

DRM Tests Brazil – December 2011

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DRM Context in Brazil



➤ DRM Tests in Brazil

- Over the last 20 months tests in DRM30, medium wave with TV Cultura and CBN (Radio Globo) in Sao Paulo low and high power
- DRM+ in the FM band with UFMG and Itatiaia in Belo Horizonte low and high power
- DRM+ trial in the FM band with very low power still on in Rio de Janeiro

➤ Call of the Ministry of Communication for a 180 days testing of all digital standards

- ▲ AVISO DE CHAMAMENTO PÚBLICO No 1/2011/June

➤ In this context, TDF offered to participate to a series of Short Wave DRM tests in December 2011

Short Wave DRM tests – Transmission Center

Broadcasts were performed from Montsinéry TDF
Short Wave site located in French Guiana

Montsinéry (GUF) is ideally located to cover Brazil



➤ Infrastructure used for the test

- ▲ 1 transmitter designed for DRM transmission (from 30kW to 150kW)
 - Broadcasts were performed at 125 kW
- ▲ Antenna type : AHR 4/3/5
- ▲ Bandwidth : 11.5 – 21.9 MHz
- ▲ Azimuth : 167° (rotatable antenna)

DRM tests over Brazil

Short Wave DRM tests - characteristics

➤ Test schedule

- ▲ 13 days of tests
- ▲ A total of 36 DRM broadcasted hours
 - Audio + data (pictures)

Date	Time UTC	Freq (kHz)
05/12 to 08/12	1100-1300	17495
09/12	1100-1200	17495
	1200-1300	21495
12/12 to 13/12	1200-1400	21495
	1600-1800	21495
14/12 to 16/12	1200-1400	21495
	1600-1800	17495
19/12 to 21/12	1800-2000	17495

Configuration	Config. 1	Config. 2
DRM mode	B	
Bandwidth	10 kHz	
MSC	64QAM	
Cor. rate	0.5	0.6
Audio	AAC + SBR	AAC+SBR
Total bit rate	17.46 kbits/s	20.96 kbits/s
Audio bit rate	16.56 kbits/s	17.56 kbits/s
Picture bit rate	0.9 kbit/s	3.40 kbits/s

➤ Technical characteristics

- ▲ 2 configurations tested with pictures embedded

Short Wave DRM tests - results

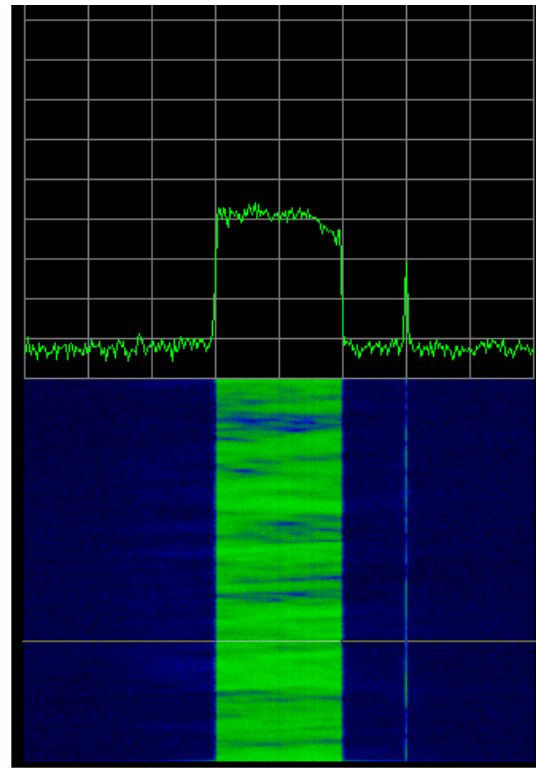
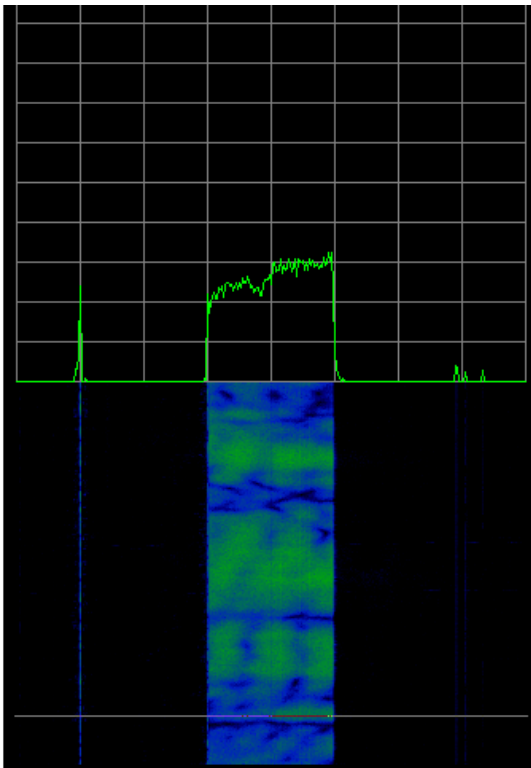
09/12 – 11.00 UT

09/12 – 12.31 UT

CR : 0.5

Reception at Belo Horizonte

Sound at reception site :

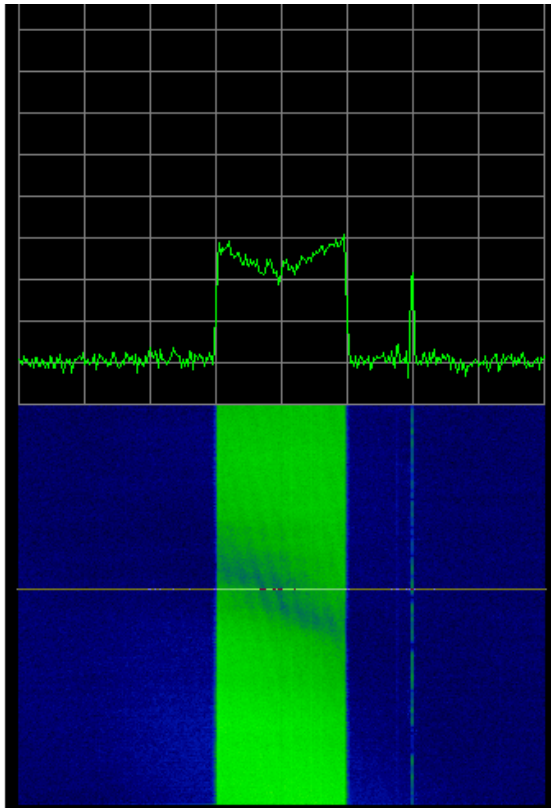


SNR: 26.8 dB, FAC: 100%, Audio: 100.0% DRM mode: B / 10 kHz, interlv: 2.0 s, SDC: 16-QAM, MSC: 64-QAM MSC bitrate: 17.46 kbps, protection level H/A/B: 0/0/0 (R=0.50) 1: TDF DRM (por/gf) [A35111, Portuguese, Varied] 1/0 Audio: AAC+ P-Stereo (16.56 kbps EEP) 1/1 Data: MOT Slideshow (0.90 kbps EEP)

SNR: 29.1 dB, FAC: 100%, Audio: 100.0% DRM mode: B / 10 kHz, interlv: 2.0 s, SDC: 16-QAM, MSC: 64-QAM MSC bitrate: 17.46 kbps, protection level H/A/B: 0/0/0 (R=0.50) 1: TDF DRM (por/gf) [A35111, Portuguese, Varied] 1/0 Audio: AAC+ P-Stereo (16.56 kbps EEP) 1/1 Data: MOT Slideshow (0.90 kbps EEP)

Short Wave DRM tests - results

16/12 – 12.02 UT



CR : 0.6

Reception at Belo Horizonte

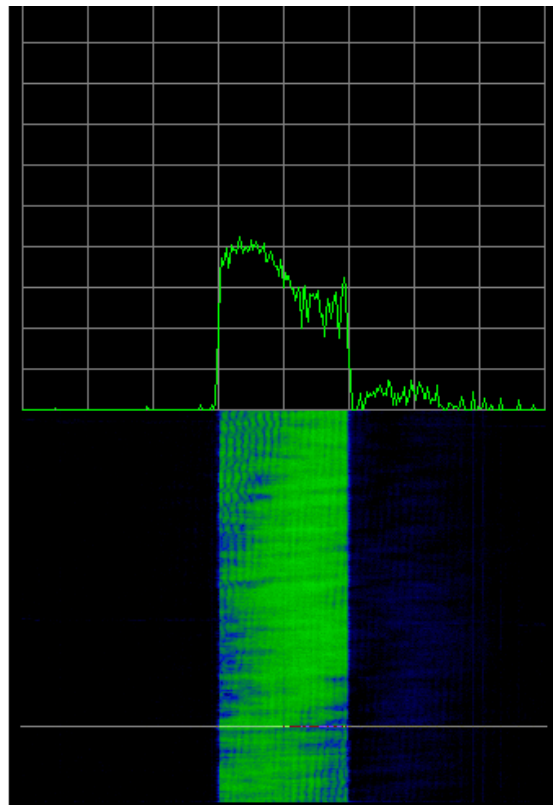
Sound at reception site :



SNR: 23.6 dB, FAC: 100%, Audio: 100.0% DRM mode: B / 10 kHz, interlv: 2.0 s, SDC: 16-QAM, MSC: 64-QAM MSC bitrate: 20.96 kbps, protection level H/A/B: 0/0/1 (R=0.60) 1: TDF DRM (por/gf) [A35111, Portuguese, Varied] 1/0 Audio: AAC+ P-Stereo (17.56 kbps EEP) 1/1 Data: MOT Slideshow (3.40 kbps EEP)

Short Wave DRM tests - results

19/12 – 18.02 UT



CR : 0.5

Reception at Belo Horizonte

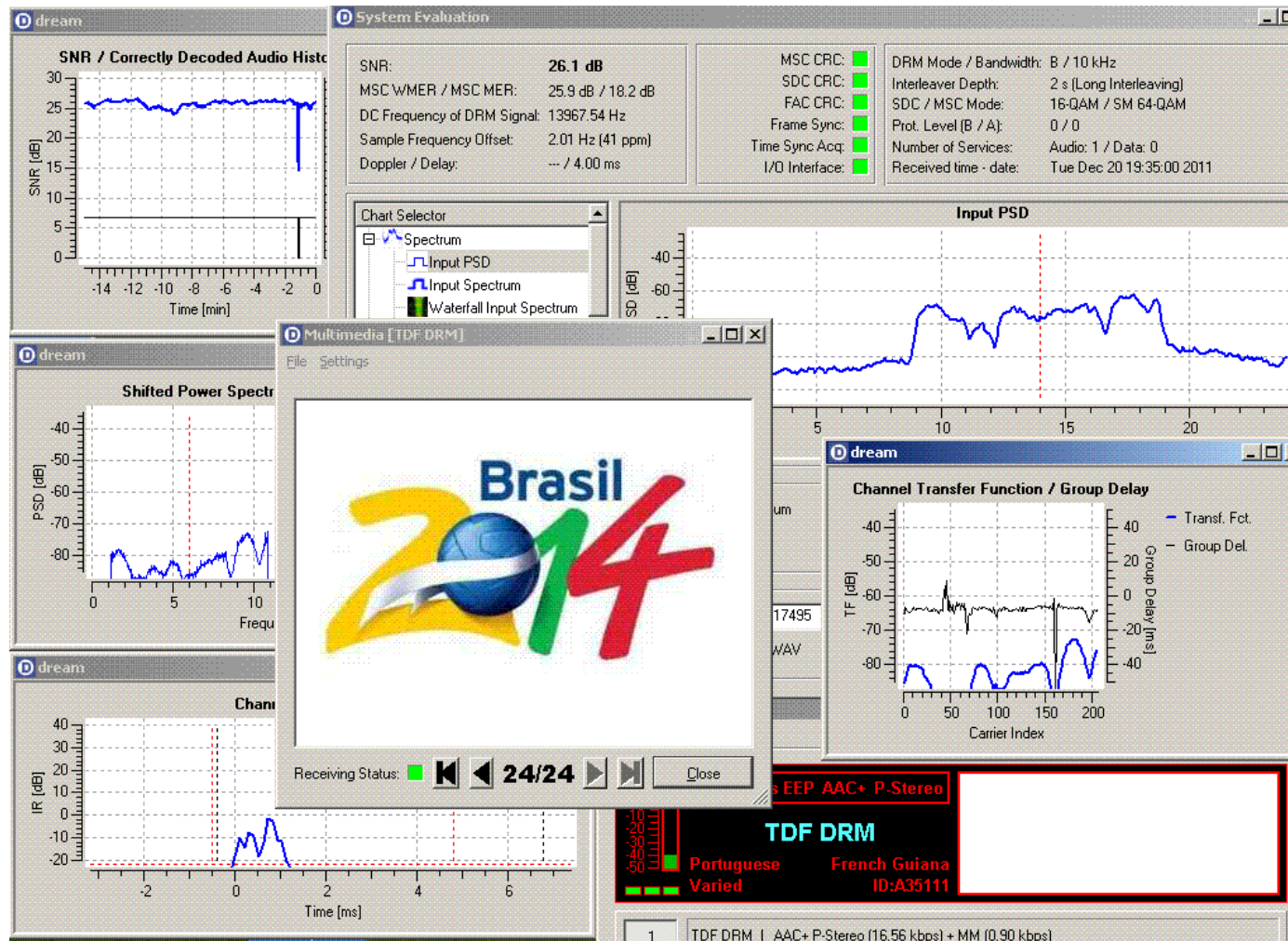
Sound at reception site :



SNR: 29.3 dB, FAC: 100%, Audio: 100.0% DRM mode: B / 10 kHz, interlv: 2.0 s, SDC: 16-QAM, MSC: 64-QAM MSC bitrate: 17.46 kbps, protection level H/A/B: 0/0/0 (R=0.50)
1: TDF DRM (por/gf) [A35111, Portuguese, Varied] 1/0
Audio: AAC+ P-Stereo (16.56 kbps EEP) 1/1 Data: MOT Slideshow (0.90 kbps EEP)

Short Wave DRM tests - results

➤ Picture at reception site (São José)





Thank You !



NEWS from CES in Las Vegas

➤ NXP Automotive Digital Radio solution to include DRM

one platform
for HD, DAB/DAB+/T-DMB and DRM

