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| **Radiocommunication Study Groups** |  |
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| **15 July 2014** |
| **English only** |
| 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 spectrum requirements for the future of sound and television broadcasting

**References**: 6/ 93 and 6/249

1 Study Group 6 (SG 6) is the ITU-R Study Group assigned to the Broadcasting service. Its scope covers radiocommunication broadcasting, including vision, sound, multimedia and data services principally intended for delivery to the general public.

2 SG 6 created a Rapporteur Group to look at the future spectrum requirements for the Broadcasting service in light 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 its catalogue of Reports and Recommendations.

3 One of the questions that needs to be addressed by SG 6 include how broadcast requirements are changing with the move to digital broadcast systems, and the introduction of new and enhanced broadcast services.

4 The following questionnaire, which is being sent to all Administrations and Sector Members, is designed to gather information on spectrum use by sound and television broadcasting in the bands allocated on a Regional[[1]](#footnote-1) or global basis to terrestrial broadcasting (see Annex 1).

5 Administrations and Sector Members are also invited to make more detailed inputs addressing the matter of current and future spectrum requirements for radio and television broadcasting to the next meeting of WP 6A and SG 6.

6 Administrations and Sector Members are requested to submit responses to [brsgd@itu.int](mailto:brsgd@itu.int) by 17 October 2014.

David Barrett

Chairman SG6 Rapporteur Group on spectrum requirements   
for the future of the broadcasting Service

QUESTIONNAIRE ON SPECTRUM REQUIREMENTS FOR THE FUTURE OF SOUND AND TELEVISION BROADCASTING

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| **Name of the Administration:** | **Vatican City State** |
| **Contact person:** | **Vatican Radio - Technical Direction** |
| E-mail address: | **dirtecsmg@vatiradio.va ; segtec@vatiradio.va** |
| Telephone number: | **+39 06 698 84308** |

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

**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: NO, Analogue switch off completed**

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 question 2a) and 2b) is provided in Annex 1

**Reply: No, analogue TXs in operation, Analogue switch off completed**

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: 3a) more than 99%**

**3b) 98% fixed roof top antenna, 2% portable indoor**

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: Analogue switch off completed**

**4a) DVB-T adopted, DVB-T2 adopted but not yet deployed**

**4b) Digital TV in operation since 2012**

**4c) See annex 2**

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 question 5b) and 5c) is provided in Annex 1

**Reply: 5a) in use VHF channels 6 and 11 UHF channels 21,45,57**

**5b) See Annex 1**

**5c) See Annex 1**

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: NO**

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: YES**

**174-223MHz + 470-790MHz for SRD (professional radio microphones, temporary audio wideband links),**

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.

**Reply: 8a) Yes**

**8b) It is foreseen that the number of enhanced program (especially HD) will increase as soon; in the final scheme all programs will be at least in HD with some further programs UHD and in 3D format**

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: 9a) Under Study**

**9b) Not yet determined**

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: The Vatican Administration foresees for the future the use of the GE06 assigned amount of spectrum taking into account the increased efficiency provided by new techniques (DVB-T2, encoding, etc.).**

**Taking into account:**

* **the present use of spectrum**
* **that during a transitional period (at least 5 years) is needed:**
  + - **Simulcast between DVB-T and DVB-T2**
* **that in the final scheme all programs will be at least in HD with some further programs in UHD and/or 3D format the total amount of needed capacity for terrestrial broadcasting is estimated in the table below:**

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Capacity used/needed [Mbit/s]** | | |
|  | **Present**  **[Annex 1]** | **Transitional period**  **[simulcasts T/T2] without considering new services** | **Final scheme**  **T2 considering new servicies** |
| **CVA** | ~110 | **~200** | **~ 180 (\*)** |

**(\*) Taking into account the possible improvement of the new coding system (e.g. H265)**

**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 question 11b) and 11c) is provided in Annex 1

**Reply: 11a) AM in MF and HF bands, FM in band VHF II**

**11b) and 11c) See annex 1**

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: 12a) NO**

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: 13a) yes**

**13b) Adopded: DAB, DRM, DRM+**

**13c) DAB started in 2008, DRM in MF and HF in 2004**

**13d) see Annex 1**

**13e) DAB: in use VHF block 7B and 12D and blocks LI and LJ in L band; DRM in use MF, HF. Planned DRM+ in VHF band II**

**13f) 99.9%**

**13g) not yet determined**

**13h) see Annex 1**

**i) not yet determined**

**j) analogue switch off not yet planned**

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: 14a) Yes**

**14b) For DAB, the frequency band VHF III is shared with digital television**

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: 13a) YES**

**13b) 174-223MHz for SRD (professional radio microphones, temporary audio wideband links),**

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: 16a) Not yet determined**

**SECTION THREE –Multimedia broadcasting**

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: 13a) Yes**

**13b) T-DMB in use; T2Lite under study**

**13c) VHF Band III, UHF, L band**

**13d) T-DMB deployed in 2010**

**13e) 99%**

**13f) not yet determined**

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 & Q2)b | **Digital TV** (Q5b & Q5c) |
| **Channel bandwidth (MHz)** | | *MF 9kHz*  *HF 10kHz*  *VHF I 180kHz*  *VHF II 300kHz* | MF, 9kHz  HF, 10 or 20kHz  VHF III 1536kHz |  | VHF 7MHz  UHF 8MHz |
| **CVA** | **LF** | 148.5-283.5 kHz |  |  |  |  |
| **MF** | 525-526.5 kHz |  |  |  |  |
| **MF** | 526.5-1606.5 kHz | 2, AM | (1), DRM30 |  |  |
| **MF** | 1606.5-1705 kHz |  |  |  |  |
| **HF** | 2.3-26.1 MHz\*\* | 1 station with 9 HF transmitters  Total 50 hours x frequency per day, AM | 1+(1), DRM30 |  |  |
| **VHF I** | 47-50 MHz |  |  |  |  |
|  | 50-54 MHz |  |  |  |  |
|  | 54-68 MHz |  |  |  |  |
|  | 68-72 MHz |  |  |  |  |
|  | 76-87.5 MHz |  |  |  |  |
| **VHF II** | 87.5-108 MHz | 1, FM |  |  |  |
| **VHF III** | 174-216 MHz |  | 3, DAB |  | 1 |
| **VHF III** | 216-230 MHz |  | 3, DAB |  | 1 |
| **UHF IV** | 470-694 MHz |  |  |  | 2 |
| **UHF V** | 694-790 MHz |  |  |  | 1 |
| **UHF V** | 790-890 MHz |  |  |  |  |
| **UHF V** | 890-960 MHz |  |  |  |  |
|  | 1452-1492 MHz |  |  |  | 2 |
|  | 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 3900-3950D, 3950-4000D kHz; the bands for tropical broadcasting: 2300-2498, 3200-3400D, 4750-4995 D, 5005-5060D kHz and the Article 12 Bands 5 900-5 950D, 5 950-6 200, 7 200-7 300, 7 300-7 400D, 7 400-7 450, 9 400-9 500D, 9 500-9 900, 11 600-11 650D, 11 650-12 050, 12 050-12 100D, 13 570-13 600D, 13 600-13 800, 13 800-13 870D, 15 100-15 600, 15 600-15 800D, 17 480-17 550D, 17 550-17 900, 18 900-19 020D, 21 450-21 850, 25 670-26 100.  D 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 standards is it using or considering adopting? When did your country start, or when is it proposed 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.

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Country** | **No of multi-plexes** | **System & modulation** | **FEC** | **GI** | **Reception mode[[2]](#footnote-2)** | **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)** |
| **CVA** | *3* | *DVB-T, 64-QAM*  *SFN in UHF band* | *3/4*  *Or*  *2/3* | *1/4*  *Or*  *1/32* | *Fixed* | *22.4* | *50%* | *>99%* | *16SD+2HD* | *~60* | *3X8MHz* | *Free to air* |
| *2* | *DVB-T, 64-QAM SFN in VHF Band* | *¾*  *or 5/6* | *1/4* | *Fixed* | *22.4 – 23.7* | *40%* | *>99.0%* | *4 SD MPEG 2 programs + 3 radio programs* | *~50* | *(2x7 MHz channels)* | *Free to Air* |

*\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_*

1. Regions 1, 2 or 3 as defined in Nos. **5.3** to **5.9** of the Radio Regulations. [↑](#footnote-ref-1)
2. E.g. fixed, portable outdoor/mobile, portable indoor. [↑](#footnote-ref-2)