INTERNATIONAL TELECOMMUNICATION UNION

ITU-T M.1350

TELECOMMUNICATION
STANDARDIZATION SECTOR
OF ITU

MAINTENANCE: INTERNATIONAL DATA TRANSMISSION SYSTEMS

SETTING UP, LINING UP AND CHARACTERISTICS OF INTERNATIONAL DATA TRANSMISSION SYSTEMS OPERATING IN THE RANGE 2.4 kbit/s TO 14.4 kbit/s

ITU-T Recommendation M.1350

(Extract from the *Blue Book*)

NOTES

1 ITU-T Recommendation M.1350 was published in Fascicle IV.2 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 M.1350

SETTING UP, LINING UP AND CHARACTERISTICS OF INTERNATIONAL DATA TRANSMISSION SYSTEMS OPERATING IN THE RANGE 2.4 kbit/s TO 14.4 kbit/s

1 General

This Recommendation deals with the setting up, lining up and characteristics of international data transmission systems operating at speeds in the range 2.4 to 14.4 kbit/s. The system may be a single connection operating at 2.4, 4.8, 7.2, 9.6 or 14.4 kbit/s, or a combination of the lower speed systems, multiplexed onto the 9.6 or 14.4 kbit/s system.

These systems may be carried on data links comprised of voice grade circuits (either analogue or digital), or multiplexed onto higher bit rate data transmission systems as described in Recommendation M.1300.

The system may terminate at terminal international centres, terminal national centres or, when multiplexing is employed to derive several channels, a combination of several termination configurations may be provided. See Figure 1/M.1300 and Figure 2/M.1300 for further information.

When an international data transmission system is assigned its designation (according to Recommendation M.140, §§ 3.2.15 and 11 [1]), the Administration with control station responsibility will assemble the necessary technical and operational information. This should be entered into the list of Related Information (as defined in Recommendation M.140, § 12 [1]) which consists of the items shown in Annex A to this Recommendation.

2 Characteristics of data links

2.1 *Analogue data links*

The transmission characteristics of analogue circuits to be used as data links are based upon Recommendation M.1020 where these links utilize modems without in-built equalizers. Alternatively, the relaxed loss/frequency and group-delay distortion limits specified in Recommendation M.1025 may be applied for those systems utilizing modems with built-in equalizers where agreed between the Administrations involved and if tests confirm suitability.

2.2 *Digital data links*

Where the data systems are multiplexed onto higher bit rate data transmission systems, the data link is set up in accordance with the requirements of the higher bit rate system, see Recommendation M.1370.

3 Setting up and lining up the data transmission system

3.1 *Setting up and testing an analogue data link*

The analogue data link is set up and tested in accordance with the principles and procedures detailed in Recommendation M.1050. In this regard the data link is to be considered as a special circuit.

Suitable adjustments may be made to the procedures stated in Recommendation M.1050 where the system terminates in terminal international centres or terminal national centres, rather than in renters premises.

3.2 *Setting up and testing a digital data link*

(Under study).

3.3 *Overall system tests*

3.3.1 When the various sections have been set up and lined up and interconnected using any necessary equipment to form an end-to-end system, overall system data tests shall be made. The objectives for these tests are as shown in Table 1/M.1350.

TABLE 1/M.1350

Data rate bit/s	Error ratio	Error in 15 min	% error-free seconds
2 400	1×10^{-5}	22	Better than 92%
4 800	1×10^{-5}	43	Better than 92%
7 200	1×10^{-5}	65	Better than 92%
9 600	1×10^{-5}	86	Better than 92%
14 400	(under study)	(under study)	(under study)

3.3.2 Where agreed between Administrations involved, or when end-to-end tests indicate less than satisfactory performance, sectionalizing tests may be performed (see Recommendation M.1355, § 3.5).

3.3.3 Bit error ratio and/or error free seconds tests are to be performed utilizing a 511 bit pseudorandom test pattern as described in Recommendation V.52 [2]. Alternatively, other patterns such as the 2047 bit pseudorandom pattern may be used when agreed between Administrations.

4 Recording of results

All measurement results are to be recorded for later reference during maintenance measurements.

5 Limits for bit error ratio and error free seconds

Provisional limits for bit error ratio and error free seconds are given in Table 1/M.1350. These limits are subject to further study. For further information see Recommendation G.821 [3].

6 Allocation of overall objectives

The allocation of the error performance objectives indicated in Table 1/M.1350 for the end-to-end system is under study.

ANNEX A

(to Recommendation M.1350)

Designation information on international data transmission systems

A.1 *Designation*

The designation is according to Recommendation M.140 [1], § 11 (for use between Administrations) or § 3.2.15 (for private use).

A.2 *Related information*

RI 1. Urgency for restoration;

RI 2. Terminal countries;

RI 3. Administrations', carriers' or broadcasting companies' names;

RI 4. Control and sub-control station(s);

RI 5. Fault report points;

RI 6. Routing;

RI 7. Association;

RI 8. Equipment information;

RI 9. Use;

RI 10. Transmission medium information;

RI 11. Composition of transmission;

RI 12. (Empty item, use: "–;");

RI 13. Occupancy.

The various items will be dealt with in § 12 of Recommendation M.140 [1].

References

[1] CCITT Recommendation *Designation of international circuits, groups and line links, digital blocks, digital paths, data transmission systems and related information*, Vol. IV, Rec. M.140.

[2] CCITT Recommendation *Characteristics of distortion and error-rate measuring apparatus for data transmission*, Vol. VIII, Rec. V.52.

[3] CCITT Recommendation *Error performance on an international digital connection forming part of an integrated services digital network*, Vol. III, Rec. G.821.