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FOR TELEMATIC SERVICES

CHARACTER REPERTOIRE AND CODED CHARACTER SETS FOR THE INTERNATIONAL TELETEX SERVICE

Reedition of CCITT Recommendation T.61 published in the Blue Book, Fascicle VII.3 (1988)

NOTES

1   CCITT Recommendation T.61 was published in Fascicle VII.3 of the *Blue Book*. This file is an extract from the *Blue Book*. While the presentation and layout of the text might be slightly different from the *Blue Book* version, the contents of the file are identical to the *Blue Book* version and copyright conditions remain unchanged (see below).

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

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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

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:

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

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 présentation

S: funciones de control de la presentación

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: présentation

S: presentación

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: combinación 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.
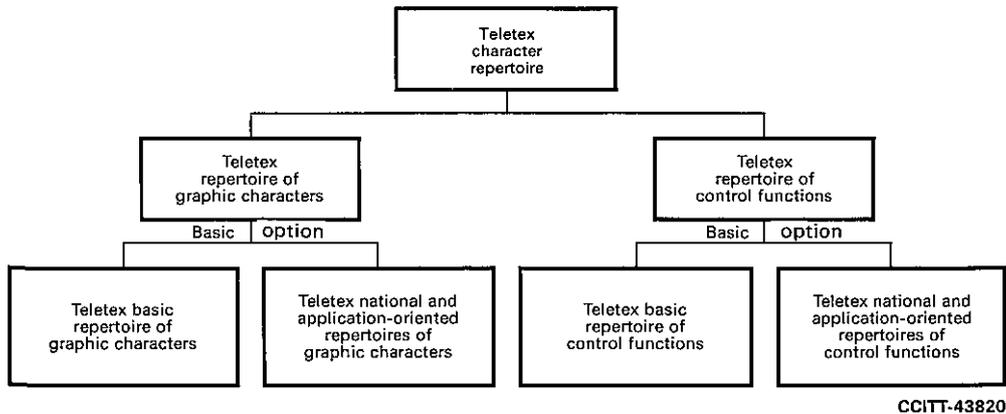

FIGURE 1/T.61

Teletex character repertoire

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	Á	capital A with acute accent
LA13	à	small a with grave accent
LA14	À	capital A with grave accent
LA15	â	small a with circumflex accent
LA16	Â	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	ă	small a with breve
LA24	Ă	capital A with breve
LA27	å	small a with ring
LA28	Å	capital A with ring
LA31	ā	small a with macron
LA32	Ā	capital A with macron
LA43	ą	small a with ogonek
LA44	Ą	capital A with ogonek
LA51	æ	small æ diphthong
LA52	Æ	capital Æ 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	č	small c with caron
LC22	Č	capital C with caron
LC29	ċ	small c with dot
LC30	Ċ	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	ď or d'	small d with caron
LD22	Ď	capital D with caron
LD61	đ	small d with stroke
LD62	Đ	capital D with stroke, Icelandic eth
LD63	ð	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	ê	small e with circumflex accent
LE16	Ê	capital E with circumflex accent
LE17	ë	small e with diaeresis or umlaut mark
LE18	Ë	capital E with diaeresis or umlaut mark
LE21	ě	small e with caron
LE22	Ě	capital E with caron
LE29	e	small e with dot
LE30	E	capital E with dot
LE31	ē	small e with macron
LE32	Ē	capital E with macron
LE43	ę	small e with ogonek
LE44	Ę	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	ğ	small g with breve
LG24	Ğ	capital G with breve
LG29	ġ	small g with dot
LG30	Ġ	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	ħ	small h with stroke
LH62	Ħ	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	î	small i with circumflex accent
LI16	Î	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	İ	capital I with dot
LI31	ī	small i with macron
LI32	Ī	capital I with macron
LI43	į	small i with ogonek
LI44	Į	capital I with ogonek
LI51	ij	small ij ligature
LI52	IJ	capital IJ ligature

LI61	ı	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	ĸ	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	ľ o l'	small l with caron
LL22	Ľ o L'	capital L with caron
LL41	ļ	small l with cedilla
LL42	Ļ	capital L with cedilla
LL61	ł	small l with stroke
LL62	Ł ↝	capital L with stroke
LL63	l·	small l with middle dot
LL64	Ŀ	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	ň	small n with caron
LN22	Ň	capital N with caron
LN41	ņ	small n with cedilla
LN42	Ņ	capital N with cedilla
LN61	ŋ	small eng, Lapp
LN62	Ŋ	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	ô	small o with circumflex accent
LO16	Ô	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	ő	small o with double acute accent
LO26	Ő	capital O with double acute accent
LO31	ō	small o with macron
LO32	Ō	capital O with macron
LO51	œ	small œ ligature
LO52	Œ	capital Œ 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	ř	small r with caron
LR22	Ř	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	Ś	capital S with acute accent
LS15	ŝ	small s with circumflex accent
LS16	Ŝ	capital S with circumflex accent
LS21	š	small s with caron
LS22	Š	capital S with caron
LS41	ş	small s with cedilla
LS42	Ş	capital S with cedilla
LS61	ß	small sharp s, German
LT01	t	small t
LT02	T	capital T
LT21	ť o t'	small t with caron
LT22	Ť	capital T with caron
LT41	ţ	small t with cedilla
LT42	Ţ	capital T with cedilla
LT61	ŧ	small t with stroke
LT62	Ŧ	capital T with stroke
LT63	þ	small thorn, Icelandic
LT64	Þ	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	û	small u with circumflex accent
LU16	Û	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	ŭ	small u with breve
LU24	Ŭ	capital U with breve
LU25	ű	small u with double acute accent
LU26	Ű	capital U with double acute accent
LU27	ů	small u with ring
LU28	Ů	capital U with ring
LU31	ū	small u with macron
LU32	Ū	capital U with macron
LU43	ų	small u with ogonek
LU44	Ų	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	ž	small z with caron
LZ22	Ž	capital Z with caron
LZ29	ż	small z with dot
LZ30	Ż	capital Z with dot

3.2.3 *Non-alphabetic characters*

3.2.3.1 *Decimal digits*

Identifier	Graphic	Name or description
ND01	1	digit 1
ND02	2	digit 2
ND03	3	digit 3
ND04	4	digit 4
ND05	5	digit 5
ND06	6	digit 6
ND07	7	digit 7
ND08	8	digit 8
ND09	9	digit 9
ND10	0	digit 0

3.2.3.2 *Currency signs*

Identifier	Graphic	Name or description
SC01	¤	general currency sign
SC02	£	pound sign
SC03	$	dollar sign
SC04	¢	cent sign
SC05	¥	yen sign

3.2.3.3 *Punctuation marks*

Identifier	Graphic	Name or description
SP01		space (see also § 3.3.2)
SP02	!	exclamation mark
SP03	¡	inverted exclamation mark
SP04	"	quotation mark
SP05	'	apostrophe
SP06	(	left parenthesis
SP07	)	right parenthesis
SP08	,	comma
SP09	_	low line
SP10	–	hyphen or minus sign
SP11	.	full stop, period
SP12	/	solidus
SP13	:	colon
SP14	;	semicolon
SP15	?	question mark
SP16	¿	inverted question mark
SP17	«	angle quotation mark left
SP18	»	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.

3.2.3.4 *Arithmetic signs*

Identifier	Graphic	Name or description
SA01	$+$	plus sign
SA02	$\pm$	plus/minus sign
SA03	$<$	less-than sign
SA04	$=$	equals sign
SA05	$>$	greater-than sign
SA06	$\div$	divide sign
SA07	$\times$	multiply sign

Note – For *minus sign* see SP10.

3.2.3.5 *Subscripts and superscripts*

Identifier	Graphic	Name or description
NS02	^{2}	superscript 2
NS03	^{3}	superscript 3

3.2.3.6 *Fractions*

Identifier	Graphic	Name or description
NF01	½	fraction one half
NF04	¼	fraction one quarter
NF05	¾	fraction three quarters

3.2.3.7 *Miscellaneous symbols*

Identifier	Graphic	Name or description
SM01	#	number sign
SM02	%	percent sign
SM03	&	ampersand
SM04	*	asterisk
SM05	@	commercial at
SM06	[	left square bracket
SM08	]	right square bracket
SM13	|	vertical line
SM17	µ	micro sign
SM18	Ω	ohm sign
SM19	°	degree sign
SM20	º	ordinal indicator, masculine
SM21	ª	ordinal indicator, feminine
SM24	§	section sign
SM25	¶	paragraph sign, pilcrow
SM26	·	middle dot

3.2.3.8 *Diacritical marks as separate graphic characters*

Identifier	Graphic	Name or description
SD11	́	acute accent with space
SD13	̀	grave accent with space
SD15	̂	circumflex accent with space
SD17	̈	diaeresis or umlaut mark with space
SD19	̃	tilde with space
SD21	̌	caron with space
SD23	̆	breve with space
SD25	̋	double acute accent with space
SD27	̊	ring with space
SD29	̇	dot with space
SD31	̄	macron with space
SD41	̧	cedilla with space
SD43	̨	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.

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*. It is 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.

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., $\underline{x^y}$), 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 definition
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.

b8	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1
b7	0	0	0	0	1	1	1	1	0	0	0	0	1	1	1	1
b6	0	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1
b5	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1
b4 b3 b2 b1	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
0 0 0 0 0			SP	0	@	P		p				°	Ⓢ		Ω	K
0 0 0 1 1			!	1	A	Q	a	q			¡	±	`		Æ	æ
0 0 1 0 2			"	2	B	R	b	r			¢	²	´		Đ	đ
0 0 1 1 3			④	3	C	S	c	s			£	³	^		a̲	ð
0 1 0 0 4			④	4	D	T	d	t			$	×	~		Ħ	ħ
0 1 0 1 5			%	5	E	U	e	u			¥	µ	‾			ı
0 1 1 0 6			&	6	F	V	f	v			#	¶	ˇ		IJ	ij
0 1 1 1 7			'	7	G	W	g	w			§	·	˙		Ŀ	ŀ
1 0 0 0 8			(	8	H	X	h	x			¤	÷	¨		Ł	ł
1 0 0 1 9			)	9	I	Y	i	y					②		Ø	ø
1 0 1 0 10			*	:	J	Z	j	z					°		Œ	œ
1 0 1 1 11			+	;	K	[	k				«	»	˛		º	ß
1 1 0 0 12			,	<	L		l						¼	③̲		Þ	þ
1 1 0 1 13			–	=	M	]	m					½	"		Ŧ	ŧ
1 1 1 0 14			.	>	N		n					¾	¸		Ŋ	ŋ
1 1 1 1 15			/	?	O	①̲	o					¿	ˇ		'n	

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Note 1 — When interworking with Videotex, this code shall have the meaning *delimiter*.

Note 2 — 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.

Note 3 — Non spacing underline is not a diacritical mark and may be combined with any graphic character of the Teletex repertoire.

Note 4 — Teletex terminals should send only the codes 10/6 and 10/8 for graphic characters # and ¤ respectively. When receiving codes 2/3 and 2/4 terminals should interpret them as # and ¤.

Note 5 — This bit combination shall not be used in the basic teletex service (see § 4.1.2.3). See Annex E, § E.3.1.1.3 for additional requirements for terminals participating in the freer teletex service.

FIGURE 2/T.61

Code table for graphic showing *Space* in position 2/0, the primary set of graphic characters in positions 2/1 to 7/14, and the supplementary set of graphic characters in positions 10/1 to 15/14

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

$$\text{CSI } P_1 \ldots P_n \, I_1 \ldots I_m \, F$$

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 ($P_1 \ldots P_n$) leading zeroes (bit combination 03/00) must not be used (e.g. if $P_1 \ldots P_n = 4$, 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 $P_1 \ldots P_n$ 2/0 4/10
CP03	SGR	CSI $P_1 \ldots P_n$ 6/13
CP04	SHS	CSI $P_1 \ldots P_n$ 2/0 4/11
CP05	SVS	CSI $P_1 \ldots P_n$ 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

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	@	commercial a	6/0		(not used)
2/2	"	quotation mark	4/1	A	capital A	6/1	a	small a
2/3		(not used)	4/2	B	capital B	6/2	b	small b
2/4		(not used)	4/3	C	capital C	6/3	c	small c
2/5	%	percent sign	4/4	D	capital D	6/4	d	small d
2/6	&	ampersand	4/5	E	capital E	6/5	e	small e
2/7	'	apostrophe	4/6	F	capital F	6/6	f	small f
2/8	(	left parenthesis	4/7	G	capital G	6/7	g	small g
2/9	)	right parenthesis	4/8	H	capital H	6/8	h	small h
2/10	*	asterisk	4/9	I	capital I	6/9	i	small i
2/11	+	plus sign	4/10	J	capital J	6/10	j	small j
2/12	,	comma	4/11	K	capital K	6/11	k	small k
2/13	−	hyphen or minus sign	4/12	L	capital L	6/12	l	small l
2/14	.	full stop, period	4/13	M	capital M	6/13	m	small m
2/15	/	solidus	4/14	N	capital N	6/14	n	small n
3/0	0	digit 0	4/15	O	capital O	6/15	o	small o
3/1	1	digit 1	5/0	P	capital P	7/0	p	small p
3/2	2	digit 2	5/1	Q	capital Q	7/1	q	small q
3/3	3	digit 3	5/2	R	capital R	7/2	r	small r
3/4	4	digit 4	5/3	S	capital S	7/3	s	small s
3/5	5	digit 5	5/4	T	capital T	7/4	t	small t
3/6	6	digit 6	5/5	U	capital U	7/5	u	small u
3/7	7	digit 7	5/6	V	capital V	7/6	v	small v
3/8	8	digit 8	5/7	W	capital W	7/7	w	small w
3/9	9	digit 9	5/8	X	capital X	7/8	x	small x
3/10	:	colon	5/9	Y	capital Y	7/9	y	small y
3/11	;	semicolon	5/10	Z	capital Z	7/10	z	small z
3/12	<	less-than sign	5/11	[	left square bracket	7/11		(not used)
3/13	=	equals sign	5/12		(not used)	7/12			vertical line
3/14	>	greater-than sign	5/13	]	right square bracket	7/13		(not used)
3/15	?	question mark	5/14		(not used)	7/14		(not used)
			5/15 a)	_	low line			

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

TABLE 2/T.61

The teletex supplementary set of graphic characters

Position	Graphic	Name or description	Position	Graphic [a]	Name or description	Position	Graphic	Name or description
10/1	¡	inverted exclamation mark	12/0		(not used)	14/0	Ω	ohm sign
10/2	¢	cent sign	12/1	◌̀	grave accent	14/1	Æ	capital Æ dipthong
10/3	£	pound sign	12/2	◌́	acute accent	14/2	Đ	capital D with stroke
10/4	$	dollar sign	12/3	◌̂	circumflex accent	14/3	ª	ordinal indicator, feminine
10/5	¥	yen sign	12/4	◌̃	tilde	14/4	Ħ	capital H with stroke
10/6	#	number sign	12/5	◌̄	macron	14/5		(not used)
10/7	§	section sign	12/6	◌̆	breve	14/6	IJ	capital IJ ligature
10/8	¤	currency symbol	12/7	◌̇	dot	14/7	Ŀ	capital L with middle dot
10/9		(not used)	12/8	◌̈	diaeresis or umlaut mark	14/8	Ł	capital L with stroke
10/10		(not used)	12/9 [b]			14/9	Ø	capital O with slash
10/11	«	angle quotation mark left	12/10	◌̊	ring	14/10	Œ	capital Œ ligature
10/12		(not used)	12/11 [b]	◌̧	cedilla	14/11	º	ordinal indicator, masculine
10/13		(not used)	12/12	◌̱	non-spacing underline	14/12	Þ	capital thorn, Icelandic
10/14		(not used)	12/13 [b]	◌̋	double acute accent	14/13	Ŧ	capital T with stroke
10/15		(not used)	12/14	◌̨	ogonek	14/14	Ŋ	capital eng, Lapp
11/0	°	degree sign	12/15 [b]	◌̌	caron	14/15	ŉ	small n with apostrophe
11/1	±	plus/minus sign	13/0		(not used)	15/0	ĸ	small k, Greenlandic
11/2	²	superscript 2	13/1		(not used)	15/1	æ	small æ dipthong
11/3	³	superscript 3	13/2		(not used)	15/2	đ	small d with stroke
11/4	×	multiply sign	13/3		(not used)	15/3	ð	small eth, Icelandic
11/5	µ	micro sign	13/4		(not used)	15/4	ħ	small h with stroke
11/6	¶	paragraph sign, pilcrow	13/5		(not used)	15/5	ı	small i without dot
11/7	·	middle dot	13/6		(not used)	15/6	ij	small ij ligature
11/8	÷	divide sign	13/7		(not used)	15/7	ŀ	small l with middle dot
11/9		(not used)	13/8		(not used)	15/8	ł	small l with stroke
11/10		(not used)	13/9		(not used)	15/9	ø	small o with slash
11/11	»	angle quotation mark right	13/10		(not used)	15/10	œ	small œ ligature
11/12	¼	fraction one quarter	13/11		(not used)	15/11	ß	small sharp s, German
11/13	½	fraction one half	13/12		(not used)	15/12	þ	small thorn, Icelandic
11/14	¾	fraction three quarters	13/13		(not used)	15/13	ŧ	small t with stroke
11/15	¿	inverted question mark left	13/14		(not used)	15/14	ŋ	small eng, Lapp
			13/15		(not used)			

[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.

b8	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1
b7	0	0	0	0	1	1	1	1	0	0	0	0	1	1	1	1
b6	0	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1
b5	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1

b4 b3 b2 b1		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
0 0 0 0	0																
0 0 0 1	1																
0 0 1 0	2																
0 0 1 1	3																
0 1 0 0	4																
0 1 0 1	5																
0 1 1 0	6																
0 1 1 1	7																
1 0 0 0	8	BS															
1 0 0 1	9		SS2 ①														
1 0 1 0	10	LF	SUB														
1 0 1 1	11		ESC ①							PLD	CSI						
1 1 0 0	12	FF								PLU							
1 1 0 1	13	CR	SS3 ①														
1 1 1 0	14	LS1 ①															
1 1 1 1	15	LS0 ①															

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Note — The characters ESC, LS1, LS0, SS2 and SS3 must not be used in the basic Teletex service. The definitions of these control characters are contained in § E.3.2.3.

FIGURE 3/T.61

Code table for control functions showing the primary set of control functions in positions 0/0 to 1/15, and the supplementary set of control functions in positions 8/0 to 9/15

ANNEX A

(to Recommendation T.61)

Code extension procedures

A.1   The basic Teletex service makes use of an 8-bit coded character set, which is implicitly designated and invoked as a default condition according to § 3.3.1.4.

A.2   This 8-bit code contains the primary set of graphic characters as G0 set in positions 2/1 to 7/14, the supplementary set of graphic characters as G2 set in positions 10/1 to 15/14, the primary set of control characters in positions 0/0 to 1/15 and the supplementary set of control characters in positions 8/0 to 9/15. The characters constituting these basic sets are described in this Recommendation.

A.3   For enhancement of the basic Teletex service the following code extension facilities will be provided:

      a)   designation and invocation of control sets C0 and C1 by means of the relevant escape sequences. See Figure A-1/T.61.

      b)   designation of up to four graphic character sets called G0, G1, G2 and G3;

      c)   invocation of the designated graphic sets, by means of locking and/or non-locking shift functions.

The shift functions used are:

LS0, LS1, LS1R, LS2, LS2R, LS3, LS3R, SS2, SS3.

According to ISO Standard 2022 the bit combination following SS2 or SS3 represents a character from columns 2 to 7, except positions 2/0 and 7/15, of a code table. All characters in columns 8 to 15 are excluded from assignment to the bit combinations following SS2 or SS3. The use of a single shift function does not affect the current status established by one or more of the locking-shift functions.

There are seven locking-shift functions used exclusively for graphic set extension. Each invokes an additional set of 94 graphic characters into columns 2 to 7 or into columns 10 to 15.

The single shift functions, the locking-shift functions and the related G-sets are shown in Table A-1/T.61.

A.4   The shift functions are defined in § E.3.2.3 and coded as specified in § E.4.2.3.

The use of shift functions is implicitly negotiated by specifying the character sets during the negotiation procedure of terminal capabilities in the control procedures of Recommendation T.62. All terminals supporting graphic character code extension techniques must support shift functions LSO, LS2R and SS2 in order to invoke the Teletex primary and supplementary graphic character sets within a page.

A.5   For the designation and invocation of control sets the following escape sequences are used:
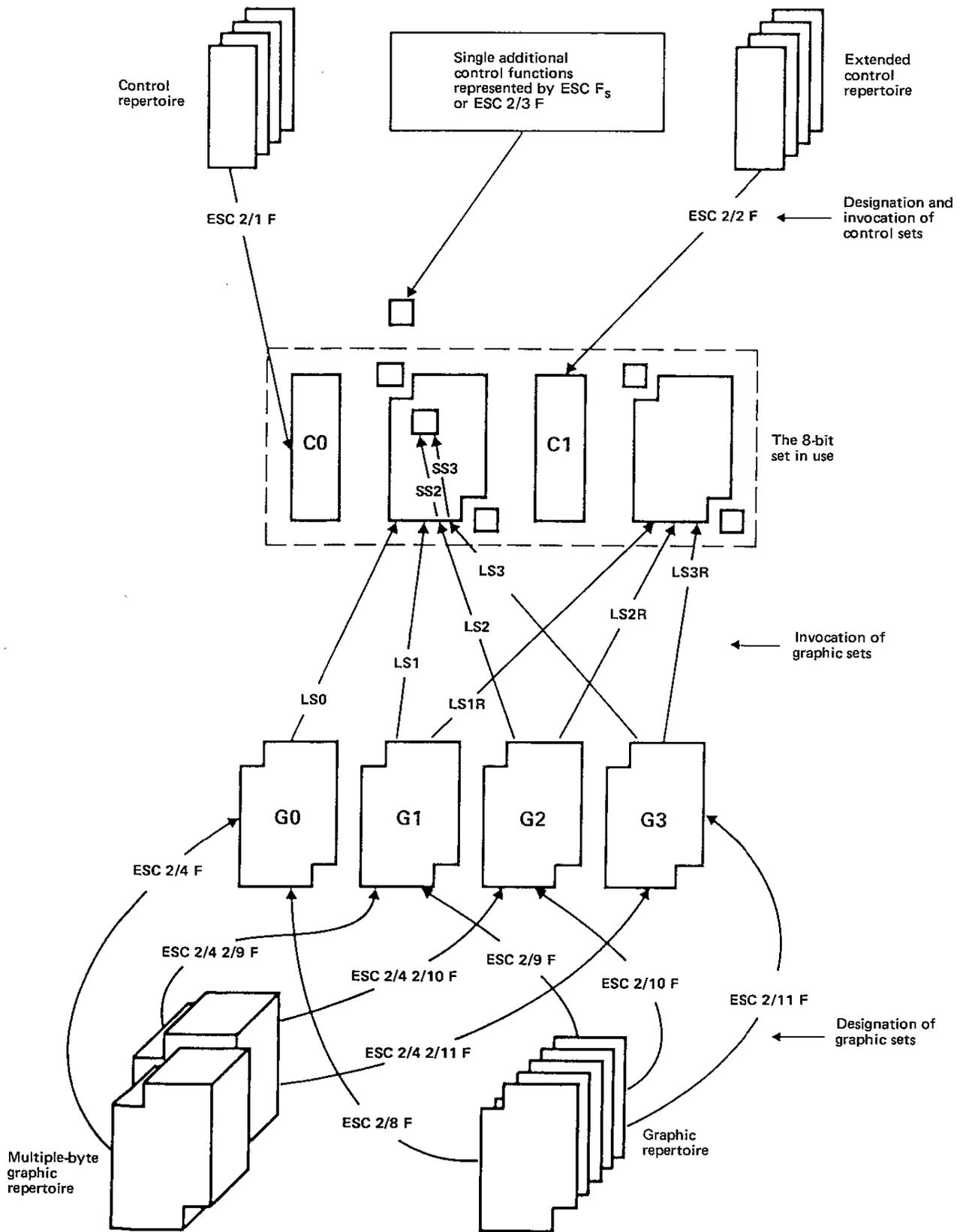
C0 set ESC 2/1 F

C1 set ESC 2/2 F

The symbol F denotes the final bit combination of an escape sequence.

The final characters F have to be provided by CCITT and ISO.

A.6   For the designation of CCITT/ISO registered graphic character sets the escape sequence formats shown in Table A-2/T.61 are used.

FIGURE A-1/T.61

Code extension in an 8-bit environment (showing all shift facilities)

TABLE A-1/T.61

Allocation of shift functions to the graphic character sets

Graphic character set	Locking shift functions for invocation of G-set to positions		Non-locking shift functions for invocation of G-set to positions
	2/1 to 7/14	10/1 to 15/14	2/1 to 7/14
G0	LS0	–	–
G1	LS1	LS1R	–
G2	LS2	LS2R	SS2
G3	LS3	LS3R	SS3

TABLE A-2/T.61

Escape sequence formats for designation of CCITT/ISO registered graphic character set

Graphic character set	Escape sequence formats for designation of	
	single-byte set	multiple-byte set
G0	ESC 2/8 F	ESC 2/4 F
G1	ESC 2/9 F	ESC 2/4 2/9 F
G2	ESC 2/10 F	ESC 2/4 2/10 F
G3	ESC 2/11 F	ESC 2/4 2/11 F

Note 1 – The symbol F denotes final bit combination of an escape sequence.

Note 2 – The final characters F have to be provided by CCITT and ISO.

A.7   For the designation of *Dynamically redefinable character sets* (DRCS) the escape sequence formats shown in Table A-3/T.61 are used.

A.8   Escape sequences for the designation of graphic character sets, and the associated shift functions for invoking these graphic sets, as well as the escape sequence for the designation and invocation of the control sets, may appear at any position within the text.

A.9   The final character F for the basic Teletex character sets are:

    –   Primary control set   04/05

    –   Supplementary control set   04/08

    –   Primary graphic set   07/05

    –   Supplementary graphic set   07/06

TABLE A-3/T.61

Escape sequence formats for designation of dynamically redefinable character sets

Graphic character set	Escape sequence formats for designation of	
	single-byte DRCS	multiple-byte DRCS
G0	ESC 2/8 2/0 F	ESC 2/4 2/8 2/0 F
G1	ESC 2/9 2/0 F	ESC 2/4 2/9 2/0 F
G2	ESC 2/10 2/0 F	ESC 2/4 2/10 2/0 F
G3	ESC 2/11 2/0 F	ESC 2/4 2/11 2/0 F

Note 1 – The final character F denotes the final bit combination of an escape sequence.

Note 2 – The character F should be in the range 4/0 to 7/14 and should be assigned by the user. It is recommended that these final characters be allocated sequentially starting with 4/0.

ANNEX B

(to Recommendation T.61)

Use of diacritical marks

B.1   The supplementary set contains 13 diacritical marks that 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. These diacritical marks, and their coded representations, are:

Acute accent	12/2
Grave accent	12/1
Circumflex accent	12/3
Diaeresis or umlaut mark	12/8
Tilde	12/4
Caron	12/15
Breve	12/6
Double acute accent	12/13
Ring	12/10
Dot	12/7
Macron	12/5
Cedilla	12/11
Ogonek	12/14

Note – 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.

B.2   Figure B-1/T.61 specifies the combinations of diacritical marks and basic letters that are defined in this Recommendation in its left part and also indicates the special alphabetic characters used, in the right part.

Basic letters	Acute accent	Grave accent	Circumflex accent	Diaeresis or umlaut mark	Tilde	Caron or hacek	Breve	Double acute accent	Ring	Dot above	Macron	Cedilla	Ogonek	Ligature	Other
aA	áÁ	àÀ	âÂ	äÄ	ãÃ		ăĂ		åÅ		āĀ		ąĄ	æ AE	
bB															
cC	ćĆ		ĉĈ			čČ				ċĊ		çÇ			
dD						ďĎ									đ Ð ð
eE	éÉ	èÈ	êÊ	ëË		ěĚ				ėĖ	ēĒ		ęĘ		
fF															
gG	ǵ		ĝĜ				ğĞ			ġĠ		ģ			
hH			ĥĤ												ħ Ħ
iI	íÍ	ìÌ	îÎ	ïÏ	ĩĨ					İ	īĪ		įĮ	ĳ Ĳ	ı
jJ			ĵĴ												
kK												ķĶ			ĸ
lL	ĺĹ					ľĽ						ļĻ			ł Ł / ŀ Ŀ
mM															
nN	ńŃ				ñÑ	ňŇ						ņŅ			ŋ Ŋ
oO	óÓ	òÒ	ôÔ	öÖ	õÕ			őŐ			ōŌ			œŒ	ø Ø
pP															
qQ															
rR	ŕŔ					řŘ						ŗŖ			
sS	śŚ		ŝŜ			šŠ						şŞ			ß
tT						ťŤ						ţŢ			ŧ Ŧ / þ Þ
uU	úÚ	ùÙ	ûÛ	üÜ	ũŨ		ŭŬ	űŰ	ůŮ		ūŪ		ųŲ		
vV															
wW			ŵŴ												
xX															
yY	ýÝ		ŷŶ	ÿŸ											
zZ	źŹ					žŽ				żŻ					

FIGURE B-1/T.61

Use of alphabetic characters with diacritical marks, ligatures or other

ANNEX C

(to Recommendation T.61)

Identification system

C.1   For the purpose of this Recommendation, a system was developed that allows for the identification and description of each graphic character or control function. The system is shown in Figure C-1/T.61

C.2   Each identifier consists of two letters and two digits.

C.3   The first letter indicates the alphabet, the language, etc.

C.4   The second letter indicates the letter of an alphabet or, in the case of a nonalphabetic graphic character or a control function, the group of characters or control functions.

C.5   The first digit indicates whether the letter in the second position is an accented one, whether the diacritical mark is above or below the letter, etc. It has no special meaning in the case of the first letter being a C, N or S.

C.6   The second digit indicates whether the letter is a capital or a small one (even or odd). If the first letter is a C, N or S, this digit being even or odd has no significance.

C.7   The numbering is used in a consistent manner so that each diacritical mark is always given the same number.

C.8   The numbering principle is shown in Table C-1/T.61.

TABLE C-1/T.61

Numbering principle for alphabetic characters

Item	Small	Capital
No diacritical mark	01	02
Acute accent	11	12
Grave accent	13	14
Circumflex accent	15	16
Diaeresis or umlaut mark	17	18
Tilde	19	20
Caron	21	22
Breve	23	24
Double acute accent	25	26
Ring	27	28
Dot	29	30
Macron	31	32
Cedilla	41	42
Ogonek	43	44
Diphthong or ligature	51	52
Special form	61, 63, etc.	62, 64, etc.
Diaeresis with acute accent	33	–

```
L    A    O    1
│    │    │    │
│    │    │    └─── For alphabetic characters:
│    │    │         odd digit = small letter;
│    │    │         even digit = capital letter.
│    │    │
│    │    └─── If C, N or S in first position:
│    │         no special meaning.
│    │
│    └─── For alphabetic characters:
│         zero = letter without diacritical mark;
│         one, two or three = letter with diacritical mark above it;
│         four = letter with diacritical mark below it;
│         five = diphthong or ligature;
│         six = special form.
│
│    └─── If C, N or S in first position:
│         no special meaning.
│
└─── For alphabetic characters:
     A to Z = the respective letter of the Latin alphabet, or the Latin equivalent in the case of a
              non-Latin letter;

     If C in first position:
     E = code extension control function;
     F = format effector;
     P = presentation control function;
     M = other control function.

     If N in first position:
     D = decimal digit;
     F = fraction;
     S = subscript or superscript.

     If S in first position:
     A = arithmetic sign;
     C = currency sign;
     D = diacritical mark;
     P = punctuation mark;
     M = other symbol.

L = Latin alphabetic character;
C = control function;
N = nonalphabetic graphic character;
S = special graphic character;
G = greek alphabetic character.
```

FIGURE C-1/T.61

Identification system

ANNEX D

(to Recommendation T.61)

Format of control sequences

This annex is for information only and does not form part of the requirements laid down by this Recommendation; instead, it provides explanations of the format of control sequences. It consists of non-contiguous extracts from the ISO Standard 6429. For ease of cross-reference to that standard the original numbering scheme has been retained in preference to allocating a new set of consistent paragraph numbers. To ensure accurate interpretation of detailed meanings, reference should be made to ISO 6429.

The double codings of parameters, intermediates and finals of a control sequence, and the operand of a single-shift character (as mentioned in Section 10 of the ISO extract) are not allowed in the Teletex service. In addition 7-bit coding is not relevant in the Teletex service.

Extract from ISO Standard 6429:

"5.1.2   *Control functions represented by control sequences*

A control sequence consists of CONTROL SEQUENCE INTRODUCER (CSI) followed by one or more characters which identify the control function and, if applicable, represent the parameters of the control function. The control function CSI itself is an element of the C1 set.

The format of a control sequence shall be:

$$\text{CSI } P_1 \ldots P_n I_1 \ldots I_m F$$

where:

a)   CSI is represented by ESC 5/11 in a 7-bit code and by bit combination 9/11 in an 8-bit code (see § 5.2).

b) $P_1 \ldots P_n$ correspond to parameter values and are represented by bit combinations of column 3; these bit combinations are omitted if the control function has no parameter, and may be omitted if the default parameter value is to apply.

c) $I_1 \ldots I_m$ are Intermediate characters represented by bit combinations of column 2 which, together with the bit combination representing the Final character **F**, identify the control function; these bit combinations are omitted if the control function is identified only by the bit combination representing the Final character F.

   Note – The number of Intermediate characters is not limited by this International Standard (ISO 6429); in practice, at the most, one Intermediate character will be sufficient since over one thousand control functions may be identified using not more than one Intermediate character.

d)   F is the Final character; it is represented by a bit combination of column 4, 5, 6 or 7 (except 7/15); it terminates the control sequence and, together with the Intermediate characters, if present, identifies the control function (however, see § 10).

The occurrence of any bit combinations which do not conform to the above format is an error condition for which recovery is not specified by this International Standard (ISO 6429).

The Final characters (either used alone or together with Intermediate characters) are classified in two categories:

i)   the control functions identified by a Final character represented by a bit combination of columns 4, 5 and 6 are either standardized or reserved for future standardization;

ii)   the control functions identified by a Final character represented by a bit combination of column 7 (except 7/15) are not standardized and are available for private (or experimental) use.

There are two types of parameters: numeric and selective (see § 5.4).

The bit combinations of columns 4, 5 and 6 representing the Final characters and the bit combinations representing the Intermediate characters are specified in Table 2 and Table 3."

5.4   *Parameter representations*

A control sequence may contain a string $P_1 . . . P_n$ representing one or more parameters to complete the specification of the control function.

The string of bit combinations representing $P_1 . . . P_n$ contained in a control sequence is called the parameter string. It consists of bit combinations of column 3 and is interpreted as follows:

– If the first bit combination of the parameter string is in the range 3/0 to 3/11, the parameter string is interpreted according to the format described below.

– If the first bit combination of the parameter string is in the range 3/12 to 3/15, the parameter string is available for private (or experimental) use. Its format and meaning are not defined by this International Standard (ISO 6429).

5.4.1   *Parameter string format*

A parameter string shall have the following format:

a)   a parameter string consists of one or more parameter sub-strings;

b)   each parameter sub-string consists of one or more bit combinations from 3/0 to 3/9, representing the digits zero to nine;

c)   parameter sub-strings are separated by one bit combination 3/11;

d)   bit combination 3/10 is reserved for future standardization as an additional parameter separator;

e)   bit combinations 3/12 to 3/15 shall not be used;

f)   in each parameter sub-string, leading bit combinations 3/0 are not significant and may be omitted;

g)   if the parameter string starts with the bit combination 3/11, an empty parameter sub-string is assumed preceding the separator; if the parameter string terminates with the bit combination 3/11, an empty parameter sub-string is assumed following the separator; if the parameter string contains successive bit combinations 3/11, empty parameter sub-strings are assumed between the separators;

h)   if the control function has more than one parameter, and some parameter sub-strings are empty, the separators (bit combination 3/11) must still be present. However, if the last parameter sub-string(s) is empty, the separator preceding it may be omitted (see Annex B – Coding examples);

j)   an empty parameter sub-string or a parameter sub-string which consists of bit combinations 3/0 only represents a default value which depends on the control function.

5.4.2   *Types of parameters*

In a control sequence representing a control function with parameters, each parameter sub-string corresponds to one parameter, and represents the value of that parameter. The number of parameters is either fixed of variable, depending on the control function. If the number of parameters is variable, neither the maximum number of values nor the order in which the corresponding actions are performed are defined by this International Standard (ISO 6429).

5.4.2.1   *Numeric parameters*

In a control sequence representing a control function with numeric parameters, each parameter sub-string which has a value other than a zero represents a quantity in decimal notation.

5.4.2.2   *Selective parameters*

In a control sequence representing a control function with selective parameters, each parameter sub-string whilst expressed by digits, is not quantitative i.e. does not represent a quantity in decimal notation. Each value corresponds to one of the actions the control function can perform.

A particular parameter value may have the same meaning as a combination of two or more separate values."

"10   *Transformation between 7-bit and 8-bit coded representations*

The control functions defined in this International Standard (ISO 6429) can be coded in a 7-bit code as well as in an 8-bit code: both forms of coded representation are equivalent and in accordance with ISO 2022.

However, when data containing these control functions are transformed from a 7-bit to an 8-bit representation or vice versa, the transformation algorithm specified in ISO 2022 may produce results which are formally in disagreement with this International Standard (ISO 6429).

In order to make allowance for such unintended but unavoidable deviations, the format rules are extended in the manner described below.

In an 8-bit code, the bit combination of columns 10 to 15 (except 10/0 and 15/15) are permitted to represent:

a)   parameters, intermediates and finals of a control sequence;

b)   the contents of a control string;

c)   the operand of a single-shift character.

In these situations, the bit combinations in the range 10/1 to 15/14 have the same meanings as the corresponding bit combination in the range 2/1 to 7/14."

ANNEX E

(to Recommendation T.61)

Standardized options

E.1   *General*

E.1.1   This annex contains detailed definitions that shall be used to implement Teletex standardized options included in the Teletex repertoire of graphic characters and control functions.

E.2   *Definitions*

E.2.1   The definitions contained in § 2 shall apply unless explicitly amended.

E.2.2   Additional definitions are for further study.

E.3   *Teletex character repertoire*

E.3.1   *Teletex optional repertoire of graphic characters*

E.3.1.1   *Registered character sets*

E.3.1.1.1   *Japanese Kanji terminal optional graphic character repertoire.*

Japanese graphic character set for information interchange (JIS C 6226-1983[1]) used as a G0 set.

E.3.1.1.2   *Chinese ideogram terminal optional graphic character repertoire.*

Chinese graphic character set for information interchange (GB 2312-80 set No. 58 in ISO Register) used as a G1 set.

E.3.1.1.3   *Greek primary set of graphic characters*

E.3.1.1.3.1   The code table of the Greek set, shown in Figure E-1/T.61, consists of the most frequently used Greek alphanumeric characters and punctuation marks. The bit combination 02/00 is used for SPACE and 07/15 is used for DELETE.

_____

[1]   Japanese Industrial Standard.

b7 b6 b5	0 0 0	0 0 1	0 1 0	0 1 1	1 0 0	1 0 1	1 1 0	1 1 1
b4 b3 b2 b1	0	1	2	3	4	5	6	7
0 0 0 0 — 0				0	@	Π	②	π
0 0 0 1 — 1			!	1	A	P	α	ρ
0 0 1 0 — 2			”	2	B	①	β	ς
0 0 1 1 — 3			#	3	Γ	Σ	γ	σ
0 1 0 0 — 4			¤	4	Δ	T	δ	τ
0 1 0 1 — 5			%	5	E	Y	ε	υ
0 1 1 0 — 6			&	6	Z	Φ	ζ	φ
0 1 1 1 — 7			'	7	H	X	η	χ
1 0 0 0 — 8			(	8	Θ	Ψ	θ	ψ
1 0 0 1 — 9			)	9	I	Ω	ι	ω
1 0 1 0 — 10			*	:	K	②	κ	②
1 0 1 1 — 11			+	;	Λ	[	λ	{
1 1 0 0 — 12			,	<	M	\	μ	|
1 1 0 1 — 13			–	=	N	]	ν	}
1 1 1 0 — 14			.	>	Ξ	^	ξ	‾
1 1 1 1 — 15			/	?	O	_	ο	

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Note 1 — Telematic terminals should not transmit this code. However, to ensure compatibility with some conversion equipments, when a telematic terminal receives code 5/2, it shall interpret it as a capital greek letter Sigma.

Note 2 — These code positions are reserved for further standardisation.

FIGURE E-1/T.61

The greek primary set of graphic characters

ID	Graphic	Name or description	Set	Position	
GA01	α	small letter Alpha	G0	6/1	
GA02	A	capital letter Alpha	G0	4/1	
GA11	ά	small letter Alpha with accent	G2	4/2	G0 6/1
GA12	Á	capital letter Alpha with accent	G2	4/2	G0 4/1
GB01	β	small letter Beta	G0	6/2	
GB02	B	capital letter Beta	G0	4/2	
GG01	γ	small letter Gamma	G0	6/3	
GG02	Γ	capital letter Gamma	G0	4/3	
GD01	δ	small letter Delta	G0	6/4	
GD02	Δ	capital letter Delta	G0	4/4	
GE01	ε	small letter Epsilon	G0	6/5	
GE02	E	capital letter Epsilon	G0	4/5	
GE11	έ	small letter Epsilon with accent	G2	4/2	G0 6/5
GE12	É	capital letter Epsilon with accent	G2	4/2	G0 4/5
GZ01	ζ	small letter Zeta	G0	6/6	
GZ02	Z	capital letter Zeta	G0	4/6	
GE61	η	small letter Eta	G0	6/7	
GE62	H	capital letter Eta	G0	4/7	
GE63	ή	small letter Eta with accent	G2	4/2	G0 6/7
GE64	Ή	capital letter Eta with accent	G2	4/2	G0 4/7
GT61	θ	small letter Theta	G0	6/8	
GT62	Θ	capital letter Theta	G0	4/8	
GI01	ι	small letter Iota	G0	6/9	
GI02	I	capital letter Iota	G0	4/9	
GI11	ί	small letter Iota with accent	G2	4/2	G0 6/9
GI12	Í	capital letter Iota with accent	G2	4/2	G0 4/9
GI17	ϊ	small letter Iota with diaeresis	G2	4/8	G0 6/9
GI18	Ϊ	capital letter Iota with diaeresis	G2	4/8	G0 4/9
GI33	ΐ	small letter Iota with accent and diaeresis	G2	4/0	G0 6/9
GK01	κ	small letter Kappa	G0	6/10	
GK02	K	capital letter Kappa	G0	4/10	
GL01	λ	small letter Lambda	G0	6/11	
GL02	Λ	capital letter Lambda	G0	4/11	
GM01	μ	small letter Mu	G0	6/12	
GM02	M	capital letter Mu	G0	4/12	
GN01	ν	small letter Nu	G0	6/13	
GN02	N	capital letter Nu	G0	4/13	
GX01	ξ	small letter Xi	G0	6/14	
GX02	Ξ	capital letter Xi	G0	4/14	
GO01	o	small letter Omicron	G0	6/15	
GO02	O	capital letter Omicron	G0	4/15	
GO11	ό	small letter Omicron with accent	G2	4/2	G0 6/15
GO12	Ó	capital letter Omicron with accent	G2	4/2	G0 4/15
GP01	π	small letter Pi	G0	7/0	
GP02	Π	capital letter Pi	G0	5/0	
GR01	ρ	small letter Rho	G0	7/1	
GR02	P	capital letter Rho	G0	5/1	
GS01	σ	small letter Sigma	G0	7/3	
GS02	Σ	capital letter Sigma	G0	5/3	
GS03	ς	small letter final Sigma	G0	7/2	

ID	Graphic	Name or description	Set	Position	
GT01	τ	small letter Tau	G0	7/4	
GT02	T	capital letter Tau	G0	5/4	
GY01	υ	small letter Upsilon	G0	7/5	
GY02	Y	capital letter Upsilon	G0	5/5	
GY11	ύ	small letter Upsilon with accent	G2	4/2	G0 7/5
GY12	Ύ	capital letter Upsilon with accent	G2	4/2	G0 5/5
GY17	ϋ	small letter Upsilon with diaeresis	G2	4/8	G0 7/5
GY18	Ϋ	capital letter Upsilon with diaeresis	G2	4/8	G0 5/5
GY33	ΰ	small letter Upsilon with accent and diaeresis	G2	4/0	G0 7/5
GF01	φ	small letter Phi	G0	7/6	
GF02	Φ	capital letter Phi	G0	5/6	
GH01	χ	small letter Khi	G0	7/7	
GH02	X	capital letter Khi	G0	5/7	
GP61	ψ	small letter Psi	G0	7/8	
GP62	Ψ	capital letter Psi	G0	5/8	
GO61	ω	small letter Omega	G0	7/9	
GO62	Ω	capital letter Omega	G0	5/9	
GO63	ώ	small letter Omega with accent	G2	4/2	G0 7/9
GO64	Ώ	capital letter Omega with accent	G2	4/2	G0 5/9

Coded representations of letters with diacritical marks are constituted of letter codes from the Greek primary set in combination with diacritical marks codes from positions 12/00 to 12/15 of the supplementary set (Figure 2/T.61 code table).

Bit combination equivalent to empty position 12/00 of the supplementary set in Figure 2/T.61 code table is used to represent the diacritical mark "Diaeresis with acute accent". (Identification SD33, graphic symbol ⸚.) that shall be transmitted in the Greek Teletex service.

E.3.1.1.3.3 Figure E-2/T.61 specifies the possible combinations of diacritical marks from the supplementary set and letters of the Greek primary set that are defined in this Recommendation.

E.3.1.1.4 The use of additional sets is for further study.

Basic letter → Diacritical mark ↓	α A	β B	γ Γ	δ Δ	ε E	ζ Z	η H	θ Θ	ι I	κ K	λ Λ	μ M	ν N	ξ Ξ	ο O	π Π	ρ P	σ Σ ς	τ T	υ Y	φ Φ	χ X	ψ Ψ	ω Ω
Acute accent	ά Ά				έ Έ		ή Ή		ί Ί						ό Ό					ύ Ύ				ώ Ώ
Diaeresis									ϊ Ϊ											ϋ Ϋ				
Diaeresis with acute accent									ΐ											ΰ				

FIGURE E-2/T.61

Use of diacritical marks

E.3.1.2 *Dynamically redefinable character sets (DRCS)*

DRCS will be used by Japanese Kanji terminal and Chinese ideogram terminal to extend their character repertoire. Japanese Kanji character patterns and Chinese ideogram character patterns will be loaded into a terminal by procedures described in Recommendation T.62, and shall be designated and invoked as described in Annex A of this Recommendation.

A definition for **DRCS** is as follows:

A DRCS is a set of graphic characters whose exact shape is specified and transmitted at the time of use. Such characters may be alphabetic, special symbols or picture element symbols. Once loaded, a DRCS is regarded as a member of a library that can be designated by appropriate ESC sequences as a G0, G1, G2 or G3 set.

ESC I 2/0 F designates such a set, where I will take a value from 2/8 . . . 2/11 to indicate whether the set is to be used as a G0, G1, G2 or G3 set respectively.

Sixty-three sets may be identified by means of such four character sequences. This should be enough for most requirements but a third or more intermediate character can be inserted between the 2/0 character and the final character if more sets are needed. See ISO Standard 2022.

Sequences with 2/0 as the second intermediate character and with 2/0 to 2/7 as the first Intermediate character are reserved for future standardization.

Multiple-byte graphic sets may also be dynamically redefinable. ECS 2/4 I 2/0 F designate such a set when it is to be a G1, G2 or G3 set, where I takes the same value and has the same meaning as in the preceding paragraphs. However, when such a set is to be a G0 set, it shall be designated by ESC 2/4 2/0 F.

Note 1 – This class of escape sequence is exceptional because the allocation of final (and possible intermediate) character is not done by the ISO Registration Authority but by the user. It is recommended that final characters be allocated sequentially, starting with 4/0.

Note 2 – There is a need for this particular escape sequence as distinct from the normal three character sequence used to represent registered sets. This escape sequence implies an exact description of the shape or font of the characters.

E.3.2 *Teletex optional repertoire of control functions*

Note – For the definition of optional control functions and the associated optional parameter values, the appropriate ISO standard should be considered.

E.3.2.1 *Format effectors*

Identifier	Abbreviation	Name and definition
CF20	RLF	*Reverse line feed*

A format effector that moves the active position to the corresponding character position on the preceding line, defined by the current value of the vertical spacing (see SVS).

Note – In order to use RLF, it is first necessary to negotiate the use of an optional supplementary control character set containing RLF (in addition to those characters shown in Figure 3/T.61 using the control procedures of Recommendation T.62. Designation and invocation of this control character set may appear at any position in the text. For further details see Annex A.

The escape sequence for this control set is ESC 2/2 F.

This control set was not assigned an escape sequence *Final* bit combination during the 1981-84 Study period since no identifiable use for RLF could be found. The need for RLF is for further study.

E.3.2.2 *Presentation control functions*

Identifier	Abbreviation	Name and definition

CP01   PFS   *Page format selection*
(Definition: see § 3.3.3)

The meaning of the parameter value is:
 0: vertical basic page format[2];
 1: horizontal basic page format[2];
 2: vertical A4 page format;
 3: horizontal A4 page format;
 4: reserved for future option;
 5: reserved for future option;
 6: vertical ISO 3535/A4 page format;
 7: horizontal ISO 3535/A4 page format;
 8: vertical North American legal size page format;
 9: horizontal North American legal size page format;
10: vertical ISO A4 page format (for use by Chinese ideogram and Japanese Kanji terminals);
11: horizontal ISO A4 page format (for use by Chinese ideogram and Japanese Kanji terminals);
12: vertical ISO B5 page format (for use by Chinese ideogram and Japanese Kanji terminals);
13: horizontal ISO B5 page format (for use by Chinese ideogram and Japanese Kanji terminals);
14: vertical ISO B4 page format (for use by Chinese ideogram and Japanese Kanji terminals);
15: horizontal ISO B4 page format (for use by Chinese ideogram and Japanese Kanji terminals);

CP03   SGR   *Select graphic rendition*
(Definition: see § 3.3.3)

The meaning of the parameter value is:
 0: default rendition; cancels the effect of any preceding occurrence of SGR; if no parameter is present, the default parameter value applies;
 1: bold or increased intensity;
 3: italicized;
 4: underlined;
 9: crossed-out (characters still legible but marked as being deleted);
22: normal intensity (not bold);
23: not italicized;
24: not underlined;
26: proportional spacing character pitch may be used. See Note 1 below. When proportional spacing character pitch is invoked, the parameter value of the SHS function shall specify the nominal character pitch;
29: not crossed-out.

Note 1 – Parameter value 26 specifies that the text that follows may be presented with proportional spacing at the recipient's option. For interworking with devices not capable of proportional spacing, no line or part of a line of text should contain more characters than are permitted by the current pitch value specified by the most recent occurrence of SHS.

Note 2 – Parameters shall be separated by bit combination 3/11. See Annex D, § 5.4.1.

Note 3 – A terminal's capability to support proportional spacing shall be indicated by including an SGR sequence, with parameter value 26 only, in the Recommendation T.62 procedure for exchanging non-basic terminal capabilities.

Note 4 – Several parameter values can be used in combination, in order to obtain, for example, underlined italics.

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[2] As defined for the basic Teletex service.

Note 5 – The default parameter value cannot be used in combination with any other parameter value.

CP04   SHS   *Select horizontal spacing*
(Definition: see § 3.3.3)

The meaning of the parameter value is:

0:    10 characters per 25.4 mm;[3]
1:    12 characters per 25.4 mm;
2:    15 characters per 25.4 mm;
3:     6 characters per 25.4 mm;
4:     3 characters per 25.4 mm;
5:     9 characters per 50.8 mm;
6:     4 characters per 25.4 mm.

Note 1 – Parameter value 3 may only be used with page formats specified by PFS parameter values 10 to 15.

Note 2 – Parameter values 5 and 6 may only be used with page formats specified by PFS parameter values 10 to 15 for Chinese ideogram terminal.

CP05   SVS   *Select vertical spacing*
(Definition: see § 3.3.3)

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;
4:     8 lines per 25.4 mm;
5:     6 lines per 30.0 mm;
6:     4 lines per 30.0 mm;
7:     3 lines per 30.0 mm;
8:    12 lines per 30.0 mm.

CP06   SPD   *Select presentation direction*

A presentation control function with one selective parameter which specifies the character path and line progression, until these directions are respecified by another occurrence of SPD.

The meaning of the parameter value is as follows:

0:    character path from left to right, line progression from top to bottom;

1:    character path from top to bottom, line progression from right to left when page is orientated for viewing. See Table E-1/T.61.

The default value of the parameter is 0.

Note 1 – An occurrence of SPD is only effective at the beginning of a page, i.e. SPD has no effect in the middle of a page.

Note 2 – Some Japanese and Chinese characters use different patterns for vertical writing from those used for horizontal writing. Table E-2/T.61 and Table E-3/T.61 show the difference between horizontal and vertical writing character patterns.

Note 3 – The perceived effects of SPD on the other control function are shown in Table E-4/T.61.

Note 4 – Figure E-3/T.61 shows an example of a page format using PFS parameter values 10, 12 and 14, with SPD parameter values 0 and 1.

Note 5 – SPD may only be used with page formats specified by PFS parameter values 10 to 15.

_____

[3] As defined for the basic Teletex service.

CP07   GSM   *Graphic size modification*

GSM is a presentation control function with two numeric parameters. Its use causes the height and/or width of the character font to be modified until a subsequent occurrence of GSM in the data stream, or a page boundary is reached.

The meaning of the parameter values are:

n :   specifies the character dimension in the direction of the line progression as a percentage of the default font size.

m :   specifies the character dimension in the direction of the character path as a percentage of the default font size.

The order of the parameters is GSM (*n*, *m*) and the default value of *n* and *m* is 100. Permitted values of parameters n and m, and the effect that these values have on the character spacing (as specified by SHS) and size, are as follows.

For horizontal writing (SPD 0):

GSM 100, 50 causes character spacing and width to be halved.
GSM 100, 100 has no effect.
GSM 100, 200 causes character spacing and width to be doubled.

For vertical writing (SPD 1):

GSM 100, 100 has no effect.
GSM 100, 200 causes character spacing and height to be doubled.

Note 1 – GSM affects only those characters which follow it in the data stream, not those previously received.

Note 2 – GSM may only be used with page formats specified by PFS parameter values 10 to 15.

CP08   SCO   *Select character orientation*

SCO is a presentation control function which is used to establish the amount of rotation of the following graphic character string. The established value remains in effect until the next occurrence of SCO.

The parameter values are:

0:     0°
2:     90°
6:     270°

The default value of the parameter is 0.

The initial position of the graphic characters corresponds to the rotation angle of 0°.

Rotation is positive, i.e. anti-clockwise and applies to the normal presentation of the graphic characters along the character path. The direction of the character path depends on the parameter of SELECT PRESENTATION DIRECTIONS (SPD).

Note – For Chinese ideogram terminals, the center of character rotation is the center of the character cell.

TABLE E-1/T.61

Intended viewing orientation of a page

Page format select parameter value	Intended viewing orientation of page with SPD parameter values	
	0	1
10, 12, 14	portrait	landscape
11, 13, 15	landscape	portrait

**Difference between character patterns
used for horizontal and vertical writing**
(Japanese Kanji terminal)

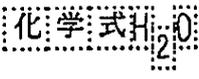| Meaning	Horizontal writing characters	Vertical writing characters	Differences
Long vowel sign			Figure
Hyphen			
Equal sign			
Numerical range sign			
Dash			
Dotted line			
Vertical line			
Parallel sign			
Parenthesis and bracket marks	( ) 〔 〕 [ ] { } 〈 〉 《 》 「 」 『 』 【 】		
Japanese comma			Position
Japanese period			
Small HIRA-KANA characters	あ い う え お や ゆ よ つ わ	あ い う え お や ゆ よ つ わ	Position
Small KATA-KANA characters	ア イ ウ エ オ ヤ ユ ヨ ツ ワ カ ケ	ア イ ウ エ オ ヤ ユ ヨ ツ ワ カ ケ	
Half-width characters (European language, KATA-KANA and numeric characters) Double-width characters (Japanese language, European language and numeric characters)	半角 (half-width) 倍角 Ａ Ｂ	半角 (half-width) a) 倍角 Ａ Ｂ	Enlarging direction
Highlight (under line)	強調	強調	Position

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a) No change in pattern.

**Differences between character patterns for horizontal and vertical writing
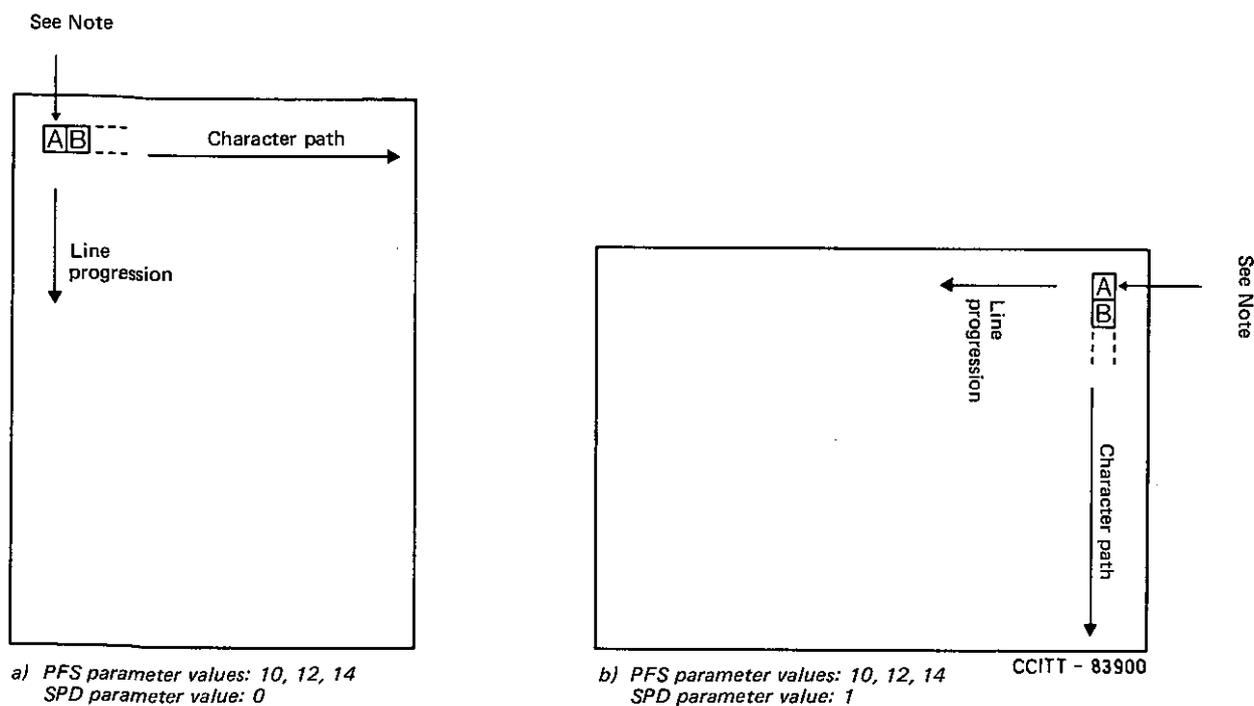used in Chinese ideogram terminal**

Meaning	Horizontal writing		Vertical writing	
Dash	—		∣	
Ellipsis	•••		⋮	
Single quotation mark	' '			
Double quotation mark	" "			
Underline				
Parenthesis and bracket marks	( ) [ ] 〔 〕 { } 〈 〉 《 》 〖 〗 【 】			
Comma	,		,	
Chinese period	。		。	
Chinese comma	、		、	
Semicolon	;		;	
Colon	:		:	
Question mark	?		?	
Exclamation mark	!		!	
Highlight (underline)	强 调 — — — — — — →		强 调	

**Perceived effect of SPD on other control functions
when page is viewed with intended orientation**

Control functions		SPD # 0 (horizontal lines)	SPD # 1 (vertical lines)
Format effectors	BS, CR	Backward (leftward)	Backward (upward)
	RLF	Upward	Rightward
	LF	Downward	Leftward
	PLU	Upward	Rightward
	PLD	Downward	Leftward
		(ex.) 化 学 式 H₂O	(ex.) 化学式H₂O
Presentation control functions	GSM	Character "height"	Character "width"
		Character "width"	Character "height"
	SVS	Vertical direction	Horizontal direction
	SHS	Horizontal direction	Vertical direction
	SGR	Under line	Right side line (for Japanese terminal)
			Left side line (for Chinese terminal)

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a) *PFS parameter values: 10, 12, 14*
   SPD parameter value: 0

b) *PFS parameter values: 10, 12, 14*
   SPD parameter value: 1

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Note – Active position when page is introduced by FF, CR as defined in Recommendation T.60.

FIGURE E-3/T.61

Explanation of page format with SPD parameters 0 and 1

E.3.2.3   *Code extension control functions*

Identifier	Abbreviation	Name and definition
CE03	ESC	*Escape*

A code extension control function which is used to provide coded representations for additional control functions.

CE04	SS2	*Single shift 2*

A code extension control function which is used in conjunction with ESCAPE to extend the graphic character set of an 8-bit code.

SS2 is a non-locking shift function which invokes one character of the currently designated G2 set.

CE05	SS3	*Single shift 3*

A code extension control function which is used in conjunction with ESCAPE to extend the graphic character set of an 8-bit code.

SS3 is a non-locking shift function which invokes one character of the currently designated G3 set.

CE07	LS0	*Locking shift 0*

A code extension control function which is used in conjunction with other locking shift functions and with ESCAPE to extend the graphic character set of an 8-bit code.

LS0 is a locking shift function which invokes the currently designated G0 set into positions 2/1 to 7/14.

CE08   LS1   *Locking shift 1*

A code extension control function which is used in conjunction with other locking shift functions and with ESCAPE to extend the graphic character set of an 8-bit code.

LS1 is a locking shift function which invokes the currently designated G1 set into positions 2/1 to 7/14.

CE09   LS1R   *Locking shift 1 right*

A code extension control function which is used in conjunction with other locking shift functions and with ESCAPE to extend the graphic character set of an 8-bit code.

LS1R is a locking shift function which invokes the currently designated G1 set into position 10/1 to 15/14.

CE10   LS2   *Locking shift 2*

A code extension control function which is used in conjunction with other locking shift functions and with ESCAPE to extend the graphic character set of an 8-bit code.

LS2 is a locking shift function which invokes the currently designated G2 set into positions 2/1 to 7/14.

CE11   LS2R   *Locking shift 2 right*

A code extension control function which is used in conjunction with other locking shift functions and with ESCAPE to extend the graphic character set of an 8-bit code.

LS2R is a locking shift function which invokes the currently designated G2 set into positions 10/1 to 15/14.

CE12   LS3   *Locking shift 3*

A code extension control function which is used in conjunction with other locking shift functions and with ESCAPE to extend the graphic character set of an 8-bit code.

LS3 is a locking shift function which invokes the currently designated G3 set into positions 2/1 to 7/14.

CE13   LS3R   *Locking shift 3 right*

A code extension control function which is used in conjunction with other locking shift functions and with ESCAPE to extend the graphic character set of an 8-bit code.

LS3R is a locking shift function which invokes the currently designated G3 set into positions 10/1 to 15/14.

E.3.2.4   *Optional miscellaneous control function*

Identifier   Abbreviation   Name and description

CM04   IGS   *Identify graphic subrepertoire*

A control function with one selective parameter which is used to indicate to the receiving terminal that a particular subrepertoire of the total repertoire of graphic characters is to be used in the subsequent text. The identification of the graphic subrepertoire may be changed at any point in the text. The selection parameter may be of any value from 0-9999.

The parameter value identifies the subrepertoire according to the register of subrepertoires. The subrepertoire that is assumed to be identified when this control function is omitted is the entire Teletex basic repertoire of graphic characters.

If any subrepertoire has been explicitly identified, it shall be restated prior to the first character of text on each subsequent page (i.e. prior to Form Feed).

E.4   *Coded representations*

E.4.1   *Optional graphic character sets*

E.4.1.1   *Registered character sets*

E.4.1.1.1   Japanese graphic character set for information interchange (set No. 87 in ISO Register) used as a G0 set.

Designation sequence: ESC 2/4 4/2.

E.4.1.1.2   Chinese graphic character set for information interchange (set No. 58 in ISO Register) used as a G1 set.

Designation sequence: ESC 02/04 02/09 04/01.

E.4.1.1.3   *Greek primary set of graphic characters*

Designation sequences:

ECS 02/08 x/x Greek primary set to G0
ECS 02/09 x/x Greek primary set to G1
ECS 02/10 x/x Greek primary set to G2
ECS 02/11 x/x Greek primary set to G3

Note – The final character x/x is awaiting international registration.

E.4.1.2   *Dynamically redefinable character sets (DRCS)*

Designation sequence: see Annex A.

E.4.2   *Optional control functions*

E.4.2.1   *Format effectors*

Identifier	Abbreviation	Coded representation
CF20	RLF	8/13

E.4.2.2   *Presentation control functions*

Identifier	Abbreviation	Coded representation
CP06	SPD	CSI P_1 . . . P_n 02/00 05/03
CP07	GSM	CSI P_1 . . . P_n 02/00 04/02
CP08	SCO	CSI P_1 . . . P_n 02/00 06/05

Additional control functions are for further study.

E.4.2.3   *Optional code extension control functions*

Identifier	Abbreviation	Coded representation
CE03	ESC	1/11
CE04	SS2	1/9
CE05	SS3	1/13
CE07	LS0	0/15
CE08	LS1	0/14
CE10	LS2	1/11 6/14
CE12	LS3	1/11 6/15
CE09	LS1R	1/11 7/14
CE11	LS2R	1/11 7/13
CE13	LS3R	1/11 7/12

E.4.2.4   *Optional miscellaneous control function*

Identifier	Abbreviation	Coded representation
CM04	IGS	CSI P_1 . . . P_n 02/00 04/13

ANNEX F

(to Recommendation T.61)

Example of underlining

The following examples demonstrate the presentation of permissible combinations of underline and other characters of the basic Teletex repertoire. They also demonstrate the interaction between underline (coded as either a *Non-spacing underline* character or as the control function *Select graphic rendition*) and the control functions PLU and PLD.

Example 1:

a b SGR(4) c d PLU e f PLD PLD g h PLU i j SGR k l

yields: abcd<u>ef</u>ghijkl (See Notes 1 and 2 below.)

Example 2:

a b SGR(4) c d SGR(0) PLU SGR(4) e f SGR(0) PLD k l

yields: ab<u>cd</u>efkl

Example 3:

a b SGR(4) c d PLU SGR(4) e f SGR(0) PLD k l

yields: ab<u>cd</u>efkl

Example 4:

a b _ c _ d _ PLU e PLD _ PLD g PLU _ i _ j k l

yields: abcd<u>e</u>gijkl (See Note 1 below.)

Example 5:

a b _ c _ d PLU _ e _ f PLD k l

yields: ab<u>cd</u>efkl

Note 1 – See § 3.1.7 for guidance on the presentation of underline in situations where a possibility of overlap exists.

Note 2 – This example also demonstrates the use of an SGR without a parameter value.

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