

# Writing Greek with the `greek` option of the `babel` package

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## 1 Overview

The `greek` option of the `babel` package is an attempt to make it possible for someone to write Greek text with L<sup>A</sup>T<sub>E</sub>X. The current version of the `greek` option supports the πολυτονικό accentual system of the Greek language. Moreover, there is support for Greek numerals. One can produce easily valid Greek numerals both in uppercase and lowercase forms, e.g. ,αϛιζ' and ,ΑϛιΖ'. The labels in second and fourth level enumerations are lowercase and uppercase Greek numerals correspondingly. The latest version of the file (1.2b as of this writing) supports the `polutoniko` language attribute for people willing to typeset documents in πολυτονικό greek.

## 2 Typing Greek Text

T<sub>E</sub>X has been designed to understand only 8-bit characters, nevertheless, L<sup>A</sup>T<sub>E</sub>X is now able to process UTF-8 encoded files. Therefore, there are several ways to enter Greek text. First of all, one can prepare a UTF-8 input file, but she must include the following command in her document's preamble:

```
\usepackage{cmap} %When using pdfLaTeX
\usepackage{ucs}
\usepackage[utf8x]{inputenc}
```

However, if, for some reason, it is not possible to prepare UTF-8 encoded input files, there is always the possibility to use the following transliteration:

α	β	γ	δ	ε	ζ	η	θ	ι	κ	λ	μ	ν
a	b	g	d	e	z	h	j	i	k	l	m	n
ξ	ο	π	ρ	σ	τ	υ	φ	χ	ψ	ω	ς	
x	o	p	r	s	t	u	f	q	y	w	c	

In order to produce in isolation the letter  $\sigma$ , one has to type `sv`. This feature is due to the strong ligature mechanism that  $\TeX$  employs. In the “modern” μονοτονικό accentual system only one accent is used—οξεία (acute). In the traditional πολυτονικό accentual system we need more accents and breathing signs. Since the later has some peculiarities, as far it regards  $\TeX$ , we decided to make the primary language the μονοτονικό and to provide the πολυτονικό as a dialect. Consequently, if someone wishes to correctly typeset πολυτονικό, he must in addition use the `polutoniko` language attribute,

We can produce an accented letter by prefixing the letter with the symbol that denotes the accent, e.g., `>a'erac` produces the word  $\acute{\alpha}\epsilon\rho\alpha\varsigma$ .<sup>1</sup> Here are the symbols that are recognized:

Accent	Symbol	Example	Output
acute	'	<code>g'ata</code>	γάτα
grave	`	<code>dad`i</code>	δαδι
circumflex	~	<code>ful~hc</code>	φυλῆς
rough breathing	<	<code>&lt;'otan</code>	ὄταν
smooth breathing	>	<code>&gt;'aneu</code>	ἄνευ
subscript		<code>&gt;anate'ilh </code>	ἀνατείλη
diaeresis	"	<code>qa"ide'uh c</code>	χαΐδεύης

Note that the subscript symbol is placed **after** the letter. The last thing someone must know in order to be able to write normal Greek text is the punctuation marks used in the language:

Punctuation Sign	Symbol	Output
period	.	.
semicolon	;	.
exclamation mark	!	!
comma	,	,
colon	:	:
question mark	?	;
left apostrophe	‘	‘
right apostrophe	’	’
left quotation mark	((	»
right quotation mark	))	»

Using these conventions it is a straightforward exercise to write Greek πολυτονικό text. For example the following excerpt from *Δύσκολος* of Μένανδρος

Τί φήμις; Ἰδὼν ἐνθέδε παιδ' ἐλευθέραν  
τὰς πλησίον Νύμφας στεφανοῦσαν, Σώστρατε,  
ἐρῶν ἀπῆλθεσ εὐθύς;

can be produced by the following  $\LaTeX$  code:

<sup>1</sup>For the technically inclined reader, we must say that  $\TeX$  uses the ligature table of the font in order to determine the character that corresponds to the input character sequence.

T'i f'hic? <Id'wn >enj'ede pa'id'' >eleuj'eran<sup>2</sup>  
t'ac plhs'ion N'umfac stefano~usan, S'wstrate,  
>er~wn 'ap~hljec e>uj'uc?

### 3 Producing Greek Text

Once the Greek language is selected with the command

```
\selectlanguage{greek}
```

for μονοτονικό or the command

```
\selectlanguage{greek}
\languageattribute{greek}{polutoniko}
```

for πολυτονικό, whatever we type will be typeset with the Greek fonts. The command `\textlatin` can be used for short passages in some language that uses the Latin alphabet, while the the command `\latintext` changes the base fonts to the ones used by languages that use the Latin alphabet. However, all words will be hyphenated by following the Greek hyphenation rules! Similar commands are available once someone has selected some other language. The commands `\textgreek` and `\greektext` behave exactly like their “Latin” counterparts. For example, the word Μίμης has been produced with the command `\textgreek{Μίμης}`. Please note that certain symbols cannot have their expected result for Greek text, unless someone has selected the Greek language, e.g., ~ is such a symbol.

As we have mentioned above this version of the `greek` option of the `babel` package supports the use of Greek numerals. The commands `\greeknumeral` and `\Greeknumeral` produce the lowercase and the uppercase Greek numeral, e.g.,

Command	Output
<code>\Greeknumeral{9999}</code>	ϠϠϠϠ
<code>\greeknumeral{9999}</code>	ϠϠϠϠ

These macros can accept as argument only Arabic numerals. In case someone wishes to produce the Greek numeral corresponding to the value of a counter variable, he can use the command `\alph{counter}`. Moreover, it is now possible to have Greek page numbering by using the command `\pagenumbering{alph}`. (`\alph` is now a synonym for `\greeknumeral`, and `\Alph` for `\Greeknumeral`.) In order to correctly typeset the greek numerals the greek option file provides the following commands:

Command	Output
<code>\qoppa</code>	Ϸ
<code>\sampi</code>	Ϡ
<code>\stigma</code>	Ϻ

<sup>2</sup>Please, bear in mind that this work correctly only if we use the `polutoniko` language attribute.

Apart from these symbols there are few more available:

Command	Output
<code>\Digamma</code>	Ϝ
<code>\ddigamma</code>	Ɔ
<code>\vardigamma</code>	ϝ
<code>\euro</code>	€
<code>\permill</code>	‰

In traditional Greek typography the first paragraph after a header is always indented, contrary to the habit of, say, American typography. This effect can be achieved by using the package `indentfirst`.

The package `athnum` provides the command `\athnum`, with which one can produce the so called *Athenian numerals*:

Command	Output
<code>\athnum{1997}</code>	XϞHHHHHϞΔΔΔΔΠΠ

The package `gmath` renames the basic log-like functions with their greek counterparts:

Command	Output
<code>\$_sin^{2}x+\cos^{2}x=1\$</code>	$\eta\mu^2 x + \sigma\nu^2 y = 1$