

ITU role in the development of Broadcasting



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Overview

- ITU and its role in the Radiocommunication
- ITU and Regulatory aspects of Broadcasting
- ITU and Broadcasting Standards



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ITU

- 193 Member States
- 800 Sector and associates Members
- 80 universities and research institutes



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History of ITU-R in brief

1906 (Berlin)	International Radiotelegraph Convention (1 st <i>Radio Regulations</i>)
1927 (Washington DC)	CCIR (International Radio Consultative Committee)
1932 (Madrid)	Telegraph & Radiotelegraph Conventions merged: the International Telegraph Union became the International Telecommunication Union
1947 (Atlantic City)	IFRB (International Frequency Registration Board) ITU as UN specialized agency
1992 (Geneva)	ITU-R (Radiocommunication Sector): <ul style="list-style-type: none"> •RRB (Radio Regulations Board) •BR (Radiocommunication Bureau)
2006	  <p>100 years of ITU Radio Regulations</p> <p>Commitment to connecting the world</p>

Main tasks of ITU-R

- Establish and update the International Regulations on the use of spectrum and orbital positions
 - Apply these Regulations
 - Produce global standards and related publications (Recommendations, Reports and Manuals) for the optimal use of orbit / spectrum
- Inform and assist the ITU Members of the Radiocommunication issues



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The objectives of the spectrum management at the national level

- Maximize the public benefit from the use of spectrum
- Protect investments on a long term
 - Against harmful interference
- Ensure consistency with the international framework to benefit from economies of scale, interoperability, roaming and international protection.



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1. Establish and update the International Regulations

- Commitment from the spectrum regulators and governments, on worldwide level and on a long-term basis to a stable regulatory environment
- Protect investments in the spectrum against harmful interference



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Radio Regulations (RR)

- Intergovernmental treaty governing the use of spectrum and orbital resources by States
- Defines the rights and obligations of Member States on the use of these resources and how to use rights can be achieved and maintained
- Require that the use of spectrum by private entities be subject to authorization by the Member State ("license")
- Updated every 3-4 years by the World Radiocommunication Conference (WRC)



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Radio Regulations (RR)

- Allocate different frequency bands to radiocommunication services
- Specify the technical parameters required to comply
- Define the procedures to be followed by States to obtain rights to use the spectrum
 - Aim to avoid harmful interference
 - Managed by the Radiocommunication Bureau of the ITU (BR)
- Identify frequency bands for specific uses, such as International Mobile Telecommunications (IMT)
 - Enable economies of scale, interoperability and roaming.



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Regional Agreements under the auspices of the ITU

- Specify the obligations of the Member States within one or more areas for the use of a specific part of the spectrum for a specific service
- Especially for broadcasting
- Ensure equitable access on a long-term basis
- Plans (instead of the general principle of first-come-first-served). Specificity:
 - spectrum resources allocated to each State
 - Procedures to access additional resources by modifying the plan.



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2. Application of the International Regulation

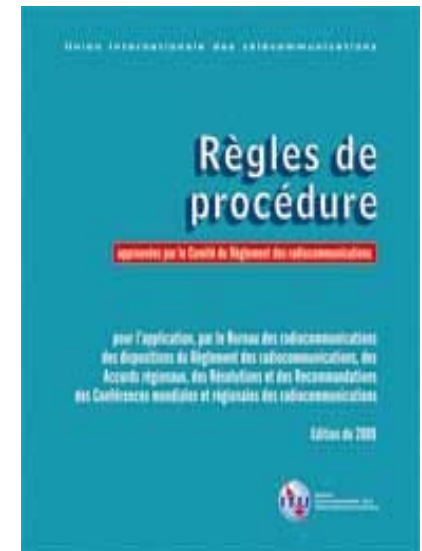
- Apply procedures for coordination and registration of frequency assignments
- To obtain the recognition and protection of international uses of spectrum authorized by the Member State.
- Foresee the control of the spectrum use and the settlement of disputes by the RRB
 - Investment protection



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Regulatory Radiocommunication Board (RRB)

- 12 Part-time elected members & 4 meetings/year for a period of 4 years, elected by the PP
- Approves Rules of Procedure to facilitate the application of the Radio Regulations
- Considers cases of harmful interference & appeals made by BR decisions in the application of RR



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3. Establish global standards for the optimal use of resources orbit / spectrum

- Promote and improve the technologies and practices to improve the spectrum usage
- Example: IMT Advanced specifications adopted in January 2012, HDTV specifications or EHD



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4. Assist and advise ITU Members

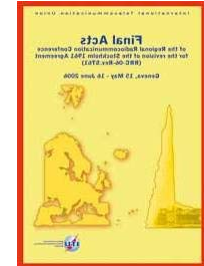
- In the application of the RR
- En organisant et développant les radiocommunications
- Organizing and developing the Radiocommunication
- Coordinating and harmonizing spectrum use on regional / global basis
- www.itu.int/en/events/Pages/Workshops-and-Seminars.aspx



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ST61 Plan

- Entry into force : 1 September 1962
- Frequency bands: ST61 Revision at RRC-06:
 - **41-68 MHz** (Sound and TV)



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GE75 Plan

LF/MF Broadcasting Conference (Regions 1 and 3)

- Entry into force : 23 November 1978
- **LF** : 15 channels (**148.5 - 283.5 kHz**), R1(European Broadcasting Area)
- **MF** : 120 channels (**526.5 - 1606.5 kHz**), R1+R3
 - **LPC*** EMRP ≤ 1kW max : 3 channels
 - **1485 kHz**
 - **1584 kHz, and**
 - **1602 kHz**

*:Low Power channels

Digital broadcasting- GE75

(Rules of Procedures Part A3)

After consideration of the relevant ITU-R studies, the Radio Regulation Board decided that any frequency assignment for AM broadcasting in the Plan may provisionally be used with digital modulation (transmission types DRM A2 or B2), provided the radiation is **reduced by at least 7 dB** in all directions, compared to the radiation of the AM modulated frequency assignment in the Plan.

Note: This Rule of Procedure is of a provisional nature (**December 2002**) until such time that it is confirmed by a competent Conference empowered to deal with the subject matter.



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In 1983, the CCIR received an "Emmy" for the development of a common world standard for digital television studios



HDTV

- "This is a remarkable achievement by Working Party 11A. It represents the culmination of over fifteen years of discussion on high definition television production standards. This agreement shows the unique effectiveness of the ITU-R as a worldwide forum for standards in broadcasting."

➤ Mr Krivocheev (1997)



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HDTV Working!

- HDTV was first demonstrated in Europe, in 1982 at the General Assembly of the European Broadcasting Union (EBU) in Killarney, Ireland.
- Digital HDTV systems demonstrated in 1991-1992 in Alexandria (USA), by the HD-DIVINE consortium and other organizations in Europe showed that narrow-band transmission of digital HDTV and digital multiprogram TV in 6, 7 and 8 MHz channels (conception 6-7-8) is not a fantasy but a reality (Recommendation ITU-R BT.798).

In accordance with Recommendations ITU-R BT.798 and BT.1206 the existing systems SDTV and HDTV of digital broadcasting could be developed.



Finally harmonized HDTV? **Yes, Indeed**

1997: Adoption of a new version of ITU-R 709 SG 11 for HDTV programme production → a new chapter in the worldwide harmonization of HDTV.



HDTV Harmonization

- 1998: after the introduction of digital techniques (Recommendation ITU-R BT.601, which became the building block of digital television systems) and over twenty years of continuous studies: unanimous approval of [Recommendation ITU-R BT.709](#) in its current version.
- It represents what is recognized today as an outstanding achievement of the ITU: the **specifications for a single worldwide standard for HDTV** production and program exchange : the Common Image Format (CIF).



HD-CIF

- The format is characterized by using a single matrix of samples (1080 by 1920), irrespective of the field and frame rate used.(can be used at 50 Hz or 60 Hz field rate)
- This matrix thus becomes a unique format for image capture for high-definition pictures for any application



The road to worldwide use of a unique type of equipment for HDTV programme production was opened.

Conclusions

- The approval of [Recommendation ITU-R BT.709](#) triggered a **high level of activity on the part of manufacturers and broadcasters** to develop the tools and the know-how to implement extensive HDTV program production.
- Since then [Recommendation ITU-R BT.709](#) has remained unchanged, thus allowing manufacturers to produce equipment at an **ever-lower cost**.
- Such equipment today costs even less than any other comparable equipment for television systems of inferior quality, thus demonstrating the **benefits offered by international broadcasting standards**, and the success of the ITU in its role as an international standard-setting body.
- The [ITU-R](#) work in the field of HDTV represents a truly “**global approach**” with the necessary harmonization, which provided the creation of the worldwide foundation for HDTV introduction and development.



DTT era...

- After a great work done in specifying and adjusting systems' parameters for digital terrestrial TV and achieving a consensus with an active participation of WG 11A, the draft ITU-R Recommendation BT.1306 "*Error-correction, data framing, modulation and emission methods for digital terrestrial television broadcasting*" was prepared in February 2000.

RRC for Region 1

- The RRC04 and **RRC-06** (digital terrestrial broadcasting) : The use of the Digital Plan provided capabilities to the parallel introduction of the multiprogram SDTV and HDTV which is extremely important today in the new environment.

GE84

for the Planning of the VHF Sound Broadcasting (Region 1 and part of Region 3)

- Entry into force: 1st July **1987**
- Frequency Plan + Appendix
- Frequency band: **87.5 MHz–108 MHz**



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Current frequencies for HFBC

Band	Frequency range (kHz)
6	5 900 – 6 200
7	7 100 – 7 300 *
7	7 300 – 7 350
7	7 350–7 450
9	9 400 – 9 900
11	11 600 – 12 100
13	13 570 – 13 870
15	15 100 – 15 800
17	17 480 – 17 900
18	18 900 – 19 020
21	21 450 – 21 850
25	25 670 – 26 100

* 7100-7200 not effective from A09-WRC-03 decision



International
Telecommunication
Union

Frequency bands for Terrestrial Broadcasting services (\neq HF)

Band	Frequency (kHz/MHz)	BC/BT	Region Geo. zone	Plan
LF	148.5-283.5 kHz	BC	R1	GE75
MF	526.5-1 606.5 kHz	BC	R1 and R3	GE75
VHF	47-68 MHz 87.5-108 174-230	BC BC BC	EBA R1* R1-MNG+IRN	ST61 GE84 GE06

* and part of R3



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I Thank U



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