WECODEC

the westbury community development centre
IT 4455/00

11 November 2024

TRAI
New Delhi – India
e-mail: 'advbcs-2@trai.gov.in'; 'jtadvbcs-1@trai.gov.in'

Dear Madam/Sir,

Consultation Paper No 14/2024 dated 30th September 2024 on 'formulating a Digital Radio Broadcast Policy for private Radio broadcasters'

The Westbury Community Development Centre Trust would like to thank TRAI for the opportunity to make a submission of counter arguments on the above subject. Our submission is attached as part of this letter.

Yours sincerely,

Joseph Cotty
Director

Peter Faver
Director

The Westbury Community Development Centre Trust (WECODEC), license holder of Kofifi FM 97.2, a community radio station in Westbury, South-West Johannesburg, South Africa, with support from the BBC World Service, Fraunhofer Institute for Integrated Circuits, and others, initiated a trial broadcast project to evaluate DRM Digital Radio Mondiale in the FM Band.

Apart from the technical part, the trial also evaluated at spectrum efficiency and socio-economic benefits for our and communities in general, as well as South Africa as a whole and its broadcasters and listeners.

One of the main objectives of the development of DRM in the FM Band was the possibility of a close placement of DRM signal to an FM signal so that it can be flexibly configured depending on the existing use of spectrum. In this way, DRM may be introduced into the FM frequency bands.

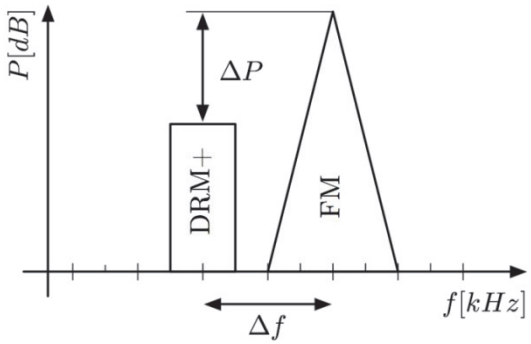


Figure1: Example configuration for DRM robustness mode E and FM signal

Figure 1 illustrates how the DRM transmission can be placed closely above or below the existing FM transmission (as demonstrated DRM needs only 10% of the power of a FM transmission so Δ*P* is naturally already at a >10dB advantage). To guarantee the respective protection levels and audio quality of the FM transmission, the carrier frequency distance Δ*f* and the power level difference Δ*P* of the FM and the DRM transmissions have to be planned accordingly. Δ*f* can be chosen according to a 50 kHz channel raster. Δ*f* >= 150 kHz is recommended. ΔP can be varied flexibly; however, a ΔP > 20dB is recommended for the minimum Δ*f* = 150kHz according to previous evaluations.

Looking at the heavily congested FM spectrum in Johannesburg, a proof of DRM not interfering with adjacent FM transmissions, would demonstrate the feasibility of the standard.

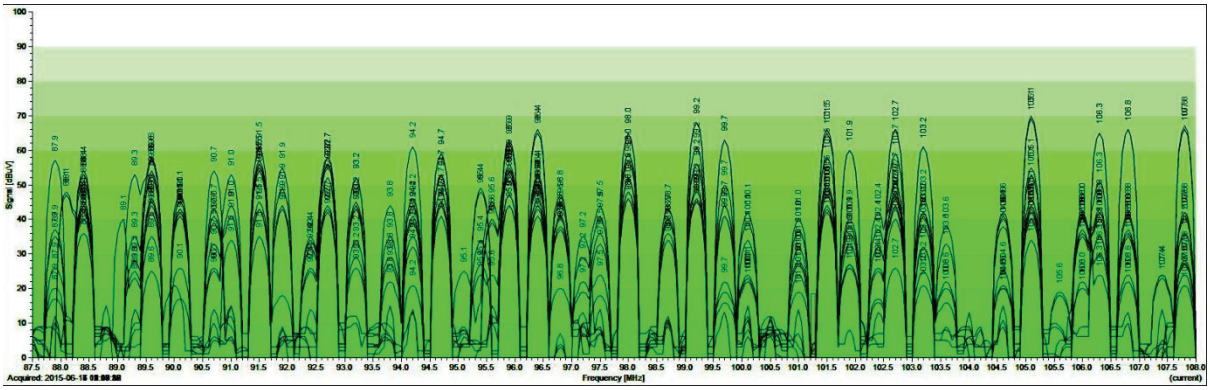


Figure 2: Overlay of Scans of the FM Spectrum in various parts of Johannesburg

Figure 2 confirms that there would be no space for another FM transmission in Johannesburg except for perhaps one or two low-power radio stations with a very limited coverage area.

However, if one gap as the one that we have identified for our trial would work for DRM without interference in both ways, it would proof that there will be suddenly plenty of available digital spectrum in the FM Band, namely 16 allocations (marked in red) as per the below figure:

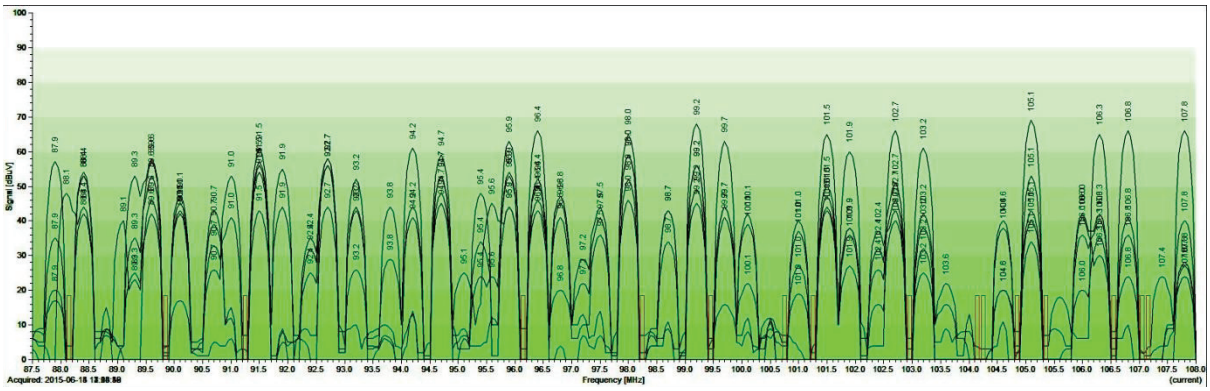
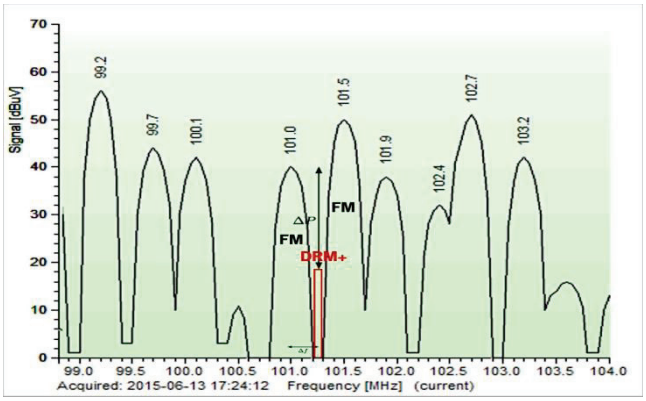


Figure 3: Possible DRM Allocations in the FM Band in Johannesburg

Considering at least 3 sound programmes per DRM signal in the FM-Band, in this scenario up to **48 additional sound programmes and 16 Journaline service could be added to the current FM spectrum in Johannesburg**. If going down to 200 kHz@-10dB or 150 kHz@-20dB this number would even increase a lot more.



As a good candidate for such a frequency we identified the frequency 101.25 MHz as a possible candidate. It is situated between 101.0 MHz (RSG Pretoria, 33 kW ERP, distance: 56 km) and 101.5 MHz (RSG Johannesburg, 38 kW, 3 km distance) with a delta f of each 250 kHz as shown in figure 4:

Figure 4: Our DRM+ allocation for the trial

The trial was then conducted with a transmission power of approximately 1 kW ERP, causing zero interference to adjacent FM stations and vice versa, and the signal, depending on the terrain, could be received in distances of almost 60km.

In the second phase we included community members and other stakeholders to experience the functionality of the DRM broadcasts. Thereafter we conducted a brief survey amongst the trialists. This should help to evaluate the usefulness of the DRM system including data services in a practical environment. Without any exception it can be reported that all individuals participating on the trial were deeply impressed by the capability of the system.

For this purpose a number of RTL-SDR receiver dongles were used at various customers' locations and connected to their existing PC's or notebooks, the same is today possible also with Android devices. Multiple audio and data services, specifically News, Sports and Community information over Journaline were experienced by the audience.

As a next step community members of WECODEC even built their own prototype of a DRM capable digital receiver based on the RTL-SDR dongle, a Raspberry Pi and software from Fraunhofer (the same software is now available for purchase for around 6 US$). With this receiver we were able to demonstrate that **job creation in the electronic industry is possible at community level**. The 100% community hand-made receiver prototype is still available at WECODEC for verification.

This trial was the first time that a totally free-to-air digital information service was broadcasted by a community in South Africa. It was evidence that Universal Access to information is possible without the usage of broadband internet and expensive airtime data whilst improving skills development in the community and creating jobs in the ICT sector in line with the National Development Plan (NDP) and other South African mandated requirements – the same we believe is valid for India.

<u>In summary the benefits of the DRM system are clear:</u>

- Spectrum efficiency: Fitting into the smallest white spaces of the existing FM Band spectrum (100 kHz with 150 kHz separation) will allow for the most efficient usage of that spectrum
- Job creation and stimulation of the local consumer electronics industry:
    - The immediate presence of digital radio signals will open a new market for digital radio receivers
    - Designed and produced in South Africa (or in your case India)
    - New product lines can also be exported to other markets within SADC, Africa, Indonesia and other countries around the world.
    - This will bring innovation to the industry

- Job Creation and uplift of media industry: DRM will allow for the kick-off of digital radio without further delay as spectrum is already available. This means that jobs can be created immediately within the media industry which will also stimulate the sector, specifically within the community radio sector where numerous initiatives are lined up for consideration but cannot be helped yet due to lack of analogue spectrum.
- Skills Development: The project will enable skills development in the very new field of digital radio. Through our community radio station we could encourage community members to participate on this pioneering project and divergent in the science and technology area of which the government has been encouraging and is in line with the governance policy in the science and technology sector.
- Creating a platform for Research and Development in the digital radio broadcasting domain
- Better Signal Quality and additional programmes: Citizens will benefit from a better signal and audio quality and improve their access to information. Additional sound and multimedia services will open opportunities for new educational programmes, interactive services (e.g. employment service), weather and traffic information, emergency warning functionality and many other benefits for the citizens and communities.
- Content Development – via Journaline
    - More content development – youth and women participation
    - University Radio upliftment and more content by university students creating a robust platform for an information repository
    - Educational purposes in rural areas
    - Health sector – e.g. Health information outbreaks will help in sending out information to communities
    - Weather Sector – e.g. Flash Floods, Droughts
    - Universal Access – No costly airtime-data required
    - Receive information without data- Benefit Rural Development in Education and Health
- Accessibility for Persons Living with Disabilities

To us it is very clear that almost all of the above – creating our own receiver, utilizing lowest-cost SDR receivers, develop our own Journaline content, and the possibility to using open source technology even for broadcasting equipment, will only be possible with an open system like DRM.

We believe that DRM can be a very powerful, if not the most powerful tool to empower communities and bridge the digital divide specifically in rural areas.

About WECODEC

The Westbury community of Johannesburg is a previously and unfortunately uncured and still disadvantaged community of people that has endured a turbulent history. Due to the legacy of apartheid and the nature and constraints of both the previous and present political administrations, the community is unable to end the suffering from unceasing socio-economic ills. The main issues are high unemployment, poor housing, poor health, poverty, gang violence and drugs.

Within Westbury, a number of small self-help groups have risen to combat the effects of the social ills. A major catalyst force for change is the Westbury Community Development Centre (WECODEC). Spearheaded by a of young people – many of who were previously key role players in gang activities – the formation of WECODEC in 1998 became a turning point in the history of the Westbury and surrounding communities.

In the same year, WECODEC negotiated the first reconciliation between the rival gangs. This has resulted in a significant drop in violent crime. The team began to initiate self-sustaining projects designed to achieve the collective aims of poverty alleviation, skills development and social upliftment.

Today, the centre hosts a number of activities and resources including computer training, upgrading and maintenance, an internet-enabled resource centre, a library, a crèche, women's groups and prayer groups. WECODEC has become a beacon of inspiration for the community and now plays a critical role in representing the community both within and externally to all strata and society.

Through persistent effort, the team behind WECODEC has secured support and recognition from Government ministers, the private and NGO sector. Journalist and writer, Dr Don Mattera has been instrumental in the development of the project. As a leading figure in the struggle against apartheid, his personal commitment to the development of Westbury has inspired the hearts and minds of the community.

In pursuing its objectives WECODEC established its community radio station, **Kofifi FM 97.2**, in order to enhance its vision and purpose and is now broadcasting on air since 2012. The radio station is one of the few who are self-providing signal distribution via an SMME company due to its natural affinity to innovation and technology. Due to this interest, WECODEC recruited Mr Johannes von Weyssenhoff, an engineer and technical consultant from Germany on a skills transfer purpose who has then – inspired by WECODEC's work for the community – developed his passion for inventing and promoting technologies for community broadcasting including a solution for broadcasting community television in the L-Band. This solution was then worldwide firstly tested within the Westbury community and in early 2015 the idea was born to undertake WECODEC DRM trial in the FM Band (DRM+) to evaluate its benefits for community radio in South Africa. WECODEC then also received support from Ms Thembeka Khaka (Thembeka & Associates) for licensing, compliance and regulatory affairs that was of great help retrieving the license and maintain relationship with ICASA.

The successful launch of the community radio station has enabled WECODEC to establish and attract other strategic partners within and external to the community. A number of companies have been

established out of this key strategic partnership which has then also enabled the radio station to grow exponentially. This symbiotic effect of the activities of a community radio station as NGO and enterprise development resulting in job creation and skills development within the community has been recognised as a ground-breaking community upliftment model. It has brought to life various business platforms, key strategic partnerships, and opportunities for the community.

The organization also renders community services such as feeding schemes, vegetable gardens and partnerships with local primary and senior secondary schools, as well as counselling. The collective organisations have established relationships with the local CPF's (Community Policing Forums) and with local and provincial government departments, as well as with MICT Seta for training and development of young entrants into the media industry, with a strong focus on youth and women with skills programmes, internships and learnerships currently being in place.