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Radiocommunication Sector of ITU

Recommendation ITU-R F.1567
(05/2002)

Radio-frequency channel arrangement for digital fixed wireless systems operating in the frequency band 406.1-450 MHz

F Series

Fixed service

Foreword

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SA	Space applications and meteorology
SF	Frequency sharing and coordination between fixed-satellite and fixed service systems
SM	Spectrum management
SNG	Satellite news gathering
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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.1567*

Radio-frequency channel arrangement for digital fixed wireless systems operating in the frequency band 406.1-450 MHz

(2002)

Scope

This Recommendation provides radio-frequency (RF) channel arrangements for fixed wireless systems in the 406.1-450 MHz range. The annex presents:

– RF channel arrangements with separations of 0.05, 0.1, 0.15, 0.2, 0.25 and 0.6 MHz in the band 406.1-413.05 MHz paired with the 423.05-430 MHz band;

– RF channel arrangements with separations of 0.25, 0.3, 0.5, 0.6, 0.75, 1, 1.75 and 3.5 MHz in the band 413.05-423.05 MHz paired with the 440-450 MHz band.

The ITU Radiocommunication Assembly,

considering

a) that according to Article 5 of the Radio Regulations (RR) the frequency bands 406.1-430 MHz and 440-450 MHz are allocated to the fixed service (FS) on a worldwide basis;

b) that FS systems in frequency bands below 1 GHz have been extensively used for many years in certain countries including developing countries;

c) that most of these systems utilize analogue technologies;

d) that administrations may wish to digitize such systems;

e) that some administrations may wish to establish digital systems utilizing their existing FS stations;

f) that interference both within digital and between digital and analogue fixed wireless systems (FWS) could be minimized by the coordination of radio-frequency (RF) channel arrangements;

g) that FWS operating in the band 406.1 to 450 MHz profit from the enhanced propagation range, relative to higher frequencies deployment;

h) that the FS frequency plans in the bands 406.1-450 MHz typically support point-to-point and point-to-multipoint systems with frequency utilization efficiency of 1 bit/s/Hz;

j) that the FS in the bands 410-430 MHz and 440-450 MHz is co-primary with the mobile service (except aeronautical mobile service), and in certain administrations only part of the bands are available to the FS,

recommends

1 that administrations should consider the channel arrangement given in Annex 1 for FS system deployment in the frequency range 406.1-430 MHz and 440-450 MHz.

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

ANNEX 1

RF channel arrangement in the bands 406.1-430 MHz and 440-450 MHz

This annex describes a digital RF channelling arrangement for the bands 406.1-430 MHz and 440-450 MHz. The arrangements provide some different channelling and capacities uses.

1 406.1-413.05 MHz paired with the 423.05-430 MHz frequency band

The RF channel arrangement for this band is based on an adjacent channel spacing from 50 kHz up to 600 kHz and is derived as follows:

Let f_n be the centre frequency of one RF channel in the lower half of the band (MHz)

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

The systems utilizing time division duplex (TDD) techniques can use both bands.

1.1 Channelling with 50 kHz spacing between carriers, for systems with 50 kHz maximum bandwidth

A Main

$$f_n = 406.075 + 0.05 \times n \quad \text{MHz}$$

$$f'_n = 423.025 + 0.05 \times n \quad \text{MHz}$$

where:

$n = 1, 2, 3, ..., 133$

B Interleaved

$$f_n = 406.100 + 0.05 \times n \quad \text{MHz}$$

$$f'_n = 423.050 + 0.05 \times n \quad \text{MHz}$$

where:

$n = 1, 2, 3, ..., 132$

1.2 Channelling with 100 kHz spacing between carriers, for systems with 100 kHz maximum bandwidth

A Main

$$f_n = 406.050 + 0.1 \times n \quad \text{MHz}$$

$$f'_n = 423.000 + 0.1 \times n \quad \text{MHz}$$

where:

$n = 1, 2, 3, ..., 66$

B Interleaved

$$f_n = 406.100 + 0.1 \times n \quad \text{MHz}$$

$$f'_n = 423.050 + 0.1 \times n \quad \text{MHz}$$

where:

$n = 1, 2, 3, ..., 66$

1.3 Channelling with 150 kHz spacing between carriers, for systems with 150 kHz maximum bandwidth

A Main

$f_n = 406.025 + 0.15 \times n$ MHz

$f'_n = 422.975 + 0.15 \times n$ MHz

where:

$n = 1, 2, 3, ..., 44$

B Interleaved

$f_n = 406.100 + 0.15 \times n$ MHz

$f'_n = 423.050 + 0.15 \times n$ MHz

where:

$n = 1, 2, 3, ..., 43$

1.4 Channelling with 200 kHz spacing between carriers, for systems with 200 kHz maximum bandwidth

A Main

$f_n = 406.000 + 0.2 \times n$ MHz

$f'_n = 422.950 + 0.2 \times n$ MHz

where:

$n = 1, 2, 3, ..., 33$

B Interleaved

$f_n = 406.100 + 0.2 \times n$ MHz

$f'_n = 423.050 + 0.2 \times n$ MHz

where:

$n = 1, 2, 3, ..., 32$

1.5 Channelling with 250 kHz spacing between carriers, for systems with 250 kHz maximum bandwidth

A Main

$f_n = 405.975 + 0.25 \times n$ MHz

$f'_n = 422.925 + 0.25 \times n$ MHz

where:

$n = 1, 2, 3, ..., 26$

B Interleaved

$f_n = 406.100 + 0.25 \times n$ MHz

$f'_n = 423.050 + 0.25 \times n$ MHz

where:

$n = 1, 2, 3, ..., 26$

1.6 Channelling with 600 kHz spacing between carriers, for systems with 600 kHz maximum bandwidth

A Main

$f_n = 405.800 + 0.6 \times n$ MHz

$f'_n = 422.800 + 0.6 \times n$ MHz

where:

$n = 1, 2, 3, ..., 11$

B Interleaved

$f_n = 406.100 + 0.6 \times n$ MHz

$f'_n = 423.100 + 0.6 \times n$ MHz

where:

$n = 1, 2, 3, ..., 11$

2 413.05-423.05 MHz paired with the 440-450 MHz frequency band

The RF channel arrangement for this band is based on an adjacent channel spacing from 250 kHz up to 3.5 MHz and is derived as follows:

Let f_n be the centre frequency of one RF channel in the lower half of the band (MHz),

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

The systems utilizing TDD techniques can use both bands.

2.1 Channelling with 250 kHz spacing between carriers, for systems with 250 kHz maximum bandwidth

A Main

$f_n = 412.875 + 0.250 \times n$ MHz

$f'_n = 439.875 + 0.250 \times n$ MHz

where:

$n = 1, 2, 3, ..., 39$

B Interleaved

$f_n = 413.000 + 0.250 \times n$ MHz

$f'_n = 440.000 + 0.250 \times n$ MHz

where:

$n = 1, 2, 3, ..., 38$

2.2 Channelling with 300 kHz spacing between carriers, for systems with 300 kHz maximum bandwidth

A Main

$f_n = 412.900 + 0.3 \times n$ MHz

$f'_n = 439.900 + 0.3 \times n$ MHz

where:

$n = 1, 2, 3, ..., 32$

B Interleaved

$f_n = 413.050 + 0.3 \times n$ MHz

$f'_n = 440.050 + 0.3 \times n$ MHz

where:

$n = 1, 2, 3, ..., 31$

2.3 Channelling with 500 kHz spacing between carriers, for systems with 500 kHz maximum bandwidth

A Main

$f_n = 412.750 + 0.5 \times n$ MHz

$f'_n = 439.750 + 0.5 \times n$ MHz

where:

$n = 1, 2, 3, ..., 19$

B Interleaved

$f_n = 413.000 + 0.5 \times n$ MHz

$f'_n = 440.000 + 0.5 \times n$ MHz

where:

$n = 1, 2, 3, ..., 19$

2.4 Channelling with 600 kHz spacing between carriers, for systems with 600 kHz maximum bandwidth

A Main

$f_n = 412.900 + 0.6 \times n$ MHz

$f'_n = 439.900 + 0.6 \times n$ MHz

where:

$n = 1, 2, 3, ..., 16$

B Interleaved

$$f_n = 413.000 + 0.6 \times n \quad \text{MHz}$$

$$f'_n = 440.000 + 0.6 \times n \quad \text{MHz}$$

where:

$n = 1, 2, 3, ..., 16$

2.5 Channelling with 750 kHz spacing between carriers, for systems with 750 kHz maximum bandwidth

A Main

$$f_n = 412.750 + 0.75 \times n \quad \text{MHz}$$

$$f'_n = 439.750 + 0.75 \times n \quad \text{MHz}$$

where:

$n = 1, 2, 3, ..., 12$

B Interleaved

$$f_n = 413.125 + 0.75 \times n \quad \text{MHz}$$

$$f'_n = 440.125 + 0.75 \times n \quad \text{MHz}$$

where:

$n = 1, 2, 3, ..., 12$

2.6 Channelling with 1 MHz spacing between carriers, for systems with 1 MHz maximum bandwidth

A Main

$$f_n = 412.500 + 1 \times n \quad \text{MHz}$$

$$f'_n = 439.500 + 1 \times n \quad \text{MHz}$$

where:

$n = 1, 2, 3, ..., 9$

B Interleaved

$$f_n = 413.000 + 1 \times n \quad \text{MHz}$$

$$f'_n = 440.000 + 1 \times n \quad \text{MHz}$$

where:

$n = 1, 2, 3, ..., 9$

2.7 Channelling with 1.75 MHz spacing between carriers, for systems with 1.75 MHz maximum bandwidth

A Main

$$f_n = 412.750 + 1.75 \times n \quad \text{MHz}$$

$$f'_n = 439.750 + 1.75 \times n \quad \text{MHz}$$

where:

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

B Interleaved

$$f_n = 413.625 + 1.75 \times n \quad \text{MHz}$$

$$f'_n = 440.625 + 1.75 \times n \quad \text{MHz}$$

where:

$n = 1, 2, 3, 4$

2.8 Channelling with 3.5 MHz spacing between carriers, for systems with 3.5 MHz maximum bandwidth

A Main

$$f_n = 411.375 + 3.5 \times n \quad \text{MHz}$$

$$f'_n = 438.375 + 3.5 \times n \quad \text{MHz}$$

where:

$n = 1, 2$

B Interleaved

$$f_n = 413.125 + 3.5 \times n \quad \text{MHz}$$

$$f'_n = 440.125 + 3.5 \times n \quad \text{MHz}$$

where:

$n = 1, 2$