INTERNATIONAL TELECOMMUNICATION UNION

ITU-T

T.60

(03/93)

TELECOMMUNICATION
STANDARDIZATION SECTOR
OF ITU

TELEMATIC SERVICES

TERMINAL EQUIPMENTS AND PROTOCOLS FOR TELEMATIC SERVICES

TERMINAL EQUIPMENT FOR USE IN THE TELETEX SERVICE

ITU-T Recommendation T.60
Superseded by a more recent version

(Previously “CCITT Recommendation”)

Superseded by a more recent version

FOREWORD

The ITU Telecommunication Standardization Sector (ITU-T) is a permanent organ of the International Telecommunication Union. The ITU-T is responsible for studying technical, operating and tariff questions and issuing Recommendations on them with a view to standardizing telecommunications on a worldwide basis.

The World Telecommunication Standardization Conference (WTSC), which meets every four years, established the topics for study by the ITU-T Study Groups which, in their turn, produce Recommendations on these topics.

ITU-T Recommendation T.60 was revised by the ITU-T Study Group VIII (1988-1993) and was approved by the WTSC (Helsinki, March 1-12, 1993).

NOTES

1 As a consequence of a reform process within the International Telecommunication Union (ITU), the CCITT ceased to exist as of 28 February 1993. In its place, the ITU Telecommunication Standardization Sector (ITU-T) was created as of 1 March 1993. Similarly, in this reform process, the CCIR and the IFRB have been replaced by the Radiocommunication Sector.

In order not to delay publication of this Recommendation, no change has been made in the text to references containing the acronyms "CCITT, CCIR or IFRB" or their associated entities such as Plenary Assembly, Secretariat, etc. Future editions of this Recommendation will contain the proper terminology related to the new ITU structure.

2 In this Recommendation, the expression "Administration" is used for conciseness to indicate both a telecommunication administration and a recognized operating agency.

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TERMINAL EQUIPMENT FOR USE IN THE TELETEX SERVICE

(Geneva, 1980; revised at Malaga-Torremolinos, 1984; at Melbourne, 1988 and at Helsinki, 1993)

The CCITT,

considering

– that the market in the field of telecommunication requires more open solutions for the exchange of documents;

– that Recommendation F.200 describes completely the basic Teletex service;

– that other F.200-Series Recommendations define additional rules for Teletex options;

– that the basic and the optional character repertoires and their coded character sets are defined in the T.50-Series Recommendations;

– that Teletex terminal equipment communicate with unique control procedures described in Recommendation T.62;

– that the network-independent basic transport service for the Teletex and the other Telematic services are described in Recommendation T.70;

– that T.500-Series Recommendations describe Teletex service options [Mixed mode (MM), Processable Mode 11 (PM11) and Processable Mode 26 (PM-26)] in a fully OSI-compatible environment [Document Architecture, Transfer and Manipulation (DATAM)] which is described in the T.400-Series Recommendations,

declares

that terminal equipment in the international Teletex service should be designed and operated in accordance with this Recommendation. Thereby the term “terminal equipment” stands as a synonym for an equipment technically able to communicate in accordance with the basic requirements specified below.

1 Scope

1.1 This Recommendation defines the basic requirements for terminal equipment participating in the international Teletex service.

1.2 Terminal equipment can present various degrees of complexity. Within this Recommendation the emphasis is on requirements for correct interworking of different terminal equipment.

1.3 Terminal equipment fulfilling these requirements denoted as basic requirements, can interwork on a defined level of compatibility.

1.4 A Teletex terminal equipment can be considered to be a word processing system (local part), to which a Teletex communication facility (soft and/or hardware, the communication part) is added. By means of this Teletex communication facility the text prepared by the wordprocessing system can be transmitted to any other Teletex terminal equipment on a defined level of compatibility, or received from them.

1.5 This Recommendation does not specify requirements for receive-only terminal equipments. However, it is not intended to exclude such terminal equipments.

1.6 In this Recommendation “text” refers to character-coded text only.

1.7 With this Recommendation the emphasis is on basic requirements. In addition, optional requirements are included in annexes.

1.8 This Recommendation takes into account the existing terminal equipment and ensures full compatibility with the facilities defined in the previous version. Any new features or communication modes are optional.

1.9 The rules to be followed in the automatic international Teletex service are defined in Recommendation F.200.

1.10 The following technical specifications apply:

a) the character repertoire and the coded character sets are defined in Recommendations T.50-Series;

b) the interface to the transport network is defined in this Recommendation (see clause 6);

c) the transport end-to-end control procedure is defined in Recommendation T.70;

d) the control procedures are defined in the Recommendation T.62;

e) the Mixed-Mode (MM) capabilities (optional) are defined in the following Recommendations:

- T.501 – *Document Application Profile MM for the interchange of formatted Mixed Mode document*;
- T.522 – *Communication Application Profile BT1 for document Bulk Transfer*;
- T.561 – *Terminal characteristics for Mixed Mode of operation MM*;
- the further development of *Document Application Profile (DAP) implementation requirements* (T.510-Series) and *Communication Application Profile (CAP) implementation requirements* (T.530-Series) is for further study;

f) the Processable-Mode (PM11) capabilities (optional) for the interchange of character content documents in processable and formatted forms are defined in the following Recommendations:

- T.502 – *Document Application Profile PM11 for the interchange of character content documents in processable and formatted forms*;
- T.522 – *Communication Application Profile BT1 for Document Bulk Transfer*;
- T.562 –*Terminal characteristics for Teletex Processable Mode PM.1*;
- the further development of *Document Application Profile (DAP) implementation requirements* (T.510-Series) and *Communication Application Profile (CAP) implementation requirements* (T.530-Series) is for further study;

g) the Processable-Mode (PM26) capabilities (optional) for the interchange of mixed content documents in processable and formated forms are defined in the following Recommendations:

- T.505 – *Document Application Profile PM-26 for the interchange of mixed content documents in processable and formatted forms*;
- T.522 – *Communication Application Profile BT1 for Document Bulk Transfer*;
- the further development of *Document Application Profile (DAP) implementation requirements* (T.510-Series), *Communication Application Profile (CAP) implementation requirements* (T.530-Series) and *Terminal Characteristics* (T.560-Series) is for further study.

1.11 Additional non-basic capabilities of the Teletex service, i.e. Teletex: Transparent Mode (TM), Teletex Interactive Mode (IM), Teletex/Telefax conversion facility and Processable Mode 36 (PH-36) for the interchange of enhanced mixed contents document in processable and for matted forms are for further study and will be subject to separate Recommendations.

2 References

The following CCITT Recommendations and ISO standards contain provisions which, through reference in this Recommendation, constitute provisions of this Recommendation. At the time of publication, the editions indicated were valid.

2.1 CCITT Recommendations

- Rec. T.50 *International Reference Alphabet*, 1992.
- Rec. T.51 *Coded character sets for Telematic services*, 1992.
- Rec. T.52 *Non-latin-character sets for Telematic services*, 1993.
- Rec. T.53 *Control functions*, 1994
- Rec. T.62 *Control procedures for Teletex and Group 4 facsimile service*, 1993.
- Rec. T.62 *bis Control procedures for Teletex and Group 4 facsimile service based on Recommendations X..215 and X.225*, 1993.
- Rec. T.70 *Network-independent basic transport service for the Telematic services*, 1992.
- Rec. F.200 *Teletex service*, 1993.
- Rec. T.501 *Document Application Profile MM for the interchange of formatted Mixed Mode document*, 1993.
- Rec. T.502 *Document Application Profile PM11 for the interchange of character content document in processable and formatted forms*, 1991.
- Rec. T.505 *Document Application Profile PM-26 for the interchange of mixed content documents in processable and formatted forms*, 1991.
- Rec. T.522 *Communication Application Profile BT1 for Document Bulk Transfer*, 1992.
- Rec. T.561 *Terminal characteristics for Mixed Mode of operation MM*, 1988.
- Rec. T.562 *Terminal characteristics for Teletex Processable Mode PM.1*, 1988.

2.2 ISO Standards

ISO 2022:1986 *Information processing – ISO 7-bit and 8-bit coded character sets – Code extension techniques.*

ISO 6429:1992 *Information processing – Control functions for 7-bit and 8-bit coded character sets.*

ISO 10538:1991 *Information Technology – Control functions for text communication.*

3 Definitions

For the purposes of this Recommendation the following definitions apply.

3.1 **text**: Text is information for human comprehension that is intended for presentation in a two-dimensional form, e.g. printed on paper or displayed on a screen. Text consists of symbols, phrases or sentences in natural or artificial languages.

3.2 **page**: A page is the basic element of office correspondence in the Teletex service. This term defines the information that can be presented on one sheet of paper. This information may be stored, displayed or printed.

NOTE – Relevant paper sizes are indicated in this Recommendation.fs

3.3 **printable area**: A printable area is defined to be the paper area available to the printing mechanism onto which graphic information can be technically impressed.

3.4 **communicated text area**: Area with a size of one line spacing (4.23 mm) less than the defined maximum printable area.

4 Requirements

Teletex terminal equipment are compatible with one another at the basic level of characteristics and functions defined in this Recommendation.

Additional optional characteristics and functions can be negotiated.

4.1 Basic characteristics

4.1.1 Common basic characteristics

4.1.1.1 In order to support a high grade of service, a signalling rate of 2.4 kbit/s (dedicated networks) or 64 kbit/s (ISDN) respectively on the subscriber line is recommended.

4.1.1.2 The Teletex terminal equipment has to allow text to be communicated from any subscriber to any other one.

4.1.1.3 With the aid of Teletex terminal equipment it is possible to produce character-coded texts and to transmit their true contents and form to a receiving Teletex terminal equipment.

4.1.1.4 The text to be transmitted is in Final Form in accordance to the Page Image Formats as described in ISO 10538.

4.1.2 Character repertoire

4.1.2.1 The Teletex terminal equipment has the ability to generate characters from the basic international Teletex character repertoire as in Recommendation T.50-Series.

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

4.1.2.3 In the sending mode, the Teletex terminal equipment must be capable of sending a selection of characters that belong to the basic repertoire of graphic characters.

4.1.2.4 The presentation device of the Teletex terminal equipment must have the ability to present as legibly as possible all graphic characters of the international basic Teletex character repertoire.

In such cases, where a word processor system is not capable of handling certain characters, fall back representation may be used.

4.1.3 Storage

4.1.3.1 The Teletex terminal equipment has memory for storage for both local and communication functions.

4.1.3.2 The texts produced locally are exchanged on an automatic memory-to-memory basis.

4.1.3.3 The minimum capacity of the receiving memory has to be 32 koctets [sufficient for about 8 business letters (1.5 pages each, 2000 characters per page)].

4.1.3.4 The storage ability of a Teletex terminal equipment to receive incoming traffic may be established by control procedures prior to message transmission (memory negotiation).

4.1.3.5 If the transmission has to be terminated as a result of insufficient storage at the receiving Teletex terminal equipment, indication of this condition will be given to both the transmitting and receiving Teletex terminal equipment by means of the control procedures.

4.1.4 Terminal identifier

4.1.4.1 The Teletex terminal equipment shall be equipped with a unique terminal identifier.

4.1.4.2 The identifier consists of 24 characters (octets) to which it shall be possible to assign any permissible bit combination of the primary set of Recommendation T.50-Series

4.1.4.3 The content and restrictions of the identifier are defined in Recommendation F.200.

4.1.4.4 The content of the identifier must be protected against loss or modification due to technical faults or unauthorised intervention.

4.1.5 Default conditions

4.1.5.1 In the absence of specific command in accordance with communication (see Recommendation T.62), the receiving Teletex terminal equipment shall assume the condition "one way" (calling Teletex terminal equipment is transmitting text) and "normal document".

4.1.5.2 Default conditions in accordance with text presentation (see 8.2.3, 8.2.8).

4.2 Basic functions

4.2.1 The local mode operation should not be disturbed by incoming calls.

4.2.2 In accordance with Recommendation F.200 the Teletex terminal equipment shall have the capability of two-way alternate (TWA) communication, which also includes one-way communication (OWC).

4.2.3 The TTE should ensure that each call may be divided in call phases as defined in Recommendation F.200.

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

4.2.5 The network-independent transport procedures is defined in Recommendation T.70.

4.2.6 The network-dependent procedures are depicted in clause 6.

5 Communication

5.1 Terminal identification

5.1.1 The Teletex communication procedures include the exchange of the terminal identifiers (see 4.1.4) prior to sending any document.

5.1.2 The sender should use the receiver identifier to check the correct establishment of the call prior to the information transfer phase (see Recommendation F.200).

5.1.3 If an automatic check is performed, this is preferably done in the mnemonic part of the terminal identifier, i.e. the part following the character "equal sign" (coding 3/13), see Recommendation F.200.

5.2 Call identification

The Teletex procedures include the exchange of reference information prior to sending any document. Details of call identification line are covered in Recommendation F.200.

6 Network dependent requirements

Teletex transport can be provided by a Circuit-Switched Data Network (CSDN), a Packet-Switched Data Network (PSDN), a Public Switched Telephone Network (PSTN) or an Integrated Services Digital Network (ISDN). In all four types of network the Teletex terminal equipment will provide automatic answering, transmission, reception and clearing.

6.1 Circuit-Switched Data Network

6.1.1 The DTE/DCE physical interface characteristics shall be in accordance with Recommendation X.21 or X.21 *bis*.

6.1.2 The functional and procedural rules for the call control phase are defined in Recommendation X.21.

6.1.3 The link and network layer procedures during the data transfer phase are defined in Recommendations X.21 and T.70, respectively.

6.1.4 On the CSDN the signalling rate of 2400 bit/s is recommended.

6.2 Packet Switched Data Network

6.2.1 The DTE/DCE physical interface characteristics shall be in accordance with Recommendation X.21 or X.21 *bis*.

6.2.2 The functional and procedural rules for the call control phase are defined in Recommendation X.25, LAPB.

6.2.3 The link and network layer procedures during the data transfer phase are defined in Recommendation X.25, LAPB.

6.2.4 On the PSDN the signalling rates of 2400, 4800, 9600 and 48 000 bit/s are recommended.

6.3 Public Switched Telephone Network

6.3.1 The DTE/DCE physical interface characteristics shall be in accordance with existing V-Series Recommendations.

6.3.2 The functional and procedural rules for the call control phase in the case of automatic calling and answering are defined in the Recommendation V.25 or V.25 *bis*.

6.3.3 The link and network layer procedures during data transfer phase are defined in Recommendation T.70 and in the case of half-duplex operation, in Recommendation T.71 too.

6.3.4 On the PSTN the signalling rates of 1200 and 2400 bit/s are recommended

6.4 Integrated Service Digital Network

6.4.1 The DTE/NT physical interface characteristics for such Teletex terminal equipment developed for ISDN application shall be in accordance with Recommendation I.430.

6.4.2 The functional and procedural rules for the connection control phase in the cases of both circuit-switched and packet-switched information transfer are defined in Recommendation T.90.

6.4.3 The link and network layer procedures during data transfer phase in the cases of both circuit-switched and packet switched information transfer are defined in Recommendation T.90.

6.4.4 On the ISDN the signalling rate of 64 000 bit/s is recommended.

NOTE – This does not exclude the possible connection of 2400 bit/s equipment to the ISDN.

7 Indicators

7.1 General

7.1.1 Indicators should inform about situations in which operator attention is required in order to maintain the grade of service.

7.1.2 The minimum requirement is a visual or an audible indicator. It must be active even if another local application is active.

7.2 Indicators and transmission alarms

7.2.1 On principle an indication of incoming documents has to be required.

7.2.2 An indication shall be provided for:

- received messages not yet presented to the user;
- receiving memory full or nearly full (less than 4 koctets);
- historic log full or nearly full (if provided).

The attention of the operator shall be drawn on the above situations either immediately, or after a local process has been finished or after the PC has been started.

7.2.3 The following transmission alarms are recommended:

- called equipment not available;
- called equipment disconnection;
- memory of receiving equipment full;
- negative local called TID checking.

8 Text handling

Todays wordprocessor systems are seen to be potential users for character coded information interchange. Due to their large variety of functions and text formats, certain rules should be recognized to allow information interchange on a compatible basis. These additional rules are given below.

8.1 Use of wordprocessors

8.1.1 If the “text only”-function of a wordprocessor is used, this can be considered as the basis that allows this text to be communicated.

8.1.2 If control functions should be used in addition (for attributes like bold, italics, sub- and superscripts, etc.) certain APIs (e. g. APPLI/COM as in Recommendation T.611) may be required.

8.2 Paper sizes, paper orientation and printable areas

For printing text on paper, the following should be take into account:

8.2.1 There are countries that use ISO A4 paper size (210 × 297 mm) or North-American paper size (216 × 280 mm) of which the common area is 210 × 280 mm. This common area is considered to be the basic printable area.

8.2.2 Printable areas are defined for both the vertical and horizontal orientation of the paper, and are expressed by the number of lines and number of characters, shown in Table 1.

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

8.2.4 The printable areas include an allowance for printing with an offset of 2.12 mm above the first base line and 2.12 mm below the last base line for subscripts and superscripts.

8.2.5 One line in the maximum printable area is reserved for the call identification line (see 5.2).

NOTE – The call identification line, if presented, will appear preferably at the superscripted level of the first printable line or the subscripted level of the last printable line, to ensure that it cannot partially overlap superscript text in the first communicated text line, or subscript text in the last communicated text line.

8.2.6 The character spacing shall be 2.54 mm (10 characters per 25.4 mm).

8.2.7 The basic character pitch shall be ten.

8.2.8 The line feed parameter values shall be 0.5, 1, 1.5 and 2 spacings of 4.233 mm (6 spacings of 4.233 mm equals 25.4 mm).

NOTE – In absence of a specific command the line feed spacing shall be 4.233 mm (single spacing).

8.2.9 For each text area a home position is defined (see Annex B).

TABLE 1/T.60

Basic printable areas and basic page formats

		Paper orientation	
		Vertical	Horizontal
Maximum number of lines per page[a)]	Line spacing (mm) 4.23	55[c)]	38[c)]
Maximum number of characters per line[b)]	Character spacing (mm) 2.54	5 + 72[d)]	5 + 100[d)]

a) The maximum number of lines per page is calculated according to the formula given in Annex B.

b) The maximum number of characters per line are given in the form *C* (*D* + *E*), where *C* is the total number of characters per line defined for the printable area, *D* the number of characters to the left side of the home position as defined for the page format, and *E* the number of characters to the right side including the home position character.

The home position is defined in Annex B.

c) The call identification line is not included.

d) The 5 characters can be positioned in the left margin by using appropriate control commands.

Annex A

Explanations of the printable areas

(This annex forms an integral part of this Recommendation)

A.1 The content of this annex does not form part of the requirements laid down by this Recommendation; instead it gives explanations of how the printable areas in Table 1 were defined.

A.2 The maximum printable area is defined to be the paper area available to the printing mechanism onto which graphic information can be technically impressed.

A.3 The following parameters were considered:

a) the use of a common paper area of 210 × 280 mm;

b) the worst case conditions for tolerances of paper size and of paper insertion as in Figure A.1;

c) the need to have the paper sheet held secure in the paper feed mechanism during the whole printout;

d) the use of line spacings of 4.23, 6.35 and 8.47 mm and a character spacing of 2.54 mm. The values for line spacings are rounded off to two decimal places (six spacings of 4.23 mm equal 25.4 mm);

e) the location of characters and base lines on a paper sheet as shown in Figure A.2;

f) the allowance to print exponents and indices with an offset of not more than 2.12 mm above and below the first and last base lines respectively.

A.4 The parameters in A.3 lead to the values for the position of the first and last printable characters as in Table A.1 and Figure A.2, and are given as examples only.

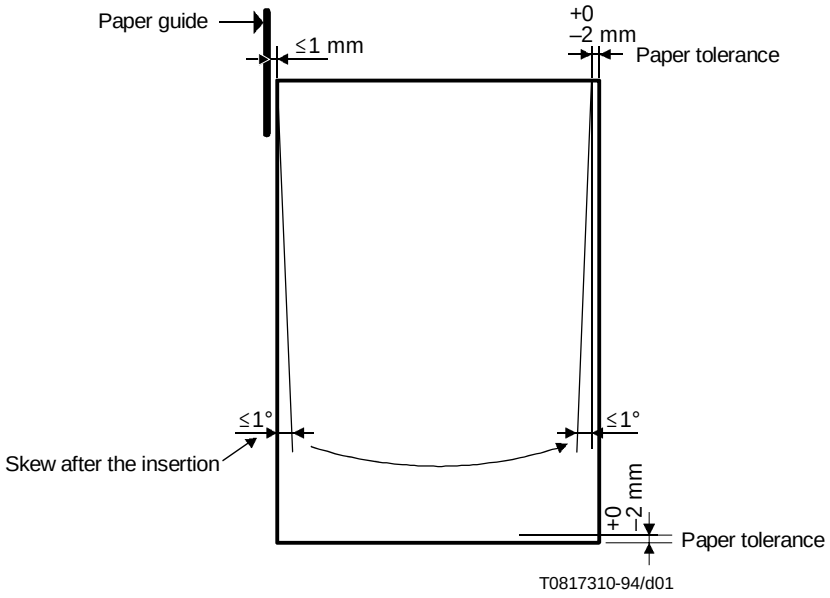
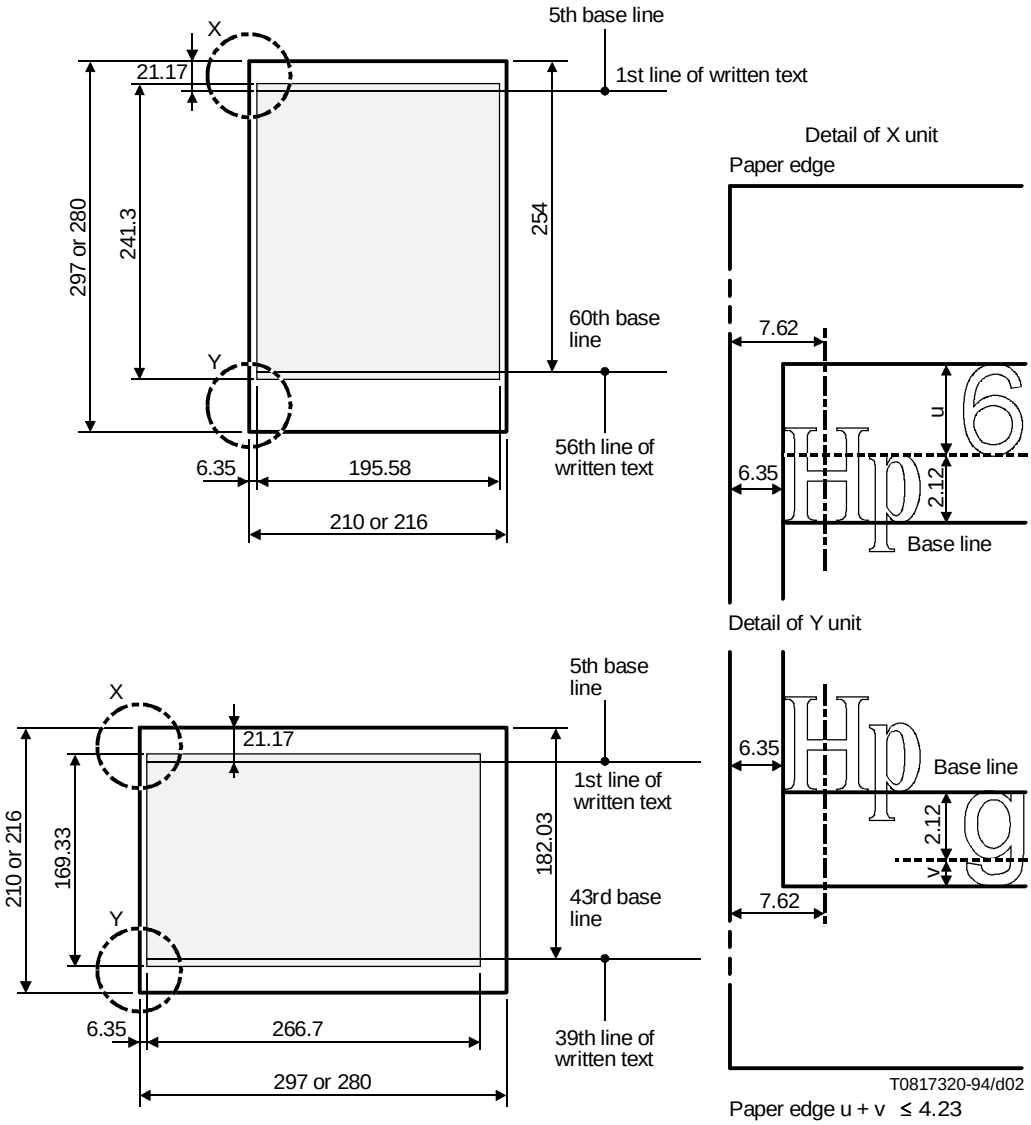


FIGURE A.1/T.60

TABLE A.1/T.60

	Best line position		Character position
	Orientation		For 2.54 mm Character spacing
	Vertical	Horizontal	
First printable positions	5	5	3
Last printable positions	60	–	79
	–	43	107



NOTES

1 Dotted area indicates the maximum printable area.

2 All values are nominal, given in mm and rounded to two decimal places.

3 The line spacing is defined as 6 lines per 25.4 mm and the character spacing as 10 characters per 25.4 mm.

FIGURE A.2/T.60

Annex B

Standardized options for printable areas

(This annex forms an integral part of this Recommendation)

B.1 This annex contains standardized optional values for different sizes of maximum printable areas.

B.1.1 Options for presentation within the basic maximum printable areas

B.1.2 Table B.1 contains the values for the usage of different optional character and line spacings.

B.1.3 In Figure B.1, the location of the home position for different character spacings is defined.

B.2 Options for presentation within ISO A4 paper size

B.2.1 With the same assumptions as used for the basic printable areas and described in this Recommendation (see clause 4 and Annex A), the appropriate maximum printable areas for the ISO A4 paper sheet (210 × 297 mm) and the values for different optional presentation attributes are found in Table B.2.

B.2.2 The optional printable areas for ISO A4 paper sheets defined by the ISO International Standard 3535 and the United Nations layout key – and the associated page formats – are those shown in Table B.3.

The part of the printable area intended for presentation of the communicated text are assumed to be located on the ISO A4 paper sheet as follows (compare with Figure A.2):

– *For vertical paper orientation:*

First line of communicated text: 3rd base line.
Last possible line for communicated text: 68th base line.

– *For horizontal paper orientation:*

First line of communicated text: 5th base line.
Last possible line for communicated text: 48th base line.

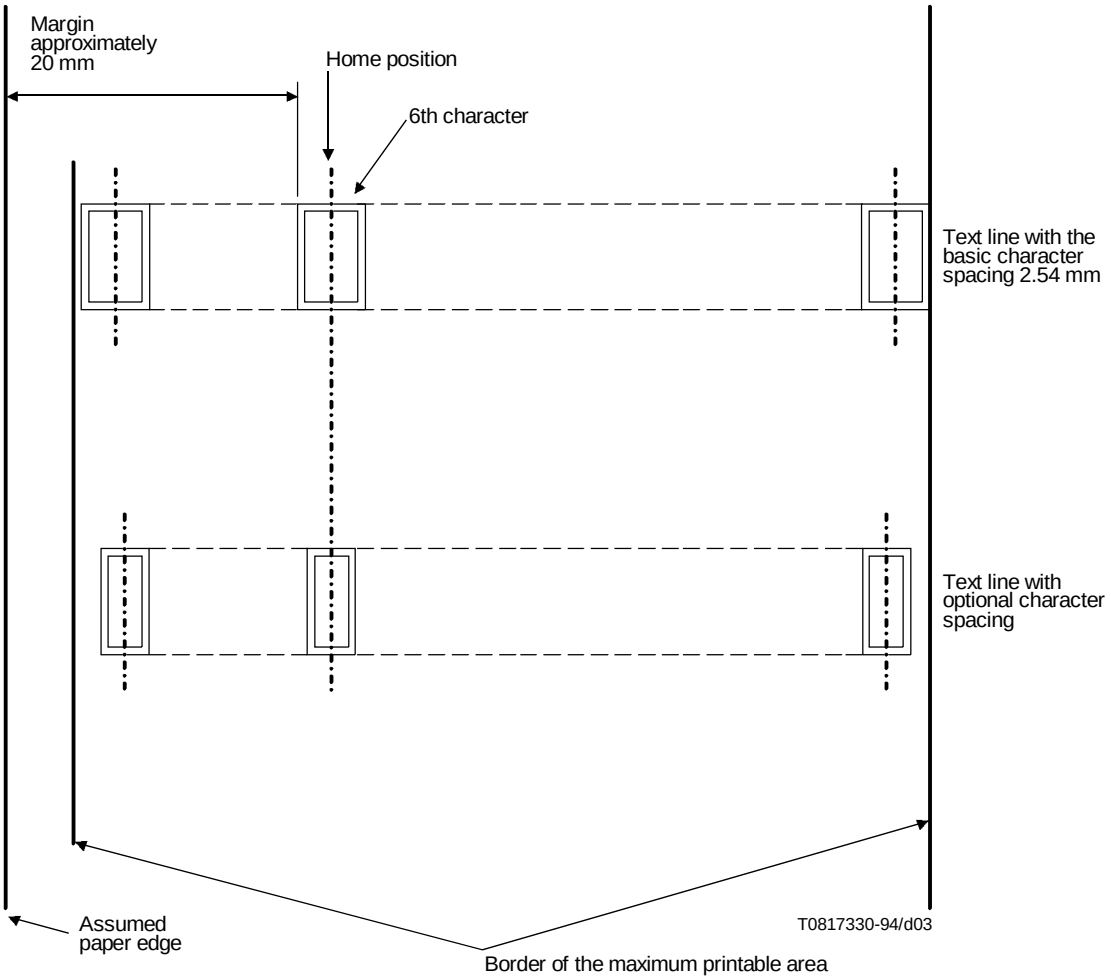
TABLE B.1/T.60

Options for presentation within the basic maximum printable areas

		Paper orientation	
		Vertical	Horizontal
Maximum number of lines per page[a)]	Line spacing (mm) 3.175 5	X = 146 HLS[a)] 73 46	X = 101 HLS[a)] 50 32
Maximum number of characters per line[b)]	Character spacing (mm) 2.12 1.69	 92 (6 + 86) 115 (7 + 108)	 125 (6 + 119) 156 (7 + 149)

a) X is the total available size for text to be communicated, measured in half-line spacings, excluding the CIL and excluding the offset for subscripted and superscripted presentations.

b) The maximum number of characters per line are given in the form *C* (*D* + *E*), where *C* is the total number of characters per line defined for the printable area, *D* the number of characters to the left side of the home position as defined for the page format (see Figure B.1) and *E* the number of characters to the right side including the home position character.



NOTES

1 The home position is defined as the 6th character position within the maximumprintable area using the character spacing 2.54 mm.

The Figure shows the home position aligned with the centre of the character field. It is permissible to use the left side of the character or character field as the home position.

2 This home position shall be used for all other optional character spacings, except in the case of Japanese Kanji terminals (see Note 3).

3 In the case of Japanese Kanji terminals the home position is such that a margin of approximately 25 mm results.

FIGURE B.1/T.60

Definition of the home position

The 2nd (and respectively 4th) base line is assumed for the locally defined presentation of the call identification line.

Presentation of superscript and subscript on the first and last base line respectively is not assumed for these printable areas.

B.3 Options for presentation within ISO paper sizes used with Japanese Kanji terminals

B.3.1 Optional printable areas for ISO A4 paper size for use with Japanese Kanji terminals are shown in Table B.4.

B.3.2 Optional printable areas for ISO B5 paper size for use with Japanese Kanji terminals are shown in Table B.5.

B.3.3 Optional printable areas for ISO B4 paper size for use with Japanese Kanji terminals are shown in Table B.6.

B.4 Options for presentation with North American legal paper size

B.4.1 The optional printable areas for North American legal paper size (216 × 356 mm) are shown in Table B.7.

B.5 Options for presentation within ISO paper sizes used with Chinese ideogram terminal

B.5.1 Optional printable areas for ISO A4 paper size used with Chinese ideogram teminal are shown in Table B.8.

B.5.2 Optional printable areas for ISO B5 paper size used with Chinese ideogram teminal are shown in Table B.9.

B.5.3 Optional printable areas for ISO B4 paper size used with Chinese ideogram teminal are shown in Table B.10.

B.6 Calculation of the maximum number of lines per page

In calculating the maximum number of lines per page one must be aware of the following calculation problem:

- when using a line spacing of 1½ there is always the combination of 2 half-line spacing text (the text-line itself) plus 1 half-line spacing of free space;
- when using a line spacing of 2 there is always the combination of 2 half-line spacing text (the text-line itself) plus 2 half-line spacings of free space.

There is always one “free space line” less than text lines.

Example (using line spacing 2 [SVS(2)])

xxxx1.linexxxxxx	2 half-line spacings for text 2 half-line spacings for “free space”
xxxx2.linexxxxxx	2 half-line spacings for text 2 half-line spacings for “free space”
xxxx3.linexxxxxx	2 half-line spacings for text

Although at the first sight when using double-line spacing [SVS(2)] 3 lines need 3 times 4 half-line spacings (equal to 12 half-line spacings), the example shows that 2 half-line spacings less (namely 10 half-line spacings) are sufficient. The reason is simple, as mentioned above, that one always need one “free-space” less than real text lines.

Taking this into account a calculation is only correct, when one of the text lines is taken out at the beginning of the calculation and added at the end, thus allowing the devision by "complete lines" (text-line plus "space-line").

Based on these principles, the calculations are made using the formula

$$n = \frac{X - d}{s} + 1$$

wherein

n is the maximum number of lines per page, measured in [lines];

X is the size of available area, excluding CIL and offsets, measured in [HLS];

d is the size of one text-line, which value is exactly 2 HLS;

s is the value of line-spacing, measured in [HLS/line].

NOTE – In Tables B.1 to B.10, the term [HLS] stands for 1/12 of 25.4 mm.

When using a line spacing of 3.175, the term [HLS*] is used, being based on 1/16 of 25.4 mm.

When using a line spacing of 5 mm, the term [HLS**] is used, being based on 2.5 mm.

TABLE B.2/T.60

Optional printable areas/page formats and associated values for ISO A4 paper size

		Paper orientation	
		Vertical	Horizontal
Maximum number of lines per page	Line spacing (mm) 4.23 6.35 8.47	X = 118 HLS[a)] 59 39 30	X = 76 HLS[a)] 38 25 19
	3.175	X = 157 HLS*[a)] 78	X = 101 HLS*[a)] 50
	5	X = 99 HLS**[a)] 49	X = 64 HLS**[a)] 32
Maximum number of characters per line[b)]	Character spacing (mm) 2.54 2.12 1.69	 77 (5 + 72) 92 (6 + 86) 115 (7 + 108)	 110 (5 + 105) 132 (6 + 126) 165 (7 + 158)

a) See a) to Table B.1.

b) See b) to Table B.1.

TABLE B.3/T.60

Optional printable areas/page formats and associated values corresponding to ISO 3535/A4

		Paper orientation	
		Vertical	Horizontal
Maximum number of lines per page	Line spacing (mm) 4.23 6.35 8.47	X = 132 HLS[a)] 66 44 33	X = 88 HLS[a)] 44 29 22
	3.175	X = 176 HLS*[a)] 88	X = 117 HLS*[a)] 58
	5	X = 111 HLS**[a)] 55	X = 74 HLS**[a)] 37
Maximum number of characters per line[b)]	Character spacing (mm) 2.54 2.12 1.69	77 (5 + 72) 92 (6 + 86) 115 (7 + 108)	110 (5 + 105) 132 (6 + 126) 165 (7 + 158)

a) See a) to Table B.1.

b) See b) to Table B.1.

TABLE B.4/T.60

Optional printable areas/page formats and associated values for ISO A4 paper size (Standardized option for Japanese Kanji terminals)

		Paper orientation	
		Vertical	Horizontal
Maximum number of lines per page	Line spacing (mm) 4.23 6.35 8.47	X = 118 HLS[a)] 59 39 30	X = 76 HLS[a)] 38 25 19
Maximum number of characters per line[b)]	Character spacing (mm) 4.23	45 (4 + 41)	66 (4 + 62)

a) See a) to Table B.1.

b) See b) to Table B.1.

TABLE B.5/T.60

Optional printable areas/page formats and associated values for ISO B5 paper size (Standardized option for Japanese Kanji terminals)

		Paper orientation	
		Vertical	Horizontal
Maximum number of lines per page	Line spacing (mm) 4.23 6.35 8.47	X = 98 HLS[a)] 49 33 24	X = 64 HLS[a)] 32 21 16
Maximum number of characters per line[b)]	Character spacing (mm) 4.23	38 (4 + 34)	56 (4 + 52)

a) See [a)] to Table B.1.

b) See [b)] to Table B.1.

TABLE B.6/T.60

Optional printable areas/page formats and associated values for ISO B4 paper size (Standardized option for Japanese Kanji terminals)

		Paper orientation	
		Vertical	Horizontal
Maximum number of lines per page	Line spacing (mm) 4.23 6.35 8.47	X = 150 HLS[a)] 75 50 38	X = 98 HLS[a)] 49 33 25
Maximum number of characters per line[b)]	Character spacing (mm) 4.23	56 (4 + 52)	79 (4 + 75)

a) See [a)] to Table B.1.

b) See [b)] to Table B.1.

TABLE B.7/T.60

Optional printable areas/page formats and associated values for North America Legal paper size (216 × 356 mm)

		Paper orientation	
		Vertical	Horizontal
Maximum number of lines per page	Line spacing (mm) 4.23 6.35 8.47	X = 146 HLS[a)] 73 49 37	X = 78 HLS[a)] 39 26 20
	3.175	X = 194 HLS*[a)] 97	X = 104 HLS*[a)] 52
Maximum number of characters per line[b)]	Character spacing (mm) 2.54 2.12 1.69	 80 (5 + 75) 96 (6 + 90) 120 (7 + 113)	 135 (5 + 130) 161 (6 + 155) 201 (7 + 194)

a) See [a)] to Table B.1.

b) See [b)] to Table B.1.

TABLE B.8/T.60

Optional printable areas/page formats and associated values for ISO B4 paper size (Standardized options for Chinese Ideogram terminals)

		Paper orientation	
		Vertical	Horizontal
Maximum number of lines per page	Line spacing (mm) 4.23[c)] 6.35 8.47	X = 118 HLS[a)] 59 39 30	X = 76 HLS[a)] 38 25 19
Maximum number of characters per line[b)]	Character spacing (mm) 4.23 5.64 6.35	 45 (4 + 41) 33 (3 + 30) 30 (3 + 27)	 66 (4 + 62) 49 (3 + 46) 44 (3 + 41)

a) See [a)] to Table B.1.

b) See [b)] to Table B.1.

c) Line spacing of 4.23 mm will not be used when character spacing is 5.64 or 6.35 mm.

TABLE B.9/T.60

Optional printable areas/page formats and associated values for ISO B5 paper size (Standardized options for Chinese Ideogram terminals)

		Paper orientation	
		Vertical	Horizontal
Maximum number of lines per page	Line spacing (mm) 4.23[c)] 6.35 8.47	X = 98 HLS[a)] 49 33 24	X = 64 HLS[a)] 32 21 16
Maximum number of characters per line[b)]	Character spacing (mm) 4.23 5.64 6.35	 38 (4 + 24) 28 (3 + 25) 25 (3 + 22)	 56 (4 + 52) 42 (3 + 39) 37 (3 + 34)

a) See [a)] to Table B.1.

b) See [b)] to Table B.1.

c) See [c)] to Table B.8.

TABLE B.10/T.60

Optional printable areas/page formats and associated values for ISO B4 paper size (Standardized options for Chinese Ideogram terminals)

		Paper orientation	
		Vertical	Horizontal
Maximum number of lines per page	Line spacing (mm) 4.23[c)] 6.35 8.47	X = 150 HLS[a)] 75 50 38	X = 98 HLS[a)] 49 33 25
Maximum number of characters per line[b)]	Character spacing (mm) 4.23 5.64 6.35	 56 (4 + 52) 42 (3 + 39) 37 (3 + 34)	 79 (4 + 75) 59 (3 + 56) 53 (3 + 50)

a) See [a)] to Table B.1.

b) See [b)] to Table B.1.

c) See [c)] to Table B.8.

Annex C

Interworking between Teletex terminals and telex terminals

(This annex forms an integral part of this Recommendation)

C.1 In text which is to be sent to a telex terminal, the graphic character set should be restricted to that of International Telegraph Alphabet No. 2 (ITA2). This restriction only applies to that part of the text which is for onward transmission to telex. This restriction should be performed in the Teletex terminal.

C.2 The text for onward transmission to telex shall only contain those characters of ITA2 that form a subset of the basic Teletex character repertoire, as specified in Table D.1. Coding of these characters shall be in accordance with Recommendations T.50-Series.

C.3 For the new line function, it is strongly recommended to use CR and LF in the order CR followed by LF. The order LF followed by CR is deprecated because this may cause improper printing in certain telex terminals.

C.4 The line length is restricted to 69 characters.

C.5 The Teletex terminal, when interworking with telex, operates at the Teletex terminal's normal data signalling rate.

C.6 The control procedures to be used between a Teletex terminal and a conversion facility (see Recommendation F.200) are defined in Recommendation T.390.

NOTE – A conversion facility provides for necessary conversion between Teletex and telex of communication procedures, signalling rates, character coding, etc.

Annex D

Conversion table between the Teletex and the telex repertoire for Teletex/telex interworking

(This annex forms an integral part of this Recommendation)

TABLE D.1/T.60

ITA No. 2 Combination No.	Telex repertoire	Teletex Repertoire	Identifier (Rec. T.50 series)
Letter case			
1	A	a or A	LA01 or LA02
2	B	b or B	LB01 or LB02
3	C	c or C	LC01 or LC02
.	.	.	.
.	.	.	.
.	.	.	.
24	X	x or X	LX01 or LX02
25	Y	y or Y	LY01 or LY02
26	Z	z or Z	LZ01 or LZ02
Figure case			
1	–	–	SP10
2	?	?	SP15
3	:	:	SP13
4	WRU	(Note 1)	
5	3	3	ND03
6	Nat. use	(Note 2)	
7	Nat. use	(Note 2)	
8	Nat. use	(Note 2)	
9	8	8	ND08
10	BELL	(Note 1)	
11	(	(	SP06
12	)	)	SP07
13	.	.	SP11
14	,	,	SP08
15	9	9	ND09
16	0	0	ND10
17	1	1	ND01
18	4	4	ND04
19	’	’	SP05
20	5	5	ND05
21	7	7	ND07
22	=	=	SA04
23	2	2	ND02
24	/	/	SP12
25	6	6	ND06
26	+	+	SA01
Either case			
27	CR	CR	CF15
28	LF	LF	CF12
29	Letter-shift	(Note 3)	
30	Figure-shift	(Note 3)	
31	SP	SP	SP01
32	NU	(Note 1)	

NOTES

1 Not defined in the teletex repertoire. It will not be transmitted from the conversion facility to the teletex terminal.

2 The use of these characters is not defined in international teletex/telex interworking.

3 This character is only used for communication between conversion and telex terminal and is not transmitted to the teletex terminal.

Superseded by a more recent version

Annexe E

Implementation of Recommendation T.61 (1988)

Considering

a) that the market in the field of telecommunication requires more open solutions for the exchange of documents;

b) that therefore the interdependence of the character sets and coding schemes in various Telematic services increase;

c) that new facilities in accordance with code conversion and interworking between various Telematic services are introduced;

d) that Recommendation T.50 specifies the International Reference Version (IRV) of 7-bit coded character set;

e) that Recommendation T.51 defines Latin based coded character sets and the corresponding character repertoire for Telematic services;

f) that Recommendation T.52 specifies the coded character sets for non-Latin based Telematic services;

g) that Recommendation T.53 specifies all the control functions for character coded applications used in Telematic services including the handling of bi-directional texts,

for the international Teletex service the character repertoire and coded character sets of the relevant T.5x Series Recommendations as mentioned above should be used.

All present Teletex applications established on T.61 as contained in the Blue Book (1988) are not required to follow the new regulations and therefore need not to be changed.