

**CEPT/ERC/RECOMMENDATION 12-04 E (Stockholm 1995)****HARMONISED RADIO FREQUENCY CHANNEL ARRANGEMENTS FOR  
DIGITAL TERRESTRIAL FIXED SYSTEMS OPERATING IN THE BAND 48.5 GHz - 51.4 GHz**

*Text of the recommendation adopted by Working Group "Spectrum Engineering" (WGSE):*

"The European Conference of Post 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 band 48.5 GHz - 51.4 GHz are ideally suited to short range low and medium capacity digital fixed systems,
3. that the anticipated developments in telecommunications networks will require large numbers of short range links in the supporting infrastructure,
4. that any radio frequency channel arrangement should incorporate a provision for the future introduction of improved equipment standards,

*noting*

- a) Article 8 of the Radio Regulations allocates the band 48.5 GHz - 50.2 GHz on an equal primary basis to the Fixed, Fixed-Satellite and Mobile services. Sharing criteria between Fixed and Mobile, and Fixed and Fixed-Satellite services may be required,
- b) Article 8 of the Radio Regulations allocates the band 50.2 GHz - 50.4 GHz on an equal primary basis to the Fixed, Earth Exploration Satellite (passive), Mobile and Space Research (passive) services, Sharing criteria between Fixed and Mobile, Fixed and Earth Exploration Satellite (passive), and Fixed and Space Research (passive) services are required,
- c) Article 8 of the Radio Regulations allocates the band 50.4 GHz - 51.4 GHz on an equal primary basis to the Fixed, Fixed-Satellite and Mobile services, Sharing criteria between Fixed and Mobile, and Fixed and Fixed-Satellite services may be required,
- d) Article 8 of the Radio Regulations footnote 904 allocates the band 48.94 GHz - 49.04 GHz to the Radio Astronomy Service on a primary basis for spectral line observations. In making assignments to stations of other services in this band, administrations are urged to take all practical steps to protect the Radio Astronomy Service from harmful interference. Co-ordination studies will be required to determine the appropriate method to be used,
- e) In some CEPT countries there are existing fixed systems that operate in bands contained within the band 48.5 GHz - 51.4 GHz on national channel arrangements and are not operating in accordance with the channel arrangements given in the Annex A,
- f) In some CEPT countries the band 48.5 GHz - 51.4 GHz is not currently available for the Fixed Service,

*recommends*

- 1) that CEPT Administrations which have the band 48.5 GHz - 51.4 GHz available for the Fixed Service should follow the recommended radio frequency arrangements for the band 48.5 GHz - 51.4 GHz given in Annex A,
- 2) that administrations that have existing systems operating within the band 48.5 GHz - 51.4 GHz may allow these systems to remain until the year 2008 and may determine on a national basis, the degree of protection given. Any international co-ordination that may be required between existing and new systems shall be in accordance with Article 12 of the Radio Regulations,
- 3) that CEPT Administrations do not use the sub-band 50.2 GHz - 50.4 GHz as it is not considered possible to share with the proposed EESS.”

## Annex A

### 1. DERIVATION OF RADIO FREQUENCY CHANNELS

The radio frequency channel arrangement for carrier spacings of 28 MHz, 14 MHz, 7 MHz and 3.5 MHz shall be derived as follows:

Let

$f_r$  be the reference frequency of 49952 MHz (14272 x 3.5 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,

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

a) for systems with a carrier spacing of 28 MHz:

lower half of the band:  $f_n = f_r - 1449 + 28 n$

upper half of the band:  $f_n' = f_r + 21 + 28 n$  where  $n = 1, 2, 3, \dots 50$

b) for systems with a carrier spacing of 14 MHz:

lower half of the band:  $f_n = f_r - 1442 + 14 n$

upper half of the band:  $f_n' = f_r + 28 + 14 n$  where  $n = 1, 2, 3, \dots 100$

c) for systems with a carrier spacing of 7 MHz:

lower half of the band:  $f_n = f_r - 1438.5 + 7 n$

upper half of the band:  $f_n' = f_r + 31.5 + 7 n$  where  $n = 1, 2, 3, \dots 200$

d) for systems with a carrier spacing of 3.5 MHz:

lower half of the band:  $f_n = f_r - 1436.75 + 3.5 n$

upper half of the band:  $f_n' = f_r + 33.25 + 3.5 n$  where  $n = 1, 2, 3, \dots 400$

Table 1: Calculated parameters according to ITU-R Rec. 746

XS MHz	n	f1 MHz	fn MHz	f'1 MHz	f'n MHz	Z1S MHz	Z2S MHz	YS MHz	DS MHz
28	1,...50	48531	49903	50001	51373	31	27	98	1470
14	1,...100	48524	49910	49994	51380	24	20	84	1470
7	1,...200	48520	49913.5	49990.5	51383.5	20.5	16.5	77	1470
3.5	1,...400	48518.75	49915.25	49988.75	51385.25	18.75	14.75	73.5	1470

XS Separation between centre frequencies of adjacent channels

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

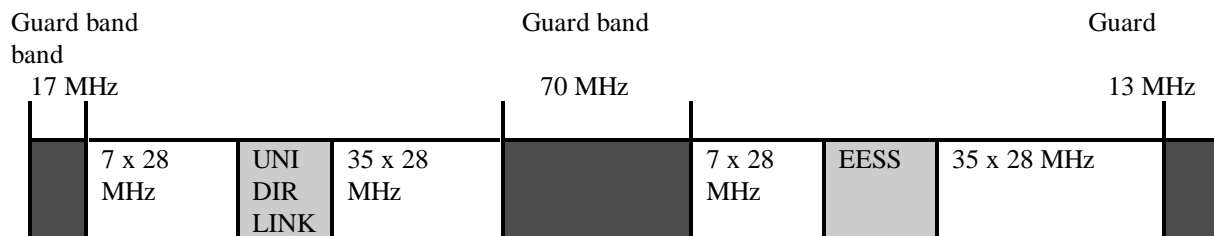
Z1S Separation between the lower band edge and the centre frequency of the first channel

Z2S Separation between centre frequencies of the final channel and the upper band edge

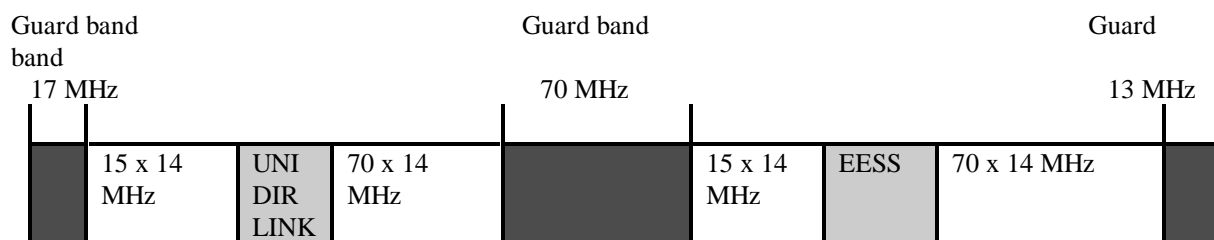
DS Duplex spacing ( $f'n - fn$ )

Table 2: Occupied spectrum: 48.5 to 51.4 GHz Band

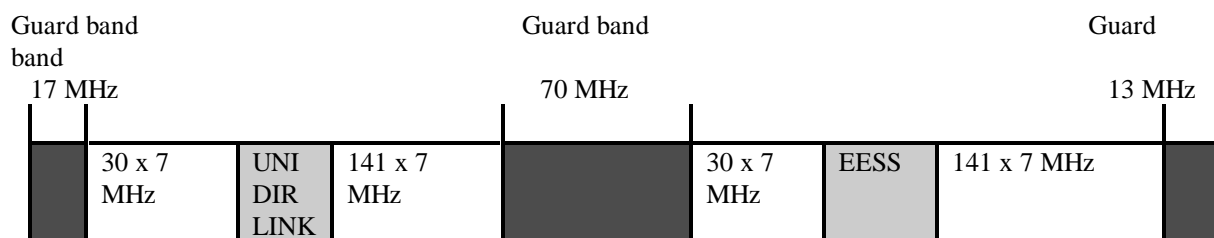
a) 28 MHz channels (3.5 MHz x 8)



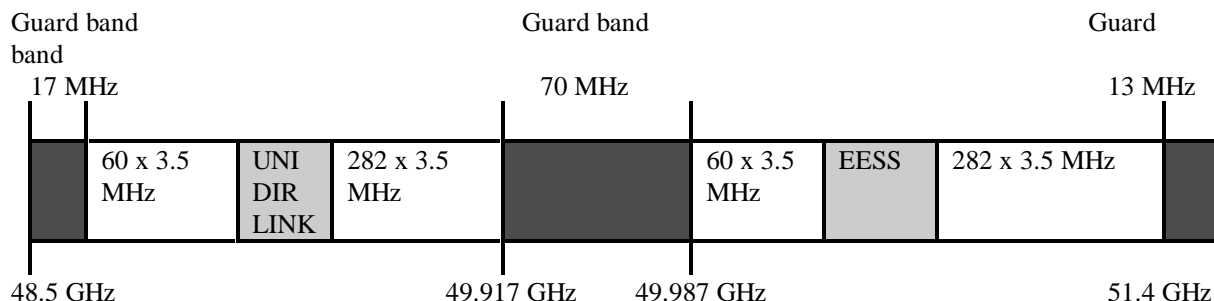
b) 14 MHz channels (3.5 MHz x 4)



c) 7 MHz channels (3.5 MHz x 2)



d) 3.5 MHz channels (3.5 MHz x 1)



Notes:

1. The sub-band 50.2 - 50.4 GHz is not used due to the EESS use of this band and its inability to share with the FS.

2. The sub-band 48.73 - 48.93 GHz is not used due to the reverse frequencies being used for EESS.
3. The sub-band 48.73 - 48.93 GHz could be used for unidirectional links.