DRM +

The Future of FM

DRM – Digital Radio Mondiale System

Global open standard for digital radio

- Ø One station – One frequency:
  Covering large areas/international broadcast (AM bands: DRM30) and local/regional markets (VHF bands: DRM+)
- Ø Radio with the “Extras”:
  Convenience Features (Labels, AFS, EPG), 5.1 Surround Sound, Multimedia Services (Slideshow, Journaline, real-time traffic, videos)
- Ø Fits and works seamlessly
  with DAB family and other standards

Where DRM fits:

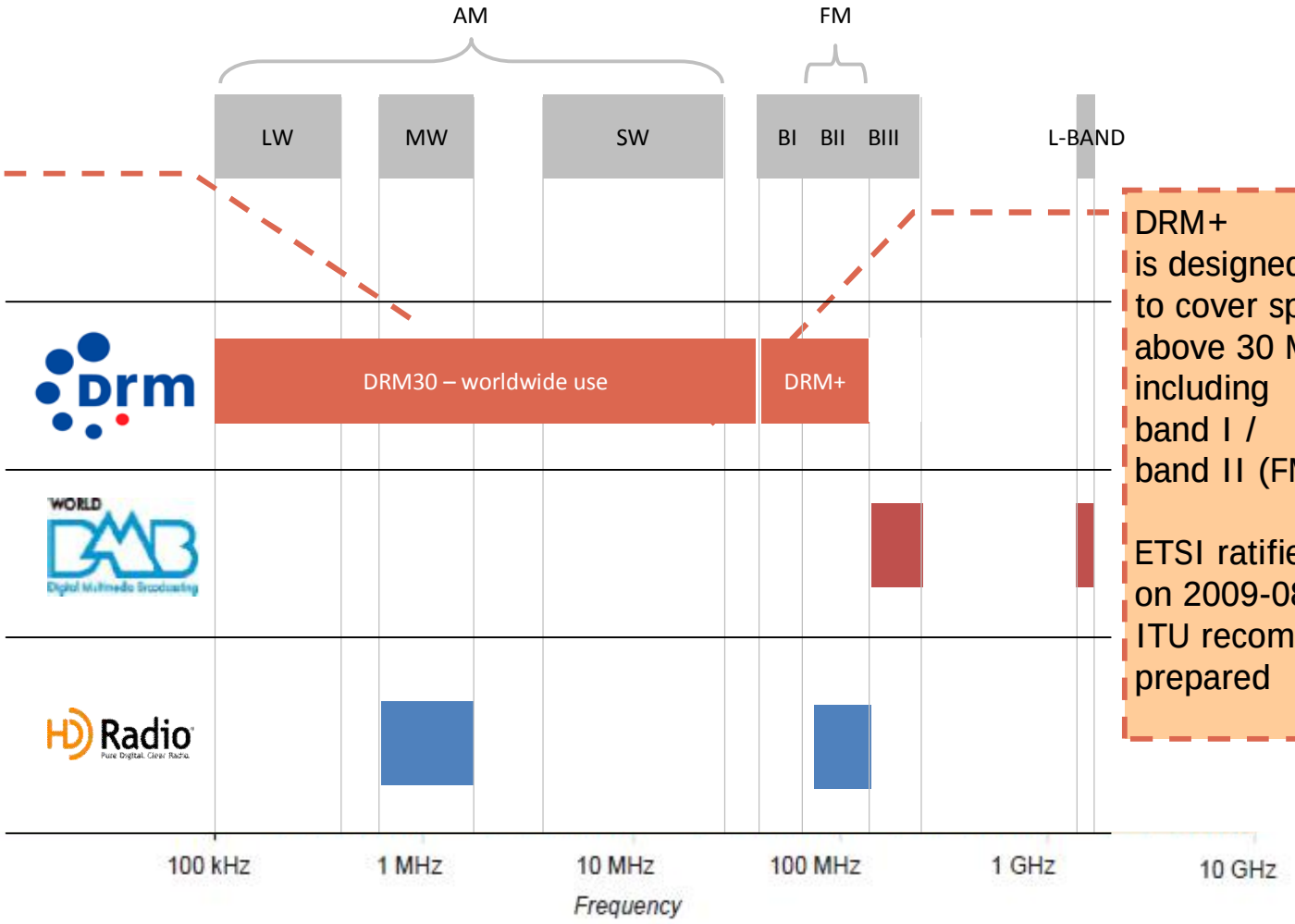
Frequency bands & capability of different digital technologies

DRM30

for AM broadcasting bands up to 30 MHz: short wave, medium wave and long wave

Large coverage areas

Robust against fading and interference



DRM+
is designed to cover spectrum above 30 MHz, including band I / band II (FM).

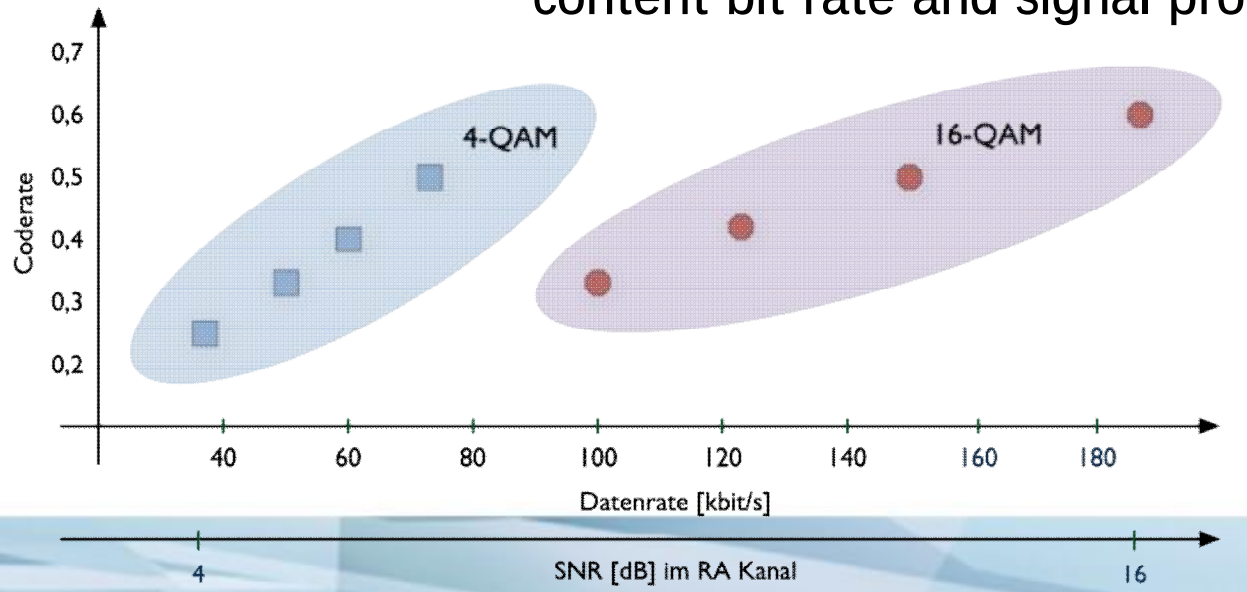
ETSI ratified on 2009-08-31; ITU recomm. prepared

Source: Digital Radio Guide, World Broadcasting Unions, Technical Committee; Innovations in AM broadcasting, Thomson, Feb 2008

DRM+
DRM Above 30 MHz to 174 MHz

- Extension to the DRM system: Robustness Mode E
- Includes band I and II (FM)

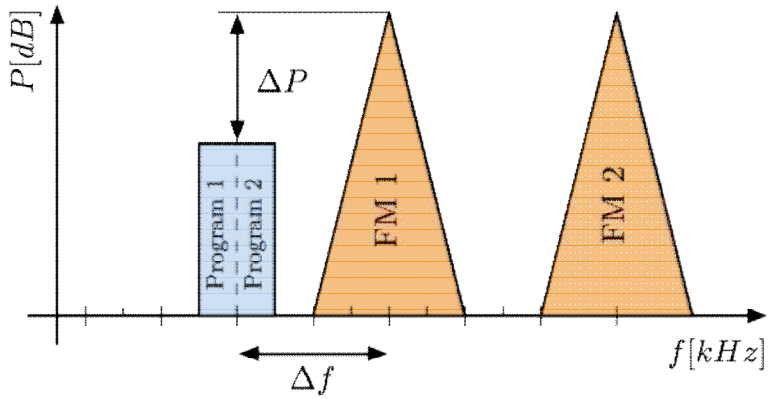
- Useful content bit rate 37–186 kbps
- Worldwide spectrum compatibility: 100 kHz bandwidth
- Minimum signal delay: 0.6 sec
- Flexible trade-off between content bit rate and signal protection:



DRM+

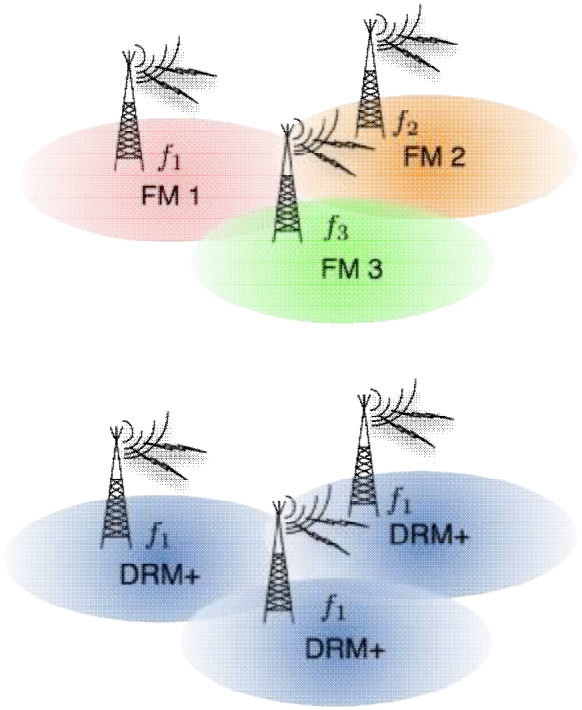
Introduction scenarios:

- Anywhere in the VHF bands (seamless receiver switching)
- Adjacent to linked FM signal:



Recommended values:
Δf = min. 150 kHz
ΔP >20 dB for Δf=150 kHz

- SFN Support (Single Frequency Network)
  à Efficient spectrum usage



What can DRM (DRM30 and DRM+) offer?

More choice for listeners
- **à** up to 4 programs on 1 frequency
- **à** simulcast analog / digital

Excellent audio quality
- **à** no distortion
- **à** stereo and 5.1 surround sound

Multimedia Applications
- **à** rich information sent along with DRM

Emergency warning and alert feature
- **à** all receivers switch,
  present audio and text information

Multimedia Applications

DRM TextMessages
programme accompanying labels (Unicode)

EPG – Electronic Program Guide
What's up now & next;
Search for programs and
schedule recording

Journaline
text based information service (Unicode),
supporting all classes of receivers,
triggers interactivity and geo-awareness

MOT Slideshow
programme accompanying images + animation

TPEG / TMC Traffic Information

à Great commercial potential !

What can DRM (DRM30 and DRM+) offer?

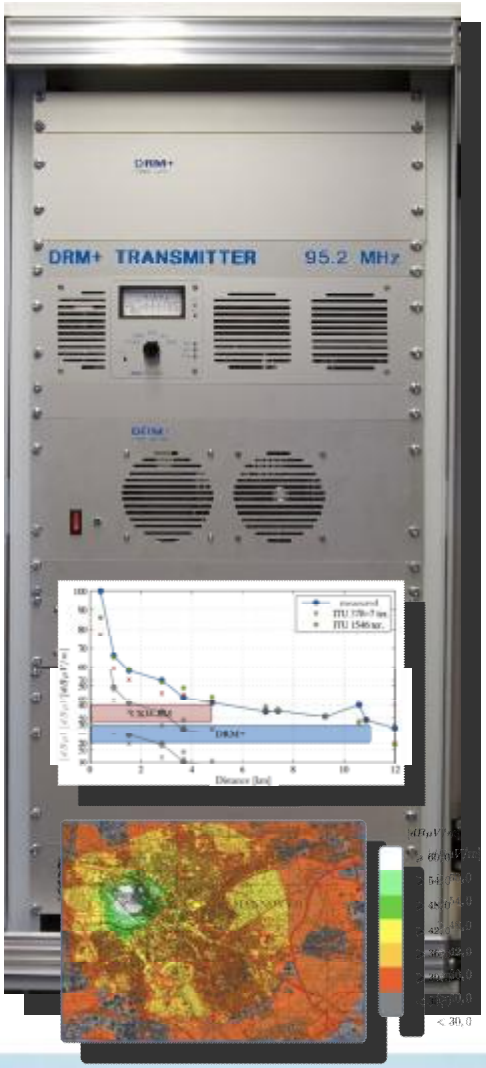
Automatic tuning
- **à** by station name, no longer by frequency
- **à** re-tunes when leaving coverage area

Good coverage area and robust signal
- **à** supporting SFN (single frequency networks)
- **à** green and energy efficient

Per-device IPR cost:
One-time license fees paid by manufacturer, part of device cost
- **à** No running royalties for broadcasters!

DRM+ System Evaluation

- Field tests with low power TX (<100W) in Band II
  - Results from Hannover and Kaiserslautern
  - Worldwide first DRM+ transmission in 2007
  - No impact on other systems (FM, flight security, emergency services)
  - Coverage and coverage reliability increased compared to FM
  - Higher resistance to interference than FM



DRM+ in the field

- Europe
  - Germany: Ongoing field trials in Kaiserslautern and Hannover
  - France: Successful field trial in Band I in Paris
  - Italy: Field trial in Band I & II in combined mode
- Brazil
  - Governmental high and low power field trials in combined mode
- Russia
  - Governmental study analyzing and testing DRM+
- China
  - Preparation of digital strategy
- Further inquiries for Band I and Band II
  - Canada, Chile, Korea, Ukraine, India, Australia, Norway, ...

DRM+

Standardization finished
System evaluation finished
Test systems available

DRM+, a viable, simple and cost effective alternative for FM digitization!

For any inquiries, comments or suggestions
Please write to
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