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SERIES G: INTERNATIONAL ANALOGUE CARRIER SYSTEMS

Transmission media – Characteristics

Digital crosstalk measurement (method used by the Administrations of France, the Netherlands and Spain)

ITU-T G-series Recommendations – Supplement 19

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NOTES

1 Supplement 19 to the G-series Recommendations was approved in Málaga-Torremolinos (1984) and published in Fascicle III.2 of the *Red Book*. This file is an extract from the *Red Book*. While the presentation and layout of the text might be slightly different from the *Red Book* version, the contents of the file are identical to the *Red Book* version and copyright conditions remain unchanged (see below).

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

DIGITAL CROSSTALK MEASUREMENT (METHOD USED BY THE ADMINISTRATIONS OF FRANCE, THE NETHERLANDS AND SPAIN)

(Geneva, 1980; referred to in Recommendation G.612)

In order to speed up crosstalk measurements, reduce their number and obtain measurement data which can be directly interpreted in relation to the system transmitted, a new digital measurement method has been developed; this method is in current use for 2 Mbit/s and 8 Mbit/s systems. It consists in sending a signal, simulating that of the system to be transmitted, simultaneously over a large number of interfering pairs of the cable to be measured. The induced noise is successively recorded on each of the pairs suffering interference, amplified in a device having the pre-emphasis characteristics of the system regenerator and measured by a voltmeter. In a variant method, the signal is converted into a measurable error rate. The measuring device is calibrated by sending the emitted signal directly to the receiver after filtering and attenuation in a calibrated network.

The measurement result may be expressed in dB if we consider the ratio between the received signal and a voltage proportional to the emitted signal or, more simply, directly in mV (or as an error rate) read on the receiver, since the emitted signal amplitude is a constant quantity for a given system.

If there are enough generators to send a signal over each of the interference pairs, it is sufficient to carry out a single measurement, in far-end or near-end crosstalk, on each of the pairs suffering interference.

For cables intended for the transmission of the 8 Mbit/s system, far-end crosstalk measurements are made on the pairs of each unit for elementary cable sections; near-end crosstalk measurements are conducted only on the longest sections, at both ends. The possibility of using the same method to measure factory lengths is being studied.

The digital measuring method is described in detail in the following articles:

Bibliography

SØRENSEN (P.): Measurement of digital crosstalk and behaviour of PCM regenerators against interference, *Electrical Communication*, pp. 293-294, 47 (1972) 4.

BOULVIN (J.), BEYNIÉ (C.), BARGETON (A.), PAYANT (A.) et COUTTY (B.): Mesures en régime numérique de la diaphonie sur des cables à paires symétriques (Digital crosstalk measurements on symmetric cable pairs) *Cables et Transmission*, April 1975.

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