DRM and DRM+

A system family up to 174 MHz for the digital radio broadcast

DRM, Digital Radio Mondiale, the international consortium founded in 1998, developed a digital transmission system for the AM-band, i.e. for long-, medium- and shortwave (**DRM30**, up to 30 MHz), and launched this system worldwide.
DRM system enhancement has been approved by the European Standards Organisation – ETSI.

DRM30 and DRM+ are the two system variants of the DRM family.

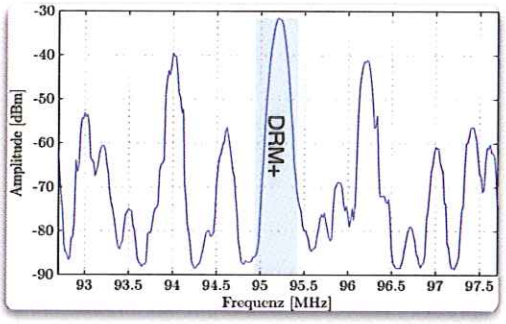
They differ in the frequency range: DRM for AM; DRM+ for VHF, i.e. Band I (47-68 MHz) and Band II (Europa: 87.5-108 MHz, Japan: 76-90 MHz, OIRT-Band: 65.8-74 MHz).

The introduction of OFDM-Modulation (Orthogonal Frequency Division Multiplex) leads to a highly efficient usage of spectrum and provides for an undisturbed mobile reception with no interferences. With its bandwidth of 95 kHz DRM+ fits into the 100 kHz FM pattern used in Europe and can thus be transmitted within the respective gaps in band II. The maximum effective data rate consists of up to 186 kbit/s (16 QAM-modulation) per multiplex. Using the MPEG 4 AAC HE V2 audio-coding, up to 4 similar or different services, e.g. audio streams, data or video services, can be distributed within one DRM+ multiplex.

DRM+ is appropriate for the transmission of local and sub-regional single radio programs, although it can obviously be extended to a bigger, up to a nationwide coverage as a single-frequency network.
The DRM+ system is independent of existing FM-structures and therefore offers all program providers the same technical transmission preconditions.

With **DRM+** and DAB+/DMB, two complementary radio systems are available to enable digital radio transmission for national, regional and local coverage.

DRM+ transmitter in Hanover, Germany



DRM+ signal inside the FM-spectrum

A short overview of DRM+

DRM+ is being developed by a worldwide consortium and is standardised under ETSI rules

DRM+ is suitable for the digitalisation of the FM frequency band and can be set interference-freely into the FM-spectrum

DRM+ offers a scalable data rate (40-186 kbit/s), transmitting frequency and power can be adopted flexibly according to the interferences situation

DRM+ enables single frequency networks for nationwide coverage

DRM+ offers the certitude to regional and local broadcasters to take part in the digitalisation of radio

DRM+ can be combined perfectly with the existing FM/DRM/DAB transmission networks and ensures switching between different programs on the receiver side

DRM+ allows for flexible use of the multiplex with respect to the number (max. 4) and type of programs (audio, data, video) subject to the broadcasters' needs and preferences

DRM+ offers a considerable choice of data services, video transmission as well as digital traffic information

DRM+ can be applied to all frequency ranges up to 174 MHz, a usage in Band III (174-230 MHz) technically is possible

DRM+ hard- and software solutions for transmission- and receiver-technology are available and placed at the disposal from the DRM consortium for testing purpose

DRM+ implementation as a digital radio platform can be foreseen as of 2010

- in Europe in addition to DAB+/DMB for regional and local coverage
- in countries without considering DAB/DAB+ as a primary replacement or enhancement of the FM platform

www.drm-hannover.de **www.deutsches-drm-forum.de** **www.drm.org**

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