International Telecommunication Union

ITU-R

Radiocommunication Sector of ITU

Recommendation ITU-R F.595-11

(02/2022)

Radio-frequency channel arrangements for fixed wireless systems operating in the 17.7-19.7 GHz frequency band

F Series

Fixed service

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Foreword

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

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Series	Title
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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

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.595-11

Radio-frequency channel arrangements for fixed wireless systems operating in the 17.7-19.7 GHz frequency band

(Question ITU-R 247-1/5)

(1982-1986-1990-1992-1995-1997-1999-2002-2003-2006-2012-2022)

Scope

This Recommendation provides radio-frequency channel arrangements for fixed wireless systems operating in the 18 GHz band (17.7-19.7 GHz), which may be used for high, medium and low capacity fixed service applications including mobile infrastructure. The channel spacings recommended in the main text are 220, 110, 55 and 27.5 MHz for co-channel arrangements as well as interleaved arrangements for 220 and 110 MHz spacings. Other arrangements used in some countries are also provided.

Keywords

Fixed service, point-to-point, channel bandwidth, channel arrangement, 18 GHz

Abbreviations/Glossary

FDD	Frequency division duplex
FWS	Fixed wireless systems
QAM	Quadrature amplitude modulation
QPSK	Quadrature phase shift keying
RF	Radio-frequency
STM	Synchronous transport module

Related ITU Recommendations and Reports

Recommendation ITU-R F.746 – Radio-frequency arrangements for fixed service systems

The ITU Radiocommunication Assembly,

considering

a) that there may be economic and operational advantages in the use of fixed wireless systems (FWS) for the transmission of digital signals in the frequency band 17.7 to 19.7 GHz;

b) that it may be desirable to interconnect such systems at radio frequencies on international circuits;

c) that a sufficient degree of compatibility between systems of different capacities should be assured;

d) that frequency block arrangements allow flexible deployment of fixed wireless systems,

recognizing

that Recommendation ITU-R SM.1540 provides guidelines for managing the unwanted emissions in the out-of-band domain falling into adjacent allocated bands,

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recommends

1 that the preferred radio-frequency (RF) channel arrangement for digital FWS systems with a capacity of the order of 280 Mbit/s, the order of 140 Mbit/s and 34 Mbit/s or synchronous digital hierarchy bit rates operating in the 17.7 to 19.7 GHz band should be derived as follows:

Let f_0 be the frequency of the centre of the band of frequencies occupied (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 (MHz) of individual channels are expressed by the following relationships:

1.1 Co-channel arrangement

1.1.1 for systems with a capacity of the order of 280 Mbit/s:

lower half of the band: $f_n = f_0 - 1\,110 + 220\,n$ MHz

upper half of the band: $f_n' = f_0 + 10 + 220\,n$ MHz

where:

n = 1, 2, 3 or 4.

The frequency arrangement is illustrated in Fig. 1a).

1.1.2 for systems with a capacity of the order of 140 Mbit/s:

lower half of the band: $f_n = f_0 - 1\,000 + 110\,n$ MHz

upper half of the band: $f_n' = f_0 + 10 + 110\,n$ MHz

where:

n = 1, 2, 3, 4, 5, 6, 7 or 8.

The frequency arrangement is illustrated in Fig. 1b).

1.1.3 for systems with a capacity of the order of 34 Mbit/s:

lower half of the band: $f_n = f_0 - 1\,000 + 27.5\,n$ MHz

upper half of the band: $f_n' = f_0 + 10 + 27.5\,n$ MHz

where:

n = 1, 2, 3, . . . 35.

The frequency arrangement is illustrated in Fig. 1c).

1.1.4 for systems with a capacity of the order of 140 Mbit/s or synchronous transport module (STM)-1 with multi-state modulation formats:

lower half of the band: $f_n = f_0 - 1\,000 + 55\,n$ MHz

upper half of the band: $f_n' = f_0 + 10 + 55\,n$ MHz

where:

n = 1, 2, 3, . . . 17.

The frequency arrangement is illustrated in Fig. 1d).

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1.2 Interleaved arrangement

1.2.1a) for systems with a capacity of the order of 280 Mbit/s with 1 120 MHz duplex spacing:

lower half of the band: $f_n = f_0 - 1\,000 + 110\,n$ MHz

upper half of the band: $f'_n = f_0 + 120 + 110\,n$ MHz

where:

n = 1, 2, 3, 4, 5, 6 or 7.

The frequency arrangement is illustrated in Fig. 2a).

1.2.1b) for systems with a capacity of the order of 280 Mbit/s with 1 010 MHz duplex spacing:

lower half of the band: $f_n = f_0 - 945 + 110\,n$ MHz

upper half of the band: $f'_n = f_0 + 65 + 110\,n$ MHz

where:

n = 1, 2, 3, 4, 5, 6 or 7.

The frequency arrangement is illustrated in Fig. 2b).

1.2.2 for systems with a capacity of the order of 140 Mbit/s with 1 010 MHz duplex spacing:

lower half of the band: $f_n = f_0 - 945 + 55\,n$ MHz

upper half of the band: $f'_n = f_0 + 65 + 55\,n$ MHz

where:

n = 1, 2, 3, . . . 15.

The frequency arrangement is illustrated in Fig. 2c);

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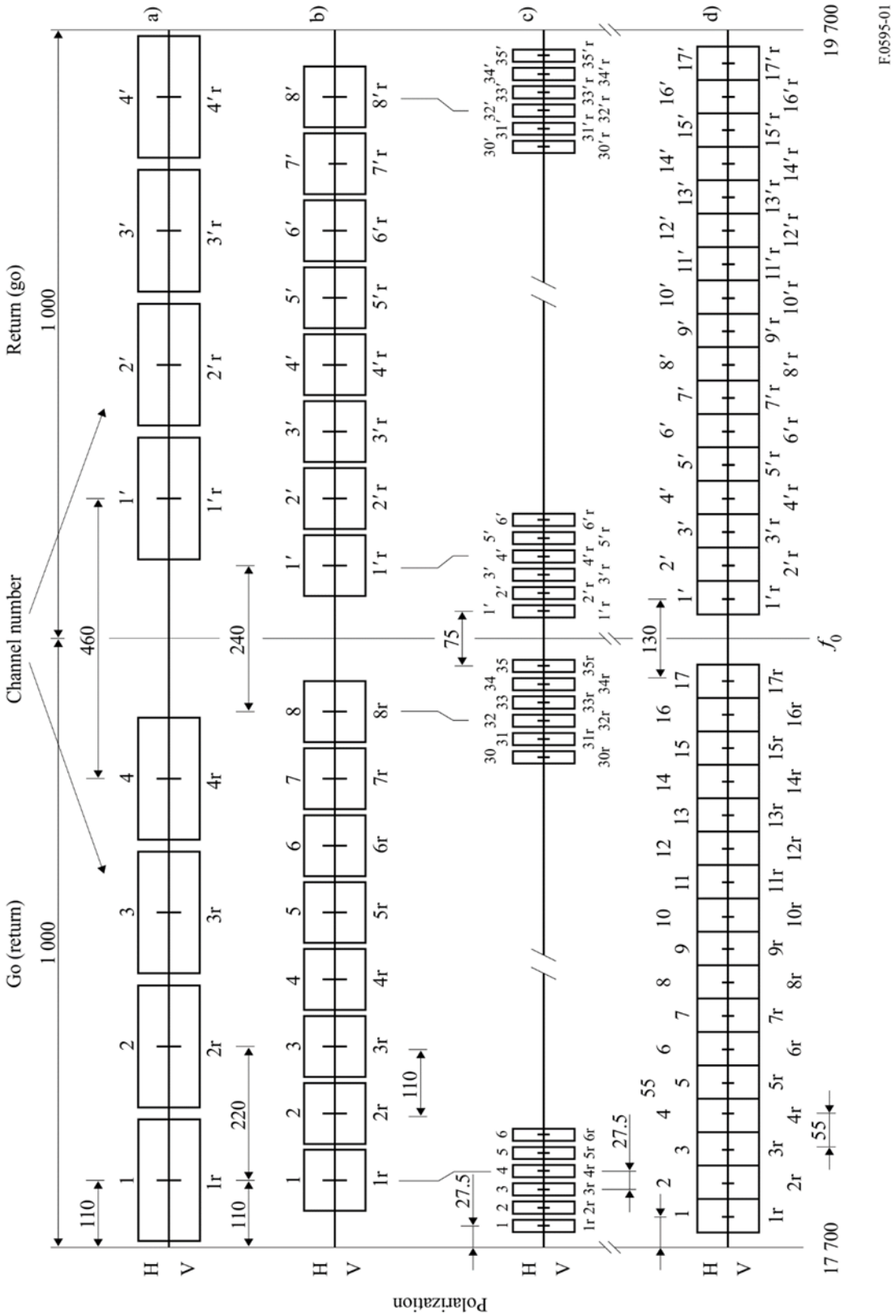
FIGURE 1

Radio-frequency channel arrangement for fixed wireless systems operating in the 17.7 to 19.7 GHz band
(Co-channel arrangement)
(All frequencies in MHz)



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