

Commission for
Communications Regulation

Ofcom
OFFICE OF COMMUNICATIONS

**MEMORANDUM OF UNDERSTANDING ON
FREQUENCY CO-ORDINATION
BETWEEN IRELAND AND
THE UNITED KINGDOM
IN THE FREQUENCY BANDS
880 - 890 MHz and 925- 935 MHz
DESIGNATED FOR EGSM**

1 - INTRODUCTION

1.1 Within Ireland and the United Kingdom, the frequency bands 880 - 890 MHz and 925 – 935 MHz are designated to be used for EGSM¹.

1.3 It is necessary to establish agreements for regulatory and technical procedures for frequency co-ordination, in order to minimise interference problems between systems operating in neighbouring countries. These agreements should be designed to reduce the administrative burden and permit a deployment of GSM in the countries concerned.

1.4 This MOU is based on the principles established in CEPT Recommendation T/R 20-08³

2 - AGREEMENT

The Administrations of Ireland and the United Kingdom agree to operate the co-ordination procedure described below.

3 - ESTABLISHMENT OF BASE-STATIONS

3.1 - Preferred frequencies

The rules allowing establishment of base stations without co-ordination shall be based on the concepts outlined in sections 3.3 and 3.4. The bands 880 -890 MHz and 925-935 MHz shall be divided into groups of frequencies which shall be assigned equally between the networks of Ireland and the United Kingdom as "preferred frequencies".

3.2 - Field strength prediction

The field strength shall be predicted by the method of CEPT T/R 20-08³. Annex A provides a summary of the method, together with some additional text to resolve ambiguities in the CEPT document.

3.3 - Use of the preferred bands

A base station may be established without co-ordination, in a preferred band allocated to a network, provided that the predicted field strength at all points along a line 15km inside the neighbouring country does not exceed 19dBµV/m.

3.4 - Use of the non-preferred bands

A base station may be established without co-ordination, to operate at a frequency outside the preferred bands on condition that the predicted field strength, at all points on the border or the territory, does not exceed 19dBµV/m. No base station may be established within 10km of the border in the non-preferred band without co-ordination (as detailed in paragraph 3.6) since the method of propagation prediction does not apply at distances of less than 10km.

3.5 - Exchange of information between operators

An MoU between the administrations of Ireland and the United Kingdom which enables co-ordination between operators, subject to agreement of the Administrations, was signed on the 13th October 1999⁵.

¹ ERC Decision (97) 02 of 21 March 1997 on the extended frequency bands to be used for the GSM Digital Pan-European Communications System.

³ The European Conference of Postal and Telecommunications Administrations, Recommendation T/R 20-08 E (Lecce 1989 CR), Frequency planning and frequency coordination for the GSM system.

⁵ Agreement between the administrations of the United Kingdom and Ireland concerning the approval of planning arrangements between operators of mobile radiocommunications network 13 October

At the request of a mobile operator, operators from the neighbouring country shall make details of existing base stations available. Where interference is believed to arise between operators, they should exchange information, with a view to resolving the difficulty. A copy of the interference details shall also be sent to both administrations.

The Administrations of Ireland and the United Kingdom agree to facilitate this exchange of information between operators and to intervene should operators not be able to resolve cases of interference by mutual agreement.

3.6 - Co-ordination procedure

The Administration of Ireland and the United Kingdom are committed to ensuring that the operators of their GSM networks, covered by this Memorandum of Understanding, respect the limits for establishment of base stations without co-ordination, given in 3.3 and 3.4 above. However, there might be an occasional need to establish stations such that the field strength at the border will exceed these limits. In such cases, each administration may seek co-ordination according to the procedure described in Paragraph 4 of CEPT Recommendation T/R 20-08³ and in line with the format given in CEPT T/R 25-08⁶.

⁶ The European Conference of Postal and Telecommunications Administrations, Recommendation T/R 25-08 (Lecce 1989, revised in Vienna 1999) Planning criteria and coordination of frequencies in the land mobile service in the range 29.7-960 MHz

4 - PREFERRED BANDS

The allocation of preferred bands between the United Kingdom and Ireland shall be:

EGSM ARFCN	Preferred	Non preferred
975-982	Ireland	United Kingdom
983-990	United Kingdom	Ireland
990-994	Ireland	United Kingdom
995-998	United Kingdom	Ireland
999-1002	Ireland	United Kingdom
1003-1006	United Kingdom	Ireland
1007-1014	Ireland	United Kingdom
1015-1022	United Kingdom	Ireland
1023-0		Ireland and United Kingdom

Annex B gives a channel by channel list of the operator assignments.

5 - REVIEW ARRANGEMENTS

The terms of this Memorandum of Understanding may be modified by mutual agreement of both administrations.

6 - TERMINATION OF THE MEMORANDUM OF UNDERSTANDING

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

7- DATE OF ENTRY INTO FORCE

This memorandum of Understanding shall enter into force on December 1st 2005.

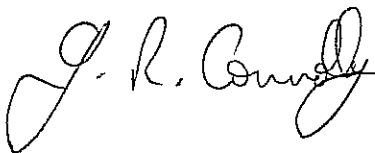
Done at London on November 4th 2005.

For the UNITED KINGDOM administration



B. LAST

For the administration of IRELAND



J. CONNOLLY

Originals of this Memorandum of Understanding for Frequency Co-ordination will be laid down with the Office of Communications (Ofcom) in London and the Commission for Communications Regulation (Comreg) in Dublin.

Annex A - Propagation Prediction Method

The method of field strength prediction shall be based upon the curves given in Annex 1 of CEPT Recommendation T/R 20-08 (3), on pages 3 and 5 and the correction factors given on page 4. The following paragraphs fully define the method.

A.1 Correction Factors

The following correction factors are added to the values derived from the curves referred to above:

- A general correction factor of -2dB for the 900MHz band
- A correction factor to allow for the height of the mobile antenna of:
 - 10 dB over sea paths
 - 10 dB over land paths at distances of <50km
 - 3dB over land paths at distances >100km
- Linear interpolation in dB used for distances between 50 and 100km

The overall effect of these correction factors is illustrated in figure A.1 below

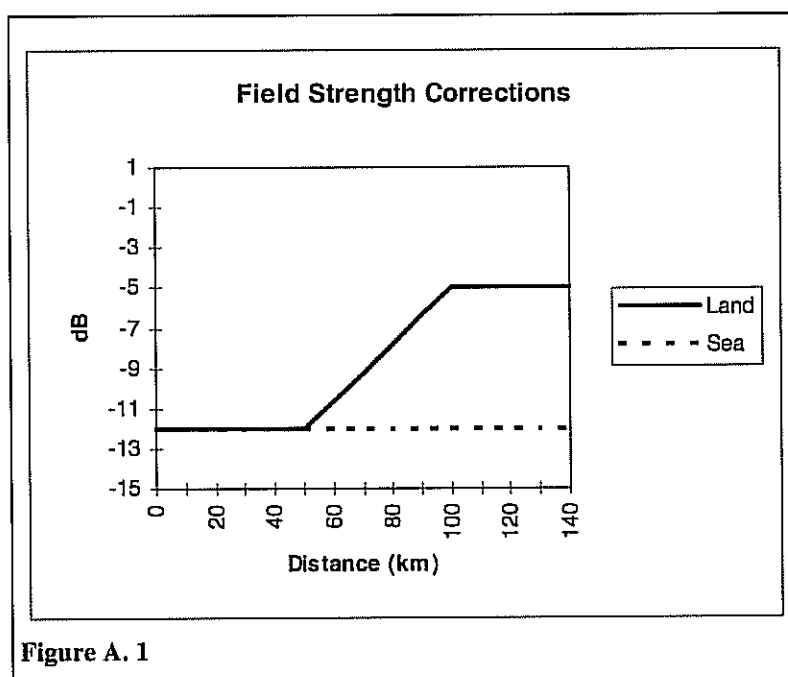


Figure A. 1

A.1 - Effective Antenna Height

Following the principles from ITU-R P370 (on which the T/R 20-08 propagation curves are based) the effective antenna height shall be defined as: The antenna height above the average ground level between distances of 3km and 15km from the transmitter, in the direction of the receiver. For prediction at distances of less than 15km and more than 10km from the transmitter, the effective antenna height shall be defined as the antenna height above the average ground level between the receiver location and a point 3km from the transmitter, in the direction of the receiver.

A.2 - Interpolation between Curves for Different Antenna Heights

When the effective antenna height falls between the values for which curves are given, the field strength in dB μ V/m shall be found by linear interpolation between the appropriate pair of curves. If the effective antenna height falls outside the range of heights for which curves are given, the value from the nearest available curve shall be used.

A.3 - Interpolation for Mixed Land-Sea Paths

In the case of mixed land-sea paths, the field strength in dB μ V/m shall be found by linear interpolation between the values determined for land and sea paths, according to the relative proportions of land and sea along the path, as follows:

$$E = (d_{sea} / d_{total}) \times E(sea, d) + (d_{land} / d_{total}) \times E(land, d)$$

d_{sea} is the length of the sea path

d_{land} is the length of the land path

$d_{total} = d_{sea} + d_{land}$ is the total path length

$E(land, d)$ is the field strength value in dB μ V/m given by the curves of T/R 20-08 applicable to land propagation for a path length (d), plus the appropriate correction factor for a path length (d).

$E(sea, d)$ is the field strength value in dB μ V/m given by the curves of T/R 20-08 applicable to sea propagation for a path length (d), plus the appropriate correction factor.

A.4 - Use of Base Station Antenna Patterns

Calculation of predicted field strengths should take into account the radiation pattern of the base station antenna in azimuth and elevation. In the case of predictions to receiver locations along an obstructed path, the vertical angle to the visible horizon rather than to the receiver shall be used. Simplified calculations may be used which ignore the vertical radiation pattern of the antenna. In this case, the gain at the peak of the vertical pattern shall be used, in order to achieve a worst-case prediction.

Annex B Operator channel assignments

.Ch. N	National Preferential Administration	UK Operator	Ireland Operator	Frequencies MHz					
				Mobile to Base			Base to Mobile		
975	Ireland	Vodafone	A	880.1	to	880.3	925.1	to	925.3
976	Ireland	Vodafone	A	880.3	to	880.5	925.3	to	925.5
977	Ireland	Vodafone	A	880.5	to	880.7	925.5	to	925.7
978	Ireland	Vodafone	A	880.7	to	880.9	925.7	to	925.9
979	Ireland	Vodafone	A	880.9	to	881.1	925.9	to	926.1
980	Ireland	Vodafone	A	881.1	to	881.3	926.1	to	926.3
981	Ireland	Vodafone	A	881.3	to	881.5	926.3	to	926.5
982	Ireland	Vodafone	A	881.5	to	881.7	926.5	to	926.7
983	UK	Vodafone	A	881.7	to	881.9	926.7	to	926.9
984	UK	Vodafone	A	881.9	to	882.1	926.9	to	927.1
985	UK	Vodafone	A	882.1	to	882.3	927.1	to	927.3
986	UK	Vodafone	A	882.3	to	882.5	927.3	to	927.5
987	UK	Vodafone	A	882.5	to	882.7	927.5	to	927.7
988	UK	Vodafone	A	882.7	to	882.9	927.7	to	927.9
989	UK	Vodafone	A	882.9	to	883.1	927.9	to	928.1
990	UK	Vodafone	A	883.1	to	883.3	928.1	to	928.3
991	Ireland	Vodafone	B	883.3	to	883.5	928.3	to	928.5
992	Ireland	Vodafone	B	883.5	to	883.7	928.5	to	928.7
993	Ireland	Vodafone	B	883.7	to	883.9	928.7	to	928.9
994	Ireland	Vodafone	B	883.9	to	884.1	928.9	to	929.1
995	UK	Vodafone	B	884.1	to	884.3	929.1	to	929.3
996	UK	Vodafone	B	884.3	to	884.5	929.3	to	929.5
997	UK	Vodafone	B	884.5	to	884.7	929.5	to	929.7
998	UK	Vodafone	B	884.7	to	884.9	929.7	to	929.9
999	Ireland	Vodafone	B	884.9	to	885.1	929.9	to	930.1
1000	Ireland	02	B	885.1	to	885.3	930.1	to	930.3
1001	Ireland	02	B	885.3	to	885.5	930.3	to	930.5

1002	Ireland	02	B	885.5	to	885.7	930.5	to	930.7
1003	UK	02	B	885.7	to	885.9	930.7	to	930.9
1004	UK	02	B	885.9	to	886.1	930.9	to	931.1
1005	UK	02	B	886.1	to	886.3	931.1	to	931.3
1006	UK	02	B	886.3	to	886.5	931.3	to	931.5
1007	Ireland	02	C	886.5	to	886.7	931.5	to	931.7
1008	Ireland	02	C	886.7	to	886.9	931.7	to	931.9
1009	Ireland	02	C	886.9	to	887.1	931.9	to	932.1
1010	Ireland	02	C	887.1	to	887.3	932.1	to	932.3
1011	Ireland	02	C	887.3	to	887.5	932.3	to	932.5
1012	Ireland	02	C	887.5	to	887.7	932.5	to	932.7
1013	Ireland	02	C	887.7	to	887.9	932.7	to	932.9
1014	Ireland	02	C	887.9	to	888.1	932.9	to	933.1
1015	UK	02	C	888.1	to	888.3	933.1	to	933.3
1016	UK	02	C	888.3	to	888.5	933.3	to	933.5
1017	UK	02	C	888.5	to	888.7	933.5	to	933.7
1018	UK	02	C	888.7	to	888.9	933.7	to	933.9
1019	UK	02	C	888.9	to	889.1	933.9	to	934.1
1020	UK	02	C	889.1	to	889.3	934.1	to	934.3
1021	UK	02	C	889.3	to	889.5	934.3	to	934.5
1022	UK	02	C	889.5	to	889.7	934.5	to	934.7
1023	non pref (1)	02		889.7	to	889.9	934.7	to	934.9
0	non pref (1)	02		889.9	to	890.1	934.9	to	935.1

(1) Non preferential channel for both administrations