

RECOMMENDATION ITU-R F.1520

**Radio-frequency channel arrangements for systems
in the fixed service operating in the band 31.8-33.4 GHz**

(Questions ITU-R 108/9 and ITU-R 229/9)

(2001)

The ITU Radiocommunication Assembly,

considering

- a) that the band 31.8-33.4 GHz is allocated, among others, to the fixed service (FS) on a primary basis;
- b) that No. 5.547 of the Radio Regulations (RR) identifies the 31.8-33.4 GHz band as being available for high-density applications in the FS;
- c) that sharing in the 31.8-33.4 GHz band with radionavigation service, space research service (deep space, space-to-Earth) and inter-satellite service is considered to be feasible;
- d) that RR No. 5.547A states that administrations should take practical measures to minimize the potential interference between stations in the FS and airborne stations in the radionavigation service in the 31.8-33.4 GHz band, taking into account the operational needs of the airborne radar systems;
- e) that harmonized radio-frequency (RF) channel arrangements can facilitate effective use of the spectrum;
- f) that several systems with various transmission signal characteristics and capacities may be in simultaneous use in this frequency band;
- g) that certain frequency block arrangements can be achieved by aggregating the frequency channels given in Annex 1;
- h) that it may sometimes be desirable to interleave additional RF channels between those of the main pattern;
- j) that a high degree of compatibility between fixed systems of different frequency arrangements can be achieved by selecting channel centre frequencies within a homogeneous basic pattern,

recognizing

that some applications in this frequency band may require differing architectures (point-to-point and multipoint systems), channel bandwidths, and systems characteristics including the accommodation of symmetrical and asymmetrical traffic; and may require the use of frequency block-based arrangements that may or may not align with the channel arrangement in Annex 1,

recommends

- 1** that administrations consider the RF channel arrangement given in Annex 1 for FS system deployment in the 31.8-33.4 GHz frequency band;

2 that when additional RF channels interleaved between those of the main pattern, as described in Annex 1, are required, the values of the centre frequencies of these RF channels should be below those of the corresponding main channel frequencies by a value of half the considered channel spacing;

3 that those administrations wishing to implement FS systems in this band using a block-based frequency arrangement consider the guidance given in Recommendation ITU-R F.1519.

ANNEX 1

Radio-frequency channel arrangement in the band 31.8-33.4 GHz

The RF channels for separations of 3.5 MHz, 7 MHz, 14 MHz, 28 MHz and 56 MHz shall be derived as follows:

let f_r be the reference frequency of 32 599 MHz,
 f_n be the centre frequency (MHz) of the RF channel in the lower half of the band,
 f'_n be the centre frequency (MHz) of the RF channel in the upper half of the band,
 frequency duplex spacing = 812 MHz,

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

a) for channel separation of 56 MHz:

$$\text{lower half of the band: } f_n = f_r - 756 + 56 n$$

$$\text{upper half of the band: } f'_n = f_r + 56 + 56 n$$

where:

$$n = 1, 2, 3, \dots 12$$

b) for a channel separation of 28 MHz:

$$\text{lower half of the band: } f_n = f_r - 798 + 28 n$$

$$\text{upper half of the band: } f'_n = f_r + 14 + 28 n$$

where:

$$n = 1, 2, 3, \dots 27$$

c) for a channel separation of 14 MHz:

$$\text{lower half of the band: } f_n = f_r - 791 + 14 n$$

$$\text{upper half of the band: } f'_n = f_r + 21 + 14 n$$

where:

$$n = 1, 2, 3, \dots 54$$

d) for a channel separation of 7 MHz:

$$\text{lower half of the band: } f_n = f_r - 787.5 + 7n$$

$$\text{upper half of the band: } f'_n = f_r + 24.5 + 7n$$

where:

$$n = 1, 2, 3, \dots, 108$$

e) for a channel separation of 3.5 MHz:

$$\text{lower half of the band: } f_n = f_r - 785.75 + 3.5n$$

$$\text{upper half of the band: } f'_n = f_r + 26.25 + 3.5n$$

where:

$$n = 1, 2, 3, \dots, 216.$$

NOTE 1 – Systems using time division duplex techniques can operate in both sub-bands and the centre gap.

Centre gap = 56 MHz for the 3.5, 7, 14 and 28 MHz channel separation, 140 MHz for the 56 MHz channel separation.

TABLE 1

Calculated parameters according to Recommendation ITU-R F.746

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)
56	1, ..., 12	31 899	32 515	32 711	33 327	99	73	196	812
28	1, ..., 27	31 829	32 557	32 641	33 369	29	31	84	812
14	1, ..., 54	31 822	32 564	32 634	33 376	22	24	70	812
7	1, ..., 108	31 818.5	32 567.5	32 630.5	33 379.5	18.5	20.5	63	812
3.5	1, ..., 216	31 816.75	32 569.25	32 628.75	33 381.25	16.75	18.75	59.5	812

XS : separation between centre frequencies of adjacent channels.

YS : separation between centre frequencies of the closest go and return channels.

ZS_1 : separation between the lower band edge and the centre frequency of the lowest channel in the lower sub-band.

ZS_2 : separation between centre frequency of the highest channel in the upper sub-band and the upper band edge.

DS : duplex spacing ($f'_n - f_n$).

FIGURE 1
Occupied spectrum: 31.8-33.4 GHz band

