



## Radiocommunication Bureau (BR)

Circular Letter  
**6/LCCE/90**

3 December 2014

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

Subject: **Questionnaire on the future spectrum demands and use of  
the broadcasting service**

During its November 2014 meeting, ITU-R Study Group 6 agreed the questionnaire<sup>1</sup> in Attachment 1 on the future spectrum demands and use of the broadcasting service, and further agreed it should be sent to all Member States and Sector Members.

The questionnaire is designed to gather information on the future spectrum demand and use by sound and television broadcasting in the bands allocated to terrestrial broadcasting in view of technical developments, decisions taken by WRC-03 and WRC-07 on the use of digital modulation in the HF bands, and the changes to frequency allocations at WRC-97, WRC-07 and WRC-12, as part of the work in maintaining ITU-R Study Group 6's catalogue of Reports and Recommendations.

One of the questions that need to be addressed by Study Group 6 includes how broadcast requirements are changing with the move to digital broadcast systems, and the introduction of new and enhanced broadcast services.

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<sup>1</sup> The questionnaire agreed by ITU-R Study Group 6 is a revision of the questionnaire previously circulated by the ITU-R Secretariat in July 2014 on behalf of the Study Group 6 Rapporteur Group on the future spectrum requirements for the broadcasting service, with the following amendments to assist in the development of responses to the questionnaire:

- a modification of the questionnaire title to better reflect its purpose;
- an addition to the questionnaire's section 3 title to clarify that the section refers to handheld devices;
- the addition of Annex 3 providing a range of indicative emission bit rates for different video formats and compression schemes to assist with responses to questions 8 and 10.

Member States and Sector Members that have responded to the earlier questionnaire (see footnote 1 and Attachment 2) are not requested to respond to this Circular Letter, although Study Group 6 would be pleased to receive any update to their original responses.

Member States and Sector Members are requested to submit responses to [brsgd@itu.int](mailto:brsgd@itu.int) by 22<sup>nd</sup> May 2015.



François Rancy  
Director

**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-R Academia
- Chairman and Vice-Chairmen of Radiocommunication Study Group 6
- Secretary General of the ITU, Director of the Telecommunication Standardization Bureau, Director of the Telecommunication Development Bureau

## ATTACHMENT 1

### Questionnaire on the future spectrum demands and use of the broadcasting service

<b>Name of the Administration:</b>	
<b>Contact person:</b>	
E-mail address:	
Telephone number:	

<b>Name of the Sector Member:</b>	
<b>Contact person:</b>	
E-mail address:	
Telephone number:	
<b>What best describes your organisation?</b> Commercial broadcaster/Public service broadcaster/ Service provider/ Other (please describe)	
<b>The geographical area over which you operate:</b>	

**SECTION ONE – Television broadcasting**

- 1)
  - a) Is your country still using analogue television?
  - b) If yes, has analogue television switch-off commenced?
  - c) If your country has any plans to switch-off analogue television:
    - i) When is the analogue switch-off process expected to be completed?
    - ii) How much extra spectrum will be required during the transition phase to digital terrestrial television broadcasting?

**Reply:**

- 2)
  - a) Please indicate how many analogue television transmitters are in operation in your country and in which bands.
  - b) What channel bandwidths are used for analogue television?
  - c) What is the spectrum requirement for analogue television in your country?

A proposed format for responses to questions 2a) and 2b) is provided in Annex 1.

**Reply:**

- 3)
  - a) What is the percentage of viewer uptake of terrestrial television in your country?
  - b) If possible, please also provide details of the number or proportion of users who receive television primarily by terrestrial means by:
    - i) Fixed roof top antenna, or
    - ii) Portable indoor antenna.

**Reply:**

- 4) If your country has switched or is considering switching to digital terrestrial television broadcasting:
  - a) What system standard is your country using or considering adopting (as specified in Recommendations ITU-R BT.1306 and BT.1877)?
  - b) When did your country start or when is it proposing to start the introduction of digital terrestrial television services?
  - c) Please provide further detail on the number of multiplexes in use, their technical specifications, the percentage of geographic area or population they cover or are intended to cover and the total spectrum use.

A proposed format for detailed responses is provided in Annex 2.

**Reply:**

- 5) a) What frequencies/channels are currently used or intended to be used by digital terrestrial television broadcasting in your country? Please distinguish between those in use and those intended to be used.
- b) Please indicate how many digital terrestrial television transmitters are currently used or intended to be used and in which bands.
- c) What channel bandwidth is used or intended to be used for digital terrestrial television in your country?

A proposed format for responses to questions 5b) and 5c) is provided in Annex 1.

**Reply:**

- 6) a) Are the terrestrial television frequency bands also shared with other primary services in your country?
- b) If yes, please give details of those systems and their spectrum use.

**Reply:**

- 7) a) Are the terrestrial television frequency bands also shared with secondary services used for the support of broadcasting such as SAB/SAP (services ancillary to broadcasting/production), or other types of services such as radio astronomy or wind-profile radar?
- b) If yes, please give details of those systems and their spectrum use.

**Reply:**

- 8) a) Does your country foresee a requirement for new and enhanced services, including multimedia and data applications, HD, 3D, and UHD television, on the terrestrial television platform?
- b) If yes, please give indicative details of the number and nature of services planned, and if known, the expected timeframe for their introduction.

Annex 3 provides an approximate guide to the video bit rate required for HD and UHD television.

**Reply:**

- 9) a) Are there plans in your country to launch more multiplexes in the future?  
b) If yes, how many more and when? Please also indicate the expected timeframe for their introduction.

**Reply:**

- 10) a) What is the amount of spectrum your country foresees will be required for terrestrial television broadcasting, taking into consideration the responses to questions 5, 6, 7, 8 and 9? Please indicate the modes of transmission that will be used, and timeframes.

**Reply:**

**SECTION TWO – Sound broadcasting**

- 11) a) What analogue sound broadcasting standards are used in your country and what bands are they operating in?
- b) Please indicate how many analogue radio transmitters are in operation in your country and in which bands.
- c) What channel bandwidths do they use?

A proposed format for responses to questions 11b) and 11c) is provided in Annex 1

**Reply:**

- 12) a) Is additional spectrum required for growth in the analogue sound broadcasting platform in your country?
- b) If yes, how much additional spectrum is required?

**Reply:**

- 13) a) Is your country considering introducing, or has it already introduced digital sound broadcasting?
- b) If yes, which system standards are used or are being considered for adoption (as specified in Recommendations ITU-R BS.1114, BS.1514, BS.1615)?
- c) When did your country start or when does it propose to start digital sound broadcasting?
- d) What channel bandwidths is your country using or considering using?
- e) What frequencies are currently used or intended to be used by digital sound broadcasting in your country? Please distinguish between those in use and those intended to be used.
- f) What is the percentage of the population that is covered by digital sound broadcasting by direct reception in your country?
- g) What additional spectrum was required or is considered to be required for the transition to digital sound broadcasting?
- h) Please indicate how many digital radio transmitters are currently used or intended to be used and in which bands.
- i) What is the spectrum requirement for digital sound broadcasting in your country?
- j) If your country has introduced digital sound broadcasting, how long will it continue to use analogue sound broadcasting?

A proposed format for responses to question 13d) and 13h) is provided in Annex 1.

**Reply:**

- 14) a) Are the terrestrial sound broadcasting bands also shared with other primary services in your country?  
b) If yes, please give details of those systems and their spectrum use.

**Reply:**

- 15) a) Are the terrestrial sound broadcasting bands also shared with secondary services e.g., used for the support of broadcasting such as SAB/SAP (services ancillary to broadcasting/production), or other types of services such as radio astronomy or wind-profile radar?  
b) If yes, please give details of those systems and their spectrum use.

**Reply:**

- 16) a) What is the amount of spectrum your country foresees will be required for terrestrial sound broadcasting, taking into consideration the responses to the previous questions? Please indicate the modes of transmission that will be used, and timeframes.

**Reply:**



**SECTION THREE – Multimedia broadcasting for handheld devices**

- 17) a) Is your country considering introducing or has already introduced multimedia broadcasting?
- b) If yes, which system standards is your country using or considering using (as specified in Recommendations ITU-R BT.1833 and BT.2016)?
- c) In which bands?
- d) When did your country start or when does it propose to start digital multimedia broadcasting?
- e) What are the current and proposed population coverages for digital multimedia broadcasting in your country?
- f) What is the spectrum requirement for multimedia broadcasting in your country?
- g) If your country has introduced digital multimedia broadcasting, please provide further information to describe the system, its implementation and any limitations on its operation.

**Reply:**

## ANNEX 1

Suggested form of presentation of reply to questions 2, 5, 11 and 13:

A sample response is shown in *Italics* for guidance only.

Country	Band		Number of Transmitting Stations*			
			Analogue Radio) (Q11b & Q11c)	Digital Radio (Q13d & Q13h)	Analogue TV (Q2a & Q2b)	Digital TV (Q5b & Q5c)
	Channel bandwidth (MHz)		<i>VHF I 180 kHz VHF II 300 kHz</i>		<i>7 MHz</i>	<i>7 MHz</i>
XX	LF	148.5-283.5 kHz				
	MF	525-526.5 kHz				
	MF	526.5-1606.5 kHz				
	MF	1606.5-1705 kHz				
	HF	2.3-26.1 MHz**				
	VHF I	47-50 MHz				
		50-54 MHz				
		54-68 MHz	<i>35</i>			
		68-72 MHz				
		76-87.5 MHz				
	VHF II	87.5-108 MHz	<i>215</i>			
	VHF III	174-216 MHz			<i>250</i>	<i>5 (221)</i>
	VHF III	216-230 MHz			<i>35</i>	<i>(7)</i>
	UHF IV	470-694 MHz			<i>5 683</i>	<i>137 (4 387)</i>
	UHF V	694-790 MHz			<i>3 940</i>	<i>(2 768)</i>
	UHF V	790-890 MHz				
	UHF V	890-960 MHz				
		1452-1492 MHz				
		11.7-12.5 GHz				
	12.5-12.7 GHz					
	40.5-42.5 GHz					
	74-76 GHz					

\* Transmitting stations please include “main stations” and “relay stations”. Please use parenthesis to indicate stations that have still to be brought into use

\*\* The bands 3 900-3 950<sup>D</sup>, 3 950-4 000<sup>D</sup> kHz; the bands for tropical broadcasting: 2 300-2 498, 3 200-3 400<sup>D</sup>, 4 750-4 995<sup>D</sup>, 5 005-5 060<sup>D</sup> kHz and the Article 12 bands 5 900-5 950<sup>D</sup>, 5 950-6 200, 7 200-7 300, 7 300-7 400<sup>D</sup>, 7 400-7 450, 9 400-9 500<sup>D</sup>, 9 500-9 900, 11 600-11 650<sup>D</sup>, 11 650-12 050, 12 050-12 100<sup>D</sup>, 13 570-13 600<sup>D</sup>, 13 600-13 800, 13 800-13 870<sup>D</sup>, 15 100-15 600, 15 600-15 800<sup>D</sup>, 17 480-17 550<sup>D</sup>, 17 550-17 900, 18 900-19 020<sup>D</sup>, 21 450-21 850, 25 670-26 100.

<sup>D</sup> Resolution 517 (Rev.WRC-07) applies. In the HF bands subject to Article 12 see also No. 5.134.

## ANNEX 2

Suggested form of presentation of reply to question 4: *If your country has switched or is considering switching to digital terrestrial television broadcasting, what system standard is it using or considering adopting? When did your country start, or when is it proposing to start the introduction of digital terrestrial television services? Please provide further detail on the number of multiplexes in use, their technical specifications, the percentage of geographic area or population they cover or are intended to cover and the total spectrum use.*

A sample response is shown in *italics* for guidance only.

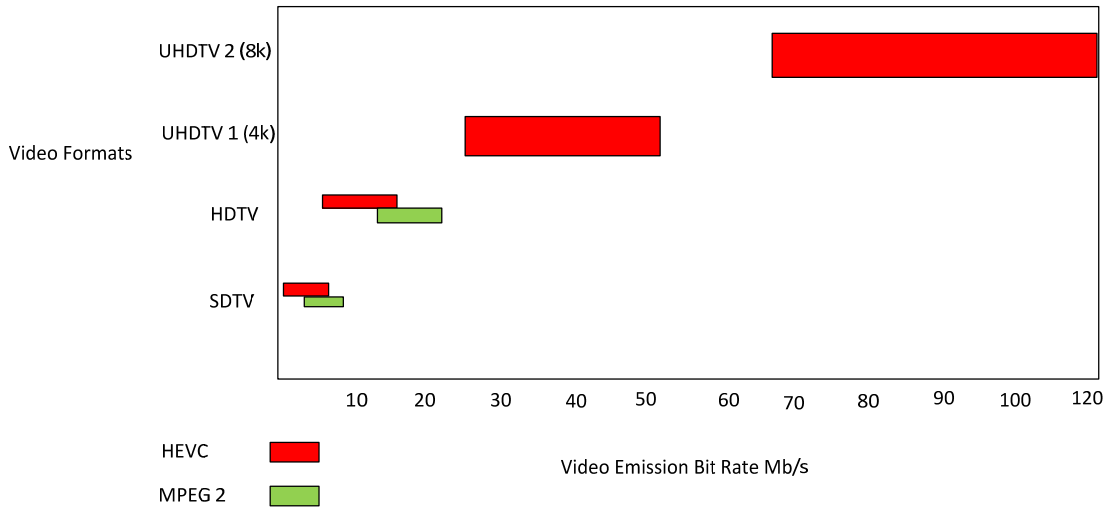
Country	No of multiplexes	System & modulation	FEC	GI	Reception mode <sup>2</sup>	Capacity per multiplex (Mb/s)	Current percentage population coverage	Intended percentage population coverage	Content per multiplex	Total capacity (Mb/s)	Total spectrum bandwidth used or intended for implementation (MHz)	Any additional comments (e.g. duration of licences)
ZZ	3	<i>DVB-T, 64-QAM</i>	<i>2/3</i>	<i>1/32</i>	<i>Fixed</i>	<i>24.10</i>	<i>98.0%</i>	<i>99.2%</i>	<i>9 SD MPEG2</i>	<i>153.6</i>	<i>256</i>	<i>Public service multiplexes licensed until 2025</i>
	3	<i>DVB-T, 64-QAM</i>	<i>3/4</i>	<i>1/32</i>	<i>Fixed</i>	<i>27.10</i>	<i>75.0%</i>	<i>90.0%</i>	<i>11 SD MPEG2</i>			<i>Licensed until 2030</i>
	1	<i>DVB-T2, 64-QAM</i>	<i>2/3</i>	<i>1/4</i>	<i>Portable indoor</i>	<i>22.6</i>	<i>–</i>	<i>60%</i>	<i>3 HD MPEG4</i>	<i>22.6</i>		<i>From 2017</i>

<sup>2</sup> E.g. fixed, portable outdoor/mobile, portable indoor.

### ANNEX 3

#### Video emission bit rates

The following chart indicates an approximate range for the video bit rate that may be used in the delivery of the video format for SDTV, HDTV and UHDTV. This video bit rate would then need to be encoded into 6 MHz, 7 MHz or 8 MHz channels, as appropriate:



The numbers in this chart should only be used as a guide line. The range of bit rates reflects compression settings of-

- Pixel Matrix
- Bit depth
- Sampling strategy
- Permitted frame rate
- Desired quality
- Compression Engine Eg HEVC, MPEG 2

It should be noted that these numbers do NOT include Audio, Closed Captioning, System Information, and Emission Error Correction. In some cases these additional services could add approximately 15% to the video bit rate

## ATTACHMENT 2

### Responses received by November 2014

The following Member States and Sector Members have submitted a response to the questionnaire on the future spectrum requirements for the broadcasting service.

#### Member States

Australia, Austria, Belgium\*, Belize, Brazil (Federative Republic of), Colombia (Republic of), Côte d'Ivoire (Republic of), Croatia (Republic of), Cyprus (Republic of), Czech Republic, Finland, France, Georgia, Germany (Federal Republic of), Hungary, Iran (Islamic Republic of), Italy, Jamaica, Japan, Korea (Republic of), Latvia (Republic of), Lesotho (Kingdom of), Madagascar (Republic of), Monaco (Principality of), Myanmar (Union of), Netherlands (Kingdom of the), New Zealand, Norway, Palestine (State of)\*\* , Papua New Guinea, Portugal, Romania, Rwanda (Republic of), Serbia (Republic of), Seychelles (Republic of), Sierra Leone, Slovak Republic, Slovenia (Republic of), Spain, Suriname (Republic of), Sweden, Switzerland (Confederation of), Syrian Arab Republic, United Arab Emirates, United Kingdom of Great Britain and Northern Ireland, Vatican City State.

#### Sector Members

Abertis Telecom Terrestre, Nippon Hoso Kyokai, North American Broadcasters Association, and Rai Way.

The responses received can be accessed at <http://www.itu.int/md/R12-SURVEY.SG6-SP/en>.

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\* Three responses have been received from the Flemish, French and German communities.

\*\* See Resolution 99 (PP-14).