Hypertext marks in LaTeX

Sebastian Rahtz (deceased)
Heiko Oberdiek (inactive)
The LaTeX Project
https://github.com/latex3/hyperref/issues

2026-10-09 v7.01s

1 Documentation overview for hyperref

The documentation for package hyperref consists of several files:

Manual The **USER MANUAL** (also available as HTML).

ChangeLog This file records the version history.

Bookmark talk, slides Slides for the talk "PDF information and navigation elements with hyperref, pdfTeX and thumbpdf" at EuroTeX 1999.

Bookmark talk, paper The paper version of the talk.

Source code documentation:

☞ **hyperref.dtx** This is the source code documentation for hyperref (this file).

backref.dtx "Back referencing from bibliographical citations"

nameref.dtx "Section name references in LaTeX"

2 Contents

1 Documentation overview for hyperref **1**

2 Contents **2**

3 File hycheck.tex **7**

4 Package options and setup **11**
4.1 Save catcodes . . . 11
4.2 Disable patches . . . 12
4.3 Version check . . . 13
4.4 Checks with regular expressions . . . 14
4.5 Compatibility with format dumps . . . 15
4.6 Switches . . . 16

5 Common help macros **18**
5.1 Macros for recursions . . . 18
5.2 Babel's protection of shorthand characters . . . 18
5.3 Coordinate transformations . . . 18

6 Dealing with PDF strings **19**
6.1 Description of PDF strings . . . 19
6.2 Definition of \pdfstringdef . . . 19
6.2.1 Preprocessing . . . 20
6.2.2 Expansion . . . 27
6.2.3 Postprocessing . . . 28
6.3 Encodings . . . 32
6.3.1 XeTeX . . . 32
6.3.2 Workaround for package linguex . . . 33
6.3.3 Catcodes saving and restoring for .def files . . . 33
6.3.4 PD1 encoding . . . 34
6.3.5 PU encoding . . . 34
6.4 Additional user commands . . . 35
6.4.1 \texorpdfstring . . . 35
6.4.2 Hooks for \pdfstringdef . . . 35
6.5 Help macros for expansion . . . 36
6.5.1 \ignorespaces . . . 36
6.5.2 Babel languages . . . 37
6.5.3 CJK patch . . . 37
6.5.4 CJK bookmarks . . . 38
6.5.5 CJK unicode . . . 39
6.5.6 \@inmathwarn-Patch . . . 44
6.5.7 Unexpandable spaces . . . 45
6.5.8 Marker for commands . . . 46
6.5.9 \hspace fix . . . 46
6.5.10 Fix for AMS classes . . . 46
6.5.11 Reference commands . . . 46
6.5.12 Redefining the defining commands . . . 49
6.5.13 \ifnextchar . . . 50

6.5.14 \@protected@testoptifnextchar . . . 50
6.6 Help macros for postprocessing . . . 51
6.6.1 Generic warning. . . . 51
6.6.2 Protecting spaces . . . 51
6.6.3 Remove grouping braces . . . 52
6.6.4 Catcode check . . . 53
6.6.5 Check for wrong glyphs . . . 57
6.6.6 Replacing tokens . . . 58
6.6.7 Support for package xspace . . . 59
6.6.8 Converting to Unicode . . . 59
6.6.9 Support for UTF-8 input encoding . . . 62
6.6.10 Support for die faces (ifsym et. al.) . . . 66
6.6.11 Support for moon phases of package china2e . . . 66
6.6.12 Support for package pifont . . . 67

7 Support of other packages 68
7.1 Package subfigure . . . 68
7.2 Package xr and xr-hyper . . . 69

8 Help macros for links 69

9 Options 71
9.1 Help macros . . . 71
9.2 Defining the options . . . 74

10 Options for different drivers 79

11 Options to add extra features 84

12 Language options 85

13 Options to change appearance of links 95

14 Bookmarking 95

15 PDF-specific options 97
15.1 Package xspace support . . . 112
15.2 Option draft . . . 112
15.3 PDF/A . . . 113
15.4 Patch for babel's \texttilde . . . 114
15.4.1 Driver loading . . . 115
15.4.2 Bookmarks . . . 119

16 User hypertext macros 122
16.1 Link box support for XeTeX and dvipdfmx . . . 129

17 Underlying basic hypertext macros 130

18 Option 'destlabel' 135

19 Forms creation **137**
19.1 Field flags . . . 137
19.1.1 Declarations of field flags . . . 139
19.1.2 Set submit flags . . . 141
19.1.3 Set annot flags in fields . . . 142
19.1.4 Pushbutton field . . . 142
19.1.5 Check box field . . . 143
19.1.6 Radio button field . . . 143
19.1.7 Text fields . . . 143
19.1.8 Choice fields . . . 144
19.2 Choice field . . . 145
19.3 Forms . . . 147

20 Setup **155**

21 Low-level utility macros **155**

22 Localized nullifying of package **156**

23 Package nohyperref **157**

24 The Mangling Of Aux and Toc Files **158**

25 Title strings **158**

26 Page numbers **160**

27 Every page **160**
27.1 PDF /PageLabels . . . 160
27.1.1 pdfTeX and VTeX . . . 164
27.1.2 xetex . . . 166
27.1.3 pdfmarkbase, dvipdfm, xetex . . . 167

28 Automated LaTeX hypertext cross-references **168**

29 Package ifthen support **174**

30 Package varwidth support **174**

31 Package titlesec and titletoc support **174**

32 Package longtable support **175**

33 Equations **176**

34 Support for theorems **178**

35 Footnotes **180**

36 Float captions **185**

37 Bibliographic references **188**
37.1 Package harvard . . . 191
37.2 Package chicago . . . 192

38 Page numbers **193**

39 Table of contents **195**

40 New counters **200**

41 AMSLaTeX compatibility **200**
41.1 \@addtoreset and \numberwithin patches . . . 201

42 Included figures **202**

43 hyperindex entries **202**

44 Configuration files **211**
44.1 PS/PDF strings . . . 211
44.2 pdftex . . . 212
44.3 hypertex . . . 226
44.4 dviwindo . . . 228
44.5 dvipdfm/xetex dvi to PDF converter . . . 234
44.6 VTeX typesetting system . . . 244
44.7 Fix for Adobe bug number 466320 . . . 257
44.8 Direct pdfmark support . . . 258
44.9 Rokicki's dvips . . . 272
44.10 VTeX's vtexpdfmark driver . . . 275
44.11 Textures . . . 277
44.12 dvipsone . . . 281
44.13 TeX4ht . . . 285

45 Driver-specific form support **288**
45.1 pdfmarks . . . 288
45.2 HyperTeX . . . 296
45.3 TeX4ht . . . 297
45.4 pdfTeX . . . 300
45.5 dvipdfm, xetex . . . 309
45.6 Common forms part . . . 317

46 Bookmarks in the PDF file **324**
46.1 Bookmarks . . . 325
46.1.1 Rerun warning . . . 328
46.1.2 Driver stuff . . . 328

47 Encoding definition files for encodings of PDF strings **335**
47.1 PD1 encoding . . . 335
47.2 PU encoding . . . 343
47.2.1 NFSS2 accents . . . 343
47.2.2 Basic Latin: U+0000 to U+007F . . . 346
47.2.3 Latin-1 Supplement: U+0080 to U+00FF . . . 348

47.2.4 Latin Extended-A: U+0080 to U+017F 352
47.2.5 Latin Extended-B: U+0180 to U+024F 357
47.2.6 IPA Extensions: U+0250 to U+02AF 362
47.2.7 Spacing Modifier Letters: U+02B0 to U+02FF 368
47.2.8 Combining Diacritical Marks: U+0300 to U+036F 369
47.2.9 Greek and Coptic: U+0370 to U+03FF 369
47.2.10 Cyrillic: U+0400 to U+04FF 369
47.2.11 Hebrew: U+0590 to U+05FF 380
47.2.12 Thai: U+0E00 to U+0E7F 382
47.2.13 Phonetic Extensions: U+1D00 to U+1D7F 382
47.2.14 Phonetic Extensions Supplement: U+1D80 to U+1DBF . . 383
47.2.15 Latin Extended Additional: U+1E00 to U+1EFF 383
47.2.16 General Punctuation: U+2000 to U+206F 389
47.2.17 Superscripts and Subscripts: U+2070 to U+209F 390
47.2.18 Currency Symbols: U+20A0 to U+20CF 392
47.2.19 Letterlike Symbols: U+2100 to U+214F 392
47.2.20 Number Forms: U+2150 to U+218F 394
47.2.21 Arrows: U+2190 to U+21FF 394
47.2.22 Mathematical Operators: U+2200 to U+22FF 398
47.2.23 Miscellaneous Technical: U+2300 to U+23FF 409
47.2.24 Control Pictures: U+2400 to U+243F 410
47.2.25 Optical Character Recognition: U+2440 to U+245F 410
47.2.26 Enclosed Alphanumerics: U+2460 to U+24FF 410
47.2.27 Box Drawing: U+2500 to 257F 413
47.2.28 Geometric Shapes: U+25A0 to U+25FF 414
47.2.29 Miscellaneous Symbols: U+2600 to U+26FF 414
47.2.30 Dingbats: U+2700 to U+27BF 419
47.2.31 Miscellaneous Mathematical Symbols-A: U+27C0 to U+27EF 422
47.2.32 Supplemental Arrows-A: U+27F0 to U+27FF 422
47.2.33 Supplemental Arrows-B: U+2900 to U+297F 423
47.2.34 Miscellaneous Mathematical Symbols-B: U+2980 to U+29FF 425
47.2.35 Supplemental Mathematical Operators: U+2A00 to U+2AFF 426
47.2.36 Miscellaneous Symbols and Arrows: U+2B00 to U+2BFF . 429
47.2.37 Latin Extended-C: U+2C60 to U+2C7F 429
47.2.38 Supplemental Punctuation: U+2E00 to U+2E7F 429
47.2.39 Modifier Tone Letters: U+A700 to U+A71F 429
47.2.40 Latin Extended-D: U+A720 to U+A7FF 429
47.2.41 Alphabetic Presentation Forms: U+FB00 to U+FB4F . . . 430
47.2.42 Musical Symbols: U+1D100 to U+1D1FF 430
47.2.43 Miscellaneous Symbols and Pictographs: U+1F300 to U+1F5FF 430
47.2.44 Transport and Map Symbols: U+1F680 to U+1F6FF . . . 431
47.2.45 Miscellaneous 431
47.2.46 Aliases 431
47.3 PU encoding, additions for VnTEX 431
47.4 PU encoding, additions for Arabi 434

48 End of file hycheck.tex **459**

49 Index **460**

3 File hycheck.tex

Many commands of LaTeX or other packages cannot be overloaded, but have to be redefined by hyperref directly. If these commands change in newer versions, these changes are not noticed by hyperref. With this test file this situation can be checked. It defines the command `\checkcommand` that is more powerful than LaTeX's `\CheckCommand`, because it takes `\DeclareRobustCommand` and optional parameters better into account.

```
⟨*check⟩
\documentclass{article}
\makeatletter
```

`\checklatex` Optional argument: release date of LaTeX.

```
\newcommand*{\checklatex}[1][]{%
  \typeout{}%
  \typeout{* Format: `LaTeX2e' #1}%
  \typeout{\space\space Loaded: `\fmtname' \fmtversion}%
}%
```

`\checkpackage` The argument of `\checkpackage` is the package name without extension optionally followed by a release date.

```
\newcommand*{\checkpackage}[1]{%
  \def\HyC@package{#1}%
  \let\HyC@date\@empty
  \@ifnextchar[\HyC@getDate\HyC@checkPackage
}
```

`\HyC@getDate` The release date is scanned.

```
\def\HyC@getDate[#1]{%
  \def\HyC@date{#1}%
  \HyC@checkPackage
}
```

`\HyC@checkPackage`

```
\def\HyC@checkPackage{%
  \typeout{}%
  \begingroup
    \edef\x{\endgroup
      \noexpand\RequirePackage{\HyC@package}%
      \ifx\HyC@date\@empty\relax\else[\HyC@date]\fi%
    }%
  \x
  \typeout{}%
  \typeout{%
    * Package `\HyC@package'%
    \ifx\HyC@date\@empty
    \else
      \space\HyC@date
    \fi
  }%
  \@ifundefined{ver@\HyC@package.sty}{%
  }{%
    \typeout{%
```

```
    \space\space Loaded: `\HyC@package' %
    \csname ver@\HyC@package.sty\endcsname
   }%
  }%
}
```

\checkcommand The macro **\checkcommand** parses the next tokens as a LaTeX definition and compares this definition with the current meaning of that command.

```
\newcommand*{\checkcommand}[1]{%
  \begingroup
  \ifx\long#1\relax
    \expandafter\HyC@checklong
  \else
    \def\HyC@defcmd{#1}%
    \expandafter\let\expandafter\HyC@next
      \csname HyC@\expandafter\@gobble\string#1\endcsname
    \expandafter\HyC@checkcommand
  \fi
}
```

\HyC@checklong The definition command **\def** or **\edef** is read.

```
\def\HyC@checklong#1{%
  \def\HyC@defcmd{\long#1}%
  \expandafter\let\expandafter\HyC@next
    \csname HyC@\expandafter\@gobble\string#1\endcsname
  \HyC@checkcommand
}
```

\HyC@checkcommand The optional star of LaTeX's definitions is parsed.

```
\def\HyC@checkcommand{%
  \ifx\HyC@next\relax
    \PackageError{hycheck}{%
      Unknown command `\expandafter\strip@prefix\meaning\HyC@cmd'%
    }\@ehd
    \expandafter\endinput
  \fi
  \@ifstar{%
    \def\HyC@star{*}%
    \HyC@check
  }{%
    \let\HyC@star\@empty
    \HyC@check
  }%
}
```

\HyC@check The macro **\HyC@check** reads the definition command.

```
\def\HyC@check#1{%
  \def\HyC@cmd{#1}%
  \let\HyC@org@cmd#1%
  \let#1\relax
  \let\HyC@param\@empty
  \HyC@Toks{}%
  \let\HyC@org@optcmd\HyC@noValue
  \let\HyC@org@robustcmd\HyC@noValue
```

```
  \let\HyC@org@robustoptcmd\HyC@noValue
  \HyC@next
}
```

\HyC@noValue

```
\def\HyC@noValue{NoValue}
```

\HyC@newcommand The code for \newcommand.

```
\def\HyC@newcommand{%
  \let\HyC@@cmd\HyC@cmd
  \@ifnextchar[\HyC@nc@opt\HyC@nc@noopt
}
```

\HyC@Toks A register for storing the default value of an optional argument.

```
\newtoks\HyC@Toks
```

\HyC@nc@noopt This macro \HyC@nc@noopt is called, if the parser has reached the definition text.

```
\long\def\HyC@nc@noopt#1{%
  \edef\x{%
    \expandafter\noexpand\HyC@defcmd
    \HyC@star
    \expandafter\noexpand\HyC@cmd
    \HyC@param\the\HyC@Toks
  }%
  \x{#1}%
  \HyC@doCheck
}
```

\HyC@nc@opt This macro scans the first optional argument of a LaTeX definition (number of arguments).

```
\def\HyC@nc@opt[#1]{%
  \def\HyC@param{[{#1}]}%
  \@ifnextchar[\HyC@nc@default\HyC@nc@noopt
}
```

\HyC@nc@default Macro \HyC@nc@default scans the default for an optional argument.

```
\def\HyC@nc@default[#1]{%
  \HyC@Toks={[{#1}]}%
  \edef\HyC@optcmd{%
    \expandafter\noexpand
    \csname\expandafter\string\HyC@@cmd\endcsname
  }%
  \expandafter\let\expandafter\HyC@org@optcmd\HyC@optcmd
  \HyC@nc@noopt
}
```

\HyC@DeclareRobustCommand \DeclareRobustCommand{\cmd} makes the command \cmd robust, that then calls \cmd␣ with an space at the end of the command name, defined by \newcommand. Therefore the further parsing is done by \HyC@nc@opt or \Hy@nc@noopt of the \HyC@newcommand chain.

```
\def\HyC@DeclareRobustCommand{%
  \edef\HyC@robustcmd{%
```

```
    \expandafter\noexpand
    \csname\expandafter\expandafter\expandafter\@gobble
      \expandafter\string\HyC@cmd\space\endcsname
  }%
  \expandafter\let\expandafter\HyC@org@robustcmd\HyC@robustcmd
  \expandafter\let\HyC@robustcmd\relax
  \let\HyC@@cmd\HyC@robustcmd
  \@ifnextchar[\HyC@nc@opt\HyC@nc@noopt
}
```

`\HyC@def` `\HyC@edef` The parameter text of `\def` or `\edef` is stored in the token register `\HyC@Toks`.

```
\def\HyC@def#1#{%
  \HyC@Toks={#1}%
  \HyC@nc@noopt
}
\let\HyC@edef\HyC@def
```

`\HyC@doCheck` This command performs the checks and prints the result.

```
\def\HyC@doCheck{%
  \typeout{* Checking `\HyC@string\HyC@cmd':}%
  \HyC@checkItem{cmd}%
  \HyC@checkItem{robustcmd}%
  \HyC@checkItem{optcmd}%
  \HyC@checkItem{robustoptcmd}%
  \endgroup
}
```

`\HyC@checkItem` A single check.

```
\def\HyC@checkItem#1{%
  \expandafter\ifx\csname HyC@org@#1\endcsname\HyC@noValue
  \else
    \expandafter\expandafter\expandafter\ifx
    \csname HyC@#1\expandafter\endcsname
    \csname HyC@org@#1\endcsname
      \expandafter\HyC@checkOk\csname HyC@#1\endcsname
    \else
      \expandafter\HyC@checkFailed
        \csname HyC@#1\expandafter\endcsname
        \csname HyC@org@#1\endcsname
    \fi
  \fi
}
```

`\HyC@string` `\HyC@meaning` Some shorthands.

```
\def\HyC@string#1{\expandafter\string#1}
\def\HyC@meaning#1{\expandafter\meaning#1}
```

`\HyC@checkOk` The result, if the check succeeds.

```
\def\HyC@checkOk#1{%
  \typeout{\space\space`\HyC@string#1' ok.}%
}
```

`\HyC@checkFailed` The result, if the check fails.

```
\def\HyC@checkFailed#1#2{%
  \typeout{\space\space`\HyC@string#1' failed.}%
  \typeout{\space\space* original: \meaning#2}%
  \typeout{\space\space* expected: \HyC@meaning#1}%
}
% ************************************************
⟨/check⟩
⟨*package⟩
```

4 Package options and setup

4.1 Save catcodes

There are many packages that change the standard catcodes.

First we save the original meaning of ` and = in the token register \toks@, because we need the two characters in the macros \Hy@SetCatcodes and \Hy@RestoreCatcodes.

```
\begingroup
  \@makeother\`%
  \@makeother\=%
  \edef\x{%
    \edef\noexpand\x{%
      \endgroup
      \noexpand\toks@{%
        \catcode 96=\noexpand\the\catcode`\noexpand\`\relax
        \catcode 61=\noexpand\the\catcode`\noexpand\=\relax
      }%
    }%
    \noexpand\x
  }%
\x
\@makeother\`
\@makeother\=
```

\Hy@SetCatcodes

```
\def\Hy@SetCatcodes{%
  \@makeother\`%
  \@makeother\=%
  \catcode`\$=3 %
  \catcode`\&=4 %
  \catcode`\^=7 %
  \catcode`\_=8 %
  \@makeother\|%
  \@makeother\:%
  \@makeother\(%
  \@makeother\)%
  \@makeother\[%
  \@makeother\]%
  \@makeother\/%
  \@makeother\!%
  \@makeother\<%
```

```
  \@makeother\>%
  \@makeother\.%
  \@makeother\;%
  \@makeother\+%
  \@makeother\-%
  \@makeother\"%
  \@makeother\'%
}
```

\Hy@RestoreCatcodes

```
\begingroup
  \def\x#1{\catcode`\noexpand#1=\the\catcode`#1\relax}%
  \xdef\Hy@RestoreCatcodes{%
    \the\toks@
    \x\$%
    \x\&%
    \x\^%
    \x\_%
    \x\|%
    \x\:%
    \x\(%
    \x\)%
    \x\[%
    \x\]%
    \x\/%
    \x\!%
    \x\<%
    \x\>%
    \x\.%
    \x\;%
    \x\+%
    \x\-%
    \x\"%
    \x\'%
  }%
\endgroup
```

```
\Hy@SetCatcodes
```

4.2 Disable patches

If new latex interfaces are used with \DocumentMetadata various patches are unneeded or do harm, so we disable them. Not handled yet: \hyper@nopatch@amsmath@tag, \hyper@nopatch@mathenv

```
\IfFormatAtLeastT{2025-11-01}
{
  \IfDocumentMetadataT
   {
     \def\hyper@nopatch@counter{} % disabled since 2024-11-01 anyway
     \def\hyper@nopatch@bib{}
     \def\hyper@nopatch@thm{}
     \def\hyper@nopatch@caption{}
     \def\hyper@nopatch@footnote{}
     \def\hyper@nopatch@sectioning{}
```

```
    \def\hyper@nopatch@toc{}
    \def\hyper@nopatch@longtable{}
  }
}
```

change 2020-07-24: require newer pdftexcmds and remove fallback code for version older than 2010. change 2021-08-14: require expl3 change 2023-11-26: no longer require pdftexcmds change 2023-11-26: no longer require expl3, we assume kernel is new enough. change 2024-05-23: load stringenc always (for pdfx)

```
\RequirePackage{iftex}[2019/10/24]
\RequirePackage{keyval}[1997/11/10]
\RequirePackage{kvsetkeys}[2007/09/29]
\RequirePackage{kvdefinekeys}[2011/04/07]
\RequirePackage{pdfescape}[2007/11/11]
\RequirePackage{hycolor}
\RequirePackage{nameref}[2012/07/28]
\RequirePackage{etoolbox}
\RequirePackage{stringenc}[2009/12/15]%
\def\Hy@Error{\PackageError{hyperref}}
\def\Hy@Warning{\PackageWarning{hyperref}}
\def\Hy@WarningNoLine{\PackageWarningNoLine{hyperref}}
\def\Hy@Info{\PackageInfo{hyperref}}
\def\Hy@InfoNoLine#1{\PackageInfo{hyperref}{#1\@gobble}}
\def\Hy@Message#1{%
  \GenericWarning{%
    (hyperref)\@spaces\@spaces\@spaces\@spaces
  }{%
    Package hyperref Message: #1\@gobble
  }%
}
```

4.3 Version check

\Hy@VersionChecked

```
\chardef\Hy@VersionChecked=0 %
```

\Hy@VersionCheck

```
\def\Hy@VersionCheck#1{%
  \begingroup
    \@ifundefined{ver@hyperref.sty}{%
      \Hy@Error{%
        This should not happen!\MessageBreak
        Missing hyperref version%
      }\@ehd
    }{%
      \@ifundefined{ver@#1}{%
        \Hy@Error{%
          This should not happen!\MessageBreak
          Missing version of `#1'%
        }\@ehd
      }{%
        \def\x##1##2##3{%
          \expandafter\expandafter\expandafter\Hy@@VersionCheck
          \expandafter\expandafter\expandafter##2%
```

```
      \csname ver@##3\endcsname##1##1\@nil
    }%
    \x{ }\y{hyperref.sty}%
    \x{ }\z{#1}%
    \ifx\y\z
    \else
      \edef\a{#1}%
      \edef\b{\HyOpt@CustomDriver.def}%
      \ifx\a\b
        \Hy@WarningNoLine{%
          Version mismatch (custom driver)!\MessageBreak
          * \y: hyperref.sty\MessageBreak
          * \z: \a
        }%
      \else
        \Hy@Error{%
          Version mismatch!\MessageBreak
          * \y: hyperref.sty\MessageBreak
          * \z: \a
        }\@ehd
      \fi
    \fi
  }%
 }%
 \endgroup
 \chardef\Hy@VersionChecked=1 %
}
```

\Hy@@VersionCheck

```
\def\Hy@@VersionCheck #1#2 #3 #4\@nil{%
 \def#1{#2 #3}%
}
```

4.4 Checks with regular expressions

```
\edef\Hy@leftbracechar{\string{}
\edef\Hy@rightbracechar{\string}}
\@ifundefined{pdfmatch}{%
 \def\Hy@Match#1#2#3#4#5{}%
}{%
 \def\Hy@Match#1#2#3{%
  \begingroup
  \edef\^{\@backslashchar\string^}%
  \edef\.{\@backslashchar.}%
  \edef\[{\@backslashchar[}% ]]
  \edef\${\@backslashchar$}%
  \edef\({\@backslashchar(}%
  \edef\){\@backslashchar)}%
  \edef\|{\@backslashchar|}%
  \edef\*{\@backslashchar*}%
  \edef\+{\@backslashchar+}%
  \edef\?{\@backslashchar?}%
  \edef\{{\@backslashchar\Hy@leftbracechar}%
  \edef\}{\Hy@rightbracechar}%
```

```
    \edef\\{\@backslashchar\@backslashchar}%
    \let\ \Hy@space
    \ifcase\pdfmatch#2{#3}{#1} %
      \endgroup
      \expandafter\@secondoftwo
    \or
      \endgroup
      \expandafter\@firstoftwo
    \else
      \Hy@Warning{%
        Internal error: Wrong pattern!\MessageBreak
        --> #3 <--\MessageBreak
        Pattern check ignored%
      }%
      \endgroup
      \expandafter\@firstoftwo
    \fi
  }%
}
```

4.5 Compatibility with format dumps

\AfterBeginDocument

For use with pre-compiled formats, created using the ldump package, there needs to be 2 hooks for adding material delayed until \begin{document}. These are called \AfterBeginDocument and \AtBeginDocument. If ldump is not loaded, then a single hook suffices for normal LaTeX processing.

The default definition of \AfterBeginDocument cannot be done by \let because of problems with xypic.

```
\@ifundefined{AfterBeginDocument}{%
  \def\AfterBeginDocument{\AtBeginDocument}%
}{}%
```

\Hy@AtBeginDocument

For the case that package 'hyperref' is loaded using \AtBeginDocument, we have to wrap the calls of \AtBeginDocument/\AfterBeginDocument in \AtEndOfPackage. However, packages must be loaded in \AtEndOfPackage *before* package 'kvoptions' has to perform its option cleanup. Therefore we use a hook.

```
\ExplSyntaxOn
\let\Hy@LocalAppendToMacro\tl_put_right:Nn
\let\Hy@GlobalAppendToMacro\tl_gput_right:Nn
\let\Hy@ifempty\tl_if_empty:nTF
\ExplSyntaxOff
\def\Hy@AtBeginDocument{%
  \Hy@LocalAppendToMacro\Hy@AtBeginDocumentHook
}
```

\Hy@AtEndOfPackage

```
\def\Hy@AtEndOfPackage{%
  \Hy@LocalAppendToMacro\Hy@AtEndOfPackageHook
}
```

\Hy@AtBeginDocumentHook

```
\let\Hy@AtBeginDocumentHook\@empty
```

\Hy@AtEndOfPackageHook

```
\let\Hy@AtEndOfPackageHook\@empty
```

Install the hook, before package 'kvoptions' is loaded.

```
\AtEndOfPackage{%
  \Hy@AtEndOfPackageHook
  \let\Hy@AtEndOfPackageHook\@undefined
  \AfterBeginDocument{%
    \Hy@AtBeginDocumentHook{}%
    \let\Hy@AtBeginDocumentHook\@undefined
  }%
}
```

Package kvoptions is used for processing options that are given as key value pairs. The package provides \ProcessKeyvalOptions, formerly known as \ProcessOptionsWithKV.

```
\RequirePackage{kvoptions}[2009/07/21]
```

4.6 Switches

```
\newif\ifHy@stoppedearly
\newif\ifHy@typexml
\newif\ifHy@activeanchor
\newif\ifHy@backref
\newif\ifHy@bookmarks
\newif\ifHy@bookmarksnumbered
\newif\ifHy@bookmarksopen
\newif\ifHy@breaklinks
\newif\ifHy@pdfcenterwindow
\newif\ifHy@CJKbookmarks
\newif\ifHy@colorlinks
\newif\ifHy@destlabel
\newif\ifHy@draft
\let\Hy@finaltrue\Hy@draftfalse
\let\Hy@finalfalse\Hy@drafttrue
\newif\ifHy@pdfescapeform
\newif\ifHy@hyperfigures
\newif\ifHy@pdffitwindow
\newif\ifHy@frenchlinks
\newif\ifHy@hyperfootnotes
\newif\ifHy@hyperindex
\newif\ifHy@hypertexnames
\newif\ifHy@implicit
\newif\ifHy@linktocpage
\newif\ifHy@localanchorname
\newif\ifHy@pdfmenubar
\newif\ifHy@naturalnames
\newif\ifHy@nesting
\newif\ifHy@pdfnewwindowset
\newif\ifHy@pdfnewwindow
\newif\ifHy@ocgcolorlinks
\newif\ifHy@pageanchor
\newif\ifHy@pdfpagelabels
\newif\ifHy@pdfstring
```

```
\newif\ifHy@plainpages
\newif\ifHy@psize
\newif\ifHy@raiselinks
\newif\ifHy@seminarslides
\newif\ifHy@setpagesize
\newif\ifHy@texht
\newif\ifHy@psdextra
\newif\ifHy@pdftoolbar
\newif\ifHy@unicode
\newif\ifHy@pdfusetitle
\newif\ifHy@verbose
\let\Hy@debugtrue\Hy@verbosetrue
\let\Hy@debugfalse\Hy@verbosefalse
\newif\ifHy@pdfwindowui
\newif\ifHy@pdfdisplaydoctitle
\newif\ifHy@pdfa
```

Defaults for the switches are now set.

```
\Hy@backreffalse
\Hy@bookmarksnumberedfalse
\Hy@bookmarksopenfalse
\Hy@bookmarkstrue
\Hy@breaklinksfalse
\Hy@pdfcenterwindowfalse
\Hy@CJKbookmarksfalse
\Hy@destlabelfalse
\Hy@pdfescapeformfalse
\Hy@hyperfiguresfalse
\Hy@pdffitwindowfalse
\Hy@hyperfootnotestrue
\Hy@hyperindextrue
\Hy@hypertexnamestrue
\Hy@implicittrue
\Hy@linktocpagefalse
\Hy@localanchornamefalse
\Hy@pdfmenubartrue
\Hy@naturalnamesfalse
\Hy@nestingfalse
\Hy@pdfnewwindowsetfalse
\Hy@pdfnewwindowfalse
\Hy@pageanchortrue
\Hy@pdfpagelabelstrue
\Hy@pdfstringfalse
\Hy@plainpagesfalse
\Hy@raiselinksfalse
\Hy@setpagesizetrue
\Hy@texhtfalse
\Hy@psdextrafalse
\Hy@pdftoolbartrue
\Hy@unicodetrue
\ifx\kanjiskip\@undefined
\else
  \ifx\forcecjktoken\@undefined
   \Hy@unicodefalse
  \fi
```

```
\fi
\Hy@pdfusetitlefalse
\Hy@verbosefalse
\Hy@pdfwindowuitrue
\Hy@pdfdisplaydoctitlefalse
\Hy@pdfafalse
```

5 Common help macros

\Hy@StepCount

```
\def\Hy@StepCount#1{\advance#1 by 1 }%
```

\Hy@GlobalStepCount

```
\def\Hy@GlobalStepCount#1{\global\advance#1 by 1 }%

\newdimen\@linkdim
\let\Hy@driver\@empty
\let\MaybeStopEarly\relax
\newcount\Hy@linkcounter
\newcount\Hy@pagecounter
\Hy@linkcounter0
\Hy@pagecounter0
\def\Hy@space{ }
```

5.1 Macros for recursions

```
\let\Hy@ReturnEnd\@empty
\long\def\Hy@ReturnAfterFi#1\fi{\fi#1}
\long\def\Hy@ReturnAfterElseFi#1\else#2\fi{\fi#1}
\long\def\Hy@ReturnAfterFiFiEnd#1\fi#2\Hy@ReturnEnd{\fi\fi#1}
\long\def\Hy@ReturnAfterElseFiFiEnd#1\else#2\Hy@ReturnEnd{\fi\fi#1}
```

5.2 Babel's protection of shorthand characters

\Hy@safe@activestrue
\Hy@safe@activesfalse

Babel's switch setting commands cannot used directly, because they can be undefined if babel is not loaded.

```
\def\Hy@safe@activestrue{\csname @safe@activestrue\endcsname}
\def\Hy@safe@activesfalse{\csname @safe@activesfalse\endcsname}
```

5.3 Coordinate transformations

At some places numbers in pdf units are expected (eg: FitBH, ...). The following macros perform the transformation from TeX units (pt) to PDF units (bp).

\hypercalcbp

The user macro `\hypercalcbp` can be used, for example, inside option values:

```
pdfstartview={FitBH \hypercalcbp{\paperheight-\topmargin-1in}}
```

- It cannot be used inside `\usepackage`, because LaTeX expands the options before package hyperref is loaded and `\hypercalcbp` is defined.
- With the now required e-TeX extensions an expandable implementation is very easy; `\hypercalcbp` can be used everywhere and is expanded at use.

Example (TEX):

```
\usepackage[...]{hyperref}
\hypersetup{
 pdfstartview={FitBH \hypercalcbp{\paperheight-\topmargin-1in
  -\headheight-\headsep}}
}
```

\hypercalcbp

```
488  \def\hypercalcbp#1{%
489    \strip@pt\dimexpr 0.99626401\dimexpr(#1)\relax\relax
490  }%
491  \def\hypercalcbpdef{\def}%
```

6 Dealing with PDF strings

The PDF string stuff done by Heiko Oberdiek.

Naming convention: All internal commands that are only needed by `\pdfstringdef` are prefixed with `\HyPsd@`.

6.1 Description of PDF strings

The PDF specification defines several places to hold text strings (bookmark names, document information, text annotations, etc.). The PDF strings have following properties:

- They are surrounded by parentheses. The hexadecimal form is not supported.
- Like PostScript language strings they use the same escaping mechanism:

`\\`	the backslash itself
`\)`, `\(`	unbalanced parentheses
`\n`, `\r`, `\t`, `\b`, `\f`	special white space escape sequences
`\ddd`	octal character code `ddd`

- Strings are stored either in PDFDocEncoding, which is a superset of ISO-Latin1 and is compatible with Unicode with character codes below 256, or in Unicode.

6.2 Definition of \pdfstringdef

The central macro for dealing with PDF strings is `\pdfstringdef`. It defines a command `#1` to be the result of the conversion from the string in `#2` to a legal PDFDocEncoded string. Currently the definition is global, but this can be changed in the future.

Important: In TEX's view PDF strings are written to a file and are expanded only in its mouth. Stomach commands that cannot be expanded further aren't executed, they are written verbatim. But the PDF reader that reads such a string isn't a TEX interpreter!

The macro `\pdfstringdef` consists of three main parts:

1. Preprocessing. Here the expansion is prepared. The encoding is set and many commands are redefined, so that they work appropriate.

2. Expansion. The TEX string is expanded the first time to get a PDF string.
3. Postprocessing. The result of the expansion is checked and converted to the final form.

\MakeUppercase and \MakeLowercase do not work by expansion in legacy code but if the expl3 code is available we can handle them. If a current babel or polyglossia is used we can also make use of the language.

ppercaseUnsupportedInPdfStrings
owercaseUnsupportedInPdfStrings

```
\providecommand*\BCPdata[1]{}
\ExplSyntaxOn
\@ifundefined{text_uppercase:n}{}
{
  \def\MakeUppercaseUnsupportedInPdfStrings#1
      {\use:e
       {\exp_args:Ne
         \text_uppercase:nn{\BCPdata { casing }}{#1}
       }
      }
  \def\MakeLowercaseUnsupportedInPdfStrings#1
      {\use:e
       {\exp_args:Ne
         \text_lowercase:nn{\BCPdata { casing }}{#1}
       }
      }
}
\ExplSyntaxOff
```

\hyper@natlinkstart
\hyper@natlinkend
\hyper@natlinkbreak
\hyper@natanchorstart
\hyper@natanchorend

We provide the natbib hooks always, for better tagging support, see issue #406

```
\def\hyper@natlinkstart#1{}
\def\hyper@natlinkend{}
\def\hyper@natlinkbreak#1#2{#1}
\def\hyper@natanchorstart#1{}
\def\hyper@natanchorend{}
```

\pdfstringdef

\pdfstringdef works on the tokens in #2 and converts them to a PDF string as far as possible:

- The result should obey the rules of the PDF specification for strings.
- The string can safely processed by TEX, because the tokens have only catcodes 10 until 12.

The result is stored in the command token given in #1.

```
\def\pdfstringdef#1#2{%
```

Many redefinitions are needed, so all the work is done in a group.

```
  \begingroup
```

6.2.1 Preprocessing

Octal escape sequences. To avoid problems with eight bit or non printable characters, the octal escape notation is supported. So most glyphs in the encoding definitions for PD1 and PU produce these octal escape sequences. All three octal digits have to be used:

- Wrong results are avoided, if digits follow that are not part of the octal sequence.
- Macros rely on the fact that the octal sequences always consist of three digits (vtex driver, Unicode support).

The escape sequences start with a backslash. By `\string` it will be printed. Therefore it is ensured that the TEX escape character indeed prints as a normal backslash. Eventually this line can be removed, because this is standard LATEX behaviour.

```
\escapechar`\\%
```

From the view of TEX a octal sequence consists of the command tokens `\0` until `\3` and two digits. For saving tokens `\0`, `\1`, `\2`, and `\3` are directly used without a preceding `\string` in the glyph definitions. This is done here locally by defining the `\0` until `\3` commands. So the user can use octal escape sequences directly, the disadvantage is that a previous definition of this short commands does not apply.

```
\edef\0{\string\0}%
\edef\1{\string\1}%
\edef\2{\string\2}%
\edef\3{\string\3}%
```

Setting font encoding. The unicode encoding uses `\8` and `\9` as marker for the higher byte. `\8` is an abbreviation for the higher bytes 0 until 7 that can be expressed by one digit. `\8` will be converted to `\00`. However `\9` only marks the next three digits as higher byte and will be removed later.

The encoding is set by `\enc@update` for optimizing reasons.

```
\ifHy@unicode
  \edef\8{\string\8}%
  \edef\9{\string\9}%
  \fontencoding{PU}%
  \HyPsd@UTFviii
  \def\ifpdfstringunicode##1##2{##1}%
\else
  \fontencoding{PD1}%
  \def\ifpdfstringunicode##1##2{##2}%
\fi
\let\utf@viii@undeferr\HyPsd@utf@viii@undeferr
\enc@update
```

Internal encoding commands. `\pdfstringdef` interprets text strings which are not allowed to contain mathematical stuff. The text glyph commands will produce a warning, if called in math mode. But this warning disturbs while expanding. Therefore we check for math mode here, before `\@inmathwarn` will be disabled (see below).

```
\@inmathwarn\pdfstringdef
```

If a glyph is used, that isn't in the PD1/PU encoding there will be an infinite error loop, because the NFSS encoding stuff have to be expanded unprotected (`\edef`), so that the assignments of `\@changed@cmd` don't take place. To patch this behaviour I only found `\@inmathwarn` as a usable hook. While an `\edef` a

warning message by \@inmathwarn or \TextSymbolUnavailable cannot be give out, so \@inmathwarn should be disabled. And with the help of it the assignments in \@changed@cmd can easily be caught (see below).

```
\let\@inmathwarn\HyPsd@inmathwarn
```

Unknown composite characters are built with \add@accent, so it is redefined to provide a warning.

```
\let\add@accent\HyPsd@add@accent
```

Commands that don't use NFSS directly. There are several commands that prints characters in the printable ASCII area that don't obey the NFSS, so they have to be redefined here. UF 29.09.2017: added a mapping for \noboundary, see issue #37 https://github.com/latex3/hyperref/issues/37 No test for PU, if some definition for PD1 is added it will work too.

```
\let\{\textbraceleft
\let\}\textbraceright
\let\\\textbackslash
\let\#\textnumbersign
\let\$\textdollar
\let\%\textpercent
\let\&\textampersand
%   \let\~\textasciitilde
\let\_\textunderscore
\let\P\textparagraph
\let\ldots\textellipsis
\let\dots\textellipsis
\@ifundefined{textEncodingNoboundary}%
  {}{\let\noboundary\textEncodingNoboundary}%
```

Newline \newline or \\ do not work in bookmarks, in text annotations they should expand to \r. In pdf strings \\ stands for a backslash. Therefore the commands are disabled now. The user can redefine them for a result what he want:

backslash: \pdfstringdefDisableCommands{\let\\\textbackslash}

new line: \pdfstringdefDisableCommands{\let\\\textCR}

disabled: \pdfstringdefDisableCommands{\let\\\empty}

At any case, however, the optional argument or the star cannot be scanned in a 100% sure manner.

```
\def\\{\pdfstringdefWarn\\}%
\def\newline{\pdfstringdefWarn\newline}%
```

Logos. Because the box shifting used in the TEX logo does not work while writing to a file, the standard TEX logos are redefined. We use the direct PU code to avoid problems if \textepsilon is not defined.

```
\def\TeX{TeX}%
\def\LaTeX{La\TeX}%
\def\LaTeXe{%
  \LaTeX2%
```

```
    \ifHy@unicode\83\265\else e\fi
  }%
  \def\eTeX{%
    \ifHy@unicode\83\265\else e\fi
    -\TeX%
  }%
  \def\SliTeX{Sli\TeX}%
  \def\MF{Metafont}%
  \def\MP{Metapost}%
```

Standard font commands. Because font changes do not work, the standard font switching commands are disabled.

```
  \let\fontencoding\@gobble
  \let\fontfamily\@gobble
  \let\fontseries\@gobble
  \let\fontshape\@gobble
  \let\fontsize\@gobbletwo
  \let\selectfont\@empty
  \let\usefont\@gobblefour
  \let\emph\@firstofone
  \let\textnormal\@firstofone
  \let\textrm\@firstofone
  \let\textsf\@firstofone
  \let\texttt\@firstofone
  \let\textbf\@firstofone
  \let\textmd\@firstofone
  \let\textit\@firstofone
  \let\textsc\@firstofone
  \let\textsl\@firstofone
  \let\textup\@firstofone
  \let\normalfont\@empty
  \let\rmfamily\@empty
  \let\sffamily\@empty
  \let\ttfamily\@empty
  \let\bfseries\@empty
  \let\mdseries\@empty
  \let\itshape\@empty
  \let\scshape\@empty
  \let\slshape\@empty
  \let\upshape\@empty
  \let\em\@empty
  \let\rm\@empty
  \let\Huge\@empty
  \let\LARGE\@empty
  \let\Large\@empty
  \let\footnotesize\@empty
  \let\huge\@empty
  \let\large\@empty
  \let\normalsize\@empty
  \let\scriptsize\@empty
  \let\small\@empty
  \let\tiny\@empty
  \let\mathversion\@gobble
```

```
    \let\phantom\@gobble
    \let\vphantom\@gobble
    \let\hphantom\@gobble
```

Package pifont.

```
    \let\ding\HyPsd@ding
    \let\Cube\HyPsd@DieFace
%* \HyPsd@DieFace -> \epsdice (epsdice)
%* \HyPsd@DieFace -> \fcdice (hhcount)
```

Environments.

```
    \def\begin##1{\csname##1\endcsname}%
    \def\end##1{\csname end##1\endcsname}%
```

Package color.

```
    \def\textcolor##1##{\@secondoftwo}%
```

Upper- and lowercase.

```
    \def\MakeUppercase{\MakeUppercaseUnsupportedInPdfStrings}%
    \def\MakeLowercase{\MakeLowercaseUnsupportedInPdfStrings}%
```

TextOrMath The `\TextOrMath` command is protected in a current LaTeX and so can not be processed.

```
\def\TextOrMath{\ifmmode\expandafter\@secondoftwo\else\expandafter\@firstoftwo\fi}%
```

Support of math commands without prefix `text`. This is controlled by option "psdextra" and only activated with Unicode PDF strings.

```
    \ifHy@psdextra
      \ifHy@unicode
        \csname psdmapshortnames\endcsname
        \csname psdaliasnames\endcsname
      \fi
    \fi
```

Package babel. Wherever "naturalnames" is used, disable `\textlatin` (from Babel 3.6k). Thanks to Felix Neubauer (Email: `Felix.Neubauer@gmx.net`).

```
    \let\foreignlanguage\@secondoftwo
    \let\textlatin\@firstofone
    \@ifundefined{language@group}{}{%
      \let\bbl@info\@gobble
      \csname HyPsd@babel@\language@group\endcsname
    }%
    \let\@safe@activestrue\relax
    \let\@safe@activesfalse\relax
```

Disable `\cyr`, used in russianb.ldf.

```
    \let\cyr\relax
```

Package german.

```
\let\glqq\textglqq
\let\grqq\textgrqq
\let\glq\textglq
\let\grq\textgrq
\let\flqq\textflqq
\let\frqq\textfrqq
\let\flq\textflq
\let\frq\textfrq
```

Package french. The support is deferred, because it needs `\GenericError` to be disabled (see below).

Package FrenchPro. This package uses:

> `\if@mid@expandable{`not fully expandable code`}{`fully expandable code`}`

```
\let\if@mid@expandable\@firstoftwo
```

AMS classes.

```
\HyPsd@AMSclassfix
```

Redefinition of `\hspace` `\hspace` don't work in bookmarks, the following fix tries to set a space if the argument is a positive length.

```
\let\hspace\HyPsd@hspace
```

Commands of referencing and indexing systems. Some LaTeX commands that are legal in `\section` commands have to be disabled here.

```
\let\label\@gobble
\let\index\@gobble
\let\glossary\@gobble
\let\href\HyPsd@href
\let\@mkboth\@gobbletwo
```

The `\ref` and `\pageref` is much more complicate because of their star form.

```
\let\ref\HyPsd@ref
\let\pageref\HyPsd@pageref
\let\nameref\HyPsd@nameref
\let\autoref\HyPsd@autoref
```

Miscellaneous commands.

```
\let\leavevmode\@empty
\let\mbox\@empty
```

`\halign` causes error messages because of the template character `#`.

```
\def\halign{\pdfstringdefWarn\halign\@gobble}%
\let\ignorespaces\HyPsd@ignorespaces
\let\Hy@SectionAnchorHref\@gobble
\let\ensuremath\@firstofone
```

Patch for cjk bookmarks.

```
\HyPsd@CJKhook
```

User hook. The switch `\Hy@pdfstring` is turned on. So user commands can detect that they are processed not to be typesetted within TEX's stomach, but to be expanded by the mouth to give a PDF string. At this place before interpreting the string in `#2` additional redefinitions can by added by the hook `\pdfstringdefPreHook`.

The position in the middle of the redefinitions is a compromise: The user should be able to provide his own (perhaps better) redefinitions, but some commands should have their original meaning, because they can be used in the hook (`\bgroup`, or `\@protected@testopt`, and `\@ifnextchar` for `\renewcommand`).

```
\Hy@pdfstringtrue
\pdfstringdefPreHook
```

Spaces. For checking the token of the string, spaces must be masked, because they cannot by caught by undelimited arguments.

```
\HyPsd@LetUnexpandableSpace\space
\HyPsd@LetUnexpandableSpace\ %
\HyPsd@LetUnexpandableSpace~%
\HyPsd@LetUnexpandableSpace\nobreakspace
```

Package xspace.

```
\@ifundefined{@xspace}{%
  \let\xspace\HyPsd@ITALCORR
}{%
  \let\xspace\HyPsd@XSPACE
}%
\let\/\HyPsd@ITALCORR
\let\bgroup\/%
\let\egroup\/%
```

Redefinitions of miscellaneous commands. Hyphenation does not make sense.

```
\let\discretionary\@gobbletwo
```

`\@ifstar` is defined in LATEX as follows:

```
\def\@ifstar#1{\@ifnextchar *{\@firstoftwo{#1}}}
```

`\@ifnextchar` doesn't work, because it uses stomach commands like `\let` and `\futurelet`. But it doesn't break. Whereas `\@firstoftwo{#1}` gives an error message because `\@firstoftwo` misses its second argument.

A mimicry of `\@ifnextchar` only with expandible commands would be very extensive and the result would be only an approximation. So here a cheaper solution follows in order to get rid of the error message at least:

```
\def\@ifnextchar{\HyPsd@ifnextchar\@ifnextchar}%
\def\kernel@ifnextchar{\HyPsd@ifnextchar\kernel@ifnextchar}%
\def\new@ifnextchar{\HyPsd@ifnextchar\new@ifnextchar}%
\let\@protected@testopt\HyPsd@protected@testopt
```

Support for package 'xargs':

```
\let\@protected@testopt@xargs\HyPsd@protected@testopt
```

6.2.2 Expansion

There are several possibilities to expand tokens within LaTeX:

\protected@edef: The weakest form isn't usable, because it does not expand the font encoding commands. They are made robust and protect themselves.

\csname: First the string is expanded within a \csname and \endcsname. Then the command name is converted to characters with catcode 12 by \string and the first escape character removed by \@gobble. This method has the great *advantage* that stomach tokens that aren't allowed in PDF strings are detected by TeX and reported as errors in order to force the user to write correct things. So he get no wrong results by forgetting the proofreading of his text. But the *disadvantage* is that old wrong code cannot processed without errors. Mainly the error message is very cryptic and for the normal user hard to understand. TeX provides no way to catch the error caused by \csname or allows to support the user with a descriptive error message. Therefore the experienced user had to enable this behaviour by an option exactdef in previous versions less or equal 6.50.

\edef This version uses this standard form for expansion. It is stronger than LaTeX's \protected@edef. So the font encoding mechanism works and the glyph commands are converted to the correct tokens for PDF strings with the definitions of the PD1 encoding. Because the protecting mechanism of LaTeX doesn't work within an \edef, there are situations thinkable where code can break. For example, assignments and definitions aren't performed and so undefined command errors or argument parsing errors can occur. But this is only a compatibility problem with old texts. Now there are possibilities to write code that gives correct PDF strings (see \texorpdfstring). In the most cases unexpandable commands and tokens (math shift, grouping characters) remains. They don't cause an error like with \csname. However a PDF reader isn't TeX, so these tokens are viewed verbatim. So this version detects them now, and removes them with an descriptive warning for the user. As additional features xspace support is possible and grouping characters can be used without problems, because they are removed silently.

Generic messages. While expanding via \xdef the \Generic... messages don't work and causes problems (error messages, invalid .out file). So they are disabled while expanding and removed silently, because a user warning would be too expensive (memory and runtime, \pdfstringdef is slow enough).

```
\begingroup
  \let\GenericError\@gobblefour
  \let\GenericWarning\@gobbletwo
  \let\GenericInfo\@gobbletwo
```

Package french. This fix only works, if \GenericError is disabled.

```
  \ifx\nofrenchguillemets\@undefined
  \else
    \nofrenchguillemets
  \fi
```

Definition commands and expansion. Redefining the defining commands (see sec. 6.5.12). The original meaning of `\xdef` is saved in `\Hy@temp`.

```
    \let\Hy@temp\xdef
    \let\def\HyPsd@DefCommand
    \let\gdef\HyPsd@DefCommand
    \let\edef\HyPsd@DefCommand
    \let\xdef\HyPsd@DefCommand
    \let\futurelet\HyPsd@LetCommand
    \let\let\HyPsd@LetCommand
    \Hy@temp#1{#2}%
  \endgroup
```

6.2.3 Postprocessing

If the string is empty time can be saved by omitting the postprocessing process.

```
  \ifx#1\@empty
  \else
```

Protecting spaces and removing grouping characters. In order to check the tokens we must separate them. This will be done with TEX's argument parsing. With this method we must the following item takes into account, that makes makes things a little more complicated:

- TEX does not accept a space as an undelimited argument, it cancels space tokens while looking for an undelimited argument. Therefore we must protect the spaces now.
- An argument can be a single token or a group of many tokens. And within curly braces tokens aren't find by TEX's argument scanning process. Third curly braces as grouping characters cannot be expanded further, so they don't vanish by the string expansion above. So these characters with catcode 1 and 2 are removed in the following and replaced by an marker for the xspace support.
- TEX silently removes the outmost pair of braces of an argument. To prevent this on unwanted places, in the following the character `|` is appended to the string to make an outer brace to an inner one.

First the top level spaces are protected by replacing. Then the string is scanned to detect token groups. Each token group will now be space protected and again scanned for another token groups.

```
    \HyPsd@ProtectSpaces#1%
    \let\HyPsd@String\@empty
    \expandafter\HyPsd@RemoveBraces\expandafter{#1|}%
    \global\let#1\HyPsd@String
```

Check tokens. After removing the spaces and the grouping characters the string now should only consists of the following tokens/catcodes:

0 command names with start with an escape character.
3 math shift
4 alignment tabs
6 parameter, but this is unlikely.
7 superscript
8 subscript
11 letter
12 other
13 commands that are active characters.

After `\HyPsd@CheckCatcodes` the command `\HyPsd@RemoveMask` is reused to remove the group protection character `|`. This character is needed to ensure that the string at least consists of one token if `\HyPsd@CheckCatcodes` is called.

Because of internal local assignments and tabulars group braces are used.

```
\let\HyPsd@SPACEOPTI\relax
{%
  \let\HyPsd@String\@empty
  \expandafter\HyPsd@CheckCatcodes#1\HyPsd@End
  \global\let#1\HyPsd@String
}%
\expandafter\HyPsd@RemoveMask\expandafter
  |\expandafter\@empty#1\HyPsd@End#1%
```

`\HyPsd@CheckCatcodes` should no have removed the tokens with catcode 3, 4, 7, and 8. Because a parameter token (6) would cause to many errors before, there should now be only tokens with catcodes 11 or 12. So I think there is no need for a safety step like:

```
\xdef#1{\expandafter\strip@prefix\meaning#1}%
```

Looking for wrong glyphs. The case that glyphs aren't defined in the PD1 encoding is caught above in such a way, that the glyph name and a marker is inserted into the string. Now we can safely scan the string for this marker and provide a descriptive warning.

```
\expandafter
\HyPsd@Subst\expandafter{\HyPsd@GLYPHERR}{\relax}#1%
\let\HyPsd@String\@empty
\expandafter\HyPsd@GlyphProcess#1\relax\@empty
\global\let#1\HyPsd@String
```

Backslash. The double backslash disturbs parsing octal sequences, for example in an string like `abc\\051` the sequence `\051` is detected although the second `\` belongs to the first backslash.

```
\HyPsd@StringSubst{\\}{\textbackslash}#1%
```

Spaces. All spaces have already the form `\040`. The last postprocessing step will be an optimizing of the spaces, so we already introduce already the necessary command `\HyPsd@SPACEOPTI`. But first it is defined to be `\relax` in order to prevent a too early expansion by an `\edef`. Secondly a `\relax` serves as a marker for a token that is detected by `\xspace`.

The code of `frenchb.ldf` can produce an additional space before `\guillemetright`, because `\lastskip` and `\unskip` do not work. Therefore it is removed here.

```
\ifHy@unicode
  \expandafter\HyPsd@StringSubst\csname 80\040\endcsname
    \HyPsd@SPACEOPTI#1%
\edef\Hy@temp@A{\HyPsd@SPACEOPTI\HyPsd@SPACEOPTI\80\273}%
  \expandafter\HyPsd@Subst\expandafter{\Hy@temp@A}%
    {\HyPsd@SPACEOPTI\80\273}#1%
\else
  \HyPsd@StringSubst{\040}\HyPsd@SPACEOPTI#1%
  \expandafter\HyPsd@Subst\expandafter{%
    \expandafter\HyPsd@SPACEOPTI\expandafter\HyPsd@SPACEOPTI
    \string\273}{\HyPsd@SPACEOPTI\273}#1%
\fi
```

Right parenthesis. Also `\xspace` detects a right parenthesis. For the `\xspace` support and the following parenthesis check the different parenthesis notations `)`, `\)`, and `\051` are converted to one type `\)` and before `\HyPsd@empty` with the meaning of `\relax` is introduced for `\xspace`. By redefining to `\@empty` `\HyPsd@empty` can easily removed later.

```
\ifHy@unicode
  \HyPsd@StringSubst{\)}{\80\051}#1%
  \HyPsd@Subst)}{\80\051}#1%
  \let\HyPsd@empty\relax
  \expandafter\HyPsd@StringSubst\csname 80\051\endcsname
    {\HyPsd@empty\80\051}#1%
\else
  \HyPsd@StringSubst{\)}{\051}#1%
  \HyPsd@Subst)}{\051}#1%
  \let\HyPsd@empty\relax
  \HyPsd@StringSubst{\051}{\HyPsd@empty\string\)}#1%
\fi
```

Support for package xspace. `\xspace` looks for the next token and decides if it expands to a space or not. Following tokens prevent its transformation to a space: Beginning and end of group, handled above by replacing by an italic correction, several punctuation marks, a closing parentheses, and several spaces.

Without package `xspace` there are tokens with catcode 11 and 12, `\HyPsd@empty` and `\HyPsd@SPACEOPTI`. With package `xspace` marker for the italic correction `\/` and `\xspace` come with. In the package `xspace` case the two markers are replaced by commands and an `\edef` performs the `\xspace` processing.

In the opposite of the original `\xspace` `\HyPsd@xspace` uses an argument instead of a `\futurelet`, so we have to provide such an argument, if `\HyPsd@xspace` comes last. Because `\HyPsd@Subst` with several equal tokens (--) needs a safe last token, in both cases the string gets an additional `\HyPsd@empty`.

```
\expandafter\HyPsd@Subst\expandafter{\/}\HyPsd@empty#1%
\@ifundefined{@xspace}{%
}{%
  \let\HyPsd@xspace\relax
  \expandafter\HyPsd@Subst\expandafter
    {\HyPsd@XSPACE}\HyPsd@xspace#1%
  \let\HyPsd@xspace\HyPsd@doxspace
}%
\xdef#1{#1\HyPsd@empty}%
```

Ligatures. TEX forms ligatures in its stomach, but the PDF strings are treated only by TEX's mouth. The PDFDocEncoding contains some ligatures, but the current version 3 of the AcrobatReader lacks the `fi` and `fl` glyphs, and the Linux version lacks the `emdash` and `endash` glyphs. So the necessary code is provided here, but currently disabled, hoping that version 4 of the AcrobatReader is better. To break the ligatures the user can use an empty group, because it leads to an insertion of an `\HyPsd@empty`. If this ligature code will be enabled some day, then the italic correction should also break the ligatures. Currently this occurs only, if package `xspace` is loaded.

Since newer AcrobatReader versions now show the en- and emdash in a correct way (AR7/Linux, AR8/Linux), the substitution code for them is enabled starting with version 6.78l.

```
752     \HyPsd@Subst{---}\textemdash#1%
753     \HyPsd@Subst{--}\textendash#1%
754 %     \HyPsd@Subst{fi}\textfi#1%
755 %     \HyPsd@Subst{fl}\textfl#1%
756     \HyPsd@Subst{!`}\textexclamdown#1%
757     \HyPsd@Subst{?`}\textquestiondown#1%
```

With the next `\edef` we get rid of the token `\HyPsd@empty`.

```
758     \let\HyPsd@empty\@empty
```

Left parentheses. Left parentheses are now converted to safe forms to avoid problems with unmatched ones (`\(` with PDFDocEncoding, the octal sequence with Unicode.

An optimization is possible. Matched parentheses can replaced by a `()` pair. But this code is removed to save TEX memory and time.

```
759     \ifHy@unicode
760       \HyPsd@StringSubst\(\textparenleft#1%
761       \HyPsd@Subst(\textparenleft#1%
762     \else
763       \HyPsd@StringSubst\({\050}#1%
764       \HyPsd@Subst({\050}#1%
765       \HyPsd@StringSubst{\050}{\string\(}#1%
766     \fi
```

Optimizing spaces. Spaces are often used, but they have a very long form `\040`. They are converted back to real spaces, but not all, so that no space follows after another. In the bookmark case several spaces are written to the `.out` file, but if the entries are read back, several spaces are merged to a single one.

With Unicode the spaces are replaced by their octal sequences.

```
767     \ifHy@unicode
768       \edef\HyPsd@SPACEOPTI{\80\040}%
769     \else
770       \let\HyPsd@SPACEOPTI\HyPsd@spaceopti
771     \fi
772     \xdef#1{#1\@empty}%
773   \fi
```

Converting to Unicode. At last the eight bit letters have to be converted to Unicode, the masks `\8` and `\9` are removed and the Unicode marker is added.

```
  \endgroup
  \begingroup
    \ifHy@unicode
      \HyPsd@ConvertToUnicode#1%
```

Try conversion back to PDFDocEncoding.

```
      \ifx\HyPsd@pdfencoding\HyPsd@pdfencoding@auto
        \EdefUnescapeString\HyPsd@temp#1%
        \iftutex
          \let\HyPsd@UnescapedString\HyPsd@temp
          \StringEncodingConvertTest\HyPsd@temp\HyPsd@temp
                                {utf16be}{ascii-print}{%
            \EdefEscapeString\HyPsd@temp\HyPsd@temp
            \global\let#1\HyPsd@temp
            \HyPsd@EscapeTeX#1%
            \Hy@unicodefalse
          }{%
            \HyPsd@EscapeTeX#1%
          }%
        \else
          \StringEncodingConvertTest\HyPsd@temp\HyPsd@temp
                                {utf16be}{pdfdoc}{%
            \EdefEscapeString\HyPsd@temp\HyPsd@temp
            \global\let#1\HyPsd@temp
            \HyPsd@EscapeTeX#1%
            \Hy@unicodefalse
          }{}%
        \fi
      \fi
    \fi
```

User hook. The hook `\pdfstringdefPostHook` can be used for the purpose to postprocess the string further.

```
    \pdfstringdefPostHook#1%
  \endgroup
}
```

`\Hy@pdfstringdef`

```
\def\Hy@pdfstringdef#1#2{%
  \pdfstringdef\Hy@gtemp{#2}%
  \let#1\Hy@gtemp
}
```

6.3 Encodings

6.3.1 XeTEX

change 2020-05-13: the special code for XeTeX big chars has been removed as no longer needed.

6.3.2 Workaround for package linguex

```
\@ifpackageloaded{linguex}{%
  \let\HyLinguex@OrgB\b
  \let\HyLinguex@OrgC\c
  \let\HyLinguex@OrgD\d
  \def\HyLinguex@Restore{%
    \let\b\HyLinguex@OrgB
    \let\c\HyLinguex@OrgC
    \let\d\HyLinguex@OrgD
  }%
  \Hy@AtEndOfPackage{%
    \pdfstringdefDisableCommands{%
      \@ifundefined{oldb}{}{\let\b\oldb}%
      \@ifundefined{oldc}{}{\let\c\oldc}%
      \@ifundefined{oldd}{}{\let\d\oldd}%
    }%
  }%
}{%
  \let\HyLinguex@Restore\relax
}%
```

6.3.3 Catcodes saving and restoring for .def files

\Hy@SaveCatcodeSettings

```
\def\Hy@SaveCatcodeSettings#1{%
  \expandafter\edef\csname Hy@cat@#1\endcsname{%
    \endlinechar=\the\endlinechar\relax
    \catcode32 \the\catcode32\relax % (space)
    \catcode34 \the\catcode34\relax % "
    \catcode35 \the\catcode35\relax % #
    \catcode37 \the\catcode37\relax % (percent)
    \catcode40 \the\catcode40\relax % (
    \catcode41 \the\catcode41\relax % )
    \catcode42 \the\catcode42\relax % *
    \catcode46 \the\catcode46\relax % .
    \catcode58 \the\catcode58\relax % :
    \catcode60 \the\catcode60\relax % <
    \catcode61 \the\catcode61\relax % =
    \catcode62 \the\catcode62\relax % >
    \catcode64 \the\catcode64\relax % @
    \catcode91 \the\catcode91\relax % [
    \catcode92 \the\catcode92\relax % (backslash)
    \catcode93 \the\catcode93\relax % ]
    \catcode123 \the\catcode123\relax % {
    \catcode124 \the\catcode124\relax % |
    \catcode125 \the\catcode125\relax % }
  }%
  \endlinechar=-1 %
  \catcode32 10 % (space)
  \catcode34 12 % "
  \catcode35 6 % #
  \catcode37 14 % (percent)
  \catcode40 12 % (
  \catcode41 12 % )
```

```
  \catcode42 12 % *
  \catcode46 12 % .
  \catcode58 12 % :
  \catcode60 12 % <
  \catcode61 12 % =
  \catcode62 12 % >
  \catcode91 12 % [
  \catcode92 0 % (backslash)
  \catcode93 12 % ]
  \catcode123 1 % {
  \catcode124 12 % |
  \catcode125 2 % }
  \makeatletter
}
```

\Hy@RestoreCatcodeSettings

```
\def\Hy@RestoreCatcodeSettings#1{%
  \csname Hy@cat@#1\endcsname
  \expandafter\let\csname Hy@cat@#1\endcsname\relax
}
```

6.3.4 PD1 encoding

The PD1 encoding implements the PDFDocEncoding for use with LaTeX 2_ε's NFSS. Because the informational strings are not set by TeX's typesetting mechanism but for interpreting by the PDF reader, the glyphs of the PD1 encoding are implemented to be safely written to a file (PDF output file, `.out` file).

The PD1 encoding can be specified as an option of the 'fontenc' package or loaded here. It does not matter what font family is selected, as TeX does not process it anyway. So use CM.

```
\@ifundefined{T@PD1}{%
  \Hy@SaveCatcodeSettings{pd1}%
  \input{pd1enc.def}%
  \Hy@RestoreCatcodeSettings{pd1}%
  \HyLinguex@Restore
}{}
\DeclareFontFamily{PD1}{pdf}{}
\DeclareFontShape{PD1}{pdf}{m}{n}{ <-> cmr10 }{}
\DeclareFontSubstitution{PD1}{pdf}{m}{n}
```

6.3.5 PU encoding

The PU encoding implements the Unicode encoding for use with LaTeX's NFSS. Because of large memory requirements the encoding file for Unicode support is only loaded, if option `unicode` is specified as package option. change 2020-08-14: Starting with version v7.00f the file is always loaded and unicode is the default option.

\HyPsd@LoadUnicode

Because the file `puenc.def` takes a lot of memory, the loading is defined in the macro `\HyPsd@LoadUnicode` called by the package option `unicode`.

```
\def\HyPsd@LoadUnicode{%
  \@ifundefined{T@PU}{%
    \Hy@SaveCatcodeSettings{pu}%
```

```
    \input{puenc.def}%
    \Hy@RestoreCatcodeSettings{pu}%
    \HyLinguex@Restore
  }{}%
  \DeclareFontFamily{PU}{pdf}{}%
  \DeclareFontShape{PU}{pdf}{m}{n}{ <-> cmr10 }{}%
  \DeclareFontSubstitution{PU}{pdf}{m}{n}%
  \HyPsd@LoadExtra
  \let\HyPsd@LoadUnicode\relax
}
```

\HyPsd@LoadExtra

```
\def\Hy@iffileloaded#1{%
  \@ifundefined{ver@#1}\@secondoftwo\@firstoftwo
}
\def\HyPsd@LoadExtra{%
  \ifHy@psdextra
    \Hy@iffileloaded{puenc.def}{%
      \Hy@SaveCatcodeSettings{psdextra}%
      \input{psdextra.def}%
      \Hy@RestoreCatcodeSettings{psdextra}%
      \let\HyPsd@LoadExtra\relax
    }{}%
  \fi
}
```

6.4 Additional user commands

6.4.1 \texorpdfstring

\texorpdfstring While expanding the string in \pdfstringdef the switch \ifHy@pdfstring is set. This is used by the full expandible macro \texorpdfstring. It expects two arguments, the first contains the string that will be set and processed by TEX's stomach, the second contains the replacement for PDF strings.

```
\def\texorpdfstring{%
  \ifHy@pdfstring
    \expandafter\@secondoftwo
  \else
    \expandafter\@firstoftwo
  \fi
}
```

6.4.2 Hooks for \pdfstringdef

\pdfstringdefPreHook \pdfstringdefPostHook Default definition of the hooks for \pdfstringdef. The construct \@ifundefined with \let is a little bit faster than \providecommand.

```
\@ifundefined{pdfstringdefPreHook}{%
  \let\pdfstringdefPreHook\@empty
}{}
\@ifundefined{pdfstringdefPostHook}{%
  \let\pdfstringdefPostHook\@gobble
}{}
```

\pdfstringdefDisableCommands In \pdfstringdefPreHook the user can add code that is executed before the string, that have to be converted by \pdfstringdef, is expanded. So replacements for problematic macros can be given. The code in \pdfstringdefPreHook should not be replaced perhaps by an \renewcommand, because a previous meaning gets lost.

Macro \pdfstringdefDisableCommands avoids this, because it reuses the old meaning of the hook and appends the new code to \pdfstringdefPreHook, e.g.:

```
\pdfstringdefDisableCommands{%
  \let~\textasciitilde
  \def\url{\pdfstringdefWarn\url}%
  \let\textcolor\@gobble
}%
```

In the argument of \pdfstringdefDisableCommands the character @ can be used in command names. So it is easy to use useful LaTeX commands like \@gobble or \@firstofone.

```
924 \def\pdfstringdefDisableCommands{%
925   \begingroup
926     \makeatletter
927     \HyPsd@DisableCommands
928 }
```

\HyPsd@DisableCommands

```
929 \long\def\HyPsd@DisableCommands#1{%
930     \Hy@GlobalAppendToMacro\pdfstringdefPreHook{#1}%
931   \endgroup
932 }
```

\pdfstringdefWarn The purpose of \pdfstringdefWarn is to produce a warning message, so the user can see, that something can go wrong with the conversion to PDF strings.

The prefix \<>- is added to the token. \noexpand protects the probably undefined one during the first expansion step. Then \HyPsd@CheckCatcodes can detect the not allowed token, \HyPsd@CatcodeWarning prints a warning message, after \HyPsd@RemovePrefix has removed the prefix.

\pdfstringdefWarn is intended for document authors or package writers, examples for use can be seen in the definition of \HyPsd@ifnextchar or \HyPsd@protected@testopt.

```
933 \def\pdfstringdefWarn#1{%
934   \expandafter\noexpand\csname<>-\string#1\endcsname
935 }
```

6.5 Help macros for expansion

6.5.1 \ignorespaces

\HyPsd@ignorespaces With the help of a trick using \romannumeral the effect of \ignorespaces can be simulated a little, In a special case using an alphabetic constant \romannumeral eats an optional space. If the constant is zero, then the \romannumeral expression vanishes. The following macro uses this trick twice, thus \HyPsd@ignorespaces eats up to two following spaces.

```
936 \begingroup
```

```
  \catcode0=12 %
  \def\x{\endgroup
    \def\HyPsd@ignorespaces{%
      \romannumeral\expandafter`\expandafter^^@%
      \romannumeral`^^@%
    }%
  }%
\x
```

6.5.2 Babel languages

change 2020-10-10: moved language patches to its own file as a first step toward removing them completely.

```
\newif\ifHy@next
⟨/package⟩
```

Since version 2008/03/16 v3.8j babel used inside `\AtBeginDocument`:

```
\pdfstringdefDisableCommands{%
  \languageshorthands{system}%
}
```

As consequence the shorthands were shown in the bookmarks, and required a hyperref patch. In version 3.48 babel removed this unneeded code and so the patch could be removed.

Nothing to do for english. change 2020/07/16: removed patch for french. No longer needed. change 2020/07/21: removed patches for german, ngerman. Will be done by the language package. https://github.com/jspitz/babel-german/issues/4 change 2020/10/10: removed patches for danish, dutch, finnish, portugues, swedish, usorbian, slovene see https://github.com/latex3/babel/issues/84 change 2020/10/10: removed patch for macedonian, ukrainian; maintainers notified. change 2020/10/11: removed patch for russian, has been merged into babel-russian see https://github.com/kia999/babel-russian/pull/3 change 2021/02/04: removed patches for greek numerals, code is now in babel-greek. spanish: Nested quoting environments are not supported (<<, >>). change 2021/07/19: removed patches for spanish, code is now in babel-spanish.

```
⟨*package⟩
```

6.5.3 CJK patch

```
\RequirePackage{intcalc}[2007/09/27]
```

`\HyPsd@CJKhook`

```
\def\HyPsd@CJKhook{%
  \@ifpackageloaded{CJK}{%
    \let\CJK@kern\relax
    \let\CJKkern\relax
    \let\CJK@CJK\relax
    \ifHy@CJKbookmarks
      \HyPsd@CJKhook@bookmarks
    \fi
    \HyPsd@CJKhook@unicode
  }{}%
}
```

6.5.4 CJK bookmarks

\HyPsd@CJKhook Some internal commands of package cjk are redefined to avoid error messages. For a rudimental support of CJK bookmarks the active characters are redefined so that they print themselves.

After preprocessing of Big5 encoded data the following string for a double-byte character is emitted:

```
^^7f<arg1>^^7f<arg2>^^7f
```

<arg1> is the first byte in the range (always $>$ 0x80); <arg2> is the second byte in decimal notation ($\geq$ 0x40).

```
\begingroup
  \catcode"7F=\active
  \toks@{%
    \let\CJK@ignorespaces\empty
    \def\CJK@char#1{\@gobbletwo}%
    \let\CJK@charx\@gobblefour
    \let\CJK@punctchar\@gobblefour
    \def\CJK@punctcharx#1{\@gobblefour}%
    \catcode"7F=\active
    \def^^7f#1^^7f#2^^7f{%
      \string #1\HyPsd@DecimalToOctal{#2}%
    }%
    % ... ?
    \ifHy@unicode
      \def\Hy@cjkpu{\80}%
    \else
      \let\Hy@cjkpu\@empty
    \fi
    \HyPsd@CJKActiveChars
  }%
  \count@=127 %
  \@whilenum\count@<255 \do{%
    \advance\count@ by 1 %
    \lccode`\~=\count@
    \lowercase{%
      \toks@\expandafter{\the\toks@ ~}%
    }%
  }%
  \toks@\expandafter{\the\toks@ !}%
  \xdef\HyPsd@CJKhook@bookmarks{%
    \the\toks@
  }%
\endgroup
```

\HyPsd@CJKActiveChars The macro \HyPsd@CJKActiveChars is only defined to limit the memory consumption of \HyPsd@CJKhook.

```
\def\HyPsd@CJKActiveChars#1{%
  \ifx#1!%
    \let\HyPsd@CJKActiveChars\relax
  \else
    \edef#1{\noexpand\Hy@cjkpu\string#1}%
  \fi
```

```
  \HyPsd@CJKActiveChars
}
```

\HyPsd@DecimalToOctal A character, given by the decimal number is converted to a PDF character.

```
\def\HyPsd@DecimalToOctal#1{%
  \ifcase #1 %
      \000\or \001\or \002\or \003\or \004\or \005\or \006\or \007%
   \or \010\or \011\or \012\or \013\or \014\or \015\or \016\or \017%
   \or \020\or \021\or \022\or \023\or \024\or \025\or \026\or \027%
   \or \030\or \031\or \032\or \033\or \034\or \035\or \036\or \037%
   \or \040\or \041\or \042\or \043\or \044\or \045\or \046\or \047%
   \or \050\or \051\or \052\or \053\or \054\or \055\or \056\or \057%
   \or   0\or   1\or   2\or   3\or   4\or   5\or   6\or   7%
   \or   8\or   9\or \072\or \073\or \074\or \075\or \076\or \077%
   \or   @\or   A\or   B\or   C\or   D\or   E\or   F\or   G%
   \or   H\or   I\or   J\or   K\or   L\or   M\or   N\or   O%
   \or   P\or   Q\or   R\or   S\or   T\or   U\or   V\or   W%
   \or   X\or   Y\or   Z\or \133\or \134\or \135\or \136\or \137%
   \or \140\or   a\or   b\or   c\or   d\or   e\or   f\or   g%
   \or   h\or   i\or   j\or   k\or   l\or   m\or   n\or   o%
   \or   p\or   q\or   r\or   s\or   t\or   u\or   v\or   w%
   \or   x\or   y\or   z\or \173\or \174\or \175\or \176\or \177%
   \or \200\or \201\or \202\or \203\or \204\or \205\or \206\or \207%
   \or \210\or \211\or \212\or \213\or \214\or \215\or \216\or \217%
   \or \220\or \221\or \222\or \223\or \224\or \225\or \226\or \227%
   \or \230\or \231\or \232\or \233\or \234\or \235\or \236\or \237%
   \or \240\or \241\or \242\or \243\or \244\or \245\or \246\or \247%
   \or \250\or \251\or \252\or \253\or \254\or \255\or \256\or \257%
   \or \260\or \261\or \262\or \263\or \264\or \265\or \266\or \267%
   \or \270\or \271\or \272\or \273\or \274\or \275\or \276\or \277%
   \or \300\or \301\or \302\or \303\or \304\or \305\or \306\or \307%
   \or \310\or \311\or \312\or \313\or \314\or \315\or \316\or \317%
   \or \320\or \321\or \322\or \323\or \324\or \325\or \326\or \327%
   \or \330\or \331\or \332\or \333\or \334\or \335\or \336\or \337%
   \or \340\or \341\or \342\or \343\or \344\or \345\or \346\or \347%
   \or \350\or \351\or \352\or \353\or \354\or \355\or \356\or \357%
   \or \360\or \361\or \362\or \363\or \364\or \365\or \366\or \367%
   \or \370\or \371\or \372\or \373\or \374\or \375\or \376\or \377%
  \fi
}
```

6.5.5 CJK unicode

\HyPsd@CJKhook@unicode

```
\def\HyPsd@CJKhook@unicode{%
  \let\Unicode\HyPsd@CJK@Unicode
  \let\CJKnumber\HyPsd@CJKnumber
  \let\CJKdigits\HyPsd@CJKdigits
}
```

\HyPsd@CJK@Unicode

```
\def\HyPsd@CJK@Unicode#1#2{%
  \ifnum#1<256 %
    \HyPsd@DecimalToOctalFirst{#1}%
```

```
    \HyPsd@DecimalToOctalSecond{#2}%
  \else
    \933%
    \expandafter\expandafter\expandafter\HyPsd@HighA
    \intcalcDiv{#1}{4}!%
    \933%
    \ifcase\intcalcMod{#1}{4} %
      4\or 5\or 6\or 7%
    \fi
    \HyPsd@DecimalToOctalSecond{#2}%
  \fi
}

\def\HyPsd@HighA#1!{%
  \expandafter\expandafter\expandafter\HyPsd@HighB
  \IntCalcDiv#1!64!!%
  \expandafter\expandafter\expandafter\HyPsd@HighD
  \IntCalcMod#1!64!!%
}
\def\HyPsd@HighB#1!{%
  \expandafter\expandafter\expandafter\HyPsd@HighC
  \IntCalcDec#1!!%
}
\def\HyPsd@HighC#1!{%
  \IntCalcDiv#1!4!%
  \@backslashchar
  \IntCalcMod#1!4!%
}
\def\HyPsd@HighD#1!{%
  \ifcase\IntCalcDiv#1!8! %
    0\or 1\or 2\or 3\or 4\or 5\or 6\or 7%
  \fi
  \ifcase\IntCalcMod#1!8! %
    0\or 1\or 2\or 3\or 4\or 5\or 6\or 7%
  \fi
}
\def\HyPsd@DecimalToOctalFirst#1{%
  \9%
  \ifcase#1 %
       000\or 001\or 002\or 003\or 004\or 005\or 006\or 007%
    \or 010\or 011\or 012\or 013\or 014\or 015\or 016\or 017%
    \or 020\or 021\or 022\or 023\or 024\or 025\or 026\or 027%
    \or 030\or 031\or 032\or 033\or 034\or 035\or 036\or 037%
    \or 040\or 041\or 042\or 043\or 044\or 045\or 046\or 047%
    \or 050\or 051\or 052\or 053\or 054\or 055\or 056\or 057%
    \or 060\or 061\or 062\or 063\or 064\or 065\or 066\or 067%
    \or 070\or 071\or 072\or 073\or 074\or 075\or 076\or 077%
    \or 100\or 101\or 102\or 103\or 104\or 105\or 106\or 107%
    \or 120\or 111\or 112\or 113\or 114\or 115\or 116\or 117%
    \or 120\or 121\or 122\or 123\or 124\or 125\or 126\or 127%
    \or 130\or 131\or 132\or 133\or 134\or 135\or 136\or 137%
    \or 140\or 141\or 142\or 143\or 144\or 145\or 146\or 147%
    \or 150\or 151\or 152\or 153\or 154\or 155\or 156\or 157%
    \or 160\or 161\or 162\or 163\or 164\or 165\or 166\or 167%
```

```
  \or 170\or 171\or 172\or 173\or 174\or 175\or 176\or 177%
  \or 200\or 201\or 202\or 203\or 204\or 205\or 206\or 207%
  \or 210\or 211\or 212\or 213\or 214\or 215\or 216\or 217%
  \or 220\or 221\or 222\or 223\or 224\or 225\or 226\or 227%
  \or 230\or 231\or 232\or 233\or 234\or 235\or 236\or 237%
  \or 240\or 241\or 242\or 243\or 244\or 245\or 246\or 247%
  \or 250\or 251\or 252\or 253\or 254\or 255\or 256\or 257%
  \or 260\or 261\or 262\or 263\or 264\or 265\or 266\or 267%
  \or 270\or 271\or 272\or 273\or 274\or 275\or 276\or 277%
  \or 300\or 301\or 302\or 303\or 304\or 305\or 306\or 307%
  \or 310\or 311\or 312\or 313\or 314\or 315\or 316\or 317%
  \or 320\or 321\or 322\or 323\or 324\or 325\or 326\or 327%
  \or 330\or 331\or 332\or 333\or 334\or 335\or 336\or 337%
  \or 340\or 341\or 342\or 343\or 344\or 345\or 346\or 347%
  \or 350\or 351\or 352\or 353\or 354\or 355\or 356\or 357%
  \or 360\or 361\or 362\or 363\or 364\or 365\or 366\or 367%
  \or 370\or 371\or 372\or 373\or 374\or 375\or 376\or 377%
 \fi
}
\def\HyPsd@DecimalToOctalSecond#1{%
 \ifcase #1 %
      \000\or \001\or \002\or \003\or \004\or \005\or \006\or \007%
  \or \010\or \011\or \012\or \013\or \014\or \015\or \016\or \017%
  \or \020\or \021\or \022\or \023\or \024\or \025\or \026\or \027%
  \or \030\or \031\or \032\or \033\or \034\or \035\or \036\or \037%
  \or \040\or \041\or \042\or \043\or \044\or \045\or \046\or \047%
  \or \050\or \051\or \052\or \053\or \054\or \055\or \056\or \057%
  \or \060\or \061\or \062\or \063\or \064\or \065\or \066\or \067%
  \or \070\or \071\or \072\or \073\or \074\or \075\or \076\or \077%
  \or \100\or \101\or \102\or \103\or \104\or \105\or \106\or \107%
  \or \110\or \111\or \112\or \113\or \114\or \115\or \116\or \117%
  \or \120\or \121\or \122\or \123\or \124\or \125\or \126\or \127%
  \or \130\or \131\or \132\or \133\or \134\or \135\or \136\or \137%
  \or \140\or \141\or \142\or \143\or \144\or \145\or \146\or \147%
  \or \150\or \151\or \152\or \153\or \154\or \155\or \156\or \157%
  \or \160\or \161\or \162\or \163\or \164\or \165\or \166\or \167%
  \or \170\or \171\or \172\or \173\or \174\or \175\or \176\or \177%
  \or \200\or \201\or \202\or \203\or \204\or \205\or \206\or \207%
  \or \210\or \211\or \212\or \213\or \214\or \215\or \216\or \217%
  \or \220\or \221\or \222\or \223\or \224\or \225\or \226\or \227%
  \or \230\or \231\or \232\or \233\or \234\or \235\or \236\or \237%
  \or \240\or \241\or \242\or \243\or \244\or \245\or \246\or \247%
  \or \250\or \251\or \252\or \253\or \254\or \255\or \256\or \257%
  \or \260\or \261\or \262\or \263\or \264\or \265\or \266\or \267%
  \or \270\or \271\or \272\or \273\or \274\or \275\or \276\or \277%
  \or \300\or \301\or \302\or \303\or \304\or \305\or \306\or \307%
  \or \310\or \311\or \312\or \313\or \314\or \315\or \316\or \317%
  \or \320\or \321\or \322\or \323\or \324\or \325\or \326\or \327%
  \or \330\or \331\or \332\or \333\or \334\or \335\or \336\or \337%
  \or \340\or \341\or \342\or \343\or \344\or \345\or \346\or \347%
  \or \350\or \351\or \352\or \353\or \354\or \355\or \356\or \357%
  \or \360\or \361\or \362\or \363\or \364\or \365\or \366\or \367%
  \or \370\or \371\or \372\or \373\or \374\or \375\or \376\or \377%
 \fi
```

```
}
\def\HyPsd@CJKnumber#1{%
  \ifnum#1<\z@
    \CJK@minus
    \expandafter\HyPsd@@CJKnumber\expandafter{\number-\number#1}%
  \else
    \expandafter\HyPsd@@CJKnumber\expandafter{\number#1}%
  \fi
}
\def\HyPsd@@CJKnumber#1{%
  \ifcase#1 %
    \CJK@zero\or\CJK@one\or\CJK@two\or\CJK@three\or\CJK@four\or
    \CJK@five\or\CJK@six\or\CJK@seven\or\CJK@eight\or\CJK@nine\or
    \CJK@ten\or\CJK@ten\CJK@one\or\CJK@ten\CJK@two\or
    \CJK@ten\CJK@three\or\CJK@ten\CJK@four\or\CJK@ten\CJK@five\or
    \CJK@ten\CJK@six\or\CJK@ten\CJK@seven\or\CJK@ten\CJK@eight\or
    \CJK@ten\CJK@nine
  \else
    \ifnum#1<10000 %
      \HyPsd@CJKnumberFour#1!\@empty{20}%
      \@empty
    \else
      \ifnum#1<100000000 %
        \expandafter\expandafter\expandafter\HyPsd@CJKnumberFour
          \IntCalcDiv#1!10000!%
        !{}{20}%
        \CJK@tenthousand
        \expandafter\expandafter\expandafter\HyPsd@CJKnumberFour
          \IntCalcMod#1!10000!%
        !\CJK@zero{10}%
        \@empty
      \else
        \expandafter\HyPsd@CJKnumberLarge
        \number\IntCalcDiv#1!100000000!\expandafter!%
        \number\IntCalcMod#1!100000000!!%
      \fi
    \fi
  \fi
}
\def\HyPsd@CJKnumberLarge#1!#2!{%
  \HyPsd@CJKnumberFour#1!{}{20}%
  \CJK@hundredmillion
  \ifnum#2=\z@
  \else
    \expandafter\expandafter\expandafter\HyPsd@CJKnumberFour
      \IntCalcDiv#2!10000!%
    !\CJK@zero{10}%
    \CJK@tenthousand
    \expandafter\expandafter\expandafter\HyPsd@CJKnumberFour
      \IntCalcMod#2!10000!%
    !\CJK@zero{10}%
    \@empty
  \fi
}
```

```
\def\HyPsd@CJKnumberFour#1!#2#3{%
  \ifnum#1=\z@
    \expandafter\@gobble
  \else
    \ifnum#1<1000 %
      #2%
      \HyPsd@CJKnumberThree#1!{}{#3}%
    \else
      \HyPsd@@CJKnumber{\IntCalcDiv#1!1000!}%
      \CJK@thousand
      \expandafter\expandafter\expandafter\HyPsd@CJKnumberThree
        \IntCalcMod#1!1000!%
      !\CJK@zero{10}%
    \fi
  \fi
}
\def\HyPsd@CJKnumberThree#1!#2#3{%
  \ifnum#1=\z@
  \else
    \ifnum#1<100 %
      #2%
      \HyPsd@CJKnumberTwo#1!{}{#3}%
    \else
      \HyPsd@@CJKnumber{\IntCalcDiv#1!100!}%
      \CJK@hundred
      \expandafter\expandafter\expandafter\HyPsd@CJKnumberTwo
        \IntCalcMod#1!100!%
      !\CJK@zero{10}%
    \fi
  \fi
}
\def\HyPsd@CJKnumberTwo#1!#2#3{%
  \ifnum#1=\z@
  \else
    \ifnum#1<#3 %
      #2%
      \HyPsd@@CJKnumber{#1}%
    \else
      \HyPsd@@CJKnumber{\IntCalcDiv#1!10!}%
      \CJK@ten
      \ifnum\IntCalcMod#1!10!=\z@
      \else
        \HyPsd@@CJKnumber{\IntCalcMod#1!10!}%
      \fi
    \fi
  \fi
}
\def\HyPsd@CJKdigits#1{%
  \ifx*#1\relax
    \expandafter\HyPsd@@CJKdigits\expandafter\CJK@zero
  \else
    \HyPsd@@CJKdigits\CJK@null{#1}%
  \fi
}
```

```
\def\HyPsd@@CJKdigits#1#2{%
  \ifx\\#2\\%
  \else
    \HyPsd@@@CJKdigits#1#2\@nil
  \fi
}%
\def\HyPsd@@@CJKdigits#1#2#3\@nil{%
  \HyPsd@CJKdigit#1{#2}%
  \ifx\\#3\\%
    \expandafter\@gobble
  \else
    \expandafter\@firstofone
  \fi
  {%
    \HyPsd@@@CJKdigits#1#3\@nil
  }%
}
\def\HyPsd@CJKdigit#1#2{%
  \ifcase#2 %
    #1\or
    \CJK@one\or\CJK@two\or\CJK@three\or\CJK@four\or
    \CJK@five\or\CJK@six\or\CJK@seven\or\CJK@eight\or\CJK@nine
  \fi
}
```

6.5.6 \@inmathwarn-Patch

\HyPsd@inmathwarn

The patch of `\@inmathwarn` is needed to get rid of the infinite error loop with glyphs of other encodings (see the explanation above). Potentially the patch is dangerous, if the code in `ltoutenc.dtx` changes. Checked with LaTeX 2_ε versions [1998/06/01] and [1998/12/01]. I expect that versions below [1995/12/01] don't work.

To understand the patch easier, the original code of `\@current@cmd` and `\@changed@cmd` follows (LaTeX 2_ε release [1998/12/01]). In the normal case `\pdfstringdef` is executed in a context where `\protect` has the meaning of `\@typeset-protect` (=`\relax`).

```
\def\@current@cmd#1{%
  \ifx\protect\@typeset@protect
    \@inmathwarn#1%
  \else
    \noexpand#1\expandafter\@gobble
  \fi}
\def\@changed@cmd#1#2{%
  \ifx\protect\@typeset@protect
    \@inmathwarn#1%
    \expandafter\ifx\csname\cf@encoding\string#1\endcsname\relax
      \expandafter\ifx\csname ?\string#1\endcsname\relax
        \expandafter\def\csname ?\string#1\endcsname{%
          \TextSymbolUnavailable#1%
        }%
      \fi
      \global\expandafter\let
          \csname\cf@encoding \string#1\expandafter\endcsname
```

```
          \csname ?\string#1\endcsname
      \fi
      \csname\cf@encoding\string#1%
        \expandafter\endcsname
    \else
      \noexpand#1%
    \fi}
  \gdef\TextSymbolUnavailable#1{%
    \@latex@error{%
      Command \protect#1 unavailable in encoding \cf@encoding%
    }\@eha}
  \def\@inmathwarn#1{%
    \ifmmode
      \@latex@warning{Command \protect#1 invalid in math mode}%
    \fi}
```

```
\def\HyPsd@inmathwarn#1#2{%
  \ifx#2\expandafter
    \expandafter\ifx\csname\cf@encoding\string#1\endcsname\relax
      \HyPsd@GLYPHERR
      \expandafter\@gobble\string#1%
      >%
      \expandafter\expandafter\expandafter\HyPsd@EndWithElse
    \else
      \expandafter\expandafter\expandafter\HyPsd@GobbleFiFi
    \fi
  \else
    \expandafter#2%
  \fi
}
\def\HyPsd@GobbleFiFi#1\fi#2\fi{}
\def\HyPsd@EndWithElse#1\else{\else}
```

\HyPsd@add@accent

```
\def\HyPsd@add@accent#1#2{%
  \HyPsd@GLYPHERR\expandafter\@gobble\string#1+\string#2>%
  #2%
}%
```

6.5.7 Unexpandable spaces

\HyPsd@LetUnexpandableSpace

In \HyPsd@@ProtectSpaces the space tokens are replaced by not expandable commands, that work like spaces:

- So they can caught by undelimited arguments.
- And they work in number, dimen, and skip assignments.

These properties are used in \HyPsd@CheckCatcodes.

```
\def\HyPsd@LetUnexpandableSpace#1{%
  \expandafter\futurelet\expandafter#1\expandafter\@gobble\space\relax
}
```

\HyPsd@UnexpandableSpace

\HyPsd@UnexpandableSpace is used in \HyPsd@@ProtectSpaces. In \yPsd@@ProtectSpaces the space tokens are replaced by unexpandable commands \HyPsd@UnexpandableSpace, but that have the effect of spaces.

```
\HyPsd@LetUnexpandableSpace\HyPsd@UnexpandableSpace
```

6.5.8 Marker for commands

\HyPsd@XSPACE
\HyPsd@ITALCORR
\HyPsd@GLYPHERR

Some commands and information cannot be utilized before the string expansion and the checking process. Command names are filtered out, so we need another way to transport the information: An unusual # with catcode 12 marks the beginning of the extra information.

```
\edef\HyPsd@XSPACE{\string#\string X}
\edef\HyPsd@ITALCORR{\string#\string I}
\edef\HyPsd@GLYPHERR{\string#\string G}
```

6.5.9 \hspace fix

\HyPsd@hspace

```
\def\HyPsd@hspace#1{\HyPsd@@hspace#1*\END}
```

\HyPsd@@hspace

\HyPsd@@hspace checks whether \hspace is called in its star form.

```
\def\HyPsd@@hspace#1*#2\END{%
  \ifx\\#2\\%
    \HyPsd@hspacetest{#1}%
  \else
    \expandafter\HyPsd@hspacetest
  \fi
}
```

\HyPsd@hspacetest

\HyPsd@hyspacetest replaces the \hspace by a space, if the length is greater than zero.

```
\def\HyPsd@hspacetest#1{\ifdim\dimexpr#1\relax>\z@\space\fi}
```

6.5.10 Fix for AMS classes

```
\@ifundefined{tocsection}{%
  \let\HyPsd@AMSclassfix\relax
}{%
  \def\HyPsd@AMSclassfix{%
    \let\tocpart\HyPsd@tocsection
    \let\tocchapter\HyPsd@tocsection
    \let\tocappendix\HyPsd@tocsection
    \let\tocsection\HyPsd@tocsection
    \let\tocsubsection\HyPsd@tocsection
    \let\tocsubsubsection\HyPsd@tocsection
    \let\tocparagraph\HyPsd@tocsection
  }%
  \def\HyPsd@tocsection#1#2#3{%
    \if @#2@\else\if @#1@\else#1 \fi#2. \fi
    #3%
  }%
}
```

6.5.11 Reference commands

\HyPsd@href

```
\def\HyPsd@href#1#{\@secondoftwo}
```

\HyPsd@ref Macro \HyPsd@ref calls the macro \HyPsd@@ref for star checking. The same methods like in \HyPsd@hspace is used.

```
\def\HyPsd@ref#1{\HyPsd@@ref#1*\END}%
```

\HyPsd@@ref Macro \HyPsd@@ref checks if a star is present.

```
\def\HyPsd@@ref#1*#2\END{%
  \ifx\\#2\\%
    \HyPsd@@@ref{#1}%
  \else
    \expandafter\HyPsd@@@ref
  \fi
}%
```

\HyPsd@@@ref \HyPsd@@@ref does the work and extracts the first argument.

```
\def\HyPsd@@@ref#1{%
  \expandafter\ifx\csname r@#1\endcsname\relax
    ??%
  \else
    \expandafter\expandafter\expandafter
    \@car\csname r@#1\endcsname\@nil
  \fi
}
```

\HyPsd@pageref Macro \HyPsd@pageref calls the macro \HyPsd@@pageref for star checking. The same methods like in \HyPsd@hspace is used.

```
\def\HyPsd@pageref#1{\HyPsd@@pageref#1*\END}
```

\HyPsd@@pageref Macro \HyPsd@@pageref checks if a star is present.

```
\def\HyPsd@@pageref#1*#2\END{%
  \ifx\\#2\\%
    \HyPsd@@@pageref{#1}%
  \else
    \expandafter\HyPsd@@@pageref
  \fi
}
```

\HyPsd@@@pageref \HyPsd@@@pageref does the work and extracts the second argument.

```
\def\HyPsd@@@pageref#1{%
  \expandafter\ifx\csname r@#1\endcsname\relax
    ??%
  \else
    \expandafter\expandafter\expandafter\expandafter
    \expandafter\expandafter\expandafter\@car
    \expandafter\expandafter\expandafter\@gobble
    \csname r@#1\endcsname{}\@nil
  \fi
}
```

\HyPsd@nameref Macro \HyPsd@nameref calls the macro \HyPsd@@nameref for star checking. The same methods like in \HyPsd@hspace is used.

```
\def\HyPsd@nameref#1{\HyPsd@@nameref#1*\END}
```

\HyPsd@@nameref Macro \HyPsd@@nameref checks if a star is present.

```
\def\HyPsd@@nameref#1*#2\END{%
  \ifx\\#2\\%
    \HyPsd@@@nameref{#1}%
  \else
    \expandafter\HyPsd@@@nameref
  \fi
}
```

\HyPsd@@@nameref \HyPsd@@@nameref does the work and extracts the third argument.

```
\def\HyPsd@@@nameref#1{%
  \expandafter\ifx\csname r@#1\endcsname\relax
    ??%
  \else
    \expandafter\expandafter\expandafter\expandafter
    \expandafter\expandafter\expandafter\@car
    \expandafter\expandafter\expandafter\@gobbletwo
    \csname r@#1\endcsname{}{}\@nil
  \fi
}
```

\HyPsd@autoref Macro \HyPsd@autoref calls the macro \HyPsd@@autoref for star checking. The same methods like in \HyPsd@hspace is used.

```
\def\HyPsd@autoref#1{\HyPsd@@autoref#1*\END}
```

\HyPsd@@autoref Macro \HyPsd@@autoref checks if a star is present.

```
\def\HyPsd@@autoref#1*#2\END{%
  \ifx\\#2\\%
    \HyPsd@@@autoref{#1}%
  \else
    \expandafter\HyPsd@@@autoref
  \fi
}
```

\HyPsd@@@autoref \HyPsd@@@autoref does the work and extracts the second argument.

```
\def\HyPsd@@@autoref#1{%
  \expandafter\ifx\csname r@#1\endcsname\relax
    ??%
  \else
    \expandafter\expandafter\expandafter\HyPsd@autorefname
       \csname r@#1\endcsname{}{}{}{}\@nil
    \expandafter\expandafter\expandafter
    \@car\csname r@#1\endcsname\@nil
  \fi
}
```

\HyPsd@autorefname At least a basic definition for getting the \autoref name.

```
\def\HyPsd@autorefname#1#2#3#4#5\@nil{%
  \ifx\\#4\\%
  \else
    \HyPsd@@autorefname#4.\@nil
  \fi
}
```

\HyPsd@@autorefname

```
\def\HyPsd@@autorefname#1.#2\@nil{%
  \@ifundefined{#1autorefname}{%
    \@ifundefined{#1name}{%
    }{%
      \csname#1name\endcsname\space
    }%
  }{%
    \csname#1autorefname\endcsname\space
  }%
}
```

6.5.12 Redefining the defining commands

Definitions aren't allowed, because they aren't executed in an only expanding context. So the command to be defined isn't defined and can perhaps be undefined. This would causes TeX to stop with an error message. With a deep trick it is possible to define commands in such a context: `\csname` does the job, it defines the command to be `\relax`, if it has no meaning.

Active characters cannot be defined with this trick. It is possible to define all undefined active characters (perhaps that they have the meaning of `\relax`). To avoid side effects this should be done in `\pdfstringdef` shortly before the `\xdef` job. But checking and defining all possible active characters of the full range (0 until 255) would take a while. `\pdfstringdef` is slow enough, so this isn't done.

`\HyPsd@DefCommand` and `\HyPsd@LetCommand` expands to the commands `\<def>-command` and `\<let>-command` with the meaning of `\def` and `\let`. So it is detected by `\HyPsd@CheckCatcodes` and the command name `\<def>-command` or `\<let>-command` should indicate a forbidden definition command.

The command to be defined is converted to a string and back to a command name with the help of `\csname`. If the command is already defined, `\noexpand` prevents a further expansion, even though the command would expand to legal stuff. If the command don't have the meaning of `\relax`, `\HyPsd@CheckCatcodes` will produce a warning. (The command itself can be legal, but the warning is legitimate because of the position after a defining command.)

The difference between `\HyPsd@DefCommand` and `\HyPsdLetCommand` is that the first one also cancels this arguments, the parameter and definition text. The right side of the `\let` commands cannot be canceled with an undelimited parameter because of a possible space token after `\futurelet`.

To avoid unmachted `\if`... tokens, the cases `\let\if`...`\iftrue` and `\let\if`...`\iffalse` are checked and ignored.

\HyPsd@DefCommand
\HyPsd@LetCommand

```
\begingroup
  \def\x#1#2{%
    \endgroup
    \let#1\def
    \def\HyPsd@DefCommand##1##2##{%
      #1%
      \expandafter\noexpand
        \csname\expandafter\@gobble\string##1\@empty\endcsname
      \@gobble
```

```
    }%
    \let#2\let
    \def\HyPsd@@LetCommand##1{%
      \expandafter\ifx\csname##1\expandafter\endcsname
                  \csname iftrue\endcsname
        \pdfstringdefWarn\let
        \expandafter\@gobble
      \else
        \expandafter\ifx\csname##1\expandafter\endcsname
                    \csname iffalse\endcsname
          \pdfstringdefWarn\let
          \expandafter\expandafter\expandafter\@gobble
        \else
          #2%
          \expandafter\noexpand
            \csname##1\expandafter\expandafter\expandafter\endcsname
        \fi
      \fi
    }%
  }%
\expandafter\x\csname <def>-command\expandafter\endcsname
            \csname <let>-command\endcsname
\def\HyPsd@LetCommand#1{%
  \expandafter\expandafter\expandafter\HyPsd@@LetCommand
    \expandafter\expandafter\expandafter{%
    \expandafter\@gobble\string#1\@empty
  }%
}
```

6.5.13 \ifnextchar

\HyPsd@ifnextchar In \pdfstringdef \@ifnextchar is disabled via a \let command to save time. First a warning message is given, then the three arguments are canceled. \@ifnextchar cannot work in a correct manner, because it uses \futurelet, but this is a stomach feature, that doesn't work in an expanding context. There are several variants of \@ifnextchar:

- \@ifnextchar
- \kernel@ifnextchar
- \new@ifnextchar from package amsgen.sty (bug report latex/3662).

```
\def\HyPsd@ifnextchar#1{%
  \pdfstringdefWarn#1%
  \expandafter\@gobbletwo\@gobble
}
```

6.5.14 \@protected@testoptifnextchar

\HyPsd@protected@testopt Macros with optional arguments doesn't work properly, because they call \@ifnextchar to detect the optional argument (see the explanation of \HyPsd@ifnextchar). But a warning, that \@ifnextchar doesn't work, doesn't help the user very

much. Therefore \@protected@testopt is also disabled, because its first argument is the problematic macro with the optional argument and it is called before \@ifnextchar.

```
\def\HyPsd@protected@testopt#1{%
  \pdfstringdefWarn#1%
  \@gobbletwo
}
```

6.6 Help macros for postprocessing

6.6.1 Generic warning.

\HyPsd@Warning For several reasons \space is masked and does not have its normal meaning. But it is used in warning messages, so it is redefined locally:

```
\def\HyPsd@Warning#1{%
  \begingroup
    \let\space\Hy@space
    \Hy@Warning{#1}%
  \endgroup
}
```

6.6.2 Protecting spaces

\HyPsd@ProtectSpaces \HyPsd@ProtectSpaces calls with the expanded string \HyPsd@@ProtectSpacesFi. The expanded string is protected by | at the beginning and end of the expanded string. Because of this there can be no group at the beginning or end of the string and grouping characters are not removed by the call of \HyPsd@@ProtectSpacesFi.

```
\let\HyPsd@fi\fi
\def\HyPsd@ProtectSpaces#1{%
  \xdef#1{%
    \iftrue
      \expandafter\HyPsd@@ProtectSpacesFi
        \expandafter|\expandafter\@empty#1| %
    \HyPsd@fi
  }%
  \expandafter\HyPsd@RemoveMask#1\HyPsd@End#1%
}%
```

\HyPsd@@ProtectSpacesFi The string can contain command tokens, so it is better to use an \def instead of an \edef.

```
\def\HyPsd@@ProtectSpacesFi#1 #2\HyPsd@fi{%
  \fi
  \unexpanded{#1}%
  \ifx\scrollmode#2\scrollmode
  \else
    \HyPsd@@ProtectSpacesFi\HyPsd@UnexpandableSpace#2%
  \HyPsd@fi
}%
```

Remove mask.

\HyPsd@RemoveMask `\HyPsd@RemoveMask` removes the protecting `|`. It is used by `\HyPsd@@ProtectSpacesFi` and by the code in `\pdfstringdef` that removes the grouping characters.

```
\def\HyPsd@RemoveMask|#1|\HyPsd@End#2{%
  \xdef#2{\unexpanded\expandafter{#1}}%
}%
```

6.6.3 Remove grouping braces

\HyPsd@RemoveBraces `#1` contains the expanded string, the result will be locally written in command `\HyPsd@String`.

```
\def\HyPsd@RemoveBraces#1{%
  \ifx\scrollmode#1\scrollmode
  \else
    \HyPsd@@RemoveBracesFi#1\HyPsd@End{#1}%
  \fi
}
```

\HyPsd@@RemoveBraces `\HyPsd@@RemoveBraces` is called with the expanded string, the end marked by `\HyPsd@End`, the expanded string again, but enclosed in braces and the string command. The first expanded string is scanned by the parameter text `#1#2`. By a comparison with the original form in `#3` we can decide whether `#1` is a single token or a group. To avoid the case that `#2` is a group, the string is extended by a `|` before.

While removing the grouping braces an italic correction marker is inserted for supporting package `xspace` and letting ligatures broken.

Because the string is already expanded, the `\if` commands should disappeared. So we can move some parts out of the argument of `\Hy@ReturnAfterFi`.

```
\def\HyPsd@@RemoveBracesFi#1#2\HyPsd@End#3\fi{%
  \fi
  \def\Hy@temp@A{#1#2}%
  \def\Hy@temp@B{#3}%
  \ifx\Hy@temp@A\Hy@temp@B
    \expandafter\def\expandafter\HyPsd@String\expandafter{%
      \HyPsd@String#1%
    }%
    \ifx\scrollmode#2\scrollmode
    \else
      \Hy@ReturnAfterFiFiEnd{%
        \HyPsd@RemoveBraces{#2}%
      }%
    \fi
  \else
    \def\Hy@temp@A{#1}%
    \HyPsd@AppendItalcorr\HyPsd@String
    \ifx\Hy@temp@A\@empty
      \Hy@ReturnAfterElseFiFiEnd{%
        \HyPsd@RemoveBraces{#2}%
      }%
    \else
      \HyPsd@ProtectSpaces\Hy@temp@A
      \HyPsd@AppendItalcorr\Hy@temp@A
```

```
      \Hy@ReturnAfterFiFiEnd{%
        \expandafter\HyPsd@RemoveBraces\expandafter
          {\Hy@temp@A#2}%
      }%
    \fi
  \fi
  \Hy@ReturnEnd
}
```

\HyPsd@AppendItalcorr
\HyPsd@@AppendItalcorr

The string can contain commands yet, so it is better to use \def instead of a shorter \edef. The two help macros limit the count of \expandafter.

```
\def\HyPsd@AppendItalcorr#1{%
  \expandafter\HyPsd@@AppendItalcorr\expandafter{\/}#1%
}
\def\HyPsd@@AppendItalcorr#1#2{%
  \expandafter\def\expandafter#2\expandafter{#2#1}%
}
```

6.6.4 Catcode check

Workaround for LuaTeX. \HyPsd@CheckCatcodes might trigger a bug of LuaTeX (0.60.2, 0.70.1, 0.70.2, ...) in the comparison with \ifcat, see http://tracker.luatex.org/view.php?id=773.

```
\@ifundefined{directlua}{%
}{%
  \expandafter\ifx\csname\endcsname\relax\fi
}
```

Check catcodes.

\HyPsd@CheckCatcodes

Because \ifcat expands its arguments, this is prevented by \noexpand. In case of command tokens and active characters \ifcat now sees a \relax. After protecting spaces and removing braces #1 should be a single token, no group of several tokens, nor an empty group. (So the \expandafter\relax between \ifcat and \noexpand is only for safety and it should be possible to remove it.)

\protect and \relax should be removed silently. But it is too dangerous and breaks some code giving them the meaning of \@empty. So commands with the meaning of \protect are removed here. (\protect should have the meaning of \@typeset@protect that is equal to \relax).

For the comparison with active characters, ~ cannot be used because it has the meaning of a blank space here. And active characters need to be checked, if they have been defined using \protected.

```
\begingroup
  \catcode`\Q=\active
  \let Q\@empty
  \gdef\HyPsd@CheckCatcodes#1#2\HyPsd@End{%
    \global\let\HyPsd@Rest\relax
    \ifcat\relax\noexpand#1\relax
      \ifx#1\protect
      \else
        \ifx#1\penalty
          \setbox\z@=\hbox{%
```

```
        \afterassignment\HyPsd@AfterCountRemove
        \count@=#2\HyPsd@End
      }%
    \else
      \ifx#1\kern
        \setbox\z@=\hbox{%
          \afterassignment\HyPsd@AfterDimenRemove
          \dimen@=#2\HyPsd@End
        }%
      \else
        \ifx#1\hskip
          \setbox\z@=\hbox{%
            \afterassignment\HyPsd@AfterSkipRemove
            \skip@=#2\HyPsd@End
          }%
        \else
          \HyPsd@CatcodeWarning{#1}%
        \fi
      \fi
    \fi
  \fi
\else
  \ifcat\noexpand#1\noexpandQ% active character
    \expandafter\expandafter\expandafter\def
    \expandafter\expandafter\expandafter\HyPsd@String
    \expandafter\expandafter\expandafter{%
      \expandafter\HyPsd@String\string#1%
    }%
  \else
    \ifcat#1A% letter
      \expandafter\def\expandafter\HyPsd@String\expandafter{%
        \HyPsd@String#1%
      }%
    \else
      \ifcat#1 % SPACE
        \expandafter\def\expandafter\HyPsd@String\expandafter{%
          \HyPsd@String\HyPsd@SPACEOPTI
        }%
      \else
        \ifcat$#1%
          \HyPsd@CatcodeWarning{math shift}%
        \else
          \ifcat&#1%
            \HyPsd@CatcodeWarning{alignment tab}%
          \else
            \ifcat^#1%
              \HyPsd@CatcodeWarning{superscript}%
            \else
              \ifcat_#1%
                \HyPsd@CatcodeWarning{subscript}%
              \else
                \expandafter\def\expandafter\HyPsd@String\expandafter{%
                  \HyPsd@String#1%
                }%
```

```
            \fi
          \fi
        \fi
      \fi
    \fi
  \fi
  \ifx\HyPsd@Rest\relax
    \ifx\scrollmode#2\scrollmode
    \else
      \Hy@ReturnAfterFiFiEnd{%
        \HyPsd@CheckCatcodes#2\HyPsd@End
      }%
    \fi
  \else
    \ifx\HyPsd@Rest\@empty
    \else
      \Hy@ReturnAfterFiFiEnd{%
        \expandafter\HyPsd@CheckCatcodes\HyPsd@Rest\HyPsd@End
      }%
    \fi
  \fi
  \Hy@ReturnEnd
}%
\endgroup
```

Remove counts, dimens, skips.

\HyPsd@AfterCountRemove Counts like \penalty are removed silently.

```
\def\HyPsd@AfterCountRemove#1\HyPsd@End{%
  \gdef\HyPsd@Rest{#1}%
}
```

\HyPsd@AfterDimenRemove If the value of the dimen (\kern) is zero, it can be removed silently. All other values are difficult to interpret. Negative values do not work in bookmarks. Should positive values be removed or should they be replaced by space(s)? The following code replaces positive values greater than 1ex with a space and removes them else.

```
\def\HyPsd@AfterDimenRemove#1\HyPsd@End{%
  \ifdim\ifx\HyPsd@String\@empty\z@\else\dimen@\fi>1ex %
    \HyPsd@ReplaceSpaceWarning{\string\kern\space\the\dimen@}%
    \gdef\HyPsd@Rest{\HyPsd@UnexpandableSpace #1}%
  \else
    \ifdim\dimen@=\z@
    \else
      \HyPsd@RemoveSpaceWarning{\string\kern\space\the\dimen@}%
    \fi
    \gdef\HyPsd@Rest{#1}%
  \fi
}
```

\HyPsd@AfterSkipRemove The glue part of skips do not work in PDF strings and are ignored. Skips (\hskip), that are not zero, have the same interpreting problems like dimens (see above).

```
\def\HyPsd@AfterSkipRemove#1\HyPsd@End{%
  \ifdim\ifx\HyPsd@String\@empty\z@\else\skip@\fi>1ex %
    \HyPsd@ReplaceSpaceWarning{\string\hskip\space\the\skip@}%
    \gdef\HyPsd@Rest{\HyPsd@UnexpandableSpace #1}%
  \else
    \ifdim\skip@=\z@
    \else
      \HyPsd@RemoveSpaceWarning{\string\kern\space\the\skip@}%
    \fi
    \gdef\HyPsd@Rest{#1}%
  \fi
}
```

Catcode warnings.

\HyPsd@CatcodeWarning `\HyPsd@CatcodeWarning` produces a warning for the user.

```
\def\HyPsd@CatcodeWarning#1{%
  \HyPsd@Warning{%
    Token not allowed in a PDF string (%
    \ifHy@unicode
      Unicode%
    \else
      PDFDocEncoding%
    \fi
    ):%
    \MessageBreak removing `\HyPsd@RemoveCmdPrefix#1'%
  }%
}
\begingroup
  \catcode`\|=0 %
  \catcode`\\=12 %
  |gdef|HyPsd@RemoveCmdPrefix#1{%
    |expandafter|HyPsd@@RemoveCmdPrefix
      |string#1|@empty\<>-|@empty|@empty
  }%
  |gdef|HyPsd@@RemoveCmdPrefix#1\<>-#2|@empty#3|@empty{#1#2}%
|endgroup
```

\HyPsd@RemoveSpaceWarning

```
\def\HyPsd@RemoveSpaceWarning#1{%
  \HyPsd@Warning{%
    Token not allowed in a PDF string (%
    \ifHy@unicode
      Unicode%
    \else
      PDFDocEncoding%
    \fi
    ):%
    \MessageBreak #1\MessageBreak
    removed%
  }%
}
```

\HyPsd@ReplaceSpaceWarning

```
\def\HyPsd@ReplaceSpaceWarning#1{%
  \HyPsd@Warning{%
    Token not allowed in a PDF string (%
    \ifHy@unicode
      Unicode%
    \else
      PDFDocEncoding%
    \fi
    ):%
    \MessageBreak #1\MessageBreak
    replaced by space%
  }%
}
```

6.6.5 Check for wrong glyphs

A wrong glyph is marked with `\relax`, the glyph name follows, delimited by `>`. `\@empty` ends the string.

```
\def\HyPsd@GlyphProcess#1\relax#2\@empty{%
  \expandafter\def\expandafter\HyPsd@String\expandafter{%
    \HyPsd@String#1%
  }%
  \ifx\\#2\\%
  \else
    \Hy@ReturnAfterFi{%
      \HyPsd@GlyphProcessWarning#2\@empty
    }%
  \fi
}
\def\HyPsd@GlyphProcessWarning#1>#2\@empty{%
  \HyPsd@@GlyphProcessWarning#1++>%
  \HyPsd@GlyphProcess#2\@empty
}
\def\HyPsd@@GlyphProcessWarning#1+#2+#3>{%
  \ifx\\#2\\%
    \HyPsd@Warning{%
      Glyph not defined in %
      P\ifHy@unicode U\else D1\fi\space encoding,\MessageBreak
      removing `\@backslashchar#1'%
    }%
  \else
    \HyPsd@Warning{%
      Composite letter `\@backslashchar#1+#2'\MessageBreak
      not defined in P\ifHy@unicode U\else D1\fi\space encoding,%
      \MessageBreak
      removing `\@backslashchar#1'%
    }%
  \fi
}
```

Spaces.

`\HyPsd@spaceopti` In the string the spaces are represented by `\HyPsd@spaceopti` tokens. Within an `\edef` it prints itself as a simple space and looks for its next argument. If another

space follows, so it replaces the next \HyPsd@spaceopti by an protected space \040.

```
\def\HyPsd@spaceopti#1{ % first space
  \ifx\HyPsd@spaceopti#1%
    \040%
  \else
    #1%
  \fi
}%
```

6.6.6 Replacing tokens

\HyPsd@Subst To save tokens \HyPsd@StringSubst is an wrapper for the command \HyPsd@Subst that does all the work: In string stored in command #3 it replaces the tokens #1 with #2.

- #1 Exact the tokens that should be replaced.
- #2 The replacement (don't need to be expanded).
- #3 Command with the string.

```
\def\HyPsd@Subst#1#2#3{%
  \def\HyPsd@@ReplaceFi##1#1##2\END\fi{%
    \fi
    ##1%
    \ifx\scrollmode##2\scrollmode
    \else
      #2%
      \HyPsd@@ReplaceFi##2\END
    \fi
  }%
  \xdef#3{%
    \iftrue
      \expandafter\HyPsd@@ReplaceFi#3#1\END
    \fi
  }%
}
```

\HyPsd@StringSubst To save tokens in \pdfstringdef \HyPsd@StringSubst is a wrapper, that expands argument #1 before calling \HyPsd@Subst.

```
\def\HyPsd@StringSubst#1{%
  \expandafter\HyPsd@Subst\expandafter{\string#1}%
}
```

\HyPsd@EscapeTeX

```
\begingroup
  \lccode`\!=`\%%
  \lccode`\|=`\\%
  \lccode`\(=`\{%
  \lccode`\)=`\}%
  \lccode`0=\z@
  \lccode`1=\z@
  \lccode`3=\z@
  \lccode`4=\z@
  \lccode`5=\z@
  \lccode`7=\z@
```

```
\lowercase{\endgroup
  \def\HyPsd@EscapeTeX#1{%
    \HyPsd@Subst!{|045}#1%
    \HyPsd@Subst({|173}#1%
    \HyPsd@Subst){|175}#1%
  }%
}
```

6.6.7 Support for package xspace

\HyPsd@doxspace

`\xspace` does not work, because it uses a `\futurelet` that cannot be executed in TEX's mouth. So this implementation uses an argument to examine the next token. In a previous version I reused `\@xspace`, but this version is shorter and easier to understand.

```
\def\HyPsd@doxspace#1{%
  \ifx#1\relax\else
   \ifx#1.\else
    \ifx#1:\else
     \ifx#1,\else
      \ifx#1;\else
       \ifx#1!\else
        \ifx#1?\else
         \ifx#1/\else
          \ifx#1-\else
           \ifx#1'\else
             \HyPsd@SPACEOPTI
           \fi
         \fi
        \fi
       \fi
      \fi
     \fi
    \fi
   \fi
  \fi
  #1%
}%
```

6.6.8 Converting to Unicode

Eight bit characters are converted to the sixteen bit ones, `\8` is replaced by `\00`, and `\9` is removed. The result should be a valid Unicode PDF string without the Unicode marker at the beginning.

```
\begingroup
  \catcode`\|=0 %
  \catcode`\\=12 %
```

\HyPsd@ConvertToUnicode

```
  |gdef|HyPsd@ConvertToUnicode#1{%
    |xdef#1{%
      |expandafter|HyPsd@DoConvert#1|@empty|@empty|@empty
    }%
```

```
  |ifx#1|@empty
  |else
    |xdef#1{%
      \376\377%
      #1%
    }%
  |fi
}%
```

\HyPsd@DoConvert

```
|gdef|HyPsd@DoConvert#1{%
  |ifx#1|@empty
  |else
    |Hy@ReturnAfterFi{%
      |ifx#1\%%
        \%%
        |expandafter|HyPsd@DoEscape
      |else
        |HyPsd@Char{#1}%
        |expandafter|HyPsd@DoConvert
      |fi
    }%
  |fi
}%
```

\HyPsd@DoEscape

```
|gdef|HyPsd@DoEscape#1{%
  |ifx#19%
    |expandafter|HyPsd@GetTwoBytes
  |else
    |Hy@ReturnAfterFi{%
      |ifx#18%
        00%
        |expandafter|HyPsd@GetTwoBytes
      |else
        #1%
        |expandafter|HyPsd@GetOneByte
      |fi
    }%
  |fi
}%
```

\HyPsd@GetTwoBytes

```
|gdef|HyPsd@GetTwoBytes#1\#2#3#4{%
  #1\#2#3#4%
  |HyPsd@DoConvert
}%
```

\HyPsd@GetOneBye

```
|gdef|HyPsd@GetOneByte#1#2{%
  #1#2%
  |HyPsd@DoConvert
}%
|endgroup
```

\HyPsd@@GetNextTwoTokens TEX does only allow nine parameters, so we need another macro to get more arguments.

```
\def\HyPsd@GetNextTwoTokens#1#2#3\END#4{%
  \xdef#4{#4#1#2}%
  \HyPsd@@ConvertToUnicode#3\END#4%
}
```

\HyPsd@Char

```
\begingroup
  \catcode0=9 %
  \catcode`\^=7 %
  \catcode`\^^^=12 %
  \def\x{^^^^0000}%
\expandafter\endgroup
\ifx\x\@empty
  \def\HyPsd@Char#1{%
    \ifnum`#1<128 %
      \@backslashchar 000#1%
    \else
      \ifnum`#1<65536 %
        \expandafter\HyPsd@CharTwoByte\number`#1!%
      \else
        \expandafter\expandafter\expandafter\HyPsd@CharSurrogate
        \intcalcSub{`#1}{65536}!%
      \fi
    \fi
  }%
  \def\HyPsd@CharTwoByte#1!{%
    \expandafter\expandafter\expandafter\HyPsd@CharOctByte
    \IntCalcDiv#1!256!!%
    \expandafter\expandafter\expandafter\HyPsd@CharOctByte
    \IntCalcMod#1!256!!%
  }%
  \def\HyPsd@CharOctByte#1!{%
    \@backslashchar
    \IntCalcDiv#1!64!%
    \intcalcDiv{\IntCalcMod#1!64!}{8}%
    \IntCalcMod#1!8!%
  }%
  \def\HyPsd@CharSurrogate#1!{%
    \@backslashchar 33%
    \IntCalcDiv#1!262144!%
    \expandafter\expandafter\expandafter\HyPsd@CharOctByte
    \intcalcDiv{\IntCalcMod#1!262144!}{1024}!%
    \@backslashchar 33%
    \expandafter\expandafter\expandafter\IntCalcAdd
    \intcalcDiv{\IntCalcMod#1!1024!}{256}!4!%
    \expandafter\expandafter\expandafter\HyPsd@CharOctByte
    \IntCalcMod#1!256!!%
  }%
\else
  \def\HyPsd@Char#1{%
    \@backslashchar 000#1%
  }%
```

```
\fi
```

change 2022-02-21 For the case that utf8 chars are protected we need to expand them. This works only is `\UTFviii@loop` is not defined in a group, which will be the case in the new latex code, so we test for it.

```
\ifcsname UTFviii@loop\endcsname
 \def\HyPsd@expand@utfviii {%
   \count@"C2
   \@tempcnta"F5
   \def\UTFviii@tmp{\expandafter\def\expandafter~\expandafter{~}}%
   \UTFviii@loop
 }
\else
 \def\HyPsd@expand@utfviii {}
\fi
```

6.6.9 Support for UTF-8 input encoding

After `\usepackage[utf8]{inputenc}` there are macros that expect the UTF-8 octets as arguments. Therefore we can calculate the PDF octal sequences directly. Because the PDF format is limited to UCS-2, conversion macros are needed for UTF-8 sequences with two and three octets only.

This calculation must be done in an expandable context, so we use eTEXhere for performance reasons. Unhappily the results of divisions are rounded. Thus a circumvention via `\dimexpr` is used, e.g.:

```
\numexpr 123/4\relax is replaced by
\number\dimexpr.25\dimexpr 123sp\relax\relax
```

```
\begingroup
  \lccode`\~=`^^f4\relax
\lowercase{\endgroup
  \def\HyPsd@UTFviii{%
    \HyPsd@expand@utfviii
    \let\UTFviii@two@octets\HyPsd@UTFviii@two
    \let\UTFviii@three@octets\HyPsd@UTFviii@three
    \let\UTFviii@four@octets\HyPsd@UTFviii@four
    \ifx~\HyPsd@UTFviii@ccxliv@undef
      \let~\HyPsd@UTFviii@ccxliv@def
    \fi
    \let\unichar\HyPsd@unichar
  }%
}%
\def\HyPsd@UTFviii@ccxliv@undef{\@inpenc@undefined@{utf8}}%
\edef\HyPsd@UTFviii@ccxliv@def{%
  \noexpand\UTFviii@four@octets\string ^^f4%
}%
```

The two octet form of UTF-8 `110aaabb` (A) and `10cccddd` (B) must be converted into octal numbers `00a` and `bcd`. The result is `\8a\bcd` (with a, b, c, d as octal numbers). The conversion equations.

$$a := A/4 - 48 \tag{1}$$

$$b := A - 4 * (A/4) \tag{2}$$

$$c := B/8 - 8 * ((8 * (B/8))/8) \tag{3}$$
$$d := B - 8 * (B/8) \tag{4}$$
$$\tag{5}$$

```
\def\HyPsd@UTFviii@two#1#2{%
  \expandafter\HyPsd@UTFviii@@two
    \number\dimexpr.25\dimexpr`#1sp\expandafter\relax\expandafter|%
    \number`#1\expandafter|%
    \number\dimexpr.125\dimexpr`#2sp\expandafter\relax\expandafter|%
    \number`#2 \@nil
}%
\def\HyPsd@UTFviii@@two#1|#2|#3|#4\@nil{%
  \expandafter\8%
  \number\numexpr #1-48\expandafter\relax
  \csname\number\numexpr #2-4*#1\relax\expandafter\endcsname
  \number\numexpr #3-8*%
     \number\dimexpr.125\dimexpr#3sp\relax\relax\expandafter\relax
  \number\numexpr #4-8*#3\relax
}%
```

Three octet form: `1110aabb` (A), `10bcccdd` (B), and `10eeefff` (C). The result is `\9abc\def` (with a, …, f as octal numbers). The conversion equations:

$$a := A/4 - 56 \tag{6}$$
$$b := 2 * (A - 4 * (A/4)) + ((B - 128 < 32)?0 : 1) \tag{7}$$
$$c := B/4 - 32 - ((B - 128 < 32)?0 : 8) \tag{8}$$
$$d := B - 4 * (B/4) \tag{9}$$
$$e := C/8 - 16 \tag{10}$$
$$f := C - 8 * (C/8) \tag{11}$$
$$\tag{12}$$

```
\def\HyPsd@UTFviii@three#1#2#3{%
  \expandafter\HyPsd@UTFviii@@three
    \number\dimexpr.25\dimexpr`#1sp\expandafter\relax\expandafter|%
    \number`#1\expandafter|%
    \number\ifnum\numexpr`#2-128\relax <32 0\else 1\fi\expandafter|%
    \number\dimexpr.25\dimexpr`#2sp\expandafter\relax\expandafter|%
    \number`#2\expandafter|%
    \number\dimexpr.125\dimexpr`#3sp\expandafter\relax\expandafter|%
    \number`#3 \@nil
}%
\def\HyPsd@UTFviii@@three#1|#2|#3|#4|#5|#6|#7\@nil{%
  \expandafter\9%
  \number\numexpr #1-56\expandafter\relax
  \number\numexpr 2*(#2-4*#1)+#3\expandafter\relax
  \number\numexpr #4 - 32 -\ifcase#3 0\else 8\fi\expandafter\relax
  \csname\number\numexpr #5-4*#4\relax\expandafter\endcsname
  \number\numexpr #6-16\expandafter\relax
  \number\numexpr #7-8*#6\relax
}%
```

Surrogates: 4 octets in UTF-8, a surrogate pair in UTF-16. High surrogate range: U+D800–U+DBFF, low surrogate range: U+DC00-U+DFFF.

```
UTF-8:  11110uuu    10uuzzzz    10yyyyyy    10xxxxxx
wwww =  uuuuu - 1
UTF-16: 110110ww    wwzzzzyy    110111yy    yyxxxxxx
octal:  011 011 0ww  0ww zzz zyy  011 011 1yy  0yy xxx xxx
```

```
\def\HyPsd@UTFviii@four#1#2{%
  \expandafter\HyPsd@@UTFviii@four\number
  \numexpr-1+(`#1-240)*4+\dimexpr.0625\dimexpr`#2sp-128sp%
  \expandafter|\number
  \numexpr`#2-16*\dimexpr.0625\dimexpr`#2sp|%
}%
\def\HyPsd@@UTFviii@four#1|#2|#3{%
  \933\number\dimexpr.25\dimexpr#1sp\relax\relax
  \csname\number\numexpr#1-4*\dimexpr.25\dimexpr#1sp\endcsname
  \ifodd#2 %
    \number\numexpr(#2-1)/2\relax
  \else
    \number\numexpr#2/2\relax
  \fi
  \number\numexpr\ifodd#2 4+\fi
     \dimexpr.0625\dimexpr`#3sp-128sp\relax\relax\relax
  \933%
  \expandafter\HyPsd@@@UTFviii@four\number
  \numexpr`#3-16*\dimexpr.0625\dimexpr`#3sp|%
}%
\def\HyPsd@@@UTFviii@four#1|#2{%
  \number\numexpr4+\dimexpr.25\dimexpr#1sp\relax\relax\relax
  \csname\number\numexpr#1-4*\dimexpr.25\dimexpr#1sp\endcsname
  \number\dimexpr.125\dimexpr`#2sp-128sp\relax\relax
  \number\numexpr`#2-8*\dimexpr.125\dimexpr`#2sp\relax\relax\relax
}%
```

Input encoding utf8x of package ucs uses macro \unichar. Values greater than "FFFF are not supported.

```
\def\HyPsd@unichar#1{%
  \ifHy@unicode
    \ifnum#1>"10FFFF %
      \HyPsd@UnicodeReplacementCharacter % illegal
    \else
      \ifnum#1>"FFFF %
```

High-surrogate code point. ("D800 = 55296, \p@ = 1pt = 65536sp)

```
        \expandafter\HyPsd@unichar\expandafter{%
          \number\numexpr 55296+%
             \dimexpr.0009765625\dimexpr\number#1sp-\p@
             \relax\relax\relax
        }%
```

Low-surrogate code point. ("DC00 = 56320, "DC00 - 65536 = -9216)

```
        \expandafter\HyPsd@unichar\expandafter{%
          \number\numexpr#1-9216%
             -1024*\dimexpr.0009765625\dimexpr\number#1sp-\p@
             \relax\relax\relax
      }%
      \else
```

```
        \ifnum#1>"7FF %
          \9%
          \expandafter\HyPsd@unichar@first@byte\expandafter{%
            \number
            \dimexpr.00390625\dimexpr\number#1sp\relax\relax
          }%
        \else
          \8%
          \number\dimexpr.00390625\dimexpr\number#1sp\relax\relax
        \fi
        \expandafter\HyPsd@unichar@second@byte\expandafter{%
          \number
          \numexpr#1-256*\number
              \dimexpr.00390625\dimexpr\number#1sp\relax\relax\relax
        }%
      \fi
    \fi
  \else
    .% unsupported (Unicode -> PDF Doc Encoding)
  \fi
}%
\def\HyPsd@UnicodeReplacementCharacter{\9377\375}%
\def\HyPsd@unichar@first@byte#1{%
  \number\dimexpr.015625\dimexpr#1sp\relax\relax
  \expandafter\HyPsd@unichar@octtwo\expandafter{%
    \number
    \numexpr#1-64*\number\dimexpr.015625\dimexpr#1sp%
    \relax\relax\relax
  }%
}%
\def\HyPsd@unichar@second@byte#1{%
  \csname\number\dimexpr.015625\dimexpr#1sp\relax\relax\endcsname
  \expandafter\HyPsd@unichar@octtwo\expandafter{%
    \number
    \numexpr#1-64*\number\dimexpr.015625\dimexpr#1sp%
    \relax\relax\relax
  }%
}%
\def\HyPsd@unichar@octtwo#1{%
  \number\dimexpr.125\dimexpr#1sp\relax\relax
  \number\numexpr#1-8*\number\dimexpr.125\dimexpr#1sp%
  \relax\relax\relax
}%
```

\HyPsd@utf@viii@undeferr `\utf@viii@undeferr` comes from file utf8x.def from package ucs.

```
\def\HyPsd@utf@viii@undeferr#1#2#3#4#5#6{%
  \ifx\@gobble#1%
  \else
    [Please insert \textbackslash PrerenderUnicode%
    \textbraceleft#1\textbraceright\space
    into preamble]%
  \fi
}%
```

6.6.10 Support for die faces (ifsym et. al.)

\HyPsd@DieFace Die faces are provided by

Package	Macro
ifsym	\Cube
epsdice	\epsdice
hhcount	\fcdice

\Cube and \epsdice restrict the range to the numbers one to six. \fcdice generates for larger numbers several dice faces with the sum matching the number. The implementation for the PDF strings follows \fcdice.

```
\def\HyPsd@DieFace#1{%
  \ifHy@unicode
    \ifnum#1<1 %
      \HyPsd@UnicodeReplacementCharacter
    \else
      \ifnum#1>6 %
        \9046\205%
        \expandafter\expandafter\expandafter
        \HyPsd@DieFaceLarge\intcalcSub{#1}{6}!%
      \else
        \9046\20\intcalcDec{#1}%
      \fi
    \fi
  \else
    .% Die faces are not part of PDFDocEncoding
  \fi
}
```

\HyPsd@DieFaceLarge

```
\def\HyPsd@DieFaceLarge#1!{%
  \ifnum#1>6 %
    \expandafter\@firstoftwo
  \else
    \expandafter\@secondoftwo
  \fi
  {%
    \9046\205%
    \expandafter\expandafter\expandafter
    \HyPsd@DieFaceLarge\IntCalcSub#1!6!!%
  }{%
    \9046\20\IntCalcDec#1!%
  }%
}
```

6.6.11 Support for moon phases of package china2e

```
\def\HyPsd@MoonPha#1{%
  \ifcase\intcalcNum{#1} %
    \HyPsd@UnicodeReplacementCharacter
  \or % 1
% U+1F31A NEW MOON WITH FACE; \MoonPha{1} (china2e)
    \9330\074\9337\032%
```

```
  \or % 2
    \HyPsd@UnicodeReplacementCharacter
  \or % 3
% U+1F31D FULL MOON WITH FACE; \MoonPha{3} (china2e)
    \9330\074\9337\035%
  \or % 4
% U+1F31C LAST QUARTER MOON WITH FACE; \MoonPha{4} (china2e)
    \9330\074\9337\034%
  \else
    \HyPsd@UnicodeReplacementCharacter
  \fi
}
%* \HyPsd@MoonPha -> \MoonPha
```

6.6.12 Support for package pifont

\HyPsd@ding

```
\def\HyPsd@ding#1{%
  \ifHy@unicode
    \ifnum#1<32 %
      \HyPsd@UnicodeReplacementCharacter
    \else
      \ifnum#1>254 %
        \HyPsd@UnicodeReplacementCharacter
      \else
        \ifnum#1<127 %
          \expandafter\expandafter\expandafter
          \HyPsd@@ding\intcalcNum{#1}!%
        \else
          \ifnum#1>160 %
            \expandafter\expandafter\expandafter
            \HyPsd@@ding\intcalcNum{#1}!%
          \else
            \HyPsd@UnicodeReplacementCharacter
          \fi
        \fi
      \fi
    \fi
  \else
    .% Dingbats are not part of PDFDocEncoding
  \fi
}
```

\HyPsd@@ding

```
\def\HyPsd@@ding#1!{%
  \@ifundefined{HyPsd@ding@#1}{%
    \ifnum#1<127 %
      \9047%
      \HyPsd@DecimalToOctalSecond{\IntCalcSub#1!32!}%
    \else
      \ifnum#1<168 %
        \9047\14\IntCalcSub#1!160!%
      \else
        \ifnum#1>181 %
          \9047\HyPsd@DecimalToOctalSecond{\IntCalcSub#1!64!}%
```

```
      \else
        % 172..181 -> U+2460..U+2469
        \9044\HyPsd@DecimalToOctalSecond{\IntCalcSub#1!76!}%
      \fi
    \fi
  \fi
 }{%
  \csname HyPsd@ding@#1\endcsname
 }%
}

\@namedef{HyPsd@ding@32}{\space}
% U+260E BLACK TELEPHONE
\@namedef{HyPsd@ding@37}{\9046\016}% U+260E
% U+261B BLACK RIGHT POINTING INDEX
\@namedef{HyPsd@ding@42}{\9046\033}% U+261B
% U+261E WHITE RIGHT POINTING INDEX
\@namedef{HyPsd@ding@43}{\9046\036}% U+261E
% U+2605 BLACK STAR
\@namedef{HyPsd@ding@72}{\9046\005}% U+2605
% U+25CF BLACK CIRCLE
\@namedef{HyPsd@ding@108}{\9045\317}% U+25CF
% U+25A0 BLACK SQUARE
\@namedef{HyPsd@ding@110}{\9045\240}% U+25A0
% U+25B2 BLACK UP-POINTING TRIANGLE
\@namedef{HyPsd@ding@115}{\9045\262}% U+25B2
% U+25BC BLACK DOWN-POINTING TRIANGLE
\@namedef{HyPsd@ding@116}{\9045\274}% U+25BC
% U+25C6 BLACK DIAMOND
\@namedef{HyPsd@ding@117}{\9045\306}% U+25C6
% U+25D7 RIGHT HALF BLACK CIRCLE
\@namedef{HyPsd@ding@119}{\9045\327}% U+25D7
\@namedef{HyPsd@ding@168}{\textclubsuitblack}%
\@namedef{HyPsd@ding@169}{\textdiamondsuitblack}%
\@namedef{HyPsd@ding@170}{\textheartsuitblack}%
\@namedef{HyPsd@ding@171}{\textspadesuitblack}%
\@namedef{HyPsd@ding@213}{\textrightarrow}%
\@namedef{HyPsd@ding@214}{\textleftrightarrow}%
\@namedef{HyPsd@ding@215}{\textupdownarrow}%
\@namedef{HyPsd@ding@240}{\HyPsd@UnicodeReplacementCharacter}
```

7 Support of other packages

7.1 Package subfigure

Added fix for version 2.1. Here `\sub@label` is defined.

```
\@ifpackageloaded{subfigure}{%
  \@ifundefined{sub@label}{%
    \Hy@hypertexnamesfalse
  }{%
    \renewcommand*{\sub@label}[1]{%
      \@bsphack
      \subfig@oldlabel{#1}%
```

```
    \if@filesw
      \begingroup
        \edef\@currentlabstr{%
          \expandafter\strip@prefix\meaning\@currentlabelname
        }%
        \protected@write\@auxout{}{%
          \string\newlabel{sub@#1}{%
            {\@nameuse{@@thesub\@captype}}%
            {\thepage}%
            {%
              \expandafter\strip@period\@currentlabstr
              \relax.\relax\@@@%
            }%
            {\@currentHref}%
            {}%
          }%
        }%
      \endgroup
    \fi
    \@esphack
  }%
 }%
}{}
```

7.2 Package xr and xr-hyper

The beta version of xr that supports `\XR@addURL` is called `xr-hyper`. If reading external aux files check whether they have a non zero fourth field in `\newlabel` and if so, add the URL as the fifth field. Change 2023-05-14: xr-hyper adds the field.

```
\def\Hy@true{true}
\def\Hy@false{false}
```

Providing dummy definitions.

```
\let\literalps@out\@gobble
\newcommand\pdfbookmark[3][]{}
\def\Acrobatmenu#1#2{\leavevmode#2}
\def\Hy@writebookmark#1#2#3#4#5{}%
```

8 Help macros for links

Anchors get created on the baseline of where they occur. If an XYZ PDF view is set, this means that the link places the top of the screen *on the baseline* of the target. If this is an equation, for instance, it means that you cannot see anything. Some links, of course, are created at the start of environments, and so it works. To allow for this, anchors are raised, where possible, by some small amount. This defaults to `\baselineskip`, but users can set it to something else in two ways (thanks to Heiko Oberdiek for suggesting this):

1. Redefine `\HyperRaiseLinkDefault` to be eg the height of a `\strut`
2. Redefine `\HyperRaiseLinkHook` to do something complicated; it must give a value to `\HyperRaiseLinkLength`, which is what actually gets used

```
\let\HyperRaiseLinkHook\@empty
\def\HyperRaiseLinkDefault{\baselineskip}
```

\HyperRaiseLinkHook allows the user to reassign \HyperRaiseLinkLength.

```
\newcount\Hy@SavedSpaceFactor
\def\Hy@SaveSpaceFactor{%
  \global\Hy@SavedSpaceFactor=\ifhmode\spacefactor\else\z@\fi
}
\def\Hy@RestoreSpaceFactor{%
  \relax
  \ifhmode
    \ifnum\Hy@SavedSpaceFactor>\z@
      \spacefactor=\Hy@SavedSpaceFactor
    \fi
  \fi
}
\def\Hy@SaveSavedSpaceFactor{%
  \edef\Hy@RestoreSavedSpaceFactor{%
    \global\Hy@SavedSpaceFactor=\the\Hy@SavedSpaceFactor\relax
  }%
}
```

Packages like varwidth need an option to change the handling in vmode. (Issue #204). With a new format we therefore insert a socket.

```
\NewSocket{hyp/raisedlink}{1}
\def\Hy@raisedlink#1{%
  \ifvmode
    \UseSocket{hyp/raisedlink}{#1}%
  \else
    \Hy@SaveSpaceFactor
    \penalty\@M
    \smash{%
      \begingroup
        \let\HyperRaiseLinkLength\@tempdima
        \setlength\HyperRaiseLinkLength\HyperRaiseLinkDefault
        \HyperRaiseLinkHook
      \expandafter\endgroup
      \expandafter\raise\the\HyperRaiseLinkLength\hbox{%
        \Hy@RestoreSpaceFactor
        #1%
        \Hy@SaveSpaceFactor
      }%
    }%
    \Hy@RestoreSpaceFactor
  \fi
}
```

\Hy@SaveLastskip
\Hy@RestoreLastskip

Inserting a \special command to set a destination destroys the \lastskip value.

```
\def\Hy@SaveLastskip{%
  \let\Hy@RestoreLastskip\relax
  \ifvmode
    \ifdim\lastskip=\z@
      \ifnum\lastnodetype=1 %
        \let\Hy@RestoreLastskip\relax
```

```
    \else
      \let\Hy@RestoreLastskip\nobreak
    \fi
  \else
    \begingroup
      \skip@=-\lastskip
      \edef\x{%
        \endgroup
        \def\noexpand\Hy@RestoreLastskip{%
          \noexpand\ifvmode
            \noexpand\nobreak
            \vskip\the\skip@
            \vskip\the\lastskip\relax
          \noexpand\fi
        }%
      }%
    \x
  \fi
 \else
  \ifhmode
    \ifdim\lastskip=\z@
      \let\Hy@RestoreLastskip\nobreak
    \else
      \begingroup
        \skip@=-\lastskip
        \edef\x{%
          \endgroup
          \def\noexpand\Hy@RestoreLastskip{%
            \noexpand\ifhmode
              \noexpand\nobreak
              \hskip\the\skip@
              \hskip\the\lastskip\relax
            \noexpand\fi
          }%
        }%
      \x
    \fi
  \fi
 \fi
}%
```

9 Options

```
\SetupKeyvalOptions{%
  family=Hyp,%
  prefix=HyOpt%
}
```

9.1 Help macros

Package like hyperxmp want to retrieve the value of keys like `pdfauthor`. To avoid that we have two parallel interfaces we provide the interface from the pdfmanagement/ltdocinit if it doesn't exist.

\AddToDocumentProperties
\GetDocumentProperties

```
\ExplSyntaxOn
\@ifundefined{AddToDocumentProperties}
 {
  \prop_new:N \g___hyp_documentproperties_prop
  \NewDocumentCommand\AddToDocumentProperties{O{\@currname}mm}
   {
    \exp_args:NNx
    \prop_gput:Nnn \g___hyp_documentproperties_prop
     {
      \tl_if_blank:eTF {#1}{top-level/}{#1/} #2
     }
     { #3}
   }
  \NewExpandableDocumentCommand\GetDocumentProperties{m}
   {
    \prop_item:Nn \g___hyp_documentproperties_prop {#1}
   }
 }{}
\ExplSyntaxOff
```

\IfHyperBooleanExists

```
\def\IfHyperBooleanExists#1{%
  \@ifundefined{Hy@#1false}\@secondoftwo{%
    \@ifundefined{KV@Hyp@#1@default}\@secondoftwo\@firstoftwo
  }%
}

\@namedef{KV@Hyp@stoppedearly@default}{}
```

\IfHyperBoolean

```
\def\IfHyperBoolean#1{%
  \IfHyperBooleanExists{#1}{%
    \csname ifHy@#1\endcsname
      \expandafter\@firstoftwo
    \else
      \expandafter\@secondoftwo
    \fi
  }\@secondoftwo
}
```

\Hy@boolkey

```
\def\Hy@boolkey#1#2{%
  \edef\Hy@tempa{#2}%
  \lowercase\expandafter{%
    \expandafter\def\expandafter\Hy@tempa\expandafter{\Hy@tempa}%
  }%
  \ifx\Hy@tempa\@empty
    \let\Hy@tempa\Hy@true
  \fi
  \ifx\Hy@tempa\Hy@true
  \else
    \ifx\Hy@tempa\Hy@false
    \else
```

```
      \let\Hy@tempa\relax
    \fi
  \fi
  \ifx\Hy@tempa\relax
    \Hy@WarnOptionValue{#2}{#1}{`true' or 'false'}%
  \else
    \Hy@Info{Option `#1' set `\Hy@tempa'}%
    \csname Hy@#1\Hy@tempa\endcsname
  \fi
}
```

\Hy@WarnOptionValue

```
\def\Hy@WarnOptionValue#1#2#3{%
  \Hy@Warning{%
    Unexpected value `#1'\MessageBreak
    of option `#2' instead of\MessageBreak
    #3%
  }%
}
```

\Hy@DisableOption

```
\def\Hy@DisableOption#1{%
  \@ifundefined{KV@Hyp@#1@default}{%
    \define@key{Hyp}{#1}%
  }{%
    \define@key{Hyp}{#1}[]%
  }%
  {\Hy@WarnOptionDisabled{#1}}%
}

```

\Hy@WarnOptionDisabled

```
\def\Hy@WarnOptionDisabled#1{%
  \Hy@Warning{%
    Option `#1' has already been used,\MessageBreak
    setting the option has no effect%
  }%
}
```

\Hy@CheckOptionValue Some options take a string value out of a limited set of values. Macro \Hy@CheckOptionValue checks whether the given value #1 for option #2 is a member of the value list #3.

```
\def\Hy@CheckOptionValue#1#2#3{%
  \begingroup
    \edef\x{#1}%
    \@onelevel@sanitize\x
    \let\y=y%
    \def\do##1##2{%
      \def\z{##1}%
      \@onelevel@sanitize\z
      \ifx\x\z
        \let\y=n%
        \let\do\@gobbletwo
```

```
    \fi
  }%
  #3%
  \ifx\y y%
    \def\do##1##2{%
      * `##1'%
      \ifx\\##2\\\else\space(##2)\fi
      \MessageBreak
    }%
    \Hy@Warning{%
      Values of option `#2':\MessageBreak
      #3%
      * An empty value disables the option.\MessageBreak
      Unknown value `\x'%
    }%
  \fi
 \endgroup
}
```

\Hy@DefNameKey #1: option name
#2: \do list with known values, first argument of \do is value, second argument is a comment.

```
\def\Hy@DefNameKey#1{%
 \expandafter\Hy@@DefNameKey\csname @#1\endcsname{#1}%
}
```

\Hy@@DefNameKey #1: macro for value storage
#2: option name
#3: \do list with known values.

```
\def\Hy@@DefNameKey#1#2#3{%
 \define@key{Hyp}{#2}{%
  \edef#1{##1}%
  \ifx#1\@empty
  \else
   \Hy@CheckOptionValue{##1}{#2}{#3}%
  \fi
 }%
 \let#1\@empty
}
```

\Hy@UseNameKey

```
\def\Hy@UseNameKey#1#2{%
 \ifx#2\@empty
 \else
  /#1/#2%
 \fi
}
```

9.2 Defining the options

```
\define@key{Hyp}{implicit}[true]{%
 \Hy@boolkey{implicit}{#1}%
}
```

```
\define@key{Hyp}{draft}[true]{%
  \Hy@boolkey{draft}{#1}%
}
\define@key{Hyp}{final}[true]{%
  \Hy@boolkey{final}{#1}%
}
\let\KV@Hyp@nolinks\KV@Hyp@draft

\def\Hy@ObsoletePaperOption#1{%
  \Hy@WarningNoLine{%
    Option `#1' is no longer used%
  }%
  \define@key{Hyp}{#1}[true]{}%
}
\def\Hy@temp#1{%
  \define@key{Hyp}{#1}[true]{%
    \Hy@ObsoletePaperOption{#1}%
  }%
}
\Hy@temp{a4paper}
\Hy@temp{a5paper}
\Hy@temp{b5paper}
\Hy@temp{letterpaper}
\Hy@temp{legalpaper}
\Hy@temp{executivepaper}

\define@key{Hyp}{setpagesize}[true]{%
  \Hy@boolkey{setpagesize}{#1}%
}
\define@key{Hyp}{debug}[true]{%
  \Hy@boolkey{debug}{#1}%
}
\define@key{Hyp}{linktocpage}[true]{%
  \Hy@boolkey{linktocpage}{#1}%
  \ifHy@linktocpage
    \let\Hy@linktoc\Hy@linktoc@page
  \else
    \let\Hy@linktoc\Hy@linktoc@section
  \fi
}
\chardef\Hy@linktoc@none=0 %
\chardef\Hy@linktoc@section=1 %
\chardef\Hy@linktoc@page=2 %
\chardef\Hy@linktoc@all=3 %
\ifHy@linktocpage
  \let\Hy@linktoc\Hy@linktoc@page
\else
  \let\Hy@linktoc\Hy@linktoc@section
\fi
\define@key{Hyp}{linktoc}{%
  \@ifundefined{Hy@linktoc@#1}{%
    \Hy@Warning{%
      Unexpected value `#1' of\MessageBreak
      option `linktoc' instead of `none',\MessageBreak
      `section', `page' or `all'%
```

```
    }%
  }{%
    \expandafter\let\expandafter\Hy@linktoc
    \csname Hy@linktoc@#1\endcsname
  }%
}
\define@key{Hyp}{extension}{\def\XR@ext{#1}}
\let\XR@ext\relax
\define@key{Hyp}{verbose}[true]{%
  \Hy@boolkey{verbose}{#1}%
}
```

If we are going to PDF via HyperTeX `\special` commands, the dvips (-z option) processor does not know the *height* of a link, as it works solely on the position of the closing `\special`. If we use this option, the `\special` is raised up by the right amount, to fool the dvi processor.

```
\define@key{Hyp}{raiselinks}[true]{%
  \Hy@boolkey{raiselinks}{#1}%
}
```

Most PDF-creating drivers do not allow links to be broken

```
\def\Hy@setbreaklinks#1{%
  \csname breaklinks#1\endcsname
}
\def\Hy@breaklinks@unsupported{%
  \ifx\Hy@setbreaklinks\@gobble
    \ifHy@breaklinks
      \Hy@WarningNoLine{%
        You have enabled option `breaklinks'.\MessageBreak
        But driver `\Hy@driver.def' does not support this.\MessageBreak
        Expect trouble with the link areas of broken links%
      }%
    \fi
  \fi
}
\define@key{Hyp}{breaklinks}[true]{%
  \Hy@boolkey{breaklinks}{#1}%
  \let\Hy@setbreaklinks\@gobble
}
\define@key{Hyp}{localanchorname}[true]{%
  \Hy@WarningNoLine{%
      Option `localanchorname' is deprecated%
    }%
  \Hy@boolkey{localanchorname}{#1}%
}
```

Determines whether an automatic anchor is put on each page

```
\define@key{Hyp}{pageanchor}[true]{%
  \Hy@boolkey{pageanchor}{#1}%
}
```

Are the page links done as plain arabic numbers, or do they follow the formatting of the package? The latter loses if you put in typesetting like `\textbf` or the like.

```
\define@key{Hyp}{plainpages}[true]{%
  \Hy@boolkey{plainpages}{#1}%
```

```
}
```

Are the names for anchors made as per the HyperTeX system, or do they simply use what LaTeX provides?

```
\define@key{Hyp}{naturalnames}[true]{%
  \Hy@boolkey{naturalnames}{#1}%
}
```

Completely ignore the names as per the HyperTeX system, and use unique counters.

```
\define@key{Hyp}{hypertexnames}[true]{%
  \Hy@boolkey{hypertexnames}{#1}%
}
```

Currently, dvips doesn't allow anchors nested within targets, so this option tries to stop that happening. Other processors may be able to cope.

```
\define@key{Hyp}{nesting}[true]{%
  \Hy@boolkey{nesting}{#1}%
}
\define@key{Hyp}{destlabel}[true]{%
  \Hy@boolkey{destlabel}{#1}%
}
\define@key{Hyp}{unicode}[true]{%
  \Hy@boolkey{unicode}{#1}%
  \ifHy@unicode
    \def\HyPsd@pdfencoding{unicode}%
    \HyPsd@LoadUnicode
  \else
    \def\HyPsd@pdfencoding{pdfdoc}%
  \fi
}
\Hy@AtBeginDocument{%
  \ifx\HyPsd@LoadUnicode\relax
  \else
    \def\HyPsd@LoadUnicode{%
      \Hy@Error{%
        Unicode support for bookmarks is not available.\MessageBreak
        Activate unicode support by using one of the options\MessageBreak
        `unicode', `pdfencoding=unicode', `pdfencoding=auto'\MessageBreak
        in the preamble%
      }\@ehc
      \global\let\HyPsd@LoadUnicode\relax
      \global\Hy@unicodefalse
      \global\let\Hy@unicodetrue\Hy@unicodefalse
    }%
  \fi
}
\define@key{Hyp}{pdfencoding}{%
  \edef\HyPsd@temp{#1}%
  \ifx\HyPsd@temp\HyPsd@pdfencoding@pdfdoc
    \let\HyPsd@pdfencoding\HyPsd@temp
    \Hy@unicodefalse
  \else
    \ifcase\ifx\HyPsd@temp\HyPsd@pdfencoding@unicode
           \z@
```

```
          \else
            \ifx\HyPsd@temp\HyPsd@pdfencoding@auto
              \z@
            \else
              \@ne
            \fi
          \fi
      \let\HyPsd@pdfencoding\HyPsd@temp
      \hypersetup{unicode}%
      \ifHy@unicode
        \def\HyPsd@pdfencoding{#1}%
      \else
        \Hy@Warning{Cannot switch to unicode bookmarks}%
        \let\HyPsd@pdfencoding\HyPsd@pdfencoding@pdfdoc
      \fi
    \else
      \@onelevel@sanitize\HyPsd@temp
      \Hy@Warning{%
        Values of option `pdfencoding':\MessageBreak
        `pdfdoc', `unicode', `auto'.\MessageBreak
        Ignoring unknown value `\HyPsd@temp'%
      }%
    \fi
  \fi
}
\def\HyPsd@pdfencoding@auto{auto}
\def\HyPsd@pdfencoding@pdfdoc{pdfdoc}
\def\HyPsd@pdfencoding@unicode{unicode}
```

change 2020-08-14, use unicode by default:

```
\let\HyPsd@pdfencoding\HyPsd@pdfencoding@unicode
\HyPsd@LoadUnicode
\define@key{Hyp}{psdextra}[true]{%
  \Hy@boolkey{psdextra}{#1}%
  \HyPsd@LoadExtra
}
\def\hypersetup{\kvsetkeys{Hyp}}
\newif\ifHy@setpdfversion
\define@key{Hyp}{pdfversion}{%
  \@ifundefined{Hy@pdfversion@#1}{%
    \PackageWarning{hyperref}{%
      Unsupported PDF version `#1'.\MessageBreak
      Valid values: 1.2-1.7, 2.0%
    }%
  }{%
    \Hy@setpdfversiontrue
    \@nameuse{Hy@pdfversion@#1}%
  }%
}
```

`\Hy@pdfminorversion` already used elsewhere to denote `\pdfminorversion` or `\pdfvariable majorversion}` so introduce new names here.

```
\@namedef{Hy@pdfversion@1.2}{\def\Hy@pdf@majorversion{1}\def\Hy@pdf@minorversion{2}}%
```

```
\@namedef{Hy@pdfversion@1.3}{\def\Hy@pdf@majorversion{1}\def\Hy@pdf@minorversion{3}}%
\@namedef{Hy@pdfversion@1.4}{\def\Hy@pdf@majorversion{1}\def\Hy@pdf@minorversion{4}}%
\@namedef{Hy@pdfversion@1.5}{\def\Hy@pdf@majorversion{1}\def\Hy@pdf@minorversion{5}}%
\@namedef{Hy@pdfversion@1.6}{\def\Hy@pdf@majorversion{1}\def\Hy@pdf@minorversion{6}}%
\@namedef{Hy@pdfversion@1.7}{\def\Hy@pdf@majorversion{1}\def\Hy@pdf@minorversion{7}}%
\@namedef{Hy@pdfversion@2.0}{\def\Hy@pdf@majorversion{2}\def\Hy@pdf@minorversion{0}}%
\def\Hy@pdf@majorversion{1}\def\Hy@pdf@minorversion{7}
```

Legacy name, earlier releases assumed 1.x

```
\let\Hy@pdfversion\Hy@pdf@minorversion
\def\Hy@pdf@majorminor@version{\numexpr100*\Hy@pdf@majorversion+\Hy@pdf@minorversion\relax}
\def\Hy@pdfmajorminor@version{\numexpr100*\Hy@pdfmajorversion+\Hy@pdfminorversion\relax}
```

if pdfminorversion is defined, make sure pdfmajorversion is too.

```
\@ifundefined{pdfminorversion}{}{%
\@ifundefined{pdfmajorversion}{%
\newcount\pdfmajorversion
\pdfmajorversion=1
}{}%
}
\ifx\pdfmajorversion\@undefined\else
\def\Hy@pdfmajorversion{\pdfmajorversion}
\fi
```

10 Options for different drivers

```
\newif\ifHy@DviMode
\let\Hy@DviErrMsg\@empty
\ifpdf
  \def\Hy@DviErrMsg{pdfTeX or LuaTeX is running in PDF mode}%
\else
  \ifxetex
    \def\Hy@DviErrMsg{XeTeX is running}%
  \else
    \ifvtex
      \ifnum\OpMode=\z@
        \Hy@DviModetrue
      \else
        \def\Hy@DviErrMsg{VTeX is running, but not in DVI mode}%
      \fi
    \else
      \Hy@DviModetrue
    \fi
  \fi
\fi
\def\HyOpt@CheckDvi#1{%
  \ifHy@DviMode
    \expandafter\@firstofone
```

```
  \else
    \Hy@Error{%
      Wrong DVI mode driver option `#1',\MessageBreak
      because \Hy@DviErrMsg
    }\@ehc
    \expandafter\@gobble
  \fi
}
\DeclareVoidOption{tex4ht}{%
  \Hy@texhttrue
  \kvsetkeys{Hyp}{colorlinks=true}%
  \def\BeforeTeXIVht{\RequirePackage{color}}%
  \def\Hy@driver{htex4ht}%
  \def\MaybeStopEarly{%
    \Hy@Message{Stopped early}%
    \Hy@AtBeginDocument{%
      \PDF@FinishDoc
      \gdef\PDF@FinishDoc{}%
    }%
    \endinput
  }%
}
\DeclareVoidOption{pdftex}{%
  \ifpdf
    \def\Hy@driver{hpdftex}%
    \PassOptionsToPackage{pdftex}{color}%
  \else
    \Hy@Error{%
      Wrong driver option `pdftex',\MessageBreak
      because pdfTeX in PDF mode is not detected%
    }\@ehc
  \fi
}
\DeclareVoidOption{luatex}{%
  \ifpdf
    \ifx\pdfextension\@undefined
      \def\Hy@driver{hpdftex}%
      \PassOptionsToPackage{pdftex}{color}%
    \else
      \def\Hy@driver{hluatex}%
      \PassOptionsToPackage{luatex}{color}%
    \fi
  \else
    \Hy@Error{%
      Wrong driver option `luatex',\MessageBreak
      because luaTeX in PDF mode is not detected%
    }\@ehc
  \fi
}
\DeclareVoidOption{nativepdf}{%
  \HyOpt@CheckDvi{nativepdf}{%
    \def\Hy@driver{hdvips}%
    \PassOptionsToPackage{dvips}{color}%
  }%
```

```
}
\DeclareVoidOption{dvipdfm}{%
  \HyOpt@CheckDvi{dvipdfm}{%
    \def\Hy@driver{hdvipdfm}%
  }%
}
\DeclareVoidOption{dvipdfmx}{%
  \HyOpt@CheckDvi{dvipdfmx}{%
    \def\Hy@driver{hdvipdfm}%
    \PassOptionsToPackage{dvipdfmx}{color}%
  }%
}
\define@key{Hyp}{dvipdfmx-outline-open}[true]{%
  \expandafter\ifx\csname if#1\expandafter\endcsname
                \csname iftrue\endcsname
    \chardef\SpecialDvipdfmxOutlineOpen\@ne
  \else
    \chardef\SpecialDvipdfmxOutlineOpen\z@
  \fi
}
\DeclareVoidOption{xetex}{%
  \ifxetex
    \def\Hy@driver{hxetex}%
  \else
    \Hy@Error{%
      Wrong driver option `xetex',\MessageBreak
      because XeTeX is not detected%
    }\@ehc
  \fi
}
\DeclareVoidOption{pdfmark}{%
  \HyOpt@CheckDvi{pdfmark}{%
    \def\Hy@driver{hdvips}%
  }%
}
\DeclareVoidOption{dvips}{%
  \HyOpt@CheckDvi{dvips}{%
    \def\Hy@driver{hdvips}%
    \PassOptionsToPackage{dvips}{color}%
  }%
}
\DeclareVoidOption{hypertex}{%
  \HyOpt@CheckDvi{hypertex}{%
    \def\Hy@driver{hypertex}%
  }%
}
\let\Hy@MaybeStopNow\relax
\DeclareVoidOption{vtex}{%
  \ifvtex
    \ifnum 0\ifnum\OpMode<1 1\fi \ifnum\OpMode>3 1\fi =0 %
      \def\Hy@driver{hvtex}%
    \else
      \ifnum\OpMode=10\relax
        \def\Hy@driver{hvtexhtm}%
```

```
      \def\MaybeStopEarly{%
        \Hy@Message{Stopped early}%
        \Hy@AtBeginDocument{%
          \PDF@FinishDoc
          \gdef\PDF@FinishDoc{}%
        }%
        \endinput
      }%
    \else
      \Hy@Error{%
        Wrong driver option `vtex',\MessageBreak
        because of wrong OpMode (\the\OpMode)%
      }\@ehc
    \fi
  \fi
 \else
  \Hy@Error{%
    Wrong driver option `vtex',\MessageBreak
    because VTeX is not running%
  }\@ehc
 \fi
}
\DeclareVoidOption{vtexpdfmark}{%
 \ifvtex
  \ifnum 0\ifnum\OpMode<1 1\fi \ifnum\OpMode>3 1\fi =0 %
    \def\Hy@driver{hvtexmrk}%
  \else
    \Hy@Error{%
      Wrong driver option `vtexpdfmark',\MessageBreak
      because of wrong OpMode (\the\OpMode)%
    }\@ehc
  \fi
 \else
  \Hy@Error{%
    Wrong driver option `vtexpdfmark,\MessageBreak
    because VTeX is not running%
  }\@ehc
 \fi
}
\DeclareVoidOption{dviwindo}{%
 \HyOpt@CheckDvi{dviwindo}{%
  \def\Hy@driver{hdviwind}%
  \kvsetkeys{Hyp}{colorlinks}%
  \PassOptionsToPackage{dviwindo}{color}%
 }%
}
\DeclareVoidOption{dvipsone}{%
 \HyOpt@CheckDvi{dvipsone}{%
  \def\Hy@driver{hdvipson}%
  \PassOptionsToPackage{dvipsone}{color}%
 }%
}
\DeclareVoidOption{textures}{%
 \HyOpt@CheckDvi{textures}{%
```

```
    \def\Hy@driver{htexture}%
  }%
}
\DeclareVoidOption{latex2html}{%
  \Hy@Warning{Option `latex2html` is obsolete. \MessageBreak
   A current html.sty will do all necessary (re)definitions%
  }%
}
\DeclareVoidOption{hitex}{%
  \ifhint
   \IfFileExists{hhitex.def}
     {\def\Hy@driver{hhitex}}%
     {\Hy@Warning{%
      Missing driver file `hhitex.def',\MessageBreak
      ignoring hitex driver%
     }}%
  \else
    \Hy@Error{%
      Wrong driver option `hitex',\MessageBreak
      because HiTeX is not detected%
    }\@ehc
  \fi
}
```

No more special treatment for ps2pdf. Let it sink or swim.

```
\DeclareVoidOption{ps2pdf}{%
  \HyOpt@CheckDvi{ps2pdf}{%
    \def\Hy@driver{hdvips}%
    \PassOptionsToPackage{dvips}{color}%
  }%
}
\let\HyOpt@DriverFallback\@empty
\define@key{Hyp}{driverfallback}{%
  \ifHy@DviMode
    \def\HyOpt@DriverFallback{#1}%
    \Hy@Match\HyOpt@DriverFallback{}{%
      ^(|dvipdfm|dvipdfmx|dvips|dvipsone|dviwindo|hypertex|ps2pdf|%
       latex2html|tex4ht)$%
    }{}{%
      \Hy@Warning{%
        Invalid driver `#1' for option\MessageBreak
        `driverfallback'%
      }%
      \let\HyOpt@DriverFallback\@empty
    }%
  \fi
}
\IfPDFManagementActiveTF
 {\def\HyOpt@CustomDriver{hgeneric-testphase}}
 {\let\HyOpt@CustomDriver\@empty}

\define@key{Hyp}{customdriver}{%
  \IfFileExists{#1.def}{%
    \def\HyOpt@CustomDriver{#1}%
```

```
  }{%
    \Hy@Warning{%
      Missing driver file `#1.def',\MessageBreak
      ignoring custom driver%
    }%
  }%
}
```

11 Options to add extra features

Make included figures (assuming they use the standard graphics package) be hypertext links. Off by default. Needs more work.

```
\define@key{Hyp}{hyperfigures}[true]{%
  \Hy@boolkey{hyperfigures}{#1}%
}
```

The automatic footnote linking can be disabled by option hyperfootnotes.

```
\define@key{Hyp}{hyperfootnotes}[true]{%
  \Hy@boolkey{hyperfootnotes}{#1}%
}
```

Set up back-referencing to be hyper links, by page, slide or section number,

```
\def\back@none{none}
\def\back@section{section}
\def\back@page{page}
\def\back@slide{slide}
\define@key{Hyp}{backref}[section]{%
  \lowercase{\def\Hy@tempa{#1}}%
  \ifx\Hy@tempa\@empty
    \let\Hy@tempa\back@section
  \fi
  \ifx\Hy@tempa\Hy@false
    \let\Hy@tempa\back@none
  \fi
  \ifx\Hy@tempa\back@slide
    \let\Hy@tempa\back@section
  \fi
  \ifx\Hy@tempa\back@page
    \PassOptionsToPackage{hyperpageref}{backref}%
    \Hy@backreftrue
  \else
    \ifx\Hy@tempa\back@section
      \PassOptionsToPackage{hyperref}{backref}%
      \Hy@backreftrue
    \else
      \ifx\Hy@tempa\back@none
        \Hy@backreffalse
      \else
        \Hy@WarnOptionValue{#1}{backref}{%
          `section', `slide', `page', `none',\MessageBreak
          or `false'}%
      \fi
    \fi
  \fi
}
```

```
\define@key{Hyp}{pagebackref}[true]{%
  \edef\Hy@tempa{#1}%
  \lowercase\expandafter{%
    \expandafter\def\expandafter\Hy@tempa\expandafter{\Hy@tempa}%
  }%
  \ifx\Hy@tempa\@empty
    \let\Hy@tempa\Hy@true
  \fi
  \ifx\Hy@tempa\Hy@true
    \PassOptionsToPackage{hyperpageref}{backref}%
    \Hy@backreftrue
  \else
    \ifx\Hy@tempa\Hy@false
      \Hy@backreffalse
    \else
      \Hy@WarnOptionValue{#1}{pagebackref}{`true' or `false'}%
    \fi
  \fi
}
```

Make index entries be links back to the relevant pages. By default this is turned on, but may be stopped.

```
\define@key{Hyp}{hyperindex}[true]{%
  \Hy@boolkey{hyperindex}{#1}%
}
```

Configuration of encap char.

```
\define@key{Hyp}{encap}[\|]{%
  \def\HyInd@EncapChar{#1}%
}
```

12 Language options

The `\autoref` feature depends on the language.

```
\def\HyLang@afrikaans{%
  \def\equationautorefname{Vergelyking}%
  \def\footnoteautorefname{Voetnota}%
  \def\itemautorefname{Item}%
  \def\figureautorefname{Figuur}%
  \def\tableautorefname{Tabel}%
  \def\partautorefname{Deel}%
  \def\appendixautorefname{Bylae}%
  \def\chapterautorefname{Hoofstuk}%
  \def\sectionautorefname{Afdeling}%
  \def\subsectionautorefname{Subafdeling}%
  \def\subsubsectionautorefname{Subsubafdeling}%
  \def\paragraphautorefname{Paragraaf}%
  \def\subparagraphautorefname{Subparagraaf}%
  \def\FancyVerbLineautorefname{Lyn}%
  \def\theoremautorefname{Teorema}%
  \def\pageautorefname{Bladsy}%
}
\def\HyLang@english{%
  \def\equationautorefname{Equation}%
```

```
  \def\footnoteautorefname{footnote}%
  \def\itemautorefname{item}%
  \def\figureautorefname{Figure}%
  \def\tableautorefname{Table}%
  \def\partautorefname{Part}%
  \def\appendixautorefname{Appendix}%
  \def\chapterautorefname{chapter}%
  \def\sectionautorefname{section}%
  \def\subsectionautorefname{subsection}%
  \def\subsubsectionautorefname{subsubsection}%
  \def\paragraphautorefname{paragraph}%
  \def\subparagraphautorefname{subparagraph}%
  \def\FancyVerbLineautorefname{line}%
  \def\theoremautorefname{Theorem}%
  \def\pageautorefname{page}%
}
\def\HyLang@french{%
  \def\equationautorefname{\'equation}%
  \def\footnoteautorefname{note}%
  \def\itemautorefname{item}%
  \def\figureautorefname{figure}%
  \def\tableautorefname{tableau}%
  \def\partautorefname{partie}%
  \def\appendixautorefname{annexe}%
  \def\chapterautorefname{chapitre}%
  \def\sectionautorefname{section}%
  \def\subsectionautorefname{sous-section}%
  \def\subsubsectionautorefname{sous-sous-section}%
  \def\paragraphautorefname{paragraphe}%
  \def\subparagraphautorefname{sous-paragraphe}%
  \def\FancyVerbLineautorefname{ligne}%
  \def\theoremautorefname{th\'eor\`eme}%
  \def\pageautorefname{page}%
}
\def\HyLang@german{%
  \def\equationautorefname{Gleichung}%
  \def\footnoteautorefname{Fu\ss note}%
  \def\itemautorefname{Punkt}%
  \def\figureautorefname{Abbildung}%
  \def\tableautorefname{Tabelle}%
  \def\partautorefname{Teil}%
  \def\appendixautorefname{Anhang}%
  \def\chapterautorefname{Kapitel}%
  \def\sectionautorefname{Abschnitt}%
  \def\subsectionautorefname{Unterabschnitt}%
  \def\subsubsectionautorefname{Unterunterabschnitt}%
  \def\paragraphautorefname{Absatz}%
  \def\subparagraphautorefname{Unterabsatz}%
  \def\FancyVerbLineautorefname{Zeile}%
  \def\theoremautorefname{Theorem}%
  \def\pageautorefname{Seite}%
}
\def\HyLang@italian{%
  \def\equationautorefname{Equazione}%
```

```
  \def\footnoteautorefname{nota}%
  \def\itemautorefname{punto}%
  \def\figureautorefname{Figura}%
  \def\tableautorefname{Tabella}%
  \def\partautorefname{Parte}%
  \def\appendixautorefname{Appendice}%
  \def\chapterautorefname{Capitolo}%
  \def\sectionautorefname{sezione}%
  \def\subsectionautorefname{sottosezione}%
  \def\subsubsectionautorefname{sottosottosezione}%
  \def\paragraphautorefname{paragrafo}%
  \def\subparagraphautorefname{sottoparagrafo}%
  \def\FancyVerbLineautorefname{linea}%
  \def\theoremautorefname{Teorema}%
  \def\pageautorefname{Pag.\@}%
}
\def\HyLang@magyar{%
  \def\equationautorefname{Egyenlet}%
  \def\footnoteautorefname{l\'abjegyzet}%
  \def\itemautorefname{Elem}%
  \def\figureautorefname{\'Abra}%
  \def\tableautorefname{T\'abl\'azat}%
  \def\partautorefname{R\'esz}%
  \def\appendixautorefname{F\"uggel\'ek}%
  \def\chapterautorefname{fejezet}%
  \def\sectionautorefname{szakasz}%
  \def\subsectionautorefname{alszakasz}%
  \def\subsubsectionautorefname{alalszakasz}%
  \def\paragraphautorefname{bekezd\'es}%
  \def\subparagraphautorefname{albekezd\'es}%
  \def\FancyVerbLineautorefname{sor}%
  \def\theoremautorefname{T\'etel}%
  \def\pageautorefname{oldal}%
}
\def\HyLang@portuges{%
  \def\equationautorefname{Equa\c c\~ao}%
  \def\footnoteautorefname{Nota de rodap\'e}%
  \def\itemautorefname{Item}%
  \def\figureautorefname{Figura}%
  \def\tableautorefname{Tabela}%
  \def\partautorefname{Parte}%
  \def\appendixautorefname{Ap\^endice}%
  \def\chapterautorefname{Cap\'itulo}%
  \def\sectionautorefname{Se\c c\~ao}%
  \def\subsectionautorefname{Subse\c c\~ao}%
  \def\subsubsectionautorefname{Subsubse\c c\~ao}%
  \def\paragraphautorefname{par\'agrafo}%
  \def\subparagraphautorefname{subpar\'agrafo}%
  \def\FancyVerbLineautorefname{linha}%
  \def\theoremautorefname{Teorema}%
  \def\pageautorefname{P\'agina}%
}
```

Next commented section for Russian is provided by Olga Lapko.

Next follow the checked reference names with commented variants and expla-

nations. All they are abbreviated and they won't create a grammatical problems in the *middle* of sentences.

The most weak points in these abbreviations are the \equationautorefname, \theoremautorefname and the \FancyVerbLineautorefname. But those three, and also the \footnoteautorefname are not *too* often referenced. Another rather weak point is the \appendixautorefname.

```
\def\HyLang@russian{%
```

The abbreviated reference to the equation: it is not for "the good face of the book", but maybe it will be better to get the company for the \theoremautorefname?

```
  \def\equationautorefname{\cyr\cyrv\cyrery\cyrr.}%
```

The name of the equation reference has common form for both nominative and accusative but changes in other forms, like "of \autoref{auto}" etc. The full name must follow full name of the \theoremautorefname.

```
% \def\equationautorefname{%
%   \cyr\cyrv\cyrery\cyrr\cyra\cyrzh\cyre\cyrn\cyri\cyre
% }%
```

The variant of footnote has abbreviation form of the synonym of the word "footnote". This variant of abbreviated synonym has alternative status (maybe obsolete?).

```
  \def\footnoteautorefname{%
    \cyr\cyrp\cyro\cyrd\cyrs\cyrt\cyrr.\ \cyrp\cyrr\cyri\cyrm.%
  }%
```

Commented form of the full synonym for "footnote". It has common form for both nominative and accusative but changes in other forms, like "of \autoref{auto}"

```
% \def\footnoteautorefname{%
%   \cyr\cyrp\cyro\cyrd\cyrs\cyrt\cyrr\cyro\cyrch\cyrn\cyro\cyre\ %
%   \cyrp\cyrr\cyri\cyrm\cyre\cyrch\cyra\cyrn\cyri\cyre
% }%
```

Commented forms of the "footnote": have different forms, the same is for the nominative and accusative. (The others needed?)

```
% \def\Nomfootnoteautorefname{\cyr\cyrs\cyrn\cyro\cyrs\cyrk\cyra}%
% \def\Accfootnoteautorefname{\cyr\cyrs\cyrn\cyro\cyrs\cyrk\cyru}%
```

Name of the list item, can be confused with the paragraph reference name, but reader could understand meaning from context(?). Commented variant has common form for both nominative and accusative but changes in other forms, like "of \autoref{auto}" etc.

```
  \def\itemautorefname{\cyr\cyrp.}%
% \def\itemautorefname{\cyr\cyrp\cyru\cyrn\cyrk\cyrt}%
```

Names of the figure and table have stable (standard) abbreviation forms. No problem in the middle of sentence.

```
  \def\figureautorefname{\cyr\cyrr\cyri\cyrs.}%
  \def\tableautorefname{\cyr\cyrt\cyra\cyrb\cyrl.}%
```

Names of the part, chapter, section(s) have stable (standard) abbreviation forms. No problem in the middle of sentence.

```
  \def\partautorefname{\cyr\cyrch.}%
  \def\chapterautorefname{\cyr\cyrg\cyrl.}%
  \def\sectionautorefname{\cyr\cyrr\cyra\cyrz\cyrd.}%
```

Name of the appendix can use this abbreviation, but it is not standard for books, i.e, not for “the good face of the book”. Commented variant has common form for both nominative and accusative but changes in other forms, like “of \autoref{auto}” etc.

```
\def\appendixautorefname{\cyr\cyrp\cyrr\cyri\cyrl.}%
% \def\appendixautorefname{%
%   \cyr\cyrp\cyrr\cyri\cyrl\cyro\cyrzh\cyre\cyrn\cyri\cyre
% }%
```

The sectioning command have stable (almost standard) and common abbreviation form for all levels (the meaning of these references visible from the section number). No problem.

```
\def\subsectionautorefname{\cyr\cyrr\cyra\cyrz\cyrd.}%
\def\subsubsectionautorefname{\cyr\cyrr\cyra\cyrz\cyrd.}%
```

The names of references to paragraphs also have stable (almost standard) and common abbreviation form for all levels (the meaning of these references is visible from the section number). No problem in the middle of sentence.

```
\def\paragraphautorefname{\cyr\cyrp.}%
\def\subparagraphautorefname{\cyr\cyrp.}%
```

Commented variant can be used in books but since it has common form for both nominative and accusative but it changes in other forms, like “of \autoref{auto}” etc.

```
% \def\paragraphautorefname{\cyr\cyrp\cyru\cyrn\cyrk\cyrt}%
% \def\subparagraphautorefname{\cyr\cyrp\cyru\cyrn\cyrk\cyrt}%
```

The name of verbatim line. Here could be a standard of the abbreviation (used very rare). But the author preprint publications (which have not any editor or corrector) can use this abbreviation for the page reference. So the meaning of the line reference can be read as reference to the page.

```
\def\FancyVerbLineautorefname{\cyr\cyrs\cyrt\cyrr.}%
```

Commented names of the “verbatim line”: have different forms, also the nominative and accusative.

```
% \def\NomFancyVerbLineautorefname{\cyr\cyrs\cyrt\cyrr\cyro\cyrk\cyra}%
% \def\AccFancyVerbLineautorefname{\cyr\cyrs\cyrt\cyrr\cyro\cyrk\cyru}%
```

The alternative, ve-e-e-ery professional abbreviation, was used in typography markup for typesetters.

```
% \def\FancyVerbLineautorefname{\cyr\cyrs\cyrt\cyrr\cyrk.}%
```

The names of theorem: if we want have “the good face of the book”, so the theorem reference must have the full name (like equation reference). But …

```
\def\theoremautorefname{\cyr\cyrt\cyre\cyro\cyrr.}%
```

Commented forms of the “theorem”: have different forms, also the nominative and accusative.

```
% \def\Nomtheoremautorefname{\cyr\cyrt\cyre\cyro\cyrr\cyre\cyrm\cyra}%
% \def\Acctheoremautorefname{\cyr\cyrt\cyre\cyro\cyrr\cyre\cyrm\cyru}%
```

Name of the page stable (standard) abbreviation form. No problem.

```
\def\pageautorefname{\cyr\cyrs.}%
}
```

```
\def\HyLang@spanish{%
  \def\equationautorefname{Ecuaci\'on}%
  \def\footnoteautorefname{Nota a pie de p\'agina}%
  \def\itemautorefname{Elemento}%
  \def\figureautorefname{Figura}%
  \def\tableautorefname{Tabla}%
  \def\partautorefname{Parte}%
  \def\appendixautorefname{Ap\'endice}%
  \def\chapterautorefname{Cap\'itulo}%
  \def\sectionautorefname{Secci\'on}%
  \def\subsectionautorefname{Subsecci\'on}%
  \def\subsubsectionautorefname{Subsubsecci\'on}%
  \def\paragraphautorefname{P\'arrafo}%
  \def\subparagraphautorefname{Subp\'arrafo}%
  \def\FancyVerbLineautorefname{L\'inea}%
  \def\theoremautorefname{Teorema}%
  \def\pageautorefname{P\'agina}%
}
\def\HyLang@catalan{%
\def\equationautorefname{Equaci\'o}%
\def\footnoteautorefname{Nota al peu de p\`agina}%
\def\itemautorefname{Element}%
\def\figureautorefname{Figura}%
\def\tableautorefname{Taula}%
\def\partautorefname{Part}%
\def\appendixautorefname{Ap\`endix}%
\def\chapterautorefname{Cap\'itol}%
\def\sectionautorefname{Secci\'o}%
\def\subsectionautorefname{Subsecci\'o}%
\def\subsubsectionautorefname{Subsubsecci\'o}%
\def\paragraphautorefname{Par\`agraf}%
\def\subparagraphautorefname{Subpar\`agraf}%
\def\FancyVerbLineautorefname{L\'inia}%
\def\theoremautorefname{Teorema}%
\def\pageautorefname{P\`agina}%
}
\def\HyLang@vietnamese{%
  \def\equationautorefname{Ph\uhorn{}\ohorn{}ng tr\`inh}%
  \def\footnoteautorefname{Ch\'u th\'ich}%
  \def\itemautorefname{m\d{u}c}%
  \def\figureautorefname{H\`inh}%
  \def\tableautorefname{B\h{a}ng}%
  \def\partautorefname{Ph\`\acircumflex{}n}%
  \def\appendixautorefname{Ph\d{u} l\d{u}c}%
  \def\chapterautorefname{ch\uhorn{}\ohorn{}ng}%
  \def\sectionautorefname{m\d{u}c}%
  \def\subsectionautorefname{m\d{u}c}%
  \def\subsubsectionautorefname{m\d{u}c}%
  \def\paragraphautorefname{\dj{}o\d{a}n}%
  \def\subparagraphautorefname{\dj{}o\d{a}n}%
  \def\FancyVerbLineautorefname{d\`ong}%
  \def\theoremautorefname{\DJ{}\d{i}nh l\'y}%
  \def\pageautorefname{Trang}%
```

```
}
```

Greek, see github issue 52

```
\def\HyLang@greek{%
  \def\equationautorefname{\textEpsilon\textxi\acctonos\textiota\textsigma\textomega\textsigma\texteta}%
    \def\footnoteautorefname{\textupsilon\textpi\textomicron\textsigma\texteta\textmu\textepsilon\acctonos\textiota\textomega\textsigma\texteta}%
  \def\itemautorefname{\textalpha\textnu\texttau\textiota\textkappa\textepsilon\acctonos\textiota\textmu\textepsilon\textnu\textomicron}%
   \def\figureautorefname{\textSigma\textchi\acctonos\texteta\textmu\textalpha}%
  \def\tableautorefname{\textPi\acctonos\textiota\textnu\textalpha\textkappa\textalpha}%
  \def\partautorefname{\textMu\acctonos\textepsilon\textrho\textomicron\textvarsigma}%
  \def\appendixautorefname{\textPi\textalpha\textrho\acctonos\textalpha\textrho\texttau\texteta\textmu\textalpha}%
    \def\chapterautorefname{\textkappa\textepsilon\textphi\acctonos\textalpha\textlambda\textalpha\textiota\textomicron}%
  \def\sectionautorefname{\textepsilon\textnu\acctonos\textomicron\texttau\texteta\texttau\textalpha}%
  \def\subsectionautorefname{\textupsilon\textpi\textomicron\textepsilon\textnu\acctonos\textomicron\texttau\texteta\texttau\textalpha}%
  \def\subsubsectionautorefname{\textupsilon\textpi\textomicron-\textupsilon\textpi\textomicron\tex
  \def\paragraphautorefname{\textpi\textalpha\textrho\acctonos\textalpha\textgamma\textrho\textalpha\textphi\textomicron\textvarsigma}%
   \def\subparagraphautorefname{\textupsilon\textpi\textomicron\textpi\textalpha\textrho\acctonos\textalpha\textgamma\textrho\textalpha\textphi\textomicron\textvarsigma}%
  \def\FancyVerbLineautorefname{\textgamma\textrho\textalpha\textmu\textmu\acctonos\texteta}%
    \def\theoremautorefname{\textTheta\textepsilon\acctonos\textomega\textrho\texteta\textmu\textalpha}%
  \def\pageautorefname{\textsigma\textepsilon\textlambda\acctonos\textiota\textdelta\textalpha}%
}

\def\HyLang@dutch{%
   \def\equationautorefname{Vergelijking}%
   \def\footnoteautorefname{voetnoot}%
   \def\itemautorefname{punt}%
   \def\figureautorefname{Figuur}%
   \def\tableautorefname{Tabel}%
   \def\partautorefname{Deel}%
   \def\appendixautorefname{Bijlage}%
   \def\chapterautorefname{hoofdstuk}%
   \def\sectionautorefname{paragraaf}%
   \def\subsectionautorefname{deelparagraaf}%
   \def\subsubsectionautorefname{deel-deelparagraaf}%
   \def\paragraphautorefname{alinea}%
   \def\subparagraphautorefname{deelalinea}%
   \def\FancyVerbLineautorefname{regel}%
   \def\theoremautorefname{Stelling}%
   \def\pageautorefname{pagina}%
```

```
}
\def\HyLang@norsk{%
    \def\equationautorefname{Ligning}%
    \def\footnoteautorefname{fotnote}%
    \def\itemautorefname{element}%
    \def\figureautorefname{Figur}%
    \def\tableautorefname{Tabell}%
    \def\partautorefname{Del}%
    \def\appendixautorefname{Tillegg}%
    \def\chapterautorefname{kapittel}%
    \def\sectionautorefname{seksjon}%
    \def\subsectionautorefname{underseksjon}%
    \def\subsubsectionautorefname{under-underseksjon}%
    \def\paragraphautorefname{avsnitt}%
    \def\subparagraphautorefname{underavsnitt}%
    \def\FancyVerbLineautorefname{Linje}%
    \def\theoremautorefname{Teorem}%
    \def\pageautorefname{side}%
}
\def\HyLang@danish{%
  \def\equationautorefname{Ligning}%
  \def\footnoteautorefname{fodnote}%
  \def\itemautorefname{element}%
  \def\figureautorefname{Figur}%
  \def\tableautorefname{Tabel}%
  \def\partautorefname{Del}%
  \def\appendixautorefname{Bilag}%
  \def\chapterautorefname{kapitel}%
  \def\sectionautorefname{sektion}%
  \def\subsectionautorefname{under-sektion}%
  \def\subsubsectionautorefname{under-under-sektion}%
  \def\paragraphautorefname{afsnit}%
  \def\subparagraphautorefname{underafsnit}%
  \def\FancyVerbLineautorefname{linje}%
  \def\theoremautorefname{Teorem}%
  \def\pageautorefname{side}%
}
\def\HyLang@swedish{%
  \def\equationautorefname{Ekvation}%
  \def\footnoteautorefname{fotnot}%
  \def\itemautorefname{punkt}%
  \def\figureautorefname{Figur}%
  \def\tableautorefname{Tabell}%
  \def\partautorefname{Del}%
  \def\appendixautorefname{Bilaga}%
  \def\chapterautorefname{kapitel}%
  \def\sectionautorefname{avsnitt}%
  \def\subsectionautorefname{underavsnitt}%
  \def\subsubsectionautorefname{under-underavsnitt}%
  \def\paragraphautorefname{paragraf}%
  \def\subparagraphautorefname{underparagraf}%
  \def\FancyVerbLineautorefname{linje}%
  \def\theoremautorefname{Teorem}%
  \def\pageautorefname{sida}%
```

```
}
```

Instead of package babel's definition of `\addto` the implementation of package varioref is used. Additionally argument `#1` is checked for `\relax`. change 2026-06-17: do not execute `\yLang@XXX` here, gh/425

```
\def\HyLang@addto#1#2{%
  \@temptokena{#2}%
  \ifx#1\relax
    \let#1\@empty
  \fi
  \ifx#1\@undefined
    \edef#1{\the\@temptokena}%
  \else
    \toks@\expandafter{#1}%
    \edef#1{\the\toks@\the\@temptokena}%
  \fi
  \@temptokena{}\toks@\@temptokena
}
\def\HyLang@DeclareLang#1#2#3{%
  \ifcsname extras#1\endcsname
    \expandafter\HyLang@addto
       \csname extras#1\expandafter\endcsname
       \csname HyLang@#2\endcsname
    \begingroup
      \edef\x{\endgroup
        #3%
      }%
    \x
    \@namedef{HyLang@#1@done}{}%
  \fi
  \begingroup
    \edef\x##1##2{%
      \noexpand\ifx##2\relax
        \errmessage{No definitions for language #2' found!}%
      \noexpand\fi
      \endgroup
      \noexpand\define@key{Hyp}{#1}[]{%
        \noexpand\@ifundefined{HyLang@#1@done}{%
          \noexpand\HyLang@addto{\noexpand##1}{\noexpand##2}%
```

Execute the command here to setup the language if babel is not used: gh/425

```
          \noexpand\UseName{HyLang@#2}%
          #3%
          \noexpand\@namedef{HyLang@#1@done}{}%
        }{}%
      }%
    }%
  \expandafter\x\csname extras#1\expandafter\endcsname
              \csname HyLang@#2\endcsname
}
\HyLang@DeclareLang{english}{english}{}
\HyLang@DeclareLang{UKenglish}{english}{}
\HyLang@DeclareLang{british}{english}{}
\HyLang@DeclareLang{USenglish}{english}{}
```

```
\HyLang@DeclareLang{american}{english}{}
\HyLang@DeclareLang{german}{german}{}
\HyLang@DeclareLang{austrian}{german}{}
\HyLang@DeclareLang{ngerman}{german}{}
\HyLang@DeclareLang{naustrian}{german}{}
\HyLang@DeclareLang{nswissgerman}{german}{}
\HyLang@DeclareLang{swissgerman}{german}{}
\HyLang@DeclareLang{russian}{russian}{\noexpand\hypersetup{unicode}}
\HyLang@DeclareLang{brazil}{portuges}{}
\HyLang@DeclareLang{brazilian}{portuges}{}
\HyLang@DeclareLang{portuguese}{portuges}{}
\HyLang@DeclareLang{spanish}{spanish}{}
\HyLang@DeclareLang{catalan}{catalan}{}
\HyLang@DeclareLang{afrikaans}{afrikaans}{}
\HyLang@DeclareLang{french}{french}{}
\HyLang@DeclareLang{frenchb}{french}{}
\HyLang@DeclareLang{francais}{french}{}
\HyLang@DeclareLang{acadian}{french}{}
\HyLang@DeclareLang{canadien}{french}{}
\HyLang@DeclareLang{italian}{italian}{}
\HyLang@DeclareLang{magyar}{magyar}{}
\HyLang@DeclareLang{hungarian}{magyar}{}
\HyLang@DeclareLang{greek}{greek}{}
\HyLang@DeclareLang{dutch}{dutch}{}
\HyLang@DeclareLang{norsk}{norsk}{}
\HyLang@DeclareLang{norwegian}{norsk}{}
\HyLang@DeclareLang{danish}{danish}{}
\HyLang@DeclareLang{swedish}{swedish}{}
```

More work is needed in case of options vietnamese and vietnam.

```
\DeclareVoidOption{vietnamese}{%
  \HyLang@addto\extrasvietnamese\HyLang@vietnamese
  \Hy@AtEndOfPackage{%
    \@ifundefined{T@PU}{}{%
      \input{puvnenc.def}%
    }%
  }%
}
\DeclareVoidOption{vietnam}{%
  \HyLang@addto\extrasvietnam\HyLang@vietnamese
  \Hy@AtEndOfPackage{%
    \@ifundefined{T@PU}{}{%
      \input{puvnenc.def}%
    }%
  }%
}
```

Similar for option arabic that just loads the additions to PU encoding for Arabi.

```
\DeclareVoidOption{arabic}{%
  \Hy@AtEndOfPackage{%
    \@ifundefined{T@PU}{}{%
      \input{puarenc.def}%
    }%
  }%
}
```

13 Options to change appearance of links

Colouring links at the LaTeX level is useful for debugging, perhaps.

```
\define@key{Hyp}{colorlinks}[true]{%
  \Hy@boolkey{colorlinks}{#1}%
}
\DeclareVoidOption{hidelinks}{%
  \Hy@colorlinksfalse
  \Hy@ocgcolorlinksfalse
  \Hy@frenchlinksfalse
  \def\Hy@colorlink##1{\begingroup}%
  \def\Hy@endcolorlink{\endgroup}%
  \def\@pdfborder{0 0 0}%
  \let\@pdfborderstyle\@empty
}
\define@key{Hyp}{ocgcolorlinks}[true]{%
  \Hy@boolkey{ocgcolorlinks}{#1}%
}
\Hy@AtBeginDocument{%
  \begingroup
    \@ifundefined{OBJ@OCG@view}{%
      \ifHy@ocgcolorlinks
        \Hy@Warning{%
          Driver does not support `ocgcolorlinks',\MessageBreak
          using `colorlinks' instead%
        }%
      \fi
    }{}%
  \endgroup
}
\define@key{Hyp}{frenchlinks}[true]{%
  \Hy@boolkey{frenchlinks}{#1}%
}
```

14 Bookmarking

```
\begingroup\expandafter\expandafter\expandafter\endgroup
\expandafter\ifx\csname chapter\endcsname\relax
  \def\toclevel@part{0}%
\else
  \def\toclevel@part{-1}%
\fi
\def\toclevel@chapter{0}
\def\toclevel@section{1}
\def\toclevel@subsection{2}
\def\toclevel@subsubsection{3}
\def\toclevel@paragraph{4}
\def\toclevel@subparagraph{5}
\def\toclevel@figure{0}
\def\toclevel@table{0}
```

```
\define@key{Hyp}{bookmarks}[true]{%
  \Hy@boolkey{bookmarks}{#1}%
}
```

```
\define@key{Hyp}{bookmarksopen}[true]{%
  \Hy@boolkey{bookmarksopen}{#1}%
}
```

The depth of the outlines is controlled by option `bookmarksdepth`. The option acts globally and distinguishes three cases:

- `bookmarksdepth`: Without value hyperref uses counter `tocdepth` (compatible behaviour and default).
- `bookmarksdepth=<number>`: the depth is set to `<number>`.
- `bookmarksdepth=<name>`: The `<name>` must not start with a number or minus sign. It is a document division name (part, chapter, section, ...). Internally the value of macro `\toclevel@<name>` is used.

```
\let\Hy@bookmarksdepth\c@tocdepth
\define@key{Hyp}{bookmarksdepth}[]{%
  \begingroup
    \edef\x{#1}%
    \ifx\x\empty
      \global\let\Hy@bookmarksdepth\c@tocdepth
    \else
      \@ifundefined{toclevel@\x}{%
        \@onelevel@sanitize\x
        \edef\y{\expandafter\@car\x\@nil}%
        \ifcase 0\expandafter\ifx\y-1\fi
              \expandafter\ifnum\expandafter`\y>47 %
                \expandafter\ifnum\expandafter`\y<58 1\fi\fi\relax
          \Hy@Warning{Unknown document division name (\x)}%
        \else
          \setbox\z@=\hbox{%
            \count@=\x
            \xdef\Hy@bookmarksdepth{\the\count@}%
          }%
        \fi
      }{%
        \setbox\z@=\hbox{%
          \count@=\csname toclevel@\x\endcsname
          \xdef\Hy@bookmarksdepth{\the\count@}%
        }%
      }%
    \fi
  \endgroup
}
```

'bookmarksopenlevel' to specify the open level. From Heiko Oberdiek.

```
\define@key{Hyp}{bookmarksopenlevel}{%
  \def\@bookmarksopenlevel{#1}%
}
\def\@bookmarksopenlevel{\maxdimen}
% `bookmarkstype' to specify which `toc' file to mimic
\define@key{Hyp}{bookmarkstype}{%
  \def\Hy@bookmarkstype{#1}%
}
\def\Hy@bookmarkstype{toc}
```

Richard Curnow <richard@curnow.demon.co.uk> suggested this functionality. It adds section numbers etc to bookmarks.

```
\define@key{Hyp}{bookmarksnumbered}[true]{%
  \Hy@boolkey{bookmarksnumbered}{#1}%
}
```

Option CJKbookmarks enables the patch for CJK bookmarks.

```
\define@key{Hyp}{CJKbookmarks}[true]{%
  \Hy@boolkey{CJKbookmarks}{#1}%
}
\def\Hy@temp#1{%
  \expandafter\Hy@@temp\csname @#1color\endcsname{#1}%
}
\def\Hy@@temp#1#2#3{%
  \define@key{Hyp}{#2color}{%
    \HyColor@HyperrefColor{##1}#1%
  }%
  \def#1{#3}%
}
\Hy@temp{link}{red}
\Hy@temp{anchor}{black}
\Hy@temp{cite}{green}
\Hy@temp{file}{cyan}
\Hy@temp{url}{magenta}
\Hy@temp{menu}{red}
\Hy@temp{run}{\@filecolor}
\define@key{Hyp}{pagecolor}{%
  \Hy@WarningPageColor
}
\def\Hy@WarningPageColor{%
  \Hy@WarningNoLine{Option `pagecolor' is not available anymore}%
  \global\let\Hy@WarningPageColor\relax
}
\define@key{Hyp}{allcolors}{%
  \HyColor@HyperrefColor{#1}\@linkcolor
  \HyColor@HyperrefColor{#1}\@anchorcolor
  \HyColor@HyperrefColor{#1}\@citecolor
  \HyColor@HyperrefColor{#1}\@filecolor
  \HyColor@HyperrefColor{#1}\@urlcolor
  \HyColor@HyperrefColor{#1}\@menucolor
  \HyColor@HyperrefColor{#1}\@runcolor
}
\def\hyperbaseurl#1{\def\@baseurl{#1}}
\define@key{Hyp}{baseurl}{\hyperbaseurl{#1}}
\let\@baseurl\@empty
\def\hyperlinkfileprefix#1{\def\Hy@linkfileprefix{#1}}
\define@key{Hyp}{linkfileprefix}{\hyperlinkfileprefix{#1}}
\hyperlinkfileprefix{file:}
```

15 PDF-specific options

`\@pdfpagetransition` The value of option `pdfpagetransition` is stored in `\@pdfpagetransition`. Its initial value is set to `\relax` in order to be able to differentiate between a not used option

and an option with an empty value.

```
\let\@pdfpagetransition\relax
\define@key{Hyp}{pdfpagetransition}{%
  \def\@pdfpagetransition{#1}%
}
```

\@pdfpageduration The value of option pdfpageduration is stored in \@pdfpageduration. Its initial value is set to \relax in order to be able to differentiate between a not used option and an option with an empty value.

```
\let\@pdfpageduration\relax
\define@key{Hyp}{pdfpageduration}{%
  \def\@pdfpageduration{#1}%
  \Hy@Match\@pdfpageduration{}{%
    ^(|[0-9]+\.?[0-9]*|[0-9]*\.?[0-9]+)$%
  }{}{%
    \Hy@Warning{%
      Invalid value `\@pdfpageduration'\MessageBreak
      of option `pdfpageduration'\MessageBreak
      is replaced by an empty value%
    }%
    \let\@pdfpageduration\@empty
  }%
}
```

The value of the bordercolor options are not processed by the color package. Therefore the value consists of space separated rgb numbers in the range 0 until 1.

Package xcolor provides \XC@bordercolor since version 1.1. If the two spaces in the color specification are missing, then the value is processed as color specification from package xcolor by using \XC@bordercolor (since xcolor 2004/05/09 v1.11, versions 2005/03/24 v2.02 until 2006/11/28 v2.10 do not work because of a bug that is fixed in 2007/01/21 v2.11).

```
\def\Hy@ColorList{cite,file,link,menu,run,url}
\@for\Hy@temp:=\Hy@ColorList\do{%
  \edef\Hy@temp{%
    \noexpand\define@key{Hyp}{\Hy@temp bordercolor}{%
      \noexpand\HyColor@HyperrefBorderColor
          {##1}%
          \expandafter\noexpand\csname @\Hy@temp bordercolor\endcsname
          {hyperref}%
          {\Hy@temp bordercolor}%
    }%
  }%
  \Hy@temp
}
\define@key{Hyp}{pagebordercolor}{%
  \Hy@WarningPageBorderColor
}
\def\Hy@WarningPageBorderColor{%
  \Hy@WarningNoLine{Option `pagebordercolor' is not available anymore}%
  \global\let\Hy@WarningPageBorderColor\relax
}
\define@key{Hyp}{allbordercolors}{%
```

```
  \def\Hy@temp##1##2{%
    \HyColor@HyperrefBorderColor{#1}##1{hyperref}{##2bordercolor}%
  }%
  \Hy@temp\@citebordercolor{cite}%
  \Hy@temp\@filebordercolor{file}%
  \Hy@temp\@linkbordercolor{link}%
  \Hy@temp\@menubordercolor{menu}%
  \Hy@temp\@runbordercolor{run}%
  \Hy@temp\@urlbordercolor{url}%
}
\define@key{Hyp}{pdfhighlight}{\def\@pdfhighlight{#1}}
\Hy@DefNameKey{pdfhighlight}{%
  \do{/I}{Invert}%
  \do{/N}{None}%
  \do{/O}{Outline}%
  \do{/P}{Push}%
}
\def\Hy@setpdfhighlight{%
  \ifx\@pdfhighlight\@empty
  \else
    /H\@pdfhighlight
  \fi
}
\define@key{Hyp}{pdfborder}{%
  \let\Hy@temp\@pdfborder
  \def\@pdfborder{#1}%
  \Hy@Match\@pdfborder{}{%
    ^\HyPat@NonNegativeReal/ %
     \HyPat@NonNegativeReal/ %
     \HyPat@NonNegativeReal/%
     ( ?\[\HyPat@NonNegativeReal/( \HyPat@NonNegativeReal/)*])?$%
  }{}{%
    \Hy@Warning{%
      Invalid value `\@pdfborder'\MessageBreak
      for option `pdfborder'.\MessageBreak
      Option setting is ignored%
    }%
    \let\@pdfborder\Hy@temp
  }%
}
\define@key{Hyp}{pdfborderstyle}{%
  \let\Hy@temp\@pdfborderstyle
  \def\@pdfborderstyle{#1}%
  \Hy@Match\@pdfborderstyle{}{%
    ^%
    ( */Type */Border%
    | */W +\HyPat@NonNegativeReal/%
    | */S */[SDBIU]%
    | */D *\[ *(\HyPat@NonNegativeReal/( \HyPat@NonNegativeReal/)?)?]%
    )* *$%
  }{}{%
    \Hy@Warning{%
      Invalid value `\@pdfborderstyle'\MessageBreak
      for option `pdfborderstyle'.\MessageBreak
```

```
      Option setting is ignored%
    }%
    \let\@pdfborderstyle\Hy@temp
  }%
}
\def\Hy@setpdfborder{%
  \ifx\@pdfborder\@empty
  \else
    /Border[\@pdfborder]%
  \fi
  \ifx\@pdfborderstyle\@empty
  \else
    /BS<<\@pdfborderstyle>>%
  \fi
}
\Hy@DefNameKey{pdfpagemode}{%
  \do{UseNone}{}%
  \do{UseOutlines}{}%
  \do{UseThumbs}{}%
  \do{FullScreen}{}%
  \do{UseOC}{PDF 1.5}%
  \do{UseAttachments}{PDF 1.6}%
}
\Hy@DefNameKey{pdfnonfullscreenpagemode}{%
  \do{UseNone}{}%
  \do{UseOutlines}{}%
  \do{UseThumbs}{}%
  \do{FullScreen}{}%
  \do{UseOC}{PDF 1.5}%
  \do{UseAttachments}{PDF 1.6}%
}
\Hy@DefNameKey{pdfdirection}{%
  \do{L2R}{Left to right}%
  \do{R2L}{Right to left}%
}
\Hy@DefNameKey{pdfviewarea}{%
  \do{MediaBox}{}%
  \do{CropBox}{}%
  \do{BleedBox}{}%
  \do{TrimBox}{}%
  \do{ArtBox}{}%
}
\Hy@DefNameKey{pdfviewclip}{%
  \do{MediaBox}{}%
  \do{CropBox}{}%
  \do{BleedBox}{}%
  \do{TrimBox}{}%
  \do{ArtBox}{}%
}
\Hy@DefNameKey{pdfprintarea}{%
  \do{MediaBox}{}%
  \do{CropBox}{}%
  \do{BleedBox}{}%
  \do{TrimBox}{}%
```

```
  \do{ArtBox}{}%
}
\Hy@DefNameKey{pdfprintclip}{%
  \do{MediaBox}{}%
  \do{CropBox}{}%
  \do{BleedBox}{}%
  \do{TrimBox}{}%
  \do{ArtBox}{}%
}
\Hy@DefNameKey{pdfprintscaling}{%
  \do{AppDefault}{}%
  \do{None}{}%
}
\Hy@DefNameKey{pdfduplex}{%
  \do{Simplex}{}%
  \do{DuplexFlipShortEdge}{}%
  \do{DuplexFlipLongEdge}{}%
}
\Hy@DefNameKey{pdfpicktraybypdfsize}{%
  \do{true}{}%
  \do{false}{}%
}
\define@key{Hyp}{pdfprintpagerange}{%
  \def\@pdfprintpagerange{#1}%
}
\Hy@DefNameKey{pdfnumcopies}{%
  \do{2}{two copies}%
  \do{3}{three copies}%
  \do{4}{four copies}%
  \do{5}{five copies}%
}
\define@key{Hyp}{pdfusetitle}[true]{%
  \Hy@boolkey{pdfusetitle}{#1}%
}
\def\HyXeTeX@CheckUnicode{%
  \ifxetex
    \ifHy@unicode
    \else
      \Hy@WarningNoLine{%
        XeTeX driver only supports unicode.\MessageBreak
        Enabling option `unicode'%
      }%
      \kvsetkeys{Hyp}{unicode}%
    \fi
  \else
    \let\HyXeTeX@CheckUnicode\relax
  \fi
}
\def\HyPsd@PrerenderUnicode#1{%
  \begingroup
    \expandafter\ifx\csname PrerenderUnicode\endcsname\relax
    \else
      \sbox0{%
        \let\GenericInfo\@gobbletwo
```

```
      \let\GenericWarning\@gobbletwo
      \let\GenericError\@gobblefour
      \PrerenderUnicode{#1}%
    }%
  \fi
 \endgroup
}
\define@key{Hyp}{pdftitle}{%
 \AddToDocumentProperties[hyperref]{pdftitle}{#1}%
 \HyXeTeX@CheckUnicode
 \HyPsd@PrerenderUnicode{#1}%
 \pdfstringdef\@pdftitle{#1}%
}
\define@key{Hyp}{pdfauthor}{%
 \AddToDocumentProperties[hyperref]{pdfauthor}{#1}%
 \HyXeTeX@CheckUnicode
 \HyPsd@PrerenderUnicode{#1}%
 \pdfstringdef\@pdfauthor{#1}%
}
\define@key{Hyp}{pdfproducer}{%
 \AddToDocumentProperties[hyperref]{pdfproducer}{#1}%
 \HyXeTeX@CheckUnicode
 \HyPsd@PrerenderUnicode{#1}%
 \pdfstringdef\@pdfproducer{#1}%
}
\define@key{Hyp}{pdfcreator}{%
 \AddToDocumentProperties[hyperref]{pdfcreator}{#1}%
 \HyXeTeX@CheckUnicode
 \HyPsd@PrerenderUnicode{#1}%
 \pdfstringdef\@pdfcreator{#1}%
}
\define@key{Hyp}{addtopdfcreator}{%
 \HyXeTeX@CheckUnicode
 \HyPsd@PrerenderUnicode{#1}%
 \pdfstringdef\@pdfcreator{\@pdfcreator, #1}%
}
\define@key{Hyp}{pdfcreationdate}{%
 \begingroup
  \Hy@unicodefalse
  \pdfstringdef\@pdfcreationdate{#1}%
 \endgroup
}
\define@key{Hyp}{pdfmoddate}{%
 \begingroup
  \Hy@unicodefalse
  \pdfstringdef\@pdfmoddate{#1}%
 \endgroup
}
\define@key{Hyp}{pdfsubject}{%
 \AddToDocumentProperties[hyperref]{pdfsubject}{#1}%
 \HyXeTeX@CheckUnicode
 \HyPsd@PrerenderUnicode{#1}%
 \pdfstringdef\@pdfsubject{#1}%
}
```

```
\define@key{Hyp}{pdfkeywords}{%
  \AddToDocumentProperties[hyperref]{pdfkeywords}{#1}%
  \HyXeTeX@CheckUnicode
  \HyPsd@PrerenderUnicode{#1}%
  \pdfstringdef\@pdfkeywords{#1}%
}
\define@key{Hyp}{pdftrapped}{%
  \lowercase{\edef\Hy@temp{#1}}%
  \ifx\Hy@temp\HyInfo@trapped@true
    \def\@pdftrapped{True}%
  \else
    \ifx\Hy@temp\HyInfo@trapped@false
      \def\@pdftrapped{False}%
    \else
      \ifx\Hy@temp\HyInfo@trapped@unknown
        \def\@pdftrapped{Unknown}%
      \else
        \ifx\Hy@temp\@empty
        \else
          \Hy@Warning{%
            Unsupported value `#1'\MessageBreak
            for option `pdftrapped'%
          }%
        \fi
        \def\@pdftrapped{}%
      \fi
    \fi
  \fi
}
\def\HyInfo@trapped@true{true}
\def\HyInfo@trapped@false{false}
\def\HyInfo@trapped@unknown{unknown}
\def\HyInfo@TrappedUnsupported{%
  \ifx\@pdftrapped\@empty
  \else
    \Hy@WarningNoLine{`pdftrapped' is not supported by this driver}%
    \gdef\HyInfo@TrappedUnsupported{}%
  \fi
}
\define@key{Hyp}{pdfinfo}{%
  \kvsetkeys{pdfinfo}{#1}%
}
\def\Hy@temp#1{%
  \lowercase{\Hy@temp@A{#1}}{#1}%
}
\def\Hy@temp@A#1#2{%
  \define@key{pdfinfo}{#2}{%
    \hypersetup{pdf#1={##1}}%
  }%
}
\Hy@temp{Title}
\Hy@temp{Author}
\Hy@temp{Keywords}
\Hy@temp{Subject}
```

```
\Hy@temp{Creator}
\Hy@temp{Producer}
\Hy@temp{CreationDate}
\Hy@temp{ModDate}
\Hy@temp{Trapped}
\newif\ifHyInfo@AddonUnsupported
\kv@set@family@handler{pdfinfo}{%
  \HyInfo@AddonHandler{#1}{#2}%
}
\let\HyInfo@do\relax
\def\HyInfo@AddonHandler#1#2{%
  \ifx\kv@value\relax
    \Hy@Warning{%
      Option `pdfinfo': ignoring key `\kv@key' without value%
    }%
  \else
    \EdefEscapeName\HyInfo@KeyEscaped{\kv@key}%
    \EdefUnescapeName\HyInfo@Key{\HyInfo@KeyEscaped}%
    \expandafter\ifx\csname KV@pdfinfo@\HyInfo@Key\endcsname\relax
      \ifHyInfo@AddonUnsupported
        \Hy@Warning{%
          This driver does not support additional\MessageBreak
          information entries, therefore\MessageBreak
          `\kv@key' is ignored%
        }%
      \else
        \def\HyInfo@tmp##1{%
          \kv@define@key{pdfinfo}{##1}{%
            \HyXeTeX@CheckUnicode
            \HyPsd@PrerenderUnicode{####1}%
            \pdfstringdef\HyInfo@Value{####1}%
            \global\expandafter
            \let\csname HyInfo@Value@##1\endcsname
                \HyInfo@Value
          }%
        }%
        \expandafter\HyInfo@tmp\expandafter{\HyInfo@Key}%
        \global\expandafter
        \let\csname KV@pdfinfo@\HyInfo@Key\expandafter\endcsname
            \csname KV@pdfinfo@\HyInfo@Key\endcsname
        \xdef\HyInfo@AddonList{%
          \HyInfo@AddonList
          \HyInfo@do{\HyInfo@Key}%
        }%
        \expandafter\kv@parse@normalized\expandafter{%
          \HyInfo@Key={#2}%
        }{%
          \kv@processor@default{pdfinfo}%
        }%
      \fi
    \else
      \expandafter\kv@parse@normalized\expandafter{%
        \HyInfo@Key={#2}%
      }{%
```

```
      \kv@processor@default{pdfinfo}%
    }%
  \fi
 \fi
}
\def\HyInfo@GenerateAddons{%
 \ifHyInfo@AddonUnsupported
  \def\HyInfo@Addons{}%
 \else
  \begingroup
   \toks@{}%
   \def\HyInfo@do##1{%
    \EdefEscapeName\HyInfo@Key{##1}%
    \edef\x{%
     \toks@{%
      \the\toks@
      /\HyInfo@Key(\csname HyInfo@Value@##1\endcsname)%
     }%
    }%
    \x
   }%
   \HyInfo@AddonList
   \edef\x{\endgroup
    \def\noexpand\HyInfo@Addons{\the\toks@}%
   }%
  \x
 \fi
}
\global\let\HyInfo@AddonList\@empty
\define@key{Hyp}{pdfview}{\calculate@pdfview#1 \\}
\define@key{Hyp}{pdflinkmargin}{\setpdflinkmargin{#1}}
\let\setpdflinkmargin\@gobble
\def\calculate@pdfview#1 #2\\{%
 \def\@pdfview{#1}%
 \ifx\\#2\\%
  \def\@pdfviewparams{ -32768}%
 \else
  \def\@pdfviewparams{ #2}%
 \fi
}
\def\Hy@number#1{%
 \the\numexpr#1\relax
 }%
\define@key{Hyp}{pdfstartpage}{%
 \ifx\\#1\\%
  \let\@pdfstartpage\@empty
 \else
  \edef\@pdfstartpage{\Hy@number{#1}}%
 \fi
}%
\define@key{Hyp}{pdfstartview}{%
 \ifx\\#1\\%
  \let\@pdfstartview\@empty
 \else
```

```
    \def\@pdfstartview{/#1}%
  \fi
}
\def\HyPat@NonNegativeReal/{%
  \ *([0-9]+\.?[0-9]*|[0-9]*\.?[0-9]+) *%
}
\define@key{Hyp}{pdfremotestartview}{%
  \ifx\\#1\\%
    \def\@pdfremotestartview{/Fit}%
  \else
    \edef\@pdfremotestartview{#1}%
    \Hy@Match\@pdfremotestartview{}{%
      ^(XYZ(%
          ()| %
          (null|-?\HyPat@NonNegativeReal/) %
          (null|-?\HyPat@NonNegativeReal/) %
          (null|\HyPat@NonNegativeReal/)%
        )|% end of "XYZ"
       Fit(%
          ()|%
          B|%
          (H|V|BH|BV)(%
             ()| %
             (null|\HyPat@NonNegativeReal/)%
           )|%
          R %
             \HyPat@NonNegativeReal/ %
             \HyPat@NonNegativeReal/ %
             \HyPat@NonNegativeReal/ %
             \HyPat@NonNegativeReal/%
        )% end of "Fit"
      )$%
    }{}{%
      \Hy@Warning{%
        Invalid value `\@pdfremotestartview'\MessageBreak
        of `pdfremotestartview'\MessageBreak
        is replaced by `Fit'%
      }%
      \let\@pdfremotestartview\@empty
    }%
    \ifx\@pdfremotestartview\@empty
      \def\@pdfremotestartview{/Fit}%
    \else
      \edef\@pdfremotestartview{/\@pdfremotestartview}%
    \fi
  \fi
}
\define@key{Hyp}{pdfpagescrop}{\edef\@pdfpagescrop{#1}}
\define@key{Hyp}{pdftoolbar}[true]{%
  \Hy@boolkey{pdftoolbar}{#1}%
}
\define@key{Hyp}{pdfmenubar}[true]{%
  \Hy@boolkey{pdfmenubar}{#1}%
}
```

```
\define@key{Hyp}{pdfwindowui}[true]{%
  \Hy@boolkey{pdfwindowui}{#1}%
}
\define@key{Hyp}{pdffitwindow}[true]{%
  \Hy@boolkey{pdffitwindow}{#1}%
}
\define@key{Hyp}{pdfcenterwindow}[true]{%
  \Hy@boolkey{pdfcenterwindow}{#1}%
}
\define@key{Hyp}{pdfdisplaydoctitle}[true]{%
  \Hy@boolkey{pdfdisplaydoctitle}{#1}%
}
\define@key{Hyp}{pdfa}[true]{%
 \IfDocumentMetadataTF
  {
    \PackageWarning{hyperref}{%
     \string\DocumentMetadata\space detected.\MessageBreak
     The 'pdfa' key will be ignored.\MessageBreak
     Please set the PDF/A standard in \string\DocumentMetadata\MessageBreak
     with the 'pdfstandard' key.}
  }
  {\Hy@boolkey{pdfa}{#1}}%
}

\define@key{Hyp}{pdfnewwindow}[true]{%
  \def\Hy@temp{#1}%
  \ifx\Hy@temp\@empty
    \Hy@pdfnewwindowsetfalse
  \else
    \Hy@pdfnewwindowsettrue
    \Hy@boolkey{pdfnewwindow}{#1}%
  \fi
}
\def\Hy@SetNewWindow{%
  \ifHy@pdfnewwindowset
    /NewWindow %
    \ifHy@pdfnewwindow true\else false\fi
  \fi
}
\Hy@DefNameKey{pdfpagelayout}{%
  \do{SinglePage}{}%
  \do{OneColumn}{}%
  \do{TwoColumnLeft}{}%
  \do{TwoColumnRight}{}%
  \do{TwoPageLeft}{PDF 1.5}%
  \do{TwoPageRight}{PDF 1.5}%
}
\define@key{Hyp}{pdflang}{%
  \edef\@pdflang{#1}%
  \def\Hy@temp{\relax}%
  \ifx\@pdflang\Hy@temp
    \let\@pdflang\relax
  \fi
  \ifx\@pdflang\relax
```

```
  \else
    \ifx\@pdflang\@empty
    \else
```

Test according to ABNF of RFC 3066.

```
      \Hy@Match\@pdflang{icase}{%
        ^%
        [a-z]{1,8}%
        (-[a-z0-9]{1,8})*%
        $%
      }{%
```

Test according to ABNF of RFC 5646.

```
        \Hy@Match\@pdflang{icase}{%
          ^%
          (%
          % langtag
            (% language
              [a-z]{2,3}%
              ([a-z]{3}(-[a-z]{3}){0,2})?% extlang
              |[a-z]{4}% reserved for future use
              |[a-z]{5,8}% registered language subtag
            )%
            (-[a-z]{4})?% script
            (-([a-z]{2}|[0-9]{3}))?% region
            (-([a-z]{5,8}|[0-9][a-z0-9]{3}))*% variant
            (-[0-9a-wyz](-[a-z0-9]{2,8})+)*% extension
            (-x(-[a-z0-9]{1,8})+)?% privateuse
          % privateuse
            |x-([a-z0-9]{1,8})+%
          % grandfathered/irregular
            |en-GB-oed%
            |i-(ami|bnn|default|enochian|hak|klingon|lux|%
                mingo|navajo|pwn|tao|tay|tsu)%
            |sgn-(BE-FR|BE-NL|CH-DE)%
          % grandfathered/regular
            |art-lojban%
            |cel-gaulish%
            |no-(bok|nyn)%
            |zh-(guoyu|hakka|min|min-nan|xiang)%
          )%
          $%
        }{%
```

Test for unique extensions.

```
        \Hy@Match{-\@pdflang}{icase}{-[a-wyz0-9]-}{%
          \Hy@Match\@pdflang{icase}{^x-}{}{%
            % remove privateuse
            \edef\Hy@temp{-\@pdflang}%
            \Hy@Match\Hy@temp{icase}{%
              ^%
              (%
                (-[a-wyz0-9]|-[a-z0-9]{2,8})*%
              )%
              -x-%
```

```
      }{%
        \edef\Hy@temp{%
          \expandafter\strip@prefix\pdflastmatch1%
        }%
      }{}%
      \Hy@Match\Hy@temp{icase}{%
        (-[a-wyz0-9]-).*\@backslashchar1%
      }{%
        \Hy@Warning{%
          Invalid language identifier `#1'\MessageBreak
          for option `pdflang', because it violates\MessageBreak
          well-formedness defined in RFC 4646\MessageBreak
          by duplicate singleton subtags%
        }%
        \let\@pdflang\relax
      }{}%
    }%
  }{}%
```

User-assigned country codes are forbidden in language tags (RFC 3066).

```
  \ifx\@pdflang\relax
  \else
    \Hy@Match\@pdflang{icase}{%
      ^%
      [a-zA-Z]{2}-%
      (%
        aa|AA|%
        [qQ][m-zM-Z]|%
        [xX][a-zA-Z]|%
        zz|ZZ%
      )%
      (-|$)%
    }{%
      \Hy@Warning{%
        Invalid language identifier `#1'\MessageBreak
        for option `pdflang' because of invalid country code%
        \MessageBreak
        in second subtag (RFC 3066)%
      }%
      \let\@pdflang\relax
    }{}%
  \fi
 }{%
  \Hy@Warning{%
    Invalid language identifier `#1'\MessageBreak
    for option `pdflang', because it violates\MessageBreak
    well-formedness defined in RFC 5646%
  }%
  \let\@pdflang\relax
 }%
}{%
  \Hy@Warning{%
    Invalid language identifier `#1'\MessageBreak
    for option `pdflang' (RFC 3066)%
  }%
```

```
      \let\@pdflang\relax
    }%
  \fi
 \fi
}
\define@key{Hyp}{pdfpagelabels}[true]{%
 \Hy@boolkey{pdfpagelabels}{#1}%
}
\define@key{Hyp}{pdfescapeform}[true]{%
 \Hy@boolkey{pdfescapeform}{#1}%
}
```

Default values:

```
\def\@linkbordercolor{1 0 0}
\def\@urlbordercolor{0 1 1}
\def\@menubordercolor{1 0 0}
\def\@filebordercolor{0 .5 .5}
\def\@runbordercolor{0 .7 .7}
\def\@citebordercolor{0 1 0}
\def\@pdfhighlight{/I}
\let\@pdftitle\@empty
\let\@pdfauthor\@empty
\let\@pdfproducer\relax
\def\@pdfcreator{LaTeX with hyperref}
\let\@pdfcreationdate\@empty
\let\@pdfmoddate\@empty
\let\@pdfsubject\@empty
\let\@pdfkeywords\@empty
\let\@pdftrapped\@empty
\let\@pdfpagescrop\@empty
\def\@pdfstartview{/Fit}
\def\@pdfremotestartview{/Fit}
\def\@pdfstartpage{1}
\let\@pdfprintpagerange\@empty
\let\@pdflang\relax
\let\PDF@SetupDoc\@empty
\let\PDF@FinishDoc\@empty
\let\phantomsection\@empty
\let\special@paper\@empty
\def\HyperDestNameFilter#1{#1}
\Hy@AtBeginDocument{%
 \begingroup
  \edef\x{\ifdim\stockheight>\z@ \stockheight\else\paperheight\fi}%
  \dimen@=\x\relax
  \ifdim\dimen@>\z@
  \else
   \dimen@=11in\relax
   \Hy@WarningNoLine{%
    Height of page (\expandafter\string\x) %
    is invalid (\the\x),\MessageBreak
    using 11in%
   }%
  \fi
  \dimen@=0.99626401\dimen@
  \xdef\Hy@pageheight{\strip@pt\dimen@}%
```

```
  \endgroup
}
\def\HyInd@EncapChar{\|}
```

Allow the user to use `\ExecuteOptions` in the cfg file even though this package does not use the normal option mechanism. Use `\hyper@normalise` as a scratch macro, since it is going to be defined in a couple of lines anyway.

```
\let\hyper@normalise\ExecuteOptions
\let\ExecuteOptions\hypersetup
\Hy@RestoreCatcodes
\InputIfFileExists{hyperref.cfg}{}{}
\Hy@SetCatcodes
\let\ExecuteOptions\hyper@normalise
\ifx\Hy@MaybeStopNow\relax
\else
  \Hy@stoppedearlytrue
  \expandafter\Hy@MaybeStopNow
\fi
\Hy@stoppedearlyfalse
```

To add flexibility, we will not use the ordinary processing of package options, but put them through the *keyval* package. This section was written by David Carlisle.

```
\SetupKeyvalOptions{family=Hyp}
\DeclareLocalOptions{%
  a4paper,a5paper,b5paper,letterpaper,legalpaper,executivepaper%
}
```

Add option `tex4ht` if package `tex4ht` is loaded.

```
\@ifpackagewith{hyperref}{tex4ht}{%
}{%
  \@ifpackageloaded{tex4ht}{%
    \PassOptionsToPackage{tex4ht}{hyperref}%
  }{%
    \@ifundefined{HCode}{%
    }{%
      \begingroup
        \def\Hy@pkg{tex4ht}%
        \def\Hy@temp@A#1\RequirePackage[#2]#3#4\Hy@NIL{%
          \def\Hy@param{#2#3}%
          \ifx\Hy@param\@empty
            \expandafter\@gobble
          \else
            \def\Hy@param{#3}%
            \ifx\Hy@param\Hy@pkg
              \PassOptionsToPackage{#2}{tex4ht}%
              \expandafter\expandafter\expandafter\@gobble
            \else
              \expandafter\expandafter\expandafter\@firstofone
            \fi
          \fi
          {\Hy@temp@A#4\Hy@NIL}%
        }%
        \expandafter
        \Hy@temp@A\@documentclasshook\RequirePackage[]{}\Hy@NIL
      \endgroup
```

```
    \PassOptionsToPackage{tex4ht}{hyperref}%
   }%
  }%
}
\let\ReadBookmarks\relax
\ProcessKeyvalOptions{Hyp}
```

After processing options.

15.1 Package xspace support

```
\def\Hy@xspace@end{}
\@ifundefined{xspaceaddexceptions}{%
  \Hy@AtBeginDocument{%
    \@ifundefined{xspaceaddexceptions}{%
    }{%
      \def\Hy@xspace@end{%
        \@gobble{end for xspace}%
      }%
      \xspaceaddexceptions{%
        \Hy@xspace@end,\hyper@linkend,\hyper@anchorend
      }%
    }%
  }%
}{%
  \def\Hy@xspace@end{%
    \@gobble{end for xspace}%
  }%
  \xspaceaddexceptions{\Hy@xspace@end,\hyper@linkend,\hyper@anchorend}%
}
```

15.2 Option draft

```
\Hy@AtBeginDocument{%
  \ifHy@draft
    \let\hyper@@anchor\@gobble
    \gdef\hyper@link#1#2#3{#3\Hy@xspace@end}%
    \def\hyper@anchorstart#1#2{#2\Hy@xspace@end}%
    \def\hyper@anchorend{\Hy@xspace@end}%
    \let\hyper@linkstart\@gobbletwo
    \def\hyper@linkend{\Hy@xspace@end}%
    \def\hyper@linkurl#1#2{#1\Hy@xspace@end}%
    \def\hyper@linkfile#1#2#3{#1\Hy@xspace@end}%
    \def\hyper@link@[#1]#2#3#4{#4\Hy@xspace@end}%
    \def\Acrobatmenu#1#2{\leavevmode#2\Hy@xspace@end}%
    \let\PDF@SetupDoc\@empty
    \let\PDF@FinishDoc\@empty
    \let\ReadBookmarks\relax
    \let\WriteBookmarks\relax
    \Hy@WarningNoLine{Draft mode on}%
  \fi
  \Hy@DisableOption{draft}%
  \Hy@DisableOption{nolinks}%
  \Hy@DisableOption{final}%
}
```

15.3 PDF/A

If an A-standard has been set in \DocumentMetadata hyperref should set the pdfa key too.

```
\ExplSyntaxOn
\IfDocumentMetadataT
{
  \tl_if_empty:eTF{\GetDocumentProperties{document/pdfstandard}}
   {
     \Hy@pdfafalse
   }
   {
     \Hy@pdfatrue
   }
}
\ExplSyntaxOff
\Hy@DisableOption{pdfa}
\ifHy@pdfa
  \ifnum \Hy@pdf@majorminor@version< 104
  \kvsetkeys{Hyp}{pdfversion=1.4}%
  \fi
  \Hy@DisableOption{pdfversion}%
  \def\Hy@Acrobatmenu#1#2{%
    \leavevmode
    \begingroup
      \edef\x{#1}%
      \@onelevel@sanitize\x
      \ifx\x\Hy@NextPage
        \let\y=Y%
      \else
        \ifx\x\Hy@PrevPage
          \let\y=Y%
        \else
          \ifx\x\Hy@FirstPage
            \let\y=Y%
          \else
            \ifx\x\Hy@LastPage
              \let\y=Y%
            \else
              \let\y=N%
            \fi
          \fi
        \fi
      \fi
    \expandafter\endgroup
    \ifx\y Y%
    \else
      \Hy@Error{%
        PDF/A: Named action `#1' is not permitted%
      }\@ehc
      {#2}%
      \expandafter\@gobble
    \fi
  }%
```

```
  \def\Hy@temp#1{%
    \expandafter\def\csname Hy@#1\endcsname{#1}%
    \expandafter\@onelevel@sanitize\csname Hy@#1\endcsname
  }%
  \Hy@temp{NextPage}%
  \Hy@temp{PrevPage}%
  \Hy@temp{FirstPage}%
  \Hy@temp{LastPage}%
\else
  \def\Hy@Acrobatmenu#1#2{\leavevmode}%
\fi
```

15.4 Patch for babel's \texttilde

Babel does not define `\texttilde` in NFSS2 manner, so the NFSS2 definitions of PD1 or PU encoding is not compatible. To fix this, `\texttilde` is defined in babel manner.

change 2020-10-10: no trace of `\texttilde` can be found in the three languages spanish, galician and estonian so the patch has been removed as outdated.

```
\def\Hy@wrapper@babel#1#2{%
  \begingroup
    \Hy@safe@activestrue
    \set@display@protect
    \edef\x{#2}%
    \@onelevel@sanitize\x
    \toks@{#1}%
    \edef\x{\endgroup\the\toks@{\x}}%
  \x
}
\def\Hy@WrapperDef#1{%
  \begingroup
    \escapechar=\m@ne
    \xdef\Hy@gtemp{%
      \expandafter\noexpand\csname HyWrap@\string#1\endcsname
    }%
  \endgroup
  \edef#1{%
    \noexpand\Hy@wrapper@babel
    \expandafter\noexpand\Hy@gtemp
  }%
  \expandafter\def\Hy@gtemp
}
\ifHy@hyperfigures
  \Hy@Info{Hyper figures ON}%
\else
  \Hy@Info{Hyper figures OFF}%
\fi
\ifHy@nesting
  \Hy@Info{Link nesting ON}%
\else
  \Hy@Info{Link nesting OFF}%
\fi
\ifHy@hyperindex
```

```
  \Hy@Info{Hyper index ON}%
\else
  \Hy@Info{Hyper index OFF}%
\fi
\ifHy@plainpages
  \Hy@Info{Plain pages ON}%
\else
  \Hy@Info{Plain pages OFF}%
\fi
\ifHy@backref
  \Hy@Info{Backreferencing ON}%
\else
  \Hy@Info{Backreferencing OFF}%
\fi
\ifHy@implicit
  \Hy@InfoNoLine{Implicit mode ON; LaTeX internals redefined}%
\else
  \Hy@InfoNoLine{Implicit mode OFF; no redefinition of LaTeX internals}%
  \def\MaybeStopEarly{%
    \Hy@Message{Stopped early}%
    \Hy@AtBeginDocument{%
      \PDF@FinishDoc
      \gdef\PDF@FinishDoc{}%
    }%
    \endinput
  }%
  \Hy@AtBeginDocument{%
    \let\autoref\ref
    \let\autopageref\pageref
    \ifx\@pdfpagemode\@empty
      \gdef\@pdfpagemode{UseNone}%
    \fi
    \global\Hy@backreffalse
  }%
  \Hy@AtEndOfPackage{%
    \global\let\ReadBookmarks\relax
    \global\let\WriteBookmarks\relax
  }%
\fi
\Hy@DisableOption{implicit}
```

15.4.1 Driver loading

Ensure that `\stockwidth` and `\stockheight` are defined

```
\@ifundefined{stockwidth}{\newdimen\stockwidth}{}
\@ifundefined{stockheight}{\newdimen\stockheight}{}
\Hy@AtEndOfPackage{%
  \@ifpackageloaded{tex4ht}{%
    \def\Hy@driver{htex4ht}%
    \Hy@texhttrue
  }{}%
```

Some drivers can be detected. Check for these drivers, whether the given driver option is ok. Otherwise force the right driver or use the default driver.

```
\ifx\Hy@driver\@empty
\else
  \ifx\pdfextension\@undefined
    \def\Hy@temp{hpdftex}%
  \else
    \def\Hy@temp{hluatex}%
  \fi
  \ifpdf
    \ifx\Hy@driver\Hy@temp
    \else
      \Hy@WarningNoLine{%
        Wrong driver `\Hy@driver.def';\MessageBreak
        pdfTeX is running in PDF mode.\MessageBreak
        Forcing driver `\Hy@temp.def'%
      }%
      \let\Hy@driver\Hy@temp
    \fi
  \else
    \ifx\Hy@driver\Hy@temp
      \Hy@WarningNoLine{%
        Wrong driver `\Hy@driver.def';\MessageBreak
        pdfTeX is not running in PDF mode.\MessageBreak
        Using default driver%
      }%
      \let\Hy@driver\@empty
    \fi
  \fi
\fi
\ifHy@texht
\else
  \ifx\Hy@driver\@empty
  \else
    \def\Hy@temp{hxetex}%
    \ifxetex
      \ifx\Hy@driver\Hy@temp
      \else
        \Hy@WarningNoLine{%
          Wrong driver `\Hy@driver.def';\MessageBreak
          XeTeX is running.\MessageBreak
          Forcing driver `\Hy@temp.def' for XeTeX%
        }%
        \let\Hy@driver\Hy@temp
      \fi
    \fi
  \fi
\fi
\ifx\Hy@driver\@empty
\else
 \def\Hy@temp{hhitex}%
 \ifhint
   \ifx\Hy@driver\Hy@temp
   \else
     \Hy@WarningNoLine{%
       Wrong driver `\Hy@driver.def';\MessageBreak
```

```
        hitex is running.\MessageBreak
        Forcing driver `\Hy@temp.def'%
      }%
      \let\Hy@driver\Hy@temp
    \fi
  \fi
\fi
\ifx\Hy@driver\@empty
\else
  \def\Hy@temp{hvtexhtm}%
  \ifnum\ifvtex\OpMode\else\m@ne\fi=10 %
    \ifx\Hy@driver\Hy@temp
    \else
      \Hy@WarningNoLine{%
        Wrong driver `\Hy@driver.def';\MessageBreak
        VTeX is running in HTML mode.\MessageBreak
        Forcing driver `\Hy@temp.def'%
      }%
      \let\Hy@driver\Hy@temp
    \fi
  \else
    \ifx\Hy@driver\Hy@temp
      \Hy@WarningNoLine{%
        Wrong driver `\Hy@driver.def';\MessageBreak
        VTeX is not running in HTML mode.\MessageBreak
        Using default driver%
      }%
      \let\Hy@driver\@empty
    \fi
  \fi
\fi
```

If the driver is not given, find the right driver or use the default driver.

```
\let\HyOpt@DriverType\@empty
\ifx\HyOpt@CustomDriver\@empty
  \ifx\Hy@driver\@empty
    \def\HyOpt@DriverType{ (autodetected)}%
    \providecommand*{\Hy@defaultdriver}{hdvips}%
    \ifpdf
      \ifx\pdfextension\@undefined
        \def\Hy@driver{hpdftex}%
      \else
        \def\Hy@driver{hluatex}%
      \fi
    \else
      \ifxetex
        \def\Hy@driver{hxetex}%
      \else
        \ifnum\ifvtex\OpMode\else\m@ne\fi=10 %
          \def\Hy@driver{hvtexhtm}%
          \def\MaybeStopEarly{%
            \Hy@Message{Stopped early}%
            \Hy@AtBeginDocument{%
              \PDF@FinishDoc
              \gdef\PDF@FinishDoc{}%
```

```
4526            }%
4527            \endinput
4528          }%
4529        \else
4530          \ifhint
4531            \def\Hy@driver{hhitex}
4532          \else
4533            \ifnum\ifvtex\OpMode\else\m@ne\fi=\@ne
4534              \def\Hy@driver{hvtex}%
4535            \else
4536              \ifnum\ifvtex\OpMode\else\m@ne\fi=\tw@
4537                \def\Hy@driver{hvtex}%
4538              \else
4539                \ifx\HyOpt@DriverFallback\@empty
4540                  \let\Hy@driver\Hy@defaultdriver
4541                  \def\HyOpt@DriverType{ (default)}%
4542                \else
4543                  \begingroup
4544                    \toks@\expandafter{\HyOpt@DriverFallback}%
4545                    \edef\x{\endgroup
4546                      \noexpand\kvsetkeys{Hyp}{\the\toks@}%
4547                    }%
4548                  \x
4549                  \ifx\Hy@driver\@empty
4550                    \let\Hy@driver\Hy@defaultdriver
4551                    \def\HyOpt@DriverType{ (default)}%
4552                  \else
4553                    \def\HyOpt@DriverType{ (fallback)}%
4554                  \fi
4555                \fi
4556              \fi
4557            \fi
4558          \fi
4559        \fi
4560      \fi
4561    \fi
4562    \ifx\Hy@driver\Hy@defaultdriver
4563      \def\Hy@temp{hdviwind}%
4564      \ifx\Hy@temp\Hy@driver
4565        \kvsetkeys{Hyp}{colorlinks}%
4566        \PassOptionsToPackage{dviwindo}{color}%
4567      \fi
4568    \fi
4569  \fi
4570\else
4571  \def\HyOpt@DriverType{ (custom)}%
4572  \let\Hy@driver\HyOpt@CustomDriver
4573\fi
4574\Hy@InfoNoLine{Driver\HyOpt@DriverType: \Hy@driver}%
4575\chardef\Hy@VersionChecked=0 %
4576\input{\Hy@driver.def}%
4577\ifcase\Hy@VersionChecked
4578  \Hy@VersionCheck{\Hy@driver.def}%
4579\fi
```

```
  \let\@unprocessedoptions\relax
  \Hy@RestoreCatcodes
  \Hy@DisableOption{tex4ht}%
  \Hy@DisableOption{pdftex}%
  \Hy@DisableOption{nativepdf}%
  \Hy@DisableOption{dvipdfm}%
  \Hy@DisableOption{dvipdfmx}%
  \Hy@DisableOption{dvipdfmx-outline-open}%
  \Hy@DisableOption{pdfmark}%
  \Hy@DisableOption{dvips}%
  \Hy@DisableOption{hypertex}%
  \Hy@DisableOption{vtex}%
  \Hy@DisableOption{vtexpdfmark}%
  \Hy@DisableOption{dviwindo}%
  \Hy@DisableOption{dvipsone}%
  \Hy@DisableOption{textures}%
  \Hy@DisableOption{latex2html}%
  \Hy@DisableOption{ps2pdf}%
  \Hy@DisableOption{xetex}%
  \Hy@DisableOption{driverfallback}%
  \Hy@DisableOption{customdriver}%
  \Hy@DisableOption{pdfversion}%
}
```

Support for open outlines is enabled for XeTeX >= 0.9995. I don't know, if older versions also support this. AFAIK older dvipdfmx versions will break, thus the switch cannot be turned on by default.

```
\newif\ifHy@DvipdfmxOutlineOpen
\ifxetex
  \ifdim\number\XeTeXversion\XeTeXrevision in<0.9995in %
  \else
    \chardef\SpecialDvipdfmxOutlineOpen\@ne
    \Hy@DvipdfmxOutlineOpentrue
  \fi
\fi
\begingroup\expandafter\expandafter\expandafter\endgroup
\expandafter\ifx\csname SpecialDvipdfmxOutlineOpen\endcsname\relax
\else
  \ifnum\SpecialDvipdfmxOutlineOpen>\z@
    \Hy@DvipdfmxOutlineOpentrue
  \fi
\fi
```

15.4.2 Bookmarks

```
\def\WriteBookmarks{0}
\def\@bookmarkopenstatus#1{%
  \ifHy@bookmarksopen
```

The purpose of the `\@firstofone`-number-space-construct is that no `\relax` will be inserted by TeX before the `\else`:

```
    \ifnum#1<\expandafter\@firstofone\expandafter
            {\number\@bookmarksopenlevel} % explicit space
    \else
      -%
```

```
    \fi
  \else
    -%
  \fi
}
\ifHy@bookmarks
  \Hy@Info{Bookmarks ON}%
  \ifx\@pdfpagemode\@empty
    \def\@pdfpagemode{UseOutlines}%
  \fi
\else
  \let\@bookmarkopenstatus\@gobble
  \Hy@Info{Bookmarks OFF}%
  \Hy@AtEndOfPackage{%
    \global\let\ReadBookmarks\relax
    \global\let\WriteBookmarks\relax
  }%
  \ifx\@pdfpagemode\@empty
    \def\@pdfpagemode{UseNone}%
  \fi
\fi
\Hy@DisableOption{bookmarks}
```

Add wrapper for setting standard catcodes (babel's shorthands).

```
\def\Hy@CatcodeWrapper#1{%
  \let\Hy@EndWrap\@empty
  \def\TMP@EnsureCode##1##2{%
    \edef\Hy@EndWrap{%
      \Hy@EndWrap
      \catcode##1 \the\catcode##1\relax
    }%
    \catcode##1 ##2\relax
  }%
  \TMP@EnsureCode{10}{12}% ^^J
  \TMP@EnsureCode{33}{12}% !
  \TMP@EnsureCode{34}{12}% "
  \TMP@EnsureCode{36}{3}% $ (math)
  \TMP@EnsureCode{38}{4}% & (alignment)
  \TMP@EnsureCode{39}{12}% '
  \TMP@EnsureCode{40}{12}% (
  \TMP@EnsureCode{41}{12}% )
  \TMP@EnsureCode{42}{12}% *
  \TMP@EnsureCode{43}{12}% +
  \TMP@EnsureCode{44}{12}% ,
  \TMP@EnsureCode{45}{12}% -
  \TMP@EnsureCode{46}{12}% .
  \TMP@EnsureCode{47}{12}% /
  \TMP@EnsureCode{58}{12}% :
  \TMP@EnsureCode{59}{12}% ;
  \TMP@EnsureCode{60}{12}% <
  \TMP@EnsureCode{61}{12}% =
  \TMP@EnsureCode{62}{12}% >
  \TMP@EnsureCode{63}{12}% ?
  \TMP@EnsureCode{91}{12}% [
  \TMP@EnsureCode{93}{12}% ]
```

```
  \TMP@EnsureCode{94}{7}% ^ (superscript)
  \TMP@EnsureCode{95}{8}% _ (subscript)
  \TMP@EnsureCode{96}{12}% `
  \TMP@EnsureCode{124}{12}% |
  \TMP@EnsureCode{126}{13}% ~ (active)
  #1\relax
  \Hy@EndWrap
}
```

\HyColor@UseColor expects a macro as argument. It contains the color specification.

```
\Hy@AtBeginDocument{%
  \ifHy@ocgcolorlinks
    \kvsetkeys{Hyp}{colorlinks}%
    \ifHy@pdfa
      \Hy@Warning{%
        PDF/A: Optional Content Groups are prohibited,\MessageBreak
        using `colorlinks' instead of `ocgcolorlinks'%
      }%
      \Hy@ocgcolorlinksfalse
    \fi
  \fi
  \ifHy@ocgcolorlinks
  \else
    \Hy@DisableOption{ocgcolorlinks}%
  \fi
  \ifHy@colorlinks
    \def\@pdfborder{0 0 0}%
    \let\@pdfborderstyle\@empty
    \Hy@CatcodeWrapper{%
      \RequirePackage{color}%
     }%
    \def\Hy@colorlink#1{%
      \begingroup
      \HyColor@UseColor#1%
    }%
    \def\Hy@endcolorlink{\endgroup}%
    \Hy@Info{Link coloring ON}%
  \else
    \ifHy@frenchlinks
      \def\Hy@colorlink#1{\begingroup\fontshape{\scdefault}\selectfont}%
      \def\Hy@endcolorlink{\endgroup}%
      \Hy@Info{French linking ON}%
    \else
```

for grouping consistency:

```
      \def\Hy@colorlink#1{\begingroup}%
      \def\Hy@endcolorlink{\endgroup}%
      \Hy@Info{Link coloring OFF}%
    \fi
  \fi
  \Hy@DisableOption{colorlinks}%
  \Hy@DisableOption{frenchlinks}%
  \ifHy@texht
  \else
```

With active links we have to redefine the starred versions to avoid that they get links from the include \@setref:

```
    \ifHy@implicit
      \let \T@Ref\HyRef@Ref
      \def\@refstar#1{%
        \NR@ref@showkeys{#1}%
        \HyRef@StarSetRef{#1}\@firstoffive
      }
      \def\@pagerefstar#1{%
        \NR@ref@showkeys{#1}%
        \HyRef@StarSetRef{#1}\@secondoffive
      }
      \def\@namerefstar#1{%
        \NR@ref@showkeys{#1}%
        \HyRef@StarSetRef{#1}\@thirdoffive
      }
      \def\@Refstar#1{%
        \NR@ref@showkeys{#1}%
        \HyRef@StarSetRef{#1}\HyRef@MakeUppercaseFirstOfFive
      }%
     \else
     \fi
  \fi
}
\Hy@AtBeginDocument{%
  \ifx\ReadBookmarks\relax
  \else
    \Hy@CatcodeWrapper\ReadBookmarks
  \fi
}
\ifHy@backref
  \RequirePackage{backref}%
\else
  \let\Hy@backout\@gobble
\fi
\Hy@DisableOption{backref}
\Hy@DisableOption{pagebackref}
\Hy@activeanchorfalse
```

16 User hypertext macros

We need to normalise all user commands taking a URL argument; Within the argument the following special definitions apply: \#, \%, ~ produce #, %, ~ respectively. for consistency \~ produces ~ as well. At the *top level only* ie not within the argument of another command, you can use # and % unescaped, to produce themselves. even if, say, # is entered as # it will be converted to \# so it does not die if written to an aux file etc. \# will write as # locally while making \specials. The catcode : is set to other to avoid problems with expl3 syntax.

```
\begingroup
  \endlinechar=-1 %
  \catcode`\^^A=14 %
  \catcode`\^^M\active
  \catcode`\%\active
```

```
\catcode`\#\active
\catcode`\_\active
\catcode`\$\active
\catcode`\&\active
\gdef\hyper@normalise{^^A
  \begingroup
  \@makeother{:}^^A
  \catcode`\^^M\active
  \def^^M{ }^^A
  \catcode`\%\active
  \let%\@percentchar
  \let\%\@percentchar
  \catcode`\#\active
  \def#{\hyper@hash}^^A
  \def\#{\hyper@hash}^^A
  \@makeother\&^^A
  \edef&{\string&}^^A
  \edef\&{\string&}^^A
  \edef\textunderscore{\string_}^^A
  \let\_\textunderscore
  \catcode`\_\active
  \let_\textunderscore
  \let~\hyper@tilde
  \let\~\hyper@tilde
  \let\textasciitilde\hyper@tilde
  \let\\\@backslashchar
  \edef${\string$}^^A
  \Hy@safe@activestrue
  \hyper@n@rmalise
}^^A
\catcode`\#=6 ^^A
\gdef\Hy@ActiveCarriageReturn{^^M}^^A
\gdef\hyper@n@rmalise#1#2{^^A
  \def\Hy@tempa{#2}^^A
  \ifx\Hy@tempa\Hy@ActiveCarriageReturn
    \Hy@ReturnAfterElseFi{^^A
      \hyper@@normalise{#1}^^A
    }^^A
  \else
    \Hy@ReturnAfterFi{^^A
      \hyper@@normalise{#1}{#2}^^A
    }^^A
  \fi
}^^A
\gdef\hyper@@normalise#1#2{^^A
  \edef\Hy@tempa{^^A
    \endgroup
    \noexpand#1{\Hy@RemovePercentCr#2%^^M\@nil}^^A
  }^^A
  \Hy@tempa
}^^A
\gdef\Hy@RemovePercentCr#1%^^M#2\@nil{^^A
  #1^^A
  \ifx\limits#2\limits
```

```
    \else
      \Hy@ReturnAfterFi{^^A
        \Hy@RemovePercentCr #2\@nil
      }^^A
    \fi
  }^^A
\endgroup
\providecommand*\hyper@chars{%
  \let\#\hyper@hash
  \let\%\@percentchar
  \Hy@safe@activestrue
}
\def\hyperlink#1#2{%
  \hyper@@link{}{#1}{#2}%
}
\def\Hy@VerboseLinkStart#1#2{%
  \ifHy@verbose
    \begingroup
      \Hy@safe@activestrue
      \xdef\Hy@VerboseGlobalTemp{(#1) `#2'}%
      \Hy@Info{Reference \Hy@VerboseGlobalTemp}%
      \xdef\Hy@VerboseGlobalTemp{%
        \Hy@VerboseGlobalTemp, %
        line \the\inputlineno
      }%
    \endgroup
    \let\Hy@VerboseLinkInfo\Hy@VerboseGlobalTemp
    \@onelevel@sanitize\Hy@VerboseLinkInfo
  \fi
}
\def\Hy@VerboseLinkInfo{<VerboseLinkInfo>}
\def\Hy@VerboseLinkStop{%
  \ifHy@verbose
    \begingroup
      \edef\x{\endgroup
        \write\m@ne{%
          Package `hyperref' Info: %
          End of reference \Hy@VerboseLinkInfo.%
        }%
      }%
    \x
  \fi
}
\def\Hy@VerboseAnchor#1{%
  \ifHy@verbose
    \begingroup
      \Hy@safe@activestrue
      \Hy@Info{Anchor `\HyperDestNameFilter{#1}'}%
    \endgroup
  \fi
}
\def\Hy@AllowHyphens{%
```

```
  \relax
  \ifhmode
    \penalty\@M
    \hskip\z@skip
  \fi
}
\DeclareRobustCommand*{\href}[1][]{%
  \begingroup
  \setkeys{href}{#1}%
  \@ifnextchar\bgroup\Hy@href{\hyper@normalise\href@}%
}
\def\Hy@href#{%
  \hyper@normalise\href@
}
\begingroup
  \catcode`\$=6 %
  \catcode`\#=12 %
  \gdef\href@$1{\expandafter\href@split$1##\\}%
  \gdef\href@split$1#$2#$3\\$4{%
    \hyper@@link{$1}{$2}{$4}%
    \endgroup
  }%
\endgroup
```

Option 'page'.

```
\define@key{href}{page}{%
  \def\Hy@href@page{#1}%
}
\let\Hy@href@page\@empty
\newcount\c@Hy@tempcnt
\def\theHy@tempcnt{\the\c@Hy@tempcnt}
\def\Hy@MakeRemoteAction{%
  \ifx\Hy@href@page\@empty
    \def\Hy@href@page{0}%
  \else
    \setcounter{Hy@tempcnt}{\Hy@href@page}%
    \ifnum\c@Hy@tempcnt<\@ne
      \Hy@Warning{%
        Invalid page number (\theHy@tempcnt)\MessageBreak
        for remote PDF file.\MessageBreak
        Using page 1%
      }%
      \def\Hy@href@page{0}%
    \else
      \global\advance\c@Hy@tempcnt\m@ne
      \edef\Hy@href@page{\theHy@tempcnt}%
    \fi
  \fi
```

If a next action is set, then also a new window should be opened. Otherwise AR reclaims that it closes the current file with discarding the next actions.

```
  \ifx\Hy@href@nextactionraw\@empty
  \else
    \Hy@pdfnewwindowsettrue
```

```
    \Hy@pdfnewwindowtrue
  \fi
}
```

Option ‘pdfremotestartview’.

```
\define@key{href}{pdfremotestartview}{%
  \setkeys{Hyp}{pdfremotestartview={#1}}%
}
```

Option ‘pdfnewwindow’.

```
\let\KV@href@pdfnewwindow\KV@Hyp@pdfnewwindow
\let\KV@href@pdfnewwindow@default\KV@Hyp@pdfnewwindow@default
```

Option ‘ismap’.

```
\newif\ifHy@href@ismap
\define@key{href}{ismap}[true]{%
  \@ifundefined{Hy@href@ismap#1}{%
    \Hy@Error{%
      Invalid value (#1) for key `ismap'.\MessageBreak
      Permitted values are `true' or `false'.\MessageBreak
      Ignoring `ismap'%
    }\@ehc
  }{%
    \csname Hy@href@ismap#1\endcsname
  }%
}
```

Option ‘nextactionraw’.

```
\let\Hy@href@nextactionraw\@empty
\define@key{href}{nextactionraw}{%
  \edef\Hy@href@nextactionraw{#1}%
  \ifx\Hy@href@nextactionraw\@empty
  \else
    \Hy@Match\Hy@href@nextactionraw{}{%
      ^(\HyPat@ObjRef/|<<.*/S[ /].+>>|%
       \[( ?\HyPat@ObjRef/|<<.*/S[ /].+>>)+ ?])$%
    }{}{%
      \Hy@Warning{Invalid value for `nextactionraw':\MessageBreak
        \Hy@href@nextactionraw\MessageBreak
        The action is discarded%
      }%
    }%
    \ifx\Hy@href@nextactionraw\@empty
    \else
      \edef\Hy@href@nextactionraw{/Next \Hy@href@nextactionraw}%
    \fi
  \fi
}
\def\HyPat@ObjRef/{.+}
```

Load package url.sty and save the meaning of the original \url in \HyOrg@url.

```
\RequirePackage{url}
\let\HyOrg@url\url
\def\Hurl{\begingroup \Url}
\DeclareRobustCommand*{\nolinkurl}{\hyper@normalise\nolinkurl@}
\def\nolinkurl@#1{\Hurl{#1}}
```

```
\DeclareRobustCommand*{\url}{\hyper@normalise\url@}
\def\url@#1{\hyper@linkurl{\Hurl{#1}}{#1}}

\DeclareRobustCommand*{\hyperimage}{\hyper@normalise\hyper@image}
\providecommand\hyper@image[2]{#2}

\def\hypertarget#1#2{%
  \ifHy@nesting
    \hyper@@anchor{#1}{#2}%
  \else
    \hyper@@anchor{#1}{\relax}#2%
  \fi
}
```

\hyperref is more complicated, as it includes the concept of a category of link, used to make the name. This is not really used in this package. \hyperdef sets up an anchor in the same way. They each have three parameters of category, linkname, and marked text, and \hyperref also has a first parameter of URL. If there is an optional first parameter to \hyperdef, it is the name of a LaTeX label which can be used in a short form of \hyperref later, to avoid remembering the name and category.

```
\DeclareRobustCommand*{\hyperref}{%
  \@ifnextchar[{\Hy@babelnormalise\label@hyperref}\@hyperref
}
\def\Hy@babelnormalise#1[#2]{%
  \begingroup
    \Hy@safe@activestrue
    \let\protect\@unexpandable@protect
    \edef\Hy@tempa{%
      \endgroup
      \noexpand#1[{#2}]%
    }%
  \Hy@tempa
}
\def\@hyperref{\hyper@normalise\@@hyperref}
\def\@@hyperref#1#2#3{%
  \edef\ref@one{\ifx\\#2\\\else#2.\fi#3}%
  \expandafter\tryhyper@link\ref@one\\{#1}%
}
\def\tryhyper@link#1\\#2{%
  \hyper@@link{#2}{#1}%
}

\def\hyperdef{\@ifnextchar[{\label@hyperdef}{\@hyperdef}}
\def\@hyperdef#1#2#3{%, category, name, text
  \ifx\\#1\\%
    \def\Hy@AnchorName{#2}%
  \else
    \def\Hy@AnchorName{#1.#2}%
  \fi
  \ifHy@nesting
    \expandafter\hyper@@anchor\expandafter{\Hy@AnchorName}{#3}%
  \else
    \expandafter\hyper@@anchor\expandafter{\Hy@AnchorName}{\relax}#3%
  \fi
}
```

We also have a need to give a LaTeX *label* to a hyper reference, to ease the pain of referring to it later. \hyperrefundefinedlink may be redefined by a user to add colour or other formatting.

```
\let\hyperrefundefinedlink\@firstofone
\def\label@hyperref[#1]{%
  \expandafter\label@@hyperref\csname r@#1\endcsname{#1}%
}%
\def\label@@hyperref#1#2#3{%
  \ifx#1\relax
    \protect\G@refundefinedtrue
    \@latex@warning{%
      Hyper reference `#2' on page \thepage \space undefined%
    }%
    \begingroup
      \hyperrefundefinedlink{#3}%
    \endgroup
  \else
    \hyper@@link{\expandafter\@fifthoffive#1}%
      {\expandafter\@fourthoffive#1\@empty\@empty}{#3}%
  \fi
}
\def\label@hyperdef[#1]#2#3#4{% label name, category, name,
                              % anchor text
  \@bsphack
  \ifx\\#2\\%
    \def\Hy@AnchorName{#3}%
  \else
    \def\Hy@AnchorName{#2.#3}%
  \fi
  \if@filesw
    \protected@write\@auxout{}{%
      \string\newlabel{#1}{{}{}{}{}{\Hy@AnchorName}{}}%
    }%
  \fi
  \@esphack
  \ifHy@nesting
    \expandafter\hyper@@anchor\expandafter{\Hy@AnchorName}{#4}%
  \else
    \expandafter\hyper@@anchor\expandafter{\Hy@AnchorName}{\relax}#4%
  \fi
}
```

\hyperget To create manually bookmarks one need the destination name. If there is a label, the name can be retrieved with commands from refcount. Such a destination name must take \HyperDestNameFilter into account

```
\HyperDestNameFilter{\getrefbykeydefault{label}{anchor}{Doc-Start}}
```

To make this easier, we define \hyperget

```
\ExplSyntaxOn
\cs_new:Npn \hyperget #1 #2
 {
   \use:c { ___hyp_get_#1:n } { #2}
```

```
 }

\cs_new:Npn \___hyp__get_anchor:n  #1
 {
  \HyperDestNameFilter
   {
    \cs_if_exist:cTF {r@#1}
     {
      \tl_item:cn {r@#1}{4}
     }
     {
      Doc-Start
     }
   }
 }
\cs_new:Npn \___hyp__get_pageanchor:n  #1
 {
  \HyperDestNameFilter
   {
    \cs_if_exist:cTF {r@#1}
     {
      page. \tl_item:cn {r@#1}{2}
     }
     {
      Doc-Start
     }
   }
 }
\cs_new:Npn \___hyp__get_currentanchor:n  #1
 {
  \HyperDestNameFilter { \@currentHref }
 }
\ExplSyntaxOff
```

16.1 Link box support for XeTeX and dvipdfmx

```
\newdimen\XeTeXLinkMargin
\setlength{\XeTeXLinkMargin}{2pt}
\newcommand\XeTeXLinkBox[1]{}
\newcommand*{\XeTeXLink@space}{}

\newcommand\Hy@setup@XeTeXLinkBox@dvipdfmx
 {\font\XeTeXLink@font=pzdr at 1sp\relax
  \renewcommand*{\XeTeXLink@space}{%
   \begingroup
    \XeTeXLink@font
    \@xxxii
   \endgroup
  }%
  \renewcommand{\XeTeXLinkBox}[1]{%
   \begingroup
    \leavevmode
    \sbox\z@{##1}%
    \begingroup
```

```
      \dimen@=\dp\z@
      \advance\dimen@\XeTeXLinkMargin
      \setbox\tw@=\llap{%
        \hb@xt@\XeTeXLinkMargin{%
          \lower\dimen@\hbox{\XeTeXLink@space}%
          \hss
        }%
      }%
      \dp\tw@=\dp\z@
      \ht\tw@=\ht\z@
      \copy\tw@
    \endgroup
    \copy\z@
    \dimen@=\ht\z@
    \advance\dimen@\XeTeXLinkMargin
    \setbox\tw@=\rlap{%
      \hb@xt@\XeTeXLinkMargin{%
        \hss
        \raise\dimen@\hbox{\XeTeXLink@space}%
      }%
    }%
    \dp\tw@=\dp\z@
    \ht\tw@=\ht\z@
    \copy\tw@
  \endgroup
 }}

\newcommand\Hy@setup@XeTeXLinkBox@default{%
 \renewcommand*{\XeTeXLinkBox}[1]{%
   \begingroup
     \leavevmode
     \sbox\z@{##1}%
     \copy\z@
   \endgroup
 }}
\ExplSyntaxOn
\AddToHook{begindocument}{%
 \bool_lazy_or:nnTF{\sys_if_engine_xetex_p:}{\str_if_eq_p:on{\c_sys_back-
end_str}{dvipdfmx}}
   {\Hy@setup@XeTeXLinkBox@dvipdfmx}
   {\Hy@setup@XeTeXLinkBox@default}}
\ExplSyntaxOff
```

17 Underlying basic hypertext macros

Links have an optional type, a filename (possibly a URL), an internal name, and some marked text. (Caution: the internal name may contain babel shorthand characters.) If the second parameter is empty, its an internal link, otherwise we need to open another file or a URL. A link start has a type, and a URL.

```
\def\hyper@@link{\let\Hy@reserved@a\relax
 \@ifnextchar[{\hyper@link@}{\hyper@link@[link]}%
}
% #1: type
% #2: URL
```

```
% #3: destination name
% #4: text
\def\hyper@link@[#1]#2#3#4{%
  \Hy@ifempty{#4}{% link text
    \Hy@Warning{Suppressing empty link}%
  }{%
    \begingroup
      \protected@edef\Hy@tempa{#2}%
      \edef\Hy@tempb{#3}%
      \ifx\Hy@tempa\@empty
        \ifx\Hy@tempb\@empty
          \Hy@Warning{Suppressing link with empty target}%
          \toks@{%
            \endgroup
            \@secondoftwo
          }%
        \else
          \toks@{%
            \endgroup
            \hyper@link{#1}%
          }%
        \fi
      \else
        \toks@{%
          \endgroup
          \expandafter\hyper@readexternallink#2\\{#1}%
        }%
      \fi
      \Hy@safe@activesfalse
      \toks@\expandafter{%
        \the\expandafter\toks@
        \expandafter{\Hy@tempb}{#4}%
      }%
    \the\toks@
  }%
}
```

The problem here is that the first (URL) parameter may be a local `file:` reference (in which case some browsers treat it differently) or a genuine URL, in which case we'll have to activate a real Web browser. Note that a simple name is also a URL, as that is interpreted as a relative file name. We have to worry about `#` signs in a local file as well.

```
\def\hyper@readexternallink#1\\#2#3#4{%
  \begingroup
    \let\\\relax
  \expandafter\endgroup
  \expandafter\@@hyper@@readexternallink#1\\{#2}{#3}{#4}%
}
\def\@@hyper@@readexternallink#1\\#2#3#4{%
```

Parameters are:

1. The URL or file name
2. The type

3. The internal name

4. The link string

We need to get the 1st parameter properly expanded, so we delimit the arguments rather than passing it inside a group.

```
  \@hyper@readexternallink{#2}{#3}{#4}#1::\\{#1}%
}
```

Now (potentially), we are passed: 1) The link type 2) The internal name, 3) the link string, 4) the URL type (http, mailto, file etc), 5) the URL details 6) anything after a real : in the URL 7) the whole URL again

```
\def\@pdftempwordfile{file}%
\def\@pdftempwordrun{run}%
\def\@hyper@readexternallink#1#2#3#4:#5:#6\\#7{%
```

If there are no colons at all (#6 is blank), its a local file; if the URL type (#4) is blank, its probably a Mac filename, so treat it like a `file:` URL. The only flaw is if its a relative Mac path, with several colon-separated elements — then we lose. Such names must be prefixed with an explicit `dvi:`

```
  \ifx\\#6\\%
    \@hyper@linkfile file:#7\\{#3}{#2}{#7}%
  \else
    \ifx\\#4\\%
      \@hyper@linkfile file:#7\\{#3}{#2}{#7}%
    \else
```

If the URL type is 'file', pass it for local opening

```
      \def\@pdftempa{#4}%
      \ifx\@pdftempa\@pdftempwordfile
        \@hyper@linkfile#7\\{#3}{#2}{#7}%
      \else
```

if it starts 'run:', its to launch an application.

```
        \ifx\@pdftempa\@pdftempwordrun
          \ifHy@pdfa
            \Hy@Error{%
              PDF/A: Launch action is prohibited%
            }\@ehc
            \begingroup
              \leavevmode
              #2%
            \endgroup
          \else
            \@hyper@launch#7\\{#3}{#2}%
          \fi
        \else
```

otherwise its a URL

```
          \hyper@linkurl{#3}{#7\ifx\\#2\\\else\hyper@hash#2\fi}%
        \fi
      \fi
    \fi
  \fi
}
```

By default, turn run: into file:

```
\def\@hyper@launch run:#1\\#2#3{% filename, anchor text, linkname
  \hyper@linkurl{#2}{%
    \Hy@linkfileprefix
    #1%
    \ifx\\#3\\%
    \else
      \hyper@hash
      #3%
    \fi
  }%
}
```

D P Story <story@uakron.edu> pointed out that relative paths starting .. fell over. Switched to using \filename@parse to solve this.

```
\def\@hyper@linkfile file:#1\\#2#3#4{%
    %file url,link string, name, original uri
  \filename@parse{#1}%
  \ifx\filename@ext\relax
    \edef\filename@ext{\XR@ext}%
  \fi
  \def\use@file{\filename@area\filename@base.\filename@ext}%
  \Hy@IfStringEndsWith\filename@ext\XR@ext{%
    \hyper@linkfile{#2}{\use@file}{#3}%
  }{%
    \ifx\@baseurl\@empty
      \hyper@linkurl{#2}{%
        #4\ifx\\#3\\\else\hyper@hash#3\fi
      }%
    \else
      \hyper@linkurl{#2}{\use@file\ifx\\#3\\\else\hyper@hash#3\fi}%
    \fi
  }%
}
```

```
\def\Hy@IfStringEndsWith#1#2{%
  \begingroup
    \edef\x{#1}%
    \@onelevel@sanitize\x
    \edef\x{.\x$}%
    \edef\y{#2}%
    \@onelevel@sanitize\y
    \edef\y{.\y$}%
   \expandafter\def\expandafter\z\expandafter##\expandafter1\y##2\@nil{%
      \endgroup
      \ifx\relax##2\relax
        \expandafter\@secondoftwo
      \else
        \expandafter\@firstoftwo
      \fi
    }%
  \expandafter\expandafter\expandafter\z\expandafter\x\y\@nil
}
```

```
\def\Hy@StringLocalhost{localhost}
```

```
\@onelevel@sanitize\Hy@StringLocalhost
\def\Hy@CleanupFile#1{%
  \edef#1{#1}%
  \expandafter\Hy@@CleanupFile#1\hbox///\hbox\@nil{#1}%
}
\def\Hy@@CleanupFile#1//#2/#3\hbox#4\@nil#5{%
  \begingroup
    \toks@{\endgroup}%
    \def\x{#1}%
    \ifx\x\@empty
      \def\x{#2}%
      \ifx\x\@empty
        \toks@{\endgroup\def#5{/#3}}%
      \else
        \@onelevel@sanitize\x
        \ifx\x\Hy@StringLocalhost
          \toks@{\endgroup\def#5{/#3}}%
        \fi
      \fi
    \fi
  \the\toks@
}
```

Anchors have a name, and marked text. We have to be careful with the marked text, as if we break off part of something to put a `\special` around it, all hell breaks loose. Therefore, we check the category code of the first token, and only proceed if its safe. Tanmoy sorted this out.

A curious case arises if the original parameter was in braces. That means that `#2` comes here a multiple letters, and the `noexpand` just looks at the first one, putting the rest in the output. Yuck.

```
\long\def\hyper@@anchor#1#2{\@hyper@@anchor#1\relax#2\relax}
\long\def\@hyper@@anchor#1\relax#2#3\relax{%
  \ifx\\#1\\%
    #2\Hy@Warning{Ignoring empty anchor}%
  \else
    \def\anchor@spot{#2#3}%
    \let\put@me@back\@empty
    \ifx\relax#2\relax
    \else
      \ifHy@nesting
      \else
        \ifcat a\noexpand#2\relax
        \else
          \ifcat 0\noexpand#2 \relax
          \else
%           \typeout{Anchor start is not alphanumeric %
%             on input line\the\inputlineno%
%           }%
            \let\anchor@spot\@empty
            \def\put@me@back{#2#3}%
          \fi
        \fi
      \fi
    \fi
```

```
    \ifHy@activeanchor
      \anchor@spot
    \else
      \hyper@anchor{#1}%
    \fi
    \expandafter\put@me@back
  \fi
  \let\anchor@spot\@empty
}
\let\anchor@spot\@empty
```

18 Option 'destlabel'

```
\ifHy@destlabel
```

\hyper@newdestlabel

```
  \def\hyper@newdestlabel#1#2{%
    \begingroup
      \Hy@safe@activestrue
      \edef\x{\endgroup
        \noexpand\@newl@bel{HyDL}{#1}{#2}%
      }%
    \x
  }%
```

\hyper@destlabel@hook

```
  \providecommand*{\hyper@destlabel@hook}{}%
```

\Hy@DestRename

```
  \newcommand*{\Hy@DestRename}[2]{%
    \@ifundefined{HyDL!#1}{%
      \begingroup
        \Hy@safe@activestrue
        \edef\dest@name{#1}%
        \edef\label@name{#2}%
        \hyper@destlabel@hook
        \Hy@IsNotEmpty{dest@name}{%
          \Hy@IsNotEmpty{label@name}{%
            \global\expandafter
            \let\csname HyDL!#1\endcsname\@empty
            \if@filesw
              \protected@write\@auxout{}{%
                \string\hyper@newdestlabel
                {#1}%
                {\label@name}%
              }%
            \fi
          }%
        }%
      \endgroup
    }{}%
  }%
```

```
\HyperDestRename
                    \newcommand*{\HyperDestRename}[2]{%
                      \AtBeginDocument{%
                        \Hy@DestRename{#1}{#2}%
                      }%
                    }%
                    \AtBeginDocument{%
                      \let\HyperDestRename\Hy@DestRename
                    }%

  \Hy@IsNotEmpty
                    \def\Hy@IsNotEmpty#1{%
                      \@ifundefined{#1}\@gobble{%
                        \expandafter\ifx\csname#1\endcsname\@empty
                          \expandafter\@gobble
                        \else
                          \expandafter\@firstofone
                        \fi
                      }%
                    }%

                    \Hy@GlobalAppendToMacro\label@hook{%
                      \HyperDestRename\@currentHref\label@name
                    }%

\HyperDestLabelReplace
                    \def\HyperDestLabelReplace#1{%
                      \@ifundefined{HyDL@#1}{%
                        #1%
                      }{%
                        \csname HyDL@#1\endcsname
                      }%
                    }%

  \HyperDestNameFilter
                    \let\HyperDestNameFilter\HyperDestLabelReplace

                    \else

    \hyper@newdestlabel
                      \let\hyper@newdestlabel\@gobbletwo

\HyperDestLabelReplace
                      \let\HyperDestLabelReplace\@firstofone

      \HyperDestRename
                      \let\HyperDestRename\@gobbletwo

                    \fi
                    \Hy@DisableOption{destlabel}
```

Provide a dummy default definition of \hyper@newdestlabel inside the .aux files.

```
\AddToHook{include/before}
 {\immediate\write\@partaux{\string\providecommand\string\hyper@newdestlabel[2]{}}}
\AddToHook{begindocument}
 {\immediate\write\@mainaux{\string\providecommand\string\hyper@newdestlabel[2]{}}}
```

19 Forms creation

Allow for creation of PDF or HTML forms. The effects here are limited somewhat by the need to support both output formats, so it may not be as clever as something which only wants to make PDF forms.

I (Sebastian) could not have started this without the encouragement of T V Raman.

19.1 Field flags

The field flags are organized in a bit set.

```
\RequirePackage{bitset}
```

Each flag has a option name, an \if switch, and a bit position. The default is always 'false', the flag is clear. This is also the default of the switch created by \newif.

The names of the flags in the PDF specification (1.7) are used as lowercase option names.

\HyField@NewFlag #1: type: F annot flags, Ff field flags
#2: PDF name
#3: PDF position

```
\def\HyField@NewFlag#1#2{%
  \lowercase{\HyField@NewOption{#2}}%
  \lowercase{\HyField@NewBitsetFlag{#2}}{#2}{#1}%
}
```

\HyField@NewFlagOnly

```
\def\HyField@NewFlagOnly#1#2{%
  \lowercase{\HyField@NewBitsetFlag{#2}}{#2}{#1}%
}
```

\HyField@NewOption #1: option name

```
\def\HyField@NewOption#1{%
  \expandafter\newif\csname ifFld@#1\endcsname
  \define@key{Field}{#1}[true]{%
    \lowercase{\Field@boolkey{##1}}{#1}%
  }%
}
```

\HyField@NewBitsetFlag Package 'bitset' uses zero based positions, the PDF specification starts with one.
#1: option
#2: PDF name

#3: type: F annot flags, Ff field flags
#4: PDF position

```
\def\HyField@NewBitsetFlag#1#2#3#4{%
  \begingroup
    \count@=#4\relax
    \advance\count@\m@ne
    \def\x##1{%
      \endgroup
      \expandafter\def\csname HyField@#3@#1\endcsname{##1}%
      \expandafter\ifx\csname HyField@#3@##1\endcsname\relax
        \expandafter\edef\csname HyField@#3@##1\endcsname{%
          (\number#4) #2%
        }%
      \else
        \expandafter\edef\csname HyField@#3@##1\endcsname{%
          \csname HyField@#3@##1\endcsname
          /#2%
        }%
      \fi
    }%
  \expandafter\x\expandafter{\the\count@}%
}
```

\HyField@UseFlag The bit set is HyField@#1

```
\def\HyField@UseFlag#1#2{%
  \lowercase{\HyField@@UseFlag{#2}}{#1}%
}
```

\HyField@@UseFlag

```
\def\HyField@@UseFlag#1#2{%
  \bitsetSetValue{HyField@#2}{%
    \csname HyField@#2@#1\endcsname
  }{%
    \csname ifFld@#1\endcsname 1\else 0\fi
  }%
}
```

\HyField@SetFlag The bit set is HyField@#1

```
\def\HyField@SetFlag#1#2{%
  \lowercase{\HyField@@SetFlag{#2}}{#1}%
}
```

\HyField@@SetFlag

```
\def\HyField@@SetFlag#1#2{%
  \bitsetSetValue{HyField@#2}{%
    \csname HyField@#2@#1\endcsname
  }{1}%
}
```

\HyField@PrintFlags

```
\def\HyField@PrintFlags#1#2{%
  \ifHy@verbose
    \begingroup
```

```
    \let\Hy@temp\@empty
    \let\MessageBreak\relax
    \expandafter\@for\expandafter\x\expandafter:\expandafter=%
    \bitsetGetSetBitList{HyField@#1}\do{%
      \edef\Hy@temp{%
        \Hy@temp
        \csname HyField@#1@\x\endcsname\MessageBreak
      }%
    }%
  \edef\x{\endgroup
    \noexpand\Hy@Info{%
      Field flags: %
        \expandafter\ifx\@car#1\@nil S\else/\fi
        #1 %
        \bitsetGetDec{HyField@#1} %
        (0x\bitsetGetHex{HyField@#1}{32})\MessageBreak
      \Hy@temp
      for #2%
    }%
  }\x
 \fi
}
```

19.1.1 Declarations of field flags

"Table 8.70 Field flags common to all field types"

```
\HyField@NewFlag{Ff}{ReadOnly}{1}
\HyField@NewFlag{Ff}{Required}{2}
\HyField@NewFlag{Ff}{NoExport}{3}
```

"Table 8.75 Field flags specific to button fields"

```
\HyField@NewFlag{Ff}{NoToggleToOff}{15}
\HyField@NewFlag{Ff}{Radio}{16}
\HyField@NewFlag{Ff}{Pushbutton}{17}
\HyField@NewFlag{Ff}{RadiosInUnison}{26}
```

"Table 8.77 Field flags specific to text fields"

```
\HyField@NewFlag{Ff}{Multiline}{13}
\HyField@NewFlag{Ff}{Password}{14}
\HyField@NewFlag{Ff}{FileSelect}{21}% PDF 1.4
\HyField@NewFlag{Ff}{DoNotSpellCheck}{23}% PDF 1.4
\HyField@NewFlag{Ff}{DoNotScroll}{24}% PDF 1.4
\HyField@NewFlag{Ff}{Comb}{25}% PDF 1.4
\HyField@NewFlag{Ff}{RichText}{26}% PDF 1.5
```

"Table 8.79 field flags specific to choice fields"

```
\HyField@NewFlag{Ff}{Combo}{18}
\HyField@NewFlag{Ff}{Edit}{19}
\HyField@NewFlag{Ff}{Sort}{20}
\HyField@NewFlag{Ff}{MultiSelect}{22}% PDF 1.4
% \HyField@NewFlag{Ff}{DoNotSpellCheck}{23}% PDF 1.4
\HyField@NewFlag{Ff}{CommitOnSelChange}{27}% PDF 1.5
```

Signature fields are not supported.

Until 6.76i hyperref uses field option 'combo' to set three flags 'Combo', 'Edit', and 'Sort'. Option 'popdown' sets flag 'Combo' only.

```
\newif\ifFld@popdown
\define@key{Field}{popdown}[true]{%
  \lowercase{\Field@boolkey{#1}}{popdown}%
}
```

Annotation flags. The form objects are widget annotations. There are two flags for readonly settings, the one in the annotation flags is ignored, instead the other in the field flags is used.

Flag Print is not much useful, because hyperref do not use the appearance entry of the annotations for most fields.

```
\HyField@NewFlag{F}{Invisible}{1}
\HyField@NewFlag{F}{Hidden}{2}% PDF 1.2
\HyField@NewFlag{F}{Print}{3}% PDF 1.2
\HyField@NewFlag{F}{NoZoom}{4}% PDF 1.2
\HyField@NewFlag{F}{NoRotate}{5}% PDF 1.3
\HyField@NewFlag{F}{NoView}{6}% PDF 1.3
\HyField@NewFlag{F}{Locked}{8}% PDF 1.4
\HyField@NewFlag{F}{ToggleNoView}{9}% PDF 1.5
\HyField@NewFlag{F}{LockedContents}{10}% PDF 1.7
```

```
\ifHy@pdfa
  \def\HyField@PDFAFlagWarning#1#2{%
    \Hy@Warning{%
      PDF/A: Annotation flag `#1' must\MessageBreak
      be set to `#2'%
    }%
  }%
  \Fld@invisiblefalse
  \def\Fld@invisibletrue{%
    \HyField@PDFAFlagWarning{invisible}{false}%
  }%
  \Fld@hiddenfalse
  \def\Fld@hiddentrue{%
    \HyField@PDFAFlagWarning{hidden}{false}%
  }%
  \Fld@printtrue
  \def\Fld@printfalse{%
    \HyField@PDFAFlagWarning{print}{true}%
  }%
  \Fld@nozoomtrue
  \def\Fld@nozoomfalse{%
    \HyField@PDFAFlagWarning{nozoom}{true}%
  }%
  \Fld@norotatetrue
  \def\Fld@norotatefalse{%
    \HyField@PDFAFlagWarning{norotate}{true}%
  }%
  \Fld@noviewfalse
  \def\Fld@noviewtrue{%
    \HyField@PDFAFlagWarning{noview}{false}%
  }%
\fi
```

Submit flags. Flag 1 Include/Exclude is not supported, use option noexport instead.

```
\HyField@NewFlag{Submit}{IncludeNoValueFields}{2}
\HyField@NewFlagOnly{Submit}{ExportFormat}{3}
\HyField@NewFlag{Submit}{GetMethod}{4}
\HyField@NewFlag{Submit}{SubmitCoordinates}{5}
\HyField@NewFlagOnly{Submit}{XFDF}{6}
\HyField@NewFlag{Submit}{IncludeAppendSaves}{7}
\HyField@NewFlag{Submit}{IncludeAnnotations}{8}
\HyField@NewFlagOnly{Submit}{SubmitPDF}{9}
\HyField@NewFlag{Submit}{CanonicalFormat}{10}
\HyField@NewFlag{Submit}{ExclNonUserAnnots}{11}
\HyField@NewFlag{Submit}{ExclFKey}{12}
\HyField@NewFlag{Submit}{EmbedForm}{14}
```

```
\define@key{Field}{export}{%
  \lowercase{\def\Hy@temp{#1}}%
  \@ifundefined{Fld@export@\Hy@temp}{%
    \@onelevel@sanitize\Hy@temp
    \Hy@Error{%
      Unknown export format `\Hy@temp'.\MessageBreak
      Known formats are `FDF', `HTML', `XFDF', and `PDF'%
    }\@ehc
  }{%
    \let\Fld@export\Hy@temp
  }%
}
\def\Fld@export{fdf}
\@namedef{Fld@export@fdf}{0}%
\@namedef{Fld@export@html}{1}%
\@namedef{Fld@export@xfdf}{2}%
\@namedef{Fld@export@pdf}{3}%
```

19.1.2 Set submit flags

\HyField@FlagsSubmit

```
\def\HyField@FlagsSubmit{%
  \bitsetReset{HyField@Submit}%
  \ifcase\@nameuse{Fld@export@\Fld@export} %
    % FDF
    \HyField@UseFlag{Submit}{IncludeNoValueFields}%
    \HyField@UseFlag{Submit}{SubmitCoordinates}%
    \HyField@UseFlag{Submit}{IncludeAppendSaves}%
    \HyField@UseFlag{Submit}{IncludeAnnotations}%
    \HyField@UseFlag{Submit}{CanonicalFormat}%
    \HyField@UseFlag{Submit}{ExclNonUserAnnots}%
    \HyField@UseFlag{Submit}{ExclFKey}%
    \HyField@UseFlag{Submit}{EmbedForm}%
  \or % HTML
    \HyField@SetFlag{Submit}{ExportFormat}%
    \HyField@UseFlag{Submit}{IncludeNoValueFields}%
    \HyField@UseFlag{Submit}{GetMethod}%
    \HyField@UseFlag{Submit}{SubmitCoordinates}%
    \HyField@UseFlag{Submit}{CanonicalFormat}%
```

```
  \or % XFDF
    \HyField@SetFlag{Submit}{XFDF}%
    \HyField@UseFlag{Submit}{IncludeNoValueFields}%
    \HyField@UseFlag{Submit}{SubmitCoordinates}%
    \HyField@UseFlag{Submit}{CanonicalFormat}%
  \or % PDF
    \HyField@SetFlag{Submit}{SubmitPDF}%
    \HyField@UseFlag{Submit}{GetMethod}%
  \fi
  \HyField@PrintFlags{Submit}{submit button field}%
  \bitsetIsEmpty{HyField@Submit}{%
    \let\Fld@submitflags\@empty
  }{%
    \edef\Fld@submitflags{/Flags \bitsetGetDec{HyField@Submit}}%
  }%
}
```

19.1.3 Set annot flags in fields

\HyField@FlagsAnnot

```
\def\HyField@FlagsAnnot#1{%
  \bitsetReset{HyField@F}%
  \HyField@UseFlag{F}{Invisible}%
  \HyField@UseFlag{F}{Hidden}%
  \HyField@UseFlag{F}{Print}%
  \HyField@UseFlag{F}{NoZoom}%
  \HyField@UseFlag{F}{NoRotate}%
  \HyField@UseFlag{F}{NoView}%
  \HyField@UseFlag{F}{Locked}%
  \HyField@UseFlag{F}{ToggleNoView}%
  \HyField@UseFlag{F}{LockedContents}%
  \HyField@PrintFlags{F}{#1}%
  \bitsetIsEmpty{HyField@F}{%
    \let\Fld@annotflags\@empty
  }{%
    \edef\Fld@annotflags{/F \bitsetGetDec{HyField@F}}%
  }%
}
```

19.1.4 Pushbutton field

\HyField@FlagsPushButton

```
\def\HyField@FlagsPushButton{%
  \HyField@FlagsAnnot{push button field}%
  \bitsetReset{HyField@Ff}%
  \HyField@UseFlag{Ff}{ReadOnly}%
  \HyField@UseFlag{Ff}{Required}%
  \HyField@UseFlag{Ff}{NoExport}%
  \HyField@SetFlag{Ff}{Pushbutton}%
  \HyField@PrintFlags{Ff}{push button field}%
  \bitsetIsEmpty{HyField@Ff}{%
    \let\Fld@flags\@empty
  }{%
```

```
    \edef\Fld@flags{/Ff \bitsetGetDec{HyField@Ff}}%
  }%
}
```

19.1.5 Check box field

\HyField@FlagsCheckBox

```
\def\HyField@FlagsCheckBox{%
  \HyField@FlagsAnnot{check box field}%
  \bitsetReset{HyField@Ff}%
  \HyField@UseFlag{Ff}{ReadOnly}%
  \HyField@UseFlag{Ff}{Required}%
  \HyField@UseFlag{Ff}{NoExport}%
  \HyField@PrintFlags{Ff}{check box field}%
  \bitsetIsEmpty{HyField@Ff}{%
    \let\Fld@flags\@empty
  }{%
    \edef\Fld@flags{/Ff \bitsetGetDec{HyField@Ff}}%
  }%
}
```

19.1.6 Radio button field

\HyField@FlagsRadioButton

```
\def\HyField@FlagsRadioButton{%
  \HyField@FlagsAnnot{radio button field}%
  \bitsetReset{HyField@Ff}%
  \HyField@UseFlag{Ff}{ReadOnly}%
  \HyField@UseFlag{Ff}{Required}%
  \HyField@UseFlag{Ff}{NoExport}%
  \HyField@UseFlag{Ff}{NoToggleToOff}%
  \HyField@SetFlag{Ff}{Radio}%
  \HyField@UseFlag{Ff}{RadiosInUnison}%
  \HyField@PrintFlags{Ff}{radio button field}%
  \bitsetIsEmpty{HyField@Ff}{%
    \let\Fld@flags\@empty
  }{%
    \edef\Fld@flags{/Ff \bitsetGetDec{HyField@Ff}}%
  }%
}
```

19.1.7 Text fields

\HyField@FlagsText

```
\def\HyField@FlagsText{%
  \HyField@FlagsAnnot{text field}%
  \bitsetReset{HyField@Ff}%
  \HyField@UseFlag{Ff}{ReadOnly}%
  \HyField@UseFlag{Ff}{Required}%
  \HyField@UseFlag{Ff}{NoExport}%
  \HyField@UseFlag{Ff}{Multiline}%
  \HyField@UseFlag{Ff}{Password}%
  \HyField@UseFlag{Ff}{FileSelect}%
```

```
  \HyField@UseFlag{Ff}{DoNotSpellCheck}%
  \HyField@UseFlag{Ff}{DoNotScroll}%
  \ifFld@comb
    \ifcase0\ifFld@multiline
          \else\ifFld@password
          \else\ifFld@fileselect
          \else 1\fi\fi\fi\relax
      \Hy@Error{%
        Field option `comb' cannot used together with\MessageBreak
        `multiline', `password', or `fileselect'%
      }\@ehc
    \else
      \HyField@UseFlag{Ff}{Comb}%
    \fi
  \fi
  \HyField@UseFlag{Ff}{RichText}%
  \HyField@PrintFlags{Ff}{text field}%
  \bitsetIsEmpty{HyField@Ff}{%
    \let\Fld@flags\@empty
  }{%
    \edef\Fld@flags{/Ff \bitsetGetDec{HyField@Ff}}%
  }%
}
```

19.1.8 Choice fields

\HyField@FlagsChoice

```
\def\HyField@FlagsChoice{%
  \HyField@FlagsAnnot{choice field}%
  \bitsetReset{HyField@Ff}%
  \HyField@UseFlag{Ff}{ReadOnly}%
  \HyField@UseFlag{Ff}{Required}%
  \HyField@UseFlag{Ff}{NoExport}%
  \HyField@UseFlag{Ff}{Combo}%
  \ifFld@combo
    \HyField@UseFlag{Ff}{Edit}%
  \fi
  \HyField@UseFlag{Ff}{Sort}%
  \HyField@UseFlag{Ff}{MultiSelect}%
  \ifFld@combo
    \ifFld@edit
      \HyField@UseFlag{Ff}{DoNotSpellCheck}%
    \fi
  \fi
  \HyField@UseFlag{Ff}{CommitOnSelChange}%
  \HyField@PrintFlags{Ff}{choice field}%
  \bitsetIsEmpty{HyField@Ff}{%
    \let\Fld@flags\@empty
  }{%
    \edef\Fld@flags{/Ff \bitsetGetDec{HyField@Ff}}%
  }%
}
```

19.2 Choice field

\HyField@PDFChoices #1: list of choices in key value syntax, key = exported name, value = displayed text.
Input: \Fld@default, \Fld@value, \ifFld@multiselect
Result: \Fld@choices with entries: /Opt, /DV, /V, /I.

```
\def\HyField@PDFChoices#1{%
  \begingroup
    \global\let\Fld@choices\@empty
    \let\HyTmp@optlist\@empty
    \let\HyTmp@optitem\relax
    \count@=0 %
    \kv@parse{#1}{%
      \Hy@pdfstringdef\kv@key\kv@key
      \ifx\kv@value\relax
     \ifnum\Hy@pdf@majorminor@version<103 % implementation note 122, PDF spec 1.7
          \xdef\Fld@choices{\Fld@choices[(\kv@key)(\kv@key)]}%
        \else
          \xdef\Fld@choices{\Fld@choices(\kv@key)}%
        \fi
      \else
        \Hy@pdfstringdef\kv@value\kv@value
        \xdef\Fld@choices{\Fld@choices[(\kv@value)(\kv@key)]}%
      \fi
      \edef\HyTmp@optlist{%
        \HyTmp@optlist
        \HyTmp@optitem{\the\count@}{\kv@key}0%
      }%
      \advance\count@ by 1 %
      \@gobbletwo
    }%
    \xdef\Fld@choices{/Opt[\Fld@choices]}%
    \ifFld@multiselect
      \HyField@@PDFChoices{DV}\Fld@default
      \HyField@@PDFChoices{V}\Fld@value
    \else
      \ifx\Fld@default\relax
      \else
        \xdef\Fld@choices{\Fld@choices/DV(\Fld@default)}%
      \fi
      \ifx\Fld@value\relax
      \else
        \xdef\Fld@choices{\Fld@choices/V(\Fld@value)}%
      \fi
    \fi
  \endgroup
}
```

\HyField@@PDFChoices

```
\def\HyField@@PDFChoices#1#2{%
  \ifx#2\relax
  \else
    \count@=0 %
    \def\HyTmp@optitem##1##2##3{%
```

```
    \def\HyTmp@key{##2}%
    \ifx\HyTmp@key\Hy@gtemp
      \expandafter\def\expandafter\HyTmp@optlist\expandafter{%
        \HyTmp@optlist
        \HyTmp@optitem{##1}{##2}1%
      }%
      \let\HyTmp@found=Y%
    \else
      \expandafter\def\expandafter\HyTmp@optlist\expandafter{%
        \HyTmp@optlist
        \HyTmp@optitem{##1}{##2}##3%
      }%
    \fi
  }%
  \expandafter\comma@parse\expandafter{#2}{%
    \pdfstringdef\Hy@gtemp\comma@entry
    \let\HyTmp@found=N %
    \expandafter\let\expandafter\HyTmp@optlist\expandafter\@empty
    \HyTmp@optlist
    \ifx\HyTmp@found Y%
      \advance\count@ by 1 %
    \else
      \@onelevel@sanitize\comma@entry
      \PackageWarning{hyperref}{%
        \string\ChoiceBox: Ignoring value `\comma@entry',%
        \MessageBreak
        it cannot be found in the choices%
      }%
    \fi
    \@gobble
  }%
  \def\HyTmp@optitem##1##2##3{%
    \ifnum##3=1 %
      (##2)%
    \fi
  }%
  \ifcase\count@
  \or
    \xdef\Fld@choices{\Fld@choices/#1\HyTmp@optlist}%
  \else
    \xdef\Fld@choices{\Fld@choices/#1[\HyTmp@optlist]}%
    \ifx#1V%
      \def\HyTmp@optitem##1##2##3{%
        \ifnum##3=1 %
          \@firstofone{ ##1}%
        \fi
      }%
      \edef\HyTmp@optlist{\HyTmp@optlist}%
      \xdef\Fld@choices{%
        \Fld@choices
        /I[\expandafter\@firstofone\HyTmp@optlist]%
      }%
    \fi
  \fi
```

```
  \fi
}
```

19.3 Forms

\HyField@SetKeys

```
\def\HyField@SetKeys{%
  \kvsetkeys{Field}%
}

\newif\ifFld@checked
\newif\ifFld@disabled
\Fld@checkedfalse
\Fld@disabledfalse
\newcount\Fld@menulength
\newdimen\Field@Width
\newdimen\Fld@charsize
\Fld@charsize=10\p@
\def\Fld@maxlen{0}
\def\Fld@align{0}
\def\Fld@color{0 0 0 rg}
\def\Fld@bcolor{1 1 1}
\def\Fld@bordercolor{1 0 0}
\def\Fld@bordersep{1\p@}
\def\Fld@borderwidth{1}
\def\Fld@borderstyle{S}
\def\Fld@cbsymbol{4}
\def\Fld@radiosymbol{H}
\def\Fld@rotation{0}
\def\Form{\@ifnextchar[{\@Form}{\@Form[]}}
\def\endForm{\@endForm}
\newif\ifForm@html
\Form@htmlfalse
\def\Form@boolkey#1#2{%
  \csname Form@#2\ifx\relax#1\relax true\else#1\fi\endcsname
}
\define@key{Form}{action}{%
  \hyper@normalise\Hy@DefFormAction{#1}%
}
\def\Hy@DefFormAction{\def\Form@action}
\def\enc@@html{html}
\define@key{Form}{encoding}{%
  \def\Hy@tempa{#1}%
  \ifx\Hy@tempa\enc@@html
    \Form@htmltrue
    \def\Fld@export{html}%
  \else
    \Hy@Warning{%
      Form `encoding' key with \MessageBreak
      unknown value `#1'%
    }%
    \Form@htmlfalse
  \fi
}
```

```
\define@key{Form}{method}{%
  \lowercase{\def\Hy@temp{#1}}%
  \@ifundefined{Form@method@\Hy@temp}{%
    \@onelevel@sanitize\Hy@temp
    \Hy@Error{%
      Unknown method `\Hy@temp'.\MessageBreak
      Known values are `post' and `get'%
    }\@ehc
  }{%
    \let\Form@method\Hy@temp
    \ifcase\@nameuse{Form@method@\Hy@temp} %
      \Fld@getmethodfalse
    \else
      \Fld@getmethodtrue
    \fi
  }%
}
\def\Form@method{}
\@namedef{Form@method@post}{0}
\@namedef{Form@method@get}{1}
\newif\ifHyField@NeedAppearances
\def\HyField@NeedAppearancesfalse{%
  \global\let\ifHyField@NeedAppearances\iffalse
}
\def\HyField@NeedAppearancestrue{%
  \global\let\ifHyField@NeedAppearances\iftrue
}
\HyField@NeedAppearancestrue
\define@key{Form}{NeedAppearances}[true]{%
  \edef\Hy@tempa{#1}%
  \ifx\Hy@tempa\Hy@true
    \HyField@NeedAppearancestrue
  \else
    \ifx\Hy@tempa\Hy@false
      \HyField@NeedAppearancesfalse
    \else
      \Hy@Error{%
        Unexpected value `\Hy@tempa'\MessageBreak
        of option `NeedAppearances' instead of\MessageBreak
        `true' or `false'%
      }\@ehc
    \fi
  \fi
}
\def\Field@boolkey#1#2{%
  \csname Fld@#2\ifx\relax#1\relax true\else#1\fi\endcsname
}
\ifHy@texht
  \newtoks\Field@toks
  \Field@toks={ }%
  \def\Field@addtoks#1#2{%
    \edef\@processme{\Field@toks{\the\Field@toks\space #1="#2"}}%
    \@processme
  }%
```

```
\else
  \def\Hy@WarnHTMLFieldOption#1{%
    \Hy@Warning{%
      HTML field option `#1'\MessageBreak
      is ignored%
    }%
  }%
\fi
\def\Fld@checkequals#1=#2=#3\\{%
  \def\@currDisplay{#1}%
  \ifx\\#2\\%
    \def\@currValue{#1}%
  \else
    \def\@currValue{#2}%
  \fi
 \expandafter\Hy@pdfstringdef\expandafter\@currValue\expandafter{\@currValue}%
}
\define@key{Field}{loc}{%
  \def\Fld@loc{#1}%
}
\define@key{Field}{checked}[true]{%
  \lowercase{\Field@boolkey{#1}}{checked}%
}
\define@key{Field}{disabled}[true]{%
  \lowercase{\Field@boolkey{#1}}{disabled}%
}
\ifHy@texht
  \define@key{Field}{accesskey}{%
    \Field@addtoks{accesskey}{#1}%
  }%
  \define@key{Field}{tabkey}{%
    \Field@addtoks{tabkey}{#1}%
  }%
\else
  \define@key{Field}{accesskey}{%
    \Hy@WarnHTMLFieldOption{accesskey}%
  }%
  \define@key{Field}{tabkey}{%
    \Hy@WarnHTMLFieldOption{tabkey}%
  }%
\fi
\define@key{Field}{name}{%
  \def\Fld@name{#1}%
}
\let\Fld@altname\relax
\define@key{Field}{altname}{%
  \def\Fld@altname{#1}%
}
\let\Fld@mappingname\relax
\define@key{Field}{mappingname}{%
  \def\Fld@mappingname{#1}%
}
\define@key{Field}{width}{%
  \def\Fld@width{#1}%
```

```
  \Field@Width#1\setbox0=\hbox{m}%
}
\define@key{Field}{maxlen}{%
  \def\Fld@maxlen{#1}%
}
\define@key{Field}{menulength}{%
  \Fld@menulength=#1\relax
}
\define@key{Field}{height}{%
  \def\Fld@height{#1}%
}
\define@key{Field}{charsize}{%
  \setlength{\Fld@charsize}{#1}%
}
\define@key{Field}{borderwidth}{%
  \Hy@defaultbp\Fld@borderwidth{#1}%
}
\def\Hy@defaultbp#1#2{%
  \begingroup
  \afterassignment\Hy@defaultbpAux
  \dimen@=#2bp\relax{#1}{#2}%
}
\def\Hy@defaultbpAux#1\relax#2#3{%
  \ifx!#1!%
    \endgroup
    \def#2{#3}%
  \else
    \edef\x{\endgroup
      \def\noexpand#2{%
        \strip@pt\dimexpr\dimen@*800/803\relax
      }%
    }\x
  \fi
}%
\define@key{Field}{borderstyle}{%
  \let\Hy@temp\Fld@borderstyle
  \def\Fld@borderstyle{#1}%
  \Hy@Match\Fld@borderstyle{}{%
    ^[SDBIU]$%
  }{}{%
    \Hy@Warning{%
      Invalid value `\@pdfborderstyle'\MessageBreak
      for option `pdfborderstyle'. Valid values:\MessageBreak
      \space\space S (Solid), D (Dashed), B (Beveled),\MessageBreak
      \space\space I (Inset), U (Underline)\MessageBreak
      Option setting is ignored%
    }%
    \let\Fld@borderstyle\Hy@temp
  }%
}
\define@key{Field}{bordersep}{%
  \def\Fld@bordersep{#1}%
}
\define@key{Field}{default}{%
```

```
  \Hy@pdfstringdef\Fld@default{#1}%
}
\define@key{Field}{align}{%
  \def\Fld@align{#1}%
}
\define@key{Field}{value}{%
  \Hy@pdfstringdef\Fld@value{#1}%
}
\define@key{Field}{checkboxsymbol}{%
  \Fld@DingDef\Fld@cbsymbol{#1}%
}
\define@key{Field}{radiosymbol}{%
  \Fld@DingDef\Fld@radiosymbol{#1}%
}
\def\Fld@DingDef#1#2{%
  \let\Fld@temp\@empty
  \Fld@@DingDef#2\ding{}\@nil
  \let#1\Fld@temp
}
\def\Fld@@DingDef#1\ding#2#3\@nil{%
  \expandafter\def\expandafter\Fld@temp\expandafter{%
    \Fld@temp
    #1%
  }%
  \ifx\\#3\\%
    \expandafter\@gobble
  \else
    \begingroup
      \lccode`0=#2\relax
    \lowercase{\endgroup
      \expandafter\def\expandafter\Fld@temp\expandafter{%
        \Fld@temp
        0%
      }%
    }%
    \expandafter\@firstofone
  \fi
  {%
    \Fld@@DingDef#3\@nil
  }%
}
\define@key{Field}{rotation}{%
  \def\Fld@rotation{#1}%
}
\define@key{Field}{backgroundcolor}{%
  \HyColor@FieldBColor{#1}\Fld@bcolor{hyperref}{backgroundcolor}%
}
\define@key{Field}{bordercolor}{%
  \HyColor@FieldBColor{#1}\Fld@bordercolor{hyperref}{bordercolor}%
}
\define@key{Field}{color}{%
  \HyColor@FieldColor{#1}\Fld@color{hyperref}{color}%
}
```

```
\let\Fld@onclick@code\@empty
\let\Fld@format@code\@empty
\let\Fld@validate@code\@empty
\let\Fld@calculate@code\@empty
\let\Fld@keystroke@code\@empty
\let\Fld@onfocus@code\@empty
\let\Fld@onblur@code\@empty
\let\Fld@onmousedown@code\@empty
\let\Fld@onmouseup@code\@empty
\let\Fld@onenter@code\@empty
\let\Fld@onexit@code\@empty
\def\Hy@temp#1{%
  \expandafter\Hy@@temp\csname Fld@#1@code\endcsname{#1}%
}
\def\Hy@@temp#1#2{%
  \ifHy@pdfa
    \define@key{Field}{#2}{%
      \Hy@Error{%
        PDF/A: Additional action `#2' is prohibited%
      }\@ehc
    }%
  \else
    \define@key{Field}{#2}{%
      \def#1{##1}%
    }%
  \fi
}
\Hy@temp{keystroke}
\Hy@temp{format}
\Hy@temp{validate}
\Hy@temp{calculate}
\Hy@temp{onfocus}
\Hy@temp{onblur}
\Hy@temp{onmousedown}
\Hy@temp{onmouseup}
\Hy@temp{onenter}
\Hy@temp{onexit}

\let\Fld@calculate@sortkey\@empty
\define@key{Field}{calculatesortkey}[1]{%
  \def\Fld@calculate@sortkey{#1}%
}

\ifHy@texht
  \def\Hy@temp#1{%
    \define@key{Field}{#1}{%
      \Field@addtoks{#1}{##1}%
    }%
  }%
\else
  \def\Hy@temp#1{%
    \define@key{Field}{#1}{%
      \Hy@WarnHTMLFieldOption{#1}%
    }%
  }%
```

```
\fi
\Hy@temp{ondblclick}
\Hy@temp{onmouseover}
\Hy@temp{onmousemove}
\Hy@temp{onmouseout}
\Hy@temp{onkeydown}
\Hy@temp{onkeyup}
\Hy@temp{onselect}
\Hy@temp{onchange}
\Hy@temp{onkeypress}
\ifHy@texht
  \define@key{Field}{onclick}{%
    \Field@addtoks{onclick}{#1}%
  }%
\else
  \ifHy@pdfa
    \define@key{Field}{onclick}{%
      \Hy@Error{%
        PDF/A: Action `onclick' is prohibited%
      }\@ehc
    }%
  \else
    \define@key{Field}{onclick}{%
      \def\Fld@onclick@code{#1}%
    }%
  \fi
\fi
\DeclareRobustCommand\TextField{%
  \@ifnextchar[{\@TextField}{\@TextField[]}%
}
\DeclareRobustCommand\ChoiceMenu{%
  \@ifnextchar[{\@ChoiceMenu}{\@ChoiceMenu[]}%
}
\DeclareRobustCommand\CheckBox{%
  \@ifnextchar[{\@CheckBox}{\@CheckBox[]}%
}
\DeclareRobustCommand\PushButton{%
  \@ifnextchar[{\@PushButton}{\@PushButton[]}%
}
\DeclareRobustCommand\Gauge{%
  \@ifnextchar[{\@Gauge}{\@Gauge[]}%
}
\DeclareRobustCommand\Submit{%
  \@ifnextchar[{\@Submit}{\@Submit[]}%
}
\DeclareRobustCommand\Reset{%
  \@ifnextchar[{\@Reset}{\@Reset[]}%
}
\def\LayoutTextField#1#2{% label, field
  \def\Hy@temp{#1}%
  \ifx\Hy@temp\@empty
    #2%
  \else
    #1 #2%
```

```
  \fi
}
\def\LayoutChoiceField#1#2{% label, field
  \def\Hy@temp{#1}%
  \ifx\Hy@temp\@empty
    #2%
  \else
    #1 #2%
  \fi
}
\def\LayoutCheckField#1#2{% label, field
  \def\Hy@temp{#1}%
  \ifx\Hy@temp\@empty
    #2%
  \else
    #1 #2%
  \fi
}
\def\LayoutPushButtonField#1{% button
  #1%
}
\def\MakeRadioField#1#2{\vbox to #2{\hbox to #1{\hfill}\vfill}}
\def\MakeCheckField#1#2{\vbox to #2{\hbox to #1{\hfill}\vfill}}
\def\MakeTextField#1#2{\vbox to #2{\hbox to #1{\hfill}\vfill}}
\def\MakeChoiceField#1#2{\vbox to #2{\hbox to #1{\hfill}\vfill}}
\def\MakeButtonField#1{%
  \sbox0{%
    \hskip\Fld@borderwidth bp#1\hskip\Fld@borderwidth bp%
  }%
  \@tempdima\ht0 %
  \advance\@tempdima by \Fld@borderwidth bp %
  \advance\@tempdima by \Fld@borderwidth bp %
  \ht0\@tempdima
  \@tempdima\dp0 %
  \advance\@tempdima by \Fld@borderwidth bp %
  \advance\@tempdima by \Fld@borderwidth bp %
  \dp0\@tempdima
  \box0\relax
}
\def\DefaultHeightofSubmit{14pt}
\def\DefaultWidthofSubmit{2cm}
\def\DefaultHeightofReset{14pt}
\def\DefaultWidthofReset{2cm}
\def\DefaultHeightofCheckBox{\normalbaselineskip}
\def\DefaultWidthofCheckBox{\normalbaselineskip}
\def\DefaultHeightofChoiceMenu{\normalbaselineskip}
\def\DefaultWidthofChoiceMenu{\normalbaselineskip}
\def\DefaultHeightofText{\normalbaselineskip}
\def\DefaultHeightofTextMultiline{4\normalbaselineskip}
\def\DefaultWidthofText{3cm}
\def\DefaultOptionsofSubmit{print,name=Submit,noexport}
\def\DefaultOptionsofReset{print,name=Reset,noexport}
\def\DefaultOptionsofPushButton{print}
\def\DefaultOptionsofCheckBox{print}
```

```
\def\DefaultOptionsofText{print}
```

Default options for the types of \ChoiceMenu.

```
\def\DefaultOptionsofListBox{print}
\def\DefaultOptionsofComboBox{print,edit,sort}
\def\DefaultOptionsofPopdownBox{print}
\def\DefaultOptionsofRadio{print,notoggletooff}
```

20 Setup

```
\ifHy@hyperfigures
  \Hy@Info{Hyper figures ON}%
\else
  \Hy@Info{Hyper figures OFF}%
\fi
\ifHy@nesting
  \Hy@Info{Link nesting ON}%
\else
  \Hy@Info{Link nesting OFF}%
\fi
\ifHy@hyperindex
  \Hy@Info{Hyper index ON}%
\else
  \Hy@Info{Hyper index OFF}%
\fi
\ifHy@backref
  \Hy@Info{backreferencing ON}%
\else
  \Hy@Info{backreferencing OFF}%
\fi
\ifHy@colorlinks
  \Hy@Info{Link coloring ON}%
\else
  \Hy@Info{Link coloring OFF}%
\fi
\ifHy@ocgcolorlinks
  \Hy@Info{Link coloring with OCG ON}%
\else
  \Hy@Info{Link coloring with OCG OFF}%
\fi
\ifHy@pdfa
  \Hy@Info{PDF/A mode ON}%
\else
  \Hy@Info{PDF/A mode OFF}%
\fi
```

21 Low-level utility macros

We need unrestricted access to the #, ~ and " characters, so make them nice macros.

```
\edef\hyper@hash{\string#}
\edef\hyper@tilde{\string~}
\edef\hyper@quote{\string"}
```

Support \label before \begin{document}.

```
\def\@currentHref{Doc-Start}
\let\Hy@footnote@currentHref\@empty
```

We give the start of document a special label; this is used in backreferencing-by-section, to allow for cites before any sectioning commands. Set up PDF info.

```
\Hy@AtBeginDocument{%
  \Hy@pdfstringtrue
  \PDF@SetupDoc
  \let\PDF@SetupDoc\@empty
  \Hy@DisableOption{pdfpagescrop}%
  \Hy@DisableOption{pdfpagemode}%
  \Hy@DisableOption{pdfnonfullscreenpagemode}%
  \Hy@DisableOption{pdfdirection}%
  \Hy@DisableOption{pdfviewarea}%
  \Hy@DisableOption{pdfviewclip}%
  \Hy@DisableOption{pdfprintarea}%
  \Hy@DisableOption{pdfprintclip}%
  \Hy@DisableOption{pdfprintscaling}%
  \Hy@DisableOption{pdfduplex}%
  \Hy@DisableOption{pdfpicktraybypdfsize}%
  \Hy@DisableOption{pdfprintpagerange}%
  \Hy@DisableOption{pdfnumcopies}%
  \Hy@DisableOption{pdfstartview}%
  \Hy@DisableOption{pdfstartpage}%
  \Hy@DisableOption{pdftoolbar}%
  \Hy@DisableOption{pdfmenubar}%
  \Hy@DisableOption{pdfwindowui}%
  \Hy@DisableOption{pdffitwindow}%
  \Hy@DisableOption{pdfcenterwindow}%
  \Hy@DisableOption{pdfdisplaydoctitle}%
  \Hy@DisableOption{pdfpagelayout}%
  \Hy@DisableOption{pdflang}%
  \Hy@DisableOption{baseurl}%
  \ifHy@texht\else\hyper@anchorstart{Doc-Start}\hyper@anchorend\fi
  \Hy@pdfstringfalse
}
```

22 Localized nullifying of package

Sometimes we just don't want the wretched package interfering with us. Define an environment we can put in manually, or include in a style file, which stops the hypertext functions doing anything. This is used, for instance, in the Elsevier classes, to stop **hyperref** playing havoc in the front matter.

```
\def\NoHyper{%
  \def\hyper@link@[##1]##2##3##4{##4\Hy@xspace@end}%
  \def\hyper@@anchor##1##2{##2\Hy@xspace@end}%
  \global\let\hyper@livelink\hyper@link
  \gdef\hyper@link##1##2##3{##3\Hy@xspace@end}%
  \let\hyper@anchor\@gobble
  \let\hyper@anchorstart\@gobble
  \def\hyper@anchorend{\Hy@xspace@end}%
  \let\hyper@linkstart\@gobbletwo
```

```
  \def\hyper@linkend{\Hy@xspace@end}%
  \def\hyper@linkurl##1##2{##1\Hy@xspace@end}%
  \def\hyper@linkfile##1##2##3{##1\Hy@xspace@end}%
  \let\Hy@backout\@gobble
}
\def\stop@hyper{%
  \def\hyper@link@[##1]##2##3##4{##4\Hy@xspace@end}%
  \let\Hy@backout\@gobble
  \let\hyper@@anchor\@gobble
  \def\hyper@link##1##2##3{##3\Hy@xspace@end}%
  \let\hyper@anchor\@gobble
  \let\hyper@anchorstart\@gobble
  \def\hyper@anchorend{\Hy@xspace@end}%
  \let\hyper@linkstart\@gobbletwo
  \def\hyper@linkend{\Hy@xspace@end}%
  \def\hyper@linkurl##1##2{##1\Hy@xspace@end}%
  \def\hyper@linkfile##1##2##3{##1\Hy@xspace@end}%
}
\def\endNoHyper{%
  \global\let\hyper@link\hyper@livelink
}
⟨/package⟩
```

23 Package nohyperref

This package is introduced by Sebastian Rahtz.

Package nohyperref is a dummy package that defines some low level and some top-level commands. It is done for jadetex, which calls hyperref low-level commands, but it would also be useful with people using normal hyperref, who really do not want the package loaded at all.

Some low-level commands:

```
⟨*nohyperref⟩
\let\hyper@@anchor\@gobble
\def\hyper@link#1#2#3{#3}%
\let\hyper@anchorstart\@gobble
\let\hyper@anchorend\@empty
\let\hyper@linkstart\@gobbletwo
\let\hyper@linkend\@empty
\def\hyper@linkurl#1#2{#1}%
\def\hyper@linkfile#1#2#3{#1}%
\def\hyper@link@[#1]#2#3{}%
\let\PDF@SetupDoc\@empty
\let\PDF@FinishDoc\@empty
\def\nohyperpage#1{#1}
```

Some top-level commands:

```
\def\Acrobatmenu#1#2{\leavevmode#2}
\let\pdfstringdefDisableCommands\@gobbletwo
\let\texorpdfstring\@firstoftwo
\let\pdfbookmark\@undefined
\newcommand\pdfbookmark[3][]{}
\let\phantomsection\@empty
\let\hypersetup\@gobble
```

```
\let\hyperbaseurl\@gobble
\newcommand*{\href}[3][]{#3}
\let\hyperdef\@gobbletwo
\let\hyperlink\@gobble
\let\hypertarget\@gobble
\protected\def\hyperref{%
  \@ifnextchar[\@gobbleopt{\expandafter\@gobbletwo\@gobble}%
}
\long\def\@gobbleopt[#1]{}
\let\hyperpage\@empty
```

⟨/nohyperref⟩

24 The Mangling Of Aux and Toc Files

Some extra tests so that the hyperref package may be removed or added to a document without having to remove .aux and .toc files (this section is by David Carlisle) All the code is delayed to `\begin{document}` change 2026-02-22: removed code for different `\newlabel` definitions.

25 Title strings

If options `pdftitle` and `pdfauthor` are not used, these data for the pdf information dictionary can be extracted by the `\title` and `\author`.

⟨*package⟩

```
\ifHy@pdfusetitle
  \let\HyOrg@title\title
  \let\HyOrg@author\author
  \def\title{\@ifnextchar[{\Hy@scanopttitle}{\Hy@scantitle}}%
  \def\Hy@scanopttitle[#1]{%
    \gdef\Hy@title{#1}%
    \HyOrg@title[{#1}]%
  }%
  \def\Hy@scantitle#1{%
    \gdef\Hy@title{#1}%
    \HyOrg@title{#1}%
  }%
  \def\author{\@ifnextchar[{\Hy@scanoptauthor}{\Hy@scanauthor}}%
  \def\Hy@scanoptauthor[#1]{%
    \gdef\Hy@author{#1}%
    \HyOrg@author[{#1}]%
  }%
  \def\Hy@scanauthor#1{%
    \gdef\Hy@author{#1}%
    \HyOrg@author{#1}%
  }%
```

The case, that `\title`, or `\author` are given before hyperref is loaded, is much more complicate, because LaTeX initializes the macros `\@title` and `\@author` with LaTeX error and warning messages.

```
  \begingroup
    \def\process@me#1\@nil#2{%
```

```
      \expandafter\let\expandafter\x\csname @#2\endcsname
      \edef\y{\expandafter\strip@prefix\meaning\x}%
      \def\c##1#1##2\@nil{%
        \ifx\\##1\\%
        \else
         \expandafter\gdef\csname Hy@#2\expandafter\endcsname
             \expandafter{\x}%
        \fi
      }%
      \expandafter\c\y\relax#1\@nil
    }%
    \expandafter\process@me\string\@latex@\@nil{title}%
    \expandafter\process@me\string\@latex@\@nil{author}%
  \endgroup
\fi
\Hy@DisableOption{pdfusetitle}
```

Macro \Hy@UseMaketitleInfos is used in the driver files, before the information entries are used.

The newline macro \newline or \\ is much more complicate. In the title a good replacement can be a space, but can be already a space after \\ in the title string. So this space is removed by scanning for the next non-empty argument.

In the macro \author the newline can perhaps separate the different authors, so the newline expands here to a comma with space.

The possible arguments such as space or the optional argument after the newline macros are not detected.

A possible [1]emoves its argument.

```
\def\Hy@UseMaketitleString#1{%
  \@ifundefined{Hy@#1}{}{%
    \begingroup
      \let\Hy@saved@hook\pdfstringdefPreHook
      \pdfstringdefDisableCommands{%
        \expandafter\let\expandafter\\\csname Hy@newline@#1\endcsname
        \let\newline\\%
        \def\and{; }%
        \let\thanks\@gobble%
      }%
      \expandafter\ifx\csname @pdf#1\endcsname\@empty
        \expandafter\pdfstringdef\csname @pdf#1\endcsname{%
          \csname Hy@#1\endcsname\@empty
        }%
      \fi
      \global\let\pdfstringdefPreHook\Hy@saved@hook
    \endgroup
  }%
}
\def\Hy@newline@title#1{ #1}
\def\Hy@newline@author#1{, #1}
\def\Hy@UseMaketitleInfos{%
  \Hy@UseMaketitleString{title}%
  \Hy@UseMaketitleString{author}%
}
```

26 Page numbers

This stuff is done by Heiko Oberdiek.

27 Every page

```
\let\Hy@EveryPageHook\@empty
\let\Hy@EveryPageBoxHook\@empty
\let\Hy@FirstPageHook\@empty
\AddToHook{shipout/before}{%
  \Hy@EveryPageHook
  \ifx\Hy@EveryPageBoxHook\@empty
  \else
    \setbox\ShipoutBox=\vbox{%
      \offinterlineskip
      \Hy@EveryPageBoxHook
      \box\ShipoutBox
    }%
  \fi
}
\Hy@iffileloaded{hpdftex.def}{%
  \AddToHook{shipout/before}{%
    \Hy@FirstPageHook
    \global\let\Hy@FirstPageHook\@empty
  }%
}{%
  \AddToHook{shipout/firstpage}{%
    \Hy@FirstPageHook
  }%
}
\g@addto@macro\Hy@FirstPageHook{%
  \PDF@FinishDoc
  \global\let\PDF@FinishDoc\@empty
}
```

27.1 PDF /PageLabels

Internal macros of this module are marked with `\HyPL@`.

```
\ifHy@pdfpagelabels
  \begingroup\expandafter\expandafter\expandafter\endgroup
  \expandafter\ifx\csname thepage\endcsname\relax
    \Hy@pdfpagelabelsfalse
    \Hy@WarningNoLine{%
      Option `pdfpagelabels' is turned off\MessageBreak
      because \string\thepage\space is undefined%
    }%
    \csname fi\endcsname
    \csname iffalse\expandafter\endcsname
  \fi
```

`\thispdfpagelabel` The command `\thispdfpagelabel` allows to label a special page without the redefinition of `\thepage` for the page.

```
\def\thispdfpagelabel#1{%
```

```
    \gdef\HyPL@thisLabel{#1}%
  }%
  \global\let\HyPL@thisLabel\relax
```

`\HyPL@Labels` The page labels are collected in `\HyPL@Labels` and set at the end of the document.

```
  \let\HyPL@Labels\@empty
```

`\Hy@abspage` We have to know the the absolute page number and introduce a new counter for that.

```
  \newcount\Hy@abspage
  \Hy@abspage=0 %
```

For comparisons with the values of the previous page, some variables are needed:

```
  \def\HyPL@LastType{init}%
  \def\HyPL@LastNumber{0}%
  \let\HyPL@LastPrefix\@empty
```

Definitions for the PDF names of the LaTeX pendents.

```
  \def\HyPL@arabic{D}%
  \def\HyPL@Roman{R}%
  \def\HyPL@roman{r}%
  \def\HyPL@Alph{A}%
  \def\HyPL@alph{a}%
```

```
  \let\HyPL@SlidesSetPage\@empty
  \@ifclassloaded{slides}{%
    \def\HyPL@SlidesSetPage{%
      \advance\c@page\@ne
      \ifnum\value{page}>\@ne
        \protected@edef\HyPL@SlidesOptionalPage{%
          \Hy@SlidesFormatOptionalPage{\thepage}%
        }%
      \else
        \let\HyPL@SlidesOptionalPage\@empty
      \fi
      \advance\c@page-\@ne
      \def\HyPL@page{%
        \csname the\Hy@SlidesPage\endcsname
        \HyPL@SlidesOptionalPage
      }%
    }%
  }{}%
```

`\HyPL@EveryPage` If a page is shipout and the page number is known, `\HyPL@EveryPage` has to be called. It stores the current page label.

```
  \def\HyPL@EveryPage{%
    \begingroup
      \ifx\HyPL@thisLabel\relax
        \let\HyPL@page\thepage
        \HyPL@SlidesSetPage
      \else
        \let\HyPL@page\HyPL@thisLabel
        \global\let\HyPL@thisLabel\relax
      \fi
```

```
    \let\HyPL@Type\relax
    \ifnum\c@page>0 %
      \ifx\HyPL@SlidesSetPage\@empty
        \expandafter\HyPL@CheckThePage\HyPL@page\@nil
      \fi
    \fi
    \let\Hy@temp Y%
    \ifx\HyPL@Type\HyPL@LastType
    \else
      \let\Hy@temp N%
    \fi
    \ifx\HyPL@Type\relax
       \pdfstringdef\HyPL@Prefix{\HyPL@page}%
    \else
       \pdfstringdef\HyPL@Prefix\HyPL@Prefix
    \fi
    \ifx\HyPL@Prefix\HyPL@LastPrefix
    \else
      \let\Hy@temp N%
    \fi
    \if Y\Hy@temp
      \advance\c@page by -1 %
      \ifnum\HyPL@LastNumber=\the\c@page\relax
      \else
        \let\Hy@temp N%
      \fi
      \Hy@StepCount\c@page
    \fi
    \if N\Hy@temp
      \ifx\HyPL@Type\relax
        \HyPL@StorePageLabel{/P(\HyPL@Prefix)}%
      \else
        \HyPL@StorePageLabel{%
          \ifx\HyPL@Prefix\@empty
          \else
            /P(\HyPL@Prefix)%
          \fi
          /S/\csname HyPL\HyPL@Type\endcsname
          \ifnum\the\c@page=1 %
          \else
            \space/St \the\c@page
          \fi
        }%
      \fi
    \fi
    \xdef\HyPL@LastNumber{\the\c@page}%
    \global\let\HyPL@LastType\HyPL@Type
    \global\let\HyPL@LastPrefix\HyPL@Prefix
  \endgroup
  \Hy@GlobalStepCount\Hy@abspage
}%
```

\HyPL@CheckThePage Macro \HyPL@CheckThePage calls \HyPL@@CheckThePage that does the job.

```
\def\HyPL@CheckThePage#1\@nil{%
```

```
    \HyPL@@CheckThePage{#1}#1\csname\endcsname\c@page\@nil
  }%
```

\HyPL@@CheckThePage The first check is, is \thepage is defined such as in LaTeX, e. g.: \csname @arabic\endcsname\c@page. In the current implement ation the check fails, if there is another \csname before.

The second check tries to detect \arabic{page} at the end of the definition text of \thepage.

```
  \def\HyPL@@CheckThePage#1#2\csname#3\endcsname\c@page#4\@nil{%
    \def\Hy@tempa{#4}%
    \def\Hy@tempb{\csname\endcsname\c@page}%
    \ifx\Hy@tempa\Hy@tempb
      \expandafter\ifx\csname HyPL#3\endcsname\relax
      \else
        \def\HyPL@Type{#3}%
        \def\HyPL@Prefix{#2}%
      \fi
    \else
      \begingroup
        \let\Hy@next\endgroup
        \let\HyPL@found\@undefined
        \def\arabic{\HyPL@Format{arabic}}%
        \def\Roman{\HyPL@Format{Roman}}%
        \def\roman{\HyPL@Format{roman}}%
        \def\Alph{\HyPL@Format{Alph}}%
        \def\alph{\HyPL@Format{alph}}%
        \protected@edef\Hy@temp{#1}%
        \ifx\HyPL@found\relax
          \toks@\expandafter{\Hy@temp}%
          \edef\Hy@next{\endgroup
            \noexpand\HyPL@@@CheckThePage\the\toks@
              \noexpand\HyPL@found\relax\noexpand\@nil
          }%
        \fi
      \Hy@next
    \fi
  }%
```

\HyPL@Format The help macro \HyPL@Format is executed while a \protected@edef in the second check method of \HyPL@@CheckPage. The first occurrences of, for example, \arabic{page} is marked by \HyPL@found that is also defined by \csname.

```
  \def\HyPL@Format#1#2{%
    \ifx\HyPL@found\@undefined
      \expandafter\ifx\csname c@#2\endcsname\c@page
        \expandafter\noexpand\csname HyPL@found\endcsname{#1}%
      \else
        \expandafter\noexpand\csname#1\endcsname{#2}%
      \fi
    \else
      \expandafter\noexpand\csname#1\endcsname{#2}%
    \fi
  }%
```

\HyPL@@@CheckThePage If the second check method is successful, \HyPL@@@CheckThePage scans the result of \HyPL@Format and stores the found values.

```
\def\HyPL@@@CheckThePage#1\HyPL@found#2#3\@nil{%
  \def\Hy@tempa{#3}%
  \def\Hy@tempb{\HyPL@found\relax}%
  \ifx\Hy@tempa\Hy@tempb
    \def\HyPL@Type{@#2}%
    \def\HyPL@Prefix{#1}%
  \fi
}%
```

\HyPL@StorePageLabel Dummy for drivers that does not support /PageLabel.

```
\providecommand*{\HyPL@StorePageLabel}[1]{}%
```

\HyPL@Useless The /PageLabels entry does not make sense, if the absolute page numbers and the page labels are the same. Then \HyPL@Labels has the meaning of \HyPL@Useless.

```
\def\HyPL@Useless{0<</S/D>>}%
\@onelevel@sanitize\HyPL@Useless
```

\HyPL@SetPageLabels The page labels are written to the PDF catalogue. The command \Hy@PutCatalog is defined in the driver files.

```
\def\HyPL@SetPageLabels{%
  \@onelevel@sanitize\HyPL@Labels
  \ifx\HyPL@Labels\@empty
  \else
    \ifx\HyPL@Labels\HyPL@Useless
    \else
      \Hy@PutCatalog{/PageLabels<</Nums[\HyPL@Labels]>>}%
    \fi
  \fi
}%

\g@addto@macro\Hy@EveryPageHook{\HyPL@EveryPage}%
\fi
```

Option 'pdfpagelabels' has been used and is now disabled.

```
\Hy@DisableOption{pdfpagelabels}
```

⟨/package⟩

27.1.1 pdfTeX and VTeX

Because of pdfTeX's \pdfcatalog command the /PageLabels entry can set at end of document in the first run.

\Hy@PutCatalog

```
⟨*pdftex⟩
\pdf@ifdraftmode{%
  \let\Hy@PutCatalog\@gobble
}{%
  \let\Hy@PutCatalog\pdfcatalog
}
⟨/pdftex⟩
```

The code for VTeX is more complicate, because it does not allow the direct access to the /Catalog object. The command scans its argument and looks for a /PageLabels entry.

VTeX 6.59g is the first version, that implements \special{!pdfpagelabels...}. For this version \VTeXversion reports 660.

```
⟨*vtex⟩
\providecommand*{\XR@ext}{pdf}
\edef\Hy@VTeXversion{%
  \ifx\VTeXversion\@undefined
    \z@
  \else
    \ifx\VTeXversion\relax
      \z@
    \else
      \VTeXversion
    \fi
  \fi
}
\begingroup
  \ifnum\Hy@VTeXversion<660 %
    \gdef\Hy@PutCatalog#1{%
      \Hy@WarningNoLine{%
        VTeX 6.59g or above required for pdfpagelabels%
      }%
    }%
  \else
    \gdef\Hy@PutCatalog#1{%
      \Hy@vt@PutCatalog#1/PageLabels<<>>\@nil
    }%
    \gdef\Hy@vt@PutCatalog#1/PageLabels<<#2>>#3\@nil{%
      \ifx\\#2\\%
      \else
        \immediate\special{!pdfpagelabels #2}%
      \fi
    }%
  \fi
\endgroup
⟨/vtex⟩

⟨*pdftex | vtex⟩
```

\HyPL@StorePageLabel This macro adds the entry #1 to \HyPL@Labels.

```
\ifHy@pdfpagelabels
  \def\HyPL@StorePageLabel#1{%
    \toks@\expandafter{\HyPL@Labels}%
    \xdef\HyPL@Labels{%
      \the\toks@
      \the\Hy@abspage<<#1>>%
    }%
  }%
```

The enddocument/afteraux hook is used to get behind the final \clearpage and to avoid a \clearpage in \AtEndDocument. Then the PDF catalog entry for \PageLabels is set.

```
  \AddToHook{enddocument/afteraux}{%
    \HyPL@SetPageLabels
  }%
\fi
⟨/pdftex | vtex⟩
```

27.1.2 xetex

```
⟨*xetex⟩
\HyPsd@LoadUnicode
\Hy@unicodetrue
\ifx\HyPsd@pdfencoding\HyPsd@pdfencoding@unicode
\else
  \let\HyPsd@pdfencoding\HyPsd@pdfencoding@auto
\fi
\define@key{Hyp}{unicode}[true]{%
  \Hy@boolkey{unicode}{#1}%
  \ifHy@unicode
  \else
    \Hy@Warning{%
      XeTeX driver only supports `unicode=true'. Ignoring\MessageBreak
      option setting `unicode=false'%
    }%
    \Hy@unicodetrue
  \fi
}
\define@key{Hyp}{pdfencoding}{%
  \edef\HyPsd@temp{#1}%
  \ifx\HyPsd@temp\HyPsd@pdfencoding@unicode
    \let\HyPsd@pdfencoding\HyPsd@temp
  \else
    \ifx\HyPsd@temp\HyPsd@pdfencoding@auto
      \let\HyPsd@pdfencoding\HyPsd@temp
    \else
      \Hy@Warning{%
        XeTeX driver only supports\MessageBreak
        `pdfencoding=unicode|auto'. Ignoring option\MessageBreak
        setting `pdfencoding=\HyPsd@temp'%
      }%
    \fi
  \fi
}
\let\HyXeTeX@CheckUnicode\relax
```

Since 2016 (x)dvipdfmx has a special to control the spacing of annotation borders. So let's make use of it:

```
\def\setpdflinkmargin#1{%
  \begingroup
    \setlength{\dimen@}{#1}%
    \special{dvipdfmx:config g \strip@pt\dimen@}%
  \endgroup}
⟨/xetex⟩
```

set the pdf version

```
⟨*dvipdfm | xetex⟩
```

```
\special{pdf:majorversion \Hy@pdf@majorversion}
\special{pdf:minorversion \Hy@pdf@minorversion}
⟨/dvipdfm | xetex⟩
```

27.1.3 pdfmarkbase, dvipdfm, xetex

```
⟨*pdfmarkbase⟩
\begingroup
  \@ifundefined{headerps@out}{}{%
    \toks@\expandafter{\Hy@FirstPageHook}%
    \xdef\Hy@FirstPageHook{%
      \noexpand\headerps@out{%
        systemdict /pdfmark known%
        {%
          userdict /?pdfmark systemdict /exec get put%
        }{%
          userdict /?pdfmark systemdict /pop get put %
          userdict /pdfmark systemdict /cleartomark get put%
        }%
        ifelse%
      }%
      \the\toks@
    }%
  }%
\endgroup
⟨/pdfmarkbase⟩
```

\Hy@PutCatalog

```
⟨dvipdfm | xetex⟩\def\Hy@PutCatalog#1{\@pdfm@mark{docview <<#1>>}}
⟨*pdfmarkbase⟩
\def\Hy@PutCatalog#1{%
  \pdfmark{pdfmark=/PUT,Raw={\string{Catalog\string} <<#1>>}}%
}
⟨/pdfmarkbase⟩

⟨*pdfmarkbase | dvipdfm | xetex⟩
\ifHy@pdfpagelabels
```

\HyPL@StorePageLabel This macro writes a string to the .aux file.

```
  \def\HyPL@StorePageLabel#1{%
    \if@filesw
      \begingroup
        \edef\Hy@tempa{\the\Hy@abspage<<#1>>}%
        \immediate\write\@mainaux{%
          \string\HyPL@Entry{\Hy@tempa}%
        }%
      \endgroup
    \fi
  }%
```

Write a dummy definition of `\HyPL@Entry` for the case, that the next run is done without hyperref. A marker for the rerun warning is set and the /PageLabels is written.

```
  \Hy@AtBeginDocument{%
    \if@filesw
```

```
      \immediate\write\@mainaux{%
        \string\providecommand\string*\string\HyPL@Entry[1]{}%
      }%
    \fi
    \ifx\HyPL@Labels\@empty
      \Hy@WarningNoLine{Rerun to get /PageLabels entry}%
    \else
      \HyPL@SetPageLabels
    \fi
    \let\HyPL@Entry\@gobble
  }%
```

\HyPL@Entry

```
  \def\HyPL@Entry#1{%
    \expandafter\gdef\expandafter\HyPL@Labels\expandafter{%
      \HyPL@Labels
      #1%
    }%
  }%

\fi
⟨/pdfmarkbase | dvipdfm | xetex⟩
⟨*packageEnd⟩
\ifx\MaybeStopEarly\relax
\else
  \Hy@stoppedearlytrue
  \expandafter\MaybeStopEarly
\fi
\Hy@stoppedearlyfalse
```

28 Automated LaTeX hypertext cross-references

Anything which can be referenced advances some counter; we overload this to put in a hypertext starting point (with no visible anchor), and make a note of that for later use in `\label`. This will fail badly if `\theH<name>` does not expand to a sensible reference. This means that classes or package which introduce new elements need to define an equivalent `\theH<name>` for every `\the<name>`. We do make a trap to make `\theH<name>` be the same as `\arabic{<name>}`, if `\theH<name>` is not defined, but this is not necessarily a good idea. Alternatively, the 'naturalnames' option uses whatever LaTeX provides, which may be usable. But then its up to you to make sure these are legal PDF and HTML names. The 'hypertexnames=false' option just makes up arbitrary names.

All the shenanigans is to make sure section numbers etc are always arabic, separated by dots. Who knows how people will set up `\@currentlabel`? If they put spaces in, or brackets (quite legal) then the hypertext processors will get upset.

But this is flaky, and open to abuse. Styles like `subeqn` will mess it up, for starters. Appendices are an issue, too. We just hope to cover most situations. We can at least cope with the standard sectioning structure, allowing for `\part` and `\chapter`.

Start with a fallback for equations

```
\def\Hy@CounterExists#1{%
```

```
  \begingroup\expandafter\expandafter\expandafter\endgroup
  \expandafter\ifx\csname c@#1\endcsname\relax
    \expandafter\@gobble
  \else
    \begingroup\expandafter\expandafter\expandafter\endgroup
    \expandafter\ifx\csname the#1\endcsname\relax
      \expandafter\expandafter\expandafter\@gobble
    \else
      \expandafter\expandafter\expandafter\@firstofone
    \fi
  \fi
}
```

change 2026-02-22: removed definitions provided for format before 2024-11-01

Thanks to Greta Meyer (gbd@pop.cwru.edu) for making me realize that enumeration starts at 0 for every list! But `\item` occurs inside `\trivlist`, so check if its a real `\item` before incrementing counters.

```
\let\H@item\item
\newcounter{Item}
\def\item{%
  \@hyper@itemfalse
  \if@nmbrlist\@hyper@itemtrue\fi
  \H@item
}
```

Tanmoy asked for this default handling of undefined `\theH<name>` situations. It really isn't clear what would be ideal, whether to turn off hyperizing of unknown elements, to pick up the textual definition of the counter, or to default it to something like `\arabic{name}`. We take the latter course, slightly worriedly.

```
\let\H@refstepcounter\@kernel@refstepcounter
\edef\name@of@eq{equation}%
```

We do not want the handler for `\refstepcounter` to cut in during the processing of `\item` (we handle that separately), so we provide a bypass conditional. change 2022-04-22: removed test for the slide counter and for the equation name. change 2022-05-02: added the new boolean set by `\LinkTargetOn/\LinkTargetOff`

```
\newif\if@hyper@item
\newif\if@skiphyperref
\@hyper@itemfalse
\@skiphyperreffalse
\ExplSyntaxOn
\NewSocketPlug{refstepcounter}{hyperref}{\ifHy@pdfstring\else#1\fi}
\AssignSocketPlug{refstepcounter}{hyperref}
```

change 2024-11-05: cleveref relies on refstepcounter to update its data.

```
\AddToHook{package/cleveref/after}
{
  \@ifpackagelater{cleveref}{2018/03/28}{}
   {
   \NewSocketPlug{refstepcounter}{hyperref/fixcleveref}
    {\ifHy@pdfstring\else
      #1%
      {\firstaid@cref@updatelabeldata{\@currentcounter}}%
     \fi}
    \AssignSocketPlug{refstepcounter}{hyperref/fixcleveref}
```

```
   }
 }
\NewSocketPlug{refstepcounter/target}{hyperref}
 {
   \bool_lazy_and:nnT
   { \l___hyp_target_create_bool }
   { ! \legacy_if_p:n{@skiphyperref} }
   {
     \legacy_if:nTF {@hyper@item}
       {
         \stepcounter{Item}%
         \hyper@refstepcounter{Item}%
         \@hyper@itemfalse
       }
       {
         \hyper@refstepcounter{\@currentcounter}%
       }
    }
  }
\AssignSocketPlug{refstepcounter/target}{hyperref}
\ExplSyntaxOff
\let\Hy@saved@refstepcounter\refstepcounter
```

AMSLaTeX processes all equations twice; we want to make sure that the hyper stuff is not executed twice, so we use the AMS \ifmeasuring@, initialized if AMS math is not used. change 2025-06-20: test if the switch already exist, see tagging-project issue 920.

```
\ifcsname ifmeasuring@\endcsname
\else
 \expandafter\newif\csname ifmeasuring@\endcsname\measuring@false
\fi
\newcommand\Hy@ifnotmeasuring[1]{#1}
\AddToHook{package/amsmath/after}
{
  \renewcommand\Hy@ifnotmeasuring[1]
   {\ifmeasuring@ \else #1\fi}
}
```

\hyper@refstepcounter changed 2026-02-22 to use \MakeLinkTarget

```
\def\hyper@refstepcounter#1{\ifHy@hypertexnames\MakeLinkTarget{#1}\else\Make-
    LinkTarget[#1]{}\fi}
```

\Hy@ProvideTheHCounter \theH<counter> is not set for counters that are defined before 'hyperref' is loaded. In \cl@@ckpt, the clear counter list of the artificial counter @ckpt, LaTeX remembers the defined counters (needed for \include). We check the clear counter lists, whether our counter is present. If we found it, then we add the parent counter value to \theH<counter>. The \@elt list is used in sanitized form for the comparison, because the list might contain other stuff than \@elts. Also it simplifies the implementation, because LaTeX', substring search \in@ can be used.

```
\def\HyCnt@ProvideTheHCounter#1{%
 \@ifundefined{theH#1}{%
   \expandafter\def\csname theH#1\endcsname{}%
   \def\Hy@temp{\@elt{#1}}%
   \@onelevel@sanitize\Hy@temp
```

```
    \let\HyOrg@elt\@elt
    \edef\@elt{%
      \noexpand\HyCnt@LookForParentCounter
      \expandafter\noexpand\csname theH#1\endcsname
    }%
    \cl@@ckpt
    \let\@elt\HyOrg@elt
    \expandafter
    \Hy@LocalAppendToMacro\csname theH#1\expandafter\endcsname
    \expandafter{%
      \expandafter\@arabic\csname c@#1\endcsname
    }%
  }{}%
}
```

\Hy@LookForParentCounter

```
\def\HyCnt@LookForParentCounter#1#2{%
  \expandafter\let\expandafter\Hy@temp@A\csname cl@#2\endcsname
  \@ifundefined{cl@#2}{%
  }{%
    \@onelevel@sanitize\Hy@temp@A
    \edef\Hy@temp@A{%
      \noexpand\in@{\Hy@temp}{\Hy@temp@A}%
    }\Hy@temp@A
    \ifin@
      \@ifundefined{theH#2}{%
        \expandafter\Hy@LocalAppendToMacro\expandafter#1%
        \expandafter{%
          \expandafter\@arabic\csname c@#2\endcsname.%
        }%
      }{%
        \expandafter\Hy@LocalAppendToMacro\expandafter#1%
        \expandafter{%
          \csname theH#2\endcsname.%
        }%
      }%
    \fi
  }%
}
```

After **\appendix** "chapter" (or "section" for classes without chapter) should be replaced by "appendix" to get **\autoref** work. Macro **\Hy@chapapp** contains the current valid name like **\@chapapp**, which cannot be used, because this string depends on the current language.

The "french" package defines counter **\thechapter** by **\newcounterchapter**, if **\@ifundefinedchapter**.

change 2026-06-17: set the target prefix, issue gh/424

```
\begingroup\expandafter\expandafter\expandafter\endgroup
\expandafter\ifx\csname chapter\endcsname\relax
  \def\Hy@chapterstring{section}%
\else
  \def\Hy@chapterstring{chapter}%
\fi
```

```
\def\Hy@appendixstring{appendix}
\def\Hy@chapapp{\Hy@chapterstring}
\hypersetup{target-prefix={chapter}{\Hy@chapapp}}
\@ifundefined{appendix}{%
}{%
  \let\HyOrg@appendix\appendix
  \def\Hy@AlphNoErr#1{%
    \ifnum\value{#1}>26 %
      Alph\number\value{#1}%
    \else
      \ifnum\value{#1}<1 %
        Alph\number\value{#1}%
      \else
        \Alph{#1}%
      \fi
    \fi
  }%
  \def\appendix{%
    \@ifundefined{chapter}{%
      \gdef\theHsection{\Hy@AlphNoErr{section}}%
    }{%
      \gdef\theHchapter{\Hy@AlphNoErr{chapter}}%
    }%
    \xdef\Hy@chapapp{\Hy@appendixstring}%
    \hypersetup{target-prefix={section}{\Hy@appendixstring}}%
    \HyOrg@appendix
  }%
}
```

\Hy@Test@alph

```
\def\Hy@Test@alph#1{%
  \ifcase#1\or
    a\or b\or c\or d\or e\or f\or g\or h\or i\or j\or
    k\or l\or m\or n\or o\or p\or q\or r\or s\or t\or
    u\or v\or w\or x\or y\or z%
  \else
    \@ctrerr
  \fi
}
```

\Hy@Test@Alph

```
\def\Hy@Test@Alph#1{%
  \ifcase#1\or
    A\or B\or C\or D\or E\or F\or G\or H\or I\or J\or
    K\or L\or M\or N\or O\or P\or Q\or R\or S\or T\or
    U\or V\or W\or X\or Y\or Z%
  \else
    \@ctrerr
  \fi
}
```

We define a hook to allow to overwrite the next destination name.

```
\NewHook{___hyp/target/setname }
\define@key{Hyp}{next-anchor}{%
```

```
    \AddToHookNext{___hyp/target/setname}%
      {\Hy@MakeCurrentHref{#1}}%
  }
```

\hyper@makecurrent Because of Babel mucking around, nullify \textlatin when making names. And \@number because of babel's lrbabel.def. change 2021-08-15: For new formats we add a hook which allows to overwrite the name of the next destination.

```
\def\hyper@makecurrent#1{%
  \begingroup
    \Hy@safe@activestrue
    \edef\Hy@param{#1}%
    \ifx\Hy@param\Hy@chapterstring
      \let\Hy@param\Hy@chapapp
    \fi
    \ifHy@hypertexnames
      \let\@number\@firstofone
      \def\@fnsymbol##1{fnsymbol\number##1}%
      \def\@arabic##1{\number##1}%
      \ifx\@alph\Hy@Test@alph
      \else
        \def\@alph{alph\number}%
      \fi
      \ifx\@Alph\Hy@Test@Alph
      \else
        \def\@Alph{Alph\number}%
      \fi
      \ifHy@naturalnames
        \let\textlatin\@firstofone
        \xdef\HyperGlobalCurrentHref{\csname the#1\endcsname}%
      \else
        \xdef\HyperGlobalCurrentHref{%
          \csname
            the%
            \expandafter\ifx\csname theH#1\endcsname\relax\else H\fi
            #1%
          \endcsname
        }%
      \fi
      \xdef\HyperGlobalCurrentHref{%
        \Hy@param.\expandafter\strip@prefix\meaning\HyperGlobalCurrentHref
      }%
    \else
      \Hy@GlobalStepCount\Hy@linkcounter
      \xdef\HyperGlobalCurrentHref{\Hy@param.\the\Hy@linkcounter}%
    \fi
  \endgroup
  \let\HyperLocalCurrentHref\HyperGlobalCurrentHref
  \ifHy@localanchorname
    \let\@currentHref\HyperLocalCurrentHref
  \else
    \global\let\@currentHref\HyperGlobalCurrentHref
  \fi
  \UseHook{___hyp/target/setname}%
}
```

\Hy@MakeCurrentHref

```
\def\Hy@MakeCurrentHref#1{%
  \edef\HyperLocalCurrentHref{#1}%
  \@onelevel@sanitize\HyperLocalCurrentHref
  \global\let\HyperGlobalCurrentHref\HyperLocalCurrentHref
  \let\HyperLocalCurrentHref\HyperGlobalCurrentHref
  \ifHy@localanchorname
    \let\@currentHref\HyperLocalCurrentHref
  \else
    \global\let\@currentHref\HyperGlobalCurrentHref
  \fi
}
```

\Hy@MakeCurrentHrefAuto This command is e.g. used to create destinations for unnumbered sections and chapters. For new formats we add a hook which allows to overwrite the name of the next destination.

```
  \def\Hy@MakeCurrentHrefAuto#1{%
  \Hy@GlobalStepCount\Hy@linkcounter
  \Hy@MakeCurrentHref{#1.\the\Hy@linkcounter}%
  \UseHook{___hyp/target/setname}}
```

\@currentHlabel \@currentHlabel is only defined for compatibility with package 'hypdvips'.

```
\def\@currentHlabel{\@currentHref}
```

29 Package ifthen support

Since version 6.75a this is done in package nameref.

For compatibility \hypergetref and \hypergetpageref are still provided. But they do not generate warnings, if the reference is undefined.

```
\def\hypergetref#1{\getrefbykeydefault{#1}{}{??}}
\def\hypergetpageref#1{\getrefbykeydefault{#1}{page}{0}}
```

30 Package varwidth support

2023-11-07: varwidth needs a special configuration point to inserts its handler. We use a socket for this.

```
\AddToHook{package/varwidth/after}
{
  \NewSocketPlug{hyp/raisedlink}{varwidth}{\@vwid@wrap{#1}}
  \appto\@vwid@setup{\AssignSocketPlug{hyp/raisedlink}{varwidth}}
}
```

31 Package titlesec and titletoc support

This code is contributed by Javier Bezos (Email: jbezos@arrakis.es).

Package titlesec support:

```
\@ifpackageloaded{titlesec}{%
  \def\ttl@Hy@steplink#1{%
    \Hy@MakeCurrentHrefAuto{#1*}%
```

```
    \edef\ttl@Hy@saveanchor{%
      \noexpand\Hy@raisedlink{%
        \noexpand\hyper@anchorstart{\@currentHref}%
        \noexpand\hyper@anchorend
        \def\noexpand\ttl@Hy@SavedCurrentHref{\@currentHref}%
        \noexpand\ttl@Hy@PatchSaveWrite
      }%
    }%
  }%
  \def\ttl@Hy@PatchSaveWrite{%
    \begingroup
      \toks@\expandafter{\ttl@savewrite}%
      \edef\x{\endgroup
        \def\noexpand\ttl@savewrite{%
          \let\noexpand\@currentHref
              \noexpand\ttl@Hy@SavedCurrentHref
          \the\toks@
        }%
      }%
    \x
  }%
  \def\ttl@Hy@refstepcounter#1{%
    \let\ttl@b\Hy@raisedlink
    \def\Hy@raisedlink##1{%
      \def\ttl@Hy@saveanchor{\Hy@raisedlink{##1}}%
    }%
    \refstepcounter{#1}%
    \let\Hy@raisedlink\ttl@b
  }%
}{}
```

32 Package longtable support

Sometimes the anchor of the longtable goes to the previous page. Thus the following patch separates the anchor setting and counter incrementation by hyperref's \refstepcounter and the anchor setting is moved after \vskip\LTpre.

Patch of \LT@array: replace \refstepcounter by the original \H@refstepcounter without anchor generation

```
\@ifpackageloaded{longtable}{%
\@ifundefined{hyper@nopatch@longtable}{%
  \begingroup
    \def\y{\LT@array}%
    \@ifundefined{scr@LT@array}{%
      \@ifundefined{adl@LT@array}{}{\def\y{\adl@LT@array}}%
    }{\def\y{\scr@LT@array}}%
    \long\def\x\refstepcounter#1#2\@sharp#3#4\@nil{%
      \expandafter\endgroup
      \expandafter\def\y[##1]##2{%
        \H@refstepcounter{#1}%
        \hyper@makecurrent{table}%
        \let\Hy@LT@currentHref\@currentHref
        #2\@sharp######4%
```

```
    }%
  }%
\expandafter\expandafter\expandafter\x\y[{#1}]{#2}\@nil
```

Patch of `\LT@start`: add anchor before first line after `\vskip\LTpre`

```
\begingroup
  \def\x#1\ifvoid\LT@foot#2\fi#3\@nil{%
    \endgroup
    \def\LT@start{%
      #1%
      \ifvoid\LT@foot#2\fi
      \let\@currentHref\Hy@LT@currentHref
      \Hy@raisedlink{%
        \hyper@anchorstart{\@currentHref}\hyper@anchorend
      }%
      #3%
    }%
  }%
  \expandafter\x\LT@start\@nil
}{}
}{}
```

33 Equations

We want to make the whole equation a target anchor. Overload equation, temporarily reverting to original `\refstepcounter`. If, however, it is in AMS math, we do not do anything, as the tag mechanism is used there (see section 41). change 2023-06-14: previously hyperref contained code that moved the equation incrementation inside the math environment to avoid specials outside and a wrong vertical spacing of equation environments. Since 2021/08/24 this code is now in amsmath directly and so has been removed here.

This and more math related patches can be suppressed with `\hyper@nopatch@mathenv`

```
\let\new@refstepcounter\refstepcounter
\let\H@equation\equation
\let\H@endequation\endequation
\@ifundefined{hyper@nopatch@mathenv}{%
```

If amsmath was loaded before the following does nothing. If amsmath is loaded later it will overwrite the definition again, which is what is wanted here. If it is not loaded the new definition of equation will be used.

```
  \@ifpackageloaded{amsmath}{}{%
    \def\equation{%
      \let\refstepcounter\H@refstepcounter
      \H@equation
      \hyper@makecurrent{equation}%
```

`\mathopen` is needed in case the equation starts with an unary minus, for example.

```
      \mathopen{%
        \Hy@raisedlink{\hyper@anchorstart{\@currentHref}{}}%
      }%
      \let\refstepcounter\new@refstepcounter
    }%
    \def\endequation{%
```

```
    \ifx\Hy@raisedlink\@empty
      \hyper@anchorend
    \else
      \mathclose{\Hy@raisedlink{\hyper@anchorend}}%
    \fi
    \H@endequation
  }%
 }
}{}
```

My goodness, why can't LaTeX be consistent? Why is `\eqnarray` set up differently from other objects?

People (you know who you are, Thomas Beuth) sometimes make an eqnarray where *all* the lines end with `\notag`, so there is no suitable anchor at all. In this case, pass by on the other side.

```
\newif\if@eqnstar
\@eqnstarfalse
\let\H@eqnarray\eqnarray
\let\H@endeqnarray\endeqnarray
\@ifundefined{hyper@nopatch@mathenv}{%
 \def\eqnarray{%
  \let\Hy@reserved@a\relax
  \def\@currentHref{}%
  \H@eqnarray
  \if@eqnstar
  \else
   \ifx\\\@currentHref\\%
   \else
    \hyper@makecurrent{equation}%
    \mathopen{%
     \Hy@raisedlink{%
      \hyper@anchorstart{\@currentHref}\hyper@anchorend
     }%
    }%
   \fi
  \fi
 }
 \def\endeqnarray{%
  \H@endeqnarray
 }
}{}
```

This is quite heavy-handed, but it works for now. If its an `eqnarray*` we need to disable the hyperref actions. There may well be a cleaner way to trap this. Bill Moss found this.

```
\@namedef{eqnarray*}{%
 \protected\def\@eqncr{\nonumber\@seqncr}\@eqnstartrue\eqnarray
}
\@namedef{endeqnarray*}{%
 \nonumber\endeqnarray\@eqnstarfalse
}
```

Then again, we have the *subeqnarray* package. Tanmoy provided some code for this:

```
\@ifundefined{subeqnarray}{}{%
```

```
  \let\H@subeqnarray\subeqnarray
  \let\H@endsubeqnarray\endsubeqnarray
  \def\subeqnarray{%
    \let\Hy@reserved@a\relax
    \H@subeqnarray
    \hyper@makecurrent{equation}%
    \hyper@anchorstart{\@currentHref}{}\hyper@anchorend
  }%
  \def\endsubeqnarray{%
    \H@endsubeqnarray
  }%
  \providecommand\theHsubequation{\theHequation\alph{subequation}}%
}
```

The aim of this macro is to produce a sanitized version of its argument, to make it a safe label.

```
\def\make@stripped@name#1{%
  \begingroup
    \escapechar\m@ne
    \global\let\newname\@empty
    \protected@edef\Hy@tempa{#1}%
    \edef\@tempb{%
      \noexpand\@tfor\noexpand\Hy@tempa:=%
        \expandafter\strip@prefix\meaning\Hy@tempa
    }%
    \@tempb\do{%
      \if{\Hy@tempa\else
        \if}\Hy@tempa\else
          \xdef\newname{\newname\Hy@tempa}%
        \fi
      \fi
    }%
  \endgroup
}
```

Support for amsmath's subequations: change 2023-06-14: we use hooks to no longer depend on amsmath being loaded before hyperref. Once amsmath sets the theH-representation itself this can go completely.

```
\AddToHook{cmd/subequations/before}
{%
   \stepcounter{equation}%
   \protected@edef\theHparentequation{\theHequation}%
   \addtocounter{equation}{-1}%
}

\AddToHook{cmd/subequations/after}
{%
  \def\theHequation{\theHparentequation\alph{equation}}%
  \ignorespaces
}
```

34 Support for theorems

Hyperlink support in theorems has to resolve typically three problems:

- The \refstepcounter can be issued to early. The target it produces can be separated from the theorem and then the link if wrong (see testfiles thm-005-xx). It can also affect spacing. This means that it is better if this \refstepcounter doesn't produce a target.

- The natural place for the target (before the theorem label) is normally not printed directly but delayed to the next paragraph begin (through the \item code or by other means). and \label commands used directly at the begin of the environment are perhaps processed *before* the target is created and so do not know the correct \@currentHref value. That means that if \refstepcounter does not produce a target, it should nevertheless update the target name.

- The target should be placed (in horizontal mode) before the theorem label to avoid side effects on spacing. For this a suitable place must be found depending on the actual theorem definition.

Theorems typically issue the \refstepcounter in \@thm. The first two points can therefore be resolved by patching this command and replacing the \refstepcounter.

The last point is the most complicated. Simply moving at the point \refstepcounter is encountered into the next para hook doesn't work, as this can be in a header if there is page break. The next item hook doesn't work for the same reason, also not every theorem environment actually use \item (e.g. amsthm and ams-classes). Patching (or using a hook) \@begintheorem doesn't work either as ntheorem redefines this on the fly.

For now we move the target creation into the item hook. This is not perfect, as it can end up in header or be to much to the right, but there is not really a better place.

The patch will not apply to cleveref, this means that with cleveref there can be a page break between target and theorem but beside this it hopefully it does the right thing. \@currentHref is updated directly for labels set before the actual start of the paragraph. The target can be behind a target created from a following list, so we restore \@currentHref just in case. Later we could use sockets here (or hope that the packages take this over.

```
\newcommand\Hy@theorem@refstepcounter[1]
 {%
  \H@refstepcounter{#1}%
  \hyper@makecurrent{#1}%
  \global\let\Hy@dth@currentHref\@currentHref
  \Hy@theorem@makelinktarget{\Hy@dth@currentHref}%
 }
\newcommand\Hy@theorem@makelinktarget[1]
{
  \AddToHookNext{cmd/item/before}
   {\AddToHookNext{para/begin}
     {\let\Hy@tempa\@currentHref
      \MakeLinkTarget*{#1}% \Hy@dth@currentHref
      \global\let\@currentHref\Hy@tempa
     }%
   }%
}
```

amsthm doesn't issue an item in the theorem, we delay the target into \deferred@thm@head and hope that it always begins a paragraph.

```
\AddToHook{begindocument}
{%
 \@ifundefined{deferred@thm@head}{}
  {%
   \let\Hy@deferred@thm@head\deferred@thm@head
   \def\deferred@thm@head#1{\Hy@deferred@thm@head{#1}}%
   \renewcommand\Hy@theorem@makelinktarget[1]
    {%
     \AddToHookNext{cmd/deferred@thm@head/before}
      {\AddToHookNext{para/begin}
        {\let\Hy@tempa\@currentHref
         \MakeLinkTarget*{#1}%
         \global\let\@currentHref\Hy@tempa
        }%
      }%
    }%
  }%
}
\@ifundefined{hyper@nopatch@thm}{%
\AtBeginDocument{%
 \@ifpackageloaded{cleveref}
  {\AddToHook{cmd/@thm/before}{\ifhmode\unskip\fi}}
  {%
   \ifpatchable\@thm{\refstepcounter}
    {\patchcmd\@thm{\refstepcounter}{\Hy@theorem@refstepcounter}{}{}}
    {}%
  }}}{}
```

35 Footnotes

The footnote mark is a hypertext link, and the text is a target. We separately number the footnotes sequentially through the text, separately from whatever labels the text assigns. Too hard to keep track of markers otherwise. If the raw forms \footnotemark and \footnotetext are used, force them to use un-hyper original. If \hyper@nopatch@footnote is defined we don't patch but assume that addings links to footnotes is handled elsewhere.

```
\@ifundefined{hyper@nopatch@footnote}{%
\ifHy@hyperfootnotes
  \@ifundefined{theHfootnote}
   {\newcounter{Hfootnote}}
   {\let\H@@theHfootnote\theHfootnote
    \let\theHfootnote\undefined
    \newcounter{Hfootnote}
    \let\theHfootnote\H@@theHfootnote
   }%
```

where is this used?

```
  \@ifundefined{theHHmpfootnote}{%
   \let\theHHmpfootnote\theHHfootnote
   }{}
```

```
\let\H@@footnotetext\@footnotetext
\let\H@@footnotemark\@footnotemark
\def\@xfootnotenext[#1]{%
  \begingroup
    \csname c@\@mpfn\endcsname #1\relax
    \unrestored@protected@xdef\@thefnmark{\thempfn}%
  \endgroup
  \ifx\@footnotetext\@mpfootnotetext
    \expandafter\H@@mpfootnotetext
  \else
    \expandafter\H@@footnotetext
  \fi
}%
\def\@xfootnotemark[#1]{%
  \begingroup
    \c@footnote #1\relax
    \unrestored@protected@xdef\@thefnmark{\thefootnote}%
  \endgroup
  \H@@footnotemark
}%
\let\H@@mpfootnotetext\@mpfootnotetext
\long\def\@mpfootnotetext#1{%
  \H@@mpfootnotetext{%
    \ifHy@nesting
      \expandafter\@firstoftwo
    \else
      \expandafter\@secondoftwo
    \fi
    {%
      \expandafter\hyper@@anchor\expandafter{%
        \Hy@footnote@currentHref
      }{\ignorespaces #1}%
    }{%
      \Hy@raisedlink{%
        \expandafter\hyper@@anchor\expandafter{%
          \Hy@footnote@currentHref
        }{\relax}%
      }%
```

Change 2025-09-29: set \@currentHref and \@currentlabelname for issue 402.

```
      \let\@currentHref\Hy@footnote@currentHref
      \let\@currentlabelname\@empty
      \ignorespaces #1%
    }%
  }%
}%
\long\def\@footnotetext#1{%
  \H@@footnotetext{%
    \ifHy@nesting
      \expandafter\@firstoftwo
    \else
      \expandafter\@secondoftwo
    \fi
    {%
      \expandafter\hyper@@anchor\expandafter{%
```

```
        \Hy@footnote@currentHref
      }{\ignorespaces #1}%
    }{%
      \Hy@raisedlink{%
        \expandafter\hyper@@anchor\expandafter{%
          \Hy@footnote@currentHref
        }{\relax}%
      }%
      \let\@currentHref\Hy@footnote@currentHref
      \let\@currentlabelname\@empty
      \ignorespaces #1%
    }%
  }%
}%
```

Redefine `\@footnotemark`, borrowing its code (at the cost of getting out of sync with latex.ltx), to take advantage of its white space and hyphenation fudges. If we just overload it, we can get variant documents (the word before the footnote is treated differently). Thanks to David Carlisle and Brian Ripley for confusing and helping me on this.

```
\def\@footnotemark{%
  \leavevmode
  \ifhmode\edef\@x@sf{\the\spacefactor}\nobreak\fi
  \stepcounter{Hfootnote}%
  \global\let\Hy@saved@currentHref\@currentHref
  \hyper@makecurrent{Hfootnote}%
  \global\let\Hy@footnote@currentHref\@currentHref
  \global\let\@currentHref\Hy@saved@currentHref
  \hyper@linkstart{link}{\Hy@footnote@currentHref}%
  \@makefnmark
  \hyper@linkend
  \ifhmode\spacefactor\@x@sf\fi
  \relax
}%
```

Tabularx causes footnote problems, disable the linking if that is loaded. Since v6.82i footnotes are only disabled inside the environment 'tabularx'.

```
\@ifpackageloaded{tabularx}{%
  \let\HyOrg@TX@endtabularx\TX@endtabularx
  \def\Hy@tabularx@hook{%
    \let\@footnotetext\H@@footnotetext
    \let\@footnotemark\H@@footnotemark
    \let\@mpfootnotetext\H@@mpfootnotetext
  }%
  \begingroup
    \toks@\expandafter{\TX@endtabularx}%
    \xdef\Hy@gtemp{%
      \noexpand\Hy@tabularx@hook
      \the\toks@
    }%
  \endgroup
  \let\TX@endtabularx\Hy@gtemp
}{}%
```

Support for footnotes in p columns of longtable. Here `\footnote` commands are

split into \footnotemark and a call of \footnotetext with the optional argument, that is not supported by hyperref. The result is a link by \footnotemark without valid anchor

```
\@ifpackageloaded{longtable}{%
  \CheckCommand{\LT@p@ftntext}[1]{%
    \edef\@tempa{%
      \the\LT@p@ftn
      \noexpand\footnotetext[\the\c@footnote]%
    }%
    \global\LT@p@ftn\expandafter{\@tempa{#1}}%
  }%
  \long\def\LT@p@ftntext#1{%
    \edef\@tempa{%
      \the\LT@p@ftn
      \begingroup
        \noexpand\c@footnote=\the\c@footnote\relax
        \noexpand\protected@xdef\noexpand\@thefnmark{%
          \noexpand\thempfn
        }%
        \noexpand\Hy@LT@footnotetext{%
          \Hy@footnote@currentHref
        }%
    }%
    \global\LT@p@ftn\expandafter{%
       \@tempa{#1}%
      \endgroup
    }%
  }%
  \long\def\Hy@LT@footnotetext#1#2{%
    \H@@footnotetext{%
      \ifHy@nesting
        \hyper@@anchor{#1}{#2}%
      \else
        \Hy@raisedlink{%
          \hyper@@anchor{#1}{\relax}%
        }%
        \def\@currentHref{#1}%
        \let\@currentlabelname\@empty
        #2%
      \fi
    }%
  }%
}{}%
```

Footnotes for fancyvrb (Fix by Manuel Pégourié-Gonnard).

```
\@ifpackageloaded{fancyvrb}{%
  \def\V@@footnotetext{%
    \insert\footins\bgroup
    \csname reset@font\endcsname
    \footnotesize
    \interlinepenalty\interfootnotelinepenalty
    \splittopskip\footnotesep
    \splitmaxdepth\dp\strutbox
    \floatingpenalty \@MM
```

```
    \hsize\columnwidth
    \@parboxrestore
    \def\@currentcounter{footnote}%
      \protected@edef\@currentlabel{\csname p@footnote\endcsname\@thefnmark}%
    \@makefntext{}%
    \rule{\z@}{\footnotesep}%
    \bgroup
    \aftergroup\V@@@footnotetext
    \Hy@raisedlink{%
      \expandafter\hyper@@anchor\expandafter{%
        \Hy@footnote@currentHref
      }{\relax}%
    }%
    \let\@currentHref\Hy@footnote@currentHref
    \let\@currentlabelname\@empty
    \ignorespaces
  }%
}{}%
```

KOMA-Script or newer LaTeX defines `\footref` that uses both `\ref` and `\@footnotemark` resulting in two links, one of them wrong.

```
\def\Hy@temp#1{%
  \begingroup
    \unrestored@protected@xdef\@thefnmark{\ref{#1}}%
  \endgroup
  \@footnotemark
}%
\ifx\Hy@temp\footref
  \def\footref#1{%
  \begingroup
    \unrestored@protected@xdef\@thefnmark{\ref{#1}}%
  \endgroup
  \H@@footnotemark
  }%
\fi
```

But the special footnotes in `\maketitle` are much too hard to deal with properly. Let them revert to plain behaviour. The koma classes add an optional argument.

```
\let\HyOrg@maketitle\maketitle
\def\maketitle{%
  \let\Hy@saved@footnotemark\@footnotemark
  \let\Hy@saved@footnotetext\@footnotetext
  \let\@footnotemark\H@@footnotemark
  \let\@footnotetext\H@@footnotetext
  \@ifnextchar[\Hy@maketitle@optarg{% ]
    \HyOrg@maketitle
    \Hy@maketitle@end
  }%
}%
\def\Hy@maketitle@optarg[#1]{%
  \HyOrg@maketitle[{#1}]%
  \Hy@maketitle@end
}%
```

```
  \def\Hy@maketitle@end{%
    \ifx\@footnotemark\H@@footnotemark
      \let\@footnotemark\Hy@saved@footnotemark
    \fi
    \ifx\@footnotetext\H@@footnotetext
      \let\@footnotetext\Hy@saved@footnotetext
    \fi
  }%
```

\realfootnote Does anyone remember the function and purpose of \realfootnote?

```
  \def\realfootnote{%
    \@ifnextchar[\@xfootnote%]
     {\stepcounter{\@mpfn}%
      \protected@xdef\@thefnmark{\thempfn}%
      \H@@footnotemark\H@@footnotetext
    }%
  }%
\fi
}{}
\Hy@DisableOption{hyperfootnotes}

⟨/packageEnd⟩
⟨*check⟩
\checklatex
\checkcommand\def\@xfootnotenext[#1]{%
  \begingroup
    \csname c@\@mpfn\endcsname #1\relax
    \unrestored@protected@xdef\@thefnmark{\thempfn}%
  \endgroup
  \@footnotetext
}
\checkcommand\def\@xfootnotemark[#1]{%
  \begingroup
    \c@footnote #1\relax
    \unrestored@protected@xdef\@thefnmark{\thefootnote}%
  \endgroup
  \@footnotemark
}
\checkcommand\def\@footnotemark{%
  \leavevmode
  \ifhmode\edef\@x@sf{\the\spacefactor}\nobreak\fi
  \@makefnmark
  \ifhmode\spacefactor\@x@sf\fi
  \relax
}
⟨/check⟩
⟨*packageEnd⟩
```

36 Float captions

Make the float caption the hypertext anchor; curiously enough, we can't just copy the definition of \@caption. Its all to do with expansion. It screws up. Sigh.

```
\@ifundefined{hyper@nopatch@caption}{%
\def\caption{%
  \ifx\@captype\@undefined
    \@latex@error{\noexpand\caption outside float}\@ehd
    \expandafter\@gobble
  \else
    \H@refstepcounter\@captype
    \let\Hy@tempa\@caption
    \@ifundefined{float@caption}{%
    }{%
      \expandafter\ifx\csname @float@c@\@captype\endcsname
                      \float@caption
        \let\Hy@tempa\Hy@float@caption
      \fi
    }%
    \expandafter\@firstofone
  \fi
  {\@dblarg{\Hy@tempa\@captype}}%
}
\long\def\@caption#1[#2]#3{%
  \expandafter\ifx\csname if@capstart\expandafter\endcsname
                  \csname iftrue\endcsname
    \global\let\@currentHref\hc@currentHref
  \else
    \hyper@makecurrent{\@captype}%
  \fi
  \@ifundefined{NR@gettitle}{%
    \def\@currentlabelname{#2}%
  }{%
    \NR@gettitle{#2}%
  }%
  \par\addcontentsline{\csname ext@#1\endcsname}{#1}{%
    \protect\numberline{\csname the#1\endcsname}{\ignorespaces #2}%
  }%
  \begingroup
    \@parboxrestore
    \if@minipage
      \@setminipage
    \fi
    \normalsize
    \expandafter\ifx\csname if@capstart\expandafter\endcsname
                    \csname iftrue\endcsname
      \global\@capstartfalse
      \@makecaption{\csname fnum@#1\endcsname}{\ignorespaces#3}%
    \else
      \@makecaption{\csname fnum@#1\endcsname}{%
        \ignorespaces
```

If we cannot have nesting, the anchor is empty.

```
        \ifHy@nesting
          \expandafter\hyper@@anchor\expandafter{\@currentHref}{#3}%
        \else
          \Hy@raisedlink{%
            \expandafter\hyper@@anchor\expandafter{%
              \@currentHref
```

```
          }{\relax}%
        }%
        #3%
      \fi
```

as the anchor are set manually here, we have to update the tagging info.

```
      \UseTaggingSocket{recordtarget}%
    }%
  \fi
  \par
 \endgroup
}}{}%end no patch
```

Compatibility with float.sty: anchor setting at the top of the float, if the float is controlled by float.sty. Several `\caption` commands inside one float are not supported.

`\HyNew@float@makebox` is introduced as feature request of Axel Sommerfeldt to make the life easier for his package 'caption'.

```
\let\Hy@float@caption\@caption
\newcommand{\HyNew@float@makebox}[1]{%
 \HyOrg@float@makebox{%
  #1\relax
  \ifx\Hy@float@currentHref\@undefined
  \else
   \expandafter\hyper@@anchor\expandafter{%
    \Hy@float@currentHref
   }{\relax}%
   \global\let\Hy@float@currentHref\@undefined
  \fi
 }%
}%
\@ifpackageloaded{float}{%
 \def\Hy@float@caption{%
  \ifx\Hy@float@currentHref\@undefined
   \hyper@makecurrent{\@captype}%
   \global\let\Hy@float@currentHref\@currentHref
  \else
   \let\@currentHref\Hy@float@currentHref
  \fi
  \float@caption
 }%
 \let\HyOrg@float@makebox\float@makebox
 \let\float@makebox\HyNew@float@makebox
}{}
```

```
⟨/packageEnd⟩
⟨*check⟩
\checklatex[1999/06/01 - 2000/06/01]
\checkcommand\def\caption{%
 \ifx\@captype\@undefined
  \@latex@error{\noexpand\caption outside float}\@ehd
  \expandafter\@gobble
 \else
  \refstepcounter\@captype
  \expandafter\@firstofone
```

```
  \fi
  {\@dblarg{\@caption\@captype}}%
}
\checkcommand\long\def\@caption#1[#2]#3{%
  \par
  \addcontentsline{\csname ext@#1\endcsname}{#1}{%
    \protect\numberline{\csname the#1\endcsname}{\ignorespaces #2}%
  }%
  \begingroup
    \@parboxrestore
    \if@minipage
      \@setminipage
    \fi
    \normalsize
    \@makecaption{\csname fnum@#1\endcsname}{\ignorespaces #3}\par
  \endgroup
}
⟨/check⟩
⟨*packageEnd⟩
```

37 Bibliographic references

This is not very robust, since many styles redefine these things. The package used to redefine `\@citex` and the like; then we tried adding the hyperref call explicitly into the .aux file. Now we redefine `\bibcite`; this still breaks some citation packages so we have to work around them. But this remains extremely dangerous. Any or all of *achemso* and *drftcite* may break.

However, lets make an attempt to get *natbib* right, because that's a powerful, important package. Patrick Daly (daly@linmpi.mpg.de) has provided hooks for us, so all we need to do is activate them.

Change 2026-02-06: use a generic hook to allow the tagging code to add its code without patching hyperref.

```
\AddToHookWithArguments{cmd/hyper@natlinkstart/before}
 {%
   \Hy@backout{#1}%
```

natbib passes the `\@extra@b@citeb` in the argument, and biblatex the refsection, so we only need to add the prefix cite..

```
     \hyper@linkstart{cite}{cite.#1}%
     \def\hyper@nat@current{#1}%
 }
\AddToHook{cmd/hyper@natlinkend/after}
  {\hyper@linkend}
\def\hyper@natlinkbreak#1#2{%
  \hyper@linkend#1\hyper@linkstart{cite}{cite.#2}%
}
\def\hyper@natanchorstart#1{%
  \Hy@raisedlink{\hyper@anchorstart{cite.#1}\relax}%
}
\def\hyper@natanchorend{\hyper@anchorend}
```

Do not play games if we have natbib support. Macro extra@binfo added for chapterbib support. Chapterbib also wants `\@extra@binfo` in the hyper-link, but since the link tag is not expanded immediately, we use `\@extra@b@citeb`, so cites in a chapter will link to the bibliography in that chapter.

```
\@ifundefined{hyper@nopatch@bib}
{%
  \@ifundefined{NAT@parse}{%
    \providecommand*\@extra@binfo{}%
    \providecommand*\@extra@b@citeb{}%
    \def\bibcite#1#2{%
      \@newl@bel{b}{#1\@extra@binfo}{%
        \hyper@@link[cite]{}{cite.#1\@extra@b@citeb}{#2}%
      }%
    }%
    \gdef\@extra@binfo{}%
```

Package `babel` redefines `\bibcite` with macro `\bbl@cite@choice`. It needs to be overwritten to avoid the warning "Label(s) may have changed.".

```
    \let\Hy@bibcite\bibcite
    \begingroup
      \@ifundefined{bbl@cite@choice}{}{%
        \g@addto@macro\bbl@cite@choice{%
          \let\bibcite\Hy@bibcite
        }%
      }%
    \endgroup
```

`\@BIBLABEL` is working around a 'feature' of RevTEX.

```
    \providecommand*{\@BIBLABEL}{\@biblabel}%
    \def\@lbibitem[#1]#2{%
      \@skiphyperreftrue
      \H@item[%
        \ifx\Hy@raisedlink\@empty
          \hyper@anchorstart{cite.#2\@extra@b@citeb}%
            \@BIBLABEL{#1}%
          \hyper@anchorend
        \else
          \Hy@raisedlink{%
            \hyper@anchorstart{cite.#2\@extra@b@citeb}\hyper@anchorend
          }%
          \@BIBLABEL{#1}%
        \fi
        \hfill
      ]%
      \@skiphyperreffalse
      \if@filesw
        \begingroup
          \let\protect\noexpand
          \immediate\write\@auxout{%
            \string\bibcite{#2}{#1}%
          }%
        \endgroup
      \fi
      \ignorespaces
```

```
    }%
```

Since \bibitem is doing its own labelling, call the raw version of \item, to avoid extra spurious labels

```
    \def\@bibitem#1{%
      \@skiphyperreftrue\H@item\@skiphyperreffalse
      \Hy@raisedlink{%
        \hyper@anchorstart{cite.#1\@extra@b@citeb}\relax\hyper@anchorend
      }%
      \if@filesw
        \begingroup
          \let\protect\noexpand
          \immediate\write\@auxout{%
            \string\bibcite{#1}{\the\value{\@listctr}}%
          }%
        \endgroup
      \fi
      \ignorespaces
    }%
  }{}%
}{}
```

If \DocumentMetadata is used hyperref can use the bibcite hooks.

```
\IfDocumentMetadataT
{
  \AddToHook{package/hyperref/after}[latex-lab-testphase-bib]{}
  \RemoveFromHook{package/hyperref/after}[latex-lab-testphase-bib]
  \AddToHookWithArguments{bibcite/before}
    {%
      \hyper@linkstart{cite}{cite.#1\@extra@b@citeb}%
    }
  \AddToHookWithArguments{bibcite/after}{\hyper@linkend}
}
```

```
⟨/packageEnd⟩
⟨*check⟩
\checklatex
\checkcommand\def\@lbibitem[#1]#2{%
  \item[\@biblabel{#1}\hfill]%
  \if@filesw
    {%
      \let\protect\noexpand
      \immediate\write\@auxout{%
        \string\bibcite{#2}{#1}%
      }%
    }%
  \fi
  \ignorespaces
}
\checkcommand\def\@bibitem#1{%
  \item
  \if@filesw
    \immediate\write\@auxout{%
      \string\bibcite{#1}{\the\value{\@listctr}}%
    }%
```

```
  \fi
  \ignorespaces
}
⟨/check⟩
⟨*packageEnd⟩
```

37.1 Package harvard

Override Peter Williams' Harvard package; we have to a) make each of the citation types into a link; b) make each citation write a backref entry, and c) kick off a backreference section for each bibliography entry.

The redefinitions have to be deferred to `\begin{document}`, because if harvard.sty is loaded and html.sty is present and detects pdfTeX, then hyperref is already loaded at the begin of harvard.sty, and the `\newcommand` macros causes error messages.

```
\@ifpackageloaded{harvard}{%
  \Hy@AtBeginDocument{%
    \Hy@Info{*** compatibility with harvard **** }%
    \Hy@raiselinksfalse
    \def\harvardcite#1#2#3#4{%
      \global\@namedef{HAR@fn@#1}{\hyper@@link[cite]{}{cite.#1}{#2}}%
      \global\@namedef{HAR@an@#1}{\hyper@@link[cite]{}{cite.#1}{#3}}%
      \global\@namedef{HAR@yr@#1}{\hyper@@link[cite]{}{cite.#1}{#4}}%
      \global\@namedef{HAR@df@#1}{\csname HAR@fn@#1\endcsname}%
    }%
    \def\HAR@citetoaux#1{%
      \if@filesw\immediate\write\@auxout{\string\citation{#1}}\fi%
      \ifHy@backref
        \ifx\@empty\@currentlabel
        \else
          \@bsphack
          \if@filesw
            \protected@write\@auxout{}{%
              \string\@writefile{brf}{%
                \string\backcite{#1}{%
                  {\thepage}{\@currentlabel}{\@currentHref}%
                }%
              }%
            }%
          \fi
          \@esphack
        \fi
      \fi
    }%
    \def\harvarditem{%
      \@ifnextchar[{\@harvarditem}{\@harvarditem[\null]}%
    }%
    \def\@harvarditem[#1]#2#3#4#5\par{%
      \item[]%
      \hyper@anchorstart{cite.#4}\relax\hyper@anchorend
      \if@filesw
        \begingroup
          \def\protect##1{\string ##1\space}%
```

```
        \ifthenelse{\equal{#1}{\null}}%
          {\def\next{{#4}{#2}{#2}{#3}}}%
          {\def\next{{#4}{#2}{#1}{#3}}}%
        \immediate\write\@auxout{\string\harvardcite\codeof\next}%
      \endgroup
    \fi
    \protect\hspace*{-\labelwidth}%
    \protect\hspace*{-\labelsep}%
    \ignorespaces
    #5%
    \ifHy@backref
      \newblock
      \backref{\csname br@#4\endcsname}%
    \fi
    \par
  }%
```

\HAR@checkcitations Package hyperref has added \hyper@@link, so the original test \HAR@checkcitations will fail every time and always will appear the "Changed labels" warning. So we have to redefine \Har@checkcitations:

```
  \long\def\HAR@checkcitations#1#2#3#4{%
    \def\HAR@tempa{\hyper@@link[cite]{}{cite.#1}{#2}}%
    \expandafter\ifx\csname HAR@fn@#1\endcsname\HAR@tempa
      \def\HAR@tempa{\hyper@@link[cite]{}{cite.#1}{#3}}%
      \expandafter\ifx\csname HAR@an@#1\endcsname\HAR@tempa
        \def\HAR@tempa{\hyper@@link[cite]{}{cite.#1}{#4}}%
        \expandafter\ifx\csname HAR@yr@#1\endcsname\HAR@tempa
        \else
          \@tempswatrue
        \fi
      \else
        \@tempswatrue
      \fi
    \else
      \@tempswatrue
    \fi
  }%
}%

}{}
```

37.2 Package chicago

The links by \citeN and \shortciteN should include the closing parentheses.

```
\@ifpackageloaded{chicago}{%
```

\citeN

```
  \def\citeN{%
    \def\@citeseppen{-1000}%
    \def\@cite##1##2{##1}%
    \def\citeauthoryear##1##2##3{##1 (##3\@cite@opt)}%
    \@citedata@opt
  }%
```

\shortciteN

```
\def\shortciteN{%
  \def\@citeseppen{-1000}%
  \def\@cite##1##2{##1}%
  \def\citeauthoryear##1##2##3{##2 (##3\@cite@opt)}%
  \@citedata@opt
}%
```

\@citedata@opt

```
\def\@citedata@opt{%
  \let\@cite@opt\@empty
  \@ifnextchar [{%
    \@tempswatrue
    \@citedatax@opt
  }{%
    \@tempswafalse
    \@citedatax[]%
  }%
}%
```

\@citedatax@opt

```
\def\@citedatax@opt[#1]{%
  \def\@cite@opt{, #1}%
  \@citedatax[{#1}]%
}%

}{}
```

38 Page numbers

The last page should not contain a /Dur key, because there is no page after the last page. Therefore at the last page there should be a command `\hypersetup{pdfpageduration={}}`. This can be set with `\AtEndDocument`, but it can be too late, if the last page is already finished, or too early, if lots of float pages will follow. Therefore currently nothing is done by hyperref.

Experimental!

This where we supply a destination for each page.

The name of destination is stored in the global command `\@currentHpage`, this allows it to retrieve it with an extended reference system like zref or the new property code from LaTeX 2023-11-01.

```
\def\@currentHpage{Doc-Start}

\@ifclassloaded{slides}{%
  \def\Hy@SlidesFormatOptionalPage#1{(#1)}%
  \def\Hy@PageAnchorSlidesPlain{%
    \advance\c@page\@ne
    \xdef\@currentHpage{page.\the\c@slide.\the\c@overlay.\the\c@note%
       \ifnum\c@page=\@ne
       \else
         .\the\c@page
       \fi}%
    \edef\Hy@TempPageAnchor{%
      \noexpand\hyper@@anchor{%
```

```
      \@currentHpage
    }%
  }%
  \advance\c@page-\@ne
}%
\def\Hy@PageAnchorSlide{%
  \advance\c@page\@ne
  \ifnum\c@page>\@ne
    \@ifundefined{theHpage}{%
      \protected@edef\Hy@TheSlideOptionalPage{%
        \Hy@SlidesFormatOptionalPage{\thepage}%
      }%
    }{%
      \protected@edef\Hy@TheSlideOptionalPage{%
        \Hy@SlidesFormatOptionalPage{\theHpage}%
      }%
    }%
  \else
    \def\Hy@TheSlideOptionalPage{}%
  \fi
  \advance\c@page-\@ne
  \pdfstringdef\@the@H@page{%
    \csname
      the%
      \@ifundefined{theH\Hy@SlidesPage}{}{H}%
      \Hy@SlidesPage
    \endcsname
    \Hy@TheSlideOptionalPage
  }%
  \@gobblethree
}%
\def\Hy@SlidesPage{slide}%
\g@addto@macro\slide{%
  \def\Hy@SlidesPage{slide}%
}%
\g@addto@macro\overlay{%
  \def\Hy@SlidesPage{overlay}%
}%
\g@addto@macro\note{%
  \def\Hy@SlidesPage{note}%
}%
}{%
\def\Hy@PageAnchorSlidesPlain{}%
\def\Hy@PageAnchorSlide{}%
}
\def\Hy@EveryPageAnchor{%
\Hy@DistillerDestFix
\ifHy@pageanchor
  \ifHy@hypertexnames
    \ifHy@plainpages
      \def\Hy@TempPageAnchor{\hyper@@anchor{page.\the\c@page}}%
      \xdef\@currentHpage{page.\the\c@page}%
      \Hy@PageAnchorSlidesPlain
    \else
```

```
      \begingroup
        \let\@number\@firstofone
        \Hy@unicodefalse
        \Hy@PageAnchorSlide
        \pdfstringdef\@the@H@page{\thepage}%
      \endgroup
      \EdefUnescapeString\@the@H@page{\@the@H@page}%
      \def\Hy@TempPageAnchor{\hyper@@anchor{page.\@the@H@page}}%
      \xdef\@currentHpage{page.\@the@H@page}%
    \fi
  \else
    \Hy@GlobalStepCount\Hy@pagecounter
    \def\Hy@TempPageAnchor{%
      \hyper@@anchor{page.\the\Hy@pagecounter}%
    }%
    \xdef\@currentHpage{page.\the\Hy@pagecounter}%
  \fi
  \vbox to 0pt{%
    \kern\voffset
    \kern\topmargin
    \kern-1bp\relax
    \hbox to 0pt{%
      \kern\hoffset
      \kern\ifodd\value{page}%
            \oddsidemargin
          \else
            \evensidemargin
          \fi
      \kern-1bp\relax
      \Hy@TempPageAnchor\relax
      \hss
    }%
    \vss
  }%
 \fi
}
\g@addto@macro\Hy@EveryPageBoxHook{%
 \Hy@EveryPageAnchor
}
```

39 Table of contents

TV Raman noticed that people who add arbitrary material into the TOC generate a bad or null link. We avoid that by checking if the current destination is empty. But if 'the most recent destination' is not what you expect, you will be in trouble. In newer LaTeX releases this is defined to put a % at the end of the line in the tocfile.

```
\providecommand\protected@file@percent{}
```

Change 2026-02-06: Add support for \DocumentMetadata. We externalize the command to allow booksmark to be set without explicit toc-entry.

```
\def\Hy@addcontentsline@addbookmark#1#2#3%#1 toc type, #2 level, #3 content
```

```
{%
 \ifHy@bookmarks
  \ifx\@currentHref\@empty
   \Hy@Warning{%
    No destination for bookmark of \string\addcontentsline,%
    \MessageBreak destination is added%
   }%
   \phantomsection
  \fi
  \begingroup
   \let\label\@gobble@om
   \let\index\@gobble@som
   \let\glossary\@gobble@om
   \expandafter\ifx\csname toclevel@#2\endcsname\relax
    \begingroup
     \def\Hy@tempa{#1}%
     \ifx\Hy@tempa\Hy@bookmarkstype
      \Hy@WarningNoLine{%
       bookmark level for unknown #2 defaults to 0%
      }%
     \else
      \Hy@Info{bookmark level for unknown #2 defaults to 0}%
     \fi
    \endgroup
    \expandafter\gdef\csname toclevel@#2\endcsname{0}%
   \fi
   \edef\Hy@toclevel{\csname toclevel@#2\endcsname}%
   \Hy@writebookmark{\csname the#2\endcsname}%
    {#3}%
    {\@currentHref}%
    {\Hy@toclevel}%
    {#1}%
   \ifHy@verbose
    \begingroup
     \def\Hy@tempa{#3}%
     \@onelevel@sanitize\Hy@tempa
     \let\temp@online\on@line
     \let\on@line\@empty
     \Hy@Info{%
      bookmark\temp@online:\MessageBreak
      thecounter {\csname the#2\endcsname}\MessageBreak
      text {\Hy@tempa}\MessageBreak
      reference {\@currentHref}\MessageBreak
      toclevel {\Hy@toclevel}\MessageBreak
      type {#1}%
     }%
    \endgroup
   \fi
  \endgroup
 \fi
}
```

If the new sec template code is used, we map the command to the new interface:

```
\@ifundefined{addcontentslinebookmark}{}
{
```

```
 \RenewCommandCopy\addcontentslinebookmark\Hy@addcontentsline@addbookmark
   \renewcommand\addcontentslinebookmarkOff
   {%
    \ifHy@bookmarks
     \let\addcontentslinebookmarkReset\Hy@bookmarkstrue
    \else
     \let\addcontentslinebookmarkReset\relax
    \fi
    \Hy@bookmarksfalse
   }
}
```

If \DocumentMetadata is not used, we must redefine \addcontentsline as in the latex-lab code to ensure that the target is written:

```
\@ifundefined{hyper@nopatch@toc}{%
\def\addcontentsline#1#2#3{% #1=toc extension, #2= heading type, tag
  \addtocontents{#1}{%
  \protect\contentsline{#2}{#3}{\thepage}{\@currentHref}\protected@file@percent
  }}{}
```

Then this addition works also if \DocumentMetadata is used.

```
\AddToHookWithArguments{cmd/addcontentsline/before}[hyp]
 {%
  \Hy@addcontentsline@addbookmark
   {#1}
   {#2}
   {#3}%
}
```

\contentsline The page number might be empty. In this case the link for the page number is suppressed to avoid little link boxes.

change 2022-11-13: To avoid problems if MakeUppercase is used around the entry we use special protected commands:

```
\protected\def\Hy@toclinkstart{\hyper@linkstart{link}{\Hy@tocdestname}}
\protected\def\Hy@toclinkend{\hyper@linkend}

\@ifundefined{hyper@nopatch@toc}{%
 \def\contentsline#1#2#3#4{%
  \begingroup
   \Hy@safe@activestrue
  \edef\x{\endgroup
   \def\noexpand\Hy@tocdestname{#4}%
  }\x
  \ifx\Hy@tocdestname\@empty
   \csname l@#1\endcsname{#2}{#3}%
  \else
   \ifcase\Hy@linktoc % none
    \csname l@#1\endcsname{#2}{#3}%
   \or % section
    \csname l@#1\endcsname{%
     \Hy@toclinkstart{#2}\Hy@toclinkend
    }{#3}%
```

```
    \or % page
      \def\Hy@temp{#3}%
      \ifx\Hy@temp\@empty
        \csname l@#1\endcsname{#2}{#3}%
      \else
        \csname l@#1\endcsname{{#2}}{%
          \Hy@toclinkstart{#3}\Hy@toclinkend
        }%
      \fi
    \else % all
      \def\Hy@temp{#3}%
      \ifx\Hy@temp\@empty
        \csname l@#1\endcsname{%
          \Hy@toclinkstart{#2}\Hy@toclinkend
        }{}%
      \else
        \csname l@#1\endcsname{%
          \Hy@toclinkstart{#2}\Hy@toclinkend
        }{%
          \Hy@toclinkstart{#3}\Hy@toclinkend
        }%
      \fi
    \fi
  \fi
 }
}{}
```

If \DocumentMetadata is used we make use of the \contentsline-hooks to add links:

```
\ExplSyntaxOn
\IfDocumentMetadataT
{
  \AddToHookWithArguments{contentsline/text/before}[hyp]
   {
    \tl_if_blank:nF {#2}%text
     {
      \tl_if_blank:nF {#4}%destination
        {
          \int_case:nnF {\Hy@linktoc}
            {
              {0}{} %none
              {1}{\hyper@linkstart{link}{#4}} %section
              {2}{} %page
            }
            {\hyper@linkstart{link}{#4}} %all
        }
      }
   }
  \AddToHookWithArguments{contentsline/text/after}[hyp]
   {
    \tl_if_blank:nF {#2}
     {
      \tl_if_blank:nF {#4}
       {
```

```
          \int_case:nnF {\Hy@linktoc}
            {
              {0}{} %none
              {1}{\hyper@linkend} %section
              {2}{} %page
            }
            {\hyper@linkend} %all
        } % none
      }
    }

  \AddToHookWithArguments{contentsline/page/before}[hyp]
   {
    \tl_if_blank:nF {#3}
     {
      \tl_if_blank:nF {#4} %
       {
        \int_case:nnF {\Hy@linktoc}
          {
            {0}{} %none
            {1}{} %section
            {2}{\hyper@linkstart{link}{#4}} %page
          }
          {\hyper@linkstart{link}{#4}} %all
        } % none
      }
    }
  \AddToHookWithArguments{contentsline/page/after}[hyp]
    {
     \tl_if_blank:nF {#3}
     {
      \tl_if_blank:nF {#4}
       {
        \int_case:nnF {\Hy@linktoc}
          {
            {0}{} %none
            {1}{} %section
            {2}{\hyper@linkend} %page
          }
          {\hyper@linkend} %all
        } % none
      }
    }
```

Until the latex-lab file is cleaned up, we need to remove the hook code

```
  \AddToHook{package/hyperref/after}[latex-lab-testphase-toc]{}
  \RemoveFromHook{package/hyperref/after}[latex-lab-testphase-toc]
}
\ExplSyntaxOff
```

⟨/packageEnd⟩
⟨*check⟩

```
\checklatex
\checkcommand\def\addcontentsline#1#2#3{%
  \addtocontents{#1}{\protect\contentsline{#2}{#3}{\thepage}}%
```

```
}
\checkcommand\def\contentsline#1{\csname l@#1\endcsname}
⟨/check⟩
⟨*packageEnd⟩
```

40 New counters

The whole theorem business makes up new counters on the fly; we are going to intercept this. Sigh. Do it at the level where new counters are defined. change 2024-02-14: use a csname to handle counter names with commands, see issue #330 change 2024-10-13: disable patches in new format 2024-11-01. change 2026-02-22: removed patches fully.

41 AMSLaTeX compatibility

Oh, no, they don't use anything as simple as `\refstepcounter` in the AMS! We need to intercept some low-level operations of theirs. Damned if we are going to try and work out what they get up to. Just stick a label of 'AMS' on the front, and use the label *they* worked out. If that produces something invalid, I give up. They'll change all the code again anyway, I expect (SR).

Version 6.77p uses a patch by Ross Moore.

If `\hyper@nopatch@amsmath@tag` is defined we don't patch but assume that kernel code adds anchors to equations. change 2023-06-14: use a hook to make it independent of loading order.

```
\@ifundefined{hyper@nopatch@amsmath@tag}
 {%
  \AddToHook{package/amsmath/after}{%
   \def\Hy@make@anchor{%
    \Hy@MakeCurrentHrefAuto{AMS}%
    \Hy@raisedlink{\hyper@anchorstart{\@currentHref}\hyper@anchorend}%
   }%
   \def\Hy@make@df@tag@@#1{%
    \gdef\df@tag{%
     \maketag@@@{\Hy@make@anchor#1}%
     \def\@currentlabel{#1}%
    }%
   }%
   \def\Hy@make@df@tag@@@#1{%
    \gdef\df@tag{%
     \tagform@{\Hy@make@anchor#1}%
     \toks@\@xp{\p@equation{#1}}%
     \edef\@currentlabel{\the\toks@}%
    }%
   }%
   \let\HyOrg@make@df@tag@@\make@df@tag@@
   \let\HyOrg@make@df@tag@@@\make@df@tag@@@
   \let\make@df@tag@@\Hy@make@df@tag@@
   \let\make@df@tag@@@\Hy@make@df@tag@@@
  }{}
 }{}
```

This code I simply cannot remember what I was trying to achieve. The final result seems to do nothing anyway.

```
\let\H@tagform@\tagform@
\def\tagform@#1{%
 \maketag@@@{\hyper@@anchor{\@currentHref}%
 {(\ignorespaces#1\unskip)}}%
}
\def\eqref#1{\textup{\H@tagform@{\ref{#1}}}}
```

41.1 \@addtoreset and \numberwithin patches

\@addtoreset puts a counter to the reset list of another counter. After a reset the counter starts again with perhaps already used values. Therefore the hyperref version of the counter print command \theHcounter is redefined in order to add the parent counter. change 2024-07-10: define \HyOrg@addtoreset always for cleveref compatibility with tagging code, see https://github.com/latex3/tagging-project/issues/2

```
\def\HyOrg@addtoreset#1#2{\expandafter\@cons\csname cl@#2\endcsname {{#1}}}
\@ifundefined{hyper@nopatch@counter}
 {
  \let\HyOrg@addtoreset\@addtoreset
  \def\@addtoreset#1#2{%
    \HyOrg@addtoreset{#1}{#2}%
    \expandafter\xdef\csname theH#1\endcsname{%
      \expandafter\noexpand
          \csname the\@ifundefined{theH#2}{}H#2\endcsname
      .\noexpand\the\noexpand\value{#1}%
    }%
  }
 }{}
```

\numberwithin A appropriate definition of hyperref's companion counter (\theH...) is added for correct link names.

```
⟨/packageEnd⟩
⟨*check⟩
\checkpackage{amsmath}[1999/12/14 - 2000/06/06]
\checkcommand\newcommand{\numberwithin}[3][\arabic]{%
  \@ifundefined{c@#2}{\@nocounterr{#2}}{%
    \@ifundefined{c@#3}{\@nocnterr{#3}}{%
      \@addtoreset{#2}{#3}%
      \@xp\xdef\csname the#2\endcsname{%
        \@xp\@nx\csname the#3\endcsname .\@nx#1{#2}%
      }%
    }%
  }%
}%
⟨/check⟩
```

change 2023-06-14: use hook to make independent of loading order

```
⟨*packageEnd⟩
\@ifundefined{hyper@nopatch@counter}
 {
  \AddToHook{package/amsmath/after}{%
```

```
    \renewcommand*{\numberwithin}[3][\arabic]{%
      \@ifundefined{c@#2}{\@nocounterr{#2}}{%
        \@ifundefined{c@#3}{\@nocnterr{#3}}{%
          \HyOrg@addtoreset{#2}{#3}%
          \@xp\xdef\csname the#2\endcsname{%
            \@xp\@nx\csname the#3\endcsname .\@nx#1{#2}%
          }%
          \@xp\xdef\csname theH#2\endcsname{%
            \@xp\@nx
            \csname the\@ifundefined{theH#3}{}H#3\endcsname
            .\@nx#1{#2}%
          }%
        }%
      }%
    }%
  }{}
}{}
```

42 Included figures

Simply intercept the low level graphics package macro.

```
\ifHy@hyperfigures
  \let\Hy@Gin@setfile\Gin@setfile
  \def\Gin@setfile#1#2#3{%
    \hyperimage{#3}{\Hy@Gin@setfile{#1}{#2}{#3}}%
  }%
\fi
\Hy@DisableOption{hyperfigures}
```

43 hyperindex entries

Internal command names are prefixed with `\HyInd@`.

Hyper-indexing works crudely, by forcing code onto the end of the index entry with the | feature; this puts a hyperlink around the printed page numbers. It will not proceed if the author has already used the | specifier for something like emboldening entries. That would make Makeindex fail (cannot have two | specifiers). The solution is for the author to use generic coding, and put in the requisite `\hyperpage` in his/her own macros along with the boldness.

This section is poor stuff; it's open to all sorts of abuse. Sensible large projects will design their own indexing macros any bypass this.

```
\ifHy@hyperindex
  \def\HyInd@ParenLeft{(}%
  \def\HyInd@ParenRight{)}%
  \def\hyperxindexformat#1#2{%
    \let\HyOrg@hyperpage\hyperpage
    \let\hyperpage\@firstofone
    #1{\HyOrg@hyperpage{#2}}%
    \let\hyperpage\HyOrg@hyperpage
  }%
```

keep the old name for compatibility.

```
\let\hyperindexformat\hyperxindexformat
\Hy@nextfalse
\@ifpackageloaded{multind}{\Hy@nexttrue}{}%
\@ifpackageloaded{index}{\Hy@nexttrue}{}%
\@ifpackageloaded{amsmidx}{\Hy@nexttrue}{}%
\begingroup
  \lccode`\|=\expandafter`\HyInd@EncapChar\relax
  \lccode`\/=`\\\relax
\lowercase{\endgroup
  \ifHy@next
    \let\HyInd@org@wrindex\@wrindex
    \def\@wrindex#1#2{\HyInd@@wrindex{#1}#2||\\}%
    \def\HyInd@@wrindex#1#2|#3|#4\\{%
      \ifx\\#3\\%
        \HyInd@org@wrindex{#1}{#2|hyperpage}%
      \else
        \HyInd@@@wrindex{#1}{#2}#3\\%
      \fi
    }%
    \def\HyInd@@@wrindex#1#2#3#4\\{%
      \def\Hy@temp@A{#3}%
      \ifcase0\ifx\Hy@temp@A\HyInd@ParenLeft 1\fi
            \ifx\Hy@temp@A\HyInd@ParenRight 1\fi
            \relax
        \HyInd@org@wrindex{#1}{%
          #2|hyperxindexformat{/#3#4}%
        }%
      \else
        \ifx\\#4\\%
          \ifx\Hy@temp@A\HyInd@ParenRight
            \HyInd@org@wrindex{#1}{#2|#3}%
          \else
            \HyInd@org@wrindex{#1}{#2|#3hyperpage}%
          \fi
        \else
          \HyInd@org@wrindex{#1}{%
            #2|#3hyperxindexformat{/#4}%
          }%
        \fi
      \fi
    }%
  \else
    \def\@wrindex#1{\@@wrindex#1||\\}%
    \def\@@wrindex#1|#2|#3\\{%
      \if@filesw
        \ifx\\#2\\%
          \protected@write\@indexfile{}{%
            \string\indexentry{#1|hyperpage}{\thepage}%
          }%
        \else
          \HyInd@@@wrindex{#1}#2\\%
        \fi
      \fi
      \endgroup
```

```
  \@esphack
}%
\def\HyInd@@@wrindex#1#2#3\\{%
  \def\Hy@temp@A{#2}%
  \ifcase0\ifx\Hy@temp@A\HyInd@ParenLeft 1\fi
        \ifx\Hy@temp@A\HyInd@ParenRight 1\fi
        \relax
    \protected@write\@indexfile{}{%
      \string\indexentry{%
        #1|hyperxindexformat{/#2#3}%
      }{\thepage}%
    }%
  \else
    \ifx\\#3\\%
      \ifx\Hy@temp@A\HyInd@ParenRight
        \HyInd@DefKey{#1}%
        \@ifundefined{HyInd@(\HyInd@key)}{%
          \let\Hy@temp\@empty
        }{%
          \expandafter\let\expandafter\Hy@temp
          \csname HyInd@(\HyInd@key)\endcsname
        }%
        \protected@write\@indexfile{}{%
          \string\indexentry{#1|#2\Hy@temp}{\thepage}%
        }%
      \else
        \protected@write\@indexfile{}{%
          \string\indexentry{#1|#2hyperpage}{\thepage}%
        }%
        \HyInd@DefKey{#1}%
        \expandafter
        \gdef\csname HyInd@(\HyInd@key)\endcsname{%
          hyperpage%
        }%
      \fi
    \else
      \protected@write\@indexfile{}{%
        \string\indexentry{%
          #1|#2hyperxindexformat{/#3}%
        }{\thepage}%
      }%
      \ifx\Hy@temp@A\HyInd@ParenLeft
        \HyInd@DefKey{#1}%
        \expandafter
        \gdef\csname HyInd@(\HyInd@key)\endcsname{%
          hyperxindexformat{/#3}%
        }%
      \fi
    \fi
  \fi
}%
\def\HyInd@DefKey#1{%
  \begingroup
    \let\protect\@unexpandable@protect
```

```
        \edef\Hy@temp{#1}%
        \@onelevel@sanitize\Hy@temp
        \global\let\HyInd@key\Hy@temp
      \endgroup
    }%
  \fi
}%
\fi
\Hy@DisableOption{hyperindex}
\Hy@DisableOption{encap}
```

\nohyperpage The definition of \nohyperpage is just a precaution. It is used to mark code that does not belong to a page number, but \nohyperpage is never executed.

```
\def\nohyperpage#1{#1}
```

This again is quite flaky, but allow for the common situation of a page range separated by en-rule. We split this into two different hyperlinked pages.

```
\def\hyperpage#1{%
  \HyInd@hyperpage#1\nohyperpage{}\@nil
}
\def\HyInd@hyperpage#1\nohyperpage#2#3\@nil{%
  \HyInd@@hyperpage{#1}%
  #2%
  \def\Hy@temp{#3}%
  \ifx\Hy@temp\@empty
  \else
    \Hy@ReturnAfterFi{%
      \HyInd@hyperpage#3\@nil
    }%
  \fi
}
\def\HyInd@@hyperpage#1{\@hyperpage#1----\\}
\def\@hyperpage#1--#2--#3\\{%
  \ifx\\#2\\%
    \@commahyperpage{#1}%
  \else
    \HyInd@pagelink{#1}--\HyInd@pagelink{#2}%
  \fi
}
\def\@commahyperpage#1{\@@commahyperpage#1, ,\\}
\def\@@commahyperpage#1, #2,#3\\{%
  \ifx\\#2\\%
    \HyInd@pagelink{#1}%
  \else
    \HyInd@pagelink{#1}, \HyInd@pagelink{#2}%
  \fi
}
```

The argument of \hyperpage can be empty. And the line breaking algorithm of Makeindex can introduce spaces. So we have to remove them.

```
\def\HyInd@pagelink#1{%
  \begingroup
    \toks@={}%
    \HyInd@removespaces#1 \@nil
```

```
  \endgroup
}
\def\HyInd@removespaces#1 #2\@nil{%
  \toks@=\expandafter{\the\toks@#1}%
  \ifx\\#2\\%
    \edef\x{\the\toks@}%
    \ifx\x\@empty
    \else
      \hyperlink{page.\the\toks@}{\the\toks@}%
    \fi
  \else
    \Hy@ReturnAfterFi{%
      \HyInd@removespaces#2\@nil
    }%
  \fi
}
```

This breaks TeX4ht, so leave it to last. Emend `\@setref` to put out a hypertext link as well as its normal text (which is used as an anchor). (`\endinput` have to be on the same line like `\fi`, or you have to use `\expandafter` before.)

change 2022-11-13: added an `\@empty` for issue#261.

```
\ifHy@texht
  \expandafter\endinput
\fi
\let\real@setref\@setref
\def\@setref#1#2#3{% csname, extract group, refname
  \ifx#1\relax
    \protect\G@refundefinedtrue
    \nfss@text{\reset@font\bfseries ??}%
    \@latex@warning{%
      Reference `#3' on page \thepage \space undefined%
    }%
  \else
    \expandafter\Hy@setref@link#1\@empty\@empty\@empty\@nil{#2}%
  \fi
}
```

`\Hy@setref@link` extracts the reference information entries, because `\hyper@@link` does not expand arguments for the automatic link type detection.

```
\def\Hy@setref@link#1#2#3#4#5#6\@nil#7{%
  \begingroup
    \toks0={\hyper@@link{#5}{#4}}%
    \toks1=\expandafter{#7{#1}{#2}{#3}{#4}{#5}}%
    \edef\x{\endgroup
      \the\toks0 {\the\toks1 }%
    }%
  \x
}
\def\@pagesetref#1#2#3{% csname, extract macro, ref
  \ifx#1\relax
    \protect\G@refundefinedtrue
    \nfss@text{\reset@font\bfseries ??}%
    \@latex@warning{%
      Reference `#3' on page \thepage \space undefined%
    }%
```

```
  \else
    \protect\hyper@@link
      {\expandafter\@fifthoffive#1}%
      {page.\expandafter\@secondoffive#1}%
      {\expandafter\@secondoffive#1}%
  \fi
}
⟨/packageEnd⟩
⟨*check⟩
\checklatex
\checkcommand\def\@setref#1#2#3{%
  \ifx#1\relax
    \protect\G@refundefinedtrue
    \nfss@text{\reset@font\bfseries ??}%
    \@latex@warning{%
      Reference `#3' on page \thepage\space undefined%
    }%
  \else
    \expandafter#2#1\null
  \fi
}
⟨/check⟩
⟨*packageEnd⟩
```

Now some extended referencing. `\ref*` and `\pageref*` are not linked, and `\autoref` prefixes with a tag based on the type.

```
\def\HyRef@StarSetRef#1{%
  \begingroup
    \Hy@safe@activestrue
    \let\protect\@unexpandable@protect
    \edef\x{#1}%
    \@onelevel@sanitize\x
    \edef\x{\endgroup
      \noexpand\HyRef@@StarSetRef
        \expandafter\noexpand\csname r@\x\endcsname{\x}%
    }%
  \x
}
\def\HyRef@@StarSetRef#1#2#3{%
  \ifx#1\@undefined
    \let#1\relax
  \fi
  \real@setref#1#3{#2}%
}
\def\@refstar#1{%
  \HyRef@StarSetRef{#1}\@firstoffive
}
\def\@pagerefstar#1{%
  \HyRef@StarSetRef{#1}\@secondoffive
}
\def\@namerefstar#1{%
  \HyRef@StarSetRef{#1}\@thirdoffive
}
\def\@Refstar#1{%
```

```
  \HyRef@StarSetRef{#1}\HyRef@MakeUppercaseFirstOfFive
}%
\def\HyRef@MakeUppercaseFirstOfFive#1#2#3#4#5{%
  \MakeUppercase#1%
}%
\def\HyRef@Ref#1{%
  \hyperref[{#1}]{\Ref*{#1}}%
}%
\Hy@AtBeginDocument{%
  \@ifpackageloaded{varioref}{%
```

This are the patches for a varioref newer after 2019-09 Older versions are no longer supported. If \hyper@nopatch@varioref is defined we don't patch but assume that varioref handles the hyperlinks.

```
  \@ifundefined{hyper@nopatch@varioref}
   {
   \renewcommand\Vref@star[2][]{%
     \begingroup
       \let\T@pageref\@pagerefstar
       \Ref*{#2}
       \vpageref[#1]{#2}%
     \endgroup
   }%
   \renewcommand\Vr@f[2][]{%
     \begingroup
       \let\T@pageref\@pagerefstar
       \hyperref[{#2}]{%
         \Ref*{#2}
         \vpageref[#1]{#2}%
       }%
     \endgroup
   }%
    \renewcommand\vr@f[2][]{%
      \begingroup
        \let\T@pageref\@pagerefstar
        \hyperref[{#2}]{%
          \ref*{#2}
          \vpageref[#1]{#2}%
        }%
      \endgroup
    }%
    \renewcommand\vref@star[2][]{%
      \begingroup
        \let\T@pageref\@pagerefstar
        \ref*{#2}
        \vpageref[#1]{#2}%
      \endgroup
    }%
   }{}%
  }{}%
}
\DeclareRobustCommand*{\autopageref}{%
  \@ifstar{%
    \HyRef@autopagerefname\pageref*%
```

```
  }\HyRef@autopageref
}
\def\HyRef@autopageref#1{%
  \hyperref[{#1}]{\HyRef@autopagerefname\pageref*{#1}}%
}
\def\HyRef@autopagerefname{%
  \@ifundefined{pageautorefname}{%
    \@ifundefined{pagename}{%
      \Hy@Warning{No autoref name for `page'}%
    }{%
      \pagename\nobreakspace
    }%
  }{%
    \pageautorefname\nobreakspace
  }%
}
```

\leavevmode is added to make package wrapfigure happy, if \autoref starts a paragraph.

```
\NewDocumentCommand\autoref{s}
   {\leavevmode
   \IfBooleanTF{#1}{\HyRef@autoref\@gobbletwo}{\HyRef@autoref\hyper@@link}}
\def\HyRef@autoref#1#2{%
  \begingroup
    \Hy@safe@activestrue
    \expandafter\HyRef@autosetref\csname r@#2\endcsname{#2}{#1}%
  \endgroup
}
\def\HyRef@autosetref#1#2#3{% link command, csname, refname
  \HyRef@ShowKeysRef{#2}%
  \ifcase 0\ifx#1\relax 1\fi\ifx#1\Hy@varioref@undefined 1\fi\relax
    \edef\HyRef@thisref{%
      \expandafter\@fourthoffive#1\@empty\@empty\@empty
    }%
    \expandafter\HyRef@testreftype\HyRef@thisref.\\%
    \Hy@safe@activesfalse
    #3{%
      \expandafter\@fifthoffive#1\@empty\@empty\@empty
    }{%
      \expandafter\@fourthoffive#1\@empty\@empty\@empty
    }{%
      \HyRef@currentHtag
      \expandafter\@firstoffive#1\@empty\@empty\@empty
      \null
    }%
  \else
    \protect\G@refundefinedtrue
    \nfss@text{\reset@font\bfseries ??}%
    \@latex@warning{%
      Reference `#2' on page \thepage\space undefined%
    }%
  \fi
}
\def\HyRef@testreftype#1.#2\\{%
```

```
  \@ifundefined{#1autorefname}{%
    \@ifundefined{#1name}{%
      \HyRef@StripStar#1\\*\\\@nil{#1}%
      \@ifundefined{\HyRef@name autorefname}{%
        \@ifundefined{\HyRef@name name}{%
          \def\HyRef@currentHtag{}%
          \Hy@Warning{No autoref name for `#1'}%
        }{%
          \edef\HyRef@currentHtag{%
            \expandafter\noexpand\csname\HyRef@name name\endcsname
            \noexpand~%
          }%
        }%
      }{%
        \edef\HyRef@currentHtag{%
          \expandafter\noexpand
          \csname\HyRef@name autorefname\endcsname
          \noexpand~%
        }%
      }%
    }{%
      \edef\HyRef@currentHtag{%
        \expandafter\noexpand\csname#1name\endcsname
        \noexpand~%
      }%
    }%
  }{%
    \edef\HyRef@currentHtag{%
      \expandafter\noexpand\csname#1autorefname\endcsname
      \noexpand~%
    }%
  }%
}
\def\HyRef@StripStar#1*\\#2\@nil#3{%
  \def\HyRef@name{#2}%
  \ifx\HyRef@name\HyRef@CaseStar
    \def\HyRef@name{#1}%
  \else
    \def\HyRef@name{#3}%
  \fi
}
\def\HyRef@CaseStar{*\\}
\def\HyRef@currentHtag{}
```

Support for package showkeys.

\HyRef@ShowKeysRef

```
\let\HyRef@ShowKeysRef\@gobble
\def\HyRef@ShowKeysInit{%
  \@ifundefined{SK@@label}{}
   {%
    \ifx\SK@ref\@empty
    \else
      \def\HyRef@ShowKeysRef{%
        \SK@\SK@@ref
```

```
    }%
  \fi
 }%
}
\AddToHook{package/showkeys/after}{\HyRef@ShowKeysInit}
```

Defaults for the names that \autoref uses.

```
\providecommand*\AMSautorefname{\equationautorefname}
\providecommand*\Hfootnoteautorefname{\footnoteautorefname}
\providecommand*\Itemautorefname{\itemautorefname}
\providecommand*\itemautorefname{item}
\providecommand*\equationautorefname{Equation}
\providecommand*\footnoteautorefname{footnote}
\providecommand*\itemautorefname{item}
\providecommand*\figureautorefname{Figure}
\providecommand*\tableautorefname{Table}
\providecommand*\partautorefname{Part}
\providecommand*\appendixautorefname{Appendix}
\providecommand*\chapterautorefname{chapter}
\providecommand*\sectionautorefname{section}
\providecommand*\subsectionautorefname{subsection}
\providecommand*\subsubsectionautorefname{subsubsection}
\providecommand*\paragraphautorefname{paragraph}
\providecommand*\subparagraphautorefname{subparagraph}
\providecommand*\FancyVerbLineautorefname{line}
\providecommand*\theoremautorefname{Theorem}
\providecommand*\pageautorefname{page}
```

```
⟨/packageEnd⟩
```

44 Configuration files

44.1 PS/PDF strings

Some drivers write PS or PDF strings. These strings are delimited by parentheses, therefore a lonely unmatched parenthesis must be avoided to avoid PS or PDF syntax errors. Also the backslash character itself has to be protected.

\Hy@pstringdef Therefore such strings should be passed through \Hy@pstringdef. The first argument holds a macro for the result, the second argument is the string that needs protecting. Since version 1.30.0 pdfTEX offers \pdfescapestring.

```
⟨*pdftex | dvipdfm | xetex | vtex | pdfmarkbase | dviwindo⟩
\begingroup\expandafter\expandafter\expandafter\endgroup
\expandafter\ifx\csname pdf@escapestring\endcsname\relax
 \begingroup
  \catcode`\|=0 %
  \@makeother\\%
 |@firstofone{|endgroup
  |def|Hy@pstringdef#1#2{%
   |begingroup
    |edef~{|string~}%
    |xdef|Hy@gtemp{#2}%
   |endgroup
```

```
    |let#1|Hy@gtemp
    |@onelevel@sanitize#1%
    |edef#1{|expandafter|Hy@ExchangeBackslash#1\|@nil}%
    |edef#1{|expandafter|Hy@ExchangeLeftParenthesis#1(|@nil}%
    |edef#1{|expandafter|Hy@ExchangeRightParenthesis#1)|@nil}%
  }%
  |def|Hy@ExchangeBackslash#1\#2|@nil{%
    #1%
    |ifx|\#2|\%%
    |else
      \\%
      |Hy@ReturnAfterFi{%
        |Hy@ExchangeBackslash#2|@nil
      }%
    |fi
  }%
}%
\def\Hy@ExchangeLeftParenthesis#1(#2\@nil{%
  #1%
  \ifx\\#2\\%
  \else
    \@backslashchar(%
    \Hy@ReturnAfterFi{%
      \Hy@ExchangeLeftParenthesis#2\@nil
    }%
  \fi
}%
\def\Hy@ExchangeRightParenthesis#1)#2\@nil{%
  #1%
  \ifx\\#2\\%
  \else
    \@backslashchar)%
    \Hy@ReturnAfterFi{%
      \Hy@ExchangeRightParenthesis#2\@nil
    }%
  \fi
}%
\else
  \def\Hy@pstringdef#1#2{%
    \begingroup
      \edef~{\string~}%
      \xdef\Hy@gtemp{\pdf@escapestring{#2}}%
    \endgroup
    \let#1\Hy@gtemp
  }%
\fi
⟨/pdftex | dvipdfm | xetex | vtex | pdfmarkbase | dviwindo⟩
```

44.2 pdftex

```
⟨*pdftex⟩
\providecommand*{\XR@ext}{pdf}
\Hy@setbreaklinks{true}
\def\HyPat@ObjRef{%
```

```
  [0-9]*[1-9][0-9]* 0 R%
}
```

This driver is for Han The Thanh's TEX variant which produces PDF directly. This has new primitives to do PDF things, which usually translate almost directly to PDF code, so there is a lot of flexibility which we do not at present harness.

Set PDF version if requested by option pdfversion.

- pdfTEX 1.10a, 2003-01-16: \pdfoptionpdfminorversion
- pdfTEX 1.30, 2005-08-081: \pdfminorversion

```
\def\Hy@pdfminorversion{\pdfoptionpdfminorversion}%
\def\Hy@pdfminorversion{\pdfminorversion}%
\ifHy@ocgcolorlinks
  \ifnum\Hy@pdfmajorminor@version<105 %
    \kvsetkeys{Hyp}{pdfversion=1.5}%
  \fi
\fi
\ifHy@setpdfversion
  \ifnum\Hy@pdf@majorminor@version<105 %
    \@ifundefined{pdfobjcompresslevel}{%
    }{%
      \ifHy@verbose
        \Hy@InfoNoLine{%
          PDF object streams are disabled, because they are%
          \MessageBreak
          not supported in requested PDF version %
          \Hy@pdf@majorversion.\Hy@pdf@minorversion
        }%
      \fi
      \pdfobjcompresslevel=\z@
    }%
  \fi
  \ifnum\Hy@pdfmajorminor@version=\Hy@pdf@majorminor@version\relax
  \else
    \let\Hy@temp\@empty
    \def\Hy@temp@A#1#2{%
      \ifnum#1>\z@
        \edef\Hy@temp{%
          \Hy@temp
          \space\space
          \the#1\space #2%
          \ifnum#1=\@ne\else s\fi
          \MessageBreak
        }%
      \fi
    }%
    \Hy@temp@A\pdflastobj{PDF object}%
    \Hy@temp@A\pdflastxform{form XObject}%
    \Hy@temp@A\pdflastximage{image XObject}%
    \Hy@temp@A\pdflastannot{annotation}%
    \@ifundefined{pdflastlink}{%
    }{%
      \Hy@temp@A\pdflastlink{link}%
    }%
```

```
  \ifx\Hy@temp\@empty
    \Hy@pdfmajorversion=\Hy@pdf@majorversion\relax
    \Hy@pdfminorversion=\Hy@pdf@minorversion\relax
  \else
    \let\Hy@temp@A\@empty
    \ifnum\Hy@pdf@majorminor@version=104 %
      \IfFileExists{pdf14.sty}{%
        \def\Hy@temp@A{%
          \MessageBreak
          Or \string\RequirePackage{pdf14} can be used%
          \MessageBreak
          before \string\documentclass\space as shortcut%
        }%
      }{}%
    \fi
    \Hy@WarningNoLine{%
      The PDF version number could not be set,\MessageBreak
      because some PDF objects are already written:%
      \MessageBreak
      \Hy@temp
      The version should be set as early as possible:%
      \MessageBreak
      \space\space
      \expandafter\string\Hy@pdfmajorversion=\Hy@pdf@majorversion, %
      \expandafter\string\Hy@pdfminorversion=\Hy@pdf@minorversion
      \string\relax
      \ifnum\Hy@pdf@majorminor@version<105 %
        \@ifundefined{pdfobjcompresslevel}{%
        }{%
          \MessageBreak
          \space\space
          \string\pdfobjcompresslevel=0\string\relax
        }%
      \fi
      \Hy@temp@A
    }%
  \fi
\fi
\PackageInfo{hyperref}{%
  \expandafter\string\Hy@pdfmajorversion.%
  \expandafter\string\Hy@pdfminorversion
  :=\number\Hy@pdf@majorversion.\number\Hy@pdf@minorversion\space
}%
\fi
\edef\Hy@pdf@majorversion{\number\Hy@pdfmajorversion}%
\edef\Hy@pdf@minorversion{\number\Hy@pdfminorversion}%
\Hy@DisableOption{pdfversion}%
\ifHy@ocgcolorlinks
  \pdf@ifdraftmode{}{%
    \immediate\pdfobj{%
      <<%
        /Type/OCG%
        /Name(View)%
        /Usage<<%
```

```
      /Print<<%
        /PrintState/OFF%
      >>%
      /View<<%
        /ViewState/ON%
      >>%
    >>%
  >>%
}%
\edef\OBJ@OCG@view{\the\pdflastobj\space 0 R}%
\immediate\pdfobj{%
  <<%
    /Type/OCG%
    /Name(Print)%
    /Usage<<%
      /Print<<%
        /PrintState/ON%
      >>%
      /View<<%
        /ViewState/OFF%
      >>%
    >>%
  >>%
}%
\edef\OBJ@OCG@print{\the\pdflastobj\space 0 R}%
\immediate\pdfobj{%
  [%
    \OBJ@OCG@view\space\OBJ@OCG@print
  ]%
}%
\edef\OBJ@OCGs{\the\pdflastobj\space 0 R}%
\pdfcatalog{%
  /OCProperties<<%
    /OCGs \OBJ@OCGs
    /D<<%
      /OFF[\OBJ@OCG@print]%
      /AS[%
        <<%
          /Event/View%
          /OCGs \OBJ@OCGs
          /Category[/View]%
        >>%
        <<%
          /Event/Print%
          /OCGs \OBJ@OCGs
          /Category[/Print]%
        >>%
        <<%
          /Event/Export%
          /OCGs \OBJ@OCGs
          /Category[/Print]%
        >>%
      ]%
    >>%
```

```
    >>%
  }%
  \begingroup
    \edef\x{\endgroup
      \pdfpageresources{%
        \the\pdfpageresources
        /Properties<<%
          /OCView \OBJ@OCG@view
          /OCPrint \OBJ@OCG@print
        >>%
      }%
    }%
  \x
}%
\Hy@AtBeginDocument{%
  \def\Hy@colorlink#1{%
    \begingroup
      \ifHy@ocgcolorlinks
        \def\Hy@ocgcolor{#1}%
        \setbox0=\hbox\bgroup\color@begingroup
      \else
        \HyColor@UseColor#1%
      \fi
  }%
  \def\Hy@endcolorlink{%
    \ifHy@ocgcolorlinks
      \color@endgroup\egroup
      \mbox{%
        \pdfliteral page{/OC/OCPrint BDC}%
        \rlap{\copy0}%
        \pdfliteral page{EMC/OC/OCView BDC}%
        \begingroup
          \expandafter\HyColor@UseColor\Hy@ocgcolor
          \box0 %
        \endgroup
        \pdfliteral page{EMC}%
      }%
    \fi
    \endgroup
  }%
}%
\else
  \Hy@DisableOption{ocgcolorlinks}%
\fi
```

First, allow for some changes and additions to pdftex syntax:

```
\def\setpdflinkmargin#1{%
  \begingroup
    \setlength{\dimen@}{#1}%
  \expandafter\endgroup
  \expandafter\pdflinkmargin\the\dimen@\relax
}
\pdflinkmargin1pt %
```

First set up the default linking

```
\providecommand*\@pdfview{XYZ}
```

First define the anchors:

```
\Hy@WrapperDef\new@pdflink#1{%
  \ifhmode
    \@savsf\spacefactor
  \fi
  \Hy@SaveLastskip
  \Hy@VerboseAnchor{#1}%
  \Hy@pstringdef\Hy@pstringDest{\HyperDestNameFilter{#1}}%
  \Hy@DestName\Hy@pstringDest\@pdfview
  \Hy@RestoreLastskip
  \ifhmode
    \spacefactor\@savsf
  \fi
}
\let\pdf@endanchor\@empty
```

`\Hy@DestName` Wrap the call of `\pdfdest name` in `\Hy@DestName`. Then it can easier be caught by package `hypdestopt`.

```
\def\Hy@DestName#1#2{%
  \pdfdest name{#1}#2\relax
}
```

Now the links; the interesting part here is the set of attributes which define how the link looks. We probably want to add a border and color it, but there are other choices. This directly translates to PDF code, so consult the manual for how to change this. We will add an interface at some point.

```
\providecommand*\@pdfborder{0 0 1}
\providecommand*\@pdfborderstyle{}
\def\Hy@undefinedname{UNDEFINED}
\def\find@pdflink#1#2{%
  \leavevmode
  \protected@edef\Hy@testname{#2}%
  \ifx\Hy@testname\@empty
    \Hy@Warning{%
      Empty destination name,\MessageBreak
      using `\Hy@undefinedname'%
    }%
    \let\Hy@testname\Hy@undefinedname
  \else
    \Hy@pstringdef\Hy@testname{%
      \expandafter\HyperDestNameFilter\expandafter{\Hy@testname}%
    }%
  \fi
  \Hy@StartlinkName{%
    \ifHy@pdfa /F 4\fi
    \Hy@setpdfborder
    \Hy@setpdfhighlight
    \ifx\CurrentBorderColor\relax
    \else
      /C[\CurrentBorderColor]%
    \fi
  }\Hy@testname
```

```
  \expandafter\Hy@colorlink\csname @#1color\endcsname
}
\def\Hy@StartlinkName#1#2{%
  \pdfstartlink attr{#1}goto name{#2}\relax
}
\def\close@pdflink{%
  \Hy@endcolorlink
  \Hy@VerboseLinkStop
  \pdfendlink
}
\def\hyper@anchor#1{%
  \new@pdflink{#1}\anchor@spot\pdf@endanchor
}
\def\hyper@anchorstart#1{%
  \new@pdflink{#1}%
  \Hy@activeanchortrue
}
\def\hyper@anchorend{%
  \pdf@endanchor
  \Hy@activeanchorfalse
}
\def\hyper@linkstart#1#2{%
  \Hy@VerboseLinkStart{#1}{#2}%
  \@ifundefined{@#1bordercolor}{%
    \let\CurrentBorderColor\relax
  }{%
    \edef\CurrentBorderColor{\csname @#1bordercolor\endcsname}%
  }%
  \find@pdflink{#1}{#2}%
}
\def\hyper@linkend{\close@pdflink}
\def\hyper@link#1#2#3{%
  \Hy@VerboseLinkStart{#1}{#2}%
  \@ifundefined{@#1bordercolor}{%
    \let\CurrentBorderColor\relax
  }{%
    \edef\CurrentBorderColor{\csname @#1bordercolor\endcsname}%
  }%
  \find@pdflink{#1}{#2}#3\Hy@xspace@end
  \close@pdflink
}
\let\CurrentBorderColor\@linkbordercolor
\def\hyper@linkurl#1#2{%
  \begingroup
    \Hy@pstringdef\Hy@pstringURI{#2}%
    \hyper@chars
    \leavevmode
    \pdfstartlink
      attr{%
        \Hy@setpdfborder
        \Hy@setpdfhighlight
        \ifx\@urlbordercolor\relax
        \else
          /C[\@urlbordercolor]%
```

```
      \fi
    }%
    user{%
     /Subtype/Link%
     \ifHy@pdfa /F 4\fi
     /A<<%
       /Type/Action%
       /S/URI%
       /URI(\Hy@pstringURI)%
       \ifHy@href@ismap
         /IsMap true%
       \fi
       \Hy@href@nextactionraw
     >>%
    }%
    \relax
  \Hy@colorlink\@urlcolor#1\Hy@xspace@end
  \close@pdflink
 \endgroup
}
\def\hyper@linkfile#1#2#3{% anchor text, filename, linkname
 \begingroup
  \def\Hy@pstringF{#2}%
  \Hy@CleanupFile\Hy@pstringF
  \Hy@pstringdef\Hy@pstringF\Hy@pstringF
  \Hy@pstringdef\Hy@pstringD{#3}%
  \Hy@MakeRemoteAction
  \leavevmode
  \pdfstartlink
    attr{%
      \Hy@setpdfborder
      \Hy@setpdfhighlight
      \ifx\@filebordercolor\relax
      \else
        /C[\@filebordercolor]%
      \fi
    }%
    user {%
      /Subtype/Link%
      \ifHy@pdfa /F 4\fi
      /A<<%
        /F(\Hy@pstringF)%
        /S/GoToR%
        \Hy@SetNewWindow
```

If #3 is empty, page 0; if its a number, Page number, otherwise a named destination.

```
 \afterassignment\xxx\count@=0\foo!%

\def\xxx#1!{%
 \ifx\xxx#1\xxx
   foo was an integer
 \else
   it wasnt
```

```
\fi}

        \ifx\\#3\\%
          /D[\Hy@href@page\@pdfremotestartview]%
        \else
          /D(\Hy@pstringD)%
        \fi
        \Hy@href@nextactionraw
      >>%
    }%
    \relax
  \Hy@colorlink\@filecolor#1\Hy@xspace@end
  \close@pdflink
 \endgroup
}
\def\@hyper@launch run:#1\\#2#3{% filename, anchor text linkname
 \begingroup
  \Hy@pstringdef\Hy@pstringF{#1}%
  \Hy@pstringdef\Hy@pstringP{#3}%
  \leavevmode
  \pdfstartlink
   attr{%
    \Hy@setpdfborder
    \Hy@setpdfhighlight
    \ifx\@runbordercolor\relax
    \else
      /C[\@runbordercolor]%
    \fi
   }%
   user {%
    /Subtype/Link%
    \ifHy@pdfa /F 4\fi
    /A<<%
      /F(\Hy@pstringF)%
      /S/Launch%
      \Hy@SetNewWindow
      \ifx\\#3\\%
      \else
        /Win<</P(\Hy@pstringP)/F(\Hy@pstringF)>>%
      \fi
      \Hy@href@nextactionraw
    >>%
   }%
   \relax
  \Hy@colorlink\@runcolor#2\Hy@xspace@end
  \close@pdflink
 \endgroup
}
```

\PDF@SetupDox

```
\def\PDF@SetupDoc{%
 \ifx\@pdfpagescrop\@empty
 \else
  \edef\process@me{%
```

```
    \pdfpagesattr={%
      /CropBox[\@pdfpagescrop]%
      \expandafter\ifx\expandafter\\\the\pdfpagesattr\\%
      \else
        ^^J\the\pdfpagesattr
      \fi
    }%
  }%
  \process@me
\fi
\Hy@pstringdef\Hy@pstringB{\@baseurl}%
\pdfcatalog{%
  /PageMode/\@pdfpagemode
  \ifx\@baseurl\@empty
  \else
    /URI<</Base(\Hy@pstringB)>>%
  \fi
}%
\ifx\@pdfstartpage\@empty
\else
  \ifx\@pdfstartview\@empty
  \else
    openaction goto page\@pdfstartpage{\@pdfstartview}%
  \fi
\fi
\edef\Hy@temp{%
  \ifHy@pdftoolbar\else /HideToolbar true\fi
  \ifHy@pdfmenubar\else /HideMenubar true\fi
  \ifHy@pdfwindowui\else /HideWindowUI true\fi
  \ifHy@pdffitwindow /FitWindow true\fi
  \ifHy@pdfcenterwindow /CenterWindow true\fi
  \ifHy@pdfdisplaydoctitle /DisplayDocTitle true\fi
  \Hy@UseNameKey{NonFullScreenPageMode}\@pdfnonfullscreenpagemode
  \Hy@UseNameKey{Direction}\@pdfdirection
  \Hy@UseNameKey{ViewArea}\@pdfviewarea
  \Hy@UseNameKey{ViewClip}\@pdfviewclip
  \Hy@UseNameKey{PrintArea}\@pdfprintarea
  \Hy@UseNameKey{PrintClip}\@pdfprintclip
  \Hy@UseNameKey{PrintScaling}\@pdfprintscaling
  \Hy@UseNameKey{Duplex}\@pdfduplex
  \ifx\@pdfpicktraybypdfsize\@empty
  \else
    /PickTrayByPDFSize \@pdfpicktraybypdfsize
  \fi
  \ifx\@pdfprintpagerange\@empty
  \else
    /PrintPageRange[\@pdfprintpagerange]%
  \fi
  \ifx\@pdfnumcopies\@empty
  \else
    /NumCopies \@pdfnumcopies
  \fi
}%
\pdfcatalog{%
```

```
    \ifx\Hy@temp\@empty
    \else
      /ViewerPreferences<<\Hy@temp>>%
    \fi
    \Hy@UseNameKey{PageLayout}\@pdfpagelayout
    \ifx\@pdflang\relax
    \else
      /Lang(\@pdflang)%
    \fi
  }%
}
```

\PDF@FinishDoc

```
\def\PDF@FinishDoc{%
  \pdf@ifdraftmode{}{%
    \Hy@UseMaketitleInfos
    \HyInfo@GenerateAddons
    \pdfinfo{%
      /Author(\@pdfauthor)%
      /Title(\@pdftitle)%
      /Subject(\@pdfsubject)%
      /Creator(\@pdfcreator)%
      \ifx\@pdfcreationdate\@empty
      \else
        /CreationDate(\@pdfcreationdate)%
      \fi
      \ifx\@pdfmoddate\@empty
      \else
        /ModDate(\@pdfmoddate)%
      \fi
      \ifx\@pdfproducer\relax
      \else
        /Producer(\@pdfproducer)%
      \fi
      /Keywords(\@pdfkeywords)%
      \ifx\@pdftrapped\@empty
      \else
        /Trapped/\@pdftrapped
      \fi
      \HyInfo@Addons
    }%
  }%
  \Hy@DisableOption{pdfauthor}%
  \Hy@DisableOption{pdftitle}%
  \Hy@DisableOption{pdfsubject}%
  \Hy@DisableOption{pdfcreator}%
  \Hy@DisableOption{addtopdfcreator}%
  \Hy@DisableOption{pdfcreationdate}%
  \Hy@DisableOption{pdfmoddate}%
  \Hy@DisableOption{pdfproducer}%
  \Hy@DisableOption{pdfkeywords}%
  \Hy@DisableOption{pdftrapped}%
  \Hy@DisableOption{pdfinfo}%
}
```

\hyper@pagetransition `\@pdfpagetransition` is initialized with `\relax`. So it indicates, if option pdfpagetransition is used. First previous `/Trans` entries are removed. If a new `/Trans` key exists, it is appended to `\pdfpageattr`.

```
\def\hyper@pagetransition{%
  \ifx\@pdfpagetransition\relax
  \else
    \expandafter\Hy@RemoveTransPageAttr
    \the\pdfpageattr^^J/Trans{}>>\END
    \ifx\@pdfpagetransition\@empty
    \else
      \edef\@processme{%
        \global\pdfpageattr{%
          \the\pdfpageattr
          ^^J/Trans << /S /\@pdfpagetransition\space >>%
        }%
      }%
      \@processme
    \fi
  \fi
}
```

\Hy@RemoveTransPageAttr Macro `\Hy@RemoveTransPageAttr` removes a `/Trans` entry from `\pdfpageattr`. It is called with the end marker `^^J/Trans{}>>\END`. The trick is the empty group that does not appear in legal `\pdfpageattr` code. It appears in argument `#2` and shows, whether the parameter text catches a really `/Trans` object or the end marker.

```
\gdef\Hy@RemoveTransPageAttr#1^^J/Trans#2#3>>#4\END{%
  \ifx\\#2\\%
    \global\pdfpageattr{#1}%
  \else
    \Hy@RemoveTransPageAttr#1#4\END
  \fi
}
```

\hyper@pageduration `\@pdfpageduration` is initialized with `\relax`. So it indicates, if option pdfpageduration is used. First previous `/Dur` entries are removed. If a new `/Dur` key exists, it is appended to `\pdfpageattr`.

```
\def\hyper@pageduration{%
  \ifx\@pdfpageduration\relax
  \else
    \expandafter
    \Hy@RemoveDurPageAttr\the\pdfpageattr^^J/Dur{} \END
    \ifx\@pdfpageduration\@empty
    \else
      \edef\@processme{%
        \global\pdfpageattr{%
          \the\pdfpageattr
          ^^J/Dur \@pdfpageduration\space
        }%
      }%
      \@processme
    \fi
  \fi
```

```
}
```

\Hy@RemoveDurPageAttr Macro \Hy@RemoveDurPageAttr removes a /Dur entry from \pdfpageattr. It is called with the end marker ^^J/Dur{} \END. The trick is the empty group that does not appear in legal \pdfpageattr code. It appears in argument #2 and shows, whether the parameter text catches a really /Dur object or the end marker.

```
\gdef\Hy@RemoveDurPageAttr#1^^J/Dur#2#3 #4\END{%
  \ifx\\#2\\%
    \global\pdfpageattr{#1}%
  \else
    \Hy@RemoveDurPageAttr#1#4\END
  \fi
}

\pdf@ifdraftmode{}{%
  \g@addto@macro\Hy@EveryPageHook{%
    \hyper@pagetransition
    \hyper@pageduration
  }%
}
```

Also XeTEX support \pdfpagewidth and \pdfpageheight, but it does not provide \pdfhorigin and \pdfvorigin.

```
⟨/pdftex⟩
⟨*pdftex | xetex⟩
\Hy@AtBeginDocument{%
  \ifHy@setpagesize
    \expandafter\@firstofone
  \else
    \expandafter\@gobble
  \fi
  {%
    \@ifclassloaded{seminar}{%
⟨*pdftex⟩
      \setlength{\pdfhorigin}{1truein}%
      \setlength{\pdfvorigin}{1truein}%
⟨/pdftex⟩
      \ifportrait
        \ifdim\paperwidth=\z@
        \else
          \setlength{\pdfpagewidth}{\strip@pt\paperwidth truept}%
        \fi
        \ifdim\paperheight=\z@
        \else
          \setlength{\pdfpageheight}{\strip@pt\paperheight truept}%
        \fi
      \else
        \ifdim\paperheight=\z@
        \else
          \setlength{\pdfpagewidth}{\strip@pt\paperheight truept}%
        \fi
        \ifdim\paperwidth=\z@
        \else
          \setlength{\pdfpageheight}{\strip@pt\paperwidth truept}%
```

```
      \fi
    \fi
  }{%
    \ifnum\mag=\@m
      \ifdim\stockwidth>\z@
        \ifdim\stockheight>\z@
         \setlength{\pdfpagewidth}{\stockwidth}%
         \setlength{\pdfpageheight}{\stockheight}%
        \else
          \ifdim\paperwidth>\z@
            \ifdim\paperheight>\z@
              \setlength{\pdfpagewidth}{\paperwidth}%
              \setlength{\pdfpageheight}{\paperheight}%
            \fi
          \fi
        \fi
      \else
        \ifdim\stockwidth=\z@
          \ifdim\paperwidth>\z@
            \ifdim\paperheight>\z@
              \setlength{\pdfpagewidth}{\paperwidth}%
              \setlength{\pdfpageheight}{\paperheight}%
            \fi
          \fi
        \fi
      \fi
    \fi
  }%
 }%
 \Hy@DisableOption{setpagesize}%
}
⟨/pdftex | xetex⟩
⟨*pdftex⟩
\def\Acrobatmenu#1#2{%
 \Hy@Acrobatmenu{#1}{#2}{%
   \leavevmode
   \EdefEscapeName\Hy@temp@menu{#1}%
   \pdfstartlink
    attr{%
      \Hy@setpdfborder
      \Hy@setpdfhighlight
      \ifx\@menubordercolor\relax
      \else
        /C[\@menubordercolor]%
      \fi
    }%
    user{%
      /Subtype/Link%
      \ifHy@pdfa /F 4\fi
      /A<<%
        /S/Named%
        /N/\Hy@temp@menu
        \Hy@href@nextactionraw
      >>%
```

```
    }%
    \relax
  \Hy@colorlink\@menucolor#2%
  \close@pdflink
 }%
}
```

⟨/pdftex⟩

44.3 hypertex

The HyperTEX specification (this is borrowed from an article by Arthur Smith) says that conformant viewers/translators must recognize the following set of \special commands:

href: html:

name: html:

end: html:

image: html:<img src = "href_string">

base_name: html:<base href = "href_string">

The *href*, *name* and *end* commands are used to do the basic hypertext operations of establishing links between sections of documents. The *image* command is intended (as with current html viewers) to place an image of arbitrary graphical format on the page in the current location. The *base_name* command is be used to communicate to the *dvi* viewer the full (URL) location of the current document so that files specified by relative URL's may be retrieved correctly.

The *href* and *name* commands must be paired with an *end* command later in the TEX file — the TEX commands between the two ends of a pair form an *anchor* in the document. In the case of an *href* command, the *anchor* is to be highlighted in the *dvi* viewer, and when clicked on will cause the scene to shift to the destination specified by *href_string*. The *anchor* associated with a name command represents a possible location to which other hypertext links may refer, either as local references (of the form `href="#name_string"` with the *name_string* identical to the one in the name command) or as part of a URL (of the form *URL#name_string*). Here *href_string* is a valid URL or local identifier, while name_string could be any string at all: the only caveat is that '"' characters should be escaped with a backslash (\), and if it looks like a URL name it may cause problems.

```
⟨*hypertex⟩
\providecommand*{\XR@ext}{dvi}
\let\PDF@FinishDoc\@empty
\def\PDF@SetupDoc{%
  \ifx\@baseurl\@empty
  \else
    \special{html:<base href="\@baseurl">}%
  \fi
}
\Hy@WrapperDef\hyper@anchor#1{%
  \Hy@SaveLastskip
```

```
  \Hy@VerboseAnchor{#1}%
  \begingroup
    \let\protect=\string
    \hyper@chars
    \special{html:<a name=%
        \hyper@quote\HyperDestNameFilter{#1}\hyper@quote>}%
  \endgroup
  \Hy@activeanchortrue
  \Hy@colorlink\@anchorcolor\anchor@spot\Hy@endcolorlink
  \special{html:</a>}%
  \Hy@activeanchorfalse
  \Hy@RestoreLastskip
}
\Hy@WrapperDef\hyper@anchorstart#1{%
  \Hy@SaveLastskip
  \Hy@VerboseAnchor{#1}%
  \begingroup
    \hyper@chars
    \special{html:<a name=%
        \hyper@quote\HyperDestNameFilter{#1}\hyper@quote>}%
  \endgroup
  \Hy@activeanchortrue
}
\def\hyper@anchorend{%
  \special{html:</a>}%
  \Hy@activeanchorfalse
  \Hy@RestoreLastskip
}
\def\@urltype{url}
\def\hyper@linkstart#1#2{%
  \Hy@VerboseLinkStart{#1}{#2}%
  \expandafter\Hy@colorlink\csname @#1color\endcsname
  \def\Hy@tempa{#1}%
  \ifx\Hy@tempa\@urltype
    \special{html:<a href=\hyper@quote#2\hyper@quote>}%
  \else
    \begingroup
      \hyper@chars
      \special{html:<a href=%
          \hyper@quote\#\HyperDestNameFilter{#2}\hyper@quote>}%
    \endgroup
  \fi
}
\def\hyper@linkend{%
  \special{html:</a>}%
  \Hy@endcolorlink
}
\def\hyper@linkfile#1#2#3{%
  \hyper@linkurl{#1}{\Hy@linkfileprefix#2\ifx\\#3\\\else\##3\fi}%
}
\def\hyper@linkurl#1#2{%
```

If we want to raise up the final link `\special`, we need to get its height; ask me why LaTeX constructs make this totally foul up, and make us revert to basic TeX.

I do not know.

```
  \leavevmode
  \ifHy@raiselinks
    \Hy@SaveSpaceFactor
    \Hy@SaveSavedSpaceFactor
    \sbox\@tempboxa{\Hy@RestoreSpaceFactor#1}%
    \Hy@RestoreSavedSpaceFactor
    \@linkdim\dp\@tempboxa
    \lower\@linkdim\hbox{%
      \hyper@chars
      \special{html:<a href=\hyper@quote#2\hyper@quote>}%
    }%
    \Hy@colorlink\@urlcolor
      \Hy@RestoreSpaceFactor
      #1%
      \Hy@SaveSpaceFactor
    \@linkdim\ht\@tempboxa
```

Because of the interaction with the dvihps processor, we have to subtract a little from the height. This is not clean, or checked. Check with Mark Doyle about what gives here. It may not be needed with the new dvips (Jan 1997).

```
    \advance\@linkdim by -6.5\p@
    \raise\@linkdim\hbox{\special{html:</a>}}%
    \Hy@endcolorlink
    \Hy@RestoreSpaceFactor
  \else
    \begingroup
      \hyper@chars
      \special{html:<a href=\hyper@quote#2\hyper@quote>}%
      \Hy@colorlink\@urlcolor#1\Hy@xspace@end
      \special{html:</a>}%
      \Hy@endcolorlink
    \endgroup
  \fi
}
```

Very poor implementation of `\hyper@link` without considering `#1`.

```
\def\hyper@link#1#2#3{%
  \Hy@VerboseLinkStart{#1}{#2}%
  \hyper@linkurl{#3}{\#\HyperDestNameFilter{#2}}%
}

\def\hyper@image#1#2{%
  \begingroup
    \hyper@chars
    \special{html:<img src=\hyper@quote#1\hyper@quote>}%
  \endgroup
}
⟨/hypertex⟩
⟨*dviwindo⟩
```

44.4 dviwindo

[This was developed by David Carlisle]. Within a file dviwindo hyperlinking is used, for external URL's a call to `\wwwbrowser` is made. (You can de-

fine this command before or after loading the hyperref package if the default `c:/netscape/netscape` is not suitable) Dviwindo could in fact handle external links to dvi files on the same machine without calling a web browser, but that would mean parsing the URL to recognise such, and this is currently not done.

This was more or less blindly copied from the hypertex cfg. For dviwindo, LaTeX must specify the size of the active area for links. For some hooks this information is available but for some, the start and end of the link are specified separately in which case a fixed size area of 10000000sp wide by `\baselineskip` high is used.

```
\providecommand*{\XR@ext}{dvi}
\providecommand*\wwwbrowser{c:\string\netscape\string\netscape}
\Hy@WrapperDef\hyper@anchor#1{%
  \Hy@SaveLastskip
  \Hy@VerboseAnchor{#1}%
  \begingroup
    \let\protect=\string
    \special{mark: #1}%
  \endgroup
  \Hy@activeanchortrue
  \Hy@colorlink\@anchorcolor\anchor@spot\Hy@endcolorlink
  \Hy@activeanchorfalse
  \Hy@RestoreLastskip
}
\Hy@WrapperDef\hyper@anchorstart#1{%
  \Hy@SaveLastskip
  \Hy@VerboseAnchor{#1}%
  \special{mark: #1}%
  \Hy@activeanchortrue
}
\def\hyper@anchorend{%
  \Hy@activeanchorfalse
  \Hy@RestoreLastskip
}
\def\hyper@linkstart#1#2{%
  \Hy@VerboseLinkStart{#1}{#2}%
  \expandafter\Hy@colorlink\csname @#1color\endcsname
  \special{button: %
    10000000 %
    \number\baselineskip\space
    #2%
  }%
}
\def\hyper@linkend{%
  \Hy@endcolorlink
}
\def\hyper@link#1#2#3{%
  \Hy@VerboseLinkStart{#1}{#2}%
  \leavevmode
  \ifHy@raiselinks
    \Hy@SaveSpaceFactor
    \Hy@SaveSavedSpaceFactor
    \sbox\@tempboxa{\Hy@RestoreSpaceFactor#3}%
    \Hy@RestoreSavedSpaceFactor
```

```
    \@linkdim\dp\@tempboxa
    \lower\@linkdim\hbox{%
      \special{button: %
        \number\wd\@tempboxa\space
        \number\ht\@tempboxa\space
        #2%
      }%
      \expandafter\Hy@colorlink\csname @#1color\endcsname
      \Hy@RestoreSpaceFactor
      #3\Hy@xspace@end
      \Hy@SaveSpaceFactor
      \Hy@endcolorlink
    }%
    \@linkdim\ht\@tempboxa
    \advance\@linkdim by -6.5\p@
    \raise\@linkdim\hbox{}%
    \Hy@RestoreSpaceFactor
  \else
    \special{button: %
      \number\wd\@tempboxa\space
      \number\ht\@tempboxa\space
      #2%
    }%
    \expandafter\Hy@colorlink\csname @#1color\endcsname
    #3\Hy@xspace@end
    \Hy@endcolorlink
  \fi
}
\def\hyper@linkurl#1#2{%
  \begingroup
    \hyper@chars
    \leavevmode
    \ifHy@raiselinks
      \Hy@SaveSpaceFactor
      \Hy@SaveSavedSpaceFactor
      \sbox\@tempboxa{\Hy@RestoreSpaceFactor#1}%
      \Hy@RestoreSavedSpaceFactor
      \@linkdim\dp\@tempboxa
      \lower\@linkdim\hbox{%
        \special{button: %
          \number\wd\@tempboxa\space
          \number\ht\@tempboxa\space
          launch: \wwwbrowser\space
          #2%
        }%
        \Hy@colorlink\@urlcolor
          \Hy@RestoreSpaceFactor
          #1\Hy@xspace@end
          \Hy@SaveSpaceFactor
        \Hy@endcolorlink
      }%
      \@linkdim\ht\@tempboxa
      \advance\@linkdim by -6.5\p@
      \raise\@linkdim\hbox{}%
```

```
      \Hy@RestoreSpaceFactor
    \else
      \special{button: %
        \number\wd\@tempboxa\space
        \number\ht\@tempboxa\space
        launch: \wwwbrowser\space
        #2%
      }%
      \Hy@colorlink\@urlcolor
        #1\Hy@xspace@end
      \Hy@endcolorlink
    \fi
  \endgroup
}
\def\hyper@linkfile#1#2#3{%
  \begingroup
    \hyper@chars
    \leavevmode
    \ifHy@raiselinks
      \Hy@SaveSpaceFactor
      \Hy@SaveSavedSpaceFactor
      \sbox\@tempboxa{\Hy@RestoreSpaceFactor#1}%
      \Hy@RestoreSavedSpaceFactor
      \@linkdim\dp\@tempboxa
      \lower\@linkdim\hbox{%
        \special{button: %
          \number\wd\@tempboxa\space
          \number\ht\@tempboxa\space
          #3,%
          file: #2%
        }%
        \Hy@colorlink\@filecolor
          \Hy@RestoreSpaceFactor
          #1\Hy@xspace@end
          \Hy@SaveSpaceFactor
        \Hy@endcolorlink
      }%
      \@linkdim\ht\@tempboxa
      \advance\@linkdim by -6.5\p@
      \raise\@linkdim\hbox{}%
      \Hy@RestoreSpaceFactor
    \else
      \special{button: %
        \number\wd\@tempboxa\space
        \number\ht\@tempboxa\space
        #3,%
        file: #2%
      }%
      \Hy@colorlink\@filecolor
        #1\Hy@xspace@end
      \Hy@endcolorlink
    \fi
  \endgroup
}
```

```
\HyInfo@AddonUnsupportedtrue
\def\PDF@FinishDoc{%
  \Hy@UseMaketitleInfos
  \HyInfo@TrappedUnsupported
  \special{PDF: Keywords \@pdfkeywords}%
  \special{PDF: Title \@pdftitle}%
  \special{PDF: Creator \@pdfcreator}%
  \ifx\@pdfcreationdate\@empty
  \else
    \special{PDF: CreationDate \@pdfcreationdate}%
  \fi
  \ifx\@pdfmoddate\@empty
  \else
    \special{PDF: ModDate \@pdfmoddate}%
  \fi
  \special{PDF: Author \@pdfauthor}%
  \ifx\@pdfproducer\relax
  \else
    \special{PDF: Producer \@pdfproducer}%
  \fi
  \special{PDF: Subject \@pdfsubject}%
  \Hy@DisableOption{pdfauthor}%
  \Hy@DisableOption{pdftitle}%
  \Hy@DisableOption{pdfsubject}%
  \Hy@DisableOption{pdfcreator}%
  \Hy@DisableOption{addtopdfcreator}%
  \Hy@DisableOption{pdfcreationdate}%
  \Hy@DisableOption{pdfcreationdate}%
  \Hy@DisableOption{pdfmoddate}%
  \Hy@DisableOption{pdfproducer}%
  \Hy@DisableOption{pdfkeywords}%
  \Hy@DisableOption{pdftrapped}%
  \Hy@DisableOption{pdfinfo}%
}
\def\PDF@SetupDoc{%
  \ifx\@baseurl\@empty
  \else
    \special{PDF: Base \@baseurl}%
  \fi
  \ifx\@pdfpagescrop\@empty\else
    \special{PDF: BBox \@pdfpagescrop}%
  \fi
  \def\Hy@temp{}%
  \ifx\@pdfstartpage\@empty
  \else
    \ifx\@pdfstartview\@empty
    \else
      \edef\Hy@temp{%
        ,Page=\@pdfstartpage
        ,View=\@pdfstartview
      }%
    \fi
  \fi
  \edef\Hy@temp{%
```

```
    \noexpand\pdfmark{%
      pdfmark=/DOCVIEW,%
      PageMode=/\@pdfpagemode
      \Hy@temp
    }%
  }%
  \Hy@temp
  \ifx\@pdfpagescrop\@empty
  \else
    \pdfmark{pdfmark=/PAGES,CropBox=\@pdfpagescrop}%
  \fi
  \edef\Hy@temp{%
    \ifHy@pdftoolbar\else /HideToolbar true\fi
    \ifHy@pdfmenubar\else /HideMenubar true\fi
    \ifHy@pdfwindowui\else /HideWindowUI true\fi
    \ifHy@pdffitwindow /FitWindow true\fi
    \ifHy@pdfcenterwindow /CenterWindow true\fi
    \ifHy@pdfdisplaydoctitle /DisplayDocTitle true\fi
    \Hy@UseNameKey{NonFullScreenPageMode}\@pdfnonfullscreenpagemode
    \Hy@UseNameKey{Direction}\@pdfdirection
    \Hy@UseNameKey{ViewArea}\@pdfviewarea
    \Hy@UseNameKey{ViewClip}\@pdfviewclip
    \Hy@UseNameKey{PrintArea}\@pdfprintarea
    \Hy@UseNameKey{PrintClip}\@pdfprintclip
    \Hy@UseNameKey{PrintScaling}\@pdfprintscaling
    \Hy@UseNameKey{Duplex}\@pdfduplex
    \ifx\@pdfpicktraybypdfsize\@empty
    \else
      /PickTrayByPDFSize \@pdfpicktraybypdfsize
    \fi
    \ifx\@pdfprintpagerange\@empty
    \else
      /PrintPageRange[\@pdfprintpagerange]%
    \fi
    \ifx\@pdfnumcopies\@empty
    \else
      /NumCopies \@pdfnumcopies
    \fi
  }%
  \pdfmark{pdfmark=/PUT,%
    Raw={%
      \string{Catalog\string}<<%
        \ifx\Hy@temp\@empty
        \else
          /ViewerPreferences<<\Hy@temp>>%
        \fi
        \Hy@UseNameKey{PageLayout}\@pdfpagelayout
        \ifx\@pdflang\relax
        \else
          /Lang(\@pdflang)%
        \fi
      >>%
    }%
  }%
```

```
}
⟨/dviwindo⟩
⟨*dvipdfm | xetex⟩
```

44.5 dvipdfm/xetex dvi to PDF converter

Provided by Mark Wicks (mwicks@kettering.edu)

(x)dvipdfmx replaces destination names by numbers. This makes it impossible to link from an external document with xr-hyper, so from version 7.00j on this is suppressed with a config special.

```
\special{dvipdfmx:config C 0x0010}
\providecommand*{\XR@ext}{pdf}
\Hy@setbreaklinks{true}
\def\HyPat@ObjRef{%
  @[^ ]+%
}
\newsavebox{\pdfm@box}
\def\@pdfm@mark#1{\special{pdf:#1}}
\Hy@WrapperDef\@pdfm@dest#1{%
  \Hy@SaveLastskip
  \Hy@VerboseAnchor{#1}%
  \begingroup
    \Hy@pstringdef\Hy@pstringDest{\HyperDestNameFilter{#1}}%
    \def\x{XYZ}%
    \ifx\x\@pdfview
      \def\x{XYZ @xpos @ypos null}%
    \else
      \def\x{FitH}%
      \ifx\x\@pdfview
        \def\x{FitH @ypos}%
      \else
        \def\x{FitBH}%
        \ifx\x\@pdfview
          \def\x{FitBH @ypos}%
        \else
          \def\x{FitV}%
          \ifx\x\@pdfview
            \def\x{FitV @xpos}%
          \else
            \def\x{FitBV}%
            \ifx\x\@pdfview
              \def\x{FitBV @xpos}%
            \else
              \def\x{Fit}%
              \ifx\x\@pdfview
                \let\x\@pdfview
              \else
                \def\x{FitB}%
                \ifx\x\@pdfview
                  \let\x\@pdfview
                \else
                  \def\x{FitR}%
                  \ifx\x\@pdfview
```

```
                \Hy@Warning{`pdfview=FitR' is not supported}%
                \def\x{XYZ @xpos @ypos null}%
              \else
                \@onelevel@sanitize\@pdfview
                \Hy@Warning{%
                  Unknown value `\@pdfview' for pdfview%
                }%
                \def\x{XYZ @xpos @ypos null}%
              \fi
            \fi
          \fi
        \fi
      \fi
    \fi
  \fi
  \@pdfm@mark{dest (\Hy@pstringDest) [@thispage /\x]}%
 \endgroup
 \Hy@RestoreLastskip
}
\providecommand*\@pdfview{XYZ}
\providecommand*\@pdfborder{0 0 1}
\providecommand*\@pdfborderstyle{}
\def\hyper@anchor#1{%
 \@pdfm@dest{#1}%
}
\def\hyper@anchorstart#1{%
 \Hy@activeanchortrue
 \@pdfm@dest{#1}%
}
\def\hyper@anchorend{%
 \Hy@activeanchorfalse
}
\newcounter{Hy@AnnotLevel}
\ifHy@ocgcolorlinks
 \def\OBJ@OCG@view{@OCG@view}%
 \@pdfm@mark{%
  obj \OBJ@OCG@view <<%
   /Type/OCG%
   /Name(View)%
   /Usage<<%
    /Print<<%
     /PrintState/OFF%
    >>%
    /View<<%
     /ViewState/ON%
    >>%
   >>%
  >>%
 }%
 \@pdfm@mark{close \OBJ@OCG@view}%
 \def\OBJ@OCG@print{@OCG@print}%
 \@pdfm@mark{%
```

```
  obj \OBJ@OCG@print <<%
    /Type/OCG%
    /Name(Print)%
    /Usage<<%
      /Print<<%
        /PrintState/ON%
      >>%
      /View<<%
        /ViewState/OFF%
      >>%
    >>%
  >>%
}%
\@pdfm@mark{close \OBJ@OCG@print}%
\def\OBJ@OCGs{@OCGs}%
\@pdfm@mark{%
  obj \OBJ@OCGs [%
    \OBJ@OCG@view\space\OBJ@OCG@print
  ]%
}%
\@pdfm@mark{close \OBJ@OCGs}%
\@pdfm@mark{%
  put @catalog <<%
    /OCProperties<<%
      /OCGs \OBJ@OCGs
      /D<<%
        /OFF[\OBJ@OCG@print]%
        /AS[%
          <<%
            /Event/View%
            /OCGs \OBJ@OCGs
            /Category[/View]%
          >>%
          <<%
            /Event/Print%
            /OCGs \OBJ@OCGs
            /Category[/Print]%
          >>%
          <<%
            /Event/Export%
            /OCGs \OBJ@OCGs
            /Category[/Print]%
          >>%
        ]%
      >>%
    >>%
  >>%
}%
\AddToHook{shipout/before}{%
  \setbox\ShipoutBox=\hbox{%
    \copy\ShipoutBox
    \@pdfm@mark{%
      put @resources <<%
        /Properties<<%
```

```
          /OCView \OBJ@OCG@view
          /OCPrint \OBJ@OCG@print
        >>%
      >>%
    }%
  }%
}%
\Hy@AtBeginDocument{%
  \def\Hy@colorlink#1{%
    \begingroup
      \ifHy@ocgcolorlinks
        \def\Hy@ocgcolor{#1}%
        \setbox0=\hbox\bgroup\color@begingroup
      \else
        \HyColor@UseColor#1%
      \fi
  }%
  \def\Hy@endcolorlink{%
    \ifHy@ocgcolorlinks
      \color@endgroup\egroup
      \mbox{%
        \@pdfm@mark{content /OC/OCPrint BDC}%
        \rlap{\copy0}%
        \@pdfm@mark{content EMC/OC/OCView BDC}%
        \begingroup
          \expandafter\HyColor@UseColor\Hy@ocgcolor
          \box0 %
        \endgroup
        \@pdfm@mark{content EMC}%
      }%
    \fi
    \endgroup
  }%
}%
\else
  \Hy@DisableOption{ocgcolorlinks}%
\fi
```

Use primitive counter arithmetic here to avoid amsmath redefining \stepcounter (github issue/13)

```
\def\Hy@BeginAnnot#1{%
  \global\advance\c@Hy@AnnotLevel\@ne
  \ifnum\c@Hy@AnnotLevel=\@ne
    #1%
  \fi
}
\def\Hy@EndAnnot{%
  \ifnum\value{Hy@AnnotLevel}=\@ne
    \Hy@endcolorlink
    \@pdfm@mark{eann}%
  \fi
  \global\advance\c@Hy@AnnotLevel\m@ne
}
\def\Hy@undefinedname{UNDEFINED}
```

```
\def\hyper@linkstart#1#2{%
  \Hy@VerboseLinkStart{#1}{#2}%
  \leavevmode
  \Hy@BeginAnnot{%
    \protected@edef\Hy@testname{#2}%
    \ifx\Hy@testname\@empty
      \Hy@Warning{%
        Empty destination name,\MessageBreak
        using `\Hy@undefinedname'%
      }%
      \let\Hy@testname\Hy@undefinedname
    \else
      \Hy@pstringdef\Hy@testname{%
        \expandafter\HyperDestNameFilter\expandafter{%
          \Hy@testname
        }%
      }%
    \fi
    \@pdfm@mark{%
      bann<<%
        /Type/Annot%
        /Subtype/Link%
        \ifHy@pdfa /F 4\fi
        \Hy@setpdfborder
        \Hy@setpdfhighlight
        \expandafter\ifx\csname @#1bordercolor\endcsname\relax
        \else
          /C[\csname @#1bordercolor\endcsname]%
        \fi
        /A<<%
          /S/GoTo%
          /D(\Hy@testname)%
          \Hy@href@nextactionraw
        >>%
      >>%
    }%
    \expandafter\Hy@colorlink\csname @#1color\endcsname
  }%
}
\def\hyper@linkend{\Hy@EndAnnot}%
\def\hyper@link#1#2#3{%
  \hyper@linkstart{#1}{#2}#3\Hy@xspace@end\hyper@linkend
}
```

2025-05-20 added a group for issue #380

```
\def\hyper@linkfile#1#2#3{%
  \leavevmode
  \begingroup
  \Hy@BeginAnnot{%
    \def\Hy@pstringF{#2}%
    \Hy@CleanupFile\Hy@pstringF
    \Hy@pstringdef\Hy@pstringF\Hy@pstringF
    \Hy@pstringdef\Hy@pstringD{#3}%
    \Hy@MakeRemoteAction
```

```
  \@pdfm@mark{%
   bann<<%
    /Type/Annot%
    /Subtype/Link%
    \ifHy@pdfa /F 4\fi
    \Hy@setpdfborder
    \Hy@setpdfhighlight
    \ifx\@filebordercolor\relax
    \else
     /C[\@filebordercolor]%
    \fi
    /A<<%
     /S/GoToR%
     /F(\Hy@pstringF)%
     /D%
     \ifx\\#3\\%
      [\Hy@href@page\@pdfremotestartview]%
     \else
      (\Hy@pstringD)%
     \fi
     \Hy@SetNewWindow
     \Hy@href@nextactionraw
    >>%
   >>%
  }%
  \Hy@colorlink\@filecolor
 }%
 #1\Hy@xspace@end
 \Hy@EndAnnot
 \endgroup
}
\def\@hyper@launch run:#1\\#2#3{% filename, anchor text linkname
 \leavevmode
 \Hy@BeginAnnot{%
  \Hy@pstringdef\Hy@pstringF{#1}%
  \Hy@pstringdef\Hy@pstringP{#3}%
  \@pdfm@mark{%
   bann<<%
    /Type/Annot%
    /Subtype/Link%
    \ifHy@pdfa /F 4\fi
    \Hy@setpdfborder
    \Hy@setpdfhighlight
    \ifx\@runbordercolor\relax
    \else
     /C[\@runbordercolor]%
    \fi
    /A<<%
     /F(\Hy@pstringF)%
     /S/Launch%
     \Hy@SetNewWindow
     \ifx\\#3\\%
     \else
      /Win<</P(\Hy@pstringP)/F(\Hy@pstringF)>>%
```

```
      \fi
      \Hy@href@nextactionraw
    >>%
  >>%
 }%
 \Hy@colorlink\@runcolor
}%
#2\Hy@xspace@end
\Hy@EndAnnot
}
\def\hyper@linkurl#1#2{%
 \leavevmode
 \Hy@BeginAnnot{%
  \Hy@pstringdef\Hy@pstringURI{#2}%
  \@pdfm@mark{%
   bann<<%
    /Type/Annot%
    /Subtype/Link%
    \ifHy@pdfa /F 4\fi
    \Hy@setpdfborder
    \Hy@setpdfhighlight
    \ifx\@urlbordercolor\relax
    \else
     /C[\@urlbordercolor]%
    \fi
    /A<<%
     /S/URI%
     /URI(\Hy@pstringURI)%
     \ifHy@href@ismap
      /IsMap true%
     \fi
     \Hy@href@nextactionraw
    >>%
   >>%
  }%
  \Hy@colorlink\@urlcolor
 }%
 #1\Hy@xspace@end
 \Hy@EndAnnot
}
\def\Acrobatmenu#1#2{%
 \Hy@Acrobatmenu{#1}{#2}{%
  \Hy@BeginAnnot{%
   \EdefEscapeName\Hy@temp@menu{#1}%
   \@pdfm@mark{%
    bann<<%
     /Type/Annot%
     /Subtype/Link%
     \ifHy@pdfa /F 4\fi
     \Hy@setpdfborder
     \Hy@setpdfhighlight
     \ifx\@menubordercolor\relax
     \else
      /C[\@menubordercolor]%
```

```
        \fi
        /A<<%
          /S/Named%
          /N/\Hy@temp@menu
          \Hy@href@nextactionraw
        >>%
      >>%
    }%
    \Hy@colorlink\@menucolor
  }%
  #2\Hy@xspace@end
  \Hy@EndAnnot
 }%
}

\def\PDF@FinishDoc{%
 \Hy@UseMaketitleInfos
 \HyInfo@GenerateAddons
 \@pdfm@mark{%
  docinfo<<%
   /Title(\@pdftitle)%
   /Subject(\@pdfsubject)%
   /Creator(\@pdfcreator)%
   \ifx\@pdfcreationdate\@empty
   \else
    /CreationDate(\@pdfcreationdate)%
   \fi
   \ifx\@pdfmoddate\@empty
   \else
    /ModDate(\@pdfmoddate)%
   \fi
   /Author(\@pdfauthor)%
   \ifx\@pdfproducer\relax
   \else
    /Producer(\@pdfproducer)%
   \fi
   /Keywords(\@pdfkeywords)%
   \ifx\@pdftrapped\@empty
   \else
    /Trapped/\@pdftrapped
   \fi
   \HyInfo@Addons
  >>%
 }%
 \Hy@DisableOption{pdfauthor}%
 \Hy@DisableOption{pdftitle}%
 \Hy@DisableOption{pdfsubject}%
 \Hy@DisableOption{pdfcreator}%
 \Hy@DisableOption{addtopdfcreator}%
 \Hy@DisableOption{pdfcreationdate}%
 \Hy@DisableOption{pdfcreationdate}%
 \Hy@DisableOption{pdfmoddate}%
 \Hy@DisableOption{pdfproducer}%
 \Hy@DisableOption{pdfkeywords}%
```

```
  \Hy@DisableOption{pdftrapped}%
  \Hy@DisableOption{pdfinfo}%
}
\def\PDF@SetupDoc{%
  \edef\Hy@temp{%
    \ifHy@pdftoolbar\else /HideToolbar true\fi
    \ifHy@pdfmenubar\else /HideMenubar true\fi
    \ifHy@pdfwindowui\else /HideWindowUI true\fi
    \ifHy@pdffitwindow /FitWindow true\fi
    \ifHy@pdfcenterwindow /CenterWindow true\fi
    \ifHy@pdfdisplaydoctitle /DisplayDocTitle true\fi
    \Hy@UseNameKey{NonFullScreenPageMode}\@pdfnonfullscreenpagemode
    \Hy@UseNameKey{Direction}\@pdfdirection
    \Hy@UseNameKey{ViewArea}\@pdfviewarea
    \Hy@UseNameKey{ViewClip}\@pdfviewclip
    \Hy@UseNameKey{PrintArea}\@pdfprintarea
    \Hy@UseNameKey{PrintClip}\@pdfprintclip
    \Hy@UseNameKey{PrintScaling}\@pdfprintscaling
    \Hy@UseNameKey{Duplex}\@pdfduplex
    \ifx\@pdfpicktraybypdfsize\@empty
    \else
      /PickTrayByPDFSize \@pdfpicktraybypdfsize
    \fi
    \ifx\@pdfprintpagerange\@empty
    \else
      /PrintPageRange[\@pdfprintpagerange]%
    \fi
    \ifx\@pdfnumcopies\@empty
    \else
      /NumCopies \@pdfnumcopies
    \fi
  }%
  \Hy@pstringdef\Hy@pstringB{\@baseurl}%
  \@pdfm@mark{%
    docview<<%
      \ifx\@pdfstartpage\@empty
      \else
        \ifx\@pdfstartview\@empty
        \else
          /OpenAction[@page\@pdfstartpage\@pdfstartview]%
        \fi
      \fi
      \ifx\@baseurl\@empty
      \else
        /URI<</Base(\Hy@pstringB)>>%
      \fi
      /PageMode/\@pdfpagemode
      \ifx\Hy@temp\@empty
      \else
        /ViewerPreferences<<\Hy@temp>>%
      \fi
      \Hy@UseNameKey{PageLayout}\@pdfpagelayout
      \ifx\@pdflang\relax
      \else
```

```
      /Lang(\@pdflang)%
    \fi
  >>%
 }%
 \ifx\@pdfpagescrop\@empty
 \else
  \@pdfm@mark{put @pages <</CropBox[\@pdfpagescrop]>>}%
 \fi
}
⟨/dvipdfm | xetex⟩
⟨*dvipdfm | xetex⟩
```

\hyper@pagetransition

```
\def\hyper@pagetransition{%
 \ifx\@pdfpagetransition\relax
 \else
  \ifx\@pdfpagetransition\@empty
  \else
   \special{pdf:put @thispage %
    <</Trans<</S/\@pdfpagetransition>>>>%
   }%
  \fi
 \fi
}
```

\hyper@pageduration

```
\def\hyper@pageduration{%
 \ifx\@pdfpageduration\relax
 \else
  \ifx\@pdfpageduration\@empty
  \else
   \special{pdf:put @thispage %
    <</Dur \@pdfpageduration>>%
   }%
  \fi
 \fi
}

\g@addto@macro\Hy@EveryPageBoxHook{%
 \hyper@pagetransition
 \hyper@pageduration
}
⟨/dvipdfm | xetex⟩
```

XeTEX uses pdfTEX's method \pdfpagewidth and \pdfpageheight for setting the paper size.

```
⟨*dvipdfm⟩
\AddToHook{shipout/firstpage}{%
 \ifHy@setpagesize
  \begingroup
   \ifnum\mag=\@m
    \ifdim\stockwidth>\z@
     \ifdim\stockheight>\z@
```

```
      \special{papersize=\the\stockwidth,\the\stockheight}%
    \else
      \ifdim\paperwidth>\z@
        \ifdim\paperheight>\z@
          \special{papersize=\the\paperwidth,\the\paperheight}%
        \fi
      \fi
    \fi
  \else
    \ifdim\stockwidth=\z@
      \ifdim\paperwidth>\z@
        \ifdim\paperheight>\z@
          \special{papersize=\the\paperwidth,\the\paperheight}%
        \fi
      \fi
    \fi
  \fi
  \endgroup
\fi
\Hy@DisableOption{setpagesize}%
}
⟨/dvipdfm⟩
```

44.6 VTeX typesetting system

Provided by MicroPress, May 1998. They require VTeX version 6.02 or newer; see http://www.micropress-inc.com/ for details.

```
⟨*vtexhtml⟩
\providecommand*{\XR@ext}{htm}
\RequirePackage{vtexhtml}
\newif\if@Localurl
\let\PDF@FinishDoc\@empty
\def\PDF@SetupDoc{%
  \ifx\@baseurl\@empty
  \else
    \special{!direct <base href="\@baseurl">}%
  \fi
}
\def\@urltype{url}
\def\hyper@link#1#2#3{%
  \Hy@VerboseLinkStart{#1}{#2}%
  \leavevmode
  \special{!direct <a href=%
     \hyper@quote\hyper@hash\HyperDestNameFilter{#2}\hyper@quote>}%
  #3\Hy@xspace@end
  \special{!direct </a>}%
}
\def\hyper@linkurl#1#2{%
  \begingroup
    \hyper@chars
    \leavevmode
    \MathBSuppress=1\relax
    \special{!direct <a href=%
```

```
      \hyper@quote\HyperDestNameFilter{#2}\hyper@quote>}%
    #1\Hy@xspace@end
    \MathBSuppress=0\relax
    \special{!direct </a>}%
  \endgroup
}
\def\hyper@linkfile#1#2#3{%
  \hyper@linkurl{#1}{\Hy@linkfileprefix#2\ifx\\#3\\\else\##3\fi}%
}
\def\hyper@linkstart#1#2{%
  \Hy@VerboseLinkStart{#1}{#2}%
  \def\Hy@tempa{#1}\ifx\Hy@tempa\@urltype
    \@Localurltrue
    \special{!direct <a href=\hyper@quote#2\hyper@quote>}%
  \else
    \@Localurlfalse
    \begingroup
      \hyper@chars
      \special{!aref \HyperDestNameFilter{#2}}%
    \endgroup
  \fi
}
\def\hyper@linkend{%
  \if@Localurl
    \special{!endaref}%
  \else
    \special{!direct </a>}%
  \fi
}
\Hy@WrapperDef\hyper@anchorstart#1{%
  \Hy@SaveLastskip
  \Hy@VerboseAnchor{#1}%
  \begingroup
    \hyper@chars
    \special{!aname #1}%
    \special{!direct <a name=%
       \hyper@quote\HyperDestNameFilter{#1}\hyper@quote>}%
  \endgroup
  \Hy@activeanchortrue
}
\def\hyper@anchorend{%
  \special{!direct </a>}%
  \Hy@activeanchorfalse
  \Hy@RestoreLastskip
}
\Hy@WrapperDef\hyper@anchor#1{%
  \Hy@SaveLastskip
  \Hy@VerboseAnchor{#1}%
  \begingroup
    \let\protect=\string
    \hyper@chars
    \leavevmode
    \special{!aname #1}%
    \special{!direct <a name=%
```

```
      \hyper@quote\HyperDestNameFilter{#1}\hyper@quote>}%
  \endgroup
  \Hy@activeanchortrue
  \bgroup\anchor@spot\egroup
  \special{!direct </a>}%
  \Hy@activeanchorfalse
  \Hy@RestoreLastskip
}
\def\@Form[#1]{%
  \Hy@Message{Sorry, TeXpider does not yet support FORMs}%
}
\let\@endForm\@empty
\def\@Gauge[#1]#2#3#4{% parameters, label, minimum, maximum
  \Hy@Message{Sorry, TeXpider does not yet support FORM gauges}%
}
\def\@TextField[#1]#2{% parameters, label
  \Hy@Message{Sorry, TeXpider does not yet support FORM text fields}%
}
\def\@CheckBox[#1]#2{% parameters, label
  \Hy@Message{Sorry, TeXpider does not yet support FORM checkboxes}%
}
\def\@ChoiceMenu[#1]#2#3{% parameters, label, choices
  \Hy@Message{Sorry, TeXpider does not yet support FORM choice menus}%
}
\def\@PushButton[#1]#2{% parameters, label
  \Hy@Message{Sorry, TeXpider does not yet support FORM pushbuttons}%
}
\def\@Reset[#1]#2{%
  \Hy@Message{Sorry, TeXpider does not yet support FORMs}%
}
\def\@Submit[#1]#2{%
  \Hy@Message{Sorry, TeXpider does not yet support FORMs}%
}
⟨/vtexhtml⟩
⟨*vtex⟩
```

VTeX version 6.68 supports \mediawidth and \mediaheight. The \ifx construct is better than a \csname, because it avoids the definition and the hash table entry of a previous undefined macro.

```
\ifcsname mediaheight\endcsname
  \ifHy@setpagesize
    \providecommand*{\VTeXInitMediaSize}{%
      \ifnum\mag=\@m
       \ifdim\stockwidth>\z@
         \ifdim\stockheight>\z@
          \setlength\mediaheight\stockheight
          \setlength\mediawidth\stockwidth
         \else
           \ifdim\paperwidth>\z@
             \ifdim\paperheight>\z@
               \setlength\mediaheight\paperheight
               \setlength\mediawidth\paperwidth
             \fi
           \fi
```

```
        \fi
      \else
        \ifdim\stockwidth=\z@
          \ifdim\paperwidth>\z@
            \ifdim\paperheight>\z@
              \setlength\mediaheight\paperheight
              \setlength\mediawidth\paperwidth
            \fi
          \fi
        \fi
      \fi
    \fi
  }%
  \Hy@AtBeginDocument{\VTeXInitMediaSize}%
 \fi
 \Hy@DisableOption{setpagesize}%
\fi
```

Older versions of VTeX require `xyz` in lower case.

```
\providecommand*\@pdfview{xyz}
\providecommand*\@pdfborder{0 0 1}
\providecommand*\@pdfborderstyle{}
\let\CurrentBorderColor\@linkbordercolor
\Hy@WrapperDef\hyper@anchor#1{%
  \Hy@SaveLastskip
  \Hy@VerboseAnchor{#1}%
  \begingroup
    \let\protect=\string
    \hyper@chars
    \special{!aname \HyperDestNameFilter{#1};\@pdfview}%
  \endgroup
  \Hy@activeanchortrue
  \Hy@colorlink\@anchorcolor\anchor@spot\Hy@endcolorlink
  \Hy@activeanchorfalse
  \Hy@RestoreLastskip
}
\Hy@WrapperDef\hyper@anchorstart#1{%
  \Hy@SaveLastskip
  \Hy@VerboseAnchor{#1}%
  \begingroup
    \hyper@chars
    \special{!aname \HyperDestNameFilter{#1};\@pdfview}%
  \endgroup
  \Hy@activeanchortrue
}
\def\hyper@anchorend{%
  \Hy@activeanchorfalse
  \Hy@RestoreLastskip
}
\def\@urltype{url}
\def\Hy@undefinedname{UNDEFINED}
\def\hyper@linkstart#1#2{%
  \Hy@VerboseLinkStart{#1}{#2}%
  \Hy@pstringdef\Hy@pstringURI{#2}%
  \expandafter\Hy@colorlink\csname @#1color\endcsname
```

```
  \@ifundefined{@#1bordercolor}{%
    \let\CurrentBorderColor\relax
  }{%
    \edef\CurrentBorderColor{%
      \csname @#1bordercolor\endcsname
    }%
  }%
  \def\Hy@tempa{#1}%
  \ifx\Hy@tempa\@urltype
    \special{!%
      aref <u=/Type/Action/S/URI/URI(\Hy@pstringURI)%
        \ifHy@href@ismap
          /IsMap true%
        \fi
        \Hy@href@nextactionraw
        >;%
      a=<%
        \ifHy@pdfa /F 4\fi
        \Hy@setpdfborder
        \ifx\CurrentBorderColor\relax
        \else
          /C [\CurrentBorderColor]%
        \fi
      >%
    }%
  \else
    \protected@edef\Hy@testname{#2}%
    \ifx\Hy@testname\@empty
      \Hy@Warning{%
        Empty destination name,\MessageBreak
        using `\Hy@undefinedname'%
      }%
      \let\Hy@testname\Hy@undefinedname
    \fi
    \special{!%
      aref \expandafter\HyperDestNameFilter
          \expandafter{\Hy@testname};%
      a=<%
        \ifHy@pdfa /F 4\fi
        \Hy@setpdfborder
        \ifx\CurrentBorderColor\relax
        \else
          /C [\CurrentBorderColor]%
        \fi
      >%
    }%
  \fi
}
\def\hyper@linkend{%
  \special{!endaref}%
  \Hy@endcolorlink
}
\def\hyper@linkfile#1#2#3{%
  \leavevmode
```

```
  \def\Hy@pstringF{#2}%
  \Hy@CleanupFile\Hy@pstringF
  \special{!%
    aref <%
    \ifnum\Hy@VTeXversion>753 \ifHy@pdfnewwindow n\fi\fi
    f=\Hy@pstringF>#3;%
    a=<%
      \ifHy@pdfa /F 4\fi
      \Hy@setpdfborder
      \ifx\@filebordercolor\relax
      \else
        /C [\@filebordercolor]%
      \fi
    >%
  }%
  \Hy@colorlink\@filecolor
    #1\Hy@xspace@end
  \Hy@endcolorlink
  \special{!endaref}%
}
\def\hyper@linkurl#1#2{%
  \begingroup
    \Hy@pstringdef\Hy@pstringURI{#2}%
    \hyper@chars
    \leavevmode
    \special{!%
      aref <u=/Type/Action/S/URI/URI(\Hy@pstringURI)%
        \ifHy@href@ismap
          /IsMap true%
        \fi
        \Hy@href@nextactionraw
        >;%
      a=<%
        \ifHy@pdfa /F 4\fi
        \Hy@setpdfborder
        \ifx\@urlbordercolor\relax
        \else
          /C [\@urlbordercolor]%
        \fi
      >%
    }%
    \Hy@colorlink\@urlcolor
      #1\Hy@xspace@end
    \Hy@endcolorlink
    \special{!endaref}%
  \endgroup
}
\def\hyper@link#1#2#3{%
  \Hy@VerboseLinkStart{#1}{#2}%
  \@ifundefined{@#1bordercolor}{%
    \let\CurrentBorderColor\relax
  }{%
    \edef\CurrentBorderColor{\csname @#1bordercolor\endcsname}%
  }%
```

```
  \leavevmode
  \protected@edef\Hy@testname{#2}%
  \ifx\Hy@testname\@empty
    \Hy@Warning{%
      Empty destination name,\MessageBreak
      using `\Hy@undefinedname'%
    }%
    \let\Hy@testname\Hy@undefinedname
  \fi
  \special{!%
    aref \expandafter\HyperDestNameFilter
        \expandafter{\Hy@testname};%
    a=<%
      \ifHy@pdfa /F 4\fi
      \Hy@setpdfborder
      \ifx\CurrentBorderColor\relax
      \else
        /C [\CurrentBorderColor]%
      \fi
    >%
  }%
  \expandafter
  \Hy@colorlink\csname @#1color\endcsname
    #3\Hy@xspace@end
  \Hy@endcolorlink
  \special{!endaref}%
}
\def\hyper@image#1#2{%
  \hyper@linkurl{#2}{#1}%
}
\def\@hyper@launch run:#1\\#2#3{%
  \Hy@pstringdef\Hy@pstringF{#1}%
  \Hy@pstringdef\Hy@pstringP{#3}%
  \leavevmode
  \special{!aref %
    <u=%
      /Type/Action%
      /S/Launch%
      /F(\Hy@pstringF)%
      \Hy@SetNewWindow
      \ifx\\#3\\%
      \else
        /Win<</F(\Hy@pstringF)/P(\Hy@pstringP)>>%
      \fi
      \Hy@href@nextactionraw
    >;%
    a=<%
      \ifHy@pdfa /F 4\fi
      \Hy@setpdfborder
      \ifx\@runbordercolor\relax
      \else
        /C[\@runbordercolor]%
      \fi
    >%
```

```
  }%
  \Hy@colorlink\@runcolor
    #2\Hy@xspace@end
  \Hy@endcolorlink
  \special{!endaref}%
}
\def\Acrobatmenu#1#2{%
  \EdefEscapeName\Hy@temp@menu{#1}%
  \Hy@Acrobatmenu{#1}{#2}{%
    \special{!%
      aref <u=/S /Named /N /\Hy@temp@menu>;%
      a=<%
        \ifHy@pdfa /F 4\fi
        \Hy@setpdfborder
        \ifx\@menubordercolor\relax
        \else
          /C[\@menubordercolor]%
        \fi
      >%
    }%
    \Hy@colorlink\@menucolor
      #2\Hy@xspace@end
    \Hy@endcolorlink
    \special{!endaref}%
  }%
}
```

The following code (transition effects) is made by Alex Kostin.

The code below makes sense for VTEX 7.02 or later.

Please never use `\@ifundefined{VTeXversion}{..}{..}` *globally*.

```
\ifnum\Hy@VTeXversion<702 %
\else
  \def\hyper@pagetransition{%
    \ifx\@pdfpagetransition\relax
    \else
      \ifx\@pdfpagetransition\@empty
```

Standard incantation.

1. Does an old entry have to be deleted? 2. If 1=yes, how to delete?

```
      \else
        \hvtex@parse@trans\@pdfpagetransition
      \fi
    \fi
  }%
```

I have to write an "honest" parser to convert raw PDF code into VTEX `\special`. (AVK)

Syntax of VTEX `\special{!trans <transition_effect>}`:

```
<transition_effect> ::= <transition_style>[,<transition_duration>]
<transition_style> ::= <Blinds_effect> | <Box_effect> |
                       <Dissolve_effect> | <Glitter_effect> |
                       <Split_effect> | <Wipe_effect>
<Blinds_effect> ::= B[<effect_dimension>]
<Box_effect> ::= X[<effect_motion>]
```

```
<Dissolve_effect> ::= D
<Glitter_effect> ::= G[<effect_direction>]
<Split_effect> ::= S[<effect_motion>][<effect_dimension>]
<Wipe_effect> ::= W[<effect_direction>]
<Replace_effect> ::= R
<effect_direction> ::= <number>
<effect_dimension> ::= H | V
<effect_motion> ::= I | O
<transition_duration> ::= <number>
```

Transition codes:

```
\def\hvtex@trans@effect@Blinds{\def\hvtex@trans@code{B}}%
\def\hvtex@trans@effect@Box{\def\hvtex@trans@code{X}}%
\def\hvtex@trans@effect@Dissolve{\def\hvtex@trans@code{D}}%
\def\hvtex@trans@effect@Glitter{\def\hvtex@trans@code{G}}%
\def\hvtex@trans@effect@Split{\def\hvtex@trans@code{S}}%
\def\hvtex@trans@effect@Wipe{\def\hvtex@trans@code{W}}%
\def\hvtex@trans@effect@R{\def\hvtex@trans@code{R}}%
```

Optional parameters:

```
\def\hvtex@par@dimension{/Dm}%
\def\hvtex@par@direction{/Di}%
\def\hvtex@par@duration{/D}%
\def\hvtex@par@motion{/M}%
```

Tokenizer:

```
\def\hvtex@gettoken{%
  \expandafter\hvtex@gettoken@\hvtex@buffer\@nil
}%
```

Notice that tokens in the input buffer must be space delimited.

```
\def\hvtex@gettoken@#1 #2\@nil{%
  \edef\hvtex@token{#1}%
  \edef\hvtex@buffer{#2}%
}%
\def\hvtex@parse@trans#1{%
```

Initializing code:

```
  \let\hvtex@trans@code\@empty
  \let\hvtex@param@dimension\@empty
  \let\hvtex@param@direction\@empty
  \let\hvtex@param@duration\@empty
  \let\hvtex@param@motion\@empty
  \edef\hvtex@buffer{#1\space}%
```

First token is the PDF transition name without escape.

```
  \hvtex@gettoken
  \ifx\hvtex@token\@empty
```

Leading space(s)?

```
    \ifx\hvtex@buffer\@empty
```

The buffer is empty, nothing to do.

```
    \else
      \hvtex@gettoken
    \fi
  \fi
  \csname hvtex@trans@effect@\hvtex@token\endcsname
```

Now is time to parse optional parameters.

```
  \hvtex@trans@params
}%
```

Reentrable macro to parse optional parameters.

```
\def\hvtex@trans@params{%
  \ifx\hvtex@buffer\@empty
  \else
    \hvtex@gettoken
    \let\hvtex@trans@par\hvtex@token
    \ifx\hvtex@buffer\@empty
    \else
      \hvtex@gettoken
      \ifx\hvtex@trans@par\hvtex@par@duration
```

/D is the effect duration in seconds. VTEX special takes it in milliseconds.

```
        \let\hvtex@param@duration\hvtex@token
      \else \ifx\hvtex@trans@par\hvtex@par@motion
```

/M can be either /I or /O

```
        \expandafter\edef\expandafter\hvtex@param@motion
          \expandafter{\expandafter\@gobble\hvtex@token}%
      \else \ifx\hvtex@trans@par\hvtex@par@dimension
```

/Dm can be either /H or /V

```
        \expandafter\edef\expandafter\hvtex@param@dimension
          \expandafter{\expandafter\@gobble\hvtex@token}%
      \else \ifx\hvtex@trans@par\hvtex@par@direction
```

Valid values for /Di are 0, 270, 315 (the Glitter effect) or 0, 90, 180, 270 (the Wipe effect).

```
        \let\hvtex@param@direction\hvtex@token
      \fi\fi\fi\fi
    \fi
  \fi
  \ifx\hvtex@buffer\@empty
    \let\next\hvtex@produce@trans
  \else
    \let\next\hvtex@trans@params
  \fi
  \next
}%
```

Merge <transition_effect> and issue the special when possible. Too lazy to validate optional parameters.

```
\def\hvtex@produce@trans{%
  \let\vtex@trans@special\@empty
  \if S\hvtex@trans@code
    \edef\vtex@trans@special{\hvtex@trans@code
      \hvtex@param@dimension\hvtex@param@motion}%
  \else\if B\hvtex@trans@code
    \edef\vtex@trans@special{%
      \hvtex@trans@code\hvtex@param@dimension
    }%
  \else\if X\hvtex@trans@code
    \edef\vtex@trans@special{%
```

```
      \hvtex@trans@code\hvtex@param@motion
    }%
  \else\if W\hvtex@trans@code
    \edef\vtex@trans@special{%
      \hvtex@trans@code\hvtex@param@direction
    }%
  \else\if D\hvtex@trans@code
    \let\vtex@trans@special\hvtex@trans@code
  \else\if R\hvtex@trans@code
    \let\vtex@trans@special\hvtex@trans@code
  \else\if G\hvtex@trans@code
    \edef\vtex@trans@special{%
      \hvtex@trans@code\hvtex@param@direction
    }%
  \fi\fi\fi\fi\fi\fi\fi
  \ifx\vtex@trans@special\@empty
  \else
    \ifx\hvtex@param@duration\@empty
    \else
      \setlength{\dimen@}{\hvtex@param@duration\p@}%
```

I'm not guilty of possible overflow.

```
      \multiply\dimen@\@m
      \edef\vtex@trans@special{%
        \vtex@trans@special,\strip@pt\dimen@
      }%
    \fi
```

And all the mess is just for this.

```
    \special{!trans \vtex@trans@special}%
  \fi
}%
\def\hyper@pageduration{%
  \ifx\@pdfpageduration\relax
  \else
    \ifx\@pdfpageduration\@empty
      \special{!duration-}%
    \else
      \special{!duration \@pdfpageduration}%
    \fi
  \fi
}%
\g@addto@macro\Hy@EveryPageBoxHook{%
  \hyper@pagetransition
  \hyper@pageduration
}%
\fi
```

Caution: In opposite to the other drivers, the argument of `\special{!onopen #1}` is a reference name. The VTeX's postscript mode will work with a version higher than 7.0x.

The command `\VTeXOS` is defined since version 7.45. Magic values encode the operating system:

1: WinTel
2: Linux
3: OS/2
4: MacOS
5: MacOS/X

```
\ifx\@pdfproducer\relax
  \def\@pdfproducer{VTeX}%
  \ifnum\Hy@VTeXversion>\z@
    \count@\VTeXversion
    \divide\count@ 100 %
    \edef\@pdfproducer{\@pdfproducer\space v\the\count@}%
    \multiply\count@ -100 %
    \advance\count@\VTeXversion
    \edef\@pdfproducer{%
      \@pdfproducer
      .\ifnum\count@<10 0\fi\the\count@
      \ifx\VTeXOS\@undefined\else
        \ifnum\VTeXOS>0 %
          \ifnum\VTeXOS<6 %
            \space(%
            \ifcase\VTeXOS
            \or Windows\or Linux\or OS/2\or MacOS\or MacOS/X%
            \fi
            )%
          \fi
        \fi
      \fi
      ,\space
      \ifnum\OpMode=\@ne PDF\else PS\fi
      \space backend%
      \ifx\gexmode\@undefined\else
        \ifnum\gexmode>\z@\space with GeX\fi
      \fi
    }%
  \fi
\fi
```

Current `!pdfinfo` key syntax:

Key	Field	Type
a	**A**uthor	String
b	Crop**B**ox	String
c	**C**reator	String
k	**K**eywords	String
l	Page**L**ayout	PS
p	**P**ageMode	PS
r	P**r**oducer	String
s	**S**ubject	String
t	**T**itle	String
u	**U**RI	PS
v	**V**iewPreferences	PS

Note: PS objects that are dicts are in `<<<..>>>` (yuck; no choice).

```
\def\PDF@SetupDoc{%
  \ifx\@pdfpagescrop\@empty
```

```
  \else
    \special{!pdfinfo b=<\@pdfpagescrop>}%
  \fi
  \ifx\@pdfstartpage\@empty
  \else
    \ifx\@pdfstartview\@empty
    \else
      \special{!onopen Page\@pdfstartpage}%
    \fi
  \fi
  \special{!pdfinfo p=</\@pdfpagemode>}%
  \ifx\@baseurl\@empty
  \else
    \special{!pdfinfo u=<<</Base (\@baseurl)>>>}%
  \fi
  \special{!pdfinfo v=<<<%
    \ifHy@pdftoolbar\else /HideToolbar true\fi
    \ifHy@pdfmenubar\else /HideMenubar true\fi
    \ifHy@pdfwindowui\else /HideWindowUI true\fi
    \ifHy@pdffitwindow /FitWindow true\fi
    \ifHy@pdfcenterwindow /CenterWindow true\fi
    \ifHy@pdfdisplaydoctitle /DisplayDocTitle true\fi
    \Hy@UseNameKey{NonFullScreenPageMode}\@pdfnonfullscreenpagemode
    \Hy@UseNameKey{Direction}\@pdfdirection
    \Hy@UseNameKey{ViewArea}\@pdfviewarea
    \Hy@UseNameKey{ViewClip}\@pdfviewclip
    \Hy@UseNameKey{PrintArea}\@pdfprintarea
    \Hy@UseNameKey{PrintClip}\@pdfprintclip
    \Hy@UseNameKey{PrintScaling}\@pdfprintscaling
    \Hy@UseNameKey{Duplex}\@pdfduplex
    \ifx\@pdfpicktraybypdfsize\@empty
    \else
      /PickTrayByPDFSize \@pdfpicktraybypdfsize
    \fi
    \ifx\@pdfprintpagerange\@empty
    \else
      /PrintPageRange[\@pdfprintpagerange]%
    \fi
    \ifx\@pdfnumcopies\@empty
    \else
      /NumCopies \@pdfnumcopies
    \fi
  >>>}%
  \ifx\@pdfpagelayout\@empty
  \else
    \special{!pdfinfo l=</\@pdfpagelayout\space>}%
  \fi
}%
\HyInfo@AddonUnsupportedtrue
\define@key{Hyp}{pdfcreationdate}{%
  \Hy@Warning{%
    VTeX does not support pdfcreationdate.\MessageBreak
    Therefore its setting is ignored%
  }%
```

```
}
\define@key{Hyp}{pdfmoddate}{%
  \Hy@Warning{%
    VTeX does not support pdfmoddate.\MessageBreak
    Therefore its setting is ignored%
  }%
}
\def\PDF@FinishDoc{%
  \Hy@UseMaketitleInfos
  \HyInfo@TrappedUnsupported
  \special{!pdfinfo a=<\@pdfauthor>}%
  \special{!pdfinfo t=<\@pdftitle>}%
  \special{!pdfinfo s=<\@pdfsubject>}%
  \special{!pdfinfo c=<\@pdfcreator>}%
  \ifx\@pdfproducer\relax
  \else
    \special{!pdfinfo r=<\@pdfproducer>}%
  \fi
  \special{!pdfinfo k=<\@pdfkeywords>}%
  \Hy@DisableOption{pdfauthor}%
  \Hy@DisableOption{pdftitle}%
  \Hy@DisableOption{pdfsubject}%
  \Hy@DisableOption{pdfcreator}%
  \Hy@DisableOption{addtopdfcreator}%
  \Hy@DisableOption{pdfcreationdate}%
  \Hy@DisableOption{pdfcreationdate}%
  \Hy@DisableOption{pdfmoddate}%
  \Hy@DisableOption{pdfproducer}%
  \Hy@DisableOption{pdfkeywords}%
  \Hy@DisableOption{pdftrapped}%
  \Hy@DisableOption{pdfinfo}%
}
⟨/vtex⟩
```

44.7 Fix for Adobe bug number 466320

If a destination occurs at the very begin of a page, the destination is moved to the previous page by Adobe Distiller 5. As workaround Adobe suggests:

```
/showpage {
  //showpage
  clippath stroke erasepage
} bind def
```

But unfortunately this fix generates an empty page at the end of the document. Therefore another fix is used by writing some clipped text.

```
⟨dviwindo⟩\def\literalps@out#1{\special{ps:#1}}%
⟨packageEnd⟩\providecommand*{\Hy@DistillerDestFix}{}
⟨*pdfmark | dviwindo⟩
\def\Hy@DistillerDestFix{%
  \begingroup
    \let\x\literalps@out
```

The fix has to be passed unchanged through GeX, if VTeX in PostScript mode with GeX is used.

```
    \ifnum \@ifundefined{OpMode}{0}{%
         \@ifundefined{gexmode}{0}{%
         \ifnum\gexmode>0 \OpMode\else 0\fi
         }}>1 %
      \def\x##1{%
       \immediate\special{!=##1}%
      }%
    \fi
    \x{%
     /product where{%
       pop %
       product(Distiller)search{%
         pop pop pop %
         version(.)search{%
           exch pop exch pop%
           (3011)eq{%
             gsave %
             newpath 0 0 moveto closepath clip%
             /Courier findfont 10 scalefont setfont %
             72 72 moveto(.)show %
             grestore%
           }if%
         }{pop}ifelse%
       }{pop}ifelse%
     }if%
    }%
  \endgroup
}
⟨/pdfmark | dviwindo⟩
```

44.8 Direct pdfmark support

Drivers that load `pdfmark.def` have to provide the correct macro definitions of

`\@pdfproducer`	for document information
`\literalps@out`	PostScript output
`\headerps@out`	PostScript output that goes in the header area

and the correct definitions of the following PostScript procedures:

H.S	start of anchor, link or rect
#1 H.A	end of anchor, argument=baselineskip in pt
#1 H.L	end of link, argument=baselineskip in pt
H.R	end of rect
H.B	raw rect code

```
⟨*pdfmark⟩
\Hy@breaklinks@unsupported
\def\HyPat@ObjRef{%
  \{[^{}]+\}%
}
\Hy@WrapperDef\hyper@anchor#1{%
  \Hy@SaveLastskip
  \Hy@VerboseAnchor{#1}%
  \begingroup
```

```
    \pdfmark[\anchor@spot]{%
      pdfmark=/DEST,%
      linktype=anchor,%
      View=/\@pdfview \@pdfviewparams,%
      DestAnchor={#1}%
    }%
  \endgroup
  \Hy@RestoreLastskip
}
\@ifundefined{hyper@anchorstart}{}{\endinput}
\Hy@WrapperDef\hyper@anchorstart#1{%
  \Hy@SaveLastskip
  \Hy@VerboseAnchor{#1}%
  \literalps@out{H.S}%
  \Hy@AllowHyphens
  \xdef\hyper@currentanchor{#1}%
  \Hy@activeanchortrue
}
\def\hyper@anchorend{%
  \literalps@out{\strip@pt@and@otherjunk\baselineskip\space H.A}%
  \pdfmark{%
    pdfmark=/DEST,%
    linktype=anchor,%
    View=/\@pdfview \@pdfviewparams,%
    DestAnchor=\hyper@currentanchor,%
  }%
  \Hy@activeanchorfalse
  \Hy@RestoreLastskip
}
\def\hyper@linkstart#1#2{%
  \Hy@VerboseLinkStart{#1}{#2}%
  \ifHy@breaklinks
  \else
    \leavevmode
    \ifmmode
      \def\Hy@LinkMath{$}%
    \else
      \let\Hy@LinkMath\@empty
    \fi
    \Hy@SaveSpaceFactor
    \hbox\bgroup
    \Hy@RestoreSpaceFactor
    \Hy@LinkMath
  \fi
  \expandafter\Hy@colorlink\csname @#1color\endcsname
  \literalps@out{H.S}%
  \Hy@AllowHyphens
  \xdef\hyper@currentanchor{#2}%
  \gdef\hyper@currentlinktype{#1}%
}
\def\hyper@linkend{%
  \literalps@out{\strip@pt@and@otherjunk\baselineskip\space H.L}%
  \@ifundefined{@\hyper@currentlinktype bordercolor}{%
    \let\Hy@tempcolor\relax
```

```
  }{%
    \edef\Hy@tempcolor{%
      \csname @\hyper@currentlinktype bordercolor\endcsname
    }%
  }%
  \pdfmark{%
    pdfmark=/ANN,%
    linktype=link,%
    Subtype=/Link,%
    PDFAFlags=4,%
    Dest=\hyper@currentanchor,%
    AcroHighlight=\@pdfhighlight,%
    Border=\@pdfborder,%
    BorderStyle=\@pdfborderstyle,%
    Color=\Hy@tempcolor,%
    Raw=H.B%
  }%
  \Hy@endcolorlink
  \ifHy@breaklinks
  \else
    \Hy@LinkMath
    \Hy@SaveSpaceFactor
    \egroup
    \Hy@RestoreSpaceFactor
  \fi
}
```

We have to allow for \baselineskip having an optional stretch and shrink (you meet this in slide packages, for instance), so we need to strip off the junk. David Carlisle, of course, wrote this bit of code.

```
\begingroup
  \catcode`P=12 %
  \catcode`T=12 %
  \lowercase{\endgroup
  \gdef\rem@ptetc#1.#2PT#3!{#1\ifnum#2>\z@.#2\fi}%
}
\def\strip@pt@and@otherjunk#1{\expandafter\rem@ptetc\the#1!}
```

\hyper@pagetransition

```
\def\hyper@pagetransition{%
  \ifx\@pdfpagetransition\relax
  \else
    \ifx\@pdfpagetransition\@empty
      % 1. Does an old entry have to be deleted?
      % 2. If 1=yes, how to delete?
    \else
      \pdfmark{%
        pdfmark=/PUT,%
        Raw={%
          \string{ThisPage\string}%
          <</Trans << /S /\@pdfpagetransition\space >> >>%
        }%
      }%
    \fi
```

```
  \fi
}
```

\hyper@pageduration

```
\def\hyper@pageduration{%
  \ifx\@pdfpageduration\relax
  \else
    \ifx\@pdfpageduration\@empty
      % 1. Does an old entry have to be deleted?
      % 2. If 1=yes, how to delete?
    \else
      \pdfmark{%
        pdfmark=/PUT,%
        Raw={%
          \string{ThisPage\string}%
          <</Dur \@pdfpageduration>>%
        }%
      }%
    \fi
  \fi
}

\g@addto@macro\Hy@EveryPageBoxHook{%
  \hyper@pagetransition
  \hyper@pageduration
}
\def\hyper@image#1#2{%
  \hyper@linkurl{#2}{#1}%
}
\def\Hy@undefinedname{UNDEFINED}
\def\hyper@link#1#2#3{%
  \Hy@VerboseLinkStart{#1}{#2}%
  \@ifundefined{@#1bordercolor}{%
    \let\Hy@tempcolor\relax
  }{%
    \edef\Hy@tempcolor{\csname @#1bordercolor\endcsname}%
  }%
  \begingroup
    \protected@edef\Hy@testname{#2}%
    \ifx\Hy@testname\@empty
      \Hy@Warning{%
        Empty destination name,\MessageBreak
        using `\Hy@undefinedname'%
      }%
      \let\Hy@testname\Hy@undefinedname
    \fi
    \pdfmark[{#3}]{%
      Color=\Hy@tempcolor,%
      linktype={#1},%
      AcroHighlight=\@pdfhighlight,%
      Border=\@pdfborder,%
      BorderStyle=\@pdfborderstyle,%
      pdfmark=/ANN,%
      Subtype=/Link,%
```

```
    PDFAFlags=4,%
    Dest=\Hy@testname
  }%
 \endgroup
}
\newtoks\pdf@docset
\def\PDF@FinishDoc{%
 \Hy@UseMaketitleInfos
 \HyInfo@GenerateAddons
 \let\Hy@temp\@empty
 \ifx\@pdfcreationdate\@empty
 \else
  \def\Hy@temp{CreationDate=\@pdfcreationdate,}%
 \fi
 \ifx\@pdfmoddate\@empty
 \else
  \expandafter\def\expandafter\Hy@temp\expandafter{%
   \Hy@temp
   ModDate=\@pdfmoddate,%
  }%
 \fi
 \ifx\@pdfproducer\relax
 \else
  \expandafter\def\expandafter\Hy@temp\expandafter{%
   \Hy@temp
   Producer=\@pdfproducer,%
  }%
 \fi
 \expandafter
 \pdfmark\expandafter{%
  \Hy@temp
  pdfmark=/DOCINFO,%
  Title=\@pdftitle,%
  Subject=\@pdfsubject,%
  Creator=\@pdfcreator,%
  Author=\@pdfauthor,%
  Keywords=\@pdfkeywords,%
  Trapped=\@pdftrapped
 }%
 \ifx\HyInfo@Addons\@empty
 \else
  \pdfmark{%
   pdfmark=/DOCINFO,%
   Raw={\HyInfo@Addons}%
  }%
 \fi
 \Hy@DisableOption{pdfauthor}%
 \Hy@DisableOption{pdftitle}%
 \Hy@DisableOption{pdfsubject}%
 \Hy@DisableOption{pdfcreator}%
 \Hy@DisableOption{addtopdfcreator}%
 \Hy@DisableOption{pdfcreationdate}%
 \Hy@DisableOption{pdfcreationdate}%
 \Hy@DisableOption{pdfmoddate}%
```

```
  \Hy@DisableOption{pdfproducer}%
  \Hy@DisableOption{pdfkeywords}%
  \Hy@DisableOption{pdftrapped}%
  \Hy@DisableOption{pdfinfo}%
}
\def\PDF@SetupDoc{%
  \def\Hy@temp{}%
  \ifx\@pdfstartpage\@empty
  \else
    \ifx\@pdfstartview\@empty
    \else
      \edef\Hy@temp{%
        ,Page=\@pdfstartpage
        ,View=\@pdfstartview
      }%
    \fi
  \fi
  \edef\Hy@temp{%
    \noexpand\pdfmark{%
      pdfmark=/DOCVIEW,%
      PageMode=/\@pdfpagemode
      \Hy@temp
    }%
  }%
  \Hy@temp
  \ifx\@pdfpagescrop\@empty
  \else
    \pdfmark{pdfmark=/PAGES,CropBox=\@pdfpagescrop}%
  \fi
  \edef\Hy@temp{%
    \ifHy@pdftoolbar\else /HideToolbar true\fi
    \ifHy@pdfmenubar\else /HideMenubar true\fi
    \ifHy@pdfwindowui\else /HideWindowUI true\fi
    \ifHy@pdffitwindow /FitWindow true\fi
    \ifHy@pdfcenterwindow /CenterWindow true\fi
    \ifHy@pdfdisplaydoctitle /DisplayDocTitle true\fi
    \Hy@UseNameKey{NonFullScreenPageMode}\@pdfnonfullscreenpagemode
    \Hy@UseNameKey{Direction}\@pdfdirection
    \Hy@UseNameKey{ViewArea}\@pdfviewarea
    \Hy@UseNameKey{ViewClip}\@pdfviewclip
    \Hy@UseNameKey{PrintArea}\@pdfprintarea
    \Hy@UseNameKey{PrintClip}\@pdfprintclip
    \Hy@UseNameKey{PrintScaling}\@pdfprintscaling
    \Hy@UseNameKey{Duplex}\@pdfduplex
    \ifx\@pdfpicktraybypdfsize\@empty
    \else
      /PickTrayByPDFSize \@pdfpicktraybypdfsize
    \fi
    \ifx\@pdfprintpagerange\@empty
    \else
      /PrintPageRange[\@pdfprintpagerange]%
    \fi
    \ifx\@pdfnumcopies\@empty
    \else
```

```
    /NumCopies \@pdfnumcopies
  \fi
 }%
 \Hy@pstringdef\Hy@pstringB{\@baseurl}%
 \pdfmark{%
  pdfmark=/PUT,%
  Raw={%
   \string{Catalog\string}<<%
    \ifx\Hy@temp\@empty
    \else
     /ViewerPreferences<<\Hy@temp>>%
    \fi
    \Hy@UseNameKey{PageLayout}\@pdfpagelayout
    \ifx\@pdflang\relax
    \else
     /Lang(\@pdflang)%
    \fi
    \ifx\@baseurl\@empty
    \else
     /URI<</Base(\Hy@pstringB)>>%
    \fi
   >>%
  }%
 }%
}
⟨/pdfmark⟩
⟨*pdfmarkbase⟩
```

We define a single macro, pdfmark, which uses the 'keyval' system to define the various allowable keys; these are *exactly* as listed in the pdfmark reference for Acrobat 3.0. The only addition is `pdfmark` which specifies the type of pdfmark to create (like ANN, LINK etc). The surrounding round and square brackets in the pdfmark commands are supplied, but you have to put in / characters as needed for the values.

```
\newif\ifHy@pdfmarkerror
\def\pdfmark{\@ifnextchar[{\pdfmark@}{\pdfmark@[]}}
\def\pdfmark@[#1]#2{%
 \Hy@pdfmarkerrorfalse
 \edef\@processme{\noexpand\pdf@toks={\the\pdf@defaulttoks}}%
 \@processme
 \let\pdf@type\relax
 \let\pdf@objdef\@empty
 \kvsetkeys{PDF}{#2}%
 \ifHy@pdfmarkerror
 \else
  \ifx\pdf@type\relax
   \Hy@WarningNoLine{no pdfmark type specified in #2!!}%
   \ifx\\#1\\%
   \else
    \pdf@rect{#1}%
   \fi
  \else
   \ifx\\#1\\%
    \literalps@out{%
```

```
        [%
        \ifx\pdf@objdef\@empty
        \else
          /__objdef\string{\pdf@objdef\string}%
        \fi
        \the\pdf@toks\space\pdf@type\space pdfmark%
      }%
    \else
      \@ifundefined{@\pdf@linktype color}{%
        \Hy@colorlink\@linkcolor
      }{%
        \expandafter\Hy@colorlink
                \csname @\pdf@linktype color\endcsname
      }%
      \pdf@rect{#1}%
      \literalps@out{%
        [%
        \ifx\pdf@objdef\@empty
        \else
          /__objdef\string{\pdf@objdef\string}%
        \fi
        \the\pdf@toks\space\pdf@type\space pdfmark%
      }%
      \Hy@endcolorlink
    \fi
  \fi
\fi
}
```

The complicated bit is working out the right enclosing rectangle of some piece of TEX text, needed by the /Rect key. This solution originates with Toby Thain (tobyt@netspace.net.au).

For the case breaklinks is enabled, I have added two hooks, the first one for package setouterhbox, it provides a hopefully better method without setting the text twice.

```
\usepackage[hyperref]{setouterhbox}
```

With the second hook, also you can set the text twice, e.g.:

```
\long\def\Hy@setouterhbox#1#2{\long\def\my@temp{#2}}
\def\Hy@breaklinksunhbox#1{\my@temp}
```

```
\newsavebox{\pdf@box}
\providecommand*{\Hy@setouterhbox}{\sbox}
\providecommand*{\Hy@breaklinksunhbox}{\unhbox}
\def\Hy@DEST{/DEST}
\def\pdf@rect#1{%
  \begingroup
    \chardef\x=1 %
    \def\Hy@temp{#1}%
    \ifx\Hy@temp\@empty
      \chardef\x=0 %
    \else
      \def\y{\anchor@spot}%
```

```
    \ifx\Hy@temp\y
      \def\y{\relax}%
      \ifx\anchor@spot\y
        \chardef\x=0 %
      \fi
    \fi
  \fi
\expandafter\endgroup
\ifcase\x
  \literalps@out{H.S}%
  \literalps@out{H.R}%
\else
  \leavevmode
  \Hy@SaveSpaceFactor
  \ifmmode
    \def\Hy@LinkMath{$}%
  \else
    \let\Hy@LinkMath\@empty
  \fi
  \ifHy@breaklinks
    \Hy@setouterhbox\pdf@box{%
      \Hy@RestoreSpaceFactor
      \Hy@LinkMath
      \Hy@AllowHyphens#1\Hy@xspace@end
      \Hy@LinkMath
      \Hy@SaveSpaceFactor
    }%
  \else
    \sbox\pdf@box{%
      \Hy@RestoreSpaceFactor
      \Hy@LinkMath
      #1\Hy@xspace@end
      \Hy@LinkMath
      \Hy@SaveSpaceFactor
    }%
  \fi
  \dimen@\ht\pdf@box
  \ifdim\dp\pdf@box=\z@
    \literalps@out{H.S}%
  \else
    \lower\dp\pdf@box\hbox{\literalps@out{H.S}}%
  \fi
```

If the text has to be horizontal mode stuff then just unbox the saved box like this, which saves executing it twice, which can mess up counters etc (thanks DPC…).

```
  \ifHy@breaklinks
    \ifhmode
      \Hy@breaklinksunhbox\pdf@box
    \else
      \box\pdf@box
    \fi
  \else
    \expandafter\box\pdf@box
  \fi
```

but if it can have multiple paragraphs you'd need one of these, but in that case the measured box size would be wrong anyway.

```
\ifHy@breaklinks#1\else\box\pdf@box\fi
\ifHy@breaklinks{#1}\else\box\pdf@box\fi
```

```
    \ifdim\dimen@=\z@
      \literalps@out{H.R}%
    \else
      \raise\dimen@\hbox{\literalps@out{H.R}}%
    \fi
    \Hy@RestoreSpaceFactor
  \fi
  \ifx\pdf@type\Hy@DEST
  \else
    \pdf@addtoksx{H.B}%
  \fi
}
```

All the supplied material is stored in a token list; since I do not feel sure I quite understand these, things may not work as expected with expansion. We'll have to experiment.

```
\newtoks\pdf@toks
\newtoks\pdf@defaulttoks
\pdf@defaulttoks={}%
\def\pdf@addtoks#1#2{%
  \edef\@processme{\pdf@toks{\the\pdf@toks/#2 #1}}%
  \@processme
}
\def\pdf@addtoksx#1{%
  \edef\@processme{\pdf@toks{\the\pdf@toks\space #1}}%
  \@processme
}
\def\PDFdefaults#1{%
  \pdf@defaulttoks={#1}%
}
```

This is the list of allowed keys. See the Acrobat manual for an explanation.

```
% what is the type of pdfmark?
\define@key{PDF}{pdfmark}{\def\pdf@type{#1}}
% what is the link type?
\define@key{PDF}{linktype}{\def\pdf@linktype{#1}}
\def\pdf@linktype{link}
% named object?
\define@key{PDF}{objdef}{\edef\pdf@objdef{#1}}
\let\pdf@objdef\@empty
% parameter is a stream of PDF
\define@key{PDF}{Raw}{\pdf@addtoksx{#1}}
% parameter is a name
\define@key{PDF}{Action}{\pdf@addtoks{#1}{Action}}
% parameter is a array
\define@key{PDF}{Border}{%
  \edef\Hy@temp{#1}%
  \ifx\Hy@temp\@empty
  \else
```

```
    \pdf@addtoks{[#1]\Hy@BorderArrayPatch}{Border}% hash-ok
  \fi
}
\let\Hy@BorderArrayPatch\@empty
% parameter is a dictionary
\define@key{PDF}{BorderStyle}{%
  \edef\Hy@temp{#1}%
  \ifx\Hy@temp\@empty
  \else
    \pdf@addtoks{<<#1>>}{BS}%
  \fi
}
% parameter is a array
\define@key{PDF}{Color}{%
  \ifx\relax#1\relax
  \else
    \pdf@addtoks{[#1]}{Color}% hash-ok
  \fi
}
% parameter is a string
\define@key{PDF}{Contents}{\pdf@addtoks{(#1)}{Contents}}
% parameter is a integer
\define@key{PDF}{Count}{\pdf@addtoks{#1}{Count}}
% parameter is a array
\define@key{PDF}{CropBox}{\pdf@addtoks{[#1]}{CropBox}}% hash-ok
% parameter is a string
\define@key{PDF}{DOSFile}{\pdf@addtoks{(#1)}{DOSFile}}
% parameter is a string or file
\define@key{PDF}{DataSource}{\pdf@addtoks{(#1)}{DataSource}}
% parameter is a destination
\define@key{PDF}{Dest}{%
  \Hy@pstringdef\Hy@pstringDest{\HyperDestNameFilter{#1}}%
  \ifx\Hy@pstringDest\@empty
    \Hy@pdfmarkerrortrue
    \Hy@Warning{Destination with empty name ignored}%
  \else
    \pdf@addtoks{(\Hy@pstringDest) cvn}{Dest}%
  \fi
}
\define@key{PDF}{DestAnchor}{%
  \Hy@pstringdef\Hy@pstringDest{\HyperDestNameFilter{#1}}%
  \ifx\Hy@pstringDest\@empty
    \Hy@pdfmarkerrortrue
    \Hy@Warning{Destination with empty name ignored}%
  \else
    \pdf@addtoks{(\Hy@pstringDest) cvn}{Dest}%
  \fi
}
% parameter is a string
\define@key{PDF}{Dir}{\pdf@addtoks{(#1)}{Dir}}
% parameter is a string
\define@key{PDF}{File}{\pdf@addtoks{(#1)}{File}}
% parameter is a int
\define@key{PDF}{Flags}{\pdf@addtoks{#1}{Flags}}
```

```
\define@key{PDF}{PDFAFlags}{%
  \ifHy@pdfa
    \pdf@addtoks{#1}{F}%
  \fi
}
% parameter is a name
\define@key{PDF}{AcroHighlight}{%
  \begingroup
    \edef\x{#1}%
  \expandafter\endgroup\ifx\x\@empty
  \else
    \pdf@addtoks{#1}{H}%
  \fi
}
% parameter is a string
\define@key{PDF}{ID}{\pdf@addtoks{[#1]}{ID}}% hash-ok
% parameter is a string
\define@key{PDF}{MacFile}{\pdf@addtoks{(#1)}{MacFile}}
% parameter is a string
\define@key{PDF}{ModDate}{\pdf@addtoks{(#1)}{ModDate}}
% parameter is a string
\define@key{PDF}{Op}{\pdf@addtoks{(#1)}{Op}}
% parameter is a Boolean
\define@key{PDF}{Open}{\pdf@addtoks{#1}{Open}}
% parameter is a integer or name
\define@key{PDF}{Page}{\pdf@addtoks{#1}{Page}}
% parameter is a name
\define@key{PDF}{PageMode}{\pdf@addtoks{#1}{PageMode}}
% parameter is a string
\define@key{PDF}{Params}{\pdf@addtoks{(#1)}{Params}}
% parameter is a array
\define@key{PDF}{Rect}{\pdf@addtoks{[#1]}{Rect}}% hash-ok
% parameter is a integer
\define@key{PDF}{SrcPg}{\pdf@addtoks{#1}{SrcPg}}
% parameter is a name
\define@key{PDF}{Subtype}{\pdf@addtoks{#1}{Subtype}}
% parameter is a string
\define@key{PDF}{Title}{\pdf@addtoks{(#1)}{Title}}
% parameter is a string
\define@key{PDF}{Unix}{\pdf@addtoks{(#1)}{Unix}}
% parameter is a string
\define@key{PDF}{UnixFile}{\pdf@addtoks{(#1)}{UnixFile}}
% parameter is an array
\define@key{PDF}{View}{\pdf@addtoks{[#1]}{View}}% hash-ok
% parameter is a string
\define@key{PDF}{WinFile}{\pdf@addtoks{(#1)}{WinFile}}
```

These are the keys used in the DOCINFO section.

```
\define@key{PDF}{Author}{\pdf@addtoks{(#1)}{Author}}
\define@key{PDF}{Creator}{\pdf@addtoks{(#1)}{Creator}}
\define@key{PDF}{CreationDate}{\pdf@addtoks{(#1)}{CreationDate}}
\define@key{PDF}{ModDate}{\pdf@addtoks{(#1)}{ModDate}}
\define@key{PDF}{Producer}{\pdf@addtoks{(#1)}{Producer}}
\define@key{PDF}{Subject}{\pdf@addtoks{(#1)}{Subject}}
\define@key{PDF}{Keywords}{\pdf@addtoks{(#1)}{Keywords}}
```

```
\define@key{PDF}{ModDate}{\pdf@addtoks{(#1)}{ModDate}}
\define@key{PDF}{Base}{\pdf@addtoks{(#1)}{Base}}
\define@key{PDF}{URI}{\pdf@addtoks{#1}{URI}}
\define@key{PDF}{Trapped}{%
  \edef\Hy@temp{#1}%
  \ifx\Hy@temp\@empty
  \else
    \pdf@addtoks{/#1}{Trapped}%
  \fi
}

⟨/pdfmarkbase⟩
⟨*pdfmark⟩
\def\Acrobatmenu#1#2{%
  \EdefEscapeName\Hy@temp@menu{#1}%
  \Hy@Acrobatmenu{#1}{#2}{%
    \pdfmark[{#2}]{%
      linktype=menu,%
      pdfmark=/ANN,%
      AcroHighlight=\@pdfhighlight,%
      Border=\@pdfborder,%
      BorderStyle=\@pdfborderstyle,%
      Color=\@menubordercolor,%
      Action={<</Subtype/Named/N/\Hy@temp@menu>>},%
      Subtype=/Link,%
      PDFAFlags=4%
    }%
  }%
}
```

And now for some useful examples:

```
\def\PDFNextPage{\@ifnextchar[{\PDFNextPage@}{\PDFNextPage@[]}}
\def\PDFNextPage@[#1]#2{%
  \pdfmark[{#2}]{%
    #1,%
    Border=\@pdfborder,%
    BorderStyle=\@pdfborderstyle,%
    Color=.2 .1 .5,%
    pdfmark=/ANN,%
    Subtype=/Link,%
    PDFAFlags=4,%
    Page=/Next%
  }%
}
\def\PDFPreviousPage{%
  \@ifnextchar[{\PDFPreviousPage@}{\PDFPreviousPage@[]}%
}
\def\PDFPreviousPage@[#1]#2{%
  \pdfmark[{#2}]{%
    #1,%
    Border=\@pdfborder,%
    BorderStyle=\@pdfborderstyle,%
    Color=.4 .4 .1,%
    pdfmark=/ANN,%
    Subtype=/Link,%
```

```
    PDFAFlags=4,%
    Page=/Prev%
  }%
}
\def\PDFOpen#1{%
  \pdfmark{#1,pdfmark=/DOCVIEW}%
}
```

This will only work if you use Distiller 2.1 or higher.

```
\def\hyper@linkurl#1#2{%
  \begingroup
    \Hy@pstringdef\Hy@pstringURI{#2}%
    \hyper@chars
    \leavevmode
    \pdfmark[{#1}]{%
      pdfmark=/ANN,%
      linktype=url,%
      AcroHighlight=\@pdfhighlight,%
      Border=\@pdfborder,%
      BorderStyle=\@pdfborderstyle,%
      Color=\@urlbordercolor,%
      Action={<<%
        /Subtype/URI%
        /URI(\Hy@pstringURI)%
        \ifHy@href@ismap
          /IsMap true%
        \fi
      >>},%
      Subtype=/Link,%
      PDFAFlags=4%
    }%
  \endgroup
}
\def\hyper@linkfile#1#2#3{%
  \begingroup
    \def\Hy@pstringF{#2}%
    \Hy@CleanupFile\Hy@pstringF
    \Hy@pstringdef\Hy@pstringF\Hy@pstringF
    \Hy@pstringdef\Hy@pstringD{#3}%
    \Hy@MakeRemoteAction
    \leavevmode
    \pdfmark[{#1}]{%
      pdfmark=/ANN,%
      Subtype=/Link,%
      PDFAFlags=4,%
      AcroHighlight=\@pdfhighlight,%
      Border=\@pdfborder,%
      BorderStyle=\@pdfborderstyle,%
      linktype=file,%
      Color=\@filebordercolor,%
      Action={%
        <<%
          /S/GoToR%
          \Hy@SetNewWindow
          /F(\Hy@pstringF)%
```

```
        /D%
        \ifx\\#3\\%
          [\Hy@href@page\@pdfremotestartview]%
        \else
          (\Hy@pstringD)cvn%
        \fi
        \Hy@href@nextactionraw
      >>%
    }%
  }%
  \endgroup
}
\def\@hyper@launch run:#1\\#2#3{%
  \begingroup
    \Hy@pstringdef\Hy@pstringF{#1}%
    \Hy@pstringdef\Hy@pstringP{#3}%
    \leavevmode
    \pdfmark[{#2}]{%
      pdfmark=/ANN,%
      Subtype=/Link,%
      PDFAFlags=4,%
      AcroHighlight=\@pdfhighlight,%
      Border=\@pdfborder,%
      BorderStyle=\@pdfborderstyle,%
      linktype=run,%
      Color=\@runbordercolor,%
      Action={%
        <<%
          /S/Launch%
          \Hy@SetNewWindow
          /F(\Hy@pstringF)%
          \ifx\\#3\\%
          \else
            /Win<</P(\Hy@pstringP)/F(\Hy@pstringF)>>%
          \fi
          \Hy@href@nextactionraw
        >>%
      }%
    }%
  \endgroup
}
⟨/pdfmark⟩
```

Unfortunately, some parts of the `pdfmark` PostScript code depend on vagaries of the dvi driver. We isolate here all the problems.

44.9 Rokicki's dvips

dvips thinks in 10ths of a big point, its coordinate space is resolution dependent, and its y axis starts at the top of the page. Other drivers can and will be different!

The work is done in `SDict`, because we add in some header definitions in a moment.

```
⟨*dvips⟩
\providecommand*{\XR@ext}{pdf}
```

```
\let\Hy@raisedlink\@empty
\def\literalps@out#1{\special{ps:SDict begin #1 end}}%
\def\headerps@out#1{\special{! #1}}%
\input{pdfmark.def}%
\ifx\@pdfproducer\relax
  \def\@pdfproducer{dvips + Distiller}%
\fi
\providecommand*\@pdfborder{0 0 1}
\providecommand*\@pdfborderstyle{}
\providecommand*\@pdfview{XYZ}
\providecommand*\@pdfviewparams{ H.V}
\def\Hy@BorderArrayPatch{BorderArrayPatch}
\g@addto@macro\Hy@FirstPageHook{%
  \headerps@out{%
```

Unless I am going mad, this *appears* to be the relationship between the default coordinate system (PDF), and dvips;

```
/DvipsToPDF { .01383701 div Resolution div } def
/PDFToDvips { .01383701 mul Resolution mul } def
```

the latter's coordinates are resolution dependent, but what that .01383701 is, who knows? well, almost everyone except me, I expect…And yes, Maarten Gelderman <mgelderman@econ.vu.nl> points out that its 1/72.27 (the number of points to an inch, big points to inch is 1/72). This also suggests that the code would be more understandable (and exact) if 0.013 div would be replaced by 72.27 mul, so here we go. If this isn't right, I'll revert it.

```
    /DvipsToPDF{72.27 mul Resolution div} def%
    /PDFToDvips{72.27 div Resolution mul} def%
    /BPToDvips{72 div Resolution mul}def
```

The values inside the /Border array are not taken literally, but interpreted by ghostscript using the resolution of the dvi driver. I don't know how other distiller programs behaves in this manner.

Note GhostScript changed its behaviour here and later versions do not need this scaling, so test the PostScript interpreter is GhostScript and if so check its version.

If using gs and release > 9.27 no-op, otherwise patch.

```
    product (Ghostscript) search {pop pop pop revision 927 gt}%
    {pop false} ifelse%
    {%
      /BorderArrayPatch{} def%
    }%
    {%
      /BorderArrayPatch{%
        [exch{%
          dup dup type/integertype eq exch type/realtype eq or%
          {BPToDvips}if%
        }forall]%
      }def%
    } ifelse
```

The rectangle around the links starts off *exactly* the size of the box; we will to make it slightly bigger, 1 point on all sides.

```
11692     /HyperBorder {1 PDFToDvips} def%
11693     /H.V {pdf@hoff pdf@voff null} def%
11694     /H.B {/Rect[pdf@llx pdf@lly pdf@urx pdf@ury]} def%
```

H.S (start of anchor, link, or rect) stores the x and y coordinates of the current point, in PDF coordinates

```
11695     /H.S {%
11696       currentpoint %
11697       HyperBorder add /pdf@lly exch def %
11698       dup DvipsToPDF 72 add /pdf@hoff exch def %
11699       HyperBorder sub /pdf@llx exch def%
11700     } def%
```

The calculation of upper left y is done without raising the point in TEX, by simply adding on the current \baselineskip to the current y. This is usually too much, so we remove a notional 2 points.

We have to see what the current baselineskip is, and convert it to the dvips coordinate system.

Argument: baselineskip in pt. The x and y coordinates of the current point, minus the baselineskip

```
11701     /H.L {%
11702       2 sub dup%
11703       /HyperBasePt exch def %
11704       PDFToDvips /HyperBaseDvips exch def %
11705       currentpoint %
11706       HyperBaseDvips sub /pdf@ury exch def%
11707       /pdf@urx exch def%
11708     } def%
11709     /H.A {%
11710       H.L %
11711 % |/pdf@voff| = the distance from the top of the page to a point
11712 % |\baselineskip| above the current point in PDF coordinates
11713       currentpoint exch pop %
11714       vsize 72 sub exch DvipsToPDF %
11715       HyperBasePt sub % baseline skip
11716       sub /pdf@voff exch def%
11717     } def%
11718     /H.R {%
11719       currentpoint %
11720       HyperBorder sub /pdf@ury exch def %
11721       HyperBorder add /pdf@urx exch def %
11722 % |/pdf@voff| = the distance from the top of the page to the current point, in
11723 % PDF coordinates
11724       currentpoint exch pop vsize 72 sub %
11725       exch DvipsToPDF sub /pdf@voff exch def%
11726     } def%
11727   }%
11728 }
11729 \AddToHook{shipout/firstpage}{%
11730   \ifHy@setpagesize
11731     \begingroup
11732      \ifnum\mag=\@m
11733       \ifdim\stockwidth>\z@
11734         \ifdim\stockheight>\z@
```

```
      \special{papersize=\the\stockwidth,\the\stockheight}%
    \else
     \ifdim\paperwidth>\z@
      \ifdim\paperheight>\z@
       \special{papersize=\the\paperwidth,\the\paperheight}%
      \fi
     \fi
    \fi
   \else
    \ifdim\stockwidth=\z@
     \ifdim\paperwidth>\z@
      \ifdim\paperheight>\z@
       \special{papersize=\the\paperwidth,\the\paperheight}%
      \fi
     \fi
    \fi
   \fi
  \fi
  \endgroup
 \fi
 \Hy@DisableOption{setpagesize}%
}
\def\setpdflinkmargin#1{%
 \begingroup
  \setlength{\dimen@}{#1}%
  \literalps@out{%
   /HyperBorder{\strip@pt\dimen@\space PDFToDvips}def%
  }%
 \endgroup
}
```

⟨/dvips⟩

44.10 VTeX's vtexpdfmark driver

This part is derived from the dvips (many names reflect this).

The origin seems to be the same as TeX's origin, 1 in from the left and 1 in downwards from the top. The direction of the y axis is downwards, the opposite of the dvips case. Units seems to be pt or bp.

```
⟨*vtexpdfmark⟩
\providecommand*{\XR@ext}{pdf}
\let\Hy@raisedlink\@empty
\def\literalps@out#1{\special{pS:#1}}%
\def\headerps@out#1{\immediate\special{pS:#1}}%
\input{pdfmark.def}%
\ifx\@pdfproducer\relax
 \ifnum\OpMode=\@ne
  \def\@pdfproducer{VTeX}%
 \else
  \def\@pdfproducer{VTeX + Distiller}%
 \fi
\fi
\providecommand*\@pdfborder{0 0 1}
```

```
\providecommand*\@pdfborderstyle{}
\providecommand*\@pdfview{XYZ}
\providecommand*\@pdfviewparams{ H.V}
\g@addto@macro\Hy@FirstPageHook{%
 \headerps@out{%
  /vsize {\Hy@pageheight} def%
```

The rectangle around the links starts off *exactly* the size of the box; we will to make it slightly bigger, 1 point on all sides.

```
  /HyperBorder {1} def%
  /H.V {pdf@hoff pdf@voff null} def%
  /H.B {/Rect[pdf@llx pdf@lly pdf@urx pdf@ury]} def%
```

H.S (start of anchor, link, or rect) stores the x and y coordinates of the current point, in PDF coordinates: pdf@lly $= Y_c -$ HyperBorder, pdf@hoff $= X_c + 72$, pdf@llx $= X_c -$ HyperBorder

```
  /H.S {%
    currentpoint %
    HyperBorder sub%
    /pdf@lly exch def %
    dup 72 add /pdf@hoff exch def %
    HyperBorder sub%
    /pdf@llx exch def%
  } def%
```

The x and y coordinates of the current point, minus the \baselineskip: pdf@ury $=$ $Y_c +$ HyperBasePt $+$ HyperBorder, pdf@urx $= X_c +$ HyperBorder

```
  /H.L {%
    2 sub%
    /HyperBasePt exch def %
    currentpoint %
    HyperBasePt add HyperBorder add%
    /pdf@ury exch def %
    HyperBorder add%
    /pdf@urx exch def%
  } def%
  /H.A {%
    H.L %
    currentpoint exch pop %
    vsize 72 sub exch %
    HyperBasePt add add%
    /pdf@voff exch def%
  } def%
```

pdf@ury $= Y_c +$ HyperBorder, pdf@urx $= X_c +$ HyperBorder

```
  /H.R {%
    currentpoint %
    HyperBorder add%
    /pdf@ury exch def %
    HyperBorder add%
    /pdf@urx exch def %
    currentpoint exch pop vsize 72 sub add%
    /pdf@voff exch def%
  } def%
 }%
```

```
}
\def\setpdflinkmargin#1{%
  \begingroup
    \setlength{\dimen@}{#1}%
    \literalps@out{%
      /HyperBorder{\strip@pt\dimen@}def%
    }%
  \endgroup
}
⟨/vtexpdfmark⟩
```

44.11 Textures

```
⟨*textures⟩
\providecommand*{\XR@ext}{pdf}
```

At the suggestion of Jacques Distler (distler@golem.ph.utexas.edu), try to derive a suitable driver for Textures. This was initially a copy of dvips, with some guesses about Textures behaviour. Ross Moore (ross@maths.mq.edu.au) has added modifications for better compatibility, and to support use of pdfmark.

Start by defining a macro that expands to the end-of-line character. This will be used to format the appearance of PostScript code, to enhance readability, and avoid excessively long lines which might otherwise become broken to bad places.

`\Hy@ps@CR` The macro `\Hy@ps@CR` contains the end-of-line character.

```
\begingroup
  \obeylines %
  \gdef\Hy@ps@CR{\noexpand
  }%
\endgroup %
```

Textures has two types of `\special` command for inserting PostScript code directly into the dvi output. The 'postscript' way preserves TeX's idea of where on the page the `\special` occurred, but it wraps the contents with a `save`–`restore` pair, and adjusts the user-space coordinate system for local drawing commands. The 'rawpostscript' way simply inserts code, without regard for the location on the page.

Thus, to put arbitrary PostScript coding at a fixed location requires using *both* `\special` constructions. It works by pushing the device-space coordinates onto the operand stack, where they can be used to transform back to the correct user-space coordinates for the whole page, within a 'rawpostscript' `\special`.

```
\def\literalps@out#1{%
  \special{postscript 0 0 transform}%
  \special{rawpostscript itransform moveto\Hy@ps@CR #1}%
}%
%
```

The 'prepostscript' is a 3rd kind of `\special`, used for inserting definitions into the dictionaries, before page-building begins. These are to be available for use on all pages.

```
\def\headerps@out#1{%
  \special{%
```

```
    prepostscript TeXdict begin\Hy@ps@CR
      #1\Hy@ps@CR
    end%
  }%
}%
%
```

To correctly support the pdfmark method, for embedding PDF definitions with .ps files in a non-intrusive way, an appropriate definition needs to be made *before* the file pdfmark.def is read. Other parameters are best set afterwards.

```
\g@addto@macro\Hy@FirstPageHook{%
  \headerps@out{%
    /betterpdfmark {%
      systemdict begin %
        dup /BP eq%
        {cleartomark gsave nulldevice []%
        {dup /EP eq%
          {cleartomark cleartomark grestore}%
          {cleartomark}%
          ifelse%
        }ifelse %
      end%
    }def\Hy@ps@CR
    ___pdfmark___ not{/pdfmark /betterpdfmark load def}if%
  }% end of \headerps@out
}% end of \AddToHook{shipout/firstpage}
%
\input{pdfmark.def}%
%
\ifx\@pdfproducer\relax
  \def\@pdfproducer{Textures + Distiller}%
\fi
\providecommand*\@pdfborder{0 0 1}
\providecommand*\@pdfborderstyle{}
\providecommand*\@pdfview{XYZ}
\providecommand*\@pdfviewparams{ H.V}
%
```

These are called at the start and end of unboxed links; their job is to leave available PS variables called pdf@llx pdf@lly pdf@urx pdf@ury, which are the coordinates of the bounding rectangle of the link, and pdf@hoff pdf@voff which are the PDF page offsets. The Rect pair are called at the LL and UR corners of a box known to TEX.

```
\Hy@AtBeginDocument{%
  \headerps@out{%
```

Textures lives in normal points, I think. So conversion from one coordinate system to another involves doing nothing.

```
    /vsize {\Hy@pageheight} def%
    /DvipsToPDF {} def%
    /PDFToDvips {} def%
    /BPToDvips {} def%
    /HyperBorder  { 1 PDFToDvips } def\Hy@ps@CR
    /H.V {pdf@hoff pdf@voff null} def\Hy@ps@CR
```

```
    /H.B {/Rect[pdf@llx pdf@lly pdf@urx pdf@ury]} def\Hy@ps@CR
    /H.S {%
      currentpoint %
      HyperBorder add /pdf@lly exch def %
      dup DvipsToPDF 72 add /pdf@hoff exch def %
      HyperBorder sub /pdf@llx exch def%
    } def\Hy@ps@CR
    /H.L {%
      2 sub %
      PDFToDvips /HyperBase exch def %
      currentpoint %
      HyperBase sub /pdf@ury exch def%
      /pdf@urx exch def%
    } def\Hy@ps@CR
    /H.A {%
      H.L %
      currentpoint exch pop %
      vsize 72 sub exch DvipsToPDF %
      HyperBase sub % baseline skip
      sub /pdf@voff exch def%
    } def\Hy@ps@CR
    /H.R {%
      currentpoint %
      HyperBorder sub /pdf@ury exch def %
      HyperBorder add /pdf@urx exch def %
      currentpoint exch pop vsize 72 sub %
      exch DvipsToPDF sub /pdf@voff exch def%
    } def\Hy@ps@CR
  }%
}
\def\setpdflinkmargin#1{%
  \begingroup
    \setlength{\dimen@}{#1}%
    \literalps@out{%
      /HyperBorder{\strip@pt\dimen@\space PDFToDvips}def%
    }%
  \endgroup
}
\Hy@AtBeginDocument{%
  \ifHy@colorlinks
    \headerps@out{/PDFBorder{/Border [0 0 0]}def}%
  \fi
}
```

Textures provides built-in support for HyperTeX specials so this part combines code from **hypertex.def** with what is established by loading **pdfmark.def**, or any other driver.

```
\expandafter\let\expandafter\keepPDF@SetupDoc
  \csname PDF@SetupDoc\endcsname
\def\PDF@SetupDoc{%
  \ifx\@baseurl\@empty
  \else
    \special{html:<base href="\@baseurl">}%
```

```
  \fi
  \keepPDF@SetupDoc
}
\Hy@WrapperDef\hyper@anchor#1{%
  \Hy@SaveLastskip
  \Hy@VerboseAnchor{#1}%
  \begingroup
    \let\protect=\string
    \special{html:<a name=%
        \hyper@quote\HyperDestNameFilter{#1}\hyper@quote>}%
  \endgroup
  \Hy@activeanchortrue
  \Hy@colorlink\@anchorcolor\anchor@spot\Hy@endcolorlink
  \special{html:</a>}%
  \Hy@activeanchorfalse
  \Hy@RestoreLastskip
}
\Hy@WrapperDef\hyper@anchorstart#1{%
  \Hy@SaveLastskip
  \Hy@VerboseAnchor{#1}%
  \begingroup
    \hyper@chars
    \special{html:<a name=%
        \hyper@quote\HyperDestNameFilter{#1}\hyper@quote>}%
  \endgroup
  \Hy@activeanchortrue
}
\def\hyper@anchorend{%
  \special{html:</a>}%
  \Hy@activeanchorfalse
  \Hy@RestoreLastskip
}
\def\@urltype{url}
\def\hyper@linkstart#1#2{%
  \Hy@VerboseLinkStart{#1}{#2}%
  \expandafter\Hy@colorlink\csname @#1color\endcsname
  \def\Hy@tempa{#1}%
  \ifx\Hy@tempa\@urltype
    \special{html:<a href=\hyper@quote#2\hyper@quote>}%
  \else
    \begingroup
      \hyper@chars
      \special{%
        html:<a href=%
        \hyper@quote\#\HyperDestNameFilter{#2}\hyper@quote>%
      }%
    \endgroup
  \fi
}
\def\hyper@linkend{%
  \special{html:</a>}%
  \Hy@endcolorlink
}
\def\hyper@linkfile#1#2#3{%
```

```
  \hyper@linkurl{#1}{%
    \Hy@linkfileprefix#2\ifx\\#3\\\else\##3\fi
  }%
}
\def\hyper@linkurl#1#2{%
  \leavevmode
  \ifHy@raiselinks
    \Hy@SaveSpaceFactor
    \Hy@SaveSavedSpaceFactor
    \sbox\@tempboxa{\Hy@RestoreSpaceFactor#1}%
    \Hy@RestoreSavedSpaceFactor
    \@linkdim\dp\@tempboxa
    \lower\@linkdim\hbox{%
      \hyper@chars
      \special{html:<a href=\hyper@quote#2\hyper@quote>}%
    }%
    \Hy@colorlink\@urlcolor
      \Hy@RestoreSpaceFactor
      #1\Hy@xspace@end
      \Hy@SaveSpaceFactor
      \@linkdim\ht\@tempboxa
      \advance\@linkdim by -6.5\p@
      \raise\@linkdim\hbox{\special{html:</a>}}%
    \Hy@endcolorlink
    \Hy@RestoreSpaceFactor
  \else
    \begingroup
      \hyper@chars
      \special{html:<a href=\hyper@quote#2\hyper@quote>}%
      \Hy@colorlink\@urlcolor#1\Hy@xspace@end
      \special{html:</a>}%
      \Hy@endcolorlink
    \endgroup
  \fi
}
```

Very poor implementation of `\hyper@link` without considering `#1`.

```
\def\hyper@link#1#2#3{%
  \Hy@VerboseLinkStart{#1}{#2}%
  \hyper@linkurl{#3}{\#\HyperDestNameFilter{#2}}%
}
\def\hyper@image#1#2{%
  \begingroup
    \hyper@chars
    \special{html:<img src=\hyper@quote#1\hyper@quote>}%
  \endgroup
}
⟨/textures⟩
```

44.12 dvipsone

```
% \subsection{dvipsone driver}
% Over-ride the default setup macro in pdfmark driver to use Y\&Y
% |\special| commands.
```

```
⟨*dvipsone⟩
\providecommand*{\XR@ext}{pdf}
\let\Hy@raisedlink\@empty
\providecommand*\@pdfborder{0 0 1}
\providecommand*\@pdfborderstyle{}
\def\literalps@out#1{\special{ps:#1}}%
\def\headerps@out#1{\special{headertext=#1}}%
\input{pdfmark.def}%
\HyInfo@AddonUnsupportedtrue
\def\PDF@FinishDoc{%
  \Hy@UseMaketitleInfos
  \HyInfo@TrappedUnsupported
  \special{PDF: Keywords \@pdfkeywords}%
  \special{PDF: Title \@pdftitle}%
  \special{PDF: Creator \@pdfcreator}%
  \ifx\@pdfcreationdate\@empty
  \else
    \special{PDF: CreationDate \@pdfcreationdate}%
  \fi
  \ifx\@pdfmoddate\@empty
  \else
    \special{PDF: ModDate \@pdfmoddate}%
  \fi
  \special{PDF: Author \@pdfauthor}%
  \ifx\@pdfproducer\relax
  \else
    \special{PDF: Producer \@pdfproducer}%
  \fi
  \special{PDF: Subject \@pdfsubject}%
  \Hy@DisableOption{pdfauthor}%
  \Hy@DisableOption{pdftitle}%
  \Hy@DisableOption{pdfsubject}%
  \Hy@DisableOption{pdfcreator}%
  \Hy@DisableOption{addtopdfcreator}%
  \Hy@DisableOption{pdfcreationdate}%
  \Hy@DisableOption{pdfcreationdate}%
  \Hy@DisableOption{pdfmoddate}%
  \Hy@DisableOption{pdfproducer}%
  \Hy@DisableOption{pdfkeywords}%
  \Hy@DisableOption{pdftrapped}%
  \Hy@DisableOption{pdfinfo}%
}
\def\PDF@SetupDoc{%
  \def\Hy@temp{}%
  \ifx\@pdfstartpage\@empty
  \else
    \ifx\@pdfstartview\@empty
    \else
      \edef\Hy@temp{%
        ,Page=\@pdfstartpage
        ,View=\@pdfstartview
      }%
    \fi
  \fi
```

```
\edef\Hy@temp{%
  \noexpand\pdfmark{%
    pdfmark=/DOCVIEW,%
    PageMode=/\@pdfpagemode
    \Hy@temp
  }%
}%
\Hy@temp
\ifx\@pdfpagescrop\@empty
\else
  \pdfmark{pdfmark=/PAGES,CropBox=\@pdfpagescrop}%
\fi
\edef\Hy@temp{%
  \ifHy@pdftoolbar\else /HideToolbar true\fi
  \ifHy@pdfmenubar\else /HideMenubar true\fi
  \ifHy@pdfwindowui\else /HideWindowUI true\fi
  \ifHy@pdffitwindow /FitWindow true\fi
  \ifHy@pdfcenterwindow /CenterWindow true\fi
  \ifHy@pdfdisplaydoctitle /DisplayDocTitle true\fi
  \Hy@UseNameKey{NonFullScreenPageMode}\@pdfnonfullscreenpagemode
  \Hy@UseNameKey{Direction}\@pdfdirection
  \Hy@UseNameKey{ViewArea}\@pdfviewarea
  \Hy@UseNameKey{ViewClip}\@pdfviewclip
  \Hy@UseNameKey{PrintArea}\@pdfprintarea
  \Hy@UseNameKey{PrintClip}\@pdfprintclip
  \Hy@UseNameKey{PrintScaling}\@pdfprintscaling
  \Hy@UseNameKey{Duplex}\@pdfduplex
  \ifx\@pdfpicktraybypdfsize\@empty
  \else
    /PickTrayByPDFSize \@pdfpicktraybypdfsize
  \fi
  \ifx\@pdfprintpagerange\@empty
  \else
    /PrintPageRange[\@pdfprintpagerange]%
  \fi
  \ifx\@pdfnumcopies\@empty
  \else
    /NumCopies \@pdfnumcopies
  \fi
}%
\Hy@pstringdef\Hy@pstringB{\@baseurl}%
\pdfmark{%
  pdfmark=/PUT,%
  Raw={%
    \string{Catalog\string}<<%
      \ifx\Hy@temp\@empty
      \else
        /ViewerPreferences<<\Hy@temp>>%
      \fi
      \Hy@UseNameKey{PageLayout}\@pdfpagelayout
      \ifx\@pdflang\relax
      \else
        /Lang(\@pdflang)%
      \fi
```

```
      \ifx\@baseurl\@empty
      \else
        /URI<</Base(\Hy@pstringB)>>%
      \fi
    >>%
  }%
 }%
}
\providecommand*\@pdfview{XYZ}
\providecommand*\@pdfviewparams{ %
 gsave revscl currentpoint grestore %
 72 add exch pop null exch null%
}
\def\Hy@BorderArrayPatch{BorderArrayPatch}
```

These are called at the start and end of unboxed links; their job is to leave available PS variables called `pdf@llx pdf@lly pdf@urx pdf@ury`, which are the coordinates of the bounding rectangle of the link, and `pdf@hoff pdf@voff` which are the PDF page offsets. These latter are currently not used in the dvipsone setup. The Rect pair are called at the LL and UR corners of a box known to TEX.

```
\g@addto@macro\Hy@FirstPageHook{%
 \headerps@out{%
```

dvipsone lives in scaled points; does this mean 65536 or 65781?

```
   /DvipsToPDF { 65781 div  } def%
   /PDFToDvips { 65781 mul } def%
   /BPToDvips{65781 mul}def%
   /HyperBorder  { 1 PDFToDvips } def%
   /H.B {/Rect[pdf@llx pdf@lly pdf@urx pdf@ury]} def%
```

The values inside the /Boder array are not taken literally, but interpreted by ghostscript using the resolution of the dvi driver. I don't know how other distiller programs behaves in this manner.

```
   /BorderArrayPatch{%
     [exch{%
       dup dup type/integertype eq exch type/realtype eq or%
       {BPToDvips}if%
     }forall]%
   }def%
   /H.S {%
     currentpoint %
     HyperBorder add /pdf@lly exch def %
     dup DvipsToPDF 72 add /pdf@hoff exch def %
     HyperBorder sub /pdf@llx exch def%
   } def%
   /H.L {%
     2 sub %
     PDFToDvips /HyperBase exch def %
     currentpoint %
     HyperBase sub /pdf@ury exch def%
     /pdf@urx exch def%
   } def%
   /H.A {%
     H.L %
     currentpoint exch pop %
```

```
      HyperBase sub % baseline skip
      DvipsToPDF /pdf@voff exch def%
    } def%
    /H.R {%
      currentpoint %
      HyperBorder sub /pdf@ury exch def %
      HyperBorder add /pdf@urx exch def %
      currentpoint exch pop DvipsToPDF /pdf@voff exch def%
    } def%
  }%
}
\def\setpdflinkmargin#1{%
  \begingroup
    \setlength{\dimen@}{#1}%
    \literalps@out{%
      /HyperBorder{\strip@pt\dimen@\space PDFToDvips}def%
    }%
  \endgroup
}
⟨/dvipsone⟩
```

44.13 TeX4ht

```
⟨*tex4ht⟩
\providecommand*{\XR@ext}{html}
\let\Hy@raisedlink\@empty
\@ifpackageloaded{tex4ht}{%
  \Hy@InfoNoLine{tex4ht is already loaded}%
}{%
  \RequirePackage[htex4ht]{tex4ht}%
}
\hyperlinkfileprefix{}
\let\PDF@FinishDoc\@empty
\def\PDF@SetupDoc{%
  \ifx\@baseurl\@empty
  \else
    \special{t4ht=<base href="\@baseurl">}%
  \fi
}
\Hy@WrapperDef\hyper@anchor#1{%
  \Hy@SaveLastskip
  \Hy@VerboseAnchor{#1}%
  \begingroup
    \let\protect=\string
    \special{t4ht=<a name=%
        \hyper@quote\HyperDestNameFilter{#1}\hyper@quote>}%
  \endgroup
  \Hy@activeanchortrue
  \Hy@colorlink\@anchorcolor\anchor@spot\Hy@endcolorlink
  \special{t4ht=</a>}%
  \Hy@activeanchorfalse
  \Hy@RestoreLastskip
}
\Hy@WrapperDef\hyper@anchorstart#1{%
```

```
  \Hy@SaveLastskip
  \Hy@VerboseAnchor{#1}%
  \begingroup
    \hyper@chars\special{t4ht=<a name=%
       \hyper@quote\HyperDestNameFilter{#1}\hyper@quote>}%
  \endgroup
  \Hy@activeanchortrue
}
\def\hyper@anchorend{%
  \special{t4ht=</a>}%
  \Hy@activeanchorfalse
  \Hy@RestoreLastskip
}
\def\@urltype{url}
\def\hyper@linkstart#1#2{%
  \Hy@VerboseLinkStart{#1}{#2}%
  \expandafter\Hy@colorlink\csname @#1color\endcsname
  \def\Hy@tempa{#1}%
  \ifx\Hy@tempa\@urltype
    \special{t4ht=<a href=\hyper@quote#2\hyper@quote>}%
  \else
    \begingroup
      \hyper@chars
      \special{t4ht=<a href=%
         \hyper@quote\#\HyperDestNameFilter{#2}\hyper@quote>}%
    \endgroup
  \fi
}
\def\hyper@linkend{%
  \special{t4ht=</a>}%
  \Hy@endcolorlink
}
\def\hyper@linkfile#1#2#3{%
  \hyper@linkurl{#1}{\Hy@linkfileprefix#2\ifx\\#3\\\else\##3\fi}%
}
\def\hyper@linkurl#1#2{%
  \leavevmode
  \ifHy@raiselinks
    \Hy@SaveSpaceFactor
    \Hy@SaveSavedSpaceFactor
    \sbox\@tempboxa{\Hy@RestoreSpaceFactor#1}%
    \Hy@RestoreSavedSpaceFactor
    \@linkdim\dp\@tempboxa
    \lower\@linkdim\hbox{%
      \begingroup
        \hyper@chars
        \special{%
          t4ht=<a href=\hyper@quote#2\hyper@quote>%
        }%
      \endgroup
    }%
    \Hy@colorlink\@urlcolor
      \Hy@RestoreSpaceFactor
      #1\Hy@xspace@end
```

```
      \Hy@SaveSpaceFactor
    \Hy@endcolorlink
    \@linkdim\ht\@tempboxa
    \advance\@linkdim by -6.5\p@
    \raise\@linkdim\hbox{\special{t4ht=</a>}}%
    \Hy@RestoreSpaceFactor
  \else
    \begingroup
      \hyper@chars
      \special{t4ht=<a href=\hyper@quote#2\hyper@quote>}%
      \Hy@colorlink\@urlcolor
        #1\Hy@xspace@end
      \Hy@endcolorlink
      \special{t4ht=</a>}%
    \endgroup
  \fi
}
```

Poor implementation of `\hyper@link` without considering `#1`.

```
\def\hyper@link#1#2#3{%
  \Hy@VerboseLinkStart{#1}{#2}%
  \hyper@linkurl{#3}{\#\HyperDestNameFilter{#2}}%
}
\def\hyper@image#1#2{%
  \begingroup
    \hyper@chars
    \special{t4ht=<img src=\hyper@quote#1\hyper@quote>}%
  \endgroup
}
\let\autoref\ref
\ifx \rEfLiNK \UnDef
  \def\rEfLiNK #1#2{#2}%
\fi
\let\backref\@gobble
```

Fix for tex4ht.

```
\AtBeginDocument{%
  \expandafter
  \let\expandafter\Hy@OrgMakeLabel\csname Make:Label\endcsname
  \expandafter\def\csname Make:Label\endcsname#1#2{%
    \ifhmode
      \Hy@SaveSpaceFactor
    \else
      \global\Hy@SavedSpaceFactor=1000 %
    \fi
    \Hy@OrgMakeLabel{#1}{%
      \Hy@RestoreSpaceFactor
      #2\Hy@xspace@end%
      \Hy@SaveSpaceFactor
    }%
    \Hy@RestoreSpaceFactor
  }%
}
⟨/tex4ht⟩
⟨*tex4htcfg⟩
```

```
\IfFileExists{\jobname.cfg}{\endinput}{}
\Preamble{html}
  \begin{document}%
\EndPreamble
\def\TeX{TeX}
\def\OMEGA{Omega}
\def\LaTeX{La\TeX}
\def\LaTeXe{\LaTeX2e}
\def\eTeX{e-\TeX}
\def\MF{Metafont}
\def\MP{MetaPost}
⟨/tex4htcfg⟩
```

45 Driver-specific form support

45.1 pdfmarks

change 2020-06-20: added /Euro to encoding

```
⟨*pdfmark⟩
\long\def\@Form[#1]{%
\g@addto@macro\Hy@FirstPageHook{%
  \headerps@out{%
[%
  /_objdef{pdfDocEncoding}%
  /type/dict%
/OBJ pdfmark%
[%
  {pdfDocEncoding}%
  <<%
    /Type/Encoding%
    /Differences[%
      24/breve/caron/circumflex/dotaccent/hungarumlaut/ogonek/ring%
        /tilde %
      39/quotesingle %
      96/grave %
      128/bullet/dagger/daggerdbl/ellipsis/emdash/endash/florin%
        /fraction/guilsinglleft/guilsinglright/minus/perthousand%
        /quotedblbase/quotedblleft/quotedblright/quoteleft%
        /quoteright/quotesinglbase/trademark/fi/fl/Lslash/OE/Scaron%
        /Ydieresis/Zcaron/dotlessi/lslash/oe/scaron/zcaron %
      160/Euro %
      164/currency %
      166/brokenbar %
      168/dieresis/copyright/ordfeminine %
      172/logicalnot/.notdef/registered/macron/degree/plusminus%
        /twosuperior/threesuperior/acute/mu %
      183/periodcentered/cedilla/onesuperior/ordmasculine %
      188/onequarter/onehalf/threequarters %
      192/Agrave/Aacute/Acircumflex/Atilde/Adieresis/Aring/AE%
        /Ccedilla/Egrave/Eacute/Ecircumflex/Edieresis/Igrave%
        /Iacute/Icircumflex/Idieresis/Eth/Ntilde/Ograve/Oacute%
        /Ocircumflex/Otilde/Odieresis/multiply/Oslash/Ugrave%
        /Uacute/Ucircumflex/Udieresis/Yacute/Thorn/germandbls%
        /agrave/aacute/acircumflex/atilde/adieresis/aring/ae%
```

```
        /ccedilla/egrave/eacute/ecircumflex/edieresis/igrave%
        /iacute/icircumflex/idieresis/eth/ntilde/ograve/oacute%
        /ocircumflex/otilde/odieresis/divide/oslash/ugrave/uacute%
        /ucircumflex/udieresis/yacute/thorn/ydieresis%
    ]%
  >>%
/PUT pdfmark%
[%
   /_objdef{ZaDb}%
   /type/dict%
/OBJ pdfmark%
[%
  {ZaDb}%
  <<%
    /Type/Font%
    /Subtype/Type1%
    /Name/ZaDb%
    /BaseFont/ZapfDingbats%
  >>%
/PUT pdfmark%
[%
  /_objdef{Helv}%
  /type/dict%
/OBJ pdfmark%
[%
  {Helv}%
  <<%
    /Type/Font%
    /Subtype/Type1%
    /Name/Helv%
    /BaseFont/Helvetica%
    /Encoding{pdfDocEncoding}%
  >>%
/PUT pdfmark%
[%
  /_objdef{aform}%
  /type/dict%
/OBJ pdfmark%
[%
  /_objdef{afields}%
  /type/array%
/OBJ pdfmark%
[%
  /_objdef{corder}%
  /type/array%
/OBJ pdfmark%
{%
  [%
    /BBox[0 0 100 100]%
    /_objdef{Check}%
  /BP pdfmark %
  1 0 0 setrgbcolor%
  /ZapfDingbats 80 selectfont %
  20 20 moveto%
```

```
(4)show%
[/EP pdfmark%
[%
  /BBox[0 0 100 100]%
  /__objdef{Cross}%
/BP pdfmark %
1 0 0 setrgbcolor%
/ZapfDingbats 80 selectfont %
20 20 moveto%
(8)show%
[/EP pdfmark%
[%
  /BBox[0 0 250 100]%
  /__objdef{Submit}%
/BP pdfmark %
0.6 setgray %
0 0 250 100 rectfill %
1 setgray %
2 2 moveto %
2 98 lineto %
248 98 lineto %
246 96 lineto %
4 96 lineto %
4 4 lineto %
fill %
0.34 setgray %
248 98 moveto %
248 2 lineto %
2 2 lineto %
4 4 lineto %
246 4 lineto %
246 96 lineto %
fill%
/Helvetica 76 selectfont %
0 setgray %
8 22.5 moveto%
(Submit)show%
[/EP pdfmark%
[%
  /BBox[0 0 250 100]%
  /__objdef{SubmitP}%
/BP pdfmark %
0.6 setgray %
0 0 250 100 rectfill %
0.34 setgray %
2 2 moveto %
2 98 lineto %
248 98 lineto %
246 96 lineto %
4 96 lineto %
4 4 lineto %
fill %
1 setgray %
248 98 moveto %
```

```
  248 2 lineto %
  2 2 lineto %
  4 4 lineto %
  246 4 lineto %
  246 96 lineto %
  fill%
  /Helvetica 76 selectfont %
  0 setgray %
   10 20.5 moveto%
  (Submit)show%
  [/EP pdfmark%
} ?pdfmark%
[%
  {aform}%
  <<%
    /Fields{afields}%
    /DR<<%
      /Font<<%
        /ZaDb{ZaDb}%
        /Helv{Helv}%
      >>%
    >>%
    /DA(/Helv 10 Tf 0 g)%
    /CO{corder}%
    \ifHy@pdfa
    \else
      \ifHyField@NeedAppearances
        /NeedAppearances true%
      \fi
    \fi
  >>%
/PUT pdfmark%
[%
  {Catalog}%
  <<%
    /AcroForm{aform}%
  >>%
/PUT pdfmark%
}}%
  \kvsetkeys{Form}{#1}%
}
\let\@endForm\@empty
\def\@Gauge[#1]#2#3#4{% parameters, label, minimum, maximum
  \Hy@Message{Sorry, pdfmark drivers do not support FORM gauges}%
}
\newcount\HyField@AnnotCount
\HyField@AnnotCount=\z@
\def\HyField@AdvanceAnnotCount{%
  \global\advance\HyField@AnnotCount\@ne
}
\def\HyField@TheAnnotCount{%
  \the\HyField@AnnotCount
}
```

```
\edef\Fld@pageobjref{/P\string{ThisPage\string}}
\def\HyField@AddToFields#1{%
  \pdfmark{%
    pdfmark=/APPEND,%
    Raw={%
      \string{afields\string}%
      \string{#1\HyField@TheAnnotCount\string}%
    }%
  }%
  \ifx\Fld@calculate@code\@empty
  \else
    \pdfmark{%
      pdfmark=/APPEND,%
      Raw={%
        \string{corder\string}%
        \string{#1\HyField@TheAnnotCount\string}%
      }%
    }%
  \fi
}
\def\@TextField[#1]#2{% parameters, label
  \def\Fld@name{#2}%
  \let\Fld@default\@empty
  \let\Fld@value\@empty
  \def\Fld@width{\DefaultWidthofText}%
  \def\Fld@height{%
    \ifFld@multiline
      \DefaultHeightofTextMultiline
    \else
      \DefaultHeightofText
    \fi
  }%
  \begingroup
    \expandafter\HyField@SetKeys\expandafter{%
      \DefaultOptionsofText,#1%
    }%
    \HyField@FlagsText
    \ifFld@hidden\def\Fld@width{1sp}\fi
    \ifx\Fld@value\@empty\def\Fld@value{\Fld@default}\fi
    \HyField@AdvanceAnnotCount
    \LayoutTextField{#2}{%
      \leavevmode
      \Hy@escapeform\PDFForm@Text
      \pdfmark[\MakeTextField{\Fld@width}{\Fld@height}]{%
        pdfmark=/ANN,%
        objdef=text\HyField@TheAnnotCount,%
        Raw={\PDFForm@Text}%
      }%
    }%
    \HyField@AddToFields{text}%
  \endgroup
}
\def\@ChoiceMenu[#1]#2#3{% parameters, label, choices
```

```
\def\Fld@name{#2}%
\let\Fld@default\relax
\let\Fld@value\relax
\def\Fld@width{\DefaultWidthofChoiceMenu}%
\def\Fld@height{\DefaultHeightofChoiceMenu}%
\begingroup
  \Fld@menulength=0 %
  \@tempdima\z@
  \@for\@curropt:=#3\do{%
    \expandafter\Fld@checkequals\@curropt==\\%
    \Hy@StepCount\Fld@menulength
    \settowidth{\@tempdimb}{\@currDisplay}%
    \ifdim\@tempdimb>\@tempdima\@tempdima\@tempdimb\fi
  }%
  \advance\@tempdima by 15\p@
  \begingroup
    \HyField@SetKeys{#1}%
  \edef\x{\endgroup
    \noexpand\expandafter
    \noexpand\HyField@SetKeys
    \noexpand\expandafter{%
      \expandafter\noexpand\csname DefaultOptionsof%
        \ifFld@radio
          Radio%
        \else
          \ifFld@combo
            \ifFld@popdown
              PopdownBox%
            \else
              ComboBox%
            \fi
          \else
            ListBox%
          \fi
        \fi
      \endcsname
    }%
  }\x
  \HyField@SetKeys{#1}%
  \ifFld@hidden\def\Fld@width{1sp}\fi
  \ifx\Fld@value\relax
    \let\Fld@value\Fld@default
  \fi
  \LayoutChoiceField{#2}{%
    \ifFld@radio
      \HyField@FlagsRadioButton
      \@@Radio{#3}%
    \else
      \begingroup
        \HyField@FlagsChoice
        \ifdim\Fld@width<\@tempdima
          \ifdim\@tempdima<1cm\@tempdima1cm\fi
          \edef\Fld@width{\the\@tempdima}%
        \fi
```

```
        \ifFld@combo
        \else
          \@tempdima=\the\Fld@menulength\Fld@charsize
          \advance\@tempdima by \Fld@borderwidth bp %
          \advance\@tempdima by \Fld@borderwidth bp %
          \edef\Fld@height{\the\@tempdima}%
        \fi
        \@@Listbox{#3}%
      \endgroup
    \fi
  }%
 \endgroup
}
\def\@@Radio#1{%
 \Fld@listcount=0 %
 \EdefEscapeName\Fld@default{\Fld@default}%
 \@for\@curropt:=#1\do{%
  \expandafter\Fld@checkequals\@curropt==\\%
  \EdefEscapeName\@currValue{\@currValue}%
  \Hy@StepCount\Fld@listcount
  \@currDisplay\space
  \Hy@escapeform\PDFForm@Radio
  \ifnum\Fld@listcount=1 %
    \HyField@AdvanceAnnotCount
  \fi
  \pdfmark[\MakeRadioField{\Fld@width}{\Fld@height}]{%
    pdfmark=/ANN,%
    objdef=\ifnum\Fld@listcount=1 radio\HyField@TheAnnotCount\fi,%
    Raw={%
      \PDFForm@Radio /AP <</N <</\@currValue\space {Check}>> >>%
    }%
  } % deliberate space between radio buttons
  \ifnum\Fld@listcount=1 %
    \HyField@AddToFields{radio}%
  \fi
 }%
}
\newcount\Fld@listcount
\def\@@Listbox#1{%
 \HyField@PDFChoices{#1}%
 \Hy@escapeform\PDFForm@List
 \HyField@AdvanceAnnotCount
 \pdfmark[\MakeChoiceField{\Fld@width}{\Fld@height}]{%
  pdfmark=/ANN,%
  objdef=list\HyField@TheAnnotCount,%
  Raw={\PDFForm@List}%
 }%
 \HyField@AddToFields{list}%
}
\def\@PushButton[#1]#2{% parameters, label
 \def\Fld@name{#2}%
 \begingroup
  \expandafter\HyField@SetKeys\expandafter{%
    \DefaultOptionsofPushButton,#1%
```

```
    }%
    \ifHy@pdfa
      \Hy@Error{%
        PDF/A: Push button with JavaScript is prohibited%
      }\@ehc
      \LayoutPushButtonField{%
        \leavevmode
        \MakeButtonField{#2}%
      }%
    \else
      \HyField@FlagsPushButton
      \ifFld@hidden\def\Fld@width{1sp}\fi
      \HyField@AdvanceAnnotCount
      \LayoutPushButtonField{%
        \leavevmode
        \Hy@escapeform\PDFForm@Push
        \pdfmark[\MakeButtonField{#2}]{%
          pdfmark=/ANN,%
          objdef=push\HyField@TheAnnotCount,%
          Raw={\PDFForm@Push}%
        }%
      }%
      \HyField@AddToFields{push}%
    \fi
  \endgroup
}
\def\@Submit[#1]#2{%
  \def\Fld@width{\DefaultWidthofSubmit}%
  \def\Fld@height{\DefaultHeightofSubmit}%
  \begingroup
    \expandafter\HyField@SetKeys\expandafter{%
      \DefaultOptionsofSubmit,#1%
    }%
    \HyField@FlagsPushButton
    \HyField@FlagsSubmit
    \ifFld@hidden\def\Fld@width{1sp}\fi
    \Hy@escapeform\PDFForm@Submit
    \HyField@AdvanceAnnotCount
    \pdfmark[\MakeButtonField{#2}]{%
      pdfmark=/ANN,%
      objdef=submit\HyField@TheAnnotCount,%
      Raw={\PDFForm@Submit /AP<</N{Submit}/D{SubmitP}>>}%
    }%
    \HyField@AddToFields{submit}%
  \endgroup
}
\def\@Reset[#1]#2{%
  \def\Fld@width{\DefaultWidthofReset}%
  \def\Fld@height{\DefaultHeightofReset}%
  \begingroup
    \expandafter\HyField@SetKeys\expandafter{%
      \DefaultOptionsofReset,#1%
    }%
    \leavevmode
```

```
    \ifHy@pdfa
      \Hy@Error{%
        PDF/A: Reset action is prohibited%
      }\@ehc
      \MakeButtonField{#2}%
    \else
      \HyField@FlagsPushButton
      \ifFld@hidden\def\Fld@width{1sp}\fi
      \Hy@escapeform\PDFForm@Reset
      \HyField@AdvanceAnnotCount
      \pdfmark[\MakeButtonField{#2}]{%
        pdfmark=/ANN,%
        objdef=reset\HyField@TheAnnotCount,%
        Raw={\PDFForm@Reset}%
      }%
      \HyField@AddToFields{reset}%
    \fi
  \endgroup
}%
\def\@CheckBox[#1]#2{% parameters, label
  \def\Fld@name{#2}%
  \def\Fld@default{0}%
  \begingroup
    \def\Fld@width{\DefaultWidthofCheckBox}%
    \def\Fld@height{\DefaultHeightofCheckBox}%
    \expandafter\HyField@SetKeys\expandafter{%
      \DefaultOptionsofCheckBox,#1%
    }%
    \HyField@FlagsCheckBox
    \ifFld@hidden\def\Fld@width{1sp}\fi
    \HyField@AdvanceAnnotCount
    \LayoutCheckField{#2}{%
      \leavevmode
      \Hy@escapeform\PDFForm@Check
      \pdfmark[\MakeCheckField{\Fld@width}{\Fld@height}]{%
        pdfmark=/ANN,%
        objdef=check\HyField@TheAnnotCount,%
        Raw={\PDFForm@Check}%
      }%
    }%
    \HyField@AddToFields{check}%
  \endgroup
}
⟨/pdfmark⟩
```

45.2 HyperTeX

```
⟨*hypertex⟩
\def\@Form[#1]{%
  \Hy@Message{Sorry, HyperTeX does not support FORMs}%
}
\let\@endForm\@empty
\def\@Gauge[#1]#2#3#4{% parameters, label, minimum, maximum
  \Hy@Message{Sorry, HyperTeX does not support FORM gauges}%
```

```
}
\def\@TextField[#1]#2{% parameters, label
  \Hy@Message{Sorry, HyperTeX does not support FORM text fields}%
}
\def\@CheckBox[#1]#2{% parameters, label
  \Hy@Message{Sorry, HyperTeX does not support FORM checkboxes}%
}
\def\@ChoiceMenu[#1]#2#3{% parameters, label, choices
  \Hy@Message{Sorry, HyperTeX does not support FORM choice menus}%
}
\def\@PushButton[#1]#2{% parameters, label
  \Hy@Message{Sorry, HyperTeX does not support FORM pushbuttons}%
}
\def\@Reset[#1]#2{%
  \Hy@Message{Sorry, HyperTeX does not support FORMs}%
}
\def\@Submit[#1]#2{%
  \Hy@Message{Sorry, HyperTeX does not support FORMs}%
}
⟨/hypertex⟩
```

45.3 TeX4ht

```
⟨*tex4ht⟩
\def\@Form[#1]{%
  \kvsetkeys{Form}{#1}%
  \HCode{<form action="\Form@action" method="\Form@method">}%
}
\def\@endForm{\HCode{</form>}}
\def\@Gauge[#1]#2#3#4{% parameters, label, minimum, maximum
  \Hy@Message{Sorry, TeX4ht does not support gauges}%
}
\def\@TextField[#1]#2{% parameters, label
  \let\Hy@reserved@a\@empty
  \def\Fld@name{#2}%
  \let\Fld@default\@empty
  \bgroup
    \Field@toks={ }%
    \kvsetkeys{Field}{#1}%
    \HCode{<label for="\Fld@name">#2</label>}%
    \ifFld@password
      \@@PasswordField
    \else
      \@@TextField
    \fi
  \egroup
}
\def\@@PasswordField{%
  \HCode{%
    <input type="password" %
     id="\Fld@name" %
     name="\Fld@name" %
     \ifFld@hidden type="hidden" \fi
     value="\Fld@default" %
     \the\Field@toks
```

```
    >%
  }%
}
\def\@@TextField{%
  \ifFld@multiline
    \HCode{<textarea %
      \ifFld@readonly readonly \fi
      id="\Fld@name" %
      name="\Fld@name" %
      \ifFld@hidden type="hidden" \fi
      \the\Field@toks>%
    }%
    \Fld@default
    \HCode{</textarea>}%
  \else
    \HCode{<input type="textbox" %
      \ifFld@readonly readonly \fi
      id="\Fld@name" %
      name="\Fld@name" %
      \ifFld@hidden type="hidden" \fi
      value="\Fld@default" %
      \the\Field@toks>%
    }%
  \fi
}
\def\@ChoiceMenu[#1]#2#3{% parameters, label, choices
  \def\Fld@name{#2}%
  \let\Fld@default\@empty
  \let\Hy@reserved@a\relax
  \begingroup
    \expandafter\Fld@findlength#3\\%
    \Field@toks={ }%
    \kvsetkeys{Field}{#1}%
    #2%
    \ifFld@radio
      \expandafter\@@Radio#3\\%
    \else
      \expandafter\@@Menu#3\\%
    \fi
  \endgroup
}
\def\Fld@findlength#1\\{%
  \Fld@menulength=0 %
  \@for\@curropt:=#1\do{\Hy@StepCount\Fld@menulength}%
}
\def\@@Menu#1\\{%
  \HCode{<select size="\the\Fld@menulength" %
    name="\Fld@name" %
    \the\Field@toks>%
  }%
  \@for\@curropt:=#1\do{%
    \expandafter\Fld@checkequals\@curropt==\\%
    \HCode{<option %
      \ifx\@curropt\Fld@default selected \fi
```

```
      value="\@currValue">\@currDisplay</option>%
    }%
  }%
  \HCode{</select>}%
}
\def\@@Radio#1\\{%
  \@for\@curropt:=#1\do{%
    \expandafter\Fld@checkequals\@curropt==\\%
    \HCode{<input type="radio" %
      \ifx\@curropt\Fld@default checked \fi
      name="\Fld@name" %
      value="\@currValue" %
      \the\Field@toks>%
    }%
    \@currDisplay
  }%
}
\def\@PushButton[#1]#2{% parameters, label
  \def\Fld@name{#2}%
  \bgroup
    \Field@toks={ }%
    \kvsetkeys{Field}{#1}%
    \HCode{<input type="button" %
      name="\Fld@name" %
      value="#2" %
      \the\Field@toks>%
    }%
    \HCode{</button>}%
  \egroup
}
\def\@Submit[#1]#2{%
  \HCode{<button type="submit">#2</button>}%
}
\def\@Reset[#1]#2{%
  \HCode{<button type="reset">#2</button>}%
}
\def\@CheckBox[#1]#2{% parameters, label
  \let\Hy@reserved@a\@empty
  \def\Fld@name{#2}%
  \def\Fld@default{0}%
  \bgroup
    \Field@toks={ }%
    \kvsetkeys{Field}{#1}%
    \HCode{<input type="checkbox" %
      \ifFld@checked checked \fi
      \ifFld@disabled disabled \fi
      \ifFld@readonly readonly \fi
      name="\Fld@name" %
      \ifFld@hidden type="hidden" \fi
      value="\Fld@default" %
      \the\Field@toks>%
      #2%
    }%
  \egroup
```

```
}
⟨/tex4ht⟩
```

45.4 pdfTeX

```
⟨*pdftex⟩
\def\@Gauge[#1]#2#3#4{% parameters, label, minimum, maximum
  \Hy@Message{Sorry, pdftex does not support FORM gauges}%
}
\def\MakeFieldObject#1#2{\sbox0{#1}%
  \immediate\pdfxform0 %
  \expandafter\edef\csname #2Object\endcsname{%
    \the\pdflastxform\space 0 R%
  }%
% \hbox to 0pt{\hskip-\maxdimen{\pdfrefxform \the\pdflastxform}}%
}%
\let\HyField@afields\@empty
\let\HyField@cofields\@empty
\@ifundefined{pdflastlink}
 {%
  \let\HyField@AddToFields\relax
  \PackageInfo{hyperref}{%
    You need pdfTeX 1.40.0 for setting the /Fields entry.%
    \MessageBreak
    Adobe Reader/Acrobat accepts an empty /Field array,%
    \MessageBreak
    but other PDF viewers might complain%
  }}%
 {%
  \let\HyField@AuxAddToFields\@gobble
  \let\HyField@AuxAddToCoFields\@gobbletwo
  \def\HyField@AfterAuxOpen{\Hy@AtBeginDocument}%
```

Insertion sort for calculation field list. In case of equal sort keys (for example, if 'calculatesortkey' is not used at all) the keys keep document calling order.

```
  \def\HyField@ABD@AuxAddToCoFields#1#2{%
    \begingroup
      \Hy@safe@activestrue
      \let\@secondoftwo\relax
      \ifx\HyField@cofields\@empty
        \xdef\HyField@cofields{%
          \@secondoftwo{#1}{ #2 0 R}%
        }%
      \else
        \let\@secondoftwo\relax
        \def\HyField@AddCoField##1##2##3{%
          \ifx##1\@empty
            \@secondoftwo{#1}{ #2 0 R}%
            \expandafter\@gobble
          \else
            \ifnum\pdfstrcmp{##2}{#1}>\z@
              \@secondoftwo{#1}{ #2 0 R}%
              \@secondoftwo{##2}{##3}%
              \expandafter\expandafter\expandafter\@gobble
            \else
```

```
          \@secondoftwo{##2}{##3}%
        \fi
      \fi
      \HyField@AddCoField
    }%
    \xdef\HyField@cofields{%
      \expandafter\HyField@AddCoField
      \HyField@cofields\@empty\@empty\@empty
    }%
  \fi
 \endgroup
}%
\Hy@AtBeginDocument{%
 \if@filesw
  \immediate\write\@mainaux{%
   \string\providecommand\string\HyField@AuxAddToFields[1]{}%
  }%
  \immediate\write\@mainaux{%
   \string\providecommand\string\HyField@AuxAddToCoFields[2]{}%
  }%
 \fi
 \let\HyField@AfterAuxOpen\@firstofone
 \def\HyField@AuxAddToFields#1{%
  \xdef\HyField@afields{%
   \ifx\HyField@afields\@empty
   \else
    \HyField@afields
    \space
   \fi
   #1 0 R%
  }%
 }%
 \let\HyField@AuxAddToCoFields\HyField@ABD@AuxAddToCoFields
}%
\def\HyField@AddToFields{%
 \expandafter\HyField@@AddToFields\expandafter{%
  \the\pdflastlink
 }%
 \ifx\Fld@calculate@code\@empty
 \else
  \begingroup
   \Hy@safe@activestrue
   \edef\Hy@temp{%
    \endgroup
    \if@filesw
     \write\@mainaux{%
      \string\HyField@AuxAddToCoFields{%
       \Fld@calculate@sortkey
      }{%
       \the\pdflastlink
      }%
     }%
    \fi
   }%
```

```
    \Hy@temp
  \fi
 }%
 \def\HyField@@AddToFields#1{%
  \HyField@AfterAuxOpen{%
   \if@filesw
    \write\@mainaux{%
     \string\HyField@AuxAddToFields{#1}%
    }%
   \fi
  }%
 }%
}
\def\@Form[#1]{%
 \@ifundefined{textcolor}{\let\textcolor\@gobble}{}%
 \kvsetkeys{Form}{#1}%
 \pdf@ifdraftmode{}{%
  \Hy@FormObjects
  \ifnum\pdftexversion>13 %
   \pdfrefobj\OBJ@pdfdocencoding
   \pdfrefobj\OBJ@ZaDb
   \pdfrefobj\OBJ@Helv
  \fi
  \AddToHook{enddocument/afteraux}{%
   \immediate\pdfobj{%
    <<%
     /Fields[\HyField@afields]%
     \ifx\HyField@cofields\@empty
     \else
      /CO[\romannumeral-`\Q\HyField@cofields]%
     \fi
     /DR<<%
      /Font<<%
       /ZaDb \OBJ@ZaDb\space 0 R%
       /Helv \OBJ@Helv\space 0 R%
      >>%
     >>%
     /DA(/Helv 10 Tf 0 g)%
     \ifHy@pdfa
     \else
      \ifHyField@NeedAppearances
       /NeedAppearances true%
      \fi
     \fi
    >>%
   }%
   \edef\OBJ@acroform{\the\pdflastobj}%
   \pdfcatalog{/AcroForm \OBJ@acroform\space 0 R}%
  }%
 }%
 \MakeFieldObject{%
```

Same as `\ding{123}` of package pifont.

```
   \begingroup
    \fontfamily{pzd}%
```

```
      \fontencoding{U}%
      \fontseries{m}%
      \fontshape{n}%
      \selectfont
      \char123 %
    \endgroup
  }{Ding}%
  \MakeFieldObject{%
    \fbox{\textcolor{yellow}{\textsf{Submit}}}%
  }{Submit}%
  \MakeFieldObject{%
    \fbox{\textcolor{yellow}{\textsf{SubmitP}}}%
  }{SubmitP}%
}
\let\@endForm\@empty
\let\HyAnn@AbsPageLabel\@empty
\let\Fld@pageobjref\@empty
\@ifundefined{pdfpageref}{%
}{%
  \@ifpackageloaded{zref-abspage}{%
    \newcount\HyAnn@Count
    \HyAnn@Count=\z@
    \def\HyAnn@AbsPageLabel{%
      \global\advance\HyAnn@Count by\@ne
      \zref@labelbyprops{HyAnn@\the\HyAnn@Count}{abspage}%
      \zref@refused{HyAnn@\the\HyAnn@Count}%
    }%
    \def\Fld@pageobjref{%
      \zref@ifrefundefined{HyAnn@\the\HyAnn@Count}{%
      }{%
        \zref@ifrefcontainsprop{HyAnn@\the\HyAnn@Count}{abspage}{%
          /P \pdfpageref
          \zref@extractdefault{HyAnn@\the\HyAnn@Count}{abspage}{1} %
          \space 0 R%
        }{%
        }%
      }%
    }%
  }{%
  }%
}
\def\@TextField[#1]#2{% parameters, label
  \def\Fld@name{#2}%
  \let\Fld@default\@empty
  \let\Fld@value\@empty
  \def\Fld@width{\DefaultWidthofText}%
  \def\Fld@height{%
    \ifFld@multiline
      \DefaultHeightofTextMultiline
    \else
      \DefaultHeightofText
    \fi
  }%
  \begingroup
```

```
    \expandafter\HyField@SetKeys\expandafter{%
      \DefaultOptionsofText,#1%
    }%
    \PDFForm@Name
    \HyField@FlagsText
    \ifFld@hidden\def\Fld@width{1sp}\fi
    \ifx\Fld@value\@empty\def\Fld@value{\Fld@default}\fi
    \LayoutTextField{#2}{%
      \leavevmode
      \HyAnn@AbsPageLabel
      \Hy@escapeform\PDFForm@Text
      \pdfstartlink user {\PDFForm@Text}\relax
      \MakeTextField{\Fld@width}{\Fld@height}\pdfendlink
      \HyField@AddToFields
    }%
  \endgroup
}
\def\@ChoiceMenu[#1]#2#3{% parameters, label, choices
  \def\Fld@name{#2}%
  \let\Fld@default\relax
  \let\Fld@value\relax
  \def\Fld@width{\DefaultWidthofChoiceMenu}%
  \def\Fld@height{\DefaultHeightofChoiceMenu}%
  \begingroup
    \Fld@menulength=0 %
    \@tempdima\z@
    \@for\@curropt:=#3\do{%
      \expandafter\Fld@checkequals\@curropt==\\%
      \Hy@StepCount\Fld@menulength
      \settowidth{\@tempdimb}{\@currDisplay}%
      \ifdim\@tempdimb>\@tempdima\@tempdima\@tempdimb\fi
    }%
    \advance\@tempdima by 15\p@
    \begingroup
      \HyField@SetKeys{#1}%
    \edef\x{\endgroup
      \noexpand\expandafter
      \noexpand\HyField@SetKeys
      \noexpand\expandafter{%
        \expandafter\noexpand\csname DefaultOptionsof%
          \ifFld@radio
            Radio%
          \else
            \ifFld@combo
              \ifFld@popdown
                PopdownBox%
              \else
                ComboBox%
              \fi
            \else
              ListBox%
            \fi
          \fi
        \endcsname
```

```
    }%
  }\x
  \HyField@SetKeys{#1}%
  \PDFForm@Name
  \ifFld@hidden\def\Fld@width{1sp}\fi
  \ifx\Fld@value\relax
    \let\Fld@value\Fld@default
  \fi
  \LayoutChoiceField{#2}{%
    \ifFld@radio
      \HyField@FlagsRadioButton
      \@@Radio{#3}%
    \else
      \begingroup
        \HyField@FlagsChoice
        \ifdim\Fld@width<\@tempdima
          \ifdim\@tempdima<1cm\@tempdima1cm\fi
          \edef\Fld@width{\the\@tempdima}%
        \fi
        \ifFld@combo
        \else
          \@tempdima=\the\Fld@menulength\Fld@charsize
          \advance\@tempdima by \Fld@borderwidth bp %
          \advance\@tempdima by \Fld@borderwidth bp %
          \edef\Fld@height{\the\@tempdima}%
        \fi
        \@@Listbox{#3}%
      \endgroup
    \fi
  }%
 \endgroup
}
\def\@@Radio#1{%
  \Fld@listcount=0 %
  \EdefEscapeName\Fld@default{\Fld@default}%
  \@for\@curropt:=#1\do{%
    \expandafter\Fld@checkequals\@curropt==\\%
    \EdefEscapeName\@currValue{\@currValue}%
    \Hy@StepCount\Fld@listcount
    \@currDisplay\space
    \leavevmode
    \HyAnn@AbsPageLabel
    \Hy@escapeform\PDFForm@Radio
    \pdfstartlink user {%
      \PDFForm@Radio
      /AP<<%
        /N<<%
```

Laurent.Guillope@math.univ-nantes.fr (Laurent Guillope) persuades me that this was wrong: `/\Fld@name\the\Fld@listcount`. But I leave it here to remind me that it is untested.

```
          /\@currValue\space \DingObject
        >>%
      >>%
```

```
    }%
    \relax
    \MakeRadioField{\Fld@width}{\Fld@height}\pdfendlink
    \ifnum\Fld@listcount=1 %
      \HyField@AddToFields
    \fi
    \space % deliberate space between radio buttons
  }%
}
\newcount\Fld@listcount
\def\@@Listbox#1{%
  \HyField@PDFChoices{#1}%
  \leavevmode
  \HyAnn@AbsPageLabel
  \Hy@escapeform\PDFForm@List
  \pdfstartlink user {\PDFForm@List}\relax
  \MakeChoiceField{\Fld@width}{\Fld@height}%
  \pdfendlink
  \HyField@AddToFields
}
\def\@PushButton[#1]#2{% parameters, label
  \def\Fld@name{#2}%
  \begingroup
    \expandafter\HyField@SetKeys\expandafter{%
      \DefaultOptionsofPushButton,#1%
    }%
    \PDFForm@Name
    \ifHy@pdfa
      \Hy@Error{%
        PDF/A: Push button with JavaScript is prohibited%
      }\@ehc
      \LayoutPushButtonField{%
        \leavevmode
        \MakeButtonField{#2}%
      }%
    \else
      \HyField@FlagsPushButton
      \ifFld@hidden\def\Fld@width{1sp}\fi
      \LayoutPushButtonField{%
        \leavevmode
        \HyAnn@AbsPageLabel
        \Hy@escapeform\PDFForm@Push
        \pdfstartlink user {\PDFForm@Push}\relax
        \MakeButtonField{#2}%
        \pdfendlink
        \HyField@AddToFields
      }%
    \fi
  \endgroup
}
\def\@Submit[#1]#2{%
  \def\Fld@width{\DefaultWidthofSubmit}%
  \def\Fld@height{\DefaultHeightofSubmit}%
  \begingroup
```

```
    \expandafter\HyField@SetKeys\expandafter{%
      \DefaultOptionsofSubmit,#1%
    }%
    \HyField@FlagsPushButton
    \HyField@FlagsSubmit
    \ifFld@hidden\def\Fld@width{1sp}\fi
    \leavevmode
    \HyAnn@AbsPageLabel
    \Hy@escapeform\PDFForm@Submit
    \pdfstartlink user {%
      \PDFForm@Submit
      /AP<</N \SubmitObject/D \SubmitPObject>>%
    }%
    \relax
    \MakeButtonField{#2}%
    \pdfendlink
    \HyField@AddToFields
  \endgroup
}
\def\@Reset[#1]#2{%
  \def\Fld@width{\DefaultWidthofReset}%
  \def\Fld@height{\DefaultHeightofReset}%
  \begingroup
    \expandafter\HyField@SetKeys\expandafter{%
      \DefaultOptionsofReset,#1%
    }%
    \leavevmode
    \ifHy@pdfa
      \Hy@Error{%
        PDF/A: Reset action is prohibited%
      }\@ehc
      \MakeButtonField{#2}%
    \else
      \HyField@FlagsPushButton
      \ifFld@hidden\def\Fld@width{1sp}\fi
      \HyAnn@AbsPageLabel
      \Hy@escapeform\PDFForm@Reset
      \pdfstartlink user {\PDFForm@Reset}\relax
      \MakeButtonField{#2}%
      \pdfendlink
      \HyField@AddToFields
    \fi
  \endgroup
}
\def\@CheckBox[#1]#2{% parameters, label
  \def\Fld@name{#2}%
  \def\Fld@default{0}%
  \begingroup
    \def\Fld@width{\DefaultWidthofCheckBox}%
    \def\Fld@height{\DefaultHeightofCheckBox}%
    \expandafter\HyField@SetKeys\expandafter{%
      \DefaultOptionsofCheckBox,#1%
    }%
    \PDFForm@Name
```

```
    \HyField@FlagsCheckBox
    \ifFld@hidden\def\Fld@width{1sp}\fi
    \LayoutCheckField{#2}{%
      \leavevmode
      \HyAnn@AbsPageLabel
      \Hy@escapeform\PDFForm@Check
      \pdfstartlink user {\PDFForm@Check}\relax
      \MakeCheckField{\Fld@width}{\Fld@height}%
      \pdfendlink
      \HyField@AddToFields
    }%
  \endgroup
}
\def\Hy@FormObjects{%
  \pdfobj {%
    <<%
      /Type/Encoding%
      /Differences[%
        24/breve/caron/circumflex/dotaccent/hungarumlaut/ogonek%
          /ring/tilde %
        39/quotesingle %
        96/grave %
        128/bullet/dagger/daggerdbl/ellipsis/emdash/endash/florin%
          /fraction/guilsinglleft/guilsinglright/minus/perthousand%
          /quotedblbase/quotedblleft/quotedblright/quoteleft%
          /quoteright/quotesinglbase/trademark/fi/fl/Lslash/OE%
          /Scaron/Ydieresis/Zcaron/dotlessi/lslash/oe/scaron/zcaron %
        160/Euro %
        164/currency %
        166/brokenbar %
        168/dieresis/copyright/ordfeminine %
        172/logicalnot/.notdef/registered/macron/degree/plusminus%
          /twosuperior/threesuperior/acute/mu %
        183/periodcentered/cedilla/onesuperior/ordmasculine %
        188/onequarter/onehalf/threequarters %
        192/Agrave/Aacute/Acircumflex/Atilde/Adieresis/Aring/AE%
          /Ccedilla/Egrave/Eacute/Ecircumflex/Edieresis/Igrave%
          /Iacute/Icircumflex/Idieresis/Eth/Ntilde/Ograve/Oacute%
          /Ocircumflex/Otilde/Odieresis/multiply/Oslash/Ugrave%
          /Uacute/Ucircumflex/Udieresis/Yacute/Thorn/germandbls%
          /agrave/aacute/acircumflex/atilde/adieresis/aring/ae%
          /ccedilla/egrave/eacute/ecircumflex/edieresis/igrave%
          /iacute/icircumflex/idieresis/eth/ntilde/ograve/oacute%
          /ocircumflex/otilde/odieresis/divide/oslash/ugrave%
          /uacute/ucircumflex/udieresis/yacute/thorn/ydieresis%
      ]%
    >>%
  }%
  \xdef\OBJ@pdfdocencoding{\the\pdflastobj}%
  \pdfobj{%
    <<%
      /Type/Font%
      /Subtype/Type1%
      /Name/ZaDb%
```

```
    /BaseFont/ZapfDingbats%
   >>%
  }%
  \xdef\OBJ@ZaDb{\the\pdflastobj}%
  \pdfobj{%
   <<%
    /Type/Font%
    /Subtype/Type1%
    /Name/Helv%
    /BaseFont/Helvetica%
    /Encoding \OBJ@pdfdocencoding\space 0 R%
   >>%
  }%
  \xdef\OBJ@Helv{\the\pdflastobj}%
  \global\let\Hy@FormObjects\relax
}
⟨/pdftex⟩
```

45.5 dvipdfm, xetex

D. P. Story adapted the pdfTEX forms part for dvipdfm, of which version 0.12.7b or higher is required because of a bug.

```
⟨*dvipdfm | xetex⟩
```

\@Gauge

```
\def\@Gauge[#1]#2#3#4{% parameters, label, minimum, maximum
  \Hy@Message{Sorry, dvipdfm/XeTeX does not support FORM gauges}%
}
```

\@Form

```
\def\@Form[#1]{%
  \@ifundefined{textcolor}{\let\textcolor\@gobble}{}%
  \kvsetkeys{Form}{#1}%
  \Hy@FormObjects
  \@pdfm@mark{obj @afields []}%
  \@pdfm@mark{obj @corder []}%
  \@pdfm@mark{%
    obj @aform <<%
      /Fields @afields%
      /DR<<%
        /Font<<%
          /ZaDb @OBJZaDb%
          /Helv @OBJHelv%
        >>%
      >>%
      /DA(/Helv 10 Tf 0 g)%
      /CO @corder%
      \ifHy@pdfa
      \else
        \ifHyField@NeedAppearances
          /NeedAppearances true%
        \fi
      \fi
    >>%
```

```
  }%
  \@pdfm@mark{put @catalog <</AcroForm @aform>>}%
}
```

\@endForm

```
\let\@endForm\@empty
```

\dvipdfm@setdim \dvipdfm@setdim sets dimensions for ann using \pdfm@box.

```
\def\dvipdfm@setdim{%
  height \the\ht\pdfm@box\space
  width  \the\wd\pdfm@box\space
  depth  \the\dp\pdfm@box\space
}
```

\HyField@AnnotCount

```
\newcount\HyField@AnnotCount
\HyField@AnnotCount=\z@
```

\HyField@AdvanceAnnotCount

```
\def\HyField@AdvanceAnnotCount{%
  \global\advance\HyField@AnnotCount\@ne
}
```

\HyField@TheAnnotCount

```
\def\HyField@TheAnnotCount{%
  \the\HyField@AnnotCount
}
```

\Fld@pageobjref

```
\def\Fld@pageobjref{/P @thispage}%
```

\HyField@AddToFields

```
\def\HyField@AddToFields#1{%
  \@pdfm@mark{put @afields @#1\HyField@TheAnnotCount}%
  \ifx\Fld@calculate@code\@empty
  \else
    \@pdfm@mark{put @corder @#1\HyField@TheAnnotCount}%
  \fi
}
```

\@TextField

```
\def\@TextField[#1]#2{% parameters, label
  \def\Fld@name{#2}%
  \let\Fld@default\@empty
  \let\Fld@value\@empty
  \def\Fld@width{\DefaultWidthofText}%
  \def\Fld@height{%
    \ifFld@multiline
      \DefaultHeightofTextMultiline
    \else
      \DefaultHeightofText
    \fi
  }%
```

```
  \begingroup
    \expandafter\HyField@SetKeys\expandafter{%
      \DefaultOptionsofText,#1%
    }%
    \PDFForm@Name
    \HyField@FlagsText
    \ifFld@hidden\def\Fld@width{1sp}\fi
    \ifx\Fld@value\@empty\def\Fld@value{\Fld@default}\fi
    \setbox\pdfm@box=\hbox{%
      \MakeTextField{\Fld@width}{\Fld@height}%
    }%
    \HyField@AdvanceAnnotCount
    \LayoutTextField{#2}{%
      \leavevmode
      \Hy@escapeform\PDFForm@Text
      \@pdfm@mark{%
        ann @text\HyField@TheAnnotCount\space
        \dvipdfm@setdim << \PDFForm@Text >>%
      }%
    }%
    \unhbox\pdfm@box
    \HyField@AddToFields{text}%
    % record in @afields array
  \endgroup
}
```

\@ChoiceMenu

```
\def\@ChoiceMenu[#1]#2#3{% parameters, label, choices
  \def\Fld@name{#2}%
  \let\Fld@default\relax
  \let\Fld@value\relax
  \def\Fld@width{\DefaultWidthofChoiceMenu}%
  \def\Fld@height{\DefaultHeightofChoiceMenu}%
  \begingroup
    \Fld@menulength=0 %
    \@tempdima\z@
    \@for\@curropt:=#3\do{%
      \expandafter\Fld@checkequals\@curropt==\\%
      \Hy@StepCount\Fld@menulength
      \settowidth{\@tempdimb}{\@currDisplay}%
      \ifdim\@tempdimb>\@tempdima\@tempdima\@tempdimb\fi
    }%
    \advance\@tempdima by 15\p@
    \begingroup
      \HyField@SetKeys{#1}%
    \edef\x{\endgroup
      \noexpand\expandafter
      \noexpand\HyField@SetKeys
      \noexpand\expandafter{%
        \expandafter\noexpand\csname DefaultOptionsof%
          \ifFld@radio
            Radio%
          \else
            \ifFld@combo
```

```
            \ifFld@popdown
              PopdownBox%
            \else
              ComboBox%
            \fi
          \else
            ListBox%
          \fi
        \fi
      \endcsname
    }%
  }\x
  \HyField@SetKeys{#1}%
  \PDFForm@Name
  \ifFld@hidden\def\Fld@width{1sp}\fi
  \ifx\Fld@value\relax
    \let\Fld@value\Fld@default
  \fi
  \LayoutChoiceField{#2}{%
    \ifFld@radio
      \HyField@FlagsRadioButton
      \@@Radio{#3}%
    \else
      \begingroup
        \HyField@FlagsChoice
        \ifdim\Fld@width<\@tempdima
          \ifdim\@tempdima<1cm\@tempdima1cm\fi
          \edef\Fld@width{\the\@tempdima}%
        \fi
        \ifFld@combo
        \else
          \@tempdima=\the\Fld@menulength\Fld@charsize
          \advance\@tempdima by \Fld@borderwidth bp %
          \advance\@tempdima by \Fld@borderwidth bp %
          \edef\Fld@height{\the\@tempdima}%
        \fi
        \@@Listbox{#3}%
      \endgroup
    \fi
  }%
\endgroup
}
```

\@@Radio

```
\def\@@Radio#1{%
  \Fld@listcount=0 %
  \EdefEscapeName\Fld@default{\Fld@default}%
  \setbox\pdfm@box=\hbox{%
    \MakeRadioField{\Fld@width}{\Fld@height}%
  }%
  \@for\@curropt:=#1\do{%
    \expandafter\Fld@checkequals\@curropt==\\%
    \EdefEscapeName\@currValue{\@currValue}%
    \Hy@StepCount\Fld@listcount
```

```
    \@currDisplay\space
    \leavevmode
    \Hy@escapeform\PDFForm@Radio
    \ifnum\Fld@listcount=1 %
      \HyField@AdvanceAnnotCount
    \fi
    \@pdfm@mark{%
      ann %
      \ifnum\Fld@listcount=1 %
        @radio\HyField@TheAnnotCount%
        \space
      \fi
      \dvipdfm@setdim
      <<%
        \PDFForm@Radio
        /AP<</N<</\@currValue /null>>>>%
      >>%
    }%
    \unhcopy\pdfm@box\space% deliberate space between radio buttons
    \ifnum\Fld@listcount=1 %
      \HyField@AddToFields{radio}%
    \fi
  }%
}
```

\Fld@listcount

```
\newcount\Fld@listcount
```

\@@Listbox

```
\def\@@Listbox#1{%
  \HyField@PDFChoices{#1}%
  \setbox\pdfm@box=\hbox{%
    \MakeChoiceField{\Fld@width}{\Fld@height}%
  }%
  \leavevmode
  \Hy@escapeform\PDFForm@List
  \HyField@AdvanceAnnotCount
  \@pdfm@mark{%
    ann @list\HyField@TheAnnotCount\space
    \dvipdfm@setdim
    <<\PDFForm@List>>%
  }%
  \unhbox\pdfm@box
  \HyField@AddToFields{list}%
}
```

\@PushButton

```
\def\@PushButton[#1]#2{% parameters, label
  \def\Fld@name{#2}%
  \begingroup
    \expandafter\HyField@SetKeys\expandafter{%
      \DefaultOptionsofPushButton,#1%
    }%
    \PDFForm@Name
```

```
    \ifHy@pdfa
      \Hy@Error{%
        PDF/A: Push button with JavaScript is prohibited%
      }\@ehc
      \LayoutPushButtonField{%
        \leavevmode
        \MakeButtonField{#2}%
      }%
    \else
      \setbox\pdfm@box=\hbox{\MakeButtonField{#2}}%
      \HyField@FlagsPushButton
      \ifFld@hidden\def\Fld@width{1sp}\fi
      \HyField@AdvanceAnnotCount
      \LayoutPushButtonField{%
        \leavevmode
        \Hy@escapeform\PDFForm@Push
        \@pdfm@mark{%
          ann @push\HyField@TheAnnotCount\space
          \dvipdfm@setdim
          <<\PDFForm@Push>>%
        }%
      }%
      \unhbox\pdfm@box
      \HyField@AddToFields{push}%
    \fi
  \endgroup
}
```

\@Submit

```
\def\@Submit[#1]#2{%
  \def\Fld@width{\DefaultWidthofSubmit}%
  \def\Fld@height{\DefaultHeightofSubmit}%
  \begingroup
    \expandafter\HyField@SetKeys\expandafter{%
      \DefaultOptionsofSubmit,#1%
    }%
    \HyField@FlagsPushButton
    \HyField@FlagsSubmit
    \ifFld@hidden\def\Fld@width{1sp}\fi
    \setbox\pdfm@box=\hbox{\MakeButtonField{#2}}%
    \leavevmode
    \Hy@escapeform\PDFForm@Submit
    \HyField@AdvanceAnnotCount
    \@pdfm@mark{%
      ann @submit\HyField@TheAnnotCount\space
      \dvipdfm@setdim
      <<\PDFForm@Submit>>%
    }%
    \unhbox\pdfm@box%
    \HyField@AddToFields{submit}%
  \endgroup
}
```

\@Reset

```
\def\@Reset[#1]#2{%
  \def\Fld@width{\DefaultWidthofReset}%
  \def\Fld@height{\DefaultHeightofReset}%
  \begingroup
    \expandafter\HyField@SetKeys\expandafter{%
      \DefaultOptionsofReset,#1%
    }%
    \leavevmode
    \ifHy@pdfa
      \Hy@Error{%
        PDF/A: Reset action is prohibited%
      }\@ehc
      \MakeButtonField{#2}%
    \else
      \HyField@FlagsPushButton
      \ifFld@hidden\def\Fld@width{1sp}\fi
      \setbox\pdfm@box=\hbox{\MakeButtonField{#2}}%
      \Hy@escapeform\PDFForm@Reset
      \HyField@AdvanceAnnotCount
      \@pdfm@mark{%
        ann @reset\HyField@TheAnnotCount\space
        \dvipdfm@setdim
        <<\PDFForm@Reset>>%
      }%
      \unhbox\pdfm@box
      \HyField@AddToFields{reset}%
    \fi
  \endgroup
}
```

\@CheckBox

```
\def\@CheckBox[#1]#2{% parameters, label
  \def\Fld@name{#2}%
  \def\Fld@default{0}%
  \begingroup
    \def\Fld@width{\DefaultWidthofCheckBox}%
    \def\Fld@height{\DefaultHeightofCheckBox}%
    \expandafter\HyField@SetKeys\expandafter{%
      \DefaultOptionsofCheckBox,#1%
    }%
    \PDFForm@Name
    \HyField@FlagsCheckBox
    \ifFld@hidden\def\Fld@width{1sp}\fi
    \setbox\pdfm@box=\hbox{%
      \MakeCheckField{\Fld@width}{\Fld@height}%
    }%
    \HyField@AdvanceAnnotCount
    \LayoutCheckField{#2}{%
      \leavevmode
      \Hy@escapeform\PDFForm@Check
      \@pdfm@mark{%
        ann @check\HyField@TheAnnotCount\space
        \dvipdfm@setdim
        <<\PDFForm@Check>>%
```

```
    }%
    \unhbox\pdfm@box
    \HyField@AddToFields{check}%
  }%
 \endgroup
}

\def\Hy@FormObjects{%
 \@pdfm@mark{obj @OBJpdfdocencoding%
  <<%
   /Type/Encoding%
   /Differences[%
     24/breve/caron/circumflex/dotaccent/hungarumlaut/ogonek/ring/tilde %
     39/quotesingle %
     96/grave %
     128/bullet/dagger/daggerdbl/ellipsis/emdash/endash/florin%
      /fraction/guilsinglleft/guilsinglright/minus/perthousand%
      /quotedblbase/quotedblleft/quotedblright/quoteleft/quoteright%
      /quotesinglbase/trademark/fi/fl/Lslash/OE/Scaron/Ydieresis%
      /Zcaron/dotlessi/lslash/oe/scaron/zcaron %
     160/Euro %
     164/currency %
     166/brokenbar %
     168/dieresis/copyright/ordfeminine %
     172/logicalnot/.notdef/registered/macron/degree/plusminus%
       /twosuperior/threesuperior/acute/mu %
     183/periodcentered/cedilla/onesuperior/ordmasculine %
     188/onequarter/onehalf/threequarters %
     192/Agrave/Aacute/Acircumflex/Atilde/Adieresis/Aring/AE%
       /Ccedilla/Egrave/Eacute/Ecircumflex/Edieresis/Igrave/Iacute%
       /Icircumflex/Idieresis/Eth/Ntilde/Ograve/Oacute/Ocircumflex%
       /Otilde/Odieresis/multiply/Oslash/Ugrave/Uacute/Ucircumflex%
       /Udieresis/Yacute/Thorn/germandbls/agrave/aacute/acircumflex%
       /atilde/adieresis/aring/ae/ccedilla/egrave/eacute%
       /ecircumflex/edieresis/igrave/iacute/icircumflex/idieresis%
       /eth/ntilde/ograve/oacute/ocircumflex/otilde/odieresis%
       /divide/oslash/ugrave/uacute/ucircumflex/udieresis/yacute%
       /thorn/ydieresis%
   ]%
  >>%
 }%
 \@pdfm@mark{obj @OBJZaDb%
  <<%
   /Type/Font%
   /Subtype/Type1%
   /Name/ZaDb%
   /BaseFont/ZapfDingbats%
  >>%
 }%
 \@pdfm@mark{obj @OBJHelv%
  <<%
   /Type/Font%
   /Subtype/Type1%
   /Name/Helv%
```

```
      /BaseFont/Helvetica%
      /Encoding @OBJpdfdocencoding%
    >>%
  }%
  \global\let\Hy@FormObjects\relax
}
⟨/dvipdfm | xetex⟩
```

45.6 Common forms part

```
⟨*pdfform⟩
```

\Fld@pageobjref

```
\providecommand*{\Fld@pageobjref}{}
```

\Hy@escapestring

```
\@ifundefined{pdf@escapestring}
{%
  \let\Hy@escapestring\@firstofone
  \def\Hy@escapeform#1{%
    \ifHy@pdfescapeform
      \def\Hy@escapestring##1{%
        \noexpand\Hy@escapestring{\noexpand##1}%
      }%
      \edef\Hy@temp{#1}%
      \expandafter\Hy@@escapeform\Hy@temp\Hy@escapestring{}\@nil
      \def\Hy@escapestring##1{%
        \@ifundefined{Hy@esc@\string##1}{%
          ##1%
          \ThisShouldNotHappen
        }{%
          \csname Hy@esc@\string##1\endcsname
        }%
      }%
    \else
      \let\Hy@escapestring\@firstofone
    \fi
  }%
  \def\Hy@@escapeform#1\Hy@escapestring#2#3\@nil{%
    \ifx\\#3\\%
    \else
      \expandafter
      \Hy@pstringdef\csname Hy@esc@\string#2\endcsname{#2}%
      \Hy@ReturnAfterFi{%
        \Hy@@escapeform#3\@nil
      }%
    \fi
  }%
}{%
  \def\Hy@escapeform#1{%
    \ifHy@pdfescapeform
      \let\Hy@escapestring\pdfescapestring
    \else
      \let\Hy@escapestring\@firstofone
```

```
    \fi
  }%
  \Hy@escapeform{}%
}
```

\PDFForm@Name

```
\def\PDFForm@Name{%
  \PDFForm@@Name\Fld@name
  \ifx\Fld@altname\relax
  \else
    \PDFForm@@Name\Fld@altname
  \fi
  \ifx\Fld@mappingname\relax
  \else
    \PDFForm@@Name\Fld@mappingname
  \fi
}
```

\PDFForm@@Name

```
\def\PDFForm@@Name#1{%
  \begingroup
   \ifnum\Hy@pdf@majorminor@version<105 % implementation note 117, PDF spec 1.7
      \ifHy@unicode
        \Hy@unicodefalse
      \fi
    \fi
    \pdfstringdef\Hy@gtemp#1%
  \endgroup
  \let#1\Hy@gtemp
}
```

\Fld@additionalactions

```
\def\Fld@@additionalactions{%
```

K input (keystroke) format

```
  \ifx\Fld@keystroke@code\@empty
  \else
    /K<</S/JavaScript/JS(\Hy@escapestring{\Fld@keystroke@code})>>%
  \fi
```

F display format

```
  \ifx\Fld@format@code\@empty
  \else
    /F<</S/JavaScript/JS(\Hy@escapestring{\Fld@format@code})>>%
  \fi
```

V validation

```
  \ifx\Fld@validate@code\@empty
  \else
    /V<</S/JavaScript/JS(\Hy@escapestring{\Fld@validate@code})>>%
  \fi
```

C calculation

```
  \ifx\Fld@calculate@code\@empty
  \else
```

```
    /C<</S/JavaScript/JS(\Hy@escapestring{\Fld@calculate@code})>>%
  \fi
```
Fo receiving the input focus
```
  \ifx\Fld@onfocus@code\@empty
  \else
    /Fo<</S/JavaScript/JS(\Hy@escapestring{\Fld@onfocus@code})>>%
  \fi
```
Bl losing the input focus (blurred)
```
  \ifx\Fld@onblur@code\@empty
  \else
    /Bl<</S/JavaScript/JS(\Hy@escapestring{\Fld@onblur@code})>>%
  \fi
```
D pressing the mouse button (down)
```
  \ifx\Fld@onmousedown@code\@empty
  \else
    /D<</S/JavaScript/JS(\Hy@escapestring{\Fld@onmousedown@code})>>%
  \fi
```
U releasing the mouse button (up)
```
  \ifx\Fld@onmouseup@code\@empty
  \else
    /U<</S/JavaScript/JS(\Hy@escapestring{\Fld@onmouseup@code})>>%
  \fi
```
E cursor enters the annotation's active area.
```
  \ifx\Fld@onenter@code\@empty
  \else
    /E<</S/JavaScript/JS(\Hy@escapestring{\Fld@onenter@code})>>%
  \fi
```
X cursor exits the annotation's active area.
```
  \ifx\Fld@onexit@code\@empty
  \else
    /X<</S/JavaScript/JS(\Hy@escapestring{\Fld@onexit@code})>>%
  \fi
}
\def\Fld@additionalactions{%
  \if-\Fld@@additionalactions-%
  \else
    \ifHy@pdfa
    \else
      /AA<<\Fld@@additionalactions>>%
    \fi
  \fi
}
```
\Fld@annotnames
```
\def\Fld@annotnames{%
  /T(\Fld@name)%
  \ifx\Fld@altname\relax
  \else
    /TU(\Fld@altname)%
  \fi
```

```
  \ifx\Fld@mappingname\relax
  \else
    /TM(\Fld@mappingname)%
  \fi
}
```

\PDFForm@Check

```
\def\PDFForm@Check{%
  /Subtype/Widget%
  \Fld@annotflags
  \Fld@pageobjref
  \Fld@annotnames
  /FT/Btn%
  \Fld@flags
  /Q \Fld@align
  /BS<</W \Fld@borderwidth /S/\Fld@borderstyle>>%
  /AP<< /N <</Yes<<>>>> >>  %new string /Yes is from below
  /MK<<%
    \ifnum\Fld@rotation=\z@
    \else
      /R \Fld@rotation
    \fi
    \ifx\Fld@bordercolor\relax
    \else
      /BC[\Fld@bordercolor]%
    \fi
    \ifx\Fld@bcolor\relax
    \else
      /BG[\Fld@bcolor]%
    \fi
    /CA(\Hy@escapestring{\Fld@cbsymbol})%
  >>%
  /DA(/ZaDb \strip@pt\Fld@charsize\space Tf%
      \ifx\Fld@color\@empty\else\space\Fld@color\fi)%
  /H/P%
  \ifFld@checked /V/Yes/AS/Yes\else /V/Off/AS/Off\fi
  \Fld@additionalactions
}
```

\PDFForm@Push

```
\ifHy@pdfa
\else
  \def\PDFForm@Push{%
    /Subtype/Widget%
    \Fld@annotflags
    \Fld@pageobjref
    \Fld@annotnames
    /FT/Btn%
    \Fld@flags
    /H/P%
    /BS<</W \Fld@borderwidth/S/\Fld@borderstyle>>%
    \ifcase0\ifnum\Fld@rotation=\z@   \else 1\fi
          \ifx\Fld@bordercolor\relax\else 1\fi
          \space
```

```
    \else
      /MK<<%
        \ifnum\Fld@rotation=\z@
        \else
          /R \Fld@rotation
        \fi
        \ifx\Fld@bordercolor\relax
        \else
          /BC[\Fld@bordercolor]%
        \fi
      >>%
    \fi
    /A<</S/JavaScript/JS(\Hy@escapestring{\Fld@onclick@code})>>%
    \Fld@additionalactions
  }%
\fi
```

\PDFForm@List

```
\def\PDFForm@List{%
  /Subtype/Widget%
  \Fld@annotflags
  \Fld@pageobjref
  \Fld@annotnames
  /FT/Ch%
  \Fld@flags
  /Q \Fld@align
  /BS<</W \Fld@borderwidth/S/\Fld@borderstyle>>%
  \ifcase0\ifnum\Fld@rotation=\z@   \else 1\fi
        \ifx\Fld@bordercolor\relax\else 1\fi
        \ifx\fld@bcolor\relax     \else 1\fi
        \space
  \else
    /MK<<%
      \ifnum\Fld@rotation=\z@
      \else
        /R \Fld@rotation
      \fi
      \ifx\Fld@bordercolor\relax
      \else
        /BC[\Fld@bordercolor]%
      \fi
      \ifx\Fld@bcolor\relax
      \else
        /BG[\Fld@bcolor]%
      \fi
    >>%
  \fi
  /DA(/Helv \strip@pt\Fld@charsize\space Tf%
     \ifx\Fld@color\@empty\else\space\Fld@color\fi)%
  \Fld@choices
  \Fld@additionalactions
}
```

\PDFForm@Radio

```
\def\PDFForm@Radio{%
  /Subtype/Widget%
  \Fld@annotflags
  \Fld@pageobjref
  \Fld@annotnames
  /FT/Btn%
  \Fld@flags
  /H/P%
  /BS<</W \Fld@borderwidth/S/\Fld@borderstyle>>%
  /MK<<%
    \ifnum\Fld@rotation=\z@
    \else
      /R \Fld@rotation
    \fi
    \ifx\Fld@bordercolor\relax
    \else
      /BC[\Fld@bordercolor]%
    \fi
    \ifx\Fld@bcolor\relax
    \else
      /BG[\Fld@bcolor]%
    \fi
    /CA(\Hy@escapestring{\Fld@radiosymbol})%
  >>%
  /DA(/ZaDb \strip@pt\Fld@charsize\space Tf%
      \ifx\Fld@color\@empty\else\space\Fld@color\fi)%
```

New code, the default value is used for all buttons

```
  \ifx\Fld@default\@empty
    /V/Off%
    /DV/Off%
  \else
   /V/\Fld@default
   /DV/\Fld@default
  \fi
  \Fld@additionalactions
}
```

\PDFForm@Text

```
\def\PDFForm@Text{%
  /Subtype/Widget%
  \Fld@annotflags
  \Fld@pageobjref
  \Fld@annotnames
  /FT/Tx%
  \Fld@flags
  /Q \Fld@align
  /BS<</W \Fld@borderwidth\space /S /\Fld@borderstyle>>%
  \ifcase0\ifnum\Fld@rotation=\z@   \else 1\fi
        \ifx\Fld@bordercolor\relax\else 1\fi
        \ifx\Fld@bcolor\relax     \else 1\fi
        \space
  \else
    /MK<<%
```

```
    \ifnum\Fld@rotation=\z@
    \else
      /R \Fld@rotation
    \fi
    \ifx\Fld@bordercolor\relax
    \else
      /BC[\Fld@bordercolor]%
    \fi
    \ifx\Fld@bcolor\relax
    \else
      /BG[\Fld@bcolor]%
    \fi
  >>%
 \fi
 /DA(/Helv \strip@pt\Fld@charsize\space Tf%
    \ifx\Fld@color\@empty\else\space\Fld@color\fi)%
 /DV(\Hy@escapestring{\Fld@default})%
 /V(\Hy@escapestring{\Fld@value})%
 \Fld@additionalactions
 \ifnum\Fld@maxlen>\z@/MaxLen \Fld@maxlen \fi
}
```

\PDFForm@Submit

```
\def\PDFForm@Submit{%
 /Subtype/Widget%
 \Fld@annotflags
 \Fld@pageobjref
 \Fld@annotnames
 /FT/Btn%
 \Fld@flags
 /H/P%
 /BS<</W \Fld@borderwidth/S/\Fld@borderstyle>>%
 \ifcase0\ifnum\Fld@rotation=\z@   \else 1\fi
       \ifx\Fld@bordercolor\relax\else 1\fi
       \space
 \else
  /MK<<%
    \ifnum\Fld@rotation=\z@
    \else
      /R \Fld@rotation
    \fi
    \ifx\Fld@bordercolor\relax
    \else
      /BC[\Fld@bordercolor]%
    \fi
  >>%
 \fi
 /A<<%
  /S/SubmitForm%
  /F<<%
    /FS/URL%
    /F(\Hy@escapestring{\Form@action})%
  >>%
  \Fld@submitflags
```

```
  >>%
  \Fld@additionalactions
}
```

\PDFForm@Reset

```
\ifHy@pdfa
\else
  \def\PDFForm@Reset{%
    /Subtype/Widget%
    \Fld@annotflags
    \Fld@pageobjref
    \Fld@annotnames
    /FT/Btn%
    \Fld@flags
    /H/P%
    /DA(/Helv \strip@pt\Fld@charsize\space Tf 0 0 1 rg)%
    \ifcase0\ifnum\Fld@rotation=\z@   \else 1\fi
          \ifx\Fld@bordercolor\relax\else 1\fi
          \space
    \else
      /MK<<%
        \ifnum\Fld@rotation=\z@
        \else
          /R \Fld@rotation
        \fi
        \ifx\Fld@bordercolor\relax
        \else
          /BC[\Fld@bordercolor]%
        \fi
%     /CA (Clear)
%     /AC (Done)
      >>%
    \fi
    /BS<</W \Fld@borderwidth/S/\Fld@borderstyle>>%
    /A<</S/ResetForm>>%
    \Fld@additionalactions
  }%
\fi
```

⟨/pdfform⟩
⟨*packageEnd⟩

46 Bookmarks in the PDF file

This was originally developed by Yannis Haralambous (it was the separate repere.sty); it needed the repere or makebook.pl post-processor to work properly. Now redundant, as it is done entirely in LaTeX macros.

To write out the current section title, and its rationalized number, we have to intercept the \@sect command, which is rather dangerous. But how else to see the information we need? We do the *same* for \@ssect, giving anchors to unnumbered sections. This allows things like bibliographies to get bookmarks when used with a manual \addcontentsline

change 2026-02-22: Use \MakeLinkTarget

```
\def\phantomsection{\MakeLinkTarget[section]{}}
⟨/packageEnd⟩
```

46.1 Bookmarks

```
⟨*outlines⟩
```

This section was written by Heiko Oberdiek; the code replaces an earlier version by David Carlisle.

The first part of bookmark code is in section 6. Further documentation is available as paper and slides of the talk, that Heiko Oberdiek has given at the EuroTeX'99 meating in Heidelberg. See `paper.pdf` and `slides.pdf` in the `doc` directory of hyperref.

When using the right-to-left typesetting based on ε-TEX, the order of the \BOOKMARK commands written to the `\@outlinefile` could appear wrong, because of a misfeature of ε-TEX's implementation (that it processes the shipped out lines left-to-right, instead of the order in which they appear in the document). The wrong order will appear when the file contains two bookmarks on the same line typeset right-to-left.

To work around this problem, the `bookmark@seq@number` counter is used to write the bookmark's sequential number into a comment in the `\@outlinefile`, which could be used to post-process it to achieve the proper ordering of \BOOKMARK commands in that file.

```
\def\Hy@writebookmark#1#2#3#4#5{%
  % section number, text, label, level, file
  \ifx\WriteBookmarks\relax%
  \else
    \ifnum#4>\Hy@bookmarksdepth\relax
    \else
      \@@writetorep{#1}{#2}{#3}{#4}{#5}%
    \fi
  \fi
}
\def\Hy@currentbookmarklevel{0}
\def\Hy@numberline#1{#1 }
\def\@@writetorep#1#2#3#4#5{%
  \begingroup
    \edef\Hy@tempa{#5}%
    \ifx\Hy@tempa\Hy@bookmarkstype
      \edef\Hy@level{#4}%
      \ifx\Hy@levelcheck Y%
        \@tempcnta\Hy@level\relax
        \advance\@tempcnta by -1 %
        \ifnum\Hy@currentbookmarklevel<\@tempcnta
          \advance\@tempcnta by -\Hy@currentbookmarklevel\relax
          \advance\@tempcnta by 1 %
          \Hy@Warning{%
            Difference (\the\@tempcnta) between bookmark levels is %
            greater \MessageBreak than one, level fixed%
          }%
          \@tempcnta\Hy@currentbookmarklevel
          \advance\@tempcnta by 1 %
```

```
      \edef\Hy@level{\the\@tempcnta}%
    \fi
  \else
    \global\let\Hy@levelcheck Y%
  \fi
  \global\let\Hy@currentbookmarklevel\Hy@level
  \@tempcnta\Hy@level\relax
  \expandafter\xdef\csname Parent\Hy@level\endcsname{#3}%
  \advance\@tempcnta by -1 %
  \edef\Hy@tempa{#3}%
  \edef\Hy@tempb{\csname Parent\the\@tempcnta\endcsname}%
  \ifx\Hy@tempa\Hy@tempb
    \Hy@Warning{%
      The anchor of a bookmark and its parent's must not%
      \MessageBreak be the same. Added a new anchor%
    }%
    \phantomsection
  \fi
  \ifHy@bookmarksnumbered
    \let\numberline\Hy@numberline
    \let\booknumberline\Hy@numberline
    \let\partnumberline\Hy@numberline
    \let\chapternumberline\Hy@numberline
  \else
    \let\numberline\@gobble
    \let\booknumberline\@gobble
    \let\partnumberline\@gobble
    \let\chapternumberline\@gobble
  \fi
  \pdfstringdef\Hy@tempa{#2}%
  \HyPsd@SanitizeForOutFile\Hy@tempa
  \if@filesw
    \stepcounter{bookmark@seq@number}%
    \@ifundefined{@outlinefile}{%
    }{%
      \protected@write\@outlinefile{}{%
        \protect\BOOKMARK
          [\Hy@level][\@bookmarkopenstatus{\Hy@level}]{#3}%
          {\Hy@tempa}{\Hy@tempb}%
          \@percentchar\space\thebookmark@seq@number
      }%
    }%
  \fi
 \fi
\endgroup
}
\newcounter{bookmark@seq@number}

\begingroup
 \lccode`(=`{%
 \lccode`)=`}%
 \lccode`1=\z@
 \lccode`2=\z@
 \lccode`3=\z@
 \lccode`5=\z@
```

```
  \lccode`7=\z@
  \lccode`\#=\z@
  \lccode`\`=\z@
  \lccode`\{=\z@
  \lccode`\}=\z@
\lowercase{%
  \endgroup
  \def\HyPsd@SanitizeForOutFile#1{%
    \@onelevel@sanitize\Hy@tempa
    \escapechar`\\%
    \edef\Hy@tempa{%
      \expandafter\HyPsd@SanitizeOut@BraceLeft\Hy@tempa(\@nil
    }%
    \edef\Hy@tempa{%
      \expandafter\HyPsd@SanitizeOut@BraceRight\Hy@tempa)\@nil
    }%
  }%
  \def\HyPsd@SanitizeOut@BraceLeft#1(#2\@nil{%
    #1%
    \ifx\\#2\\%
      \expandafter\@gobble
    \else
      \expandafter\@firstofone
    \fi
    {%
      \string\173%
      \HyPsd@SanitizeOut@BraceLeft#2\@nil
    }%
  }%
  \def\HyPsd@SanitizeOut@BraceRight#1)#2\@nil{%
    #1%
    \ifx\\#2\\%
      \expandafter\@gobble
    \else
      \expandafter\@firstofone
    \fi
    {%
      \string\175%
      \HyPsd@SanitizeOut@BraceRight#2\@nil
    }%
  }%
}
```

In the call of \BOOKMARK the braces around #4 are omitted, because it is not likely, that the level number contains].

```
\newcommand{\currentpdfbookmark}{%
  \pdfbookmark[\Hy@currentbookmarklevel]%
}
\newcommand{\subpdfbookmark}{%
  \@tempcnta\Hy@currentbookmarklevel
  \Hy@StepCount\@tempcnta
  \expandafter\pdfbookmark\expandafter[\the\@tempcnta]%
}
\newcommand{\belowpdfbookmark}[2]{%
  \@tempcnta\Hy@currentbookmarklevel
```

```
  \Hy@StepCount\@tempcnta
  \expandafter\pdfbookmark\expandafter[\the\@tempcnta]{#1}{#2}%
  \advance\@tempcnta by -1 %
  \xdef\Hy@currentbookmarklevel{\the\@tempcnta}%
}
```

Tobias Oetiker rightly points out that we need a way to force a bookmark entry. So we introduce `\pdfbookmark`, with two parameters, the title, and a symbolic name. By default this is at level 1, but we can reset that with the optional first argument.

```
\renewcommand\pdfbookmark[3][0]{%
  \Hy@writebookmark{}{#2}{#3.#1}{#1}{toc}%
  \hyper@anchorstart{#3.#1}\hyper@anchorend
}
\def\BOOKMARK{%
  \@ifnextchar[{\@BOOKMARK}{\@@BOOKMARK[1][-]}%
}
\def\@BOOKMARK[#1]{%
  \@ifnextchar[{\@@BOOKMARK[{#1}]}{\@@BOOKMARK[{#1}][-]}%
}
```

The macros for calculating structure of outlines are derived from those by Petr Olsak used in the texinfopdf macros.

46.1.1 Rerun warning

`\Hy@OutlineRerunCheck`

```
\RequirePackage{rerunfilecheck}[2009/12/10]
\def\Hy@OutlineRerunCheck{%
  \RerunFileCheck{\jobname.out}{%
    \immediate\closeout\@outlinefile
  }{%
    Rerun to get outlines right\MessageBreak
    or use package `bookmark'%
  }%
}
```

46.1.2 Driver stuff

The VTEX section was written originally by VTEX, but then amended by Denis Girou (denis.girou@idris.fr), then by by Taco Hoekwater (taco.hoekwater@wkap.nl. The problem is that VTEX, with its close integration of the PDF backend, does look at the contents of bookmarks, escaping \ and the like.

```
⟨*vtex⟩
\newcount\@serial@counter\@serial@counter=1\relax
```

`\hv@pdf@char` Plain octal codes doesn't work with versions below 6.50. So for early versions hex numbers have to be used. It would be possible to program this instead of the large `\ifcase`, but I'm too lazy to sort that out now.

```
\begingroup
  \catcode`\'=12 %
  \ifnum\Hy@VTeXversion<650 %
    \catcode`\"=12 %
    \gdef\hv@pdf@char#1#2#3{%
      \char
```

```
      \ifcase'#1#2#3 %
        "00\or"01\or"02\or"03\or"04\or"05\or"06\or"07%
      \or"08\or"09\or"0A\or"0B\or"0C\or"0D\or"0E\or"0F%
      \or"10\or"11\or"12\or"13\or"14\or"15\or"16\or"17%
      \or"18\or"19\or"1A\or"1B\or"1C\or"1D\or"1E\or"1F%
      \or"20\or"21\or"22\or"23\or"24\or"25\or"26\or"27%
      \or"28\or"29\or"2A\or"2B\or"2C\or"2D\or"2E\or"2F%
      \or"30\or"31\or"32\or"33\or"34\or"35\or"36\or"37%
      \or"38\or"39\or"3A\or"3B\or"3C\or"3D\or"3E\or"3F%
      \or"40\or"41\or"42\or"43\or"44\or"45\or"46\or"47%
      \or"48\or"49\or"4A\or"4B\or"4C\or"4D\or"4E\or"4F%
      \or"50\or"51\or"52\or"53\or"54\or"55\or"56\or"57%
      \or"58\or"59\or"5A\or"5B\or"5C\or"5D\or"5E\or"5F%
      \or"60\or"61\or"62\or"63\or"64\or"65\or"66\or"67%
      \or"68\or"69\or"6A\or"6B\or"6C\or"6D\or"6E\or"6F%
      \or"70\or"71\or"72\or"73\or"74\or"75\or"76\or"77%
      \or"78\or"79\or"7A\or"7B\or"7C\or"7D\or"7E\or"7F%
      \or"80\or"81\or"82\or"83\or"84\or"85\or"86\or"87%
      \or"88\or"89\or"8A\or"8B\or"8C\or"8D\or"8E\or"8F%
      \or"90\or"91\or"92\or"93\or"94\or"95\or"96\or"97%
      \or"98\or"99\or"9A\or"9B\or"9C\or"9D\or"9E\or"9F%
      \or"A0\or"A1\or"A2\or"A3\or"A4\or"A5\or"A6\or"A7%
      \or"A8\or"A9\or"AA\or"AB\or"AC\or"AD\or"AE\or"AF%
      \or"B0\or"B1\or"B2\or"B3\or"B4\or"B5\or"B6\or"B7%
      \or"B8\or"B9\or"BA\or"BB\or"BC\or"BD\or"BE\or"BF%
      \or"C0\or"C1\or"C2\or"C3\or"C4\or"C5\or"C6\or"C7%
      \or"C8\or"C9\or"CA\or"CB\or"CC\or"CD\or"CE\or"CF%
      \or"D0\or"D1\or"D2\or"D3\or"D4\or"D5\or"D6\or"D7%
      \or"D8\or"D9\or"DA\or"DB\or"DC\or"DD\or"DE\or"DF%
      \or"E0\or"E1\or"E2\or"E3\or"E4\or"E5\or"E6\or"E7%
      \or"E8\or"E9\or"EA\or"EB\or"EC\or"ED\or"EE\or"EF%
      \or"F0\or"F1\or"F2\or"F3\or"F4\or"F5\or"F6\or"F7%
      \or"F8\or"F9\or"FA\or"FB\or"FC\or"FD\or"FE\or"FF%
      \fi
    }%
  \else
    \gdef\hv@pdf@char{\char'}%
  \fi
\endgroup
```

\@@BOOKMARK

```
\def\@@BOOKMARK[#1][#2]#3#4#5{%
  \expandafter\edef\csname @count@#3\endcsname{%
    \the\@serial@counter
  }%
  \edef\@mycount{\the\@serial@counter}%
  \Hy@StepCount\@serial@counter
  \edef\@parcount{%
    \expandafter\ifx\csname @count@#5\endcsname\relax
      0%
    \else
      \csname @count@#5\endcsname
    \fi
  }%
```

```
  \immediate\special{%
    !outline \HyperDestNameFilter{#3};p=\@parcount,i=\@mycount,%
    s=\ifx#2-c\else o\fi,t=#4%
  }%
}%
```

\ReadBookmarks

```
\def\ReadBookmarks{%
  \begingroup
    \def\0{\hv@pdf@char 0}%
    \def\1{\hv@pdf@char 1}%
    \def\2{\hv@pdf@char 2}%
    \def\3{\hv@pdf@char 3}%
    \def\({(}%
    \def\){)}%
    \def\do##1{%
      \ifnum\catcode`##1=\active
        \@makeother##1%
      \else
        \ifnum\catcode`##1=6 %
          \@makeother##1%
        \fi
      \fi
    }%
    \dospecials
    \Hy@safe@activestrue
    \InputIfFileExists{\jobname.out}{}{}%
  \endgroup
  \ifx\WriteBookmarks\relax
  \else
    \if@filesw
      \newwrite\@outlinefile
      \Hy@OutlineRerunCheck
      \immediate\openout\@outlinefile=\jobname.out\relax
    \fi
  \fi
}
```

⟨/vtex⟩

⟨*!vtex⟩

```
\def\ReadBookmarks{%
  \pdf@ifdraftmode{}{%
    \begingroup
      \def\do##1{%
        \ifnum\catcode`##1=\active
          \@makeother##1%
        \else
          \ifnum\catcode`##1=6 %
            \@makeother##1%
          \fi
        \fi
      }%
      \dospecials
      \Hy@safe@activestrue
```

```
      \escapechar=`\\%
      \def\@@BOOKMARK[##1][##2]##3##4##5{%
        \calc@bm@number{##5}%
      }%
      \InputIfFileExists{\jobname.out}{}{}%
      \ifx\WriteBookmarks\relax
        \global\let\WriteBookmarks\relax
      \fi
      \def\@@BOOKMARK[##1][##2]##3##4##5{%
        \def\Hy@temp{##4}%
⟨*pdftex⟩
        \Hy@pstringdef\Hy@pstringName{\HyperDestNameFilter{##3}}%
        \Hy@OutlineName{}\Hy@pstringName{%
          ##2\check@bm@number{##3}%
        }{%
          \expandafter\strip@prefix\meaning\Hy@temp
        }%
⟨/pdftex⟩
⟨*pdfmark⟩
        \pdfmark{%
          pdfmark=/OUT,%
          Count={##2\check@bm@number{##3}},%
          Dest={##3},%
          Title=\expandafter\strip@prefix\meaning\Hy@temp
        }%
⟨/pdfmark⟩
⟨*dvipdfm | xetex⟩
        \Hy@pstringdef\Hy@pstringName{\HyperDestNameFilter{##3}}%
        \@pdfm@mark{%
          outline \ifHy@DvipdfmxOutlineOpen
                  [%
                  \ifnum##21>\z@
                  \else
                    -%
                  \fi
                  ] %
                \fi
                ##1<<%
            /Title(\expandafter\strip@prefix\meaning\Hy@temp)%
            /A<<%
              /S/GoTo%
              /D(\Hy@pstringName)%
            >>%
          >>%
        }%
⟨/dvipdfm | xetex⟩
      }%
      \begingroup
        \def\WriteBookmarks{0}%
        \InputIfFileExists{\jobname.out}{}{}%
      \endgroup
      %{\escapechar\m@ne\InputIfFileExists{\jobname.out}{}{}}%
    \endgroup
  }%
```

```
  \ifx\WriteBookmarks\relax
  \else
    \if@filesw
      \newwrite\@outlinefile
      \Hy@OutlineRerunCheck
      \immediate\openout\@outlinefile=\jobname.out\relax
    \fi
  \fi
}
⟨*pdftex⟩
\def\Hy@OutlineName#1#2#3#4{%
  \pdfoutline goto name{#2}count#3{#4}%
}
⟨/pdftex⟩
\def\check@bm@number#1{%
  \expandafter\ifx\csname B_#1\endcsname\relax
    0%
  \else
    \csname B_#1\endcsname
  \fi
}
\def\calc@bm@number#1{%
  \@tempcnta=\check@bm@number{#1}\relax
  \advance\@tempcnta by 1 %
  \expandafter\xdef\csname B_#1\endcsname{\the\@tempcnta}%
}
⟨/!vtex⟩
\ifHy@implicit
\else
  \expandafter\endinput
\fi
⟨/outlines⟩
⟨*outlines | hypertex⟩
\newlength\Hy@SectionHShift
\def\Hy@SectionAnchorHref#1{%
  \ifx\protect\@typeset@protect
    \Hy@@SectionAnchor{#1}%
  \fi
}
\DeclareRobustCommand*{\Hy@@SectionAnchor}[1]{%
  \leavevmode
  \hbox to 0pt{%
    \kern-\Hy@SectionHShift
    \Hy@raisedlink{%
      \hyper@anchorstart{#1}\hyper@anchorend
    }%
    \hss
  }%
}
\AddToNoCaseChangeList{\Hy@@SectionAnchor}
\@ifundefined{hyper@nopatch@sectioning}
{
\let\H@old@ssect\@ssect
```

```
\def\@ssect#1#2#3#4#5{%
  \Hy@MakeCurrentHrefAuto{section*}%
  \setlength{\Hy@SectionHShift}{#1}%
  \begingroup
    \toks@{\H@old@ssect{#1}{#2}{#3}{#4}}%
    \toks\tw@\expandafter{%
      \expandafter\Hy@SectionAnchorHref\expandafter{\@currentHref}%
      #5%
    }%
  \edef\x{\endgroup
    \the\toks@{\the\toks\tw@}%
  }\x
}
\let\H@old@schapter\@schapter
\def\@schapter#1{%
  \begingroup
    \let\@mkboth\@gobbletwo
    \Hy@MakeCurrentHrefAuto{\Hy@chapapp*}%
    \Hy@raisedlink{%
      \hyper@anchorstart{\@currentHref}\hyper@anchorend
    }%
  \endgroup
  \H@old@schapter{#1}%
}
```

If there is no chapter number (\frontmatter or \backmatter) then the counting by \refstepcounter{chapter} is not executed, so there will be no destination for \ddcontentsline. So \@chapter is overloaded to avoid this:

```
\@ifundefined{@chapter}{}{%
  \let\Hy@org@chapter\@chapter
  \def\@chapter{%
    \def\Hy@next{%
      \Hy@MakeCurrentHrefAuto{\Hy@chapapp*}%
      \Hy@raisedlink{%
        \hyper@anchorstart{\@currentHref}\hyper@anchorend
      }%
    }%
    \ifnum\c@secnumdepth>\m@ne
      \@ifundefined{if@mainmatter}%
      \iftrue{\csname if@mainmatter\endcsname}%
        \let\Hy@next\relax
      \fi
    \fi
    \Hy@next
    \Hy@org@chapter
  }%
}
\let\H@old@part\@part
\@ifundefined{chapter}
  {\let\Hy@secnum@part\z@}
  {\let\Hy@secnum@part\m@ne}
\def\@part{%
  \ifnum\Hy@secnum@part>\c@secnumdepth
    \phantomsection
```

```
  \fi
  \H@old@part
}
\let\H@old@spart\@spart
\def\@spart#1{%
  \Hy@MakeCurrentHrefAuto{part*}%
  \Hy@raisedlink{%
    \hyper@anchorstart{\@currentHref}\hyper@anchorend
  }%
  \H@old@spart{#1}%
}
\let\H@old@sect\@sect
\def\@sect#1#2#3#4#5#6[#7]#8{%
  \ifnum #2>\c@secnumdepth
    \expandafter\@firstoftwo
  \else
    \expandafter\@secondoftwo
  \fi
  {%
    \Hy@MakeCurrentHrefAuto{section*}%
    \setlength{\Hy@SectionHShift}{#3}%
    \begingroup
      \toks@{\H@old@sect{#1}{#2}{#3}{#4}{#5}{#6}[{#7}]}%
      \toks\tw@\expandafter{%
        \expandafter\Hy@SectionAnchorHref\expandafter{\@currentHref}%
        #8%
      }%
    \edef\x{\endgroup
      \the\toks@{\the\toks\tw@}%
    }\x
  }{%
    \H@old@sect{#1}{#2}{#3}{#4}{#5}{#6}[{#7}]{#8}%
  }%
}
}{}
⟨/outlines | hypertex⟩
⟨*outlines⟩
\expandafter\def\csname Parent-4\endcsname{}
\expandafter\def\csname Parent-3\endcsname{}
\expandafter\def\csname Parent-2\endcsname{}
\expandafter\def\csname Parent-1\endcsname{}
\expandafter\def\csname Parent0\endcsname{}
\expandafter\def\csname Parent1\endcsname{}
\expandafter\def\csname Parent2\endcsname{}
\expandafter\def\csname Parent3\endcsname{}
\expandafter\def\csname Parent4\endcsname{}
⟨/outlines⟩
```

47 Encoding definition files for encodings of PDF strings

This was contributed by Heiko Oberdiek.

47.1 PD1 encoding

```
⟨*pd1enc⟩
\DeclareFontEncoding{PD1}{}{}
```

Accents

```
\DeclareTextAccent{\`}{PD1}{\textasciigrave}
\DeclareTextAccent{\'}{PD1}{\textacute}
\DeclareTextAccent{\^}{PD1}{\textasciicircum}
\DeclareTextAccent{\~}{PD1}{\texttilde}
\DeclareTextAccent{\"}{PD1}{\textasciidieresis}
\DeclareTextAccent{\r}{PD1}{\textring}
\DeclareTextAccent{\v}{PD1}{\textasciicaron}
\DeclareTextAccent{\.}{PD1}{\textdotaccent}
\DeclareTextAccent{\c}{PD1}{\textcedilla}
\DeclareTextAccent{\=}{PD1}{\textasciimacron}
\DeclareTextAccent{\b}{PD1}{\textmacronbelow}
\DeclareTextAccent{\d}{PD1}{\textdotbelow}
\DeclareTextCompositeCommand{\`}{PD1}{\@empty}{\textasciigrave}
\DeclareTextCompositeCommand{\'}{PD1}{\@empty}{\textacute}
\DeclareTextCompositeCommand{\^}{PD1}{\@empty}{\textasciicircum}
\DeclareTextCompositeCommand{\~}{PD1}{\@empty}{\texttilde}
\DeclareTextCompositeCommand{\"}{PD1}{\@empty}{\textasciidieresis}
\DeclareTextCompositeCommand{\r}{PD1}{\@empty}{\textring}
\DeclareTextCompositeCommand{\v}{PD1}{\@empty}{\textasciicaron}
\DeclareTextCompositeCommand{\.}{PD1}{\@empty}{\textdotaccent}
\DeclareTextCompositeCommand{\c}{PD1}{\@empty}{\textcedilla}
\DeclareTextCompositeCommand{\=}{PD1}{\@empty}{\textasciimacron}
\DeclareTextCompositeCommand{\b}{PD1}{\@empty}{\textmacronbelow}
\DeclareTextCompositeCommand{\d}{PD1}{\@empty}{\textdotbelow}
\DeclareTextCompositeCommand{\`}{PD1}{\ }{\textasciigrave}
\DeclareTextCompositeCommand{\'}{PD1}{\ }{\textacute}
\DeclareTextCompositeCommand{\^}{PD1}{\ }{\textasciicircum}
\DeclareTextCompositeCommand{\~}{PD1}{\ }{\texttilde}
\DeclareTextCompositeCommand{\"}{PD1}{\ }{\textasciidieresis}
\DeclareTextCompositeCommand{\r}{PD1}{\ }{\textring}
\DeclareTextCompositeCommand{\v}{PD1}{\ }{\textasciicaron}
\DeclareTextCompositeCommand{\.}{PD1}{\ }{\textdotaccent}
\DeclareTextCompositeCommand{\c}{PD1}{\ }{\textcedilla}
\DeclareTextCompositeCommand{\=}{PD1}{\ }{\textasciimacron}
\DeclareTextCompositeCommand{\b}{PD1}{\ }{\textmacronbelow}
\DeclareTextCompositeCommand{\d}{PD1}{\ }{\textdotbelow}
\DeclareTextCommand{\k}{PD1}[1]{\TextSymbolUnavailable{\k{#1}}#1}
\DeclareTextCommand{\t}{PD1}[1]{\TextSymbolUnavailable{\t{#1}}#1}
\DeclareTextCommand{\newtie}{PD1}[1]{%
  \TextSymbolUnavailable{\newtie{#1}}#1%
}
```

Special white space escape characters not for use in bookmarks but for other PDF strings.

```
% U+0009 (CHARACTER TABULATION)
\DeclareTextCommand{\textHT}{PD1}{\011}% U+0009
% U+000A (LINE FEED)
\DeclareTextCommand{\textLF}{PD1}{\012}% U+000A
% U+000D (CARRIAGE RETURN)
\DeclareTextCommand{\textCR}{PD1}{\015}% U+000D
```

Accent glyph names

```
% U+02D8 BREVE; breve
\DeclareTextCommand{\textasciibreve}{PD1}{\030}% U+02D8
% U+02C7 CARON; caron
\DeclareTextCommand{\textasciicaron}{PD1}{\031}% U+02C7
% U+02C6 MODIFIER LETTER CIRCUMFLEX ACCENT; circumflex
\DeclareTextCommand{\textcircumflex}{PD1}{\032}% U+02C6
% U+02D9 DOT ABOVE; dotaccent
\DeclareTextCommand{\textdotaccent}{PD1}{\033}% U+02D9
% U+02DD DOUBLE ACUTE ACCENT; hungarumlaut
\DeclareTextCommand{\texthungarumlaut}{PD1}{\034}% U+02DD
% U+02DB OGONEK; ogonek
\DeclareTextCommand{\textogonek}{PD1}{\035}% U+02DB
% U+02DA RING ABOVE; ring
\DeclareTextCommand{\textring}{PD1}{\036}% U+02DA
% U+02DC SMALL TILDE; ilde, *tilde
\DeclareTextCommand{\texttilde}{PD1}{\037}% U+02DC
```

\040: U+0020 SPACE; *space, spacehackarabic
\041: U+0021 EXCLAMATION MARK; exclam

```
% U+0022 QUOTATION MARK; quotedbl
\DeclareTextCommand{\textquotedbl}{PD1}{"}% \042 U+0022
% U+0023 NUMBER SIGN; numbersign
\DeclareTextCommand{\textnumbersign}{PD1}{\043}% U+0023
% U+0024 DOLLAR SIGN; dollar
\DeclareTextCommand{\textdollar}{PD1}{\044}% U+0024
% U+0025 PERCENT SIGN; percent
\DeclareTextCommand{\textpercent}{PD1}{\045}% U+0025
% U+0026 AMPERSAND; ampersand
\DeclareTextCommand{\textampersand}{PD1}{\046}% U+0026
```

\047: U+0027 APOSTROPHE; quotesingle

```
% U+0028 LEFT PARENTHESIS; parenleft
\DeclareTextCommand{\textparenleft}{PD1}{\string\(}% \050 U+0028
% U+0029 RIGHT PARENTHESIS; parenright
\DeclareTextCommand{\textparenright}{PD1}{\string\)}% \051 U+0029
```

\052: U+002A ASTERISK; asterisk
\053: U+002B PLUS SIGN; plus
\054: U+002C COMMA; comma
\055: U+002D HYPHEN-MINUS; hyphen
\056: U+002E FULL STOP; period

```
% U+002E FULL STOP; period
\DeclareTextCommand{\textdotbelow}{PD1}{.}% \056 U+002E
```

\057: U+002F SOLIDUS; slash
\060: U+0030 DIGIT ZERO; zero
...
\071: U+0039 DIGIT NINE; nine

\072: U+003A COLON; colon
\073: U+003B SEMICOLON; semicolon
```
% U+003C LESS-THAN SIGN; less
\DeclareTextCommand{\textless}{PD1}{<}% \074 U+003C
```
\075: U+003D EQUALS SIGN; equal
```
% U+003E GREATER-THAN SIGN; greater
\DeclareTextCommand{\textgreater}{PD1}{>}% \076 U+003E
```
\077: U+003F QUESTION MARK; question
\100: U+0040 COMMERCIAL AT; at
\101: U+0041 LATIN CAPITAL LETTER A; A
...
\132: U+005A LATIN CAPITAL LETTER Z; Z
\133: U+005B LEFT SQUARE BRACKET; bracketleft
```
% U+005C REVERSE SOLIDUS; backslash
\DeclareTextCommand{\textbackslash}{PD1}{\134}% U+005C
% "U+2216 SET MINUS" simulated by "U+005C REVERSE SOLIDUS"
\DeclareTextCommand{\textsetminus}{PD1}{\textbackslash}
```
\135: U+005D RIGHT SQUARE BRACKET; bracketright
```
% U+005E CIRCUMFLEX ACCENT; asciicircum
\DeclareTextCommand{\textasciicircum}{PD1}{\136}% U+005E
% U+005F LOW LINE; underscore
\DeclareTextCommand{\textunderscore}{PD1}{\137}% U+005F
\DeclareTextCommand{\textmacronbelow}{PD1}{\137}% U+005F
% U+0060 GRAVE ACCENT; grave
\DeclareTextCommand{\textasciigrave}{PD1}{\140}% U+0060
```
\141: U+0061 LATIN SMALL LETTER A; a
...
\150: U+0068 LATIN SMALL LETTER H; h
```
% U+0069 LATIN SMALL LETTER I; i
\DeclareTextCompositeCommand{\.}{PD1}{i}{i}% \151 U+0069
```
\152: U+006A LATIN SMALL LETTER J; j
...
\172: U+007A LATIN SMALL LETTER Z; z
```
% U+007B LEFT CURLY BRACKET; braceleft
\DeclareTextCommand{\textbraceleft}{PD1}{\173}% U+007B
% U+007C VERTICAL LINE; *bar, verticalbar
\DeclareTextCommand{\textbar}{PD1}{|}% U+007C
% U+007D RIGHT CURLY BRACKET; braceright
\DeclareTextCommand{\textbraceright}{PD1}{\175}% U+007D
% U+007E TILDE; asciitilde
\DeclareTextCommand{\textasciitilde}{PD1}{\176}% U+007E
```
Slot \177 (0x7F) is undefined in PDFDocEncoding.
```
% U+2022 BULLET; bullet
\DeclareTextCommand{\textbullet}{PD1}{\200}% U+2022
% U+2020 DAGGER; dagger
\DeclareTextCommand{\textdagger}{PD1}{\201}% U+2020
% U+2021 DOUBLE DAGGER; daggerdbl; \ddagger (LaTeX)
\DeclareTextCommand{\textdaggerdbl}{PD1}{\202}% U+2021
\DeclareTextCommand{\textddagger}{PD1}{\textdaggerdbl}
% U+2026 HORIZONTAL ELLIPSIS; ellipsis
\DeclareTextCommand{\textellipsis}{PD1}{\203}% U+2026
```

```
% U+2014 EM DASH; emdash
\DeclareTextCommand{\textemdash}{PD1}{\204}% U+2014
% U+2013 EN DASH; endash
\DeclareTextCommand{\textendash}{PD1}{\205}% U+2013
% U+0192 LATIN SMALL LETTER F WITH HOOK; florin
\DeclareTextCommand{\textflorin}{PD1}{\206}% U+0192
% U+2044 FRACTION SLASH; fraction
\DeclareTextCommand{\textfractionsolidus}{PD1}{\207}% U+2044
% U+2039 SINGLE LEFT-POINTING ANGLE QUOTATION MARK; guilsinglleft
\DeclareTextCommand{\guilsinglleft}{PD1}{\210}% U+2039
% U+203A SINGLE RIGHT-POINTING ANGLE QUOTATION MARK; guilsinglright
\DeclareTextCommand{\guilsinglright}{PD1}{\211}% U+203A
% U+2212 MINUS SIGN; minus
\DeclareTextCommand{\textminus}{PD1}{\212}% U+2212
% U+2030 PER MILLE SIGN; perthousand
\DeclareTextCommand{\textperthousand}{PD1}{\213}% U+2030
% U+201E DOUBLE LOW-9 QUOTATION MARK; quotedblbase
\DeclareTextCommand{\quotedblbase}{PD1}{\214}% U+201E
% U+201C LEFT DOUBLE QUOTATION MARK; quotedblleft
\DeclareTextCommand{\textquotedblleft}{PD1}{\215}% U+201C
% U+201D RIGHT DOUBLE QUOTATION MARK; quotedblright
\DeclareTextCommand{\textquotedblright}{PD1}{\216}% U+201D
% U+2018 LEFT SINGLE QUOTATION MARK; quoteleft
\DeclareTextCommand{\textquoteleft}{PD1}{\217}% U+2018
% U+2019 RIGHT SINGLE QUOTATION MARK; quoteright
\DeclareTextCommand{\textquoteright}{PD1}{\220}% U+2019
% U+201A SINGLE LOW-9 QUOTATION MARK; quotesinglbase
\DeclareTextCommand{\quotesinglbase}{PD1}{\221}% U+201A
% U+2122 TRADE MARK SIGN; trademark
\DeclareTextCommand{\texttrademark}{PD1}{\222}% U+2122
% U+FB01 LATIN SMALL LIGATURE FI; fi
\DeclareTextCommand{\textfi}{PD1}{\223}% U+FB01
% U+FB02 LATIN SMALL LIGATURE FL; fl
\DeclareTextCommand{\textfl}{PD1}{\224}% U+FB02
% U+0141 LATIN CAPITAL LETTER L WITH STROKE; Lslash
\DeclareTextCommand{\L}{PD1}{\225}% U+0141
% U+0152 LATIN CAPITAL LIGATURE OE; OE
\DeclareTextCommand{\OE}{PD1}{\226}% U+0152
% U+0160 LATIN CAPITAL LETTER S WITH CARON; Scaron
\DeclareTextCompositeCommand{\v}{PD1}{S}{\227}% U+0160
% U+0178 LATIN CAPITAL LETTER Y WITH DIAERESIS; Ydieresis
\DeclareTextCompositeCommand{\"}{PD1}{Y}{\230}% U+0178
\DeclareTextCommand{\IJ}{PD1}{IJ}% ligature U+0049 U+004A
% U+017D LATIN CAPITAL LETTER Z WITH CARON; Zcaron
\DeclareTextCompositeCommand{\v}{PD1}{Z}{\231}% U+017D
% U+0131 LATIN SMALL LETTER DOTLESS I; dotlessi
\DeclareTextCommand{\i}{PD1}{\232}% U+0131
% U+0142 LATIN SMALL LETTER L WITH STROKE; lslash
\DeclareTextCommand{\l}{PD1}{\233}% U+0142
% U+0153 LATIN SMALL LIGATURE OE; oe
\DeclareTextCommand{\oe}{PD1}{\234}% U+0153
% U+0161 LATIN SMALL LETTER S WITH CARON; scaron
```

```
\DeclareTextCompositeCommand{\v}{PD1}{s}{\235}% U+0161
% U+017E LATIN SMALL LETTER Z WITH CARON; zcaron
\DeclareTextCompositeCommand{\v}{PD1}{z}{\236}% U+017E
```

Slot \237 (0x9F) is not defined in PDFDocEncoding.
The euro \240 is inserted in version 1.3 of the pdf specification.

```
% U+20AC EURO SIGN; *Euro, euro
\DeclareTextCommand{\texteuro}{PD1}{\240}% U+20AC
% U+00A1 INVERTED EXCLAMATION MARK; exclamdown
\DeclareTextCommand{\textexclamdown}{PD1}{\241}% U+00A1
% U+00A2 CENT SIGN; cent
\DeclareTextCommand{\textcent}{PD1}{\242}% U+00A2
% U+00A3 POUND SIGN; sterling
\DeclareTextCommand{\textsterling}{PD1}{\243}% U+00A3
% U+00A4 CURRENCY SIGN; currency
\DeclareTextCommand{\textcurrency}{PD1}{\244}% U+00A4
% U+00A5 YEN SIGN; yen
\DeclareTextCommand{\textyen}{PD1}{\245}% U+00A5
% U+00A6 BROKEN BAR; brokenbar
\DeclareTextCommand{\textbrokenbar}{PD1}{\246}% U+00A6
% U+00A7 SECTION SIGN; section
\DeclareTextCommand{\textsection}{PD1}{\247}% U+00A7
% U+00A8 DIAERESIS; dieresis
\DeclareTextCommand{\textasciidieresis}{PD1}{\250}% U+00A8
% U+00A9 COPYRIGHT SIGN; copyright
\DeclareTextCommand{\textcopyright}{PD1}{\251}% U+00A9
% U+00AA FEMININE ORDINAL INDICATOR; ordfeminine
\DeclareTextCommand{\textordfeminine}{PD1}{\252}% U+00AA
% U+00AB LEFT-POINTING DOUBLE ANGLE QUOTATION MARK; guillemetleft
\DeclareTextCommand{\guillemotleft}{PD1}{\253}% U+00AB
\DeclareTextCommand{\guillemetleft}{PD1}{\253}% U+00AB
% U+00AC NOT SIGN; logicalnot
\DeclareTextCommand{\textlogicalnot}{PD1}{\254}% U+00AC
\DeclareTextCommand{\textlnot}{PD1}{\254}% logical not
```

No glyph \255 in PDFDocEncoding.

```
% U+00AE REGISTERED SIGN; registered
\DeclareTextCommand{\textregistered}{PD1}{\256}% U+00AE
% U+00AF MACRON; *macron, overscore
\DeclareTextCommand{\textasciimacron}{PD1}{\257}% U+00AF
% U+00B0 DEGREE SIGN; degree
\DeclareTextCommand{\textdegree}{PD1}{\260}% U+00B0
% U+00B1 PLUS-MINUS SIGN; plusminus
\DeclareTextCommand{\textplusminus}{PD1}{\261}% U+00B1
% U+00B2 SUPERSCRIPT TWO; twosuperior
\DeclareTextCommand{\texttwosuperior}{PD1}{\262}%* U+00B2
% U+00B3 SUPERSCRIPT THREE; threesuperior
\DeclareTextCommand{\textthreesuperior}{PD1}{\263}%* U+00B3
% U+00B4 ACUTE ACCENT; acute
\DeclareTextCommand{\textacute}{PD1}{\264}% U+00B4
% U+00B5 MICRO SIGN; mu, mu1
\DeclareTextCommand{\textmu}{PD1}{\265}% U+00B5
% U+00B6 PILCROW SIGN; paragraph
\DeclareTextCommand{\textparagraph}{PD1}{\266}% U+00B6
% U+00B7 MIDDLE DOT; middot, *periodcentered
```

```
\DeclareTextCommand{\textperiodcentered}{PD1}{\267}% U+00B7
% U+00B8 CEDILLA; cedilla
\DeclareTextCommand{\textcedilla}{PD1}{\270}% U+00B8
% U+00B9 SUPERSCRIPT ONE; onesuperior
\DeclareTextCommand{\textonesuperior}{PD1}{\271}%* U+00B9
% U+00BA MASCULINE ORDINAL INDICATOR; ordmasculine
\DeclareTextCommand{\textordmasculine}{PD1}{\272}% U+00BA
% U+00BB RIGHT-POINTING DOUBLE ANGLE QUOTATION MARK; guillemetright
\DeclareTextCommand{\guillemotright}{PD1}{\273}% U+00BB
\DeclareTextCommand{\guillemetright}{PD1}{\273}% U+00BB
% U+00BC VULGAR FRACTION ONE QUARTER; onequarter
\DeclareTextCommand{\textonequarter}{PD1}{\274}% U+00BC
% U+00BD VULGAR FRACTION ONE HALF; onehalf
\DeclareTextCommand{\textonehalf}{PD1}{\275}% U+00BD
% U+00BE VULGAR FRACTION THREE QUARTERS; threequarters
\DeclareTextCommand{\textthreequarters}{PD1}{\276}% U+00BE
% U+00BF INVERTED QUESTION MARK; questiondown
\DeclareTextCommand{\textquestiondown}{PD1}{\277}% U+00BF
% U+00C0 LATIN CAPITAL LETTER A WITH GRAVE; Agrave
\DeclareTextCompositeCommand{\`}{PD1}{A}{\300}% U+00C0
% U+00C1 LATIN CAPITAL LETTER A WITH ACUTE; Aacute
\DeclareTextCompositeCommand{\'}{PD1}{A}{\301}% U+00C1
% U+00C2 LATIN CAPITAL LETTER A WITH CIRCUMFLEX; Acircumflex
\DeclareTextCompositeCommand{\^}{PD1}{A}{\302}% U+00C2
% U+00C3 LATIN CAPITAL LETTER A WITH TILDE; Atilde
\DeclareTextCompositeCommand{\~}{PD1}{A}{\303}% U+00C3
% U+00C4 LATIN CAPITAL LETTER A WITH DIAERESIS; Adieresis
\DeclareTextCompositeCommand{\"}{PD1}{A}{\304}% U+00C4
% U+00C5 LATIN CAPITAL LETTER A WITH RING ABOVE; Aring
\DeclareTextCompositeCommand{\r}{PD1}{A}{\305}% U+00C5
% U+00C6 LATIN CAPITAL LETTER AE; AE
\DeclareTextCommand{\AE}{PD1}{\306}% U+00C6
% U+00C7 LATIN CAPITAL LETTER C WITH CEDILLA; Ccedilla
\DeclareTextCompositeCommand{\c}{PD1}{C}{\307}% U+00C7
% U+00C8 LATIN CAPITAL LETTER E WITH GRAVE; Egrave
\DeclareTextCompositeCommand{\`}{PD1}{E}{\310}% U+00C8
% U+00C9 LATIN CAPITAL LETTER E WITH ACUTE; Eacute
\DeclareTextCompositeCommand{\'}{PD1}{E}{\311}% U+00C9
% U+00CA LATIN CAPITAL LETTER E WITH CIRCUMFLEX; Ecircumflex
\DeclareTextCompositeCommand{\^}{PD1}{E}{\312}% U+00CA
% U+00CB LATIN CAPITAL LETTER E WITH DIAERESIS; Edieresis
\DeclareTextCompositeCommand{\"}{PD1}{E}{\313}% U+00CB
% U+00CC LATIN CAPITAL LETTER I WITH GRAVE; Igrave
\DeclareTextCompositeCommand{\`}{PD1}{I}{\314}% U+00CC
% U+00CD LATIN CAPITAL LETTER I WITH ACUTE; Iacute
\DeclareTextCompositeCommand{\'}{PD1}{I}{\315}% U+00CD
% U+00CE LATIN CAPITAL LETTER I WITH CIRCUMFLEX; Icircumflex
\DeclareTextCompositeCommand{\^}{PD1}{I}{\316}% U+00CE
% U+00CF LATIN CAPITAL LETTER I WITH DIAERESIS; Idieresis
\DeclareTextCompositeCommand{\"}{PD1}{I}{\317}% U+00CF
% U+00D0 LATIN CAPITAL LETTER ETH; Eth
\DeclareTextCommand{\DH}{PD1}{\320}% U+00D0
\DeclareTextCommand{\DJ}{PD1}{\320}% U+00D0
% U+00D1 LATIN CAPITAL LETTER N WITH TILDE; Ntilde
```

```
\DeclareTextCompositeCommand{\~}{PD1}{N}{\321}% U+00D1
% U+00D2 LATIN CAPITAL LETTER O WITH GRAVE; Ograve
\DeclareTextCompositeCommand{\`}{PD1}{O}{\322}% U+00D2
% U+00D3 LATIN CAPITAL LETTER O WITH ACUTE; Oacute
\DeclareTextCompositeCommand{\'}{PD1}{O}{\323}% U+00D3
% U+00D4 LATIN CAPITAL LETTER O WITH CIRCUMFLEX; Ocircumflex
\DeclareTextCompositeCommand{\^}{PD1}{O}{\324}% U+00D4
% U+00D5 LATIN CAPITAL LETTER O WITH TILDE; Otilde
\DeclareTextCompositeCommand{\~}{PD1}{O}{\325}% U+00D5
% U+00D6 LATIN CAPITAL LETTER O WITH DIAERESIS; Odieresis
\DeclareTextCompositeCommand{\"}{PD1}{O}{\326}% U+00D6
% U+00D7 MULTIPLICATION SIGN; multiply
\DeclareTextCommand{\textmultiply}{PD1}{\327}% U+00D7
% U+00D8 LATIN CAPITAL LETTER O WITH STROKE; Oslash
\DeclareTextCommand{\O}{PD1}{\330}% U+00D8
% U+00D9 LATIN CAPITAL LETTER U WITH GRAVE; Ugrave
\DeclareTextCompositeCommand{\`}{PD1}{U}{\331}% U+00D9
% U+00DA LATIN CAPITAL LETTER U WITH ACUTE; Uacute
\DeclareTextCompositeCommand{\'}{PD1}{U}{\332}% U+00DA
% U+00DB LATIN CAPITAL LETTER U WITH CIRCUMFLEX; Ucircumflex
\DeclareTextCompositeCommand{\^}{PD1}{U}{\333}% U+00DB
% U+00DC LATIN CAPITAL LETTER U WITH DIAERESIS; Udieresis
\DeclareTextCompositeCommand{\"}{PD1}{U}{\334}% U+00DC
% U+00DD LATIN CAPITAL LETTER Y WITH ACUTE; Yacute
\DeclareTextCompositeCommand{\'}{PD1}{Y}{\335}% U+00DD
% U+00DE LATIN CAPITAL LETTER THORN; Thorn; \TH, \Thorn (wasysym)
\DeclareTextCommand{\TH}{PD1}{\336}% U+00DE
\DeclareTextCommand{\textThorn}{PD1}{\336}%* U+00DE
% U+00DF LATIN SMALL LETTER SHARP S; germandbls
\DeclareTextCommand{\ss}{PD1}{\337}% U+00DF
% U+00E0 LATIN SMALL LETTER A WITH GRAVE; agrave
\DeclareTextCompositeCommand{\`}{PD1}{a}{\340}% U+00E0
% U+00E1 LATIN SMALL LETTER A WITH ACUTE; aacute
\DeclareTextCompositeCommand{\'}{PD1}{a}{\341}% U+00E1
% U+00E2 LATIN SMALL LETTER A WITH CIRCUMFLEX; acircumflex
\DeclareTextCompositeCommand{\^}{PD1}{a}{\342}% U+00E2
% U+00E3 LATIN SMALL LETTER A WITH TILDE; atilde
\DeclareTextCompositeCommand{\~}{PD1}{a}{\343}% U+00E3
% U+00E4 LATIN SMALL LETTER A WITH DIAERESIS; adieresis
\DeclareTextCompositeCommand{\"}{PD1}{a}{\344}% U+00E4
% U+00E5 LATIN SMALL LETTER A WITH RING ABOVE; aring
\DeclareTextCompositeCommand{\r}{PD1}{a}{\345}% U+00E5
% U+00E6 LATIN SMALL LETTER AE; ae
\DeclareTextCommand{\ae}{PD1}{\346}% U+00E6
% U+00E7 LATIN SMALL LETTER C WITH CEDILLA; ccedilla
\DeclareTextCompositeCommand{\c}{PD1}{c}{\347}% U+00E7
% U+00E8 LATIN SMALL LETTER E WITH GRAVE; egrave
\DeclareTextCompositeCommand{\`}{PD1}{e}{\350}% U+00E8
% U+00E9 LATIN SMALL LETTER E WITH ACUTE; eacute
\DeclareTextCompositeCommand{\'}{PD1}{e}{\351}% U+00E9
% U+00EA LATIN SMALL LETTER E WITH CIRCUMFLEX; ecircumflex
\DeclareTextCompositeCommand{\^}{PD1}{e}{\352}% U+00EA
% U+00EB LATIN SMALL LETTER E WITH DIAERESIS; edieresis
\DeclareTextCompositeCommand{\"}{PD1}{e}{\353}% U+00EB
```

```
% U+00EC LATIN SMALL LETTER I WITH GRAVE; igrave
\DeclareTextCompositeCommand{\`}{PD1}{i}{\354}% U+00EC
\DeclareTextCompositeCommand{\`}{PD1}{\i}{\354}% U+00EC
% U+00ED LATIN SMALL LETTER I WITH ACUTE; iacute
\DeclareTextCompositeCommand{\'}{PD1}{i}{\355}% U+00ED
\DeclareTextCompositeCommand{\'}{PD1}{\i}{\355}% U+00ED
% U+00EE LATIN SMALL LETTER I WITH CIRCUMFLEX; icircumflex
\DeclareTextCompositeCommand{\^}{PD1}{i}{\356}% U+00EE
\DeclareTextCompositeCommand{\^}{PD1}{\i}{\356}% U+00EE
% U+00EF LATIN SMALL LETTER I WITH DIAERESIS; idieresis
\DeclareTextCompositeCommand{\"}{PD1}{i}{\357}% U+00EF
\DeclareTextCompositeCommand{\"}{PD1}{\i}{\357}% U+00EF
% U+00F0 LATIN SMALL LETTER ETH; eth
\DeclareTextCommand{\dh}{PD1}{\360}% U+00F0
% U+00F1 LATIN SMALL LETTER N WITH TILDE; ntilde
\DeclareTextCompositeCommand{\~}{PD1}{n}{\361}% U+00F1
% U+00F2 LATIN SMALL LETTER O WITH GRAVE; ograve
\DeclareTextCompositeCommand{\`}{PD1}{o}{\362}% U+00F2
% U+00F3 LATIN SMALL LETTER O WITH ACUTE; oacute
\DeclareTextCompositeCommand{\'}{PD1}{o}{\363}% U+00F3
% U+00F4 LATIN SMALL LETTER O WITH CIRCUMFLEX; ocircumflex
\DeclareTextCompositeCommand{\^}{PD1}{o}{\364}% U+00F4
% U+00F5 LATIN SMALL LETTER O WITH TILDE; otilde
\DeclareTextCompositeCommand{\~}{PD1}{o}{\365}% U+00F5
% U+00F6 LATIN SMALL LETTER O WITH DIAERESIS; odieresis
\DeclareTextCompositeCommand{\"}{PD1}{o}{\366}% U+00F6
% U+00F7 DIVISION SIGN; divide
\DeclareTextCommand{\textdivide}{PD1}{\367}% U+00F7
% U+00F8 LATIN SMALL LETTER O WITH STROKE; oslash
\DeclareTextCommand{\o}{PD1}{\370}% U+00F8
% U+00F9 LATIN SMALL LETTER U WITH GRAVE; ugrave
\DeclareTextCompositeCommand{\`}{PD1}{u}{\371}% U+00F9
% U+00FA LATIN SMALL LETTER U WITH ACUTE; uacute
\DeclareTextCompositeCommand{\'}{PD1}{u}{\372}% U+00FA
% U+00FB LATIN SMALL LETTER U WITH CIRCUMFLEX; ucircumflex
\DeclareTextCompositeCommand{\^}{PD1}{u}{\373}% U+00FB
% U+00FC LATIN SMALL LETTER U WITH DIAERESIS; udieresis
\DeclareTextCompositeCommand{\"}{PD1}{u}{\374}% U+00FC
% U+00FD LATIN SMALL LETTER Y WITH ACUTE; yacute
\DeclareTextCompositeCommand{\'}{PD1}{y}{\375}% U+00FD
% U+00FE LATIN SMALL LETTER THORN; thorn; \th, \thorn (wasysym)
\DeclareTextCommand{\th}{PD1}{\376}% U+00FE
\DeclareTextCommand{\textthorn}{PD1}{\376}%* U+00FE
% U+00FF LATIN SMALL LETTER Y WITH DIAERESIS; ydieresis
\DeclareTextCompositeCommand{\"}{PD1}{y}{\377}% U+00FF
\DeclareTextCommand{\ij}{PD1}{ij}% ligature U+0069 U+006A
```

Glyphs that consist of several characters.

```
\DeclareTextCommand{\SS}{PD1}{SS}%
\DeclareTextCommand{\textcelsius}{PD1}{\textdegree C}%
```

Aliases (german.sty)

```
\DeclareTextCommand{\textglqq}{PD1}{\quotedblbase}%
\DeclareTextCommand{\textgrqq}{PD1}{\textquotedblleft}%
\DeclareTextCommand{\textglq}{PD1}{\quotesinglbase}%
```

```
\DeclareTextCommand{\textgrq}{PD1}{\textquoteleft}%
\DeclareTextCommand{\textflqq}{PD1}{\guillemetleft}%
\DeclareTextCommand{\textfrqq}{PD1}{\guillemetright}%
\DeclareTextCommand{\textflq}{PD1}{\guilsinglleft}%
\DeclareTextCommand{\textfrq}{PD1}{\guilsinglright}%
```

Aliases (math names)

```
\DeclareTextCommand{\textneg}{PD1}{\textlogicalnot}%
\DeclareTextCommand{\texttimes}{PD1}{\textmultiply}%
\DeclareTextCommand{\textdiv}{PD1}{\textdivide}%
\DeclareTextCommand{\textpm}{PD1}{\textplusminus}%
\DeclareTextCommand{\textcdot}{PD1}{\textperiodcentered}%
\DeclareTextCommand{\textbeta}{PD1}{\ss}%
```

Polish aliases. PDF encoding does not have the characters, but it is useful to Poles to have the plain letters regardless. Requested by Wojciech Myszka (W.Myszka@immt.pwr.wroc.pl).

```
\DeclareTextCompositeCommand{\k}{PD1}{a}{a}% aogonek
\DeclareTextCompositeCommand{\'}{PD1}{c}{c}% cacute
\DeclareTextCompositeCommand{\k}{PD1}{e}{e}% eogonek
\DeclareTextCompositeCommand{\'}{PD1}{n}{n}% nacute
\DeclareTextCompositeCommand{\'}{PD1}{s}{s}% sacute
\DeclareTextCompositeCommand{\'}{PD1}{z}{z}% zacute
\DeclareTextCompositeCommand{\.}{PD1}{z}{z}% zdot
\DeclareTextCompositeCommand{\k}{PD1}{A}{A}% Aogonek
\DeclareTextCompositeCommand{\'}{PD1}{C}{C}% Cacute
\DeclareTextCompositeCommand{\k}{PD1}{E}{E}% Eogonek
\DeclareTextCompositeCommand{\'}{PD1}{N}{N}% Nacute
\DeclareTextCompositeCommand{\'}{PD1}{S}{S}% Sacute
\DeclareTextCompositeCommand{\'}{PD1}{Z}{Z}% Zacute
\DeclareTextCompositeCommand{\.}{PD1}{Z}{Z}% Zdot
```

⟨/pd1enc⟩

47.2 PU encoding

```
⟨*puenc⟩
\DeclareFontEncoding{PU}{}{}
```

47.2.1 NFSS2 accents

```
% U+0300 COMBINING GRAVE ACCENT; gravecmb, *gravecomb
\DeclareTextCommand{\`}{PU}[1]{#1\83\000}% U+0300
% U+0301 COMBINING ACUTE ACCENT; acutecmb, *acutecomb
\DeclareTextCommand{\'}{PU}[1]{#1\83\001}% U+0301
% U+0302 COMBINING CIRCUMFLEX ACCENT; circumflexcmb
\DeclareTextCommand{\^}{PU}[1]{#1\83\002}% U+0302
% U+0303 COMBINING TILDE; tildecmb, *tildecomb
\DeclareTextCommand{\~}{PU}[1]{#1\83\003}% U+0303
% U+0304 COMBINING MACRON; macroncmb
\DeclareTextCommand{\=}{PU}[1]{#1\83\004}% U+0304
% U+0306 COMBINING BREVE; brevecmb
\DeclareTextCommand{\u}{PU}[1]{#1\83\006}% U+0306
\ifx\CYRDZE\@undefined \else
\DeclareTextCommand{\U}{PU}[1]{#1\83\006}% U+0306
\fi
% U+0307 COMBINING DOT ABOVE; dotaccentcmb
```

```
\DeclareTextCommand{\.}{PU}[1]{#1\83\007}% U+0307
% U+0308 COMBINING DIAERESIS; dieresiscmb
\DeclareTextCommand{\"}{PU}[1]{#1\83\010}% U+0308
% U+030A COMBINING RING ABOVE; ringcmb
\DeclareTextCommand{\r}{PU}[1]{#1\83\012}% U+030A
% U+030B COMBINING DOUBLE ACUTE ACCENT; hungarumlautcmb
\DeclareTextCommand{\H}{PU}[1]{#1\83\013}% U+030B
% U+030C COMBINING CARON; caroncmb
\DeclareTextCommand{\v}{PU}[1]{#1\83\014}% U+030C
⟨/puenc⟩
% U+030F COMBINING DOUBLE GRAVE ACCENT; dblgravecmb
⟨puextra⟩\DeclareTextCommand{\G}{PU}[1]{#1\83\017}% U+030F
⟨*puenc⟩
\ifx\CYRDZE\@undefined \else
\DeclareTextCommand{\C}{PU}[1]{#1\83\017}% U+030F
\fi
% U+0311 COMBINING INVERTED BREVE; breveinvertedcmb
\DeclareTextCommand{\textinvbreve}{PU}[1]{#1\83\021}% U+0311
\DeclareTextCommand{\newtie}{PU}[1]{#1\83\021}% U+0311
% U+0323 COMBINING DOT BELOW; dotbelowcmb, *dotbelowcomb
\DeclareTextCommand{\d}{PU}[1]{#1\83\043}% U+0323
% U+0324 COMBINING DIAERESIS BELOW; dieresisbelowcmb; \textsubum-
    laut (tipa)
\DeclareTextCommand{\textsubumlaut}{PU}[1]{#1\83\044}% U+0324
% U+0325 COMBINING RING BELOW; ringbelowcmb; \textsubring (tipa)
\DeclareTextCommand{\textsubring}{PU}[1]{#1\83\045}% U+0325
% U+0327 COMBINING CEDILLA; cedillacmb
\DeclareTextCommand{\c}{PU}[1]{#1\83\047}% U+0327
% U+0328 COMBINING OGONEK; ogonekcmb
\DeclareTextCommand{\k}{PU}[1]{#1\83\050}% U+0328
% U+032D COMBINING CIRCUMFLEX ACCENT BELOW;
%   \textsubcircum (tipa)
\DeclareTextCommand{\textsubcircum}{PU}[1]{#1\83\055}% U+032D
% U+032E COMBINING BREVE BELOW; brevebelowcmb
\DeclareTextCommand{\textsubbreve}{PU}[1]{#1\83\056}% U+032E
% U+0330 COMBINING TILDE BELOW; tildebelowcmb; \textsubtilde (tipa)
\DeclareTextCommand{\textsubtilde}{PU}[1]{#1\83\060}% U+0330
% U+0331 COMBINING MACRON BELOW; macronbelowcmb
\DeclareTextCommand{\b}{PU}[1]{#1\83\061}% U+0331
% U+0361 COMBINING DOUBLE INVERTED BREVE; breveinverteddou-
    blecmb
\DeclareTextCommand{\t}{PU}[1]{#1\83\141}% U+0361
% U+20DD COMBINING ENCLOSING CIRCLE
\DeclareTextCommand{\textcircled}{PU}[1]{#1\9040\335}% U+20DD
```

Double accents.

```
\DeclareTextCommand{\textacutemacron}{PU}[1]{#1\83\001\83\004}% U+0301 U+0304
\DeclareTextCommand{\textgravemacron}{PU}[1]{#1\83\000\83\004}% U+0300 U+0304
```

`\@empty` is an artefact of the NFSS2 machinery, it gets inserted for empty arguments and spaces.

```
\DeclareTextCompositeCommand{\`}{PU}{\@empty}{\textasciigrave}%
\DeclareTextCompositeCommand{\'}{PU}{\@empty}{\textacute}%
\DeclareTextCompositeCommand{\^}{PU}{\@empty}{\textasciicircum}%
\DeclareTextCompositeCommand{\~}{PU}{\@empty}{\texttilde}%
```

```
\DeclareTextCompositeCommand{\"}{PU}{\@empty}{\textasciidieresis}%
\DeclareTextCompositeCommand{\r}{PU}{\@empty}{\textring}%
\DeclareTextCompositeCommand{\v}{PU}{\@empty}{\textasciicaron}%
\DeclareTextCompositeCommand{\.}{PU}{\@empty}{\textdotaccent}%
\DeclareTextCompositeCommand{\c}{PU}{\@empty}{\textcedilla}%
\DeclareTextCompositeCommand{\u}{PU}{\@empty}{\textasciibreve}%
⟨/puenc⟩
⟨puextra⟩\DeclareTextCompositeCommand{\G}{PU}{\@empty}{\textdoublegrave}%
⟨*puenc⟩
\DeclareTextCompositeCommand{\=}{PU}{\@empty}{\textasciimacron}%
\DeclareTextCompositeCommand{\H}{PU}{\@empty}{\texthungarumlaut}%
\DeclareTextCompositeCommand{\k}{PU}{\@empty}{\textogonek}%
\DeclareTextCompositeCommand{\textinvbreve}{PU}{\@empty}{{ \83\021}}% U+0311
\DeclareTextCompositeCommand{\textsubumlaut}{PU}{\@empty}{{ \83\044}}% U+0324
\DeclareTextCompositeCommand{\textsubring}{PU}{\@empty}{\textringlow}%
\DeclareTextCompositeCommand{\textsubcircum}{PU}{\@empty}{\textcircum-
low}%
\DeclareTextCompositeCommand{\textsubbreve}{PU}{\@empty}{{ \83\056}}% U+032E
\DeclareTextCompositeCommand{\textsubtilde}{PU}{\@empty}{\texttildelow}%
\DeclareTextCompositeCommand{\b}{PU}{\@empty}{\textmacronbelow}%
\DeclareTextCompositeCommand{\d}{PU}{\@empty}{\textdotbelow}%
\DeclareTextCompositeCommand{\t}{PU}{\@empty}{\texttie}%
\DeclareTextCompositeCommand{\newtie}{PU}{\@empty}{\textnewtie}%
\DeclareTextCompositeCommand{\textcircled}{PU}{\@empty}{\textbigcircle}%
\DeclareTextCompositeCommand{\textacutemacron}{PU}{\@empty}{{ \83\001\83\004}}% U+0301 U
\DeclareTextCompositeCommand{\textgravemacron}{PU}{\@empty}{{ \83\000\83\004}}% U+0300 U
\DeclareTextCompositeCommand{\`}{PU}{\ }{\textasciigrave}%
\DeclareTextCompositeCommand{\'}{PU}{\ }{\textacute}%
\DeclareTextCompositeCommand{\^}{PU}{\ }{\textasciicircum}%
\DeclareTextCompositeCommand{\~}{PU}{\ }{\texttilde}%
\DeclareTextCompositeCommand{\"}{PU}{\ }{\textasciidieresis}%
\DeclareTextCompositeCommand{\r}{PU}{\ }{\textring}%
\DeclareTextCompositeCommand{\v}{PU}{\ }{\textasciicaron}%
\DeclareTextCompositeCommand{\.}{PU}{\ }{\textdotaccent}%
\DeclareTextCompositeCommand{\c}{PU}{\ }{\textcedilla}%
\DeclareTextCompositeCommand{\u}{PU}{\ }{\textasciibreve}%
⟨/puenc⟩
⟨puextra⟩\DeclareTextCompositeCommand{\G}{PU}{\ }{\textdoublegrave}%
⟨*puenc⟩
\DeclareTextCompositeCommand{\=}{PU}{\ }{\textasciimacron}%
\DeclareTextCompositeCommand{\H}{PU}{\ }{\texthungarumlaut}%
\DeclareTextCompositeCommand{\k}{PU}{\ }{\textogonek}%
\DeclareTextCompositeCommand{\textinvbreve}{PU}{\ }{{ \83\021}}% U+0311
\DeclareTextCompositeCommand{\textsubumlaut}{PU}{\ }{{ \83\044}}% U+0324
\DeclareTextCompositeCommand{\textsubring}{PU}{\ }{\textringlow}%
\DeclareTextCompositeCommand{\textsubcircum}{PU}{\ }{\textcircumlow}%
\DeclareTextCompositeCommand{\textsubbreve}{PU}{\ }{{ \83\056}}% U+032E
\DeclareTextCompositeCommand{\textsubtilde}{PU}{\ }{\texttildelow}%
\DeclareTextCompositeCommand{\b}{PU}{\ }{\textmacronbelow}%
\DeclareTextCompositeCommand{\d}{PU}{\ }{\textdotbelow}%
\DeclareTextCompositeCommand{\t}{PU}{\ }{\texttie}%
\DeclareTextCompositeCommand{\newtie}{PU}{\ }{\textnewtie}%
\DeclareTextCompositeCommand{\textcircled}{PU}{\ }{\textbigcircle}%
\DeclareTextCompositeCommand{\textacutemacron}{PU}{\ }{{ \83\001\83\004}}% U+0301 U+0304
```

```
\DeclareTextCompositeCommand{\textgravemacron}{PU}{\ }{{ \83\000\83\004}}% U+0300 U+0304
```

Accents for capitals (see encoding TS1)

```
\DeclareTextCommand{\capitalcedilla}{PU}[1]{\c{#1}}%
\DeclareTextCommand{\capitalogonek}{PU}[1]{\k{#1}}%
\DeclareTextCommand{\capitalgrave}{PU}[1]{\`{#1}}%
\DeclareTextCommand{\capitalacute}{PU}[1]{\'{#1}}%
\DeclareTextCommand{\capitalcircumflex}{PU}[1]{\^{#1}}%
\DeclareTextCommand{\capitaltilde}{PU}[1]{\~{#1}}%
\DeclareTextCommand{\capitaldieresis}{PU}[1]{\"{#1}}%
\DeclareTextCommand{\capitalhungarumlaut}{PU}[1]{\H{#1}}%
\DeclareTextCommand{\capitalring}{PU}[1]{\r{#1}}%
\DeclareTextCommand{\capitalcaron}{PU}[1]{\v{#1}}%
\DeclareTextCommand{\capitalbreve}{PU}[1]{\u{#1}}%
\DeclareTextCommand{\capitalmacron}{PU}[1]{\={#1}}%
\DeclareTextCommand{\capitaldotaccent}{PU}[1]{\.{#1}}%
\DeclareTextCommand{\capitaltie}{PU}[1]{\t{#1}}%
\DeclareTextCommand{\capitalnewtie}{PU}[1]{\newtie{#1}}%
```

47.2.2 Basic Latin: U+0000 to U+007F

Special white space escape characters.

```
% U+0009 (CHARACTER TABULATION)
\DeclareTextCommand{\textHT}{PU}{\80\011}% U+0009
% U+000A (LINE FEED)
\DeclareTextCommand{\textLF}{PU}{\80\012}% U+000A
% U+000D (CARRIAGE RETURN)
\DeclareTextCommand{\textCR}{PU}{\80\015}% U+000D
```

\80\040: U+0020 SPACE; space, spacehackarabic
\80\041: U+0021 EXCLAMATION MARK; exclam

```
% U+0022 QUOTATION MARK; quotedbl
\DeclareTextCommand{\textquotedbl}{PU}{"}% \80\042 U+0022
% U+0023 NUMBER SIGN; numbersign
\DeclareTextCommand{\textnumbersign}{PU}{\80\043}% U+0023
% U+0024 DOLLAR SIGN; dollar
\DeclareTextCommand{\textdollar}{PU}{\80\044}% U+0024
%* \textdollar -> \mathdollar
%* \textdollar -> \EyesDollar (marvosym)
% U+0025 PERCENT SIGN; percent
\DeclareTextCommand{\textpercent}{PU}{\80\045}% U+0025
% U+0026 AMPERSAND; ampersand
\DeclareTextCommand{\textampersand}{PU}{\80\046}% U+0026
%* \textampersand -> \binampersand (stmaryrd)
%* \textampersand -> \with (cmll)
% U+0027 APOSTROPHE; quotesingle
\DeclareTextCommand{\textquotesingle}{PU}{\80\047}% U+0027
% U+0028 LEFT PARENTHESIS; parenleft
\DeclareTextCommand{\textparenleft}{PU}{\80\050}% U+0028
% U+0029 RIGHT PARENTHESIS; parenright
\DeclareTextCommand{\textparenright}{PU}{\80\051}% U+0029
% U+002A ASTERISK; asterisk; (?)
\DeclareTextCommand{\textasteriskcentered}{PU}{\80\052}% U+002A
% U+002B PLUS SIGN; plus; \MVPlus (marvosym)
\DeclareTextCommand{\textMVPlus}{PU}{\80\053}%* U+002B
% U+002C COMMA; comma; \MVComma (marvosym)
```

```
\DeclareTextCommand{\textMVComma}{PU}{\80\054}%* U+002C
% U+002D HYPHEN-MINUS; hyphen; \MVMinus (marvosym)
\DeclareTextCommand{\textMVMinus}{PU}{\80\055}%* U+002D
% U+002E FULL STOP; period; \MVPeriod (marvosym)
\DeclareTextCommand{\textMVPeriod}{PU}{\80\056}%* U+002E
% U+002F SOLIDUS; slash; \MVDivision (marvosym)
\DeclareTextCommand{\textMVDivision}{PU}{\80\057}%* U+002F
% U+0030 DIGIT ZERO; zero; \MVZero (marvosym)
\DeclareTextCommand{\textMVZero}{PU}{\80\060}%* U+0030
% U+0031 DIGIT ONE; one; \MVOne (marvosym)
\DeclareTextCommand{\textMVOne}{PU}{\80\061}%* U+0031
% U+0032 DIGIT TWO; two; \MVTwo (marvosym)
\DeclareTextCommand{\textMVTwo}{PU}{\80\062}%* U+0032
% U+0033 DIGIT THREE; three; \MVThree (marvosym)
\DeclareTextCommand{\textMVThree}{PU}{\80\063}%* U+0033
% U+0034 DIGIT FOUR; four; \MVFour (marvosym)
\DeclareTextCommand{\textMVFour}{PU}{\80\064}%* U+0034
% U+0035 DIGIT FIVE; five; \MVFive (marvosym)
\DeclareTextCommand{\textMVFive}{PU}{\80\065}%* U+0035
% U+0036 DIGIT SIX; six; \MVSix (marvosym)
\DeclareTextCommand{\textMVSix}{PU}{\80\066}%* U+0036
% U+0037 DIGIT SEVEM; seven; \MVSeven (marvosym)
\DeclareTextCommand{\textMVSeven}{PU}{\80\067}%* U+0037
% U+0038 DIGIT EIGHT; eight; \MVEight (marvosym)
\DeclareTextCommand{\textMVEight}{PU}{\80\070}%* U+0038
% U+0039 DIGIT NINE; nine; \MVNine (marvosym)
\DeclareTextCommand{\textMVNine}{PU}{\80\071}%* U+0039
```

\80\072: U+003A COLON; colon
\80\073: U+003B SEMICOLON; semicolon

```
% U+003C LESS-THAN SIGN; less
\DeclareTextCommand{\textless}{PU}{<}% \80\074 U+003C
```

\80\075: U+003D EQUALS SIGN; equal

```
% U+003E GREATER-THAN SIGN; greater
\DeclareTextCommand{\textgreater}{PU}{>}% \80\076 U+003E
```

\80\077: U+003F QUESTION MARK; question

```
% U+0040 COMMERCIAL AT; at; \MVAt (marvosym)
\DeclareTextCommand{\textMVAt}{PU}{\80\100}%* U+0040
```

\80\101: U+0041 LATIN CAPITAL LETTER A; A

...

\80\132: U+005A LATIN CAPITAL LETTER Z; Z
\80\133: U+005B LEFT SQUARE BRACKET; bracketleft

```
% U+005C REVERSE SOLIDUS; backslash
\DeclareTextCommand{\textbackslash}{PU}{\80\134}% U+005C
```

\80\135: U+005D RIGHT SQUARE BRACKET; bracketright

```
% U+005E CIRCUMFLEX ACCENT; asciicircum
\DeclareTextCommand{\textasciicircum}{PU}{\80\136}% U+005E
% U+005F LOW LINE; underscore
\DeclareTextCommand{\textunderscore}{PU}{\80\137}% U+005F
%* \textunderscore -> \mathunderscore (LaTeX)
% U+0060 GRAVE ACCENT; grave
\DeclareTextCommand{\textasciigrave}{PU}{\80\140}% U+0060
```

\80\141: U+0061 LATIN SMALL LETTER A; a

...

\80\150: U+0068 LATIN SMALL LETTER H; h

```
% U+0069 LATIN SMALL LETTER I; i
\DeclareTextCompositeCommand{\.}{PU}{\i}{i}% \80\151 U+0069
\DeclareTextCompositeCommand{\.}{PU}{i}{i}% \80\151 U+0069
```

\80\152: U+006A LATIN SMALL LETTER J; j

...

\80\172: U+007A LATIN SMALL LETTER Z; z

```
% U+007B LEFT CURLY BRACKET; braceleft
\DeclareTextCommand{\textbraceleft}{PU}{\80\173}% U+007B
% U+007C VERTICAL LINE; *bar, verticalbar
\DeclareTextCommand{\textbar}{PU}{|}% \80\174 U+007C
%* \textbar -> \textvertline (tipa)
% U+007D RIGHT CURLY BRACKET; braceright
\DeclareTextCommand{\textbraceright}{PU}{\80\175}% U+007D
% U+007E TILDE; asciitilde
\DeclareTextCommand{\textasciitilde}{PU}{\80\176}% U+007E
```

47.2.3 Latin-1 Supplement: U+0080 to U+00FF

\80\240: U+00A0 NO-BREAK SPACE; nbspace, nonbreakingspace

```
% U+00A1 INVERTED EXCLAMATION MARK; exclamdown
\DeclareTextCommand{\textexclamdown}{PU}{\80\241}% U+00A1
% U+00A2 CENT SIGN; cent
\DeclareTextCommand{\textcent}{PU}{\80\242}% U+00A2
% U+00A3 POUND SIGN; sterling
\DeclareTextCommand{\textsterling}{PU}{\80\243}% U+00A3
%* \textsterling -> \mathsterling (LaTeX)
%* \textsterling -> \pounds (LaTeX)
% U+00A4 CURRENCY SIGN; currency
\DeclareTextCommand{\textcurrency}{PU}{\80\244}% U+00A4
% U+00A5 YEN SIGN; yen
\DeclareTextCommand{\textyen}{PU}{\80\245}% U+00A5
% U+00A6 BROKEN BAR; brokenbar
\DeclareTextCommand{\textbrokenbar}{PU}{\80\246}% U+00A6
%* \textbrokenbar -> \brokenvert (wasysym)
% U+00A7 SECTION SIGN; section
\DeclareTextCommand{\textsection}{PU}{\80\247}% U+00A7
%* \textsection -> \mathsection (LaTeX)
%* \textsection -> \S (LaTeX)
% U+00A8 DIAERESIS; dieresis
\DeclareTextCommand{\textasciidieresis}{PU}{\80\250}% U+00A8
% U+00A9 COPYRIGHT SIGN; copyright
\DeclareTextCommand{\textcopyright}{PU}{\80\251}%* U+00A9
% U+00AA FEMININE ORDINAL INDICATOR; ordfeminine
\DeclareTextCommand{\textordfeminine}{PU}{\80\252}% U+00AA
% U+00AB LEFT-POINTING DOUBLE ANGLE QUOTATION MARK; guillemetleft
\DeclareTextCommand{\guillemotleft}{PU}{\80\253}% U+00AB
\DeclareTextCommand{\guillemetleft}{PU}{\80\253}% U+00AB
% U+00AC NOT SIGN; logicalnot
\DeclareTextCommand{\textlogicalnot}{PU}{\80\254}% U+00AC
\DeclareTextCommand{\textlnot}{PU}{\80\254}% U+00AC
```

\80\255: U+00AD SOFT HYPHEN; sfthyphen, softhyphen

```
% U+00AE REGISTERED SIGN; registered
\DeclareTextCommand{\textregistered}{PU}{\80\256}% U+00AE
% U+00AF MACRON; *macron, overscore
\DeclareTextCommand{\textasciimacron}{PU}{\80\257}% U+00AF
% U+00B0 DEGREE SIGN; degree
\DeclareTextCommand{\textdegree}{PU}{\80\260}% U+00B0
% U+00B1 PLUS-MINUS SIGN; plusminus
\DeclareTextCommand{\textplusminus}{PU}{\80\261}% U+00B1
% U+00B2 SUPERSCRIPT TWO; twosuperior
\DeclareTextCommand{\texttwosuperior}{PU}{\80\262}%* U+00B2
% U+00B3 SUPERSCRIPT THREE; threesuperior
\DeclareTextCommand{\textthreesuperior}{PU}{\80\263}%* U+00B3
% U+00B4 ACUTE ACCENT; acute
\DeclareTextCommand{\textacute}{PU}{\80\264}% U+00B4
\DeclareTextCommand{\textasciiacute}{PU}{\80\264}% U+00B4
% U+00B5 MICRO SIGN; mu, mu1
\DeclareTextCommand{\textmu}{PU}{\80\265}% U+00B5
% U+00B6 PILCROW SIGN; paragraph
\DeclareTextCommand{\textparagraph}{PU}{\80\266}% U+00B6
%* \textparagraph -> \mathparagraph (LaTeX)
% U+00B7 MIDDLE DOT; middot, *periodcentered
\DeclareTextCommand{\textperiodcentered}{PU}{\80\267}% U+00B7
%* \textperiodcentered -> \MultiplicationDot (marvosym)
%* \textperiodcentered -> \Squaredot (marvosym)
% U+00B8 CEDILLA; cedilla
\DeclareTextCommand{\textcedilla}{PU}{\80\270}% U+00B8
% U+00B9 SUPERSCRIPT ONE; onesuperior
\DeclareTextCommand{\textonesuperior}{PU}{\80\271}%* U+00B9
% U+00BA MASCULINE ORDINAL INDICATOR; ordmasculine
\DeclareTextCommand{\textordmasculine}{PU}{\80\272}% U+00BA
% U+00BB RIGHT-POINTING DOUBLE ANGLE QUOTATION MARK; guillemetright
\DeclareTextCommand{\guillemotright}{PU}{\80\273}% U+00BB
\DeclareTextCommand{\guillemetright}{PU}{\80\273}% U+00BB
% U+00BC VULGAR FRACTION ONE QUARTER; onequarter
\DeclareTextCommand{\textonequarter}{PU}{\80\274}% U+00BC
% U+00BD VULGAR FRACTION ONE HALF; onehalf
\DeclareTextCommand{\textonehalf}{PU}{\80\275}% U+00BD
% U+00BE VULGAR FRACTION THREE QUARTERS; threequarters
\DeclareTextCommand{\textthreequarters}{PU}{\80\276}% U+00BE
% U+00BF INVERTED QUESTION MARK; questiondown
\DeclareTextCommand{\textquestiondown}{PU}{\80\277}% U+00BF
% U+00C0 LATIN CAPITAL LETTER A WITH GRAVE; Agrave
\DeclareTextCompositeCommand{\`}{PU}{A}{\80\300}% U+00C0
% U+00C1 LATIN CAPITAL LETTER A WITH ACUTE; Aacute
\DeclareTextCompositeCommand{\'}{PU}{A}{\80\301}% U+00C1
% U+00C2 LATIN CAPITAL LETTER A WITH CIRCUMFLEX; Acircumflex
\DeclareTextCompositeCommand{\^}{PU}{A}{\80\302}% U+00C2
% U+00C3 LATIN CAPITAL LETTER A WITH TILDE; Atilde
\DeclareTextCompositeCommand{\~}{PU}{A}{\80\303}% U+00C3
% U+00C4 LATIN CAPITAL LETTER A WITH DIAERESIS; Adieresis
\DeclareTextCompositeCommand{\"}{PU}{A}{\80\304}% U+00C4
% U+00C5 LATIN CAPITAL LETTER A WITH RING ABOVE; Aring
\DeclareTextCompositeCommand{\r}{PU}{A}{\80\305}% U+00C5
```

```
% U+00C6 LATIN CAPITAL LETTER AE; AE
\DeclareTextCommand{\AE}{PU}{\80\306}% U+00C6
% U+00C7 LATIN CAPITAL LETTER C WITH CEDILLA; Ccedilla
\DeclareTextCompositeCommand{\c}{PU}{C}{\80\307}% U+00C7
% U+00C8 LATIN CAPITAL LETTER E WITH GRAVE; Egrave
\DeclareTextCompositeCommand{\`}{PU}{E}{\80\310}% U+00C8
% U+00C9 LATIN CAPITAL LETTER E WITH ACUTE; Eacute
\DeclareTextCompositeCommand{\'}{PU}{E}{\80\311}% U+00C9
% U+00CA LATIN CAPITAL LETTER E WITH CIRCUMFLEX; Ecircumflex
\DeclareTextCompositeCommand{\^}{PU}{E}{\80\312}% U+00CA
% U+00CB LATIN CAPITAL LETTER E WITH DIAERESIS; Edieresis
\DeclareTextCompositeCommand{\"}{PU}{E}{\80\313}% U+00CB
% U+00CC LATIN CAPITAL LETTER I WITH GRAVE; Igrave
\DeclareTextCompositeCommand{\`}{PU}{I}{\80\314}% U+00CC
% U+00CD LATIN CAPITAL LETTER I WITH ACUTE; Iacute
\DeclareTextCompositeCommand{\'}{PU}{I}{\80\315}% U+00CD
% U+00CE LATIN CAPITAL LETTER I WITH CIRCUMFLEX; Icircumflex
\DeclareTextCompositeCommand{\^}{PU}{I}{\80\316}% U+00CE
% U+00CF LATIN CAPITAL LETTER I WITH DIAERESIS; Idieresis
\DeclareTextCompositeCommand{\"}{PU}{I}{\80\317}% U+00CF
% U+00D0 LATIN CAPITAL LETTER ETH; Eth
\DeclareTextCommand{\DH}{PU}{\80\320}% U+00D0
% U+00D1 LATIN CAPITAL LETTER N WITH TILDE; Ntilde
\DeclareTextCompositeCommand{\~}{PU}{N}{\80\321}% U+00D1
% U+00D2 LATIN CAPITAL LETTER O WITH GRAVE; Ograve
\DeclareTextCompositeCommand{\`}{PU}{O}{\80\322}% U+00D2
% U+00D3 LATIN CAPITAL LETTER O WITH ACUTE; Oacute
\DeclareTextCompositeCommand{\'}{PU}{O}{\80\323}% U+00D3
% U+00D4 LATIN CAPITAL LETTER O WITH CIRCUMFLEX; Ocircumflex
\DeclareTextCompositeCommand{\^}{PU}{O}{\80\324}% U+00D4
% U+00D5 LATIN CAPITAL LETTER O WITH TILDE; Otilde
\DeclareTextCompositeCommand{\~}{PU}{O}{\80\325}% U+00D5
% U+00D6 LATIN CAPITAL LETTER O WITH DIAERESIS; Odieresis
\DeclareTextCompositeCommand{\"}{PU}{O}{\80\326}% U+00D6
% U+00D7 MULTIPLICATION SIGN; multiply
\DeclareTextCommand{\textmultiply}{PU}{\80\327}% U+00D7
%* \textmultiply -> \vartimes (stmaryrd)
%* \textmultiply -> \MVMultiplication (marvosym)
% U+00D8 LATIN CAPITAL LETTER O WITH STROKE; Oslash
\DeclareTextCommand{\O}{PU}{\80\330}% U+00D8
% U+00D9 LATIN CAPITAL LETTER U WITH GRAVE; Ugrave
\DeclareTextCompositeCommand{\`}{PU}{U}{\80\331}% U+00D9
% U+00DA LATIN CAPITAL LETTER U WITH ACUTE; Uacute
\DeclareTextCompositeCommand{\'}{PU}{U}{\80\332}% U+00DA
% U+00DB LATIN CAPITAL LETTER U WITH CIRCUMFLEX; Ucircumflex
\DeclareTextCompositeCommand{\^}{PU}{U}{\80\333}% U+00DB
% U+00DC LATIN CAPITAL LETTER U WITH DIAERESIS; Udieresis
\DeclareTextCompositeCommand{\"}{PU}{U}{\80\334}% U+00DC
% U+00DD LATIN CAPITAL LETTER Y WITH ACUTE; Yacute
\DeclareTextCompositeCommand{\'}{PU}{Y}{\80\335}% U+00DD
% U+00DE LATIN CAPITAL LETTER THORN; Thorn; \TH, \Thorn (wasysym)
\DeclareTextCommand{\TH}{PU}{\80\336}% U+00DE
\DeclareTextCommand{\textThorn}{PU}{\80\336}%* U+00DE
% U+00DF LATIN SMALL LETTER SHARP S; germandbls
```

```
\DeclareTextCommand{\ss}{PU}{\80\337}% U+00DF
% U+00E0 LATIN SMALL LETTER A WITH GRAVE; agrave
\DeclareTextCompositeCommand{\`}{PU}{a}{\80\340}% U+00E0
% U+00E1 LATIN SMALL LETTER A WITH ACUTE; aacute
\DeclareTextCompositeCommand{\'}{PU}{a}{\80\341}% U+00E1
% U+00E2 LATIN SMALL LETTER A WITH CIRCUMFLEX; acircumflex
\DeclareTextCompositeCommand{\^}{PU}{a}{\80\342}% U+00E2
% U+00E3 LATIN SMALL LETTER A WITH TILDE; atilde
\DeclareTextCompositeCommand{\~}{PU}{a}{\80\343}% U+00E3
% U+00E4 LATIN SMALL LETTER A WITH DIAERESIS; adieresis
\DeclareTextCompositeCommand{\"}{PU}{a}{\80\344}% U+00E4
% U+00E5 LATIN SMALL LETTER A WITH RING ABOVE; aring
\DeclareTextCompositeCommand{\r}{PU}{a}{\80\345}% U+00E5
% U+00E6 LATIN SMALL LETTER AE; ae
\DeclareTextCommand{\ae}{PU}{\80\346}% U+00E6
% U+00E7 LATIN SMALL LETTER C WITH CEDILLA; ccedilla
\DeclareTextCompositeCommand{\c}{PU}{c}{\80\347}% U+00E7
% U+00E8 LATIN SMALL LETTER E WITH GRAVE; egrave
\DeclareTextCompositeCommand{\`}{PU}{e}{\80\350}% U+00E8
% U+00E9 LATIN SMALL LETTER E WITH ACUTE; eacute
\DeclareTextCompositeCommand{\'}{PU}{e}{\80\351}% U+00E9
% U+00EA LATIN SMALL LETTER E WITH CIRCUMFLEX; ecircumflex
\DeclareTextCompositeCommand{\^}{PU}{e}{\80\352}% U+00EA
% U+00EB LATIN SMALL LETTER E WITH DIAERESIS; edieresis
\DeclareTextCompositeCommand{\"}{PU}{e}{\80\353}% U+00EB
% U+00EC LATIN SMALL LETTER I WITH GRAVE; igrave
\DeclareTextCompositeCommand{\`}{PU}{i}{\80\354}% U+00EC
\DeclareTextCompositeCommand{\`}{PU}{\i}{\80\354}% U+00EC
% U+00ED LATIN SMALL LETTER I WITH ACUTE; iacute
\DeclareTextCompositeCommand{\'}{PU}{i}{\80\355}% U+00ED
\DeclareTextCompositeCommand{\'}{PU}{\i}{\80\355}% U+00ED
% U+00EE LATIN SMALL LETTER I WITH CIRCUMFLEX; icircumflex
\DeclareTextCompositeCommand{\^}{PU}{i}{\80\356}% U+00EE
\DeclareTextCompositeCommand{\^}{PU}{\i}{\80\356}% U+00EE
% U+00EF LATIN SMALL LETTER I WITH DIAERESIS; idieresis
\DeclareTextCompositeCommand{\"}{PU}{i}{\80\357}% U+00EF
\DeclareTextCompositeCommand{\"}{PU}{\i}{\80\357}% U+00EF
% U+00F0 LATIN SMALL LETTER ETH; eth
\DeclareTextCommand{\dh}{PU}{\80\360}% U+00F0
%* \dh -> \eth (wsuipa, phonetic)
% U+00F1 LATIN SMALL LETTER N WITH TILDE; ntilde
\DeclareTextCompositeCommand{\~}{PU}{n}{\80\361}% U+00F1
% U+00F2 LATIN SMALL LETTER O WITH GRAVE; ograve
\DeclareTextCompositeCommand{\`}{PU}{o}{\80\362}% U+00F2
% U+00F3 LATIN SMALL LETTER O WITH ACUTE; oacute
\DeclareTextCompositeCommand{\'}{PU}{o}{\80\363}% U+00F3
% U+00F4 LATIN SMALL LETTER O WITH CIRCUMFLEX; ocircumflex
\DeclareTextCompositeCommand{\^}{PU}{o}{\80\364}% U+00F4
% U+00F5 LATIN SMALL LETTER O WITH TILDE; otilde
\DeclareTextCompositeCommand{\~}{PU}{o}{\80\365}% U+00F5
% U+00F6 LATIN SMALL LETTER O WITH DIAERESIS; odieresis
\DeclareTextCompositeCommand{\"}{PU}{o}{\80\366}% U+00F6
% U+00F7 DIVISION SIGN; divide
\DeclareTextCommand{\textdivide}{PU}{\80\367}% U+00F7
```

```
% U+00F8 LATIN SMALL LETTER O WITH STROKE; oslash
\DeclareTextCommand{\o}{PU}{\80\370}% U+00F8
% U+00F9 LATIN SMALL LETTER U WITH GRAVE; ugrave
\DeclareTextCompositeCommand{\`}{PU}{u}{\80\371}% U+00F9
% U+00FA LATIN SMALL LETTER U WITH ACUTE; uacute
\DeclareTextCompositeCommand{\'}{PU}{u}{\80\372}% U+00FA
% U+00FB LATIN SMALL LETTER U WITH CIRCUMFLEX; ucircumflex
\DeclareTextCompositeCommand{\^}{PU}{u}{\80\373}% U+00FB
% U+00FC LATIN SMALL LETTER U WITH DIAERESIS; udieresis
\DeclareTextCompositeCommand{\"}{PU}{u}{\80\374}% U+00FC
% U+00FD LATIN SMALL LETTER Y WITH ACUTE; yacute
\DeclareTextCompositeCommand{\'}{PU}{y}{\80\375}% U+00FD
% U+00FE LATIN SMALL LETTER THORN; thorn;
%   \th, \thorn (wasysym), \textthorn (tipa)
\DeclareTextCommand{\th}{PU}{\80\376}% U+00FE
\DeclareTextCommand{\textthorn}{PU}{\80\376}%* U+00FE
% U+00FF LATIN SMALL LETTER Y WITH DIAERESIS; ydieresis
\DeclareTextCompositeCommand{\"}{PU}{y}{\80\377}% U+00FF
```

47.2.4 Latin Extended-A: U+0080 to U+017F

```
% U+0100 LATIN CAPITAL LETTER A WITH MACRON; Amacron
\DeclareTextCompositeCommand{\=}{PU}{A}{\81\000}% U+0100
% U+0101 LATIN SMALL LETTER A WITH MACRON; amacron
\DeclareTextCompositeCommand{\=}{PU}{a}{\81\001}% U+0101
% U+0102 LATIN CAPITAL LETTER A WITH BREVE; Abreve
\DeclareTextCompositeCommand{\u}{PU}{A}{\81\002}% U+0102
% U+0103 LATIN SMALL LETTER A WITH BREVE; abreve
\DeclareTextCompositeCommand{\u}{PU}{a}{\81\003}% U+0103
% U+0104 LATIN CAPITAL LETTER A WITH OGONEK; Aogonek
\DeclareTextCompositeCommand{\k}{PU}{A}{\81\004}% U+0104
% U+0105 LATIN SMALL LETTER A WITH OGONEK; aogonek
\DeclareTextCompositeCommand{\k}{PU}{a}{\81\005}% U+0105
% U+0106 LATIN CAPITAL LETTER C WITH ACUTE; Cacute
\DeclareTextCompositeCommand{\'}{PU}{C}{\81\006}% U+0106
% U+0107 LATIN SMALL LETTER C WITH ACUTE; cacute
\DeclareTextCompositeCommand{\'}{PU}{c}{\81\007}% U+0107
% U+0108 LATIN CAPITAL LETTER C WITH CIRCUMFLEX; Ccircumflex
\DeclareTextCompositeCommand{\^}{PU}{C}{\81\010}% U+0108
% U+0109 LATIN SMALL LETTER C WITH CIRCUMFLEX; ccircumflex
\DeclareTextCompositeCommand{\^}{PU}{c}{\81\011}% U+0109
% U+010A LATIN CAPITAL LETTER C WITH DOT ABOVE; Cdot, Cdotac-
    cent
\DeclareTextCompositeCommand{\.}{PU}{C}{\81\012}% U+010A
% U+010B LATIN SMALL LETTER C WITH DOT ABOVE; cdot, cdotaccent
\DeclareTextCompositeCommand{\.}{PU}{c}{\81\013}% U+010B
% U+010C LATIN CAPITAL LETTER C WITH CARON; Ccaron
\DeclareTextCompositeCommand{\v}{PU}{C}{\81\014}% U+010C
% U+010D LATIN SMALL LETTER C WITH CARON; ccaron
\DeclareTextCompositeCommand{\v}{PU}{c}{\81\015}% U+010D
% U+010E LATIN CAPITAL LETTER D WITH CARON; Dcaron
\DeclareTextCompositeCommand{\v}{PU}{D}{\81\016}% U+010E
% U+010F LATIN SMALL LETTER D WITH CARON; dcaron
\DeclareTextCompositeCommand{\v}{PU}{d}{\81\017}% U+010F
```

```
% U+0110 LATIN CAPITAL LETTER D WITH STROKE; Dcroat, Dslash
\DeclareTextCommand{\DJ}{PU}{\81\020}% U+0110
% U+0111 LATIN SMALL LETTER D WITH STROKE; dcroat, dmacron;
%   \textcrd (tipa)
\DeclareTextCommand{\dj}{PU}{\81\021}% U+0111
\DeclareTextCommand{\textcrd}{PU}{\81\021}% U+0111
%* \textcrd -> \crossd (wsuipa)
% An alternate glyph with the stroke through the bowl:
%* \textcrd -> \textbard (tipa)
%* \textcrd -> \bard (wsuipa)
% U+0112 LATIN CAPITAL LETTER E WITH MACRON; Emacron
\DeclareTextCompositeCommand{\=}{PU}{E}{\81\022}% U+0112
% U+0113 LATIN SMALL LETTER E WITH MACRON; emacron
\DeclareTextCompositeCommand{\=}{PU}{e}{\81\023}% U+0113
% U+0114 LATIN CAPITAL LETTER E WITH BREVE; Ebreve
\DeclareTextCompositeCommand{\u}{PU}{E}{\81\024}% U+0114
% U+0115 LATIN SMALL LETTER E WITH BREVE; ebreve
\DeclareTextCompositeCommand{\u}{PU}{e}{\81\025}% U+0115
% U+0116 LATIN CAPITAL LETTER E WITH DOT ABOVE; Edot, Edotaccent
\DeclareTextCompositeCommand{\.}{PU}{E}{\81\026}% U+0116
% U+0117 LATIN SMALL LETTER E WITH DOT ABOVE; edot, edotaccent
\DeclareTextCompositeCommand{\.}{PU}{e}{\81\027}% U+0117
% U+0118 LATIN CAPITAL LETTER E WITH OGONEK; Eogonek
\DeclareTextCompositeCommand{\k}{PU}{E}{\81\030}% U+0118
% U+0119 LATIN SMALL LETTER E WITH OGONEK; eogonek
\DeclareTextCompositeCommand{\k}{PU}{e}{\81\031}% U+0119
% U+011A LATIN CAPITAL LETTER E WITH CARON; Ecaron
\DeclareTextCompositeCommand{\v}{PU}{E}{\81\032}% U+011A
% U+011B LATIN SMALL LETTER E WITH CARON; ecaron
\DeclareTextCompositeCommand{\v}{PU}{e}{\81\033}% U+011B
% U+011C LATIN CAPITAL LETTER G WITH CIRCUMFLEX; Gcircumflex
\DeclareTextCompositeCommand{\^}{PU}{G}{\81\034}% U+011C
% U+011D LATIN SMALL LETTER G WITH CIRCUMFLEX; gcircumflex
\DeclareTextCompositeCommand{\^}{PU}{g}{\81\035}% U+011D
% U+011E LATIN CAPITAL LETTER G WITH BREVE; Gbreve
\DeclareTextCompositeCommand{\u}{PU}{G}{\81\036}% U+011E
% U+011F LATIN SMALL LETTER G WITH BREVE; gbreve
\DeclareTextCompositeCommand{\u}{PU}{g}{\81\037}% U+011F
% U+0120 LATIN CAPITAL LETTER G WITH DOT ABOVE; Gdot, Gdotac-
    cent
\DeclareTextCompositeCommand{\.}{PU}{G}{\81\040}% U+0120
% U+0121 LATIN SMALL LETTER G WITH DOT ABOVE; gdot, gdotaccent
\DeclareTextCompositeCommand{\.}{PU}{g}{\81\041}% U+0121
% U+0122 LATIN CAPITAL LETTER G WITH CEDILLA; Gcedilla, Gcom-
    maaccent
\DeclareTextCompositeCommand{\c}{PU}{G}{\81\042}% U+0122
% U+0123 LATIN SMALL LETTER G WITH CEDILLA; gcedilla, gcommaaccent
\DeclareTextCompositeCommand{\c}{PU}{g}{\81\043}% U+0123
% U+0124 LATIN CAPITAL LETTER H WITH CIRCUMFLEX; Hcircumflex
\DeclareTextCompositeCommand{\^}{PU}{H}{\81\044}% U+0124
% U+0125 LATIN SMALL LETTER H WITH CIRCUMFLEX; hcircumflex
\DeclareTextCompositeCommand{\^}{PU}{h}{\81\045}% U+0125
% U+0126 LATIN CAPITAL LETTER H WITH STROKE; Hbar
\DeclareTextCommand{\textHslash}{PU}{\81\046}% U+0126
```

```
% U+0127 LATIN SMALL LETTER H WITH STROKE; hbar; \hbar (AmS)
\DeclareTextCommand{\texthbar}{PU}{\81\047}%* U+0127
%* \texthbar -> \textcrh (tipa)
%* \texthbar -> \crossh (wsuipa)
%* \texthbar -> \planck (phonetic)
% U+0128 LATIN CAPITAL LETTER I WITH TILDE; Itilde
\DeclareTextCompositeCommand{\~}{PU}{I}{\81\050}% U+0128
% U+0129 LATIN SMALL LETTER I WITH TILDE; itilde
\DeclareTextCompositeCommand{\~}{PU}{i}{\81\051}% U+0129
\DeclareTextCompositeCommand{\~}{PU}{\i}{\81\051}% U+0129
% U+012A LATIN CAPITAL LETTER I WITH MACRON; Imacron
\DeclareTextCompositeCommand{\=}{PU}{I}{\81\052}% U+012A
% U+012B LATIN SMALL LETTER I WITH MACRON; imacron
\DeclareTextCompositeCommand{\=}{PU}{i}{\81\053}% U+012B
\DeclareTextCompositeCommand{\=}{PU}{\i}{\81\053}% U+012B
% U+012C LATIN CAPITAL LETTER I WITH BREVE; Ibreve
\DeclareTextCompositeCommand{\u}{PU}{I}{\81\054}% U+012C
% U+012D LATIN SMALL LETTER I WITH BREVE; ibreve
\DeclareTextCompositeCommand{\u}{PU}{i}{\81\055}% U+012D
\DeclareTextCompositeCommand{\u}{PU}{\i}{\81\055}% U+012D
% U+012E LATIN CAPITAL LETTER I WITH OGONEK; Iogonek
\DeclareTextCompositeCommand{\k}{PU}{I}{\81\056}% U+012E
% U+012F LATIN SMALL LETTER I WITH OGONEK; iogonek
\DeclareTextCompositeCommand{\k}{PU}{i}{\81\057}% U+012F
\DeclareTextCompositeCommand{\k}{PU}{\i}{\81\057}% U+012F
% U+0130 LATIN CAPITAL LETTER I WITH DOT ABOVE; Idot, Idotaccent
\DeclareTextCompositeCommand{\.}{PU}{I}{\81\060}% U+0130
% U+0131 LATIN SMALL LETTER DOTLESS I; dotlessi
\DeclareTextCommand{\i}{PU}{\81\061}% U+0131
% U+0132 LATIN CAPITAL LIGATURE IJ; IJ
\DeclareTextCommand{\IJ}{PU}{\81\062}% U+0132
% U+0133 LATIN SMALL LIGATURE IJ; ij
\DeclareTextCommand{\ij}{PU}{\81\063}% U+0133
% U+0134 LATIN CAPITAL LETTER J WITH CIRCUMFLEX; Jcircumflex
\DeclareTextCompositeCommand{\^}{PU}{J}{\81\064}% U+0134
% U+0135 LATIN SMALL LETTER J WITH CIRCUMFLEX; jcircumflex
\DeclareTextCompositeCommand{\^}{PU}{j}{\81\065}% U+0135
\DeclareTextCompositeCommand{\^}{PU}{\j}{\81\065}% U+0135
% U+0136 LATIN CAPITAL LETTER K WITH CEDILLA; Kcedilla, Kcommaaccent
\DeclareTextCompositeCommand{\c}{PU}{K}{\81\066}% U+0136
% U+0137 LATIN SMALL LETTER K WITH CEDILLA; kcedilla, kcommaaccent
\DeclareTextCompositeCommand{\c}{PU}{k}{\81\067}% U+0137
```

The canonical name of U+0138, small letter kra, would be \textkgreenlandic, following the glyph naming convention. However latex/base/inputenc.dtx has chosen \textkra.

```
% U+0138 LATIN SMALL LETTER KRA; kgreenlandic
\DeclareTextCommand{\textkra}{PU}{\81\070}% U+0138
% U+0139 LATIN CAPITAL LETTER L WITH ACUTE; Lacute
\DeclareTextCompositeCommand{\'}{PU}{L}{\81\071}% U+0139
% U+013A LATIN SMALL LETTER L WITH ACUTE; lacute
\DeclareTextCompositeCommand{\'}{PU}{l}{\81\072}% U+013A
% U+013B LATIN CAPITAL LETTER L WITH CEDILLA; Lcedilla, Lcommaac-
```

```
cent
\DeclareTextCompositeCommand{\c}{PU}{L}{\81\073}% U+013B
% U+013C LATIN SMALL LETTER L WITH CEDILLA; lcedilla, lcommaaccent
\DeclareTextCompositeCommand{\c}{PU}{l}{\81\074}% U+013C
% U+013D LATIN CAPITAL LETTER L WITH CARON; Lcaron
\DeclareTextCompositeCommand{\v}{PU}{L}{\81\075}% U+013D
% U+013E LATIN SMALL LETTER L WITH CARON; lcaron
\DeclareTextCompositeCommand{\v}{PU}{l}{\81\076}% U+013E
```

There seems to be no variants of letters ‘L’ and ‘l’ with a dot above (reasonable). Therefore the \. accent is reused instead of making a separate accent macro \textmiddledot.

```
% U+013F LATIN CAPITAL LETTER L WITH MIDDLE DOT; Ldot, Ldotaccent
\DeclareTextCompositeCommand{\.}{PU}{L}{\81\077}% U+013F
% U+0140 LATIN SMALL LETTER L WITH MIDDLE DOT; ldot, ldotaccent
\DeclareTextCompositeCommand{\.}{PU}{l}{\81\100}% U+0140
% U+0141 LATIN CAPITAL LETTER L WITH STROKE; Lslash
\DeclareTextCommand{\L}{PU}{\81\101}% U+0141
% U+0142 LATIN SMALL LETTER L WITH STROKE; lslash
\DeclareTextCommand{\l}{PU}{\81\102}% U+0142
% U+0143 LATIN CAPITAL LETTER N WITH ACUTE; Nacute
\DeclareTextCompositeCommand{\'}{PU}{N}{\81\103}% U+0143
% U+0144 LATIN SMALL LETTER N WITH ACUTE; nacute
\DeclareTextCompositeCommand{\'}{PU}{n}{\81\104}% U+0144
% U+0145 LATIN CAPITAL LETTER N WITH CEDILLA; Ncedilla, Ncommaaccent
\DeclareTextCompositeCommand{\c}{PU}{N}{\81\105}% U+0145
% U+0146 LATIN SMALL LETTER N WITH CEDILLA; ncedilla, ncommaaccent
\DeclareTextCompositeCommand{\c}{PU}{n}{\81\106}% U+0146
% U+0147 LATIN CAPITAL LETTER N WITH CARON; Ncaron
\DeclareTextCompositeCommand{\v}{PU}{N}{\81\107}% U+0147
% U+0148 LATIN SMALL LETTER N WITH CARON; ncaron
\DeclareTextCompositeCommand{\v}{PU}{n}{\81\110}% U+0148
% U+0149 LATIN SMALL LETTER N PRECEDED BY APOSTROPHE; napostrophe, quoterightn
\DeclareTextCommand{\textnapostrophe}{PU}{\81\111}% U+0149
% U+014A LATIN CAPITAL LETTER ENG; Eng
\DeclareTextCommand{\NG}{PU}{\81\112}% U+014A
% U+014B LATIN SMALL LETTER ENG; eng
\DeclareTextCommand{\ng}{PU}{\81\113}% U+014B
%* \ng -> \eng (wsuipa)
%* \ng -> \engma (phonetic)
% U+014C LATIN CAPITAL LETTER O WITH MACRON; Omacron
\DeclareTextCompositeCommand{\=}{PU}{O}{\81\114}% U+014C
% U+014D LATIN SMALL LETTER O WITH MACRON; omacron
\DeclareTextCompositeCommand{\=}{PU}{o}{\81\115}% U+014D
% U+014E LATIN CAPITAL LETTER O WITH BREVE; Obreve
\DeclareTextCompositeCommand{\u}{PU}{O}{\81\116}% U+014E
% U+014F LATIN SMALL LETTER O WITH BREVE; obreve
\DeclareTextCompositeCommand{\u}{PU}{o}{\81\117}% U+014F
% U+0150 LATIN CAPITAL LETTER O WITH DOUBLE ACUTE; Odblacute, Ohungarumlaut
\DeclareTextCompositeCommand{\H}{PU}{O}{\81\120}% U+0150
% U+0151 LATIN SMALL LETTER O WITH DOUBLE ACUTE; odbla-
```

```
cute, ohungarumlaut
\DeclareTextCompositeCommand{\H}{PU}{o}{\81\121}% U+0151
% U+0152 LATIN CAPITAL LIGATURE OE; OE
\DeclareTextCommand{\OE}{PU}{\81\122}% U+0152
% U+0153 LATIN SMALL LIGATURE OE; oe
\DeclareTextCommand{\oe}{PU}{\81\123}% U+0153
% U+0154 LATIN CAPITAL LETTER R WITH ACUTE; Racute
\DeclareTextCompositeCommand{\'}{PU}{R}{\81\124}% U+0154
% U+0155 LATIN SMALL LETTER R WITH ACUTE; racute
\DeclareTextCompositeCommand{\'}{PU}{r}{\81\125}% U+0155
% U+0156 LATIN CAPITAL LETTER R WITH CEDILLA; Rcedilla, Rcommaaccent
\DeclareTextCompositeCommand{\c}{PU}{R}{\81\126}% U+0156
% U+0157 LATIN SMALL LETTER R WITH CEDILLA; rcedilla, rcommaaccent
\DeclareTextCompositeCommand{\c}{PU}{r}{\81\127}% U+0157
% U+0158 LATIN CAPITAL LETTER R WITH CARON; Rcaron
\DeclareTextCompositeCommand{\v}{PU}{R}{\81\130}% U+0158
% U+0159 LATIN SMALL LETTER R WITH CARON; rcaron
\DeclareTextCompositeCommand{\v}{PU}{r}{\81\131}% U+0159
% U+015A LATIN CAPITAL LETTER S WITH ACUTE; Sacute
\DeclareTextCompositeCommand{\'}{PU}{S}{\81\132}% U+015A
% U+015B LATIN SMALL LETTER S WITH ACUTE; sacute
\DeclareTextCompositeCommand{\'}{PU}{s}{\81\133}% U+015B
% U+015C LATIN CAPITAL LETTER S WITH CIRCUMFLEX; Scircumflex
\DeclareTextCompositeCommand{\^}{PU}{S}{\81\134}% U+015C
% U+015D LATIN SMALL LETTER S WITH CIRCUMFLEX; scircumflex
\DeclareTextCompositeCommand{\^}{PU}{s}{\81\135}% U+015D
% U+015E LATIN CAPITAL LETTER S WITH CEDILLA; Scedilla
\DeclareTextCompositeCommand{\c}{PU}{S}{\81\136}% U+015E
% U+015F LATIN SMALL LETTER S WITH CEDILLA; scedilla
\DeclareTextCompositeCommand{\c}{PU}{s}{\81\137}% U+015F
% U+0160 LATIN CAPITAL LETTER S WITH CARON; Scaron
\DeclareTextCompositeCommand{\v}{PU}{S}{\81\140}% U+0160
% U+0161 LATIN SMALL LETTER S WITH CARON; scaron
\DeclareTextCompositeCommand{\v}{PU}{s}{\81\141}% U+0161
% U+0162 LATIN CAPITAL LETTER T WITH CEDILLA; Tcedilla, Tcommaaccent
\DeclareTextCompositeCommand{\c}{PU}{T}{\81\142}% U+0162
% U+0163 LATIN SMALL LETTER T WITH CEDILLA; tcedilla, tcommaaccent
\DeclareTextCompositeCommand{\c}{PU}{t}{\81\143}% U+0163
% U+0164 LATIN CAPITAL LETTER T WITH CARON; Tcaron
\DeclareTextCompositeCommand{\v}{PU}{T}{\81\144}% U+0164
% U+0165 LATIN SMALL LETTER T WITH CARON; tcaron
\DeclareTextCompositeCommand{\v}{PU}{t}{\81\145}% U+0165
% U+0166 LATIN CAPITAL LETTER T WITH STROKE; Tbar
\DeclareTextCommand{\textTslash}{PU}{\81\146}% U+0166
% U+0167 LATIN SMALL LETTER T WITH STROKE; tbar
\DeclareTextCommand{\texttslash}{PU}{\81\147}% U+0167
% U+0168 LATIN CAPITAL LETTER U WITH TILDE; Utilde
\DeclareTextCompositeCommand{\~}{PU}{U}{\81\150}% U+0168
% U+0169 LATIN SMALL LETTER U WITH TILDE; utilde
\DeclareTextCompositeCommand{\~}{PU}{u}{\81\151}% U+0169
% U+016A LATIN CAPITAL LETTER U WITH MACRON; Umacron
\DeclareTextCompositeCommand{\=}{PU}{U}{\81\152}% U+016A
```

```
% U+016B LATIN SMALL LETTER U WITH MACRON; umacron
\DeclareTextCompositeCommand{\=}{PU}{u}{\81\153}% U+016B
% U+016C LATIN CAPITAL LETTER U WITH BREVE; Ubreve
\DeclareTextCompositeCommand{\u}{PU}{U}{\81\154}% U+016C
% U+016D LATIN SMALL LETTER U WITH BREVE; ubreve
\DeclareTextCompositeCommand{\u}{PU}{u}{\81\155}% U+016D
% U+016E LATIN CAPITAL LETTER U WITH RING ABOVE; Uring
\DeclareTextCompositeCommand{\r}{PU}{U}{\81\156}% U+016E
% U+016F LATIN SMALL LETTER U WITH RING ABOVE; uring
\DeclareTextCompositeCommand{\r}{PU}{u}{\81\157}% U+016F
% U+0170 LATIN CAPITAL LETTER U WITH DOUBLE ACUTE; Udblacute, Uhungarumlaut
\DeclareTextCompositeCommand{\H}{PU}{U}{\81\160}% U+0170
% U+0171 LATIN SMALL LETTER U WITH DOUBLE ACUTE; udblacute, uhungarumlaut
\DeclareTextCompositeCommand{\H}{PU}{u}{\81\161}% U+0171
% U+0172 LATIN CAPITAL LETTER U WITH OGONEK; Uogonek
\DeclareTextCompositeCommand{\k}{PU}{U}{\81\162}% U+0172
% U+0173 LATIN SMALL LETTER U WITH OGONEK; uogonek
\DeclareTextCompositeCommand{\k}{PU}{u}{\81\163}% U+0173
% U+0174 LATIN CAPITAL LETTER W WITH CIRCUMFLEX; Wcircumflex
\DeclareTextCompositeCommand{\^}{PU}{W}{\81\164}% U+0174
% U+0175 LATIN SMALL LETTER W WITH CIRCUMFLEX; wcircumflex
\DeclareTextCompositeCommand{\^}{PU}{w}{\81\165}% U+0175
% U+0176 LATIN CAPITAL LETTER Y WITH CIRCUMFLEX; Ycircumflex
\DeclareTextCompositeCommand{\^}{PU}{Y}{\81\166}% U+0176
% U+0177 LATIN SMALL LETTER Y WITH CIRCUMFLEX; ycircumflex
\DeclareTextCompositeCommand{\^}{PU}{y}{\81\167}% U+0177
% U+0178 LATIN CAPITAL LETTER Y WITH DIAERESIS; Ydieresis
\DeclareTextCompositeCommand{\"}{PU}{Y}{\81\170}% U+0178
% U+0179 LATIN CAPITAL LETTER Z WITH ACUTE; Zacute
\DeclareTextCompositeCommand{\'}{PU}{Z}{\81\171}% U+0179
% U+017A LATIN SMALL LETTER Z WITH ACUTE; zacute
\DeclareTextCompositeCommand{\'}{PU}{z}{\81\172}% U+017A
% U+017B LATIN CAPITAL LETTER Z WITH DOT ABOVE; Zdot, Zdotaccent
\DeclareTextCompositeCommand{\.}{PU}{Z}{\81\173}% U+017B
% U+017C LATIN SMALL LETTER Z WITH DOT ABOVE; zdot, zdotaccent
\DeclareTextCompositeCommand{\.}{PU}{z}{\81\174}% U+017C
% U+017D LATIN CAPITAL LETTER Z WITH CARON; Zcaron
\DeclareTextCompositeCommand{\v}{PU}{Z}{\81\175}% U+017D
% U+017E LATIN SMALL LETTER Z WITH CARON; zcaron
\DeclareTextCompositeCommand{\v}{PU}{z}{\81\176}% U+017E
% U+017F LATIN SMALL LETTER LONG S; longs, slong
\DeclareTextCommand{\textlongs}{PU}{\81\177}% U+017F
```

47.2.5 Latin Extended-B: U+0180 to U+024F

```
% U+0180 LATIN SMALL LETTER B WITH STROKE; bstroke; \textcrb (tipa)
\DeclareTextCommand{\textcrb}{PU}{\81\200}% U+0180
%* \textcrb -> \crossb (wsuipa)
% An alternate glyph with the stroke through the bowl:
%* \textcrb -> \textbarb (tipa)
%* \textcrb -> \barb (wsuipa)
% U+0181 LATIN CAPITAL LETTER B WITH HOOK; Bhook; \hausaB (phonetic)
```

```
\DeclareTextCommand{\texthausaB}{PU}{\81\201}%* U+0181
% U+0188 LATIN SMALL LETTER C WITH HOOK; chook; \texthtc (tipa)
\DeclareTextCommand{\texthtc}{PU}{\81\210}% U+0188
% U+018A LATIN CAPITAL LETTER D WITH HOOK; Dhook; \hausaD (phonetic)
\DeclareTextCommand{\texthausaD}{PU}{\81\212}%* U+018A
% U+018E LATIN CAPITAL LETTER REVERSED E; Ereversed
\DeclareTextCommand{\textEreversed}{PU}{\81\216}% U+018E
\DeclareTextCommand{\textrevE}{PU}{\81\216}% U+018E
% U+0192 LATIN SMALL LETTER F WITH HOOK; florin
\DeclareTextCommand{\textflorin}{PU}{\81\222}% U+0192
%* \textflorin -> \Florin (marvosym)
% U+0195 LATIN SMALL LETTER HV; hv; \texthvlig (tipa)
\DeclareTextCommand{\texthvlig}{PU}{\81\225}% U+0195
%* \texthvlig -> \hv (wsuipa)
% U+0198 LATIN CAPITAL LETTER K WITH HOOK; Khook; \hausaK (phonetic)
\DeclareTextCommand{\texthausaK}{PU}{\81\230}%* U+0198
% U+0199 LATIN SMALL LETTER K WITH HOOK; khook; \texthtk (tipa)
\DeclareTextCommand{\texthtk}{PU}{\81\231}% U+0199
%* \texthtk -> \hausak (phonetic)
% U+019A LATIN SMALL LETTER L WITH BAR; lbar;
%   \textbarl (tipa), \barl (wsuipa)
\DeclareTextCommand{\textbarl}{PU}{\81\232}%* U+019A
% U+019B LATIN SMALL LETTER LAMBDA WITH STROKE/
%   LATIN SMALL LETTER BARRED LAMBDA; lambdastroke;
%   \textcrlambda (tipa)
\DeclareTextCommand{\textcrlambda}{PU}{\81\233}% U+019B
%* \textcrlambda -> \crossnilambda (wsuipa)
%* \textcrlambda -> \barlambda (phonetic)
%* \textcrlambda -> \lambdabar (txfonts/pxfonts)
%* \textcrlambda -> \lambdaslash (txfonts/pxfonts)
% U+019E LATIN SMALL LETTER N WITH LONG RIGHT LEG; nlegrightlong;
%   \textnrleg (tipx)
\DeclareTextCommand{\textPUnrleg}{PU}{\81\236}% U+019E
%* \textPUnrleg -> \textnrleg (tipx)
% U+01A5 LATIN SMALL LETTER P WITH HOOK; phook; \texthtp (tipa)
\DeclareTextCommand{\texthtp}{PU}{\81\245}% U+01A5
% U+01AB LATIN SMALL LETTER T WITH PALATAL HOOK; tpalatalhook;
%   \textlhookt (tipa)
\DeclareTextCommand{\textlhookt}{PU}{\81\253}% U+01AB
% U+01AD LATIN SMALL LETTER T WITH HOOK; thook; \texthtt (tipa)
\DeclareTextCommand{\texthtt}{PU}{\81\255}% U+01AD
% U+01B9 LATIN SMALL LETTER EZH REVERSED/
%   LATIN SMALL LETTER REVERSED YOGH; \textrevyogh (tipa)
\DeclareTextCommand{\textrevyogh}{PU}{\81\271}% U+01B9
% U+01BB LATIN LETTER TWO WITH STROKE; twostroke; \textcrtwo (tipa)
\DeclareTextCommand{\textcrtwo}{PU}{\81\273}% U+01BB
% U+01BE LATIN LETTER INVERTED GLOTTAL STOP WITH STROKE;
%   glottalinvertedstroke; \textcrinvglotstop (tipa)
\DeclareTextCommand{\textcrinvglotstop}{PU}{\81\276}% U+01BE
% U+01BF LATIN LETTER WYNN; wynn; \textwynn (tipa)
\DeclareTextCommand{\textwynn}{PU}{\81\277}% U+01BF
```

```
% U+01C0 LATIN LETTER DENTAL CLICK/LATIN LETTER PIPE; clickdental;
%   \textpipe (tipa)
\DeclareTextCommand{\textpipe}{PU}{\81\300}% U+01C0
%* \textpipe -> \textpipevar (tipx)
% U+01C1 LATIN LETTER LATERAL CLICK/LATIN LETTER
%   DOUBLE PIPE; clicklateral; \textdoublepipe (tipa)
\DeclareTextCommand{\textdoublepipe}{PU}{\81\301}% U+01C1
%* \textdoublepipe -> \textdoublepipevar (tipx)
% U+01C2 LATIN LETTER ALVEOLAR CLICK/LATIN LETTER PIPE DOUBLE BAR;
%   clickalveolar; \textdoublebarpipe (tipa)
\DeclareTextCommand{\textdoublebarpipe}{PU}{\81\302}% U+01C2
%* \textdoublebarpipe -> \textdoublebarpipevar (tipx)
% U+01CD LATIN CAPITAL LETTER A WITH CARON; Acaron
\DeclareTextCompositeCommand{\v}{PU}{A}{\81\315}% U+01CD
% U+01CE LATIN SMALL LETTER A WITH CARON; acaron
\DeclareTextCompositeCommand{\v}{PU}{a}{\81\316}% U+01CE
% U+01CF LATIN CAPITAL LETTER I WITH CARON; Icaron
\DeclareTextCompositeCommand{\v}{PU}{I}{\81\317}% U+01CF
% U+01D0 LATIN SMALL LETTER I WITH CARON; icaron
\DeclareTextCompositeCommand{\v}{PU}{\i}{\81\320}% U+01D0
\DeclareTextCompositeCommand{\v}{PU}{i}{\81\320}% U+01D0
% U+01D1 LATIN CAPITAL LETTER O WITH CARON; Ocaron
\DeclareTextCompositeCommand{\v}{PU}{O}{\81\321}% U+01D1
% U+01D2 LATIN SMALL LETTER O WITH CARON; ocaron
\DeclareTextCompositeCommand{\v}{PU}{o}{\81\322}% U+01D2
% U+01D3 LATIN CAPITAL LETTER U WITH CARON; Ucaron
\DeclareTextCompositeCommand{\v}{PU}{U}{\81\323}% U+01D3
% U+01D4 LATIN SMALL LETTER U WITH CARON; ucaron
\DeclareTextCompositeCommand{\v}{PU}{u}{\81\324}% U+01D4
% U+01DD LATIN SMALL LETTER TURNED E; eturned; \inve (wasysym)
\DeclareTextCommand{\textinve}{PU}{\81\335}%* U+01DD
% U+01E4 LATIN CAPITAL LETTER G WITH STROKE; Gstroke
\DeclareTextCommand{\textGslash}{PU}{\81\344}% U+01E4
% U+01E5 LATIN SMALL LETTER G WITH STROKE; gstroke
\DeclareTextCommand{\textgslash}{PU}{\81\345}% U+01E5
%* \textgslash -> \textcrg (tipa)
% U+01E6 LATIN CAPITAL LETTER G WITH CARON; Gcaron
\DeclareTextCompositeCommand{\v}{PU}{G}{\81\346}% U+01E6
% U+01E7 LATIN SMALL LETTER G WITH CARON; gcaron
\DeclareTextCompositeCommand{\v}{PU}{g}{\81\347}% U+01E7
% U+01E8 LATIN CAPITAL LETTER K WITH CARON; Kcaron
\DeclareTextCompositeCommand{\v}{PU}{K}{\81\350}% U+01E8
% U+01E9 LATIN SMALL LETTER K WITH CARON; kcaron
\DeclareTextCompositeCommand{\v}{PU}{k}{\81\351}% U+01E9
% U+01EA LATIN CAPITAL LETTER O WITH OGONEK; Oogonek
\DeclareTextCompositeCommand{\k}{PU}{O}{\81\352}% U+01EA
% U+01EB LATIN SMALL LETTER O WITH OGONEK; oogonek
\DeclareTextCompositeCommand{\k}{PU}{o}{\81\353}% U+01EB
% U+01F0 LATIN SMALL LETTER J WITH CARON; jcaron
\DeclareTextCompositeCommand{\v}{PU}{\j}{\81\360}% U+01F0
\DeclareTextCompositeCommand{\v}{PU}{j}{\81\360}% U+01F0
% U+01F4 LATIN CAPITAL LETTER G WITH ACUTE; Gacute
```

```
\DeclareTextCompositeCommand{\'}{PU}{G}{\81\364}% U+01F4
% U+01F5 LATIN SMALL LETTER G WITH ACUTE; gacute
\DeclareTextCompositeCommand{\'}{PU}{g}{\81\365}% U+01F5
% U+01F8 LATIN CAPITAL LETTER N WITH GRAVE
\DeclareTextCompositeCommand{\`}{PU}{N}{\81\370}% U+01F8
% U+01F9 LATIN SMALL LETTER N WITH GRAVE
\DeclareTextCompositeCommand{\`}{PU}{n}{\81\371}% U+01F9
% U+01FC LATIN CAPITAL LETTER AE WITH ACUTE; AEacute
\DeclareTextCompositeCommand{\'}{PU}{\AE}{\81\374}% U+01FC
% U+01FD LATIN SMALL LETTER AE WITH ACUTE; aeacute
\DeclareTextCompositeCommand{\'}{PU}{\ae}{\81\375}% U+01FD
% U+01FE LATIN CAPITAL LETTER O WITH STROKE AND ACUTE;
%   *Oslashacute, Ostrokeacut
\DeclareTextCompositeCommand{\'}{PU}{\O}{\81\376}% U+01FE
% U+01FF LATIN SMALL LETTER O WITH STROKE AND ACUTE;
%   *oslashacute, ostrokeacute
\DeclareTextCompositeCommand{\'}{PU}{\o}{\81\377}% U+01FF
⟨/puenc⟩
⟨*puextra⟩
% U+0200 LATIN CAPITAL LETTER A WITH DOUBLE GRAVE; Adblgrave
\DeclareTextCompositeCommand{\G}{PU}{A}{\82\000}% U+0200
% U+0201 LATIN SMALL LETTER A WITH DOUBLE GRAVE; adblgrave
\DeclareTextCompositeCommand{\G}{PU}{a}{\82\001}% U+0201
% U+0204 LATIN CAPITAL LETTER E WITH DOUBLE GRAVE; Edblgrave
\DeclareTextCompositeCommand{\G}{PU}{E}{\82\004}% U+0204
% U+0205 LATIN SMALL LETTER E WITH DOUBLE GRAVE; edblgrave
\DeclareTextCompositeCommand{\G}{PU}{e}{\82\005}% U+0205
⟨/puextra⟩
⟨*puenc⟩
% U+0206 LATIN CAPITAL LETTER E WITH INVERTED BREVE; Einvert-
    edbreve
\DeclareTextCompositeCommand{\textinvbreve}{PU}{E}{\82\006}% U+0206
% U+0207 LATIN SMALL LETTER E WITH INVERTED BREVE; einverted-
    breve
\DeclareTextCompositeCommand{\textinvbreve}{PU}{e}{\82\007}% U+0207
⟨/puenc⟩
⟨*puextra⟩
% U+0208 LATIN CAPITAL LETTER I WITH DOUBLE GRAVE; Idblgrave
\DeclareTextCompositeCommand{\G}{PU}{I}{\82\010}% U+0208
% U+0209 LATIN SMALL LETTER I WITH DOUBLE GRAVE; idblgrave
\DeclareTextCompositeCommand{\G}{PU}{\i}{\82\011}% U+0209
\DeclareTextCompositeCommand{\G}{PU}{i}{\82\011}% U+0209
⟨/puextra⟩
⟨*puenc⟩
% U+020A LATIN CAPITAL LETTER I WITH INVERTED BREVE; Iinverted-
    breve
\DeclareTextCompositeCommand{\textinvbreve}{PU}{I}{\82\012}% U+020A
% U+020B LATIN SMALL LETTER I WITH INVERTED BREVE; iinverted-
    breve
\DeclareTextCompositeCommand{\textinvbreve}{PU}{i}{\82\013}% U+020B
\DeclareTextCompositeCommand{\textinvbreve}{PU}{\i}{\82\013}% U+020B
⟨/puenc⟩
⟨*puextra⟩
% U+020C LATIN CAPITAL LETTER O WITH DOUBLE GRAVE; Odblgrave
```

```
\DeclareTextCompositeCommand{\G}{PU}{O}{\82\014}% U+020C
% U+020D LATIN SMALL LETTER O WITH DOUBLE GRAVE; odblgrave
\DeclareTextCompositeCommand{\G}{PU}{o}{\82\015}% U+020D
⟨/puextra⟩
⟨*puenc⟩
% U+020E LATIN CAPITAL LETTER O WITH INVERTED BREVE; Oinvertedbreve
\DeclareTextCompositeCommand{\textinvbreve}{PU}{O}{\82\016}% U+020E
% U+020F LATIN SMALL LETTER O WITH INVERTED BREVE; oinvertedbreve
\DeclareTextCompositeCommand{\textinvbreve}{PU}{o}{\82\017}% U+020F
⟨/puenc⟩
⟨*puextra⟩
% U+0210 LATIN CAPITAL LETTER R WITH DOUBLE GRAVE; Rdblgrave
\DeclareTextCompositeCommand{\G}{PU}{R}{\82\020}% U+0210
% U+0211 LATIN SMALL LETTER R WITH DOUBLE GRAVE; rdblgrave
\DeclareTextCompositeCommand{\G}{PU}{r}{\82\021}% U+0211
% U+0214 LATIN CAPITAL LETTER U WITH DOUBLE GRAVE; Udblgrave
\DeclareTextCompositeCommand{\G}{PU}{U}{\82\024}% U+0214
% U+0215 LATIN SMALL LETTER U WITH DOUBLE GRAVE; udblgrave
\DeclareTextCompositeCommand{\G}{PU}{u}{\82\025}% U+0215
⟨/puextra⟩
⟨*puenc⟩
% U+0216 LATIN CAPITAL LETTER U WITH INVERTED BREVE; Uinvertedbreve
\DeclareTextCompositeCommand{\textinvbreve}{PU}{U}{\82\026}% U+0216
% U+0217 LATIN SMALL LETTER U WITH INVERTED BREVE; uinvertedbreve
\DeclareTextCompositeCommand{\textinvbreve}{PU}{u}{\82\027}% U+0217
% U+021E LATIN CAPITAL LETTER H WITH CARON
\DeclareTextCompositeCommand{\v}{PU}{H}{\82\036}% U+021E
% U+021F LATIN SMALL LETTER H WITH CARON
\DeclareTextCompositeCommand{\v}{PU}{h}{\82\037}% U+021F
% U+0221 LATIN SMALL LETTER D WITH CURL; \textctd (tipa)
\DeclareTextCommand{\textctd}{PU}{\82\041}% U+0221
% U+0225 LATIN SMALL LETTER Z WITH HOOK; \textcommatailz (tipa)
\DeclareTextCommand{\textcommatailz}{PU}{\82\045}% U+0225
% U+0226 LATIN CAPITAL LETTER A WITH DOT ABOVE
\DeclareTextCompositeCommand{\.}{PU}{A}{\82\046}% U+0226
% U+0227 LATIN SMALL LETTER A WITH DOT ABOVE
\DeclareTextCompositeCommand{\.}{PU}{a}{\82\047}% U+0227
% U+0228 LATIN CAPITAL LETTER E WITH CEDILLA
\DeclareTextCompositeCommand{\c}{PU}{E}{\82\050}% U+0228
% U+0229 LATIN SMALL LETTER E WITH CEDILLA
\DeclareTextCompositeCommand{\c}{PU}{e}{\82\051}% U+0229
% U+022E LATIN CAPITAL LETTER O WITH DOT ABOVE
\DeclareTextCompositeCommand{\.}{PU}{O}{\82\056}% U+022E
% U+022F LATIN SMALL LETTER O WITH DOT ABOVE
\DeclareTextCompositeCommand{\.}{PU}{o}{\82\057}% U+022F
% U+0232 LATIN CAPITAL LETTER Y WITH MACRON
\DeclareTextCompositeCommand{\=}{PU}{Y}{\82\062}% U+0232
% U+0233 LATIN SMALL LETTER Y WITH MACRON
\DeclareTextCompositeCommand{\=}{PU}{y}{\82\063}% U+0233
% U+0235 LATIN SMALL LETTER N WITH CURL; \textctn (tipa)
```

```
\DeclareTextCommand{\textctn}{PU}{\82\065}% U+0235
% U+0236 LATIN SMALL LETTER T WITH CURL; \textctt (tipa)
\DeclareTextCommand{\textctt}{PU}{\82\066}% U+0236
% U+0237 LATIN SMALL LETTER DOTLESS J
\DeclareTextCommand{\j}{PU}{\82\067}% U+0237
% U+0238 LATIN SMALL LETTER DB DIGRAPH; \textdblig (tipx)
\DeclareTextCommand{\textPUdblig}{PU}{\82\070}% U+0238
%* \textPUdblig -> \textdblig (tipx)
% U+0239 LATIN SMALL LETTER QP DIGRAPH; \textqplig (tipx)
\DeclareTextCommand{\textPUqplig}{PU}{\82\071}% U+0239
%* \textPUqplig -> \textqplig (tipx)
% U+023C LATIN SMALL LETTER C WITH STROKE; \slashc (wsuipa)
\DeclareTextCommand{\textslashc}{PU}{\82\074}%* U+023C
%* \textslashc -> \textcentoldstyle (textcomp)
% With bar instead of stroke:
%* \textslashc -> \textbarc (tipa)
```

47.2.6 IPA Extensions: U+0250 to U+02AF

```
% U+0250 LATIN SMALL LETTER TURNED A; aturned; \textturna (tipa)
\DeclareTextCommand{\textturna}{PU}{\82\120}% U+0250
%* \textturna -> \inva (wasysym)
% U+0251 LATIN SMALL LETTER ALPHA/LATIN SMALL LETTER
%   SCRIPT A; ascript; \textscripta (tipa), \scripta (wsuipa)
\DeclareTextCommand{\textscripta}{PU}{\82\121}%* U+0251
%* \textscripta -> \vara (phonetic)
% U+0252 LATIN SMALL LETTER TURNED ALPHA; ascriptturned;
%   \textturnscripta (tipa)
\DeclareTextCommand{\textturnscripta}{PU}{\82\122}% U+0252
%* \textturnscripta -> \invscripta (wsuipa)
%* \textturnscripta -> \rotvara (phonetic)
% U+0253 LATIN CAPITAL LETTER B WITH HOOK; bhook; \texthtb (tipa)
\DeclareTextCommand{\texthtb}{PU}{\82\123}% U+0253
%* \texthtb -> \hookb (wsuipa)
%* \texthtb -> \hausab (phonetic)
% U+0254 LATIN SMALL LETTER OPEN O; oopen;
%   \textopeno (tipa), \openo (wasysym)
\DeclareTextCommand{\textopeno}{PU}{\82\124}%* U+0254
%* \textopeno -> \varopeno (phonetic)
% U+0255 LATIN SMALL LETTER C WITH CURL; ccurl; \textctc (tipa)
\DeclareTextCommand{\textctc}{PU}{\82\125}% U+0255
%* \textctc -> \curlyc (wsuipa)
% U+0256 LATIN SMALL LETTER D WITH TAIL; dtail; \textrtaild (tipa)
\DeclareTextCommand{\textrtaild}{PU}{\82\126}%* U+0256
%* \textrtaild -> \taild (wsuipa)
% U+0257 LATIN SMALL LETTER D WITH HOOK; dhook; \texthtd (tipa)
\DeclareTextCommand{\texthtd}{PU}{\82\127}% U+0257
%* \texthtd -> \hookd (wsuipa)
%* \texthtd -> \hausad (phonetic)
% U+0258 LATIN SMALL LETTER REVERSED E; ereversed;
%   \textreve (tipa), \reve (wsuipa)
\DeclareTextCommand{\textreve}{PU}{\82\130}%* U+0258
% U+0259 LATIN SMALL LETTER SCHWA; schwa;
%   \textschwa (tipa), \schwa (wsuipa, phonetic)
\DeclareTextCommand{\textschwa}{PU}{\82\131}%* U+0259
```

```
% U+025A LATIN SMALL LETTER SCHWA WITH HOOK; schwahook;
%   \textrhookschwa (tipa)
\DeclareTextCommand{\textrhookschwa}{PU}{\82\132}% U+025A
%* \textrhookschwa -> \er (wsuipa)
% U+025B LATIN SMALL LETTER OPEN E/LATIN SMALL LETTER EPSILON; eopen;
%   \niepsilon (wsuipa)
\DeclareTextCommand{\textniepsilon}{PU}{\82\133}%* U+025B
%* \textniepsilon -> \epsi (phonetic)
% U+025C LATIN SMALL LETTER REVERSED OPEN E; eopenreversed;
%   \textrevepsilon (tipa), \revepsilon (wsuipa)
\DeclareTextCommand{\textrevepsilon}{PU}{\82\134}%* U+025C
% U+025D LATIN SMALL LETTER REVERSED OPEN E WITH HOOK; eopenreversedhook;
%   \textrhookrevepsilon (tipa)
\DeclareTextCommand{\textrhookrevepsilon}{PU}{\82\135}%* U+025D
%* \textrhookrevepsilon -> \hookrevepsilon (wsuipa)
% U+025E LATIN SMALL LETTER CLOSED REVERSED OPEN E; eopenreversedclosed;
%   \textcloserevepsilon (tipa)
\DeclareTextCommand{\textcloserevepsilon}{PU}{\82\136}% U+025E
%* \textcloserevepsilon -> \closedrevepsilon (wsuipa)
% U+025F LATIN SMALL LETTER DOTLESS J WITH STROKE; jdotlessstroke;
%   \textbardotlessj (tipa)
\DeclareTextCommand{\textbardotlessj}{PU}{\82\137}% U+025F
%* \textbardotlessj -> \barj (phonetic)
% U+0260 LATIN SMALL LETTER G WITH HOOK; ghook; \texthtg (tipa)
\DeclareTextCommand{\texthtg}{PU}{\82\140}% U+0260
%* \texthtg -> \hookg (wsuipa)
% U+0261 LATIN SMALL LETTER SCRIPT G; gscript;
%   \textscriptg (tipa), \scriptg (wsuipa)
\DeclareTextCommand{\textscriptg}{PU}{\82\141}%* U+0261
%* \textscriptg -> \varg (phonetic)
% U+0262 LATIN LETTER SMALL CAPITAL G; \textscg (tipa), \scg (wsuipa)
\DeclareTextCommand{\textscg}{PU}{\82\142}%* U+0262
% U+0263 LATIN SMALL LETTER GAMMA; gammalatinsmall;
%   \ipagamma (wsuipa), \vod (phonetic)
\DeclareTextCommand{\textipagamma}{PU}{\82\143}%* U+0263
%* \textipagamma -> \vod (pnonetic)
% U+0264 LATIN SMALL LETTER RAMS HORN; ramshorn;
%   \babygamma (wsuipa)
\DeclareTextCommand{\textbabygamma}{PU}{\82\144}%* U+0264
% U+0265 LATIN SMALL LETTER TURNED H; hturned; \textturnh (tipa)
\DeclareTextCommand{\textturnh}{PU}{\82\145}% U+0265
%* \textturnh -> \invh (wsuipa)
%* \textturnh -> \udesc (phonetic)
% U+0266 LATIN SMALL LETTER H WITH HOOK; hhook; \texthth (tipa)
\DeclareTextCommand{\texthth}{PU}{\82\146}% U+0266
%* \texthth -> \hookh (wsuipa)
%* \texthth -> \voicedh (phonetic)
% U+0267 LATIN SMALL LETTER HENG WITH HOOK; henghook; \textheng (tipa)
\DeclareTextCommand{\textheng}{PU}{\82\147}% U+0267
```

```
%* \textththeng -> \hookheng (wsuipa)
% U+0268 LATIN SMALL LETTER I WITH STROKE;
%   \textbari (tipa), \bari (wsuipa)
\DeclareTextCommand{\textbari}{PU}{\82\150}%* U+0268
%* \textbari -> \ibar (phonetic)
% U+0269 LATIN SMALL LETTER IOTA; iotalatin; \niiota (wsuipa)
\DeclareTextCommand{\textniiota}{PU}{\82\151}%* U+0269
%* \textniiota -> \vari (phonetic)
% U+026A LATIN LETTER SMALL CAPITAL I; \textsci (tipa), \sci (wsuipa)
\DeclareTextCommand{\textsci}{PU}{\82\152}%* U+026A
% U+026B LATIN SMALL LETTER L WITH MIDDLE TILDE; lmiddletilde;
%   \textltilde (tipa)
\DeclareTextCommand{\textltilde}{PU}{\82\153}% U+026B
%* \textltilde -> \tildel (wsuipa)
% U+026C LATIN SMALL LETTER L WITH BELT; lbelt; \textbeltl (tipa)
\DeclareTextCommand{\textbeltl}{PU}{\82\154}% U+026C
%* \textbeltl -> \latfric (wsuipa)
% U+026D LATIN SMALL LETTER L WITH RETROFLEX HOOK;
%   lhookretroflex; \textrtaill (tipa)
\DeclareTextCommand{\textrtaill}{PU}{\82\155}% U+026D
%* \textrtaill -> \taill (wsuipa)
% U+026E LATIN SMALL LETTER LEZH; lezh; \textlyoghlig (tipa)
\DeclareTextCommand{\textlyoghlig}{PU}{\82\156}% U+026E
%* \textlyoghlig -> \lz (wsuipa)
% U+026F LATIN SMALL LETTER TURNED M; mturned; \textturnm (tipa)
\DeclareTextCommand{\textturnm}{PU}{\82\157}% U+026F
%* \textturnm -> \invm (wsuipa)
%* \textturnm -> \rotm (phonetic)
% U+0270 LATIN SMALL LETTER TURNED M WITH LONG LEG; mlonglegturned;
%   \textturnmrleg (tipa)
\DeclareTextCommand{\textturnmrleg}{PU}{\82\160}% U+0270
%* \textturnmrleg -> \legm (wsuipa)
% U+0271 LATIN SMALL LETTER M WITH HOOK; mhook; \textltailm (tipa)
\DeclareTextCommand{\textltailm}{PU}{\82\161}% U+0271
%* \textltailm -> \labdentalnas (wsuipa)
%* \textltailm -> \emgma (phonetic)
% U+0272 LATIN SMALL LETTER N WITH LEFT HOOK; nhookleft; \textltailn (tipa)
\DeclareTextCommand{\textltailn}{PU}{\82\162}% U+0272
%* \textltailn -> \nj (wsuipa)
%* \textltailn -> \enya (phonetic)
% U+0273 LATIN SMALL LETTER N WITH RETROFLEX HOOK;
%   nhookretroflex; \textrtailn (tipa)
\DeclareTextCommand{\textrtailn}{PU}{\82\163}% U+0273
%* \textrtailn -> \tailn (wsuipa)
% U+0274 LATIN LETTER SMALL CAPITAL N; \textscn (tipa), \scn (wsuipa)
\DeclareTextCommand{\textscn}{PU}{\82\164}%* U+0274
% U+0275 LATIN CAPITAL LETTER O WITH MIDDLE TILDE/
%   LATIN CAPITAL LETTER BARRED O; obarred;
%   \textbaro (tipa), \baro (wsuipa)
% But \baro from stmaryrd is different!
\DeclareTextCommand{\textbaro}{PU}{\82\165}% U+0275
% U+0276 LATIN LETTER SMALL CAPITAL OE; \textscoelig (tipa)
```

```
\DeclareTextCommand{\textscoelig}{PU}{\82\166}% U+0276
% U+0277 LATIN SMALL LETTER CLOSED OMEGA; omegalatinclosed;
%   \textcloseomega (tipa)
\DeclareTextCommand{\textcloseomega}{PU}{\82\167}% U+0277
%* \textcloseomega -> \closedniomega (wsuipa)
%* \textcloseomega -> \varomega (phonetic)
% U+0278 LATIN SMALL LETTER PHI; philatin; \niphi (wsuipa)
\DeclareTextCommand{\textniphi}{PU}{\82\170}%* U+0278
% U+0279 LATIN SMALL LETTER TURNED R; rturned; \textturnr (tipa)
\DeclareTextCommand{\textturnr}{PU}{\82\171}% U+0279
%* \textturnr -> \invr (wsuipa)
%* \textturnr -> \rotr (phonetic)
% U+027A LATIN SMALL LETTER TURNED R WITH LONG LEG;
%   rlonglegturned; \textturnlonglegr (tipa)
\DeclareTextCommand{\textturnlonglegr}{PU}{\82\172}% U+027A
%* \textturnlonglegr -> \invlegr (wsuipa)
% U+027B LATIN SMALL LETTER TURNED R WITH HOOK; rhookturned;
%   \textturnrrtail (tipa)
\DeclareTextCommand{\textturnrrtail}{PU}{\82\173}% U+027B
%* \textturnrrtail -> \tailinvr (wsuipa)
% U+027C LATIN SMALL LETTER R WITH LONG LEG; rlongleg; \textlonglegr (tipa)
\DeclareTextCommand{\textlonglegr}{PU}{\82\174}%* U+027C
%* \textlonglegr -> \legr (wsuipa)
% U+027D LATIN SMALL LETTER R WITH TAIL; rhook; \textrtailr (tipa)
\DeclareTextCommand{\textrtailr}{PU}{\82\175}% U+027D
%* \textrtailr -> \tailr (wsuipa)
% U+027E LATIN SMALL LETTER R WITH FISHHOOK; rfishhook;
%   \textfishhookr (tipa)
\DeclareTextCommand{\textfishhookr}{PU}{\82\176}% U+027E
%* \textfishhookr -> \flapr (wsuipa)
%* \textfishhookr -> \flap (phonetic)
% U+027F LATIN SMALL LETTER REVERSED R WITH FISHHOOK; rfishhookreversed;
%   \textlhtlongi (tipa)
\DeclareTextCommand{\textlhtlongi}{PU}{\82\177}% U+027F
% U+0280 LATIN LETTER SMALL CAPITAL R; \textscr (tipa), \scr (wsuipa)
\DeclareTextCommand{\textscr}{PU}{\82\200}%* U+0280
% U+0281 LATIN LETTER SMALL CAPITAL INVERTED R; Rsmallinverted;
%   \textinvscr (tipa), \invscr (wsuipa)
\DeclareTextCommand{\textinvscr}{PU}{\82\201}%* U+0281
% U+0282 LATIN SMALL LETTER S WITH HOOK; shook; \textrtails (tipa)
\DeclareTextCommand{\textrtails}{PU}{\82\202}% U+0282
%* \textrtails -> \tails (wsuipa)
% U+0283 LATIN SMALL LETTER ESH; esh; \textesh (tipa), \esh (wsuipa)
\DeclareTextCommand{\textesh}{PU}{\82\203}%* U+0283
% U+0284 LATIN SMALL LETTER DOTLESS J WITH STROKE AND HOOK;
%   dotlessjstrokehook; \texthtbardotlessj (tipa)
\DeclareTextCommand{\texthtbardotlessj}{PU}{\82\204}% U+0284
% U+0285 LATIN SMALL LETTER SQUAT REVERSED ESH; eshsquatreversed;
%   \textvibyi (tipa)
\DeclareTextCommand{\textvibyi}{PU}{\82\205}% U+0285
% U+0286 LATIN SMALL LETTER ESH WITH CURL; eshcurl; \textctesh (tipa)
```

```
\DeclareTextCommand{\textctesh}{PU}{\82\206}% U+0286
%* \textctesh -> \curlyesh (wsuipa)
% U+0287 LATIN SMALL LETTER TURNED T; tturned; \textturnt (tipa)
\DeclareTextCommand{\textturnt}{PU}{\82\207}% U+0287
%* \textturnt -> \clickt (wsuipa)
% U+0288 LATIN SMALL LETTER T WITH RETROFLEX HOOK; tretroflexhook;
%   \textrtailt (tipa)
\DeclareTextCommand{\textrtailt}{PU}{\82\210}% U+0288
%* \textrtailt -> \tailt (wsuipa)
% U+0289 LATIN SMALL LETTER U BAR; ubar;
%   \textbaru (tipa), \baru (wsuipa)
\DeclareTextCommand{\textbaru}{PU}{\82\211}%* U+0289
%* \textbaru -> \ubar (phonetic)
% U+028A LATIN SMALL LETTER UPSILON; \niupsilon (wsuipa)
\DeclareTextCommand{\textniupsilon}{PU}{\82\212}%* U+028A
%* \textniupsilon -> \rotOmega (phonetic)
% U+028B LATIN SMALL LETTER V WITH HOOK/LATIN SMALL LETTER SCRIPT V;
%   vhook; \textscriptv (tipa), \scriptv (wsuipa)
\DeclareTextCommand{\textscriptv}{PU}{\82\213}%* U+028B
% U+028C LATIN SMALL LETTER TURNED V; vturned; \textturnv (tipa)
\DeclareTextCommand{\textturnv}{PU}{\82\214}%* U+028C
%* \textturnv -> \invv (wsuipa)
%* \textturnv -> \pwedge (phonetic)
% U+028D LATIN SMALL LETTER TURNED W; wturned; \textturnw (tipa)
\DeclareTextCommand{\textturnw}{PU}{\82\215}%* U+028D
%* \textturnw -> \invw (wsuipa)
%* \textturnw -> \rotw (phonetic)
% U+028E LATIN SMALL LETTER TURNED Y; yturned; \textturny (tipa)
\DeclareTextCommand{\textturny}{PU}{\82\216}%* U+028E
%* \textturny -> \invy (wsuipa)
%* \textturny -> \roty (phonetic)
% U+028F LATIN LETTER SMALL CAPITAL Y; \textscy (tipa), \scy (wsuipa)
\DeclareTextCommand{\textscy}{PU}{\82\217}%* U+028F
% U+0290 LATIN SMALL LETTER Z WITH RETROFLEX HOOK; zretroflexhook;
%   \textrtailz (tipa)
\DeclareTextCommand{\textrtailz}{PU}{\82\220}% U+0290
%* \textrtailz -> \tailz (wsuipa)
% U+0291 LATIN SMALL LETTER Z WITH CURL; zcurl; \textctz (tipa)
\DeclareTextCommand{\textctz}{PU}{\82\221}% U+0291
%* \textctz -> \curlyz (wsuipa)
% U+0292 LATIN SMALL LETTER EZH/LATIN SMALL LETTER YOGH; ezh;
%   \textyogh (tipa), \yogh (wsuipa)
\DeclareTextCommand{\textyogh}{PU}{\82\222}%* U+0292
% U+0293 LATIN SMALL LETTER EZH WITH CURL/LATIN SMALL LETTER YOGH CURL;
%   ezhcurl; \textctyogh (tipa)
\DeclareTextCommand{\textctyogh}{PU}{\82\223}% U+0293
%* \textctyogh -> \curlyyogh (wsuipa)
% U+0294 LATIN LETTER GLOTTAL STOP; glottalstop;
%   \textglotstop (tipa), \glotstop (wsuipa)
\DeclareTextCommand{\textglotstop}{PU}{\82\224}%* U+0294
```

```
%* \textglotstop -> \ejective (wsuipa)
%* \textglotstop -> \glottal (phonetic)
% U+0295 LATIN LETTER PHARYNGEAL VOICED FRICATIVE/
%   LATIN LETTER REVERSED GLOTTAL STOP; glottalstopreversed;
%   \textrevglotstop (tipa), \revglotstop (wsuipa)
\DeclareTextCommand{\textrevglotstop}{PU}{\82\225}%* U+0295
%* \textrevglotstop -> \reveject (wsuipa)
% U+0296 LATIN LETTER INVERTED GLOTTAL STOP; glottalstopinverted;
%   \textinvglotstop (tipa), \invglotstop (wsuipa)
\DeclareTextCommand{\textinvglotstop}{PU}{\82\226}%* U+0296
% U+0297 LATIN LETTER STRETCHED C; cstretched; \textstretchc (tipa)
\DeclareTextCommand{\textstretchc}{PU}{\82\227}% U+0297
%* \textstretchc -> \clickc (wsuipa)
%* \textstretchc -> \textstretchcvar (tipx)
% U+0298 LATIN LETTER BILABIAL CLICK; bilabialclick;
%   \textbullseye (tipa)
\DeclareTextCommand{\textbullseye}{PU}{\82\230}% U+0298
%* \textbullseye -> \clickb (wsuipa)
%* \textbullseye -> \textObullseye (tipx)
% U+0299 LATIN LETTER SMALL CAPITAL B; \textscb (tipa)
\DeclareTextCommand{\textscb}{PU}{\82\231}% U+0299
% U+029A LATIN SMALL LETTER CLOSED OPEN E; eopenclosed;
%   \textcloseepsilon (tipa)
\DeclareTextCommand{\textcloseepsilon}{PU}{\82\232}% U+029A
% U+029B LATIN LETTER SMALL CAPITAL G WITH HOOK; Gsmallhook;
%   \texthtscg (tipa)
\DeclareTextCommand{\texthtscg}{PU}{\82\233}% U+029B
% U+029C LATIN LETTER SMALL CAPITAL H; \textsch (tipa)
\DeclareTextCommand{\textsch}{PU}{\82\234}% U+029C
% U+029D LATIN SMALL LETTER J WITH CROSSED-TAIL; jcrossed-
    tail; \textcdj (tipa)
\DeclareTextCommand{\textctj}{PU}{\82\235}% U+029D
%* \textctj -> \textctjvar (tipx)
% U+029E LATIN SMALL LETTER TURNED K; kturned; \textturnk (tipa)
\DeclareTextCommand{\textturnk}{PU}{\82\236}% U+029E
%* \textturnk -> \textturnsck (tipx)
% U+029F LATIN LETTER SMALL CAPITAL L; \textscl (tipa)
\DeclareTextCommand{\textscl}{PU}{\82\237}% U+029F
% U+02A0 LATIN SMALL LETTER Q WITH HOOK; qhook; \texthtq (tipa)
\DeclareTextCommand{\texthtq}{PU}{\82\240}% U+02A0
% U+02A1 LATIN LETTER GLOTTAL STOP WITH STROKE; glottalstop-
    stroke;
%   \textbarglotstop (tipa)
\DeclareTextCommand{\textbarglotstop}{PU}{\82\241}% U+02A1
% U+02A2 LATIN LETTER REVERSED GLOTTAL STOP WITH STROKE/
%   LATIN LETTER REVERSED GLOTTAL STOP BAR; glottalstopstrokere-
    versed;
%   \textbarrevglotstop (tipa)
\DeclareTextCommand{\textbarrevglotstop}{PU}{\82\242}% U+02A2
% U+02A3 LATIN SMALL LETTER DZ DIGRAPH; dzaltone; \textdzlig (tipa)
\DeclareTextCommand{\textdzlig}{PU}{\82\243}% U+02A3
%* \textdzlig -> \dz (wsupipa)
% U+02A4 LATIN SMALL LETTER DEZH DIGRAPH; dezh; \textdyogh-
    lig (tipa)
```

```
\DeclareTextCommand{\textdyoghlig}{PU}{\82\244}% U+02A4
% U+02A5 LATIN SMALL LETTER DZ DIGRAPH WITH CURL; dzcurl;
%   \textdctzlig (tipa)
\DeclareTextCommand{\textdctzlig}{PU}{\82\245}% U+02A5
% U+02A6 LATIN SMALL LETTER TS DIGRAPH; ts; \texttslig (tipa)
\DeclareTextCommand{\texttslig}{PU}{\82\246}% U+02A6
% U+02A7 LATIN SMALL LETTER TESH DIGRAPH; tesh; \textteshlig (tipa)
\DeclareTextCommand{\textteshlig}{PU}{\82\247}% U+02A7
%* \textteshlig -> \tesh (wsuipa)
% U+02A8 LATIN SMALL LETTER TC DIGRAPH WITH CURL; tccurl;
%   \texttctclig (tipa)
\DeclareTextCommand{\texttctclig}{PU}{\82\250}% U+02A8
% U+02AE LATIN SMALL LETTER TURNED H WITH FISHHOOK;
%   \textlhtlongy (tipa)
\DeclareTextCommand{\textlhtlongy}{PU}{\82\256}% U+02AE
% U+02AF LATIN SMALL LETTER TURNED H WITH FISHHOOK AND TAIL;
%   \textvibyy (tipa)
\DeclareTextCommand{\textvibyy}{PU}{\82\257}% U+02AF
```

47.2.7 Spacing Modifier Letters: U+02B0 to U+02FF

```
% U+02BD MODIFIER LETTER REVERSED COMMA;
%   commareversedmod, afii64937; \textrevapostrophe (tipa)
\DeclareTextCommand{\textrevapostrophe}{PU}{\82\275}% U+02BD
% U+02C0 MODIFIER LETTER GLOTTAL STOP; glottalstopmod;
%   \textraiseglotstop (tipa)
\DeclareTextCommand{\textraiseglotstop}{PU}{\82\300}% U+02C0
% U+02C2 MODIFIER LETTER LEFT ARROWHEAD; arrowheadleftmod;
%   \textlptr (tipa)
\DeclareTextCommand{\textlptr}{PU}{\82\302}% U+02C2
% U+02C3 MODIFIER LETTER RIGHT ARROWHEAD; arrowheadrightmod;
%   \textrptr (tipa)
\DeclareTextCommand{\textrptr}{PU}{\82\303}% U+02C3
% U+02C7 CARON; caron
\DeclareTextCommand{\textasciicaron}{PU}{\82\307}% U+02C7
% U+02C8 MODIFIER LETTER VERTICAL LINE; verticallinemod;
%   \textprimstress (tipa)
\DeclareTextCommand{\textprimstress}{PU}{\82\310}% U+02C8
% U+02CC MODIFIER LETTER LOW VERTICAL LINE; verticallinelowmod;
%   \textsecstress (tipa)
\DeclareTextCommand{\textsecstress}{PU}{\82\314}% U+02CC
% U+02D0 MODIFIER LETTER TRIANGULAR COLON; colontriangularmod;
%   \textlengthmark (tipa)
\DeclareTextCommand{\textlengthmark}{PU}{\82\320}% U+02D0
% U+02D1 MODIFIER LETTER HALF TRIANGULAR COLON; colontriangu-
    larhalfmod;
%   \texthalflength (tipa)
\DeclareTextCommand{\texthalflength}{PU}{\82\321}% U+02D1
% U+02D8 BREVE; breve
\DeclareTextCommand{\textasciibreve}{PU}{\82\330}% U+02D8
% U+02D9 DOT ABOVE; dotaccent
\DeclareTextCommand{\textdotaccent}{PU}{\82\331}% U+02D9
% U+02DA RING ABOVE; ring
\DeclareTextCommand{\textring}{PU}{\82\332}% U+02DA
% U+02DB OGONEK; ogonek
```

```
\DeclareTextCommand{\textogonek}{PU}{\82\333}% U+02DB
% U+02DC SMALL TILDE; ilde, *tilde
\DeclareTextCommand{\texttilde}{PU}{\82\334}% U+02DC
% U+02DD DOUBLE ACUTE ACCENT; hungarumlaut
\DeclareTextCommand{\texthungarumlaut}{PU}{\82\335}% U+02DD
\DeclareTextCommand{\textacutedbl}{PU}{\82\335}% U+02DD
% U+02F3 MODIFIER LETTER LOW RING
\DeclareTextCommand{\textringlow}{PU}{\82\363}% U+02F3
% U+02F5 MODIFIER LETTER MIDDLE DOUBLE GRAVE ACCENT
\DeclareTextCommand{\textgravedbl}{PU}{\82\365}% U+02F5
% U+02F7 MODIFIER LETTER LOW TILDE
\DeclareTextCommand{\texttildelow}{PU}{\82\367}% U+02F7
% U+02F9 MODIFIER LETTER BEGIN HIGH TONE; \textopencorner (tipa)
\DeclareTextCommand{\textopencorner}{PU}{\82\371}% U+02F9
% U+02FA MODIFIER LETTER END HIGH TONE; \textcorner (tipa)
\DeclareTextCommand{\textcorner}{PU}{\82\372}% U+02FA
```

47.2.8 Combining Diacritical Marks: U+0300 to U+036F

```
% U+030F COMBINING DOUBLE GRAVE ACCENT; dblgravecmb
\DeclareTextCommand{\textdoublegrave}{PU}{ \83\017}% U+030F
% U+0311 COMBINING INVERTED BREVE; breveinvertedcmb
\DeclareTextCommand{\textnewtie}{PU}{ \83\021}% U+0311
% U+0323 COMBINING DOT BELOW; dotbelowcmb, *dotbelowcomb
\DeclareTextCommand{\textdotbelow}{PU}{ \83\043}% U+0323
% U+0331 COMBINING MACRON BELOW; macronbelowcmb
\DeclareTextCommand{\textmacronbelow}{PU}{ \83\061}% U+0331
% U+0361 COMBINING DOUBLE INVERTED BREVE; breveinverteddoublecmb
\DeclareTextCommand{\texttie}{PU}{ \83\141}% U+0361
```

47.2.9 Greek and Coptic: U+0370 to U+03FF

Greek is only loaded if `\textBeta` is defined.

```
\ifx\textBeta\@undefined \else
\input{puenc-greek.def}
\fi
⟨/puenc⟩
```

47.2.10 Cyrillic: U+0400 to U+04FF

Thanks to Vladimir Volovich (vvv@vvv.vsu.ru) for the help with the Cyrillic glyph names. Cyrillic only loaded if `\CYRDZE` is defined.

```
⟨*puenc⟩
\ifx\CYRDZE\@undefined \else
% U+0400 CYRILLIC CAPITAL LETTER IE WITH GRAVE
\DeclareTextCompositeCommand{\`}{PU}{\CYRE}{\84\000}% U+0400
% U+0401 CYRILLIC CAPITAL LETTER IO; Iocyrillic, *afii10023
\DeclareTextCommand{\CYRYO}{PU}{\84\001}% U+0401
\DeclareTextCompositeCommand{\"}{PU}{\CYRE}{\84\001}% U+0401
% U+0402 CYRILLIC CAPITAL LETTER DJE; Djecyrillic, *afii10051
\DeclareTextCommand{\CYRDJE}{PU}{\84\002}% U+0402
% U+0403 CYRILLIC CAPITAL LETTER GJE; Gjecyrillic, *afii10052
\DeclareTextCompositeCommand{\'}{PU}{\CYRG}{\84\003}% U+0403
% U+0404 CYRILLIC CAPITAL LETTER UKRAINIAN IE; Ecyrillic, *afii10053
```

```
\DeclareTextCommand{\CYRIE}{PU}{\84\004}% U+0404
% U+0405 CYRILLIC CAPITAL LETTER DZE; Dzecyrillic, *afii10054
\DeclareTextCommand{\CYRDZE}{PU}{\84\005}% U+0405
% U+0406 CYRILLIC CAPITAL LETTER BYELORUSSIAN-UKRAINIAN I;
%   Icyrillic, *afii10055
\DeclareTextCommand{\CYRII}{PU}{\84\006}% U+0406
% U+0407 CYRILLIC CAPITAL LETTER YI; Yicyrillic, *afii10056
\DeclareTextCommand{\CYRYI}{PU}{\84\007}% U+0407
\DeclareTextCompositeCommand{\"}{PU}{\CYRII}{\84\007}% U+0407
% U+0408 CYRILLIC CAPITAL LETTER JE; Jecyrillic, *afii10057
\DeclareTextCommand{\CYRJE}{PU}{\84\010}% U+0408
% U+0409 CYRILLIC CAPITAL LETTER LJE; Ljecyrillic, *afii10058
\DeclareTextCommand{\CYRLJE}{PU}{\84\011}% U+0409
% U+040A CYRILLIC CAPITAL LETTER NJE; Njecyrillic, *afii10059
\DeclareTextCommand{\CYRNJE}{PU}{\84\012}% U+040A
% U+040B CYRILLIC CAPITAL LETTER TSHE; Tshecyrillic, *afii10060
\DeclareTextCommand{\CYRTSHE}{PU}{\84\013}% U+040B
% U+040C CYRILLIC CAPITAL LETTER KJE; Kjecyrillic, *afii10061
\DeclareTextCompositeCommand{\'}{PU}{\CYRK}{\84\014}% U+040C
% U+040D CYRILLIC CAPITAL LETTER I WITH GRAVE
\DeclareTextCompositeCommand{\`}{PU}{\CYRI}{\84\015}% U+040D
% U+040E CYRILLIC CAPITAL LETTER SHORT U; Ushortcyrillic, *afii10062
\DeclareTextCommand{\CYRUSHRT}{PU}{\84\016}% U+040E
\DeclareTextCompositeCommand{\U}{PU}{\CYRU}{\84\016}% U+040E
% U+040F CYRILLIC CAPITAL LETTER DZHE; Dzhecyrillic, *afii10145
\DeclareTextCommand{\CYRDZHE}{PU}{\84\017}% U+040F
% U+0410 CYRILLIC CAPITAL LETTER A; Acyrillic, *afii10017
\DeclareTextCommand{\CYRA}{PU}{\84\020}% U+0410
% U+0411 CYRILLIC CAPITAL LETTER BE; Becyrillic, *afii10018
\DeclareTextCommand{\CYRB}{PU}{\84\021}% U+0411
% U+0412 CYRILLIC CAPITAL LETTER VE; Vecyrillic, *afii10019
\DeclareTextCommand{\CYRV}{PU}{\84\022}% U+0412
% U+0413 CYRILLIC CAPITAL LETTER GHE; Gecyrillic, *afii10020
\DeclareTextCommand{\CYRG}{PU}{\84\023}% U+0413
% U+0414 CYRILLIC CAPITAL LETTER DE; Decyrillic, *afii10021
\DeclareTextCommand{\CYRD}{PU}{\84\024}% U+0414
% U+0415 CYRILLIC CAPITAL LETTER IE; Iecyrillic, *afii10022
\DeclareTextCommand{\CYRE}{PU}{\84\025}% U+0415
% U+0416 CYRILLIC CAPITAL LETTER ZHE; Zhecyrillic, *afii10024
\DeclareTextCommand{\CYRZH}{PU}{\84\026}% U+0416
% U+0417 CYRILLIC CAPITAL LETTER ZE; Zecyrillic, *afii10025
\DeclareTextCommand{\CYRZ}{PU}{\84\027}% U+0417
% U+0418 CYRILLIC CAPITAL LETTER I; Iicyrillic, *afii10026
\DeclareTextCommand{\CYRI}{PU}{\84\030}% U+0418
% U+0419 CYRILLIC CAPITAL LETTER SHORT I; Iishortcyrillic, *afii10027
\DeclareTextCommand{\CYRISHRT}{PU}{\84\031}% U+0419
\DeclareTextCompositeCommand{\U}{PU}{\CYRI}{\84\031}% U+0419
% U+041A CYRILLIC CAPITAL LETTER KA; Kacyrillic, *afii10028
\DeclareTextCommand{\CYRK}{PU}{\84\032}% U+041A
% U+041B CYRILLIC CAPITAL LETTER EL; Elcyrillic, *afii10029
\DeclareTextCommand{\CYRL}{PU}{\84\033}% U+041B
% U+041C CYRILLIC CAPITAL LETTER EM; Emcyrillic, *afii10030
\DeclareTextCommand{\CYRM}{PU}{\84\034}% U+041C
% U+041D CYRILLIC CAPITAL LETTER EN; Encyrillic, *afii10031
```

```
\DeclareTextCommand{\CYRN}{PU}{\84\035}% U+041D
% U+041E CYRILLIC CAPITAL LETTER O; Ocyrillic, *afii10032
\DeclareTextCommand{\CYRO}{PU}{\84\036}% U+041E
% U+041F CYRILLIC CAPITAL LETTER PE; Pecyrillic, *afii10033
\DeclareTextCommand{\CYRP}{PU}{\84\037}% U+041F
% U+0420 CYRILLIC CAPITAL LETTER ER; Ercyrillic, *afii10034
\DeclareTextCommand{\CYRR}{PU}{\84\040}% U+0420
% U+0421 CYRILLIC CAPITAL LETTER ES; Escyrillic, *afii10035
\DeclareTextCommand{\CYRS}{PU}{\84\041}% U+0421
% U+0422 CYRILLIC CAPITAL LETTER TE; Tecyrillic, *afii10036
\DeclareTextCommand{\CYRT}{PU}{\84\042}% U+0422
% U+0423 CYRILLIC CAPITAL LETTER U; Ucyrillic, *afii10037
\DeclareTextCommand{\CYRU}{PU}{\84\043}% U+0423
% U+0424 CYRILLIC CAPITAL LETTER EF; Efcyrillic, *afii10038
\DeclareTextCommand{\CYRF}{PU}{\84\044}% U+0424
% U+0425 CYRILLIC CAPITAL LETTER HA; Khacyrillic, *afii10039
\DeclareTextCommand{\CYRH}{PU}{\84\045}% U+0425
% U+0426 CYRILLIC CAPITAL LETTER TSE; Tsecyrillic, *afii10040
\DeclareTextCommand{\CYRC}{PU}{\84\046}% U+0426
% U+0427 CYRILLIC CAPITAL LETTER CHE; Checyrillic, *afii10041
\DeclareTextCommand{\CYRCH}{PU}{\84\047}% U+0427
% U+0428 CYRILLIC CAPITAL LETTER SHA; Shacyrillic, *afii10042
\DeclareTextCommand{\CYRSH}{PU}{\84\050}% U+0428
% U+0429 CYRILLIC CAPITAL LETTER SHCHA; Shchacyrillic, *afii10043
\DeclareTextCommand{\CYRSHCH}{PU}{\84\051}% U+0429
% U+042A CYRILLIC CAPITAL LETTER HARD SIGN;
%   Hardsigncyrillic, *afii10044
\DeclareTextCommand{\CYRHRDSN}{PU}{\84\052}% U+042A
% U+042B CYRILLIC CAPITAL LETTER YERU; Yericyrillic, *afii10045
\DeclareTextCommand{\CYRERY}{PU}{\84\053}% U+042B
% U+042C CYRILLIC CAPITAL LETTER SOFT SIGN;
%   Softsigncyrillic, *afii10046
\DeclareTextCommand{\CYRSFTSN}{PU}{\84\054}% U+042C
% U+042D CYRILLIC CAPITAL LETTER E; Ereversedcyrillic, *afii10047
\DeclareTextCommand{\CYREREV}{PU}{\84\055}% U+042D
% U+042E CYRILLIC CAPITAL LETTER YU; IUcyrillic, *afii10048
\DeclareTextCommand{\CYRYU}{PU}{\84\056}% U+042E
% U+042F CYRILLIC CAPITAL LETTER YA; IAcyrillic, *afii10049
\DeclareTextCommand{\CYRYA}{PU}{\84\057}% U+042F
% U+0430 CYRILLIC SMALL LETTER A; acyrillic, *afii10065
\DeclareTextCommand{\cyra}{PU}{\84\060}% U+0430
% U+0431 CYRILLIC SMALL LETTER BE; *afii10066, becyrillic
\DeclareTextCommand{\cyrb}{PU}{\84\061}% U+0431
% U+0432 CYRILLIC SMALL LETTER VE; *afii10067, vecyrillic
\DeclareTextCommand{\cyrv}{PU}{\84\062}% U+0432
% U+0433 CYRILLIC SMALL LETTER GHE; *afii10068, gecyrillic
\DeclareTextCommand{\cyrg}{PU}{\84\063}% U+0433
% U+0434 CYRILLIC SMALL LETTER DE; *afii10069, decyrillic
\DeclareTextCommand{\cyrd}{PU}{\84\064}% U+0434
% U+0435 CYRILLIC SMALL LETTER IE; *afii10070, iecyrillic
\DeclareTextCommand{\cyre}{PU}{\84\065}% U+0435
% U+0436 CYRILLIC SMALL LETTER ZHE; *afii10072, zhecyrillic
\DeclareTextCommand{\cyrzh}{PU}{\84\066}% U+0436
% U+0437 CYRILLIC SMALL LETTER ZE; *afii10073, zecyrillic
```

```
\DeclareTextCommand{\cyrz}{PU}{\84\067}% U+0437
% U+0438 CYRILLIC SMALL LETTER I; *afii10074, iicyrillic
\DeclareTextCommand{\cyri}{PU}{\84\070}% U+0438
% U+0439 CYRILLIC SMALL LETTER SHORT I; *afii10075, iishortcyrillic
\DeclareTextCommand{\cyrishrt}{PU}{\84\071}% U+0439
\DeclareTextCompositeCommand{\U}{PU}{\cyri}{\84\071}% U+0439
% U+043A CYRILLIC SMALL LETTER KA; *afii10076, kacyrillic
\DeclareTextCommand{\cyrk}{PU}{\84\072}% U+043A
% U+043B CYRILLIC SMALL LETTER EL; *afii10077, elcyrillic
\DeclareTextCommand{\cyrl}{PU}{\84\073}% U+043B
% U+043C CYRILLIC SMALL LETTER EM; *afii10078, emcyrillic
\DeclareTextCommand{\cyrm}{PU}{\84\074}% U+043C
% U+043D CYRILLIC SMALL LETTER EN; *afii10079, encyrillic
\DeclareTextCommand{\cyrn}{PU}{\84\075}% U+043D
% U+043E CYRILLIC SMALL LETTER O; *afii10080, ocyrillic
\DeclareTextCommand{\cyro}{PU}{\84\076}% U+043E
% U+043F CYRILLIC SMALL LETTER PE; *afii10081, pecyrillic
\DeclareTextCommand{\cyrp}{PU}{\84\077}% U+043F
% U+0440 CYRILLIC SMALL LETTER ER; *afii10082, ercyrillic
\DeclareTextCommand{\cyrr}{PU}{\84\100}% U+0440
% U+0441 CYRILLIC SMALL LETTER ES; *afii10083, escyrillic
\DeclareTextCommand{\cyrs}{PU}{\84\101}% U+0441
% U+0442 CYRILLIC SMALL LETTER TE; *afii10084, tecyrillic
\DeclareTextCommand{\cyrt}{PU}{\84\102}% U+0442
% U+0443 CYRILLIC SMALL LETTER U; *afii10085, ucyrillic
\DeclareTextCommand{\cyru}{PU}{\84\103}% U+0443
% U+0444 CYRILLIC SMALL LETTER EF; *afii10086, efcyrillic
\DeclareTextCommand{\cyrf}{PU}{\84\104}% U+0444
% U+0445 CYRILLIC SMALL LETTER HA; *afii10087, khacyrillic
\DeclareTextCommand{\cyrh}{PU}{\84\105}% U+0445
% U+0446 CYRILLIC SMALL LETTER TSE; *afii10088, tsecyrillic
\DeclareTextCommand{\cyrc}{PU}{\84\106}% U+0446
% U+0447 CYRILLIC SMALL LETTER CHE; *afii10089, checyrillic
\DeclareTextCommand{\cyrch}{PU}{\84\107}% U+0447
% U+0448 CYRILLIC SMALL LETTER SHA; *afii10090, shacyrillic
\DeclareTextCommand{\cyrsh}{PU}{\84\110}% U+0448
% U+0449 CYRILLIC SMALL LETTER SHCHA; *afii10091, shchacyrillic
\DeclareTextCommand{\cyrshch}{PU}{\84\111}% U+0449
% U+044A CYRILLIC SMALL LETTER HARD SIGN; *afii10092, hardsigncyril-
    lic
\DeclareTextCommand{\cyrhrdsn}{PU}{\84\112}% U+044A
%* \cyrhrdsn -> \hardsign (tipa)
% U+044B CYRILLIC SMALL LETTER YERU; *afii10093, yericyrillic
\DeclareTextCommand{\cyrery}{PU}{\84\113}% U+044B
% U+044C CYRILLIC SMALL LETTER SOFT SIGN; *afii10094, softsigncyrillic
\DeclareTextCommand{\cyrsftsn}{PU}{\84\114}% U+044C
%* \cyrsftsn -> \softsign (tipa)
% U+044D CYRILLIC SMALL LETTER E; *afii10095, ereversedcyrillic
\DeclareTextCommand{\cyrerev}{PU}{\84\115}% U+044D
% U+044E CYRILLIC SMALL LETTER YU; *afii10096, iucyrillic
\DeclareTextCommand{\cyryu}{PU}{\84\116}% U+044E
% U+044F CYRILLIC SMALL LETTER YA; *afii10097, iacyrillic
\DeclareTextCommand{\cyrya}{PU}{\84\117}% U+044F
% U+0450 CYRILLIC SMALL LETTER IE WITH GRAVE
```

```
\DeclareTextCompositeCommand{\`}{PU}{\cyre}{\84\120}% U+0450
% U+0451 CYRILLIC SMALL LETTER IO; *afii10071, iocyrillic
\DeclareTextCommand{\cyryo}{PU}{\84\121}% U+0451
\DeclareTextCompositeCommand{\"}{PU}{\cyre}{\84\121}% U+0451
% U+0452 CYRILLIC SMALL LETTER DJE; *afii10099, djecyrillic
\DeclareTextCommand{\cyrdje}{PU}{\84\122}% U+0452
% U+0453 CYRILLIC SMALL LETTER GJE; *afii10100, gjecyrillic
\DeclareTextCompositeCommand{\'}{PU}{\cyrg}{\84\123}% U+0453
% U+0454 CYRILLIC SMALL LETTER UKRAINIAN IE; *afii10101, ecyrillic
\DeclareTextCommand{\cyrie}{PU}{\84\124}% U+0454
% U+0455 CYRILLIC SMALL LETTER DZE; *afii10102, dzecyrillic
\DeclareTextCommand{\cyrdze}{PU}{\84\125}% U+0455
% U+0456 CYRILLIC SMALL LETTER BYELORUSSIAN-UKRAINIAN I;
%   *afii10103, icyrillic
\DeclareTextCommand{\cyrii}{PU}{\84\126}% U+0456
% U+0457 CYRILLIC SMALL LETTER YI; *afii10104, yicyrillic
\DeclareTextCommand{\cyryi}{PU}{\84\127}% U+0457
\DeclareTextCompositeCommand{\"}{PU}{\cyrii}{\84\127}% U+0457
% U+0458 CYRILLIC SMALL LETTER JE; *afii10105, jecyrillic
\DeclareTextCommand{\cyrje}{PU}{\84\130}% U+0458
% U+0459 CYRILLIC SMALL LETTER LJE; *afii10106, ljecyrillic
\DeclareTextCommand{\cyrlje}{PU}{\84\131}% U+0459
% U+045A CYRILLIC SMALL LETTER NJE; *afii10107, njecyrillic
\DeclareTextCommand{\cyrnje}{PU}{\84\132}% U+045A
% U+045B CYRILLIC SMALL LETTER TSHE; *afii10108, tshecyrillic
\DeclareTextCommand{\cyrtshe}{PU}{\84\133}% U+045B
% U+045C CYRILLIC SMALL LETTER KJE; *afii10109, kjecyrillic
\DeclareTextCompositeCommand{\'}{PU}{\cyrk}{\84\134}% U+045C
% U+045D CYRILLIC SMALL LETTER I WITH GRAVE
\DeclareTextCompositeCommand{\`}{PU}{\cyri}{\84\135}% U+045D
% U+045E CYRILLIC SMALL LETTER SHORT U; *afii10110, ushortcyrillic
\DeclareTextCommand{\cyrushrt}{PU}{\84\136}% U+045E
\DeclareTextCompositeCommand{\U}{PU}{\curu}{\84\136}% U+045E
% U+045F CYRILLIC SMALL LETTER DZHE; *afii10193, dzhecyrillic
\DeclareTextCommand{\cyrdzhe}{PU}{\84\137}% U+045F
% U+0460 CYRILLIC CAPITAL LETTER OMEGA; Omegacyrillic
\DeclareTextCommand{\CYROMEGA}{PU}{\84\140}% U+0460
% U+0461 CYRILLIC SMALL LETTER OMEGA; omegacyrillic
\DeclareTextCommand{\cyromega}{PU}{\84\141}% U+0461
% U+0462 CYRILLIC CAPITAL LETTER YAT; Yatcyrillic, *afii10146
\DeclareTextCommand{\CYRYAT}{PU}{\84\142}% U+0462
% U+0463 CYRILLIC SMALL LETTER YAT; *afii10194, yatcyrillic
\DeclareTextCommand{\cyryat}{PU}{\84\143}% U+0463
% U+0464 CYRILLIC CAPITAL LETTER IOTIFIED E; Eiotifiedcyrillic
\DeclareTextCommand{\CYRIOTE}{PU}{\84\144}% U+0464
% U+0465 CYRILLIC SMALL LETTER IOTIFIED E; eiotifiedcyrillic
\DeclareTextCommand{\cyriote}{PU}{\84\145}% U+0465
% U+0466 CYRILLIC CAPITAL LETTER LITTLE YUS; Yuslittlecyrillic
\DeclareTextCommand{\CYRLYUS}{PU}{\84\146}% U+0466
% U+0467 CYRILLIC SMALL LETTER LITTLE YUS; yuslittlecyrillic
\DeclareTextCommand{\cyrlyus}{PU}{\84\147}% U+0467
% U+0468 CYRILLIC CAPITAL LETTER IOTIFIED LITTLE YUS; Yuslittlei-
    otifiedcyrillic
\DeclareTextCommand{\CYRIOTLYUS}{PU}{\84\150}% U+0468
```

```
% U+0469 CYRILLIC SMALL LETTER IOTIFIED LITTLE YUS; yuslittleiotifiedcyrillic
\DeclareTextCommand{\cyriotlyus}{PU}{\84\151}% U+0469
% U+046A CYRILLIC CAPITAL LETTER BIG YUS; Yusbigcyrillic
\DeclareTextCommand{\CYRBYUS}{PU}{\84\152}% U+046A
% U+046B CYRILLIC SMALL LETTER BIG YUS; yusbigcyrillic
\DeclareTextCommand{\cyrbyus}{PU}{\84\153}% U+046B
% U+046C CYRILLIC CAPITAL LETTER IOTIFIED BIG YUS; Yusbigiotifiedcyrillic
\DeclareTextCommand{\CYRIOTBYUS}{PU}{\84\154}% U+046C
% U+046D CYRILLIC SMALL LETTER IOTIFIED BIG YUS; yusbigiotifiedcyrillic
\DeclareTextCommand{\cyriotbyus}{PU}{\84\155}% U+046D
% U+046E CYRILLIC CAPITAL LETTER KSI; Ksicyrillic
\DeclareTextCommand{\CYRKSI}{PU}{\84\156}% U+046E
% U+046F CYRILLIC SMALL LETTER KSI; ksicyrillic
\DeclareTextCommand{\cyrksi}{PU}{\84\157}% U+046F
% U+0470 CYRILLIC CAPITAL LETTER PSI; Psicyrillic
\DeclareTextCommand{\CYRPSI}{PU}{\84\160}% U+0470
% U+0471 CYRILLIC SMALL LETTER PSI; psicyrillic
\DeclareTextCommand{\cyrpsi}{PU}{\84\161}% U+0471
% U+0472 CYRILLIC CAPITAL LETTER FITA; Fitacyrillic, *afii10147
\DeclareTextCommand{\CYRFITA}{PU}{\84\162}% U+0472
% U+0473 CYRILLIC SMALL LETTER FITA; *afii10195, fitacyrillic
\DeclareTextCommand{\cyrfita}{PU}{\84\163}% U+0473
% U+0474 CYRILLIC CAPITAL LETTER IZHITSA; Izhitsacyrillic, *afii10148
\DeclareTextCommand{\CYRIZH}{PU}{\84\164}% U+0474
% U+0475 CYRILLIC SMALL LETTER IZHITSA; *afii10196, izhitsacyrillic
\DeclareTextCommand{\cyrizh}{PU}{\84\165}% U+0475
% U+0476 CYRILLIC CAPITAL LETTER IZHITSA WITH DOUBLE
%   GRAVE ACCENT; Izhitsadblgravecyrillic
\DeclareTextCompositeCommand{\C}{PU}{\CYRIZH}{\84\166}% U+0476
% U+0477 CYRILLIC SMALL LETTER IZHITSA WITH DOUBLE
%   GRAVE ACCENT; izhitsadblgravecyrillic
\DeclareTextCompositeCommand{\C}{PU}{\cyrizh}{\84\167}% U+0477
% U+0478 CYRILLIC CAPITAL LETTER UK; Ukcyrillic
\DeclareTextCommand{\CYRUK}{PU}{\84\170}% U+0478
% U+0479 CYRILLIC SMALL LETTER UK; ukcyrillic
\DeclareTextCommand{\cyruk}{PU}{\84\171}% U+0479
% U+047A CYRILLIC CAPITAL LETTER ROUND OMEGA; Omegaroundcyrillic
\DeclareTextCommand{\CYROMEGARND}{PU}{\84\172}% U+047A
% U+047B CYRILLIC SMALL LETTER ROUND OMEGA; omegaroundcyrillic
\DeclareTextCommand{\cyromegarnd}{PU}{\84\173}% U+047B
% U+047C CYRILLIC CAPITAL LETTER OMEGA WITH TITLO; Omegatitlocyrillic
\DeclareTextCommand{\CYROMEGATITLO}{PU}{\84\174}% U+047C
% U+047D CYRILLIC SMALL LETTER OMEGA WITH TITLO; omegatitlocyrillic
\DeclareTextCommand{\cyromegatitlo}{PU}{\84\175}% U+047D
% U+047E CYRILLIC CAPITAL LETTER OT; Otcyrillic
\DeclareTextCommand{\CYROT}{PU}{\84\176}% U+047E
% U+047F CYRILLIC SMALL LETTER OT; otcyrillic
\DeclareTextCommand{\cyrot}{PU}{\84\177}% U+047F
```

```
% U+0480 CYRILLIC CAPITAL LETTER KOPPA; Koppacyrillic
\DeclareTextCommand{\CYRKOPPA}{PU}{\84\200}% U+0480
% U+0481 CYRILLIC SMALL LETTER KOPPA; koppacyrillic
\DeclareTextCommand{\cyrkoppa}{PU}{\84\201}% U+0481
% U+0482 CYRILLIC THOUSANDS SIGN; thousandcyrillic
\DeclareTextCommand{\cyrthousands}{PU}{\84\202}% U+0482
```

\84\203: U+0483 COMBINING CYRILLIC TITLO; titlocyrilliccmb
\84\204: U+0484 COMBINING CYRILLIC PALATALIZATION; palatalizationcyrilliccmb
\84\205: U+0485 COMBINING CYRILLIC DASIA PNEUMATA; dasiapneumatacyrilliccmb
\84\206: U+0486 COMBINING CYRILLIC PSILI PNEUMATA; psilipneumatacyrilliccmb
\84\207: U+0487 COMBINING CYRILLIC POKRYTIE
\84\210: U+0488 COMBINING CYRILLIC HUNDRED THOUSANDS SIGN
\84\211: U+0489 COMBINING CYRILLIC MILLIONS SIGN

```
% U+048A CYRILLIC CAPITAL LETTER SHORT I WITH TAIL
\DeclareTextCommand{\CYRISHRTDSC}{PU}{\84\212}% U+048A
% U+048B CYRILLIC SMALL LETTER SHORT I WITH TAIL
\DeclareTextCommand{\cyrishrtdsc}{PU}{\84\213}% U+048B
% U+048C CYRILLIC CAPITAL LETTER SEMISOFT SIGN
\DeclareTextCommand{\CYRSEMISFTSN}{PU}{\84\214}% U+048C
% U+048D CYRILLIC SMALL LETTER SEMISOFT SIGN
\DeclareTextCommand{\cyrsemisftsn}{PU}{\84\215}% U+048D
% U+048E CYRILLIC CAPITAL LETTER ER WITH TICK
\DeclareTextCommand{\CYRRTICK}{PU}{\84\216}% U+048E
% U+048F CYRILLIC SMALL LETTER ER WITH TICK
\DeclareTextCommand{\cyrrtick}{PU}{\84\217}% U+048F
% U+0490 CYRILLIC CAPITAL LETTER GHE WITH UPTURN; Gheupturncyrillic, *afii10050
\DeclareTextCommand{\CYRGUP}{PU}{\84\220}% U+0490
% U+0491 CYRILLIC SMALL LETTER GHE WITH UPTURN; *afii10098, gheupturncyrillic
\DeclareTextCommand{\cyrgup}{PU}{\84\221}% U+0491
% U+0492 CYRILLIC CAPITAL LETTER GHE WITH STROKE; Ghestrokecyrillic
\DeclareTextCommand{\CYRGHCRS}{PU}{\84\222}% U+0492
% U+0493 CYRILLIC SMALL LETTER GHE WITH STROKE; ghestrokecyrillic
\DeclareTextCommand{\cyrghcrs}{PU}{\84\223}% U+0493
% U+0494 CYRILLIC CAPITAL LETTER GHE WITH MIDDLE HOOK;
%    Ghemiddlehookcyrillic
\DeclareTextCommand{\CYRGHK}{PU}{\84\224}% U+0494
% U+0495 CYRILLIC SMALL LETTER GHE WITH MIDDLE HOOK;
%    ghemiddlehookcyrillic
\DeclareTextCommand{\cyrghk}{PU}{\84\225}% U+0495
% U+0496 CYRILLIC CAPITAL LETTER ZHE WITH DESCENDER;
%    Zhedescendercyrillic
\DeclareTextCommand{\CYRZHDSC}{PU}{\84\226}% U+0496
% U+0497 CYRILLIC SMALL LETTER ZHE WITH DESCENDER;
%    zhedescendercyrillic
\DeclareTextCommand{\cyrzhdsc}{PU}{\84\227}% U+0497
% U+0498 CYRILLIC CAPITAL LETTER ZE WITH DESCENDER; Zedescendercyrillic
```

```
\DeclareTextCommand{\CYRZDSC}{PU}{\84\230}% U+0498
\DeclareTextCompositeCommand{\c}{PU}{\CYRZ}{\84\230}% U+0498
% U+0499 CYRILLIC SMALL LETTER ZE WITH DESCENDER; zedescendercyrillic
\DeclareTextCommand{\cyrzdsc}{PU}{\84\231}% U+0499
\DeclareTextCompositeCommand{\c}{PU}{\cyrz}{\84\231}% U+0499
% U+049A CYRILLIC CAPITAL LETTER KA WITH DESCENDER; Kadescendercyrillic
\DeclareTextCommand{\CYRKDSC}{PU}{\84\232}% U+049A
% U+049B CYRILLIC SMALL LETTER KA WITH DESCENDER; kadescendercyrillic
\DeclareTextCommand{\cyrkdsc}{PU}{\84\233}% U+049B
% U+049C CYRILLIC CAPITAL LETTER KA WITH VERTICAL STROKE;
%    Kaverticalstrokecyrillic
\DeclareTextCommand{\CYRKVCRS}{PU}{\84\234}% U+049C
% U+049D CYRILLIC SMALL LETTER KA WITH VERTICAL STROKE;
%    kaverticalstrokecyrillic
\DeclareTextCommand{\cyrkvcrs}{PU}{\84\235}% U+049D
% U+049E CYRILLIC CAPITAL LETTER KA WITH STROKE; Kastrokecyrillic
\DeclareTextCommand{\CYRKHCRS}{PU}{\84\236}% U+049E
% U+049F CYRILLIC SMALL LETTER KA WITH STROKE; kastrokecyrillic
\DeclareTextCommand{\cyrkhcrs}{PU}{\84\237}% U+049F
% U+04A0 CYRILLIC CAPITAL LETTER BASHKIR KA; Kabashkircyrillic
\DeclareTextCommand{\CYRKBEAK}{PU}{\84\240}% U+04A0
% U+04A1 CYRILLIC SMALL LETTER BASHKIR KA; kabashkircyrillic
\DeclareTextCommand{\cyrkbeak}{PU}{\84\241}% U+04A1
% U+04A2 CYRILLIC CAPITAL LETTER EN WITH DESCENDER; Endescendercyrillic
\DeclareTextCommand{\CYRNDSC}{PU}{\84\242}% U+04A2
% U+04A3 CYRILLIC SMALL LETTER EN WITH DESCENDER; endescendercyrillic
\DeclareTextCommand{\cyrndsc}{PU}{\84\243}% U+04A3
% U+04A4 CYRILLIC CAPITAL LIGATURE EN GHE; Enghecyrillic
\DeclareTextCommand{\CYRNG}{PU}{\84\244}% U+04A4
% U+04A5 CYRILLIC SMALL LIGATURE EN GHE; enghecyrillic
\DeclareTextCommand{\cyrng}{PU}{\84\245}% U+04A5
% U+04A6 CYRILLIC CAPITAL LETTER PE WITH MIDDLE HOOK; Pemiddlehookcyrillic
\DeclareTextCommand{\CYRPHK}{PU}{\84\246}% U+04A6
% U+04A7 CYRILLIC SMALL LETTER PE WITH MIDDLE HOOK; pemiddlehookcyrillic
\DeclareTextCommand{\cyrphk}{PU}{\84\247}% U+04A7
% U+04A8 CYRILLIC CAPITAL LETTER ABKHASIAN HA; Haabkhasiancyrillic
\DeclareTextCommand{\CYRABHHA}{PU}{\84\250}% U+04A8
% U+04A9 CYRILLIC SMALL LETTER ABKHASIAN HA; haabkhasiancyrillic
\DeclareTextCommand{\cyrabhha}{PU}{\84\251}% U+04A9
% U+04AA CYRILLIC CAPITAL LETTER ES WITH DESCENDER; Esdescendercyrillic
\DeclareTextCommand{\CYRSDSC}{PU}{\84\252}% U+04AA
\DeclareTextCompositeCommand{\k}{PU}{\CYRS}{\84\252}% U+04AA
% U+04AB CYRILLIC SMALL LETTER ES WITH DESCENDER; esdescendercyrillic
\DeclareTextCommand{\cyrsdsc}{PU}{\84\253}% U+04AB
```

```
\DeclareTextCompositeCommand{\k}{PU}{\cyrs}{\84\253}% U+04AB
% U+04AC CYRILLIC CAPITAL LETTER TE WITH DESCENDER; Tedescendercyrillic
\DeclareTextCommand{\CYRTDSC}{PU}{\84\254}% U+04AC
% U+04AD CYRILLIC SMALL LETTER TE WITH DESCENDER; tedescendercyrillic
\DeclareTextCommand{\cyrtdsc}{PU}{\84\255}% U+04AD
% U+04AE CYRILLIC CAPITAL LETTER STRAIGHT U; Ustraightcyrillic
\DeclareTextCommand{\CYRY}{PU}{\84\256}% U+04AE
% U+04AF CYRILLIC SMALL LETTER STRAIGHT U; ustraightcyrillic
\DeclareTextCommand{\cyry}{PU}{\84\257}% U+04AF
% U+04B0 CYRILLIC CAPITAL LETTER STRAIGHT U WITH STROKE; Ustraightstrokecyrillic
\DeclareTextCommand{\CYRYHCRS}{PU}{\84\260}% U+04B0
% U+04B1 CYRILLIC SMALL LETTER STRAIGHT U WITH STROKE; ustraightstrokecyrillic
\DeclareTextCommand{\cyryhcrs}{PU}{\84\261}% U+04B1
% U+04B2 CYRILLIC CAPITAL LETTER HA WITH DESCENDER; Hadescendercyrillic
\DeclareTextCommand{\CYRHDSC}{PU}{\84\262}% U+04B2
% U+04B3 CYRILLIC SMALL LETTER HA WITH DESCENDER; hadescendercyrillic
\DeclareTextCommand{\cyrhdsc}{PU}{\84\263}% U+04B3
% U+04B4 CYRILLIC CAPITAL LIGATURE TE TSE; Tetsecyrillic
\DeclareTextCommand{\CYRTETSE}{PU}{\84\264}% U+04B4
% U+04B5 CYRILLIC SMALL LIGATURE TE TSE; tetsecyrillic
\DeclareTextCommand{\cyrtetse}{PU}{\84\265}% U+04B5
% U+04B6 CYRILLIC CAPITAL LETTER CHE WITH DESCENDER;
%   Chedescendercyrillic
\DeclareTextCommand{\CYRCHRDSC}{PU}{\84\266}% U+04B6
% U+04B7 CYRILLIC SMALL LETTER CHE WITH DESCENDER; chedescendercyrillic
\DeclareTextCommand{\cyrchrdsc}{PU}{\84\267}% U+04B7
% U+04B8 CYRILLIC CAPITAL LETTER CHE WITH VERTICAL STROKE;
%   Cheverticalstrokecyrillic
\DeclareTextCommand{\CYRCHVCRS}{PU}{\84\270}% U+04B8
% U+04B9 CYRILLIC SMALL LETTER CHE WITH VERTICAL STROKE;
%   cheverticalstrokecyrillic
\DeclareTextCommand{\cyrchvcrs}{PU}{\84\271}% U+04B9
% U+04BA CYRILLIC CAPITAL LETTER SHHA; Shhacyrillic
\DeclareTextCommand{\CYRSHHA}{PU}{\84\272}% U+04BA
% U+04BB CYRILLIC SMALL LETTER SHHA; shhacyrillic
\DeclareTextCommand{\cyrshha}{PU}{\84\273}% U+04BB
% U+04BC CYRILLIC CAPITAL LETTER ABKHASIAN CHE; Cheabkhasiancyrillic
\DeclareTextCommand{\CYRABHCH}{PU}{\84\274}% U+04BC
% U+04BD CYRILLIC SMALL LETTER ABKHASIAN CHE; cheabkhasiancyrillic
\DeclareTextCommand{\cyrabhch}{PU}{\84\275}% U+04BD
% U+04BE CYRILLIC CAPITAL LETTER ABKHASIAN CHE WITH DESCENDER; Chedescenderabkhasiancyrillic
\DeclareTextCommand{\CYRABHCHDSC}{PU}{\84\276}% U+04BE
\DeclareTextCompositeCommand{\k}{PU}{\CYRABHCH}{\84\276}% U+04BE
% U+04BF CYRILLIC SMALL LETTER ABKHASIAN CHE WITH DESCEN-
```

DER; chedescenderabkhasiancyrillic
16794 \DeclareTextCommand{\cyrabhchdsc}{PU}{\84\277}% U+04BF
16795 \DeclareTextCompositeCommand{\k}{PU}{\cyrabhch}{\84\277}% U+04BF
16796 % U+04C0 CYRILLIC LETTER PALOCHKA; palochkacyrillic
16797 \DeclareTextCommand{\CYRpalochka}{PU}{\84\300}% U+04C0
16798 % U+04C1 CYRILLIC CAPITAL LETTER ZHE WITH BREVE; Zhebrevecyrillic
16799 \DeclareTextCompositeCommand{\U}{PU}{\CYRZH}{\84\301}% U+04C1
16800 % U+04C2 CYRILLIC SMALL LETTER ZHE WITH BREVE; zhebrevecyrillic
16801 \DeclareTextCompositeCommand{\U}{PU}{\cyrzh}{\84\302}% U+04C2
16802 % U+04C3 CYRILLIC CAPITAL LETTER KA WITH HOOK; Kahookcyrillic
16803 \DeclareTextCommand{\CYRKHK}{PU}{\84\303}% U+04C3
16804 % U+04C4 CYRILLIC SMALL LETTER KA WITH HOOK; kahookcyrillic
16805 \DeclareTextCommand{\cyrkhk}{PU}{\84\304}% U+04C4
16806 % U+04C5 CYRILLIC CAPITAL LETTER EL WITH TAIL
16807 \DeclareTextCommand{\CYRLDSC}{PU}{\84\305}% U+04C5
16808 % U+04C6 CYRILLIC SMALL LETTER EL WITH TAIL
16809 \DeclareTextCommand{\cyrldsc}{PU}{\84\306}% U+04C6
16810 % U+04C7 CYRILLIC CAPITAL LETTER EN WITH HOOK; Enhookcyrillic
16811 \DeclareTextCommand{\CYRNHK}{PU}{\84\307}% U+04C7
16812 % U+04C8 CYRILLIC SMALL LETTER EN WITH HOOK; enhookcyrillic
16813 \DeclareTextCommand{\cyrnhk}{PU}{\84\310}% U+04C8
16814 % U+04CB CYRILLIC CAPITAL LETTER KHAKASSIAN CHE; Chekhakassiancyrillic
16815 \DeclareTextCommand{\CYRCHLDSC}{PU}{\84\313}% U+04CB
16816 % U+04CC CYRILLIC SMALL LETTER KHAKASSIAN CHE; chekhakassiancyrillic
16817 \DeclareTextCommand{\cyrchldsc}{PU}{\84\314}% U+04CC
16818 % U+04CD CYRILLIC CAPITAL LETTER EM WITH TAIL
16819 \DeclareTextCommand{\CYRMDSC}{PU}{\84\315}% U+04CD
16820 % U+04CE CYRILLIC SMALL LETTER EM WITH TAIL
16821 \DeclareTextCommand{\cyrmdsc}{PU}{\84\316}% U+04CE

\84\317: U+04CF CYRILLIC SMALL LETTER PALOCHKA

16822 % U+04D0 CYRILLIC CAPITAL LETTER A WITH BREVE; Abrevecyrillic
16823 \DeclareTextCompositeCommand{\U}{PU}{\CYRA}{\84\320}% U+04D0
16824 % U+04D1 CYRILLIC SMALL LETTER A WITH BREVE; abrevecyrillic
16825 \DeclareTextCompositeCommand{\U}{PU}{\cyra}{\84\321}% U+04D1
16826 % U+04D2 CYRILLIC CAPITAL LETTER A WITH DIAERESIS; Adieresiscyrillic
16827 \DeclareTextCompositeCommand{\"}{PU}{\CYRA}{\84\322}% U+04D2
16828 % U+04D3 CYRILLIC SMALL LETTER A WITH DIAERESIS; adieresiscyrillic
16829 \DeclareTextCompositeCommand{\"}{PU}{\cyra}{\84\323}% U+04D3
16830 % U+04D4 CYRILLIC CAPITAL LIGATURE A IE; Aiecyrillic
16831 \DeclareTextCommand{\CYRAE}{PU}{\84\324}% U+04D4
16832 % U+04D5 CYRILLIC SMALL LIGATURE A IE; aiecyrillic
16833 \DeclareTextCommand{\cyrae}{PU}{\84\325}% U+04D5
16834 % U+04D6 CYRILLIC CAPITAL LETTER IE WITH BREVE; Iebrevecyrillic
16835 \DeclareTextCompositeCommand{\U}{PU}{\CYRE}{\84\326}% U+04D6
16836 % U+04D7 CYRILLIC SMALL LETTER IE WITH BREVE; iebrevecyrillic
16837 \DeclareTextCompositeCommand{\U}{PU}{\cyre}{\84\327}% U+04D7
16838 % U+04D8 CYRILLIC CAPITAL LETTER SCHWA; Schwacyrillic
16839 \DeclareTextCommand{\CYRSCHWA}{PU}{\84\330}% U+04D8
16840 % U+04D9 CYRILLIC SMALL LETTER SCHWA; *afii10846, schwacyrillic
16841 \DeclareTextCommand{\cyrschwa}{PU}{\84\331}% U+04D9
16842 % U+04DA CYRILLIC CAPITAL LETTER SCHWA WITH DIAERESIS;

```
% Schwadieresiscyrillic
\DeclareTextCompositeCommand{\"}{PU}{\CYRSCHWA}{\84\332}% U+04DA
% U+04DB CYRILLIC SMALL LETTER SCHWA WITH DIAERESIS;
% schwadieresiscyrillic
\DeclareTextCompositeCommand{\"}{PU}{\cyrschwa}{\84\333}% U+04DB
% U+04DC CYRILLIC CAPITAL LETTER ZHE WITH DIAERESIS; Zhedieresiscyrillic
\DeclareTextCompositeCommand{\"}{PU}{\CYRZH}{\84\334}% U+04DC
% U+04DD CYRILLIC SMALL LETTER ZHE WITH DIAERESIS; zhedieresiscyrillic
\DeclareTextCompositeCommand{\"}{PU}{\cyrzh}{\84\335}% U+04DD
% U+04DE CYRILLIC CAPITAL LETTER ZE WITH DIAERESIS; Zedieresiscyrillic
\DeclareTextCompositeCommand{\"}{PU}{\CYRZ}{\84\336}% U+04DE
% U+04DF CYRILLIC SMALL LETTER ZE WITH DIAERESIS; zedieresiscyrillic
\DeclareTextCompositeCommand{\"}{PU}{\cyrz}{\84\337}% U+04DF
% U+04E0 CYRILLIC CAPITAL LETTER ABKHASIAN DZE; Dzeabkhasiancyrillic
\DeclareTextCommand{\CYRABHDZE}{PU}{\84\340}% U+04E0
% U+04E1 CYRILLIC SMALL LETTER ABKHASIAN DZE; dzeabkhasiancyrillic
\DeclareTextCommand{\cyrabhdze}{PU}{\84\341}% U+04E1
% U+04E2 CYRILLIC CAPITAL LETTER I WITH MACRON; Imacroncyrillic
\DeclareTextCompositeCommand{\=}{PU}{\CYRI}{\84\342}% U+04E2
% U+04E3 CYRILLIC SMALL LETTER I WITH MACRON; imacroncyrillic
\DeclareTextCompositeCommand{\=}{PU}{\cyri}{\84\343}% U+04E3
% U+04E4 CYRILLIC CAPITAL LETTER I WITH DIAERESIS; Idieresiscyrillic
\DeclareTextCompositeCommand{\"}{PU}{\CYRI}{\84\344}% U+04E4
% U+04E5 CYRILLIC SMALL LETTER I WITH DIAERESIS; idieresiscyrillic
\DeclareTextCompositeCommand{\"}{PU}{\cyri}{\84\345}% U+04E5
% U+04E6 CYRILLIC CAPITAL LETTER O WITH DIAERESIS; Odieresiscyrillic
\DeclareTextCompositeCommand{\"}{PU}{\CYRO}{\84\346}% U+04E6
% U+04E7 CYRILLIC SMALL LETTER O WITH DIAERESIS; odieresiscyrillic
\DeclareTextCompositeCommand{\"}{PU}{\cyro}{\84\347}% U+04E7
% U+04E8 CYRILLIC CAPITAL LETTER BARRED O; Obarredcyrillic
\DeclareTextCommand{\CYROTLD}{PU}{\84\350}% U+04E8
% U+04E9 CYRILLIC SMALL LETTER BARRED O; obarredcyrillic
\DeclareTextCommand{\cyrotld}{PU}{\84\351}% U+04E9
% U+04EA CYRILLIC CAPITAL LETTER BARRED O WITH DIAERESIS;
% Obarreddieresiscyrillic
\DeclareTextCompositeCommand{\"}{PU}{\CYROTLD}{\84\352}% U+04EA
% U+04EB CYRILLIC SMALL LETTER BARRED O WITH DIAERESIS;
% obarreddieresiscyrillic
\DeclareTextCompositeCommand{\"}{PU}{\cyrotld}{\84\353}% U+04EB
% U+04EC CYRILLIC CAPITAL LETTER E WITH DIAERESIS
\DeclareTextCompositeCommand{\"}{PU}{\CYREREV}{\84\354}% U+04EC
% U+04ED CYRILLIC SMALL LETTER E WITH DIAERESIS
\DeclareTextCompositeCommand{\"}{PU}{\cyrerev}{\84\355}% U+04ED
% U+04EE CYRILLIC CAPITAL LETTER U WITH MACRON; Umacroncyrillic
\DeclareTextCompositeCommand{\=}{PU}{\CYRU}{\84\356}% U+04EE
% U+04EF CYRILLIC SMALL LETTER U WITH MACRON; umacroncyrillic
\DeclareTextCompositeCommand{\=}{PU}{\cyru}{\84\357}% U+04EF
```

```
% U+04F0 CYRILLIC CAPITAL LETTER U WITH DIAERESIS; Udieresiscyrillic
\DeclareTextCompositeCommand{\"}{PU}{\CYRU}{\84\360}% U+04F0
% U+04F1 CYRILLIC SMALL LETTER U WITH DIAERESIS; udieresiscyrillic
\DeclareTextCompositeCommand{\"}{PU}{\cyru}{\84\361}% U+04F1
% U+04F2 CYRILLIC CAPITAL LETTER U WITH DOUBLE ACUTE; Uhungarumlautcyrillic
\DeclareTextCompositeCommand{\H}{PU}{\CYRU}{\84\362}% U+04F2
% U+04F3 CYRILLIC SMALL LETTER U WITH DOUBLE ACUTE; uhungarumlautcyrillic
\DeclareTextCompositeCommand{\H}{PU}{\cyru}{\84\363}% U+04F3
% U+04F4 CYRILLIC CAPITAL LETTER CHE WITH DIAERESIS; Chedieresiscyrillic
\DeclareTextCompositeCommand{\"}{PU}{\CYRCH}{\84\364}% U+04F4
% U+04F5 CYRILLIC SMALL LETTER CHE WITH DIAERESIS; chedieresiscyrillic
\DeclareTextCompositeCommand{\"}{PU}{\cyrch}{\84\365}% U+04F5
% U+04F6 CYRILLIC CAPITAL LETTER GHE WITH DESCENDER
\DeclareTextCommand{\CYRGDSC}{PU}{\84\366}% U+04F6
% U+04F7 CYRILLIC SMALL LETTER GHE WITH DESCENDER
\DeclareTextCommand{\cyrgdsc}{PU}{\84\367}% U+04F7
% U+04F8 CYRILLIC CAPITAL LETTER YERU WITH DIAERESIS; Yerudieresiscyrillic
\DeclareTextCompositeCommand{\"}{PU}{\CYRERY}{\84\370}% U+04F8
% U+04F9 CYRILLIC SMALL LETTER YERU WITH DIAERESIS; yerudieresiscyrillic
\DeclareTextCompositeCommand{\"}{PU}{\cyrery}{\84\371}% U+04F9
```

\84\372: U+04FA CYRILLIC CAPITAL LETTER GHE WITH STROKE AND HOOK
\84\373: U+04FB CYRILLIC SMALL LETTER GHE WITH STROKE AND HOOK

```
% U+04FC CYRILLIC CAPITAL LETTER HA WITH HOOK
\DeclareTextCommand{\CYRHHK}{PU}{\84\374}% U+04FC
% U+04FD CYRILLIC SMALL LETTER HA WITH HOOK
\DeclareTextCommand{\cyrhhk}{PU}{\84\375}% U+04FD
\fi
```

\84\376: U+04FE CYRILLIC CAPITAL LETTER HA WITH STROKE
\84\377: U+04FF CYRILLIC SMALL LETTER HA WITH STROKE

47.2.11 Hebrew: U+0590 to U+05FF

Macro names are taken from he8enc.def. hebrew is only loaded if \hebdalet is defined

```
\ifx\hebdalet\@undefined\else
% U+05C3 HEBREW PUNCTUATION SOF PASUQ
\DeclareTextCommand{\sofpasuq}{PU}{\85\303}% U+05C3
% U+05D0 HEBREW LETTER ALEF
\DeclareTextCommand{\hebalef}{PU}{\85\320}% U+05D0
% U+05D1 HEBREW LETTER BET
\DeclareTextCommand{\hebbet}{PU}{\85\321}% U+05D1
% U+05D2 HEBREW LETTER GIMEL
\DeclareTextCommand{\hebgimel}{PU}{\85\322}% U+05D2
```

```
% U+05D3 HEBREW LETTER DALET
\DeclareTextCommand{\hebdalet}{PU}{\85\323}% U+05D3
% U+05D4 HEBREW LETTER HE
\DeclareTextCommand{\hebhe}{PU}{\85\324}% U+05D4
% U+05D5 HEBREW LETTER VAV
\DeclareTextCommand{\hebvav}{PU}{\85\325}% U+05D5
% U+05D6 HEBREW LETTER ZAYIN
\DeclareTextCommand{\hebzayin}{PU}{\85\326}% U+05D6
% U+05D7 HEBREW LETTER HET
\DeclareTextCommand{\hebhet}{PU}{\85\327}% U+05D7
% U+05D8 HEBREW LETTER TET
\DeclareTextCommand{\hebtet}{PU}{\85\330}% U+05D8
% U+05D9 HEBREW LETTER YOD
\DeclareTextCommand{\hebyod}{PU}{\85\331}% U+05D9
% U+05DA HEBREW LETTER FINAL KAF
\DeclareTextCommand{\hebfinalkaf}{PU}{\85\332}% U+05DA
% U+05DB HEBREW LETTER KAF
\DeclareTextCommand{\hebkaf}{PU}{\85\333}% U+05DB
% U+05DC HEBREW LETTER LAMED
\DeclareTextCommand{\heblamed}{PU}{\85\334}% U+05DC
% U+05DD HEBREW LETTER FINAL MEM
\DeclareTextCommand{\hebfinalmem}{PU}{\85\335}% U+05DD
% U+05DE HEBREW LETTER MEM
\DeclareTextCommand{\hebmem}{PU}{\85\336}% U+05DE
% U+05DF HEBREW LETTER FINAL NUN
\DeclareTextCommand{\hebfinalnun}{PU}{\85\337}% U+05DF
% U+05E0 HEBREW LETTER NUN
\DeclareTextCommand{\hebnun}{PU}{\85\340}% U+05E0
% U+05E1 HEBREW LETTER SAMEKH
\DeclareTextCommand{\hebsamekh}{PU}{\85\341}% U+05E1
% U+05E2 HEBREW LETTER AYIN
\DeclareTextCommand{\hebayin}{PU}{\85\342}% U+05E2
% U+05E3 HEBREW LETTER FINAL PE
\DeclareTextCommand{\hebfinalpe}{PU}{\85\343}% U+05E3
% U+05E4 HEBREW LETTER PE
\DeclareTextCommand{\hebpe}{PU}{\85\344}% U+05E4
% U+05E5 HEBREW LETTER FINAL TSADI
\DeclareTextCommand{\hebfinaltsadi}{PU}{\85\345}% U+05E5
% U+05E6 HEBREW LETTER TSADI
\DeclareTextCommand{\hebtsadi}{PU}{\85\346}% U+05E6
% U+05E7 HEBREW LETTER QOF
\DeclareTextCommand{\hebqof}{PU}{\85\347}% U+05E7
% U+05E8 HEBREW LETTER RESH
\DeclareTextCommand{\hebresh}{PU}{\85\350}% U+05E8
% U+05E9 HEBREW LETTER SHIN
\DeclareTextCommand{\hebshin}{PU}{\85\351}% U+05E9
%* \hebshin -> \hebsin (he8)
% U+05EA HEBREW LETTER TAV
\DeclareTextCommand{\hebtav}{PU}{\85\352}% U+05EA
% U+05F0 HEBREW LIGATURE YIDDISH DOUBLE VAV
\DeclareTextCommand{\doublevav}{PU}{\85\360}% U+05F0
% U+05F1 HEBREW LIGATURE YIDDISH VAV YOD
\DeclareTextCommand{\vavyod}{PU}{\85\361}% U+05F1
% U+05F2 HEBREW LIGATURE YIDDISH DOUBLE YOD
```

```
\DeclareTextCommand{\doubleyod}{PU}{\85\362}% U+05F2
\fi
```

47.2.12 Thai: U+0E00 to U+0E7F

```
% U+0E3F THAI CURRENCY SYMBOL BAHT; bahtthai
\DeclareTextCommand{\textbaht}{PU}{\9016\077}% U+0E3F
```

47.2.13 Phonetic Extensions: U+1D00 to U+1D7F

```
% U+1D00 LATIN LETTER SMALL CAPITAL A; \textsca (tipa)
\DeclareTextCommand{\textsca}{PU}{\9035\000}% U+1D00
% U+1D05 LATIN LETTER SMALL CAPITAL D; \scd (wsuipa)
\DeclareTextCommand{\textscd}{PU}{\9035\005}%* U+1D05
% U+1D07 LATIN LETTER SMALL CAPITAL E; \textsce (tipa)
\DeclareTextCommand{\textsce}{PU}{\9035\007}% U+1D07
% U+1D0A LATIN LETTER SMALL CAPITAL J; \textscj (tipa)
\DeclareTextCommand{\textscj}{PU}{\9035\012}% U+1D0A
% U+1D0B LATIN LETTER SMALL CAPITAL K; \textsck (tipx)
\DeclareTextCommand{\textPUsck}{PU}{\9035\013}% U+1D0B
%* \textPUsck -> \textsck (tipx)
% U+1D0D LATIN LETTER SMALL CAPITAL M; \textscm (tipx)
\DeclareTextCommand{\textPUscm}{PU}{\9035\015}% U+1D0D
%* \textPUscm -> \textscm (tipx)
% U+1D18 LATIN LETTER SMALL CAPITAL P; \textscp (tipx)
\DeclareTextCommand{\textPUscp}{PU}{\9035\030}% U+1D18
%* \textPUscp -> \textscp (tipx)
% U+1D19 LATIN LETTER SMALL CAPITAL REVERSED R; \textrevscr (tipx)
\DeclareTextCommand{\textPUrevscr}{PU}{\9035\031}% U+1D19
%* \textPUrevscr -> \textrevscr (tipx)
% U+1D1C LATIN LETTER SMALL CAPITAL U; \textscu (tipa), \scu (wsuipa)
\DeclareTextCommand{\textscu}{PU}{\9035\034}%* U+1D1C
% U+1D62 LATIN SUBSCRIPT SMALL LETTER I
\DeclareTextCommand{\textiinferior}{PU}{\9035\142}%* U+1D62
% U+1D63 LATIN SUBSCRIPT SMALL LETTER R
\DeclareTextCommand{\textrinferior}{PU}{\9035\143}%* U+1D63
% U+1D64 LATIN SUBSCRIPT SMALL LETTER U
\DeclareTextCommand{\textuinferior}{PU}{\9035\144}%* U+1D64
% U+1D65 LATIN SUBSCRIPT SMALL LETTER V
\DeclareTextCommand{\textvinferior}{PU}{\9035\145}%* U+1D65
% U+1D66 GREEK SUBSCRIPT SMALL LETTER BETA
\DeclareTextCommand{\textbetainferior}{PU}{\9035\146}%* U+1D66
% U+1D67 GREEK SUBSCRIPT SMALL LETTER GAMMA
\DeclareTextCommand{\textgammainferior}{PU}{\9035\147}%* U+1D67
% U+1D68 GREEK SUBSCRIPT SMALL LETTER RHO
\DeclareTextCommand{\textrhoinferior}{PU}{\9035\150}%* U+1D68
% U+1D69 GREEK SUBSCRIPT SMALL LETTER PHI
\DeclareTextCommand{\textphiinferior}{PU}{\9035\151}%* U+1D69
% U+1D6A GREEK SUBSCRIPT SMALL LETTER CHI
\DeclareTextCommand{\textchiinferior}{PU}{\9035\152}%* U+1D6A
% U+1D7B LATIN SMALL CAPITAL LETTER I WITH STROKE;
%   \barsci (wsuipa)
\DeclareTextCommand{\textbarsci}{PU}{\9035\173}%* U+1D7B
% U+1D7D LATIN SMALL LETTER P WITH STROKE; \barp (wsuipa)
\DeclareTextCommand{\textbarp}{PU}{\9035\175}%* U+1D7D
```

```
% U+1D7E LATIN SMALL CAPITAL LETTER U WITH STROKE;
%   \barscu (wsuipa)
\DeclareTextCommand{\textbarscu}{PU}{\9035\176}%* U+1D7E
```

47.2.14 Phonetic Extensions Supplement: U+1D80 to U+1DBF

```
% U+1D8F LATIN SMALL LETTER A WITH RETROFLEX HOOK; \textrhooka (tipx)
\DeclareTextCommand{\textPUrhooka}{PU}{\9035\217}% U+1D8F
%* \textPUrhooka -> \textrhooka (tipx)
% U+1D91 LATIN SMALL LETTER D WITH HOOK AND TAIL; \texthtrtaild (tipa)
\DeclareTextCommand{\texthtrtaild}{PU}{\9035\221}%* U+1D91
% U+1D92 LATIN SMALL LETTER E WITH RETROFLEX HOOK; \textrhooke (tipx)
\DeclareTextCommand{\textPUrhooke}{PU}{\9035\222}% U+1D92
%* \textPUrhooke -> \textrhooke (tipx)
% U+1D93 LATIN SMALL LETTER OPEN E WITH RETROFLEX HOOK;
%   \textrhookepsilon (tipx)
\DeclareTextCommand{\textPUrhookepsilon}{PU}{\9035\223}% U+1D93
%* \textPUrhookepsilon -> \textrhookepsilon (tipx)
% U+1D97 LATIN SMALL LETTER OPEN O WITH RETROFLEX HOOK;
%   \textrhookopeno (tipx)
\DeclareTextCommand{\textPUrhookopeno}{PU}{\9035\227}% U+1D97
%* \textPUrhookopeno -> \textrhookopeno (tipx)
```

47.2.15 Latin Extended Additional: U+1E00 to U+1EFF

```
% U+1E00 LATIN CAPITAL LETTER A WITH RING BELOW; Aringbelow
\DeclareTextCompositeCommand{\textsubring}{PU}{A}{\9036\000}% U+1E00
% U+1E01 LATIN SMALL LETTER A WITH RING BELOW; aringbelow
\DeclareTextCompositeCommand{\textsubring}{PU}{a}{\9036\001}% U+1E01
% U+1E02 LATIN CAPITAL LETTER B WITH DOT ABOVE; Bdotaccent
\DeclareTextCompositeCommand{\.}{PU}{B}{\9036\002}% U+1E02
% U+1E03 LATIN SMALL LETTER B WITH DOT ABOVE; bdotaccent
\DeclareTextCompositeCommand{\.}{PU}{b}{\9036\003}% U+1E03
% U+1E04 LATIN CAPITAL LETTER B WITH DOT BELOW; Bdotbelow
\DeclareTextCompositeCommand{\d}{PU}{B}{\9036\004}% U+1E04
% U+1E05 LATIN SMALL LETTER B WITH DOT BELOW; bdotbelow
\DeclareTextCompositeCommand{\d}{PU}{b}{\9036\005}% U+1E05
% U+1E06 LATIN CAPITAL LETTER B WITH LINE BELOW; Blinebelow
\DeclareTextCompositeCommand{\b}{PU}{B}{\9036\006}% U+1E06
% U+1E07 LATIN SMALL LETTER B WITH LINE BELOW; blinebelow
\DeclareTextCompositeCommand{\b}{PU}{b}{\9036\007}% U+1E07
% U+1E0A LATIN CAPITAL LETTER D WITH DOT ABOVE; Ddotaccent
\DeclareTextCompositeCommand{\.}{PU}{D}{\9036\012}% U+1E0A
% U+1E0B LATIN SMALL LETTER D WITH DOT ABOVE; ddotaccent
\DeclareTextCompositeCommand{\.}{PU}{d}{\9036\013}% U+1E0B
% U+1E0C LATIN CAPITAL LETTER D WITH DOT BELOW; Ddotbelow
\DeclareTextCompositeCommand{\d}{PU}{D}{\9036\014}% U+1E0C
% U+1E0D LATIN SMALL LETTER D WITH DOT BELOW; ddotbelow
\DeclareTextCompositeCommand{\d}{PU}{d}{\9036\015}% U+1E0D
% U+1E0E LATIN CAPITAL LETTER D WITH LINE BELOW; Dlinebelow
\DeclareTextCompositeCommand{\b}{PU}{D}{\9036\016}% U+1E0E
% U+1E0F LATIN SMALL LETTER D WITH LINE BELOW; dlinebelow
\DeclareTextCompositeCommand{\b}{PU}{d}{\9036\017}% U+1E0F
```

```
% U+1E10 LATIN CAPITAL LETTER D WITH CEDILLA; Dcedilla
\DeclareTextCompositeCommand{\c}{PU}{D}{\9036\020}% U+1E10
% U+1E11 LATIN SMALL LETTER D WITH CEDILLA; dcedilla
\DeclareTextCompositeCommand{\c}{PU}{d}{\9036\021}% U+1E11
% U+1E12 LATIN CAPITAL LETTER D WITH CIRCUMFLEX BELOW; Dcircumflexbelow
\DeclareTextCompositeCommand{\textsubcircum}{PU}{D}{\9036\022}% U+1E12
% U+1E13 LATIN SMALL LETTER D WITH CIRCUMFLEX BELOW; dcircumflexbelow
\DeclareTextCompositeCommand{\textsubcircum}{PU}{d}{\9036\023}% U+1E13
% U+1E14 LATIN CAPITAL LETTER E WITH MACRON AND GRAVE;
%   Emacrongrave
\DeclareTextCompositeCommand{\textgravemacron}{PU}{E}{\9036\024}% U+1E14
% U+1E15 LATIN SMALL LETTER E WITH MACRON AND GRAVE;
%   emacrongrave
\DeclareTextCompositeCommand{\textgravemacron}{PU}{e}{\9036\025}% U+1E15
% U+1E16 LATIN CAPITAL LETTER E WITH MACRON AND ACUTE;
%   Emacronacute
\DeclareTextCompositeCommand{\textacutemacron}{PU}{E}{\9036\026}% U+1E16
% U+1E17 LATIN SMALL LETTER E WITH MACRON AND ACUTE;
%   emacronacute
\DeclareTextCompositeCommand{\textacutemacron}{PU}{e}{\9036\027}% U+1E17
% U+1E18 LATIN CAPITAL LETTER E WITH CIRCUMFLEX BELOW; Ecircumflexbelow
\DeclareTextCompositeCommand{\textsubcircum}{PU}{E}{\9036\030}% U+1E18
% U+1E19 LATIN SMALL LETTER E WITH CIRCUMFLEX BELOW; ecircumflexbelow
\DeclareTextCompositeCommand{\textsubcircum}{PU}{e}{\9036\031}% U+1E19
% U+1E1A LATIN CAPITAL LETTER E WITH TILDE BELOW; Etildebelow
\DeclareTextCompositeCommand{\textsubtilde}{PU}{E}{\9036\032}% U+1E1A
% U+1E1B LATIN SMALL LETTER E WITH TILDE BELOW; etildebelow
\DeclareTextCompositeCommand{\textsubtilde}{PU}{e}{\9036\033}% U+1E1B
% U+1E1E LATIN CAPITAL LETTER F WITH DOT ABOVE; Fdotaccent
\DeclareTextCompositeCommand{\.}{PU}{F}{\9036\036}% U+1E1E
% U+1E1F LATIN SMALL LETTER F WITH DOT ABOVE; fdotaccent
\DeclareTextCompositeCommand{\.}{PU}{f}{\9036\037}% U+1E1F
% U+1E20 LATIN CAPITAL LETTER G WITH MACRON; Gmacron
\DeclareTextCompositeCommand{\=}{PU}{G}{\9036\040}% U+1E20
% U+1E21 LATIN SMALL LETTER G WITH MACRON; gmacron
\DeclareTextCompositeCommand{\=}{PU}{g}{\9036\041}% U+1E21
% U+1E22 LATIN CAPITAL LETTER H WITH DOT ABOVE; Hdotaccent
\DeclareTextCompositeCommand{\.}{PU}{H}{\9036\042}% U+1E22
% U+1E23 LATIN SMALL LETTER H WITH DOT ABOVE; hdotaccent
\DeclareTextCompositeCommand{\.}{PU}{h}{\9036\043}% U+1E23
% U+1E24 LATIN CAPITAL LETTER H WITH DOT BELOW; Hdotbelow
\DeclareTextCompositeCommand{\d}{PU}{H}{\9036\044}% U+1E24
% U+1E25 LATIN SMALL LETTER H WITH DOT BELOW; hdotbelow
\DeclareTextCompositeCommand{\d}{PU}{h}{\9036\045}% U+1E25
% U+1E26 LATIN CAPITAL LETTER H WITH DIAERESIS; Hdieresis
\DeclareTextCompositeCommand{\"}{PU}{H}{\9036\046}% U+1E26
% U+1E27 LATIN SMALL LETTER H WITH DIAERESIS; hdieresis
\DeclareTextCompositeCommand{\"}{PU}{h}{\9036\047}% U+1E27
% U+1E28 LATIN CAPITAL LETTER H WITH CEDILLA; Hcedilla
\DeclareTextCompositeCommand{\c}{PU}{H}{\9036\050}% U+1E28
```

```
% U+1E29 LATIN SMALL LETTER H WITH CEDILLA; hcedilla
\DeclareTextCompositeCommand{\c}{PU}{h}{\9036\051}% U+1E29
% U+1E2A LATIN CAPITAL LETTER H WITH BREVE BELOW; Hbrevebelow
\DeclareTextCompositeCommand{\textsubbreve}{PU}{H}{\9036\052}% U+1E2A
% U+1E2B LATIN SMALL LETTER H WITH BREVE BELOW; hbrevebelow
\DeclareTextCompositeCommand{\textsubbreve}{PU}{h}{\9036\053}% U+1E2B
% U+1E2C LATIN CAPITAL LETTER I WITH TILDE BELOW; Itildebelow
\DeclareTextCompositeCommand{\textsubtilde}{PU}{I}{\9036\054}% U+1E2C
% U+1E2D LATIN SMALL LETTER I WITH TILDE BELOW; itildebelow
\DeclareTextCompositeCommand{\textsubtilde}{PU}{i}{\9036\055}% U+1E2D
% U+1E30 LATIN CAPITAL LETTER K WITH ACUTE; Kacute
\DeclareTextCompositeCommand{\'}{PU}{K}{\9036\060}% U+1E30
% U+1E31 LATIN SMALL LETTER K WITH ACUTE; kacute
\DeclareTextCompositeCommand{\'}{PU}{k}{\9036\061}% U+1E31
% U+1E32 LATIN CAPITAL LETTER K WITH DOT BELOW; Kdotbelow
\DeclareTextCompositeCommand{\d}{PU}{K}{\9036\062}% U+1E32
% U+1E33 LATIN SMALL LETTER K WITH DOT BELOW; kdotbelow
\DeclareTextCompositeCommand{\d}{PU}{k}{\9036\063}% U+1E33
% U+1E34 LATIN CAPITAL LETTER K WITH LINE BELOW; Klinebelow
\DeclareTextCompositeCommand{\b}{PU}{K}{\9036\064}% U+1E34
% U+1E35 LATIN SMALL LETTER K WITH LINE BELOW; klinebelow
\DeclareTextCompositeCommand{\b}{PU}{k}{\9036\065}% U+1E35
% U+1E36 LATIN CAPITAL LETTER L WITH DOT BELOW; Ldotbelow
\DeclareTextCompositeCommand{\d}{PU}{L}{\9036\066}% U+1E36
% U+1E37 LATIN SMALL LETTER L WITH DOT BELOW; ldotbelow
\DeclareTextCompositeCommand{\d}{PU}{l}{\9036\067}% U+1E37
% U+1E3A LATIN CAPITAL LETTER L WITH LINE BELOW; Llinebelow
\DeclareTextCompositeCommand{\b}{PU}{L}{\9036\072}% U+1E3A
% U+1E3B LATIN SMALL LETTER L WITH LINE BELOW; llinebelow
\DeclareTextCompositeCommand{\b}{PU}{l}{\9036\073}% U+1E3B
% U+1E3C LATIN CAPITAL LETTER L WITH CIRCUMFLEX BELOW; Lcir-
    cumflexbelow
\DeclareTextCompositeCommand{\textsubcircum}{PU}{L}{\9036\074}% U+1E3C
% U+1E3D LATIN SMALL LETTER L WITH CIRCUMFLEX BELOW; lcir-
    cumflexbelow
\DeclareTextCompositeCommand{\textsubcircum}{PU}{l}{\9036\075}% U+1E3D
% U+1E3E LATIN CAPITAL LETTER M WITH ACUTE; Macute
\DeclareTextCompositeCommand{\'}{PU}{M}{\9036\076}% U+1E3E
% U+1E3F LATIN SMALL LETTER M WITH ACUTE; macute
\DeclareTextCompositeCommand{\'}{PU}{m}{\9036\077}% U+1E3F
% U+1E40 LATIN CAPITAL LETTER M WITH DOT ABOVE; Mdotaccent
\DeclareTextCompositeCommand{\.}{PU}{M}{\9036\100}% U+1E40
% U+1E41 LATIN SMALL LETTER M WITH DOT ABOVE; mdotaccent
\DeclareTextCompositeCommand{\.}{PU}{m}{\9036\101}% U+1E41
% U+1E42 LATIN CAPITAL LETTER M WITH DOT BELOW; Mdotbelow
\DeclareTextCompositeCommand{\d}{PU}{M}{\9036\102}% U+1E42
% U+1E43 LATIN SMALL LETTER M WITH DOT BELOW; mdotbelow
\DeclareTextCompositeCommand{\d}{PU}{m}{\9036\103}% U+1E43
% U+1E44 LATIN CAPITAL LETTER N WITH DOT ABOVE; Ndotaccent
\DeclareTextCompositeCommand{\.}{PU}{N}{\9036\104}% U+1E44
% U+1E45 LATIN SMALL LETTER N WITH DOT ABOVE; ndotaccent
\DeclareTextCompositeCommand{\.}{PU}{n}{\9036\105}% U+1E45
% U+1E46 LATIN CAPITAL LETTER N WITH DOT BELOW; Ndotbelow
\DeclareTextCompositeCommand{\d}{PU}{N}{\9036\106}% U+1E46
```

```
% U+1E47 LATIN SMALL LETTER N WITH DOT BELOW; ndotbelow
\DeclareTextCompositeCommand{\d}{PU}{n}{\9036\107}% U+1E47
% U+1E48 LATIN CAPITAL LETTER N WITH LINE BELOW; Nlinebelow
\DeclareTextCompositeCommand{\b}{PU}{N}{\9036\110}% U+1E48
% U+1E49 LATIN SMALL LETTER N WITH LINE BELOW; nlinebelow
\DeclareTextCompositeCommand{\b}{PU}{n}{\9036\111}% U+1E49
% U+1E4A LATIN CAPITAL LETTER N WITH CIRCUMFLEX BELOW; Ncircumflexbelow
\DeclareTextCompositeCommand{\textsubcircum}{PU}{N}{\9036\112}% U+1E4A
% U+1E4B LATIN SMALL LETTER N WITH CIRCUMFLEX BELOW; ncircumflexbelow
\DeclareTextCompositeCommand{\textsubcircum}{PU}{n}{\9036\113}% U+1E4B
% U+1E50 LATIN CAPITAL LETTER O WITH MACRON AND GRAVE;
%   Omacrongrave
\DeclareTextCompositeCommand{\textgravemacron}{PU}{O}{\9036\120}% U+1E50
% U+1E51 LATIN SMALL LETTER O WITH MACRON AND GRAVE;
%   omacrongrave
\DeclareTextCompositeCommand{\textgravemacron}{PU}{o}{\9036\121}% U+1E51
% U+1E52 LATIN CAPITAL LETTER O WITH MACRON AND ACUTE;
%   Omacronacute
\DeclareTextCompositeCommand{\textacutemacron}{PU}{O}{\9036\122}% U+1E52
% U+1E53 LATIN SMALL LETTER O WITH MACRON AND ACUTE;
%   omacronacute
\DeclareTextCompositeCommand{\textacutemacron}{PU}{o}{\9036\123}% U+1E53
% U+1E54 LATIN CAPITAL LETTER P WITH ACUTE; Pacute
\DeclareTextCompositeCommand{\'}{PU}{P}{\9036\124}% U+1E54
% U+1E55 LATIN SMALL LETTER P WITH ACUTE; pacute
\DeclareTextCompositeCommand{\'}{PU}{p}{\9036\125}% U+1E55
% U+1E56 LATIN CAPITAL LETTER P WITH DOT ABOVE; Pdotaccent
\DeclareTextCompositeCommand{\.}{PU}{P}{\9036\126}% U+1E56
% U+1E57 LATIN SMALL LETTER P WITH DOT ABOVE; pdotaccent
\DeclareTextCompositeCommand{\.}{PU}{p}{\9036\127}% U+1E57
% U+1E58 LATIN CAPITAL LETTER R WITH DOT ABOVE; Rdotaccent
\DeclareTextCompositeCommand{\.}{PU}{R}{\9036\130}% U+1E58
% U+1E59 LATIN SMALL LETTER R WITH DOT ABOVE; rdotaccent
\DeclareTextCompositeCommand{\.}{PU}{r}{\9036\131}% U+1E59
% U+1E5A LATIN CAPITAL LETTER R WITH DOT BELOW; Rdotbelow
\DeclareTextCompositeCommand{\d}{PU}{R}{\9036\132}% U+1E5A
% U+1E5B LATIN SMALL LETTER R WITH DOT BELOW; rdotbelow
\DeclareTextCompositeCommand{\d}{PU}{r}{\9036\133}% U+1E5B
% U+1E5E LATIN CAPITAL LETTER R WITH LINE BELOW; Rlinebelow
\DeclareTextCompositeCommand{\b}{PU}{R}{\9036\136}% U+1E5E
% U+1E5F LATIN SMALL LETTER R WITH LINE BELOW; rlinebelow
\DeclareTextCompositeCommand{\b}{PU}{r}{\9036\137}% U+1E5F
% U+1E60 LATIN CAPITAL LETTER S WITH DOT ABOVE; Sdotaccent
\DeclareTextCompositeCommand{\.}{PU}{S}{\9036\140}% U+1E60
% U+1E61 LATIN SMALL LETTER S WITH DOT ABOVE; sdotaccent
\DeclareTextCompositeCommand{\.}{PU}{s}{\9036\141}% U+1E61
% U+1E62 LATIN CAPITAL LETTER S WITH DOT BELOW; Sdotbelow
\DeclareTextCompositeCommand{\d}{PU}{S}{\9036\142}% U+1E62
% U+1E63 LATIN SMALL LETTER S WITH DOT BELOW; sdotbelow
\DeclareTextCompositeCommand{\d}{PU}{s}{\9036\143}% U+1E63
% U+1E6A LATIN CAPITAL LETTER T WITH DOT ABOVE; Tdotaccent
\DeclareTextCompositeCommand{\.}{PU}{T}{\9036\152}% U+1E6A
```

```
% U+1E6B LATIN SMALL LETTER T WITH DOT ABOVE; tdotaccent
\DeclareTextCompositeCommand{\.}{PU}{t}{\9036\153}% U+1E6B
% U+1E6C LATIN CAPITAL LETTER T WITH DOT BELOW; Tdotbelow
\DeclareTextCompositeCommand{\d}{PU}{T}{\9036\154}% U+1E6C
% U+1E6D LATIN SMALL LETTER T WITH DOT BELOW; tdotbelow
\DeclareTextCompositeCommand{\d}{PU}{t}{\9036\155}% U+1E6D
% U+1E6E LATIN CAPITAL LETTER T WITH LINE BELOW; Tlinebelow
\DeclareTextCompositeCommand{\b}{PU}{T}{\9036\156}% U+1E6E
% U+1E6F LATIN SMALL LETTER T WITH LINE BELOW; tlinebelow
\DeclareTextCompositeCommand{\b}{PU}{t}{\9036\157}% U+1E6F
% U+1E70 LATIN CAPITAL LETTER T WITH CIRCUMFLEX BELOW; Tcir-
    cumflexbelow
\DeclareTextCompositeCommand{\textsubcircum}{PU}{T}{\9036\160}% U+1E70
% U+1E71 LATIN SMALL LETTER T WITH CIRCUMFLEX BELOW; tcir-
    cumflexbelow
\DeclareTextCompositeCommand{\textsubcircum}{PU}{t}{\9036\161}% U+1E71
% U+1E72 LATIN CAPITAL LETTER U WITH DIAERESIS BELOW; Udiere-
    sisbelow
\DeclareTextCompositeCommand{\textsubumlaut}{PU}{U}{\9036\162}% U+1E72
% U+1E73 LATIN SMALL LETTER U WITH DIAERESIS BELOW; udieresis-
    below
\DeclareTextCompositeCommand{\textsubumlaut}{PU}{u}{\9036\163}% U+1E73
% U+1E74 LATIN CAPITAL LETTER U WITH TILDE BELOW; Utildebelow
\DeclareTextCompositeCommand{\textsubtilde}{PU}{U}{\9036\164}% U+1E74
% U+1E75 LATIN SMALL LETTER U WITH TILDE BELOW; utildebelow
\DeclareTextCompositeCommand{\textsubtilde}{PU}{u}{\9036\165}% U+1E75
% U+1E76 LATIN CAPITAL LETTER U WITH CIRCUMFLEX BELOW; Ucir-
    cumflexbelow
\DeclareTextCompositeCommand{\textsubcircum}{PU}{U}{\9036\166}% U+1E76
% U+1E77 LATIN SMALL LETTER U WITH CIRCUMFLEX BELOW; ucir-
    cumflexbelow
\DeclareTextCompositeCommand{\textsubcircum}{PU}{u}{\9036\167}% U+1E77
% U+1E7C LATIN CAPITAL LETTER V WITH TILDE; Vtilde
\DeclareTextCompositeCommand{\~}{PU}{V}{\9036\174}% U+1E7C
% U+1E7D LATIN SMALL LETTER V WITH TILDE; vtilde
\DeclareTextCompositeCommand{\~}{PU}{v}{\9036\175}% U+1E7D
% U+1E7E LATIN CAPITAL LETTER V WITH DOT BELOW; Vdotbelow
\DeclareTextCompositeCommand{\d}{PU}{V}{\9036\176}% U+1E7E
% U+1E7F LATIN SMALL LETTER V WITH DOT BELOW; vdotbelow
\DeclareTextCompositeCommand{\d}{PU}{v}{\9036\177}% U+1E7F
% U+1E80 LATIN CAPITAL LETTER W WITH GRAVE; Wgrave
\DeclareTextCompositeCommand{\`}{PU}{W}{\9036\200}% U+1E80
% U+1E81 LATIN SMALL LETTER W WITH GRAVE; wgrave
\DeclareTextCompositeCommand{\`}{PU}{w}{\9036\201}% U+1E81
% U+1E82 LATIN CAPITAL LETTER W WITH ACUTE; Wacute
\DeclareTextCompositeCommand{\'}{PU}{W}{\9036\202}% U+1E82
% U+1E83 LATIN SMALL LETTER W WITH ACUTE; wacute
\DeclareTextCompositeCommand{\'}{PU}{w}{\9036\203}% U+1E83
% U+1E84 LATIN CAPITAL LETTER W WITH DIAERESIS; Wdieresis
\DeclareTextCompositeCommand{\"}{PU}{W}{\9036\204}% U+1E84
% U+1E85 LATIN SMALL LETTER W WITH DIAERESIS; wdieresis
\DeclareTextCompositeCommand{\"}{PU}{w}{\9036\205}% U+1E85
% U+1E86 LATIN CAPITAL LETTER W WITH DOT ABOVE; Wdotaccent
\DeclareTextCompositeCommand{\.}{PU}{W}{\9036\206}% U+1E86
```

```
% U+1E87 LATIN SMALL LETTER W WITH DOT ABOVE; wdotaccent
\DeclareTextCompositeCommand{\.}{PU}{w}{\9036\207}% U+1E87
% U+1E88 LATIN CAPITAL LETTER W WITH DOT BELOW; wdotbelow
\DeclareTextCompositeCommand{\d}{PU}{W}{\9036\210}% U+1E88
% U+1E89 LATIN SMALL LETTER W WITH DOT BELOW; wdotbelow
\DeclareTextCompositeCommand{\d}{PU}{w}{\9036\211}% U+1E89
% U+1E8A LATIN CAPITAL LETTER X WITH DOT ABOVE; Xdotaccent
\DeclareTextCompositeCommand{\.}{PU}{X}{\9036\212}% U+1E8A
% U+1E8B LATIN SMALL LETTER X WITH DOT ABOVE; xdotaccent
\DeclareTextCompositeCommand{\.}{PU}{x}{\9036\213}% U+1E8B
% U+1E8C LATIN CAPITAL LETTER X WITH DIAERESIS; Xdieresis
\DeclareTextCompositeCommand{\"}{PU}{X}{\9036\214}% U+1E8C
% U+1E8D LATIN SMALL LETTER X WITH DIAERESIS; xdieresis
\DeclareTextCompositeCommand{\"}{PU}{x}{\9036\215}% U+1E8D
% U+1E8E LATIN CAPITAL LETTER Y WITH DOT ABOVE; Ydotaccent
\DeclareTextCompositeCommand{\.}{PU}{Y}{\9036\216}% U+1E8E
% U+1E8F LATIN SMALL LETTER Y WITH DOT ABOVE; ydotaccent
\DeclareTextCompositeCommand{\.}{PU}{y}{\9036\217}% U+1E8F
% U+1E90 LATIN CAPITAL LETTER Z WITH CIRCUMFLEX; Zcircumflex
\DeclareTextCompositeCommand{\^}{PU}{Z}{\9036\220}% U+1E90
% U+1E91 LATIN SMALL LETTER Z WITH CIRCUMFLEX; zcircumflex
\DeclareTextCompositeCommand{\^}{PU}{z}{\9036\221}% U+1E91
% U+1E92 LATIN CAPITAL LETTER Z WITH DOT BELOW; Zdotbelow
\DeclareTextCompositeCommand{\d}{PU}{Z}{\9036\222}% U+1E92
% U+1E93 LATIN SMALL LETTER Z WITH DOT BELOW; zdotbelow
\DeclareTextCompositeCommand{\d}{PU}{z}{\9036\223}% U+1E93
% U+1E94 LATIN CAPITAL LETTER Z WITH LINE BELOW; Zlinebelow
\DeclareTextCompositeCommand{\b}{PU}{Z}{\9036\224}% U+1E94
% U+1E95 LATIN SMALL LETTER Z WITH LINE BELOW; zlinebelow
\DeclareTextCompositeCommand{\b}{PU}{z}{\9036\225}% U+1E95
% U+1E96 LATIN SMALL LETTER H WITH LINE BELOW; hlinebelow
\DeclareTextCompositeCommand{\b}{PU}{h}{\9036\226}% U+1E96
% U+1E97 LATIN SMALL LETTER T WITH DIAERESIS; tdieresis
\DeclareTextCompositeCommand{\"}{PU}{t}{\9036\227}% U+1E97
% U+1E98 LATIN SMALL LETTER W WITH RING ABOVE; wring
\DeclareTextCompositeCommand{\r}{PU}{w}{\9036\230}% U+1E98
% U+1E99 LATIN SMALL LETTER Y WITH RING ABOVE; yring
\DeclareTextCompositeCommand{\r}{PU}{y}{\9036\231}% U+1E99
% U+1E9B LATIN SMALL LETTER LONG S WITH DOT ABOVE; slongdo-
    taccent
\DeclareTextCompositeCommand{\.}{PU}{\textlongs}{\9036\233}% U+1E9B
% U+1EA0 LATIN CAPITAL LETTER A WITH DOT BELOW; Adotbelow
\DeclareTextCompositeCommand{\d}{PU}{A}{\9036\240}% U+1EA0
% U+1EA1 LATIN SMALL LETTER A WITH DOT BELOW; adotbelow
\DeclareTextCompositeCommand{\d}{PU}{a}{\9036\241}% U+1EA1
% U+1EB8 LATIN CAPITAL LETTER E WITH DOT BELOW; Edotbelow
\DeclareTextCompositeCommand{\d}{PU}{E}{\9036\270}% U+1EB8
% U+1EB9 LATIN SMALL LETTER E WITH DOT BELOW; edotbelow
\DeclareTextCompositeCommand{\d}{PU}{e}{\9036\271}% U+1EB9
% U+1EBC LATIN CAPITAL LETTER E WITH TILDE; Etilde
\DeclareTextCompositeCommand{\~}{PU}{E}{\9036\274}% U+1EBC
% U+1EBD LATIN SMALL LETTER E WITH TILDE; etilde
\DeclareTextCompositeCommand{\~}{PU}{e}{\9036\275}% U+1EBD
% U+1ECA LATIN CAPITAL LETTER I WITH DOT BELOW; Idotbelow
```

```
\DeclareTextCompositeCommand{\d}{PU}{I}{\9036\312}% U+1ECA
% U+1ECB LATIN SMALL LETTER I WITH DOT BELOW; idotbelow
\DeclareTextCompositeCommand{\d}{PU}{i}{\9036\313}% U+1ECB
% U+1ECC LATIN CAPITAL LETTER O WITH DOT BELOW; Odotbelow
\DeclareTextCompositeCommand{\d}{PU}{O}{\9036\314}% U+1ECC
% U+1ECD LATIN SMALL LETTER O WITH DOT BELOW; odotbelow
\DeclareTextCompositeCommand{\d}{PU}{o}{\9036\315}% U+1ECD
% U+1EE4 LATIN CAPITAL LETTER U WITH DOT BELOW; Udotbelow
\DeclareTextCompositeCommand{\d}{PU}{U}{\9036\344}% U+1EE4
% U+1EE5 LATIN SMALL LETTER U WITH DOT BELOW; udotbelow
\DeclareTextCompositeCommand{\d}{PU}{u}{\9036\345}% U+1EE5
% U+1EF2 LATIN CAPITAL LETTER Y WITH GRAVE; Ygrave
\DeclareTextCompositeCommand{\`}{PU}{Y}{\9036\362}% U+1EF2
% U+1EF3 LATIN SMALL LETTER Y WITH GRAVE; ygrave
\DeclareTextCompositeCommand{\`}{PU}{y}{\9036\363}% U+1EF3
% U+1EF4 LATIN CAPITAL LETTER Y WITH DOT BELOW; Ydotbelow
\DeclareTextCompositeCommand{\d}{PU}{Y}{\9036\364}% U+1EF4
% U+1EF5 LATIN SMALL LETTER Y WITH DOT BELOW; ydotbelow
\DeclareTextCompositeCommand{\d}{PU}{y}{\9036\365}% U+1EF5
% U+1EF8 LATIN CAPITAL LETTER Y WITH TILDE; Ytilde
\DeclareTextCompositeCommand{\~}{PU}{Y}{\9036\370}% U+1EF8
% U+1EF9 LATIN SMALL LETTER Y WITH TILDE; ytilde
\DeclareTextCompositeCommand{\~}{PU}{y}{\9036\371}% U+1EF9
```

47.2.16 General Punctuation: U+2000 to U+206F

```
% U+200C ZERO WIDTH NON-JOINER; *afii61664, zerowidthnonjoiner
\DeclareTextCommand{\textcompwordmark}{PU}{\9040\014}% U+200C
% U+2013 EN DASH; endash
\DeclareTextCommand{\textendash}{PU}{\9040\023}% U+2013
% U+2014 EM DASH; emdash
\DeclareTextCommand{\textemdash}{PU}{\9040\024}% U+2014
% U+2016 DOUBLE VERTICAL LINE; dblverticalbar
\DeclareTextCommand{\textbardbl}{PU}{\9040\026}% U+2016
%* \textbardbl -> \textdoublevertline (tipa)
% U+2018 LEFT SINGLE QUOTATION MARK; quoteleft
\DeclareTextCommand{\textquoteleft}{PU}{\9040\030}% U+2018
% U+2019 RIGHT SINGLE QUOTATION MARK; quoteright
\DeclareTextCommand{\textquoteright}{PU}{\9040\031}% U+2019
% U+201A SINGLE LOW-9 QUOTATION MARK; quotesinglbase
\DeclareTextCommand{\quotesinglbase}{PU}{\9040\032}% U+201A
% U+201C LEFT DOUBLE QUOTATION MARK; quotedblleft
\DeclareTextCommand{\textquotedblleft}{PU}{\9040\034}% U+201C
% U+201D RIGHT DOUBLE QUOTATION MARK; quotedblright
\DeclareTextCommand{\textquotedblright}{PU}{\9040\035}% U+201D
% U+201E DOUBLE LOW-9 QUOTATION MARK; quotedblbase
\DeclareTextCommand{\quotedblbase}{PU}{\9040\036}% U+201E
% U+2020 DAGGER; dagger
\DeclareTextCommand{\textdagger}{PU}{\9040\040}%* U+2020
%* \textdagger -> \dag (LaTeX)
% U+2021 DOUBLE DAGGER; daggerdbl; \ddagger (LaTeX)
\DeclareTextCommand{\textdaggerdbl}{PU}{\9040\041}% U+2021
%* \textdaggerdbl -> \ddagger (LaTeX)
%* \textdaggerdbl -> \ddag (LaTeX)
% U+2022 BULLET; bullet
```

```
\DeclareTextCommand{\textbullet}{PU}{\9040\042}%* U+2022
% U+2025 TWO DOT LEADER; \hdotfor (MnSymbol)
\DeclareTextCommand{\texthdotfor}{PU}{\9040\045}%* U+2025
% U+2026 HORIZONTAL ELLIPSIS; ellipsis
\DeclareTextCommand{\textellipsis}{PU}{\9040\046}% U+2026
%* \textellipsis -> \mathellipsis
% U+2030 PER MILLE SIGN; perthousand
\DeclareTextCommand{\textperthousand}{PU}{\9040\060}% U+2030
% U+2031 PER TEN THOUSAND SIGN
\DeclareTextCommand{\textpertenthousand}{PU}{\9040\061}% U+2031
% U+2032 PRIME; minute; \prime (MnSymbol)
\DeclareTextCommand{\textprime}{PU}{\9040\062}%* U+2032
% U+2033 DOUBLE PRIME; \second (mathabx)
\DeclareTextCommand{\textsecond}{PU}{\9040\063}%* U+2033
% U+2034 TRIPLE PRIME; \third (mathabx)
\DeclareTextCommand{\textthird}{PU}{\9040\064}%* U+2034
% U+2035 REVERSED PRIME; \backprime (AmS)
\DeclareTextCommand{\textbackprime}{PU}{\9040\065}%* U+2035
% U+2039 SINGLE LEFT-POINTING ANGLE QUOTATION MARK; guilsinglleft
\DeclareTextCommand{\guilsinglleft}{PU}{\9040\071}% U+2039
% U+203A SINGLE RIGHT-POINTING ANGLE QUOTATION MARK; guilsinglright
\DeclareTextCommand{\guilsinglright}{PU}{\9040\072}% U+203A
% U+203B REFERENCE MARK; referencemark
\DeclareTextCommand{\textreferencemark}{PU}{\9040\073}% U+203B
% U+203D INTERROBANG
\DeclareTextCommand{\textinterrobang}{PU}{\9040\075}% U+203D
% U+2044 FRACTION SLASH; fraction
\DeclareTextCommand{\textfractionsolidus}{PU}{\9040\104}% U+2044
% U+2045 LEFT SQUARE BRACKET WITH QUILL
\DeclareTextCommand{\textlquill}{PU}{\9040\105}% U+2045
% U+2046 RIGHT SQUARE BRACKET WITH QUILL
\DeclareTextCommand{\textrquill}{PU}{\9040\106}% U+2046
% U+2052 COMMERCIAL MINUS SIGN
\DeclareTextCommand{\textdiscount}{PU}{\9040\122}% U+2052
% U+2056 THREE DOT PUNCTUATION; \leftthereforе (MnSymbol)
\DeclareTextCommand{\textleftthereforе}{PU}{\9040\126}%* U+2056
% U+2057 QUADRUPLE PRIME; \fourth (mathabx)
\DeclareTextCommand{\textfourth}{PU}{\9040\127}%* U+2057
% U+2058 FOUR DOT PUNCTUATION; \diamonddots (MnSymbol)
\DeclareTextCommand{\textdiamonddots}{PU}{\9040\130}%* U+2058
```

47.2.17 Superscripts and Subscripts: U+2070 to U+209F

```
% U+2070 SUPERSCRIPT ZERO; zerosuperior
\DeclareTextCommand{\textzerosuperior}{PU}{\9040\160}%* U+2070
% U+2071 SUPERSCRIPT LATIN SMALL LETTER I
\DeclareTextCommand{\textisuperior}{PU}{\9040\161}%* U+2071
% U+2074 SUPERSCRIPT FOUR; foursuperior
\DeclareTextCommand{\textfoursuperior}{PU}{\9040\164}%* U+2074
% U+2075 SUPERSCRIPT FIVE; fivesuperior
\DeclareTextCommand{\textfivesuperior}{PU}{\9040\165}%* U+2075
% U+2076 SUPERSCRIPT SIX; sixsuperior
\DeclareTextCommand{\textsixsuperior}{PU}{\9040\166}%* U+2076
```

```
% U+2077 SUPERSCRIPT SEVEN; sevensuperior
\DeclareTextCommand{\textsevensuperior}{PU}{\9040\167}%* U+2077
% U+2078 SUPERSCRIPT EIGHT; eightsuperior
\DeclareTextCommand{\texteightsuperior}{PU}{\9040\170}%* U+2078
% U+2079 SUPERSCRIPT NINE; ninesuperior
\DeclareTextCommand{\textninesuperior}{PU}{\9040\171}%* U+2079
% U+207A SUPERSCRIPT PLUS SIGN; plussuperior
\DeclareTextCommand{\textplussuperior}{PU}{\9040\172}%* U+207A
% U+207B SUPERSCRIPT MINUS
\DeclareTextCommand{\textminussuperior}{PU}{\9040\173}%* U+207B
% U+207C SUPERSCRIPT EQUALS SIGN; equalsuperior
\DeclareTextCommand{\textequalsuperior}{PU}{\9040\174}%* U+207C
% U+207D SUPERSCRIPT LEFT PARENTHESIS; parenleftsuperior
\DeclareTextCommand{\textparenleftsuperior}{PU}{\9040\175}%* U+207D
% U+207E SUPERSCRIPT RIGHT PARENTHESIS; parenrightsuperior
\DeclareTextCommand{\textparenrightsuperior}{PU}{\9040\176}%* U+207E
% U+207F SUPERSCRIPT LATIN SMALL LETTER N; nsuperior
\DeclareTextCommand{\textnsuperior}{PU}{\9040\177}%* U+207F
% U+2080 SUBSCRIPT ZERO; zeroinferior
\DeclareTextCommand{\textzeroinferior}{PU}{\9040\200}%* U+2080
% U+2081 SUBSCRIPT ONE; oneinferior
\DeclareTextCommand{\textoneinferior}{PU}{\9040\201}%* U+2081
% U+2082 SUBSCRIPT TWO; twoinferior
\DeclareTextCommand{\texttwoinferior}{PU}{\9040\202}%* U+2082
% U+2083 SUBSCRIPT THREE; threeinferior
\DeclareTextCommand{\textthreeinferior}{PU}{\9040\203}%* U+2083
% U+2084 SUBSCRIPT FOUR; fourinferior
\DeclareTextCommand{\textfourinferior}{PU}{\9040\204}%* U+2084
% U+2085 SUBSCRIPT FIVE; fiveinferior
\DeclareTextCommand{\textfiveinferior}{PU}{\9040\205}%* U+2085
% U+2086 SUBSCRIPT SIX; sixinferior
\DeclareTextCommand{\textsixinferior}{PU}{\9040\206}%* U+2086
% U+2087 SUBSCRIPT SEVEN; seveninferior
\DeclareTextCommand{\textseveninferior}{PU}{\9040\207}%* U+2087
% U+2088 SUBSCRIPT EIGHT; eightinferior
\DeclareTextCommand{\texteightinferior}{PU}{\9040\210}%* U+2088
% U+2089 SUBSCRIPT NINE; nineinferior
\DeclareTextCommand{\textnineinferior}{PU}{\9040\211}%* U+2089
% U+208A SUBSCRIPT PLUS SIGN
\DeclareTextCommand{\textplusinferior}{PU}{\9040\212}%* U+208A
% U+208B SUBSCRIPT MINUS
\DeclareTextCommand{\textminusinferior}{PU}{\9040\213}%* U+208B
% U+208C SUBSCRIPT EQUALS SIGN
\DeclareTextCommand{\textequalsinferior}{PU}{\9040\214}%* U+208C
% U+208D SUBSCRIPT LEFT PARENTHESIS; parenleftinferior
\DeclareTextCommand{\textparenleftinferior}{PU}{\9040\215}%* U+208D
% U+208E SUBSCRIPT RIGHT PARENTHESIS; parenrightinferior
\DeclareTextCommand{\textparenrightinferior}{PU}{\9040\216}%* U+208E
% U+2090 LATIN SUBSCRIPT SMALL LETTER A
\DeclareTextCommand{\textainferior}{PU}{\9040\220}%* U+2090
% U+2091 LATIN SUBSCRIPT SMALL LETTER E
\DeclareTextCommand{\texteinferior}{PU}{\9040\221}%* U+2091
% U+2092 LATIN SUBSCRIPT SMALL LETTER O
\DeclareTextCommand{\textoinferior}{PU}{\9040\222}%* U+2092
```

```
% U+2093 LATIN SUBSCRIPT SMALL LETTER X
\DeclareTextCommand{\textxinferior}{PU}{\9040\223}%* U+2093
% U+2094 LATIN SUBSCRIPT SMALL LETTER SCHWA
\DeclareTextCommand{\textschwainferior}{PU}{\9040\224}%* U+2094
% U+2095 LATIN SUBSCRIPT SMALL LETTER H
\DeclareTextCommand{\texthinferior}{PU}{\9040\225}%* U+2095
% U+2096 LATIN SUBSCRIPT SMALL LETTER K
\DeclareTextCommand{\textkinferior}{PU}{\9040\226}%* U+2096
% U+2097 LATIN SUBSCRIPT SMALL LETTER L
\DeclareTextCommand{\textlinferior}{PU}{\9040\227}%* U+2097
% U+2098 LATIN SUBSCRIPT SMALL LETTER M
\DeclareTextCommand{\textminferior}{PU}{\9040\230}%* U+2098
% U+2099 LATIN SUBSCRIPT SMALL LETTER N
\DeclareTextCommand{\textninferior}{PU}{\9040\231}%* U+2099
% U+209A LATIN SUBSCRIPT SMALL LETTER P
\DeclareTextCommand{\textpinferior}{PU}{\9040\232}%* U+209A
% U+209B LATIN SUBSCRIPT SMALL LETTER S
\DeclareTextCommand{\textsinferior}{PU}{\9040\233}%* U+209B
% U+209C LATIN SUBSCRIPT SMALL LETTER T
\DeclareTextCommand{\texttinferior}{PU}{\9040\234}%* U+209C
```

47.2.18 Currency Symbols: U+20A0 to U+20CF

```
% U+20A1 COLON SIGN; *colonmonetary, colonsign
\DeclareTextCommand{\textcolonmonetary}{PU}{\9040\241}% U+20A1
% U+20A4 LIRA SIGN; afii08941, *lira
\DeclareTextCommand{\textlira}{PU}{\9040\244}% U+20A4
% U+20A6 NAIRA SIGN
\DeclareTextCommand{\textnaira}{PU}{\9040\246}% U+20A6
% U+20A7 PESETA SIGN; peseta
\DeclareTextCommand{\textpeseta}{PU}{\9040\247}% U+20A7
% U+20A9 WON SIGN; won
\DeclareTextCommand{\textwon}{PU}{\9040\251}% U+20A9
% U+20AB DONG SIGN; dong
\DeclareTextCommand{\textdong}{PU}{\9040\253}% U+20AB
% U+20AC EURO SIGN; *Euro, euro
\DeclareTextCommand{\texteuro}{PU}{\9040\254}% U+20AC
%* \texteuro -> \EurDig (marvosym)
%* \texteuro -> \EURdig (marvosym)
%* \texteuro -> \EurHv (marvosym)
%* \texteuro -> \EURhv (marvosym)
%* \texteuro -> \EurCr (marvosym)
%* \texteuro -> \EURcr (marvosym)
%* \texteuro -> \EurTm (marvosym)
%* \texteuro -> \EURtm (marvosym)
%* \texteuro -> \Eur (marvosym)
% U+20B0 GERMAN PENNY SIGN; \Deleatur (marvosym)
\DeclareTextCommand{\textDeleatur}{PU}{\9040\260}%* U+20B0
%* \textDeleatur -> \Denarius (marvosym)
% U+20B1 PESO SIGN
\DeclareTextCommand{\textpeso}{PU}{\9040\261}% U+20B1
% U+20B2 GUARANI SIGN
\DeclareTextCommand{\textguarani}{PU}{\9040\262}% U+20B2
```

47.2.19 Letterlike Symbols: U+2100 to U+214F

```
% U+2103 DEGREE CELSIUS; centigrade
\DeclareTextCommand{\textcelsius}{PU}{\9041\003}% U+2103
% U+210F PLANCK CONSTANT OVER TWO PI; \hslash (AmS)
\DeclareTextCommand{\texthslash}{PU}{\9041\017}%* U+210F
% U+2111 BLACK-LETTER CAPITAL I (=imaginary part); Ifraktur; \Im (LaTeX)
\DeclareTextCommand{\textIm}{PU}{\9041\021}%* U+2111
% U+2113 SCRIPT SMALL L (=ell, liter); afii61289, lsquare; \ell (LaTeX)
\DeclareTextCommand{\textell}{PU}{\9041\023}%* U+2113
% U+2116 NUMERO SIGN; *afii61352, numero
\DeclareTextCommand{\textnumero}{PU}{\9041\026}% U+2116
% U+2117 SOUND RECORDING COPYRIGHT
\DeclareTextCommand{\textcircledP}{PU}{\9041\027}% U+2117
% U+2118 SCRIPT CAPITAL P (=Weierstrass elliptic function);
%   weierstrass; \wp (LaTeX)
\DeclareTextCommand{\textwp}{PU}{\9041\030}%* U+2118
% U+211C BLACK-LETTER CAPITAL R (=real part); Rfraktur; \Re (LaTeX)
\DeclareTextCommand{\textRe}{PU}{\9041\034}%* U+211C
% U+211E PRESCRIPTION TAKE; prescription
\DeclareTextCommand{\textrecipe}{PU}{\9041\036}% U+211E
% U+2120 SERVICE MARK
\DeclareTextCommand{\textservicemark}{PU}{\9041\040}% U+2120
% U+2122 TRADE MARK SIGN; trademark
\DeclareTextCommand{\texttrademark}{PU}{\9041\042}% U+2122
% U+2126 OHM SIGN; Ohm, Omega
\DeclareTextCommand{\textohm}{PU}{\9041\046}% U+2126
% U+2127 INVERTED OHM SIGN
\DeclareTextCommand{\textmho}{PU}{\9041\047}%* U+2127
%* \textmho -> \agemO (wasysym)
% U+2129 TURNED GREEK SMALL LETTER IOTA; \riota (phonetic)
\DeclareTextCommand{\textriota}{PU}{\9041\051}%* U+2129
% U+212B ANGSTROM SIGN; angstrom
\DeclareTextCommand{\textangstrom}{PU}{\9041\053}% U+212B
% U+212E ESTIMATED SYMBOL; estimated
\DeclareTextCommand{\textestimated}{PU}{\9041\056}% U+212E
%* \textestimated -> \EstimatedSign (marvosym)
%* \textestimated -> \Ecommerce (marvosym)
% U+2132 TURNED CAPITAL F; \Finv (AmS)
\DeclareTextCommand{\textFinv}{PU}{\9041\062}%* U+2132
% U+2135 ALEF SYMBOL; aleph; \aleph (LaTeX)
\DeclareTextCommand{\textaleph}{PU}{\9041\065}%* U+2135
% U+2136 BET SYMBOL; \beth (AmS, MnSymbol)
\DeclareTextCommand{\textbeth}{PU}{\9041\066}%* U+2136
% U+2137 GIMEL SYMBOL; \gimel (AmS, MnSymbol)
\DeclareTextCommand{\textgimel}{PU}{\9041\067}%* U+2137
% U+2138 DALET SYMBOL; \daleth (AmS, MnSymbol)
\DeclareTextCommand{\textdaleth}{PU}{\9041\070}%* U+2138
% U+213B FACSIMILE SIGN; \fax (marvosym)
\DeclareTextCommand{\textfax}{PU}{\9041\073}%* U+213B
% U+2141 TURNED SANS-SERIF CAPITAL G (=game); \Game
\DeclareTextCommand{\textGame}{PU}{\9041\101}%* U+2141
% U+214B TURNED AMPERSAND; \invamp (txfonts/pxfonts)
\DeclareTextCommand{\textinvamp}{PU}{\9041\113}% U+214B
%* \textinvamp -> \bindnasrepma (stmaryrd)
```

```
%* \textinvamp -> \parr (cmll)
```

47.2.20 Number Forms: U+2150 to U+218F

```
% U+2150 VULGAR FRACTION ONE SEVENTH
\DeclareTextCommand{\textoneseventh}{PU}{\9041\120}% U+2150
% U+2151 VULGAR FRACTION ONE NINTH
\DeclareTextCommand{\textoneninth}{PU}{\9041\121}% U+2151
% U+2152 VULGAR FRACTION ONE TENTH
\DeclareTextCommand{\textonetenth}{PU}{\9041\122}% U+2152
% U+2153 VULGAR FRACTION ONE THIRD; onethird
\DeclareTextCommand{\textonethird}{PU}{\9041\123}% U+2153
% U+2154 VULGAR FRACTION TWO THIRDS; twothirds
\DeclareTextCommand{\texttwothirds}{PU}{\9041\124}% U+2154
% U+2155 VULGAR FRACTION ONE FIFTH
\DeclareTextCommand{\textonefifth}{PU}{\9041\125}% U+2155
% U+2156 VULGAR FRACTION TWO FIFTHS
\DeclareTextCommand{\texttwofifths}{PU}{\9041\126}% U+2156
% U+2157 VULGAR FRACTION THREE FIFTHS
\DeclareTextCommand{\textthreefifths}{PU}{\9041\127}% U+2157
% U+2158 VULGAR FRACTION FOUR FIFTHS
\DeclareTextCommand{\textfourfifths}{PU}{\9041\130}% U+2158
% U+2159 VULGAR FRACTION ONE SIXTH
\DeclareTextCommand{\textonesixth}{PU}{\9041\131}% U+2159
% U+215A VULGAR FRACTION FIVE SIXTHS
\DeclareTextCommand{\textfivesixths}{PU}{\9041\132}% U+215A
% U+215B VULGAR FRACTION ONE EIGHTH; oneeighth
\DeclareTextCommand{\textoneeighth}{PU}{\9041\133}% U+215B
% U+215C VULGAR FRACTION THREE EIGHTHS; threeeighths
\DeclareTextCommand{\textthreeeighths}{PU}{\9041\134}% U+215C
% U+215D VULGAR FRACTION FIVE EIGHTHS; fiveeighths
\DeclareTextCommand{\textfiveeighths}{PU}{\9041\135}% U+215D
% U+215E VULGAR FRACTION SEVEN EIGHTHS; seveneighths
\DeclareTextCommand{\textseveneighths}{PU}{\9041\136}% U+215E
% U+2184 LATIN SMALL LETTER REVERSED C
\DeclareTextCommand{\textrevc}{PU}{\9041\204}% U+2184
% U+2189 VULGAR FRACTION ZERO THIRDS
\DeclareTextCommand{\textzerothirds}{PU}{\9041\211}% U+2189
```

47.2.21 Arrows: U+2190 to U+21FF

```
% U+2190 LEFTWARDS ARROW; arrowleft
\DeclareTextCommand{\textleftarrow}{PU}{\9041\220}%* U+2190
% U+2191 UPWARDS ARROW; arrowup
\DeclareTextCommand{\textuparrow}{PU}{\9041\221}%* U+2191
% U+2192 RIGHTWARDS ARROW; arrowright
\DeclareTextCommand{\textrightarrow}{PU}{\9041\222}%* U+2192
%* \textrightarrow -> \MVRightArrow (marvosym)
%* \textrightarrow -> \MVRightarrow (marvosym)
% U+2193 DOWNWARDS ARROW; arrowdown
\DeclareTextCommand{\textdownarrow}{PU}{\9041\223}%* U+2193
%* \textdownarrow -> \MVArrowDown (marvosym)
%* \textdownarrow -> \Force (marvosym)
% U+2194 LEFT RIGHT ARROW; arrowboth; \leftrightarrow (LaTeX)
\DeclareTextCommand{\textleftrightarrow}{PU}{\9041\224}%* U+2194
% U+2195 UP DOWN ARROW; arrowupdn; \updownarrow (LaTeX)
```

```
\DeclareTextCommand{\textupdownarrow}{PU}{\9041\225}%* U+2195
% U+2196 NORTH WEST ARROW; arrowupleft; \nwarrow (LaTeX)
\DeclareTextCommand{\textnwarrow}{PU}{\9041\226}%* U+2196
% U+2197 NORTH EAST ARROW; arrowupright; \nearrow (LaTeX)
\DeclareTextCommand{\textnearrow}{PU}{\9041\227}%* U+2197
%* \textnearrow -> \textglobrise (tipa)
% U+2198 SOUTH EAST ARROW; arrowdownright; \searrow (LaTeX)
\DeclareTextCommand{\textsearrow}{PU}{\9041\230}%* U+2198
%* \textsearrow -> \textglobfall (tipa)
% U+2199 SOUTH WEST ARROW; arrowdownleft; \swarrow (LaTeX)
\DeclareTextCommand{\textswarrow}{PU}{\9041\231}%* U+2199
% U+219A LEFTWARDS ARROW WITH STROKE; \nleftarrow (AmS)
\DeclareTextCommand{\textnleftarrow}{PU}{\9041\232}%* U+219A
% U+219B RIGHTWARDS ARROW WITH STROKE; \nrightarrow (AmS)
\DeclareTextCommand{\textnrightarrow}{PU}{\9041\233}%* U+219B
% U+219E LEFTWARDS TWO HEADED ARROW; \twoheadleftarrow (AmS)
\DeclareTextCommand{\texttwoheadleftarrow}{PU}{\9041\236}%* U+219E
% \ntwoheadleftarrow (txfonts/pxfonts)
\DeclareTextCommand{\textntwoheadleftarrow}{PU}{\9041\236\83\070}%* U+219E U+0338
% U+219F UPWARDS TWO HEADED ARROW; \twoheaduparrow (MnSymbol)
\DeclareTextCommand{\texttwoheaduparrow}{PU}{\9041\237}%* U+219F
% U+21A0 RIGHTWARDS TWO HEADED ARROW;
%   \twoheadrightarrow (AmS)
\DeclareTextCommand{\texttwoheadrightarrow}{PU}{\9041\240}%* U+21A0
% \ntwoheadrightarrow (txfonts/pxfonts)
\DeclareTextCommand{\textntwoheadrightarrow}{PU}{\9041\240\83\070}%* U+21A0 U+0338
% U+21A1 DOWNWARDS TWO HEADED ARROW; \twoheaddownarrow (Mn-
    Symbol)
\DeclareTextCommand{\texttwoheaddownarrow}{PU}{\9041\241}%* U+21A1
% U+21A2 LEFTWARDS ARROW WITH TAIL; \leftarrowtail (AmS)
\DeclareTextCommand{\textleftarrowtail}{PU}{\9041\242}%* U+21A2
% U+21A3 RIGHTWARDS ARROW WITH TAIL; \rightarrowtail (AmS)
\DeclareTextCommand{\textrightarrowtail}{PU}{\9041\243}%* U+21A3
% U+21A6 RIGHTWARDS ARROW FROM BAR; \mapsto (LaTeX)
\DeclareTextCommand{\textmapsto}{PU}{\9041\246}%* U+21A6
% U+21A9 LEFTWARDS ARROW WITH HOOK; \hookleftarrow (LaTeX)
\DeclareTextCommand{\texthookleftarrow}{PU}{\9041\251}%* U+21A9
% U+21AA RIGHTWARDS ARROW WITH HOOK; \hookrightarrow (LaTeX)
\DeclareTextCommand{\texthookrightarrow}{PU}{\9041\252}%* U+21AA
% U+21AB LEFTWARDS ARROW WITH LOOP; \looparrowleft (AmS)
\DeclareTextCommand{\textlooparrowleft}{PU}{\9041\253}%* U+21AB
% U+21AC RIGHTWARDS ARROW WITH LOOP; \looparrowright (AmS)
\DeclareTextCommand{\textlooparrowright}{PU}{\9041\254}%* U+21AC
% U+21AE LEFT RIGHT ARROW WITH STROKE; \nleftrightarrow (AmS)
\DeclareTextCommand{\textnleftrightarrow}{PU}{\9041\256}%* U+21AE
% U+21AF DOWNWARDS ZIGZAG ARROW; \lightning (stmaryrd)
\DeclareTextCommand{\textlightning}{PU}{\9041\257}%* U+21AF
%* \textlightning -> \Lightning (marvosym)
% U+21B5 DOWNWARDS ARROW WITH CORNER LEFTWARDS;
%   \dlsh (mathabx)
\DeclareTextCommand{\textdlsh}{PU}{\9041\265}%* U+21B5
% U+21B6 ANTICLOCKWISE TOP SEMICIRCLE ARROW;
%   \curvearrowleft (AmS)
\DeclareTextCommand{\textcurvearrowleft}{PU}{\9041\266}%* U+21B6
```

```
% U+21B7 CLOCKWISE TOP SEMICIRCLE ARROW; \curvearrowright (AmS)
\DeclareTextCommand{\textcurvearrowright}{PU}{\9041\267}%* U+21B7
% U+21BC LEFTWARDS HARPOON WITH BARB UPWARDS; harpoonleftbarbup;
%   \leftharpoonup (LaTeX)
\DeclareTextCommand{\textleftharpoonup}{PU}{\9041\274}%* U+21BC
% U+21BD LEFTWARDS HARPOON WITH BARB DOWNWARDS;
%   \leftharpoondown (LaTeX)
\DeclareTextCommand{\textleftharpoondown}{PU}{\9041\275}%* U+21BD
% U+21BE UPWARDS HARPOON WITH BARB RIGHTWARDS;
%   \upharpoonright (AmS)
\DeclareTextCommand{\textupharpoonright}{PU}{\9041\276}%* U+21BE
% U+21BF UPWARDS HARPOON WITH BARB LEFTWARDS;
%   \upharpoonleft (AmS)
\DeclareTextCommand{\textupharpoonleft}{PU}{\9041\277}%* U+21BF
% U+21C0 RIGHTWARDS HARPOON WITH BARB UPWARDS; harpoonrightbarbup
%   \rightharpoonup (LaTeX)
\DeclareTextCommand{\textrightharpoonup}{PU}{\9041\300}%* U+21C0
% U+21C1 RIGHTWARDS HARPOON WITH BARB DOWNWARDS;
%   \rightharpoondown (LaTeX)
\DeclareTextCommand{\textrightharpoondown}{PU}{\9041\301}%* U+21C1
% U+21C2 DOWNWARDS HARPOON WITH BARB RIGHTWARDS;
%   \downharpoonright (AmS)
\DeclareTextCommand{\textdownharpoonright}{PU}{\9041\302}%* U+21C2
% U+21C3 DOWNWARDS HARPOON WITH BARB LEFTWARDS;
%   \downharpoonleft (AmS)
\DeclareTextCommand{\textdownharpoonleft}{PU}{\9041\303}%* U+21C3
% U+21C4 RIGHTWARDS ARROW OVER LEFTWARDS ARROW;
%   arrowrightoverleft; \rightleftarrows (MnSymbol)
\DeclareTextCommand{\textrightleftarrows}{PU}{\9041\304}%* U+21C4
% U+21C5 UPWARDS ARROW LEFTWARDS OF DOWNWARDS ARROW; arrowupleftofdown;
%   \updownarrows (MnSymbol)
\DeclareTextCommand{\textupdownarrows}{PU}{\9041\305}%* U+21C5
% U+21C6 LEFTWARDS ARROW OVER RIGHTWARDS ARROW; arrowleftoverright;
%   \leftrightarrows (AmS)
\DeclareTextCommand{\textleftrightarrows}{PU}{\9041\306}%* U+21C6
% U+21C7 LEFTWARDS PAIRED ARROWS; \leftleftarrows (AmS)
\DeclareTextCommand{\textleftleftarrows}{PU}{\9041\307}%* U+21C7
% U+21C8 UPWARDS PAIRED ARROWS; \upuparrows (AmS)
\DeclareTextCommand{\textupuparrows}{PU}{\9041\310}%* U+21C8
% U+21C9 RIGHTWARDS PAIRED ARROWS; \rightrightarrows (AmS)
\DeclareTextCommand{\textrightrightarrows}{PU}{\9041\311}%* U+21C9
% U+21CA DOWNWARDS PAIRED ARROWS; \downdownarrows (AmS)
\DeclareTextCommand{\textdowndownarrows}{PU}{\9041\312}%* U+21CA
% U+21CB LEFTWARDS HARPOON OVER RIGHTWARDS HARPOON;
%   \leftrightharpoons (AmS);
\DeclareTextCommand{\textleftrightharpoons}{PU}{\9041\313}%* U+21CB
% U+21CC RIGHTWARDS HARPOON OVER LEFTWARDS HARPOON;
%   \rightleftharpoons (LaTeX, AmS)
\DeclareTextCommand{\textrightleftharpoons}{PU}{\9041\314}%* U+21CC
% U+21CD LEFTWARDS DOUBLE ARROW WITH STROKE; arrowleftd-
```

```
blstroke;
%   \nLeftarrow (AmS)
\DeclareTextCommand{\textnLeftarrow}{PU}{\9041\315}%* U+21CD
% U+21CE LEFT RIGHT DOUBLE ARROW WITH STROKE; \nLeftrightarrow (AmS)
\DeclareTextCommand{\textnLeftrightarrow}{PU}{\9041\316}%* U+21CE
% U+21CF RIGHTWARDS DOUBLE ARROW WITH STROKE; arrowrightdblstroke;
%  \nRightarrow (AmS)
\DeclareTextCommand{\textnRightarrow}{PU}{\9041\317}%* U+21CF
% U+21D0 LEFTWARDS DOUBLE ARROW; arrowdblleft, arrowleftdbl;
%   \Leftarrow (LaTeX)
\DeclareTextCommand{\textLeftarrow}{PU}{\9041\320}%* U+21D0
% U+21D1 UPWARDS DOUBLE ARROW; arrowdblup; \Uparrow (LaTeX)
\DeclareTextCommand{\textUparrow}{PU}{\9041\321}%* U+21D1
% U+21D2 RIGHTWARDS DOUBLE ARROW; arrowdblright, dblarrowright;
%   \Rightarrow (LaTeX)
\DeclareTextCommand{\textRightarrow}{PU}{\9041\322}%* U+21D2
%* \textRightarrow -> \Conclusion (marvosym)
% U+21D3 DOWNWARDS DOUBLE ARROW; arrowdbldown; \Downarrow (LaTeX)
\DeclareTextCommand{\textDownarrow}{PU}{\9041\323}%* U+21D3
% U+21D4 LEFT RIGHT DOUBLE ARROW; arrowdblboth;
%   \Leftrightarrow (LaTeX)
\DeclareTextCommand{\textLeftrightarrow}{PU}{\9041\324}%* U+21D4
%* textLeftrightarrow -> \Equivalence (marvosym)
% U+21D5 UP DOWN DOUBLE ARROW; \Updownarrow (LaTeX)
\DeclareTextCommand{\textUpdownarrow}{PU}{\9041\325}%* U+21D5
% U+21D6 NORTH WEST DOUBLE ARROW; \Nwarrow (MnSymbol)
\DeclareTextCommand{\textNwarrow}{PU}{\9041\326}%* U+21D6
% U+21D7 NORTH EAST DOUBLE ARROW; \Nearrow (MnSymbol)
\DeclareTextCommand{\textNearrow}{PU}{\9041\327}%* U+21D7
% U+21D8 SOUTH EAST DOUBLE ARROW; \Searrow (MnSymbol)
\DeclareTextCommand{\textSearrow}{PU}{\9041\330}%* U+21D8
% U+21D9 SOUTH WEST DOUBLE ARROW; \Swarrow (MnSymbol)
\DeclareTextCommand{\textSwarrow}{PU}{\9041\331}%* U+21D9
% U+21DA LEFTWARDS TRIPLE ARROW; \Lleftarrow (AmS)
\DeclareTextCommand{\textLleftarrow}{PU}{\9041\332}%* U+21DA
% U+21DB RIGHTWARDS TRIPLE ARROW; \Rrightarrow (MnSymbol)
\DeclareTextCommand{\textRrightarrow}{PU}{\9041\333}%* U+21DB
% U+21DC LEFTWARDS SQUIGGLE ARROW; \leftsquigarrow (mathabx)
\DeclareTextCommand{\textleftsquigarrow}{PU}{\9041\334}%* U+21DC
% U+21DD RIGHTWARDS SQUIGGLE ARROW; \rightsquigarrow (mathabx)
\DeclareTextCommand{\textrightsquigarrow}{PU}{\9041\335}%* U+21DD
% U+21E0 LEFTWARDS DASHED ARROW; arrowdashleft;
%   \dashleftarrow (AmS)
\DeclareTextCommand{\textdashleftarrow}{PU}{\9041\340}%* U+21E0
%* \textdashleftarrow -> \dashedleftarrow (MnSymbol)
% U+21E1 UPWARDS DASHED ARROW; arrowdashup; \dasheduparrow (MnSymbol)
\DeclareTextCommand{\textdasheduparrow}{PU}{\9041\341}%* U+21E1
% U+21E2 RIGHTWARDS DASHED ARROW; arrowdashright; \dashrightarrow (AmS)
\DeclareTextCommand{\textdashrightarrow}{PU}{\9041\342}%* U+21E2
```

```
%* \textdashrightarrow -> \dashedrightarrow (MnSymbol)
% U+21E3 DOWNWARDS DASHED ARROW; arrowdashdown; \dasheddownarrow (MnSymbol)
\DeclareTextCommand{\textdasheddownarrow}{PU}{\9041\343}%* U+21E3
% U+21E8 RIGHTWARDS WHITE ARROW; \pointer (wasysym)
\DeclareTextCommand{\textpointer}{PU}{\9041\350}%* U+21E8
% U+21F5 DOWNWARDS ARROW LEFTWARDS OF UPWARDS ARROW;
%   \downuparrows (MnSymbol)
\DeclareTextCommand{\textdownuparrows}{PU}{\9041\365}%* U+21F5
% U+21FD LEFTWARDS OPEN-HEADED ARROW; \leftarrowtriangle (stmaryrd)
\DeclareTextCommand{\textleftarrowtriangle}{PU}{\9041\375}%* U+21FD
% U+21FE RIGHTWARDS OPEN-HEADED ARROW; \rightarrowtriangle (stmaryrd)
\DeclareTextCommand{\textrightarrowtriangle}{PU}{\9041\376}%* U+21FE
% U+21FF LEFT RIGHT OPEN-HEADED ARROW; \leftrightarrowtriangle (stmaryrd)
\DeclareTextCommand{\textleftrightarrowtriangle}{PU}{\9041\377}%* U+21FF
```

47.2.22 Mathematical Operators: U+2200 to U+22FF

```
% U+2200 FOR ALL; forall; \forall (LaTeX)
\DeclareTextCommand{\textforall}{PU}{\9042\000}%* U+2200
% U+2201 COMPLEMENT; \complement (AmS)
\DeclareTextCommand{\textcomplement}{PU}{\9042\001}%* U+2201
% U+2202 PARTIAL DIFFERENTIAL; partialdiff; \partial (LaTeX)
\DeclareTextCommand{\textpartial}{PU}{\9042\002}%* U+2202
% U+2203 THERE EXISTS; existential; \exists (LaTeX)
\DeclareTextCommand{\textexists}{PU}{\9042\003}%* U+2203
% U+2204 THERE DOES NOT EXIST; \nexists (AmS)
\DeclareTextCommand{\textnexists}{PU}{\9042\004}%* U+2204
% U+2205 EMPTY SET; emptyset; \emptyset (LaTeX), \varnothing (AmS)
\DeclareTextCommand{\textemptyset}{PU}{\9042\005}%* U+2205
%* \textemptyset -> \varnothing (AmS)
% U+2206 INCREMENT; increment, Deta; \triangle (LaTeX)
\DeclareTextCommand{\texttriangle}{PU}{\9042\006}%* U+2206
% U+2207 NABLA; nabla, gradient; \nabla (LaTeX)
\DeclareTextCommand{\textnabla}{PU}{\9042\007}%* U+2207
% U+2208 ELEMENT OF; element; \in (LaTeX)
\DeclareTextCommand{\textinsymbol}{PU}{\9042\010}%* U+2208
% U+2209 NOT AN ELEMENT OF; notelement, notelementof; \notin (LaTeX)
\DeclareTextCommand{\textnotin}{PU}{\9042\011}%* U+2209
% U+220A SMALL ELEMENT OF; \smallin (mathdesign)
\DeclareTextCommand{\textsmallin}{PU}{\9042\012}%* U+220A
% U+220B CONTAINS AS MEMBER; suchthat; \ni (LaTeX)
\DeclareTextCommand{\textni}{PU}{\9042\013}%* U+220B
%* \textni -> \owns (mathabx)
% U+220C DOES NOT CONTAIN AS MEMBER; \notowner (mathabx)
\DeclareTextCommand{\textnotowner}{PU}{\9042\014}%* U+220C
%* \textnotowner -> \notni (txfonts/pxfonts)
% U+220D SMALL CONTAINS AS MEMBER; \smallowns (mathdesign)
\DeclareTextCommand{\textsmallowns}{PU}{\9042\015}%* U+220D
% U+220F N-ARY PRODUCT; \prod (LaTeX)
\DeclareTextCommand{\textprod}{PU}{\9042\017}%* U+220F
% U+2210 N-ARY COPRODUCT; \amalg (LaTeX)
\DeclareTextCommand{\textamalg}{PU}{\9042\020}%* U+2210
% U+2211 N-ARY SUMMATION; summation; \sum (LaTeX)
```

```
\DeclareTextCommand{\textsum}{PU}{\9042\021}%* U+2211
% U+2212 MINUS SIGN; minus
\DeclareTextCommand{\textminus}{PU}{\9042\022}% U+2212
% U+2213 MINUS-OR-PLUS SIGN; minusplus; \mp (LaTeX)
\DeclareTextCommand{\textmp}{PU}{\9042\023}%* U+2213
% U+2214 DOT PLUS; \dotplus (AmS)
\DeclareTextCommand{\textdotplus}{PU}{\9042\024}%* U+2214
% U+2215 DIVISION SLASH; divisionslash; \Divides (marvosym)
\DeclareTextCommand{\textDivides}{PU}{\9042\025}%* U+2215
% \DividesNot (marvosym)
\DeclareTextCommand{\textDividesNot}{PU}{\9042\025\9040\322}%* U+2215 U+20D2
% U+2216 SET MINUS; \setminus (LaTeX)
\DeclareTextCommand{\textsetminus}{PU}{\9042\026}%* U+2216
% U+2217 ASTERISK OPERATOR; asteriskmath; \ast (LaTeX)
\DeclareTextCommand{\textast}{PU}{\9042\027}%* U+2217
% U+2218 RING OPERATOR; \circ (LaTeX)
\DeclareTextCommand{\textcirc}{PU}{\9042\030}%* U+2218
% U+2219 BULLET OPERATOR; bulletoperator; \bullet (LaTeX)
\DeclareTextCommand{\textbulletoperator}{PU}{\9042\031}% U+2219
% U+221A SQUARE ROOT; radical
\DeclareTextCommand{\textsurd}{PU}{\9042\032}%* U+221A
% U+221D PROPORTIONAL TO; proportional; \propto (LaTeX)
\DeclareTextCommand{\textpropto}{PU}{\9042\035}%* U+221D
%* \textpropto -> \varprop (wasysym)
% U+221E INFINITY; infinity; \infty (LaTeX)
\DeclareTextCommand{\textinfty}{PU}{\9042\036}%* U+221E
% U+2220 ANGLE; angle; \angle (LaTeX)
\DeclareTextCommand{\textangle}{PU}{\9042\040}%* U+2220
% U+2221 MEASURED ANGLE; \measuredangle (mathabx, MnSymbol)
\DeclareTextCommand{\textmeasuredangle}{PU}{\9042\041}%* U+2221
% U+2222 SPHERICAL ANGLE; \sphericalangle (AmS)
\DeclareTextCommand{\textsphericalangle}{PU}{\9042\042}%* U+2222
%* \textsphericalangle -> \varangle (wasysym)
%* \textsphericalangle -> \Anglesign (marvosym)
%* \textsphericalangle -> \AngleSign (marvosym)
% U+2223 DIVIDES; divides; \mid (LaTeX)
\DeclareTextCommand{\textmid}{PU}{\9042\043}%* U+2223
% U+2224 DOES NOT DIVIDE; \nmid (AmS)
\DeclareTextCommand{\textnmid}{PU}{\9042\044}%* U+2224
%* \textnmid -> \notdivides (mathabx)
% U+2225 PARALLEL TO; parallel; \parallel (LaTeX)
\DeclareTextCommand{\textparallel}{PU}{\9042\045}%* U+2225
% U+2226 NOT PARALLEL TO; notparallel; \nparallel (AmS)
\DeclareTextCommand{\textnparallel}{PU}{\9042\046}%* U+2226
%* \textnparallel -> nUpdownline (MnSymbol)
% U+2227 LOGICAL AND; logicaland; \wedge (LaTeX)
\DeclareTextCommand{\textwedge}{PU}{\9042\047}%* U+2227
% \owedge (stmaryrd)
\DeclareTextCommand{\textowedge}{PU}{\9042\047\9040\335}%* U+2227 U+20DD
%* \textowedge -> \varowedge (stmaryrd)
% U+2228 LOGICAL OR; logicalor; \vee (LaTeX)
\DeclareTextCommand{\textvee}{PU}{\9042\050}%* U+2228
% \ovee (stmaryrd)
\DeclareTextCommand{\textovee}{PU}{\9042\050\9040\335}%* U+2228 U+20DD
```

```
%* \textovee -> \varovee (stmaryrd)
% U+2229 INTERSECTION; intersection; \cap (LaTeX)
\DeclareTextCommand{\textcap}{PU}{\9042\051}%* U+2229
% U+222A UNION; union; \cup (LaTeX)
\DeclareTextCommand{\textcup}{PU}{\9042\052}%* U+222A
% U+222B INTEGRAL; integral; \int (LaTeX)
\DeclareTextCommand{\textint}{PU}{\9042\053}%* U+222B
%* \textint -> \varint (wasysym)
% U+222C DOUBLE INTEGRAL; dblintegral; \iint (AmS)
\DeclareTextCommand{\textiint}{PU}{\9042\054}%* U+222C
% U+222D TRIPLE INTEGRAL; \iiint (AmS)
\DeclareTextCommand{\textiiint}{PU}{\9042\055}%* U+222D
% U+222E CONTOUR INTEGRAL; contourintegral; \oint (LaTeX)
\DeclareTextCommand{\textoint}{PU}{\9042\056}%* U+222E
%* \textoint -> \varoint (wasysym)
% U+222F SURFACE INTEGRAL; \oiint (wasysym)
\DeclareTextCommand{\textoiint}{PU}{\9042\057}%* U+222F
% U+2232 CLOCKWISE CONTOUR INTEGRAL;
%   \ointclockwise (txfonts/pxfonts)
\DeclareTextCommand{\textointclockwise}{PU}{\9042\062}%* U+2232
% U+2233 ANTICLOCKWISE CONTOUR INTEGRAL; \ointctrclockwise (tx-
    fonts/pxfonts)
\DeclareTextCommand{\textointctrclockwise}{PU}{\9042\063}%* U+2233
% U+2234 THEREFORE; therefore; \therefore (AmS)
\DeclareTextCommand{\texttherefore}{PU}{\9042\064}%* U+2234
%* \texttherefore -> uptherefore (MnSymbol)
% U+2235 BECAUSE; because; \because (AmS)
\DeclareTextCommand{\textbecause}{PU}{\9042\065}%* U+2235
%* \textbecause -> \downtherefore (MnSymbol)
% U+2236 RATIO; \vdotdot (MnSymbol)
\DeclareTextCommand{\textvdotdot}{PU}{\9042\066}%* U+2236
% U+2237 PROPORTION; \squaredots (MnSymbol)
\DeclareTextCommand{\textsquaredots}{PU}{\9042\067}%* U+2237
% U+2238 DOT MINUS; \dotminus (MnSymbol)
\DeclareTextCommand{\textdotminus}{PU}{\9042\070}%* U+2238
%* \textdotminus -> \textdotdiv (mathabx)
% U+2239 EXCESS; \eqcolon (txfonts/pxfonts)
\DeclareTextCommand{\texteqcolon}{PU}{\9042\071}%* U+2239
% U+223C TILDE OPERATOR; similar; \sim (LaTeX)
\DeclareTextCommand{\textsim}{PU}{\9042\074}%* U+223C
%* \textsim -> \AC (wasysym)
% U+223D REVERSED TILDE; reversedtilde; \backsim (AmS)
\DeclareTextCommand{\textbacksim}{PU}{\9042\075}%* U+223D
% \nbacksim (txfonts/pxfonts)
\DeclareTextCommand{\textnbacksim}{PU}{\9042\075\83\070}%* U+223D U+0338
% U+2240 WREATH PRODUCT; \wr (LaTeX)
\DeclareTextCommand{\textwr}{PU}{\9042\100}%* U+2240
%* \textwr -> \wreath (MnSymbol)
% U+2241 NOT TILDE; \nsim (AmS)
\DeclareTextCommand{\textnsim}{PU}{\9042\101}%* U+2241
% U+2242 MINUS TILDE; \eqsim (MnSymbol)
\DeclareTextCommand{\texteqsim}{PU}{\9042\102}%* U+2242
% \neqsim (MnSymbol)
\DeclareTextCommand{\textneqsim}{PU}{\9042\102\83\070}%* U+2242 U+0338
```

```
% U+2243 ASYMPTOTICALLY EQUAL TO; asymptoticallyequal; \simeq (LaTeX)
\DeclareTextCommand{\textsimeq}{PU}{\9042\103}%* U+2243
% U+2244 NOT ASYMPTOTICALLY EQUAL TO; \nsimeq (txfonts/pxfonts)
\DeclareTextCommand{\textnsimeq}{PU}{\9042\104}%* U+2244
% U+2245 APPROXIMATELY EQUAL TO; approximatelyequal; \cong (LaTeX)
\DeclareTextCommand{\textcong}{PU}{\9042\105}%* U+2245
% U+2247 NEITHER APPROXIMATELY NOR ACTUALLY EQUAL TO;
%   \ncong (AmS)
\DeclareTextCommand{\textncong}{PU}{\9042\107}%* U+2247
% U+2248 ALMOST EQUAL TO; approxequal; \approx (LaTeX)
\DeclareTextCommand{\textapprox}{PU}{\9042\110}%* U+2248
% U+2249 NOT ALMOST EQUAL TO; \napprox (txfonts/pxfonts0
\DeclareTextCommand{\textnapprox}{PU}{\9042\111}%* U+2249
%* \textnapprox -> \nthickapprox (txfonts/pxfonts)
% U+224A ALMOST EQUAL OR EQUAL TO; \approxeq (AmS)
\DeclareTextCommand{\textapproxeq}{PU}{\9042\112}%* U+224A
% \napproxeq (txfonts/pxfonts)
\DeclareTextCommand{\textnapproxeq}{PU}{\9042\112\83\070}%* U+224A U+0338
% U+224B TRIPLE TILDE; \triplesim (MnSymbol)
\DeclareTextCommand{\texttriplesim}{PU}{\9042\113}%* U+224B
%* \texttriplesim -> \VHF (wasysym)
% \ntriplesim (MnSymbol)
\DeclareTextCommand{\textntriplesim}{PU}{\9042\113\83\070}%* U+224B U+0338
% U+224C ALL EQUAL TO; allequal; \backcong (MnSymbol)
\DeclareTextCommand{\textbackcong}{PU}{\9042\114}%* U+224C
% \nbackcong (MnSymbol)
\DeclareTextCommand{\textnbackcong}{PU}{\9042\114\83\070}%* U+224C U+0338
% U+224D EQUIVALENT TO; \asymp (LaTeX)
\DeclareTextCommand{\textasymp}{PU}{\9042\115}%* U+224D
% \nasymp (txfonts/pxfonts)
\DeclareTextCommand{\textnasymp}{PU}{\9042\115\83\070}%* U+224D U+0338
%* \textnasymp -> \notasymp (mathabx)
% U+224E GEOMETRICALLY EQUIVALENT TO; \Bumpeq (AmS)
\DeclareTextCommand{\textBumpeq}{PU}{\9042\116}%* U+224E
% \nBumpeq (txfonts/pxfonts)
\DeclareTextCommand{\textnBumpeq}{PU}{\9042\116\83\070}%* U+224E U+0338
% U+224F DIFFERENCE BETWEEN; \bumpeq (AmS)
\DeclareTextCommand{\textbumpeq}{PU}{\9042\117}%* U+224F
% \nbumpeq (txfonts/pxfonts)
\DeclareTextCommand{\textnbumpeq}{PU}{\9042\117\83\070}%* U+224F U+0338
% U+2250 APPROACHES THE LIMIT; approaches; \doteq (LaTeX)
\DeclareTextCommand{\textdoteq}{PU}{\9042\120}%* U+2250
% \ndoteq (MnSymbol)
\DeclareTextCommand{\textndoteq}{PU}{\9042\120\83\070}%* U+2250 U+0338
% U+2251 GEOMETRICALLY EQUAL TO; geometricallyequal;
%   \doteqdot (AmS)
\DeclareTextCommand{\textdoteqdot}{PU}{\9042\121}%* U+2251
%* \textdoteqdot -> \Doteq (MnSymbol)
% \nDoteq (MnSymbol)
\DeclareTextCommand{\textnDoteq}{PU}{\9042\121\83\070}%* U+2251 U+0338
% U+2252 APPROXIMATELY EQUAL TO OR THE IMAGE OF; approxequalorimage;
%   \fallingdotseq (AmS)
```

```
\DeclareTextCommand{\textfallingdoteq}{PU}{\9042\122}%* U+2252
% \nfallingdotseq (MnSymbol)
\DeclareTextCommand{\textnfallingdoteq}{PU}{\9042\122\83\070}%* U+2252 U+0338
% U+2253 IMAGE OF OR APPROXIMATELY EQUAL TO; imageorapproximatelyequal;
%   \risingdotseq (AmS)
\DeclareTextCommand{\textrisingdoteq}{PU}{\9042\123}%* U+2253
% \nrisingdoteq (MnSymbol)
\DeclareTextCommand{\textnrisingdoteq}{PU}{\9042\123\83\070}%* U+2253 U+0338
% U+2254 COLON EQUALS; \colonequals (colonequals)
\DeclareTextCommand{\textcolonequals}{PU}{\9042\124}%* U+2254
% U+2255 EQUALS COLON; \equalscolon (colonequals)
\DeclareTextCommand{\textequalscolon}{PU}{\9042\125}%* U+2255
% U+2256 RING IN EQUAL TO; \eqcirc (AmS)
\DeclareTextCommand{\texteqcirc}{PU}{\9042\126}%* U+2256
% \neqcirc (MnSymbol)
\DeclareTextCommand{\textneqcirc}{PU}{\9042\126\83\070}%* U+2256 U+0338
% U+2257 RING EQUAL TO; \circeq (AmS)
\DeclareTextCommand{\textcirceq}{PU}{\9042\127}%* U+2257
% \ncirceq (MnSymbol)
\DeclareTextCommand{\textncirceq}{PU}{\9042\127\83\070}%* U+2257 U+0338
% U+2259 ESTIMATES; \hateq (MnSymbol)
\DeclareTextCommand{\texthateq}{PU}{\9042\131}%* U+2259
%* \texthateq -> \corresponds (mathabx)
%* \texthateq -> \Corresponds (marvosym)
% \nhateq (MnSymbol)
\DeclareTextCommand{\textnhateq}{PU}{\9042\131\83\070}%* U+2259 U+0338
% U+225C DELTA EQUAL TO; \triangleeq (AmS)
\DeclareTextCommand{\texttriangleeq}{PU}{\9042\134}%* U+225C
% U+2260 NOT EQUAL TO; notequal; \ne (LaTeX), \neq (LaTeX)
\DeclareTextCommand{\textneq}{PU}{\9042\140}%* U+2260
\DeclareTextCommand{\textne}{PU}{\9042\140}%* U+2260
%* \textneq -> \nequal (MnSymbol)
% U+2261 IDENTICAL TO; equivalence; \equiv (LaTeX)
\DeclareTextCommand{\textequiv}{PU}{\9042\141}%* U+2261
%* \textequiv -> \Congruent (marvosym)
% U+2262 NOT IDENTICAL TO; notidentical; \nequiv (txfonts/pxfonts)
\DeclareTextCommand{\textnequiv}{PU}{\9042\142}%* U+2262
%* \textnequiv -> \NotCongruent (marvosym)
%* \textnequiv -> \notequiv (mathabx)
% U+2264 LESS-THAN OR EQUAL TO; lessequal; \le (LaTeX), \leq (LaTeX)
\DeclareTextCommand{\textleq}{PU}{\9042\144}%* U+2264
\DeclareTextCommand{\textle}{PU}{\9042\144}%* U+2264
%* \textleq -> \LessOrEqual (marvosym)
% U+2265 GREATER-THAN OR EQUAL TO; greaterequal;
%   \ge (LaTeX), \geq (LaTeX)
\DeclareTextCommand{\textgeq}{PU}{\9042\145}%* U+2265
\DeclareTextCommand{\textge}{PU}{\9042\145}%* U+2265
%* \textgeq -> \LargerOrEqual (marvosym)
% U+2266 LESS-THAN OVER EQUAL TO; lessoverequal; \leqq (AmS)
\DeclareTextCommand{\textleqq}{PU}{\9042\146}%* U+2266
% \nleqq (txfonts/pxfonts)
\DeclareTextCommand{\textnleqq}{PU}{\9042\146\83\070}%* U+2266 U+0338
% U+2267 GREATER-THAN OVER EQUAL TO; greateroverequal; \geqq (AmS)
```

```
\DeclareTextCommand{\textgeqq}{PU}{\9042\147}%* U+2267
% \ngeqq (txfonts/pxfonts)
\DeclareTextCommand{\textngeqq}{PU}{\9042\147\83\070}%* U+2267 U+0338
% U+2268 LESS-THAN BUT NOT EQUAL TO; \lneqq (AmS)
\DeclareTextCommand{\textlneqq}{PU}{\9042\150}%* U+2268
% U+2269 GREATER-THAN BUT NOT EQUAL TO; \gneqq (AmS)
\DeclareTextCommand{\textgneqq}{PU}{\9042\151}%* U+2269
% U+226A MUCH LESS-THAN; muchless; \ll (LaTeX)
\DeclareTextCommand{\textll}{PU}{\9042\152}%* U+226A
% \nll (txfonts/pxfonts)
\DeclareTextCommand{\textnll}{PU}{\9042\152\83\070}%* U+226A U+0338
% U+226B MUCH GREATER-THAN; muchgreater; \gg (LaTeX)
\DeclareTextCommand{\textgg}{PU}{\9042\153}%* U+226B
% \ngg (txfonts/pxfonts)
\DeclareTextCommand{\textngg}{PU}{\9042\153\83\070}%* U+226B U+0338
% U+226C BETWEEN; \between (AmS)
\DeclareTextCommand{\textbetween}{PU}{\9042\154}%* U+226C
% U+226E NOT LESS-THAN; notless; \nless (AmS)
\DeclareTextCommand{\textnless}{PU}{\9042\156}%* U+226E
% U+226F NOT GREATER-THAN; notgreater; \ngtr (AmS)
\DeclareTextCommand{\textngtr}{PU}{\9042\157}%* U+226F
% U+2270 NEITHER LESS-THAN NOR EQUAL TO; notlessnorequal;
%   \nleq (AmS)
\DeclareTextCommand{\textnleq}{PU}{\9042\160}%* U+2270
% U+2271 NEITHER GREATER-THAN NOR EQUAL TO; notgreaternore-
    qual; \ngeq (AmS)
\DeclareTextCommand{\textngeq}{PU}{\9042\161}%* U+2271
% U+2272 LESS-THAN OR EQUIVALENT TO; lessorequivalent; \lesssim (AmS)
\DeclareTextCommand{\textlesssim}{PU}{\9042\162}%* U+2272
%* \textlesssim -> \apprle (wasysym)
% U+2273 GREATER-THAN OR EQUIVALENT TO; greaterorequivalent; \gtr-
    sim (AmS)
\DeclareTextCommand{\textgtrsim}{PU}{\9042\163}%* U+2273
%* \textgtrsim -> \apprge (wasysym)
% U+2274 NEITHER LESS-THAN NOR EQUIVALENT TO; \nlesssim (tx-
    fonts/pxfonts)
\DeclareTextCommand{\textnlesssim}{PU}{\9042\164}%* U+2274
% U+2275 NEITHER GREATER-THAN NOR EQUIVALENT TO; \ngtrsim (tx-
    fonts/pxfonts)
\DeclareTextCommand{\textngtrsim}{PU}{\9042\165}%* U+2275
% U+2276 LESS-THAN OR GREATER-THAN; lessorgreater; \lessgtr (AmS)
\DeclareTextCommand{\textlessgtr}{PU}{\9042\166}%* U+2276
% U+2277 GREATER-THAN OR LESS-THAN; greaterorless; \gtrless (AmS)
\DeclareTextCommand{\textgtrless}{PU}{\9042\167}%* U+2277
% U+2278 NEITHER LESS-THAN NOR GREATER-THAN; \ngtrless (tx-
    fonts/pxfonts)
\DeclareTextCommand{\textngtrless}{PU}{\9042\170}%* U+2278
% U+2279 NEITHER GREATER-THAN NOR LESS-THAN; \nlessgtr (tx-
    fonts/pxfonts)
\DeclareTextCommand{\textnlessgtr}{PU}{\9042\171}%* U+2279
% U+227A PRECEDES; precedes; \prec (LaTeX)
\DeclareTextCommand{\textprec}{PU}{\9042\172}%* U+227A
% U+227B SUCCEEDS; succeeds; \succ (LaTeX)
\DeclareTextCommand{\textsucc}{PU}{\9042\173}%* U+227B
```

```
% U+227C PRECEDES OR EQUAL TO; \preccurlyeq (AmS)
\DeclareTextCommand{\textpreccurlyeq}{PU}{\9042\174}%* U+227C
% U+227D SUCCEEDS OR EQUAL TO; \succcurlyeq (AmS)
\DeclareTextCommand{\textsuccurlyeq}{PU}{\9042\175}%* U+227D
% U+227E PRECEDES OR EQUIVALENT TO; \precsim (AmS)
\DeclareTextCommand{\textprecsim}{PU}{\9042\176}%* U+227E
% \nprecsim (txfonts/pxfonts)
\DeclareTextCommand{\textnprecsim}{PU}{\9042\176\83\070}%* U+227E U+0338
% U+227F SUCCEEDS OR EQUIVALENT TO; \succsim (AmS)
\DeclareTextCommand{\textsuccsim}{PU}{\9042\177}%* U+227F
% \nsuccsim (txfonts/pxfonts)
\DeclareTextCommand{\textnsuccsim}{PU}{\9042\177\83\070}%* U+227F U+0338
% U+2280 DOES NOT PRECEDE; notprecedes; \nprec (AmS)
\DeclareTextCommand{\textnprec}{PU}{\9042\200}%* U+2280
% U+2281 DOES NOT SUCCEED; notsucceeds; \nsucc (AmS)
\DeclareTextCommand{\textnsucc}{PU}{\9042\201}%* U+2281
% U+2282 SUBSET OF; propersubset; \subset (LaTeX)
\DeclareTextCommand{\textsubset}{PU}{\9042\202}%* U+2282
% U+2283 SUPERSET OF; propersuperset; \supset (LaTeX)
\DeclareTextCommand{\textsupset}{PU}{\9042\203}%* U+2283
% U+2284 NOT A SUBSET OF; notsubset; \nsubset (mathabx)
\DeclareTextCommand{\textnsubset}{PU}{\9042\204}%* U+2284
% U+2285 NOT A SUPERSET OF; notsuperset; \nsupset (mathabx)
\DeclareTextCommand{\textnsupset}{PU}{\9042\205}%* U+2285
% U+2286 SUBSET OF OR EQUAL TO; reflexsubset; \subseteq (LaTeX)
\DeclareTextCommand{\textsubseteq}{PU}{\9042\206}%* U+2286
% U+2287 SUPERSET OF OR EQUAL TO; reflexsuperset; \supseteq (LaTeX)
\DeclareTextCommand{\textsupseteq}{PU}{\9042\207}%* U+2287
% U+2288 NEITHER A SUBSET OF NOR EQUAL TO; \nsubseteq (AmS)
\DeclareTextCommand{\textnsubseteq}{PU}{\9042\210}%* U+2288
% U+2289 NEITHER A SUPERSET OF NOR EQUAL TO; \nsupseteq (AmS)
\DeclareTextCommand{\textnsupseteq}{PU}{\9042\211}%* U+2289
% U+228A SUBSET OF WITH NOT EQUAL TO; subsetnotequal; \subsetneq (AmS)
\DeclareTextCommand{\textsubsetneq}{PU}{\9042\212}%* U+228A
% U+228B SUPERSET OF WITH NOT EQUAL TO; supersetnotequal; \supsetneq (AmS)
\DeclareTextCommand{\textsupsetneq}{PU}{\9042\213}%* U+228B
% U+228D MULTISET MULTIPLICATION; \cupdot (MnSymbol)
\DeclareTextCommand{\textcupdot}{PU}{\9042\215}%* U+228D
% U+228E MULTISET UNION; \cupplus (MnSymbol)
\DeclareTextCommand{\textcupplus}{PU}{\9042\216}%* U+228E
% U+228F SQUARE IMAGE OF; \sqsubset (latexsym, ...)
\DeclareTextCommand{\textsqsubset}{PU}{\9042\217}%* U+228F
% \nsqsubset (txfonts/pxfonts)
\DeclareTextCommand{\textnsqsubset}{PU}{\9042\217\83\070}%* U+228F U+0338
% U+2290 SQUARE ORIGINAL OF; \sqsupset (latexsym, ...)
\DeclareTextCommand{\textsqsupset}{PU}{\9042\220}%* U+2290
% \nsqsupset (txfonts/pxfonts)
\DeclareTextCommand{\textnsqsupset}{PU}{\9042\220\83\070}%* U+2290 U+0338
% U+2291 SQUARE IMAGE OF OR EQUAL TO; \sqsubseteq (LaTeX)
\DeclareTextCommand{\textsqsubseteq}{PU}{\9042\221}%* U+2291
% \nsqsubseteq (txfonts/pxfonts)
\DeclareTextCommand{\textnsqsubseteq}{PU}{\9042\221\83\070}%* U+2291 U+0338
```

```
% U+2292 SQUARE ORIGINAL OF OR EQUAL TO; \sqsupseteq (LaTeX)
\DeclareTextCommand{\textsqsupseteq}{PU}{\9042\222}%* U+2292
% \nsqsupseteq (txfonts/pxfonts)
\DeclareTextCommand{\textnsqsupseteq}{PU}{\9042\222\83\070}%* U+2292 U+0338
% U+2293 SQUARE CAP; \sqcap (LaTeX)
\DeclareTextCommand{\textsqcap}{PU}{\9042\223}%* U+2293
% U+2294 SQUARE CUP; \sqcup (LaTeX)
\DeclareTextCommand{\textsqcup}{PU}{\9042\224}%* U+2294
% U+2295 CIRCLED PLUS; circleplus; \oplus (LaTeX)
\DeclareTextCommand{\textoplus}{PU}{\9042\225}%* U+2295
%* \textoplus -> \varoplus (stmaryrd)
% U+2296 CIRCLED MINUS; minuscircle; \ominus (LaTeX)
\DeclareTextCommand{\textominus}{PU}{\9042\226}%* U+2296
%* \textominus -> \varominus (stmaryrd)
% U+2297 CIRCLED TIMES; circlemultiply; \otimes (LaTeX)
\DeclareTextCommand{\textotimes}{PU}{\9042\227}%* U+2297
%* \textotimes -> \varotimes (stmaryrd)
% U+2298 CIRCLED DIVISION SLASH; \oslash (LaTeX)
\DeclareTextCommand{\textoslash}{PU}{\9042\230}%* U+2298
%* \textoslash -> \varoslash (stmaryrd)
% U+2299 CIRCLED DOT OPERATOR; circle(d?)ot; \odot (LaTeX)
\DeclareTextCommand{\textodot}{PU}{\9042\231}%* U+2299
%* \textodot -> \varodot (stmaryrd)
% U+229A CIRCLED RING OPERATOR; \circledcirc (AmS)
\DeclareTextCommand{\textcircledcirc}{PU}{\9042\232}%* U+229A
%* \textcircledcirc -> \ocirc (mathabx)
%* \textcircledcirc -> \varocircle (stmaryrd)
% U+229B CIRCLED ASTERISK OPERATOR; \circledast (AmS)
\DeclareTextCommand{\textcircledast}{PU}{\9042\233}%* U+229B
%* \textcircledast -> \varoast (stmaryrd)
%* \textcircledast -> \oasterisk (mathabx)
% U+229D CIRCLED DASH; \circleddash (AmS)
\DeclareTextCommand{\textcircleddash}{PU}{\9042\235}%* U+229D
% U+229E SQUARED PLUS; \boxplus (AmS)
\DeclareTextCommand{\textboxplus}{PU}{\9042\236}%* U+229E
% U+229F SQUARED MINUS; \boxminus (AmS)
\DeclareTextCommand{\textboxminus}{PU}{\9042\237}%* U+229F
% U+22A0 SQUARED TIMES; \boxtimes (AmS)
\DeclareTextCommand{\textboxtimes}{PU}{\9042\240}%* U+22A0
% U+22A1 SQUARED DOT OPERATOR; \boxdot (AmS)
\DeclareTextCommand{\textboxdot}{PU}{\9042\241}%* U+22A1
% U+22A2 RIGHT TACK; \vdash (LaTeX)
\DeclareTextCommand{\textvdash}{PU}{\9042\242}%* U+22A2
%* \textvdash -> \rightvdash (MnSymbol)
% U+22A3 LEFT TACK; tackleft; \dashv (LaTeX)
\DeclareTextCommand{\textdashv}{PU}{\9042\243}%* U+22A3
%* \textdashv -> \leftvdash (MnSymbol)
% \ndashv (mathabx)
\DeclareTextCommand{\textndashv}{PU}{\9042\243\83\070}%* U+22A3 U+0338
%* \textndashv -> \nleftvdash (MnSymbol)
% U+22A4 DOWN TACK (=top); tackdown; \top (LaTeX)
\DeclareTextCommand{\texttop}{PU}{\9042\244}%* U+22A4
%* \texttop -> \downvdash (MnSymbol)
% \ndownvdash (MnSymbol)
```

```
\DeclareTextCommand{\textndownvdash}{PU}{\9042\244\83\070}%* U+22A4 U+0338
% U+22A5 UP TACK (=base, bottom); \bot (LaTeX)
\DeclareTextCommand{\textbot}{PU}{\9042\245}%* U+22A5
%* \textbot -> \upvdash (MnSymbol)
% \nupvdash (MnSymbol)
\DeclareTextCommand{\textnupvdash}{PU}{\9042\245\83\070}%* U+22A5 U+0338
%* \textnupvdash -> \nperp (MnSymbol)
% U+22A8 TRUE; \vDash (AmS)
\DeclareTextCommand{\textvDash}{PU}{\9042\250}%* U+22A8
%* \textvDash -> \models (LaTeX)
%* \textvDash -> \rightmodels (MnSymbol)
% U+22A9 FORCES; \Vdash (AmS)
\DeclareTextCommand{\textVdash}{PU}{\9042\251}%* U+22A9
%* \textVdash -> \rightVdash (MnSymbol)
% U+22AA TRIPLE VERTICAL BAR RIGHT TURNSTILE; \Vvdash (AmS)
\DeclareTextCommand{\textVvdash}{PU}{\9042\252}%* U+22AA
% \nVvash (mathabx)
\DeclareTextCommand{\textnVvash}{PU}{\9042\252\83\070}%* U+22AA U+0338
% U+22AB DOUBLE VERTICAL BAR DOUBLE RIGHT TURNSTILE;
%   \VDash (mathabx)
\DeclareTextCommand{\textVDash}{PU}{\9042\253}%* U+22AB
%* \textVDash -> \rightModels (MnSymbol)
% U+22AC DOES NOT PROVE; \nvdash (AmS)
\DeclareTextCommand{\textnvdash}{PU}{\9042\254}%* U+22AC
%* \textnvdash -> \nrightvdash (MnSymbol)
% U+22AD NOT TRUE; \nvDash (AmS)
\DeclareTextCommand{\textnvDash}{PU}{\9042\255}%* U+22AD
%* \textnvDash -> \nrightmodels (MnSymbol)
%* \textnvDash -> \nmodels (MnSymbol)
% U+22AE DOES NOT FORCE; \nVdash (txfonts/pxfonts)
\DeclareTextCommand{\textnVdash}{PU}{\9042\256}%* U+22AE
%* \textnVdash -> \nrightVdash (MnSymbol)
% U+22AF NEGATED DOUBLE VERTICAL BAR DOUBLE RIGHT TURN-
    STILE; \nVDash (AmS)
\DeclareTextCommand{\textnVDash}{PU}{\9042\257}%* U+22AF
%* \textnVDash -> \nrightModels (MnSymbol)
% U+22B2 NORMAL SUBGROUP OF; \lhd (latexsym, ...)
\DeclareTextCommand{\textlhd}{PU}{\9042\262}%* U+22B2
%* \textlhd -> \lessclosed (MnSymbol)
% U+22B3 CONTAINS AS NORMAL SUBGROUP; \rhd (latexsym, ...)
\DeclareTextCommand{\textrhd}{PU}{\9042\263}%* U+22B3
%* \textrhd -> \gtrclosed (MnSymbol)
% U+22B4 NORMAL SUBGROUP OF OR EQUAL TO; \unlhd (latexsym, ...)
\DeclareTextCommand{\textunlhd}{PU}{\9042\264}%* U+22B4
%* \textunlhd -> \leqclosed (MnSymbol)
%* \textunlhd -> \trianglelefteq (MnSymbol)
% U+22B5 CONTAINS AS NORMAL SUBGROUP OR EQUAL TO; \unrhd (la-
    texsym, ...)
\DeclareTextCommand{\textunrhd}{PU}{\9042\265}%* U+22B5
%* \textunrhd -> \geqclosed (MnSymbol)
%* \textunrhd -> \trianglerighteq (MnSymbol)
% U+22B6 ORIGINAL OF; \multimapdotbothA (txfonts/pxfonts)
\DeclareTextCommand{\textmultimapdotbothA}{PU}{\9042\266}%* U+22B6
% U+22B7 IMAGE OF; \multimapdotbothB (txfonts/pxfonts)
```

```
\DeclareTextCommand{\textmultimapdotbothB}{PU}{\9042\267}%* U+22B7
% U+22B8 MULTIMAP; \multimap (AmS, txfonts/pxfonts)
\DeclareTextCommand{\textmultimap}{PU}{\9042\270}%* U+22B8
% U+22BB XOR; \veebar (AmS)
\DeclareTextCommand{\textveebar}{PU}{\9042\273}%* U+22BB
% U+22BC NAND; \barwedge (mathabx)
\DeclareTextCommand{\textbarwedge}{PU}{\9042\274}%* U+22BC
% U+22C6 STAR OPERATOR; \star (LaTeX)
\DeclareTextCommand{\textstar}{PU}{\9042\306}%* U+22C6
% U+22C7 DIVISION TIMES; \divideontimes (AmS)
\DeclareTextCommand{\textdivideontimes}{PU}{\9042\307}%* U+22C7
% U+22C8 BOWTIE; \bowtie (LaTeX)
\DeclareTextCommand{\textbowtie}{PU}{\9042\310}%* U+22C8
%* \textbowtie -> \Bowtie (wasysym)
% U+22C9 LEFT NORMAL FACTOR SEMIDIRECT PRODUCT; \ltimes (AmS)
\DeclareTextCommand{\textltimes}{PU}{\9042\311}%* U+22C9
% U+22CA RIGHT NORMAL FACTOR SEMIDIRECT PRODUCT;
%   \rtimes (AmS)
\DeclareTextCommand{\textrtimes}{PU}{\9042\312}%* U+22CA
% U+22CB LEFT SEMIDIRECT PRODUCT; \leftthreetimes (AmS)
\DeclareTextCommand{\textleftthreetimes}{PU}{\9042\313}%* U+22CB
% U+22CC RIGHT SEMIDIRECT PRODUCT; \rightthreetimes (AmS)
\DeclareTextCommand{\textrightthreetimes}{PU}{\9042\314}%* U+22CC
% U+22CD REVERSED TILDE EQUALS; \backsimeq (AmS)
\DeclareTextCommand{\textbacksimeq}{PU}{\9042\315}%* U+22CD
% \nbacksimeq (txfonts/pxfonts)
\DeclareTextCommand{\textnbacksimeq}{PU}{\9042\315\83\070}%* U+22CD U+0338
% U+22CE CURLY LOGICAL OR; curlyor; \curlyvee (AmS)
\DeclareTextCommand{\textcurlyvee}{PU}{\9042\316}%* U+22CE
%* \textcurlyvee -> \varcurlyvee (stmaryrd)
% U+22CF CURLY LOGICAL AND; curlyand; \curlywedge (AmS)
\DeclareTextCommand{\textcurlywedge}{PU}{\9042\317}%* U+22CF
%* \textcurlywedge -> \varcurlywedge (stmaryrd)
% U+22D0 DOUBLE SUBSET; \Subset (AmS)
\DeclareTextCommand{\textSubset}{PU}{\9042\320}%* U+22D0
% \nSubset (txfonts/pxfonts)
\DeclareTextCommand{\textnSubset}{PU}{\9042\320\83\070}%* U+22D0 U+0338
% U+22D1 DOUBLE SUPERSET; \Supset (AmS)
\DeclareTextCommand{\textSupset}{PU}{\9042\321}%* U+22D1
% \nSupset (txfonts/pxfonts)
\DeclareTextCommand{\textnSupset}{PU}{\9042\321\83\070}%* U+22D1 U+0338
% U+22D2 DOUBLE INTERSECTION; \Cap (AmS)
\DeclareTextCommand{\textCap}{PU}{\9042\322}%* U+22D2
%* \textCap -> \doublecap (mathabx)
% U+22D3 DOUBLE UNION; \Cup (AmS)
\DeclareTextCommand{\textCup}{PU}{\9042\323}%* U+22D3
%* \textCup -> \doublecup (mathabx)
% U+22D4 PITCHFORK; \pitchfork (mathabx)
\DeclareTextCommand{\textpitchfork}{PU}{\9042\324}%* U+22D4
% U+22D6 LESS-THAN WITH DOT; \lessdot (AmS)
\DeclareTextCommand{\textlessdot}{PU}{\9042\326}%* U+22D6
% U+22D7 GREATER-THAN WITH DOT; \gtrdot (AmS)
\DeclareTextCommand{\textgtrdot}{PU}{\9042\327}%* U+22D7
% U+22D8 VERY MUCH LESS-THAN; \lll (AmS)
```

```
\DeclareTextCommand{\textlll}{PU}{\9042\330}%* U+22D8
% U+22D9 VERY MUCH GREATER-THAN; \ggg (AmS)
\DeclareTextCommand{\textggg}{PU}{\9042\331}%* U+22D9
% U+22DA LESS-THAN EQUAL TO OR GREATER-THAN; lessequalorgreater;
%   \lesseqgtr (AmS)
\DeclareTextCommand{\textlesseqgtr}{PU}{\9042\332}%* U+22DA
% U+22DB GREATER-THAN EQUAL TO OR LESS-THAN; greaterequalorless;
%   \gtreqless (AmS)
\DeclareTextCommand{\textgtreqless}{PU}{\9042\333}%* U+22DB
% U+22DE EQUAL TO OR PRECEDES; \curlyeqprec (MnSymbol)
\DeclareTextCommand{\textcurlyeqprec}{PU}{\9042\336}%* U+22DE
% \ncurlyeqprec (mathabx)
\DeclareTextCommand{\textncurlyeqprec}{PU}{\9042\336\83\070}%* U+22DE U+0338
% U+22DF EQUAL TO OR SUCCEEDS; \curlyeqsucc (MnSymbol)
\DeclareTextCommand{\textcurlyeqsucc}{PU}{\9042\337}%* U+22DF
% \ncurlyeqsucc (mathabx)
\DeclareTextCommand{\textncurlyeqsucc}{PU}{\9042\337\83\070}%* U+22DF U+0338
% U+22E0 DOES NOT PRECEDE OR EQUAL; \npreccurlyeq (txfonts/pxfonts)
\DeclareTextCommand{\textnpreccurlyeq}{PU}{\9042\340}%* U+22E0
% U+22E1 DOES NOT SUCCEED OR EQUAL; \nsucccurlyeq (txfonts/pxfonts)
\DeclareTextCommand{\textnsucccurlyeq}{PU}{\9042\341}%* U+22E1
% U+22E2 NOT SQUARE IMAGE OF OR EQUAL TO; \nsqsubseteq (tx-
    fonts/pxfonts)
\DeclareTextCommand{\textnqsubseteq}{PU}{\9042\342}%* U+22E2
% U+22E3 NOT SQUARE ORIGINAL OF OR EQUAL TO; \nsqsupseteq (tx-
    fonts/pxfonts)
\DeclareTextCommand{\textnqsupseteq}{PU}{\9042\343}%* U+22E3
% U+22E4 SQUARE IMAGE OF OR NOT EQUAL TO; \sqsubsetneq (mathabx)
\DeclareTextCommand{\textsqsubsetneq}{PU}{\9042\344}%* U+22E4
%* \textsqsubsetneq -> \varsqsubsetneq (mathabx)
% U+22E5 SQUARE ORIGINAL OF OR NOT EQUAL TO; \sqsupsetneq (math-
    abx)
\DeclareTextCommand{\textsqsupsetneq}{PU}{\9042\345}%* U+22E5
%* \textsqsupsetneq -> \varsqsupsetneq (mathabx)
% U+22E6 LESS-THAN BUT NOT EQUIVALENT TO; \lnsim (AmS)
\DeclareTextCommand{\textlnsim}{PU}{\9042\346}%* U+22E6
% U+22E7 GREATER-THAN BUT NOT EQUIVALENT TO; \gnsim (AmS)
\DeclareTextCommand{\textgnsim}{PU}{\9042\347}%* U+22E7
% U+22E8 PRECEDES BUT NOT EQUIVALENT TO; \precnsim (AmS)
\DeclareTextCommand{\textprecnsim}{PU}{\9042\350}%* U+22E8
% U+22E9 SUCCEEDS BUT NOT EQUIVALENT TO; \succnsim (AmS)
\DeclareTextCommand{\textsuccnsim}{PU}{\9042\351}%* U+22E9
% U+22EA NOT NORMAL SUBGROUP OF; \ntriangleleft (AmS)
\DeclareTextCommand{\textntriangleleft}{PU}{\9042\352}%* U+22EA
%* \textntriangleleft -> \nlessclosed (MnSymbol)
% U+22EB DOES NOT CONTAIN AS NORMAL SUBGROUP; \ntriang-
    leright (AmS)
\DeclareTextCommand{\textntriangleright}{PU}{\9042\353}%* U+22EB
%* \textntriangleright -> \ngtrclosed (MnSymbol)
% U+22EC NOT NORMAL SUBGROUP OF OR EQUAL TO;
%   \ntrianglelefteq (AmS)
\DeclareTextCommand{\textntrianglelefteq}{PU}{\9042\354}%* U+22EC
% U+22ED DOES NOT CONTAIN AS NORMAL SUBGROUP OR EQUAL;
%   \ntrianglerighteq (AmS)
```

```
\DeclareTextCommand{\textntrianglerighteq}{PU}{\9042\355}%* U+22ED
%* \textntrianglerighteq -> textngeqclosed
% U+22EE VERTICAL ELLIPSIS; ellipsisvertical; \vdots (LaTeX)
\DeclareTextCommand{\textvdots}{PU}{\9042\356}%* U+22EE
% U+22EF MIDLINE HORIZONTAL ELLIPSIS; \cdots (LaTeX)
\DeclareTextCommand{\textcdots}{PU}{\9042\357}%* U+22EF
% U+22F0 UP RIGHT DIAGONAL ELLIPSIS; \udots (MnSymbol)
\DeclareTextCommand{\textudots}{PU}{\9042\360}%* U+22F0
% U+22F1 DOWN RIGHT DIAGONAL ELLIPSIS; \ddots (LaTeX)
\DeclareTextCommand{\textddots}{PU}{\9042\361}%* U+22F1
% U+22F6 ELEMENT OF WITH OVERBAR; \barin (mathabx)
\DeclareTextCommand{\textbarin}{PU}{\9042\366}%* U+22F6
```

47.2.23 Miscellaneous Technical: U+2300 to U+23FF

```
% U+2300 DIAMETER SIGN; \diameter (mathabx,wasysym)
\DeclareTextCommand{\textdiameter}{PU}{\9043\000}%* U+2300
% U+2310 REVERSED NOT SIGN; \backneg (MnSymbol)
\DeclareTextCommand{\textbackneg}{PU}{\9043\020}%* U+2310
% U+2311 SQUARE LOZENGE; \wasylozenge (wasysym)
\DeclareTextCommand{\textwasylozenge}{PU}{\9043\021}%* U+2311
% U+2319 TURNED NOT SIGN; \invbackneg (MnSymbol)
\DeclareTextCommand{\textinvbackneg}{PU}{\9043\031}%* U+2319
% U+231A WATCH; \clock (wasysym)
\DeclareTextCommand{\textclock}{PU}{\9043\032}%* U+231A
%* \textclock -> \Clocklogo (marvosym)
%* \textclock -> \ClockLogo (marvosym)
% U+231C TOP LEFT CORNER; \ulcorner (AmS)
\DeclareTextCommand{\textulcorner}{PU}{\9043\034}%* U+231C
% U+231D TOP RIGHT CORNER; \urcorner (AmS)
\DeclareTextCommand{\texturcorner}{PU}{\9043\035}%* U+231D
% U+231E BOTTOM LEFT CORNER; \llcorner (AmS)
\DeclareTextCommand{\textllcorner}{PU}{\9043\036}%* U+231E
% U+231F BOTTOM RIGHT CORNER; \lrcorner (AmS)
\DeclareTextCommand{\textlrcorner}{PU}{\9043\037}%* U+231F
% U+2322 FROWN; \frown (LaTeX)
\DeclareTextCommand{\textfrown}{PU}{\9043\042}%* U+2322
% U+2323 SMILE; \smile (LaTeX)
\DeclareTextCommand{\textsmile}{PU}{\9043\043}%* U+2323
% U+2328 KEYBOARD; \Keyboard (marvosym)
\DeclareTextCommand{\textKeyboard}{PU}{\9043\050}%* U+2328
% U+2329 LEFT-POINTING ANGLE BRACKET; angleleft; \langle (LaTeX)
\DeclareTextCommand{\textlangle}{PU}{\9043\051}%* U+2329
% U+232A RIGHT-POINTING ANGLE BRACKET; angleright; \rangle (LaTeX)
\DeclareTextCommand{\textrangle}{PU}{\9043\052}%* U+232A
% U+2339 APL FUNCTIONAL SYMBOL QUAD DIVIDE; \APLinv (wasysym)
\DeclareTextCommand{\textAPLinv}{PU}{\9043\071}%* U+2339
% U+233C APL FUNCTIONAL SYMBOL QUAD CIRCLE; \Tumbler (marvosym)
\DeclareTextCommand{\textTumbler}{PU}{\9043\074}%* U+233C
% U+233D APL FUNCTIONAL SYMBOL CIRCLE STILE; \baro (stmaryrd)
\DeclareTextCommand{\textstmaryrdbaro}{PU}{\9043\075}% U+233D
%* \textstmaryrdbaro -> \baro (stmaryrd)
% U+233F APL FUNCTIONAL SYMBOL SLASH BAR; \notslash (wasysym)
\DeclareTextCommand{\textnotslash}{PU}{\9043\077}%* U+233F
```

```
% U+2340 APL FUNCTIONAL SYMBOL BACKSLASH BAR;
%   \notbackslash (wasysym)
\DeclareTextCommand{\textnotbackslash}{PU}{\9043\100}%* U+2340
% U+2342 APL FUNCTIONAL SYMBOL QUAD BACKSLASH; \boxbackslash (mathabx)
\DeclareTextCommand{\textboxbackslash}{PU}{\9043\102}%* U+2342
% U+2347 APL FUNCTIONAL SYMBOL QUAD LEFTWARDS ARROW;
%   \APLleftarrowbox (wasysym)
\DeclareTextCommand{\textAPLleftarrowbox}{PU}{\9043\107}%* U+2347
% U+2348 APL FUNCTIONAL SYMBOL QUAD RIGHTWARDS ARROW;
%   \APLrightarrowbox (wasysym)
\DeclareTextCommand{\textAPLrightarrowbox}{PU}{\9043\110}%* U+2348
% U+2350 APL FUNCTIONAL SYMBOL QUAD UPWARDS ARROW; \APLuparrowbox (wasysym)
\DeclareTextCommand{\textAPLuparrowbox}{PU}{\9043\120}%* U+2350
% U+2357 APL FUNCTIONAL SYMBOL QUAD DOWNWARDS ARROW;
%   \APLdownarrowbox (wasysym)
\DeclareTextCommand{\textAPLdownarrowbox}{PU}{\9043\127}%* U+2357
% U+235E APL FUNCTIONAL SYMBOL QUOTE QUAD;
%   \APLinput (wasysym)
\DeclareTextCommand{\textAPLinput}{PU}{\9043\136}%* U+235E
% U+2370 APL FUNCTIONAL SYMBOL QUAD QUESTION; \Request (china2e)
\DeclareTextCommand{\textRequest}{PU}{\9043\160}%* U+2370
% U+2393 DIRECT CURRENT SYMBOL FORM TWO; \Beam (marvosym)
\DeclareTextCommand{\textBeam}{PU}{\9043\223}%* U+2393
% U+2394 SOFTWARE-FUNCTION SYMBOL; \hexagon (wasysym)
\DeclareTextCommand{\texthexagon}{PU}{\9043\224}%* U+2394
% U+2395 APL FUNCTIONAL SYMBOL QUAD; \APLbox (wasysym)
\DeclareTextCommand{\textAPLbox}{PU}{\9043\225}%* U+2395
% U+23ED BLACK RIGHT-POINTING DOUBLE TRIANGLE WITH VERTICAL BAR;
%   \ForwardToIndex (marvosym)
\DeclareTextCommand{\textForwardToIndex}{PU}{\9043\355}%* U+23ED
% U+23EE BLACK LEFT-POINTING DOUBLE TRIANGLE WITH VERTICAL BAR;
%   \RewindToIndex (marvosym)
\DeclareTextCommand{\textRewindToIndex}{PU}{\9043\356}%* U+23EE
```

47.2.24 Control Pictures: U+2400 to U+243F

```
% U+2422 BLANK SYMBOL
\DeclareTextCommand{\textblank}{PU}{\9044\042}% U+2422
% U+2423 OPEN BOX; blank
\DeclareTextCommand{\textvisiblespace}{PU}{\9044\043}% U+2423
```

47.2.25 Optical Character Recognition: U+2440 to U+245F

```
% U+244A OCR DOUBLE BACKSLASH; \bbslash (stmaryrd)
\DeclareTextCommand{\textbbslash}{PU}{\9044\112}%* U+244A
%* \textbbslash -> \varparallelinv (txfonts/pxfonts)
```

47.2.26 Enclosed Alphanumerics: U+2460 to U+24FF

```
% U+2460 CIRCLED DIGIT ONE; onecircle
\DeclareTextCompositeCommand{\textcircled}{PU}{1}{\9044\140}% U+2460
% U+2461 CIRCLED DIGIT TWO; twocircle
\DeclareTextCompositeCommand{\textcircled}{PU}{2}{\9044\141}% U+2461
```

```
% U+2462 CIRCLED DIGIT THREE; threecircle
\DeclareTextCompositeCommand{\textcircled}{PU}{3}{\9044\142}% U+2462
% U+2463 CIRCLED DIGIT FOUR; fourcircle
\DeclareTextCompositeCommand{\textcircled}{PU}{4}{\9044\143}% U+2463
% U+2464 CIRCLED DIGIT FIVE; fivecircle
\DeclareTextCompositeCommand{\textcircled}{PU}{5}{\9044\144}% U+2464
% U+2465 CIRCLED DIGIT SIX; sixcircle
\DeclareTextCompositeCommand{\textcircled}{PU}{6}{\9044\145}% U+2465
% U+2466 CIRCLED DIGIT SEVEN; sevencircle
\DeclareTextCompositeCommand{\textcircled}{PU}{7}{\9044\146}% U+2466
% U+2467 CIRCLED DIGIT EIGHT; eightcircle
\DeclareTextCompositeCommand{\textcircled}{PU}{8}{\9044\147}% U+2467
% U+2468 CIRCLED DIGIT NINE; ninecircle
\DeclareTextCompositeCommand{\textcircled}{PU}{9}{\9044\150}% U+2468
% U+2469 CIRCLED NUMBER TEN; tencircle
\DeclareTextCompositeCommand{\textcircled}{PU}{10}{\9044\151}% U+2469
% U+246A CIRCLED NUMBER ELEVEN; elevencircle
\DeclareTextCompositeCommand{\textcircled}{PU}{11}{\9044\152}% U+246A
% U+246B CIRCLED NUMBER TWELVE; twelvecircle
\DeclareTextCompositeCommand{\textcircled}{PU}{12}{\9044\153}% U+246B
% U+246C CIRCLED NUMBER THIRTEEN; thirteencircle
\DeclareTextCompositeCommand{\textcircled}{PU}{13}{\9044\154}% U+246C
% U+246D CIRCLED NUMBER FOURTEEN; fourteencircle
\DeclareTextCompositeCommand{\textcircled}{PU}{14}{\9044\155}% U+246D
% U+246E CIRCLED NUMBER FIFTEEN; fifteencircle
\DeclareTextCompositeCommand{\textcircled}{PU}{15}{\9044\156}% U+246E
% U+246F CIRCLED NUMBER SIXTEEN; sixteencircle
\DeclareTextCompositeCommand{\textcircled}{PU}{16}{\9044\157}% U+246F
% U+2470 CIRCLED NUMBER SEVENTEEN; seventeencircle
\DeclareTextCompositeCommand{\textcircled}{PU}{17}{\9044\160}% U+2470
% U+2471 CIRCLED NUMBER EIGHTEEN; eighteencircle
\DeclareTextCompositeCommand{\textcircled}{PU}{18}{\9044\161}% U+2471
% U+2472 CIRCLED NUMBER NINETEEN; nineteencircle
\DeclareTextCompositeCommand{\textcircled}{PU}{19}{\9044\162}% U+2472
% U+2473 CIRCLED NUMBER TWENTY; twentycircle
\DeclareTextCompositeCommand{\textcircled}{PU}{20}{\9044\163}% U+2473
% U+24B6 CIRCLED LATIN CAPITAL LETTER A; Acircle
\DeclareTextCompositeCommand{\textcircled}{PU}{A}{\9044\266}% U+24B6
% \CircledA (marvosym)
\DeclareTextCommand{\textCircledA}{PU}{\9044\266}%* U+24B6
%* \textCircledA -> \CleaningA
% U+24B7 CIRCLED LATIN CAPITAL LETTER B; Bcircle
\DeclareTextCompositeCommand{\textcircled}{PU}{B}{\9044\267}% U+24B7
% U+24B8 CIRCLED LATIN CAPITAL LETTER C; Ccircle
\DeclareTextCompositeCommand{\textcircled}{PU}{C}{\9044\270}% U+24B8
% U+24B9 CIRCLED LATIN CAPITAL LETTER D; Dcircle
\DeclareTextCompositeCommand{\textcircled}{PU}{D}{\9044\271}% U+24B9
% U+24BA CIRCLED LATIN CAPITAL LETTER E; Ecircle
\DeclareTextCompositeCommand{\textcircled}{PU}{E}{\9044\272}% U+24BA
% U+24BB CIRCLED LATIN CAPITAL LETTER F; Fcircle
\DeclareTextCompositeCommand{\textcircled}{PU}{F}{\9044\273}% U+24BB
% \CleaningF (marvosym)
\DeclareTextCommand{\textCleaningF}{PU}{\9044\273}%* U+24BB
% \CleaningFF (marvosym)
```

```
\DeclareTextCommand{\textCleaningFF}{PU}{\9044\273\83\062}%* U+24BB U+0332
% U+24BC CIRCLED LATIN CAPITAL LETTER G; Gcircle
\DeclareTextCompositeCommand{\textcircled}{PU}{G}{\9044\274}% U+24BC
% U+24BD CIRCLED LATIN CAPITAL LETTER H; Hcircle
\DeclareTextCompositeCommand{\textcircled}{PU}{H}{\9044\275}% U+24BD
% U+24BE CIRCLED LATIN CAPITAL LETTER I; Icircle
\DeclareTextCompositeCommand{\textcircled}{PU}{I}{\9044\276}% U+24BE
% U+24BF CIRCLED LATIN CAPITAL LETTER J; Jcircle
\DeclareTextCompositeCommand{\textcircled}{PU}{J}{\9044\277}% U+24BF
% U+24C0 CIRCLED LATIN CAPITAL LETTER K; Kcircle
\DeclareTextCompositeCommand{\textcircled}{PU}{K}{\9044\300}% U+24C0
% U+24C1 CIRCLED LATIN CAPITAL LETTER L; Lcircle
\DeclareTextCompositeCommand{\textcircled}{PU}{L}{\9044\301}% U+24C1
% U+24C2 CIRCLED LATIN CAPITAL LETTER M; Mcircle
\DeclareTextCompositeCommand{\textcircled}{PU}{M}{\9044\302}% U+24C2
% U+24C3 CIRCLED LATIN CAPITAL LETTER N; Ncircle
\DeclareTextCompositeCommand{\textcircled}{PU}{N}{\9044\303}% U+24C3
% U+24C4 CIRCLED LATIN CAPITAL LETTER O; Ocircle
\DeclareTextCompositeCommand{\textcircled}{PU}{O}{\9044\304}% U+24C4
% U+24C5 CIRCLED LATIN CAPITAL LETTER P; Pcircle
\DeclareTextCompositeCommand{\textcircled}{PU}{P}{\9044\305}% U+24C5
% \CleaningP (marvosym)
\DeclareTextCommand{\textCleaningP}{PU}{\9044\305}%* U+24C5
% \CleaningPP (marvosym)
\DeclareTextCommand{\textCleaningPP}{PU}{\9044\305\83\062}%* U+24C5 U+0332
% U+24C6 CIRCLED LATIN CAPITAL LETTER Q; Qcircle
\DeclareTextCompositeCommand{\textcircled}{PU}{Q}{\9044\306}% U+24C6
% U+24C7 CIRCLED LATIN CAPITAL LETTER R; Rcircle
\DeclareTextCompositeCommand{\textcircled}{PU}{R}{\9044\307}% U+24C7
% U+24C8 CIRCLED LATIN CAPITAL LETTER S; Scircle
\DeclareTextCompositeCommand{\textcircled}{PU}{S}{\9044\310}% U+24C8
% U+24C9 CIRCLED LATIN CAPITAL LETTER T; Tcircle
\DeclareTextCompositeCommand{\textcircled}{PU}{T}{\9044\311}% U+24C9
% U+24CA CIRCLED LATIN CAPITAL LETTER U; Ucircle
\DeclareTextCompositeCommand{\textcircled}{PU}{U}{\9044\312}% U+24CA
% U+24CB CIRCLED LATIN CAPITAL LETTER V; Vcircle
\DeclareTextCompositeCommand{\textcircled}{PU}{V}{\9044\313}% U+24CB
% U+24CC CIRCLED LATIN CAPITAL LETTER W; Wcircle
\DeclareTextCompositeCommand{\textcircled}{PU}{W}{\9044\314}% U+24CC
% U+24CD CIRCLED LATIN CAPITAL LETTER X; Xcircle
\DeclareTextCompositeCommand{\textcircled}{PU}{X}{\9044\315}% U+24CD
% U+24CE CIRCLED LATIN CAPITAL LETTER Y; Ycircle
\DeclareTextCompositeCommand{\textcircled}{PU}{Y}{\9044\316}% U+24CE
% U+24CF CIRCLED LATIN CAPITAL LETTER Z; Zcircle
\DeclareTextCompositeCommand{\textcircled}{PU}{Z}{\9044\317}% U+24CF
% U+24D0 CIRCLED LATIN SMALL LETTER A; acircle
\DeclareTextCompositeCommand{\textcircled}{PU}{a}{\9044\320}% U+24D0
% U+24D1 CIRCLED LATIN SMALL LETTER B; bcircle
\DeclareTextCompositeCommand{\textcircled}{PU}{b}{\9044\321}% U+24D1
% U+24D2 CIRCLED LATIN SMALL LETTER C; ccircle
\DeclareTextCompositeCommand{\textcircled}{PU}{c}{\9044\322}% U+24D2
% U+24D3 CIRCLED LATIN SMALL LETTER D; dcircle
\DeclareTextCompositeCommand{\textcircled}{PU}{d}{\9044\323}% U+24D3
% U+24D4 CIRCLED LATIN SMALL LETTER E; ecircle
```

```
\DeclareTextCompositeCommand{\textcircled}{PU}{e}{\9044\324}% U+24D4
% U+24D5 CIRCLED LATIN SMALL LETTER F; fcircle
\DeclareTextCompositeCommand{\textcircled}{PU}{f}{\9044\325}% U+24D5
% U+24D6 CIRCLED LATIN SMALL LETTER G; gcircle
\DeclareTextCompositeCommand{\textcircled}{PU}{g}{\9044\326}% U+24D6
% U+24D7 CIRCLED LATIN SMALL LETTER H; hcircle
\DeclareTextCompositeCommand{\textcircled}{PU}{h}{\9044\327}% U+24D7
% U+24D8 CIRCLED LATIN SMALL LETTER I; icircle
\DeclareTextCompositeCommand{\textcircled}{PU}{i}{\9044\330}% U+24D8
% U+24D9 CIRCLED LATIN SMALL LETTER J; jcircle
\DeclareTextCompositeCommand{\textcircled}{PU}{j}{\9044\331}% U+24D9
% U+24DA CIRCLED LATIN SMALL LETTER K; kcircle
\DeclareTextCompositeCommand{\textcircled}{PU}{k}{\9044\332}% U+24DA
% U+24DB CIRCLED LATIN SMALL LETTER L; lcircle
\DeclareTextCompositeCommand{\textcircled}{PU}{l}{\9044\333}% U+24DB
% U+24DC CIRCLED LATIN SMALL LETTER M; mcircle
\DeclareTextCompositeCommand{\textcircled}{PU}{m}{\9044\334}% U+24DC
% U+24DD CIRCLED LATIN SMALL LETTER N; ncircle
\DeclareTextCompositeCommand{\textcircled}{PU}{n}{\9044\335}% U+24DD
% U+24DE CIRCLED LATIN SMALL LETTER O; ocircle
\DeclareTextCompositeCommand{\textcircled}{PU}{o}{\9044\336}% U+24DE
% U+24DF CIRCLED LATIN SMALL LETTER P; pcircle
\DeclareTextCompositeCommand{\textcircled}{PU}{p}{\9044\337}% U+24DF
% U+24E0 CIRCLED LATIN SMALL LETTER Q; qcircle
\DeclareTextCompositeCommand{\textcircled}{PU}{q}{\9044\340}% U+24E0
% U+24E1 CIRCLED LATIN SMALL LETTER R; rcircle
\DeclareTextCompositeCommand{\textcircled}{PU}{r}{\9044\341}% U+24E1
% U+24E2 CIRCLED LATIN SMALL LETTER S; scircle
\DeclareTextCompositeCommand{\textcircled}{PU}{s}{\9044\342}% U+24E2
% U+24E3 CIRCLED LATIN SMALL LETTER T; tcircle
\DeclareTextCompositeCommand{\textcircled}{PU}{t}{\9044\343}% U+24E3
% U+24E4 CIRCLED LATIN SMALL LETTER U; ucircle
\DeclareTextCompositeCommand{\textcircled}{PU}{u}{\9044\344}% U+24E4
% U+24E5 CIRCLED LATIN SMALL LETTER V; vcircle
\DeclareTextCompositeCommand{\textcircled}{PU}{v}{\9044\345}% U+24E5
% U+24E6 CIRCLED LATIN SMALL LETTER W; wcircle
\DeclareTextCompositeCommand{\textcircled}{PU}{w}{\9044\346}% U+24E6
% U+24E7 CIRCLED LATIN SMALL LETTER X; xcircle
\DeclareTextCompositeCommand{\textcircled}{PU}{x}{\9044\347}% U+24E7
% U+24E8 CIRCLED LATIN SMALL LETTER Y; ycircle
\DeclareTextCompositeCommand{\textcircled}{PU}{y}{\9044\350}% U+24E8
% U+24E9 CIRCLED LATIN SMALL LETTER Z; zcircle
\DeclareTextCompositeCommand{\textcircled}{PU}{z}{\9044\351}% U+24E9
% U+24EA CIRCLED DIGIT ZERO
\DeclareTextCompositeCommand{\textcircled}{PU}{0}{\9044\352}% U+24EA
```

47.2.27 Box Drawing: U+2500 to 257F

```
% U+2504 BOX DRAWINGS LIGHT TRIPLE DASH HORIZONTAL; \Cutting-
    Line (marvosym)
\DeclareTextCommand{\textCuttingLine}{PU}{\9045\004}%* U+2504
%* \textCuttingLine -> \Kutline (marvosym)
%* \textCuttingLine -> \CutLine (marvosym)
%* \textCuttingLine -> \Cutline (marvosym)
```

47.2.28 Geometric Shapes: U+25A0 to U+25FF

```
% U+25B2 BLACK UP-POINTING TRIANGLE; \UParrow (wasysym)
\DeclareTextCommand{\textUParrow}{PU}{\9045\262}%* U+25B2
%* \textUParrow -> \MoveUp (marvosym)
% U+25B3 WHITE UP-POINTING TRIANGLE; whiteuppointingtriangle;
%   \bigtriangleup (LaTeX)
\DeclareTextCommand{\textbigtriangleup}{PU}{\9045\263}%* U+25B3
%* \textbigtriangleup -> \APLup (wasysym)
%* \textbigtriangleup -> \Bleech (marvosym)
% U+25B6 BLACK RIGHT-POINTING TRIANGLE; \Forward (marvosym)
\DeclareTextCommand{\textForward}{PU}{\9045\266}%* U+25B6
% U+25B7 WHITE RIGHT-POINTING TRIANGLE (= z notation range restriction);
%   whiterightpointingtriangle; \triangleright (LaTeX)
\DeclareTextCommand{\texttriangleright}{PU}{\9045\267}%* U+25B7
% U+25BA BLACK RIGHT-POINTING POINTER; \RHD (wasysym)
\DeclareTextCommand{\textRHD}{PU}{\9045\272}%* U+25BA
% U+25BC BLACK DOWN-POINTING TRIANGLE; \DOWNarrow (wasysym)
\DeclareTextCommand{\textDOWNarrow}{PU}{\9045\274}%* U+25BC
%* \textDOWNarrow -> \MoveDown (marvosym)
% U+25BD WHITE DOWN-POINTING TRIANGLE; whitedownpointingtriangle;
%   \bigtriangledown (LaTeX)
\DeclareTextCommand{\textbigtriangledown}{PU}{\9045\275}%* U+25BD
%* \textbigtriangledown -> \APLdown (wasysym)
% U+25C0 BLACK LEFT-POINTING TRIANGLE; \Rewind (marvosym)
\DeclareTextCommand{\textRewind}{PU}{\9045\300}%* U+25C0
% U+25C1 WHITE RIGHT-POINTING TRIANGLE (= z notation domain restriction);
%   whiteleftpointingtriangle; \triangleleft (LaTeX)
\DeclareTextCommand{\texttriangleleft}{PU}{\9045\301}%* U+25C1
% U+25C4 BLACK LEFT-POINTING POINTER; \LHD (wasysym)
\DeclareTextCommand{\textLHD}{PU}{\9045\304}%* U+25C4
% U+25C7 WHITE DIAMOND; whitediamond; \diamond (LaTeX)
\DeclareTextCommand{\textdiamond}{PU}{\9045\307}%* U+25C7
%* \textdiamond -> \Diamond (wasysym)
% U+25CA LOZENGE; lozenge; \lozenge (AmS)
\DeclareTextCommand{\textlozenge}{PU}{\9045\312}%* U+25CA
% U+25D6 LEFT HALF BLACK CIRCLE; \LEFTCIRCLE (wasysym)
\DeclareTextCommand{\textLEFTCIRCLE}{PU}{\9045\326}%* U+25D6
% U+25D7 RIGHT HALF BLACK CIRCLE; \RIGHTCIRCLE (wasysym)
\DeclareTextCommand{\textRIGHTCIRCLE}{PU}{\9045\327}%* U+25D7
% U+25E6 WHITE BULLET; *openbullet, whitebullet
\DeclareTextCommand{\textopenbullet}{PU}{\9045\346}%* U+25E6
% U+25EB WHITE SQUARE WITH VERTICAL BISECTING LINE;
%   \boxbar (stmaryrd)
\DeclareTextCommand{\textboxbar}{PU}{\9045\353}%* U+25EB
% U+25EF LARGE CIRCLE; largecircle
\DeclareTextCommand{\textbigcircle}{PU}{\9045\357}%* U+25EF
%* \textbigcircle -> \varbigcirc (stmaryrd)
%
```

47.2.29 Miscellaneous Symbols: U+2600 to U+26FF

```
% U+2601 CLOUD; \Cloud (ifsym)
\DeclareTextCommand{\textCloud}{PU}{\9046\001}%* U+2601
% U+2605 BLACK STAR; \FiveStar (bbding)
\DeclareTextCommand{\textFiveStar}{PU}{\9046\005}%* U+2605
% U+2606 WHITE STAR; \FiveStarOpen (bbding)
\DeclareTextCommand{\textFiveStarOpen}{PU}{\9046\006}%* U+2606
% U+260E BLACK TELEPHONE; telephoneblack; \Phone (bbding)
\DeclareTextCommand{\textPhone}{PU}{\9046\016}%* U+260E
%* \textPhone -> \Telefon (marvosym)
% U+2610 BALLOT BOX; \boxempty (stmaryrd)
\DeclareTextCommand{\textboxempty}{PU}{\9046\020}%* U+2610
%* \textboxempty -> \Box (wasysym)
% U+2611 BALLOT BOX WITH CHECK; \Checkedbox (marvosym)
\DeclareTextCommand{\textCheckedbox}{PU}{\9046\021}%* U+2611
%* \textCheckedbox -> \CheckedBox (marvosym)
% U+2612 BALLOT BOX WITH X; \Crossedbox (marvosym)
\DeclareTextCommand{\textCrossedbox}{PU}{\9046\022}%* U+2612
%* \textCrossedbox -> \XBox (wasysym)
%* \textCrossedbox -> \CrossedBox (marvosym)
% U+2615 HOT BEVERAGE; \Coffeecup (marvosym)
\DeclareTextCommand{\textCoffeecup}{PU}{\9046\025}%* U+2615
% U+261A BLACK LEFT POINTING INDEX; \HandCuffLeft (bbding)
\DeclareTextCommand{\textHandCuffLeft}{PU}{\9046\032}%* U+261A
% U+261B BLACK RIGHT POINTING INDEX; \HandCuffRight (bbding)
\DeclareTextCommand{\textHandCuffRight}{PU}{\9046\033}%* U+261B
% U+261C WHITE LEFT POINTING INDEX; \HandLeft (bbding)
\DeclareTextCommand{\textHandLeft}{PU}{\9046\034}%* U+261C
%* \textHandLeft -> \rightpointleft (fourier)
% U+261E WHITE RIGHT POINTING INDEX; \HandRight (bbding)
\DeclareTextCommand{\textHandRight}{PU}{\9046\036}%* U+261E
%* \textHandRight -> \leftpointright (fourier)
%* \textHandRight -> \PointingHand (marvosym)
%* \textHandRight -> \Pointinghand (marvosym)
% U+2622 RADIOACTIVE SIGN; \Radioactivity (marvosym)
\DeclareTextCommand{\textRadioactivity}{PU}{\9046\042}%* U+2622
%* \textRadioactivity -> \Radiation (ifsym)
% U+2623 BIOHAZARD SIGN; \Biohazard (marvosym)
\DeclareTextCommand{\textBiohazard}{PU}{\9046\043}%* U+2623
% U+2625 ANKH; \Ankh (marvosym)
\DeclareTextCommand{\textAnkh}{PU}{\9046\045}%* U+2625
% U+262F YIN YANG; \YinYang (marvosym)
\DeclareTextCommand{\textYinYang}{PU}{\9046\057}%* U+262F
%* \textYinYang -> \Yinyang (marvosym)
%* \textYinYang -> \YingYang (marvosym)
%* \textYinYang -> \Yingyang (marvosym)
% U+2639 WHITE FROWNING FACE; \frownie (wasysym)
\DeclareTextCommand{\textfrownie}{PU}{\9046\071}%* U+2639
%* \textfrownie -> \Frowny (marvosym)
% U+263A WHITE SMILING FACE; \smiley (wasysym)
\DeclareTextCommand{\textsmiley}{PU}{\9046\072}%* U+263A
%* \textsmiley -> \Smiley (marvosym)
% U+263B BLACK SMILING FACE; \blacksmiley (wasysym)
\DeclareTextCommand{\textblacksmiley}{PU}{\9046\073}%* U+263B
% U+263C WHITE SUN WITH RAYS; \sun (wasysym)
```

```
\DeclareTextCommand{\textsun}{PU}{\9046\074}%* U+263C
%* \textsun -> \Sun (marvosym)
% U+263D FIRST QUARTER MOON; \leftmoon (wasysym, mathabx)
\DeclareTextCommand{\textleftmoon}{PU}{\9046\075}%* U+263D
% U+263E LAST QUARTER MOON; \rightmoon (wasysym, mathabx)
\DeclareTextCommand{\textrightmoon}{PU}{\9046\076}%* U+263E
% U+263F MERCURY; \mercury (wasysym)
\DeclareTextCommand{\textmercury}{PU}{\9046\077}%* U+263F
%* \textmercury -> \Mercury (marvosym)
% U+2640 FEMALE SIGN; female; \female (wasysym)
\DeclareTextCommand{\textPUfemale}{PU}{\9046\100}% U+2640
%* \textPUfemale -> \textfemale (tipx)
%* \textPUfemale -> \female (wasysym)
%* \textPUfemale -> \venus (wasysym)
%* \textPUfemale -> \Venus (marvosym)
%* \textPUfemale -> \Female (marvosym)
% U+2641 EARTH; \earth (wasysym)
\DeclareTextCommand{\textearth}{PU}{\9046\101}%* U+2641
%* \textearth -> \Earth (marvosym)
% U+2642 MALE SIGN; male, mars; \male (wasysym)
\DeclareTextCommand{\textmale}{PU}{\9046\102}%* U+2642
%* \textmale -> \mars (wasysym)
%* \textmale -> \Mars (marvosym)
%* \textmale -> \Male (marvosym)
% U+2643 JUPITER; \jupiter (wasysym)
\DeclareTextCommand{\textjupiter}{PU}{\9046\103}%* U+2643
%* \textjupiter -> \Jupiter (marvosym)
% U+2644 SATURN; \saturn (wasysym)
\DeclareTextCommand{\textsaturn}{PU}{\9046\104}%* U+2644
%* \textsaturn -> \Saturn (marvosym)
% U+2645 URANUS; \uranus (wasysym)
\DeclareTextCommand{\texturanus}{PU}{\9046\105}%* U+2645
%* \texturanus -> \Uranus (marvosym)
% U+2646 NEPTUNE; \neptune (wasysym)
\DeclareTextCommand{\textneptune}{PU}{\9046\106}%* U+2646
%* \textneptune -> \Neptune (marvosym)
% U+2647 PLUTO; \pluto (wasysym)
\DeclareTextCommand{\textpluto}{PU}{\9046\107}%* U+2647
%* \textpluto -> \Pluto (marvosym)
% U+2648 ARIES; \aries (wasysym)
\DeclareTextCommand{\textaries}{PU}{\9046\110}%* U+2648
%* \textaries -> \Aries (marvosym)
% U+2649 TAURUS; \taurus (wasysym)
\DeclareTextCommand{\texttaurus}{PU}{\9046\111}%* U+2649
%* \texttaurus -> \Taurus (marvosym)
% U+264A GEMINI; \gemini (wasysym)
\DeclareTextCommand{\textgemini}{PU}{\9046\112}%* U+264A
%* \textgemini -> \Gemini (marvosym)
% U+264B CANCER; \cancer (wasysym)
\DeclareTextCommand{\textcancer}{PU}{\9046\113}%* U+264B
%* \textcancer -> \Cancer (marvosym)
% U+264C LEO; \leo (wasysym)
\DeclareTextCommand{\textleo}{PU}{\9046\114}%* U+264C
%* \textleo -> \Leo (marvosym)
```

```
% U+264D VIRGO; \virgo (wasysym)
\DeclareTextCommand{\textvirgo}{PU}{\9046\115}%* U+264D
%* \textvirgo -> \Virgo (marvosym)
% U+264E LIBRA; \libra (wasysym)
\DeclareTextCommand{\textlibra}{PU}{\9046\116}%* U+264E
%* \textlibra -> \Libra (marvosym)
% U+264F SCORPIO; \scorpio (wasysym)
\DeclareTextCommand{\textscorpio}{PU}{\9046\117}%* U+264F
%* \textscorpio -> \Scorpio (marvosym)
% U+2650 SAGITTARIUS; \sagittarius (wasysym)
\DeclareTextCommand{\textsagittarius}{PU}{\9046\120}%* U+2650
%* \textsagittarius -> \Sagittarius (marvosym)
% U+2651 CAPRICORN; \capricornus (wasysym)
\DeclareTextCommand{\textcapricornus}{PU}{\9046\121}%* U+2651
%* \textcapricornus -> \Capricorn (marvosym)
% U+2652 AQUARIUS; \aquarius (wasysym)
\DeclareTextCommand{\textaquarius}{PU}{\9046\122}%* U+2652
%* \textaquarius -> \Aquarius (marvosym)
% U+2653 PISCES; \pisces (wasysym)
\DeclareTextCommand{\textpisces}{PU}{\9046\123}%* U+2653
%* \textpisces -> \Pisces (marvosym)
% U+2660 BLACK SPADE SUIT; spade, spadesuitblack; \spadesuit (LaTeX)
\DeclareTextCommand{\textspadesuitblack}{PU}{\9046\140}% U+2660
%* \textspadesuitblack -> \spadesuit (MnSymbol)
% U+2661 WHITE HEART SUIT; heartsuitwhite; \heartsuit (LaTeX)
\DeclareTextCommand{\textheartsuitwhite}{PU}{\9046\141}% U+2661
%* \textheartsuitwhite -> \Heart (marvosym)
%* \textheartsuitwhite -> \heartsuit (MnSymbol)
% U+2662 WHITE DIAMOND SUIT; diamondsuitwhite; \diamondsuit (LaTeX)
\DeclareTextCommand{\textdiamondsuitwhite}{PU}{\9046\142}% U+2662
%* \textdiamondsuitwhite -> \diamondsuit (MnSymbol)
% U+2663 BLACK CLUB SUIT; club, clubsuitblack; \clubsuit (LaTeX)
\DeclareTextCommand{\textclubsuitblack}{PU}{\9046\143}% U+2663
%* \textclubsuitblack -> \clubsuit (MnSymbol)
% U+2664 WHITE SPADE SUIT; spadesuitwhite
\DeclareTextCommand{\textspadesuitwhite}{PU}{\9046\144}% U+2664
% U+2665 BLACK HEART SUIT; heartsuitblack, heart
\DeclareTextCommand{\textheartsuitblack}{PU}{\9046\145}% U+2665
% U+2666 BLACK DIAMOND SUIT; diamond
\DeclareTextCommand{\textdiamondsuitblack}{PU}{\9046\146}% U+2666
% U+2667 WHITE CLUB SUIT; clubsuitwhite
\DeclareTextCommand{\textclubsuitwhite}{PU}{\9046\147}% U+2667
% U+2669 QUARTER NOTE; quarternote; \quarternote (wasysym, arev)
\DeclareTextCommand{\textquarternote}{PU}{\9046\151}%* U+2669
% U+266A EIGHTH NOTE; musicalnote; \textmusicalnote (textcomp)
\DeclareTextCommand{\textmusicalnote}{PU}{\9046\152}% U+266A
%* \textmusicalnote -> \eighthnote (wasysym, arev)
% U+266B BEAMED EIGHTH NOTES; eighthnotebeamed; \twonotes (wasysym)
\DeclareTextCommand{\texttwonotes}{PU}{\9046\153}%* U+266B
% U+266C BEAMED SIXTEENTH NOTES; beamedsixteenthnotes; \sixteenth-
    note (arev)
\DeclareTextCommand{\textsixteenthnote}{PU}{\9046\154}%* U+266C
% U+266D MUSIC FLAT SIGN; musicflatsign; \flat (LaTeX)
\DeclareTextCommand{\textflat}{PU}{\9046\155}%* U+266D
```

```
% U+266E MUSIC NATURAL SIGN; \natural (LaTeX)
\DeclareTextCommand{\textnatural}{PU}{\9046\156}%* U+266E
% U+266F MUSIC SHARP SIGN; musicsharpsign; \sharp (LaTeX)
\DeclareTextCommand{\textsharp}{PU}{\9046\157}%* U+266F
% U+2672 UNIVERSAL RECYCLING SYMBOL; \recycle (recycle)
\DeclareTextCommand{\textrecycle}{PU}{\9046\162}%* U+2672
%* \textrecycle -> \Recycling (marvosym)
% U+267F WHEELCHAIR SYMBOL; \Wheelchair (marvosym)
\DeclareTextCommand{\textWheelchair}{PU}{\9046\177}%* U+267F
% U+2691 BLACK FLAG; \Flag (ifsym)
\DeclareTextCommand{\textFlag}{PU}{\9046\221}%* U+2691
%* \textFlag -> \VarFlag (ifsym)
% U+2692 HAMMER AND PICK; \MineSign (marvosym)
\DeclareTextCommand{\textMineSign}{PU}{\9046\222}%* U+2692
% U+2694 CROSSED SWORDS; \dsmilitary (dictsym)
\DeclareTextCommand{\textdsmilitary}{PU}{\9046\224}%* U+2694
%* \textdsmilitary -> \textxswup (fourier)
% U+2695 STAFF OF AESCULAPIUS; \dsmedical (dictsym)
\DeclareTextCommand{\textdsmedical}{PU}{\9046\225}%* U+2695
% U+2696 SCALES; \dsjuridical (dictsym)
\DeclareTextCommand{\textdsjuridical}{PU}{\9046\226}%* U+2696
% U+2697 ALEMBIC; \dschemical (dictsym)
\DeclareTextCommand{\textdschemical}{PU}{\9046\227}%* U+2697
% U+2698 FLOWER; \dsbiological (dictsym)
\DeclareTextCommand{\textdsbiological}{PU}{\9046\230}%* U+2698
% U+269A STAFF OF HERMES; \dscommercial (dictsym)
\DeclareTextCommand{\textdscommercial}{PU}{\9046\232}%* U+269A
% U+269D OUTLINED WHITE STAR; \manstar (manfnt)
\DeclareTextCommand{\textmanstar}{PU}{\9046\235}%* U+269D
% U+26A0 WARNING SIGN; \danger (fourier)
\DeclareTextCommand{\textdanger}{PU}{\9046\240}%* U+26A0
% U+26A2 DOUBLED FEMALE SIGN; \FemaleFemale (marvosym)
\DeclareTextCommand{\textFemaleFemale}{PU}{\9046\242}%* U+26A2
% U+26A3 DOUBLED MALE SIGN; \MaleMale (marvosym)
\DeclareTextCommand{\textMaleMale}{PU}{\9046\243}%* U+26A3
% U+26A4 INTERLOCKED FEMALE AND MALE SIGN; \FemaleMale (marvosym)
\DeclareTextCommand{\textFemaleMale}{PU}{\9046\244}%* U+26A4
% U+26A5 MALE AND FEMALE SIGN; \Hermaphrodite (marvosym)
\DeclareTextCommand{\textHermaphrodite}{PU}{\9046\245}%* U+26A5
% U+26AA MEDIUM WHITE CIRCLE; \Neural (marvosym)
\DeclareTextCommand{\textNeutral}{PU}{\9046\252}%* U+26AA
% U+26AD MARRIAGE SYMBOL
\DeclareTextCommand{\textmarried}{PU}{\9046\255}% U+26AD
% U+26AE DIVORCE SYMBOL
\DeclareTextCommand{\textdivorced}{PU}{\9046\256}% U+26AE
% U+26B2 NEUTER; \textuncrfemale (tipx)
\DeclareTextCommand{\textPUuncrfemale}{PU}{\9046\262}% U+26B2
%* \textPUuncrfemale -> \textuncrfemale (tipx)
% U+26B9 SEXTILE; \hexstar (wasysym)
\DeclareTextCommand{\texthexstar}{PU}{\9046\271}%* U+26B9
% U+26BD SOCCER BALL; \Football (marvosym)
\DeclareTextCommand{\textSoccerBall}{PU}{\9046\275}% U+26BD
%* \textSoccerBall -> \Football (marvosym)
```

```
% U+26C5 SUN BEHIND CLOUD; \SunCloud (ifsym)
\DeclareTextCommand{\textSunCload}{PU}{\9046\305}%* U+26C5
% U+26C6 RAIN; \Rain (ifsym)
\DeclareTextCommand{\textRain}{PU}{\9046\306}%* U+26C6
% U+26D4 NO ENTRY; \noway (fourier)
\DeclareTextCommand{\textnoway}{PU}{\9046\324}%* U+26D4
% U+26F0 MOUNTAIN; \Mountain (ifsym)
\DeclareTextCommand{\textMountain}{PU}{\9046\360}%* U+26F0
% U+26FA TENT; \Tent (ifsym)
\DeclareTextCommand{\textTent}{PU}{\9046\372}%* U+26FA
```

47.2.30 Dingbats: U+2700 to U+27BF

```
% U+2701 UPPER BLADE SCISSORS; \ScissorRightBrokenBottom (bbding)
\DeclareTextCommand{\textScissorRightBrokenBottom}{PU}{\9047\001}% U+2701
%* \textScissorRightBrokenBottom -> \CutLeft (marvosym)
%* \textScissorRightBrokenBottom -> \Cutright (marvosym)
% U+2702 BLACK SCISSORS; \ScissorRight (bbding)
\DeclareTextCommand{\textScissorRight}{PU}{\9047\002}%* U+2702
%* \textScissorRight -> \RightScissors (marvosym)
%* \textScissorRight -> \Leftscissors (marvosym)
% U+2703 LOWER BLADE SCISSORS; \ScissorRightBrokenTop (bbding)
\DeclareTextCommand{\textScissorRightBrokenTop}{PU}{\9047\003}%* U+2703
% U+2704 WHITE SCISSORS; \ScissorHollowRight (bbding)
\DeclareTextCommand{\textScissorHollowRight}{PU}{\9047\004}%* U+2704
% U+2706 TELEPHONE LOCATION SIGN; \PhoneHandset (bbding)
\DeclareTextCommand{\textPhoneHandset}{PU}{\9047\006}%* U+2706
% U+2707 TAPE DRIVE; \Tape (bbding)
\DeclareTextCommand{\textTape}{PU}{\9047\007}%* U+2707
% U+2708 AIRPLANE; \Plane (bbding)
\DeclareTextCommand{\textPlane}{PU}{\9047\010}%* U+2708
% U+2709 ENVELOPE; \Envelope (bbding),
\DeclareTextCommand{\textEnvelope}{PU}{\9047\011}%* U+2709
%* \textEnvelope -> \Letter (marvosym)
% U+270C VICTORY HAND; \Peace (bbding)
\DeclareTextCommand{\textPeace}{PU}{\9047\014}%* U+270C
% U+270D WRITING HAND; \WritingHand (marvosym)
\DeclareTextCommand{\textWritingHand}{PU}{\9047\015}%* U+270D
%* \textWritingHand -> \Writinghand (marvosym)
% U+270E LOWER RIGHT PENCIL; \PencilRightDown (bbding)
\DeclareTextCommand{\textPencilRightDown}{PU}{\9047\016}%* U+270E
% U+270F PENCIL; \PencilRight (bbding)
\DeclareTextCommand{\textPencilRight}{PU}{\9047\017}%* U+270F
% U+2710 UPPER RIGHT PENCIL; \PencilRightUp (bbding)
\DeclareTextCommand{\textPencilRightUp}{PU}{\9047\020}%* U+2710
% U+2711 WHITE NIB; \NibRight (bbding)
\DeclareTextCommand{\textNibRight}{PU}{\9047\021}%* U+2711
% U+2712 BLACK NIB; \NibSolidRight (bbding)
\DeclareTextCommand{\textNibSolidRight}{PU}{\9047\022}%* U+2712
% U+2713 CHECK MARK; checkmark; \Checkmark (bbding)
\DeclareTextCommand{\textCheckmark}{PU}{\9047\023}%* U+2713
%* \textCheckmark -> \checkmark (MnSymbol)
% U+2714 HEAVY CHECK MARK; \CheckmarkBold (bbding)
\DeclareTextCommand{\textCheckmarkBold}{PU}{\9047\024}%* U+2714
% U+2715 MULTIPLICATION X; \XSolid (bbding)
```

```
\DeclareTextCommand{\textXSolid}{PU}{\9047\025}%* U+2715
% U+2716 HEAVY MULTIPLICATION X; \XSolidBold (bbding)
\DeclareTextCommand{\textXSolidBold}{PU}{\9047\026}%* U+2716
% U+2717 BALLOT X; \XSolidBrush (bbding)
\DeclareTextCommand{\textXSolidBrush}{PU}{\9047\027}%* U+2717
% U+2719 OUTLINED GREEK CROSS; \PlusOutline (bbding)
\DeclareTextCommand{\textPlusOutline}{PU}{\9047\031}%* U+2719
% U+271A HEAVY GREEK CROSS; \Plus (bbding)
\DeclareTextCommand{\textPlus}{PU}{\9047\032}%* U+271A
% U+271B OPEN CENTRE CROSS; \PlusThinCenterOpen (bbding)
\DeclareTextCommand{\textPlusThinCenterOpen}{PU}{\9047\033}%* U+271B
% U+271C HEAVY OPEN CENTRE CROSS; \PlusCenterOpen (bbding)
\DeclareTextCommand{\textPlusCenterOpen}{PU}{\9047\034}%* U+271C
% U+271D LATIN CROSS; \Cross (bbding)
\DeclareTextCommand{\textCross}{PU}{\9047\035}%* U+271D
% U+271E SHADOWED WHITE LATIN CROSS; \CrossOpenShadow (bbding)
\DeclareTextCommand{\textCrossOpenShadow}{PU}{\9047\036}%* U+271E
% U+271F OUTLINED LATIN CROSS; \CrossOutline (bbding)
\DeclareTextCommand{\textCrossOutline}{PU}{\9047\037}%* U+271F
% U+2720 MALTESE CROSS; \CrossMaltese (bbding)
\DeclareTextCommand{\textCrossMaltese}{PU}{\9047\040}%* U+2720
% U+2721 STAR OF DAVID; \DavidStar (bbding)
\DeclareTextCommand{\textDavidStar}{PU}{\9047\041}%* U+2721
%* \textDavidStar -> \davidstar (wasysym)
% U+2722 FOUR TEARDROP-SPOKED ASTERISK; \FourAsterisk (bbding)
\DeclareTextCommand{\textFourAsterisk}{PU}{\9047\042}%* U+2722
% U+2723 FOUR BALLOON-SPOKED ASTERISK; \JackStar (bbding)
\DeclareTextCommand{\textJackStar}{PU}{\9047\043}%* U+2723
% U+2724 HEAVY FOUR BALLOON-SPOKED ASTERISK; \JackStarBold (bb-
  ding)
\DeclareTextCommand{\textJackStarBold}{PU}{\9047\044}%* U+2724
% U+2725 FOUR CLUB-SPOKED ASTERISK; \CrossClowerTips (bbding)
\DeclareTextCommand{\textClowerTips}{PU}{\9047\045}%* U+2725
% U+2726 BLACK FOUR POINTED STAR; \FourStar (bbding)
\DeclareTextCommand{\textFourStar}{PU}{\9047\046}%* U+2726
% U+2727 WHITE FOUR POINTED STAR; \FourStarOpen (bbding)
\DeclareTextCommand{\textFourStarOpen}{PU}{\9047\047}%* U+2727
% U+272A CIRCLED WHITE STAR; \FiveStarOpenCircled (bbding)
\DeclareTextCommand{\textFiveStarOpenCircled}{PU}{\9047\052}%* U+272A
% U+272B OPEN CENTRE BLACK STAR; \FiveStarCenterOpen (bbding)
\DeclareTextCommand{\textFiveStarCenterOpen}{PU}{\9047\053}%* U+272B
% U+272C BLACK CENTRE WHITE STAR; \FiveStarOpenDotted (bbding)
\DeclareTextCommand{\textFiveStarOpenDotted}{PU}{\9047\054}%* U+272C
% U+272D OUTLINED BLACK STAR; \FiveStarOutline (bbding)
\DeclareTextCommand{\textFiveStarOutline}{PU}{\9047\055}%* U+272D
% U+272E HEAVY OUTLINED BLACK STAR; \FiveStarOutlineHeavy (bbding)
\DeclareTextCommand{\textFiveStarOutlineHeavy}{PU}{\9047\056}%* U+272E
% U+272F PINWHEEL STAR; \FiveStarConvex (bbding)
\DeclareTextCommand{\textFiveStarConvex}{PU}{\9047\057}%* U+272F
% U+2730 SHADOWED WHITE STAR; \FiveStarShadow (bbding)
\DeclareTextCommand{\textFiveStarShadow}{PU}{\9047\060}%* U+2730
% U+2731 HEAVY ASTERISK; \AsteriskBold (bbding)
\DeclareTextCommand{\textAsteriskBold}{PU}{\9047\061}%* U+2731
% U+2732 OPEN CENTRE ASTERISK; \AsteriskCenterOpen (bbding)
```

```
\DeclareTextCommand{\textAsteriskCenterOpen}{PU}{\9047\062}%* U+2732
% U+2734 EIGHT POINTED BLACK STAR; \EightStarTaper (bbding)
\DeclareTextCommand{\textEightStarTaper}{PU}{\9047\064}%* U+2734
% U+2735 EIGHT POINTED PINWHEEL STAR; \EightStarConvex (bbding)
\DeclareTextCommand{\textEightStarConvex}{PU}{\9047\065}%* U+2735
% U+2736 SIX POINTED BLACK STAR; \SixStar (bbding)
\DeclareTextCommand{\textSixStar}{PU}{\9047\066}%* U+2736
% U+2737 EIGHT POINTED RECTILINEAR BLACK STAR; \EightStar (bbding)
\DeclareTextCommand{\textEightStar}{PU}{\9047\067}%* U+2737
% U+2738 HEAVY EIGHT POINTED RECTILINEAR BLACK STAR; \EightStarBold (bbding)
\DeclareTextCommand{\textEightStarBold}{PU}{\9047\070}%* U+2738
% U+2739 TWELVE POINTED BLACK STAR; \TwelveStar (bbding)
\DeclareTextCommand{\textTwelveStar}{PU}{\9047\071}%* U+2739
% U+273A SIXTEEN POINTED ASTERISK; \SixteenStarLight (bbding)
\DeclareTextCommand{\textSixteenStarLight}{PU}{\9047\072}%* U+273A
% U+273B TEARDROP-SPOKED ASTERISK; \SixFlowerPetalRemoved (bbding)
\DeclareTextCommand{\textSixFlowerPetalRemoved}{PU}{\9047\073}%* U+273B
% U+273C OPEN CENTRE TEARDROP-SPOKED ASTERISK;
%   \SixFlowerOpenCenter (bbding)
\DeclareTextCommand{\textSixFlowerOpenCenter}{PU}{\9047\074}%* U+273C
% U+273D HEAVY TEARDROP-SPOKED ASTERISK; \Asterisk (bbding)
\DeclareTextCommand{\textAsterisk}{PU}{\9047\075}%* U+273D
% U+273E SIX PETALLED BLACK AND WHITE FLORETTE; \SixFlowerAlternate (bbding)
\DeclareTextCommand{\textSixFlowerAlternate}{PU}{\9047\076}%* U+273E
% U+273F BLACK FLORETTE; \FiveFlowerPetal (bbding)
\DeclareTextCommand{\textFiveFlowerPetal}{PU}{\9047\077}%* U+273F
% U+2740 WHITE FLORETTE; \FiveFlowerOpen (bbding)
\DeclareTextCommand{\textFiveFlowerOpen}{PU}{\9047\100}%* U+2740
% U+2741 EIGHT PETALLED OUTLINED BLACK FLORETTE; \EightFlowerPetal (bbding)
\DeclareTextCommand{\textEightFlowerPetal}{PU}{\9047\101}%* U+2741
% U+2742 CIRCLED OPEN CENTRE EIGHT POINTED STAR; \SunshineOpenCircled (bbding)
\DeclareTextCommand{\textSunshineOpenCircled}{PU}{\9047\102}%* U+2742
% U+2743 HEAVY TEARDROP-SPOKED PINWHEEL ASTERISK; \SixFlowerAltPetal (bbding)
\DeclareTextCommand{\textSixFlowerAltPetal}{PU}{\9047\103}%* U+2743
% U+2744 SNOWFLAKE; \SnowflakeChevron (bbding)
\DeclareTextCommand{\textSnowflakeChevron}{PU}{\9047\104}%* U+2744
% U+2745 TIGHT TRIFOLIATE SNOWFLAKE; \Snowflake (bbding)
\DeclareTextCommand{\textSnowflake}{PU}{\9047\105}%* U+2745
% U+2746 HEAVY CHEVRON SNOWFLAKE; \SnowflakeChevronBold (bbding)
\DeclareTextCommand{\textSnowflakeChevronBold}{PU}{\9047\106}%* U+2746
% U+2747 SPARKLE; \Sparkle (bbding)
\DeclareTextCommand{\textSparkle}{PU}{\9047\107}%* U+2747
% U+2748 HEAVY SPARKLE; \SparkleBold (bbding)
\DeclareTextCommand{\textSparkleBold}{PU}{\9047\110}%* U+2748
% U+2749 BALLOON-SPOKED ASTERISK; \AsteriskRoundedEnds (bbding)
\DeclareTextCommand{\textAsteriskRoundedEnds}{PU}{\9047\111}%* U+2749
% U+274A EIGHT TEARDROP-SPOKED PROPELLER ASTERISK;
```

```
% \EightFlowerPetalRemoved (bbding)
\DeclareTextCommand{\textEightFlowerPetalRemoved}{PU}{\9047\112}%* U+274A
% U+274B HEAVY EIGHT TEARDROP-SPOKED PROPELLER ASTERISK;
% \EightAsterisk (bbding)
\DeclareTextCommand{\textEightAsterisk}{PU}{\9047\113}%* U+274B
% U+274D SHADOWED WHITE CIRCLE; \CircleShadow (bbding)
\DeclareTextCommand{\textCircleShadow}{PU}{\9047\115}%* U+274D
% U+274F LOWER RIGHT DROP-SHADOWED WHITE SQUARE;
% \SquareShadowBottomRight (bbding)
\DeclareTextCommand{\textSquareShadowBottomRight}{PU}{\9047\117}%* U+274F
% U+2750 UPPER RIGHT DROP-SHADOWED WHITE SQUARE;
% \SquareShadowTopRight (bbding)
\DeclareTextCommand{\textSquareTopRight}{PU}{\9047\120}%* U+2750
% U+2751 LOWER RIGHT SHADOWED WHITE SQUARE;
% \SquareCastShadowBottomRight (bbding)
\DeclareTextCommand{\textSquareCastShadowBottomRight}{PU}{\9047\121}%* U+2751
% U+2752 UPPER RIGHT SHADOWED WHITE SQUARE;
% \SquareCastShadowTopRight (bbding)
\DeclareTextCommand{\textSquareCastShadowTopRight}{PU}{\9047\122}%* U+2752
% U+2756 BLACK DIAMOND MINUS WHITE X; \OrnamentDiamondSolid (bb-
  ding)
\DeclareTextCommand{\textDiamondSolid}{PU}{\9047\126}%* U+2756
% U+2758 LIGHT VERTICAL BAR; \RectangleThin (bbding)
\DeclareTextCommand{\textRectangleThin}{PU}{\9047\130}%* U+2758
% U+2759 MEDIUM VERTICAL BAR; \Rectangle (bbding)
\DeclareTextCommand{\textRectangle}{PU}{\9047\131}%* U+2759
% U+275A HEAVY VERTICAL BAR; \RectangleBold (bbding)
\DeclareTextCommand{\textRectangleBold}{PU}{\9047\132}%* U+275A
```

47.2.31 Miscellaneous Mathematical Symbols-A: U+27C0 to U+27EF

```
% U+27C2 PERPENDICULAR; perpendicular; \perp (LaTeX)
\DeclareTextCommand{\textperp}{PU}{\9047\302}%* U+27C2
% \notperp (mathabx)
\DeclareTextCommand{\textnotperp}{PU}{\9047\302\83\070}%* U+27C2 U+0338
% U+27C7 OR WITH DOT INSIDE; \veedot (MnSymbol)
\DeclareTextCommand{\textveedot}{PU}{\9047\307}%* U+27C7
% U+27D1 AND WITH DOT; \wedgedot (MnSymbol)
\DeclareTextCommand{\textwedgedot}{PU}{\9047\321}%* U+27D1
% U+27DC LEFT MULTIMAP; \leftspoon (MnSymbol)
\DeclareTextCommand{\textleftspoon}{PU}{\9047\334}%* U+27DC
% U+27E6 MATHEMATICAL LEFT WHITE SQUARE BRACKET
\DeclareTextCommand{\textlbrackdbl}{PU}{\9047\346}%* U+27E6
%* \textlbrackdbl -> \llbracket (stmaryrd)
% U+27E7 MATHEMATICAL RIGHT WHITE SQUARE BRACKET
\DeclareTextCommand{\textrbrackdbl}{PU}{\9047\347}%* U+27E7
%* \textrbrackdbl -> \rrbracket (stmaryrd)
```

47.2.32 Supplemental Arrows-A: U+27F0 to U+27FF

```
% U+27F2 ANTICLOCKWISE GAPPED CIRCLE ARROW;
%   \circlearrowleft (AmS)
\DeclareTextCommand{\textcirclearrowleft}{PU}{\9047\362}%* U+27F2
% U+27F3 CLOCKWISE GAPPED CIRCLE ARROW; \circlearrowright (AmS)
\DeclareTextCommand{\textcirclearrowright}{PU}{\9047\363}%* U+27F3
% U+27F5 LONG LEFTWARDS ARROW; \longleftarrow (AmS)
```

```
\DeclareTextCommand{\textlongleftarrow}{PU}{\9047\365}%* U+27F5
% U+27F6 LONG RIGHTWARDS ARROW; \longrightarrow (AmS)
\DeclareTextCommand{\textlongrightarrow}{PU}{\9047\366}%* U+27F6
% U+27F7 LONG LEFT RIGHT ARROW; \longleftrightarrow (AmS)
\DeclareTextCommand{\textlongleftrightarrow}{PU}{\9047\367}%* U+27F7
% U+27F8 LONG LEFTWARDS DOUBLE ARROW; \Longleftarrow (AmS)
\DeclareTextCommand{\textLongleftarrow}{PU}{\9047\370}%* U+27F8
% U+27F9 LONG RIGHTWARDS DOUBLE ARROW; \Longrightarrow (AmS)
\DeclareTextCommand{\textLongrightarrow}{PU}{\9047\371}%* U+27F9
% U+27FA LONG LEFT RIGHT DOUBLE ARROW; \Longleftrightarrow (AmS)
\DeclareTextCommand{\textLongleftrightarrow}{PU}{\9047\372}%* U+27FA
% U+27FC LONG RIGHTWARDS ARROW FROM BAR; \longmapsto (AmS)
\DeclareTextCommand{\textlongmapsto}{PU}{\9047\374}%* U+27FC
% U+27FD LONG LEFTWARDS DOUBLE ARROW FROM BAR; \Longmapsfrom (stmaryrd)
\DeclareTextCommand{\textLongmapsfrom}{PU}{\9047\375}%* U+27FD
% U+27FE LONG RIGHTWARDS DOUBLE ARROW FROM BAR; \Longmapsto (stmaryrd)
\DeclareTextCommand{\textLongmapsto}{PU}{\9047\376}%* U+27FE
```

47.2.33 Supplemental Arrows-B: U+2900 to U+297F

```
% U+2921 NORTH WEST AND SOUTH EAST ARROW; \nwsearrow (MnSymbol)
\DeclareTextCommand{\textnwsearrow}{PU}{\9051\041}%* U+2921
% U+2922 NORTH EAST AND SOUTH WEST ARROW; \neswarrow (MnSymbol)
\DeclareTextCommand{\textneswarrow}{PU}{\9051\042}%* U+2922
% U+2923 NORTH WEST ARROW WITH HOOK; \lhooknwarrow (MnSymbol)
\DeclareTextCommand{\textlhooknwarrow}{PU}{\9051\043}%* U+2923
% U+2924 NORTH EAST ARROW WITH HOOK; \rhooknearrow (MnSymbol)
\DeclareTextCommand{\textrhooknearrow}{PU}{\9051\044}%* U+2924
% U+2925 SOUTH EAST ARROW WITH HOOK; \lhooksearrow (MnSymbol)
\DeclareTextCommand{\textlhooksearrow}{PU}{\9051\045}%* U+2925
% U+2926 SOUTH WEST ARROW WITH HOOK; \rhookswarrow (MnSymbol)
\DeclareTextCommand{\textrhookswarrow}{PU}{\9051\046}%* U+2926
% U+2933 WAVE ARROW POINTING DIRECTLY RIGHT; \leadsto (wasysym)
\DeclareTextCommand{\textleadsto}{PU}{\9051\063}%* U+2933
% U+2934 ARROW POINTING RIGHTWARDS THEN CURVING UPWARDS;
%   \rcurvearrowne (MnSymbol)
\DeclareTextCommand{\textrcurvearrowne}{PU}{\9051\064}%* U+2934
% U+2935 ARROW POINTING RIGHTWARDS THEN CURVING DOWNWARDS;
%   \lcurvearrowse (MnSymbol)
\DeclareTextCommand{\textlcurvearrowse}{PU}{\9051\065}%* U+2935
% U+2936 ARROW POINTING DOWNWARDS THEN CURVING LEFTWARDS;
%   \lcurvearrowsw (MnSymbol)
\DeclareTextCommand{\textlcurvearrowsw}{PU}{\9051\066}%* U+2936
% U+2937 ARROW POINTING DOWNWARDS THEN CURVING RIGHTWARDS;
%   \rcurvearrowse (MnSymbol)
\DeclareTextCommand{\textrcurvearrowse}{PU}{\9051\067}%* U+2937
% U+2938 RIGHT-SIDE ARC CLOCKWISE ARROW; \lcurvearrowdown (MnSymbol)
```

```
\DeclareTextCommand{\textlcurvearrowdown}{PU}{\9051\070}%* U+2938
%* \textlcurvearrowdown -> \RightTorque (marvosym)
%* \textlcurvearrowdown -> \Righttorque (marvosym)
% U+2939 LEFT-SIDE ARC ANTICLOCKWISE ARROW;
%   \rcurvearrowdown (MnSymbol)
\DeclareTextCommand{\textrcurvearrowdown}{PU}{\9051\071}%* U+2939
%* \textrcurvearrowdown -> \LeftTorque (marvosym)
%* \textrcurvearrowdown -> \Lefttorque (marvosym)
% U+293A TOP ARC ANTICLOCKWISE ARROW; \rcurvearrowleft (MnSymbol)
\DeclareTextCommand{\textrcurvearrowleft}{PU}{\9051\072}%* U+293A
% U+293B BOTTOM ARC ANTICLOCKWISE ARROW;
%   \rcurvearrowright (MnSymbol)
\DeclareTextCommand{\textrcurvearrowright}{PU}{\9051\073}%* U+293B
% U+294A LEFT BARB UP RIGHT BARB DOWN HARPOON; \leftrightharpoon (mathabx)
\DeclareTextCommand{\textleftrightharpoon}{PU}{\9051\112}%* U+294A
% U+294B LEFT BARB DOWN RIGHT BARB UP HARPOON; \rightleftharpoon (mathabx)
\DeclareTextCommand{\textrightleftharpoon}{PU}{\9051\113}%* U+294B
% U+294C UP BARB RIGHT DOWN BARB LEFT HARPOON;
%   \updownharpoonrightleft (MnSymbol)
\DeclareTextCommand{\textupdownharpoonrightleft}{PU}{\9051\114}%* U+294C
% U+294D UP BARB LEFT DOWN BARB RIGHT HARPOON;
%   \updownharpoonleftright (MnSymbol)
\DeclareTextCommand{\textupdownharpoonleftright}{PU}{\9051\115}%* U+294D
% U+2962 LEFTWARDS HARPOON WITH BARB UP ABOVE LEFTWARDS
%   HARPOON WITH BARB DOWN; \leftleftharpoons (mathabx)
\DeclareTextCommand{\textleftleftharpoons}{PU}{\9051\142}%* U+2962
% U+2963 UPWARDS HARPOON WITH BARB LEFT BESIDE UPWARDS
%   HARPOON WITH BARB RIGHT; \upupharpoons (mathabx)
\DeclareTextCommand{\textupupharpoons}{PU}{\9051\143}%* U+2963
% U+2964 RIGHTWARDS HARPOON WITH BARB UP ABOVE RIGHTWARDS HARPOON
%   WITH BARB DOWN; \rightrightharpoons (mathabx)
\DeclareTextCommand{\textrightrightharpoons}{PU}{\9051\144}%* U+2964
% U+2965 DOWNWARDS HARPOON WITH BARB LEFT BESIDE DOWNWARDS HARPOON
%   WITH BARB RIGHT; \downdownharpoons (mathabx)
\DeclareTextCommand{\textdowndownharpoons}{PU}{\9051\145}%* U+2965
% U+296A LEFTWARDS HARPOON WITH BARB UP ABOVE LONG DASH;
%   \leftbarharpoon (mathabx)
\DeclareTextCommand{\textleftbarharpoon}{PU}{\9051\152}%* U+296A
% U+296B LEFTWARDS HARPOON WITH BARB DOWN BELOW
%   LONG DASH; \barleftharpoon (mathabx)
\DeclareTextCommand{\textbarleftharpoon}{PU}{\9051\153}%* U+296B
% U+296C RIGHTWARDS HARPOON WITH BARB UP ABOVE
%   LONG DASH; \rightbarharpoon (mathabx)
\DeclareTextCommand{\textrightbarharpoon}{PU}{\9051\154}%* U+296C
% U+296D RIGHTWARDS HARPOON WITH BARB DOWN BELOW
%   LONG DASH; \barrightharpoon (mathabx)
\DeclareTextCommand{\textbarrightharpoon}{PU}{\9051\155}%* U+296D
% U+296E UPWARDS HARPOON WITH BARB LEFT BESIDE DOWNWARDS HARPOON
```

```
% WITH BARB RIGHT; \updownharpoons (mathabx)
\DeclareTextCommand{\textupdownharpoons}{PU}{\9051\156}%* U+296E
% U+296F DOWNWARDS HARPOON WITH BARB LEFT BESIDE UPWARDS HARPOON
% WITH BARB RIGHT; \downupharpoons (mathabx)
\DeclareTextCommand{\textdownupharpoons}{PU}{\9051\157}%* U+296F
% U+297F DOWN FISH TAIL
\DeclareTextCommand{\textmoo}{PU}{\9051\177\83\066}%* U+297F U+0336
```

47.2.34 Miscellaneous Mathematical Symbols-B: U+2980 to U+29FF

```
% U+2987 Z NOTATION LEFT IMAGE BRACKET; \llparenthesis (stmaryrd)
\DeclareTextCommand{\textllparenthesis}{PU}{\9051\207}%* U+2987
% U+2988 Z NOTATION RIGHT IMAGE BRACKET; \rrparenthesis (stmaryrd)
\DeclareTextCommand{\textrrparenthesis}{PU}{\9051\210}%* U+2988
% U+29B0 REVERSED EMPTY SET; \invdiameter (wasysym)
\DeclareTextCommand{\textinvdiameter}{PU}{\9051\260}%* U+29B0
% U+29B6 CIRCLED VERTICAL BAR; \obar (stmaryrd)
\DeclareTextCommand{\textobar}{PU}{\9051\266}%* U+29B6
%* \textobar -> \textvarobar (stmaryrd)
% U+29B8 CIRCLED REVERSE SOLIDUS; \obslash (stmaryrd)
\DeclareTextCommand{\textobslash}{PU}{\9051\270}%* U+29B8
%* \textobslash -> \circledbslash (txfonts/pxfonts)
%* \textobslash -> \obackslash (mathabx)
%* \textobslash -> \varobslash (stmaryrd)
% U+29BA CIRCLE DIVIDED BY HORIZONTAL BAR AND TOP HALF
%   DIVIDED BY VERTICAL BAR; \obot (mathabx)
\DeclareTextCommand{\textobot}{PU}{\9051\272}%* U+29BA
%* \textobot -> \odplus (ulsy)
% U+29BB CIRCLE WITH SUPERIMPOSED X; \NoChemicalCleaning (marvosym)
\DeclareTextCommand{\textNoChemicalCleaning}{PU}{\9051\273}%* U+29BB
% U+29C0 CIRCLED LESS-THAN; \olessthan (stmaryrd)
\DeclareTextCommand{\textolessthan}{PU}{\9051\300}%* U+29C0
%* \textolessthan -> \varolessthan (stmaryrd)
% U+29C1 CIRCLED GREATER-THAN; \ogreaterthan (stmaryrd)
\DeclareTextCommand{\textogreaterthan}{PU}{\9051\301}%* U+29C1
%* \textogreaterthan -> \varogreaterthan (stmaryrd)
% U+29C4 SQUARED RISING DIAGONAL SLASH; \boxslash (mathabx, stmaryrd)
\DeclareTextCommand{\textboxslash}{PU}{\9051\304}%* U+29C4
% U+29C5 SQUARED FALLING DIAGONAL SLASH; \boxbslash (stmaryrd)
\DeclareTextCommand{\textboxbslash}{PU}{\9051\305}%* U+29C5
% U+29C6 SQUARED ASTERISK; \boxast (stmaryrd)
\DeclareTextCommand{\textboxast}{PU}{\9051\306}%* U+29C6
% U+29C7 SQUARED SMALL CIRCLE; \boxcircle (stmaryrd)
\DeclareTextCommand{\textboxcircle}{PU}{\9051\307}%* U+29C7
% U+29C8 SQUARED SQUARE; \boxbox (stmaryrd)
\DeclareTextCommand{\textboxbox}{PU}{\9051\310}%* U+29C8
% U+29D3 BLACK BOWTIE; \Valve (marvosym)
\DeclareTextCommand{\textValve}{PU}{\9051\323}%* U+29D3
% U+29DF DOUBLE-ENDED MULTIMAP; \multimapboth (txfonts/pxfonts)
\DeclareTextCommand{\textmultimapboth}{PU}{\9051\337}%* U+29DF
% U+29E2 SHUFFLE PRODUCT; \shuffle (shuffle)
\DeclareTextCommand{\textshuffle}{PU}{\9051\342}%* U+29E2
```

47.2.35 Supplemental Mathematical Operators: U+2A00 to U+2AFF

```
% U+2A04 N-ARY UNION OPERATOR WITH PLUS; \uplus (LaTeX)
\DeclareTextCommand{\textuplus}{PU}{\9052\004}%* U+2A04
% U+2A07 TWO LOGICAL AND OPERATOR; \bigdoublewedge (MnSymbol)
\DeclareTextCommand{\textbigdoublewedge}{PU}{\9052\007}%* U+2A07
% U+2A08 TWO LOGICAL OR OPERATOR; \bigdoublevee (MnSymbol)
\DeclareTextCommand{\textbigdoublevee}{PU}{\9052\010}%* U+2A08
% U+2A1D JOIN; \Join (latexsym, amsfonts, amssymb, mathabx, txfonts,
%   pxfonts, wasysym)
\DeclareTextCommand{\textJoin}{PU}{\9052\035}%* U+2A1D
% U+2A1F Z NOTATION SCHEMA COMPOSITION; \fatsemi (stmaryrd)
\DeclareTextCommand{\textfatsemi}{PU}{\9052\037}%* U+2A1F
% U+2A22 PLUS SIGN WITH SMALL CIRCLE ABOVE; \circplus (mathabx)
\DeclareTextCommand{\textcircplus}{PU}{\9052\042}%* U+2A22
% U+2A2A MINUS SIGN WITH DOT BELOW; \minusdot (MnSymbol)
\DeclareTextCommand{\textminusdot}{PU}{\9052\052}%* U+2A2A
%* \textminusdot -> \divdot (mathabx)
% U+2A30 MULTIPLICATION SIGN WITH DOT ABOVE; \dottimes (mathabx)
\DeclareTextCommand{\textdottimes}{PU}{\9052\060}%* U+2A30
% U+2A32 SEMIDIRECT PRODUCT WITH BOTTOM CLOSED;
%   \dtimes (mathdesign)
\DeclareTextCommand{\textdtimes}{PU}{\9052\062}%* U+2A32
% U+2A38 CIRCLED DIVISION SIGN; \odiv (mathabx)
\DeclareTextCommand{\textodiv}{PU}{\9052\070}%* U+2A38
% U+2A3C INTERIOR PRODUCT; \invneg (MnSymbol)
\DeclareTextCommand{\textinvneg}{PU}{\9052\074}%* U+2A3C
% U+2A4E DOUBLE SQUARE INTERSECTION; \sqdoublecap (mathabx)
\DeclareTextCommand{\textsqdoublecap}{PU}{\9052\116}%* U+2A4E
%* \textsqdoublecap -> \doublesqcap (MnSymbol)
% U+2A40 INTERSECTION WITH DOT; \capdot (MnSymbol)
\DeclareTextCommand{\textcapdot}{PU}{\9052\100}%* U+2A40
% U+2A4F DOUBLE SQUARE UNION; \sqdoublecup (mathabx)
\DeclareTextCommand{\textsqdoublecup}{PU}{\9052\117}%* U+2A4F
%* \textsqdoublecup -> \doublesqcup (MnSymbol)
% U+2A55 TWO INTERSECTING LOGICAL AND; \doublewedge (MnSymbol)
\DeclareTextCommand{\textdoublewedge}{PU}{\9052\125}%* U+2A55
% U+2A56 TWO INTERSECTING LOGICAL OR; \doublevee (MnSymbol
\DeclareTextCommand{\textdoublevee}{PU}{\9052\126}%* U+2A56
%* \textdoublevee -> \merge (stmaryrd)
% U+2A5E LOGICAL AND WITH DOUBLE OVERBAR;
%   \doublebarwedge (AmS)
\DeclareTextCommand{\textdoublebarwedge}{PU}{\9052\136}%* U+2A5E
% U+2A63 LOGICAL OR WITH DOUBLE UNDERBAR;
%   \veedoublebar (mahtabx)
\DeclareTextCommand{\textveedoublebar}{PU}{\9052\143}%* U+2A63
% U+2A66 EQUALS SIGN WITH DOT BELOW; \eqdot (MnSymbol)
\DeclareTextCommand{\texteqdot}{PU}{\9052\146}%* U+2A66
% \neqdot (MnSymbol)
\DeclareTextCommand{\textneqdot}{PU}{\9052\146\83\070}%* U+2A66 U+0338
% U+2A74 DOUBLE COLON EQUAL; \coloncolonequals (colonequals)
\DeclareTextCommand{\textcoloncolonequals}{PU}{\9052\164}%* U+2A74
% U+2A7D LESS-THAN OR SLANTED EQUAL TO; \leqslant (AmS)
\DeclareTextCommand{\textleqslant}{PU}{\9052\175}%* U+2A7D
```

```
% \nleqslant (txfonts/pxfonts)
\DeclareTextCommand{\textnleqslant}{PU}{\9052\175\83\070}%* U+2A7D U+0338
% U+2A7E GREATER-THAN OR SLANTED EQUAL TO; \geqslant (AmS)
\DeclareTextCommand{\textgeqslant}{PU}{\9052\176}%* U+2A7E
% \ngeqslang (txfonts/pxfonts)
\DeclareTextCommand{\textngeqslant}{PU}{\9052\176\83\070}%* U+2A7E U+0338
% U+2A85 LESS-THAN OR APPROXIMATE; \lessapprox (AmS)
\DeclareTextCommand{\textlessapprox}{PU}{\9052\205}%* U+2A85
% \nlessapprox (txfonts/pxfonts)
\DeclareTextCommand{\textnlessapprox}{PU}{\9052\205\83\070}%* U+2A85 U+0338
% U+2A86 GREATER-THAN OR APPROXIMATE; \gtrapprox (AmS)
\DeclareTextCommand{\textgtrapprox}{PU}{\9052\206}%* U+2A86
% \ngtrapprox (txfonts/pxfonts)
\DeclareTextCommand{\textngtrapprox}{PU}{\9052\206\83\070}%* U+2A86 U+0338
% U+2A87 LESS-THAN AND SINGLE-LINE NOT EQUAL TO; \lneq (AmS)
\DeclareTextCommand{\textlneq}{PU}{\9052\207}%* U+2A87
% U+2A88 GREATER-THAN AND SINGLE-LINE NOT EQUAL TO;
%   \gneq (AmS)
\DeclareTextCommand{\textgneq}{PU}{\9052\210}%* U+2A88
% U+2A89 LESS-THAN AND NOT APPROXIMATE; \lnapprox (AmS)
\DeclareTextCommand{\textlnapprox}{PU}{\9052\211}%* U+2A89
% U+2A8A GREATER-THAN AND NOT APPROXIMATE; \gnapprox (AmS)
\DeclareTextCommand{\textgnapprox}{PU}{\9052\212}%* U+2A8A
% U+2A8B LESS-THAN ABOVE DOUBLE-LINE EQUAL ABOVE GREATER-
    THAN;
%   \lesseqqgtr (AmS)
\DeclareTextCommand{\textlesseqqgtr}{PU}{\9052\213}%* U+2A8B
% U+2A8C GREATER-THAN ABOVE DOUBLE-LINE EQUAL ABOVE LESS-
    THAN;
%   \gtreqqless (AmS)
\DeclareTextCommand{\textgtreqqless}{PU}{\9052\214}%* U+2A8C
% U+2A95 SLANTED EQUAL TO OR LESS-THAN; \eqslantless (AmS)
\DeclareTextCommand{\texteqslantless}{PU}{\9052\225}%* U+2A95
% U+2A96 SLANTED EQUAL TO OR GREATER-THAN; \eqslantgtr (AmS)
\DeclareTextCommand{\texteqslantgtr}{PU}{\9052\226}%* U+2A96
% U+2AA6 LESS-THAN CLOSED BY CURVE; \leftslice (stmaryrd)
\DeclareTextCommand{\textleftslice}{PU}{\9052\246}%* U+2AA6
% U+2AA7 GREATER-THAN CLOSED BY CURVE; \rightslice (stmaryrd)
\DeclareTextCommand{\textrightslice}{PU}{\9052\247}%* U+2AA7
% U+2AAF PRECEDES ABOVE SINGLE-LINE EQUALS SIGN; \preceq (Mn-
    Symbol)
\DeclareTextCommand{\textpreceq}{PU}{\9052\257}%* U+2AAF
% \npreceq (txfonts/pxfonts)
\DeclareTextCommand{\textnpreceq}{PU}{\9052\257\83\070}%* U+2AAF U+0338
% U+2AB0 SUCCEEDS ABOVE SINGLE-LINE EQUALS SIGN; \succeq (Mn-
    Symbol)
\DeclareTextCommand{\textsucceq}{PU}{\9052\260}%* U+2AB0
% \nsucceq (txfonts/pxfonts)
\DeclareTextCommand{\textnsucceq}{PU}{\9052\260\83\070}%* U+2AB0 U+0338
% U+2AB1 PRECEDES ABOVE SINGLE-LINE NOT EQUAL TO; \prec-
    neq (mathabx)
\DeclareTextCommand{\textprecneq}{PU}{\9052\261}%* U+2AB1
% U+2AB2 SUCCEEDS ABOVE SINGLE-LINE NOT EQUAL TO; \succ-
    neq (mathabx)
```

```
\DeclareTextCommand{\textsuccneq}{PU}{\9052\262}%* U+2AB2
% U+2AB3 PRECEDES ABOVE EQUALS SIGN; \preceqq (txfonts/pxfonts)
\DeclareTextCommand{\textpreceqq}{PU}{\9052\263}%* U+2AB3
% \npreceqq (txfonts/pxfonts)
\DeclareTextCommand{\textnpreceqq}{PU}{\9052\263\83\070}%* U+2AB3 U+0338
% U+2AB4 SUCCEEDS ABOVE EQUALS SIGN; \succeqq (txfonts/pxfonts)
\DeclareTextCommand{\textsucceqq}{PU}{\9052\264}%* U+2AB4
% \nsucceqq (txfonts/pxfonts)
\DeclareTextCommand{\textnsucceqq}{PU}{\9052\264\83\070}%* U+2AB4 U+0338
% U+2AB5 PRECEDES ABOVE NOT EQUAL TO; \precneqq (txfonts/pxfonts)
\DeclareTextCommand{\textprecneqq}{PU}{\9052\265}%* U+2AB5
% U+2AB6 SUCCEEDS ABOVE NOT EQUAL TO; \succneqq (txfonts/pxfonts)
\DeclareTextCommand{\textsuccneqq}{PU}{\9052\266}%* U+2AB6
% U+2AB7 PRECEDES ABOVE ALMOST EQUAL TO; \precapprox (AmS)
\DeclareTextCommand{\textprecapprox}{PU}{\9052\267}%* U+2AB7
% \nprecapprox (txfonts/pxfonts)
\DeclareTextCommand{\textnprecapprox}{PU}{\9052\267\83\070}%* U+2AB7 U+0338
% U+2AB8 SUCCEEDS ABOVE ALMOST EQUAL TO; \succapprox (AmS)
\DeclareTextCommand{\textsuccapprox}{PU}{\9052\270}%* U+2AB8
% \nsuccapprox (txfonts/pxfonts)
\DeclareTextCommand{\textnsuccapprox}{PU}{\9052\270\83\070}%* U+2AB8 U+0338
% U+2AB9 PRECEDES ABOVE NOT ALMOST EQUAL TO; \precnapprox (AmS)
\DeclareTextCommand{\textprecnapprox}{PU}{\9052\271}%* U+2AB9
% U+2ABA SUCCEEDS ABOVE NOT ALMOST EQUAL TO; \succnapprox (AmS)
\DeclareTextCommand{\textsuccnapprox}{PU}{\9052\272}%* U+2ABA
% U+2AC5 SUBSET OF ABOVE EQUALS SIGN; \subseteqq (AmS)
\DeclareTextCommand{\textsubseteqq}{PU}{\9052\305}%* U+2AC5
% \nsubseteqq (txfonts/pxfonts, mathabx)
\DeclareTextCommand{\textnsubseteqq}{PU}{\9052\305\83\070}%* U+2AC5 U+0338
% U+2AC6 SUPERSET OF ABOVE EQUALS SIGN; \supseteqq (AmS)
\DeclareTextCommand{\textsupseteqq}{PU}{\9052\306}%* U+2AC6
% \nsupseteqq (mathabx)
\DeclareTextCommand{\textnsupseteqq}{PU}{\9052\306\83\070}%* U+2AC6 U+0338
% U+2AE3 DOUBLE VERTICAL BAR LEFT TURNSTILE
\DeclareTextCommand{\textdashV}{PU}{\9052\343}%* U+2AE3
%* \textdashV -> \leftVdash (MnSymbol)
% \ndashV (mathabx)
\DeclareTextCommand{\textndashV}{PU}{\9052\343\83\070}%* U+2AE3 U+0338
%* \textndashV -> \nleftVdash (MnSymbol)
% U+2AE4 VERTICAL BAR DOUBLE LEFT TURNSTILE; \Dashv (mathabx)
\DeclareTextCommand{\textDashv}{PU}{\9052\344}%* U+2AE4
%* \textDashv -> \leftmodels (MnSymbol)
% \nDashv (mathabx)
\DeclareTextCommand{\textnDashv}{PU}{\9052\344\83\070}%* U+2AE4 U+0338
%* \textnDashv -> \nleftmodels (MnSymbol)
% U+2AE5 DOUBLE VERTICAL BAR DOUBLE LEFT TURNSTILE;
%   \DashV (mathabx)
\DeclareTextCommand{\textDashV}{PU}{\9052\345}%* U+2AE5
%* \textDashV -> \leftModels (MnSymbol)
% \nDashV (mathabx)
\DeclareTextCommand{\textnDashV}{PU}{\9052\345\83\070}%* U+2AE5 U+0338
%* \textnDashV -> \nleftModels (MnSymbol)
```

```
% U+2AEA DOUBLE DOWN TACK; \downmodels (MnSymbol)
\DeclareTextCommand{\textdownmodels}{PU}{\9052\352}%* U+2AEA
% \ndownmodels (MnSymbol)
\DeclareTextCommand{\textndownmodels}{PU}{\9052\352\83\070}%* U+2AEA U+0338
% U+2AEB DOUBLE UP TACK; \upmodels (MnSymbol)
\DeclareTextCommand{\textupmodels}{PU}{\9052\353}%* U+2AEB
% \nupmodels (MnSymbol)
\DeclareTextCommand{\textnupmodels}{PU}{\9052\353\83\070}%* U+2AEB U+0338
% U+2AEF VERTICAL LINE WITH CIRCLE ABOVE; \upspoon (MnSymbol)
\DeclareTextCommand{\textupspoon}{PU}{\9052\357}%* U+2AEF
% U+2AF4 TRIPLE VERTICAL BAR BINARY RELATION;
%   \interleave (stmaryrd)
\DeclareTextCommand{\textinterleave}{PU}{\9052\364}%* U+2AF4
% U+2AFD DOUBLE SOLIDUS OPERATOR; \sslash (stmaryrd)
\DeclareTextCommand{\textsslash}{PU}{\9052\375}%* U+2AFD
%* \textsslash -> \varparallel (txfonts\pxfonts)
```

47.2.36 Miscellaneous Symbols and Arrows: U+2B00 to U+2BFF

```
% U+2B20 WHITE PENTAGON; \pentagon (wasysym)
\DeclareTextCommand{\textpentagon}{PU}{\9053\040}%* U+2B20
% U+2B21 WHITE HEXAGON; \varhexagon (wasysym)
\DeclareTextCommand{\textvarhexagon}{PU}{\9053\041}%* U+2B21
```

47.2.37 Latin Extended-C: U+2C60 to U+2C7F

```
% U+2C7C LATIN SUBSCRIPT SMALL LETTER J
\DeclareTextCommand{\textjinferior}{PU}{\9054\174}%* U+2C7C
```

47.2.38 Supplemental Punctuation: U+2E00 to U+2E7F

```
% U+2E13 DOTTED OBELOS; \slashdiv (MnSymbol)
\DeclareTextCommand{\textslashdiv}{PU}{\9056\023}%* U+2E13
% U+2E18 INVERTED INTERROBANG; \textinterrobangdown (textcomp)
\DeclareTextCommand{\textinterrobangdown}{PU}{\9056\030}% U+2E18
% U+2E2D FIVE DOT MARK; \fivedots (MnSymbol)
\DeclareTextCommand{\textfivedots}{PU}{\9056\055}%* U+2E2D
```

47.2.39 Modifier Tone Letters: U+A700 to U+A71F

```
% U+A71B MODIFIER LETTER RAISED UP ARROW; \textupstep (tipa)
\DeclareTextCommand{\textupstep}{PU}{\9247\033}% U+A71B
% U+A71C MODIFIER LETTER RAISED DOWN ARROW;
%   \textdownstep (tipa)
\DeclareTextCommand{\textdownstep}{PU}{\9247\034}% U+A71C
```

47.2.40 Latin Extended-D: U+A720 to U+A7FF

```
% U+A727 LATIN SMALL LETTER HENG; \textheng (tipx)
\DeclareTextCommand{\textPUheng}{PU}{\9247\047}% U+A727
%* \textPUheng -> \textheng (tipx)
% U+A72C LATIN CAPITAL LETTER CUATRILLO; \textlhookfour (tipx)
\DeclareTextCommand{\textPUlhookfour}{PU}{\9247\054}% U+A72C
%* \textPUlhookfour -> \textlhookfour (tipx)
% U+A730 LATIN LETTER SMALL CAPITAL F; \textscf (tipx)
\DeclareTextCommand{\textPUscf}{PU}{\9247\060}% U+A730
%* \textPUscf -> \textscf (tipx)
% U+A735 LATIN SMALL LETTER AO; \textaolig (tipx)
\DeclareTextCommand{\textPUaolig}{PU}{\9247\065}% U+A735
```

```
%* \textPUaolig -> \textaolig (tipx)
% U+A74F LATIN SMALL LETTER OO; \oo (wsuipa)
\DeclareTextCommand{\textoo}{PU}{\9247\117}%* U+A74F
% U+A788 MODIFIER LETTER LOW CIRCUMFLEX ACCENT
\DeclareTextCommand{\textcircumlow}{PU}{\9247\210}% U+A788
```

47.2.41 Alphabetic Presentation Forms: U+FB00 to U+FB4F

```
% U+FB01 LATIN SMALL LIGATURE FI; fi
\DeclareTextCommand{\textfi}{PU}{\9373\001}% U+FB01
% U+FB02 LATIN SMALL LIGATURE FL; fi
\DeclareTextCommand{\textfl}{PU}{\9373\002}% U+FB02
```

47.2.42 Musical Symbols: U+1D100 to U+1D1FF

```
% U+1D13B MUSICAL SYMBOL WHOLE REST; \GaPa (harmony)
\DeclareTextCommand{\textGaPa}{PU}{\9330\064\9335\073}%* U+1D13B
% U+1D13C MUSICAL SYMBOL HALF REST; \HaPa (harmony)
\DeclareTextCommand{\textHaPa}{PU}{\9330\064\9335\074}%* U+1D13C
% U+1D13D MUSICAL SYMBOL QUARTER REST; \ViPa (harmony)
\DeclareTextCommand{\textViPa}{PU}{\9330\064\9335\075}%* U+1D13D
% U+1D13E MUSICAL SYMBOL EIGHTH REST; \AcPa (harmony)
\DeclareTextCommand{\textAcPa}{PU}{\9330\064\9335\076}%* U+1D13E
% U+1D13F MUSICAL SYMBOL SIXTEENTH REST; \SePa (harmony)
\DeclareTextCommand{\textSePa}{PU}{\9330\064\9335\077}%* U+1D13F
% U+1D140 MUSICAL SYMBOL THIRTY-SECOND REST; \ZwPa (harmony)
\DeclareTextCommand{\textZwPa}{PU}{\9330\064\9335\100}%* U+1D140
% U+1D15D MUSICAL SYMBOL WHOLE NOTE; \fullnote (wasysym)
\DeclareTextCommand{\textfullnote}{PU}{\9330\064\9335\135}%* U+1D15D
%* \textfullnote -> \Ganz (harmony)
% U+1D15E MUSICAL SYMBOL HALF NOTE; \halfnote (wasysym)
\DeclareTextCommand{\texthalfnote}{PU}{\9330\064\9335\136}%* U+1D15E
%* \texthalfnote -> \Halb (harmony)
% U+1D15F MUSICAL SYMBOL QUARTER NOTE; \Vier (harmony)
\DeclareTextCommand{\textVier}{PU}{\9330\064\9335\137}%* U+1D15F
% U+1D160 MUSICAL SYMBOL EIGHTH NOTE; \Acht (harmony)
\DeclareTextCommand{\textAcht}{PU}{\9330\064\9335\140}%* U+1D160
% U+1D161 MUSICAL SYMBOL SIXTEENTH NOTE; \Sech (harmony)
\DeclareTextCommand{\textSech}{PU}{\9330\064\9335\141}%* U+1D161
% U+1D162 MUSICAL SYMBOL THIRTY-SECOND NOTE; \Zwdr (harmony)
\DeclareTextCommand{\textZwdr}{PU}{\9330\064\9335\142}%* U+1D162
```

47.2.43 Miscellaneous Symbols and Pictographs: U+1F300 to U+1F5FF

```
% U+1F30D EARTH GLOBE EUROPE-AFRICA; \Mundus (marvosym)
\DeclareTextCommand{\textMundus}{PU}{\9330\074\9337\015}%* U+1F30D
% U+1F319 CRESCENT MOON; \Moon (marvosym)
\DeclareTextCommand{\textMoon}{PU}{\9330\074\9337\031}%* U+1F319
% U+1F468 MAN; \ManFace (marvosym)
\DeclareTextCommand{\textManFace}{PU}{\9330\075\9334\150}%* U+1F468
% U+1F469 WOMAN; \WomanFace (marvosym)
\DeclareTextCommand{\textWomanFace}{PU}{\9330\075\9334\151}%* U+1F469
%* \textWomanFace -> \Womanface (marvosym)
% U+1F4E0 FAX MACHINE; \Fax (marvosym)
\DeclareTextCommand{\textFax}{PU}{\9330\075\9334\340}%* U+1F4E0
%* \textFax -> \Faxmachine (marvosym)
% U+1F525 FIRE; \Fire (ifsym)
```

```
\DeclareTextCommand{\textFire}{PU}{\9330\075\9335\045}%* U+1F525
```

47.2.44 Transport and Map Symbols: U+1F680 to U+1F6FF

```
% U+1F6B2 BICYCLE; \Bicycle (marvosym)
\DeclareTextCommand{\textBicycle}{PU}{\9330\075\9336\262}%* U+1F6B2
% U+1F6B9 MENS SYMBOL; \Gentsroom (marvosym)
\DeclareTextCommand{\textGentsroom}{PU}{\9330\075\9336\271}%* U+1F6B9
% U+1F6BA WOMENS SYMBOL; \Ladiesroom (marvosym)
\DeclareTextCommand{\textLadiesroom}{PU}{\9330\075\9336\272}%* U+1F6BA
```

47.2.45 Miscellaneous

```
\DeclareTextCommand{\SS}{PU}{SS}%
% \textcopyleft (textcomp)
\DeclareTextCommand{\textcopyleft}{PU}{\9041\204\9040\335}% U+2184 U+20DD
% \ccnc (cclicenses)
\DeclareTextCommand{\textccnc}{PU}{\80\044\9040\340}%* U+0024 U+20E0
% \ccnd (cclicenses)
\DeclareTextCommand{\textccnd}{PU}{=\9040\335}%* U+003D U+20DD
% \ccsa (cclicenses)
\DeclareTextCommand{\textccsa}{PU}{\9047\362\9040\335}%* U+27F2 U+20DD
% \Info (marvosym, china2e)
\DeclareTextCommand{\textInfo}{PU}{\9330\065\9334\042\9040\336}%* U+1D422 U+20DE
% \CESign (marvosym)
\DeclareTextCommand{\textCESign}{PU}{\80\103\80\105}%* U+0043 U+0045
%* \textCESign -> \CEsign (marvosym)
```

47.2.46 Aliases

Aliases (german.sty)

```
\DeclareTextCommand{\textglqq}{PU}{\quotedblbase}%
\DeclareTextCommand{\textgrqq}{PU}{\textquotedblleft}%
\DeclareTextCommand{\textglq}{PU}{\quotesinglbase}%
\DeclareTextCommand{\textgrq}{PU}{\textquoteleft}%
\DeclareTextCommand{\textflqq}{PU}{\guillemetleft}%
\DeclareTextCommand{\textfrqq}{PU}{\guillemetright}%
\DeclareTextCommand{\textflq}{PU}{\guilsinglleft}%
\DeclareTextCommand{\textfrq}{PU}{\guilsinglright}%
```

Aliases (math names)

```
\DeclareTextCommand{\textneg}{PU}{\textlogicalnot}%*
\DeclareTextCommand{\texttimes}{PU}{\textmultiply}%*
\DeclareTextCommand{\textdiv}{PU}{\textdivide}%*
\DeclareTextCommand{\textpm}{PU}{\textplusminus}%*
\DeclareTextCommand{\textcdot}{PU}{\textperiodcentered}%*
```

⟨/puenc⟩

47.3 PU encoding, additions for VnTEX

This file is provided by Han The Thanh.

⟨*puvnenc⟩

```
\DeclareTextCommand{\abreve}{PU}{\81\003}% U+0103
\DeclareTextCommand{\acircumflex}{PU}{\80\342}% U+00E2
\DeclareTextCommand{\ecircumflex}{PU}{\80\352}% U+00EA
```

```
\DeclareTextCommand{\ocircumflex}{PU}{\80\364}% U+00F4
\DeclareTextCommand{\ohorn}{PU}{\81\241}% U+01A1
\DeclareTextCommand{\uhorn}{PU}{\81\260}% U+01B0
\DeclareTextCommand{\ABREVE}{PU}{\81\002}% U+0102
\DeclareTextCommand{\ACIRCUMFLEX}{PU}{\80\302}% U+00C2
\DeclareTextCommand{\ECIRCUMFLEX}{PU}{\80\312}% U+00CA
\DeclareTextCommand{\OCIRCUMFLEX}{PU}{\80\324}% U+00D4
\DeclareTextCommand{\OHORN}{PU}{\81\240}% U+01A0
\DeclareTextCommand{\UHORN}{PU}{\81\257}% U+01AF

\DeclareTextCompositeCommand{\'}{PU}{a}{\80\341}% U+00E1
\DeclareTextCompositeCommand{\d}{PU}{a}{\9036\241}% U+1EA1
\DeclareTextCompositeCommand{\`}{PU}{a}{\80\340}% U+00E0
\DeclareTextCompositeCommand{\h}{PU}{a}{\9036\243}% U+1EA3
\DeclareTextCompositeCommand{\~}{PU}{a}{\80\343}% U+00E3
\DeclareTextCompositeCommand{\'}{PU}{\abreve}{\9036\257}% U+1EAF
\DeclareTextCompositeCommand{\d}{PU}{\abreve}{\9036\267}% U+1EB7
\DeclareTextCompositeCommand{\`}{PU}{\abreve}{\9036\261}% U+1EB1
\DeclareTextCompositeCommand{\h}{PU}{\abreve}{\9036\263}% U+1EB3
\DeclareTextCompositeCommand{\~}{PU}{\abreve}{\9036\265}% U+1EB5
\DeclareTextCompositeCommand{\'}{PU}{\acircumflex}{\9036\245}% U+1EA5
\DeclareTextCompositeCommand{\d}{PU}{\acircumflex}{\9036\255}% U+1EAD
\DeclareTextCompositeCommand{\`}{PU}{\acircumflex}{\9036\247}% U+1EA7
\DeclareTextCompositeCommand{\h}{PU}{\acircumflex}{\9036\251}% U+1EA9
\DeclareTextCompositeCommand{\~}{PU}{\acircumflex}{\9036\253}% U+1EAB
\DeclareTextCompositeCommand{\'}{PU}{e}{\80\351}% U+00E9
\DeclareTextCompositeCommand{\d}{PU}{e}{\9036\271}% U+1EB9
\DeclareTextCompositeCommand{\`}{PU}{e}{\80\350}% U+00E8
\DeclareTextCompositeCommand{\h}{PU}{e}{\9036\273}% U+1EBB
\DeclareTextCompositeCommand{\~}{PU}{e}{\9036\275}% U+1EBD
\DeclareTextCompositeCommand{\'}{PU}{\ecircumflex}{\9036\277}% U+1EBF
\DeclareTextCompositeCommand{\d}{PU}{\ecircumflex}{\9036\307}% U+1EC7
\DeclareTextCompositeCommand{\`}{PU}{\ecircumflex}{\9036\301}% U+1EC1
\DeclareTextCompositeCommand{\h}{PU}{\ecircumflex}{\9036\303}% U+1EC3
\DeclareTextCompositeCommand{\~}{PU}{\ecircumflex}{\9036\305}% U+1EC5
\DeclareTextCompositeCommand{\'}{PU}{i}{\80\355}% U+00ED
\DeclareTextCompositeCommand{\d}{PU}{i}{\9036\313}% U+1ECB
\DeclareTextCompositeCommand{\`}{PU}{i}{\80\354}% U+00EC
\DeclareTextCompositeCommand{\h}{PU}{i}{\9036\311}% U+1EC9
\DeclareTextCompositeCommand{\~}{PU}{i}{\81\051}% U+0129
\DeclareTextCompositeCommand{\'}{PU}{o}{\80\363}% U+00F3
\DeclareTextCompositeCommand{\d}{PU}{o}{\9036\315}% U+1ECD
\DeclareTextCompositeCommand{\`}{PU}{o}{\80\362}% U+00F2
\DeclareTextCompositeCommand{\h}{PU}{o}{\9036\317}% U+1ECF
\DeclareTextCompositeCommand{\~}{PU}{o}{\80\365}% U+00F5
\DeclareTextCompositeCommand{\'}{PU}{\ocircumflex}{\9036\321}% U+1ED1
\DeclareTextCompositeCommand{\d}{PU}{\ocircumflex}{\9036\331}% U+1ED9
\DeclareTextCompositeCommand{\`}{PU}{\ocircumflex}{\9036\323}% U+1ED3
\DeclareTextCompositeCommand{\h}{PU}{\ocircumflex}{\9036\325}% U+1ED5
\DeclareTextCompositeCommand{\~}{PU}{\ocircumflex}{\9036\327}% U+1ED7
\DeclareTextCompositeCommand{\'}{PU}{\ohorn}{\9036\333}% U+1EDB
\DeclareTextCompositeCommand{\d}{PU}{\ohorn}{\9036\343}% U+1EE3
\DeclareTextCompositeCommand{\`}{PU}{\ohorn}{\9036\335}% U+1EDD
\DeclareTextCompositeCommand{\h}{PU}{\ohorn}{\9036\337}% U+1EDF
\DeclareTextCompositeCommand{\~}{PU}{\ohorn}{\9036\341}% U+1EE1
```

```
\DeclareTextCompositeCommand{\'}{PU}{u}{\80\372}% U+00FA
\DeclareTextCompositeCommand{\d}{PU}{u}{\9036\345}% U+1EE5
\DeclareTextCompositeCommand{\`}{PU}{u}{\80\371}% U+00F9
\DeclareTextCompositeCommand{\h}{PU}{u}{\9036\347}% U+1EE7
\DeclareTextCompositeCommand{\~}{PU}{u}{\81\151}% U+0169
\DeclareTextCompositeCommand{\'}{PU}{\uhorn}{\9036\351}% U+1EE9
\DeclareTextCompositeCommand{\d}{PU}{\uhorn}{\9036\361}% U+1EF1
\DeclareTextCompositeCommand{\`}{PU}{\uhorn}{\9036\353}% U+1EEB
\DeclareTextCompositeCommand{\h}{PU}{\uhorn}{\9036\355}% U+1EED
\DeclareTextCompositeCommand{\~}{PU}{\uhorn}{\9036\357}% U+1EEF
\DeclareTextCompositeCommand{\'}{PU}{y}{\80\375}% U+00FD
\DeclareTextCompositeCommand{\d}{PU}{y}{\9036\365}% U+1EF5
\DeclareTextCompositeCommand{\`}{PU}{y}{\9036\363}% U+1EF3
\DeclareTextCompositeCommand{\h}{PU}{y}{\9036\367}% U+1EF7
\DeclareTextCompositeCommand{\~}{PU}{y}{\9036\371}% U+1EF9
\DeclareTextCompositeCommand{\'}{PU}{A}{\80\301}% U+00C1
\DeclareTextCompositeCommand{\d}{PU}{A}{\9036\240}% U+1EA0
\DeclareTextCompositeCommand{\`}{PU}{A}{\80\300}% U+00C0
\DeclareTextCompositeCommand{\h}{PU}{A}{\9036\242}% U+1EA2
\DeclareTextCompositeCommand{\~}{PU}{A}{\80\303}% U+00C3
\DeclareTextCompositeCommand{\'}{PU}{\ABREVE}{\9036\256}% U+1EAE
\DeclareTextCompositeCommand{\d}{PU}{\ABREVE}{\9036\266}% U+1EB6
\DeclareTextCompositeCommand{\`}{PU}{\ABREVE}{\9036\260}% U+1EB0
\DeclareTextCompositeCommand{\h}{PU}{\ABREVE}{\9036\262}% U+1EB2
\DeclareTextCompositeCommand{\~}{PU}{\ABREVE}{\9036\264}% U+1EB4
\DeclareTextCompositeCommand{\'}{PU}{\ACIRCUMFLEX}{\9036\244}% U+1EA4
\DeclareTextCompositeCommand{\d}{PU}{\ACIRCUMFLEX}{\9036\254}% U+1EAC
\DeclareTextCompositeCommand{\`}{PU}{\ACIRCUMFLEX}{\9036\246}% U+1EA6
\DeclareTextCompositeCommand{\h}{PU}{\ACIRCUMFLEX}{\9036\250}% U+1EA8
\DeclareTextCompositeCommand{\~}{PU}{\ACIRCUMFLEX}{\9036\252}% U+1EAA
\DeclareTextCompositeCommand{\'}{PU}{E}{\80\311}% U+00C9
\DeclareTextCompositeCommand{\d}{PU}{E}{\9036\270}% U+1EB8
\DeclareTextCompositeCommand{\`}{PU}{E}{\80\310}% U+00C8
\DeclareTextCompositeCommand{\h}{PU}{E}{\9036\272}% U+1EBA
\DeclareTextCompositeCommand{\~}{PU}{E}{\9036\274}% U+1EBC
\DeclareTextCompositeCommand{\'}{PU}{\ECIRCUMFLEX}{\9036\276}% U+1EBE
\DeclareTextCompositeCommand{\d}{PU}{\ECIRCUMFLEX}{\9036\306}% U+1EC6
\DeclareTextCompositeCommand{\`}{PU}{\ECIRCUMFLEX}{\9036\300}% U+1EC0
\DeclareTextCompositeCommand{\h}{PU}{\ECIRCUMFLEX}{\9036\302}% U+1EC2
\DeclareTextCompositeCommand{\~}{PU}{\ECIRCUMFLEX}{\9036\304}% U+1EC4
\DeclareTextCompositeCommand{\'}{PU}{I}{\80\315}% U+00CD
\DeclareTextCompositeCommand{\d}{PU}{I}{\9036\312}% U+1ECA
\DeclareTextCompositeCommand{\`}{PU}{I}{\80\314}% U+00CC
\DeclareTextCompositeCommand{\h}{PU}{I}{\9036\310}% U+1EC8
\DeclareTextCompositeCommand{\~}{PU}{I}{\81\050}% U+0128
\DeclareTextCompositeCommand{\'}{PU}{O}{\80\323}% U+00D3
\DeclareTextCompositeCommand{\d}{PU}{O}{\9036\314}% U+1ECC
\DeclareTextCompositeCommand{\`}{PU}{O}{\80\322}% U+00D2
\DeclareTextCompositeCommand{\h}{PU}{O}{\9036\316}% U+1ECE
\DeclareTextCompositeCommand{\~}{PU}{O}{\80\325}% U+00D5
\DeclareTextCompositeCommand{\'}{PU}{\OCIRCUMFLEX}{\9036\320}% U+1ED0
\DeclareTextCompositeCommand{\d}{PU}{\OCIRCUMFLEX}{\9036\330}% U+1ED8
\DeclareTextCompositeCommand{\`}{PU}{\OCIRCUMFLEX}{\9036\322}% U+1ED2
\DeclareTextCompositeCommand{\h}{PU}{\OCIRCUMFLEX}{\9036\324}% U+1ED4
```

```
\DeclareTextCompositeCommand{\~}{PU}{\OCIRCUMFLEX}{\9036\326}% U+1ED6
\DeclareTextCompositeCommand{\'}{PU}{\OHORN}{\9036\332}% U+1EDA
\DeclareTextCompositeCommand{\d}{PU}{\OHORN}{\9036\342}% U+1EE2
\DeclareTextCompositeCommand{\`}{PU}{\OHORN}{\9036\334}% U+1EDC
\DeclareTextCompositeCommand{\h}{PU}{\OHORN}{\9036\336}% U+1EDE
\DeclareTextCompositeCommand{\~}{PU}{\OHORN}{\9036\340}% U+1EE0
\DeclareTextCompositeCommand{\'}{PU}{U}{\80\332}% U+00DA
\DeclareTextCompositeCommand{\d}{PU}{U}{\9036\344}% U+1EE4
\DeclareTextCompositeCommand{\`}{PU}{U}{\80\331}% U+00D9
\DeclareTextCompositeCommand{\h}{PU}{U}{\9036\346}% U+1EE6
\DeclareTextCompositeCommand{\~}{PU}{U}{\81\150}% U+0168
\DeclareTextCompositeCommand{\'}{PU}{\UHORN}{\9036\350}% U+1EE8
\DeclareTextCompositeCommand{\d}{PU}{\UHORN}{\9036\360}% U+1EF0
\DeclareTextCompositeCommand{\`}{PU}{\UHORN}{\9036\352}% U+1EEA
\DeclareTextCompositeCommand{\h}{PU}{\UHORN}{\9036\354}% U+1EEC
\DeclareTextCompositeCommand{\~}{PU}{\UHORN}{\9036\356}% U+1EEE
\DeclareTextCompositeCommand{\'}{PU}{Y}{\80\335}% U+00DD
\DeclareTextCompositeCommand{\d}{PU}{Y}{\9036\364}% U+1EF4
\DeclareTextCompositeCommand{\`}{PU}{Y}{\9036\362}% U+1EF2
\DeclareTextCompositeCommand{\h}{PU}{Y}{\9036\366}% U+1EF6
\DeclareTextCompositeCommand{\~}{PU}{Y}{\9036\370}% U+1EF8
```

⟨/puvnenc⟩

47.4 PU encoding, additions for Arabi

This file is provided and maintained by Youssef Jabri.

⟨*puarenc⟩

```
% U+0621;afii57409;ARABIC LETTER HAMZA
\DeclareTextCommand{\hamza}{PU}{\86\041}% U+0621
% U+0622;afii57410;ARABIC LETTER ALEF WITH MADDA ABOVE
\DeclareTextCommand{\alefmadda}{PU}{\86\042}% U+0622
% U+0623;afii57411;ARABIC LETTER ALEF WITH HAMZA ABOVE
\DeclareTextCommand{\alefhamza}{PU}{\86\043}% U+0623
% U+0624;afii57412;ARABIC LETTER WAW WITH HAMZA ABOVE
\DeclareTextCommand{\wawhamza}{PU}{\86\044}% U+0624
% U+0625;afii57413;ARABIC LETTER ALEF WITH HAMZA BELOW
\DeclareTextCommand{\aleflowerhamza}{PU}{\86\045}% U+0625
% U+0626;afii57414;ARABIC LETTER YEH WITH HAMZA ABOVE
\DeclareTextCommand{\yahamza}{PU}{\86\046}% U+0626
% U+0627;afii57415;ARABIC LETTER ALEF
\DeclareTextCommand{\alef}{PU}{\86\047}% U+0627
% U+0628;afii57416;ARABIC LETTER BEH
\DeclareTextCommand{\baa}{PU}{\86\050}% U+0628
% U+0629;afii57417;ARABIC LETTER TEH MARBUTA
\DeclareTextCommand{\T}{PU}{\86\051}% U+0629
% U+062A;afii57418;ARABIC LETTER TEH
\DeclareTextCommand{\taa}{PU}{\86\052}% U+062A
% U+062B;afii57419;ARABIC LETTER THEH
\DeclareTextCommand{\thaa}{PU}{\86\053}% U+062B
% U+062C;afii57420;ARABIC LETTER JEEM
\DeclareTextCommand{\jeem}{PU}{\86\054}% U+062C
% U+062D;afii57421;ARABIC LETTER HAH
\DeclareTextCommand{\Haa}{PU}{\86\055}% U+062D
```

```
% U+062E;afii57422;ARABIC LETTER KHAH
\DeclareTextCommand{\kha}{PU}{\86\056}% U+062E
% U+062F;afii57423;ARABIC LETTER DAL
\DeclareTextCommand{\dal}{PU}{\86\057}% U+062F
% U+0630;afii57424;ARABIC LETTER THAL
\DeclareTextCommand{\dhal}{PU}{\86\060}% U+0630
% U+0631;afii57425;ARABIC LETTER REH
\DeclareTextCommand{\ra}{PU}{\86\061}% U+0631
% U+0632;afii57426;ARABIC LETTER ZAIN
\DeclareTextCommand{\zay}{PU}{\86\062}% U+0632
% U+0633;afii57427;ARABIC LETTER SEEN
\DeclareTextCommand{\seen}{PU}{\86\063}% U+0633
% U+0634;afii57428;ARABIC LETTER SHEEN
\DeclareTextCommand{\sheen}{PU}{\86\064}% U+0634
% U+0635;afii57429;ARABIC LETTER SAD
\DeclareTextCommand{\sad}{PU}{\86\065}% U+0635
% U+0636;afii57430;ARABIC LETTER DAD
\DeclareTextCommand{\dad}{PU}{\86\066}% U+0636
% U+0637;afii57431;ARABIC LETTER TAH
\DeclareTextCommand{\Ta}{PU}{\86\067}% U+0637
% U+0638;afii57432;ARABIC LETTER ZAH
\DeclareTextCommand{\za}{PU}{\86\070}% U+0638
% U+0639;afii57433;ARABIC LETTER AIN
\DeclareTextCommand{\ayn}{PU}{\86\071}% U+0639
% U+063A;afii57434;ARABIC LETTER GHAIN
\DeclareTextCommand{\ghayn}{PU}{\86\072}% U+063A
% U+0640;afii57440;ARABIC TATWEEL
\DeclareTextCommand{\tatweel}{PU}{\86\100}% U+0640
% U+0641;afii57441;ARABIC LETTER FEH
\DeclareTextCommand{\fa}{PU}{\86\101}% U+0641
% U+0642;afii57442;ARABIC LETTER QAF
\DeclareTextCommand{\qaf}{PU}{\86\102}% U+0642
% U+0643;afii57443;ARABIC LETTER KAF
\DeclareTextCommand{\kaf}{PU}{\86\103}% U+0643
% U+0644;afii57444;ARABIC LETTER LAM
\DeclareTextCommand{\lam}{PU}{\86\104}% U+0644
% U+0645;afii57445;ARABIC LETTER MEEM
\DeclareTextCommand{\meem}{PU}{\86\105}% U+0645
% U+0646;afii57446;ARABIC LETTER NOON
\DeclareTextCommand{\nun}{PU}{\86\106}% U+0646
% U+0647;afii57470;ARABIC LETTER HEH
\DeclareTextCommand{\ha}{PU}{\86\107}% U+0647
% U+0648;afii57448;ARABIC LETTER WAW
\DeclareTextCommand{\waw}{PU}{\86\110}% U+0648
% U+0649;afii57449;ARABIC LETTER ALEF MAKSURA
\DeclareTextCommand{\alefmaqsura}{PU}{\86\111}% U+0649
% U+064A;afii57450;ARABIC LETTER YEH
\DeclareTextCommand{\ya}{PU}{\86\112}% U+064A

% U+064B;afii57451;ARABIC FATHATAN
\DeclareTextCommand{\nasb}{PU}{\86\113}% U+064B
% U+064C;afii57452;ARABIC DAMMATAN
\DeclareTextCommand{\raff}{PU}{\86\114}% U+064C
% U+064D;afii57453;ARABIC KASRATAN
\DeclareTextCommand{\jarr}{PU}{\86\115}% U+064D
```

```
% U+064E;afii57454;ARABIC FATHA
\DeclareTextCommand{\fatha}{PU}{\86\116}% U+064E
% U+064F;afii57455;ARABIC DAMMA
\DeclareTextCommand{\damma}{PU}{\86\117}% U+064F
% U+0650;afii57456;ARABIC KASRA
\DeclareTextCommand{\kasra}{PU}{\86\120}% U+0650
% U+0651;afii57457;ARABIC SHADDA
\DeclareTextCommand{\shadda}{PU}{\86\121}% U+0651
% U+0652;afii57458;ARABIC SUKUN
\DeclareTextCommand{\sukun}{PU}{\86\122}% U+0652
```

Farsi

```
% U+067E ARABIC LETTER PEH; afii57506
\DeclareTextCommand{\peh}{PU}{\86\176}% U+067E
% U+0686 ARABIC LETTER TCHEH; afii57507
\DeclareTextCommand{\tcheh}{PU}{\86\206}% U+0686
% U+0698 ARABIC LETTER JEH; afii57508
\DeclareTextCommand{\jeh}{PU}{\86\230}% U+0698
% U+06A9 ARABIC LETTER KEHEH
\DeclareTextCommand{\farsikaf}{PU}{\86\251}% U+06A9
% U+06AF ARABIC LETTER GAF; afii57509
\DeclareTextCommand{\gaf}{PU}{\86\257}% U+06AF
% U+06CC ARABIC LETTER FARSI YEH
\DeclareTextCommand{\farsiya}{PU}{\86\314}% U+06CC

% U+200C ZERO WIDTH NON-JOINER; afii61664
\DeclareTextCommand{\ZWNJ}{PU}{\9040\014}% U+200C
% U+200D ZERO WIDTH JOINER; afii301
\DeclareTextCommand{\textEncodingNoboundary}{PU}{\9040\015}% U+200D

⟨/puarenc⟩

⟨*psdextra⟩
\Hy@VersionCheck{psdextra.def}
\DeclareTextCommand{\textGamma}{PU}{\83\223}%* U+0393
\DeclareTextCommand{\textDelta}{PU}{\83\224}%* U+0394
\DeclareTextCommand{\textTheta}{PU}{\83\230}%* U+0398
\DeclareTextCommand{\textLambda}{PU}{\83\233}%* U+039B
\DeclareTextCommand{\textXi}{PU}{\83\236}%* U+039E
\DeclareTextCommand{\textPi}{PU}{\83\240}%* U+03A0
\DeclareTextCommand{\textSigma}{PU}{\83\243}%* U+03A3
\DeclareTextCommand{\textUpsilon}{PU}{\83\245}%* U+03A5
\DeclareTextCommand{\textPhi}{PU}{\83\246}%* U+03A6
\DeclareTextCommand{\textChi}{PU}{\83\247}% U+03A7
\DeclareTextCommand{\textPsi}{PU}{\83\250}%* U+03A8
\DeclareTextCommand{\textOmega}{PU}{\83\251}%* U+03A9
\DeclareTextCommand{\textalpha}{PU}{\83\261}%* U+03B1
\DeclareTextCommand{\textbeta}{PU}{\83\262}%* U+03B2
\DeclareTextCommand{\textgamma}{PU}{\83\263}%* U+03B3
\DeclareTextCommand{\textdelta}{PU}{\83\264}%* U+03B4
\DeclareTextCommand{\textepsilon}{PU}{\83\265}%* U+03B5
\DeclareTextCommand{\textzeta}{PU}{\83\266}%* U+03B6
\DeclareTextCommand{\texteta}{PU}{\83\267}%* U+03B7
\DeclareTextCommand{\texttheta}{PU}{\83\270}%* U+03B8
\DeclareTextCommand{\textiota}{PU}{\83\271}%* U+03B9
\DeclareTextCommand{\textkappa}{PU}{\83\272}%* U+03BA
```

```
\DeclareTextCommand{\textlambda}{PU}{\83\273}%* U+03BB
\DeclareTextCommand{\textmugreek}{PU}{\83\274}%* U+03BC
\DeclareTextCommand{\textnu}{PU}{\83\275}%* U+03BD
\DeclareTextCommand{\textxi}{PU}{\83\276}%* U+03BE
\DeclareTextCommand{\textpi}{PU}{\83\300}%* U+03C0
\DeclareTextCommand{\textrho}{PU}{\83\301}%* U+03C1
\DeclareTextCommand{\textvarsigma}{PU}{\83\302}%* U+03C2
\DeclareTextCommand{\textsigma}{PU}{\83\303}%* U+03C3
\DeclareTextCommand{\texttau}{PU}{\83\304}%* U+03C4
\DeclareTextCommand{\textupsilon}{PU}{\83\305}%* U+03C5
\DeclareTextCommand{\textphi}{PU}{\83\306}%* U+03C6
\DeclareTextCommand{\textchi}{PU}{\83\307}%* U+03C7
\DeclareTextCommand{\textpsi}{PU}{\83\310}%* U+03C8
\DeclareTextCommand{\textomega}{PU}{\83\311}%* U+03C9
\newcommand*{\psdmapshortnames}{%
  \let\MVPlus\textMVPlus
  \let\MVComma\textMVComma
  \let\MVMinus\textMVMinus
  \let\MVPeriod\textMVPeriod
  \let\MVDivision\textMVDivision
  \let\MVZero\textMVZero
  \let\MVOne\textMVOne
  \let\MVTwo\textMVTwo
  \let\MVThree\textMVThree
  \let\MVFour\textMVFour
  \let\MVFive\textMVFive
  \let\MVSix\textMVSix
  \let\MVSeven\textMVSeven
  \let\MVEight\textMVEight
  \let\MVNine\textMVNine
  \let\MVAt\textMVAt
  \let\copyright\textcopyright
  \let\twosuperior\texttwosuperior
  \let\threesuperior\textthreesuperior
  \let\onesuperior\textonesuperior
  \let\Thorn\textThorn
  \let\thorn\textthorn
  \let\hbar\texthbar
  \let\hausaB\texthausaB
  \let\hausaD\texthausaD
  \let\hausaK\texthausaK
  \let\barl\textbarl
  \let\inve\textinve
  \let\slashc\textslashc
  \let\scripta\textscripta
  \let\openo\textopeno
  \let\rtaild\textrtaild
  \let\reve\textreve
  \let\schwa\textschwa
  \let\niepsilon\textniepsilon
  \let\revepsilon\textrevepsilon
  \let\rhookrevepsilon\textrhookrevepsilon
  \let\scriptg\textscriptg
  \let\scg\textscg
```

```
\let\ipagamma\textipagamma
\let\babygamma\textbabygamma
\let\bari\textbari
\let\niiota\textniiota
\let\sci\textsci
\let\scn\textscn
\let\niphi\textniphi
\let\longlegr\textlonglegr
\let\scr\textscr
\let\invscr\textinvscr
\let\esh\textesh
\let\baru\textbaru
\let\niupsilon\textniupsilon
\let\scriptv\textscriptv
\let\turnv\textturnv
\let\turnw\textturnw
\let\turny\textturny
\let\scy\textscy
\let\yogh\textyogh
\let\glotstop\textglotstop
\let\revglotstop\textrevglotstop
\let\invglotstop\textinvglotstop
\let\Gamma\textGamma
\let\Delta\textDelta
\let\Theta\textTheta
\let\Lambda\textLambda
\let\Xi\textXi
\let\Pi\textPi
\let\Sigma\textSigma
\let\Upsilon\textUpsilon
\let\Phi\textPhi
\let\Psi\textPsi
\let\Omega\textOmega
\let\alpha\textalpha
\let\beta\textbeta
\let\gamma\textgamma
\let\delta\textdelta
\let\epsilon\textepsilon
\let\zeta\textzeta
\let\eta\texteta
\let\theta\texttheta
\let\iota\textiota
\let\kappa\textkappa
\let\lambda\textlambda
\let\mu\textmu
\let\mugreek\textmugreek
\let\nu\textnu
\let\xi\textxi
\let\pi\textpi
\let\rho\textrho
\let\varsigma\textvarsigma
\let\sigma\textsigma
\let\tau\texttau
\let\upsilon\textupsilon
```

```
\let\phi\textphi
\let\chi\textchi
\let\psi\textpsi
\let\omega\textomega
\let\scd\textscd
\let\scu\textscu
\let\iinferior\textiinferior
\let\rinferior\textrinferior
\let\uinferior\textuinferior
\let\vinferior\textvinferior
\let\betainferior\textbetainferior
\let\gammainferior\textgammainferior
\let\rhoinferior\textrhoinferior
\let\phiinferior\textphiinferior
\let\chiinferior\textchiinferior
\let\barsci\textbarsci
\let\barp\textbarp
\let\barscu\textbarscu
\let\htrtaild\texthtrtaild
\let\dagger\textdagger
\let\bullet\textbullet
\let\hdotfor\texthdotfor
\let\prime\textprime
\let\second\textsecond
\let\third\textthird
\let\backprime\textbackprime
\let\leftthereforе\textleftthereforе
\let\fourth\textfourth
\let\diamonddots\textdiamonddots
\let\zerosuperior\textzerosuperior
\let\isuperior\textisuperior
\let\foursuperior\textfoursuperior
\let\fivesuperior\textfivesuperior
\let\sixsuperior\textsixsuperior
\let\sevensuperior\textsevensuperior
\let\eightsuperior\texteightsuperior
\let\ninesuperior\textninesuperior
\let\plussuperior\textplussuperior
\let\minussuperior\textminussuperior
\let\equalsuperior\textequalsuperior
\let\parenleftsuperior\textparenleftsuperior
\let\parenrightsuperior\textparenrightsuperior
\let\nsuperior\textnsuperior
\let\zeroinferior\textzeroinferior
\let\oneinferior\textoneinferior
\let\twoinferior\texttwoinferior
\let\threeinferior\textthreeinferior
\let\fourinferior\textfourinferior
\let\fiveinferior\textfiveinferior
\let\sixinferior\textsixinferior
\let\seveninferior\textseveninferior
\let\eightinferior\texteightinferior
\let\nineinferior\textnineinferior
\let\plusinferior\textplusinferior
```

```
\let\minusinferior\textminusinferior
\let\equalsinferior\textequalsinferior
\let\parenleftinferior\textparenleftinferior
\let\parenrightinferior\textparenrightinferior
\let\ainferior\textainferior
\let\einferior\texteinferior
\let\oinferior\textoinferior
\let\xinferior\textxinferior
\let\schwainferior\textschwainferior
\let\hinferior\texthinferior
\let\kinferior\textkinferior
\let\linferior\textlinferior
\let\minferior\textminferior
\let\ninferior\textninferior
\let\pinferior\textpinferior
\let\sinferior\textsinferior
\let\tinferior\texttinferior
\let\Deleatur\textDeleatur
\let\hslash\texthslash
\let\Im\textIm
\let\ell\textell
\let\wp\textwp
\let\Re\textRe
\let\mho\textmho
\let\riota\textriota
\let\Finv\textFinv
\let\aleph\textaleph
\let\beth\textbeth
\let\gimel\textgimel
\let\daleth\textdaleth
\let\fax\textfax
\let\Game\textGame
\let\leftarrow\textleftarrow
\let\uparrow\textuparrow
\let\rightarrow\textrightarrow
\let\downarrow\textdownarrow
\let\leftrightarrow\textleftrightarrow
\let\updownarrow\textupdownarrow
\let\nwarrow\textnwarrow
\let\nearrow\textnearrow
\let\searrow\textsearrow
\let\swarrow\textswarrow
\let\nleftarrow\textnleftarrow
\let\nrightarrow\textnrightarrow
\let\twoheadleftarrow\texttwoheadleftarrow
\let\ntwoheadleftarrow\textntwoheadleftarrow
\let\twoheaduparrow\texttwoheaduparrow
\let\twoheadrightarrow\texttwoheadrightarrow
\let\ntwoheadrightarrow\textntwoheadrightarrow
\let\twoheaddownarrow\texttwoheaddownarrow
\let\leftarrowtail\textleftarrowtail
\let\rightarrowtail\textrightarrowtail
\let\mapsto\textmapsto
\let\hookleftarrow\texthookleftarrow
```

```
\let\hookrightarrow\texthookrightarrow
\let\looparrowleft\textlooparrowleft
\let\looparrowright\textlooparrowright
\let\nleftrightarrow\textnleftrightarrow
\let\lightning\textlightning
\let\dlsh\textdlsh
\let\curvearrowleft\textcurvearrowleft
\let\curvearrowright\textcurvearrowright
\let\leftharpoonup\textleftharpoonup
\let\leftharpoondown\textleftharpoondown
\let\upharpoonright\textupharpoonright
\let\upharpoonleft\textupharpoonleft
\let\rightharpoonup\textrightharpoonup
\let\rightharpoondown\textrightharpoondown
\let\downharpoonright\textdownharpoonright
\let\downharpoonleft\textdownharpoonleft
\let\rightleftarrows\textrightleftarrows
\let\updownarrows\textupdownarrows
\let\leftrightarrows\textleftrightarrows
\let\leftleftarrows\textleftleftarrows
\let\upuparrows\textupuparrows
\let\rightrightarrows\textrightrightarrows
\let\downdownarrows\textdowndownarrows
\let\leftrightharpoons\textleftrightharpoons
\let\rightleftharpoons\textrightleftharpoons
\let\nLeftarrow\textnLeftarrow
\let\nLeftrightarrow\textnLeftrightarrow
\let\nRightarrow\textnRightarrow
\let\Leftarrow\textLeftarrow
\let\Uparrow\textUparrow
\let\Rightarrow\textRightarrow
\let\Downarrow\textDownarrow
\let\Leftrightarrow\textLeftrightarrow
\let\Updownarrow\textUpdownarrow
\let\Nwarrow\textNwarrow
\let\Nearrow\textNearrow
\let\Searrow\textSearrow
\let\Swarrow\textSwarrow
\let\Lleftarrow\textLleftarrow
\let\Rrightarrow\textRrightarrow
\let\leftsquigarrow\textleftsquigarrow
\let\rightsquigarrow\textrightsquigarrow
\let\dashleftarrow\textdashleftarrow
\let\dasheduparrow\textdasheduparrow
\let\dashrightarrow\textdashrightarrow
\let\dasheddownarrow\textdasheddownarrow
\let\pointer\textpointer
\let\downuparrows\textdownuparrows
\let\leftarrowtriangle\textleftarrowtriangle
\let\rightarrowtriangle\textrightarrowtriangle
\let\leftrightarrowtriangle\textleftrightarrowtriangle
\let\forall\textforall
\let\complement\textcomplement
\let\partial\textpartial
```

```
\let\exists\textexists
\let\nexists\textnexists
\let\emptyset\textemptyset
\let\triangle\texttriangle
\let\nabla\textnabla
\let\in\textinsymbol
\let\notin\textnotin
\let\smallin\textsmallin
\let\ni\textni
\let\notowner\textnotowner
\let\smallowns\textsmallowns
\let\prod\textprod
\let\amalg\textamalg
\let\sum\textsum
\let\mp\textmp
\let\dotplus\textdotplus
\let\Divides\textDivides
\let\DividesNot\textDividesNot
\let\setminus\textsetminus
\let\ast\textast
\let\circ\textcirc
\let\surd\textsurd
\let\propto\textpropto
\let\infty\textinfty
\let\angle\textangle
\let\measuredangle\textmeasuredangle
\let\sphericalangle\textsphericalangle
\let\mid\textmid
\let\nmid\textnmid
\let\parallel\textparallel
\let\nparallel\textnparallel
\let\wedge\textwedge
\let\owedge\textowedge
\let\vee\textvee
\let\ovee\textovee
\let\cap\textcap
\let\cup\textcup
\let\int\textint
\let\iint\textiint
\let\iiint\textiiint
\let\oint\textoint
\let\oiint\textoiint
\let\ointclockwise\textointclockwise
\let\ointctrclockwise\textointctrclockwise
\let\therefore\textttherefore
\let\because\textbecause
\let\vdotdot\textvdotdot
\let\squaredots\textsquaredots
\let\dotminus\textdotminus
\let\eqcolon\texteqcolon
\let\sim\textsim
\let\backsim\textbacksim
\let\nbacksim\textnbacksim
\let\wr\textwr
```

```
\let\nsim\textnsim
\let\eqsim\texteqsim
\let\neqsim\textneqsim
\let\simeq\textsimeq
\let\nsimeq\textnsimeq
\let\cong\textcong
\let\ncong\textncong
\let\approx\textapprox
\let\napprox\textnapprox
\let\approxeq\textapproxeq
\let\napproxeq\textnapproxeq
\let\triplesim\texttriplesim
\let\ntriplesim\textntriplesim
\let\backcong\textbackcong
\let\nbackcong\textnbackcong
\let\asymp\textasymp
\let\nasymp\textnasymp
\let\Bumpeq\textBumpeq
\let\nBumpeq\textnBumpeq
\let\bumpeq\textbumpeq
\let\nbumpeq\textnbumpeq
\let\doteq\textdoteq
\let\ndoteq\textndoteq
\let\doteqdot\textdoteqdot
\let\nDoteq\textnDoteq
\let\fallingdoteq\textfallingdoteq
\let\nfallingdoteq\textnfallingdoteq
\let\risingdoteq\textrisingdoteq
\let\nrisingdoteq\textnrisingdoteq
\let\colonequals\textcolonequals
\let\equalscolon\textequalscolon
\let\eqcirc\texteqcirc
\let\neqcirc\textneqcirc
\let\circeq\textcirceq
\let\ncirceq\textncirceq
\let\hateq\texthateq
\let\nhateq\textnhateq
\let\triangleeq\texttriangleeq
\let\neq\textneq
\let\ne\textne
\let\equiv\textequiv
\let\nequiv\textnequiv
\let\leq\textleq
\let\le\textle
\let\geq\textgeq
\let\ge\textge
\let\leqq\textleqq
\let\nleqq\textnleqq
\let\geqq\textgeqq
\let\ngeqq\textngeqq
\let\lneqq\textlneqq
\let\gneqq\textgneqq
\let\ll\textll
\let\nll\textnll
```

```
\let\gg\textgg
\let\ngg\textngg
\let\between\textbetween
\let\nless\textnless
\let\ngtr\textngtr
\let\nleq\textnleq
\let\ngeq\textngeq
\let\lesssim\textlesssim
\let\gtrsim\textgtrsim
\let\nlesssim\textnlesssim
\let\ngtrsim\textngtrsim
\let\lessgtr\textlessgtr
\let\gtrless\textgtrless
\let\ngtrless\textngtrless
\let\nlessgtr\textnlessgtr
\let\prec\textprec
\let\succ\textsucc
\let\preccurlyeq\textpreccurlyeq
\let\succcurlyeq\textsucccurlyeq
\let\precsim\textprecsim
\let\nprecsim\textnprecsim
\let\succsim\textsuccsim
\let\nsuccsim\textnsuccsim
\let\nprec\textnprec
\let\nsucc\textnsucc
\let\subset\textsubset
\let\supset\textsupset
\let\nsubset\textnsubset
\let\nsupset\textnsupset
\let\subseteq\textsubseteq
\let\supseteq\textsupseteq
\let\nsubseteq\textnsubseteq
\let\nsupseteq\textnsupseteq
\let\subsetneq\textsubsetneq
\let\supsetneq\textsupsetneq
\let\cupdot\textcupdot
\let\cupplus\textcupplus
\let\sqsubset\textsqsubset
\let\nsqsubset\textnsqsubset
\let\sqsupset\textsqsupset
\let\nsqsupset\textnsqsupset
\let\sqsubseteq\textsqsubseteq
\let\nsqsubseteq\textnsqsubseteq
\let\sqsupseteq\textsqsupseteq
\let\nsqsupseteq\textnsqsupseteq
\let\sqcap\textsqcap
\let\sqcup\textsqcup
\let\oplus\textoplus
\let\ominus\textominus
\let\otimes\textotimes
\let\oslash\textoslash
\let\odot\textodot
\let\circledcirc\textcircledcirc
\let\circledast\textcircledast
```

```
\let\circleddash\textcircleddash
\let\boxplus\textboxplus
\let\boxminus\textboxminus
\let\boxtimes\textboxtimes
\let\boxdot\textboxdot
\let\vdash\textvdash
\let\dashv\textdashv
\let\ndashv\textndashv
\let\top\texttop
\let\ndownvdash\textndownvdash
\let\bot\textbot
\let\nupvdash\textnupvdash
\let\vDash\textvDash
\let\Vdash\textVdash
\let\Vvdash\textVvdash
\let\nVvash\textnVvash
\let\VDash\textVDash
\let\nvdash\textnvdash
\let\nvDash\textnvDash
\let\nVdash\textnVdash
\let\nVDash\textnVDash
\let\lhd\textlhd
\let\rhd\textrhd
\let\unlhd\textunlhd
\let\unrhd\textunrhd
\let\multimapdotbothA\textmultimapdotbothA
\let\multimapdotbothB\textmultimapdotbothB
\let\multimap\textmultimap
\let\veebar\textveebar
\let\barwedge\textbarwedge
\let\star\textstar
\let\divideontimes\textdivideontimes
\let\bowtie\textbowtie
\let\ltimes\textltimes
\let\rtimes\textrtimes
\let\leftthreetimes\textleftthreetimes
\let\rightthreetimes\textrightthreetimes
\let\backsimeq\textbacksimeq
\let\nbacksimeq\textnbacksimeq
\let\curlyvee\textcurlyvee
\let\curlywedge\textcurlywedge
\let\Subset\textSubset
\let\nSubset\textnSubset
\let\Supset\textSupset
\let\nSupset\textnSupset
\let\Cap\textCap
\let\Cup\textCup
\let\pitchfork\textpitchfork
\let\lessdot\textlessdot
\let\gtrdot\textgtrdot
\let\lll\textlll
\let\ggg\textggg
\let\lesseqgtr\textlesseqgtr
\let\gtreqless\textgtreqless
```

```
\let\curlyeqprec\textcurlyeqprec
\let\ncurlyeqprec\textncurlyeqprec
\let\curlyeqsucc\textcurlyeqsucc
\let\ncurlyeqsucc\textncurlyeqsucc
\let\npreccurlyeq\textnpreccurlyeq
\let\nsucccurlyeq\textnsucccurlyeq
\let\nqsubseteq\textnqsubseteq
\let\nqsupseteq\textnqsupseteq
\let\sqsubsetneq\textsqsubsetneq
\let\sqsupsetneq\textsqsupsetneq
\let\lnsim\textlnsim
\let\gnsim\textgnsim
\let\precnsim\textprecnsim
\let\succnsim\textsuccnsim
\let\ntriangleleft\textntriangleleft
\let\ntriangleright\textntriangleright
\let\ntrianglelefteq\textntrianglelefteq
\let\ntrianglerighteq\textntrianglerighteq
\let\vdots\textvdots
\let\cdots\textcdots
\let\udots\textudots
\let\ddots\textddots
\let\barin\textbarin
\let\diameter\textdiameter
\let\backneg\textbackneg
\let\wasylozenge\textwasylozenge
\let\invbackneg\textinvbackneg
\let\clock\textclock
\let\ulcorner\textulcorner
\let\urcorner\texturcorner
\let\llcorner\textllcorner
\let\lrcorner\textlrcorner
\let\frown\textfrown
\let\smile\textsmile
\let\Keyboard\textKeyboard
\let\langle\textlangle
\let\rangle\textrangle
\let\APLinv\textAPLinv
\let\Tumbler\textTumbler
\let\notslash\textnotslash
\let\notbackslash\textnotbackslash
\let\boxbackslash\textboxbackslash
\let\APLleftarrowbox\textAPLleftarrowbox
\let\APLrightarrowbox\textAPLrightarrowbox
\let\APLuparrowbox\textAPLuparrowbox
\let\APLdownarrowbox\textAPLdownarrowbox
\let\APLinput\textAPLinput
\let\Request\textRequest
\let\Beam\textBeam
\let\hexagon\texthexagon
\let\APLbox\textAPLbox
\let\ForwardToIndex\textForwardToIndex
\let\RewindToIndex\textRewindToIndex
\let\bbslash\textbbslash
```

```
\let\CircledA\textCircledA
\let\CleaningF\textCleaningF
\let\CleaningFF\textCleaningFF
\let\CleaningP\textCleaningP
\let\CleaningPP\textCleaningPP
\let\CuttingLine\textCuttingLine
\let\UParrow\textUParrow
\let\bigtriangleup\textbigtriangleup
\let\Forward\textForward
\let\triangleright\texttriangleright
\let\RHD\textRHD
\let\DOWNarrow\textDOWNarrow
\let\bigtriangledown\textbigtriangledown
\let\Rewind\textRewind
\let\triangleleft\texttriangleleft
\let\LHD\textLHD
\let\diamond\textdiamond
\let\lozenge\textlozenge
\let\LEFTCIRCLE\textLEFTCIRCLE
\let\RIGHTCIRCLE\textRIGHTCIRCLE
\let\openbullet\textopenbullet
\let\boxbar\textboxbar
\let\bigcircle\textbigcircle
\let\Cloud\textCloud
\let\FiveStar\textFiveStar
\let\FiveStarOpen\textFiveStarOpen
\let\Phone\textPhone
\let\boxempty\textboxempty
\let\Checkedbox\textCheckedbox
\let\Crossedbox\textCrossedbox
\let\Coffeecup\textCoffeecup
\let\HandCuffLeft\textHandCuffLeft
\let\HandCuffRight\textHandCuffRight
\let\HandLeft\textHandLeft
\let\HandRight\textHandRight
\let\Radioactivity\textRadioactivity
\let\Biohazard\textBiohazard
\let\Ankh\textAnkh
\let\YinYang\textYinYang
\let\frownie\textfrownie
\let\smiley\textsmiley
\let\blacksmiley\textblacksmiley
\let\sun\textsun
\let\leftmoon\textleftmoon
\let\rightmoon\textrightmoon
\let\mercury\textmercury
\let\earth\textearth
\let\male\textmale
\let\jupiter\textjupiter
\let\saturn\textsaturn
\let\uranus\texturanus
\let\neptune\textneptune
\let\pluto\textpluto
\let\aries\textaries
```

```
\let\taurus\texttaurus
\let\gemini\textgemini
\let\cancer\textcancer
\let\leo\textleo
\let\virgo\textvirgo
\let\libra\textlibra
\let\scorpio\textscorpio
\let\sagittarius\textsagittarius
\let\capricornus\textcapricornus
\let\aquarius\textaquarius
\let\pisces\textpisces
\let\quarternote\textquarternote
\let\twonotes\texttwonotes
\let\sixteenthnote\textsixteenthnote
\let\flat\textflat
\let\natural\textnatural
\let\sharp\textsharp
\let\recycle\textrecycle
\let\Wheelchair\textWheelchair
\let\Flag\textFlag
\let\MineSign\textMineSign
\let\dsmilitary\textdsmilitary
\let\dsmedical\textdsmedical
\let\dsjuridical\textdsjuridical
\let\dschemical\textdschemical
\let\dsbiological\textdsbiological
\let\dscommercial\textdscommercial
\let\manstar\textmanstar
\let\danger\textdanger
\let\FemaleFemale\textFemaleFemale
\let\MaleMale\textMaleMale
\let\FemaleMale\textFemaleMale
\let\Hermaphrodite\textHermaphrodite
\let\Neutral\textNeutral
\let\hexstar\texthexstar
\let\SunCload\textSunCload
\let\Rain\textRain
\let\noway\textnoway
\let\Mountain\textMountain
\let\Tent\textTent
\let\ScissorRight\textScissorRight
\let\ScissorRightBrokenTop\textScissorRightBrokenTop
\let\ScissorHollowRight\textScissorHollowRight
\let\PhoneHandset\textPhoneHandset
\let\Tape\textTape
\let\Plane\textPlane
\let\Envelope\textEnvelope
\let\Peace\textPeace
\let\WritingHand\textWritingHand
\let\PencilRightDown\textPencilRightDown
\let\PencilRight\textPencilRight
\let\PencilRightUp\textPencilRightUp
\let\NibRight\textNibRight
\let\NibSolidRight\textNibSolidRight
```

```
\let\Checkmark\textCheckmark
\let\CheckmarkBold\textCheckmarkBold
\let\XSolid\textXSolid
\let\XSolidBold\textXSolidBold
\let\XSolidBrush\textXSolidBrush
\let\PlusOutline\textPlusOutline
\let\Plus\textPlus
\let\PlusThinCenterOpen\textPlusThinCenterOpen
\let\PlusCenterOpen\textPlusCenterOpen
\let\Cross\textCross
\let\CrossOpenShadow\textCrossOpenShadow
\let\CrossOutline\textCrossOutline
\let\CrossMaltese\textCrossMaltese
\let\DavidStar\textDavidStar
\let\FourAsterisk\textFourAsterisk
\let\JackStar\textJackStar
\let\JackStarBold\textJackStarBold
\let\ClowerTips\textClowerTips
\let\FourStar\textFourStar
\let\FourStarOpen\textFourStarOpen
\let\FiveStarOpenCircled\textFiveStarOpenCircled
\let\FiveStarCenterOpen\textFiveStarCenterOpen
\let\FiveStarOpenDotted\textFiveStarOpenDotted
\let\FiveStarOutline\textFiveStarOutline
\let\FiveStarOutlineHeavy\textFiveStarOutlineHeavy
\let\FiveStarConvex\textFiveStarConvex
\let\FiveStarShadow\textFiveStarShadow
\let\AsteriskBold\textAsteriskBold
\let\AsteriskCenterOpen\textAsteriskCenterOpen
\let\EightStarTaper\textEightStarTaper
\let\EightStarConvex\textEightStarConvex
\let\SixStar\textSixStar
\let\EightStar\textEightStar
\let\EightStarBold\textEightStarBold
\let\TwelveStar\textTwelveStar
\let\SixteenStarLight\textSixteenStarLight
\let\SixFlowerPetalRemoved\textSixFlowerPetalRemoved
\let\SixFlowerOpenCenter\textSixFlowerOpenCenter
\let\Asterisk\textAsterisk
\let\SixFlowerAlternate\textSixFlowerAlternate
\let\FiveFlowerPetal\textFiveFlowerPetal
\let\FiveFlowerOpen\textFiveFlowerOpen
\let\EightFlowerPetal\textEightFlowerPetal
\let\SunshineOpenCircled\textSunshineOpenCircled
\let\SixFlowerAltPetal\textSixFlowerAltPetal
\let\SnowflakeChevron\textSnowflakeChevron
\let\Snowflake\textSnowflake
\let\SnowflakeChevronBold\textSnowflakeChevronBold
\let\Sparkle\textSparkle
\let\SparkleBold\textSparkleBold
\let\AsteriskRoundedEnds\textAsteriskRoundedEnds
\let\EightFlowerPetalRemoved\textEightFlowerPetalRemoved
\let\EightAsterisk\textEightAsterisk
\let\CircleShadow\textCircleShadow
```

```
\let\SquareShadowBottomRight\textSquareShadowBottomRight
\let\SquareTopRight\textSquareTopRight
\let\SquareCastShadowBottomRight\textSquareCastShadowBottomRight
\let\SquareCastShadowTopRight\textSquareCastShadowTopRight
\let\DiamondSolid\textDiamondSolid
\let\RectangleThin\textRectangleThin
\let\Rectangle\textRectangle
\let\RectangleBold\textRectangleBold
\let\perp\textperp
\let\notperp\textnotperp
\let\veedot\textveedot
\let\wedgedot\textwedgedot
\let\leftspoon\textleftspoon
\let\lbrackdbl\textlbrackdbl
\let\rbrackdbl\textrbrackdbl
\let\circlearrowleft\textcirclearrowleft
\let\circlearrowright\textcirclearrowright
\let\longleftarrow\textlongleftarrow
\let\longrightarrow\textlongrightarrow
\let\longleftrightarrow\textlongleftrightarrow
\let\Longleftarrow\textLongleftarrow
\let\Longrightarrow\textLongrightarrow
\let\Longleftrightarrow\textLongleftrightarrow
\let\longmapsto\textlongmapsto
\let\Longmapsfrom\textLongmapsfrom
\let\Longmapsto\textLongmapsto
\let\nwsearrow\textnwsearrow
\let\neswarrow\textneswarrow
\let\lhooknwarrow\textlhooknwarrow
\let\rhooknearrow\textrhooknearrow
\let\lhooksearrow\textlhooksearrow
\let\rhookswarrow\textrhookswarrow
\let\leadsto\textleadsto
\let\rcurvearrowne\textrcurvearrowne
\let\lcurvearrowse\textlcurvearrowse
\let\lcurvearrowsw\textlcurvearrowsw
\let\rcurvearrowse\textrcurvearrowse
\let\lcurvearrowdown\textlcurvearrowdown
\let\rcurvearrowdown\textrcurvearrowdown
\let\rcurvearrowleft\textrcurvearrowleft
\let\rcurvearrowright\textrcurvearrowright
\let\leftrightharpoon\textleftrightharpoon
\let\rightleftharpoon\textrightleftharpoon
\let\updownharpoonrightleft\textupdownharpoonrightleft
\let\updownharpoonleftright\textupdownharpoonleftright
\let\leftleftharpoons\textleftleftharpoons
\let\upupharpoons\textupupharpoons
\let\rightrightharpoons\textrightrightharpoons
\let\downdownharpoons\textdowndownharpoons
\let\leftbarharpoon\textleftbarharpoon
\let\barleftharpoon\textbarleftharpoon
\let\rightbarharpoon\textrightbarharpoon
\let\barrightharpoon\textbarrightharpoon
\let\updownharpoons\textupdownharpoons
```

```
\let\downupharpoons\textdownupharpoons
\let\moo\textmoo
\let\llparenthesis\textllparenthesis
\let\rrparenthesis\textrrparenthesis
\let\invdiameter\textinvdiameter
\let\obar\textobar
\let\obslash\textobslash
\let\obot\textobot
\let\NoChemicalCleaning\textNoChemicalCleaning
\let\olessthan\textolessthan
\let\ogreaterthan\textogreaterthan
\let\boxslash\textboxslash
\let\boxbslash\textboxbslash
\let\boxast\textboxast
\let\boxcircle\textboxcircle
\let\boxbox\textboxbox
\let\Valve\textValve
\let\multimapboth\textmultimapboth
\let\shuffle\textshuffle
\let\uplus\textuplus
\let\bigdoublewedge\textbigdoublewedge
\let\bigdoublevee\textbigdoublevee
\let\Join\textJoin
\let\fatsemi\textfatsemi
\let\circplus\textcircplus
\let\minusdot\textminusdot
\let\dottimes\textdottimes
\let\dtimes\textdtimes
\let\odiv\textodiv
\let\invneg\textinvneg
\let\sqdoublecap\textsqdoublecap
\let\capdot\textcapdot
\let\sqdoublecup\textsqdoublecup
\let\doublewedge\textdoublewedge
\let\doublevee\textdoublevee
\let\doublebarwedge\textdoublebarwedge
\let\veedoublebar\textveedoublebar
\let\eqdot\texteqdot
\let\neqdot\textneqdot
\let\coloncolonequals\textcoloncolonequals
\let\leqslant\textleqslant
\let\nleqslant\textnleqslant
\let\geqslant\textgeqslant
\let\ngeqslant\textngeqslant
\let\lessapprox\textlessapprox
\let\nlessapprox\textnlessapprox
\let\gtrapprox\textgtrapprox
\let\ngtrapprox\textngtrapprox
\let\lneq\textlneq
\let\gneq\textgneq
\let\lnapprox\textlnapprox
\let\gnapprox\textgnapprox
\let\lesseqqgtr\textlesseqqgtr
\let\gtreqqless\textgtreqqless
```

```
\let\eqslantless\texteqslantless
\let\eqslantgtr\texteqslantgtr
\let\leftslice\textleftslice
\let\rightslice\textrightslice
\let\preceq\textpreceq
\let\npreceq\textnpreceq
\let\succeq\textsucceq
\let\nsucceq\textnsucceq
\let\precneq\textprecneq
\let\succneq\textsuccneq
\let\preceqq\textpreceqq
\let\npreceqq\textnpreceqq
\let\succeqq\textsucceqq
\let\nsucceqq\textnsucceqq
\let\precneqq\textprecneqq
\let\succneqq\textsuccneqq
\let\precapprox\textprecapprox
\let\nprecapprox\textnprecapprox
\let\succapprox\textsuccapprox
\let\nsuccapprox\textnsuccapprox
\let\precnapprox\textprecnapprox
\let\succnapprox\textsuccnapprox
\let\subseteqq\textsubseteqq
\let\nsubseteqq\textnsubseteqq
\let\supseteqq\textsupseteqq
\let\nsupseteqq\textnsupseteqq
\let\dashV\textdashV
\let\ndashV\textndashV
\let\Dashv\textDashv
\let\nDashv\textnDashv
\let\DashV\textDashV
\let\nDashV\textnDashV
\let\downmodels\textdownmodels
\let\ndownmodels\textndownmodels
\let\upmodels\textupmodels
\let\nupmodels\textnupmodels
\let\upspoon\textupspoon
\let\interleave\textinterleave
\let\sslash\textsslash
\let\pentagon\textpentagon
\let\varhexagon\textvarhexagon
\let\jinferior\textjinferior
\let\slashdiv\textslashdiv
\let\fivedots\textfivedots
\let\oo\textoo
\let\GaPa\textGaPa
\let\HaPa\textHaPa
\let\ViPa\textViPa
\let\AcPa\textAcPa
\let\SePa\textSePa
\let\ZwPa\textZwPa
\let\fullnote\textfullnote
\let\halfnote\texthalfnote
\let\Vier\textVier
```

```
  \let\Acht\textAcht
  \let\Sech\textSech
  \let\Zwdr\textZwdr
  \let\Mundus\textMundus
  \let\Moon\textMoon
  \let\ManFace\textManFace
  \let\WomanFace\textWomanFace
  \let\Fax\textFax
  \let\Fire\textFire
  \let\Bicycle\textBicycle
  \let\Gentsroom\textGentsroom
  \let\Ladiesroom\textLadiesroom
  \let\ccnc\textccnc
  \let\ccsa\textccsa
  \let\Info\textInfo
  \let\CESign\textCESign
  \let\neg\textneg
  \let\times\texttimes
  \let\div\textdiv
  \let\pm\textpm
  \let\cdot\textcdot
}% \psdmapshortnames
\newcommand*{\psdaliasnames}{%
  \let\epsdice\HyPsd@DieFace
  \let\fcdice\HyPsd@DieFace
  \let\MoonPha\HyPsd@MoonPha
  \let\mathdollar\textdollar
  \let\EyesDollar\textdollar
  \let\binampersand\textampersand
  \let\with\textampersand
  \let\mathunderscore\textunderscore
  \let\textvertline\textbar
  \let\mathsterling\textsterling
  \let\pounds\textsterling
  \let\brokenvert\textbrokenbar
  \let\mathsection\textsection
  \let\S\textsection
  \let\mathparagraph\textparagraph
  \let\MultiplicationDot\textperiodcentered
  \let\Squaredot\textperiodcentered
  \let\vartimes\textmultiply
  \let\MVMultiplication\textmultiply
  \let\eth\dh
  \let\crossd\textcrd
  \let\textbard\textcrd
  \let\bard\textcrd
  \let\textcrh\texthbar
  \let\crossh\texthbar
  \let\planck\texthbar
  \let\eng\ng
  \let\engma\ng
  \let\crossb\textcrb
  \let\textbarb\textcrb
  \let\barb\textcrb
```

```
\let\Florin\textflorin
\let\hv\texthvlig
\let\hausak\texthtk
\let\crossnilambda\textcrlambda
\let\barlambda\textcrlambda
\let\lambdabar\textcrlambda
\let\lambdaslash\textcrlambda
\let\textnrleg\textPUnrleg
\let\textpipevar\textpipe
\let\textdoublepipevar\textdoublepipe
\let\textdoublebarpipevar\textdoublebarpipe
\let\textcrg\textgslash
\let\textdblig\textPUdblig
\let\textqplig\textPUqplig
\let\textcentoldstyle\textslashc
\let\textbarc\textslashc
\let\inva\textturna
\let\vara\textscripta
\let\invscripta\textturnscripta
\let\rotvara\textturnscripta
\let\hookb\texthtb
\let\hausab\texthtb
\let\varopeno\textopeno
\let\curlyc\textctc
\let\taild\textrtaild
\let\hookd\texthtd
\let\hausad\texthtd
\let\er\textrhookschwa
\let\epsi\textniepsilon
\let\hookrevepsilon\textrhookrevepsilon
\let\closedrevepsilon\textcloserevepsilon
\let\barj\textbardotlessj
\let\hookg\texthtg
\let\varg\textscriptg
\let\vod\textipagamma
\let\invh\textturnh
\let\udesc\textturnh
\let\hookh\texthth
\let\voicedh\texthth
\let\hookheng\texththeng
\let\ibar\textbari
\let\vari\textniiota
\let\tildel\textltilde
\let\latfric\textbeltl
\let\taill\textrtaill
\let\lz\textlyoghlig
\let\invm\textturnm
\let\rotm\textturnm
\let\legm\textturnmrleg
\let\labdentalnas\textltailm
\let\emgma\textltailm
\let\nj\textltailn
\let\enya\textltailn
\let\tailn\textrtailn
```

```
\let\closedniomega\textcloseomega
\let\varomega\textcloseomega
\let\invr\textturnr
\let\rotr\textturnr
\let\invlegr\textturnlonglegr
\let\tailinvr\textturnrrtail
\let\legr\textlonglegr
\let\tailr\textrtailr
\let\flapr\textfishhookr
\let\flap\textfishhookr
\let\tails\textrtails
\let\curlyesh\textctesh
\let\clickt\textturnt
\let\tailt\textrtailt
\let\ubar\textbaru
\let\rotOmega\textniupsilon
\let\invv\textturnv
\let\pwedge\textturnv
\let\invw\textturnw
\let\rotw\textturnw
\let\invy\textturny
\let\roty\textturny
\let\tailz\textrtailz
\let\curlyz\textctz
\let\curlyyogh\textctyogh
\let\ejective\textglotstop
\let\glottal\textglotstop
\let\reveject\textrevglotstop
\let\clickc\textstretchc
\let\textstretchcvar\textstretchc
\let\clickb\textbullseye
\let\textObullseye\textbullseye
\let\textctjvar\textctj
\let\textturnsck\textturnk
\let\dz\textdzlig
\let\tesh\textteshlig
\let\digamma\textdigammagreek
\let\hardsign\cyrhrdsn
\let\softsign\cyrsftsn
\let\hebsin\hebshin
\let\textsck\textPUsck
\let\textscm\textPUscm
\let\textscp\textPUscp
\let\textrevscr\textPUrevscr
\let\textrhooka\textPUrhooka
\let\textrhooke\textPUrhooke
\let\textrhookepsilon\textPUrhookepsilon
\let\textrhookopeno\textPUrhookopeno
\let\textdoublevertline\textbardbl
\let\dag\textdagger
\let\ddagger\textdaggerdbl
\let\ddag\textdaggerdbl
\let\mathellipsis\textellipsis
\let\EurDig\texteuro
```

```
\let\EURdig\texteuro
\let\EurHv\texteuro
\let\EURhv\texteuro
\let\EurCr\texteuro
\let\EURcr\texteuro
\let\EurTm\texteuro
\let\EURtm\texteuro
\let\Eur\texteuro
\let\Denarius\textDeleatur
\let\agemO\textmho
\let\EstimatedSign\textestimated
\let\Ecommerce\textestimated
\let\bindnasrepma\textinvamp
\let\parr\textinvamp
\let\MVRightArrow\textrightarrow
\let\MVRightarrow\textrightarrow
\let\MVArrowDown\textdownarrow
\let\Force\textdownarrow
\let\textglobrise\textnearrow
\let\textglobfall\textsearrow
\let\Lightning\textlightning
\let\Conclusion\textRightarrow
\let\dashedleftarrow\textdashleftarrow
\let\dashedrightarrow\textdashrightarrow
\let\varnothing\textemptyset
\let\owns\textni
\let\notni\textnotowner
\let\varprop\textpropto
\let\varangle\textsphericalangle
\let\Anglesign\textsphericalangle
\let\AngleSign\textsphericalangle
\let\notdivides\textnmid
\let\varowedge\textowedge
\let\varovee\textovee
\let\varint\textint
\let\varoint\textoint
\let\downtherefore\textbecause
\let\textdotdiv\textdotminus
\let\AC\textsim
\let\wreath\textwr
\let\nthickapprox\textnapprox
\let\VHF\texttriplesim
\let\notasymp\textnasymp
\let\Doteq\textdoteqdot
\let\corresponds\texthateq
\let\Corresponds\texthateq
\let\nequal\textneq
\let\Congruent\textequiv
\let\NotCongruent\textnequiv
\let\notequiv\textnequiv
\let\LessOrEqual\textleq
\let\LargerOrEqual\textgeq
\let\apprle\textlesssim
\let\apprge\textgtrsim
```

```
\let\varoplus\textoplus
\let\varominus\textominus
\let\varotimes\textotimes
\let\varoslash\textoslash
\let\varodot\textodot
\let\ocirc\textcircledcirc
\let\varocircle\textcircledcirc
\let\varoast\textcircledast
\let\oasterisk\textcircledast
\let\rightvdash\textvdash
\let\leftvdash\textdashv
\let\nleftvdash\textndashv
\let\downvdash\texttop
\let\upvdash\textbot
\let\nperp\textnupvdash
\let\models\textvDash
\let\rightmodels\textvDash
\let\rightVdash\textVdash
\let\rightModels\textVDash
\let\nrightvdash\textnvdash
\let\nrightmodels\textnvDash
\let\nmodels\textnvDash
\let\nrightVdash\textnVdash
\let\nrightModels\textnVDash
\let\lessclosed\textlhd
\let\gtrclosed\textrhd
\let\leqclosed\textunlhd
\let\trianglelefteq\textunlhd
\let\geqclosed\textunrhd
\let\trianglerighteq\textunrhd
\let\Bowtie\textbowtie
\let\varcurlyvee\textcurlyvee
\let\varcurlywedge\textcurlywedge
\let\doublecap\textCap
\let\doublecup\textCup
\let\varsqsubsetneq\textsqsubsetneq
\let\varsqsupsetneq\textsqsupsetneq
\let\nlessclosed\textntriangleleft
\let\ngtrclosed\textntriangleright
\let\Clocklogo\textclock
\let\ClockLogo\textclock
\let\baro\textstmaryrdbaro
\let\varparallelinv\textbbslash
\let\CleaningA\textCircledA
\let\Kutline\textCuttingLine
\let\CutLine\textCuttingLine
\let\Cutline\textCuttingLine
\let\MoveUp\textUParrow
\let\APLup\textbigtriangleup
\let\Bleech\textbigtriangleup
\let\MoveDown\textDOWNarrow
\let\APLdown\textbigtriangledown
\let\Diamond\textdiamond
\let\varbigcirc\textbigcircle
```

```
\let\Telefon\textPhone
\let\Box\textboxempty
\let\CheckedBox\textCheckedbox
\let\XBox\textCrossedbox
\let\CrossedBox\textCrossedbox
\let\rightpointleft\textHandLeft
\let\leftpointright\textHandRight
\let\PointingHand\textHandRight
\let\Pointinghand\textHandRight
\let\Radiation\textRadioactivity
\let\Yinyang\textYinYang
\let\YingYang\textYinYang
\let\Yingyang\textYinYang
\let\Frowny\textfrownie
\let\Smiley\textsmiley
\let\Sun\textsun
\let\Mercury\textmercury
\let\textfemale\textPUfemale
\let\female\textPUfemale
\let\venus\textPUfemale
\let\Venus\textPUfemale
\let\Female\textPUfemale
\let\Earth\textearth
\let\mars\textmale
\let\Mars\textmale
\let\Male\textmale
\let\Jupiter\textjupiter
\let\Saturn\textsaturn
\let\Uranus\texturanus
\let\Neptune\textneptune
\let\Pluto\textpluto
\let\Aries\textaries
\let\Taurus\texttaurus
\let\Gemini\textgemini
\let\Cancer\textcancer
\let\Leo\textleo
\let\Virgo\textvirgo
\let\Libra\textlibra
\let\Scorpio\textscorpio
\let\Sagittarius\textsagittarius
\let\Capricorn\textcapricornus
\let\Aquarius\textaquarius
\let\Pisces\textpisces
\let\spadesuit\textspadesuitblack
\let\Heart\textheartsuitwhite
\let\heartsuit\textheartsuitwhite
\let\diamondsuit\textdiamondsuitwhite
\let\clubsuit\textclubsuitblack
\let\eighthnote\textmusicalnote
\let\Recycling\textrecycle
\let\VarFlag\textFlag
\let\textxswup\textdsmilitary
\let\textuncrfemale\textPUuncrfemale
\let\Football\textSoccerBall
```

```
  \let\CutLeft\textScissorRightBrokenBottom
  \let\Cutright\textScissorRightBrokenBottom
  \let\RightScissors\textScissorRight
  \let\Leftscissors\textScissorRight
  \let\Letter\textEnvelope
  \let\Writinghand\textWritingHand
  \let\checkmark\textCheckmark
  \let\davidstar\textDavidStar
  \let\llbracket\textlbrackdbl
  \let\rrbracket\textrbrackdbl
  \let\RightTorque\textlcurvearrowdown
  \let\Righttorque\textlcurvearrowdown
  \let\LeftTorque\textrcurvearrowdown
  \let\Lefttorque\textrcurvearrowdown
  \let\textvarobar\textobar
  \let\circledbslash\textobslash
  \let\obackslash\textobslash
  \let\varobslash\textobslash
  \let\odplus\textobot
  \let\varolessthan\textolessthan
  \let\varogreaterthan\textogreaterthan
  \let\divdot\textminusdot
  \let\doublesqcap\textsqdoublecap
  \let\doublesqcup\textsqdoublecup
  \let\merge\textdoublevee
  \let\leftVdash\textdashV
  \let\nleftVdash\textndashV
  \let\leftmodels\textDashv
  \let\nleftmodels\textnDashv
  \let\leftModels\textDashV
  \let\nleftModels\textnDashV
  \let\varparallel\textsslash
  \let\textheng\textPUheng
  \let\textlhookfour\textPUlhookfour
  \let\textscf\textPUscf
  \let\textaolig\textPUaolig
  \let\Ganz\textfullnote
  \let\Halb\texthalfnote
  \let\Womanface\textWomanFace
  \let\Faxmachine\textFax
  \let\CEsign\textCESign
}% \psdaliasnames
⟨/psdextra⟩
```

48 End of file hycheck.tex

```
⟨*check⟩
\typeout{}
\begin{document}
\end{document}
⟨/check⟩
```

49 Index

Numbers written in italic refer to the page where the corresponding entry is described; numbers underlined refer to the code line of the definition; numbers in roman refer to the code lines where the entry is used.

Symbols

\! 195, 220, 1766
\" 202, 227, 3061, 14384, 14700, 14712, 14724, 14850, 14938, 14952, 14960, 14975, 14987, 15004, 15018, 15029, 15030, 15044, 15056, 15063, 15116, 15162, 15191, 15222, 15397, 15411, 15419, 15433, 15447, 15464, 15478, 15489, 15490, 15505, 15517, 15525, 15783, 16399, 16413, 16569, 16583, 16827, 16829, 16844, 16847, 16849, 16851, 16853, 16855, 16865, 16867, 16869, 16871, 16878, 16881, 16883, 16885, 16891, 16893, 16899, 16901, 16907, 16909, 17119, 17121, 17271, 17273, 17287, 17289, 17309
\# . 540, 1851, 1852, 4769, 4781, 4783, 4799, 4831, 4891, 8702, 8704, 9446, 9455, 9490, 10333, 11981, 11992, 12028, 12266, 12275, 12315, 14304
\$ 184, 209, 325, 541, 4771, 4890
\% . 542, 1766, 1826, 1827, 4768, 4778, 4780, 4832, 8704
\& . . . 185, 210, 543, 4772, 4784, 4786, 12038
\' 203, 228, 3001, 3015, 3056, 3058, 3059, 3060, 3061, 3066, 3067, 3069, 3074, 3080, 3084, 3085, 3088, 3131, 3132, 3137, 3138, 3139, 3140, 3141, 3142, 3143, 3144, 3146, 3149, 3156, 3157, 3158, 3159, 3162, 3168, 3181, 14382, 14697, 14709, 14721, 14932, 14948, 14956, 14969, 14983, 14989, 14998, 15014, 15023, 15024, 15038, 15052, 15058, 15082, 15084, 15085, 15086, 15089, 15091, 15092, 15093, 15101, 15159, 15188, 15219, 15391, 15407, 15415, 15427, 15443, 15449, 15458, 15474, 15483, 15484, 15499, 15513, 15519, 15539, 15541, 15655, 15657, 15675, 15677, 15711, 15713, 15723, 15725, 15785, 15787, 15908, 15910, 15916, 15918, 15921, 15924, 16403, 16423, 16573, 16593, 17135, 17137, 17159, 17161, 17199, 17201, 17267, 17269, 19509, 19514, 19519, 19524, 19529, 19534, 19539, 19544, 19549, 19554, 19559, 19564, 19569, 19574, 19579, 19584, 19589, 19594, 19599, 19604, 19609, 19614, 19619, 19624
\(. 190, 215, 326, 760, 763, 765, 1768, 14450, 14770
\) . 191, 216, 327, 732, 738, 741, 1769, 14451, 14772
* 329
\+ 200, 225, 330
\- 201, 226
\. 198, 223, 323, 3512, 3925, 14703, 14715, 14727, 14791, 15087, 15094, 15114, 15165, 15194, 15228, 15305, 15306, 15547, 15549, 15577, 15579, 15597, 15599, 15636, 15667, 15669, 15789, 15791, 15992, 15994, 16000, 16002, 17051, 17053, 17063, 17065, 17103, 17105, 17111, 17113, 17163, 17165, 17171, 17173, 17203, 17205, 17207, 17209, 17219, 17221, 17227, 17229, 17275, 17277, 17283, 17285, 17291, 17293, 17315
\/ . 194, 219, 673, 674, 675, 743, 1535, 8262
\: 189, 214
\; 199, 224
\< 196, 221
\= . . . 167, 173, 180, 183, 14705, 14717, 14729, 15107, 15171, 15200, 15227, 15527, 15529, 15569, 15571, 15621, 15623, 15624, 15695, 15697, 15755, 15757, 16004, 16006, 16861, 16863, 16887, 16889, 17107, 17109
\> 197, 222
\? 331
\@ 3052
\@@@ 2210
\@@BOOKMARK 14365, 14368, 14426, 14491, 14498
\@@Listbox 12670, 12701, 13272, 13306, 13628, 13669
\@@Menu 12911, 12919
\@@PasswordField 12860, 12866
\@@Radio 12655, 12676, 12909, 12933, 13257, 13278, 13613, 13634
\@@TextField . . . 12862, 12877
\@@commahyperpage 8396, 8397
\@@hyper@@readexternallink 5194, 5196
\@@hyperref 4994, 4995
\@@wrindex 8297, 8298
\@@writetorep . . . 14226, 14232
\@Alph 7009, 7011
\@BIBLABEL . 7675, 7681, 7687
\@BOOKMARK . 14365, 14367
\@CheckBox 6181, 10398, 12790, 12826, 12964, 13394, 13771
\@ChoiceMenu 6178, 10401, 12608, 12829, 12899, 13209, 13565
\@Form . . . 5854, 10388, 12360, 12816, 12843, 13098, 13479
\@Gauge . . 6187, 10392, 12545, 12820, 12848, 12985, 13476
\@Localurlfalse 10341
\@Localurltrue 10338
\@M 2253, 4877
\@MM 7431
\@PushButton 6184, 10404, 12712, 12832, 12945, 13316, 13685
\@Refstar 4742, 8505
\@Reset . . . 6193, 10407, 12763, 12835, 12961, 13369, 13742
\@Submit . 6190, 10410, 12743, 12838, 12958, 13346, 13719
\@TextField 6175, 10395, 12576, 12823, 12851, 13179, 13528
\@addtoreset . . 8194, 8195, 8210

\@alph 7005, 7007
\@anchorcolor 3491, 9415, 9510, 10460, 11949, 12236
\@arabic 6910, 6926, 7004
\@auxout 2204, 5042, 5358, 7695, 7710, 7737, 7747, 7766, 7772, 7796
\@backslashchar . 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 334, 1069, 1728, 1732, 1735, 1873, 1890, 1896, 1900, 1908, 4084, 4794, 8717, 8727
\@baseurl 3498, 3500, 5252, 9154, 9157, 9400, 9402, 9687, 9689, 10210, 10220, 10306, 10308, 10843, 10845, 11227, 11241, 11934, 11936, 12134, 12148, 12222, 12224
\@bibitem 7702, 7744
\@biblabel 7675, 7733
\@bookmarkopenstatus . . 4619, 4636, 14286
\@bookmarksopenlevel . . 3452, 3454, 4622
\@bsphack 2197, 5035, 7770
\@capstartfalse 7565
\@caption 7530, 7542, 7586, 7623, 7625
\@captype . . . 2206, 7525, 7529, 7533, 7540, 7547, 7602, 7616, 7620, 7623
\@car . . . 1351, 1367, 1385, 1405, 3431, 5474
\@chapter 14622, 14623
\@cite 7831, 7837
\@cite@opt . . 7832, 7838, 7842, 7852
\@citebordercolor . . 3546, 4147
\@citecolor 3492
\@citedata@opt 7833, 7839, 7841
\@citedatax 7848, 7853
\@citedatax@opt . . . 7845, 7851
\@citeseppen 7830, 7836
\@commahyperpage . 8391, 8396
\@cons 8191
\@ctrerr 6977, 6986
\@currDisplay 5942, 12620, 12683, 12928, 12942, 13221, 13285, 13577, 13644
\@currValue . . 5944, 5946, 5948, 12681, 12692, 12928, 12939, 13283, 13293, 13642, 13659
\@currentHlabel 7056
\@currentHpage 7856, 7861, 7868, 7919, 7930, 7937
\@currentHref 2212, 5087, 5387, 6298, 7035, 7037, 7047, 7049, 7056, 7069, 7071, 7081, 7109, 7120, 7122, 7140, 7161, 7165, 7170, 7193, 7234, 7241, 7243, 7257, 7259, 7324, 7347, 7357, 7359, 7360, 7416, 7445, 7545, 7571, 7575, 7603, 7605, 7775, 7965, 7992, 8005, 8030, 8170, 14603, 14616, 14627, 14654, 14671
\@currentcounter . . . 6859, 6877, 7434
\@currentlabel 7435, 7768, 7775, 8175, 8182
\@currentlabelname . 2202, 7325, 7348, 7417, 7446, 7550
\@currentlabstr 2201, 2209
\@currname 2323
\@curropt 12617, 12618, 12679, 12680, 12917, 12924, 12925, 12927, 12934, 12935, 12937, 13218, 13219, 13281, 13282, 13574, 13575, 13640, 13641
\@dblarg 7540, 7623
\@documentclasshook . . . 4228
\@ehc . . 2575, 2683, 2709, 2725, 2760, 2799, 2806, 2817, 2823, 2861, 4322, 4939, 5216, 5568, 5692, 5886, 5919, 6113, 6166, 12721, 12774, 13326, 13380, 13695, 13753
\@ehd . 63, 274, 280, 304, 7526, 7617
\@elt . . . 6898, 6900, 6901, 6906
\@endForm 5855, 10391, 12544, 12819, 12847, 13152, 13506
\@eqncr 7181
\@eqnstarfalse 7155, 7184
\@eqnstartrue 7181
\@esphack 2218, 5046, 7780, 8309
\@extra@b@citeb . . . 7660, 7663, 7680, 7685, 7705, 7725
\@extra@binfo . 7659, 7662, 7666
\@fifthoffive . . . 5029, 8457, 8590
\@filebordercolor . . . 3547, 4145, 9082, 9084, 10023, 10025, 10546, 10548, 11612
\@filecolor . . . 3481, 3493, 9103, 9629, 9646, 10041, 10552
\@firstoffive . . . 4732, 8497, 8595
\@firstofone 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 627, 660, 1271, 2678, 4222, 4621, 5015, 5382, 5399, 5820, 5826, 6076, 6832, 7002, 7014, 7538, 7621, 7923, 8251, 9308, 13052, 13858, 13875, 13893, 14325, 14337
\@firstoftwo 341, 349, 619, 643, 899, 915, 2086, 2340, 2347, 5274, 6377, 7310, 7333, 14661
\@fnsymbol 7003
\@footnotemark 7287, 7353, 7371, 7454, 7466, 7468, 7480, 7481, 7512, 7514
\@footnotetext 7286, 7293, 7330, 7370, 7467, 7469, 7483, 7484, 7505
\@for . 3523, 5464, 12617, 12679, 12917, 12924, 12934, 13218, 13281, 13574, 13640
\@fourthoffive . 5030, 8585, 8592
\@gobble 49, 56, 117, 259, 264, 566, 567, 568, 569, 606, 607, 608, 609, 629, 646, 647, 648, 657, 659, 922, 1208, 1269, 1288, 1301, 1305, 1368, 1431, 1432, 1439, 1444, 1458, 1463, 2060, 2224, 2519, 2531, 2684, 3898, 4215, 4220, 4242, 4251, 4257, 4324, 4636, 4759, 5378, 5380, 5805, 6066, 6336, 6337, 6343, 6347, 6348, 6350, 6351, 6363, 6365, 6381, 6382, 6385, 6386, 6388, 6441, 6660, 6806, 6826, 6830, 7527, 7618, 8650, 9310, 10729, 10732, 12327, 13008, 13024, 13029, 13099, 13480, 14273, 14274, 14275, 14276, 14323, 14335
\@gobble@om 7973, 7975
\@gobble@som 7974
\@gobblefour 572, 683, 965, 966, 967, 3706
\@gobbleopt 6388, 6390
\@gobblethree 7897

\@gobbletwo 570, 650, 676, 684, 685, 964, 1386, 1463, 1467, 2407, 3704, 3705, 4261, 5398, 5400, 5753, 6339, 6353, 6367, 6376, 6384, 6388, 8574, 13009, 14613
\@harvarditem 7785, 7787
\@hyper@@anchor . . 5302, 5303
\@hyper@itemfalse . . 6839, 6847, 6874
\@hyper@itemtrue 6840
\@hyper@launch . . . 5222, 5231, 9107, 10047, 10621, 11630
\@hyper@linkfile . . . 5203, 5206, 5210, 5242
\@hyper@readexternallink 5197, 5201
\@hyperdef 5002, 5003
\@hyperpage 8388, 8389
\@hyperref 4982, 4994
\@ifclassloaded 6513, 7857, 9313
\@ifnextchar . . 12, 88, 103, 123, 677, 4884, 4982, 5002, 5150, 5854, 6175, 6178, 6181, 6184, 6187, 6190, 6193, 6388, 6397, 6406, 7470, 7488, 7785, 7843, 11252, 11541, 11555, 14365, 14368
\@ifpackagelater 6854
\@ifpackageloaded 809, 950, 2192, 4205, 4415, 7064, 7097, 7134, 7267, 7367, 7383, 7423, 7599, 7755, 7828, 8257, 8258, 8259, 8515, 12214, 13157
\@ifpackagewith 4203
\@ifstar 66, 8554
\@ifundefined 34, 270, 276, 317, 353, 494, 549, 628, 668, 744, 820, 821, 822, 876, 886, 899, 918, 921, 1320, 1415, 1416, 1540, 2143, 2193, 2320, 2339, 2340, 2383, 2496, 2627, 2648, 2649, 3306, 3352, 3360, 3367, 3389, 3429, 4208, 4237, 4239, 4412, 4413, 4934, 5347, 5378, 5390, 5563, 5881, 6434, 6759, 6896, 6916, 6923, 6946, 6961, 7098, 7101, 7102, 7133, 7158, 7186, 7249, 7265, 7274, 7276, 7283, 7523, 7531, 7549, 7656, 7658, 7669, 7876, 7892, 8014, 8027, 8042, 8165, 8192, 8199, 8208, 8209, 8219, 8223, 8224, 8231, 8325, 8516, 8562, 8563, 8607, 8608, 8610, 8611, 8652, 8758, 8789, 8820, 9019, 9029, 10483, 10586, 10925, 10926, 10972, 11015, 11094, 11279, 12997, 13099, 13155, 13480, 13856, 13867, 14282, 14594, 14621, 14631, 14641
\@indexfile . . . 8301, 8316, 8331, 8335, 8345
\@inmathwarn 534, 535
\@inpenc@undefined@ . . . 1935
\@kernel@refstepcounter . 6843
\@latex@ 6428, 6429
\@latex@error 7526, 7617
\@latex@warning . . . 5022, 8432, 8452, 8469, 8601
\@lbibitem 7676, 7732
\@linkbordercolor . . 3548, 4142, 9037, 10450
\@linkcolor 3490, 11280
\@linkdim 473, 9464, 9465, 9473, 9474, 9475, 9544, 9545, 9557, 9558, 9559, 9581, 9582, 9595, 9596, 9597, 9621, 9622, 9635, 9636, 9637, 12002, 12003, 12011, 12012, 12013, 12284, 12285, 12298, 12299, 12300
\@listctr 7711, 7748
\@m 9338, 10274, 10418, 10776, 11732
\@mainaux . . 5406, 6789, 6797, 13045, 13048, 13076, 13091
\@makecaption 7566, 7568, 7636
\@makefnmark 7362, 7517
\@makefntext 7436
\@makeother 166, 167, 179, 180, 182, 183, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 4775, 4784, 8689, 14454, 14457, 14481, 14484
\@menubordercolor . 3549, 4144, 9376, 9378, 10121, 10123, 10659, 10661, 11534
\@menucolor 3495, 9391, 10132, 10665
\@mkboth 650, 14613
\@mpfn 7290, 7489, 7502
\@mpfootnotetext . . 7293, 7306, 7307, 7372
\@mycount 14430, 14440
\@namedef . . . 2163, 2165, 2167, 2169, 2171, 2173, 2175, 2177, 2179, 2181, 2183, 2184, 2185, 2186, 2187, 2188, 2189, 2190, 2191, 2343, 2637, 2638, 2639, 2640, 2641, 2642, 2643, 3297, 3310, 5574, 5575, 5576, 5577, 5897, 5898, 7180, 7183, 7760, 7761, 7762, 7763
\@namerefstar 4738, 8502
\@nameuse . . 2206, 2634, 5580, 5889
\@ne 2594, 2748, 4533, 4607, 4909, 6515, 6516, 6523, 7860, 7862, 7871, 7874, 7875, 7888, 8780, 9951, 9952, 9957, 10822, 11773, 12551, 13161, 13515
\@newl@bel 5341, 7662
\@nil 285, 312, 1263, 1266, 1274, 1351, 1369, 1387, 1403, 1405, 1408, 1411, 1414, 1944, 1946, 1962, 1964, 3431, 4816, 4820, 4825, 5269, 5277, 5283, 5285, 5474, 6057, 6060, 6079, 6416, 6419, 6426, 6428, 6429, 6542, 6590, 6591, 6593, 6616, 6633, 6687, 6689, 7104, 7113, 7115, 7127, 8375, 8377, 8384, 8407, 8410, 8420, 8436, 8439, 8609, 8640, 8713, 8719, 8723, 8729, 10694, 10696, 13865, 13878, 13884, 14314, 14317, 14320, 14329, 14332, 14341
\@nocnterr 8209, 8224
\@nocounterr 8208, 8223
\@number 7002, 7923
\@nx . . . 8212, 8227, 8230, 8232
\@onelevel@sanitize . 2400, 2404, 2606, 3430, 4299, 4329, 4343, 4850, 5264, 5267, 5280, 5294, 5564, 5798, 5882, 6643, 6645, 6899, 6918, 7043, 7998, 8364,

8483, 9809, 14311
\@outlinefile 14284, 14373, 14468, 14470, 14547, 14549
\@pagerefstar . 4734, 8499, 8520, 8527, 8536, 8545
\@pagesetref 8448
\@parboxrestore 7433, 7558, 7631
\@parcount 14432, 14440
\@part 14640, 14644
\@partaux 5404
\@pdfauthor . 3722, 4150, 9214, 9667, 10155, 10896, 11151, 12063
\@pdfborder 3381, 3567, 3568, 3569, 3576, 3580, 3603, 3605, 4702, 8970, 9827, 10448, 11029, 11112, 11532, 11545, 11560, 11581, 11609, 11640, 11669, 11779, 11875, 12043
\@pdfborderstyle . . . 3382, 3584, 3585, 3586, 3595, 3599, 3607, 3609, 4703, 6028, 8971, 9828, 10449, 11030, 11113, 11533, 11546, 11561, 11582, 11610, 11641, 11670, 11780, 11876, 12044
\@pdfcreationdate 3744, 4153, 9218, 9220, 9659, 9661, 10147, 10149, 11126, 11128, 12055, 12057
\@pdfcreator . 3734, 3739, 4152, 9217, 9658, 10146, 10899, 11150, 12054
\@pdfdirection 9177, 9725, 10190, 10855, 11207, 12114
\@pdfduplex 9183, 9731, 10196, 10861, 11213, 12120
\@pdfhighlight 3553, 3561, 3563, 4148, 11028, 11111, 11531, 11580, 11608, 11639
\@pdfkeywords 3763, 4156, 9230, 9656, 10160, 10904, 11152, 12052
\@pdflang 4023, 4025, 4026, 4028, 4030, 4032, 4038, 4068, 4069, 4071, 4092, 4096, 4098, 4115, 4124, 4131, 4163, 9203, 9205, 9753, 9755, 10230, 10232, 11237, 11239, 12144, 12146
\@pdfm@dest . . 9771, 9830, 9834
\@pdfm@mark 6777, 9770, 9822, 9842, 9856, 9858, 9872, 9874, 9879, 9880, 9910, 9934, 9936, 9941, 9959, 9982, 10016, 10052, 10084, 10114, 10142, 10211, 10238, 13483, 13484, 13485, 13504, 13522, 13525, 13555, 13650, 13677, 13708, 13733, 13761, 13790, 13801, 13834, 13842, 14518
\@pdfmoddate 3750, 4154, 9222, 9224, 9663, 9665, 10151, 10153, 11130, 11134, 12059, 12061
\@pdfnonfullscreenpagemode . . 9176, 9724, 10189, 10854, 11206, 12113
\@pdfnumcopies 9192, 9194, 9740, 9742, 10205, 10207, 10870, 10872, 11222, 11224, 12129, 12131
\@pdfpageduration . 3508, 9275, 9279, 9284, 10255, 10257, 10260, 10785, 10787, 10790, 11068, 11070, 11078
\@pdfpagelayout 9202, 9752, 10229, 10875, 10877, 11236, 12143
\@pdfpagemode 4401, 4402, 4632, 4633, 4642, 4643, 9156, 9708, 10224, 10842, 11190, 12097
\@pdfpagescrop 3968, 4158, 9141, 9145, 9691, 9692, 9713, 9715, 10236, 10238, 10831, 10833, 11195, 11197, 12102, 12104
\@pdfpagetransition . 3504, 9251, 9255, 9260, 10244, 10246, 10249, 10674, 10676, 10678, 11051, 11053, 11061
\@pdfpicktraybypdfsize 9184, 9186, 9732, 9734, 10197, 10199, 10862, 10864, 11214, 11216, 12121, 12123
\@pdfprintarea 9180, 9728, 10193, 10858, 11210, 12117
\@pdfprintclip 9181, 9729, 10194, 10859, 11211, 12118
\@pdfprintpagerange 3674, 4162, 9188, 9190, 9736, 9738, 10201, 10203, 10866, 10868, 11218, 11220, 12125, 12127
\@pdfprintscaling . . 9182, 9730, 10195, 10860, 11212, 12119
\@pdfproducer 3728, 4151, 9226, 9228, 9668, 9670, 10156, 10158, 10799, 10800, 10804, 10807, 10808, 10900, 10902, 11137, 11141, 11666, 11667, 11772, 11774, 11776, 11872, 11873, 12064, 12066
\@pdfremotestartview 3929, 3931, 3932, 3955, 3959, 3961, 3962, 3964, 4160, 9095, 10032, 11620
\@pdfstartpage 3912, 3914, 4161, 9162, 9166, 9695, 9700, 10213, 10217, 10835, 10839, 11177, 11182, 12084, 12089
\@pdfstartview 3919, 3921, 4159, 9164, 9166, 9697, 9701, 10215, 10217, 10837, 11179, 11183, 12086, 12090
\@pdfsubject . 3757, 4155, 9216, 9672, 10145, 10898, 11149, 12068
\@pdftempa . . . 5208, 5209, 5212
\@pdftempwordfile . . 5199, 5209
\@pdftempwordrun . 5200, 5212
\@pdftitle 3716, 4149, 9215, 9657, 10144, 10897, 11148, 12053
\@pdftrapped 3768, 3771, 3774, 3783, 3792, 4157, 9231, 9233, 10161, 10163, 11153
\@pdfview . . . 3900, 8952, 8960, 9777, 9781, 9785, 9789, 9793, 9797, 9798, 9801, 9802, 9805, 9809, 9811, 9826, 10447, 10457, 10469, 10966, 10986, 11671, 11781, 11877, 12156
\@pdfviewarea 9178, 9726, 10191, 10856, 11208, 12115
\@pdfviewclip 9179, 9727, 10192, 10857, 11209, 12116
\@pdfviewparams 3902, 3904, 10966, 10986, 11672, 11782, 11878, 12157
\@percentchar 4779, 4780, 4832, 14288
\@processme 5930, 5931, 9257, 9263,

9281, 9287, 11255, 11256, 11378, 11379, 11382, 11383
\@protected@testopt 680
\@protected@testopt@xargs 681
\@refstar 4730, 8496
\@runbordercolor . . . 3550, 4146, 9116, 9118, 10059, 10061, 10640, 10642, 11643
\@runcolor . . 3496, 9136, 10075, 10646
\@safe@activesfalse 633
\@safe@activestrue 632
\@savsf 8955, 8963
\@schapter 14610, 14611
\@secondoffive 4736, 8458, 8459, 8500
\@secondoftwo 338, 616, 619, 626, 899, 913, 1337, 2088, 2339, 2340, 2349, 2351, 5168, 5272, 7312, 7335, 13014, 13017, 13020, 13023, 13027, 13028, 13031, 14663
\@sect 14658, 14659
\@seqncr 7181
\@serial@counter . 14380, 14428, 14430, 14431
\@setminipage 7560, 7633
\@setref 8427, 8428, 8465
\@sharp 7104, 7110
\@skiphyperreffalse . 6848, 7691, 7703
\@skiphyperreftrue . 7677, 7703
\@spaces 262
\@spart 14650, 14651
\@ssect 14596, 14597
\@tempa 7385, 7389, 7392, 7404
\@tempb 7205, 7209
\@tempboxa . 9462, 9464, 9473, 9542, 9544, 9547, 9548, 9557, 9563, 9564, 9579, 9581, 9584, 9585, 9595, 9601, 9602, 9619, 9621, 9624, 9625, 9635, 9641, 9642, 12000, 12002, 12011, 12282, 12284, 12298
\@tempcnta 1914, 14238, 14239, 14240, 14241, 14242, 14244, 14247, 14248, 14249, 14255, 14257, 14259, 14349, 14350, 14351, 14354, 14355, 14356, 14357, 14358, 14566, 14567, 14568
\@tempdima . 2256, 6230, 6231, 6232, 6233, 6234, 6235, 6236, 6237, 12616, 12621, 12623, 12659, 12660, 12661, 12665, 12666, 12667, 12668, 13217, 13222, 13224, 13261, 13262, 13263, 13267, 13268, 13269, 13270, 13573, 13578, 13580, 13617, 13618, 13619, 13623, 13624, 13625, 13626
\@tempdimb 12620, 12621, 13221, 13222, 13577, 13578
\@tempswafalse 7847
\@tempswatrue 7817, 7820, 7823, 7844
\@temptokena 3275, 3280, 3283, 3285
\@tfor 7206
\@the@H@page 7889, 7926, 7928, 7929, 7930
\@thefnmark . 7291, 7302, 7396, 7435, 7452, 7459, 7490, 7503, 7510
\@thirdoffive 4740, 8503
\@thm 7270, 7271
\@typeset@protect 14579
\@undefined . 371, 374, 460, 462, 686, 2654, 2714, 3279, 4421, 4510, 6378, 6605, 6623, 6668, 7525, 7590, 7595, 7601, 7616, 8491, 10810, 10824, 15110, 15127, 16389, 16394, 16915
\@unexpandable@protect . 4987, 8362, 8481
\@unprocessedoptions . . . 4580
\@urlbordercolor . . . 3551, 4143, 9047, 9049, 10091, 10093, 10572, 10574, 11583
\@urlcolor 3494, 9066, 9469, 9482, 9589, 9606, 10105, 10578, 12007, 12020, 12293, 12306
\@urltype . . 9435, 9440, 10311, 10337, 10477, 10491, 11969, 11974, 12255, 12260
\@vwid@setup 7062
\@vwid@wrap 7061
\@whilenum 981
\@wrindex 8265, 8266, 8297
\@writefile 7773
\@x@sf . . 7355, 7364, 7516, 7518
\@xfootnote 7488
\@xfootnotemark . . . 7299, 7507
\@xfootnotenext . . . 7288, 7500
\@xp . . . 8181, 8211, 8212, 8226, 8227, 8229, 8230
\@xxxii 5100
\[192, 217, 324, 3573, 3591, 4951
\{ . 332, 537, 1768, 10957, 14306
\} . 333, 538, 1769, 10957, 14307
\␣ 335, 665, 3096, 3099, 3925, 14720, 14721, 14722, 14723, 14724, 14725, 14726, 14727, 14728, 14729, 14730, 14731, 15187, 15188, 15189, 15190, 15191, 15192, 15193, 15194, 15195, 15196, 15198, 15200, 15201, 15202, 15203, 15204, 15205, 15206, 15207, 15208, 15209, 15210, 15211, 15212, 15213, 15214, 15215
\] 193, 218
\^ 186, 211, 322, 1866, 1867, 3079, 4766, 4767, 4776, 14698, 14710, 14722, 14934, 14950, 14958, 14971, 14985, 15000, 15016, 15026, 15027, 15040, 15054, 15103, 15160, 15189, 15220, 15393, 15409, 15417, 15429, 15445, 15460, 15476, 15486, 15487, 15501, 15515, 15543, 15545, 15589, 15591, 15605, 15607, 15644, 15646, 15647, 15727, 15729, 15775, 15777, 15779, 15781, 17295, 17297
_ . . . 187, 212, 545, 4770, 4788, 4789, 5059, 5072, 5085
\` 166, 172, 179, 182, 3015, 3150, 3155, 3160, 3161, 3164, 3167, 3170, 3172, 3180, 14305, 14696, 14708, 14720, 14930, 14946, 14954, 14967, 14981, 14996, 15012, 15020, 15021, 15036, 15050, 15099, 15158, 15187, 15218, 15389, 15405, 15413, 15425, 15441, 15456, 15472, 15480, 15481, 15497, 15511, 15912, 15914, 16396, 16425, 16566, 16595, 17263, 17265, 17341, 17343, 19511, 19516, 19521, 19526, 19531, 19536, 19541, 19546, 19551, 19556, 19561, 19566, 19571, 19576, 19581, 19586, 19591, 19596, 19601, 19606, 19611, 19616, 19621, 19626

\| 188, 213, 328, 1674, 1767, 1808, 2961, 4186, 8261, 8688, 8698
\~ 544, 983, 1922, 3073, 3081, 3082, 3083, 4792, 14699, 14711, 14723, 14936, 14965, 14973, 15002, 15034, 15042, 15105, 15161, 15190, 15221, 15395, 15423, 15431, 15462, 15495, 15503, 15616, 15618, 15619, 15751, 15753, 17255, 17257, 17325, 17327, 17349, 17351, 19513, 19518, 19523, 19528, 19533, 19538, 19543, 19548, 19553, 19558, 19563, 19568, 19573, 19578, 19583, 19588, 19593, 19598, 19603, 19608, 19613, 19618, 19623, 19628

Numbers

\3 . . . . . 521, 1027, 1028, 1029, 1030, 1031, 1032, 1033, 1034, 1143, 1144, 1145, 1146, 1147, 1148, 1149, 1150, 2037, 2173, 2181, 2183, 14449, 14930, 14932, 14934, 14936, 14938, 14940, 14942, 14944, 14946, 14948, 14950, 14952, 14954, 14956, 14958, 14960, 14962, 14963, 14965, 14967, 14969, 14971, 14973, 14975, 14977, 14979, 14981, 14983, 14985, 14987, 14989, 14991, 14992, 14994, 14996, 14998, 15000, 15002, 15004, 15006, 15008, 15010, 15012, 15014, 15016, 15018, 15020, 15021, 15023, 15024, 15026, 15027, 15029, 15030, 15032, 15034, 15036, 15038, 15040, 15042, 15044, 15046, 15048, 15050, 15052, 15054, 15056, 15058, 15060, 15061, 15063, 15155, 15389, 15391, 15393, 15395, 15397, 15399, 15401, 15403, 15405, 15407, 15409, 15411, 15413, 15415, 15417, 15419, 15421, 15423, 15425, 15427, 15429, 15431, 15433, 15435, 15439, 15441, 15443, 15445, 15447, 15449, 15451, 15452, 15454, 15456, 15458, 15460, 15462, 15464, 15466, 15468, 15470, 15472, 15474, 15476, 15478, 15480, 15481, 15483, 15484, 15486, 15487, 15489, 15490, 15492, 15495, 15497, 15499, 15501, 15503, 15505, 15507, 15509, 15511, 15513, 15515, 15517, 15519, 15522, 15523, 15525, 15858, 15862, 15866, 15869, 15871, 15873, 15875, 15876, 15878, 15880, 15882, 15884, 15886, 15888, 15890, 15893, 15895, 15897, 15899, 15901, 15903, 15905, 15906, 15908, 15910, 15912, 15914, 15916, 15918, 15921, 15924, 16335, 16338, 16341, 16343, 16346, 16349, 16352, 16355, 16357, 16359, 16361, 16363, 16365, 16367, 16368, 16370, 16372, 16374, 16376, 16378, 16797, 16799, 16801, 16803, 16805, 16807, 16809, 16811, 16813, 16815, 16817, 16819, 16821, 16823, 16825, 16827, 16829, 16831, 16833, 16835, 16837, 16839, 16841, 16844, 16847, 16849, 16851, 16853, 16855, 16857, 16859, 16861, 16863, 16865, 16867, 16869, 16871, 16873, 16875, 16878, 16881, 16883, 16885, 16887, 16889, 16891, 16893, 16895, 16897, 16899, 16901, 16903, 16905, 16907, 16909, 16911, 16913, 16917, 16919, 16921, 16923, 16925, 16927, 16929, 16931, 16933, 16935, 16937, 16939, 16941, 16943, 16945, 16947, 16949, 16951, 16953, 16955, 16957, 16959, 16961, 16963, 16965, 16967, 16969, 16972, 16974, 16976, 16978, 17329, 17331, 17333, 17335, 17337, 17339, 17341, 17343, 17345, 17347, 17349, 17351, 17707, 17710, 17713, 17716, 17719, 17722, 17725, 17727, 17729, 17731, 17733, 17736, 17739, 17742, 17744, 17747, 17750, 17752, 17755, 17758, 17761, 17764, 17766, 17768, 17770, 17772, 17774, 17776, 17778, 17780, 17783, 17786, 17788, 17791, 17793, 17796, 17798, 17800, 17802, 17849, 17887, 17892, 18265, 18267, 18269, 18272, 18275, 18277, 18279, 18281, 18283, 18285, 18288, 18291, 18293, 18295, 18297, 18299, 18302, 18305, 18307, 18309, 18311, 18313, 18316, 18319, 18321, 18323, 18325, 18327, 18329, 18331, 18333, 18335, 18337, 18340, 18343, 18345, 18347, 18349, 18351, 18354, 18358, 18361, 18364, 18366, 18368, 18370, 18372, 18441, 18444, 18520, 18522, 18524, 18526, 18528, 18530, 18532, 18534, 18536, 18538, 18540, 18542, 18544, 18546, 18548, 18550, 18552, 18554, 18556, 18558, 18560, 18562, 18564, 18566, 18568, 18570, 18572, 18574, 18576, 18578, 18580, 18582, 18584, 18586, 18588, 18590, 18592, 18594, 18596, 18598, 18600, 18602, 18604, 18606, 18608, 18637, 18640, 18642, 18644, 18647, 18649, 18651, 18653, 18656, 18658, 18876, 18878, 18880, 18882, 18884, 19055, 19057, 19059, 19061, 19063, 19065, 19068, 19072, 19074, 19076, 19078, 19080, 19082, 19084, 19086, 19088, 19090, 19092, 19196, 19199, 19202, 19204, 19206, 19208, 19210, 19212, 19214, 19216, 19343, 19345, 19347, 19349, 19351, 19354, 19357, 19360, 19364, 19367, 19370, 19372, 19374, 19376, 19378, 19381, 19383, 19458, 19470, 19472, 19474, 19476, 19478, 19498, 19499, 19500, 19504, 19505, 19506, 19509, 19511, 19513, 19524, 19526, 19530, 19531, 19532, 19533, 19534, 19535, 19536, 19537, 19539, 19540, 19541, 19542, 19543, 19544, 19545, 19546, 19547, 19548, 19549, 19550, 19551, 19552, 19553, 19554, 19555, 19556, 19557, 19559, 19560, 19561, 19562, 19563, 19564, 19565, 19566, 19567,

19568, 19569, 19571, 19573, 19584, 19586, 19590, 19591, 19592, 19593, 19594, 19595, 19596, 19597, 19599, 19600, 19601, 19602, 19603, 19604, 19605, 19606, 19607, 19608, 19609, 19610, 19611, 19612, 19613, 19614, 19615, 19616, 19617, 19619, 19620, 19621, 19622, 19623, 19624, 19625, 19626, 19627, 19628, 19732, 19766, 19767, 19768, 19769, 19770, 19771, 19772, 19773, 19774, 19775

\9 . 524, 1047, 1050, 1081, 1965, 1980, 1989, 2017, 2037, 2073, 2077, 2091, 2095, 2103, 2108, 2111, 2145, 2149, 2152, 2155, 2165, 2167, 2169, 2171, 2173, 2175, 2177, 2179, 2181, 2183, 15155, 16981, 16983, 16985, 16987, 16989, 16991, 16994, 16997, 17000, 17003, 17005, 17007, 17009, 17011, 17013, 17015, 17017, 17019, 17021, 17024, 17026, 17029, 17031, 17034, 17036, 17040, 17044, 17047, 17049, 17051, 17053, 17055, 17057, 17059, 17061, 17063, 17065, 17067, 17069, 17071, 17073, 17075, 17077, 17079, 17081, 17084, 17087, 17090, 17093, 17095, 17097, 17099, 17101, 17103, 17105, 17107, 17109, 17111, 17113, 17115, 17117, 17119, 17121, 17123, 17125, 17127, 17129, 17131, 17133, 17135, 17137, 17139, 17141, 17143, 17145, 17147, 17149, 17151, 17153, 17155, 17157, 17159, 17161, 17163, 17165, 17167, 17169, 17171, 17173, 17175, 17177, 17179, 17181, 17183, 17185, 17188, 17191, 17194, 17197, 17199, 17201, 17203, 17205, 17207, 17209, 17211, 17213, 17215, 17217, 17219, 17221, 17223, 17225, 17227, 17229, 17231, 17233, 17235, 17237, 17239, 17241, 17243, 17245, 17247, 17249, 17251, 17253, 17255, 17257, 17259, 17261, 17263, 17265, 17267, 17269, 17271, 17273, 17275, 17277, 17279, 17281, 17283, 17285, 17287, 17289, 17291, 17293, 17295, 17297, 17299, 17301, 17303, 17305, 17307, 17309, 17311, 17313, 17315, 17317, 17319, 17321, 17323, 17325, 17327, 17329, 17331, 17333, 17335, 17337, 17339, 17341, 17343, 17345, 17347, 17349, 17351, 17353, 17355, 17357, 17359, 17362, 17364, 17366, 17368, 17370, 17372, 17374, 17377, 17381, 17383, 17385, 17388, 17390, 17392, 17394, 17396, 17398, 17400, 17402, 17404, 17406, 17408, 17410, 17412, 17414, 17416, 17418, 17420, 17422, 17424, 17426, 17428, 17430, 17432, 17434, 17436, 17438, 17440, 17442, 17444, 17446, 17448, 17450, 17452, 17454, 17456, 17458, 17460, 17462, 17464, 17466, 17468, 17470, 17472, 17474, 17476, 17478, 17480, 17482, 17484, 17486, 17488, 17490, 17492, 17494, 17496, 17498, 17500, 17502, 17504, 17506, 17508, 17510, 17512, 17514, 17516, 17518, 17529, 17532, 17534, 17536, 17538, 17540, 17542, 17544, 17546, 17549, 17551, 17553, 17555, 17557, 17559, 17561, 17564, 17566, 17568, 17572, 17574, 17576, 17578, 17580, 17582, 17584, 17586, 17590, 17592, 17594, 17596, 17598, 17600, 17602, 17604, 17606, 17608, 17610, 17612, 17614, 17616, 17618, 17620, 17622, 17624, 17626, 17628, 17632, 17636, 17638, 17640, 17642, 17645, 17648, 17650, 17652, 17654, 17656, 17658, 17661, 17663, 17665, 17667, 17669, 17671, 17673, 17675, 17677, 17679, 17681, 17683, 17687, 17690, 17692, 17695, 17698, 17701, 17704, 17707, 17710, 17713, 17716, 17719, 17722, 17725, 17727, 17729, 17731, 17733, 17736, 17739, 17742, 17744, 17747, 17750, 17752, 17755, 17758, 17761, 17764, 17766, 17768, 17770, 17772, 17774, 17776, 17778, 17780, 17783, 17786, 17788, 17791, 17793, 17796, 17798, 17800, 17802, 17804, 17806, 17808, 17810, 17812, 17814, 17817, 17819, 17821, 17823, 17825, 17827, 17830, 17833, 17835, 17837, 17839, 17841, 17843, 17845, 17847, 17849, 17851, 17853, 17855, 17857, 17859, 17861, 17864, 17866, 17868, 17870, 17875, 17877, 17880, 17882, 17885, 17887, 17890, 17892, 17895, 17897, 17899, 17902, 17904, 17906, 17909, 17912, 17914, 17916, 17919, 17922, 17924, 17926, 17929, 17931, 17934, 17936, 17938, 17941, 17943, 17945, 17947, 17949, 17951, 17954, 17956, 17958, 17961, 17963, 17965, 17968, 17970, 17972, 17974, 17976, 17979, 17981, 17983, 17985, 17987, 17989, 17992, 17995, 17998, 18000, 18003, 18005, 18007, 18009, 18011, 18013, 18015, 18017, 18019, 18023, 18025, 18027, 18028, 18031, 18034, 18038, 18039, 18043, 18044, 18047, 18049, 18051, 18053, 18055, 18057, 18059, 18061, 18063, 18065, 18067, 18069, 18071, 18074, 18076, 18078, 18081, 18084, 18086, 18088, 18090, 18092, 18094, 18096, 18098, 18100, 18102, 18104, 18106, 18108, 18110, 18112, 18114, 18116, 18118, 18120, 18122, 18124, 18126, 18128, 18130, 18132, 18134, 18136, 18138, 18140, 18142, 18144, 18146, 18148, 18150, 18152, 18154, 18156, 18158, 18160, 18163, 18166, 18169, 18172, 18175, 18179, 18183, 18185, 18187, 18189, 18191, 18193, 18196, 18199, 18202, 18205, 18207, 18210, 18213, 18217, 18220, 18222, 18225, 18228, 18231, 18235, 18238,

18241, 18244, 18247, 18251, 18255, 18257, 18259, 18261, 18263, 18265, 18267, 18269, 18272, 18275, 18277, 18279, 18281, 18283, 18285, 18288, 18291, 18293, 18295, 18297, 18299, 18302, 18305, 18307, 18309, 18311, 18313, 18316, 18319, 18321, 18323, 18325, 18327, 18329, 18331, 18333, 18335, 18337, 18340, 18343, 18345, 18347, 18349, 18351, 18354, 18358, 18361, 18364, 18366, 18368, 18370, 18372, 18374, 18376, 18378, 18380, 18382, 18386, 18388, 18390, 18392, 18394, 18396, 18398, 18400, 18402, 18404, 18406, 18408, 18411, 18414, 18416, 18419, 18422, 18424, 18427, 18430, 18432, 18434, 18436, 18438, 18441, 18444, 18446, 18448, 18450, 18453, 18455, 18457, 18459, 18461, 18463, 18465, 18467, 18469, 18471, 18473, 18475, 18477, 18479, 18481, 18483, 18485, 18487, 18489, 18491, 18493, 18495, 18498, 18500, 18502, 18504, 18506, 18508, 18510, 18512, 18514, 18516, 18518, 18520, 18522, 18524, 18526, 18528, 18530, 18532, 18534, 18536, 18538, 18540, 18542, 18544, 18546, 18548, 18550, 18552, 18554, 18556, 18558, 18560, 18562, 18564, 18566, 18568, 18570, 18572, 18574, 18576, 18578, 18580, 18582, 18584, 18586, 18588, 18590, 18592, 18594, 18596, 18598, 18600, 18602, 18604, 18606, 18608, 18610, 18615, 18619, 18623, 18626, 18628, 18630, 18634, 18637, 18640, 18642, 18644, 18647, 18649, 18651, 18653, 18656, 18658, 18662, 18664, 18666, 18668, 18671, 18674, 18677, 18681, 18683, 18685, 18687, 18690, 18695, 18698, 18700, 18702, 18707, 18710, 18713, 18715, 18718, 18720, 18722, 18725, 18732, 18735, 18740, 18743, 18746, 18749, 18752, 18755, 18758, 18761, 18764, 18767, 18770, 18773, 18776, 18779, 18782, 18785, 18788, 18791, 18794, 18798, 18801, 18804, 18806, 18808, 18810, 18812, 18814, 18817, 18819, 18821, 18823, 18825, 18827, 18830, 18832, 18835, 18837, 18840, 18842, 18844, 18846, 18848, 18850, 18852, 18854, 18856, 18858, 18860, 18862, 18864, 18866, 18868, 18871, 18873, 18876, 18878, 18880, 18882, 18884, 18886, 18890, 18894, 18896, 18898, 18900, 18902, 18904, 18907, 18909, 18912, 18914, 18916, 18918, 18920, 18922, 18925, 18927, 18929, 18931, 18933, 18935, 18937, 18939, 18941, 18943, 18945, 18947, 18949, 18952, 18954, 18956, 18958, 18960, 18962, 18964, 18966, 18968, 18970, 18972, 18974, 18976, 18978, 18980, 18982, 18984, 18986, 18988, 18990, 18992, 18994, 18996, 18999, 19001, 19003, 19005, 19007, 19009, 19011, 19013, 19015, 19017, 19019, 19021, 19023, 19025, 19028, 19031, 19033, 19036, 19039, 19042, 19045, 19047, 19049, 19051, 19053, 19055, 19057, 19059, 19061, 19063, 19065, 19068, 19072, 19074, 19076, 19078, 19080, 19082, 19084, 19086, 19088, 19090, 19092, 19094, 19096, 19098, 19100, 19102, 19104, 19106, 19109, 19112, 19115, 19118, 19120, 19125, 19129, 19132, 19134, 19136, 19139, 19142, 19145, 19148, 19151, 19154, 19157, 19160, 19163, 19166, 19169, 19172, 19174, 19176, 19178, 19180, 19182, 19185, 19191, 19194, 19196, 19199, 19202, 19204, 19206, 19208, 19210, 19212, 19214, 19216, 19218, 19220, 19222, 19225, 19227, 19229, 19231, 19234, 19237, 19239, 19241, 19243, 19246, 19248, 19251, 19253, 19257, 19260, 19262, 19264, 19266, 19268, 19270, 19272, 19274, 19276, 19278, 19280, 19282, 19284, 19287, 19289, 19291, 19294, 19297, 19299, 19301, 19303, 19305, 19307, 19309, 19311, 19313, 19315, 19317, 19319, 19321, 19323, 19325, 19327, 19329, 19331, 19333, 19335, 19337, 19339, 19341, 19343, 19345, 19347, 19349, 19351, 19354, 19357, 19360, 19364, 19367, 19370, 19372, 19374, 19376, 19378, 19381, 19383, 19386, 19388, 19390, 19392, 19394, 19396, 19398, 19401, 19403, 19406, 19409, 19412, 19415, 19417, 19419, 19421, 19423, 19425, 19427, 19429, 19431, 19433, 19435, 19438, 19441, 19443, 19445, 19447, 19449, 19451, 19453, 19455, 19458, 19461, 19463, 19465, 19467, 19470, 19472, 19474, 19476, 19478, 19510, 19512, 19514, 19515, 19516, 19517, 19518, 19519, 19520, 19521, 19522, 19523, 19525, 19527, 19528, 19529, 19530, 19531, 19532, 19533, 19535, 19537, 19540, 19542, 19544, 19545, 19546, 19547, 19548, 19549, 19550, 19551, 19552, 19553, 19555, 19557, 19559, 19560, 19561, 19562, 19563, 19565, 19566, 19567, 19568, 19570, 19572, 19574, 19575, 19576, 19577, 19578, 19579, 19580, 19581, 19582, 19583, 19585, 19587, 19588, 19589, 19590, 19591, 19592, 19593, 19595, 19597, 19600, 19602, 19604, 19605, 19606, 19607, 19608, 19609, 19610, 19611, 19612, 19613, 19615, 19617, 19619, 19620, 19621, 19622, 19623, 19625, 19626, 19627, 19628, 19734, 19736

A

\a 291, 293, 297, 303
\ABREVE 19503, 19574, 19575, 19576, 19577, 19578
\abreve . . 19497, 19514, 19515,

19516, 19517, 19518
\AC 17932, 20826
\AccFancyVerbLineautorefname 3123
\Accfootnoteautorefname . 3103
\Acctheoremautorefname . 3127
\acctonos 3185, 3186, 3187, 3188, 3189, 3190, 3191, 3192, 3193, 3194, 3195, 3196, 3197, 3198, 3199, 3200
\Acht 19442, 20626
\ACIRCUMFLEX 19504, 19579, 19580, 19581, 19582, 19583
\acircumflex 3172, 19498, 19519, 19520, 19521, 19522, 19523
\AcPa 19428, 20620
\Acrobatmenu 2226, 4266, 6375, 9368, 10110, 10651, 11525
\active 961, 968, 1545, 4767, 4768, 4769, 4770, 4771, 4772, 4776, 4778, 4781, 4789, 14453, 14480
\add@accent 536
\addcontentsline . . . 7554, 7627, 7967, 8028, 8159
\addcontentslinebookmark 8016
\addcontentslinebookmarkOff 8017
\addcontentslinebookmarkReset 8020, 8022
\addtocontents 8029, 8160
\addtocounter 7222
\AddToDocumentProperties 2319, 3713, 3719, 3725, 3731, 3754, 3760
\AddToHook . 5144, 5403, 5405, 6461, 6473, 6478, 6707, 6852, 6889, 7059, 7218, 7225, 7247, 7268, 7647, 7721, 8152, 8167, 8221, 8662, 9907, 10271, 11729, 11868, 13108
\AddToHookNext . . 6991, 7239, 7240, 7255, 7256
\AddToHookWithArguments 7641, 7723, 7727, 8032, 8087, 8103, 8120, 8136
\AddToNoCaseChangeList 14593
\adl@LT@array 7102
\advance 471, 472, 982, 4917, 5109, 5122, 5424, 5752, 5796, 6231, 6232, 6235, 6236, 6515, 6523, 6560, 7860, 7871, 7874, 7888, 9474, 9558, 9596, 9636, 9951, 9961, 10806, 12012, 12299, 12551, 12623, 12666, 12667, 13161, 13224, 13268, 13269, 13515, 13580, 13624, 13625, 14239, 14241, 14242, 14248, 14257, 14357, 14567
\AE 14942, 15401, 15916
\ae 15008, 15468, 15918
\afterassignment . . . 1554, 1560, 1566, 6006
\AfterBeginDocument . 353, 372
\aftergroup 7439
\agemO 17562, 20797
\ainferior 19928
\alef 19644
\alefhamza 19636
\aleflowerhamza 19640
\alefmadda 19634
\alefmaqsura 19702
\aleph 17573, 19950
\Alph 6609, 6956
\alph 6610, 7198, 7227
\alpha 19849
\amalg 17836, 20044
\AMSautorefname 8663
\anchor@spot . 5307, 5320, 5327, 5333, 5335, 9007, 9415, 9510, 10383, 10460, 10963, 11310, 11313, 11949, 12236
\and 6440
\angle 17865, 20056
\AngleSign 17873, 20818
\Anglesign 17872, 20817
\Ankh 18699, 20339
\APLbox 18437, 20298
\APLdown 18635, 20893
\APLdownarrowbox . . . 18426, 20293
\APLinput 18429, 20294
\APLinv 18403, 20285
\APLleftarrowbox 18418, 20290
\APLrightarrowbox 18421, 20291
\APLup 18620, 20890
\APLuparrowbox . 18423, 20292
\appendix 6948, 6960
\appendixautorefname 2971, 2989, 3007, 3025, 3043, 3061, 3079, 3111, 3112, 3137, 3155, 3173, 3191, 3209, 3227, 3245, 3263, 8673
\apprge 18082, 20841
\apprle 18079, 20840
\approx 17955, 20093
\approxeq 17960, 20095
\appto 7062
\Aquarius 18786, 20937
\aquarius 18784, 20365
\arabic 6606, 8207, 8222
\Aries 18756, 20927
\aries 18754, 20355
\AssignSocketPlug . . 6851, 6861, 6881, 7062
\ast 17852, 20051
\Asterisk 19000, 20448
\AsteriskBold . . . 18977, 20437
\AsteriskCenterOpen . . . 18979, 20438
\AsteriskRoundedEnds . 19024, 20460
\asymp 17973, 20101
\AtBeginDocument . 354, 5370, 5374, 7266, 12328
\AtEndOfPackage 369
\author 6396, 6406
\autopageref 4400, 8553
\autoref . 654, 4399, 8572, 12323
\ayn 19680

B

\b 292, 293, 810, 814, 820, 14706, 14718, 14730, 15151, 15180, 15209, 17059, 17061, 17071, 17073, 17143, 17145, 17151, 17153, 17179, 17181, 17215, 17217, 17235, 17237, 17303, 17305, 17307
\baa 19646
\babygamma 16097, 19817
\back@none . . . 2906, 2916, 2929
\back@page 2908, 2921
\back@section 2907, 2913, 2919, 2925
\back@slide 2909, 2918
\backcite 7774
\backcong 17969, 20099
\backneg 18375, 20272
\backprime 17397, 19895
\backref 7805, 12327
\backsim 17933, 20083
\backsimeq 18280, 20231
\barb 15803, 20679
\bard 15567, 20671
\bari 16111, 19818
\barin 18371, 20270

\barj 16082, 20711
\barl 15825, 19803
\barlambda 15832, 20684
\barleftharpoon . . 19159, 20514
\baro 16157, 16158, 18407, 18409, 20883
\barp 17025, 19886
\barrightharpoon . 19165, 20516
\barsci 17023, 19885
\barscu 17028, 19887
\baru 16222, 19827
\barwedge 18262, 20223
\baselineskip 2229, 9529, 10982, 11014, 11712
\bbl@cite@choice 7670
\bbl@info 629
\bbslash 18449, 20301
\BCPdata 492, 499, 505
\Beam 18433, 20296
\because 17918, 20077
\BeforeTeXIVht 2690
\begin 614, 12349, 20995
\belowpdfbookmark 14353
\beta 19850
\betainferior 19880
\beth 17575, 19951
\between 18066, 20142
\bfseries 588, 8431, 8451, 8468, 8600
\bgroup . 674, 4884, 7425, 7438, 8920, 9925, 10383, 11003, 12855, 12947, 12968
\bibcite . 7661, 7667, 7671, 7696, 7711, 7738, 7748
\Bicycle 19462, 20635
\bigcircle 20324
\bigdoublevee . . . 19221, 20539
\bigdoublewedge . 19219, 20538
\bigtriangledown . 18633, 20314
\bigtriangleup . . . 18618, 20309
\binampersand . . 15249, 20654
\bindnasrepma . . 17587, 20800
\Biohazard 18697, 20338
\bitsetGetDec 5476, 5609, 5627, 5641, 5654, 5670, 5702, 5727
\bitsetGetHex 5477
\bitsetGetSetBitList 5465
\bitsetIsEmpty 5606, 5624, 5638, 5651, 5667, 5699, 5724
\bitsetReset . . 5579, 5613, 5632, 5646, 5659, 5675, 5707
\bitsetSetValue 5445, 5455
\blacksmiley 18712, 20343
\Bleech 18621, 20891
\BOOKMARK . . 14285, 14364
\booknumberline . 14269, 14274
\bool 5145, 6866
\bot 18206, 20204
\Bowtie 18270, 20872
\bowtie 18268, 20226
\Box 18672, 20897
\box . . . 6238, 6468, 8934, 9939, 11357, 11360
\boxast 19205, 20531
\boxbackslash . . . 18415, 20289
\boxbar 18655, 20323
\boxbox 19209, 20533
\boxbslash 19203, 20530
\boxcircle 19207, 20532
\boxdot 18190, 20198
\boxempty 18670, 20329
\boxminus 18186, 20196
\boxplus 18184, 20195
\boxslash 19201, 20529
\boxtimes 18188, 20197
\brokenvert 15330, 20660
\bullet 17856, 19890
\Bumpeq 17978, 20103
\bumpeq 17982, 20105

C

\C 15128, 16647, 16650
\c 811, 815, 821, 3073, 3081, 3082, 3083, 5145, 6419, 6426, 14704, 14716, 14728, 14944, 15010, 15140, 15166, 15195, 15216, 15403, 15470, 15601, 15603, 15649, 15651, 15659, 15661, 15679, 15681, 15715, 15717, 15731, 15733, 15739, 15741, 15996, 15998, 16707, 16710, 17075, 17077, 17123, 17125
\c@footnote . . 7301, 7387, 7395, 7509
\c@Hy@AnnotLevel . 9951, 9952, 9961
\c@Hy@tempcnt . . . 4902, 4903, 4909, 4917
\c@note 7861
\c@overlay 7861
\c@page . 6515, 6523, 6540, 6560, 6561, 6565, 6577, 6579, 6584, 6591, 6593, 6595, 6624, 7860, 7862, 7864, 7871, 7874, 7875, 7888, 7918, 7919
\c@secnumdepth . 14630, 14645, 14660
\c@slide 7861
\c@tocdepth 3422, 3427
\calc@bm@number 14492, 14565
\calculate@pdfview . 3896, 3899
\Cancer 18765, 20930
\cancer 18763, 20358
\Cap 18298, 20239
\cap 17894, 20067
\capdot 19245, 20549
\capitalacute 15219
\capitalbreve 15226
\capitalcaron 15225
\capitalcedilla 15216
\capitalcircumflex 15220
\capitaldieresis 15222
\capitaldotaccent 15228
\capitalgrave 15218
\capitalhungarumlaut . . . 15223
\capitalmacron 15227
\capitalnewtie 15230
\capitalogonek 15217
\capitalring 15224
\capitaltie 15229
\capitaltilde 15221
\Capricorn 18783, 20936
\capricornus 18781, 20364
\caption 7524, 7526, 7615, 7617
\catcode . . . 172, 173, 184, 185, 186, 187, 206, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 937, 961, 968, 1545, 1674, 1675, 1808, 1809, 1865, 1866, 1867, 4652, 4654, 4766, 4767, 4768, 4769, 4770, 4771, 4772, 4776, 4778, 4781, 4789, 4799, 4890, 4891, 8688, 11044, 11045, 14382, 14384, 14453, 14456, 14480, 14483
\ccnc 19471, 20638
\ccnd 19473
\ccsa 19475, 20639
\cdot 20646
\cdots 18365, 20267
\CESign 19479, 20641
\CEsign 19481, 20990
\cf@encoding 1286

\chapterautorefname 2972, 2990, 3008, 3026, 3044, 3062, 3080, 3109, 3138, 3156, 3174, 3192, 3210, 3228, 3246, 3264, 8674
\chapternumberline 14271, 14276
\char 13142, 14386, 14423
\chardef 267, 310, 2486, 2487, 2488, 2489, 2748, 2750, 4575, 4607, 11305, 11308, 11314
\check@bm@number . . . 14503, 14511, 14558, 14566
\CheckBox 6180
\CheckCommand 7384
\checkcommand 42, 7500, 7507, 7514, 7615, 7625, 7732, 7744, 8159, 8162, 8207, 8465
\CheckedBox 18675, 20898
\Checkedbox 18673, 20330
\checklatex 4, 7499, 7614, 7731, 8158, 8464
\Checkmark 18921, 20410
\checkmark 18923, 20956
\CheckmarkBold . 18924, 20411
\checkpackage 9, 8206
\chi 19871
\chiinferior 19884
\ChoiceBox 5800
\ChoiceMenu 6177
\circ 17854, 20052
\circeq 18014, 20119
\circlearrowleft . . 19071, 20479
\circlearrowright . 19073, 20480
\CircledA 18494, 20302
\circledast 18178, 20193
\circledbslash . . . 19186, 20965
\circledcirc 18174, 20192
\circleddash 18182, 20194
\CircleShadow . . . 19032, 20463
\circplus 19228, 20542
\citation 7766
\citeauthoryear 7832, 7838
\citeN 7829
\CJK@char 964
\CJK@charx 965
\CJK@CJK 953
\CJK@eight . . . 1164, 1167, 1281
\CJK@five 1164, 1166, 1281
\CJK@four . . . 1163, 1166, 1280
\CJK@hundred 1230
\CJK@hundredmillion . . . 1193
\CJK@ignorespaces 963
\CJK@kern 951
\CJK@minus 1155
\CJK@nine . . . 1164, 1168, 1281
\CJK@null 1257
\CJK@one 1163, 1165, 1280
\CJK@punctchar 966
\CJK@punctcharx 967
\CJK@seven . . 1164, 1167, 1281
\CJK@six 1164, 1167, 1281
\CJK@ten . . . 1165, 1166, 1167, 1168, 1245
\CJK@tenthousand . 1178, 1199
\CJK@thousand 1215
\CJK@three . . . 1163, 1166, 1280
\CJK@two 1163, 1165, 1280
\CJK@zero . . 1163, 1181, 1198, 1202, 1218, 1233, 1255
\CJKdigits 1040
\CJKkern 952
\CJKnumber 1039
\cl@@ckpt 6905
\CleaningA 18496, 20885
\CleaningF 18507, 20303
\CleaningFF 18509, 20304
\CleaningP 18531, 20305
\CleaningPP 18533, 20306
\clickb 16279, 20764
\clickc 16274, 20762
\clickt 16216, 20746
\clock 18381, 20275
\ClockLogo 18384, 20882
\Clocklogo 18383, 20881
\close@pdflink 9001, 9026, 9035, 9067, 9104, 9137, 9392
\closedniomega . . 16165, 20734
\closedrevepsilon . 16078, 20710
\closeout 14373
\Cloud 18661, 20325
\ClowerTips 20427
\clubsuit . . 18800, 18802, 20943
\codeof 7796
\Coffeecup 18680, 20332
\coloncolonequals 19265, 20557
\colonequals 18006, 20115
\color@begingroup . . 8920, 9925
\color@endgroup . . . 8927, 9932
\columnwidth 7432
\comma@entry 5791, 5798, 5800
\comma@parse 5790
\complement 17805, 20030
\Conclusion 17756, 20809
\cong 17950, 20091
\Congruent 18032, 20835
\contentsline . 8030, 8039, 8160, 8162
\copy . . . 5118, 5120, 5131, 5140, 8930, 9909, 9935
\copyright 19793
\Corresponds 18021, 20833
\corresponds 18020, 20832
\count@ 980, 981, 982, 983, 1555, 1913, 3438, 3439, 3444, 3445, 5423, 5424, 5439, 5735, 5750, 5752, 5774, 5796, 5812, 10802, 10803, 10804, 10805, 10806, 10809
\Cross 18940, 20419
\crossb 15800, 20677
\CrossClowerTips 18957
\crossd 15564, 20669
\CrossedBox 18679, 20900
\Crossedbox 18676, 20331
\crossh 15613, 20673
\CrossMaltese . . . 18946, 20422
\crossnilambda . . 15831, 20683
\CrossOpenShadow 18942, 20420
\CrossOutline . . . 18944, 20421
\cs 5054, 5059, 5063, 5072, 5076, 5085
\Cube 611
\Cup 18301, 20240
\cup 17896, 20068
\cupdot 18135, 20175
\cupplus 18137, 20176
\curlyc 16046, 20703
\curlyeqprec 18320, 20248
\curlyeqsucc 18324, 20250
\curlyesh 16213, 20745
\curlyvee 18284, 20233
\curlywedge 18287, 20234
\curlyyogh 16258, 20758
\curlyz 16251, 20757
\CurrentBorderColor 8991, 8993, 9020, 9022, 9030, 9032, 9037, 10450, 10484, 10486, 10502, 10504, 10523, 10525, 10587, 10589, 10606, 10608
\currentpdfbookmark . . . 14345
\curu 16598
\curvearrowleft . . 17689, 19984
\curvearrowright . 17691, 19985
\CutLeft 18887, 20950
\CutLine 18612, 20887
\Cutline 18613, 20888
\Cutright 18888, 20951

\CuttingLine 18609, 20307
\cyr 634, 3091, 3093, 3096, 3099, 3102, 3103, 3104, 3105, 3106, 3107, 3108, 3109, 3110, 3111, 3113, 3115, 3116, 3117, 3118, 3119, 3120, 3121, 3122, 3123, 3124, 3125, 3126, 3127, 3128
\CYRA . . . 16432, 16823, 16827
\cyra . . . 3093, 3100, 3102, 3107, 3110, 3115, 3116, 3122, 3126, 16499, 16825, 16829
\CYRABHCH . . . 16787, 16792
\cyrabhch 16789, 16795
\CYRABHCHDSC 16791
\cyrabhchdsc 16794
\CYRABHDZE 16857
\cyrabhdze 16859
\CYRABHHA 16742
\cyrabhha 16744
\CYRAE 16831
\cyrae 16833
\CYRB 16434
\cyrb 3107, 16501
\CYRBYUS 16622
\cyrbyus 16624
\CYRC 16477
\cyrc 16544
\CYRCH 16479, 16899
\cyrch . 3099, 3100, 3108, 16546, 16901
\CYRCHLDSC 16815
\cyrchldsc 16817
\CYRCHRDSC 16773
\cyrchrdsc 16775
\CYRCHVCRS 16778
\cyrchvcrs 16781
\CYRD 16440
\cyrd . . . 3096, 3099, 3110, 3115, 3116, 16507
\CYRDJE 16401
\cyrdje 16571
\CYRDZE 15110, 15127, 16394, 16407
\cyrdze 16577
\CYRDZHE 16430
\cyrdzhe 16600
\CYRE . . 16396, 16399, 16442, 16835
\cyre . . . 3093, 3099, 3100, 3113, 3125, 3126, 3127, 16509, 16566, 16569, 16837
\CYREREV 16493, 16883
\cyrerev 16560, 16885
\CYRERY 16488, 16907
\cyrery 3091, 3093, 16555, 16909
\CYRF 16473
\cyrf 16540
\CYRFITA 16638
\cyrfita 16640
\CYRG 16403, 16438
\cyrg 3109, 16505, 16573
\CYRGDSC 16903
\cyrgdsc 16905
\CYRGHCRS 16690
\cyrghcrs 16692
\CYRGHK 16695
\cyrghk 16698
\CYRGUP 16686
\cyrgup 16688
\CYRH 16475
\cyrh 16542
\CYRHDSC 16764
\cyrhdsc 16766
\CYRHHK 16911
\cyrhhk 16913
\CYRHRDSN 16486
\cyrhrdsn . 16552, 16553, 20771
\CYRI . . . 16425, 16448, 16451, 16861, 16865
\cyri 3093, 3096, 3100, 3106, 3111, 3113, 16515, 16518, 16595, 16863, 16867
\CYRIE 16405
\cyrie 16575
\CYRII 16410, 16413
\cyrii 16580, 16583
\CYRIOTBYUS 16626
\cyriotbyus 16628
\CYRIOTE 16610
\cyriote 16612
\CYRIOTLYUS 16618
\cyriotlyus 16620
\CYRISHRT 16450
\cyrishrt 16517
\CYRISHRTDSC 16674
\cyrishrtdsc 16676
\CYRIZH 16642, 16647
\cyrizh 16644, 16650
\CYRJE 16415
\cyrje 16585
\CYRK 16423, 16453
\cyrk . . . 3102, 3103, 3105, 3119, 3120, 3122, 3123, 3124, 16520, 16593
\CYRKBEAK 16726
\cyrkbeak 16728
\CYRKDSC 16712
\cyrkdsc 16714
\CYRKHCRS 16722
\cyrkhcrs 16724
\CYRKHK 16803
\cyrkhk 16805
\CYRKOPPA 16668
\cyrkoppa 16670
\CYRKSI 16630
\cyrksi 16632
\CYRKVCRS 16717
\cyrkvcrs 16720
\CYRL 16455
\cyrl . . . 3107, 3109, 3111, 3113, 16522
\CYRLDSC 16807
\cyrldsc 16809
\CYRLJE 16417
\cyrlje 16587
\CYRLYUS 16614
\cyrlyus 16616
\CYRM 16457
\cyrm . . 3096, 3100, 3126, 3127, 16524
\CYRMDSC 16819
\cyrmdsc 16821
\CYRN 16459
\cyrn . . . 3093, 3099, 3100, 3102, 3103, 3105, 3113, 3119, 3120, 16526
\CYRNDSC 16730
\cyrndsc 16732
\CYRNG 16734
\cyrng 16736
\CYRNHK 16811
\cyrnhk 16813
\CYRNJE 16419
\cyrnje 16589
\CYRO 16461, 16869
\cyro . . . 3096, 3099, 3102, 3103, 3113, 3122, 3123, 3125, 3126, 3127, 16528, 16871
\CYROMEGA 16602
\cyromega 16604
\CYROMEGARND 16656
\cyromegarnd 16658
\CYROMEGATITLO . . . 16660
\cyromegatitlo 16662
\CYROT 16664
\cyrot 16666
\CYROTLD 16873, 16878
\cyrotld 16875, 16881
\CYRP 16463

\cyrp . . . 3096, 3099, 3100, 3104, 3105, 3111, 3113, 3117, 3118, 3119, 3120, 16530
\CYRpalochka 16797
\CYRPHK 16738
\cyrphk 16740
\CYRPSI 16634
\cyrpsi 16636
\CYRR 16465
\cyrr . . . 3091, 3093, 3096, 3099, 3100, 3106, 3110, 3111, 3113, 3115, 3116, 3121, 3122, 3123, 3124, 3125, 3126, 3127, 16532
\CYRRTICK 16682
\cyrrtick 16684
\CYRS 16467, 16747
\cyrs . . . 3096, 3099, 3102, 3103, 3106, 3121, 3122, 3123, 3124, 3128, 16534, 16750
\CYRSCHWA . . . 16839, 16844
\cyrschwa 16841, 16847
\CYRSDSC 16746
\cyrsdsc 16749
\CYRSEMISFTSN 16678
\cyrsemisftsn 16680
\CYRSFTSN 16491
\cyrsftsn . . 16557, 16558, 20772
\CYRSH 16481
\cyrsh 16548
\CYRSHCH 16483
\cyrshch 16550
\CYRSHHA 16783
\cyrshha 16785
\CYRT 16469
\cyrt . . . 3096, 3099, 3105, 3107, 3119, 3120, 3121, 3122, 3123, 3124, 3125, 3126, 3127, 16536
\CYRTDSC 16752
\cyrtdsc 16754
\CYRTETSE 16768
\cyrtetse 16770
\cyrthousands 16672
\CYRTSHE 16421
\cyrtshe 16591
\CYRU . . 16428, 16471, 16887, 16891, 16895
\cyru . . . 3103, 3105, 3119, 3120, 3123, 3127, 16538, 16889, 16893, 16897
\CYRUK 16652
\cyruk 16654
\CYRUSHRT 16427
\cyrushrt 16597
\CYRV 16436
\cyrv 3091, 3093, 16503
\CYRY 16756
\cyry 16758
\CYRYA 16497
\cyrya 16564
\CYRYAT 16606
\cyryat 16608
\CYRYHCRS 16760
\cyryhcrs 16762
\CYRYI 16412
\cyryi 16582
\CYRYO 16398
\cyryo 16568
\CYRYU 16495
\cyryu 16562
\CYRZ . . . 16446, 16707, 16853
\cyrz . . 3110, 3115, 3116, 16513, 16710, 16855
\CYRZDSC 16706
\cyrzdsc 16709
\CYRZH . . 16444, 16799, 16849
\cyrzh 3093, 3113, 16511, 16801, 16851
\CYRZHDSC 16701
\cyrzhdsc 16704

D

\d 812, 816, 822, 3169, 3173, 3175, 3176, 3177, 3178, 3179, 3181, 14707, 14719, 14731, 15134, 15181, 15210, 17055, 17057, 17067, 17069, 17115, 17117, 17139, 17141, 17147, 17149, 17167, 17169, 17175, 17177, 17211, 17213, 17223, 17225, 17231, 17233, 17259, 17261, 17279, 17281, 17299, 17301, 17317, 17319, 17321, 17323, 17329, 17331, 17333, 17335, 17337, 17339, 17345, 17347, 19510, 19515, 19520, 19525, 19530, 19535, 19540, 19545, 19550, 19555, 19560, 19565, 19570, 19575, 19580, 19585, 19590, 19595, 19600, 19605, 19610, 19615, 19620, 19625
\dad 19674
\dag 17375, 20783
\dagger 19889
\dal 19660
\daleth 17579, 19953
\damma 19714
\danger 18851, 20384
\dasheddownarrow 17790, 20023
\dashedleftarrow . 17784, 20810
\dashedrightarrow 17789, 20811
\dasheduparrow . . 17785, 20021
\dashleftarrow . . . 17782, 20020
\dashrightarrow . . 17787, 20022
\DashV 19363, 20602
\Dashv 19356, 20600
\dashV 20598
\dashv 18195, 20200
\DavidStar 18948, 20423
\davidstar 18950, 20957
\ddag 17379, 20785
\ddagger . 14804, 17376, 17378, 20784
\ddots 18369, 20269
\DeclareFontEncoding . . 14695, 15097
\DeclareFontFamily . . . 882, 892
\DeclareFontShape . . . 883, 893
\DeclareFontSubstitution . . 884, 894
\DeclareLocalOptions . . . 4200
\DeclareRobustCommand 4881, 4968, 4970, 4972, 4981, 6174, 6177, 6180, 6183, 6186, 6189, 6192, 8553, 14583
\DeclareTextAccent 14696, 14697, 14698, 14699, 14700, 14701, 14702, 14703, 14704, 14705, 14706, 14707
\DeclareVoidOption . 2687, 2701, 2712, 2728, 2734, 2739, 2753, 2763, 2768, 2774, 2780, 2809, 2826, 2833, 2839, 2844, 2849, 2864, 3349, 3357, 3365, 3375
\DefaultHeightofCheckBox 6244, 12795, 13399, 13776
\DefaultHeightofChoiceMenu . . 6246, 12613, 13214, 13570
\DefaultHeightofReset . . . 6242, 12765, 13371, 13744
\DefaultHeightofSubmit . 6240, 12745, 13348, 13721
\DefaultHeightofText 6248, 12585, 13188, 13537
\DefaultHeightofTextMultiline . 6249, 12583, 13186, 13535

\DefaultOptionsofCheckBox . . 6254, 12797, 13401, 13778
\DefaultOptionsofComboBox 6257
\DefaultOptionsofListBox 6256
\DefaultOptionsofPopdownBox 6258
\DefaultOptionsofPushButton . 6253, 12716, 13320, 13689
\DefaultOptionsofRadio . . 6259
\DefaultOptionsofReset . . 6252, 12768, 13374, 13747
\DefaultOptionsofSubmit 6251, 12748, 13351, 13724
\DefaultOptionsofText . . 6255, 12590, 13193, 13542
\DefaultWidthofCheckBox 6245, 12794, 13398, 13775
\DefaultWidthofChoiceMenu . . 6247, 12612, 13213, 13569
\DefaultWidthofReset . . . 6243, 12764, 13370, 13743
\DefaultWidthofSubmit . . 6241, 12744, 13347, 13720
\DefaultWidthofText 6250, 12580, 13183, 13532
\deferred@thm@head 7251, 7252
\define@key . . 2384, 2386, 2430, 2445, 2448, 2451, 2459, 2462, 2472, 2475, 2478, 2495, 2507, 2509, 2512, 2529, 2533, 2539, 2542, 2545, 2548, 2551, 2554, 2557, 2582, 2620, 2626, 2745, 2871, 2890, 2900, 2903, 2910, 2939, 2958, 2961, 3305, 3372, 3384, 3399, 3416, 3419, 3423, 3451, 3456, 3460, 3463, 3470, 3482, 3489, 3499, 3502, 3505, 3509, 3525, 3535, 3542, 3553, 3566, 3583, 3673, 3682, 3712, 3718, 3724, 3730, 3736, 3741, 3747, 3753, 3759, 3765, 3798, 3805, 3896, 3897, 3910, 3917, 3927, 3968, 3969, 3972, 3975, 3978, 3981, 3984, 3987, 3999, 4022, 4136, 4139, 4898, 4927, 4933, 4945, 5417, 5505, 5561, 5861, 5866, 5879, 5907, 5950, 5953, 5956, 5960, 5963, 5967, 5970, 5974, 5978, 5982, 5985, 5989, 5992, 5995, 5998, 6001, 6021, 6037, 6040, 6043, 6046, 6049, 6052, 6082, 6085, 6088, 6091, 6110, 6116, 6132, 6137, 6143, 6158, 6163, 6169, 6719, 6730, 6990, 10881, 10887, 11389, 11391, 11394, 11397, 11399, 11401, 11410, 11418, 11425, 11427, 11429, 11431, 11433, 11435, 11444, 11454, 11456, 11458, 11459, 11465, 11474, 11476, 11478, 11480, 11482, 11484, 11486, 11488, 11490, 11492, 11494, 11496, 11498, 11500, 11502, 11504, 11505, 11506, 11507, 11508, 11509, 11510, 11511, 11512, 11513, 11514, 11515
\Deleatur 17528, 19941
\Delta 19839
\delta 19852
\Denarius 17530, 20796
\dest@name 5350
\df@tag 8173, 8179
\DH 14962, 15421
\dh . 15032, 15492, 15493, 20668
\dhal 19662
\diameter 18373, 20271
\Diamond 18645, 20894
\diamond 18643, 20318
\diamonddots . . . 17419, 19898
\DiamondSolid 20468
\diamondsuit 18797, 18799, 20942
\digamma 20770
\dimen@ 1561, 1638, 1639, 1642, 1644, 4172, 4173, 4175, 4182, 4183, 5108, 5109, 5112, 5121, 5122, 5126, 6007, 6016, 6749, 6750, 8947, 8949, 10775, 10776, 10778, 11347, 11362, 11365, 11759, 11761, 11826, 11828, 11920, 11922, 12204, 12206
\dimexpr 489, 1319, 1941, 1943, 1951, 1956, 1959, 1961, 1975, 1977, 1980, 1981, 1988, 1991, 1994, 1995, 1996, 1997, 2007, 2012, 2020, 2024, 2029, 2039, 2042, 2047, 2050, 2055, 2056, 6016
\ding 610, 6057, 6060
\DingObject 13293
\discretionary 676
\div 20644
\divdot 19232, 20971
\divide 10803
\divideontimes . . . 18266, 20225
\Divides 17846, 20048
\DividesNot 17848, 20049
\DJ 3181, 14963, 15559
\dj 3178, 3179, 15562
\dlsh 17686, 19983
\do 981, 2402, 2407, 2412, 3523, 3555, 3556, 3557, 3558, 3613, 3614, 3615, 3616, 3617, 3618, 3621, 3622, 3623, 3624, 3625, 3626, 3629, 3630, 3633, 3634, 3635, 3636, 3637, 3640, 3641, 3642, 3643, 3644, 3647, 3648, 3649, 3650, 3651, 3654, 3655, 3656, 3657, 3658, 3661, 3662, 3665, 3666, 3667, 3670, 3671, 3677, 3678, 3679, 3680, 4015, 4016, 4017, 4018, 4019, 4020, 5465, 7209, 12617, 12679, 12917, 12924, 12934, 13218, 13281, 13574, 13640, 14452, 14479
\documentclass 2, 8804
\DocumentMetadata 3991, 3993
\dospecials 14461, 14488
\Doteq 17993, 20831
\doteq 17986, 20107
\doteqdot 17991, 20109
\dotminus 17925, 20080
\dotplus 17844, 20047
\dots 548
\dottimes 19233, 20544
\doublebarwedge . 19256, 20553
\doublecap 18300, 20875
\doublecup 18303, 20876
\doublesqcap 19244, 20972
\doublesqcup 19249, 20973
\doublevav 16974
\doublevee 19252, 20552
\doublewedge . . . 19250, 20551
\doubleyod 16978
\DOWNarrow . . . 18629, 20313
\Downarrow 17757, 20009
\downarrow 19959

\downdownarrows 17732, 20000
\downdownharpoons ... 19153, 20512
\downharpoonleft 17715, 19993
\downharpoonright 17712, 19992
\downmodels 19369, 20604
\downtherefore .. 17920, 20824
\downuparrows .. 17795, 20025
\downupharpoons 19171, 20518
\downvdash 18203, 20854
\dp 5108, 5116, 5129, 6234, 6237, 7430, 9464, 9544, 9581, 9621, 11348, 11351, 12002, 12284, 13510
\dsbiological 18845, 20381
\dschemical 18843, 20380
\dscommercial ... 18847, 20382
\dsjuridical 18841, 20379
\dsmedical 18839, 20378
\dsmilitary 18836, 20377
\dtimes 19236, 20545
\dvipdfm@setdim 13507, 13557, 13656, 13679, 13710, 13735, 13763, 13792
\dz 16310, 20768

E

\Earth 18733, 20918
\earth 18731, 20348
\ECIRCUMFLEX 19505, 19589, 19590, 19591, 19592, 19593
\ecircumflex 19499, 19529, 19530, 19531, 19532, 19533
\Ecommerce 17570, 20799
\EdefEscapeName .. 3829, 3879, 9371, 10113, 10652, 11526, 12678, 12681, 13280, 13283, 13636, 13642
\EdefEscapeString 784, 794
\EdefUnescapeName 3830
\EdefUnescapeString . 779, 7928
\egroup . 675, 8927, 9932, 10383, 11039, 12864, 12956, 12981
\EightAsterisk ... 19030, 20462
\EightFlowerPetal 19008, 20452
\EightFlowerPetalRemoved 19027, 20461
\eighthnote 18815, 20944
\eightinferior 19921
\EightStar 18987, 20442
\EightStarBold .. 18989, 20443
\EightStarConvex 18983, 20440
\EightStarTaper . 18981, 20439
\eightsuperior 19905
\einferior 19929
\ejective 16262, 20759
\ell 17541, 19944
\em 594
\emgma 16144, 20730
\emph 573
\empty 963, 3426
\emptyset 17813, 20034
\enc@@html 5865, 5868
\enc@update 533
\END .. 1311, 1312, 1338, 1339, 1354, 1355, 1372, 1373, 1390, 1391, 1747, 1753, 1758, 1860, 1862, 9254, 9267, 9271, 9278, 9291, 9295
\end 615, 20996
\endeqnarray .. 7157, 7176, 7184
\endequation 7132, 7144
\endForm 5855
\endinput 64, 2698, 2793, 4396, 4527, 8425, 10972, 12347, 14573
\endlinechar ... 830, 851, 4765
\endNoHyper 6358
\EndPreamble 12350
\endsubeqnarray ... 7188, 7195
\eng 15692, 20675
\engma 15693, 20676
\ensuremath 660
\Envelope 18903, 20402
\enya 16148, 20732
\epsdice 612, 20649
\epsi 16067, 20708
\epsilon 19853
\eqcirc 18010, 20117
\eqcolon 17928, 20081
\eqdot 19261, 20555
\eqnarray 7156, 7159, 7181
\eqsim 17942, 20087
\eqslantgtr 19300, 20573
\eqslantless 19298, 20572
\equal 7793
\equalscolon 18008, 20116
\equalsinferior 19925
\equalsuperior 19909
\equation 7131, 7135
\equationautorefname 2965, 2983, 3001, 3019, 3037, 3055, 3073, 3091, 3092, 3131, 3149, 3167, 3185, 3203, 3221, 3239, 3257, 8663, 8667
\equiv 18030, 20126
\Equivalence 17762
\er 16063, 20707
\errmessage 3302
\escapechar ... 517, 4350, 7202, 14312, 14490, 14541
\esh 16203, 19826
\EstimatedSign .. 17569, 20798
\eta 19855
\eTeX 559, 12355
\eth 15493, 20668
\Eur 17527, 20795
\EURcr 17524, 20792
\EurCr 17523, 20791
\EURdig 17520, 20788
\EurDig 17519, 20787
\EURhv 17522, 20790
\EurHv 17521, 20789
\EURtm 17526, 20794
\EurTm 17525, 20793
\evensidemargin 7948
\ExecuteOptions ... 4187, 4188, 4192
\exists 17809, 20032
\exp 498, 504, 2325
\ExplSyntaxOff 360, 509, 2337, 4288, 5089, 5148, 6882, 8155
\ExplSyntaxOn 356, 493, 2319, 4277, 5053, 5143, 6849, 8084
\extrasvietnam 3358
\extrasvietnamese 3350
\EyesDollar 15244, 20653

F

\fa 19686
\fallingdoteq 20111
\fallingdotseq 17997
\FancyVerbLineautorefname 2978, 2996, 3014, 3032, 3050, 3068, 3086, 3121, 3124, 3144, 3162, 3180, 3198, 3216, 3234, 3252, 3270, 8680
\farsikaf 19728
\farsiya 19732
\fatha 19712
\fatsemi 19226, 20541
\Fax 19457, 20633
\fax 17581, 19954
\Faxmachine 19459, 20989
\fbox 13146, 13149
\fcdice 613, 20650
\Female 18730, 20917

\female . . . 18724, 18727, 20914
\FemaleFemale . . 18853, 20385
\FemaleMale 18857, 20387
\Field@addtoks 5929, 5961, 5964, 6138, 6159
\Field@boolkey 5418, 5506, 5923, 5954, 5957
\Field@toks 5927, 5928, 5930, 12856, 12873, 12884, 12895, 12905, 12922, 12940, 12948, 12953, 12969, 12978
\Field@Width 5840, 5987
\figureautorefname . 2968, 2986, 3004, 3022, 3040, 3058, 3076, 3106, 3134, 3152, 3170, 3188, 3206, 3224, 3242, 3260, 8670
\filename@area 5248
\filename@base 5248
\filename@ext 5245, 5246, 5248, 5249
\filename@parse 5244
\find@pdflink . . 8973, 9024, 9034
\Finv 17571, 19949
\Fire 19460, 20634
\firstaid@cref@updatelabeldata 6859
\fivedots 19395, 20615
\FiveFlowerOpen . 19006, 20451
\FiveFlowerPetal . 19004, 20450
\fiveinferior 19918
\FiveStar 18663, 20326
\FiveStarCenterOpen . . 18965, 20431
\FiveStarConvex . 18973, 20435
\FiveStarOpen . . 18665, 20327
\FiveStarOpenCircled . . 18963, 20430
\FiveStarOpenDotted . . 18967, 20432
\FiveStarOutline . 18969, 20433
\FiveStarOutlineHeavy . 18971, 20434
\FiveStarShadow . 18975, 20436
\fivesuperior 19902
\Flag 18831, 20375
\flap 16191, 20743
\flapr 16190, 20742
\flat 18820, 20370
\Fld@@additionalactions 13920, 13963, 13967
\Fld@@DingDef 6057, 6060, 6079
\Fld@additionalactions . 13920, 14011, 14040, 14075, 14110, 14145, 14180, 14212
\Fld@align . . 5844, 6044, 13989, 14050, 14119
\Fld@altname 5977, 5979, 13900, 13902, 13973, 13975
\Fld@annotflags 5625, 5627, 13984, 14017, 14045, 14079, 14114, 14150, 14186
\Fld@annotnames 13971, 13986, 14019, 14047, 14081, 14116, 14152, 14188
\Fld@bcolor . 5846, 6086, 14001, 14003, 14066, 14068, 14095, 14097, 14123, 14135, 14137
\fld@bcolor 14054
\Fld@bordercolor 5847, 6089, 13997, 13999, 14025, 14033, 14035, 14053, 14062, 14064, 14091, 14093, 14122, 14131, 14133, 14158, 14166, 14168, 14194, 14202, 14204
\Fld@bordersep 5848, 6038
\Fld@borderstyle 5850, 6022, 6023, 6024, 6034, 13990, 14023, 14051, 14085, 14120, 14156, 14210
\Fld@borderwidth 5849, 6002, 6228, 6231, 6232, 6235, 6236, 12666, 12667, 13268, 13269, 13624, 13625, 13990, 14023, 14051, 14085, 14120, 14156, 14210
\Fld@calculate@code 6097, 12565, 13069, 13523, 13933, 13935
\Fld@calculate@sortkey . . 6131, 6133, 13078
\Fld@cbsymbol 5851, 6050, 14005
\Fld@charsize 5841, 5842, 5999, 12665, 13267, 13623, 14007, 14072, 14101, 14141, 14192
\Fld@checkedfalse 5837
\Fld@checkequals . . 5941, 12618, 12680, 12925, 12935, 13219, 13282, 13575, 13641
\Fld@choices 5732, 5740, 5742, 5746, 5755, 5762, 5766, 5814, 5816, 5824, 5825, 14074
\Fld@color . . 5845, 6092, 14008, 14073, 14102, 14142
\Fld@default . 5757, 5760, 5762, 6041, 12578, 12594, 12610, 12650, 12678, 12792, 12854, 12872, 12886, 12894, 12901, 12927, 12937, 12967, 12977, 13181, 13198, 13211, 13252, 13280, 13396, 13530, 13547, 13567, 13608, 13636, 13773, 14103, 14107, 14108, 14143
\Fld@DingDef . 6050, 6053, 6055
\Fld@disabledfalse 5838
\Fld@export . 5570, 5573, 5580, 5870
\Fld@findlength . . 12904, 12915
\Fld@flags 5639, 5641, 5652, 5654, 5668, 5670, 5700, 5702, 5725, 5727, 13988, 14021, 14049, 14083, 14118, 14154, 14190
\Fld@format@code . 6095, 13925, 13927
\Fld@getmethodfalse 5890
\Fld@getmethodtrue 5892
\Fld@height 5996, 12581, 12599, 12613, 12668, 12688, 12705, 12745, 12765, 12795, 12805, 13184, 13204, 13214, 13270, 13298, 13312, 13348, 13371, 13399, 13411, 13533, 13549, 13570, 13626, 13638, 13672, 13721, 13744, 13776, 13784
\Fld@hiddenfalse 5528
\Fld@hiddentrue 5529
\Fld@invisiblefalse 5524
\Fld@invisibletrue 5525
\Fld@keystroke@code 6098, 13921, 13923
\Fld@listcount . . . 12677, 12682, 12685, 12690, 12695, 12700, 13279, 13284, 13299, 13305, 13635, 13643, 13647, 13652, 13663, 13668
\Fld@loc 5951
\Fld@mappingname . 5981, 5983, 13904, 13906, 13977, 13979
\Fld@maxlen . 5843, 5990, 14146
\Fld@menulength . . 5839, 5993, 12615, 12619, 12665, 12916, 12917, 12920, 13216, 13220, 13267, 13572, 13576, 13623
\Fld@name 5975, 12577, 12609, 12713, 12791, 12853, 12858, 12869, 12870, 12881, 12882, 12891, 12892, 12900, 12921, 12938, 12946, 12951, 12966, 12975, 13180, 13210, 13317,

13395, 13529, 13566, 13686, 13772, 13899, 13972
\Fld@norotatefalse 5541
\Fld@norotatetrue 5540
\Fld@noviewfalse 5544
\Fld@noviewtrue 5545
\Fld@nozoomfalse 5537
\Fld@nozoomtrue 5536
\Fld@onblur@code . 6100, 13941, 13943
\Fld@onclick@code . 6094, 6170, 14039
\Fld@onenter@code 6103, 13953, 13955
\Fld@onexit@code . 6104, 13957, 13959
\Fld@onfocus@code 6099, 13937, 13939
\Fld@onmousedown@code 6101, 13945, 13947
\Fld@onmouseup@code . . 6102, 13949, 13951
\Fld@pageobjref . 12556, 13154, 13165, 13520, 13855, 13985, 14018, 14046, 14080, 14115, 14151, 14187
\Fld@printfalse 5533
\Fld@printtrue 5532
\Fld@radiosymbol . . 5852, 6053, 14099
\Fld@rotation 5853, 6083, 13993, 13995, 14024, 14029, 14031, 14052, 14058, 14060, 14087, 14089, 14121, 14127, 14129, 14157, 14162, 14164, 14193, 14198, 14200
\Fld@submitflags . . . 5607, 5609, 14178
\Fld@temp . . 6056, 6058, 6061, 6062, 6071, 6072
\Fld@validate@code 6096, 13929, 13931
\Fld@value . . 5758, 5764, 5766, 6047, 12579, 12594, 12611, 12649, 12650, 13182, 13198, 13212, 13251, 13252, 13531, 13547, 13568, 13607, 13608, 14144
\Fld@width 5986, 12580, 12593, 12599, 12612, 12648, 12659, 12661, 12688, 12705, 12728, 12744, 12752, 12764, 12778, 12794, 12800, 12805, 13183, 13197, 13204, 13213, 13250, 13261, 13263, 13298, 13312, 13333, 13347, 13355, 13370, 13384, 13398, 13405, 13411, 13532, 13546, 13549, 13569, 13606, 13617, 13619, 13638, 13672, 13703, 13720, 13728, 13743, 13757, 13775, 13782, 13784
\float@caption 7534, 7607
\float@makebox 7609, 7610
\floatingpenalty 7431
\Florin 15815, 20680
\flq 641
\flqq 639
\fmtname 7
\fmtversion 7
\font 5096
\fontencoding . . . 525, 529, 566, 13138
\fontfamily 567, 13137
\fontseries 568, 13139
\fontshape 569, 4715, 13140
\fontsize 570
\Football . . 18872, 18874, 20949
\footins 7425
\footnoteautorefname 2966, 2984, 3002, 3020, 3038, 3056, 3074, 3095, 3098, 3132, 3150, 3168, 3186, 3204, 3222, 3240, 3258, 8664, 8668
\footnotesep 7429, 7437
\footnotesize 599, 7427
\footnotetext 7387
\footref 7456, 7457
\forall 17803, 20029
\Force 17634, 20805
\forcecjktoken 462
\foreignlanguage 626
\Form 5854
\Form@action 5864, 12845, 14176
\Form@boolkey 5858
\Form@htmlfalse . . . 5857, 5876
\Form@htmltrue 5869
\Form@method 5888, 5896, 12845
\Forward 18622, 20310
\ForwardToIndex . 18440, 20299
\FourAsterisk . . . 18951, 20424
\fourinferior 19917
\FourStar 18959, 20428
\FourStarOpen . . 18961, 20429
\foursuperior 19901
\fourth 17417, 19897
\frown 18393, 20280
\frownie 18706, 20341
\Frowny 18708, 20909
\frq 642
\frqq 640
\fullnote 19434, 20623
\futurelet 695, 1305

G

\G . 15125, 15169, 15198, 15928, 15930, 15932, 15934, 15944, 15946, 15947, 15958, 15960, 15970, 15972, 15974, 15976
\g 2322, 2326, 2334
\g@addto@macro . . . 6482, 6654, 7670, 7900, 7903, 7906, 7958, 9299, 10265, 10794, 11084, 11674, 11783, 11853, 12162, 12361
\G@refundefinedtrue 5021, 8430, 8450, 8467, 8599
\gaf 19730
\Game 17583, 19955
\Gamma 19838
\gamma 19851
\gammainferior 19881
\Ganz 19436, 20986
\GaPa 19422, 20617
\Gauge 6186
\ge 18042, 20131
\Gemini 18762, 20929
\gemini 18760, 20357
\GenericError 683, 3706
\GenericInfo 685, 3704
\GenericWarning 261, 684, 3705
\Gentsroom 19464, 20636
\geq 18042, 20130
\geqclosed 18252, 20870
\geqq 18050, 20134
\geqslant 19271, 20560
\GetDocumentProperties . 2319, 4280
\getrefbykeydefault . 7057, 7058
\gexmode . 10824, 10825, 10927
\gg 18062, 20140
\ggg 18312, 20245
\ghayn 19682
\gimel 17577, 19952
\Gin@setfile 8240, 8241
\glossary 648, 7975
\glotstop 16260, 19835
\glottal 16263, 20760
\glq 637
\glqq 635
\gnapprox 19290, 20569

\gneq 19286, 20567
\gneqq 18056, 20137
\gnsim 18344, 20259
\grq 638
\grqq 636
\gtrapprox 19279, 20564
\gtrclosed 18245, 20867
\gtrdot 18308, 20243
\gtreqless 18318, 20247
\gtreqqless 19296, 20571
\gtrless 18089, 20152
\gtrsim 18080, 20148
\guillemetleft 14888, 15071, 15343, 19486
\guillemetright . . 14920, 15072, 15379, 19487
\guillemotleft . . . 14887, 15342
\guillemotright . . 14919, 15378
\guilsinglleft 14818, 15073, 17400, 19488
\guilsinglright . . . 14820, 15074, 17402, 19489

H

\H . 15120, 15172, 15201, 15223, 15703, 15705, 15767, 15769, 16895, 16897
\h . . 3171, 19512, 19517, 19522, 19527, 19532, 19537, 19542, 19547, 19552, 19557, 19562, 19567, 19572, 19577, 19582, 19587, 19592, 19597, 19602, 19607, 19612, 19617, 19622, 19627
\H@@footnotemark 7287, 7304, 7371, 7461, 7468, 7480, 7491
\H@@footnotetext 7286, 7296, 7331, 7370, 7409, 7469, 7483, 7491
\H@@mpfootnotetext 7294, 7306, 7308, 7372
\H@@theHfootnote . 7278, 7281
\H@endeqnarray . . . 7157, 7177
\H@endequation . . . 7132, 7150
\H@endsubeqnarray . 7188, 7196
\H@eqnarray 7156, 7162
\H@equation 7131, 7137
\H@item 6836, 6841, 7678, 7703
\H@old@part 14640, 14648
\H@old@schapter . 14610, 14619
\H@old@sect 14658, 14669, 14678
\H@old@spart . . . 14650, 14656
\H@old@ssect 14596, 14601
\H@refstepcounter . . 6843, 7107, 7136, 7232, 7529
\H@subeqnarray . . . 7187, 7191
\ha 19698
\Haa 19656
\Halb 19439, 20987
\halfnote 19437, 20624
\halign 657
\hamza 19632
\HandCuffLeft . . . 18682, 20333
\HandCuffRight . . 18684, 20334
\HandLeft 18686, 20335
\HandRight 18689, 20336
\HaPa 19424, 20618
\HAR@checkcitations 7809
\HAR@citetoaux 7765
\HAR@tempa 7810, 7811, 7812, 7813, 7814, 7815
\hardsign 16553, 20771
\harvardcite 7759, 7796
\harvarditem 7784
\hateq 18018, 20121
\hausaB 15804, 19800
\hausab 16039, 20701
\hausaD 15808, 19801
\hausad 16053, 20706
\hausaK 15819, 19802
\hausak 15823, 20682
\hb@xt@ 5111, 5124
\hbar 15610, 19799
\hbox . . 1553, 1559, 1565, 2260, 3437, 3443, 5112, 5126, 5283, 5285, 5987, 6222, 6223, 6224, 6225, 7943, 8920, 9465, 9475, 9545, 9559, 9582, 9597, 9622, 9637, 9908, 9925, 11003, 11351, 11365, 12003, 12013, 12285, 12300, 12993, 13548, 13637, 13671, 13701, 13729, 13758, 13783, 14585
\hc@currentHref 7545
\HCode . . 12845, 12847, 12858, 12867, 12879, 12887, 12889, 12920, 12926, 12931, 12936, 12950, 12955, 12959, 12962, 12971
\hdotfor 17382, 19891
\headerps@out 6762, 11664, 11675, 11770, 11784, 11845, 11854, 11867, 11881, 11928, 12046, 12163, 12362
\Heart 18795, 20940
\heartsuit . 18793, 18796, 20941
\hebalef 16919
\hebayin 16955
\hebbet 16921
\hebdalet 16915, 16925
\hebfinalkaf 16939
\hebfinalmem 16945
\hebfinalnun 16949
\hebfinalpe 16957
\hebfinaltsadi 16961
\hebgimel 16923
\hebhe 16927
\hebhet 16933
\hebkaf 16941
\heblamed 16943
\hebmem 16947
\hebnun 16951
\hebpe 16959
\hebqof 16965
\hebresh 16967
\hebsamekh 16953
\hebshin . . 16969, 16970, 20773
\hebsin 16970, 20773
\hebtav 16972
\hebtet 16935
\hebtsadi 16963
\hebvav 16929
\hebyod 16937
\hebzayin 16931
\Hermaphrodite . . 18859, 20388
\hexagon 18435, 20297
\hexstar 18870, 20390
\hfill . . . 6222, 6223, 6224, 6225, 7689, 7733
\Hfootnoteautorefname . . 8664
\hinferior 19933
\hoffset 7944
\hookb 16038, 20700
\hookd 16052, 20705
\hookg 16085, 20712
\hookh 16105, 20717
\hookheng 16109, 20719
\hookleftarrow . . . 17672, 19977
\hookrevepsilon . . 16074, 20709
\hookrightarrow . 17674, 19978
\hphantom 609
\href 649, 4881, 6383
\href@ 4884, 4887, 4892
\href@split 4892, 4893
\hsize 7432
\hskip . . 1564, 1651, 2305, 2306, 4878, 6228, 12993
\hslash 17537, 19942
\hspace 645, 7799, 7800
\hss . . . 5113, 5125, 7952, 14590

\ht 5117, 5121, 5130, 6230, 6233, 9473, 9548, 9557, 9564, 9585, 9595, 9602, 9625, 9635, 9642, 11347, 12011, 12298, 13508
\htrtaild 19888
\Huge 596
\huge 600
\Hurl 4967, 4969, 4971
\hv 15818, 20681
\hv@pdf@char . . . 14381, 14446, 14447, 14448, 14449
\hvtex@buffer . . . 10694, 10698, 10706, 10709, 10718, 10722, 10738
\hvtex@gettoken . 10693, 10707, 10711, 10720, 10724
\hvtex@gettoken@ 10694, 10696
\hvtex@par@dimension . 10689, 10730
\hvtex@par@direction . . 10690, 10733
\hvtex@par@duration . . . 10691, 10725
\hvtex@par@motion 10692, 10727
\hvtex@param@dimension 10702, 10731, 10749, 10752
\hvtex@param@direction 10703, 10734, 10760, 10768
\hvtex@param@duration 10704, 10726, 10773, 10775
\hvtex@param@motion . 10705, 10728, 10749, 10756
\hvtex@parse@trans 10678, 10700
\hvtex@produce@trans . . 10739, 10745
\hvtex@token . . . 10697, 10708, 10714, 10721, 10726, 10729, 10732, 10734
\hvtex@trans@code 10682, 10683, 10684, 10685, 10686, 10687, 10688, 10701, 10747, 10748, 10750, 10752, 10754, 10756, 10758, 10760, 10762, 10763, 10764, 10765, 10766, 10768
\hvtex@trans@effect@Blinds 10682
\hvtex@trans@effect@Box 10683
\hvtex@trans@effect@Dissolve 10684
\hvtex@trans@effect@Glitter 10685
\hvtex@trans@effect@R . . 10688
\hvtex@trans@effect@Split 10686
\hvtex@trans@effect@Wipe 10687
\hvtex@trans@par 10721, 10725, 10727, 10730, 10733
\hvtex@trans@params . . 10715, 10717, 10741
\Hy@@CleanupFile . 5283, 5285
\Hy@@DefNameKey . 2427, 2429
\Hy@@escapeform 13865, 13878, 13884
\Hy@@SectionAnchor . . . 14580, 14583, 14593
\Hy@@temp . . 3467, 3469, 6106, 6108
\Hy@@VersionCheck . . 283, 312
\Hy@abspage . 6502, 6588, 6704, 6788
\Hy@Acrobatmenu . . 4295, 4336, 9369, 10111, 10653, 11527
\Hy@activeanchorfalse 4763, 9015, 9417, 9432, 9511, 9521, 9837, 10368, 10385, 10461, 10474, 10989, 11951, 11966, 12238, 12252
\Hy@activeanchortrue 9011, 9414, 9428, 9509, 9518, 9833, 10364, 10382, 10459, 10471, 10979, 11948, 11962, 12235, 12248
\Hy@ActiveCarriageReturn 4800, 4803
\Hy@addcontentsline@addbookmark . . . 7962, 8016, 8034
\Hy@AllowHyphens 4874, 10977, 11009, 11334
\Hy@AlphNoErr 6949, 6962, 6964
\Hy@AnchorName . . 5005, 5007, 5010, 5012, 5037, 5039, 5043, 5048, 5050
\Hy@appendixstring 6943, 6966, 6967
\Hy@AtBeginDocument 356, 2566, 2694, 2789, 3387, 4169, 4238, 4255, 4392, 4398, 4523, 4686, 4750, 6300, 6795, 7756, 8514, 8915, 9306, 9920, 10443, 11880, 11926, 13010, 13043
\Hy@AtBeginDocumentHook 362, 367, 373, 374
\Hy@AtEndOfPackage 364, 818, 3351, 3359, 3366, 4406, 4414, 4638
\Hy@AtEndOfPackageHook 365, 368, 370, 371
\Hy@author 6408, 6412
\Hy@babelnormalise 4982, 4984
\Hy@backout . 4759, 6343, 6347, 7643
\Hy@backreffalse . . . 428, 2930, 2952, 4404
\Hy@backreftrue . . . 2923, 2927, 2949
\Hy@BeginAnnot . . . 9950, 9967, 10010, 10049, 10082, 10112
\Hy@bibcite 7667, 7671
\Hy@bookmarksdepth . . . 3422, 3427, 3439, 3445, 14224
\Hy@bookmarksfalse 8024
\Hy@bookmarksnumberedfalse 429
\Hy@bookmarksopenfalse . 430
\Hy@bookmarkstrue . 431, 8020
\Hy@bookmarkstype 3457, 3459, 7979, 14235
\Hy@boolkey . 2353, 2446, 2449, 2452, 2473, 2476, 2479, 2510, 2513, 2530, 2537, 2540, 2543, 2546, 2549, 2552, 2555, 2558, 2621, 2901, 2904, 2959, 3373, 3385, 3400, 3417, 3420, 3461, 3464, 3683, 3970, 3973, 3976, 3979, 3982, 3985, 3996, 4005, 4137, 4140, 6720
\Hy@BorderArrayPatch . 11405, 11408, 11673, 12161
\Hy@breaklinks@unsupported 2518, 10955
\Hy@breaklinksfalse 432
\Hy@breaklinksunhbox . 11301, 11355
\Hy@CatcodeWrapper . . . 4647, 4704, 4753
\Hy@chapapp 6944, 6945, 6966, 6999, 14614, 14625
\Hy@chapterstring . . 6939, 6941, 6944, 6998
\Hy@CheckOptionValue . . 2397, 2434
\Hy@CJKbookmarksfalse . . 434
\Hy@cjkpu 974, 976, 997
\Hy@CleanupFile . . . 5281, 9073, 10012, 10538, 11599
\Hy@colorlink 3379, 4707, 4715, 4719,

8916, 8996, 9066, 9103, 9136, 9391, 9415, 9438, 9469, 9482, 9510, 9526, 9551, 9567, 9589, 9606, 9629, 9646, 9921, 10000, 10041, 10075, 10105, 10132, 10460, 10482, 10552, 10578, 10613, 10646, 10665, 11007, 11280, 11282, 11949, 11972, 12007, 12020, 12236, 12258, 12293, 12306
\Hy@colorlinksfalse 3376
\Hy@ColorList 3522, 3523
\Hy@CounterExists 6823
\Hy@currentbookmarklevel 14230, 14240, 14241, 14247, 14254, 14346, 14349, 14354, 14358
\Hy@debugfalse 424
\Hy@debugtrue 423
\Hy@defaultbp 6002, 6004
\Hy@defaultbpAux . 6006, 6009
\Hy@defaultdriver . . 4508, 4540, 4550, 4562
\Hy@deferred@thm@head . 7251, 7252
\Hy@DefFormAction 5862, 5864
\Hy@DefNameKey . . 2426, 3554, 3612, 3620, 3628, 3632, 3639, 3646, 3653, 3660, 3664, 3669, 3676, 4014
\Hy@DEST 11302, 11369
\Hy@destlabelfalse 435
\Hy@DestName 8960, 8967
\Hy@DestRename . . 5346, 5371, 5375
\Hy@DisableOption 2382, 4273, 4274, 4275, 4289, 4294, 4411, 4582, 4583, 4584, 4585, 4586, 4587, 4588, 4589, 4590, 4591, 4592, 4593, 4594, 4595, 4596, 4597, 4598, 4599, 4600, 4601, 4646, 4699, 4724, 4725, 4761, 4762, 5402, 6304, 6305, 6306, 6307, 6308, 6309, 6310, 6311, 6312, 6313, 6314, 6315, 6316, 6317, 6318, 6319, 6320, 6321, 6322, 6323, 6324, 6325, 6326, 6327, 6432, 6656, 7496, 8245, 8371, 8372, 8839, 8943, 9238, 9239, 9240, 9241, 9242, 9243, 9244, 9245, 9246, 9247, 9248, 9364, 9673, 9674, 9675, 9676, 9677, 9678, 9679, 9680, 9681, 9682, 9683, 9684, 9948, 10168, 10169, 10170, 10171, 10172, 10173, 10174, 10175, 10176, 10177, 10178, 10179, 10297, 10445, 10905, 10906, 10907, 10908, 10909, 10910, 10911, 10912, 10913, 10914, 10915, 10916, 11162, 11163, 11164, 11165, 11166, 11167, 11168, 11169, 11170, 11171, 11172, 11173, 11755, 12069, 12070, 12071, 12072, 12073, 12074, 12075, 12076, 12077, 12078, 12079, 12080
\Hy@DistillerDestFix 7914, 10920, 10922
\Hy@draftfalse 391
\Hy@drafttrue 392
\Hy@driver . . . 474, 2523, 2691, 2703, 2715, 2718, 2730, 2736, 2741, 2755, 2765, 2770, 2776, 2783, 2786, 2812, 2828, 2835, 2841, 2852, 2866, 4416, 4419, 4427, 4430, 4434, 4437, 4439, 4443, 4449, 4453, 4456, 4460, 4465, 4469, 4472, 4476, 4480, 4484, 4487, 4491, 4494, 4496, 4500, 4506, 4511, 4513, 4517, 4520, 4531, 4534, 4537, 4540, 4549, 4550, 4562, 4564, 4572, 4574, 4576, 4578
\Hy@dth@currentHref . . . 7234, 7235, 7242
\Hy@DviErrMsg . . . 2658, 2660, 2663, 2669, 2682
\Hy@DviModetrue . . 2667, 2672
\Hy@DvipdfmxOutlineOpentrue 4608, 4615
\Hy@EndAnnot . . . 9956, 10003, 10044, 10078, 10108, 10135
\Hy@endcolorlink . . 3380, 4711, 4716, 4720, 8925, 9002, 9415, 9452, 9476, 9484, 9510, 9534, 9555, 9569, 9593, 9608, 9633, 9648, 9930, 9958, 10460, 10533, 10554, 10580, 10615, 10648, 10667, 11034, 11294, 11949, 11988, 12014, 12022, 12236, 12272, 12297, 12308
\Hy@EndWrap 4648, 4650, 4651, 4684
\Hy@Error 255, 271, 277, 300, 2570, 2680, 2706, 2722, 2757, 2796, 2803, 2814, 2820, 2858, 4320, 4935, 5214, 5565, 5689, 5883, 5915, 6111, 6164, 12719, 12772, 13324, 13378, 13693, 13751
\Hy@escapeform . 12598, 12684, 12703, 12732, 12753, 12779, 12804, 13202, 13288, 13310, 13337, 13358, 13386, 13409, 13554, 13646, 13675, 13707, 13731, 13759, 13789, 13859, 13889, 13896
\Hy@escapestring 13856, 13923, 13927, 13931, 13935, 13939, 13943, 13947, 13951, 13955, 13959, 14005, 14039, 14099, 14143, 14144, 14176
\Hy@EveryPageAnchor . . 7913, 7959
\Hy@EveryPageBoxHook 6459, 6463, 6467, 7958, 10265, 10794, 11084
\Hy@EveryPageHook 6458, 6462, 6654, 9299
\Hy@ExchangeLeftParenthesis 8713, 8719
\Hy@ExchangeRightParenthesis 8723, 8729
\Hy@false 2223, 2363, 2915, 2951, 5912
\Hy@finalfalse 392
\Hy@finaltrue 391
\Hy@FirstPage 4306
\Hy@FirstPageHook 6460, 6474, 6475, 6479, 6482, 6760, 6761, 11674, 11783, 11853, 12162, 12361
\Hy@float@caption . . 7535, 7586, 7600
\Hy@float@currentHref 7590, 7593, 7595, 7601, 7603, 7605
\Hy@footnote@currentHref 6299, 7316, 7321, 7324,

7339, 7344, 7347, 7359, 7361, 7400, 7442, 7445
\Hy@FormObjects 13102, 13417, 13472, 13482, 13800, 13851
\Hy@frenchlinksfalse 3378
\Hy@Gin@setfile . . . 8240, 8242
\Hy@GlobalAppendToMacro 358, 930, 5386
\Hy@GlobalStepCount 472, 6588, 7029, 7053, 7933
\Hy@gtemp 806, 807, 4351, 4357, 4359, 5777, 5791, 7376, 7381, 8737, 8739, 13916, 13918
\Hy@href 4884, 4886
\Hy@href@nextactionraw 4921, 4944, 4946, 4947, 4949, 4954, 4958, 4960, 9062, 9099, 9132, 9387, 9996, 10037, 10071, 10101, 10128, 10497, 10567, 10635, 11624, 11653
\Hy@href@page 4899, 4901, 4905, 4906, 4908, 4915, 4918, 9095, 10032, 11620
\Hy@hyperfiguresfalse 437
\Hy@hyperfootnotestrue . . 439
\Hy@hyperindextrue 440
\Hy@hypertexnamesfalse . 2194
\Hy@hypertexnamestrue . . 441
\Hy@ifempty 359, 5157
\Hy@iffileloaded . 898, 903, 6472
\Hy@ifnotmeasuring 6888, 6891
\Hy@IfStringEndsWith . . 5249, 5261
\Hy@implicittrue 442
\Hy@Info 258, 2371, 4362, 4364, 4367, 4369, 4372, 4374, 4377, 4379, 4382, 4384, 4631, 4637, 4712, 4717, 4721, 4843, 4870, 5472, 6261, 6263, 6266, 6268, 6271, 6273, 6276, 6278, 6281, 6283, 6286, 6288, 6291, 6293, 7757, 7984, 8001
\Hy@InfoNoLine 259, 4387, 4389, 4574, 8761, 12215
\Hy@IsNotEmpty . . 5353, 5354, 5377
\Hy@LastPage 4309
\Hy@leftbracechar 315, 332
\Hy@level 14236, 14238, 14249, 14254, 14255, 14256, 14286
\Hy@levelcheck . . 14237, 14252
\Hy@linkcounter 476, 478, 7029, 7030, 7053, 7054
\Hy@linkfileprefix . . 3501, 5233, 9455, 10333, 11992, 12275
\Hy@LinkMath . . 10998, 11000, 11005, 11037, 11326, 11328, 11333, 11335, 11341, 11343
\Hy@linktoc . 2481, 2483, 2491, 2493, 2503, 8052, 8093, 8109, 8126, 8142
\Hy@linktoc@all 2489
\Hy@linktoc@none 2486
\Hy@linktoc@page . . 2481, 2488, 2491
\Hy@linktoc@section 2483, 2487, 2493
\Hy@linktocpagefalse 443
\Hy@localanchornamefalse . 444
\Hy@LocalAppendToMacro 357, 362, 365, 6908, 6924, 6929
\Hy@LookForParentCounter 6914
\Hy@LT@currentHref 7109, 7120
\Hy@LT@footnotetext 7399, 7408
\Hy@make@anchor . 8168, 8174, 8180
\Hy@make@df@tag@@ 8172, 8187
\Hy@make@df@tag@@@ . . 8178, 8188
\Hy@MakeCurrentHref . . 6992, 7041, 7054
\Hy@MakeCurrentHrefAuto 7052, 7066, 8169, 14598, 14614, 14625, 14652, 14666
\Hy@MakeRemoteAction . 4904, 9076, 10015, 11602
\Hy@maketitle@end . 7472, 7477, 7479
\Hy@maketitle@optarg . . . 7470, 7475
\Hy@Match 318, 320, 2874, 3511, 3569, 3586, 3932, 4032, 4038, 4068, 4069, 4072, 4083, 4098, 4949, 6024
\Hy@MaybeStopNow 2779, 4193, 4196
\Hy@Message . 260, 2693, 2788, 4391, 4522, 10389, 10393, 10396, 10399, 10402, 10405, 10408, 10411, 12546, 12817, 12821, 12824, 12827, 12830, 12833, 12836, 12839, 12849, 12986, 13477
\Hy@naturalnamesfalse . . . 446
\Hy@nestingfalse 447
\Hy@newline@author 6453
\Hy@newline@title 6452
\Hy@next . . . 6604, 6614, 6619, 14624, 14633, 14636
\Hy@nextfalse 8256
\Hy@NextPage 4300
\Hy@nexttrue . 8257, 8258, 8259
\Hy@NIL 4212, 4225, 4228
\Hy@number 3907, 3914
\Hy@numberline . 14231, 14268, 14269, 14270, 14271
\Hy@ObsoletePaperOption 2455, 2463
\Hy@ocgcolor 8919, 8933, 9924, 9938
\Hy@ocgcolorlinksfalse . . . 3377, 4694
\Hy@org@chapter 14622, 14637
\Hy@OrgMakeLabel 12330, 12337
\Hy@OutlineName 14502, 14554
\Hy@OutlineRerunCheck 14370, 14469, 14548
\Hy@PageAnchorSlide . . . 7873, 7911, 7925
\Hy@PageAnchorSlidesPlain 7859, 7910, 7920
\Hy@pageanchortrue 450
\Hy@pagecounter 477, 479, 7933, 7935, 7937
\Hy@pageheight . . . 4183, 11785, 11882
\Hy@param . . 4213, 4214, 4217, 4218, 6997, 6998, 6999, 7026, 7030
\Hy@pdf@majorminor@version . . . 2646, 4291, 5739, 8757, 8771, 8798, 8819, 13911
\Hy@pdf@majorversion 2637, 2638, 2639, 2640, 2641, 2642, 2643, 2644, 2646, 6754, 8765, 8794, 8816, 8834, 8837
\Hy@pdf@minorversion 2637, 2638, 2639, 2640, 2641, 2642, 2643, 2644, 2645, 2646, 6755, 8765, 8795, 8817, 8834, 8838
\Hy@pdfafalse 470, 4282
\Hy@pdfatrue 4285
\Hy@pdfcenterwindowfalse 433
\Hy@pdfdisplaydoctitlefalse 469
\Hy@pdfescapeformfalse . . 436
\Hy@pdffitwindowfalse . . . 438

\Hy@pdfmajorminor@version 2647, 8752, 8771
\Hy@pdfmajorversion 2647, 2655, 8794, 8816, 8832, 8837
\Hy@pdfmarkerrorfalse . . 11254
\Hy@pdfmarkerrortrue . . 11438, 11447
\Hy@pdfmenubartrue 445
\Hy@pdfminorversion 2647, 8749, 8750, 8795, 8817, 8833, 8838
\Hy@pdfnewwindowfalse . . 449
\Hy@pdfnewwindowsetfalse 448, 4002
\Hy@pdfnewwindowsettrue 4004, 4923
\Hy@pdfnewwindowtrue . 4924
\Hy@pdfpagelabelsfalse . . 6489
\Hy@pdfpagelabelstrue . . . 451
\Hy@pdfstringdef . . . 805, 5737, 5745, 5948, 6041, 6047
\Hy@pdfstringfalse . . 452, 6329
\Hy@pdfstringtrue . . . 662, 6301
\Hy@pdftoolbartrue 458
\Hy@pdfusetitlefalse 466
\Hy@pdfversion 2645
\Hy@pdfwindowuitrue 468
\Hy@pkg 4211, 4218
\Hy@plainpagesfalse 453
\Hy@PrevPage 4303
\Hy@ProvideTheHCounter 6895
\Hy@ps@CR 11835, 11842, 11847, 11848, 11865, 11886, 11887, 11888, 11894, 11901, 11908, 11915
\Hy@psdextrafalse 457
\Hy@pstringB 9154, 9159, 10210, 10222, 11227, 11243, 12134, 12150
\Hy@pstringD 9075, 9097, 10014, 10034, 11601, 11622
\Hy@pstringdef 8684, 8959, 8983, 9040, 9074, 9075, 9109, 9110, 9154, 9775, 9976, 10013, 10014, 10050, 10051, 10083, 10210, 10481, 10559, 10622, 10623, 11227, 11436, 11445, 11574, 11600, 11601, 11632, 11633, 12134, 13882, 14501, 14517
\Hy@pstringDest . . . 8959, 8960, 9775, 9822, 11436, 11437, 11441, 11445, 11446, 11450
\Hy@pstringF 9072, 9073, 9074, 9091, 9109, 9125, 9130, 10011, 10012, 10013, 10029, 10050, 10064, 10069, 10537, 10538, 10542, 10622, 10629, 10633, 11598, 11599, 11600, 11617, 11632, 11648, 11651
\Hy@pstringName 14501, 14502, 14517, 14531
\Hy@pstringP 9110, 9130, 10051, 10069, 10623, 10633, 11633, 11651
\Hy@pstringURI . . . 9040, 9058, 10083, 10097, 10481, 10493, 10559, 10563, 11574, 11586
\Hy@PutCatalog . . . 6650, 6658, 6777
\Hy@raisedlink 2248, 7068, 7089, 7090, 7091, 7094, 7121, 7140, 7145, 7148, 7169, 7319, 7342, 7413, 7440, 7573, 7653, 7679, 7684, 7704, 8170, 11662, 11768, 12042, 12213, 14587, 14615, 14626, 14653
\Hy@raiselinksfalse . . 454, 7758
\Hy@RemoveDurPageAttr 9278, 9291
\Hy@RemovePercentCr . . 4816, 4820, 4825
\Hy@RemoveTransPageAttr 9253, 9267
\Hy@reserved@a . . . 5149, 7160, 7190, 12852, 12902, 12965
\Hy@RestoreCatcodes 205, 4189, 4581
\Hy@RestoreCatcodeSettings 872, 879, 889, 906
\Hy@RestoreLastskip 2269, 8961, 9418, 9433, 9512, 9522, 9824, 10369, 10386, 10462, 10475, 10970, 10990, 11952, 11967, 12239, 12253
\Hy@RestoreSavedSpaceFactor . . 2243, 9463, 9543, 9580, 9620, 12001, 12283
\Hy@RestoreSpaceFactor 2234, 2261, 2266, 9462, 9470, 9477, 9542, 9552, 9560, 9579, 9590, 9598, 9619, 9630, 9638, 11004, 11040, 11332, 11340, 11367, 12000, 12008, 12015, 12282, 12294, 12301, 12338, 12342
\Hy@ReturnAfterElseFi . . . 483, 4804
\Hy@ReturnAfterElseFiFiEnd 485, 1520
\Hy@ReturnAfterFi . 482, 1714, 4808, 4824, 8383, 8419, 8718, 8728, 13883
\Hy@ReturnAfterFiFiEnd . 484, 1512, 1526, 1619, 1626
\Hy@ReturnEnd . 481, 484, 485, 1532, 1631
\Hy@rightbracechar . . . 316, 333
\Hy@safe@activesfalse 486, 5182, 8588
\Hy@safe@activestrue 486, 4340, 4796, 4833, 4841, 4869, 4986, 5339, 5349, 6996, 8045, 8480, 8577, 13013, 13072, 14462, 14489
\Hy@SaveCatcodeSettings . 828, 877, 887, 904
\Hy@saved@currentHref . . 7357, 7360
\Hy@saved@footnotemark 7466, 7481
\Hy@saved@footnotetext . 7467, 7484
\Hy@saved@hook . . . 6436, 6448
\Hy@saved@refstepcounter 6883
\Hy@SavedSpaceFactor 2230, 2232, 2237, 2238, 2244, 12335
\Hy@SaveLastskip 2269, 8957, 9406, 9421, 9503, 9515, 9772, 10356, 10372, 10452, 10465, 10960, 10974, 11941, 11955, 12228, 12242
\Hy@SaveSavedSpaceFactor . . . 2242, 9461, 9541, 9578, 9618, 11999, 12281
\Hy@SaveSpaceFactor 2231, 2252, 2263, 9460, 9472, 9540, 9554, 9577, 9592, 9617, 9632, 11002, 11038, 11324, 11336, 11344, 11998, 12010, 12280, 12296, 12333, 12340
\Hy@scanauthor . . . 6406, 6411
\Hy@scanoptauthor . 6406, 6407
\Hy@scanopttitle . . . 6397, 6398

\Hy@scantitle 6397, 6402
\Hy@secnum@part 14642, 14643, 14645
\Hy@SectionAnchorHref . . 659, 14578, 14603, 14671
\Hy@SectionHShift 14577, 14586, 14599, 14667
\Hy@setbreaklinks . . 2515, 2519, 2531, 8745, 9765
\Hy@SetCatcodes 181, 231, 4191
\Hy@SetNewWindow 4008, 9093, 9127, 10036, 10066, 10630, 11616, 11647
\Hy@setouterhbox 11300, 11331
\Hy@setpagesizetrue 455
\Hy@setpdfborder 3602, 8989, 9045, 9080, 9114, 9374, 9987, 10021, 10057, 10089, 10119, 10501, 10522, 10545, 10571, 10605, 10639, 10658
\Hy@setpdfhighlight 3560, 8990, 9046, 9081, 9115, 9375, 9988, 10022, 10058, 10090, 10120
\Hy@setpdfversiontrue . . . 2633
\Hy@setref@link 8436, 8439
\Hy@setup@XeTeXLinkBox@default 5135, 5147
\Hy@setup@XeTeXLinkBox@dvipdfmx 5095, 5146
\Hy@SlidesFormatOptionalPage . 6518, 7858, 7878, 7882
\Hy@SlidesPage 6525, 7892, 7893, 7899, 7901, 7904, 7907
\Hy@space 335, 480, 1471
\Hy@StartlinkName . 8987, 8998
\Hy@StepCount 471, 6565, 12619, 12682, 12917, 13220, 13284, 13576, 13643, 14350, 14355, 14431
\Hy@stoppedearlyfalse . . . 4198, 6822
\Hy@stoppedearlytrue 4195, 6819
\Hy@StringLocalhost 5279, 5280, 5295
\Hy@tabularx@hook 7369, 7377
\Hy@temp 690, 697, 2461, 2466, 2467, 2468, 2469, 2470, 2471, 3466, 3475, 3476, 3477, 3478, 3479, 3480, 3481, 3523, 3524, 3525, 3528, 3530, 3533, 3543, 3546, 3547, 3548, 3549, 3550, 3551, 3567, 3580, 3584, 3599, 3766, 3767, 3770, 3773, 3776, 3801, 3809, 3810, 3811, 3812, 3813, 3814, 3815, 3816, 3817, 4000, 4001, 4024, 4025, 4071, 4072, 4079, 4083, 4327, 4331, 4332, 4333, 4334, 4422, 4424, 4427, 4432, 4434, 4437, 4451, 4453, 4458, 4460, 4467, 4469, 4474, 4476, 4482, 4484, 4489, 4491, 4494, 4563, 4564, 5462, 5466, 5467, 5478, 5562, 5563, 5564, 5566, 5570, 5880, 5881, 5882, 5884, 5888, 5889, 6022, 6034, 6105, 6121, 6122, 6123, 6124, 6125, 6126, 6127, 6128, 6129, 6130, 6136, 6142, 6148, 6149, 6150, 6151, 6152, 6153, 6154, 6155, 6156, 6196, 6197, 6204, 6205, 6212, 6213, 6545, 6548, 6557, 6559, 6563, 6567, 6611, 6613, 6898, 6899, 6920, 7450, 7456, 8059, 8060, 8068, 8069, 8326, 8328, 8332, 8363, 8364, 8365, 8380, 8381, 8773, 8776, 8777, 8793, 8812, 9169, 9198, 9200, 9694, 9699, 9705, 9709, 9712, 9717, 9748, 9750, 10182, 10225, 10227, 11125, 11128, 11132, 11133, 11139, 11140, 11146, 11176, 11181, 11187, 11191, 11194, 11199, 11232, 11234, 11306, 11307, 11311, 11402, 11403, 11411, 11412, 11516, 11517, 12083, 12088, 12094, 12098, 12101, 12106, 12139, 12141, 13073, 13085, 13864, 13865, 14499, 14505, 14513, 14528
\Hy@temp@A 722, 723, 1504, 1506, 1517, 1519, 1524, 1525, 1528, 3802, 3804, 4212, 4225, 4228, 6915, 6918, 6919, 6920, 6921, 8275, 8276, 8277, 8284, 8312, 8313, 8314, 8323, 8350, 8774, 8785, 8786, 8787, 8788, 8791, 8797, 8800, 8827
\Hy@temp@B 1505, 1506
\Hy@temp@menu 9371, 9386, 10113, 10127, 10652, 10655, 11526, 11535
\Hy@tempa 2354, 2356, 2358, 2359, 2361, 2363, 2365, 2368, 2371, 2372, 2911, 2912, 2913, 2915, 2916, 2918, 2919, 2921, 2925, 2929, 2940, 2942, 2944, 2945, 2947, 2951, 4802, 4803, 4814, 4818, 4988, 4992, 5161, 5163, 5867, 5868, 5908, 5909, 5912, 5916, 6594, 6596, 6634, 6636, 6788, 6790, 7204, 7206, 7207, 7210, 7211, 7212, 7241, 7243, 7257, 7259, 7530, 7535, 7540, 7978, 7979, 7997, 7998, 8004, 9439, 9440, 10337, 10490, 10491, 11973, 11974, 12259, 12260, 14234, 14235, 14258, 14260, 14278, 14279, 14287, 14311, 14313, 14314, 14316, 14317
\Hy@tempb 5162, 5164, 5185, 6595, 6596, 6635, 6636, 14259, 14260, 14287
\Hy@tempcolor . . 11016, 11018, 11031, 11095, 11097, 11109
\Hy@TempPageAnchor . . 7866, 7918, 7929, 7934, 7951
\Hy@Test@Alph 6980, 7009
\Hy@Test@alph 6971, 7005
\Hy@testname 8975, 8976, 8981, 8983, 8984, 8995, 9968, 9969, 9974, 9976, 9978, 9995, 10509, 10510, 10515, 10519, 10592, 10593, 10598, 10602, 11100, 11101, 11106, 11117
\Hy@texhtfalse 456
\Hy@texhttrue 2688, 4417
\Hy@theorem@makelinktarget 7235, 7237, 7253
\Hy@theorem@refstepcounter 7230, 7271

\Hy@TheSlideOptionalPage 7877, 7881, 7886, 7895
\Hy@title 6399, 6403
\Hy@tocdestname . . 8039, 8047, 8049
\Hy@toclevel . . 7989, 7993, 8006
\Hy@toclinkend 8040, 8056, 8064, 8071, 8075, 8077
\Hy@toclinkstart . . . 8039, 8056, 8064, 8071, 8075, 8077
\Hy@true 2222, 2359, 2361, 2945, 2947, 5909
\Hy@undefinedname 8972, 8979, 8981, 9963, 9972, 9974, 10478, 10513, 10515, 10596, 10598, 11091, 11104, 11106
\Hy@unicodefalse 463, 787, 797, 2577, 2578, 2586, 3743, 3749, 7924, 13913
\Hy@unicodetrue . . . 459, 2578, 6714, 6727
\Hy@UseMaketitleInfos . . 6454, 9211, 9654, 10140, 10894, 11123, 12050
\Hy@UseMaketitleString . 6433, 6455, 6456
\Hy@UseNameKey 2439, 9176, 9177, 9178, 9179, 9180, 9181, 9182, 9183, 9202, 9724, 9725, 9726, 9727, 9728, 9729, 9730, 9731, 9752, 10189, 10190, 10191, 10192, 10193, 10194, 10195, 10196, 10229, 10854, 10855, 10856, 10857, 10858, 10859, 10860, 10861, 11206, 11207, 11208, 11209, 11210, 11211, 11212, 11213, 11236, 12113, 12114, 12115, 12116, 12117, 12118, 12119, 12120, 12143
\Hy@varioref@undefined . 8583
\Hy@VerboseAnchor 4866, 8958, 9407, 9422, 9504, 9516, 9773, 10357, 10373, 10453, 10466, 10961, 10975, 11942, 11956, 12229, 12243
\Hy@verbosefalse 424, 467
\Hy@VerboseGlobalTemp 4842, 4843, 4844, 4845, 4849
\Hy@VerboseLinkInfo . . . 4849, 4850, 4853, 4860
\Hy@VerboseLinkStart 4838, 9018, 9028, 9437, 9489, 9525, 9537, 9965, 10313, 10336, 10480, 10585, 10993, 11093, 11971, 12027, 12257, 12314
\Hy@VerboseLinkStop 4854, 9003
\Hy@verbosetrue 423
\Hy@VersionCheck . 268, 4578, 19739
\Hy@VersionChecked . 267, 310, 4575, 4577
\Hy@vt@PutCatalog 6687, 6689
\Hy@VTeXversion . . 6667, 6679, 10541, 10671, 10801, 14383
\Hy@WarnHTMLFieldOption . . 5934, 5968, 5971, 6144
\Hy@Warning 256, 343, 1472, 2376, 2392, 2417, 2497, 2602, 2607, 2845, 2853, 2878, 2894, 3391, 3435, 3514, 3575, 3594, 3778, 3825, 3833, 3954, 4086, 4109, 4119, 4127, 4690, 4910, 4953, 5158, 5165, 5305, 5519, 5872, 5935, 6027, 6723, 6738, 7966, 8564, 8613, 8977, 9806, 9810, 9970, 10511, 10594, 10882, 10888, 11102, 11439, 11448, 14243, 14261
\Hy@WarningNoLine 257, 294, 2456, 2521, 2534, 3486, 3539, 3689, 3794, 4176, 4271, 4429, 4438, 4455, 4471, 4486, 4495, 6490, 6681, 6802, 7980, 8808, 11263
\Hy@WarningPageBorderColor . . . 3536, 3538, 3540
\Hy@WarningPageColor . 3483, 3485, 3487
\Hy@WarnOptionDisabled 2388, 2391
\Hy@WarnOptionValue . . 2369, 2375, 2932, 2954
\Hy@wrapper@babel 4338, 4356
\Hy@WrapperDef 4348, 8953, 9405, 9420, 9502, 9514, 9771, 10355, 10371, 10451, 10464, 10959, 10973, 11940, 11954, 12227, 12241
\Hy@writebookmark 2227, 7990, 14220, 14361
\Hy@xspace@end 4236, 4241, 4245, 4250, 4253, 4258, 4259, 4260, 4262, 4263, 4264, 4265, 4266, 6332, 6333, 6335, 6338, 6340, 6341, 6342, 6346, 6349, 6352, 6354, 6355, 6356, 9034, 9066, 9103, 9136, 9482, 9553, 9568, 9591, 9607, 9631, 9647, 10005, 10043, 10077, 10107, 10134, 10317, 10327, 10553, 10579, 10614, 10647, 10666, 11334, 11342, 12009, 12020, 12295, 12307, 12339
\HyAnn@AbsPageLabel . 13153, 13160, 13201, 13287, 13309, 13336, 13357, 13385, 13408
\HyAnn@Count . . 13158, 13159, 13161, 13162, 13163, 13166, 13168, 13170
\HyC@@cmd 87, 109, 122
\HyC@check 68, 71, 74
\HyC@checkcommand 50, 57, 59
\HyC@checkFailed 146, 157
\HyC@checkItem . 132, 133, 134, 135, 138
\HyC@checklong 45, 53
\HyC@checkOk 144, 154
\HyC@checkPackage . 12, 16, 18
\HyC@cmd . 62, 75, 87, 95, 118, 131
\HyC@date . . 11, 15, 23, 29, 31
\HyC@DeclareRobustCommand 114
\HyC@def 125
\HyC@defcmd 47, 54, 93
\HyC@doCheck 99, 130
\HyC@edef 125
\HyC@getDate 12, 14
\HyC@meaning 152, 160
\HyC@nc@default 103, 105
\HyC@nc@noopt . . 88, 91, 103, 112, 123, 127
\HyC@nc@opt 88, 101, 123
\HyC@newcommand 86
\HyC@next 48, 55, 60, 83
\HyC@noValue 80, 81, 82, 85, 139
\HyC@optcmd 107, 111
\HyC@org@cmd 76
\HyC@org@optcmd 80, 111
\HyC@org@robustcmd . . 81, 120

\HyC@org@robustoptcmd . . 82
\HyC@package 10, 22, 28, 34, 37, 38
\HyC@param 78, 96, 102
\HyC@robustcmd 115, 120, 121, 122
\HyC@star 67, 70, 94
\HyC@string 131, 152, 155, 158
\HyC@Toks 79, 90, 96, 106, 126
\HyCnt@LookForParentCounter 6902, 6914
\HyCnt@ProvideTheHCounter 6895
\HyColor@FieldBColor . . 6086, 6089
\HyColor@FieldColor . . . 6092
\HyColor@HyperrefBorderColor 3526, 3544
\HyColor@HyperrefColor 3471, 3490, 3491, 3492, 3493, 3494, 3495, 3496
\HyColor@UseColor . 4709, 8922, 8933, 9927, 9938
\HyField@@AddToFields 13066, 13088
\HyField@@PDFChoices . 5757, 5758, 5771
\HyField@@SetFlag . 5452, 5454
\HyField@@UseFlag . 5442, 5444
\HyField@ABD@AuxAddToCoFields 13011, 13063
\HyField@AddCoField . . 13021, 13034, 13037
\HyField@AddToFields . 12557, 12605, 12696, 12710, 12739, 12760, 12786, 12811, 12999, 13065, 13205, 13300, 13314, 13341, 13366, 13390, 13413, 13521, 13561, 13664, 13683, 13715, 13739, 13767, 13796
\HyField@AdvanceAnnotCount 12550, 12595, 12686, 12704, 12729, 12754, 12780, 12801, 13514, 13551, 13648, 13676, 13704, 13732, 13760, 13786
\HyField@afields . 12995, 13054, 13055, 13057, 13111
\HyField@AfterAuxOpen 13010, 13052, 13089
\HyField@AnnotCount . 12548, 12549, 12551, 12554, 13512, 13515, 13518
\HyField@AuxAddToCoFields 13009, 13049, 13063, 13077
\HyField@AuxAddToFields 13008, 13046, 13053, 13092
\HyField@cofields 12996, 13015, 13016, 13036, 13038, 13112, 13114
\HyField@FlagsAnnot 5612, 5631, 5645, 5658, 5674, 5706
\HyField@FlagsCheckBox 5644, 12799, 13404, 13781
\HyField@FlagsChoice . . . 5705, 12658, 13260, 13616
\HyField@FlagsPushButton 5630, 12727, 12750, 12777, 13332, 13353, 13383, 13702, 13726, 13756
\HyField@FlagsRadioButton . . 5657, 12654, 13256, 13612
\HyField@FlagsSubmit . . 5578, 12751, 13354, 13727
\HyField@FlagsText 5673, 12592, 13196, 13545
\HyField@NeedAppearancesfalse 5900, 5913
\HyField@NeedAppearancestrue . . . 5903, 5906, 5910
\HyField@NewBitsetFlag . 5410, 5413, 5421
\HyField@NewFlag 5408, 5484, 5485, 5486, 5487, 5488, 5489, 5490, 5491, 5492, 5493, 5494, 5495, 5496, 5497, 5498, 5499, 5500, 5501, 5502, 5503, 5508, 5509, 5510, 5511, 5512, 5513, 5514, 5515, 5516, 5549, 5551, 5552, 5554, 5555, 5557, 5558, 5559, 5560
\HyField@NewFlagOnly . 5412, 5550, 5553, 5556
\HyField@NewOption 5409, 5415
\HyField@PDFAFlagWarning . . . 5518, 5526, 5530, 5534, 5538, 5542, 5546
\HyField@PDFChoices . . 5730, 12702, 13307, 13670
\HyField@PrintFlags 5459, 5605, 5623, 5637, 5650, 5666, 5698, 5723
\HyField@SetFlag . . 5451, 5591, 5597, 5602, 5636, 5664
\HyField@SetKeys . 5832, 12589, 12625, 12628, 12647, 12715, 12747, 12767, 12796, 13192, 13226, 13229, 13248, 13319, 13350, 13373, 13400, 13541, 13582, 13585, 13604, 13688, 13723, 13746, 13777
\HyField@TheAnnotCount 12553, 12562, 12571, 12601, 12690, 12707, 12735, 12757, 12783, 12807, 13517, 13522, 13525, 13556, 13653, 13678, 13709, 13734, 13762, 13791
\HyField@UseFlag 5441, 5582, 5583, 5584, 5585, 5586, 5587, 5588, 5589, 5592, 5593, 5594, 5595, 5598, 5599, 5600, 5603, 5614, 5615, 5616, 5617, 5618, 5619, 5620, 5621, 5622, 5633, 5634, 5635, 5647, 5648, 5649, 5660, 5661, 5662, 5663, 5665, 5676, 5677, 5678, 5679, 5680, 5681, 5682, 5683, 5694, 5697, 5708, 5709, 5710, 5711, 5713, 5715, 5716, 5719, 5722
\HyInd@@@wrindex . 8271, 8274, 8305, 8311
\HyInd@@hyperpage 8378, 8388
\HyInd@@wrindex . . 8266, 8267
\HyInd@DefKey 8324, 8338, 8351, 8360
\HyInd@EncapChar . 2962, 4186, 8261
\HyInd@hyperpage . 8375, 8377, 8384
\HyInd@key . . 8325, 8329, 8340, 8353, 8365
\HyInd@org@wrindex 8265, 8269, 8279, 8285, 8287, 8290
\HyInd@pagelink . . . 8393, 8399, 8401, 8404
\HyInd@ParenLeft . . 8247, 8276, 8313, 8350
\HyInd@ParenRight . 8248, 8277, 8284, 8314, 8323
\HyInd@removespaces . . . 8407, 8410, 8420

\HyInfo@AddonHandler . . 3820, 3823
\HyInfo@AddonList . 3853, 3854, 3888, 3895
\HyInfo@Addons . . . 3874, 3890, 9235, 10165, 11155, 11159
\HyInfo@AddonUnsupportedtrue . . 9652, 10880, 12048
\HyInfo@do . . . 3822, 3855, 3878
\HyInfo@GenerateAddons 3872, 9212, 10141, 11124
\HyInfo@Key . 3830, 3831, 3849, 3851, 3852, 3855, 3858, 3865, 3879, 3883
\HyInfo@KeyEscaped 3829, 3830
\HyInfo@tmp 3839, 3849
\HyInfo@trapped@false . . 3770, 3789
\HyInfo@trapped@true . . . 3767, 3788
\HyInfo@trapped@unknown 3773, 3790
\HyInfo@TrappedUnsupported . 3791, 3795, 9655, 10895, 12051
\HyInfo@Value 3843, 3846
\HyLang@addto 3274, 3289, 3307, 3350, 3358
\HyLang@afrikaans 2964
\HyLang@catalan 3148
\HyLang@danish 3238
\HyLang@DeclareLang . . . 3287, 3317, 3318, 3319, 3320, 3321, 3322, 3323, 3324, 3325, 3326, 3327, 3328, 3329, 3330, 3331, 3332, 3333, 3334, 3335, 3336, 3337, 3338, 3339, 3340, 3341, 3342, 3343, 3344, 3345, 3346, 3347, 3348
\HyLang@dutch 3202
\HyLang@english 2982
\HyLang@french 3000
\HyLang@german 3018
\HyLang@greek 3184
\HyLang@italian 3036
\HyLang@magyar 3054
\HyLang@norsk 3220
\HyLang@portuges 3072
\HyLang@russian 3090
\HyLang@spanish 3130
\HyLang@swedish 3256
\HyLang@vietnamese 3166, 3350, 3358
\HyLinguex@OrgB . . . 810, 814
\HyLinguex@OrgC . . . 811, 815
\HyLinguex@OrgD . . . 812, 816
\HyLinguex@Restore . 813, 826, 880, 890
\HyNew@float@makebox . 7587, 7610
\HyOpt@CheckDvi 2676, 2729, 2735, 2740, 2764, 2769, 2775, 2827, 2834, 2840, 2865
\HyOpt@CustomDriver 292, 2887, 2888, 2892, 4505, 4572
\HyOpt@DriverFallback 2870, 2873, 2874, 2882, 4539, 4544
\HyOpt@DriverType 4504, 4507, 4541, 4551, 4553, 4571, 4574
\HyOrg@addtoreset . 8191, 8194, 8196, 8225
\HyOrg@appendix . . 6948, 6968
\HyOrg@author 6396, 6409, 6413
\HyOrg@elt 6900, 6906
\HyOrg@float@makebox . . 7588, 7609
\HyOrg@hyperpage . 8250, 8252, 8253
\HyOrg@make@df@tag@@ 8185
\HyOrg@make@df@tag@@@ 8186
\HyOrg@maketitle . . 7464, 7471, 7476
\HyOrg@title . . 6395, 6400, 6404
\HyOrg@TX@endtabularx 7368
\HyOrg@url 4966
\HyPat@NonNegativeReal 3570, 3571, 3572, 3573, 3589, 3591, 3924, 3935, 3936, 3937, 3944, 3947, 3948, 3949, 3950
\HyPat@ObjRef 4950, 4951, 4964, 8746, 9766, 10956
\hyper@@anchor . . . 4257, 4976, 4978, 5010, 5012, 5048, 5050, 5302, 6333, 6348, 6363, 7315, 7320, 7338, 7343, 7411, 7414, 7441, 7571, 7574, 7592, 7867, 7918, 7929, 7935
\hyper@@link . 4836, 4894, 5000, 5029, 5149, 7663, 7760, 7761, 7762, 7810, 7812, 7814, 8441, 8456, 8574
\hyper@@normalise . 4805, 4809, 4813
\hyper@anchor 5329, 6336, 6350, 9006, 9405, 9502, 9829, 10371, 10451, 10959, 11940, 12227
\hyper@anchorend 4245, 4253, 4260, 6328, 6338, 6352, 6366, 7070, 7122, 7146, 7148, 7170, 7193, 7655, 7682, 7685, 7705, 7789, 8170, 9013, 9430, 9520, 9836, 10366, 10473, 10981, 11964, 12250, 14362, 14588, 14616, 14627, 14654
\hyper@anchorstart . 4259, 6328, 6337, 6351, 6365, 7069, 7122, 7140, 7170, 7193, 7653, 7680, 7685, 7705, 7789, 8170, 9009, 9420, 9514, 9832, 10355, 10464, 10973, 11954, 12241, 14362, 14588, 14616, 14627, 14654
\hyper@chars 4830, 9041, 9410, 9424, 9444, 9466, 9480, 9494, 9574, 9614, 10322, 10343, 10359, 10376, 10456, 10468, 10560, 11575, 11958, 11978, 12004, 12018, 12032, 12245, 12264, 12287, 12304, 12319
\hyper@currentanchor . . 10978, 10987, 11010, 11027
\hyper@currentlinktype . 11011, 11015, 11019
\hyper@destlabel@hook . . 5345, 5352
\hyper@hash . 4782, 4783, 4831, 5225, 5237, 5254, 5257, 6295, 10316
\hyper@image 4972, 4973, 9492, 10618, 11088, 12030, 12317
\hyper@link 4258, 5173, 6334, 6335, 6349, 6359, 6364, 9027, 9488, 9536, 10004, 10312, 10584, 11092, 12026, 12313
\hyper@link@ . 4265, 5150, 5156, 6332, 6346, 6371
\hyper@linkend 4245, 4253, 4262, 6340, 6354, 6368, 7363, 7648, 7650, 7727, 8040, 8112,

8115, 8146, 8148, 9026, 9450, 9533, 10003, 10005, 10348, 10531, 11013, 11986, 12270
\hyper@linkfile 4264, 5250, 6342, 6356, 6370, 9070, 9454, 9612, 10007, 10332, 10535, 11596, 11990, 12274
\hyper@linkstart 4261, 6339, 6353, 6367, 7361, 7644, 7650, 7725, 8039, 8096, 8099, 8130, 8132, 9017, 9436, 9524, 9964, 10005, 10335, 10479, 10992, 11970, 12256
\hyper@linkurl 4263, 4971, 5225, 5232, 5253, 5257, 6341, 6355, 6369, 9038, 9455, 9457, 9490, 9572, 10080, 10320, 10333, 10557, 10619, 11089, 11572, 11991, 11995, 12028, 12275, 12277, 12315
\hyper@livelink 6334, 6359
\hyper@makecurrent 6994, 7108, 7138, 7167, 7192, 7233, 7358, 7547, 7602
\hyper@n@rmalise . . 4797, 4801
\hyper@nat@current 7645
\hyper@natanchorend 510, 7655
\hyper@natanchorstart 510, 7652
\hyper@natlinkbreak . 510, 7649
\hyper@natlinkend 510
\hyper@natlinkstart 510
\hyper@newdestlabel 5337, 5359, 5398, 5404, 5406
\hyper@nopatch@bib 237
\hyper@nopatch@caption . . 239
\hyper@nopatch@counter . . 236
\hyper@nopatch@footnote . 240
\hyper@nopatch@longtable 243
\hyper@nopatch@sectioning 241
\hyper@nopatch@thm 238
\hyper@nopatch@toc 242
\hyper@normalise . . 4187, 4192, 4773, 4884, 4887, 4968, 4970, 4972, 4994, 5862
\hyper@pageduration 9274, 9301, 10254, 10267, 10784, 10796, 11067, 11086
\hyper@pagetransition . . . 9250, 9300, 10243, 10266, 10673, 10795, 11050, 11085
\hyper@quote 6297, 9412, 9426, 9441, 9446, 9467, 9481, 9495, 10316, 10326, 10339, 10362, 10380, 11946, 11960, 11975, 11981, 12005, 12019, 12033, 12233, 12246, 12261, 12266, 12289, 12305, 12320
\hyper@readexternallink . 5179, 5190
\hyper@refstepcounter . . . 6873, 6877, 6894
\hyper@tilde . 4791, 4792, 4793, 6296
\hyperbaseurl . 3498, 3499, 6382
\hypercalcbp 488, 488
\hypercalcbpdef 491
\hyperdef 5002, 6384
\HyperDestLabelReplace . 5389, 5396, 5399
\HyperDestNameFilter 4168, 4870, 5061, 5074, 5087, 5396, 8959, 8984, 9412, 9426, 9446, 9490, 9775, 9977, 10316, 10326, 10344, 10362, 10380, 10457, 10469, 10518, 10601, 11436, 11445, 11946, 11960, 11981, 12028, 12233, 12246, 12266, 12315, 14440, 14501, 14517
\HyperDestRename . 5369, 5387, 5400
\hyperget 5053
\hypergetpageref 7058
\hypergetref 7057
\HyperGlobalCurrentHref 7015, 7017, 7025, 7026, 7030, 7033, 7037, 7044, 7045, 7049
\hyperimage 4972, 8242
\hyperindexformat 8255
\hyperlink 4835, 6385, 8416
\hyperlinkfileprefix . 3501, 3502, 3503, 12219
\HyperLocalCurrentHref 7033, 7035, 7042, 7043, 7044, 7045, 7047
\hyperpage . . 6391, 8250, 8251, 8253, 8374
\HyperRaiseLinkDefault . 2229, 2257
\HyperRaiseLinkHook 2228, 2258
\HyperRaiseLinkLength . . 2256, 2257, 2260
\hyperref 4981, 6387, 8512, 8528, 8537, 8559
\hyperrefundefinedlink . . 5015, 5026
\hypersetup 2598, 2624, 3328, 3806, 4188, 6381, 6945, 6967
\hypertarget 4974, 6386
\hyperxindexformat . 8249, 8255
\HyPL@@@CheckThePage 6615, 6633
\HyPL@@CheckThePage . 6591, 6593
\HyPL@Alph 6510
\HyPL@alph 6511
\HyPL@arabic 6507
\HyPL@CheckThePage . . 6542, 6590
\HyPL@Entry 6790, 6798, 6806, 6808
\HyPL@EveryPage . 6530, 6654
\HyPL@Format 6606, 6607, 6608, 6609, 6610, 6622
\HyPL@found 6605, 6612, 6616, 6623, 6633, 6635
\HyPL@Labels 6501, 6645, 6646, 6648, 6650, 6701, 6702, 6801, 6809, 6810
\HyPL@LastNumber 6505, 6561, 6584
\HyPL@LastPrefix . . 6506, 6555, 6586
\HyPL@LastType . . 6504, 6546, 6585
\HyPL@page . 6524, 6533, 6536, 6542, 6551
\HyPL@Prefix 6551, 6553, 6555, 6569, 6572, 6574, 6586, 6600, 6638
\HyPL@Roman 6508
\HyPL@roman 6509
\HyPL@SetPageLabels . . . 6644, 6708, 6804
\HyPL@SlidesOptionalPage 6517, 6521, 6526
\HyPL@SlidesSetPage . . . 6512, 6514, 6534, 6541
\HyPL@StorePageLabel . . 6569, 6571, 6641, 6699, 6785
\HyPL@thisLabel . . 6498, 6500, 6532, 6536, 6537
\HyPL@Type 6539, 6546, 6550, 6568, 6576, 6585, 6599, 6637

\HyPL@Useless 6642, 6648
\HyPsd@@@autoref . 1393, 1395, 1398
\HyPsd@@@CJKdigits . . . 1263, 1266, 1274
\HyPsd@@@nameref 1375, 1377, 1380
\HyPsd@@@pageref . 1357, 1359, 1362
\HyPsd@@@ref . 1341, 1343, 1346
\HyPsd@@@UTFviii@four 1990, 1993
\HyPsd@@AppendItalcorr 1534
\HyPsd@@autoref . . 1390, 1391
\HyPsd@@autorefname . . 1411, 1414
\HyPsd@@CJKdigits 1255, 1257, 1260
\HyPsd@@CJKnumber 1156, 1158, 1161, 1214, 1229, 1242, 1244, 1248
\HyPsd@@ConvertToUnicode 1862
\HyPsd@@ding 2127, 2131, 2142
\HyPsd@@GetNextTwoTokens 1860
\HyPsd@@GlyphProcessWarning 1720, 1723
\HyPsd@@hspace . . . 1311, 1312
\HyPsd@@LetCommand . 1435, 1456
\HyPsd@@nameref . . 1372, 1373
\HyPsd@@pageref . . 1354, 1355
\HyPsd@@ProtectSpacesFi 1479, 1485
\HyPsd@@ref 1338, 1339
\HyPsd@@RemoveBraces . 1502
\HyPsd@@RemoveBracesFi 1499, 1502
\HyPsd@@RemoveCmdPrefix 1677, 1680
\HyPsd@@ReplaceFi 1747, 1753, 1758
\HyPsd@@UTFviii@four . . 1974, 1979
\HyPsd@add@accent . 536, 1300
\HyPsd@AfterCountRemove 1554, 1634
\HyPsd@AfterDimenRemove 1560, 1637
\HyPsd@AfterSkipRemove 1566, 1649
\HyPsd@AMSclassfix 644, 1321, 1323
\HyPsd@AppendItalcorr . 1518, 1525, 1534
\HyPsd@autoref 654, 1390
\HyPsd@autorefname 1402, 1408
\HyPsd@CatcodeWarning 1570, 1594, 1597, 1600, 1603, 1661
\HyPsd@Char 1864
\HyPsd@CharOctByte . . . 1884, 1886, 1889, 1898, 1903
\HyPsd@CharSurrogate . . 1878, 1895
\HyPsd@CharTwoByte . . 1876, 1883
\HyPsd@CheckCatcodes . . 708, 1544
\HyPsd@CJK@Unicode . . 1038, 1042
\HyPsd@CJKActiveChars . 978, 993
\HyPsd@CJKdigit . . 1267, 1277
\HyPsd@CJKdigits . 1040, 1253
\HyPsd@CJKhook 661, 949, 960
\HyPsd@CJKhook@bookmarks 955, 989
\HyPsd@CJKhook@unicode 957, 1037
\HyPsd@CJKnumber 1039, 1153
\HyPsd@CJKnumberFour 1171, 1175, 1179, 1192, 1196, 1200, 1206
\HyPsd@CJKnumberLarge 1184, 1191
\HyPsd@CJKnumberThree 1212, 1216, 1222
\HyPsd@CJKnumberTwo 1227, 1231, 1237
\HyPsd@ConvertToUnicode 777, 1810
\HyPsd@DecimalToOctal . . 970, 1001
\HyPsd@DecimalToOctalFirst 1044, 1080
\HyPsd@DecimalToOctalSecond . . 1045, 1054, 1117, 2146, 2152, 2155
\HyPsd@DefCommand 691, 692, 693, 694, 1424
\HyPsd@DieFace . 611, 612, 613, 2067, 20649, 20650
\HyPsd@DieFaceLarge . . . 2075, 2084
\HyPsd@ding 610, 2117
\HyPsd@DisableCommands 927, 929
\HyPsd@DoConvert . 1812, 1822
\HyPsd@DoEscape 1836
\HyPsd@doxspace . . . 749, 1783
\HyPsd@empty . . 734, 736, 740, 741, 743, 751, 758
\HyPsd@End . . . 708, 712, 1483, 1493, 1499, 1502, 1547, 1555, 1561, 1567, 1620, 1627, 1634, 1637, 1649
\HyPsd@EndWithElse . . . 1290, 1299
\HyPsd@EscapeTeX . 786, 789, 796, 1765
\HyPsd@expand@utfviii . . 1912, 1919, 1925
\HyPsd@fi 1475, 1481, 1485, 1491
\HyPsd@GetNextTwoTokens 1860
\HyPsd@GetOneBye 1855
\HyPsd@GetTwoBytes . . . 1851
\HyPsd@GLYPHERR 714, 1287, 1301, 1308
\HyPsd@GlyphProcess . . . 716, 1708, 1721
\HyPsd@GlyphProcessWarning 1715, 1719
\HyPsd@GobbleFiFi 1292, 1298
\HyPsd@HighA 1048, 1057
\HyPsd@HighB 1058, 1063
\HyPsd@HighC 1064, 1067
\HyPsd@HighD 1060, 1072
\HyPsd@href 649, 1337
\HyPsd@hspace 645, 1311
\HyPsd@hspacetest . 1314, 1316, 1319
\HyPsd@ifnextchar 677, 678, 679, 1461
\HyPsd@ignorespaces . 658, 936
\HyPsd@inmathwarn . 535, 1284
\HyPsd@ITALCORR . 669, 673, 1308
\HyPsd@LetCommand 695, 696, 1424
\HyPsd@LetUnexpandableSpace . 664, 665, 666, 667, 1304, 1307
\HyPsd@LoadExtra . . 895, 898, 2622
\HyPsd@LoadUnicode 885, 2561, 2567, 2569, 2576, 2619, 6713

\HyPsd@MoonPha . . 2098, 2116, 20651
\HyPsd@nameref 653, 1372
\HyPsd@pageref 652, 1354
\HyPsd@pdfencoding 778, 2560, 2563, 2585, 2597, 2600, 2603, 2618, 6715, 6717, 6733, 6736
\HyPsd@pdfencoding@auto 778, 2591, 2615, 6717, 6735
\HyPsd@pdfencoding@pdfdoc 2584, 2603, 2616
\HyPsd@pdfencoding@unicode . . . 2588, 2617, 2618, 6715, 6732
\HyPsd@PrerenderUnicode 3699, 3715, 3721, 3727, 3733, 3738, 3756, 3762, 3842
\HyPsd@protected@testopt 680, 681, 1465
\HyPsd@ProtectSpaces . . . 701, 1475, 1524
\HyPsd@ref 651, 1338
\HyPsd@RemoveBraces . . . 703, 1496, 1513, 1521, 1527
\HyPsd@RemoveCmdPrefix 1670, 1676
\HyPsd@RemoveMask 711, 1483, 1493
\HyPsd@RemoveSpaceWarning . . . 1644, 1656, 1682
\HyPsd@ReplaceSpaceWarning . . . 1639, 1651, 1695
\HyPsd@Rest 1548, 1616, 1624, 1627, 1635, 1640, 1646, 1652, 1658
\HyPsd@SanitizeForOutFile 14279, 14310
\HyPsd@SanitizeOut@BraceLeft . . 14314, 14320, 14329
\HyPsd@SanitizeOut@BraceRight . . 14317, 14332, 14341
\HyPsd@SPACEOPTI 705, 721, 722, 724, 726, 728, 729, 768, 770, 1590, 1794
\HyPsd@spaceopti . . . 770, 1739
\HyPsd@String 702, 704, 707, 709, 715, 717, 1507, 1508, 1518, 1578, 1580, 1584, 1585, 1589, 1590, 1605, 1606, 1638, 1650, 1709, 1710
\HyPsd@StringSubst . 718, 720, 726, 732, 735, 738, 741, 760, 763, 765, 1762
\HyPsd@Subst 714, 723, 727, 733, 739, 743, 747, 752, 753, 754, 755, 756, 757, 761, 764, 1746, 1763, 1778, 1779, 1780
\HyPsd@temp 779, 781, 782, 784, 785, 792, 794, 795, 2583, 2584, 2585, 2588, 2591, 2597, 2606, 2610, 6731, 6732, 6733, 6735, 6736, 6741
\HyPsd@tocsection 1324, 1325, 1326, 1327, 1328, 1329, 1330, 1332
\HyPsd@UnescapedString . 781
\HyPsd@UnexpandableSpace . . . 1307, 1490, 1640, 1652
\HyPsd@unichar . . . 1932, 1999, 2005, 2010
\HyPsd@unichar@first@byte 2018, 2038
\HyPsd@unichar@octtwo . 2040, 2048, 2054
\HyPsd@unichar@second@byte 2026, 2046
\HyPsd@UnicodeReplacementCharacter . . 2002, 2037, 2070, 2100, 2105, 2113, 2120, 2123, 2133, 2191
\HyPsd@utf@viii@undeferr . 532, 2059
\HyPsd@UTFviii 526, 1924
\HyPsd@UTFviii@@three . 1955, 1964
\HyPsd@UTFviii@@two . . 1940, 1946
\HyPsd@UTFviii@ccxliv@def 1930, 1936
\HyPsd@UTFviii@ccxliv@undef 1929, 1935
\HyPsd@UTFviii@four . . . 1928, 1973
\HyPsd@UTFviii@three . . 1927, 1954
\HyPsd@UTFviii@two 1926, 1939
\HyPsd@Warning . . 1469, 1662, 1683, 1696, 1725, 1731
\HyPsd@XSPACE 671, 748, 1308
\HyPsd@xspace . . 746, 748, 749
\HyRef@@StarSetRef 8485, 8490
\HyRef@autopageref 8556, 8558
\HyRef@autopagerefname 8555, 8559, 8561
\HyRef@autoref 8574, 8575
\HyRef@autosetref . . 8578, 8581
\HyRef@CaseStar . . 8642, 8648
\HyRef@currentHtag 8594, 8612, 8615, 8621, 8628, 8634, 8649
\HyRef@MakeUppercaseFirstOfFive . . . 4744, 8506, 8508
\HyRef@name 8610, 8611, 8616, 8623, 8641, 8642, 8643, 8645
\HyRef@Ref 4729, 8511
\HyRef@ShowKeysInit . . . 8651, 8662
\HyRef@ShowKeysRef 8582, 8650
\HyRef@StarSetRef . 4732, 4736, 4740, 4744, 8478, 8497, 8500, 8503, 8506
\HyRef@StripStar . . 8609, 8640
\HyRef@testreftype . 8587, 8606
\HyRef@thisref 8584, 8587
\HyTmp@found 5782, 5792, 5795
\HyTmp@key 5776, 5777
\HyTmp@optitem 5734, 5750, 5775, 5780, 5786, 5807, 5818
\HyTmp@optlist . . . 5733, 5748, 5749, 5778, 5779, 5784, 5785, 5793, 5794, 5814, 5816, 5823, 5826
\HyXeTeX@CheckUnicode 3685, 3696, 3714, 3720, 3726, 3732, 3737, 3755, 3761, 3841, 6746

I

\i . . 14855, 15021, 15024, 15027, 15030, 15305, 15481, 15484, 15487, 15490, 15619, 15624, 15629, 15634, 15638, 15875, 15946, 15954
\ibar 16113, 20720
\if 1333, 6559, 6567, 7210, 7211, 10747, 10750, 10754, 10758, 10762, 10764, 10766, 13963
\if@eqnstar 7154, 7163
\if@filesw 2199, 5041, 5357, 6786, 6796, 7692, 7707, 7734, 7746, 7766, 7771, 7790, 8299, 13044, 13075, 13090, 14280, 14467, 14546
\if@hyper@item 6845
\if@Localurl 10303, 10349
\if@mid@expandable 643
\if@minipage 7559, 7632

\if@nmbrlist 6840
\if@skiphyperref 6846
\IfBooleanTF 8574
\ifcase . . 336, 1002, 1051, 1073, 1076, 1082, 1118, 1162, 1278, 1968, 2099, 2588, 3432, 4577, 5580, 5685, 5812, 5889, 6972, 6981, 8052, 8276, 8313, 8583, 10814, 11319, 14024, 14052, 14121, 14157, 14193, 14387
\ifcat . . . 1549, 1576, 1583, 1588, 1593, 1596, 1599, 1602, 5313, 5315
\ifcsname 1911, 3288, 6884, 10415
\ifdim . . 1319, 1638, 1642, 1650, 1654, 2272, 2295, 4171, 4173, 4605, 9319, 9323, 9328, 9332, 9339, 9340, 9344, 9345, 9352, 9353, 9354, 10275, 10276, 10279, 10280, 10286, 10287, 10288, 10419, 10420, 10424, 10425, 10432, 10433, 10434, 11348, 11362, 11733, 11734, 11737, 11738, 11744, 11745, 11746, 12621, 12659, 12660, 13222, 13261, 13262, 13578, 13617, 13618
\IfDocumentMetadataT . . . 234, 4278, 7719, 8085
\IfDocumentMetadataTF . 3988
\iffalse 5901
\IfFileExists . 2851, 2891, 8799, 12347
\ifFld@checked . . . 5835, 12972, 14010
\ifFld@comb 5684
\ifFld@combo 5712, 5717, 12634, 12663, 13235, 13265, 13591, 13621
\ifFld@disabled . . . 5836, 12973
\ifFld@edit 5718
\ifFld@fileselect 5687
\ifFld@hidden . . . 12593, 12648, 12728, 12752, 12778, 12800, 12871, 12883, 12893, 12976, 13197, 13250, 13333, 13355, 13384, 13405, 13546, 13606, 13703, 13728, 13757, 13782
\ifFld@multiline . . . 5685, 12582, 12878, 13185, 13534
\ifFld@multiselect 5756
\ifFld@password . . 5686, 12859
\ifFld@popdown . . 5504, 12635, 13236, 13592
\ifFld@radio 12631, 12653, 12908, 13232, 13255, 13588, 13611
\ifFld@readonly . . 12880, 12890, 12974
\ifForm@html 5856
\IfFormatAtLeastT 232
\ifhint 2850, 4468, 4530
\ifhmode 2232, 2236, 2294, 2303, 4876, 7268, 7355, 7364, 7516, 7518, 8954, 8962, 11354, 12332
\ifHy@activeanchor . . 380, 5326
\ifHy@backref . 381, 4381, 4756, 6275, 7767, 7803
\ifHy@bookmarks . . 382, 4630, 7964, 8019
\ifHy@bookmarksnumbered 383, 14267
\ifHy@bookmarksopen 384, 4620
\ifHy@breaklinks . . . 385, 2520, 10994, 11035, 11330, 11353
\ifHy@CJKbookmarks . 387, 954
\ifHy@colorlinks 388, 4701, 6280, 11927
\ifHy@destlabel 389, 5336
\ifHy@draft 390, 4256
\ifHy@DviMode 2657, 2677, 2872
\ifHy@DvipdfmxOutlineOpen 4603, 14519
\ifHy@frenchlinks . . . 396, 4714
\ifHy@href@ismap . . 4932, 9059, 10098, 10494, 10564, 11587
\ifHy@hyperfigures . 394, 4361, 6260, 8239
\ifHy@hyperfootnotes 397, 7275
\ifHy@hyperindex . . 398, 4371, 6270, 8246
\ifHy@hypertexnames 399, 6894, 7001, 7916
\ifHy@implicit . 400, 4386, 4728, 14571
\ifHy@linktocpage . . 401, 2480, 2490
\ifHy@localanchorname . . . 402, 7034, 7046
\ifHy@naturalnames . 404, 7013
\ifHy@nesting . 405, 4366, 4975, 5009, 5047, 5311, 6265, 7309, 7332, 7410, 7570
\ifHy@next 945, 8264
\ifHy@ocgcolorlinks 408, 3390, 4687, 4697, 6285, 8751, 8840, 8918, 8926, 9840, 9923, 9931
\ifHy@pageanchor . . . 409, 7915
\ifHy@pdfa 427, 4290, 4689, 5213, 5517, 6109, 6162, 6290, 8988, 9054, 9089, 9123, 9383, 9986, 10020, 10056, 10088, 10118, 10500, 10521, 10544, 10570, 10604, 10638, 10657, 11460, 12527, 12718, 12771, 13123, 13323, 13377, 13496, 13692, 13750, 13965, 14013, 14182
\ifHy@pdfcenterwindow . . . 386, 9174, 9722, 10187, 10852, 11204, 12111
\ifHy@pdfdisplaydoctitle . . 426, 9175, 9723, 10188, 10853, 11205, 12112
\ifHy@pdfescapeform 393, 13860, 13890
\ifHy@pdffitwindow . 395, 9173, 9721, 10186, 10851, 11203, 12110
\ifHy@pdfmarkerror 11251, 11260
\ifHy@pdfmenubar . . 403, 9171, 9719, 10184, 10849, 11201, 12108
\ifHy@pdfnewwindow 407, 4011, 10541
\ifHy@pdfnewwindowset . . 406, 4009
\ifHy@pdfpagelabels 410, 6486, 6699, 6784
\ifHy@pdfstring . 411, 912, 6850, 6857
\ifHy@pdftoolbar . . . 419, 9170, 9718, 10183, 10848, 11200, 12107
\ifHy@pdfusetitle 421, 6394
\ifHy@pdfwindowui . 425, 9172, 9720, 10185, 10850, 11202, 12109
\ifHy@plainpages 412, 4376, 7917
\ifHy@psdextra . . 418, 620, 902
\ifHy@psize 413
\ifHy@raiselinks 414, 9459, 9539, 9576, 9616, 11997, 12279
\ifHy@seminarslides 415
\ifHy@setpagesize . . 416, 9307, 10272, 10416, 11730
\ifHy@setpdfversion . 2625, 8756
\ifHy@stoppedearly 378

\ifHy@texht . . . 417, 4447, 4726, 5926, 5959, 6135, 6157, 6328, 8424
\ifHy@typexml 379
\ifHy@unicode . . . 420, 522, 557, 560, 621, 719, 731, 759, 767, 776, 973, 1664, 1685, 1698, 1727, 1733, 2000, 2068, 2118, 2559, 2599, 3687, 6721, 13912
\ifHy@verbose . 422, 4839, 4855, 4867, 5460, 7995, 8760
\ifHyField@NeedAppearances . . 5899, 5901, 5904, 12529, 13125, 13498
\ifHyInfo@AddonUnsupported 3818, 3832, 3873
\IfHyperBoolean 2344
\IfHyperBooleanExists . . . 2338, 2345
\ifin@ 6922
\ifmeasuring@ 6892
\ifmmode . . . 619, 10997, 11325
\ifnum . . 1043, 1154, 1170, 1174, 1194, 1207, 1210, 1223, 1225, 1238, 1240, 1246, 1872, 1875, 1958, 2001, 2004, 2016, 2069, 2072, 2085, 2119, 2122, 2125, 2129, 2144, 2148, 2151, 2237, 2273, 2666, 2782, 2785, 2811, 3433, 3434, 4291, 4483, 4519, 4533, 4536, 4614, 4621, 4909, 5739, 5808, 5819, 6516, 6540, 6561, 6577, 6679, 6950, 6953, 7862, 7875, 8752, 8757, 8771, 8775, 8780, 8798, 8819, 9338, 9952, 9957, 10274, 10418, 10541, 10671, 10801, 10809, 10811, 10812, 10822, 10825, 10925, 10927, 11047, 11732, 11773, 12685, 12690, 12695, 13026, 13103, 13299, 13647, 13652, 13663, 13911, 13993, 14024, 14029, 14052, 14058, 14087, 14121, 14127, 14146, 14157, 14162, 14193, 14198, 14224, 14240, 14383, 14453, 14456, 14480, 14483, 14521, 14630, 14645, 14660
\ifodd 1982, 1987, 7945
\ifpatchable 7270
\ifpdf . . . 2659, 2702, 2713, 4426, 4509
\IfPDFManagementActiveTF 2886
\ifpdfstringunicode . . . 527, 530
\ifportrait 9318
\ifthenelse 7793
\iftrue . 1478, 1757, 5904, 14632
\iftutex 780
\ifvmode 2249, 2271, 2284
\ifvoid 7115, 7119
\ifvtex . . 2665, 2781, 2810, 4483, 4519, 4533, 4536
\ifxetex . 2662, 2754, 3686, 4452, 4516, 4604
\ignorespaces . . 658, 7228, 7317, 7326, 7340, 7349, 7447, 7555, 7566, 7569, 7628, 7636, 7700, 7715, 7742, 7751, 7801
\iiint 17903, 20071
\iinferior 19876
\iint 17901, 20070
\IJ 14851, 15640
\ij 15064, 15642
\Im 17539, 19943
\immediate 5404, 5406, 6692, 6789, 6797, 7695, 7710, 7737, 7747, 7766, 7796, 8842, 8857, 8872, 10930, 11770, 12989, 13045, 13048, 13109, 14373, 14439, 14470, 14549
\in 17820, 20037
\in@ 6920
\index 647, 7974
\indexentry . . 8302, 8317, 8332, 8336, 8346
\Info 19477, 20640
\infty 17863, 20055
\input 878, 888, 905, 3353, 3361, 3368, 4576, 11665, 11771, 11870, 12047, 16390
\InputIfFileExists . 4190, 14463, 14494, 14539, 14541
\inputlineno 4846, 5318
\insert 7425
\int 8093, 8109, 8126, 8142, 17898, 20069
\IntCalcAdd 1901
\IntCalcDec 1065, 2095
\intcalcDec 2077
\IntCalcDiv 1059, 1068, 1073, 1176, 1185, 1197, 1214, 1229, 1244, 1885, 1891, 1897
\intcalcDiv . . 1049, 1892, 1899, 1902
\IntCalcMod 1061, 1070, 1076, 1180, 1186, 1201, 1217, 1232, 1246, 1248, 1887, 1892, 1893, 1899, 1902, 1904
\intcalcMod 1051
\intcalcNum . . 2099, 2127, 2131
\IntCalcSub . . 2093, 2146, 2149, 2152, 2155
\intcalcSub 1879, 2075
\interfootnotelinepenalty . 7428
\interleave 19380, 20609
\interlinepenalty 7428
\inva 16026, 20696
\invamp 17585
\invbackneg 18379, 20274
\invdiameter 19179, 20522
\inve 15885, 19804
\invglotstop 16270, 19837
\invh 16101, 20715
\invlegr 16176, 20738
\invm 16135, 20726
\invneg 19240, 20547
\invr 16171, 20736
\invscr 16198, 19825
\invscripta 16034, 20698
\invv 16233, 20750
\invw 16237, 20752
\invy 16241, 20754
\iota 19857
\ipagamma 16093, 19816
\isuperior 19900
\item . . . 6836, 6838, 7733, 7745, 7788
\Itemautorefname 8665
\itemautorefname 2967, 2985, 3003, 3021, 3039, 3057, 3075, 3104, 3105, 3133, 3151, 3169, 3187, 3205, 3223, 3241, 3259, 8665, 8666, 8669
\itshape 590

J

\j 15647, 15905, 16012
\JackStar 18953, 20425
\JackStarBold . . . 18955, 20426
\jarr 19710

\jeem 19654
\jeh 19726
\jinferior 20613
\jobname . 12347, 14372, 14463, 14470, 14494, 14539, 14541, 14549
\Join 19223, 20540
\Jupiter 18741, 20922
\jupiter 18739, 20350

K

\k . 14732, 15081, 15083, 15088, 15090, 15142, 15173, 15202, 15217, 15535, 15537, 15581, 15583, 15631, 15633, 15634, 15771, 15773, 15901, 15903, 16747, 16750, 16792, 16795
\kaf 19690
\kanjiskip 460
\kappa 19858
\kasra 19716
\keepPDF@SetupDoc . . 11931, 11938
\kern . . . 1558, 1639, 1644, 1656, 7940, 7941, 7942, 7944, 7945, 7950, 14586
\kernel@ifnextchar 678
\Keyboard 18397, 20282
\kha 19658
\kinferior 19934
\Kutline 18611, 20886
\kv@define@key 3840
\KV@href@pdfnewwindow 4930
\KV@href@pdfnewwindow@default 4931
\KV@Hyp@draft 2454
\KV@Hyp@nolinks 2454
\KV@Hyp@pdfnewwindow 4930
\KV@Hyp@pdfnewwindow@default 4931
\kv@key 3826, 3829, 3836, 5737, 5740, 5742, 5746, 5750
\kv@parse 5736
\kv@parse@normalized . . . 3857, 3864
\kv@processor@default . . . 3860, 3867
\kv@set@family@handler . 3819
\kv@value 3824, 5738, 5745, 5746
\kvsetkeys 2624, 2689, 2829, 3693, 3799, 4292, 4546, 4565, 4688, 5833, 8753, 11259, 12542, 12844, 12857, 12906, 12949, 12970, 13100, 13481

L

\L 14844, 15671
\l 6867, 14857, 15673
\labdentalnas . . . 16143, 20729
\label 646, 7973
\label@@hyperref . . . 5017, 5019
\label@hook 5386
\label@hyperdef 5002, 5033
\label@hyperref 4982, 5016
\label@name . . 5351, 5361, 5387
\labelsep 7800
\labelwidth 7799
\Ladiesroom 19466, 20637
\lam 19692
\Lambda 19841
\lambda 19859
\lambdabar 15833, 20685
\lambdaslash 15834, 20686
\langle 18399, 20283
\language@group 630
\LARGE 597
\Large 598
\large 601
\LargerOrEqual . . 18045, 20839
\lastnodetype 2273
\lastskip 2272, 2280, 2287, 2295, 2299, 2306
\LaTeX . 554, 556, 12353, 12354
\LaTeXe 555, 12354
\latfric 16125, 20723
\LayoutCheckField 6211, 12802, 13406, 13787
\LayoutChoiceField 6203, 12652, 13254, 13610
\LayoutPushButtonField . 6219, 12722, 12730, 13327, 13334, 13696, 13705
\LayoutTextField . 6195, 12596, 13199, 13552
\lbrackdbl 20477
\lccode . 983, 1766, 1767, 1768, 1769, 1770, 1771, 1772, 1773, 1774, 1775, 1922, 6069, 8261, 8262, 14297, 14298, 14299, 14300, 14301, 14302, 14303, 14304, 14305, 14306, 14307
\lcurvearrowdown 19119, 20501
\lcurvearrowse . . . 19111, 20498
\lcurvearrowsw . . 19114, 20499
\ldots 547
\le 18037, 20129
\leadsto 19105, 20496
\leavevmode 655, 2226, 4266, 4296, 4336, 5105, 5138, 5218, 6375, 7354, 7515, 8573, 8974, 9042, 9077, 9111, 9370, 9458, 9538, 9575, 9615, 9966, 10008, 10048, 10081, 10314, 10323, 10377, 10536, 10561, 10591, 10624, 10996, 11323, 11576, 11603, 11634, 11996, 12278, 12597, 12723, 12731, 12770, 12803, 13200, 13286, 13308, 13328, 13335, 13356, 13376, 13407, 13553, 13645, 13674, 13697, 13706, 13730, 13749, 13788, 14584
\Leftarrow 17749, 20006
\leftarrow 19956
\leftarrowtail 17666, 19974
\leftarrowtriangle 17797, 20026
\leftbarharpoon . . 19156, 20513
\LEFTCIRCLE . . 18648, 20320
\leftharpoondown 17697, 19987
\leftharpoonup . . 17694, 19986
\leftleftarrows . . . 17726, 19997
\leftleftharpoons . 19144, 20509
\leftModels 19365, 20979
\leftmodels 19358, 20977
\leftmoon 18717, 20345
\leftpointright . . . 18691, 20902
\Leftrightarrow . . 17760, 20010
\leftrightarrow . . . 17635, 19960
\leftrightarrows . . 17724, 19996
\leftrightarrowtriangle . . 17801, 20028
\leftrightharpoon . 19133, 20505
\leftrightharpoons 17735, 20001
\Leftscissors 18892, 20953
\leftslice 19302, 20574
\leftspoon 19062, 20476
\leftsquigarrow . . 17777, 20018
\leftthereforе 17415, 19896
\leftthreetimes . . . 18276, 20229
\LeftTorque 19126, 20962
\Lefttorque 19127, 20963
\leftVdash 19352, 20975
\leftvdash 18197, 20852
\legacy 6868, 6870
\legm 16140, 20728
\legr 16183, 20740
\Leo 18768, 20931
\leo 18766, 20359
\leq 18037, 20128

\leqclosed 18248, 20868
\leqq 18046, 20132
\leqslant 19267, 20558
\lessapprox 19275, 20562
\lessclosed 18242, 20866
\lessdot 18306, 20242
\lesseqgtr 18315, 20246
\lesseqqgtr 19293, 20570
\lessgtr 18087, 20151
\LessOrEqual . . . 18040, 20838
\lesssim 18077, 20147
\Letter 18905, 20954
\LHD 18641, 20317
\lhd 18240, 20215
\lhooknwarrow . . 19097, 20492
\lhooksearrow . . . 19101, 20494
\Libra 18774, 20933
\libra 18772, 20361
\Lightning 17684, 20808
\lightning 17682, 19982
\limits 4822
\linferior 19935
\literalps@out 2224, 10919, 10924, 10976, 10982, 11008, 11014, 11270, 11286, 11320, 11321, 11349, 11351, 11363, 11365, 11663, 11760, 11769, 11827, 11840, 11921, 12045, 12205
\ll 18058, 20138
\llap 5110
\llbracket 19066, 20958
\llcorner 18389, 20278
\Lleftarrow 17773, 20016
\lll 18310, 20244
\llparenthesis 19175, 20520
\lnapprox 19288, 20568
\lneq 19283, 20566
\lneqq 18054, 20136
\lnsim 18342, 20258
\Longleftarrow . . 19081, 20484
\longleftarrow . . . 19075, 20481
\Longleftrightarrow 19085, 20486
\longleftrightarrow 19079, 20483
\longlegr 19823
\Longmapsfrom . . 19089, 20488
\Longmapsto 19091, 20489
\longmapsto 19087, 20487
\Longrightarrow . 19083, 20485
\longrightarrow . . 19077, 20482
\looparrowleft . . . 17676, 19979
\looparrowright . . 17678, 19980
\lower . . 5112, 9465, 9545, 9582, 9622, 11351, 12003, 12285
\lowercase 984, 1776, 1923, 2355, 2911, 2941, 3766, 3802, 5409, 5410, 5413, 5418, 5442, 5452, 5506, 5562, 5880, 5954, 5957, 6070, 8263, 11046, 14308
\lozenge 18646, 20319
\lrcorner 18391, 20279
\LT@array 7100
\LT@foot 7115, 7119
\LT@p@ftn . . 7386, 7389, 7393, 7403
\LT@p@ftntext 7384, 7391
\LT@start 7117, 7127
\ltimes 18271, 20227
\lz 16132, 20725

M

\m@ne . . 4350, 4483, 4519, 4533, 4536, 4858, 4917, 5424, 7202, 9961, 14541, 14630, 14643
\mag 9338, 10274, 10418, 11732
\make@df@tag@@ . . . 8185, 8187
\make@df@tag@@@ . 8186, 8188
\make@stripped@name . . 7200
\makeatletter 3, 870, 926
\MakeButtonField . 6226, 12724, 12733, 12755, 12775, 12781, 13329, 13339, 13364, 13381, 13388, 13698, 13701, 13729, 13754, 13758
\MakeCheckField . 6223, 12805, 13411, 13784
\MakeChoiceField . 6225, 12705, 13312, 13672
\MakeFieldObject 12988, 13135, 13145, 13148
\MakeLinkTarget . . . 6894, 7242, 7258, 14217
\MakeLowercase 618
\MakeLowercaseUnsupportedInPdfStrings 492, 618
\MakeRadioField . . 6222, 12688, 13298, 13638
\maketag@@@ 8174
\MakeTextField . . . 6224, 12599, 13204, 13549
\maketitle 7464, 7465
\MakeUppercase 617, 8509
\MakeUppercaseUnsupportedInPdfStrings 492, 617
\Male 18738, 20921
\male 18734, 20349
\MaleMale 18855, 20386
\ManFace 19452, 20631
\manstar 18849, 20383
\mapsto 17670, 19976
\Mars 18737, 20920
\mars 18736, 20919
\MathBSuppress . 10324, 10328
\mathclose 7148
\mathdollar 15243, 20652
\mathellipsis 17386, 20786
\mathopen 7139, 7168
\mathparagraph . 15366, 20663
\mathsection 15333, 20661
\mathsterling . . . 15322, 20658
\mathunderscore . 15301, 20656
\mathversion 606
\maxdimen 3454, 12993
\MaybeStopEarly 475, 2692, 2787, 4390, 4521, 6817, 6820
\mbox 656, 8928, 9933
\mdseries 589
\meaning 62, 153, 159, 2202, 6418, 7026, 7207, 14505, 14513, 14528
\measuredangle . . 17867, 20057
\measuring@false 6886
\mediaheight 10421, 10426, 10435
\mediawidth 10422, 10427, 10436
\meem 19694
\Mercury 18723, 20912
\mercury 18721, 20347
\merge 19254, 20974
\MessageBreak 272, 278, 295, 296, 301, 302, 344, 345, 1670, 1691, 1704, 1727, 1732, 1734, 2377, 2378, 2393, 2415, 2418, 2420, 2498, 2499, 2522, 2523, 2571, 2572, 2573, 2608, 2609, 2629, 2681, 2707, 2723, 2758, 2797, 2804, 2815, 2821, 2845, 2854, 2859, 2879, 2895, 2933, 3392, 3515, 3516, 3576, 3577, 3595, 3596, 3690, 3779, 3834, 3835, 3955, 3956, 3991, 3992, 3993, 4087, 4088, 4089, 4110, 4112, 4120, 4121, 4128, 4178, 4430, 4431, 4439, 4440, 4456, 4457, 4472, 4473, 4487, 4488, 4496, 4497, 4691, 4911, 4912,

4936, 4937, 4953, 4954, 5463, 5468, 5477, 5520, 5566, 5690, 5801, 5873, 5884, 5916, 5917, 5936, 6028, 6029, 6030, 6031, 6491, 6724, 6739, 6740, 7968, 8002, 8003, 8004, 8005, 8006, 8763, 8781, 8801, 8803, 8809, 8811, 8814, 8822, 8978, 9971, 10512, 10595, 10883, 10889, 11103, 13002, 13004, 14245, 14263, 14375
\MF 564, 12356
\mho 19947
\mid 17874, 20059
\MineSign 18834, 20376
\minferior 19936
\minusdot 19230, 20543
\minusinferior 19924
\minussuperior 19908
\models 18214, 20857
\moo 20519
\Moon 19450, 20630
\MoonPha . . . 2102, 2107, 2110, 2116, 20651
\Mountain 18881, 20394
\MoveDown 18631, 20892
\MoveUp 18616, 20889
\MP 565, 12357
\mp 17842, 20046
\mu 19860
\mugreek 19861
\multimap 18258, 20221
\multimapboth . . 19213, 20535
\multimapdotbothA . . . 18254, 20219
\multimapdotbothB . . . 18256, 20220
\MultiplicationDot 15369, 20664
\multiply 10776, 10805
\Mundus 19448, 20629
\MVArrowDown . 17633, 20804
\MVAt 15293, 19792
\MVComma 15261, 19778
\MVDivision 15267, 19781
\MVEight 15285, 19790
\MVFive 15279, 19787
\MVFour 15277, 19786
\MVMinus 15263, 19779
\MVMultiplication 15437, 20667
\MVNine 15287, 19791
\MVOne 15271, 19783
\MVPeriod 15265, 19780
\MVPlus 15259, 19777
\MVRightArrow . 17629, 20802
\MVRightarrow . . 17630, 20803
\MVSeven 15283, 19789
\MVSix 15281, 19788
\MVThree 15275, 19785
\MVTwo 15273, 19784
\MVZero 15269, 19782

N

\nabla 17818, 20036
\name@of@eq 6844
\nameref 653
\napprox 17957, 20094
\napproxeq 17962, 20096
\nasb 19706
\nasymp 17975, 20102
\natural 18822, 20371
\nbackcong 17971, 20100
\nbacksim 17935, 20084
\nbacksimeq 18282, 20232
\nBumpeq 17980, 20104
\nbumpeq 17984, 20106
\ncirceq 18016, 20120
\ncong 17953, 20092
\ncurlyeqprec . . . 18322, 20249
\ncurlyeqsucc . . . 18326, 20251
\nDashV 19366, 20603
\nDashv 19359, 20601
\ndashV 19353, 20599
\ndashv 18198, 20201
\nDoteq 17994, 20110
\ndoteq 17988, 20108
\ndownmodels . . . 19371, 20605
\ndownvdash 18204, 20203
\ne 18026, 20125
\Nearrow 17767, 20013
\nearrow 17641, 19963
\neg 20642
\Neptune 18750, 20925
\neptune 18748, 20353
\neq 18026, 20124
\neqcirc 18012, 20118
\neqdot 19263, 20556
\neqsim 17944, 20088
\nequal 18029, 20834
\nequiv 18033, 20127
\neswarrow 19095, 20491
\netscape 9501
\Neural 18861
\Neutral 20389
\new@ifnextchar 679
\new@pdflink . . 8953, 9007, 9010
\new@refstepcounter 7130, 7142
\newblock 7804
\newcommand 4, 9, 42, 2225, 5092, 5093, 5095, 5135, 5346, 5369, 6379, 6383, 6888, 7230, 7237, 7587, 8207, 14345, 14348, 14353, 19776, 20648
\newcount 476, 477, 2230, 2650, 4902, 5839, 6502, 12548, 12700, 13158, 13305, 13512, 13668, 14380
\newcounter . 6837, 7277, 7280, 9839, 14295
\newdimen . . . 473, 4412, 4413, 5090, 5840, 5841
\NewDocumentCommand 2323, 8572
\NewExpandableDocumentCommand 2332
\NewHook 6989
\newif 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 425, 426, 427, 945, 2625, 2657, 3818, 4603, 4932, 5416, 5504, 5835, 5836, 5856, 5899, 6845, 6846, 6886, 7154, 10303, 11251
\newlabel 2205, 5043
\newlength 14577
\newline 552, 6439
\newname 7203, 7212
\newsavebox 9769, 11299
\NewSocket 2247
\NewSocketPlug . . . 6850, 6856, 6864, 7061
\newtie . . 14734, 14735, 15132, 15183, 15212, 15230
\newtoks 90, 5927, 11121, 11374, 11375
\newwrite 14468, 14547
\nexists 17811, 20033
\next . . 7794, 7795, 7796, 10739, 10741, 10743
\nfallingdoteq 20112
\nfallingdotseq 17999
\nfss@text 8431, 8451, 8468, 8600
\NG 15689

\ng 15691, 15692, 15693, 20675, 20676
\ngeq 18075, 20146
\ngeqq 18052, 20135
\ngeqslang 19273
\ngeqslant 20561
\ngg 18064, 20141
\ngtr 18070, 20144
\ngtrapprox 19281, 20565
\ngtrclosed 18355, 20880
\ngtrless 18091, 20153
\ngtrsim 18085, 20150
\nhateq 18022, 20122
\ni 17826, 20040
\NibRight 18917, 20408
\NibSolidRight . . 18919, 20409
\niepsilon 16065, 19811
\niiota 16114, 19819
\nineinferior 19922
\ninesuperior 19906
\ninferior 19937
\niphi 16167, 19822
\niupsilon 16225, 19828
\nj 16147, 20731
\nLeftarrow 17741, 20003
\nleftarrow 17649, 19966
\nleftModels 19368, 20980
\nleftmodels 19361, 20978
\nLeftrightarrow . 17743, 20004
\nleftrightarrow . . 17680, 19981
\nleftVdash 19355, 20976
\nleftvdash 18200, 20853
\nleq 18073, 20145
\nleqq 18048, 20133
\nleqslant 19269, 20559
\nless 18068, 20143
\nlessapprox 19277, 20563
\nlessclosed 18352, 20879
\nlessgtr 18093, 20154
\nlesssim 18083, 20149
\nll 18060, 20139
\nmid 17876, 20060
\nmodels 18233, 20863
\noboundary 550
\nobreak 2276, 2285, 2296, 2304, 7355, 7516
\nobreakspace . 667, 8566, 8569
\NoChemicalCleaning . . 19193, 20526
\noexpand . 22, 93, 95, 108, 116, 169, 171, 172, 173, 176, 206, 934, 997, 1430, 1447, 1549, 1576, 1937, 2283, 2284, 2285, 2288, 2302, 2303, 2304, 2307, 3301, 3303, 3305, 3306, 3307, 3308, 3310, 3328, 3525, 3526, 3528, 3890, 4352, 4356, 4357, 4546, 4816, 4990, 5313, 5315, 5341, 5472, 6015, 6615, 6616, 6625, 6627, 6630, 6762, 6902, 6903, 6920, 7068, 7069, 7070, 7071, 7072, 7080, 7081, 7082, 7206, 7377, 7387, 7395, 7396, 7397, 7399, 7526, 7617, 7694, 7709, 7736, 7867, 8047, 8198, 8200, 8485, 8486, 8616, 8617, 8622, 8624, 8629, 8630, 8635, 8636, 9706, 11188, 11255, 11837, 12095, 12627, 12628, 12629, 12630, 13228, 13229, 13230, 13231, 13584, 13585, 13586, 13587, 13862
\noexpandQ 1576
\nofrenchguillemets . . . 686, 688
\NoHyper 6331
\nohyperpage 6374, 8373, 8375, 8377
\nolinkurl 4968
\nolinkurl@ 4968, 4969
\NomFancyVerbLineautorefname 3122
\Nomfootnoteautorefname 3102
\Nomtheoremautorefname 3126
\nonumber 7181, 7184
\normalbaselineskip . 6244, 6245, 6246, 6247, 6248, 6249
\normalfont 584
\normalsize . . . 602, 7562, 7635
\notasymp 17977, 20830
\notbackslash . . . 18413, 20288
\NotCongruent . . 18035, 20836
\notdivides 17878, 20819
\note 7906
\notequiv 18036, 20837
\notin 17822, 20038
\notni 17831, 20814
\notowner 17829, 20041
\notperp 19056, 20473
\notslash 18410, 20287
\noway 18879, 20393
\nparallel 17881, 20062
\nperp 18211, 20856
\nprec 18111, 20163
\nprecapprox 19332, 20589
\npreccurlyeq . . . 18328, 20252
\npreceq 19308, 20577
\npreceqq 19320, 20583
\nprecsim 18105, 20160
\nqsubseteq 20254
\nqsupseteq 20255
\NR@gettitle 7552
\NR@ref@showkeys . 4731, 4735, 4739, 4743
\nRightarrow 17746, 20005
\nrightarrow 17651, 19967
\nrightModels . . . 18239, 20865
\nrightmodels . . . 18232, 20862
\nrightVdash 18236, 20864
\nrightvdash 18229, 20861
\nrisingdoteq 18004, 20114
\nsim 17940, 20086
\nsimeq 17948, 20090
\nsqsubset 18141, 20178
\nsqsubseteq 18149, 18332, 20182
\nsqsupset 18145, 20180
\nsqsupseteq 18153, 18334, 20184
\nSubset 18292, 20236
\nsubset 18119, 20167
\nsubseteq 18127, 20171
\nsubseteqq 19344, 20595
\nsucc 18113, 20164
\nsuccapprox 19336, 20591
\nsucccurlyeq . . . 18330, 20253
\nsucceq 19312, 20579
\nsucceqq 19324, 20585
\nsuccsim 18109, 20162
\nsuperior 19912
\nSupset 18296, 20238
\nsupset 18121, 20168
\nsupseteq 18129, 20172
\nsupseteqq 19348, 20597
\nthickapprox . . . 17959, 20828
\ntriangleleft 18350, 20262
\ntrianglelefteq . . 18357, 20264
\ntriangleright . . . 18353, 20263
\ntrianglerighteq . 18360, 20265
\ntriplesim 17967, 20098
\ntwoheadleftarrow 17655, 19969
\ntwoheadrightarrow . . . 17662, 19972
\nu 19862
\null . . . 7785, 7793, 8473, 8596
\number 1156, 1158, 1185, 1186, 1876, 1941, 1942, 1943, 1944, 1948, 1949, 1950, 1951, 1952, 1956, 1957, 1958, 1959, 1960, 1961, 1962, 1966, 1967, 1968,

1969, 1970, 1971, 1974, 1976, 1980, 1981, 1983, 1985, 1987, 1990, 1994, 1995, 1996, 1997, 2006, 2007, 2011, 2012, 2019, 2020, 2024, 2027, 2028, 2029, 2039, 2041, 2042, 2047, 2049, 2050, 2055, 2056, 4605, 4622, 5430, 6951, 6954, 7003, 7004, 7007, 7011, 8834, 8837, 8838, 9529, 9547, 9548, 9563, 9564, 9584, 9585, 9601, 9602, 9624, 9625, 9641, 9642
\numberline . 7555, 7628, 14268, 14273
\numberwithin 8204
\numexpr 1948, 1949, 1950, 1952, 1958, 1966, 1967, 1968, 1969, 1970, 1971, 1975, 1977, 1981, 1983, 1985, 1987, 1991, 1994, 1995, 1997, 2006, 2011, 2028, 2042, 2050, 2056, 2646, 2647, 3908
\nun 19696
\nupmodels 19375, 20607
\nupvdash 18209, 20205
\nVDash 18237, 20214
\nVdash 18234, 20213
\nvDash 18230, 20212
\nvdash 18227, 20211
\nVvash 18221, 20209
\Nwarrow 17765, 20012
\nwarrow 17639, 19962
\nwsearrow 19093, 20490

O

\O 14979, 15439, 15921
\o 15048, 15509, 15924
\oasterisk 18181, 20850
\obackslash 19187, 20966
\obar 19181, 20523
\obeylines 11836
\OBJ@acroform .. 13131, 13132
\OBJ@Helv 13106, 13119, 13471
\OBJ@OCG@print .. 8871, 8874, 8882, 8909, 9857, 9859, 9872, 9876, 9885, 9914
\OBJ@OCG@view 8856, 8874, 8908, 9841, 9843, 9856, 9876, 9913
\OBJ@OCGs 8877, 8880, 8886, 8891, 8896, 9873, 9875, 9879, 9883, 9889, 9894, 9899
\OBJ@pdfdocencoding . 13104, 13452, 13468
\OBJ@ZaDb 13105, 13118, 13461
\obot 19190, 20525
\obslash 19184, 20524
\ocirc 18176, 20847
\OCIRCUMFLEX 19506, 19604, 19605, 19606, 19607, 19608
\ocircumflex 19500, 19544, 19545, 19546, 19547, 19548
\oddsidemargin 7946
\odiv 19238, 20546
\odot 18171, 20191
\odplus 19192, 20968
\OE 14846, 15707
\oe 14859, 15709
\offinterlineskip 6466
\ogreaterthan ... 19198, 20528
\OHORN . 19507, 19609, 19610, 19611, 19612, 19613
\ohorn 3167, 3174, 19501, 19549, 19550, 19551, 19552, 19553
\oiint 17908, 20073
\oinferior 19930
\oint 17905, 20072
\ointclockwise ... 17911, 20074
\ointctrclockwise . 17913, 20075
\oldb 820
\oldc 821
\oldd 822
\olessthan 19195, 20527
\OMEGA 12352
\Omega 19848
\omega 19873
\ominus 18162, 20188
\on@line 7999, 8000
\oneinferior 19914
\onesuperior 19796
\oo 19414, 20616
\openbullet 20322
\openo 16041, 19807
\openout 14470, 14549
\oplus 18159, 20187
\OpMode 2666, 2782, 2785, 2798, 2811, 2816, 4483, 4519, 4533, 4536, 10822, 10927, 11773
\or 339, 1003, 1004, 1005, 1006, 1007, 1008, 1009, 1010, 1011, 1012, 1013, 1014, 1015, 1016, 1017, 1018, 1019, 1020, 1021, 1022, 1023, 1024, 1025, 1026, 1027, 1028, 1029, 1030, 1031, 1032, 1033, 1034, 1052, 1074, 1077, 1083, 1084, 1085, 1086, 1087, 1088, 1089, 1090, 1091, 1092, 1093, 1094, 1095, 1096, 1097, 1098, 1099, 1100, 1101, 1102, 1103, 1104, 1105, 1106, 1107, 1108, 1109, 1110, 1111, 1112, 1113, 1114, 1119, 1120, 1121, 1122, 1123, 1124, 1125, 1126, 1127, 1128, 1129, 1130, 1131, 1132, 1133, 1134, 1135, 1136, 1137, 1138, 1139, 1140, 1141, 1142, 1143, 1144, 1145, 1146, 1147, 1148, 1149, 1150, 1163, 1164, 1165, 1166, 1167, 1279, 1280, 1281, 2101, 2104, 2106, 2109, 5590, 5596, 5601, 5813, 6972, 6973, 6974, 6975, 6981, 6982, 6983, 6984, 8054, 8058, 10815, 14388, 14389, 14390, 14391, 14392, 14393, 14394, 14395, 14396, 14397, 14398, 14399, 14400, 14401, 14402, 14403, 14404, 14405, 14406, 14407, 14408, 14409, 14410, 14411, 14412, 14413, 14414, 14415, 14416, 14417, 14418, 14419
\OrnamentDiamondSolid . 19046
\oslash 18168, 20190
\otimes 18165, 20189
\ovee 17891, 20066
\overlay 7903
\owedge 17886, 20064
\owns 17828, 20813

P

\P 546
\p@ 2007, 2012, 5842, 5848, 9474, 9558, 9596, 9636, 10775, 12012, 12299, 12623, 13224, 13580
\p@equation 8181
\PackageError 61, 255

\PackageInfo . . . 258, 259, 8831, 13000
\PackageWarning . . 256, 2628, 3990, 5799
\PackageWarningNoLine . . 257
\pageautorefname . . 2980, 2998, 3016, 3034, 3052, 3070, 3088, 3128, 3146, 3164, 3182, 3200, 3218, 3236, 3254, 3272, 8569, 8682
\pagename 8566
\pageref . . 652, 4400, 8555, 8559
\paperheight . 4171, 9323, 9325, 9328, 9330, 9345, 9347, 9354, 9356, 10280, 10281, 10288, 10289, 10425, 10426, 10434, 10435, 11738, 11739, 11746, 11747
\paperwidth . 9319, 9321, 9332, 9334, 9344, 9346, 9353, 9355, 10279, 10281, 10287, 10289, 10424, 10427, 10433, 10436, 11737, 11739, 11745, 11747
\par 7554, 7583, 7626, 7636, 7787, 7807
\paragraphautorefname 2976, 2994, 3012, 3030, 3048, 3066, 3084, 3117, 3119, 3142, 3160, 3178, 3196, 3214, 3232, 3250, 3268, 8678
\parallel 17879, 20061
\parenleftinferior 19926
\parenleftsuperior 19910
\parenrightinferior 19927
\parenrightsuperior 19911
\parr 17588, 20801
\partautorefname . . 2970, 2988, 3006, 3024, 3042, 3060, 3078, 3108, 3136, 3154, 3172, 3190, 3208, 3226, 3244, 3262, 8672
\partial 17807, 20031
\partnumberline . 14270, 14275
\PassOptionsToPackage 2704, 2716, 2719, 2731, 2742, 2771, 2830, 2836, 2867, 2922, 2926, 2948, 4206, 4219, 4230, 4566
\patchcmd 7271
\pdf@addtoks . . . 11377, 11399, 11405, 11414, 11421, 11425, 11427, 11429, 11431, 11433, 11441, 11450, 11454, 11456, 11458, 11461, 11470, 11474, 11476, 11478, 11480, 11482, 11484, 11486, 11488, 11490, 11492, 11494, 11496, 11498, 11500, 11502, 11504, 11505, 11506, 11507, 11508, 11509, 11510, 11511, 11512, 11513, 11514, 11519
\pdf@addtoksx . . 11371, 11381, 11397
\pdf@box . 11299, 11331, 11339, 11347, 11348, 11351, 11355, 11357, 11360
\pdf@defaulttoks . 11255, 11375, 11376, 11386
\pdf@docset 11121
\pdf@endanchor 8966, 9007, 9014
\pdf@escapestring 8737
\PDF@FinishDoc . . . 2695, 2696, 2790, 2791, 4165, 4268, 4393, 4394, 4524, 4525, 6373, 6483, 6484, 9209, 9398, 9653, 10139, 10304, 10893, 11122, 12049, 12220
\pdf@ifdraftmode . . 6659, 8841, 9210, 9298, 13101, 14477
\pdf@linktype . . . 11279, 11283, 11391, 11392
\pdf@objdef 11258, 11272, 11274, 11288, 11290, 11394, 11395
\pdf@rect . 11266, 11285, 11303
\PDF@SetupDoc . . . 4164, 4267, 6302, 6303, 6372, 9140, 9399, 9686, 10181, 10305, 10830, 11175, 11933, 12082, 12221
\PDF@SetupDox 9140
\pdf@toks 11255, 11276, 11292, 11374, 11378, 11382
\pdf@type 11257, 11262, 11276, 11292, 11369, 11389
\pdfbookmark 2225, 6378, 6379, 14346, 14351, 14356, 14360
\pdfcatalog . . 6662, 8878, 9155, 9197, 13132
\PDFdefaults 11385
\pdfdest 8968
\pdfendlink 9004, 13204, 13298, 13313, 13340, 13365, 13389, 13412
\pdfescapestring 13891
\pdfextension . 2714, 4421, 4510
\PDFForm@@Name 13899, 13902, 13906, 13909
\PDFForm@Check 12804, 12808, 13409, 13410, 13789, 13793, 13982
\PDFForm@List . 12703, 12708, 13310, 13311, 13675, 13680, 14043
\PDFForm@Name 13195, 13249, 13322, 13403, 13544, 13605, 13691, 13780, 13898
\PDFForm@Push . 12732, 12736, 13337, 13338, 13707, 13711, 14013
\PDFForm@Radio 12684, 12692, 13288, 13290, 13646, 13658, 14077
\PDFForm@Reset 12779, 12784, 13386, 13387, 13759, 13764, 14182
\PDFForm@Submit 12753, 12758, 13358, 13360, 13731, 13736, 14148
\PDFForm@Text . 12598, 12602, 13202, 13203, 13554, 13557, 14112
\pdfhorigin 9315
\pdfinfo 9213
\pdflastannot 8788
\pdflastlink . 8791, 13067, 13080
\pdflastmatch 4080
\pdflastobj . . 8785, 8856, 8871, 8877, 13131, 13452, 13461, 13471
\pdflastxform 8786, 12991, 12993
\pdflastximage 8787
\pdflinkmargin 8949, 8951
\pdfliteral 8929, 8931, 8936
\pdfm@box 9769, 13508, 13509, 13510, 13548, 13560, 13637, 13662, 13671, 13682, 13701, 13714, 13729, 13738, 13758, 13766, 13783, 13795
\pdfmajorversion . . . 2650, 2651, 2654, 2655
\pdfmark 6780, 9706, 9715, 9745, 10963, 10983, 11022, 11057, 11074, 11108, 11145, 11157, 11188, 11197, 11228, 11252, 11528, 11543, 11558, 11570, 11577, 11604, 11635, 12095, 12104, 12135, 12558, 12567, 12599, 12688, 12705, 12733, 12755, 12781, 12805, 14509

\pdfmark@ 11252, 11253
\pdfmatch 336
\pdfminorversion 8750
\PDFNextPage 11541
\PDFNextPage@ . 11541, 11542
\pdfobj 8842, 8857, 8872, 13109, 13418, 13453, 13462
\pdfobjcompresslevel 8768, 8824
\PDFOpen 11569
\pdfoptionpdfminorversion 8749
\pdfoutline 14555
\pdfpageattr 9254, 9258, 9259, 9269, 9278, 9282, 9283, 9293
\pdfpageheight 9325, 9334, 9342, 9347, 9356
\pdfpageref 13169
\pdfpageresources . . 8905, 8906
\pdfpagesattr . 9144, 9146, 9148
\pdfpagewidth 9321, 9330, 9341, 9346, 9355
\PDFPreviousPage 11554
\PDFPreviousPage@ . . . 11555, 11557
\pdfrefobj . 13104, 13105, 13106
\pdfrefxform 12993
\pdfstartlink . 8999, 9043, 9078, 9112, 9372, 13203, 13289, 13311, 13338, 13359, 13387, 13410
\pdfstrcmp 13026
\pdfstringdef 515, 806, 3716, 3722, 3728, 3734, 3739, 3744, 3750, 3757, 3763, 3843, 5791, 6444, 6551, 6553, 7889, 7926, 13916, 14278
\pdfstringdefDisableCommands . . 819, 924, 6376, 6437
\pdfstringdefPostHook . 802, 918
\pdfstringdefPreHook 663, 918, 930, 6436, 6448
\pdfstringdefWarn 551, 552, 657, 933, 1438, 1443, 1462, 1466
\pdftexversion 13103
\pdfvorigin 9316
\pdfxform 12989
\Peace 18906, 20403
\peh 19722
\penalty 1552, 2253, 4877
\PencilRight 18913, 20406
\PencilRightDown 18911, 20405
\PencilRightUp . . 18915, 20407
\pentagon 19385, 20611
\perp 19054, 20472
\phantom 607
\phantomsection . . . 4166, 6380, 7970, 14217, 14265, 14646
\Phi 19846
\phi 19870
\phiinferior 19883
\Phone 18667, 20328
\PhoneHandset . . 18897, 20399
\Pi 19843
\pi 19864
\pinferior 19938
\Pisces 18789, 20938
\pisces 18787, 20366
\pitchfork 18304, 20241
\planck 15614, 20674
\Plane 18901, 20401
\Plus 18934, 20416
\PlusCenterOpen . 18938, 20418
\plusinferior 19923
\PlusOutline 18932, 20415
\plussuperior 19907
\PlusThinCenterOpen . . 18936, 20417
\Pluto 18753, 20926
\pluto 18751, 20354
\pm 20645
\pointer 17792, 20024
\PointingHand . . . 18692, 20903
\Pointinghand . . . 18693, 20904
\pounds 15323, 20659
\Preamble 12348
\prec 18095, 20155
\precapprox 19330, 20588
\preccurlyeq 18099, 20157
\preceq 19306, 20576
\preceqq 19318, 20582
\precnapprox 19338, 20592
\precneq 19314, 20580
\precneqq 19326, 20586
\precnsim 18346, 20260
\precsim 18103, 20159
\PrerenderUnicode 3707
\prime 17391, 19892
\process@me . 6416, 6428, 6429, 9143, 9152
\ProcessKeyvalOptions . . 4235
\prod 17834, 20043
\prop 2322, 2326, 2334
\propto 17860, 20054
\protect . 1550, 4987, 5021, 7555, 7628, 7694, 7709, 7736, 7792, 7799, 7800, 8030, 8160, 8362, 8430, 8450, 8456, 8467, 8481, 8599, 9409, 9506, 10375, 10455, 11944, 12231, 14285, 14579
\protected 6387, 7181, 8039, 8040
\protected@edef 5161, 6517, 6611, 7204, 7221, 7435, 7877, 7881, 8975, 9968, 10509, 10592, 11100
\protected@file@percent . . 7961, 8030
\protected@write . . . 2204, 5042, 5358, 7772, 8301, 8316, 8331, 8335, 8345, 14284
\protected@xdef . . . 7396, 7490
\providecommand 492, 4508, 4830, 4973, 5345, 5404, 5406, 6641, 6666, 6798, 7198, 7659, 7660, 7675, 7961, 8663, 8664, 8665, 8666, 8667, 8668, 8669, 8670, 8671, 8672, 8673, 8674, 8675, 8676, 8677, 8678, 8679, 8680, 8681, 8682, 8744, 8952, 8970, 8971, 9397, 9500, 9501, 9764, 9826, 9827, 9828, 10301, 10417, 10447, 10448, 10449, 10920, 11300, 11301, 11661, 11669, 11670, 11671, 11672, 11767, 11779, 11780, 11781, 11782, 11834, 11875, 11876, 11877, 11878, 12041, 12043, 12044, 12156, 12157, 12212, 13046, 13049, 13855
\psdaliasnames . . 20648, 20991
\psdmapshortnames . . . 19776, 20647
\Psi 19847
\psi 19872
\PushButton 6183
\put@me@back 5308, 5321, 5331
\pwedge 16234, 20751
\pxfonts 19384

Q

\Q 1545, 13114
\qaf 19688
\quarternote 18811, 20367
\quotedblbase . . . 14826, 15067, 17372, 19482
\quotesinglbase . . 14836, 15069, 17366, 19484

R

\r . 14701, 14713, 14725, 14940, 15006, 15118, 15163, 15192, 15224, 15399, 15466, 15763, 15765, 17311, 17313
\ra 19664
\Radiation 18696, 20905
\Radioactivity . . . 18694, 20337
\raff 19708
\Rain 18877, 20392
\raise . . . 2260, 5126, 9475, 9559, 9597, 9637, 11365, 12013, 12300
\rangle 18401, 20284
\rbrackdbl 20478
\rcurvearrowdown 19124, 20502
\rcurvearrowleft . . 19128, 20503
\rcurvearrowne . . 19108, 20497
\rcurvearrowright 19131, 20504
\rcurvearrowse . . . 19117, 20500
\Re 17550, 19946
\ReadBookmarks 4234, 4269, 4407, 4639, 4751, 4753, 14444, 14476
\real@setref 8427, 8494
\realfootnote 7487
\Rectangle 19050, 20470
\RectangleBold . . 19052, 20471
\RectangleThin . . 19048, 20469
\recycle 18826, 20373
\Recycling 18828, 20945
\Ref 8512, 8521, 8529
\ref 651, 4399, 7452, 7459, 8538, 8546, 12323
\ref@one 4996, 4997
\rEfLiNK 12324, 12325
\refstepcounter 6883, 7093, 7104, 7130, 7136, 7142, 7270, 7271, 7620
\rem@ptetc 11047, 11049
\RemoveFromHook . 7722, 8153
\renewcommand . . . 2196, 5097, 5103, 5136, 6891, 7253, 8017, 8222, 8518, 8525, 8534, 8543, 14360
\RenewCommandCopy . . 8016
\Request 18431, 20295
\RequirePackage . 22, 246, 247, 248, 249, 250, 251, 252, 253, 254, 377, 948, 2690, 4212, 4228, 4705, 4757, 4965, 5407, 8802, 10302, 12217, 14370
\RerunFileCheck 14372
\Reset 6192
\reset@font . . 8431, 8451, 8468, 8600
\reve 16055, 19809
\reveject 16268, 20761
\revepsilon 16069, 19812
\revglotstop 16266, 19836
\Rewind 18636, 20315
\RewindToIndex . 18443, 20300
\RHD 18627, 20312
\rhd 18243, 20216
\rho 19865
\rhoinferior 19882
\rhooknearrow . . . 19099, 20493
\rhookrevepsilon 19813
\rhookswarrow . . 19103, 20495
\Rightarrow 17754, 20008
\rightarrow 19958
\rightarrowtail . . . 17668, 19975
\rightarrowtriangle 17799, 20027
\rightbarharpoon . 19162, 20515
\RIGHTCIRCLE . 18650, 20321
\rightharpoondown 17709, 19991
\rightharpoonup . 17706, 19990
\rightleftarrows . . 17718, 19994
\rightleftharpoon . 19135, 20506
\rightleftharpoons 17738, 20002
\rightModels 18226, 20860
\rightmodels 18215, 20858
\rightmoon 18719, 20346
\rightpointleft . . . 18688, 20901
\rightrightarrows . 17730, 19999
\rightrightharpoons 19150, 20511
\RightScissors . . . 18891, 20952
\rightslice 19304, 20575
\rightsquigarrow . 17779, 20019
\rightthreetimes . 18278, 20230
\RightTorque . . . 19121, 20960
\Righttorque 19122, 20961
\rightVdash 18218, 20859
\rightvdash 18194, 20851
\rinferior 19877
\riota 17563, 19948
\risingdoteq 20113
\risingdotseq 18002
\rlap 5123, 8930, 9935
\rm 595
\rmfamily 585
\Roman 6607
\roman 6608
\romannumeral 940, 941, 13114
\rotm 16136, 20727
\rotOmega 16227, 20749
\rotr 16172, 20737
\rotvara 16035, 20699
\rotw 16238, 20753
\roty 16242, 20755
\rrbracket 19069, 20959
\Rrightarrow 17775, 20017
\rrparenthesis . . . 19177, 20521
\rtaild 19808
\rtimes 18274, 20228
\rule 7437

S

\S 15334, 20662
\sad 19672
\Sagittarius 18780, 20935
\sagittarius 18778, 20363
\Saturn 18744, 20923
\saturn 18742, 20351
\sbox 3703, 5106, 5139, 6227, 9462, 9542, 9579, 9619, 11300, 11339, 12000, 12282, 12988
\scd 16984, 19874
\scdefault 4715
\scg 16090, 19815
\schwa 16058, 19810
\schwainferior 19932
\sci 16117, 19820
\ScissorHollowRight . . . 18895, 20398
\ScissorRight 18889, 20396
\ScissorRightBrokenBottom 18885
\ScissorRightBrokenTop 18893, 20397
\scn 16153, 19821
\Scorpio 18777, 20934
\scorpio 18775, 20362
\scr 16195, 19824
\scr@LT@array 7103
\scripta 16028, 19806
\scriptg 16087, 19814
\scriptsize 603
\scriptv 16229, 19829
\scrollmode . . 1488, 1497, 1510, 1617, 1750
\scshape 591
\scu 17002, 19875
\scy 16243, 19833
\Searrow 17769, 20014
\searrow 17644, 19964
\Sech 19444, 20627
\second 17393, 19893
\sectionautorefname 2973, 2991, 3009, 3027, 3045, 3063,

3081, 3110, 3139, 3157, 3175, 3193, 3211, 3229, 3247, 3265, 8675
\seen 19668
\selectfont 571, 4715, 13141
\SePa 19430, 20621
\set@display@protect 4341
\setbox 1553, 1559, 1565, 3437, 3443, 5110, 5123, 5987, 6465, 8920, 9908, 9925, 13548, 13637, 13671, 13701, 13729, 13758, 13783
\setcounter 4908
\setkeys 4883, 4928
\setlength 2257, 5091, 5999, 6749, 8947, 9315, 9316, 9321, 9325, 9330, 9334, 9341, 9342, 9346, 9347, 9355, 9356, 10421, 10422, 10426, 10427, 10435, 10436, 10775, 11759, 11826, 11920, 12204, 14599, 14667
\setminus 17850, 20050
\setpdflinkmargin . . 3897, 3898, 6747, 8945, 11757, 11824, 11918, 12202
\settowidth 12620, 13221, 13577
\SetupKeyvalOptions 2315, 4199
\seveninferior 19920
\sevensuperior 19904
\sffamily 586
\shadda 19718
\sharp 18824, 20372
\sheen 19670
\ShipoutBox . 6465, 6468, 9908, 9909
\shortciteN 7835
\shuffle 19215, 20536
\Sigma 19844
\sigma 19867
\sim 17930, 20082
\simeq 17946, 20089
\sinferior 19939
\SixFlowerAlternate . . . 19002, 20449
\SixFlowerAltPetal 19012, 20454
\SixFlowerOpenCenter . 18998, 20447
\SixFlowerPetalRemoved 18995, 20446
\sixinferior 19919
\SixStar 18985, 20441
\sixsuperior 19903
\SixteenStarLight 18993, 20445
\sixteenthnote . . . 18818, 20369
\SK@ 8657
\SK@@ref 8657
\SK@ref 8654
\skip@ . . 1567, 1650, 1651, 1654, 1656, 2280, 2286, 2299, 2305
\slashc 16019, 19805
\slashdiv 19391, 20614
\slide 7900
\SliTeX 563
\slshape 592
\small 604
\smallin 17824, 20039
\smallowns 17832, 20042
\smash 2254
\smile 18395, 20281
\Smiley 18711, 20910
\smiley 18709, 20342
\Snowflake 19016, 20456
\SnowflakeChevron 19014, 20455
\SnowflakeChevronBold . 19018, 20457
\sofpasuq 16917
\softsign 16558, 20772
\spacefactor 2232, 2238, 7355, 7364, 7516, 7518, 8955, 8963
\spadesuit . 18790, 18792, 20939
\Sparkle 19020, 20458
\SparkleBold 19022, 20459
\special@paper 4167
\SpecialDvipdfmxOutlineOpen . 2748, 2750, 4607, 4614
\sphericalangle . . 17869, 20058
\splitmaxdepth 7430
\splittopskip 7429
\sqcap 18155, 20185
\sqcup 18157, 20186
\sqdoublecap 19242, 20548
\sqdoublecup 19247, 20550
\sqsubset 18139, 20177
\sqsubseteq 18147, 20181
\sqsubsetneq 18336, 20256
\sqsupset 18143, 20179
\sqsupseteq 18151, 20183
\sqsupsetneq 18339, 20257
\SquareCastShadowBottomRight 19041, 20466
\SquareCastShadowTopRight 19044, 20467
\Squaredot 15370, 20665
\squaredots 17923, 20079
\SquareShadowBottomRight 19035, 20464
\SquareShadowTopRight . 19038
\SquareTopRight 20465
\SS 15065, 19468
\ss . . 3020, 14994, 15080, 15454
\sslash 19382, 20610
\star 18264, 20224
\stepcounter . 6872, 7220, 7356, 7489, 14281
\stockheight . 4171, 4413, 9340, 9342, 10276, 10277, 10420, 10421, 11734, 11735
\stockwidth . . 4412, 9339, 9341, 9352, 10275, 10277, 10286, 10419, 10422, 10432, 11733, 11735, 11744
\stop@hyper 6345
\str 5145
\StringEncodingConvertTest 782, 792
\strip@period 2209
\strip@prefix 62, 2202, 4080, 6418, 7026, 7207, 14505, 14513, 14528
\strip@pt 489, 4183, 6016, 6750, 9321, 9325, 9330, 9334, 10778, 11761, 11828, 11922, 12206, 14007, 14072, 14101, 14141, 14192
\strip@pt@and@otherjunk 10982, 11014, 11049
\strutbox 7430
\sub@label 2196
\subeqnarray 7187, 7189
\subfig@oldlabel 2198
\Submit 6189
\SubmitObject 13361
\SubmitPObject 13361
\subparagraphautorefname . . . 2977, 2995, 3013, 3031, 3049, 3067, 3085, 3118, 3120, 3143, 3161, 3179, 3197, 3215, 3233, 3251, 3269, 8679
\subpdfbookmark 14348
\subsection 12037
\subsectionautorefname . . 2974, 2992, 3010, 3028, 3046, 3064, 3082, 3115, 3140, 3158, 3176, 3194, 3212, 3230, 3248, 3266, 8676
\Subset 18290, 20235
\subset 18115, 20165

\subseteq 18123, 20169
\subseteqq 19342, 20594
\subsetneq 18131, 20173
\subsubsectionautorefname 2975, 2993, 3011, 3029, 3047, 3065, 3083, 3116, 3141, 3159, 3177, 3195, 3213, 3231, 3249, 3267, 8677
\succ 18097, 20156
\succapprox 19334, 20590
\succcurlyeq 18101, 20158
\succeq 19310, 20578
\succeqq 19322, 20584
\succnapprox 19340, 20593
\succneq 19316, 20581
\succneqq 19328, 20587
\succnsim 18348, 20261
\succsim 18107, 20161
\sukun 19720
\sum 17838, 20045
\Sun 18716, 20911
\sun 18714, 20344
\SunCload 20391
\SunCloud 18875
\SunshineOpenCircled . . 19010, 20453
\Supset 18294, 20237
\supset 18117, 20166
\supseteq 18125, 20170
\supseteqq 19346, 20596
\supsetneq 18133, 20174
\surd 20053
\Swarrow 17771, 20015
\swarrow 17647, 19965
\sys 5145

T

\T 19648
\t . 14733, 15153, 15182, 15211, 15229
\T@pageref . . 8520, 8527, 8536, 8545
\T@Ref 4729
\Ta 19676
\taa 19650
\tableautorefname . . 2969, 2987, 3005, 3023, 3041, 3059, 3077, 3107, 3135, 3153, 3171, 3189, 3207, 3225, 3243, 3261, 8671
\tagform@ 8180
\taild 16049, 20704
\tailinvr 16180, 20739
\taill 16129, 20724
\tailn 16152, 20733
\tailr 16186, 20741
\tails 16202, 20744
\tailt 16220, 20747
\tailz 16248, 20756
\Tape 18899, 20400
\tatweel 19684
\tau 19868
\Taurus 18759, 20928
\taurus 18757, 20356
\tcheh 19724
\Telefon 18669, 20896
\temp@online 7999, 8002
\Tent 18883, 20395
\tesh 16320, 20769
\TeX . 553, 554, 561, 563, 12351, 12353, 12355
\texorpdfstring 911, 6377
\text 499, 505
\textAcht 19443, 20626
\textAcPa 19429, 20620
\textacute 14697, 14709, 14721, 14905, 15159, 15188, 15360
\textacutedbl 16368
\textacutemacron 15156, 15185, 15214, 17090, 17093, 17194, 17197
\textainferior 17480, 19928
\textaleph 17574, 19950
\textalpha . . . 3187, 3188, 3189, 3191, 3192, 3193, 3194, 3195, 3196, 3197, 3198, 3199, 3200, 19752, 19849
\textamalg 17837, 20044
\textampersand 543, 14768, 15248, 15249, 15250, 20654, 20655
\textangle 17866, 20056
\textangstrom 17566
\textAnkh 18700, 20339
\textaolig . 19411, 19413, 20985
\textAPLbox 18438, 20298
\textAPLdownarrowbox 18427, 20293
\textAPLinput . . 18430, 20294
\textAPLinv 18404, 20285
\textAPLleftarrowbox . . 18419, 20290
\textAPLrightarrowbox . 18422, 20291
\textAPLuparrowbox . . 18424, 20292
\textapprox 17956, 20093
\textapproxeq . . . 17961, 20095
\textaquarius 18785, 18786, 20365, 20937
\textaries . 18755, 18756, 20355, 20927
\textasciiacute 15361
\textasciibreve . . . 14744, 15167, 15196, 16357
\textasciicaron . . . 14702, 14714, 14726, 14746, 15164, 15193, 16343
\textasciicircum . . 14698, 14710, 14722, 14784, 15160, 15189, 15298
\textasciidieresis . 14700, 14712, 14724, 14881, 15162, 15191, 15336
\textasciigrave . . . 14696, 14708, 14720, 14789, 15158, 15187, 15303
\textasciimacron . 14705, 14717, 14729, 14895, 15171, 15200, 15350
\textasciitilde 544, 4793, 14799, 15315
\textast 17853, 20051
\textAsterisk 19001, 20448
\textAsteriskBold 18978, 20437
\textasteriskcentered 15258
\textAsteriskCenterOpen 18980, 20438
\textAsteriskRoundedEnds 19025, 20460
\textasymp 17974, 20101
\textbabygamma . 16098, 19817
\textbackcong . . . 17970, 20099
\textbackneg 18376, 20272
\textbackprime . . 17398, 19895
\textbacksim 17934, 20083
\textbacksimeq . . 18281, 20231
\textbackslash . . 539, 718, 2062, 14780, 14782, 15296
\textbaht 16981
\textbar . 14795, 15310, 15311, 20657
\textbarb 15802, 20678
\textbarc 16023, 20695
\textbard 15566, 20670
\textbardbl 17359, 17360, 20782
\textbardotlessj . . 16080, 16081, 16082, 20711
\textbarglotstop . 16302, 16303
\textbari . 16111, 16112, 16113, 19818, 20720
\textbarin 18372, 20270

\textbarl . . 15825, 15826, 19803
\textbarleftharpoon 19160, 20514
\textbaro 16157, 16159
\textbarp 17026, 19886
\textbarrevglotstop 16306, 16307
\textbarrightharpoon . . . 19166, 20516
\textbarsci 17024, 19885
\textbarscu 17029, 19887
\textbaru . 16222, 16223, 16224, 19827, 20748
\textbarwedge . . . 18263, 20223
\textbbslash 18450, 18451, 20301, 20884
\textBeam 18434, 20296
\textbecause 17919, 17920, 20077, 20824
\textbeltl . 16123, 16124, 16125, 20723
\textBeta 16389
\textbeta . . 15080, 19753, 19850
\textbetainferior . 17013, 19880
\textbeth 17576, 19951
\textbetween 18067, 20142
\textbf 578
\textBicycle 19463, 20635
\textbigcircle 15184, 15213, 18658, 18659, 20324, 20895
\textbigdoublevee 19222, 20539
\textbigdoublewedge . . . 19220, 20538
\textbigtriangledown . . . 18634, 18635, 20314, 20893
\textbigtriangleup 18619, 18620, 18621, 20309, 20890, 20891
\textBiohazard . . 18698, 20338
\textblacksmiley . 18713, 20343
\textblank 18446
\textbot . 18207, 18208, 20204, 20855
\textbowtie 18269, 18270, 20226, 20872
\textboxast 19206, 20531
\textboxbackslash 18416, 20289
\textboxbar 18656, 20323
\textboxbox 19210, 20533
\textboxbslash . . . 19204, 20530
\textboxcircle . . . 19208, 20532
\textboxdot 18191, 20198
\textboxempty . . 18671, 18672, 20329, 20897
\textboxminus . . . 18187, 20196
\textboxplus 18185, 20195
\textboxslash 19202, 20529
\textboxtimes . . . 18189, 20197
\textbraceleft 537, 2063, 14793, 15308
\textbraceright 538, 2063, 14797, 15313
\textbrokenbar . . 14877, 15329, 15330, 20660
\textbullet . 14801, 17381, 19890
\textbulletoperator 17857
\textbullseye 16277, 16278, 16279, 16280, 20764, 20765
\textBumpeq 17979, 20103
\textbumpeq 17983, 20105
\textcancer 18764, 18765, 20358, 20930
\textCap . 18299, 18300, 20239, 20875
\textcap 17895, 20067
\textcapdot 19246, 20549
\textcapricornus . 18782, 18783, 20364, 20936
\textccnc 19472, 20638
\textccnd 19474
\textccsa 19476, 20639
\textcdj 16291
\textcdot . . 15079, 19494, 20646
\textcdots 18366, 20267
\textcedilla 14704, 14716, 14728, 14913, 15166, 15195, 15372
\textcelsius 15066, 17536
\textcent 14869, 15319
\textcentoldstyle . 16021, 20694
\textCESign 19480, 19481, 20641, 20990
\textCheckedbox . 18674, 18675, 20330, 20898
\textCheckmark . 18922, 18923, 20410, 20956
\textCheckmarkBold . . . 18925, 20411
\textChi 19749
\textchi 3188, 19773, 19871
\textchiinferior . . 17021, 19884
\textcirc 17855, 20052
\textcirceq 18015, 20119
\textcirclearrowleft 19072, 20479
\textcirclearrowright . . . 19074, 20480
\textcircled 15155, 15184, 15213, 18453, 18455, 18457, 18459, 18461, 18463, 18465, 18467, 18469, 18471, 18473, 18475, 18477, 18479, 18481, 18483, 18485, 18487, 18489, 18491, 18493, 18498, 18500, 18502, 18504, 18506, 18512, 18514, 18516, 18518, 18520, 18522, 18524, 18526, 18528, 18530, 18536, 18538, 18540, 18542, 18544, 18546, 18548, 18550, 18552, 18554, 18556, 18558, 18560, 18562, 18564, 18566, 18568, 18570, 18572, 18574, 18576, 18578, 18580, 18582, 18584, 18586, 18588, 18590, 18592, 18594, 18596, 18598, 18600, 18602, 18604, 18606, 18608
\textCircledA . . . 18495, 18496, 20302, 20885
\textcircledast . . . 18179, 18180, 18181, 20193, 20849, 20850
\textcircledcirc . . 18175, 18176, 18177, 20192, 20847, 20848
\textcircleddash . . 18183, 20194
\textcircledP 17546
\textCircleShadow 19033, 20463
\textcircplus 19229, 20542
\textcircumflex 14748
\textcircumlow . . 15177, 15206, 19417
\textCleaningF . . 18508, 20303
\textCleaningFF . 18510, 20304
\textCleaningP . . 18532, 20305
\textCleaningPP . 18534, 20306
\textclock 18382, 18383, 18384, 20275, 20881, 20882
\textcloseepsilon . 16284, 16285
\textcloseomega . . 16163, 16164, 16165, 16166, 20734, 20735
\textcloserevepsilon 16076, 16077, 16078, 20710
\textCloud 18662, 20325
\textClowerTips . 18958, 20427
\textclubsuitblack . 2184, 18801, 18802, 20943
\textclubsuitwhite 18810
\textCoffeecup . . . 18681, 20332
\textcoloncolonequals . . 19266, 20557
\textcolonequals . 18007, 20115
\textcolonmonetary 17506
\textcolor . . 616, 13099, 13146, 13149, 13480
\textcommatailz . 15989, 15990
\textcomplement . 17806, 20030
\textcompwordmark 17353
\textcong 17951, 20091

\textcopyleft 19469, 19470
\textcopyright ... 14883, 15338, 19793
\textcorner 16377, 16378
\textCR 14742, 15236
\textcrb .. 15798, 15799, 15800, 15802, 15803, 20677, 20678, 20679
\textcrd .. 15561, 15563, 15564, 15566, 15567, 20669, 20670, 20671
\textcrg 15891, 20691
\textcrh 15612, 20672
\textcrinvglotstop 15852, 15853
\textcrlambda ... 15829, 15830, 15831, 15832, 15833, 15834, 20683, 20684, 20685, 20686
\textCross 18941, 20419
\textCrossedbox . 18677, 18678, 18679, 20331, 20899, 20900
\textCrossMaltese 18947, 20422
\textCrossOpenShadow . 18943, 20420
\textCrossOutline 18945, 20421
\textcrtwo 15849, 15850
\textctc .. 16044, 16045, 16046, 20703
\textctd 15987, 15988
\textctesh 16211, 16212, 16213, 20745
\textctj ... 16292, 16293, 20766
\textctjvar 16293, 20766
\textctn 16007, 16008
\textctt 16009, 16010
\textctyogh 16256, 16257, 16258, 20758
\textctz .. 16249, 16250, 16251, 20757
\textCup . 18302, 18303, 20240, 20876
\textcup 17897, 20068
\textcupdot 18136, 20175
\textcupplus 18138, 20176
\textcurlyeqprec . 18321, 20248
\textcurlyeqsucc . 18325, 20250
\textcurlyvee 18285, 18286, 20233, 20873
\textcurlywedge .. 18288, 18289, 20234, 20874
\textcurrency ... 14873, 15325
\textcurvearrowleft 17690, 19984
\textcurvearrowright ... 17692, 19985
\textCuttingLine . 18610, 18611, 18612, 18613, 20307, 20886, 20887, 20888
\textdagger 14803, 17374, 17375, 19889, 20783
\textdaggerdbl ... 14805, 14806, 17377, 17378, 17379, 20784, 20785
\textdaleth 17580, 19953
\textdanger 18852, 20384
\textdasheddownarrow . 17791, 20023
\textdasheduparrow 17786, 20021
\textdashleftarrow 17783, 17784, 20020, 20810
\textdashrightarrow 17788, 17789, 20022, 20811
\textDashV 19364, 19365, 20602, 20979
\textDashv 19357, 19358, 20600, 20977
\textdashV 19351, 19352, 20598, 20975
\textdashv 18196, 18197, 20200, 20852
\textDavidStar .. 18949, 18950, 20423, 20957
\textdblig . 16013, 16015, 20692
\textdctzlig 16314, 16315
\textddagger 14806
\textddots 18370, 20269
\textdegree 14897, 15066, 15352
\textDeleatur ... 17529, 17530, 19941, 20796
\textDelta 19741, 19839
\textdelta .. 3200, 19755, 19852
\textdiameter ... 18374, 20271
\textdiamond ... 18644, 18645, 20318, 20894
\textdiamonddots 17420, 19898
\textDiamondSolid 19047, 20468
\textdiamondsuitblack ... 2185, 18808
\textdiamondsuitwhite . 18798, 18799, 20942
\textdigammagreek 20770
\textdiscount 17414
\textdiv ... 15077, 19492, 20644
\textdivide 15046, 15077, 15507, 19492
\textdivideontimes 18267, 20225
\textDivides 17847, 20048
\textDividesNot .. 17849, 20049
\textdivorced 18866
\textdlsh 17687, 19983
\textdollar .. 541, 14764, 15242, 15243, 15244, 20652, 20653
\textdong 17516
\textdotaccent ... 14703, 14715, 14727, 14750, 15165, 15194, 16359
\textdotbelow ... 14707, 14719, 14731, 14774, 15181, 15210, 16384
\textdotdiv 17927, 20825
\textdoteq 17987, 20107
\textdoteqdot ... 17992, 17993, 20109, 20831
\textdotminus ... 17926, 17927, 20080, 20825
\textdotplus 17845, 20047
\textdottimes ... 19234, 20544
\textdoublebarpipe 15865, 15866, 15867, 20690
\textdoublebarpipevar .. 15867, 20690
\textdoublebarwedge ... 19257, 20553
\textdoublegrave . 15169, 15198, 16380
\textdoublepipe .. 15861, 15862, 15863, 20689
\textdoublepipevar 15863, 20689
\textdoublevee ... 19253, 19254, 20552, 20974
\textdoublevertline 17360, 20782
\textdoublewedge 19251, 20551
\textDOWNarrow 18630, 18631, 20313, 20892
\textDownarrow . 17758, 20009
\textdownarrow .. 17632, 17633, 17634, 19959, 20804, 20805
\textdowndownarrows .. 17733, 20000
\textdowndownharpoons 19154, 20512
\textdownharpoonleft .. 17716, 19993
\textdownharpoonright . 17713, 19992
\textdownmodels . 19370, 20604
\textdownstep ... 19400, 19401
\textdownuparrows 17796, 20025
\textdownupharpoons .. 19172, 20518
\textdsbiological . 18846, 20381
\textdschemical .. 18844, 20380
\textdscommercial 18848, 20382

\textdsjuridical . . 18842, 20379
\textdsmedical . . . 18840, 20378
\textdsmilitary . . 18837, 18838, 20377, 20947
\textdtimes 19237, 20545
\textdyoghlig 16311, 16312
\textdzlig 16308, 16309, 16310, 20768
\textearth 18732, 18733, 20348, 20918
\textEightAsterisk 19031, 20462
\textEightFlowerPetal . . 19009, 20452
\textEightFlowerPetalRemoved 19028, 20461
\texteightinferior . 17466, 19921
\textEightStar . . . 18988, 20442
\textEightStarBold 18990, 20443
\textEightStarConvex . . 18984, 20440
\textEightStarTaper . . . 18982, 20439
\texteightsuperior 17434, 19905
\texteinferior 17482, 19929
\textell 17542, 19944
\textellipsis . . . 547, 548, 14808, 17385, 17386, 20786
\textemdash . 752, 14810, 17357
\textemptyset . . . 17814, 17815, 20034, 20812
\textEncodingNoboundary 550, 19736
\textendash . . 753, 14812, 17355
\textEnvelope . . . 18904, 18905, 20402, 20954
\textEpsilon 3185
\textepsilon . . 3186, 3187, 3190, 3192, 3193, 3194, 3195, 3199, 3200, 19756, 19853
\texteqcirc 18011, 20117
\texteqcolon 17929, 20081
\texteqdot 19262, 20555
\texteqsim 17943, 20087
\texteqslantgtr . . 19301, 20573
\texteqslantless . . 19299, 20572
\textequalscolon . 18009, 20116
\textequalsinferior 17474, 19925
\textequalsuperior 17442, 19909
\textequiv 18031, 18032, 20126, 20835
\textEreversed 15811
\textesh . . . 16203, 16204, 19826
\textestimated . . . 17568, 17569, 17570, 20798, 20799
\texteta . 3185, 3186, 3188, 3191, 3193, 3194, 3195, 3198, 3199, 19758, 19855
\texteuro . 14865, 17518, 17519, 17520, 17521, 17522, 17523, 17524, 17525, 17526, 17527, 20787, 20788, 20789, 20790, 20791, 20792, 20793, 20794, 20795
\textexclamdown . . . 756, 14867, 15317
\textexists 17810, 20032
\textfallingdoteq . 17998, 20111
\textfatsemi 19227, 20541
\textFax . 19458, 19459, 20633, 20989
\textfax 17582, 19954
\textfemale 18726, 20913
\textFemaleFemale 18854, 20385
\textFemaleMale . 18858, 20387
\textfi 754, 14840, 19419
\TextField 6174
\textFinv 17572, 19949
\textFire 19461, 20634
\textfishhookr . . . 16188, 16189, 16190, 16191, 20742, 20743
\textfivedots 19396, 20615
\textfiveeighths 17616
\textFiveFlowerOpen . . 19007, 20451
\textFiveFlowerPetal . . . 19005, 20450
\textfiveinferior . . 17460, 19918
\textfivesixths 17610
\textFiveStar 18664, 20326
\textFiveStarCenterOpen 18966, 20431
\textFiveStarConvex . . . 18974, 20435
\textFiveStarOpen 18666, 20327
\textFiveStarOpenCircled 18964, 20430
\textFiveStarOpenDotted 18968, 20432
\textFiveStarOutline . . . 18970, 20433
\textFiveStarOutlineHeavy 18972, 20434
\textFiveStarShadow . . . 18976, 20436
\textfivesuperior . 17428, 19902
\textfl 755, 14842, 19421
\textFlag . 18832, 18833, 20375, 20946
\textflat 18821, 20370
\textflorin 14814, 15814, 15815, 20680
\textflq 641, 15073, 19488
\textflqq 639, 15071, 19486
\textforall 17804, 20029
\textForward 18623, 20310
\textForwardToIndex . . . 18441, 20299
\textFourAsterisk 18952, 20424
\textfourfifths 17606
\textfourinferior . 17458, 19917
\textFourStar . . . 18960, 20428
\textFourStarOpen 18962, 20429
\textfoursuperior . 17426, 19901
\textfourth 17418, 19897
\textfractionsolidus 14816, 17408
\textfrown 18394, 20280
\textfrownie 18707, 18708, 20341, 20909
\textfrq 642, 15074, 19489
\textfrqq 640, 15072, 19487
\textfullnote 19435, 19436, 20623, 20986
\textGame 17584, 19955
\textGamma 19740, 19838
\textgamma . . 3196, 3197, 3198, 19754, 19851
\textgammainferior 17015, 19881
\textGaPa 19423, 20617
\textge 18044, 20131
\textgemini 18761, 18762, 20357, 20929
\textGentsroom . . 19465, 20636
\textgeq . 18043, 18045, 20130, 20839
\textgeqq 18051, 20134
\textgeqslant 19272, 20560
\textgg 18063, 20140
\textggg 18313, 20245
\textgimel 17578, 19952
\textglobfall 17646, 20807
\textglobrise 17643, 20806
\textglotstop 16260, 16261, 16262, 16263, 19835, 20759, 20760
\textglq 637, 15069, 19484
\textglqq 635, 15067, 19482
\textgnapprox . . . 19291, 20569
\textgneq 19287, 20567
\textgneqq 18057, 20137
\textgnsim 18345, 20259
\textgravedbl 16372

\textgravemacron 15157, 15186, 15215, 17084, 17087, 17188, 17191
\textgreater 14778, 15292
\textgrq 638, 15070, 19485
\textgrqq 636, 15068, 19483
\textGslash 15888
\textgslash 15890, 15891, 20691
\textgtrapprox . . . 19280, 20564
\textgtrdot 18309, 20243
\textgtreqless . . . 18319, 20247
\textgtreqqless . . 19297, 20571
\textgtrless 18090, 20152
\textgtrsim 18081, 18082, 20148, 20841
\textguarani 17534
\texthalflength . . 16354, 16355
\texthalfnote 19438, 19439, 20624, 20987
\textHandCuffLeft 18683, 20333
\textHandCuffRight . . . 18685, 20334
\textHandLeft . . . 18687, 18688, 20335, 20901
\textHandRight . . 18690, 18691, 18692, 18693, 20336, 20902, 20903, 20904
\textHaPa 19425, 20618
\texthateq 18019, 18020, 18021, 20121, 20832, 20833
\texthausaB 15805, 19800
\texthausaD 15809, 19801
\texthausaK 15820, 19802
\texthbar . 15611, 15612, 15613, 15614, 19799, 20672, 20673, 20674
\texthdotfor 17383, 19891
\textheartsuitblack 2186, 18806
\textheartsuitwhite 18794, 18795, 18796, 20940, 20941
\textheng . 19402, 19404, 20982
\textHermaphrodite . . . 18860, 20388
\texthexagon 18436, 20297
\texthexstar 18871, 20390
\texthinferior 17490, 19933
\texthookleftarrow 17673, 19977
\texthookrightarrow . . . 17675, 19978
\textHslash 15609
\texthslash 17538, 19942
\textHT 14738, 15232
\texthtb . 16036, 16037, 16038, 16039, 20700, 20701
\texthtbardotlessj 16206, 16207
\texthtc 15806, 15807
\texthtd . 16050, 16051, 16052, 16053, 20705, 20706
\texthtg . . 16083, 16084, 16085, 20712
\texthth . 16103, 16104, 16105, 16106, 20717, 20718
\texththeng 16107, 16108, 16109, 20719
\texthtk . 15821, 15822, 15823, 20682
\texthtp 15839, 15840
\texthtq 16299, 16300
\texthtrtaild 17033, 17034, 19888
\texthtscg 16287, 16288
\texthtt 15844, 15845
\texthungarumlaut 14752, 15172, 15201, 16367
\texthvlig 15816, 15817, 15818, 20681
\textiiint 17904, 20071
\textiinferior 17005, 19876
\textiint 17902, 20070
\textIm 17540, 19943
\textInfo 19478, 20640
\textinfty 17864, 20055
\textinsymbol . . . 17821, 20037
\textint . . 17899, 17900, 20069, 20822
\textinterleave . . . 19381, 20609
\textinterrobang 17406
\textinterrobangdown . . 19393, 19394
\textinvamp 17586, 17587, 17588, 20800, 20801
\textinvbackneg . . 18380, 20274
\textinvbreve 15131, 15174, 15203, 15938, 15940, 15951, 15953, 15954, 15964, 15966, 15980, 15982
\textinvdiameter . 19180, 20522
\textinve 15886, 19804
\textinvglotstop . . 16270, 16271, 19837
\textinvneg 19241, 20547
\textinvscr . 16198, 16199, 19825
\textiota 3185, 3186, 3187, 3189, 3192, 3200, 19760, 19857
\textipagamma . . 16094, 16095, 19816, 20714
\textisuperior . . . 17424, 19900
\textit 580
\textJackStar . . . 18954, 20425
\textJackStarBold 18956, 20426
\textjinferior 19390, 20613
\textJoin 19225, 20540
\textjupiter 18740, 18741, 20350, 20922
\textkappa . . 3187, 3189, 3192, 19761, 19858
\textKeyboard . . . 18398, 20282
\textkinferior 17492, 19934
\textkra 15653
\textLadiesroom . 19467, 20637
\textLambda 19743, 19841
\textlambda 3192, 3200, 19762, 19859
\textlangle 18400, 20283
\textlatin 627, 7014
\textlbrackdbl . . . 19065, 19066, 20477, 20958
\textlcurvearrowdown . . 19120, 19121, 19122, 20501, 20960, 20961
\textlcurvearrowse 19112, 20498
\textlcurvearrowsw 19115, 20499
\textle 18039, 20129
\textleadsto 19106, 20496
\textLeftarrow . . . 17750, 20006
\textleftarrow . . . 17624, 19956
\textleftarrowtail . 17667, 19974
\textleftarrowtriangle . . 17798, 20026
\textleftbarharpoon 19157, 20513
\textLEFTCIRCLE 18649, 20320
\textleftharpoondown . . 17698, 19987
\textleftharpoonup 17695, 19986
\textleftleftarrows 17727, 19997
\textleftleftharpoons . . . 19145, 20509
\textleftmoon . . . 18718, 20345
\textLeftrightarrow 17761, 20010
\textleftrightarrow . 2189, 17636, 19960
\textleftrightarrows 17725, 19996
\textleftrightarrowtriangle 17802, 20028
\textleftrightharpoon . . . 19134, 20505
\textleftrightharpoons . . 17736, 20001
\textleftslice 19303, 20574
\textleftspoon . . . 19063, 20476
\textleftsquigarrow 17778, 20018
\textlefttherefore . 17416, 19896
\textleftthreetimes 18277, 20229

\textlengthmark . 16351, 16352
\textleo . . 18767, 18768, 20359, 20931
\textleq . . 18038, 18040, 20128, 20838
\textleqq 18047, 20132
\textleqslant 19268, 20558
\textless 14776, 15290
\textlessapprox . . 19276, 20562
\textlessdot 18307, 20242
\textlesseqgtr . . . 18316, 20246
\textlesseqqgtr . . 19294, 20570
\textlessgtr 18088, 20151
\textlesssim 18078, 18079, 20147, 20840
\textLF 14740, 15234
\textLHD 18642, 20317
\textlhd . . 18241, 18242, 20215, 20866
\textlhookfour . . . 19405, 19407, 20983
\textlhooknwarrow 19098, 20492
\textlhooksearrow 19102, 20494
\textlhookt 15842, 15843
\textlhtlongi 16193, 16194
\textlhtlongy 16325, 16326
\textlibra . 18773, 18774, 20361, 20933
\textlightning . . . 17683, 17684, 19982, 20808
\textlinferior 17494, 19935
\textlira 17508
\textll 18059, 20138
\textllcorner 18390, 20278
\textLleftarrow . . 17774, 20016
\textlll 18311, 20244
\textllparenthesis . 19176, 20520
\textlnapprox . . . 19289, 20568
\textlneq 19284, 20566
\textlneqq 18055, 20136
\textlnot 14891, 15346
\textlnsim 18343, 20258
\textlogicalnot . . . 14890, 15075, 15345, 19490
\textLongleftarrow 19082, 20484
\textlongleftarrow 19076, 20481
\textLongleftrightarrow . 19086, 20486
\textlongleftrightarrow . 19080, 20483
\textlonglegr 16181, 16182, 16183, 19823, 20740
\textLongmapsfrom 19090, 20488
\textLongmapsto . 19092, 20489
\textlongmapsto . 19088, 20487
\textLongrightarrow . . . 19084, 20485
\textlongrightarrow 19078, 20482
\textlongs 15797, 17315
\textlooparrowleft 17677, 19979
\textlooparrowright 17679, 19980
\textlozenge 18647, 20319
\textlptr 16337, 16338
\textlquill 17410
\textlrcorner 18392, 20279
\textltailm 16141, 16142, 16143, 16144, 20729, 20730
\textltailn 16145, 16146, 16147, 16148, 20731, 20732
\textltilde 16120, 16121, 16122, 20722
\textltimes 18272, 20227
\textlyoghlig 16130, 16131, 16132, 20725
\textmacronbelow 14706, 14718, 14730, 14787, 15180, 15209, 16386
\textmale 18735, 18736, 18737, 18738, 20349, 20919, 20920, 20921
\textMaleMale . . . 18856, 20386
\textManFace . . . 19453, 20631
\textmanstar 18850, 20383
\textmapsto 17671, 19976
\textmarried 18864
\textmd 579
\textmeasuredangle 17868, 20057
\textmercury 18722, 18723, 20347, 20912
\textmho . 17561, 17562, 19947, 20797
\textmid 17875, 20059
\textMineSign . . . 18835, 20376
\textminferior . . . 17496, 19936
\textminus 14822, 17841
\textminusdot . . . 19231, 19232, 20543, 20971
\textminusinferior 17472, 19924
\textminussuperior 17440, 19908
\textmoo 19174, 20519
\textMoon 19451, 20630
\textMountain . . . 18882, 20394
\textmp 17843, 20046
\textMu 3190
\textmu . 3186, 3187, 3188, 3191, 3198, 3199, 14907, 15363, 19860
\textmugreek 19763, 19861
\textmultimap . . . 18259, 20221
\textmultimapboth 19214, 20535
\textmultimapdotbothA 18255, 20219
\textmultimapdotbothB 18257, 20220
\textmultiply 14977, 15076, 15435, 15436, 15437, 19491, 20666, 20667
\textMundus 19449, 20629
\textmusicalnote . 18813, 18814, 18815, 20944
\textMVAt 15294, 19792
\textMVComma . 15262, 19778
\textMVDivision . 15268, 19781
\textMVEight . . . 15286, 19790
\textMVFive 15280, 19787
\textMVFour 15278, 19786
\textMVMinus . . . 15264, 19779
\textMVNine 15288, 19791
\textMVOne 15272, 19783
\textMVPeriod . . 15266, 19780
\textMVPlus 15260, 19777
\textMVSeven . . . 15284, 19789
\textMVSix 15282, 19788
\textMVThree . . . 15276, 19785
\textMVTwo 15274, 19784
\textMVZero 15270, 19782
\textnabla 17819, 20036
\textnaira 17510
\textnapostrophe 15687
\textnapprox 17958, 17959, 20094, 20828
\textnapproxeq . . 17963, 20096
\textnasymp 17976, 17977, 20102, 20830
\textnatural 18823, 20371
\textnbackcong . . 17972, 20100
\textnbacksim . . . 17936, 20084
\textnbacksimeq . 18283, 20232
\textnBumpeq . . . 17981, 20104
\textnbumpeq . . . 17985, 20106
\textncirceq 18017, 20120
\textncong 17954, 20092
\textncurlyeqprec 18323, 20249
\textncurlyeqsucc 18327, 20251
\textnDashV 19367, 19368, 20603, 20980
\textnDashv 19360, 19361, 20601, 20978
\textndashV 19354, 19355, 20599, 20976
\textndashv 18199, 18200, 20201, 20853

\textnDoteq 17995, 20110
\textndoteq 17989, 20108
\textndownmodels 19372, 20605
\textndownvdash . 18205, 20203
\textne 18028, 20125
\textNearrow 17768, 20013
\textnearrow 17642, 17643, 19963, 20806
\textneg .. 15075, 19490, 20642
\textneptune 18749, 18750, 20353, 20925
\textneq . 18027, 18029, 20124, 20834
\textneqcirc 18013, 20118
\textneqdot 19264, 20556
\textneqsim 17945, 20088
\textnequiv 18034, 18035, 18036, 20127, 20836, 20837
\textneswarrow .. 19096, 20491
\textNeutral 18862, 20389
\textnewtie 15183, 15212, 16382
\textnexists 17812, 20033
\textnfallingdoteq 18000, 20112
\textngeq 18076, 20146
\textngeqq 18053, 20135
\textngeqslant ... 19274, 20561
\textngg 18065, 20141
\textngtr 18071, 20144
\textngtrapprox .. 19282, 20565
\textngtrless 18092, 20153
\textngtrsim 18086, 20150
\textnhateq 18023, 20122
\textni ... 17827, 17828, 20040, 20813
\textNibRight ... 18918, 20408
\textNibSolidRight 18920, 20409
\textniepsilon ... 16066, 16067, 19811, 20708
\textniiota 16115, 16116, 19819, 20721
\textnineinferior . 17468, 19922
\textninesuperior . 17436, 19906
\textninferior 17498, 19937
\textniphi 16168, 19822
\textniupsilon ... 16226, 16227, 19828, 20749
\textnLeftarrow .. 17742, 20003
\textnleftarrow .. 17650, 19966
\textnLeftrightarrow ... 17744, 20004
\textnleftrightarrow 17681, 19981
\textnleq 18074, 20145
\textnleqq 18049, 20133
\textnleqslant ... 19270, 20559
\textnless 18069, 20143
\textnlessapprox . 19278, 20563
\textnlessgtr 18094, 20154
\textnlesssim 18084, 20149
\textnll 18061, 20139
\textnmid 17877, 17878, 20060, 20819
\textNoChemicalCleaning 19194, 20526
\textnormal 574
\textnotbackslash 18414, 20288
\textnotin 17823, 20038
\textnotowner ... 17830, 17831, 20041, 20814
\textnotperp 19057, 20473
\textnotslash 18411, 20287
\textnoway 18880, 20393
\textnparallel ... 17882, 17883, 20062
\textnprec 18112, 20163
\textnprecapprox . 19333, 20589
\textnpreccurlyeq 18329, 20252
\textnpreceq 19309, 20577
\textnpreceqq ... 19321, 20583
\textnprecsim ... 18106, 20160
\textnqsubseteq .. 18333, 20254
\textnqsupseteq .. 18335, 20255
\textnRightarrow 17747, 20005
\textnrightarrow . 17652, 19967
\textnrisingdoteq . 18005, 20114
\textnrleg . 15836, 15838, 20687
\textnsim 17941, 20086
\textnsimeq 17949, 20090
\textnsqsubset ... 18142, 20178
\textnsqsubseteq . 18150, 20182
\textnsqsupset ... 18146, 20180
\textnsqsupseteq . 18154, 20184
\textnSubset 18293, 20236
\textnsubset 18120, 20167
\textnsubseteq ... 18128, 20171
\textnsubseteqq .. 19345, 20595
\textnsucc 18114, 20164
\textnsuccapprox . 19337, 20591
\textnsucccurlyeq 18331, 20253
\textnsucceq 19313, 20579
\textnsucceqq ... 19325, 20585
\textnsuccsim ... 18110, 20162
\textnsuperior ... 17448, 19912
\textnSupset 18297, 20238
\textnsupset 18122, 20168
\textnsupseteq ... 18130, 20172
\textnsupseteqq .. 19349, 20597
\textntriangleleft . 18351, 18352, 20262, 20879
\textntrianglelefteq 18358, 20264
\textntriangleright 18354, 18355, 20263, 20880
\textntrianglerighteq ... 18361, 18362, 20265
\textntriplesim .. 17968, 20098
\textntwoheadleftarrow . 17656, 19969
\textntwoheadrightarrow 17663, 19972
\textnu . 3187, 3189, 3193, 3194, 3195, 19764, 19862
\textnumbersign ... 540, 14762, 15240
\textnumero 17544
\textnupmodels .. 19376, 20607
\textnupvdash ... 18210, 18211, 20205, 20856
\textnVDash 18238, 18239, 20214, 20865
\textnVdash 18235, 18236, 20213, 20864
\textnvDash 18231, 18232, 18233, 20212, 20862, 20863
\textnvdash 18228, 18229, 20211, 20861
\textnVvash 18222, 20209
\textNwarrow ... 17766, 20012
\textnwarrow 17640, 19962
\textnwsearrow .. 19094, 20490
\textobar . 19182, 19183, 20523, 20964
\textobot . 19191, 19192, 20525, 20968
\textobslash 19185, 19186, 19187, 19188, 20524, 20965, 20966, 20967
\textObullseye ... 16280, 20765
\textodiv 19239, 20546
\textodot . 18172, 18173, 20191, 20846
\textogonek 14754, 15173, 15202, 16363
\textogreaterthan 19199, 19200, 20528, 20970
\textohm 17559
\textoiint 17909, 20073
\textoinferior 17484, 19930
\textoint . 17906, 17907, 20072, 20823
\textointclockwise 17912, 20074
\textointctrclockwise ... 17914, 20075

\textolessthan . . . 19196, 19197, 20527, 20969
\textOmega 19751, 19848
\textomega . . 3185, 3186, 3199, 19775, 19873
\textomicron . 3186, 3187, 3190, 3192, 3193, 3194, 3195, 3196, 3197
\textominus 18163, 18164, 20188, 20843
\textoneeighth 17612
\textonefifth 17600
\textonehalf 14924, 15383
\textoneinferior . . 17452, 19914
\textoneninth 17592
\textonequarter . . 14922, 15381
\textoneseventh 17590
\textonesixth 17608
\textonesuperior . 14915, 15374, 19796
\textonetenth 17594
\textonethird 17596
\textoo 19415, 20616
\textopenbullet . . 18653, 20322
\textopencorner . . 16375, 16376
\textopeno 16041, 16042, 16043, 19807, 20702
\textoplus 18160, 18161, 20187, 20842
\textordfeminine . 14885, 15340
\textordmasculine 14917, 15376
\TextOrMath 619
\textoslash 18169, 18170, 20190, 20845
\textotimes 18166, 18167, 20189, 20844
\textovee . 17892, 17893, 20066, 20821
\textowedge 17887, 17888, 20064, 20820
\textparagraph 546, 14909, 15365, 15366, 20663
\textparallel 17880, 20061
\textparenleft . 760, 761, 14770, 15254
\textparenleftinferior . . . 17476, 19926
\textparenleftsuperior . . 17444, 19910
\textparenright . . 14772, 15256
\textparenrightinferior . . 17478, 19927
\textparenrightsuperior . 17446, 19911
\textpartial 17808, 20031
\textPeace 18907, 20403
\textPencilRight . 18914, 20406
\textPencilRightDown . . 18912, 20405
\textPencilRightUp 18916, 20407
\textpentagon . . . 19386, 20611
\textpercent . 542, 14766, 15246
\textperiodcentered 14911, 15079, 15368, 15369, 15370, 19494, 20664, 20665
\textperp 19055, 20472
\textpertenthousand 17390
\textperthousand . 14824, 17388
\textpeseta 17512
\textpeso 17532
\textPhi 19748, 19846
\textphi 3192, 3196, 3197, 19772, 19870
\textphiinferior . . 17019, 19883
\textPhone 18668, 18669, 20328, 20896
\textPhoneHandset 18898, 20399
\textPi 3189, 3191, 19745, 19843
\textpi . . 3186, 3194, 3195, 3196, 3197, 19766, 19864
\textpinferior 17500, 19938
\textpipe . 15857, 15858, 15859, 20688
\textpipevar 15859, 20688
\textpisces 18788, 18789, 20366, 20938
\textpitchfork . . . 18305, 20241
\textPlane 18902, 20401
\textPlus 18935, 20416
\textPlusCenterOpen . . 18939, 20418
\textplusinferior . 17470, 19923
\textplusminus . . 14899, 15078, 15354, 19493
\textPlusOutline . 18933, 20415
\textplussuperior . 17438, 19907
\textPlusThinCenterOpen 18937, 20417
\textpluto 18752, 18753, 20354, 20926
\textpm . . . 15078, 19493, 20645
\textpointer 17793, 20024
\textprec 18096, 20155
\textprecapprox . . 19331, 20588
\textpreccurlyeq . 18100, 20157
\textpreceq 19307, 20576
\textpreceqq 19319, 20582
\textprecnapprox . 19339, 20592
\textprecneq 19315, 20580
\textprecneqq . . . 19327, 20586
\textprecnsim . . . 18347, 20260
\textprecsim 18104, 20159
\textprime 17392, 19892
\textprimstress . . 16345, 16346
\textprod 17835, 20043
\textpropto 17861, 17862, 20054, 20815
\textPsi 19750, 19847
\textpsi 19774, 19872
\textPUaolig 19412, 19413, 20985
\textPUdblig 16014, 16015, 20692
\textPUfemale . . . 18725, 18726, 18727, 18728, 18729, 18730, 20913, 20914, 20915, 20916, 20917
\textPUheng 19403, 19404, 20982
\textPUlhookfour 19406, 19407, 20983
\textPUnrleg 15837, 15838, 20687
\textPUqplig 16017, 16018, 20693
\textPUrevscr . . . 17000, 17001, 20777
\textPUrhooka . . 17031, 17032, 20778
\textPUrhooke . . 17036, 17037, 20779
\textPUrhookepsilon . . . 17040, 17041, 20780
\textPUrhookopeno 17044, 17045, 20781
\textPUscf . 19409, 19410, 20984
\textPUsck 16991, 16992, 20774
\textPUscm 16994, 16995, 20775
\textPUscp 16997, 16998, 20776
\textPUuncrfemale 18868, 18869, 20948
\textqplig . 16016, 16018, 20693
\textquarternote . 18812, 20367
\textquestiondown . . 757, 14928, 15387
\textquotedbl . . . 14760, 15238
\textquotedblleft . 14828, 15068, 17368, 19483
\textquotedblright 14830, 17370
\textquoteleft . . . 14832, 15070, 17362, 19485
\textquoteright . . 14834, 17364
\textquotesingle 15252
\textRadioactivity 18695, 18696, 20337, 20905

\textRain 18878, 20392
\textraiseglotstop 16334, 16335
\textrangle 18402, 20284
\textrbrackdbl . . . 19068, 19069, 20478, 20959
\textrcurvearrowdown . . 19125, 19126, 19127, 20502, 20962, 20963
\textrcurvearrowleft . . . 19129, 20503
\textrcurvearrowne 19109, 20497
\textrcurvearrowright . . 19132, 20504
\textrcurvearrowse 19118, 20500
\textRe 17551, 19946
\textrecipe 17553
\textRectangle . . . 19051, 20470
\textRectangleBold 19053, 20471
\textRectangleThin 19049, 20469
\textrecycle 18827, 18828, 20373, 20945
\textreferencemark 17404
\textregistered . . . 14893, 15348
\textRequest 18432, 20295
\textrevapostrophe 16331, 16332
\textrevc 17620
\textrevE 15812
\textreve . . 16055, 16056, 19809
\textrevepsilon . . 16069, 16070, 19812
\textrevglotstop . 16266, 16267, 16268, 19836, 20761
\textrevscr 16999, 17001, 20777
\textrevyogh 15847, 15848
\textRewind 18637, 20315
\textRewindToIndex . . . 18444, 20300
\textRHD 18628, 20312
\textrhd . 18244, 18245, 20216, 20867
\textrho 3190, 3191, 3196, 3197, 3198, 3199, 19767, 19865
\textrhoinferior . . 17017, 19882
\textrhooka 17030, 17032, 20778
\textrhooke 17035, 17037, 20779
\textrhookepsilon 17039, 17041, 20780
\textrhooknearrow 19100, 20493
\textrhookopeno . 17043, 17045, 20781
\textrhookrevepsilon . . . 16072, 16073, 16074, 19813, 20709
\textrhookschwa . 16061, 16062, 16063, 20707
\textrhookswarrow 19104, 20495
\textRightarrow . 17755, 17756, 20008, 20809
\textrightarrow . . . 2188, 17628, 17629, 17630, 19958, 20802, 20803
\textrightarrowtail 17669, 19975
\textrightarrowtriangle . 17800, 20027
\textrightbarharpoon . . . 19163, 20515
\textRIGHTCIRCLE . . . 18651, 20321
\textrightharpoondown . 17710, 19991
\textrightharpoonup . . . 17707, 19990
\textrightleftarrows 17719, 19994
\textrightleftharpoon . . . 19136, 20506
\textrightleftharpoons . . 17739, 20002
\textrightmoon . . 18720, 20346
\textrightrightarrows . . . 17731, 19999
\textrightrightharpoons . 19151, 20511
\textrightslice . . . 19305, 20575
\textrightsquigarrow . . . 17780, 20019
\textrightthreetimes . . . 18279, 20230
\textrinferior 17007, 19877
\textring . 14701, 14713, 14725, 14756, 15163, 15192, 16361
\textringlow 15176, 15205, 16370
\textriota 17564, 19948
\textrisingdoteq . . 18003, 20113
\textrm 575
\textrptr 16340, 16341
\textrquill 17412
\textRrightarrow . 17776, 20017
\textrrparenthesis 19178, 20521
\textrtaild 16047, 16048, 16049, 19808, 20704
\textrtaill 16127, 16128, 16129, 20724
\textrtailn 16150, 16151, 16152, 20733
\textrtailr 16184, 16185, 16186, 20741
\textrtails 16200, 16201, 16202, 20744
\textrtailt 16218, 16219, 16220, 20747
\textrtailz 16246, 16247, 16248, 20756
\textrtimes 18275, 20228
\textsagittarius . . 18779, 18780, 20363, 20935
\textsaturn 18743, 18744, 20351, 20923
\textsc 581
\textsca 16982, 16983
\textscb 16281, 16282
\textscd 16985, 19874
\textsce 16986, 16987
\textscf . . . 19408, 19410, 20984
\textscg . . . 16090, 16091, 19815
\textsch 16289, 16290
\textschwa . 16058, 16059, 19810
\textschwainferior 17488, 19932
\textsci . . . 16117, 16118, 19820
\textScissorHollowRight 18896, 20398
\textScissorRight . 18890, 18891, 18892, 20396, 20952, 20953
\textScissorRightBrokenBottom 18886, 18887, 18888, 20950, 20951
\textScissorRightBrokenTop 18894, 20397
\textscj 16988, 16989
\textsck . . . 16990, 16992, 20774
\textscl 16297, 16298
\textscm . . 16993, 16995, 20775
\textscn . . . 16153, 16154, 19821
\textscoelig 16160, 16161
\textscorpio 18776, 18777, 20362, 20934
\textscp . . . 16996, 16998, 20776
\textscr . . . 16195, 16196, 19824
\textscripta 16028, 16029, 16030, 19806, 20697
\textscriptg 16087, 16088, 16089, 19814, 20713
\textscriptv 16229, 16230, 19829
\textscu . . . 17002, 17003, 19875
\textscy . . . 16243, 16244, 19833
\textSearrow 17770, 20014
\textsearrow 17645, 17646, 19964, 20807
\textSech 19445, 20627
\textsecond 17394, 19893
\textsecstress 16348, 16349
\textsection 14879, 15332, 15333, 15334, 20661, 20662

\textSePa 19431, 20621
\textservicemark 17555
\textsetminus . . . 14782, 17851, 20050
\textseveneighths 17618
\textseveninferior 17464, 19920
\textsevensuperior 17432, 19904
\textsf 576, 13146, 13149
\textsharp 18825, 20372
\textshuffle 19216, 20536
\textSigma . 3188, 19746, 19844
\textsigma . . . 3185, 3186, 3200, 19769, 19867
\textsim . 17931, 17932, 20082, 20826
\textsimeq 17947, 20089
\textsinferior 17502, 19939
\textSixFlowerAlternate 19003, 20449
\textSixFlowerAltPetal . 19013, 20454
\textSixFlowerOpenCenter 18999, 20447
\textSixFlowerPetalRemoved 18996, 20446
\textsixinferior . . 17462, 19919
\textSixStar 18986, 20441
\textsixsuperior . . 17430, 19903
\textSixteenStarLight . . 18994, 20445
\textsixteenthnote 18819, 20369
\textsl 582
\textslashc 16020, 16021, 16023, 19805, 20694, 20695
\textslashdiv 19392, 20614
\textsmallin 17825, 20039
\textsmallowns . . 17833, 20042
\textsmile 18396, 20281
\textsmiley 18710, 18711, 20342, 20910
\textSnowflake . . 19017, 20456
\textSnowflakeChevron . 19015, 20455
\textSnowflakeChevronBold 19019, 20457
\textSoccerBall . . 18873, 18874, 20949
\textspadesuitblack 2187, 18791, 18792, 20939
\textspadesuitwhite 18804
\textSparkle 19021, 20458
\textSparkleBold . 19023, 20459
\textsphericalangle 17870, 17871, 17872, 17873, 20058, 20816, 20817, 20818
\textsqcap 18156, 20185
\textsqcup 18158, 20186
\textsqdoublecap . 19243, 19244, 20548, 20972
\textsqdoublecup . 19248, 19249, 20550, 20973
\textsqsubset 18140, 20177
\textsqsubseteq . . 18148, 20181
\textsqsubsetneq . 18337, 18338, 20256, 20877
\textsqsupset 18144, 20179
\textsqsupseteq . . 18152, 20183
\textsqsupsetneq . 18340, 18341, 20257, 20878
\textSquareCastShadowBottomRight 19042, 20466
\textSquareCastShadowTopRight 19045, 20467
\textsquaredots . . 17924, 20079
\textSquareShadowBottomRight 19036, 20464
\textSquareTopRight . . . 19039, 20465
\textsslash 19383, 19384, 20610, 20981
\textstar 18265, 20224
\textsterling 14871, 15321, 15322, 15323, 20658, 20659
\textstmaryrdbaro 18408, 18409, 20883
\textstretchc 16272, 16273, 16274, 16275, 20762, 20763
\textstretchcvar . . 16275, 20763
\textsubbreve . . . 15147, 15178, 15207, 17127, 17129
\textsubcircum . . 15144, 15145, 15177, 15206, 17079, 17081, 17095, 17097, 17155, 17157, 17183, 17185, 17239, 17241, 17251, 17253
\textsubring 15137, 15138, 15176, 15205, 17047, 17049
\textSubset 18291, 20235
\textsubset 18116, 20165
\textsubseteq 18124, 20169
\textsubseteqq . . . 19343, 20594
\textsubsetneq . . . 18132, 20173
\textsubtilde 15148, 15149, 15179, 15208, 17099, 17101, 17131, 17133, 17247, 17249
\textsubumlaut . . 15135, 15136, 15175, 15204, 17243, 17245
\textsucc 18098, 20156
\textsuccapprox . . 19335, 20590
\textsucccurlyeq . 18102, 20158
\textsucceq 19311, 20578
\textsucceqq 19323, 20584
\textsuccnapprox . 19341, 20593
\textsuccneq 19317, 20581
\textsuccneqq . . . 19329, 20587
\textsuccnsim . . . 18349, 20261
\textsuccsim 18108, 20161
\textsum 17839, 20045
\textsun . 18715, 18716, 20344, 20911
\textSunCload . . . 18876, 20391
\textSunshineOpenCircled 19011, 20453
\textSupset 18295, 20237
\textsupset 18118, 20166
\textsupseteq 18126, 20170
\textsupseteqq . . . 19347, 20596
\textsupsetneq . . . 18134, 20174
\textsurd 17859, 20053
\textSwarrow 17772, 20015
\textswarrow 17648, 19965
\TextSymbolUnavailable 14732, 14733, 14735
\textTape 18900, 20400
\texttau 3187, 3191, 3193, 3194, 3195, 19770, 19868
\texttaurus 18758, 18759, 20356, 20928
\texttctclig 16322, 16323
\textTent 18884, 20395
\textteshlig 16318, 16319, 16320, 20769
\textthere fore . . . 17916, 17917, 20076
\textTheta . 3199, 19742, 19840
\texttheta 19759, 19856
\textthird 17396, 19894
\textThorn 14992, 15452, 19797
\textthorn 15061, 15521, 15523, 19798
\textthreeeighths 17614
\textthreefifths 17604
\textthreeinferior . 17456, 19916
\textthreequarters 14926, 15385
\textthreesuperior 14903, 15358, 19795
\texttie . . . 15182, 15211, 16388
\texttilde . 14699, 14711, 14723, 14758, 15161, 15190, 16365

\texttildelow 15179, 15208, 16374
\texttimes . 15076, 19491, 20643
\texttinferior 17504, 19940
\texttop . 18202, 18203, 20202, 20854
\texttrademark .. 14838, 17557
\texttriangle 17817, 20035
\texttriangleeq .. 18025, 20123
\texttriangleleft .. 18640, 20316
\texttriangleright . 18626, 20311
\texttriplesim ... 17965, 17966, 20097, 20829
\textTslash 15747
\texttslash 15749
\texttslig 16316, 16317
\texttt 577
\textTumbler 18406, 20286
\textturna 16024, 16025, 16026, 20696
\textturnh 16099, 16100, 16101, 16102, 20715, 20716
\textturnk 16294, 16295, 16296, 20767
\textturnlonglegr . 16174, 16175, 16176, 20738
\textturnm 16133, 16134, 16135, 16136, 20726, 20727
\textturnmrleg .. 16138, 16139, 16140, 20728
\textturnr 16169, 16170, 16171, 16172, 20736, 20737
\textturnrrtail ... 16178, 16179, 16180, 20739
\textturnsck 16296, 20767
\textturnscripta .. 16032, 16033, 16034, 16035, 20698, 20699
\textturnt 16214, 16215, 16216, 20746
\textturnv 16231, 16232, 16233, 16234, 19830, 20750, 20751
\textturnw 16235, 16236, 16237, 16238, 19831, 20752, 20753
\textturny 16239, 16240, 16241, 16242, 19832, 20754, 20755
\textTwelveStar .. 18992, 20444
\texttwofifths 17602
\texttwoheaddownarrow 17665, 19973
\texttwoheadleftarrow .. 17654, 19968
\texttwoheadrightarrow . 17661, 19971
\texttwoheaduparrow .. 17658, 19970
\texttwoinferior .. 17454, 19915
\texttwonotes ... 18817, 20368
\texttwosuperior . 14901, 15356, 19794
\texttwothirds 17598
\textudots 18368, 20268
\textuinferior 17009, 19878
\textulcorner 18386, 20276
\textuncrfemale .. 18867, 18869, 20948
\textunderscore 545, 4787, 4788, 4790, 14786, 15300, 15301, 20656
\textunlhd 18247, 18248, 18249, 20217, 20868, 20869
\textunrhd 18251, 18252, 18253, 20218, 20870, 20871
\textup 583
\textUParrow ... 18615, 18616, 20308, 20889
\textUparrow ... 17752, 20007
\textuparrow 17626, 19957
\textUpdownarrow 17764, 20011
\textupdownarrow . 2190, 17638, 19961
\textupdownarrows 17722, 19995
\textupdownharpoonleftright 19142, 20508
\textupdownharpoonrightleft 19139, 20507
\textupdownharpoons .. 19169, 20517
\textupharpoonleft 17704, 19989
\textupharpoonright ... 17701, 19988
\textuplus 19218, 20537
\textupmodels ... 19374, 20606
\textUpsilon 19747, 19845
\textupsilon .. 3186, 3194, 3195, 3197, 19771, 19869
\textupspoon 19378, 20608
\textupstep 19397, 19398
\textupuparrows . 17729, 19998
\textupupharpoons 19148, 20510
\texturanus 18746, 18747, 20352, 20924
\texturcorner 18388, 20277
\textValve 19212, 20534
\textvarhexagon . 19388, 20612
\textvarobar 19183, 20964
\textvarsigma 3190, 3196, 3197, 19768, 19866
\textVDash 18225, 18226, 20210, 20860
\textVdash 18217, 18218, 20207, 20859
\textvDash 18213, 18214, 18215, 20206, 20857, 20858
\textvdash 18193, 18194, 20199, 20851
\textvdotdot 17922, 20078
\textvdots 18364, 20266
\textvee 17890, 20065
\textveebar 18261, 20222
\textveedot 19059, 20474
\textveedoublebar 19260, 20554
\textvertline 15311, 20657
\textvibyi 16209, 16210
\textvibyy 16328, 16329
\textVier 19441, 20625
\textvinferior 17011, 19879
\textViPa 19427, 20619
\textvirgo 18770, 18771, 20360, 20932
\textvisiblespace 18448
\textVvdash 18220, 20208
\textwasylozenge . 18378, 20273
\textwedge 17885, 20063
\textwedgedot ... 19061, 20475
\textWheelchair .. 18830, 20374
\textWomanFace . 19455, 19456, 20632, 20988
\textwon 17514
\textwp 17549, 19945
\textwr .. 17938, 17939, 20085, 20827
\textWritingHand 18909, 18910, 20404, 20955
\textwynn 15854, 15855
\textXi 19744, 19842
\textxi 3185, 19765, 19863
\textxinferior 17486, 19931
\textXSolid 18927, 20412
\textXSolidBold . 18929, 20413
\textXSolidBrush 18931, 20414
\textxswup 18838, 20947
\textyen 14875, 15327
\textYinYang ... 18702, 18703, 18704, 18705, 20340, 20906, 20907, 20908
\textyogh . 16253, 16254, 19834
\textzeroinferior . 17450, 19913
\textzerosuperior . 17422, 19899
\textzerothirds 17622
\textzeta 19757, 19854
\textZwdr 19447, 20628
\textZwPa 19433, 20622
\TH . 14990, 14991, 15450, 15451

\th . 15059, 15060, 15521, 15522
\thaa 19652
\thanks 6441
\thebookmark@seq@number 14288
\thefootnote 7302, 7510
\theHchapter 6964
\theHequation . 7198, 7221, 7227
\theHfootnote . 7278, 7279, 7281
\theHHfootnote 7284
\theHHmpfootnote 7284
\theHpage 7882
\theHparentequation 7221, 7227
\theHsection 6962
\theHsubequation 7198
\theHy@tempcnt . . . 4903, 4911, 4918
\thempfn 7291, 7397, 7490, 7503
\theoremautorefname 2979, 2997, 3015, 3033, 3051, 3069, 3087, 3125, 3145, 3163, 3181, 3199, 3217, 3235, 3253, 3271, 8681
\thepage 2207, 5023, 6492, 6518, 6533, 7775, 7878, 7926, 8030, 8160, 8302, 8319, 8332, 8336, 8348, 8433, 8453, 8470, 8602
\therefore 17915, 20076
\Theta 19840
\theta 19856
\third 17395, 19894
\thispdfpagelabel 6497
\ThisShouldNotHappen . . 13869
\Thorn . . . 14990, 15450, 19797
\thorn 15059, 15521, 19798
\threeinferior 19916
\threesuperior 19795
\tildel 16122, 20722
\times 20643
\tinferior 19940
\tiny 605
\title 6395, 6397
\tl 357, 358, 359, 2328, 4280, 5065, 5078, 8089, 8091, 8105, 8107, 8122, 8124, 8138, 8140
\TMP@EnsureCode 4649, 4656, 4657, 4658, 4659, 4660, 4661, 4662, 4663, 4664, 4665, 4666, 4667, 4668, 4669, 4670, 4671, 4672, 4673, 4674, 4675, 4676, 4677, 4678, 4679, 4680, 4681, 4682
\tocappendix 1326
\tocchapter 1325
\toclevel@chapter 3408
\toclevel@figure 3414
\toclevel@paragraph 3412
\toclevel@part 3404, 3406
\toclevel@section 3409
\toclevel@subparagraph . . 3413
\toclevel@subsection 3410
\toclevel@subsubsection . . 3411
\toclevel@table 3415
\tocparagraph 1330
\tocpart 1324
\tocsection 1327
\tocsubsection 1328
\tocsubsubsection 1329
\toks . . 8441, 8442, 8444, 14602, 14607, 14670, 14675
\toks@ . 171, 208, 962, 985, 988, 990, 3282, 3283, 3285, 3877, 3881, 3882, 3890, 4344, 4345, 4544, 4546, 5166, 5171, 5177, 5183, 5184, 5187, 5287, 5292, 5296, 5300, 6613, 6615, 6701, 6703, 6760, 6772, 7078, 7083, 7375, 7378, 8181, 8182, 8406, 8411, 8413, 8416, 14601, 14607, 14669, 14675
\top 18201, 20202
\topmargin 7941
\triangle 17816, 20035
\triangleeq 18024, 20123
\triangleleft 18639, 20316
\trianglelefteq . . . 18249, 20869
\triangleright 18625, 20311
\trianglerighteq . . 18253, 20871
\triplesim 17964, 20097
\tryhyper@link 4997, 4999
\ttfamily 587
\ttl@b 7089, 7094
\ttl@Hy@PatchSaveWrite . 7072, 7076
\ttl@Hy@refstepcounter . . 7088
\ttl@Hy@saveanchor 7067, 7091
\ttl@Hy@SavedCurrentHref 7071, 7082
\ttl@Hy@steplink 7065
\ttl@savewrite 7078, 7080
\Tumbler 18405, 20286
\turnv 19830
\turnw 19831
\turny 19832
\tw@ . . . 4536, 5110, 5116, 5117, 5118, 5123, 5129, 5130, 5131, 14602, 14607, 14670, 14675
\TwelveStar 18991, 20444
\twoheaddownarrow . . . 17664, 19973
\twoheadleftarrow 17653, 19968
\twoheadrightarrow 17660, 19971
\twoheaduparrow . 17657, 19970
\twoinferior 19915
\twonotes 18816, 20368
\twosuperior 19794
\TX@endtabularx . . 7368, 7375, 7381
\typeout . . . 5, 6, 7, 19, 26, 27, 36, 131, 155, 158, 159, 160, 5317, 20994

U

\U . 15111, 16428, 16451, 16518, 16598, 16799, 16801, 16823, 16825, 16835, 16837
\u . 15109, 15167, 15196, 15226, 15531, 15533, 15573, 15575, 15593, 15595, 15626, 15628, 15629, 15699, 15701, 15759, 15761
\ubar 16224, 20748
\udesc 16102, 20716
\udots 18367, 20268
\UHORN . 19508, 19619, 19620, 19621, 19622, 19623
\uhorn 3167, 3174, 19502, 19559, 19560, 19561, 19562, 19563
\uinferior 19878
\ulcorner 18385, 20276
\UnDef 12324
\undefined 7279
\unexpanded 1487, 1494
\unhbox . 11301, 13560, 13682, 13714, 13738, 13766, 13795
\unhcopy 13662
\unichar 1932
\Unicode 1038
\unlhd 18246, 20217
\unrestored@protected@xdef 7291, 7302, 7452, 7459, 7503, 7510
\unrhd 18250, 20218
\unskip 7268
\UParrow 18614, 20308

\Uparrow 17751, 20007
\uparrow 19957
\Updownarrow . . 17763, 20011
\updownarrow . . . 17637, 19961
\updownarrows . . 17721, 19995
\updownharpoonleftright 19141, 20508
\updownharpoonrightleft 19138, 20507
\updownharpoons 19168, 20517
\upharpoonleft . . 17703, 19989
\upharpoonright . 17700, 19988
\uplus 19217, 20537
\upmodels 19373, 20606
\upshape 593
\Upsilon 19845
\upsilon 19869
\upspoon 19377, 20608
\upuparrows 17728, 19998
\upupharpoons . . 19147, 20510
\upvdash 18208, 20855
\Uranus 18747, 20924
\uranus 18745, 20352
\urcorner 18387, 20277
\Url 4967
\url 4966, 4970
\url@ 4970, 4971
\use 497, 503, 5056
\use@file 5248, 5250, 5257
\usefont 572
\UseHook 7039, 7055
\UseName 3308
\UseSocket 2250
\UseTaggingSocket 7580
\utf@viii@undeferr 532
\UTFviii@four@octets 1928, 1937
\UTFviii@loop 1916
\UTFviii@three@octets . . 1927
\UTFviii@tmp 1915
\UTFviii@two@octets 1926

V

\v . 14702, 14714, 14726, 14848, 14853, 14861, 14863, 15122, 15164, 15193, 15225, 15551, 15553, 15555, 15557, 15585, 15587, 15663, 15665, 15683, 15685, 15719, 15721, 15735, 15737, 15743, 15745, 15793, 15795, 15869, 15871, 15873, 15875, 15876, 15878, 15880, 15882, 15884, 15893, 15895, 15897, 15899, 15905, 15906, 15984, 15986
\V@@@footnotetext 7439
\V@@footnotetext 7424
\value . . 6516, 6950, 6951, 6953, 6954, 7711, 7748, 7945, 8200, 9957
\Valve 19211, 20534
\vara 16030, 20697
\varangle 17871, 20816
\varbigcirc 18659, 20895
\varcurlyvee 18286, 20873
\varcurlywedge . . 18289, 20874
\VarFlag 18833, 20946
\varg 16089, 20713
\varhexagon 19387, 20612
\vari 16116, 20721
\varint 17900, 20822
\varnothing 17813, 17815, 20812
\varoast 18180, 20849
\varobslash 19188, 20967
\varocircle 18177, 20848
\varodot 18173, 20846
\varogreaterthan . 19200, 20970
\varoint 17907, 20823
\varolessthan 19197, 20969
\varomega 16166, 20735
\varominus 18164, 20843
\varopeno 16043, 20702
\varoplus 18161, 20842
\varoslash 18170, 20845
\varotimes 18167, 20844
\varovee 17893, 20821
\varowedge 17888, 20820
\varparallel 19384, 20981
\varparallelinv . . . 18451, 20884
\varprop 17862, 20815
\varsigma 19866
\varsqsubsetneq . . 18338, 20877
\varsqsupsetneq . . 18341, 20878
\vartimes 15436, 20666
\vavyod 16976
\vbox . . 6222, 6223, 6224, 6225, 6465, 7939
\VDash 18224, 20210
\Vdash 18216, 20207
\vDash 18212, 20206
\vdash 18192, 20199
\vdotdot 17921, 20078
\vdots 18363, 20266
\vee 17889, 20065
\veebar 18260, 20222
\veedot 19058, 20474
\veedoublebar . . . 19259, 20554
\Venus 18729, 20916
\venus 18728, 20915
\vfill . . . 6222, 6223, 6224, 6225
\VHF 17966, 20829
\Vier 19440, 20625
\vinferior 19879
\ViPa 19426, 20619
\Virgo 18771, 20932
\virgo 18769, 20360
\vod 16093, 16095, 20714
\voffset 7940
\voicedh 16106, 20718
\vpageref 8522, 8530, 8539, 8547
\vphantom 608
\Vr@f 8525
\vr@f 8534
\Vref@star 8518
\vref@star 8543
\vskip 2286, 2287
\vss 7954
\vtex@trans@special . . . 10746, 10748, 10751, 10755, 10759, 10763, 10765, 10767, 10771, 10777, 10778, 10781
\VTeXInitMediaSize . . . 10417, 10443
\VTeXOS 10810, 10811, 10812, 10814
\VTeXversion 6668, 6671, 6674, 10802, 10806
\Vvdash 18219, 20208

W

\wasylozenge 18377, 20273
\waw 19700
\wawhamza 19638
\wd 9547, 9563, 9584, 9601, 9624, 9641, 13509
\wedge 17884, 20063
\wedgedot 19060, 20475
\Wheelchair 18829, 20374
\with 15250, 20655
\WomanFace 19454, 20632
\Womanface 19456, 20988
\wp 17548, 19945
\wr 17937, 20085
\wreath 17939, 20827
\write . . 4858, 5404, 5406, 6789, 6797, 7695, 7710, 7737, 7747, 7766, 7796, 13045, 13048, 13076, 13091
\WriteBookmarks . . 4270, 4408, 4618, 4640, 14222, 14465, 14495, 14496, 14538, 14544
\WritingHand . . . 18908, 20404
\Writinghand 18910, 20955

\wwwbrowser . 9501, 9586, 9603

X

\x 21, 25, 92, 98, 168, 169, 176, 178, 206, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 282, 287, 288, 938, 944, 1425, 1453, 1868, 1870, 2281, 2291, 2300, 2310, 2399, 2400, 2405, 2421, 3293, 3296, 3300, 3314, 3425, 3426, 3429, 3430, 3431, 3435, 3438, 3444, 3880, 3886, 3889, 3892, 4171, 4172, 4177, 4178, 4298, 4299, 4300, 4303, 4306, 4309, 4342, 4343, 4345, 4346, 4545, 4548, 4857, 4863, 5263, 5264, 5265, 5277, 5288, 5289, 5290, 5291, 5294, 5295, 5340, 5343, 5425, 5439, 5464, 5468, 5471, 5481, 6014, 6018, 6417, 6418, 6423, 7079, 7086, 7104, 7113, 7115, 7127, 8046, 8048, 8413, 8414, 8443, 8446, 8482, 8483, 8484, 8486, 8488, 8904, 8913, 9776, 9777, 9778, 9780, 9781, 9782, 9784, 9785, 9786, 9788, 9789, 9790, 9792, 9793, 9794, 9796, 9797, 9798, 9800, 9801, 9802, 9804, 9805, 9807, 9813, 9822, 10924, 10929, 10933, 11305, 11308, 11314, 11319, 11467, 11468, 12626, 12646, 13227, 13247, 13583, 13603, 14606, 14608, 14674, 14676

\XBox 18678, 20899
\XeTeXLink@font . . 5096, 5099
\XeTeXLink@space . 5093, 5097, 5112, 5126
\XeTeXLinkBox 5092, 5103, 5136
\XeTeXLinkMargin . 5090, 5091, 5109, 5111, 5122, 5124
\XeTeXrevision 4605
\XeTeXversion 4605
\Xi 19842
\xi 19863
\xinferior 19931
\XR@ext 2507, 2508, 5246, 5249, 6666, 8744, 9397, 9500, 9764, 10301, 11661, 11767, 11834, 12041, 12212
\XSolid 18926, 20412
\XSolidBold 18928, 20413
\XSolidBrush . . . 18930, 20414
\xspace 669, 671
\xspaceaddexceptions 4244, 4253

Y

\y 287, 289, 296, 302, 2401, 2406, 2411, 3431, 3432, 3433, 3434, 4301, 4304, 4307, 4310, 4312, 4318, 5266, 5267, 5268, 5269, 5277, 6418, 6426, 7100, 7102, 7103, 7106, 7113, 11310, 11311, 11312, 11313
\ya 19704
\yahamza 19642
\YingYang 18704, 20907
\Yingyang 18705, 20908
\YinYang 18701, 20340
\Yinyang 18703, 20906
\yogh 16253, 19834

Z

\z 288, 289, 297, 303, 2403, 2404, 2405, 5269, 5277

\z@ 1154, 1194, 1207, 1223, 1246, 1319, 1553, 1565, 1638, 1642, 1654, 1770, 1771, 1773, 1774, 1775, 2237, 2272, 2295, 2592, 2666, 2750, 3443, 4171, 4173, 5106, 5108, 5116, 5120, 5121, 5129, 5139, 5140, 6669, 7437, 8768, 8775, 9323, 9328, 9332, 9340, 9344, 9345, 9353, 9354, 10275, 10279, 10280, 10286, 10288, 10419, 10420, 10425, 10432, 10433, 10801, 10825, 11047, 11362, 11733, 11734, 11738, 11744, 11745, 12549, 12616, 13026, 13217, 13513, 13573, 14024, 14029, 14052, 14087, 14121, 14127, 14157, 14162, 14193, 14299, 14300, 14301, 14303, 14304, 14305, 14307, 14521, 14642
\z@skip . . . . . .
\za 1
\zay 1
\zeroinferior 1
\zerosuperior 1
\zeta 1
\zref@extractdefault 1
\zref@ifrefcontainsprop . . 1
\zref@ifrefundefined 1
\zref@labelbyprops 1
\zref@refused 1
\Zwdr 19446, 2
\ZWNJ 1
\ZwPa 19432, 2