

CEN/TC304 N932

Source: Secretariat

Date: 15 Dec 1999

Title: European Fallback Rules, ballot

Mailed: 15 Dec 1999

Status: TC-enquiry: DEADLINE 1st March 2000

Action required: Respond before 1 March 2000

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Notes:

This is a TC-enquiry, to establish the suitability of N932 to be sent for Formal vote as prENV. National member body officers, responsible for CEN/TC304 issues are asked to fill in this form and send it **to the TC-secretariat** before **1 March 2000**.

Comments in any form will be forwarded to the CEN/TC 304 Project Team of European Fallback Rules. The PT will before the next plenary of TC304 in April 2000 produce a disposition of comments and a revised draft. The PT will produce a disposition of comments and plans to ask the TC304 plenary in November to approve a revised draft to be sent for Formal Vote. Comments from affiliated members of CEN and liaisons are welcome and will be considered.

Country:_____

Approves without comments ____

Approves with comments ____

Disapproves with comments ____

Date:_____

Signature_____ (National Member Body officer)

Name:_____

ICS: 35.040

Descriptors: Data processing, information interchange, text processing, text communication, graphic characters, character sets, representation of characters, coded character sets, conversion, fallback

English version

Information Technology European fallback rules

Technologies de l'information-

Character repertoire and coding transformations:

European fallback rules - N° 1

Informations technologies

Character repertoire and coding transformations:

European fallback rules - N° 1

This draft ENV is submitted to CEN members for Formal Vote. It has been drawn up by the Technical Committee CEN/TC 304.

This draft ENV was prepared by CEN in one official version (English). A version in another language made by translation under the responsibility of a CEN member into its own language and notified to the Central Secretariat has the same status as the official version.

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CEN

European Committee for Standardisation

Comité Européen de Normalisation

Europäisches Komitee für Normung

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Ref.No. ENV_____:1999

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Foreword

This ENV was prepared by CEN/TC304 European Localisation Requirements. It was approved in the month of _____ 1999. No other organisation than CEN took part in the preparation of this document.

This European Standard is intended to facilitate cross border communications and data exchange and to ensure that European cultural requirements are safeguarded in the increasingly interconnected world of today. It provides rules for fallback for multilingual European texts into the invariant set of ISO/IEC 646. These rules come into effect if data from different languages must be represented by equipment and systems which do not support the presentation of all the characters in the different language repertoires.

This European Standard does not intend to influence, let alone substitute itself for, national standards or customs in this field. Nevertheless, national standards have the opportunity to adapt this European Standard by declaring a formalized set of deviation rules («delta») if they so wish.

This document does not cancel or replace another standard.

There is no known identical national standard in Europe.

According to the CEN/CENELEC Common Rules the following countries are bound to announce the existence of this ENV: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, and United Kingdom.

0. Introduction

0.1 Rationale for the standard provision of fallback rules

Users who are trying to write text in a language which is not their mother language often wish to write that text using a character repertoire which does not contain all the letters needed for that language, especially those with diacritic marks. A standard method of character substitution would be useful for such users.

In spite of the computers being able to process larger repertoires of graphic characters than ever before, there are cases where it is not possible to render all the characters of a processing repertoire on an output device. In these cases, not all the characters in a processing repertoire are available in an output repertoire. In order to cater for these situations, a widely applicable standard method of character substitution (fallback) is required which will allow an approximate rendition to be made of the unsupported characters of the processing repertoire for output and rendition.

Examples of key applications are:

- a) a multilingual information service offered across Europe where personal or business documents come from different countries and are presented in a standardised rendition using MES 2 characters and which cannot be properly represented by the information service; and
- b) search engines in the World Wide Web which make use of "fuzzy" search techniques based on the use of search terms which have diacritical marks removed and make use of common substitutions for less frequently used letters of the Latin alphabet. Examples of the latter are - eth (ð), thorn (þ), æ, œ and the German sharp s (ß)

The provision of single fallback rules with a collection of fallback representations for MES 2 will enable the services to be improved and the applications easier for use by the human end user. A standard set of substitutions would be useful for such applications in order to avoid confusion. The same applies for the other two scripts represented by MES-2, Cyrillic and Greek.

The justification for preparing an ENV for these purposes is that the concept of representing the characters without diacritical marks is not useful for scripts originating outside Europe. Furthermore, Standardisation bodies of Europe that may wish to specify National schemes for fallback may modify the scheme given in this ENV for a limited set of characters and promulgate national standards for fallbacks. Greek and Cyrillic fallback representation specified in this ENV should be used with caution since transliteration into various Latin script languages depends on the target language. Local standards or local best practice should be referenced where they exist.

The European standard fallback specification can be used as a default in all relevant situations. It can be used as the basis for national standards with local preferences being used for specific substitutions defined by particular nation. It is expected that national standards for fallback will be registered in the international cultural registry as part of national locales. Well known local solutions will also be documented in addition to the default values.

0.2 Basic concepts

This standard specifies how a source stream of coded characters from a processing repertoire is represented in a target stream of an output repertoire. The worst case that is covered by the substitutions defined in this standard is where the processing repertoire is MES-2 and the output repertoire is the invariant repertoire of ISO/IEC 646. The coding of the processing repertoire and the coding of the output repertoire are outside the scope of this standard.

Characters in the source stream which occur in the output repertoire are transferred directly to the target stream without substitution. Characters in the source stream which do not occur in the output repertoire are subject to substitution.

There are two types of substitution. In the first type, the target characters are represented in a way that disables the reverse transformation of the target stream to the source stream because of **loss of information**. A very common example of this type of presentation is when the Latin small letter e acute (é) is presented by Latin small letter e (e). This type of substitution when a letter with diacritical mark is represented with the same character but without diacritical mark is known as accent dropping. The second type of presentation introduces special symbols that preserve the information about the original graphical symbol enabling transformation of the character stream to the original encoding. An example of this is the use of the SGML symbols (e.g. ´ in the case above). This type of substitution is outside the scope of this standard.

The substitution with loss of information can have more forms, but two main classes are always recognised as basic:

-one-to-many when one graphical character of the source stream is substituted with more than one graphical character from the output repertoire in the target stream. An example of this type of presentation is Latin capital letter Æ presented as AE. This class is recommended for general use.

-one-to-one when one graphical character of the source stream is substituted with one graphical character of the output repertoire in the target stream. This type of presentation is required in applications where the number of characters in the data entries or fields (e.g. in data bases or application forms) is fixed. The accent dropping is a type of one to one substitution. It is anticipated that this class will have minority application and should be discouraged, only to be used when there are strong technical reason for doing so.

0.3 Requirements

It is desirable that a standard fallback specification have a very large field of application so that it may be used across a wide range of platforms. To achieve this, a fallback specification is needed for a processing repertoire which is a superset of a large proportion of existing processing repertoires. Also, a fallback repertoire is needed which is a subset of a large proportion of existing output repertoires.

The characters contained in the collection Multilingual European Subset No.2 (MES-2) specified in ISO/IEC 10646, have a wide usage across Europe. In many cases, MES-2 will become the processing repertoire of choice. MES-2 is a large repertoire for which there will be a need for a fallback specification.

0.4 Satisfying the requirements

MES-2 has been designed to be a superset of a wide range of processing repertoires for commercial and administrative applications in office environments across the EEA.

It is a valid assumption that the minimum output repertoire that is implemented in computer systems is the invariant repertoire of ISO/IEC 646. Therefore a substitution with one or more characters from the invariant repertoire of ISO/IEC 646 will always be able to be rendered on an output device. The invariant repertoire of ISO/IEC 646 does not have letters with diacritic marks nor letters from national alphabets used in Europe.

This standard satisfies the requirements by providing a fallback specification which can represent each character of MES-2 with one or more characters of the invariant repertoire of ISO/IEC 646.

1. Scope and field of application

1.1 Scope

This standard specifies the representation of the characters of the collection Multilingual European Subset No.2 (MES 2) with the characters from the repertoire of the invariant part of ISO/IEC 646 (83 graphic characters). Where a character of MES-2 is not available in the invariant set of ISO/IEC 646, a fallback representation for rendering is specified.

1.2 Field of application

The fallback rules given here are only intended for data in more than one European language, i.e. for use in pan-European applications. They are not meant to influence, let alone replace existing national standards or practices.

2. Normative references

2.1 ISO/IEC 10646-1:1993, *Information technology-Universal Multiple-Octet Coded Character Set (UCS)-Part 1: Architecture and Basic Multilingual Plane*.

2.2 ISO/IEC 10646-1:1993/Cor.1:1996, *Information technology-Universal Multiple-Octet Coded Character Set (UCS)-Part 1: Architecture and Basic Multilingual Plane, Technical Corrigendum 1*.

2.3 ISO/IEC 646:1991, *Information technology - ISO 7-bit coded character set for information interchange*.

3. Definitions and abbreviations

3.1 Basic definitions

For the purposes of this standard the basic definitions of ISO/IEC 10646-1 section 4 apply. The following are reproduced here for ease of reference:

3.1.1 *character*: A member of a set of elements used for organisation, control, or representation of data.

3.1.2 *coded character*: A character together with its coded representation.

3.1.3 *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.

3.1.4 *repertoire*: A specified set of characters that are represented in a coded character set

3.1.5 *presentation*: To present: the process of writing, printing, or displaying of a graphic symbol.

3.1.6 *graphic symbol*: The visual representation of a graphic character or of a composite sequence.

3.1.7 *graphic character*: A character, other than a control function, that has a visual representation, normally hand-written, printed, or displayed.

3.2 Other definitions

Also, the following definitions apply:

3.2.1 *diacritical mark*: Any of a number of recurring graphical structures placed over, under, next to, or through a basic letter which does not significantly modify the shape of the basic letter itself and which in combination with that basic letter is a graphic character of the identified repertoire of MES-2.

3.2.2 *letter with diacritical mark*: A letter which is constructed as the combination of a basic letter and a diacritical mark.

3.2.3 *basic letter*: a letter that is one of the letters of the repertoire of the IRV of ISO 646.

3.2.4 *character stream*: A series of coded characters in sequence, sometimes referenced as a stream.

3.2.5 *character classification*: The characters of the repertoire characters are classified into letters, digits and special characters.

3.2.6 *processing repertoire*: This is the repertoire used by an application for processing character based information.

3.2.7 output repertoire: This the repertoire used by a computer system for external representation of character based information.

3.2 Abbreviations

The following abbreviations apply:

3.2.1 MES-2: Multilingual European Subset No. 2

4. Conformance

A claim of conformance to this standard during a fallback operation implies representing the characters of MES-2 (as specified in Table 1 columns 1-3) by the characters of the Invariant Subset of ISO/IEC 646 (as specified in Table 1, column 4).

The fallbacks used in Table 1, column 5 should only be used where no other fallback is possible.

5. Fallback rules specification

5.1 Specification of the general fallback rules

This standard provides two mappings for substitution. The first mapping is one to many (1: many) and the second is one to one (1:0) fallback for characters outside of the ISO/IEC 646 Invariant Subset. The one-to-one mapping should be avoided, and used only when technical difficulties prevent the use of the one-to-many fallback.

Common practice is used as the basis for determining fallbacks, where possible. Both fallback methods drop accents (diacritical marks). Common practice in several European countries leads to fallbacks to digraphs for several accented and modified vowels used in Nordic countries and in German-speaking countries (aa, ae, oe, ue, etc). One character may default to several characters, especially in the case of symbols, where fallbacks are sometimes based on the name of the character.

Fallbacks for the letters of the Greek and Cyrillic alphabets are based on the international romanisation standards ISO 843 and ISO 9 where possible, amended where necessary to allow fallbacks to be limited to the Invariant Subset of ISO/IEC 646.

ANNEX 1. (Normative) The list of fallback specification per character

Table I GENERAL FALLBACK TABLE

Column 1 contains the ISO/IEC 10646-1 code for the source character

Column 2 contains a glyph

Column 3 contains the ISO/IEC 10646-1 character name

Column 4 contains a glyph or glyphs for the one-to-many fallback

Column 5 contains a glyph for the one-to-one fallback

ANNEX II . (Informative)

Examples of fallback representation of text in different languages and scripts

Multilingual original text

Notre ancienne langue est le fondement de notre héritage culturel et spirituel sans lequel nous ne pourrions exister de la façon prévue par notre Créateur. L'éducation est la transmission de la culture et des valeurs; par conséquent, nous déclarons que l'éducation de la langue ancienne sera le moyen de transmission de la de l'héritage spirituel et culturel.

In alten, alten Zeiten, als die Menschen noch in ganz anderen Sprachen redeten, gab es in den warmen Ländern schon große und prächtige Städte. Da erhoben sich die Paläste der Könige und Kaiser, da gab es breite Straßen, enge Gassen und winkelige Gäßchen, da standen herrliche Tempel mit goldenen und marmornen Götterstatuen, da gab es bunte Märkte, wo Waren aus aller Herren Länder feilgeboten wurden, und weite schöne Plätze, wo die Leute sich versammelten, um Neuigkeiten zu besprechen und Reden zu halten oder anzuhören. Und vor allem gab es dort große Theater.

Internet je tehnološki in družbeni fenomen devedesetih let. O Internetu se povsod govori in piše. Nekateri opisujejo Internet kot pojav novega obdobja v razvoju družbe in jo imenujejo globalna informacijska družba ali bolj natančno informacijska infrastruktura te družbe. Poenostavljeno informacijska družba je globalna širokopasovna komunikacijska infrastruktura in storitve za občane, podjetja, ustanove in vse ostale subjekte svetovnega gospodarstva.

Kroz projekt Hrvatske akademske i istraživačke mreže CARnet i Klinike za bolesti srca i krvnih žila Medicinskog fakulteta po prvi put u kardiološkoj praksi biti će izvršenoudaljeno podešavanje elektrostimulatora srca na bolesniku putem Interneta. Uvođenje ovakve prakse u područje medicine znači niz prednosti za bolesnike sa ugrađenim elektrostimulatorom.

На ВСЕХ виртуальных серверах, размещенных на базе компании Элвис-Телеком без взимания дополнительной оплаты включена возможность использования РНРЗ. Расширение файлов, используемое для обработки РНР. Документация по РНРЗ и другим средствам WWW программирования доступна тут. Уважаемые Пользователи ! Несмотря на введение в Москве с 1 июля 1999 года 2%-ного налога с продаж, компания ЭЛВИС-ТЕЛЕКОМ приняла решение : не повышать свои тарифы на все виды услуг.

И као што свака бајка јелте почиње ево и ми ћемо почети а како ће се завршити зависи од наше прљаве маште. Некада давно живели су Ивица и Марица у густој шуми. Међутим у истој шуми је живела стара вештица.

Ὅπως διαπιστώσατε το πιο βασικό από τα ενδιαφέροντά μου είναι τα άτομα με τις λεγόμενες "ειδικές ανάγκες" ή οι άνθρωποι με αναπηρίες. Ασχολούμαι με την έκδοση του περιοδικού ΑΝΑΠΗΡΙΑ ΤΩΡΑ καθώς και με το στήσιμο αυτών των σελίδων

Multilingual text with fallbacks

Notre ancienne langue est le fondement de notre heritage culturel et spirituel sans lequel nous ne pourrions exister de la facon prevue par notre Createur. L'education est la transmission de la culture et des valeurs; par consequent, nous declarons que l'education de la langue ancienne sera le moyen de transmission de l'heritage spirituel et culturel.

In alten, alten Zeiten, als die Menschen nochin ganz anderen Sprachen redeten, gab es in den warmen Laendern schongrosse und praechtige Staedte. Da erhoben sich die Palaeste der Koenigeund Kaiser, da gab es breite Strassen, enge Gaessen und winkelige Gasschen, da standen herrliche Tempel mitgoldenen und marmornen Goetterstatuen, da gab es bunte Maerkte, wo Warenaus aller Herren Laender feilgeboten wurden, und weite schoene Plaetze, wo die Leute sich versammelten, um Neuigkeiten zu besprechen und Reden zu halten oder anzuehoren. Und vorallem gab es dortgrosse Theater.

Internet je tehnoloshki in druzhbeni fenomen devedesetih let. O Internetu se povsod govori in pishe. Nekateri opisujejo Internet kot pojav novega obdobja v razvoju druzhbe in jo imenujejo globalna informacijska druzhba ali bolj natanchno informacijska infrastruktura te druzhbe. Poenostavljeno informacijska druzhba je globalna širokopasovna komunikacijska infrastruktura in storitve za obchane, podjetja, ustanove in vse ostale subjekte svetovnega gospodarstva.

Kroz projekt Hrvatske akademske i istrazhivachke mrezhe CARnet i Klinike za bolesti srca i krvnih zhila Medicinskog fakulteta po prvi put u kardioloshkoj praksi biti ce izvrsheno udaljeno podeshavanje elektrostimulatora srca na bolesniku putem Interneta. Uvodjenje ovakve prakse u podruchje medicine znachi niz prednosti za bolesnike sa ugradjenim elektrostimulatorom.

Na VSEKH virtualnykh serverakh, razmeshchennyikh na baze kompanii Yelvis-Telekom bez vzimaniya dopolnitel'noj oplat'i vklyuchena vozmozhnost' ispol'zovaniya RNR3. Rasshirenie fajlov, ispol'zuemoe dlya obrabotki RNR. Dokumentatsiya po RNR3 i drugim sredstva WWW programmirovaniya dostupna tut. Uvazhaemye Polz'ovateli! Nesmotrya na vvedenie v Moskve s 1 iyulya 1999 goda 2%-nogo naloga s prodazh, kompaniya YELVIS-TELEKOM prinyala reshenie: ne povyshat' svoi tarif'i na vse vidyi uslug.

I kao shto svaka bajka jelte pochinje evo i mi c'emo pocheti a kako c'e se zavrshiti zavisi od nashe prljave mashte. Nekada davno zhiveli su Ivica i Marica u gustoj shumi. Medjutim u istoj shumi je zhivela stara veshtica.

Opo6- diapisto-sate to pio basiko apo ta endiaferonta moy einai ta atoma me ti6- legomene6- "eidekes anagke6-" i- oi anthro-poi me anapi-rie6-. Ascholoymai me ti-n ekdosi- toy periodikoy ANAPI-RIA TO-RA katho-6- kai me to sti-sipso ayto-n to-n selido-n.

Annex III: Notes on fallback for Latin, Greek and Cyrillic characters

III.0 Fallback from extended Latin characters

Diacritics as parts of pre-composed Latin characters are not recorded, although non-combining free-standing diacritics (rarely used in practice, compared to their precomposed forms in MES-2 (or in combination with their combining forms if this fallback standard were to be extended to MES-3) are recorded as " . "

Note: sometimes extended Latin to basic Latin fallback is described as transliteration. This should more correctly be described as fallback, as transliteration really relates to the Conversion of Scripts: transliteration is a form of Romanization as noted below in section III.1.

III.1 Fallback from Greek characters to Latin characters

Fallback from Greek characters to the ISO/IEC 646 Invariant Subset is effectively the same as Romanization. There are two types of romanization: transliteration and transcription.

Transliteration is a simple character by character conversion, irrespective of pronunciation.

Transcription undertakes additional conversions to maximise compatibility with pronunciation, and may differ in detail from a simple transliteration. For some languages and scripts the two outcomes can be identical, but for some languages, including Greek, transcription is desirable due to the way the Greek language is written in Greek script.

In some cases, including Greek to Latin, transcription can also be undertaken through a multiple-pass (usually a two pass) process, to achieve a more pronounceable fallback. Restoration of the original script is possible both from fallback using transliteration, and from fallback using transcription. Transcription is the preferred method used in Greece.

In this context transcription provides different conversions on some character pairs, before undertaking a simple transliteration fallback. The fallback repertoire in both cases is the Invariant Subset of ISO/IEC 646.

From the Greek characters in Table 1 it is possible to derive:

- one-to-many transliteration fallbacks,
- one-to-many transcription fallbacks, or
- one-to-one transliteration fallbacks.

In any body of Greek text that has been converted via a fallback conversion to the repertoire of the ISO/IEC 646 Invariant Subset, it should be possible to compare the text against Table 1 or Table 2, to determine whether the fallback conversion has used (in order of preference) a one-to-many transliteration fallback, a one-to-many transcription fallback, or a one-to-one transliteration fallback.

III.2. one-to-many transliteration fallbacks

Fallbacks that are listed in Table 1 for Greek characters provide a one-to-many transliteration fallback for Greek according to the provisions of the Romanization standards ISO 843 and ELOT 743 with minor modifications to ensure that the fallbacks are limited to the repertoire of the Invariant Subset of ISO/IEC 646.

The most obvious modification is use of " - " (HYPHEN-MINUS) instead of the macron specified in ISO 843 and ELOT 743. In one-to-many fallback, this is used with the Greek letters OMEGA and ETA, as is typically used in Greece. The use of " - " is also extended to the much more rarely used Greek symbols outside the range of basic Greek characters in order to maximise distinctiveness in characters, while maximising readability.

In Greek text there is little use of HYPHEN-MINUS within words, so ambiguous fallback text is unlikely as a result of this usage.

In addition, diacritics as parts of pre-composed Greek characters are not recorded, although non-combining free-standing diacritics (rarely used in practice, compared to Greek letters including precomposed diacritics) are recorded as " . " which is identical to the treatment of such characters in fallback from Latin script characters.

III.3. one-to-many transcription fallbacks

Note: for Greek characters, a one-to-many transcription fallback is strongly preferred to a one-to-many transliteration fallback. It is the transcription tables from ISO 843 and ELOT 743 that are used in Greece and Cyprus, not simply the transliteration tables.

Transcription can also be achieved automatically, using a multiple stage fallback conversion, again using only the repertoire of the ISO/IEC 646 Invariant Subset.

Transcription provides a better equivalence to Greek pronunciation, by using a simple automatic multiple-pass conversion on some digraphs or trigraphs used in Greek before performing a simple fallback conversion on the remaining single characters.

Transcription can be applied either to the source data or the target data, after a one-to-many transcription fallback has been performed.

The transcription table appears as Table 2 in this standard.

III.4. Restoring Greek text from Latin script fallback text

A reversible transformation from the Invariant Subset of ISO/IEC 646 back to the equivalent Greek characters is also possible, whether this is done using a one-to-many transcription fallback or a one-to-many transliteration fallback, although information on restoration of relevant Greek diacritics is outside the scope of this standard.

III.5. one-to-one transliteration fallbacks

Note that the use of a one-to-one transliteration fallback would result in incorrect data if a similar Latin to Greek conversion were to be applied. Use of one-to-one fallback is generally discouraged in this standard, and should be particularly avoided when dealing with Greek text.

III.6 Fallback from Cyrillic characters to Latin characters

From the Cyrillic characters in Table 1 it is possible to derive one-to-many transliteration fallbacks or one-to-one transliteration fallbacks.

In any body of Cyrillic script text that has been converted via a fallback conversion to the repertoire of the ISO/IEC 646 Invariant Subset, it may be possible to use statistical analysis of fallback text to determine the likely languages used in fallback text.

Specification of such analyses is outside the scope of this standard: however it may be useful to note that the characters in the Cyrillic section of Table 1 can be loosely grouped as:

- (a) 0410-044F Basic Slavonic Cyrillic characters (in Russian/Bulgarian)
- (b) 0490-0491 Additional Ukrainian/Belarusian characters
- (c) 0401-040F& Additional modern Slavonic Cyrillic characters
0451-045F) (in the above languages and in Serbian and Macedonian)
- (d) 0492-04F9)
 - + 048C-048F) Additional modern non-Slavonic Cyrillic characters
 - + 04EC-04ED)
- (e) 0460-0486 Additional archaic Slavonic Cyrillic characters
 - + indicates new to ISO/IEC 10646-1:2000.

Languages using ranges (b), (c), (d) and (e) also tend to use most of the characters from the range (a). Russian (except for using 0401 CYRILLIC CAPITAL LETTER IO and 0451 CYRILLIC SMALL LETTER IO) and Bulgarian generally use only characters from the range (a).

Diacritics as parts of pre-composed Cyrillic script characters are noted in the same way as other modifications to basic characters, mainly through use of " ' " (APOSTROPHE).

[Combining diacritics, which are rarely used in practice, compared to their pre composed forms in MES-2 (or in combination with their combining forms if this fallback standard were to be extended to MES-3) are recorded as " . "]

III.7. one-to-many transliteration fallbacks

Fallbacks that are listed in the section of Table 1 listing Cyrillic characters provide a one-to-many transliteration fallback for Cyrillic script, based where possible on tables in the Cyrillic Romanization standard ISO 9, with modifications to ensure that the fallbacks are limited to the repertoire of the Invariant Subset of ISO/IEC 646, and to allow the possibility of conversion of fallback text from the repertoire of ISO/IEC 646 back to Cyrillic characters, if required.

As ISO 9 is currently under process of revision, the fallbacks in the Cyrillic section of Table 1 also take into account approaches being considered during this revision. These include the use of

"fallback-like" transliterations available as an option in ISO R/9, the predecessor of ISO 9 for the following characters:

0416; 0419; 0425; 0426; 0427; 0428; 0429; 042E and 042F (upper-case)
0436; 0439; 0445; 0446; 0447; 0448; 0449; 044E and 044F (lower-case).

It is also planned to document language-specific romanizations both in the revised ISO 9 and in this European fallback standard.

The main modification of ISO 9 is use of " ' " (APOSTROPHE) instead of the various diacritics specified in ISO 9. APOSTROPHE is mainly used for the fallback of less common characters, in order to maximise distinctiveness of characters, while maximising readability. In Cyrillic text there is very little use of APOSTROPHE within words, so ambiguous fallback text is unlikely as a result of this usage.

III.8 Restoring Cyrillic text from Latin script fallback text

Unequivocal reversible transformation from the Invariant Subset of ISO/IEC 646 back to the equivalent Cyrillic text is not possible, due to the number of Cyrillic characters with identical fallbacks.

However, it may still be possible to produce readable Cyrillic text, in transforming back from fallback text which may contain errors due to information loss, and to use other comparison methods, including the use of spelling checkers, to improve the text. Before any such transformation back to Cyrillic script text, it would be essential to do a multiple pass conversion first, transforming various multiple character fallbacks first.

Specification of such comparison methods to improve the accuracy of text converted back to Cyrillic script is outside the scope of this standard.

III.9 One-to-one transliteration fallbacks

One-to-one transliteration fallbacks are discouraged due to the resulting ambivalent text, which is likely to be much more difficult to read, or to enable reconstruction of the original text, than is the case for Latin or Greek text, as there are more basic Cyrillic script letters in many languages than is the case for basic letters in Greek script or Latin script.

Note that the use of a one-to-one transliteration fallback would result in incorrect data if a similar Latin script to Cyrillic script conversion were to be applied. Use of one-to-one fallback is generally discouraged in this standard, and should be particularly avoided when dealing with Cyrillic text.

Table 2

ISO 843 Transcription modified for ISO/IEC 646 Invariant Subset fallback

Transliteration, and Transcription possibilities for character pairs (transcription shown only where different from transliteration)

UCS ID	1st and 2nd letters	Transliterated	Transcription
0391 03B1	ALPHA ALPHA + UPSILON ALPHA + UPSILON	A Ay Ay	a ay ay
		AV AF	av [1] af [2]
0392 03B2	BETA	V	v
0393 03B3	GAMMA GAMMA + GAMMA GAMMA + XI GAMMA + CHI	G Gg Gx Gch	g gg gx gch
		NG NX NCH	ng nx nch
0394 03B4	DELTA	D	d
0395 03B5	EPSILON EPSILON+UPSILON EPSILON+UPSILON	E Ey Ey	e ey ey
		EV EF	ev [1] ef [2]
0396 03B6	ZETA	Z	z
0397 03B7	ETA ETA + UPSILON ETA + UPSILON	I- I-y I-y	i- i-y i-y
		IV IF	iv [1] if [2]
0398 03B8	THETA	Th	th
0399 03B9	IOTA	I	i
039A 03BA	KAPPA	K	k
039B 03BB	LAMDA	L	l
039C 03BC	MU MU + PI	M Mp	m mp
		B	b [3]
039D 03BD	NU	N	n
039E 03BE	XI	X	x
039F 03BF	OMICRON OMICRON+UPSILON	O Oy	o oy
		OU	ou [4]
03A0 03C0	PI	P	p
03A1 03C1	RHO	R	r
03A3 03C3	SIGMA	S	s [5]
03A4 03C4	TAU	T	t
03A5 03C5	UPSILON	Y	y
03A6 03C6	PHI	F	f
03A7 03C7	CHI	Ch	ch
03A8 03C8	PSI	Ps	ps
03A9 03C9	OMEGA	O- o-	

[1] Before BETA, GAMMA, DELTA, ZETA, LAMDA, MU, NU, RHO & before all vowels, unless the fallback is from an accented UPSILON, when a simple transliteration is used. [2] Before THETA, KAPPA, XI, PI, SIGMA, TAU, CHI, PSI and at end of words, unless the fallback is from an accented UPSILON, when a simple transliteration is used.

[3] "B" At the beginning or end of words; "mp" in the middle of words. Note that sometimes 03D0 GREEK BETA SYMBOL is used as an explicit B, in cases where users want to make clear its distinction as sounding like a B, in comparison to BETA (romanized as V). Unlike MU with PI, note that NU with TAU are not transcribed to LATIN LETTER D in ISO 843 or ELOT 743.

[4] If a vowel in the pair is accented, then a simple transliteration is used.

[5] 03C2 GREEK SMALL LETTER FINAL SIGMA only occurs at the end of words, so it is straightforward to distinguish 03C3 from 03C2 in reversion, even though in Latin fallback text both default to a single character s.

ANNEX IV (Informative) Bibliography

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3. EWOS EG/ODA/91/Technical Guidance in Fallbacks for ENV 41 510: 1992
4. CWA TC304/MES-2:1999
5. Information Technology -Character Repertoire and Coding for Interworking with Telex services, EN 1922:1997

CHARACTERS AND FALLBACKS MES-2

		SOURCE CHARACTER	FALLBACKS CHARACTERS	FALLBACK CHARACTER
Code	Glyph	Character name	One-to-many glyph(s)	One-to-one glyph
0020	SP	SPACE	SP	SP
0021	!	EXCLAMATION MARK	!	!
0022	"	QUOTATION MARK	"	"
0023	#	NUMBER SIGN	N o	N
24	\$	DOLLAR SIGN	D o l l a r	D
0025	%	PERCENT SIGN	%	%
0026	&	AMPERSAND	&	&
0027	'	APOSTROPHE	'	'
0028	(	LEFT PARENTHESIS	(	(
0029	)	RIGHT PARENTHESIS	)	)
002A	*	ASTERISK	*	*
002B	+	PLUS SIGN	+	+
002C	,	COMMA	,	,
002D	-	HYPHEN-MINUS	-	-
002E	.	FULL STOP	.	.
002F	/	SOLIDUS	/	/
0030	0	DIGIT ZERO	0	0
0031	1	DIGIT ONE	1	1
0032	2	DIGIT TWO	2	2
0033	3	DIGIT THREE	3	3

0034	4	DIGIT FOUR	4	4
0035	5	DIGIT FIVE	5	5
0036	6	DIGIT SIX	6	6
0037	7	DIGIT SEVEN	7	7
0038	8	DIGIT EIGHT	8	8
0039	9	DIGIT NINE	9	9
003A	:	COLON	:	:
003B	;	SEMICOLON	;	;
003C	<	LESS-THAN SIGN	<	<
003D	=	EQUALS SIGN	=	=
003E	>	GREATER-THAN SIGN	>	>
003F	?	QUESTION MARK	?	?
0040	@	COMMERCIAL AT	a t	a
0041	A	LATIN CAPITAL LETTER A	A	A
0042	B	LATIN CAPITAL LETTER B	B	B
0043	C	LATIN CAPITAL LETTER C	C	C
0044	D	LATIN CAPITAL LETTER D	D	D
0045	E	LATIN CAPITAL LETTER E	E	E
0046	F	LATIN CAPITAL LETTER F	F	F
0047	G	LATIN CAPITAL LETTER G	G	G
0048	H	LATIN CAPITAL LETTER H	H	H
0049	I	LATIN CAPITAL LETTER I	I	I
004A	J	LATIN CAPITAL LETTER J	J	J

004B	K	LATIN CAPITAL LETTER K	K	K
004C	L	LATIN CAPITAL LETTER L	L	L
004D	M	LATIN CAPITAL LETTER M	M	M
004E	N	LATIN CAPITAL LETTER N	N	N
004F	O	LATIN CAPITAL LETTER O	O	O
0050	P	LATIN CAPITAL LETTER P	P	P
0051	Q	LATIN CAPITAL LETTER Q	Q	Q
0052	R	LATIN CAPITAL LETTER R	R	R
0053	S	LATIN CAPITAL LETTER S	S	S
0054	T	LATIN CAPITAL LETTER T	T	T
0055	U	LATIN CAPITAL LETTER U	U	U
0056	V	LATIN CAPITAL LETTER V	V	V
0057	W	LATIN CAPITAL LETTER W	W	W
0058	X	LATIN CAPITAL LETTER X	X	X
0059	Y	LATIN CAPITAL LETTER Y	Y	Y
005A	Z	LATIN CAPITAL LETTER Z	Z	Z
005B	[	LEFT SQUARE BRACKET	(	(
005C	\	REVERSE SOLIDUS	/	/
005D	]	RIGHT SQUARE BRACKET	)	)
005E	^	CIRCUMFLEX ACCENT	.	.
005F	_	LOW LINE	—	—
0060	`	GRAVE ACCENT	.	.
0061	a	LATIN SMALL LETTER A	a	a

0062	b	LATIN SMALL LETTER B	b	b
0063	c	LATIN SMALL LETTER C	c	c
0064	d	LATIN SMALL LETTER D	d	d
0065	e	LATIN SMALL LETTER E	e	e
0066	f	LATIN SMALL LETTER F	f	f
0067	g	LATIN SMALL LETTER G	g	g
0068	h	LATIN SMALL LETTER H	h	h
0069	i	LATIN SMALL LETTER I	i	i
006A	j	LATIN SMALL LETTER J	j	j
006B	k	LATIN SMALL LETTER K	k	k
006C	l	LATIN SMALL LETTER L	l	l
006D	m	LATIN SMALL LETTER M	m	m
006E	n	LATIN SMALL LETTER N	n	n
006F	o	LATIN SMALL LETTER O	o	o
0070	p	LATIN SMALL LETTER P	p	p
0071	q	LATIN SMALL LETTER Q	q	q
0072	r	LATIN SMALL LETTER R	r	r
0073	s	LATIN SMALL LETTER S	s	s
0074	t	LATIN SMALL LETTER T	t	t
0075	u	LATIN SMALL LETTER U	u	u
0076	v	LATIN SMALL LETTER V	v	v
0077	w	LATIN SMALL LETTER W	w	w
0078	x	LATIN SMALL LETTER X	x	x

0079	y	LATIN SMALL LETTER Y	y	y
007A	z	LATIN SMALL LETTER Z	z	z
007B	{	LEFT CURLY BRACKET	(	(
007C		VERTICAL LINE	!	!
007D	}	RIGHT CURLY BRACKET	)	)
007E	~	TILDE	.	.
00A0		NO-BREAK SPACE	.	.
00A1	¡	INVERTED EXCLAMATION MARK	!	!
00A2	¢	CENT SIGN	c e n t	c
00A3	£	POUND SIGN	P o u n d	L
00A4	¤	CURRENCY SIGN	¢	¢
00A5	¥	YEN SIGN	Y e n	Y
00A6	!	BROKEN BAR	!	!
00A7	§	SECTION SIGN	p a r	.
00A8	¨	DIAERESIS	.	.
00A9	©	COPYRIGHT SIGN	(C)	c
00AA		FEMININE ORDINAL INDICATOR	a	a
00AB	«	LEFT-POINTING DOUBLE ANGLE QUOTATION MARK	"	"
00AC	¬	NOT SIGN	n o t	.
00AD	-	SOFT HYPHEN	-	-
00AE	®	REGISTERED SIGN	(R)	R
00AF	-	MACRON	.	.
00B0	°	DEGREE SIGN	D	D

00B1	±	PLUS-MINUS SIGN	+ / -	.
00B2	²	SUPERSCRIPT TWO	* 2	.
00B3	³	SUPERSCRIPT THREE	* * 3	.
00B4	´	ACUTE ACCENT	.	.
00B5	µ	MICRO SIGN	u	u
00B6	¶	PILCROW SIGN	p a r	.
00B7	·	MIDDLE DOT	.	.
00B8	¸	CEDILLA	.	.
00B9	¹	SUPERSCRIPT ONE	* * 1	1
00BA	º	MASCULINE ORDINAL INDICATOR	o	o
00BB	»	RIGHT-POINTING DOUBLE ANGLE QUOTATION MARK	"	"
00BC	¼	VULGAR FRACTION ONE QUARTER	1 / 4	.
00BD	½	VULGAR FRACTION ONE HALF	1 / 2	.
00BE	¾	VULGAR FRACTION THREE QUARTERS	3 / 4	.
00BF	¿	INVERTED QUESTION MARK	?	?
00C0	À	LATIN CAPITAL LETTER A WITH GRAVE	A	A
00C1	Á	LATIN CAPITAL LETTER A WITH ACUTE	A	A
00C2	Ā	LATIN CAPITAL LETTER A WITH CIRCUMFLEX	A	A
00C3	Ã	LATIN CAPITAL LETTER A WITH TILDE	A	A
00C4	Ä	LATIN CAPITAL LETTER A WITH DIAERESIS	A e	A
00C5	Å	LATIN CAPITAL LETTER A WITH RING ABOVE	A a	A
00C6	Æ	LATIN CAPITAL LETTER AE	A e	A
00C7	Ç	LATIN CAPITAL LETTER C WITH CEDILLA	C	C

00C8	È	LATIN CAPITAL LETTER E WITH GRAVE	È	E
00C9	É	LATIN CAPITAL LETTER E WITH ACUTE	É	E
00CA	Ê	LATIN CAPITAL LETTER E WITH CIRCUMFLEX	Ê	E
00CB	Ë	LATIN CAPITAL LETTER E WITH DIAERESIS	Ë	E
00CC	Ì	LATIN CAPITAL LETTER I WITH GRAVE	Ì	I
00CD	Í	LATIN CAPITAL LETTER I WITH ACUTE	Í	I
00CE	Î	LATIN CAPITAL LETTER I WITH CIRCUMFLEX	Î	I
00CF	Ï	LATIN CAPITAL LETTER I WITH DIAERESIS	Ï	I
00D0	Ð	LATIN CAPITAL LETTER ETH	Ð	D
00D1	Ñ	LATIN CAPITAL LETTER N WITH TILDE	Ñ	N
00D2	Ò	LATIN CAPITAL LETTER O WITH GRAVE	Ò	O
00D3	Ó	LATIN CAPITAL LETTER O WITH ACUTE	Ó	O
00D4	Ô	LATIN CAPITAL LETTER O WITH CIRCUMFLEX	Ô	O
00D5	Õ	LATIN CAPITAL LETTER O WITH TILDE	Õ	O
00D6	Ö	LATIN CAPITAL LETTER O WITH DIAERESIS	Ö	O
00D7	×	MULTIPLICATION SIGN	*	*
00D8	Ø	LATIN CAPITAL LETTER O WITH STROKE	Ø	O
00D9	Ù	LATIN CAPITAL LETTER U WITH GRAVE	Ù	U
00DA	Ú	LATIN CAPITAL LETTER U WITH ACUTE	Ú	U
00DB	Û	LATIN CAPITAL LETTER U WITH CIRCUMFLEX	Û	U
00DC	Ü	LATIN CAPITAL LETTER U WITH DIAERESIS	Ü	U
00DD	Ý	LATIN CAPITAL LETTER Y WITH ACUTE	Ý	Y
00DE	Þ	LATIN CAPITAL LETTER THORN	Þ	T

00DF	ß	LATIN SMALL LETTER SHARP S	s	s
00E0	à	LATIN SMALL LETTER A WITH GRAVE	a	a
00E1	á	LATIN SMALL LETTER A WITH ACUTE	a	a
00E2	â	LATIN SMALL LETTER A WITH CIRCUMFLEX	a	a
00E3	ã	LATIN SMALL LETTER A WITH TILDE	a	a
00E4	ä	LATIN SMALL LETTER A WITH DIAERESIS	a	a
00E5	å	LATIN SMALL LETTER A WITH RING ABOVE	a	a
00E6	æ	LATIN SMALL LETTER AE	a	e
00E7	ç	LATIN SMALL LETTER C WITH CEDILLA	c	c
00E8	è	LATIN SMALL LETTER E WITH GRAVE	e	e
00E9	é	LATIN SMALL LETTER E WITH ACUTE	e	e
00EA	ê	LATIN SMALL LETTER E WITH CIRCUMFLEX	e	e
00EB	ë	LATIN SMALL LETTER E WITH DIAERESIS	e	e
00EC	ì	LATIN SMALL LETTER I WITH GRAVE	i	i
00ED	í	LATIN SMALL LETTER I WITH ACUTE	i	i
00EE	î	LATIN SMALL LETTER I WITH CIRCUMFLEX	i	i
00EF	ï	LATIN SMALL LETTER I WITH DIAERESIS	i	i
00F0	ð	LATIN SMALL LETTER ETH	d	d
00F1	ñ	LATIN SMALL LETTER N WITH TILDE	n	n
00F2	ò	LATIN SMALL LETTER O WITH GRAVE	o	o
00F3	ó	LATIN SMALL LETTER O WITH ACUTE	o	o
00F4	ô	LATIN SMALL LETTER O WITH CIRCUMFLEX	o	o
00F5	õ	LATIN SMALL LETTER O WITH TILDE	o	o

00F6	ö	LATIN SMALL LETTER O WITH DIAERESIS	o	e	o
00F7	÷	DIVISION SIGN	/		
00F8	ø	LATIN SMALL LETTER O WITH STROKE	o	e	o
00F9	ù	LATIN SMALL LETTER U WITH GRAVE	u		
00FA	ú	LATIN SMALL LETTER U WITH ACUTE	u		
00FB	û	LATIN SMALL LETTER U WITH CIRCUMFLEX	u		
00FC	ü	LATIN SMALL LETTER U WITH DIAERESIS	u	e	u
00FD	ý	LATIN SMALL LETTER Y WITH ACUTE	y		
00FE	þ	LATIN SMALL LETTER THORN	t	h	t
00FF	ÿ	LATIN SMALL LETTER Y WITH DIAERESIS	y		
0100	Ā	LATIN CAPITAL LETTER A WITH MACRON	A		
0101	ā	LATIN SMALL LETTER A WITH MACRON	a		
0102	Ǻ	LATIN CAPITAL LETTER A WITH BREVE	A		
0103	ǻ	LATIN SMALL LETTER A WITH BREVE	a		
0104	Ą	LATIN CAPITAL LETTER A WITH OGONEK	A		
0105	ą	LATIN SMALL LETTER A WITH OGONEK	a		
0106	Ć	LATIN CAPITAL LETTER C WITH ACUTE	C		
0107	ć	LATIN SMALL LETTER C WITH ACUTE	c		
0108	Ĉ	LATIN CAPITAL LETTER C WITH CIRCUMFLEX	C		
0109	ĉ	LATIN SMALL LETTER C WITH CIRCUMFLEX	c		
010A	Č	LATIN CAPITAL LETTER C WITH DOT ABOVE	C		
010B	č	LATIN SMALL LETTER C WITH DOT ABOVE	c		
010C	Č̣	LATIN CAPITAL LETTER C WITH CARON	C	h	C

010D	č̣	LATIN SMALL LETTER C WITH CARON	c	h	c
010E	Ď	LATIN CAPITAL LETTER D WITH CARON	D		
010F	ď	LATIN SMALL LETTER D WITH CARON	d		
0110	Đ	LATIN CAPITAL LETTER D WITH STROKE	D	j	D
0111	đ	LATIN SMALL LETTER D WITH STROKE	d	j	d
0112	Ē	LATIN CAPITAL LETTER E WITH MACRON	E		
0113	ē	LATIN SMALL LETTER E WITH MACRON	e		
0114	Ĕ	LATIN CAPITAL LETTER E WITH BREVE	E		
0115	ĕ	LATIN SMALL LETTER E WITH BREVE	e		
0116	Ẹ	LATIN CAPITAL LETTER E WITH DOT ABOVE	E		
0117	ẹ	LATIN SMALL LETTER E WITH DOT ABOVE	e		
0118	Ė	LATIN CAPITAL LETTER E WITH OGONEK	E		
0119	ė	LATIN SMALL LETTER E WITH OGONEK	e		
011A	Ě	LATIN CAPITAL LETTER E WITH CARON	E		
011B	ě	LATIN SMALL LETTER E WITH CARON	e		
011C	Ĝ	LATIN CAPITAL LETTER G WITH CIRCUMFLEX	G		
011D	ĝ	LATIN SMALL LETTER G WITH CIRCUMFLEX	g		
011E	Ğ	LATIN CAPITAL LETTER G WITH BREVE	G		
011F	ğ	LATIN SMALL LETTER G WITH BREVE	g		
0120	Ġ	LATIN CAPITAL LETTER G WITH DOT ABOVE	G		
0121	ġ	LATIN SMALL LETTER G WITH DOT ABOVE	g		
0122	Ģ	LATIN CAPITAL LETTER G WITH CEDILLA	G		
0123	ģ	LATIN SMALL LETTER G WITH CEDILLA	g		

0124	Ĥ	LATIN CAPITAL LETTER H WITH CIRCUMFLEX	H	H
0125	ĥ	LATIN SMALL LETTER H WITH CIRCUMFLEX	h	h
0126	Ħ	LATIN CAPITAL LETTER H WITH STROKE	Ħ	Ħ
0127	ħ	LATIN SMALL LETTER H WITH STROKE	ħ	ħ
0128	İ	LATIN CAPITAL LETTER I WITH TILDE	İ	İ
0129	ı	LATIN SMALL LETTER I WITH TILDE	ı	ı
012A	Ī	LATIN CAPITAL LETTER I WITH MACRON	Ī	Ī
012B	ī	LATIN SMALL LETTER I WITH MACRON	ī	ī
012C	Ȫ	LATIN CAPITAL LETTER I WITH BREVE	Ȫ	Ȫ
012D	ȩ	LATIN SMALL LETTER I WITH BREVE	ȩ	ȩ
012E	Ĭ	LATIN CAPITAL LETTER I WITH OGONEK	Ĭ	Ĭ
012F	į	LATIN SMALL LETTER I WITH OGONEK	į	į
0130	İ̇	LATIN CAPITAL LETTER I WITH DOT ABOVE	İ̇	İ̇
0131	ı̇	LATIN SMALL LETTER DOTLESS İ	ı̇	ı̇
0132	IJ	LATIN CAPITAL LIGATURE IJ	I j	Y
0133	ij	LATIN SMALL LIGATURE IJ	i j	y
0134	Ĵ	LATIN CAPITAL LETTER J WITH CIRCUMFLEX	Ĵ	Ĵ
0135	ĵ	LATIN SMALL LETTER J WITH CIRCUMFLEX	ĵ	ĵ
0136	Ʒ	LATIN CAPITAL LETTER K WITH CEDILLA	Ʒ	Ʒ
0137	Ǯ	LATIN SMALL LETTER K WITH CEDILLA	Ǯ	Ǯ
0138	Ʒ̥	LATIN SMALL LETTER KRA	Ʒ̥	Ʒ̥
0139	Ł	LATIN CAPITAL LETTER L WITH ACUTE	Ł	Ł
013A	ł	LATIN SMALL LETTER L WITH ACUTE	ł	ł

013B	Ł̣	LATIN CAPITAL LETTER L WITH CEDILLA	Ł̣	Ł̣
013C	ł̣	LATIN SMALL LETTER L WITH CEDILLA	ł̣	ł̣
013D	Ł̂	LATIN CAPITAL LETTER L WITH CARON	Ł̂	Ł̂
013E	ĺ̂	LATIN SMALL LETTER L WITH CARON	ĺ̂	ĺ̂
013F	Ł̆	LATIN CAPITAL LETTER L WITH MIDDLE DOT	Ł̆	Ł̆
0140	ł̆	LATIN SMALL LETTER L WITH MIDDLE DOT	ł̆	ł̆
0141	Ł̇	LATIN CAPITAL LETTER L WITH STROKE	Ł̇	Ł̇
0142	ł̇	LATIN SMALL LETTER L WITH STROKE	ł̇	ł̇
0143	Ń	LATIN CAPITAL LETTER N WITH ACUTE	Ń	Ń
0144	ń	LATIN SMALL LETTER N WITH ACUTE	ń	ń
0145	Ñ	LATIN CAPITAL LETTER N WITH CEDILLA	Ñ	Ñ
0146	ņ	LATIN SMALL LETTER N WITH CEDILLA	ņ	ņ
0147	Ñ̂	LATIN CAPITAL LETTER N WITH CARON	Ñ̂	Ñ̂
0148	ň̂	LATIN SMALL LETTER N WITH CARON	ň̂	ň̂
0149	ṇ̃	LATIN SMALL LETTER N PRECEDED BY APOSTROPHE	ṇ̃	ṇ̃
014A	Ñ̇	LATIN CAPITAL LETTER ENG	Ñ̇ g	Ñ̇
014B	ŋ	LATIN SMALL LETTER ENG	ŋ g	ŋ
014C	Ō	LATIN CAPITAL LETTER O WITH MACRON	Ō	Ō
014D	ō	LATIN SMALL LETTER O WITH MACRON	ō	ō
014E	Ŏ	LATIN CAPITAL LETTER O WITH BREVE	Ŏ	Ŏ
014F	ó̆	LATIN SMALL LETTER O WITH BREVE	ó̆	ó̆
0150	Ŏ̂	LATIN CAPITAL LETTER O WITH DOUBLE ACUTE	Ŏ̂	Ŏ̂
0151	ó̇	LATIN SMALL LETTER O WITH DOUBLE ACUTE	ó̇	ó̇

0152	Œ	LATIN CAPITAL LIGATURE OE	O	e	O
0153	œ	LATIN SMALL LIGATURE OE	o	e	o
0154	Ŕ	LATIN CAPITAL LETTER R WITH ACUTE	R		R
0155	ŕ	LATIN SMALL LETTER R WITH ACUTE	r		r
0156	Ŗ	LATIN CAPITAL LETTER R WITH CEDILLA	R		R
0157	ŗ	LATIN SMALL LETTER R WITH CEDILLA	r		r
0158	Ř	LATIN CAPITAL LETTER R WITH CARON	R		R
0159	ř	LATIN SMALL LETTER R WITH CARON	r		r
015A	Ś	LATIN CAPITAL LETTER S WITH ACUTE	S		S
015B	ś	LATIN SMALL LETTER S WITH ACUTE	s		s
015C	Ŝ	LATIN CAPITAL LETTER S WITH CIRCUMFLEX	Ŝ		Ŝ
015D	ŝ	LATIN SMALL LETTER S WITH CIRCUMFLEX	s		s
015E	Ș	LATIN CAPITAL LETTER S WITH CEDILLA	Ș		Ș
015F	ș	LATIN SMALL LETTER S WITH CEDILLA	s		s
0160	Ş	LATIN CAPITAL LETTER S WITH CARON	S	h	S
0161	ş	LATIN SMALL LETTER S WITH CARON	s	h	s
0162	Ţ	LATIN CAPITAL LETTER T WITH CEDILLA	T		T
0163	ţ	LATIN SMALL LETTER T WITH CEDILLA	t		t
0164	Ț	LATIN CAPITAL LETTER T WITH CARON	T		T
0165	ț	LATIN SMALL LETTER T WITH CARON	t		t
0166	Ț	LATIN CAPITAL LETTER T WITH STROKE	T		T
0167	Ț	LATIN SMALL LETTER T WITH STROKE	t		t
0168	Ů	LATIN CAPITAL LETTER U WITH TILDE	U		U

0169	Ũ	LATIN SMALL LETTER U WITH TILDE	u		u
016A	Ū	LATIN CAPITAL LETTER U WITH MACRON	Ū		Ū
016B	ū	LATIN SMALL LETTER U WITH MACRON	u		u
016C	Ů	LATIN CAPITAL LETTER U WITH BREVE	Ů		Ů
016D	ů	LATIN SMALL LETTER U WITH BREVE	u		u
016E	Ǫ	LATIN CAPITAL LETTER U WITH RING ABOVE	Ǫ		Ǫ
016F	ǫ	LATIN SMALL LETTER U WITH RING ABOVE	u		u
0170	Ǫ	LATIN CAPITAL LETTER U WITH DOUBLE ACUTE	Ǫ		Ǫ
0171	ǫ	LATIN SMALL LETTER U WITH DOUBLE ACUTE	u		u
0172	Ǫ	LATIN CAPITAL LETTER U WITH OGONEK	Ǫ		Ǫ
0173	ǫ	LATIN SMALL LETTER U WITH OGONEK	u		u
0174	Ŵ	LATIN CAPITAL LETTER W WITH CIRCUMFLEX	Ŵ		Ŵ
0175	ŵ	LATIN SMALL LETTER W WITH CIRCUMFLEX	w		w
0176	Ỳ	LATIN CAPITAL LETTER Y WITH CIRCUMFLEX	Ỳ		Ỳ
0177	ỳ	LATIN SMALL LETTER Y WITH CIRCUMFLEX	y		y
0178	Ỳ	LATIN CAPITAL LETTER Y WITH DIAERESIS	Ỳ		Ỳ
0179	Ẑ	LATIN CAPITAL LETTER Z WITH ACUTE	Z		Z
017A	ẑ	LATIN SMALL LETTER Z WITH ACUTE	z		z
017B	Ẑ	LATIN CAPITAL LETTER Z WITH DOT ABOVE	Z		Z
017C	ẑ	LATIN SMALL LETTER Z WITH DOT ABOVE	z		z
017D	Ž	LATIN CAPITAL LETTER Z WITH CARON	Z	h	Z
017E	ž	LATIN SMALL LETTER Z WITH CARON	z	h	z
017F	ſ	LATIN SMALL LETTER LONG S	s		s

018F	Ɔ	LATIN CAPITAL LETTER SCHWA	E	E
0192	f	LATIN SMALL LETTER F WITH HOOK	f	f
01B7	Ʒ	LATIN CAPITAL LETTER EZH	Z	Z
01DE	Ǽ	LATIN CAPITAL LETTER A WITH DIAERESIS AND MACRON	A	A
01DF	ǻ	LATIN SMALL LETTER A WITH DIAERESIS AND MACRON	a	a
01E0	Ǻ	LATIN CAPITAL LETTER A WITH DOT ABOVE AND MACRON	Å	Å
01E1	ǻ	LATIN SMALL LETTER A WITH DOT ABOVE AND MACRON	a	a
01E2	Æ	LATIN CAPITAL LETTER AE WITH MACRON	A e	A
01E3	Ǽ	LATIN SMALL LETTER AE WITH MACRON	a e	a
01E4	G	LATIN CAPITAL LETTER G WITH STROKE	G	G
01E5	g	LATIN SMALL LETTER G WITH STROKE	g	g
01E6	Ĝ	LATIN CAPITAL LETTER G WITH CARON	G	G
01E7	g	LATIN SMALL LETTER G WITH CARON	g	g
01E8	Ķ	LATIN CAPITAL LETTER K WITH CARON	K	K
01E9	ķ	LATIN SMALL LETTER K WITH CARON	k	k
01EA	Q	LATIN CAPITAL LETTER O WITH OGONEK	O	O
01EB	q	LATIN SMALL LETTER O WITH OGONEK	o	o
01EC	Ų	LATIN CAPITAL LETTER U WITH OGONEK AND MACRON	O	O
01ED	ū	LATIN SMALL LETTER U WITH OGONEK AND MACRON	o	o
01EE	Ž	LATIN CAPITAL LETTER EZH WITH CARON	Z	Z
01EF	ž	LATIN SMALL LETTER EZH WITH CARON	z	z
01FA	Ǻ	LATIN CAPITAL LETTER A WITH RING ABOVE AND ACUTE	Å å	Å
01FB	ǻ	LATIN SMALL LETTER A WITH RING ABOVE AND ACUTE	a å	a

01FC	Æ	LATIN CAPITAL LETTER AE WITH ACUTE	A e	A
01FD	Ǽ	LATIN SMALL LETTER AE WITH ACUTE	a e	a
01FE	Ø	LATIN CAPITAL LETTER O WITH STROKE AND ACUTE	O e	O
01FF	ø	LATIN SMALL LETTER O WITH STROKE AND ACUTE	o e	o
0218		LATIN CAPITAL LETTER S WITH COMMA BELOW	S	S
0219		LATIN SMALL LETTER S WITH COMMA BELOW	s	s
021A		LATIN CAPITAL LETTER T WITH COMMA BELOW	T	T
021B		LATIN SMALL LETTER T WITH COMMA BELOW	t	t
021E		LATIN CAPITAL LETTER H WITH COMMA BELOW	H	H
021F		LATIN SMALL LETTER H WITH COMMA BELOW	h	h
0259	ə	LATIN SMALL LETTER SCHWA	e	e
027C	ŀ	LATIN SMALL LETTER R WITH LONG LEG	R	R
0292	Ʒ	LATIN SMALL LETTER EZH	z	z
02BB	‘	MODIFIER LETTER TURNED COMMA	.	.
02BC	’	MODIFIER LETTER APOSTROPHE	.	.
02BD	ƒ	MODIFIER LETTER REVERSED COMMA	.	.
02C6	ˆ	MODIFIER LETTER CIRCUMFLEX ACCENT	.	.
02C7	ˇ	CARON	.	.
02C9	˘	MODIFIER LETTER MACRON	.	.
02D8	˙	BREVE	.	.
02D9	˚	DOT ABOVE	.	.
02DA	◌̥	RING ABOVE	.	.

02DB	◌	OGONEK	◌	◌	◌
02DC	˜	SMALL TILDE	◌	◌	◌
02DD	◌	DOUBLE ACUTE ACCENT	◌	◌	◌
02EE		MODIFIER LETTER DOUBLE APOSTROPHE	◌	◌	◌
0374	◌	GREEK NUMERAL SIGN	◌	◌	◌
0375	◌	GREEK LOWER NUMERAL SIGN	◌	◌	◌
037A	◌	GREEK YPOGEGRAMMENI	◌	◌	◌
037E	◌	GREEK QUESTION MARK	◌	◌	◌
0384	◌	GREEK TONOS	◌	◌	◌
0385	◌	GREEK DIALYTIKA TONOS	◌	◌	◌
0386	Α	GREEK CAPITAL LETTER ALPHA WITH TONOS	Α	Α	Α
0387	◌	GREEK ANO TELEIA	◌	◌	◌
0388	Ε	GREEK CAPITAL LETTER EPSILON WITH TONOS	Ε	Ε	Ε
0389	Η	GREEK CAPITAL LETTER ETA WITH TONOS	Η -	Η	Η
038A	Ι	GREEK CAPITAL LETTER IOTA WITH TONOS	Ι	Ι	Ι
038C	Ο	GREEK CAPITAL LETTER OMICRON WITH TONOS	Ο	Ο	Ο
038E	Υ	GREEK CAPITAL LETTER UPSILON WITH TONOS	Υ	Υ	Υ
038F	Ω	GREEK CAPITAL LETTER OMEGA WITH TONOS	Ω -	Ω	Ω
0390	◌	GREEK SMALL LETTER IOTA WITH DIALYTIKA AND TONOS	◌	◌	◌
0391	Α	GREEK CAPITAL LETTER ALPHA	Α	Α	Α
0392	Β	GREEK CAPITAL LETTER BETA	Β	Β	Β
0393	Γ	GREEK CAPITAL LETTER GAMMA	Γ	Γ	Γ
0394	Δ	GREEK CAPITAL LETTER DELTA	Δ	Δ	Δ

0395	Ε	GREEK CAPITAL LETTER EPSILON	Ε	Ε	Ε
0396	Ζ	GREEK CAPITAL LETTER ZETA	Ζ	Ζ	Ζ
0397	Η	GREEK CAPITAL LETTER ETA	Η	Η -	Η
0398	Θ	GREEK CAPITAL LETTER THETA	Θ	Θ h	Θ
0399	Ι	GREEK CAPITAL LETTER IOTA	Ι	Ι	Ι
039A	Κ	GREEK CAPITAL LETTER KAPPA	Κ	Κ	Κ
039B	Λ	GREEK CAPITAL LETTER LAMDA	Λ	Λ	Λ
039C	Μ	GREEK CAPITAL LETTER MU	Μ	Μ	Μ
039D	Ν	GREEK CAPITAL LETTER NU	Ν	Ν	Ν
039E	Ξ	GREEK CAPITAL LETTER XI	Ξ	Ξ	Ξ
039F	Ο	GREEK CAPITAL LETTER OMICRON	Ο	Ο	Ο
03A0	Π	GREEK CAPITAL LETTER PI	Π	Π	Π
03A1	Ρ	GREEK CAPITAL LETTER RHO	Ρ	Ρ	Ρ
03A3	Σ	GREEK CAPITAL LETTER SIGMA	Σ	Σ	Σ
03A4	Τ	GREEK CAPITAL LETTER TAU	Τ	Τ	Τ
03A5	Υ	GREEK CAPITAL LETTER UPSILON	Υ	Υ	Υ
03A6	Φ	GREEK CAPITAL LETTER PHI	Φ	Φ	Φ
03A7	Χ	GREEK CAPITAL LETTER CHI	Χ	Χ h	Χ
03A8	Ψ	GREEK CAPITAL LETTER PSI	Ψ	Ψ s	Ψ
03A9	Ω	GREEK CAPITAL LETTER OMEGA	Ω	Ω -	Ω
03AA	◌	GREEK CAPITAL LETTER IOTA WITH DIALYTIKA	◌	◌	◌
03AB	◌	GREEK CAPITAL LETTER UPSILON WITH DIALYTIKA	◌	◌	◌
03AC	α	GREEK SMALL LETTER ALPHA WITH TONOS	α	α	α

03AD	Ε	GREEK SMALL LETTER EPSILON WITH TONOS	ε	e	e
03AE	Η	GREEK SMALL LETTER ETA WITH TONOS	ι -		ι
03AF	Ι	GREEK SMALL LETTER IOTA WITH TONOS	ι		ι
03B0	Υ	GREEK SMALL LETTER UPSILON WITH DIALYTIKA AND TONOS	υ		υ
03B1	Α	GREEK SMALL LETTER ALPHA	α		α
03B2	Β	GREEK SMALL LETTER BETA	β		β
03B3	Γ	GREEK SMALL LETTER GAMMA	γ		γ
03B4	Δ	GREEK SMALL LETTER DELTA	δ		δ
03B5	Ε	GREEK SMALL LETTER EPSILON	ε		ε
03B6	Ζ	GREEK SMALL LETTER ZETA	ζ		ζ
03B7	Η	GREEK SMALL LETTER ETA	ι -		ι
03B8	Θ	GREEK SMALL LETTER THETA	τ θ		τ
03B9	Ι	GREEK SMALL LETTER IOTA	ι		ι
03BA	Κ	GREEK SMALL LETTER KAPPA	κ		κ
03BB	Λ	GREEK SMALL LETTER LAMDA	λ		λ
03BC	Μ	GREEK SMALL LETTER MU	μ		μ
03BD	Ν	GREEK SMALL LETTER NU	ν		ν
03BE	Ξ	GREEK SMALL LETTER XI	ξ		ξ
03BF	Ο	GREEK SMALL LETTER OMICRON	ο		ο
03C0	Π	GREEK SMALL LETTER PI	π		π
03C1	Ρ	GREEK SMALL LETTER RHO	ρ		ρ
03C2	Σ	GREEK SMALL LETTER FINAL SIGMA	ς		ς
03C3	σ	GREEK SMALL LETTER SIGMA	ς		ς

03C4	Τ	GREEK SMALL LETTER TAU	τ	t	t
03C5	Υ	GREEK SMALL LETTER UPSILON	υ	υ	υ
03C6	Φ	GREEK SMALL LETTER PHI	φ	φ	φ
03C7	Χ	GREEK SMALL LETTER CHI	χ	χ	χ
03C8	Ψ	GREEK SMALL LETTER PSI	ψ	ψ	ψ
03C9	Ω	GREEK SMALL LETTER OMEGA	ω	ω -	ο
03CA	Ι	GREEK SMALL LETTER IOTA WITH DIALYTIKA	ι	ι	ι
03CB	Υ	GREEK SMALL LETTER UPSILON WITH DIALYTIKA	υ	υ	υ
03CC	Ο	GREEK SMALL LETTER OMICRON WITH TONOS	ο	ο	ο
03CD	Υ	GREEK SMALL LETTER UPSILON WITH TONOS	υ	υ	υ
03CE	Ω	GREEK SMALL LETTER OMEGA WITH TONOS	ω	ο -	ο
03D7		GREEK KAI SYMBOL		κ -	κ
03DA	Σ	GREEK LETTER STIGMA	ς	ς -	ς
03DB	Σ	GREEK SMALL LETTER STIGMA	ς	ς -	ς
03DC	Ϝ	GREEK LETTER DIGAMMA	Ϝ	Ϝ -	Ϝ
03DD	ϝ	GREEK SMALL LETTER DIGAMMA	ϝ	ϝ -	ϝ
03DE	Ϛ	GREEK LETTER KOPPA	Ϛ	9 0 -	9
03DF	ϛ	GREEK SMALL LETTER KOPPA	ϛ	9 0 -	9
03E0	Ϝ	GREEK LETTER SAMPI	Ϝ	9 0 0 -	9
03E1	ϝ	GREEK SMALL LETTER SAMPI	ϝ	9 0 0 -	9
0400		CYRILLIC CAPITAL LETTER IE WITH GRAVE		Е '	Е
0401	Ё	CYRILLIC CAPITAL LETTER IO	Ё	Е '	Е
0402	Ђ	CYRILLIC CAPITAL LETTER DJE	Ђ	Д ј	Д

0403	Ґ	CYRILLIC CAPITAL LETTER GJE	Ґ	Г	G
0404	Є	CYRILLIC CAPITAL LETTER UKRAINIAN IE	Є	Е	E
0405	З	CYRILLIC CAPITAL LETTER DZE	З	З	Z
0406	І	CYRILLIC CAPITAL LETTER BYELORUSSIAN-UKRAINIAN I	І	І	I
0407	Ї	CYRILLIC CAPITAL LETTER YI	Ї	И	I
0408	Ј	CYRILLIC CAPITAL LETTER JE	Ј	Ј	J
0409	Љ	CYRILLIC CAPITAL LETTER LJE	Љ	Л	L
040A	Њ	CYRILLIC CAPITAL LETTER NJE	Њ	Н	N
040B	Ѡ	CYRILLIC CAPITAL LETTER TSHE	Ѡ	С	C
040C	Ѳ	CYRILLIC CAPITAL LETTER KJE	Ѳ	К	K
040D		CYRILLIC CAPITAL LETTER I WITH GRAVE	І	І	I
040E	Ѣ	CYRILLIC CAPITAL LETTER SHORT U	Ѣ	Ѣ	W
040F	Ѥ	CYRILLIC CAPITAL LETTER DZHE	Ѥ	Ѥ	Z
0410	А	CYRILLIC CAPITAL LETTER A	А	А	A
0411	Б	CYRILLIC CAPITAL LETTER BE	Б	Б	B
0412	В	CYRILLIC CAPITAL LETTER VE	В	В	V
0413	Г	CYRILLIC CAPITAL LETTER GHE	Г	Г	G
0414	Д	CYRILLIC CAPITAL LETTER DE	Д	Д	D
0415	Е	CYRILLIC CAPITAL LETTER E	Е	Е	E
0416	Ж	CYRILLIC CAPITAL LETTER ZHE	Ж	Ж	Z
0417	З	CYRILLIC CAPITAL LETTER ZE	З	З	Z
0418	И	CYRILLIC CAPITAL LETTER I	И	И	I
0419	Й	CYRILLIC CAPITAL LETTER SHORT I	Й	Й	J

041A	К	CYRILLIC CAPITAL LETTER KA	К	К	K
041B	Л	CYRILLIC CAPITAL LETTER EL	Л	Л	L
041C	М	CYRILLIC CAPITAL LETTER EM	М	М	M
041D	Н	CYRILLIC CAPITAL LETTER EN	Н	Н	N
041E	О	CYRILLIC CAPITAL LETTER O	О	О	O
041F	П	CYRILLIC CAPITAL LETTER PE	П	П	P
0420	Р	CYRILLIC CAPITAL LETTER ER	Р	Р	R
0421	С	CYRILLIC CAPITAL LETTER ES	С	С	S
0422	Т	CYRILLIC CAPITAL LETTER TE	Т	Т	T
0423	У	CYRILLIC CAPITAL LETTER U	У	У	U
0424	Ф	CYRILLIC CAPITAL LETTER EF	Ф	Ф	F
0425	Х	CYRILLIC CAPITAL LETTER HA	Х	Х	H
0426	Ц	CYRILLIC CAPITAL LETTER TSE	Ц	Ц	C
0427	Ч	CYRILLIC CAPITAL LETTER CHE	Ч	Ч	C
0428	Ш	CYRILLIC CAPITAL LETTER SHA	Ш	Ш	S
0429	Щ	CYRILLIC CAPITAL LETTER SHCHA	Щ	Щ	S
042A	Ъ	CYRILLIC CAPITAL LETTER HARD SIGN	Ъ	Ъ	"
042B	Ы	CYRILLIC CAPITAL LETTER YERU	Ы	Ы	Y
042C	Ь	CYRILLIC CAPITAL LETTER SOFT SIGN	Ь	Ь	'
042D	Э	CYRILLIC CAPITAL LETTER E	Э	Э	E
042E	Ю	CYRILLIC CAPITAL LETTER YU	Ю	Ю	U
042F	Я	CYRILLIC CAPITAL LETTER YA	Я	Я	A
0430	а	CYRILLIC SMALL LETTER A	а	а	a

0431	б	CYRILLIC SMALL LETTER BE	b		b
0432	В	CYRILLIC SMALL LETTER VE	v		v
0433	Г	CYRILLIC SMALL LETTER GHE	g		g
0434	Д	CYRILLIC SMALL LETTER DE	d		d
0435	е	CYRILLIC SMALL LETTER IE	e		e
0436	Ж	CYRILLIC SMALL LETTER ZHE	z	h	z
0437	З	CYRILLIC SMALL LETTER ZE	z		z
0438	И	CYRILLIC SMALL LETTER I	i		i
0439	Й	CYRILLIC SMALL LETTER SHORT I	j		j
043A	К	CYRILLIC SMALL LETTER KA	k		k
043B	Л	CYRILLIC SMALL LETTER EL	l		l
043C	М	CYRILLIC SMALL LETTER EM	m		m
043D	Н	CYRILLIC SMALL LETTER EN	n		n
043E	О	CYRILLIC SMALL LETTER O	o		o
043F	П	CYRILLIC SMALL LETTER PE	p		p
0440	Р	CYRILLIC SMALL LETTER ER	r		r
0441	С	CYRILLIC SMALL LETTER ES	s		s
0442	Т	CYRILLIC SMALL LETTER TE	t		t
0443	У	CYRILLIC SMALL LETTER U	u		u
0444	Ф	CYRILLIC SMALL LETTER EF	f		f
0445	Х	CYRILLIC SMALL LETTER HA	k	h	h
0446	Ц	CYRILLIC SMALL LETTER TSE	t	s	c
0447	Ч	CYRILLIC SMALL LETTER CHE	c	h	c

0448	Ш	CYRILLIC SMALL LETTER SHA	s	h	s		
0449	Щ	CYRILLIC SMALL LETTER SHCHA	s	h	c	h	s
044A	Ъ	CYRILLIC SMALL LETTER HARD SIGN	"		"		
044B	Ы	CYRILLIC SMALL LETTER YERU	y		y		
044C	Ь	CYRILLIC SMALL LETTER SOFT SIGN	'		'		
044D	Э	CYRILLIC SMALL LETTER E	e		e		
044E	Ю	CYRILLIC SMALL LETTER YU	y	u	u		
044F	Я	CYRILLIC SMALL LETTER YA	y	a	a		
0450		CYRILLIC SMALL LETTER IE WITH GRAVE	e	'	e		
0451	ѐ	CYRILLIC SMALL LETTER IO	e	'	e		
0452	ђ	CYRILLIC SMALL LETTER DJE	d	j	d		
0453	ѓ	CYRILLIC SMALL LETTER GJE	g	'	g		
0454	є	CYRILLIC SMALL LETTER UKRAINIAN IE	y	e	e		
0455	ѕ	CYRILLIC SMALL LETTER DZE	d	z	z		
0456	і	CYRILLIC SMALL LETTER BYELORUSSIAN-UKRAINIAN I	i	'	i		
0457	ї	CYRILLIC SMALL LETTER YI	y	i	i		
0458	ј	CYRILLIC SMALL LETTER JE	j		j		
459	љ	CYRILLIC SMALL LETTER LJE	l	j	l		
045A	њ	CYRILLIC SMALL LETTER NJE	n	j	n		
045B	ћ	CYRILLIC SMALL LETTER TSHE	c	'	c		
045C	ќ	CYRILLIC SMALL LETTER KJE	k	'	k		
045D		CYRILLIC SMALL LETTER I WITH GRAVE	i	'	i		
045E	Ѱ	CYRILLIC SMALL LETTER SHORT U	Ѱ		Ѱ		

045F	П	CYRILLIC SMALL LETTER DZHE	д	з	h	z
048C		CYRILLIC CAPITAL LETTER SEMISOFT SIGN	.			.
048D		CYRILLIC SMALL LETTER SEMISOFT SIGN	.			.
048E		CYRILLIC CAPITAL LETTER ER WITH TICK	Р			Р
048F		CYRILLIC SMALL LETTER ER WITH TICK	р			р
0490	Г	CYRILLIC CAPITAL LETTER GHE WITH UPTURN	Г	’		Г
0491	г	CYRILLIC SMALL LETTER GHE WITH UPTURN	г	’		г
0492	Ғ	CYRILLIC CAPITAL LETTER GHE WITH STROKE	Ғ	h		Ғ
0493	ғ	CYRILLIC SMALL LETTER GHE WITH STROKE	ғ	h		ғ
0494	Һ	CYRILLIC CAPITAL LETTER GHE WITH MIDDLE HOOK	Һ	h		Һ
0495	һ	CYRILLIC SMALL LETTER GHE WITH MIDDLE HOOK	һ	h		һ
0496	Ж	CYRILLIC CAPITAL LETTER ZHE WITH DESCENDER	Ж	’		Ж
0497	ж	CYRILLIC SMALL LETTER ZHE WITH DESCENDER	ж	’		ж
0498	З	CYRILLIC CAPITAL LETTER ZE WITH DESCENDER	Т	h	’	Д
0499	з	CYRILLIC SMALL LETTER ZE WITH DESCENDER	т	h	’	д
049A	Қ	CYRILLIC CAPITAL LETTER KA WITH DESCENDER	Q			Q
049B	қ	CYRILLIC SMALL LETTER KA WITH DESCENDER	q			q
049C	Ҡ	CYRILLIC CAPITAL LETTER KA WITH VERTICAL STROKE	Г	’		Г
049D	қ	CYRILLIC SMALL LETTER KA WITH VERTICAL STROKE	г	’		г
049E	Ң	CYRILLIC CAPITAL LETTER KA WITH STROKE	Q			Q
049F	ң	CYRILLIC SMALL LETTER KA WITH STROKE	q			q
04A0	Ң	CYRILLIC CAPITAL LETTER BASHKIR KA	Q			Q

04A1	К	CYRILLIC SMALL LETTER BASHKIR KA	қ	қ
04A2	Ң	CYRILLIC CAPITAL LETTER EN WITH DESCENDER	Н г ’	Н
04A3	Һ	CYRILLIC SMALL LETTER EN WITH DESCENDER	н г ’	н
04A4	Н	CYRILLIC CAPITAL LIGATURE EN GHE	Н г ’	Н
04A5	Һ	CYRILLIC SMALL LIGATURE EN GHE	н г ’	н
04A6	П	CYRILLIC CAPITAL LETTER PE WITH MIDDLE HOOK	П ’	П
04A7	п	CYRILLIC SMALL LETTER PE WITH MIDDLE HOOK	п ’	п
04A8	Ң	CYRILLIC CAPITAL LETTER ABKHASIAN HA	Н y ’	Н
04A9	ң	CYRILLIC SMALL LETTER ABKHASIAN HA	н y ’	н
04AA	С	CYRILLIC CAPITAL LETTER ES WITH DESCENDER	Т h	С
04AB	с	CYRILLIC SMALL LETTER ES WITH DESCENDER	т h	с
04AC	Т	CYRILLIC CAPITAL LETTER TE WITH DESCENDER	Т ’	Т
04AD	т	CYRILLIC SMALL LETTER TE WITH DESCENDER	т ’	т
04AE	У	CYRILLIC CAPITAL LETTER STRAIGHT U	У ’	У
04AF	у	CYRILLIC SMALL LETTER STRAIGHT U	у ’	у
04B0	Ү	CYRILLIC CAPITAL LETTER STRAIGHT U WITH STROKE	У ”	У
04B1	ү	CYRILLIC SMALL LETTER STRAIGHT U WITH STROKE	у ’	у
04B2	Х	CYRILLIC CAPITAL LETTER HA WITH DESCENDER	Н ’	Н
04B3	х	CYRILLIC SMALL LETTER HA WITH DESCENDER	н ’	н
04B4	Ң	CYRILLIC CAPITAL LIGATURE TE TSE	Т s ’	С
04B5	ң	CYRILLIC SMALL LIGATURE TE TSE	т s ’	с
04B6	Ң	CYRILLIC CAPITAL LETTER CHE WITH DESCENDER	С h ’	С
04B7	ң	CYRILLIC SMALL LETTER CHE WITH DESCENDER	с h ’	с

04B8	Ҫ	CYRILLIC CAPITAL LETTER CHE WITH VERTICAL STROKE	Ҫ	J	J
04B9	ҫ	CYRILLIC SMALL LETTER CHE WITH VERTICAL STROKE	ҫ	j	j
04BA	Һ	CYRILLIC CAPITAL LETTER SHHA	Һ	Ҳ	Ҳ
04BB	һ	CYRILLIC SMALL LETTER SHHA	һ	h	h
04BC	Ҟ	CYRILLIC CAPITAL LETTER ABKHASIAN CHE	Ҟ	Ҳ	Ҳ
04BD	ҟ	CYRILLIC SMALL LETTER ABKHASIAN CHE	ҟ	h	h
04BE	Ҡ	CYRILLIC CAPITAL LETTER ABKHASIAN CHE WITH DESCENDER	Ҡ	Ҳ	Ҳ
04BF	қ	CYRILLIC SMALL LETTER ABKHASIAN CHE WITH DESCENDER	қ	h	h
04C0	І	CYRILLIC LETTER PALOCHKA	І	h	h
04C1	Ҝ	CYRILLIC CAPITAL LETTER ZHE WITH BREVE	Ҝ	J	J
04C2	ҝ	CYRILLIC SMALL LETTER ZHE WITH BREVE	ҝ	j	j
04C3	Ҟ	CYRILLIC CAPITAL LETTER KA WITH HOOK	Ҟ	Q	Q
04C4	ҟ	CYRILLIC SMALL LETTER KA WITH HOOK	ҟ	q	q
04C7	Ҡ	CYRILLIC CAPITAL LETTER EN WITH HOOK	Ҡ	g	N
04C8	ҡ	CYRILLIC SMALL LETTER EN WITH HOOK	ҡ	g	n
04CB	Ң	CYRILLIC CAPITAL LETTER KHAKASSIAN CHE	Ң	J	J
04CC	ң	CYRILLIC SMALL LETTER KHAKASSIAN CHE	ң	j	j
04D0	Ӑ	CYRILLIC CAPITAL LETTER A WITH BREVE	Ӑ	A	A
04D1	ӑ	CYRILLIC SMALL LETTER A WITH BREVE	ӑ	a	a
04D2	Ӓ	CYRILLIC CAPITAL LETTER A WITH DIAERESIS	Ӓ	A	A
04D3	ӓ	CYRILLIC SMALL LETTER A WITH DIAERESIS	ӓ	a	a
04D4	Ӕ	CYRILLIC CAPITAL LIGATURE A IE	Ӕ	A e	A

04D5	ӕ	CYRILLIC SMALL LIGATURE A IE	a e	a
04D6	Ё	CYRILLIC CAPITAL LETTER IE WITH BREVE	Ё	Е
04D7	ё	CYRILLIC SMALL LETTER IE WITH BREVE	ё	е
04D8	Ә	CYRILLIC CAPITAL LETTER SCHWA	Ӑ	Ӑ
04D9	ә	CYRILLIC SMALL LETTER SCHWA	ӑ	ӑ
04DA	Ӑ	CYRILLIC CAPITAL LETTER SCHWA WITH DIAERESIS	Ӑ	Ӑ
04DB	ӑ	CYRILLIC SMALL LETTER SCHWA WITH DIAERESIS	ӑ	ӑ
04DC	Ӓ	CYRILLIC CAPITAL LETTER ZHE WITH DIAERESIS	Ӓ	J
04DD	ӓ	CYRILLIC SMALL LETTER ZHE WITH DIAERESIS	ӓ	j
04DE	Ӕ	CYRILLIC CAPITAL LETTER ZE WITH DIAERESIS	Ӕ	Z
04DF	ӕ	CYRILLIC SMALL LETTER ZE WITH DIAERESIS	ӕ	z
04E0	Ӧ	CYRILLIC CAPITAL LETTER ABKHASIAN DZE	Ӧ	Z
04E1	ӧ	CYRILLIC SMALL LETTER ABKHASIAN DZE	ӧ	z
04E2	Ө	CYRILLIC CAPITAL LETTER I WITH MACRON	Ө	I
04E3	ө	CYRILLIC SMALL LETTER I WITH MACRON	ө	i
04E4	Ӫ	CYRILLIC CAPITAL LETTER I WITH DIAERESIS	Ӫ	I
04E5	ӫ	CYRILLIC SMALL LETTER I WITH DIAERESIS	ӫ	i
04E6	Ӭ	CYRILLIC CAPITAL LETTER O WITH DIAERESIS	Ӭ	O
04E7	ӭ	CYRILLIC SMALL LETTER O WITH DIAERESIS	ӭ	o
04E8	Ӯ	CYRILLIC CAPITAL LETTER BARRED O	Ӯ	O
04E9	ӯ	CYRILLIC SMALL LETTER BARRED O	ӯ	o
04EA	Ӱ	CYRILLIC CAPITAL LETTER BARRED O WITH DIAERESIS	Ӱ	O
04EB	ӱ	CYRILLIC SMALL LETTER BARRED O WITH DIAERESIS	ӱ	o

04EC		CYRILLIC CAPITAL LETTER BARRED E WITH DIAERESIS	Е " "		Е
04ED		CYRILLIC SMALL LETTER BARRED E WITH DIAERESIS	е " "		е
04EE	Ѣ	CYRILLIC CAPITAL LETTER U WITH MACRON	У ' '		У
04EF	ѣ	CYRILLIC SMALL LETTER U WITH MACRON	у ' '		у
04F0	Ѥ	CYRILLIC CAPITAL LETTER U WITH DIAERESIS	У ' '		У
04F1	ѥ	CYRILLIC SMALL LETTER U WITH DIAERESIS	у ' '		у
04F2	Ѧ	CYRILLIC CAPITAL LETTER U WITH DOUBLE ACUTE	У ' '		У
04F3	ѧ	CYRILLIC SMALL LETTER U WITH DOUBLE ACUTE	у ' '		у
04F4	Ѩ	CYRILLIC CAPITAL LETTER CHE WITH DIAERESIS	С h ' '		С
04F5	ѩ	CYRILLIC SMALL LETTER CHE WITH DIAERESIS	с h ' '		с
04F8	Ѫ	CYRILLIC CAPITAL LETTER YERU WITH DIAERESIS	Y ' '		Y
04F9	ѫ	CYRILLIC SMALL LETTER YERU WITH DIAERESIS	y ' '		y
1E02	Ḃ	LATIN CAPITAL LETTER B WITH DOT ABOVE	B		B
1E03	ḃ	LATIN SMALL LETTER B WITH DOT ABOVE	b		b
1E0A	Ḑ	LATIN CAPITAL LETTER D WITH DOT ABOVE	D		D
1E0B	ḑ	LATIN SMALL LETTER D WITH DOT ABOVE	d		d
1E1E	Ṕ	LATIN CAPITAL LETTER F WITH DOT ABOVE	F		F
1E1F	ṑ	LATIN SMALL LETTER F WITH DOT ABOVE	f		f
1E40	Ṣ	LATIN CAPITAL LETTER M WITH DOT ABOVE	M		M
1E41	ṣ	LATIN SMALL LETTER M WITH DOT ABOVE	m		m
1E56	Ṗ	LATIN CAPITAL LETTER P WITH DOT ABOVE	P		P
1E57	ṗ	LATIN SMALL LETTER P WITH DOT ABOVE	p		p
1E60	Ṡ	LATIN CAPITAL LETTER S WITH DOT ABOVE	S		S

1E61	Ŧ	LATIN SMALL LETTER S WITH DOT ABOVE	Ŧ		Ŧ
1E6A	Ṭ	LATIN CAPITAL LETTER T WITH DOT ABOVE	Ṭ		Ṭ
1E6B	ṭ	LATIN SMALL LETTER T WITH DOT ABOVE	ṭ		ṭ
1E80	Ẁ	LATIN CAPITAL LETTER W WITH GRAVE	Ẁ		Ẁ
1E81	ẁ	LATIN SMALL LETTER W WITH GRAVE	ẁ		ẁ
1E82	Ẃ	LATIN CAPITAL LETTER W WITH ACUTE	Ẃ		Ẃ
1E83	ẃ	LATIN SMALL LETTER W WITH ACUTE	ẃ		ẃ
1E84	Ẅ	LATIN CAPITAL LETTER W WITH DIAERESIS	Ẅ		Ẅ
1E85	ẅ	LATIN SMALL LETTER W WITH DIAERESIS	ẅ		ẅ
1E9B	ƒ	LATIN SMALL LETTER LONG S WITH DOT ABOVE	ſ		ſ
1EF2	Ỳ	LATIN CAPITAL LETTER Y WITH GRAVE	Ỳ		Ỳ
1EF3	ỳ	LATIN SMALL LETTER Y WITH GRAVE	ỳ		ỳ
1F00	ᾀ	GREEK SMALL LETTER ALPHA WITH PSILI	ᾀ		ᾀ
1F01	ᾁ	GREEK SMALL LETTER ALPHA WITH DASIA	ᾁ		ᾁ
1F02	ᾂ	GREEK SMALL LETTER ALPHA WITH PSILI AND VARIA	ᾂ		ᾂ
1F03	ᾃ	GREEK SMALL LETTER ALPHA WITH DASIA AND VARIA	ᾃ		ᾃ
1F04	ᾄ	GREEK SMALL LETTER ALPHA WITH PSILI AND OXIA	ᾄ		ᾄ
1F05	ᾅ	GREEK SMALL LETTER ALPHA WITH DASIA AND OXIA	ᾅ		ᾅ
1F06	ᾆ	GREEK SMALL LETTER ALPHA WITH PSILI AND PERISPOMENI	ᾆ		ᾆ
1F07	ᾇ	GREEK SMALL LETTER ALPHA WITH DASIA AND PERISPOMENI	ᾇ		ᾇ
1F08	Ἀ	GREEK CAPITAL LETTER ALPHA WITH PSILI	Ἀ		Ἀ
1F09	Ἀ	GREEK CAPITAL LETTER ALPHA WITH DASIA	Ἀ		Ἀ
1F0A	Ἀ	GREEK CAPITAL LETTER ALPHA WITH PSILI AND VARIA	Ἀ		Ἀ

1F3C	Ͱͱ	GREEK CAPITAL LETTER IOTA WITH PSILI AND OXIA	ͱ	ͱ
1F3D	Ͱͱ̂	GREEK CAPITAL LETTER IOTA WITH DASIA AND OXIA	ͱ̂	ͱ̂
1F3E	Ͱͱ͂	GREEK CAPITAL LETTER IOTA WITH PSILI AND PERISPOMENI	ͱ͂	ͱ͂
1F3F	Ͱͱ͂̂	GREEK CAPITAL LETTER IOTA WITH DASIA AND PERISPOMENI	ͱ͂̂	ͱ͂̂
1F40	ͰͲ̂	GREEK SMALL LETTER OMICRON WITH PSILI	Ͳ̂	Ͳ̂
1F41	ͰͲ̂̂	GREEK SMALL LETTER OMICRON WITH DASIA	Ͳ̂̂	Ͳ̂̂
1F42	ͰͲ̂͂	GREEK SMALL LETTER OMICRON WITH PSILI AND VARIA	Ͳ̂͂	Ͳ̂͂
1F43	ͰͲ̂͂̂	GREEK SMALL LETTER OMICRON WITH DASIA AND VARIA	Ͳ̂͂̂	Ͳ̂͂̂
1F44	ͰͲ̂͂͂̂	GREEK SMALL LETTER OMICRON WITH PSILI AND OXIA	Ͳ̂͂͂̂	Ͳ̂͂͂̂
1F45	ͰͲ̂͂͂̂̂	GREEK SMALL LETTER OMICRON WITH DASIA AND OXIA	Ͳ̂͂͂̂̂	Ͳ̂͂͂̂̂
1F48	Ͱͳ̂	GREEK CAPITAL LETTER OMICRON WITH PSILI	ͳ̂	ͳ̂
1F49	Ͱͳ̂̂	GREEK CAPITAL LETTER OMICRON WITH DASIA	ͳ̂̂	ͳ̂̂
1F4A	Ͱͳ̂͂	GREEK CAPITAL LETTER OMICRON WITH PSILI AND VARIA	ͳ̂͂	ͳ̂͂
1F4B	Ͱͳ̂͂̂	GREEK CAPITAL LETTER OMICRON WITH DASIA AND VARIA	ͳ̂͂̂	ͳ̂͂̂
1F4C	Ͱͳ̂͂͂̂	GREEK CAPITAL LETTER OMICRON WITH PSILI AND OXIA	ͳ̂͂͂̂	ͳ̂͂͂̂
1F4D	Ͱͳ̂͂͂̂̂	GREEK CAPITAL LETTER OMICRON WITH DASIA AND OXIA	ͳ̂͂͂̂̂	ͳ̂͂͂̂̂
1F50	Ͱʹ̂	GREEK SMALL LETTER UPSILON WITH PSILI	ʹ̂	ʹ̂
1F51	Ͱʹ̂̂	GREEK SMALL LETTER UPSILON WITH DASIA	ʹ̂̂	ʹ̂̂
1F52	Ͱʹ̂͂	GREEK SMALL LETTER UPSILON WITH PSILI AND VARIA	ʹ̂͂	ʹ̂͂
1F53	Ͱʹ̂͂̂	GREEK SMALL LETTER UPSILON WITH DASIA AND VARIA	ʹ̂͂̂	ʹ̂͂̂
1F54	Ͱʹ̂͂͂̂	GREEK SMALL LETTER UPSILON WITH PSILI AND OXIA	ʹ̂͂͂̂	ʹ̂͂͂̂
1F55	Ͱʹ̂͂͂̂̂	GREEK SMALL LETTER UPSILON WITH DASIA AND OXIA	ʹ̂͂͂̂̂	ʹ̂͂͂̂̂

1F56	Ͱ͵̂	GREEK SMALL LETTER UPSILON WITH PSILI AND PERISPOMENI	͵̂	͵̂
1F57	Ͱ͵̂̂	GREEK SMALL LETTER UPSILON WITH DASIA AND PERISPOMENI	͵̂̂	͵̂̂
1F59	ͰͶ̂	GREEK CAPITAL LETTER UPSILON WITH DASIA	Ͷ̂	Ͷ̂
1F5B	ͰͶ̂̂	GREEK CAPITAL LETTER UPSILON WITH DASIA AND VARIA	Ͷ̂̂	Ͷ̂̂
1F5D	ͰͶ̂͂	GREEK CAPITAL LETTER UPSILON WITH DASIA AND OXIA	Ͷ̂͂	Ͷ̂͂
1F5F	ͰͶ̂͂̂	GREEK CAPITAL LETTER UPSILON WITH DASIA AND PERISPOMENI	Ͷ̂͂̂	Ͷ̂͂̂
1F60	Ͱͷ̂	GREEK SMALL LETTER OMEGA WITH PSILI	ͷ̂	ͷ̂
1F61	Ͱͷ̂̂	GREEK SMALL LETTER OMEGA WITH DASIA	ͷ̂̂	ͷ̂̂
1F62	Ͱͷ̂͂	GREEK SMALL LETTER OMEGA WITH PSILI AND VARIA	ͷ̂͂	ͷ̂͂
1F63	Ͱͷ̂͂̂	GREEK SMALL LETTER OMEGA WITH DASIA AND VARIA	ͷ̂͂̂	ͷ̂͂̂
1F64	Ͱͷ̂͂͂̂	GREEK SMALL LETTER OMEGA WITH PSILI AND OXIA	ͷ̂͂͂̂	ͷ̂͂͂̂
1F65	Ͱͷ̂͂͂̂̂	GREEK SMALL LETTER OMEGA WITH DASIA AND OXIA	ͷ̂͂͂̂̂	ͷ̂͂͂̂̂
1F66	Ͱͷ̂͂͂̂̂̂	GREEK SMALL LETTER OMEGA WITH PSILI AND PERISPOMENI	ͷ̂͂͂̂̂̂	ͷ̂͂͂̂̂̂
1F67	Ͱͷ̂͂͂̂̂̂̂	GREEK SMALL LETTER OMEGA WITH DASIA AND PERISPOMENI	ͷ̂͂͂̂̂̂̂	ͷ̂͂͂̂̂̂̂
1F68	Ͱ͸̂	GREEK CAPITAL LETTER OMEGA WITH PSILI	͸̂	͸̂
1F69	Ͱ͸̂̂	GREEK CAPITAL LETTER OMEGA WITH DASIA	͸̂̂	͸̂̂
1F6A	Ͱ͸̂͂	GREEK CAPITAL LETTER OMEGA WITH PSILI AND VARIA	͸̂͂	͸̂͂
1F6B	Ͱ͸̂͂̂	GREEK CAPITAL LETTER OMEGA WITH DASIA AND VARIA	͸̂͂̂	͸̂͂̂
1F6C	Ͱ͸̂͂̂̂	GREEK CAPITAL LETTER OMEGA WITH PSILI AND OXIA	͸̂͂̂̂	͸̂͂̂̂
1F6D	Ͱ͸̂͂̂̂̂	GREEK CAPITAL LETTER OMEGA WITH DASIA AND OXIA	͸̂͂̂̂̂	͸̂͂̂̂̂
1F6E	Ͱ͸̂͂̂̂̂̂	GREEK CAPITAL LETTER OMEGA WITH PSILI AND PERISPOMENI	͸̂͂̂̂̂̂	͸̂͂̂̂̂̂
1F6F	Ͱ͸̂͂̂̂̂̂̂	GREEK CAPITAL LETTER OMEGA WITH DASIA AND PERISPOMENI	͸̂͂̂̂̂̂̂	͸̂͂̂̂̂̂̂

1F70	ἄ	GREEK SMALL LETTER ALPHA WITH VARIA	α		α
1F71	ᾰ	GREEK SMALL LETTER ALPHA WITH OXIA	α		α
1F72	ἐ	GREEK SMALL LETTER EPSILON WITH VARIA	ε		ε
1F73	ἐ	GREEK SMALL LETTER EPSILON WITH OXIA	ε		ε
1F74	ἥ	GREEK SMALL LETTER ETA WITH VARIA	ἥ -		ἥ
1F75	ἦ	GREEK SMALL LETTER ETA WITH OXIA	ἦ -		ἦ
1F76	ἰ	GREEK SMALL LETTER IOTA WITH VARIA	ἰ		ἰ
1F77	ἱ	GREEK SMALL LETTER IOTA WITH OXIA	ἱ		ἱ
1F78	ὀ	GREEK SMALL LETTER OMICRON WITH VARIA	ο		ο
1F79	ό	GREEK SMALL LETTER OMICRON WITH OXIA	ο		ο
1F7A	ύ	GREEK SMALL LETTER UPSILON WITH VARIA	υ		υ
1F7B	ύ	GREEK SMALL LETTER UPSILON WITH OXIA	υ		υ
1F7C	ὦ	GREEK SMALL LETTER OMEGA WITH VARIA	ο -		ο
1F7D	ώ	GREEK SMALL LETTER OMEGA WITH OXIA	ο -		ο
1F80	ᾱ	GREEK SMALL LETTER ALPHA WITH PSILI AND YPOGEGRAMMENI	α		α
1F81	ᾰ	GREEK SMALL LETTER ALPHA WITH DASIA AND YPOGEGRAMMENI	α		α
1F82	ᾱ̣	GREEK SMALL LETTER ALPHA WITH PSILI AND VARIA AND YPOGEGRAMMENI	α		α
1F83	ᾱ̣	GREEK SMALL LETTER ALPHA WITH DASIA AND VARIA AND YPOGEGRAMMENI	α		α
1F84	ῥᾱ	GREEK SMALL LETTER ALPHA WITH PSILI AND OXIA AND YPOGEGRAMMENI	α		α
1F85	ῥᾱ̣	GREEK SMALL LETTER ALPHA WITH DASIA AND OXIA AND YPOGEGRAMMENI	α		α
1F86	ῥᾱ̣	GREEK SMALL LETTER ALPHA WITH PSILI AND PERISPOMENI AND YPOGEGRAMMENI	α		α

1F87	ᾗ	GREEK SMALL LETTER ALPHA WITH DASIA AND PERISPOMENI AND YPOGEGRAMMENI	α		α
1F88	Ἀ	GREEK CAPITAL LETTER ALPHA WITH PSILI AND PROSGEGRAMMENI	Α		Α
1F89	Ἀ	GREEK CAPITAL LETTER ALPHA WITH DASIA AND PROSGEGRAMMENI	Α		Α
1F8A	Ἀ	GREEK CAPITAL LETTER ALPHA WITH PSILI AND VARIA AND PROSGEGRAMMENI	Α		Α
1F8B	Ἀ	GREEK CAPITAL LETTER ALPHA WITH DASIA AND VARIA AND PROSGEGRAMMENI	Α		Α
1F8C	Ἀ	GREEK CAPITAL LETTER ALPHA WITH PSILI AND OXIA AND PROSGEGRAMMENI	Α		Α
1F8D	Ἀ	GREEK CAPITAL LETTER ALPHA WITH DASIA AND OXIA AND PROSGEGRAMMENI	Α		Α
1F8E	Ἀ	GREEK CAPITAL LETTER ALPHA WITH PSILI AND PERISPOMENI AND PROSGEGRAMMENI	Α		Α
1F8F	Ἀ	GREEK CAPITAL LETTER ALPHA WITH DASIA AND PERISPOMENI AND PROSGEGRAMMENI	Α		Α
1F90	Ὶ	GREEK SMALL LETTER ETA WITH PSILI AND YPOGEGRAMMENI	ἥ -		ἥ
1F91	Ὶ	GREEK SMALL LETTER ETA WITH DASIA AND YPOGEGRAMMENI	ἥ -		ἥ
1F92	Ὶ	GREEK SMALL LETTER ETA WITH PSILI AND VARIA AND YPOGEGRAMMENI	ἥ -		ἥ
1F93	Ὶ	GREEK SMALL LETTER ETA WITH DASIA AND VARIA AND YPOGEGRAMMENI	ἥ -		ἥ
1F94	Ὶ̣	GREEK SMALL LETTER ETA WITH PSILI AND OXIA AND YPOGEGRAMMENI	ἥ -		ἥ
1F95	Ὶ̣	GREEK SMALL LETTER ETA WITH DASIA AND OXIA AND YPOGEGRAMMENI	ἥ -		ἥ
1F96	Ὶ̣	GREEK SMALL LETTER ETA WITH PSILI AND PERISPOMENI AND YPOGEGRAMMENI	ἥ -		ἥ
1F97	Ὶ̣	GREEK SMALL LETTER ETA WITH DASIA AND PERISPOMENI AND YPOGEGRAMMENI	ἥ -		ἥ
1F98	Ὶ̣	GREEK CAPITAL LETTER ETA WITH PSILI AND PROSGEGRAMMENI	Ἠ -		Ἠ

1F99	Ἠ	GREEK CAPITAL LETTER ETA WITH DASIA AND PROSGEGRAMMENI	I -	I
1F9A	Ἡ	GREEK CAPITAL LETTER ETA WITH PSILI AND VARIA AND PROSGEGRAMMENI	I -	I
1F9B	Ἢ	GREEK CAPITAL LETTER ETA WITH DASIA AND VARIA AND PROSGEGRAMMENI	I -	I
1F9C	Ἣ	GREEK CAPITAL LETTER ETA WITH PSILI AND OXIA AND PROSGEGRAMMENI	I -	I
1F9D	Ἤ	GREEK CAPITAL LETTER ETA WITH DASIA AND OXIA AND PROSGEGRAMMENI	I -	I
1F9E	Ἥ	GREEK CAPITAL LETTER ETA WITH PSILI AND PERISPOMENI AND PROSGEGRAMMENI	I -	I
1F9F	Ἰ	GREEK CAPITAL LETTER ETA WITH DASIA AND PERISPOMENI AND PROSGEGRAMMENI	I -	I
1FA0	Ῐ	GREEK SMALL LETTER OMEGA WITH PSILI AND YPOGEGRAMMENI	O -	O
1FA1	Ῑ	GREEK SMALL LETTER OMEGA WITH DASIA AND YPOGEGRAMMENI	O -	O
1FA2	Ὶ	GREEK SMALL LETTER OMEGA WITH PSILI AND VARIA AND YPOGEGRAMMENI	O -	O
1FA3	Ί	GREEK SMALL LETTER OMEGA WITH DASIA AND VARIA AND YPOGEGRAMMENI	O -	O
1FA4	῜	GREEK SMALL LETTER OMEGA WITH PSILI AND OXIA AND YPOGEGRAMMENI	O -	O
1FA5	῝	GREEK SMALL LETTER OMEGA WITH DASIA AND OXIA AND YPOGEGRAMMENI	O -	O
1FA6	῞	GREEK SMALL LETTER OMEGA WITH PSILI AND PERISPOMENI AND YPOGEGRAMMENI	O -	O
1FA7	῟	GREEK SMALL LETTER OMEGA WITH DASIA AND PERISPOMENI AND YPOGEGRAMMENI	O -	O
1FA8	Ω	GREEK CAPITAL LETTER OMEGA WITH PSILI AND PROSGEGRAMMENI	O -	O
1FA9	Ϟ	GREEK CAPITAL LETTER OMEGA WITH DASIA AND PROSGEGRAMMENI	O -	O

1FAA	Ϛ	GREEK CAPITAL LETTER OMEGA WITH PSILI AND VARIA AND PROSGEGRAMMENI	O -	O
1FAB	ϛ	GREEK CAPITAL LETTER OMEGA WITH DASIA AND VARIA AND PROSGEGRAMMENI	O -	O
1FAC	Ϝ	GREEK CAPITAL LETTER OMEGA WITH PSILI AND OXIA AND PROSGEGRAMMENI	O -	O
1FAD	ϝ	GREEK CAPITAL LETTER OMEGA WITH DASIA AND OXIA AND PROSGEGRAMMENI	O -	O
1FAE	Ϟ	GREEK CAPITAL LETTER OMEGA WITH PSILI AND PERISPOMENI AND PROSGEGRAMMENI	O -	O
1FAF	ϟ	GREEK CAPITAL LETTER OMEGA WITH DASIA AND PERISPOMENI AND PROSGEGRAMMENI	O -	O
1FB0	α	GREEK SMALL LETTER ALPHA WITH VRACHY	α	α
1FB1	ᾀ	GREEK SMALL LETTER ALPHA WITH MACRON	α	α
1FB2	ᾁ	GREEK SMALL LETTER ALPHA WITH VARIA AND YPOGEGRAMMENI	α	α
1FB3	ᾂ	GREEK SMALL LETTER ALPHA WITH YPOGEGRAMMENI	α	α
1FB4	ᾃ	GREEK SMALL LETTER ALPHA WITH OXIA AND YPOGEGRAMMENI	α	α
1FB6	ᾄ	GREEK SMALL LETTER ALPHA WITH PERISPOMENI	α	α
1FB7	ᾅ	GREEK SMALL LETTER ALPHA WITH PERISPOMENI AND YPOGEGRAMMENI	α	α
1FB8	ᾆ	GREEK CAPITAL LETTER ALPHA WITH VRACHY	Α	Α
1FB9	ᾇ	GREEK CAPITAL LETTER ALPHA WITH MACRON	Α	Α
1FBA	ᾈ	GREEK CAPITAL LETTER ALPHA WITH VARIA	Α	Α
1FBB	ᾉ	GREEK CAPITAL LETTER ALPHA WITH OXIA	Α	Α
1FBC	ᾊ	GREEK CAPITAL LETTER ALPHA WITH PROSGEGRAMMENI	Α	Α
1FBD	,	GREEK KORONIS	.	.
1FBE	·	GREEK PROSGEGRAMMENI	.	.

1FBF	Ϳ	GREEK PSILI	Ϳ	Ϳ	Ϳ
1FC0	Ͱ	GREEK PERISPOMENI	Ͱ	Ͱ	Ͱ
1FC1	ͱ	GREEK DIALYTIKA AND PERISPOMENI	ͱ	ͱ	ͱ
1FC2	Ͳ	GREEK SMALL LETTER ETA WITH VARIA AND YPOGEGRAMMENI	Ͳ	Ͳ	Ͳ
1FC3	ͳ	GREEK SMALL LETTER ETA WITH YPOGEGRAMMENI	ͳ	ͳ	ͳ
1FC4	ʹ	GREEK SMALL LETTER ETA WITH OXIA AND YPOGEGRAMMENI	ʹ	ʹ	ʹ
1FC6	͵	GREEK SMALL LETTER ETA WITH PERISPOMENI	͵	͵	͵
1FC7	Ͷ	GREEK SMALL LETTER ETA WITH PERISPOMENI AND YPOGEGRAMMENI	Ͷ	Ͷ	Ͷ
1FC8	ͷ	GREEK CAPITAL LETTER EPSILON WITH VARIA	ͷ	ͷ	ͷ
1FC9	͸	GREEK CAPITAL LETTER EPSILON WITH OXIA	͸	͸	͸
1FCA	͹	GREEK CAPITAL LETTER ETA WITH VARIA	͹	͹	͹
1FCB	ͺ	GREEK CAPITAL LETTER ETA WITH OXIA	ͺ	ͺ	ͺ
1FCC	ͻ	GREEK CAPITAL LETTER ETA WITH PROSGEGRAMMENI	ͻ	ͻ	ͻ
1FCD	ͼ	GREEK PSILI AND VARIA	ͼ	ͼ	ͼ
1FCE	ͽ	GREEK PSILI AND OXIA	ͽ	ͽ	ͽ
1FCF	Ϳ	GREEK PSILI AND PERISPOMENI	Ϳ	Ϳ	Ϳ
1FD0	Ͱ	GREEK SMALL LETTER IOTA WITH VRACHY	Ͱ	Ͱ	Ͱ
1FD1	ͱ	GREEK SMALL LETTER IOTA WITH MACRON	ͱ	ͱ	ͱ
1FD2	Ͳ	GREEK SMALL LETTER IOTA WITH DIALYTIKA AND VARIA	Ͳ	Ͳ	Ͳ
1FD3	ͳ	GREEK SMALL LETTER IOTA WITH DIALYTIKA AND OXIA	ͳ	ͳ	ͳ
1FD6	ʹ	GREEK SMALL LETTER IOTA WITH PERISPOMENI	ʹ	ʹ	ʹ
1FD7	͵	GREEK SMALL LETTER IOTA WITH DIALYTIKA AND PERISPOMENI	͵	͵	͵

1FD8	Ͷ	GREEK CAPITAL LETTER IOTA WITH VRACHY	Ͷ	Ͷ	Ͷ
1FD9	ͷ	GREEK CAPITAL LETTER IOTA WITH MACRON	ͷ	ͷ	ͷ
1FDA	͸	GREEK CAPITAL LETTER IOTA WITH VARIA	͸	͸	͸
1FDB	͹	GREEK CAPITAL LETTER IOTA WITH OXIA	͹	͹	͹
1FDD	ͺ	GREEK DASIA AND VARIA	ͺ	ͺ	ͺ
1FDE	ͻ	GREEK DASIA AND OXIA	ͻ	ͻ	ͻ
1FDF	ͼ	GREEK DASIA AND PERISPOMENI	ͼ	ͼ	ͼ
1FE0	ͽ	GREEK SMALL LETTER UPSILON WITH VRACHY	ͽ	ͽ	ͽ
1FE1	Ϳ	GREEK SMALL LETTER UPSILON WITH MACRON	Ϳ	Ϳ	Ϳ
1FE2	Ͱ	GREEK SMALL LETTER UPSILON WITH DIALYTIKA AND VARIA	Ͱ	Ͱ	Ͱ
1FE3	ͱ	GREEK SMALL LETTER UPSILON WITH DIALYTIKA AND OXIA	ͱ	ͱ	ͱ
1FE4	Ͳ	GREEK SMALL LETTER RHO WITH PSILI	Ͳ	Ͳ	Ͳ
1FE5	ͳ	GREEK SMALL LETTER RHO WITH DASIA	ͳ	ͳ	ͳ
1FE6	ʹ	GREEK SMALL LETTER UPSILON WITH PERISPOMENI	ʹ	ʹ	ʹ
1FE7	͵	GREEK SMALL LETTER UPSILON WITH DIALYTIKA AND PERISPOMENI	͵	͵	͵
1FE8	Ͷ	GREEK CAPITAL LETTER UPSILON WITH VRACHY	Ͷ	Ͷ	Ͷ
1FE9	ͷ	GREEK CAPITAL LETTER UPSILON WITH MACRON	ͷ	ͷ	ͷ
1FEA	͸	GREEK CAPITAL LETTER UPSILON WITH VARIA	͸	͸	͸
1FEB	͹	GREEK CAPITAL LETTER UPSILON WITH OXIA	͹	͹	͹
1FEC	ͺ	GREEK CAPITAL LETTER RHO WITH DASIA	ͺ	ͺ	ͺ
1FED	ͻ	GREEK DIALYTIKA AND VARIA	ͻ	ͻ	ͻ
1FEE	ͼ	GREEK DIALYTIKA AND OXIA	ͼ	ͼ	ͼ
1FEF	ͽ	GREEK VARIA	ͽ	ͽ	ͽ

1FF2	Ω̣	GREEK SMALL LETTER OMEGA WITH VARIA AND YPOGEGRAMMENI	Ω -	Ω
1FF3	Ω̣̂	GREEK SMALL LETTER OMEGA WITH YPOGEGRAMMENI	Ω -	Ω
1FF4	Ω̣̇	GREEK SMALL LETTER OMEGA WITH OXIA AND YPOGEGRAMMENI	Ω -	Ω
1FF6	Ω̣̈́	GREEK SMALL LETTER OMEGA WITH PERISPOMENI	Ω -	Ω
1FF7	Ω̣̉	GREEK SMALL LETTER OMEGA WITH PERISPOMENI AND YPOGEGRAMMENI	Ω -	Ω
1FF8	Ω̣̊	GREEK CAPITAL LETTER OMICRON WITH VARIA	Ω	Ω
1FF9	Ω̣̋	GREEK CAPITAL LETTER OMICRON WITH OXIA	Ω	Ω
1FFA	Ω̣̌	GREEK CAPITAL LETTER OMEGA WITH VARIA	Ω -	Ω
1FFB	Ω̣̍	GREEK CAPITAL LETTER OMEGA WITH OXIA	Ω -	Ω
1FFC	Ω̣̎	GREEK CAPITAL LETTER OMEGA WITH PROSGEGRAMMENI	Ω -	Ω
1FFD	Ω̣̏	GREEK OXIA	Ω̣̏	Ω̣̏
1FFE	Ω̣̐	GREEK DASIA	Ω̣̐	Ω̣̐
2013	—	EN DASH	-	-
2014	—	EM DASH	-	-
2015	—	HORIZONTAL BAR	-	-
2017	—	DOUBLE LOW LINE	—	—
2018	‘	LEFT SINGLE QUOTATION MARK	"	"
2019	’	RIGHT SINGLE QUOTATION MARK	"	"
201A	‚	SINGLE LOW-9 QUOTATION MARK	"	"
201B	‘	SINGLE HIGH-REVERSED-9 QUOTATION MARK	"	"
201C	“	LEFT DOUBLE QUOTATION MARK	"	"
201D	”	RIGHT DOUBLE QUOTATION MARK	"	"

201E	”	DOUBLE LOW-9 QUOTATION MARK	"	"
2020	‡	DAGGER	+	+
2021	‡	DOUBLE DAGGER	+	+
2022	•	BULLET	*	*
2026	…	HORIZONTAL ELLIPSIS	. . .	.
2030	‰	PER MILLE SIGN	1 / 0 0 0	.
2032	’	PRIME	’	’
2033	″	DOUBLE PRIME	"	"
2039	◁	SINGLE LEFT-POINTING ANGLE QUOTATION MARK	<	<
203A	▷	SINGLE RIGHT-POINTING ANGLE QUOTATION MARK	>	>
203C	!!	DOUBLE EXCLAMATION MARK	! !	!
203E	—	OVERLINE	.	.
2044	/	FRACTION SLASH	/	/
204A		TIRONIAN ET SIGN	&	&
207F	Ꝁ	SUPERSCRIPIT LATIN SMALL LETTER N	n	n
2082	₂	SUBSCRIPT TWO	₂	₂
20A3	₣	FRENCH FRANC SIGN	₣ r a n c	₣
20A4	₧	LIRA SIGN	₧ i r a	₧
20A7	₧	PESETA SIGN	₧ e s e t a	₧
20AC	€	EURO SIGN	€ U R	€
20AF		DRACHMA SIGN	.	.
2105	¢	CARE OF	¢ / o	.
2116	№	NUMERO SIGN	№ o	№

2122	$\mathbb{M}$	TRADE MARK SIGN	$\mathbb{T}$ $\mathbb{M}$	.
2126	Ω	OHM SIGN	$\mathbb{O}$ $\mathbb{h}$ $\mathbb{m}$	.
215B	$\frac{1}{8}$	VULGAR FRACTION ONE EIGHTH	$\mathbb{1}$ $\mathbb{/}$ $\mathbb{8}$	.
215C	$\frac{3}{8}$	VULGAR FRACTION THREE EIGHTHS	$\mathbb{3}$ $\mathbb{/}$ $\mathbb{8}$	.
215D	$\frac{5}{8}$	VULGAR FRACTION FIVE EIGHTHS	$\mathbb{5}$ $\mathbb{/}$ $\mathbb{8}$	.
215E	$\frac{7}{8}$	VULGAR FRACTION SEVEN EIGHTHS	$\mathbb{7}$ $\mathbb{/}$ $\mathbb{8}$	.
2190	$\leftarrow$	LEFTWARDS ARROW	$\mathbb{<}$ $\mathbb{-}$	$\mathbb{<}$
2191	$\uparrow$	UPWARDS ARROW	$\mathbb{A}$	$\mathbb{A}$
2192	$\rightarrow$	RIGHTWARDS ARROW	$\mathbb{-}$ $\mathbb{>}$	$\mathbb{>}$
2193	$\downarrow$	DOWNWARDS ARROW	$\mathbb{V}$	$\mathbb{V}$
2194	$\leftrightarrow$	LEFT RIGHT ARROW	$\mathbb{-}$ $\mathbb{>}$	.
2195	$\Uparrow$	UP DOWN ARROW	.	.
21A8	$\Downarrow$	UP DOWN ARROW WITH BASE	.	.
2200	$\forall$	FOR ALL	.	.
2202	∂	PARTIAL DIFFERENTIAL	.	.
2203	$\exists$	THERE EXISTS	.	.
2206	Δ	INCREMENT	.	.
2208	$\in$	ELEMENT OF	.	.
2209	$\notin$	NOT AN ELEMENT OF	.	.
220F	$\prod$	N-ARY PRODUCT	$\mathbb{P}$ $\mathbb{r}$ $\mathbb{o}$ $\mathbb{d}$	.
2211	$\sum$	N-ARY SUMMATION	$\mathbb{S}$ $\mathbb{u}$ $\mathbb{m}$	.
2212	$-$	MINUS SIGN	$\mathbb{-}$	$\mathbb{-}$
2219	$\bullet$	BULLET OPERATOR	.	.

221A	$\surd$	SQUARE ROOT	.	.
221E	∞	INFINITY	.	.
221F	$\perp$	RIGHT ANGLE	.	.
2227	$\wedge$	LOGICAL AND	$\mathbb{.}$ $\mathbb{A}$ $\mathbb{N}$ $\mathbb{D}$ $\mathbb{.}$	.
2228	$\vee$	LOGICAL OR	$\mathbb{.}$ $\mathbb{O}$ $\mathbb{R}$ $\mathbb{.}$	.
2229	$\cap$	INTERSECTION	.	.
222A	$\cup$	UNION	.	.
222B	$\int$	INTEGRAL	.	.
2248	$\approx$	ALMOST EQUAL TO	.	.
2259	$\triangleq$	ESTIMATES	.	.
2260	$\neq$	NOT EQUAL TO	.	.
2261	$\equiv$	IDENTICAL TO	.	.
2264	$\leq$	LESS-THAN OR EQUAL TO	.	.
2265	$\geq$	GREATER-THAN OR EQUAL TO	.	.
2282	$\subset$	SUBSET OF	.	.
2283	$\supset$	SUPERSET OF	.	.
2295	$\oplus$	CIRCLED PLUS	.	.
2297	$\otimes$	CIRCLED TIMES	.	.
2302	$\oslash$	HOUSE	.	.
2310	$\rceil$	REVERSED NOT SIGN	.	.
2320	$\int$	TOP HALF INTEGRAL	.	.
2321	$\int$	BOTTOM HALF INTEGRAL	.	.
2329	$\angle$	LEFT-POINTING ANGLE BRACKET	$\mathbb{<}$	$\mathbb{<}$

232A		RIGHT-POINTING ANGLE BRACKET		
2500		BOX DRAWINGS LIGHT HORIZONTAL		
2502		BOX DRAWINGS LIGHT VERTICAL		
250C		BOX DRAWINGS LIGHT DOWN AND RIGHT		
2510		BOX DRAWINGS LIGHT DOWN AND LEFT		
2514		BOX DRAWINGS LIGHT UP AND RIGHT		
2518		BOX DRAWINGS LIGHT UP AND LEFT		
251C		BOX DRAWINGS LIGHT VERTICAL		
2524		BOX DRAWINGS LIGHT VERTICAL		
252C		BOX DRAWINGS LIGHT DOWN AND HORIZONTAL		
2534		BOX DRAWINGS LIGHT UP AND HORIZONTAL		
253C		BOX DRAWINGS LIGHT VERTICAL		
2550		BOX DRAWINGS DOUBLE HORIZONTAL		
2551		BOX DRAWINGS DOUBLE VERTICAL		
2552		BOX DRAWINGS DOWN SINGLE AND RIGHT DOUBLE		
2553		BOX DRAWINGS DOWN DOUBLE AND RIGHT SINGLE		
2554		BOX DRAWINGS DOUBLE DOWN		
2555		BOX DRAWINGS DOWN SINGLE AND LEFT DOUBLE		
2556		BOX DRAWINGS DOWN DOUBLE AND LEFT SINGLE		
2557		BOX DRAWINGS DOUBLE DOWN AND LEFT		
2558		BOX DRAWINGS UP SINGLE AND RIGHT DOUBLE		
2559		BOX DRAWINGS UP DOUBLE AND RIGHT SINGLE		
255A		BOX DRAWINGS DOUBLE UP AND RIGHT		

255B		BOX DRAWINGS UP SINGLE AND LEFT DOUBLE		
255C		BOX DRAWINGS UP DOUBLE AND LEFT SINGLE		
255D		BOX DRAWINGS DOUBLE UP AND LEFT		
255E		BOX DRAWINGS VERTICAL SINGLE AND RIGHT DOUBLE		
255F		BOX DRAWINGS VERTICAL DOUBLE AND RIGHT SINGLE		
2560		BOX DRAWINGS DOUBLE VERTICAL AND RIGHT		
2561		BOX DRAWINGS VERTICAL SINGLE AND LEFT DOUBLE		
2562		BOX DRAWINGS VERTICAL DOUBLE AND LEFT SINGLE		
2563		BOX DRAWINGS DOUBLE VERTICAL AND LEFT		
2564		BOX DRAWINGS DOWN SINGLE AND HORIZONTAL DOUBLE		
2565		BOX DRAWINGS DOWN DOUBLE AND HORIZONTAL SINGLE		
2566		BOX DRAWINGS DOUBLE DOWN AND HORIZONTAL		
2567		BOX DRAWINGS UP SINGLE AND HORIZONTAL DOUBLE		
2568		BOX DRAWINGS UP DOUBLE AND HORIZONTAL SINGLE		
2569		BOX DRAWINGS DOUBLE UP AND HORIZONTAL		
256A		BOX DRAWINGS VERTICAL SINGLE AND HORIZONTAL DOUBLE		
256B		BOX DRAWINGS VERTICAL DOUBLE AND HORIZONTAL SINGLE		
256C		BOX DRAWINGS DOUBLE VERTICAL AND HORIZONTAL		
2580		UPPER HALF BLOCK		
2584		LOWER HALF BLOCK		
2588		FULL BLOCK		
258C		LEFT HALF BLOCK		

2590		RIGHT HALF BLOCK		
2591		LIGHT SHADE		
2592		MEDIUM SHADE		
2593		DARK SHADE		
25A0		BLACK SQUARE		
25AC		BLACK RECTANGLE		
25B2		BLACK UP-POINTING TRIANGLE		
25BA		BLACK RIGHT-POINTING POINTER		
25BC		BLACK DOWN-POINTING TRIANGLE		
25C4		BLACK LEFT-POINTING POINTER		
25CA		LOZENGE		
25CB		WHITE CIRCLE		
25D8		INVERSE BULLET		
25D9		INVERSE WHITE CIRCLE		
263A		WHITE SMILING FACE		
263B		BLACK SMILING FACE		
263C		WHITE SUN WITH RAYS		
2640		FEMALE SIGN		
2642		MALE SIGN		
2660		BLACK SPADE SUIT		
2663		BLACK CLUB SUIT		
2665		BLACK HEART SUIT		
2666		BLACK DIAMOND SUIT		

266A		EIGHTH NOTE		
266B		BEAMED EIGHTH NOTES		
FB01		LATIN SMALL LIGATURE FI		
FB02		LATIN SMALL LIGATURE FL		
FFFD		REPLACEMENT CHARACTER		