



## **DRM Response to “SMALL SCALE DAB” Experiment by Rashid Mustapha (OFCOM Research Document 05/08/2013)**

We read with interest the results of this SDR-based test and this imaginative, relatively low-cost solution for small scale FM broadcasters for which “DAB is currently an unsuitable replacement technology” (p.22). This concept may be regarded as an economical alternative to buying a professional DAB Content Server and a DAB transmitter unit offering a doorway (albeit a very small one) to the digital platform for small local or community stations.

In our view, the small scale DAB system, based on the freely-available software and a Linux-PC, has a lot of drawbacks too. Mainly, it is not fully suited to broadcast professionally and in a stable fashion DAB programmes. Why?

Firstly, a deep knowledge of the Linux systems is absolutely critical for the installation of the system and for the programming of audio streams out of the multiplex configuration. And then, in this limited and relatively inflexible set-up, once operational, no reconfiguration is possible. The software is not yet able to handle single frequency networks. In addition, there are no add-ons to generate data channels or dynamic labels. The transmission of DAB “classic” is indeed free of charge. For DAB+ there is an add-on (“CRC-DABPLUS”), a license fee that has to be paid on top.

The good news is that the Brighton set-up and equipment is adequate to build a demonstrator not only for DAB but also for DRM in mode E (DRM+). The DRM software “SPARK” (by Michael Feilen) also runs on such a Linux-PC in addition to the mmb Tools.

In March 2014 the Technical University of Kaiserslautern and other supporting organizations in western Germany are going to build a DAB multiplex generator based on the mmb Tools and a VHF band III transmitter unit based on the USRP with about 10 W ERP. This demonstrator would just offer DAB programs at events, trade fairs or other demonstrations to whet the appetite of commercial broadcasters transmitting radio on DAB. Then, an implementation of SPARK is also planned to broadcast DRM+ for the same demonstration purposes.

We regard the concept, as shown in Brighton, to be a simple, cost-effective way of demonstrating DAB and how this might provide a solution for non-commercial radios covering limited areas. We disagree, therefore, with the study conclusion that, using this solution, it might be eventually possible to broadcast to a wide area. Suitable spectrum has not yet been identified for these purposes, and licensing concerns must be considered.

The proposal to transfer the local FM stations to local DAB structures seems hardly feasible. In order to migrate all existing local radio allocations in Europe (commercial, non-commercial and even public) in the future, there is not enough spectrum in the VHF band III to generate sufficient DAB allotments (this is already true in Germany). Besides, a DAB or DAB+ channel is always 1.5 MHz wide and in less populated areas it might contain as little as one program – pure spectrum waste, whereas a DRM+ channel with a similar performance is only 100 kHz wide (half as wide as an FM channel.)



As a DAB multiplex can carry up to 16 programmes, where the full multiplex is not fully utilised it becomes very inefficient and means that using DRM+ instead would require about 10% of the DAB radiated power.

It is widely accepted that, when replacing FM transmissions on a one-for-one basis, a DRM+ transmission needs much less spectrum and energy than FM in order to provide the same high audio quality. The spectrum needed for each programme stream is about one quarter of that needed for an FM sound broadcasting channel. These advantages have been confirmed by DRM+ test transmissions carried out in Edinburgh by the BBC and the DRM Consortium and also in a series of European countries (i.e. Italy, France, Norway, Germany). Moreover, DRM+ can be configured in different ways in order to offer greater flexibility than FM or DAB broadcasting. DRM+ can, for example, offer the option of allowing much more locally orientated broadcasting within 4-way mini-multiplexes using the same amount of spectrum as a single FM channel.<sup>i</sup>

The most attractive advantage of the DRM system for switchover purposes is that transmissions are maintained on the current model of a single transmitter per service area. Thus, listeners can be assured that their favourite programming, whether national, regional, local or community based will continue to be available. Moreover, the switchover can be phased in over a period of time according to individual decisions on a per transmitter/area basis, if necessary making use of the simultaneous dual transmission possibilities offered by DRM.

As stated in the EBU recommendation 138: *Terrestrial broadcast delivery is the only free-to-air and cost-effective method for truly mobile reception, particularly in cars...*

*FM radio is constrained by a lack of available spectrum in all developed markets.*

*DAB and DRM are openly specified, complementary, digital radio standards that meet the needs of Europe's radio broadcasters. In addition, they are proven to be energy efficient.*

*Multi-standard chips for digital radio decoding are available from many major manufacturers which enable radios to be built that decode FM, DAB and DRM.*

In 2012 a simple software upgrade (done in Germany) for the NOXON-DAB USB stick (price 30 euros) has created the DAB+/DRM+ cheap receiver.

Current and upcoming generations of digital receiver chipsets are already designed as multi-standard chips or modules supporting both DAB and DRM. This gives a robust, readily available, tried and tested solution covering small and big radio operators with small and large coverage areas. This also becomes a realistic solution. This has to be better than setting up small cottage industries that are partly meeting a need, whilst creating so many other problems which, in turn, are undermining one of the key attributes of digital radio, flexibility.

11/11/2013

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<sup>i</sup> [UK DRM+ Trials](#) [Vatican City Trials](#)