



## Radiocommunication Bureau (BR)

Administrative Circular  
**CACE/768**

3 May 2016

**To Administrations of Member States of the ITU, Radiocommunication Sector Members, ITU-R Associates participating in the work of the Radiocommunication Study Group 6 and ITU Academia**

**Subject: Radiocommunication Study Group 6 (Broadcasting service)**  
**– Approval of 2 revised ITU-R Questions**

By Administrative Circular CACE/765 of 19 February 2016, 2 draft revised ITU-R Questions were submitted for approval by correspondence in accordance with Resolution ITU-R 1-7 (§ A2.5.2.3).

The conditions governing this procedure were met on 19 April 2016.

The texts of the approved Questions are attached for your reference in the Annexes 1 and 2 and will be published by the ITU.

François Rancy  
Director

**Annexes: 2**

**Distribution:**

- Administrations of Member States of the ITU and Radiocommunication Sector Members participating in the work of Radiocommunication Study Group 6
- ITU-R Associates participating in the work of Radiocommunication Study Group 6
- ITU Academia
- Chairmen and Vice-Chairmen of Radiocommunication Study Groups
- Chairman and Vice-Chairmen of the Conference Preparatory Meeting
- Members of the Radio Regulations Board
- Secretary-General of the ITU, Director of the Telecommunication Standardization Bureau, Director of the Telecommunication Development Bureau

## Annex 1

### QUESTION ITU-R 56-2/6

#### **Characteristics of terrestrial digital sound broadcasting systems for reception by vehicular, portable and fixed receivers**

(1993-2006-2016)

The ITU Radiocommunication Assembly,

*considering*

- a) that there is an increasing requirement by some countries for suitable means of broadcasting high quality stereo/multi-channel sound to vehicular, portable and fixed receivers;
- b) that significant progress has been made in technical studies on digital sound broadcasting systems and that some systems have been widely implemented with good success;
- c) that it has been demonstrated that advanced digital sound broadcasting systems can lead to improved spectrum and power efficiency and immunity to multipath compared with conventional analogue sound broadcasting systems;
- d) that digital sound broadcasting systems can be designed to allow common signal processing in receivers for various broadcasting bands;
- e) that digital sound broadcasting systems can be used for national, regional and local terrestrial services;
- f) that it would be advantageous for a digital sound broadcasting system if a common receiver, capable of receiving terrestrial and satellite services, could be designed;
- g) that digital sound broadcasting systems may be configured to broadcast programmes with lower or higher bit rates in order to trade sound quality against the number of sound channels;
- h) that digital sound broadcasting systems are able to provide additional facilities to deliver programme-related and non-programme-related data;
- i) that some radiofrequency bands are still used for emissions of analogue sound broadcasting services;
- j) that ITU-R has already studied various aspects of digital sound broadcasting, e.g.: in Recommendations ITU-R BS.774 and ITU-R BS.1114;
- k) that some Administrations are considering switching off their analogue sound broadcasting services,

*noting*

that studies on the use of various radiofrequency bands for emission of digital sound broadcasting services are reported in the Final Acts of the CEPT Wiesbaden 1995 planning meeting,

*recognizing*

a) that the World Administrative Radio Conference (Malaga-Torremolinos, 1992) (WARC-92) asked the former CCIR to undertake as a matter of urgency the technical studies associated with terrestrial digital audio broadcasting;

b) that the Regional Radiocommunication Conference (GE-06) has planned some parts of band III in Region 1 and Islamic Republic of Iran for digital sound broadcasting,

*decides* that the following questions should be studied

1 What are the technical characteristics of digital sound broadcasting systems for reception by vehicular, portable and fixed receivers?

2 What are the most suitable VHF/UHF bands, technically, economically and from a sharing and programme capacity point of view, for the implementation of a terrestrial digital sound broadcasting service?

3 What are the system and service requirements for a digital sound broadcasting service?

4 What are the most appropriate source coding, channel coding, multiplexing and modulation methods for a digital sound broadcasting service?

5 Which approaches can meet the needs of local, regional and national broadcasting in terms of service area and multiplexing?

6 What are the benefits which can be achieved by using hierarchically modulated signals?

7 What are the effects of normal, abnormal and very abnormal propagation, including multipath on digital sound broadcasting systems?

8 What protection ratios are required to prevent mutual interference between different digital sound broadcasting services and other services using the same or adjacent frequency bands?

9 What steps need to be taken to mitigate any issues in the transition from analogue to digital sound broadcasting?

10 What are the necessary planning criteria for national, regional and local area coverage for vehicular, portable and fixed reception?

11 What advantages can be obtained by the combined use of satellite and terrestrial services operating in the same frequency band?

12 What would be the advantages in the use of diversity reception?

13 What, in the light of *considering g*), would be the tradeoff in terms of the quality and capacity between the digital sound broadcasting systems and the analogue systems being replaced?

*further decides*

1 that the results of the above studies should be included in (a) Report(s) and/or (a) Recommendation(s);

2 that the above studies should be completed by 2019.

Category: S2

## Annex 2

### QUESTION ITU-R 142-1/6

#### High dynamic range television for broadcasting

(2015-2016)

The ITU Radiocommunication Assembly,

*considering*

- a) that digital television image formats for SDTV, HDTV and UHD TV have been specified by the ITU-R in Recommendations ITU-R BT.601, BT.709 and BT.2020;
- b) that Recommendation ITU-R BT.2022 provides general viewing conditions for subjective assessment of quality of SDTV and HDTV television pictures on flat panel displays;
- c) that numerous ITU-R Recommendations exist in the BT-series, that specify methods:
  - for the subjective assessments of television picture quality;
  - for the international exchange of television programmes;
- d) that modern television displays are capable of reproducing images at a higher luminance, and with a greater contrast ratio and wider colour gamut (WCG) than is employed in conventional programme production;
- e) that although UHD TV offers higher spatial resolution, wider colour gamut, and the option of a higher frame rate, it remains limited in the image dynamic range in a similar way to HDTV and SDTV;
- f) that high dynamic range television (HDR-TV) is intended to be capable of reproducing images at a significantly higher luminance and greater contrast ratio;
- g) that HDR-TV has been reported to increase viewer enjoyment of television pictures;
- h) that many television programmes will continue to be produced and exchanged in the standard image dynamic range of SDTV, HDTV and UHD TV;
- i) that for a number of years, many television programmes broadcast in HDR-TV will be viewed on legacy consumer television displays which are capable of Standard Dynamic Range only;
- j) that it is desirable that HDR-TV should have, where appropriate, a degree of compatibility with existing workflows and broadcaster infrastructure,

*decides* that the following questions should be studied

- 1 What are the appropriate parameter values for HDR-TV image signals for production and international programme exchange?
- 2 Which methods for production and formatting for delivery to consumers, including any requirements for metadata, would enable degrees of compatibility with viewing on most television sets currently used in the homes of television audiences?

3 What range of viewing conditions should be assumed, for consumer viewing of HDR-TV programmes?

4 What signal representation and signaling is required for transport of HDR-TV through interfaces within television broadcasting systems?

5 What scientifically assessed relationship exists, in home viewing environments, between the amount of image dynamic range extension and the consumer viewing appreciation?

6 Which practices should be recommended in order that the television home audience does not perceive annoying jumps in the television image appearance at transitions between HDR-TV programmes and standard dynamic range television programmes?

7 Which methods should be used for the subjective assessment of HDR-TV picture quality?

*further decides*

1 that the results of the above studies should be included in one or more Recommendations or Reports;

2 that the above studies should be completed by 2019<sup>1</sup>.

Category: S2

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<sup>1</sup> Relevant results of the studies should in due course be brought to attention of the IEC as appropriate.