

## RECOMMENDATION ITU-R F.348-4\*, \*\*

**ARRANGEMENT OF CHANNELS IN MULTI-CHANNEL SINGLE-SIDEBAND  
AND INDEPENDENT-SIDEBAND TRANSMITTERS FOR LONG-RANGE  
CIRCUITS OPERATING AT FREQUENCIES BELOW ABOUT 30 MHz**

(1953-1956-1959-1963-1966-1974-1986-1990)

The ITU Radiocommunication Assembly,

*considering*

(a) that the lack of uniformity, in the arrangement and designation of the channels in multi-channel transmitters for long-range circuits operating on frequencies below about 30 MHz, may give rise to certain difficulties when one transmitting station has to work with several receiving stations;

(b) that, since it is necessary to economize in the use of the radio-frequency spectrum, when considering international circuits consisting mainly of single long-distance radio links, operating on frequencies below 30 MHz, it is desirable:

- to use independent-sideband transmissions to the maximum extent possible;
- to transmit a band less than the 300 to 3400 Hz recommended by the ITU-T for landline circuits;
- to reduce the upper frequency to 3000 Hz, or less in special circumstances, but never below 2600 Hz;

(c) that there are already in operation international multi-channel radiotelephone circuits, in which the bandwidth allocated to each channel is 3000 Hz, but which are actually transmitting a speech band of 250 to 3000 Hz;

(d) that a number of countries also use a band for digital transmission with an upper frequency of 3400 Hz, and are actually transmitting a band from 300 to 3400 Hz;

(e) that, in general, the outer channels are liable to cause and receive more interference to and from stations operating on adjacent assigned frequencies, the outer channels being those located furthest from the assigned frequency;

(f) that there are advantages in adopting channel arrangements which are the same in all parts of the HF (decametric) range,

*recommends*

1. that standard channel arrangements should be adopted for multi-channel radiotelephone systems;
2. that for channels with an effective frequency band of 2750 Hz the transmitted band in each channel should be from 250 Hz with an upper frequency of 3000 Hz, or lower in special circumstances, but never below 2600 Hz;
3. that for channels with an effective frequency band of 3000 Hz the transmitted band in each channel should be from 300 Hz with an upper frequency of 3400 Hz, or lower in special circumstances, but never below 2600 Hz;
4. that in four-channel systems the channel arrangement should be as shown in Fig. 1a);

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\* This Recommendation should be brought to the attention of Radiocommunication Study Group 8.

\*\* Radiocommunication Study Group 9 made editorial amendments to this Recommendation in 2000 in accordance with Resolution ITU-R 44.

5. that, when less than four channels are used, the channels nearest to the carrier should be selected according to the arrangements shown in Figs. 1b), 1c), 1d), 1e) or 1f).

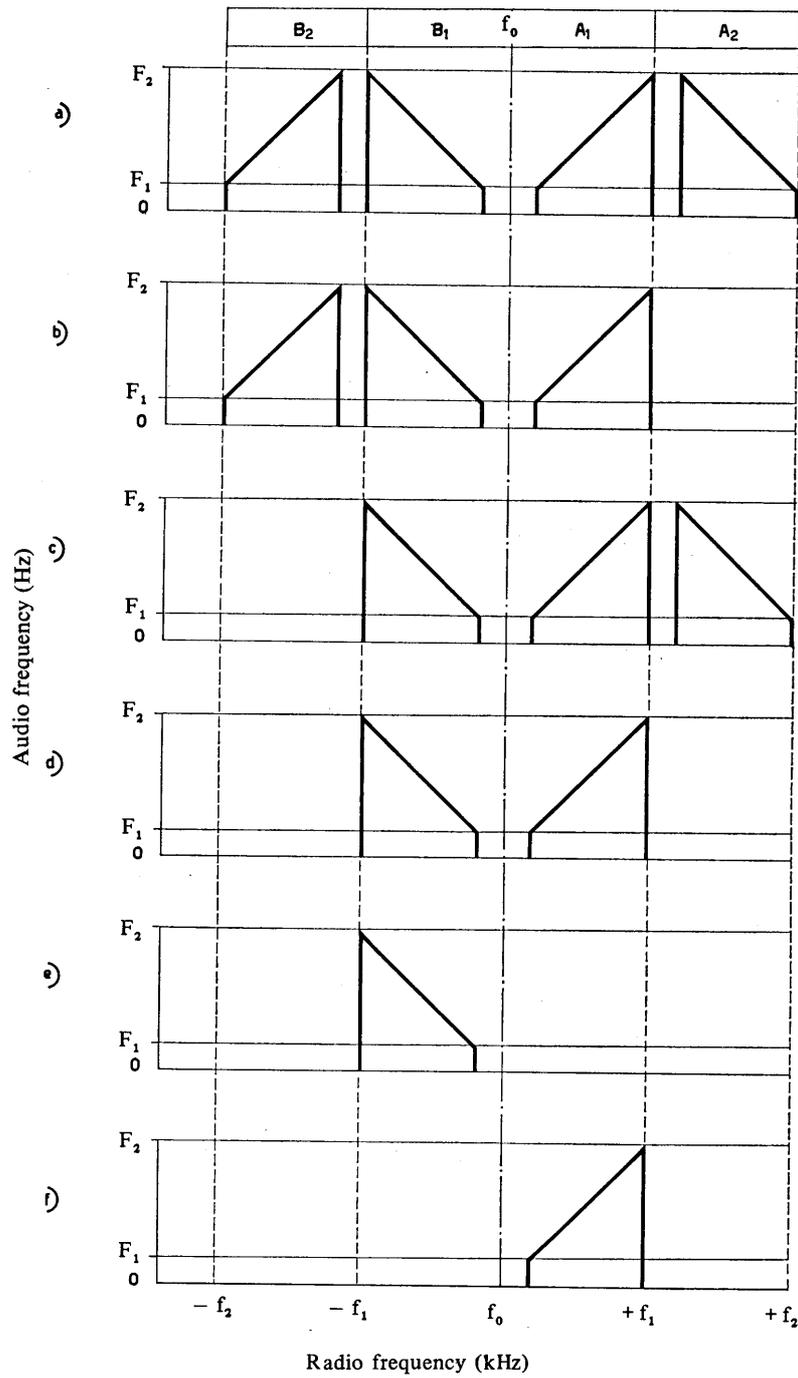


FIGURE 1 – Relationship between audio frequencies and radio frequencies for the various channel arrangements

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For an effective channel frequency band of 2750 Hz:

$$F_1 = 250 \text{ Hz}; F_2 = 3000 \text{ Hz}; f_1 = 3 \text{ kHz}; f_2 = 6 \text{ kHz}$$

For an effective channel frequency band of 3100 Hz:

$$F_1 = 300 \text{ Hz}; F_2 = 3400 \text{ Hz}; f_1 = 3.4 \text{ kHz}; f_2 = 6.8 \text{ kHz}$$