



## Radiocommunication Bureau (BR)

Administrative Circular  
**CACE/850**

10 January 2018

**To Administrations of Member States of the ITU, Radiocommunication Sector Members and 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 3 revised ITU-R Questions**
- Suppression of 1 ITU-R Question**

By Administrative Circular CACE/839 of 30 October 2017, 3 draft revised ITU-R Questions were submitted for approval by correspondence in accordance with Resolution ITU-R 1-7 (§ A2.5.2.3). In addition, the Study Group proposed the suppression of 1 ITU-R Question.

The conditions governing this procedure were met on 1 January 2018.

The texts of the approved Questions are attached for your reference in Annexes 1 to 3 and will be published by the ITU. The suppressed ITU-R Question is indicated in Annex 4.

A handwritten signature in blue ink, appearing to read 'FRANCIS RANCY'.

**François Rancy**  
Director

**Annexes: 4**

**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 56-3/6

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

(1993-2006-2016-2017)

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 channel coding, multiplexing and modulation methods for a digital sound broadcasting service, taking into account the properties of the source coding applied?
- 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 132-4/6

#### **Digital terrestrial television broadcasting technology and planning**

(2010-2011-2011-2015-2017)

The ITU Radiocommunication Assembly,

*considering*

*a)* that many administrations have already introduced, and others are introducing, Digital Terrestrial Television Broadcasting (DTTB) services in VHF (Band III) and/or UHF (Bands IV/V) bands;

*b)* that experience gained through the implementation of DTTB services will be useful in refining the assumptions and techniques to be applied in the planning and implementation of DTTB services,

*decides* that the following Questions should be studied

- 1 What are the frequency planning parameters for such services, including but not limited to:
  - minimum field strengths;
  - implications of modulation and emission methods;
  - receiving and transmitting antenna characteristics;
  - implications of using diversity transmission and reception methods;
  - location correction values;
  - time variability values;
  - single frequency networks;
  - speed ranges;
  - environmental noise and its impact on digital terrestrial TV reception;
  - effect of wet foliage on digital terrestrial TV reception;
  - effect of wind turbine farms and airplane flutter on digital terrestrial TV reception;
  - building penetration loss;
  - indoor location variations?
- 2 What is the likely impact on matters related to the planning of broadcasting networks for terrestrial television broadcasting in the migration from existing<sup>1</sup> digital television modulation parameters to new and more spectrally efficient<sup>2</sup> modulation parameters?

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<sup>1</sup> For example DVB-T (ITU-R DTTB System B).

<sup>2</sup> For example DVB-T2.

- 3 What protection ratios are required when two or more digital transmitters of the same system, digital television and multimedia transmitters of different systems, or analogue and digital television transmitters are operating:
  - in the same channel;
  - in adjacent channels;
  - with overlapping channels;
  - in other potential interference relationships (e.g. image channel)?
- 4 What receiver characteristics should be used for frequency planning with respect to more efficient use of the frequency spectrum (e.g. selectivity, noise figure, etc.)?
- 5 What are the protection ratios needed to protect television broadcasting services from other services sharing the bands or operating in adjacent bands?
- 6 What techniques can be used to mitigate interference?
- 7 What are acceptable durations of outages due to local short-term interference to DTTB services?
- 8 What are the technical bases required for planning which lead to efficient utilization of the VHF and UHF bands for terrestrial television services?
- 9 What are the characteristic multipath conditions that need to be taken into account in the planning of such services?
- 10 What time availability percentages can be practically achieved in DTTB service implementation and what margins in planning parameters are required to achieve these time availability percentages?
- 11 What technical or planning criteria can be optimized to facilitate the implementation of terrestrial digital broadcasting, taking into account existing services?
- 12 What are the characteristics of the mobile multipath channel that need to be taken into account in the use of mobile reception, at different speeds?
- 13 What are the characteristics of the multipath channel that need to be taken into account in the use of hand-held reception, at different speeds?
- 14 What methods can be used to combine several multiplex channels within one transmission?
- 15 What are the appropriate modulation and emission methods and their relevant parameters, for the broadcasting of digitally encoded TV signals in terrestrial channels?
- 16 What are the appropriate channel coding, including error correction, methods for digital terrestrial television broadcasting?
- 17 What are the appropriate strategies to introduce and implement digital terrestrial TV broadcast services, taking account of existing terrestrial broadcast services?

- 18 What are the technical and operational factors affecting the choice of scenarios for standard and high definition digital television broadcasting?
- 19 What are radiocommunication technologies or applications that could be provided by digital terrestrial TV systems and what sets of system parameters could be used for different applications?
- 20 What strategies should be employed by administrations, particularly those sharing common borders, for migration from an established digital terrestrial television broadcasting service to a more advanced digital terrestrial television broadcasting service?

*further decides*

- 1 that the results of the above studies should be included in (a) Report(s) and/or Recommendation(s);
- 2 that the above studies should be completed by 2018.

Category: S3

### Annex 3

#### QUESTION ITU-R 140-1/6

#### **Global platform for the broadcasting service<sup>1, 2</sup>**

(2015-2017)

The ITU Radiocommunication Assembly,

*considering*

- a)* that future broadcasting end-user<sup>3</sup> requirements and technical requirements may differ significantly from current requirements;
- b)* that the transmission and reception of various broadcast programmes (sound, multimedia and TV) are now achieved via terrestrial, satellite, cable broadcasting and other networks;
- c)* that through interactive communication, end-users can choose the way in which they receive programmes;
- d)* that broadcasting is often used in conjunction with interactivity and in multi-screen configuration;
- e)* that various digital TV, multimedia and sound broadcasting systems for fixed, portable and mobile broadcast reception, and their parameters are described in ITU-R Recommendations and Reports;
- f)* that ITU-R is also studying and preparing draft new Recommendation(s) on worldwide broadcasting roaming, which will offer end-users an option to receive broadcasting programmes of interest in any location of the world where those programmes are available;
- g)* that ITU-R and ITU-T are collaborating on studies of IBB (integrated broadcast-broadband);
- h)* that ITU-T in cooperation with ISO/IEC has been studying high efficiency source coding methods and transport methods;

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<sup>1</sup> This Question should be brought to the attention of ITU-R Study Groups 4 and 5, ITU-T Study Groups 9 and 16 as well as to ITU-D Study Group 2.

<sup>2</sup> The global platform is defined as a delivery platform to facilitate distribution of broadcast content to end-users with various receiving devices in multiple reception environments, implemented by using both broadcasting and non-broadcasting (e.g. broadband) technologies.

<sup>3</sup> For the purpose of this Question, the term “end-user” refers to a consumer that is part of a broadcaster’s audience.



i) that broadcasters and content providers are often required to provide access services (subtitles, captions, signing, etc.) on all material and via all delivery means,

*decides* that the following Questions should be studied

1 What are the end-user requirements for a global platform for the broadcasting service, including the technical performances required by global platform implementations to optimize the quality of experience of its end-users, and how would these end-user requirements impact on the technical requirements, e.g. in terms of data rate, bit-error-rate, resilience to errors, latency, perceptual transparency, etc.?

2 What means and measures could be recommended, that would allow broadcast content to be flexibly delivered to end-users via the widest possible range of terminal devices?

3 What overall quality improvements of television, sound radio and multimedia broadcasting content may be implemented in the new global platform for broadcasting (e.g. improved image resolution, colour range, video sample quantization, picture rate, multichannel sound, adaptation to the viewing/hearing environment, etc.)?

4 How can access service requirements (subtitles, captions, signing, etc.) be fully integrated so that they form part of the core services?

*further decides*

1 that a detailed technology view<sup>4</sup> be undertaken in each area of study to ensure video/audiovisual, audio and multimedia content can be flexibly and efficiently delivered to the end-users via the widest possible range of networks;

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

3 that this work should be coordinated with the relevant Study Groups in the Radiocommunication, Telecommunication Standardization and Telecommunication Development Sectors;

4 that the above studies should be completed by 2019.

Category: S1

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<sup>4</sup> A view of a system and its environment that focuses on the choice of technology in that system.

## Annex 4

### Suppressed ITU-R Question

Question ITU-R	Title
80/6	Coding for the broadcasting of digitally-encoded TV signals in terrestrial narrow-band channels

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