ISO/IEC International Standard

International Standard 10646

ISO/IEC 10646 1st Edition + Amd1

Information technology — Universal Multiple-Octet Coded Character Set (UCS) —

Architecture and Basic Multilingual Plane

Supplementary Planes

WORKING DRAFT

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Foreword

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialized system for worldwide standardization. National bodies that are members of ISO or IEC participate in the development of International Standards through technical committees established by the respective organization to deal with particular fields of technical activity. ISO and IEC technical committees collaborate in fields of mutual interest. Other international organizations, governmental and non-governmental, in liaison with ISO and IEC, also take part in the work. In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC1.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of the joint technical committee is to prepare International Standards. Draft International Standards adopted by the joint technical committee are circulated to national bodies for voting. Publication as an International Standard requires approval by at least 75% of the national bodies casting a vote.

Attention is drawn to the possibility that some of the elements of ISO/IEC 10646 may be the subject of patent rights. ISO and IEC shall not be held responsible for identifying any or all such patent rights.

International Standard ISO/IEC 10646 was prepared by Joint Technical Committee ISO/IEC JTC1, *Information technology*, Subcommittee SC 2, *Coded Character sets*.

This second edition of ISO/IEC 10646 cancels and replaces ISO/IEC 10646:2003. It also incorporates ISO/IEC 10646:2003/Amd.1:2005.

Introduction

ISO/IEC 10646 specifies the Universal Multiple-Octet Coded Character Set (UCS). It is applicable to the representation, transmission, interchange, processing, storage, input and presentation of the written form of the languages of the world as well as additional symbols.

By defining a consistent way of encoding multilingual text it enables the exchange of data internationally. The information technology industry gains data stability, greater global interoperability and data interchange. ISO/IEC 10646 has been widely adopted in new Internet protocols and implemented in modern operating systems and computer languages. This edition covers over 95 000 characters from the world's scripts.

ISO/IEC 10646 contains material which may only be available to users who obtain their copy in a machine readable format. That material consists of the following printable files:

— CJKU_SR.txt

— CJKC_SR.txt

— IICORE.txt

— Allnames.txt

— HangulX.txt

— HangulSy.txt

Information technology — Universal Multiple-Octet Coded Character Set (UCS) —

1 Scope

ISO/IEC 10646 specifies the Universal Multiple-Octet Coded Character Set (UCS). It is applicable to the representation, transmission, interchange, processing, storage, input, and presentation of the written form of the languages of the world as well as of additional symbols.

This document:

- specifies the architecture of ISO/IEC 10646,

- defines terms used in ISO/IEC 10646,

- describes the general structure of the coded character set;

- specifies the Basic Multilingual Plane (BMP) of the UCS,

- specifies supplementary planes of the UCS: the Supplementary Multilingual Plane (SMP), the Supplementary Ideographic Plane (SIP) and the Supplementary Special-purpose Plane (SSP),

- defines a set of graphic characters used in scripts and the written form of languages on a world-wide scale;

- specifies the names for the graphic characters of the BMP, SMP, SIP, SSP and their coded representations;

- specifies the four-octet (32-bit) canonical form of the UCS: UCS-4;

- specifies a two-octet (16-bit) BMP form of the UCS: UCS-2;

- specifies the coded representations for control functions;

- specifies the management of future additions to this coded character set.

The UCS is a coding system different from that specified in ISO/IEC 2022. The method to designate UCS from ISO/IEC 2022 is specified in clause 16.2.

A graphic characters will be assigned only one code position in the standard, located either in the BMP or in one of the supplementary planes.

NOTE – The Unicode Standard, Version 4.1 includes a set of characters, names, and coded representations that are identical with those in this International Standard. It additionally provides details of character properties, processing algorithms, and definitions that are useful to implementers.

2 Conformance

2.1 General

Whenever private use characters are used as specified in ISO/IEC 10646, the characters themselves shall not be covered by these conformance requirements.

2.2 Conformance of information interchange

A coded-character-data-element (CC-data-element) within coded information for interchange is in conformance with ISO/IEC 10646 if

a) all the coded representations of graphic characters within that CC-data-element conform to clauses 6 and 7, to an identified form chosen from clause 13 or annex C or annex D, and to an identified implementation level chosen from clause 14;

b) all the graphic characters represented within that CC-data-element are taken from those within an identified subset (see clause 12);

c) all the coded representations of control functions within that CC-data-element conform to clause 15.

A claim of conformance shall identify the adopted form, the adopted implementation level and the adopted subset by means of a list of collections and/or characters.

2.3 Conformance of devices

A device is in conformance with ISO/IEC 10646 if it conforms to the requirements of item a) below, and either or both of items b) and c).

NOTE – The term device is defined (in 4.19) as a component of information processing equipment which can transmit and/or receive coded information within CC-data-elements. A device may be a conventional input/output device, or a process such as an application program or gateway function.

A claim of conformance shall identify the document that contains the description specified in a) below, and shall identify the adopted form(s), the adopted implementation level, the adopted subset (by means of a list of collections and/or characters), and the selection of control functions adopted in accordance with clause 15.

a) **Device description**: A device that conforms to ISO/IEC 10646 shall be the subject of a description that identifies the means by which the user may supply characters to the device and/or may recognize them when they are made available to

the user, as specified respectively, in sub-clauses b), and c) below.

b) **Originating device**: An originating device shall allow its user to supply any characters from an adopted subset, and be capable of transmitting their coded representations within a CC-data-element in accordance with the adopted form and implementation level.

c) **Receiving device**: A receiving device shall be capable of receiving and interpreting any coded representation of characters that are within a CC-data-element in accordance with the adopted form and implementation level, and shall make any corresponding characters from the adopted subset available to the user in such a way that the user can identify them.

Any corresponding characters that are not within the adopted subset shall be indicated to the user. The way used for indicating them need not distinguish them from each other.

> NOTE 1 – An indication to the user may consist of making available the same character to represent all characters not in the adopted subset, or providing a distinctive audible or visible signal when appropriate to the type of user.

> NOTE 2 – See also annex J for receiving devices with re-transmission capability.

3 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of ISO/IEC 10646. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on ISO/IEC 10646 are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of ISO and IEC maintain registers of currently valid International Standards.

ISO/IEC 2022:1994 *Information technology — Character code structure and extension techniques.*

ISO/IEC 6429:1992 *Information technology — Control functions for coded character sets.*

Unicode Standard Annex, UAX#9, The Unicode Bidirectional Algorithm, Version 4.1.0, 2005-03-25.

Unicode Standard Annex, UAX#15, Unicode Normalization Forms, Version 4.1.0, 2005-03-25.

4 Terms and definitions

For the purposes of ISO/IEC 10646, the following terms and definitions apply:

4.1 Base character
A graphic character that does not graphically combine with preceding characters.

> NOTE – Most graphic characters are base characters. This sense of graphic combination does not preclude the presentation of base characters from adopting different contextual forms or from participating in ligatures.

4.2 Basic Multilingual Plane (BMP)
Plane 00 of Group 00.

4.3 Block
A contiguous range of code positions to which a set of characters that share common characteristics, such as a script, are allocated. A block does not overlap another block. One or more of the code positions within a block may have no character allocated to them.

4.4 Canonical form
The form with which characters of this coded character set are specified using four octets to represent each character.

4.5 CC-data-element (coded-character-data-element)
An element of interchanged information that is specified to consist of a sequence of coded representations of characters, in accordance with one or more identified standards for coded character sets.

4.6 Cell
The place within a row at which an individual character may be allocated.

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

4.8 Character boundary
Within a stream of octets the demarcation between the last octet of the coded representation of a character and the first octet of that of the next coded character.

4.9 Coded character
A character together with its coded representation.

4.10 Coded character set
A set of unambiguous rules that establishes a character set and the relationship between the characters of the set and their coded representation.

4.11 Code table
A table showing the characters allocated to the octets in a code.

4.12 Collection
A set of coded characters which is numbered and named and which consists of those coded characters

whose code positions lie within one or more identified ranges.

> NOTE – If any of the identified ranges include code positions to which no character is allocated, the repertoire of the collection will change if an additional character is assigned to any of those positions at a future amendment of this International Standard. However it is intended that the collection number and name will remain unchanged in future editions of this International Standard.

4.13 Combining character
A member of an identified subset of the coded character set of ISO/IEC 10646 intended for combination with the preceding non-combining graphic character, or with a sequence of combining characters preceded by a non-combining character (see also 4.15).

> NOTE – ISO/IEC 10646 specifies several subset collections which include combining characters.

4.14 Compatibility character
A graphic character included as a coded character of ISO/IEC 10646 primarily for compatibility with existing coded character sets.

4.15 Composite sequence
A sequence of graphic characters consisting of a non-combining character followed by one or more combining characters, ZERO WIDTH JOINER, or ZERO WIDTH NON-JOINER (see also 4.13).

> NOTE 1 – A graphic symbol for a composite sequence generally consists of the combination of the graphic symbols of each character in the sequence.

> NOTE 2 – A composite sequence is not a character and therefore is not a member of the repertoire of ISO/IEC 10646.

4.16 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 octets.

4.17 Default state
The state that is assumed when no state has been explicitly specified.

4.18 Detailed code table
A code table showing the individual characters, and normally showing a partial row.

4.19 Device
A component of information processing equipment which can transmit and/or receive coded information within CC-data-elements. (It may be an input/output device in the conventional sense, or a process such as an application program or gateway function.)

4.20 Fixed collection
A collection in which every code position within the identified range(s) has a character allocated to it, and which is intended to remain unchanged in future editions of this International Standard.

4.21 Format character
A character whose primary function is to affect the layout or processing of characters around them. It generally does not have a visible representation of its own.

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

4.23 Graphic symbol
The visual representation of a graphic character or of a composite sequence.

4.24 Group
A subdivision of the coding space of this coded character set; of 256 x 256 x 256 cells.

4.25 High-half zone
A set of cells reserved for use in UTF-16 (see annex C); an RC-element corresponding to any of these cells may be used in UTF-16 as the first of a pair of RC-elements which represents a character from a plane other than the BMP.

4.26 Interchange
The transfer of character coded data from one user to another, using telecommunication means or interchangeable media.

4.27 Interworking
The process of permitting two or more systems, each employing different coded character sets, meaningfully to interchange character coded data; conversion between the two codes may be involved.

4.28 ISO/IEC 10646-1
A former subdivision of the standard. It is also referred to as Part 1 of ISO/IEC 10646 and contained the specification of the overall architecture and the Basic Multilingual Plane (BMP). There are a First and a Second Edition of ISO/IEC 10646-1.

4.29 ISO/IEC 10646-2
A former subdivision of the standard. It is also referred to as Part 2 of ISO/IEC 10646 and contained the specification of the Supplementary Multilingual Plane (SMP), the Supplementary Ideographic Plane (SIP) and the Supplementary Special-purpose Plane (SSP). There is only a First Edition of ISO/IEC 10646-2.

4.30 Low-half zone
A set of cells reserved for use in UTF-16 (see annex C); an RC-element corresponding to any of these cells may be used in UTF-16 as the second of a pair of RC-elements which represents a character from a plane other than the BMP.

4.31 Octet
An ordered sequence of eight bits considered as a unit.

4.32 Plane
A subdivision of a group; of 256 x 256 cells.

4.33 Presentation; to present
The process of writing, printing, or displaying a graphic symbol.

4.34 Presentation form
In the presentation of some scripts, a form of a graphic symbol representing a character that depends on the position of the character relative to other characters.

4.35 Private use plane
A plane within this coded character set; the contents of which is not specified in ISO/IEC 10646 (see clause 10).

4.36 RC-element
A two-octet sequence comprising the R-octet and the C-octet (see clause 6.2) from the four octet sequence (in the canonical form) that corresponds to a cell in the coding space of this coded character set.

4.37 Repertoire
A specified set of characters that are represented in a coded character set.

4.38 Row
A subdivision of a plane; of 256 cells.

4.39 Script
A set of graphic characters used for the written form of one or more languages.

4.40 Supplementary plane
A plane other than Plane 00 of Group 00; a plane that accommodates characters which have not been allocated to the Basic Multilingual Plane.

4.41 Supplementary Multilingual Plane for scripts and symbols (SMP)
Plane 01 of Group 00.

4.42 Supplementary Ideographic Plane (SIP)
Plane 02 of Group 00.

4.43 Supplementary Special-purpose Plane (SSP)
Plane 0E of Group 00.

4.44 Unpaired RC-element
An RC-element in a CC-data element that is either:

- an RC-element from the high-half zone that is not immediately followed by an RC-element from the low-half zone, or

- an RC-element from the low-half zone that is not immediately preceded by an RC-element from the high-half zone.

4.45 User
A person or other entity that invokes the service provided by a device. (This entity may be a process such

as an application program if the "device" is a code converter or a gateway function, for example.)

4.46 Zone
A sequence of cells of a code table, comprising one or more rows, either in whole or in part, containing characters of a particular class (for example see clause 8).

5 General structure of the UCS

The general structure of the Universal Multiple-Octet Coded Character Set (referred to hereafter as "this coded character set") is described in this explanatory clause, and is illustrated in figures 1 and 2. The normative specification of the structure is given in the following clauses.

The value of any octet is expressed in hexadecimal notation from 00 to FF in ISO/IEC 10646 (see annex K).

The canonical form of this coded character set – the way in which it is to be conceived – uses a four-dimensional coding space, regarded as a single entity, consisting of 128 three-dimensional groups.

> NOTE 1 – Thus, bit 8 of the most significant octet in the canonical form of a coded character can be used for internal processing purposes within a device as long as it is set to zero within a conforming CC-data-element.

Each group consists of 256 two-dimensional planes. Each plane consists of 256 one-dimensional rows, each row containing 256 cells. A character is located and coded at a cell within this coding space or the cell is declared unused.

In the canonical form, four octets are used to represent each character, and they specify the group, plane, row and cell, respectively. The canonical form consists of four octets since two octets are not sufficient to cover all the characters in the world, and a 32-bit representation follows modern processor architectures.

The four-octet canonical form can be used as a four-octet coded character set, in which case it is called UCS-4.

> NOTE 2 – The use of the term "canonical" for this form does not imply any restriction or preference for this form over transformation formats that a conforming implementation may choose for the representation of UCS characters.

ISO/IEC 10646 defines graphic characters and their coded representation for the following planes:

- The Basic Multilingual Plane (BMP, Plane 00 of Group 00). The Basic Multilingual Plane can be used as a two-octet coded character set identified as UCS-2.

- The Supplementary Multilingual Plane for scripts and symbols (SMP, Plane 01 of Group 00).

- The Supplementary Ideographic Plane (SIP, Plane 02 of Group 00).

- The Supplementary Special-purpose Plane (SSP, Plane 0E of Group 00).

Additional supplementary planes may be defined in the future to accommodate additional graphic characters.

The planes that are reserved for private use are specified in clause 10. The contents of the cells in private use planes and zones are not specified in ISO/IEC 10646.

Each character is located within the coded character set in terms of its Group-octet, Plane-octet, Row-octet, and Cell-octet.

Subsets of the coding space may be used in order to give a sub-repertoire of graphic characters.

A UCS Transformation Format (UTF-16) is specified in annex C which can be used to represent characters from 16 supplementary planes of Group 00 (Planes 01 to 10), in addition to the BMP (Plane 00), in a form that is compatible with the two-octet BMP form.

Another UCS Transformation Format (UTF-8) is specified in annex D which can be used to transmit text data through communication systems which are sensitive to octet values for control characters coded according to the 8-bit structure of ISO/IEC 2022, and to ISO/IEC 4873. UTF-8 also avoids the use of octet values according to ISO/IEC 4873 that have special significance during the parsing of file-name character strings in widely-used file-handling systems.

6 Basic structure and nomenclature

6.1 Structure

The Universal Multiple-Octet Coded Character Set as specified in ISO/IEC 10646 shall be regarded as a single entity.

This entire coded character set shall be conceived of as comprising 128 groups of 256 planes. Each plane shall be regarded as containing 256 rows of characters, each row containing 256 cells. In a code table representing the contents of a plane (such as in figure 2), the horizontal axis shall represent the least significant octet, with its smaller value to the left; and the vertical axis shall represent the more significant octet, with its smaller value at the top.
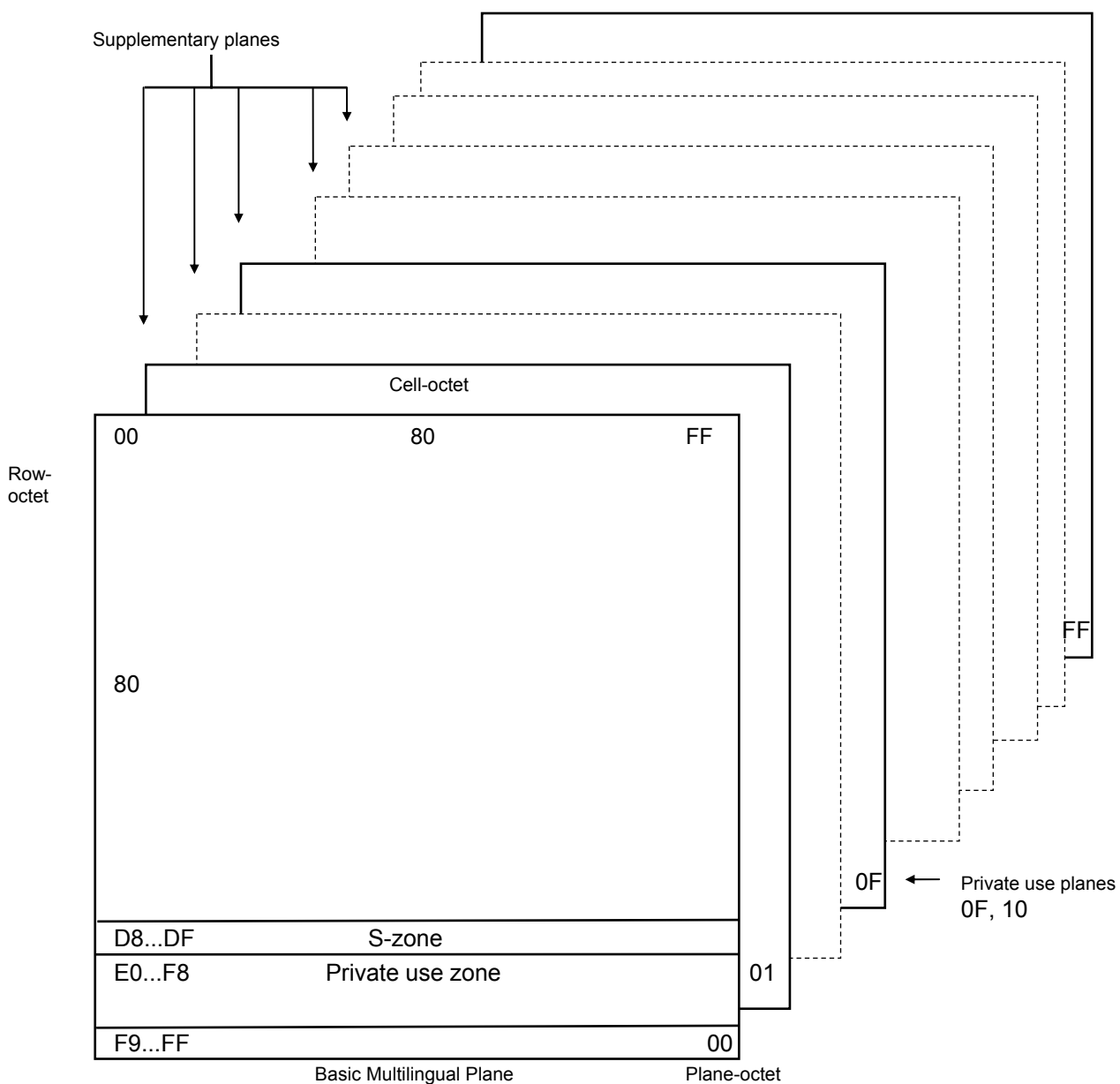
Each axis of the coding space shall be coded by one octet. Within each octet the most significant bit shall be bit 8 and the least significant bit shall be bit 1. Accordingly, the weight allocated to each bit shall be:

bit 8	bit 7	bit 6	bit 5	bit 4	bit 3	bit 2	bit 1
128	64	32	16	8	4	2	1
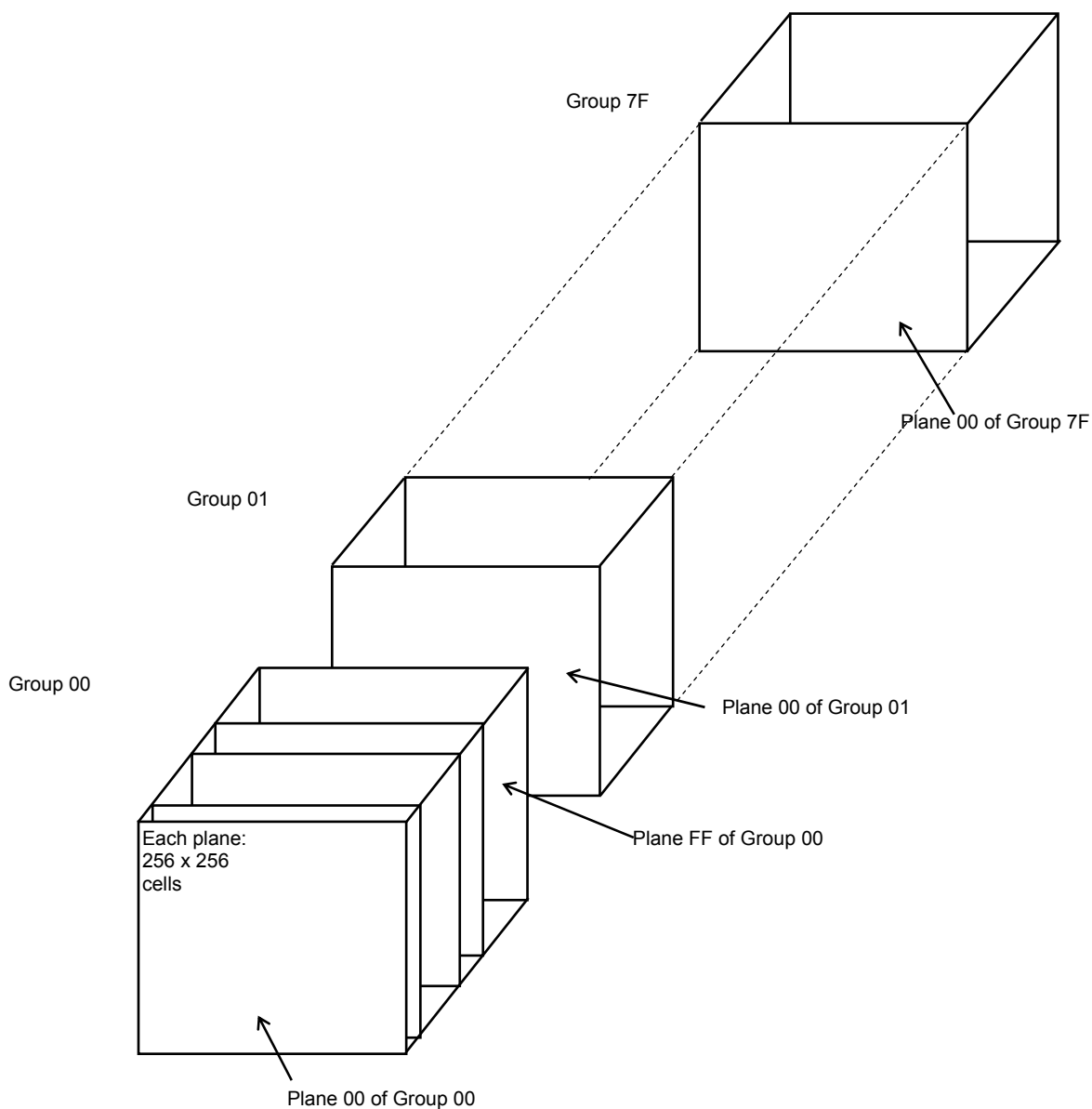
Group 7F

Plane 00 of Group 7F

Group 01

Group 00

Plane 00 of Group 01

Plane FF of Group 00

Each plane:
256 x 256
cells

Plane 00 of Group 00

NOTE – To ensure continued interoperability between the UTF-16 form and other coded representations of the UCS, it is intended that no characters will be allocated to code positions in Planes 11 to FF in Group 00 or any planes in any other groups.

Figure 1 - Entire coding space of the Universal Multiple-Octet Coded Character Set

Supplementary planes

Cell-octet

00   80   FF

Row-
octet

80

D8...DF   S-zone

E0...F8   Private use zone

F9...FF   00

Basic Multilingual Plane   Plane-octet

FF

0F ← Private use planes
0F, 10

01

NOTE 1 – Labels "S-zone" and "Private use zone" are specified in clause 8.

NOTE 2 – To ensure continued interoperability between the UTF-16 form and other coded representations of the UCS, it is intended that no characters will be allocated to code positions in Planes 11 to FF in Group 00.

Figure 2 - Group 00 of the Universal Multiple-Octet Coded Character Set

6.2   Coding of characters

In the canonical form of the coded character set, each character within the entire coded character set shall be represented by a sequence of four octets. The most significant octet of this sequence shall be the group-octet. The least significant octet of this sequence shall be the cell-octet. Thus this sequence may be represented as

m.s.   l.s.

Group-octet	Plane-octet	Row-octet	Cell-octet

where m.s. means the most significant octet, and l.s. means the least significant octet.

For brevity, the octets may be termed

m.s.   l.s.

G-octet	P-octet	R-octet	C-octet

Where appropriate, these may be further abbreviated to G, P, R, and C.

The value of any octet shall be represented by two hexadecimal digits, for example: 31 or FE. When a single character is to be identified in terms of the values of its group, plane, row, and cell, this shall be represented such as:

0000 0030   for DIGIT ZERO

0000 0041   for LATIN CAPITAL LETTER A

When referring to characters within an identified plane, the leading four digits (for G-octet and P-octet) may be omitted. For example, within the Plane 00 (BMP), 0030 may be used to refer to DIGIT ZERO.

When referring to characters within planes 00 to 0F, the leading three digits may be omitted. For example, the five-digit value 11100 corresponds to the canonical form 0001 1100 and the corresponding coded character is part of Plane 01.

6.3   Octet order

The sequence of the octets that represent a character, and the most significant and least significant ends of it, shall be maintained as shown above. When serialized as octets, a more significant octet shall precede less significant octets. When not serialized as octets, the order of octets may be specified by agreement between sender and recipient (see clause 16.1 and annex H).

6.4   Naming of characters

ISO/IEC 10646 assigns a unique name to each character. The name of a character either:

a.   denotes the customary meaning of the character, or

b.   describes the shape of the corresponding graphic symbol, or

c.   follows the rule given in clause 28.2 for Chinese /Japanese/Korean (CJK) unified ideographs, or

d.   follows the rule given in clause 28.3 for Hangul syllables.

Guidelines to be used for constructing the names of characters in cases a. and b. are given in annex L.

6.5   Short identifiers for code positions (UIDs)

ISO/IEC 10646 defines short identifiers for each code position, including code positions that are reserved. A short identifier for any code position is distinct from a short identifier for any other code position. If a character is allocated at a code position, a short identifier for that code position can be used to refer to the character allocated at that code position.

> NOTE 1 – For instance, U+DC00 identifies a code position that is permanently reserved for UTF-16, and U+FFFF identifies a code position that is permanently reserved. U+0025 identifies a code position to which a character is allocated; U+0025 also identifies that character (named PERCENT SIGN).

> NOTE 2 – These short identifiers are independent of the language in which this standard is written, and are thus retained in all translations of the text.

The following alternative forms of notation of a short identifier are defined here.

a.   The eight-digit form of short identifier shall consist of the sequence of eight hexadecimal digits that represents the code position of the character (see clause 6.2).

b.   The four-to-six-digit form of short identifier shall consist of the last four to six digits of the eight-digit form. It is not defined if the eight-digit form is greater than 0010FFFF. Leading zeroes beyond four digits are suppressed.

c.   The character "-" (HYPHEN-MINUS) may, as an option, precede the 8-digit form of short identifier.

d.   The character "+" (PLUS SIGN) may, as an option, precede the four-to-six-digit form of short identifier.

e.   The prefix letter "U" (LATIN CAPITAL LETTER U) may, as an option, precede any of the four forms of short identifier defined in a. to d. above.

f.   For the 8 digit forms, the characters SPACE or NO-BREAK SPACE may optionally be inserted before the four last digits.

The capital letters A to F, and U that appear within short identifiers may be replaced by the corresponding small letters.

The full syntax of the notation of a short identifier, in Backus-Naur form, is:

{ U | u } [{+}(xxxx | xxxxx | xxxxxx) | {-}xxxxxxxx]

where "x" represents one hexadecimal digit (0 to 9, A to F, or a to f). For example:

```
 -hhhhhhhh   +kkkk
 Uhhhhhhhh U+kkkk
```

where hhhhhhhh indicates the eight-digit form and kkkk indicates the four-to-six-digit form.

NOTE 3 – As an example the short identifier for LATIN SMALL LETTER LONG S (see tables for Row 01 in clause 33) may be notated in any of the following forms:

```
0000017F  -0000017F  U0000017F   U-0000017F
017F      +017F      U017F       U+017F
```

Any of the capital letters may be replaced by the corresponding small letter.

NOTE 4 – Two special prefixed forms of notation have also been used, in which the letter T (LATIN CAPITAL LETTER T or LATIN SMALL LETTER T) replaces the letter U in the corresponding prefixed forms. The forms of notation that included the prefix letter T indicated that the short identifier refers to a character in ISO/IEC 10646-1 First Edition (before the application of any Amendments), whereas the forms of notation that include the prefix letter U always indicate that the short identifier refers to a character in ISO/IEC 10646 at the most recent state of amendment. Corresponding short identifiers of the form T-xxxxxxxx and U-xxxxxxxx refer to the same character except when xxxxxxxx lies in the range 00003400 to 00004DFF inclusive. Forms of notation that include no prefix letter always indicate a reference to the most recent state of amendment of ISO/IEC 10646, unless otherwise qualified.

6.6   UCS Sequence Identifiers

ISO/IEC 10646 defines an identifier for any sequence of code positions taken from the standard. Such an identifier is known as a UCS Sequence Identifier (USI). For a sequence of n code positions it has the following form:

<UID1, UID2, ..., UIDn>

where UID1, UID2, etc. represent the short identifiers of the corresponding code positions, in the same order as those code positions appear in the sequence. If each of the code positions in such a sequence has a character allocated to it, the USI can be used to identify the sequence of characters allocated at those code positions. The syntax for UID1, UID2, etc. is specified in clause 6.5. A COMMA character (optionally followed by a SPACE character) separates the UIDs. The UCS Sequence Identifier shall include at least two UIDs; it shall begin with a LESS-THAN SIGN and be terminated by a GREATER-THAN SIGN.

NOTE – UCS Sequences Identifiers cannot be used for specification of subset and collection content. They may be used outside this standard to identify: composite sequences for mapping purposes, font repertoire, etc.

7   General requirements for the UCS

The following requirements apply to the entire coded character set.

a. The values of P-, and R-, and C-octets used for representing graphic characters shall be in the range 00 to FF. The values of G-octets used for representation of graphic characters shall be in the range 00 to 7F. On any plane, code positions FFFE and FFFF are permanently reserved.

NOTE 1 – These code positions can be used for internal processing uses requiring a numeric value that is guaranteed not to be a coded character.

NOTE 2 – A "permanently reserved" code position cannot be changed by future amendments.

b. Code positions to which a character is not allocated, except for the positions reserved for private use characters or for transformation formats, are reserved for future standardization and shall not be used for any other purpose. Future editions of ISO/IEC 10646 will not allocate any characters to code positions reserved for private use characters or for transformation formats.

c. The same graphic character shall not be allocated to more than one code position. There are graphic characters with similar shapes in the coded character set; they are used for different purposes and have different character names.

8   The Basic Multilingual Plane

The Plane 00 of Group 00 is the Basic Multilingual Plane (BMP). The BMP can be used as a two-octet coded character set in which case it shall be called UCS-2 (see clause 13.1).

NOTE 1 – Since UCS-2 only contains the repertoire of the BMP it is not fully interoperable with UCS-4, UTF-8 and UTF-16.

Code positions 0000 to 001F in the BMP are reserved for control characters, and code position 007F is reserved for the character DELETE (see clause 15). Code positions 0080 to 009F are reserved for control characters.

Code positions 2060 to 206F, FFF0 to FFFC, and E0000 to E0FFF are reserved for Format Characters (see annex F).

NOTE 2 – Unassigned code positions in those ranges may be ignored in normal processing and display.

Code positions D800 to DFFF are reserved for the use of UTF-16 (see annex C). These positions are known as the S-zone.

Code positions E000 to F8FF are reserved for private use (see clause 10). These positions are known as the private use zone.

In addition to code positions FFFE and FFFF (see sub-clause 7.a), code positions FDEF to FDD0 are also permanently reserved.

NOTE 3 – Code position FFFE is reserved for "signature" (see annex H). Code positions FDD0 to FDEF, and FFFF can be used for internal processing uses requiring numeric values which are guaranteed not to be coded characters, such as in terminating tables, or signaling end-of-text. Furthermore, since FFFF is the largest BMP value, it may also be used as the final value in binary or sequential searching index within the context of UCS-2 or UTF-16.

9   Supplementary planes

9.1   Planes accessible by UTF-16

Each code position in Planes 01 to 10 of Group 00 has a unique mapping to a four-octet sequence in accordance with the UTF-16 form of coded representation (see annex C). This form is compatible with the two-octet BMP form of UCS-2 (see clause 13.1).

The planes 01, 02 and 0E of Group 00 are the Supplementary Multilingual Plane (SMP), the Supplementary Ideographic Plane (SIP) and the Supplementary Special-purpose Plane (SSP) respectively. Like the BMP, these planes contain graphic characters allocated to code positions. The Planes from 03 to 0D of Group 00 are reserved for future standardization. See clause 10.2 for the definition of Plane 0F and 10 of Group 00.

NOTE – The following table shows the boundary code positions for planes 01, 02 and 0E expressed in UCS-4 abbreviated five-digit values and in UTF-16 pairs values.

Plane	UCS-4 values	UTF-16 pairs values
01	10000 - 1FFFF	D800 DC00 - D83F DFFF
02	20000 - 2FFFF	D840 DC00 - D87F DFFF
0E	E0000 - EFFFF	DB40 DC00 - DB7F DFFF

In the UCS Transformation Format UTF-8 (see annex D), the UCS-4 representation of characters shall be used as the source for the mapping. Using the high-half zone value and low-half zone values as source for the mapping is undefined.

NOTE – The following table shows the boundary code positions for planes 01, 02 and 0E expressed in UCS-4 five-digit abbreviated values and in UTF-8 sequence values.

Plane	UCS-4 values	UTF-8 sequence values
01	10000 - 1FFFF	F0908080 - F09FBFBF
02	20000 - 2FFFF	F0A08080 - F0AFBFBF
0E	E0000 - EFFFF	F3A08080 - F3AFBFBF

UCS-2 cannot be used to represent any characters on the Supplementary Planes.

9.2   Other Planes reserved for future standardization

Planes 11 to FF in Group 00 and all planes in any other groups (i.e. Planes 00 to FF in Groups 01 to 7F) are reserved for future standardization, and thus those code positions shall not be used for any other purpose.

Code positions in these planes do not have a mapping to the UTF-16 form (see annex C).

NOTE – To ensure continued interoperability between the UTF-16 form and other coded representations of the UCS, it is intended that no characters will be allocated to code positions in Planes 11 to FF in Group 00 or any planes in any other groups.

10   Private use planes and zones

10.1   Private use characters

Private use characters are not constrained in any way by ISO/IEC 10646. Private use characters can be used to provide user-defined characters. For example, this is a common requirement for users of ideographic scripts.

NOTE 1 – For meaningful interchange of private use characters, an agreement, independent of ISO/IEC 10646, is necessary between sender and recipient.

Private use characters can be used for dynamically-redefinable character applications.

NOTE 2 – For meaningful interchange of dynamically-redefinable characters, an agreement, independent of ISO/IEC 10646 is necessary between sender and recipient. ISO/IEC 10646 does not specify the techniques for defining or setting up dynamically-redefinable characters.

10.2   Code positions for private use characters

The code positions of Plane 0F and Plane 10 of Group 00 shall be for private use.

The 6400 code positions E000 to F8FF of the Basic Multilingual Plane shall be for private use.

The contents of these code positions are not specified in ISO/IEC 10646 (see clause 10.1).

11   Revision and updating of the UCS

The revision and updating of this coded character set will be carried out by ISO/IEC JTC1/SC2.

NOTE – It is intended that in future editions of ISO/IEC 10646, the names and allocation of the characters in this edition will remain unchanged.

12   Subsets

ISO/IEC 10646 provides the specification of subsets of coded graphic characters for use in interchange, by originating devices, and by receiving devices.

There are two alternatives for the specification of subsets: limited subset and selected subset. An adopted subset may comprise either of them, or a combination of the two.

12.1   Limited subset

A limited subset consists of a list of graphic characters in the specified subset. This specification allows applications and devices that were developed using other codes to inter-work with this coded character set.

A claim of conformance referring to a limited subset shall list the graphic characters in the subset by the names of graphic characters or code positions as defined in ISO/IEC 10646.

12.2 Selected subset

A selected subset consists of a list of collections of graphic characters as defined in ISO/IEC 10646. The collections from which the selection may be made are listed in annex A. A selected subset shall always automatically include the Cells 20 to 7E of Row 00 of Plane 00 of Group 00.

A claim of conformance referring to a selected subset shall list the collections chosen as defined in ISO/IEC 10646.

13 Coded representation forms of the UCS

ISO/IEC 10646 provides four alternative forms of coded representation of characters. Two of these forms are specified in this clause, and two others, UTF-16 and UTF-8, are specified in annexes C and D respectively.

> NOTE – The characters from the ISO/IEC 646 IRV repertoire are coded by simple zero extensions to their coded representations in ISO/IEC 646 IRV. Therefore, their coded representations have the same integer values when represented as 8-bit, 16-bit, or 32-bit integers. For implementations sensitive to a zero-valued octet (e.g. for use as a string terminator), use of 8-bit based array data type should be avoided as any zero-valued octet may be interpreted incorrectly. Use of data types at least 16-bits wide is more suitable for UCS-2, and use of data types at least 32-bits wide is more suitable for UCS-4.

13.1 Two-octet BMP form (UCS-2)

This coded representation form permits the use of characters from the Basic Multilingual Plane with each character represented by two octets.

Within a CC-data-element conforming to the two-octet BMP form, a character from the Basic Multilingual Plane shall be represented by two octets comprising the R-octet and the C-octet as specified in clause 6.2 (i.e. its RC-element).

> NOTE – A coded graphic character using the two-octet BMP form may be implemented by a 16-bit integer for processing.

13.2 Four-octet canonical form (UCS-4)

The canonical form permits the use of all the characters of ISO/IEC 10646, with each character represented by four octets.

Within a CC-data-element conforming to the four-octet canonical form, every character shall be represented by four octets comprising the G-octet, the P-octet, the R-octet, and the C-octet as specified in clause 6.2.

> NOTE 1 – A coded graphic character using the four-octet canonical form may be implemented by a 32-bit integer for processing.

> NOTE 2 – When confined to the code positions in Planes 00 to 10 (U+0000 to U+10FFFF), UCS-4 is also referred to as UCS Transformation Format 32 (UTF-32). The Unicode Standard, Version 4.0, defines the following forms of UTF-32:
>
> - UTF-32: the ordering of octets (specified in clause 6.3) is not defined and the signatures (specified in annex H) may appear;
>
> - UTF-32BE: in the ordering of octets the more significant octets precede the less significant octets, as specified in clause 6.2, and no signatures appear;
>
> - UTF-32LE: in the ordering of octets the less significant octets precede the more significant octets, and no signatures appear.

14 Implementation levels

ISO/IEC 10646 specifies three levels of implementation. Combining characters are described in clause 24 and listed in annex B.

14.1 Implementation level 1

When implementation level 1 is used, a CC-data-element shall not contain coded representations of combining characters (see clause B.1) nor of characters from the HANGUL JAMO block (see clause 26.1). When implementation level 1 is used the unique-spelling rule shall apply (see clause 26.2).

14.2 Implementation level 2

When implementation level 2 is used, a CC-data-element shall not contain coded representations of characters listed in clause B.2. When implementation level 2 is used the unique-spelling rule shall apply (see clause 26.2).

14.3 Implementation level 3

When implementation level 3 is used, a CC-data-element may contain coded representations of any characters.

15 Use of control functions with the UCS

This coded character set provides for use of control functions encoded according to ISO/IEC 6429 or similarly structured standards for control functions, and standards derived from these. A set or subset of such coded control functions may be used in conjunction with this coded character set. These standards encode a control function as a sequence of one or more octets.

When a control character of ISO/IEC 6429 is used with this coded character set, its coded representation as specified in ISO/IEC 6429 shall be padded to correspond with the number of octets in the adopted form (see clause 13 and annexes C and D). Thus, the least

significant octet shall be the bit combination specified in ISO/IEC 6429, and the more significant octet(s) shall be zeros.

For example, the control character FORM FEED is represented by "000C" in the two-octet form, and "0000 000C" in the four-octet form.

For escape sequences, control sequences, and control strings (see ISO/IEC 6429) consisting of a coded control character followed by additional bit combinations in the range 20 to 7F, each bit combination shall be padded by octet(s) with value 00.

For example, the escape sequence "ESC 02/00 04/00" is represented by "001B 0020 0040" in the two-octet form, and "0000 001B 0000 0020 0000 0040" in the four-octet form.

> NOTE – The term "character" appears in the definition of many of the control functions specified in ISO/IEC 6429, to identify the elements on which the control functions will act. When such control functions are applied to coded characters according to ISO/IEC 10646 the action of those control functions will depend on the type of element from ISO/IEC 10646 that has been chosen, by the application, to be the element (or character) on which the control functions act. These elements may be chosen to be characters (non-combining characters and/or combining characters) or may be chosen in other ways (such as composite sequences) when applicable.

Code extension control functions for the ISO/IEC 2022 code extension techniques (such as designation escape sequences, single shift, and locking shift) shall not be used with this coded character set.

16 Declaration of identification of features

16.1 Purpose and context of identification

CC-data-elements conforming to ISO/IEC 10646 are intended to form all or part of a composite unit of coded information that is interchanged between an originator and a recipient. The identification of ISO/IEC 10646 (including the form), the implementation level, and any subset of the coding space that have been adopted by the originator must also be available to the recipient. The route by which such identification is communicated to the recipient is outside the scope of ISO/IEC 10646.

However, some standards for interchange of coded information may permit, or require, that the coded representation of the identification applicable to the CC-data-element forms a part of the interchanged information. This clause specifies a coded representation for the identification of UCS with an implementation level and a subset of ISO/IEC 10646, and also of a C0 and a C1 set of control functions from ISO/IEC 6429 for use in conjunction with ISO/IEC 10646. Such coded representations provide all or part of an identification data element, which may be included in information interchange in accordance with the relevant standard.

If two or more of the identifications are present, the order of those identifications shall follow the order as specified in this clause.

> NOTE – An alternative method of identification is described in annex N.

16.2 Identification of UCS coded representation form with implementation level

When the escape sequences from ISO/IEC 2022 are used, the identification of a coded representation form of UCS (see clause 13) and an implementation level (see clause 14) specified by ISO/IEC 10646 shall be by a designation sequence chosen from the following list:

ESC 02/05 02/15 04/00
> UCS-2 with implementation level 1

ESC 02/05 02/15 04/01
> UCS-4 with implementation level 1

ESC 02/05 02/15 04/03
> UCS-2 with implementation level 2

ESC 02/05 02/15 04/04
> UCS-4 with implementation level 2

ESC 02/05 02/15 04/05
> UCS-2 with implementation level 3

ESC 02/05 02/15 04/06
> UCS-4 with implementation level 3

or from the lists in clause C.5 for UTF-16 forms and clause D.6 for UTF-8 forms.

If such an escape sequence appears within a CC-data-element conforming to ISO/IEC 2022, it shall consist only of the sequences of bit combinations as shown above.

If such an escape sequence appears within a CC-data-element conforming to ISO/IEC 10646, it shall be padded in accordance with clause 15.

16.3 Identification of subsets of graphic characters

When the control sequences of ISO/IEC 6429 are used, the identification of subsets (see clause 12) specified by ISO/IEC 10646 shall be by a control sequence IDENTIFY UNIVERSAL CHARACTER SUBSET (IUCS) as shown below.

 CSI Ps... 02/00 06/13

Ps... means that there can be any number of selective parameters. The parameters are to be taken from the subset collection numbers as shown in annex A of ISO/IEC 10646. When there is more than one parameter, each parameter value is separated by an octet with value 03/11.

Parameter values are represented by digits where octet values 03/00 to 03/09 represent digits 0 to 9.

If such an escape sequence appears within a CC-data-element conforming to ISO/IEC 2022, it shall consist only of the sequences of bit combinations as shown above.

If such a control sequence appears within a CC-data-element conforming to ISO/IEC 10646, it shall be padded in accordance with clause 15.

16.4 Identification of control function set

When the escape sequences from ISO/IEC 2022 are used, the identification of each set of control functions (see clause 15) of ISO/IEC 6429 to be used in conjunction with ISO/IEC 10646 shall be an identifier sequence of the type shown below.

ESC 02/01 04/00	identifies the full C0 set of ISO/IEC 6429
ESC 02/02 04/03	identifies the full C1 set of ISO/IEC 6429

For other C0 or C1 sets, the final octet F shall be obtained from the International Register of Coded Character Sets. The identifier sequences for these sets shall be:

ESC 02/01 F	identifies a C0 set
ESC 02/02 F	identifies a C1 set

If such an escape sequence appears within a CC-data-element conforming to ISO/IEC 2022, it shall consist only of the sequences of bit combinations as shown above.

If such an escape sequence appears within a CC-data-element conforming to ISO/IEC 10646, it shall be padded in accordance with clause 15.

16.5 Identification of the coding system of ISO/IEC 2022

When the escape sequences from ISO/IEC 2022 are used, the identification of a return, or transfer, from UCS to the coding system of ISO/IEC 2022 shall be by the escape sequence ESC 02/05 04/00. If such an escape sequence appears within a CC-data-element conforming to ISO/IEC 10646, it shall be padded in accordance with clause 15.

If such an escape sequence appears within a CC-data-element conforming to ISO/IEC 2022, it shall consist only of the sequence of bit combinations as shown above.

> NOTE – Escape sequence ESC 02/05 04/00 is normally used for return to the restored state of ISO/IEC 2022. The escape sequence ESC 02/05 04/00 specified here is sometimes not exactly as specified in ISO/IEC 2022 due to the presence of padding octets. For this reason the escape sequences in clause 16.2 for the identification of UCS include the octet 02/15 to indicate that the return does not always conform to that standard.

17 Structure of the code tables and lists

Clause 33 sets out the detailed code tables and the lists of character names for the graphic characters. It specifies graphic characters, their coded representation, and the character name for each character.

The graphic symbols are to be regarded as typical visual representations of the characters. ISO/IEC 10646 does not attempt to prescribe the exact shape of each character. The shape is affected by the design of the font employed, which is outside the scope of ISO/IEC 10646.

Graphic characters specified in ISO/IEC 10646 are uniquely identified by their names. This does not imply that the graphic symbols by which they are commonly imaged are always different. Examples of graphic characters with similar graphic symbols are LATIN CAPITAL LETTER A, GREEK CAPITAL LETTER ALPHA and CYRILLIC CAPITAL LETTER A.

The meaning attributed to any character is not specified by ISO/IEC 10646; it may differ from country to country, or from one application to another.

For the alphabetic scripts, the general principle has been to arrange the characters within any row in approximate alphabetic sequence; where the script has capital and small letters, these are arranged in pairs. However, this general principle has been overridden in some cases. For example, for those scripts for which a relevant standard exists, the characters are allocated according to that standard. This arrangement within the code tables will aid conversion between the existing standards and this coded character set. In general, however, it is anticipated that conversion between this coded character set and any other coded character set will use a table lookup technique.

It is not intended, nor will it often be the case, that the characters needed by any one user will be found all grouped together in one part of the code table.

Furthermore, the user of any script will find that needed characters may have been coded elsewhere in this coded character set. This especially applies to the digits, to the symbols, and to the use of Latin letters in dual-script applications.

Therefore, in using this coded character set, the reader is advised to refer first to the block names list in annex A.2 or an overview of the Planes in figures 3 to 7, and then to turn to the specific code table rows for the relevant script and for symbols and digits. In addition, annex G contains an alphabetically sorted list of character names.

18 Block names

Named blocks of contiguous code positions are specified within a plane for the purpose of allocation of

characters sharing some common characteristic, such as script. The blocks specified within the BMP, SMP, SIP and SSP are listed in clause A.2 of annex A, and are illustrated in figures 3 to 7.

19 Mirrored characters in bidirectional context

A class of characters has special significance in the context of bidirectional text. The interpretation and rendering of any of these characters depend on the state related to the symmetric swapping characters (see clause F.2.2) and on the direction of the character being rendered that are in effect at the point in the CC-data-element where the coded representation of the character appears. The list of these characters is provided in Annex E.

> NOTE – That list also represents all characters which have the 'Bidi Mirrored' property in the Unicode Standard Version 4.1.

For example, if the character ACTIVATE SYMMETRIC SWAPPING occurs and if the direction of the character is from right to left, the character shall be interpreted as if the term LEFT or RIGHT in its name had been replaced by the term RIGHT or LEFT, respectively.

This character mirroring is not limited to paired characters and shall be applied to all characters belonging to that class.

19.1 Directionality of bidirectional text

The Unicode Bidirectional Algorithm (see clause 3) describes the algorithm used to determine the directionality for bidirectional text.

20 Special characters

There are some characters that do not have printable graphic symbols or are otherwise special in some ways.

20.1 Space characters

The following characters are space characters. They are

Code Position	Name
0020	SPACE
00A0	NO-BREAK SPACE
1680	OGHAM SPACE MARK
180E	MONGOLIAN VOWEL SEPARATOR
2000	EN QUAD
2001	EM QUAD
2002	EN SPACE
2003	EM SPACE
2004	THREE-PER-EM SPACE
2005	FOUR-PER-EM SPACE
2006	SIX-PER-EM SPACE
2007	FIGURE SPACE
2008	PUNCTUATION SPACE
2009	THIN SPACE
200A	HAIR SPACE
202F	NARROW NO-BREAK SPACE
205F	MEDIUM MATHEMATICAL SPACE
3000	IDEOGRAPHIC SPACE

20.2 Currency symbols

Currency symbols in ISO/IEC 10646 do not necessarily identify the currency of a country. For example, YEN SIGN can be used for Japanese Yen and Chinese Yuan. Also, DOLLAR SIGN is used in numerous countries including the United States of America.

20.3 Format Characters

The following characters are format characters.

Code	Name
00AD	SOFT HYPHEN
034F	COMBINING GRAPHEME JOINER
0600	ARABIC NUMBER SIGN
0601	ARABIC SIGN SANAH
0602	ARABIC FOOTNOTE MARKER
0603	ARABIC SIGN SAFHA
06DD	ARABIC END OF AYAH
070F	SYRIAC ABBREVIATION MARK
180E	MONGOLIAN VOWEL SEPARATOR
200B	ZERO WIDTH SPACE
200C	ZERO WIDTH NON-JOINER
200D	ZERO WIDTH JOINER
200E	LEFT-TO-RIGHT MARK
200F	RIGHT-TO-LEFT MARK
2028	LINE SEPARATOR
2029	PARAGRAPH SEPARATOR
202A	LEFT-TO-RIGHT EMBEDDING
202B	RIGHT-TO-LEFT EMBEDDING
202C	POP DIRECTIONAL FORMATTING
202D	LEFT-TO-RIGHT OVERRIDE
202E	RIGHT-TO-LEFT OVERRIDE
202F	NARROW NO-BREAK SPACE
2060	WORD JOINER
206A	INHIBIT SYMMETRIC SWAPPING
206B	ACTIVATE SYMMETRIC SWAPPING
206C	INHIBIT ARABIC FORM SHAPING
206D	ACTIVATE ARABIC FORM SHAPING
206E	NATIONAL DIGIT SHAPES
206F	NOMINAL DIGIT SHAPES
2FF0	IDEOGRAPHIC DESCRIPTION CHARACTER LEFT TO RIGHT
2FF1	IDEOGRAPHIC DESCRIPTION CHARACTER ABOVE TO BELOW
2FF2	IDEOGRAPHIC DESCRIPTION CHARACTER LEFT TO MIDDLE AND RIGHT
2FF3	IDEOGRAPHIC DESCRIPTION CHARACTER ABOVE TO MIDDLE AND BELOW
2FF4	IDEOGRAPHIC DESCRIPTION CHARACTER FULL SURROUND
2FF5	IDEOGRAPHIC DESCRIPTION CHARACTER SURROUND FROM ABOVE
2FF6	IDEOGRAPHIC DESCRIPTION CHARACTER SURROUND FROM BELOW
2FF7	IDEOGRAPHIC DESCRIPTION CHARACTER SURROUND FROM LEFT
2FF8	IDEOGRAPHIC DESCRIPTION CHARACTER SURROUND FROM UPPER LEFT

2FF9	IDEOGRAPHIC DESCRIPTION CHARACTER SURROUND FROM UPPER RIGHT
2FFA	IDEOGRAPHIC DESCRIPTION CHARACTER SURROUND FROM LOWER LEFT
2FFB	IDEOGRAPHIC DESCRIPTION CHARACTER OVERLAID
3164	HANGUL FILLER
FEFF	ZERO WIDTH NO-BREAK SPACE
FFA0	HALFWIDTH HANGUL FILLER
FFF9	INTERLINEAR ANNOTATION ANCHOR
FFFA	INTERLINEAR ANNOTATION SEPARATOR
FFFB	INTERLINEAR ANNOTATION TERMINATOR
10A3F	KHAROSHTHI VIRAMA
1D159	MUSICAL SYMBOL NULL NOTEHEAD
1D173	MUSICAL SYMBOL BEGIN BEAM
1D174	MUSICAL SYMBOL END BEAM
1D175	MUSICAL SYMBOL BEGIN TIE
1D176	MUSICAL SYMBOL END TIE
1D177	MUSICAL SYMBOL BEGIN SLUR
1D178	MUSICAL SYMBOL END SLUR
1D179	MUSICAL SYMBOL BEGIN PHRASE
1D17A	MUSICAL SYMBOL END PHRASE

These characters are described in annex F.

20.4 Variation selectors

Variation selectors are combining characters following immediately a specific base character to indicate a specific variant form of graphic symbol for that character.

> NOTE 1 – Some variation selectors are specific to a script, such as the Mongolian free variation selectors, others are used with various other base characters such as the mathematical symbols.

Variation selectors following other base characters and any non-base characters have no effect on the selection of the graphic symbol for that character.

No sequences using characters from VARIATION SELECTOR-2 to VARIATION SELECTOR-16 from the Basic Multilingual Plane and VARIATION SELECTOR-17 to VARIATION SELECTOR-256 from the Supplementary Special-purpose Plane are defined at this time.

All the allowed sequences using variation selectors are defined in this clause; all other such sequences are undefined. Furthermore, no sequences containing variation selectors and a mix of combining characters or composite characters will be defined.

The following table provides a description of the variant appearances corresponding to the use of appropriate variation selectors with all allowed base mathematical symbols.

> NOTE 2 – The VARIATION SELECTOR-1 is the only variation selector used with mathematical symbols.

Sequence (UID notation)	Description of variant appearance
<2229, FE00>	INTERSECTION with serifs

<222A, FE00>	UNION with serifs
<2268, FE00>	LESS-THAN BUT NOT EQUAL TO with vertical stroke
<2269, FE00>	GREATER-THAN BUT NOT EQUAL TO with vertical stroke
<2272, FE00>	LESS-THAN OR EQUIVALENT TO following the slant of the lower leg
<2273, FE00>	GREATER-THAN OR EQUIVALENT TO following the slant of the lower leg
<228A, FE00>	SUBSET OF WITH NOT EQUAL TO with stroke through bottom members
<228B, FE00>	SUPERSET OF WITH NOT EQUAL TO with stroke through bottom members
<2293, FE00>	SQUARE CAP with serifs
<2294, FE00>	SQUARE CUP with serifs
<2295, FE00>	CIRCLED PLUS with white rim
<2297, FE00>	CIRCLED TIMES with white rim
<229C, FE00>	CIRCLED EQUALS equal sign touching the circle
<22DA, FE00>	LESS-THAN EQUAL TO OR GREATER-THAN with slanted equal
<22DB, FE00>	GREATER-THAN EQUAL TO OR LESS-THAN with slanted equal
<2A3C, FE00>	INTERIOR PRODUCT tall variant with narrow foot
<2A3D, FE00>	RIGHTHAND INTERIOR PRODUCT tall variant with narrow foot
<2A9D, FE00>	SIMILAR OR LESS-THAN with similar following the slant of the upper leg
<2A9E, FE00>	SIMILAR OR GREATER-THAN with similar following the slant of the upper leg
<2AAC, FE00>	SMALLER THAN OR EQUAL TO with slanted equal
<2AAD, FE00>	LARGER THAN OR EQUAL TO with slanted equal
<2ACB, FE00>	SUBSET OF ABOVE NOT EQUAL TO with stroke through bottom members
<2ACC, FE00>	SUPERSET OF ABOVE NOT EQUAL TO with stroke through bottom members

The following table provides a description of the variant appearances corresponding to the use of appropriate variation selectors with all allowed base Mongolian characters. Only some presentation forms of the base Mongolian characters used with the Mongolian free variation selectors produce variant appearances. These combinations are described in the following table.

> NOTE 3 – The Mongolian characters have various presentation forms depending on their position in a CC-data element. These presentations forms are called isolate, initial, medial and final.

Sequence (UID notation)	position	Description of variant appearance
<1820, 180B>	isolate, medial, final	MONGOLIAN LETTER A second form
<1820, 180C>	medial	MONGOLIAN LETTER A third form
<1821, 180B>	initial, final	MONGOLIAN LETTER E second form
<1822, 180B>	medial	MONGOLIAN LETTER I second form
<1823, 180B>	medial, final	MONGOLIAN LETTER O second form
<1824, 180B>	medial	MONGOLIAN LETTER U second form
<1825, 180B>	medial, final	MONGOLIAN LETTER OE second form
<1825, 180C>	medial	MONGOLIAN LETTER OE third form
<1826, 180B>	isolate, medial, final	MONGOLIAN LETTER UE second form
<1826, 180C>	medial	MONGOLIAN LETTER UE third form
<1828, 180B>	initial, medial	MONGOLIAN LETTER NA second form
<1828, 180C>	medial	MONGOLIAN LETTER NA third form
<1828, 180D>	medial	MONGOLIAN LETTER NA separate form
<182A, 180B>	final	MONGOLIAN LETTER BA alternative form
<182C, 180B>	initial, medial	MONGOLIAN LETTER QA second form
<182C, 180B>	isolate	MONGOLIAN LETTER QA feminine second form
<182C, 180C>	medial	MONGOLIAN LETTER QA third form
<182C, 180D>	medial	MONGOLIAN LETTER QA fourth form
<182D, 180B>	initial, medial	MONGOLIAN LETTER GA second form
<182D, 180B>	final	MONGOLIAN LETTER GA feminine form
<182D, 180C>	medial	MONGOLIAN LETTER GA third form
<182D, 180D>	medial	MONGOLIAN LETTER GA feminine form
<1830, 180B>	final	MONGOLIAN LETTER SA second form
<1830, 180C>	final	MONGOLIAN LETTER SA third form
<1832, 180B>	medial	MONGOLIAN LETTER TA second form
<1833, 180B>	initial, medial, final	MONGOLIAN LETTER DA second form
<1835, 180B>	final	MONGOLIAN LETTER JA second form
<1836, 180B>	initial, medial	MONGOLIAN LETTER YA second form
<1836, 180C>	medial	MONGOLIAN LETTER YA third form
<1838, 180B>	final	MONGOLIAN LETTER WA second form
<1844, 180B>	medial	MONGOLIAN LETTER TODO E second form
<1845, 180B>	medial	MONGOLIAN LETTER TODO I second form
<1846, 180B>	medial	MONGOLIAN LETTER TODO O second form
<1847, 180B>	isolate, medial, final	MONGOLIAN LETTER TODO U second form
<1847, 180C>	medial	MONGOLIAN LETTER TODO U third form
<1848, 180B>	medial	MONGOLIAN LETTER TODO OE second form
<1849, 180B>	isolate, medial	MONGOLIAN LETTER TODO UE second form
<184D, 180B>	initial, medial	MONGOLIAN LETTER TODO QA feminine form
<184E, 180B>	medial	MONGOLIAN LETTER TODO GA second form
<185D, 180B>	medial, final	MONGOLIAN LETTER SIBE E second form
<185E, 180B>	medial, final	MONGOLIAN LETTER SIBE I second form
<185E, 180C>	medial, final	MONGOLIAN LETTER SIBE I third form
<1860, 180B>	medial, final	MONGOLIAN LETTER SIBE UE second form
<1863, 180B>	medial	MONGOLIAN LETTER SIBE KA second form
<1868, 180B>	initial, medial	MONGOLIAN LETTER SIBE TA second form
<1868, 180C>	medial	MONGOLIAN LETTER SIBE TA third form
<1869, 180B>	initial, medial	MONGOLIAN LETTER SIBE DA second form
<186F, 180B>	initial, medial	MONGOLIAN LETTER SIBE ZA second form
<1873, 180B>	medial, final	MONGOLIAN LETTER MANCHU I second form

<1873, 180C>	medial, final	MONGOLIAN LETTER MANCHU I third form
<1873, 180D>	medial	MONGOLIAN LETTER MANCHU I fourth form
<1874, 180B>	medial	MONGOLIAN LETTER MANCHU KA second form
<1874, 180B>	final	MONGOLIAN LETTER MANCHU KA feminine first form
<1874, 180C>	medial	MONGOLIAN LETTER MANCHU KA feminine first form
<1874, 180C>	final	MONGOLIAN LETTER MANCHU KA feminine second form
<1874, 180D>	medial	MONGOLIAN LETTER MANCHU KA feminine second form
<1876, 180B>	initial, medial	MONGOLIAN LETTER MANCHU FA second form
<1880, 180B>	all	MONGOLIAN LETTER ALI GALI ANUSVARA ONE second form
<1881, 180B>	all	MONGOLIAN LETTER ALI GALI VISARGA ONE second form
<1887, 180B>	isolate, final	MONGOLIAN LETTER ALI GALI A second form
<1887, 180C>	final	MONGOLIAN LETTER ALI GALI A third form
<1887, 180D>	final	MONGOLIAN LETTER ALI GALI A fourth form
<1888, 180B>	final	MONGOLIAN LETTER ALI GALI I second form
<188A, 180B>	initial, medial	MONGOLIAN LETTER ALI GALI NGA second form

NOTE 4 – The variation selector only selects a different *appearance* of an already encoded character. It is not intended as a general code extension mechanism.

NOTE 5 – The exhaustive list of standardized variants is also described as *StandardizedVariants.html* in the Unicode character database (http://www.unicode.org/Public/4.0-Update/StandardizedVariants-4.0.0.html).

20.5 Tag characters

The functionality of the TAGS characters, part of the TAGS block within the Supplementary Special-purpose Plane (SSP), is not specified by this international standard.

NOTE – However the intended use of these characters is described in annex T.

21 Presentation forms of characters

Each presentation form of a character provides an alternative form, for use in a particular context, to the nominal form of the character or sequence of characters from the other zones of graphic characters. The transformation from the nominal form to the presentation forms may involve substitution, superimposition, or combination.

The rules for the superimposition, choice of differently shaped characters, or combination into ligatures, or conjuncts, which are often of extreme complexity, are not specified in ISO/IEC 10646.

In general, presentation forms are not intended to be used as a substitute for the nominal forms of the graphic characters specified elsewhere within this coded character set. However, specific applications may encode these presentation forms instead of the nominal forms for specific reasons among which is compatibility with existing devices. The rules for searching, sorting, and other processing operations on presentation forms are outside the scope of ISO/IEC 10646.

Within the BMP these characters are mostly allocated to positions in rows FB to FF.

22 Compatibility characters

Compatibility characters are included in ISO/IEC 10646 primarily for compatibility with existing coded character sets to allow two-way code conversion without loss of information.

Within the BMP many of these characters are allocated to positions within rows F9, FA, FE, and FF, and within rows 31 and 33. Some compatibility characters are also allocated within other rows.

NOTE 1 – There are twelve code positions in the row FA of the BMP which are allocated to CJK Unified Ideographs.

Within the Supplementary Ideographic Plane (SIP) these characters are allocated to positions within rows F8 to FA.

The CJK compatibility ideographs (characters that are part of the CJK COMPATIBILITY IDEOGRAPHS-2001 collection) are ideographs that should have been unified with one of the CJK unified ideographs (characters that are part of the CJK UNIFIED IDEOGRAPHS-2001 collection), per the unification rule described in annex S.

However, they are included in this International Standard as separate characters, because, based on various national, cultural, or historical reasons for some specific country and region, some national and regional standards assign separate code positions for them.

NOTE 2 – For this reason, compatibility ideographs should only be used for maintaining and guaranteeing a round trip conversion with the specific national, regional, or other standard. Other usage is strongly discouraged.

23 Order of characters

Usually, coded characters appear in a CC-data-element in logical order (logical or backing store order corresponds approximately to the order in which characters are entered from the keyboard, after corrections such as insertions, deletions, and overtyping have taken place). This applies even when characters of different dominant direction are mixed: left-to-right (Greek, Latin, Thai) with right-to-left (Arabic, Hebrew), or with vertical (Mongolian) script.

Some characters may not appear linearly in final rendered text. For example, the medial form of DEVANAGARI VOWEL SIGN I is displayed before the character that it logically follows in the CC-data-element.

24 Combining characters

This clause specifies the use of combining characters. A list of combining characters is shown in clause B.1. A list of combining characters not allowed in implementation level 2 is shown in clause B.2.

NOTE – The names of many script-independent combining characters contain the word "COMBINING".

24.1 Order of combining characters

Coded representations of combining characters shall follow that of the graphic character with which they are associated (for example, coded representations of LATIN SMALL LETTER A followed by COMBINING TILDE represent a composite sequence for Latin "ã").
If a combining character is to be regarded as a composite sequence in its own right, it shall be coded as a composite sequence by association with the character SPACE. For example, grave accent can be composed as SPACE followed by COMBINING GRAVE ACCENT.

NOTE – Indic matras form a special category of combining characters, since the presentation can depend on more than one of the surrounding characters. Thus it might not be desirable to associate Indic matra with the character SPACE.

24.2 Appearance in code tables

Combining characters intended to be positioned relative to the associated character are depicted within the character code tables above, below, to the right of, to the left of, in, around, or through a dotted circle to show their position relative to the base character. In presentation, these characters are intended to be positioned relative to the preceding base character in some manner, and not to stand alone or function as base characters. This is the motivation for the term "combining".

NOTE – Diacritics are the principal class of combining characters used in European alphabets. For many other scripts used in India and South East Asia, combining characters encode vowel letters; as such they are not generally referred to as "diacritical marks".

24.3 Alternate coded representations

Alternate coded representations of text are generated by using multiple combining characters in different orders, or using various equivalent combinations of characters and composite sequences. These alternate coded representations result in multiple representations of the same text. Normalizing (see clause 25) these coded representations creates a unique representation.

NOTE – For example, in implementation level 3 the French word "là" may be represented by the characters LATIN SMALL LETTER L followed by LATIN SMALL LETTER A WITH GRAVE, or may be represented by the characters LATIN SMALL LETTER L followed by LATIN SMALL LETTER A followed by COMBINING GRAVE ACCENT. When the normalization forms are applied on those alternate coded representations, only one representation remains. The form of the remaining representation depends on the normalization form used.

24.4 Multiple combining characters

There are instances where more than one combining character is applied to a single graphic character. ISO/IEC 10646 does not restrict the number of combining characters that can follow a base character. The following rules shall apply:

a. If the combining characters can interact in presentation (for example, COMBINING MACRON and COMBINING DIAERESIS), then the position of the combining characters in the resulting graphic display is determined by the order of the coded representation of the combining characters. The presentations of combining characters are to be positioned from the base character outward. For example, combining characters placed above a base character are stacked vertically, starting with the first encountered in the sequence of coded representations and continuing for as many marks above as are required by the coded combining characters following the coded base character. For combining characters placed below a base character, the situation is inverted, with the combining characters starting from the base character and stacking downward.

An example of multiple combining characters above the base character is found in Thai, where a consonant letter can have above it one of the vowels 0E34 to 0E37 and, above that, one of four tone marks 0E48 to 0E4B. The order of the coded representation is: base consonant, followed by a vowel, followed by a tone mark.

b. Some specific combining characters override the default stacking behavior by being positioned

horizontally rather than stacking, or by forming a ligature with an adjacent combining character. When positioned horizontally, the order of coded representations is reflected by positioning in the dominant order of the script with which they are used. For example, horizontal accents in a left-to-right script are coded left-to-right.

Prominent characters that show such override behavior are associated with specific scripts or alphabets. For example, the COMBINING GREEK KORONIS (0343) requires that, together with a following acute or grave accent, they be rendered side-by-side above a letter, rather than the accent marks being stacked above the COMBINING GREEK KORONIS. The order of the coded representations is: the letter itself, followed by that of the breathing mark, followed by that of the accent marks. Two Vietnamese tone marks which have the same graphic appearance as the Latin acute and grave accent marks do not stack above the three Vietnamese vowel letters which already contain the circumflex diacritic (â, ê, ô). Instead, they form ligatures with the circumflex component of the vowel letters.

c. If the combining characters do not interact in presentation (for example, when one combining character is above a graphic character and another is below), the resultant graphic symbol from the base character and combining characters in different orders may appear the same. For example, the coded representations of LATIN SMALL LETTER A, followed by COMBINING CARON, followed by COMBINING OGONEK may result in the same graphic symbol as the coded representations of LATIN SMALL LETTER A, followed by COMBINING OGONEK, followed by COMBINING CARON.

Combining characters in Hebrew or Arabic scripts do not normally interact. Therefore, the sequence of their coded representations in a composite sequence does not affect its graphic symbol. The rules for forming the combined graphic symbol are beyond the scope of ISO/IEC 10646.

24.5 Collections containing combining characters

In some collections of characters listed in annex A, such as collections 14 (BASIC ARABIC) or 25 (THAI), both combining characters and non-combining characters are included.

When implementation level 1 or 2 is adopted, a CC-data-element shall not contain the coded representations of combining characters listed in annex B, even though the adopted subset may include them.

Other collections of characters listed in annex A comprise only combining characters, for example collec-

tion 7 (COMBINING DIACRITICAL MARKS). Such a collection shall not be included in the adopted subset when implementation level 1 is adopted.

25 Normalization forms

Normalization forms are the mechanisms allowing the selection of a unique coded representation among alternative, but equivalent coded text representations of the same text. Normalization forms for use with ISO/IEC 10646 are specified in the Unicode Standard UAX#15 (see clause 3).

> NOTE 1 – By definition, the result of applying any of these normalization forms is stable over time. It means that a normalized representation of text remains normalized even when the standard is amended.

> NOTE 2 – Some normalization forms favor composite sequences over shorter representations of text, others favor the shorter representations. The backward compatibility requirement is provided by establishing ISO/IEC 10646-1:2000 (2nd Edition) and ISO/IEC 10646-2:2001 (1st Edition) as the reference versions for the definition of the shorter representation of text. The union of their repertoire is identical to the fixed collection UNICODE 3.2 (see clause A.6.2).

> NOTE 3 – The goal of normalization is to provide a unique normalized result for any given CC-data element to facilitate, among other things, identity matching. A normalized form does not necessarily represent the optimal sequence from a linguistic point of view.

26 Special features of individual scripts and symbol repertoires

26.1 Hangul syllable composition method

In rendering, a sequence of Hangul Jamo (from HANGUL JAMO block: 1100 to 11FF) is displayed as a series of syllable blocks. Jamo can be classified into three classes: Choseong (syllable-initial character), Jungseong (syllable-peak character), and Jongseong (syllable-final character). A complete syllable block is composed of a Choseong and a Jungseong, and optionally a Jongseong.

An incomplete syllable is a string of one or more characters which does not constitute a complete syllable (for example, a Choseong alone, a Jungseong alone, a Jongseong alone, or a Jungseong followed by a Jongseong). An incomplete syllable which starts with a Jungseong or a Jongseong shall be preceded by a CHOSEONG FILLER (115F). An incomplete syllable composed of a Choseong alone shall be followed by a JUNGSEONG FILLER (1160).

The implementation level 3 shall be used for the Hangul syllable composition method.

> NOTE 1 – Hangul Jamo are not combining characters.

> NOTE 2 – When a combining character such as HANGUL SINGLE DOT TONE MARK (302E) is intended to apply to a sequence of Hangul Jamo it should be placed at the end of

the sequence, after the Hangul Jamo character which completes the syllable block.

26.2 Features of scripts used in India and some other South Asian countries

In the tables for Rows 09 to 0D and 0F, and for the MYANMAR block in Row 10, of the BMP (see clause 33) the graphic symbols shown for some characters appear to be formed as compounds of the graphic symbols for two other characters in the same table.

Examples:

Row 0B Tamil.

The graphic symbol for 0B94 TAMIL LETTER AU appears as if it is constructed from the graphic symbols for:
0B93 TAMIL LETTER OO and 0BD7 TAMIL AU LENGTH MARK

Row 0D Malayalam.

The graphic symbol for 0D4A MALAYALAM VOWEL SIGN O appears as if it is constructed from the graphic symbols for:
0D46 MALAYALAM VOWEL SIGN E and 0D3E MALAYALAM VOWEL SIGN AA

In such cases a single coded character may appear to the user to be equivalent to the sequence of two coded characters whose graphic symbols, when combined, are visually similar to the graphic symbol of that single character, as in a composite sequence (see clause 4.15).

A "unique-spelling" rule is defined as follows. According to this rule, no coded character from a table for Rows 09 to 0D or 0F, or for the MYANMAR block in Row 10, shall be regarded as equivalent to a sequence of two or more other coded characters taken from the same table.

This "unique-spelling" rule shall apply in Levels 1 and 2.

NOTE – In Levels 1 and 2, if such a sequence occurs in a CC-data-element it is always made available to the user as two distinct characters in accordance with their respective character names.

26.3 Byzantine musical symbols

The Byzantine Musical Notation System makes use of the so-called 'three-stripe' effect. There are signs that appear in the Upper, Middle or Lower stripes. Other signs are known as musical characters and appear in the textual part of the notation system. Multiple signs can be stacked together in their appropriate stripe.

27 Source references for CJK Ideographs

A CJK Ideograph is always referenced by at least one source reference. These source references are pro-

vided in a machine-readable format that is accessible as links to this document. The content pointed by these links is also normative.

NOTE – The referenced files are only available to users who obtain their copy of the standard in a machine-readable format. However, the file format makes them printable.

The source reference information establishes the character identity for CJK Ideographs. A source reference is established by associating a CJK Ideograph code position with one or several values in the source standards listed in clause 27.1 and 27.3. Such a source standard originates from the following categories:

- Hanzi G sources,
- Hanzi H sources,
- Hanzi T sources,
- Kanji J sources,
- Hanja K sources,
- Hanja KP sources,
- ChuNom V sources, and
- Unicode U sources.

For a given code position, only one source reference can be created for each of the source standard category (G, H, T, J, K, KP, V, and U). In order to provide a comprehensive coverage for a source standard category, when a source standard is referenced, all its unique associations with existing CJK Ideographs are documented.

27.1 Source references for CJK Unified Ideographs

The procedures that were used to derive the unified ideographs from the source character set standards, and the rules for their arrangement in the code tables in clause 33, are described in annex S.

NOTE 1 – The source separation rule described by the clause S.1.6 of that annex only apply to CJK Unified Ideographs within the BMP.

The following list identifies all sources referenced by the CJK Unified Ideographs in both the BMP and the SIP. The set of CJK Unified Ideographs is represented by the collection CJK UNIFIED IDEOGRAPHS-2001 (See annex A.1).

The Hanzi G sources are

G0   GB2312-80

G1   GB12345-90 with 58 Hong Kong and 92 Korean "Idu" characters

G3   GB7589-87 unsimplified forms

G5   GB7590-87 unsimplified forms

G7   General Purpose Hanzi List for Modern Chinese Language, and General List of Simplified Hanzi

GS   Singapore Characters

G8   GB8565-88

G9   GB18030-2000

GE   GB16500-95

G_KX   Kangxi Dictionary ideographs（康熙字典）
        including the addendum（康熙字典）補遺

G_HZ   Hanyu Dazidian ideographs（漢語大字典）

G_CY   Ci Yuan （辭源）

G_CH   Ci Hai （辞海）

G_HC   Hanyu Dacidian （漢語大詞典）

G_BK   Chinese Encyclopedia （中國大百科全書）

G_FZ   Founder Press System （方正排版系統）

G_4K   Siku Quanshu （四庫全書）

The Hanzi H source is

H   Hong Kong Supplementary Character Set –
        2004

Hanzi T sources are

T1   TCA-CNS 11643-1992 1st plane

T2   TCA-CNS 11643-1992 2nd plane

T3   TCA-CNS 11643-1992 3rd plane with some
        additional characters

T4   TCA-CNS 11643-1992 4th plane

T5   TCA-CNS 11643-1992 5th plane

T6   TCA-CNS 11643-1992 6th plane

T7   TCA-CNS 11643-1992 7th plane

TF   TCA-CNS 11643-1992 15th plane

Kanji J sources are

J0   JIS X 0208-1990

J1   JIS X 0212-1990

J3   JIS X 0213:2000 level-3

J3A   JIS X 0213:2004 level-3

J4   JIS X 0213:2000 level-4

JA   Unified Japanese IT Vendors Contemporary
        Ideographs, 1993

Hanja K sources are

K0   KS C 5601-1987

K1   KS C 5657-1991

K2   PKS C 5700-1 1994

K3   PKS C 5700-2 1994

K4   PKS 5700-3:1998

Hanja KP sources are

KP0   KPS 9566-97

KP1   KPS 10721-2000

ChuNom V sources are

V0   TCVN 5773:1993

V1   TCVN 6056:1995

V2   VHN 01:1998

V3   VHN 02: 1998

The Unicode U source is:

U0   The Unicode Standard 4.0-2003

> NOTE 2 – Even if source references get updated, the source reference information is not be updated. The updated source references may only identify characters not previously covered by the older version.

The content linked to is a plain text file, using ISO/IEC 646-IRV characters with LINE FEED as end of line mark, that specifies, after a 12-lines header, as many lines as CJK Unified Ideographs in the sum of the two planes; each containing the following information organized in fields delimited by ';' (empty fields use no character):

- 1st field: BMP or SIP code position `(0hhhh)`, `(2hhhh)`

- 2nd field: Hanzi G sources `(G0-hhhh)`, `(G1-hhhh)`, `(G3-hhhh)`, `(G5-hhhh)`, `(G7-hhhh)`, `(GS-hhhh)`, `(G8-hhhh)`, `(G9-hhhh)`, `(GE-hhhh)`, `(G_KX)`, `(G_HZ)`, `(G_CY)`, `(G_CH)`, `(G_HC)`, `(G_BK)`, `(G_FZ)` or `(G_4K)`.

- 3rd field: Hanzi T sources `T1-hhhh)`, `(T2-hhhh)`, `(T3-hhhh)`, `(T4-hhhh)`, `(T5-hhhh)`, `(T6-hhhh)`, `(T7-hhhh)` or `(TF-hhhh)`.

- 4th field: Kanji J sources `(J0-hhhh)`, `(J1-hhhh)`, `(J3-hhhh)`, `(J3A-hhhh)`, `(J4-hhhh)` or `(JA-hhhh)`.

- 5th field: Hanja K sources `(K0-hhhh)`, `(K1-hhhh)`, `(K2-hhhh)`, `(K3-hhhh)` or `(K4-hhhh)`.

- 6th field: ChuNom V sources `(V0-hhhh)`, `(V1-hhhh)`, `(V2-hhhh)` or `(V3-hhhh)`.

- 7th field: Hanzi H source `(H-hhhh)`.

- 8th field: Hanja KP sources `(KP0-hhhh)` or `(KP1-hhhh)`.

- 9th field: Unicode U source `(U0-hhhh)`.

The format definition uses 'h' as a hexadecimal unit. Uppercase characters, digits and all other symbols between parentheses appear as shown.

> NOTE 3 – Concerning JIS X 0213:2000 and 2004 sources, level-4 references correspond to the second plane; other level references correspond to the first plane.

> NOTE 4 – The original source references in the Hanja K4 source (PKS 5700-3:1998) are described using a single

decimal index. For better consistency with the other sources, those indexes have been converted into hexadecimal values in the source reference file. Unlike the other hexadecimal values, they do not decompose in row, column values.

Click on this highlighted text to access the reference file.

NOTE 4 – The content is also available as a separate viewable file in the same file directory as this document. The file is named: "CJKU_SR.txt".

27.2 Source reference presentation for BMP CJK Unified Ideographs

In the BMP code tables, entries for both CJK Unified Ideographs and its Extension A are arranged as follows.

Row/Cell Hex code	C G- Hanzi	-T	J Kanji	K Hanja	V ChuNom
078/000	——▲	——▲	——▲	——▲	——▲
4E00	0-523B 0-5027	1-4421 1-3601	0-306C 0-1676	0-6C69 0-7673	1-2121 1-0101

The leftmost column of an entry shows the code position in ISO/IEC 10646, giving the code representation both in decimal (in row/cell format) and in hexadecimal notation.

Each of the other columns shows the graphic symbol for the character, and its coded representation, as specified in a source standard for character sets that is also identified in the table entry. Each of these source standards is assigned to one of five groups indicated by G, T, J, K, or V as shown in the lists below. In each table entry, a separate column is assigned for the corresponding character (if any) from each of those groups of source standards.

An entry in any of the G, T, J, K, or V columns includes a sample graphic symbol from the source character set standard, together with its coded representation in that standard. The first line below the graphic symbol shows the coded representation in hexadecimal notation. When non-empty, the second line shows the coded representation in decimal notation which comprises two digits for section number followed by two digits for position number except for the K4 source where it shows the original decimal source as a single 4 digit value. Hanzi H source characters are identified in the G column using the 'H-' prefix. Each of the coded representations is prefixed by a one-character source identification followed by a hyphen. This source character identifies the coded character set standard from which the character is taken as shown in the lists above.

27.3 Source references for CJK Compatibility Ideographs

The following list identifies all sources referenced by the CJK Compatibility Ideographs in both the BMP and the SIP. The set of CJK Compatibility Ideographs is represented by the collection CJK COMPATIBILITY IDEOGRAPHS-2003 (See annex A.1).

The Hanzi H source is:

H   Hong Kong Supplementary Character Set - 2004

Hanzi T sources are:

T3   TCA-CNS 11643-1992 3rd plane
T4   TCA-CNS 11643-1992 4th plane
T5   TCA-CNS 11643-1992 5th plane
T6   TCA-CNS 11643-1992 6th plane
T7   TCA-CNS 11643-1992 7th plane
TF   TCA-CNS 11643-1992 15th plane

Kanji J sources are:

J3   JIS X 0213:2000 level-3
J4   JIS X 0213:2000 level-4

The Hanja K source is:

K0   KS C 5601-1987

The Hanja KP source is:

KP1   KPS 10721-2000

The Unicode U source is:

U0   The Unicode Standard 3.0-2000

The content linked to is a plain text file, using ISO/IEC 646-IRV characters with LINE FEED as end of line mark, that specifies, after a 11-lines header, as many lines as CJK Compatibility Ideographs; each containing the following information organized in fields delimited by ';' (empty fields use no character):

- 1st field: BMP or SIP code position (`0hhhh`) or (`2hhhh`).

- 2nd field: Code position of corresponding CJK Unified Ideograph (`0hhhh`) or (`2hhhh`).

- 3rd field: Hanzi T sources (`T3-hhhh`), (`T4-hhhh`), (`T5-hhhh`), (`T6-hhhh`), (`T7-hhhh`), or (`TF-hhhh`).

- 4th field: Hanzi H source (`H-hhhh`).

- 5th field: Kanji J sources (`J3-hhhh`), (`J4-hhhh`).

- 6th field: Hanja K source (`K0-hhhh`).

- 7th field: Unicode U source (`U0-hhhh`)

- 8th field: Hanja KP source (`KP1-hhhh`)

The format definition uses '`h`' as a hexadecimal unit. Uppercase characters, digits and all other symbols between parentheses appear as shown.

> NOTE 1 – Concerning JIS X 0213:2000 and 2004 sources, level-4 references correspond to the second plane; other level references correspond to the first plane.

Click on this highlighted text to access the reference file.

> NOTE 2 – The content is also available as a separate viewable file in the same file directory as this document. The file is named: "CJKC_SR.txt".

28 Character names and annotations

28.1 General

Guidelines to be used for constructing names of characters are given in annex L for information. In some cases, a name of a character is followed by additional explanatory statements not part of the name. These statements are in parentheses and not in capital letters except for the initials of the word, where required.

28.2 Character names for CJK Ideographs

For CJK Ideographs the names are algorithmically constructed by appending their coded representation in hexadecimal notation to "CJK UNIFIED IDEOGRAPH-" for CJK Unified Ideographs and "CJK COMPATIBILITY IDEOGRAPH-" for CJK Compatibility Ideographs.

For CJK Ideographs within the BMP, the coded representation is their two-octet value expressed as four hexadecimal digits. For example, the first CJK Ideograph character in the BMP has the name "CJK UNIFIED IDEOGRAPH-3400".

For CJK Ideographs within the SIP, the coded representation is their five hexadecimal digit value. For example, the first CJK Ideograph character in the SIP has the name "CJK UNIFIED IDEOGRAPH-20000".

28.3 Character names and annotations for Hangul syllables

Names for the Hangul syllable characters in code positions 0000 AC00 - 0000 D7A3 are derived from their code position numbers by the numerical procedure described below. Lists of names for these characters are not provided opposite the code tables.

1. Obtain the code position number of the Hangul syllable character. It is of the form $0000\ h_1h_2h_3h_4$ where h_1, h_2, h_3, and h_4 are hexadecimal digits; h_1h_2 is the Row number within the BMP and h_3h_4 is the cell number within the row. The number $h_1h_2h_3h_4$ lies within the range AC00 to D7A3.

2. Derive the decimal numbers d_1, d_2, d_3, d_4 that are numerically equal to the hexadecimal digits h_1, h_2, h_3, h_4 respectively.

3. Calculate the character index C from the formula:
C = 4096 × (d_1 - 10) + 256 × (d_2 - 12) + 16 × d_3 + d_4

> NOTE – If C < 0 or > 11171 then the character is not in the HANGUL SYLLABLES block.

4. Calculate the syllable component indices I, P, F from the following formulae:

$I = C / 588$	(Note: $0 \le I \le 18$)
$P = (C \% 588) / 28$	(Note: $0 \le P \le 20$)
$F = C \% 28$	(Note: $0 \le F \le 27$)

where "/" indicates integer division (i.e. x / y is the integer quotient of the division), and "%" indicates the modulo operation (i.e. $x \% y$ is the remainder after the integer division x / y).

5. Obtain the Latin character strings that correspond to the three indices I, P, F from columns 2, 3, and 4 respectively of table 1 below (for I = 11 and for F = 0 the corresponding strings are null). Concatenate these three strings in left-to-right order to make a single string, the syllable-name.

6. The character name for the character at position $0000\ h_1h_2h_3h_4$ is then:

HANGUL SYLLABLE *s-n*

where "*s-n*" indicates the syllable-name string derived in step 5.

Example.
For the character in code position D4DE:
d_1 = 13, d_2 = 4, d_3 = 13, d_4 = 14.
C = 10462
I = 17, P = 16, F = 18.
The corresponding Latin character strings are:
P, WI, BS.
The syllable-name is PWIBS, and the character name is:

HANGUL SYLLABLE PWIBS

For each Hangul syllable character a short annotation is defined. This annotation consists of an alternative transliteration of the Hangul syllable into Latin characters.

Annotations for the Hangul syllable characters in code positions 0000 AC00 - 0000 D7A3 are also derived from their code position numbers by a similar numerical procedure described below.

7. Carry out steps 1 to 4 as described above.

8. Obtain the Latin character strings that correspond to the three indices I, P, F from columns 5, 6, and 7 respectively of Table 1 below (for I = 11 and for F = 0

the corresponding strings are null). Concatenate these three strings in left-to-right order to make a single string, and enclose it within parentheses to form the annotation.

Example.
For the character in code position D4DE:

d_1 = 13, d_2 = 4, d_3 = 13, d_4 = 14.
C = 10462
I = 17, P = 16, F = 18.

The corresponding Latin character strings are:

ph, wi, ps,

and the annotation is (phwips).

> NOTE – The annex R provides a list of syllable-names as well as a link to a file providing in machine-readable format the full name and annotation for each Hangul syllable.

Table 1: Elements of Hangul syllable names and annotations

Index number	Syllable name elements			Annotation elements		
	I string	*P* string	*F* string	*I* string	*P* string	*F* string
0	G	A		k	a	
1	GG	AE	G	kk	ae	k
2	N	YA	GG	n	ya	kk
3	D	YAE	GS	t	yae	ks
4	DD	EO	N	tt	eo	n
5	R	E	NJ	r	e	nc
6	M	YEO	NH	m	yeo	nh
7	B	YE	D	p	ye	t
8	BB	O	L	pp	o	l
9	S	WA	LG	s	wa	lk
10	SS	WAE	LM	ss	wae	lm
11		OE	LB		oe	lp
12	J	YO	LS	c	yo	ls
13	JJ	U	LT	cc	u	lth
14	C	WEO	LP	ch	weo	lph
15	K	WE	LH	kh	we	lh
16	T	WI	M	th	wi	m
17	P	YU	B	ph	yu	p
18	H	EU	BS	h	eu	ps
19		YI	S		yi	s
20		I	SS		i	ss
21			NG			ng
22			J			c
23			C			ch
24			K			kh
25			T			th
26			P			ph
27			H			h

25

29 Structure of the Basic Multilingual Plane

An overview of the Basic Multilingual Plane is shown in figure 3 and a more detailed overview of Rows 00 to 33 is shown in figure 4.

The Basic Multilingual Plane includes characters in general use in alphabetic, syllabic, and ideographic scripts together with various symbols and digits.

Row-octet

00 33	Rows 00 to 33 (see figure 4)
34 .. .. 4D	CJK Unified Ideographs Extension A / Yijing Hexagram Symb.
4E 9F	CJK Unified Ideographs
A0.. A3	Yi Syllables
A4	Yi Radicals
A5 A6 A7 A8 A9.. AB	Modifier T L / Syloti Nagri
AC D7	Hangul Syllables
D8.. DF	**S-zone (for use in UTF-16 only)**
E0 .. .. F8	Private Use Zone
F9 FA	CJK Compatibility Ideographs
FB	Alphabetic Presentation Forms
FC FD	Arabic Presentation Forms-A
FE	VS / VF / CHM / CJK CF / Small Form Variants / Arabic Presentation Forms-B
FF	Halfwidth And Fullwidth Forms / Spe-

= permanently reserved   = reserved for future standardization

NOTE – Vertical boundaries within rows are indicated in approximate positions only.

Figure 3 - Overview of the Basic Multilingual Plane

Row-octet

Row	Contents
00	Controls / Basic Latin / Controls / Latin-1 Supplement
01	Latin Extended-A / Latin Extended-B
02	Latin Extended-B / IPA (Intl. Phonetic Alph.) Extensions / Spacing Modifier Letters
03	Combining Diacritical Marks / Greek and Coptic
04	Cyrillic
05	Cyrillic Supplement / Armenian / Hebrew
06	Arabic
07	Syriac / Arabic Sup. / Thaana / ▨
08	▨
09	Devanagari / Bengali
0A	Gurmukhi / Gujarati
0B	Oriya / Tamil
0C	Telugu / Kannada
0D	Malayalam / Sinhala
0E	Thai / Lao
0F	Tibetan
10	Myanmar / Georgian
11	Hangul Jamo
12	Ethiopic
13	Ethiopic Sup. / Cherokee
14	Unified Canadian Aboriginal Syllabics
16	Ogham / Runic
17	Tagalog / Hanunoo / Buhid / Tagbanwa / Khmer
18	Mongolian / ▨
19	Limbu / Tai Le / New Tai Lue * / Khmer Symb.
1A..	Buginese / ▨
1C	▨
1D	Phonetic Extension / Phonetic Extensions Sup. / Combining Diacritical M Sup.
1E	Latin Extended Additional
1F	Greek Extended
20	General Punctuation / Super-/Subscripts / Currency Symbols / Comb. Mks. Symb.
21	Letterlike Symbols / Number Forms / Arrows
22	Mathematical Operators
23	Miscellaneous Technical
24	Control Pictures / O.C.R. / Enclosed Alphanumerics
25	Box Drawing / Block Elements / Geometric Shapes
26	Miscellaneous Symbols
27	Dingbats / Misc. Math. Symbols-A / S A A
28	Braille Patterns
29	Supplemental Arrows-B / Miscellaneous Mathematical Symbols-B
2A	Supplemental Mathematical Operators
2B	Miscellaneous Symbols and Arrows / ▨
2C	Glagolitic / ▨ / Coptic
2D	Georgian Sup. / Tifinagh / Ethiopic Extended / ▨
2E	Supplemental Punctuation / CJK Radicals Supplement
2F	Kangxi Radicals / ▨ / Ideog. Descr.
30	CJK Symbols And Punctuation / Hiragana / Katakana
31	Bopomofo / Hangul Compatibility Jamo / Kanbun / Bopomofo E. / CJK Strokes / K P E
32	Enclosed CJK Letters And Months
33	CJK Compatibility

▨ = reserved for future standardization

* NOTE 1 – New Tai Lue is also known as Xishuang Banna Dai

NOTE 2 – Vertical boundaries within rows are indicated in approximate positions only.

Figure 4 - Overview of Rows 00 to 33 of the Basic Multilingual Plane

27

30 Structure of the Supplementary Multilingual Plane for Scripts and symbols

The Plane 02 of Group 00 is the Supplementary Multilingual Plane (SMP).

Because another supplementary plane is reserved for additional CJK Ideographs, the SMP is not used to date for encoding CJK Ideographs. Instead, the SMP is used for encoding graphic characters used in other scripts of the world that are not encoded in the BMP. Most, but not all, of the scripts encoded to date in the SMP are not in use as living scripts by modern user communities.

NOTE 1 – The following subdivision of the SMP has been proposed:
- Alphabetic scripts,
- Hieroglyphic, ideographic and syllabaries,
- Non CJK ideographic scripts,
- Newly invented scripts,
- Symbol sets.

An overview of the Supplementary Multilingual Plane for scripts and symbols is shown in figure 5.

Row-octet

= reserved for future standardization

NOTE 2 – Vertical boundaries within rows are indicated in approximate positions only.

NOTE 3 – The Old Italic block represents a unified script that covers the Etruscan, Oscan, Umbrian, Faliscan, North Picene, and South Picene alphabets. Some of these alphabets can be written with characters oriented in either left-to-right or right-to-left direction. The glyphs in the code table are shown with left to right orientation.

Figure 5 – Overview of the Supplementary Multilingual Plane for scripts and symbols

31 Structure of the Supplementary Ideographic Plane
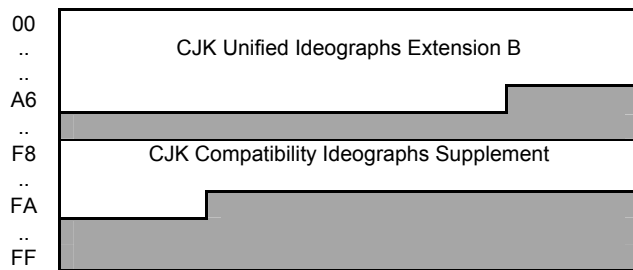
The Plane 02 of Group 00 is the Supplementary Ideographic Plane (SIP).

The SIP is used for CJK unified ideographs (unified East Asian ideographs) that are not encoded in the BMP. The procedures for the unification and the rules for their arrangement are described in annex S.

The SIP is also used for compatibility CJK ideographs. These ideographs are compatibility characters as specified in clause 4.14.

The following figure 6 shows an overview of the Supplementary Ideographic Plane.

Row-octet

= reserved for future standardization

NOTE – Vertical boundaries within rows are indicated in approximate positions only.

Figure 6 – Overview of the Supplementary Ideographic Plane

32 Structure of the Supplementary Special-purpose Plane

The Plane 0E of Group 0 is the Supplementary Special-purpose Plane (SSP).

The SSP is used for special purpose use graphic characters. Code positions from E0000 to E0FFF are reserved for Alternate Format Characters (see clause 20).

NOTE 1 – Some of these characters do not have a visual representation and do not have printable graphic symbols. The Tag Characters are example of such characters.

An overview of the Supplementary Special-purpose Plane is shown in figure 7.

NOTE 2 – Unassigned code points in this range should be ignored in normal processing and display.

Row-octet
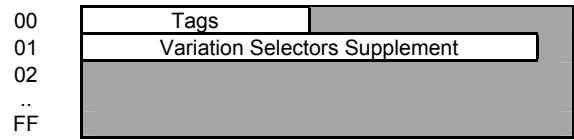
= reserved for future standardization

NOTE 3 – Vertical boundaries within rows are indicated in approximate positions only.

Figure 7 – Overview of the Supplementary Special-purpose Plane

33 Code tables and lists of character names

Detailed code tables and lists of character names for the BMP, SMP, SIP and SSP are shown on the following pages. Access is provided by clicking on the appropriate highlighted text below.

- Basic Latin to CJK Compatibility (0000-33FF)
- CJK Unified Ideographs Extension A (3400-4DBF)
- Yijing Hexagram Symbols (4DC0-4DFF)
- CJK Unified Ideographs Part 1 of 3 (4E00-680F)
- CJK Unified Ideographs Part 2 of 3 (6810-824F)
- CJK Unified Ideographs Part 3 of 3 (8250-9FFF)
- Yi Syllables to Specials (A000-FFFD)
- Linear B Syllabary to Mathematical Alphanumeric Symbols (10000-1D7FF)
- CJK Unified Ideographs Extension B (20000-2A6DF)
- CJK Compatibility Ideographs (2F800-2FA1F)
- Tag to Variation Selectors Supplement (E0000-E01EF)

NOTE – To preserve the odd-even layout of the code charts, a page from the previous block may be inserted before the actual start of the code table.

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Annex A
(normative)

Collections of graphic characters for subsets

A.1 Collections of coded graphic characters

The collections listed below are ordered by collection number. An * in the "positions" column indicates that the collection is a fixed collection.

Collection number and name	Positions
1 BASIC LATIN	0020-007E *
2 LATIN-1 SUPPLEMENT	00A0-00FF *
3 LATIN EXTENDED-A	0100-017F *
4 LATIN EXTENDED-B	0180-024F
5 IPA EXTENSIONS	0250-02AF
6 SPACING MODIFIER LETTERS	02B0-02FF *
7 COMBINING DIACRITICAL MARKS	0300-036F *
8 BASIC GREEK	0370-03CF
9 GREEK SYMBOLS AND COPTIC	03D0-03FF
10 CYRILLIC	0400-04FF
11 ARMENIAN	0530-058F
12 BASIC HEBREW	05D0-05EA *
13 HEBREW EXTENDED	0590-05CF 05EB-05FF
14 BASIC ARABIC	0600-065F
15 ARABIC EXTENDED	0660-06FF *
16 DEVANAGARI	0900-097F 200C, 200D
17 BENGALI	0980-09FF 200C, 200D
18 GURMUKHI	0A00-0A7F 200C, 200D
19 GUJARATI	0A80-0AFF 200C, 200D
20 ORIYA	0B00-0B7F 200C, 200D
21 TAMIL	0B80-0BFF 200C, 200D
22 TELUGU	0C00-0C7F 200C, 200D
23 KANNADA	0C80-0CFF 200C, 200D
24 MALAYALAM	0D00-0D7F 200C, 200D
25 THAI	0E00-0E7F
26 LAO	0E80-0EFF
27 BASIC GEORGIAN	10D0-10FF

Collection number and name	Positions
28 GEORGIAN EXTENDED	10A0-10CF
29 HANGUL JAMO	1100-11FF
30 LATIN EXTENDED ADDITIONAL	1E00-1EFF
31 GREEK EXTENDED	1F00-1FFF
32 GENERAL PUNCTUATION	2000-206F
33 SUPERSCRIPTS AND SUBSCRIPTS	2070-209F
34 CURRENCY SYMBOLS	20A0-20CF
35 COMBINING DIACRITICAL MARKS FOR SYMBOLS	20D0-20FF
36 LETTERLIKE SYMBOLS	2100-214F
37 NUMBER FORMS	2150-218F
38 ARROWS	2190-21FF *
39 MATHEMATICAL OPERATORS	2200-22FF *
40 MISCELLANEOUS TECHNICAL	2300-23FF
41 CONTROL PICTURES	2400-243F
42 OPTICAL CHARACTER RECOGNITION	2440-245F
43 ENCLOSED ALPHANUMERICS	2460-24FF *
44 BOX DRAWING	2500-257F *
45 BLOCK ELEMENTS	2580-259F *
46 GEOMETRIC SHAPES	25A0-25FF *
47 MISCELLANEOUS SYMBOLS	2600-26FF
48 DINGBATS	2700-27BF
49 CJK SYMBOLS AND PUNCTUATION	3000-303F *
50 HIRAGANA	3040-309F
51 KATAKANA	30A0-30FF *
52 BOPOMOFO	3100-312F 31A0-31BF
53 HANGUL COMPATIBILITY JAMO	3130-318F
54 CJK MISCELLANEOUS	3190-319F
55 ENCLOSED CJK LETTERS AND MONTHS	3200-32FF
56 CJK COMPATIBILITY	3300-33FF *
57, 58, 59 (These collection numbers shall not be used, see Note 2.)	
60 CJK UNIFIED IDEOGRAPHS	4E00-9FFF
61 PRIVATE USE AREA	E000-F8FF
62 CJK COMPATIBILITY IDEOGRAPHS	F900-FAFF
63 (Collection specified as union of other collections)	
64 ARABIC PRESENTATION FORMS-A	FB50-FDCF FDF0-FDFF

65	COMBINING HALF MARKS	FE20-FE2F
66	CJK COMPATIBILITY FORMS	FE30-FE4F *
67	SMALL FORM VARIANTS	FE50-FE6F
68	ARABIC PRESENTATION FORMS-B	FE70-FEFE
69	HALFWIDTH AND FULLWIDTH FORMS	FF00-FFEF
70	SPECIALS	FFF0-FFFD
71	HANGUL SYLLABLES	AC00-D7A3 *
72	BASIC TIBETAN	0F00-0FBF
73	ETHIOPIC	1200-137F
74	UNIFIED CANADIAN ABORIGINAL SYLLABICS	1400-167F
75	CHEROKEE	13A0-13FF
76	YI SYLLABLES	A000-A48F
77	YI RADICALS	A490-A4CF
78	KANGXI RADICALS	2F00-2FDF
79	CJK RADICALS SUPPLEMENT	2E80-2EFF
80	BRAILLE PATTERNS	2800-28FF
81	CJK UNIFIED IDEOGRAPHS EXTENSION A	3400-4DBF FA1F, FA23
82	OGHAM	1680-169F
83	RUNIC	16A0-16FF
84	SINHALA	0D80-0DFF
85	SYRIAC	0700-074F
86	THAANA	0780-07BF
87	BASIC MYANMAR	1000-104F 200C, 200D
88	KHMER	1780-17FF 200C, 200D
89	MONGOLIAN	1800-18AF
90	EXTENDED MYANMAR	1050-109F
91	TIBETAN	0F00-0FFF
92	CYRILLIC SUPPLEMENT	0500-052F
93	TAGALOG	1700-171F
94	HANUNOO	1720-173F
95	BUHID	1740-175F
96	TAGBANWA	1760-177F
97	MISCELLANEOUS MATHEMATICAL SYMBOLS-A	27C0-27EF
98	SUPPLEMENTAL ARROWS-A	27F0-27FF *
99	SUPPLEMENTAL ARROWS-B	2900-297F *
100	MISCELLANEOUS MATHEMATICAL SYMBOLS-B	2980-29FF *
101	SUPPLEMENTAL MATHEMATICAL OPERATORS	2A00-2AFF *
102	KATAKANA PHONETIC EXTENSIONS	31F0-31FF *
103	VARIATION SELECTORS	FE00-FE0F *
104	LTR ALPHABETIC PRESENTATION FORMS	FB00-FB1C
105	RTL ALPHABETIC PRESENTATION FORMS	FB1D – FB4F
106	LIMBU	1900-194F
107	TAI LE	1950-197F
108	KHMER SYMBOLS	19E0-19FF *
109	PHONETIC EXTENSIONS	1D00-1D7F *
110	MISCELLANEOUS SYMBOLS AND ARROWS	2B00-2BFF
111	YIJING HEXAGRAM SYMBOLS	4DC0-4DFF *
112	ARABIC SUPPLEMENT	0750-077F
113	ETHIOPIC SUPPLEMENT	1380-139F
114	NEW TAI LUE	1980-19DF
115	BUGINESE	1A00-1A1F
116	PHONETIC EXTENSIONS SUPPLEMENT *	1D80-1DBF
117	COMBINING DIACRITICAL MARKS SUPPLEMENT	1DC0-1DFF
118	GLAGOLITIC	2c00-2c5F
119	COPTIC	03E2-03EF 2C80-2CFF
120	GEORGIAN SUPPLEMENT	2D00-2D2F
121	TIFINAGH	2D30-2D7F
122	ETHIOPIC EXTENDED	2D80-2DDF
123	SUPPLEMENTAL PUNCTUATION	2E00-2E7F
124	CJK STROKES	31C0-31EF
125	MODIFIER TONE LETTERS	A700-A71F
126	SYLOTI NAGRI	A800-A82F
127	VERTICAL FORMS	FE10-FE1F
1001	OLD ITALIC	10300-1032F
1002	GOTHIC	10330-1034F
1003	DESERET	10400-1044F *
1004	BYZANTINE MUSICAL SYMBOLS	1D000-1D0FF
1005	MUSICAL SYMBOLS	1D100-1D1FF
1006	MATHEMATICAL ALPHANUMERIC SYMBOLS	1D400-1D7FF
1007	LINEAR B SYLLABARY	10000-1007F
1008	LINEAR B IDEOGRAMS	10080-100FF
1009	AEGEAN NUMBERS	10100-1013F
1010	UGARITIC	10380-1039F
1011	SHAVIAN	10450-1047F *
1012	OSMANYA	10480-104AF
1013	CYPRIOT SYLLABARY	10800-1083F
1014	TAI XUAN JING SYMBOLS	1D300-1D35F
1015	ANCIENT GREEK NUMBERS	10140-1018F
1016	OLD PERSIAN	103A0-103DF
1017	KHAROSHTHI	10A00-10A5F
1018	ANCIENT GREEK MUSICAL NOTATION	1D200-1D24F
2001	CJK UNIFIED IDEOGRAPHS EXTENSION B	20000-2A6DF
2002	CJK COMPATIBILITY IDEOGRAPHS SUPPLEMENT	2F800-2FA1F

3001	TAGS	E0000-E007F
3003	VARIATION SELECTORS SUPPLEMENT	E0100-E01EF *

The following collections specify characters used for alternate formats and script-specific formats. See annex F for more information.

200	ZERO-WIDTH BOUNDARY INDICATORS	200B-200D FEFF
201	FORMAT SEPARATORS	2028-2029
202	BI-DIRECTIONAL FORMAT MARKS	200E-200F
203	BI-DIRECTIONAL FORMAT EMBEDDINGS	202A-202E
204	HANGUL FILL CHARACTERS	3164, FFA0
205	CHARACTER SHAPING SELECTORS	206A-206D
206	NUMERIC SHAPE SELECTORS	206E-206F
207	IDEOGRAPHIC DESCRIPTION CHARACTERS	2FF0-2FFF
3002	ALTERNATE FORMAT CHARACTERS	E0000-E0FFF

The following specify other collections.

270	COMBINING CHARACTERS characters specified in annex B.1	
271	COMBINING CHARACTERS B-2 characters specified in annex B.2	
281	MES-1	see A.4.1 *
282	MES-2	see A.4.2 *
283	MODERN EUROPEAN SCRIPTS	see A.4.3 *
299	(This collection number shall not be used, see A.3.2.)	
300	BMP	0000-D7FF E000-FFFD
301	BMP-AMD.7	see A.3.1 *
302	BMP SECOND EDITION	see A.3.3 *
1000	SMP	10000-1FFFD
1900	SMP COMBINING CHARACTERS SMP characters specified in annex B.1	
2000	SIP	20000-2FFFD
3000	SSP	E0000-EFFFD

The following specify collections which are the union of particular collections defined above.

63	ALPHABETIC PRESENTATION FORMS	Collections 104-105
250	GENERAL FORMAT CHARACTERS	Collections 200-203
251	SCRIPT-SPECIFIC FORMAT CHARACTERS	Collections 204-206
4000	UCS PART-2	Collections 1000, 2000, 3000

The following collections contain characters both inside and outside the Basic Multilingual Plane.

303	UNICODE 3.1	see A6.1 *
304	UNICODE 3.2	see A6.2 *
305	UNICODE 4.0	see A6.3 *
306	UNICODE 4.1	see A6.4 *
340	COMBINED FIRST EDITION	see A5.1 *
370	IICORE	see A5.2 *
380	CJK UNIFIED IDEOGRAPHS-2001	3400-4DB5 * 4E00-9FA5 FA0E-FA0F FA11 FA13-FA14 FA1F FA21 FA23-FA24 FA27-FA29 20000-2A6D6
382	CJK UNIFIED IDEOGRAPHS-2005	collection 380 * 9FA6-9FBB
381	CJK COMPATIBILITY IDEOGRAPHS-2001 *	F900-FA0D FA10 FA12 FA15-FA1E FA20 FA22 FA25-FA26 FA2A-FA6A 2F800-2FA1D
383	CJK COMPATIBILITY IDEOGRAPHS-2005 *	collection 381 FA70-FAD9
10646	UNICODE	0000-FDCF FDF0-FFFD 10000-1FFFD 20000-2FFFD 30000-3FFFD 40000-4FFFD 50000-5FFFD 60000-6FFFD 70000-7FFFD 80000-8FFFD 90000-9FFFD A0000-AFFFD B0000-BFFFD C0000-CFFFD D0000-DFFFD E0000-EFFFD F0000-FFFFD 100000-10FFFD

NOTE 1 – The UNICODE collection incorporates all characters currently encoded in the standard.

The following collections are outside the Basic Multilingual Plane.

400	(This collection number shall not be used, see Note 3.)	
401	PRIVATE USE PLANES-0F-10	G=00, P=0F-10

500   (This collection number shall not be used, see Note 3.)

NOTE 2 – Use of implementation levels 1 and 2 restricts the repertoire of some character collections (see 24.5). Collections which include combining characters are 7, 10, 13 to 26, 35, 49, 50, 63, 65, 72, 73, 84, 85, 86, 87, 88, 89, 90, 91, 93, 94, 95, 96 ,104, 114, 115, 117, 126, 1005, 1017, and 1018.

NOTE 3 – Collections numbered 57, 58, and 59 were specified in the First Edition of ISO/IEC 10646-1 but have now been deleted. Collections numbered 400 and 500 were specified in the First and Second Editions of ISO/IEC 10646-1 but have now been deleted.

NOTE 4 – The principal terms (keywords) used in the collection names shown above are listed below in alphabetical order. The entry for a term shows the collection number of every collection whose name includes the term. These terms do not provide a complete cross-reference to all the collections where characters sharing a particular attribute, such as script name, may be found. Although most of the terms identify an attribute of the characters within the collection, some characters that possess that attribute may be present in other collections whose numbers do not appear in the entry for that term.

Aegean numbers	1009
Alphabetic	63
Alphanumeric	43
Ancient Greek	1015 1018
Arabic	14 15 64 68 112
Armenian	11
Arrows	38 98 99 110
Bengali	17
Bidirectional	202 203
Block elements	45
BMP	300 301 302 (299)
Box drawing	44
Bopomofo	52
Braille patterns	80
Buginese	115
Buhid	95
Byzantine musical symbols	1004
Canadian Aboriginal	74
Cherokee	75
CJK	49 54 55 56 60 62 66 78 81 124 2001 2002
Combining	7 35 65 117 270 271
Compatibility	53 56 62 66
Control pictures	41
Coptic	9 119
Currency	34
Cypriot syllabary	1013
Cyrillic	10 92
Deseret	1003
Devanagari	16
Diacritical marks	7 117 35
Dingbats	48
Enclosed	43 55
Ethiopic	73 113 122
Format	201 202 203 250 251
Fullwidth	69
Geometric shapes	46
Georgian	27 28 120
Glagolitic	118
Gothic	1002
Greek	8 9 31
Gujarati	19
Gurmukhi	18
Half (marks, width)	65 69

Hangul	29 53 71 204
Hanunoo	94
Hebrew	12 13
Hiragana	50
Ideographs	60 62 81 207 380 381
IPA extensions	5
Jamo	29 53
Kangxi	78
Kannada	23
Katakana	51 102
Kharoshthi	1017
Khmer	88 108
Lao	26
Latin	1 2 3 4 30
Letter	36 55
Limbu	106
Linear B syllabary	1007
Linear B ideograms	1008
Malayalam	24
Mathematical alphanumeric symbols	1006
Mathematical operators	39 101
Mathematical symbols	97 100
MES	281 282
Mongolian	89
Months	55
Musical notation	1018
Musical symbols	1005 1004
Myanmar	87 90
New Tai Lue	114
Number	37 1009 1015
Ogham	82
Old Italic	1001
Old Persian	1016
Optical character recognition	42
Oriya	20
Osmanya	1012
Phonetic extensions	109 116
Presentation forms	63 64 68 104 105
Private use	61 401
Punctuation	32 49 123
Radicals	77 78 79
Runic	83
Shape, shaping	205 206
Shavian	1011
Sinhala	84
Small form	67
Spacing modifier	6 125
Specials	70
Strokes	124
Subscripts, superscripts	33
Syllables, syllabics	71 74 76
Syloti Nagri	126
Symbols	9 34 35 36 47 49 97 100
Syriac	85
Tagalog	93
Tagbanwa	96
Tags	3001
Tai Xuan Jing symbols	1014
Tail Le	107
Tamil	21
Technical	40
Telugu	22
Thaana	86
Thai	25
Tibetan	72 91
Tifinagh	121
Ugaritic	1010
Unicode	303 304 305 306 10646
Variation selectors	103 3003
Vertical form	127

Yi	76 77
Yijing hexagram symbols	111
Zero-width	200

A.2 Blocks lists

A.2.1 Blocks in the BMP

The following blocks are specified in the Basic Multi-lingual Plane. They are ordered by code position.

Block name	from	to
BASIC LATIN	0020-007E	
LATIN-1 SUPPLEMENT	00A0-00FF	
LATIN EXTENDED-A	0100-017F	
LATIN EXTENDED-B	0180-024F	
IPA (INTERNATIONAL PHONETIC ALPHABET) EXTENSIONS	0250-02AF	
SPACING MODIFIER LETTERS	02B0-02FF	
COMBINING DIACRITICAL MARKS	0300-036F	
GREEK AND COPTIC	0370-03FF	
CYRILLIC	0400-04FF	
CYRILLIC SUPPLEMENT	0500-052F	
ARMENIAN	0530-058F	
HEBREW	0590-05FF	
ARABIC	0600-06FF	
SYRIAC	0700-074F	
ARABIC SUPPLEMENT	0750-077F	
THAANA	0780-07BF	
DEVANAGARI	0900-097F	
BENGALI	0980-09FF	
GURMUKHI	0A00-0A7F	
GUJARATI	0A80-0AFF	
ORIYA	0B00-0B7F	
TAMIL	0B80-0BFF	
TELUGU	0C00-0C7F	
KANNADA	0C80-0CFF	
MALAYALAM	0D00-0D7F	
SINHALA	0D80-0DFF	
THAI	0E00-0E7F	
LAO	0E80-0EFF	
TIBETAN	0F00-0FFF	
MYANMAR	1000-109F	
GEORGIAN	10A0-10FF	
HANGUL JAMO	1100-11FF	
ETHIOPIC	1200-137F	
ETHIOPIC SUPPLEMENT	1380-139F	
CHEROKEE	13A0-13FF	
UNIFIED CANADIAN ABORIGINAL SYLLABICS	1400-167F	
OGHAM	1680-169F	
RUNIC	16A0-16FF	
TAGALOG	1700-171F	
HANUNOO	1720-173F	
BUHID	1740-175F	
TAGBANWA	1760-177F	
KHMER	1780-17FF	
MONGOLIAN	1800-18AF	
LIMBU	1900-194F	
TAI LE	1950-197F	
NEW TAI LUE	1980-19DF	
KHMER SYMBOLS	19E0-19FF	
BUGINESE	1A00-1A1F	
PHONETIC EXTENSIONS	1D00-1D7F	
PHONETIC EXTENSIONS SUPPLEMENT	1D80-1DBF	

COMBINING DIACRITICAL MARKS SUPPLEMENT	1DC0-1DFF
LATIN EXTENDED ADDITIONAL	1E00-1EFF
GREEK EXTENDED	1F00-1FFF
GENERAL PUNCTUATION	2000-206F
SUPERSCRIPTS AND SUBSCRIPTS	2070-209F
CURRENCY SYMBOLS	20A0-20CF
COMBINING DIACRITICAL MARKS FOR SYMBOLS	20D0-20FF
LETTERLIKE SYMBOLS	2100-214F
NUMBER FORMS	2150-218F
ARROWS	2190-21FF
MATHEMATICAL OPERATORS	2200-22FF
MISCELLANEOUS TECHNICAL	2300-23FF
CONTROL PICTURES	2400-243F
OPTICAL CHARACTER RECOGNITION	2440-245F
ENCLOSED ALPHANUMERICS	2460-24FF
BOX DRAWING	2500-257F
BLOCK ELEMENTS	2580-259F
GEOMETRIC SHAPES	25A0-25FF
MISCELLANEOUS SYMBOLS	2600-26FF
DINGBATS	2700-27BF
MISCELLANEOUS MATHEMATICAL SYMBOLS-A	27C0-27EF
SUPPLEMENTAL ARROWS-A	27F0-27FF
BRAILLE PATTERNS	2800-28FF
SUPPLEMENTAL ARROWS-B	2900-297F
MISCELLANEOUS MATHEMATICAL SYMBOLS-B	2980-29FF
SUPPLEMENTAL MATHEMATICAL OPERATORS	2A00-2AFF
MISCELLANEOUS SYMBOLS AND ARROWS	2B00-2BFF
GLAGOLITIC	2C00-2C5F
COPTIC	2C80-2CFF
GEORGIAN SUPPLEMENT	2D00-2D2F
TIFINAGH	2D30-2D7F
ETHIOPIC EXTENDED	2D80-2DDF
SUPPLEMENTAL PUNCTUATION	2E00-2E7F
CJK RADICALS SUPPLEMENT	2E80-2EFF
KANGXI RADICALS	2F00-2FDF
IDEOGRAPHIC DESCRIPTION CHARACTERS	2FF0-2FFF
CJK SYMBOLS AND PUNCTUATION	3000-303F
HIRAGANA	3040-309F
KATAKANA	30A0-30FF
BOPOMOFO	3100-312F
HANGUL COMPATIBILITY JAMO	3130-318F
KANBUN (CJK miscellaneous)	3190-319F
BOPOMOFO EXTENDED	31A0-31BF
CJK STROKES	31C0-31EF
KATAKANA PHONETIC EXTENSIONS	31F0-31FF
ENCLOSED CJK LETTERS AND MONTHS	3200-32FF
CJK COMPATIBILITY	3300-33FF
CJK UNIFIED IDEOGRAPHS EXTENSION A	3400-4DBF
YIJING HEXAGRAM SYMBOLS	4DC0-4DFF
CJK UNIFIED IDEOGRAPHS	4E00-9FFF
YI SYLLABLES	A000-A48F
YI RADICALS	A490-A4CF
MODIFIER TONE LETTERS	A700-A71F
SYLOTI NAGRI	A800-A82F
HANGUL SYLLABLES	AC00-D7A3
PRIVATE USE AREA	E000-F8FF
CJK COMPATIBILITY IDEOGRAPHS	F900-FAFF

ALPHABETIC PRESENTATION FORMS	FB00-FB4F
ARABIC PRESENTATION FORMS-A	FB50-FDFF
VARIATION SELECTORS	FE00-FE0F
VERTICAL FORMS	FE10-FE1F
COMBINING HALF MARKS	FE20-FE2F
CJK COMPATIBILITY FORMS	FE30-FE4F
SMALL FORM VARIANTS	FE50-FE6F
ARABIC PRESENTATION FORMS-B	FE70-FEFE
HALFWIDTH AND FULLWIDTH FORMS	FF00-FFEF
SPECIALS	FFF0-FFFD

A.2.2   Blocks in the SMP

The following blocks are specified in the Supplementary Multilingual Plane for scripts and symbols. They are ordered by code position.

Block name	from	to
LINEAR B SYLLABARY	10000-1007F	
LINEAR B IDEOGRAMS	10080-100FF	
AEGEAN NUMBERS	10100-1013F	
ANCIENT GREEK NUMBERS	10140-1018F	
OLD ITALIC	10300-1032F	
GOTHIC	10330-1034F	
UGARITIC	10380-1039F	
OLD PERSIAN	103A0-103DF	
DESERET	10400-1044F	
SHAVIAN	10450-1047F	
OSMANYA	10480-104AF	
CYPRIOT SYLLABARY	10800-1083F	
KHAROSHTHI	10A00-10A5F	
BYZANTINE MUSICAL SYMBOLS	1D000-1D0FF	
MUSICAL SYMBOLS	1D100-1D1FF	
ANCIENT GREEK MUSICAL NOTATION	1D200-1D24F	
TAI XUAN JING SYMBOLS	1D300-1D35F	
MATHEMATICAL ALPHANUMERIC SYMBOLS	1D400-1D7FF	

A.2.3   Blocks in the SIP

The following blocks are specified in the Supplementary Ideographic Plane. They are ordered by code position.

Block name	from	to
CJK UNIFIED IDEOGRAPHS EXTENSION B	20000-2A6DF	
CJK COMPATIBILITY IDEOGRAPHS SUPPLEMENT	2F800-2FA1F	

A.2.4   Blocks in the SSP

The following blocks are specified in the Supplementary Special-purpose Plane. They are ordered by code position.

Block name	from	to
TAGS	E0000-E007F	
VARIATION SELECTORS SUPPLEMENT	E0100-E01EF	

A.3 Fixed collections of the whole BMP

A.3.1   301 BMP-AMD.7

The collection 301 BMP-AMD.7 is specified below as a fixed collection (see clause 4.20). It comprises only those coded characters that were in the BMP after amendments up to, but not after, AMD.7 were applied to the First Edition of ISO/IEC 10646-1. Accordingly the repertoire of this collection is not subject to change if new characters are added to the BMP by any subsequent amendments.

NOTE – The repertoire of the collection 300 BMP is subject to change if new characters are added to the BMP by an amendment to this International Standard.

301 BMP-AMD.7 is specified by the following ranges of code positions as indicated for each row or contiguous series of rows.

Rows	Positions (cells)
00	20-7E A0-FF
01	00-F5 FA-FF
02	00-17 50-A8 B0-DE E0-E9
03	00-45 60-61 74-75 7A 7E 84-8A 8C 8E-A1 A3-CE D0-D6 DA DC DE E0 E2-F3
04	01-0C 0E-4F 51-5C 5E-86 90-C4 C7-C8 CB-CC D0-EB EE-F5 F8-F9
05	31-56 59-5F 61-87 89 91-A1 A3-B9 BB-C4 D0-EA F0-F4
06	0C 1B 1F 21-3A 40-52 60-6D 70-B7 BA-BE C0-CE D0-ED F0-F9
09	01-03 05-39 3C-4D 50-54 58-70 81-83 85-8C 8F-90 93-A8 AA-B0 B2 B6-B9 BC BE-C4 C7-C8 CB-CD D7 DC-DD DF-E3 E6-FA
0A	02 05-0A 0F-10 13-28 2A-30 32-33 35-36 38-39 3C 3E-42 47-48 4B-4D 59-5C 5E 66-74 81-83 85-8B 8D 8F-91 93-A8 AA-B0 B2-B3 B5-B9 BC-C5 C7-C9 CB-CD D0 E0 E6-EF
0B	01-03 05-0C 0F-10 13-28 2A-30 32-33 36-39 3C-43 47-48 4B-4D 56-57 5C-5D 5F-61 66-70 82-83 85-8A 8E-90 92-95 99-9A 9C 9E-9F A3-A4 A8-AA AE-B5 B7-B9 BE-C2 C6-C8 CA-CD D7 E7-F2
0C	01-03 05-0C 0E-10 12-28 2A-33 35-39 3E-44 46-48 4A-4D 55-56 60-61 66-6F 82-83 85-8C 8E-90 92-A8 AA-B3 B5-B9 BE-C4 C6-C8 CA-CD D5-D6 DE E0-E1 E6-EF
0D	02-03 05-0C 0E-10 12-28 2A-39 3E-43 46-48 4A-4D 57 60-61 66-6F
0E	01-3A 3F-5B 81-82 84 87-88 8A 8D 94-97 99-9F A1-A3 A5 A7 AA-AB AD-B9 BB-BD C0-C4 C6 C8-CD D0-D9 DC-DD
0F	00-47 49-69 71-8B 90-95 97 99-AD B1-B7 B9
10	A0-C5 D0-F6 FB
11	00-59 5F-A2 A8-F9
1E	00-9B A0-F9
1F	00-15 18-1D 20-45 48-4D 50-57 59 5B 5D 5F-7D 80-B4 B6-C4 C6-D3 D6-DB DD-EF F2-F4 F6-FE
20	00-2E 30-46 6A-70 74-8E A0-AB D0-E1
21	00-38 53-82 90-EA
22	00-F1
23	00 02-7A
24	00-24 40-4A 60-EA
25	00-95 A0-EF
26	00-13 1A-6F
27	01-04 06-09 0C-27 29-4B 4D 4F-52 56 58-5E 61-67 76-94 98-AF B1-BE
30	00-37 3F 41-94 99-9E A1-FE
31	05-2C 31-8E 90-9F

32	00-1C 20-43 60-7B 7F-B0 C0-CB D0-FE
33	00-76 7B-DD E0-FE
4E-9F	4E00-9FA5
AC-D7	AC00-D7A3
E0-F8	E000-F8FF
F9-FA	F900-FA2D
FB	00-06 13-17 1E-36 38-3C 3E 40-41 43-44 46-B1 D3-FF
FC	00-FF
FD	00-3F 50-8F 92-C7 F0-FB
FE	20-23 30-44 49-52 54-66 68-6B 70-72 74 76-FC FF
FF	01-5E 61-BE C2-C7 CA-CF D2-D7 DA-DC E0-E6 E8-EE FD

A.3.2   299 BMP FIRST EDITION

The collection number and collection name 299 BMP FIRST EDITION have been reserved to identify the fixed collection comprising all of the coded characters that were in the BMP in the First Edition of ISO/IEC 10646-1. This collection is not now in conformity with this International Standard.

> NOTE – The specification of collection 299 BMP FIRST EDITION consisted of the specification of collection 301 BMP-AMD.7 except for the replacement of the corresponding entries in the list above with the entries shown below:
>
> | rows | positions |
> |---|---|
> | 05 | 31-56 59-5F 61-87 89 B0-B9 BB-C3 D0-EA F0-F4 |
> | 0F | [no positions] |
> | 1E | 00-9A A0-F9 |
> | 20 | 00-2E 30-46 6A-70 74-8E A0-AA D0-E1 |
> | AC-D7 | [no positions] |
>
> and by including an additional entry:
>
> | | |
> |---|---|
> | 34-4D | 3400-4DFF |
>
> for the code position ranges of three collections (57, 58, 59) of coded characters which have been deleted from this International Standard since the First Edition of IO/IEC 10646-1.

A.3.3   302 BMP SECOND EDITION

The fixed collection 302 BMP SECOND EDITION comprises only those coded characters that are in the BMP in the Second Edition of ISO/IEC 10646-1. The repertoire of this collection is not subject to change if new characters are added to the BMP by any subsequent amendments.

302 BMP SECOND EDITION is specified by the following ranges of code positions as indicated for each row or contiguous series of rows.

Rows	Positions (cells)
00	20-7E A0-FF
01	00-FF
02	00-1F 22-33 50-AD B0-EE
03	00-4E 60-62 74-75 7A 7E 84-8A 8C 8E-A1 A3-CE D0-D7 DA-F3
04	00-86 88-89 8C-C4 C7-C8 CB-CC D0-F5 F8-F9
05	31-56 59-5F 61-87 89-8A 91-A1 A3-B9 BB-C4 D0-EA F0-F4
06	0C 1B 1F 21-3A 40-55 60-6D 70-ED F0-FE
07	00-0D 0F-2C 30-4A 80-B0

09	01-03 05-39 3C-4D 50-54 58-70 81-83 85-8C 8F-90 93-A8 AA-B0 B2 B6-B9 BC BE-C4 C7-C8 CB-CD D7 DC-DD DF-E3 E6-FA
0A	02 05-0A 0F-10 13-28 2A-30 32-33 35-36 38-39 3C 3E-42 47-48 4B-4D 59-5C 5E 66-74 81-83 85-8B 8D 8F-91 93-A8 AA-B0 B2-B3 B5-B9 BC-C5 C7-C9 CB-CD D0 E0 E6-EF
0B	01-03 05-0C 0F-10 13-28 2A-30 32-33 36-39 3C-43 47-48 4B-4D 56-57 5C-5D 5F-61 66-70 82-83 85-8A 8E-90 92-95 99-9A 9C 9E-9F A3-A4 A8-AA AE-B5 B7-B9 BE-C2 C6-C8 CA-CD D7 E7-F2
0C	01-03 05-0C 0E-10 12-28 2A-33 35-39 3E-44 46-48 4A-4D 55-56 60-61 66-6F 82-83 85-8C 8E-90 92-A8 AA-B3 B5-B9 BE-C4 C6-C8 CA-CD D5-D6 DE E0-E1 E6-EF
0D	02-03 05-0C 0E-10 12-28 2A-39 3E-43 46-48 4A-4D 57 60-61 66-6F 82-83 85-96 9A-B1 B3-BB BD C0-C6 CA CF-D4 D6 D8-DF F2-F4
0E	01-3A 3F-5B 81-82 84 87-88 8A 8D 94-97 99-9F A1-A3 A5 A7 AA-AB AD-B9 BB-BD C0-C4 C6 C8-CD D0-D9 DC-DD
0F	00-47 49-6A 71-8B 90-97 99-BC BE-CC CF
10	00-21 23-27 29-2A 2C-32 36-39 40-59 A0-C5 D0-F6 FB
11	00-59 5F-A2 A8-F9
12	00-06 08-46 48 4A-4D 50-56 58 5A-5D 60-86 88 8A-8D 90-AE B0 B2-B5 B8-BE C0 C2-C5 C8-CE D0-D6 D8-EE F0-FF
13	00-0E 10 12-15 18-1E 20-46 48-5A 61-7C A0-F4
14-15	1401-15FF
16	00-76 80-9C A0-F0
17	80-DC E0-E9
18	00-0E 10-19 20-77 80-A9
1E	00-9B A0-F9
1F	00-15 18-1D 20-45 48-4D 50-57 59 5B 5D 5F-7D 80-B4 B6-C4 C6-D3 D6-DB DD-EF F2-F4 F6-FE
20	00-46 48-4D 6A-70 74-8E A0-AF D0-E3
21	00-3A 53-83 90-F3
22	00-F1
23	00-7B 7D-9A
24	00-26 40-4A 60-EA
25	00-95 A0-F7
26	00-13 19-71
27	01-04 06-09 0C-27 29-4B 4D 4F-52 56 58-5E 61-67 76-94 98-AF B1-BE
28	00-FF
2E	80-99 9B-F3
2F	00-D5 F0-FB
30	00-3A 3E-3F 41-94 99-9E A1-FE
31	05-2C 31-8E 90-B7
32	00-1C 20-43 60-7B 7F-B0 C0-CB D0-FE
33	00-76 7B-DD E0-FE
34-4D	3400-4DB5
4E-9F	4E00-9FA5
A0-A3	A000-A3FF
A4	00-8C 90-A1 A4-B3 B5-C0 C2-C4 C6
AC-D7	AC00-D7A3
E0-F8	E000-F8FF
F9-FA	F900-FA2D
FB	00-06 13-17 1D-36 38-3C 3E 40-41 43-44 46-B1 D3-FF
FC	00-FF
FD	00-3F 50-8F 92-C7 F0-FB

FE	20-23 30-44 49-52 54-66 68-6B 70-72 74 76-FC FF
FF	01-5E 61-BE C2-C7 CA-CF D2-D7 DA-DC E0-E6 E8-EE F9-FD

A.4 Other collections within the BMP

The collections specified within this clause are entirely within Plane 00.

> NOTE – The acronym MES indicates Multilingual European Subset.

A.4.1   281 MES-1

281   The fixed collection MES-1 is specified by the following ranges of code positions as indicated for each row.

Rows	Positions (cells)
00	20-7E A0-FF
01	00-13 16-2B 2E-4D 50-7E
02	C7 D8-DB DD
20	15 18-19 1C-1D AC
21	22 26 5B-5E 90-93
26	6A

A.4.2   282 MES-2

282   The fixed collection MES-2 is specified by the following ranges of code positions as indicated for each row.

Rows	Positions (cells)
00	20-7E A0-FF
01	00-7F 8F 92 B7 DE-EF FA-FF
02	18-1B 1E-1F 59 7C 92 BB-BD C6-C7 C9 D8-DD EE
03	74-75 7A 7E 84-8A 8C 8E-A1 A3-CE D7 DA-E1
04	00-5F 90-C4 C7-C8 CB-CC D0-EB EE-F5 F8-F9
1E	02-03 0A-0B 1E-1F 40-41 56-57 60-61 6A-6B 80-85 9B F2-F3
1F	00-15 18-1D 20-45 48-4D 50-57 59 5B 5D 5F-7D 80-B4 B6-C4 C6-D3 D6-DB DD-EF F2-F4 F6-FE
20	13-15 17-1E 20-22 26 30 32-33 39-3A 3C 3E 44 4A 7F 82 A3-A4 A7 AC AF
21	05 16 22 26 5B-5E 90-95 A8
22	00 02-03 06 08-09 0F 11-12 19-1A 1E-1F 27-2B 48 59 60-61 64-65 82-83 95 97
23	02 10 20-21 29-2A
25	00 02 0C 10 14 18 1C 24 2C 34 3C 50-6C 80 84 88 8C 90-93 A0 AC B2 BA BC C4 CA-CB D8-D9
26	3A-3C 40 42 60 63 65-66 6A-6B
FB	01-02
FF	FD

A.4.3   283 MODERN EUROPEAN SCRIPTS

283   The collection MODERN EUROPEAN SCRIPTS is specified by the following collections:

Collection number and name	
1	BASIC LATIN
2	LATIN-1 SUPPLEMENT
3	LATIN EXTENDED-A
4	LATIN EXTENDED-B
5	IPA EXTENSIONS
6	SPACING MODIFIER LETTERS
7	COMBINING DIACRITICAL MARKS
8	BASIC GREEK
9	GREEK SYMBOLS AND COPTIC
10	CYRILLIC
11	ARMENIAN
27	BASIC GEORGIAN
30	LATIN EXTENDED ADDITIONAL
31	GREEK EXTENDED
32	GENERAL PUNCTUATION
33	SUPERSCRIPTS AND SUBSCRIPTS
34	CURRENCY SYMBOLS
35	COMBINING DIACRITICAL MARKS FOR SYMBOLS
36	LETTERLIKE SYMBOLS
37	NUMBER FORMS
38	ARROWS
39	MATHEMATICAL OPERATORS
40	MISCELLANEOUS TECHNICAL
42	OPTICAL CHARACTER RECOGNITION
44	BOX DRAWING
45	BLOCK ELEMENTS
46	GEOMETRIC SHAPES
47	MISCELLANEOUS SYMBOLS
65	COMBINING HALF MARKS
70	SPECIALS
92	CYRILLIC SUPPLEMENT
104	LTR ALPHABETIC PRESENTATION FORMS

A.5 Fixed collections encompassing several planes

A.5.1   340 COMBINED FIRST EDITION

The collection 340 COMBINED FIRST EDITION is specified below as a fixed collection. It comprises only those coded characters that were in the First Edition of 10646:2003 and consists of collections from clause A.1 and A.3 and several ranges of code positions. The collection list is arranged by planes as follows.

Plane 00

Collection number and name	
302	BMP SECOND EDITION
98	SUPPLEMENTAL ARROWS-A
99	SUPPLEMENTAL ARROWS-B
100	MISCELLANEOUS MATHEMATICAL SYMBOLS-B
101	SUPPLEMENTAL MATHEMATICAL OPERATORS
102	KATAKANA PHONETIC EXTENSIONS
103	VARIATION SELECTORS
108	KHMER SYMBOLS
111	YIJING HEXAGRAM SYMBOLS

Row	Positions (cells)
02	20-21 34-36 AE-AF EF-FF
03	4F-57 5D-5F 63-6F D8-D9 F4-FB
04	8A-8B C5-C6 C9-CA CD-CE
05	00-0F
06	00-03 0D-15 56-58 6E-6F EE-EF FF
07	2D-2F 4D-4F B1
09	04 BD
0A	01 03 8C E1-E3 F1
0B	35 71 F3-FA
0C	BC-BD

10	F7-F8
17	00-0C 0E-14 20-36 40-53 60-6C 6E-70 72-73 DD F0-F9
19	00-1C 20-2B 30-3B 40 44-4F 50-6D 70-74
1D	00-6B
20	47 4E-54 57 5F-63 71 B0-B1 E4-EA
21	3B 3D-4B F4-FF
22	F2-FF
23	7C 9B-D0
24	EB-FF
25	96-9F F8-FF
26	14-17 72-7D 80-91 A0-A1
27	68-75 D0-EB
2B	00-0D
30	3B-3D 95-96 9F-A0 FF
32	1D-1E 50-5F 7C-7D B1-BF CC-CF
33	77-7A DE-DF FF
A4	A2-A3 B4 C1 C5
FA	30-6A
FD	FC-FD
FE	45-48 73
FF	5F-60

Plane 01

Collection number and name

1003	DESERET
1011	SHAVIAN

Rows	Positions
00	00-0B 0D-26 28-3A 3C-3D 3F-4D 50-5D 80-FA
01	00-02 07-33 37-3F
03	80-9D 9F
04	80-9D A0-A9
08	00-05 08 0A-35 37-38 3C 3F
D0	00-F5
D1	00-26 2A-DD
D3	00-56
D4	C1
D4	00-54 56-9C 9E-9F A2 A5-A6 A9-AC AE-B9 BB BD-C3 C5-FF
D5	00-05 07-0A 0D-14 16-1C 1E-39 3B-3E 40-44 46 4A-50 52-FF
D6	00-A3 A8-FF
D7	00-C9 CE-FF

Plane 02

Row	Positions (cells)
00-A6	0000-A6D6
F8-FA	F800-FA1D

Plane 0E

Collection number and name

3003	VARIATION SELECTORS SUPPLEMENT

Row	Positions (cells)
00	01 20-7F

Plane 0F

Row	Positions (cells)
00-FF	0000-FFFD

Plane 10

Row	Positions (cells)
00-FF	0000-FFFD

A.5.2   370 IICORE

370   The fixed collection IICORE is the International Core subset of the CJK UNIFIED IDEOGRAPHS-2001 collection.

NOTE 1 – Given its large size (9810 characters) and the large number of sparse ranges, the collection is not specified by Rows/positions but instead by a linked content.

The content linked to is a plain text file, using ISO/IEC 646-IRV characters with LINE FEED as end of line mark, that specifies, after a 11-lines header, as many lines as IICORE characters; each containing the following information in fixed length field:

- 1st field: BMP or SIP code position (`0hhhh`), (`2hhhh`), normative.

- 2nd field: Hanzi G usage identifier (`G0a`), (`G1a`), (`G3a`), (`G5a`), (`G7a`), (`G8a`), (`G9a`), or (`GEa`), informative.

- 3rd field: Hanzi T usage identifier (`T1a`), (`T2a`), (`T3a`), (`T4a`), (`T5a`) or (`TFa`), informative.

- 4th field: Kanji J usage identifier (`J1A`), informative.

- 5th field: Hanzi H usage identifier (`H1a`), informative.

- 6th field: Hanja K usage identifier (`K0a`), (`K1a`), (`K2a`) or (`K3a`), informative.

- 7th field: Hanzi M (for Macao SAR) usage identifier(`M1a`), informative.

- 8th field: Hanja KP usage identifier (`P0a`), informative.

- 9th field: General category, informative (`A`, `B` or `C` in decreasing order of priority).

NOTE 2 – The usage information provided in this subclause describes the usage and priority level of individual IICORE characters in the context of each source (G, T, J, H, K, M, and KP). This should not be confused with the source references for CJK Ideographs in clause 27 which establish the identity of all CJK Ideographs.

Click on this highlighted text to access the reference file.

NOTE 3 – The content is also available as a separate viewable file in the same file directory as this document. The file is named: "IICORE.txt".

A.6 Unicode collections

These collections correspond to various versions of the Unicode Standard. They include characters from the BMP as well as Supplementary planes.

> NOTE – Unicode 2.0 corresponds to collection 301. Unicode 2.1 adds the code positions 20AC EURO SIGN and FFFC OBJECT REPLACEMENT CHARACTER to the collection 301. Unicode 3.0 corresponds to collection 302.

A.6.1   303 UNICODE 3.1

303   The fixed collection UNICODE 3.1 consists of collections from clause A.3 and several ranges of code positions. The collection list is arranged by planes as follows.

Plane 00

Collection number and name
302   BMP SECOND EDITION

Row	Positions (cells)
03	F4-F5

Plane 01

Row	Positions (cells)
03	00-1E 20-23 30-4A
04	00-25 28-4D
D0	00-F5
D1	00-26 2A-DD
D4	00-54 56-9C 9E-9F A2 A5-A6 A9-AC AE-B9 BB BD-C0 C2-C3 C5-FF
D5	00-05 07-0A 0D-14 16-1C 1E-39 3B-3E 40-44 46 4A-50 52-FF
D6	00-A3 A8-FF
D7	00-C9 CE-FF

Plane 02

Row	Positions (cells)
00-A6	0000-A6D6
F8-FA	F800-FA1D

Plane 0E

Row	Positions (cells)
00	01 20-7F

Plane 0F

Row	Positions (cells)
00-FF	0000-FFFD

Plane 10

Row	Positions (cells)
00-FF	0000-FFFD

A.6.2   304 UNICODE 3.2

304 The fixed collection UNICODE 3.2 consists of fixed collections from clause A.1 and A.6 and several ranges of code positions arranged by planes as follows.

Planes 00-10

Collection number and name
303   UNICODE 3.1

Plane 00

Collection number and name
98   SUPPLEMENTAL ARROWS-A
99   SUPPLEMENTAL ARROWS-B
100   MISCELLANEOUS MATHEMATICAL SYMBOLS-B
101   SUPPLEMENTAL MATHEMATICAL OPERATORS
102   KATAKANA PHONETIC EXTENSIONS
103   VARIATION SELECTORS

Rows	Positions (cells)
02	20
03	4F 63-6F D8-D9 F6
04	8A-8B C5-C6 C9-CA CD-CE
05	00-0F
06	6E-6F
07	B1
10	F7-F8
17	00-0C 0E-14 20-36 40-53 60-6C 6E-70 72-73
20	47 4E-52 57 5F-63 71 B0-B1 E4-EA
21	3D-4B F4-FF
22	F2-FF
23	7C 9B-CE
24	EB-FE
25	96-9F F8-FF
26	16-17 72-7D 80-89
27	68-75 D0-EB
30	3B-3D 95-96 9F-A0 FF
32	51-5F B1-BF
A4	A2-A3 B4 C1 C5
FA	30-6A
FE	45-46 73
FF	5F-60

A.6.3   305 UNICODE 4.0

305   The fixed collection UNICODE 4.0 is identical to the fixed collection 340 COMBINED FIRST EDITION.

A.6.4   306 UNICODE 4.1

306   The fixed collection UNICODE 4.1 consists of a fixed collection from A.6 and several ranges of code positions. The collection list is arranged by planes as follows.

Plane 00-10

Collection number and name
305   UNICODE 4.0

Plane 00

Row	Positions (cells)
02	37-41
03	58-5C FC-FF
04	F6-F7
05	A2 C5-C7
06	0B 1E 59-5E
07	50-6D
09	7D CE

0B	B6 E6
0F	D0-D1
10	F9-FA FC
12	07 47 87 AF CF EF
13	0F 1F 47 5F-60 80-99
19	80-A9 B0-C9 D0-D9 DE-DF
1A	00-1B 1E-1F
1D	6C-C3
20	55-56 58-5E 90-94 B2-B5 EB
21	3C 4C
23	D1-DB
26	18 7E-7F 92-9C A2-B1
27	C0-C6
2B	0E-13
2C	00-2E 30-5E 80-EA F9-FF
2D	00-25 30-65 6F 80-96 A0-A6 A8-AE B0-B6 B8-BE C0-C6 C8-CE D0-D6 D8-DE
2E	00-17 1C-1D
31	C0-CF

32	7E
9F	A6-BB
A7	00-16
A8	00-2B
FA	70-D9
FE	10-19

Plane 01

Row	Positions (cells)
01	40-8A
03	A0-C3 C8-D5
0A	00-03 05-06 0C-13 15-17 19-33 38-3A 3F-47 50-58
D2	00-45
D6	A4-A5

Annex B
(normative)

List of combining characters

B.1 List of all combining characters

The characters in the collections:

- COMBINING DIACRITICAL MARKS (0300-036F), COMBINING DIACRITICAL MARKS SUPPLEMENT (1DC0-1DFF),
- COMBINING DIACRITICAL MARKS FOR SYMBOLS (20D0-20FF),
- VARIATION SELECTORS (FE00-FE0F),
- COMBINING HALF MARKS (FE20-FE2F), and
- VARIATION SELECTORS SUPPLEMENT (E0100-E01EF)

are combining characters. In addition, the following characters are combining characters.

0483	COMBINING CYRILLIC TITLO
0484	COMBINING CYRILLIC PALATALIZATION
0485	COMBINING CYRILLIC DASIA PNEUMATA
0486	COMBINING CYRILLIC PSILI PNEUMATA
0488	COMBINING CYRILLIC HUNDRED THOUSANDS SIGN
0489	COMBINING CYRILLIC MILLIONS SIGN
0591	HEBREW ACCENT ETNAHTA
0592	HEBREW ACCENT SEGOL
0593	HEBREW ACCENT SHALSHELET
0594	HEBREW ACCENT ZAQEF QATAN
0595	HEBREW ACCENT ZAQEF GADOL
0596	HEBREW ACCENT TIPEHA
0597	HEBREW ACCENT REVIA
0598	HEBREW ACCENT ZARQA
0599	HEBREW ACCENT PASHTA
059A	HEBREW ACCENT YETIV
059B	HEBREW ACCENT TEVIR
059C	HEBREW ACCENT GERESH
059D	HEBREW ACCENT GERESH MUQDAM
059E	HEBREW ACCENT GERSHAYIM
059F	HEBREW ACCENT QARNEY PARA
05A0	HEBREW ACCENT TELISHA GEDOLA
05A1	HEBREW ACCENT PAZER
05A2	HEBREW ACCENT ATNAH HAFUKH
05A3	HEBREW ACCENT MUNAH
05A4	HEBREW ACCENT MAHAPAKH
05A5	HEBREW ACCENT MERKHA
05A6	HEBREW ACCENT MERKHA KEFULA
05A7	HEBREW ACCENT DARGA
05A8	HEBREW ACCENT QADMA
05A9	HEBREW ACCENT TELISHA QETANA
05AA	HEBREW ACCENT YERAH BEN YOMO
05AB	HEBREW ACCENT OLE
05AC	HEBREW ACCENT ILUY
05AD	HEBREW ACCENT DEHI
05AE	HEBREW ACCENT ZINOR

05AF	HEBREW MARK MASORA CIRCLE
05B0	HEBREW POINT SHEVA
05B1	HEBREW POINT HATAF SEGOL
05B2	HEBREW POINT HATAF PATAH
05B3	HEBREW POINT HATAF QAMATS
05B4	HEBREW POINT HIRIQ
05B5	HEBREW POINT TSERE
05B6	HEBREW POINT SEGOL
05B7	HEBREW POINT PATAH
05B8	HEBREW POINT QAMATS
05B9	HEBREW POINT HOLAM
05BB	HEBREW POINT QUBUTS
05BC	HEBREW POINT DAGESH OR MAPIQ
05BD	HEBREW POINT METEG
05BF	HEBREW POINT RAFE
05C1	HEBREW POINT SHIN DOT
05C2	HEBREW POINT SIN DOT
05C4	HEBREW MARK UPPER DOT
05C5	HEBREW MARK LOWER DOT
05C7	HEBREW POINT QAMATS QATAN
0610	ARABIC SIGN SALLALLAHOU ALAYHE WASALLAM
0611	ARABIC SIGN ALAYHE ASSALAM
0612	ARABIC SIGN RAHMATULLAH ALAYHE
0613	ARABIC SIGN RADI ALLAHOU ANHU
0614	ARABIC SIGN TAKHALLUS
0615	ARABIC SMALL HIGH TAH
064B	ARABIC FATHATAN
064C	ARABIC DAMMATAN
064D	ARABIC KASRATAN
064E	ARABIC FATHA
064F	ARABIC DAMMA
0650	ARABIC KASRA
0651	ARABIC SHADDA
0652	ARABIC SUKUN
0653	ARABIC MADDAH ABOVE
0654	ARABIC HAMZA ABOVE
0655	ARABIC HAMZA BELOW
0656	ARABIC SUBSCRIPT ALEF
0657	ARABIC INVERTED DAMMA
0658	ARABIC NOON GHUNNA
0659	ARABIC ZWARAKAY
065A	ARABIC VOWEL SIGN SMALL V ABOVE
065B	ARABIC VOWEL SIGN INVERTED SMALL V ABOVE
065C	ARABIC VOWEL SIGN DOT BELOW
065D	ARABIC REVERSED DAMMA
065E	ARABIC FATHA WITH TWO DOTS
0670	ARABIC LETTER SUPERSCRIPT ALEF
06D7	ARABIC SMALL HIGH LIGATURE QAF WITH LAM WITH ALEF MAKSURA
06D8	ARABIC SMALL HIGH MEEM INITIAL FORM
06D9	ARABIC SMALL HIGH LAM ALEF

06DA	ARABIC SMALL HIGH JEEM		0941	DEVANAGARI VOWEL SIGN U
06DB	ARABIC SMALL HIGH THREE DOTS		0942	DEVANAGARI VOWEL SIGN UU
06DC	ARABIC SMALL HIGH SEEN		0943	DEVANAGARI VOWEL SIGN VOCALIC R
06DE	ARABIC START OF RUB EL HIZB		0944	DEVANAGARI VOWEL SIGN VOCALIC RR
06DF	ARABIC SMALL HIGH ROUNDED ZERO		0945	DEVANAGARI VOWEL SIGN CANDRA E
06E0	ARABIC SMALL HIGH UPRIGHT RECTANGULAR ZERO		0946	DEVANAGARI VOWEL SIGN SHORT E
06E1	ARABIC SMALL HIGH DOTLESS HEAD OF KHAH		0947	DEVANAGARI VOWEL SIGN E
06E2	ARABIC SMALL HIGH MEEM ISOLATED FORM		0948	DEVANAGARI VOWEL SIGN AI
06E3	ARABIC SMALL LOW SEEN		0949	DEVANAGARI VOWEL SIGN CANDRA O
06E4	ARABIC SMALL HIGH MADDA		094A	DEVANAGARI VOWEL SIGN SHORT O
06E7	ARABIC SMALL HIGH YEH		094B	DEVANAGARI VOWEL SIGN O
06E8	ARABIC SMALL HIGH NOON		094C	DEVANAGARI VOWEL SIGN AU
06EA	ARABIC EMPTY CENTRE LOW STOP		094D	DEVANAGARI SIGN VIRAMA
06EB	ARABIC EMPTY CENTRE HIGH STOP		0951	DEVANAGARI STRESS SIGN UDATTA
06EC	ARABIC ROUNDED HIGH STOP WITH FILLED CENTRE		0952	DEVANAGARI STRESS SIGN ANUDATTA
			0953	DEVANAGARI GRAVE ACCENT
06ED	ARABIC SMALL LOW MEEM		0954	DEVANAGARI ACUTE ACCENT
0711	SYRIAC LETTER SUPERSCRIPT ALAPH		0962	DEVANAGARI VOWEL SIGN VOCALIC L
0730	SYRIAC PTHAHA ABOVE		0963	DEVANAGARI VOWEL SIGN VOCALIC LL
0731	SYRIAC PTHAHA BELOW		0981	BENGALI SIGN CANDRABINDU
0732	SYRIAC PTHAHA DOTTED		0982	BENGALI SIGN ANUSVARA
0733	SYRIAC ZQAPHA ABOVE		0983	BENGALI SIGN VISARGA
0734	SYRIAC ZQAPHA BELOW		09BC	BENGALI SIGN NUKTA
0735	SYRIAC ZQAPHA DOTTED		09BE	BENGALI VOWEL SIGN AA
0736	SYRIAC RBASA ABOVE		09BF	BENGALI VOWEL SIGN I
0737	SYRIAC RBASA BELOW		09C0	BENGALI VOWEL SIGN II
0738	SYRIAC DOTTED ZLAMA HORIZONTAL		09C1	BENGALI VOWEL SIGN U
0739	SYRIAC DOTTED ZLAMA ANGULAR		09C2	BENGALI VOWEL SIGN UU
073A	SYRIAC HBASA ABOVE		09C3	BENGALI VOWEL SIGN VOCALIC R
073B	SYRIAC HBASA BELOW		09C4	BENGALI VOWEL SIGN VOCALIC RR
073C	SYRIAC HBASA-ESASA DOTTED		09C7	BENGALI VOWEL SIGN E
073D	SYRIAC ESASA ABOVE		09C8	BENGALI VOWEL SIGN AI
073E	SYRIAC ESASA BELOW		09CB	BENGALI VOWEL SIGN O
073F	SYRIAC RWAHA		09CC	BENGALI VOWEL SIGN AU
0740	SYRIAC FEMININE DOT		09CD	BENGALI SIGN VIRAMA
0741	SYRIAC QUSHSHAYA		09D7	BENGALI AU LENGTH MARK
0742	SYRIAC RUKKAKHA		09E2	BENGALI VOWEL SIGN VOCALIC L
0743	SYRIAC TWO VERTICAL DOTS ABOVE		09E3	BENGALI VOWEL SIGN VOCALIC LL
0744	SYRIAC TWO VERTICAL DOTS BELOW		0A01	GURMUKHI SIGN ADAK BINDI
0745	SYRIAC THREE DOTS ABOVE		0A02	GURMUKHI SIGN BINDI
0746	SYRIAC THREE DOTS BELOW		0A03	GURMUKHI SIGN VISARGA
0747	SYRIAC OBLIQUE LINE ABOVE		0A3C	GURMUKHI SIGN NUKTA
0748	SYRIAC OBLIQUE LINE BELOW		0A3E	GURMUKHI VOWEL SIGN AA
0749	SYRIAC MUSIC		0A3F	GURMUKHI VOWEL SIGN I
074A	SYRIAC BARREKH		0A40	GURMUKHI VOWEL SIGN II
07A6	THAANA ABAFILI		0A41	GURMUKHI VOWEL SIGN U
07A7	THAANA AABAAFILI		0A42	GURMUKHI VOWEL SIGN UU
07A8	THAANA IBIFILI		0A47	GURMUKHI VOWEL SIGN EE
07A9	THAANA EEBEEFILI		0A48	GURMUKHI VOWEL SIGN AI
07AA	THAANA UBUFILI		0A4B	GURMUKHI VOWEL SIGN OO
07AB	THAANA OOBOOFILI		0A4C	GURMUKHI VOWEL SIGN AU
07AC	THAANA EBEFILI		0A4D	GURMUKHI SIGN VIRAMA
07AD	THAANA EYBEYFILI		0A70	GURMUKHI TIPPI
07AE	THAANA OBOFILI		0A71	GURMUKHI ADDAK
07AF	THAANA OABOAFILI		0A81	GUJARATI SIGN CANDRABINDU
07B0	THAANA SUKUN		0A82	GUJARATI SIGN ANUSVARA
0901	DEVANAGARI SIGN CANDRABINDU		0A83	GUJARATI SIGN VISARGA
0902	DEVANAGARI SIGN ANUSVARA		0ABC	GUJARATI SIGN NUKTA
0903	DEVANAGARI SIGN VISARGA		0ABE	GUJARATI VOWEL SIGN AA
093C	DEVANAGARI SIGN NUKTA		0ABF	GUJARATI VOWEL SIGN I
093E	DEVANAGARI VOWEL SIGN AA		0AC0	GUJARATI VOWEL SIGN II
093F	DEVANAGARI VOWEL SIGN I		0AC1	GUJARATI VOWEL SIGN U
0940	DEVANAGARI VOWEL SIGN II		0AC2	GUJARATI VOWEL SIGN UU
			0AC3	GUJARATI VOWEL SIGN VOCALIC R

0AC4	GUJARATI VOWEL SIGN VOCALIC RR		0CBF	KANNADA VOWEL SIGN I
0AC5	GUJARATI VOWEL SIGN CANDRA E		0CC0	KANNADA VOWEL SIGN II
0AC7	GUJARATI VOWEL SIGN E		0CC1	KANNADA VOWEL SIGN U
0AC8	GUJARATI VOWEL SIGN AI		0CC2	KANNADA VOWEL SIGN UU
0AC9	GUJARATI VOWEL SIGN CANDRA O		0CC3	KANNADA VOWEL SIGN VOCALIC R
0ACB	GUJARATI VOWEL SIGN O		0CC4	KANNADA VOWEL SIGN VOCALIC RR
0ACC	GUJARATI VOWEL SIGN AU		0CC6	KANNADA VOWEL SIGN E
0ACD	GUJARATI SIGN VIRAMA		0CC7	KANNADA VOWEL SIGN EE
0AE2	GUJARATI VOWEL SIGN VOCALIC L		0CC8	KANNADA VOWEL SIGN AI
0AE3	GUJARATI VOWEL SIGN VOCALIC LL		0CCA	KANNADA VOWEL SIGN O
0B01	ORIYA SIGN CANDRABINDU		0CCB	KANNADA VOWEL SIGN OO
0B02	ORIYA SIGN ANUSVARA		0CCC	KANNADA VOWEL SIGN AU
0B03	ORIYA SIGN VISARGA		0CCD	KANNADA SIGN VIRAMA
0B3C	ORIYA SIGN NUKTA		0CD5	KANNADA LENGTH MARK
0B3E	ORIYA VOWEL SIGN AA		0CD6	KANNADA AI LENGTH MARK
0B3F	ORIYA VOWEL SIGN I		0D02	MALAYALAM SIGN ANUSVARA
0B40	ORIYA VOWEL SIGN II		0D03	MALAYALAM SIGN VISARGA
0B41	ORIYA VOWEL SIGN U		0D3E	MALAYALAM VOWEL SIGN AA
0B42	ORIYA VOWEL SIGN UU		0D3F	MALAYALAM VOWEL SIGN I
0B43	ORIYA VOWEL SIGN VOCALIC R		0D40	MALAYALAM VOWEL SIGN II
0B47	ORIYA VOWEL SIGN E		0D41	MALAYALAM VOWEL SIGN U
0B48	ORIYA VOWEL SIGN AI		0D42	MALAYALAM VOWEL SIGN UU
0B4B	ORIYA VOWEL SIGN O		0D43	MALAYALAM VOWEL SIGN VOCALIC R
0B4C	ORIYA VOWEL SIGN AU		0D46	MALAYALAM VOWEL SIGN E
0B4D	ORIYA SIGN VIRAMA		0D47	MALAYALAM VOWEL SIGN EE
0B56	ORIYA AI LENGTH MARK		0D48	MALAYALAM VOWEL SIGN AI
0B57	ORIYA AU LENGTH MARK		0D4A	MALAYALAM VOWEL SIGN O
0B82	TAMIL SIGN ANUSVARA		0D4B	MALAYALAM VOWEL SIGN OO
0BBE	TAMIL VOWEL SIGN AA		0D4C	MALAYALAM VOWEL SIGN AU
0BBF	TAMIL VOWEL SIGN I		0D4D	MALAYALAM SIGN VIRAMA
0BC0	TAMIL VOWEL SIGN II		0D57	MALAYALAM AU LENGTH MARK
0BC1	TAMIL VOWEL SIGN U		0D82	SINHALA SIGN ANUSVARAYA
0BC2	TAMIL VOWEL SIGN UU		0D83	SINHALA SIGN VISARGAYA
0BC6	TAMIL VOWEL SIGN E		0DCA	SINHALA SIGN AL-LAKUNA
0BC7	TAMIL VOWEL SIGN EE		0DCF	SINHALA VOWEL SIGN AELA-PILLA
0BC8	TAMIL VOWEL SIGN AI		0DD0	SINHALA VOWEL SIGN KETTI AEDA-PILLA
0BCA	TAMIL VOWEL SIGN O		0DD1	SINHALA VOWEL SIGN DIGA AEDA-PILLA
0BCB	TAMIL VOWEL SIGN OO		0DD2	SINHALA VOWEL SIGN KETTI IS-PILLA
0BCC	TAMIL VOWEL SIGN AU		0DD3	SINHALA VOWEL SIGN DIGA IS-PILLA
0BCD	TAMIL SIGN VIRAMA		0DD4	SINHALA VOWEL SIGN KETTI PAA-PILLA
0BD7	TAMIL AU LENGTH MARK		0DD6	SINHALA VOWEL SIGN DIGA PAA-PILLA
0C01	TELUGU SIGN CANDRABINDU		0DD8	SINHALA VOWEL SIGN GAETTA-PILLA
0C02	TELUGU SIGN ANUSVARA		0DD9	SINHALA VOWEL SIGN KOMBUVA
0C03	TELUGU SIGN VISARGA		0DDA	SINHALA VOWEL SIGN DIGA KOMBUVA
0C3E	TELUGU VOWEL SIGN AA		0DDB	SINHALA VOWEL SIGN KOMBU DEKA
0C3F	TELUGU VOWEL SIGN I		0DDC	SINHALA VOWEL SIGN KOMBUVA HAA AELA-PILLA
0C40	TELUGU VOWEL SIGN II			
0C41	TELUGU VOWEL SIGN U		0DDD	SINHALA VOWEL SIGN KOMBUVA HAA DIGA AELA-PILLA
0C42	TELUGU VOWEL SIGN UU			
0C43	TELUGU VOWEL SIGN VOCALIC R		0DDE	SINHALA VOWEL SIGN KOMBUVA HAA GAYANUKITTA
0C44	TELUGU VOWEL SIGN VOCALIC RR			
0C46	TELUGU VOWEL SIGN E		0DDF	SINHALA VOWEL SIGN GAYANUKITTA
0C47	TELUGU VOWEL SIGN EE		0DF2	SINHALA VOWEL SIGN DIGA GAETTA-PILLA
0C48	TELUGU VOWEL SIGN AI		0DF3	SINHALA VOWEL SIGN DIGA GAYANUKITTA
0C4A	TELUGU VOWEL SIGN O		0E31	THAI CHARACTER MAI HAN-AKAT
0C4B	TELUGU VOWEL SIGN OO		0E34	THAI CHARACTER SARA I
0C4C	TELUGU VOWEL SIGN AU		0E35	THAI CHARACTER SARA II
0C4D	TELUGU SIGN VIRAMA		0E36	THAI CHARACTER SARA UE
0C55	TELUGU LENGTH MARK		0E37	THAI CHARACTER SARA UEE
0C56	TELUGU AI LENGTH MARK		0E38	THAI CHARACTER SARA U
0C82	KANNADA SIGN ANUSVARA		0E39	THAI CHARACTER SARA UU
0C83	KANNADA SIGN VISARGA		0E3A	THAI CHARACTER PHINTHU
0CBC	KANNADA SIGN NUKTA		0E47	THAI CHARACTER MAITAIKHU
0CBE	KANNADA VOWEL SIGN AA		0E48	THAI CHARACTER MAI EK

0E49	THAI CHARACTER MAI THO
0E4A	THAI CHARACTER MAI TRI
0E4B	THAI CHARACTER MAI CHATTAWA
0E4C	THAI CHARACTER THANTHAKHAT
0E4D	THAI CHARACTER NIKHAHIT
0E4E	THAI CHARACTER YAMAKKAN
0EB1	LAO VOWEL SIGN MAI KAN
0EB4	LAO VOWEL SIGN I
0EB5	LAO VOWEL SIGN II
0EB6	LAO VOWEL SIGN Y
0EB7	LAO VOWEL SIGN YY
0EB8	LAO VOWEL SIGN U
0EB9	LAO VOWEL SIGN UU
0EBB	LAO VOWEL SIGN MAI KON
0EBC	LAO SEMIVOWEL SIGN LO
0EC8	LAO TONE MAI EK
0EC9	LAO TONE MAI THO
0ECA	LAO TONE MAI TI
0ECB	LAO TONE MAI CATAWA
0ECC	LAO CANCELLATION MARK
0ECD	LAO NIGGAHITA
0F18	TIBETAN ASTROLOGICAL SIGN -KHYUD PA
0F19	TIBETAN ASTROLOGICAL SIGN SDONG TSHUGS
0F35	TIBETAN MARK NGAS BZUNG NYI ZLA
0F37	TIBETAN MARK NGAS BZUNG SGOR RTAGS
0F39	TIBETAN MARK TSA -PHRU
0F3E	TIBETAN SIGN YAR TSHES
0F3F	TIBETAN SIGN MAR TSHES
0F71	TIBETAN VOWEL SIGN AA
0F72	TIBETAN VOWEL SIGN I
0F73	TIBETAN VOWEL SIGN II
0F74	TIBETAN VOWEL SIGN U
0F75	TIBETAN VOWEL SIGN UU
0F76	TIBETAN VOWEL SIGN VOCALIC R
0F77	TIBETAN VOWEL SIGN VOCALIC RR
0F78	TIBETAN VOWEL SIGN VOCALIC L
0F79	TIBETAN VOWEL SIGN VOCALIC LL
0F7A	TIBETAN VOWEL SIGN E
0F7B	TIBETAN VOWEL SIGN EE
0F7C	TIBETAN VOWEL SIGN O
0F7D	TIBETAN VOWEL SIGN OO
0F7E	TIBETAN SIGN RJES SU NGA RO
0F7F	TIBETAN SIGN RNAM BCAD
0F80	TIBETAN VOWEL SIGN REVERSED I
0F81	TIBETAN VOWEL SIGN REVERSED II
0F82	TIBETAN SIGN NYI ZLA NAA DA
0F83	TIBETAN SIGN SNA LDAN
0F84	TIBETAN MARK HALANTA
0F86	TIBETAN MARK LCI RTAGS
0F87	TIBETAN MARK YANG RTAGS
0F90	TIBETAN SUBJOINED LETTER KA
0F91	TIBETAN SUBJOINED LETTER KHA
0F92	TIBETAN SUBJOINED LETTER GA
0F93	TIBETAN SUBJOINED LETTER GHA
0F94	TIBETAN SUBJOINED LETTER NGA
0F95	TIBETAN SUBJOINED LETTER CA
0F96	TIBETAN SUBJOINED LETTER CHA
0F97	TIBETAN SUBJOINED LETTER JA
0F99	TIBETAN SUBJOINED LETTER NYA
0F9A	TIBETAN SUBJOINED LETTER TTA
0F9B	TIBETAN SUBJOINED LETTER TTHA
0F9C	TIBETAN SUBJOINED LETTER DDA
0F9D	TIBETAN SUBJOINED LETTER DDHA
0F9E	TIBETAN SUBJOINED LETTER NNA
0F9F	TIBETAN SUBJOINED LETTER TA
0FA0	TIBETAN SUBJOINED LETTER THA
0FA1	TIBETAN SUBJOINED LETTER DA
0FA2	TIBETAN SUBJOINED LETTER DHA
0FA3	TIBETAN SUBJOINED LETTER NA
0FA4	TIBETAN SUBJOINED LETTER PA
0FA5	TIBETAN SUBJOINED LETTER PHA
0FA6	TIBETAN SUBJOINED LETTER BA
0FA7	TIBETAN SUBJOINED LETTER BHA
0FA8	TIBETAN SUBJOINED LETTER MA
0FA9	TIBETAN SUBJOINED LETTER TSA
0FAA	TIBETAN SUBJOINED LETTER TSHA
0FAB	TIBETAN SUBJOINED LETTER DZA
0FAC	TIBETAN SUBJOINED LETTER DZHA
0FAD	TIBETAN SUBJOINED LETTER WA
0FAE	TIBETAN SUBJOINED LETTER ZHA
0FAF	TIBETAN SUBJOINED LETTER ZA
0FB0	TIBETAN SUBJOINED LETTER -A
0FB1	TIBETAN SUBJOINED LETTER YA
0FB2	TIBETAN SUBJOINED LETTER RA
0FB3	TIBETAN SUBJOINED LETTER LA
0FB4	TIBETAN SUBJOINED LETTER SHA
0FB5	TIBETAN SUBJOINED LETTER SSA
0FB6	TIBETAN SUBJOINED LETTER SA
0FB7	TIBETAN SUBJOINED LETTER HA
0FB8	TIBETAN SUBJOINED LETTER A
0FB9	TIBETAN SUBJOINED LETTER KSSA
0FBA	TIBETAN SUBJOINED LETTER FIXED-FORM WA
0FBB	TIBETAN SUBJOINED LETTER FIXED-FORM YA
0FBC	TIBETAN SUBJOINED LETTER FIXED-FORM RA
0FC6	TIBETAN SYMBOL PADMA GDAN
102C	MYANMAR VOWEL SIGN AA
102D	MYANMAR VOWEL SIGN I
102E	MYANMAR VOWEL SIGN II
102F	MYANMAR VOWEL SIGN U
1030	MYANMAR VOWEL SIGN UU
1031	MYANMAR VOWEL SIGN E
1032	MYANMAR VOWEL SIGN AI
1036	MYANMAR SIGN ANUSVARA
1037	MYANMAR SIGN DOT BELOW
1038	MYANMAR SIGN VISARGA
1039	MYANMAR SIGN VIRAMA
1056	MYANMAR VOWEL SIGN VOCALIC R
1057	MYANMAR VOWEL SIGN VOCALIC RR
1058	MYANMAR VOWEL SIGN VOCALIC L
1059	MYANMAR VOWEL SIGN VOCALIC LL
135F	ETHIOPIC COMBINING GEMINATION MARK
1712	TAGALOG VOWEL SIGN I
1713	TAGALOG VOWEL SIGN U
1714	TAGALOG VIRAMA
1732	HANUNOO VOWEL SIGN I
1733	HANUNOO VOWEL SIGN U
1734	HANUNOO PAMUDPOD
1752	BUHID VOWEL SIGN I
1753	BUHID VOWEL SIGN U
1772	TAGBANWA VOWEL SIGN I
1773	TAGBANWA VOWEL SIGN U
17B6	KHMER VOWEL SIGN AA
17B7	KHMER VOWEL SIGN I
17B8	KHMER VOWEL SIGN II
17B9	KHMER VOWEL SIGN Y
17BA	KHMER VOWEL SIGN YY
17BB	KHMER VOWEL SIGN U
17BC	KHMER VOWEL SIGN UU

17BD	KHMER VOWEL SIGN UA
17BE	KHMER VOWEL SIGN OE
17BF	KHMER VOWEL SIGN YA
17C0	KHMER VOWEL SIGN IE
17C1	KHMER VOWEL SIGN E
17C2	KHMER VOWEL SIGN AE
17C3	KHMER VOWEL SIGN AI
17C4	KHMER VOWEL SIGN OO
17C5	KHMER VOWEL SIGN AU
17C6	KHMER SIGN NIKAHIT
17C7	KHMER SIGN REAHMUK
17C8	KHMER SIGN YUUKALEAPINTU
17C9	KHMER SIGN MUUSIKATOAN
17CA	KHMER SIGN TRIISAP
17CB	KHMER SIGN BANTOC
17CC	KHMER SIGN ROBAT
17CD	KHMER SIGN TOANDAKHIAT
17CE	KHMER SIGN KAKABAT
17CF	KHMER SIGN AHSDA
17D0	KHMER SIGN SAMYOK SANNYA
17D1	KHMER SIGN VIRIAM
17D2	KHMER SIGN COENG
17D3	KHMER SIGN BATHAMASAT
17DD	KHMER SIGN ATTHACAN
180B	MONGOLIAN FREE VARIATION SELECTOR ONE
180C	MONGOLIAN FREE VARIATION SELECTOR TWO
180D	MONGOLIAN FREE VARIATION SELECTOR THREE
18A9	MONGOLIAN LETTER AG DAGALGA
1920	LIMBU VOWEL SIGN A
1921	LIMBU VOWEL SIGN I
1922	LIMBU VOWEL SIGN U
1923	LIMBU VOWEL SIGN EE
1924	LIMBU VOWEL SIGN AI
1925	LIMBU VOWEL SIGN OO
1926	LIMBU VOWEL SIGN AU
1927	LIMBU VOWEL SIGN E
1928	LIMBU VOWEL SIGN O
1929	LIMBU SUBJOINED LETTER YA
192A	LIMBU SUBJOINED LETTER RA
192B	LIMBU SUBJOINED LETTER WA
1930	LIMBU SMALL LETTER KA
1931	LIMBU SMALL LETTER NGA
1932	LIMBU SMALL LETTER ANUSVARA
1933	LIMBU SMALL LETTER TA
1934	LIMBU SMALL LETTER NA
1935	LIMBU SMALL LETTER PA
1936	LIMBU SMALL LETTER MA
1937	LIMBU SMALL LETTER RA
1938	LIMBU SMALL LETTER LA
1939	LIMBU SIGN MUKPHRENG
193A	LIMBU SIGN KEMPHRENG
193B	LIMBU SIGN SA-I
19B0	NEW TAI LUE VOWEL SIGN VOWEL SHORTENER
19B1	NEW TAI LUE VOWEL SIGN AA
19B2	NEW TAI LUE VOWEL SIGN II
19B3	NEW TAI LUE VOWEL SIGN U
19B4	NEW TAI LUE VOWEL SIGN UU
19B5	NEW TAI LUE VOWEL SIGN EE
19B6	NEW TAI LUE VOWEL SIGN AE
19B7	NEW TAI LUE VOWEL SIGN O
19B8	NEW TAI LUE VOWEL SIGN OA
19B9	NEW TAI LUE VOWEL SIGN UE
19BA	NEW TAI LUE VOWEL SIGN AY
19BB	NEW TAI LUE VOWEL SIGN AAY
19BC	NEW TAI LUE VOWEL SIGN UY
19BD	NEW TAI LUE VOWEL SIGN OY
19BE	NEW TAI LUE VOWEL SIGN OAY
19BF	NEW TAI LUE VOWEL SIGN UEY
19C0	NEW TAI LUE VOWEL SIGN IY
19C8	NEW TAI LUE TONE MARK-1
19C9	NEW TAI LUE TONE MARK-2
1A17	BUGINESE VOWEL SIGN I
1A18	BUGINESE VOWEL SIGN U
1A19	BUGINESE VOWEL SIGN E
1A1A	BUGINESE VOWEL SIGN O
1A1B	BUGINESE VOWEL SIGN AE
302A	IDEOGRAPHIC LEVEL TONE MARK
302B	IDEOGRAPHIC RISING TONE MARK
302C	IDEOGRAPHIC DEPARTING TONE MARK
302D	IDEOGRAPHIC ENTERING TONE MARK
302E	HANGUL SINGLE DOT TONE MARK
302F	HANGUL DOUBLE DOT TONE MARK
3099	COMBINING KATAKANA-HIRAGANA VOICED SOUND MARK
309A	COMBINING KATAKANA-HIRAGANA SEMI-VOICED SOUND MARK
A802	SYLOTI NAGRI SIGN DVISVARA
A806	SYLOTI NAGRI SIGN HASANTA
A80B	SYLOTI NAGRI SIGN ANUSVARA
A823	SYLOTI NAGRI VOWEL SIGN A
A824	SYLOTI NAGRI VOWEL SIGN I
A825	SYLOTI NAGRI VOWEL SIGN U
A826	SYLOTI NAGRI VOWEL SIGN E
A827	SYLOTI NAGRI VOWEL SIGN OO
FB1E	HEBREW POINT JUDEO-SPANISH VARIKA
10A01	KHAROSHTHI VOWEL SIGN I
10A02	KHAROSHTHI VOWEL SIGN U
10A03	KHAROSHTHI VOWEL SIGN VOCALIC R
10A05	KHAROSHTHI VOWEL SIGN E
10A06	KHAROSHTHI VOWEL SIGN O
10A0C	KHAROSHTHI VOWEL LENGTH MARK
10A0D	KHAROSHTHI SIGN DOUBLE RING BELOW
10A0E	KHAROSHTHI SIGN ANUSVARA
10A0F	KHAROSHTHI SIGN VISARGA
10A38	KHAROSHTHI SIGN BAR ABOVE
10A39	KHAROSHTHI SIGN CAUDA
10A3A	KHAROSHTHI SIGN DOT BELOW
1D165	MUSICAL SYMBOL COMBINING STEM
1D166	MUSICAL SYMBOL COMBINING SPRECHGESANG STEM
1D167	MUSICAL SYMBOL COMBINING TREMOLO ONE
1D168	MUSICAL SYMBOL COMBINING TREMOLO TWO
1D169	MUSICAL SYMBOL COMBINING TREMOLO THREE
1D16D	MUSICAL SYMBOL COMBINING AUGMENTATION DOT
1D16E	MUSICAL SYMBOL COMBINING FLAG ONE
1D16F	MUSICAL SYMBOL COMBINING FLAG TWO
1D170	MUSICAL SYMBOL COMBINING FLAG THREE
1D171	MUSICAL SYMBOL COMBINING FLAG FOUR
1D172	MUSICAL SYMBOL COMBINING FLAG FIVE
1D17B	MUSICAL SYMBOL COMBINING ACCENT
1D17C	MUSICAL SYMBOL COMBINING STACCATO
1D17D	MUSICAL SYMBOL COMBINING TENUTO
1D17E	MUSICAL SYMBOL COMBINING STACCATISSIMO
1D17F	MUSICAL SYMBOL COMBINING MARCATO
1D180	MUSICAL SYMBOL COMBINING MARCATO STACCATO

1D181 MUSICAL SYMBOL COMBINING ACCENT-
       STACCATO
1D182 MUSICAL SYMBOL COMBINING LOURE
1D185 MUSICAL SYMBOL COMBINING DOIT
1D186 MUSICAL SYMBOL COMBINING RIP
1D187 MUSICAL SYMBOL COMBINING FLIP
1D188 MUSICAL SYMBOL COMBINING SMEAR
1D189 MUSICAL SYMBOL COMBINING BEND
1D18A MUSICAL SYMBOL COMBINING DOUBLE TONGUE

1D18B MUSICAL SYMBOL COMBINING TRIPLE TONGUE
1D1AA MUSICAL SYMBOL COMBINING DOWN BOW
1D1AB MUSICAL SYMBOL COMBINING UP BOW
1D1AC MUSICAL SYMBOL COMBINING HARMONIC
1D1AD MUSICAL SYMBOL COMBINING SNAP PIZZICATO
1D242 COMBINING GREEK MUSICAL TRISEME
1D243 COMBINING GREEK MUSICAL TETRASEME
1D244 COMBINING GREEK MUSICAL PENTASEME

B.2 List of combining and other characters not allowed in implementation level 2

The characters in the subset collections
COMBINING DIACRITICAL MARKS (0300 to 036F),
COMBINING DIACRITICAL MARKS FOR
  SYMBOLS (20D0 to 20FF),
HANGUL JAMO (1100 to 11FF) and
COMBINING HALF MARKS (FE20 to FE2F)
are not allowed in implementation level 2. In addition, the
following individual characters are also not allowed.

> NOTE – This list is a subset of the list in clause B.1 except for
> HANGUL JAMO (see 26.1).

0483	COMBINING CYRILLIC TITLO
0484	COMBINING CYRILLIC PALATALIZATION
0485	COMBINING CYRILLIC DASIA PNEUMATA
0486	COMBINING CYRILLIC PSILI PNEUMATA
0591	HEBREW ACCENT ETNAHTA
0592	HEBREW ACCENT SEGOL
0593	HEBREW ACCENT SHALSHELET
0594	HEBREW ACCENT ZAQEF QATAN
0595	HEBREW ACCENT ZAQEF GADOL
0596	HEBREW ACCENT TIPEHA
0597	HEBREW ACCENT REVIA
0598	HEBREW ACCENT ZARQA
0599	HEBREW ACCENT PASHTA
059A	HEBREW ACCENT YETIV
059B	HEBREW ACCENT TEVIR
059C	HEBREW ACCENT GERESH
059D	HEBREW ACCENT GERESH MUQDAM
059E	HEBREW ACCENT GERSHAYIM
059F	HEBREW ACCENT QARNEY PARA
05A0	HEBREW ACCENT TELISHA GEDOLA
05A1	HEBREW ACCENT PAZER
05A3	HEBREW ACCENT MUNAH
05A4	HEBREW ACCENT MAHAPAKH
05A5	HEBREW ACCENT MERKHA

05A6	HEBREW ACCENT MERKHA KEFULA
05A7	HEBREW ACCENT DARGA
05A8	HEBREW ACCENT QADMA
05A9	HEBREW ACCENT TELISHA QETANA
05AA	HEBREW ACCENT YERAH BEN YOMO
05AB	HEBREW ACCENT OLE
05AC	HEBREW ACCENT ILUY
05AD	HEBREW ACCENT DEHI
05AE	HEBREW ACCENT ZINOR
05AF	HEBREW MARK MASORA CIRCLE
05C4	HEBREW MARK UPPER DOT
093C	DEVANAGARI SIGN NUKTA
0953	DEVANAGARI GRAVE ACCENT
0954	DEVANAGARI ACUTE ACCENT
09BC	BENGALI SIGN NUKTA
09D7	BENGALI AU LENGTH MARK
0A3C	GURMUKHI SIGN NUKTA
0A70	GURMUKHI TIPPI
0A71	GURMUKHI ADDAK
0ABC	GUJARATI SIGN NUKTA
0B3C	ORIYA SIGN NUKTA
0B56	ORIYA AI LENGTH MARK
0B57	ORIYA AU LENGTH MARK
0BD7	TAMIL AU LENGTH MARK
0C55	TELUGU LENGTH MARK
0C56	TELUGU AI LENGTH MARK
0CD5	KANNADA LENGTH MARK
0CD6	KANNADA AI LENGTH MARK
0D57	MALAYALAM AU LENGTH MARK
0F39	TIBETAN MARK TSA -PHRU
302A	IDEOGRAPHIC LEVEL TONE MARK
302B	IDEOGRAPHIC RISING TONE MARK
302C	IDEOGRAPHIC DEPARTING TONE MARK
302D	IDEOGRAPHIC ENTERING TONE MARK
302E	HANGUL SINGLE DOT TONE MARK
302F	HANGUL DOUBLE DOT TONE MARK
3099	COMBINING KATAKANA-HIRAGANA VOICED SOUND MARK
309A	COMBINING KATAKANA-HIRAGANA SEMI-VOICED SOUND MARK

Annex C
(normative)

Transformation format for 16 planes of Group 00 (UTF-16)

UTF-16 provides a coded representation of over a million graphic characters of UCS-4 in a form that is compatible with the two-octet BMP form of UCS-2 (see clause 13.1). This permits the coexistence of those characters from UCS-4 within coded character data that is in accordance with UCS-2.

In UTF-16 each graphic character from the BMP repertoire retains its UCS-2 coded representation. In addition, the coded representation of any character from a single contiguous block of 16 Planes in Group 00 (1,048,576 code positions) consists of a pair of RC-elements (see clause 4.36), where each such RC-element corresponds to a cell in a single contiguous block of 8 Rows in the BMP (2048 code positions). These code positions are reserved for the use of this coded representation form, and shall not be allocated for any other purpose.

C.1 Specification of UTF-16

The specification of UTF-16 is as follows:

1. The high-half zone shall be the 4 rows D8 to DB of the BMP, i.e., the 1024 cells in the S-zone whose code positions are from D800 through DBFF.

2. The low-half zone shall be the 4 rows DC to DF of the BMP, i.e., the 1024 cells in the S-zone whose code positions are from DC00 through DFFF.

3. All cells in the high-half zone and the low-half zone shall be permanently reserved for the use of the UTF-16 coded representation form.

4. In UTF-16, any UCS character from the BMP shall be represented by its UCS-2 coded representation as specified by the body of this international standard.

5. In UTF-16, any UCS character whose UCS-4 coded representation is in the range 0001 0000 to 0010 FFFF shall be represented by a sequence of two RC-elements from the S-zone, of which the first is an RC-element from the high-half zone, and the second is an RC-element from the low-half zone.

   The mapping between UCS-4 and UTF-16 for these characters shall be as shown in clause C.3; the reverse mapping is shown in clause C.4.

   NOTE – The Unicode Standard, Version 4.0, defines the following forms of UTF-16.

- UTF-16: the ordering of octets (see clause 6.3) is not defined and signatures (see annex H) may appear;
- UTF-16BE: in the ordering of octets the more significant octet precedes the less significant octet, as specified in 6.2, and no signatures appear;
- UTF-16LE: in the ordering of octets the less significant octet precedes the more significant octet and no signatures appear.

C.2 Notation

1. All numbers are in hexadecimal notation.

2. Double-octet boundaries in the notations for UTF-16 are indicated with semicolons.

3. The symbol "%" indicates the modulo operation, e.g.: 7 % 3 = 1.

4. The symbol "/" indicates the integer division operation, e.g.: 7 / 3 = 2.

5. Precedence is -
   integer-division > modulo-operation > integer-multiplication > integer-addition.

C.3 Mapping from UCS-4 form to UTF-16 form

UCS-4 (4-octet)	UTF-16, 2-octet elements

$x =$ 0000 0000 .. x % 0001 0000;
0000 FFFF (see Note 1)

$x =$ 0001 0000 .. y; z;
0010 FFFF

where $y = ((x - 0001\ 0000) / 400) + D800$
$z = ((x - 0001\ 0000)$ % $400) + DC00$

x 0011 0000 ..   (no mapping
7FFF FFFF   (is defined

NOTE – Code positions from 0000 D800 to 0000 DFFF are reserved for the UTF-16 form and do not occur in UCS-4. The values 0000 FFFE and 0000 FFFF also do not occur (see clause 7). The mapping of these code positions in UTF-16 is undefined.

Example:

The UCS-4 sequence [0000 0048] [0000 0069] [0001 0000] [0000 0021] [0000 0021]

represents "Hi<0001 0000>!!".

It is mapped to UTF-16 as:

[0048] [0069] [D800] [DC00] [0021] [0021]

If interpreted as UCS-2 this sequence will be

"Hi<RC-element from high-half zone> <RC-element from low-half zone>!!"

C.4 Mapping from UTF-16 form to UCS-4 form

UTF-16, 2-octet elements		UCS-4 (4-octet)
x =	0000; ... D7FF;	x
x =	E000; ... FFFF;	x

pair (x, y) such that

x =	D800; ... DBFF;	((x - D800) * 400
y =	DC00; ... DFFF;	+ (y - DC00))
		+ 0001 0000

Example:

The UTF-16 sequence

[0048] [0069] [D800] [DC00] [0021] [0021]

is mapped to UCS-4 as

[0000 0048] [0000 0069] [0001 0000] [0000 0021] [0000 0021]

and represents "Hi ⊤ !!" (⊤ is the graphic symbol representing 10000 LINEAR B SYLLABLE B008 A).

C.5 Identification of UTF-16

When the escape sequences from ISO/IEC 2022 are used, the identification of UTF-16 and an implementation level (see clause 14) shall be by a designation sequence chosen from the following list:

ESC 02/05 02/15 04/10
       UTF-16 with implementation level 1

ESC 02/05 02/15 04/11
       UTF-16 with implementation level 2

ESC 02/05 02/15 04/12
       UTF-16 with implementation level 3

If such an escape sequence appears within a CC-data-element conforming to ISO/IEC 2022, it shall consist only of the sequences of bit combinations as shown above.

If such an escape sequence appears within a CC-data-element conforming to ISO/IEC 10646, it shall be padded in accordance with clause 15.

When the escape sequences from ISO 2022 are used, the identification of a return, or transfer, from UTF-16 to the coding system of ISO 2022 shall be as specified in clause 16.5 for a return or transfer from UCS.

C.6 Unpaired RC-elements: Interpretation by receiving devices

According to clause C.1 an unpaired RC-element (see clause 4.36) is not in conformance with the requirements of UTF-16.

If a receiving device that has adopted the UTF-16 form receives an unpaired RC-element because of error conditions either:

- in an originating device, or
- in the interchange between an originating and the receiving device, or
- in the receiving device itself,

then it shall interpret that unpaired RC-element in the same way that it interprets a character that is outside the adopted subset that has been identified for the device (see sub-clause 2.3c).

> NOTE – Since a high-half RC-element followed by a low-half RC-element is a sequence that is in accordance with UTF-16, the only possible type of syntactically malformed sequence is one or more unpaired RC-element.

Example:

A receiving/originating device which only handles the Basic Latin repertoire, and uses boxes (shown here as ◊) to display characters outside that repertoire, would display:

"The Greek letter Σ is the capital form of letter σ."

as:

"The Greek letter ◊ is the capital form of letter ◊."

Accordingly a similar device that can also interpret a UTF-16 data stream should also display an unpaired RC-element as a box.

C.7 Receiving devices, advisory notes

When a receiving device interprets a CC-data-element that is in accordance with UTF-16 the following advisory notes apply.

1. UTF-16 is designed to be compatible with the UCS-2 two-octet BMP Form (see clause 13.1). The high-half and low-half zones are assigned to separate ranges of code positions, to which characters can never be assigned. Thus the function of every RC-element (two-octet unit) within a UTF-16 data stream is always immediately identifiable from its value, without regard to context.

   For example, the valid UTF-16 sequence [0048] [0069] [D800] [DC00] [0021] [0021] may also be interpreted by a receiving device that has adopted only UCS-2 as the coded representation of

   "Hi<unrecognized><unrecognized>!!"

This form of compatibility is possible because RC-elements from the S-zone are interpreted according to UTF-16 by receiving devices that have adopted UTF-16, and as unrecognized characters by receiving devices that have only adopted UCS-2. Consequently an originating device may transmit UTF-16 data even if the receiving device can only interpret that data as UCS-2 characters.

2. Designers of devices may choose to use UTF-16 as an internal representation for processing or other purposes. There are two primary issues for such devices:

    •   Does the device interpret (i.e., process according to the assigned semantics) some subset of the pairs (high-half + low-half) of RC-elements, e.g., render the pair as the intended single character?

    •   Does the device guarantee the integrity of every pair (high-half + low-half) of RC-elements, e.g., never separate such pairs in operations such as string truncation, insertion, or other modifications of the coded character sequence?

    The decisions on these issues give rise to four possible combinations of capability in a device:

    (U) UCS-2 implementations:
    - Interpret no pairs.
    - Do not guarantee integrity of pairs.

    (W) Weak UTF-16 implementations:
    - Interpret a non-null subset of pairs.
    - Do not guarantee integrity of pairs.

    (A) Aware UTF-16 implementations:
    - Interpret no pairs.
    - Guarantee integrity of pairs.

    (S) Strong UTF-16 implementations:
    - Interpret a non-null subset of pairs.
    - Guarantee integrity of pairs.

Example:

The following sentence could be displayed in four different ways, assuming that both the weak and strong implementations have Etruscan fonts but no hieroglyphic fonts:

"The Greek letter Σ corresponds to <hieroglyphic-High> <hieroglyphic-Low> and to <Etruscan-High> <Etruscan-Low>."

where <xxx-High> and <xxx-Low> represent RC-elements, from the High-half and Low-half zones respectively, corresponding to a character from the block indicated by xxx. These four ways are shown below.

U: "The Greek letter Σ corresponds to ◊◊ and to ◊◊."

W: "The Greek letter Σ corresponds to ◊◊ and to _Σ_."

A: "The Greek letter Σ corresponds to ◊ and to ◊."

S: "The Greek letter Σ corresponds to ◊ and to _Σ_."

where _Σ_ here indicates the letter ES in the Etruscan font.

Annex D
(normative)

UCS Transformation Format 8 (UTF-8)

UTF-8 is an alternative coded representation form for all of the characters of the UCS. It can be used to transmit text data through communication systems which assume that individual octets in the range 00 to 7F have a definition according to ISO/IEC 4873, including a C0 set of control functions according to the 8-bit structure of ISO/IEC 2022. UTF-8 also avoids the use of octet values in this range which have special significance during the parsing of file-name character strings in widely-used file-handling systems.

The number of octets in the UTF-8 coded representation of the characters of the UCS ranges from one to six; the value of the first octet indicates the number of octets in that coded representation.

D.1 Features of UTF-8

- UCS characters from the BASIC LATIN collection are represented in UTF-8 in accordance with ISO/IEC 4873, i.e. single octets with values ranging from 20 to 7E.

- Control functions in positions 0000 to 001F, and the DELETE character in position 007F, are represented without the padding octets specified in clause 15, i.e. as single octets with values ranging from 00 to 1F, and 7F respectively in accordance with ISO/IEC 4873 and with the 8-bit structure of ISO/IEC 2022.

- Octet values 00 to 7F do not otherwise occur in the UTF-8 coded representation of any character. This provides compatibility with existing file-handling systems and communications sub-systems which parse CC-data-elements for these octet values.

- The first octet in the UTF-8 coded representation of any character can be directly identified when a CC-data-element is examined, one octet at a time, starting from an arbitrary location. It indicates the number of continuing octets (if any) in the multi-octet sequence that constitutes the coded representation of that character.

D.2 Specification of UTF-8

In the UTF-8 coded representation form each character from this International Standard shall have a coded representation that comprises a sequence of octets of length 1, 2, 3, 4, 5, or 6 octets.

For all sequences of one octet the most significant bit shall be a ZERO bit.

For all sequences of more than one octet, the number of consecutive ONE bits in the first octet, starting from the most significant bit position, shall indicate the number of octets in the sequence. The next most significant bit shall be a ZERO bit.

> NOTE 1 – For example, the first octet of a 2-octet sequence has bits 110 in the most significant positions, and the first octet of a 6-octet sequence has bits 1111110 in the most significant positions.

All of the octets, other than the first in a sequence, are known as continuing octets. The two most significant bits of a continuing octet shall be a ONE bit followed by a ZERO bit.

The remaining bit positions in the octets of the sequence shall be "free bit positions" that are used to distinguish between the characters of this International Standard. These free bit positions shall be used, in order of increasing significance, for the bits of the UCS-4 coded representation of the character, starting from its least significant bit. Some of the high-order ZERO bits of the UCS-4 representation shall be omitted, as specified below.

Table D.1 below shows the format of the octets of a coded character according to UTF-8. Each free bit position available for distinguishing between the characters is indicated by an x. Each entry in the column "Maximum UCS-4 value" indicates the upper end of the range of coded representations from UCS-4 that may be represented in a UTF-8 sequence having the length indicated in the "Octet usage" column.

Table D.1 - Format of octets in a UTF-8 sequence			
Octet usage	Format (binary)	No. of free bits	Maximum UCS-4 value
1st of 1	0xxxxxxx	7	0000 007F
1st of 2	110xxxxx	5	0000 07FF
1st of 3	1110xxxx	4	0000 FFFF
1st of 4	11110xxx	3	001F FFFF
1st of 5	111110xx	2	03FF FFFF
1st of 6	1111110x	1	7FFF FFFF
continuing)	10xxxxxx	6	
2nd .. 6th)			

Table D.1 shows that, in a CC-data-element conforming to UTF-8, the range of values for each octet indicates its usage as follows:

00 to 7F   first and only octet of a sequence;

80 to BF   continuing octet of a multi-octet sequence;

C0 to FD   first octet of a multi-octet sequence;

FE or FF   not used.

The mapping between UCS-4 and UTF-8 shall be as shown in D.4; the reverse mapping is shown in D.5.

NOTE 2 – Examples of UCS-4 coded representations and the corresponding UTF-8 coded representations are shown in Tables D.2 and D.3.

Table D.2 shows the UCS-4 and the UTF-8 coded representations, in binary notation, for a selection of code positions from the UCS.

Table D.3 shows the UCS-4 and the UTF-8 coded representations, in hexadecimal notation, for the same selection of code positions from the UCS.

NOTE 3 – Control functions in positions 0000 0080 to 0000 009F are represented by two-octet sequences obtained by applying the rules specified in this clause to the four-octet padded forms of the control functions, i.e. such a control function is represented by a sequence in the range C2 80 to C2 9F.

Table D.3 - Examples in hexadecimal notation

UCS-4 form	UTF-8 form
0000 0001;	01;
0000 007F;	7F;
0000 0080;	C2; 80;
0000 07FF;	DF; BF;
0000 0800;	E0; A0; 80;
0000 FFFF;	EF; BF; BF;
0001 0000;	F0; 90; 80; 80;
0010 FFFF;	F4; 8F; BF; BF;
001F FFFF;	F7; BF; BF; BF;
0020 0000;	F8; 88; 80; 80; 80;
03FF FFFF;	FB; BF; BF; BF; BF;
0400 0000;	FC; 84; 80; 80; 80;80;
7FFF FFFF;	FD; BF; BF; BF; BF; BF;

Table D.2 - Examples in binary notation

Four-octet form - UCS-4	UTF-8 form
00000000 00000000 00000000 00000001;	00000001;
00000000 00000000 00000000 01111111;	01111111;
00000000 00000000 00000000 10000000;	11000010; 10000000;
00000000 00000000 00000111 11111111;	11011111; 10111111;
00000000 00000000 00001000 00000000;	11100000; 10100000; 10000000;
00000000 00000000 11111111 11111111;	11101111; 10111111; 10111111;
00000000 00000001 00000000 00000000;	11110000; 10010000; 10000000;10000000;
00000000 00011111 11111111 11111111;	11110111; 10111111; 10111111;10111111;
00000000 00100000 00000000 00000000;	11111000; 10001000; 10000000;10000000; 10000000;
00000011 11111111 11111111 11111111;	11111011; 10111111; 10111111;10111111; 10111111;
00000100 00000000 00000000 00000000;	11111100; 10000100; 10000000;10000000; 10000000; 10000000;
01111111 11111111 11111111 11111111;	11111101; 10111111; 10111111;10111111; 10111111; 10111111;

D.3 Notation

1. All numbers are in hexadecimal notation, except for the decimal numbers used in the power-of operation (see 5 below).

2. Boundaries of code elements are indicated with semicolons; these are single-octet boundaries within UTF-8 coded representations, and four-octet boundaries within UCS-4 coded representations.

3. The symbol "%" indicates the modulo operation, e.g.: $7\ \%\ 3 = 1$

4. The symbol "/" indicates the integer division operation, e.g.: $7\ /\ 3 = 2$

5. Superscripting indicates the power-of operation, e.g.: $2^3 = 8$

6. Precedence is: power-of operation > integer division > modulo operation > integer multiplication > integer addition.

   e.g.: $x\ /\ y^z\ \%\ w = ((x\ /\ (y^z))\ \%\ w)$

D.4 Mapping from UCS-4 form to UTF-8 form

Table D.4 defines in mathematical notation the mapping from the UCS-4 coded representation form to the UTF-8 coded representation form.

In the left column (UCS-4) the notation x indicates the four-octet coded representation of a single character of the UCS. In the right column (UTF-8) x indicates the corresponding integer value.

> NOTE 1 – Values of x in the range 0000 D800 .. 0000 DFFF are reserved for the UTF-16 form and do not occur in UCS-4. The mappings of these code positions in UTF-8 are undefined.

> NOTE 2 – The algorithm for converting from UCS-4 to UTF-8 can be summarised as follows.

> For each coded character in UCS-4 the length of octet sequence in UTF-8 is determined by the entry in the right column of Table D.1. The bits in the UCS-4 coded representation, starting from the least significant bit, are then distributed across the free bit positions in order of increasing significance until no more free bit positions are available.

D.5 Mapping from UTF-8 form to UCS-4 form

Table D.5 defines in mathematical notation the mapping from the UTF-8 coded representation form to the UCS-4 coded representation form.

In the left column (UTF-8) the following notations apply:

z is the first octet of a sequence. Its value determines the number of continuing octets in the sequence.

y is the 2nd octet in the sequence.

x is the 3rd octet in the sequence.

w is the 4th octet in the sequence.

v is the 5th octet in the sequence.

u is the 6th octet in the sequence.

The ranges of values applicable to these octets are shown in D.2 above, following Table D.1.

> NOTE – The algorithm for converting from UTF-8 to UCS-4 can be summarised as follows.

> For each coded character in UTF-8 the bits in the free bit positions are concatenated as a bit-string. The bits from this string, in increasing order of significance, are then distributed across the bit positions of a four-octet sequence, starting from the least significant bit position. The remaining bit positions of that sequence are filled with ZERO bits.

Table D.4 - Mapping from UCS-4 to UTF-8	
Range of values in UCS-4	**Sequence of octets in UTF-8**
$x = 0000\ 0000\ ..\ 0000\ 007F$;	x;
$x = 0000\ 0080\ ..\ 0000\ 07FF$;	$C0 + x\ /\ 2^6$; $\quad 80 + x\ \%\ 2^6$;
$x = 0000\ 0800\ ..\ 0000\ FFFF$; (see Note 3)	$E0 + x/2^{12}$; $80 + x/2^6\%2^6$; $80 + x\%2^6$;
$x = 0001\ 0000\ ..\ 001F\ FFFF$;	$F0 + x/2^{18}$; $80 + x/2^{12}\%2^6$; $80 + x/2^6\%2^6$; $80 + x\%2^6$;
$x = 0020\ 0000\ ..\ 03FF\ FFFF$;	$F8 + x/2^{24}$; $80 + x/2^{18}\%2^6$; $80 + x/2^{12}\%2^6$; $80 + x/2^6\%2^6$; $80 + x\%2^6$;
$x = 0400\ 0000\ ..\ 7FFF\ FFFF$;	$FC + x/2^{30}$; $80 + x/2^{24}\%2^6$; $80 + x/2^{18}\%2^6$; $80 + x/2^{12}\%2^6$; $80 + x/2^6\%2^6$; $80 + x\%2^6$;

Table D.5 - Mapping from UTF-8 to UCS-4

Sequence of octets in UTF-8	Four-octet sequences in UCS-4
z = 00 .. 7F;	z;
z = C0 .. DF; y;	$(z-C0)*2^6 + (y-80)$;
z = E0 .. EF; y; x;	$(z-E0)*2^{12} + (y-80)*2^6 + (x-80)$;
z = F0 .. F7; y; x; w;	$(z-F0)*2^{18} + (y-80)*2^{12} +(x-80)*2^6 + (w-80)$;
z = F8 ..FB; y; x; w; v;	$(z-F8)*2^{24} + (y-80)*2^{18} +(x-80)*2^{12} + (w-80)*2^6 + (v - 80)$;
z = FC, FD; y; x; w; v; u;	$(z-FC)*2^{30} + (y-80)*2^{24} +(x-80)*2^{18} + (w-80)*2^{12} + (v-80)*2^6 + (u-80)$;

D.6 Identification of UTF-8

When the escape sequences from ISO/IEC 2022 are used, the identification of UTF-8 and an implementation level (see clause 14) shall be by a designation sequence chosen from the following list:

ESC 02/05 02/15 04/07
    UTF-8 with implementation level 1

ESC 02/05 02/15 04/08
    UTF-8 with implementation level 2

ESC 02/05 02/15 04/09
    UTF-8 with implementation level 3

If such an escape sequence appears within a CC-data-element conforming to ISO/IEC 2022, it shall consist only of the sequences of bit combinations as shown above.

If such an escape sequence appears within a CC-data-element conforming to ISO/IEC 10646, it shall be padded in accordance with clause 15.

When the escape sequences from ISO/IEC 2022 are used, the identification of a return, or transfer, from UTF-8 to the coding system of ISO/IEC 2022 shall be as specified in clause 16.5 for a return or transfer from UCS.

NOTE – The following escape sequence may also be used:

ESC 02/05 04/07   UTF-8.

The implementation level is not defined. The escape sequence used for a return to the coding system of ISO/IEC 2022 is not padded as specified in clause 16.5.

D.7 Incorrect sequences of octets: Interpretation by receiving devices

According to D.2 an octet in the range 00 to 7F or C0 to FB is the first octet of a UTF-8 sequence, and is followed by the appropriate number (from 0 to 5) of continuing octets in the range 80 to BF. Furthermore, octets whose value is FE or FF are not used; thus they are invalid in UTF-8.

If a CC-data-element includes either:

* a first octet that is not immediately followed by the correct number of continuing octets, or

* one or more continuing octets that are not required to complete a sequence of first and continuing octets, or

* an invalid octet,

then according to D.2 such a sequence of octets is not in conformance with the requirements of UTF-8. It is known as a malformed sequence.

If a receiving device that has adopted the UTF-8 form receives a malformed sequence, because of error conditions either:

* in an originating device, or

* in the interchange between an originating and a receiving device, or

* in the receiving device itself,

then it shall interpret that malformed sequence in the same way that it interprets a character that is outside the adopted subset that has been identified for the device (see sub-clause 2.3c).

Annex E
(normative)

Mirrored characters in bidirectional context

In the context of right-to-left (bidirectional) text, the following characters have semantic meaning. To preserve the meaning in right-to-left text, the graphic symbol representing the character may be rendered as the mirror image of the associated graphical symbol from the left-to-right context. These characters include mathematical symbols and paired characters such as the SQUARE BRACKETS. For example, in a right-to-left text segment, the GREATER-THAN SIGN (rendered as ">" in left-to-right text) may be rendered as the "<" graphic symbol.

> NOTE – Many ancient scripts and some scripts in modern use can be written either right-to-left or left-to-right. It is often customary for one of these scripts to use the appropriately mirrored graphical symbol for any character represented by a graphic symbol that is not symmetric around the vertical axis. In such cases, it is up to the rendering system to display the graphic image appropriate for the writing direction employed. The directionality of the representative graphic symbol shown in the character code charts matches the default writing direction for the script.

> Examples of such scripts include, but are not limited to, Old Italic, an ancient script for which the default writing direction in this standard is left-to-right, and Cypriot, an ancient script for which the default writing direction in this standard is right-to-left.

0028	LEFT PARENTHESIS
0029	RIGHT PARENTHESIS
003C	LESS-THAN SIGN
003E	GREATER-THAN SIGN
005B	LEFT SQUARE BRACKET
005D	RIGHT SQUARE BRACKET
007B	LEFT CURLY BRACKET
007D	RIGHT CURLY BRACKET
00AB	LEFT-POINTING DOUBLE ANGLE QUOTATION MARK
00BB	RIGHT-POINTING DOUBLE ANGLE QUOTATION MARK
2039	SINGLE LEFT-POINTING ANGLE QUOTATION MARK
203A	SINGLE RIGHT-POINTING ANGLE QUOTATION MARK
2045	LEFT SQUARE BRACKET WITH QUILL
2046	RIGHT SQUARE BRACKET WITH QUILL
207D	SUPERSCRIPT LEFT PARENTHESIS
207E	SUPERSCRIPT RIGHT PARENTHESIS
208D	SUBSCRIPT LEFT PARENTHESIS
208E	SUBSCRIPT RIGHT PARENTHESIS
2140	DOUBLE-STRUCK N-ARY SUMMATION
2201	COMPLEMENT
2202	PARTIAL DIFFERENTIAL
2203	THERE EXISTS
2204	THERE DOES NOT EXIST

2208	ELEMENT OF
2209	NOT AN ELEMENT OF
220A	SMALL ELEMENT OF
220B	CONTAINS AS MEMBER
220C	DOES NOT CONTAIN AS MEMBER
220D	SMALL CONTAINS AS MEMBER
2211	N-ARY SUMMATION
2215	DIVISION SLASH
2216	SET MINUS
221A	SQUARE ROOT
221B	CUBE ROOT
221C	FOURTH ROOT
221D	PROPORTIONAL TO
221F	RIGHT ANGLE
2220	ANGLE
2221	MEASURED ANGLE
2222	SPHERICAL ANGLE
2224	DOES NOT DIVIDE
2226	NOT PARALLEL TO
222B	INTEGRAL
222C	DOUBLE INTEGRAL
222D	TRIPLE INTEGRAL
222E	CONTOUR INTEGRAL
222F	SURFACE INTEGRAL
2230	VOLUME INTEGRAL
2231	CLOCKWISE INTEGRAL
2232	CLOCKWISE CONTOUR INTEGRAL
2233	ANTICLOCKWISE CONTOUR INTEGRAL
2239	EXCESS
223B	HOMOTHETIC
223C	TILDE OPERATOR
223D	REVERSED TILDE
223E	INVERTED LAZY S
223F	SINE WAVE
2240	WREATH PRODUCT
2241	NOT TILDE
2242	MINUS TILDE
2243	ASYMPTOTICALLY EQUAL TO
2244	NOT ASYMPTOTICALLY EQUAL TO
2245	APPROXIMATELY EQUAL TO
2246	APPROXIMATELY BUT NOT ACTUALLY EQUAL TO
2247	NEITHER APPROXIMATELY NOR ACTUALLY EQUAL TO
2248	ALMOST EQUAL TO
2249	NOT ALMOST EQUAL TO
224A	ALMOST EQUAL OR EQUAL TO
224B	TRIPLE TILDE
224C	ALL EQUAL TO
2252	APPROXIMATELY EQUAL TO OR THE IMAGE OF
2253	IMAGE OF OR APPROXIMATELY EQUAL TO
2254	COLON EQUALS
2255	EQUALS COLON

225F	QUESTIONED EQUAL TO
2260	NOT EQUAL TO
2262	NOT IDENTICAL TO
2264	LESS-THAN OR EQUAL TO
2265	GREATER-THAN OR EQUAL TO
2266	LESS-THAN OVER EQUAL TO
2267	GREATER-THAN OVER EQUAL TO
2268	LESS-THAN BUT NOT EQUAL TO
2269	GREATER-THAN BUT NOT EQUAL TO
226A	MUCH LESS-THAN
226B	MUCH GREATER-THAN
226E	NOT LESS-THAN
226F	NOT GREATER-THAN
2270	NEITHER LESS-THAN NOR EQUAL TO
2271	NEITHER GREATER-THAN NOR EQUAL TO
2272	LESS-THAN OR EQUIVALENT TO
2273	GREATER-THAN OR EQUIVALENT TO
2274	NEITHER LESS-THAN NOR EQUIVALENT TO
2275	NEITHER GREATER-THAN NOR EQUIVALENT TO
2276	LESS-THAN OR GREATER-THAN
2277	GREATER-THAN OR LESS-THAN
2278	NEITHER LESS-THAN NOR GREATER-THAN
2279	NEITHER GREATER-THAN NOR LESS-THAN
227A	PRECEDES
227B	SUCCEEDS
227C	PRECEDES OR EQUAL TO
227D	SUCCEEDS OR EQUAL TO
227E	PRECEDES OR EQUIVALENT TO
227F	SUCCEEDS OR EQUIVALENT TO
2280	DOES NOT PRECEDE
2281	DOES NOT SUCCEED
2282	SUBSET OF
2283	SUPERSET OF
2284	NOT A SUBSET OF
2285	NOT A SUPERSET OF
2286	SUBSET OF OR EQUAL TO
2287	SUPERSET OF OR EQUAL TO
2288	NEITHER A SUBSET OF NOR EQUAL TO
2289	NEITHER A SUPERSET OF NOR EQUAL TO
228A	SUBSET OF WITH NOT EQUAL TO
228B	SUPERSET OF WITH NOT EQUAL TO
228C	MULTISET
228F	SQUARE IMAGE OF
2290	SQUARE ORIGINAL OF
2291	SQUARE IMAGE OF OR EQUAL TO
2292	SQUARE ORIGINAL OF OR EQUAL TO
2298	CIRCLED DIVISION SLASH
22A2	RIGHT TACK
22A3	LEFT TACK
22A6	ASSERTION
22A7	MODELS
22A8	TRUE
22A9	FORCES
22AA	TRIPLE VERTICAL BAR RIGHT TURNSTILE
22AB	DOUBLE VERTICAL BAR DOUBLE RIGHT TURNSTILE
22AC	DOES NOT PROVE
22AD	NOT TRUE
22AE	DOES NOT FORCE
22AF	NEGATED DOUBLE VERTICAL BAR DOUBLE RIGHT TURNSTILE
22B0	PRECEDES UNDER RELATION
22B1	SUCCEEDS UNDER RELATION
22B2	NORMAL SUBGROUP OF
22B3	CONTAINS AS NORMAL SUBGROUP
22B4	NORMAL SUBGROUP OF OR EQUAL TO
22B5	CONTAINS AS NORMAL SUBGROUP OR EQUAL TO
22B6	ORIGINAL OF
22B7	IMAGE OF
22B8	MULTIMAP
22BE	RIGHT ANGLE WITH ARC
22BF	RIGHT TRIANGLE
22C9	LEFT NORMAL FACTOR SEMIDIRECT PRODUCT
22CA	RIGHT NORMAL FACTOR SEMIDIRECT PRODUCT
22CB	LEFT SEMIDIRECT PRODUCT
22CC	RIGHT SEMIDIRECT PRODUCT
22CD	REVERSED TILDE EQUALS
22D0	DOUBLE SUBSET
22D1	DOUBLE SUPERSET
22D6	LESS-THAN WITH DOT
22D7	GREATER-THAN WITH DOT
22D8	VERY MUCH LESS-THAN
22D9	VERY MUCH GREATER-THAN
22DA	LESS-THAN EQUAL TO OR GREATER-THAN
22DB	GREATER-THAN EQUAL TO OR LESS-THAN
22DC	EQUAL TO OR LESS-THAN
22DD	EQUAL TO OR GREATER-THAN
22DE	EQUAL TO OR PRECEDES
22DF	EQUAL TO OR SUCCEEDS
22E0	DOES NOT PRECEDE OR EQUAL
22E1	DOES NOT SUCCEED OR EQUAL
22E2	NOT SQUARE IMAGE OF OR EQUAL TO
22E3	NOT SQUARE ORIGINAL OF OR EQUAL TO
22E4	SQUARE IMAGE OF OR NOT EQUAL TO
22E5	SQUARE ORIGINAL OF OR NOT EQUAL TO
22E6	LESS-THAN BUT NOT EQUIVALENT TO
22E7	GREATER-THAN BUT NOT EQUIVALENT TO
22E8	PRECEDES BUT NOT EQUIVALENT TO
22E9	SUCCEEDS BUT NOT EQUIVALENT TO
22EA	NOT NORMAL SUBGROUP OF
22EB	DOES NOT CONTAIN AS NORMAL SUBGROUP
22EC	NOT NORMAL SUBGROUP OF OR EQUAL TO
22ED	DOES NOT CONTAIN AS NORMAL SUBGROUP OR EQUAL
22F0	UP RIGHT DIAGONAL ELLIPSIS
22F1	DOWN RIGHT DIAGONAL ELLIPSIS
22F2	ELEMENT OF WITH LONG HORIZONTAL STROKE
22F3	ELEMENT OF WITH VERTICAL BAR AT END OF HORIZONTAL STROKE
22F4	SMALL ELEMENT OF WITH VERTICAL BAR AT END OF HORIZONTAL STROKE
22F5	ELEMENT OF WITH DOT ABOVE
22F6	ELEMENT OF WITH OVERBAR
22F7	SMALL ELEMENT OF WITH OVERBAR
22F8	ELEMENT OF WITH UNDERBAR
22F9	ELEMENT OF WITH TWO HORIZONTAL STROKES
22FA	CONTAINS WITH LONG HORIZONTAL STROKE
22FB	CONTAINS WITH VERTICAL BAR AT END OF HORIZONTAL STROKE
22FC	SMALL CONTAINS WITH VERTICAL BAR AT END OF HORIZONTAL STROKE
22FD	CONTAINS WITH OVERBAR
22FE	SMALL CONTAINS WITH OVERBAR
22FF	Z NOTATION BAG MEMBERSHIP
2308	LEFT CEILING
2309	RIGHT CEILING
230A	LEFT FLOOR

230B	RIGHT FLOOR
2320	TOP HALF INTEGRAL
2321	BOTTOM HALF INTEGRAL
2329	LEFT-POINTING ANGLE BRACKET
232A	RIGHT-POINTING ANGLE BRACKET
2768	MEDIUM LEFT PARENTHESIS ORNAMENT
2769	MEDIUM RIGHT PARENTHESIS ORNAMENT
276A	MEDIUM FLATTENED LEFT PARENTHESIS ORNAMENT
276B	MEDIUM FLATTENED RIGHT PARENTHESIS ORNAMENT
276C	MEDIUM LEFT-POINTING ANGLE BRACKET ORNAMENT
276D	MEDIUM RIGHT-POINTING ANGLE BRACKET ORNAMENT
276E	HEAVY LEFT-POINTING ANGLE QUOTATION MARK ORNAMENT
276F	HEAVY RIGHT-POINTING ANGLE QUOTATION MARK ORNAMENT
2770	HEAVY LEFT-POINTING ANGLE BRACKET ORNAMENT
2771	HEAVY RIGHT-POINTING ANGLE BRACKET ORNAMENT
2772	LIGHT LEFT TORTOISE SHELL BRACKET ORNAMENT
2773	LIGHT RIGHT TORTOISE SHELL BRACKET ORNAMENT
2774	MEDIUM LEFT CURLY BRACKET ORNAMENT
2775	MEDIUM RIGHT CURLY BRACKET ORNAMENT
27C0	THREE DIMENSIONAL ANGLE
27C3	OPEN SUBSET
27C4	OPEN SUPERSET
27C5	LEFT S-SHAPED BAG DELIMITER
27C6	RIGHT S-SHAPED BAG DELIMITER
27D3	LOWER RIGHT CORNER WITH DOT
27D4	UPPER LEFT CORNER WITH DOT
27D5	LEFT OUTER JOIN
27D6	RIGHT OUTER JOIN
27DC	LEFT MULTIMAP
27DD	LONG RIGHT TACK
27DE	LONG LEFT TACK
27E2	WHITE CONCAVE-SIDED DIAMOND WITH LEFTWARDS TICK
27E3	WHITE CONCAVE-SIDED DIAMOND WITH RIGHTWARDS TICK
27E4	WHITE SQUARE WITH LEFTWARDS TICK
27E5	WHITE SQUARE WITH RIGHTWARDS TICK
27E6	MATHEMATICAL LEFT WHITE SQUARE BRACKET
27E7	MATHEMATICAL RIGHT WHITE SQUARE BRACKET
27E8	MATHEMATICAL LEFT ANGLE BRACKET
27E9	MATHEMATICAL RIGHT ANGLE BRACKET
27EA	MATHEMATICAL LEFT DOUBLE ANGLE BRACKET
27EB	MATHEMATICAL RIGHT DOUBLE ANGLE BRACKET
2983	LEFT WHITE CURLY BRACKET
2984	RIGHT WHITE CURLY BRACKET
2985	LEFT WHITE PARENTHESIS
2986	RIGHT WHITE PARENTHESIS
2987	Z NOTATION LEFT IMAGE BRACKET
2988	Z NOTATION RIGHT IMAGE BRACKET
2989	Z NOTATION LEFT BINDING BRACKET
298A	Z NOTATION RIGHT BINDING BRACKET
298B	LEFT SQUARE BRACKET WITH UNDERBAR
298C	RIGHT SQUARE BRACKET WITH UNDERBAR

298D	LEFT SQUARE BRACKET WITH TICK IN TOP CORNER
298E	RIGHT SQUARE BRACKET WITH TICK IN BOTTOM CORNER
298F	LEFT SQUARE BRACKET WITH TICK IN BOTTOM CORNER
2990	RIGHT SQUARE BRACKET WITH TICK IN TOP CORNER
2991	LEFT ANGLE BRACKET WITH DOT
2992	RIGHT ANGLE BRACKET WITH DOT
2993	LEFT ARC LESS-THAN BRACKET
2994	RIGHT ARC GREATER-THAN BRACKET
2995	DOUBLE LEFT ARC GREATER-THAN BRACKET
2996	DOUBLE RIGHT ARC LESS-THAN BRACKET
2997	LEFT BLACK TORTOISE SHELL BRACKET
2998	RIGHT BLACK TORTOISE SHELL BRACKET
299B	MEASURED ANGLE OPENING LEFT
299C	RIGHT ANGLE VARIANT WITH SQUARE
299D	MEASURED RIGHT ANGLE WITH DOT
299E	ANGLE WITH S INSIDE
299F	ACUTE ANGLE
29A0	SPHERICAL ANGLE OPENING LEFT
29A1	SPHERICAL ANGLE OPENING UP
29A2	TURNED ANGLE
29A3	REVERSED ANGLE
29A4	ANGLE WITH UNDERBAR
29A5	REVERSED ANGLE WITH UNDERBAR
29A6	OBLIQUE ANGLE OPENING UP
29A7	OBLIQUE ANGLE OPENING DOWN
29A8	MEASURED ANGLE WITH OPEN ARM ENDING IN ARROW POINTING UP AND RIGHT
29A9	MEASURED ANGLE WITH OPEN ARM ENDING IN ARROW POINTING UP AND LEFT
29AA	MEASURED ANGLE WITH OPEN ARM ENDING IN ARROW POINTING DOWN AND RIGHT
29AB	MEASURED ANGLE WITH OPEN ARM ENDING IN ARROW POINTING DOWN AND LEFT
29AC	MEASURED ANGLE WITH OPEN ARM ENDING IN ARROW POINTING RIGHT AND UP
29AD	MEASURED ANGLE WITH OPEN ARM ENDING IN ARROW POINTING LEFT AND UP
29AE	MEASURED ANGLE WITH OPEN ARM ENDING IN ARROW POINTING RIGHT AND DOWN
29AF	MEASURED ANGLE WITH OPEN ARM ENDING IN ARROW POINTING LEFT AND DOWN
29B8	CIRCLED REVERSE SOLIDUS
29C0	CIRCLED LESS-THAN
29C1	CIRCLED GREATER-THAN
29C2	CIRCLE WITH SMALL CIRCLE TO THE RIGHT
29C3	CIRCLE WITH TWO HORIZONTAL STROKES TO THE RIGHT
29C4	SQUARED RISING DIAGONAL SLASH
29C5	SQUARED FALLING DIAGONAL SLASH
29C9	TWO JOINED SQUARES
29CE	RIGHT TRIANGLE ABOVE LEFT TRIANGLE
29CF	LEFT TRIANGLE BESIDE VERTICAL BAR
29D0	VERTICAL BAR BESIDE RIGHT TRIANGLE
29D1	BOWTIE WITH LEFT HALF BLACK
29D2	BOWTIE WITH RIGHT HALF BLACK
29D4	TIMES WITH LEFT HALF BLACK
29D5	TIMES WITH RIGHT HALF BLACK
29D8	LEFT WIGGLY FENCE
29D9	RIGHT WIGGLY FENCE
29DA	LEFT DOUBLE WIGGLY FENCE

29DB	RIGHT DOUBLE WIGGLY FENCE
29DC	INCOMPLETE INFINITY
29E1	INCREASES AS
29E3	EQUALS SIGN AND SLANTED PARALLEL
29E4	EQUALS SIGN AND SLANTED PARALLEL WITH TILDE ABOVE
29E5	IDENTICAL TO AND SLANTED PARALLEL
29E8	DOWN-POINTING TRIANGLE WITH LEFT HALF BLACK
29E9	DOWN-POINTING TRIANGLE WITH RIGHT HALF BLACK
29F4	RULE-DELAYED
29F5	REVERSE SOLIDUS OPERATOR
29F6	SOLIDUS WITH OVERBAR
29F7	REVERSE SOLIDUS WITH HORIZONTAL STROKE
29F8	BIG SOLIDUS
29F9	BIG REVERSE SOLIDUS
29FC	LEFT-POINTING CURVED ANGLE BRACKET
29FD	RIGHT-POINTING CURVED ANGLE BRACKET
2A0A	MODULO TWO SUM
2A0B	SUMMATION WITH INTEGRAL
2A0C	QUADRUPLE INTEGRAL OPERATOR
2A0D	FINITE PART INTEGRAL
2A0E	INTEGRAL WITH DOUBLE STROKE
2A0F	INTEGRAL AVERAGE WITH SLASH
2A10	CIRCULATION FUNCTION
2A11	ANTICLOCKWISE INTEGRATION
2A12	LINE INTEGRATION WITH RECTANGULAR PATH AROUND POLE
2A13	LINE INTEGRATION WITH SEMICIRCULAR PATH AROUND POLE
2A14	LINE INTEGRATION NOT INCLUDING THE POLE
2A15	INTEGRAL AROUND A POINT OPERATOR
2A16	QUATERNION INTEGRAL OPERATOR
2A17	INTEGRAL WITH LEFTWARDS ARROW WITH HOOK
2A18	INTEGRAL WITH TIMES SIGN
2A19	INTEGRAL WITH INTERSECTION
2A1A	INTEGRAL WITH UNION
2A1B	INTEGRAL WITH OVERBAR
2A1C	INTEGRAL WITH UNDERBAR
2A1E	LARGE LEFT TRIANGLE OPERATOR
2A1F	Z NOTATION SCHEMA COMPOSITION
2A20	Z NOTATION SCHEMA PIPING
2A21	Z NOTATION SCHEMA PROJECTION
2A24	PLUS SIGN WITH TILDE ABOVE
2A26	PLUS SIGN WITH TILDE BELOW
2A29	MINUS SIGN WITH COMMA ABOVE
2A2B	MINUS SIGN WITH FALLING DOTS
2A2C	MINUS SIGN WITH RISING DOTS
2A2D	PLUS SIGN IN LEFT HALF CIRCLE
2A2E	PLUS SIGN IN RIGHT HALF CIRCLE
2A34	MULTIPLICATION SIGN IN LEFT HALF CIRCLE
2A35	MULTIPLICATION SIGN IN RIGHT HALF CIRCLE
2A3C	INTERIOR PRODUCT
2A3D	RIGHTHAND INTERIOR PRODUCT
2A3E	Z NOTATION RELATIONAL COMPOSITION
2A57	SLOPING LARGE OR
2A58	SLOPING LARGE AND
2A64	Z NOTATION DOMAIN ANTIRESTRICTION
2A65	Z NOTATION RANGE ANTIRESTRICTION
2A6A	TILDE OPERATOR WITH DOT ABOVE
2A6B	TILDE OPERATOR WITH RISING DOTS
2A6C	SIMILAR MINUS SIMILAR

2A6D	CONGRUENT WITH DOT ABOVE
2A6F	ALMOST EQUAL TO WITH CIRCUMFLEX ACCENT
2A70	APPROXIMATELY EQUAL OR EQUAL TO
2A73	EQUALS SIGN ABOVE TILDE OPERATOR
2A74	DOUBLE COLON EQUAL
2A79	LESS-THAN WITH CIRCLE INSIDE
2A7A	GREATER-THAN WITH CIRCLE INSIDE
2A7B	LESS-THAN WITH QUESTION MARK ABOVE
2A7C	GREATER-THAN WITH QUESTION MARK ABOVE
2A7D	LESS-THAN OR SLANTED EQUAL TO
2A7E	GREATER-THAN OR SLANTED EQUAL TO
2A7F	LESS-THAN OR SLANTED EQUAL TO WITH DOT INSIDE
2A80	GREATER-THAN OR SLANTED EQUAL TO WITH DOT INSIDE
2A81	LESS-THAN OR SLANTED EQUAL TO WITH DOT ABOVE
2A82	GREATER-THAN OR SLANTED EQUAL TO WITH DOT ABOVE
2A83	LESS-THAN OR SLANTED EQUAL TO WITH DOT ABOVE RIGHT
2A84	GREATER-THAN OR SLANTED EQUAL TO WITH DOT ABOVE LEFT
2A85	LESS-THAN OR APPROXIMATE
2A86	GREATER-THAN OR APPROXIMATE
2A87	LESS-THAN AND SINGLE-LINE NOT EQUAL TO
2A88	GREATER-THAN AND SINGLE-LINE NOT EQUAL TO
2A89	LESS-THAN AND NOT APPROXIMATE
2A8A	GREATER-THAN AND NOT APPROXIMATE
2A8B	LESS-THAN ABOVE DOUBLE-LINE EQUAL ABOVE GREATER-THAN
2A8C	GREATER-THAN ABOVE DOUBLE-LINE EQUAL ABOVE LESS-THAN
2A8D	LESS-THAN ABOVE SIMILAR OR EQUAL
2A8E	GREATER-THAN ABOVE SIMILAR OR EQUAL
2A8F	LESS-THAN ABOVE SIMILAR ABOVE GREATER-THAN
2A90	GREATER-THAN ABOVE SIMILAR ABOVE LESS-THAN
2A91	LESS-THAN ABOVE GREATER-THAN ABOVE DOUBLE-LINE EQUAL
2A92	GREATER-THAN ABOVE LESS-THAN ABOVE DOUBLE-LINE EQUAL
2A93	LESS-THAN ABOVE SLANTED EQUAL ABOVE GREATER-THAN ABOVE SLANTED EQUAL
2A94	GREATER-THAN ABOVE SLANTED EQUAL ABOVE LESS-THAN ABOVE SLANTED EQUAL
2A95	SLANTED EQUAL TO OR LESS-THAN
2A96	SLANTED EQUAL TO OR GREATER-THAN
2A97	SLANTED EQUAL TO OR LESS-THAN WITH DOT INSIDE
2A98	SLANTED EQUAL TO OR GREATER-THAN WITH DOT INSIDE
2A99	DOUBLE-LINE EQUAL TO OR LESS-THAN
2A9A	DOUBLE-LINE EQUAL TO OR GREATER-THAN
2A9B	DOUBLE-LINE SLANTED EQUAL TO OR LESS-THAN
2A9C	DOUBLE-LINE SLANTED EQUAL TO OR GREATER-THAN
2A9D	SIMILAR OR LESS-THAN
2A9E	SIMILAR OR GREATER-THAN
2A9F	SIMILAR ABOVE LESS-THAN ABOVE EQUALS SIGN

2AA0	SIMILAR ABOVE GREATER-THAN ABOVE EQUALS SIGN
2AA1	DOUBLE NESTED LESS-THAN
2AA2	DOUBLE NESTED GREATER-THAN
2AA3	DOUBLE NESTED LESS-THAN WITH UNDERBAR
2AA6	LESS-THAN CLOSED BY CURVE
2AA7	GREATER-THAN CLOSED BY CURVE
2AA8	LESS-THAN CLOSED BY CURVE ABOVE SLANTED EQUAL
2AA9	GREATER-THAN CLOSED BY CURVE ABOVE SLANTED EQUAL
2AAA	SMALLER THAN
2AAB	LARGER THAN
2AAC	SMALLER THAN OR EQUAL TO
2AAD	LARGER THAN OR EQUAL TO
2AAF	PRECEDES ABOVE SINGLE-LINE EQUALS SIGN
2AB0	SUCCEEDS ABOVE SINGLE-LINE EQUALS SIGN
2AB1	PRECEDES ABOVE SINGLE-LINE NOT EQUAL TO
2AB2	SUCCEEDS ABOVE SINGLE-LINE NOT EQUAL TO
2AB3	PRECEDES ABOVE EQUALS SIGN
2AB4	SUCCEEDS ABOVE EQUALS SIGN
2AB5	PRECEDES ABOVE NOT EQUAL TO
2AB6	SUCCEEDS ABOVE NOT EQUAL TO
2AB7	PRECEDES ABOVE ALMOST EQUAL TO
2AB8	SUCCEEDS ABOVE ALMOST EQUAL TO
2AB9	PRECEDES ABOVE NOT ALMOST EQUAL TO
2ABA	SUCCEEDS ABOVE NOT ALMOST EQUAL TO
2ABB	DOUBLE PRECEDES
2ABC	DOUBLE SUCCEEDS
2ABD	SUBSET WITH DOT
2ABE	SUPERSET WITH DOT
2ABF	SUBSET WITH PLUS SIGN BELOW
2AC0	SUPERSET WITH PLUS SIGN BELOW
2AC1	SUBSET WITH MULTIPLICATION SIGN BELOW
2AC2	SUPERSET WITH MULTIPLICATION SIGN BELOW
2AC3	SUBSET OF OR EQUAL TO WITH DOT ABOVE
2AC4	SUPERSET OF OR EQUAL TO WITH DOT ABOVE
2AC5	SUBSET OF ABOVE EQUALS SIGN
2AC6	SUPERSET OF ABOVE EQUALS SIGN
2AC7	SUBSET OF ABOVE TILDE OPERATOR
2AC8	SUPERSET OF ABOVE TILDE OPERATOR
2AC9	SUBSET OF ABOVE ALMOST EQUAL TO
2ACA	SUPERSET OF ABOVE ALMOST EQUAL TO
2ACB	SUBSET OF ABOVE NOT EQUAL TO
2ACC	SUPERSET OF ABOVE NOT EQUAL TO
2ACD	SQUARE LEFT OPEN BOX OPERATOR
2ACE	SQUARE RIGHT OPEN BOX OPERATOR
2ACF	CLOSED SUBSET
2AD0	CLOSED SUPERSET
2AD1	CLOSED SUBSET OR EQUAL TO
2AD2	CLOSED SUPERSET OR EQUAL TO
2AD3	SUBSET ABOVE SUPERSET
2AD4	SUPERSET ABOVE SUBSET
2AD5	SUBSET ABOVE SUBSET
2AD6	SUPERSET ABOVE SUPERSET
2ADC	FORKING
2ADE	SHORT LEFT TACK
2AE2	VERTICAL BAR TRIPLE RIGHT TURNSTILE
2AE3	DOUBLE VERTICAL BAR LEFT TURNSTILE
2AE4	VERTICAL BAR DOUBLE LEFT TURNSTILE

2AE5	DOUBLE VERTICAL BAR DOUBLE LEFT TURNSTILE
2AE6	LONG DASH FROM LEFT MEMBER OF DOUBLE VERTICAL
2AEC	DOUBLE STROKE NOT SIGN
2AED	REVERSED DOUBLE STROKE NOT SIGN
2AEE	DOES NOT DIVIDE WITH REVERSED NEGATION SLASH
2AF3	PARALLEL WITH TILDE OPERATOR
2AF7	TRIPLE NESTED LESS-THAN
2AF8	TRIPLE NESTED GREATER-THAN
2AF9	DOUBLE-LINE SLANTED LESS-THAN OR EQUAL TO
2AFA	DOUBLE-LINE SLANTED GREATER-THAN OR EQUAL TO
2AFB	TRIPLE SOLIDUS BINARY RELATION
2AFD	DOUBLE SOLIDUS OPERATOR
2E02	LEFT SUBSTITUTION BRACKET
2E03	RIGHT SUBSTITUTION BRACKET
2E04	LEFT DOTTED SUBSTITUTION BRACKET
2E05	RIGHT DOTTED SUBSTITUTION BRACKET
2E09	LEFT TRANSPOSITION BRACKET
2E0A	RIGHT TRANSPOSITION BRACKET
2E0C	LEFT RAISED OMISSION BRACKET
2E0D	RIGHT RAISED OMISSION BRACKET
2E1C	LEFT LOW PARAPHRASE BRACKET
2E1D	RIGHT LOW PARAPHRASE BRACKET
3008	LEFT ANGLE BRACKET
3009	RIGHT ANGLE BRACKET
300A	LEFT DOUBLE ANGLE BRACKET
300B	RIGHT DOUBLE ANGLE BRACKET
300C	LEFT CORNER BRACKET
300D	RIGHT CORNER BRACKET
300E	LEFT WHITE CORNER BRACKET
300F	RIGHT WHITE CORNER BRACKET
3010	LEFT BLACK LENTICULAR BRACKET
3011	RIGHT BLACK LENTICULAR BRACKET
3014	LEFT TORTOISE SHELL BRACKET
3015	RIGHT TORTOISE SHELL BRACKET
3016	LEFT WHITE LENTICULAR BRACKET
3017	RIGHT WHITE LENTICULAR BRACKET
3018	LEFT WHITE TORTOISE SHELL BRACKET
3019	RIGHT WHITE TORTOISE SHELL BRACKET
301A	LEFT WHITE SQUARE BRACKET
301B	RIGHT WHITE SQUARE BRACKET
FF08	FULLWIDTH LEFT PARENTHESIS
FF09	FULLWIDTH RIGHT PARENTHESIS
FF1C	FULLWIDTH LESS-THAN SIGN
FF1E	FULLWIDTH GREATER-THAN SIGN
FF3B	FULLWIDTH LEFT SQUARE BRACKET
FF3D	FULLWIDTH RIGHT SQUARE BRACKET
FF5B	FULLWIDTH LEFT CURLY BRACKET
FF5D	FULLWIDTH RIGHT CURLY BRACKET
FF5F	FULLWIDTH LEFT WHITE PARENTHESIS
FF60	FULLWIDTH RIGHT WHITE PARENTHESIS
FF62	HALFWIDTH LEFT CORNER BRACKET
FF63	HALFWIDTH RIGHT CORNER BRACKET

Annex F
(informative)

Format characters

There is a special class of characters called Format characters the primary purpose of which is to affect the layout or processing of characters around them. With few exceptions, these characters do not have printable graphic symbols and, like the space characters, are represented in the character code tables by dotted boxes.

The function of most of these characters is to indicate the correct presentation of a CC-data element. For any text processing other than presentation (such as sorting and searching), the alternate format characters, except for ZWJ and ZWNJ described in F.1.1, can be ignored by filtering them out. The alternate format characters are not intended to be used in conjunction with bidirectional control functions from ISO/IEC 6429.

There are collections of graphic characters for selected subsets which consist of Alternate Format Characters (see annex A).

F.1 General format characters

F.1.1   Zero-width boundary indicators

COMBINING GRAPHEME JOINER (034F): The Combining Grapheme Joiner is used to indicate that adjacent characters are to be treated as a unit for the purpose of language-sensitive collation and searching. In language-sensitive collation and searching, the combining grapheme joiner should be ignored unless it specifically occurs with a tailored collation element mapping. For rendering, the combining grapheme joiner is invisible.

> NOTE 1 – The combining grapheme joiner may be used to differentiate two usages of a combining character by using it for one of the two cases. For example, where a distinction is needed between the German umlaut and the tréma, the COMBINING GRAPHEME JOINER (034F) followed by the COMBINING DIAERESIS (0308) should be used to represent the tréma while the COMBINING DIAERESIS (0308) alone should be used to represent the German umlaut.

The following characters are used to indicate whether or not the adjacent characters are separated by a word boundary or hyphenation boundary. Each of these zero-width boundary indicators has no width in its usual own presentation.

SOFT HYPHEN (00AD): SOFT HYPHEN (SHY) is a format character that indicates a preferred intra-word line-break opportunity. If the line is broken at that point, then whatever mechanism is appropriate for intra-word line-

breaks should be invoked, just as if the line break had been triggered by another mechanism, such as a dictionary lookup. Depending on the language and the word, that may produce different visible results, such as:

- inserting a graphic symbol indicating the hyphenation and breaking the line after it,
- inserting a graphic symbol indicating the hyphenation, breaking the line after the symbol and changing spelling in the divided word parts,
- not showing any visible change and simply breaking the line at that point.

The inserted graphic symbol, if any, can take a wide variety of shapes, such as HYPHEN (2010), ARMENIAN HYPHEN (058A), MONGOLIAN TODO SOFT HYPHEN (1806), as appropriate for the situation.

When encoding text that includes explicit line breaking opportunities, including actual hyphenations, characters such as HYPHEN, ARMENIAN HYPHEN, and MONGOLIAN TODO SOFT HYPHEN may be used, depending on the language.

When a SOFT HYPHEN is inserted into a CC-data-element to encode a possible hyphenation point (for example: "tug{00AD}gumi"), the character representation remains otherwise unchanged. When encoding a CC-data-element that includes characters encoding hard line breaks, including actual hyphenations, the character representation of the text sequence must reflect any changes due to hyphenation (for example: "tugg{2010}" / "gumi", where / represents the line break).

> NOTE 2 – The notations {00AD} and {2010} indicate the inclusion of the corresponding code points: 00AD and 2010 into the CC-data-elements. The curly brackets "{}" are not part of the CC-data elements.

ZERO WIDTH SPACE (200B): This character behaves like a SPACE in that it indicates a word boundary, but unlike SPACE it has no presentational width. For example, this character could be used to indicate word boundaries in Thai, which does not use visible gaps to separate words.

WORD JOINER (2060) and **ZERO WIDTH NO-BREAK SPACE** (FEFF): These characters behave like a NO-BREAK SPACE in that they indicate the absence of word boundaries, but unlike NO-BREAK SPACE they have no

presentational width. For example, these characters could be inserted after the fourth character in the text "base+delta" to indicate that there is to be no word break between the "e" and the "+".

> NOTE 3 – For additional usages of the ZERO WIDTH NO-BREAK SPACE for "signature", see annex H.

The following characters are used to indicate whether or not the adjacent characters are joined together in rendering (cursive joiners).

ZERO WIDTH NON-JOINER (200C): This character indicates that the adjacent characters are not joined together in cursive connection even when they would normally join together as cursive letter forms. For example, ZERO WIDTH NON-JOINER between ARABIC LETTER NOON and ARABIC LETTER MEEM indicates that the characters are not rendered with the normal cursive connection.

ZERO WIDTH JOINER (200D): This character indicates that the adjacent characters are represented with joining forms in cursive connection even when they would not normally join together as cursive letter forms. For example, in the sequence SPACE followed by ARABIC LETTER BEH followed by SPACE, ZERO WIDTH JOINER can be inserted between the first two characters to display the final form of the ARABIC LETTER BEH.

F.1.2   Format separators

The following characters are used to indicate formatting boundaries between lines or paragraphs.

LINE SEPARATOR (2028): This character indicates where a new line starts; although the text continues to the next line, it does not start a new paragraph; e.g. no inter-paragraph indentation might be applied.

PARAGRAPH SEPARATOR (2029): This character indicates where a new paragraph starts; e.g. the text continues on the next line and inter-paragraph line spacing or paragraph indentation might be applied.

F.1.3   Bidirectional text formatting

The following characters are used in formatting bidirectional text. If the specification of a subset includes these characters, then texts containing right-to-left characters are to be rendered with an implicit bidirectional algorithm.

An implicit algorithm uses the directional character properties to determine the correct display order of characters on a horizontal line of text.

The following characters are format characters that act exactly like right-to-left or left-to-right characters in terms of affecting ordering (Bidirectional format marks). They have no visible graphic symbols, and they do not have any other semantic effect.

Their use can be more convenient than the explicit embeddings or overrides, since their scope is more local.

LEFT-TO-RIGHT MARK (200E): In bidirectional formatting, this character acts like a left-to-right character (such as LATIN SMALL LETTER A).

RIGHT-TO-LEFT MARK (200F): In bidirectional formatting, this character acts like a right-to-left character (such as ARABIC LETTER NOON).

The following format characters indicate that a piece of text is to be treated as embedded, and is to have a particular ordering attached to it (Bidirectional format embeddings). For example, an English quotation in the middle of an Arabic sentence can be marked as being an embedded left-to-right string. These format characters nest in blocks, with the embedding and override characters initiating (pushing) a block, and the pop character terminating (popping) a block.

The function of the embedding and override characters are very similar; the main difference is that the embedding characters specify the implicit direction of the text, while the override characters specify the explicit direction of the text. When text has an explicit direction, the normal directional character properties are ignored, and all of the text is assumed to have the ordering direction determined by the override character.

LEFT-TO-RIGHT EMBEDDING (202A): This character is used to indicate the start of a left-to-right implicit embedding.

RIGHT-TO-LEFT EMBEDDING (202B): This character is used to indicate the start of a right-to-left implicit embedding.

LEFT-TO-RIGHT OVERRIDE (202D): This character is used to indicate the start of a left-to-right explicit embedding.

RIGHT-TO-LEFT OVERRIDE (202E): This character is used to indicate the start of a right-to-left explicit embedding.

POP DIRECTIONAL FORMATTING (202C): This character is used to indicate the termination of an implicit or explicit directional embedding initiated by the above characters.

F.1.4   Other boundary indicators

NARROW NO-BREAK SPACE (202F): This character is a non-breaking space. It is similar to 00A0 NO-BREAK SPACE, except that it is rendered with a narrower width. When used with the Mongolian script this character is usually rendered at one-third of the width of a normal space, and it separates a suffix from the Mongolian word-stem. This allows for the normal rules of Mongolian character shaping to apply, while indicating that there is no word boundary at that position.

F.2 Script-specific format characters

F.2.1   Hangul fill characters

The following format characters have a special usage for Hangul characters.

HANGUL FILLER (3164): This character represents the fill value used with the standard spacing Jamos.

HALFWIDTH HANGUL FILLER (FFA0): As with the other halfwidth characters, this character is included for compatibility with certain systems that provide halfwidth forms of characters.

F.2.2   Symmetric swapping format characters

The following characters are used in conjunction with the class of left/right handed pairs of characters listed in clause 19. The following format characters indicate whether the interpretation of the term LEFT or RIGHT in the character names is OPENING or CLOSING respectively. The following characters do not nest.

The default state of interpretation may be set by a higher level protocol or standard, such as ISO/IEC 6429. In the absence of such a protocol, the default state is as established by ACTIVATE SYMMETRIC SWAPPING.

INHIBIT SYMMETRIC SWAPPING (206A): Between this character and the following ACTIVATE SYMMETRIC SWAPPING format character (if any), the stored characters listed in clause 19 are interpreted and rendered as LEFT and RIGHT, and the processing specified in that clause is not performed.

ACTIVATE SYMMETRIC SWAPPING (206B): Between this character and the following INHIBIT SYMMETRIC SWAPPING format character (if any), the stored characters listed in clause 19 are interpreted and rendered as OPENING and CLOSING characters as specified in that clause.

F.2.3   Character shaping selectors

The following characters are used in conjunction with Arabic presentation forms. During the presentation process, certain characters may be joined together in cursive connection or ligatures. The following characters indicate that the character shape determination process used to achieve this presentation effect is either activated or inhibited. The following characters do not nest.

INHIBIT ARABIC FORM SHAPING (206C): Between this character and the following ACTIVATE ARABIC FORM SHAPING format character (if any), the character shaping determination process is inhibited. The stored Arabic presentation forms are presented without shape modification. This is the default state.

ACTIVATE ARABIC FORM SHAPING (206D): Between this character and the following INHIBIT ARABIC FORM SHAPING format character (if any), the stored Arabic presentation forms are presented with shape modification by means of the character shaping determination process.

NOTE – These characters have no effect on characters that are not presentation forms: in particular, Arabic nominal char-

acters as from 0600 to 06FF are always subject to character shaping, and are unaffected by these formatting characters.

F.2.4   Numeric shape selectors

The following characters allow the selection of the shapes in which the digits from 0030 to 0039 are rendered. The following characters do not nest.

NATIONAL DIGIT SHAPES (206E): Between this character and the following NOMINAL DIGIT SHAPES format character (if any), digits from 0030 to 0039 are rendered with the appropriate national digit shapes as specified by means of appropriate agreements. For example, they could be displayed with shapes such as the ARABIC-INDIC digits from 0660 to 0669.

NOMINAL DIGIT SHAPES (206F): Between this character and the following NATIONAL DIGIT SHAPES format character (if any), the digits from 0030 to 0039 are rendered with the shapes as those shown in the code tables for those digits. This is the default state.

F.2.5   Mongolian vowel separator

MONGOLIAN VOWEL SEPARATOR (180E): This character may be used between the MONGOLIAN LETTER A or the MONGOLIAN LETTER E at the end of a word and the preceding consonant letter. It indicates a special form of the graphic symbol for the letter A or E and the preceding consonant. When rendered in visible form it is generally shown as a narrow space between the letters, but it may sometimes be shown as a distinct graphic symbol to assist the user.

F.2.6   Kharoshthi virama

KHAROSHTHI VIRAMA (10A3F): This character, which indicates the suppression of an inherent vowel, when followed by a consonant, causes a combined form consisting of two or more consonants. When not followed by another consonant, it causes the consonant which precedes it to be written as subscript to the left of the letter before it and is not displayed as a visible stroke or dot as VIRAMAs are in other scripts.

F.3 Ideographic description characters

An Ideographic Description Character (IDC) is a graphic character, which is used with a sequence of other graphic characters to form an Ideographic Description Sequence (IDS). Such a sequence may be used to describe an ideographic character which is not specified within this International Standard.

The IDS describes the ideograph in the abstract form. It is not interpreted as a composed character and does not imply any specific form of rendering.

NOTE – An IDS is not a character and therefore is not a member of the repertoire of ISO/IEC 10646.

F.3.1 Syntax of an ideographic description sequence

An IDS consists of an IDC followed by a fixed number of Description Components (DC). A DC may be any one of the following :

- a coded ideograph
- a coded radical
- another IDS

> NOTE 1 – The above description implies that any IDS may be nested within another IDS.

Each IDC has four properties as summarized in table F.1 below;

- the number of DCs used in the IDS that commences with that IDC,
- the definition of its acronym,
- the syntax of the corresponding IDS,
- the relative positions of the DCs in the visual representation of the ideograph that is being described in its abstract form.

The syntax of the IDS introduced by each IDC is indicated in the "IDS Acronym and Syntax" column of the table by the abbreviated name of the IDC (e.g. IDC-LTR) followed by the corresponding number of DCs, i.e. $(D_1 \ D_2)$ or $(D_1 \ D_2 \ D_3)$.

> NOTE 2 – An IDS is restricted to no more than 16 characters in length. Also no more than six ideographs and/or radicals may occur between any two instances of an IDC character within an IDS.

F.3.2 Individual definitions of the ideographic description characters

IDEOGRAPHIC DESCRIPTION CHARACTER LEFT TO RIGHT (2FF0): The IDS introduced by this character describes the abstract form of the ideograph with D_1 on the left and D_2 on the right.

IDEOGRAPHIC DESCRIPTION CHARACTER ABOVE TO BELOW (2FF1): The IDS introduced by this character describes the abstract form of the ideograph with D_1 above D_2.

IDEOGRAPHIC DESCRIPTION CHARACTER LEFT TO MIDDLE AND RIGHT (2FF2): The IDS introduced by this character describes the abstract form of the ideograph with D_1 on the left of D_2, and D_2 on the left of D_3.

IDEOGRAPHIC DESCRIPTION CHARACTER ABOVE TO MIDDLE AND BELOW (2FF3): The IDS introduced by this character describes the abstract form of the ideograph with D_1 above D_2, and D_2 above D_3.

IDEOGRAPHIC DESCRIPTION CHARACTER FULL SURROUND (2FF4): The IDS introduced by this character describes the abstract form of the ideograph with D_1 surrounding D_2 .

IDEOGRAPHIC DESCRIPTION CHARACTER SURROUND FROM ABOVE (2FF5): The IDS introduced by this character describes the abstract form of the ideograph with D_1 above D_2, and surrounding D_2 on both sides.

IDEOGRAPHIC DESCRIPTION CHARACTER SURROUND FROM BELOW (2FF6): The IDS introduced by this character describes the abstract form of the ideograph with D_1 below D_2, and surrounding D_2 on both sides.

IDEOGRAPHIC DESCRIPTION CHARACTER SURROUND FROM LEFT (2FF7): The IDS introduced by this character describes the abstract form of the ideograph with D_1 on the left of D_2, and surrounding D_2 above and below.

IDEOGRAPHIC DESCRIPTION CHARACTER SURROUND FROM UPPER LEFT (2FF8): The IDS introduced by this character describes the abstract form of the ideograph with D_1 at the top left corner of D_2, and partly surrounding D_2 above and to the left.

IDEOGRAPHIC DESCRIPTION CHARACTER SURROUND FROM UPPER RIGHT (2FF9): The IDS introduced by this character describes the abstract form of the ideograph with D_1 at the top right corner of D_2, and partly surrounding D_2 above and to the right.

IDEOGRAPHIC DESCRIPTION CHARACTER SURROUND FROM LOWER LEFT (2FFA): The IDS introduced by this character describes the abstract form of the ideograph with D_1 at the bottom left corner of D_2, and partly surrounding D_2 below and to the left.

IDEOGRAPHIC DESCRIPTION CHARACTER OVERLAID (2FFB): The IDS introduced by this character describes the abstract form of the ideograph with D_1 and D_2 overlaying each other.

Table F.1: Properties of ideographic description characters

Character Name: IDEOGRAPHIC DESCRIPTION CHARACTER ...	no. of DCs	IDS Acronym and Syntax	Relative positions of DCs	Example of IDS	IDS example represents:
LEFT TO RIGHT	2	IDC-LTR D_1 D_2		⿰ 亻 母	侮
ABOVE TO BELOW	2	IDC-ATB D_1 D_2		⿱ 八 天	关
LEFT TO MIDDLE AND RIGHT	3	IDC-LMR D_1 D_2 D_3		⿲ 彳 言 亍	衏
ABOVE TO MIDDLE AND BELOW	3	IDC-AMB D_1 D_2 D_3		⿳ 从 从 日	朁
FULL SURROUND	2	IDC-FSD D_1 D_2		⿴ 囗 巷	圏
SURROUND FROM ABOVE	2	IDC-SAV D_1 D_2		⿵ 門 卜	閁
SURROUND FROM BELOW	2	IDC-SBL D_1 D_2		⿶ 凵 士	𠘧
SURROUND FROM LEFT	2	IDC-SLT D_1 D_2		⿷ 匚 虎	虘
SURROUND FROM UPPER LEFT	2	IDC-SUL D_1 D_2		⿸ 广 舞	廡
SURROUND FROM UPPER RIGHT	2	IDC-SUR D_1 D_2		⿹ 勹 去	匃
SURROUND FROM LOWER LEFT	2	IDC-SLL D_1 D_2		⿺ 辶 交	迭
OVERLAID	2	IDC-OVL D_1 D_2	*	⿻ 从 工	巫

* NOTE – D_1 and D_2 overlap each other. This diagram does not imply that D_1 is on the top left corner and D_2 is on the bottom right corner.

F.4 Interlinear annotation characters

The following characters are used to indicate that an identified character string (the annotation string) is regarded as providing an annotation for another identified character string (the base string).

INTERLINEAR ANNOTATION ANCHOR (FFF9): This character indicates the beginning of the base string.

INTERLINEAR ANNOTATION SEPARATOR (FFFA): This character indicates the end of the base string and the beginning of the annotation string.

INTERLINEAR ANNOTATION TERMINATOR (FFFB): This character indicates the end of the annotation string.

The relationship between the annotation string and the base string is defined by agreement between the user of the originating device and the user of the receiving device. For example, if the base string is rendered in a visible form the annotation string may be rendered on a different line from the base string, in a position close to the base string.

If the interlinear annotation characters are filtered out during processing, then all characters between the Interlinear Annotation Separator and the Interlinear Annotation Terminator should also be filtered out.

F.5 Subtending format characters

The following characters are used to subtend a sequence of subsequent characters:

0600	ARABIC NUMBER SIGN
0601	ARABIC SIGN SANAH
0602	ARABIC FOOTNOTE MARKER
0603	ARABIC SIGN SAFHA
06DD	ARABIC END OF AYAH
070F	SYRIAC ABBREVIATION MARK

The scope of these characters is the subsequent sequence of digits (plus certain other characters), with the exact specification as defined in the Unicode Standard, Version 4.0 (see annex M for referencing information), for ARABIC END OF AYAH.

F.6 Western musical symbols

This international standard does not specify an encoding solution for musical scores or musical pitch. Solutions for these needs would require another description layer on top of the encoding definition of the characters specified in this standard. However, even without that additional layer, these characters can be used as simple musical reference symbols for general purposes in text descriptions of musical matters.

Extended beams are used frequently in music notation between groups of notes having short values. The format characters MUSICAL SYMBOL BEGIN BEAM and MUSICAL SYMBOL END BEAM can be used to indicate the extents of beam groupings. In some exceptional cases, beams are unclosed on one end. This can be indicated with a "null note" (MUSICAL SYMBOL NULL NOTEHEAD) character if no stem is to appear at the end of the beam.

Similarly, other format characters have been provided for other connecting structures. The characters

- MUSICAL SYMBOL BEGIN TIE
- MUSICAL SYMBOL END TIE
- MUSICAL SYMBOL BEGIN SLUR
- MUSICAL SYMBOL END SLUR
- MUSICAL SYMBOL BEGIN PHRASE
- MUSICAL SYMBOL END PHRASE

indicate the extent of these features.

These pairs of characters modify the layout and grouping of notes and phrases in full music notation. When musical examples are written or rendered in plain text without special software, the start/end control characters may be rendered as brackets or left un-interpreted. More sophisticated in-line processes may interpret them, to the extent possible, in their actual control capacity, rendering ties, slurs, beams, and phrases as appropriate.

For maximum flexibility, the character set includes both pre-composed note values as well as primitives from which complete notes are constructed. Due to their ubiquity, the pre-composed versions are provided mainly for convenience.

Coding convenience notwithstanding, notes built up from alternative noteheads, stems and flags, and articulation symbols are necessary for complete implementations and complex scores. Examples of their use include American shape-note and modern percussion notations. For example,

MUSICAL SYMBOL SQUARE NOTEHEAD BLACK + MUSICAL SYMBOL COMBINING STEM

MUSICAL SYMBOL X NOTEHEAD + MUSICAL SYMBOL COMBINING STEM

Augmentation dots and articulation symbols may be appended to either the pre-composed or built-up notes.

In addition, augmentation dots and articulation symbols may be repeated as necessary to build a complete note symbol. For example,

MUSICAL SYMBOL EIGHTH NOTE + MUSICAL SYMBOL COMBINING AUGMENTATION DOT + MUSICAL SYMBOL COMBINING AUGMENTATION DOT + MUSICAL SYMBOL COMBINING ACCENT

Annex G
(informative)

Alphabetically sorted list of character names

The alphabetically sorted list of character names is provided in machine-readable format that is accessible as a link to this document. The content linked to is a plain text file, using ISO/IEC 646-IRV characters with LINE FEED as end of line mark, that specifies, after a 4-lines header, all the character names from ISO/IEC 10646 except Hangul syllables and CJK-ideographs (these are characters from blocks:
HANGUL SYLLABLES,
CJK UNIFIED IDEOGRAPHS,
CJK UNIFIED IDEOGRAPHS EXTENSION A,
CJK UNIFIED IDEOGRAPHS EXTENSION B,
CJK COMPATIBILITY IDEOGRAPHS and
CJK COMPATIBILITY IDEOGRAPHS SUPPLEMENT).

The format of the file, after the header, is as follows:

01-05 octet: UCS-4 five-digit abbreviated form,

06 octet: TAB character,

07-end of line: character name with the annotation between parentheses.

Click on this highlighted text to access the reference file.

NOTE 1 – The content is also available as a separate viewable file in the same file directory as this document. The file is named: "Allnames.txt".

NOTE 2 – The referenced files are only available to users who obtain their copy of the standard in a machine-readable format. However, the file format makes them printable.

Annex H
(informative)

The use of "signatures" to identify UCS

This annex describes a convention for the identification of features of the UCS, by the use of "signatures" within data streams of coded characters. The convention makes use of the character ZERO WIDTH NO-BREAK SPACE, and is applied by a certain class of applications.

When this convention is used, a signature at the beginning of a stream of coded characters indicates that the characters following are encoded in the UCS-2 or UCS-4 coded representation, and indicates the ordering of the octets within the coded representation of each character (see clause 6.3). It is typical of the class of applications mentioned above, that some make use of the signatures when receiving data, while others do not. The signatures are therefore designed in a way that makes it easy to ignore them.

In this convention, the ZERO WIDTH NO-BREAK SPACE character has the following significance when it is present at the beginning of a stream of coded characters:

UCS-2 signature: FEFF

UCS-4 signature: 0000 FEFF

UTF-8 signature: EF BB BF

UTF-16 signature: FEFF

An application receiving data may either use these signatures to identify the coded representation form, or may ignore them and treat FEFF as the ZERO WIDTH NO-BREAK SPACE character.

If an application which uses one of these signatures recognizes its coded representation in reverse sequence (e.g. hexadecimal FFFE), the application can identify that the coded representations of the following characters use the opposite octet sequence to the sequence expected, and may take the necessary action to recognize the characters correctly.

NOTE – The hexadecimal value FFFE does not correspond to any coded character within ISO/IEC 10646.

Annex J
(informative)

Recommendation for combined receiving/originating devices with internal storage

This annex is applicable to a widely-used class of devices that can store received CC-data elements for subsequent retransmission.

This recommendation is intended to ensure that loss of information is minimized between the receipt of a CC-data-element and its retransmission.

A device of this class includes a receiving device component and an originating device component as in clause 2.3, and can also store received CC-data-elements for retransmission, with or without modification by the actions of the user on the corresponding characters represented within it. Within this class of device, two distinct types are identified here, as follows.

1. Receiving device with full retransmission capability

   The originating device component will retransmit the coded representations of any received characters, including those that are outside the identified subset of the receiving device component, without change to their coded representation, unless modified by the user.

2. Receiving device with subset retransmission capability

   The originating device component can re-transmit only the coded representations of the characters of the subset adopted by the receiving device component.

Annex K
(informative)

Notations of octet value representations

Representation of octet values in ISO/IEC 10646 except in clause 16 is different from other character coding standards such as ISO/IEC 2022, ISO/IEC 6429 and ISO 8859. This annex clarifies the relationship between the two notations.

- In ISO/IEC 10646, the notation used to express an octet value is z, where z is a hexadecimal number in the range 00 to FF.

    For example, the character ESCAPE (ESC) of ISO/IEC 2022 is represented by 1B.

- In other character coding standards, the notation used to express an octet value is x/y, where x and y are two decimal numbers in the range 00 to 15. The correspondence between the notations of the form x/y and the octet value is as follows.

x is the number represented by bit 8, bit 7, bit 6 and bit 5 where these bits are given the weight 8, 4, 2 and 1 respectively;

y is the number represented by bit 4, bit 3, bit 2 and bit 1 where these bits are given the weight 8, 4, 2 and 1 respectively.

For example, the character ESC of ISO/IEC 2022 is represented by 01/11.

Thus ISO/IEC 2022 (and other character coding standards) octet value notation can be converted to ISO/IEC 10646 octet value notation by converting the value of x and y to hexadecimal notation. For example; 04/15 is equivalent to 4F.

Annex L
(informative)

Character naming guidelines

Guidelines for generating and presenting unique names of characters in ISO/IEC JTC1/SC2 standards are listed in this annex for information. These guidelines are used in information technology coded character set standards such as ISO/IEC 646, ISO/IEC 6937, ISO/IEC 8859, ISO/IEC 10367 as well as in ISO/IEC 10646.

These Guidelines specify rules for generating and presenting unique names of characters in those versions of the standards that are in the English language.

> NOTE – In a version of such a standard in another language:
>
> a) these rules may be amended to permit names of characters to be generated using words and syntax that are considered appropriate within that language;
>
> b) the names of the characters from this version of the standard may be replaced by equivalent unique names constructed according to the rules amended as in a) above.

Rules 1 to 4 are implemented without exceptions, unless mentioned in the rule itself (see Rule 4). However it must be accepted that in some cases (e.g. historical or traditional usage, unforeseen special cases, and difficulties inherent to the nature of the character considered), exceptions to some of the other rules will have to be tolerated. Nonetheless, these rules are applied wherever possible.

Rule 1

By convention, only Latin capital letters A to Z, space, and hyphen are used for writing the names of characters.

> NOTE – Names of characters may also include digits 0 to 9 (provided that a digit is not the first character in a word) if inclusion of the name of the corresponding digit(s) would be inappropriate. As an example the name of the character at position 201A is SINGLE LOW-9 QUOTATION MARK; the symbol for the digit 9 is included in this name to illustrate the shape of the character, and has no numerical significance.

Rule 2

The names of control functions are coupled with an acronym consisting of Latin capital letters A to Z and, where required, digits. Once the name has been specified for the first time, the acronym may be used in the remainder of the text where required for simplification and clarity of the text. Exceptionally, acronyms may be used for graphic characters where usage already exists and clarity requires it, in particular in code tables.

Examples:

Name: LOCKING-SHIFT TWO RIGHT
Acronym: LS2R
Name: SOFT HYPHEN
Acronym: SHY

> NOTE – In ISO/IEC 6429, also the names of the modes have been presented in the same way as control functions.

Rule 3

In some cases, the name of a character can be followed by an additional explanatory statement not part of the name. These statements are in parentheses and not in capital Latin letters except the initials of the word where required. See examples in rule 13.

The name of a character may also be followed by a single * symbol not part of the name. This indicates that additional information on the character appears in annex P. Any * symbols are omitted from the character names listed in annex G.

Rule 4

Names are unique if SPACE and medial HYPHEN-MINUS characters are ignored, and if the strings "LETTER", "CHARACTER", and "DIGIT" are ignored in comparison of the names.

Examples of unacceptable unique names:

SARATI LETTER AA
SARATI CHARACTER AA

These two names would not be unique if the strings "LETTER" and "CHARACTER" were ignored.

The following two character names are exceptions to this rule, since there were created before this rule was specified.

116C   HANGUL JUNGSEONG OE
1180   HANGUL JUNGSEONG O-E

Rule 5

The name of a character wherever possible denotes its customary meaning, for example PLUS SIGN. Where this is not possible, names describe shapes, not usage; for example: UPWARDS ARROW.

The name of a character is not intended to identify its properties or attributes, or to provide information on its linguistic characteristics, except as defined in Rule 6 below.

Rule 6

Only one name is given to each character.

Rule 7

The names are constructed from an appropriate set of the applicable terms of the following grid and ordered in the sequence of this grid. Exceptions are specified in Rule 11. The words WITH and AND may be included for additional clarity when needed.

1	Script	5	Attribute
2	Case	6	Designation
3	Type	7	Mark(s)
4	Language	8	Qualifier

Examples of such terms:

Script	Latin, Cyrillic, Arabic
Case	capital, small
Type	letter, ligature, digit
Language	Ukrainian
Attribute	final, sharp, subscript, vulgar
Designation	customary name, name of letter
Mark	acute, ogonek, ring above, diaeresis
Qualifier	sign, symbol

Examples of names:

LATIN CAPITAL LETTER A WITH ACUTE
   1   2   3   6   7

DIGIT FIVE
   3   6

LEFT CURLY BRACKET
  5   5   6

> NOTE 1 – A ligature is a graphic symbol in which two or more other graphic symbols are imaged as a single graphic symbol.

> NOTE 2 – Where a character comprises a base letter with multiple marks, the sequence of those in the name is the order in which the marks are positioned relative to the base letter, starting with the marks above the letters taken in upwards sequence, and followed by the marks below the letters taken in downwards sequence.

Rule 8

The letters of the Latin script are represented within their name by their basic graphic symbols (A, B, C, etc.). The letters of all other scripts are represented by their transcription in the language of the first published International Standard.

Examples:

K	LATIN CAPITAL LETTER K
Ю	CYRILLIC CAPITAL LETTER YU

Rule 9

In principle when a character of a given script is used in more than one language, no language name is specified. Exceptions are tolerated where an ambiguity would otherwise result.

Examples:

И	CYRILLIC CAPITAL LETTER I
I	CYRILLIC CAPITAL LETTER BYELORUSSIAN-UKRAINIAN I

Rule 10

Letters that are elements of more than one script are considered different even if their shape is the same; they have different names.

Examples:

A	LATIN CAPITAL LETTER A
A	GREEK CAPITAL LETTER ALPHA
A	CYRILLIC CAPITAL LETTER A

Rule 11

A character of one script used in isolation in another script, for example as a graphic symbol in relation with physical units of dimension, is considered as a character different from the character of its native script.

Example:

µ	MICRO SIGN

Rule 12

A number of characters have a traditional name consisting of one or two words. It is not intended to change this usage.

Examples:

'	APOSTROPHE
:	COLON
@	COMMERCIAL AT
_	LOW LINE
~	TILDE

Rule 13

In some cases, characters of a given script, often punctuation marks, are used in another script for a different usage. In these cases the customary name reflecting the most general use is given to the character. The customary name may be followed in the list of characters of a particular standard by the name in parentheses which this character has in the script specified by this particular standard.

Example:

‿	UNDERTIE (Enotikon)

Rule 14

The above rules do not apply to ideographic characters. These characters are identified by alpha-numeric identifiers specified for each ideographic character (see clause 28.2).

Annex M
(informative)

Sources of characters

Several sources and contributions were used for constructing this coded character set. In particular, characters of the following national and international standards are included in ISO/IEC 10646.

ISO 233:1984, *Documentation - Transliteration of Arabic characters into Latin characters.*

ISO/IEC 646:1991, *Information technology - ISO 7-bit coded character set for information interchange.*

ISO 2033:1983, *Information processing - Coding of machine readable characters (MICR and OCR).*

ISO 2047:1975, *Information processing - Graphical representations for the control characters of the 7-bit coded character set.*

ISO 5426:1983, *Extension of the Latin alphabet coded character set for bibliographic information interchange.*

ISO 5427:1984, *Extension of the Cyrillic alphabet coded character set for bibliographic information interchange.*

ISO 5428:1984, *Greek alphabet coded character set for bibliographic information interchange.*

ISO 6438:1983, *Documentation - African coded character set for bibliographic information interchange.*

ISO 6861, *Information and documentation - Glagolitic coded character set for bibliographic information interchange.*

ISO 6862, *Information and documentation - Mathematical coded character set for bibliographic information interchange.*

ISO 6937:1994, *Information technology - Coded graphic character sets for text communication - Latin alphabet.*

ISO/IEC 8859, *Information technology - 8-bit single-byte coded graphic character sets*

-Part 1: Latin alphabet No. 1 (1998).

-Part 2: Latin alphabet No. 2 (1999).

-Part 3: Latin alphabet No. 3 (1999).

-Part 4: Latin alphabet No. 4 (1998).

-Part 5: Latin/Cyrillic alphabet (1999)

-Part 6: Latin/Arabic alphabet (1999)

-Part 7: Latin/Greek alphabet

-Part 8: Latin/Hebrew alphabet (1999)

-Part 9: Latin alphabet No. 5 (1999)

-Part 10: Latin alphabet No. 6 (1998).

ISO 8879:1986, *Information processing - Text and office systems - Standard Generalized Markup Language (SGML).*

ISO 8957:1996, *Information and documentation - Hebrew alphabet coded character sets for bibliographic information interchange.*

ISO 9036:1987, *Information processing - Arabic 7-bit coded character set for information interchange.*

ISO/IEC 9995-7:1994, *Information technology – Keyboard layouts for text and office systems – Part 7: Symbols used to represent functions.*

ISO/IEC 10367:1991, *Information technology - Standardized coded graphic character sets for use in 8-bit codes.*

ISO 10754:1984, *Information and documentation – Extension of the Cyrillic alphabet coded character set for non-Slavic languages for bibliographic information interchange.*

ISO 11548-1:2001. *Communication aids for blind persons – identifiers, names and assignation to coded character sets for 8-dot Braille characters – Part 1: General guidelines for Braille identifiers and shift marks.*

ISO/IEC TR 15285:1998, *Information technology - An operational model for characters and glyphs.*

ISO international register of character sets to be used with escape sequences. (registration procedure ISO 2375:1985) .

ANSI X3.4-1986 American National Standards Institute. *Coded character set - 7-bit American national standard code.*

ANSI X3.32-1973 American National Standards Institute. *American national standard graphic representation of the control characters of American national standard code for information interchange.*

ANSI Y10.20-1988 American National Standards Institute. *Mathematic signs and symbols for use in physical sciences and technology.*

ANSI Y14.5M-1982 American National Standard. *Engineering drawings and related document practices, dimensioning and tolerances.*

ANSI Z39.47-1985 American National Standards Institute. *Extended Latin alphabet coded character set for bibliographic use.*

ANSI Z39.64-1989 American National Standards Institute. *East Asian character code for bibliographic use.*

ASMO 449-1982 Arab Organization for Standardization and Metrology. *Data processing - 7-bit coded character set for information interchange.*

GB2312-80 *Code of Chinese Graphic Character Set for Information Interchange: Jishu Biaozhun Chubanshe* (Technical Standards Publishing).

> NOTE – For additional sources of the CJK unified ideographs in ISO/IEC 10646 refer to clause 27.

GB13134: *Xinxi jiaohuanyong yiwen bianma zifuji (Yi coded character set for information interchange),* [prepared by] Sichuansheng minzushiwu weiyuanhui. Beijing, Jishu Biaozhun Chubanshe (Technical Standards Press), 1991. (GB 13134-1991).

GBK (*Guo Biao Kuo*) *Han character internal code extension specification: Jishu Biaozhun Chubanshe* (Technical Standards Publishing, Beijing)

IS 13194:1991 Bureau of Indian Standards *Indian script code for information interchange - ISCII*

LTD 37(1610)-1988 *Indian standard code for information interchange.*

I. S. 434:1999, *Information Technology - 8-bit single-byte graphic coded character set for Ogham = Teicneolaíocht Eolais - Tacar carachtar grafach Oghaim códaithe go haonbheartach le 8 ngiotán.* National Standards Authority of Ireland.

JIS X 0201-1976 Japanese Standards Association. *Jouhou koukan you fugou (Code for Information Interchange).*

JIS X 0208-1990 Japanese Standards Association. *Jouhou koukan you kanji fugoukei (Code of the Japanese Graphic Character Set for Information Interchange).*

JIS X 0212-1990 Japanese Standards Association. *Jouhou koukan you kanji fugou-hojo kanji (Code of the supplementary Japanese graphic character set for information interchange).*

JIS X 0213:2000, Japanese Standards Association. *7-bit and 8-bit double byte coded extended KANJI sets for information interchange, 2000-01-20.*

KS C 5601-1992 Korean Industrial Standards Association. *Jeongbo gyohwanyong buho (Code for Information Interchange).*

LVS 18-92 Latvian National Centre for Standardization and Metrology *Libiesu kodu tabula ar 191 simbolu.*

SI 1311.2 - 1996 The Standards Institution of Israel Information Technology. *ISO 8-bit coded character set for information interchange with Hebrew points and cantillation marks.*

SLS 1134:1996 Sri Lanka Standards Institution *Sinhala character code for information interchange.*

TIS 620-2533 *Thai Industrial Standard for Thai Character Code for Computer.* (1990)

The following publications were also used as sources of characters for the Basic Multilingual Plane.

Allworth, Edward. *Nationalities of the Soviet East: Publications and Writing Systems.* New York, London, Columbia University Press, 1971. ISBN 0-231-03274-9.

Armbruster, Carl Hubert. *Initia Amharica: an Introduction to Spoken Amharic.* Cambridge, Cambridge University Press, 1908-20.

Barry, Randall K. 1997. *ALA-LC romanization tables: transliteration schemes for non-Roman scripts.* Washington, DC: Library of Congress Cataloging Distribution Service. ISBN 0-8444-0940-5

Benneth, Solbritt, Jonas Ferenius, Helmer Gustavson, & Marit Åhlén. 1994. *Runmärkt: från brev till klotter. Runorna under medeltiden.* [Stockholm]: Carlsson Bokförlag. ISBN 91-7798-877-9

Beyer, Stephen V. *The classical Tibetan language.* State University of New York. ISBN 0-7914-1099-4

Bburx Ddie Su (= Bian Xiezhe). 1984. *Nuo-su bbur-ma shep jie zzit: Syp-chuo se nuo bbur-ma syt mu curx su niep sha zho ddop ma bbur-ma syt mu wo yuop hop, Bburx Ddie da Su.* [Chengdu]: Syp-chuo co cux tep yy ddurx dde. *Yi wen jian zi ben: Yi Han wen duizhao ban.* Chengdu: Sichuan minzu chubanshe. [*An examination of the fundamentals of the Yi script.* Chengdu: Sichuan National Press.]

Bburx Ddie Su. *Nip huo bbur-ma ssix jie: Nip huo bbur-ma ssi jie Bburx Ddie curx Su. = Yi Han zidian.* Chengdu: Sichuan minzu chubanshe, 1990. ISBN 7-5409-0128-4

Daniels, Peter T., and William Bright, eds. 1996. *The world's writing systems.* New York; Oxford: Oxford University Press. ISBN 0-19-507993-0

Derolez, René. 1954. *Runica manuscripta: the English tradition.* (Rijksuniversiteit te Gent: Werken uitgegeven door de Faculteit van de Wijsbegeerte en Letteren; 118e aflevering) Brugge: De Tempel.

Diringer, David. 1996. *The alphabet: a key to the history of mankind.* New Delhi: Munshiram Manoharlal. ISBN 81-215-0780-0

Esling, John. *Computer coding of the IPA: supplementary report.* Journal of the International Phonetic Association, 20:1 (1990), p. 22-26.

Faulmann, Carl. 1990 (1880). *Das Buch der Schrift.* Frankfurt am Main: Eichborn. ISBN 3-8218-1720-8

Friesen, Otto von. *Runorna.* Stockholm, A. Bonnier [1933]. (Nordisk kultur, 6).

Geiger, Wilhelm. *Maldivian Linguistic Studies.* New Delhi, Asian Educational Services, 1996. ISBN 81-206-1201-9.

Gunasekara, Abraham Mendis. 1986 (1891). *A comprehensive grammar of the Sinhalese language.* New Delhi: Asian Educational Services.

Haarmann, Harald. 1990. *Universalgeschichte der Schrift.* Frankfurt/Main; New York: Campus. ISBN 3-593-34346-0

Holmes, Ruth Bradley, and Betty Sharp Smith. 1976. *Beginning Cherokee: Talisgo galiquogi dideliquasdodi Tsalagi digoweli* . Norman: University of Oklahoma Press.

International Phonetic Association. The IPA 1989 Kiel Convention Workgroup 9 report: *Computer Coding of IPA Symbols and Computer Representation of Individual Languages.* Journal of the International Phon. Assoc., 19:2 (1989), p. 81-82.

Imprimerie Nationale. 1990. *Les caractères de l'Imprimerie Nationale.* Paris: Imprimerie Nationale Éditions. ISBN 2-11-081085-8

International Phonetic Association. *The International Phonetic Alphabet* (revised to 1989).

Jensen, Hans. 1969. *Die Schrift in Vergangenheit und Gegenwart.* 3., neubearbeitete und erweiterte Auflage. Berlin: VEB Deutscher Verlag der Wissenschaften.

Kefarnissy, Paul. *Grammaire de la langue araméenne syriaque.* Beyrouth, 1962.

Knuth, Donald E. *The TeXbook.* – 19th. printing, rev, – Reading, MA : Addison-Wesley, 1990.

Kuruch, Rimma Dmitrievna. *Saamsko-russkiy slovar'.* Moskva: Russkiy iazyk. 1985

Launhardt, Johannes. *Guide to Learning the Oromo (Galla) Language.* Addis Ababa, Launhardt [1973?]

Leslau, Wolf. *Amharic Textbook.* Weisbaden, Harrassowitz; Berkeley, University of California Press, 1968.

Mandarin Promotion Council, Ministry of Education, Taiwan. *Shiangtu yuyan biauyin fuhau shoutse* (*The Handbook of Taiwan Languages Phonetic Alphabet*). 1999.

Nakanishi, Akira. 1990. *Writing systems of the world: alphabets, syllabaries, pictograms.* Rutland, VT: Charles E. Tuttle. ISBN 0-8048-1654-9

Okell, John. 1971. *A guide to the romanization of Burmese.* (James G. Forlang Fund; 27) London: Royal Asiatic Society of Great Britain and Ireland.

Page, R. I. 1987. *Runes.* (Reading the Past; 4) Berkeley & Los Angeles: University of California Press. ISBN 0-520-06114-4

Pullum, Geoffrey K. *Phonetic symbol guide.* Geoffrey K. Pullum and William A. Ladusaw. – Chicago : University of Chicago Press, 1986.

Pullum, Geoffrey K. *Remarks on the 1989 revision of the International Phonetic Alphabet.* Journal of the International Phonetic Association, 20:1 (1990), p. 33-40.

Roop, D. Haigh. 1972. *An introduction to the Burmese writing system.* New Haven and London: Yale University Press. ISBN 0-300-01528-3

Santos, Hector. 1994. *The Tagalog script.* (Ancient Philippine Scripts Series; 1). Los Angeles: Sushi Dog Graphics.

Santos, Hector. 1995. *The living scripts.* (Ancient Philippine Scripts Series; 2). Los Angeles: Sushi Dog Graphics.

Selby, Samuel M. *Standard mathematical tables.* – 16th ed. – Cleveland, OH : Chemical Rubber Co., 1968. Shepherd, Walter.

Shepherd, Walter. *Shepherd's glossary of graphic signs and symbols.* Compiled and classified for ready reference. – New York : Dover Publications, [1971].

Shinmura, Izuru. *Kojien – Dai 4-han.* – Tokyo : Iwanami Shoten, Heisei 3 [1991].

The Unicode Consortium *The Unicode Standard. Worldwide Character Encoding Version 1.0, Volume One.* – Reading, MA : Addison-Wesley, 1991.

The Unicode Consortium *The Unicode Standard, Version 2.0.* Reading, MA: Addison-Wesley, 1996. ISBN 0-201-48345-9

The Unicode Consortium *The Unicode Standard, Version 3.0.* Reading, MA: Addison-Wesley Developer's Press, 2000. ISBN 0-201-61633-5

The Unicode Consortium *The Unicode standard, Version 4.0.* Reading, MA: Addison-Wesley Developer's Press, 2003. ISBN 0-321-18578-1

The Unicode Consortium *Unicode Standard Annexes, UAX#9, The Unicode Bidirectional Algorithm, UAX#15 Unicode Normalization Forms, Version 4.0.0* 2003, and related Unicode Technical Reports, available at: http://www.unicode.org/reports/

The following publications were also used as sources of characters for the Supplementary Multilingual Plane.

Deseret

Ivins, Stanley S. "The Deseret Alphabet" *Utah Humanities Review 1* (1947):223-39.

Old Italic

Bonfante, Larissa. 1996. "The scripts of Italy", in Peter T. Daniels and William Bright, eds. *The world's writing systems.* New York; Oxford: Oxford University Press. ISBN 0-19-507993-0

Gothic

Fairbanks, Sydney, and F. P. Magoun Jr. 1940. 'On writing and printing Gothic', in *Speculum* 15:313-16.

Byzantine Musical Symbols

ELOT 1373. *The Greek Byzantine Musical Notation System.* Athens, 1997 (ΣΕΠ ΕΛΟΤ 1373: 1997).

Musical Symbols

Heussenstamm, George. *Norton Manual of Music Notation.* New York: W. W. Norton, 1987

Rastall, Richard. *Notation of Western Music*: An Introduction. London: Dent, 1983.

Annex N
(informative)

External references to character repertoires

N.1 Methods of reference to character repertoires and their coding

Within programming languages and other methods for defining the syntax of data objects there is commonly a need to declare a specific character repertoire from among those that are specified in ISO/IEC 10646. There may also be a need to declare the corresponding coded representations applicable to that repertoire.

For any character repertoire that is in accordance with ISO/IEC 10646 a precise declaration of that repertoire should include the following parameters:

- identification of ISO/IEC 10646,

- the adopted subset of the repertoire, identified by one or more collection numbers,

- the adopted implementation level (1, 2 or 3),

- the adopted coded representation form (4-octet or 2-octet).

One of the methods now in common use for defining the syntax of data objects is Abstract Syntax Notation 1 (ASN.1) specified in ISO/IEC 8824. The corresponding coded representations are specified in ISO/IEC 8825. When this method is used the forms of the references to character repertoires and coding are as indicated in the following clauses.

N.2 Identification of ASN.1 character abstract syntaxes

The set of all character strings that can be formed from the characters of an identified repertoire in accordance with ISO/IEC 10646 is defined to be a "character abstract syntax" in the terminology of ISO/IEC 8824. For each such character abstract syntax, a corresponding object identifier value is defined to permit references to be made to that syntax when the ASN.1 notation is used.

ISO/IEC 8824-1 annex B specifies the form of object identifier values for objects that are specified in an ISO standard. In such an object identifier the features and options of ISO/IEC 10646 are identified by means of numbers (arcs) which follow the arcs "10646" and "0" which identify the whole ISO/IEC 10646.

NOTE 1 – The arc (0) is required to complement the arcs (1) and (2) which represent respectively ISO/IEC 10646-1 and ISO/IEC 10646-2. These two arcs should not be used.

The first such arc following a 10646 arc identifies the adopted implementation level, and is either:

- level-1 (1), or
- level-2 (2), or
- level-3 (3).

The second such arc identifies the repertoire subset, and is either:

- all (0), or
- collections (1).

Arc (0) identifies the entire collection of characters specified in ISO/IEC 10646. No further arc follows this arc.

NOTE 2 – This collection includes private groups and planes, and is therefore not fully-defined. Its use without additional prior agreement is deprecated.

Arc (1) is followed by one or a sequence of further arcs, each of which is a collection number from annex A, in ascending numerical order. This sequence identifies the subset consisting of the collections whose numbers appear in the sequence.

NOTE 3 – As an example, the object identifier for the subset comprising the collections BASIC LATIN, LATIN-1 SUPPLEMENT, and MATHEMATICAL OPERATORS, at implementation level 1, is:

{iso standard 10646 0 level-1 (1) collections (1) 1 2 39}

ISO/IEC 8824 also specifies object descriptors corresponding to object identifier values. For each combination of arcs the corresponding object descriptors are as follows:

1 0 : "ISO 10646 level-1 unrestricted"
2 0 : "ISO 10646 level-2 unrestricted"
3 0 : "ISO 10646 level-3 unrestricted"

For a single collection with collection name "xxx".

1 1 : "ISO 10646 level-1 xxx"
2 1 : "ISO 10646 level-2 xxx"
3 1 : "ISO 10646 level-3 xxx"

For a repertoire comprising more than one collection, numbered m1, m2, etc.

1 1 : "ISO 10646 level-1 collections m1, m2, m3, .. "

2 1 : "ISO 10646 level-2 collections m1, m2, m3, .. "

3 1 : "ISO 10646 level-3 collections m1, m2, m3, .. "

NOTE 4 – All spaces are single spaces.

N.3 Identification of ASN.1 character transfer syntaxes

The coding method for character strings that can be formed from the characters in accordance with ISO/IEC 10646 is defined to be a "character transfer syntax" in the terminology of ISO/IEC 8824. For each such character transfer syntax, a corresponding object identifier value is defined to permit references to be made to that syntax when the ASN.1 notation is used.

In an object identifier in accordance with ISO/IEC 8824-1 annex B, the coded representation form specified in ISO/IEC 10646 is identified by means of numbers (arcs) which follow the arcs "10646" and "0" which identify the whole ISO/IEC 10646.

The first such arc is:
- transfer-syntaxes (0).

The second such arc identifies the form and is either:

- two-octet-BMP-form (2), or
- four-octet-form (4), or
- utf16-form (5), or
- utf8-form (8).

NOTE – As an example, the object identifier for the two-octet coded representation form is:

{iso standard 10646 0 transfer-syntaxes (0) two-octet-BMP-form (2)}

The following form is also valid but deprecated:

{iso standard 10646 1 transfer-syntaxes (0) two-octet-BMP-form (2)}

The corresponding object descriptors are:

- "ISO 10646 form 2"

- "ISO 10646 form 4"

- "ISO 10646 utf-16"

- "ISO 10646 utf-8".

Annex P
(informative)

Additional information on characters

This annex contains additional information on some of the characters specified in clause 33 of this International Standard. This information is intended to clarify some feature of a character, such as its naming or usage, or its associated graphic symbol.

Each entry in this annex consists of the name of a character preceded by its code position in the two-octet form, followed by the related additional information. Entries are arranged in ascending sequence of code position.

When an entry for a character is included in this annex an * symbol appears immediately following its name in the corresponding table in clause 33 of this International Standard.

00AB LEFT-POINTING DOUBLE ANGLE QUOTATION MARK
This character may be used as an Arabic opening quotation mark, if it appears in a bidirectional context as described in clause 19. The graphic symbol associated with it may differ from that in the table for Row 00.

00BB RIGHT-POINTING DOUBLE ANGLE QUOTATION MARK
This character may be used as an Arabic closing quotation mark, if it appears in a bidirectional context as described in clause 19. The graphic symbol associated with it may differ from that in the table for Row 00.

00C6 LATIN CAPITAL LETTER AE (ash)
In the first edition of ISO/IEC 10646-1 the name of this character was:
LATIN CAPITAL LIGATURE AE

00E6 LATIN SMALL LETTER AE (ash)
In the first edition of ISO/IEC 10646-1 the name of this character was:
LATIN SMALL LIGATURE AE

0189 LATIN CAPITAL LETTER AFRICAN D
This character is the capital letter form of:
0256 LATIN SMALL LETTER D WITH TAIL

019F LATIN CAPITAL LETTER O WITH MIDDLE TILDE
This character is the capital letter form of:
0275 LATIN SMALL LETTER BARRED O

01A6 LATIN LETTER YR
This character is the capital letter form of:
0280 LATIN LETTER SMALL CAPITAL R

01E2 LATIN CAPITAL LETTER AE WITH MACRON (ash)
In the first edition of ISO/IEC 10646-1 the name of this character was:
LATIN CAPITAL LIGATURE AE WITH MACRON

01E3 LATIN SMALL LETTER AE WITH MACRON (ash)
In the first edition of ISO/IEC 10646-1 the name of this character was:
LATIN SMALL LIGATURE AE WITH MACRON

01FC LATIN CAPITAL LETTER AE WITH ACUTE (ash)
In the first edition of ISO/IEC 10646-1 the name of this character was:
LATIN CAPITAL LIGATURE AE WITH ACUTE

01FD LATIN SMALL LETTER AE WITH ACUTE (ash)
In the first edition of ISO/IEC 10646-1 the name of this character was:
LATIN SMALL LIGATURE AE WITH ACUTE

0218 LATIN CAPITAL LETTER S WITH COMMA BELOW
This character is intended for use only in those cases where it is necessary to make a distinction from the letter with cedilla. Both forms of the letter may be found in a single document written in a single language, e.g. Romanian or Turkish.

In ISO/IEC 8859-2 only a single (8-bit) coded character is provided, LATIN CAPITAL LETTER S WITH CEDILLA, which maps to 015E in ISO/IEC 10646 by default, and may map by mutual agreement between sender and receiver to this letter with comma below. See ISO/IEC 8859-2 for further information on the use of that standard.

0219 LATIN SMALL LETTER S WITH COMMA BELOW
This character is intended for use only in those cases where it is necessary to make a distinction from the letter with cedilla. Both forms of the letter may be found in a single document written in a single language, e.g. Romanian or Turkish.

In ISO/IEC 8859-2 only a single (8-bit) coded character is provided, LATIN SMALL LETTER S WITH CEDILLA, which maps to 015F in ISO/IEC 10646 by default, and may map by mutual agreement between sender and receiver to this letter with comma below. See ISO/IEC 8859-2 for further information on the use of that standard.

021A LATIN CAPITAL LETTER T WITH COMMA BELOW
This character is intended for use only in those cases where it is necessary to make a distinction from the letter with cedilla. Both forms of the letter

may be found in a single document written in a single language, e.g. Romanian.

In ISO/IEC 8859-2 only a single (8-bit) coded character is provided, LATIN CAPITAL LETTER T WITH CEDILLA, which maps to 0162 in ISO/IEC 10646 by default, and may map by mutual agreement between sender and receiver to this letter with comma below. See ISO/IEC 8859-2 for further information on the use of that standard.

021B LATIN SMALL LETTER T WITH COMMA BELOW

This character is intended for use only in those cases where it is necessary to make a distinction from the letter with cedilla. Both forms of the letter may be found in a single document written in a single language, e.g. Romanian.

In ISO/IEC 8859-2 only a single (8-bit) coded character is provided, LATIN SMALL LETTER T WITH CEDILLA, which maps to 0163 in ISO/IEC 10646 by default, and may map by mutual agreement between sender and receiver to this letter with comma below. See ISO/IEC 8859-2 for further information on the use of that standard.

0280 LATIN LETTER SMALL CAPITAL R

This character is the small letter form of:
     01A6 LATIN LETTER YR

03D8 GREEK LETTER ARCHAIC KOPPA

The name of this character distinguishes it from 03DE GREEK LETTER KOPPA, which is most commonly used with its numeric value, such as in the dating of legal documentation. GREEK LETTER ARCHAIC KOPPA is primarily used alphabetically to represent the letter used in early Greek inscriptions.

03D9 GREEK SMALL LETTER ARCHAIC KOPPA

The name of this character distinguishes it from 03DF GREEK SMALL LETTER KOPPA, which is most commonly used with its numeric value, such as in the dating of legal documentation. GREEK SMALL LETTER ARCHAIC KOPPA is primarily used alphabetically to represent the letter used in early Greek inscriptions.

0596 HEBREW ACCENT TIPEHA

This character may be used as a Hebrew accent tarha.

0598 HEBREW ACCENT ZARQA

This character may be used as a Hebrew accent zinorit.

05A5 HEBREW ACCENT MERKHA

This character may be used as a Hebrew accent yored.

05A8 HEBREW ACCENT QADMA

This character may be used as a Hebrew accent azla.

05AA HEBREW ACCENT YERAH BEN YOMO

This character may be used as a Hebrew accent galgal.

05B8 HEBREW POINT QAMATS

This character may be used generically or as qamats gadol in orthography which distinguishes it from 05C7 HEBREW POINTS QAMATS QATAN.

05BD HEBREW POINT METEG

This character may be used as a Hebrew accent sof pasuq or siluq.

05C0 HEBREW PUNCTUATION PASEQ

This character may be used as a Hebrew accent legarme.

05C3 HEBREW PUNCTUATION SOF PASUQ

This character may be used as a Hebrew punctuation colon.

06AF ARABIC LETTER GAF

The symbol for a Hamza (see position 0633) may appear in the centre of the graphic symbol associated with this character.

06D0 ARABIC LETTER E

This character may be used as an Arabic letter Sindhi bbeh.

0F6A TIBETAN LETTER FIXED-FORM RA

This character has the same graphic symbol as that shown in the table for:
     0F62 TIBETAN LETTER RA

It may be used when the graphic symbol is required to remain unchanged regardless of context.

0FAD TIBETAN SUBJOINED LETTER WA

The graphic symbol for this character occurs in two alternative forms, a full form and a short form (known as *wa.zur* (wazur)). The short form of the letter is shown in the table, since it occurs more frequently.

0FB1 TIBETAN SUBJOINED LETTER YA

The graphic symbol for this character occurs in two alternative forms, a full form and a short form (known as *ya.btags* (ya ta)). The short form of the letter is shown in the table, since it occurs more frequently.

0FB2 TIBETAN SUBJOINED LETTER RA

The graphic symbol for this character occurs in two alternative forms, a full form and a short form (known as *ra.btags* (ra ta)). The short form of the letter is shown in the table, since it occurs more frequently.

1100 HANGUL CHOSEONG KIYEOK ...
1112 HANGUL CHOSEONG HIEUH

The Latin letters shown in parenthesis after the names of the characters in the range 1100 to 1112 (except 110B) are transliterations of these Hangul characters. These transliterations are used in the construction of the names of the Hangul syllables that are allocated in code positions AC00 to D7A3 in this International Standard.

11A8 HANGUL JONGSEONG KIYEOK ...
11C2 HANGUL JONGSEONG HIEUH

The Latin letters shown in parenthesis after the names of the characters in the range 11A8 to 11C2

are transliterations of these Hangul characters. These transliterations are used in the construction of the names of the Hangul syllables that are allocated in code positions AC00 to D7A3 in this International Standard.

17A3   KHMER INDEPENDENT VOWEL QAQ
This character is only used for Pali/Sanskrit transliteration. The use of this character is discouraged; 17A2 KHMER LETTER QA should be used instead.

17A4   KHMER INDEPENDENT VOWEL QAA
This character is only used for Pali/Sanskrit transliteration. The use of this character is discouraged; the sequence <17A2, 17B6> (KHMER LETTER QA followed by KHMER VOWEL SIGN AA) should be used instead.

17B4   KHMER VOWEL INHERENT AQ
17B5   KHMER VOWEL INHERENT AA
Khmer inherent vowels. These characters are for phonetic transcription to distinguish Indic language inherent vowels from Khmer inherent vowels. They are included solely for compatibility with particular applications; their use in other contexts is discouraged.

17D3   KHMER SIGN BATHAMASAT
This character represents a rare sign representing the first August of leap year in the lunar calendar. The use of this character is discouraged in favor of the characters from the KHMER SYMBOLS collection.

17D8 KHMER SIGN BEYYAL
This character represents the concept of 'et cetera'. The use of this character is discouraged; other abbreviations for 'et cetera' also exist. The preferred spelling is the sequence <17D4, 179B, 17D4>.

234A APL FUNCTIONAL SYMBOL DOWN TACK UNDERBAR
The relation between the name of this character and the orientation of the "tack" element in its graphical symbol is inconsistent with that of other characters in this International Standard, such as:
    22A4 DOWN TACK and 22A5 UP TACK

234E APL FUNCTIONAL SYMBOL DOWN TACK JOT
Information for the character at 234A applies.

2351 APL FUNCTIONAL SYMBOL UP TACK OVERBAR
Information for the character at 234A applies.

2355 APL FUNCTIONAL SYMBOL UP TACK JOT
Information for the character at 234A applies.

2361 APL FUNCTIONAL SYMBOL UP TACK DIAERESIS
Information for the character at 234A applies.

9FB9   CJK UNIFIED IDEOGRAPH-9FB9
9FBA   CJK UNIFIED IDEOGRAPH-9FBA
9FBB   CJK UNIFIED IDEOGRAPH-9FBB
These three characters are intended to represent a component at a specific position of a full ideograph. The ideographs representing the same structure without a preferred positional preference are encoded at 20509, 2099D, and 470C respectively.

FA1F CJK COMPATIBILITY IDEOGRAPH-FA1F
This character should be considered as an extension to the block of characters CJK UNIFIED IDEOGRAPHS EXTENSION A (see clause 27). It is not a duplicate of a character already allocated in the blocks of CJK Unified Ideographs, unlike many other characters in the block CJK COMPATIBILITY IDEOGRAPHS. The source of this character, shown as described in clause 27, is:

C	**J**	**K**	**V**
G - Hanzi - T	Kanji	Hanja	ChuNom

<p align="center">藆</p>

<p align="center">A-264B
A-0643</p>

FA23 CJK COMPATIBILITY IDEOGRAPH-FA23
This character should be considered as an extension to the block of characters CJK UNIFIED IDEOGRAPHS EXTENSION A (see clause 27). It is not a duplicate of a character already allocated in the blocks of CJK Unified Ideographs, unlike many other characters in the block CJK COMPATIBILITY IDEOGRAPHS. The sources of this character, shown as described in clause 27, are:

C	**J**	**K**	**V**
G - Hanzi - T	Kanji	Hanja	ChuNom

<p align="center">赶   赶</p>

<p align="center">F-3862   A-2728
F-2466   A-0708</p>

FF5F FULLWIDTH LEFT WHITE PARENTHESIS
This character has a common glyph variation that looks like a double left parenthesis.

FF60 FULLWIDTH RIGHT WHITE PARENTHESIS
This character has a common glyph variation that looks like a double right parenthesis.

FFE3   FULLWIDTH MACRON
This character is the full-width form of the character: 00AF MACRON. It is also used as the full-width form of the character:
    203E OVERLINE

Annex Q
(informative)

Code mapping table for Hangul syllables

This annex provides a cross-reference between the Hangul syllables (and code positions) that were specified in the First Edition of ISO/IEC 10646-1 and their amended code positions as now specified in this edition of ISO/IEC 10646.

In the First Edition of ISO/IEC 10646-1 6656 Hangul syllables were allocated to consecutive code positions in the range 3400 to 4DFF. These Hangul syllables are now re-allocated non-consecutively to code positions in the larger range AC00 to D7A3.

The cross-reference is provided in machine-readable format that is accessible as link to this document. The content linked to is a plain text file, using ISO/IEC 646-IRV characters with LINE FEED as end of line mark, that specifies, after a 5-lines header, as many lines as Hangul syllables specified in the First Edition of ISO/IEC 10646-1; each containing the following information organized in fixed width fields:

- 01-05 octet: First Edition of ISO/IEC 10646-1 code positions for Hangul syllables (`hhhh`)

- 05 octet: SEMICOLON ';' used as a separator

- 06-09 octet: Current Edition of ISO/IEC 10646 code positions for Hangul syllables (`hhhh`).

The format definition uses '`h`' as a hexadecimal unit.

Click on this highlighted text to access the cross-reference file.

NOTE 1 – The content is also available as a separate viewable file in the same file directory as this document. The file is named: "HangulX.txt".

NOTE 2 – The referenced files are only available to users who obtain their copy of the standard in a machine-readable format. However, the file format makes them printable.

Annex R
(informative)

Names of Hangul syllables

This annex shows in a tabular arrangement the sylla-ble-name of each character in the block HANGUL SYLLABLES (AC00 - D7A3). The syllable-name is the final component of the full character name, and is de-rived as described in 28.3, steps 1 to 5, which is the definitive specification of the names in that block.

The leftmost column of the table shows the cell num-bers (00 - FF) of the corresponding characters. The headings of the other columns of the table show the row numbers of the characters.

> NOTE – The full name and annotation of the Hangul syllables are also provided in a machine-readable format that is accessible as a link to this document.

> The content linked to is a plain text file, using ISO/IEC 646-IRV characters with LINE FEED as end of line

mark that specifies, after a 5-lines header, as all the Hangul syllables, each line specified as follows:

- 01-04 octet: UCS-2 code position in hexa-decimal notation,
- 05 octet: SPACE character,
- 06 octet until end of line: Hangul syllable with the annotation between parentheses.

Click on this highlighted text to access the file contain-ing the Hangul syllable names.

The content is also available as a separate viewable file in the same directory as this document. The file is named: "HangulSy.txt". The reference file is only available to users who obtain their copy of the amendment in a machine-readable form. However, the file format makes it printable.

Table R.1 - Final components of character names in Hangul Syllables block, Rows AC - B6

	AC	AD	AE	AF	B0	B1	B2	B3	B4	B5	B6
00	GA	GWAN	GEUL	GGYEOLS	GGWEM	NYAESS	NYOK	DAE	DWAEN	DYIL	DDYELS
01	GAG	GWANJ	GEULG	GGYEOLT	GGWEB	NYAENG	NYOT	DAEG	DWAENJ	DYILG	DDYELT
02	GAGG	GWANH	GEULM	GGYEOLP	GGWEBS	NYAEJ	NYOP	DAEGG	DWAENH	DYILM	DDYELP
03	GAGS	GWAD	GEULB	GGYEOLH	GGWES	NYAEC	NYOH	DAEGS	DWAED	DYILB	DDYELH
04	GAN	GWAL	GEULS	GGYEOM	GGWESS	NYAEK	NU	DAEN	DWAEL	DYILS	DDYEM
05	GANJ	GWALG	GEULT	GGYEOB	GGWENG	NYAET	NUG	DAENJ	DWAELG	DYILT	DDYEB
06	GANH	GWALM	GEULP	GGYEOBS	GGWEJ	NYAEP	NUGG	DAENH	DWAELM	DYILP	DDYEBS
07	GAD	GWALB	GEULH	GGYEOS	GGWEC	NYAEH	NUGS	DAED	DWAELB	DYILH	DDYES
08	GAL	GWALS	GEUM	GGYEOSS	GGWEK	NEO	NUN	DAEL	DWAELS	DYIM	DDYESS
09	GALG	GWALT	GEUB	GGYEONG	GGWET	NEOG	NUNJ	DAELG	DWAELT	DYIB	DDYENG
0A	GALM	GWALP	GEUBS	GGYEOJ	GGWEP	NEOGG	NUNH	DAELM	DWAELP	DYIBS	DDYEJ
0B	GALB	GWALH	GEUS	GGYEOC	GGWEH	NEOGS	NUD	DAELB	DWAELH	DYIS	DDYEC
0C	GALS	GWAM	GEUSS	GGYEOK	GGWI	NEON	NUL	DAELS	DWAEM	DYISS	DDYEK
0D	GALT	GWAB	GEUNG	GGYEOT	GGWIG	NEONJ	NULG	DAELT	DWAEB	DYING	DDYET
0E	GALP	GWABS	GEUJ	GGYEOP	GGWIGG	NEONH	NULM	DAELP	DWAEBS	DYIJ	DDYEP
0F	GALH	GWAS	GEUC	GGYEOH	GGWIGS	NEOD	NULB	DAELH	DWAES	DYIC	DDYEH
10	GAM	GWASS	GEUK	GGYE	GGWIN	NEOL	NULS	DAEM	DWAESS	DYIK	DDO
11	GAB	GWANG	GEUT	GGYEG	GGWINJ	NEOLG	NULT	DAEB	DWAENG	DYIT	DDOG
12	GABS	GWAJ	GEUP	GGYEGG	GGWINH	NEOLM	NULP	DAEBS	DWAEJ	DYIP	DDOGG
13	GAS	GWAC	GEUH	GGYEGS	GGWID	NEOLB	NULH	DAES	DWAEC	DYIH	DDOGS
14	GASS	GWAK	GYI	GGYEN	GGWIL	NEOLS	NUM	DAESS	DWAEK	DI	DDON
15	GANG	GWAT	GYIG	GGYENJ	GGWILG	NEOLT	NUB	DAENG	DWAET	DIG	DDONJ
16	GAJ	GWAP	GYIGG	GGYENH	GGWILM	NEOLP	NUBS	DAEJ	DWAEP	DIGG	DDONH
17	GAC	GWAH	GYIGS	GGYED	GGWILB	NEOLH	NUS	DAEC	DWAEH	DIGS	DDOD
18	GAK	GWAE	GYIN	GGYEL	GGWILS	NEOM	NUSS	DAEK	DOE	DIN	DDOL
19	GAT	GWAEG	GYINJ	GGYELG	GGWILT	NEOB	NUNG	DAET	DOEG	DINJ	DDOLG
1A	GAP	GWAEGG	GYINH	GGYELM	GGWILP	NEOBS	NUJ	DAEP	DOEGG	DINH	DDOLM
1B	GAH	GWAEGS	GYID	GGYELB	GGWILH	NEOS	NUC	DAEH	DOEGS	DID	DDOLB
1C	GAE	GWAEN	GYIL	GGYELS	GGWIM	NEOSS	NUK	DYA	DOEN	DIL	DDOLS
1D	GAEG	GWAENJ	GYILG	GGYELT	GGWIB	NEONG	NUT	DYAG	DOENJ	DILG	DDOLT
1E	GAEGG	GWAENH	GYILM	GGYELP	GGWIBS	NEOJ	NUP	DYAGG	DOENH	DILM	DDOLP
1F	GAEGS	GWAED	GYILB	GGYELH	GGWIS	NEOC	NUH	DYAGS	DOED	DILB	DDOLH
20	GAEN	GWAEL	GYILS	GGYEM	GGWISS	NEOK	NWEO	DYAN	DOEL	DILS	DDOM
21	GAENJ	GWAELG	GYILT	GGYEB	GGWING	NEOT	NWEOG	DYANJ	DOELG	DILT	DDOB
22	GAENH	GWAELM	GYILP	GGYEBS	GGWIJ	NEOP	NWEOGG	DYANH	DOELM	DILP	DDOBS
23	GAED	GWAELB	GYILH	GGYES	GGWIC	NEOH	NWEOGS	DYAD	DOELB	DILH	DDOS
24	GAEL	GWAELS	GYIM	GGYESS	GGWIK	NE	NWEON	DYAL	DOELS	DIM	DDOSS
25	GAELG	GWAELT	GYIB	GGYEONG	GGWIT	NEG	NWEONJ	DYALG	DOELT	DIB	DDONG
26	GAELM	GWAELP	GYIBS	GGYEJ	GGWIP	NEGG	NWEONH	DYALM	DOELP	DIBS	DDOJ
27	GAELB	GWAELH	GYIS	GGYEC	GGWIH	NEGS	NWEOD	DYALB	DOELH	DIS	DDOC
28	GAELS	GWAEM	GYISS	GGYEK	GGYU	NEN	NWEOL	DYALS	DOEM	DISS	DDOK
29	GAELT	GWAEB	GYING	GGYET	GGYUG	NENJ	NWEOLG	DYALT	DOEB	DING	DDOT
2A	GAELP	GWAEBS	GYIJ	GGYEP	GGYUGG	NENH	NWEOLM	DYALP	DOEBS	DIJ	DDOP
2B	GAELH	GWAES	GYIC	GGYEH	GGYUGS	NED	NWEOLB	DYALH	DOES	DIC	DDOH
2C	GAEM	GWAESS	GYIK	GGO	GGYUN	NEL	NWEOLS	DYAM	DOESS	DIK	DDWA
2D	GAEB	GWAENG	GYIT	GGOG	GGYUNJ	NELG	NWEOLT	DYAB	DOENG	DIT	DDWAG
2E	GAEBS	GWAEJ	GYIP	GGOGG	GGYUNH	NELM	NWEOLP	DYABS	DOEJ	DIP	DDWAGG
2F	GAES	GWAEC	GYIH	GGOGS	GGYUD	NELB	NWEOLH	DYAS	DOEC	DIH	DDWAGS
30	GAESS	GWAEK	GI	GGON	GGYUL	NELS	NWEOM	DYASS	DOEK	DDA	DDWAN

	AC	AD	AE	AF	B0	B1	B2	B3	B4	B5	B6
31	GAENG	GWAET	GIG	GGONJ	GGYULG	NELT	NWEOB	DYANG	DOET	DDAG	DDWANJ
32	GAEJ	GWAEP	GIGG	GGONH	GGYULM	NELP	NWEOBS	DYAJ	DOEP	DDAGG	DDWANH
33	GAEC	GWAEH	GIGS	GGOD	GGYULB	NELH	NWEOS	DYAC	DOEH	DDAGS	DDWAD
34	GAEK	GOE	GIN	GGOL	GGYULS	NEM	NWEOSS	DYAK	DYO	DDAN	DDWAL
35	GAET	GOEG	GINJ	GGOLG	GGYULT	NEBS	NWEONG	DYAT	DYOG	DDANJ	DDWALG
36	GAEP	GOEGG	GINH	GGOLM	GGYULP	NES	NWEOJ	DYAP	DYOGG	DDANH	DDWALM
37	GAEH	GOEGS	GID	GGOLB	GGYULH	NESS	NWEOC	DYAH	DYON	DDAD	DDWALB
38	GYA	GOEN	GIL	GGOLS	GGYUM	NENG	NWEOK	DYAE	DYONJ	DDAL	DDWALS
39	GYAG	GOENJ	GILG	GGOLT	GGYUB	NEJ	NWEOT	DYAEG	DYONH	DDALG	DDWALT
3A	GYAGG	GOENH	GILM	GGOLP	GGYUBS	NEC	NWEOP	DYAEGG	DYOD	DDALM	DDWALP
3B	GYAGS	GOED	GILB	GGOLH	GGYUS	NEK	NWEOH	DYAEGS	DYOD	DDALB	DDWALH
3C	GYAN	GOEL	GILS	GGOM	GGYUSS	NET	NWE	DYAEN	DYOL	DDALS	DDWAM
3D	GYANJ	GOELG	GILT	GGOBS	GGYUNG	NEP	NWEG	DYAENJ	DYOLG	DDALT	DDWAB
3E	GYANH	GOELM	GILP	GGOS	GGYUJ	NEH	NWEGG	DYAENH	DYOLM	DDALP	DDWABS
3F	GYAD	GOELB	GILH	GGOSS	GGYUC	NYEO	NWEGS	DYAED	DYOLB	DDALH	DDWAS
40	GYAL	GOELS	GIM	GGONG	GGYUK	NYEOG	NWEN	DYAEL	DYOLS	DDAM	DDWASS
41	GYALG	GOELT	GIB	GGOJ	GGYUT	NYEOGG	NWENJ	DYAELG	DYOLT	DDAB	DDWANG
42	GYALM	GOELP	GIBS	GGOC	GGYUP	NYEOGS	NWENH	DYAELM	DYOLP	DDABS	DDWAJ
43	GYALB	GOELH	GIS	GGOK	GGYUH	NYEON	NWED	DYAELB	DYOLH	DDAS	DDWAC
44	GYALS	GOEM	GISS	GGOT	GGEUG	NYEONJ	NWEL	DYAELS	DYOM	DDASS	DDWAK
45	GYALT	GOEB	GING	GGOP	GGEUGG	NYEONH	NWELG	DYAELT	DYOB	DDANG	DDWAT
46	GYALP	GOEBS	GIJ	GGOH	GGEUGS	NYEOD	NWELM	DYAELP	DYOBS	DDAJ	DDWAP
47	GYALH	GOES	GIC	GGWA	GGEUN	NYEOL	NWELB	DYAELH	DYOS	DDAC	DDWAH
48	GYAM	GOESS	GIK	GGWAG	GGEUNJ	NYEOLG	NWELS	DYAEM	DYOSS	DDAK	DDWAEG
49	GYAB	GOENG	GIT	GGWAGG	GGEUNH	NYEOLM	NWELT	DYAEB	DYONG	DDAT	DDWAEGG
4A	GYABS	GOEJ	GIP	GGWAGS	GGEUD	NYEOLB	NWELP	DYAEBS	DYOJ	DDAP	DDWAEGS
4B	GYAS	GOEC	GIH	GGWAN	GGEUL	NYEOLS	NWELH	DYAES	DYOC	DDAH	DDWAEN
4C	GYASS	GOEK	GGA	GGWANJ	GGEULG	NYEOLT	NWEM	DYAESS	DYOK	DDAE	DDWAENJ
4D	GYANG	GOET	GGAG	GGWANH	GGEULM	NYEOLP	NWEB	DYAENG	DYOT	DDAEG	DDWAENH
4E	GYAJ	GOEP	GGAGG	GGWAD	GGEULB	NYEOLH	NWEBS	DYAEJ	DYOP	DDAEGG	DDWAED
4F	GYAC	GOEH	GGAGS	GGWAL	GGEULS	NYEOM	NWES	DYAEC	DYOH	DDAEGS	DDWAEL
50	GYAK	GYO	GGAN	GGWAL	GGEULS	NYEOB	NWESS	DYAEK	DU	DDAEN	DDWAELG
51	GYAT	GYOG	GGANJ	GGWALG	GGEULT	NYEOB	NWENG	DYAET	DUG	DDAENJ	DDWAELM
52	GYAP	GYOGG	GGANH	GGWALM	GGEULP	NYEOBS	NWEJ	DYAEP	DUGG	DDAED	DDWAELB
53	GYAH	GYOGS	GGAD	GGWALB	GGEULH	NYEOS	NWEC	DYAEH	DUGS	DDAEL	DDWAELS
54	GYAE	GYON	GGAL	GGWALS	GGEUM	NYEOSS	NWEK	DEO	DUN	DDAELG	DDWAELT
55	GYAEG	GYONJ	GGALG	GGWALT	GGEUB	NYEONG	NWET	DEOG	DUNJ	DDAELM	DDWAELP
56	GYAEGG	GYONH	GGALM	GGWALP	GGEUBS	NYEOJ	NWEP	DEOGG	DUNH	DDAELB	DDWAELH
57	GYAEGS	GYOD	GGALB	GGWALH	GGEUS	NYEOC	NWEH	DEOGS	DUD	DDAELS	DDWAEM
58	GYAEN	GYOL	GGALS	GGWAM	GGEUSS	NYEOK	NWI	DEON	DUL	DDAELT	DDWAEB
59	GYAENJ	GYOLG	GGALT	GGWAB	GGEUNG	NYEOT	NWIG	DEONJ	DULG	DDAELP	DDWAEBS
5A	GYAENH	GYOLM	GGALP	GGWABS	GGEUJ	NYEOP	NWIGG	DEONH	DULM	DDAELH	DDWAES
5B	GYAED	GYOLB	GGALH	GGWAS	GGEUC	NYEOH	NWIGS	DEOD	DULB	DDAEM	DDWAESS
5C	GYAEL	GYOLS	GGAM	GGWASS	GGEUK	NYE	NWIN	DEOL	DULS	DDAEM	DDWAENG
5D	GYAELG	GYOLT	GGAB	GGWANG	GGEUT	NYEG	NWINJ	DEOLG	DULT	DDAEB	DDWAENG
5E	GYAELM	GYOLP	GGABS	GGWAJ	GGEUP	NYEGG	NWINH	DEOLM	DULP	DDAEBS	DDWAEJ
5F	GYAELB	GYOLH	GGAS	GGWAC	GGEUH	NYEGS	NWID	DEOLB	DULH	DDAES	DDWAEC
60	GYAELS	GYOM	GGASS	GGWAK	GGYI	NYEN	NWIL	DEOLS	DUM	DDAESS	DDWAEK
61	GYAELT	GYOB	GGANG	GGWAT	GGYIG	NYENJ	NWILG	DEOLT	DUB	DDAENG	DDWAET
62	GYAELP	GYOBS	GGAJ	GGWAP	GGYIGG	NYENH	NWILM	DEOLP	DUBS	DDAEJ	DDWAEP
63	GYAELH	GYOS	GGAC	GGWAH	GGYIGS	NYED	NWILB	DEOLH	DUS	DDAEC	DDWAEH
64	GYAEM	GYOSS	GGAK	GGWAE	GGYIN	NYEL	NWILS	DEOM	DUSS	DDAEK	DDOE
65	GYAEB	GYONG	GGAT	GGWAEG	GGYILG	NYELG	NWILT	DEOB	DUNG	DDAET	DDOEG
66	GYAEBS	GYOJ	GGAP	GGWAEGG	GGYINH	NYELM	NWILP	DEOBS	DUJ	DDAEP	DDOEGG
67	GYAES	GYOC	GGAH	GGWAEGS	GGYID	NYELB	NWILH	DEOS	DUC	DDAEH	DDOEGS
68	GYAESS	GYOK	GGAE	GGWAEN	GGYIL	NYELS	NWIM	DEOSS	DUK	DDYA	DDOEN
69	GYAENG	GYOT	GGAEG	GGWAENJ	GGYILG	NYELT	NWIB	DEONG	DUT	DDYAG	DDOENJ
6A	GYAEJ	GYOP	GGAEGG	GGWAENH	GGYILP	NYELP	NWIBS	DEOJ	DUP	DDYAGS	DDOENH
6B	GYAEC	GYOH	GGAEGS	GGWAED	GGYILB	NYELH	NWIS	DEOC	DUH	DDYAGS	DDOED
6C	GYAEK	GU	GGAEN	GGWAEL	GGYILS	NYEM	NWISS	DEOK	DWEO	DDYAN	DDOEL
6D	GYAET	GUG	GGAENJ	GGWAELG	GGYILT	NYEB	NWING	DEOT	DWEOG	DDYANJ	DDOELG
6E	GYAEP	GUGG	GGAENH	GGWAELM	GGYILP	NYEBS	NWIJ	DEOP	DWEOGG	DDYANH	DDOELM
6F	GYAEH	GUGS	GGAED	GGWAELB	GGYILH	NYES	NWIC	DEOH	DWEOGS	DDYAD	DDOELB
70	GEO	GUN	GGAEL	GGWAELS	GGYIM	NYESS	NWIK	DE	DWEON	DDYAL	DDOELS
71	GEOG	GUNJ	GGAELG	GGWAELT	GGYIB	NYENG	NWIT	DEG	DWEONJ	DDYALG	DDOELT
72	GEOGG	GUNH	GGAELM	GGWAELP	GGYIBS	NYEJ	NWIP	DEGG	DWEONH	DDYALM	DDOELP
73	GEOGS	GUD	GGAELB	GGWAELH	GGYIS	NYEC	NWIH	DEGS	DWEOD	DDYALB	DDOELH
74	GEON	GUL	GGAELS	GGWAEM	GGYING	NYEK	NYU	DEN	DWEOL	DDYALS	DDOEM
75	GEONJ	GULG	GGAELT	GGWAEB	GGYIJ	NYET	NYUG	DENJ	DWEOLG	DDYALT	DDOEB
76	GEONH	GULM	GGAELP	GGWAEBS	GGYIC	NYEP	NYUGG	DENH	DWEOLM	DDYALP	DDOEBS
77	GEOD	GULB	GGAELH	GGWAES	GGYIK	NYEH	NYUGS	DED	DWEOLB	DDYALH	DDOES
78	GEOL	GULS	GGAEM	GGWAESS	GGYIK	NO	NYUN	DEL	DWEOLS	DDYAM	DDOESS
79	GEOLG	GULT	GGAEB	GGWAENG	GGYIT	NOG	NYUNJ	DELG	DWEOLT	DDYAB	DDOENG
7A	GEOLM	GULP	GGAEBS	GGWAEJ	GGYIP	NOGG	NYUNH	DELM	DWEOLP	DDYABS	DDOEJ
7B	GEOLB	GULH	GGAES	GGWAEC	GGYIH	NOGS	NYUD	DELB	DWEOLH	DDYAS	DDOEC
7C	GEOLS	GUM	GGAESS	GGWAEK	GGI	NON	NYUL	DELS	DWEOM	DDYASS	DDOEK
7D	GEOLT	GUB	GGAENG	GGWAET	GGIG	NONJ	NYULG	DELT	DWEOB	DDYANG	DDOET
7E	GEOLP	GUBS	GGAEJ	GGWAEP	GGIGG	NONH	NYULM	DELP	DWEOBS	DDYAJ	DDOEP
7F	GEOLH	GUS	GGAEC	GGWAEH	GGIGS	NOD	NYULB	DELH	DWEOS	DDYAC	DDOEH
80	GEOM	GUSS	GGAEK	GGOE	GGIN	NOL	NYULS	DEM	DWEOSS	DDYAK	DDYO
81	GEOB	GUNG	GGAET	GGOEG	GGINJ	NOLG	NYULT	DEB	DWEONG	DDYAT	DDYOG
82	GEOBS	GUJ	GGAEP	GGOEGG	GGINH	NOLM	NYULP	DEBS	DWEOJ	DDYAP	DDYOGG
83	GEOS	GUC	GGAEH	GGOEGS	GGID	NOLB	NYULH	DES	DWEOC	DDYAH	DDYOGS
84	GEOSS	GUK	GGYA	GGOEN	GGIL	NOLS	NYUM	DESS	DWEOK	DDYAE	DDYON
85	GEONG	GUT	GGYAG	GGOENJ	GGILG	NOLT	NYUB	DENG	DWEOT	DDYAEG	DDYONJ
86	GEOJ	GUP	GGYAGG	GGOENH	GGILM	NOLP	NYUBS	DEJ	DWEOP	DDYAEGG	DDYONH
87	GEOC	GUH	GGYAGS	GGOED	GGILB	NOLH	NYUS	DEC	DWEOH	DDYAEGS	DDYOD
88	GEOK	GWEO	GGYAN	GGOEL	GGILS	NOM	NYUSS	DEK	DWE	DDYAEN	DDYOL
89	GEOT	GWEOG	GGYANJ	GGOELG	GGILT	NOB	NYUNG	DET	DWEG	DDYAENJ	DDYOLG
8A	GEOP	GWEOGG	GGYANH	GGOELM	GGILH	NOBS	NYUJ	DEP	DWEGG	DDYAENH	DDYOLM
8B	GEOH	GWEOGS	GGYAD	GGOELB	GGIM	NOS	NYUC	DEH	DWEGS	DDYAED	DDYOLB
8C	GE	GWEON	GGYAL	GGOELS	GGIM	NOSS	NYUK	DYEO	DWEN	DDYAEL	DDYOLS
8D	GEG	GWEONJ	GGYALG	GGOELT	GGIB	NONG	NYUT	DYEOG	DWENJ	DDYAELG	DDYOLT
8E	GEGG	GWEONH	GGYALM	GGOELP	GGIBS	NOJ	NYUP	DYEOGG	DWENH	DDYAELM	DDYOLP
8F	GEGS	GWEOD	GGYALB	GGOELH	GGIS	NOC	NYUH	DYEOGS	DWED	DDYAELB	DDYOLH
90	GEN	GWEOL	GGYALS	GGOEM	GGISS	NOK	NEU	DYEON	DWEL	DDYAELS	DDYOM
91	GENJ	GWEOLG	GGYALT	GGOEB	GGING	NOT	NEUG	DYEONJ	DWELG	DDYAELT	DDYOB
92	GENH	GWEOLM	GGYALP	GGOEBS	GGIJ	NOP	NEUGG	DYEONH	DWELM	DDYAELP	DDYOBS
93	GED	GWEOLB	GGYALH	GGOES	GGIC	NOH	NEUGS	DYEOD	DWELB	DDYAELH	DDYOS

	AC	AD	AE	AF	B0	B1	B2	B3	B4	B5	B6
94	GEL	GWEOLS	GGYAM	GGOESS	GGIK	NWA	NEUN	DYEOL	DWELS	DDYAEM	DDYOSS
95	GELG	GWEOLT	GGYAB	GGOENG	GGIT	NWAG	NEUNJ	DYEOLG	DWELT	DDYAEB	DDYONG
96	GELM	GWEOLP	GGYABS	GGOEJ	GGIP	NWAGG	NEUNH	DYEOLM	DWELP	DDYAEBS	DDYOJ
97	GELB	GWEOLH	GGYAS	GGOEC	GGIH	NWAGS	NEUD	DYEOLB	DWELH	DDYAES	DDYOC
98	GELS	GWEOM	GGYASS	GGOEK	NA	NWAN	NEUL	DYEOLS	DWEM	DDYAESS	DDYOK
99	GELT	GWEOB	GGYANG	GGOET	NAG	NWANJ	NEULG	DYEOLT	DWEB	DDYAENG	DDYOT
9A	GELP	GWEOBS	GGYAJ	GGOEP	NAGG	NWANH	NEULM	DYEOLP	DWEBS	DDYAEJ	DDYOP
9B	GELH	GWEOS	GGYAC	GGOEH	NAGS	NWAD	NEULB	DYEOLH	DWES	DDYAEC	DDYOH
9C	GEM	GWEOSS	GGYAK	GGYO	NAN	NWAL	NEULS	DYEOM	DWESS	DDYAEK	DDU
9D	GEB	GWEONG	GGYAT	GGYOG	NANJ	NWALG	NEULT	DYEOB	DWENG	DDYAET	DDUG
9E	GEBS	GWEOJ	GGYAP	GGYOGG	NANH	NWALM	NEULP	DYEOBS	DWEJ	DDYAEP	DDUGG
9F	GES	GWEOC	GGYAH	GGYOGS	NAD	NWALB	NEULH	DYEOS	DWEC	DDYAEH	DDUGS
A0	GESS	GWEOK	GGYAE	GGYON	NAL	NWALS	NEUM	DYEOSS	DWEK	DDEO	DDUN
A1	GENG	GWEOT	GGYAEG	GGYONJ	NALG	NWALT	NEUB	DYEONG	DWET	DDEOG	DDUNJ
A2	GEJ	GWEOP	GGYAEGG	GGYONH	NALM	NWALP	NEUBS	DYEOJ	DWEP	DDEOGG	DDUNH
A3	GEC	GWEOH	GGYAEGS	GGYOD	NALB	NWALH	NEUS	DYEOC	DWEH	DDEOGS	DDUD
A4	GEK	GWE	GGYAEN	GGYOL	NALS	NWAM	NEUSS	DYEOK	DWI	DDEON	DDUL
A5	GET	GWEG	GGYAENJ	GGYOLG	NALT	NWAB	NEUNG	DYEOT	DWIG	DDEONJ	DDULG
A6	GEP	GWEGG	GGYAENH	GGYOLM	NALP	NWABS	NEUJ	DYEOP	DWIGG	DDEONH	DDULM
A7	GEH	GWEGS	GGYAED	GGYOLB	NALH	NWAS	NEUC	DYEOH	DWIGS	DDEOD	DDULB
A8	GYEO	GWEN	GGYAEL	GGYOLS	NAM	NWASS	NEUK	DYE	DWIN	DDEOL	DDULS
A9	GYEOG	GWENJ	GGYAELG	GGYOLT	NAB	NWANG	NEUT	DYEG	DWINJ	DDEOLG	DDULT
AA	GYEOGG	GWENH	GGYAELM	GGYOLP	NABS	NWAJ	NEUP	DYEGG	DWINH	DDEOLM	DDULP
AB	GYEOGS	GWED	GGYAELB	GGYOLH	NAS	NWAC	NEUH	DYEGS	DWID	DDEOLB	DDULH
AC	GYEON	GWEL	GGYAELS	GGYOM	NASS	NWAK	NYI	DYEN	DWIL	DDEOLS	DDUM
AD	GYEONJ	GWELG	GGYAELT	GGYOB	NANG	NWAT	NYIG	DYENJ	DWILG	DDEOLT	DDUB
AE	GYEONH	GWELM	GGYAELP	GGYOBS	NAJ	NWAP	NYIGG	DYENH	DWILM	DDEOLP	DDUBS
AF	GYEOD	GWELB	GGYAELH	GGYOS	NAC	NWAH	NYIGS	DYED	DWILB	DDEOLH	DDUS
B0	GYEOL	GWELS	GGYAEM	GGYOSS	NAK	NWAE	NYIN	DYEL	DWILS	DDEOM	DDUSS
B1	GYEOLG	GWELT	GGYAEB	GGYONG	NAT	NWAEG	NYINJ	DYELG	DWILT	DDEOB	DDUNG
B2	GYEOLM	GWELP	GGYAEBS	GGYOJ	NAP	NWAEGG	NYINH	DYELM	DWILP	DDEOBS	DDUJ
B3	GYEOLB	GWELH	GGYAES	GGYOC	NAH	NWAEGS	NYID	DYELB	DWILH	DDEOS	DDUC
B4	GYEOLS	GWEM	GGYAENG	GGYOK	NAE	NWAEN	NYIL	DYELS	DWIM	DDEOSS	DDUK
B5	GYEOLT	GWEB	GGYAEJ	GGYOT	NAEG	NWAENJ	NYILG	DYELT	DWIB	DDEONG	DDUT
B6	GYEOLP	GWEBS	GGYAEC	GGYOP	NAEGG	NWAENH	NYILM	DYELP	DWIBS	DDEOJ	DDUP
B7	GYEOLH	GWES	GGYAEK	GGYOH	NAEGS	NWAED	NYILB	DYELH	DWIS	DDEOC	DDUH
B8	GYEOM	GWESS	GGYAET	GGU	NAEN	NWAEL	NYILS	DYEM	DWISS	DDEOK	DDWEO
B9	GYEOB	GWENG	GGYAEP	GGUG	NAENJ	NWAELG	NYILT	DYEB	DWING	DDEOT	DDWEOG
BA	GYEOBS	GWEJ	GGYAEH	GGUGG	NAENH	NWAELM	NYILP	DYEBS	DWIJ	DDEOP	DDWEOGG
BB	GYEOS	GWEC	GGYAEGG	GGUGS	NAED	NWAELB	NYILH	DYES	DWIC	DDEOH	DDWEOGS
BC	GYEOSS	GWEK	GGEO	GGUN	NAEL	NWAELS	NYIM	DYESS	DWIK	DDE	DDWEON
BD	GYEONG	GWET	GGEOG	GGUNJ	NAELG	NWAELT	NYIB	DYENG	DWIT	DDEG	DDWEONJ
BE	GYEOJ	GWEP	GGEOGG	GGUNH	NAELM	NWAELP	NYIBS	DYEJ	DWIP	DDEGG	DDWEONH
BF	GYEOC	GWEH	GGEOGS	GGUD	NAELB	NWAELH	NYIS	DYEC	DWIH	DDEGS	DDWEOD
C0	GYEOK	GWI	GGEON	GGUL	NAELS	NWAEM	NYISS	DYEK	DYU	DDEN	DDWEOL
C1	GYEOT	GWIG	GGEONJ	GGULG	NAELT	NWAEB	NYING	DYET	DYUG	DDENJ	DDWEOLG
C2	GYEOP	GWIGG	GGEONH	GGULM	NAELP	NWAEBS	NYIJ	DYEP	DYUGG	DDENH	DDWEOLM
C3	GYEOH	GWIGS	GGEOD	GGULB	NAELH	NWAES	NYIC	DYEH	DYUGS	DDED	DDWEOLB
C4	GYE	GWIN	GGEOL	GGULS	NAEM	NWAESS	NYIK	DO	DYUN	DDEL	DDWEOLS
C5	GYEG	GWINJ	GGEOLG	GGULT	NAEB	NWAENG	NYIT	DOG	DYUNJ	DDELG	DDWEOLT
C6	GYEGG	GWINH	GGEOLM	GGULP	NAEBS	NWAEJ	NYIP	DOGG	DYUNH	DDELM	DDWEOLP
C7	GYEGS	GWID	GGEOLB	GGULH	NAES	NWAEC	NYIH	DOGS	DYUD	DDELB	DDWEOLH
C8	GYEN	GWIL	GGEOLS	GGUM	NAESS	NWAEK	NI	DON	DYUL	DDELS	DDWEOM
C9	GYENJ	GWILG	GGEOLT	GGUB	NAENG	NWAET	NIG	DONJ	DYULG	DDELT	DDWEOB
CA	GYENH	GWILM	GGEOLP	GGUBS	NAEJ	NWAEP	NIGG	DONH	DYULM	DDELP	DDWEOBS
CB	GYED	GWILB	GGEOLH	GGUS	NAEC	NWAEH	NIGS	DOD	DYULB	DDELH	DDWEOS
CC	GYEL	GWILS	GGEOM	GGUSS	NAEK	NOE	NIN	DOL	DYULS	DDEM	DDWEOSS
CD	GYELG	GWILT	GGEOB	GGUNG	NAET	NOEG	NINJ	DOLG	DYULT	DDEB	DDWEONG
CE	GYELM	GWILP	GGEOBS	GGUJ	NAEP	NOEGG	NINH	DOLM	DYULP	DDEBS	DDWEOJ
CF	GYELB	GWILH	GGEOS	GGUC	NAEH	NOEGS	NID	DOLB	DYULH	DDES	DDWEOC
D0	GYELS	GWIM	GGEOSS	GGUK	NYA	NOEN	NIL	DOLS	DYUM	DDESS	DDWEOK
D1	GYELT	GWIB	GGEONG	GGUT	NYAG	NOENJ	NILG	DOLT	DYUB	DDENG	DDWEOT
D2	GYELP	GWIBS	GGEOJ	GGUP	NYAGS	NOENH	NILM	DOLP	DYUBS	DDEJ	DDWEOP
D3	GYELH	GWIS	GGEOC	GGUH	NYAN	NOED	NILB	DOLH	DYUS	DDEC	DDWEOH
D4	GYEM	GWISS	GGEOK	GGWEO	NYANJ	NOEL	NILS	DOM	DYUSS	DDEK	DDWE
D5	GYEB	GWING	GGEOT	GGWEOG	NYANH	NOELG	NILT	DOB	DYUNG	DDET	DDWEG
D6	GYEBS	GWIJ	GGEOP	GGWEOGG	NYAD	NOELM	NILP	DOBS	DYUJ	DDEP	DDWEGG
D7	GYES	GWIC	GGEOH	GGWEOGS	NYAL	NOELB	NILH	DOS	DYUC	DDEH	DDWEGS
D8	GYESS	GWIK	GGE	GGWEON	NYALG	NOELS	NIM	DOSS	DYUK	DDYEO	DDWEN
D9	GYENG	GWIT	GGEG	GGWEONJ	NYALM	NOELT	NIB	DONG	DYUT	DDYEOG	DDWENJ
DA	GYEJ	GWIP	GGEGG	GGWEONH	NYALB	NOELP	NIBS	DOJ	DYUP	DDYEOGG	DDWENH
DB	GYEC	GWIH	GGEGS	GGWEOD	NYALS	NOELH	NIS	DOC	DYUH	DDYEOGS	DDWED
DC	GYEK	GYU	GGEN	GGWEOL	NYALT	NOEM	NISS	DOK	DEU	DDYEON	DDWEL
DD	GYET	GYUG	GGENJ	GGWEOLG	NYALP	NOEB	NING	DOT	DEUG	DDYEONJ	DDWELG
DE	GYEP	GYUGG	GGENH	GGWEOLM	NYALH	NOEBS	NIJ	DOP	DEUGG	DDYEONH	DDWELM
DF	GYEH	GYUGS	GGED	GGWEOLB	NYAM	NOES	NIC	DOH	DEUGS	DDYEOD	DDWELB
E0	GO	GYUN	GGEL	GGWEOLS	NYAB	NOESS	NIK	DWA	DEUN	DDYEOL	DDWELS
E1	GOG	GYUNJ	GGELG	GGWEOLT	NYABS	NOENG	NIT	DWAG	DEUNJ	DDYEOLG	DDWELT
E2	GOGG	GYUNH	GGELM	GGWEOLP	NYAS	NOEJ	NIP	DWAGG	DEUNH	DDYEOLM	DDWELP
E3	GOGS	GYUD	GGELB	GGWEOLH	NYASS	NOEC	NIH	DWAGS	DEUD	DDYEOLB	DDWELH
E4	GON	GYUL	GGELS	GGWEOM	NYANG	NOEK	DA	DWAN	DEUL	DDYEOLS	DDWEM
E5	GONJ	GYULG	GGELT	GGWEOB	NYAJ	NOET	DAG	DWANJ	DEULG	DDYEOLT	DDWEB
E6	GONH	GYULM	GGELP	GGWEOBS	NYAC	NOEP	DAGG	DWANH	DEULM	DDYEOLP	DDWEBS
E7	GOD	GYULB	GGELH	GGWEOS	NYAK	NOEH	DAGS	DWAD	DEULB	DDYEOLH	DDWES
E8	GOL	GYULS	GGEM	GGWEOSS	NYAT	NYO	DAN	DWAL	DEULS	DDYEOM	DDWESS
E9	GOLG	GYULT	GGEB	GGWEONG	NYAP	NYOG	DANJ	DWALG	DEULT	DDYEOB	DDWENG
EA	GOLM	GYULP	GGEBS	GGWEOJ	NYAH	NYOGG	DANH	DWALM	DEULP	DDYEOBS	DDWEJ
EB	GOLB	GYULH	GGES	GGWEOC	NYAE	NYOGS	DAD	DWALB	DEULH	DDYEOS	DDWEC
EC	GOLS	GYUM	GGESS	GGWEOK	NYAEG	NYON	DAL	DWALS	DEUM	DDYEOSS	DDWEK
ED	GOLT	GYUB	GGENG	GGWEOT	NYAEGG	NYONJ	DALG	DWALT	DEUB	DDYEONG	DDWET
EE	GOLP	GYUBS	GGEJ	GGWEOP	NYAEGS	NYONH	DALM	DWALP	DEUBS	DDYEOJ	DDWEP
EF	GOLH	GYUS	GGEC	GGWEOH	NYAED	NYOD	DALB	DWALH	DEUS	DDYEOC	DDWEH
F0	GOM	GYUSS	GGEK	GGWE	NYAEN	NYOL	DALS	DWAM	DEUSS	DDYEOK	DDWI
F1	GOB	GYUNG	GGET	GGWEG	NYAENJ	NYOLG	DALT	DWAB	DEUNG	DDYEOT	DDWIG
F2	GOBS	GYUJ	GGEP	GGWEGG	NYAENH	NYOLM	DALP	DWABS	DEUJ	DDYEOP	DDWIGG
F3	GOS	GYUC	GGEH	GGWEGS	NYAED	NYOLB	DALH	DWAS	DEUC	DDYEOH	DDWIGS
F4	GOSS	GYUK	GGYEO	GGWEN	NYAEL	NYOLS	DAM	DWASS	DEUK	DDYE	DDWIN
F5	GONG	GYUT	GGYEOG	GGWENJ	NYAELG	NYOLT	DAB	DWANG	DEUT	DDYEG	DDWINJ
F6	GOJ	GYUP	GGYEOGG	GGWENH	NYAELM	NYOLP	DABS	DWAJ	DEUP	DDYEGG	DDWINH

	AC	AD	AE	AF	B0	B1	B2	B3	B4	B5	B6
F7	GOC	GYUH	GGYEOGS	GGWED	NYAELB	NYOLH	DAS	DWAC	DEUH	DDYEGS	DDWID
F8	GOK	GEU	GGYEON	GGWEL	NYAELS	NYOM	DASS	DWAK	DYI	DDYEN	DDWIL
F9	GOT	GEUG	GGYEONJ	GGWELG	NYAELT	NYOB	DANG	DWAT	DYIG	DDYENJ	DDWILG
FA	GOP	GEUGG	GGYEONH	GGWELM	NYAELP	NYOBS	DAJ	DWAP	DYIGG	DDYENH	DDWILM
FB	GOH	GEUGS	GGYEOD	GGWELB	NYAELH	NYOS	DAC	DWAH	DYIGS	DDYED	DDWILB
FC	GWA	GEUN	GGYEOL	GGWELS	NYAEM	NYOSS	DAK	DWAE	DYIN	DDYEL	DDWILS
FD	GWAG	GEUNJ	GGYEOLG	GGWELT	NYAEB	NYONG	DAT	DWAEG	DYINJ	DDYELG	DDWILT
FE	GWAGG	GEUNH	GGYEOLM	GGWELP	NYAEBS	NYOJ	DAP	DWAEGG	DYINH	DDYELM	DDWILP
FF	GWAGS	GEUD	GGYEOLB	GGWELH	NYAES	NYOC	DAH	DWAEGS	DYID	DDYELB	DDWILH

Table R.2 - Final components of character names in Hangul Syllables block, Rows B7 - C1

	B7	B8	B9	BA	BB	BC	BD	BE	BF	C0	C1
00	DDWIM	REOSS	RUK	MYA	MOEN	MIL	BOLS	BYUM	BBESS	BBWEOK	SYAE
01	DDWIB	REONG	RUT	MYAG	MOENJ	MILG	BOLT	BYUB	BBENG	BBWEOT	SYAEG
02	DDWIBS	REOJ	RUP	MYAGG	MOENH	MILM	BOLP	BYUBS	BBEJ	BBWEOP	SYAEGG
03	DDWIS	REOC	RUH	MYAGS	MOED	MILB	BOLH	BYUS	BBEC	BBWEOH	SYAEGS
04	DDWISS	REOK	RWEO	MYAN	MOEL	MILS	BOM	BYUSS	BBEK	BBWE	SYAEN
05	DDWING	REOT	RWEOG	MYANJ	MOELG	MILT	BOB	BYUNG	BBET	BBWEG	SYAENJ
06	DDWIJ	REOP	RWEOGG	MYANH	MOELM	MILP	BOBS	BYUJ	BBEP	BBWEGG	SYAENH
07	DDWIC	REOH	RWEOGS	MYAD	MOELB	MILH	BOS	BYUC	BBEH	BBWEGS	SYAED
08	DDWIK	RE	RWEON	MYAL	MOELS	MIM	BOSS	BYUK	BBYEO	BBWEN	SYAEL
09	DDWIT	REG	RWEONJ	MYALG	MOELT	MIB	BONG	BYUT	BBYEOG	BBWENJ	SYAELG
0A	DDWIP	REGG	RWEONH	MYALM	MOELP	MIBS	BOJ	BYUP	BBYEOGG	BBWENH	SYAELM
0B	DDWIH	REGS	RWEOD	MYALB	MOELH	MIS	BOC	BYUH	BBYEOGS	BBWED	SYAELB
0C	DDYU	REN	RWEOL	MYALS	MOEM	MISS	BOK	BEU	BBYEON	BBWEL	SYAELS
0D	DDYUG	RENJ	RWEOLG	MYALT	MOEB	MING	BOT	BEUG	BBYEONJ	BBWELG	SYAELT
0E	DDYUGG	RENH	RWEOLM	MYALP	MOEBS	MIJ	BOP	BEUGG	BBYEONH	BBWELM	SYAELP
0F	DDYUGS	RED	RWEOLB	MYALH	MOES	MIC	BOH	BEUGS	BBYEOD	BBWELB	SYAELH
10	DDYUN	REL	RWEOLS	MYAM	MOESS	MIK	BWA	BEUN	BBYEOL	BBWELS	SYAEM
11	DDYUNJ	RELG	RWEOLT	MYAB	MOENG	MIT	BWAG	BEUNJ	BBYEOLG	BBWELT	SYAEB
12	DDYUNH	RELM	RWEOLP	MYABS	MOEJ	MIP	BWAGG	BEUNH	BBYEOLM	BBWELP	SYAEBS
13	DDYUD	RELB	RWEOLH	MYAS	MOEC	MIH	BWAGS	BEUD	BBYEOLB	BBWELH	SYAES
14	DDYUL	RELS	RWEOM	MYASS	MOEK	BA	BWAN	BEUL	BBYEOLS	BBWEM	SYAESS
15	DDYULG	RELT	RWEOB	MYANG	MOET	BAG	BWANJ	BEULG	BBYEOLT	BBWEB	SYAENG
16	DDYULM	RELP	RWEOBS	MYAJ	MOEP	BAGG	BWANH	BEULM	BBYEOLP	BBWEBS	SYAEJ
17	DDYULB	RELH	RWEOS	MYAC	MOEH	BAGS	BWAD	BEULB	BBYEOLH	BBWES	SYAEC
18	DDYULS	REM	RWEOSS	MYAK	MYO	BAN	BWAL	BEULS	BBYEOM	BBWESS	SYAEK
19	DDYULT	REB	RWEONG	MYAT	MYOG	BANJ	BWALG	BEULT	BBYEOB	BBWENG	SYAET
1A	DDYULP	REBS	RWEOJ	MYAP	MYOGG	BANH	BWALM	BEULP	BBYEOBS	BBWEJ	SYAEP
1B	DDYULH	RES	RWEOC	MYAH	MYOGS	BAD	BWALB	BEULH	BBYEOS	BBWEC	SYAEH
1C	DDYUM	RESS	RWEOK	MYAE	MYON	BAL	BWALS	BEUM	BBYEOSS	BBWEK	SEO
1D	DDYUB	RENG	RWEOT	MYAEG	MYONJ	BALG	BWALT	BEUB	BBYEONG	BBWET	SEOG
1E	DDYUBS	REJ	RWEOP	MYAEGG	MYONH	BALM	BWALP	BEUBS	BBYEOJ	BBWEP	SEOGG
1F	DDYUS	REC	RWEOH	MYAEGS	MYOD	BALB	BWALH	BEUS	BBYEOC	BBWEH	SEOGS
20	DDYUSS	REK	RWE	MYAEN	MYOL	BALS	BWAM	BEUSS	BBYEOK	BBWI	SEON
21	DDYUNG	RET	RWEG	MYAENJ	MYOLG	BALT	BWAB	BEUNG	BBYEOT	BBWIG	SEONJ
22	DDYUJ	REP	RWEGG	MYAENH	MYOLM	BALP	BWABS	BEUJ	BBYEOP	BBWIGG	SEONH
23	DDYUC	REH	RWEGS	MYAED	MYOLB	BALH	BWAS	BEUC	BBYEOH	BBWIGS	SEOD
24	DDYUK	RYEO	RWEN	MYAEL	MYOLS	BAM	BWASS	BEUK	BBYE	BBWIN	SEOL
25	DDYUT	RYEOG	RWENJ	MYAELG	MYOLT	BAB	BWANG	BEUT	BBYEG	BBWINJ	SEOLG
26	DDYUP	RYEOGG	RWENH	MYAELM	MYOLP	BABS	BWAJ	BEUP	BBYEGG	BBWINH	SEOLM
27	DDYUH	RYEOGS	RWED	MYAELB	MYOLH	BAS	BWAC	BEUH	BBYEGS	BBWID	SEOLB
28	DDEU	RYEON	RWEL	MYAELS	MYOM	BASS	BWAK	BYI	BBYEN	BBWIL	SEOLS
29	DDEUG	RYEONJ	RWELG	MYAELT	MYOB	BANG	BWAT	BYIG	BBYENJ	BBWILG	SEOLT
2A	DDEUGG	RYEONH	RWELM	MYAELP	MYOBS	BAJ	BWAP	BYIGG	BBYENH	BBWILM	SEOLP
2B	DDEUGS	RYEOD	RWELB	MYAELH	MYOS	BAC	BWAH	BYIGS	BBYED	BBWILB	SEOLH
2C	DDEUN	RYEOL	RWELS	MYAEM	MYOSS	BAK	BWAE	BYIN	BBYEL	BBWILS	SEOM
2D	DDEUNJ	RYEOLG	RWELT	MYAEB	MYONG	BAT	BWAEG	BYINJ	BBYELG	BBWILT	SEOB
2E	DDEUNH	RYEOLM	RWELP	MYAEBS	MYOJ	BAP	BWAEGG	BYINH	BBYELM	BBWILP	SEOBS
2F	DDEUD	RYEOLB	RWELH	MYAES	MYOC	BAH	BWAEGS	BYID	BBYELB	BBWILH	SEOS
30	DDEUL	RYEOLS	RWEM	MYAESS	MYOK	BAE	BWAEN	BYIL	BBYELS	BBWIM	SEOSS
31	DDEULG	RYEOLT	RWEB	MYAENG	MYOT	BAEG	BWAENJ	BYILG	BBYELT	BBWIB	SEONG
32	DDEULM	RYEOLP	RWEBS	MYAEJ	MYOP	BAEGG	BWAENH	BYILM	BBYELP	BBWIBS	SEOJ
33	DDEULB	RYEOLH	RWES	MYAEC	MYOH	BAEGS	BWAED	BYILB	BBYELH	BBWIS	SEOC
34	DDEULS	RYEOM	RWESS	MYAEK	MU	BAEN	BWAEL	BYILS	BBYEM	BBWISS	SEOK
35	DDEULT	RYEOB	RWENG	MYAET	MUG	BAENJ	BWAELG	BYILT	BBYEB	BBWING	SEOT
36	DDEULP	RYEOBS	RWEJ	MYAEP	MUGG	BAENH	BWAELM	BYILP	BBYEBS	BBWIJ	SEOP
37	DDEULH	RYEOS	RWEC	MYAEH	MUGS	BAED	BWAELB	BYILH	BBYES	BBWIC	SEOH
38	DDEUM	RYEOSS	RWEK	MEO	MUN	BAEL	BWAELS	BYIM	BBYESS	BBWIK	SE
39	DDEUB	RYEONG	RWET	MEOG	MUNJ	BAELG	BWAELT	BYIB	BBYENG	BBWIT	SEG
3A	DDEUBS	RYEOJ	RWEP	MEOGG	MUNH	BAELM	BWAELP	BYIBS	BBYEJ	BBWIP	SEGG
3B	DDEUS	RYEOC	RWEH	MEOGS	MUD	BAELB	BWAELH	BYIS	BBYEC	BBWIH	SEGS
3C	DDEUSS	RYEOK	RWI	MEON	MUL	BAELS	BWAEM	BYISS	BBYEK	BBYU	SEN
3D	DDEUNG	RYEOT	RWIG	MEONJ	MULG	BAELT	BWAEB	BYING	BBYET	BBYUG	SENJ
3E	DDEUJ	RYEOP	RWIGG	MEONH	MULM	BAELP	BWAEBS	BYIJ	BBYEP	BBYUGG	SENH
3F	DDEUC	RYEOH	RWIGS	MEOD	MULB	BAELH	BWAES	BYIC	BBYEH	BBYUGS	SED
40	DDEUK	RYE	RWIN	MEOL	MULS	BAEM	BWAESS	BYIK	BBO	BBYUN	SEL
41	DDEUT	RYEG	RWINJ	MEOLG	MULT	BAEB	BWAENG	BYIT	BBOG	BBYUNJ	SELG
42	DDEUP	RYEGG	RWINH	MEOLM	MULP	BAEBS	BWAEJ	BYIP	BBOGG	BBYUNH	SELM
43	DDEUH	RYEGS	RWID	MEOLB	MULH	BAES	BWAEC	BYIH	BBOGS	BBYUD	SELB
44	DDYI	RYEN	RWIL	MEOLS	MUM	BAESS	BWAEK	BI	BBON	BBYUL	SELS
45	DDYIG	RYENJ	RWILG	MEOLT	MUB	BAENG	BWAET	BIG	BBONJ	BBYULG	SELT
46	DDYIGG	RYENH	RWILM	MEOLP	MUBS	BAEJ	BWAEP	BIGG	BBONH	BBYULM	SELP
47	DDYIGS	RYED	RWILB	MEOLH	MUS	BAEC	BWAEH	BIGS	BBOD	BBYULB	SELH
48	DDYIN	RYEL	RWILS	MEOM	MUSS	BAEK	BOE	BIN	BBOL	BBYULS	SEM
49	DDYINJ	RYELG	RWILT	MEOB	MUNG	BAET	BOEG	BINJ	BBOLG	BBYULT	SEB
4A	DDYINH	RYELM	RWILH	MEOBS	MUJ	BAEP	BOEGG	BINH	BBOLM	BBYULP	SEBS
4B	DDYID	RYELB	RWIM	MEOS	MUC	BAEH	BOEGS	BID	BBOLB	BBYULH	SES
4C	DDYIL	RYELS	RWIB	MEOSS	MUK	BYA	BOEN	BIL	BBOLS	BBYUM	SESS
4D	DDYILG	RYELT	RWIBS	MEONG	MUT	BYAG	BOENJ	BILG	BBOLT	BBYUB	SENG
4E	DDYILM	RYELP	RWIS	MEOJ	MUP	BYAGG	BOENH	BILM	BBOLP	BBYUBS	SEJ
4F	DDYILB	RYELH	RWISS	MEOC	MUH	BYAGS	BOED	BILB	BBOLH	BBYUS	SEC
50	DDYILS	RYEM	RWING	MEOK	MWEO	BYAN	BOEL	BILS	BBOM	BBYUSS	SEK

	B7	B8	B9	BA	BB	BC	BD	BE	BF	C0	C1
51	DDYILT	RYEB	RWING	MEOT	MWEOG	BYANJ	BOELG	BILT	BBOB	BBYUNG	SET
52	DDYILP	RYEBS	RWIJ	MEOP	MWEOGG	BYANH	BOELM	BILP	BBOBS	BBYUJ	SEP
53	DDYILH	RYES	RWIC	MEOH	MWEOGS	BYAD	BOELB	BILH	BBOS	BBYUC	SEH
54	DDYIM	RYESS	RWIK	ME	MWEON	BYAL	BOELS	BIM	BBOSS	BBYUK	SYEO
55	DDYIB	RYENG	RWIT	MEG	MWEONJ	BYALG	BOELT	BIB	BBONG	BBYUT	SYEOG
56	DDYIBS	RYEJ	RWIP	MEGG	MWEONH	BYALM	BOELP	BIBS	BBOJ	BBYUP	SYEOGG
57	DDYIS	RYEC	RWIH	MEGS	MWEOD	BYALB	BOELH	BIS	BBOC	BBYUH	SYEOGS
58	DDYISS	RYEK	RYU	MEN	MWEOL	BYALS	BOEM	BISS	BBOK	BBEU	SYEON
59	DDYING	RYET	RYUG	MENJ	MWEOLG	BYALT	BOEB	BING	BBOT	BBEUG	SYEONJ
5A	DDYIJ	RYEP	RYUGG	MENH	MWEOLM	BYALP	BOEBS	BIJ	BBOP	BBEUGG	SYEONH
5B	DDYIC	RYEH	RYUGS	MED	MWEOLB	BYALH	BOES	BIC	BBOH	BBEUGS	SYEOD
5C	DDYIK	RO	RYUN	MEL	MWEOLS	BYAM	BOESS	BIK	BBWA	BBEUN	SYEOL
5D	DDYIT	ROG	RYUNJ	MELG	MWEOLT	BYAB	BOENG	BIT	BBWAG	BBEUNJ	SYEOLG
5E	DDYIP	ROGG	RYUNH	MELM	MWEOLP	BYABS	BOEJ	BIP	BBWAGG	BBEUNH	SYEOLM
5F	DDYIH	ROGS	RYUD	MELB	MWEOLH	BYAS	BOEC	BIH	BBWAGS	BBEUD	SYEOLB
60	DDI	RON	RYUL	MELS	MWEOM	BYASS	BOEK	BBA	BBWAN	BBEUL	SYEOLS
61	DDIG	RONJ	RYULG	MELT	MWEOB	BYANG	BOET	BBAG	BBWANJ	BBEULG	SYEOLT
62	DDIGG	RONH	RYULM	MELP	MWEOBS	BYAJ	BOEP	BBAGG	BBWANH	BBEULM	SYEOLP
63	DDIGS	ROD	RYULB	MELH	MWEOS	BYAC	BOEH	BBAGS	BBWAD	BBEULB	SYEOLH
64	DDIN	ROL	RYULS	MEM	MWEOSS	BYAK	BYO	BBAN	BBWAL	BBEULS	SYEOM
65	DDINJ	ROLG	RYULT	MEB	MWEONG	BYAT	BYOG	BBANJ	BBWALG	BBEULT	SYEOB
66	DDINH	ROLM	RYULP	MEBS	MWEOJ	BYAP	BYOGG	BBANH	BBWALM	BBEULP	SYEOBS
67	DDID	ROLB	RYULH	MES	MWEOC	BYAH	BYOGS	BBAD	BBWALB	BBEULH	SYEOS
68	DDIL	ROLS	RYUM	MESS	MWEOK	BYAE	BYON	BBAL	BBWALS	BBEUM	SYEOSS
69	DDILG	ROLT	RYUB	MENG	MWEOT	BYAEG	BYONJ	BBALG	BBWALT	BBEUB	SYEONG
6A	DDILM	ROLP	RYUBS	MEJ	MWEOP	BYAEGG	BYONH	BBALM	BBWALP	BBEUBS	SYEOJ
6B	DDILB	ROLH	RYUS	MEC	MWEOH	BYAEGS	BYOD	BBALB	BBWALH	BBEUS	SYEOC
6C	DDILS	ROM	RYUSS	MEK	MWE	BYAEN	BYOL	BBALS	BBWAM	BBEUSS	SYEOK
6D	DDILT	ROB	RYUNG	MET	MWEG	BYAENJ	BYOLG	BBALT	BBWAB	BBEUNG	SYEOT
6E	DDILP	ROBS	RYUJ	MEP	MWEGG	BYAENH	BYOLM	BBALP	BBWABS	BBEUJ	SYEOP
6F	DDILH	ROS	RYUC	MEH	MWEGS	BYAED	BYOLB	BBALH	BBWAS	BBEUC	SYEOH
70	DDIM	ROSS	RYUK	MYEO	MWEN	BYAEL	BYOLS	BBAM	BBWASS	BBEUK	SYE
71	DDIB	RONG	RYUT	MYEOG	MWENJ	BYAELG	BYOLT	BBAB	BBWANG	BBEUT	SYEG
72	DDIBS	ROJ	RYUP	MYEOGG	MWENH	BYAELM	BYOLP	BBABS	BBWAJ	BBEUP	SYEGG
73	DDIS	ROC	RYUH	MYEOGS	MWED	BYAELB	BYOLH	BBAS	BBWAC	BBEUH	SYEGS
74	DDISS	ROK	REU	MYEON	MWEL	BYAELS	BYOM	BBASS	BBWAK	BBYI	SYEN
75	DDING	ROT	REUG	MYEONJ	MWELG	BYAELT	BYOB	BBANG	BBWAT	BBYIG	SYENJ
76	DDIJ	ROP	REUGG	MYEONH	MWELM	BYAELP	BYOBS	BBAJ	BBWAP	BBYIGG	SYENH
77	DDIC	ROH	REUGS	MYEOD	MWELB	BYAELH	BYOS	BBAC	BBWAH	BBYIGS	SYED
78	DDIK	RWA	REUN	MYEOL	MWELS	BYAEM	BYOSS	BBAK	BBWAE	BBYIN	SYEL
79	DDIT	RWAG	REUNJ	MYEOLG	MWELT	BYAEB	BYONG	BBAT	BBWAEG	BBYINJ	SYELG
7A	DDIP	RWAGG	REUNH	MYEOLM	MWELP	BYAEBS	BYOJ	BBAP	BBWAEGG	BBYINH	SYELM
7B	DDIH	RWAGS	REUD	MYEOLB	MWELH	BYAES	BYOC	BBAH	BBWAEGS	BBYID	SYELB
7C	RA	RWAN	REUL	MYEOLS	MWEM	BYAESS	BYOK	BBAE	BBWAEN	BBYIL	SYELS
7D	RAG	RWANJ	REULG	MYEOLT	MWEB	BYAENG	BYOT	BBAEG	BBWAENJ	BBYILG	SYELT
7E	RAGG	RWANH	REULM	MYEOLP	MWEBS	BYAEJ	BYOP	BBAEGG	BBWAENH	BBYILM	SYELP
7F	RAGS	RWAD	REULB	MYEOLH	MWES	BYAEC	BYOH	BBAEGS	BBWAED	BBYILB	SYELH
80	RAN	RWAL	REULS	MYEOM	MWESS	BYAEK	BU	BBAEN	BBWAEL	BBYILS	SYEM
81	RANJ	RWALG	REULT	MYEOB	MWENG	BYAET	BUG	BBAENJ	BBWAELG	BBYILT	SYEB
82	RANH	RWALM	REULP	MYEOBS	MWEJ	BYAEP	BUGG	BBAENH	BBWAELM	BBYILP	SYEBS
83	RAD	RWALB	REULH	MYEOS	MWEC	BYAEH	BUGS	BBAED	BBWAELB	BBYILH	SYES
84	RAL	RWALS	REUM	MYEOSS	MWEK	BEO	BUN	BBAEL	BBWAELS	BBYIM	SYESS
85	RALG	RWALT	REUB	MYEONG	MWET	BEOG	BUNJ	BBAELG	BBWAELT	BBYIB	SYENG
86	RALM	RWALP	REUBS	MYEOJ	MWEP	BEOGG	BUNH	BBAELM	BBWAELP	BBYIBS	SYEJ
87	RALB	RWALH	REUS	MYEOC	MWEH	BEOGS	BUD	BBAELB	BBWAELH	BBYIS	SYEC
88	RALS	RWAM	REUSS	MYEOK	MWI	BEON	BUL	BBAELS	BBWAEM	BBYISS	SYEK
89	RALT	RWAB	REUNG	MYEOT	MWIG	BEONJ	BULG	BBAELT	BBWAEB	BBYING	SYET
8A	RALP	RWABS	REUJ	MYEOP	MWIGG	BEONH	BULM	BBAELP	BBWAEBS	BBYIJ	SYEP
8B	RALH	RWAS	REUC	MYEOH	MWIGS	BEOD	BULB	BBAELH	BBWAES	BBYIC	SYEH
8C	RAM	RWASS	REUK	MYE	MWIN	BEOL	BULS	BBAEM	BBWAESS	BBYIK	SO
8D	RAB	RWANG	REUT	MYEG	MWINJ	BEOLG	BULT	BBAEB	BBWAENG	BBYIT	SOG
8E	RABS	RWAJ	REUP	MYEGG	MWINH	BEOLM	BULP	BBAEBS	BBWAEJ	BBYIP	SOGG
8F	RAS	RWAC	REUH	MYEGS	MWID	BEOLB	BULH	BBAES	BBWAEC	BBYIH	SOGS
90	RASS	RWAK	RYI	MYEN	MWIL	BEOLS	BUM	BBAESS	BBWAEK	BBI	SON
91	RANG	RWAT	RYIG	MYENJ	MWILG	BEOLT	BUB	BBAENG	BBWAET	BBIG	SONJ
92	RAJ	RWAP	RYIGG	MYENH	MWILM	BEOLP	BUBS	BBAEJ	BBWAEP	BBIGG	SONH
93	RAC	RWAH	RYIGS	MYED	MWILB	BEOLH	BUS	BBAEC	BBWAEH	BBIGS	SOD
94	RAK	RWAE	RYIN	MYEL	MWILS	BEOM	BUSS	BBAEK	BBOE	BBIN	SOL
95	RAT	RWAEG	RYINJ	MYELG	MWILT	BEOB	BUNG	BBAET	BBOEG	BBINJ	SOLG
96	RAP	RWAEGG	RYINH	MYELM	MWILP	BEOBS	BUJ	BBAEP	BBOEGG	BBINH	SOLM
97	RAH	RWAEGS	RYID	MYELB	MWILH	BEOS	BUC	BBAEH	BBOEGS	BBID	SOLB
98	RAE	RWAEN	RYIL	MYELS	MWIM	BEOSS	BUK	BBYA	BBOEN	BBIL	SOLS
99	RAEG	RWAENJ	RYILG	MYELT	MWIB	BEONG	BUT	BBYAG	BBOENJ	BBILG	SOLT
9A	RAEGG	RWAENH	RYILM	MYELP	MWIBS	BEOJ	BUP	BBYAGG	BBOENH	BBILM	SOLP
9B	RAEGS	RWAED	RYILB	MYELH	MWIS	BEOC	BUH	BBYAGS	BBOED	BBILB	SOLH
9C	RAEN	RWAEL	RYILS	MYEM	MWISS	BEOK	BWEO	BBYAN	BBOEL	BBILS	SOM
9D	RAENJ	RWAELG	RYILT	MYEB	MWING	BEOT	BWEOG	BBYANJ	BBOELG	BBILT	SOB
9E	RAENH	RWAELM	RYILP	MYEBS	MWIJ	BEOP	BWEOGG	BBYANH	BBOELM	BBILP	SOBS
9F	RAED	RWAELB	RYILH	MYES	MWIC	BEOH	BWEOGS	BBYAD	BBOELB	BBILH	SOS
A0	RAEL	RWAELS	RYIM	MYESS	MWIK	BE	BWEON	BBYAL	BBOELS	BBIM	SOSS
A1	RAELG	RWAELT	RYIB	MYENG	MWIT	BEG	BWEONJ	BBYALG	BBOELT	BBIB	SONG
A2	RAELM	RWAELP	RYIBS	MYEJ	MWIP	BEGG	BWEONH	BBYALM	BBOELP	BBIBS	SOJ
A3	RAELB	RWAELH	RYIS	MYEC	MWIH	BEGS	BWEOD	BBYALB	BBOELH	BBIS	SOC
A4	RAELS	RWAEM	RYISS	MYEK	MYU	BEN	BWEOL	BBYALS	BBOEM	BBISS	SOK
A5	RAELT	RWAEB	RYING	MYET	MYUG	BENJ	BWEOLG	BBYALT	BBOEB	BBING	SOT
A6	RAELP	RWAEBS	RYIJ	MYEP	MYUGG	BENH	BWEOLM	BBYALP	BBOEBS	BBIJ	SOP
A7	RAELH	RWAES	RYIC	MYEH	MYUGS	BED	BWEOLB	BBYALH	BBOES	BBIC	SOH
A8	RAEM	RWAESS	RYIK	MO	MYUN	BEL	BWEOLS	BBYAM	BBOESS	BBIK	SWA
A9	RAEB	RWAENG	RYIT	MOG	MYUNJ	BELG	BWEOLT	BBYAB	BBOENG	BBIT	SWAG
AA	RAEBS	RWAEJ	RYIP	MOGG	MYUNH	BELM	BWEOLP	BBYABS	BBOEJ	BBIP	SWAGG
AB	RAES	RWAEC	RYIH	MOGS	MYUD	BELB	BWEOLH	BBYAS	BBOEC	BBIH	SWAGS
AC	RAESS	RWAEK	RI	MON	MYUL	BELS	BWEOM	BBYASS	BBOEK	SA	SWAN
AD	RAENG	RWAET	RIG	MONJ	MYULG	BELT	BWEOB	BBYANG	BBOET	SAG	SWANJ
AE	RAEJ	RWAEP	RIGG	MONH	MYULM	BELP	BWEOBS	BBYAJ	BBOEP	SAGG	SWANH
AF	RAEC	RWAEH	RIGS	MOD	MYULB	BELH	BWEOS	BBYAC	BBOEH	SAGS	SWAD
B0	RAEK	ROE	RIN	MOL	MYULS	BEM	BWEOSS	BBYAK	BBYO	SAN	SWAL
B1	RAET	ROEG	RINJ	MOLG	MYULT	BEB	BWEONG	BBYAT	BBYOG	SANJ	SWALG
B2	RAEP	ROEGG	RINH	MOLM	MYULP	BEBS	BWEOJ	BBYAP	BBYOGG	SANH	SWALM
B3	RAEH	ROEGS	RID	MOLB	MYULH	BES	BWEOC	BBYAH	BBYOGS	SAD	SWALB

	B7	B8	B9	BA	BB	BC	BD	BE	BF	C0	C1
B4	RYA	ROEN	RIL	MOLS	MYUM	BESS	BWEOK	BBYAE	BBYON	SAL	SWALS
B5	RYAG	ROENJ	RILG	MOLT	MYUB	BENG	BWEOT	BBYAEG	BBYONJ	SALG	SWALT
B6	RYAGG	ROENH	RILM	MOLP	MYUBS	BEJ	BWEOP	BBYAEGG	BBYONH	SALM	SWALP
B7	RYAGS	ROED	RILB	MOLH	MYUS	BEC	BWEOH	BBYAEGS	BBYOD	SALB	SWALH
B8	RYAN	ROEL	RILS	MOM	MYUSS	BEK	BWE	BBYAEN	BBYOL	SALS	SWAM
B9	RYANJ	ROELG	RILT	MOB	MYUNG	BET	BWEG	BBYAENJ	BBYOLG	SALT	SWAB
BA	RYANH	ROELM	RILP	MOBS	MYUJ	BEP	BWEGG	BBYAENH	BBYOLM	SALP	SWABS
BB	RYAD	ROELB	RILH	MOS	MYUC	BEH	BWEGS	BBYAED	BBYOLB	SALH	SWAS
BC	RYAL	ROELS	RIM	MOSS	MYUK	BYEO	BWEN	BBYAEL	BBYOLS	SAM	SWASS
BD	RYALG	ROELT	RIB	MONG	MYUT	BYEOG	BWENJ	BBYAELG	BBYOLT	SAB	SWANG
BE	RYALM	ROELP	RIBS	MOJ	MYUP	BYEOGG	BWENH	BBYAELM	BBYOLP	SABS	SWAJ
BF	RYALB	ROELH	RIS	MOC	MYUH	BYEOGS	BWED	BBYAELB	BBYOLH	SAS	SWAC
C0	RYALS	ROEM	RISS	MOK	MEU	BYEON	BWEL	BBYAELS	BBYOM	SASS	SWAK
C1	RYALT	ROEB	RING	MOT	MEUG	BYEONJ	BWELG	BBYAELT	BBYOB	SANG	SWAT
C2	RYALP	ROEBS	RIJ	MOP	MEUGG	BYEONH	BWELM	BBYAELP	BBYOBS	SAJ	SWAP
C3	RYALH	ROES	RIC	MOH	MEUGS	BYEOD	BWELB	BBYAELH	BBYOS	SAC	SWAH
C4	RYAM	ROESS	RIK	MWA	MEUN	BYEOL	BWELS	BBYAEM	BBYOSS	SAK	SWAE
C5	RYAB	ROENG	RIT	MWAG	MEUNJ	BYEOLG	BWELT	BBYAEB	BBYONG	SAT	SWAEG
C6	RYABS	ROEJ	RIP	MWAGG	MEUNH	BYEOLM	BWELP	BBYAEBS	BBYOJ	SAP	SWAEGG
C7	RYAS	ROEC	RIH	MWAGS	MEUD	BYEOLB	BWELH	BBYAES	BBYOC	SAH	SWAEGS
C8	RYASS	ROEK	MA	MWAN	MEUL	BYEOLS	BWEM	BBYAESS	BBYOK	SAE	SWAEN
C9	RYANG	ROET	MAG	MWANJ	MEULG	BYEOLT	BWEB	BBYAENG	BBYOT	SAEG	SWAENJ
CA	RYAJ	ROEP	MAGG	MWANH	MEULM	BYEOLP	BWEBS	BBYAEJ	BBYOP	SAEGG	SWAENH
CB	RYAC	ROEH	MAGS	MWAD	MEULB	BYEOLH	BWES	BBYAEC	BBYOH	SAEGS	SWAED
CC	RYAK	RYO	MAN	MWAL	MEULS	BYEOM	BWESS	BBYAEK	BBU	SAEN	SWAEL
CD	RYAT	RYOG	MANJ	MWALG	MEULT	BYEOB	BWENG	BBYAET	BBUG	SAENJ	SWAELG
CE	RYAP	RYOGG	MANH	MWALM	MEULP	BYEOBS	BWEJ	BBYAEP	BBUGG	SAENH	SWAELM
CF	RYAH	RYOGS	MAD	MWALB	MEULH	BYEOS	BWEC	BBYAEH	BBUGS	SAED	SWAELB
D0	RYAE	RYON	MAL	MWALS	MEUM	BYEOSS	BWEK	BBEO	BBUN	SAEL	SWAELS
D1	RYAEG	RYONJ	MALG	MWALT	MEUB	BYEONG	BWET	BBEOG	BBUNJ	SAELG	SWAELT
D2	RYAEGG	RYONH	MALM	MWALP	MEUBS	BYEOJ	BWEP	BBEOGG	BBUNH	SAELM	SWAELP
D3	RYAEGS	RYOD	MALB	MWALH	MEUS	BYEOC	BWEH	BBEOGS	BBUD	SAELB	SWAELH
D4	RYAEN	RYOL	MALS	MWAM	MEUSS	BYEOK	BWI	BBEON	BBUL	SAELS	SWAEM
D5	RYAENJ	RYOLG	MALT	MWAB	MEUNG	BYEOT	BWIG	BBEONJ	BBULG	SAELT	SWAEB
D6	RYAENH	RYOLM	MALP	MWABS	MEUJ	BYEOP	BWIGG	BBEONH	BBULM	SAELP	SWAEBS
D7	RYAED	RYOLB	MALH	MWAS	MEUC	BYEOH	BWIGS	BBEOD	BBULB	SAELH	SWAES
D8	RYAEL	RYOLS	MAM	MWASS	MEUK	BYE	BWIN	BBEOL	BBULS	SAEM	SWAESS
D9	RYAELG	RYOLT	MAB	MWANG	MEUT	BYEG	BWINJ	BBEOLG	BBULT	SAEB	SWAENG
DA	RYAELM	RYOLP	MABS	MWAJ	MEUP	BYEGG	BWINH	BBEOLM	BBULP	SAEBS	SWAEJ
DB	RYAELB	RYOLH	MAS	MWAC	MEUH	BYEGS	BWID	BBEOLB	BBULH	SAES	SWAEC
DC	RYAELS	RYOM	MASS	MWAK	MYI	BYEN	BWIL	BBEOLS	BBUM	SAESS	SWAEK
DD	RYAELT	RYOB	MANG	MWAT	MYIG	BYENJ	BWILG	BBEOLT	BBUB	SAENG	SWAET
DE	RYAELP	RYOBS	MAJ	MWAP	MYIGG	BYENH	BWILM	BBEOLP	BBUBS	SAEJ	SWAEP
DF	RYAELH	RYOS	MAC	MWAH	MYIGS	BYED	BWILB	BBEOLH	BBUS	SAEC	SWAEH
E0	RYAEM	RYOSS	MAK	MWAE	MYIN	BYEL	BWILS	BBEOM	BBUSS	SAEK	SOE
E1	RYAEB	RYONG	MAT	MWAEG	MYINJ	BYELG	BWILT	BBEOB	BBUNG	SAET	SOEG
E2	RYAEBS	RYOJ	MAP	MWAEGG	MYINH	BYELM	BWILP	BBEOBS	BBUJ	SAEP	SOEGG
E3	RYAES	RYOC	MAH	MWAEGS	MYID	BYELB	BWILH	BBEOS	BBUC	SAEH	SOEGS
E4	RYAESS	RYOK	MAE	MWAEN	MYIL	BYELS	BWIM	BBEOSS	BBUK	SYA	SOEN
E5	RYAENG	RYOT	MAEG	MWAENJ	MYILG	BYELT	BWIB	BBEONG	BBUT	SYAG	SOENJ
E6	RYAEJ	RYOP	MAEGG	MWAENH	MYILM	BYELP	BWIBS	BBEOJ	BBUP	SYAGG	SOENH
E7	RYAEC	RYOH	MAEGS	MWAED	MYILB	BYELH	BWIS	BBEOC	BBUH	SYAGS	SOED
E8	RYAEK	RU	MAEN	MWAEL	MYILS	BYEM	BWISS	BBEOK	BBWEO	SYAN	SOEL
E9	RYAET	RUG	MAENJ	MWAELG	MYILT	BYEB	BWING	BBEOT	BBWEOG	SYANJ	SOELG
EA	RYAEP	RUGG	MAENH	MWAELM	MYILP	BYEBS	BWIJ	BBEOP	BBWEOGG	SYANH	SOELM
EB	RYAEH	RUGS	MAED	MWAELB	MYILH	BYES	BWIC	BBEOH	BBWEOGS	SYAD	SOELB
EC	REO	RUN	MAEL	MWAELS	MYIM	BYESS	BWIK	BBE	BBWEON	SYAL	SOELS
ED	REOG	RUNJ	MAELG	MWAELT	MYIB	BYENG	BWIT	BBEG	BBWEONJ	SYALG	SOELT
EE	REOGG	RUNH	MAELM	MWAELP	MYIBS	BYEJ	BWIP	BBEGG	BBWEONH	SYALM	SOELP
EF	REOGS	RUD	MAELB	MWAELH	MYIS	BYEC	BWIH	BBEGS	BBWEOD	SYALB	SOELH
F0	REON	RUL	MAELS	MWAEM	MYISS	BYEK	BYU	BBEN	BBWEOL	SYALS	SOEM
F1	REONJ	RULG	MAELT	MWAEB	MYING	BYET	BYUG	BBENJ	BBWEOLG	SYALT	SOEB
F2	REONH	RULM	MAELP	MWAEBS	MYIJ	BYEP	BYUGG	BBENH	BBWEOLM	SYALP	SOEBS
F3	REOD	RULB	MAELH	MWAES	MYIC	BYEH	BYUGS	BBED	BBWEOLB	SYALH	SOES
F4	REOL	RULS	MAEM	MWAESS	MYIK	BO	BYUN	BBEL	BBWEOLS	SYAM	SOESS
F5	REOLG	RULT	MAEB	MWAENG	MYIT	BOG	BYUNJ	BBELG	BBWEOLT	SYAB	SOENG
F6	REOLM	RULP	MAEBS	MWAEJ	MYIP	BOGG	BYUNH	BBELM	BBWEOLP	SYABS	SOEJ
F7	REOLB	RULH	MAES	MWAEC	MYIH	BOGS	BYUD	BBELB	BBWEOLH	SYAS	SOEC
F8	REOLS	RUM	MAESS	MWAEK	MI	BON	BYUL	BBELS	BBWEOM	SYASS	SOEK
F9	REOLT	RUB	MAENG	MWAET	MIG	BONJ	BYULG	BBELT	BBWEOB	SYANG	SOET
FA	REOLP	RUBS	MAEJ	MWAEP	MIGG	BONH	BYULM	BBELP	BBWEOBS	SYAJ	SOEP
FB	REOLH	RUS	MAEC	MWAEH	MIGS	BOD	BYULB	BBELH	BBWEOS	SYAC	SOEH
FC	REOM	RUSS	MAEK	MOE	MIN	BOL	BYULS	BBEM	BBWEOSS	SYAK	SYO
FD	REOB	RUNG	MAET	MOEG	MINJ	BOLG	BYULT	BBEB	BBWEONG	SYAT	SYOG
FE	REOBS	RUJ	MAEP	MOEGG	MINH	BOLM	BYULP	BBEBS	BBWEOJ	SYAP	SYOGG
FF	REOS	RUC	MAEH	MOEGS	MID	BOLB	BYULH	BBES	BBWEOC	SYAH	SYOGS

Table R.3 - Final components of character names in Hangul Syllables block, Rows C2 - CC

	C2	C3	C4	C5	C6	C7	C8	C9	CA	CB	CC
00	SYON	SSAL	SSWALS	SSEUM	YEOSS	WEK	JEO	JUN	JJAEL	JJWAELS	JJYIM
01	SYONJ	SSALG	SSWALT	SSEUB	YEONG	WET	JEOG	JUNJ	JJAELG	JJWAELT	JJYIB
02	SYONH	SSALM	SSWALP	SSEUBS	YEOJ	WEP	JEOGG	JUNH	JJAELM	JJWAELP	JJYIBS
03	SYOD	SSALB	SSWALH	SSEUS	YEOC	WEH	JEOGS	JUD	JJAELB	JJWAELH	JJYIS
04	SYOL	SSALS	SSWAM	SSEUSS	YEOK	WI	JEON	JUL	JJAELS	JJWAEM	JJYISS
05	SYOLG	SSALT	SSWAB	SSEUNG	YEOT	WIG	JEONJ	JULG	JJAELT	JJWAEB	JJYING
06	SYOLM	SSALP	SSWABS	SSEUJ	YEOP	WIGG	JEONH	JULM	JJAELP	JJWAEBS	JJYIJ
07	SYOLB	SSALH	SSWAS	SSEUC	YEOH	WIGS	JEOD	JULB	JJAELH	JJWAES	JJYIC
08	SYOLS	SSAM	SSWASS	SSEUK	YE	WIN	JEOL	JULS	JJAEM	JJWAESS	JJYIK
09	SYOLT	SSAB	SSWANG	SSEUT	YEG	WINJ	JEOLG	JULT	JJAEB	JJWAENG	JJYIT
0A	SYOLP	SSABS	SSWAJ	SSEUP	YEGG	WINH	JEOLM	JULP	JJAEBS	JJWAEJ	JJYIP
0B	SYOLH	SSAS	SSWAC	SSEUH	YEGS	WID	JEOLB	JULH	JJAES	JJWAEC	JJYIH

	C2	C3	C4	C5	C6	C7	C8	C9	CA	CB	CC
0C	SYOM	SSASS	SSWAK	SSYI	YEN	WIL	JEOLS	JUM	JJAESS	JJWAEK	JJI
0D	SYOB	SSANG	SSWAT	SSYIG	YENJ	WILG	JEOLT	JUB	JJAENG	JJWAET	JJIG
0E	SYOBS	SSAJ	SSWAP	SSYIGG	YENH	WILM	JEOLP	JUBS	JJAEJ	JJWAEP	JJIGG
0F	SYOS	SSAC	SSWAH	SSYIGS	YED	WILB	JEOLH	JUS	JJAEC	JJWAEH	JJIGS
10	SYOSS	SSAK	SSWAE	SSYIN	YEL	WILS	JEOM	JUSS	JJAEK	JJOE	JJIN
11	SYONG	SSAT	SSWAEG	SSYINJ	YELG	WILT	JEOB	JUNG	JJAET	JJOEG	JJINJ
12	SYOJ	SSAP	SSWAEGG	SSYINH	YELM	WILP	JEOBS	JUJ	JJAEP	JJOEGG	JJINH
13	SYOC	SSAH	SSWAEGS	SSYID	YELB	WILH	JEOS	JUC	JJAEH	JJOEGS	JJID
14	SYOK	SSAE	SSWAEN	SSYIL	YELS	WIM	JEOSS	JUK	JJYA	JJOEN	JJIL
15	SYOT	SSAEG	SSWAENJ	SSYILG	YELT	WIB	JEONG	JUT	JJYAG	JJOENJ	JJILG
16	SYOP	SSAEGG	SSWAENH	SSYILM	YELP	WIBS	JEOJ	JUP	JJYAGG	JJOENH	JJILM
17	SYOH	SSAEGS	SSWAED	SSYILB	YELH	WIS	JEOC	JUH	JJYAGS	JJOED	JJILB
18	SU	SSAEN	SSWAEL	SSYILS	YEM	WISS	JEOK	JWEO	JJYAN	JJOEL	JJILS
19	SUG	SSAENJ	SSWAELG	SSYILT	YEB	WING	JEOT	JWEOG	JJYANJ	JJOELG	JJILT
1A	SUGG	SSAENH	SSWAELM	SSYILP	YEBS	WIJ	JEOP	JWEOGG	JJYANH	JJOELM	JJILP
1B	SUGS	SSAED	SSWAELB	SSYILH	YES	WIC	JEOH	JWEOGS	JJYAD	JJOELB	JJILH
1C	SUN	SSAEL	SSWAELS	SSYIM	YESS	WIK	JE	JWEON	JJYAL	JJOELS	JJIM
1D	SUNJ	SSAELG	SSWAELT	SSYIB	YENG	WIT	JEG	JWEONJ	JJYALG	JJOELT	JJIB
1E	SUNH	SSAELM	SSWAELP	SSYIBS	YEJ	WIP	JEGG	JWEONH	JJYALM	JJOELP	JJIBS
1F	SUD	SSAELB	SSWAELH	SSYIS	YEC	WIH	JEGS	JWEOD	JJYALB	JJOELH	JJIS
20	SUL	SSAELS	SSWAEM	SSYISS	YEK	YU	JEN	JWEOL	JJYALS	JJOEM	JJISS
21	SULG	SSAELT	SSWAEB	SSYING	YET	YUG	JENJ	JWEOLG	JJYALT	JJOEB	JJING
22	SULM	SSAELP	SSWAEBS	SSYIJ	YEP	YUGG	JENH	JWEOLM	JJYALP	JJOEBS	JJIJ
23	SULB	SSAELH	SSWAES	SSYIC	YEH	YUGS	JED	JWEOLB	JJYALH	JJOES	JJIC
24	SULS	SSAEM	SSWAESS	SSYIK	O	YUN	JEL	JWEOLS	JJYAM	JJOESS	JJIK
25	SULT	SSAEB	SSWAENG	SSYIT	OG	YUNJ	JELG	JWEOLT	JJYAB	JJOENG	JJIT
26	SULP	SSAEBS	SSWAEJ	SSYIP	OGG	YUNH	JELM	JWEOLP	JJYABS	JJOEJ	JJIP
27	SULH	SSAES	SSWAEC	SSYIH	OGS	YUD	JELB	JWEOLH	JJYAS	JJOEC	JJIH
28	SUM	SSAESS	SSWAEK	SSI	ON	YUL	JELS	JWEOM	JJYASS	JJOEK	CA
29	SUB	SSAENG	SSWAET	SSIG	ONJ	YULG	JELT	JWEOB	JJYANG	JJOET	CAG
2A	SUBS	SSAEJ	SSWAEP	SSIGG	ONH	YULM	JELP	JWEOBS	JJYAJ	JJOEP	CAGG
2B	SUS	SSAEC	SSWAEH	SSIGS	OD	YULB	JELH	JWEOS	JJYAC	JJOEH	CAGS
2C	SUSS	SSAEK	SSOE	SSIN	OL	YULS	JEM	JWEOSS	JJYAK	JJYO	CAN
2D	SUNG	SSAET	SSOEG	SSINJ	OLG	YULT	JEB	JWEONG	JJYAT	JJYOG	CANJ
2E	SUJ	SSAEP	SSOEGG	SSINH	OLM	YULP	JEBS	JWEOJ	JJYAP	JJYOGG	CANH
2F	SUC	SSAEH	SSOEGS	SSID	OLB	YULH	JES	JWEOC	JJYAH	JJYOGS	CAD
30	SUK	SSYA	SSOEN	SSIL	OLS	YUM	JESS	JWEOK	JJYAE	JJYON	CAL
31	SUT	SSYAG	SSOENH	SSILG	OLT	YUB	JENG	JWEOT	JJYAEG	JJYONJ	CALG
32	SUP	SSYAGG	SSOENH	SSILM	OLP	YUBS	JEJ	JWEOP	JJYAEGG	JJYONH	CALM
33	SUH	SSYAGS	SSOED	SSILB	OLH	YUS	JEC	JWEOH	JJYAEGS	JJYOD	CALB
34	SWEO	SSYAN	SSOEL	SSILS	OM	YUSS	JEK	JWE	JJYAEN	JJYOL	CALS
35	SWEOG	SSYANJ	SSOELG	SSILT	OB	YUNG	JET	JWEG	JJYAENJ	JJYOLG	CALT
36	SWEOGG	SSYANH	SSOELM	SSILP	OBS	YUJ	JEP	JWEGG	JJYAENH	JJYOLM	CALP
37	SWEOGS	SSYAD	SSOELB	SSILH	OS	YUC	JEH	JWEGS	JJYAED	JJYOLB	CALH
38	SWEON	SSYAL	SSOELS	SSIM	OSS	YUK	JYEO	JWEN	JJYAEL	JJYOLS	CAM
39	SWEONJ	SSYALG	SSOELT	SSIB	ONG	YUT	JYEOG	JWENJ	JJYAELG	JJYOLT	CAB
3A	SWEONH	SSYALM	SSOELP	SSIBS	OJ	YUP	JYEOGG	JWENH	JJYAELM	JJYOLP	CABS
3B	SWEOD	SSYALB	SSOELH	SSIS	OC	YUH	JYEOGS	JWED	JJYAELB	JJYOLH	CAS
3C	SWEOL	SSYALS	SSOEM	SSISS	OK	EU	JYEON	JWEL	JJYAELS	JJYOM	CASS
3D	SWEOLG	SSYALT	SSOEB	SSING	OT	EUG	JYEONJ	JWELG	JJYAELT	JJYOB	CANG
3E	SWEOLM	SSYALP	SSOEBS	SSIJ	OP	EUGG	JYEONH	JWELM	JJYAELP	JJYOBS	CAJ
3F	SWEOLB	SSYALH	SSOES	SSIC	OH	EUGS	JYEOD	JWELB	JJYAELH	JJYOS	CAC
40	SWEOLS	SSYAM	SSOESS	SSIK	WA	EUN	JYEOL	JWELS	JJYAEM	JJYOSS	CAK
41	SWEOLT	SSYAB	SSOENG	SSIT	WAG	EUNJ	JYEOLG	JWELT	JJYAEB	JJYONG	CAT
42	SWEOLP	SSYABS	SSOEJ	SSIP	WAGG	EUNH	JYEOLM	JWELP	JJYAEBS	JJYOJ	CAP
43	SWEOLH	SSYAS	SSOEC	SSIH	WAGS	EUD	JYEOLB	JWELH	JJYAES	JJYOC	CAH
44	SWEOM	SSYASS	SSOEK	A	WAN	EUL	JYEOLS	JWEM	JJYAESS	JJYOK	CAE
45	SWEOB	SSYANG	SSOET	AG	WANJ	EULG	JYEOLT	JWEB	JJYAENG	JJYOT	CAEG
46	SWEOBS	SSYAJ	SSOEP	AGG	WANH	EULM	JYEOLP	JWEBS	JJYAEJ	JJYOP	CAEGG
47	SWEOS	SSYAC	SSOEH	AGS	WAD	EULB	JYEOLH	JWES	JJYAEC	JJYOH	CAEGS
48	SWEOSS	SSYAK	SSYO	AN	WAL	EULS	JYEOM	JWESS	JJYAEK	JJU	CAEN
49	SWEONG	SSYAT	SSYOG	ANJ	WALG	EULT	JYEOB	JWENG	JJYAET	JJUG	CAENJ
4A	SWEOJ	SSYAP	SSYOGG	ANH	WALM	EULP	JYEOBS	JWEJ	JJYAEP	JJUGG	CAENH
4B	SWEOC	SSYAH	SSYOGS	AD	WALB	EULH	JYEOS	JWEC	JJYAEH	JJUGS	CAED
4C	SWEOK	SSYAE	SSYON	AL	WALS	EUM	JYEOSS	JWEK	JJEO	JJUN	CAEL
4D	SWEOT	SSYAEG	SSYONJ	ALG	WALT	EUB	JYEONG	JWET	JJEOG	JJUNJ	CAELG
4E	SWEOP	SSYAEGG	SSYONH	ALM	WALP	EUBS	JYEOJ	JWEP	JJEOGG	JJUNH	CAELM
4F	SWEOH	SSYAEGS	SSYOD	ALB	WALH	EUS	JYEOC	JWEH	JJEOGS	JJUD	CAELB
50	SWE	SSYAEN	SSYOL	ALS	WAM	EUSS	JYEOK	JWI	JJEON	JJUL	CAELS
51	SWEG	SSYAENJ	SSYOLG	ALT	WAB	EUNG	JYEOT	JWIG	JJEONJ	JJULG	CAELT
52	SWEGG	SSYAENH	SSYOLM	ALP	WABS	EUJ	JYEOP	JWIGG	JJEONH	JJULM	CAELP
53	SWEGS	SSYAED	SSYOLB	ALH	WAS	EUC	JYEOH	JWIGS	JJEOD	JJULB	CAELH
54	SWEN	SSYAEL	SSYOLS	AM	WASS	EUK	JYE	JWIN	JJEOL	JJULS	CAEM
55	SWENJ	SSYAELG	SSYOLT	AB	WANG	EUT	JYEG	JWINJ	JJEOLG	JJULT	CAEB
56	SWENH	SSYAELM	SSYOLP	ABS	WAJ	EUP	JYEGG	JWINH	JJEOLM	JJULP	CAEBS
57	SWED	SSYAELB	SSYOLH	AS	WAC	EUH	JYEGS	JWID	JJEOLB	JJULH	CAES
58	SWEL	SSYAELS	SSYOM	ASS	WAK	YI	JYEN	JWIL	JJEOLS	JJUM	CAESS
59	SWELG	SSYAELT	SSYOB	ANG	WAT	YIG	JYENJ	JWILG	JJEOLT	JJUB	CAENG
5A	SWELM	SSYAELP	SSYOBS	AJ	WAP	YIGG	JYENH	JWILM	JJEOLP	JJUBS	CAEJ
5B	SWELB	SSYAELH	SSYOS	AC	WAH	YIGS	JYED	JWILB	JJEOLH	JJUS	CAEC
5C	SWELS	SSYAEM	SSYOSS	AK	WAE	YIN	JYEL	JWILS	JJEOM	JJUSS	CAEK
5D	SWELT	SSYAEB	SSYONG	AT	WAEG	YINJ	JYELG	JWILT	JJEOB	JJUNG	CAET
5E	SWELP	SSYAEBS	SSYOJ	AP	WAEGG	YINH	JYELM	JWILH	JJEOBS	JJUJ	CAEP
5F	SWELH	SSYAES	SSYOC	AH	WAEGS	YID	JYELB	JWIM	JJEOS	JJUC	CAEH
60	SWEM	SSYAESS	SSYOK	AE	WAEN	YIL	JYELS	JWIB	JJEOSS	JJUK	CYA
61	SWEB	SSYAENG	SSYOT	AEG	WAENJ	YILG	JYELT	JWIBS	JJEONG	JJUT	CYAG
62	SWEBS	SSYAEJ	SSYOP	AEGG	WAENH	YILM	JYELP	JWIS	JJEOJ	JJUP	CYAGG
63	SWES	SSYAEC	SSYOH	AEGS	WAED	YILB	JYELH	JWISS	JJEOC	JJUH	CYAGS
64	SWESS	SSYAEK	SSU	AEN	WAEL	YILS	JYEM	JWING	JJEOK	JJWEO	CYAN
65	SWENG	SSYAET	SSUG	AENJ	WAELG	YILT	JYEB	JWIJ	JJEOT	JJWEOG	CYANJ
66	SWEJ	SSYAEP	SSUGG	AENH	WAELM	YILP	JYEBS	JWIC	JJEOP	JJWEOGG	CYANH
67	SWEC	SSYAEH	SSUGS	AED	WAELB	YILH	JYES	JWIK	JJEOH	JJWEOGS	CYAD
68	SWEK	SSEO	SSUN	AEL	WAELS	YIM	JYESS	JWIT	JJE	JJWEON	CYAL
69	SWET	SSEOG	SSUNJ	AELG	WAELT	YIB	JYENG	JWIP	JJEG	JJWEONJ	CYALG
6A	SWEP	SSEOGG	SSUNH	AELM	WAELP	YIBS	JYEJ	JWIH	JJEGG	JJWEONH	CYALM
6B	SWEH	SSEOGS	SSUD	AELB	WAELH	YIS	JYEC	JYU	JJEGS	JJWEOD	CYALB
6C	SWI	SSEON	SSUL	AELS	WAEM	YISS	JYEK	JYUG	JJEN	JJWEOL	CYALS
6D	SWIG	SSEONJ	SSULG	AELT	WAEB	YING	JYET	JYUG	JJENJ	JJWEOLG	CYALT
6E	SWIGG	SSEONH	SSULM	AELP	WAEBS	YIJ	JYEP	JYUGG	JJENH	JJWEOLM	CYALP

	C2	C3	C4	C5	C6	C7	C8	C9	CA	CB	CC
6F	SWIGS	SSEOD	SSULB	AELH	WAES	YIC	JYEH	JYUGS	JJED	JJWEOLB	CYALH
70	SWIN	SSEOL	SSULS	AEM	WAESS	YIK	JO	JYUN	JJEL	JJWEOLS	CYAM
71	SWINJ	SSEOLG	SSULT	AEB	WAENG	YIT	JOG	JYUNJ	JJELG	JJWEOLT	CYAB
72	SWINH	SSEOLM	SSULP	AEBS	WAEJ	YIP	JOGG	JYUNH	JJELM	JJWEOLP	CYABS
73	SWID	SSEOLB	SSULH	AES	WAEC	YIH	JOGS	JYUD	JJELB	JJWEOLH	CYAS
74	SWIL	SSEOLS	SSUM	AESS	WAEK	I	JON	JYUL	JJELS	JJWEOM	CYASS
75	SWILG	SSEOLT	SSUB	AENG	WAET	IG	JONJ	JYULG	JJELT	JJWEOB	CYANG
76	SWILM	SSEOLP	SSUBS	AEJ	WAEP	IGG	JONH	JYULM	JJELP	JJWEOBS	CYAJ
77	SWILB	SSEOLH	SSUS	AEC	WAEH	IGS	JOD	JYULB	JJELH	JJWEOS	CYAC
78	SWILS	SSEOM	SSUSS	AEK	OE	IN	JOL	JYULS	JJEM	JJWEOSS	CYAK
79	SWILT	SSEOB	SSUNG	AET	OEG	INJ	JOLG	JYULT	JJEB	JJWEONG	CYAT
7A	SWILP	SSEOBS	SSUJ	AEP	OEGG	INH	JOLM	JYULP	JJEBS	JJWEOJ	CYAP
7B	SWILH	SSEOS	SSUC	AEH	OEGS	ID	JOLB	JYULH	JJES	JJWEOC	CYAH
7C	SWIM	SSEOSS	SSUK	YA	OEN	IL	JOLS	JYUM	JJESS	JJWEOK	CYAE
7D	SWIB	SSEONG	SSUT	YAG	OENJ	ILG	JOLT	JYUB	JJENG	JJWEOT	CYAEG
7E	SWIBS	SSEOJ	SSUP	YAGG	OENH	ILM	JOLP	JYUBS	JJEJ	JJWEOP	CYAEGG
7F	SWIS	SSEOC	SSUH	YAGS	OED	ILB	JOLH	JYUS	JJEC	JJWEOH	CYAEGS
80	SWISS	SSEOK	SSWEO	YAN	OEL	ILS	JOM	JYUSS	JJEK	JJWE	CYAEN
81	SWING	SSEOT	SSWEOG	YANJ	OELG	ILT	JOB	JYUNG	JJET	JJWEG	CYAENJ
82	SWIJ	SSEOP	SSWEOGG	YANH	OELM	ILP	JOBS	JYUJ	JJEP	JJWEGG	CYAENH
83	SWIC	SSEOH	SSWEOGS	YAD	OELB	ILH	JOS	JYUC	JJEH	JJWEGS	CYAED
84	SWIK	SSE	SSWEON	YAL	OELS	IM	JOSS	JYUK	JJYEO	JJWEN	CYAEL
85	SWIT	SSEG	SSWEONJ	YALG	OELT	IB	JONG	JYUT	JJYEOG	JJWENJ	CYAELG
86	SWIP	SSEGG	SSWEONH	YALM	OELP	IBS	JOJ	JYUP	JJYEOGG	JJWENH	CYAELM
87	SWIH	SSEGS	SSWEOD	YALB	OELH	IS	JOC	JYUH	JJYEOGS	JJWED	CYAELB
88	SYU	SSEN	SSWEOL	YALS	OEM	ISS	JOK	JEU	JJYEON	JJWEL	CYAELS
89	SYUG	SSENJ	SSWEOLG	YALT	OEB	ING	JOT	JEUG	JJYEONJ	JJWELG	CYAELT
8A	SYUGG	SSENH	SSWEOLM	YALP	OEBS	IJ	JOP	JEUGG	JJYEONH	JJWELM	CYAELP
8B	SYUGS	SSED	SSWEOLB	YALH	OES	IC	JOH	JEUGS	JJYEOD	JJWELB	CYAELH
8C	SYUN	SSEL	SSWEOLS	YAM	OESS	IK	JWA	JEUN	JJYEOL	JJWELS	CYAEM
8D	SYUNJ	SSELG	SSWEOLT	YAB	OENG	IT	JWAG	JEUNJ	JJYEOLG	JJWELT	CYAEB
8E	SYUNH	SSELM	SSWEOLP	YABS	OEJ	IP	JWAGG	JEUNH	JJYEOLM	JJWELP	CYAEBS
8F	SYUD	SSELB	SSWEOLH	YAS	OEC	IH	JWAGS	JEUD	JJYEOLB	JJWELH	CYAES
90	SYUL	SSELS	SSWEOM	YASS	OEK	JA	JWAN	JEUL	JJYEOLS	JJWEM	CYAESS
91	SYULG	SSELT	SSWEOB	YANG	OET	JAG	JWANJ	JEULG	JJYEOLT	JJWEB	CYAENG
92	SYULM	SSELP	SSWEOBS	YAJ	OEP	JAGG	JWANH	JEULM	JJYEOLP	JJWEBS	CYAEJ
93	SYULB	SSELH	SSWEOS	YAC	OEH	JAGS	JWAD	JEULB	JJYEOLH	JJWES	CYAEC
94	SYULS	SSEM	SSWEOSS	YAK	YO	JAN	JWAL	JEULS	JJYEOM	JJWESS	CYAEK
95	SYULT	SSEB	SSWEONG	YAT	YOG	JANJ	JWALG	JEULT	JJYEOB	JJWENG	CYAET
96	SYULP	SSEBS	SSWEOJ	YAP	YOGG	JANH	JWALM	JEULP	JJYEOBS	JJWEJ	CYAEP
97	SYULH	SSES	SSWEOC	YAH	YOGS	JAD	JWALB	JEULH	JJYEOS	JJWEC	CYAEH
98	SYUM	SSESS	SSWEOK	YAE	YON	JAL	JWALS	JEUM	JJYEOSS	JJWEK	CEO
99	SYUB	SSENG	SSWEOT	YAEG	YONJ	JALG	JWALT	JEUB	JJYEONG	JJWET	CEOG
9A	SYUBS	SSEJ	SSWEOP	YAEGG	YONH	JALM	JWALP	JEUBS	JJYEOJ	JJWEP	CEOGG
9B	SYUS	SSEC	SSWEOH	YAEGS	YOD	JALB	JWALH	JEUS	JJYEOC	JJWEH	CEOGS
9C	SYUSS	SSEK	SSWE	YAEN	YOL	JALS	JWAM	JEUSS	JJYEOK	JJWI	CEON
9D	SYUNG	SSET	SSWEG	YAENJ	YOLG	JALT	JWAB	JEUNG	JJYEOT	JJWIG	CEONJ
9E	SYUJ	SSEP	SSWEGG	YAENH	YOLM	JALP	JWABS	JEUJ	JJYEOP	JJWIGG	CEONH
9F	SYUC	SSEH	SSWEGS	YAED	YOLB	JALH	JWAS	JEUC	JJYEOH	JJWIGS	CEOD
A0	SYUK	SSYEO	SSWEN	YAEL	YOLS	JAM	JWASS	JEUK	JJYE	JJWIN	CEOL
A1	SYUT	SSYEOG	SSWENJ	YAELG	YOLT	JAB	JWANG	JEUT	JJYEG	JJWINJ	CEOLG
A2	SYUP	SSYEOGG	SSWENH	YAELM	YOLP	JABS	JWAJ	JEUP	JJYEGG	JJWINH	CEOLM
A3	SYUH	SSYEOGS	SSWED	YAELB	YOLH	JAS	JWAC	JEUH	JJYEGS	JJWID	CEOLB
A4	SEU	SSYEON	SSWEL	YAELS	YOM	JASS	JWAK	JYI	JJYEN	JJWIL	CEOLS
A5	SEUG	SSYEONJ	SSWELG	YAELT	YOB	JANG	JWAT	JYIG	JJYENJ	JJWILG	CEOLT
A6	SEUGG	SSYEONH	SSWELM	YAELP	YOBS	JAJ	JWAP	JYIGG	JJYENH	JJWILM	CEOLP
A7	SEUGS	SSYEOD	SSWELB	YAELH	YOS	JAC	JWAH	JYIGS	JJYED	JJWILB	CEOLH
A8	SEUN	SSYEOL	SSWELS	YAEM	YOSS	JAK	JWAE	JYIN	JJYEL	JJWILS	CEOM
A9	SEUNJ	SSYEOLG	SSWELT	YAEB	YONG	JAT	JWAEG	JYINJ	JJYELG	JJWILT	CEOB
AA	SEUNH	SSYEOLM	SSWELP	YAEBS	YOJ	JAP	JWAEGG	JYINH	JJYELM	JJWILP	CEOBS
AB	SEUD	SSYEOLB	SSWELH	YAES	YOC	JAH	JWAEGS	JYID	JJYELB	JJWILH	CEOS
AC	SEUL	SSYEOLS	SSWEM	YAESS	YOK	JAE	JWAEN	JYIL	JJYELS	JJWIM	CEOSS
AD	SEULG	SSYEOLT	SSWEB	YAENG	YOT	JAEG	JWAENJ	JYILG	JJYELT	JJWIB	CEONG
AE	SEULM	SSYEOLP	SSWEBS	YAEJ	YOP	JAEGG	JWAENH	JYILM	JJYELP	JJWIBS	CEOJ
AF	SEULB	SSYEOLH	SSWES	YAEC	YOH	JAEGS	JWAED	JYILB	JJYELH	JJWIS	CEOC
B0	SEULS	SSYEOM	SSWESS	YAEK	U	JAEN	JWAEL	JYILS	JJYEM	JJWISS	CEOK
B1	SEULT	SSYEOB	SSWENG	YAET	UG	JAENJ	JWAELG	JYILT	JJYEB	JJWING	CEOT
B2	SEULP	SSYEOBS	SSWEJ	YAEP	UGG	JAENH	JWAELM	JYILP	JJYEBS	JJWIJ	CEOP
B3	SEULH	SSYEOS	SSWEC	YAEH	UGS	JAED	JWAELB	JYILH	JJYES	JJWIC	CEOH
B4	SEUM	SSYEOSS	SSWEK	EO	UN	JAEL	JWAELS	JYIM	JJYESS	JJWIK	CE
B5	SEUB	SSYEONG	SSWET	EOG	UNJ	JAELG	JWAELT	JYIB	JJYENG	JJWIT	CEG
B6	SEUBS	SSYEOJ	SSWEP	EOGG	UNH	JAELM	JWAELP	JYIBS	JJYEJ	JJWIP	CEGG
B7	SEUS	SSYEOC	SSWEH	EOGS	UD	JAELB	JWAELH	JYIS	JJYEC	JJWIH	CEGS
B8	SEUSS	SSYEOK	SSWI	EON	UL	JAELS	JWAEM	JYISS	JJYEK	JJYU	CEN
B9	SEUNG	SSYEOT	SSWIG	EONJ	ULG	JAELT	JWAEB	JYING	JJYET	JJYUG	CENJ
BA	SEUJ	SSYEOP	SSWIGG	EONH	ULM	JAELP	JWAEBS	JYIJ	JJYEP	JJYUGG	CENH
BB	SEUC	SSYEOH	SSWIGS	EOD	ULB	JAELH	JWAES	JYIC	JJYEH	JJYUGS	CED
BC	SEUK	SSYE	SSWIN	EOL	ULS	JAEM	JWAESS	JYIK	JJO	JJYUN	CEL
BD	SEUT	SSYEG	SSWINJ	EOLG	ULT	JAEB	JWAENG	JYIT	JJOG	JJYUNJ	CELG
BE	SEUP	SSYEGG	SSWINH	EOLM	ULP	JAEBS	JWAEJ	JYIP	JJOGG	JJYUNH	CELM
BF	SEUH	SSYEGS	SSWID	EOLB	ULH	JAES	JWAEC	JYIH	JJOGS	JJYUD	CELB
C0	SYI	SSYEN	SSWIL	EOLS	UM	JAESS	JWAEK	JI	JJON	JJYUL	CELS
C1	SYIG	SSYENJ	SSWILG	EOLT	UB	JAENG	JWAET	JIG	JJONJ	JJYULG	CELT
C2	SYIGG	SSYENH	SSWILM	EOLP	UBS	JAEJ	JWAEP	JIGG	JJONH	JJYULM	CELP
C3	SYIGS	SSYED	SSWILB	EOLH	US	JAEC	JWAEH	JIGS	JJOD	JJYULB	CELH
C4	SYIN	SSYEL	SSWILS	EOM	USS	JAEK	JOE	JIN	JJOL	JJYULS	CEM
C5	SYINJ	SSYELG	SSWILT	EOB	UNG	JAET	JOEG	JINJ	JJOLG	JJYULT	CEB
C6	SYINH	SSYELM	SSWILP	EOBS	UJ	JAEP	JOEGG	JINH	JJOLM	JJYULP	CEBS
C7	SYID	SSYELB	SSWILH	EOS	UC	JAEH	JOEGS	JID	JJOLB	JJYULH	CES
C8	SYIL	SSYELS	SSWIM	EOSS	UK	JYA	JOEN	JIL	JJOLS	JJYUM	CESS
C9	SYILG	SSYELT	SSWIB	EONG	UT	JYAG	JOENJ	JILG	JJOLT	JJYUB	CENG
CA	SYILM	SSYELP	SSWIBS	EOJ	UP	JYAGG	JOENH	JILM	JJOLP	JJYUBS	CEJ
CB	SYILB	SSYELH	SSWIS	EOC	UH	JYAGS	JOED	JILB	JJOLH	JJYUS	CEC
CC	SYILS	SSYEM	SSWISS	EOK	WEO	JYAN	JOEL	JILS	JJOM	JJYUSS	CEK
CD	SYILT	SSYEB	SSWING	EOT	WEOG	JYANJ	JOELG	JILT	JJOB	JJYUNG	CET
CE	SYILP	SSYEBS	SSWIJ	EOP	WEOGG	JYANH	JOELM	JILP	JJOBS	JJYUJ	CEP
CF	SYILH	SSYES	SSWIC	EOH	WEOGS	JYAD	JOELB	JILH	JJOS	JJYUC	CEH
D0	SYIM	SSYESS	SSWIK	E	WEON	JYAL	JOELS	JIM	JJOSS	JJYUK	CYEO
D1	SYIB	SSYENG	SSWIT	EG	WEONJ	JYALG	JOELT	JIB	JJONG	JJYUT	CYEOG

	C2	C3	C4	C5	C6	C7	C8	C9	CA	CB	CC
D2	SYIBS	SSYEJ	SSWIP	EGG	WEONH	JYALM	JOELP	JIBS	JJOJ	JJYUP	CYEOGG
D3	SYIS	SSYEC	SSWIH	EGS	WEOD	JYALB	JOELH	JIS	JJOC	JJYUH	CYEOGS
D4	SYISS	SSYEK	SSYU	EN	WEOL	JYALS	JOEM	JISS	JJOK	JJEU	CYEON
D5	SYING	SSYET	SSYUG	ENJ	WEOLG	JYALT	JOEB	JING	JJOT	JJEUG	CYEONJ
D6	SYIJ	SSYEP	SSYUGG	ENH	WEOLM	JYALP	JOEBS	JIC	JJOP	JJEUGG	CYEONH
D7	SYIC	SSYEH	SSYUGS	ED	WEOLB	JYALH	JOES	JIK	JJOH	JJEUGS	CYEOD
D8	SYIK	SSO	SSYUN	EL	WEOLS	JYAM	JOESS	JIT	JJWA	JJEUN	CYEOL
D9	SYIT	SSOG	SSYUNJ	ELG	WEOLT	JYAB	JOENG	JIP	JJWAG	JJEUNJ	CYEOLG
DA	SYIP	SSOGG	SSYUNH	ELM	WEOLP	JYABS	JOEJ	JIH	JJWAGG	JJEUNH	CYEOLM
DB	SYIH	SSOGS	SSYUD	ELB	WEOLH	JYAS	JOEC	JJA	JJWAGS	JJEUD	CYEOLB
DC	SI	SSON	SSYUL	ELS	WEOM	JYASS	JOEK	JJAG	JJWAN	JJEUL	CYEOLS
DD	SIG	SSONJ	SSYULG	ELT	WEOB	JYANG	JOET	JJAGS	JJWANJ	JJEULG	CYEOLT
DE	SIGG	SSONH	SSYULM	ELP	WEOBS	JYAJ	JOEP	JJAGG	JJWANH	JJEULM	CYEOLP
DF	SIGS	SSOD	SSYULB	ELH	WEOS	JYAC	JOEH	JJAD	JJWAD	JJEULB	CYEOLH
E0	SIN	SSOL	SSYULS	EM	WEOSS	JYAK	JYO	JJAN	JJWAL	JJEULS	CYEOM
E1	SINJ	SSOLG	SSYULT	EB	WEONG	JYAT	JYOG	JJANJ	JJWALG	JJEULT	CYEOB
E2	SINH	SSOLM	SSYULP	EBS	WEOJ	JYAP	JYOGG	JJANH	JJWALM	JJEULP	CYEOBS
E3	SID	SSOLB	SSYULH	ES	WEOC	JYAH	JYOGS	JJAD	JJWALB	JJEULH	CYEOS
E4	SIL	SSOLS	SSYUM	ESS	WEOK	JYAE	JYON	JJAL	JJWALS	JJEUM	CYEOSS
E5	SILG	SSOLT	SSYUB	ENG	WEOT	JYAEG	JYONJ	JJALG	JJWALT	JJEUB	CYEONG
E6	SILM	SSOLP	SSYUBS	EJ	WEOP	JYAEGG	JYONH	JJALM	JJWALP	JJEUBS	CYEOJ
E7	SILB	SSOLH	SSYUS	EC	WEOH	JYAEGS	JYOD	JJALB	JJWALH	JJEUS	CYEOC
E8	SILS	SSOM	SSYUSS	EK	WE	JYAEN	JYOL	JJALS	JJWAM	JJEUSS	CYEOK
E9	SILT	SSOB	SSYUNG	ET	WEG	JYAENJ	JYOLG	JJALT	JJWAB	JJEUNG	CYEOT
EA	SILP	SSOBS	SSYUJ	EP	WEGG	JYAENH	JYOLM	JJALP	JJWABS	JJEUJ	CYEOP
EB	SILH	SSOS	SSYUC	EH	WEGS	JYAED	JYOLB	JJALH	JJWAS	JJEUC	CYEOH
EC	SIM	SSOSS	SSYUK	YEO	WEN	JYAEL	JYOLS	JJAM	JJWASS	JJEUK	CYE
ED	SIB	SSONG	SSYUT	YEOG	WENJ	JYAELG	JYOLT	JJAB	JJWANG	JJEUT	CYEG
EE	SIBS	SSOJ	SSYUP	YEOGG	WENH	JYAELM	JYOLP	JJABS	JJWAJ	JJEUP	CYEGG
EF	SIS	SSOC	SSYUH	YEOGS	WED	JYAELB	JYOLH	JJAS	JJWAC	JJEUH	CYEGS
F0	SISS	SSOK	SSEU	YEON	WEL	JYAELS	JYOM	JJASS	JJWAK	JJYI	CYEN
F1	SING	SSOT	SSEUG	YEONJ	WELG	JYAELT	JYOB	JJANG	JJWAT	JJYIG	CYENJ
F2	SIJ	SSOP	SSEUGG	YEONH	WELM	JYAELP	JYOBS	JJAJ	JJWAP	JJYIGS	CYENH
F3	SIC	SSOH	SSEUGS	YEOD	WELB	JYAELH	JYOS	JJAC	JJWAH	JJYINJ	CYED
F4	SIK	SSWA	SSEUN	YEOL	WELS	JYAEM	JYOSS	JJAK	JJWAE	JJYIN	CYEL
F5	SIT	SSWAG	SSEUNJ	YEOLG	WELT	JYAEB	JYONG	JJAT	JJWAEG	JJYINJ	CYELG
F6	SIP	SSWAGG	SSEUNH	YEOLM	WELP	JYAEBS	JYOJ	JJAP	JJWAEGG	JJYINH	CYELM
F7	SIH	SSWAGS	SSEUD	YEOLB	WELH	JYAES	JYOC	JJAH	JJWAEGS	JJYID	CYELB
F8	SSA	SSWAN	SSEUL	YEOLS	WEM	JYAESS	JYOK	JJAE	JJWAEN	JJYIL	CYELS
F9	SSAG	SSWANJ	SSEULG	YEOLT	WEB	JYAENG	JYOT	JJAEG	JJWAENJ	JJYILG	CYELT
FA	SSAGG	SSWANH	SSEULM	YEOLP	WEBS	JYAEJ	JYOP	JJAEGG	JJWAENH	JJYILM	CYELP
FB	SSAGS	SSWAD	SSEULB	YEOLH	WES	JYAEC	JYOH	JJAEGS	JJWAED	JJYILB	CYELH
FC	SSAN	SSWAL	SSEULS	YEOM	WESS	JYAEK	JU	JJAEN	JJWAEL	JJYILS	CYEM
FD	SSANJ	SSWALG	SSEULT	YEOB	WENG	JYAET	JUG	JJAENJ	JJWAELG	JJYILT	CYEB
FE	SSANH	SSWALM	SSEULP	YEOBS	WEJ	JYAEP	JUGG	JJAENH	JJWAELM	JJYILP	CYEBS
FF	SSAD	SSWALB	SSEULH	YEOS	WEC	JYAEH	JUGS	JJAED	JJWAELB	JJYILH	CYES

Table R.4 - Final components of character names in Hangul Syllables block, Rows CD - D7

	CD	CE	CF	D0	D1	D2	D3	D4	D5	D6	D7
00	CYESS	CWIK	KE	KWEON	TYAL	TOELS	TIM	POSS	PYUK	HYEO	HWEN
01	CYENG	CWIT	KEG	KWEONH	TYALG	TOELT	TIB	PONG	PYUP	HYEOG	HWENJ
02	CYEJ	CWIP	KEGG	KWEONH	TYALM	TOELP	TIBS	POJ	PYUH	HYEOGG	HWENH
03	CYEC	CWIH	KEGS	KWEOD	TYALB	TOELH	TIS	POC	PYUH	HYEOGS	HWED
04	CYEK	CYU	KEN	KWEOL	TYALS	TOEM	TISS	POK	PEU	HYEON	HWEL
05	CYET	CYUG	KENJ	KWEOLG	TYALT	TOEB	TING	POT	PEUG	HYEONJ	HWELG
06	CYEP	CYUGG	KENH	KWEOLM	TYALP	TOEBS	TIJ	POP	PEUGG	HYEONH	HWELM
07	CYEH	CYUGS	KED	KWEOLB	TYALH	TOES	TIC	POH	PEUGS	HYEOD	HWELB
08	CO	CYUN	KEL	KWEOLS	TYAM	TOESS	TIK	PWA	PEUN	HYEOL	HWELS
09	COG	CYUNJ	KELG	KWEOLT	TYAB	TOENG	TIT	PWAG	PEUNJ	HYEOLG	HWELT
0A	COGG	CYUNH	KELM	KWEOLP	TYABS	TOEJ	TIP	PWAGG	PEUNH	HYEOLM	HWELP
0B	COGS	CYUD	KELB	KWEOLH	TYAS	TOEC	TIH	PWAGS	PEUD	HYEOLB	HWELH
0C	CON	CYUL	KELS	KWEOM	TYASS	TOEK	PA	PWAN	PEUL	HYEOLS	HWEM
0D	CONJ	CYULG	KELT	KWEOB	TYANG	TOET	PAG	PWANJ	PEULG	HYEOLT	HWEB
0E	CONH	CYULM	KELP	KWEOBS	TYAJ	TOEP	PAGG	PWANH	PEULM	HYEOLP	HWEBS
0F	COD	CYULB	KELH	KWEOS	TYAC	TOEH	PAGS	PWAD	PEULB	HYEOLH	HWES
10	COL	CYULS	KEM	KWEOSS	TYAK	TYO	PAN	PWAL	PEULS	HYEOM	HWESS
11	COLG	CYULT	KEB	KWEONG	TYAT	TYOG	PANJ	PWALG	PEULT	HYEOB	HWENG
12	COLM	CYULP	KEBS	KWEOJ	TYAP	TYOGG	PANH	PWALM	PEULP	HYEOBS	HWEJ
13	COLB	CYULH	KES	KWEOC	TYAH	TYOGS	PAD	PWALB	PEULH	HYEOS	HWEC
14	COLS	CYUM	KESS	KWEOK	TYAE	TYON	PAL	PWALS	PEUM	HYEOSS	HWEK
15	COLT	CYUB	KENG	KWEOT	TYAEG	TYONJ	PALG	PWALT	PEUB	HYEONG	HWET
16	COLP	CYUBS	KEJ	KWEOP	TYAEGG	TYONH	PALM	PWALP	PEUBS	HYEOJ	HWEP
17	COLH	CYUS	KEC	KWEOH	TYAEGS	TYOD	PALB	PWALH	PEUS	HYEOC	HWEH
18	COM	CYUSS	KEK	KWE	TYAEN	TYOL	PALS	PWAM	PEUSS	HYEOK	HWI
19	COB	CYUNG	KET	KWEG	TYAENJ	TYOLG	PALT	PWAB	PEUNG	HYEOT	HWIG
1A	COBS	CYUJ	KEP	KWEGG	TYAENH	TYOLM	PALP	PWABS	PEUJ	HYEOP	HWIGG
1B	COS	CYUC	KEH	KWEGS	TYAED	TYOLB	PALH	PWAS	PEUC	HYEOH	HWIGS
1C	COSS	CYUK	KYEO	KWEN	TYAEL	TYOLS	PAM	PWASS	PEUK	HYE	HWIN
1D	CONG	CYUT	KYEOG	KWENJ	TYAELG	TYOLT	PAB	PWANG	PEUT	HYEG	HWINJ
1E	COJ	CYUP	KYEOGG	KWENH	TYAELM	TYOLP	PABS	PWAJ	PEUP	HYEGG	HWINH
1F	COC	CYUH	KYEOGS	KWED	TYAELB	TYOLH	PAS	PWAC	PEUH	HYEGS	HWID
20	COK	CEU	KYEON	KWEL	TYAELS	TYOM	PASS	PWAK	PYI	HYEN	HWIL
21	COT	CEUG	KYEONJ	KWELG	TYAELT	TYOB	PANG	PWAT	PYIG	HYENJ	HWILG
22	COP	CEUGG	KYEONH	KWELM	TYAELP	TYOBS	PAJ	PWAP	PYIGS	HYENH	HWILM
23	COH	CEUGS	KYEOD	KWELB	TYAELH	TYOS	PAC	PWAH	PYID	HYED	HWILB
24	CWA	CEUN	KYEOL	KWELS	TYAEM	TYOSS	PAK	PWAE	PYIN	HYEL	HWILS
25	CWAG	CEUNJ	KYEOLG	KWELT	TYAEB	TYONG	PAT	PWAEG	PYINJ	HYELG	HWILT
26	CWAGG	CEUNH	KYEOLM	KWELP	TYAEBS	TYOJ	PAP	PWAEGG	PYINH	HYELM	HWILP
27	CWAGS	CEUD	KYEOLB	KWELH	TYAES	TYOC	PAH	PWAEGS	PYID	HYELB	HWILH
28	CWAN	CEUL	KYEOLS	KWEM	TYAESS	TYOK	PAE	PWAEN	PYIL	HYELS	HWIM
29	CWANJ	CEULG	KYEOLT	KWEB	TYAENG	TYOT	PAEG	PWAENJ	PYILG	HYELT	HWIB
2A	CWANH	CEULM	KYEOLP	KWEBS	TYAEJ	TYOP	PAEGG	PWAENH	PYILM	HYELP	HWIBS

	CD	CE	CF	D0	D1	D2	D3	D4	D5	D6	D7
2B	CWAD	CEULB	KYEOLH	KWES	TYAEC	TYOH	PAEGS	PWAED	PYILB	HYELH	HWIS
2C	CWAL	CEULS	KYEOM	KWESS	TYAEK	TU	PAEN	PWAEL	PYILS	HYEM	HWISS
2D	CWALG	CEULT	KYEOB	KWENG	TYAET	TUG	PAENJ	PWAELG	PYILT	HYEB	HWING
2E	CWALM	CEULP	KYEOBS	KWEJ	TYAEP	TUGG	PAENH	PWAELM	PYILP	HYEBS	HWIJ
2F	CWALB	CEULH	KYEOS	KWEC	TYAEH	TUGS	PAED	PWAELB	PYILH	HYES	HWIC
30	CWALS	CEUM	KYEOSS	KWEK	TEO	TUN	PAEL	PWAELS	PYIM	HYESS	HWIK
31	CWALT	CEUB	KYEONG	KWET	TEOG	TUNJ	PAELG	PWAELT	PYIB	HYENG	HWIT
32	CWALP	CEUBS	KYEOJ	KWEP	TEOGG	TUNH	PAELM	PWAELP	PYIBS	HYEJ	HWIP
33	CWALH	CEUS	KYEOC	KWEH	TEOGS	TUD	PAELB	PWAELH	PYIS	HYEC	HWIH
34	CWAM	CEUSS	KYEOK	KWI	TEON	TUL	PAELS	PWAEM	PYISS	HYEK	HYU
35	CWAB	CEUNG	KYEOT	KWIG	TEONJ	TULG	PAELT	PWAEB	PYING	HYET	HYUG
36	CWABS	CEUJ	KYEOP	KWIGG	TEONH	TULM	PAELP	PWAEBS	PYIJ	HYEP	HYUGG
37	CWAS	CEUC	KYEOH	KWIGS	TEOD	TULB	PAELH	PWAES	PYIC	HYEH	HYUGS
38	CWASS	CEUK	KYE	KWIN	TEOL	TULS	PAEM	PWAESS	PYIK	HO	HYUN
39	CWANG	CEUT	KYEG	KWINJ	TEOLG	TULT	PAEB	PWAENG	PYIT	HOG	HYUNJ
3A	CWAJ	CEUP	KYEGG	KWINH	TEOLM	TULP	PAEBS	PWAEJ	PYIP	HOGG	HYUNH
3B	CWAC	CEUH	KYEGS	KWID	TEOLB	TULH	PAES	PWAEC	PYIH	HOGS	HYUD
3C	CWAK	CYI	KYEN	KWIL	TEOLS	TUM	PAESS	PWAEK	PI	HON	HYUL
3D	CWAT	CYIG	KYENJ	KWILG	TEOLT	TUB	PAENG	PWAET	PIG	HONJ	HYULG
3E	CWAP	CYIGG	KYENH	KWILM	TEOLP	TUBS	PAEJ	PWAEP	PIGG	HONH	HYULM
3F	CWAH	CYIGS	KYED	KWILB	TEOLH	TUS	PAEC	PWAEH	PIGS	HOD	HYULB
40	CWAE	CYIN	KYEL	KWILS	TEOM	TUSS	PAEK	POE	PIN	HOL	HYULS
41	CWAEG	CYINJ	KYELG	KWILT	TEOB	TUNG	PAET	POEG	PINJ	HOLG	HYULT
42	CWAEGG	CYINH	KYELM	KWILP	TEOBS	TUJ	PAEP	POEGG	PINH	HOLM	HYULP
43	CWAEGS	CYID	KYELB	KWILH	TEOS	TUC	PAEH	POEGS	PID	HOLB	HYULH
44	CWAEN	CYIL	KYELS	KWIM	TEOSS	TUK	PYA	POEN	PIL	HOLS	HYUM
45	CWAENJ	CYILG	KYELT	KWIB	TEONG	TUT	PYAG	POENJ	PILG	HOLT	HYUB
46	CWAENH	CYILM	KYELP	KWIBS	TEOJ	TUP	PYAGG	POENH	PILM	HOLP	HYUBS
47	CWAED	CYILB	KYELH	KWIS	TEOC	TUH	PYAGS	POED	PILB	HOLH	HYUS
48	CWAEL	CYILS	KYEM	KWISS	TEOK	TWEO	PYAN	POEL	PILS	HOM	HYUSS
49	CWAELG	CYILT	KYENG	KWING	TEOT	TWEOG	PYANJ	POELG	PILT	HOB	HYUNG
4A	CWAELM	CYILP	KYEBS	KWIJ	TEOP	TWEOGG	PYANH	POELM	PILP	HOBS	HYUJ
4B	CWAELB	CYILH	KYES	KWIC	TEOH	TWEOGS	PYAD	POELB	PILH	HOS	HYUC
4C	CWAELS	CYIM	KYESS	KWIK	TE	TWEON	PYAL	POELS	PIM	HOSS	HYUK
4D	CWAELT	CYIB	KYENG	KWIT	TEG	TWEONJ	PYALG	POELT	PIB	HONG	HYUT
4E	CWAELP	CYIBS	KYEJ	KWIP	TEGG	TWEONH	PYALM	POELP	PIBS	HOJ	HYUP
4F	CWAELH	CYIS	KYEC	KWIH	TEGS	TWEOD	PYALB	POELH	PIS	HOC	HYUH
50	CWAEM	CYISS	KYEK	KYU	TEN	TWEOL	PYALS	POEM	PISS	HOK	HEU
51	CWAEB	CYING	KYET	KYUG	TENJ	TWEOLG	PYALT	POEB	PING	HOT	HEUG
52	CWAEBS	CYIJ	KYEP	KYUGG	TENH	TWEOLM	PYALP	POEBS	PIJ	HOP	HEUGG
53	CWAES	CYIC	KYEH	KYUGS	TED	TWEOLB	PYALH	POES	PIC	HOH	HEUGS
54	CWAESS	CYIK	KO	KYUN	TEL	TWEOLS	PYAM	POESS	PIK	HWA	HEUN
55	CWAENG	CYIT	KOG	KYUNJ	TELG	TWEOLT	PYAB	POENG	PIT	HWAG	HEUNJ
56	CWAEJ	CYIP	KOGG	KYUNH	TELM	TWEOLP	PYABS	POEJ	PIP	HWAGG	HEUNH
57	CWAEC	CYIH	KOGS	KYUD	TELB	TWEOLH	PYAS	POEC	PIH	HWAGS	HEUD
58	CWAEK	CI	KON	KYUL	TELS	TWEOM	PYASS	POEK	HA	HWAN	HEUL
59	CWAET	CIG	KONJ	KYULG	TELT	TWEOB	PYANG	POET	HAG	HWANJ	HEULG
5A	CWAEP	CIGG	KONH	KYULM	TELP	TWEOBS	PYAJ	POEP	HAGG	HWANH	HEULM
5B	CWAEH	CIGS	KOD	KYULB	TELH	TWEOS	PYAC	POEH	HAGS	HWAD	HEULB
5C	COE	CIN	KOL	KYULS	TEM	TWEOSS	PYAK	PYO	HAN	HWAL	HEULS
5D	COEG	CINJ	KOLG	KYULT	TEB	TWEONG	PYAT	PYOG	HANJ	HWALG	HEULT
5E	COEGG	CINH	KOLM	KYULP	TEBS	TWEOJ	PYAP	PYOGG	HANH	HWALM	HEULP
5F	COEGS	CID	KOLB	KYULH	TES	TWEOC	PYAH	PYOGS	HAD	HWALB	HEULH
60	COEN	CIL	KOLS	KYUM	TESS	TWEOK	PYAE	PYON	HAL	HWALS	HEUM
61	COENJ	CILG	KOLT	KYUB	TENG	TWEOT	PYAEG	PYONJ	HALG	HWALT	HEUB
62	COENH	CILM	KOLP	KYUBS	TEJ	TWEOP	PYAEGG	PYONH	HALM	HWALP	HEUBS
63	COED	CILB	KOLH	KYUS	TEC	TWEOH	PYAEGS	PYOD	HALB	HWALH	HEUS
64	COEL	CILS	KOM	KYUSS	TEK	TWE	PYAEN	PYOL	HALS	HWAM	HEUSS
65	COELG	CILT	KOB	KYUNG	TET	TWEG	PYAENJ	PYOLG	HALT	HWAB	HEUNG
66	COELM	CILP	KOBS	KYUJ	TEP	TWEGG	PYAENH	PYOLM	HALP	HWABS	HEUJ
67	COELB	CILH	KOS	KYUC	TEH	TWEGS	PYAED	PYOLB	HALH	HWAS	HEUC
68	COELS	CIM	KOSS	KYUK	TYEO	TWEN	PYAEL	PYOLS	HAM	HWASS	HEUK
69	COELT	CIB	KONG	KYUT	TYEOG	TWENJ	PYAELG	PYOLT	HAB	HWANG	HEUT
6A	COELP	CIBS	KOJ	KYUP	TYEOGG	TWENH	PYAELM	PYOLP	HABS	HWAJ	HEUP
6B	COELH	CIS	KOC	KYUH	TYEOGS	TWED	PYAELB	PYOLH	HAS	HWAC	HEUH
6C	COEM	CISS	KOK	KEU	TYEON	TWEL	PYAELS	PYOM	HASS	HWAK	HYI
6D	COEB	CING	KOT	KEUG	TYEONJ	TWELG	PYAELT	PYOB	HANG	HWAT	HYIG
6E	COEBS	CIJ	KOP	KEUGG	TYEONH	TWELM	PYAELP	PYOBS	HAJ	HWAP	HYIGG
6F	COES	CIC	KOH	KEUGS	TYEOD	TWELB	PYAELH	PYOS	HAC	HWAH	HYIGS
70	COESS	CIK	KWA	KEUN	TYEOL	TWELS	PYAEM	PYOSS	HAK	HWAE	HYIN
71	COENG	CIT	KWAG	KEUNJ	TYEOLG	TWELT	PYAEB	PYONG	HAT	HWAEG	HYINJ
72	COEJ	CIP	KWAGG	KEUNH	TYEOLM	TWELP	PYAEBS	PYOJ	HAP	HWAEGG	HYINH
73	COEC	CIH	KWAGS	KEUD	TYEOLB	TWELH	PYAES	PYOC	HAH	HWAEGS	HYID
74	COEK	KA	KWAN	KEUL	TYEOLS	TWEM	PYAESS	PYOK	HAE	HWAEN	HYIL
75	COET	KAG	KWANJ	KEULG	TYEOLT	TWEB	PYAENG	PYOT	HAEG	HWAENJ	HYILG
76	COEP	KAGG	KWANH	KEULM	TYEOLP	TWEBS	PYAEJ	PYOP	HAEGG	HWAENH	HYILM
77	COEH	KAGS	KWAD	KEULB	TYEOLH	TWES	PYAEC	PYOH	HAEGS	HWAED	HYILB
78	CYO	KAN	KWAL	KEULS	TYEOM	TWESS	PYAEK	PU	HAEN	HWAEL	HYILS
79	CYOG	KANJ	KWALG	KEULT	TYEOB	TWENG	PYAET	PUG	HAENJ	HWAELG	HYILT
7A	CYOGG	KANH	KWALM	KEULP	TYEOBS	TWEJ	PYAEP	PUGG	HAENH	HWAELM	HYILP
7B	CYOGS	KAD	KWALB	KEULH	TYEOS	TWEC	PYAEH	PUGS	HAED	HWAELB	HYILH
7C	CYON	KAL	KWALS	KEUM	TYEOSS	TWEK	PEO	PUN	HAEL	HWAELS	HYIM
7D	CYONJ	KALG	KWALT	KEUB	TYEONG	TWET	PEOG	PUNJ	HAELG	HWAELT	HYIB
7E	CYONH	KALM	KWALP	KEUBS	TYEOJ	TWEP	PEOGG	PUNH	HAELM	HWAELP	HYIBS
7F	CYOD	KALB	KWALH	KEUS	TYEOC	TWEH	PEOGS	PUD	HAELB	HWAELH	HYIS
80	CYOL	KALS	KWAM	KEUSS	TYEOK	TWI	PEON	PUL	HAELS	HWAEM	HYISS
81	CYOLG	KALT	KWAB	KEUNG	TYEOT	TWIG	PEONJ	PULG	HAELT	HWAEB	HYING
82	CYOLM	KALP	KWABS	KEUJ	TYEOP	TWIGG	PEONH	PULM	HAELP	HWAEBS	HYIJ
83	CYOLB	KALH	KWAS	KEUC	TYEOH	TWIGS	PEOD	PULB	HAELH	HWAES	HYIC
84	CYOLS	KAM	KWASS	KEUK	TYE	TWIN	PEOL	PULS	HAEM	HWAESS	HYIK
85	CYOLT	KAB	KWANG	KEUT	TYEG	TWINJ	PEOLG	PULT	HAEB	HWAENG	HYIT
86	CYOLP	KABS	KWAJ	KEUP	TYEGG	TWINH	PEOLM	PULP	HAEBS	HWAEJ	HYIP
87	CYOLH	KAS	KWAC	KEUH	TYEGS	TWID	PEOLB	PULH	HAES	HWAEC	HYIH
88	CYOM	KASS	KWAK	KYI	TYEN	TWIL	PEOLS	PUM	HAESS	HWAEK	HI
89	CYOB	KANG	KWAT	KYIG	TYENJ	TWILG	PEOLT	PUB	HAENG	HWAET	HIG
8A	CYOBS	KAJ	KWAP	KYIGG	TYENH	TWILM	PEOLP	PUBS	HAEJ	HWAEP	HIGG
8B	CYOS	KAC	KWAH	KYIGS	TYED	TWILB	PEOLH	PUS	HAEC	HWAEH	HIGS
8C	CYOSS	KAK	KWAE	KYIN	TYEL	TWILS	PEOM	PUSS	HAEK	HOE	HIN
8D	CYONG	KAT	KWAEG	KYINJ	TYELG	TWILT	PEOB	PUNG	HAET	HOEG	HINJ

	CD	CE	CF	D0	D1	D2	D3	D4	D5	D6	D7
8E	CYOJ	KAP	KWAEGG	KYINH	TYELM	TWILP	PEOBS	PUJ	HAEP	HOEGG	HINH
8F	CYOC	KAH	KWAEGS	KYID	TYELB	TWILH	PEOS	PUC	HAEH	HOEGS	HID
90	CYOK	KAE	KWAEN	KYIL	TYELS	TWIM	PEOSS	PUK	HYA	HOEN	HIL
91	CYOT	KAEG	KWAENJ	KYILG	TYELT	TWIB	PEONG	PUT	HYAG	HOENJ	HILG
92	CYOP	KAEGG	KWAENH	KYILM	TYELP	TWIBS	PEOJ	PUP	HYAGG	HOENH	HILM
93	CYOH	KAEGS	KWAED	KYILB	TYELH	TWIS	PEOC	PUH	HYAGS	HOED	HILB
94	CU	KAEN	KWAEL	KYILS	TYEM	TWISS	PEOK	PWEO	HYAN	HOEL	HILS
95	CUG	KAENJ	KWAELG	KYILT	TYEB	TWING	PEOT	PWEOG	HYANJ	HOELG	HILT
96	CUGG	KAENH	KWAELM	KYILP	TYEBS	TWIJ	PEOP	PWEOGG	HYANH	HOELM	HILP
97	CUGS	KAED	KWAELB	KYILH	TYES	TWIC	PEOH	PWEOGS	HYAD	HOELB	HILH
98	CUN	KAEL	KWAELS	KYIM	TYESS	TWIK	PE	PWEON	HYAL	HOELS	HIM
99	CUNJ	KAELG	KWAELT	KYIB	TYENG	TWIT	PEG	PWEONJ	HYALG	HOELT	HIB
9A	CUNH	KAELM	KWAELP	KYIBS	TYEJ	TWIP	PEGG	PWEONH	HYALM	HOELP	HIBS
9B	CUD	KAELB	KWAELH	KYIS	TYEC	TWIH	PEGS	PWEOD	HYALB	HOELH	HIS
9C	CUL	KAELS	KWAEM	KYISS	TYEK	TYU	PEN	PWEOL	HYALS	HOEM	HISS
9D	CULG	KAELT	KWAEB	KYING	TYET	TYUG	PENJ	PWEOLG	HYALT	HOEB	HING
9E	CULM	KAELP	KWAEBS	KYIJ	TYEP	TYUGG	PENH	PWEOLM	HYALP	HOEBS	HIJ
9F	CULB	KAELH	KWAES	KYIC	TYEH	TYUGS	PED	PWEOLB	HYALH	HOES	HIC
A0	CULS	KAEM	KWAESS	KYIK	TO	TYUN	PEL	PWEOLS	HYAM	HOESS	HIK
A1	CULT	KAEB	KWAENG	KYIT	TOG	TYUNJ	PELG	PWEOLT	HYAB	HOENG	HIT
A2	CULP	KAEBS	KWAEJ	KYIP	TOGG	TYUNH	PELM	PWEOLP	HYABS	HOEJ	HIP
A3	CULH	KAES	KWAEC	KYIH	TOGS	TYUD	PELB	PWEOLH	HYAS	HOEC	HIH
A4	CUM	KAESS	KWAEK	KI	TON	TYUL	PELS	PWEOM	HYASS	HOEK	
A5	CUB	KAENG	KWAET	KIG	TONJ	TYULG	PELT	PWEOB	HYANG	HOET	
A6	CUBS	KAEJ	KWAEP	KIGG	TONH	TYULM	PELP	PWEOBS	HYAJ	HOEP	
A7	CUS	KAEC	KWAEH	KIGS	TOD	TYULB	PELH	PWEOS	HYAC	HOEH	
A8	CUSS	KAEK	KOE	KIN	TOL	TYULS	PEM	PWEOSS	HYAK	HYO	
A9	CUNG	KAET	KOEG	KINJ	TOLG	TYULT	PEB	PWEONG	HYAT	HYOG	
AA	CUJ	KAEP	KOEGG	KINH	TOLM	TYULP	PEBS	PWEOJ	HYAP	HYOGG	
AB	CUC	KAEH	KOEGS	KID	TOLB	TYULH	PES	PWEOC	HYAH	HYOGS	
AC	CUK	KYA	KOEN	KIL	TOLS	TYUM	PESS	PWEOK	HYAE	HYON	
AD	CUT	KYAG	KOENJ	KILG	TOLT	TYUB	PENG	PWEOT	HYAEG	HYONJ	
AE	CUP	KYAGG	KOENH	KILM	TOLP	TYUBS	PEJ	PWEOP	HYAEGG	HYONH	
AF	CUH	KYAGS	KOED	KILB	TOLH	TYUS	PEC	PWEOH	HYAEGS	HYOD	
B0	CWEO	KYAN	KOEL	KILS	TOM	TYUSS	PEK	PWE	HYAEN	HYOL	
B1	CWEOG	KYANJ	KOELG	KILT	TOB	TYUNG	PET	PWEG	HYAENJ	HYOLG	
B2	CWEOGG	KYANH	KOELM	KILP	TOBS	TYUJ	PEP	PWEGG	HYAENH	HYOLM	
B3	CWEOGS	KYAD	KOELB	KILH	TOS	TYUC	PEH	PWEGS	HYAED	HYOLB	
B4	CWEON	KYAL	KOELS	KIM	TOSS	TYUK	PYEO	PWEN	HYAEL	HYOLS	
B5	CWEONJ	KYALG	KOELT	KIB	TONG	TYUT	PYEOG	PWENJ	HYAELG	HYOLT	
B6	CWEONH	KYALM	KOELP	KIBS	TOJ	TYUP	PYEOGG	PWENH	HYAELM	HYOLP	
B7	CWEOD	KYALB	KOELH	KIS	TOC	TYUH	PYEOGS	PWED	HYAELB	HYOLH	
B8	CWEOL	KYALS	KOEM	KISS	TOK	TEU	PYEON	PWEL	HYAELS	HYOM	
B9	CWEOLG	KYALT	KOEB	KING	TOT	TEUG	PYEONJ	PWELG	HYAELT	HYOB	
BA	CWEOLM	KYALP	KOEBS	KIJ	TOP	TEUGG	PYEONH	PWELM	HYAELP	HYOBS	
BB	CWEOLB	KYALH	KOES	KIC	TOH	TEUGS	PYEOD	PWELB	HYAELH	HYOS	
BC	CWEOLS	KYAM	KOESS	KIK	TWA	TEUN	PYEOL	PWELS	HYAEM	HYOSS	
BD	CWEOLT	KYAB	KOENG	KIT	TWAG	TEUNJ	PYEOLG	PWELT	HYAEB	HYONG	
BE	CWEOLP	KYABS	KOEJ	KIP	TWAGG	TEUNH	PYEOLM	PWELP	HYAEBS	HYOJ	
BF	CWEOLH	KYAS	KOEC	KIH	TWAGS	TEUD	PYEOLB	PWELH	HYAES	HYOC	
C0	CWEOM	KYASS	KOEK	TA	TWAN	TEUL	PYEOLS	PWEM	HYAESS	HYOK	
C1	CWEOB	KYANG	KOET	TAG	TWANJ	TEULG	PYEOLT	PWEB	HYAENG	HYOT	
C2	CWEOBS	KYAJ	KOEP	TAGG	TWANH	TEULM	PYEOLP	PWEBS	HYAEJ	HYOP	
C3	CWEOS	KYAC	KOEH	TAGS	TWAD	TEULB	PYEOLH	PWES	HYAEC	HYOH	
C4	CWEOSS	KYAK	KYO	TAN	TWAL	TEULS	PYEOM	PWESS	HYAEK	HU	
C5	CWEONG	KYAT	KYOG	TANJ	TWALG	TEULT	PYEOB	PWENG	HYAET	HUG	
C6	CWEOJ	KYAP	KYOGG	TANH	TWALM	TEULP	PYEOBS	PWEJ	HYAEP	HUGG	
C7	CWEOC	KYAH	KYOGS	TAD	TWALB	TEULH	PYEOS	PWEC	HYAEH	HUGS	
C8	CWEOK	KYAE	KYON	TAL	TWALS	TEUM	PYEOSS	PWEK	HEO	HUN	
C9	CWEOT	KYAEG	KYONJ	TALG	TWALT	TEUB	PYEONG	PWET	HEOG	HUNJ	
CA	CWEOP	KYAEGG	KYONH	TALM	TWALP	TEUBS	PYEOJ	PWEP	HEOGG	HUNH	
CB	CWEOH	KYAEGS	KYOD	TALB	TWALH	TEUS	PYEOC	PWEH	HEOGS	HUD	
CC	CWE	KYAEN	KYOL	TALS	TWAM	TEUSS	PYEOK	PWI	HEON	HUL	
CD	CWEG	KYAENJ	KYOLG	TALT	TWAB	TEUNG	PYEOT	PWIG	HEONJ	HULG	
CE	CWEGG	KYAENH	KYOLM	TALP	TWABS	TEUJ	PYEOP	PWIGG	HEONH	HULM	
CF	CWEGS	KYAED	KYOLB	TALH	TWAS	TEUC	PYEOH	PWIGS	HEOD	HULB	
D0	CWEN	KYAEL	KYOLS	TAM	TWASS	TEUK	PYE	PWIN	HEOL	HULS	
D1	CWENJ	KYAELG	KYOLT	TAB	TWANG	TEUT	PYEG	PWINJ	HEOLG	HULT	
D2	CWENH	KYAELM	KYOLP	TABS	TWAJ	TEUP	PYEGG	PWINH	HEOLM	HULP	
D3	CWED	KYAELB	KYOLH	TAS	TWAC	TEUH	PYEGS	PWID	HEOLB	HULH	
D4	CWEL	KYAELS	KYOM	TASS	TWAK	TYI	PYEN	PWIL	HEOLS	HUM	
D5	CWELG	KYAELT	KYOB	TANG	TWAT	TYIG	PYENJ	PWILG	HEOLT	HUB	
D6	CWELM	KYAELP	KYOBS	TAJ	TWAP	TYIGG	PYENH	PWILM	HEOLP	HUBS	
D7	CWELB	KYAELH	KYOS	TAC	TWAH	TYIGS	PYED	PWILB	HEOLH	HUS	
D8	CWELS	KYAEM	KYOSS	TAK	TWAE	TYIN	PYEL	PWILS	HEOM	HUSS	
D9	CWELT	KYAEB	KYONG	TAT	TWAEG	TYINJ	PYELG	PWILT	HEOB	HUNG	
DA	CWELP	KYAEBS	KYOJ	TAP	TWAEGG	TYINH	PYELM	PWILP	HEOBS	HUJ	
DB	CWELH	KYAES	KYOC	TAH	TWAEGS	TYID	PYELB	PWILH	HEOS	HUC	
DC	CWEM	KYAESS	KYOK	TAE	TWAEN	TYIL	PYELS	PWIM	HEOSS	HUK	
DD	CWEB	KYAENG	KYOT	TAEG	TWAENJ	TYILG	PYELT	PWIB	HEONG	HUT	
DE	CWEBS	KYAEJ	KYOP	TAEGG	TWAENH	TYILM	PYELP	PWIBS	HEOJ	HUP	
DF	CWES	KYAEC	KYOH	TAEGS	TWAED	TYILB	PYELH	PWIS	HEOC	HUH	
E0	CWESS	KYAEK	KU	TAEN	TWAEL	TYILS	PYEM	PWISS	HEOK	HWEO	
E1	CWENG	KYAET	KUG	TAENJ	TWAELG	TYILT	PYEB	PWING	HEOT	HWEOG	
E2	CWEJ	KYAEP	KUGG	TAENH	TWAELM	TYILP	PYEBS	PWIJ	HEOP	HWEOGG	
E3	CWEC	KYAEH	KUGS	TAED	TWAELB	TYILH	PYES	PWIC	HEOH	HWEOGS	
E4	CWEK	KEO	KUN	TAEL	TWAELS	TYIM	PYESS	PWIK	HE	HWEON	
E5	CWET	KEOG	KUNJ	TAELG	TWAELT	TYIB	PYENG	PWIT	HEG	HWEONJ	
E6	CWEP	KEOGG	KUNH	TAELM	TWAELP	TYIBS	PYEJ	PWIP	HEGG	HWEONH	
E7	CWEH	KEOGS	KUD	TAELB	TWAELH	TYIS	PYEC	PWIH	HEGS	HWEOD	
E8	CWI	KEON	KUL	TAELS	TWAEM	TYISS	PYEK	PYU	HEN	HWEOL	
E9	CWIG	KEONJ	KULG	TAELT	TWAEB	TYING	PYET	PYUG	HENJ	HWEOLG	
EA	CWIGG	KEONH	KULM	TAELP	TWAEBS	TYIJ	PYEP	PYUGG	HENH	HWEOLM	
EB	CWIGS	KEOD	KULB	TAELH	TWAES	TYIC	PYEH	PYUGS	HED	HWEOLB	
EC	CWIN	KEOL	KULS	TAEM	TWAESS	TYIK	PO	PYUN	HEL	HWEOLS	
ED	CWINJ	KEOLG	KULT	TAEB	TWAENG	TYIT	POG	PYUNJ	HELG	HWEOLT	
EE	CWINH	KEOLM	KULP	TAEBS	TWAEJ	TYIP	POGG	PYUNH	HELM	HWEOLP	
EF	CWID	KEOLB	KULH	TAES	TWAEC	TYIH	POGS	PYUD	HELB	HWEOLH	
F0	CWIL	KEOLS	KUM	TAESS	TWAEK	TI	PON	PYUL	HELS	HWEOM	

	CD	CE	CF	D0	D1	D2	D3	D4	D5	D6	D7
F1	CWILG	KEOLT	KUB	TAENG	TWAET	TIG	PONJ	PYULG	HELT	HWEOB	
F2	CWILM	KEOLP	KUBS	TAEJ	TWAEP	TIGG	PONH	PYULM	HELP	HWEOBS	
F3	CWILB	KEOLH	KUS	TAEC	TWAEH	TIGS	POD	PYULB	HELH	HWEOS	
F4	CWILS	KEOM	KUSS	TAEK	TOE	TIN	POL	PYULS	HEM	HWEOSS	
F5	CWILT	KEOB	KUNG	TAET	TOEG	TINJ	POLG	PYULT	HEBS	HWEONG	
F6	CWILP	KEOBS	KUJ	TAEP	TOEGG	TINH	POLM	PYULP	HES	HWEOJ	
F7	CWILH	KEOS	KUC	TAEH	TOEGS	TID	POLB	PYULH	HESS	HWEOC	
F8	CWIM	KEOSS	KUK	TYA	TOEN	TIL	POLS	PYUM	HENG	HWEOK	
F9	CWIB	KEONG	KUT	TYAG	TOENJ	TILG	POLT	PYUB	HEJ	HWEOT	
FA	CWIBS	KEOJ	KUP	TYAGG	TOENH	TILM	POLP	PYUBS	HEC	HWEOH	
FB	CWIS	KEOC	KUH	TYAGS	TOED	TILB	POLH	PYUS	HEK	HWE	
FC	CWISS	KEOK	KWEO	TYAN	TOEL	TILS	POM	PYUSS	HET	HWEG	
FD	CWING	KEOT	KWEOG	TYANJ	TOELG	TILT	POB	PYUNG	HEP	HWEGG	
FE	CWIJ	KEOP	KWEOGG	TYANH	TOELM	TILP	POBS	PYUJ	HEH	HWEGS	
FF	CWIC	KEOH	KWEOGS	TYAD	TOELB	TILH	POS	PYUC			

Annex S
(informative)

Procedure for the unification and arrangement of CJK Ideographs

The graphic character collections of CJK unified ideographs in ISO/IEC 10646 are specified in clause 33. They are derived from many more ideographs which are found in various different national and regional standards for coded character sets (the "sources").

This annex describes how the ideographs in this standard are derived from the sources by applying a set of unification procedures. It also describes how the ideographs in this standard are arranged in the sequence of consecutive code positions to which they are assigned.

The source references for CJK unified ideographs are specified in clause 27.1.

Within the context of ISO/IEC 10646 a unification process is applied to the ideographic characters taken from the codes in the source groups. In this process, single ideographs from two or more of the source groups are associated together, and a single code position is assigned to them in this standard. The associations are made according to a set of procedures that are described below. Ideographs that are thus associated are described here as "unified".

> NOTE – The unification process does not apply to the following collections of ideographic characters:
> - CJK RADICALS SUPPLEMENT (2E80 - 2EFF)
> - KANGXI RADICALS (2F00 - 2FDF)
> - CJK COMPATIBILITY IDEOGRAPHS (F900 - FAFF with the exception of FA0E, FA0F, FA11, FA13, FA14, FA1F, FA21, FA23, FA24, FA27, FA28 and FA29)
> - CJK COMPATIBILITY IDEOGRAPHS SUPPLEMENT (2F800-2FA1F).

S.1 Unification procedure

S.1.1   Scope of unification

Ideographs that are unrelated in historical derivation (non-cognate characters) have not been unified.

Example:

土 , 土

> NOTE – The difference of shape between the two ideographs in the above example is in the length of the lower horizontal line. This is considered an actual difference of shape. Furthermore these ideographs have different meanings. The meaning of the first is "Soldier" and of the second is "Soil or Earth".

An association between ideographs from different sources is made here if their shapes are sufficiently similar, according to the following system of classification.

S.1.2   Two level classification

A two-level system of classification is used to differentiate (a) between abstract shapes and (b) between actual shapes determined by particular typefaces. Variant forms of an ideograph, which can not be unified, are identified based on the difference between their abstract shapes.

S.1.3   Procedure

A unification procedure is used to determine whether two ideographs have the same abstract shape or different ones. The unification procedure has two stages, applied in the following order:

a) Analysis of component structure;

b) Analysis of component features;

S.1.3.1 Analysis of component structure

In the first stage of the procedure the component structure of each ideograph is examined. A component of an ideograph is a geometrical combination of primitive elements. Alternative ideographs can be configured from the same set of components. Components can be combined to create a new component with a more complicated structure. An ideograph, therefore, can be defined as a component tree, where the top node is the ideograph itself, and the bottom nodes are the primitive elements. This is shown in Figure S.1.
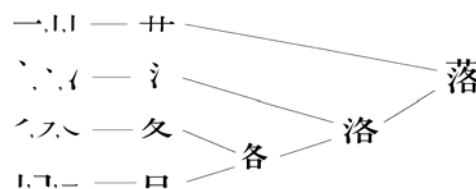

Figure S.1 - Component structure

S.1.3.2 Analysis of component features

In the second stage of the procedure, the components located at corresponding nodes of two ideographs are

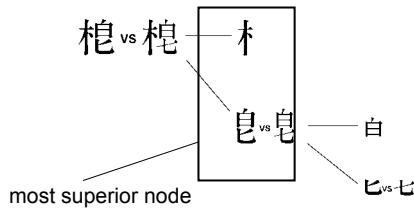compared, starting from the most superior node, as shown in Figure S.2.

Figure S.2 - The most superior node of a component

The following features of each ideograph to be compared are examined:

a) the number of components,

b) the relative position of the components in each complete ideograph,

c) the structure of corresponding components.

If one or more of the features a) to c) above are different between the ideographs in the comparison, the ideographs are considered to have different abstract shapes and are therefore not unified.

If all of the features a) to c) above are the same between the ideographs, the ideographs are considered to have the same abstract shape and are therefore unified.

S.1.4 Examples of differences of abstract shapes

To illustrate rules derived from a) to c) in S.1.3.2, some typical examples of ideographs that are not unified, owing to differences of abstract shapes, are shown below.

S.1.4.1 Different number of components

The examples below illustrate rule a) since the two ideographs in each pair have different numbers of components.

崖•厓, 肱•厷, 降•夅

S.1.4.2 Different relative positions of components

The examples below illustrate rule b). Although the two ideographs in each pair have the same number of components, the relative positions of the components are different.

峰•峯, 荊•荆

S.1.4.3 Different structure of a corresponding component

The examples below illustrate rule c). The structure of one (or more) corresponding components within the two ideographs in each pair is different.

拡•擴, 策•䇳, 炏•燚, 圣•巠,
僉•僉, 区•區, 夹•夾, 单•單,
萑•蒦, 戋•戔 赞•贊, 襄•襄,
㦰•戩, 間•閒, 朶•朵, 隽•隽,
恒•恆, 奂•奐, 从•从, 秦•秦,
夒•夒

S.1.5 Differences of actual shapes

To illustrate the classification described in S.1.2, some typical examples of ideographs that are unified are shown below. The two or three ideographs in each group below have different actual shapes, but they are considered to have the same abstract shape, and are therefore unified.

辶•辶•辶, 示•示•礻, 且•皀•皀, 食•食•飠 ,
黄•黃, 盈•盁, 曷•曷, 包•包 ,
青•靑, 每•每, 册•冊, 爭•争 ,
嗂•嗂•嗂, 彔•录, 步•步, 者•者 ,
臭•臭, 幷•并, 骨•骨, 呂•吕 ,
直•直, 県•県, 吴•吳•呉, 眞•真•真 ,
爲•為, 单•単, 曾•曾•曽, 成•成 ,
專•専, 内•內, 晉•晋, 龜•龜 ,
艹•艹

The differences are further classified according to the following examples.

a) Differences in rotated strokes/dots

牛•半, 勺•勹, 羽•羽, 酋 • 酉 ,
兼•兼, 益•益

b) Differences in overshoot at the stroke initiation and/or termination

身•身, 雪•雪, 拐•拐, 不 • 不 ,
非•非, 周•周

c) Differences in contact of strokes

奥•奧，酉•酉，查•查

d) Differences in protrusion at the folded corner of strokes

巨•巨

e) Differences in bent strokes

册•冊

f) Differences in folding back at the stroke termination

佘•佘

g) Differences in accent at the stroke initiation

父•父，丈•丈

h) Differences in "rooftop" modification

八•八，穴•穴

j) Combinations of the above differences

刃•刃•刃

These differences in actual shapes of a unified ideograph are presented in the corresponding source columns for each code position entry in the code table in clause 33 of this International Standard.

S.1.6   Source separation rule

To preserve data integrity through multiple stages of code conversion (commonly known as "round-trip integrity"), any ideographs that are separately encoded in any one of the source standards listed below have not been unified.

G-source: GB2312-80, GB12345-90,
              GB7589-87*, GB7590-87*,
              GB8565-88*,
              General Purpose Hanzi List for
              Modern Chinese Language*
T-source: TCA-CNS 11643-1986/1st plane,
              TCA-CNS 11643-1986/2nd plane,
              TCA-CNS 11643-1986/14th plane*
J-source: JIS X 0208-1990, JIS X 0212-1990
K-source: KS C 5601-1989, KS C 5657-1991

(A " * " after the reference number of a standard indicates that some of the ideographs included in that standard are not introduced into the unified collection.)

However, some ideographs encoded in two standards belonging to the same source group (e.g. GB2312-80 and GB12345-90) have been unified during the process of collecting ideographs from the source group.

The source separation rule described in this clause only applies to the CJK UNIFIED IDEOGRAPHS block specified in the Basic Multilingual Plane.

> NOTE – CJK Compatibility Ideographs are created following a rule very similar to the source separation rule. However, the end result is the combination of a single CJK Unified Ideograph and one or several CJK Compatibility Ideographs. When the source separation rule is applied, all 'similar' source CJK Ideographs result in separate CJK Unified Ideographs.

S.2   Arrangement procedure

S.2.1   Scope of arrangement

The arrangement of the CJK UNIFIED IDEOGRAPHS in the code table of clause 33 of this International Standard is based on the filing order of ideographs in the following dictionaries.

Priority	Dictionary		Edition
1	Kangxi Dictionary	康熙字典	Beijing 7th edition
2	Daikanwa Jiten	大漢和辞典	9th edition
3	Hanyu Dazidian	漢語大字典	1st edition
4	Daejaweon	大字源	1st edition

The dictionaries are used according to the priority order given in the table above. Priority 1 is highest. If an ideograph is found in one dictionary, the dictionaries of lower priority are not examined.

S.2.2   Procedure

S.2.2.1   Ideographs found in the dictionaries

a) If an ideograph is found in the Kangxi Dictionary, it is positioned in the code table in accordance with the Kangxi Dictionary order.

b) If an ideograph is not found in the Kangxi Dictionary but is found in the Daikanwa Jiten, it is given a position at the end of the radical-stroke group under which is indexed the nearest preceding Daikanwa Jiten character that also appears in the Kangxi dictionary.

c) If an ideograph is found in neither the Kangxi nor the Daikanwa, the Hanyu Dazidian and the Daejaweon dictionaries are referred to with a similar procedure.

S.2.2.2   Ideographs not found in the dictionaries

If an ideograph is not found in any of the four dictionaries, it is given a position at the end of the radical-stroke group (after the characters that are present in the dictionaries) and it is indexed under the same radical-stroke count.

S.3 Source code separation examples

The pairs (or triplets) of ideographs shown below are exceptions to the unification rules described in clause S.1 of this annex. They are not unified because of the source separation rule described in clause S.1.6.

NOTE – The particular source group (or groups) that causes the source separation rule to apply is indicated by the letter (G, J, K, or T) that appears to the right of each pair (or triplet) of ideographs. The source groups that correspond to these letters are identified at the beginning of this annex.

丟丟	T	兖兗	T	単單	T	国国	T
4E1F 4E22		5156 5157		5355 5358		56EF 56FD	
么幺	GT	冊册	TJ	即卽	TK	圈圈	TJ
4E48 5E7A		518A 518C		5373 537D		5708 570F	
争爭	GTJ	净淨	G	卷卷	TJ	圓圓	T
4E89 722D		51C0 51C8		5377 5DFB		570E 5713	
仞仭	J	几几	T	叄參	GT	圖圗	T
4EDE 4EED		51E2 51E3		53C1 53C2		5716 5717	
併併	T	刃刄	TJ	參叄	T	坙巠	T
4F75 5002		5203 5204		53C3 53C4		5759 5DE0	
侣侶	T	刊刋	TJ	吕呂	T	埒埓	J
4FA3 4FB6		520A 520B		5415 5442		57D2 57D3	
俁俣	TJK	删删	T	吞吞	T	堅堅	T
4FC1 4FE3		5220 522A		541E 5451		5848 588D	
俞兪	T	別别	T	吳吴吴	TJ	塡填	TJ
4FDE 516A		5225 522B		5433 5434 5449		5861 586B	
俱俱	T	券券	TJ	呐呐	T	增增	T
4FF1 5036		5238 52B5		5436 5450		5897 589E	
值值	T	刹剎	T	告告	T	壯壯	GTJ
5024 503C		5239 524E		543F 544A		58EE 58EF	
偷偸	T	翂翔	T	唧喞	T	壽壽	T
5077 5078		524F 5259		5527 559E		58FD 5900	
偽僞	TJ	剝剥	T	喻喻	T	夐夏	T
507D 50DE		525D 5265		55A9 55BB		5910 657B	
兌兑	T	劒劔	J	噓嘘	T	本本	GTJ
514C 5151		5292 5294		5618 5653		5932 672C	
兔兔	TJ	勻匀	T	噏嘑	GTJ	奧奧	J
514E 5154		52FB 5300		568F 5694		5965 5967	

獎獎奬 TJ	寢寢 GTJ	弹彈 T	戲戲 T
5968 596C 734E	5BDD 5BE2	5F39 5F3E	622F 6231
妆妝 GT	專専 J	彐互 TJ	戶户戸 T
5986 599D	5C02 5C08	5F50 5F51	6236 6237 6238
姸姸 T	将將 GTJ	彔录 T	戻戻 T
598D 59F8	5C06 5C07	5F54 5F55	623B 623E
姍姍 T	尓尔 T	彙彚 T	抛拋 T
59CD 59D7	5C13 5C14	5F59 5F5A	629B 62CB
姬姬 GT	尙尚 T	彛彝 J	拔拔 TJ
59EB 59EC	5C19 5C1A	5F5B 5F5C	629C 62D4
娛娛娯 T	尫尪 T	彞彛 T	挩捝 T
5A1B 5A2F 5A31	5C2A 5C2B	5F5D 5F5E	6329 635D
婕婕 T	尶尷 T	彥彦 T	挿插揷 TJ
5A55 5AAB	5C36 5C37	5F65 5F66	633F 63D2 63F7
婾婾 T	屏屛 T	德德 T	捏揑 TJ
5A7E 5AAE	5C4F 5C5B	5FB3 5FB7	634F 63D1
媪媼 TK	崝崢 GT	徵徴 T	搜搜 TJ
5AAA 5ABC	5CE5 5D22	5FB4 5FB5	635C 641C
媯媯 T	巓巔 T	惠惠 TJ	揭揭 T
5AAF 5B00	5DD3 5DD4	6075 60E0	63B2 63ED
嬎嬎 T	帡帲 T	悅悦 T	摇搖摇 TJ
5B0E 5B14	5E21 5E32	6085 60A6	63FA 6416 6447
嬤嬷 GT	帶帯 TJ	惞惮 T	搾搵 T
5B24 5B37	5E2F 5E36	609E 60AE	63FE 6435
孳孳 T	并幷 T	想惪 T	擊擊 TJ
5B73 5B76	5E76 5E77	60B3 60EA	6483 64CA
宮宮 T	廄廐 T	愠愠 T	敎教 T
5BAB 5BAE	5EC4 5ECF	6120 614D	654E 6559
寬寬 T	弒弑 T	愼慎 TJ	敓敚 T
5BDB 5BEC	5F11 5F12	613C 614E	6553 655A
寧寧 T	強强 T	戩戩 GT	既旣 T
5BDC 5BE7	5F37 5F3A	6229 622C	65E2 65E3

昂 昂	T	歲 歲	T	為 潙	T	眾 衆	TJK
6602 663B		6B72 6B73		6E88 6F59		773E 8846	
晚 晚	T	歾 歾	T	漑 漑	T	研 研	T
665A 6669		6B7F 6B81		6E89 6F11		7814 784F	
暨 暨	T	殼 殼	GTJ	滾 滾	T	祿 禄	TJ
66A8 66C1		6BBB 6BBC		6EDA 6EFE		797F 7984	
曾 曾	J	毀 毀	T	潛 潛	GTJK	禿 禿	T
66FD 66FE		6BC0 6BC1		6F5B 6FF3		79BF 79C3	
枏 枏	T	每 每	T	瀨 瀨	T	稅 税	T
67B4 67FA		6BCE 6BCF		7028 702C		7A05 7A0E	
查 查	T	氲 氲	T	為 爲	GTJ	穗 穗	TJ
67E5 67FB		6C32 6C33		70BA 7232		7A42 7A57	
柵 柵	T	污 污	T	凭 熒	GTJK	箏 箏	GJ
67F5 6805		6C5A 6C61		712D 7162		7B5D 7B8F	
梲 梲	T	沒 没	TJ	熙 熙	J	簳 簳	T
68B2 68C1		6C92 6CA1		7155 7199		7BB3 7C08	
榆 榆	T	淨 淨	TJ	熅 熅	T	簒 簒	T
6961 6986		6D44 6DE8		7174 7185		7BE1 7C12	
概 概	T	涉 涉	T	狀 狀	GT	粵 粤	T
6982 69EA		6D89 6E09		72B6 72C0		7CA4 7CB5	
榲 榲	T	涗 涗	T	瑤 瑶	TJ	絕 絶	T
6985 69B2		6D97 6D9A		7464 7476		7D55 7D76	
橺 橺	T	淚 淚	T	瓶 瓶	T	綠 緑	T
699D 6A27		6D99 6DDA		74F6 7501		7DA0 7DD1	
槟 槙	J	淥 淥	T	產 産	T	緒 緒	T
69C7 69D9		6DE5 6E0C		7522 7523		7DD2 7DD6	
樣 樣	TJ	清 清	T	瘦 瘦	J	緣 縁	T
69D8 6A23		6DF8 6E05		75E9 7626		7DE3 7E01	
橫 橫	T	渴 渴	T	皐 皐	T	縕 縕	T
6A2A 6A6B		6E07 6E34		76A1 76A5		7DFC 7E15	
步 步	T	温 溫	T	眞 真	TJ	繐 繐	T
6B65 6B69		6E29 6EAB		771E 771F		7E48 7E66	

羹羹	TJ	虚虚	T	遙遥	J	頹頹	T
7FAE 7FB9		865A 865B		9059 9065		9839 983D	
翶翶	T	蜕蜕	T	邢邢	T	顔顔	TJ
7FF6 7FFA		86FB 8715		90A2 90C9		984F 9854	
胼胼	T	衛衞	TJK	郎郎	T	顚顚	J
80FC 8141		885B 885E		90CE 90DE		985A 985B	
脫脱	T	袞袞	TK	鄉鄉鄕	T	飲飮	J
812B 8131		886E 889E		90F7 9109 9115		98EE 98F2	
膃膃	T	裝裝	GJK	醞醞	T	餅餠	TJ
817D 8183		88C5 88DD		9196 919E		9905 9920	
鳥鳥	GT	訐訐	T	醬醬	J	駄駄	TJK
8203 8204		8A2E 8A7D		91A4 91AC		99B1 99C4	
舍舎	TJ	說説	T	鈃鈃	T	駢駢	TK
820D 820E		8AAA 8AAC		9203 9292		99E2 9A08	
舖舖	J	諫諫	TJ	銳鋭	T	骹骹	T
8216 8217		8ACC 8AEB		92B3 92ED		9AA9 9AAB	
莊莊	TJ	謠謡	J	錄録	T	高髙	T
8358 838A		8B20 8B21		9304 9332		9AD8 9AD9	
螢蕾	TJ	豜豝	T	鍊錬	TK	髮髮	TJ
83D1 8458		8C5C 8C63		932C 934A		9AEA 9AEE	
菖藍	T	走赱	TJ	鎮鎭	TJ	鬬鬭	T
8480 8495		8D70 8D71		93AD 93AE		9B2C 9B2D	
蔣蔣	GJ	輧軿	T	閱閲	T	鯉鱨	TJ
848B 8523		8EFF 8F27		95B1 95B2		9C1B 9C2E	
蔫蔫	T	輜輜	J	陞陞	G	鳳鳳	T
848D 853F		8F1C 8F3A		9667 9689		9CEF 9CF3	
蘊蘊	T	輻輻	T	青青	T	鶇鶇	J
8570 8580		8F3C 8F40		9751 9752		9D87 9DAB	
薰薫	T	达达	T	静静	GTJ	鸝鸕	J
85AB 85B0		8FBE 8FD6		9759 975C		9DC6 9DCF	
蘊蘊	T	迸迸	TJ	靭靱	J	麵麪	T
85F4 860A		8FF8 902C		976D 9771		9EAA 9EAB	

麽 麽	T	黃 黃	T	黑 黑	T
9EBC 9EBD		9EC3 9EC4		9ED1 9ED2	

In accordance with the unification procedures described in clause S.1 of this annex the pairs (or triplets) of ideographs shown below are not unified. The reason for non-unification is indicated by the reference which appears to the right of each pair (or triplet). For "non-cognate" see clause S.1.1

NOTE – The reason for non-unification in these examples is different from the source separation rule described in clause S.1.6.

冑 冑	non cognate	寶 寶	S.1.4.3	胸 胸	non cognate	稻 稻	S.1.4.3
5191 80C4		5BF3 5BF6		6710 80CA		7A32 7A3B	
冲 沖	S.1.4.3	廳 廰	S.1.4.1	胐 胐	non cognate	翱 翶	S.1.4.3
51B2 6C96		5EF0 5EF3		6713 8101		7FF1 7FF6	
决 決	S.1.4.3	懷 懷	S.1.4.1	腶 腶	non cognate	耇 耈 耉	S.1.4.3
51B3 6C7A		61D0 61F7		6718 8127		8007 8008 8009	
况 況	S.1.4.3	敠 敪	S.1.4.3	朣 朣	non cognate	聴 聽 聽	S.1.4.1
51B5 6CC1		6560 656A		6723 81A7		8074 807C 807D	
埻 埻	S.1.4.3	朌 朌	non cognate	朵 朵	S.1.4.3	荆 荊	S.1.4.2
579B 579C		670C 80A6		6735 6736		8346 834A	
孼 孽	S.1.4.2	朏 朏	non cognate	灔 灧	S.1.4.3	躱 躲	S.1.4.3
5B7C 5B7D		670F 80D0		7054 7067		8EB1 8EB2	

Annex T
(informative)

Language tagging using Tag Characters

The purpose of Tag characters is to associate a text attribute with a point or range of a text string. The value of a particular tag is not generally considered to be part of the content of the text. For example, tagging could be used to mark the language or the font applied to a portion of text. Outside of that usage, these characters are ignorable.

These tag characters can be used to spell out a character string in any ASCII-based tagging scheme that needs to be embedded into plain text. These characters can be easily identified by their code value and there is no overloading of usage for these tag characters. They can only express tag values and never textual content itself.

When characters are used within the context of a protocol or syntax containing explicit markup providing the same association, the Tag characters may be filtered out and ignored by these protocols.

For example, in SGML/XML context, an explicit language markup is specified. Therefore, the LANGUAGE TAG and other tag characters should not be used to mark a language in that context. The Unicode Consortium and the W3C have co-written a technical report: Unicode in XML and other Markup Languages (UTR#20), available from the Unicode web site (http://www.unicode.org/reports/), which describes these issues in detail.

The TAGS block contains 97 dedicated tag characters consisting of a clone of the BASIC LATIN graphic characters (names formed by prefixing these BASIC LATIN names with the word 'TAG'), as well as a language tag identification character: LANGUAGE TAG and a cancel tag character: CANCEL TAG.

The tag identification character is used as a mechanism for identifying tags of different types. This enables multiple types of tags to coexist amicably embedded in plain text and solves the problem of delimitation if a tag is concatenated directly onto another tag. Although only one type of tag is currently specified, namely the language tag, the encoding of other tag identification characters in the future would allow for distinct types to be used.

T.1 Syntax for embedding tag characters

In order to embed any ASCII-derived tag in plain text, the tag is simply spelled out with the tag characters, prefixed with the relevant tag identification character. The resultant string is embedded directly in the text.

No termination character is required for a tag. A tag terminates either when the first non Special Purpose Plane character is encountered, or when the next tag identification character is encountered.

Tag arguments can only encoded using tag characters. No other characters are valid for expressing the tag arguments.

T.2 Tag scope and nesting

The value of a tag continues from the point the tag is embedded in text until:

- either the end of the cc-data-element is reached,

- or the tag is explicitly cancelled by the CANCEL TAG character.

Tags of the same type cannot be nested. The appearance of a new embedded language tag, for example after text which was already language-tagged, simply changes the tagged value for subsequent text to that specified in the new tag.

T.3 Canceling tag values

The CANCEL TAG character is provided to allow the specific canceling of a tag value. For example to cancel a language tag, the LANGUAGE TAG must precede the CANCEL TAG character.

The usage of the CANCEL TAG character without a prefixed tag identification character cancels any tag value that may be defined.

The main function of the character is to make possible such operations as blind concatenation of strings in a tagged context without the propagation of inappropriate tag values across the string boundaries.

T.4 Language tags

Language tags are of general interest and may have a high degree of interoperability for protocol usage. For example, to embed a language tag for Japanese, the tag characters would be used as follows:

E0001 E006A E0061

The first value is the coded value of the LANGUAGE TAG character, the second corresponds to the TAG LATIN SMALL LETTER J, and the third corresponds to the TAG LATIN SMALL LETTER A. The sequence 'ja' corresponds to the 2-letter code representing the Japanese language in ISO 639:1988.

Annex U
(informative)

Removed