



# World Radiocommunication Conference 2012 (WRC-12)

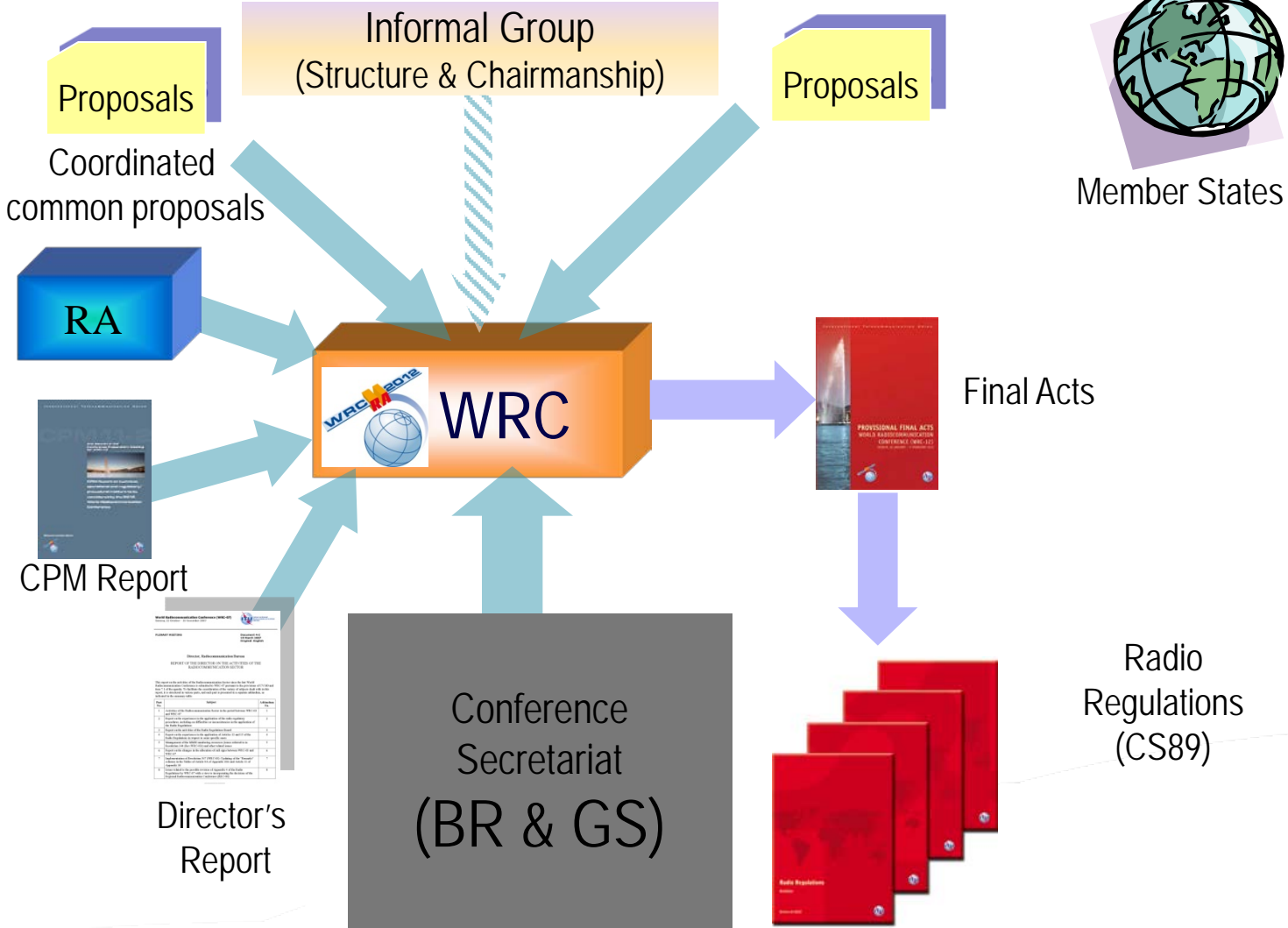
**Fabio LEITE**  
( [fabio.leite@itu.int](mailto:fabio.leite@itu.int) )  
Deputy-Director  
Radiocommunication Bureau

# Overview of the preparations of WRC-12 (23 Jan-17 Feb 2012)



Regional preparation  
Resolution 72 (Rev.WRC-07)

Agenda: draft in WRC Res & final in Council Res



# Some WRC success stories



Radio Determination Satellite Service (RDSS) (e.g., *Geostar Corp.*, began in 1983)

↳ WARC (MOB-87): allocation of 1610-1626.5 (↑) / 2483.5-2500 MHz (↓) to RDSS



International Mobile Telecommunications (IMT) (e.g., UMTS, began in 1985)

↳ WARC-92: identification of 1885-2025 / 2110-2200 MHz MS bands to IMT-2000



Global Mobile Personal Communication by Satellite (GMPCS) (e.g., *Iridium*, *Globalstar*, began in the '80's)

↳ WARC-92: allocation of 1610-1626.5 (↑) / 2483.5-2500 MHz (↓) to MSS



Constellation of low-Earth orbit satellites in Ka-Band (e.g., *Teledesic* began in the '90's)

↳ WARC-95: allocation of 18.6-19.3 (↓) / 28.6-29.1 GHz (↑) to FSS



Global Navigation Satellite System (GNSS) (e.g., *Galileo* began in late '90's)

↳ WRC-2000: allocation of additional spectrum in L-band and 5 GHz to RDSS

WLAN additional spectrum (e.g., *WiFi 802.11a*)

↳ WRC-2003: allocation of the 5 GHz on a global basis

IMT additional spectrum (e.g., mobile broadband)

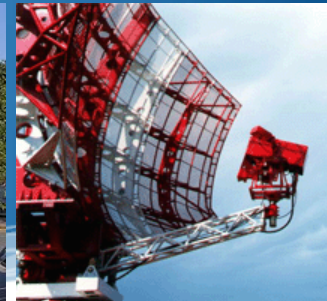
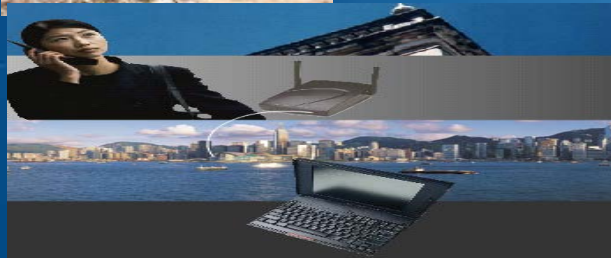
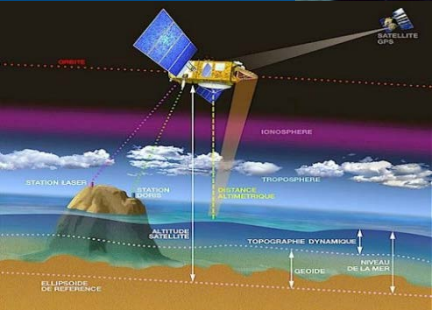
↳ WRC-2007: allocation of 450 and 700 MHz to IMT





# WRC-12

9 kHz > proposals > 1000 GHz



<http://www.itu.int/ITU-R/go/WRC-12>



# WRC-12

- 3060 Participants
- 163 Member States (165 represented)
- 1 Res.99 Observer
- 102 Observers



- 1615 Documents
- 2992 MS Proposals  
~½ of common proposals
- 153 signatures of the Prov. Final Acts
- 119 Declarations





# WRC-12 Structure

**WRC-12 Chairman:**

**T. Al-Awadhi (UAE)**

**Vice-Chairmen:**

**D. Anstrom (USA), E. Fournier (F), A. Nalbandian (ARM),  
M. Ouhadj (ALG), H. Al-Shankiti (ARS), A. Jamieson (NZL)**

**COM 1 (Steering) Chairman: same as for WRC-12**

**COM 2 (Credentials)**

Chair.:

**Y. Selek (TUR)**

**COM 3 (Budget)**

Chair.:

**B. Gracie (CAN)**

**COM 7 (Editorial)**

Chair.:

**M.T. Alajouanine (F)**

**COM 4**

(specified agenda items)

Chair.: **J. Mettrop (UK)**

**COM 5**

(specified agenda items)

Chair.: **M. Abe (J)**

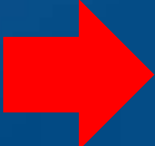
**COM 6**

(specified agenda items)

Chair.: **A. Zourmba (CME)**

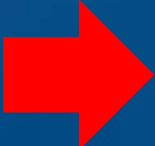


# Mobile Broadband, including IMT

 In addition to establishing the conditions to use of the 800 MHz band (i.e., 790-862 MHz) in Region 1 (the “first “ digital dividend), WRC-12 considered further spectrum allocations to the mobile service, including International Mobile Telecommunications (IMT) to facilitate the development of terrestrial mobile broadband applications; thus the extension of the 800 MHz band, i.e., 694-790 MHz (the “second “ digital dividend) in Region 1 will be available from 2015.

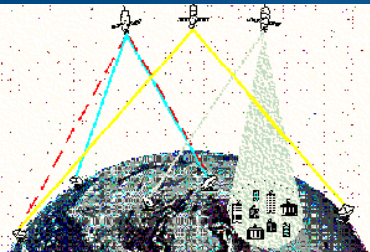


# Regulatory issues



Several regulatory issues were considered including: the enhancement of the international spectrum regulatory framework; consideration of the difficulties in the space regulations; mechanisms and allocations for the use of the broadcasting-satellite service in the 22 GHz band; impact on the spectrum management of new radio technologies as software-defined and cognitive radio, and short-range devices, and finally, use of free-space optical-links.





# Satellite regulations

The Conference agreed on a long series of changes and improvements to the applicable regulations with special emphasis to the ones affecting directly the rights of access to the orbit/spectrum resources:

- ✓ clearer definition of the **date of bringing into use** of a satellite network (i.e., a technically capable satellite must occupy an orbital location for at least 90 days to be considered as “in use” or “back in use”),
- ✓ extension of the **suspension period** to 3 years (as it is considered to be a more realistic timeframe),
- ✓ enhancement of the satellite frequency coordination requirements by reducing the **coordination arc** in the most demanding frequency bands (C and Ku), and
- ✓ better control by the ITU of the **spacecraft movements** in the orbit.



# Satellite broadcasting in 22 GHz band

WRC-12 decisions on this issue can be considered as pioneering a paradigm in satellite regulations as a series of innovative concepts and regulatory mechanism were introduced to meet the challenge of equitable access in an unplanned environment. These include:

- procedures for coordination,
- notification and recording of assignments, which contains: improved due diligence provisions, preferential treatment of special submissions, harmonized technical parameters,
- measures to invite administrations to review their number of submissions and harmonize the technical parameters contained in them.

In addition, WRC-12 decisions included a new FSS allocation for feederlink of the BSS in 24.65 – 25.25 GHz in Region 1 and FSS allocation in 24.65 – 24.75 GHz in Region 3 (100 MHz added to the existing allocation in 24.75 – 25.25 GHz) and hard PFD limits to protect the terrestrial services with a maximum power spectral density in all three regions.





# Topical technological subjects

- Software-defined radio (SDR)
- Cognitive radio systems (CRS)
- Short-range devices (SRD)
- Free-space optical links

**NOC to RR**

- High-altitude platform stations (HAPS) gateway links
- Electronic news gathering (ENG)
- High-density fixed wireless systems above 71 GHz

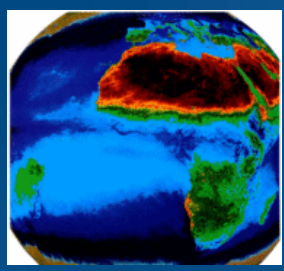
**MOD RR** (allocations to countries & sharing conditions)



# Safety issues

- Unmanned aircraft systems (UAS) → worldwide allocations in the 5 GHz band
- Aeronautical mobile-satellite (in route) service in L-band → detailed coordination meeting procedure
- Radars for aerospace surveillance, tracking and maneuvering spacecraft → additional primary allocation to the radiolocation service
- Maritime service → provision of satellite detection of signals from automatic identification systems (AIS) onboard ships for global ship-tracking and enhance search and rescue; improvement of broadcasting of safety and security information for ships and ports; improvement of VHF communications for port operations and ship movement

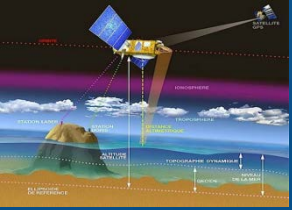




# Environment

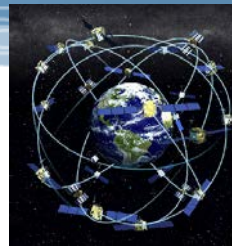
- Oceanographic radars for environmental, meteorological, climatological, maritime and disaster mitigation operations → **primary and secondary allocations to the radiolocation service**
- Lightning detection and location → **new primary allocation for passive systems at 8.3-11.3 kHz**
- Non-geostationary meteorological satellite (MetSat) systems to provide data used in the areas of operational meteorology, climate monitoring, and detection of global climatic changes → **extension of the current allocation**





# Science & satellite navigation

- Space research missions in near-Earth orbit, including robotic and other missions in transit to the Moon and at or near the Moon → **new allocation**
- Space research service (SRS) earth station receivers to support manned near-Earth missions and deep-space missions → **exclusion of the aeronautical mobile service from the shared band**
- Space systems for navigation and mobile communications in 2.5 GHz band → **new primary allocation and upgrade of RDSS**



# WRC-15 Agenda

- ✓ Mobile broadband (IMT)
- ✓ PPDR (emergency comms)
- ✓ Amateur service
- ✓ UAS satellite component
- ✓ FSS in 7-8 GHz, 10-17 GHz
- ✓ MSS 22-26 GHz
- ✓ MSS feederlinks in 5 GHz (non-GSO)
- ✓ EESS in 7-8 GHz & extension of 9.3-9.9 GHz
- ✓ ESV regulations
- ✓ SRS in 400 MHz
- ✓ Maritime mobile: on-board comms & AIS
- ✓ Aeronautical mobile: WAIC
- ✓ Radars for ITS in 78 GHz
- ✓ UTC





# ITU-R Studies for WRC-15 on IMT

## Agenda items for WRC-15 (ResCOM6/6):

- 1.1 to consider additional spectrum allocations to the mobile service on a primary basis and identification of additional frequency bands for International Mobile Telecommunications (IMT) and related regulatory provisions, to facilitate the development of **terrestrial mobile broadband applications**, in accordance with Resolution **COM6/8 (WRC-12)**;
- 1.2 to examine the results of ITU-R studies, in accordance with Resolution **COM5/10 (WRC-12)**, on the **use of the frequency band 694-790 MHz by the mobile**, except aeronautical mobile, service in Region 1 and take the appropriate measures;

## **Spectrum requirements for the mobile service**

including suitable frequency ranges, and other specific requirements  
(WP 5D)

## **Spectrum sharing and compatibility with other services**

including consolidation of draft CPM text  
(JTG 4-5-6-7)



# Current work at ITU for further harmonization after WRC-12

**July 2012:** receive contributions from members/develop work plan/  
begin compatibility studies in 694-790 MHz

**November 2012:** consider contributions received/  
continue compatibility studies in 694-790 MHz

**July 2013:** continue compatibility studies in 694-790 MHz

**November 2013:** complete compatibility studies in 694-790 MHz

**February 2014:** draft CPM text  
for WRC-15

**July 2014:** complete CPM text  
for WRC-15

**Current work at ITU for further harmonization after WRC-12 focus on:**

- establishing **harmonized channeling arrangements** for IMT in Region 1 (band 694-790 MHz);
- undertaking all the necessary technical studies to **ensure coexistence** with the networks operated in the new allocation.

