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SERIES T: TERMINAL EQUIPMENT AND PROTOCOLS FOR TELEMATIC SERVICES

CODED CHARACTER SETS FOR TELEMATIC SERVICES

Reedition of CCITT Recommendation T.51 published in the Blue Book, Fascicle VII.3 (1988)

NOTES

1 CCITT Recommendation T.51 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.

Recommendation T.51

CODED CHARACTER SETS FOR TELEMATIC SERVICES

(*Malaga-Torremolinos, 1984; amended at Melburne, 1988*)

1 Scope

1.1 The CCITT

considering

(a) the increasing interdependence of the various CCITT character sets and coding schemes in various telematic services;

(b) the introduction of new facilities such as code conversion and interworking between various telematic services;

(c) the convenience of having all relevant CCITT Recommendations on character sets and coding schemes compiled in one series of Recommendations;

(d) that Recommendations T.61 and T.100/T.101 define the character coding systems for Teletex and Videotex;

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

provides the following Recommendation as a reference document

from which coded character subsets and elements of code extension mechanisms can be derived for individual telematic services.

1.2 This Recommendation specifies a primary set and two supplementary sets of graphic characters which are to be the respective supersets of primary and supplementary character sets used in various telematic services. When various telematic services restrict their primary and supplementary sets to be respective subsets of those given in this Recommendation, it will be ensured that no code position in any of the specified code tables is assigned more than one meaning within different telematic services.

1.3 This Recommendation gives the escape sequences for designating the primary and supplementary sets of graphic characters, to be used according to the code extension techniques specified.

1.4 Additional sets of graphic characters will be subject to further inclusion in this Recommendation once they become applicable to more than one CCITT telematic service.

1.5 This Recommendation describes those code extension mechanisms that are relevant to existing telematic services. Additional mechanisms will be included in this Recommendation as the need for such is identified for one or more telematic services. The purpose of this Recommendation is to include an up-to-date reference superset of all code extension mechanisms used by character coding systems in various telematic services.

1.6 In this Recommendation 7-bit code tables are described which can be used either in a 7-bit or in an 8-bit environment, with applicable code extension mechanisms that are given in other Recommendations specific to given telematic services.

1.7 This Recommendation gives a superset of the repertoire of Latin based alphanumeric characters used in CCITT telematic services, (see Annex A).

1.8 This Recommendation gives a table of character and control sets used in CCITT telematic services, (see Annex B).

1.9 There is no conformance clause in this Recommendation specifying the mandatory and optional subsets of code extension mechanisms and coded character sets. Conformance requirements will be the subject of other CCITT Recommendations specific to particular telematic services.

2 Graphic character sets

2.1 *Primary set*

2.1.1 The primary set of graphic characters specified in Figure 1/T.51 is identical with the set of graphic characters of the International Reference Version (IRV) of the 7-bit coded character set of Recommendation T.50.

A number of notes are associated with this primary set which are specific to Teletex or Videotex.

2.1.2 The primary set is designated as G0 by the sequence ESC 2/8 4/0. It can also be alternatively designated as G1, G2 or G3 by the sequences ESC 2/9 4/0, ESC 2/10 4/0 or ESC 2/11 4/0 respectively. See § 3 of this Recommendation for details on code extension techniques.

2.2 *Supplementary set*

2.2.1 The first supplementary set of graphic characters specified in Figure 2a/T.51 is a superset of the supplementary set given in Recommendation T.61 and that given in Recommendation T.100. The second supplementary set of graphic characters specified in Figure 2b/T.51 is identical to the first supplementary set, with the addition of four graphic characters, namely: “broken bar”, “not sign”, “no-break space” and “soft hyphen”.

2.2.2 Unallocated code positions are subject to future standardization and will be allocated when a need for such is identified.

2.2.3 The first supplementary set is designated as G2 by the sequence ESC 2/10 6/2. It can be alternatively designated at G0, G1 or G3 by the sequences ESC 2/8 6/2, ESC 2/9 6/2 or ESC 2/11 6/2 respectively. See § 3 of this Recommendation for details on code extension techniques.

2.2.4 The second supplementary set is designated as G2 by the sequence ESC 2/14 F. It can be alternatively designated as G1 or G3 by the sequences ESC 2/13 F or ESC 2/15 F respectively. (The final character F to be assigned by ISO Registration Authority.)

2.2.5 *Notes on the primary and supplementary sets of graphic characters for Figures 1/T.51, 2a/T.51 and 2b/T.51*

In the figures the number of the Note being referred to is encircled.

Note 1 – All the characters in column 4 of the supplementary set are non-spacing characters. They are all diacritical marks with the exception of 4/12.

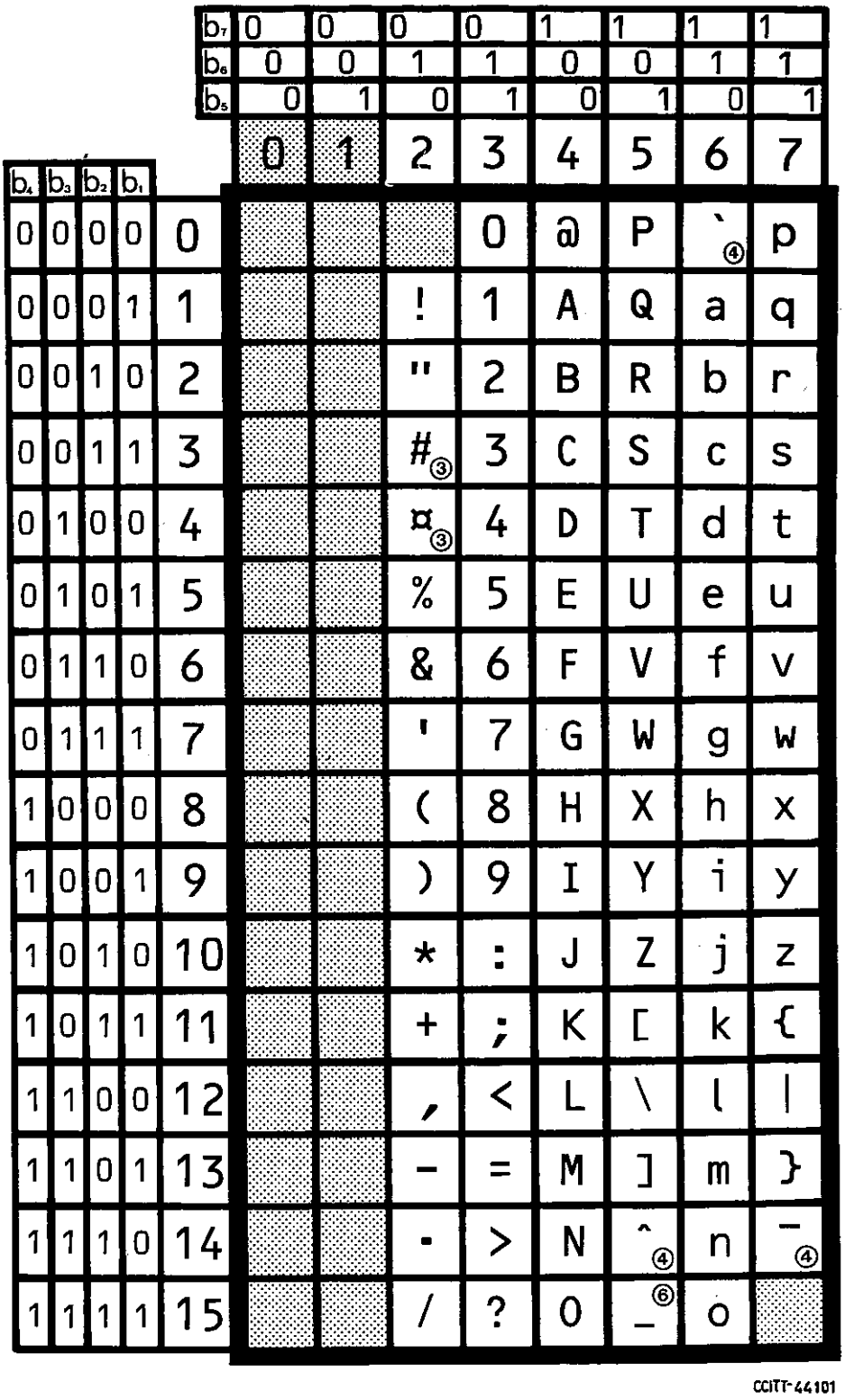
Note 2 – Cross-shaded code positions are reserved for future standardization by the CCITT.

Note 3 – Terminals used for CCITT defined telematic services should send only the codes 2/6 and 2/8 of the supplementary set for the number sign and currency sign, respectively. When receiving codes 2/3 and 2/4 from the primary set of graphic characters, terminals should interpret them as # and ¤ respectively.

Note 4 – Terminals used for CCITT defined telematic services should send only the codes 4/1 of the supplementary set followed by SPACE for a stand-alone grave accent, 4/3 of the supplementary set followed by SPACE for a stand-alone circumflex accent, and 4/4 of the supplementary set followed by SPACE for a stand-alone tilde. Whenever a telematic terminal is capable of receiving and interpreting codes 6/0, 5/14 and 7/14 from the primary set of graphic characters, terminals shall interpret them as $\grave{\square}$, $\hat{\square}$ and $\tilde{\square}$, respectively.

Note 5 – This code position is reserved and shall not be used.

Note 6 – In certain interactive Videotex systems the code 5/15 of the primary set is used as a terminator for data input field transmitted from terminal to host. Its graphic representation may be different from “low line”.

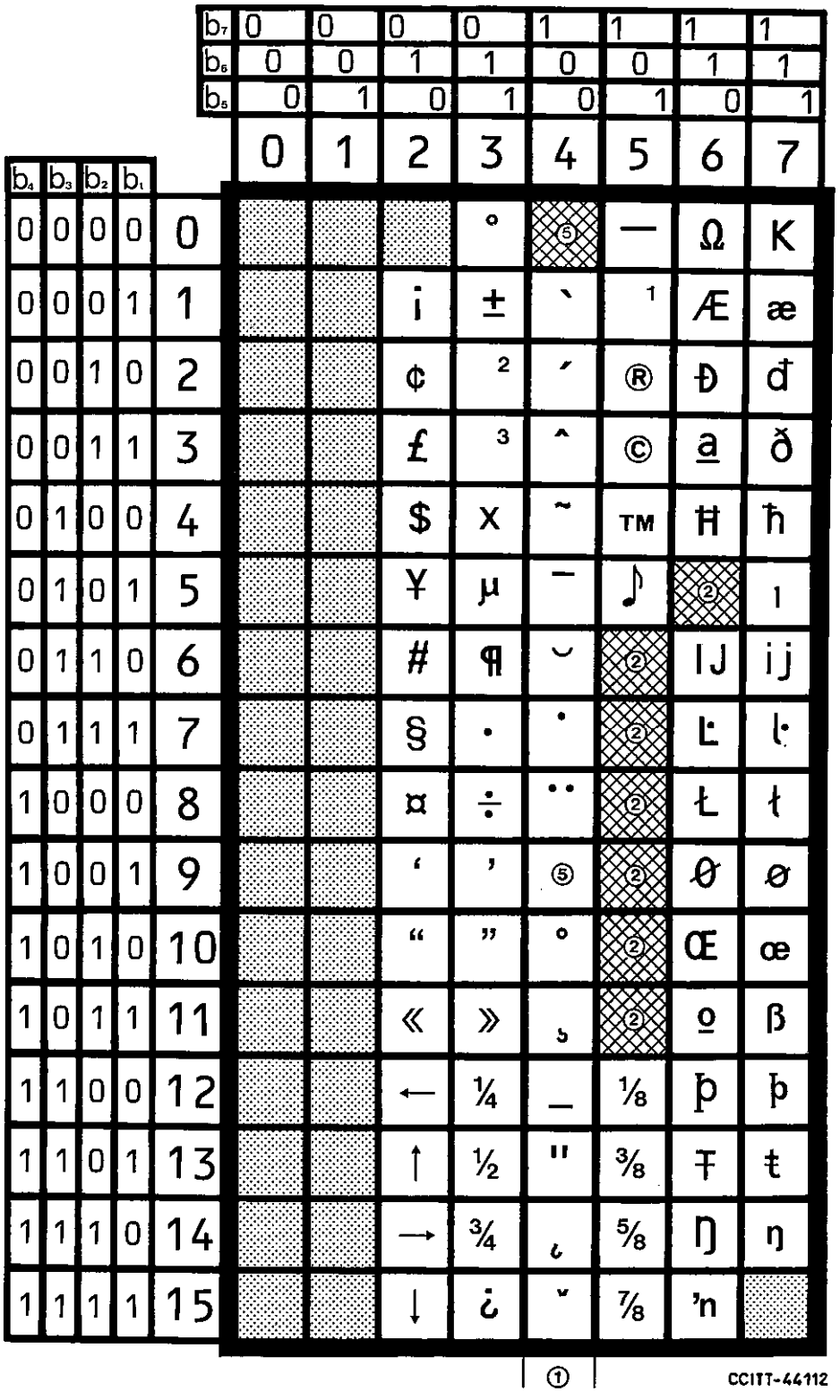


Note – Notes to this Figure are contained in § 2.2.5.

FIGURE 1/T.51

The primary set of graphic characters for telematic services

(coded representation when invoked in columns 2-7 of the code table)

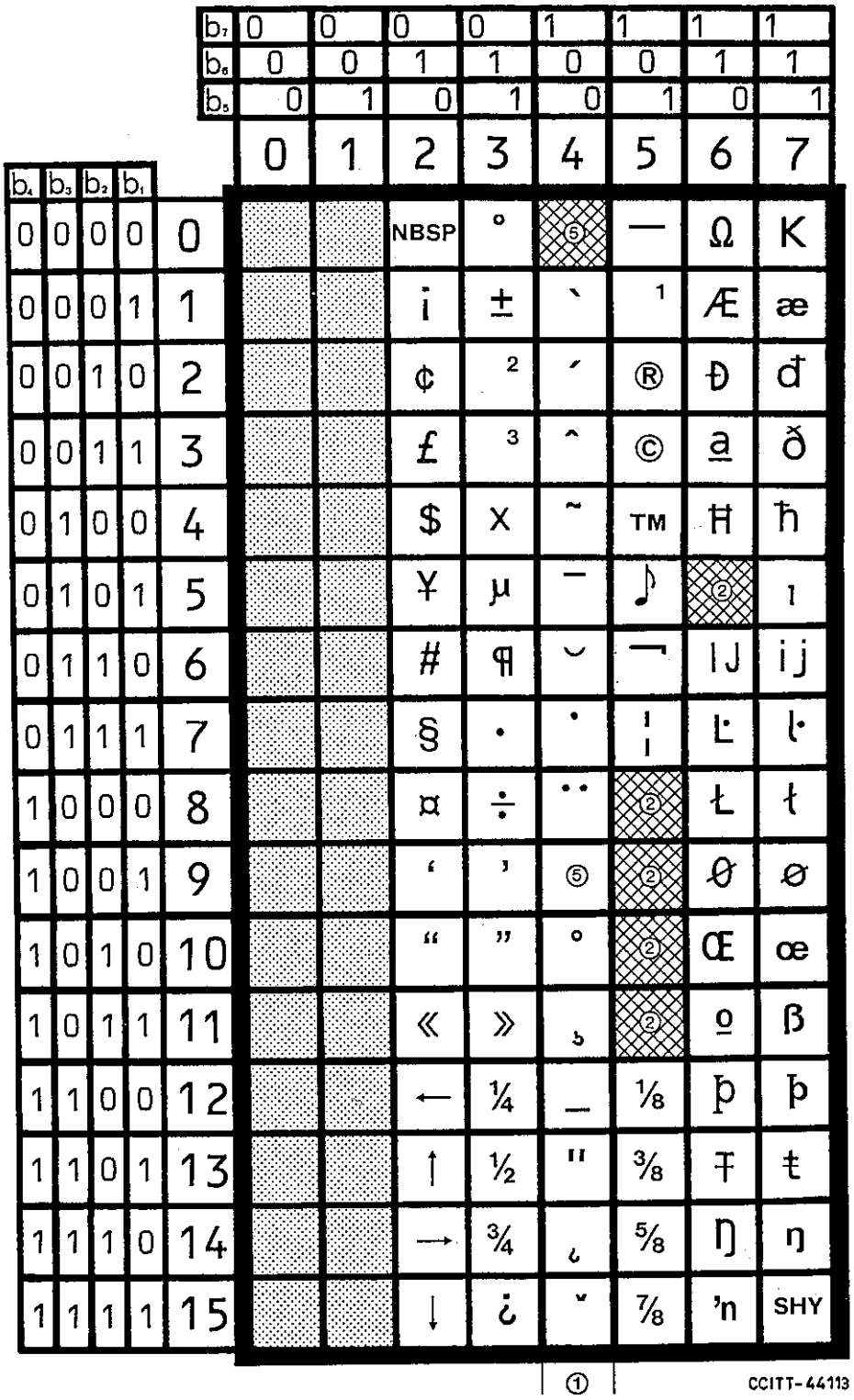


Note – Notes to this Figure are contained in § 2.2.5.

FIGURE 2a/T.51

The first supplementary set of graphic characters for Telematic services

(coded representation when invoked in columns 2-7 of the code table)



Note – Notes to this Figure are contained in § 2.2.5.

FIGURE 2b/T.51

The second supplementary set of graphic characters for Telematic services

(coded representation when invoked in colomns 2-7 of the code table)

3 Code extension technique

3.1 *General*

3.1.1 Code extension techniques are required for the designation of various graphic or control character sets and their invocation in the 7-bit set or 8-bit set in use. Such techniques are derived from ISO Standard 2022.

3.1.2 This Recommendation describes only those code extension techniques currently specified for existing telematic services. Additional techniques will be further incorporated as they are identified for use in one or more telematic services.

3.2 *Definitions*

For the purpose of code extension techniques given in this Recommendation, the following definitions apply.

3.2.1 **bit combination**

An ordered set of bits used for the representation of characters.

3.2.2 **byte**

A bit string that is operated upon as a unit and the size of which is independent of redundancy or framing techniques.

3.2.3 **character**

A member of a set of elements used for the organization, control or representation of data.

3.2.4 **coded character set; code**

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

3.2.5 **code extension**

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

3.2.6 **code table**

A table showing the character allocated to each bit combination in a code.

3.2.7 **control character**

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

3.2.8 **control function**

An action that affects the recording, processing, transmission or interpretation of data and that has a coded representation consisting of one or more bit combinations.

3.2.9 **to designate**

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.

3.2.10 **environment**

The characteristic that identifies the number of bits used to represent a character in a data processing or data communication system or in part of such a system.

3.2.11 **escape sequence**

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 bit combinations represents the character ESCAPE (1/11).

3.2.12 **final character**

The character the bit combination of which terminates an escape sequence.

3.2.13 **graphic character**

A character, other than a control function, that has a visual representation normally handwritten, printed or displayed.

3.2.14 **intermediate character**

A character the bit combination of which occurs between that of the ESCAPE character and that of the Final character in an escape sequence consisting of more than two bit combinations.

3.2.15 **to invoke**

To cause a designated set of characters to be represented by the prescribed bit combinations whenever those bit combinations occur, until an appropriate code extension function occurs.

3.2.16 **position**

That part of a code table identified by its column and row coordinates.

3.2.17 **to represent**

a) to use a prescribed bit combination with the meaning of a character in a set of characters that has been designated and invoked; or

b) to use an escape sequence with the meaning of an additional control function.

3.3 *Code extension facilities*

These are depicted in Figure 3/T.51 for the 7-bit environment and Figure 4/T.51 for the 8-bit environment. They include the following functions:

a) designation and invocation of control sets C0 and C1 by means of the relevant escape sequences given in § 3.4;

b) designation of a graphic character set G0 by means of the relevant escape sequence given in § 3.4;

c) designation of up to three additional G-sets called G1, G2 and G3 by means of the relevant escape sequences given in § 3.4;

d) invocation of the designated graphic sets, by means of locking and/or non-locking shift functions, given in § 3.5;

e) designation and invocation of a complete code by means of the relevant escape sequence given in § 3.4.

3.4 *Types of character sets*

There are a number of different types of control and graphic character sets that can be designated and invoked for use in the 7-bit or 8-bit environment. These are listed in Table 3/T.51 and defined below. A given control or graphic character set can be designated by an escape sequence terminated by a Final character F from bit combination 4/0 to 7/14, specific to the character set to be designated. Final characters are allocated by ISO and registered in the ISO "International register of coded character sets to be used with escape sequences."

3.4.1 C0 set of 32 control characters (bit combinations 0/0 to 1/15). A C0 set is designated and invoked by the sequence ESC 2/1 F, where F identifies a registered C0 set.

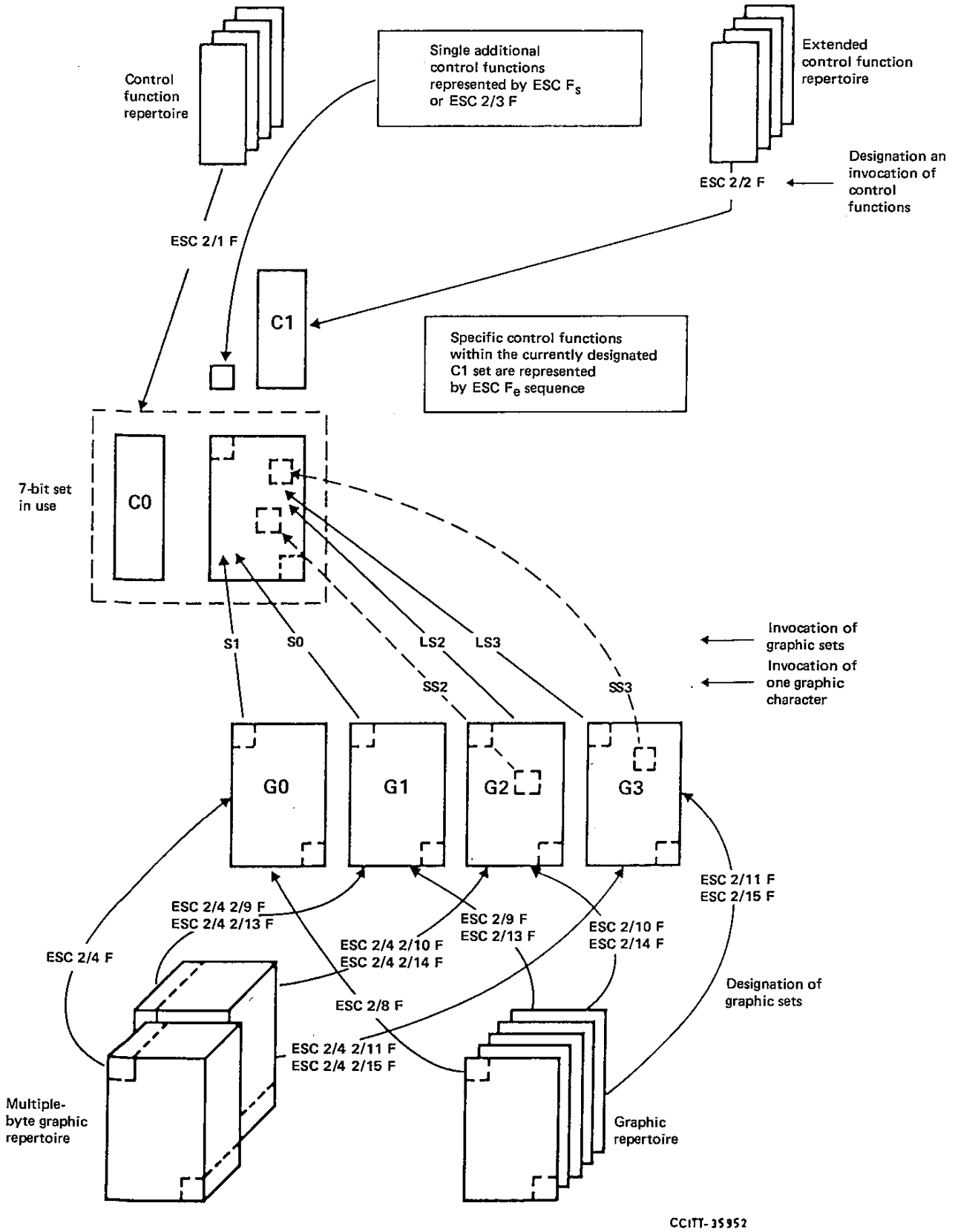


FIGURE 3/T.51

Code extension in 7-bit environment

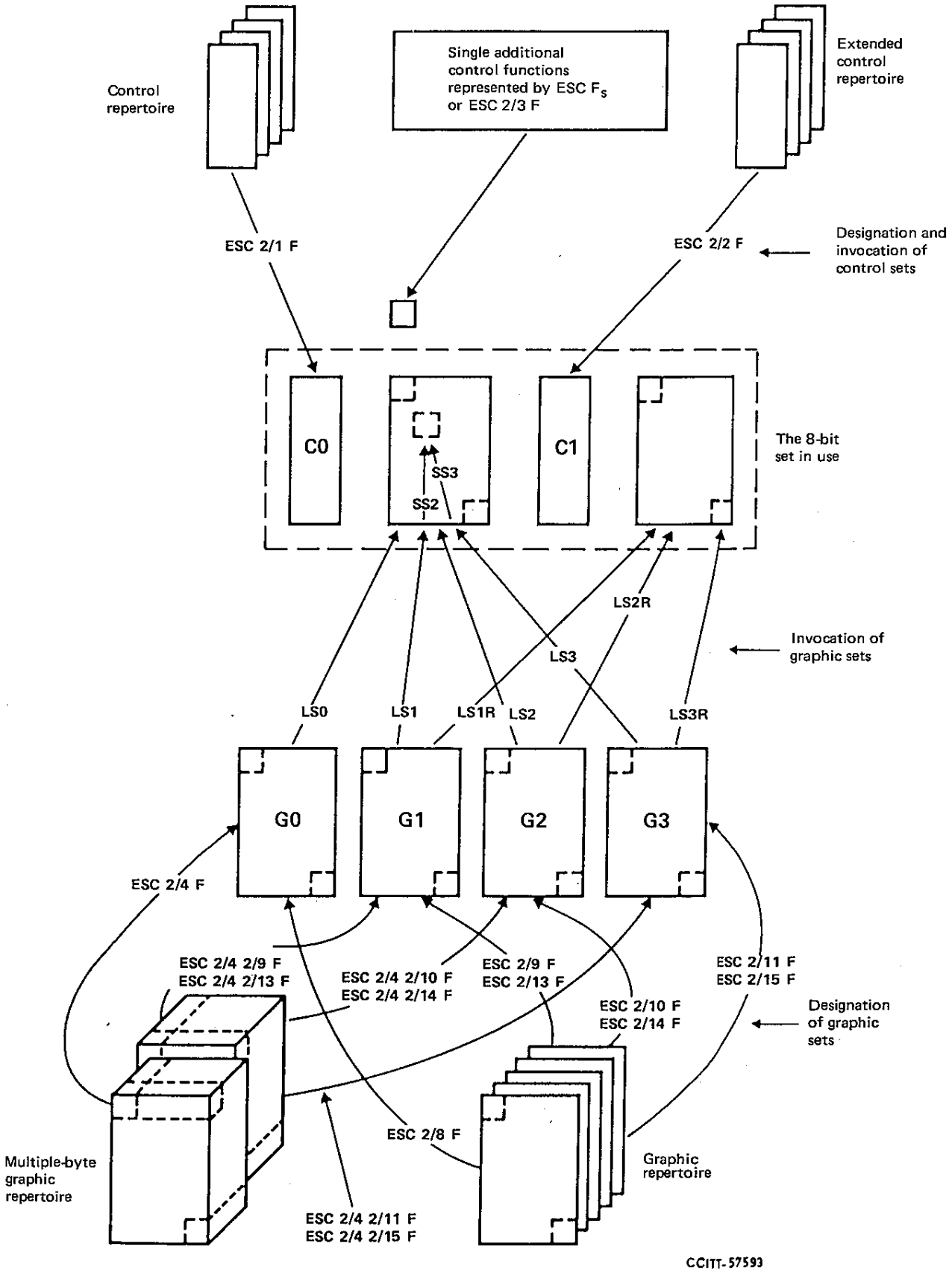


FIGURE 4/T.51

Code extension in 8-bit environment

3.4.2 C1 set of 32 control characters (bit combinations 8/0 to 9/15 in an 8-bit environment, or ESC 4/0 to ESC 5/15 in a 7-bit environment). A C1 set is designated and invoked by the sequence ESC 2/2 F, where F identifies a registered C1 set.

3.4.3 G0 set of 94 graphic characters (bit combinations 2/1 to 7/14).

3.4.4 G1, G2 and G3 sets of 94 graphic characters (bit combinations 2/1 to 7/14 or 10/1 to 15/14). A registered set of 94 graphic characters can be designated by the escape sequence ESC 2/8 F, ESC 2/9 F, ESC 2/10 F or ESC 2/11 F in order to be used as a G0, G1, G2 or G3 set respectively, where F identifies the designated set.

3.4.5 G1, G2 and G3 sets of 96 graphic characters (bit combinations 2/0 to 7/15 or 10/0 to 15/15). A registered set of 96 graphic characters can be designated by the escape sequence ESC 2/13 F, ESC 2/14 F or ESC 2/15 F in order to be used as a G1, G2 or G3 set respectively, where F identifies the designated set.

3.4.6 Multiple-byte G0 set of more than 94 graphic characters each represented by more than one bit combinations from 2/1 to 7/14.

3.4.7 Multiple-byte G1, G2 and G3 sets of more than 94 graphic characters each represented by more than one bit combination from 2/1 to 7/14 or from 10/1 to 15/14. A registered multiple-byte set of more than 94 graphic characters can be designated by the escape sequence ESC 2/4 F, ESC 2/4 2/9 F, ESC 2/4 2/10 F or ESC 2/4 2/11 F in order to be used as a G0, G1, G2 or G3 set respectively, where F identifies the designated set.

3.4.8 Multiple-byte G1, G2 and G3 sets of more than 96 graphic characters each represented by more than one bit combination from 2/0 to 7/15 or from 10/0 to 15/15. A registered multiple-byte set of this type identified by a Final character F can be designated by the escape sequence ESC 2/4 2/13 F, ESC 2/4 2/14 F or ESC 2/4 2/15 F in order to be used as G1, G2 or G3 set respectively.

3.4.9 Complete code containing all bit combinations 0/0 to 7/15 in 7-bit environment, or 0/0 to 15/15 in 8-bit environment. A complete code identified by a Final character F, can be designated and invoked by the escape sequence ESC 2/5 F.

Note – Complete code is now referred to in ISO 2022 as “Coding System different from that of ISO 2022”.

3.5 *Invocation functions*

Following the designation of a G0, G1, G2 or G3 set as specified in § 3.4, any one of these sets will require invocation into the 7-bit or 8-bit in-use code table. This is performed by the use of either locking shift functions or non-locking shift functions listed in Table 4/T.51. Coding for these functions is given in Table 5/T.51.

3.5.1 *Use of locking shift functions*

There are seven locking shift functions as given in Tables 4/T.51 and 5/T.51. A locking shift function invokes the relevant G0, G1, G2 or G3 set into columns 2 to 7 or into columns 10 to 15 (8-bit code only) in order to replace the previously invoked G-set. The occurrence of a locking shift function shall not affect those bit combinations that are included in any escape sequence or those that follow single shift function SS2 or SS3. If a particular set has already been invoked, use of the corresponding locking shift function has no effect.

3.5.2 *Use of single shift functions*

The single shift function SS2 shall invoke one character from the last designated G2 set. Similarly SS3 shall invoke one character from the last designated G3 set. In the case of using single-byte graphic sets, these invocations alter the meaning of the immediately following bit combination only and ascribe to it the meaning of the corresponding bit combination of the G2 or G3 set. The bit combination permitted to follow SS2 or SS3 is limited to one from columns 2 to 7. If a single-shift function is used to invoke a character from a multiple-byte set, the shift function will affect two or more bit-combinations to represent that character. The use of a single-shift function does not affect the current shift status established by a locking-shift function.

TABLEAU 3/T.51

Types of character sets

Description	Character set	Designation sequence	Bit combinations	
			7-bit environment	8-bit environment
Sets of 32 control characters	C0 C1	ESC 2/1 F ESC 2/2 F	0/0 to 1/15 ESC 4/1 to ESC 5/15	0/0 to 1/15 8/0 to 9/15
Sets of 94 graphic characters	G0	ESC 2/8 F	2/1 to 7/14	2/1 to 7/14
	G1 G2 G3	ESC 2/9 F ESC 2/10 F ESC 2/11 F	2/1 to 7/14	2/1 to 7/14 or 10/1 to 15/14
Sets of 96 graphic characters	G1 G2 G3	ESC 2/13 F ESC 2/14 F ESC 2/15 F	2/0 to 7/15	2/0 to 7/15 or 10/1 to 15/15
Sets of more than 94 graphic characters each represented by more than one byte	G0	ESC 2/4 F	2/1 to 7/14	2/1 to 7/14
	G1 G2 G3	ESC 2/4 2/9 F ESC 2/4 2/10 F ESC 2/4 2/11 F	2/1 to 7/14	2/1 to 7/14 or 10/1 to 15/14
Sets of more than 96 graphic characters each represented by more than one byte	G1 G2 G3	ESC 2/4 2/13 F ESC 2/4 2/14 F ESC 2/4 2/15 F	2/0 to 7/15	2/0 to 7/15 or 10/0 to 15/15
Complete code		ESC 2/5 F	0/0 to 7/15	0/0 to 15/15

Note – Control sets C0 and C1, and complete codes are simultaneously designated and invoked by the relevant escape sequences indicated.

TABLEAU 4/T.51

Allocation of shift functions to the graphic character sets to be invoked

	Locking shift functions		Non-locking shift functions
A set	Columns 2 to 7 of 7-bit or 8-bit code	Columns 10 to 15 of 8-bit code	Columns 2 to 7 of 7-bit or 8-bit code
G0	SI(7-bit), LS0(8-bit)	–	–
G1	SO(7-bit), LS1(8-bit)	LS1R	–
G2	LS2	LS2R	SS2
G3	LS3	LS3R	SS3

TABLE 5/T.51

Coding for shift functions

Shift function		Coding
Single-shift two	SS2	1/9
Single-shift three	SS3	1/13
Shift in SI(7-bit), locking-shift zero	LS0(8-bit)	0/15
Shift out SO(7-bit), locking-shift one	LS1(8-bit)	0/14
Locking-shift one right	LS1R	ESC 7/14
Loching-shift two	LS2	ESC 6/14
Locking-shift two right	LS2R	ESC 7/13
Locking-shift three	LS3	ESC 6/15
Locking-shift three right	LS3R	ESC 7/12

ANNEX A

(to Recommendation T.51)

Superset of the Repertoire of the Latin Based Character Set

A.1 This Annex contains a superset of the repertoire of Latin based alphanumeric graphic characters used in CCITT telematic services, with the exception of the following four characters which are not yet in use in telematic services.

“Broken Bar”

“Not Sign”

“No-Break SPACE”

“Soft-Hyphen”

Each graphic character is identified by the identification system identical to that used in Recommendation T.61 (see § A.2).

In the tables of § A.4, DS I, DS II and DS III refer to the Data Syntaxes I, II and III respectively of Recommendation T.101.

In the tables of § A.4, a mark “x” signifies the particular graphic character is used. On the other hand a “–” mark signifies that the graphic character is not used.

A.2 *Identification system*

A system was developed that allows for the identification and description of each graphic character or control function. The system is shown in Figure A-1/T.51.

Each identifier consists of two letters and two digits.

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

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.

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 not special meaning in the case of the first letter being a C, N or S.

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

The numbering is used in a consistent manner so that each diacritical mark is always given the same number. The numbering principle is shown in Table A-1/T.51.

TABLE A-1/T.51

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.

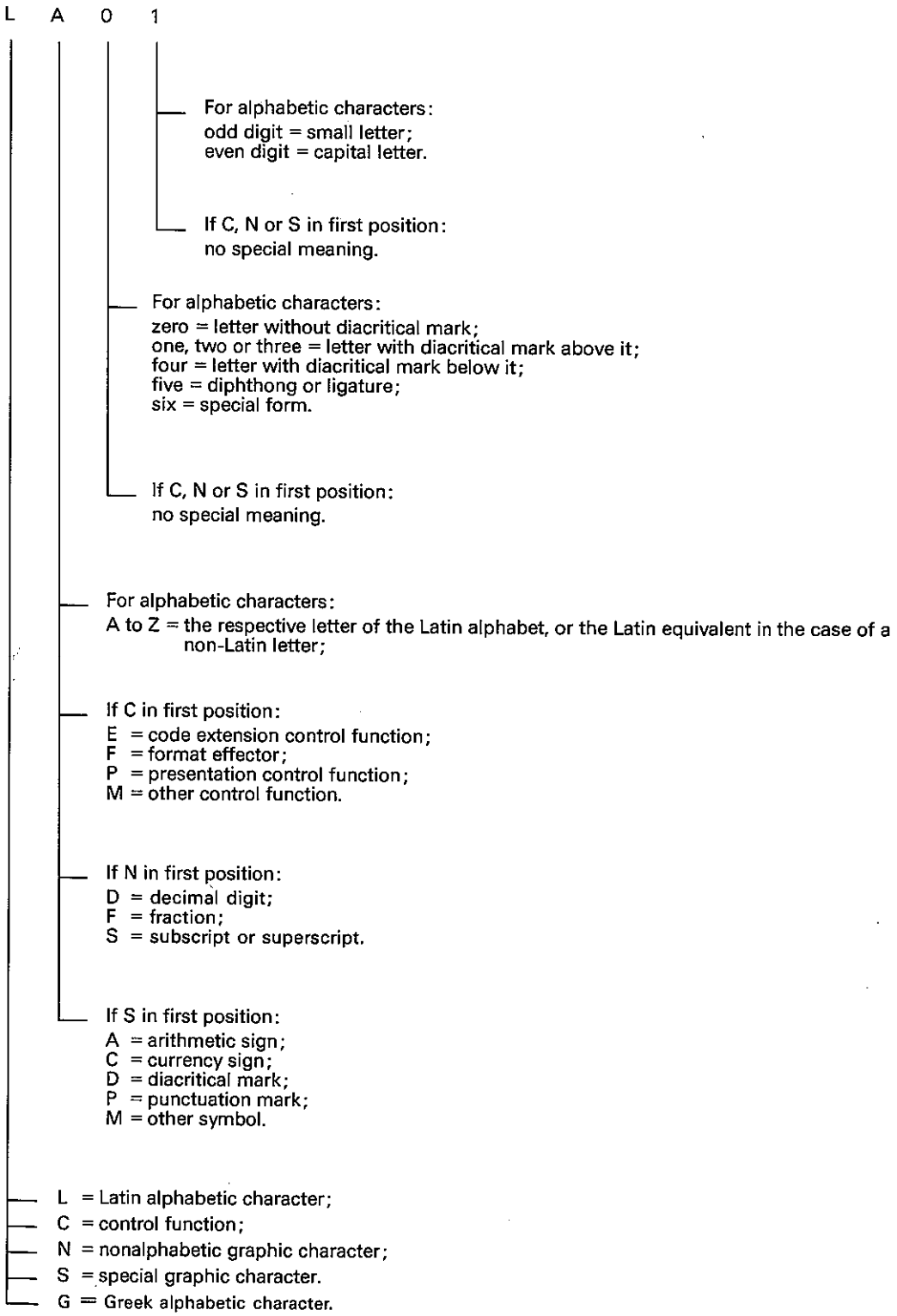


FIGURE A.1/T.51

Identification system

A.3 *Combination of diacritical marks and basic letters*

Figure A-2/T.51 specifies the combinations of diacritical marks and basic letters that are defined in this Annex A/T.51.

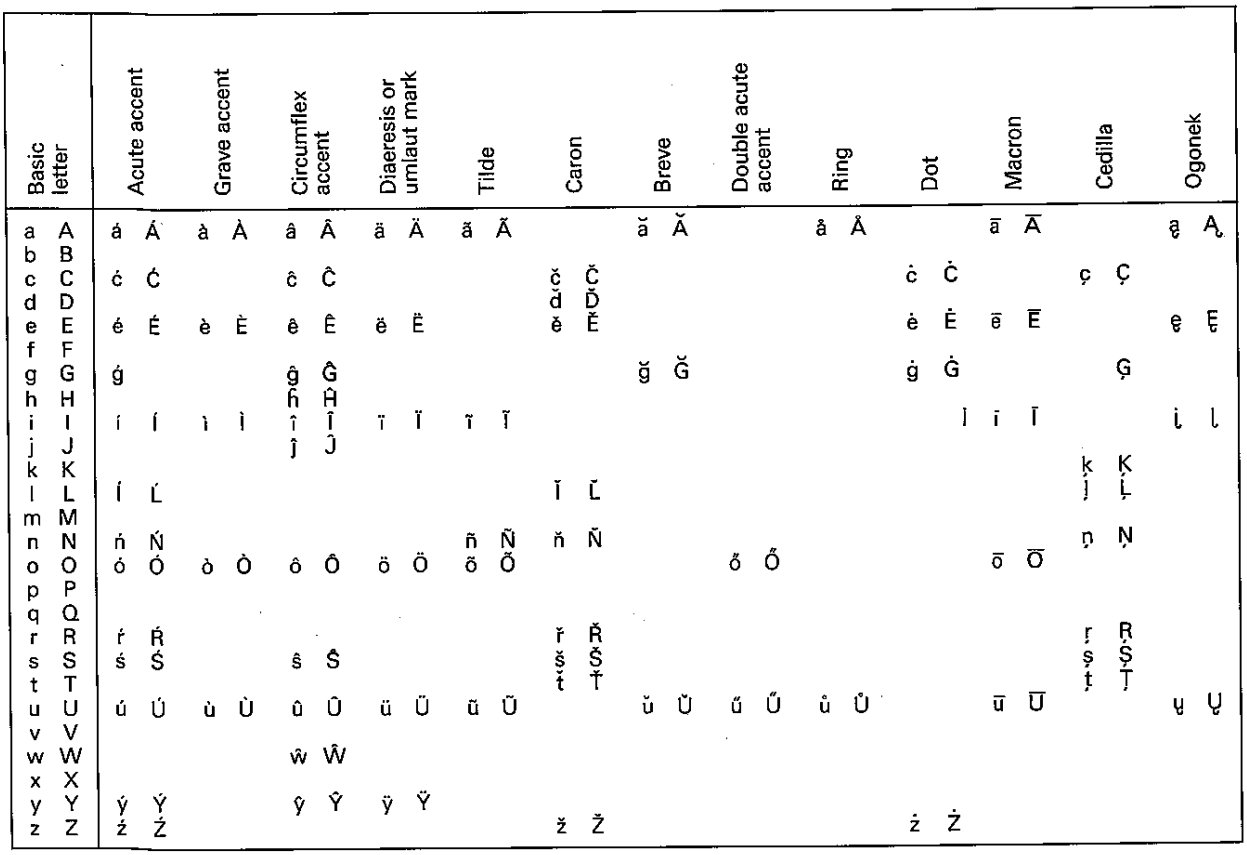


FIGURE A.2/T.51

Use of diacritical marks

A.4 *Tables of superset of repertoire*

A.4.1 *Latin alphabetic characters*

Identifier	Graphic	Name or description	T.61	DS I	DS II	DS III
LA01	a	small a	x	x	x	x
LA02	A	capital A	x	x	x	x
LA11	á	small a with acute accent	x	–	x	x
LA12	Á	capital A with acute accent	x	–	x	x
LA13	à	small a with grave accent	x	–	x	x
LA14	À	capital A with grave accent	x	–	x	x
LA15	â	small a with circumflex accent	x	–	x	x
LA16	Â	capital A with circumflex accent	x	–	x	x
LA17	ä	small a with diaeresis or umlaut mark	x	–	x	x
LA18	Ä	capital A with diaeresis or umlaut mark	x	–	x	x
LA19	ã	small a with tilde	x	–	x	x
LA20	Ã	capital A with tilde	x	–	x	x
LA23	ă	small a with breve	x	–	x	x
LA24	Ă	capital A with breve	x	–	x	x
LA27	å	small a with ring	x	–	x	x
LA28	Å	capital A with ring	x	–	x	x
LA31	ā	small a with macron	x	–	x	x
LA32	Ā	capital A with macron	x	–	x	x
LA43	ą	small a with ogonek	x	–	x	x
LA44	Ą	capital A with ogonek	x	–	x	x
LA51	æ	small diphtong	x	–	x	x
LA52	Æ	capital diphtong	x	–	x	x
LB01	b	small b	x	x	x	x
LB02	B	capital B	x	x	x	x
LC01	c	small c	x	x	x	x
LC02	C	capital C	x	x	x	x
LC11	ć	small c with acute accent	x	–	x	x
LC12	Ć	capital C with acute accent	x	–	x	x
LC15	ĉ	small c with circumflex accent	x	–	x	x
LC16	Ĉ	capital C with circumflex accent	x	–	x	x
LC21	č	small c with caron	x	–	x	x
LC22	Č	capital c with caron	x	–	x	x
LC29	ċ	small c with dot	x	–	x	x
LC30	Ċ	capital C with dot	x	–	x	x
LC41	ç	small c with cedilla	x	–	x	x
LC42	Ç	capital C with cedilla	x	–	x	x
LD01	d	small d	x	x	x	x
LD02	D	capital D	x	x	x	x
LD21	ď or d'	small d with caron	x	–	x	x
LD22	Ď	capital D with caron	x	–	x	x
LD61	đ	small d with stroke	x	–	x	x
LD62	Đ	capital D with stroke, Icelandic eth	x	–	x	x
LD63	ð	small eth, Icelandic	x	–	x	x
LE01	e	small e	x	x	x	x
LE02	E	capital E	x	x	x	x
LE11	é	small e with acute accent	x	–	x	x
LE12	É	capital E with acute accent	x	–	x	x
LE13	è	small e with grave accent	x	–	x	x
LE14	È	capital E with grave accent	x	–	x	x
LE15	ê	small e with circumflex accent	x	–	x	x
LE16	Ê	capital E with circumflex accent	x	–	x	x
LE17	ë	small e with diaeresis or umlaut mark	x	–	x	x
LE18	Ë	capital E with diaereis or umlaut mark	x	–	x	x
LE21	ě	small e with caron	x	–	x	x
LE22	Ě	capital E with caron	x	–	x	x
LE29	ė	small e with dot	x	–	x	x
LE30	Ė	capital E with dot	x	–	x	x
LE31	ē	small e with macron	x	–	x	x
LE32	Ē	capital E with macron	x	–	x	x
LE43	ę	small e with ogonek	x	–	x	x
LE44	Ę	capital E with ogonek	x	–	x	x
LF01	f	small f	x	x	x	x
LF02	F	capital F	x	x	x	x
LG01	g	small g	x	x	x	x
LG02	G	capital G	x	x	x	x

Note – "x" means used, "–" means not used.

Identifier	Graphic	Name or description	T.61	DS I	DS II	DS III
LG11	ǵ	small g with acute accent	x	–	x	x
LG15	ĝ	small g with circumflex accent	x	–	x	x
LG16	Ĝ	capital G with circumflex accent	x	–	x	x
LG23	ğ	small g with breve	x	–	x	x
LG24	Ğ	capital G with breve	x	–	x	x
LG29	ġ	small g with dot	x	–	x	x
LG30	Ġ	capital G with dot	x	–	x	x
LG42	Ģ	capital G with cedilla	x	–	x	x
LH01	h	small h	x	x	x	x
LH02	H	capital H	x	x	x	x
LH15	ĥ	small h with circumflex accent	x	–	x	x
LH16	Ĥ	capital H with circumflex accent	x	–	x	x
LH61	ħ	small h with stroke	x	–	x	x
LH62	Ħ	capital H with stroke	x	–	x	x
LI01	i	small i	x	x	x	x
LI02	I	capital I	x	x	x	x
LI11	í	small i with acute accent	x	–	x	x
LI12	Í	capital I with acute accent	x	–	x	x
LI13	ì	small i with grave accent	x	–	x	x
LI14	Ì	capital I with grave accent	x	–	x	x
LI15	î	small i with circumflex accent	x	–	x	x
LI16	Î	capital I with circumflex accent	x	–	x	x
LI17	ï	small i with diaeresis or umlaut mark	x	–	x	x
LI18	Ï	capital I with diaeresis or umlaut mark	x	–	x	x
LI19	ĩ	small i with tilde	x	–	x	x
LI20	Ĩ	capital I with tilde	x	–	x	x
LI30	İ	capital I with dot	x	–	x	x
LI31	ī	small i with macron	x	–	x	x
LI32	Ī	capital I with macron	x	–	x	x
LI43	į	small i with ogonek	x	–	x	x
LI44	Į	capital I with ogonek	x	–	x	x
LI51	ij	small ij ligature	x	–	x	x
LI52	IJ	capital IJ ligature	x	–	x	x
LI61	ı	small i without dot	x	–	x	x
LJ01	j	small j	x	x	x	x
LJ02	J	capital J	x	x	x	x
LJ15	ĵ	small j with circumflex accent	x	–	x	x
LJ16	Ĵ	capital J with circumflex accent	x	–	x	x
LK01	k	small k	x	x	x	x
LK02	K	capital K	x	x	x	x
LK41	ķ	small k with cedilla	x	–	x	x
LK42	Ķ	capital K with cedilla	x	–	x	x
LK61	ĸ	small k, Greenlandic	x	–	x	x
LL01	l	small l	x	x	x	x
LL02	L	capital L	x	x	x	x
LL11	ĺ	small l with acute accent	x	–	x	x
LL12	Ĺ	capital L with acute accent	x	–	x	x
LL21	ľ or l'	small l with caron or apostrophe	x	–	x	x
LL22	Ľ or L'	capital L with caron or apostrophe	x	–	x	x
LL41	ļ	small l with cedilla	x	–	x	x
LL42	Ļ	capital L with cedilla	x	–	x	x
LL61	ł	small l with stroke	x	–	x	x
LL62	Ł	capital L with stroke	x	–	x	x
LL63	l·	small l with middle dot	x	–	x	x
LL64	L·	capital L with middle dot	x	–	x	x
LM01	m	small m	x	x	x	x
LM02	M	capital M	x	x	x	x
LN01	n	small n	x	x	x	x
LN02	N	capital N	x	x	x	x
LN11	ń	small n with acute accent	x	–	x	x
LN12	Ń	capital N with acute accent	x	–	x	x
LN19	ñ	small n with tilde	x	–	x	x
LN20	Ñ	capital N with tilde	x	–	x	x

Identifier	Graphic	Name or description	T.61	DS I	DS II	DS III
LN21	ň	small n with caron	x	—	x	x
LN22	Ň	capital N with caron	x	—	x	x
LN41	ņ	small n with cedilla	x	—	x	x
LN42	Ņ	capital N with cedilla	x	—	x	x
LN61	ŋ	small eng, Lapp	x	—	x	x
LN62	Ŋ	capital eng, Lapp	x	—	x	x
LN63	'n	small n with apostrophe	x	—	x	x
LO01	o	small o	x	x	x	x
LO02	O	capital O	x	x	x	x
LO11	ó	small o with acute accent	x	—	x	x
LO12	Ó	capital O with acute accent	x	—	x	x
LO13	ò	small o with grave accent	x	—	x	x
LO14	Ò	capital O with grave accent	x	—	x	x
LO15	ô	small o with circumflex accent	x	—	x	x
LO16	Ô	capital O with circumflex accent	x	—	x	x
LO17	ö	small o with diaeresis or umlaut mark	x	—	x	x
LO18	Ö	capital O with diaeresis or umlaut mark	x	—	x	x
LO19	õ	small o with tilde	x	—	x	x
LO20	Õ	capital O with tilde	x	—	x	x
LO25	o	small o with double acute accent	x	—	x	x
LO26	O	capital O with double acute accent	x	—	x	x
LO31	ō	small o with macron	x	—	x	x
LO32	Ō	capital O with macron	x	—	x	x
LO51	œ	small œ ligature	x	—	x	x
LO52	Œ	capital Œ ligature	x	—	x	x
LO61	ø	small o with slash	x	—	x	x
LO62	Ø	capital O with slash	x	—	x	x
LP01	p	small p	x	x	x	x
LP02	P	capital P	x	x	x	x
LQ01	q	small q	x	x	x	x
LQ02	Q	capital Q	x	x	x	x
LR01	r	small r	x	x	x	x
LR02	R	capital R	x	x	x	x
LR11	ŕ	small r with acute accent	x	—	x	x
LR12	Ŕ	capital R with acute accent	x	—	x	x
LR21	ř	small r with caron	x	—	x	x
LR22	Ř	capital R with caron	x	—	x	x
LR41	ŗ	small r with cedilla	x	—	x	x
LR42	Ŗ	capital R with cedilla	x	—	x	x
LS01	s	small s	x	x	x	x
LS02	S	capital S	x	x	x	x
LS11	ś	small s with acute accent	x	—	x	x
LS12	Ś	capital S with acute accent	x	—	x	x
LS15	ŝ	small s with circumflex accent	x	—	x	x
LS16	Ŝ	capital S with circumflex accent	x	—	x	x
LS21	š	small s with caron	x	—	x	x
LS22	Š	capital S with caron	x	—	x	x
LS41	ş	small s with cedilla	x	—	x	x
LS42	Ş	capital S with cedilla	x	—	x	x
LS61		small sharp s, German	x	—	x	x
LT01	t	small t	x	x	x	x
LT02	T	capital T	x	x	x	x
LT21	ť or t'	small t with caron or apostrophe	x	—	x	x
LT22	Ť	capital T with caron	x	—	x	x
LT41	ţ	small t with cedilla	x	—	x	x
LT42	Ţ	capital T with cedilla	x	—	x	x
LT61	ŧ	small t with stroke	x	—	x	x
LT62	Ŧ	capital T with stroke	x	—	x	x
LT63	þ	small thorn, Icelandic	x	—	x	x
LT64	Þ	capital thorn, Icelandic	x	—	x	x
LU01	u	small u	x	x	x	x
LU02	U	capital U	x	x	x	x

Identifier	Graphic	Name or description	T.61	DS I	DS II	DS III
LU11	ú	small u with acute accent	x	–	x	x
LU12	Ú	capital U with acute accent	x	–	x	x
LU13	ù	small u with grave accent	x	–	x	x
LU14	Ù	capital U with grave accent	x	–	x	x
LU15	û	small u with circumflex accent	x	–	x	x
LU16	Û	capital U with circumflex accent	x	–	x	x
LU17	ü	small u with diaeresis or umlaut mark	x	–	x	x
LU18	Ü	capital U with diaeresis or umlaut mark	x	–	x	x
LU19	ũ	small u with tilde	x	–	x	x
LU20	Ũ	capital U with tilde	x	–	x	x
LU23	ŭ	small u with breve	x	–	x	x
LU24	Ŭ	capital U with breve	x	–	x	x
LU25	ű	small u with double acute accent	x	–	x	x
LU26	Ű	capital U with double acute accent	x	–	x	x
LU27	ů	small u with ring	x	–	x	x
LU28	Ů	capital U with ring	x	–	x	x
LU31	ū	small u with macron	x	–	x	x
LU32	Ū	capital U with macron	x	–	x	x
LU43	ų	small u with ogonek	x	–	x	x
LU44	Ų	capital U with ogonek	x	–	x	x
LV01	v	small v	x	x	x	x
LV02	V	capital V	x	x	x	x
LW01	w	small w	x	x	x	x
LW02	W	capital W	x	x	x	x
LW15	ŵ	small w with circumflex accent	x	–	x	x
LW16	Ŵ	capital W with circumflex accent	x	–	x	x
LX01	x	small x	x	x	x	x
LX02	X	capital X	x	x	x	x
LY01	y	small y	x	x	x	x
LY02	Y	capital Y	x	x	x	x
LY11	ý	small y with acute accent	x	–	x	x
LY12	Ý	capital Y with acute accent	x	–	x	x
LY15	ŷ	small y with circumflex accent	x	–	x	x
LY16	Ŷ	capital Y with circumflex accent	x	–	x	x
LY17	ÿ	small y with diaeresis or umlaut mark	x	–	x	x
LY18	Ÿ	capital Y with diaeresis or umlaut mark	x	–	x	x
LZ01	z	small z	x	x	x	x
LZ02	Z	capital Z	x	x	x	x
LZ11	ź	small z with acute accent	x	x	x	x
LZ12	Ź	capital Z with acute accent	x	x	x	x
LZ21	ž	small z with caron	x	–	x	x
LZ22	Ž	capital Z with caron	x	–	x	x
LZ29	ż	small z with dot	x	–	x	x
LZ30	Ż	capital Z with dot	x	–	x	x

A.4.2 *Non-alphabetic characters*

A.4.2.1 *Decimal digits*

Identifier	Graphic	Name or description	T.61	DS I	DS II	DS III
ND01	1	digit 1	x	x	x	x
ND02	2	digit 2	x	x	x	x
ND03	3	digit 3	x	x	x	x
ND04	4	digit 4	x	x	x	x
ND05	5	digit 5	x	x	x	x
ND06	6	digit 6	x	x	x	x
ND07	7	digit 7	x	x	x	x
ND08	8	digit 8	x	x	x	x
ND09	9	digit 9	x	x	x	x
ND10	0	digit 0	x	x	x	x

A.4.2.2 *Currency signs*

Identifier	Graphic	Name or description	T.61	DS I	DS II	DS III
SC01	¤	general currency sign	x	–	x	x
SC02	£	pound sign	x	x	x	x
SC03	$	dollar sign	x	x	x	x
SC04	¢	cent sign	x	x	x	x
SC05	¥	yen sign	x	x	x	x

A.4.2.3 *Punctuation marks*

Identifier	Graphic	Name or description	T.61	DS I	DS II	DS III
SP01		space (see also § 3.3.2)	x	x	x	x
SP02	!	exclamation mark	x	x	x	x
SP03	¡	inverted exclamation mark	x	–	x	x
SP04	"	quotation mark	x	x	x	x
SP05	'	apostrophe	x	x	x	x
SP06	(	left parenthesis	x	x	x	x
SP07	)	right parenthesis	x	x	x	x
SP08	,	comma	x	x	x	x
SP09	_	low line	x	x	x	x
SP10	-	hyphen or minus sign	x	x	x	x
SP11	.	full stop, period	x	x	x	x
SP12	/	solidus	x	x	x	x
SP13	:	colon	x	x	x	x
SP14	;	semicolon	x	x	x	x
SP15	?	question mark	x	x	x	x
SP16	¿	inverted question mark	x	–	x	x
SP17	«	angle quotation mark left	x	–	x	x
SP18	»	angle quotation mark right	x	–	x	x
SP19	‘	single quotation mark left	–	–	x	x
SP20	’	single quotation mark right	–	–	x	x
SP21	“	double quotation mark left	–	–	x	x
SP22	”	double quotation mark right	–	–	x	x

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

A.4.2.4 *Arithmetic signs*

Identifier	Graphic	Name or description	T.61	DS I	DS II	DS III
SA01	+	plus sign	x	x	x	x
SA02	±	plus/minus sign	x	x	x	x
SA03	<	less-than sign	x	x	x	x
SA04	=	equals sign	x	x	x	x
SA05	>	greater-than sign	x	x	x	x
SA06	÷	divide sign	x	x	x	x
SA07	×	multiply sign	x	x	x	x

Note – For *minus sign* see SP10.

A.4.2.5 *Subscripts and superscripts*

Identifier	Graphic	Name or description	T.61	DS I	DS II	DS III
NS02	^{2}	superscript 2	x	–	x	x
NS03	^{3}	superscript 3	x	–	x	x

A.4.2.6 *Fractions*

Identifier	Graphic	Name or description	T.61	DS I	DS II	DS III
NF01	½	fraction one-half	x	–	x	x
NF04	¼	fraction one-quarter	x	–	x	x
NF05	¾	fraction three-quarters	x	–	x	x
NF06	$^{1}/_{8}$	fraction one-eight	–	–	x	x
NF07	$^{3}/_{8}$	fraction three-eights	–	–	x	x
NF08	$^{5}/_{8}$	fraction five-eights	–	–	x	x
NF09	$^{7}/_{8}$	fraction seven-eights	–	–	x	x

A.4.3 *Miscellaneous symbols*

Identifier	Graphic	Name or description	T.61	DS I	DS II	DS III
SM01	#	number sign	x	x	x	x
SM02	%	percent sign	x	x	x	x
SM03	&	ampersand	x	x	x	x
SM04	*	asterisk	x	x	x	x
SM05	@	commercial at	x	x	x	x
SM06	[	left square bracket	x	x	x	x
SM07	\	reverse solidus	–	x	x	x
SM08	]	right square bracket	x	x	x	x
SM11	{	left curly bracket	–	x	x	x
SM12	–	central horizontal bar jointive	–	x	x	x
SM13	|	vertical line	x	x	x	x
SM14	}	right curly bracket	–	x	x	x
SM17	µ	micro sign	x	–	x	x
SM18	Ω	ohm sign	x	–	x	x
SM19	°	degree sign	x	–	x	x
SM20	º	ordinal indicator, masculine	x	–	x	x
SM21	ª	ordinal indicator, feminine	x	–	x	x
SM24	§	section sign	x	x	x	x
SM25	¶	paragraph sign, pilcrow	x	–	x	x
SM26	·	middle dot	x	–	x	x
SM30	←	leftward arrow	–	x	x	x
SM31	→	rightward arrow	–	x	x	x
SM32	↑	upward arrow	–	x	x	x
SM33	↓	downward arrow	–	x	x	x
SM34	■	delete	–	x	x	–
SM53	®	registered sign	–	–	x	x
SM57	©	copyright sign	–	–	x	x
SM54	TM	trade mark	–	–	x	x
SM93	♪	musical note	–	x	x	x
SM45	|,	left vertical bar jointive	–	–	x	–
SM46	|	right vertical bar jointive	–	–	x	–
SM65	¦	broken bar	–	–	–	–
SM66	¬	not sign	–	–	–	–
SP31	NBSP	no-break space	–	–	–	–
SP32	SHY	soft hyphen	–	–	–	–
SM94	▨	diagonal	–	x	–	x
SM95	▧	reverse diagonal	–	x	–	x
SM96		filled diagonal	–	–	–	x
SM97		filled reverse diagonal	–	–	–	x
SM98		cross	–	x	–	x
SM99		full vertical line	–	x	–	x
SM100		horizontal bar	–	–	–	x

A.4.4 *Diacritical marks as separate graphic characters*

Identifier	Graphic	Name or description	T.61	DS I	DS II	DS III
SD11	◌́	acute accent with space	x	x	x	x
SD13	◌̀	grave accent with space	x	x	x	x
SD15	◌̂	circumflex accent with space	x	x	x	x
SD17	◌̈	diaeresis or umlaut mark with space	x	x	x	x
SD19	◌̃	tilde with space	x	x	x	x
SD21	◌̌	caron with space	x	–	x	x
SD23	◌̆	breve with space	x	–	x	x
SD25	◌̋	double acute accent with space	x	–	x	x
SD27	◌̊	ring with space	x	–	x	x
SD29	◌̇	dot with space	x	–	x	x
SD31	◌̄	macron with space	x	–	x	x
SD41	◌̧	cedilla with space	x	–	x	x
SD43	◌̨	ogonek with space	x	–	x	x

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

A.4.5 *Non-spacing characters*

Identifier	Graphic	Name or description	T.61	DS I	DS II	DS III
SM27	◌̲	non spacing underline	x	–	–	x
SM101	◌⃒	non spacing vector overbar	–	–	–	x
SM102	◌̸	non spacing slant	–	–	–	x

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*.

ANNEX B

(to Recommendation T.51)

Table of character and control sets

Reg. No.	Name of registered set	(Note 1)	Final character	C0	C1	G0	G1	G2	G3
2	Rec. T.50. International reference version, IRV. This is also the primary set of T.51, as modified by Notes 3 and 4 of T.51	94	4/0			x	x	x	x
70	Rec. T.51. First supplementary graphic set	94	6/2			x	x	x	x
132	Rec. T.101. Data Syntax I Primary control set	C0	4/9	x					
125	Rec. T.101. Data Syntax I Supplementary control set	C1	4/4		x				
42	Rec. T.101. Data Syntax I Kanji set (2 byte set) JISC 6226 (1978)	94 × 94	4/0			x	x	x	x
137	Rec. T.101. Data Syntax I Mosaic 1 set	94	7/9			x	x	x	x
14	Rec. T.101. Data Syntax I Primary character set (JISC 6220 (1969))	94	4/10			x	x	x	x
131	Rec. T.101. Data Syntax I Complete code	–	4/3						
134	Rec. T.101. Data Syntax II Primary control set	C0	4/10	x					
56	Rec. T.101. Data Syntax II Serial supplementary control set	C1	4/0		x				
73	Rec. T.101. Data Syntax II Parallel supplementary control set	C1	4/1		x				
70	Rec. T.101. Data Syntax II Supplementary character set	94	6/2			x	x	x	x
71	Rec. T.101. Data Syntax II 2nd supplementary mosaic set	94	6/3			x	x	x	x
72	Rec. T.101. Data Syntax II 3rd supplementary mosaic set	94	6/4			x	x	x	x

Reg. No.	Name of registered set	(Note 1)	Final character	C0	C1	G0	G1	G2	G3
145	Rec. T.101. Data Syntax II Complete code	–	4/4						
Note 2	Rec. T.101. Data Syntax II Greek primary set	94	Note 2			x	x	x	x
108	Rec. T.101. Data Syntax III Complete code	–	4/1						
135	Rec. T.101. Data Syntax III Primary control set	C0	4/11	x					
136	Rec. T.101. Data Syntax III Supplementary control set	C1	4/6		x				
6	Rec. T.101. Data Syntax III Primary character set	94	4/2			x	x	x	x
128	Rec. T.101. Data Syntax III Supplementary character set	94	7/12			x	x	x	x
Cannot be reg.	Rec. T.101. Data Syntax III PDI set	96	(5/7) never to be assigned				x	x	x
129	Rec. T.101. Data Syntax III Mosaic set	96	7/13			x	x	x	x
102	Rec. T.61. Primary graphic character set (left half of Fig. 2/T.61)	94	7/5			x	x	x	x
103	Rec. T.61. Supplementary character set (right half of Fig. 2/T.61)	94	7/6			x	x	x	x
106	Rec. T.61. Primary control set	C0	4/5	x					
107	Rec. T.61. Supplementary control set	C1	4/8		x				
Note 2	Rec. T.51. Second supplementary graphic set	96	Note 2				x	x	x

Note 1 – The 94 or 96 character set applies only to single byte graphic character sets. The 94 × 94 set applies to two byte graphic character set. Primary control sets are C0. Supplementary control sets are C1. Complete code is also referred to as "Coding System different from that of ISO 2022".

Note 2 – Application for ISO Registration will take place after the Recommendation T.51 is approved.

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