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DIGITAL radio mondiale

The FUTURE of global radio

"Flexible and Complete Digital Radio for Europe"

DRM European Workshop

In conjuction with the DRM General Assembly

6th - 7th April 2016 - Erlangen, Germany

DRM+ in VHF band III

Technical parameters of DRM+ for all the VHF bands

DRM+ as complement to DAB/DAB+ in VHF band III

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► *Worldwide basic for DRM+ in VHF bands I, II, III*

ITU Rec. BS.1114-9 „Systems for terrestrial digital sound broadcasting to vehicular, portable and fixed receivers in the frequency range 30 - 3 000 MHz"

- **describes DRM+ (DRM robustness Mode E, ITU-System G) as designed for all the VHF bands**

ITU-Rec. BS.1660-7 „Technical basis for planning of terrestrial digital sound broadcasting in the VHF band"

Report ITU-R BS.2214-1 "Planning parameters for terrestrial digital sound broadcasting systems in VHF bands"

- **give all the core technical parameters for the use of DRM+ in all VHF bands (30 – 300 MHz):**
  - Required minimum field strength levels for the given reception modes
  - Frequency grid of 100 kHz (in FM band and VHF band III)
  - Out-of-band spectrum mask
  - Protection ratios of DRM+, FM,T-DAB, DVB-T interfered with by DRM+

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► *Europe related basic for DRM+ in VHF band III*

RRC-06 (ITU Regional Radio Conference 2006, Geneva):

- gives administrative and technical regulations in the ITU Region 1 for **DVB-T and T-DAB**
- **Final Acts, Article 5** *(Note: quote shortened)*: in the case of the use of an entry in the digital Plan with different characteristics the conditions specified in Section II of Annex 4 *(Note: Examination of the conformity with the digital Plan entry)* are met.
  Such use shall not claim more protection than that afforded to the above-mentioned digital entry.

DRM+ fulfils the requirements of the RRC-06:

- T-DAB is not more interfered with by DRM+ as by T-DAB
- DRM+ is less interfered with by T-DAB as by DRM+ (due to the different rating bandwidth)

DRM+ can be used in VHF band III compatible with T-DAB / DVB-T

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► *Status of DAB/DAB+ in VHF band III in Europe*

Most countries in Europe have DAB/DAB+ in operation or in consideration.

To respect the DAB/DAB+ development the following conditions have to be taken into account to operate DRM+:

- Availability of sufficient frequencies without avoiding the development of T-DAB
- Low transmitting power to reduce the interference impact

Source: https://www.worlddab.org/country-information

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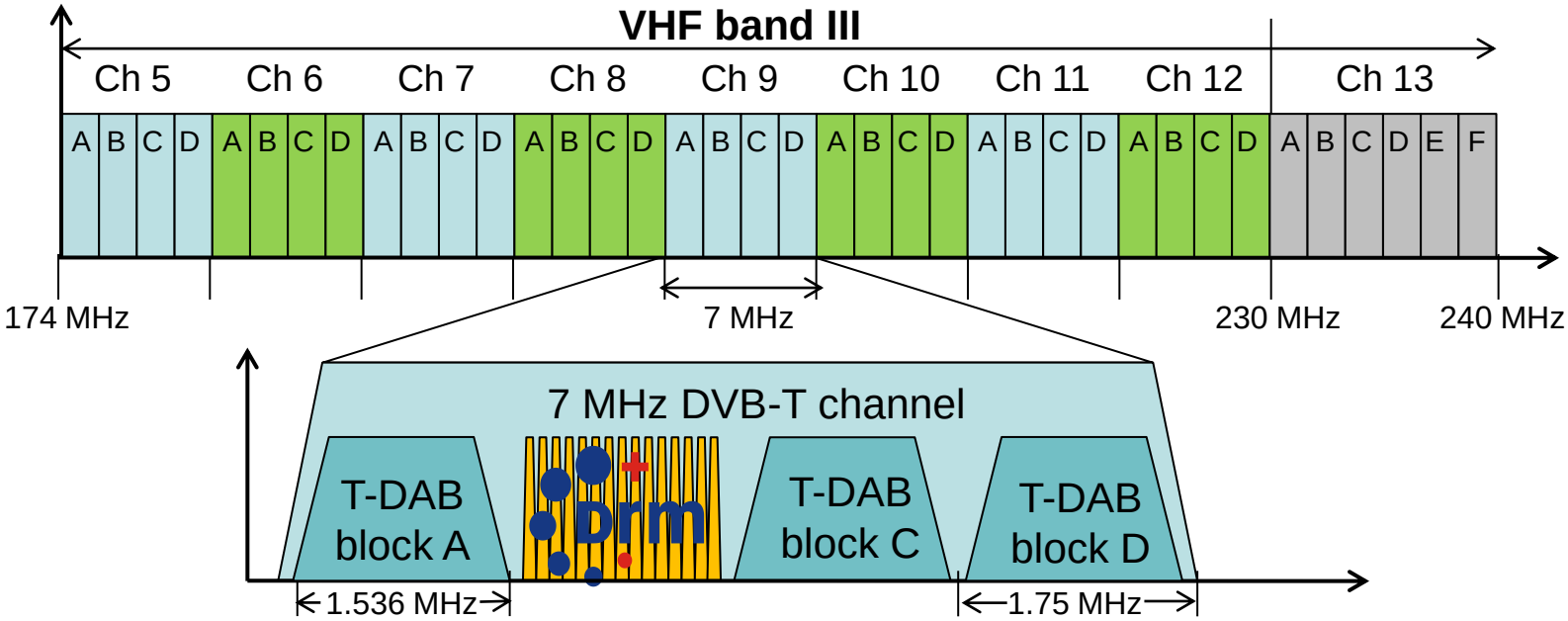
► *DRM+ frequency grid in VHF band III*



The frequency grid of 100 kHz and the low protection ratios of DRM+ gives a flexible use without avoiding the T-DAB development

- 70 DRM+ channels in one 7 MHz DVB-T channel
- 15 DRM+ channels in one DAB block (1.536 MHz, without guard band)

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► *Transmitting power of DRM+ compared to T-DAB*

To cover the same service area

- **DRM+ needs less transmitting power and less minimum field strength level than DAB/DAB+ in any case:**

Mean value of the difference of the needed transmitting power / the minimum field strength level	DAB+ (mean of PL 1A - 4A)	DAB (mean of PL 1 - 5)
DRM+ (4-QAM)	**12 dB**	**15 dB**
DRM+ (16-QAM)	**4 dB**	**7 dB**

- **Therefore and due to better protection ratios: DRM+ has less interference impact than DAB/DAB+**

For more information: *"Study on the Comparison of the Transmitting Power between DRM+ and DAB/DAB+ in VHF Band III to Cover the same Service Area",* German DRM Platform, 2015

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► *DRM+ compared to DAB/DAB+*

In VHF band III DRM+ is the little cousin of DAB/DAB+

The similarities of both are:

- both can be **operated compatible together** without preventing development potentials
- both can use available **transmitting and antenna equipment**
- both include **identical content services** for the user
- both are **receivable with one digital multi-standard radio**

The advantages of DRM+ are:

- **less bandwidth** for a **flexible service** to broadcast **a small number of programmes** in one multiplex
- **less transmission power** to reach the same coverage area
- **less interferences impacts**

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► *Summary: DRM+ as ideal complement to DAB/DAB+*

DAB/DAB+ is far established in Europe

- we have to take into account that DAB/DAB+ in operation or in consideration in most European counties
- will be used to deliver a high amount of programmes in a large multiplex to cover wide areas
- cannot serve local service areas and therefore is not a solution for the small broadcasters in any way

DRM+ is market ready but still not completely marketable

- most suitable to cover local areas with a small amount of programmes
- the ideal complement (not a competitor) to DAB/DAB+ and gives the best chance to speed-up the digitalization of terrestrial radio for all radio broadcasters
- mandatory condition is the availability of multi-standard radio for FM, DAB/DAB+ and DRM/DRM+ on the European market

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► *Summary – once again..*

Assumptions to provide DRM in VHF band III:

- The market power of single European counties is obviously too weak to bring DRM+ in addition to DAB/DAB+ into the market
- The famous ‘chicken or egg’ problem must be solved from the receiver aspect. That will inspire the content providers to broadcast via DRM (DRM30 and DRM+)
- The impetus to the radio receiver and car industry must be given at a European level with a harmonised strategy of the European countries

Solving *the Chicken and the Egg Problem*

- **at a European level**
- **from the receiver aspect**
- **essential immediately!**

Pictures: amazon.co.uk / dreamstime.com

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► *Finally…*

Thank you for your kind attention

For more information please contact the presenter directly thereafter

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