INTERNATIONAL TELECOMMUNICATION UNION

CCITT

THE INTERNATIONAL
TELEGRAPH AND TELEPHONE
CONSULTATIVE COMMITTEE

RED BOOK

VOLUME II – FASCICLE II.5

TELEMATIC SERVICES: OPERATIONS AND QUALITY OF SERVICE

RECOMMENDATIONS F.160-F.350

VIIITH PLENARY ASSEMBLY
MALAGA-TORREMOLINOS, 8-19 OCTOBER 1984

Geneva 1985

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CONTENTS OF FASCICLE II.5 OF THE RED BOOK

Recommendations F.160-F.350

Telematic services: Operations and quality of service

1 Fascicle II.4 of the *Yellow Book* (Geneva, 1981) has been divided into two fascicles in the *Red Book*:

- Fascicle II.4 – Telegraph services: Operations and quality of service
- Fascicle II.5 – Telematic services: Operations and quality of service.

2 The following new Recommendations and Supplement did not appear in Fascicle II.4 of the *Yellow Book* and were developed during the Study Period 1981-1984:

Recommendations

F.72	F.162
F.122	F.190
F.150	F.201
F.161	F.350

Supplement

No. 1 (Fascicle II.4)

3 The following Recommendations were revised during the Study Period 1981-1984:

Recommendations

F.1	F.85
F.2	F.110 [1]
F.20	F.111 [1]
F.31	F.120
F.60	F.121
F.63	F.130
F.69	F.160
F.79	F.170
F.80	F.180
F.80 *bis*	F.200
F.82	F.300

4 The following Recommendations which appeared in Fascicle II.4 of the *Yellow Book* have been deleted from the *Red Book*:

Recommendations

F.84 [2]

F.132 [3]

---

1) Emanating from Joint Working Party SMM.

2) This Recommendation, which concerned phototelegraph communications established over radio circuits, was considered to be no longer relevant in today's conditions.

3) This Recommendation, dealing with procedures for use of store-and-forward facilities in the maritime mobile services, has been superseded and replaced by new Recommendation F.72.

PRELIMINARY NOTES

1 The Questions entrusted to each Study Group for the Study Period 1985-1988 can be found in Contribution No. 1 to that Study Group.

2 In this Fascicle, the expression "Administration" is used for shortness to indicate both a telecommunication Administration and a recognized private operating agency.

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FASCICLE II.5

Recommendations F.160-F.350

TELEMATIC SERVICES[1]: OPERATIONS AND QUALITY OF SERVICE

[1] The term "telematic services" is used provisionally.

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PROTECTION OF THE COMMON NAMES OF CCITT DEFINED INTERNATIONAL PUBLIC SERVICES

Resolution No. 13 published in Volume I is reproduced below for the convenience of the reader.

Resolution No. 13

PROTECTION OF THE COMMON NAMES OF CCITT DEFINED INTERNATIONAL PUBLIC SERVICES

(Geneva, 1980)

The CCITT,

considering

(a) that CCITT has defined, *inter alia*, the international public services "teletex", "telefax" and "bureaufax" in Service Recommendations;

(b) that those international public services are characterized by complete end-to-end compatibility;

(c) that it is desirable to use on a worldwide basis for those CCITT defined international public services their respective common name, i.e. "teletex", "telefax" or "bureaufax", to qualify any service provided in that respect as complying completely with the CCITT definitions for the respective international public service in order to guarantee end-to-end compatibility;

(d) that it is essential to protect the use of the aforementioned common names;

noting

(a) that within a number of countries, several Recognized Private Operating Agencies (RPOAs) may provide such CCITT defined international public services and may also wish to add further optional user facilities in addition to the respective basic international public service as defined by the CCITT;

(b) that, for the preceding reason, some RPOAs may wish to use service designations, e.g. XXX/teletex, indicating a combination of a basic international public service as defined by the CCITT with additional optional user facilities;

resolves to request Administrations

(1) to ensure that any such international public service offered by an Administration be denominated by its respective common name, i.e. "teletex", "telefax" or "bureaufax" and comply completely with the respective CCITT definitions for such service;

(2) to endeavour to protect the common names of the CCITT defined international public services "teletex", "telefax" and "bureaufax", *inter alia* through the communication of those names to the national, regional and international authorities for the registration and administration of trade marks and service marks in order to ensure that the said names be not made the subject of trade marks or service marks or if claimed in an application for the registration of trade marks or service marks be made the subject of a disclaimer;

(3) to ensure that in the case of a combination of any such CCITT defined international public services together with further optional user facilities in addition to that basic service, the trade mark or the service mark for such a combined service offered by any RPOA be always combined with the respective common name of the basic CCITT defined international public service, i.e. "teletex", "telefax" or "bureaufax", and that the latter names, in the case of registration of such a trade mark or service mark, be made the subject of a disclaimer;

(4) to inform the Director of the CCITT continuously about the measures taken with regard to resolves (1) to (3) above;

requests the Director of the CCITT

to compile the information received in respect of such measures and to make this information available on request for consultation by Administrations.

SECTION 1

PUBLIC FACSIMILE SERVICE

Recommendation F.160

GENERAL OPERATIONAL PROVISIONS FOR THE INTERNATIONAL PUBLIC FACSIMILE SERVICES[1)]

1 General provisions

1.1 *General considerations*

Considering:

a) the growing importance of facsimile (see § 1.2.1) as a means of communication in international relations;

b) the need of users to have facsimile services (see § 1.2.5) available at international level for the exchange of documents, whether between subscriber stations or through the intermediary of public stations;

c) that facsimile services cover a part of the needs not met by other methods of telecommunication;

d) that, in accordance with the Series T Recommendations, facsimile services may be operated using various methods of transmission and switching;

e) that the characteristics specified in the relevant Series T Recommendations in respect of standardization of equipment for operating facsimile services promote these services and simplify operational questions;

f) that the use of universal terms to regulate operating procedures for facsimile services between manual terminals would avoid difficulties of understanding that could arise in relations between users speaking different languages;

g) that universal terminology would be desirable at international level with regard to facsimile services;

it is important that the Administrations be requested to observe common provisions in respect of the operation of facsimile services in all relations.

1.2 *Terminology*

1.2.1 **facsimile**

F: télécopie

S: facsímil

Reproduction of all forms of graphical, handwritten or printed material, at a distant location of the original material, within the limits and characteristics specified by the relevant CCITT Recommendations.

---

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

1.2.2 **facsimile terminal (facsimile machine)**

F: terminal de télécopie (télécopieur)

S: terminal facsímil (aparato facsímil)

Machine used for the transmission and/or receipt of documents in facsimile services.

1.2.3 **subscriber's facsimile station**

F: poste d'abonné de télécopie

S: estación facsímil de abonado

Equipment made available to a facsimile service subscriber, including a facsimile terminal, access to the appropriate public telecommunication networks as well as connecting and possible additional equipment.

1.2.4 **public facsimile station**

F: poste public de télécopie

S: estación facsímil pública

Equipment operated by an Administration in a facsimile bureau open to the public, including a facsimile terminal, access to the telecommunication networks (with possible use of dedicated circuits) as well as connecting and possible additional equipment.

1.2.5 **facsimile service**

F: service de télécopie

S: servicio facsímil

Telecommunication service offered for the purpose of transmitting documents between facsimile machines.

1.2.6 **facsimile on private networks**

F: télécopie sur réseaux privés

S: facsímil por redes privadas

With regard to facsimile communications on private networks, circuits leased must be used in accordance with the provisions of Recommendation T.10 and the Series D Recommendations.

1.2.7 **international public facsimile service**

F: service public international de télécopie

S: servicio facsímil público internacional

A telecommunication service between facsimile stations in different countries. These services may be classified in three categories:

a) public facsimile service between subscribers' stations (use of a public telecommunication network);

b) public facsimile service between Administrations' public bureaux (see § 1.2.8) (use of a public telecommunication network or dedicated circuits);

c) public facsimile service between Administrations' public bureaux and subscribers' stations, and vice versa (use of a public telecommunication network).

1.2.8 **public facsimile bureau**

F: bureau public de télécopie

S: oficina facsímil pública

An Administration's public bureau responsible for accepting, transmitting, receiving and delivering facsimile documents.

1.3 *General characteristics of the facsimile service*

1.3.1 Specification and classification of compatible terminals shall be in accordance with:

a) the relevant Series T Recommendations for transmission of facsimile documents over telephone-type circuits;

b) the Series T Recommendations that are under study for transmission of facsimile documents over data networks;

c) current national legislation.

1.3.2 The facsimile service may utilize:

a) the public switched telephone network (or circuits allocated for DATEL service); and/or

b) a public data transmission network; and/or

c) a network allocated to that application; and/or

d) dedicated circuits between public facsimile bureaux.

1.4 *Restrictions on the use of a facsimile service*

1.4.1 Administrations reserve the right to suspend facsimile services in the circumstances described in Articles 19 and 20 of the *Convention* [1].

1.4.2 Administrations shall refuse to make facsimile services available to an agency that is known to be organized for the purpose of sending or receiving documents for third parties and for retransmission by any means in order to avoid the payment of the full charges normally levied for such correspondence.

1.4.3 Administrations shall refuse to make facsimile services available to a client whose activities may be regarded as an infringement of the functions of an Administration in providing a public telecommunication service.

2 General operational provisions for the international public facsimile service

2.1 *Scope*

2.1.1 The provisions set out below shall apply to the operation of international public facsimile services via the public telecommunication networks, in particular on the public switched telephone network, or on public data networks (or circuits allocated for DATEL service) in international relations:

a) between subscribers' facsimile stations (see Recommendation F.180);

b) between public facsimile bureaux (Bureaufax: see Recommendation F.170);

c) between public fascimile bureaux and subscribers' facsimile stations, and vice versa (see Recommendation F.190).

Note – Figure 1/F.160 shows the different types of facsimile service.

2.1.2 *Classes of service*

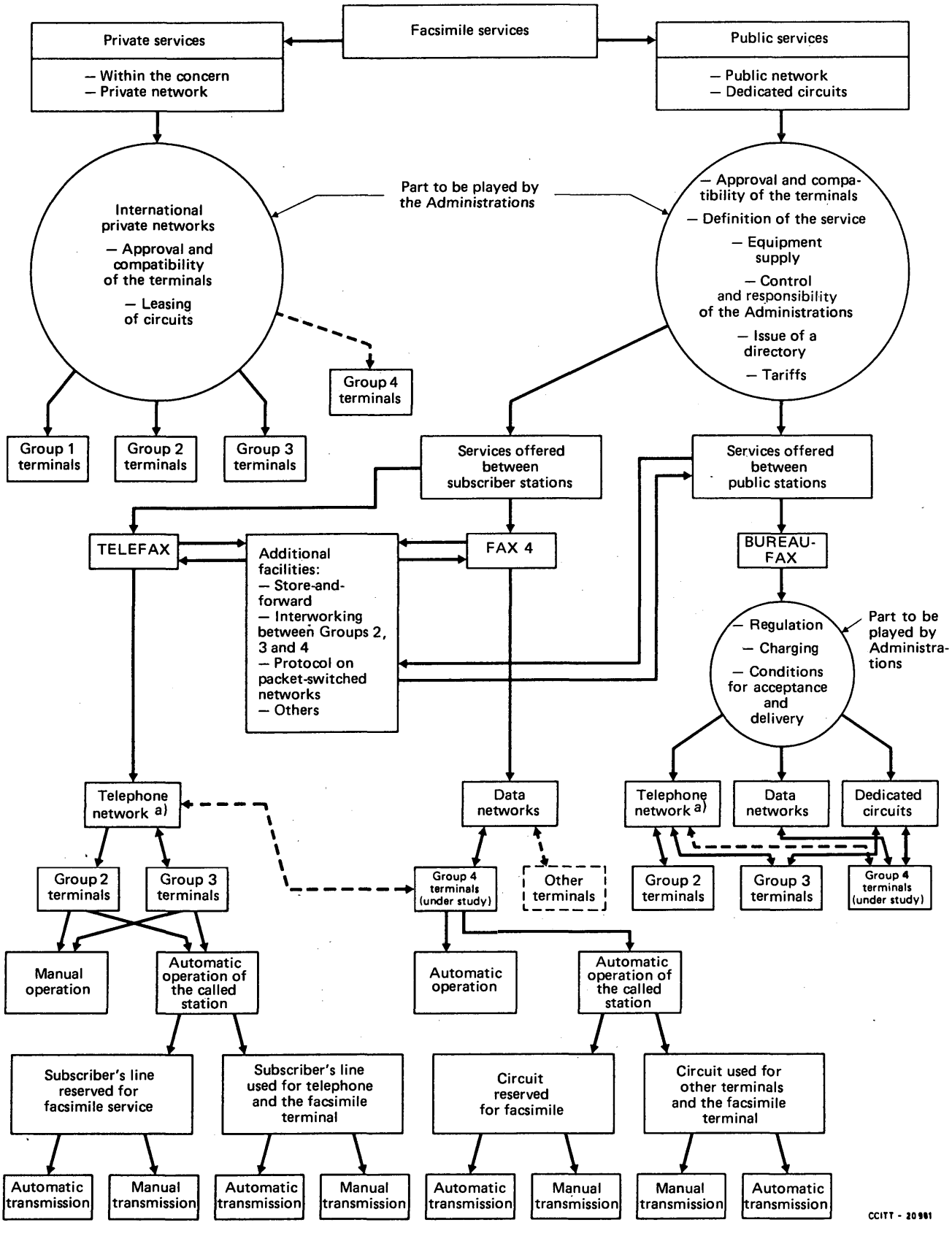
Two classes of facsimile service in each category mentioned in § 2.1.1 are handled by the Administration. They are:

a) ordinary private facsimile correspondence;

b) service facsimile correspondence, including franking privilege correspondence where consistent with national law.

2.1.3 Service facsimile correspondence is exchanged between the Administrations concerned (see the relevant Series D Recommendations).

2.1.4 Where agreement is reached between Administrations, similar arrangements may be made to those described in Recommendation F.1, paragraphs D.15 and D.16 (service telegrams), and Recommendation F.60, §§ 2.2.2 and 2.2.3 (service telex calls).



a) Or on circuits allocated for DATEL service.

Note – Further refinement will be needed as the study progresses.

FIGURE 1/F.160

Types of facsimile service

2.1.5 Service facsimile correspondence may be requested only by persons authorized to do so by their respective Administrations.

2.1.6 Service facsimile correspondence relating to the official business of the ITU may be exchanged between Administrations and recognized private operating agencies on the one hand and the Chairman of the Administrative Council of the ITU, the Secretary-General of the ITU, the Director of the CCITT, the Director of the CCIR and the Chairman of the IFRB on the other hand.

2.1.7 Franking privilege facsimile correspondence is considered as service facsimile correspondence and is admitted on a reciprocal and optional basis where consistent with national law.

2.1.8 Service facsimile correspondence should be made, as far as possible, outside the busiest hours.

2.2 *Quality of service*

2.2.1 The quality of service depends on the normal characteristics of the network used and of the facsimile terminals, in particular their scanning and reproduction parts.

2.2.2 Terminal-to-terminal quality shall be checked by various measurements. In particular, the quality of the scanning and reproduction functions may be checked:

a) between manually operated terminals;

b) between a terminal operated manually and an automatic terminal;

c) between automatic terminals;

by:

i) automatic transmission of a test chart to check the reproduction system of the destination terminal;

ii) transmission of a chart on paper to check the scanning system on the transmitting terminal or the reproduction system of the destination terminal.

The standardized CCITT test chart shall be used for this purpose.

2.2.3 Administrations shall perform test and measurement services:

a) to locate faults and to restore service on the public network excluding terminal equipment; or

b) to locate and to clear faults, including those involving the terminals.

2.3 *Terminal identification*

2.3.1 Identification of terminals is effected following the procedures laid down in Recommendations T.30 and the relevant Series T Recommendation under study [see § 1.3.1 b) above].

2.4 *Enquiries and complaints*

2.4.1 Enquiries and complaints services shall be provided by Administrations.

Reference

[1] *International Telecommunication Convention*, Nairobi, 1982.

Recommendation F.161

INTERNATIONAL FACSIMILE SERVICE BETWEEN SUBSCRIBERS WITH GROUP 4 TERMINALS (FAX 4)[1)]

1 Introduction

1.1 *Scope*

1.1.1 This Recommendation defines the rules to be followed in the international Group 4 facsimile (FAX 4) service.

1.1.2 FAX 4 is an international service, offered by Administrations enabling subscribers to exchange correspondence either manually or automatically via telecommunication networks.

1.1.3 The basic element of the correspondence between people using the service is the page, as the smallest unit of text treated as an entity. No restrictions shall exist as far as the operator procedures for generation of the text or the positioning of text within the reproducible area on a page are concerned.

1.1.4 Questions of an essentially technical nature concerning the international FAX 4 service are dealt with by other Recommendations.

1.1.5 In this Recommendation, the word terminal is used instead of apparatus which appears in Recommendations T.5 and T.6. These two words should be considered as being equivalent.

1.2 *Service definitions*

1.2.1 *General*

1.2.1.1 An essential characteristic of the FAX 4 service is that it provides a basic level of compatibility between all terminals participating in the service.

1.2.1.2 There are three classes of Group 4 facsimile terminals:

- *Class I* – minimum requirement is a terminal able to send and receive documents containing facsimile encoded information (in accordance with Recommendation T.6 and T.73).
- *Class II* – minimum requirement is a terminal able to transmit documents that are facsimile encoded (in accordance with Recommendations T.6 and T.73). In addition, the terminal must be capable of receiving documents which are facsimile coded (in accordance with Recommendations T.6 and T.73), Teletex coded (in accordance with the basic coded character repertoire as defined in Recommendation T.61) and also mixed-mode documents (in accordance with Recommendations T.72 and T.73).
- *Class III* – minimum requirement is a terminal that is capable of generating, transmitting and receiving facsimile coded documents (in accordance with Recommendations T.6 and T.73), Teletex coded documents (in accordance with the basic coded character as defined in Recommendation T.61) and mixed-mode documents (in accordance with Recommendations T.72 and T.73 – when defined).

1.2.2 *Basic requirements*

1.2.2.1 The basic requirements of the Group 4 facsimile service are as follows:

a) a basic level of compatibility is provided between any two terminals both nationally and internationally so that they may communicate image-coded information to each other. This is to be achieved by requiring that terminals comply with Recommendations T.5, T.6, T.62, T.70 and T.73.

b) It is for each Administration to decide on the network(s) on which the FAX 4 service will be carried. There shall be no restriction on the type of network to be used.

[1)] Provisional name.

c) It should be possible to extend the FAX 4 service to any number of countries.

d) To permit private use applications, for example, encryption, there should be no technical limitation on the bit sequence of the subscribers' information that may be transmitted.

e) A received FAX 4 message can be printed or displayed as decided by the recipient and the terminal 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.

f) It is intended that the FAX 4 service should require no changes to the Recommendations for existing services or networks.

1.2.3 *Standardized options*

1.2.3.1 It is recognized that some subscribers may need to use their Group 4 facsimile terminals to communicate nationally and internationally using service features that are not included in the basic requirements. A number of CCITT-standardized options should, therefore, be defined. However, the provision of any option in a service leads 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 terminal shall ensure the transmission of documents using only those options that have been indicated as being available at the receiving terminal.

1.2.3.2 The standardized options should provide means for:

a) different pel transmission densities (T.5);

b) optional coding schemes (T.6);

c) grey scale images (T.6);

d) colour images (T.6);

e) use of the mixed-mode of operation (T.73, T.61, T.6 and T.72);

f) printable areas (T.72 – classes II and III only, T.5);

g) escape into national and private options (T.62);

h) resolution conversion algorithms (T.5).

Note 1 – Administrations are encouraged to ensure that standardized and nationally defined options are 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.

1.3 *Classes of call*

There are two accepted classes of call;

a) ordinary private FAX 4 calls;

b) FAX 4 service calls, including franking privilege calls.

Note – Please refer to CCITT Recommendation F.160 for details.

1.4 *Restrictions on the use of the FAX 4 service*

Note – Please refer to CCITT Recommendation F.160 for details.

2 Network requirements

2.1 It is the responsibility of each Administration to decide in which network(s) the FAX 4 service is to be provided. The term FAX 4 network, as used in this Recommendation, shall be taken to mean a network on which FAX 4 service is provided.

2.2 Four possibilities are considered below:

a) FAX 4 service on a circuit switched public data network (CSPDN).

b) FAX 4 service on a packet switched public data network (PSPDN).

c) FAX 4 service on a public switched telephone network (PSTN).

d) FAX 4 service on integrated services digital networks (ISDNs).

Note – Interworking between Group 4 facsimile terminals supported on any network must be possible.

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

2.4 Connection between PSTNs may use international telephone circuits.

In all cases for interworking between networks of different types, the same network should be used for both traffic directions.

2.5 In the case of international interworking between Group 4 facsimile terminals connected to dissimilar networks, Recommendation X.300 shall apply.

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 FAX 4 service in accordance with the options noted in § 2, the FAX 4 numbering plan must accommodate these options.

3.2 The FAX 4 numbering plan is based on the individual numbering plans of each of these networks, i.e. Recommendation E.163 for PSTNs and Recommendation X.121 for public data networks (PDNs).

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

3.4 The numbering plan for PDNs provides for calls to national and international PSTNs.

3.5 As the numbering plan for PSTNs does not provide for calls to PDNs, those Administrations that use the PSTN nationally for the FAX 4 service must provide for call set-up procedures to give access to the National FAX 4 service in the other countries on a PDN.

3.6 ISDN is for further study.

4 Coding scheme

4.1 The basic coding scheme and control functions for the international FAX 4 service are detailed in Recommendation T.6.

4.2 The basic character repertoire of graphic characters and control functions for the FAX 4 service – Class II and Class III – and the coding of these characters for transmission between terminals are found in Recommendation T.61.

4.3 The use of other recognized national and/or application-oriented coding schemes is for further study (see Recommendation T.61).

5 Operation of the FAX 4 service

5.1 *General*

5.1.1 The FAX 4 service in each country and the interconnection between countries or networks shall use automatic switching so that it is possible for any FAX 4 subscriber to reach any other FAX 4 subscriber using fully automatic selection. This shall not, however, preclude, on a purely interim basis, the use of manual call set-up by international operators, where the calling terminal is served from a PSTN in which international call access to another PSTN serving the called terminal cannot be automatically provided.

Note 1 – Special requirements may in these instances be applicable to the terminals in order not to affect unduly the grade of service.

Note 2 – The feasibility of this approach requires further study.

5.1.2 It is a requirement to allow the through-connection of a call between Group 4 facsimile terminals connected to a private automatic branch exchange (or similar systems) and those connected to public exchanges used for the Group 4 facsimile service.

5.1.3 Two-way alternate (TWA) communication is a capability of the FAX 4 service, which also includes one-way communication (OWC); the calling subscriber will have full control of the Group 4 facsimile call. Two-way simultaneous (TWS) communication is not regarded as a basic requirement for the FAX 4 service and is for further study.

5.1.4 *Interworking with other services*

5.1.4.1 Interworking[2] between basic mode and mixed mode Teletex terminals and Classes I, II and III Group 4 facsimile terminals connected to the FAX 4 service is shown in Table 1/F.161. Where direct interworking between Teletex and Group 4 facsimile terminals is not possible, it is essential that Administrations provide the interworking capability as a function of the network or through specific features.

TABLE 1/F.161

Possible cases of direct interworking for Teletex and Group 4 facsimile terminals on the same network

From \ To	Facsimile Group 4 Class I	Facsimile Group 4 Class II	Facsimile Group 4 Class III	Teletex basic mode	Teletex mixed mode
Facsimile Group 4 Class I	F	F	F		F
Facsimile Group 4 Class II	F	F	F		F
Facsimile Group 4 Class III	F	T, F, MM	T, F, MM	T	T, F, MM
Teletex basic mode		T	T	T	T
Teletex mixed mode	F	T, F, MM	T, F, MM	T	T, F, MM

T: Document with Teletex character coded information only.
F: Document with fax coded information only.
MM: Mixed-mode document with character and fax coded information.

5.1.4.2 Interworking between facsimile terminals of the FAX 4 service and Telefax terminals of the Telefax 3 service (see Rec. F.180) is essential, and Administrations should provide the interworking capability.

[2] For further study.

5.1.4.3 Interworking between FAX 4 terminals provided on different public data networks (PDNs), shall be provided in accordance with the appropriate CCITT Recommendation.

5.1.4.4 Interworking is desirable between terminals of the FAX 4 service and terminals of services other than facsimile provided over public switched networks.

5.1.4.5 In both the Teletex and FAX 4 services, the machines providing mixed mode should enable a direct exchange of documents in accordance with Recommendations T.6, T.61 and T.73.

Note – Interworking with other services is for further study.

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 to be transmitted.

b) Transmission:
   - call establishment (manual or automatic);
   - pre-information phase (see Note);
   - information transfer (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: displaying the message.

   Note – The information may consist of one or more FAX 4 documents each consisting of one or more FAX 4 pages.

5.2.2 The control procedures as specified in Recommendation T.73 and T.62 shall be used as end-to-end communication procedures between terminals in the service.

5.2.3 The network independent basic transport service for FAX 4 is specified in Recommendation T.70.

5.2.4 The network-dependent control procedures for the FAX 4 service should be those that are defined for that network on which the FAX 4 service is provided (see the relevant Recommendations).

5.3 *Call identification*

5.3.1 *General*

5.3.1.1 The FAX 4 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*

Details of the format of the call identification line are given in Recommendation F.200.

6 Quality of service

6.1 *Class I terminals*

6.1.1 The quality of service depends on the normal characteristics of the network used and of the facsimile terminal, in particular the scanning and reproduction parts.

6.1.2 Terminal to terminal quality shall be checked by various measurements. In particular, the quality of the scanning and reproduction functions may be checked:

a) between manually operated terminals;

b) between a terminal operated manually and an automatic terminal;

c) between automatic terminals;

by:

i) automatic transmission of a test chart to check the reproduction system of the destination terminal;

ii) transmission of a chart on paper to check the scanning system on the transmitting terminal or the reproduction system of the destination terminal.

The standardized CCITT test charts shall be used for this purpose.

6.1.3 Administrations perform test and measurement services:

a) to locate faults and to restore service on the public network excluding terminal equipment; or

b) to locate and to clear faults, including those involving the terminals.

6.2 *Class II and III terminals*

6.2.1 The quality of service for Class II and III terminals and interworking with other services is for further study.

6.3 *Error Protection*

To ensure call integrity, error protection will be provided by FAX 4 control procedures (see Recommendations T.62 and T.70). The error rate on the pre-information, information and post-information phases should not exceed 1×10^{-6}.

6.4 *International routes*

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

6.5 *Duration of service*

6.5.1 The national and international facilities of the FAX 4 service shall be open continuously.

6.5.2 FAX 4 terminals for which call numbers are published in the directories shall, in principle, be available to accept calls continuously.

6.6 *Observations on the quality of the service (for further study)*

6.6.1 Administrations shall make observations to evaluate the quality of the FAX 4 service internally as required and internationally at least as described below.

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

6.6.3 Observations should be made at such points and in such quantity as to provide 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.

6.6.4 When exchanging statistics, Administrations should forward not only statistics of the route concerned but also comparable statistics for either all international FAX 4 traffic or FAX 4 traffic over similar routes.

7 Subscriber terminals

7.1 *General*

7.1.1 In order to support a high quality of service, a range of data signalling rates has been defined as follows:

7.1.1.1 *Public data networks*

Terminals on a circuit switched data network shall operate in accordance with user classes of service 5 to 7 as defined in Recommendation X.1.

Terminals on a packet switched data network shall operate in accordance with user classes of service 9 to 11 as defined in Recommendation X.1.

7.1.1.2 *Public switched telephone networks*

For further study.

7.1.1.3 *ISDN*

For further study.

7.1.2 The facilities required in terminals connected to the international FAX 4 service are listed in the following paragraphs.

7.2 *Coding scheme*

7.2.1 Class I Group 4 facsimile terminals shall have the ability to send, receive and display documents encoded using the Group 4 coding scheme defined in Recommendation T.6.

7.2.2 In addition to the requirements detailed in § 7.2.1, Class II terminals shall have provision for receiving and displaying basic Teletex and mixed-mode documents.

7.2.3 In addition to the requirements detailed in §§ 7.2.1 and 7.2.2, Class III terminals shall have provisions for generating basic Teletex and mixed-mode documents (see Recommendation T.61).

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

7.4 *Receiving capability*

7.4.1 The ability of a terminal to receive incoming traffic is a prerequisite for it to answer the call.

Note – The control procedures may allow for negotiation of storage capability between terminals. This matter is for further study.

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

7.5 *Alarms/indicators*

7.5.1 Alarm indicators (visual and/or audible) are required in the terminals to inform users about conditions that could have an adverse effect on the quality of service.

7.5.2 Where appropriate, the following indicators are required:

a) terminals unable to transmit (e.g. paper jam at transmitting end);

b) terminals unable or soon unable to receive (e.g. paper jam or receiving memory nearly full);

c) operator assistance required;

d) message received in store.

7.6 *Terminal identification*

7.6.1 Each terminal in the FAX 4 service shall have a unique identification. Details of the identification are given in Recommendation F.200.

7.6.2 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.

7.7 *Page format, FAX 4 service*

7.7.1 *General*

7.7.1.1 The principal objective of the FAX 4 service is to establish a basic, defined mode of operation common to all machines used in the service. Therefore, a minimum basic requirement is defined, and all terminals used in the FAX 4 service shall comply with this minimum basic requirement. This, however, does not preclude the possibility that terminals may by prior agreement operate in modes different from these basic minimum requirements.

7.7.1.2 The maximum reproducible areas for various standard paper sizes are defined in Recommendation T.5.

The minimum requirement is that the image **area** defined by the United Nations' layout key and ISO 3535 shall be reproduced.

7.7.1.3 The range of the terminals' capabilities is exchanged during session establishment, prior to document transmission. These procedures are defined in Recommendation T.62 and Recommendation T.73 along with the default values for these capabilities if this exchange is not explicitly stated.

7.7.1.4 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.

8 Customer information

8.1 *Directories*

A terminal must comply with all the requirements of a service in order to be included in the directory for that service.

Mixed-mode terminals may have entries in both directories. The entries for such terminals may include indication of their dual capability.

8.2 *Operating instructions*

For further study.

9 Access to facsimile Message Handling Facilities

Users of the FAX 4 service may wish to have access to the services offered by Message Handling Facilities. This is for further study.

10 Tariff principles

(This matter requires further studies in conjunction with Study Group III.)

Recommendation F.162

OPERATIONAL REQUIREMENTS OF AN INTERNATIONAL STORE-AND-FORWARD FACSIMILE SWITCHING SERVICE

1 Introduction

1.1 With the development of equipment that provides store-and-forward facilities for facsimile service, and that permits inter-operation between dissimilar facsimile terminals, there is a requirement to ensure that such systems should have the capability of interworking with each other.

1.2 It is therefore necessary to define the areas in which common procedures or facilities are essential to provide a standardized international service.

2 Scope

2.1 This Recommendation defines the basic operational requirements of an international store-and-forward facsimile switching service, whereby switching and protocol conversion facilities are provided by Administrations using computer-controlled store-and-forward switching nodes.

2.2 The possibility of input from character terminals is recognized (for output to facsimile terminals) but the details of interworking with telex, Teletex and Videotex are for further study.

2.3 Technical requirements of the service are not covered in this Recommendation. Facsimile terminals are covered in the relevant Recommendations in the Series-T (see also Recommendations F.180, § 1.3 and F.161).

2.4 Tariff aspects are not covered in this Recommendation.

3 General requirements

3.1 The service shall offer a range of store-and-forward facilities using message switching principles.

3.2 The service shall be capable of converting the transmission formats of a range of normally incompatible document facsimile terminals so that these can communicate with each other. The requirement is that facsimile terminals conforming to CCITT Group 2, Group 3 and Group 4 standards should be acceptable.

3.3 The service may also be capable of accepting input from character-orientated terminals, for transmission to a facsimile terminal.

3.4 Customers shall gain access to the switching node either by dialling over the PSTN, or a data network or by direct connection. Transmission from the node to customers' facsimile terminals shall be effected either by automatic dialling over the PSTN or a data network or by direct connections. Access to an ISDN node is for further study.

3.5 Communication between nodes internationally shall be in accordance with CCITT Recommendations.

4 Service facilities

4.1 *Broadcast transmissions*

Customers can register lists of destinations to which they regularly transmit identical messages, and can then initiate transmission to those destinations by input of a single address code. The systems need not necessarily transmit a message to the required customers simultaneously. The minimum number of destinations to be provided is provisionally 40. As an option, more than 40 destinations may be provided.

4.2 *Multi-address transmissions*

Customers can send the same message to many locations by entering the destination addresses sequentially before transmitting the message. The multi-address facility differs from the broadcast facility in that it is not necessary to specify destination addresses in advance. Broadcast facility would therefore be used for transmitting multi-destination messages on a regular basis; multi-address facility would be used for occasional multi-destination messages. The minimum number of destinations to be provided is provisionally 40. As an option, more than 40 destinations may be provided.

4.3 *Abbreviated addressing*

4.3.1 Abbreviated address codes can be assigned to frequently called destination numbers; these are, in effect, broadcast lists containing a single entry.

4.3.2 A customer shall be able to retrieve the abbreviated address codes assigned to destination numbers by using the terminal for verification purposes.

4.4 *Hold for delivery requested by the originator*

The node shall enable originators to send documents into the system that will not be delivered automatically, but will remain stored in the system.

The system shall inform to the recipient that the message being sent to him is being held in the facility.

The receiving customer can retrieve the message whenever desired by inputting the appropriate request code and identification information.

4.5 *Hold for delivery requested by the recipient*

The system shall enable recipients to receive documents from the node that will not be delivered automatically, but will remain stored in the system.

Before accepting the message from the originator, the system shall inform the originator that a message will be held for delivery in the node.

The receiving customer can retrieve the message when desired by inputting the appropriate request code and identification information.

4.6 *Deferred delivery by the recipient*

The destination customer has the option of requesting that the delivery of all documents be deferred until a specified time, by input of a request code, followed by the required delivery time. Before accepting the message from the originator, the system shall audibly inform him that the message will be held for delivery in the facility.

4.7 *Deferred delivery by the originator*

The originator has the option of requesting on a per document basis that the delivery of a document be deferred and take place as close to the date and time specified as possible, but not before, by input of a request code followed by the required delivery time.

4.8 *Multi-page facility*

When transmitting a facsimile document of more than one page during a single session, the initial dialogue between the originating customer and computer establishes the information necessary to link the pages of a multi-page document.

4.9 *Automatic reception*

The destination node shall recognize the tones generated by terminals capable of unattended automatic reception and, upon recognition of these tones, shall transmit the messages.

4.10 *Date, time and originator's identity*

The originating node shall include reference information on all documents. This information should be composed of date, time and calling terminal identification. Called terminal identification may be prepared as an option. Ideally, this reference information should appear on the first line of each page of the document.

The time mentioned above should be defined as the time that the reception of a message from an originating terminal has been completed.

4.11 *Recall attempts*

If a destination terminal is busy, it shall be recalled at a certain interval up to a maximum period of 4 hours. The method for recall attempts should be left to national decision. When it is impossible for a destination terminal to receive messages due to the absence of recording paper, lack of power supply or the terminal being out of order, a non-delivery advice should be sent to the originator after the confirmation of this situation.

When the originator receives the non-delivery advice, the message shall be deemed "non-deliverable".

4.12 *Closed user group*

Exchange of communication is limited to a group of terminals designated by a subscriber and no calls into or out of the closed user group are permitted. However, outgoing access from the closed user group may be provided at the discretion of the controlling Administration.

4.13 *Information retrieval*

Information may be stored in a node in advance which can be retrieved by any customers through dialling the appropriate number. Such information could be weather reports, stock market quotes, etc.

5 Operational requirements of nodes

5.1 Sufficient information shall be stored in the node to enable charging to be carried out. Information from Study Group III is required on this point.

5.2 After the destination node has successfully completed the delivery of a message to the destination terminal, the destination node notifies the originating node of the completion of transmission.

5.3 If the destination node cannot deliver after recalls are attempted, it shall notify the originating node of this fact along with the call identification information.

5.4 Facsimile messages may be sent internationally by the originating node to distant customers in one of the following ways:

5.4.1 From the originating node to the destination node, and then to the customer.

The need for the originating node to verify connectibility of the distant customer's terminal at the destination node before accepting the message from the originating customer is for agreement between Administrations on a bilateral basis.

5.4.2 From the originating node directly to a distant customer in those cases where a node does not exist in the country concerned. This is subject to bilateral agreement.

6 Assistance operator

If a customer encounters difficulty in making a facsimile call, the input of a specific code shall give access to an assistance operator at the origin node. Also, if an access procedure error occurs more than three times when setting up a call, the caller shall be automatically transferred to an assistance operator. The operator has equipment which can be used to obtain information and to identify procedural errors, and to give information on the progress of message delivery.

7 Non-delivery advice

If a destination terminal is busy or out of order in spite of recalling, a non-delivery message shall be transmitted to the originator's terminal.

The non-delivery message should be composed of a non-delivery notification (NDN), the originating date and time, the destination identification and an indication of whether the whole or part of the document was not delivered.

8 Delivery confirmation

As an extra chargeable service, if a customer requests delivery confirmation this information will be transmitted to the customer when available.

9 Call establishment procedures

9.1 *Originating a call*

After gaining access to the switching node, the following information is provided to the node to establish a facsimile call.

9.1.1 *Destination customer identity*

9.1.2 *Originating customer's identity*

The method of entry shall be at the discretion of the Administration. Further study is required on whether additional information is required.

9.2 *Receiving a call*

9.2.1 The store-and-forward system shall be able to handle calls that are manually or automatically answered.

9.2.2 In both cases, the destination customer's identity will be provided to the node.

9.2.3 Administrations may also provide for inaudible automatic reception over the public switched telephone network.

Note – Further study is required on some of the features mentioned in § 9.

10 Service classification

The classification of the services corresponding to each section above is included in Annex A.

ANNEX A
(to Recommendation F.162)

Classification of services

Item	Section	Service classification
General requirements	3.1	B
	3.2	E
	3.3	A
	3.4	B
Service facilities		
Broadcast transmission	4.1	E
Multi-address transmission	4.2	E
Abbreviated addressing	4.3.1	E
	4.3.2	A
Hold for delivery requested by the originator	4.4	A
Hold for delivery requested by the recipient	4.5	A
Deferred delivery by the recipient	4.6	A
Deferred delivery by the originator	4.7	A
Multi-page facility	4.8	B
Automatic reception	4.9	B
Date, time and originator's identity	4.10	B
Recall attempts	4.11	B
Closed user group	4.12	A
Information retrieval	4.13	A
Operational requirement of nodes	5	B
Assistance operator	6	A
Non-delivery advice	7	B
Delivery confirmation	8	E
Call establishment procedures	9.1	B
	9.2.1	B
	9.2.2	A
	9.2.3	A

B: Basic facility, inherently the service, available at all times.
E: Essential facility, mandatory and will be provided upon customers request.
A: Additional/optional facility.

Recommendation F.170

OPERATIONAL PROVISIONS FOR THE INTERNATIONAL PUBLIC FACSIMILE SERVICE BETWEEN PUBLIC BUREAUX (BUREAUFAX) [1]

1 General provisions

1.1 In accordance with the general conditions of Recommendation F.160, Administrations may operate an international public facsimile service between public bureaux[2] provided that terminals are compatible or compatibility is ensured by the network from the standpoint of the characteristics specified in the relevant Recommendations and in accordance with bilateral or multilateral agreements.

Note – The operation of the international public facsimile service between public bureaux and subscribers' stations (and inversely) is covered by Recommendation F.190.

1.2 Facsimile terminals may be manual, have automatic operation of the called station or be fully automatic. The operational procedures applicable in relations between the different types of stations are set out in Recommendation T.30 for use of the public switched telephone network, and are under study for use of a public data network (see Questions 4/VIII [1] and 22/VIII [2]).

2 Conditions for acceptance

2.1 Documents for facsimile transmission shall normally be accepted up to a maximum size ISO A4 (210 × 297 mm). Exceptionally, documents of a different size may be accepted by bilateral agreement between those administrations concerned, for example the North American "legal" size (216 × 356 mm).

2.2 For faithful transmission, the contents of documents must leave minimum blank margins on all four sides. With regard to the ISO A4 format, the following four figures show the guaranteed reproducible areas for the following cases:

a) least favourable cases of use:
   - for Group 2 machines: Figure 1/F.170;
   - for Group 3 machines: Figure 3/F.170;

b) objectives to be attained by Administrations and manufacturers in providing adequate subscriber service:
   - for Group 2 machines: Figure 2/F.170;
   - for Group 3 machines: Figure 4/F.170.

Note 1 – The shaded part in the figures represents the guaranteed reproducible area.

Note 2 – With regard to formats other than A4 which have been bilaterally agreed, a margin of 15 mm on all four sides of the documents should be observed. On this basis, the guaranteed reproducible area would be 186 × 249 mm for the North American standard (216 × 279 mm) and 186 × 326 mm for the North American "legal" standard (216 × 356 mm).

2.3 Where the area to be transmitted exceeds the area reproducible by facsimile, a document may be divided by the sender, who shall indicate the order in which the parts must be transmitted.

2.4 Care must be taken to ensure that there is no loss of the reproducible part transmitted.

2.5 To ensure the satisfactory facsimile transmission of a document, senders should be advised not to submit documents with insufficiently sharp contrast or inadequate definition.

2.6 If the customer presents a document containing colours of half-tones, he should be informed that, with existing equipment, faithful reproduction at the distant end will not be possible as printing will be in black and white only.

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

[2] Public bureaux may be offices of Telecommunication or of Postal Administrations.

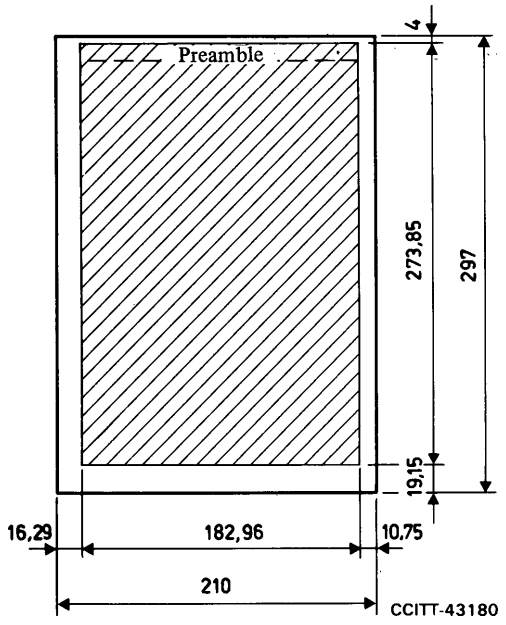


FIGURE 1/F. 170

Dimensions and location of the reproducible area of an A4 format document (in mm) for Group 2 machines under the least favourable conditions (information supplied by former Study Group XIV)

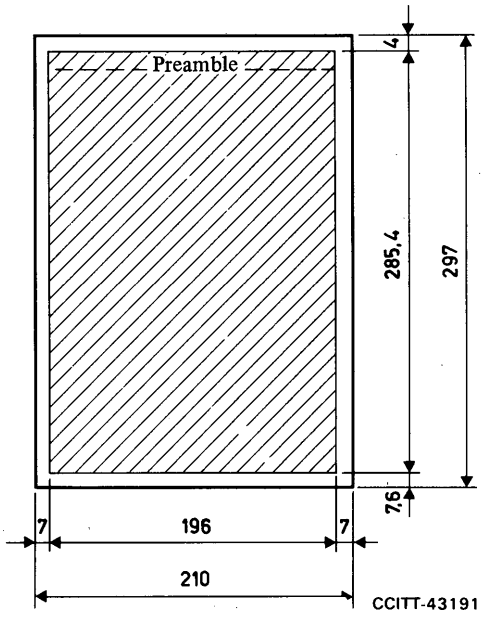


FIGURE 2/F. 170

Dimensions and location of the reproducible area of an A4 format document (in mm) for Group 2 machines, which Administrations must endeavour to achieve in the Bureaufax service

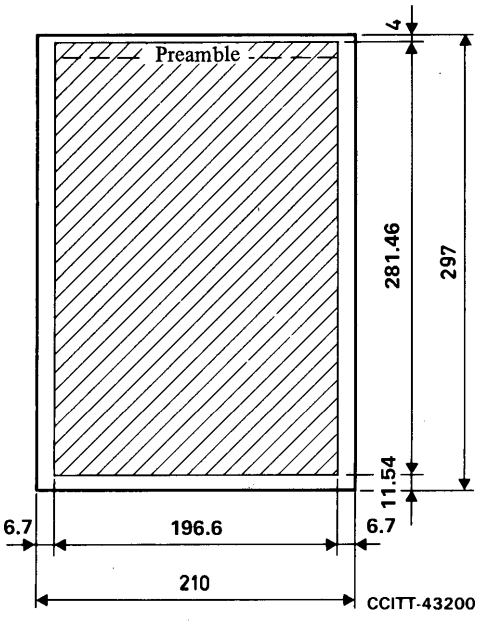


FIGURE 3/F.170

Dimensions and location of the reproducible area of an A4 format document (in mm) for Group 3 machines under the least favourable conditions (information suppled by Study Group VIII)

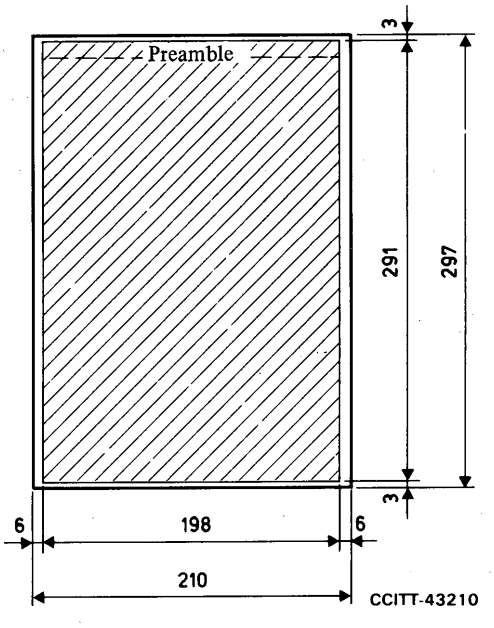


FIGURE 4/F.170

Dimensions and location of the reproducible area of an A4 format document (in mm) for Group 3 machines, which Administrations must aim for in the Bureaufax service

2.7 If, after having been informed that the quality of the document to be transmitted is unsuitable for satisfactory facsimile transmission (this includes all photographs and documents in colour), the sender of the document still insists on its transmission, it shall be accepted by the public bureau only at the sender's own risk. In this event the service instruction RISQUES EXPEDITEUR (abbreviated RE) may be inserted on the transmittal sheet or in the preamble. When the service instruction RE is not applicable to the whole document, the relevant pages may be designated, for example: "RE 3 + 5 + 12".

2.8 Administrations shall reserve the right to refuse the transmission of documents in the circumstances described in Articles 19 and 20 of the ITU *Convention* [3] and in Article 36 of the UPU *Convention* [4].

3 Composition of a facsimile transmission

3.1 Every facsimile transmission shall include

- a transmittal sheet as the first page, in accordance with § 3.2, or a preamble and an address in accordance with § 3.3, and
- a customer's document in accordance with § 3.4.

3.2 *Transmittal sheet*

3.2.1 The transmittal sheet must permit the identification of the following information:

1) originating office;
2) international transmitting bureau (sending office);
3) document number;
4) number of pages (excluding the transmittal sheet, except in those cases where the lower portion of the sheet carries a message for the addressee);
5) date and, if necessary, time of acceptance;
6) service instruction RE (Risk of Sender) in accordance with § 2.7, if applicable;
7) delivery instructions, in coded form, and other service instructions, if any;
8) the addressee's address containing all the particulars necessary to ensure the routing and delivery of the facsimile document without enquiries or requests for information. As a general rule, it should indicate:
   i) the designation of the addressee;
   ii) his full postal address including, if it exists, the postal code;
   iii) the telephone number of the addressee when known;
   iv) the call number of the addressee's facsimile station and the CCITT group number where delivery by facsimile (at the national level) is desired, although it may not be possible to guarantee delivery by this means;
9) sender's address (including, if it exists, the postal code) and, if available, his telephone number.

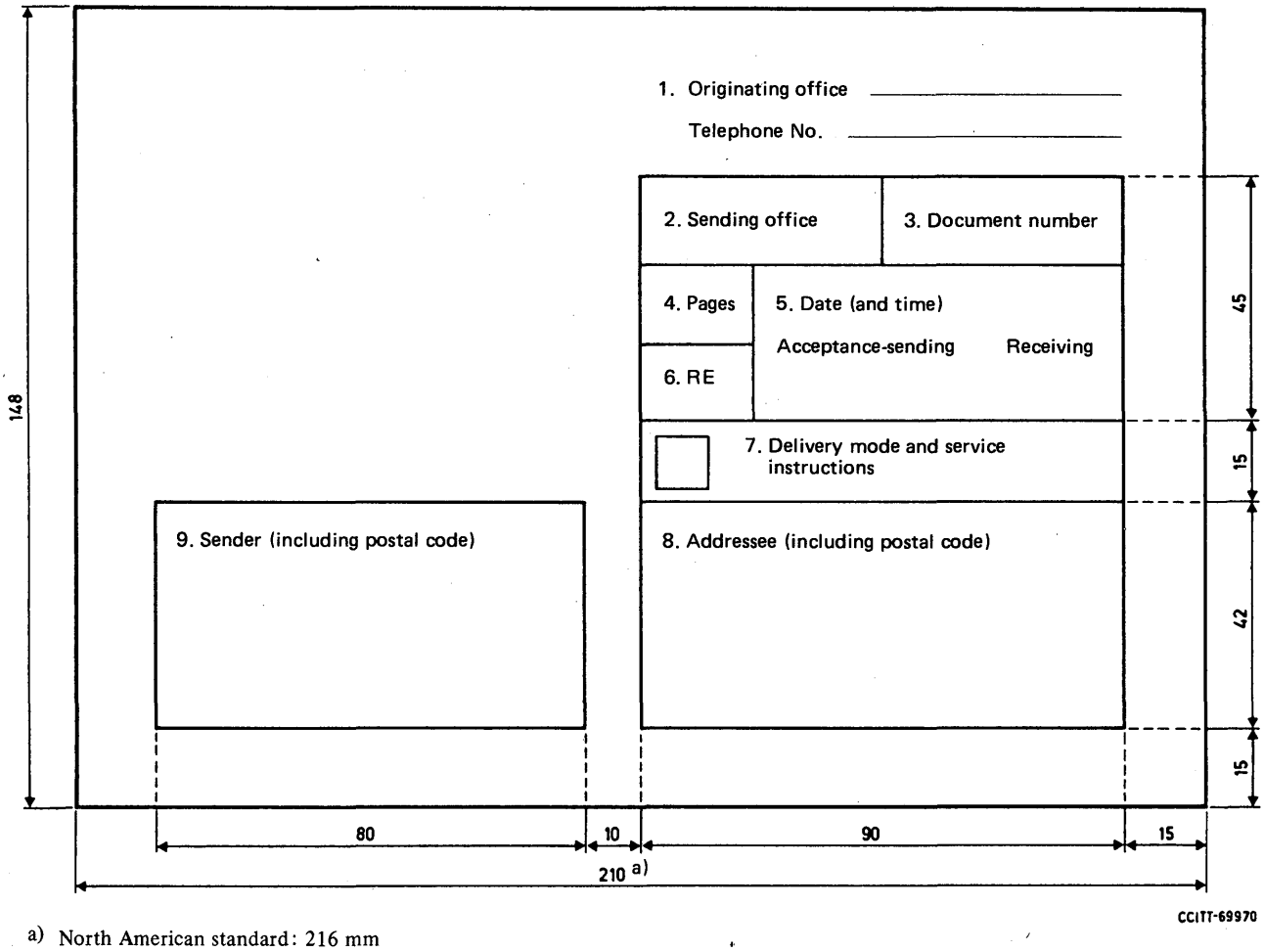
Note – Items 1) and 9) may be omitted from the transmittal sheet if this information can be traced from other information provided elsewhere on the form.

3.2.2 The various parts of the transmittal sheet shall be contained within ISO format A5 (210 × 148 mm). They may also be located in the upper half of a sheet of ISO format A4 so that the sender can use the lower half to write a document.

Note – If a North American format is used for the transmittal sheet, the width of the sheet will be 216 mm (instead of 210).

3.2.3 The various parts of the transmittal sheet shall be designated at least in French or in English or in Spanish. Other languages may be added by Administrations.

3.2.4 Figure 5/F.170 shows the measurements, locations and designations of the various parts of the transmittal sheet.



a) North American standard: 216 mm

Note 1 – The information in boxes 1 and 9 need not necessarily be transmitted and may be inserted elsewhere on the sheet. When the information in box 9 (sender) is given on the front of the sheet, it must appear in the left-hand part.

Note 2 – In box 5, the time and words "acceptance-sending" and "receiving" are optional.

Note 3 – Concerning box 7, the following delivery modes may be supplied on the basis of agreements between the terminal Administrations concerned:

A	Normal delivery	Courrier ordinaire
B	Special delivery	Exprès
C	Express mail	Service accéléré du régime intérieur
D	Counter collection	Retrait au guichet
E	Counter collection with telephone advice to the indicated call number	Retrait au guichet avec avis téléphonique au numéro indiqué
F	Telefax (with call number and CCITT group)	Téléfax (avec numéro d'appel et groupe du CCITT)
G	Counter collection with telex advice to the indicated call number	Retrait au guichet avec avis télex au numéro indiqué

Other modes of delivery may be agreed between Administrations.

FIGURE 5/F.170

Measurements, locations and designations of the various parts of the transmittal sheet in accordance with § 3.2

3.3 *Preamble and address when the transmittal sheet described in § 3.2 is not used*

3.3.1 The preamble must permit the identification of the following:

a) originating bureau;
b) international transmitting bureau
c) document number;
d) number of pages (excluding the page which includes preamble and address, unless it carries a message for the addressee);
e) date and, if necessary, time of acceptance;
f) service instructions, if any, for example, RE according to § 2.7 including routing and delivery information when necessary.

3.3.2 The address must contain all the particulars necessary to ensure the routing and delivery of the facsimile document without enquiries or requests for information. As a general rule, it should indicate:

a) the designation of the addressee;
b) his full postal address including, if it exists, the postal code;
c) the telephone number of the addressee when known;
d) the call number of the addressee's facsimile station and the CCITT group number where delivery by facsimile (at the national level) is desired, although it may not be possible to guarantee delivery by this means.

3.4 *Customer's document*

3.4.1 The document for facsimile transmission can contain written or printed matter, drawings, or any other graphic, subject to the limitations referred to under conditions for acceptance in § 2 above. A signature is optional.

4 Acceptance

4.1 A document for facsimile transmission may be handed in at the counter of a public bureau, or be accepted by such other means as may be designated by the Administration responsible for the public bureau.

4.2 The sender may use a facsimile transmittal form that consists of the A4 version of the transmittal sheet in accordance with § 3.2.2 or that includes a preamble and an address in accordance with § 3.3, if available, for writing out a document instead of submitting his own document for transmission. The facsimile transmission form should have an inner frame delimiting the contents (reproducible) part of the form. The preamble information mentioned in § 3.3.1 shall be contained in a printed band at the top of the form, as indicated in Figures 1/F.170 to 4/F.170. Where more than one page is to be transmitted, it will not be necessary to repeat all the preamble information on each page. The address, as indicated in § 3.3.2, should be inserted immediately beneath the preamble information on the first page of the facsimile transmission.

4.3 The customer's document need not necessarily be a facsimile message form. In this case, if there is not a separate transmittal form, the document submitted for transmission must permit the insertion, inside the reproducible format frame, of the preamble and address information (possibly using a printed band containing the information described in § 3.3).

4.4 The accepting public facsimile bureau shall ask the sender to give his name and his full address and telephone number so as to be able, if required, to provide him with any information or to request from him any details concerning his facsimile document.

4.5 The sender of a facsimile document shall be required to establish his identity if called upon to do so by the accepting public facsimile bureau.

5 Transmission

5.1 In principle, documents shall be transmitted by a public bureau in the order in which they are accepted, except where a priority system is established.

5.2 If necessary, the international receiving public bureau should acknowledge the satisfactory receipt of a facsimile document to the international transmitting public bureau.

5.3 A transmission prevented by adverse conditions shall be repeated as soon as conditions allow.

5.4 If a facsimile document received at the international receiving public facsimile station is unsatisfactory after a maximum of three attempts, in principle no further attempts shall be made. The sender will be informed of the situation.

5.5 If transmission cannot be effected by the international transmitting public bureau within 4 hours of acceptance by the public facsimile bureau, the sender should be informed as soon as possible.

5.6 On no account will the international receiving public bureau request repeat transmissions in an attempt to improve the quality of facsimile reproduction of pages designated as unsuitable by the service instruction RE.

6 Delivery

6.1 A facsimile document received at a destination public facsimile bureau shall be collected by the addressee or his authorized representative or shall be delivered to the addressee in accordance with the appropriate methods provided by the Administration concerned.

6.2 Where a facsimile document is received and satisfactorily retransmitted by the destination public facsimile bureau to the national subscriber's facsimile station, it shall be considered to have been delivered to the addressee.

6.3 The destination public facsimile bureau shall, if required, record the time of receipt of each facsimile document and the time and method of despatch to the addressee. In this case, according to the method used at the national level, delivery of a facsimile document shall be considered to be effected, for example:

a) at the time of delivery to the addressee or to his address; or

b) at the time when the addressee, having been informed of the receipt of the facsimile document, expressed the intention of collecting it or sending for it at the counter; or

c) in the case of delivery by facsimile (see § 6.2), at the time when transmission is completed.

6.4 The addressee of a facsimile document must establish his identity if required to do so by the destination public facsimile bureau.

6.5 The addressee of a facsimile document with the service instruction RE in accordance with § 2.7 above shall be obliged to accept the quality of facsimile reproduction offered.

6.6 When a facsimile document cannot be delivered to the addressee, the destination Administration must advise the international transmitting office of the origin Administration which will inform the sender. The treatment of the facsimile document will be subject to national regulations of the destination Administration and bilateral agreements between Administrations.

7 Service facsimile correspondence

7.1 By agreement between Administrations, service facsimile correspondence may be exchanged between the Administrations concerned for the purposes mentioned below:

- to exchange communications between the Administrations concerned for the efficient operation of the Bureaufax service as necessary, including communications concerning enquiries or claims from customers in connection with the Bureaufax service;
- to exchange communications between the Administrations concerned in connection with other telecommunication services provided mutually by these Administrations, in particular urgent communications that cannot be effected by other telecommunication means, e.g. by international telex or telegram services, because they contain diagrammatic material or other material where it is important for the original to be exactly reproduced.

Note – The indication SERVICE should be clearly shown on the transmittal sheet or in the preamble.

8 Archives

8.1 The maintenance of archives shall be at the discretion of the individual Administrations concerned which will decide on the most suitable arrangements to answer any subsequent queries, in particular on the international accounts.

9 Charging, refunds and accounting

9.1 Charging principles, refund of charges and international accounting for the transmission of documents in the international public facsimile service between public bureaux are governed by Recommendations, agreements and/or conventions such as are given in CCITT Recommendation D.70.

10 Cancellation at the request of the sender

10.1 Where permitted by the Administration concerned, the sender of a facsimile document, or his authorized representative, may, upon establishing his identity or authority, cancel his document provided its international transmission has not begun.

10.2 In the case of multipage facsimile documents, one or more pages may be cancelled if their international transmission has not yet begun. The transmitting public bureau must then amend accordingly the number of pages cited on the transmittal sheet or in the preamble and request the receiving public bureau to do likewise.

10.3 At the sender's request, pages already received by the receiving public facsimile bureau may be either delivered to the addressee or destroyed according to the instructions of the sender.

11 List of public bureaux

11.1 Administrations shall compile a list of public facsimile bureaux participating in the Bureaufax service on the public switched telephone network and on public data networks (or on any networks allocated for facsimile application).

11.2 The list shall contain, in alphabetical order of names of bureaux:

Column 1: names of bureaux equipped with public facsimile stations (including the postal code if any).

Column 2: any supplementary routing information regarding the selection of the appropriate receiving bureau for the address shown on the document, e.g. postal codes for places for which that particular bureau has the local routing responsibility.

Column 3: international call numbers of the public bureaux listed under Column 1 with an indication of the network to be used. Where traffic is routed only through international gateways, it is not necessary to include call numbers of other public bureaux.

Column 4: the service hours (UTC) of the public bureaux listed in Column 1. This column shall be subdivided into Monday-Friday/Saturday/Sunday and holidays. Holidays shall be indicated at the head of the list of the country concerned.

Column 5: the names of the public bureaux to be called upon for re-routing in the event of service closure, equipment failure or busy condition of the public facsimile stations of the public bureaux listed in Column 1.

Column 6: the type(s) of terminal at the public facsimile stations of the public bureaux listed in Column 1, from the standpoint of the characteristics specified in the relevant Recommendations (group number and indication of "automatic" or "manual"); for automatic terminals details of the identification should be given.

Column 7: Comments and observations

11.3 In order to enable the widest possible dissemination of information, Administrations should, wherever possible, send their list of Bureaufax bureaux and any subsequent changes to that list to the General Secretariat of the ITU, either directly or via the UPU international bureau.

11.4 The ITU General Secretariat issues a document containing these lists arranged in accordance with § 11.2 above.

11.5 Amendments to the ITU list shall be published in the ITU Operational Bulletin in accordance with the changes announced by Administrations.

12 Bureaufax service via the public switched telephone network, via a public data network or via facilities dedicated to Bureaufax service

12.1 The special provisions applicable in the case of international public facsimile service via the public switched telephone network are normally those indicated in Recommendation F.180, § 5.

12.2 Special provisions applicable in the case of international public facsimile service via a public data network are being studied.

12.3 Special provisions applicable in the case of international public facsimile service via dedicated circuits are for further study.

12.4 Special provisions applicable in the case of international public facsimile service using store-and-forward switching facilities are under study.

ANNEX A

(to Recommendation F.170)

List of expressions for use in the operation of facsimile services

English	French	Spanish	Local language
1. *Identification of facsimile station*	1. *Identification du poste de télécopie*	1. *Identificación de la estación facsímil*	
1.1 Public facsimile station ... here.	1.1 Ici le poste publie de télécopie de ...	1.1 Aquí la estación facsímil pública de ...	
1.2 Subscriber's facsimile station ... here.	1.2 Ici le poste d'abonné de télécopie ...	1.2 Aquí la estación facsímil de abonado ...	
1.3 Who are you?	1.3 Qui êtes-vous?	1.3 ¿Con quién comunico?	
1.4 Give your call number in ... (language).	1.4 Donnez votre numéro d'appel en ... (langue)	1.4 Indique su número de llamada en ... (idioma)	
2. *Transmission/reception*	2. *Transmission/réception*	2. *Transmisión/recepción*	
2.1 I have a facsimile document for you.	2.1 J'ai une télécopie à vous transmettre	2.1 Tengo un documento facsímil para usted	
2.2 Are you ready to receive?	2.2 Etes-vous prêt pour la réception?	2.2 ¿Está usted listo para recibir?	
2.3 I am ready to receive.	2.3 Je suis prêt pour la réception	2.3 Estoy listo para recibir	
2.4 Are you ready to send?	2.4 Etes-vous prêt pour la transmission?	2.4 ¿Está usted listo para transmitir?	
2.5 I am ready to send.	2.5 Je suis prêt pour la transmission	2.5 Estoy listo para transmitir	
2.6 Please switch over to facsimile machine.	2.6 Veuillez commuter sur «télécopieur»	2.6 Por favor, pase a aparato facsímil	
2.7 I am switching over to facsimile machine.	2.7 Je commute sur télécopieur	2.7 Paso a aparato facsímil	
2.8 How many pages in the facsimile document?	2.8 Combien de pages comporte la télécopie?	2.8 ¿Cuántas páginas comprende el documento facsímil?	
2.9 The facsimile document consists of ... pages.	2.9 La télécopie comporte ... pages	2.9 El documento facsímil comprende ... páginas	
2.10 Transmission speed: ... minutes.	2.10 Vitesse de transmission: ... minutes	2.10 Velocidad de transmisión: ... minutos	
2.11 Have you finished?	2.11 Avez-vous terminé?	2.11 ¿Ha terminado?	
2.12 I have finished.	2.12 J'ai terminé	2.12 He terminado	
2.13 We can terminate the call.	2.13 Nous pouvons couper la communication	2.13 Podemos cortar la comunicación	
3. *Transmission quality and irregularities*	3. *Qualité de transmission et irrégularités*	3. *Calidad e irregularidades de transmisión*	
3.1 Facsimile document well received.	3.1 Télécopie bien reçue	3.1 Documento facsímil bien recibido	
3.2 Facsimile document badly received, repeat in full.	3.2 Télécopie mal reçue, redonnez tout	3.2 Documento facsímil mal recibido, repita todo	
3.3 Facsimile document badly received, repeat page(s) ...	3.3 Télécopie mal reçue, redonnez page(s) ...	3.3 Documento facsímil mal recibido, repita la(s) página(s) ...	
3.4 Bad connection, will call you back.	3.4 Communication mauvaise, je vous rappelle	3.4 Mala conexión, le llamo de nuevo	
3.5 Bad connection, am cutting off, call me back.	3.5 Communication mauvaise, je coupe, rappelez-moi	3.5 Mala conexión, voy a cortar, llámeme de nuevo	
3.6 My facsimile machine is defective.	3.6 Mon télécopieur est défectueux	3.6 Mi aparato facsímil está defectuoso	
4. *Routing*	4. *Acheminement*	4. *Encaminamiento*	
4.1 Please route facsimile document to ...	4.1 Veuillez acheminer la télécopie sur ...	4.1 Por favor, encamine el documento facsímil à ...	
4.2 I cannot accept the facsimile document.	4.2 Je ne peux accepter la télécopie	4.2 No puedo aceptar el documento facsímil	
4.3 Can you accept traffic for ... ?	4.3 Pouvez-vous accepter le trafic pour ...?	4.3 ¿Puede usted aceptar tráfico para ...?	
4.4 Routing error.	4.4 Erreur d'acheminement	4.4 Error de encaminamiento	
5. *Miscellaneous*	5. *Divers*	5. *Expresiones varias*	
5.1 Tell us what to do.	5.1 Dites-nous que faire	5.1 Díganos qué hay que hacer	
5.2 Wait a moment.	5.2 Attendez un instant	5.2 Espere un momento	
5.3 Find somebody who speaks ... (language).	5.3 Passez-moi une personne parlant ... (langue)	5.3 Póngame con alguien que hable ... (idioma)	
5.4 I am giving you someone who speaks ... (language).	5.4 Je vous passe une personne parlant ... (langue)	5.4 Le pongo con una persona que habla ... (idioma)	
5.5 I cannot understand you.	5.5 Je ne vous comprends pas	5.5 No le comprendo	
5.6 Please call me by telex at number ...	5.6 Veuillez m'appeler par télex au numéro ...	5.6 Por favor, llámeme por télex al número ...	

References

[1] CCITT Question 4/VIII, Contribution COM VIII-No. 1, Study Period 1985-1988, ITU, Geneva 1985.

[2] CCITT Question 22/VIII, Contribution COM VIII-No. 1, Study Period 1985-1988, ITU, Geneva 1985.

[3] *International Telecommunication Convention*, Nairobi, 1982.

[4] *Universal Postal Union Convention*, Rio de Janeiro, 1979.

Recommendation F.180

OPERATIONAL PROVISIONS FOR THE INTERNATIONAL PUBLIC FACSIMILE SERVICE BETWEEN SUBSCRIBERS' STATIONS [1]

1 General

1.1 In accordance with the general conditions in Recommendation F.160, facsimile subscribers' stations may participate in the subscriber facsimile service operated over the public telecommunication network, provided that their installations are compatible or that compatibility is ensured by the network, in terms of the characteristics specified in the relevant Recommendations.

1.2 Administrations shall establish the conditions and procedures for connecting facsimile subscriber station terminals to the public telecommunication networks in accordance with their regulations, where appropriate.

1.3 Facsimile terminals may be manual, automatic for incoming calls or fully automatic. The operating procedures applicable in relations between the different types of stations are set out in Recommendation T.30 for the public switched telephone network and are under study for the public data network (see Questions 4/VIII [1] and 22/VIII [2]).

Note – The operation of the public international facsimile service between subscriber stations and public bureaux (and vice versa) is the subject of the Recommendation F.190.

2 Conditions of acceptance

2.1 Calls between subscribers' stations participating in the subscriber facsimile service shall in principle be accepted without any limits on duration. Nevertheless, the procedures prescribed for the public networks used shall also apply to the facsimile service between subscribers' stations.

2.2 Conditions relating to maximum format, quality of paper to be used and other practical and operational aspects shall be limited and prescribed by the characteristics of facsimile terminals, as laid down in the relevant Recommendations.

3 Service facsimile correspondence

3.1 Service facsimile documents may be exchanged between the Administrations concerned for the purposes mentioned below:

- to exchange communications between the Administrations concerned for the efficient operation of the service as necessary, including communications in connection with subscribers' requests or enquiries (for example directory information) with respect to the service;
- by agreement between Administrations, to exchange communications between the Administrations concerned in connection with other telecommunication services, in particular urgent communications which cannot be effected by other telecommunication means e.g. by international telex or telegram services because they contain diagrammatic material or other material where it is important for the original to be exactly reproduced;
- for franking privilege documents where considerations similar to the above apply (see the relevant Series D Recommendations) [2].

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

[2] See Recommendation F.160, § 2.1

4 Tariffs, refunds and accounting

4.1 Tariffs, refund of charges and international accounting for the transmission of facsimile documents in the international public facsimile service between subscribers' stations shall be governed by Recommendation D.71.

5 International public facsimile service between subscribers' stations via the public switched telephone network (Telefax)

5.1 *Terminal equipment*

5.1.1 The facsimile terminals using the public switched telephone network shall be in accordance with the relevant Series T Recommendations.

5.2 *The network*

5.2.1 The Telefax service shall be provided over the public switched telephone network (PSTN) and/or specialized DATEL service circuits as appropriate.

Note 1 – Some Administrations do not permit PSTN circuits, which are randomly selected, to be used for facsimile transmission.

Note 2 – The DATEL service may employ conditioned telephone-type circuits (normally conforming to Recommendation M.1020) and/or PSTN circuits assigned for DATEL use on a shared basis. These circuits enable Administrations to permit customer transmission of data and/or facsimile documents on an assured basis.

5.3 *Procedures for the transmission of documents*

5.3.1 *Control procedures*

5.3.1.1 Terminals of the Telefax service may be manual, or have automatic operation of the called station, or be fully automatic.

5.3.1.2 The operational procedures applicable to the Telefax service are to be found in Recommendation T.30.

5.3.2 *Terminal identification*

5.3.2.1 In the manual service, it is assumed that terminal identification is established by normal telephone conversation.

5.3.2.2 In the case of automatic operation at the called station, an answering tone of 2100 Hz shall identify connection to a non-voice terminal. Additionally, an automatic identification (recorded verbal or digital) shall be used.

Note 1 – Automatic digital identification of the called station must be regarded as compulsory for Group 3 machines or machines of later standards participating in the Telefax service. Automatic digital identification of the calling station is desirable.

Note 2 – A facility for printing, rather than merely displaying, the identification of the called station at the calling station would be desirable (at least). The appropriate operational and technical arrangements require further study.

5.3.2.3 Where used, the digital station identification shall consist of up to 20 characters (including only digits and spaces). For all stations served by the public switched telephone network the identification shall be the international telephone number (including the country code, area code and subscriber's number). For the coding arrangements, see Recommendation T.30, § 5.3.6.2.

5.4 *Service name*

5.4.1 **Telefax**

5.4.1.1 The public facsimile service between subscriber stations on the public switched telephone network (or circuits intended for DATEL) shall be known as the Telefax service.

5.4.1.2 It is assumed that all terminals forming a part of the international Telefax service shall be "hardwired" (the question of the use of acoustic couplers is for further study).

5.4.1.3 The service shall consist of the Telefax 2 and Telefax 3 services.

5.4.2 **Telefax 2**

5.4.2.1 Telefax service using Group 2 terminals shall be known as Telefax 2.

5.4.2.2 Administrations wishing to establish an international Telefax 2 service shall ensure that all terminals conform to the appropriate Recommendations and that international operational procedures and service quality (Recommendation F.160, § 2.2) are observed.

5.4.3 **Telefax 3**

5.4.3.1 Telefax service using Group 3 terminals shall be known as Telefax 3.

5.4.3.2 Administrations wishing to establish an international Telefax 3 service shall ensure that all terminals conform to the appropriate Recommendations and that international operational procedures and service quality (Recommendation F.160, § 2.2) are observed.

5.5 *Directories*

5.5.1 *Compilation of directories*

5.5.1.1 As far as possible each Administration shall publish a directory of its subscribers participating in the Telefax service at least once a year.

Note 1 – Some Administrations may wish to provide the directory as an annex to their telephone or telex directories. Additionally, some may wish to place an identifying mark against entries in telephone directories to indicate Telefax subscribers.

Note 2 – The question of directories for the FAX 4 service is for further study.

5.5.1.2 Directories should not be larger than 210 × 297 mm (A4).

5.5.1.3 The directories sent to Administrations shall be set up in Roman letters. When the directory is written in a language other than that used in the country to which it is sent, it shall contain an explanatory note to facilitate its use. This note shall be drawn up in whatever official language of the Union has been agreed upon by the Administrations concerned.

5.5.1.4 The call number published shall be that which the calling subscriber has to transmit in order to obtain the called subscriber in accordance with the procedure prescribed in his own country.

5.5.2 *Contents of directories*

5.5.2.1 As far as possible, directories shall contain at least, in alphabetical order of subscribers' names (subscribers of the same name being classified in the alphabetical order of the places where they are located):

Column 1: subscriber's name and address, including the locality.

Column 2: type of facsimile equipment according to the characteristics specified in CCITT Recommendations:

- group number (2, 3 or 3 + 2 in the case of interworking between Telefax 3 and Telefax 2 services);
- indication "a" for equipment with automatic reception and "m" for manual equipment.

Column 3: national call number of the facsimile subscriber's station, i.e.:

- trunk code in parentheses ( );
- subscriber's number (followed by an extension number if the terminal is connected to a PABX, and night service number, if any).

For a model see Table 1/F.180.

TABLE 1/F.180

Subscriber's name and address, including the locality 1	Facsimile equipment 2	Call number 3
Laboratoires Durant Analyses médicales Rue Bellevue 108 1205 GENEVE	3 + 2a	(022) 56 12 14
Lacta SA Produits laitiers Route du Centre 14 1701 FRIBOURG	2m	(037) 30 18 22

Note 1 – The positioning of the contents of the three columns of the directory shall be decided by individual Administrations.

Note 2 – The exchange name may precede the trunk code where this is national practice.

5.5.2.2 It would be desirable for the directory also to contain supplementary information of assistance to the subscriber, as follows:

- telephone numbers for customer services such as faults, enquiries, test centre, sales departments;
- user procedures, both for national and international calls;
- general information about facsimile terminals, i.e. compatibility matters, facilities (unattended operation, serial numbering, etc.);
- information on any Bureaufax service provided by the Administration (general information, list of offices including call numbers, opening hours, tariffs, Bureaufax – Telefax interworking);
- information on public Telefax stations (general information, places, addresses, call numbers, opening hours, tariffs).

5.5.2.3 It would be desirable for the directory to contain other lists of subscribers:

- classified according to type of business;
- in order of station identification.

5.5.3 *Supply of directories*

5.5.3.1 Each Administration publishing a directory shall supply, free of charge, to the Administrations with which it has Telefax relations a sufficient number of copies of its directories to meet the requirements of operating the service. This number shall be fixed in advance by mutual agreement and shall be regarded as applicable until a request to change it is received. Such request must be made not later than 1 February each year.

5.5.3.2 Each Administration publishing a Telefax directory shall supply, against payment, to the Administrations with which it has Telefax relations a number of its directories to be put on sale. This number shall be fixed in advance by mutual agreement and shall be regarded as applicable until a request to change it is received. Such a request must be made not later than 1 February each year.

5.5.3.3 A subscriber wishing to obtain a copy of the Telefax directory of another country must apply to his own Administration. If an Administration receives a direct application for a directory from a subscriber in a foreign country, it must forward the request to the Administration of the subscriber's country.

5.5.3.4 An Administration that has supplied directories of its country intended for sale to another Administration shall indicate the equivalent in gold francs or special drawing rights (SDR) of the sale price of the directories applied in the country of origin plus any postal charges.

5.5.4 *Accounting arrangements concerning the paid supply of directories*

5.5.4.1 At least once a year and preferably at the end of the current period of the directories concerned, each Administration that has supplied another Administration with directories for which payment is due in accordance with § 5.5.3 above, shall draw up a special account for the amounts due to it for such directory supplies, including the cost of dispatch, and shall send it to the last-named Administration for settlement. These amounts may be included in the monthly telephone or telex accounts depending on the bilateral arrangements made by Administrations.

5.5.4.2 Except where the Administrations have agreed otherwise, no accounts shall be established for the paid supply of directories unless the total number of copies delivered to an Administration for service requirements and for sale exceeds 50. When the number is 50 or less, all directories shall be delivered free of charge.

5.6 *Interworking between services*

5.6.1 Interworking between Telefax 2 and Telefax 3 services is desirable insofar as it is technically feasible.

5.6.2 Interworking between the Telefax and Bureaufax service is dealt with in Recommendation F.190.

5.6.3 Interworking with other services: the entire problem of interworking is under study.

5.7 *Complementary services*

5.7.1 *Public Telefax stations* (public Telefax booths)

5.7.1.1 A public Telefax station is an equipment comprising the facsimile terminal (see § 5.1) and the access to the network (see § 5.2) which an Administration places at the disposal of the public for the operation of the Telefax service.

5.7.1.2 Public Telefax stations are operated in the same way as Telefax subscriber stations and form an integral part of the Telefax service.

5.7.1.3 Where necessary, public Telefax stations are listed in the Telefax directory (see § 5.5.2.2).

5.7.1.4 As far as possible, public Telefax stations should be equipped with facsimile machines permitting the exchange of terminal identifications and communication with both Group 2 and Group 3 facsimile machines. In this way maximum security should be given to the customer for the transmission of his Telefax messages.

5.7.1.5 In the interest of preventing misrouted transmissions at the receiving end, the equipment of public Telefax stations with manual receivers is recommended.

5.7.1.6 The service quality of connections with public Telefax stations shall correspond to the quality of the Telefax service.

5.7.1.7 The Administrations establish the conditions under which public Telefax stations are placed at the disposal of users.

Note – A regulation of the international operational procedure to be applied to the exchange of facsimile messages between public bureaux and public Telefax stations still requires further study.

6 International public facsimile service between subscribers' stations via a public data network

6.1 See Recommendation F.161 for the use of Group 4 terminals (FAX 4).

References

[1] CCITT Question 4/VIII, Contribution COM VIII-No. 1, Study Period 1985-1988, Geneva 1985.

[2] CCITT Question 22/VIII, Contribution COM VIII-No. 1, Study Period 1985-1988, Geneva 1985.

OPERATIONAL PROVISIONS FOR THE INTERNATIONAL FACSIMILE SERVICE BETWEEN PUBLIC BUREAUX AND SUBSCRIBER STATIONS AND VICE VERSA

1 General

1.1 Recommendation F.160 lays down general provisions for all forms of international public facsimile services. The specific provisions concerning international public facsimile service between public bureaux (Bureaufax) and between subscriber stations are contained in Recommendations F.170 and F.180 respectively.

1.2 With a view to increasing the flexibility and range of these facsimile services, this Recommendation deals with the international transmission of facsimile documents:

a) from a public bureau to a subscriber station (public-to-private); and

b) from a subscriber station to a public bureau (private-to-public).

1.3 Since these methods of operation do not involve the participation of a public bureau at both ends of the connection, the quality of reproduction and speed of delivery normally available in the conventional Bureaufax service may not be attainable.

1.4 The relevant tariff provisions may be found in Recommendation D.73.

2 Public-to-private transmission

2.1 Public-to-private facsimile transmission may be permitted, subject to agreement between the two terminal Administrations concerned. Such a facility is useful in particular where the destination Administration does not operate a Bureaufax service, but where Telefax service is permitted between the two countries.

2.2 The accepting public facsimile bureau should ask the sender of the document for the following information before accepting the document for transmission:

a) the CCITT Group and preferably the precise type of the destination subscriber's facsimile machine;

b) the destination facsimile station's call number;

c) an assurance that the receiving subscriber or his representative is able to communicate an acknowledgement of receipt and quality of document copy (i.e., there are no language barriers between the terminal point operators).

2.3 In those cases where:

a) the sending bureau considers that the quality of the document to be transmitted is unsuitable for satisfactory facsimile transmission; or

b) the sender is unsure of the destination machine type; or

c) the sender is not able to give an assurance on the receiving subscriber's ability to acknowledge receipt; or

d) the receiving machine is known to be operating in a fully automatic mode,

the document will be sent only if the sender accepts the possible risk of non-delivery or of unsatisfactory quality on reception. In effect the same provisions apply as for "RISQUES EXPEDITEUR" in the Bureaufax service (Recommendation F.170). If b), c) or d) above apply, or if after a maximum of 3 attempts the destination subscriber cannot be reached, the sender should be given the option of transmission by means of the normal Bureaufax service (where available) in accordance with Recommendation F.170 at the tariffs applicable to that service.

3 Private-to-public transmission

3.1 Except where contrary provisions are published by the terminal Administrations concerned, international private-to-public facsimile transmission is permitted subject to any specific operational arrangements concluded between the two terminal Administrations concerned.

3.2 Facsimile documents received by a public bureau from a subscriber station in another country are handled and delivered to the addressee in accordance with appropriate methods laid down by the destination Administration. In general, the provisions concerning delivery in Recommendation F.170, § 6 apply.

3.3 The sending subscriber must provide at least the following information to the destination public bureau in order to expedite the handling of his documents:

a) clear identification of the sender and/or the sending station;

b) date and, if necessary, time of sending (in legal time);

c) the total number of pages and, possibly, individual page numbers where more than one page is involved;

d) full details of address complying with the provisions for addresses in the Bureaufax service (Recommendation F.170).

3.4 In order to avoid blocking access to the receiving bureau for other subscribers of public bureaux, the sending subscriber should:

- check that his machine is technically compatible before an attempt is made to transmit documents where possible;
- transmit his document(s) expeditiously once a connection has been established.

3.5 Nevertheless, after transmitting his document the sender should pause briefly before clearing the connection, in order to allow sufficient time for the receiving operator (where applicable) to acknowledge proper reception or to seek any necessary clarification.

3.6 In the case of automatic operation at the receiving public bureau, delivery of the document copy to the recipient will be delayed until such time as the public bureau is in a position to arrange the delivery. The sender will normally be contacted only in the event of insufficient information being provided under § 3.3 above or when the received copy is considered by the public bureau to be of unsatisfactory quality. In the latter case, the sender shall be informed that the document as received is of poor quality and unsuitable for delivery. If appropriate, the sender should then be requested to repeat transmission of the document.

SECTION 2

TELETEX SERVICE[1)]

Recommendation F.200

TELETEX SERVICE[1)]

1 Introduction

1.1 *Scope*

1.1.1 This Recommendation fixes 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 It is intended that the service requirements accommodate a suitable communicating office typewriter as one type of basic Teletex terminal.

1.1.4 The basic element of the correspondence between people using the service is the page, as the smallest unit of text treated as an entity. No restrictions shall exist as far as the operator procedures for generation of the text or the positioning of text within the printable area on a page are concerned.

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

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

Note 3 – 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 terminal.

1.1.5 It is not the intention of the new 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.

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

1.2 *Service definitions*

1.2.1 *General*

1.2.1.1 The Teletex service provides – in addition and in parallel to the existing Telex service – communication between terminals, which are 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 terminals 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 terminals both nationally and internationally so that they may communicate 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.

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

d) The graphic character repertoire of any office typewriter 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.

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

f) Local mode operation will not be disturbed by incoming calls under normal operating conditions.

g) A received Teletex message can be printed or displayed otherwise as decided by the recipient and the terminal 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.

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

i) The Teletex service will provide the ability to interwork in both directions with the telex service by means of conversion facilities. (Refer to Recommendation F.201.)

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

1.2.3 *Standardized options*

1.2.3.1 It is recognized that some subscribers may need to use their Teletex terminals to communicate nationally and internationally using service features that are not included in the Teletex basic requirements, but that are, nonetheless, frequently used in office text equipment. A number of CCITT-standardized options should, therefore, be defined. However, the provision of any option in a service leads 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 terminal shall ensure the transmission of documents using only those options which have been indicated as being available at the receiving terminal.

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) use of the mixed-mode of operation (refer to Annex C);

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

h) escape into national and private options;

i) use of Kanji character repertoires (JIS[1]) C6226) and associated character spacing (6-pitch) and page formats (ISO A4, B5, B4);

j) 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 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.

1.3 *Definitions of terms used in the Teletex service*

1.3.1 The terms listed in Annex B have the definitions given there when used in these provisions.

1.4 *Duration 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.

1.5 *Classes of call*

1.5.1 There are two accepted classes of call:

a) ordinary private Teletex calls;

b) service calls, including franking privilege calls. (Where Administrations choose to allow service calls via semiautomatic or manual operation these calls shall be permitted.)

Note – The methods of treating service calls for accounting purposes (see also Recommendation F.60, § 2.2) require further study and possible liaison with Study Group III.

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 to make the Teletex service available to an agency that is known to be organized for the purpose of sending or receiving messages for 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 client 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 Three possibilities are considered below:

a) Teletex in a circuit switched public data network (CSPDN) (it is possible for a CSPDN to be simulated by a modern switching system used also for telex);

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

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

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

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[1] JIS: Japanese Industrial Standard.

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

2.4 Connection between PSTNs may use international telephone circuits.

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

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

Note – It is recognized that national implementations of a 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.

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 and Recommendation X.121 for public data networks (PDNs).

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 national and international PSTNs.

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 national Teletex service in the other countries on PDN.

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 stations 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.

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 so that it is possible for any Teletex subscriber to reach any other Teletex subscriber using fully automatic selection. This shall not, however, preclude, on a *purely interim basis*, the use of manual call set-up by international operators, where the calling terminal is served from a PSTN in which international call access to another PSTN serving the called terminal cannot be automatically provided.

Note 1 – Special requirements may in these instances be applicable to the terminals in order not to affect unduly the grade of service.

Note 2 – The feasibility of this approach requires further study.

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

5.1.3 A virtual dialogue mode of operation, which appears to the subscriber as a conversational mode, should be possible, although this is not a basic requirement of the Teletex service initially. (This point is for further study.)

5.1.4 Mixed modes of operation within the Teletex service using specialized techniques such as facsimile as well as character-coded text will be important facilities for the Teletex service in the future.

5.1.5 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. Two-way simultaneous (TWS) communication is not regarded as a basic requirement for the Teletex service and is for further study.

5.1.6 Interworking with other services such as facsimile, videotex is envisaged and may form the basis of 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 a memory.

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

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

c) Output
   - emptying the memory.

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

5.2.2 The control procedures as specified in Recommendation T.62 shall be used as end-to-end communication procedures between any terminals in the basic 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 in the end-to-end control procedures, which may be used by a terminal to identify additional information found in a document. Details of the additional document information are for further study.

5.3 *Call identification*

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 call identification line is to be printed or otherwise displayed at the point of interruption as well as at the point at which transmission is resumed as defined in Recommendation T.62.

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

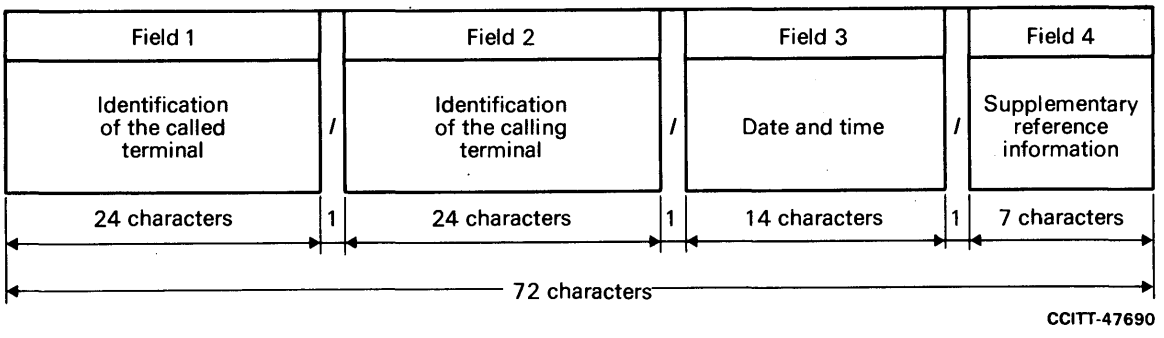


FIGURE 1/F. 200

Format of the call identification line

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.

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

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.

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.

5.4 *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:

- storage in the network (e.g. delayed delivery);
- abbreviated address calling;
- multi-address calling;
- line 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 the Teletex terminal 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.

6 Quality of service

(This section will be the subject of further study in the 1985-1988 study period.)

6.1 *General*

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

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

Note – 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. A new study Question, which is currently under urgent investigation, may result in new revised quality of service figures.

6.2 *Terminal*

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

6.2.2 *Circuit switched 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 teletex traffic, excluding the use of interactive and mixed mode of operation. For the purpose of calculation it is assumed that 20% of the 24-hour total traffic occurs in the busy hour. 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 data networks*

The quality of service criteria for these networks is for further study.

6.2.4 *Public switched telephone networks*

The quality of service criteria for these networks is for further study.

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.

6.4 *International routes*

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

6.5 *Duration 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 subscriber equipments 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 Document Storage Facility which can be network or customer premises based. This facility must appear in every respect to the originator as a Teletex terminal.

6.5.4 Two methods of delivery are available from the Document Storage Facility to the called Teletex terminal: automatic delivery, where the Document Storage Facility delivers messages when the called terminal is available to receive them, and retrieval initiated by the users.

6.6 *Observations on the quality of the service*

6.6.1 Administrations should make observations to evaluate the quality of the Teletex service internally as required and internationally at least as described below.

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 (a first draft only – based on Recommendation F.70).

6.6.4 Observations should be made at such points and in such quantity as to provide 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 Subscriber terminals

7.1 *General*

7.1.1 In order to support a high quality of service, a signalling rate of 2.4 kbit/s on the subscriber line wherever possible is recommended. (The 2.4 kbit/s rate refers to the information transmission speed as seen by the subscribers' equipment.)

7.1.2 The facilities required in terminals 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 terminals which have only ability to receive messages. For this type of terminal, the requirements of § 7.2.1 are waived.

7.2 *Character repertoire*

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

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

7.2.3 The terminal 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 terminal will have memory for storage to be used for both local and communication functions.

7.3.1.2 A memory is required in the receiving terminal so that an operator may be assured undisturbed operation when working in local mode. A 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 a terminal to receive incoming traffic is a prerequisite for the terminal to answer the call. This ability must be sufficient to meet the quality of service as specified in § 6 of this Recommendation.

Note – The control procedures may allow for negotiation of storage capability between terminals. This matter is for further study.

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

7.3.3 *Interruption of local mode*

7.3.3.1 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 *Alarms/indicators*

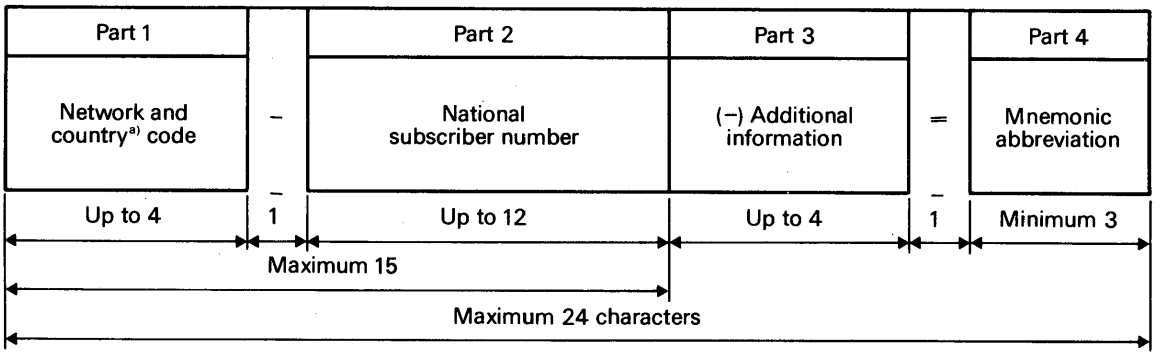
7.4.1 Alarm indicators (visual and/or audible) are required in the terminal to signify each of the following conditions:

a) receiving storage contains one or more messages;
b) receiving storage threshold reached;
c) output medium (e.g. paper) low.

7.5 *Terminal identification*

7.5.1 Each terminal in the Teletex service shall have a unique identification. The different parts of the terminal identification are contiguous as shown in Figure 2/F.200 and no characters other than those specified there are used.

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



[a] Country or geographical area code.

FIGURE 2/F.200

Format of the terminal identification

7.5.3 Part 1 (network and country[2] code) contains the relevant information about the network and country concerned in accordance with the principles of Recommendation X.121[3].

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 subscriber can be reached by other subscribers of the same country and on the same network[3]. This part is separated from Part 1 by 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:

a) the extension number of a terminal 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 a specific terminal. This possibility can be used for indication of, for exemple, terminals 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 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 interworking 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.

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2) Country or geographical area code.

3) These are not necessarily the numbers used in call establishment.

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

7.6 *Format of Teletex pages*

7.6.1 *Objectives*

7.6.1.1 It is an 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 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 terminals may by prior agreement 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 terminal 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 *Line spacing per line-feed character*

7.6.5.1 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.

7.6.6 *Left margin*

7.6.6.1 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.

7.6.7 *Character pitch*

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

7.6.8 *Positioning of text*

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

7.6.8.2 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.

7.6.9 *Use of the page format*

7.6.9.1 Table 1/F.200 gives the maxima that may be used in the basic service with the basic values given above. For interworking with telex, see Recommendation F.201.

TABLE 1/F. 200

	Vertical format	Horizontal format
Maximum number of text lines	55[a)]	38[a)]
Maximum number of characters per line	5 + 72[b)]	5 + 100[b)]

[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.

8 Customer information

8.1 *Directories*

8.1.1 As far as possible a directory of Teletex subscribers shall be provided by each Administration that introduces a Teletex service. Initially it will also be most useful if Teletex subscribers are listed in telex and data service directories.

8.1.2 As far as possible each Administration shall publish a directory of its subscribers 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.

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 mutual agreement and shall be regarded as applying until a request to change is received; such requests must be made not later than 1 February each year.

8.1.8 Each Administration shall supply against payment to Administrations with which a Teletex service exists a number of its subscriber 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 not later than 1 February each year.

8.1.9 A subscriber 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 subscriber of another Administration the request shall be forwarded to the subscriber's own Administration.

8.1.10 An Administration that has supplied directories of its subscribers, intended for sale, to another Administration shall indicate the equivalent in gold francs of the sale price of the directories supplied in its own country plus any postal charges.

8.2 *Operating instructions*

[Operating instructions (along the lines of those in Annex A to Recommendation F.60) are to be developed at a later stage.]

9 Tariff principles

(This matter requires further studies in conjunction with Study Group III.)

ANNEX A

(to Recommendation F.200)

Standard format for reporting the results of service observations

(draft only – requires further study)

Administration (or RPOA).....

Period of observation: ..... 19.... to ..... 19....

Route busy hour (outgoing):

..... UTC to.....

Traffic from ..... to.....

Period of day:

..... UTC to..... UTC

Total calls observed:.....

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 case 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)		

ANNEX B

(to Recommendation F.200)

Definitions of terms used in the Teletex service

B.1 call phases

F: phases d'une communication

S: fases de la comunicación

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: équipement terminal demandeur

S: terminal llamante

That terminal that initiates the procedures to establish a call.

B.3 called terminal

F: équipement terminal demandé

S: terminal llamado

That terminal to which a call is made.

B.4 conversational mode

F: mode conversation

S: modo conversacional (modo dialogado)

The alternate exchange of user information during a call or series of calls between calling and called terminals.

B.5 fully automatic operation

F: fonctionnement entièrement automatique

S: explotación automática (operación automática)

Operation such that Teletex terminals are 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.

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 terminal served by one network to a Teletex terminal 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 terminal and a terminal of another service, e.g. telex.

B.8 **local mode**

F: mode local

S: modo local

That state of a terminal that permits operation of some of the functions of the terminal independently of any network functions.

B.9 **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 graphical information encoded using techniques other than those defined for the basic Teletex service.

B.10 **multi-station Teletex terminal installation**

F: installation terminale télétex à postes multiples

S: instalación terminal teletex multiestación

A Teletex installation that includes more than one work station.

B.11 **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.12 **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).

B.13 **Teletex call**

F: communication télétex

S: comunicación teletex

The temporary connection (or apparent connection as perceived by the caller) of one terminal to another for the purpose of exchanging information.

B.14 **Teletex page**

F: page télétex

S: página teletex

The basic element of office correspondence in the Teletex 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.15 **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.16 **Teletex terminal**

F: équipement terminal télétex

S: terminal teletex

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

ANNEX C

(to Recommendation F.200)

Service requirements unique to the Teletex mixed mode of operation

C.1 *Introduction*

C.1.1 *Scope*

C.1.1.1 Teletex mixed mode of operation is one of the standardized options of the Teletex service.

C.1.1.2 Teletex terminals providing mixed mode of operation belong to the Teletex service and shall meet with all the rules fixed in Recommendation F.200. Furthermore, they shall meet with the additional rules described in this Annex C.

C.1.1.3 Questions of an essentially technical nature concerning this operational mode of the Teletex terminals are dealt with by other Recommendations (T.6, T.60, T.61, T.62, T.70, T.72, T.73).

C.1.2 **mixed mode of operation**

C.1.2.1 *Definition*

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 graphical information encoded using techniques other than those defined for the basic Teletex service.

C.1.2.2 *General requirements*

C.1.2.2.1 The Teletex mixed mode of operation requires a document architecture (see Recommendation T.73) to provide means for structuring texts into layout and logical portions. The basic layout portion is a "block". (The definition and the use of logical structure is for further study.)

Note – In this annex, all references to blocks are to be interpreted as applying to basic layout objects i.e., either to blocks or to pages that are not subdivided into blocks.

C.1.2.2.2 A "block" contains information encoded with only one of the different coding schemes listed in § C.1.2.3.

C.1.2.2.3 The Teletex mixed mode of operation allows these blocks of information to be superimposed for presentation purposes.

C.1.2.2.4 For the purpose of communication or subsequent text editing, it should be possible to either handle blocks separately or to link them together. It is recognized that the ability to edit text after reception is a matter for further study.

C.1.2.2.5 The information encoded by means of an image coding scheme cannot be sent to a subscriber station which indicates, during pre-information phase, it has only the basic Teletex receiving capabilities. Substitution of this image-encoded information by an alternative information, coded in a form compatible with the basic Teletex service, is at the discretion of the sender.

C.1.2.2.6 In both Teletex and Group 4 facsimile services, the machines providing mixed mode shall be able to exchange documents directly in accordance with Recommendations T.6, T.61, T.72 and T.73.

C.1.2.3 *Coding techniques available*

C.1.2.3.1 Recommendation T.61 defines the character repertoire and associated coding to be used for character encoded information.

C.1.2.3.2 Recommendation T.6 defines the Group 4 facsimile coding techniques that can be used for image-encoded information.

C.1.2.3.3 The use of other image coding techniques is for further study.

C.2 *Information to be transmitted*

C.2.1 A Teletex terminal providing mixed mode of operation may have the ability to create, transmit and present structured documents composed of:

C.2.1.1 One (or more) page(s) containing only graphic characters belonging to the Teletex character repertoire of Recommendation T.61.

C.2.1.2 One (or more) page(s) containing only information encoded by using one or more of the image coding techniques listed in § C.1.2.3 above.

C.2.1.3 One (or more) page(s) containing graphic characters as per § C.2.1.1 and information encoded as per § C.2.1.2.

C.2.1.4 Any combination of the pages defined in §§ C.2.1.1, C.2.1.2 and C.2.1.3.

C.2.2 The incremental spacing for positioning and dimensioning of text blocks shall be equal in both the vertical and horizontal directions, to permit a single character image storage to be used for character generation in both the vertical and horizontal print orientation, and to facilitate establishing coordinate points of curves, graphs, and their associated scale coordinates.

C.3 *Teletex terminal facilities for mixed mode*

C.3.1 *General*

New facilities are provided by Teletex terminals supporting mixed mode of operation.

A Teletex terminal having mixed mode of operation shall provide as a minimum the set of facilities defined in § C.3.2. This set is globally indicated during the pre-information phase.

It may provide in addition, facilities defined in § C.3.3. These facilities are negotiated separately from the set of facilities defined in § C.3.2.

C.3.2 *Minimum set of facilities required for Teletex terminals supporting mixed mode*

C.3.2.1 The minimum set of facilities required for Teletex terminals supporting mixed mode of operation is:

C.3.2.1.1 The ability to handle a layout document structure composed of mandatory explicit layout elements:

- document profile,
- document,
- page,
- block.

C.3.2.1.2 The ability to specify the boundary of each block and to reference the location of each block using a standardized coordinate system.

C.3.2.1.3 The ability to identify and select the type of coding used to represent, and to position, the information contained in a block, e.g., byte-oriented such as characters, or image-oriented such as facsimile.

C.1.2.1.4 The ability to link blocks together at the presentation layer for imaging or communication purposes.

C.3.2.1.5 The ability to provide the image area defined for ISO A4 paper size in Recommendation T.72.

C.3.2.1.6 The ability to print on each page of documents using mixed-mode facilities a call identification line (CIL) having the same content and format as the one defined in § 5.3 of Recommendation F.200 for the Teletex service. General CIL printing rules defined for the Teletex service apply. A special area is reserved for printing the CIL (see Recommendation T.72).

C.3.2.1.7 The ability to handle and exchange only once the layout elements of a document appearing repetitively in the document.

C.3.2.1.8 The ability to create, transmit and present documents composed of:

a) one (or more) page(s) containing only graphic characters belonging to the Teletex basic character repertoire of Recommendation T.61;

b) one (or more) page(s) containing only information encoded by the basic facsimile coding scheme defined in Recommendation T.6;

c) one (or more) page(s) containing graphic characters as per a) and information encoded as per b);

d) any combination of pages defined in a), b) and c);

Note – It is recognized that in certain applications, there may be a need for terminals which have only ability to receive messages (see § 7.1.3 of Recommendation F.200). For this type of terminal, the requirements concerning creation and sending are waived.

C.3.2.1.9 In principle, as a service requirement, the ability to process an unlimited number of blocks for presentation as a single page. It is recognized that technical restrictions may limit the number of blocks without using negotiation (see Recommendation T.72).

C.3.2.1.10 The ability to superimpose transparently the information contained in blocks.

C.3.3 *Additional facilities for mixed mode*

C.3.3.1 One or more additional facilities listed below may be provided by a Teletex terminal supporting mixed mode.

C.3.3.2 The ability to receive and present documents the presentation of which requires grey scales or colour (further study).

C.3.3.3 The ability to handle other elements described in Recommendation T.73 (e.g., page set, frame, etc.).

C.3.3.4 The ability to superimpose opaquely information contained in blocks.

C.3.3.5 The ability to provide other image areas than that defined for ISO A4 page size (for instance, the image size defined in Annex E of Recommendation T.72 for North American paper format).

C.3.4 *Receiving capabilities*

C.3.4.1 Considering the different types of documents that may be received by a Teletex terminal supporting mixed mode, it is recognized that:

C.3.4.1.1 The negotiation of the storage capacity at the pre-information phase of the communication as described in §§ 3.4.4.2 and 5.7.22 of Recommendation T.62 is mandatory for Teletex terminals when using mixed-mode facilities.

C.3.4.1.2 Since the terminal may receive pages wholly encoded with an image coding technique, the receiving storage capacity should be sufficient in order to store at least one full page encoded with an image coding technique (see Recommendation T.72).

C.3.4.1.3 The alarm indicator of memory threshold reached as referred to in § 7.4.1.b) of Recommendation F.200 should be managed as indicated above.

C.4 *Interworking with other services*

C.4.1 *General*

This section only deals with the additional possibilities of interworking offered by the Teletex terminals providing the mixed mode of operation.

C.4.2 *With the services using the Group 4 Facsimile terminals* (For further study)

Group 4 Facsimile terminals have been defined in three classes. The definition of each of the classes is summarized below. These definitions have been used to define the interworking configurations defined in § C.4.2.1:

- Group 4, Class I: minimum requirement is a terminal able to send and receive documents containing facsimile encoded information (in accordance with Recommendations T.6 and T.73).
- Group 4, Class II: minimum requirement is a terminal able to transmit documents which are Facsimile coded (in accordance with Recommendations T.6 and T.73). In addition, the terminal must be capable of receiving documents which are Facsimile encoded (in accordance with Recommendations T.6 and T.73), Teletex coded (in accordance with the basic coded character repertoire as defined in Recommendation T.61) and also mixed-mode documents (in accordance with Recommendations T.72 and T.73).
- Group 4, Class III: minimum requirement is a terminal which is capable of generating, transmitting and receiving facsimile coded documents (in accordance with Recommendations T.6 and T.73), Teletex coded documents (in accordance with Recommendation T.61) and mixed mode documents (in accordance with Recommendations T.72 and T.73).

C.4.2.1 *Documents to be exchanged directly from terminal to terminal*

C.4.2.1.1 From a Teletex terminal providing mixed mode to a Group 4 facsimile terminal:

- to Class I: documents where the information is only Group 4 facsimile encoded;
- to Class II: documents defined in § C.3.2.1.8;
- to Class III: the same as Class II.

C.4.2.1.2 From a Group 4 facsimile terminal to a Teletex terminal providing mixed mode:

- from Class I: documents where the information is only Group 4 facsimile encoded;
- from Class II: the same as class I;
- from Class III: documents defined in § C.3.2.1.8.

C.4.2.2 *Documents to be exchanged via a conversion facility*

Further study.

C.4.3 *With the Videotex service*

Further study.

C.4.4 *With telewriting*

Further study.

C.5 *Quality of service*

Further study.

C.6 *Customer's information*

C.6.1 *Directories*

C.6.1.1 In the Teletex service directory published by each Administration, the special symbol "MM", the meaning of which is Mixed Mode, shall be inserted when a Teletex terminal provides mixed mode of operation in order to give some guidance to the users.

C.6.1.2 This symbol "MM" follows the full terminal identification defined in § 7.5 of Recommendation F.200.

Reference

[1] *International Telecommunication Convention*, Nairobi, 1982.

Recommendation F.201

INTERWORKING BETWEEN THE TELETEX SERVICE AND THE TELEX SERVICE

CONTENTS

1 Introduction

1.1 This Recommendation defines the procedures to be followed for interworking between the Teletex service and the telex service.

1.2 The Teletex service is defined in Recommendation F.200 and other relevant technical Recommendations.

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

1.4 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).

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

1.6 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) Because some Administrations may be unable to 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 should be studied. 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. The existing specifications apply to the telex terminals.

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.

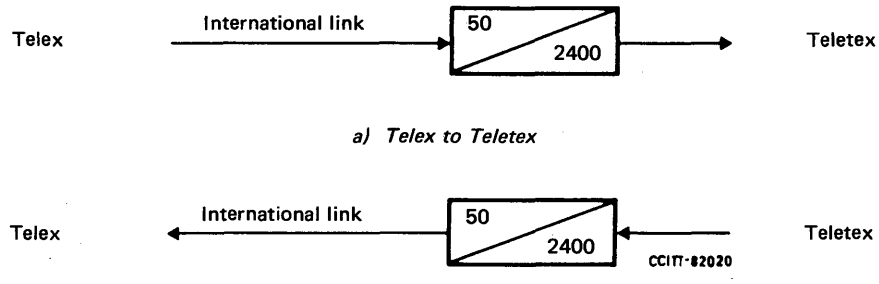


FIGURE 1/F.201

Because the various countries will introduce the Teletex service at different times, it must always be assumed that the conversion facility is in the same country as the Teletex terminal, as far as the basic interworking service is concerned.

2.3 *Methods of interworking*

a) Considering that the Teletex service can be provided upon various networks (cf. 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.

2.3.1 Interworking between the Teletex service and the telex service is normally performed by a conversion facility (CF) using store and forward principles. When packet-switched data networks are used to support the Teletex service, real-time conversion facilities can also be provided. The real-time conversion principles and requirements are to be found as a part of the description of the one-stage selection method (see § 3.2).

2.3.2 Conversational mode is not required for interworking.

2.3.3 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.

A table giving the method of interworking for each Administration is recorded in Annex A.

2.4 *General service requirements for telex to Teletex direction of interworking*

2.4.1 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.

2.4.2 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.

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

2.4.4 Initially, in the basic service, international interworking should be on a single call basis.

Note – Multi-address facilities are for further study.

2.4.5 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.)

2.4.6 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.

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

2.5 *General service requirements for Teletex to telex direction of interworking*

2.5.1 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.

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

2.5.3 The provision by the store and forward CF of an acknowledgement following 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.

2.5.4 The implementation 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 for telex to Teletex procedure

3.1 *Interworking using store and forward conversion facility*

3.1.1 *Service principles: telex to Teletex direction*

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

3.1.1.1 *Numbering plan and Teletex network environment*

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

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

3.1.1.2 *Validation during selection*

Validation by direct call will reduce risk of delivery failure to an absolute minimum.

3.1.1.3 *Text delivery to the Teletex terminal*

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

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

3.1.2 *Figures 2/F.201 and 3/F.201 and appending notes of telex to Teletex procedure*

a) Figure 2/F.201 deals with the interworking using store and forward CF in the telex to Teletex direction.

b) Figure 3/F.201 deals with this interworking with telex automatic emitting devices.

Note – Taking into account that most of the notes related to the two figures are similar, the notes related to Figure 3/F.201 only emphasize the differences from notes to Figure 2/F.201.

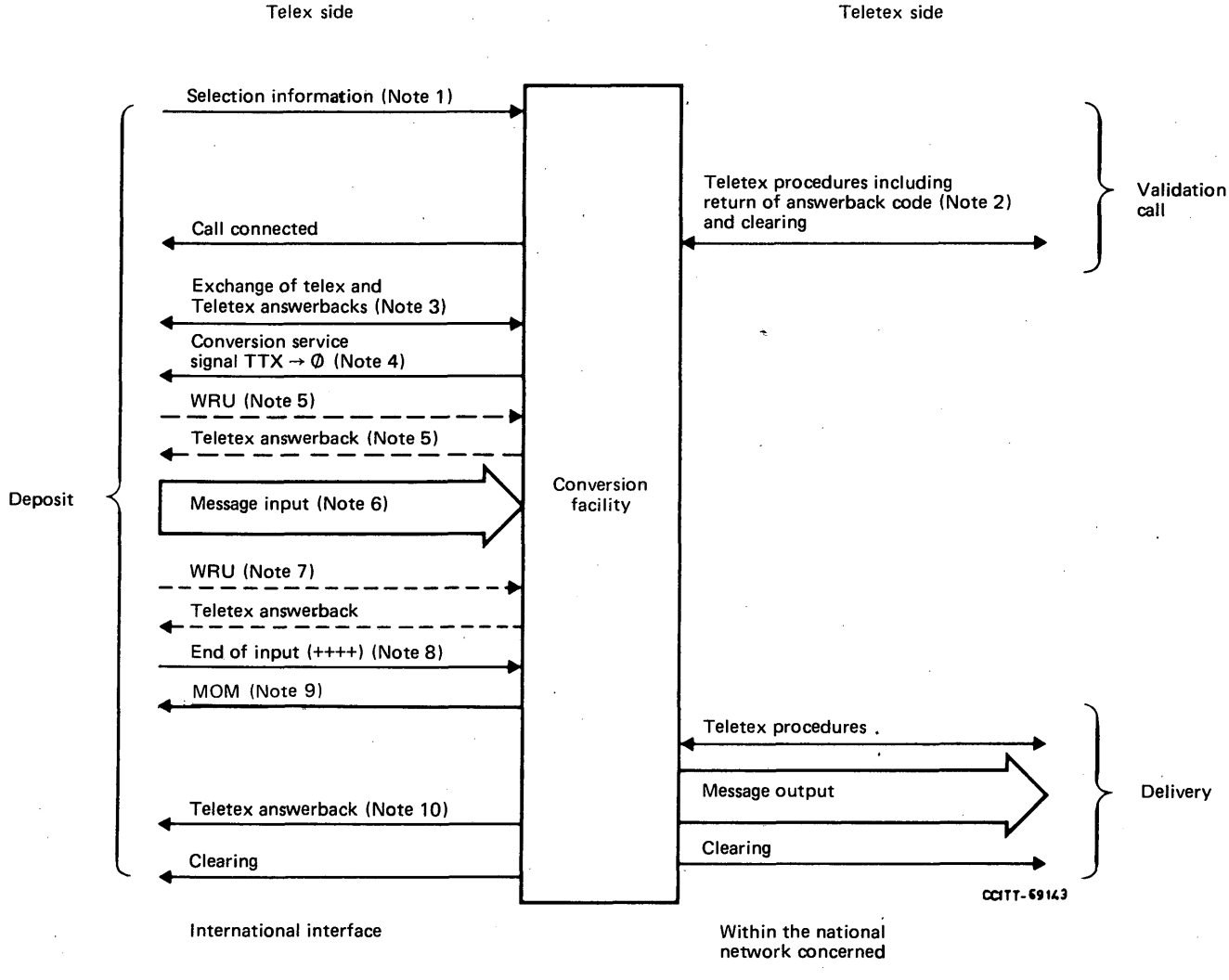


FIGURE 2/F.201

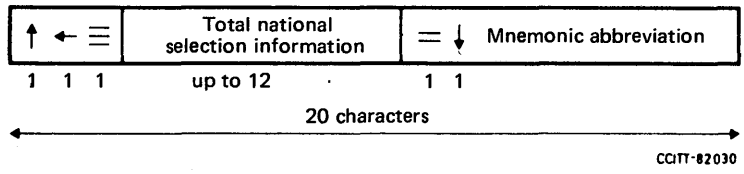
Interworking in the telex to Teletex direction using one-stage selection procedure: (case of manual telex)

Notes relative to Figure 2/F.201:

Note 1 – The total selection information of the Teletex subscriber should not be longer than 12 digits.

Note 2 – See Recommendations T.90 and U.70.

Note 3 – The Teletex answerback sent to the telex subscriber is a rearranged Teletex terminal identification, as follows:



where

↑ is a figure shift, ← is a carriage return, ≡ is a line feed, ↓ is a letter-shift and → is a space.

i) The total national selection information contains the national access code to the CF (if necessary), the network identification as mentioned in Recommendation X.121 (if necessary) and the national Teletex subscriber number (Part 2 of the Teletex terminal identification), but shall not include the additional information (Part 3 of the Teletex terminal identification).

There should be no separators in the numeric part of the Teletex answerback.

ii) If the length of the Teletex answerback above *exceeds* 20 characters, including control characters, the final part of the mnemonic abbreviation shall be omitted so as to reduce the total length to 20 characters.

iii) If the length of the Teletex answerback is *less* than 20 characters, unused character positions shall be filled in accordance with Recommendation F.60.

Note 4 – i) There shall be an interval between the sending of the Teletex answerback and the sending of the conversion service signal. This interval is provisionally set to 800 ms. If information is sent by the telex subscriber within this period, no "TTX→Ø" service signal is returned by the CF and the CF will enter into the input mode.

ii) TTX is the telex/Teletex conversion facility; Ø is the telex network identification code as provided in Recommendation F.69.

Note 5 – The CF shall accept the possible occurrence of an extra WRU at this stage. The answerback returned by the CF is the Teletex answerback obtained during the validation call. (See Note 3.)

Note 6 – The CF shall wait at least 15 seconds for the message input. See also Annex B for abnormal conditions during text input.

Note 7 – i) This procedure is recommended but not mandatory. See Recommendation F.60.

ii) The answerback returned by the CF is the Teletex answerback obtained during the validation call. (See Note 3.)

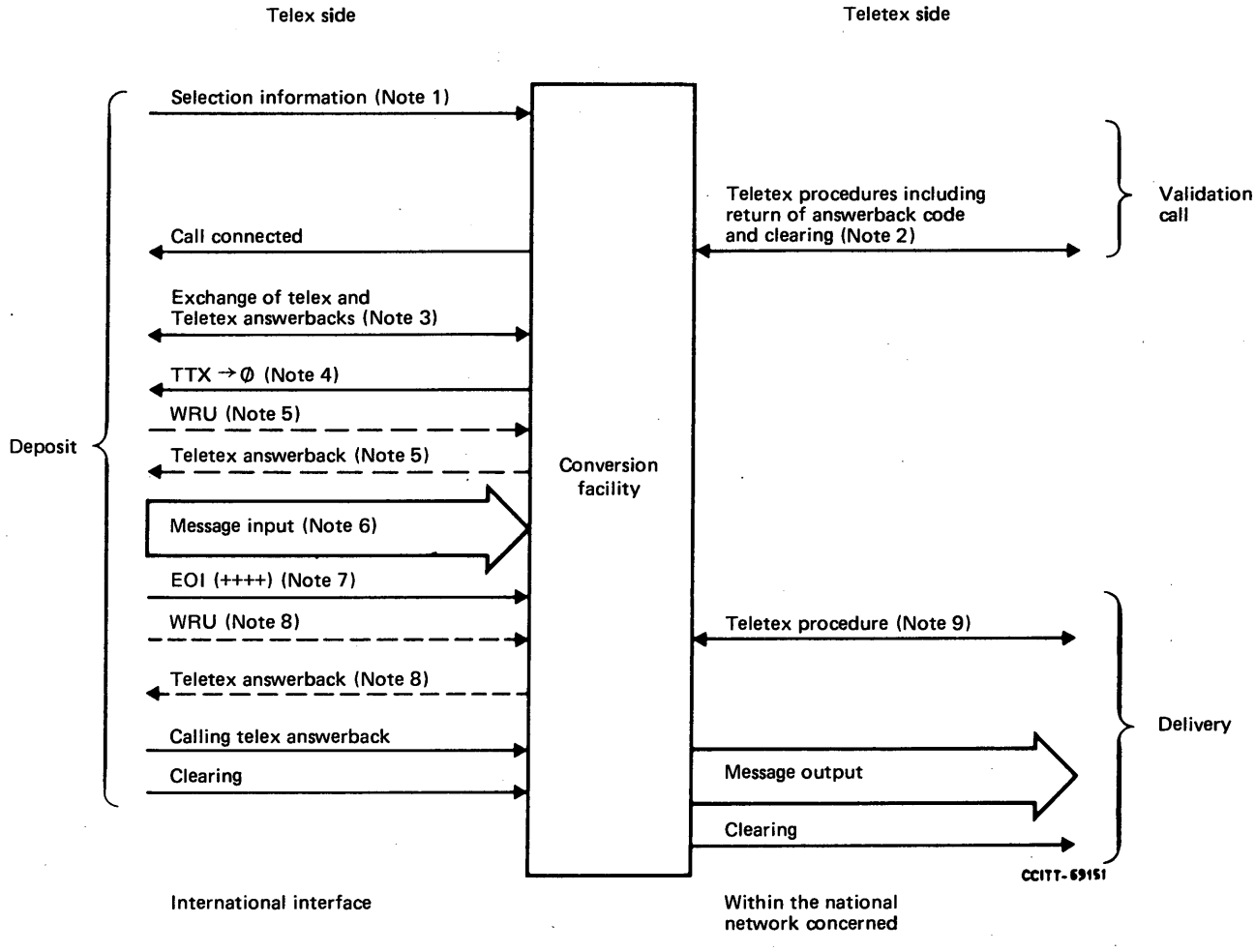
Note 8 – i) The end of input (EOI) signal is the plus symbol (ITA No. 2 combination No. 26) repeated four times (+ + + +). This EOI signal need not be transferred to the Teletex side.

ii) If the caller clears without the EOI signal, the network will endeavour to deliver the message as received. However, customers must be clearly warned that the network cannot guarantee delivery in these circumstances.

Note 9 – i) The CF shall wait 800 ms for WRU after EOI. If no WRU is received within this period, the terminal is considered as a manual one. A MOM signal is then sent by the CF at each call attempt. If a WRU is sent by the telex terminal within this period, the terminal is considered as a telex automatic emitting device.

ii) When the EOI signal is received, the conversion facility shall immediately establish the second call to the Teletex terminal. For the case of unsuccessful calls on the PSPDN and CSPDN, the conversion facility shall make several attempts with five-second intervals measured from the end of one attempt to the beginning of the next. At each attempt, the MOM signal followed by service signals defined in Recommendation U.70, if appropriate, shall be sent to the waiting telex terminal. As a whole, the telex line is not to be held for a period exceeding 30 seconds. If all these attempts are unsuccessful, the conversion facility shall send the service message ITL→TTX→Ø (ITL = I'll transmit later) to the waiting telex terminal and clear down. It shall then be the responsibility of the Administration operating the conversion facility to effect delivery of the message by whatever means are available.

Note 10 – This answerback returned by the CF is the Teletex answerback obtained during the delivery call to the Teletex terminal and having the same format and content as described in Note 3. This answerback is an "on-line" delivery acknowledgement for the telex user.



Notes 1 to 6 – Identical to Notes of Figure 2/F.201.

Note 7 – Same as Note 8, Figure 2/F.201.

Note 8 – i) The CF shall wait 800 ms for WRU after EOI. The terminal is considered a telex automatic emitting device (TAED) if a WRU is sent within this period.

The answerback returned by the CF is the Teletex answerback obtained during the validation call (see Note 3) to confirm that the connection still exists. It is not a proof of delivery.

No progress signal (e.g. MOM, ITL→TTX→Ø) will be returned by the CF to the telex automatic emitting device after the EOI signal.

ii) When the EOI signal is received, the CF should establish immediately a delivery call to the Teletex terminal.

Note 9 – The CF shall make several attempts with five-second intervals measured from the end of each attempt to the beginning of the next. It is the responsibility of each Administration operating the conversion facility to effect the delivery of the message by whatever means are available.

FIGURE 3/F.201

Interworking in the telex to Teletex direction using one-stage selection procedure (case of Telex Automatic Emitting Devices, TAEDs)

3.1.3 *Service principles: Teletex to telex direction*

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

3.1.3.2 *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 simulating a Teletex terminal. The Teletex terminal would clear the call after text deposit without waiting for the delivery to the telex terminal.

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

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

3.1.3.3.2 Before forwarding the text, to ensure security of delivery, the telex answerback is taken and compared with the telex answerback given by the Teletex subscriber. The method of validation is the responsibility of the Administration operating the CF.

3.1.3.3.3 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".

3.1.3.3.4 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 of answerbacks, 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".

3.1.3.3.5 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.

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

3.1.4 *Figure 4/F.201 and appending notes of Teletex to telex procedure*

Figure 4/F.201 shows the interworking in the Teletex to telex direction using one-stage selection procedure.

3.2 *Interworking using real-time conversion facilities*

3.2.1 *General principles for real-time interworking*

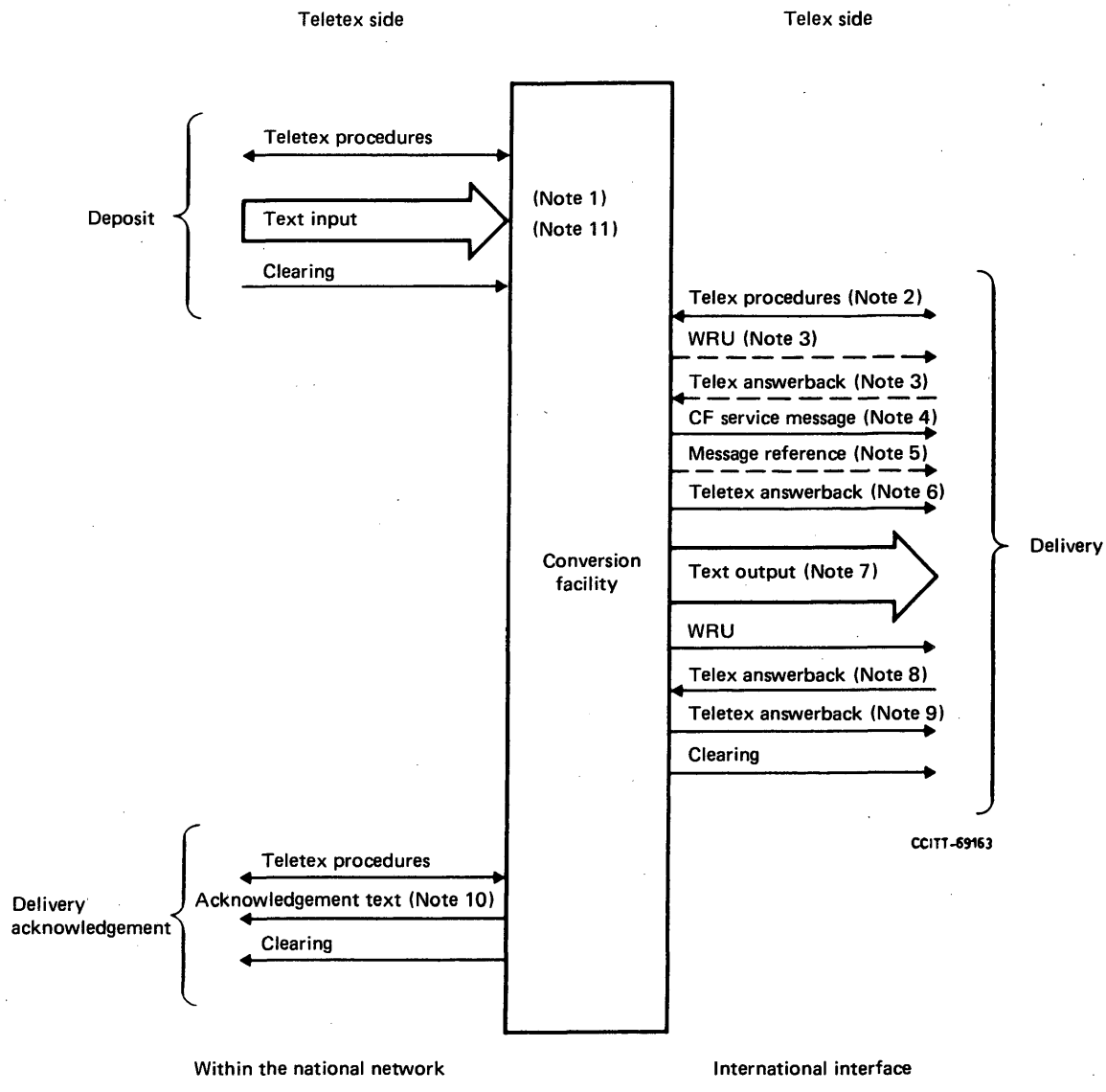
A real-time conversion facility for telex/Teletex interworking uses the speed adaptation and multiplexing capabilities on the subscriber line of the packet-switching network.

Such a conversion facility shall transfer a message, in one unique communication, from a telex terminal to a Teletex terminal or from a Teletex terminal to a telex terminal, without storage of the message.

The real-time conversion facility shall emulate a Teletex terminal to the Teletex network and emulate a telex terminal to the telex network.

Therefore, this CF shall perform the required code conversion, adapt the data transfer rates and map in real-time, the procedural elements from one network into the other, such as for example, call set-up, data transfer, clearing or error conditions, etc.

With this principle, the text information shall be transferred from one network to the other with an effective bit rate of 50 bits/s. This implies that provision shall be made at the Teletex terminal/network interface to satisfy § 7 of Recommendation F.200, by providing at least two logical channels.



Note 1 – See Recommendation T.90.

Note 2 – If a WRU is received by the CF, the rearranged Teletex terminal identification, which is described in Note 3 to Figure 2/F.201, is to be returned.

Note 3 – This step is only necessary if the answerback was not available during normal telex procedures.

Note 4 – Service message indicating that the call is being made by a telex automatic emitting device and showing clearly the origin of the call. The coding of the service message to be returned is the following:

$$\downarrow \leftarrow \equiv \text{CI} \leftarrow \equiv \text{TTX} \rightarrow \emptyset$$

Note 5 – Reference of the message is the Teletex date and time of the message input, in the following format:

$$\leftarrow \equiv \downarrow \text{REF} \rightarrow \uparrow \text{yy} \rightarrow \text{mm} \rightarrow \text{dd} \rightarrow \text{hh:mm} \leftarrow \equiv \text{xxx xxx} \leftarrow \equiv$$

Remark: xxx xxx ← ≡ is an additional reference and is optional.

Note 6 – See Figure 2/F.201, Note 3.

Note 7 – The CF shall transmit to the telex terminal the stored message in the format in which it was originated. See also § 3.1.3.3.3.

Note 8 – See § 3.1.3.3.4.

Note 9 – After text transmission is complete, the CF shall send to the telex terminal the Teletex answerback, as described in Note 3 to Figure 2/F.201.

Note 10 – The acknowledgement call is mandatory if the telex call is unsuccessful, but optional if the telex call succeeds.

Note 11 – 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.

FIGURE 4/F.201

Interworking in the Teletex to telex direction using one-stage selection procedure

3.2.2 *Service principles: telex to Teletex direction*

3.2.2.1 The general requirements developed in § 2.4 except § 2.4.3 are relevant for this method of interworking. For real-time CF, overflow or error conditions signalled by the called Teletex terminal shall be brought on-line to the attention of the calling telex subscriber (see also Annex B).

3.2.2.2 *Numbering plan and Teletex network environment*

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

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

3.2.2.2.3 The real-time conversion facility shall use the national selection information to establish the call to the Teletex terminal.

3.2.2.3 *Validation during selection*

Validation is implicit in a unique successful call set-up to the Teletex terminal.

3.2.2.4 *Text delivery to the Teletex terminal*

3.2.2.4.1 The text received from the telex terminal by the conversion facility shall be forwarded according to normal Teletex procedure, while both the telex and the Teletex terminals are on line.

3.2.3 *Figures 5/F.201 and 6/F.201 and appending notes of telex to Teletex procedure*

a) Figure 5/F.201 deals with the interworking using a real-time conversion facility.

b) Figure 6/F.201 deals with the interworking using a real-time conversion facility, for telex automatic emitting devices.

Note – Taking into account that most of the notes to the two figures are similar, the notes related to Figure 6/F.201 only emphasize the differences from notes to Figure 5/F.201.

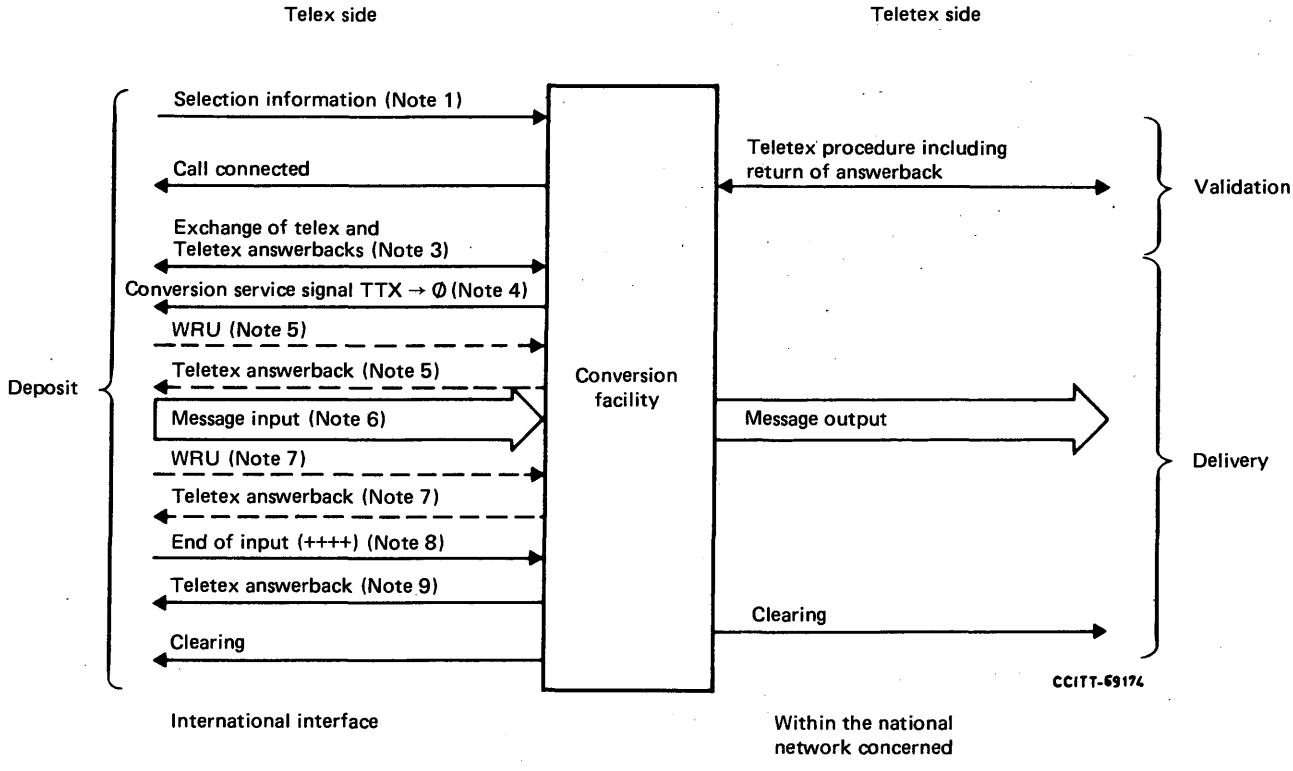


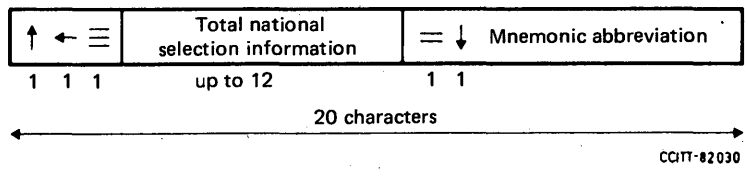
FIGURE 5/F.201

Interworking in the telex to Teletex direction using a real-time conversion facility (case of manual telex terminals)

Note 1 – The total selection information of the Teletex subscriber should not be longer than 12 digits.

Note 2 – See Recommendations T.91 and U.70.

Note 3 – The Teletex answerback sent to the telex subscriber is a rearranged Teletex terminal identification, as follows:



where

↑ is a figure shift, ← is a carriage return, ≡ is a line feed, ↓ is a letter shift and → is a space.

i) The total national selection information contains the national access code to the CF (if necessary), the network identification as mentioned in Recommendation X.121 (if necessary) and the national Teletex subscriber number (Part 2 of the Teletex terminal identification), but should not include the additional information (Part 3 of the Teletex terminal identification).

There should be no separators in the numeric part of the Teletex answerback.

ii) If the length of the Teletex answerback above *exceeds* 20 characters, including control characters, the final part of the mnemonic abbreviation shall be omitted so as to reduce the total length to 20 characters.

iii) If the length of the Teletex answerback above is *less* than 20 characters, unused character positions shall be filled in accordance with Recommendation F.60.

Note 4 – i) There shall be an interval between the sending of the Teletex answerback and the sending of the conversion service signal. This interval is provisionally set to 800 ms. If information is sent by the telex subscriber within this period, no "TTX→Ø" service signal is sent by the CF and the CF will enter into the input mode.

ii) TTX is the telex/Teletex conversion facility; Ø is the telex network identification code as provided in Recommendation F.69.

Note 5 – The CF shall accept the possible occurrence of an extra WRU at this stage. The answerback returned by the CF is the Teletex answerback received during the call establishment. (See Note 3.)

Note 6 – The CF shall wait at least 15 seconds for the message input. See also Annex B for abnormal conditions during text input.

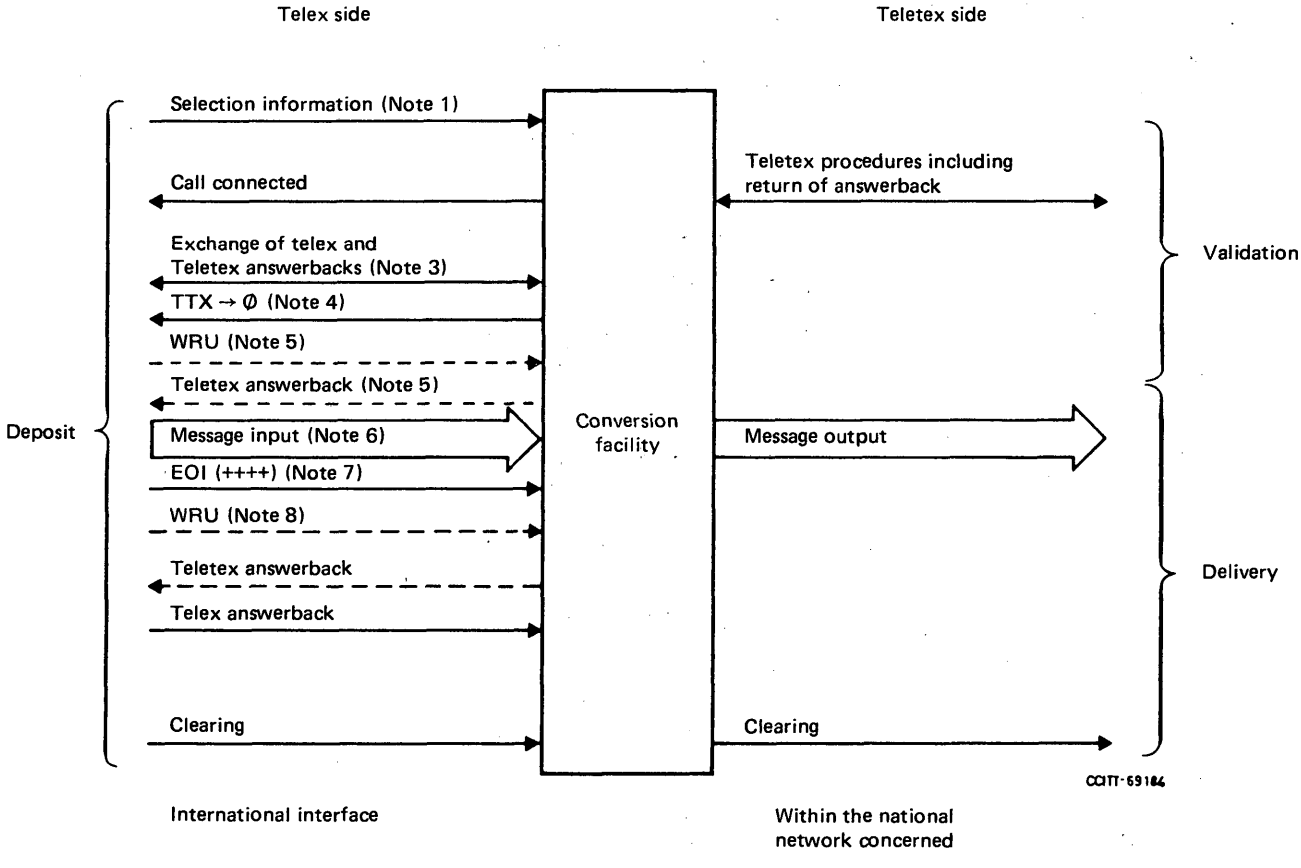
Note 7 – i) This procedure is recommended but not mandatory. See Recommendation F.60.

ii) The answerback returned by the CF is the Teletex answerback received during the call establishment (see Note 3).

Note 8 – i) This end of input (EOI) signal is the plus symbol (ITA2 combination No. 26 figure case) repeated four times (+ + + +). This EOI signal needs not to be transferred to the Teletex side.

ii) If the caller clears without the EOI signal, the CF will endeavour to deliver the message as received. However, customers must be clearly warned that the CF cannot guarantee delivery in these circumstances.

Note 9 – The CF shall wait 800 ms for a WRU after EOI. If no WRU is received within this period, the terminal is considered as a manual one, and in this case, the return of the Teletex answerback, as described in Note 3, is an "on-line" delivery acknowledgement for the telex user. If WRU is received within this period, the terminal is considered as a telex automatic emitting device. (See Figure 6/F.201.)



Notes 1 to 6 – Same as for Figure 5/F.201.

Note 7 – Same as Note 8, Figure 5/F.201.

Note 8 – The CF shall wait 800 ms for WRU after EOI. The telex terminal is considered a telex automatic emitting device if a WRU is received by the CF within this period. The returned Teletex answerback (received during call establishment) confirms that the connection is still established but does not guarantee the delivery to the Teletex terminal of the text received so far by the CF.

FIGURE 6/F.201

Interworking in the telex to Teletex direction using a real-time conversion facility (case of Telex Automatic Emitting Devices, TAEDS)

3.2.4 *Service principles: Teletex to telex direction*

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

3.2.4.2 *Text deposit to the conversion facility by the Teletex terminal*

The Teletex terminal shall deliver the message to the real-time conversion facility (which emulates a Teletex terminal) following the normal Teletex procedure. The Teletex terminal will clear the call at the end of the text transfer.

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

3.2.4.3.1 The principles of Recommendation U.40 shall apply for call establishment reattempt requirements.

3.2.4.3.2 Before forwarding the text, to ensure security of delivery the telex answerback is taken and compared with the telex answerback given by the Teletex subscriber. The method of validation is the responsibility of the Administration operating the CF.

3.2.4.3.3 The text received from the Teletex terminal by the conversion facility shall be forwarded while both telex and Teletex terminals are on-line, using normal telex procedure.

3.2.4.3.4 If any signal is received from the telex network during the text delivery to the telex terminal, the call shall be cleared.

3.2.4.3.5 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 of answerbacks, 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 no reattempt may be made by the real-time conversion facility.

3.2.4.3.6 A normal clearing phase, according to Recommendation T.62, will ensure to the Teletex terminal a correct delivery of the text to the telex terminal.

3.2.5 *Figure 7/F.201 and appending notes of Teletex to telex procedure*

Figure 7/F.201 shows the interworking in the Teletex to telex direction using a real-time conversion facility.

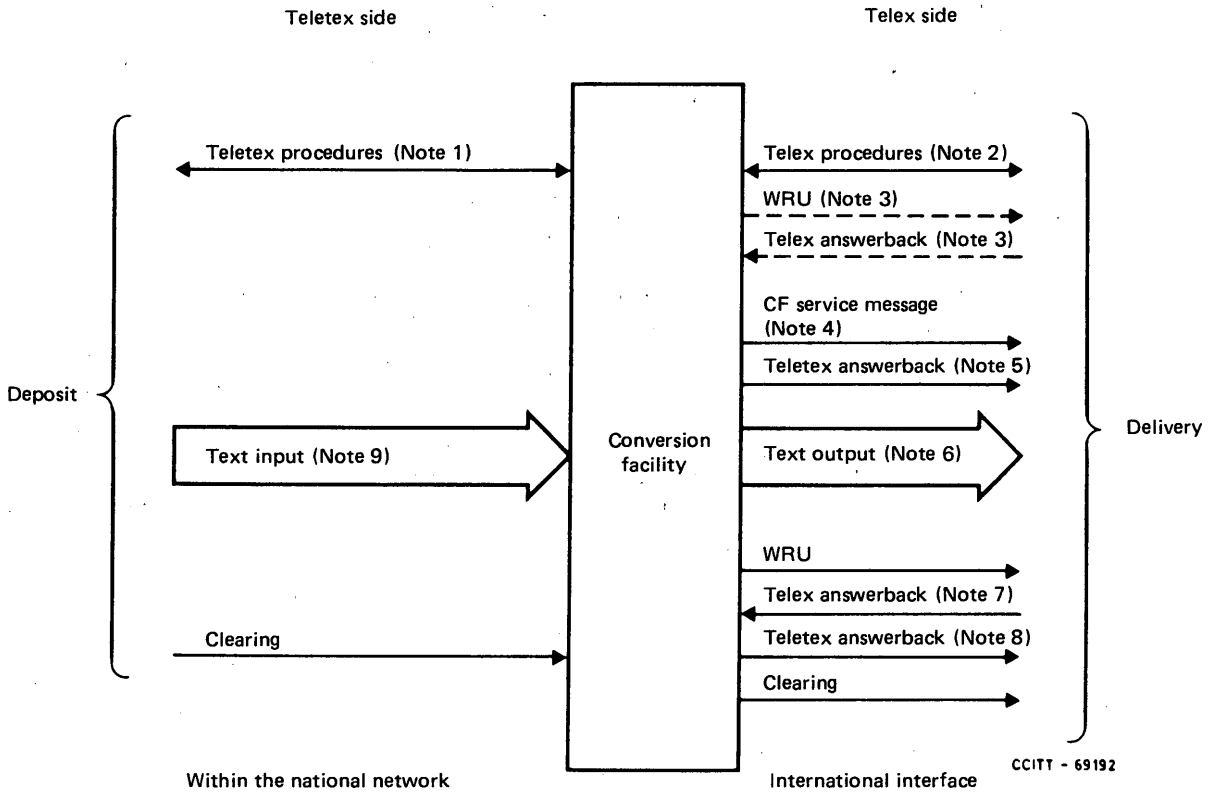
4 Interworking with two-stage selection for telex to Teletex procedure

4.1 *Service principles: telex to Teletex direction*

4.1.1 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.



Note 1 – See Recommendation T.90.

Note 2 – If a WRU is received by the CF, the rearranged Teletex terminal identification, which is described in Note 3 of Figure 5/F.201, is to be returned.

Note 3 – This step is only necessary if the answerback was not available during normal telex procedures.

Note 4 – Service message indicating that the call is being made by a telex automatic emitting device and showing clearly the origin of the call. The coding of the service message to be returned is the following:

$$\downarrow \leftarrow \equiv \text{CI} \leftarrow \equiv \text{R} \rightarrow \text{TTX} \rightarrow \text{Ø}$$

where:

↑ is a figure shift, ← is a carriage return, ≡ is a line feed, → is a space and ↓ is a letter shift.

Note 5 – See Figure 5/F.201, Note 3.

Note 6 – The CF shall transfer to the telex terminal the message in the format in which it was originated. See also § 3.2.4.3.4.

Note 7 – See § 3.2.4.3.5.

Note 8 – After text transmission is complete, the CF shall send to the telex terminal the Teletex answerback (see Note 3 of Figure 5/F.201) and clear.

Note 9 – Administrations should advise their customers of the meaning and possible consequence of using special telex character sequences (see Recommendation S.4) in the submitted text.

FIGURE 7/F.201

Interworking in the Teletex to telex direction using a real-time conversion facility

4.1.3 *Validation*

4.1.3.1 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 (see also Note 2 of Figure 8/F.201).

4.1.3.2 The two recommended validation methods are:

a) validation call to the Teletex subscriber,

b) automatic checking in a data base.

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

4.1.3.4 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.

4.1.3.5 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.

4.1.3.6 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).

TABLE 1/F.201

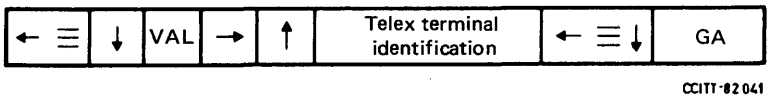
Action of CF following validation result

Telex emitter state following the Teletex address input	Action of CF when validation result becomes available	
	Positive result	Negative result
Inputting own telex address	Wait for end of address input and send positive validation answer as defined in § 4.1.3.8.	Interrupt input with "TTT..." characters. If input stops, send telex service signal and clear. If not, clear the call.
Waiting to start input (see Note)	Send positive validation answer as defined in § 4.1.3.8.	Send telex service signal and clear.
Message input in progress	Wait for end of input and send positive validation answer as in § 4.1.3.8, with GA replaced by the IMA message.	Interrupt input with "TTT..." characters. If input stops, send telex signal and clear. If not, clear the call.
Input finished and waiting	Send positive validation answer as in § 4.1.3.8, with GA replaced by the IMA message.	Send telex service signal and clear.
Subscriber has cleared the call	No action.	Recall subscriber and send an appropriate NDN.

Note – If the validation result is not available within 5 seconds, the CF shall return GA, continue the validation process, and wait for text input. (See § 4.1.3.6.)

4.1.3.7 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.

4.1.3.8 The format of the positive validation answer and the GA signal is:



The Teletex terminal identification is the Teletex subscriber directory information, according to Recommendation F.200.

For a negative validation answer, see § 2.4.2.

4.1.4 *Capture of the calling telex address*

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

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

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

4.1.5 *Input message acknowledgement*

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

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

The structure of the input message acknowledgement is as follows:

←≡↓IMA→ ↑yy→ mm→ dd→ hh:mm ←≡xxx xxx←≡

Note – xxx xxx←≡ is an additional reference number and is optional.

4.1.6 *Text delivery and clearing*

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

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

4.1.6.3 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.

4.1.6.4 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 11/F.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.

4.1.6.5 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.)

4.1.6.6 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 message has the format and content shown in Figure 8/F.201.

Telex subscriber's answerback

Content:

↑←≡CF NATIONAL NUMBER→↓T→TTX→Ø [↓]

←≡←≡

←≡NDN [→TELETEX]

←≡↑YY→MM→DD→HH:MM←≡ (Date and time of the CF)

←≡↓TELETEX→ADDRESS↑:XX– – –XX (Received Teletex address by the CF)

←≡↓IMA→↑YY→MM→DD→HH:MM←≡[xxxxxx←≡] (The same information as given after the input of the message)

←≡↓CAUSE↑:xxx←≡ (Telex service signal of the last delivery attempt, as specified in Recommendation U.70)

←≡←≡

Telex subscriber's answerback

↑←≡CF NATIONAL NUMBER→↓T→TTX→Ø

←≡(8x)

↑: Figure shift
←: Carriage return
≡: Line feed
↓: Letter shift
→: Space
(8x): Eight times

Note – Text given in [ ] is optional.

FIGURE 8/F.201

4.2 *Figures 9/F.201 and 10/F.201, with appending notes of telex to Teletex procedure*

a) Figure 9/F.201 deals with the general interworking using store and forward CF in the telex to Teletex direction.

b) Figure 10/F.201 deals with this interworking in case of telex automatic emitting devices.

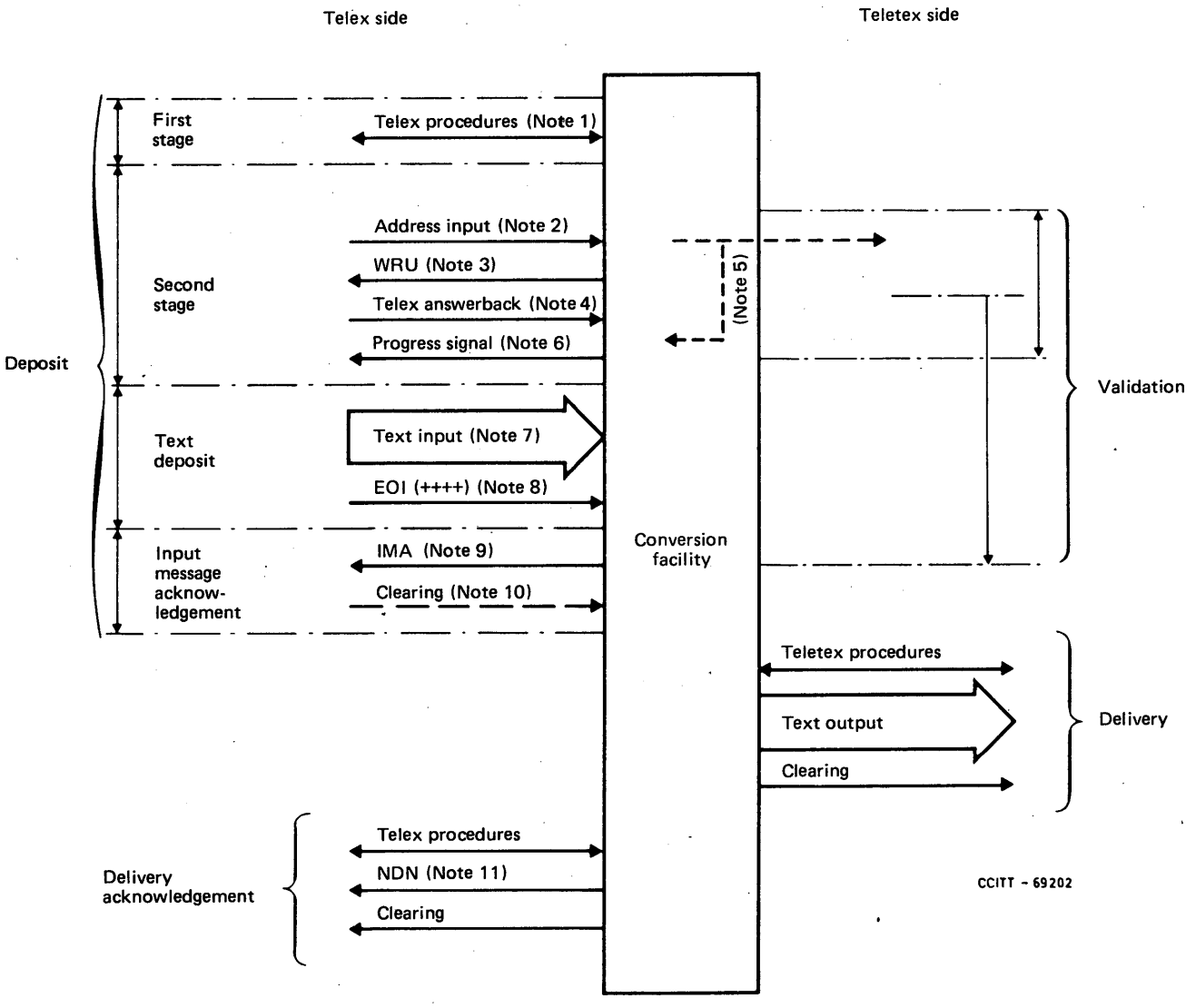
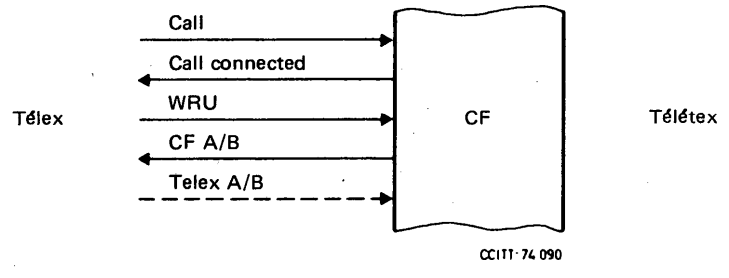


FIGURE 9/F.201

Interworking in the telex to Teletex direction using two-stage selection procedure (case of manual telex terminals)

Note 1 – An example of telex procedures is:

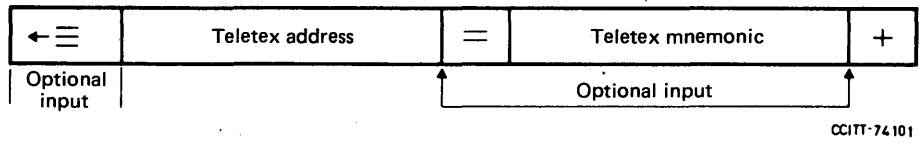


If a WRU is received by the CF, it shall return its answerback. Coding of the CF answerback is the following:

$$\uparrow \leftarrow \equiv \underbrace{\text{CF NATIONAL NUMBER}}_{\text{up to 7 digits}} \rightarrow \downarrow T \rightarrow TTX \rightarrow \emptyset$$

Note 2 – Address input:

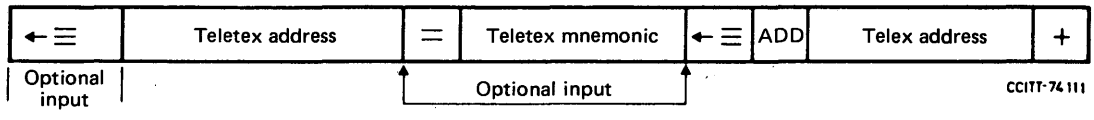
Case 1: If the telex subscriber has a processable answerback (according to Recommendation U.74) minimum address input is:



Teletex address is the all-numeric string necessary to select the Teletex terminal, i.e.:

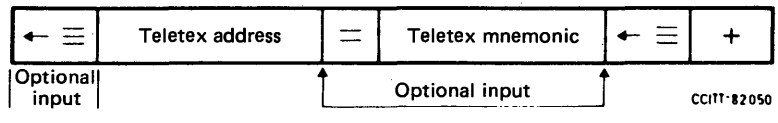
- if there is only one network supporting the Teletex service, the Teletex address is the national Teletex number;
- if there is more than one network supporting the Teletex service, the Teletex address includes the DNIC/TCC number according to Recommendation X.121. DNIC or TCC may be separated from the national Teletex number by a hyphen (-), Combination No. 1 of ITA2.

Case 2: If the telex subscriber has a non-processable answerback (according to Recommendation U.74), he should input the following string:



Telex address is the Recommendation F.69 code followed by the national telex number. Any spaces shall be ignored by the CF.

Remark: A telex subscriber may skip the input of his address by transmitting:



In this case no "ADD" signal should be sent by the CF.

The signal "+" is the end of address signal, not to be used within the address line other than to indicate "end of address"

Note 3 – WRU signal should be sent immediately after the address input.

Note 4 – If the returned telex answerback cannot be processed according to Recommendation U.74 and if no telex address was input, and no skipping indication was given (see Note 2, Case 2), then the CF shall request the telex address with a specific prompt signal ADD.

Remark: The telex address input in response to this ADD must be terminated with a "+", Combination No. 26 of ITA2 in figure case.

If a telex address is not received within 15 seconds after the prompt signal ADD has been sent, the CF should proceed by sending back a GA signal. In this case, an NDN signal cannot be sent to this telex user.

Note 5 – Validation of the Teletex address by means of a validation call or data base retrieval of the Teletex address (see § 4.1.3 and Table 1/F.201).

Note 6 – See details in § 4.1.3 and Table 1/F.201.

Note 7 – See § 2.4.5 and Annex B to this Recommendation.

Note 8 – EOI is coded as four ITA2 Combination No. 26 "+ + + +" in figure case. This EOI signal needs not to be transferred to the Teletex side.

Note 9 – Content of IMA is defined in § 4.1.5.

Note 10 – The telex user may maintain connection at this step of the procedure in order to obtain an on-line delivery acknowledgement (see § 4.1.6).

Note 11 – After the call reattempt procedures have been completed and the message cannot be delivered to the Teletex terminal, a non-delivery notification (NDN) should be sent to the originating telex customer (see § 4.1.6.6).

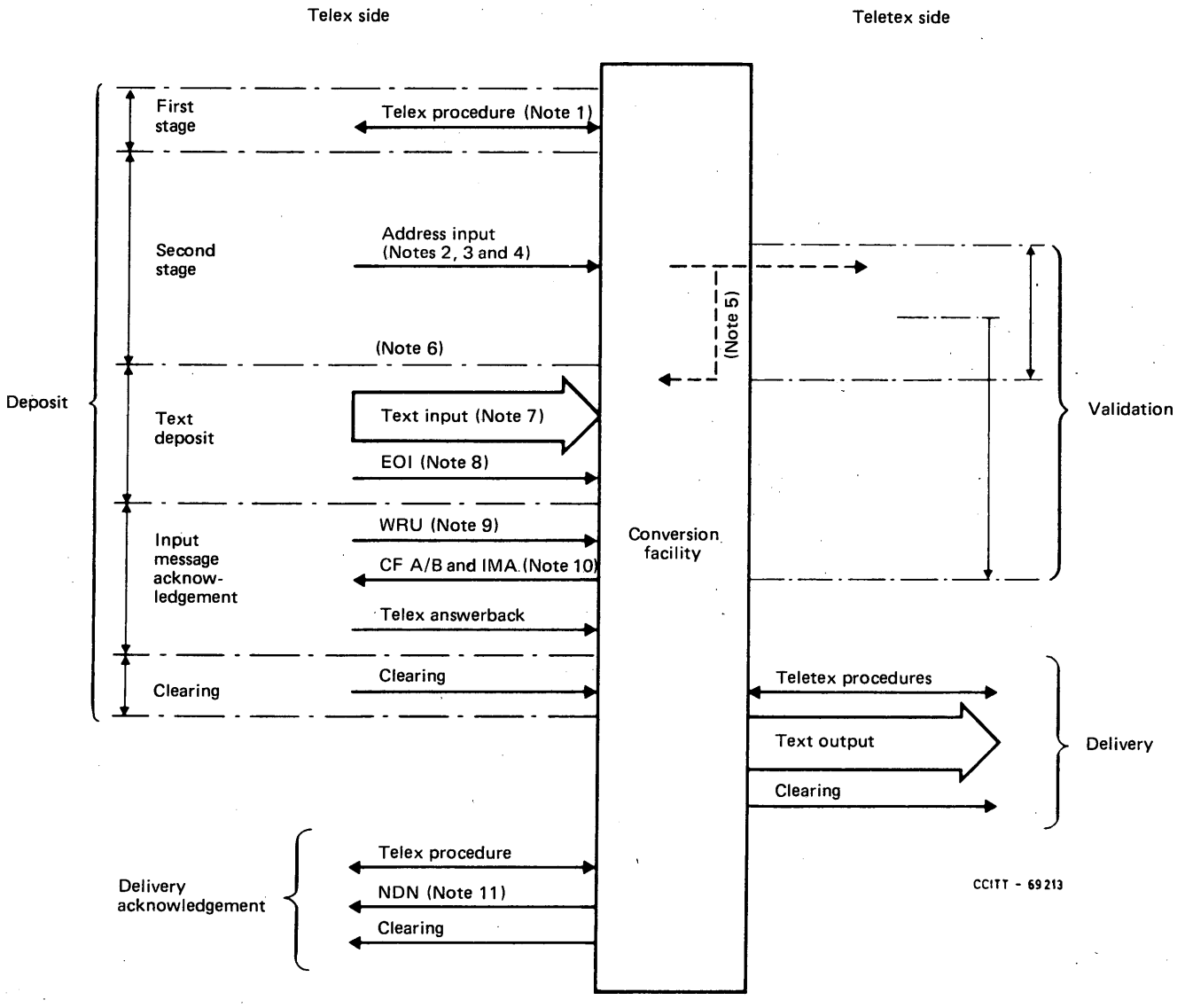
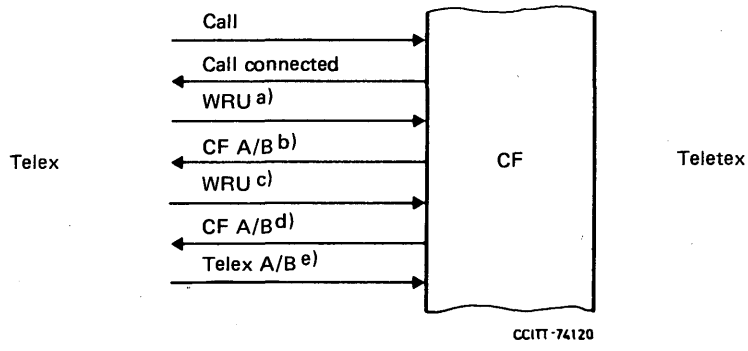


FIGURE 10/F.201

Interworking in the telex to Teletex direction using two-stage selection procedure (case of telex automatic emitting devices)

Notes relative to Figure 10/F.201:

Note 1 – An example of a call procedure by means of a telex automatic emitting device is shown below:



a) Network generated WRU.

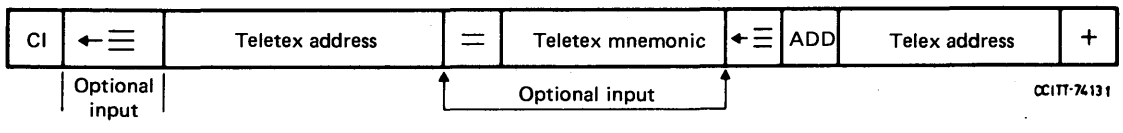
b) CF answerback may be preceded by date/time information and register numbers, etc. and may be followed by a recorded message.

c) WRU generated by Telex automatic emitting devices.

d) Clear CF answerback for validation purposes.

e) Telex automatic emitting devices transmit their answerback at this stage in accordance with Recommendation F.60, § A.1.

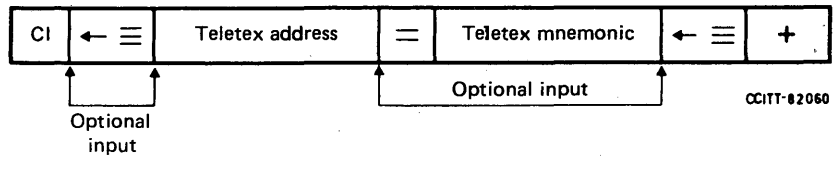
Notes 2, 3 and 4 – Whether or not the telex subscriber has a processable answerback (according to Recommendation U.74), he should input his telex address as described below:



– The start of address "CI" informs the CF that prompts, that validation information and WRU signal must not be returned to the telex automatic emitting devices.

– Teletex address and telex address have the same definition as in Note 2 to Figure 9/F.201.

Remark – A telex subscriber may omit his address input either inadvertently or intentionally by transmitting:



Note 5 – Same as for Figure 9/F.201.

Note 6 – If the validation result is negative, the CF should transmit TTT ... (Recommendation F.60) to interrupt the telex terminal transmission. If the terminal continues to transmit for more than 20 seconds, the CF shall clear the call. This will be followed, after a pause of one second, by the appropriate service signal according to Recommendation U.70 and clear.

Notes 7, 8 – Same as for Figure 9/F.201.

Note 9 – The clearing procedure is in accordance with Recommendation S.20.

Note 10 – i) If positive validation result becomes available during input, the CF will indicate this after receiving the whole text by sending its answerback followed, without pause, by the validation result and the IMA as defined in §§ 4.1.3 and 4.1.5 respectively.

ii) If the validation result is positive, but abnormal conditions have occurred during text input (see Annex B), the CF will send a service code instead of its answerback.

iii) If the validation result is negative but arrived after text input, the CF answerback will be replaced by a service signal as defined in Recommendation U.70.

iv) If a second WRU is sent by the telex terminal, the CF should return only its answerback (this will be compared by the telex caller with that obtained during the first stage of procedure, to confirm that the call is still connected).

Note 11 – Same as for Figure 9/F.201.

4.3 *Service principles: Teletex to telex direction*

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

4.3.2 *Text deposit on 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 will clear the call after text deposit without waiting for the delivery to the telex terminal.

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

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

4.3.3.2 Before forwarding the text, to ensure security of delivery, the telex answerback is taken and compared, with the telex answerback given by the Teletex subscriber. The method of validation is the responsibility of the Administration operating the CF.

4.3.3.3 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 message text shall be preceded by "POSSIBLE DUPLICATE MESSAGE".

4.3.3.4 After text transmission is completed, the (telex) answerback should be taken and compared with that received at the start of message delivery. In the event of a mismatch of answerbacks, 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".

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

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

4.4 *Figure 11/F.201 and appending notes of Teletex to telex procedure*

Figure 11/F.201 shows the interworking in the Teletex to telex direction using the two-stage selection procedure.

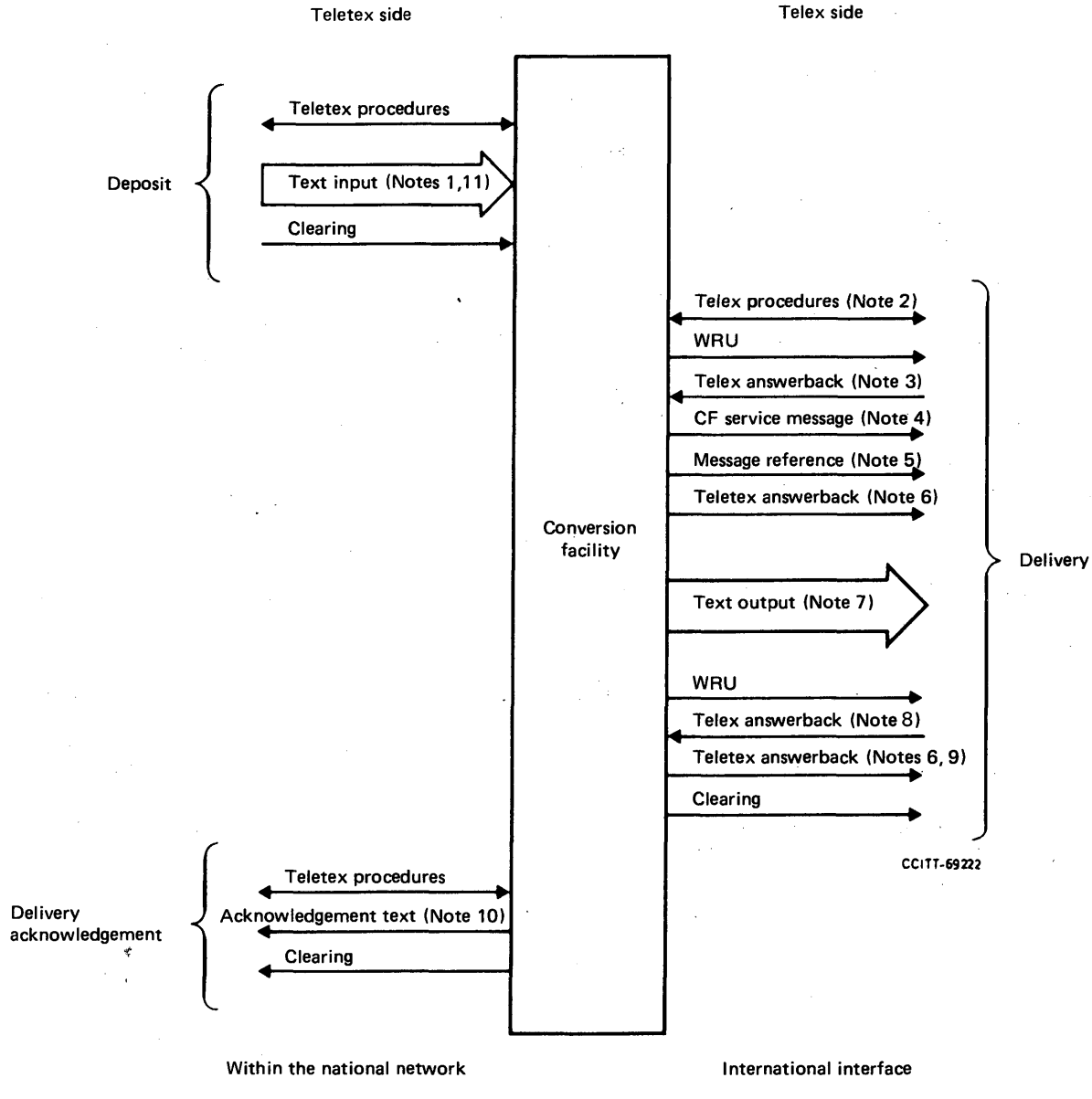


FIGURE 11/F.201

Interworking in the Teletex to telex direction using two-stage selection procedure

Note 1 – See Recommendation T.90.

Note 2 – If a WRU is received by the CF, it shall return its answerback. Coding of the CF answerback is the following:

$$\uparrow \leftarrow \equiv \underbrace{\text{CF NATIONAL NUMBER}}_{\text{up to 7 digits}} \rightarrow \downarrow T \rightarrow TTX \rightarrow \emptyset$$

Note 3 – See § 4.3.3.2.

Note 4 – Service message indicating that the call is being made by an automatic installation and showing clearly the origin of the call.

The coding of the service message to be returned is the CF telex answerback (as described in Note 2) preceded by "$\downarrow \leftarrow \equiv$ CI".

Note 5 – Reference of the message is the Teletex date and time of the message input in the following format:

$$\leftarrow \equiv \downarrow \text{REF} \rightarrow \uparrow yy \rightarrow mm \rightarrow dd \rightarrow hh{:}mm \leftarrow \equiv xxx\ xxx \leftarrow \equiv$$

Remark: "xxx xxx $\leftarrow \equiv$" is an additional reference and is optional.

Note 6 – This rearranged Teletex terminal identification (or "Teletex answerback") contains the Teletex subscriber 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 answerback will contain the mnemonic part of the Teletex identification.

Note 7 – The CF shall transmit to the telex terminal the stored message in the format in which it was originated.

Note 8 – See § 4.3.3.4.

Note 9 – After text transmission is complete, the CF shall send to the telex terminal the Teletex answerback (see Note 6 above).

Note 10 – The acknowledgement call is mandatory if the telex call is unsuccessful but optional if the telex call succeeds.

Note 11 – Administrations should advise their customers of the meaning and possible consequences of using special telex character sequences (see Recommendation S.4) in the submitted text.

ANNEX A

(to Recommendation F.201)

TABLE A-1/F.201

Table giving the method of interworking in use for each Administration and/or RPOA

Country	Interworking method(s) [a]	CF prefix for one-stage selection or CF telex number for two-stage selection	Type of date and time [b]

[a] O one-stage selection interworking.
T two-stage selection interworking.
R Real-time interworking (one-stage selection).

[b] UCT or local time

ANNEX B

(to Recommendation F.201)

Reactions to abnormal conditions during the telex input

B.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 subscriber.

B.2 *Telex subscriber 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.

B.3 *Telex subscriber 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 subscriber 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 in the case of real-time interworking, clear the call and forward the message to the Teletex subscriber in case of store and forward interworking.

B.4 *Telex subscriber 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 Figures 2/F.201 or 5/F.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 § B.1 above;
- if WRU is followed by an idle condition, the conversion facility proceeds as in § B.3 above.

B.5 *Telex subscriber 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 stop the telex transmission and then send an input message acknowledgement signal followed by clearing. After clearing, the message should be normally forwarded to the Teletex terminal.

B.6 *Telex subscriber clearing after the end of input signal and before the input message acknowledgement signal*

The message shall be normally forwarded to the Teletex terminal.

B.7 *Telex subscriber 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.

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

Reactions to the detection of distortion are a national matter.

B.9 *Telex subscriber sending a bell signal*

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

B.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 12 000 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 subscriber 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 subscriber that the message may be incomplete.

Note – For real-time conversion facilities, it is the available storage in the called Teletex terminal which may impose a limitation on the text length.

In case of an overflow, the Teletex terminal shall inform the CF, using normal Teletex procedure. The CF will then try to stop the telex terminal as indicated above. However, no IMA shall be returned before clearing.

ANNEX C

(to Recommendation F.201)

Provisional definition of terms

C.1 *General glossary*

C.1.1 **interworking**

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

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

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

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

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).

C.1.4 **store and forward conversion facility (CF using store and forward principles)**

CFs that "store" the received telex (or Teletex) messages before "forwarding" them to the called Teletex (or telex) terminal (see Recommendation F.201, §§ 3.1 and 4; see also § C.1.5 below).

C.1.5 **real-time conversion facility (real-time interworking)**

Such a CF shall transfer a message, in a unique communication, from a telex terminal to a Teletex terminal, and from a Teletex terminal to a telex terminal, without storage of the message (see Recommendation F.201, § 3.2).

C.1.6 **validation of the called Teletex terminal [validation result (positive or negative)]**

This validation is performed by the CF to verify that the Teletex terminal is an available one, 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, § 4.1.3).

C.1.7 **message deposit/message delivery (text deposit/delivery)**

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 (see Recommendation F.201, §§ 2.4.5 and 2.4.6).

C.1.8 **on-line delivery acknowledgement: 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, Note 10 to Figure 2/F.201, Note 9 to Figure 5/F.201 and § 4.1.6).

C.1.9 **non-delivery notification: NDN / positive delivery notification: 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 T2-defined 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 (see Recommendation F.201, §§ 3.1.3.4 and 4.1.6).

Note 1 – The NDN facility is not provided in the first method of interworking for the telex to Teletex direction (see Recommendation F.201, §§ 3.1.1, 3.1.2, 3.2.1 and 3.2.2).

Note 2 – The PDN facility, i.e. the ability of the CF to send back a proof of the delivery, is for further study.

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

C.2.1 **CF prefix**

In the first 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 (see Recommendation F.201, §§ 3.1 and 3.2).

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

C.3.1 **CF national number**

In the second 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 (see Recommendation F.201, § 4).

C.3.2 **input message acknowledgement: 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, § 4.1.5).

C.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 acknowledgement
SOA	Start of address
TAED	Telex automatic emitting devices
TCC	Telephone country code (Recommendation X.121)
TTX	Teletex

C.5 *Codes*

ADD Manual input of the telex ADDress

CI Conversation impossible (Recommendation F.60)

IMA Code of the IMA in the IMA message

ITL I'll transmit later (Recommendation F.60)

GA Go ahead (Recommendation F.60)

LDE Telex service signal for message Length exceeDEd indication

NDN Code of the non-delivery notification in the NDN message

REF Code of the reference of the message delivered to the telex side

TTX Code for designating the CF in the conversion signal

VAL Code of the positive validation answer

WRU Who aRe yoU (Recommendation F.60)

Ø Letter code for the CF's country (Recommendations F.60/F.69)

BK, NA, NC, NP Telex service signals for error conditions (Recommendation F.60)

SECTION 3

VIDEOTEX SERVICE

Recommendation F.300

VIDEOTEX SERVICE

CONTENTS

1 Scope

1.1 This Recommendation describes the superset of characteristics and functions of international Videotex services.

1.2 The characteristics and functions of Videotex services are specified to ensure that users of a Videotex service are able to access Videotex services in other countries operating in accordance with Recommendations T.100 and T.101 and other relevant CCITT Recommendations.

1.3 The organisational and technical structures used to configure the service may differ from country to country depending on national circumstances. In particular, whether an Administration is a Videotex service provider will depend on national circumstances. However, it is the responsibility of Administrations to ensure that telecommunications facilities permit users to access Videotex services in other countries, subject to bilateral agreements and/or current regulations of both countries.

2 Definition of terms

2.1 Videotex service

2.1.1 *General*

A Videotex service is an interactive service which provides, through appropriate access by standardized procedures, for users of Videotex terminals to communicate with data bases via telecommunication networks.

The Videotex service includes the following set of characteristics:

1) information is generally in an alphanumeric and/or pictorial form;
2) information is stored in a data base;
3) information is transmitted between the data base and users by telecommunication networks;
4) displayable information is presented on a suitably modified television receiver or other visual display device;
5) access is under the user's direct or indirect control;
6) the service is easily operated by the general public as well as specialist users, i.e. the service is user-friendly;
7) the service provides facilities for users to create and modify information in the data bases;
8) the service provides data base management facilities which allow information providers to create, maintain and manage data bases and to manage closed user group facilities.

2.1.2 **videotex service profile**

The set of functionalities required by a Videotex service.

2.2 videotex service facilities

2.2.1 *General*

A Videotex service facility is an application layer implementation in a Videotex service, providing a specific, clearly defined facility to Videotex users. Videotex service provides users with a number of such service facilities.

2.2.2 information retrieval

A Videotex service facility in which a user obtains information by means of a dialogue with a data base.

2.2.3 transaction

A Videotex service facility which allows users to create and/or modify information stored in a data base. Access to these facilities will generally require special functions and procedures to authenticate the authority to access. This service facility includes, but is not limited to, transactions leading to or influencing a commercial relationship between users and information providers.

2.2.4 message handling

A Videotex service facility which allows users to communicate with each other by storing messages in a commonly accessible data base. These stored messages may either be retrieved by the user or delivered automatically.

2.2.5 terminal-to-terminal messaging

A Videotex service facility which, by providing routing and switching functions, enables users or terminals to send and receive messages in a conversational manner. This does not preclude direct terminal-to-terminal messaging using existing networks.

2.2.6 data processing

A Videotex service facility which allows the user to employ processing and storage capacity either at the host computer or by downloading a program or other data into suitable Videotex terminal equipment.

2.2.7 interworking with other Telematic services

Videotex service facilities which allow users to access the facilities and/or users of other telematic services and vice versa.

2.3 *Participants in Videotex service*

2.3.1 **videotex service provider**

A party responsible to the user for the provision and operation of a Videotex service.

2.3.2 **information provider**

A party responsible by agreement with a Videotex service provider for providing information or transaction facilities to Videotex service users. The information provider may or may not operate the host computer on which the data base is stored.

2.3.2.1 **internal information provider**

An information provider whose data bases are stored on and/or whose facilities are provided by means of the service provider's host computer(s).

2.3.2.2 **external information provider**

An information provider whose data bases are stored on and/or whose facilities are provided by means of host computers not provided by the service provider.

2.3.3 **communications network provider**

A party responsible by agreement with a Videotex service provider for providing telecommunication services for interconnecting user terminals, information provider equipment and/or Videotex host computers.

2.3.4 **videotex user**

A person who, by means of a Videotex terminal, uses the Videotex service.

2.3.5 **closed user group**

A group of users who are permitted access to parts of a data base or other Videotex service facilities that are not available to other users.

2.4 **videotex systems**

2.4.1 *General*

A Videotex system is the hardware and software used to implement a Videotex service. For examples of possible service configurations, see Annex A.

2.4.2 **videotex terminal**

The equipment by means of which the user interacts with the Videotex service. A typical Videotex terminal includes:

1) a numeric keypad and/or alphanumeric keyboard and/or other graphical input devices;
2) a visual display unit (often a suitably modified television receiver);
3) identification capability, either automatic or manual;
4) electronic processing and storage devices required to interface these components to the telecommunications network and to generate the display.

The terminal may also provide a direct terminal-to-terminal capability, and may include other components, such as a hard copy output unit, magnetic or optical storage devices, and additional processing and/or storage devices.

2.4.3 **telecommunication network**

Telecommunications means for transmission of Videotex information.

2.4.4 **host computer**

The computer (or network of computers provided by a single party) on which one or more data bases are stored and/or one or more other Videotex service facilities are provided.

2.4.4.1 **external host computer**

A host computer not operated by the service provider.

2.4.5 **videotex service centre**

A computer used by the Videotex service provider to authorize access to a Videotex service. Other functions of the service centre may include assistance to users in selecting the particular data base required (either provided by the service centre or by other host computers), as well as management facilities such as billing, statistics gathering, etc. The same computer may also be a host computer and/or provide a gateway function.

2.4.6 **videotex gateway**:

A function of a computer providing access to data base(s) of other computer(s). This may include selection and/or protocol conversion and/or dialogue handling functions.

2.4.7 **data base**

A set of information and/or transaction facilities that can be accessed by, or made available to, users.

2.4.7.1 **frame**

The information that is retrieved by a single user function from a terminal and presented as a complete entity (full screen contents or parts of the screen, e.g. areas on the screen) by the terminal, but may include information that requires scrolling before it is displayed and may include dynamic effects such as overwriting. Local user action may take place within a frame.

2.4.7.2 **page**

An organised set of one or more frames.

3 Functionalities of the service

3.1 *General*

3.1.1 § 3 describes the various facilities that may be used to convey information by the Videotex service. These facilities may be common to all Videotex services or be used only by some services according to service profile(s) in use.

3.1.2 In order to ensure non-obsolescence of the data bases, and to permit international exchange of data, a range of service profiles should be defined by comparing the service profile assumed in preparing a data base and the service profile of a user terminal. It will then be possible to determine whether the terminal can represent the data exactly, whether an acceptable fall-back representation may be possible, whether transcoding or conversion is required or whether the data cannot be acceptably represented.

3.1.3 Data bases may require knowledge of terminal capabilities and/or limitations in order to exercise discretion in limiting access to data when displayed information may not convey the complete meaning (as interpreted by the data base) of a frame, due to the absence of one or more applications, presentation or session functions of the terminal.

3.2 *Application level*

3.2.1 The application level describes the functions of the Videotex service that enable users to access and use the different applications. While it is desirable that all Videotex services employ the same keying sequences and visual identifiers for these functions, further studies are required. Some keying sequences may be used for more than one

function. Some of these functions may be implicit in other functions and some functions may not be implemented or appropriate in some Videotex services. Additional functions may be required subject to further study.

3.2.2 *Control functions*

The following control functions may be used:

a) Function C1: clear an unwanted entry.

b) Function C2: interrupt the action in progress (e.g. transmission of information, computation).

c) Function C3: terminate and declare valid an input from the terminal.

3.2.3 *Service functions*

These functions may be used within the service, according to implementation. From the user point of view they are selected by routing to or selecting an appropriate point in the Videotex service:

a) Function S1: select an application provided by the Videotex service (containing an identification of the application).

b) Function S2: return to the point where the first effective choice in the Videotex service is offered.

c) Function S3: leave the Videotex service.

d) Function S4: leave the Videotex service with billing information.

e) Function S5: provide billing information without leaving the service.

3.2.4 *Retrieval functions*

The following functions may be used to retrieve items of information:

a) Function RO: give, by use of keyword searching, direct or indirect access to a page or frame.

b) Function R1: give direct access to a page or to a frame if it is directly retrievable.

c) Function R2: progress through a choice from one frame to another page or, if it is directly addressable, to another frame. The destination page or frame for each possible choice is determined by the information provider when the reference frame is input to the host computer.

d) Function R3: progress from one frame to the next frame in the same page. On the last frame of a page, function R3 may have no effect on the display except possibly to generate an appropriate service message, or it may give access to any page or directly retrievable frame in the data base.

e) Function R4: return from one frame to the previous frame in the same page. On the first frame of a page function R4 may have no effect on the display except possibly to generate an appropriate service message.

f) Function R5: restore the displayed image with the information unchanged (for example, where a transmission error is suspected; within a certain time limit).

g) Function R6: repeat the same frame with any changes that may have been made since the last access.

h) Function R7: retrace the previous progression of the user's action. The number of possible steps in this retrace may need to be limited and certain steps may be excluded from the retrace.

i) Function R8: give access to the immediately adjacent page in a routing structure in the direction towards the starting point of the structure.

j) Function R9: set a marker to the current page or, if it is directly retrievable, to the current frame for direct access at a later time within the same session.

k) Function R10: retrieve a marked page or frame (see Function R9).

l) Function R11: cause the entire display within the screen or display area to be scrolled one row upwards.

m) Function R12: cause the entire display within the screen or display area to be scrolled one row downwards.

3.2.5 *Functions common to all applications*

The following functions must be recognized by any application provided by the Videotex service, in addition to the control functions specified in § 3.2.2 above:

a) Function F1: return to service level.

Note – Contingent upon definition of service level.

b) Function F2: "service assistance" – give information about the service without disturbing the status of the session.

c) Function F3: "application assistance" – give appropriate assistance within the application.

d) Function F4: give access to the data base identification page.

3.2.6 *Data collection functions*

In order to handle data collection, the following functions may be used:

a) erase a character or a string of characters;

b) format effector functions;

c) forward or abstain from forwarding the contents of the input fields;

d) explicit or implicit termination of input fields.

3.3 *Presentation level*

3.3.1 *General principles*

3.3.1.1 This section provides a set of definitions and specifies a set of functional capabilities and possible enhancements for the presentation level of the international Videotex service.

3.3.1.2 The definitions provided, and functional capabilities specified in this section apply to text in its broad sense; i.e. text consisting of symbols, phrases or sentences in natural or artificial languages, pictures, diagrams and tables.

3.3.1.3 Each functional capability is individually specified independent of what implementation techniques or coding schemes are used by the terminal equipment. Specification of the repertoires and coding is the subject of Recommendations T.100 and T.101.

3.3.2 *Structure of display*

3.3.2.1 **defined display area**

The rectangular part of the screen that can be used by the Videotex service. Its structure may be redefined. (See Figure 1/F.300.)

3.3.2.2 **border area**

The part of the screen which is outside the defined display area. (See Figure 1/F.300.)

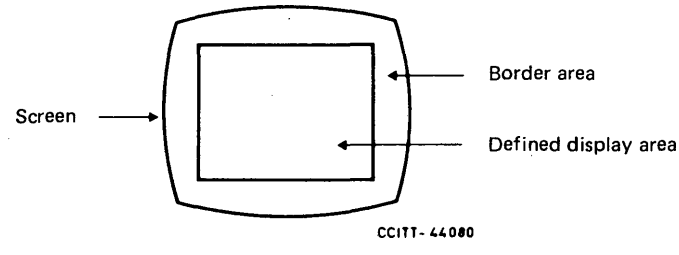


FIGURE 1/F.300

3.3.2.3 *Character location structure*

The defined display area is made up of an array of contiguous character locations in which each character location is the area needed for the display of one character in normal size including any space required to separate alphanumeric characters. In this structure each graphic element is displayed in one or more character locations on the defined display area.

3.3.2.4 *Cartesian coordinate structure*

Graphic elements are defined within a two-dimensional space using either normalized or absolute coordinates. Rectangular defined display areas map into the square coordinate space.

Normalized coordinates use a cartesian 0 to 1 (non inclusive) numbering scheme. As an example, in the case of a television screen with a 4:3 aspect ratio, the defined display area corresponds to 0 to 1 (non inclusive) in the X axis and 0 to approximately 0.75 in the Y axis. The drawing of graphic elements into the entire normalized coordinate space may be permissible but only the inscribed 4:3 area will be visible.

An absolute coordinate system may, for example, use a CCIR-defined standard for digitized television signals of 540 pixels horizontally and 480 pixels vertically within the defined display area.

3.3.2.5 *Active drawing area*

An active drawing area is an area within the defined display area within which graphic elements are to be displayed. The definition of an active drawing area cancels any previous active drawing area, but has no effect on graphic elements already being displayed.

3.3.2.6 *Scrolling area*

A scrolling area is an area smaller than or equal to the defined display area, within which the characters and associated attributes move in specified increments under the action of format effectors (whether explicit or implied) or specific controls. The procedure for scrolling is defined by two processes:

1) the designation of the screen area inside which a scroll operation is to be executed;
2) the execution of the scrolling action.

Scrolling occurs in a direction perpendicular to the character path or logical pel path and far enough to bring the next intended character location or the location of the next logical pel just into the scrolling area.

3.3.2.7 *Input field*

This function specifies an input field to be used as a user area on the display screen. An input field may be provided to accept user input from the terminal keyboard and to support local editing by the user. Any number of input fields may be defined.

3.3.2.8 *Marked characters*

Characters may be marked for further action at the terminal, such as transfer to an output device.

More than one type of marking may exist and each may be separately processed.

3.3.2.9 *Protected/unprotected area*

Areas within the defined display area can be protected against alteration, manipulation or erasure. The protection is valid for attributes as well as characters.

Protected areas can only be altered by the use of an unprotected function or by the action of clearing the screen.

3.3.2.10 *Multi-plane configuration*

A multi-plane configuration can be defined through multi-plane control commands which include addressing, priority relationship and attribute. For example, a character plane on a photographic plane configuration offers scrolling characters on a steady photographic picture, or a photographic plane on another photographic plane configuration offers simple animation.

3.3.3 *Graphic elements*

Graphic elements are used to display text, including symbols, or pictures. They are categorized below. Applicable to each of the following categories is a set of display attributes and control functions. Attributes and control functions for each category are specified in §§ 3.3.5, 3.3.6, 3.3.7 and 3.3.8, for the international Videotex service. Those attributes and control functions which are commonly applicable to all categories of graphic elements are defined in § 3.3.4.

3.3.3.1 *Alphanumeric characters*

3.3.3.1.1 Alphanumeric characters are those graphic elements pertaining to the written form of text. They include alphabetic letters with or without diacritical signs, numerical digits and fractions, punctuation marks, typographical symbols, mathematical signs, as well as space and special letters, signs and symbols.

3.3.3.1.2 In this Recommendation, alphanumeric characters are denoted by names which are intended to reflect their customary meaning and not to specify a particular style or font design for the textual characters when displayed.

3.3.3.1.3 Dynamically redefinable characters are defined and down-loaded into the terminal, which can then use them as additional graphic elements.

3.3.3.2 *Pictorial characters*

Pictorial characters are used to construct drawings with blocks; each character defines a pattern within a block of predetermined dimensions and will occupy one character position when displayed. Unlike alphanumeric characters, a pictorial character has a specifically designed pattern when displayed. The pattern can either be predetermined such as in the case of mosaic characters or line drawing characters or be dynamically redefinable. Pictorial characters also differ from alphanumeric characters in the manner in which certain attributes such as underlining or proportional spacing apply.

3.3.3.3 *Geometric elements*

Geometric elements are used to construct drawings of various types by a succession of overlay of points, straight lines, arcs, etc. Each element is specified in terms of normalized Cartesian coordinates to describe the position, end-points, or vertices of each drawing operation.

3.3.3.4 *Photographic elements*

Photographic elements are used to render an image by the transmission and display of an array of individual picture elements (pixels) within an active drawing area. The photographic elements may be used to display a two-colour picture, a picture using a range of colours from a palette, or a picture with an unrestricted range of colours. In the case of an unrestricted range of colours the image may be subjectively similar to a still broadcast-quality television picture.

3.3.4 *Common display attributes and control functions*

The attributes and control functions detailed in this section apply to all types of graphic elements described in § 3.3.3 above.

3.3.4.1 *General*

3.3.4.1.1 *Foreground and background specification*

The foreground is a graphic element and the background is the remaining area of the display against which the foreground is displayed.

Note – The background may be specified in two different ways, depending on the implementation:

a) as a single solid colour at the location of each graphic element on the display,

b) as the cumulative result of all graphic elements displayed prior to the foreground, which subsequently amends the affected background by overwriting.

3.3.4.1.2 *Attribute techniques*

3.3.4.1.2.1 *Parallel attributes*

Parallel attributes are the property of the active position and move with it under the action of format effectors or spacing display characters (including space).

3.3.4.1.2.2 *Serial attributes*

Serial attributes are set between markers on a row. They apply from the position of the active position at the time they are received to the end of the row or until a contradictory marker is reached.

3.3.4.1.2.3 *Non-spacing and spacing attributes*

Display attributes may be implemented in such a way that they may be changed at each character location (non-spacing attributes) or a displayed character location may be required to implement the change (spacing attribute).

3.3.4.1.3 *Colour*

Colour in this context is considered to include saturated and unsaturated colours of any intensity, grey tones, black and white. A colour may also be set to "transparent", in which case a lower plane (e.g. background) will be displayed.

Alternative colour modes are used to interpret the numerical value of the colour parameter, either directly in terms of colour components or indirectly as an index into a colour look-up table (palette).

The colour range may be extended by providing a number of colour look-up tables. These colour look-up tables may hold a fixed repertoire of colours, or may be redefinable.

3.3.4.2 *Common display attributes*

3.3.4.2.1 *Foreground colour*

The colour of graphic elements can be specified by this attribute.

3.3.4.2.2 *Background colour*

This attribute is used to specify the colour to be used for the background when graphic elements are displayed, in a similar manner to the specification of foreground colour.

3.3.4.2.3 *Border colour*

The border area may be specified as a single colour or more than one colour.

3.3.4.2.4 *Flash*

This attribute allows the graphic element to be flashed at a specified rate and phase relationship for the primary purpose of gathering attention. The following attribute states are defined:

Steady

The graphic elements are displayed normally.

Flash rate

The on/off interval and the rate of flashing may be specified or may take on predefined values.

Flash phase

The phase relationship between flashing graphic entities may be specified or may take on predefined values.

Flash colour

The graphic elements may change between various colours, that is between foreground or background colours or between referenced colours in a colour look-up table.

3.3.4.2.5 *Conceal*

The characters are displayed as spaces until the user chooses to make them appear.

3.3.4.3 *Common control functions*

The following functions control the display of either a portion of the graphic elements or the entire screen. They apply to all types of graphic elements described in § 3.3.3.

3.3.4.3.1 *Reset*

This function reinitializes the control and attribute parameters to their default values, either on a selective basis or on a global basis.

Certain control functions implicitly reset some attributes.

Note – Study Group I intends to specify default attributes.

3.3.4.3.2 *Overwriting mode*

Specified elements of the displayed image can be cleared and replaced by the display of new data, or can be logically combined (e.g. logical OR operation) with the new data to produce a superposed display.

3.3.4.3.3 *Clear screen*

This function clears the whole screen to black or to the background colour.

3.3.4.3.4 *Clear partial screen*

This function clears part of the screen to black or to the background colour on a selective basis. Any of the following structures may be chosen:

- active drawing area;
- scrolling area;
- input field;
- one or more planes;
- marked characters;
- protected area.

3.3.4.3.5 *Wait*

This function is used to cause a delay of a specified time in the processing of presentation level functions currently received by the Videotex terminal.

3.3.4.3.6 *Define dynamically redefinable sequences (macro)*

This function provides the capability of grouping graphic elements, attributes and control functions. A macro is labelled with a name and consists of an arbitrary sequence of graphic elements, attributes, parameter values and appropriate control functions. The name thereafter acts as a substitute for the entire string of specified functions which make up that particular macro. Separate groupings may exist which contain only graphic elements from one of the categories defined in § 3.3.3 above.

3.3.4.3.7 *Select macro sets*

This function provides for the selection of an already defined set of macro sequences, allowing individual sequences within such a set to be called by their names. When a macro name is called, the entire macro sequence is processed.

3.3.5 *Display of alphanumeric text*

The character repertoires for this section are those specified in Recommendations T.100 and T.101.

Terminals must be able to display correctly the following formats:

31 columns 16 rows
40 columns 20 rows } of latin-based alphanumeric characters
40 columns 24 rows

Whereas the attributes and control functions defined in this section are used mainly with alphanumeric characters, some also apply to pictorial characters.

3.3.5.1 *Attributes for alphanumeric text*

3.3.5.1.1 *Character rotation*

This attribute determines the rotation of an alphanumeric character relative to the horizontal direction. The rotation can either be chosen from a fixed set, i.e., 0°, 90°, 180°, or 270°, or can be any angle between 0° and 360°.

3.3.5.1.2 *Character path*

This attribute determines the writing direction, i.e., the direction in which the active position is automatically advanced after a character is displayed. Four directions are possible: right, left, up and down. These directions may either be expressed relative to the character rotation or relative to fixed screen coordinates.

3.3.5.1.3 *Inter-character spacing*

This attribute determines the distance the cursor is moved after a character is displayed.

3.3.5.1.4 *Inter-row spacing*

This attribute determines the relative location of the active cursor when it is advanced to a new line in a direction perpendicular (relative −90°) to the character path.

3.3.5.1.5 *Alphanumeric character size*

The size of an alphanumeric character can be specified in one of the following manners:

a) by specifying the width and height of the character field,

b) by specifying a double-height character, where the height is set to twice its default value and the width is set to its default value,

c) by specifying a double-width character, where the width is set to twice its default value and the height is set to its default value,

d) by specifying a double-size character, where both height and width are set to twice their default values,

e) by specifying proportional spacing in a given character height.

3.3.5.1.6 *Underline*

This attribute is used for underlining alphanumeric characters either individually or on a character-string basis.

3.3.5.1.7 *Invert*

Alphanumeric characters can be displayed either in normal mode or in inverted (reverse video) mode. In inverted mode, the explicit background and foreground colours are interchanged.

3.3.5.1.8 *Cursor*

A cursor may be used to indicate the character location(s) on the screen in which the next alphanumeric or pictorial character is to be written. More than one style can be defined for the cursor, e.g. underscore, block, cross hair or manufacturer dependent. Also the cursor can be either flashing or steady or invisible.

3.3.5.1.9 *Text font*

This attribute determines which of a choice of fonts is to be used for displaying the text.

3.3.5.2 *Format effector functions*

Format effectors are control functions that influence the positioning of alphanumeric text and pictorial characters. They include the functions given below:

a) moving the active position a distance equal to the inter-character spacing lying parallel to the character path in the direction opposite to the character path (i.e., 180° to the direction of the character path);

b) moving the active position a distance equal to the inter-character spacing lying parallel to the character path in the direction of the character path;

c) moving the active position a distance equal to the inter-row space in a direction perpendicular to the character path (relative −90°);

d) moving the active position a distance equal to the inter-row space lying perpendicular to the character path in a direction perpendicular to the character path (relative 90°);

e) moving the active position to the first character position within the active drawing area along the character path;

f) moving the active position to the home character position in the display area;

g) moving the active position to a given location in the display area.

3.3.5.3 *Other control functions for alphanumeric text*

3.3.5.3.1 *Word wrap*

This function causes the alphanumeric text to be buffered into words. A word is displayed on the current line only if the entire buffered word will fit into the space remaining on the current line within the display area. If the word does not fit into the space remaining on the current line, then the cursor is repositioned beginning at the first character position on the next line and the word is displayed. The space character should be omitted if the last word on the line is terminated with a space that does not fit on that line.

3.3.5.4 *Dynamically redefinable character set (DRCS)*

A DRCS is a set of characters whose shapes are sent from the service and down-loaded via the line. It may be used to represent alphanumeric characters, special symbols, or picture element symbols for constructing fine graphics. Once loaded, the DRCS is regarded as a member of a library.

Two types of DRCS have been identified. The first type is the basic DRCS. Only the shapes of the characters are down-loaded. Characters are displayed on the screen according to prevailing attributes.

The second type of DRCS is described in § 3.3.6.4.

3.3.5.4.1 *Define dynamically redefinable character sets*

This function enables the definition of a dynamically redefinable character set (DRCS); identified by a name either by using any sequence of graphic elements, attributes and control functions or by using bit patterns defining the shape of the characters.

3.3.5.4.2 *Select DRCS*

This function determines which DRCS, already defined, will be used.

3.3.6 *Display of pictorial characters*

The attributes and control functions defined below are used specifically with pictorial characters such as mosaics. Many of the attributes and functions (including the format effectors) of alphanumeric text also apply to pictorial characters.

3.3.6.1 *Attributes for pictorial characters*

3.3.6.1.1 *Contiguous/separated characters*

This attribute allows a pictorial character to be displayed in either one of two styles:

a) contiguous: the characters adjoin one another,

b) separated: each character is surrounded and separated by a border of the background colour, the width of which may be specified.

3.3.6.1.2 *Size of pictorial characters*

This attribute specifies the size of a pictorial character either by means of normalized Cartesian coordinates or in terms of a predetermined default character size (as per § 3.3.5.1.5 above).

3.3.6.2 *Control function for pictorial characters*

3.3.6.2.1 *Select mosaic subrepertoire*

This function determines which subsets of the mosaic repertoire will be used for constructing mosaic pictures.

3.3.6.3 *Mosaic repertoire*

(The mosaic repertoire for this section is specified in Recommendations T.100 and T.101.

3.3.6.4 *Pictorial DRCS*

General considerations for DRCS are given in § 3.3.5.4. In pictorial DRCS, the down-loaded characters are completely defined in foreground colours, i.e. all the dots of a character cell have a defined foreground colour, chosen from a number of colours.

3.3.7 *Display of geometric drawings*

3.3.7.1 *Normalized Cartesian coordinates*

Geometric elements are defined within a two-dimensional space using normalized coordinates, that is, a Cartesian 0 to 1 numbering scheme (see § 3.3.2.4).

3.3.7.2 *Control functions of geometric drawings*

3.3.7.2.1 *Specify resolution*

This function specifies the resolution of coordinate data, that is, the accuracy to which the X and Y coordinates are specified.

3.3.7.2.2 *Define filling texture*

This function is used to dynamically redefine filling textures in addition to the ones that are already predetermined. See the description of "texture pattern" attribute (§ 3.3.7.3.3).

3.3.7.2.3 *Define graphic object (segment)*

This function provides the capability of grouping geometric elements, attributes for geometric elements, control functions of geometric elements and alphanumeric text into a named segment. The elements are stored in the display device. They can be displayed or not under control of the visibility attribute (§ 3.3.7.3.5).

3.3.7.2.4 *Insert graphic object*

This function provides for the selection of an already defined named segment. Before the elements are processed the coordinate data within the elements are transformed using a transformation matrix (§ 3.3.7.2.6).

3.3.7.2.5 *Delete graphic object*

This function deletes the named segment and its contents.

3.3.7.2.6 *Define transformation matrix*

This function allows the specification of a transformation matrix used during insertion of a graphic object (§ 3.3.7.2.4).

3.3.7.2.7 *Window*

This function defines a rectangular part of the normalized coordinate space to be used.

3.3.7.2.8 *Viewport*

This function defines the rectangular region of display space to be used.

3.3.7.3 *Attributes for geometric elements*

3.3.7.3.1 *Logical pel (brush)*

This attribute is used to determine the size and shape of the logical pel (brush). Geometric elements are drawn by moving the logical pel (brush) around the screen. The size and shape of the logical pel (brush) therefore directly determines the line width of geometric elements. The logical pel (brush) size will correspond to at least one and possibly many display pixels. The shape of the logical pel (brush) can be of different types, e.g. square or circle. By choosing appropriate values for the width (dx) and the height (dy), these types can be formed into a rectangle or an ellipse.

3.3.7.3.2 *Line texture*

The line texture can be solid, dotted, dashed or dot-dashed. It is used for lines as well as outlines.

3.3.7.3.3 *Texture pattern*

Enclosed geometric elements may be filled by texture patterns. The texture pattern can be chosen from solid colour, hatched or patterned. The hatched textures can be chosen from vertical hatching, horizontal hatching, diagonal hatching (45° and −45°), vertical and horizontal crosshatching and diagonal crosshatching. Pattern textures can be dynamically defined (§ 3.3.7.2.2).

3.3.7.3.4 *Highlighting*

Filled and enclosed geometric elements can be highlighted by drawing their perimeters in black, as a line in the background colour or in a manufacturer dependent way. This attribute applies either to segments or to individual elements.

3.3.7.3.5 *Visibility*

This attribute controls the display of elements during the creation of a named segment (§ 3.3.7.2.3).

3.3.7.3.6 *Marker representation*

This attribute determines the size and the type of a marker to be used in the *marker (point).* A marker representation may be chosen from a <.>, a <+>, a <*>, a <o> and a <x>, or other shape or be the default to the logical pel shape. The origin of the marker representation may be at its centre, or at other points of the marker representation.

3.3.7.4 *Geometric elements*

When drawing pictures with geometric elements the start location of each geometric element may be specified in either one of two ways:

a) as an absolute position (current drawing point position independent)

b) as a relative position with respect to the final drawing point position of the previously drawn geometric element (current drawing point position dependent).

Further coordinate positions may be specified in either an absolute, a relative or an incremental manner.

3.3.7.4.1 *Marker (point)*

Marker is used to perform the operation of writing a marker representation at specified positions. The size and type of the marker representation is controlled by the marker representation attribute (§ 3.3.7.3.6).

3.3.7.4.2 *Line*

Line is used to draw a straight line between specified drawing positions using the current line texture.

3.3.7.4.3 *Arc/circle*

Arc/circle provides the capability of drawing a circle, or a segment of a circle using the current line texture. The arc is drawn from an initial drawing position to a final drawing position through an intermediate point on the arc.

A circle is drawn when the start and end points are coincident. For the definition of a circle, the intermediate point on the arc defines the diameter of the circle.

Alternatively a circle may be defined by the position of its centre and its radius.

A straight line is drawn if the three points are co-linear.

An arc and the chord joining the start and end points of the arc define an enclosed arc.

3.3.7.4.4 *Rectangle*

Rectangle is used to draw a rectangular area of specified width and height.

3.3.7.4.5 *Polygon*

Polygon is used to draw a polygon with the current line texture, from the initial drawing position, through a series of vertices, back to the initial drawing position. There is an implicit closure between the initial drawing position and the last vertex specified so that the final drawing position is identical with the initial drawing position.

3.3.7.4.6 *Polycurve*

Polycurve is used to draw a curved line through, or best fit to, more than three given point positions.

3.3.7.4.7 *Infill*

Infill is used to fill the surrounding area of the specified position with the current texture.

3.3.7.4.8 *Pixel array*

Pixel array is used to define a rectangle with m by n cells. In drawing the cells of this rectangle, all cells may have different colours.

3.3.8 *Display of photographic pictures*

3.3.8.1 *Control functions for photographic pictures*

3.3.8.1.1 *Photographic image development mode*

This function controls the sequence of development of the image on the display. Possible modes include:

a) successive display of horizontal lines of the height of the logical pel;
b) successive display of rectangular blocks;
c) progressive improvement of the spatial resolution over the whole active drawing area;
d) progressive improvement of colour resolution over the whole active drawing area.

3.3.8.2 *Attributes of photographic elements*

3.3.8.2.1 *Logical pel size*

This attribute is used to determine the width (dx) and height (dy) of the logical pel which is a rectangle whose orientation is fixed with respect to the Cartesian coordinate system. The logical pel size will correspond to at least one and possibly many display pixels. Photographic images are created by defining the colours of logical pels.

3.3.8.2.2 *Colouring block size*

This attribute determines the size of the rectangular colouring block. The logical pels within each colouring block may only take the foreground or background colour specified for that block.

3.3.9 *Audio capability*

Audio capability includes music, voice, and other sounds. This section also identifies possible enhancements.

3.3.9.1 *Synthesized musical sounds*

This function may be used to present synthesized musical sounds having various timbre. The musical tone coding system is employed to represent musical information. Musical information is transmitted to the user terminal, and sounds are reproduced in the user terminal, possibly with tone synthesizer techniques. Capabilities include the following:

3.3.9.1.1 *Part*

Multiple parts can be defined in a single tune. Each part may be defined separately; however, they could be reproduced simultaneously.

3.3.9.1.2 *Timbre*

The timbre of sounds may be defined by specifying a particular musical instrument. Each part may have a different timbre.

3.3.9.1.3 *Pitch and duration*

Every sound in a part may be reproduced by specifying the pitch and the duration of each musical tone.

3.3.9.1.4 *Data transfer control*

Start and end of the entire transfer of the musical definition or start and end of a part definition may be indicated. Start of reproduction may also be indicated.

3.3.9.1.5 *Jump and repetition control*

Jump and repetition in the reproduction of a tune may be defined. Labels may be defined to indicate a range of repetition or the destination of the jump.

3.3.9.1.6 *Sound level control*

Sound level in reproduction of a tune may be defined.

3.3.9.2 *Other possible audio techniques* (for further study.)

3.3.9.2.1 *Text and music synchronization*

This function may be used to specify the visual and audible effects of synchronization.

3.3.9.2.2 *Synthesized voice*

This function is used to present human voice with the help of voice synthesis techniques. Coded voice parameters-to-voice conversion, and character coded text-to-voice conversion may be possible.

3.3.9.2.3 *Arbitrary sounds*

This function is used to reproduce any sounds including that of human voice and musical instruments.

3.3.10 *Animation capability*

This provides animation (movement) capability, and identifies possible enhancements.

3.3.10.1 *Colour manipulation*

This function may be used to create simple animation effects by manipulating the flash and colour attributes.

3.3.10.2 *Display position manipulation*

This function may be used for a form of animated display by manipulating the relative display position with the help of multi-plane display capability.

3.3.10.3 *Other possible animation techniques* (for further study)

3.3.10.3.1 *Timed execution of drawing an image*

This function may be used for time-regulated drawing of coded pictorial information.

3.3.10.3.2 *Successive overwriting of selected pictorial information*

This function realizes animated or moving display of pictorial information through successive overwriting.

3.4 *Session level*

3.4.1 *General*

The purpose of the session is to establish and organize the dialogue(s) between the user and the data base. The Videotex session is an interactive session that may permit one or more steps of questions and answers.

3.4.2 *Session establishment/closure*

The basic function of the session is to establish the logical connection between the applications. It includes the facility to negotiate a set of capabilities that can be used at the beginning of the session. The renegotiation of those capabilities is for further study.

The function to close the logical connection is also performed by the session level either in an orderly manner or through an aborting mechanism.

3.4.3 *Dialogue management*

The session level provides the tools to establish the right of the user and the data base to send and receive data. In the case where one party has the need to send data without having the right for it, it provides a facility to obtain it.

3.5 *Communication levels* (to be defined)

4 Operation of the Videotex service (to be defined)

5 International interworking of Videotex service

5.1 International interworking for alphanumeric text shall be based on the Latin based character repertoire in Recommendations T.100 and T.101. Interworking between two countries both having the same non-Latin based alphabet should be possible but needs further studies.

5.2 International interworking between Videotex services should use those functions that are defined in the data syntaxes implemented by the Administrations concerned. Data Syntaxes I, II and III are defined in the relevant CCITT Recommendations. Conversion of some functions at a gateway may be necessary, but substantial degrees of compatibility of the functions exist among the three data syntaxes. An interworking data syntax may be developed during the next study period as part of the Recommendations.

6 Interworking with other telematic services

6.1 *Videotex-telex*

Videotex-telex interworking may be provided to enable users to send messages by means of a Videotex service to terminals connected to the telex network.

6.1.1 In order to minimize telex network holding times and to enhance the service to the user, messages may be handled on a store-and-forward basis.

6.1.2 Only the graphic characters of the Videotex graphic character repertoire corresponding to International Telegraph Alphabet No. 2 can be included in messages transmitted to the telex network.

6.1.3 The message format will be limited by the Videotex page format.

6.2 *Telex-Videotex*

Two distinct facilities may be provided by means of telex-Videotex interworking.

6.2.1 *Telex-Videotex message handling*

This facility may be provided to enable users to send messages from terminals connected to the telex network to terminals accessing a Videotex service.

6.2.1.1 Since Videotex terminals may not be capable of auto-answer operation this facility may be provided on a store-and-retrieve basis. The possibilities of store-and-forward or real-time communication are for further study.

6.2.1.2 The format of messages transmitted from telex terminals cannot be preserved unless the sender restricts the message format to the width of the Videotex display.

6.2.2 *Telex-Videotex data base access*

This facility may be provided to enable users to access the Videotex service by means of terminals connected to the telex network.

6.2.2.1 The facility available to telex users will be severely limited by the character repertoire, the lack of any Videotex attributes and the transmission speed of telex.

6.2.2.2. The telex character repertoire does not include the * and # characters used to form user commands in many Videotex services.

6.3 *Videotex-Teletex*

Videotex-Teletex interworking may be provided to enable users to send messages by means of a Videotex service to Teletex terminals.

6.3.1 In order to comply with the operational characteristics of Teletex it will probably be necessary to handle messages on a store-and-forward basis.

6.3.2 The Teletex and Videotex graphic repertoires are largely identical. The following fallback representations of Videotex characters (Table 1/F.300) may be transcoded at a Videotex-Teletex interworking facility.

TABLE 1/F.300

Identifier	Videotex character	Fallback representation	
SM30	←	<	SA03
SM31	→	>	SA05
SM32	↑	¡	SP03
SM33	↓	!	SP02
SP19	‘	'	SP05
SP20	’	'	SP05
SP21	“	"	SP04
SP22	”	"	SP04
SM12	—	–	SP10
MG01 to MG63	Block graphics	/	SP12

6.3.3 For Teletex terminals having the ability to present the Videotex character repertoire in its entirety the need for fallback representation disappears. Therefore on initial call establishment the terminal display/printing capabilities must be determined.

6.3.4 Possible conversion of the Videotex attribute control functions is for further study.

6.3.5 The message format will be limited by the Videotex page format.

6.4 *Teletex-Videotex*

Two distinct facilities may be provided by means of Teletex-Videotex interworking:

6.4.1 *Teletex-Videotex message handling*

This facility may be provided to enable users to send messages from Teletex terminals to terminals accessing a Videotex service.

6.4.1.1 Since Videotex terminals may not be capable of auto-answer operation this facility may be provided on a store-and-retrieve basis. The possibilities of store-and-forward or of real-time communication are for further study.

6.4.1.2 An interworking facility will need to transcode Teletex characters and control functions which are not in the Videotex repertoire.

6.4.1.3 The format of messages transmitted from Teletex terminals cannot be preserved unless the sender restricts the message format to the width of the Videotex display.

6.4.2 *Teletex-Videotex data base access*

This facility may be provided to enable users to access the Videotex service by means of Teletex terminals.

6.4.2.1 The facility available to Teletex users will be limited by the inability of basic Teletex to represent many of the attributes and graphic elements (e.g. DRCS, geometric) of Videotex. Some alphanumeric characters will have to be transmitted to Teletex terminals in a fall-back form. (Table 1/F.300).

6.5 *Videotex-facsimile and facsimile-Videotex* (for further study).

7 Service quality

The items listed in §§ 7.1 to 7.6 are for further study.

7.1 *Transport network*

7.2 *Access, grade of service*

7.3 *Error rate and error protection*

7.4 *Terminals, visual quality of characters*

7.5 *Videotex service response time*

7.6 *Service observation*

8 Tariff principles

(To be studied in conjunction with Study Group III.)

8.1 Allowance must be made for the international implications of the following parameters:

- the network (volume of information, distance, time);
- value of access service offered;
- information value;
- billing procedures.

ANNEX A

(to Recommendation F.300)

Some of the possible Videotex service implementations

This annex describes some possible implementations of Videotex services. Figure A-1/F.300 is intended to indicate possible implementations, not to provide an exhaustive set of permutations of the different possibilities.

The symbols and abbreviations used are listed in the legend.

Figure A-1/F.300 mixes different implementations. This means that more elements may exist in a particular implementation or that some of the elements may not be implemented. For example:

a) In the most general situation the users access services via one or more service centres, and the centres themselves are interconnected with one another and with other host computers.

b) Videotex services may be provided by one or more independent service centres provided by independent service providers.

c) One host computer may act as the service centre for a range of users accessing a range of data bases and service facilities provided, using several external host computers.

It follows from the definition of Videotex service centre in § 2.4.5 that A is a service centre if it is responsible for authorizing access to Videotex services, that is, if it provides Videotex services itself or exercises discretion as to which users may use its gateway facility. If a computer at A only has a gateway function then it can be part of the telecommunications network.

If both A and B authorize a user before he may access a service on B (for example), then for that service both A and B are Videotex service providers.

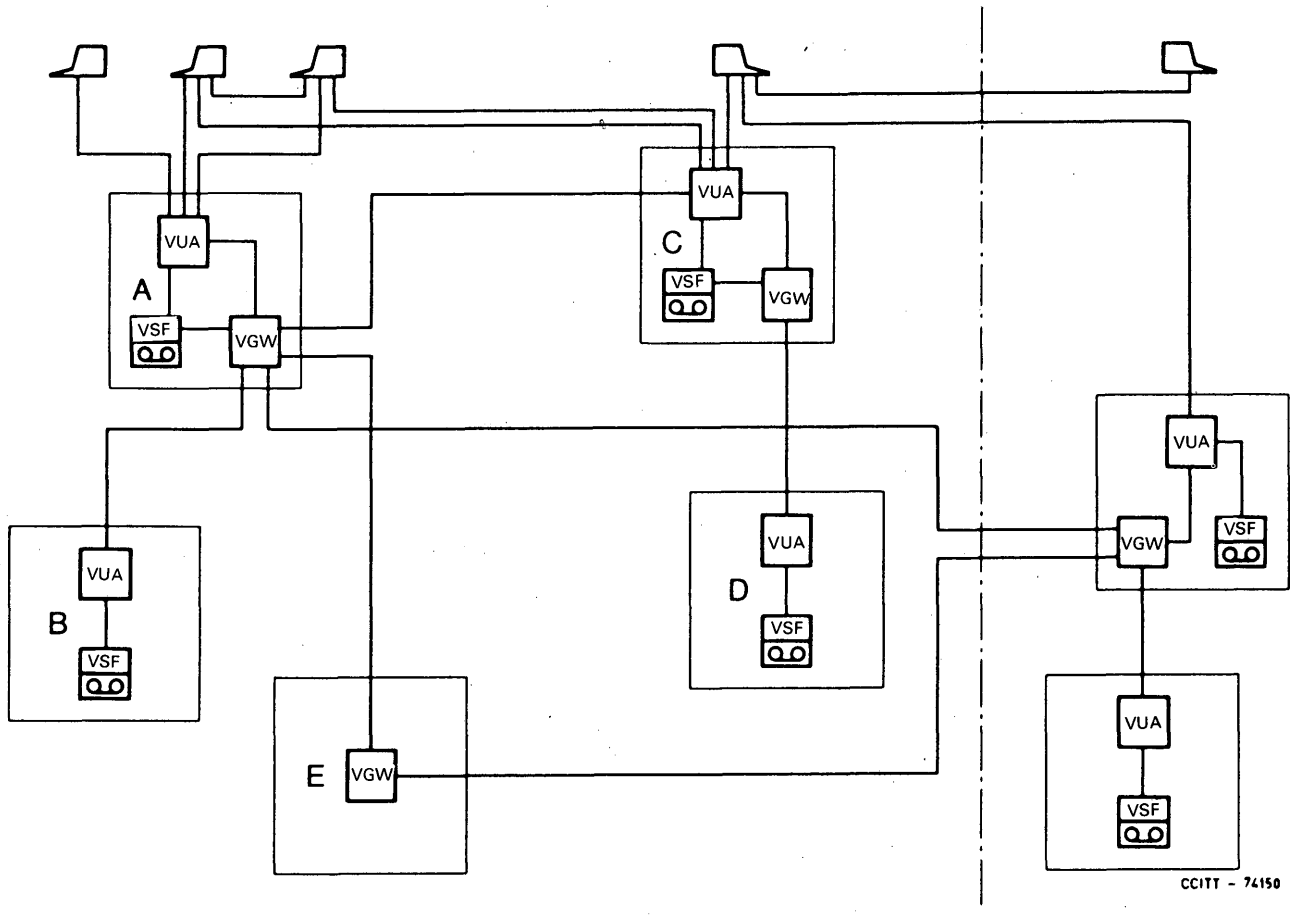


FIGURE A-1/F.300

Some of the possible Videotex service implementations

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SECTION 4

TELEMATIC SERVICES, GENERAL

Recommendation F.350

APPLICATION OF SERIES T RECOMMENDATIONS

The CCITT,

considering

(a) that Study Group I defines the basic and optional features to be offered by the various telematic Services;

(b) that Study Group VIII defines the mandatory technical requirements for telematic equipment;

(c) that Study Group VIII defines also optional technical capabilities which may be included in telematic equipment;

(d) that there is a need to define how the mandatory and optional technical requirements should be applied;

unanimously agrees

that the Series T Recommendations shall be applied in accordance with this Recommendation.

1 CCITT recommended services defined in the Series F Recommendations, excluding Videotex

In order to ensure full end-to-end compatibility within a CCITT recommended service, equipment shall be capable of providing the mandatory technical requirements defined in the Series T Recommendations to which the Series F Service Recommendation refers.

2 Optional technical capabilities

Where optional technical capabilities are defined in CCITT Series T Recommendations, e.g. for use as national or regional options, the equipment shall be capable also of operating in the mandatory fallback mode. This mandatory fallback mode provides the basic features required by the relevant Series F Recommendation, and hence the mandatory technical requirements are met.

3 Non-standardized capabilities

These capabilities are not defined in CCITT Recommendations but are laid down by Administrations and/or individual manufacturers. Provision is made for the use of such non-standardized capabilities in the procedures detailed in the relevant Series T Recommendations.

Equipment shall be capable also of operating in the mandatory fallback mode which provides the basic features required by the relevant Series F Recommendation, and hence the mandatory technical requirements are met.

Note 1 – The term "mandatory technical requirements" covers the "basic functions" in Recommendation T.60, the "basic capabilities" in Recommendation T.62, the "recommended standards" in Recommendation T.4 and the "standard capabilities" in Recommendation T.30.

Note 2 – The term "optional technical capabilities" covers the "standardized optional functions" in Recommendation T.60, the "non-basic standardized capabilities" in Recommendation T.62 and the "recognized options" in Recommendation T.4.

Note 3 – The term "non-standardized capabilities" covers the "optional functions" in Recommendation T.60, the "non-basic capabilities" and "private use" in Recommendation T.62 and the "non-standard capabilities" in Recommendation T.30.

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