# The `lcyw` package

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**Abstract**

This package is used to provide LaTeX support for Cyrillic CM Type 1 fonts (`wcm*.vf`) which are presented in every TeX distribution.

## 1 Definitions for the LCYW encoding

This provides Russian/Bulgarian languages support for LaTeX users at the base of the Type 1 copies (Cyrillic part by B. Malyshev) of classic CM fonts (`OT1` part by D. E. Knuth, Cyrillic part by A. Samarin & N. Glonti) which present in all TeX distributions. These virtual fonts are using 'TeX text Cyrillic' (`LCYW`) encoding. They provide only support for `OT1` encoding, numero sign, left and right pointing guillemets (double angle quotation marks) and Russian alphabets symbols.

However `LCYW` option to `fontenc` is not enough to provide copy & search features of the pdf viewers because standard `cmap` package lacks support for the virtual fonts. The `LCYW` encoding companion package `cmap-cyr-vf` should be used together with `cmap` package to provide such support.

The `LCYW` encoding is an extension of the `OT1` encoding: all lower 128 positions are almost the same (and this part of the file `lcywenc.def` was mostly taken from `ot1enc.def`) but 69 of the upper 128 positions are used for Cyrillic glyphs, Spanish exclamation and question marks, and the numero sign (`U+2116`). The guillemets are situated at the places of the mentioned above Spanish marks. So the left guillemet is at position 60 and the right guillemet is at position 62. The upper positions (192–255) are the same as in the most popular `T2A` encoding for main 64 (32 capital + 32 small) letters of Russian alphabet. The positions for other symbols are: `\CYRYO` — 168, `\cyryo` — 184, `\textnumero` — 185, ¡ — 171, ¿ — 187 (see table below).

You may use `less-than` (`<`) and `greater-than` (`>`) signs to enter guillemets. Spanish marks may be entered by standard ligatures `!‘` and `?‘`.

Important note: Unlike old `LCY` font encoding `LCYW` is completely *compatible* with the LaTeX $2_\varepsilon$ standards.

| | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | A | B | C | D | E | F |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 00 | Γ | Δ | Θ | Λ | Ξ | Π | Σ | Υ | Φ | Ψ | Ω | ff | fi | fl | ffi | ffl |
| 10 | ı | ȷ | ` | ´ | ˘ | ¯ | ˚ | ¸ | ß | æ | œ | ø | Æ | Œ | Ø | |
| 20 | ˝ | ! | ” | # | $ | % | & | ’ | ( | ) | * | + | , | - | . | / |
| 30 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | : | ; | « | = | » | ? |
| 40 | @ | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O |
| 50 | P | Q | R | S | T | U | V | W | X | Y | Z | [ | “ | ] | ˆ | ˙ |
| 60 | ‘ | a | b | c | d | e | f | g | h | i | j | k | l | m | n | o |
| 70 | p | q | r | s | t | u | v | w | x | y | z | – | — | ″ | ˜ | ¨ |
| 80 | | | | | | | | | | | | | | | | |
| 90 | | | | | | | | | | | | | | | | |
| A0 | | | | | | | | | Ё | | | ¡ | | | | |
| B0 | | | | | | | | | ё | № | | ¿ | | | | |
| C0 | А | Б | В | Г | Д | Е | Ж | З | И | Й | К | Л | М | Н | О | П |
| D0 | Р | С | Т | У | Ф | Х | Ц | Ч | Ш | Щ | Ъ | Ы | Ь | Э | Ю | Я |
| E0 | а | б | в | г | д | е | ж | з | и | й | к | л | м | н | о | п |
| F0 | р | с | т | у | ф | х | ц | ч | ш | щ | ъ | ы | ь | э | ю | я |

# 2 A Unicode support companion package for the LCYW encoding

Use `cmap-cyr-vf.sty` to provide copy & find features of pdf viewers. Just place `\usepackage{cmap-cyr-vf}` to the preamble of a document. This style file uses `koi7a.cmap` file. It provides support for all Cyrillic Type 1 fonts by B. Malyshev in the following virtual fonts: `kcm*.vf`, `wcm*.vf` (used by this package), `xcmr*.vf`, and `ycmr*.vf`. These virtual fonts give the same symbols set but in the different encodings (see `cmap-cyr-vf.sty` for more details). The `LCYW` encoding is directly taken from `wcm*.vf`.

This style may be used separately from `LCYW` encoding to direct Unicode support for any of the mentioned above virtual fonts (at 5, 6, 7, 8, 9, 10, 10.95, 12, 14.4, 17.28, 20.74, 24.88, 29.86, 35.83 pt), e. g., in the MetaPost programs.

# 3 A PDF cmap file to support Unicode mapping of LCYW fonts

The file `koi7a.cmap` sets the following font symbol positions Unicode mapping.

| | | |
|---|---|---|
| `19` | Numero sign | `U+2116` |
| `1D` | Left-pointing double angle quotation | `U+00AB` |
| `1E` | Right-pointing double angle quotation | `U+00BB` |
| `3C` | Cyrillic small letter io (it is missed in some fonts) | `U+0451` |
| `3E` | Cyrillic capital letter io | `U+0401` |
| `40`–`7E` | KOI-7 Standard | |
| `7F` | Cyrillic capital letter hard sign | `U+042A` |