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SECTION 2

TELETEX SERVICE

Recommendation F.200

TELETEX SERVICE [1]

1 Introduction

1.1 *Scope*

1.1.1 This Recommendation defines the rules to be followed in the automatic international Teletex service.

1.1.2 Teletex is an international service, offered by Administrations, enabling subscribers to exchange correspondence on an automatic memory-to-memory basis via telecommunication networks.

1.1.3 In the basic Teletex service the element of the correspondence between people using the service is the page-formatted document with the page, as the smallest unit of text treated as an entity. No restrictions shall exist for generation of the text and/or the positioning of text within the printable area on a page.

Note — Exception to this rule is the application of the processable mode of operation for which the page as basic element of correspondence cannot be used.

1.1.4 It is not the intention of the service to compete with or to duplicate public data services, although the use of Teletex for transmission of data (e.g. to question a data bank) may be a possible by-product.

1.1.5 Questions of an essentially technical nature concerning the Teletex service are dealt with by other Recommendations.

1.1.6 Throughout this Recommendation the term Teletex equipment is used addressing user’s equipment independently, whether this equipment is a dedicated teletex terminal or a terminal or system with added Teletex capabilities.

1.2 *Service definitions*

1.2.1 *General*

1.2.1.1 The Teletex service provides communication between equipment which is used for the preparation, editing and printing of correspondence.

[1] See Resolution No. 13 at the beginning of this fascicle.

1.2.1.2 It is an essential characteristic of the Teletex service that it provides a basic level of compatibility between all equipment participating in the service.

1.2.2 *Basic requirements*

1.2.2.1 The basic requirements of the Teletex service are as follows:

a) A basic level of compatibility is provided between any two Teletex terminals both nationally and internationally so that they may communicate formatted documents composed of character-coded information to each other. This is to be achieved by requiring that terminals comply with Recommendations T.60, T.61, T.62 and T.70. (T.70 does not yet include operation on the ISDN.)

b) It is for each Administration to decide on the network(s) on which the Teletex service will be carried. There shall be no restriction on the type of network to be used.

c) Real time connection between Teletex equipment operating at different speeds is required for the duration of the call. The information on the successful transmission should be given by the receiving equipment to the sending equipment within the call.

d) It should be possible to extend the Teletex service to any number of countries.

e) The graphic character repertoire of any office machine keyboard that satisfies the provisions of Recommendation T.61 and that is acceptable to the national Administrations for use within the Teletex service should be permitted as a source.

f) In order to enable private applications and facilities, such as, for example, encryption, there should be no technical limitation on the bit sequence of the users' information that may be transmitted.

g) Local mode operation should not be disturbed by incoming calls under normal operating conditions.

h) A received Teletex message can be printed or displayed otherwise as decided by the recipient and equipment characteristics. If the message is printed, the receiving subscriber will be furnished with a document that is identical with that produced by the sending subscriber as far as its contents, layout and format are concerned.

i) It is intended that the service should require no changes to the Recommendations for existing services or networks.

j) The Teletex service will provide the ability to intercommunicate in both directions with the telex service by means of conversion facilities. (Refer to Recommendations F.201, U.201 and T.90.)

k) The Teletex service allows for intercommunication with the IPM service using a Public Teletex Access Unit (refer to Recommendation F.422).

l) Facilities for providing a permanent copy (not necessarily on paper) of every message should exist at every Teletex installation.

m) The man/machine interface in the Teletex service should be as simple as possible in accordance with the normal use of office equipment.

Note — The use of ''terminal'' is in accordance with the Note in § 5.3.

1.2.3 *Standardized options*

1.2.3.1 It is recognized that some subscribers may need to use their Teletex equipment to communicate nationally and internationally using service features which are not included in the Teletex basic requirements, but which are, nonetheless, frequently used in office equipment. A number of CCITT-standardized options should, therefore, be defined. However, the provision of any option in a service could lead to some degree of incompatibility and the number of standardized options should be restricted, as shown below, to those features for which a clear international need can be foreseen.

The sending Teletex equipment shall ensure the transmission of documents using only those options which have been indicated as being available at the receiving Teletex equipment.

1.2.3.2 The standardized options should provide means for:

a) different character spacings (initially 12 and 15 pitch);

b) different metric values for line spacing (initially 3.175 mm and 5 mm);

c) selection of different graphic rendition of any selected portion of the text;

d) indication that special stationery should be used;

e) use of a wide range of character repertoires other than the Teletex basic character repertoires (both national and application-orientated);

f) specification of increased printable areas for paper sizes normally used for office correspondence; e.g. ISO A4, A4L and North American paper size;

g) escape into national and private options;

h) use of Kanji character repertoires (JIS C6226) and associated character spacing (6-pitch) and page formats (ISO A4, B5, B4);

i) specification of paper sizes other than ISO A4 or A4L as well as the associated printable areas.

Note 1 — Administrations are encouraged to ensure that standardized and nationally defined options are available and used in such a way as to minimize the need for the introduction of private use options.

Note 2 — There is a need for further study as the service develops. Changes may be required to this list.

1.2.3.3 In addition to the basic mode of operation, a number of possible other modes may be offered, which in principle should also be able to exchange the basic mode between them.

a) *Use of the mixed mode of operation*

This mode provides the user with means for transferring documents containing graphical information encoded using techniques other than those defined for the basic Teletex service, e.g. the Teletex/Telefax mixed mode of operation (see Recommendation F.230).

b) *Use of the interactive mode of operation*

The interactive mode allows Teletex equipment (terminals or fully automatic systems) to communicate in real time with each other.

c) *Use of the processable mode of operation*

The processable mode of operation provides the user with means of interchanging documents containing sufficient information to reprocess them efficiently (see Recommendation F.220).

d) *Network based storage*

In addition network based store-and-forward and (at the discretion of the recipient) store-and-retrieve facilities may become available (see Recommendation F.203).

1.3 *Definitions of terms used in the Teletex service*

1.3.1 The terms listed in Annex B contain the definitions given as they are used in these provisions.

1.4 *Availability of service*

1.4.1 In principle the Teletex service offered by Administrations shall normally operate on a fully automatic basis and be open continuously.

JIS: Japanese Industrial Standard.

1.5 *Classes of call*

1.5.1 There are two accepted classes of call:

a) ordinary private Teletex calls;

b) service calls, including privilege telecommunications using Teletex, which in accordance with Recommendation D.193, may be offered during conferences and meetings of the ITU. (Where Administrations choose to allow service calls via semiautomatic or manual operation these calls shall be permitted.)

1.6 *Restrictions on the use of the Teletex service*

1.6.1 Administrations reserve the right to suspend the Teletex service in the cases mentioned in Articles 19 and 20 of the *Convention* [1].

1.6.2 Administrations shall refuse, in accordance with national regulations, to make the Teletex service available to an agency that is known to be organized for the purpose of sending or receiving messages to/from third parties and for retransmission by any means in order to avoid the full charges normally levied for such correspondence.

1.6.3 Administrations shall refuse to make Teletex service available to a user whose activities may be regarded as an infringement of the functions of an Administration in providing a public telecommunication service.

2 Network requirements

2.1 It is the responsibility of Administrations to decide in which network(s) the Teletex service is to be provided. The term Teletex network, as used in this Recommendation, shall be taken to mean a network on which Teletex service is provided.

2.2 Considering that the Teletex service my be operated on the following networks:

a) Teletex in a circuit switched public data network (CSPDN);

b) Teletex in a packet switched public data network (PSPDN);

c) Teletex in a public switched telephone network (PSTN);

d) Teletex in an integrated services digital network (ISDN).

Interworking between Teletex terminals supported on any network must be possible.

2.3 The procedures for call set-up to Teletex equipment connected to different networks shall be as similar as possible.

2.4 The international connection shall use international data transmission facilities. Exceptionally, bilateral agreements to use other means may be made where necessary.

2.5 Connection between PSTNs may use international telephone circuits.

2.6 In the case of international interworking between Teletex equipment connected to dissimilar networks, Recommendation X.300 shall apply.

2.7 International routes shall be capable of supporting user data rates of at least 2400 bits/s (see applicable Recommendations).

Note — It is recognized that national implementations of the Teletex service on varying types of network may involve national operation at different information throughput rates. It should be noted that in these cases buffering and/or flow control may be required (see Recommendations T.60, T.62 and T.70).

2.8 International routes between ISDNs for the Teletex service shall be capable of supporting user data rates of 64 bit/s.

3 Numbering plan

3.1 Considering that it is the responsibility of each Administration to decide on the network(s) to be used for the Teletex service in accordance with the options noted in § 2, the Teletex numbering plan must accommodate these options.

3.2 The Teletex numbering plan is based on the individual numbering plans of each of these networks, i.e. Recommendation E.163 for PSTNs, Recommendation X.121 for public data networks and Recommendation E.164 for ISDN.

3.3 Each of these numbering plans provides for international calls between similar networks.

3.4 The numbering plan for PDNs (Recommendation X.121) provides for calls to PSTNs and ISDNs.

3.5 As the numbering plan for PSTNs does not provide for calls to PDNs, those Administrations that use the PSTN nationally for the Teletex service must provide for call set-up procedures to give access to the Teletex service on a PDN in other countries.

3.6 The numbering plan for ISDNs (Recommendation E.164) provides for calls to PDNs.

3.7 Numbering and addressing in intercommunication between the Teletex service and the IPM (Interpersonal Messaging) Service are in accordance with rules as laid down in Recommendation F.422.

4 Character repertoire

4.1 The basic Teletex character repertoire of graphic characters and control functions for the international Teletex service and the coding of these characters for transmission between Teletex equipment are found in Recommendation T.61.

4.2 Other recognized national and/or application-oriented character repertoires can be used. These repertoires should only be used after registration by the CCITT and in accordance with the rules given in Recommendation T.61.

4.3 To indicate the use of a subset of the Teletex graphic character repertoire, a control function IGS (Identify Graphic Sub-repertoire) is used.

4.4 Each IGS is registered by the CCITT and each Administration can ask for registration of one or more IGSs following the rules specified in the appropriate Recommendation.

4.5 If a graphic symbol that is not in the basic Teletex character repertoire is generated, the service cannot guarantee that it will be represented in a recognizable form at the receiving Teletex equipment.

5 Operation of the Teletex service

5.1 *General*

5.1.1 The Teletex service in each country and the international interconnection between countries or networks shall use automatic switching allowing any Teletex user to reach any other Teletex user using fully automatic selection.

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

5.1.3 A virtual dialogue mode of operation, which appears to the subscriber as a interactive mode, may become possible, as a new standardized option within the Teletex service, both allowing for communication between persons and data base access.

5.1.4 Mixed modes of operation within the Teletex service using specialized techniques such as they are used in the Telefax service as well as character-coded texts, are important additional facilities for the Teletex service.

5.1.5 Other standardized options (such as processable modes and EDI) may be offered for meeting applications to be undertaken via Teletex.

5.1.6 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.

5.1.7 Intercommunication with other services such as telefax, interpersonal messaging, telex and videotex is envisaged and is (to be) defined in a separate Recommendation.

5.2 *Call phases*

5.2.1 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 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.

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

5.2.3 The network independent basic transport service for Teletex is specified in Recommendation T.70.

5.2.4 The network-dependent control procedures for the Teletex service should be those that are defined for that network on which the Teletex service is provided (see the relevant Recommendations).

5.2.5 Further information should be available through end-to-end control procedures, which may be used by Teletex equipment to identify additional information found in a document. Details of the additional document information are for further study.

5.2.6 Reference to the control procedures to be applied in intercommunication with other services can, in case of differences with the Teletex service, be found in the appropriate Recommendations covering these intercommunication cases.

5.3 *Call identification*

Note — In this paragraph ‘‘terminal’’ is used to identify the end-point of responsibility of the Teletex service.

5.3.1 *General*

5.3.1.1 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.

5.3.1.2 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. In the case of automatic linking, the use of this information is for further study.

5.3.2 *Format of the call identification line*

5.3.2.1 The call identification line is composed of four fields as follows:

— Field 1: identification of the called terminal;

— Field 2: identification of the calling terminal;

— Field 3: date and time;

— Field 4: supplementary reference information.

5.3.2.2 Presentation of this information may be made on the first or last line on each page of a document or on only one page of a document, or it may be omitted. The maximum allowable number of printable lines transmitted per page is reduced by one to allow optional printing of the call identification line. The choice of whether and where this presentation is made is a local decision except in certain recovery situations.

5.3.2.3 Where the transmission of a document is interrupted for any reason, the receiving equipment should print, or otherwise display, only the acknowledged pages as defined in Recommendation T.62. Both terminals should also notify the occurrence of interruption to operators (see §§ 7.8 and 7.9).

5.3.2.4 When the call identification line is presented the format shown in Figure 1/F.200 is used.

Figure 1/F.200 (trait´e comme tableau) [T1.200], p.

5.3.2.5 Field 1 (identification of the called terminal) contains the identification of the called terminal in the format defined in § 7.5. It is originated in the control procedures by the called terminal equipment.

5.3.2.6 Field 2 (identification of the calling equipment) contains the identification of the calling terminal in the format defined in § 7.5. It is originated in the control procedures by the calling equipment.

5.3.2.7 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 terminal. (*Note* — The calling terminal may obtain this information from the network, an internal clock or manual input.) This time represents the local time at the calling terminal and is intended to represent the time of call origination.

5.3.2.8 Field 4 (supplementary reference information) contains a document reference number, a hyphen (coding 2/13) as a separator and a page reference 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 terminal that is sending the associated documents.

In the processable mode of operation as defined in Recommendation F.220, the page as basic element of correspondence cannot be used. As a consequence part 4 of the CIL presenting the page number will not be printed.

5.3.2.9 Each of the fields of the call identification line is separated by the solidus (/) character (coding 2/15).

5.3.2.10 Only graphic characters of the Teletex graphic character repertoire corresponding to those of International Telegraph Alphabet No. 2 are used in the call identification line.

5.3.3 The long term objective for identification of Teletex equipment is the application of Recommendation F.351. This requires further study.

5.4 *Special services*

5.4.1 Since the effectiveness of the Teletex service will be increased by the availability of special facilities such as those given in the list of examples below, Administrations should give attention to their early introduction:

— network-based storage (see Recommendation F.203);

— abbreviated address calling;

— multi-address calling;

— identification by the network;

— automatic date and time indication;

— indication of charge.

5.4.2 Most of these facilities will be provided by the network on a national basis and it should be borne in mind that the Teletex service will be carried by different networks.

5.4.3 They may also be provided from Teletex equipment and systems instead of, or as well as, from the network.

5.4.4 The network should not impose any limitations on optional and private use applications.

5.4.5 Intercommunication with other services is covered in separate Recommendations.

5.4.6 For the ISDN, the international supplementary services which may be used for Teletex in the circuit mode on the B channel are, as a minimum as follows: in accordance with Recommendation X.30:

i) closed user group;

ii) multiple numbers for a subscriber;

iii) direct dialling in (DDI);

iv) user-to-user signalling;

v) calling line identification presentation;

vi) calling line identification restriction;

vii) connected line identification presentation.

Use of other supplementary services is for further study.

5.4.7 The use of national supplementary services is beyond the scope of this Recommendation. Indication-wise, the following is a list of national supplementary services available in the ISDN;

i) number selection barred;

ii) direct call;

iii) selective direct call;

iv) abbreviated address calling;

v) redirection of calls to a mailbox in the network;

vi) outgoing calls barred;

vii) incoming calls barred;

viii) line hunting with only one TID;

ix) connect when free;

x) call waiting;

xi) centralized distribution in original country of record private;

xii) information;

xiii) centralized PBS facilities;

xiv) credit card calling from public booth;

xv) date and time call duration record for billing;

xvi) directory enquiries;

xvii) fault reporting service;

xviii) freephone service (name and definition of this service need to be changed for Teletex);

xix) general deactivation;

xx) general telecommunication information;

xxi) operator access to, and control of, supplementary services;

xxii) out of area lines;

xxiii) priority selection;

xxiv) store and forward;

xxv) deferred delivery;

xxvi) itemized bill;

xxvii) traffic statistics;

xxviii) bilateral closed user group;

xxix) bilateral closed user group with outgoing access;

xxx) on-line facilities parameter registration/cancellation;

xxxi) DTE inactive registration/cancellation;

xxxii) RPOA selection.

5.4.8 *Supplementary services for Teletex in the packet mode on the ISDN*

5.4.8.1 The provision of packet mode services within the ISDN in accordance with Recommendation X.31 is for further study.

5.4.8.2 Equally the use of international supplementary services for packet mode on international ISDNs is for further study.

6 Quality of service

6.1 *General*

6.1.1 The Teletex service provides any user with the facility to communicate text, or other suitable data, to any other user nationally and internationally.

The characteristics of the user equipment, as described in § 7 are of relevance to this matter.

Note 1 — As practical experience of the implementation of the Teletex service has increased, the need to revise the quality of service figures quoted in this section has been foreseen.

Note 2 — The quality notions for the Teletex service do not necessarily apply to all extensions and types of inter-communication. Each case may need its own arrangements to be defined in the appropriate Recommendations.

Note 3 — Additional quality of service parameters may be added.

6.1.2 In order to ensure to the user of the Teletex service (i.e. to the sender) an adequate Quality of Service, which includes information about the minimum presentation capabilities on the receiving side, the capability of printing a paper copy shall be available at least once at each Teletex installation. This capability need not necessarily reside at each terminal, but rather could be provided by a central facility.

6.2 *Teletex equipment*

6.2.1 The quality of the service depends, among other things, on the ability of the called equipment to receive calls.

6.2.2 *Circuit switched public data networks*

6.2.2.1 In order to ensure an adequate grade of service, it should be an objective that the total loss probability of calls to a Teletex number should not exceed 0.05.

6.2.2.2 It is understood that the total loss probability (P_E) is composed of the loss probability due to incoming traffic (P_i), outgoing traffic (P_o) and due to temporary memory overload (P_m). P_m should not exceed 0.005 at a traffic intensity of 2 received messages per busy hour.

6.2.2.3 The values specified above for total loss probability shall apply to basic teletex, not covering the use of processable, interactive and mixed modes of operation. For the purpose of calculation it is assumed that 20% of the 24-hour total traffic occurs during peak hours. The foregoing values assume a skewed distribution for the character content of normal business correspondence, the distribution having a mean value of 1600 characters (including approximately 400 characters ‘‘header’’ information), a standard deviation of 800 characters and a mode of 1214 characters.

6.2.3 *Packet switched public data networks*

The quality of service criteria for these networks is the subject of separate Recommendations.

6.2.4 *Public switched telephone networks*

The quality of service criteria for these networks is the subject of separate Recommendations.

6.2.5 *Integrated Services Digital Networks*

The quality of service criteria for these networks is the subject of separate Recommendations.

6.2.6 The quality of service criteria for the above networks is for further study. The network used should in principle not degrade the quality of service for Teletex.

6.3 *Error protection*

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

6.3.2 The control procedures to be applied to this end in intercommunication with other services may be different and are then a matter for the appropriate Recommendations (e.g.Recommendation F.422 for intercommunication between the Teletex service and the IPM service.)

6.4 *International routes*

6.4.1 The capacity of the routes between countries also has an important impact on the quality of the service. For that reason, the number of circuits provided between any two networks should be such that during peak hours not more than one call in 50 is lost due to a lack of international circuits (see Recommendation T.62).

6.5 *Availability of service*

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

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

6.5.3 In order to meet the requirement of § 6.5.2, it is permissible to use a Storage Facility which can be network or customer premises based. This facility must appear in every respect to the originator as Teletex equipment. (Refer to Recommendation F.203.)

6.5.4 Two methods of delivery are available from the Document Storage Facility to the called Teletex equipment: automatic delivery, where the Storage Facility delivers messages when the called equipment is available to receive them, and retrieval initiated by the recipient. (Refer to Recommendation F.203.)

6.6 *Observations on the quality of the service*

6.6.1 Administrations should, as a minimum, monitor and evaluate the quality of the Teletex service internationally as described above.

6.6.2 Administrations should arrange to exchange statistics on the quality of the service at least once a year.

6.6.3 It is desirable that the statistics provide the information contained in Annex A.

6.6.4 Observations should be made at such points and in such quantity as to provide by preference a representative sample of at least 200 calls for each period on each route and to take into account the effects of store-and-forward services.

6.6.5 When exchanging statistics, Administrations should forward not only statistics of the route concerned but also comparable statistics for either all international Teletex traffic or Teletex traffic over similar routes.

7 Users' Teletex equipment

7.1 *General*

7.1.1 In order to support a high quality of service, a signalling rate of at least 2.4 kbit/s on the local loop is recommended except for the ISDN where a signalling rate of 64 kbit/s applies. This signalling rate refers to the information transmission speed as seen by the users' equipment.

7.1.2 The facilities required on equipment connected to the international Teletex service are listed in the following.

7.1.3 It is recognized that in certain applications, there may be a need for equipment only having the ability to receive messages. For this type of Teletex equipment, the requirements of § 7.2.1 are waived.

7.2 *Character repertoire*

7.2.1 Teletex equipment shall have the ability to generate characters of the basic international Teletex character repertoire (see Recommendation T.61).

7.2.2 Teletex equipment must be able to receive and store all the characters of the basic Teletex character repertoire.

7.2.3 Teletex equipment shall have the ability to represent as legibly as possible all graphic characters of the basic international Teletex repertoire and to respond to control characters.

7.2.4 No constraints should be made on the type of presentation technology employed.

7.3 *Storage*

7.3.1 *General*

7.3.1.1 The Teletex equipment will have memory for storage to be used for both local and communication functions.

7.3.1.2 Memory is required in the receiving equipment so that an operator may be assured undisturbed operation when working in local mode. Memory is also necessary to bridge the difference in speeds between reception from line and transfer to secondary storage media.

7.3.2 *Receiving capability*

7.3.2.1 The ability of Teletex equipment to receive incoming traffic is a prerequisite to answer the call. This ability must be sufficient to meet the quality of service as specified in § 6 of this Recommendation.

The entire receive memory of Teletex equipment should be available to incoming documents. If requested by the originating equipment, the available receive memory in the called equipment should not be partitioned into pages. Consequently, in principle, there should be no limitation to the number of characters per page.

7.3.2.2 If during a call the ability of the receiving equipment to continue to accept traffic is jeopardized (e.g. memory threshold reached) an indication of this condition will be passed to the sending equipment by the control procedures to permit the orderly termination and resumption of the transmission.

7.3.3 *Memory negotiation*

7.3.3.1 Memory negotiation is an optional capability.

7.3.3.2 Teletex equipment supporting memory negotiation must be able to interwork with equipment not supporting memory negotiation.

7.3.3.3 Requests for memory should be related to the size of the document(s) to be sent (i.e., must not be a value less than that required to send the document(s), should not be a predetermined value, and should not be significantly larger than the document(s) to be sent).

7.3.3.4 Reservations of memory should be related to the size of the memory requested.

7.3.3.5 It is to be determined by the sending Teletex equipment whether or not to initiate sending. A document may have to be sent during more than one session, if the receiving equipment responds with not sufficient memory to receive that document.

7.3.4 *Interruption of local mode*

7.3.4.1 Appropriate indicators signifying the presence of a message, as well as receive storage full will be provided to allow for interruption of local mode operation to permit presentation of Teletex message(s).

7.4 *Alarm indicators*

7.4.1 Alarm indicators (visual and/or audible) are required in Teletex equipment to signify each of the following conditions:

a) receiving storage contains one or more messages;

b) receiving storage threshold reached;

c) output medium (e.g. paper) low.

7.5 *Teletex terminal identification*

Note — In this paragraph ‘‘terminal’’ is used to identify the end-point of responsibility of the Teletex service.

7.5.1 For each connection to the network, the terminals in the Teletex service shall have a unique identification. The different parts of this identification are contiguous as shown in Figure 2/F.200 and no characters other than those specified there are used.

Figure 2/F.200 (trait´e comme tableau) [T2.200], p.

7.5.2 It is the responsibility of the calling terminal to verify the identification of the called terminal prior to the information transfer phase of the call.

These are not necessarily the numbers used in call establishment.

7.5.3 Part 1 (network and country code) contains the relevant information about the network and country concerned in accordance with the principles of Recommendation X.121 by the 1 to 3 digit country code of E.164 (see also Recommendation F.351).

7.5.4 Part 2 (national subscriber number) is the number of the main station or of the private branch exchange. It will be the complete call number including any national area code applicable within the country concerned, by means of which a user can be reached by other subscribers of the same country and on the same network a hyphen (coding 2/13).

7.5.5 Part 3 (additional information), when used, begins with a hyphen (coding 2/13) and may contain alphanumeric characters for:

Country or geographical area code.

a) the extension number of Teletex equipment connected to local networks, e.g. PBXs (see Recommandation T.70, extending addressing);

b) the code abbreviation of an extension number when the numeric number cannot be contained in Part 3;

c) the code identifier of specific equipment. This possibility can be used for indication of, for example, Teletex equipment in a ‘‘group number’’ or when a call is terminated in a document storage facility outside the terminal. In the latter case the value <<+++>> in Part 3 will be returned to the calling terminal;

The indication of special service signals within Part 3 is for further study.

Where alphabetic characters are used, the use of capital or small letters does not effect the meaning. The maximum number of characters in Part 3 is normally four. However, observing the other rules in § 7.5, Part 3 may be enlarged. (This item requires further study.)

7.5.6 Part 4 (mnemonic abbreviation) will consist of a minimum of three letters as information for the automatic identification of the connected subscriber. Both capital and small letters can be used and mixed. Only non-accented letters **A** -**Z** and **a** -**z** must be used (coding 4/1 to 5/10 and 6/1 to 7/10).

The use of capital or small letters does not change the meaning of the mnemonic especially in the telex/Teletex intercommunication case (e.g. ‘‘ABC’’ mnemonic has the same meaning as ‘‘AbC’’ mnemonic). The mnemonic abbreviation must always be preceded by the character = (equals sign, coding 3/13).

7.5.7 The parts of the terminal identification are justified to the left and the format is fixed at a length of 24 characters. If the total number of characters in parts 1 to 4 is less than 24, the format must be filled to 24 characters by the addition of space characters (coding 2/0) immediately following Part 4.

7.5.8 The directories issued by Administrations must include at least Parts 1, 2 and 4 of the Teletex user’s terminal identifications.

7.5.9 In intercommunication with other services as much as possible the identification systems of the separate services should be maintained, with required conversion to be provided by network devices. This point will be covered by each intercommunication case separately via the appropriate Recommendations.

7.6 *Format of Teletex pages*

7.6.1 *Objectives*

7.6.1.1 It is a basic objective of the Teletex service to achieve as much similarity as possible to existing operating procedures of office machines. Another objective is to establish a basic, defined mode of operation common to all Teletex equipment machines used in the service. Therefore, a minimum basic requirement is defined, and all terminals used in the Teletex service shall comply with this minimum basic requirement. This, however, does not preclude the possibility that equipment may by prior agreement between the parties concerned operate in modes different from these basic minimum requirements.

7.6.2 *General*

7.6.2.1 The maximum printable areas for various standard paper sizes are defined in Recommendation T.60 and shall not be exceeded. The range of equipment capabilities is exchanged during session establishment, prior to document transmission. These procedures are defined in Recommendation T.62 along with the default values for these capabilities if this exchange is not explicitly stated.

7.6.2.2 A particular selection from this established range of capabilities is made preceding transmission of each document. Some of these selections may be changed at page boundaries and some may also be changed within a page.

7.6.3 *Basic requirements*

7.6.3.1 As minimum requirement for the specification of the format used, four parameters are required. These parameters are:

a) paper orientation;

b) line spacing per line-feed character;

c) left margin;

d) character pitch.

Additional parameters may be used to identify optional capabilities used for a document.

7.6.3.2 These parameters remain effective until changed. In the absence of an explicit selection these parameters must be automatically restated in every control signal that causes feeding of the next page.

7.6.4 *Paper size and paper orientation*

7.6.4.1 It is a requirement that the Teletex service should accommodate both the ISO A4 (210 × 297 mm) as well as the North American (216 × 280 mm) size of paper format in both the vertical and the horizontal paper orientation.

7.6.4.2 The standard paper orientation, in the absence of an appropriate control signal, is with the long dimension being vertical as viewed for reading. This orientation is hereafter called the A4 orientation.

7.6.5 *Number of characters per page*

It is a requirement to have a page of undefined size. Theoretically it must be of sufficient size to contain all characters, including control characters when the originating equipment negotiated impartitioned storage of a specific transmission.

7.6.6 *Line spacing per line-feed character*

7.6.6.1 This parameter may be changed at any point within a document. In the absence of an operator selection the default value shall be one line-feed (= 4.23 mm). Provision shall be made for selecting 0.5, 1, 1.5 and 2 line-feeds per line-feed character.

7.6.7 *Left margin*

7.6.7.1 This parameter selection may be changed at any point within a document. In the absence of an operator selection the default value shall be approximately 20 mm and may be expressed as an integral number of character pitches. Printing left of the defined margin on a per line basis must be possible by means of operator commands.

7.6.8 *Character pitch*

7.6.8.1 The basic character pitch shall be ten (= 2.54 mm character spacing).

7.6.9 *Positioning of text*

7.6.9.1 One line in the maximum printable area is reserved for the call identification line, see § 5.3 for details.

7.6.9.2 The printable areas include an allowance for printing with an offset of 2.12 mm above the first baseline and 2.12 mm below the last baseline for exponents and indices respectively. Equally, such offsets may be used within the page. Text should not be positioned by such offsets in such a way that characters overlay characters previously printed or displayed.

7.6.10 *Use of the page format*

7.6.10.1 Table 1/F.200 gives the maxima of lines per page and characters per line that may be used in the basic service with the basic values given below. For intercommunication with telex, see Recommendation F.201.

H.T. [T3.200]

TABLE 1/F.200

Vertical format	Horizontal format	
Maximum number of text lines {	55 | ua)	38 | ua)
Maximum number of characters per line }	5 + 72 | ub)	5 + 100 | ub)

a) The call identification line is not included in this figure.

b) The 5 characters can be positioned in the left margin by using appropriate control commands (see § 7.6.6).

Tableau 1/F.200 [T3.200], p.

7.7 *Information to the Teletex user*

The operator must be given sufficient information to identify difficulties with sending and receiving documents.

7.7.1 Sufficient information should be provided to enable an operator to perform a status check to be made of documents in store.

7.7.2 If equipment cannot automatically transmit a document, sufficient information should be given to the operator to be able to:

i) identify the document;

ii) identify the reason for failure.

This information will enable the operator to take appropriate action to resolve this difficulty.

Multi-address calls will be reported on a per address basis.

7.7.3 If the CIL is presented on every page of a document, information will need to be provided to enable an operator to identify interrupted and continued documents received.

7.7.4 In view of the importance of using the same indicators/reason codes for a clear understanding and efficient way for the exchange of information between international operators to overcome service difficulties, it is recommended to adopt the same indicators/reason codes to report service abnormalities detected by the Teletex equipment to the international operators.

With this approach, difficulties for the international operator should be minimized to change his working equipment.

7.7.5 In the case of document interruption during transmission, the receiving equipment should automatically notify the interruption to the operator. After the interruption the terminal should generate and/or add a note to the text of the unfinished message specifying the event of the interruption. This note should be in such a way as to easily separate the original text to allow message reconstruction. The message bearing the note should be printed or otherwise displayed showing the event of the interruption.

7.7.6 After an interruption of a document transmission, two resumption procedures should be considered: manual (§ 7.8) and automatic (§ 7.9).

7.8 *Manual procedure for interrupted document resumption*

7.8.1 The transmitting operator informed by his terminal of the unfinished transmission of a document, should generate an ‘‘Operator Message’’ as a separate cover sheet to the remaining part of an interrupted document whose CIL was specified.

The Operator Message should contain the indication ‘‘Operator Message’’.

All other pages containing the text of the untransmitted part of the interrupted document.

7.8.2 The operator who receives an unfinished document should keep the received part waiting for document completion and, if required, manual linkage.

7.9 *Automatic procedure for interrupted document resumption*

7.9.1 This procedure is optional and should be activated after the receiving Teletex equipment has detected that the message concerns the completion of a previously received unfinished document.

7.9.2 After interruption, the sending Teletex equipment should keep in its permanent memory the remaining pages of the interrupted document with the receiving equipment to keep the received pages of the unfinished document.

At the resumption of communication, the sending equipment transmits the remaining pages, sending and presenting all the information the receiving terminal needs to link the parts of the interrupted document.

7.9.3 If the receiving Teletex equipment is not able to link the interrupted document, it should submit to the operator within the time limit of 12 hours the part of the document received. In this case the operator will follow the manual procedure.

8 Customer information

8.1 *Directories*

8.1.1 As far as possible a directory of Teletex users shall be provided by each Administration that operates a Teletex service.

8.1.2 As far as possible each Administration shall publish a directory of its users at least once a year.

8.1.3 Directories should be A4 size (210 × 297 mm). The printed area should be compatible with the printable area in the basic Teletex service.

8.1.4 The directories sent to Administrations shall be set up in Roman letters. The entry for each installation should show the full terminal identification as defined in § 7.5 of this Recommendation.

8.1.5 When directories are written in a language other than the language used in that country, they shall be accompanied by an explanatory note to facilitate the use of such directories. This note shall be drawn up in whatever official language of the Union has been agreed by the Administrations concerned.

8.1.6 Each directory shall include the following:

a) how to use the directory, including lists of any symbols or abbreviations used;

b) an alphabetic list of subscribers with the full terminal identification and business descriptions;

c) a list of the network codes for those networks to which the subscribers have access together with the full access prefixes to those networks;

d) how to use the service;

e) how to establish international calls;

f) how to establish calls to the telex service;

g) how to establish calls to other services with which intercommunication is offered;

h) how to use standardized options;

i) where to go for help, responsible contact addresses for further information and/or maintenance.

8.1.7 Each Administration shall supply free of charge to Administrations with which a Teletex service exists a sufficient number of copies of its subscriber directories for official use. The number of such copies shall be fixed in advance by bilateral agreement and shall be regarded as applying until a request to change is received; such requests must be made at least three months in advance.

8.1.8 Each Administration shall supply against payment to Administrations with which a Teletex service exists a number of its directories to be put on sale. The number of copies intended for sale shall be regarded as applying until a request to change it is received; such requests must be made at least three months in advance.

8.1.9 Since the updating of directories in new services is a complicated matter Administrations should develop adequate procedures to keep each other informed on a regular basis of the changes to their directories. To that end electronic directory access may be adequate, e.g., using the mechanisms of the interactive mode of operation, whereas a further or alternative mechanism may also be provided by offering national operator services or help desks in such a way that efficient procedures come into existence for obtaining information on foreign Teletex services and their users.

8.1.10 A user wishing to obtain a copy of the directory of another Administration must apply to his own Administration. If an application for its directory is received directly by an Administration from a user of another Administration the request shall be forwarded to the user's own Administration.

8.2 *Operating instructions*

These instructions are being provided nationally taking into account the typical national environment of the Teletex service. Possible international aspects are for further study. Administrations are suggested to release user manuals.

8.3 *Printing of Teletex numbers*

Standardized printing of Teletex numbers (terminal identification) on letterheads is especially valuable for international purposes. It is recommended that this printing contain the word Teletex, followed by the complete number in accordance with the terminal identification format of Figure 2/F.200, § 7.5 above. For example:

Teletex: 933—99384965=DAIISEDE

9 Tariff principles

These are laid down in separate Recommendations, called the D. Series. For intercommunication with other services different tariff principles may apply.

ANNEX A
(to Recommendation F.200)

Standard format for reporting the results of service observations

H.T. [T4.200]

{ Administration (or RPOA) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | } Traffic from | | | | | | | | | | | | | | | | | | | to . | | | | | | | | | | | | | | | | | | } { Period of observation: | | | | | | | | | | | 19 | | | | to . | | | | | | | | | 19 | | | | } Route busy hour (outgoing): to . | | | | | | | | | | | | | | | | | | | | UTC } { to . | | | | | | | | | | | | | | | | | | | | | | UTC } Total calls observed: }	{ Period of day: { {	
Subject Observations traffic to | | | | | } Average of all outgoing Teletex traffic }	{ {	
{ Effective calls (% of total call attempts) }		
Average chargeable time(s)		
{ Analysis of ineffective attempts (% stated in each of ineffective attempts) to be: }		
{ — cut-offs during call selection }		
{ — cut-offs during call progress }		
{ — lack of outgoing international circuits }		
{ — lack of circuits in distant national network }		
— invalid selection		
— wrong number obtained		
{ — distant terminal engaged }		
{ — distant terminal not ready }		
— mutilations		
— other (specify)		

Tableau [T4.200], p.

ANNEX B
(to Recommendation F.200)

Refers also to F.200-Series

Glossary of terms used in the Teletex service

B.1 **call phases**

F: phases d'une communication

S: fases de la comunicaci´on

The five phases of a Teletex call that cover the activities between the calling terminal's call request signal and the disconnection of the terminals are:

a) call set-up;

b) pre-information sequence;

c) information transmission;

d) post-information sequence;

e) call clearing.

B.2 **calling terminal**

F: ´equipement terminal demandeur

S: terminal llamante

That terminal that initiates the procedures to establish a call.

B.3 **called terminal**

F: ´equipement terminal demand´e

S: terminal llamado

That equipment to which a call is made.

B.4 **interactive mode**

F: mode interactif

S: modo interactivo (modo dialogado)

The exchange in real time of user information during a call or series of calls between calling and called equipment.

B.5 **fully automatic operation**

F: fonctionnement enti`erement automatique

S: explotación automática (operación automática)

Operation such that Teletex equipment is able to send documents (prepared in local mode, e.g., by an operator) into receiving storage without the intervention of an operator beyond the initial command and similarly are capable of receiving messages while they are unattended. Operator selection and operator assisted printing are not excluded.

Note — Examples are the intercommunication between the Teletex service and the telex service, the intercommunication between the Teletex service and the IPM service.

B.6 **interworking in the Teletex service between different networks**

F: interfonctionnement, dans le service télétex, entre des réseaux différents

S: interfuncionamiento de redes diferentes en el servicio teletex

The facility of making calls from a Teletex equipment served by one network to a Teletex equipment served by a different (and possibly a different type of) network.

B.7 **interworking between Teletex and other services**

F: interfonctionnement entre le service télétex et d'autres services

S: interfuncionamiento del servicio teletex con otros servicios

The facility of sending and receiving information between a Teletex equipment and an equipment/user of another service, such as telex, interpersonal messaging, videotex, etc.

B.8 **intercommunication**

F: intercommunication

S: intercomunicación

In the context of Teletex, a relationship between services, where one of the services is Teletex, enabling the user of the Teletex service to communicate with users of other services.

B.9 **local mode**

F: mode local

S: modo local

That state of an equipment that permits operation of some of its functions independently of any network functions.

B.10 **mixed mode of operation**

F: mode d'exploitation mixte

S: modo mixto de explotación

In the Teletex service, the mixed mode of operation provides the user, in addition to the basic features of the Teletex service, with means for transferring documents containing encoded graphical information using techniques other than those defined for the basic Teletex service.

B.11 **multi-station Teletex installation**

F: installation télétex à postes multiples

S: instalación teletex multiestación

A Teletex installation that includes more than one work station.

B.12 **standardized option**

F: option normalisée

S: opción normalizada

A service feature, defined by CCITT as an addition to the basic requirements, that may optionally be used by subscribers in the international Teletex service.

B.13 **storage within the network**

F: stockage dans le réseau

S: almacenamiento dentro de la red

A network-provided facility that will accept and store messages and relay them to the addressee(s), or (in case of store-and-retrieve) will be retrieved by the addressee.

B.14 **Teletex call**

F: communication télétex

S: comunicación teletex

The temporary connection (or apparent connection as perceived by the caller) of Teletex equipment to other Teletex devices for the purpose of exchanging information.

B.15 Teletex page

F: page télétex

S: página teletex

The smallest unit of text treated as an entity in office correspondence in the Teletext service. One A4 (or A4L or North American Standard) page or the information that may be presented on it. Paper sizes other than ISO A4 or A4L may be included as standardized options.

B.16 Teletex document

F: document télétex

S: documento teletex

A sequence of one or more pages intended by the originator to be delivered as a single entity in the original page sequence.

B.17 Teletex equipment

F: équipement télétex

S: equipo teletex

A device that is capable of transmitting and receiving Teletex documents in accordance with the basic requirements of Recommendation T.60.

Recommendation F.201

INTERWORKING BETWEEN TELETEX SERVICE AND TELEX SERVICE — GENERAL PRINCIPLES

CONTENTS

Annex B — Glossary of terms

1 Introduction

This Recommendation defines the general principles and operational aspects of interworking between the teletex service and the telex service.

The teletex service is defined in Recommendation F.200 and in the relevant technical Recommendations.

The telex service is defined in Recommendations F.60, F.69 and in the relevant technical Recommendations.

The technical details of teletex/telex interworking are defined in Recommendations T.90 and U.201.

In order to promote the use of the teletex service, it is necessary to provide interworking with the telex service. (See Recommendation F.200, § 1.2.2.1 i)).

The implementation of national interworking between the teletex service and the telex service, which should be provided, is a matter for the Administration concerned.

International interworking should also be provided, and in this case the following three general principles should be adopted:

a) Interworking should be entirely automatic and no operator intervention should be necessary.

b) Where Administrations do not provide conversion facilities, basic interworking on international connections will be at 50 bauds.

c) Where two Administrations both have a teletex service, or at least suitable conversion equipment, the possibility of a bilateral agreement to use an international teletex connection can be considered. It is recommended that, where possible, an international teletex connection should be used provided that the practical operational difficulties (e.g. tariff, routing and conversion problems) can be overcome.

2 Basic interworking service

2.1 *Conversion*

The teletex terminal should be capable of selecting a subset of its graphic character repertoire corresponding to International Telegraph Alphabet No. 2 and of restricting the length of a line to 69 characters: the necessary conversion between the services (e.g. of service procedures, transmission rates and codings) should be provided within the networks. To the telex terminals, existing specifications apply.

2.2 *Location of the conversion facilities in the case of international traffic*

There are two possible situations to be considered in the basic service as shown in Figure 1/F.201.

Figure 1/F.201, (M), p.

In cases that countries introduce the teletex service at different time, it must be assumed that the conversion facility is in the same country as the teletex terminal, in cases of operational conversion facilities on both ends § 1 c) above could apply.

2.3 *Methods of interworking*

a) Considering that the teletex service can be provided upon various networks (see Recommendation F.200, § 2);

b) Considering that an Administration can provide the teletex service on more than one network (e.g., PSTN and PSPDN, . | |);

c) Considering the technical constraints of the existing networks (e.g. numbering plans, . | |);

The two following methods of interworking between the telex service and the teletex service can be provided:

i) interworking with one-stage selection for telex to teletex procedure;

ii) interworking with two-stage selection for telex to teletex procedure.

The conversion facility (CF) is performing interworking using store and forward principles.

The interactive mode is not required for interworking.

The two methods are described in §§ 3 (one-stage) and 4 (two-stage) with their conditions of implementation and their service characteristics. It is up to Administrations to decide which method they can provide. Administrations should take into account possible implications of the operational procedures to foreign subscribers.

The Administrations whose telex subscribers make access to foreign CFs should inform their customers of the procedures attached to the two methods.

2.4 *General service requirements for telex to teletex direction*

In the selection step of the one-stage selection procedure and in the first selection step of the two-stage selection procedure, the procedures should appear to the telex operator to be the same as for any other telex call.

Validation of the called teletex terminal is mandatory. Validation is performed either by a direct validation call or by data base access, in order to minimize the number of possible unsuccessful calls.

Format checking of the teletex address is desirable in both cases, immediately after the address input.

If the validation leads to a negative result, the CF should send at least the telex service signal ‘‘NP’’ or, if available, other appropriate service signals, according to Recommendation U.70, and the CF should then clear the call.

The storage capacity of the store and forward conversion facility may impose a limit on the length of messages (see also Annex B).

If abnormal conditions occur during the text deposit of the telex message, and the call is cleared before its normal completion, the conversion facility shall nevertheless transmit to the teletex terminal the text received so far and indicate that this transmitted text is probably not complete (see also Annex B).

The teletex terminal must be capable of properly reproducing a telex text. However, the conversion facility must provide any necessary rearrangement of the text, such as paging.

In principle, the telex customer should not be charged for unsuccessful calls, that is, when his message fails to reach the teletex user due to congestion or fault of the Administration’s equipment, etc. Refund procedure should be in accordance with Recommendation F.67, Division E.

The CF shall wait at least 15 seconds for activity on the line before clearing. See also Annex A for abnormal conditions during message input.

2.5 *General service requirements for teletex to telex direction*

The teletex terminal shall provide to the conversion facility a telex mode. In this mode it shall:

a) transmit only the character repertoire of the International Telegraph Alphabet No. 2 with the code frame of teletex characters;

b) restrict the line length to 69 characters or less;

c) insert the control characters carriage-return and line-feed at the appropriate positions. Only the sequence carriage-return and line-feed should be used to introduce a new line.

The message should appear to the receiving telex terminal as a normal telex message.

The CF shall transmit to the telex terminal the stored message in the format in which it was originated. After text transmission is complete, the CF shall send to the telex terminal the teletex answerback. This rearranged teletex terminal identification (or ‘‘teletex answerback’’) contains the teletex user directory information:

— DNIC or TCC and national number according to Recommendation X.121 if there is more than one network for teletex service (in this case, DNIC, or TCC are separated from the national number by a hyphen (—), Combination No. 1 of ITA2);

— National number if only one network. If space is available, the teletex terminal answerback will contain the mnemonic part of the teletex identification.

The provision by the store and forward CF of an acknowledgement following a successful call is a matter for national consideration, but an indication of failure, and the cause of failure, should be given whenever a message is undelivered.

The provision of interworking with the telex service must not reduce the quality of service on the teletex network as a result of excessive holding time caused, for example, by difficulties in setting up the telex connection.

3 Interworking with one-stage selection procedure for telex to teletex

3.1 *Service principles: telex to teletex direction*

3.1.1 *Numbering plan and teletex network environment*

The procedure for making the call should appear to the telex operator to be the same as for any telex call.

The numbering plan and teletex network environment should support the above principle.

The total selection information of the teletex user should not be longer than 12 digits.

3.1.2 *Text delivery to the teletex terminal*

Normally, text delivery to the teletex terminal would occur while the telex call is held, immediately after the end of input (EOI) signal.

It is the responsibility of Administrations operating the store and forward conversion facilities to arrange alternative means of delivering for the messages that could not be delivered directly to the teletex terminal.

3.1.3 *Protocol and technical aspects*

Teletex protocol and other technical aspects of interworking using the one-stage procedure are described in Recommendation U.201.

3.2 *Service principles: teletex to telex direction*

3.2.1 *General requirements*

The general requirements developed in § 2.5 are relevant for this method of interworking.

3.2.2 *Text deposit to the conversion facility by the teletex terminal*

Text deposit takes place during a call which follows normal teletex procedures with the conversion facility emulating a teletex terminal. The teletex terminal should clear the call after text deposit without waiting for the delivery to the telex terminal.

3.2.3 *Text delivery to the telex terminal by the conversion facility*

The principles of Recommendation U.40 shall be applied for all delivery reattempt requirements.

Before forwarding the text, to ensure security of delivery, the telex answerback is taken and compared with the telex answer-back given by the teletex user.

The method of validation of the recipient’s answerback shall be in accordance with Recommendation U.75.

In case of unsuccessful evaluation (see Figure 1/U.75), the message shall not be forwarded, the NDN control document returned to the teletex subscriber shall include the answerback received.

In case the teletex user has so requested, by inputting a single character in the mnemonic field, no check of the answerback shall be performed. The message is then to be forwarded.

If no information is present in the mnemonic field, the conversion facility (CF) should try to extract the Telex number of the called telex party from its answerback:

— If extraction is not possible, the message is forwarded.

— If extraction result matches with the selection, the message is forwarded.

— If extraction result mismatches with the selection, the message is not forwarded.

If any signal is received from the telex network during the delivery to the telex terminal, the call shall be cleared and one further attempt to deliver the message may be made after an interval of at least three minutes. In this case the text shall be preceded by ‘‘POSSIBLE DUPLICATE MESSAGE’’.

After text transmission is completed, the telex answerback should be taken and compared with that received at the start of delivery. In the event of a mismatch, the telex answerback shall be taken again, and if there is a match with that received at the start of delivery, the delivery shall be deemed successful. If there is a second mismatch, the call shall be cleared and one further attempt to deliver the message may be made after an interval of at least three minutes. In this case the text shall be preceded by ‘‘POSSIBLE DUPLICATE MESSAGE’’.

The action to be taken when a notification cannot be delivered should be the responsibility of the Administration operating the conversion facility and is a national matter.

Administrations should advise their customers of the meaning and possible consequences of using special telex characters sequences (see Recommendation S.4) in the submitted text.

An acknowledgement call to the teletex terminal is mandatory if the telex delivery was unsuccessful (Non-Delivery Notification: NDN) but optional if the telex delivery succeeds (Positive Delivery Notification: PDN).

3.2.4 *Protocol and technical aspects*

Teletex protocol and other technical aspects of interworking are described in Recommendation T.90.

4 Interworking with two-stage selection procedure for telex to teletex

4.1 *Service principles: telex to teletex direction*

4.1.1 *General requeriments*

The general requirements developed in § 2.4 are relevant for this method of interworking.

4.1.2 *Numbering plan and teletex network environment*

Two-stage selection must be used if total selection information requires the input of more than 12 digits.

4.1.3 *Multiple address input facility*

It is up to the Administrations operating the CF to offer this facility or not, on a bilateral agreement basis.

This facility allows the telex originator to send a single message to several teletex recipients.

Format of multiple address input is described in detail in Recommendation U.201.

4.1.4 *Validation*

Validation of the national address of the called teletex terminal is mandatory. Validation of the teletex mnemonic, whenever input by the telex user, is also mandatory.

The two recommended validation methods are:

a) validation call to the teletex subscriber,

b) automatic checking in a data base.

It is the responsibility of the Administration providing the CF to determine which of the two methods is to be implemented.

In both methods it is desirable to check the format of the teletex selection information before the start of the validation process. The validation process should begin immediately after the complete teletex address has been received.

The subscriber is expected to wait after the end of address (EOA) signal for his answerback to be tripped and for the receipt of a progress signal. This signal may be either a GA, a positive validation answer followed by a GA, or a negative validation answer.

The progress signal should appear within five seconds counted after the address input (i.e. after the EOA) even if the validation process is not completed (see Table 1/F.201).

H.T. [T1.201]

TABLE 1/F.201

Action of CF following validation result

lw(72p) | lw(78p) | lw(78p) .

Tableau 1/F.201 [T1.201], p.

If the subscriber does not wait for the progress signal, then the input of the message and its subsequent delivery is at his own risk. There is also a risk that a collision can occur between the message input and the validation answer.

When receiving multiple address, the procedure is similar to the single-address one. The CF should try to validate one of the proposed Teletex addresses, and return the result of the first positive one followed by GA.

If no address is valid the call shall be rejected.

4.1.5 *Capture of the calling telex address*

Capture of the calling telex address by the conversion facility is necessary for later use in order to recall the telex user if needed (e.g. non-delivery notification, . | |).

Where the answerback is not processable according to U.74, the calling telex address should be input directly.

Format of the telex address is the Recommendation F.69 country code followed by the national telex number.

4.1.6 *Input message acknowledgement*

The input message acknowledgement (IMA) is to be returned by the CF to the calling telex user after the EOI.

This information is used as the message reference in case of a non-delivery notification (NDN).

The input message acknowledgement will consist of the ‘‘IMA’’ service signal, a date and time and an optional message reference number.

4.1.7 *Text delivery and clearing*

After the EOI, the telex user should hold the line until receiving IMA.

Whenever technically possible, the CF should attempt to deliver the message to the teletex user immediately after the EOI in order to provide an on-line delivery acknowledgement (ODA) facility.

If the CF provides the on-line delivery acknowledgement facility (ODA), it sends a MOM signal immediately after the IMA. If the ODA facility cannot be provided, the CF sends a service signal (ITL) immediately after the IMA, followed by clearing.

If the on-line delivery acknowledgement facility is provided, the CF attempts *to establish* the delivery call within a maximum period of 30 seconds, with several attempts (at least one in the case of PSTN). Attempts should be made at 5-second intervals measured from the end of one attempt to the beginning of the next.

A MOM signal is returned after each attempt followed eventually by network service signals. If the message delivery succeeds, the teletex answerback as described in Note 6 of Figure 7/U.201 is the on-line delivery acknowledgement for the telex user.

If the teletex *call establishment* | fails within 30 seconds, the CF sends a service signal (ITL) and clears the call.

After sending an ITL signal, in all cases, the CF should attempt to deliver the message within four hours. The CF should make at least 16 series of four calls, with 15 minutes between each series. (These figures may be revised in some cases, e.g. in the case of a PSTN.)

If the delivery fails despite the performance of the cycle of delivery attempts, the CF should send a non-delivery notification (NDN). This information is sent to the telex user with the complete reference of the related message in order to allow the telex user to take further action. No further delivery action shall be taken by the CF.

The NDN is described in the relevant sections of Recommendation U.201 and should contain the following items:

— CF's telex answerback;

— indication of content (NDN);

— CF's current date and time;

— received teletex identifier (as transmitted by the user during message deposit);

— IMA (as transmitted by the CF after message deposit);

— cause of non-delivery (telex service signal of the last delivery attempt as specified).

In case multiple address delivery is offered, every non-delivered address should be notified to the telex originator of the message.

4.1.8 *''Follow-on'' message facility*

4.1.8.1 *General service aspects*

It is up to the Administration operating the CF to offer this facility or not.

If offered, this facility allows the telex originator to enter a new message after the deposit of the previous one, without clearing the call.

If available, this facility should be offered to both manual terminals and Telex Automatic Emitting Devices (TAEDs).

When the CF offers the ODA facility, the new message is entered after the on-line-delivery acknowledgement of the previous one has been returned.

When the ODA facility is not offered by the CF, the next message is entered after the ''ITL'' prompt related to the previous message.

4.1.8.2 *Protocol aspects*

Detailed protocol aspects are described in the relevant sections of Recommendation U.201.

4.1.8.2.1 *Manual terminals*

— When offered, the use of the follow-on message facility is prompted by the CF to the subscribers by means of a prompt sent after the ODA or the ITL (see Recommendation U.201) ‘‘CRLF TTX NBR’’;

— If no data has been received within 15 seconds after this prompt, the CF should clear the call.

4.1.8.2.2 *Telex automatic emitting devices*

— The operator of TAEDs may request the follow-on facility when offered, after checking in an international directory its existence.

— Request for follow-on messages is done by concatenation of several sequences: ‘‘teletex Address, Message, EOI’’.

— The CF should wait 15 seconds after the end of message (EOI) sequence before clearing the call, for a possible following message.

— When the facility is not offered, the CF should stop the transmission of the following message by means of ‘‘TTT . | | ’’ sequences and clear the call (see abnormal conditions in Recommendation F.201).

4.1.9 *Positive delivery notification to a telex originator (PDN)*

4.1.9.1 *General service aspects*

In case on-line delivery acknowledge facility (ODA) is not offered by the CF, implementation of the PDN facility is considered as useful.

It is up to the Administration operating the CF to offer this facility or not.

Access to the facility is available to users of Administrations having an agreement with the one operating the CF.

This facility allows the originator telex user to ask for the sending of a positive delivery notification (PDN).

The PDN is returned to the telex originator as soon as possible, within an eight-hour delay, after the delivery of the message to the teletex recipient.

If delivery of the PDN to the originator is not possible, the PDN should be printed out on a suitable service position and sent by mail.

4.1.9.2 *Protocol aspects*

Detailed protocol aspects are described in the relevant sections of Recommendation U.201.

4.1.9.2.1 *PDN facility request by the calling telex user*

If the PDN facility is offered, the telex originator requires a PDN by means of a specific sequence of characters following the input of the recipient teletex address.

When the facility is requested by the user whilst not offered by the CF, the CF should stop the transmission by means of sequences of ‘‘Ts’’ and clear the call.

4.1.9.2.2 *PDN facility content*

If the PDN facility is offered, the PDN should contain the following items, with the format described in the relevant sections of Recommendation U.201:

— CF’s telex answerback;

— indication of content (PDN);

— CF’s current date and time;

— selection information (Teletex address as received from the user during deposit);

— received Teletex identifier;

— IMA (as transmitted by the CF after message deposit);

— date and time of delivery (CF's time).

4.1.10 *Protocol and technical aspects of interworking with two-stage selection*

Telex protocol and other technical aspects are described in Recommendation U.201, § 3.2.

4.2 *Service principles: teletex to telex direction*

4.2.1 Service principles teletex to telex direction are identical for one-stage and two-stage telex/teletex interworking.

The principles described in § 3.2 apply in total to two-stage selection.

4.2.2 Differences between protocols occurring on the telex side are described in relevant parts of Recommendation U.201.

ANNEX A

(to Recommendation F.201)

Reactions to abnormal conditions during the telex input

A.1 *Telex connection clearing without the end of input signal*

After a clear without the end of input (EOI) signal, the conversion facility should forward the message to the teletex user.

A.2 *Telex user pausing during input of address information*

If there is a delay greater than 15 seconds at the start of the address input or between characters within the address input, the CF shall clear the connection.

A.3 *Telex users stopping transmission without sending the end of input signal*

After at least a 30 seconds time-out, the conversion facility should send a prompt ‘‘GA’’ to the telex user in order to request more information input (e.g. a text or the end of input signal). If after a further 30 seconds time-out there is no more information, then the conversion facility should send the input message acknowledgement signal, followed by a service message BK. After this the conversion facility should clear the call and forward the message to the teletex user.

A.4 *Telex users sending a WRU to the conversion facility during text input*

i) In case of one-stage selection procedure, the CF should return the rearranged teletex answerback (see Note 3 of Figure 1/U.201).

ii) In case of two-stage selection procedure, in any step of the procedure, the conversion facility should return its answerback after receiving a WRU. In addition:

— if WRU is followed by text, message input is continued after the conversion facility answerback. Also the WRU is deleted from the message text;

— if WRU is followed by a clear from the telex network, the conversion facility proceeds as in § A.1 above;

— if WRU is followed by an idle condition, the conversion facility proceeds as in § A.3 above.

A.5 *Telex users sending a text after the end of input signal*

Any characters received after the end of input signal will be ignored. The conversion facility should use the ‘‘TTT . | | ’’ characters to attempt to stop the telex transmission and if successful, then send an input message acknowledgement signal followed by clearing. After clearing, the message should be normally forwarded to the teletex terminal.

A.6 *Telex users clearing after the end of input signal and before the input message acknowledgement signal*

The message shall be normally forwarded to the teletex terminal.

A.7 *Telex users sending national variants of ITA2 characters (figure shift characters of F, G and H)*

These combinations could either be converted into a teletex code which is a non-telex character (e.g.: ‘‘*’’), or into the national use of these combinations. The choice is a national matter.

A.8 *The conversion facility detecting signal distortion during text input*

Reactions to the detection of distortion are a national matter.

A.9 *Telex users sending a bell signal*

The conversion facility has to ignore the bell signal in text input.

A.10 *CF’s storage capacity overflow during telex message input*

— In order to avoid memory overflow occurring during message input, a guaranteed message length of 12 | 00 characters is defined.

— The CF should return an ‘‘NC’’ service signal if guaranteed storage space is not available.

— Messages exceeding the guaranteed length will continue to be accepted if storage is available.

— If the number of characters received by the conversion facility during a message input exceeds the available storage to that input, the conversion facility should discard the excess characters and no attempt should be made by the conversion facility to overwrite previously stored characters. When this occurs, the conversion facility should immediately attempt to prevent the telex user from sending further characters by transmitting a sequence of ‘‘TTT . | | ’’ characters for a maximum of 20 seconds.

If the calling terminal stops transmission within this period, the conversion facility should return the message length exceeded indication, ‘‘LDE’’, return IMA in case of the two-stage selection procedure and then behave as normal, as if the text input phase had finished.

If the terminal continues to transmit characters after this period, the conversion facility should forcefully clear the connection.

The conversion facility should attempt to deliver the message text, accepted and stored, preceded by a special text prefix to indicate to the called teletex user that the message may be incomplete.

ANNEX B

(to Recommendation F.201)

Glossary of terms

B.1 *General glossary*

B.1.1 **interworking**

F: interfonctionnement

S: interfuncionamiento

Same as definition in Recommendation F.200, § B.7.

B.1.2 **conversion facility (CF)**

F: unit´e de conversion (UC)

S: unidad de conversi´on (UC)

Fully automatic system performing the necessary conversion between the teletex service and the telex service (see Recommendation F.201, § 2.1).

B.1.3 **one-stage/two-stage selection procedure for telex to teletex direction of interworking**

F: proc´edure de num´erotation en une ´etape ou en deux ´etapes pour l’interfonctionnement dans le sens t´elex vers t´el´etex

S: procedimientos con marcaci´on mono o bietapa para el interfuncionamiento de t´elex a teletex

Addressing of the teletex terminal by the telex terminal can be done, either by sending the total selection information in one phase to the CF or by calling first the CF (first stage of the selection), and by sending the teletex address after the connection to the CF has been established (second stage of the selection).

B.1.4 **validation of the called teletex terminal [validation result (positive or negative)]**

F: validation du terminal t´el´etex demand´e [r´esultat de la validation (positif ou n´egatif)]

S: validaci´on del terminal teletex llamado [resultado de validaci´on (positivo o negativo)]

This validation is performed by the CF to verify that the teletex terminal is available, i.e. either the teletex terminal has been called with this address (validation call) or this address has been controlled in a data base (see Recommendation F.201, § 4.1.4).

B.1.5 **message deposit/message delivery (text deposit/delivery)**

F: d´ep | t du message/remise du message (d´epot/remise du texte)

S: dep´osito de mensaje/entrega de mensaje (dep´osito/entrega de texto)

The message ‘‘deposit’’ is the sending by the calling terminal of the whole message to the store and forward CF before its further ‘‘delivery’’ to the called terminal.

B.1.6 **on-line delivery acknowledgement (ODA)**

F: avis de remise en ligne (ODA)

S: acuse de recibo de entrega en l´inea (ODA)

The on-line delivery acknowledgement facility gives to the waiting telex (i.e. having maintained the connection with the CF after its message deposit) the opportunity to receive ‘‘on-line’’ a proof of the CF’s message delivery to the teletex terminal, provided the call establishment to the teletex terminal has been performed within 30 seconds counted after the end of the message input (see Recommendation F.201, § 4.1.7).

B.1.7 **non-delivery notification: NDN / positive delivery notification: PDN**

F: avis de non remise (ANR)/avis de remise positive (ARP)

S: notificaci´on de no entrega (NDN)/notificaci´on de entrega positiva (PDN)

If the CF has not been able to deliver the message to the called terminal despite the performance of a defined cycle of delivery attempts on the called terminal network (each network has a specific cycle) and within a maximum of a four hours duration, the CF should send a NDN to the calling user to indicate to him that his message has not been delivered to the called terminal and that no further delivery action will be taken by the CF.

Note — The NDN facility is not provided in the one-stage selection method of interworking from telex to teletex.

B.2 *Specific glossary to one-stage selection procedure*

B.2.1 **CF prefix**

F: pr´efixe de L’UC

S: prefijo de UC

In the one-stage selection method of interworking, the ‘‘CF prefix’’ is the special number (up to 7 digits) to be put before the called teletex number, to indicate that the total telex selection is for reaching a teletex terminal.

B.3 *Specific glossary to two-stage selection procedure*

B.3.1 **CF national number**

F: num´ero national de L’UC

S: n´umero nacional de UC

In the two stage selection method of interworking, the ‘‘CF national number’’ is the national telex number of the CF, given to the called telex users at the beginning of the telex delivery phase of the teletex to telex exchange for further use of interworking with the teletex of the CF’s country.

B.3.2 **input message acknowledgement: IMA**

F: accus´e de dep | t (IMA)

S: acuse de recibo de mensaje introducido (IMA)

The IMA message sent by the CF to the telex user is used to indicate that the message has been well received by the CF and to give to the telex user a unique reference for this message. This reference should be used again when sending an NDN (see Recommendation F.201, § 4.1.6).

B.4 *Abbreviations*

A/B Answerback

CF Conversion facility

DNIC Data network identification code (Recommendation X.121)

EOA End of address

EOI End of input

IMA Input message acknowledgement

NBR Number

NDN Non-delivery notification

ODA On-line delivery acknowledgement

PDN Positive delivery notification

SOA Start of address

TAED Telex automatic emitting devices

TCC Telephone country code (Recommendation E.163)

TTX Teletex

Recommendation F.202

INTERWORKING BETWEEN THE TELEX SERVICE AND THE TELETEX SERVICE
— | fR
GENERAL PROCEDURES AND OPERATIONAL REQUIREMENTS FOR THE INTERNATIONAL

INTERCONNECTION OF TELEX/TELETEX CONVERSION FACILITIES

CONTENTS

1 *Scope*

1 Scope

1.1 Many Administrations have implemented, or are about to implement teletex/telex conversion facilities (CF). In many cases the telex selection and message input procedures, for the CF, differ for each country of destination.

1.2 This Recommendation proposes operational procedures for the international interconnection of CFs allowing access from the telex service to the international teletex service to be in the country of origin.

2 Introduction

2.1 The introduction of the international interconnection of CFs will, in many cases, lead to single selection and message input procedures, for telex access to the international teletex service, in the country of origin. Thus ensuring that the message input procedure may be tailored to meet national needs.

2.2 Use of error detecting transmission protocols between interconnected CFs will extend the performance characteristics of the teletex service across the international boundary when interworking between the telex and teletex services.

2.3 Telex customers interworking with the international teletex service may be identified in the country of origin.

2.4 The return of non-delivery and delivery notifications across international boundaries may be simplified.

2.5 Greater transmission efficiency may be achieved with multi-address messages and messages addressed to both telex and teletex addresses may be accommodated.

2.6 International accounting principles may be established for the international inter-CF traffic.

3 Service Outline

3.1 The international interconnection of CFs should be established between Administrations on a bilateral basis.

3.2 The general service requirements for telex to teletex and teletex to telex directions of interworking respectively should be in accordance with § 2 of Recommendation F.201.

3.3 The interconnection of CFs allows a telex or teletex subscriber to deposit a message with a CF in the originating country for subsequent delivery, via a CF in the destination country, to a teletex or telex subscriber respectively.

3.4 In the international interconnection of CFs, using store-and-forward principles, the message is deposited with a CF in the originating country and transferred to a CF in the destination country for delivery.

3.5 Provision may be made for both single and multi-address messages, where the multi-address message may contain both telex and teletex addresses.

3.6 In the event of failure to deliver to any address or addresses a non-delivery notification shall be issued to the originating CF by the destination CF. The requirement to send a non-delivery notification is mandatory.

3.7 A delivery notification may be issued to the originating CF, to indicate successful delivery to any address or addresses, by the destination CF by bilateral agreement. However it should be a function of the CF that delivery notification is provided if requested.

3.8 Any request for delivery notification should be provided on a service basis and not on an individual message basis.

3.9 The need for a status enquiry for outstanding messages is for further study.

4 International Interconnection

4.1 The term ‘‘ network management boundary ´boundary within which the CF service is provided under the control of one Administration.

4.2 The extension of CF facilities beyond the management network boundary of an Administration requires co-operation between CFs across international connections.

4.3 Administrations should agree bilaterally on the network(s) to be used to interconnect CFs.

4.4 Five possibilities may be considered:

a) Circuit Switched Public Data Network (CSPDN);

b) Packet Switched Public Data Network (PSPDN);

c) Public Switched Telephone Network (PSTN);

d) Private Leased Circuits;

e) ISDN.

4.5 International routes shall be capable of supporting a minimum data rate of 2400 bit/s; data transmission rates should be agreed bilaterally.

4.6 In the international interconnection of CFs the responsibility to deliver messages is transferred from the originating Administration to the destination Administration.

4.7 In the basic service messages addressed to more than one destination CF management network should be separated at the originating CF management network.

4.8 The possibility of forwarding messages via transit CF management networks is for further study.

5 Delivery/Non-Delivery Notification

5.1 In the international interconnection of CFs it is necessary to return delivery/non-delivery status information to the originating CF. This information should be compiled at the destination CF when either the message has been delivered or no further attempts to deliver will be made to that address.

5.2 The return of delivery and non-delivery advice information to the originating CF may be on a per message address or per message basis.

5.3 Delivery and non-delivery information provided on a per message address basis requires explicit notification to the originating CF.

5.4 Delivery and non-delivery information provided on a per message basis may only require explicit notification of non-deliveries and implicit notification of deliveries.

5.5 Where bilateral agreement exists to return delivery notifications, all notifications should be explicit.

5.6 The method employed on an international connection between two CFs to transfer delivery/non-delivery information should be the subject of bilateral agreement. Account should be taken of the means by which the interconnection is established and the possible effects on service.

5.7 If technically possible the attempt to deliver the message, in the telex to teletex direction, by the destination CF should allow the provision of an on-line delivery acknowledgement facility.

5.8 The interconnection procedures with CFs employing single-stage selection in telex to teletex direction are for further study.

6 Message Transfer

6.1 The co-operation of two or more CFs may be required to complete the function of message transfer.

6.2 The transfer of the message between CFs should be as soon as practically possible after the deposit of the message in the originating CF.

6.3 Where an originating CF is unable to transfer the message to the destination CF a non-delivery notification should be returned to the originating customer.

6.4 In assuming responsibility for the delivery of the message the destination CF should attempt to deliver the message immediately after receipt of the message from the originating CF. The action to be taken where the message cannot immediately be delivered is for further study.

6.5 The delivery time targets for both the transmission of messages between CFs and the delivery of the message from the destination CF should be agreed bilaterally.

6.6 The destination CF should return the delivery information, to the originating CF, immediately after delivery of the message or the final attempt to deliver the message.

6.7 In the event of non-delivery the action to be taken with regard to the message text is for further study. It may be required to return the message text with the non-delivery advice.

7 Elements of inter-CF message transfer procedure

7.1 The basic element of the message transfer procedure is the message transfer unit. This unit is classified as either a text message transfer unit or a service message transfer unit allowing easy identification of the function(s) for which co-operation is required.

7.2 Text message transfer units carry messages submitted by a telex or teletex customer for delivery to a specified address or addresses.

7.3 Service message transfer units do not contain customer messages but are used to convey service information about messages.

7.4 There are four types of message transfer unit which may be used to provide a CF interworking capability:

i) Text transfer — used to transfer destination address information and the customer message;

ii) Delivery notification — used to provide information on an address (or addresses) to which the message has been delivered;

iii) Non-delivery notification — used to provide information on an address (or addresses) to which the message has not been delivered;

iv) Combined delivery/non-delivery notification — used to provide information on whether a message has or has not been delivered to a number of addresses.

Other types of message transfer units are for further study.

7.5 The provision of a status report covering one or more messages is for further study.

7.6 To achieve reliable message transfer the control procedures for the transfer of messages between CFs should be in accordance with the relevant CCITT technical Recommendations.

8 Error Recovery

8.1 For error conditions arising during the CF to CF transfer normal error recovery procedures should be in accordance with the relevant CCITT technical Recommendations.

8.2 For error conditions arising during the input to or delivery from a CF the procedures detailed in Recommendations F.201 and T.90 should apply.

9 Message Input and Message Delivery

9.1 Message input and delivery procedures should be generally in accordance with Recommendations F.201 and T.90 for telex and teletex respectively.

Recommendation F.203

NETWORK BASED STORAGE FOR THE TELETEX SERVICE

The CCITT,

considering

(a) that Teletex service has been and is being introduced by many countries;

(b) that a requirement for Teletex access to a store-and-forward unit in the country of origination has been identified;

(c) that a requirement for Teletex access to a store-and-forward unit in the destination country has been identified;

(d) that a requirement for Teletex access to a store-and-retrieve unit in the destination country has been identified;

(e) that the units described in this Recommendation enhance the Teletex service,

unanimously declares

that the general principles described in this Recommendation should be adopted for the provision of network based storage for the Teletex service.

1 Scope

1.1 This Recommendation describes the principles for the provision of network based storage for the Teletex service. This includes store-and-forward (SF) and store-and-retrieve (SR) units.

1.2 The Teletex service is described in Recommendation F.200.

1.3 The technical aspects of SF and SR are to be defined in the relevant T series Recommendations.

2 General

2.1 The access to store-and-forward and store-and-retrieve units by international Teletex users and the international interconnection of the units are provided on the basis of bilateral agreements between Administrations.

2.2 The Administratons providing the unit(s) are responsible for the barring of international access from unauthorized users and for the barring of unauthorized calls such as transit calls to specific countries. The method of barring is the responsibility of the Administration which is providing the unit(s) and is beyond the scope of this Recommendation.

2.3 It may also be necessary for Administrations to make provision to selectively block access to international SF and SR in other countries.

3 Service Requirements

3.1 The relation between the Teletex service and the SF and SR is illustrated in Figure 1/F.203.

Figure 1/F.203, (N), p.

3.2 The preferred method for the service concept should be the utilization of Message Handling Services as defined in the F.400 series Recommendations. The technical implementation of these units is a national matter.

3.3 For international compatibiltiy the SF will support the basic requirements of the Teletex service as defined in Recommendation F.200. The support of standardized options of the Teletex service is a national matter.

3.4 The SF may be available to the Teletex user(s) either by subscription or on a per message request basis. The SR is usually available by subscription. The availability of the unit(s) and one stage or two stage selection procedures are a national matter.

3.5 In principle the originating Teletex terminal equipment may select the SF either in the country of origin or the country of destination. Typically if the call is intended for multiple deliveries in one country of destination, the SF of that country may be used.

3.6 A Teletex document is considered by the SF to be delivered when it has been positively acknowledged by either the destination Teletex terminal equipment or the SR. When a document has been delivered to an SR, the originating Teletex terminal equipment will be advised by the SF to which the document was submitted.

4 Description of Store-and-Forward and Store-and-Retrieve Units

4.1 *Store-and-forward unit*

4.1.1 A Teletex user may select any of the store-and-forward facilities as described in § 5 of this Recommendation.

4.1.2 The SF should only accept messages for delivery to destination addresses served by the SF.

The destination addresses may be addresses of Teletex terminal equipment and other equipment using services to which Teletex is interconnected.

4.1.3 Acceptance of the message by the SF does not guarantee that the message can be delivered to the destination address.

4.1.4 Delivery of the accepted document shall be attempted immediately after receipt of the message.

4.1.5 If message delivery was not successful within 24 hours from time of input, the SF will send a non-delivery notification to the originating Teletex terminal equipment and shall eliminate the document from the storage of the SF. The intervals of delivery attempts are a national matter.

4.2 *Store-and-Retrieve Unit*

4.2.1 The SR requires a subscription by the receiving terminal. Therefore the function shall be located in the destination point of delivery.

4.2.2 The SR is required to support all of the store-and-retrieve facilities described in § 5.

4.2.3 From the service point of view a document is considered to be delivered when it becomes available for retrievable by the recipient.

4.2.4 The following options are available:

1) the receiving Teletex terminal equipment or user retrieves the Teletex document(s);

2) the SR conveys the Teletex documents to the Teletex terminal equipment during specific time interval(s) as subscribed to.

The choice of either or both of the option(s) is a national matter.

5 Facilities

5.1 *Facilities for Store-and-Forward Teletex*

5.1.1 *Deferred Delivery*

This facility enables an originating Teletex user to instruct the SF that a document being submitted should be delivered no sooner than a specified date and time. Delivery will take place as close to the date and time specified as possible, but not before. The date and time specified for deferred delivery is subject to a limit which is defined by the SF of the originating country.

5.1.2 *Delivery notification*

This facility enables an originator to request that an explicit notification be returned when a submitted document has been successfully delivered to the recipient or an SR. The notification is related to the submitted document by means of the document identifier and includes the date and the time of delivery. In the case of a multi-destination document, a delivery notification may refer to any or all of the recipient(s) to which the document was delivered.

When a document is delivered after distribution list expansion, the notification shall be sent to the document originator.

The delivery notification carries no implication that any user action, such as examination of the document's content, has taken place. This is especially applicable when delivery to an SR has occurred.

5.1.3 *Distribution List*

This facility allows a sender to have a document transmitted to a group of recipients, by naming the group instead of having to enumerate each of the final recipients.

The creation and management of the distribution list is a national matter.

The provisioning of distribution lists in destination countries is a matter for bilateral agreements.

5.1.4 *Grade of Delivery Selection*

This facility enables an originating Teletex user to request that transfer through the SF be urgent or non-urgent, rather than normal. The time periods defined for non-urgent and urgent transfer are longer and shorter, respectively, than that defined for normal transfer. This indication is also sent to the recipient with the document.

5.1.5 *Multi Destination Delivery*

This facility enables an originator to specify that a document being submitted is to be delivered to more than one recipient. Simultaneous delivery to all specified destinations is not implied by this facility. The number of recipients on a submitted recipient document is unlimited.

5.1.6 *Non-Delivery Notification*

This facility enables the SF to notify an originating Teletex user if a submitted document was not delivered to the specified recipient(s). The reason the document was not delivered is included as part of the notification. For example, the recipient may be unknown to the SF.

In the case of a multi destination document, a non-delivery notification may refer to any or all the recipient(s) to which the document could not be delivered.

In the case of a distribution list, a non-delivery notification may refer to one or all of the recipients to which the document could not be delivered.

5.2 *Facilities for Store-and-Retrieve Teletex*

5.2.1 *Storage Requested by the Recipient*

A Teletex user may subscribe to SR. He may request that all documents destined for his Teletex terminal equipment be delivered to the SR for subsequent retrieval or conveyance by the SR at specified time intervals.

5.2.2 *Retrieval by the Recipient*

The method of retrieval by the recipient of Teletex documents stored in SR is a national matter.

6 Quality of Service

6.1 The basic quality of service requirements are those defined in Recommendation F.200. Additional quality of service requirements are for further study.

6.2 The unique identification of each Teletex document enables the system to provide information about the status of a document.

In the event of system failure all accepted and non-delivered documents should be traceable. If a document cannot be delivered, the originator must be informed by a non-delivery notification.

Administrations should provide assistance to their subscribers, with regard to non-delivery notifications not being received in due time. Additional provisions on support of status and tracing of messages may be provided under national responsibility.

7 Special provisions for internationally interconnected Teletex store-and-forward units

7.1 *Service outline*

7.1.1 The interconnection of SFs allows a Teletex subscriber to deposit a document with an SF in the originating country for subsequent delivery, via an SF in the destination country, to a Teletex subscriber or an SR.

7.1.2 Documents addressed to more than one destination SF should be separated at the originating SF. This may include the separation of distribution lists resident in more than one destination SF.

7.1.3 The responsibility to deliver single and multi-address messages is transferred from the originating Administration to one or a number of destination Administrations.

7.1.4 The transfer of the document between SFs should be as soon as practically possible after the deposit of the message in the originating SF.

7.1.5 In assuming responsibility for the delivery of the document the destination SF should attempt to deliver the document immediately upon receipt of the document from the originating SF.

7.1.6 In the international interconnection of the SFs it is necessary to return delivery/non-delivery status information to the originating SF. This information is compiled on a per address basis at the destination SF when either the document has been delivered or no further attempts to deliver will be made.

Recommendation F.220

SERVICE REQUIREMENTS UNIQUE TO THE PROCESSABLE MODE NUMBER ONE (PM1) USED WITHIN THE TELETEX SERVICE

CONTENTS

4 *Quality of service*

5 *Customer's information* .bp

1 Introduction

1.1 *Scope*

1.1.1 The processable mode number one (PM1) is one of the standardized options of the teletex service.

1.1.2 Equipments with teletex capabilities providing PM1 belong to the teletex service and shall meet with all the rules expressed in the main body of the Recommendation F.200. Furthermore, they shall meet with the additional rules described in this Recommendation.

1.1.3 The purpose of PM1 is to cater for the interchange of documents such as memoranda, letters and reports that contain characters only. The documents can be interchanged in a form that will enable the recipient:

— either to further process the document;

— or, to display or print the document as intended by the sender.

1.1.4 Questions of an essentially technical nature concerning this processable mode PM1 of the equipments with teletex capabilities are dealt with by the following Recommendations:

— T.400 series of Recommendations: Document Architecture, Transfer and Manipulation'';

— Recommendation T.502: ''A document application profile PM1 for the interchange of processable form documents'';

— Recommendation T.522: ''Communication application profile BT1 for document bulk transfer'';

— Recommendation T.562: ''Terminal characteristics for Teletex processable mode PM1''.

1.2 *Definition*

1.2.1 *General on the processable mode*

a) The processable mode of operation provides the user, in addition to the basic features of the Teletex service, with means for interchanging documents containing suitable information to reprocess them efficiently.

b) Several processable modes are being defined within the CCITT depending on the users' needs (number of reprocess functions provided to the user and the ability or not to reprocess text containing graphics or other contents).

c) They all are to be designed as application profiles of the T.400 series of Recommendations. Each new one is a superset of the previous. It is intended that equipments supporting a higher level of Processable Mode will always support any lower level.

1.2.2 *Definition of PM1*

PM1 is a processable mode designed to take into account a common set of functions commonly available to wordprocessing softwares.

Its main characteristics are that it allows to reprocess transmitted documents with only a single-column layout and containing only character encoded text. Additional characteristics may be found in § 2.

The complete definition of this mode includes:

— the definition of the document features which can be interchanged between equipments supporting PM1. These features are functionally as well as technically defined in Recommendation T.502;

— the definition of the protocol elements to be used for the transfer of documents and for the negotiation of optional features between equipments supporting PM1. This definition is technically specified in Recommendation T.522;

— the specification of the equipment characteristics to be supported for PM1. These characteristics are defined in Recommendation T.562.

1.2.3 *Document application profiles* | (T.500 series)

The document application profiles defined in the T.500 series of Recommendations may be used by any telematic services. Supplementary constraints may be added by particular services using these document application profiles.

This Recommendation F.220 defines in § 2.2.4 the constraints unique to the equipments participating in the Teletex service using the application profile PM1 as described in Recommendation T.502.

1.2.4 *Communication application profiles* | (T.520 series)

A DTAM protocol subset has to be used for the interchange of documents between PM1 equipments with Teletex capabilities. These subsets are defined in the T.520 series of Recommendations as ‘‘communication application profiles’’.

This Recommendation F.220 refers in § 2.3.1 to Recommendation T.522 defining the adequate communication application profile (called BT1 for Bulk Transfer 1’’) to be used for PM1.

1.2.5 *Equipment characteristics* | (T.560 series)

The characteristics of equipments using application profiles are defined in the T.560 series of Recommendations.

This Recommendation F.220 refers in § 2.4 to Recommendation T.562 defining the particular characteristics for equipments with Teletex capabilities supporting PM1.

2 Description

2.1 *General*

Documents can be interchanged in three principal forms, namely:

— processable form, which allows a document to be revised by a recipient, if required;

— formatted processable form, which allows a recipient to reproduce the document as intended by the sender and/or to revise the document;

— formatted form, which allows a recipient to reproduce the document as intended by the sender.

2.2 *Characteristics of a PM1 interchanged document*

2.2.1 *Logical characteristics*

From the logical point of view, the document interchanged between equipments using PM1 consists of a set of paragraphs.

The paragraph refers to an amount of text that is distinct from any other part of the document. The use of such paragraphs is therefore to distinguish between portions of the document content that have different properties.

2.2.2 *Layout characteristics*

a) A document may be divided into one or more page sets, which are not nested. This allows, for example, sets of pages having different layouts to be distinguished.

b) A page set is considered to consist of a sequence of pages. The first page of this sequence may have a layout different from the other pages of the set.

c) The maximum number of independent and non-overlapping areas which may subdivide a page is three. These areas consist of an area lying at the top of the page that is reserved for header text, an area lying at the bottom that contains footer text and an area lying between the header and footer areas that is reserved for body text.

d) Text designated as header or footer text may consist of one or more paragraphs and these are intended to be laid out entirely in the header or footer area respectively on each page of a document. Header and footer text may not occur in any other area of the page. Header and footer text is optional and therefore may not exist on each page of the document. Also, the header and footer text may not be the same throughout the document.

e) Also, it is possible to specify that the text area is to be laid out on the ‘‘recto’’ or ‘‘verso’’ side of the sheet of paper and to specify the orientation (portrait or landscape) for any page of the document.

2.2.3 *Document content*

Only a character content shall be used within a document interchanged between equipments with Teletex capabilities supporting PM1.

Characters rendition are: normal rendition, bold, italicized, underlined and crossed out (this last is non-basic).

2.2.4 *Features supported by PM1*

The features supported by PM1 are described by Recommendation T.502: ‘‘Document application profile PM1 for the interchange of processable form documents’’. The purpose of this paragraph is to give an overview of these features.

2.2.4.1 The features which can be interchanged using PM1 mode fall into the following categories:

— Page format features: these relate to how the layout of each page of a document will appear when reproduced (e.g. left and right margins, headers and footers).

— Character content layout and imaging features: these relate to how the document content will appear within the page of the reproduced document (e.g. first line indentation, alignment).

— Character repertoire: this relates to the character sets and control functions that make up the document content.

— Document management features: these concern the information associated with the document that relates to the document as a whole, such as its title, history and creation date. This information can be used in applications such as filing and retrieval.

2.2.4.2 *Paper formats and assured reproduction areas*

a) *Paper formats*

Different paper formats can be declared by the sender for the presentation of the interchanged document.

The two principal paper formats which can be used without any negotiation are:

— ISO A4 paper format (210 × 297 mm);

— North American letter paper format (215.9 × 279.4 mm).

The following paper formats may also be used, but need a negotiation:

— ISO A3 paper format (297 × 420 mm);

— Japanese legal paper format (257 × 364 mm);

— Japanese letter paper format (182 × 257 mm).

b) *Assured reproduction areas*

Recommendation T.562 specifies the assured reproduction areas for the paper formats listed above.

The presentation of the document layout and content by the recipient is guaranteed if the dimensions of the interchanged page do not exceed the dimensions of the assured reproduction area.

c) *Page dimensions*

The page dimensions are always smaller than the paper formats.

The maximum dimensions of the basic interchanged page correspond to the common area between the assured reproduction areas of A4 and North American paper formats.

These dimensions are given in Recommendation T.562. This allows any PM1 document to be printed by using one of the two principal paper formats. The use of larger page dimensions must be negotiated.

2.2.4.3 *Fall-back techniques*

a) Some basic and non-basic features described in Recommendation T.562 are allowed to be approximated using fall-back techniques.

b) This Recommendation determines the fall-back procedure which may be used by the recipient if features present in the interchanged document are not locally available (see Table 1/F.220).

c) All other features, not listed in Table 1/F.220, must not be approximated.

2.3 *Communication aspects*

2.3.1 All the non-basic features defined for PM1 in Recommendation T.502 must be negotiated before the interchange of the document. Negotiation is only allowed to fail when a required non-basic feature is not supported by the recipient’s system and that this system does not support any suitable fall-back mode for this feature.

2.3.2 A processable mode document can only be sent as a unit. If an equipment tries, for any reason, to send one document in different parts, the contribution of the document is not accepted by the recipient because it is not possible to provide an automatic linkage for PM1 documents. Consequently, the sender has to retransmit the whole document.

H.T. [T1.220]

TABLE 1/F.220

Features	Fall-back modes
Document layout	
Separation	Ignore
Widows and orphans	Ignore
Association of paragraphs	Ignore
Recto/verso pages	Recto
{ *Content layout and imaging* }	
Emphasis	
— Italicized	Bold or underlined
— Bold	Italicized or underlined
{ *Document management* | (e.g.: title, subject, etc.) }	Ignore

Tableau 1/F.220 [T1.220], p. 8

2.3.3 Direct communication of basic teletex documents between a teletex equipment supporting only the basic mode and a teletex equipment supporting both the basic and the processable mode PM1 is provided. Technical communication rules are defined in Recommendation T.562, § 8, taking into account the case where an equipment tries to send a PM1 document to an equipment supporting only the basic mode.

2.3.4 If the transmission of a PM1 document fails, the user should always be informed of the reason of the failure.

Note — The consultation, before the communication, of the teletex service directory allows to know the nature of the receiving equipment and so, allows to avoid communication failures due to incompatible modes.

Some local mechanisms may also be implemented to check the nature of the receiving equipment by consulting a local directory before any communication. The process may be useful when the recipient belongs to a list of usual addressees.

2.3.5 Generally, equipment will provide an automatic conversion from a PM1 document to a basic teletex document if the PM1 document is in a formatted form.

2.4 *Equipment characteristics*

2.4.1 Equipments with Teletex capabilities supporting PM1 must provide the user with the ability:

— To create, transmit, receive the three forms of documents defined in § 2.1. The sender’s intention, concerning the transmitted document, is expressed by the particular form of this document.

— To present (print or display on screen) the received document when it has been transmitted in the formatted processable form or the formatted form. If printed, the receiving user is furnished with a document identical with that produced by the sending subscriber as far as its contents, layout and format are concerned.

Note — If sent in a processable form, the layout of the document between the sending and the receiving sides may differ.

— To reprocess the received document when it has been transmitted in the processable or the formatted processable form.

2.4.2 Other characteristics of equipments with teletex capabilities supporting the processable mode PM1 are described in Recommendation T.562.

2.4.3 The CIL presentation rules, as defined in Recommendation F.200, apply with the restriction that there is no page number in the field 4 of the CIL.

3 Intercommunication with other services

Equipment belonging to the processable mode PM1 of the Teletex service has the ability to intercommunicate with equipment belonging to any other services that incorporate the PM1 document application profile, BT1 communication profile, and PM1 terminal characteristics.

4 Quality of service

For further study.

5 Customer's information

5.1 *Directories*

5.1.1 In the Teletex directory published by each Administration, the special symbol PM1, the meaning of which is ''Processable Mode number 1'', shall be inserted when an equipment with Teletex capabilities provides this processable mode in order to give some guidance to the users.

5.1.2 This symbol should be placed so that it could not be understood as a part of the equipment identification.

Recommendation F.230

SERVICE REQUIREMENTS UNIQUE TO THE MIXED MODE (MM) USED WITHIN THE TELETEX SERVICE

CONTENTS

1 Introduction

1.1 *Scope*

1.1.1 The mixed mode (MM) is one of the standardized options of the teletex service.

1.1.2 Terminals equipment with teletex capabilities providing MM belong to the teletex service and shall meet with all the rules expressed in the main body of the Recommendation F.200. They shall also meet the additional rules described in this Recommendation.

1.1.3 The purpose of MM is to provide for the interchange of formatted documents such as memoranda, letters and reports that contain characters and raster-graphic images.

1.1.4 Questions of an essentially technical nature concerning the operational mode MM of equipment with teletex capabilities are described in the following Recommendations:

— T.400-Series of Recommendations: ‘‘Document Architecture, Transfer and Manipulation’’;

— Recommendation T.501: ‘‘Document application profile MM for the interchange of formatted mixed- mode documents’’;

— Recommendation T.521: ‘‘Communication application profile BT0 for document bulk transfer.’’

— Recommendation T.561: ‘‘Terminal characteristics for mixed-mode of operation MM.’’

1.2 *Definition*

1.2.1 *General*

The mixed-mode of operation provides the user, in addition to the basic features of the teletex service, with means for interchanging documents containing raster-graphic images.

Future developments in the processable mode may allow the interchange of MM documents with equipment having a higher level than PM1 of processable mode capability.

1.2.2 *Definition of MM*

MM allows the interchange of documents containing fully laid out pages containing character-coded and raster-graphic coded information. These documents cannot be further processed after delivery to the recipient.

The complete definition of this mode includes:

— the definition of the document features which can be interchanged between equipment supporting MM. These features are functionally as well as technically defined in Recommendation T.501;

— the definition of the protocol elements to be used for the transfer of documents and for the negotiation of optional features between equipment supporting MM. This definition is technically specified in Recommendation T.522;

— the specification of the equipment characteristics to be supported by MM. These characteristics are defined in Recommendation T.561.

1.2.3 *Document application profiles* | (T.500 series)

The document application profiles defined in the T.500 series of Recommendations may be used by any Telematic services. Supplementary constraints may be added by particular services using these document application profiles.

This Recommendation F.230 defines in § 2.2.4 the constraints unique to the equipment participating in the teletex service using the document application profile MM as described in Recommendation T.501.

1.2.4 *Communication application profiles* | (T.520 series)

A DTAM protocol subset has to be used for the interchange of documents between MM equipment with teletex capabilities. These subsets are defined in the T.520 series of Recommendations as ‘‘communication application profiles’’.

This Recommendation F.230 refers in § 2.3.1 to Recommendation T.522 defining the adequate communication application profile (called BT1 for ‘‘Bulk Transfer 1’’) to be used for MM.

1.2.5 *Equipment characteristics* | (T.560 series)

The characteristics of equipment using application profiles are defined in the T.560 series of Recommendations.

This Recommendation F.230 refers in § 2.4 to Recommendation T.561 defining the particular characteristics for equipment with teletex capabilities supporting MM.

2 Description

2.1 *General*

Documents can only be interchanged in formatted form, which allows a recipient to reproduce the document as intended by the sender.

2.2 *Characteristics of an interchanged MM document*

2.2.1 *Layout characteristics*

Pages are laid out in blocks. Each block contains either character-code or raster-graphic coded information.

Blocks may be transparent or opaque. Blocks may be superimposed.

In principle, there is no limit to the number of blocks on a page. Technical restrictions may limit the number of blocks on a page.

2.2.2 *Document content*

Character content, raster-graphics content, or both may be used within a document interchanged between equipment with Teletex capabilities supporting MM.

Character renditions are: normal rendition, bold, italicized, underlined and crossed out (this last is non-basic).

2.2.3 *Features supported by MM*

The features supported by MM are described by Recommendation T.501: ‘‘Document application profile MM for the interchange of formatted mixed-mode documents’’. The purpose of this paragraph is to give an overview of these features.

2.2.3.1 The features which can be interchanged using MM fall into the following categories:

— Page format features: these ensure that the page layout can be completely specified such that it can be reproduced exactly.

— Character content layout and imaging features: these relate to how the document character content will appear within the page of the reproduced document (i.e. exactly as specified in the original).

— Raster-graphic image layout and imaging features: these relate as to how the image content will appear within the page of the reproduced document (i.e. exactly as specified in the original).

— Character repertoire: this relates to the character set and control functions that make up the character content.

— Raster-graphic image coding: this relates to the image coding method used to encode the raster-graphic image content.

— Document management features: these concern the information associated with the document that relates to the document as a whole, such as its title, history and creation date. This information can be used in applications such as filing and retrieval.

2.2.3.2 *Paper formats and assured reproduction areas*

a) *Paper formats*

Different paper formats can be declared by the sender for the presentation of the interchanged document.

The two principal paper formats which can be used without any negotiation are:

— ISO A4 paper format (210 × 297 mm);

— North American letter paper format (215.9 × 279.4 mm).

The following paper formats may also be used, but need a negotiation:

— ISO A3 paper format (297 × 420 mm);

— Japanese legal paper format (257 × 364 mm);

— Japanese letter paper format (182 × 257 mm).

b) *Assured reproduction areas*

Recommendation T.561 specifies the assured reproduction areas for the paper formats listed above.

The presentation of the document layout and content by the recipient is guaranteed if the dimensions of the interchanged page do not exceed the dimensions of the assured reproduction area.

c) *Page dimensions*

The page dimensions are always smaller than the paper format

The maximum dimensions of the basic interchanged page correspond to the common area between the assured reproduction areas of A4 and North American paper formats.

These dimensions are given in Recommendation T.561. This allows any MM document to be printed by using one of the two principal paper formats. The use of larger page dimensions must be negotiated.

2.2.4.3 *Fall-back techniques*

Some basic and non-basic features described in Recommendation T.561 are allowed to be approximated using fall-back techniques.

This Recommendation determines the fall-back procedure which may be used by the recipient if features present in the interchanged document are not locally available.

They concern character renditions:

H.T. [T1.230]

Renditions	Fall-back modes
Bold	Italicized or underlined
Italicized	Bold or underlined

Tableau [T1.230], p.

2.3 *Communication aspects*

2.3.1 All the non-basic features defined for PM1 in Recommendation T.501 must be negotiated before the interchange of the document. Negotiation is only allowed to fail when a required non-basic feature is not supported by the recipient's system and that this system does not support any suitable fall-back mode for this feature.

2.3.2 Direct communication of basic teletex documents between a teletex equipment supporting only the basic mode and a teletex equipment supporting both the basic and the mixed mode MM is provided. Technical communication rules are defined in Recommendation T.561, § 8, taking into account the case where an equipment tries to send a MM document to an equipment supporting only the basic mode.

2.3.3 If the transmission of a MM document fails, the user should always be informed of the reason of the failure.

Note — The consultation, before the communication, of the teletex service directory allows to know the nature of the receiving equipment and so, allows to avoid communication failures due to incompatible modes.

Some local mechanisms may also be implemented to check the nature of the receiving equipment by consulting a local directory before any communication. The process may be useful when the recipient belongs to a list of usual addressees.

2.3.4 Equipment may provide an automatic conversion from a MM document to a basic teletex document deleting raster-graphic content. This conversion should always be made with the user's agreement.

Note — Equipment may also provide automatic conversion from a MM document to a formatted PM1 document by deleting the rest of graphic contents.

2.4 *Equipment characteristics*

2.4.1 Equipment with teletex capabilities supporting MM must provide the user with the ability:

— to create, transmit and receive the documents defined in § 2.1;

— to present (print or display on screen) the received document when it has been transmitted. If printed, the receiving user is furnished with a document identical to that produced by the sending subscriber as far as its contents, layout and format are concerned.

2.4.2 Other characteristics of equipment with teletex capabilities supporting the mixed mode MM are described in Recommendation T.561.

3 Intercommunication with other services

Equipment belonging to the mixed mode MM of the teletex service has the ability to intercommunicate with equipment belonging to any other services that incorporate the MM document application profile, BT1 communication profile, and MM terminal characteristics.

4 Quality of service

For further study.

5 Customer's information

5.1 *Directories*

5.1.1 In the teletex directory published by each Administration, the special symbol MM, the meaning of which is ''Mixed Mode'', shall be inserted when equipment with teletex capabilities provides the mixed mode in order to give some guidance to the users.

5.1.2 This symbol should be placed so that it could not be understood as a part of the equipment identification.

BLANC

MONTAGE:
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