

Greek LICR definitions with XeTeX/LuaTeX

The `textalpha` package from the `lgrx` bundle is a convenient way to load Greek LICR macros for use anywhere in the document and with any TeX engine supporting the e-TeX extensions (pdfTeX, XeTeX, or LuaTeX). With XeTeX or LuaTeX, it loads the file `greek-euenc.def`.

Typesetting Greek texts requires a font containing Greek letters. With the XeTeX or LuaTeX engines, the user should ensure that the chosen font contains the required glyphs (the default Latin Modern fonts have only capital Greek letters). Examples for suitable fonts are the “Deja Vu” or the “Linux Libertine” OpenType fonts.

1 LICR input

The example from `usage.tex` in *babel-greek* input using the LICR macros:

Τί φηις; Ἰδὼν ἐνθέδε παῖδ' ἐλευθέραν
τὰς πλησίον Νύμφας στεφανοῦσαν, Σώστρατε,
ἔρῳ ἀπῆλθες εὐθύς;

1.1 Greek alphabet

Greek letters via LICR macros:

Α Β Γ Δ Ε Ζ Η Θ Ι Κ Λ Μ Ν Ξ Ο Π Ρ Σ Τ Υ Φ Χ Ψ Ω

α β γ δ ε ζ η θ ι κ λ μ ν ξ ο π ρ σ τ υ φ χ ψ ω

The small sigma is set with a different glyph if it ends a word:

σ `textsigma`

ς `textfinalsigma` or `textvarsigma`

In the Latin transcription, the letter ‘s’ stands for `\textautosigma` which automatically chooses the glyph according to the position.

1.2 Additional Greek symbols

Ϝ `textkoppa`

ϝ `textqoppa` (archaic koppa)

Ϟ `textQoppa` (archaic Koppa)

Ϛ `textstigma`

ϛ `textStigma` (Sigma-Tau-Ligature in CB-fonts)¹

Ϝ `textsampi`

ϝ `textSampi`

Ϛ `textdigamma`

ϛ `textDigamma`

¹the name “stigma” originally applied to a medieval sigma-tau ligature, whose shape was confusably similar to the cursive digamma

```
' textdexiakeraia
, textaristerikeraia
```

Mathematical notation uses variant shapes for pi, kappa, rho, theta, and phi as additional symbols. These variations have no syntactic meaning in Greek text and are not given separate code-points in the LGR text encoding. Some text fonts use the variant shapes in place of the “regular” ones.

TeX's concept of “standard” vs. “variant” symbols does not map to the distinction between “Greek Letter ...” vs. “Greek Symbol ...” in the Unicode standard:

math symbol	Unicode «letter»	var math symbol	Unicode «symbol»
π	π	ϖ	ϖ
ρ	ρ	ϱ	ϱ
θ	θ	ϑ	ϑ
ϵ	ϵ	ε	ϵ
ϕ	φ	φ	ϕ
β	β	<i>missing</i>	\mathfrak{B}
κ	κ	<i>missing</i>	\mathfrak{K}
Θ	Θ	<i>missing</i>	Θ

1.3 Diacritics

Greek diacritics can be input by named macro or symbol macro. Named macros are defined in `xunicode-greek.sty` for `\LastDeclaredEncoding` (here EU2).

áá x́x́ àà x̀x̀ ü ẍẍ ãã x̃x̃ áá x̀x̀ áá x̀x̀

Composite commands for combined diacritics are defined in “greek-fontenc.def”, also for the `\LastDeclaredEncoding`. There are composite definitions for all pre-composed characters, the fallback definition uses composite characters:

$$\dot{t} \dot{t} \dot{t} \dot{x} \dot{x} \dot{x} \dot{t} \dot{t} \dot{t} \ddot{x} \ddot{x} \ddot{x} \tilde{t} \tilde{t} \tilde{t} \tilde{x} \tilde{x} \tilde{x}$$
$$\begin{array}{cccccccccccccccc} \tilde{l} & \tilde{l} & \tilde{l}' & e' & e' & e' & \tilde{\nu}_l & \tilde{\nu}_l & \tilde{\nu}_l & e & e & e & \tilde{\nu}_l & \tilde{\nu}_l & \tilde{\nu}_l & \tilde{\nu}_l & \tilde{\nu}_l \\ l & l & l & X & X & X & l & l & l & X & X & X & l & l & l & X & X & X \end{array}$$
$$\begin{array}{cccccccccccccccccccc} \text{1} & \text{1} & \text{1} & \text{2} & \text{2} & \text{2} & \text{1} & \text{1} & \text{1} & \text{2} & \text{2} & \text{2} & \text{1} & \text{1} & \text{1} & \text{2} & \text{2} & \text{2} & \text{1} & \text{1} & \text{1} & \text{2} & \text{2} & \text{2} \end{array}$$

Problems: Composite diacritics with breathings overlap when set using two combining characters (in the tested fonts).

Up casing with \MakeUppercase drops diacritics (except dialytika and sub-iota):

$$\ddot{\Pi} \ddot{X} \ddot{X} \ddot{\Pi} \ddot{X} \ddot{X} \ddot{\Pi} \ddot{X} \ddot{X}$$

Π Χ Χ Π Χ Χ Π Χ Χ

Π Χ Χ Π Χ Χ Π Χ Χ

The sub-iota is input after the base letter. Ligature definitions in the 8-bit LGR fonts ensure that pre-composed characters are used. This does not work with XeTeX/LuaTeX:²

²When copy/pasting generated output from the “evince” PDF viewer, the COMBINING GREEK YPOGEGRAMMENI is merged with the base character. A capital letter + combining ypogegrammeni results in GREEK CAPITAL LETTER ... WITH [.. AND] PROSGEGRAMMENI). This indicates that for a subfix (in

Both, the standard LaTeX and the “xunicode” composite mechanism require the first part of a composite definition to be a macro requiring one argument. I.e. selecting pre-defined characters with sub-iota would require prefix `\accypogegrammeni` and `\accprosgegrammeni` accent macros and composite definitions for all combination of letters and letters with diacritic and sub-iota.

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A B Γ Δ Ε Ζ Η Θ Ι Κ Λ Μ Ν Ξ Ο Π Ρ Σ Τ Υ Φ Χ Ψ Ω
İ Ÿ á é ĭ ü
α β γ δ ε ζ η θ ι κ λ μ ν ξ ο π ρ σ τ υ φ χ ψ ω
ï ü ó ú ő
Q q Z z F f Z z Th th

[illegible]

