



European Radiocommunications Committee (ERC)
within the European Conference of Postal and Telecommunications Administrations (CEPT)

ERC RECOMMENDATION 12-11 (Luxembourg 1999, revised 2001)

**RADIO FREQUENCY CHANNEL ARRANGEMENT FOR FIXED SERVICE SYSTEMS
OPERATING IN THE BAND 51.4 – 52.6 GHz**

Recommendation adopted by the Working Group “Spectrum Engineering” (WGSE)

“The European Conference of Postal and Telecommunications Administrations,

considering

- 1) that CEPT should develop radio frequency channel arrangements in consultation with organisations developing standards for radio systems, in order to make the most effective use of the spectrum available;
- 2) that the propagation characteristics of the 51.4 - 52.6 GHz are ideally suited for use of short range digital radio links in high density networks;
- 3) that characteristics of FS systems to be deployed in this band are provided in the relevant standard (eg maximum transmit power and unwanted emission limits)

noting

- a) that Radio Regulations allocate the band 51.4 - 52.6 GHz on a primary basis for Fixed and Mobile;
- b) 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 services;
- c) that differing applications licensed by various administrations may require different radio-frequency channel arrangements;
- d) that the applications in this frequency band may require differing channel bandwidths;
- e) that several services with various transmission signal characteristics and capacities may be in simultaneous use in this frequency band;
- f) that a high degree of compatibility between radio-frequency channels of different arrangements can be achieved by selecting channel centre frequencies within a homogeneous basic pattern;

recommends

- 1) that the CEPT Administrations should follow the recommended channel arrangements for systems in the frequency range 51.4 - 52.6 GHz given in **Annex A.**”

Note:

Please check the ERO 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

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

- Fr be the reference frequency of 51412 MHz,
fn be the centre frequency (MHz) of the radio-frequency channel in the lower half of the band,
fn' 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:

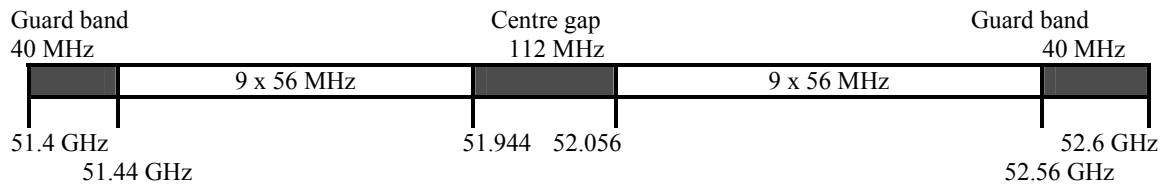
- a) for systems with a channel separation of 56 MHz:
lower half of the band: $f_n = f_r + 56 n$
upper half of the band: $f_{n'} = f_r + 616 + 56 n$ where $n = 1, 2, \dots, 9$
- b) for systems with a channel separation of 28 MHz:
lower half of the band: $f_n = f_r + 14 + 28 n$
upper half of the band: $f_{n'} = f_r + 630 + 28 n$ 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 $n = 1, 2, 3, \dots, 144$

ANNEX A

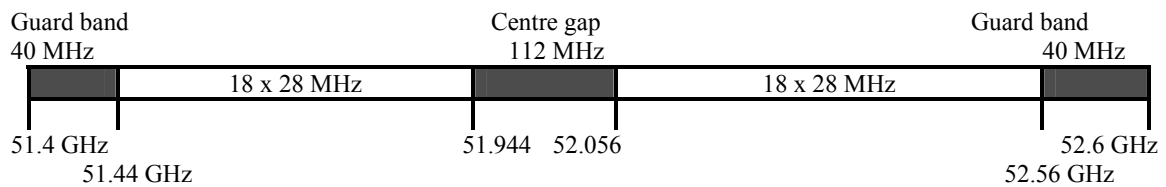
Figure 1

Occupied spectrum: 51.4 to 52.6 GHz Band

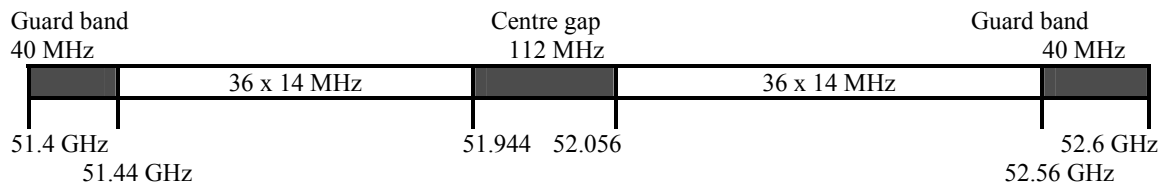
a) 56 MHz channels



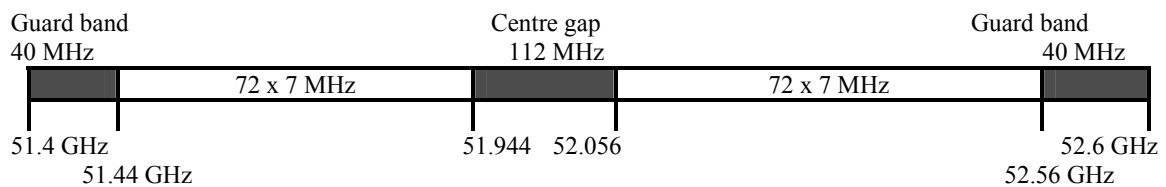
b) 28 MHz channels



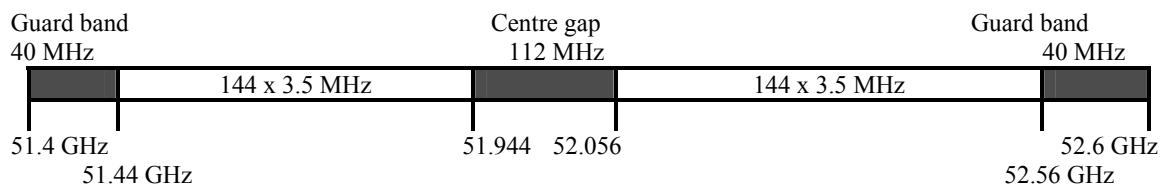
c) 14 MHz channels



d) 7 MHz channels



e) 3.5 MHz channels



ANNEX B

Table 1

Calculated parameters according to ITU-R Rec. 746

XS MHz	n	f _l MHz	f _n MHz	f ₁ MHz	f _n MHz	Z1S MHz	Z2S MHz	YS MHz	DS MHz
56	1,...9	51468	51916	52084	52532	68	68	168	616
28	1,...18	51454	51930	52070	52546	54	54	140	616
14	1,...36	51447	51937	52063	52553	47	47	126	616
7	1,...72	51443.5	51940.5	52059.5	52556.5	43.5	43.5	119	616
3.5	1,...144	51441.75	51942.25	52057.75	52558.25	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

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

DS Duplex spacing ($f_n - f_1$)