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G.612

TRANSMISSION MEDIA CHARACTERISTICS

CHARACTERISTICS OF SYMMETRIC CABLE PAIRS DESIGNED FOR THE TRANSMISSION OF SYSTEMS WITH BIT RATES OF THE ORDER OF 6 TO 34 Mbit/s

ITU-T Recommendation G.612

(Extract from the *Blue Book*)

NOTES

1 ITU-T Recommendation G.612 was published in Fascicle III.3 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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Recommendation G.612

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(Geneva, 1976; amended at Geneva, 1980)

1 Preamble

This Recommendation relates to symmetric pair cables which have been developed for the transmission of signals with bit rates of the order of 6 to 34 Mbit/s, but they are not ruled out for the transmission of lower or higher bit rates, subject to the use of an appropriate regeneration section; in most cases they can also be used for baseband transmission of videophone or television signals.

These cables fall into two categories, according to whether or not the cable is intended for use in both directions of transmission in the same cable.

2 Parameters to be measured

Those parameters which, for digital system transmission, have to be measured by a particular method or at frequencies different from those defined in Recommendation G.611, are: characteristic impedance, attenuation coefficient, and far-end crosstalk between pairs on the same direction of transmission. If the cable is intended for use with both directions of transmission within the same cable, it is also necessary to measure the near-end crosstalk between pairs intended for different directions of transmission.

2.1 Characteristic impedance

The characteristic impedance may be measured:

- either in the sinusoidal mode, when the measured pair will be terminated by an impedance constantly equal to that measured by the bridge, except when the length is sufficient for the measurement result to be independent of the termination impedance;
- or by a pulse echo meter¹⁾, when the impedance of the pair being measured is compensated by an adjustable balancing network graduated to show the impedance value. The pair being measured is terminated by an identical network.

2.2 Attenuation coefficient

The attenuation per km of the pairs is derived from that value to be obtained on an elementary cable section, allowance being made for the tolerance accepted on the length of these sections.

Note - In the case of looped measurement, a check should be carried out to ensure that the near-end crosstalk attenuation between the ends of the circuit being measured is sufficient.

2.3 Crosstalk

Crosstalk may be specified either in sinusoidal mode, at a frequency near the timing half-frequency of the system concerned, or in digital mode²⁾.

1) This method is similar to the one used for coaxial pairs, but with a symmetrical measuring head and networks. The pulse duration is equal to 100 ns; the echo is not corrected.

2) An example of a digital technique is given in Supplement No. 19.