INTERNATIONAL TELECOMMUNICATION UNION

ITU-T Q.44

TELECOMMUNICATION
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OF ITU

GENERAL RECOMMENDATIONS ON TELEPHONE SWITCHING AND SIGNALLING

INTERNATIONAL AUTOMATIC AND SEMI-AUTOMATIC WORKING

ATTENUATION DISTORTION

ITU-T Recommendation Q.44

(Extract from the *Blue Book*)

NOTES

1 ITU-T Recommendation Q.44 was published in Fascicle VI.1 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 Q.44

ATTENUATION DISTORTION

1 Attenuation distortion

1.1 *All-analogue conditions*

The design objectives recommended for carrier terminal equipment by the Recommendation cited in [3] are such that for a chain of six circuits, each equipped with a single pair of channel translating equipments in accordance with that Recommendation, the network performance objective for the attenuation distortion given by Figure 1/G.132 [2] will in most cases be met. The distortion contributed by the seven international centres is thereby included.

Note - To assess the attenuation distortion of the international chain, the limits indicated for international circuits in Recommendation G.151, § 1 [4] must not be added to the limits for international centres mentioned in Recommendation Q.45. In fact, on the one hand, some exchange equipment would be counted twice if this addition were made; on the other, the specification limits of Recommendation Q.45 apply to the worst possible connection through an international exchange, while the maintenance limits of Recommendation G.151, § 1 apply to the poorest international circuit. The specifications of the various equipments are such that the mean performance will be appreciably better than could be estimated by the above-mentioned addition.

1.2 *Mixed analogue/digital conditions*

In the mixed analogue/digital period, it is expected that the attenuation/frequency characteristics of the analogue carrier terminal equipment that is to be used in international telephone connections will continue to be governed by existing Recommendations that are relevant to this type of circuit.

Where unintegrated PCM digital processes are to be included in international telephone connections, it is recommended that the attenuation/frequency characteristic of the bandpass filters associated with such processes should comply with the more stringent version of Figure 1/G.712 [5]. The latter Recommendation applies specifically to cases where integrated PCM digital processes are associated with trunk junctions (toll connecting trunks), trunk circuits (intertoll trunks), and international circuits.

With regard to the incorporation of unintegrated PCM digital processes in local telephone networks, the required attenuation/frequency characteristics of the bandpass filters involved are still under study.

2 The network performance objectives for the variation with frequency of transmission loss in terminal condition of a worldwide 4-wire chain of 12 circuits (international plus national extensions), each one routed over a single group link, are shown in Figure 1/Q.44 which assumes that no use is made of high-frequency radio circuits or 3-kHz channel equipment.

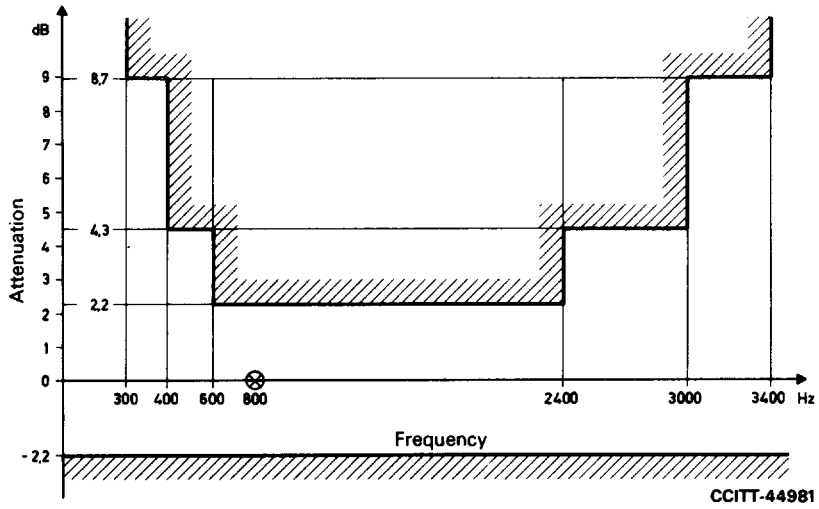

FIGURE 1/Q.44

Permissible attenuation variation with respect to its value measured at 800 Hz (objective for worldwide 4-wire chain of 12 circuits in terminal service)

References

[1] CCITT Recommendation *Transmission losses, relative levels and attenuation distortion*, Vol. III, Rec. G.141.

[2] CCITT Recommendation *Attenuation distortion*, Vol. III, Rec. G.132.

[3] CCITT Recommendation *12-channel terminal equipments*, Vol. III, Rec. G.232, § 1.

[4] CCITT Recommendation *General performance objectives applicable to all modern international circuits and national extension circuits*, Vol. III, Rec. G.151, § 1.

[5] CCITT Recommendation *Performance characteristics of the PCM multiplex at audio frequencies*, Vol. III, Rec. G.712.