



# ***Digital Sound broadcasting***

*ITU Regulation*

***Radiocommunication Bureau***

# ITU instruments

## **Constitution (CS) and Convention (CV)**

- Establishes the legal basis for the Union
- Defines: purpose, structure, rights and obligations of Member States

A large, light blue downward-pointing arrow indicating the flow from the Constitution and Convention to the Radio Regulations and Rules of Procedures.

## **Radio Regulations (RR) and Rules of Procedures (RoP)**

- Binding international treaty that governs the use of the spectrum and the orbits in an international level
- Administrations adapt their national legislation accordingly

A large, light green downward-pointing arrow indicating the flow from the Radio Regulations and Rules of Procedures to the Regional Agreements, Special Agreements, ITU-R Recommendations, Reports and Handbooks.

## **Regional Agreements, Special Agreements, ITU-R Recommendations, Reports and Handbooks**

- Complement the basic instruments

# Radio Regulations (RR)



RR are revised and updated during the World

Radiocommunication Conference (WRC) every 3-4 years  
Next WRC will be in 2019

## RR two main concepts:

Frequency allocations: Article 5 of the RR contains the Table of Frequency Allocations and Footnotes

Regulatory procedures: coordination, notification and recording



# Frequency Coordination is Key!



A diagram consisting of two large, light blue arrows. The left arrow points to the left and contains the text 'Introduction of digital sound broadcasting'. The right arrow points to the right and contains the text 'Regional Broadcasting Agreements And HFBC'. The two arrows overlap in the center, with the right arrow appearing to be on top. In the background, there is a faint, light blue globe with a grid of lines.

Introduction of digital  
sound broadcasting

Regional Broadcasting  
Agreements  
And HFBC



# Frequency bands for Broadcasting Regional Plans ( $\neq$ HF)

Band	Frequency (kHz/MHz)	BC/BT	Region Geo. zone	Plan
<b>LF</b>	148.5-283.5 kHz	BC	R1	GE75
<b>MF</b>	526.5-1 606.5 kHz	BC	R1 and R3	GE75
	525-1 605	BC	R2	RJ81
	1 605-1 705	BC	R2	RJ88
<b>VHF /UHF</b>	47-68 MHz	BC, BT	EBA	ST61
	47-68	BT	ABA	GE89
	87.5-100	BT	EBA	ST61
	87.5-108	BC	R1*	GE84
	162-170 MHz	BT	MRC	ST61
	(170 <sub>MRC</sub> )174-230	BC , BT	R1-MNG+IRN	GE06
	230-238, 246-254	BT	See RR 5.252	GE89
	470-862	BT	R1-MNG+IRN	GE06

\* and part of R3



# Introduction of Digital Sound in Regional Agreements (LF/MF)

## RJ81

MF: 535 - 1605

R2



Does **not provide** the possibility of introducing digital modulation in the bands concerned.

Question ITU-R 120/6 (2006) "Digital sound broadcasting in Region 2" has been adopted by Study Group 6E.

## RJ88

1 605 – 1 705 kHz

R2



CCRR/20(6 September 2002), the BR concluded that the formulations in the RJ88 Agreement would permit the introduction of digital modulation DRM A3 or B3 and also perhaps that of IBOC DSB

subject to completion of the studies related to co-channel, first and second adjacent channel protection ratios and subject to further limitations at the band edges in order to be consistent with RR 4.5.

## GE75

LF:150 –285 kHz; MF –  
525 –1 605 kHz;

R1 and R3



Rule of Procedure (RRB): Transmission systems DRM A2 and B2. Radiation reduced by at least 7 dB in all directions w.r.t analogue assignment

Temporary measure until the decision from a competent conference



# Introduction of Digital Sound in Regional Agreements (VHF/UHF)

## ST61

41-68 MHz  
Regions 1 & 3



under RoP Part A2/ST61  
paragraph 5 – same  
coordination distances as  
analogue systems

No submission or  
notification to date

## GE84

37.5 –108 MHz: FM  
Regions 1 & 3



possible under 3.1 of  
Chapter 3 of Annex 2 to  
GE84: not cause greater  
interference, Nor require  
higher protection

Problematic to introduce  
new digital assignments in  
**congested bands**

## GE06

174 –230 MHz (Band III)  
1.536 kHz T-DAB  
Region 1 & Iran



Adopted T-DAB as  
planned standard for  
digital sound broadcasting

Implementation of alternative  
standards under envelope of  
Plan entries : DVB-T → 1 –4 T-  
DAB blocks (Prov. 5.1.2 e + RoP  
A10)  
•T-DAB → Other digital systems  
(Prov. 5.1.3)





# Introduction of digital HFBC

**12.7 § 6 of RR: Other modulation techniques recommended by ITU-R**



shall be permitted in place of double-sideband or single-sideband emissions, provided that the level of interference caused to existing emissions is not increased.

**Res. 517 (Rev.WRC-03)**

Introduction of digital modulation schemes  
5 900 – 26 100 kHz

Entry into force July 2003



# Digital Broadcasting Not under Regional Agreements



**Frequency to be in conformity with article 5 of the RR (11.31)**



**Conditions: for ex.: 5.86 In Region 2, in the band 525-535 kHz the carrier power of broadcasting stations shall not exceed 1 kW during the day and 250 W at night.**



**System: No specific standard**



**Notification and recording in the MIFR Article 11 of the RR**



# ITU-R recommendations

## Recommendation ITU-R BS.1514-2:

System for digital sound broadcasting in the broadcasting bands below 30 MHz.



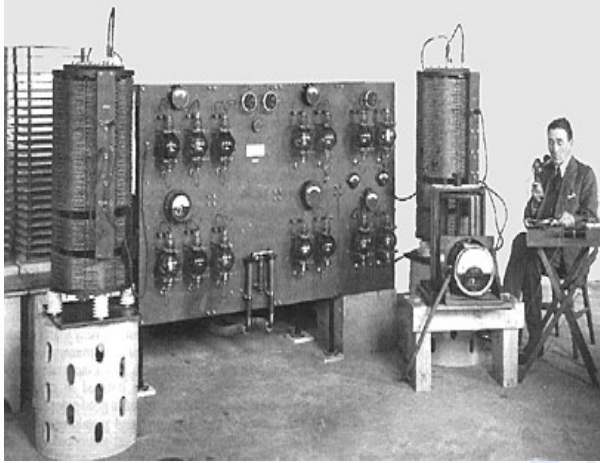
## Recommendation ITU-R BS.1114-7:

Systems for terrestrial digital sound broadcasting to vehicular, portable and fixed receivers in the frequency range 30-3 000 MHz.



## Recommendation ITU-R BS.774-3:

Service requirements for digital sound broadcasting to vehicular, portable and fixed receivers using terrestrial transmitters in the VHF/UHF bands.



Radio Platform- Chelmsford (England)-1920



# Thank you

ITU – Radiocommunication Bureau  
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