

# Greek characters supported by *alphabet*

Günter Milde

September 12, 2023

## Abstract

This document lists all Greek characters that are supported by *alphabet*. It also tests the outcome of `\MakeUppercase` and `\MakeLowercase`.

The document is compiled with pdfTeX, format version 2023-06-01 patch-level 1, and the L3 programming layer from 2023-08-29. The *babel-greek* version is “2023/08/18 1.14 Greek support for the babel system”.

The `\greekfontencoding` is LGR and the current language variant is *polutoniko*.

## Contents

### 1 Input Variants

The columns represent the following input variants:

1. literal character
2. named accent macro + LICR
3. short accent macro + LICR / alias
4. short accent macro (reversed order) + LICR (only composite diacritics)

### 2 Greek and Coptic

Characters from the Greek and Coptic Unicode block that use the macros defined in *alphabet*:

|       |         |         |         |
|-------|---------|---------|---------|
| x0386 | Ά Ά Ά   | Α Α Α   | ά ά ά   |
| x0388 | Έ Έ Έ   | Ε Ε Ε   | έ έ έ   |
| x0389 | Ή Ή Ή   | Η Η Η   | ή ή ή   |
| x038A | Ί Ί Ί   | Ι Ι Ι   | ί ί ί   |
| x038C | Ό Ό Ό   | Ο Ο Ο   | ό ό ό   |
| x038E | Υ Υ Υ   | Υ Υ Υ   | ύ ύ ύ   |
| x038F | Ω Ω Ω   | Ω Ω Ω   | ώ ώ ώ   |
|       |         |         |         |
| x0390 | ϊ ι ι ι | ϊ ι ι ι | ι ι ι ι |
| x0391 | Α Α     | Α Α     | α α     |
| x0392 | Β Β     | Β Β     | β β     |
| x0393 | Γ Γ     | Γ Γ     | γ γ     |
| x0394 | Δ Δ     | Δ Δ     | δ δ     |

|       |         |         |         |
|-------|---------|---------|---------|
| x0395 | E E     | E E     | ε ε     |
| x0396 | Z Z     | Z Z     | ζ ζ     |
| x0397 | H H     | H H     | η η     |
| x0398 | Θ Θ     | Θ Θ     | θ θ     |
| x0399 | I I     | I I     | ι ι     |
| x039A | K K     | K K     | κ κ     |
| x039B | Λ Λ     | Λ Λ     | λ λ     |
| x039C | M M     | M M     | μ μ     |
| x039D | N N     | N N     | ν ν     |
| x039E | Ξ Ξ     | Ξ Ξ     | ξ ξ     |
| x039F | O O     | O O     | ο ο     |
|       |         |         |         |
| 0x3A0 | Π Π     | Π Π     | π π     |
| 0x3A1 | P P     | P P     | ρ ρ     |
| 0x3A3 | Σ Σ     | Σ Σ     | ς ς     |
| 0x3A4 | T T     | T T     | τ τ     |
| 0x3A5 | Υ Υ     | Υ Υ     | υ υ     |
| 0x3A6 | Φ Φ     | Φ Φ     | φ φ     |
| 0x3A7 | X X     | X X     | χ χ     |
| 0x3A8 | Ψ Ψ     | Ψ Ψ     | ψ ψ     |
| 0x3A9 | Ω Ω     | Ω Ω     | ω ω     |
| 0x3AA | Ī Ī Ī   | Ī Ī Ī   | ĩ ĩ ĩ   |
| 0x3AB | Ų Ų Ų   | Ų Ų Ų   | ü ü ü   |
| 0x3AC | ά ά ά   | Α Α Α   | ά ά ά   |
| 0x3AD | έ έ έ   | Ε Ε Ε   | έ έ έ   |
| 0x3AE | ή ή ή   | Η Η Η   | ή ή ή   |
| 0x3AF | ί ί ί   | Ι Ι Ι   | ί ί ί   |
|       |         |         |         |
| x03B0 | ó ó ó ó | Ų Ų Ų Ų | ó ó ó ó |
| x03B1 | α α     | Α Α     | α α     |
| x03B2 | β β     | Β Β     | β β     |
| x03B3 | γ γ     | Γ Γ     | γ γ     |
| x03B4 | δ δ     | Δ Δ     | δ δ     |
| x03B5 | ε ε     | Ε Ε     | ε ε     |
| x03B6 | ζ ζ     | Ζ Ζ     | ζ ζ     |
| x03B7 | η η     | Η Η     | η η     |
| x03B8 | θ θ     | Θ Θ     | θ θ     |
| x03B9 | ι ι     | Ι Ι     | ι ι     |
| x03BA | κ κ     | Κ Κ     | κ κ     |
| x03BB | λ λ     | Λ Λ     | λ λ     |
| x03BC | μ μ     | Μ Μ     | μ μ     |
| x03BD | ν ν     | Ν Ν     | ν ν     |
| x03BE | ξ ξ     | Ξ Ξ     | ξ ξ     |
| x03BF | ο ο     | Ο Ο     | ο ο     |
|       |         |         |         |
| x03C0 | π π     | Π Π     | π π     |
| x03C1 | ρ ρ     | P P     | ρ ρ     |
| x03C2 | ς ς ς   | Σ Σ Σ   | ς ς ς   |
| x03C3 | σ σ     | Σ Σ     | σ σ     |
| x03C4 | τ τ     | T T     | τ τ     |
| x03C5 | υ υ     | Υ Υ     | υ υ     |
| x03C6 | φ φ     | Φ Φ     | φ φ     |
| x03C7 | χ χ     | X X     | χ χ     |
| x03C8 | ψ ψ     | Ψ Ψ     | ψ ψ     |

|       |       |       |       |
|-------|-------|-------|-------|
| x03C9 | ω ω   | Ω Ω   | ω ω   |
| x03CA | ı ı ı | İ İ İ | ı ı ı |
| x03CB | ü ü ü | Ÿ Ÿ Ÿ | ü ü ü |
| x03CC | ó ó ó | Ó Ó Ó | ó ó ó |
| x03CD | ú ú ú | Ů Ů Ů | ú ú ú |
| x03CE | ώ ώ ώ | Ω Ω Ω | ώ ώ ώ |
|       |       |       |       |
| x03D0 | β β   | B B   | β β   |
| x03D1 | θ θ   | Θ Θ   | θ θ   |
| x03D5 | φ φ   | Φ Φ   | φ φ   |
| x03D6 | π π   | Π Π   | π π   |
| x03D8 | ϙ ϙ   | Ϛ Ϛ   | ϙ ϙ   |
| x03D9 | ϣ ϣ   | Ϟ Ϟ   | ϣ ϣ   |
| x03DA | ϭ ϭ   | Ϯ Ϯ   | ϭ ϭ   |
| x03DB | ϯ ϯ   | ϰ ϰ   | ϯ ϯ   |
| x03DC | F F   | F F   | F F   |
| x03DD | ƒ ƒ   | F F   | ƒ ƒ   |
| x03DE | ı ı   | ı ı   | ı ı   |
| x03DF | ı ı   | ı ı   | ı ı   |
|       |       |       |       |
| x03E0 | ℔ ℔   | ℔ ℔   | ᳚ ᳚   |
| x03E1 | ᳚ ᳚   | ℔ ℔   | ᳚ ᳚   |
|       |       |       |       |
| x03F0 | ⋈ ⋈   | K K   | ⋈ ⋈   |
| x03F1 | ρ ρ   | P P   | ρ ρ   |
| x03F4 | Θ Θ   | Θ Θ   | θ θ   |
| x03F5 | ε ε   | E E   | ε ε   |

### 3 Greek extended

|       |           |         |         |
|-------|-----------|---------|---------|
| x1F00 | ἁ ἁ ἁ     | A A A   | ἁ ἁ ἁ   |
| x1F01 | ἂ ἂ ἂ     | A A A   | ἂ ἂ ἂ   |
| x1F02 | ἃ ἃ ἃ ἃ   | A A A A | ἃ ἃ ἃ ἃ |
| x1F03 | ἄ ἄ ἄ ἄ   | A A A A | ἄ ἄ ἄ ἄ |
| x1F04 | ἅ ἅ ἅ ἅ   | A A A A | ἅ ἅ ἅ ἅ |
| x1F05 | ἆ ἆ ἆ ἆ   | A A A A | ἆ ἆ ἆ ἆ |
| x1F06 | ἇ ἇ ἇ ἇ   | A A A A | ἇ ἇ ἇ ἇ |
| x1F07 | Ἀ Ἀ Ἀ Ἀ   | A A A A | Ἀ Ἀ Ἀ Ἀ |
| x1F08 | Ἁ Ἁ Ἁ Ἁ   | A A A   | ἁ ἁ ἁ   |
| x1F09 | Ἂ Ἂ Ἂ Ἂ   | A A A   | ἂ ἂ ἂ   |
| x1F0A | Ἃ Ἃ Ἃ Ἃ Ἃ | A A A A | ἃ ἃ ἃ ἃ |
| x1F0B | Ἄ Ἄ Ἄ Ἄ Ἄ | A A A A | ἄ ἄ ἄ ἄ |
| x1F0C | Ἅ Ἅ Ἅ Ἅ Ἅ | A A A A | ἅ ἅ ἅ ἅ |
| x1F0D | Ἆ Ἆ Ἆ Ἆ Ἆ | A A A A | ἆ ἆ ἆ ἆ |
| x1F0E | Ἇ Ἇ Ἇ Ἇ Ἇ | A A A A | ἇ ἇ ἇ ἇ |
| x1F0F | Ἀ Ἀ Ἀ Ἀ Ἀ | A A A A | Ἀ Ἀ Ἀ Ἀ |
|       |           |         |         |
| x1F10 | Ἐ Ἐ Ἐ     | E E E   | Ἐ Ἐ Ἐ   |
| x1F11 | Ἑ Ἑ Ἑ     | E E E   | Ἑ Ἑ Ἑ   |
| x1F12 | Ἒ Ἒ Ἒ Ἒ   | E E E E | Ἒ Ἒ Ἒ Ἒ |
| x1F13 | Ἓ Ἓ Ἓ Ἓ   | E E E E | Ἓ Ἓ Ἓ Ἓ |
| x1F14 | Ἔ Ἔ Ἔ Ἔ   | E E E E | Ἔ Ἔ Ἔ Ἔ |

|       |             |             |         |
|-------|-------------|-------------|---------|
| x1F15 | ě ě ě ě     | E E E E     | ě ě ě ě |
| x1F18 | ‘E ‘E ‘E    | E E E       | è è è   |
| x1F19 | ‘E ‘E ‘E    | E E E       | è è è   |
| x1F1A | “E “E “E “E | E E E E     | ë ë ë ë |
| x1F1B | “E “E “E “E | E E E E     | ë ë ë ë |
| x1F1C | “E “E “E “E | E E E E     | ě ě ě ě |
| x1F1D | “E “E “E “E | E E E E     | ě ě ě ě |
|       |             |             |         |
| x1F20 | ĥ ĥ ĥ       | H H H       | ĥ ĥ ĥ   |
| x1F21 | ĥ ĥ ĥ       | H H H       | ĥ ĥ ĥ   |
| x1F22 | ĥ ĥ ĥ ĥ     | ‘H ‘H ‘H ‘H | ĥ ĥ ĥ ĥ |
| x1F23 | ĥ ĥ ĥ ĥ     | H H H H     | ĥ ĥ ĥ ĥ |
| x1F24 | ĥ ĥ ĥ ĥ     | H H H H     | ĥ ĥ ĥ ĥ |
| x1F25 | ĥ ĥ ĥ ĥ     | H H H H     | ĥ ĥ ĥ ĥ |
| x1F26 | ĥ ĥ ĥ ĥ     | H H H H     | ĥ ĥ ĥ ĥ |
| x1F27 | ĥ ĥ ĥ ĥ     | H H H H     | ĥ ĥ ĥ ĥ |
| x1F28 | ‘H ‘H ‘H    | H H H       | ĥ ĥ ĥ   |
| x1F29 | ‘H ‘H ‘H    | H H H       | ĥ ĥ ĥ   |
| x1F2A | “H “H “H “H | ‘H ‘H ‘H ‘H | ĥ ĥ ĥ ĥ |
| x1F2B | “H “H “H “H | H H H H     | ĥ ĥ ĥ ĥ |
| x1F2C | “H “H “H “H | H H H H     | ĥ ĥ ĥ ĥ |
| x1F2D | “H “H “H “H | H H H H     | ĥ ĥ ĥ ĥ |
| x1F2E | “H “H “H “H | H H H H     | ĥ ĥ ĥ ĥ |
| x1F2F | “H “H “H “H | H H H H     | ĥ ĥ ĥ ĥ |
|       |             |             |         |
| x1F30 | ı ı ı       | I I I       | ı ı ı   |
| x1F31 | ı ı ı       | I I I       | ı ı ı   |
| x1F32 | ı ı ı ı     | I I I I     | ı ı ı ı |
| x1F33 | ı ı ı ı     | I I I I     | ı ı ı ı |
| x1F34 | ı ı ı ı     | I I I I     | ı ı ı ı |
| x1F35 | ı ı ı ı     | I I I I     | ı ı ı ı |
| x1F36 | ı ı ı ı     | I I I I     | ı ı ı ı |
| x1F37 | ı ı ı ı     | I I I I     | ı ı ı ı |
| x1F38 | ‘I ‘I ‘I    | I I I       | ı ı ı   |
| x1F39 | ‘I ‘I ‘I    | I I I       | ı ı ı   |
| x1F3A | “I “I “I “I | I I I I     | ı ı ı ı |
| x1F3B | “I “I “I “I | I I I I     | ı ı ı ı |
| x1F3C | “I “I “I “I | I I I I     | ı ı ı ı |
| x1F3D | “I “I “I “I | I I I I     | ı ı ı ı |
| x1F3E | “I “I “I “I | I I I I     | ı ı ı ı |
| x1F3F | “I “I “I “I | I I I I     | ı ı ı ı |
|       |             |             |         |
| x1F40 | ó ó ó       | O O O       | ó ó ó   |
| x1F41 | ó ó ó       | O O O       | ó ó ó   |
| x1F42 | ò ò ò ò     | O O O O     | ò ò ò ò |
| x1F43 | ò ò ò ò     | O O O O     | ò ò ò ò |
| x1F44 | ố ố ố ố     | O O O O     | ố ố ố ố |
| x1F45 | ố ố ố ố     | O O O O     | ố ố ố ố |
| x1F48 | ‘O ‘O ‘O    | O O O       | ó ó ó   |
| x1F49 | ‘O ‘O ‘O    | O O O       | ó ó ó   |
| x1F4A | “O “O “O “O | O O O O     | ò ò ò ò |
| x1F4B | “O “O “O “O | O O O O     | ò ò ò ò |
| x1F4C | “O “O “O “O | O O O O     | ố ố ố ố |
| x1F4D | “O “O “O “O | O O O O     | ố ố ố ố |

|       |             |   |         |
|-------|-------------|---|---------|
| x1F50 | ò ò ò       | Υ Υ Υ   | ò ò ò   |
| x1F51 | ó ó ó       | Υ Υ Υ   | ó ó ó   |
| x1F52 | ô ô ô ô     | Υ Υ Υ Υ   | ô ô ô ô |
| x1F53 | õ õ õ õ     | Υ Υ Υ Υ   | õ õ õ õ |
| x1F54 | ö ö ö ö     | Υ Υ Υ Υ   | ö ö ö ö |
| x1F55 | ï ï ï ï     | Υ Υ Υ Υ   | ï ï ï ï |
| x1F56 | ü ü ü ü     | Υ Υ Υ Υ   | ü ü ü ü |
| x1F57 | ÿ ÿ ÿ ÿ     | Υ Υ Υ Υ   | ÿ ÿ ÿ ÿ |
| x1F59 | ˆΥ ˆΥ ˆΥ    | Υ Υ Υ   | ó ó ó   |
| x1F5B | ˜Υ ˜Υ ˜Υ ˜Υ | Υ Υ Υ Υ   | ô ô ô ô |
| x1F5D | ˘Υ ˘Υ ˘Υ ˘Υ | Υ Υ Υ Υ   | ö ö ö ö |
| x1F5F | ˙Υ ˙Υ ˙Υ ˙Υ | Υ Υ Υ Υ   | ü ü ü ü |
|       |             |   |         |
| x1F60 | Ω Ω Ω       | Ω Ω Ω   | ω ω ω   |
| x1F61 | ω ω ω       | Ω Ω Ω   | ω ω ω   |
| x1F62 | δ δ δ δ     | Ω Ω Ω Ω   | δ δ δ δ |
| x1F63 | δ δ δ δ     | Ω Ω Ω Ω   | δ δ δ δ |
| x1F64 | δ δ δ δ     | Ω Ω Ω Ω   | δ δ δ δ |
| x1F65 | δ δ δ δ     | Ω Ω Ω Ω   | δ δ δ δ |
| x1F66 | δ δ δ δ     | Ω Ω Ω Ω   | δ δ δ δ |
| x1F67 | δ δ δ δ     | Ω Ω Ω Ω   | δ δ δ δ |
| x1F68 | ˆΩ ˆΩ ˆΩ    | Ω Ω Ω   | ω ω ω   |
| x1F69 | ˜Ω ˜Ω ˜Ω    | Ω Ω Ω   | ω ω ω   |
| x1F6A | ˘Ω ˘Ω ˘Ω ˘Ω | Ω Ω Ω Ω   | δ δ δ δ |
| x1F6B | ˙Ω ˙Ω ˙Ω ˙Ω | Ω Ω Ω Ω   | δ δ δ δ |
| x1F6C | ˘Ω ˘Ω ˘Ω ˘Ω | Ω Ω Ω Ω   | δ δ δ δ |
| x1F6D | ˙Ω ˙Ω ˙Ω ˙Ω | Ω Ω Ω Ω   | δ δ δ δ |
| x1F6E | ˘Ω ˘Ω ˘Ω ˘Ω | Ω Ω Ω Ω   | δ δ δ δ |
| x1F6F | ˙Ω ˙Ω ˙Ω ˙Ω | Ω Ω Ω Ω   | δ δ δ δ |
|       |             |   |         |
| x1F70 | À Á Â       | A A A   | à á â   |
| x1F71 | Á Á Á       | A A A   | á á á   |
| x1F72 | È È È       | E E E   | è è è   |
| x1F73 | É É É       | E E E   | é é é   |
| x1F74 | Ħ Ħ Ħ       | H H H   | ħ ħ ħ   |
| x1F75 | Ħ Ħ Ħ       | H H H   | ħ ħ ħ   |
| x1F76 | Ì Ì Ì       | I I I   | ì ì ì   |
| x1F77 | Í Í Í       | I I I   | í í í   |
| x1F78 | Ò Ò Ò       | O O O   | ò ò ò   |
| x1F79 | Ó Ó Ó       | O O O   | ó ó ó   |
| x1F7A | Ù Ù Ù       | Υ Υ Υ   | ù ù ù   |
| x1F7B | Ú Ú Ú       | Υ Υ Υ   | ú ú ú   |
| x1F7C | Ẁ Ẁ Ẁ       | Ω Ω Ω   | ẁ ẁ ẁ   |
| x1F7D | ẁ ẁ ẁ       | Ω Ω Ω   | Ẃ Ẃ Ẃ   |
|       |             |   |         |
| x1F80 | Ȧ Ȧ Ȧ       | A <sub>1</sub> A <sub>1</sub> A <sub>1</sub>                | Ȧ Ȧ Ȧ   |
| x1F81 | Ȧ Ȧ Ȧ       | A <sub>1</sub> A <sub>1</sub> A <sub>1</sub>                | Ȧ Ȧ Ȧ   |
| x1F82 | Ȧ Ȧ Ȧ Ȧ     | A <sub>1</sub> A <sub>1</sub> A <sub>1</sub> A <sub>1</sub> | Ȧ Ȧ Ȧ Ȧ |
| x1F83 | Ȧ Ȧ Ȧ Ȧ     | A <sub>1</sub> A <sub>1</sub> A <sub>1</sub> A <sub>1</sub> | Ȧ Ȧ Ȧ Ȧ |
| x1F84 | Ȧ Ȧ Ȧ Ȧ     | A <sub>1</sub> A <sub>1</sub> A <sub>1</sub> A <sub>1</sub> | Ȧ Ȧ Ȧ Ȧ |
| x1F85 | Ȧ Ȧ Ȧ Ȧ     | A <sub>1</sub> A <sub>1</sub> A <sub>1</sub> A <sub>1</sub> | Ȧ Ȧ Ȧ Ȧ |
| x1F86 | Ȧ Ȧ Ȧ Ȧ     | A <sub>1</sub> A <sub>1</sub> A <sub>1</sub> A <sub>1</sub> | Ȧ Ȧ Ȧ Ȧ |
| x1F87 | Ȧ Ȧ Ȧ Ȧ     | A <sub>1</sub> A <sub>1</sub> A <sub>1</sub> A <sub>1</sub> | Ȧ Ȧ Ȧ Ȧ |

6

|       |  |  |             |
|-------|--|--|-------------|
| x1FBC | A <sub>ı</sub> A <sub>ı</sub> A <sub>ı</sub> | A <sub>ı</sub> A <sub>ı</sub> A <sub>ı</sub> | ȶ ȶ ȶ       |
| x1FC2 | Ȧ Ȧ Ȧ  | H <sub>ı</sub> H <sub>ı</sub> H <sub>ı</sub> | Ȧ Ȧ Ȧ       |
| x1FC3 | Ȧ Ȧ Ȧ  | H <sub>ı</sub> H <sub>ı</sub> H <sub>ı</sub> | Ȧ Ȧ Ȧ       |
| x1FC4 | Ȧ Ȧ Ȧ  | H <sub>ı</sub> H <sub>ı</sub> H <sub>ı</sub> | Ȧ Ȧ Ȧ       |
| x1FC6 | Ȧ Ȧ Ȧ  | H <sub>ı</sub> H <sub>ı</sub> H <sub>ı</sub> | Ȧ Ȧ Ȧ       |
| x1FC7 | Ȧ Ȧ Ȧ  | H <sub>ı</sub> H <sub>ı</sub> H <sub>ı</sub> | Ȧ Ȧ Ȧ       |
| x1FC8 | Ȧ Ȧ Ȧ  | E E E  | Ȧ Ȧ Ȧ       |
| x1FC9 | Ȧ Ȧ Ȧ  | E E E  | Ȧ Ȧ Ȧ       |
| x1FCA | Ȧ Ȧ Ȧ  | H H H  | Ȧ Ȧ Ȧ       |
| x1FCB | Ȧ Ȧ Ȧ  | H H H  | Ȧ Ȧ Ȧ       |
| x1FCC | H <sub>ı</sub> H <sub>ı</sub> H <sub>ı</sub> | H <sub>ı</sub> H <sub>ı</sub> H <sub>ı</sub> | Ȧ Ȧ Ȧ       |
| x1FD0 | Ȧ Ȧ Ȧ  | Ȧ Ȧ Ȧ  | Ȧ Ȧ Ȧ       |
| x1FD1 | Ȧ Ȧ Ȧ  | Ȧ Ȧ Ȧ  | Ȧ Ȧ Ȧ       |
| x1FD2 | Ȧ Ȧ Ȧ Ȧ Ȧ                                    | Ȧ Ȧ Ȧ Ȧ Ȧ                                    | Ȧ Ȧ Ȧ Ȧ Ȧ   |
| x1FD3 | Ȧ Ȧ Ȧ Ȧ Ȧ                                    | Ȧ Ȧ Ȧ Ȧ Ȧ                                    | Ȧ Ȧ Ȧ Ȧ Ȧ   |
| x1FD6 | Ȧ Ȧ Ȧ  | I I I  | Ȧ Ȧ Ȧ       |
| x1FD7 | Ȧ Ȧ Ȧ Ȧ Ȧ                                    | Ȧ Ȧ Ȧ Ȧ Ȧ                                    | Ȧ Ȧ Ȧ Ȧ Ȧ   |
| x1FD8 | Ȧ Ȧ Ȧ  | Ȧ Ȧ Ȧ  | Ȧ Ȧ Ȧ       |
| x1FD9 | Ȧ Ȧ Ȧ  | Ȧ Ȧ Ȧ  | Ȧ Ȧ Ȧ       |
| x1FDA | Ȧ Ȧ Ȧ  | I I I  | Ȧ Ȧ Ȧ       |
| x1FDB | Ȧ Ȧ Ȧ  | I I I  | Ȧ Ȧ Ȧ       |
| x1FE0 | Ȧ Ȧ Ȧ  | Ȧ Ȧ Ȧ  | Ȧ Ȧ Ȧ       |
| x1FE1 | Ȧ Ȧ Ȧ  | Ȧ Ȧ Ȧ  | Ȧ Ȧ Ȧ       |
| x1FE2 | Ȧ Ȧ Ȧ Ȧ Ȧ Ȧ                                  | Ȧ Ȧ Ȧ Ȧ Ȧ Ȧ                                  | Ȧ Ȧ Ȧ Ȧ Ȧ Ȧ |
| x1FE3 | Ȧ Ȧ Ȧ Ȧ Ȧ Ȧ                                  | Ȧ Ȧ Ȧ Ȧ Ȧ Ȧ                                  | Ȧ Ȧ Ȧ Ȧ Ȧ Ȧ |
| x1FE4 | Ȧ Ȧ Ȧ  | P P P  | Ȧ Ȧ Ȧ       |
| x1FE5 | Ȧ Ȧ Ȧ  | P P P  | Ȧ Ȧ Ȧ       |
| x1FE6 | Ȧ Ȧ Ȧ  | Ȧ Ȧ Ȧ  | Ȧ Ȧ Ȧ       |
| x1FE7 | Ȧ Ȧ Ȧ Ȧ Ȧ Ȧ                                  | Ȧ Ȧ Ȧ Ȧ Ȧ Ȧ                                  | Ȧ Ȧ Ȧ Ȧ Ȧ Ȧ |
| x1FE8 | Ȧ Ȧ Ȧ  | Ȧ Ȧ Ȧ  | Ȧ Ȧ Ȧ       |
| x1FE9 | Ȧ Ȧ Ȧ  | Ȧ Ȧ Ȧ  | Ȧ Ȧ Ȧ       |
| x1FEA | Ȧ Ȧ Ȧ  | Ȧ Ȧ Ȧ  | Ȧ Ȧ Ȧ       |
| x1FEB | Ȧ Ȧ Ȧ  | Ȧ Ȧ Ȧ  | Ȧ Ȧ Ȧ       |
| x1FEC | Ȧ Ȧ Ȧ  | P P P  | Ȧ Ȧ Ȧ       |
| x1FF3 | Ȧ Ȧ Ȧ  | Ȧ Ȧ Ȧ  | Ȧ Ȧ Ȧ       |
| x1FF4 | Ȧ Ȧ Ȧ  | Ȧ Ȧ Ȧ  | Ȧ Ȧ Ȧ       |
| x1FF5 | Ȧ Ȧ Ȧ  | Ȧ Ȧ Ȧ  | Ȧ Ȧ Ȧ       |
| x1FF6 | Ȧ Ȧ Ȧ  | Ȧ Ȧ Ȧ  | Ȧ Ȧ Ȧ       |
| x1FF7 | Ȧ Ȧ Ȧ  | Ȧ Ȧ Ȧ  | Ȧ Ȧ Ȧ       |
| x1FF8 | Ȧ Ȧ Ȧ  | O O O  | Ȧ Ȧ Ȧ       |
| x1FF9 | Ȧ Ȧ Ȧ  | O O O  | Ȧ Ȧ Ȧ       |
| x1FFA | Ȧ Ȧ Ȧ  | Ȧ Ȧ Ȧ  | Ȧ Ȧ Ȧ       |
| x1FFB | Ȧ Ȧ Ȧ  | Ȧ Ȧ Ȧ  | Ȧ Ȧ Ȧ       |
| x1FFC | Ȧ Ȧ Ȧ  | Ȧ Ȧ Ȧ  | Ȧ Ȧ Ȧ       |

## 4 Discussion

This section only discusses differences and limitations due to the (re)definitions of the *alphabet* package. For a general discussion of characters supported

by [greek-fontenc](#), see [char-list.pdf](#).

## 4.1 Pre-composed vs. combining characters

All input variants select pre-composed characters if such a character exists.<sup>1</sup>

## 4.2 Symbol variants

For several Greek letters, there are alternative glyphs which may have a different semantic in a mathematical context. Unicode reserves code points for the alternative glyphs (naming them SYMBOL as opposed to LETTER). Some of these symbols are available as `\var<name>` macros in TeX's mathematical mode. *alphabet* makes them available in text mode, too. A full list of symbol-variant macros is in Table 1 in [alphabet-doc.pdf](#).

In text, the alternative glyphs are considered typographical variants without special meaning. The 8-bit LGR font encoding does not allocate code points for them. *Babel-greek*, *textalpha* and *alphabet* provide the `normalize-symbols` option (ignored with Xe/LuaTeX) that is also used in this test document.

Test the handling of symbol variants in text

literal letter, LICR, `\var<name>`, `\<name>symbol`, literal symbol

No case change

ββββ εεεε ϑϑϑϑ ΘΘΘΘ κκκκ ππππ ρρρρ φφφφ

MakeUppercase selects the matching capital letter:

BBBBB EEEEE ΘΘΘΘ ΘΘΘΘ ΚΚΚΚΚ ΠΠΠΠΠ ΡΡΡΡ ΡΦΦΦΦ

MakeLowercase selects the lowercase letter (not the symbol):

ββ εε ϑϑ ϑϑ κκ ππ ρρ φφ.

LGR provides two lowercase variants of the archaic letter *stigma*. Both map to GREEK LETTER STIGMA Ϯ.

The lowercase of Ϯ is ϻ (`\stigma`), not `\varstigma` (Ͽ).

## 4.3 Hiatus

Tonos and psili mark a *hiatus* (break-up) if placed on the first of two vowels that would otherwise form a diphthong. A dialytika must be placed on the second vowel if they are dropped:

αι αυ ει υι ου ει ου → Αῖ Ἀῖ Εῖ Ὠῖ Ὠῖ (literal)

αι αυ ει υι ου ει ου → Αῖ Ἀῖ Εῖ Ὠῖ Ὠῖ (named+LICR)

αι αυ ει υι ου ει ου → Αῖ Ἀῖ Εῖ Ὠῖ Ὠῖ (short+LICR)

The hiatus feature does not work correctly with the pre-2022 `\MakeUppercase`.

---

<sup>1</sup>With LuaTeX, this document selects the Harfbuzz renderer to enable the NFC normalization (see source `char-list-alphabet.tex`).