

Recommendation T/R 12-01 (Helsinki 1991)

**HARMONIZED RADIO FREQUENCY CHANNEL ARRANGEMENTS
FOR ANALOGUE AND DIGITAL TERRESTRIAL FIXED SYSTEMS
OPERATING IN THE BAND 37 GHz-39.5 GHz**

Recommendation proposed by the "Frequency Management" Working Group T/WG 18 (FM)

Text of the Recommendation adopted by the "European Radiocommunications Committee" (ERC):

“The European Conference of Postal and Telecommunications Administrations,

considering that

- a) CEPT has a long-term objective to harmonise the use of frequencies throughout Europe,
- b) 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,
- c) development of a radio frequency channel arrangement for the band 37 GHz-39.5 GHz requires urgent action,
- d) the propagation characteristics of the band 37 GHz-39.5 GHz are ideally suited to short-range medium and low grade analogue and digital fixed systems,
- e) the anticipated development in large-scale mobile networks will require large numbers of short-range links in the supporting infra-structure,
- f) a number of new or existing systems could operate successfully in the band 37 GHz-39.5 GHz thus relieving congestion and reducing the demand for spectrum in the lower frequency bands,
- g) any radio frequency channel arrangement should incorporate a provision for the future introduction of improved equipment standards,
- h) in lower frequency bands, cross-polar antenna discrimination is a system-planning technique that offers greater frequency re-use,

noting that

1. Article 8 of the Radio Regulations allocates the band 37 GHz-37.5 GHz on an equal primary basis to the Fixed and Mobile services and the band 37.5 GHz-39.5 GHz to the Fixed, Mobile and Fixed Satellite services (space to earth). Sharing criteria between Fixed and Mobile, and Fixed and Fixed Satellite services may be required,
2. if an allocation is made to new space services in the band 37.5 GHz-39.5 GHz at WARC 92 then urgent sharing studies will be required,
3. in some CEPT countries there are existing fixed systems in the band 37 GHz-39.5 GHz which are not operating in accordance with the channel arrangement given in Annex A,
4. in some CEPT countries the band 37 GHz-37.5 GHz is currently unavailable for the Fixed service,
5. current equipment standards support a 7 MHz raster. In the future it is expected that standards supporting a 3.5 MHz raster will be developed,
6. currently, insufficient propagation data is available to permit planning based on a cross-polar operation,

recommends that

1. CEPT Administrations which have the band 37 GHz-39.5 GHz available for the Fixed service should follow the recommended radio frequency channel arrangements for the band 37 GHz-39.5 GHz given in Annex A. Until equipment standards have been developed based on a 3.5 MHz raster, the 7 MHz raster should be used,
2. in order to obtain maximum spectrum utilisation, the centre gap and guard bands may be used for a variety of low capacity systems, provided that the limits for out-of-band emissions are met,
3. the maximum power for terrestrial fixed systems operating in the band 37 GHz-39.5 GHz shall be limited to 50 dBW e.i.r.p.,
4. until reliable propagation data is available, antenna polarisation shall be limited to vertical,
5. until sharing criteria between the Fixed and Fixed Satellite services are developed the RR 2578 limits for the PFD of space to earth services shall apply,
6. if, at WARC 92, new space services are allocated to the band 37.5 GHz-39.5 GHz, the RR 2578 limits for the PFD of space to earth services shall apply until parameters for the space services are defined sufficiently for appropriate sharing criteria to be developed,
7. Administrations may choose to allow existing systems to remain in the band 37 GHz-39.5 GHz until the year 2005, and may determine, on a national basis, the degree of protection given. International co-ordination between existing and new systems shall be in accordance with Article 12 of the Radio Regulations.”

Annex A

1. DERIVATION OF RADIO FREQUENCY CHANNELS

1.1. The radio frequency channel arrangement for carrier spacings of 140 MHz, 56 MHz, 28 MHz, 14 MHz, 7 MHz and 3.5 MHz shall be derived as follows:

Let f_r be the reference frequency of 38.248 MHz;
 f_n be the centre frequency (MHz) of a radio-frequency channel in the lower half of the band;
 f'_n be the centre frequency (MHz) of a radio-frequency channel in the upper half of the band;

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

- a) For systems with a carrier spacing of 140 MHz:
Lower half of band: $f_n = (f_r - 1260 + 140 n)$ MHz
Upper half of band: $f'_n = (f_r + 140 n)$ MHz
where:
 $n = 1, 2, 3, \dots 8$
- b) For systems with a carrier spacing of 56 MHz:
Lower half of band: $f_n = (f_r - 1218 + 56 n)$ MHz
Upper half of band: $f'_n = (f_r + 42 + 56 n)$ MHz
where:
 $n = 1, 2, 3, \dots 20$
- c) For systems with a carrier spacing of 28 MHz:
Lower half of band: $f_n = (f_r - 1204 + 28 n)$ MHz
Upper half of band: $f'_n = (f_r + 56 + 28 n)$ MHz
where:
 $n = 1, 2, 3, \dots 40$
- d) For systems with a carrier spacing of 14 MHz:
Lower half of band: $f_n = (f_r - 1197 + 14 n)$ MHz
Upper half of band: $f'_n = (f_r + 63 + 14 n)$ MHz
where:
 $n = 1, 2, 3, \dots 80$
- e) For systems with a carrier spacing of 7 MHz:
Lower half of band: $f_n = (f_r - 1193.5 + 7 n)$ MHz
Upper half of band: $f'_n = (f_r + 66.5 + 7 n)$ MHz
where:
 $n = 1, 2, 3, \dots 160$
- f) For systems with a carrier spacing of 3.5 MHz:
Lower half of band: $f_n = (f_r - 1191.75 + 3.5 n)$ MHz
Upper half of band: $f'_n = (f_r + 68.25 + 3.5 n)$ MHz
where:
 $n = 1, 2, 3, \dots 320$

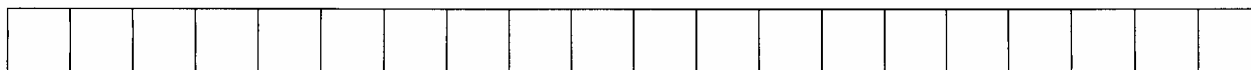
Table 1. Channel Frequency Plan

This is a fully homogeneous band plan, based on a 3.5 MHz raster, with channel edges aligned

a) 140 MHz channels ($7 \text{ MHz} \times 20$) 8 channels



b) 56 MHz channels ($7 \text{ MHz} \times 8$) 20 channels



c) 28 MHz channels ($7 \text{ MHz} \times 4$) 40 channels



d) 14 MHz channels ($7 \text{ MHz} \times 2$) 80 channels



e) 7 MHz channels 160 channels



f) 3.5 MHz channels 320 channels



↑
37,058 MHz

↑
38,178 MHz

Table 2. Occupied spectrum: 37 GHz to 39.5 GHz Band

