



INTERNATIONAL TELECOMMUNICATION UNION

CCITT

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THE INTERNATIONAL
TELEGRAPH AND TELEPHONE
CONSULTATIVE COMMITTEE

(10/92)

SPECIFICATIONS OF MEASURING EQUIPMENT

ERROR PERFORMANCE MEASURING EQUIPMENT OPERATING AT THE PRIMARY RATE AND ABOVE



Recommendation O.151

FOREWORD

The CCITT (the International Telegraph and Telephone Consultative Committee) is a permanent organ of the International Telecommunication Union (ITU). CCITT is responsible for studying technical, operating and tariff questions and issuing Recommendations on them with a view to standardizing telecommunications on a worldwide basis.

The Plenary Assembly of CCITT which meets every four years, establishes the topics for study and approves Recommendations prepared by its Study Groups. The approval of Recommendations by the members of CCITT between Plenary Assemblies is covered by the procedure laid down in CCITT Resolution No. 2 (Melbourne, 1988).

Recommendation O.151 was revised by Study Group IV and was approved under the Resolution No. 2 procedure on the 5th of October 1992.

CCITT NOTE

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

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Recommendation O.151**ERROR PERFORMANCE MEASURING EQUIPMENT
OPERATING AT THE PRIMARY RATE AND ABOVE¹⁾***(Published 1976; revised 1980, 1984, 1988 and 1992)**Abstract*

Defines the requirements for an equipment to measure error performance of digital systems at the hierarchical bit rates between 1.5 and 140 Mbit/s.

Keywords

- digital error detector;
- digital pattern generator;
- error performance measurement;
- measurement;
- tester.

PREAMBLE

The requirements for the characteristics of bit-error performance measuring equipment which are described below must be adhered to in order to ensure compatibility between equipment produced by different manufacturers.

1 General

The equipment is designed to measure the bit-error performance of digital systems²⁾ by the direct comparison of a received pseudo-random test pattern with a locally generated test pattern identical to the transmitted test pattern. In addition, the capability to measure errored time intervals is provided.

2 Test patterns

The following patterns are recommended (see Recommendation O.150 for further details).

2.1 Pseudo-random pattern for systems using a $2^{15} - 1$ (32 767 bit) pattern length

This pattern is primarily intended for error and jitter measurements at bit rates of 1544, 2048, 6312, 8448, 32 064 and 44 736 kbit/s.

This pattern may be generated in a fifteen-stage shift register whose 14th and 15th stage outputs are added in a modulo-two addition stage, and the result is fed back to the input of the first stage.

¹⁾ This Recommendation is the joint responsibility of Study Groups IV, XVII and XVIII.

²⁾ "Digital system" is used as a generic term for paths, links, transmission systems, etc.