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| **Radiocommunication Study Groups** |  |
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| 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**: Documents [6/ 93](http://www.itu.int/md/R12-SG06-C-0093/en) and [6/249](http://www.itu.int/md/R12-SG06-C-0249/en)

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 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:** | **Ofcom (UK)** |
| **Contact person:** | **Steve Ripley** |
|  E-mail address: | **Steve.Ripley@ofcom.org.uk** |
|  Telephone number: | **+44 (0)20 7783 4382**  |

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| **Name of the Sector Member (1):** | **BBC**  |
| **Contact person:** | **David Hemingway** |
|  E-mail address: | **david.hemingway@bbc.co.uk** |
|  Telephone number: | **+44 7921 648822** |
| **What best describes your organisation?**Commercial broadcaster/Public service broadcaster/ Service provider/ Other (please describe) | **Public Service Broadcaster** |
| **The geographical area over which you operate:** | **UK & Global** |
|  |
| **Name of the Sector Member (2):** | **Arqiva Ltd** |
| **Contact person:** | **Dr Peter D. Couch**  |
|  E-mail address: | **Peter.Couch@arqiva.com** |
|  Telephone number: | **+44 (0)775 383 2828** |
| **What best describes your organisation?**Commercial broadcaster/Public service broadcaster/ Service provider/ Other (please describe) | **Service Provider** |
| **The geographical area over which you operate:** | **UK & Global** |

**SECTION ONE – Television broadcasting**

1) a) Is your country still using analogue television?

No

 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.

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 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:**

3) a) What is the percentage of viewer uptake of terrestrial television in your country?

Approximately 75% of households use digital terrestrial TV on at least one television set (Q4 2012 figure). 36% of households use terrestrial as their only television reception platform (Q1 2014 figure).

 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.

We estimate that between 2% and 10% of households rely solely on a set top aerial. A higher proportion of secondary (e.g. bedroom or kitchen) sets are likely to use set-top aerials.

**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)?

DVB-T and DVB-T2 in 8 MHz channels

 b) When did your country start or when is it proposing to start the introduction of digital terrestrial television services?

DVB-T transmissions commenced in 1998, DVB-T2 transmissions commenced in 2009.

 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.

**7 National Multiplexes in total;**

* 2 universal multiplexes (98.5% coverage) utilising DVB-T
* 1 universal multiplex (98.5% coverage) utilising DVB-T2 to deliver High Definition content.
* 3 national multiplexes (circa 90% coverage) utilising DVB-T
* 1 national multiplex (circa 70% coverage) utilising DVB-T2
* More details are provided in Annex 2

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?

UHF channels 21 to 33 in use.

UHF channels 34, 35 & 37 planned.

Channels 39 to 60 in use.

 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:**

6) a) Are the terrestrial television frequency bands also shared with other primary services in your country?

No

 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?

Yes

 b) If yes, please give details of those systems and their spectrum use.

SAB/SAP on an exclusive basis in channel 38, and on an interleaved/opportunistic basis in the remainder of the TV band.

**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?

HD services are already delivered on terrestrial TV across two multiplexes. Future demand or opportunities for other enhanced services is currently unclear. UHD trials have been undertaken.

 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:**

9) a) Are there plans in your country to launch more multiplexes in the future?

Yes

 b) If yes, how many more and when? Please also indicate the expected timeframe for their introduction.

Two additional interim DVB-T2 multiplexes have been licensed and the first multiplex launched in December 2013 with full roll-out to 70% population coverage achieved in June 2014. There is scope for one additional multiplex within the licence but there is no launch date for this.

**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:**

Ofcom is currently considering a possible future clearance of the 700 MHz (694 MHz to 790 MHz) band for mobile broadband. Our analysis suggests that through more efficient frequency planning it would be possible to reconfigure the DTT network in the spectrum between 470–694 MHz without materially affecting the coverage or channel mix that UK viewers currently enjoy. More detailed information on our work in this area is available in our recent *Consultation on Future Use of the 700 MHz Band: Cost-benefit analysis of changing its use to mobile services*, which is available at <http://stakeholders.ofcom.org.uk/consultations/700MHz>.

**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:**

The UK uses Amplitude Modulation in the LF and MF bands, and Frequency Modulation in VHF Band II. In addition, Amplitude Modulation is used for HF broadcasts originating in the UK and in the UK’s overseas dependencies.

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:**

There is still high demand for additional FM services in the UK, especially in urban areas. However additional spectrum would be problematic with regards the existing receiver base which cannot operate outside of existing bands.

13) a) Is your country considering introducing, or has it already introduced digital sound broadcasting?

Yes

 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)?

System A (T-DAB)

Additionally DRM-30 is used for some HF transmissions.

 c) When did your country start or when does it propose to start digital sound broadcasting?

1995

 d) What channel bandwidths is your country using or considering using?

1.536 MHz per ensemble (1.75 MHz channel raster) (T-DAB)

5 kHz (DRM-30)

 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.

Band III - Blocks 10B to 12D inclusive (T-DAB)

 f) What is the percentage of the population that is covered by digital sound broadcasting by direct reception in your country?

Approximately 95% of the population can receive at least one DAB multiplex

 g) What additional spectrum was required or is considered to be required for the transition to digital sound broadcasting?

None at present

 h) Please indicate how many digital radio transmitters are currently used or intended to be used and in which bands.

More than 630 transmitters are on-air and this is presently increasing by around 5 transmitters per month.

1. What is the spectrum requirement for digital sound broadcasting in your country?

Present requirement is approximately 20 MHz

 j) If your country has introduced digital sound broadcasting, how long will it continue to use analogue sound broadcasting?

There are no plans to cease analogue broadcasting at the present time.

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:**

No

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:**

No

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:**

No change to the existing requirements

**SECTION THREE –Multimedia broadcasting**

17) a) Is your country considering introducing or has already introduced multimedia broadcasting?

No

 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.

|  |  |  |
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| **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)** | VHF II 300kHz | 1.75 MHz |  | 8MHz |
| **XX** | **LF** | 148.5-283.5 kHz | 3 |  |  |  |
| **MF** | 525-526.5 kHz |  |  |  |  |
| **MF** | 526.5-1606.5 kHz | 314 (+2 in UK overseas territories) |  |  |  |
| **MF** | 1606.5-1705 kHz |  |  |  |  |
| **HF** | 2.3-26.1 MHz\*\* | 1 (+ 2 in UK overseas territories) | 1 (+1 in UK overseas territories) |  |  |
| **VHF I** | 47-50 MHz |  |  |  |  |
|  | 50-54 MHz |  |  |  |  |
|  | 54-68 MHz |  |  |  |  |
|  | 68-72 MHz |  |  |  |  |
|  | 76-87.5 MHz |  |  |  |  |
| **VHF II** | 87.5-108 MHz | 1901(50) |  |  |  |
| **VHF III** | 174-216 MHz |  | 36 |  |  |
| **VHF III** | 216-230 MHz |  | 616 (100 approximately) |  |  |
| **UHF IV** | 470-694 MHz |  |  |  | The UK has 1156 UHF TV transmitting station sites, each carrying between 3 and 7 ‘national’ multiplexes, plus ‘sub-national’ multiplexes in some cases. Some sites use frequencies which straddle Bands IV and V. Currently there are 2419 individual operational frequency allocations in Band IV, and 1356 in Band V. (Approximately 40 additional Band IV and 10 Band V allocations are likely to be brought into use during the next 24 months.) |
| **UHF V** | 694-790 MHz |  |  |  |
| **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 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)** |
| G | 2 | DVB-T, 64-QAM | 2/3 | 1/32 | Fixed | 24.1 | >98.5% | >98.5% | 7 to 9 SD, MPEG2 | 48.2 | 304(of which 48 MHz is licensed on an interim basis with a minimum term to 2018) | Public service multiplexes. One multiplex is authorised under the BBC Charter and Agreement and is not licensed by Ofcom.One multiplex licence term to 2022 |
| G | 3 | DVB-T, 64-QAM | 3/4 | 1/32 | Fixed | 27.1 | ~90% | ~90% | 14 SD, MPEG2 | 81.3 | One licence term to 2022Two licences term to 2026 |
| G | 1 | DVB-T2, 256-QAM | 2/3 | 1/128 | Fixed | 40.2 | >98.5% | >98.5% | 5 HD, MPEG4 | 40.2 | Public service multiplex.Licence term to 2026 |
| G | 1 | DVB-T2, 256-QAM | 2/3 | 1/128 | Fixed | 40.2 | ~70% | ~70% | 6 HD, MPEG42 SD, MPEG4 | 40.2 | Licence term to 2026, but has a minimum term to 2018. A second multiplex with similar characteristics has been licensed but is not yet operational. |
| G | 1 | DVB-T, QPSK,  | 3/4 | 1/32 | Fixed | 9.0 | ~40% | ~50% | 3 SD, MPEG2 | 9.0 | Licence term to 2025 |
| G | 1 | DVB-T2, QPSK | 2/3 | 1/128 | Fixed | 9.8 | Northern Ireland only | Northern Ireland only | 3 SD, MPEG4 | 9.8 | Licence term to 2024 |

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

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)