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INTEGRATED SERVICES DIGITAL NETWORK (ISDN)

ISDN USER-NETWORK INTERFACES

RELATIONSHIP OF TERMINAL FUNCTIONS TO ISDN

ITU-T Recommendation I.470

(Extract from the *Blue Book*)

NOTES

1 ITU-T Recommendation I.470 was published in Fascicle III.8 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 I.470

RELATIONSHIP OF TERMINAL FUNCTIONS TO ISDN

(Melbourne, 1988)

1 General

1.1 An ISDN is intended to support a wide range of new and existing terminals (TE1, TE2 + TA, NT2) of various capabilities and designed for different access interfaces. This is necessary to permit a full application of the ISDN service potential.

1.2 The purpose of this Recommendation is to provide direction to the potential functional requirements which may be called upon for any specific terminal. The terminal functions used are more specific examples of the general functions described in Recommendation I.310. In this issue of the Recommendation, it is primarily directed at the TE1 and TA devices operating at the basic rate.

2 Relationship between terminals and services in the ISDN

2.1 A terminal device can be described by the list of its functional and physical characteristics. This Recommendation is concerned with only those functional characteristics which the terminal requires in order to be compatible with the network to which the terminal is to be connected, i.e. the ISDN.

2.2 Figure 1/I.470 displays the functional relationship between user, terminal and network. The terminal functions may be those necessary to interface with the user or the network and also those necessary to provide the required network dependent services.

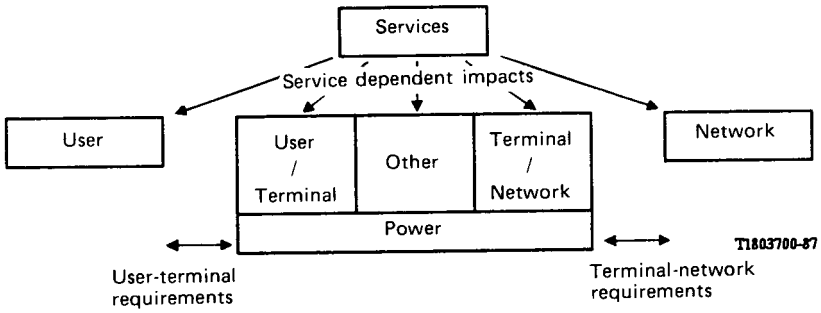

FIGURE 1/I.470

Terminal relationships

2.3 The terminal being considered may be an individual element (e.g. a TE1) or a composite clement (e.g. a TE2 + TA or TE1 + NT2). Figure 2/I.470 shows these arrangements.

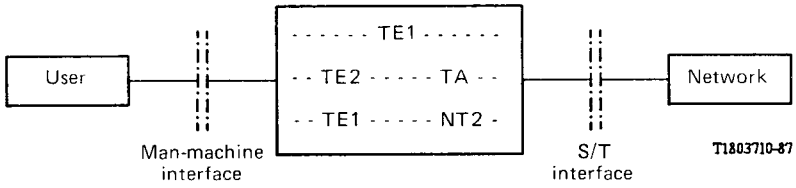

FIGURE 2/I.470

Terminal versions

A TE1 is generally considered as an ISDN interface compatible terminal, intended for use by an individual and connecting directly to the network at a T reference point or via an NT2 at a S reference point.

A TA provides the functions to adopt a non-ISDN compatible terminal to the network at either an S or T reference point. It normally provides the TE2 with compatibility to the network interface. The TE2 interconnects to the TA via a R reference point which may be real or virtual.

An NT2 is a multiple user device providing connection to a number of TE1s and/or TE2 + TAs (as for PBX). It provides S interfaces for these associated terminal devices and connects to the network via a T interface.

2.4 Certain common functions, in particular, concerning the signalling on the D-channel will be found in all terminals connecting to the same type of interface. These functions are essential for interworking with the network and may be therefore considered mandatory. Individual terminals will also have a selected set of service related functions necessary for the services to which they are to be applied.

2.5 Each terminal will have an interface to the user. These interfaces are not a function of the ISDN and are not discussed in this Recommendation.

2.6 A terminal may in addition supply other services to the user, which are independent of the network. The functions are not part of this Recommendation.

3 List of network related functions

3.1 The following list of functions represent an initial view. Additional functions may be required, both in the terminal and the network as new services are identified.

3.2 The mandatory functions for basic rate terminals are given below in the following three Tables 1/I.470, 2/I.470 and 3/I.470 for the physical, link and network layers respectively.

TABLE 1/I.470
Mandatory physical layer functions

Functions	Description	Reference, Rec. I.430
Wiring configuration	Interconnection of one TE with one NT	§ 4
Line code	Inverse of AMI	§ 5.5
Frame structure	Alignment of bit, octet and frame	§ 6.3
D-channel contention control	To control access to D-channel	§ 6.1
Channel identification	To identify B-, D-channels	Rec. I.412 (Definition)
Maintenance	Activities in support of maintaining network subscriber access and installations	§ 7
Electrical characteristics	Interfacing in passive bus interconnections	§ 8
Physical characteristics	Interface connector and contact assignments	§ 10

TABLE 2/I.470

Mandatory LAPD functions

Functions	Description	Reference, Rec. I.441 (Q.921)
Zero suppression	Transparency transfer	§ 2.6
Frame identification	To recognize and validate all frames	§ 2.3
Establish transfer mode	Terminal transmis message to network for initiation	§ 5.3
Sequential control	Sequence integrity of frame transfer/reception on one connection	§ 3.5.2
Error detection	Detection of errors in transfer; format errors and operation errors	§ 5.8
Recovery	Recovery from detected errors and information outputs to managements entity for unrecoverable errors	§ 5.8
Flow control	Flow control by modulo and acknowledgement	§ 3.6
Broacast capability	Provision of broadcast data links that are identifiable by global TEI	§ 3.3.4.1

TABLE 3/I.470

Mandatory network layer functions

Functions	Description	Reference, Rec. I.451 (Q.931)
Identify message and process message	To recognize and validate the message formats	§ 4
Call reference	To identify the call request at the local user-network interface	§ 4.3
Support messages	A set of mandatory messages for basic call control procedures	§ 3
Support information elements	Specification of the message types	§ 4.4

3.3 A list of service related functions is given below. Not all have yet been identified as related to a specific ISDN service.

a) *Other terminal functions*

Terminal equipment may include some of the following service dependent functions:

- analogue-digital conversion
- teleservice identification/selection
- supplementary service identification/selection
- stimulus to functional signalling conversion
- storage/memory
- code/rate translation
- encryption-decryption
- speech pattern recognition
- speech synthesis
- authorization checking
- charge data recording
- network maintenance data recording
- network control capability service/maintenance
- echo control
- dialled number identification
- bearer service identification/selection.

b) *Power*

- local power supply
- power feeding
- terminal energizing control
- activation/deactivation.