

# Agreement between the German Federal Network Agency and the Swedish Post and Telecom Authority concerning the use of the 700 MHz band (694-790 MHz) for terrestrial systems

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June 2016

## Protection of DTT from MFCN and protection of MFCN from DTT

Sections 1 and 2 of this agreement are valid from 1 April 2017 until a potential change of service in the 700 MHz band in Germany. Germany will inform Sweden as soon as a final date of the change of service is set.

### 1. Principles and definitions

- 1.1. The 700 MHz band, as referred to in this agreement, corresponds to the frequencies from 694 MHz to 790 MHz.
- 1.2. The agreement covers the protection of DTT in accordance with Geneva Agreement 2006 (GE06) from MFCN with the FDD (Frequency Division Duplex 2x30 MHz, 703-733/758-788 MHz) arrangement, including optional SDL (Supplemental Downlink, up to 4x5 MHz, 738-758 MHz) and optional PPDR (Public Protection and Disaster Relief, 1x5 MHz, 753-758 MHz) in the duplex gap in accordance with CEPT Report 053 (28 Nov, 2014), ECC REC(15)01 and ECC DEC(15)01. The use of other arrangements such as TDD (Time Division Duplex) is not covered in this agreement.
- 1.3. This agreement also covers the protection of MFCN from new or previously not coordinated DTT allotments/transmitters.
- 1.4. This agreement covers the coordination of MFCN base stations in relation to DTT. The MFCN user equipment, or terminals, are allowed to be used on a non-interference basis, in accordance with ITU RR 4.4.
- 1.5. This agreement is based on the concept of field strength levels on borderlines.
- 1.6. The latest version of ITU-R P.1546 "Method for point-to-area predictions for terrestrial services in the frequency range 30-3000 MHz" shall be used for predictions of field strength values. The field strength values in this agreement for protection of DTT are based on a receiving antenna height of 10 m, curves for 1% of the time and 50% of the locations. For the protection of MFCN receiving antenna height of 3 m and curves for 10% of the time and 50% of the locations are used. The power sum method is used for accumulation.

## **2. Use of frequencies without coordination by administrations**

- 2.1. DTT transmitters may continue to operate and to be implemented in the 700 MHz band in Germany as set out in the GE06 Agreement and in the subsequent bilateral agreements between Germany and Sweden concerning the use of the 470-790 MHz band for broadcasting. MFCN shall not claim protection from DTT services operating according to the GE06 Plan.
- 2.2. MFCN base stations may be implemented in the 700 MHz band without coordination in relation to DTT as long as the cumulative interfering field strength is below  $34 \text{ dB}(\mu\text{V}/\text{m})/1 \text{ MHz}$ , calculated for 1% of the time and 50% of the locations, 10 m above ground, at the border of co-channel (overlapping) DTT allotments which have DTT transmitters in operation.
- 2.3. By May 2016 the DTT transmitters that are in operation in accordance with GE06 in Germany and within the frequency band 694-790 MHz (CH49 – CH60) are listed in Annex 1.
- 2.4. New or previously not coordinated DTT transmitters may be implemented in Germany in the 758 - 788 MHz and 738 - 758 MHz range without coordination with Sweden in relation to MFCN as long as the cumulative interfering field strength is below  $59 \text{ dB}(\mu\text{V}/\text{m})/5 \text{ MHz}$ , calculated for 10% of the time and 50% of the locations, at a height of 3 m above the ground at the Swedish border or beyond.
- 2.5. New or previously not coordinated DTT transmitters may be implemented in Germany in the 703 – 733 MHz range without coordination with Sweden in relation to MFCN as long as the cumulative interfering field strength is below  $41 \text{ dB}(\mu\text{V}/\text{m})/5 \text{ MHz}$ , calculated for 10% of the time and 50% of the locations, at a height of 3 m above the ground at the Swedish border or beyond.

## Coordination agreement between MFCN and MFCN

Sections 3, 4, and 5 replaces the agreement as stated in sections 1 and 2 and is valid from the date of a potential German change of service from DTT to MFCN in the 700 MHz band.

### 3. Principles and definitions

- 3.1. The 700 MHz band, as referred to in this agreement, covers the frequencies from 694 MHz to 790 MHz, with the FDD (Frequency Division Duplex 2x30 MHz, 703-733/758-788 MHz) arrangement, including optional SDL (Supplemental Downlink, up to 4x5 MHz, 738-758 MHz) and optional PPDR (Public Protection and Disaster Relief, 1x5 MHz, 753-758 MHz) in the duplex gap in accordance with CEPT Report 053 (28 Nov, 2014), ECC REC(15)01 and ECC DEC(15)01. The use of other arrangements such as TDD is not covered in this agreement.
- 3.2. This agreement is based on the concept of field strength levels on borderlines and in the case when LTE systems are used preferential PCIs as defined in Annex 2.
- 3.3. This agreement covers the coordination of the base stations. The user equipment, or terminals, are allowed to be used on non-interference basis, in accordance with ITU RR 4.4.
- 3.4. For the purpose of this agreement the borderline of Germany and Sweden respectively is defined as the coastline of the other country according ITU Digitized World Map (IDWM).

### 4. Use of frequencies without coordination by administrations

- 4.1. Germany may use the 700 MHz band without coordination with Sweden, if the predicted mean field strength produced by a base station does not exceed 59 dB( $\mu$ V/m)/5 MHz, calculated for 10% of the time and 50% of the locations, at a height of 3 m above the ground at the Swedish borderline or beyond.
- 4.2. Sweden may use the 700 MHz band without coordination with Germany, if the predicted mean field strength produced by a base station does not exceed 59 dB( $\mu$ V/m)/5 MHz, calculated for 10% of the time and 50% of the locations, at a height of 3 m above the ground at the German borderline or beyond.
- 4.3. Field strength values are defined within a reference block of 5 MHz. In cases of other frequency block sizes a value  $10 \times \log_{10}(\text{frequency block size}/5 \text{ MHz})$  should be added to the field strength values.

### 5. General

- 5.1. A complaint in case of harmful interference shall be based on the median values of measurements of field strength, performed at 3 meter of receiving antenna height at least on two different occasions over a range of at least 100 m along the border.
- 5.2. In the presence of interference, the report of harmful interference shall be presented in accordance with Appendix 10 of the Radio Regulations. The other administration shall take all possible steps in order to eliminate the interference.
- 5.3. The field strength values (see 4.1 and 4.2) in this agreement are based on a receiving antenna height of 3 m, curves for 10% of the time and 50% of the locations.
- 5.4. The latest version of ITU-R P.1546 " Method for point-to-area predictions for terrestrial services in the frequency range 30-3000 MHz" shall be used for prediction of field strength values.

## 6. Coordination procedure

- 6.1. If an intended frequency assignment has to be coordinated, the period of coordination shall not exceed 45 days from the date of the receipt of a written request and 20 days after a reminder. A request may be sent by e-mail to the administration's official e-mail address. If no reply is received after 65 days after the initial request the frequency assignment shall be considered as coordinated.
- 6.2. The exchange of the coordination information between the administrations shall be in electronic form and sent by e-mail or by other electronic means as appropriate or agreed bilaterally.
- 6.3. Preliminary coordination may take place between the operators concerned. The results of such preliminary coordination have to be covered by operators' arrangements which must be approved by the administrations.

## 7. Revision and cancellation

- 7.1. This agreement may be revised upon mutual agreement of the two administrations. This agreement may be cancelled with a notice of at least twelve months from any of the two parties.

## 8. Enter into force

- 8.1. This agreement shall come into force 1<sup>st</sup> April 2017.
- 8.2. This agreement has been drawn in two identical copies, one for Germany and one for Sweden.

Place

*Berlin*

Date

*11/07/2016*

For the German Federal Network Agency

Jens Franke

Head of section of Mobile Services Department

Place

*Stockholm*

Date

*30 June 2016*

For the Swedish Post and Telecom Authority

Pia Högset

Head of unit of the Spectrum Department

ANNEX 1 -DTT transmitters in operation in Germany within the frequency band 694-790 MHz (CH49 – CH60)

All transmitters are in operation for the migration from DVB-T to DVB-T2 and will be switched off not later than July 2019.

|    | TX-Name               | Ch. | ERP / dBW | Longitude     | Latitude     |
|----|-----------------------|-----|-----------|---------------|--------------|
| 1  | Bremen                | 49  | 47        | 008E47 30.000 | 53N05 45.000 |
| 2  | Flensburg             | 49  | 20        | 009E30 17.000 | 54N47 35.000 |
| 3  | Schiffdorf            | 49  | 37        | 008E38 57.000 | 53N31 15.000 |
| 4  | Steinkimmen           | 49  | 37        | 008E27 26.000 | 53N02 37.000 |
| 5  | Berlin Alexanderplatz | 50  | 47        | 013E24 34.000 | 52N31 15.000 |
| 6  | Berlin Schaeferberg   | 50  | 47        | 013E07 40.000 | 52N25 03.000 |
| 7  | Wolfsburg             | 50  | 30        | 010E46 28.000 | 52N24 51.000 |
| 8  | Boossen               | 53  | 47        | 014E25 33.000 | 52N22 59.000 |
| 9  | Schwerin              | 53  | 47        | 011E27 27.000 | 53N35 32.000 |
| 10 | Hamburg               | 54  | 47        | 009E58 34.000 | 53N33 44.000 |
| 11 | Hamburg Hoeltigbaum   | 54  | 45        | 010E11 46.000 | 53N37 33.000 |
| 12 | Hamburg Moorfleet     | 54  | 45        | 010E06 10.000 | 53N31 08.000 |
| 13 | Bremen                | 55  | 43        | 008E47 30.000 | 53N05 45.000 |
| 14 | Schiffdorf            | 55  | 34        | 008E38 57.000 | 53N31 15.000 |
| 15 | Steinkimmen           | 55  | 50        | 008E27 26.000 | 53N02 37.000 |
| 16 | Berlin Alexanderplatz | 56  | 40        | 013E24 34.000 | 52N31 15.000 |
| 17 | Berlin Schaeferberg   | 56  | 43        | 013E07 40.000 | 52N25 03.000 |
| 18 | Hannover              | 56  | 43        | 009E47 59.000 | 52N23 35.000 |
| 19 | Rosengarten           | 56  | 43        | 009E51 57.000 | 53N23 51.000 |
| 20 | Boossen               | 57  | 47        | 014E25 33.000 | 52N22 59.000 |
| 21 | Kiel                  | 57  | 43        | 010E07 06.000 | 54N18 02.000 |
| 22 | Dannenberg            | 58  | 40        | 010E53 50.000 | 53N03 57.000 |
| 23 | Lueneburg             | 58  | 39        | 010E30 30.000 | 53N15 13.000 |
| 24 | Uelzen                | 58  | 47        | 010E31 56.000 | 52N47 39.000 |
| 25 | Visselhoevede         | 58  | 49        | 009E36 26.000 | 52N58 40.000 |
| 26 | Berlin Alexanderplatz | 59  | 40        | 013E24 35.000 | 52N31 15.000 |
| 27 | Berlin Schaeferberg   | 59  | 37        | 013E07 40.000 | 52N25 03.000 |
| 28 | Lingen                | 59  | 43        | 007E21 11.000 | 52N32 06.000 |
| 29 | Luebeck Berkenthin    | 59  | 43        | 010E42 15.000 | 53N44 31.000 |
| 30 | Osnabrueck            | 59  | 47        | 008E01 48.000 | 52N22 29.000 |
| 31 | Stockelsdorf          | 59  | 43        | 010E38 31.000 | 53N54 21.000 |

Additional, Germany will use following stations for the migration from DVB-T to DVB-T2 during time period May 2016 until July 2019:

| TX-Name   | Ch. | ERP / dBW | Longitude     | Latitude     |
|-----------|-----|-----------|---------------|--------------|
| Kiel      | 52  | 43        | 010E07 06.000 | 54N18 02.000 |
| Flensburg | 57  | 43        | 009E30 17.000 | 54N47 35.000 |

## ANNEX 2 - PREFERENTIAL PHYSICAL-LAYER CELL IDENTITIES (PCI) FOR LTE

PCI division, according to table below, may be used in border areas to improve coverage and service when channel centre frequencies are aligned.

The PCIs are divided between the administrations according to the following table:

| PCI     | Set A<br>0 to 83 | Set B<br>84 to 167 | Set C<br>168 to 251 | Set D<br>252 to 335 | Set E<br>336 to 419 | Set F<br>420 to 503 |
|---------|------------------|--------------------|---------------------|---------------------|---------------------|---------------------|
| Country | Sweden           | Germany            | Germany             | Germany             | Sweden              | Sweden              |