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STANDARDIZATION SECTOR
OF ITU

X.141

**PUBLIC DATA NETWORKS
NETWORK ASPECTS**

**GENERAL PRINCIPLES FOR THE DETECTION
AND CORRECTION OF ERRORS IN PUBLIC
DATA NETWORKS**

ITU-T Recommendation X.141

(Extract from the *Blue Book*)

NOTES

- 1 ITU-T Recommendation X.141 was published in Fascicle VIII.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 X.141

GENERAL PRINCIPLES FOR THE DETECTION AND CORRECTION OF ERRORS IN PUBLIC DATA NETWORKS

(Malaga-Torremolinos, 1984)

The CCITT,

considering

- (a) that errors have to be detected and corrected with a very high degree of reliability;
- (b) that some error correction procedures may be more advantageous than others depending on transmission delays in the network and on the distribution (with time) of errors;
- (c) that the distribution (with time) of errors at the ends of a path may depend on forward error correction procedures implemented in one or more of the path segments;
- (d) that the applicability of some error correction procedures may be affected by the number of satellite systems in the connection, which may be in national or international links or in the Maritime Mobile Service;
- (e) that different error correction procedures may be concatenated in some connections,

unanimously recommends

that the general principles identified in this Recommendation be taken into account in the design and application of procedures for the detection and correction of errors in public data networks.

1 General

1.1 The purpose of this Recommendation is to describe general principles applicable to the detection and correction or recovery of link transmission errors in public data networks.

1.2 Two fundamental objectives of error control procedures are:

- to ensure an incidence of undetected errors that is within acceptably low probability limits;
- to ensure that detected errors are corrected or recovered using an error control procedure consistent with data throughput and sequencing requirements which apply when the error rate of the Physical Layer is within the fully acceptable and the tolerance limits of specified performance.

1.3 In the context of the Reference Model of Open Systems Interconnection, it is noted in Recommendation X.200 that each (N) peer protocol should include sufficient control information to enable the (N) entities to detect or recover from error conditions within its purview. Reporting detected but unrecovered errors is a service that must be provided by each layer.

Specifically, it is an objective of the Data Link Layer to detect and possibly correct errors which may occur in the Physical Layer.

1.4 For any particular error detection arrangement the probability of undetected errors will generally tend to increase:

- with increasing error rate,
- for any given error rate, as the error distribution becomes less random and as the length of error bursts increases,
- with increasing frame length,
- possibly due to scrambling arrangements which may have factors in common with the generating polynomial used for error detection.