International Telecommunication Union

ITU-R
Radiocommunication Sector of ITU

Recommendation ITU-R F.1496-1
(02/2002)

Radio-frequency channel arrangements for fixed wireless systems operating in the band 51.4-52.6 GHz

F Series

Fixed service

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Foreword

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Note: *This ITU-R Recommendation was approved in English under the procedure detailed in Resolution ITU-R 1.*

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RECOMMENDATION ITU-R F.1496-1*

Radio-frequency channel arrangements for fixed wireless systems operating in the band 51.4-52.6 GHz

(2000-2002)

Scope

This Recommendation specifies radio-frequency channel arrangements for fixed wireless systems with channel separations of 3.5, 7, 14, 28 and 56 MHz in the band 51.4-52.6 GHz, which has been identified for use for high density applications in the fixed service (HDFS).

The ITU Radiocommunication Assembly,

considering

a)   that the band 51.4-52.6 GHz is allocated to the fixed and mobile services on a primary basis;

b)   the band 51.4-52.6 GHz is available for high-density applications in the fixed service (FS);

c)   that ITU-R should develop radio-frequency channel arrangements in order to make the most effective use of the spectrum available;

d)   that the propagation characteristics of the 51.4-52.6 GHz band are ideally suited for use of short-range digital point-to-point radio links in high-density applications in the FS networks;

e)   that in the frequency range a high antenna directivity is achievable even with small size antennas, increasing the density of equipment and further reducing risk of interference with same and other radio services;

f)   that differing applications licensed by various administrations may require different radio-frequency channel arrangements;

g)   that the applications in this frequency band may require differing channel bandwidths;

h)   that several radio services with various transmission signal characteristics and capacities may be in simultaneous use in this frequency band;

j)   that a high degree of compatibility between radio-frequency channels of different arrange-ments can be achieved by selecting channel centre frequencies within a homogeneous basic pattern,

recommends

1   that administrations should consider the channel arrangement given in Annex 1 for FS system deployment in the frequency range 51.4-52.6 GHz.

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*   Radiocommunication Study Group 5 made editorial amendments to this Recommendation in December 2009 in accordance with Resolution ITU-R 1.

Annex 1

Radio-frequency channel arrangement in the band 51.4-52.6 GHz

The radio-frequency channel arrangement for channel separations of 56 MHz, 28 MHz, 14 MHz, 7 MHz and 3.5 MHz shall be derived as follows:

Let f_r be the reference frequency of 51 412 MHz,

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

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

Tx/Rx separation = 616 MHz,

band separation = 112 MHz,

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

a) for systems with a channel separation of 56 MHz:

lower half of the band: $f_n = f_r + 56\,n$

upper half of the band: $f_n' = f_r + 616 + 56\,n$

where:

$n = 1, 2, \dots 9$

b) for systems with a channel separation of 28 MHz:

lower half of the band: $f_n = f_r + 14 + 28\,n$

upper half of the band: $f_n' = f_r + 630 + 28\,n$

where:

$n = 1, 2, 3, \dots 18$

c) for systems with a channel separation of 14 MHz:

lower half of the band: $f_n = f_r + 21 + 14\,n$

upper half of the band: $f_n' = f_r + 637 + 14\,n$

where:

$n = 1, 2, 3, \dots 36$

d) for systems with a channel separation of 7 MHz:

lower half of the band: $f_n = f_r + 24.5 + 7\,n$

upper half of the band: $f_n' = f_r + 640.5 + 7\,n$

where:

$n = 1, 2, 3, \dots 72$

e)   for systems with a channel separation of 3.5 MHz:

lower half of the band: $f_n = f_r + 26.25 + 3.5\,n$

upper half of the band: $f'_n = f_r + 642.25 + 3.5\,n$

where:

$n = 1, 2, 3, \ldots 144$.

Annex 2

TABLE 1

Calculated parameters according to Recommendation ITU-R F.746

XS (MHz)	n	f_1 (MHz)	f_{nmax} (MHz)	f'_1 (MHz)	f'_{nmax} (MHz)	Z_1S (MHz)	Z_2S (MHz)	YS (MHz)	DS (MHz)
56	1, ... 9	51 468	51 916	52 084	52 532	68	68	168	616
28	1, ... 18	51 454	51 930	52 070	52 546	54	54	140	616
14	1, ... 36	51 447	51 937	52 063	52 553	47	47	126	616
7	1, …72	51 443.5	51 940.5	52 059.5	52 556.5	43.5	43.5	119	616
3.5	1, …144	51 441.75	51 942.25	52 057.75	52 558.25	41.75	41.75	115.5	616

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 first channel
Z_2S: separation between centre frequencies of the final channel and the upper band edge
DS: duplex spacing $(f'_n - f_n)$.