INTERNATIONAL TELECOMMUNICATION UNION

ITU-T

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J.33
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TELEVISION AND SOUND TRANSMISSION

CHARACTERISTICS OF EQUIPMENT AND LINES USED FOR SETTING UP 6.4 kHz TYPE SOUND - PROGRAMME CIRCUITS

ITU-T Recommendation J.33

Superseded by a more recent version

(Extract from the *Blue Book*)

Superseded by a more recent version

NOTES

1 ITU-T Recommendation J.33 was published in Fascicle III.6 of the *Blue Book*. This file is an extract from the *Blue Book*. While the presentation and layout of the text might be slightly different from the *Blue Book* version, the contents of the file are identical to the *Blue Book* version and copyright conditions remain unchanged (see below).

2 In this Recommendation, the expression "Administration" is used for conciseness to indicate both a telecommunication administration and a recognized operating agency.

Recommendation J.33

CHARACTERISTICS OF EQUIPMENT AND LINES USED FOR SETTING UP 6.4 kHz TYPE SOUND-PROGRAMME CIRCUITS[1)]

The CCITT recommends that, when an Administration wishes to provide a sound-programme circuit transmitted on a carrier system using a frequency band corresponding to two telephone channels, the circuit should occupy the frequency range 88 kHz to 96 kHz in the basic 12-channel group B frequency band and the virtual carrier frequency within this range should be 96 kHz, or as an alternative, 95.5 kHz[2)].

If there is an arrangement between interested Administrations, including if necessary the Administration of transit countries, a solution allowing the establishment of up to four 6.4 kHz-type sound-programme circuits in a basic group, as described in Annex A, may be used.

ANNEX A

(to Recommendation J.33)

Four 6.4 kHz type sound-programme circuits in a basic group

(Contribution by the PTT of China)

A.1 *Frequency position and modulation scheme*

In order that the requirements of the performance characteristics of adjacent basic groups, supergroups, etc., through-connection equipments are not more stringent than those for the 15 kHz type sound-programme circuits, the band of four 6.4 kHz programme frequencies in a group should be within the range of 65.3 to 102.7 kHz band.

In order that modulation procedure is the same as that of 15 kHz type sound-programme circuits, three level modulations are adopted. Modulation procedure and frequency position are shown in Figure A-1/J.33. All the carriers and pilots are derived from 12 kHz basic frequency.

A.2 *Emphasis network and compandor*

In order that the signal mean load of four 6.4 kHz type sound-programme circuits in telephone circuits is less than – 3 dBm0, and the peak value load less than +19 dBm0, it is necessary that the programme relative level (dBrs) be lower than that of telephone relative level (dBr) by 6.5 dB and emphasis network be applied.

In order to meet the requirement of – 39 dBm0s noise level of 2500 km hypothetical reference circuits defined in Recommendation J.23 (Yellow Book, 1980) in addition to the emphasis network, compandor should also be applied.

6.4 kHz system applies emphasis network as described in Recommendation J.17. At 0.8 kHz, the insertion loss of pre-emphasis is 6.5 dB, while the insertion gain of de-emphasis is 6.5 dB.

6.4 kHz system applies the same compandors as 15 kHz system does. (See Figure 4/J.31, Recommendation J.31.)

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1) The performance characteristics of 6.4 kHz type sound-programme circuits are given in Recommendation J.23 (Yellow Book, 1980).

2) For the choice of groups and supergroups used, see Recommendation J.32.

A.3 *Pilot*

To ensure the stability of instertion loss and deviation of frequency required in programme circuits, a 7.5 kHz pilot at a level of – 29 dBm0 ± 0.1 dB is inserted after pre-emphasis and before modulator in transmission path.

The pilot, after demodulator in receiving path, is derived so as to regulate frequencies and levels.

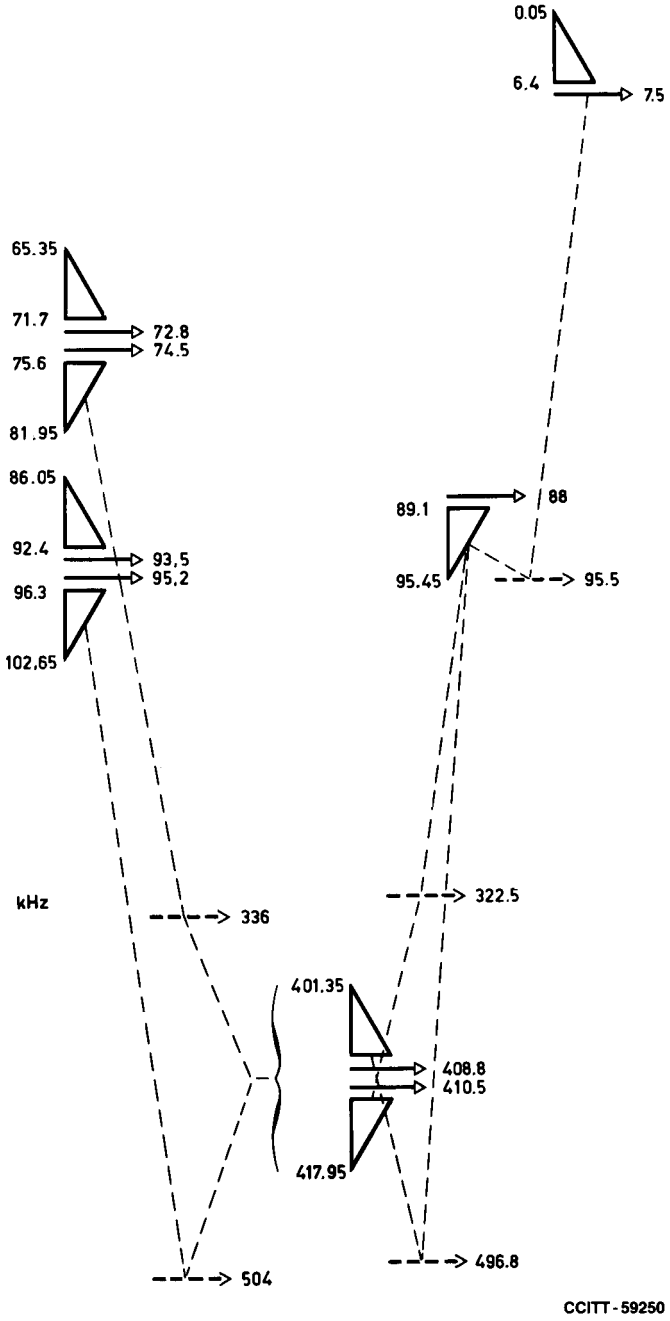

FIGURE A-1/J.33

Frequency position of four 6.4 kHz-type sound-programme channels in a group

A.4 *Noise*

Weighted noise of telephone channel hypothetical reference circuits	–50 dBm0p
Due to:	
telephone weighting network loss	2.5 dB
bandwidth expanding from 3.1 kHz to 6.4 kHz	3.2 dB
CCIR Recommendation 468 sound-programme weighted network (0.05 to 6.4 kHz)	9.0 dB
CCIR Recommendation 468 quasi-peak value measurement	5 dB

Sum (noise of hypothetical reference circuit without emphasis and compandor)	–30.3 dBq0ps
Variation of weighted noise level within the range of 0.05 to 6.4 kHz band due to de-emphasis (6.5 dB/800 Hz)	– 3 dB
Variation of noise level due to expandor	–12 dB

Noise of weighted hypothetical reference circuit of 6.4 kHz type programme channels (with emphasis and compandor) – 45.3 dBq0ps

There is about 6 dB safety margin compared with – 39 dBq0ps for 6.4 kHz type programme circuits described in Recommendation J.23.

A.5 *Summary*

In a group, four 6.4 kHz sound-programme channels (A, B, C and D) can be established, and A (or D) can be replaced by three telephone channels, A **Error! Bookmark not defined.** B (or C **Error! Bookmark not defined.** D) can be replaced by one 15 kHz sound-programme channel or by six telephone channels.

This system meets every requirement of 6.4 kHz type sound-programme circuits described in Recommendation J.23 (Yellow Book, 1980). There is no risk of overload in a group even when four programme channels transmit the same programme simultaneously.