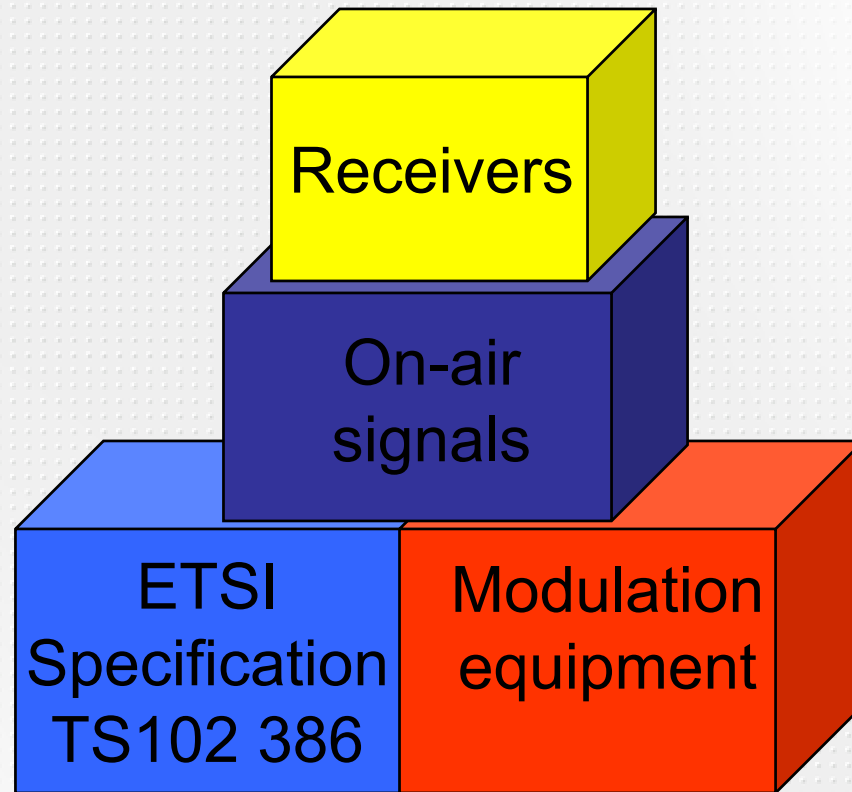
What's the plan? DRM + timeline



AM Signalling System “AMSS”



AMSS: Progress



BBC AMSS Modulator



Installation in Cyprus



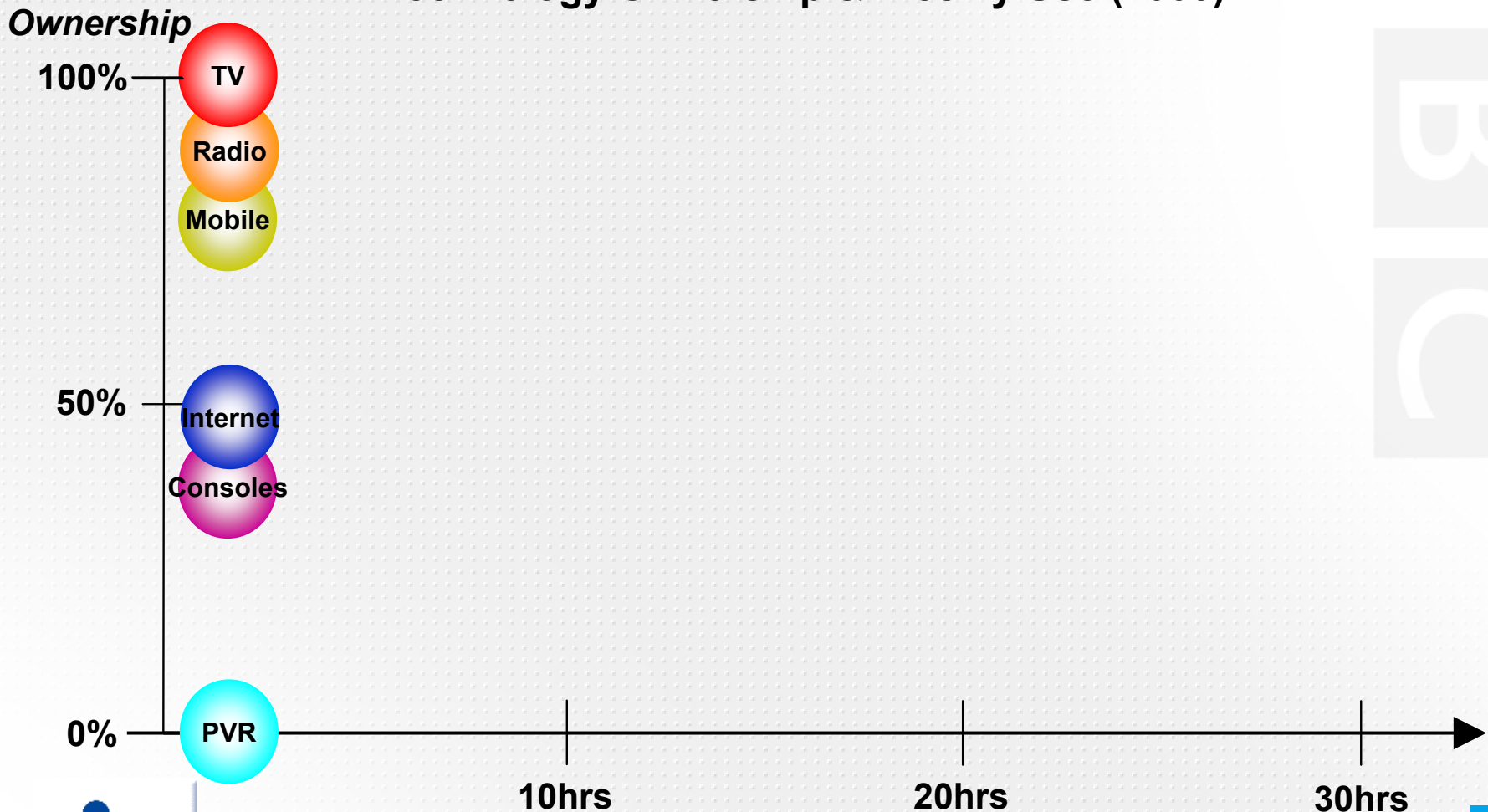
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Radios: function.

Technology Ownership & Weekly Use (2003)



Radios: The Consumer perspective

The consumer

- is not at all interested in *how* the service is delivered
- wants radios that work & are intuitive to use
- Would like to receive *all* radio services, not a sub-set
- Will increasingly wish to self-schedule

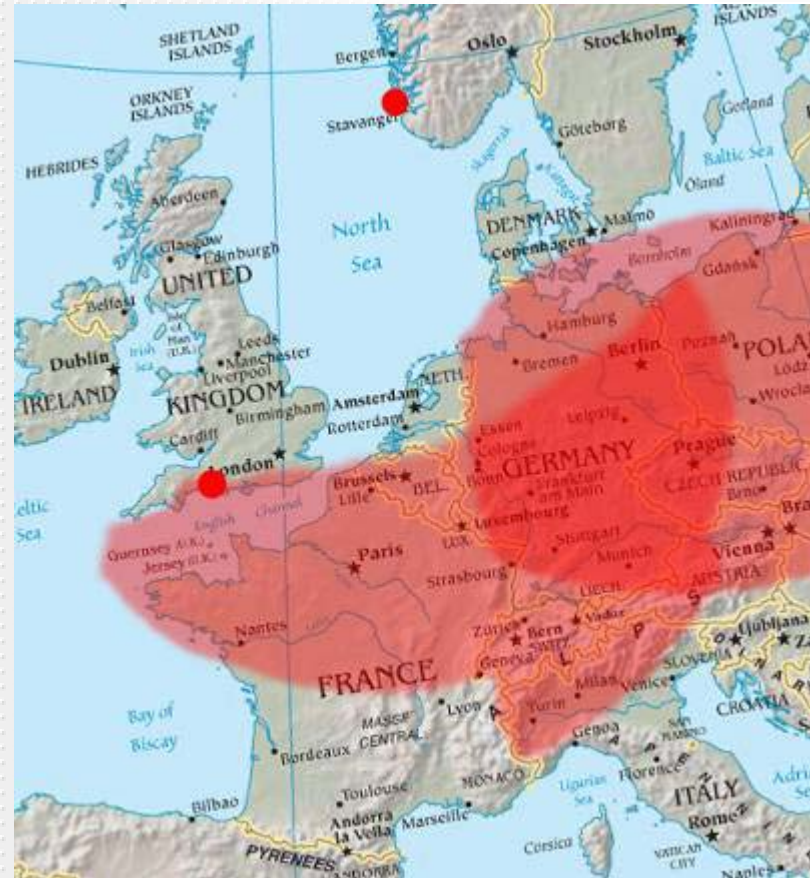
It's the Broadcasters responsibility to ensure these needs are met

- Through engagement with the receiver & chip industry
- Insistence on minimum standards & harmonisation of core functions
- Provision of EPG etc.
- Development of common branding for Digital Radio



BBC World Service DRM Launch

- BBC European service launch at IFA 2005
 - Core coverage from VTC 1296kHz DRM Tx at Orfordness
 - Augmented by SW from UK and Norway
 - expanding to France/Germany
 - English for Europe initially



BBC World Service DRM Launch



- Worked closely with other broadcasters to achieve critical mass –
 - both public and commercial sector (DW, RTL etc.)
- Need digital radios in shops within 3 months of launch.
 - DRM, DAB, FM and AM
- Phase 2: bid for new transmitters in Northern Europe and Cyprus provide HF MFN into Europe
 - Important to have digital receivers which can exploit frequency redundancy
 - And which can receive analogue services ..



Predicted Phase 2 coverage

Summary

- DAB and DRM will be integrated seamlessly into consumer radios
 - Europe initially
- AMSS and RDS allow same MMI for analogue & digital services
- Receiver storage combined with Radio EPG key functions for future
 - “What I want, when I want it”
- Broadcasters should be pro-active in working with manufacturers
 - Basic performance standards
 - Harmonised functions

Digital Radio

Thank you!



Further reading/references

OFCOM paper: "The Communications Market 2004 – Radio" available in PDF form from

http://www.ofcom.org.uk/research/industry_market_research/m_i_index/

BBC R&D web-site includes numerous papers relating to digital Radio & TV: see

<http://www.bbc.co.uk/rd/pubs/whp/index.shtml>

The UK Digital Radio Development Bureau (DRDB) web site

<http://www.drdb.org/>

The DRM and WorldDAB web-sites:

<http://www.drm.org> <http://www.worlddab.org>

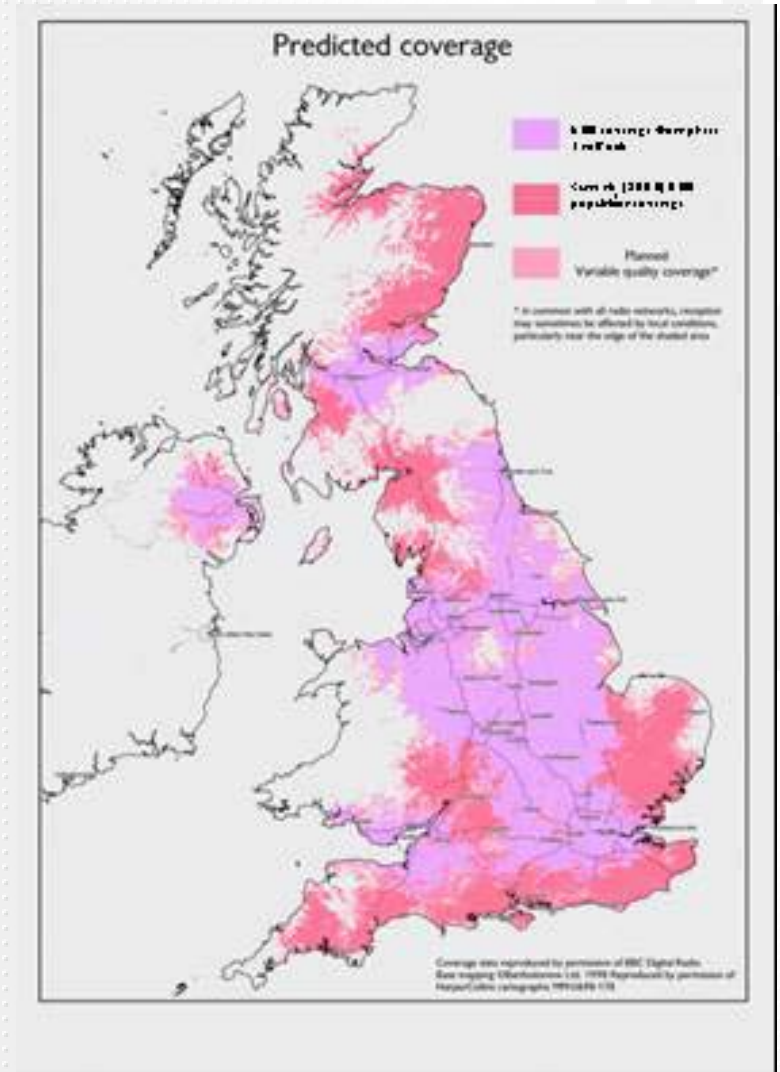
CT-aacPlus – a state-of-the-art AUDIO CODING scheme

Martin Dietz and Stefan Meltzer, CodingTechnologies, Germany

EBU Technical Review, July 2002

DAB: the UK today

- DAB coverage c. 85% population
- DAB's strengths:
 - multiple-services +
 - national coverage
- Single service, local coverage?



Rural

