

**MEMORANDUM OF UNDERSTANDING  
CONCLUDED BETWEEN  
THE ADMINISTRATIONS OF  
FRANCE  
AND  
THE UNITED KINGDOM  
ON CO-ORDINATION IN THE  
47-68 MHz  
FREQUENCY BAND**

## 1. INTRODUCTION

1.1- The 47-68 MHz band is allocated by the Radio Regulations to the Broadcasting Service on a primary basis. Additionally, the footnote 5.164 allocates this band to the Land Mobile Service on a primary basis in CEPT countries, including France and the United Kingdom.

1.2- The Frequency band 47-68 MHz is divided into three sub-bands. The first, 47-54 MHz, is used for low power, short range simplex services. The second and third sub-bands are a duplex pair, 54-61 MHz (mobile transmit) and 61-68 MHz (base transmit) are designated for pan-European Land Mobile services according to CEPT Recommendation T/R 25-08.

1.3- In the UK the band 47 – 68 MHz is used for the land mobile service.

1.4- In France the band 47-68 MHz is currently used by the land mobile and broadcasting (television) services.

1.5- In France and the United Kingdom, different services occupy these frequency bands; due to the differing characteristics of these services, separate co-ordination procedures are required in the following cases :

- Land Mobile in France and in the United Kingdom
- Broadcasting (TV) in France and Land Mobile in the United Kingdom

1.6- Therefore, the Administrations of the United Kingdom and France have agreed the following co-ordination procedures

## 2 - PROCEDURE FOR FREQUENCY CO-ORDINATION BETWEEN LAND MOBILE SYSTEMS IN 47-68 MHz FREQUENCY BAND

### 2.1 - General case

The co-ordination procedure is based on the concept of preferential frequencies and in accordance with the “2003 Agreement (Berlin, November 2003)” in force. The 47-54 MHz simplex, 54-61 and 61-68 MHz duplex frequency bands will be apportioned as groups of frequencies which can be assigned in an equitable manner by both countries as "preferential sub-bands". The administrative procedure is described in paragraph 2.4.

As an exception, systems exempt from co-ordination in paragraph 2.5 should not follow the procedure for the general case.

### 2.2 - Technical characteristics

In a preferential sub-band allocated to one country, a base station may be established without prior co-ordination if the predicted field strength at all points 80 km inside the neighbouring country does not exceed the trigger value specified in paragraph 2.2.1.

In a non-preferential sub-band assigned to one country, a base station may be established without prior co-ordination if the predicted field strength at all points on the coastline does not exceed the trigger value specified in paragraph 2.2.2. Neither such a base station nor a mobile served by that station may

complain of interference caused by a station in the neighbouring country which complies with the conditions laid down for the use of preferential frequencies.

#### *2.2.1 - Preferential sub-bands*

In a preferential sub-band, the field strength shall not exceed the trigger value of 6 dB $\mu$ V/m at 10 metres above ground level at all points 80 km inside the neighbouring country.

#### *2.2.2 - Non-preferential sub-bands*

In a non-preferential sub-band, the field strength shall not exceed the trigger value of 6 dB $\mu$ V/m at 10 metres above ground level at all points on the coastline of the neighbouring country.

#### *2.2.3 - Method for the Prediction of field strength level*

Both administrations shall use the HCM software, which includes in particular a sea path algorithm.

#### 2.3 - Preferential frequencies

The division of preferential channels between the two countries shall be in accordance with **Annex 1**.

#### 2.4 - Administrative procedure

Where possible, a regular summary of all co-ordinated base stations should be submitted every 6 months. The technical characteristics of Land Mobile base stations to be supplied by both administrations shall be in accordance with the format specified in the “2003 Agreement (Berlin, November 2003) in force”.

If necessary, in cases where other technical solutions are not viable, an Administration can request the co-ordination of any Land mobile Base station which exceed 6 dB $\mu$ V/m trigger values in paragraphs. 2.2.1 and 2.2.2. Frequencies must be co-ordinated in accordance with the conditions and requirements defined in the “2003 Agreement (Berlin, November 2003) in force”

#### 2.5 – Systems exempt from co-ordination.

2.5.1 In the United Kingdom the systems using the band 47 - 68 MHz may be short range low power systems, typically on site. Systems of this type will be exempt from any co-ordination procedure. These low power systems must fall into at least one of the following exemption categories:

- a) All systems with an ERP of 500mW or less.
- b) All systems with a maximum ERP of 5 W, maximum transmitter antenna height less than 120m above ground level and outside an area 100 km from the coast of the neighbouring country.
- c) All systems with a maximum ERP of 5 W and outside an area 200 km from the coast of the neighbouring country.

### *2.5.2 Ancillary Broadcast links*

In the United Kingdom and France the frequency sub-bands contained in **Annex 5** are used by broadcast ancillary links. These links are established on a temporary basis at any location within the country. However each administration should ensure that these systems do not cause harmful interference to existing land mobile services.

## **3 – PROCEDURE FOR FREQUENCY CO-ORDINATION BETWEEN LAND MOBILE IN THE UNITED KINGDOM AND TV BROADCASTING IN FRANCE**

Frequency co-ordination is necessary in order to protect existing and planned services:

- Protection of Land Mobile services in the United Kingdom from interference caused by TV broadcasting in France;
- Protection of TV broadcasting in France from interference caused by Land Mobile services in United Kingdom;

### *3.1 Protection of TV broadcasting in France from interference caused by Land Mobile services in the United Kingdom*

The existing and planned TV Broadcast transmitters must be protected, using the co-ordination method in **Annex 2** irrespective of the arrangement for allocating preferential channels for Land Mobile co-ordination, as shown in **Annex 1**, noting the following exclusions which are not subject to this co-ordination procedure:

- a) Systems complying with paragraph 2.5
- b) All Base Stations more than 500 km from the French coast

Calculations relating to interference from mobile services shall be carried out by the UK using the calculation and propagation method in **Annex 2** so as to ensure the minimum interference level to broadcast reception in France.

A list of all existing French TV broadcast transmitters requiring protection is given in **Annex 4**. The protection ratios curves for L-SECAM transmitters can be found in Rec. ITU-R- IS.851-1. There are no plans to increase significantly the number of these transmitters.

### *3.2 – Protection of Land Mobile services in the UK from interference caused by TV broadcasting in France*

The existing French TV broadcast transmitters do not exceed the agreed trigger values in this MoU. The introduction of new TV broadcast transmitters that exceed the trigger values will require individual co-ordination.

Calculations relating to interference from TV Broadcasting transmitters shall be carried out by France using the calculation and propagation method in **Annex 3** so as to ensure the minimum interference levels to Land Mobile stations in the United Kingdom.

France is not required to provide the UK with information regarding the bringing into use of TV Broadcast Transmitters more than 500 km from the United Kingdom coast.

### 3.3 – Administrative procedure

A regular summary of all co-ordinated base stations shall be submitted every 6 months. The technical characteristics of Land Mobile base stations to be supplied by the United Kingdom administration shall be in accordance with the format specified in the “2003 Agreement (Berlin, November 2003) in force”.

If necessary, in cases where other technical solutions are not viable, the UK Administration can request the co-ordination of any Land Mobile Base station which exceeds the L-SECAM TV transmitter protection ratios levels in Rec. ITU-R IS.851-1. The French Administration may request any further information to assess the probability of harmful interference to its TV stations. If agreement is reached, the UK Administration may proceed with its project. If the French Administration has not replied within ten weeks following the date of the consultation letter, it shall be reminded by urgent fax. If the French Administration has not replied within two weeks following the date of the reminder, it is assumed that the station is co-ordinated. In the event that more detailed co-ordination is required the United Kingdom and French administrations shall co-operate to resolve the issue in a timely manner.

## **4 – PROVISIONS RELATING TO CONFIDENTIALITY OF INFORMATION**

Both Administrations undertake not to inform their operators of the characteristics of their neighbouring Administration’s Land Mobile Services.

## **5 – EXCHANGE OF INFORMATION**

For the mobile service, exchanges of information for co-ordination purposes shall be in the format set out in the “2003 Agreement (Berlin, November 2003)” in force. By preference, a list of new assignments should be exchanged every six months, by e-mail.

## **6 – CHANNEL ISLANDS**

This Memorandum of Understanding shall not apply to the Channel Islands.

Co-ordination in the 47- 68 MHz frequency band will be the subject of a separate Memorandum of Understanding between France and the United Kingdom covering the Channel Islands.

## **7 – CHANNEL TUNNEL**

This Memorandum of Understanding shall not apply to the Channel Tunnel.

Co-ordination in the 47- 68 MHz frequency band for Land Mobile will be the subject of a separate Memorandum of Understanding between France and the United Kingdom covering the Channel Tunnel.

## **8 – REVISION OF THE MEMORANDUM OF UNDERSTANDING**

Either Administration may request a revision of this MoU. Any part of this MoU may be revised in the light of future developments and experience in the operation of the networks covered by the MoU.

## **9 – TERMINATION OF THE MEMORANDUM OF UNDERSTANDING**

Either Administration may withdraw from this Memorandum of Understanding subject to 6 months notice.

## **10 – LANGUAGE OF THE MEMORANDUM OF UNDERSTANDING**

This Memorandum of Understanding exists in French and English languages, both texts being equally authoritative.

The original version in English is laid down with Ofcom in London, the original version in French is laid down with the Agence Nationale des Fréquences in Maisons-Alfort.

## **11 – DATE OF ENTRY INTO FORCE**

This Memorandum of Understanding will enter into force on **1<sup>st</sup> June 2004**.

Done at Maisons-Alfort on **19<sup>th</sup> March 2004**,

For **FRANCE**

For the **UNITED KINGDOM**

A. RIGOLE

B. LAST

## ANNEX 1

### DIVISION OF PREFERENTIAL CHANNELS BETWEEN FRANCE AND THE UNITED KINGDOM (simplex 47-54 MHz)

Preferential Channel. Block No.	Country	Start Channel	End Channel	Simplex Or Duplex MTx First Centre Frequency	Simplex Or Duplex MTx Last Centre Frequency	Simplex Or Duplex Channel Block
1	FRANCE	1	16	47.00625	47.19375	Simplex
2	UK	17	32	47.20625	47.39375	Simplex
3	FRANCE	33	48	47.40625	47.59375	Simplex
4	UK	49	64	47.60625	47.79375	Simplex
5	FRANCE	65	80	47.80625	47.99375	Simplex
6	UK	81	96	48.00625	48.19375	Simplex
7	FRANCE	97	112	48.20625	48.39375	Simplex
8	UK	113	128	48.40625	48.59375	Simplex
9	FRANCE	129	144	48.60625	48.79375	Simplex
10	UK	145	160	48.80625	48.99375	Simplex
11	FRANCE	161	176	49.00625	49.19375	Simplex
12	UK	177	192	49.20625	49.39375	Simplex
13	FRANCE	193	208	49.40625	49.59375	Simplex
14	UK	209	224	49.60625	49.79375	Simplex
15	FRANCE	225	240	49.80625	49.99375	Simplex
16	UK	241	256	50.00625	50.19375	Simplex
17	FRANCE	257	272	50.20625	50.39375	Simplex
18	UK	273	288	50.40625	50.59375	Simplex
19	FRANCE	289	304	50.60625	50.79375	Simplex
20	UK	305	320	50.80625	50.99375	Simplex
21	FRANCE	321	336	51.00625	51.19375	Simplex
22	UK	337	352	51.20625	51.39375	Simplex
23	FRANCE	353	368	51.40625	51.59375	Simplex
24	UK	369	384	51.60625	51.79375	Simplex
25	FRANCE	385	400	51.80625	51.99375	Simplex
26	UK	401	416	52.00625	52.19375	Simplex
27	FRANCE	417	432	52.20625	52.39375	Simplex
28	UK	433	448	52.40625	52.59375	Simplex
29	FRANCE	449	464	52.60625	52.79375	Simplex
30	UK	465	480	52.80625	52.99375	Simplex
31	FRANCE	481	496	53.00625	53.19375	Simplex
32	UK	497	512	53.20625	53.39375	Simplex
33	FRANCE	513	528	53.40625	53.59375	Simplex
34	UK	529	544	53.60625	53.79375	Simplex
35	FRANCE	545	560	53.80625	53.99375	Simplex

# ANNEX 1

## DIVISION OF PREFERENTIAL CHANNELS BETWEEN FRANCE AND THE UNITED KINGDOM (duplex 54-68MHz)

Preferential Channel. Block No.	Country	Start Channel	End Channel	Simplex Or Duplex MTx First Centre Frequency	Simplex Or Duplex MTx First Centre Frequency	Simplex Or Duplex Channel Block	Duplex BTx First Centre Frequency	Duplex BTx First Centre Frequency
36	UK	561	576	54.00625	54.19375	Simplex	Guard-band	(MTx to-BTx)
37	FRANCE	577	592	54.20625	54.39375	Duplex	61.20625	61.39375
38	UK	593	608	54.40625	54.59375	Duplex	61.40625	61.59375
39	FRANCE	609	624	54.60625	54.79375	Duplex	61.60625	61.79375
40	UK	625	640	54.80625	54.99375	Duplex	61.80625	61.99375
41	FRANCE	641	656	55.00625	55.19375	Duplex	62.00625	62.19375
42	UK	657	672	55.20625	55.39375	Duplex	62.20625	62.39375
43	FRANCE	673	688	55.40625	55.59375	Duplex	62.40625	62.59375
44	UK	689	704	55.60625	55.79375	Duplex	62.60625	62.79375
45	FRANCE	705	720	55.80625	55.99375	Duplex	62.80625	62.99375
46	UK	721	736	56.00625	56.19375	Duplex	63.00625	63.19375
47	FRANCE	737	752	56.20625	56.39375	Duplex	63.20625	63.39375
48	UK	753	768	56.40625	56.59375	Duplex	63.40625	63.59375
49	FRANCE	769	784	56.60625	56.79375	Duplex	63.60625	63.79375
50	UK	785	800	56.80625	56.99375	Duplex	63.80625	63.99375
51	FRANCE	801	816	57.00625	57.19375	Duplex	64.00625	64.19375
52	UK	817	832	57.20625	57.39375	Duplex	64.20625	64.39375
53	FRANCE	833	848	57.40625	57.59375	Duplex	64.40625	64.59375
54	UK	849	864	57.60625	57.79375	Duplex	64.60625	64.79375
55	FRANCE	865	880	57.80625	57.99375	Duplex	64.80625	64.99375
56	UK	881	896	58.00625	58.19375	Duplex	65.00625	65.19375
57	FRANCE	897	912	58.20625	58.39375	Duplex	65.20625	65.39375
58	UK	913	928	58.40625	58.59375	Duplex	65.40625	65.59375
59	FRANCE	929	944	58.60625	58.79375	Duplex	65.60625	65.79375
60	UK	945	960	58.80625	58.99375	Duplex	65.80625	65.99375
61	FRANCE	961	976	59.00625	59.19375	Duplex	66.00625	66.19375
62	UK	977	992	59.20625	59.39375	Duplex	66.20625	66.39375
63	FRANCE	993	1008	59.40625	59.59375	Duplex	66.40625	66.59375
64	UK	1009	1024	59.60625	59.79375	Duplex	66.60625	66.79375
65	FRANCE	1025	1040	59.80625	59.99375	Duplex	66.80625	66.99375
66	UK	1041	1056	60.00625	60.19375	Duplex	67.00625	67.19375
67	FRANCE	1057	1072	60.20625	60.39375	Duplex	67.20625	67.39375
69	UK	1073	1088	60.40625	60.59375	Duplex	67.40625	67.59375
65	FRANCE	1089	1104	60.60625	60.79375	Duplex	67.60625	67.79375
70	UK	1105	1120	60.80625	60.99375	Duplex	67.80625	67.99375



## ANNEX 2

### CO-ORDINATION METHOD FOR THE PROTECTION OF TV BROADCASTING IN FRANCE FROM INTERFERENCE CAUSED BY LAND MOBILE SERVICES IN THE UK

The minimum median value of the field strength to be protected in the television service in Band I is 46 dB $\mu$ V/m, from table I of ITU-R Recommendation IS.851.

This field strength shall not be exceeded, at the coastline of France in the frequency band 47-68 MHz, by the usable field strength of the land mobile service in the United Kingdom when calculated according to the simplified multiplication method as detailed in Appendix 1 of Annex 1 of ITU-R Recommendation IS.851.

Calculations shall include all land mobile base stations within 300 km of the French Coast (400 km if the effective antenna height exceeds 200 m).

The nuisance field strength from each base station site shall be determined from :

$$E = 10 \text{Log}_{10} \sum_{i=1}^N 10^{\frac{E_i}{10}}$$

Where “N” is the number of transmitters on the site, and:

$$E_i = E_{ni} + A_i + B_i$$

Where

$E_{ni}$  is the interfering field strength at the French coast of the i-th transmitter. This value shall be determined using the ITU-R Recommendation PN1546 curves, for the case of 10 % time, 50 % location and  $h_2 = 10$  m.

$A_i$  is the Radio frequency protection ratio associated with the i-th transmitter. This value shall be determined from tables 3, 5 and figure 2 of ITU Recommendation IS.851 (tropospheric interference), noting that for some paths the interference may be continuous.

$B_i$  is the receiving antenna discrimination factor associated with the i-th transmitter. It shall be -16 dB for horizontally polarised Broadcasting transmitters in France, and equal to the receiving antenna directivity discrimination, according to Recommendation ITU-R BT 419 for vertically polarised Broadcasting transmitters in France.

The nuisance fields from mobile stations shall be calculated according to section 4.1.3 and 4.1.4 of ITU-R Recommendation IS.851 i.e. by considering the mobile station as located at the same place as the base station, with an effective height of 75 m and an adjustment factor of -15 dB.

### **Explanatory note**

Within the bandwidth of a television channel there is the potential to use up to 500 mobile channels. Multiple narrow-band transmissions may produce additional interfering effect into the relatively broadband television signal. The addition from a single site will be a power addition as detailed above. From different sites however an attempt should be made to use the statistical (in locations) nature of propagation and the simplified multiplication method is appropriate.

The protection ratio for the television signal is not constant over the television channel and thus an individual value is used for each mobile channel. Advantage is taken of the horizontal polarisation used in France by including an antenna discrimination factor.

Mobile stations will produce a smaller interfering effect than base stations because of their lower antenna height above ground, leading to greater shielding by terrain and buildings, and because of their typically lower radiated power. A global reduction of 15 dB is assumed to allow for these factors.

## ANNEX 3

### CO-ORDINATION METHOD FOR THE PROTECTION OF LAND MOBILE SERVICES IN THE UK FROM INTERFERENCE CAUSED BY TV BROADCASTING IN FRANCE

The maximum interfering field strength measured in a 12.5 kHz bandwidth for 50% locations and 10% of the time at a height of 10m above ground shall be:

30 dB $\mu$ V/m for horizontally polarised broadcasting emissions (12 dB $\mu$ V/m Interfering F.S.+18 dB cross polarisation)

12 dB $\mu$ V/m for vertically polarised broadcasting emissions

This field strength shall not be exceeded at the coastline of the United Kingdom in the frequency band 47- 68 MHz.

For the purpose of calculation, ITU-R Recommendation PN.1546 shall be used for the case of 10% time, 50 % locations and  $h_2= 10\text{m}$ .

#### **Explanatory Note:**

In the band 47-68 MHz, the minimum median value of the field strength to be protected for analogue systems using 12.5 kHz channel is 22 dB $\mu$ V/m signal quality 4, from Table 14 and note (1) of ITU-R Recommendation IS. 851.

The protection ratio for analogue land mobile systems is 10 dB, from Table 16 of ITU-R Recommendation IS. 851.

The adjustment factor for cross polarisation emissions is -18 dB, from section 4.1 of ITU-R Recommendation IS. 851.

## ANNEX 4

### TV BROADCAST TRANSMITTERS IN FRANCE REQUIRING PROTECTION

TV Transmitter Site	LONG/LAT	SECAM Channel	Vision MHz	Sound MHz	Max Erp (kW)	UK Systems
CAEN	0037W 4858N	2 H	55.75	49.25	50	LPS
CHARTRES	0101E 48.24N	2V	55.75	49.25	1	LPS
BREST	0353W 4825N	2V	55.75	49.25	1	LPS
NANTES	0126W 4711N	2H	55.75	49.25	1	LPS
CHERBOURG	0133W 4937N	2H	55.75	49.25	1	LPS
AMIENS	0224E 4931N	2H	55.75	49.25	1	LPS
RENNES	0157W 4817N	4H	63.75	57.25	10	LPS/LM
LE HAVRE	0011E 4931N	4H	63.75	57.25	2	LPS/LM
LA ROCHE-SUR-YON	0125W 4640N	4H	63.75	57.25	0.015	LPS/LM
QUIMPERLE	0333W 4752N	4H	63.75	57.25	0.001	LPS/LM

LPS: Low Power Systems

LM: Land Mobile

## ANNEX 5

### ANCILLARY BROADCAST LINKS

#### Sound links in UK

Frequency		Power	Bandwidth Max/Min	Class of Emission	Licensed apparatus/Restrictions
47.55	48.8 MHz	25 W	200k0 12k5	F1D__ F2D__ F3E__ F7D__ F8E__ F9E__ F9W__ G3E__	On a non-interference basis to continental broadcasting.
52	52.95 MHz	25 W	200k0 12k5	F1D__ F2D__ F3E__ F7D__ F8E__ F9E__ F9W__ G3E__	On a non-interference basis to continental broadcasting.
53.75	55.75 MHz	5 W	200k0 12k5	F1D__ F2D__ F3E__ F7D__ F8E__ F9E__ F9W__ G3E__	On a non-interference basis to continental broadcasting.
60.75	62.75 MHz	5 W	200k0 12k5	F1D__ F2D__ F3E__ F7D__ F8E__ F9E__ F9W__ G3E__	On a non-interference basis to continental broadcasting.
67.7500	67.8375MHz	25 W	12k5	F1D__ F2D__ F3E__ F7D__ F8E__ F9E__ F9W__ G3E__	On a non-interference basis to continental broadcasting.

#### Sound links in France

Frequency	Bandwidth	Comments
47,0125-47,1125 MHz paired with 50,0125-50,1125 MHz	4 channel duplex 25 kHz	
47,5 MHz paired with 50,5 MHz	Single channel duplex 25 kHz	Only in Paris area
47,7 MHz paired with 50,7 MHz	Single channel duplex 25 kHz	
53 MHz	Single channel simplex 25 kHz	