

STATEMENT ON THE PERFORMANCE OF DRM vs. HD RADIO

This brief summary was compiled by SZOMEL Kft., a telecommunications design house, providing RF and microwave consultancy and circuit design services, as well as various broadcasting related measurement and system design services.

As a technology company, we are committed to follow the latest trends in all fields of RF technology, providing as objective analyses as possible on the basis of the available technical data and other open sources, along with our proprietary field tests.

Concerning the possible introduction of HD radio in India in addition to DRM, we lay down the following recommendations.

1. System uniformity

Although alternative technologies may induce healthy market competition in general, in case of broadcasting the parallel operation of different standards in a country usually leads to confusion and inadequate service coverage. This is mainly due to the fact that the (financial) resources are fragmented between diverse networks and none of the systems is implemented, optimized adequately. Once India has already built up a comprehensive DRM network, we strongly recommend to continue with this standard and get the maximum out of it (optimization of FM- and AM-band DRM services, ensuring compatible and continuous service coverages in large areas, etc.).

2. Technical comparison

Although HD Radio and DRM have many similarities, there are some technical parameters which make considerable difference between the two systems.

FM-band

In the following a comparison is given about the **network coverage** and **spectral efficiency** of the two systems.

Regarding **network coverage**, the carrier structure of DRM allows longer transmitter distances in a single frequency network than HD Radio, i. e. more efficient networks can be implemented with DRM.

Concerning **spectral efficiency**, it first must be pointed out that HD Radio has one constellation, whereas FM-band DRM is scalable. In its most robust mode, DRM has similar SNR/fading performance to HD Radio** at comparable data rates, but DRM occupies 4-times less bandwidth than HD Radio, i. e. its spectral efficiency is considerably higher***. In other words, FM-band DRM occupies only 100 kHz, whereas HD Radio requires 400 kHz of bandwidth. The better spectral efficiency of DRM is even more apparent if it is operated in its less robust mode, offering even higher data rates (if wave propagation allows). From this perspective DRM is more economical, therefore it is not recommended to introduce a less economical system in parallel.

In addition to the above, as a result of its narrower spectrum, FM-band DRM can be co-ordinated in much more VHF subbands than HD Radio, making FM-band DRM more flexible than HD Radio.

** Reference: So Ra Park et al.: Laboratory Trials and Evaluations of In-Band Digital Radio Technologies: HD Radio and DRM+, Researchgate, 2014

*** Based on figures from "Comparison FM, HD Radio™, China Digital, DRM+ and DAB+", published by GatesAir

AM-band

In AM-bands both systems offer similar data rates, have similar occupied bandwidths and scalable constellations, making them highly adaptable to various reception conditions. The main advantage of AM-band DRM over HD Radio is that AM-band DRM has considerably longer guard intervals*, therefore **larger areas can be covered much more efficiently with AM-band DRM**. This should be a deciding factor in case of countries like India, where huge distances have to be bridged.

Once India has already introduced an exemplary DRM network on AM frequencies, again, we strongly recommend to establish DRM also in the FM band, to enable and facilitate the development of compatible and interoperable services.

*Reference: HD Radio™ Air Interface Design Description – Layer 1 AM, Rev. E, March 22, 2005 (Ibiquity Digital)