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LEGISLATIVE COUNCIL BRIEF

Telecommunications Ordinance
(Chapter 106)

TELECOMMUNICATIONS (TELECOMMUNICATIONS APPARATUS) (EXEMPTION FROM LICENSING) (AMENDMENT) ORDER 2005

INTRODUCTION

At the meeting of the Executive Council on 22 February 2005, the Council ADVISED and the Chief Executive ORDERED that the Telecommunications (Telecommunications Apparatus) (Exemption from Licensing) (Amendment) Order 2005, at Annex A, should be made under section 39 of the Telecommunications Ordinance (the Ordinance) to exempt a person from the obligation to hold a licence under the Ordinance in respect of certain telecommunications apparatus.

A

JUSTIFICATIONS

2. Several types of telecommunications apparatus (such as wireline telephones, fax terminals, mobile phones, cordless phones, remote controls, wireless microphones, portable radios, smart card readers and wireless local area network equipment) have already been exempted from the licensing obligation vide the existing exemption order. In view of the emergence of new telecommunications apparatus as a result of technological advancement, we recommend the following additional types of telecommunications apparatus in compliance with the specifications stipulated in the Order be exempted from the licensing requirement under the Ordinance.

Radio Frequency Identification (RFID) Apparatus

3. RFID is an advanced technology using radio waves to identify and track product items automatically. An RFID system consists of passive tags attached to product items, each made up of a microchip with an antenna, and a tag reader with an antenna. Through receiving electromagnetic waves transmitted from the tag reader, the passive tags will supply to the tag reader, through radio waves, information of the product items stored in the microchips.

4. RFID applications are gaining popularity in global supply chain management systems. Their use is being promoted in economies such as Australia, Canada, Japan, Korea, the United Kingdom, and the United States of America (USA). For Hong Kong's logistics industry to remain internationally competitive, we should facilitate the development and implementation of RFID systems in Hong Kong.

5. Following the recommendation of the EPCglobal Inc., the international RFID standardization body, to allocate the 860-960 MHz band for RFID applications using passive tags and taking into account the current allocation of radio frequency spectrum in Hong Kong, we intend to make available within the above band the 865-868 MHz and 920-925 MHz bands for RFID applications in Hong Kong. Accordingly, we propose to exempt apparatus operating in these radio frequency bands from the licensing obligation.

Mobile Earth Stations for Mobile-satellite Service and Wireless Local Area Network Equipment

6. In June 2003, the International Telecommunication Union decided that the 1518-1525 MHz and 1668-1675 MHz radio frequency bands should be allocated to support mobile-satellite service, and that the 5470-5725 MHz radio frequency bands should be allocated to facilitate further deployment of wireless local area networks worldwide. We recommend that the same radio frequency bands should be included in the Order to enable apparatus operating in those radio frequency bands to be exempted from the licensing obligation.

Automotive Radar Systems

7. In Japan, Europe, and the USA, telecommunications apparatus operating in the 76-77 GHz band is exempted from licensing, covering a major application – automotive radar detection, whereby the conditions of a vehicle up to 100 metres can be checked using radio waves. To encourage the use of such applications to enhance vehicle safety in Hong Kong, we recommend that telecommunications apparatus operating in the same radio frequency band of 76-77 GHz be exempted from the licensing obligation.

Control Apparatus for Model Aircrafts

8. At present, the only suitable radio frequency band for controlling model aircraft is 26.96 – 27.28 MHz band. In line with Australia, Canada, and the USA where licence-exempted channels in the radio frequency bands of 35 MHz, 40 MHz and 72 MHz are open for control apparatus for model aircrafts, we recommend that telecommunications apparatus operating in some channels in the above bands (specifically, 35.145-35.225 MHz, 40.66-40.70 MHz, 72.00-72.02 MHz, 72.12-72.14 MHz, 72.16-72.22 MHz, and 72.26-72.28 MHz) should also be exempted from the licensing obligation.

THE ORDER

9. **Section 2** of the Order provides for the addition of five types of telecommunications apparatus to Schedules 1 and 2 the existing exemption order. The key changes are summarized as follows.

Additional frequency bands where the operations of telecommunications apparatus are exempted from licensing	**Telecommunications application**
35.145 – 35.225 MHz 40.66 – 40.70 MHz 72.00 – 72.02 MHz 72.12 – 72.14 MHz 72.16 – 72.22 MHz	Control of Model Aircrafts

Additional frequency bands where the operations of telecommunications apparatus are exempted from licensing	Telecommunications application
72.26 – 72.28 MHz	
865 – 868 MHz 920 – 925 MHz	Radio Frequency Identification
1518 – 1525 MHz 1668 – 1675 MHz	Mobile-Satellite Service
5470 – 5725 MHz	Wireless Local Area Network
76 – 77 GHz	Automotive Radar Systems

B

The existing Schedules 1 and 2 are at Annex B.

LEGISLATIVE TIMETABLE

10. The legislative timetable will be –

Publication in the Gazette	4 March 2005
Tabling at the Legislative Council	9 March 2005

IMPLICATIONS OF THE PROPOSAL

11. The proposal has positive economic implications. As it will relax the current exemption regime, it is conducive to developing a vibrant telecommunications market, which will in turn bring benefits to businesses and consumers in Hong Kong. A thriving telecommunications market helps maintain the status of Hong Kong as a world-class business centre and underpins the development of other economic sectors. Besides, the proposal will also facilitate the

implementation of the latest telecommunications applications such as RFID applications in Hong Kong. This will help maintain the international competitiveness of the logistics industry in Hong Kong.

12. The proposal is in conformity with the Basic Law, including the provisions concerning human rights. It has no financial, civil service, productivity or environmental implications. It does not have any significant sustainability implications. The Order does not affect the current binding effect of the Ordinance.

PUBLIC CONSULTATION

13. The Office of Telecommunications Authority has taken into account the latest technological application and market situation through its regular contact with industry. The Legislative Council Panel on Information Technology and Broadcasting indicated no objection to the proposal at its meeting on 13 December 2004.

PUBLICITY

14. A press release will be issued when the Order is published in the Gazette. A spokesman will be available to answer media and public enquiries.

BACKGROUND

15. Under section 8(1) of the Ordinance, licences are required for possessing, using, dealing in the course of trade, or demonstrating with a view of sale, radiocommunications apparatus. Under section 9 of the Ordinance, licences are required for the import and export of radiocommunications transmitting apparatus. Section 39 of the Ordinance also provides that the Chief Executive in Council may by order exempt any person from any of the provisions in the Ordinance.

16. The existing exemption order was made in February 2003. The present exercise aims to expand and update the types of apparatus exempted from licensing to reflect technological advancement and market situation. This will reduce the onus of regulatory compliance by industry and consumers. It will improve the business environment, albeit in a relatively small way.

ENQUIRIES

17. For any enquiries related to this Brief, please contact –

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Communications and Technology Branch
Commerce, Industry and Technology Bureau
4 March 2005

TELECOMMUNICATIONS (TELECOMMUNICATIONS APPARATUS) (EXEMPTION FROM LICENSING) (AMENDMENT) ORDER 2005

(Made by the Chief Executive in Council under section 39 of the Telecommunications Ordinance (Cap. 106))

1. Commencement

This Order shall come into operation on a day to be appointed by the Telecommunications Authority by notice published in the Gazette.

2. Schedules 1 and 2 substituted

Schedules 1 and 2 to the Telecommunications (Telecommunications Apparatus) (Exemption from Licensing) Order (Cap. 106 sub. leg. Z) are repealed and the following substituted -

"SCHEDULE 1 [s. 5]

TECHNICAL CRITERIA FOR APPARATUS USED, ETC. AS MOBILE EARTH STATIONS

1. The operating frequency for transmission shall be within the frequency bands 1610 MHz to 1660.5 MHz, 1668 MHz to 1675 MHz or 1980 MHz to 2010 MHz.

2. The operating frequency for reception shall be within the frequency bands 1518 MHz to 1559 MHz, 1613.8 MHz to 1626.5 MHz, 2170 MHz to 2200 MHz or 2483.5 MHz to 2500 MHz.

3. The mean equivalent isotropically radiated power density produced by the mobile earth station shall not exceed -3 dBW/4kHz within the frequency band 1610 MHz to 1626.5 MHz.

4. The unwanted emissions generated by the mobile earth station shall comply with the relevant requirements in -

(a) Recommendation ITU-R M.1343 "Essential Technical Requirements of Mobile Earth Stations for Global Non-Geostationary Mobile-Satellite Service Systems in the Bands 1-3 GHz"; or

(b) Recommendation ITU-R M.1480 "Essential Technical Requirements of Mobile Earth Stations of Geostationary Mobile-Satellite Systems that are Implementing the Global Mobile Personal Communications By Satellite (GMPCS) - Memorandum of Understanding Arrangements in Parts of the Frequency Band 1-3 GHz",

approved by the International Telecommunication Union as revised from time to time.

SCHEDULE 2 [ss. 3 & 5]

TECHNICAL CRITERIA FOR APPARATUS USED, ETC. OTHER THAN AS MOBILE EARTH STATIONS

Telecommunications apparatus shall operate within a frequency band shown in column 1 of the following table and

the output level and spurious emission level generated by the apparatus shall not exceed the limits set out opposite to that frequency band in columns 2 and 3 -

Column 1	Column 2	Column 3
Frequency Band	Limits on Output Level	Limits on Spurious Emission Level
3-195 kHz	electric field strength not to exceed 40 dBμV/m and magnetic field strength not to exceed 48.4 dBnA/m at 100 m from the apparatus	spurious emission level not to exceed the limits set out in Note[9]
1627.5-1796.5 kHz[1]	electric field strength not to exceed 88 dBμV/m at 30 m from the apparatus	electric field strength not to exceed 34 dBμV/m at 30 m from the apparatus within 0.5-30 MHz; spurious emission level not to exceed the limits set out in Note[9](b)
13.553-13.567 MHz	(a) electric field strength not to exceed 80 dBμV/m at 30 m from the apparatus; or (b) magnetic field strength not to exceed 42 dBμA/m at 10 m from the apparatus	spurious emission level not to exceed the limits set out in Note[3]
26.96-27.28 MHz	mean power not to exceed 0.5 W	
33-33.28 MHz	e.r.p. not to exceed 10 mW	

35.145 - 35.225 MHz	e.r.p. not to exceed 100 mW	(a) e.r.p. not to exceed 2 nW for frequency below 1 GHz; and (b) e.r.p. not to exceed 20 nW for frequency at or above 1 GHz
36.26-36.54 MHz	e.r.p. not to exceed 10 mW	spurious emission level not to exceed the limits set out in Note[9]
36.41-36.69 MHz		
36.71-36.99 MHz		
36.96-37.24 MHz		
40.66-40.70 MHz	e.r.p. not to exceed 100 mW	(a) e.r.p. not to exceed 2 nW for frequency below 1 GHz; and (b) e.r.p. not to exceed 20 nW for frequency at or above 1 GHz
42.75-43.03 MHz	e.r.p. not to exceed 10 mW	spurious emission level not to exceed the limits set out in Note[9]
43.71-44.49 MHz[2]	electric field strength not to exceed 10 mV/m at 3 m from the apparatus	spurious emission level not to exceed the limits set out in Note[10]
44.73-45.01 MHz	e.r.p. not to exceed 10 mW	spurious emission level not to exceed the limits set out in Note[9]
46.6-46.98 MHz[2]	electric field strength not to exceed 10 mV/m at 3 m from the apparatus	spurious emission level not to exceed the limits set out in Note[10]
47.13-47.41 MHz	e.r.p. not to exceed 10 mW	spurious emission level not to exceed the limits set out in Note[9]

47.43-47.56 MHz[1]	e.r.p. not to exceed 10 mW	spurious emission level not to exceed the limits set out in Note[9](b)
48.75-50 MHz[2]	electric field strength not to exceed 10 mV/m at 3 m from the apparatus	spurious emission level not to exceed the limits set out in Note[10]
72.00-72.02 MHz	carrier power not to exceed 750 mW	spurious emission level not to exceed 30 µW
72.12-72.14 MHz		
72.16-72.22 MHz		
72.26-72.28 MHz		
173.96-174.24 MHz	e.r.p. not to exceed 20 mW	spurious emission level not to exceed the limits set out in Note[9]
187.5-188.0 MHz	e.r.p. not to exceed 10 mW	
253.85-255 MHz[3]	e.r.p. not to exceed 12 mW	e.r.p. not to exceed 2.5 µW
266.75-267.25 MHz	e.r.p. not to exceed 10 mW	spurious emission level not to exceed the limits set out in Note[9]
313.75-314.25 MHz		
314.75-315.25 MHz		
380.2-381.325 MHz[3]	e.r.p. not to exceed 12 mW	e.r.p. not to exceed 2.5 µW
409.74-410 MHz[4]	e.r.p. not to exceed 0.5 W	e.r.p. not to exceed 50 µW
819.1-823.1 MHz	(a) e.r.p. not to exceed 100 mW; and (b) power spectral density not to exceed 10 mW per 25 kHz	spurious emission level not to exceed the limits set out in Note[9]

864.1-868.1 MHz[5]	carrier power or e.r.p. not to exceed 10 mW	(a) e.r.p. not to exceed 250 nW for frequency below 1 GHz excluding 41-68 MHz, 87.5-118 MHz, 162-230 MHz and 470-862 MHz; (b) e.r.p. not to exceed 4 nW for frequency in the bands 41-68 MHz, 87.5-118 MHz, 162-230 MHz and 470-862 MHz; and (c) e.r.p. not to exceed 1 µW for frequency at or above 1 GHz
865-868 MHz[13]	e.r.p. not to exceed 100 mW	(a) e.r.p. not to exceed 250 nW for frequency below 1 GHz excluding 47-74 MHz, 87.5-118 MHz, 174-230 MHz and 470-862 MHz; (b) e.r.p. not to exceed 4 nW for frequency in the bands 47-74 MHz, 87.5-118 MHz, 174-230 MHz and 470-862 MHz; and (c) e.r.p. not to exceed 1 µW for frequency at or above 1 GHz
865.6-867.6 MHz[14]	e.r.p. not to exceed 2 W	
865.6-868 MHz[15]	e.r.p. not to exceed 500 mW	
919.5-920.0 MHz	e.r.p. not to exceed 10 mW	spurious emission level not to exceed the limits set out in Note[9]

920-925 MHz[16]	e.i.r.p. not to exceed 4 W	e.r.p. not to exceed 10 μW for frequency outside the frequency band in which the fundamental frequencies are located
1880-1900 MHz[6]	(a) peak power not to exceed 250 mW for apparatus with antenna output terminal; or (b) peak e.i.r.p. not to exceed 250 mW for apparatus with integral antenna	(a) e.r.p. not to exceed 250 nW for frequency below 1 GHz; and (b) e.r.p. not to exceed 1 μW for frequency at or above 1 GHz
1895-1906.1 MHz[7]	(a) carrier power not to exceed 10 mW for apparatus with antenna output terminal; or (b) e.r.p. not to exceed 10 mW for apparatus with integral antenna	(a) e.r.p. not to exceed 250 nW for frequency within 1895-1906.1 MHz; and (b) e.r.p. not to exceed 2.5 μW for frequency within 30 MHz-10 GHz excluding 1895-1906.1 MHz
2400-2483.5 MHz	(a) peak e.i.r.p. not to exceed 4 W for frequency hopping spread spectrum modulation or digital modulation systems; or (b) aggregate e.r.p. not to exceed 100 mW for any modulation	e.r.p. not to exceed 10 μW for frequency outside the frequency band in which the fundamental frequencies are located

5150-5350 MHz [11]	e.i.r.p. not to exceed 200 mW using only digital modulation	e.r.p. not to exceed 10 µW
5470-5725 MHz [12]	e.i.r.p. not to exceed 1 W	
5725-5850 MHz	(a) peak e.i.r.p. not to exceed 4 W for frequency hopping spread spectrum modulation or digital modulation systems; or (b) aggregate e.r.p. not to exceed 100 mW for any modulation	e.r.p. not to exceed 10 µW for frequency outside the frequency band in which the fundamental frequencies are located
18.82-18.87 GHz	(a) e.r.p. not to exceed 100 mW; and (b) power spectral density not to exceed 3 mW per 100 kHz	e.r.p. not to exceed 10 µW for frequency outside the frequency band in which the fundamental frequencies are located
76-77 GHz	carrier power not to exceed 10 mW	(a) power density not to exceed 600 pW/cm^2 at 3 m from the apparatus for frequency above 40 GHz but below 200 GHz; and (b) power density not to exceed 1000 pW/cm^2 at 3 m from the apparatus for frequency at or above 200 GHz
3000 GHz or above [8]	Not applicable	Not applicable

Note: [1] The apparatus shall operate within the frequency bands 1627.5-1796.5 kHz paired with 47.43-47.56 MHz and on one of the following pairs of frequencies -

Channel Number	kHz	MHz
1	1642.00	47.45625
2	1662.00	47.46875
3	1682.00	47.48125
4	1702.00	47.49375
5	1722.00	47.50625
6	1742.00	47.51875
7	1762.00	47.53125 or 47.44375
8	1782.00	47.54375

[2] The apparatus shall operate within the frequency bands 43.71-44.49 MHz, 46.6-46.98 MHz and 48.75-50 MHz and on any one or more of the following pairs of frequencies -

Channel Number	MHz	MHz
1	43.720	48.760
2	43.740	48.840
3	43.820	48.860
4	43.840	48.920
5	43.920	49.020
6	43.960	49.080
7	44.120	49.100
8	44.160	49.160
9	44.180	49.200
10	44.200	49.240
11	44.320	49.280
12	44.360	49.360

13	44.400	49.400
14	44.460	49.460
15	44.480	49.500
16	46.610	49.670
17	46.630	49.845
18	46.670	49.860
19	46.710	49.770
20	46.730	49.875
21	46.770	49.830
22	46.830	49.890
23	46.870	49.930
24	46.930	49.990
25	46.970	49.970

[3] The apparatus shall operate within the frequency bands 253.85-255 MHz paired with 380.2-381.325 MHz and the frequency pairs shall be as follows -

Speech Channel	380.2 + n x 0.0125 MHz, where n is an integer in the range 1 to 88 (except 46)	253.85 + n x 0.0125 MHz, where n is an integer in the range 1 to 88 (except 46)
Control Channel	380.775 MHz and 381.3125 MHz	254.425 MHz and 254.9625 MHz

[4] The apparatus shall employ frequency modulation and the carrier frequencies of the apparatus shall be 409.7375 + (0.0125 x n) MHz, where n is an integer in the range 1 to 20.

[5] The carrier frequencies of the apparatus shall be 864.05 + (0.1 x n) MHz, where n is an integer in the range 1 to 40.

[6] The carrier frequencies of the apparatus shall be 1880.064 + (1.728 x n) MHz, where n is an integer in the range 1 to 10.

[7] The carrier frequencies of the apparatus shall be 1895.15 + (n - 1) x 0.3 MHz, where n is an integer in the range 1 to 37.

[8] The apparatus shall satisfy at least one of the following conditions -

(a) the maximum usable range of the apparatus does not exceed 30 m;

(b) the transmission path does not cross a public street or unleased Government land.

[9] An apparatus with the following frequency range shall not generate a spurious emission level which exceeds the limits set out opposite to that frequency range -

(a) 3 kHz-30 MHz

Frequency Range	Limits on Spurious Emission Level
3-415 kHz	electric field strength not to exceed 17 dBμV/m and magnetic field strength not to exceed 25.4 dBnA/m at 300 m from the apparatus
415 kHz-30 MHz	electric field strength not to exceed 30 dBμV/m and magnetic field strength not to exceed 38.4 dBnA/m at 30 m from the apparatus

(b) 30 MHz-1000 MHz

Frequency Range	Limits on Spurious Emission Level
30-1000 MHz excluding 87-137 MHz and 470-790 MHz	e.r.p. not to exceed 300 nW
87-137 MHz and 470-790 MHz	e.r.p. not to exceed 60 nW

(c) 1-2 GHz

Frequency Range	Limits on Spurious Emission Level
1-2 GHz	e.r.p. not to exceed 1 μW

[10] An apparatus with the following frequency range shall not generate a spurious emission level which exceeds the limits set out opposite to that frequency range -

Frequency Range	Limits on Spurious Emission Level
1.705-30.0 MHz	electric field strength not to exceed 30 μV/m at 30 m from the apparatus
30-88 MHz	electric field strength not to exceed 100 μV/m at 3 m from the apparatus
88-216 MHz	electric field strength not to exceed 150 μV/m at 3 m from the apparatus
216-960 MHz	electric field strength not to exceed 200 μV/m at 3 m from the apparatus
above 960 MHz	electric field strength not to exceed 500 μV/m at 3 m from the apparatus

[11] Use of the band 5150-5350 MHz is restricted to indoor operations.

[12] Use of the band 5470-5725 MHz shall comply with the technical requirements in Recommendation ITU-R M.1652 "Dynamic frequency selection (DFS) in wireless access systems including radio local area networks for the purpose of protecting the radiodetermination service in the 5 GHz band" approved by the International Telecommunication Union as revised from time to time.

[13] The carrier frequencies of the apparatus shall be 864.90 + (0.2 x n) MHz, where n is an integer in the range 1 to 15.

[14] The carrier frequencies of the apparatus shall be 864.90 + (0.2 x n) MHz, where n is an integer in the range 4 to 13.

[15] The carrier frequencies of the apparatus shall be 864.90 + (0.2 x n) MHz, where n is an integer in the range 4 to 15.

[16] Use of the band 920-925 MHz is restricted to apparatus operating with frequency hopping spread spectrum modulation.".

Clerk to the Executive Council

COUNCIL CHAMBER

2005

Explanatory Note

This Order expands and updates the types of telecommunications apparatus exempted from licensing under the Telecommunications Ordinance (Cap. 106) to reflect technological advancement and market situation.

Chapter:	106Z	TELECOMMUNICATIONS (TELECOMMUNICATIONS APPARATUS) (EXEMPTION FROM LICENSING) ORDER	Gazette Number	Version Date

Schedule:	1	TECHNICAL CRITERIA FOR APPARATUS USED, ETC. AS MOBILE EARTH STATIONS	L.N. 50 of 2003	21/02/2003

[section 5]

1. The operating frequency for transmission shall be within the frequency band 1610 MHz to 1660.5 MHz or 1980 MHz to 2010 MHz.
2. The operating frequency for reception shall be within the frequency bands 1525 MHz to 1559 MHz, 1613.8 MHz to 1626.5 MHz, 2170 MHz to 2200 MHz or 2483.5 MHz to 2500 MHz.
3. The mean equivalent isotropically radiated power density produced by the mobile earth station shall not exceed -3 dBW/4kHz within the frequency band 1610 MHz to 1626.5 MHz.
4. The unwanted emissions generated by the mobile earth station shall comply with the relevant requirements in-
   (a) Recommendation ITU-R M.1343 "Essential Technical Requirements of Mobile Earth Stations for Global Non-Geostationary Mobile-Satellite Service Systems in the Bands 1-3 GHz"; or
   (b) Recommendation ITU-R M.1480 "Essential Technical Requirements of Mobile Earth Stations of Geostationary Mobile-Satellite Systems that are Implementing the Global Mobile Personal Communications By Satellite (GMPCS)-Memorandum of Understanding Arrangements in Parts of the Frequency Band 1-3 GHz",

   approved by the International Telecommunication Union as revised from time to time.

Chapter:	106Z	TELECOMMUNICATIONS (TELECOMMUNICATIONS APPARATUS) (EXEMPTION FROM LICENSING) ORDER	Gazette Number	Version Date

Schedule:	2	TECHNICAL CRITERIA FOR APPARATUS USED, ETC. OTHER THAN AS MOBILE EARTH STATIONS	L.N. 50 of 2003	21/02/2003

[sections 3 & 5]

Telecommunications apparatus shall operate within a frequency band shown in column 1 of the following table and shall generate an output level and spurious emission level as set out opposite to that frequency band in columns 2 and 3-

Column 1 Frequency Band	Column 2 Output Level	Column 3 Spurious Emission Level
3-195 kHz	electric field strength not to exceed 40 dB μ V/m and magnetic field strength not to exceed 48.4 dBnA/m at 100 m from the apparatus	spurious emission level not to exceed the limits set out in Note [9]
1627.5-1796.5 kHz [1]	electric field strength not to exceed 88 dB μ V/m at 30 m from the apparatus	electric field strength not to exceed 34 dB μ V/m at 30 m from the apparatus within 0.5-30 MHz; spurious emission level not to exceed the limits set out in Note [9](b)
13.553-13.567 MHz	(a) electric field strength not to exceed 80 dB μ V/m at 30 m; or (b) magnetic field strength not to exceed 42 dB μ A/m at 10 m from the apparatus	spurious emission level not to exceed the limits set out in Note [9]
26.96-27.28 MHz	mean power not to exceed 0.5 W	
33-33.28 MHz	e.r.p. not to exceed 10 mW	
36.26-36.54 MHz 36.41-36.69 MHz 36.71-36.99 MHz 36.96-37.24 MHz 40.66-40.70 MHz 42.75-43.03 MHz		
43.71-44.49 MHz [2]	electric field strength not to exceed 10 mV/m at 3 m from the apparatus	spurious emission level not to exceed the limits set out in Note [10]
44.73-45.01 MHz	e.r.p. not to exceed 10 mW	spurious emission level not to exceed the limits set out in Note [9]
46.6-46.98 MHz [2]	electric field strength not to exceed 10 mV/m at 3 m from the apparatus	spurious emission level not to exceed the limits set out in Note [10]
47.13-47.41 MHz	e.r.p. not to exceed 10 mW	spurious emission level not to exceed the limits set out in Note [9]

47.43-47.56 MHz [1]	e.r.p. not to exceed 10 mW	spurious emission level not to exceed the limits set out in Note [9](b)
48.75-50 MHz [2]	electric field strength not to exceed 10 mV/m at 3 m from the apparatus	spurious emission level not to exceed the limits set out in Note [10]
173.96-174.24 MHz	e.r.p. not to exceed 20 mW	
187.5-188.0 MHz	e.r.p. not to exceed 10 mW	spurious emission level not to exceed the limits set out in Note [9]
253.85-255 MHz [3]	e.r.p. not to exceed 12 mW	e.r.p. not to exceed 2.5 μW
266.75-267.25 MHz		
313.75-314.25 MHz		
314.75-315.25 MHz	e.r.p. not to exceed 10 mW	spurious emission level not to exceed the limits set out in Note [9]
380.2-381.325 MHz [3]	e.r.p. not to exceed 12 mW	e.r.p. not to exceed 2.5 μW
409.74-410 MHz [4]	e.r.p. not to exceed 0.5 W	e.r.p. not to exceed 50 μW
819.1-823.1 MHz	(a) e.r.p. not to exceed 100 mW; and (b) power spectral density not to exceed 10 mW per 25 kHz	spurious emission level not to exceed the limits set out in Note [9]
864.1-868.1 MHz [5]	carrier power or e.r.p. not to exceed 10 mW	(a) e.r.p. not to exceed 250 nW for frequency below 1 GHz excluding 41-68 MHz, 87.5-118 MHz, 162-230 MHz and 470-862 MHz; (b) e.r.p. not to exceed 4 nW for frequency in the bands 41-68 MHz, 87.5-118 MHz, 162-230 MHz and 470-862 MHz; and (c) e.r.p. not to exceed 1 μW for frequency above 1 GHz
919.5-920.0 MHz	e.r.p. not to exceed 10	spurious emission

	mW	level not to exceed the limits set out in Note [9]
1880-1900 MHz [6]	(a) peak power not to exceed 250 mW for apparatus with antenna output terminal; or (b) peak e.i.r.p. not to exceed 250 mW for apparatus with integral antenna	(a) e.r.p. not to exceed 250 nW for frequency below 1 GHz; and (b) e.r.p. not to exceed 1 μW for frequency above or equal to 1 GHz
1895-1906.1 MHz [7]	(a) carrier power not to exceed 10 mW for apparatus with antenna output terminal; or (b) e.r.p. not to exceed 10 mW for apparatus with integral antenna	(a) e.r.p. not to exceed 250 nW for frequency within 1895-1906.1 MHz; and (b) e.r.p. not to exceed 2.5 μW for frequency within 30 MHz-10 GHz excluding 1895-1906.1 MHz
2400-2483.5 MHz	(a) peak e.i.r.p. not to exceed 4 W for frequency hopping spread spectrum modulation or digital modulation systems; or (b) aggregate e.r.p. not to exceed 100 mW for any modulation	e.r.p. not to exceed 10 μW outside the frequency band in which the fundamental frequencies are located
5150-5350 MHz [11]	e.i.r.p. not to exceed 200 mW using only digital modulation	e.r.p. not to exceed 10 μW
5725-5850 MHz	(a) peak e.i.r.p. not to exceed 4 W for frequency hopping spread spectrum modulation or digital modulation systems; or (b) aggregate e.r.p. not to exceed 100 mW for any modulation	e.r.p. not to exceed 10 μW outside the frequency band in which the fundamental frequencies are located
18.82-18.87 GHz	(a) e.r.p. not to exceed 100 mW; and (b) power spectral density not to exceed	e.r.p. not to exceed 10 μW outside the frequency band in which the

	3 mW per 100 kHz	fundamental frequencies are located
3000 GHz or above [8]	Not applicable	Not applicable

Note: [1] The apparatus shall operate within the frequency bands 1627.5-1796.5 kHz paired with 47.43-47.56 MHz and on one of the following pairs of frequencies-

Channel Number	kHz	MHz
1	1642.00	47.45625
2	1662.00	47.46875
3	1682.00	47.48125
4	1702.00	47.49375
5	1722.00	47.50625
6	1742.00	47.51875
7	1762.00	47.53125 or 47.44375
8	1782.00	47.54375

[2] The apparatus shall operate within the frequency bands 43.71-44.49 MHz, 46.6-46.98 MHz and 48.75-50 MHz and on any one or more of the following pairs of frequencies-

Channel Number	MHz	MHz
1	43.720	48.760
2	43.740	48.840
3	43.820	48.860
4	43.840	48.920
5	43.920	49.020
6	43.960	49.080
7	44.120	49.100
8	44.160	49.160
9	44.180	49.200
10	44.200	49.240
11	44.320	49.280
12	44.360	49.360
13	44.400	49.400
14	44.460	49.460
15	44.480	49.500
16	46.610	49.670
17	46.630	49.845
18	46.670	49.860
19	46.710	49.770
20	46.730	49.875
21	46.770	49.830
22	46.830	49.890
23	46.870	49.930
24	46.930	49.990
25	46.970	49.970

[3] The apparatus shall operate within the frequency bands 253.85-255 MHz paired with 380.2-381.325 MHz and the frequency pairs shall be as follows-

Speech Channel	380.2 + n x 0.0125 MHz, where n is an integer in the ranges 1 to 45 and 47 to 88	253.85 + n x 0.0125 MHz, where n is an integer in the ranges 1 to 45 and 47 to 88
Control Channel	380.775 MHz and 381.3125 MHz	254.425 MHz and 254.9625 MHz

[4] The apparatus shall employ frequency modulation and the carrier frequencies of the apparatus shall be 409.7375 + (0.0125 x n) MHz, where n is an integer in the range 1 to 20.

[5] The carrier frequencies of the apparatus shall be 864.05 + (0.1 x n) MHz, where n is an integer in the range 1 to 40.

[6] The carrier frequencies of the apparatus shall be 1880.064 + (1.728 x n) MHz, where n is an integer in the range 1 to 10.

[7] The carrier frequencies of the apparatus shall be 1895.15 + (n - 1) x 0.3 MHz, where n is an integer in the range 1 to 37.

[8] The apparatus shall satisfy at least one of the following conditions:-

(a) the maximum usable range of the apparatus does not exceed 30 m;

(b) the transmission path does not cross a public street or unleased Government land.

[9] The apparatus shall generate a spurious emission level as set out opposite to the following frequency range-

(a) 3 kHz-30 MHz

Frequency Range	Spurious Emission Level
3-415 kHz	electric field strength not to exceed 17 dB μ V/m and magnetic field strength not to exceed 25.4 dBnA/m at 300 m from the apparatus
415 kHz-30 MHz	electric field strength not to exceed 30 dB μ V/m and magnetic field strength not to exceed 38.4 dBnA/m at 30 m from the apparatus

(b) 30 MHz-1000 MHz

Frequency Range	Spurious Emission Level
30-1000 MHz excluding 87-137 MHz and 470-790 MHz	e.r.p. not to exceed 300 nW
87-137 MHz and 470-790 MHz	e.r.p. not to exceed 60 nW

(c) 1-2 GHz

Frequency Range	Spurious Emission Level
1-2 GHz	e.r.p. not to exceed 1 μ W

[10] The apparatus shall generate a spurious emission level as set out opposite to the following frequency range-

Frequency Range	Spurious Emission Level
1.705-30.0 MHz	electric field strength not to exceed 30 μ V/m at 30 m from the apparatus
30-88 MHz	electric field strength not to exceed 100 μ V/m at 3 m from the apparatus
88-216 MHz	electric field strength not to exceed 150 μ V/m at 3 m from the apparatus
216-960 MHz	electric field strength not to exceed 200 μ V/m at 3 m from the apparatus
above 960 MHz	electric field strength not to exceed 500 μ V/m at 3 m from the apparatus

[11] Use of the band 5150-5350 MHz is restricted to indoor operations until the requirements of the International Telecommunication Union as applicable to the band are available, by which time the use of the band shall be in compliance with the requirements as laid down by the International Telecommunication Union.