

# About up $\LaTeX$ 2 $\epsilon$

Ken Nakano & Japanese  $\TeX$  Development Community & TTK

Date: 2017/12/02

## *Attention:*

This document provides a brief description of up $\LaTeX$  2 $\epsilon$ , the Japanese extended version of  $\LaTeX$  2 $\epsilon$ . This version is based on ‘p $\LaTeX$  2 $\epsilon$  Community Edition.’ It is now maintained by Japanese  $\TeX$  Development Community<sup>1</sup>.

ASCII p $\TeX$  is the most popular  $\TeX$  engine in Japan and is widely used for a high-quality typesetting, even for commercial printing. However, p $\TeX$  has some limitations:

- The Character set available is limited to JIS X 0208, namely JIS level-1 and level-2
- Difficulty in handling 8-bit Latin, due to legacy double byte Japanese encodings
- Difficulty in typesetting CJK (Chinese, Japanese and Korean) multilingual documents

To overcome these weak points, a Unicode extension of p $\TeX$ , up $\TeX$ , has been developed.<sup>2</sup> The Unicode p $\LaTeX$  format run on up $\TeX$  is called up $\LaTeX$ . Current up $\LaTeX$  is maintained by Japanese  $\TeX$  Development Community,<sup>3</sup> in sync with p $\LaTeX$  community edition.<sup>4</sup> The development version is available from GitHub repository<sup>5</sup>. Any bug reports and requests should be sent to Japanese  $\TeX$  Development Community, using GitHub Issue system.

---

<sup>1</sup><https://texjp.org>

<sup>2</sup><http://www.t-lab.opal.ne.jp/tex/uptex.html>

<sup>3</sup><https://texjp.org>

<sup>4</sup><https://github.com/texjporg/platex>

<sup>5</sup><https://github.com/texjporg/uplatex>

# 1 Introduction to this document

This document briefly describes  $\text{upL}^{\text{A}}\text{T}_{\text{E}}\text{X } 2_{\epsilon}$ , but is not a manual of  $\text{upL}^{\text{A}}\text{T}_{\text{E}}\text{X } 2_{\epsilon}$ . The basic functions of  $\text{upL}^{\text{A}}\text{T}_{\text{E}}\text{X } 2_{\epsilon}$  are almost the same with those of  $\text{pL}^{\text{A}}\text{T}_{\text{E}}\text{X } 2_{\epsilon}$  and  $\text{L}^{\text{A}}\text{T}_{\text{E}}\text{X } 2_{\epsilon}$ , so please refer to the documentation of those formats.

For  $\text{upT}_{\text{E}}\text{X}$ , please refer to the official website or [1] (in English).

This document consists of following parts:

**Section 1** This section; describes this document itself.

**Section 2** Brief explanation of extensions in  $\text{upL}^{\text{A}}\text{T}_{\text{E}}\text{X } 2_{\epsilon}$ . Also describes the standard classes and packages.

**Section 3** The compatibility note for users of the old version of  $\text{upL}^{\text{A}}\text{T}_{\text{E}}\text{X } 2_{\epsilon}$  or those of the original  $\text{pL}^{\text{A}}\text{T}_{\text{E}}\text{X } 2_{\epsilon}/\text{L}^{\text{A}}\text{T}_{\text{E}}\text{X } 2_{\epsilon}$ .

**Appendix A** Describes `DOCSTRIP` Options for this document.

**Appendix B** Description of ‘`upldoc.tex`’ (counterpart for ‘`source2e.tex`’ in  $\text{L}^{\text{A}}\text{T}_{\text{E}}\text{X } 2_{\epsilon}$ ).

**Appendix C** Description of a shell script to process ‘`upldoc.tex`’, etc.

## 2 About Functions of $\text{pL}^{\text{A}}\text{T}_{\text{E}}\text{X } 2_{\epsilon}$

The structure of  $\text{upL}^{\text{A}}\text{T}_{\text{E}}\text{X } 2_{\epsilon}$  is similar to that of  $\text{pL}^{\text{A}}\text{T}_{\text{E}}\text{X } 2_{\epsilon}$ ; it consists of 3 types of files: a format (`uplatex.ltx`), classes and packages.

### 2.1 About the Format

To make a format for  $\text{upL}^{\text{A}}\text{T}_{\text{E}}\text{X}$ , process “`uplatex.ltx`” with INI mode of  $\epsilon\text{-upT}_{\text{E}}\text{X}$ .<sup>6</sup> A handy command ‘`fmtutil-sys`’ (or ‘`fmtutil`’) for this purpose is available in  $\text{T}_{\text{E}}\text{X}$  Live. The following command generates `uplatex.fmt`.

```
fmtutil-sys --byfmt uplatex
```

The content of `uplatex.ltx` is shown below. In the current version of  $\text{upL}^{\text{A}}\text{T}_{\text{E}}\text{X}$ , first we simply load `latex.ltx` and modify/extend some definitions by loading `uplcore.ltx`.

```
1 < *plcore >
```

---

<sup>6</sup>Formerly both  $\text{upT}_{\text{E}}\text{X}$  and  $\epsilon\text{-upT}_{\text{E}}\text{X}$  can make the format file for  $\text{upL}^{\text{A}}\text{T}_{\text{E}}\text{X}$ , however, it’s not true anymore because  $\text{L}^{\text{A}}\text{T}_{\text{E}}\text{X}$  requires  $\epsilon\text{-pT}_{\text{E}}\text{X}$  since 2017.

Temporarily disable `\dump` at the end of `latex.ltx`.

```
2 \let\orgdump\dump
3 \let\dump\relax
```

Load `latex.ltx` here. Within the standard installation of T<sub>E</sub>X Live, `hyphen.cfg` provided by “Babel” package will be used.

```
4 \input latex.ltx
```

Load `uplcore.ltx`.

```
5 \typeout{*****^J%
6      *^J%
7      * making upLaTeX format^J%
8      *^J%
9      *****}
10 \makeatletter
11 \input uplcore.ltx
```

Display upL<sup>A</sup>T<sub>E</sub>X version on the terminal, so that it can be easily recognized during format creation.

```
12 \the\everyjob
```

Load `uplatex.cfg` if it exists at runtime of upL<sup>A</sup>T<sub>E</sub>X 2<sub>ε</sub>. (Counterpart of `platex.cfg` in pL<sup>A</sup>T<sub>E</sub>X 2<sub>ε</sub>.)

```
13 \everyjob\expandafter{%
14   \the\everyjob
15   \IfFileExists{uplatex.cfg}{%
16     \typeout{*****^J%
17           * Loading uplatex.cfg.^J%
18           *****}%
19     \input{uplatex.cfg}}{%
20 }
```

Dump to the format file.

```
21 \let\dump\orgdump
22 \let\orgdump\@undefined
23 \makeatother
24 \dump
25 %\endinput
26 </plcore>
```

The file `uplcore.ltx`, which provides modifications/extensions to make upL<sup>A</sup>T<sub>E</sub>X 2<sub>ε</sub>, is a concatenation of stripped files below using DOCSTRIP program.

- `uplvers.dtx` defines the format version of upL<sup>A</sup>T<sub>E</sub>X 2<sub>ε</sub>.
- `uplfonts.dtx` extends NFSS2 for Japanese font selection.
- `plcore.dtx` (the same content as pL<sup>A</sup>T<sub>E</sub>X 2<sub>ε</sub>); defines other modifications to L<sup>A</sup>T<sub>E</sub>X 2<sub>ε</sub>.

Moreover, default settings of pre-loaded fonts and typesetting parameters are done by loading `upldefs.ltx` inside `uplcore.ltx`. This file `upldefs.ltx` is also stripped from `uplfonts.dtx`.

*Attention:*

You can customize `upLATEX 2ε` by tuning these settings. If you need to do that, copy/rename it as `upldefs.cfg` and edit it, instead of overwriting `upldefs.ltx` itself. If a file named `upldefs.cfg` is found at a format creation time, it will be read as a substitute of `upldefs.ltx`.

As shown above, the files in `upLATEX` is named after `pLATEX` ones, prefixed with “u.”

### 2.1.1 Version

The version (like “2017/10/28u01”) and the format name (“pLaTeX2e”) of `upLATEX 2ε` are defined in `uplvers.dtx`. This is similar to `pLATEX 2ε`, which defines those in `plvers.dtx`.

### 2.1.2 NFSS2 Commands

`upLATEX 2ε` extends NFSS2 in the same way as `pLATEX 2ε`, to enable selection of Japanese fonts.

### 2.1.3 Output Routine and Floats

`upLATEX 2ε` shares `plcore.dtx` with `pLATEX 2ε`, so the output routine and footnote macros will behave similar to `pLATEX 2ε`.

## 2.2 Classes and Packages

Classes and packages bundled with `upLATEX 2ε` are based on those in original `pLATEX 2ε`, and modified some parameters.

`upLATEX 2ε` classes:

- `ujarticle.cls`, `ujbook.cls`, `ujreport.cls`

Standard *yoko-kumi* (horizontal writing) classes; stripped from `ujclasses.dtx`.  
`upLATEX` edition of `jarticle.cls`, `jbook.cls` and `jreport.cls`.

- `utarticle.cls`, `utbook.cls`, `utreport.cls`

Standard *tate-kumi* (vertical writing) classes; stripped from `ujclasses.dtx`.  
up $\LaTeX$  edition of `tarticle.cls`, `tbook.cls` and `treport.cls`.

We don't provide up $\LaTeX$  edition of `jltxdoc.cls`, but the one from p $\LaTeX$  can be used also on up $\LaTeX$  without problem.

up $\LaTeX$  2 $\epsilon$  packages:

- `uptrace.sty`

up $\LaTeX$  2 $\epsilon$  version of `tracefnt.sty`; the package `tracefnt.sty` overwrites up $\LaTeX$  2 $\epsilon$ -style `NFSS2` commands, so `uptrace.sty` provides redefinitions to recover up $\LaTeX$  2 $\epsilon$  extensions. Stripped from `uplfonts.dtx`.

Other p $\LaTeX$  packages work also on up $\LaTeX$ .

### 3 Compatibility with Other Formats and Older Versions

Here we provide some information about the compatibility between current up $\LaTeX$  2 $\epsilon$  and older versions or original p $\LaTeX$  2 $\epsilon$ /L $\TeX$  2 $\epsilon$ .

#### 3.1 Compatibility with p $\LaTeX$ 2 $\epsilon$ /L $\TeX$ 2 $\epsilon$

up $\LaTeX$  2 $\epsilon$  is in most part upper compatible with p $\LaTeX$  2 $\epsilon$ , so you can move from p $\LaTeX$  2 $\epsilon$  to up $\LaTeX$  2 $\epsilon$  by simply replacing the document class and some macros. However, the default Japanese font metrics in up $\LaTeX$  2 $\epsilon$  is different from those in p $\LaTeX$  2 $\epsilon$ ; therefore, you should not expect identical output from both p $\LaTeX$  2 $\epsilon$  and up $\LaTeX$  2 $\epsilon$ .

Note that up $\LaTeX$  is a new format, so we do *not* provide support for 2.09 compatibility mode. Follow the standard L $\TeX$  2 $\epsilon$  convention!

We hope that most classes and packages meant for L $\TeX$  2 $\epsilon$ /p $\LaTeX$  2 $\epsilon$  works also for up $\LaTeX$  2 $\epsilon$  without any modification. However for example, if a class or a package uses Kanji encoding 'JY1' or 'JT1' (default on p $\LaTeX$  2 $\epsilon$ ), an error complaining the mismatch of Kanji encoding might happen on up $\LaTeX$ , in which the default is 'JY2' and 'JT2.' In this case, we have to say that the class or package does not support up $\LaTeX$  2 $\epsilon$ ; you should use p $\LaTeX$ , or report to the author of the package or class.

### 3.2 Support for Package ‘latexrelease’

pL<sup>A</sup>T<sub>E</sub>X provides ‘latexrelease’ package, which is based on ‘latexrelease’ package (introduced in L<sup>A</sup>T<sub>E</sub>X <2015/01/01>). It could be better if we also provide a similar package on upL<sup>A</sup>T<sub>E</sub>X, but currently we don’t need it; upL<sup>A</sup>T<sub>E</sub>X does not have any recent upL<sup>A</sup>T<sub>E</sub>X-specific changes. So, you can safely use ‘latexrelease’ package for emulating the specified format date.

## A DOCSTRIP Options

By processing `uplatex.dtx` with DOCSTRIP program, different files can be generated. Here are the DOCSTRIP options for this document:

<i>Option</i>	<i>Function</i>
<code>plcore</code>	Generates a fragment of format sources
<code>pldoc</code>	Generates ‘upldoc.tex’ for typesetting upL <sup>A</sup> T <sub>E</sub> X 2 <sub>ε</sub> sources
<code>shprog</code>	Generates a shell script to process ‘upldoc.tex’
<code>Xins</code>	Generates a DOCSTRIP batch file ‘Xins.ins’ for generating the above shell/perl scripts

## B Documentation of upL<sup>A</sup>T<sub>E</sub>X 2<sub>ε</sub> sources

The contents of ‘upldoc.tex’ for typesetting upL<sup>A</sup>T<sub>E</sub>X 2<sub>ε</sub> sources is described here. Compared to individual processings, batch processing using ‘upldoc.tex’ prints also changes and an index.

By default, the description of upL<sup>A</sup>T<sub>E</sub>X 2<sub>ε</sub> sources is written in Japanese. If you need English version, first save

```
\newif\ifJAPANESE
```

as `uplatex.cfg`, and process `upldoc.tex` (upL<sup>A</sup>T<sub>E</sub>X 2<sub>ε</sub> newer than July 2016 is required).

Here we explain only difference between `pldoc.tex` (pL<sup>A</sup>T<sub>E</sub>X 2<sub>ε</sub>) and `upldoc.tex` (upL<sup>A</sup>T<sub>E</sub>X 2<sub>ε</sub>).

```
27 <*pldoc>
28 \begin{filecontents}{upldoc.dic}
29 西暦      せいれき
30 和暦      われき
31 \end{filecontents}
```

The document of p<sub>La</sub>T<sub>E</sub>X 2<sub>ε</sub> requires p<sub>lex</sub>t package, since p<sub>lex</sub>t.d<sub>tx</sub> contains several examples of partial vertical writing. However, we don't have such examples in up<sub>La</sub>T<sub>E</sub>X 2<sub>ε</sub> files, so no need for it.

```

32 \documentclass{jltxdoc}
33 %\usepackage{plext} %% comment out for upLaTeX
34 \listfiles
35
36 \DoNotIndex{\def,\long,\edef,\xdef,\gdef,\let,\global}
37 \DoNotIndex{\if,\ifnum,\ifdim,\ifcat,\ifmmode,\ifvmode,\ifhmode,%
38             \iftrue,\iffalse,\ifvoid,\ifx,\ifeof,\ifcase,\else,\or,\fi}
39 \DoNotIndex{\box,\copy,\setbox,\unvbox,\unhbox,\hbox,%
40             \vbox,\vtop,\vcenter}
41 \DoNotIndex{\@empty,\immediate,\write}
42 \DoNotIndex{\egroup,\bgroup,\expandafter,\begingroup,\endgroup}
43 \DoNotIndex{\divide,\advance,\multiply,\count,\dimen}
44 \DoNotIndex{\relax,\space,\string}
45 \DoNotIndex{\csname,\endcsname,\@spaces,\openin,\openout,%
46             \closein,\closeout}
47 \DoNotIndex{\catcode,\endinput}
48 \DoNotIndex{\jobname,\message,\read,\the,\m@ne,\noexpand}
49 \DoNotIndex{\hsize,\vsize,\hskip,\vskip,\kern,\hfil,\hfill,\hss,\vss,\unskip}
50 \DoNotIndex{\m@ne,\z@,\z@skip,\@ne,\tw@,\p@,\@minus,\@plus}
51 \DoNotIndex{\dp,\wd,\ht,\setlength,\addtolength}
52 \DoNotIndex{\newcommand,\renewcommand}
53
54 \ifJAPANESE
55 \IndexPrologue{\part*{索引}}%
56             \markboth{索引}{索引}%
57             \addcontentsline{toc}{part}{索引}%
58 イタリアック体の数字は、その項目が説明されているページを示しています。
59 下線の引かれた数字は、定義されているページを示しています。
60 その他の数字は、その項目が使われているページを示しています。}
61 \else
62 \IndexPrologue{\part*{Index}}%
63             \markboth{Index}{Index}%
64             \addcontentsline{toc}{part}{Index}%
65 The italic numbers denote the pages where the corresponding entry
66 is described, numbers underlined point to the definition,
67 all others indicate the places where it is used.}
68 \fi
69 %
70 \ifJAPANESE
71 \GlossaryPrologue{\part*{変更履歴}}%
72             \markboth{変更履歴}{変更履歴}%
73             \addcontentsline{toc}{part}{変更履歴}}
74 \else
75 \GlossaryPrologue{\part*{Change History}}%
76             \markboth{Change History}{Change History}%
77             \addcontentsline{toc}{part}{Change History}}

```

```

78 \fi
79
80 \makeatletter
81 \def\changes@#1#2#3{%
82   \let\protect\@unexpandable\protect
83   \edef\@tempa{\noexpand\glossary{#2\space\currentfile\space#1\levelchar
84     \ifx\saved@macroname\@empty
85       \space\actualchar\generalname
86     \else
87       \expandafter\@gobble
88       \saved@macroname\actualchar
89       \string\verb\quotechar*%
90       \verbatimchar\saved@macroname
91       \verbatimchar
92     \fi
93     :\levelchar #3}}%
94   \@tempa\endgroup\@esphack}
95 \makeatother
96 \RecordChanges
97 \CodelineIndex
98 \EnableCrossrefs
99 \setcounter{IndexColumns}{2}
100 \settowidth\MacroIndent{\ttfamily\scriptsize 000\ }

```

Here starts the document body.

```

101 \begin{document}
102 \title{The \upLaTeXe\ Sources}
103 \author{Ken Nakano \& Japanese \TeX\ Development Community \& TTK}
104
105 % This command will be used to input the patch file
106 % if that file exists.
107 \newcommand{\includelpatch}{%
108   \def\currentfile{uplpatch.ltx}
109   \part{uplpatch}
110   {\let\ttfamily\relax
111     \xdef\filekey{\filekey, \thepart={\ttfamily\currentfile}}}%
112   Things we did wrong\ldots
113   \IndexInput{uplpatch.ltx}}
114
115 % Get the date and patch level from uplvers.dtx
116 \makeatletter
117 \let\patchdate=\@empty
118 \begingroup
119   \def\ProvidesFile#1\pfmtversion#2#3\ppatch@level#4{%
120     \date{#2}\xdef\patchdate{#4}\endinput}
121   \input{uplvers.dtx}
122 \global\let\X@date=\@date
123
124 % Add the patch version if available.
125 \long\def\Xdef#1#2#3\def#4#5{%

```



```

126 \xdef\X@date{#2}%
127 \xdef\patchdate{#5}%
128 \endinput}%
129 \InputIfFileExists{uplpatch.ltx}
130 {\let\def\Xdef}{\global\let\includeltpatch\relax}
131 \endgroup
132
133 \ifx\@date\X@date
134 \def\Xpatch{0}
135 \ifx\patchdate\Xpatch\else
136 % number is assumed
137 \ifnum\patchdate>0
138 \edef\@date{\@date\space Patch level\space\patchdate}
139 \else
140 \edef\@date{\@date\space Pre-Release\patchdate}
141 \fi\fi
142 \else
143 \@warning{uplpatch.ltx does not match uplvers.dtx!}
144 \let\includeltpatch\relax
145 \fi
146 \makeatother
147
148 \pagenumbering{roman}
149 \maketitle
150 \renewcommand\maketitle{}
151 \tableofcontents
152 \clearpage
153 \pagenumbering{arabic}
154
155 \DocInclude{uplvers} % upLaTeX version
156
157 \DocInclude{uplfonts} % NFSS2 commands
158
159 %\DocInclude{plcore} % kernel commands (comment out for upLaTeX)
160
161 \DocInclude{ukinsoku} % kinsoku parameter
162
163 \DocInclude{ujclasses} % Standard class
164
165 %\includeltpatch % patch file (comment out May 8, 2016)
166
167 \StopEventually{\end{document}}
168
169 \clearpage
170 \pagestyle{headings}
171 % Make TeX shut up.
172 \hbadness=10000
173 \newcount\hbadness
174 \hfuzz=\maxdimen
175 %

```

```

176 \PrintChanges
177 \clearpage
178 %
179 \begingroup
180 \def\endash{--}
181 \catcode'\- \active
182 \def-\{\futurelet\temp\indexdash}
183 \def\indexdash{\ifx\temp-\endash\fi}
184
185 \PrintIndex
186 \endgroup
187 \let\PrintChanges\relax
188 \let\PrintIndex\relax
189 \end{document}
190 \pdoc)

```

## C Additional Utility Programs

### C.1 Shell Script mkpdoc.sh

A shell script to process ‘pdoc.tex’ and produce a fully indexed source code description. Run `sh mkpdoc.sh` to use it.

The script is almost identical to that in pL<sup>A</sup>T<sub>Ε</sub>X 2<sub>ε</sub>, so here we describe only the difference.

```

191 \shprog)
192 for f in upldoc.toc upldoc.idx upldoc.glo ; do
193 if [ -e $f ]; then rm $f; fi
194 done
195 echo "" > ltxdoc.cfg
196 uplatex upldoc.tex

```

To make the Change log and Glossary (Change History) for upL<sup>A</sup>T<sub>Ε</sub>X using ‘mendex,’ we need to run it in UTF-8 mode. So, option `-U` is important.<sup>7</sup>

```

197 mendex -U -s gind.ist -d upldoc.dic -o upldoc.ind upldoc.idx
198 mendex -U -f -s gglo.ist -o upldoc.gls upldoc.glo
199 echo "\includeonly{" > ltxdoc.cfg
200 uplatex upldoc.tex
201 echo "" > ltxdoc.cfg
202 uplatex upldoc.tex
203 # EOT
204 \shprog)

```

---

<sup>7</sup>The command ‘uplatex’ should be also in UTF-8 mode, but it defaults to UTF-8 mode; therefore, we don’t need to add `-kanji=utf8` explicitly.

## C.2 Perl Script `dstcheck.pl`

The one from  $\text{p}\text{L}\text{A}\text{T}\text{E}\text{X} 2_{\epsilon}$  can be use without any change, so omitted here in  $\text{up}\text{L}\text{A}\text{T}\text{E}\text{X} 2_{\epsilon}$ .

## C.3 DOCSTRIP Batch file

Here we introduce a DOCSTRIP batch file ‘Xins.ins,’ which generates the script described in Appendix C.1. The code is almost identical to that in  $\text{p}\text{L}\text{A}\text{T}\text{E}\text{X} 2_{\epsilon}$ .

```
205 <*Xins>
206 \input docstrip
207 \keepsilent

208 {\catcode'#=12 \gdef\MetaPrefix{## }}

209 \declarepreamble\thispre
210 \endpreamble
211 \usepreamble\thispre

212 \declarepostamble\thispost
213 \endpostamble
214 \usepostamble\thispost

215 \generate{
216   \file{mkpldoc.sh}{\from{uplatex.dtx}{shprog}}
217 }
218 \endbatchfile
219 </Xins>
```

## References

- [1] Takuji Tanaka, UpTeX — Unicode version of pTeX with CJK extensions  
TUGboat issue 34:3, 2013].  
(<http://tug.org/TUGboat/tb34-3/tb108tanaka.pdf>)

## Change History

2011/05/07 v1.0c-u00	<code>uplvers.dtx</code> (based on	
Created up $\LaTeX$ version based on	<code>platex.dtx</code> 2016/06/19 v1.0l) . . .	8
p $\LaTeX$ one (based on		
<code>platex.dtx</code> 1997/01/29 v1.0c) . . .	2016/08/26 v1.0m-u01	
2016/05/08 v1.0h-u00	Moved loading <code>uplatex.cfg</code> from	
Exclude <code>uplpatch.ltx</code> from the	<code>uplcore.ltx</code> to <code>uplatex.ltx</code>	
document (based on <code>platex.dtx</code>	(based on <code>platex.dtx</code>	
2016/05/08 v1.0h) . . . . .	2016/08/26 v1.0m) . . . . .	3
2016/06/06 v1.0k-u01	2017/11/29 v1.0q-u01	
Update documents for up $\LaTeX$ . . .	New English documentation added	
2016/06/19 v1.0l-u01	(based on <code>platex.dtx</code>	
Get the patch level from	2017/11/29 v1.0q) . . . . .	1