DRM RECEIVERS FOR INDIA

Executive Summary

The receiver industry is already on board in India, and it has invested millions of dollars in DRM so far.

- models of cars with line-fit DRM receivers are available and the numbers of such cars are growing by the month with DRM radios incorporated at no extra charge to the user (as it is an extra free feature in any new car);
- desktop radios are being produced in India (http://www.avionelectronics.in) and more models should be announced once the digital broadcast has officially been communicated and started.
- New receiver SDR technology allows for the production of multi-standard receivers, already showcased at IBC Amsterdam in Sept 2017 (http://www.radioworld.com/author/marguerite-clark/article)
- Migration to DRM in radios needs only software updates, as the hardware is fully prepared.
- First developments of receivers for mobile phones are underway
- There are no licence royalties to be paid by suppliers to DRM receivers manufacturers.

Automotive support for DRM:

- More than 100 thousand cars are on the road in India today and are equipped with DRM receivers (Hyundai, Maruti Suzuki, Mahinda); Hyundai for instance has six models with DRM receivers on the Indian roads with new models to come

- Additional major automotive brands (probably all major brands) are ready for launch once the DRM new digital content on-air will be finalised and announced publicly by AIR

- Chipset and receiver development takes place in the country and it is introduced by Indian car manufacturers – all relevant international brands have DRM offered as part of their product portfolio; the development resources and the know-how exists in India (including in companies like NXP, Bosch, Analog Devices, etc.)
- Car chipset manufacturers have confirmed that receivers, which may currently only support DRM in the AM bands based on AIR's communication in the past, can support DRM in all broadcast bands with a simple software upgrade – NO new hardware or hardware replacements are required
- The first after-market car radio and add-on dongle with DRM support was publicly presented at IBC 2017 in Amsterdam both for the AM bands and ready for the FM/VHF bands; it is a multi-standard receiver (link: http://www.drm.org/wp-content/uploads/2017/09/GR-227-Press-Release.pdf). A picture of the Gospell after-market add-on dongle for cars is shown below:

Mobile phone support for DRM:

- USB dongles are available along with the appropriate apps to support DRM reception in the VHF bands
- A first USB adapter, introduced and showcased at IBC 2017 in Amsterdam can support DRM with some modifications for reception of both the AM bands and the VHF bands in future; it is a multi-standard receiver (link: http://www.drm.org/wp-content/uploads/2017/09/GR-227-Press-Release.pdf)
- DRM receiver support with the full feature set and at potentially low cost is being developed for mobile phones with the Android operating system and is ready for other platforms. See the picture below:

- Modern phones supporting FM analogue reception can also support DRM reception if mobile phone manufacturers are simply installing the DRM software radio app – no additional hardware or expensive re-designs of phones are required, therefore introducing DRM reception on mobile phones is minimal as only an app needs to be installed

Multi-standard receivers:

- Currently the first DRM (both DRM modes) SDR multi-standard receiver (including DAB+, FM and AM analogue) has been showcased at IBC Amsterdam; it is called Titus II manufactured by the PantronX company in the USA (link: https://titusradio.com/)

- additional standards to DRM in AM or VHF bands always add extra costs to receivers for testing, implementation, and probably IP licensing (HD Radio being a proprietary commercial company, hence not an open standard!).
- multi-standard receivers combining HD Radio and DRM do not exist anywhere in the world and therefore require additional development, testing, investment and delays.
- Any receiver supporting DRM today in the AM bands can be upgraded to DRM in the VHF bands with a simple software update, once the DRM roll-out is announced by the broadcaster and regulator. There is NO additional cost for IP royalties and the introduction can be quick. Therefore, there is no more economical and faster way for digitising the FM bands in India than by using the same technology already introduced for the AM bands. DRM is the only standard that supports all the broadcast bands deployed today in India.

Cost of receivers:

- The initial cost is driven by a one-time development, not by the actual manufacturing, and prices come down dramatically with volumes sold (see FM receivers, mobile phones, smart phones, etc.)
- Cost for DRM line-fit car receivers is **nil** for consumers (it is a default feature in any car – see Hyundai with their current 6 models)

- Cost for DRM in the VHF bands on mobile phones is minimal as no hardware changes are required for those phones already supporting analogue FM reception today (DRM reception is a simple software installation for manufacturers)

Licencing and royalties for receivers

- For DRM, chipset, receiver module or receiver manufacturers **do not need to sign a document to gain full access to the required technology to start building products**, since all the technology of the DRM standard is openly publicised and freely available to everybody (including the Indian industry). Nobody, and in particular not a single commercial company, owns the DRM technology – it is therefore a direct successor of the open AM and FM standards.

- For DRM, chipset, receiver module manufacturers, or other suppliers to receiver manufacturers **do not pay any license royalties**. And it should be noted that these costs early in the production chain mean that they multiply in size with every sell-purchase process along the chain (due to profit being added), so that eventually the final product would be significantly more expensive to the customer than only the sum of the royalties collected from every step in the production chain.

- However, **receiver manufacturers need to pay royalties, but only during the run-time of the related patents**. The rates are very low with special discounts for emerging markets such as India (see **www.vialicensing.com**). The rates are published and therefore apply equally to every manufacturer – and since in the case of DRM nobody needs to apply for a ”license” to use the technology, manufacturer can be excluded from obtaining a license. The rates only refer to patent IP, but NOT to trade secrets (i.e. closed software and technologies that are only accessible after signing a license contract with a manufacturer); this implies that ***patent related royalties*** will ***cease*** after at most 20 years after their initial application or publication (and thus the technology becomes completely freely usable to everybody without further payments, such as AM and FM), whereas ***trade secret related license royalties*** can be charged ***forever***.

‘Make in India’:

Chipset and receiver development is taking place, it is controlled and produced in India for India as well as for international markets, thus fully fulfilling the ‘Make in India’ and Digital India’ pledges by the Prime Minister – instead of Made in China or Made in the USA.

This is due to **the open DRM standard**, where all technology is fully available to Indian manufacturers and stakeholders, compared to other closed and commercial solutions such as HD Radio where licences need to be paid. In DRM, everybody can start developing and producing devices today, without asking for technology disclosure or signing licence contracts upfront. Therefore no Indian manufacturer can be denied a license.

DRM is the only digital radio standard that has started and already maintains an Indian industry, and has the potential to maintain a global leading position for the Indian consumer electronics industry! One such example is a desktop receiver, developed and manufactured by Avion Electronics in Delhi.

The millions of receivers claimed to be in the market by HD Radio for example, are mainly available in the USA and almost exclusively produced in China, creating jobs for the Chinese and US industry only, in strict contrast to DRM, which already today is a true Indian technology and standard.