

HFCC Bratislava, Aug. 2013

Ampegon, Company Overview DRM – FM Rebroadcasting

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AMPEGON



Name change November 2012: Our new Identity

AMPEGON



Transmission
Systems



Antenna
Systems



Scientific
Applications



Green
Technologies



Transmission
Systems



Antenna
Systems

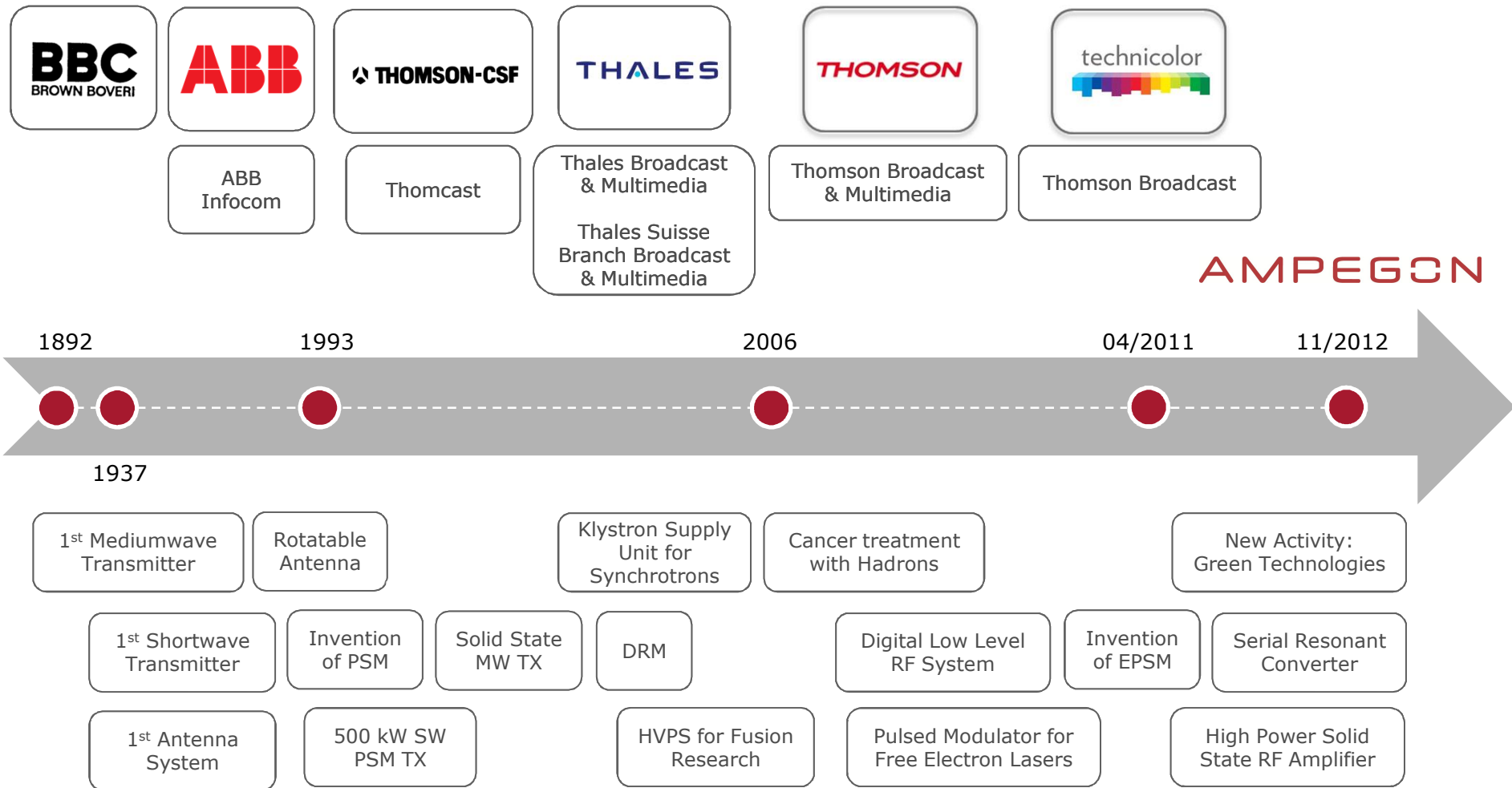


Scientific
Applications



Green
Technologies

Heritage of Excellence



Our Mission



Ampegon is the leading designer, manufacturer and system integrator of AM/DRM Radio Transmission Systems worldwide.

» We offer the complete system including transmitters, antennas and a wide range of auxiliary equipment.



Ampegon is developing world-class technology to serve scientific institutions with best overall performance.

» We offer high power RF amplifiers, regulated high voltage modulators and power supplies (HVPS) and fully integrated solutions.

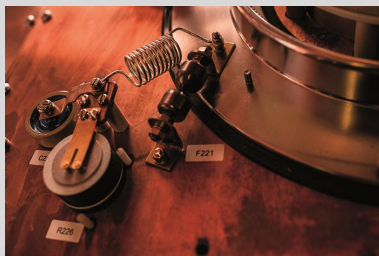


Ampegon is introducing Green Technologies for the benefit of our environment and to improve climate protection.

» We offer photovoltaic power plants based on our extensive turnkey experience and system approach.

Ampegon Product Portfolio

Transmission Systems



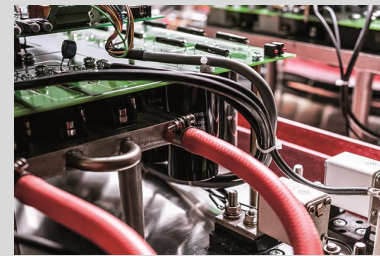
- “ Shortwave Transmitters
- “ Mediumwave Transmitters
- “ DRM Equipment
- “ Broadcast Control Systems
- “ Transmission Auxiliaries

Antenna Systems



- “ SW Broadcast Antennas
- “ LW/MW Broadcast Antennas
- “ LF/VLF Antennas
- “ Towers and Masts

Scientific Applications



- “ RF Amplifiers
- “ High Voltage Power Supplies
- “ Digital Low Level RF

Green Technologies



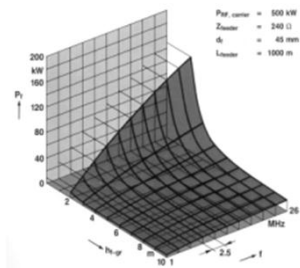
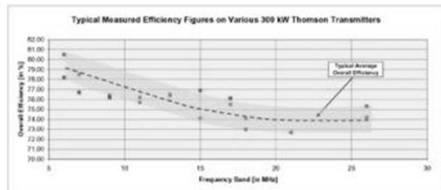
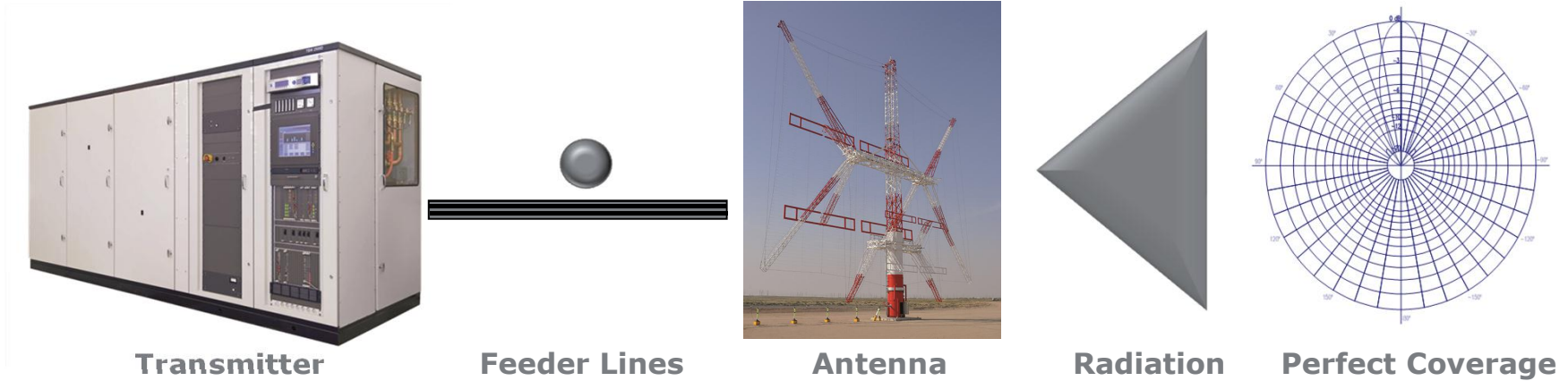
- “ Photovoltaic (PV) Power Plants



SW Transmission Systems

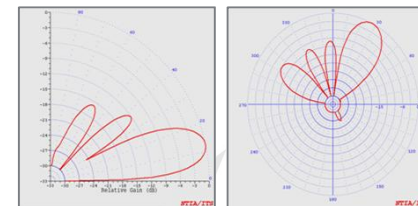


Engineering – System Optimization



- ground losses
- ohmic losses
- Radiation losses

Reality with slewing "rotating beams"



η TX	η Feeder	η Antenna	η Radiation	η Total
Modern TX: 75 to 80 % Older TX: 50 to 55 %	Best: 95 % Very Often: 70 %	Best: 98 % Very Often: 95 %	Perfect Design: 99 % With Shielding: 70 %	Best: ~ 70 % Very Often: ~ 25 %

System Efficiency = $\eta_{\text{Transmitter}} \times \eta_{\text{Feeder}} \times \eta_{\text{Antenna}} \times \eta_{\text{Radiation}}$

Shortwave Transmitter Range

100 kW, 250/300 kW, 500 kW

Launch at IBC 2013: New Shortwave transmitter generation

- ” Universal Control System UCS
- ” New Tuning System
- ” Simplified measurement acquisition system
 - Data display
 - Data logging
 - Data analysis
- ” DRM integration



Station Control System: Master Series II

Offering solutions tailored to meet any automation needs



AM Broadcasting Antennas

A full spectrum of frequency ranges & configurations

Shortwave Broadcasting Antennas

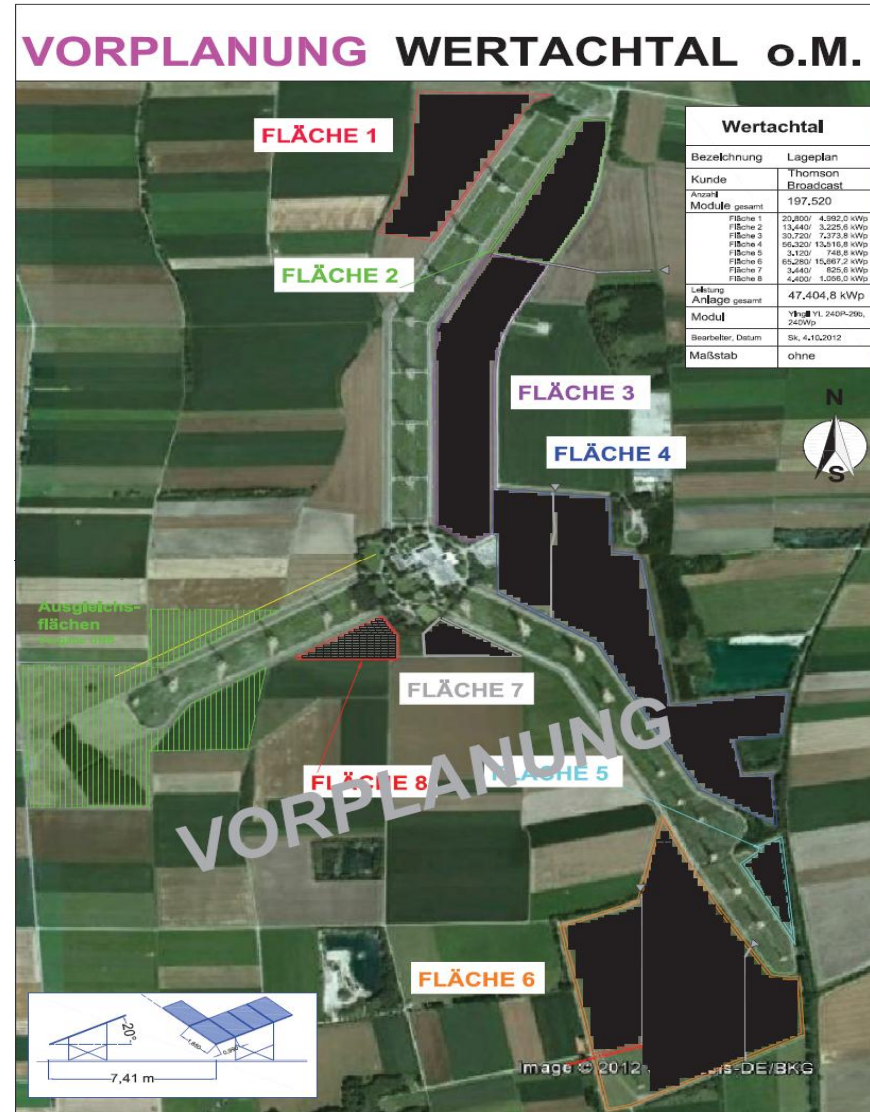
- “ Fixed curtain antennas
- “ Rotatable curtain antennas
- “ Fixed log-periodic antennas
- “ Rotatable / Inclined log-periodic antennas
- “ Omni-directional antennas
- “ Associated RF circuits



Green Technologies: Photovoltaic (PV) Power Plants



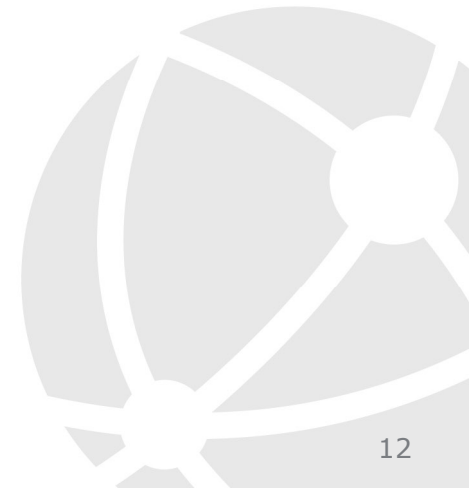
PV power plant planning works at MediaBroadcast Shortwave Station in Wertachtal, Germany



AMPECON

Revival of Shortwave ? / Overview on recent projects

- “ 3 x 250 kW SW near Abuja, Nigeria, including one rotatable antenna 4/4/1.0, commissioned 2012
- “ One 100 kW SW Tx near Tashkent, Uzbekistan, commissioned 2012.
- “ One 250 kW SW near Dhaka, Bangladesh, including one rotatable antenna 2/2/0.5, commissioned 2012
- “ 4 x 250 kW SW Tx for Hike / KDDI Japan, the first one commissioned mid 2013.
- “ 10 x 300 kW SW Tx and 12 rigid dipole Antennas are in production for Taiwan, two units commissioned in May 2013.
- “ 2 x 100 kW SW Tx are contracted for AIR in India, production started
- “ Large tender requests ongoing: AIR India, Saudi Arabia (Riyadh), TDA Algeria



Strategic Cooperation with Transradio

Transradio: AM/DRM Broadcasting Equipment

- “ MW and LW transmitters TRAM line
- “ Associated auxiliaries



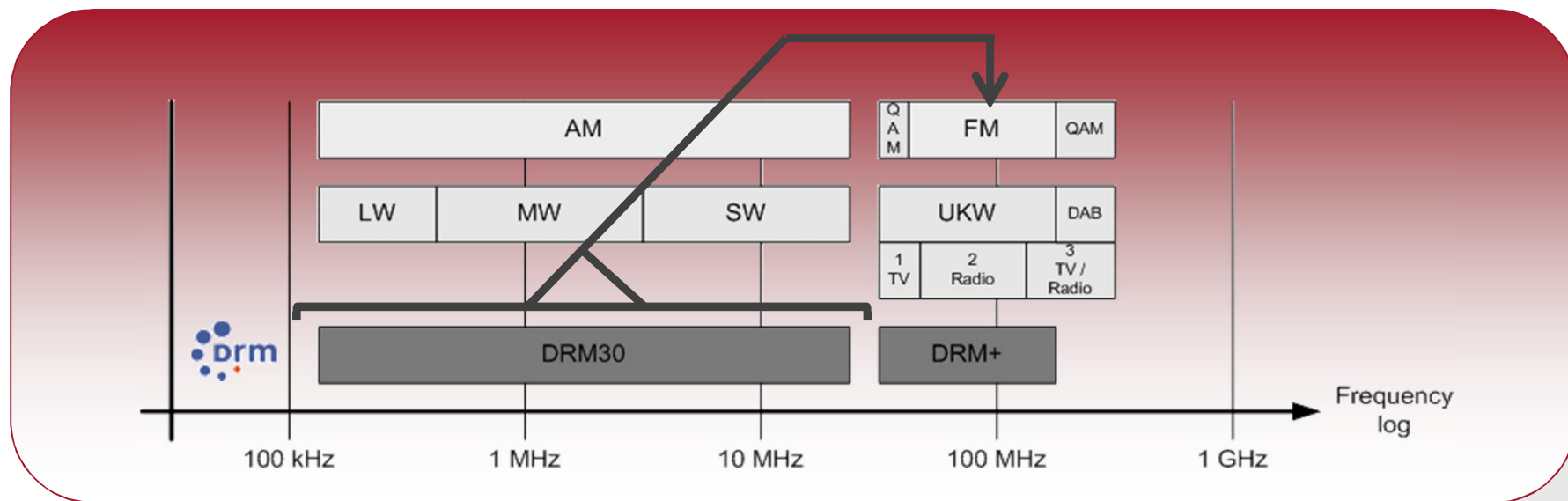
Ampegon: Long-/Mediumwave Broadcasting Antennas

- “ Base-fed and shunt-fed monopoles
- “ Base-fed and shunt-fed towers
- “ Anti-fading antennas
- “ Associated RF circuits

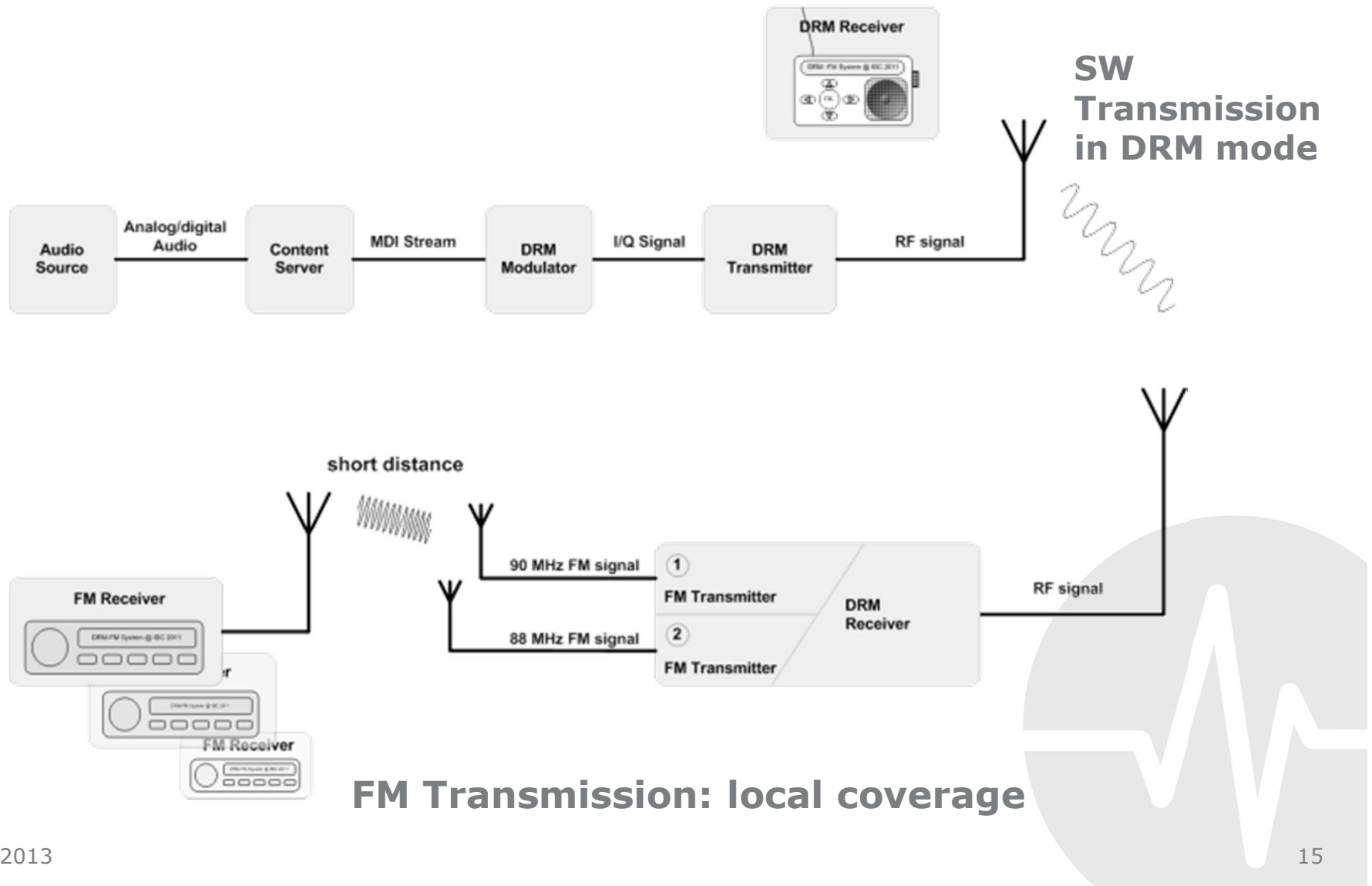


DRM – FM Rebroadcasting: Overview

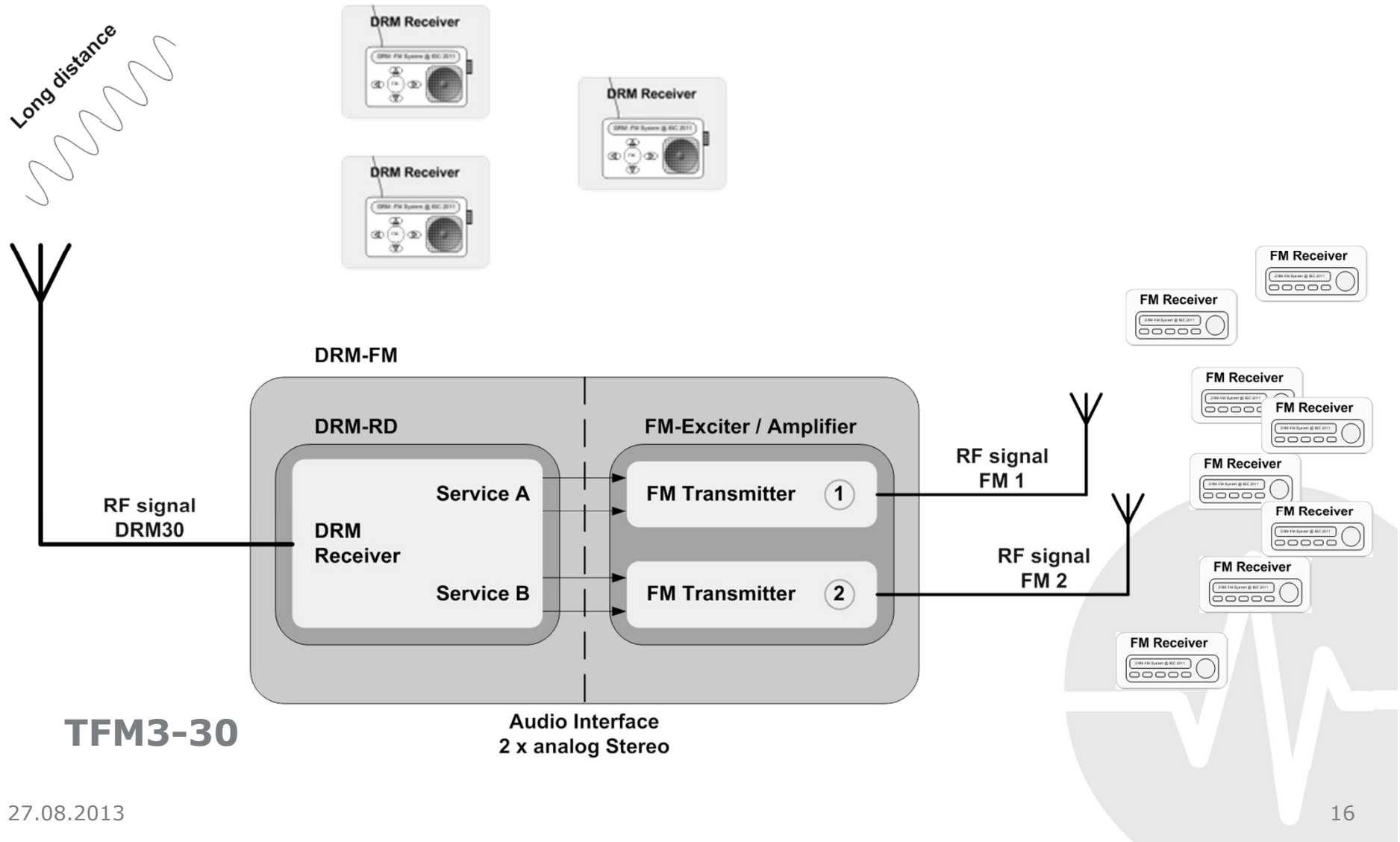
- Radio Transmissions:
AM / DRM to FM technology bridge by Re-broadcasting



DRM – FM Rebroadcasting: SW Transmission Setup



DRM – FM Rebroadcasting: System Diagram



DRM – FM Rebroadcasting: Data Stream

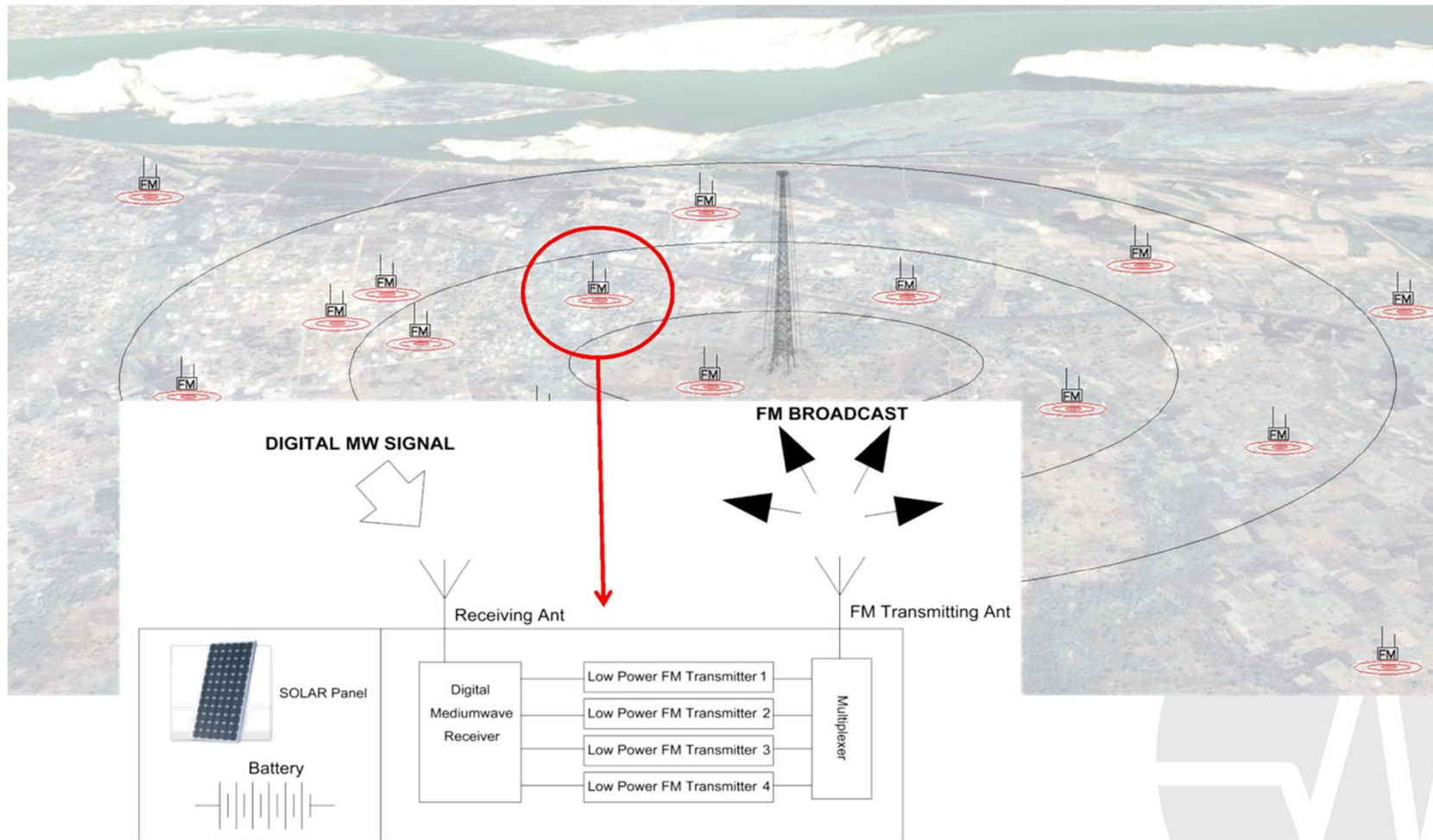
Sample of a DRM Setup for Rebroadcasting in FM

The screenshot shows a DRM configuration window with the following details:

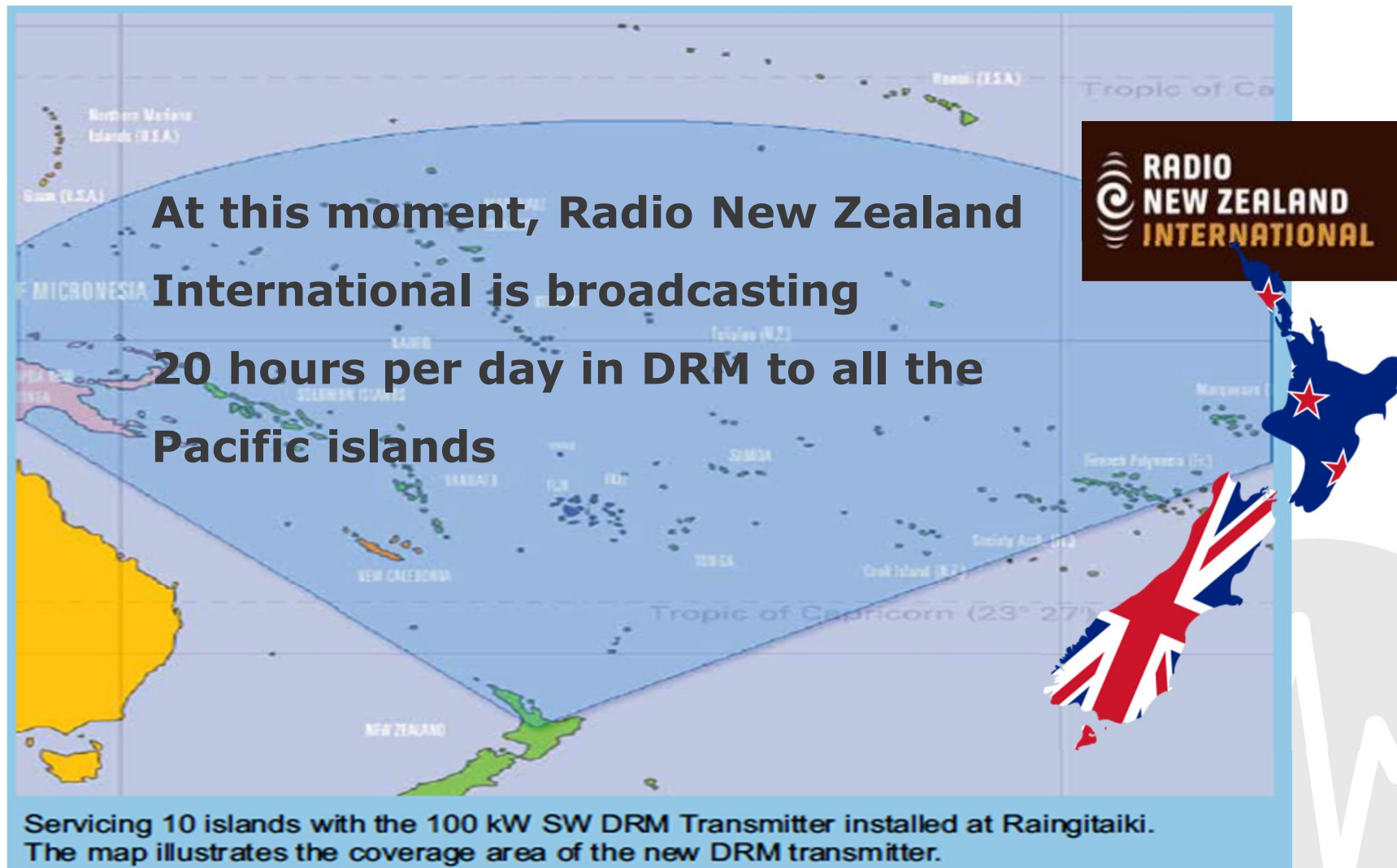
- DRM Services:**
 - A DRM:** English (English) Current affairs from United States, Service Id: 0x1001 (4097), AFS Frequency List: ""
 - Audio_1 [Audio]
 - + DRM Text Message_1 [Text/Message]
 - NAB Journaline [PAD-Data]
 - B DRM Service B:** Service Id: 0x1002 (4098), AFS Frequency List: ""
 - Audio_2 [Audio]
 - + DRM Text Message_2 [Text/Message]
 - NAB Journaline [PAD-Data]
 - C:** not used
 - D:** not used
- DRM Channel Parameters:** Robustness mode A (DRM), 10 kHz, long (2s) interleaver, MSC mode 64-QAM, SDC mode 16-QAM, Protection level EEP: PL=3 [0.78] (lowest protection, highest bitrate)
- DRM Channel Capacity:** Max. net bitrate: 34760 bps, Unassigned bitrate: +440 bps
- Bandwidth Allocation Bar:** Shows a total of 34760 bps. It is divided into a green section (14760 bps), a blue section (14760 bps), and a yellow section (4800 bps (4500 bps) 440). The yellow section represents the data service.
- MDI Output:** dcp.udp.pft://10.11.152.99:50000?spread=0.4, Transmission offset: 1.2 s

1. One DRM transmission with two audio service included (green / blue)
2. Text Message and Journaline (data service in yellow 4.8 kBps)
3. 10 kHz DRM bandwidth
4. Audio bit rate 2 x 14.7 kBps -> parametric stereo

DRM – FM Rebroadcasting with MW Transmission



DRM – FM Rebroadcasting



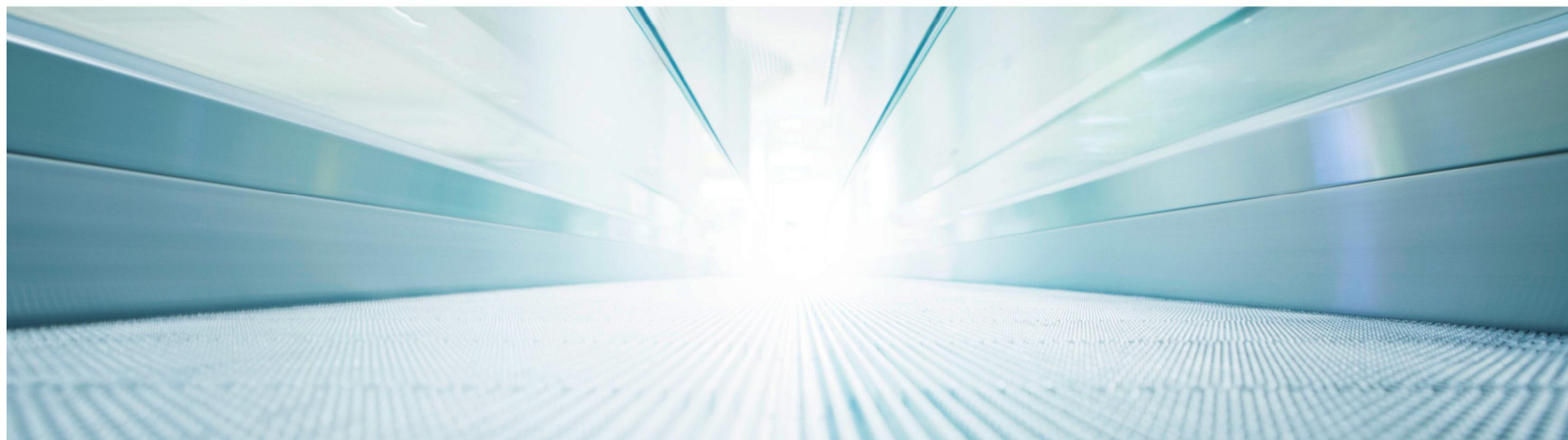
At this moment, Radio New Zealand International is broadcasting 20 hours per day in DRM to all the Pacific islands

RADIO NEW ZEALAND INTERNATIONAL

Serviceing 10 islands with the 100 kW SW DRM Transmitter installed at Raingitaiki. The map illustrates the coverage area of the new DRM transmitter.

DRM – FM Rebroadcasting: Features

1. Program distribution by SW, MW / DRM for Rebroadcasting in FM
2. Independent Operation (independent from Satellites)
3. Extensive coverage with shortwave signal DRM30
4. Digital audio quality and full feature list within coverage area
5. DRM and FM reception of the program in the coverage area
6. Low power consumption => stand alone solution in remote areas with solar energy and battery
7. One single channel DRM transmission can feed two FM audio programs
8. DRM receiver and two full featured FM Exciter included
9. FM-RF amplifier and antenna can be individually selected, depending on the target area for the coverage
10. Ideal solution for FM-Gap filling in remote areas with low power FM
11. Listeners can use their existing (old) FM receiver



Thank you !

ampegon.com

27.08.2013



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