



ECC Recommendation

(01)04

Radio frequency channel arrangements for point-to-point
(P-P) fixed wireless systems in the frequency band
40.5 - 43.5 GHz

approved 10 October 2001

latest amended 24 January 2025

1. INTRODUCTION

This Recommendation provides radio-frequency channel arrangements for point-to-point (P-P) fixed wireless systems operating in the 42 GHz (40.5-43.5 GHz) band, which may be used for high, medium and low capacity systems. The preferred radio-frequency channel arrangements are based on multiples of basic channels of 7 MHz width merged to form higher channel widths up to 224 MHz.

This Recommendation is based on ITU-R Recommendation F.2005 [1].

WRC-19 identified the frequency band 40.5-43.5 GHz for IMT on a global basis. In March 2020, CEPT decided to develop a new ECC Decision to harmonise the frequency band 40.5-43.5 GHz for Mobile/Fixed Communications Networks (MFCN). The harmonisation measures comprise of a band plan and technical conditions suitable for next generation terrestrial wireless systems, taking into account the applications according to ERC Report 25 (ECA Table) [3].

In November 2022, ECC finalised and adopted ECC Decision (22)06 [4] on these harmonised technical conditions for MFCN in the band 40.5-43.5 GHz. ECC also withdrew ERC Decision (99)15 which previously designated the 40.5-43.5 GHz band also to multimedia wireless systems (MWS) (see ECC Decision (22)05 [5]). The implementation of MFCN including IMT-2020/5G systems in CEPT countries should support the provision of mobile high data rate applications in the band 40.5-43.5 GHz.

Based on the harmonised technical conditions included in ECC Decision (22)06, coexistence with the FSS, the FS and RAS in the same band is to be managed at national level, as appropriate.

ECC RECOMMENDATION (01)04 OF 10 OCTOBER 2001 ON RADIO FREQUENCY CHANNEL ARRANGEMENTS FOR POINT-TO-POINT (P-P) FIXED WIRELESS SYSTEMS IN THE FREQUENCY BAND 40.5-43.5 GHZ, AMENDED 5 FEBRUARY 2010, AMENDED 13 MAY 2014 AND LATEST AMENDMENT 24 JANUARY 2025

“The European Conference of Postal and Telecommunications Administrations,

considering

- a) that the 40.5-43.5 GHz band is allocated worldwide to the fixed service (FS) on a primary basis;
- b) that in the Radio Regulations (RR) the 40.5-43.5 GHz band is identified for high-density applications in the FS;
- c) that there is particular need for point-to-point (P-P) links for large data capacity transport, e.g. for mobile networks applications, the deployment of which is expected to rapidly grow;
- d) that the deployment of P-P links may result in greater spectrum efficiency when using conventional link-by-link coordination within a dedicated radio-frequency channel arrangement;
- e) that the band 40.5-42.5 GHz is co-primary allocated to broadcasting-satellite service and ECC Decision(23)01 [2] states that Earth stations shall not claim protection from FS systems;
- f) that the radio astronomy service is also allocated with a primary status in the range 42.5-43.5 GHz; in some locations appropriate measures will be needed in the planning and deployment P-P systems around radio astronomy stations to protect the radio astronomy service;
- g) that any coexistence issues between fixed links and MFCN in the 40.5-43.5 GHz frequency band will be managed at national level or through bilateral agreements for cross-border coordination;
- h) that ETSI has published EN 302 217-2 [6] with characteristics and limits of Point-to-Point equipment in these bands;
- i) that ECC Recommendation (01)05 [7] provides information for planning of P-P Fixed Service systems;

recommends

1. that administrations wishing to deploy P-P links in the 40.5-43.5 GHz band, using a specific radio frequency channel arrangement, should consider the radio frequency channel arrangement in Annex 1;

Note:

Please check the Office web site (<https://docdb.cept.org>) for the up to date position on the implementation of this and other ECC/ERC Recommendations.

ANNEX 1: RADIO FREQUENCY CHANNELS ARRANGEMENT ACCORDING RECOMMENDS

DERIVATION OF CENTER FREQUENCY OF RADIO FREQUENCY CHANNELS

The radio-frequency channel arrangement for carrier separations of 224 MHz, 112 MHz, 56 MHz, 28 MHz, 14 MHz and 7 MHz shall be derived as follows:

Let f_o be the reference frequency = 42 000 MHz;

f_n be the centre frequency of a RF channel in the lower half of the band (MHz);

f'_n be the centre frequency of a RF channel in the upper half of the band (MHz);

then the frequencies of individual channels are expressed by the following relationships:

a) for systems with a carrier spacing of 224 MHz¹:

$$\text{lower half of band: } f_n = f_o - 1\,562 + 224n \quad \text{MHz}$$

$$\text{upper half of band: } f'_n = f_o - 62 + 224n \quad \text{MHz}$$

where:

$$n = 1, 2, 3, \dots, 6$$

b) for systems with a carrier spacing of 112 MHz:

$$\text{lower half of band: } f_n = f_o - 1\,506 + 112n \quad \text{MHz}$$

$$\text{upper half of band: } f'_n = f_o - 6 + 112n \quad \text{MHz}$$

where:

$$n = 1, 2, 3, \dots, 12$$

c) for systems with a carrier spacing of 56 MHz:

$$\text{lower half of band: } f_n = f_o - 1\,478 + 56n \quad \text{MHz}$$

$$\text{upper half of band: } f'_n = f_o + 22 + 56n \quad \text{MHz}$$

where:

$$n = 1, 2, 3, \dots, 25$$

d) for systems with a carrier spacing of 28 MHz:

$$\text{lower half of band: } f_n = f_o - 1\,464 + 28n \quad \text{MHz}$$

$$\text{upper half of band: } f'_n = f_o + 36 + 28n \quad \text{MHz}$$

where:

¹ The arrangement for 224 MHz carrier spacing differs from that given in ITU-R Recommendation F.2005 only for not adopting the additional interleaved channels option. The centre frequencies of these 6 channels are coincident to the odd channels number (1, 3, 5,11) given in ITU-R Recommendation.

$$n = 1, 2, 3, \dots 50$$

In addition, the use of channel with index $n = 0$ may be considered with the agreement of the administrations concerned.

e) for systems with a carrier spacing of 14 MHz:

$$\text{lower half of band: } f_n = f_o - 1\,457 + 14n \quad \text{MHz}$$

$$\text{upper half of band: } f'_n = f_o + 43 + 14n \quad \text{MHz}$$

where:

$$n = 1, 2, 3, \dots 101$$

In addition, the use of channels with index $n = -1$ and 0 may be considered with the agreement of the administrations concerned.

f) for systems with a carrier spacing of 7 MHz:

$$\text{lower half of band: } f_n = f_o - 1\,453.5 + 7n \quad \text{MHz}$$

$$\text{upper half of band: } f'_n = f_o + 46.5 + 7n \quad \text{MHz}$$

where:

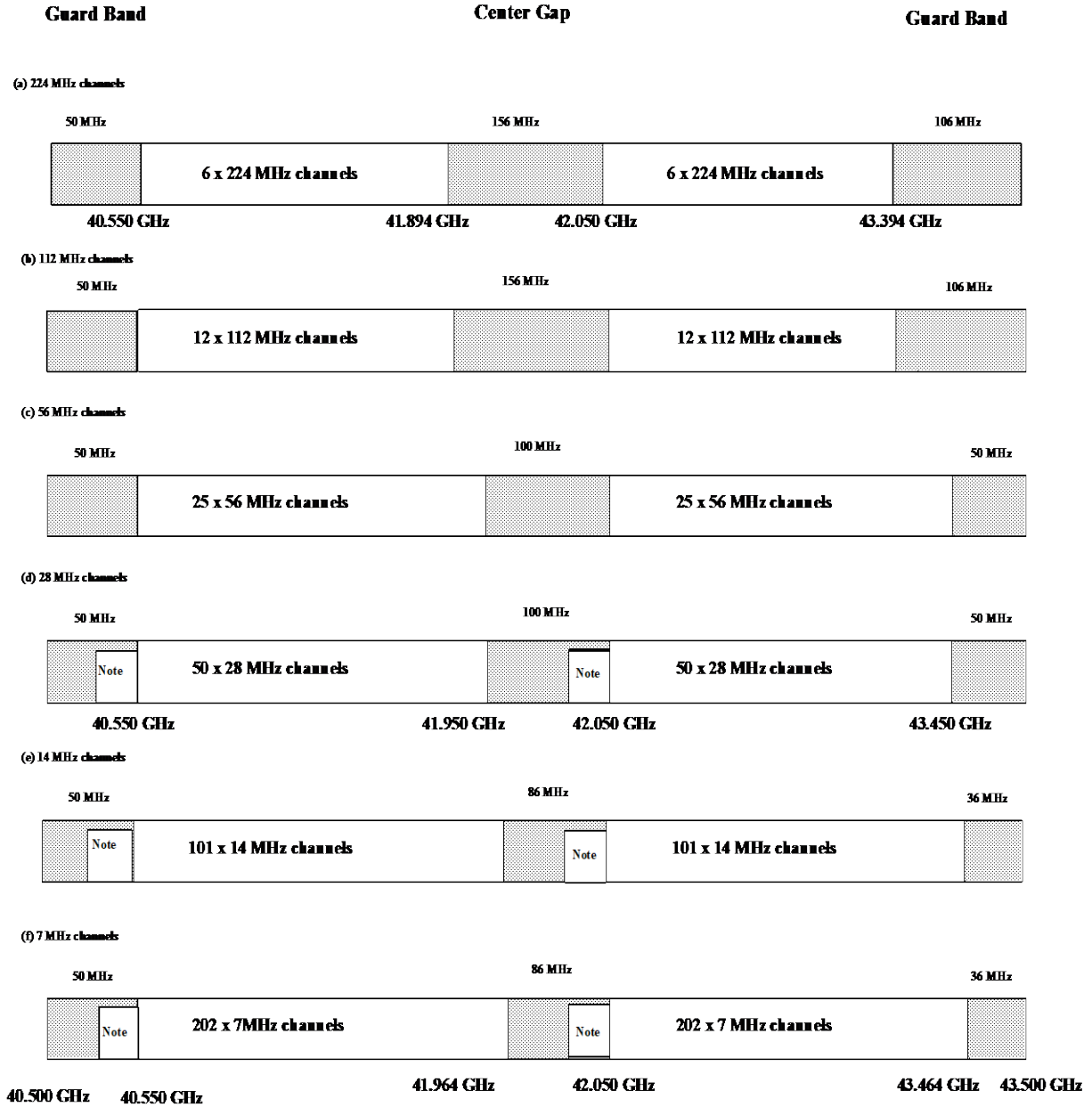
$$n = 1, 2, 3, \dots 202$$

In addition, the use of channels with index $n = -3, -2, -1$ and 0 may be considered with the agreement of the administrations concerned.

Table 1: Calculated parameters according to Recommendation ITU-R F.746

XS (MHz)	n	f_1 (MHz)	f_n (MHz)	f'_1 (MHz)	f'_n (MHz)	Z_1S (MHz)	Z_2S (MHz)	YS (MHz)	DS (MHz)
224	1, ..., 6	40662	41782	42162	43282	162	218	380	1500
112	1, ..., 12	40606	41838	42106	43338	106	162	268	1500
56	1, ..., 25	40578	41922	42078	43422	78	78	156	1500
28	1, ..., 50	40564	41936	42064	43436	64	64	128	1500
14	1, ..., 101	40557	41957	42057	43457	57	43	100	1500
7	1, ..., 202	40553.5	41960.5	42053.5	43460.5	53.5	39.5	93	1 500

XS: separation between centre frequencies of adjacent channels.
 YS: separation between centre frequencies of the closest go and return channels.
 Z_1S : separation between the lower band edge and the centre frequency of the lowest channel in the lower sub-band.
 Z_2S : separation between centre frequency of the highest channel in the upper sub-band and the upper band edge.
 DS: duplex spacing ($f'_n - f_n$).



Note: 28 MHz for additional 7, 14 and 28 MHz channels with the agreement of administrations concerned

Figure 1: Occupied spectrum from 40.5-43.5 GHz

ANNEX 2: LIST OF REFERENCES

- [1] Recommendation ITU-R F.2005-1: "Radio-frequency channel and block arrangements for fixed wireless systems operating in the 42 GHz (40.5 to 43.5 GHz) band"
- [2] [ECC Decision \(23\)01](#): "The use of the band 40.5-42.5 GHz by earth stations in the fixed-satellite service (space-to-Earth) and broadcasting-satellite service and on the use of the band 42.5-43.5 GHz by earth stations in the fixed-satellite service (Earth-to-space)", approved July 2023
- [3] [ERC Report 25](#): "The European table of frequency allocations and applications in the frequency range 8.3 kHz to 3000 GHz", approved 1994, latest amended January 2025
- [4] [ECC Decision \(22\)06](#): "Harmonised technical conditions for Mobile/Fixed Communications Networks (MFCN) in the band 40.5-43.5 GHz", approved November 2022
- [5] [ECC Decision \(22\)05](#): "Withdrawal of ERC Decision (99)15 on the designation of the harmonised frequency band 40.5 to 43.5 GHz for the introduction of Multimedia Wireless Systems (MWS) and Point-to-Point (PtP) Fixed Wireless Systems", approved November 2022
- [6] EN 302 217-2 V3.3.0 (2021-06): "Fixed Radio Systems; Characteristics and requirements for point-to-point equipment and antennas; Part 2: Digital systems operating in frequency bands from 1 GHz to 86 GHz; Harmonised Standard for access to radio spectrum"
- [7] [ECC Recommendation \(01\)05](#): "List of parameters of digital point-to-point fixed radio links used for national planning", approved October 2001