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INTEGRATED SERVICES DIGITAL NETWORK (ISDN)
SERVICE CAPABILITIES

TELESERVICES SUPPORTED BY AN ISDN: TELETEX

ITU-T Recommendation I.241.2

(Extract from the *Blue Book*)

NOTES

1 ITU-T Recommendation I.241.2 was published in Fascicle III.7 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.241.2

TELESERVICES SUPPORTED BY AN ISDN: TELETEX

(Melbourne, 1988)

2 Teletex

The prose description of the Teletex service is an extract of Recommendation F.200. If more detail is required this Recommendation should be referred to. As such, this service description does not strictly follow step 1.1 of the service description method. Further alignment with this description method requires further study.

2.1 *Definition*

Teletex is an international service, enabling subscribers to exchange office correspondence in the form of documents containing Teletex coded information on an automatic memory-to-memory basis via the ISDN.

2.2 *Description*

2.2.1 *Scope*

The Teletex service provides communication between Teletex equipment[1] which are used for the preparation, editing and printing of correspondence containing text information using a standardized character set (see Recommendation T.61).

The basic element of the correspondence between users is the page which is the smallest unit of text treated as an entity. No restrictions shall exist concerning the operator procedures for generation of the text or the positioning of text within the printable area on a page.

Note 1 - This does not necessarily imply that the characters used to construct a graphic symbol are transmitted in the same sequence as that in which they are keyed.

Note 2 - This does not necessarily imply that the order in which text on a page is transmitted is the same as that in which it was keyed.

Note 3 - An exception to this rule is the application of the processable mode of operation for which the page, as a basic element of correspondence, cannot be used. The processable mode of operation within the Teletex service is defined in Recommendation F.220.

2.2.2 *Operation*

2.2.2.1 *General*

The Teletex service in each country and the international interconnection between countries or networks shall use automatic switching so that it is possible for any Teletex subscriber to reach any other Teletex subscriber using fully automatic selection.

It is a requirement to allow the through-connection of a call between a Teletex terminal connected to a private automatic branch exchange (or similar systems) and those connected to public exchanges used for the Teletex service.

A virtual dialogue mode of operation, which appears to the subscriber as an interactive mode, should be possible, although this is not a basic requirement of the Teletex service.

A virtual dialogue mode of operation, which appears to the subscriber as an interactive mode, may become possible as a new standardized option within the Teletex service, allowing both communications between persons and data base access (see Recommendation I.210).

Processable mode of operation, as a standardized option within the Teletex service, allows the transfer of text containing information to permit convenient further editing and processing by the recipient (see Recommendation F.220).

Mixed mode of operation using the techniques of Telefax 4 for the transfer of facsimile-coded information and of Teletex for the transfer of character-coded text is described as a standardized option within the Teletex service in Recommendation F.230.

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[1] Teletex equipment may be a Teletex terminal or a system.

Two-way alternate (TWA) communication is a capability of the Teletex service, which also includes one-way communication (OWC); the calling subscriber will have full control of the Teletex call.

2.3 *Procedures*

2.3.1 *Provision/withdrawal*

The national and international facilities of the Teletex service, including the Teletex/telex conversion facilities, shall be open continuously.

Teletex subscriber equipment for which call numbers are published in the directories shall, in principle, be available to accept calls continuously.

In order to facilitate the 24-hour duration of the service, it is permitted to use a centralized storage in the network to realize the receiving memory capability of the terminal.

2.3.2 *Call phases*

The operations for each call may be divided into the following three phases:

a) Preparation
   - preparation of the information in local mode;
   - loading of the information into a memory,

b) Transmission (in principle, automatic)
   - call establishment;
   - pre-information phase (see Note);
   - information transfer from memory-to-memory (see Note);
   - post information phase (see Note);
   - call clearing.

   Note - During these parts of the transmission phase the network must be transparent with respect to control procedures.

c) Output
   - emptying the memory.

Note - The information may consist of one or more Teletex documents each consisting of one or more Teletex pages.

The control procedures as specified in Recommendation T.62 shall be used as end-to-end communication procedures between any Teletex equipment in the basic service.

The lower layer protocols and the network independent basic transport protocol to be used for Teletex are specified in Recommendations T.70 and T.90.

The network-dependent control procedures for the Teletex are those that are defined for ISDN.

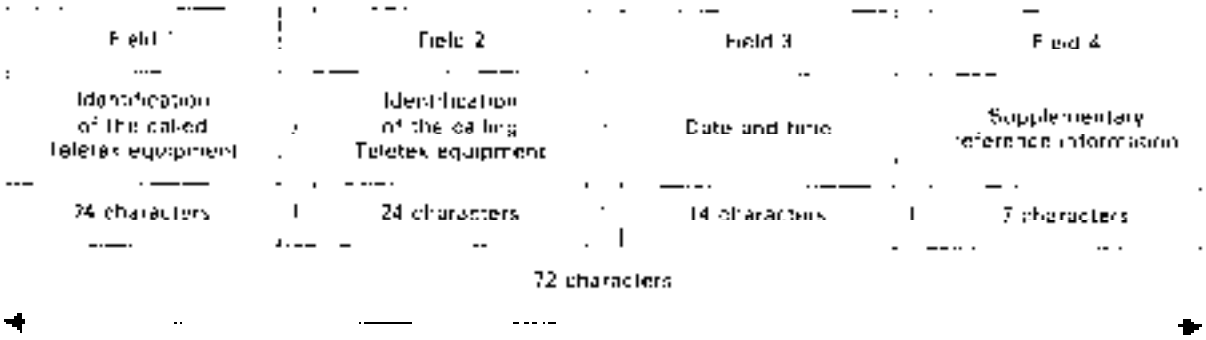
2.3.3 *Call identification line*

The Teletex procedures include the exchange of reference information prior to sending any document. This reference information includes identification of the parties to the call as well as the date and time. Also, supplementary reference information is exchanged during a call to allow reference to an individual document or page for error recovery or other purposes.

This reference information, taken together, is defined to be printable on a single line called the call identification line. Use of this information is a local decision except in recovering from an interrupted transmission.

The call identification line is composed of four fields as follows (see Figure 1/I.241.2):

- Field 1: identification of the called Teletex equipment;
- Field 2: identification of the calling Teletex equipment;
- Field 3: date and time;
- Field 4: supplementary reference information.



Field 1 - (identification of the called equipment) contains the identification of the called equipment. It is originated in the control procedures by the called equipment.

Field 2 - (identification of the calling equipment) contains the identification of the calling equipment. It is originated in the control procedures by the calling equipment.

Field 3 - (date and time) contains the date and time reference information showing the year, month, day, hour and minute in the fixed format of 14 characters thus YY-MM-DD-HH:MM. This field is originated in the control procedures by the calling equipment which obtains this information from the network. This time represents the local time at the calling equipment and is intended to represent the time of call origination.

Field 4 - (supplementary reference information) contains a document reference number, a hyphen (coding 2/13) as a separator and a page reference number as number as defined in Recommendation T.62. This field has a fixed length of seven character positions and is originated in the control procedures by the Teletex equipment that is sending the associated documents.

FIGURE 1/I.241.2

Format of the call identification line

2.3.4 *Error protection*

Within the Teletex service a high layer error detection and correction is provided in the session layer for all those errors which are not corrected by the network layers.

To ensure call integrity, error protection will be provided by Teletex control procedures (see Recommendations T.62, T.70 and T.90). The error rate on the pre-information, information and post-information phases should not exceed 1 in 10^6 characters.

2.4 *Network capabilities for charging*

This Recommendation does not cover charging principles. Future Recommendations in the D-Series are expected to contain that information.

It shall be possible to charge the subscriber accurately for the service.

2.5 *Interworking requirements*

2.5.1 Within the Teletex service, interworking between terminals connected to different networks is required. Real-time connection between terminals operating at different speeds has to be provided on the basis of at least 2.4 kbit/s.

2.5.2 *Intercommunication with other services*

2.5.2.1 The Teletex service will provide the ability for intercommunication in both directions with the telex service by means of conversion facilities (see Recommendations F.201, U.201, T.390).

2.5.2.2 Intercommunication between basic mode and mixed mode Teletex terminals and Classes I, II and III Group 4 facsimile terminals is shown in Table 1/I.241.2 (see Recommendation F.184).

2.5.2.3 The Teletex service allows for intercommunication with telex and with the Interpersonal Messaging Service (IPM) (see Recommendations F.421, F.422).

TABLE 1/I.241.2

Current status of direct intercommunication for Teletex and Group 4 facsimile terminals on the same network

To / From	Facsimile Group 4, Class I	Facsimile Group 4, Class II	Facsimile Group 4, Class III	Teletex basic mode	Teletex mixed mode	Teletex processable mode 1
Facsimile Group 4, Class I	F	F	F			
Facsimile Group 4, Class II	F	F	F			
Facsimile Group 4, Class III	F	T, F, MM	T, F, MM	T	T, MM	T
Teletex basic mode		T	T	T	T	T
Teletex mixed mode		T, MM	T, MM	T	T, MM	T
Teletex processable mode 1		T	T	T	T	T, PM1

T: Basic Teletex document with character coded information only.

F: Group 4 facsimile document with facsimile coded information only.

MM: Mixed-mode document with character and facsimile coded information.

PM1: Processable mode document with character coded information only.

2.6 *Interaction with supplementary services*

Each supplementary service description identifies the applicability with this teleservice.

For the ISDN, the international supplementary services which may be used for Teletex in the circuit mode using a B-Channel are:

i) closed user group;

ii) multiple subscriber number;

iii) user-to-user signalling;

iv) calling line identification presentation;

v) calling line identification restriction;

vi) connected line identification presentation;

vii) connected line identification restriction;

viii) direct-dialling-in.

The use of other supplementary services is for further study.

Supplementary services for Teletex with a packet-mode of operation are for further study.

2.7 *Attributes and values of attributes of the Teletex service*

a) *LOW LAYER ATTRIBUTES*

Information transfer attributes

		Circuit-mode bearer capability	*Packet-mode bearer capability*
1.	Information transfer mode	circuit	packet
2.	Information transfer rate	64 kbit/s	maximum throughput of a given virtual circuit is less than or equal to the maximum bit rate of the user information access channel and the throughput class of the virtual circuit
3.	Information transfer capability	unrestricted (Note 1)	unrestricted
4.	Structure	unstructured (Note 2)	service data unit integrity
5.	Establishment of communication	demand	demand (VC), permanent (PVC)
6.	Symmetry	bidirectional symmetric	bidirectional symmetric
7.	Communication configuration	point-to-point	point-to-point

Access attributes

		Circuit-mode bearer capability	*Packet-mode bearer capability*
8.	Access channel:	B for user information D for signalling	user information over virtual circuit within B- or D-channel. When D-channel is used, maximum packet size and quality of service may be restricted. Signalling may be provided via D-channel and/or virtual circuit within B-channel.
9.	Access protocol		
9.1	Signalling access protocol layer 1:	Rec. I.430/I.431	Rec. I.430/I.431
9.2	Signalling access protocol layer 2:	Rec. I.440/I.441	Rec. I.440/I.441, X.31
9.3	Signalling access protocol layer 3:	Rec. I.450/I.451	Rec. I.450/I.451, X.31
9.4	Information access protocol layer 1:	Rec. I.430/I.431	Rec. I.430/I.431
9.5	Information access protocol layer 2:	Rec. X.75 (SLP)	Rec. X.25 (LAPB)
9.6	Information access protocol layer 3:	ISO 8208	Rec. X.25 (PLP)

b) *HIGH LAYER ATTRIBUTES*

10. Type of user information : Teletex
11. Layer 4 protocol functions: T.70
12. Layer 5 protocol functions: T.62
13. Layer 6 protocol functions: T.61
14. Layer 7 protocol functions: T.60

c) *GENERAL ATTRIBUTES*

15. Supplementary services provided: see § 2.6
16. Quality of service: for further study
17. Interworking possibilities: see § 2.5
18. Operational and commercial: for further study

SLP – Single link protocol

PLP – Packet layer protocol

VC – Virtual circuit

PVC – Permanent virtual circuit

Note 1 - The interworking arrangements with networks having a restricted 64 kbit/s information transfer capability require further study.

Note 2 - Even if no structure is required the network may provide 8 kHz integrity.

2.8 *Recommended support of Teletex by an ISDN*

a) Overall support[2]: A

b) Variations of non-dominant attributes:

1) Information transfer mode

Note - In the interim period, the circuit mode method of operation is preferred

– circuit: A

– packet: A

2)

Establishment of communication	*Symmetry*	*Communication configuration*	*Support*[2]
demand	bidirectional symmetric	pt-pt	E

[2] The definition of E (essential) and A (additional) can be found in Recommendation I.240.

3) *Access*

Signalling and OAM (Note 1)		User information		Support
Channel and rate	Protocols	Channel and rate	Protocols	
Circuit mode				
D(16)	I.430, I.440, I.441, I.450, I.451 (Note 2)	B(64)	I.430, X.75 (SLP), ISO 8208	A
D(64)	I.431, I.440, I.441, I.450, I.451 (Note 2)	B(64)	I.431, X.75 (SLP), ISO 8208	A
Packet mode				
D(16)	I.430, I.440, I.441, I.450, I.451, X.31	B(64) or D (16)	I.430, X.25 LAPB, X.25 (PLP)	A
D(64)	I.431, I.440, I.441, I.450, I.451, X.31	B(64)	I.431, X.25 LAPB, X.25 (PLP)	FS
VC in B(64)	for further study	B(64)	for further study	FS

Note 1 - Definition of protocols for OAM is for further study.

Note 2 - Demand services only. Others are for further study.

2.9 *Dynamic description*

The circuit-mode dynamic description appears in Recommendation I.220.