



Electronic Communications Committee (ECC)
within the European Conference of Postal and Telecommunications Administrations (CEPT)

ECC RECOMMENDATION (02) 02 (Revised, Rottach Egern, February 2010)

**PREFERRED CHANNEL ARRANGEMENTS FOR FIXED SERVICE SYSTEMS
(POINT-TO-POINT AND POINT-TO-MULTIPOINT) OPERATING
IN THE FREQUENCY BAND 31.0 – 31.3 GHz**

Recommendation adopted by the Working Group "Spectrum Engineering" (SE)

1 INTRODUCTION

This ECC Recommendation provides channel arrangements for digital fixed service systems using TDD or FDD recognising that in some CEPT countries particular FS applications are in operation for which specific national channel arrangements have been designed.

This ECC Recommendation takes due account of the protection requirements of the passive services in the neighbouring band 31.3 - 31.5 GHz.

"The European Conference of Postal and Telecommunications Administrations,

considering

- a) that the band 31.0 - 31.3 GHz is allocated on a world-wide primary basis to the fixed service and the mobile service;
- b) that for the band 31.2 - 31.3 GHz and 31.5 - 31.8 GHz footnote 5.149 of the ITU Radio Regulations urges administrations to take all practicable steps to protect the radio astronomy service from harmful interference;
- c) that the band 31.3 - 31.5 GHz is allocated on a world-wide primary basis to the Earth exploration-satellite service (passive), the radio astronomy service and the space research service (passive);
- d) that according to footnote 5.340 of the ITU Radio Regulations all emissions are prohibited in the band 31.3 - 31.5 GHz;
- e) that a combination of a limit on the output power delivered by a transmitter to the antenna and a guard band will be required to ensure the protection of the passive services in the neighbouring band 31.3 - 31.5 GHz;
- f) that some administrations already have a national channel plan for the 31.0 - 31.3 GHz band that may not align with the channel arrangement given in the Annex;
- g) that due to the narrowness of the spectrum and the rather high position in the millimetric bands the small duplex spacing could put some constraints on FDD system design which is not the case for TDD systems;
- h) that consideration may be given to the use of this band in conjunction with other bands, either by providing additional capacity in the downlink direction of a P-MP system or by providing uplink capacity associated with a larger downlink band;

recommends

1. that CEPT administrations consider the channel arrangements for the frequency band 31.0 - 31.3 GHz given in the Annex;
2. that in order to protect the passive services in the neighbouring band 31.3 - 31.5 GHz the output power delivered by a transmitter to the antenna should be limited to 0 dBW."

Note:

Please check the ECO web site(<http://www.ero.dk>) for the up to date position on the implementation of this and other ECC and ERC Recommendations.

Annex

A) Channel arrangement in the band 31.0 – 31.3 GHz for TDD systems

The centre frequencies for channel separations of 3.5 MHz, 7 MHz, 14 MHz and 28 MHz shall be derived as follows:

Let f_r be the reference frequency of 31000 MHz,
 f_n be the centre frequency of a radio-frequency channel in the band 31.0 - 31.3 GHz,

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

- a) for systems with a channel separation of 28 MHz:
 $f_n = f_r + 3 + 28n$ MHz where: $n = 1, 2, 3, \dots, 9$
- b) for systems with a channel separation of 14 MHz:
 $f_n = f_r + 10 + 14n$ MHz where: $n = 1, 2, 3, \dots, 18$
- c) for systems with a channel separation of 7 MHz:
 $f_n = f_r + 13.5 + 7n$ MHz where: $n = 1, 2, 3, \dots, 36$
- d) for systems with a channel separation of 3.5 MHz:
 $f_n = f_r + 15.25 + 3.5n$ MHz where: $n = 1, 2, 3, \dots, 72$

XS MHz	n	f1 MHz	fn MHz	Z1S MHz	Z2S MHz
28	1,...9	31031	31255	31	45
14	1,...18	31024	31262	24	38
7	1,...36	31020.5	31265.5	20.5	34.5
3.5	1, ...72	31018.75	31267.25	18.75	32.75

XS Separation between centre frequencies of adjacent channels
 Z1S Separation between the lower band edge and the centre frequency of the first channel
 Z2S Separation between centre frequencies of the final channel and the upper band edge

Table A1: Calculated parameters according to Recommendation ITU-R F.746

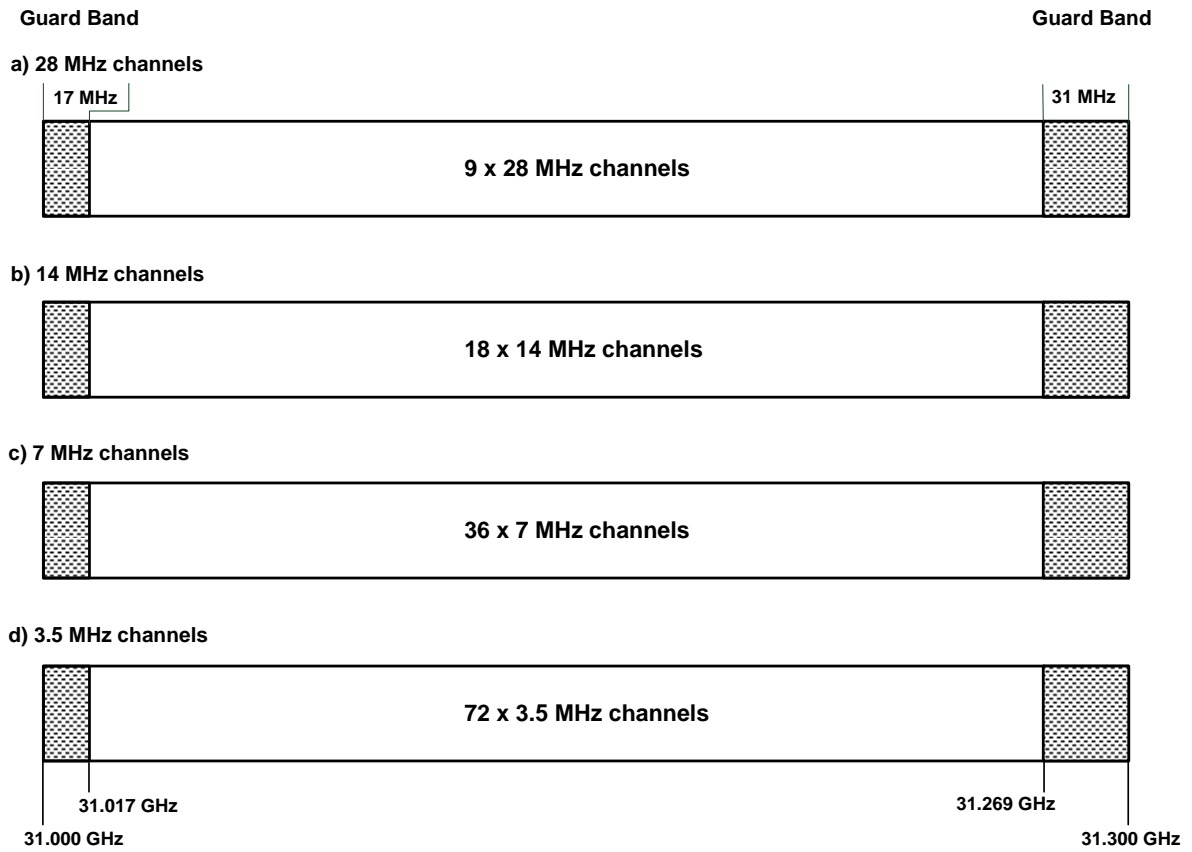


Figure A1: Occupied spectrum: 31.0 to 31.3 GHz Band for TDD systems

B) Channel arrangement in the band 31.0 - 31.3 GHz for FDD systems

The centre frequencies for channel separations of 3.5 MHz, 7 MHz, 14 MHz and 28 MHz shall be derived as follows:

Let

f_r be the reference frequency of 31150 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,

$$\text{Duplex spacing} = 140 \text{ MHz,}$$

$$\text{Centre gap} = 28 \text{ MHz.}$$

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

a) for a channel separation of 28 MHz:

$$\begin{array}{llll} \text{lower half of the band:} & f_n = f_r - 147 + 28n & \text{MHz} & \\ \text{upper half of the band:} & f_n' = f_r - 7 + 28n & \text{MHz} & \text{where } n = 1, 2, \dots 4 \end{array}$$

b) for a channel separation of 14 MHz:

$$\begin{array}{llll} \text{lower half of the band:} & f_n = f_r - 140 + 14n & \text{MHz} & \\ \text{upper half of the band:} & f_n' = f_r + 0 + 14n & \text{MHz} & \text{where } n = 1, 2, \dots 8 \end{array}$$

c) for a channel separation of 7 MHz:

$$\begin{array}{llll} \text{lower half of the band:} & f_n = f_r - 136.5 + 7n & \text{MHz} & \\ \text{upper half of the band:} & f_n' = f_r + 3.5 + 7n & \text{MHz} & \text{where } n = 1, 2, \dots 16 \end{array}$$

d) for a channel separation of 3.5 MHz:

$$\begin{array}{llll} \text{lower half of the band:} & f_n = f_r - 134.75 + 3.5n & \text{MHz} & \\ \text{upper half of the band:} & f_n' = f_r + 5.25 + 3.5n & \text{MHz} & \text{where } n = 1, 2, \dots 32 \end{array}$$

XS MHz	n	f_1 MHz	f_n MHz	f_1' MHz	f_n' MHz	ZS ₁ MHz	ZS ₂ MHz	YS MHz	DS MHz
28	1...4	31031	31115	31171	31255	31	45	56	140
14	1...8	31024	31122	31164	31262	24	38	42	140
7	1...16	31020.5	31125.5	31160.5	31265.5	20.5	34.5	35	140
3.5	1...32	31018.75	31127.25	31158.75	31267.25	18.75	32.75	31.5	140

XS Separation between centre frequencies of adjacent channels

YS Separation between centre frequencies of the closest go and return channels

ZS₁ Separation between the lower band edge and the centre frequency of the lowest channel in the lower half of the band

ZS₂ Separation between centre frequency of the highest channel in the upper half of the band and the upper band edge

DS Duplex spacing ($f_n' - f_n$)

Table B1: Calculated parameters according to Recommendation ITU-R F.746

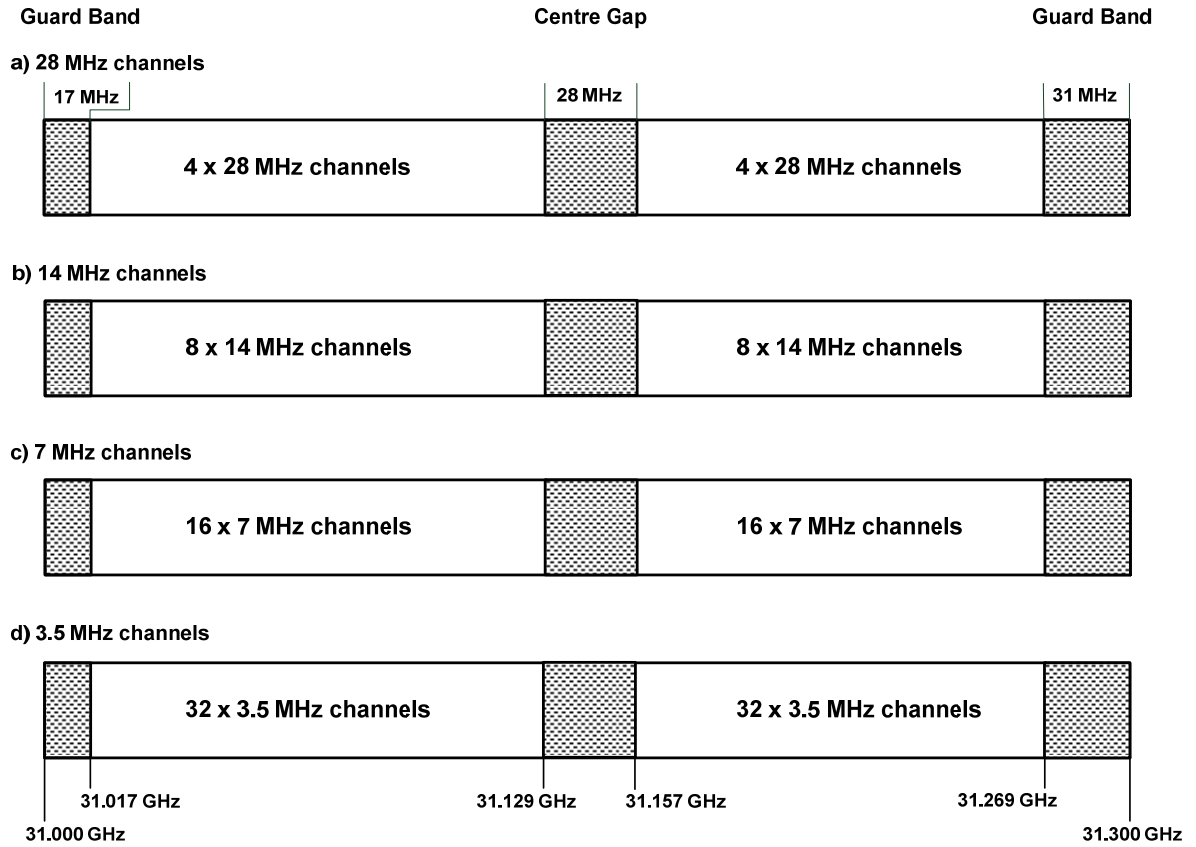


Figure B1: Occupied spectrum: 31.0 to 31.3 GHz Band for FDD systems