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SPECIFICATIONS FOR MEASURING EQUIPMENT

QUANTIZING DISTORTION MEASURING EQUIPMENT USING A PSEUDO-RANDOM NOISE TEST SIGNAL

ITU-T Recommendation O.131

(Extract from the *Blue Book*)

NOTES

1 ITU-T Recommendation O.131 was published in Fascicle IV.4 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.

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QUANTIZING DISTORTION MEASURING EQUIPMENT USING A PSEUDO-RANDOM NOISE TEST SIGNAL

(Geneva, 1976; amended at Geneva, 1980, and at Melbourne, 1988)

1 Preamble

It is important that the characteristics of quantizing distortion measuring apparatus are specified with sufficient precision to ensure that all future designs of measuring apparatus conforming to the recommended specification shall be compatible with one another, i.e., they shall be capable of interworking and give results of specified accuracy without the need for any special procedures or corrections to the measurements results. It is considered equally important that all designs of measuring apparatus conforming to the recommended specification shall be capable of interworking with existing designs of measuring apparatus already in use by various Administrations, who will thus not be placed at any economic disadvantage. The following specification is based on the proposals studied by Study Group XVIII and is specifically aimed at the foregoing compatibility objectives.

Note – The question of interworking between existing designs of quantizing distortion measuring apparatus is not, in itself, directly relevant to this specification, but it is worth recording that this topic has been studied by the Federal Republic of Germany and the United Kingdom Post Office. Satisfactory rules have been established to facilitate interworking between the different existing types of measuring apparatus which use a band-limited pseudo-random noise source.

2 Testing method proposed

The method proposed is that described in Method 1 in § 9 of Recommendation G.712 [1]. The proposed noise source is band-limited pseudo-random noise having a probability density distribution of amplitudes which is substantially near to a Gaussian distribution¹⁾.

The signal-to-total distortion power, including quantizing distortion, is measured as the ratio of the power of received stimulus in the reference band, to the noise power in the measured band. A correction is included to relate the measurement to the full PCM speech channel bandwidth.

1) The receive measuring apparatus specified in § 3.2 may also be used to measure quantizing distortion using a sinusoidal test signal in the frequency range 350-550 Hz (preferably at 420 ± 20 Hz) instead of the pseudo-random noise stimulus. It should be noted, however, that while the measurement is similar to Method 2 described in Recommendation G.712 [1], the obtained measurement results are related to a bandwidth of 3.1 kHz and that no noise weighting is provided. It should also be noted that results given by the pseudo-random noise and sinusoidal methods may not be the same.