

# The `bxcjkatype` Package

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v0.5a [2026/03/31]

## Abstract

This package provides working configuration of the CJK package suitable for Japanese typesetting of moderate quality. Moreover, it facilitates use of the CJK package for pL<sup>A</sup>T<sub>E</sub>X users, by providing commands that are similar to those used by the pL<sup>A</sup>T<sub>E</sub>X kernel and some other packages used with it.

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## 1 Package Loading

`\usepackage[<option>,...]{bxcjkatype}`

The available options are described hereafter.

### 1.1 Options for auto-wrapping by CJK environments

These options wrap the document body with a CJK(\*) environment automatically and safely. They are suitable when CJK needs to be effective in the whole document, or some “moving arguments” hold CJK text.

- **whole, wholeCJK\*:** Wraps the whole document body with a CJK\* environment.  
*Note:* Precisely speaking, it wraps with `\begin{uCJK*}...\end{uCJK*}`.
- **wholeCJK:** Wraps the whole document body with a CJK environment.  
*Note:* Precisely speaking, it wraps with `\begin{uCJK}...\end{uCJK}`.
- **nowhole (default):** Negation of **wholeCJK\*** or **wholeCJK**.

## 1.2 Options for “auto-tilde”

The CJK package does not support auto-insertion of “shibuaki” (a thin space between alphabetic and ideographic letters) and thus authors must manually insert “shibuaki”. To help them CJK package provides a mechanism to switch the meaning of the tilde character “~” between a non-breaking space (the original meaning) and “shibuaki”. The `\autotilde` command changes “~” to “shibuaki”<sup>1</sup>.

The option `autotilde` triggers automatic invocation of `\CJKtilde`, which makes “~” in CJK environments insert “shibuaki” by default.

- **autotilde:** Makes `\CJKtilde` invoked at the beginning of every `CJK(*)` environment.
- **noautotilde (default):** Negation of `autotilde`.

## 1.3 Options for configuring “shibuaki” in PDF strings

As explained above, in  $\text{\LaTeX}$  grammar “~” represents a non-breaking space. Accordingly, when the `hyperref` package generates PDF strings, “~” in  $\text{\LaTeX}$  text will be converted to a space character.

However, when `\CJKtilde` is effective the meaning of “~” changes to “shibuaki”. The “shibuaki” is device on typesetting and is not a space as text data, and thus the behavior of `hyperref` is undesirable. When this package is loaded, “~” with `\CJKtilde` effective is tailored to be deleted at conversion to PDF strings.

Moreover this behavior can be configured by options.

- **noCJKtildeasspace (default):** When `\CJKtilde` is effective, “~” will be deleted in PDF strings.
- **CJKtildeasspace:** When `\CJKtilde` is effective, “~” will be converted to a space character in PDF strings.

*Note:* This is the original behavior of `hyperref`.

## 1.4 Options for font-mapping

You can use preset font mappings in the same way as in the `pxchfon` package. Please refer to the manual of that package for detailed explanation of this feature.

- **oneweight, nooneweight:** The same as in `pxchfon`.
- You can use font preset options (such as `ms`) which are available in `pxchfon` (except obsolete ones).

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<sup>1</sup>`\standardtilde` cancels the effect of `\CJKtilde` and changes “~” back to non-breaking space. `\nbs` always inserts non-breaking space, which is useful in CJK environments.

- **ttfname**=*<pattern>*: Specifies the pattern of the TTF font names which are used when TTC substitution (Section 1.7) is employed.
- **ipaex-type1**: Disables the font management of this package and directly uses the families provided by the **ipaex-type1** package, namely **ipxm** and **ipxg**. In this setting the value of **\mcdefault** is **ipxm** and the value of **\gtdefault** and **\mgdefault** is **ipxg**, so that the higher level commands (such as **\sffamily** and **\gtfamily**) can work correctly.

## 1.5 Options for CJK font scaling

- **scale**=*<real>*: Sets the scaling factor for CJK fonts.

*Note:* When using version 0.3 or later, one can employ the scaling even with the **ipaex-type1** option.

## 1.6 Other options

- **everypage**: Outputs the font mapping information on every page of the resulted DVI document. Available only with **dvipdfmx** driver.
- **noeverypage** (default): Negation of **everypage**.
- Driver options: **pdftex**, **dvipdfmx**, **dvips** and **none** (= **nodvidriver**) are available. The driver setting is relevant only when using font mappings other than the default one (**ipaex-type1** fonts), so you need not care of drivers in using default fonts. Moreover, non-default font mappings are supported only by **pdftex** and **dvipdfmx**, and these two values are auto-detected (**pdftex** is default in PDF mode and **dvipdfmx** in DVI mode). Thus you will never need to specify the driver.
- **resetdvidriver**: Reset the driver setting.
- **substmingoth**: Applies the substitution of families **min**, **goth** and **maru** (used conventionally for Japanese) with families **mc**, **gt** and **mg** (standard in this package).
- **nosubstmingoth** (default): Negation of **substmingoth**.
- **boldbyembolden** (default): Changes the implementation of **\CJKbold** (pseudo-bold) from “overstriking” to “synthetic emboldening”.
- **noboldbyembolden**: Negation of **boldbyembolden**.

## 1.7 TTC substitution

The pdfTeX engine does not support fonts in TTC format. Thus when you want to use TTC fonts for this package, all you can do is to decompose a TTC font into several TTF fonts.

Moreover there is another problem when you use this package. The decomposed TTF files have names different from the original TTC font, which means that the preset settings (options such as **moba-moga**) no longer work. The **ttfname** option is a workaround for this problem.

The **ttfname** option key must have a file name pattern, which is a string containing (exactly) one occurrence of “\*” and one occurrence of a numeral string, such as “\*\_1” and “TEMP-\*-00.TTF”. (If the pattern does not have an extension, “.ttf” is appended.)

For example, when the option **ttfname=\*\_1** is given, the font “index 0 of mogam.ttc” will map to “mogam\_1.ttf”, and similarly, “index 1” to “mogam\_2.ttf” (the numeral part is incremented) and so on.

## 2 Usage

### 2.1 Selecting CJK fonts

The present package provides three “generic” CJK font familie in the same way as p<sup>L</sup>A<sup>T</sup>E<sup>X</sup> plus the [japanese-otf package](#): Mincho family (`\mcfamily`), Gothic family (`\gtfamily`), and Maru-gothic family (`\mgfamily`). In default setting, the font set from the `ipaex-type1` package is allocated; Mincho family uses IPAex Mincho font, and Gothic and Maru-gothic families use IPAex Gothic font. This allocation can be altered by users.

- `\mcfamily`: Changes the CJK family to Mincho family.  
*Note:* Equivalent to `\CJKfamily{\mcdefault}`.
- `\gtfamily`: Changes the CJK family to Gothic family.  
*Note:* Equivalent to `\CJKfamily{\gtdefault}`.
- `\mgfamily`: Changes the CJK family to Maru-gothic family.  
*Note:* Equivalent to `\CJKfamily{\mgdefault}`.

More advanced commands:

- `\mcdefault/\gtdefault/\mgdefault`: The names of CJK families corresponding to the three generic families. In the standard allocation their values are `mc/gt/mg` respectively and the allocation is used as default.
- `\setCJKfamilydefault{<CJK-family>}`: Declares the default CJK family. This default value is used when family names are missing in some commands, such as `\CJKfamily{}` and `\begin{CJK}{UTF8}{}`. The (redefined) `\normalfont` also switches the CJK family to the family specified by this command.

The default value of this default family is the “counterpart” (Section 2.2) of the alphabetic font family which is in effect at the beginning of the document body.

### 2.2 Synchronization of CJK and non-CJK families

The CJK package (and p<sup>T</sup>E<sup>X</sup> engine) manages separate “current families” for CJK and alphabetic (non-CJK) families. While this treatment has its merit, synchronization of the two “current families” is convenient in many cases. Accordingly, the present package redefines some of the L<sup>A</sup>T<sup>E</sup>X commands that switches current alphabetic font families so that the CJK family will be switched to the counterpart of the current alphabetic family, where the “counterpart” is defined as follows:

- `\rmfamily` (Serif) → `\mcfamily` (Mincho)
- `\sffamily` (Sans-serif) → `\gtfamily` (Gothic)
- `\ttfamily` (Monospace) → `\gtfamily` (Gothic)
- The counterpart of the other families is `\mcfamily`.

Redefined commands:

- `\rmfamily/\sffamily/\ttfamily`: Changes the CJK family to the counterpart of the alphabetic font family after executing the original function.

- `\normalfont`: Changes the CJK family to the default CJK family that is specified by the `\setCJKfamilydefault` command.

There are shorthand forms of CJK/CJK\* environments:

- `\begin{uCJK*}...\end{uCJK*}`: Equivalent to:  
  
`\begin{CJK*}{UTF8}{<counterpart>}...\end{CJK*}`

where `<counterpart>` means the counterpart of the current alphabetic font family.

Note that this is *not* equivalent to

`\begin{CJK*}{UTF8}{ }...\end{CJK*}`

structure, which uses the default CJK family.

- `\begin{uCJK}...\end{uCJK}`: Equivalent to:  
  
`\begin{CJK}{UTF8}{counterpart}...\end{CJK}`

## 2.3 Font mapping

The usage of these commands are the same as in the `pxchfon` package. Please refer to the manual of that package for detail.

- `\setminchofont{<id>}{<font-file>}`
- `\setgothicfont{<id>}{<font-file>}`
- `\setmarugothicfont{<id>}{<font-file>}`
- `\setmediumminchofont{<id>}{<font-file>}`
- `\setboldminchofont{<id>}{<font-file>}`
- `\setmediumgothicfont{<id>}{<font-file>}`
- `\setboldgothicfont{<id>}{<font-file>}`
- `\setxboldgothicfont{<id>}{<font-file>}`

However there is a major limitation as to the use of font mapping with the pdf<sub>T</sub>E<sub>X</sub> engine. You can use only TrueType fonts and moreover TTC format is not allowed. (You can use any flavor of OpenType fonts when using dvipdfmx.)

*Note:* The present package does not support the light-weight Mincho font, and thus the `\setlightminchofont` command does nothing useful.

## 2.4 Other commands

- `\UTF{⟨hexadecimal-number⟩}`: Inputs a CJK character through Unicode codepoint value. `\UTF{5B57}` is equivalent to `\Unicode{"5B}{57}`.
- `\CJKforce{⟨character⟩...}`: Afterwards treats the characters given in the argument as CJK characters (printed using CJK fonts).
- `\CJKunforce{⟨character⟩...}`: Cancels the effect of the `\CJKforce` command.
- `\@⟨character⟩`: Treats the next character (only that occurrence) as a CJK character, when the character is outside the ASCII range; otherwise the standard meaning of `\@` is retained.
- `\CJKeckglue`: Inserts a “shibuaki” space. This will be invoked by `~` when `\CJKtilde` is in effect. This command can be redefined by users to adjust the value of shibuaki space, just as `\CJKglue` can be redefined to adjust inter-ideographic space.

For example, you can write:

```
\renewcommand{\CJKeckglue}{\hspace{0.125em minus 0.125em}}
```

## 3 Remarks

- The standard font families provided by this package does *not* support vertical writing, even when using default `ipaex-type1` font set. However, the families provided by `ipaex-type1` (`ipxm` and `ipxg`) do support vertical writing, and you can utilize these families directly by specifying `ipaex-type1` option.