

Test LGR font encoding definitions

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The file `lgrenc.def` provides a comprehensive set of macros to typeset Greek with LGR encoded fonts. It works for both, monotonic and polytonic Greek, independent of the *Babel* package.

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

Τῖ φῆις; Ἰδὼν ἐνθῆδε παῖδ' ἐλευθέραν
τὰς πλησίον Νύμφας στεφανοῦσαν, Σώστρατε,
ἑρῶν ἀπῆλθε εὐθύς;

1 Symbols

See the source file [lgrenc-test.tex](#) for the macros used to access the symbols.

1.1 Generic text symbols

Latin: + - = < > - — [()] { } \ | ‰ ‰ ‰ □

LGR: + - = - — [()]

```
< \textless
> \textgreater
{ \textbraceleft
} \textbraceright
\ \textbackslash
| \textbar
‰ \textperthousand (Per-mille symbol is missing in LGR.)
◻ \textvisiblespace
```

Quotes:¹ «a» «α», ‘a’ ‘α’, “a” “α” (double quotes wrong with Kerkis fonts)

Single guillemets and base-quotes (‹a› „a” ‚a’) are missing in LGR.

Ligature break up with `\textcompwordmark`: AY fi AY ï ↦ AY fi AY ï

¹Single quotes need special attention to prevent conversion to accents. Test the input conventions: ‘α’ ‘α’ ‘α’ ‘α’ but not ᾿ ᾿ ᾿ ᾿

Letter schwa and Euro symbol: `ə \textschwa`, `€ \texteuro`

Beware that " # & ' ; < > ? @ becomes ' " . ' . ' ; ' .

textcomp also provides the upright MICRO SIGN and OHM SIGN for SI units:
 $R = 5\,\mu\Omega$

1.2 Greek alphabet

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

$$\sigma \backslash \text{texts sigma}$$

$$\varsigma \backslash \text{textfinal sigma}$$

1.3 additional Greek symbols

\textkappa (numeral kappa = 90)
 \textKappa (numeral Kappa = 90)³
 \textqoppa (archaic kappa)
 \textQoppa (archaic Kappa)
 \textstigma
 \textvarstigma

²loaded by default in not too old LaTeX

³In LGR, there is no separate code point for uppercase koppa.

Υ \textStigma (Sigma-Tau-Ligature in CB-fonts)⁴
 \mathfrak{A} \textsampi
 \mathfrak{A} \textSampi
 $\text{\text{F}}$ \textdigamma
 $\text{\text{F}}$ \textDigamma
 $\text{\text{'}}$ \textdexiakeraia (dexia keraia)
 $\text{\text{,}}$ \textaristerikeraia (aristeri keraia)

Up/Downcasing of the additional Symbols from the Greek And Coptic Unicode block:

' , , ; ' " A · E H T O Υ Ω τ ĩ Ÿ á é ħ í ü ü ó ú ő ű ϑ ϑ Γ ϯ F ₣ ₣ ₣ λ λ

MakeUppercase:

' , , ; " A · E H I O Υ Ω İ İ Ÿ A E H I Ÿ İ Ÿ O Υ Ω ϑ ϑ Ϯ Ϯ F F ♁ ♁ λ λ

MakeLowercase:

' , ; ' " á · é ή ί ό ú ώ ð ò ö á é ή ί ó ù ü ó ú ω ϑ ϑ ϕ ϕ ρ ρ η η θ θ

1.4 aliases

Aliases are defined in the included file `greek-fontenc.def`.

Names matching mathematical variant symbols:

$$\begin{aligned}\varepsilon \text{ \texttt{\textbackslash textvarepsilon}} &= \varepsilon \text{ \texttt{\textbackslash textepsilon}} \\ \varphi \text{ \texttt{\textbackslash textvarphi}} &= \varphi \text{ \texttt{\textbackslash textphi}} \\ \varsigma \text{ \texttt{\textbackslash textvarsigma}} &= \varsigma \text{ \texttt{\textbackslash textfinalsigma}}\end{aligned}$$

Compatibility aliases for hyperref's puenc.def:

μ \textmugreek = μ \textmu
 \textkoppagreek = \textkoppa
 \textKoppagreek = \textKoppa
 \textStigmatreek = \textStigma
 \textstigmatreek = \textstigma
 \textSampigreek = \textSampi
 \textsampigreek = \textsampi
 \textdigammagreek = \textdigamma
 \textDigammagreek = \textDigamma
 $\text{\textnumeralsigngreek}$ = \textdexiakraia
 $\text{\textnumeralsignlowergreek}$ = $\text{\textaristerikeraia}$

Two Unicode code points and names for one character:

' \accoxia = ' \acctonos
' \acckoronis = ' \accpsili

⁴the name “stigma” originally applied to a medieval sigma-tau ligature, whose shape was confusingly similar to the cursive digamma

1.5 symbol variants

Mathematical notation distinguishes variant shapes for pi ($\pi|\varpi$), rho ($\rho|\varrho$), theta ($\theta|\vartheta$), beta ($\beta|\varnothing$), and kappa ($\kappa|\varkappa$) (characters for the last two variant symbols are not included in TeX's standard math fonts). These variations have no syntactic meaning in Greek text and are not given code-points in the LGR encoding. Greek text fonts use the shape variants interchangeably.

2 Diacritics

Capital Greek letters have breathings and accents (except dialytika) to the left (instead of above) and drop them if text is set in UPPERCASE.⁵ This is implemented for all combinations that are used in Greek texts (i.e. for which pre-composed Unicode character exist), but not for, e.g., $\tilde{\Omega}$).

Different conventions exist for the treatment of the sub-iota with uppercase letters. The CB-Fonts use a capital Iota “index” (A_I , H_I , Ω_I).

LaTeX standard accents⁶ (Latin, Greek, Greek Capitals \mapsto UPPERCASE)

[illegible]

à á â ã ä å æ ç è é ê ë ì í î ï ð ñ ò ó ô õ ö × ø ù ú û ü ý ÿ ↦ A A A Ä Â Ã Ä Å Æ Ç È É

$$\text{'A'A}\tilde{\text{A}}\ddot{\text{A}}\hat{\text{A}}\bar{\text{A}}\text{'A}\dot{\text{A}}\text{'A}\ddot{\text{A}}\check{\text{A}}\text{A}\text{A}\text{A}\mapsto\text{AAAA}\ddot{\text{A}}\hat{\text{A}}\bar{\text{A}}\text{'A}\dot{\text{A}}\text{'A}\ddot{\text{A}}\check{\text{A}}\text{A}\text{A}\text{A}$$
Additional Greek diacritics (Greek, Greek Capitals⁷ \mapsto UPPERCASE)
$$\grave{\alpha} \, \acute{\epsilon} \, \grave{\imath} \, \grave{\imath} \, \grave{\imath} \, \grave{\imath} \, \grave{\imath} \, \grave{\eta} \, \acute{o} \, \acute{o} \, \acute{u} \, \acute{\omega} \, \alpha \mapsto \text{A E I } \ddot{\text{I}} \ddot{\text{I}} \ddot{\text{I}} \text{H O O } \Upsilon \, \Omega \, \text{A},$$
$$\mathbb{A}^{\epsilon} \mathbb{E}^{\epsilon} \mathbb{I}^{\epsilon} \mathbb{H}^{\epsilon} \mathbb{O}^{\epsilon} \mathbb{O}^{\epsilon} \mathbb{Y}^{\epsilon} \mathbb{\Omega}^{\epsilon} \mathbb{A}_i \mapsto \mathbb{A} \mathbb{E} \mathbb{I} \mathbb{H} \mathbb{O} \mathbb{O} \mathbb{Y} \mathbb{\Omega} \mathbb{A}_i$$

Input variants and their conversion with MakeUppercase:

ǎ ǎ ǎ, ǎ ǎ ǎ ǎ ǎ, ħ ħ ħ ħ ħ ħ, ħ ħ, ǝ ǝ, ǝ ǝ, ǝ ǝ ǝ.

ට ට, ට ට, ට ට, ට, ට, ට ට, ට ට, ආ ආ

A A A, A A A A A, H H H H H H, H H, I I, I I, İ İ

$$\Upsilon \Upsilon, \Upsilon \Upsilon, \ddot{\Upsilon} \ddot{\Upsilon}, \Omega, \Omega, \Omega \Omega, \Omega \Omega, A_I A_I$$
 $\grave{\alpha} \acute{\epsilon} \grave{\imath} \grave{\eta} \grave{\eta} \acute{o} \acute{u} \acute{\omega} \grave{A} \grave{E} \grave{I} \grave{H} \acute{O} \acute{\Upsilon} \acute{\Omega}, \alpha \alpha$
$$A E \ddot{I} H H O \Upsilon \Omega A E \ddot{I} H O \Upsilon \Omega, A_1 A_2$$
$${}^vA \ {}^vA \ {}^vA \ {}^vA \mapsto A \ A \ A \ A.$$

Input variants and their conversion with MakeLowercase:

$${}^3\text{A} \text{ } ^3\text{A} \text{ } ^3\text{A}, \text{ } ^3\text{A} \text{ } ^3\text{A} \text{ } ^3\text{A} \text{ } ^3\text{A}, \text{ } ^3\text{H} \text{ } ^3\text{H} \text{ } ^3\text{H} \text{ } ^3\text{H} \text{ } ^3\text{H}_\text{I}, \text{ } ^3\text{H} \text{ } ^3\text{H}, \text{ } ^1\text{I} \text{ } ^1\text{I}, \text{ } ^1\text{I} \text{ } ^1\text{I}$$

ǎ ǎ ǎ, ǎ ǎ ǎ ǎ, ħ ħ ħ ħ ħ, ħ ħ, ỉ ỉ, ỉ ỉ

⁵The word "H (or), is an exception to this rule because of the need to distinguish it from the nominative feminine article H.

⁶The ogonek (*little hook*) accent, ($\backslash k$) is not defined in LGR.

⁷The dialytika is not used on Initial letters.

$\Upsilon \Upsilon \Upsilon, \Omega, \Omega, \Omega \Omega, \Omega \Omega, A_1 A_1 A_1,$
 $\mathfrak{U} \mathfrak{U}, \acute{\omega}, \acute{\omega}, \mathfrak{W} \mathfrak{W}, \mathfrak{W} \mathfrak{W}, \alpha \alpha \alpha.$
 $\acute{\alpha} \acute{\epsilon} \acute{\eta} \acute{\theta} \acute{\vartheta} \acute{\omega} \acute{A} \acute{E} \acute{I} \acute{H} \acute{O} \acute{\Upsilon} \acute{\Omega} A_1 A_1 A_1$
 $\acute{\alpha} \acute{\epsilon} \acute{\eta} \acute{\theta} \acute{\vartheta} \acute{\omega} \acute{\alpha} \acute{\epsilon} \acute{\eta} \acute{\theta} \acute{\vartheta} \acute{\omega} \alpha \alpha \alpha$
 $\text{''}A \text{''} A \text{''} A \text{''} A \mapsto \check{\alpha} \check{\alpha} \check{\alpha} \check{\alpha}$

The tilde character can be used in combined accents. However, in documents not defining the Babel language *greek* or *polutonikogreek*, better use the tilde-accent macro, as the tilde produces a no-break space if converted with `\MakeUppercase` or `\MakeLowercase`:

combined accent with tilde character:

$$\begin{array}{c} \tilde{I} \tilde{I} \tilde{O} \tilde{O} \tilde{O} \mapsto \cdots I \ I \cdots \Upsilon \ \Upsilon \ \Upsilon \\ \tilde{I} \ \tilde{I} \ \tilde{\Upsilon} \ \tilde{\Upsilon} \ \tilde{\Upsilon} \mapsto \cdots I^c \ I^c \cdots \Upsilon^c \ \Upsilon^c \ \Upsilon^c \end{array}$$

combined accent with tilde-accent macro:

$$\begin{array}{l} \tilde{\mathfrak{I}} \tilde{\mathfrak{U}} \mapsto \mathfrak{I} \mathfrak{Y} \\ \mathfrak{I} \mathfrak{Y} \mapsto \tilde{\mathfrak{I}} \tilde{\mathfrak{U}} \end{array}$$

Accents input via the Latin transliteration are not dropped with `MakeUppercase`, unless `Babel` is loaded and the current language is Greek (because the required local re-definitions of the `uccode` are done in `greek.ldf` from the *babel-greek* package).

$$\acute{\alpha} \ddot{\alpha} \grave{\alpha} \check{\alpha} \tilde{\alpha} \alpha \mapsto 'A \ddot{I} 'A 'A 'A A,$$

Accent macros can start with `\a` instead of `\` when the short form is redefined, e.g. inside a *tabbing* environment. This also works for the locally defined *dasia* and *psili* shortcuts `\<` and `\>`:

COL1	COL2	COL3	COL4
COL1		COL3	
Viele	Grüße	ô	ô

Combinations with named accents: $\check{\alpha}$ $\hat{\alpha}$ $\tilde{\alpha}$.

The dialytika must be kept in UPPERCASE, e. g.

μαῖστρος \mapsto ΜΑΪΣΤΡΟΣ or εὐζωΐα \mapsto ΕΥΖΩΪΑ.

This is implemented for all input variants of diacritics with dialytika:

$$\mathfrak{u} \mathfrak{t} \mathfrak{t} \mathfrak{t} \mathfrak{u} \mathfrak{o} \mathfrak{o} \mathfrak{u} \mapsto \mathfrak{i} \mathfrak{i} \mathfrak{i} \mathfrak{i} \mathfrak{y} \mathfrak{y} \mathfrak{y} \mathfrak{y},$$

Tonos and dasia mark a *hiatus* (break-up of a diphthong) if placed on the first vowel of a diphthong (άι, άυ, έι). A dialytika must be placed on the second vowel if they are dropped: (Αῖ, Ἀῦ, Εῖ).

ἄυλος \mapsto AÿΛΟΣ, ἄυλος \mapsto AÿΛΟΣ, μάινα \mapsto MAÏNA, κείκ \mapsto KEÏK,
 ἄυπνία \mapsto AÿΠΝΙΑ, ρωμείκα \mapsto ΡΩΜΕÏKA

Test the auto-hiatus feature for side-effects:

A B (must keep space after A).

Kerning (see the input):

```

AO AΨ AI AΥ PA OA ʔA ΔΥ [
^ AO AΨ AI AΥ PA OA ʔA ΔΥ [
^ AO AΨ AĬ AŸ PA OA ʔA ΔΥ [
^ AO AΨ AĬ AŸ PA OA ʔA ΔΥ [
^ AO AΨ AĬ AŸ PA OA ʔA ΔΥ [
^ AO AΨ AĬ AŸ PA OA ʔA ΔΥ [
^ AO AΨ AĬ AŸ PA OA ʔA ΔΥ [
^ AO AΨ AI AΥ PA OA ʔA ΔΥ [
^ AO AΨ AI AΥ PA OA ʔA ΔΥ [
^ AO AΨ AI AΥ PA OA ʔA ΔΥ [
^ AO AΨ AI AΥ PA OA ʔA ΔΥ [
^ AO AΨ AI AΥ PA OA ʔA ΔΥ [
^ AO AΨ AI AΥ PA OA ʔA ΔΥ [
^ AO AΨ AĬ AŸ PA OA ʔA ΔΥ [
^ ÄO ÄΨ ÄI ÄΥ P̈A ÖA ʔÄ Δ̈Υ [
^ ÄO ÄΨ ÄI ÄΥ P̈A ÖA ʔÄ Δ̈Υ [

```

Rows 3 . . . 7: Look-ahead (to check for a hiatus) breaks kerning before ‘A’ with tonos or psili.

Rows 15 and 16: Like in any font encoding, there is no kerning for non-defined accent-letter-combinations (dialytica on A O Δ).

Downcasing should keep diacritics (of course, it cannot regenerate “manually” dropped ones): ‘A Ĭ Ÿ ʔA ↦ á ĭ ŷ ǻ