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| **Recommendation ITU-R F.2004**  **(03/2012)** |
| **Radio-frequency channel arrangements for fixed service systems operating in the 92-95 GHz range** |
| **F Series**  **Fixed service** |

Foreword

The role of the Radiocommunication Sector is to ensure the rational, equitable, efficient and economical use of the radio-frequency spectrum by all radiocommunication services, including satellite services, and carry out studies without limit of frequency range on the basis of which Recommendations are adopted.

The regulatory and policy functions of the Radiocommunication Sector are performed by World and Regional Radiocommunication Conferences and Radiocommunication Assemblies supported by Study Groups.

# Policy on Intellectual Property Right (IPR)

ITU-R policy on IPR is described in the Common Patent Policy for ITU-T/ITU-R/ISO/IEC referenced in Annex 1 of Resolution ITU-R 1. Forms to be used for the submission of patent statements and licensing declarations by patent holders are available from <http://www.itu.int/ITU-R/go/patents/en> where the Guidelines for Implementation of the Common Patent Policy for ITU‑T/ITU‑R/ISO/IEC and the ITU-R patent information database can also be found.

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| Series of ITU-R Recommendations  (Also available online at <http://www.itu.int/publ/R-REC/en>) | |
| **Series** | Title |
| **BO** | Satellite delivery |
| **BR** | Recording for production, archival and play-out; film for television |
| **BS** | Broadcasting service (sound) |
| **BT** | Broadcasting service (television) |
| F | Fixed service |
| **M** | Mobile, radiodetermination, amateur and related satellite services |
| **P** | Radiowave propagation |
| **RA** | Radio astronomy |
| **RS** | Remote sensing systems |
| **S** | Fixed-satellite service |
| **SA** | Space applications and meteorology |
| **SF** | Frequency sharing and coordination between fixed-satellite and fixed service systems |
| **SM** | Spectrum management |
| **SNG** | Satellite news gathering |
| **TF** | Time signals and frequency standards emissions |
| **V** | Vocabulary and related subjects |

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

*Electronic Publication*

Geneva, 2012

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RECOMMENDATION ITU-R F.2004

Radio-frequency channel arrangements for fixed service systems   
operating in the 92-95 GHz range

(Question ITU-R 247/5)

(2012)

Scope

This Recommendation describes channel arrangements in the portions of the frequency range 92.0-95.0 GHz allocated to the fixed service. The arrangements are based on a homogeneous pattern of 50 MHz slots and are proposed for either, frequency division duplex (FDD) or time division duplex (TDD) applications.

The ITU Radiocommunication Assembly,

considering

a) that, within the frequency range 92-95 GHz, the bands 92.0-94.0 GHz and 94.1-95 GHz are allocated to the fixed service;

b) that the propagation characteristics of the 92.0-95.0 GHz band are ideally suited for use of short-range digital radio links in high-density networks;

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

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

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

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

g) that the low end of the frequency band is suitable for the longest-hop radio links because the atmospheric attenuation is less than at the top of the band,

recommends

**1** that the preferred radio-frequency channel arrangement for the 92.0-95.0 GHz band should be based on homogeneous patterns;

**2** that the channel arrangements for time division duplex (TDD) systems in the frequency range 92.0-95.0 GHz should be defined as given in Annex 1;

**3** that the channel arrangements for frequency division duplex (FDD) systems in the frequency range 92-95.0 GHz should be defined as given in Annex 2.

**Annex 1**

Radio-frequency channel arrangements in the band 92.0-95.0 GHz[[1]](#footnote-1)\*  
for systems using TDD

Let: *fr*: be the reference frequency of 92 000 MHz,

*fn*: be the centre frequency of a radio-frequency channel in the band 92-95 GHz,

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

a) for systems with a channel separation of 100 MHz: *fn*  *fr*  100 *n*  MHz

where: *n* = 1, 2, …, 19, 22, 23, …, 29 (Notes 1 and 2)

b) for systems with a channel separation of 50 MHz: *fn*  *fr* + 25  50 *n*  MHz

where: *n* = 1, 2, …, 39, 43, 44, …, 58 (Note 1).

Figure 1

Occupied spectrum: 92 to 95 GHz band (Note 1)



**Annex 2**

Radio-frequency channel arrangement in the band 92.0-95.0 GHz[[2]](#footnote-2)\*  
for systems using FDD

The radio-frequency channel arrangement for channel separations of 100 MHz and 50 MHz shall be derived as follows:

Let *fr*: be the reference frequency of 92 000 MHz,

*fn*: 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 = 1 500 MHz,

band separation = 100 MHz,

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

a) for systems with a channel separation of 100 MHz:

lower half of the band: *fn* = *fr* + 100 *n*

upper half of the band: *f′n* = *fr* + 1 500 + 100 *n*

where *n* = 1, 2, 3, 4, 7, 8, …, 14 (Notes 1 and 2)

b) for systems with a channel separation of 50 MHz:

lower half of the band: *fn* = *fr* + 25 + 50 *n*

upper half of the band: *f*′*n* = *fr +* 1 525 + 50 *n*

where *n* = 1, 2, 3, …, 9, 12, 13, …, 28 (Note 1).

Figure 2

Occupied spectrum: 92.0 to 95.0 GHz band (Note 1)



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1. \* The band 94-94.1 GHz is not allocated to the fixed service in the Radio Regulations. [↑](#footnote-ref-1)
2. \* The band 94-94.1 GHz is not allocated to the fixed service in the Radio Regulations. [↑](#footnote-ref-2)