

## RECOMMENDATION ITU-R F.389-2\*

**Preferred characteristics of auxiliary radio-relay systems  
operating in the 2, 4, 6 or 11 GHz bands**

(1959-1963-1970-1974)

The ITU Radiocommunication Assembly,

*considering*

- a) that an auxiliary radio-relay system may be required for the provision of service channels for the maintenance, supervision and control of radio-relay links, using either the radio-frequency channel arrangements of Recommendations ITU-R F.382, ITU-R F.383 or ITU-R F.387;
- b) that, sometimes, the auxiliary radio-relay system may be required to operate with frequencies in or near the band of the main radio-relay system, and may, for reasons of economy, share the same antennas;
- c) that occasionally, a different frequency band from that of the main radio-relay system may be preferred for the auxiliary radio-relay system;
- d) that the characteristics of an auxiliary radio-relay system, sharing the same frequency band as the main radio-relay system and, in particular, the radio-frequency channel arrangement, should be such as not to cause mutual interference;
- e) that the auxiliary radio channels may employ either frequency or amplitude modulation;
- f) that two pairs of frequency allocations may be needed for the auxiliary radio-relay system, to provide either two normal service channels in each direction, or a normal service channel and a stand-by service channel in each direction, and to allow for the use of frequency diversity where this is essential and other forms of diversity are not practicable;
- g) that the numbers of the service channels to be provided and their functions have been defined in Recommendation ITU-R F.400,

*recommends*

**1** that, for an auxiliary radio-relay system sharing the same frequency band as the main radio-relay system, operating in the 2 or 4 GHz bands (Recommendation ITU-R F.382), the preferred frequencies (MHz) of the radio-frequency channels of the auxiliary system should be related to the centre frequency  $f_0$  of the normal pattern of the main system as shown below:

*Normal:*

lower half of the band:  $f_0 - 204.5$  and  $f_0 - 12$

upper half of the band:  $f_0 + 8.5$  and  $f_0 + 199$

*Interleaved:*

lower half of the band:  $f_0 - 213.5$  and  $f_0 - 23$

upper half of the band:  $f_0 - 2.5$  and  $f_0 + 190$

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\* Radiocommunication Study Group 9 made editorial amendments to this Recommendation in 2001 in accordance with Resolution ITU-R 44.

The arrangement of the radio-frequency channels and the preferred polarizations are shown in Fig. 1. Other radio-frequency channel arrangements for the auxiliary radio-relay systems may be used by agreement between the administrations concerned;\*

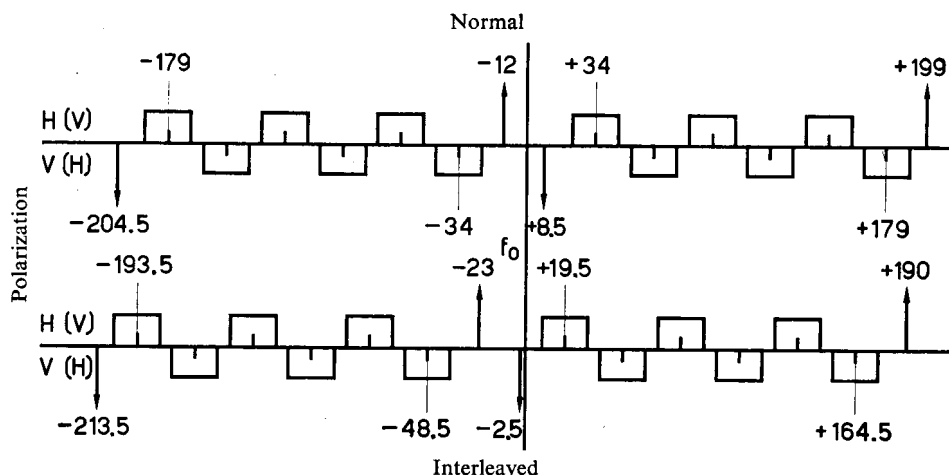


FIGURE 1 – Radio-frequency channel arrangement for main and auxiliary radio-relay systems operating in the 2 and 4 GHz bands

(All frequencies are in MHz)

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2 that, for an auxiliary radio-relay system sharing the frequency band of the main radio-relay system, operating in the 6 GHz band (Recommendation ITU-R F.383), the preferred frequencies (in MHz) of the radio-frequency channels of this auxiliary system should be related to the centre frequency  $f_0$  of the normal pattern of the main system, as shown below:

### 2.1 For frequency-modulation systems\*\*

lower half of the band:  $f_0 - 248.9$  and  $f_0 - 3.1$

upper half of the band:  $f_0 + 3.1$  and  $f_0 + 248.9$

### 2.2 For amplitude-modulation or frequency-modulation systems\*\*

lower half of the band:  $f_0 - 249.5$  and  $f_0 - 2.5$

upper half of the band:  $f_0 + 2.5$  and  $f_0 + 249.5$

The arrangement of the radio-frequency channels and the preferred polarizations are shown in Fig. 2.

If the radio-frequency channel arrangement of the main system follows the interleaved pattern of Recommendation ITU-R F.383, § 5, the lowest channel in each half of the band of that interleaved pattern should be left free, if the two lowest auxiliary radio-frequency channels are to be accommodated;

\* The use of the frequency  $f_0 + 199$  MHz ( $f_0$  being 4003.5 MHz) may not be in accordance with Article S5 of the Radio Regulations (RR). A special agreement of the administrations concerned to use this frequency is necessary, and interference must not be caused to users of the frequency in accordance with the RR.

\*\* Apart from the type of modulation, certain other characteristics (e.g. load on main channels, frequency stability, frequency allocation plan of the adjacent bands) should be taken into account.

3 that, for an auxiliary radio-relay system sharing the frequency band of the main radio-relay system, operating in the 11 GHz band (Recommendation ITU-R F.387), the preferred provisions to that end, set out in § 3 of that Recommendation, should be observed;

4 that the other characteristics of the auxiliary radio-relay system should be the subject of further study and, for the present, be subject to agreement between the administrations directly concerned.

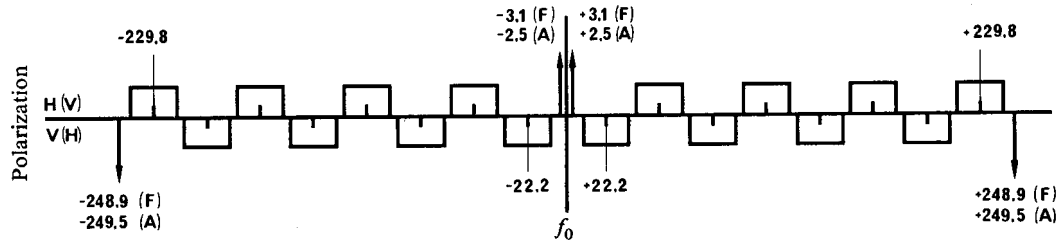


FIGURE 2 – *Radio-frequency channel arrangement for main and auxiliary radio-relay systems operating in the 6 GHz band*

(All frequencies are in MHz)

↑ or ↓ indicate the radio-frequency channels of the auxiliary radio-relay system

F: frequency modulation

A: amplitude modulation

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