RECOMMENDATION ITU-R F.1098-1*

Radio-frequency channel arrangements for fixed wireless systems in the 1 900-2 300 MHz band

(Question ITU-R 136/9)

(1994-1995)

The ITU Radiocommunication Assembly,

considering

a) that as a result of the World Administrative Radio Conference for Dealing with Frequency Allocations in Certain Parts of the Spectrum (Malaga-Torremolinos, 1992) (WARC-92) the fixed service is required to share the band 1 900-2 300 MHz more extensively with new services on a co-primary basis;

b) that fixed services have shared the 2 025-2 110 MHz and 2 200-2 290 MHz bands satisfactorily with the space operation, space research, and Earth-exploration satellite services under the current provisions of Articles 27 and 28 of the Radio Regulations;

c) that use of the spectrum outside 2 025-2 110 MHz and 2 200-2 290 MHz by fixed service may be possible subject to sharing conditions with the mobile-satellite service (MSS) and future public land mobile telecommunication systems (FPLMTS), such as by using adequate geographical and/or frequency separation;

d) that Resolution No. 113 of WARC-92 recognized that there are technical and economic factors that will require continued operation of fixed systems in the range 1-3 GHz;

e) that the channel plans presented in Recommendations ITU-R F.283 and ITU-R F.382 are not optimally arranged to accommodate the new allocations between 1 900 and 2 300 MHz;

f) that administrations may have different requirements for sharing spectrum with the fixed service, and they may not require all the spectrum allocated to MSS or designated for FPLMTS;

g) that applications in this band will require different channel bandwidths;

h) that a high degree of compatibility between different systems and between radio-frequency channels of different arrangements can be achieved by selecting channel centre frequencies within a homogeneous basic pattern;

j) that efficiencies can be realized by minimizing the number of basic patterns,

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* Radiocommunication Study Group 9 made editorial amendments to this Recommendation in 2002 in accordance with Resolution ITU-R 44.

recommends

1 that where the introduction of FPLMTS and/or MSS is not compatible with the existing radio-frequency channel arrangements in the 1 900-2 300 MHz band, the new radio-frequency channel arrangements be based on utilizing the bands 2 025-2 110 MHz and 2 200-2 290 MHz;

2 that the preferred new radio-frequency channel arrangements for the 1 900-2 300 MHz band should be based on homogeneous patterns;

3 that the homogeneous pattern (f_p) with a preferred 3.5 MHz interval be defined by the relation:

$$f_p = f_r + 3.5\,p$$

where: $0 \le p \le 113$

f_r : reference frequency of the homogeneous pattern = 1 903 MHz;

4 that the homogeneous pattern (f_p) with a preferred 2.5 MHz interval be defined by the relation:

$$f_p = f_r + 2.5\,p$$

where: $0 \le p \le 160$

f_r: reference frequency of the homogeneous pattern = 1 900 MHz;

5 that the channel spacings, the centre gap, and the distance to the lower and upper band limits respectively, should be agreed by the administrations concerned, dependent on the application and channel capacity envisaged.

NOTE 1 – Examples of radio-frequency channel arrangements based on § 3 are described in Annexes 1 and 2 to this Recommendation.

NOTE 2 – An example of radio-frequency channel arrangements based on § 4 is described in Annex 3 to this Recommendation.

ANNEX 1

A description of a radio-frequency channel arrangement in the 1 900-2 300 MHz band in accordance with § 3

An example of a radio-frequency channel arrangement for up to six go and return channels with a transmitter-receiver duplex spacing of 175 MHz, is derived as follows:

Let f_0 be the centre frequency of the band, which equals 2 155 MHz,

f_n be the centre frequency of one radio-frequency channel in the lower half of this band (MHz),

f'_n be the centre frequency of one radio-frequency channel in the upper half of this band (MHz),

then the frequencies (MHz) of individual channels are expressed by the following relationship:

lower half of the band: $f_n = f_0 - 136.5 + 14\,n$

upper half of the band: $f'_n = f_0 + 38.5 + 14\,n$

where:

$n = 1, 2, 3, 4, 5$ or 6.

Channel arrangements with carrier spacings of 7, 3.5 and 1.75 MHz are possible by means of channel subdivision.

However, in certain countries, alignment with the channels given in Recommendation ITU-R F.283 might be required, in which case the preferred radio-frequency channel arrangement for up to five go and return channels also with a transmitter-receiver duplex spacing of 175 MHz, would be derived as follows:

Let f_0 be the centre frequency of the band, which equals 2 155 MHz,

f_n be the centre frequency of one radio-frequency channel in the lower half of this band (MHz),

f'_n be the centre frequency of one radio-frequency channel in the upper half of this band (MHz),

then the frequencies (MHz) of individual channels are expressed by the following relationship:

lower half of the band: $f_n = f_0 - 130.5 + 14\,n$

upper half of the band: $f'_n = f_0 + 44.5 + 14\,n$

where:

$n = 1, 2, 3, 4$ or 5.

Channel arrangements with carrier spacings of 7, 3.5 and 1.75 MHz are possible by means of channel subdivision.

ANNEX 2

A description of a radio-frequency channel arrangement in the 1 900-2 300 MHz band in accordance with § 3

An example of a radio-frequency channel arrangement for five go and return channels, and up to eleven go and return channels in areas where other co-primary services may not fully utilize all of the spectrum, or geographic separation will allow continued use by the fixed service is described. This uses a transmitter-receiver duplex spacing of 189 MHz, and is derived as follows:

Let f_0 be the centre frequency of the band, which equals 2 155 MHz,

f_n be the centre frequency of one radio-frequency channel in the lower half of this band (MHz),

f'_n be the centre frequency of one radio-frequency channel in the upper half of this band (MHz),

then the frequencies (MHz) of individual channels are expressed by the following relationship:

channels 1-11: $f_n = f_0 - 150.5 + 14\,n$, (where $n = 1, 2, ..., 11$)

channels 1'-7': $f'_n = f_0 + 38.5 + 14\,n$, (where $n = 1, 2, ..., 7$)

channels 8'-11': $f'_n = f_0 - 339.5 + 14\,n$, (where $n = 8, 9, ..., 11$).

Channel arrangements with carrier spacings of 7, 3.5 and 1.75 MHz are possible by means of channel subdivision.

Channel arrangements with carrier spacings of 28 MHz are possible by channel concatenation.

ANNEX 3

Description of a radio-frequency channel arrangement in the 1 900-2 300 MHz band in accordance with § 4

An example of a radio-frequency channel arrangement based on § 4 of this Recommendation for carrier spacings of 10 MHz is derived as follows:

Let f_0 be the centre frequency of 2 110 MHz $= f_r + (84 \times 2.5)$,

f_n be the centre frequency of a radio-frequency channel in the lower half of the band (MHz),

f'_n be the centre frequency of one radio-frequency channel in the upper half of this band (MHz),

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

a) for systems with a carrier spacing of 10 MHz centred about the core band 2 030-2 110 MHz paired with 2 220-2 300 MHz (80 + 80 MHz), and with a transmitter-receiver duplex spacing of 190 MHz:

lower half of the band: $f_n = f_0 + 5 - 10\,n$ MHz

upper half of the band: $f'_n = f_0 + 195 - 10\,n$ MHz

where:

$n = 1, 2, 3, ..., 8$ (core);

b) for systems with a carrier spacing of 10 MHz centred about the extended band 1 920-2 110 MHz paired with 2 110-2 300 MHz (190 + 190 MHz), and with a transmitter-receiver duplex spacing of 190 MHz:

lower half of the band: $f_n = f_0 + 5 - 10\,n$ MHz

upper half of the band: $f'_n = f_0 + 195 - 10\,n$ MHz

where:

$n = 1, 2, 3, ..., 19$ (extended).

NOTE 1 – In the application of this Annex, § 1 of the main text should be observed.