



Commission for
Communications Regulation



**MEMORANDUM OF UNDERSTANDING ON
FREQUENCY COORDINATION BETWEEN
IRELAND AND THE UNITED KINGDOM OF GREAT BRITAIN AND
NORTHERN IRELAND
CONCERNING THE SPECTRUM COORDINATION
OF SCANNING TELEMETRY NETWORKS
IN THE UHF FREQUENCY RANGE 456.9875 – 458.5 / 462.4875 –
464.0 MHz APPLIED IN THE AREA INCLUDING IRELAND,
THE UNITED KINGDOM AND NORTHERN IRELAND**

1 INTRODUCTION

1.1 Scope of MoU

This Memorandum of Understanding (MoU) describes the procedures for the coordination of Scanning Telemetry (ST) networks between Ireland and the United Kingdom of Great Britain and Northern Ireland (UK), in particular for National ST licences in the UHF spectrum. For the purposes of this MoU, the ST frequency range in the UK extends from 457.5 to 458.5 MHz paired with 463 to 464 MHz, and the ST frequency range in Ireland extends from 456.9875 to 458.475 MHz paired with 462.4875 to 463.975 MHz.

The MoU therefore covers the frequency range 456.9875 – 464MHz but only applies to those frequencies where ST services are used exclusively in the territories of both the UK and Ireland (i.e. where the ST channels are fully within the overlapping ST frequency blocks used by the two administrations, specifically: 457.5 – 458.475 MHz & 463 – 463.975 MHz). For the frequencies where one administration uses ST and the other Administration uses non-ST systems, coordination is still required and should be carried out in the same manner as the current coordination process for non-ST systems.

1.2 Current Scanning Telemetry Band Plans

The administrations of Ireland and the UK have licensed utility services operating on a National basis within their respective territories for ST networks. Both administrations have adopted a common Adaptable Cellular Plan (ACP¹), comprising of 72 (2 x 12.5 kHz) channels arranged over a 12-cell repeating/reuse structure, with 6 channels available per cell². In Ireland, there are, at present, two main utility operators (Electricity and Water), utilising two blocks of 12 (2x12.5 kHz) channels for Electricity and one block of 12 (2x12.5 kHz) channels for Water on a national ACP. All 36 currently licensed channels in Ireland are allocated according to the common 12 Cell repeating/reuse structure. In the UK there are two national licences operating on the national ACP; one licence allowing access to 48 (2 x12.5 KHz) channels (with 24 channels allocated to the gas industry and 24 channels allocated to the electricity industry) and the other licence allowing access to 24 (2 x 12.5 KHz) channels which are allocated to the water industry³. All 72 channels are allocated in the UK across the common 12 Cell repeating/reuse structure. A further 8 (2x12.5 kHz) channels are also available in the UK primarily for non-utility applications⁴ which do not form part of the UK ACP. The frequency ranges and channels for the above are described in ANNEX C (Ireland) and ANNEX D (UK) of this MoU.

¹ The ACP defines cells with a radius = 25 km and a twelve cell cluster {A, B, C, D, E, F, G, H, J, K, L, M} that is repeated and extends across the entire UK & Northern Ireland & Ireland; this gives a frequency re-use distance of 150 km. Six radio channels are allocated to each cell and each utility (e.g. Gas, Electricity & Water) has access to two of these channels. The ACP also has 'adaptive features'. Specifically, in order for the assigner to be able to cope with assignment difficulty or excess demand in a cell, frequencies can be migrated from non-adjacent cells. This procedure is specified in the TFAC including a look-up table of frequencies that can be migrated into a specific cell.

² It is noted that the 72 2x12.5 KHz channels available in Ireland across the 2 x 1.4875 MHz ST band are not entirely contiguous, consisting also of some interleaved 12.5 kHz channels which are offset by 6.25 kHz. In the UK, channels are contiguous across the 2 x 1MHz which gives 2 x 80 12.5 KHz Channels (i.e. 72 + 8).

³ Seventy two of the eighty channels available in the UK are specified in the Adaptable Cellular Plan (ACP).

⁴ The 8 non-ACP channels can also be used by the water industry under certain circumstances.

Spectrum available for ST licensing is illustrated in Figure 1, below, for both administrations:

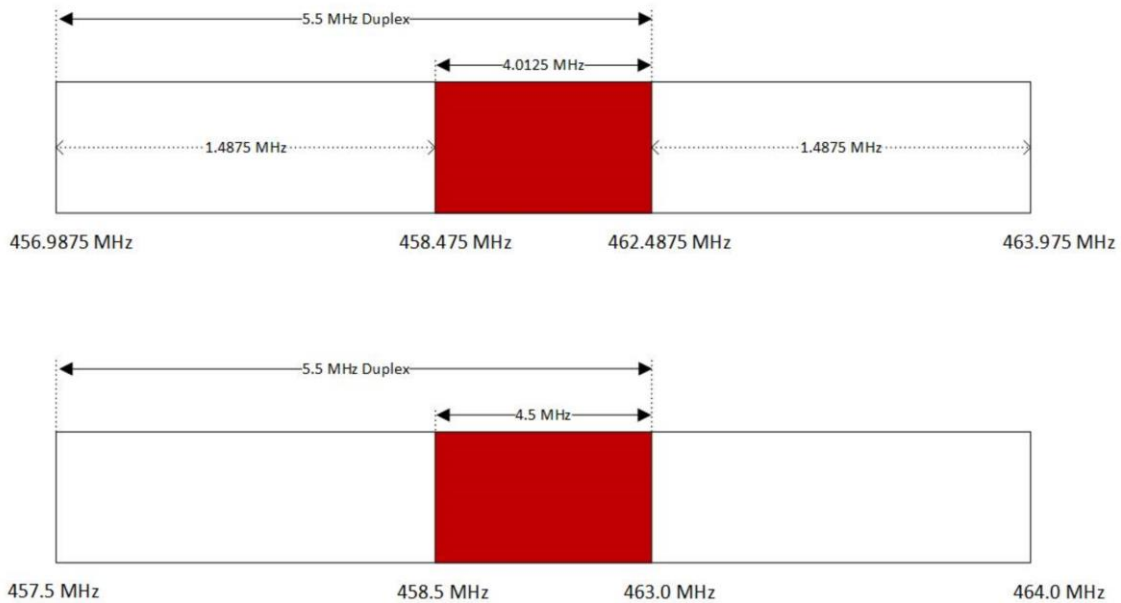


Figure 1 Ireland (top) and UK (bottom) Telemetry band plans

As indicated in Figure 1, the band plans for Ireland and the UK are not in full alignment with one another and not all the ST channels align exactly. Where the bands are not in alignment, it should be noted that other services may be in operation in one Administration, whilst telemetry systems may be operational in the other.

1.3 Relevant International Telecommunications Union (ITU) Provisions and MoU Purpose

The provisions of this MoU add to the requirements of the ITU Constitution and the ITU Radio Regulations, which both have the status of an International Treaty, and in particular:

- Article°15.2 of the ITU Radio Regulations: “*Transmitting stations shall radiate only as much power as is necessary to ensure a satisfactory service*”
- Articles°15.3, 15.4 & 15.5 of the ITU Radio Regulations: “*In order to avoid interference [...], a) locations of transmitting stations and, where the nature of the service permits, locations of receiving stations, shall be selected with particular care; b) radiation in and reception from unnecessary directions shall be minimized by taking the maximum practical advantage of the properties of directional antennas whenever the nature of the service permits*”

This MoU has therefore been established with a view to further:

- reducing the risk of harmful interference⁵ between ST systems operating in neighbouring countries; and
- optimising the use of spectrum resources in the border areas.

In particular, this MoU has been established with a view to implementing a balanced and pragmatic solution between:

- minimising the potential of harmful emissions, emanating from one neighbouring territory into another, that may cause harmful interference to or may prevent the other Administration from utilising portions of its allocated national spectrum; and,
- easing resource burden on both administrations and the operators of ST systems, while ensuring that the risk of interference across the Ireland / UK international border is adequately managed.

The coordination procedure in this MoU is based on the principle of equitable access to the spectrum resource, taking into account that neighbouring Administrations need to accept and agree a certain level of interference (as defined in Article^o1.168 of the ITU Radio Regulations⁶) to facilitate coordination.

1.4 Existing Scanning Telemetry Systems Prior to the Introduction of this MoU

It is also accepted and agreed that, given ST systems have been established and operated for a number of years prior to the introduction of this MoU, Stations that are operational at the time of this MoU coming into force, shall be deemed to be coordinated without requiring further formal action.⁷

2 SPECTRUM PLANS FOR SCANNING TELEMETRY SYSTEMS AND REQUIREMENT FOR COORDINATION

2.1 National Adaptive Cellular Plan

The national cellular re-use plan for both administrations, as illustrated in figure 2 below, was developed to facilitate the operation of 72 national duplex channels⁸ (2 x 12.5 kHz) with adequate levels of co-channel interference protection between adjacent cells. The cellular plan also provides an effective framework for coordinating cross border utility operators, where there is channel alignment. The high-level structure and parameters of the national cellular plan used by both administrations are as follows:

⁵ Article^o1.169 of the ITU Radio Regulations - "*Harmful Interference*: Interference which endangers the functioning of a radionavigation service or of other safety services or seriously degrades, obstructs, or repeatedly interrupts a radiocommunication service operating in accordance with Radio Regulations."

⁶ Article^o1.168 of the ITU Radio Regulations: "*Accepted interference*: Interference at a higher level than that defined as permissible interference and which has been agreed upon between two or more administrations without prejudice to other administrations."

⁷ It is, however, also noted that, in cases where existing stations operate in excess of the coordination limits as set out under this MoU, there may be a risk that these stations could have an adverse impact on newly planned or implemented stations not yet operational at the time of initial implementation of this MoU. New stations (following the introduction of this MoU) should therefore take this aspect into account at the planning stage. While it is noted that such cases are outside the scope of this MoU, all parties concerned are encouraged to work together with the aim of pragmatically resolving any potential interference scenarios if needed.

⁸ Although every effort has been made to align the 72 national duplex channels with one another insofar as possible in both territories, full alignment across all channels has been not possible to achieve. Please refer to Tables 1a and 1b (p7 & p8) for specific channel alignment details, including the 8 UK 'non-utility' channels.

- 72 channels arranged on a twelve-cell regular frequency re-use plan.
- 12 cells per cluster (see figure 2 below),
- 6 (2x12.5 kHz) channels per cell
- Cell radii set at 25 km, giving a standard co-channel re-use distance of 150 km;
- Potential channel re-use of 23 times across the UK and 6 times across Ireland;

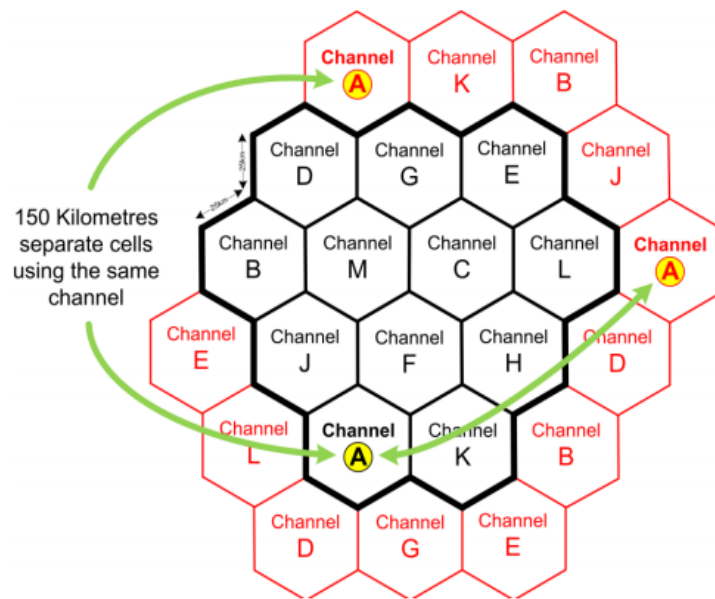


Figure 2 National Telemetry Reuse Plan⁹

Note: In the UK there are also an additional 8 Non-Utility ST channels that have similar technical characteristics that do not form part of the national cellular plan and are instead separately and individually coordinated.

2.2 Coordination Requirement

Existing Stations that are operational at the time this MoU comes into force

Stations that are operational at the time of this MoU coming into force shall be deemed to be coordinated without requiring further action.

New Stations following the introduction of this MoU - Coordinated Frequencies

A Scanning Telemetry base station may be established without cross border coordination if operating on an assigned 'coordinated channel', as outlined in Tables 1a and 1b below or on a channel that falls fully within the overlapping ST frequency blocks used by the two administrations (i.e. 457.5 – 458.475 MHz & 463 – 463.975 MHz), provided that the field strength at all points at a height of 10 m above ground and at a distance of 15 km inside the

⁹ For further reference, Annexes A and B provide more detailed cellular re-use plan illustrations for both the UK and Ireland respectively.

neighbouring country does not exceed 18.5 dB μ V/m. Should the predicted field strength exceed the values outlined above, and unless an arrangement exists between operators (as outlined in section 4), coordination must be carried out using the procedures referred to in Section 5.

To establish the predicted field strength produced by a station, the methodology as set out in section 3 shall be employed.

A Scanning Telemetry base station in one jurisdiction with an outstation in another is considered to be operating "cross-border". Cross-border operation must be coordinated with both the UK and Ireland using the procedure referred to in Section 5, unless:

1. An agreement exists between all potentially affected operators as outlined in Section 4; and
2. The channel used is an assigned coordinated channel, as per Table 1, below.

Coordinated Channels: Ireland and UK

Tables 1a and 1b are based on the UK channel band plan for national use (Ref: Annex B of OfW49). Irish channels aligned with the UK are referenced in square brackets within the relevant cells, using the format [XN] and are referred to as 'Coordinated Channels' for the purpose of this MoU. Unaligned channels are highlighted in Grey¹⁰.

UK Scanning Telemetry Channels												
Cell	Gas				Electricity				Water			
	Channel 1		Channel 2		Channel 1		Channel 2		Channel 1		Channel 2	
	Base	Outstation	Base	Outstation	Base	Outstation	Base	Outstation	Base	Outstation	Base	Outstation
A	458.20625 T57 [A2]	463.70625 T57 [A2]	458.23125 T59 [A3]	463.73125 T59 [A3]	457.53125 T3	463.03125 T3	457.64375 T12 [A1]	463.14375 T12 [A1]	458.04375 T44	463.54375 T44	458.08125 T47	463.58125 T47
B	458.35625 T69 [B6]	463.85625 T65 [B6]	458.30625 T65 [B5]	463.80625 T65 [B5]	457.89375 T32	463.39375 T32	457.56875 T6	463.06875 T6	457.75625 T21 [B1]	463.25625 T21 [B1]	457.94375 T36	463.44375 T36
C	458.09375 T48	463.59375 T48	458.11875 T50 [C3]	463.71875 T50 [C3]	457.85625 T29 [C1]	463.35625 T29 [C1]	457.99375 T40 [C2]	463.49375 T40 [C2]	457.88125 T31	463.38125 T31	458.19375 T56	463.59375 T56
D	458.10625 T49 [D3]	463.60625 T49 [D3]	458.13125 T51 [D4]	463.63125 T51 [D4]	457.65625 T13 [D1]	463.15625 T13 [D1]	457.79375 T24	463.29375 T24	457.66875 T14	463.16875 T14	457.69375 T16 [D2]	463.19375 T16 [D2]
E	458.29375 T64 [E5]	463.79375 T64 [E5]	458.31875 T66 [E6]	463.81875 T66 [E6]	457.83125 T27 [E1]	463.33125 T27 [E1]	457.58125 T7	463.08125 T7	457.86875 T30 [E2]	463.36875 T30 [E2]	457.95625 T37 [E3]	463.45625 T37 [E3]
F	458.24375 T60 [F2]	463.74375 T60 [F2]	458.26875 T62 [F6]	463.76875 T62 [F6]	458.00625 T41 [F1]	463.50625 T41 [F1]	457.80625 T25	463.30625 T25	457.93125 T35	463.43125 T35	458.05625 T45	463.55625 T45
G	458.36875 T70 [G6]	463.86875 T70 [G6]	458.39375 T72 [G4]	463.89375 T72 [G4]	457.61875 T10 [G1]	463.11875 T10 [G1]	457.63125 T11 [G2]	463.13125 T11 [G2]	457.73125 T19 [G3]	463.23125 T19 [G3]	457.70625 T17	463.20625 T17
H	458.25625 T61 [H4]	463.75625 T61 [H4]	458.28125 T63 [H6]	463.78125 T63 [H6]	457.60625 T9 [H1]	463.10625 T9 [H1]	457.91875 T34 [H2]	463.41875 T34 [H2]	457.96875 T38 [H3]	463.46875 T38 [H3]	458.06875 T46	463.56875 T46
J	458.14375 T52 [J2]	463.64375 T52 [J2]	458.16875 T54 [J3]	463.66875 T54 [J3]	457.78125 T23	463.28125 T23	457.84375 T28 [J1]	463.34375 T28 [J1]	457.55625 T5	463.05625 T5	457.68125 T15	463.18125 T15
K	458.33125 T67	463.83125 T67	458.21875 T58 [K2]	463.71875 T58 [K2]	457.51875 T2	463.01875 T2	457.90625 T33 [K5]	463.40625 T33 [K5]	457.50625 T1	463.00625 T1	457.98125 T39 [K1]	463.48125 T39 [K1]
L	458.34375 T68 [L5]	463.84375 T68 [L5]	458.38125 T71 [L6]	463.88125 T71 [L6]	457.59375 T8 [L1]	463.09375 T8 [L1]	457.81875 T26	463.31875 T26	457.74375 T20 [L4]	463.24375 T20 [L4]	458.03125 T43	463.53125 T43
M	458.15625 T53 [M1]	463.65625 T53 [M1]	458.18125 T55	463.68125 T55	457.54375 T4	463.04375 T4	458.01875 T42	463.51875 T42	457.71875 T18	463.21875 T18	457.76875 T22	463.26875 T22

Table 1a: UK Channel Band Plan with Aligned Channels for Ireland Overlaid

¹⁰ For reference, the entire channel listing for both the Ireland and the UK is provided in Annexes C and Annex D respectively.

Base	Outstation
458.40625 T73 [A6]	463.90625 T73 [A6]
458.41875 T74	463.91875 T74
458.43125 T75	463.93125 T75
458.44375 T76 [C6]	463.94375 T76 [C6]
458.45625 T77 [J6]	463.95625 T77 [J6]
458.46875 T78 [M6]	463.96875 T78 [M6]
458.48125 T79	463.98125 T79
458.49375 T80	463.99375 T80

Table 1b: Non-Utility UK Scanning Telemetry Channels with Aligned Channels for Ireland Overlaid

Table 1a & 1b Reference

[XN]	X = RoI Cell Reference
ANNEX C	N = RoI Block Reference

Tnn	T = UK Transmit Frequency Reference
ANNEX D	nn = UK Channel Number

UNALIGNED

3 PREDICTION OF PROPAGATION

The field strength prediction method shall be according to the latest version of Recommendation ITU-R P.1812¹¹, for

- 1% of the time and 50% of locations

taking account of the:

- Terrain profile
- Clutter (e.g. Urban, Suburban, Rural)
- Effective Isotropic Radiated Power (EIRP) of base station
- Antenna tilt and azimuth if appropriate

¹¹ Recommendation ITU-R P.1812, A path-specific propagation prediction method for point-to-area terrestrial services in the VHF and UHF bands

4 ARRANGEMENT FOR PLANNING AT AN OPERATIONAL LEVEL

A “Framework” MoU between the administrations of Ireland and the United Kingdom, which enables planning arrangements between operators, subject to agreement of the Administrations, was signed on 1st May 2005¹².

The administrations of Ireland and the UK agree to extend the principle of the Framework MoU to all operators of ST systems operating in the frequency bands that are the subject of this MoU.

Licensees holding rights, in each of the neighbouring countries, to use the frequencies of operation of a radio communication station may mutually agree conditions whereby a station can exceed the predicted field strength as set out in section 2.2.

Where licensees have reached such a mutual agreement, coordination of the corresponding station in accordance with Section 5 is not required, subject to the terms of the agreement between the licensees and subject to the agreement being lawful.

It is the responsibility of the licensees to ensure that:

- the agreement is lawful;
- an appropriate agreement is reached with all licensees in the neighbouring country authorised to use frequencies at which the predicted field strength may exceed the thresholds as set out in section 2.2.

To facilitate reasonable and timely development of their systems, licensees are encouraged to develop Arrangements which shall be made available to the relevant national Administration on request.

Operators may only negotiate Arrangements concerning the aligned ‘coordinated channels’ as set out in Table 1a and 1b of this MoU and for ST channels that fall fully within the overlapping ST frequency blocks used by the two administrations (i.e. 457.5 – 458.475 MHz & 463 – 463.975 MHz), for which they have been licensed by the National Administration. The provisions in the Arrangements shall not result in an impairment of the authorised use of radio frequencies by third parties not involved in the Arrangements.

In order to facilitate Arrangements between operators, each Administration will provide names and point of contact information for the relevant licensees, subject to the agreement of the licensees.

¹² Agreement between the administrations of the United Kingdom and Ireland concerning the approval of planning arrangements between operators of mobile radio communications networks - 1st May 2005

5 COORDINATION PROCEDURE - FREQUENCIES REQUIRING COORDINATION

Where coordination is required (see section 2.2 above) an Administration wishing to bring a ST Base Station (& its associated outstations) into service must submit a request for coordination to the other Administration by way of notice. As a minimum, the notice should include the technical parameters of the base station set out in Annex E of this MoU:

The coordination request / notice must be sent by the licensee through the Administration responsible for its authorisation.

The Administration affected shall evaluate the request for coordination and shall, within 60 days, notify the result of the evaluation to the Administration requesting coordination.

If in the course of the coordination procedure the Administration affected requires additional information, it may request such information.

An Administration not having responded within 60 days following receipt of a coordination request shall be deemed to have given its consent, and the station may be put into use with the characteristics given in the request for coordination.

6 HARMFUL INTERFERENCE

In the event of interference between authorised users of the bands in Ireland and the UK, and where interference is believed to be caused by the other operator(s), the affected users shall exchange information between themselves with a view to resolving the interference by mutual agreement. A report of the interference and the details of the information exchanged shall be sent to both Administrations who can, if requested, intervene should operators not be able to resolve cases of interference by mutual agreement.

7 REVIEW AND FOLLOW UP OF THE MOU

Either signatory Administration may request a review of this MoU. Any part of this MoU may be revised in the light of future developments (e.g. introduction of new technologies) and experience in the operation of the networks covered by the MoU.

8 TERMINATION OF THE MOU

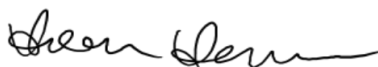
Either signatory Administration may withdraw from this MoU subject to 6 month's notice.

9 DATE OF ENTRY INTO FORCE

This MoU will enter into force on the date of signature.

Done in London/Dublin by e-mail, 4 August 2021

For the Administration of the
United Kingdom



Helen Hearn

For the Administration of Ireland



Dr Samuel Ritchie

ANNEX A

Technical Frequency Assignment Criteria 457.5 to 458.5 MHz paired with 463.0 to 464.0 MHz
OfW 49

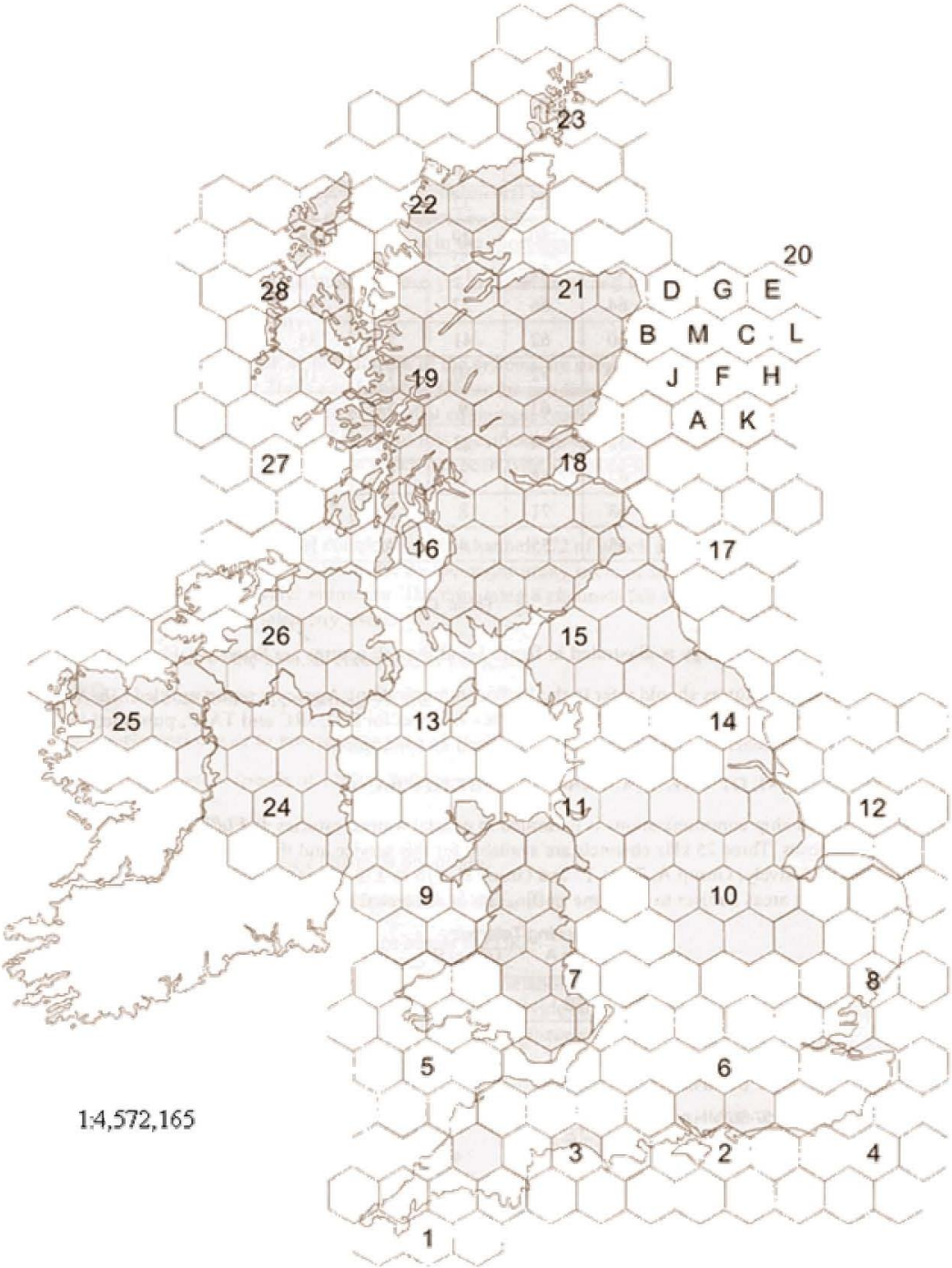


Figure 3: UK Cellular Plan for Scanning Telemetry and Telecontrol Services for the Utilities

ANNEX B

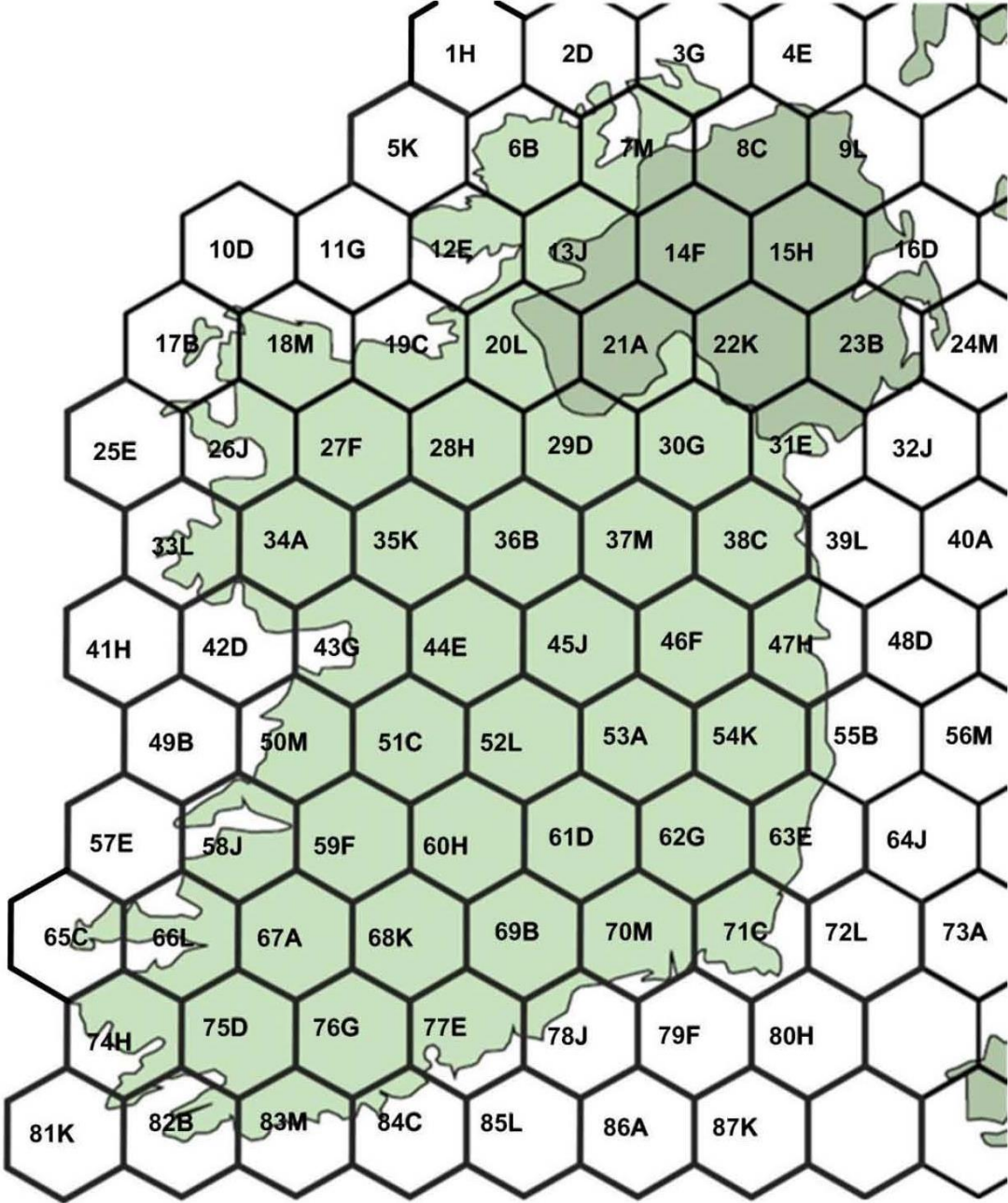


Figure 4: Cellular Plan for National Telemetry in Ireland

ANNEX C – RoI National Block Frequency Assignments

NATIONAL BLOCK FREQUENCY ASSIGNMENTS

Cell	Block 1		Block 2		Block 3		Block 4		Block 5		Block 6	
	MHz	MHz	MHz	MHz	MHz	MHz	MHz	MHz	MHz	MHz	MHz	MHz
	Base	Outstation	Base	Outstation	Base	Outstation	Base	Outstation	Base	Outstation	Base	Outstation
A	457.64375	463.14375	458.20625	463.70625	458.23125	463.73125	456.99375	462.49375	457.24375	462.74375	458.40625	463.90625
B	457.75625	463.25625	457.00625	462.50625	457.25625	462.75625	457.46875	462.96875	458.31250	462.81250	458.35625	463.85625
C	457.85625	463.35625	457.99375	463.49375	458.11875	463.61875	457.01875	462.51875	457.26875	462.76875	458.44375	463.94375
D	457.65625	463.15625	457.69375	463.19375	458.10625	463.60625	458.13125	463.63125	457.03125	462.53125	457.39375	462.89375
E	457.83125	463.33125	457.86875	463.36875	457.95625	463.45625	457.04375	462.54375	458.29375	463.79375	458.31875	463.81875
F	458.00625	463.50625	458.24375	463.74375	457.05625	462.55625	457.40625	462.90625	457.48125	462.98125	458.26875	463.76875
G	457.61875	463.11875	457.63125	463.13125	457.73125	463.23125	458.39375	463.89375	457.09375	462.59375	458.36875	463.86875
H	457.60625	463.10625	457.91875	463.41875	457.96875	463.46875	458.25625	463.75625	457.10625	462.60625	458.28125	463.78125
J	457.84375	463.34375	458.14375	463.64375	458.16875	463.66875	457.11875	462.61875	457.41875	462.91875	458.45625	463.95625
K	457.98125	463.48125	458.21875	463.71875	457.18125	462.68125	457.43125	462.93125	457.90625	463.40625	458.33750	463.83750
L	457.59375	463.09375	457.19375	462.69375	457.44375	462.94375	457.74375	463.24375	458.34375	463.84375	458.38125	463.88125
M	458.15625	463.65625	457.23125	462.73125	457.28125	462.78125	457.45625	462.95625	457.49375	462.99375	458.46875	463.96875

Figure 5: Ireland National Block Frequency Assignments (Blocks 1 and 2 – ESB, Blocks 3 – Irish Water)

Reserve	
MHz	MHz
Base	Outstation
458.493750 [UK T80]	463.993750 [UK T80]
458.48125 [UK T79]	463.98125 [UK T79]

Note:

Reserve channels are available but will only be released should an interference issue arise.

Irish Channels Not aligned with UK

Note: Blocks 4, 5 & 6 are not currently assigned in Ireland

Future Release Channel aligned with UK

ANNEX D – UK National Channels / Transmit Frequencies

The following table shows the transmit frequencies for the scanning telemetry and telecontrol radio services operating in the band 457.5 to 458.5 MHz paired with 463.0 - 464.0 MHz.

Channels	Scanner	Outstations	Channels	Scanner	Outstations	Channels	Scanner	Outstations	Channels	Scanner	Outstations
1	457.50625	463.00625	21	457.75625	463.25625	41	458.00625	463.50625	61	458.25625	463.75625
2	457.51875	463.01875	22	457.76875	463.26875	42	458.01875	463.51875	62	458.26875	463.76875
3	457.53125	463.03125	23	457.78125	463.28125	43	458.03125	463.53125	63	458.28125	463.78125
4	457.54375	463.04375	24	457.79375	463.29375	44	458.04375	463.54375	64	458.29375	463.79375
5	457.55625	463.05625	25	457.80625	463.30625	45	458.05625	463.55625	65	458.30625	463.80625
6	457.56875	463.06875	26	457.81875	463.31875	46	458.06875	463.56875	66	458.31875	463.81875
7	457.58125	463.08125	27	457.83125	463.33125	47	458.08125	463.58125	67	458.33125	463.83125
8	457.59375	463.09375	28	457.84375	463.34375	48	458.09375	463.59375	68	458.34375	463.84375
9	457.60625	463.10625	29	457.85625	463.35625	49	458.10625	463.60625	69	458.35625	463.85625
10	457.61875	463.11875	30	457.86875	463.36875	50	458.11875	463.61875	70	458.36875	463.86875
11	457.63125	463.13125	31	457.88125	463.38125	51	458.13125	463.63125	71	458.38125	463.88125
12	457.64375	463.14375	32	457.89375	463.39375	52	458.14375	463.64375	72	458.39375	463.89375
13	457.65625	463.15625	33	457.90625	463.40625	53	458.15625	463.65625	73	458.40625	463.90625
14	457.66875	463.16875	34	457.91875	463.41875	54	458.16875	463.66875	74	458.41875	463.91875
15	457.68125	463.18125	35	457.93125	463.43125	55	458.18125	463.68125	75	458.43125	463.93125
16	457.69375	463.19375	36	457.94375	463.44375	56	458.19375	463.69375	76	458.44375	463.94375
17	457.70625	463.20625	37	457.95625	463.45625	57	458.20625	463.70625	77	458.45625	463.95625
18	457.71875	463.21875	38	457.96875	463.46875	58	458.21875	463.71875	78	458.46875	463.96875
19	457.73125	463.23125	39	457.98125	463.48125	59	458.23125	463.73125	79	458.48125	463.98125
20	457.74375	463.24375	40	457.99375	463.49375	60	458.24375	463.74375	80	458.49375	463.99375

Figure 6: UK Transmit Frequencies for Scanning Telemetry and Telecontrol

The channel numbers are annotated 'Tnn', where nn represents a number from 01 to 80.

The Industry for which the channel is nominated is shown using the following colour code:

Electricity
Gas
Water
Other

ANNEX E – Minimum technical parameters to be sent as part of a coordination request

No.	Parameter Required	Units
1	Name of transmitter station site	
2	Geographical coordinates of transmitter site	To 1m accuracy
3	Ground height at transmitter station site (or mean sea level if offshore)	metres
4	Antenna height above ground level (or mean seal level if offshore)	metres
5	Transmitting frequency	MHz
6	Channel bandwidth	KHz
7	Type of antenna	
8	Antenna Polarisation	
9	Antenna Gain	dBi
10	Maximum radiated power (EIRP)	dBW
11	Azimuth in direction of maximum radiated power (boresight bearing east of true north) if applicable	degrees
12	Elevation angle of antenna in direction of maximum radiated power, if applicable	degrees