



Smart Radio
Accessible
to All

DRM Africa Roundtable Benefits for Africa



Virtual Event

July 26th, 2023

For more info visit: www.drm.org

Write to: projectoffice@drm.org

www.drm.org

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DRM – Facts

Ruxandra Obreja

DRM Digital Radio Mondiale

Technology



Standard

- Global digital radio standard
- Immediate successor to analogue AM and FM
- ITU Endorsed Open Technology



No Ownership

- Non-proprietary
- Full and free access to spec by all
- No trade secrets or not under control of a single company

LF

MF

HF

VHF

DRM

All Band Support

- Supports all frequency bands and all coverage requirements
- Same standard and feature set for all bands
- **Per-Broadcaster digitisation in AM/FM bands – no multiplex required**
- DRM has already been selected in India and other countries worldwide for the MW/SW bands with all band support for future

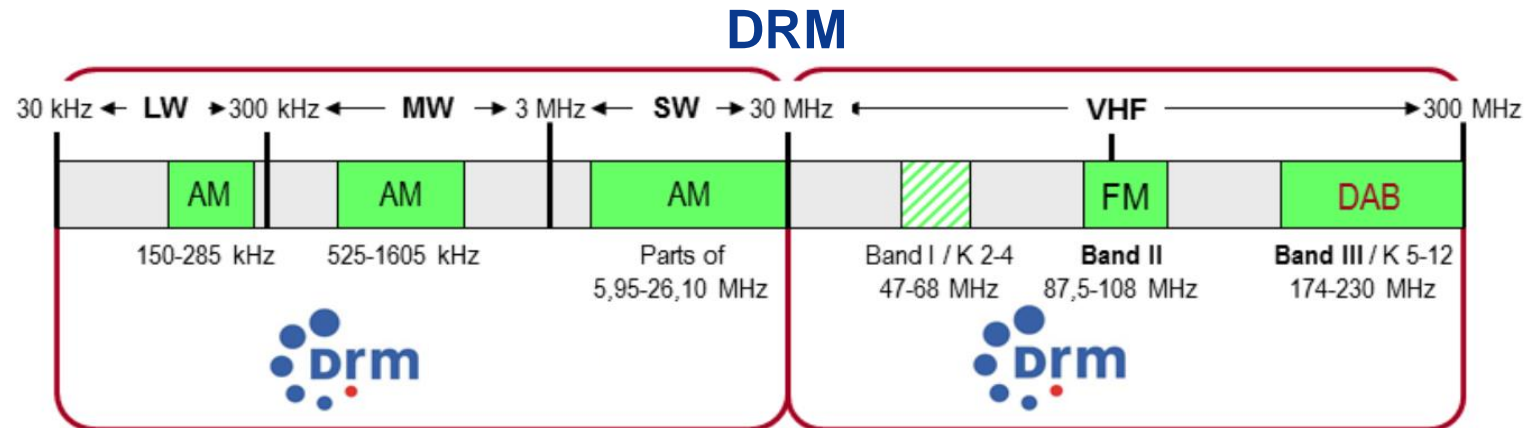
DRM Works In All Frequency Bands



DRM for local / regional coverage (VHF bands)
 (Band I, II – FM band, III)

30 MHz

DRM for medium/large area coverage (AM bands)
 (or LW, MW, SW) – the AM bands



**DRM Digital Radio standard – One single standard:
 Same key features throughout**

Clear Advantages of DRM Standard, a Superior Technology to Analogue

- **Universal and free access** to information, education & entertainment (+disaster warning)
- Using a **single technical standard**, a solution for local, regional, national and international radio services
- Using spectrum more **efficiently** (3+1 channels for 1 frequency) at much **reduced costs**
- Making radio the **digital media hub** for modern listeners, with multi-lingual and on-demand information
- Enabling a **smooth transition from analogue to digital radio (with network upgrades possible)** taking listeners along, and using existing infrastructure
- Great opportunity for **local manufacturing and know-how**

Reaching **all citizens in a country**
wherever they live and giving **full-country coverage**

DRM – Key Features

Alexander Zink

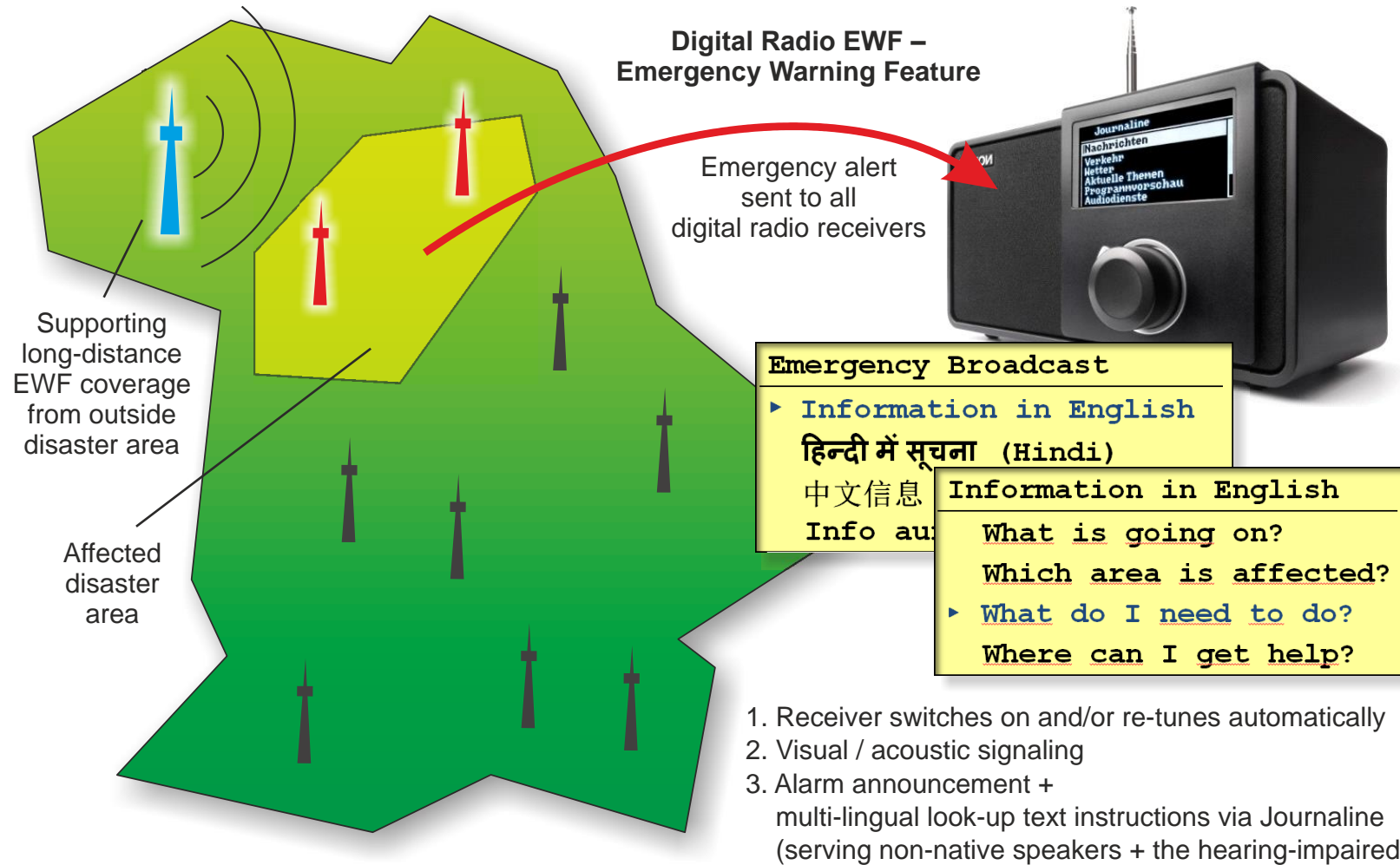
DRM Key Features on All Bands

- **More choice** for listeners
 - Up to **3 programmes + multimedia on 1 frequency**
 - Simulcast analogue / digital
- **Excellent audio** quality
 - No distortion
 - Stereo and 5.1 surround sound
- **Multimedia Applications**
 - Great listener benefits incl. Distance Learning
 - Extra revenue opportunities for broadcasters
- **Good coverage** area and robust signal
 - Supporting SFN (Single Frequency Networks)
 - Green and energy efficient

- **Automatic tuning**
 - by station name, no longer by frequency
 - re-tunes when leaving coverage area
- **Emergency warning & alert**
 - All stations switch, present audio and text information



DRM Emergency Warning – Overview



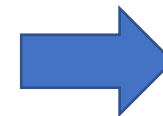
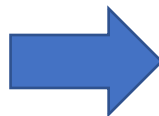
DRM Enables Distance Learning Without Internet

Purpose:

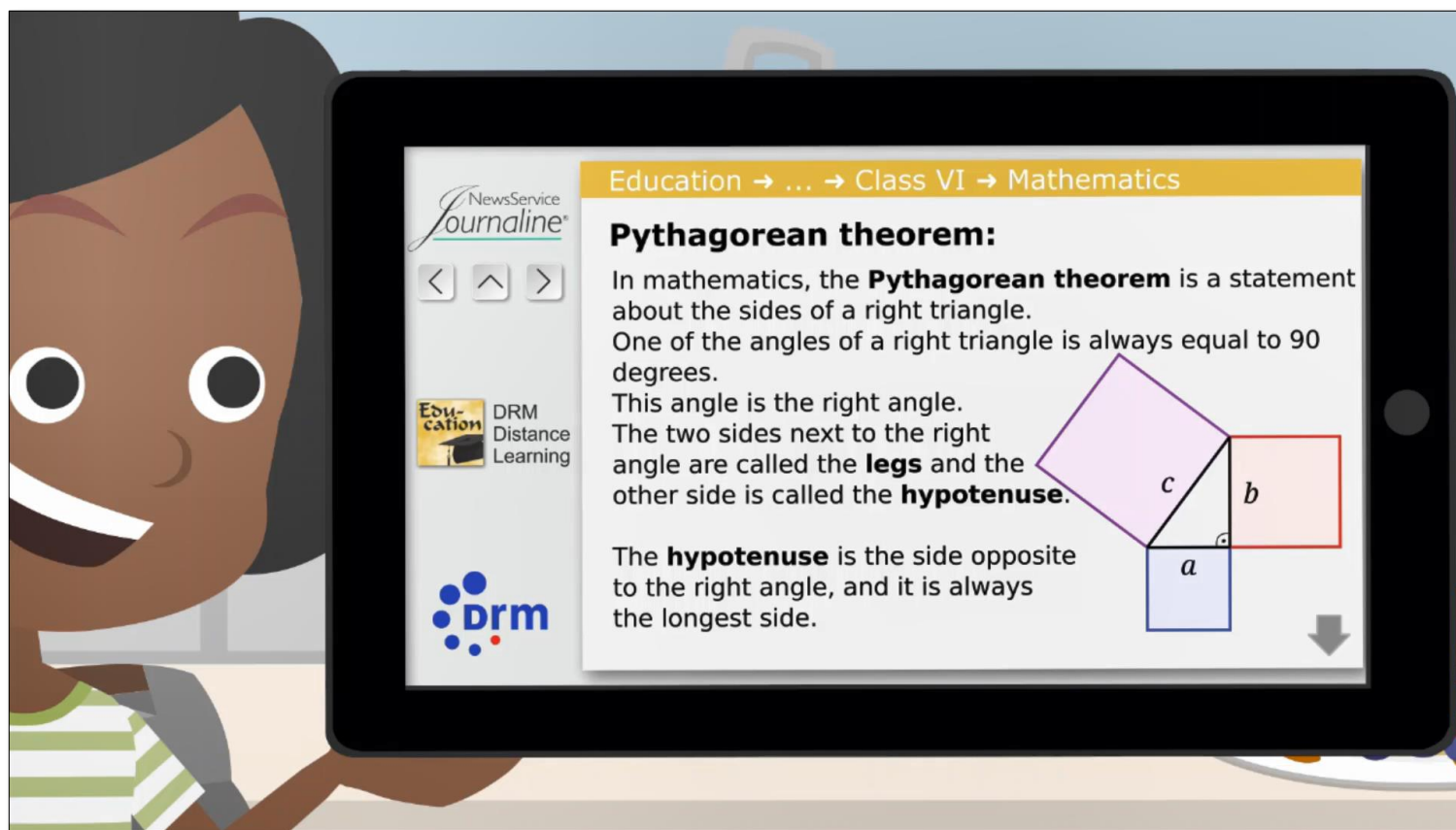
- Self- and class-based learning option via radio
- During pandemics and reaching remote areas
- Pure radio broadcast
→ no Internet required

How it works:

- Lessons and textbook-content via **Journaline**
→ Always available on-demand, even for self-study
- At specific times, accompanied by **live teacher** (audio service)
→ Referencing the current Journaline textbook location
- Options for student **interactivity**: Journaline quiz, Q&A re-broadcast, etc.



DRM Application in Education: Distance Learning



The image shows a child holding a tablet that displays a digital learning interface. The interface includes a breadcrumb trail: "Education → ... → Class VI → Mathematics". The main heading is "Pythagorean theorem:". The text explains that the theorem is a statement about the sides of a right triangle, with one angle being 90 degrees. It defines the two sides next to the right angle as "legs" and the longest side as the "hypotenuse". A diagram of a right-angled triangle is shown with legs labeled 'a' and 'b', and the hypotenuse labeled 'c'. Squares are drawn on each side to illustrate the theorem. The interface also features a "NewsService Journaline" logo, navigation arrows, a "DRM Distance Learning" logo, and the DRM logo at the bottom left.

DRM Distance Learning – Practical Considerations

Johannes von Weyssenhoff



STAR WAVES

DRM Receiver for Distance Learning with WiFi-Hotspot



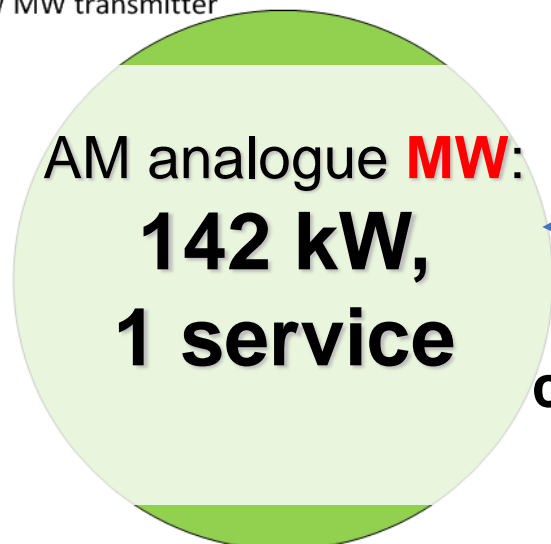
**DRM for large-area coverage
in the AM bands
(SW, MW and LW) Below 30 MHz**

Simon Keens

Coverage – AM (MW) analogue vs. DRM MW

AM analogue vs. DRM – Same coverage, 1 single tx

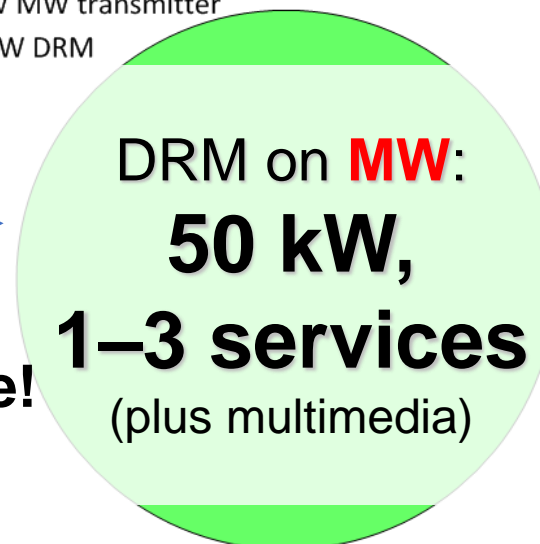
AM Coverage
100kW MW transmitter



600km

100 kW ERP @ 72% efficiency
→ 142 kW power consumption

DRM Coverage
100kW MW transmitter
-> 40kW DRM



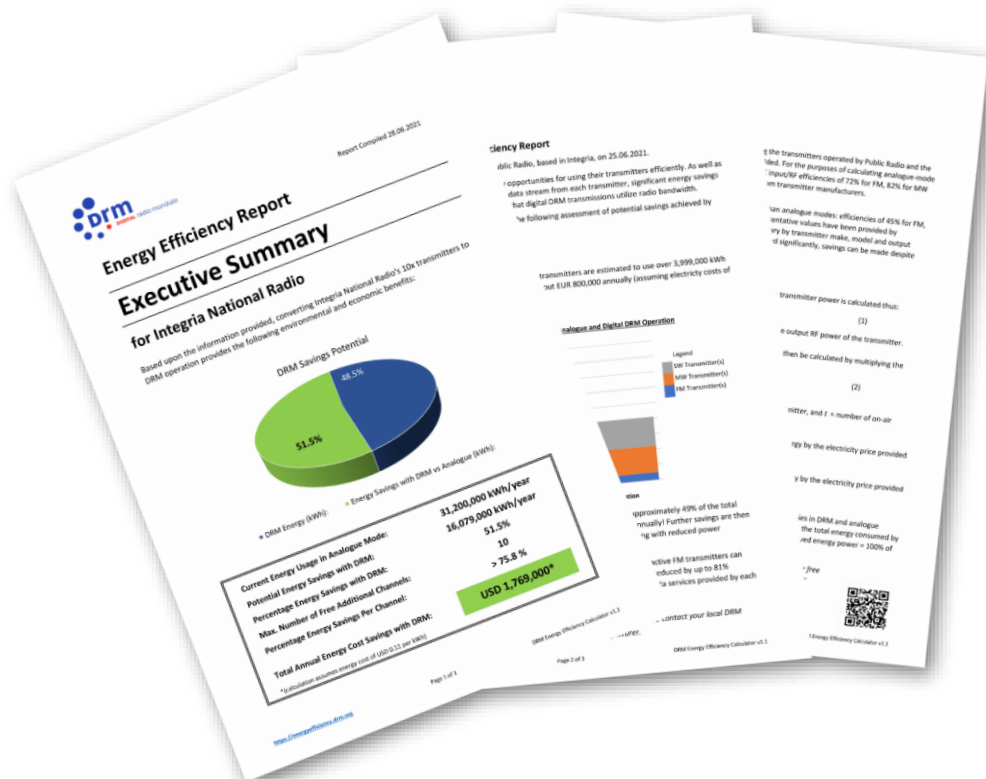
600km

40 kW ERP @ 80% efficiency
→ 50kW power consumption



DRM Energy Efficiency Calculator – Ready for Use

The **DRM Energy Efficiency Calculator** is a user-friendly tool in six languages that allows users to calculate how much energy can be saved by switching transmitters from analogue to digital DRM operation



See how much you could save:
energyefficiency.drm.org



If you are interested, e-mail us:
energyefficiency@drm.org

**DRM for local/regional coverage
in the VHF bands
(incl. the FM band)**

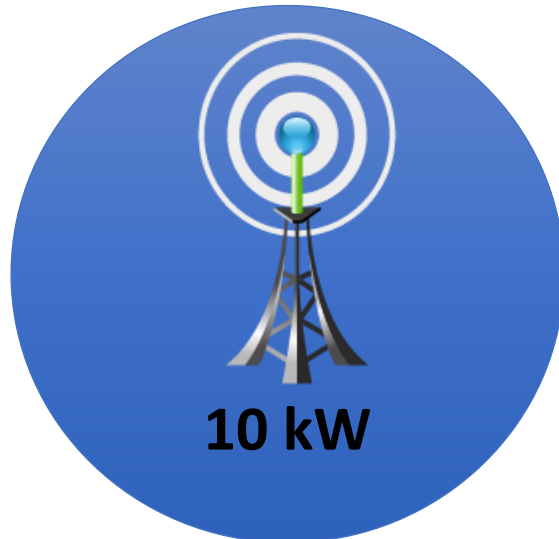
Alexander Zink

Coverage of DRM in FM Band

Assumption:

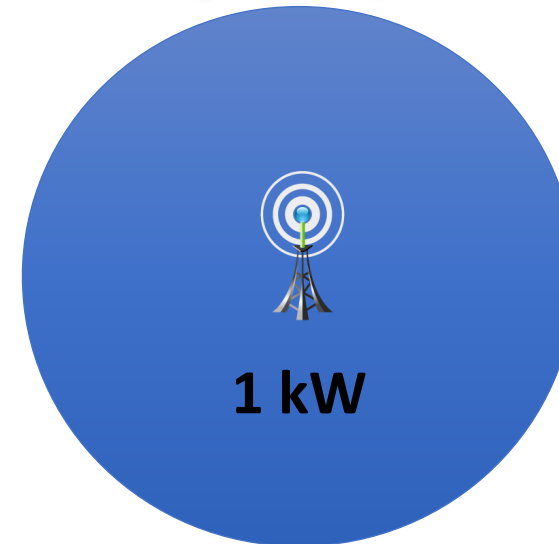
- **Same coverage** in FM and DRM
- **Stationary** reception profile in acc. to ITU-R
- **Same Antenna Gain**

1x Analog FM
200 kHz bandwidth



10 kW

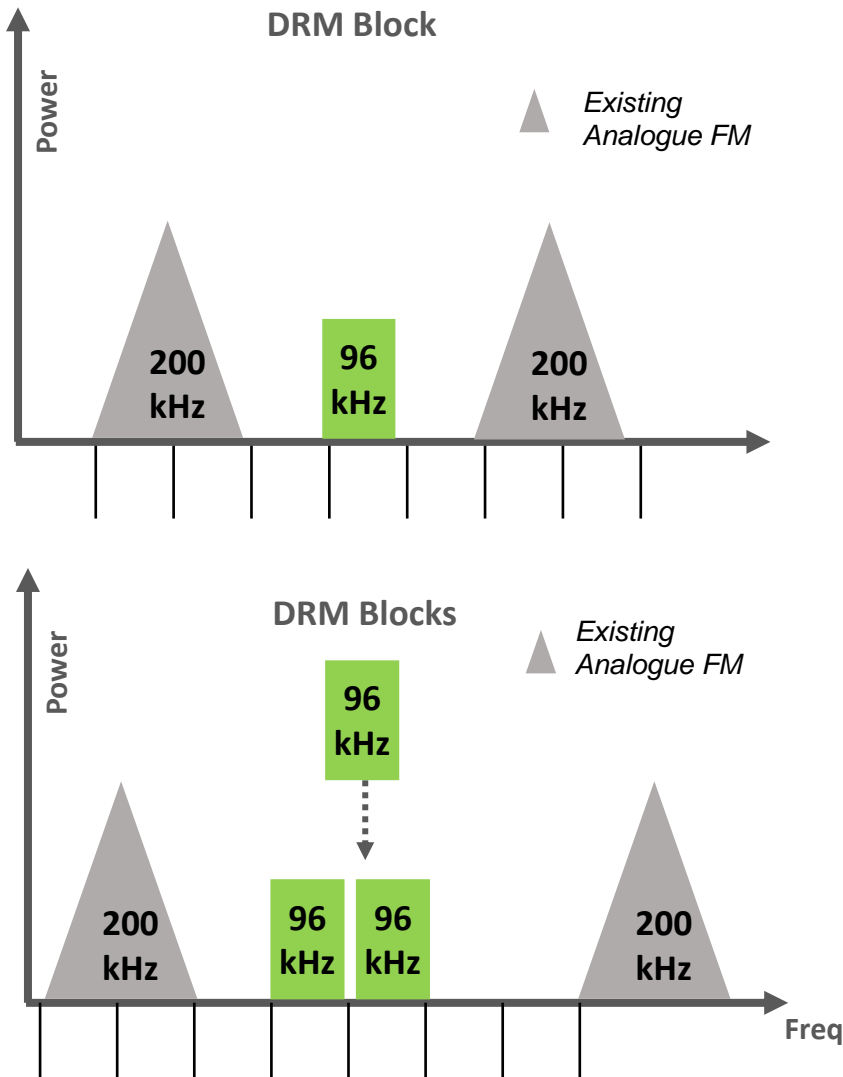
3x DRM
96 kHz bandwidth



1 kW

10 : 1 power

DRM FM – Simulcast without replacing the existing FM transmitter



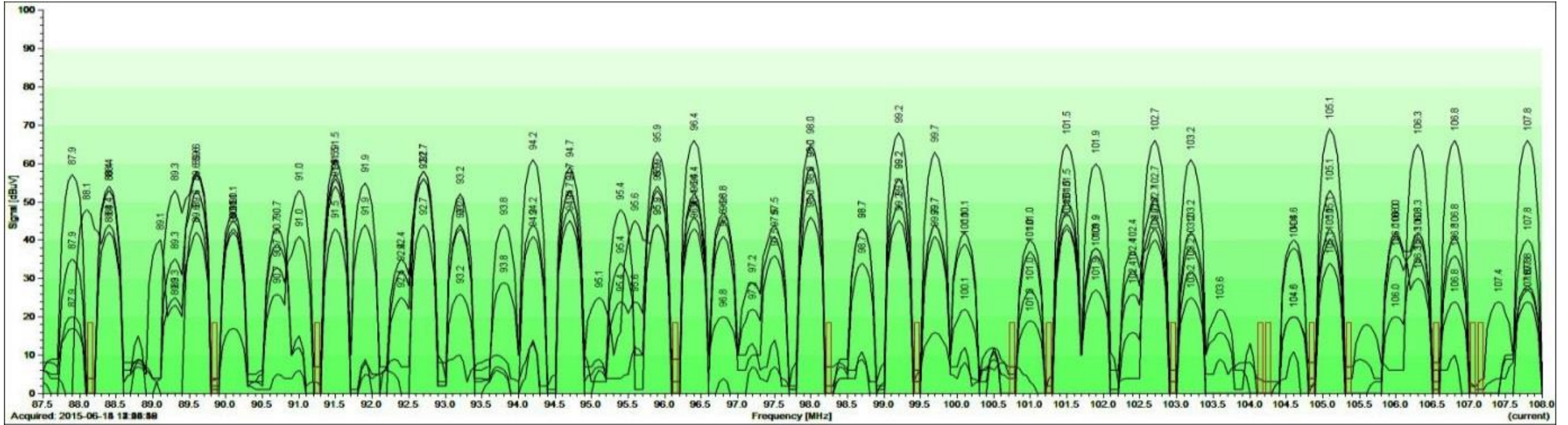
DRM FM allows for Simulcast without the need of replacing exiting FM transmitter!

- One or more DRM FM blocks can be placed in existing spectrum gaps
 → **shared Tx infrastructure**; more info to follow later
- Existing FM transmitter untouched
- Significant and practical during the transition phase
- **Analogue and DRM FM services seamlessly linked via AFS**
- The transmitter can be extended to operate in Simulcast (same transmitter) and digital mode in future

DRM in Africa

Aldred Dreyer

More Services can be introduced using DRM in FM



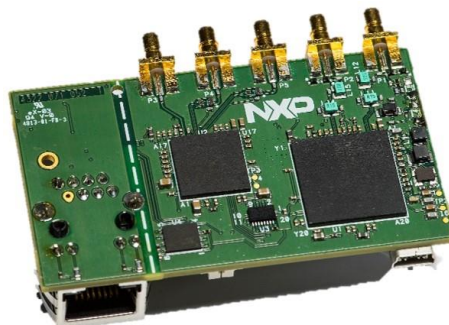
- Considering at least 3 sound services per DRM signal, up to 48 additional sound services could be added to the current FM spectrum in Johannesburg.
- This can be done immediately without restacking or changing any of the existing analogue broadcast services in the band.

DRM Receivers

Radu Obreja

Car, Portable, Mobile DRM Receivers and chip, module solutions

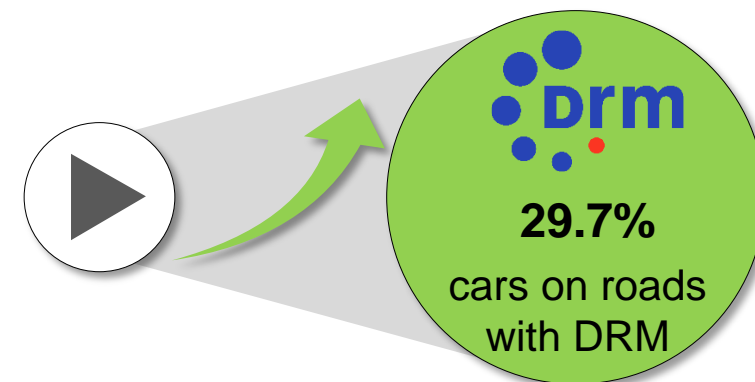
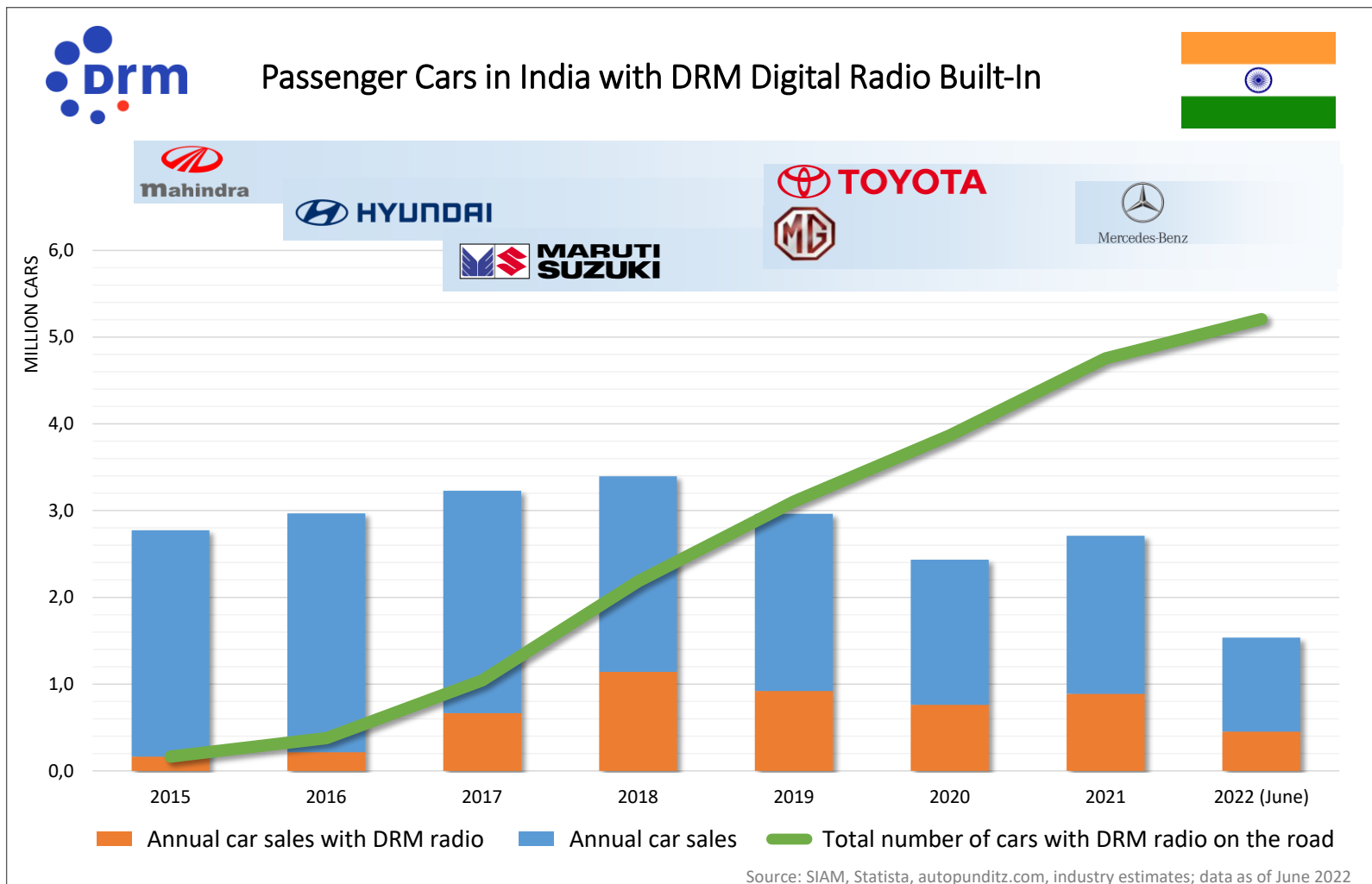
Manufacturers in **China, Germany, India, UK, South Korea** are producing DRM receivers and are willing to do **local manufacturing**.





**IBC
Announcement!!**

DRM in Indian Cars

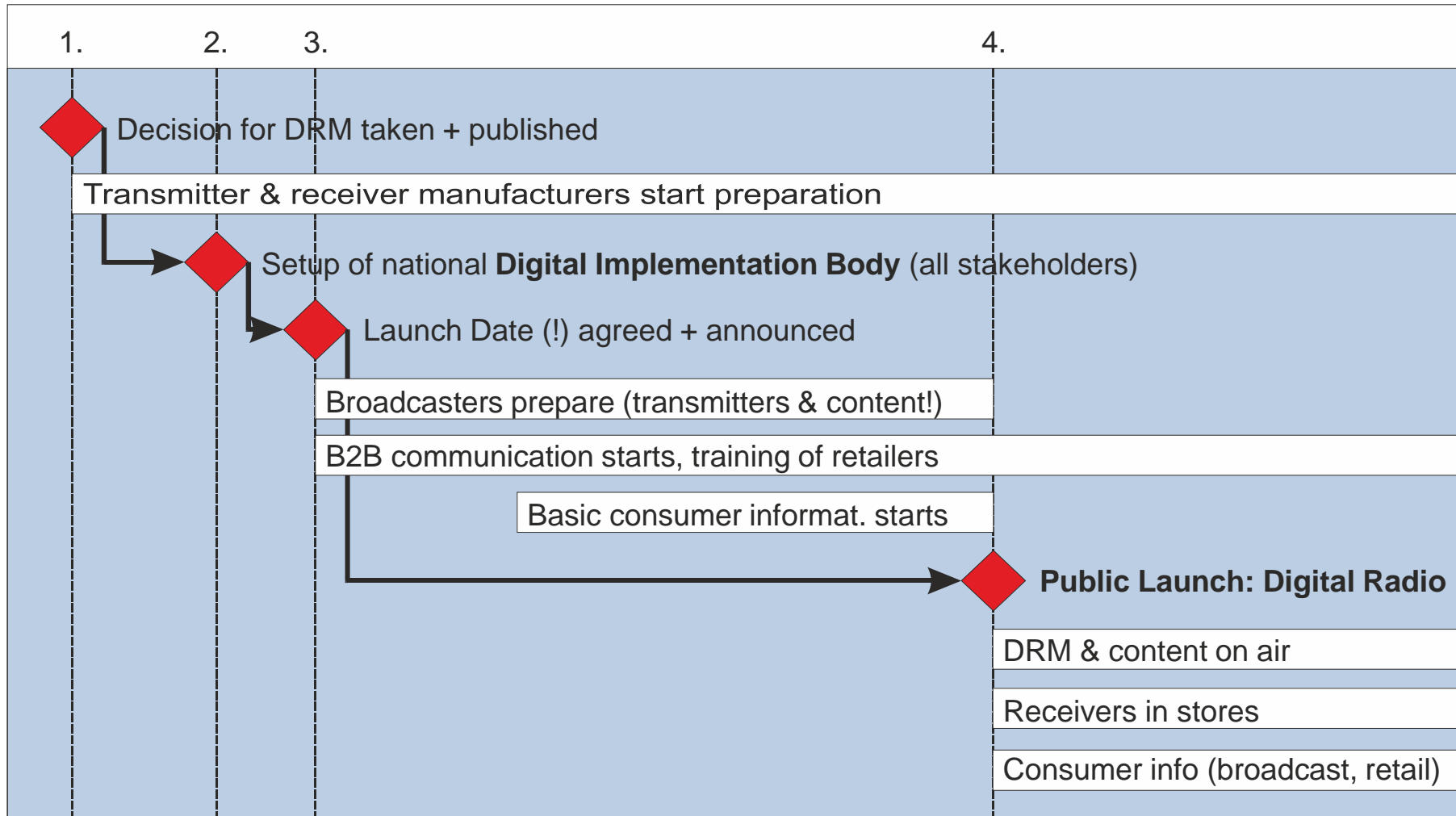


**Over 6 million cars
on Indian roads
(June 2023)**

PLANNING THE TRANSITION FROM ANALOGUE TO DRM DIGITAL RADIO

Alexander Zink

Blue-Print Timeline Example for National Digital Radio Launch Project

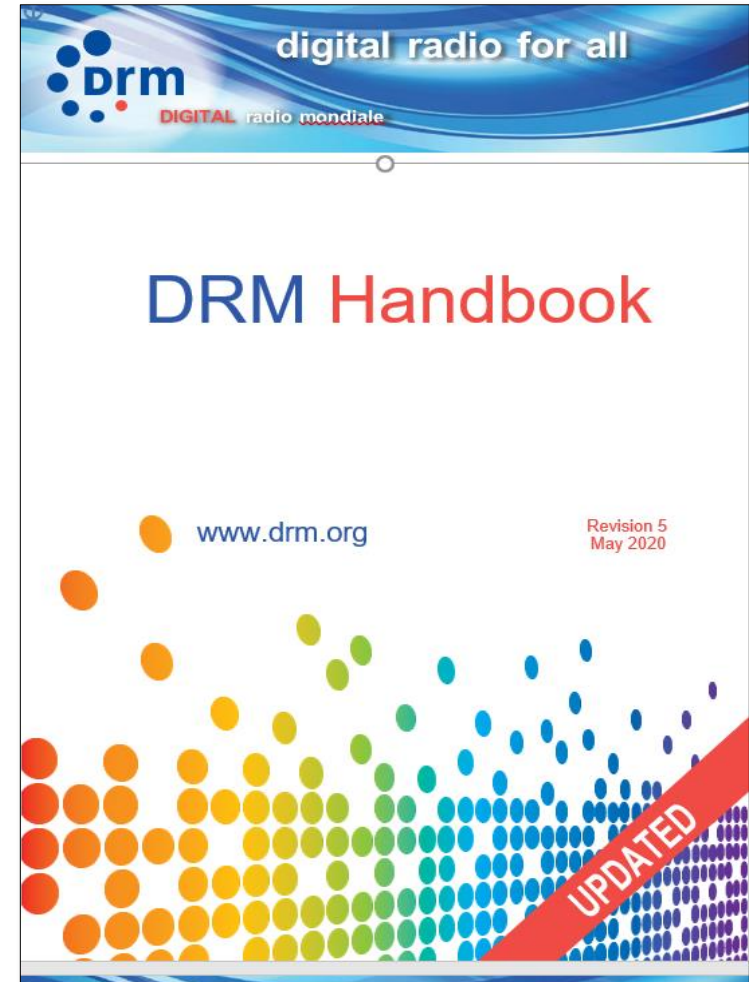


All you need to know about DRM Digital Radio

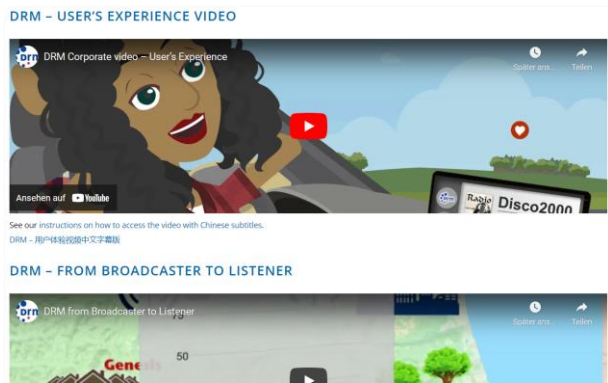
DRM Handbook Version 5

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youtube.drm.org

Some of the Questions Received

1. What is digital radio? How does it work?
2. With it what are the major challenges it has ?
3. Does it have any advantage over the current FM radio?
4. With digital radio does it need a  gadget to listen to it? Or it is online purely.
5. What types of equipment does it need to be on air?
6. Is it aimed at killing FM radios?
7. Is it cost effective to run compared to current FM radio?

Now: Your Questions....