



INTERNATIONAL TELECOMMUNICATION UNION

**ITU-T**

TELECOMMUNICATION  
STANDARDIZATION SECTOR  
OF ITU

**S.31**

**TELEGRAPHY**

**ALPHABETICAL TELEGRAPH TERMINAL  
EQUIPMENT**

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**TRANSMISSION CHARACTERISTICS FOR  
START - STOP DATA TERMINAL EQUIPMENT  
USING INTERNATIONAL ALPHABET No. 5**

**ITU-T Recommendation S.31**

(Extract from the *Blue Book*)

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## NOTES

1 ITU-T Recommendation S.31 was published in Fascicle VII.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 S.31

### TRANSMISSION CHARACTERISTICS FOR START-STOP DATA TERMINAL EQUIPMENT USING INTERNATIONAL ALPHABET No. 5

(Geneva, 1972; amended at Geneva, 1976)

The CCITT,

*considering*

(a) that taking into account Recommendations T.50 [1] and X.4 [2], this Recommendation applies to the characteristics, from the transmission point of view, at the interchange point between data circuit-terminating equipment and start-stop data terminal equipment using International Alphabet No. 5. Except where otherwise specified, *data terminal equipment* in this Recommendation should be understood to mean *start-stop apparatus* in the wide sense of the term, as defined in [3] i.e. it includes reperforators, service signals sent by switching equipment, signals from answer-back units, automatic transmitters, etc.;

(b) that, bearing in mind the definition of User Class of Service 1 in Recommendation X.1 [4], where it is specified that a signalling rate of 300 bit/s, a structure of 11 units per character and start-stop operation shall be used for address selection, call progress signals and data transfer;

(c) that the characteristics laid down below are those that should be evident in service conditions at the interchange point between data terminal equipment and data circuit-terminating equipment,

*unanimously declares the view:*

#### **1 Equipment characteristics**

1.1 The nominal modulation rate should be:

- a) 300 bauds; or
- b) 200 bauds.

1.2 The difference between the real mean modulation rate of the signals when in service and the nominal rate should not exceed  $\pm 0.1\%$ .

1.3 The nominal duration of the transmitting cycle should be at least 11 units, the stop element lasting for at least 2 units.

1.4 The receiver must be able to translate correctly in service the signals coming from a source that appears to have a nominal transmit cycle equal to or greater than 10 units.

#### **2 Transmitter characteristics**

2.1 The degree of gross start-stop distortion of transmitted signals, measured at the interchange point between data terminal equipment and data circuit-terminating equipment, must not exceed 5%. This value applies to all working conditions of the equipment under consideration encountered during normal service, whether the signals are transmitted separately or whether they succeed one another at the maximum rate compatible with the modulation rate.

2.2 It is recommended that the measurement should be made with a start-stop distortion measuring set for two consecutive periods, each of about 15 seconds (corresponding to about 1200 transitions at 200 bauds or 1800 transitions at 300 bauds). Early distortion should be observed during one period and late distortion during the other.

#### **3 Receiver characteristics**

3.1 The effective net margin measured at the interchange point between data terminal equipment and data circuit-terminating equipment should not be less than 40% for signals corresponding to a nominal transmit cycle equal to or greater than 10 units.

- 3.2 It is recommended that the measurement should be made under the following conditions, in service:
- 11-unit cycle for the signals transmitted by the measuring apparatus;
  - use of one of the signal trains specified in Recommendation S.33;
  - first test with an identical distortion rate on all transitions of the signal train, obtained by lengthening the start element;
  - a second test with the same rate of identical distortion on all the transitions of the signal train, but obtained in this case by shortening the start element;
  - reading the margin when one error per test sentence is obtained (the margin is the lesser of the two values of the degree of distortion obtained from the two measurements);
  - the length of the start element or of any data element must in no case be less than 50% of the theoretical unit element.

*Note* – It will be up to Administrations using some other measuring method to work out for their own use figures to give equivalent results to those which would have been obtained by the recommended method.

### **References**

- [1] CCITT Recommendation *International Alphabet No. 5*, Rec. T.50.
- [2] CCITT Recommendation *General structure of signals of International Alphabet No. 5 code for data transmission over public data networks*, Rec. X.4.
- [3] CCITT Definitions: *Start-stop apparatus*, Vol. X, Fascicle X.1 (Terms and Definitions).
- [4] CCITT Recommendation *International user classes of service in public data networks*, Rec. X.1.