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Recommendation T.60

TERMINAL EQUIPMENT FOR USE IN THE TELETEX SERVICE

(Geneva, 1980; amended at Malaga-Torremolinos, 1984

and Melbourne, 1988)

1 Scope of Recommendations concerning the Teletex service

1.1 This Recommendation defines the requirements for terminal equipment used in the international Teletex service

1.2 The rules to be followed in the Teletex service are defined in Recommendation F.200.

1.3 The character repertoire and the coded character sets for the Teletex service are defined in Recommendation T.61.

1.4 All Teletex terminals have to communicate with unique procedures that are described as follows:

a) the interface to the transport network is defined in this Recommendation, see § 6;

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

c) the Teletex control procedures are defined in Recommendation T.62.

1.5 Requirements for terminals providing mixed-mode capability are specified in Recommendation T.72.

2 Introduction

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

2.2 A Teletex terminal , operating in the local mode, can also be used like a typewriter to prepare ordinary office documents. By means of the Teletex communication facilities, the text thus prepared can be transmitted to other Teletex terminals or received from them.

2.3 In this Recommendation *text* refers to character-coded text only.

2.4 Terminals can have various degrees of complexity. Within this Recommendation the emphasis is on requirements for correct interworking of different terminals.

2.5 Details are given on dimensions and positioning of text. Various dimensions refer to the presentation of text on paper. In this respect, paper formats of both 210 × 297 mm (ISO A4) and 216 × 280 mm are taken into account. Other paper sizes are included as options.

2.6 Terminals fulfilling the requirements denoted as *basic requirements* can participate in the Teletex service on a defined level of compatibility

3 General characteristics of the terminal equipment

3.1 *Basic characteristics*

3.1.1 The Teletex terminal allows text to be communicated from any subscriber to any other subscriber.

3.1.2 All terminals participating in the international Teletex service have to be compatible with one another at the basic level defined in this Recommendation. Additional optional functions may be invoked.

3.1.3 In order to support a high grade of service, a user data rate of 2.4 kbit/s on the subscriber line is recommended wherever possible. Detailed arrangements on a national level are left to the Administrations concerned, as it is recognized that national implementation of the Teletex service on various types of network may involve national operation at different data throughput rates.

3.1.4 When operated in the local mode, e.g. when the Teletex terminal is used in the same way as an office typewriter, the operation in the local mode should not be interrupted by incoming traffic. However, under *receive store full* conditions, the production of a permanent copy of the incoming messages must have priority over the local mode. In this context, a permanent copy is understood to be, e.g., paper, tape, magnetic media, etc., except volatile memory devices (such as semi-conductor memory without battery back-up).

A compulsory printout due to full memory (interruption of the local mode of operation) is not required.

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

3.1.6 In the receiving mode, the Teletex terminal must be capable of receiving into store all characters from the basic repertoire of graphic characters.

3.1.7 The presentation device of the terminal must have the ability to represent as legibly as possible all graphic characters of the basic international Teletex character repertoire. Unambiguous presentation of the basic international Teletex character repertoire is a minimum requirement.

3.1.8 The terminal must have the ability to respond to the control functions of the basic international Teletex repertoire

3.1.9 The use of graphic character repertoires other than the Teletex basic repertoire of graphic characters is subject to ascertaining the mutual capability of the terminals and has to be initiated by the appropriate procedural steps.

3.1.10 The page is the basis for text formatting and text transmission.

3.1.11 The terminal must be able to handle paper formats in both the vertical and horizontal orientation (see § 4.2 below).

3.1.12 A printable area of the page is defined within which free positioning of the text is possible during local text preparation (see § 4.2 below).

3.1.13 After transmission, the content, layout and format of a Teletex message must be identical at the transmitting and the receiving terminals, when using the defined basic mode of Teletex operation.

3.1.14 The Teletex terminal must be provided with storage for transmitting and receiving functions. See § 5.2 for further details.

3.1.15 The Teletex terminal must provide means for *fully automatic operation* (see definitions in Recommendation F.200).

3.1.16 For the purpose of automatic operation, an internationally agreed unique terminal identification must be provided (see § 5.1 for further details).

3.1.17 The basic Teletex terminal should provide the capability of interworking with telex. Necessary constraints on the Teletex terminal are defined in § 8.

3.1.18 Teletex terminals shall incorporate all functions defined as basic for the Teletex service in § 3.2 below. In addition, optional functions can be incorporated. In this Recommendation, the optional functions are divided into CCITT-standardized options (§ 3.3) and nationally and/or privately specified options (§ 3.4).

3.1.19 This Recommendation does not specify requirements for receive-only terminals. However, it is not intended to exclude such terminals.

3.2 *Basic functions*

3.2.1 A terminal shall be capable of handling:

a) the end-to-end control procedures as defined in Recommendations T.62 and T.70;

b) the appropriate network-dependent procedure, see § 6;

c) the Teletex basic graphic character repertoire;

d) the Teletex basic control function repertoire;

e) text in the basic vertical and horizontal page formats;

f) subscripts and superscripts.

3.2.2 Basic text formatting functions for printers (or other presentation devices as applicable) are as follows:

a) vertical and horizontal page orientation;

b) printable area common to ISO A4 and 216 × 280 mm paper formats;

c) character spacing of 2.54 mm (10 characters per 25.4 mm);

d) line feed parameter values of 0.5, 1, 1.5 and 2 spacings of 4.233 mm (six spacings of 4.233 mm equals 25.4 mm);

e) free positioning of text within the printable area using the Teletex basic repertoire of graphic characters and control functions;

f) partial line up and partial line down functions (for presenting superscript and subscript).

3.2.3 The following Teletex service requirements must be met:

a) terminal identification;

b) storage for receiving and transmitting functions;

c) provisions for a permanent copy (not necessarily on paper) of all text received;

d) provisions for interworking with the telex service.

Note — The use of the terminal identification (transmission, reception) is a matter for the communication procedure (see Recommendation T.62).

3.3 *CCITT-standardized optional functions*

3.3.1 The possibility of using optional functions can be negotiated between terminals during a handshaking procedure in the end-to-end control procedure (see Recommendation T.62).

3.3.2 As the service develops, additions and changes to the CCITT-standardized optional functions listed below may be needed.

3.3.3 For the optional functions of the communication control procedures, see Recommendations T.62 and T.70.

3.3.4 Optional text formatting functions for printers (or other presentation devices as applicable) are to be found in:

a) Annex B to this Recommendation;

b) Annex E to Recommendation T.61.

3.3.5 Alternative character repertoires may be invoked by designation of CCITT-registered national and/or application-oriented character repertoires.

Note — The definition and designation of CCITT-registered national and/or application-oriented character repertoires is a matter for study in the future.

3.3.6 For Teletex terminals supporting the mixed mode of operation (MM), additional terminal characteristics are specified in Recommendation T.561.

3.3.7 For Teletex terminals supporting the processable mode (PM.1), additional terminal characteristics are specified in Recommendation T.562.

3.4 *Optional functions for national standardization or private use*

3.4.1 The CCITT standardization includes the necessary rules and means for indication of or escape into functions specified nationally or for private use (see standardized options in Recommendation F.200).

3.5 *Default conditions*

3.5.1 In the absence of specific indication, the receiving terminal shall assume the following conditions:

a) communication (as specified in Recommendation T.62):

— one way (calling terminal is transmitting text),

— normal document;

b) character repertoire — basic international Teletex character repertoire;

c) text presentation:

— vertical basic page format,

— character spacing of 2.54 mm,

— line-feed spacing of 4.23 mm (single spacing),

— default rendition.

4 Text handling

4.1 *Character repertoire*

4.1.1 The terminal, participating in the international Teletex service, can exchange text with all other Teletex terminals. To enable this communication, the international Teletex basic graphic character and control function repertoires, as defined in Recommendation T.61, shall be used.

4.1.2 On an optional basis a terminal can use other national and/or application-oriented character repertoires registered by CCITT. The rules for the code extension technique are described in Recommendation T.61.

4.2 *Paper sizes and printable areas*

4.2.1 If the Teletex terminal is capable of printing text on paper, it has to act like a normal office typewriter. Therefore the following applies.

4.2.2 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.

4.2.3 Printable areas are defined for both the vertical and horizontal orientation of the paper, and are expressed by the number of line positions and character positions shown in Table 1/T.60.

4.2.4 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 superscripts and subscripts respectively.

4.2.5 For the definitions of the printable areas in Table 1/T.60 certain assumptions about technical and operational problems have been taken. Further details about these assumptions are given in Annex A.

H.T. [T1.60]
TABLE 1/T.60
Basic printable areas and basic page formats

Paper orientation Vertical	Horizontal		
{ Maximum number of lines per page | ua) } Line spacing (mm) 4.23 6.35 8.47 }	{ X = 110 HLS 55 37 28	X = 76 HLS 38 25 19	
{ Maximum number of characters per line | ub) } **Character spacing (mm)** 77 (5 + 72) }	Character spacing (mm) 2.54 **Character spacing (mm)**	{	

105 (5 + 100) [a] The maximum number of lines per page is calculated according to the formula given.

b) The maximum number of characters per line are given in the form C | D + E), where C | s 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 Figure B-1/T.60.

Table 1/T.60 [T1.60], p.

4.2.6 It is not the intention of this Recommendation to define precisely the location and the size of the printable areas on paper sheets. However, the design of printing equipment shall always provide for the maximum number of lines and the maximum number of characters per line as shown in Table 1/T.60.

Note — The optional use of preprinted forms needs further study

4.2.7 Optional printable areas are found in Annex B.

4.3 *Page format*

4.3.1 The size of the communicated text area, vertically or horizontally oriented, is one line spacing (4.23 mm) less than the defined maximum printable area, to allow for presentation of the call identification line

4.3.2 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 communicable text line , or subscript text in the last communicable text line

Note — Some existing equipment may be unable to comply with the requirement. If overlapped printing occurs on such terminals, it will be the recipient's responsibility to obtain clarification of text from the sender.

4.3.3 For each text area a home position is defined. See Recommendations T.61 and F.200.

Note — The home positions for different character spacings are shown in Figure B-1/T.60.

5 Communications

5.1 *Terminal identification*

5.1.1 Each Teletex terminal shall be equipped with a unique terminal identifier stored in the terminal.

5.1.2 The terminal 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.61.

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

5.1.3 The content of the terminal identifier must be protected against loss or modification due to technical faults or non-authorized intervention.

5.1.4 The Teletex communication procedures include the exchange of the terminal identifiers prior to sending any document. The sender should use the receivers identifier to check the correct establishment of the call. If an automatic check is performed, this is preferably done on the mnemonic part of the terminal identifier, i.e. the part following the equals sign (=), see Recommendation F.200.

5.2 *Storage*

5.2.1 The terminals have to be equipped with a memory for reception, transmission and undisturbed local operation.

5.2.2 The storage ability of a terminal to receive incoming traffic may be established by control procedures prior to message transmission.

5.2.3 If the transmission has to be terminated as a result of insufficient storage at the receiving end, indication of this condition will be given to both the transmitting and receiving parties.

5.2.4 The storage capacity shall be sufficient to meet the quality of service criteria laid down in Recommendation F.200.

5.2.5 Terminal design and/or operating procedures shall be such as to minimize the possibility of loss of messages due to power failure or memory failure (for example by the use of nonvolatile memory or by forced print-out as appropriate).

5.3 *Call identification*

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

6 Network-dependent requirements

6.1 Teletex transport can be provided by a circuit-switched data network (CSDN), a packet-switched data network (PSDN) or a public switched telephone network (PSTN). In all three types of network the Teletex terminal will provide automatic answering, transmission, reception and clearing.

6.2 *Circuit-switched data network*

a) functional and procedural rules for the call control phase: Recommendation X.21;

b) bit rate: 2400 bit/s;

c) link and network layer procedures during the data transfer phase: duplex as defined in Recommendation T.70.

6.3 *Packet-switched data network*

a) functional and procedural rules for the call control phase: Recommendation X.25;

b) bit rates: 2400, 4800, 9600 and 48 | 00 bit/s.

6.4 *Public switched telephone network*

a) functional and procedural rules for the call control phase in the case of automatic calling and answering: Recommendation V.25 line requirements for automatic calling and answering;

b) bit rates: half-duplex 2400 bit/s; duplex 1200 or 2400 bit/s; Recommendation V.22, V.22 | fIbis or V.26 | fIter modem line requirements;

Note — V.22 | fIbis line requirements are preferable to V.22.

c) link and network layer procedures during data transfer phase : Recommendation T.70 and in the case of half-duplex operation also Recommendation T.71.

7 Indicators

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

7.2 An indication of the following situations shall be provided:

a) message received in store;

b) terminal unable or soon unable to receive, e.g. when receiving memory is nearly full;

c) operator assistance required, e.g. when printing element or paper orientation requires changing.

The terminal operator's attention shall be drawn to the above situations immediately regardless of the actual condition of the terminal, e.g. when terminal is in stand-by mode.

8 Interworking between Teletex terminals and telex terminals

8.1 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.

8.2 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 C-1/T.60. Coding of these characters shall be in accordance with Recommendation T.61.

8.3 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.

8.4 The line length is restricted to 69 characters.

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

8.6 The control procedures to be used between a Teletex terminal and a conversion facility (see Recommendation F.200) are defined in Recommendation T.90.

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

9 Interworking between basic Teletex equipments and equipments supporting PM.1 and/or MM option

9.1 *General*

Basic Teletex documents are to be interchanged according to the rules defined in Recommendation T.62 **|** fIbis .

PM.1 and MM Teletex documents are to be interchanged according to the application context defined in Recommendations T.561 and T.562.

Figure 1/T.60 below illustrates the two different sets of rules to be used by Teletex equipments depending on the interchanged document format.

Figure 1/T.60, p.

9.2 *Interworking rules*

9.2.1 The basic Teletex equipment is the sender.

The only type of document that can be sent by the basic Teletex equipment is the basic Teletex document. The sender should therefore try to send this type of document by using the appropriate rules, i.e. T.62 | fIbis rules.

In order to accept the reception of the basic Teletex document, the receiver has to recognize the ‘‘nature’’ of the originator and to select the adequate rules. For this purpose, when receiving the CONNECT SPDU (which corresponds to the CSS command of Recommendation T.62), the recipient must detect the absence of Session User Data (SUD) and select the T.62 | fIbis module to accept the interchanged document [case a)].

9.2.2 The PM.1/MM Teletex equipment is the sender.

9.2.2.1 The recipient is a basic Teletex equipment.

If the document type to be transmitted is a basic Teletex document, the sender will initiate the communication by selecting the T.62 | fIbis module [case a)] and the basic Teletex equipment can accept the document.

If the document type to be transmitted is a PM.1/MM document, the sender will initiate the communication by selecting the T.522 module [case b)].

The receiver will then send an ACCEPT SPDU without Session User Data. This allows the sender to recognize that the receiver is a basic Teletext equipment and therefore that the documents are to be interchanged in a basic Teletex format by using T.62 | fIbis communication rules [case a)], the sender could then inform the user that the interchange of the PM.1/MM document is not possible as the addressee is a basic Teletex equipment.

9.2.2.2 The recipient is a PM.1 and/or MM Teletex equipment.

If the document type to be transmitted is a basic Teletex document, the sender will initiate the communication by selecting the T.62 | fIbis module [case a)] and the rules specified in § 2.1 apply.

If the document type to be transmitted is a PM.1 or MM.1 Teletex document the sender will initiate the communication by selecting the T.522 module [case b)].

The recipient will detect the presence of Session User Data and therefore will select the T.522 module to give an adequate response to the sender.

ANNEX A

(to Recommendation T.60)

Explanations of the printable areas

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/T.60 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/T.60;

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/T.60;

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/T.60 and Figure A-2/T.60, and are given as examples only.

FIGURE A-1/T.60, p.

H.T. [T2.60]

TABLE A-1/T.60

	Best line position	Character position
Unable to convert table		

Table A-1/T.60 [T1.60], p.

FIGURE A-2/T.60, p.

ANNEX B

(to Recommendation T.60)

Standardized options for printable areas

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

B.1 *Options for presentation within the basic maximum printable areas*

B.1.1 Table B-1/T.60 contains the values for the usage of different optional character and line spacings.

B.1.2 In Figure B-1/T.60, 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 (§ 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/T.60.

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/T.60.

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 Figure A-2/T.60):

— 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.

The 2nd (resp. 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/T.60.

B.3.2 Optional printable areas for ISO B5 paper size for use with Japanese Kanji terminals are shown in Table B-5/T.60.

B.3.3 Optional printable areas for ISO B4 paper size for use with Japanese Kanji terminals are shown in Table B-6/T.60.

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/T.60.

B.5 *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 1 1/2 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.lignexxxxxx 2 half-line spacings for ‘‘free-space’’ xxxx3.lignexxxxxx 2 half-line spacings for text

2 half-line spacing for text 2 half-line spacings for ‘‘free space’’ xxxx2.lignexxxxxx 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 maximum number of lines per page, measured in [lines],

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

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

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

Note — In the following tables 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.

H.T. [T3.60]

TABLE B-1/T.60

Options for presentation within the basic maximum printable areas

(see § 4)

Paper orientation			
Vertical	Horizontal		
{ Maximum number of lines per page } Line spacing (mm) 3.175 5. } X = 146 HLS | ua) 73 46 }	{ { X = 101 HLS | ua) 50 32		
{ Maximum number of characters per line | ub) } Character spacing (mm) 2.12 1.69 } **Character spacing (mm)** 92 (6 + 86) 115 (7 + 108) } **Character spacing (mm)** 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 sub- and superscripted presentations.

b) The maximum number of characters per line are given in the form *C*
| *D* + *E*), where *C*
| s the total number of characters per line defined for the printable area, *D*
| he number of characters on the left side of the home position as defined for the page format (see Figure B-1/T.60) and *E*
| he number of characters to the right side including the home position character.

Tableau B-1/T.60 [T3.60], p.6

Figure B-1/T.60, p.7

H.T. [T4.60]

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 | ua) 59 39 30 } X = 76 HLS | ua) 38 25 19 }	{ { {		
{ **Maximum number of lines per page** } **Line spacing (mm)** 3.175 }	{ X = 157 HLS* | ua) 78	X = 101 HLS* | ua) 50	
{ **Maximum number of lines per page** } **Line spacing (mm)** 5**.175** }	{ X = 99 HLS** | ua) 49	X = 64 HLS** | ua) 32	
{ Maximum number of characters per line | ub) } Character spacing (mm) 2.54 2.12 1.69 } **Character spacing (mm)** 77 (5 + 72) 92 (6 + 86) 115 (7 + 108) } **Character spacing (mm)** 110 (5 + 105) 132 (6 + 126) 165 (7 + 158) }	{ { {		

a) See footnote | ua) to Table B-1/T.60.

b) See footnote | ub) to Table B-1/T.60.

Tableau B-2/T.60 [T4.60], p.8

H.T. [T5.60]

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 | ua) 66 44 33 } X = 88 HLS | ua) 44 29 22 }	{ { {		
{ **Maximum number of lines per page** } **Line spacing (mm)** 3.175 }	{ X = 176 HLS* | ua) 88	X = 117 HLS* | ua) 58	
{ **Maximum number of lines per page** } **Line spacing (mm)** 5**.175** }	{ X = 111 HLS** | ua) 55	X = 74 HLS** | ua) 37	
{ Maximum number of characters per line | ub) } Character spacing (mm) 2.54 2.12 1.69 } **Character spacing (mm)** 77 (5 + 72) 92 (6 + 86) 115 (7 + 108) } **Character spacing (mm)** 110 (5 + 105) 132 (6 + 126) 165 (7 + 158) }	{ { {		

a) See footnote | ua) to Table B-1/T.60.

b) See footnote | ub) to Table B-1/T.60.

Tableau B-3/T.60 [T5.60], p.9

H.T. [T6.60]

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 | ua) 59 39 30 } X = 76 HLS | ua) 38 25 19 }	{ { {		
{ Maximum number of characters per line | ub) } **Character spacing (mm)** 45 (4 + 41) } **Character spacing (mm)** 66 (4 + 62) }	Character spacing (mm) 4.23 {	{	

a) See footnote | ua) to Table B-1/T.60.

b) See footnote | ub) to Table B-1/T.60.

Tableau B-4/T.60 [T6.60], p.10

H.T. [T7.60]

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 | ua) 49 33 24 } X = 64 HLS | ua) 32 21 16 }	{ { {		
{ Maximum number of characters per line | ub) } **Character spacing (mm)** 38 (4 + 34) } **Character spacing (mm)** 56 (4 + 52) }	Character spacing (mm) 4.23 {	{	

a) See footnote | ua) to Table B-1/T.60.

b) See footnote | ub) to Table B-1/T.60.

Tableau B-5/T.60 [T7.60], p.11

H.T. [T8.60]

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 | ua) 75 50 38 } X = 98 HLS | ua) 49 33 25 }	{ { {		
{ Maximum number of characters per line | ub) } **Character spacing (mm)** 56 (4 + 52) } **Character spacing (mm)** 79 (4 + 75) }	Character spacing (mm) 4.23 {	{	

a) See footnote | ua) to Table B-1/T.60.

b) See footnote | ub) to Table B-1/T.60.

Tableau B-6/T.60 [T8.60], p.12

H.T. [T9.60]

TABLE B-7/T.60

Optional printable areas/page formats and associated

values for North American Legal paper size (216 mm × 356 mm)

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

a) See footnote | ua) to Table B-1/T.60.

b) See footnote | ub) to Table B-1/T.60.

Tableau B-7/T.60 [T9.60], p.13

B.6 *Options for presentation within ISO paper sizes used with Chinese ideogram terminal*

B.6.1 Optional printable areas for ISO A4 paper size used with Chinese ideogram terminal are shown in Table B-8/T.60.

B.6.2 Optional printable areas for ISO B5 paper size used with Chinese ideogram terminal are shown in Table B-9/T.60.

B.6.3 Optional printable areas for ISO B4 paper size used with Chinese ideogram terminal are shown in Table B-10/T.60.

H.T. [T10.60]

TABLE B-8/T.60

Optional printable areas/page formats and associated values for ISO A4 paper size (Standardized options for Chinese ideogram terminal)

Paper orientation Vertical	Horizontal		
{ Maximum number of lines per page } Line spacing (mm) 4.23 | uc) 6.35 **| fR↑c↑)** 8.47 **| fR↑c↑)** } X = 118 HLS | ua) 59 39 30 } X = 76 HLS | ua) 38 25 19 }	{ { {		
{ Maximum number of characters per line | ub) } Character spacing (mm) 4.23 **| fR↑c↑)** **5.64 | fR↑c↑)** **6.35 | fR↑c↑)** } **Character spacing (mm)** **45 (4 + 41)** **33 (3 + 30)** **30 (3 + 27)** **}** **Character spacing (mm)** **66 (4 + 62)** **49 (3 + 46)** **44 (3 + 41)** **}**	{ { **{**		

a) See footnote | ua) to Table B-1/T.60.

b) See footnote | ub) to Table B-1/T.60.

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

Tableau B-8/T.60 [T10.60], p.14

H.T. [T11.60]

TABLE B-9/T.60

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

<table>
<tr><td colspan="4">Paper orientation</td></tr>
<tr><td>Vertical</td><td colspan="3">Horizontal</td></tr>
<tr><td>{</td><td></td><td></td><td></td></tr>
<tr><td>Maximum number of lines per page</td><td></td><td></td><td></td></tr>
<tr><td>}</td><td>{</td><td></td><td></td></tr>
<tr><td>Line spacing (mm)</td><td></td><td></td><td></td></tr>
<tr><td>4.23 | uc)</td><td></td><td></td><td></td></tr>
<tr><td>6.35 | fR↑c↑)</td><td></td><td></td><td></td></tr>
<tr><td>8.47 | fR↑c↑)</td><td></td><td></td><td></td></tr>
<tr><td>}</td><td>{</td><td></td><td></td></tr>
<tr><td>X = 98 HLS | ua)</td><td></td><td></td><td></td></tr>
<tr><td>49</td><td></td><td></td><td></td></tr>
<tr><td>33</td><td></td><td></td><td></td></tr>
<tr><td>24</td><td></td><td></td><td></td></tr>
<tr><td>}</td><td>{</td><td></td><td></td></tr>
<tr><td>X = 64 HLS | ua)</td><td></td><td></td><td></td></tr>
<tr><td>32</td><td></td><td></td><td></td></tr>
<tr><td>21</td><td></td><td></td><td></td></tr>
<tr><td>16</td><td></td><td></td><td></td></tr>
<tr><td>}</td><td></td><td></td><td></td></tr>
<tr><td>{</td><td></td><td></td><td></td></tr>
<tr><td>Maximum number of characters per line | ub)</td><td></td><td></td><td></td></tr>
<tr><td>}</td><td>{</td><td></td><td></td></tr>
<tr><td>Character spacing (mm)</td><td></td><td></td><td></td></tr>
<tr><td>4.23 | fR↑c↑)</td><td></td><td></td><td></td></tr>
<tr><td>5.64 | fR↑c↑)</td><td></td><td></td><td></td></tr>
<tr><td>6.35 | fR↑c↑)</td><td></td><td></td><td></td></tr>
<tr><td>}</td><td>{</td><td></td><td></td></tr>
<tr><td>Chaaracter spacing (mm)</td><td></td><td></td><td></td></tr>
<tr><td>38 (4 + 34)</td><td></td><td></td><td></td></tr>
<tr><td>28 (3 + 25)</td><td></td><td></td><td></td></tr>
<tr><td>25 (3 + 22)</td><td></td><td></td><td></td></tr>
<tr><td>}</td><td>{</td><td></td><td></td></tr>
<tr><td>Character spacing (mm)</td><td></td><td></td><td></td></tr>
<tr><td>56 (4 + 52)</td><td></td><td></td><td></td></tr>
<tr><td>42 (3 + 39)</td><td></td><td></td><td></td></tr>
<tr><td>37 (3 + 34)</td><td></td><td></td><td></td></tr>
<tr><td>}</td><td></td><td></td><td></td></tr>
</table>

a) See footnote | ua) to Table B-1/T.60.

b) See footnote | ub) to Table B-1/T.60.

c) See footnote | uc) to Table B-8/T.60.

Tableau B-9/T.60 [T11.60], p.15

H.T. [T12.60]

TABLE B-10/T.60

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

<table>
<tr><th colspan="4">Paper orientation</th></tr>
<tr><th>Vertical</th><th colspan="3">Horizontal</th></tr>
<tr><td>{
Maximum number of lines per page
}
Line spacing (mm)
4.23 | uc)
6.35 | fR↑c↑)
8.47 | fR↑c↑)
}
X = 150 HLS | ua)
75
50
38
}
X = 98 HLS | ua)
49
33
25
}</td><td>{
{
{</td><td></td><td></td></tr>
<tr><td>{
Maximum number of characters per line | ub)
}
Character spacing (mm)
4.23 | fR↑c↑)
5.64 | fR↑c↑)
6.35 | fR↑c↑)
}
Character spacing (mm)
56 (4 + 52)
42 (3 + 39)
37 (3 + 34)
}
Character spacing (mm)
79 (4 + 75)
59 (3 + 56)
53 (3 + 50)
}</td><td>{
{
{</td><td></td><td></td></tr>
</table>

a) See footnote | ua) to Table B-1/T.60.

b) See footnote | ub) to Table B-1/T.60.

c) See footnote | uc) to Table B-8/T.60.

Tableau B-10/T.60 [T12.60], p.16

ANNEX C
(to Recommendation T.60)

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

H.T. [T13.60]
TABLE C-1/T.60

ITA No. 2 Combination No.	Telex repertoire	Teletex repertoire	Identifier (Rec. T.61)
{			
Letter case			
1			
2			
3			
.			
.			
.			
24			
25			
26			
}			
{			
A			
B			
C			
X			
Y			
Z			
}	{		
a			
or **A**			
b			
or **B**			
c			
or **C**			
x			
or **X**			
y			
or **Y**			
z			
or **Z**			
}	{		
LA01 or LA02			
LB01 or LB02			
LC01 or LC02			
LX01 or LX02			
LY01 or LY02			
LZ01 or LZ02			
}			
Figure case			
{			
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			

20
21
22
23
24
25
26
} {
—
?
:
WRU
3
Nat. use
Nat. use
Nat. use
8
BELL
(
)
.
,
9
0
1
4
'
5
7
=
2
/
6
+
} {
—
?
:
Note 1
3
Note 2
Note 2
Note 2
8
Note 1
(
)
.
,
9
0
1
4
'
5
7
=
2
/
6
+
} {
SP10

SP15 SP13 . ND03 . . . ND08 . SP06 SP07 SP11 SP08 ND09 ND10 ND01 ND04 SP05 ND05 ND07 SA04 ND02 SP12 ND06 SA01 }			
Either case 27 28 29 30 31 32 CR LF letter-shift figure-shift SP NU } CF15 CF12 . . SP01 . }	{ CR LF Note 3 Note 3 SP Note 1	{	

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

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

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

Table C-1/T.60 [T13.60] p.

ANNEX D
(to Recommendation T.60)

Definitions

D.1 **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.

D.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.

D.3 **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, pictures, diagrams and tables.

D.4 **communicated text area**

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

Recommendation T.61

CHARACTER REPERTOIRE AND CODED CHARACTER SETS

FOR THE INTERNATIONAL TELETEX SERVICE

(Geneva, 1980; amended at Malaga-Torremolinos, 1984

and Melbourne, 1988)

CONTENTS

Annex A — Code extension procedures

Annex B — Use of diacritical marks

Annex C — Identification system

Annex D — Format of control sequences

Annex E — Standardized options

Annex F — Example of underlining

Note — Octets notation in Recommendation T.61.

Notation for identifying octets coding has been changed, referring to new ISO practice, decided within ISO/IEC JTC 1/SC2.

According to the new notation, each number now must have two figures according to the following examples:

H.T. [T1.61]

0/4	to become	00/04
4/12	to become	04/12
10/12	to become	10/12
(previous notation)		(new notation)

Table [T1.61], p.

The amendments of T.61 may be done in conformity to this new notation.

Occurence of this new notation is indicated by a ‘‘*’’ sign on the right of the page.

The existing text still remains with the previous notations.

1 Introduction

1.1 This Recommendation contains detailed definitions of the repertoires of graphic characters and control functions to be used in the basic international Teletex service, and their coded representations for communication. Additionally, the means are described whereby supplementary character repertoires and their coded representations may optionally be used.

1.2 In the Teletex service, control functions may be communicated as coded characters within the text or by means of the control procedures. This Recommendation defines the repertoire and coding of the former category.

1.3 The character repertoires and coded character sets for Teletex are not intended to replace International Alphabet No. 5 (IA5) or International Telegraph Alphabet No. 2 (ITA2). This Recommendation, based on Recommendation T.50, provides an extended alphabet for use in the international text communication service, Teletex. Where graphic characters of IA5 are not required for Teletex, their code table positions have been left unused, thereby assuring compatibility with IA5. The resulting subset of IA5 has been extended by the definition of additional graphic character sets.

1.4 The development of the coded character set defined in this Recommendation is based on the use of an 8-bit structure for the basic Teletex service.

1.5 This Recommendation should be read in conjunction with the following Recommendations:

T.60 — Terminal equipment for use in the Teletex service;

T.62 — Control procedures for Teletex and Groupe 4 Facsimile services;

F.200 — Teletex service.

1.6 The following Recommendations and ISO standards are related to this Recommendation, however, for the Teletex service this Recommendation only is relevant:

T.50 International Alphabet No. 5;

T.51 Coded character sets for the telematic services.

ISO 646 Information processing — ISO 7-bit coded character set for information interchange;

ISO 2022 Information processing — ISO 7-bit and 8-bit coded character sets — Code extension techniques;

ISO 6429 Information processing — ISO 7-bit and 8-bit coded character sets — Additional control functions for character imaging devices;

ISO 6937 Information processing — Coded character sets for text communication.

1.7 This Recommendation contains ordered lists of graphic characters and control functions forming the Teletex basic repertoire, together with the coded character sets necessary for their communication. For this purpose, the elements of the coded character sets are used either individually or in defined combinations.

1.8 The optional use of additional character repertoires is provided for, but the composition of such repertoires is not defined. Similarly, the code extension techniques for the representation of the additional repertoires are described in general, but no specific allocations of code tables are made.

2 Definitions

2.1 format effectors

F: caractères de mise en page

S: determinantes de formato

Control functions that influence the positioning of text, within the text area, on a presentation device. The following concepts are used in defining format effectors.

2.1.1 active position

F: position active

S: posición activa

The character position where the next character would appear if it were presented.

2.1.2 text area

F: zone de texte

S: zona de texto

The part of a printed page that is actually used for the presentation of text. The active position moves within the text area only. For Teletex, the text area is the *maximum printable area* (see Recommendation T.60).

2.1.3 home position

F: position initiale

S: posición inicial

The reference position on any line to which the active position moves after a terminal receives a *Carriage return* . The starting position for printing is then established from this reference position by the sending terminal, using *Space* or *Backspace* characters as required.

2.2 presentation control functions

F: fonctions de commande pour la pr´esentation

S: funciones de control de la presentaci´on

Control functions that influence in a uniform way the presentation attributes of the text (e.g. line spacing or page format) on a presentation device.

2.3 **graphic code extension**

F: extension de code graphique

S: extensión del código gráfico

The method of encoding graphic characters in excess of those that may be represented by the 8-bit code combinations of the basic code table. Alternative sets of 94 graphic characters may be *designated* by means of escape sequences and *invoked* by means of shift functions. Depending on the designating escape sequence, the alternative sets of characters are represented by bit combinations of the left-hand half (positions 2/1 to 7/14 inclusive) or the right-hand half (positions 10/1 to 15/14 inclusive) of the 8-bit code table.

In the basic Teletex service, escape sequences and shift functions are not used. The primary set of graphic characters defined in § 4.1.3.3 is implicitly designated and invoked into positions 2/1 to 7/14 of the 8-bit code table. The supplementary set of graphic characters defined in § 4.1.3.4

is implicitly designated and invoked into positions 10/1 to 15/14 of the 8-bit code table.

Note — As an enhancement to the basic Teletex service, national or application-oriented sets of graphic characters may be designated by means of appropriate escape sequences, thereby overlaying the primary and supplementary sets. Return to the primary and supplementary sets is accomplished by similar escape sequences.

2.4 **Teletex character repertoire**

F: répertoire des caractères télétex

S: repertorio teletex de caracteres

The total range of graphic characters and control functions that may be communicated between Teletex terminals.

2.5 **Teletex graphic character repertoire**

F: répertoire des caractères graphiques télétex

S: repertorio teletex de caracteres gráficos

The total range of graphic characters that may be communicated between and presented by Teletex terminals.

2.6 **Teletex basic graphic character repertoire**

F: répertoire des caractères graphiques télétex de base

S: repertorio teletex básico de caracteres gráficos

A comprehensive list of graphic characters whose communication is guaranteed by the Teletex service, and which are capable of being presented on all Teletex terminals.

2.7 **Teletex control function repertoire**

F: répertoire des fonctions de commande télétex

S: repertorio teletex de funciones de control

The total range of control functions communicated between Teletex terminals to enable the action of the receiving terminal to be controlled.

2.8 **Teletex basic control function repertoire**

F: répertoire des fonctions de commande télétex de base

S: repertorio teletex básico de funciones de control

A comprehensive list of control functions communicated between Teletex terminals whose effect on the receiving terminal is defined and guaranteed by the service.

2.9 **other teletex character repertoires**

F: autres répertoires de caractères télétex

S: otros repertorios teletex de caracteres

National or application-oriented lists of graphic characters and control functions, in addition to the Teletex basic repertoires of graphic characters and control functions, that may be communicated between Teletex terminals by mutual agreement.

Note — Specific additional character repertoires may be the subject of CCITT Recommendations.

2.10 **character**

F: caractère

S: carácter

A member of a set of elements that is used for the organization control or representation of data. A character repertoire contains two types of elements: graphic characters and control functions.

2.11 **control function**

F: fonction de commande

S: función de control

An action that affects the recording, processing, transmission or interpretation of data. The coded representation of a control function consists of one or more bit combinations. A control function is not a graphic character, but may have a graphic representation in some circumstances (e.g. for record purposes). It must not, however, be transmitted with the specific intent of producing a graphic representation.

2.12 **control character**

F: caractère de commande

S: carácter de control

A control function, the coded representation of which consists of a single bit combination.

2.13 **graphic character**

F: caractère graphique

S: carácter gráfico

A character, other than a control function, that has a visual representation normally hand-written, printed or displayed. The term *graphic character* is used with a dual meaning:

a) Graphic characters that are elements of a set that can be designated. These are called *elementary graphic characters* in order to distinguish them from the *composite graphic characters* . Some of the elementary graphic characters are used in combinations to represent composite graphic characters.

b) Graphic characters that are members of a repertoire. Some of these are *composite graphic characters* represented by combinations of *elementary graphic characters* .

2.14 **presentation**

F: pr´esentation

S: presentaci´on

The printing or display of a stored character or characters to allow for human comprehension of the stored information.

2.15 **bit combination**

F: combinaison binaire

S: combinaci´on de bits

An ordered set of bits that represents a character.

2.16 **code, coded character set**

F: code, jeu de caractères codés

S: código, juego de caracteres codificados

A set of unambiguous rules that establish a character set and the one-to-one relationship between the characters of the set and their bit combinations.

2.17 **code table**

F: tableau de code

S: tabla de código

A table showing the character corresponding to each bit combination in a code. A code table is normally represented as a rectangular matrix of columns and rows.

2.18 **position**

F: position

S: posición

An item in a code table identified by its column and row coordinates.

2.19 **code extension**

F: extension de code

S: extensión de código

Techniques for encoding characters that are not included in the character set of a given code.

2.20 **escape sequence**

F: séquence d'échappement

S: secuencia de escape

A bit string that is used for control purposes in code extension procedures and that consists of two or more bit combinations. The first of these combinations corresponds to the character *escape* .

2.21 **to designate**

F: désigner

S: designar

To identify a set of characters that are to be represented, in some cases immediately and in others on the occurrence of a further control function, in a prescribed manner.

2.22 **to invoke**

F: appeler

S: invocar

To cause a designated set of characters to be represented by the prescribed bit combinations.

3 Teletex character repertoire

3.1 *General*

3.1.1 The Teletex character repertoire is composed as defined below and as illustrated in Figure 1/T.61.

Figure 1/T.61 p.

3.1.2 The Teletex character repertoire consists of the *Teletex repertoire of graphic characters* and the *Teletex repertoire of control functions* .

3.1.3 The Teletex repertoire of graphic characters consists of the *Teletex basic repertoire of graphic characters* and the *Teletex national and application-oriented repertoires of graphic characters* . The basic repertoire of graphic characters is defined in § 3.2.

3.1.4 The Teletex repertoire of control functions consists of the *Teletex basic repertoire of control functions* and the *Teletex national and application-oriented repertoires of control functions* . The basic repertoire of control functions is defined in § 3.3.

3.1.5 The Teletex basic repertoire of graphic characters, together with the Teletex basic repertoire of control functions, constitute the Teletex basic character repertoire.

3.1.6 Bit combinations or sequences of bit combinations that do not represent graphic characters or control functions of the Teletex basic character repertoire, are not defined in this Recommendation.

Note — With the Teletex sets of coded graphic characters and control functions it is, in principle, possible to produce combinations of diacritical marks and graphic characters other than those defined in the Teletex basic graphic character repertoire. However, the presentation of such composite symbols at the receiving terminal cannot be predicted and is therefore not defined in this Recommendation.

3.1.7 Sequences of graphic characters and control functions that would result in the presentation of two or more graphic characters in a single character position are not defined in this Recommendation.

Note — It is possible, in text preparation, to overlay graphic symbols by the use of the control functions BS, SP, CR and RLF. However, no character of the Teletex basic graphic character repertoire shall be transmitted over the communication medium by this means. As it is normal office practice to create graphic symbols by overlaying graphic characters, the user cannot be prevented from using the keyboard to image locally composite symbols and the Teletex service shall not exclude the possibility of the transmission of these overlaid graphic symbols. The presentation of such overlaid graphic symbols at the receiving terminal cannot be predicted and is, therefore, not defined in this Recommendation. To prevent problems coming from overlaid characters, it is recommended not to transmit *Backspace* regardless of operator keying sequences, except in the left margin. However, because overlaid characters may be received from certain terminals, it is recommended that the terminal can represent the overlay. Similarly, an underline implemented by SGR or by *Non spacing underline* and followed by PLD may be a cause of overlap of graphic symbols. Although the definition of PLD in § 3.3.2 states that it is the sender's responsibility to avoid overlap, it may be difficult to prevent an accidental occurrence. In such cases the receiver may suppress printing of the underline to preserve legibility of the other graphic symbol.

3.1.8 The control functions of the Teletex basic repertoire enable a receiving terminal to produce a document that is identical in contents, layout and format, to that produced by the sending terminal.

3.1.9 The use of character repertoires other than the basic repertoire of graphic characters is subject to mutual agreement between terminals and shall be initiated by the appropriate procedural steps.

3.2 *Teletex basic repertoire of graphic characters*

3.2.1 *General*

3.2.1.1 The repertoire of graphic characters defined in this Recommendation consists of:

a) Latin alphabetic characters, listed in § 3.2.2, which comprise:

i) the 52 small and capital letters of the basic Latin alphabet ;

ii) accented letters and umlauts, the graphical representations of which consist of combinations of basic Latin letters and diacritical marks;

iii) alphabetic characters that are neither basic Latin letters nor combinations of basic Latin letters and diacritical marks;

b) non-alphabetic characters, listed in § 3.2.3, which comprise decimal digits, currency signs, punctuation marks (including *Space*), diacritical marks , arithmetic signs, subscripts and superscripts, fractions, miscellaneous symbols that have individual special meanings and non-spacing characters.

3.2.1.2 The lists in §§ 3.2.2 and 3.2.3 are composed as described below:

a) the first column contains the identifier of each character, assigned in accordance with the identification system explained in Annex C;

b) the second column presents the graphical representation of the character;

c) the third column specifies the name or the description of the character.

Note — The repertoire of graphic characters defined in this Recommendation contains a limited set of accented letters and umlauts. This set is summarized in Annex B.

3.2.2 *Latin alphabetic characters*

Identifier	Graphic	Name or description
LA01	a	small a
LA02	A	capital A
LA11	á	small a with acute accent
LA12	A	capital A with acute accent
LA13	à	small a with grave accent
LA14	A	capital A with grave accent
LA15	|	small a with circumflex accent
LA16	|	capital A with circumflex accent
LA17	ä	small a with diaeresis or umlaut mark

LA18	Ä	capital A with diaeresis or umlaut mark
LA19	ã	small a with tilde
LA20	Ã	capital A with tilde
LA23	a	small a with breve
LA24	A	capital A with breve
LA27	a	small a with ring
LA28	A	capital A with ring
LA31	a	small a with macron
LA32	A	capital A with macron
LA43	a	small a with ogonek
LA44	A	capital A with ogonek
LA51	ae	small ae diphthong
LA52	AE	capital AE diphthong
LB01	b	small b
LB02	B	capital B
LC01	c	small c
LC02	C	capital C
LC11	ć	small c with acute accent
LC12	Ć	capital C with acute accent

LC15	ĉ	small c with circumflex accent
LC16	Ĉ	capital C with circumflex accent
LC21	c	small c with caron
LC22	C	capital C with caron
LC29	c	small c with dot
LC30	C	capital C with dot
LC41	ç	small c with cedilla
LC42	Ç	capital C with cedilla
LD01	d	small d
LD02	D	capital D
LD21	d or d’	small d with caron
LD22	D	capital D with caron
LD61	d	small d with stroke
LD62	D	capital D with stroke, Icelandic eth
LD63	d	small eth, Icelandic
LE01	e	small e
LE02	E	capital E
LE11	é	small e with acute accent
LE12	É	capital E with acute accent
LE13	è	small e with grave accent
LE14	È	capital E with grave accent
LE15	|	small e with circumflex accent
LE16	|	capital E with circumflex accent
LE17	ë	small e with diaeresis or umlaut mark
LE18	Ë	capital E with diaeresis or umlaut mark
LE21	e	small e with caron
LE22	E	capital E with caron
LE29	e	small e with dot
LE30	E	capital E with dot
LE31	e	small e with macron
LE32	E	capital E with macron
LE43	e	small e with ogonek
LE44	E	capital E with ogonek
LF01	f	small f

LF02	F	capital F
LG01	g	small g
LG02	G	G capital G
LG11	ǵ	small g with acute accent
LG15	ĝ	small g with circumflex accent
LG16	Ĝ	capital G with circumflex accent
LG23	g	small g with breve
LG24	G	capital G with breve
LG29	g	small g with dot
LG30	G	capital G with dot
LG42	Ģ	capital G with cedilla
LH01	h	small h
LH02	H	capital H
LH15	ĥ	small h with circumflex accent
LH16	Ĥ	capital H with circumflex accent
LH61	h	small h with stroke
LH62	H	capital H with stroke
LI01	i	small i
LI02	I	capital I
LI11	í	small i with acute accent
LI12	Í	capital I with acute accent
LI13	ì	small i with grave accent
LI14	Ì	capital I with grave accent
LI15	|	small i with circumflex accent
LI16	|	capital I with circumflex accent
LI17	ï	small i with diaeresis or umlaut mark
LI18	Ï	capital I with diaeresis or umlaut mark
LI19	ĩ	small i with tilde
LI20	Ĩ	capital I with tilde
LI30	I	capital I with dot
LI31	i	small i with macron
LI32	I	capital I with macron
LI43	i	small i with ogonek
LI44	I	capital I with ogonek

LI51	ij	small ij ligature
LI52	IJ	capital IJ ligature

LI61	i	small i without dot
LJ01	j	small j
LJ02	J	capital J
LJ15	ĵ	small j with circumflex accent
LJ16	Ĵ	capital J with circumflex accent
LK01	k	small k
LK02	K	capital K
LK41	ķ	small k with cedilla
LK42	Ķ	capital K with cedilla
LK61	k	small k, Greenlandic
LL01	l	small l
LL02	L	capital L
LL11	ĺ	small l with acute accent
LL12	Ĺ	capital L with acute accent
LL21	l o l’	small l with caron
LL22	L o L’	capital L with caron
LL41	ļ	small l with cedilla
LL42	Ļ	capital L with cedilla
LL61	l	small l with stroke
LL62	L	capital L with stroke
LL63	l	small l with middle dot
LL64	L	capital L with middle dot
LM01	m	small m
LM02	M	capital M
LN01	n	small n
LN02	N	capital N
LN11	ń	small n with acute accent
LN12	Ń	capital N with acute accent
LN19	ñ	small n with tilde
LN20	Ñ	capital N with tilde
LN21	n	small n with caron
LN22	N	capital N with caron
LN41	ņ	small n with cedilla
LN42	Ņ	capital N with cedilla

LN61	n	small eng, Lapp
LN62	N	capital eng, Lapp
LN63	’n	small n with apostrophe
LO01	o	small o
LO02	O	capital O
LO11	ó	small o with acute accent
LO12	Ó	capital O with acute accent
LO13	ò	small o with grave accent
LO14	Ò	capital O with grave accent
LO15	|	small o with circumflex accent
LO16	|	capital O with circumflex accent
LO17	ö	small o with diaeresis or umlaut mark
LO18	Ö	capital O with diaeresis or umlaut mark
LO19	õ	small o with tilde
LO20	Õ	capital O with tilde
LO25	o	small o with double acute accent
LO26	O	capital O with double acute accent
LO31	o	small o with macron
LO32	O	capital O with macron
LO51	oe	small oe ligature
LO52	OE	capital OE ligature
LO61	ø	small o with slash
LO62	ø	capital O with slash
LP01	p	small p
LP02	P	capital P
LQ01	q	small q
LQ02	Q	capital Q
LR01	r	small r
LR02	R	capital R
LR11	ŕ	small r with acute accent
LR12	Ŕ	capital R with acute accent
LR21	r	small r with caron
LR22	R	capital R with caron
LR41	ŗ	small r with cedilla

LR42	Ŗ	capital R with cedilla

LS01	s	small s
LS02	S	capital S
LS11	ś	small s with acute accent
LS12	S	capital S with acute accent
LS15	ŝ	small s with circumflex accent
LS16	Ŝ	capital S with circumflex accent
LS21	s	small s with caron
LS22	S	capital S with caron
LS41	ş	small s with cedilla
LS42	Ş	capital S with cedilla
LS61	β	small sharp s, German
LT01	t	small t
LT02	T	capital T
LT21	t o t’	small t with caron
LT22	T	capital T with caron
LT41	ţ	small t with cedilla
LT42	Ţ	capital T with cedilla
LT61	t	small t with stroke
LT62	T	capital T with stroke
LT63	p	small thorn, Icelandic
LT64	P	capital thorn, Icelandic
LU01	u	small u
LU02	U	capital U
LU11	ú	small u with acute
LU12	Ú	capital U with acute accent
LU13	ù	small u with grave accent
LU14	Ù	capital U with grave accent
LU15	|	small u with circumflex accent
LU16	|	capital U with circumflex accent
LU17	ü	small u with diaeresis or umlaut mark
LU18	Ü	capital U with diaeresis or umlaut mark
LU19	ũ	small u with tilde
LU20	Ũ	capital U with tilde
LU23	u	small u with breve

LU24	U	capital U with breve
LU25	u	small u with double acute accent
LU26	U	capital U with double acute accent
LU27	u	small u with ring
LU28	U	capital U with ring
LU31	u	small u with macron
LU32	U	capital U with macron
LU43	u	small u with ogonek
LU44	U	capital U with ogonek
LV01	v	small v
LV02	V	capital V
LW01	w	small w
LW02	W	capital W
LW15	ŵ	small w with circumflex accent
LW16	Ŵ	capital W with circumflex accent
LX01	x	small x
LX02	X	capital x
LY01	y	small y
LY02	Y	capital Y
LY11	ý	small y with acute accent
LY12	Ý	capital Y with acute accent
LY15	ŷ	small y with circumflex accent
LY16	Ŷ	capital Y with circumflex accent
LY17	ÿ	small y with diaeresis or umlaut mark
LY18	Ÿ	capital Y with diaeresis or umlaut mark
LZ01	z	small z
LZ02	Z	capital Z
LZ11	ź	small z with acute accent
LZ12	Ź	capital Z with acute accent
LZ21	z	small z with caron
LZ22	Z	capital Z with caron
LZ29	z	small z with dot
LZ30	Z	capital Z with dot

3.2.3 *Non-alphabetic characters*

3.2.3.1 *Decimal digits*

Identifier
Graphic
Name or description
ND01
ND02
ND03
ND04
ND05
ND06
ND07
ND08
ND09

ND10
1
2
3
4
5
6
7
8
9

0 digit 1 digit 2 digit 3 digit 4 digit 5 digit 6 digit 7 digit 8 digit 9 digit 0

.PS 10

3.2.3.2 *Currency signs*

Identifier
Graphic
Name or description
SC01
SC02
SC03
SC04
SC05
Ł
$

general currency sign pound sign dollar sign cent sign yen sign

.PS 10

3.2.3.3 *Punctuation marks*

Identifier
Graphic
Name or description
SP01
SP02
SP03
SP04
SP05

SP06
SP07
SP08
SP09
SP10
SP11
SP12
SP13
SP14
SP15
SP16
SP17

SP18

!
!
‘‘.ce 0
(
)
,
—
-
/
:
;
?
?
<<

>>

space (see also § 3.3.2) exclamation mark inverted exclamation mark quotation mark apostrophe left parenthesis right parenthesis comma low line hyphen or minus sign full stop, period solidus colon semicolon question mark inverted question mark angle quotation mark left angle quotation mark right

Note — In Teletex (and Videotex), *Quotation mark, Apostrophe* and *Comma* are independent characters that cannot have the meaning of diacritical marks. .PS 10

3.2.3.4 *Arithmetic signs*

Identifier
Graphic
Name or description
SA01
SA02
SA03
SA04
SA05
SA06
SA07
+
±
<
=
>
÷

×

plus sign plus/minus sign less-than sign equals sign greater-than sign divide sign multiply sign

Note — For *minus sign* see SP10. .PS 10

3.2.3.5 *Subscripts and superscripts*

Identifier
Graphic
Name or description
NS02
NS03
2

3 superscript 2 superscript 3

.PS 10

3.2.3.6 *Fractions*

Identifier
Graphic
Name or description
NF01
NF04
NF05
½
¼

¾ fraction one half fraction one quarter fraction three quarters

.PS 10

3.2.3.7 *Miscellaneous symbols*

Identifier
Graphic
Name or description
SM01
SM02
SM03
SM04

SM05
SM06
SM08
SM13
SM17
SM18
SM19
SM20
SM21
SM24
SM25

SM26

##
%
&
*

[
]
|
µ
Ω
°
o
a
§

×

number sign percent sign ampersand asterisk commercial at left square bracket right square bracket vertical line micro sign ohm sign degree sign ordinal indicator, masculine ordinal indicator, feminine section sign paragraph sign, pilcrow middle dot

.PS 10

3.2.3.8 *Diacritical marks as separate graphic characters*

Identifier
Graphic
Name or description
SD11
SD13
SD15
SD17
SD19
SD21
SD23
SD25
SD27
SD29
SD31
SD41

SD43

☐
☐
☐
☐
☐
☐
☐
☐
☐
☐
☐
☐

☐

acute accent with space grave accent with space circumflex accent with space diaeresis or umlaut mark with space tilde with space caron with space breve with space double acute accent with space ring with space dot with space macron with space cedilla with space ogonek with space

Note — The diacritical marks are illustrated together with a rectangle representing the relative position of the graphic character with which they are normally associated. .PS 10

3.2.3.9 *Non-spacing characters*

Identifier Graphic Name or description SM27 ☐ non spacing underline

Note — The *Non-spacing underline* character is never used individually but always in combination with some other graphic character to represent the graphic rendition ‘‘underlined’’ for the associated character. The *Non-spacing underline* character can be used in combination with any graphic character of the repertoire, including an accented letter or an umlaut, or *Space* recommended to implement the ‘‘underline’’ function by means of the control function SGR(4) instead of the ‘‘non-spacing underline’’ graphic character. However, both must be correctly interpreted when received. .PS 10

3.3 *Teletex basic repertoire of control functions*

3.3.1 *General*

3.3.1.1 The repertoire of control functions defined in this Recommendation consists of:

a) format effectors;

b) presentation control functions;

c) code extension control functions;

d) miscellaneous control functions.

3.3.1.2 In addition to the categories mentioned above, other control functions may be used in the Teletex service, in particular transmission control functions required by lower-level control procedures. These control functions, however, are not specified in this Recommendation since they are not used during the transmission of text in the basic Teletex service.

3.3.1.3 Format effectors, presentation control functions, code extension control functions and miscellaneous control functions are listed in §§ 3.3.2, 3.3.3, 3.3.4 and 3.3.5 respectively. These lists are composed as described below:

a) the first column contains the identifier of each control function, assigned in accordance with the identification system explained in Annex C;

b) the second column presents the abbreviated name of the control function;

c) the third column specifies the name and the definition of the control function.

3.3.1.4 The default state for all control functions defined in § 3.3 § E.3.2 are assumed at the beginning of each page. The same applies to the implicit designation and invocation of character sets defined in §§ A.1 and A.2.

The start of a new page is indicated by either a *Command document start* (CDS), a *Command document continued* (CDC), or a *Command document page boundary* (CDPB) all accompanied by a *Command document user information* (CDUI). See Recommendation T.62.

Because of their immediate effect on the presentation of the new page, parameter values other than default values of those control functions according to §§ 3.3 and E.3.2, e.g., *Page format selection* or *Select horizontal spacing* , must be transmitted before the *Form feed* , *Carriage return* or *Carriage return* , *Form feed* sequence. By this sequence the control functions will become effective.

3.3.2 *Format effectors*

Identifier Abbreviation Name and definition SP01 SP *Space*

A format effector that advances the active position one character position on the same line.

This character is also regarded as a nonprinting graphic.

CF10 BS *Backspace*

A format effector that moves the active position one character position backwards on the same line.

CF12 LF *Line feed*

A format effector that advances the active position to the corresponding character position of the next line.

LF never causes a horizontal movement of the active position. To obtain the equivalent of *New line* , *Line feed* shall be used in combination with *Carriage return* (CR). In this character sequence CR must immediately be followed by LF or vice versa. See also § 2.1.2 (text area).

CF14 FF *Form feed*

A format effector that advances the active position to the corresponding character position on the first line of the communicated text area of a new page.

Form feed never causes a horizontal movement of the active position.

Form feed shall only be used in combination with *Carriage return* (CR).

In this character sequence CR must immediately be followed by FF or vice versa.

This sequence affects the presentation of the new page (see also § 3.3.1.4).

The text shall be introduced by this sequence in every page (including the first page of a document). Any control functions that need to be defined at the start of the page shall precede this sequence. This sequence must not be used more than once within a page according to Recommendation T.62.

CF15 CR *Carriage return*

A format effector that moves the active position to the home position on the same line.

Note — In some circumstances, CR may involve a forward movement of the active position, viz. when the active position has been moved in front of the home position.

CF16 PLD *Partial line down*

(Start of subscript/End of superscript)

A format effector that moves the active position to the corresponding character position on an imaginary line with a partial vertical offset. This offset should be sufficient either to image following characters as subscripts until the first following occurrence of *Partial line up* (PLU) in the data stream or, if the immediately preceding character

is imaged as a superscript to restore subsequent imaging of characters to the active line. Any interactions between PLD and vertical format effectors other than PLU are not defined by this Recommendation.

Therefore, any occurrence of PLD to start subscript presentation shall be followed by PLU in the same line without another PLD's intervening. Any other use may produce a different printing format at the receiver than was intended by the sender.

PLD does not affect the vertical position of any underlining of subsequent character(s) if the underlining is invoked (by SGR or *Non-spacing underline*) prior to the PLD.

Note — It is intended that the imaging may be achieved by either:

— special fonts with or without movement of the active position, or

— movement of the active position not exceeding a half line space.

The sender is responsible for avoiding overlapped printing. The interpretation and rendition is the responsibility of the receiving terminal.

CF17 PLU *Partial line up*

(Start of superscript/End of subscript)

A format effector that moves the active position to the corresponding character position on an imaginary line with a partial vertical offset. This offset should be sufficient either to image following characters as superscripts until the first following occurrence of *Partial line down* (PLD) in the data stream or, if the immediately preceding character is imaged as a subscript, to restore subsequent imaging of characters to the active line. Any interactions between PLU and vertical format effectors other than PLD are not defined by this Recommendation.

Therefore, any occurrence of PLU to start superscript presentation shall be followed by PLD in the same line without another PLU's intervening. Any other use may produce a different printing format at the receiver than was intended by the sender.

PLU does not affect the vertical position of any underlining of subsequent character(s) if the underlining is invoked (by SGR or *Non-spacing underline*) prior to the PLU.

Note — It is intended that the imaging may be achieved by either:

— special fonts with or without movement of the active position, or

— movement of the active position not exceeding a half line space.

The sender is responsible for avoiding overlapped printing. The interpretation and rendition is the responsibility of the receiving terminal.

3.3.3 *Presentation control functions*

3.3.3.1 The presentation control functions defined in this Recommendation influence the following presentation attributes:

— page format (vertical or horizontal orientation);

— vertical spacing (line spacing);

— graphic rendition (underlining).

3.3.3.2 Presentation control functions are functions with parameters. Parameter values not defined in this Recommendation are reserved for future standardization by CCITT and/or ISO. In the basic Teletex service the horizontal spacing (character pitch) is fixed; however, in order to facilitate extensions to the basic service, a presentation control function involving this attribute has been included.

3.3.3.3 Vertical spacing, horizontal spacing and graphic rendition may be changed within a page.

3.3.3.4 *Presentation control function descriptions*

Identifier Abbreviation Name and definition CP01 PFS *Page format selection*

A presentation control function with a selective parameter that specifies the format of the page to be introduced by a subsequent *Form feed* (FF) control function.

The meaning of the parameter value is:

0: vertical basic page format;

1: horizontal basic page format.

The default value of the parameter is 0. The text areas corresponding to these page formats are defined in Recommendation T.60.

CP03 SGR *Select graphic rendition*

A control function with one or more parameters which specify one or more graphic rendition aspects for graphic characters and *Space* characters in the subsequent text.

Each specified graphic rendition aspect takes effect immediately and remains in effect until it is changed by a subsequent occurrence of SGR with an appropiate parameter value within the page.

When SGR is used to start underlining within the scope of subscript or superscript presentation (see PLD and PLU § 3.3.2) any horizontal lines used to implement such underlining are lowered or raised together with the subscript or superscript characters to which they apply. Any PLU or PLD functions occurring when underlining is already in effect, do not affect the vertical position of such horizontal lines. (See also Note to § 3.1.7.)

The representation of multiple underlining is one character position caused by combinations of SGR and *Non-spacing underline* or by other means (e.g., x y), is not guaranteed at the receiving end in the basic Teletex service.

The meaning of the parameter value is:

0: default rendition;

4: underlined.

The default value of the parameter is 0.

CP04 SHS *Select horizontal spacing*

A presentation control function with a selective parameter, which specifies the character spacing for subsequent text. The parameter value of this control function may be changed within a page, provided that no graphic characters occur between the SHS and the next occurrence of both *Carriage return* (CR) and *Line feed* or both CR and *Form feed* . The new parameter value will take effect immediately.

The meaning of the parameter value is:

0: 10 characters per 25.4 mm.

The default value of the parameter is 0.

Note — In the basic Teletex service, terminals should avoid sending SHS because only one parameter value is valid, and this value is implied by default (see § 3.3.1.4), however, all terminals must be able to receive text containing SHS with parameter value ‘‘0’’ and SHS without a parameter value.

CP05 SVS *Select vertical spacing*

A presentation control function with a selective parameter that specifies the line spacing for subsequent text. The value of this attribute may be changed at any point within a page to become effective upon the next occurrence of *Line feed* or *Reverse line feed* (see Annex E).

The meaning of the parameter value is:

0: 6 lines per 25.4 mm;

1: 4 lines per 25.4 mm;

2: 3 lines per 25.4 mm;

3: 12 lines per 25.4 mm.

The default value of the parameter is 0.

Parameter value 3 is used to specify half line down spacing (or half line up spacing if used in conjunction with *Reverse line feed*).

3.3.4 *Code extension control function*

Identifier Abbreviation Name and definition CE06 CSI *Control sequence introducer*

A code extension control function, which is used to provide coded representations for additional control functions, in particular for control functions with parameters, such as presentation control functions.

Note — Control functions for graphic code extension are defined in §§ E.3.2.3 and E.4.2.3.

3.3.5 *Miscellaneous control functions*

Identifier Abbreviation Name and description CM02 SUB *Substitute character*

A control function used as defined in Recommendation T.50 to indicate an erroneous character. It is intended to permit printing an error indication or otherwise identify the location of a character received in error.

It is not allowed for a terminal to send the substitute character SUB (01/10).

Terminals receiving a substitute character may either represent it with a spacing character or ignore it.

4 Coded representations

4.1 *Graphic character sets*

4.1.1 *Introduction*

4.1.1.1 The coded representations of the graphic characters defined in this Recommendation consist of the bit combination 2/0 for *Space* , and bit combinations of a *primary set* and a *supplementary set* of graphic characters

4.1.1.2 The primary set and the supplementary set are defined in § 4.1.2. The use of the elements of the primary and supplementary sets to represent the graphic characters of the repertoire defined in § 3.2 is specified in § 4.1.3.

4.1.2 *Code table*

4.1.2.1 The primary set, specified in Figure 2/T.61 is a subset of the set of graphic characters of the International Reference Version of the 7-bit coded character set of Recommendation T.50.

4.1.2.2 The supplementary set, also specified in Figure 2/T.61 contains three types of elements:

a) Diacritical marks, which are used in combination with the letters of the basic Latin alphabet in the primary set to constitute the coded representations of accented letters and umlauts. Each of these characters acts as a modifier indicating that the immediately following letter is to be transformed into an accented letter or an umlaut.

b) Alphabetic characters, which are used in addition to the basic Latin alphabet in the primary set and which are not composed of diacritical marks and basic letters.

c) Nonalphabetic characters, which are used in addition to those in the primary set.

4.1.2.3 Bit combinations equivalent to the empty positions in Figure 2/T.61 code table shall not be transmitted in the basic Teletex service. Shaded positions denote bit combinations which are not part of the sets specified by the table.

Note — In Recommendations T.50 and T.100, and in ISO Standard 6937, bit combinations equivalent to empty positions in Figure 2/T.61 are used to represent graphic characters that are not, however, relevant to the basic Teletex service.

4.1.3 *Formats of coded representations*

4.1.3.1 The formats of the coded representations of the graphic characters of the repertoire defined in this Recommendation are as follows:

a) Alphabetic and nonalphabetic characters of the primary set: Each of these characters is represented by a single bit combination in the range 2/1 to 7/14. The primary set contains the letters of the basic Latin alphabet.

b) Accented letters and umlauts: Each of these characters is represented by a sequence of two bit combinations. The first part of this sequence consists of a bit combination in the range 12/0 to 12/15 (excluding 12/12) representing a diacritical mark. The second part consists of a bit combination in the range 4/1 to 5/10 or 6/1 to 7/10 representing a basic Latin letter.

Figure 2/T.61, p.20

c) Alphabetic and nonalphabetic characters of the supplementary set: Each of these characters is represented by a single bit combination in the range 10/1 to 11/15 or 13/0 to 15/14.

d) Diacritical marks as separate graphic characters are represented by sequences of bit combinations, in the same way as accented letters and umlauts, with bit combination 2/0 (*Space*) instead of a basic Latin letter.

e) The coded representation of the *Non-spacing underline* character shall precede that of the character to which it applies. In particular, when used to underline an accented letter or umlaut, the *Non-spacing underline* shall precede the bit combination representing the diacritical mark. Between the *Non-spacing underline* character and the character to which it applies, one or more control functions may occur, e.g. *Partial line down* (PLD), *Partial line up* (PLU) or a code extension control function.

As there are two possibilities of underlining (the *Non-spacing underline* and the control function *Select graphic rendition*) some examples to show the use of them, and their interaction with the control functions PLU and PLD, are included in Annex F.

4.1.3.2 *Space* **|** is coded as 2/0.

4.1.3.3 The coded representation of the Teletex primary set of graphic characters is given in Table 1/T.61.

4.1.3.4 The coded representation of the Teletex supplementary set of graphic characters is given in Table 2/T.61.

4.2 *Control function sets*

4.2.1 *Introduction*

4.2.1.1 The coded representations of the control functions defined in this Recommendation consist of bit combinations of a *primary set* and a *supplementary set* of control functions.

4.2.1.2 The primary set and the supplementary set are defined in § 4.2.2. The use of the elements of the primary and supplementary sets to represent the control functions of the repertoire defined in § 3.3 is specified in § 4.2.3.

4.2.2 *Code table*

4.2.2.1 The primary set, specified in Figure 3/T.61, has been derived from the set of control functions of the 7-bit coded character set of Recommendation T.50.

4.2.2.2 The supplementary set is also specified in Figure 3/T.61.

4.2.2.3 Empty positions in the code table denote bit combinations that are reserved for future standardization. Shaded positions denote bit combinations that are not part of the sets specified by the table.

Note — In Recommendation T.50 and in ISO Standard 6429, bit combinations equivalent to empty positions in Figure 3/T.61 are used to represent control functions, which are not, however, relevant to the transmission of text in the basic Teletex service.

4.2.3 *Formats of coded representations*

4.2.3.1 The formats of the coded representations of the control functions of the repertoire defined in this Recommendation are as follows:

a) Control functions that are elements of the primary set: Each of these control functions is represented by a single bit combination in the range 0/0 to 1/15.

b) Control functions that are elements of the supplementary set: Each of these control functions is represented by a single bit combination in the range 8/0 to 9/15.

c) Control functions with parameters: Each of these control functions is represented by a control sequence of the form

$$CSI\ P_1 .\ |\ |\ P_n\ I_1 .\ |\ |\ I_m\ F$$

as explained in Annex D. The first part of this sequence consists of the coded representation of the code extension control function *Control sequence introducer* (CSI) of the supplementary set; the second part (which may be omitted) consists of one or more bit combinations in the range 3/0 to 3/15 representing one or more parameters of the control function; the last part of the control sequence is composed of one or more bit combinations that identify the intended control function; this part consists of either a single *final* (F) bit combination in the range 4/0 to 7/14, or one or more *intermediate* (I) bit combinations in the range 2/0 to 2/15 followed by a *final* bit combination in the range 4/0 to 7/14.

Note — For the coded representation of the parameters (P_1 | | | | $_n$) leading zeroes (bit combination 03/00) must not be used (e.g. if P_1 | | | | $_n$ = 4, it is not allowed to use 03/00 03/04 to code the parameter value 4).

4.2.3.2 The coded representations of the control functions of the repertoire defined in this Recommendation are specified by the lists in §§ 4.2.4.1 (format effectors), 4.2.4.2 (presentation control functions), 4.2.4.3 (code extension control functions) and 4.2.4.4 (miscellaneous control functions). These lists are composed as described below:

a) the first column contains the identifier of each control function;

b) the second column presents the abbreviated name of the control function;

c) the third column specifies the coded representation of the control function.

4.2.4 *Coded representations*

4.2.4.1 *Format effectors*

Identifier	Abbreviation	Coded representation
CF10	BS	0/8
CF12	LF	0/10
CF14	FF	0/12
CF15	CR	0/13
CF16	PLD	8/11
CF17	PLU	8/12

4.2.4.2 *Presentation control functions*

Identifier	Abbreviation	Coded representation
CP01	PFS	CSI P_1.		P_n 2/0 4/10
CP03	SGR	CSI P_1.		P_n 6/13
CP04	SHS	CSI P_1.		P_n 2/0 4/11
CP05	SVS	CSI P_1.		P_n 2/0 4/12

4.2.4.3 *Code extension control functions*

Identifier	Abbreviation	Coded representation
CE06	CSI	9/11

4.2.4.4 *Miscellaneous control functions*

Identifier	Abbreviation	Coded representation
CM02	SUB	1/10

H.T. [T2.61]

TABLE 1/T.61 { **The teletex primary set of graphic characters** }

Position	Graphic	Name or description	Position	Graphic	Name or description	Position	Graphic	Name or description
2/1	!	exclamation mark	{					
4/0 ↑**a**↑)								
}		commercial a	6/0		(not used)			
2/2	‘‘	quotation mark	{					
4/1 ↑**a**↑)								
}	A	capital A	6/1	a	small a			
2/3	.	(not used)	{					
4/2 ↑**a**↑)								
}	B	capital B	6/2	b	small b			
2/4	.	(not used)	{					
4/3 ↑**a**↑)								
}	C	capital C	6/3	c	small c			
2/5	%	percent	{					
4/4 ↑**a**↑)								
}	D	capital D	6/4	d	small d			
		sign	{					
4/5 ↑**a**↑)								
}	E	capital E	6/5	e	small e			
2/6	&	ampersand	{					
4/6 ↑**a**↑)								
}	F	capital F	6/6	f	small f			
2/7	’	apostrophe	{					
4/7 ↑**a**↑)								
}	G	capital G	6/7	g	small g			
2/8	(	left parenthesis	{					
4/8 ↑**a**↑)								
}	H	capital H	6/8	h	small h			
2/9	)	right parenthesis	{					
4/9 ↑**a**↑)								
}	I	capital I	6/9	i	small I			
2/10	*	asterisk	{					
4/10↑**a**↑)								
}	J	capital J	6/10	j	small j			
2/11	+	plus sign	{					
4/11↑**a**↑)								
}	K	capital K	6/11	k	small k			
2/12	,	comma	{					
4/12↑**a**↑)								
}	L	capital L	6/12	l	small l			
2/13	—	hyphen or minus sign	{					
4/13↑**a**↑)								
}	M	capital M	6/13	m	small m			
2/14	.	full stop, period	{					
4/14↑**a**↑)								
}	N	capital N	6/14	n	small n			
2/15	/	solidus	{					
4/15↑**a**↑)								
}	O	capital O	6/15	o	small o			
3/0	0	digit 0	{					
5/0 ↑**a**↑)								
}	P	capital P	7/0	p	small p			
3/1	1	digit 1	{					
5/1 ↑**a**↑)								
}	Q	capital Q	7/1	q	small q			
3/2	2	digit 2	{					
5/2 ↑**a**↑)								
}	R	capital R	7/2	r	small r			
3/3	3	digit 3	{					
5/3 ↑**a**↑)								
}	S	capital S	7/3	s	small s			
3/4	4	digit 4	{					

5/4 ↑**a**↑**)**								
}	T	capital T	7/4	t	small t			
3/5	5	digit 5	{					
5/5 ↑**a**↑**)**								
}	U	capital U	7/5	u	small u			
3/6	6	digit 6	{					
5/6 ↑**a**↑**)**								
}	V	capital V	7/6	v	small v			
3/7	7	digit 7	{					
5/7 ↑**a**↑**)**								
}	W	capital W	7/7	w	small w			
3/8	8	digit 8	{					
5/8 ↑**a**↑**)**								
}	X	capital X	7/8	x	small x			
3/9	9	digit 9	{					
5/9 ↑**a**↑**)**								
}	Y	capital Y	7/9	y	small y			
3/10	:	colon	{					
5/10↑**a**↑**)**								
}	Z	capital Z	7/10	z	small z			
3/11	;	semicolon	{					
5/11↑**a**↑**)**								
}	[	left square	7/11		(not used)			
3/12	<	less-than sign			bracket	7/12	|	vertical line
3/13		equals sign	{					
5/12↑**a**↑**)**								
}		(not used)	7/13		(not used)			
3/14	>	greater-than sign	{					
5/13↑**a**↑**)**								
}	]	right square bracket	7/14		(not used)			
3/15	?	question mark	{					
5/14↑**a**↑**)**								
}		(not used)			.			
			5/15 | ua)	—	low line			.

a) When interworking with videotex, this code shall have the meaning *delimiter*

Tableau 1/T.61 [T2.61] A L'ITALIENNE, p.21

H.T. [T3.61]

TABLE 2/T.61 { **The teletex supplementary set of graphic characters** }

Position	Graphic	Name or description	Position	Graphic | ua)	Name or description	Position	Graphic	Name or description
10/1	!	inverted	{					
12/0 ↑**a**↑**)**								
}	.	(not used)	14/0	Ω	ohm sign			
.	.	exclamation mark	{					
12/1 ↑**a**↑**)**								
}	☐	grave accent	14/1	*A* E	{			
capital *A*								
E dipthong								
}								
10/2	c /	cent sign	{					
12/2 ↑**a**↑**)**								
}	☐	acute accent	14/2	D —	capital D with stroke			
10/3	Ł	pound sign	{					
12/3 ↑**a**↑**)**								
}	☐	circumflex accent	14/3	a	ordinal indicator, feminine			
10/4	$	dollar sign	{					
12/4 ↑**a**↑**)**								
}	☐	tilde	14/4	H —	capital H with stroke			
10/5	Y =	yen sign	{					
12/5 ↑**a**↑**)**								
}	☐‾	macron	14/5		(not used)			
10/6	##	number sign	{					
12/6 ↑**a**↑**)**								
}	☐	breve	14/6	I J	capital I J ligature			
10/7	§	section sign	{					
12/7 ↑**a**↑**)**								
}	☐	dot	14/7	L :	capital L with middle dot			
10/8	○	currency symbol	{					
12/8 ↑**a**↑**)**								
}	☐	diaresis or umlaut mark	14/8	L /	capital L with stroke			
10/9		(not used)	12/9 b)			14/9	O /	capital O with slash
10/10		(not used)	{					
12/10↑**a**↑**)**								
}	☐ °	ring	14/10	OE	capital OE ligature			
10/11	<<	angle quotation mark left	12/11 b)	☐	cedilla	14/11	o	ordinal indicator, masculine
10/12		(not used)	{					
12/12↑**a**↑**)**								
}	☐	non-spacing underline	14/12	.	capital thorn, Icelandic			
10/13		(not used)	12/13 b)	☐	double acute accent	14/13	T	capital T with stroke
10/14		(not used)	{					
12/14↑**a**↑**)**								
}	☐	ogonek	14/14	.	capital eng, Lapp			
10/15		(not used)	12/15 b)	☐	caron	14/15	’n	small n with apostrophe
11/0	°	degree sign	{					
13/0 ↑**a**↑**)**								
}		(not used)	15/0	k	small k, Greenlandic			
11/1	±	plus/minus sign	{					
13/1 ↑**b**↑**)**								
}		(not used)	15/1	a e	small a e dipthong			
11/2	2	superscript 2	{					
13/2 ↑**a**↑**)**								
}		(not used)	15/2	d	small d with stroke			
11/3	3	superscript 3	{					
13/3 ↑**b**↑**)**								
}		(not used)	15/3	.	small eth, Icelandic			
11/4	×	multiply sign	{					
13/4 ↑**a**↑**)**								
}		(not used)	15/4	h	small h with stroke			
11/5	µ	micro sign	{					
13/5 ↑**b**↑**)**								
}		(not used)	15/5	i	small i without dot			

11/6		paragraph sign, pilcrow	{					
13/6 ↑**a**↑**)**								
}		(not used)	15/6	ij	small ij ligature			
11/7	×	middle dot	{					
13/7 ↑**b**↑**)**								
}		(not used)	15/7	l×	small l with middle dot			
11/8	÷	divide sign	{					
13/8 ↑**a**↑**)**								
}		(not used)	15/8	l /	small l with stroke			
11/9		(not used)	{					
13/9 ↑**b**↑**)**								
}		(not used)	15/9	o /	small o with slash			
11/10		(not used)	{					
13/10↑**a**↑**)**								
}		(not used)	15/10	oe	small oe ligature			
11/11	>>	angle quotation mark right	{					
13/11↑**b**↑**)**								
}		(not used)	15/11	B	small sharp s, German			
11/12	¼	fraction one quarter	{					
13/12↑**a**↑**)**								
}		(not used)	15/12	**| fR o**	**small thorn. Icelandic**			
11/13	**½**	**fraction one half**	**{**					
13/13↑**b**↑**)**								
}		(not used)	15/13	- t	small t with stroke			
11/14	¾	fraction three quarters	{					
13/14↑**a**↑**)**								
}		(not used)	15/14	η	small eng, Lapp			
11/15	?	inverted question	{					
13/15↑**b**↑**)**								
}		(not used)						
		mark left						

a) Diacritical marks are illustrated together with a rectangle representing the relative position of the graphic character with which they are normally associated.

b) In the 1980 version of this Recommendation, code 12/9 was allocated to represent the umlaut mark. The use of this facility is discouraged. Its removal is foreseen in the future.

Tableau 2/T.61 [T3.61] A L'ITALIENNE, p.22

Figure 3/T.61, p.23