

# The `pageslts` package

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2015/08/17 v1.2e

## Abstract

This L<sup>A</sup>T<sub>E</sub>X package puts the labels `LastPage` (`\AtEndDocument`) and `VeryLastPage` (`\AfterLastShipout`) into the `.aux` file, allowing the user to refer to the (very) last page of a document. This might be particularly useful in places like headers or footers. When more than one page numbering scheme is used, these references do not give the total *number* of pages. For this case the label `LastPages` is introduced. Additionally, at the last page of each page numbering scheme a label `pagesLTS.<numbering scheme>` is placed, where `<numbering scheme>` is e.g. `arabic`, `roman`, `Roman`, `alph`, or `Alph`. For `fnsymbol` please use `\lastpageref{pagesLTS.fnsymbol}` instead of `\pageref{pagesLTS.fnsymbol}`. When the same numbering scheme is used twice, the page numbers are either reset to one or continued automatically, depending on the option given when the package is called. The command `\theCurrentPage` prints the current total/absolute page number – in contrast to `\thepage`, which gives only the page *name* in the current page numbering scheme. `\theCurrentPageLocal` gives the current number of pages in the current page numbering scheme. `\thepage` and `\theCurrentPageLocal` are different e.g. when `\addtocounter{page}{...}` or `\setcounter{page}{...}` were used. At the first page of the document a label `pagesLTS.0` is created. This label can be referred to, too. Further labels are provided for special cases.

The `alphalph` package is supported, i.e. page numbers `alph` or `Alph` > 26 and `fnsymbol` > 9 can be used (with according options set). Even zero and negative page numbers can be used with `arabic`, `alph`, `Alph`, `roman`, `Roman`, and `fnsymbol` page numbering (with `alphalph` package and according options).

`\pageref*` and `\lastpageref*`, for using `hyperref` but suppressing links, are supported.

**Please make sure to first deinstall the obsolete `pagesLTS` package before installing this `pageslts` package!**

(There is at least one operating system which otherwise automatically renames `pageslts` to `pagesLTS`.)

Right after `\begin{document}` a `\pagenumbering{...}` should be called – with the appropriate argument out of e.g.

`arabic` (Arabic numerals: 1, 2, 3, 4,...),

`roman` (Lowercase Roman numerals: i, ii, iii, iv,...), `Roman` (Uppercase Roman numerals: I, II, III, IV,...),

`alph` (Lowercase letters: a, b, c, d,...), `Alph` (Uppercase letters: A, B, C, D,...),

`fnsymbol` (Footnote symbols: \*, †, ‡, §,...).

This package first started as a revision of the `lastpage` package of **Jeffrey P. Goldberg** (Thanks!), but then it became obvious that a replacement was needed.

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Save per page about 200 ml water, 2 g CO<sub>2</sub> and 2 g wood: Therefore please print only if this is really necessary.

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# 1 Introduction

This package puts the labels `LastPage` (`\AtEndDocument`) (same as my `LastPage` package, invented by JEFFREY P. GOLDBERG) and `VeryLastPage` (`\AfterLastShipout`) into the `.aux` file, allowing the user to refer to the (very) last page of a document via `\lastpageref{LastPage}` and `\lastpageref{VeryLastPage}`. This might be particularly useful in places like headers or footers. When more than one page numbering scheme is used, these references do not give the total *number* of pages. For this case the label `LastPages` is introduced (similar to the label `TotPages` of the `TotPages` package, but the label `LastPages` is set later in the document). Additionally, at the last page of each page numbering scheme a label `pagesLTS.<numbering scheme>` is placed, where `<numbering scheme>` is e.g. `arabic`, `roman`, `Roman`, `alph`, or `Alph`. For fn-symbol please use `\lastpageref{pagesLTS.fnsymbol}` instead of `\pageref{pagesLTS.fnsymbol}`. When the same numbering scheme is used twice, the page numbers are either reset to one or continued automatically, depending on the option given when the package is called. The command `\theCurrentPage` prints the current total/absolute page number - in contrast to `\thepage`, which gives only the page *name* in the current page numbering scheme. `\theCurrentPageLocal` gives the current number of pages in the current page numbering scheme. `\thepage` and `\theCurrentPageLocal` are different e.g. when `\addtocounter{page}{...}` or `\setcounter{page}{...}` were used. (See also L<sup>A</sup>T<sub>E</sub>X bug 3421: 3rd page is even (twoside, titlepage, abstract), <http://www.latex-project.org/cgi-bin/ltxbugs2html?category=LaTeX&responsible=anyone&state=anything&keyword=pagenumber&pr=latex%2F3421&search=>.) At the first page of the document a label `pagesLTS.0` is created. This label can be referred to, too. Further labels are provided for special cases.

The `alphalph` package is supported, i.e. page numbers `alph` or `Alph` > 26 and `fnsymbol` > 9 can be used (with the according options set). Even zero or negative page numbers can be used with `arabic`, `alph`, `Alph`, and `fnsymbol` page numbering (with `alphalph` package and according options), and zero `roman` and `Roman` pages, too.

Right after `\begin{document}` a `\pagenumbering{...}` should be called – with the appropriate argument out of e.g. `arabic` (Arabic numerals: 1, 2, 3, 4,...), `roman` (Lowercase Roman numerals: i, ii, iii, iv,...), `Roman` (Uppercase Roman numerals: I, II, III, IV,...), `alph` (Lowercase letters: a, b, c, d,...), `Alph` (Uppercase letters: A, B, C, D,...), `fnsymbol` (Footnote symbols: \*, †, ‡, §,...).

This package first started as a revision of the `lastpage` package of JEFFREY P. GOLDBERG (Thanks!), but then it became obvious that a replacement was needed to accomplish what this package does.

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logical page numbers

**Tip:** For the display of the pdf file use **logical page numbers** together with `hyperref`!

- In Adobe Reader DC 2015.008.20082 enable:

    Edit > Preferences > Categories: Page Display > Page Content and Information: Use logical page numbers

- Use the `hyperref` package with option `plainpages=false`.

The display will be e.g. “7 (7 of 9)”, or, in case of Roman instead of arabic numbers, “VII (7 of 9)”, and when different page numbers are used (see below) e.g. `arabic` after 10 Roman pages: “17 (27 of 30)”. Please try this with the compiled `pageslts-example` file!

The name of the `pageslts` package refers to Last, Total, and page numbering Schemes pages. `pagesLTS` was a former name of this package.

## 2 Usage

Just load the package placing

```
\usepackage[<options>]{pageslts}
```

in the preamble of your L<sup>A</sup>T<sub>ε</sub>X source file (about `\AtEndDocument` see subsection 3.2) and place a `\pagenumbering{...}` with appropriate argument (e.g. arabic, roman, Roman, fnsymbol, alph, or Alph) right behind `\begin{document}` (see subsection 2.3.1)!

For example for various draft forms it is desirable to have a page reference to the last page, so that e.g. page footers can contain something like “page  $N$  of  $K$ ”, where  $N$  is the current page and  $K$  is the last page. Once the package is loaded, anywhere in the text references can be made to the labels `LastPage`, `VeryLastPage`, and `LastPages` (most times with `\pageref{...}`, but more save with `\lastpageref{...}`). In particular one can use the `fancyhdr` or `nccfancyhdr` package, or redefinitions of the page headings and footings to get a reference to the (very) last page.

`\pageref*` If the `hyperref` package is used, the references are hyperlinked to their aims. If these hyperlinks shall be suppressed, `\lastpageref*` `\pageref*{...}` and `\lastpageref*{...}` can be used.

### 2.1 Options

`options` The `pageslts` package takes the following options:

#### 2.1.1 pagecontinue

`pagecontinue` When option `pagecontinue=false` is **not** given (i.e. `pagecontinue` or `pagecontinue=true` or no `pagecontinue` option at all), at each `\pagenumbering{...}` command the number of the page will be continued with the page number following the last page of the same page numbering scheme. For example, if there are V Roman pages in the frontmatter, some arabic ones in the mainmatter, and then Roman ones again in the backmatter, the last ones will start with VI instead of I again.

If you want to start with I (or i, 1, a, A, \*,...) again, set option `pagecontinue=false`. If you want to generally continue the numbers, but for some page numbering scheme do not want this, use `pagecontinue=true` and say `\setcounter{page}{1}` after `\pagenumbering{...}` for that page numbering scheme.

#### 2.1.2 alphMult, AlphMulti, fnsymbolmult

The page number printed in `fnsymbol`<sup>1</sup> must be  $> 0$  and  $< 10$  and those printed in `alph`<sup>2</sup> and `Alph`<sup>3</sup> must be  $> 0$  and  $< 27$ . After page  $Z$  L<sup>A</sup>T<sub>ε</sub>X *should* continue with AA, AB, AC,... Some people prefer AA, BB, CC,..., but in hexadecimal it is  $AA_{16} = 170_{10}$  and  $171_{10} = AB_{16}$ , whereas  $BB_{16} = 187_{10}$ . In any way it should continue at all (maybe even with an user option to choose between the two continuations), but instead only gives an error:

```
LaTeX Error: Counter too large
See the LaTeX manual or LaTeX Companion for explanation.
You've lost some text. Try typing <return> to proceed.
If that doesn't work, type X <return> to quit.
```

---

<sup>1</sup> \*, †, ‡, §, ¶, ||, \*\*, ††, ‡‡

<sup>2</sup> a, b, c, d, e, f, g, h, i, j, k, l, m, n, o, p, q, r, s, t, u, v, w, x, y, z

<sup>3</sup> A, B, C, D, E, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z

But thanks to the `alphalph` package by HEIKO OBERDIEK these limitation no longer hold. With his `\erroralph` command now even negative or zero page “numbers” are possible.

`alphMult` The string option `alphMult` takes three values: `ab`, `bb`, `0`:

**ab** After page `z`, the page “numbers” continue with `aa`, `ab`, `ac`, `ad`,..., `fxshrxw` (the default), and before `a` with `0`, `-a`, `-b`,..., `-z`, `-aa`, `-ab`,..., `-fxshrxw` (= `-21 474 836 47`).

**bb** After page `z`, the page “numbers” continue with `aa`, `bb`, `cc`, `dd`,..., and before `a` with `0`, `-a`, `-b`,..., `-z`, `-aa`, `-bb`,... (Internally up to `±55 834 558` is allowed, but when printed will exceed the  $\LaTeX$  capacity even for smaller numbers – in the example file this happens at about 6 500.) (If you have a document with more than 6 500 pages, you might think about splitting it in volumes. And page “numbers” with about 100 digits are probably not easy to grasp for the reader, too.)

**0** (zero) The `pageslts` package does nothing, thus the user is free to define the page “numbers” after `z` and before `a`. (But if the user does not do anything at all, the **LaTeX Error: Counter too large** will appear again.)

`AlphMulti` The string option `AlphMulti` takes three values: `AB`, `BB`, `0`:

**AB** After page `Z`, the page “numbers” continue with `AA`, `AB`, `AC`, `AD`,..., `FXSHRXW` (the default), and before `A` with `0`, `-A`, `-B`,..., `-Z`, `-AA`, `-AB`,..., `-FXSHRXW`.

**BB** After page `Z`, the page “numbers” continue with `AA`, `BB`, `CC`, `DD`,..., and before `A` with `0`, `-A`, `-B`,..., `-Z`, `-AA`, `-BB`,... (About the limits please see `alphMult` above.)

**0** (zero) The `pageslts` package does nothing, thus the user is free to define the page “numbers” after `Z` and before `A`. (But if the user does not do anything at all, the **LaTeX Error: Counter too large** will appear again.)

`fnsymbolmult` When option `fnsymbolmult=false` is **not** given (i.e. `fnsymbolmult` or `fnsymbolmult=true` or no `fnsymbolmult` option at all), after 5 (¶) the page “number” is continued with the doubled “number” of the first, second, third,... page (`**`, `††`, `‡‡`, `§§`, `¶¶`), and after the tenth page the “number” is tripled (`***`, `†††`,...). Compile the `pageslts-example.tex` with `pdf $\LaTeX$`  and see the resulting `pdf` file.

Before `*` (page 1) the page “numbers” are continued with `0`, `-*`, `-†`,..., `-¶`, `-**`, `-††`,...

If this is not wanted, set option `fnsymbolmult=false`, and `pageslts` will do nothing and allow the user to change the page “number”. (But if the user does not do anything at all, the

**LaTeX Error: Counter too large** will appear again.)

While in  $\LaTeX 2_{\epsilon}$  arabic (page) numbers are possible up to `MAX = 2 147 483 647` (cf. the `alphalph` package), `\erroralphalph{\fnsymbolmult}{...}` numbers are possible up to 10 737 415 only. If this number is not only used internally but printed, after number about 11 705 (which is 2 341 times ¶) the  $\LaTeX 2_{\epsilon}$  capacity is exceeded, depending on the remaining file and its use of  $\TeX$  capacity, of course. (If you have a document with more than 11 705 pages, you might think about splitting it in volumes. And page “numbers” with 2 341 digits are probably not easy to grasp for the reader, too.)

### 2.1.3 romanMult, RomanMulti

`romanMult` The options `romanMult(=true)` and `RomanMulti(=true)` expand the `\roman` and `\Roman` page numbering scheme to values below one ( $< 1$ ), i. e. 0, -i, -ii, -iii, -iv, . . . and 0, -I, -II, -III, -IV, . . . , respectively.

Again the  $\text{\TeX}$  capacity will be exceeded before  $\pm \text{MAX} = \pm 2147483647$ , and even if 1 000 000 000 is internally possible, this would print 1 000 000 times the letter m (or M), which would require either very small print or quite huge paper size.

(If you have a document with so many pages, you might think about splitting it in volumes. And page “numbers” with thousands of digits are probably not easy to grasp for the reader, too.)

If the expansion below 1 is not wanted, set options `romanMult=false` and/or `RomanMulti=false`, and `pageslts` will do nothing and allow the user to change the page “number”. (But if the user does not do anything at all,  $\text{\LaTeX}$  will just ignore the values - not even a warning will be issued.)

### 2.1.4 Arabic page numbers

`Arabic page numbers` In  $\text{\LaTeX 2}_\epsilon$  arabic (page) numbers are already possible between  $-\text{MAX} . . \text{MAX}$ , where  $\text{MAX} = 2147483647$  (cf. the `alphalph` package), without any expansion necessary. (But if you have a document with so many pages, you might think about splitting it in volumes!)

## 2.2 Labels

`pagesLTS.0` At the first page a label `pagesLTS.0` is created. If `\pagenumbering{. . .}` is used right after `\begin{document}`, this is much easier for the `pageslts` package (and chances for successful placing of all labels are much higher; cf. subsection 2.3.2).

`LastPage` `\AtEndDocument` (see subsection 3.2) this package defines a label, `LastPage`, which the user can refer to with the `\lastpageref{LastPage}` command. While `\pageref{LastPage}` is also possible (especially for backward compatibility with the `LastPage` package), this is discouraged, because it will not work when it is used together with the `hyperref` package and the `fnsymbol` page numbering scheme. (The `LastPage` package did not work with this combination, too, so if you want to, you can reproduce the old error – but you do not have to do it, but can use `\lastpageref{LastPage}`.)

`VeryLastPage` `\AfterLastShipout` the label `VeryLastPage` is defined, which the user can also refer to with the `\lastpageref{VeryLastPage}` command. Depending on usage of `\AtEndDocument` by other packages, `LastPage` might not point to the very last page, but `\lastpageref{VeryLastPage}` should do this (cf. subsection 3.2).

`LastPages` When more than one page numbering scheme is used, neither `LastPage` nor `VeryLastPage` give the total **number** of pages. For example, for a document with VI+36 pages, both give “36” as reference to the last page. While this is correct, the total number of pages is 42, and this is given by the reference to `LastPages`: `\lastpageref{LastPages}` (note the “s” at the end). When the page number was manipulated by `\addtocounter{page}{. . .}` or `\setcounter{page}{. . .}`, `LastPages` ignores this. (At a page numbering change the page is reset to one (without option `pagecontinue`). This is done by `\setcounter{page}{1}`, thus this is ignored, too.)

`\pageref{totpages}` of the `totpages` package is similar to `\lastpageref{LastPages}`, but while the target for `\pageref{totpages}` is placed `\AtEndDocument`, the target for `\lastpageref{LastPages}` is placed `\AfterLastShipout`, therefore `\lastpageref{LastPages}` is safer to really get the total page number.

`\theCurrentPage` `\theCurrentPage` gives the current total/absolute page, in contrast to `\thepage`, which gives only the page *name* in the current page numbering scheme. For example, when there are Roman VII pages in the frontmatter and afterwards in the mainmatter you are at arabic page 9, then `\theCurrentPage` is 16, whereas `\thepage` is 9. When the page “number” (name) is manipulated by `\addtocounter{page}{...}` or `\setcounter{page}{...}`, `\theCurrentPage` ignores this. Because `CurrentPage` is a normal counter, you can also say e.g. `\Roman{CurrentPage}` to get the value in Roman page numbering scheme (e.g. VIII for 8).

`\theCurrentPageLocal` `\theCurrentPageLocal` gives the current (arabic) number of pages in the current page numbering scheme. `\thepage` and `\theCurrentPageLocal` are different e.g. when `\addtocounter{page}{...}` or `\setcounter{page}{...}` were used. `\theCurrentPageLocal` can be printed in other formats, e.g. `\roman{pagesLTS.current.local.roman}`, but probably it only makes sense if page numbering scheme and format are the same, e.g. `\Roman{pagesLTS.current.local.Roman}` or `\Alph{pagesLTS.current.local.Alph}`. `\arabic{pagesLTS.current.local....}` probably make sense even when combined with another page numbering scheme. And this is exactly what `\theCurrentPageLocal` does:  
`\def\theCurrentPageLocal{\arabic{pagesLTS.current.local.\pagesLTS@pnc}}.`

`pagesLTS. page numbering scheme . number` If you want to refer to the last page of the first, second,... use of a page numbering scheme, you can refer to `pagesLTS.<page numbering scheme>.<number>`, e.g. `\lastpageref{pagesLTS.Roman.1}`, where `<number>` is the occurrence of the page numbering scheme. For details please see page 9.

`\lastpageref` For pages with the `fnsymbol` page numbering scheme, `\lastpageref{...}` instead of `\pageref{...}` *must* be used. This is required for pages somewhere inside of the document as well as the (very) last page(s). Because `\lastpageref{...}` is a synonym for `\pageref{...}`, where no `fnsymbol` page numbering scheme is used, it is save(r) to use it for all references to labels provided by the `pageslts` package.

## 2.3 `\pagenumbering{...}`

`\pagenumbering`

### 2.3.1 If `\pagenumbering{...}` is not used

When the `pageslts` package is used, but `\pagenumbering{...}` (with an argument like arabic, roman, Roman, fnsymbol, alph, or Alph) is not used, there should be no problem, except that you might need more (!) compiler runs to get all references right, and some references might even be missing (see below). The `pageslts` package tries to determine the page numbering scheme at the first shipout, but success is not guaranteed. Thus please use `\pagenumbering{...}` at the beginning of your document!

Without `\pagenumbering{<something>}` (`<something>` e.g. = arabic) at the beginning of the document, the page numbers might be given in arabic *by (class) default*, but the `pageslts` package does not know about this without `\pagenumbering{arabic}`. –

The label `pagesLTS.0` is created at the first page even if no `\pagenumbering{...}` command is given. Maybe have a look at the `.aux` file after compiling your document to detect further labels (of other packages, too).



### 2.3.2 If `\pagenumbering{...}` is used once

`pagesLTS.0` At the first page a label `pagesLTS.0` is created. If `\pagenumbering{...}` is used right after `\begin{document}`, this is much easier for the `pageslts` package (and chances for successful placing of all labels are much higher).

### 2.3.3 If `\pagenumbering{...}` is used more than once

Everything from the preceding subsections applies and additionally the following:

When different page numbering schemes are used, e.g. Roman numbers for the frontmatter and arabic numbers for the mainmatter, please use `\pagenumbering{...}` for each of them! Even if you do this, the reference to neither the label `LastPage` nor the label `VeryLastPage` gives the **total** number of pages, but only the number of pages of the last used page numbering scheme (which could be exactly what you want, e.g. if you want to refer to the last page itself and do not want to give the total number of pages).

`LastPages` For remediation the label `LastPages` (with “s” at its end) is introduced. Please then refer to this label by `\lastpageref{LastPages}` instead of `LastPage` or `VeryLastPage`.

`pagesLTS.arabic` Additionally, at the last page of each page numbering scheme a label `pagesLTS.<numbering scheme>` is placed, where  
`pagesLTS.roman` `<numbering scheme>` is e.g. arabic, roman, Roman, alph, Alph,...  
`pagesLTS.Roman` For the **fnsymbol** page numbering scheme `\lastpageref{pagesLTS.fnsymbol}` is needed instead of  
`pagesLTS.alph` `\pageref{pagesLTS.fnsymbol}`. You can and should use `\lastpageref{...}` also for the other page numbering schemes.  
`pagesLTS.Alph`  
`pagesLTS.fnsymbol`

While at the time of the last revision of the `pageslts` package no other page numbering schemes were known to the maintainer, this package in principle works with every scheme which is recognized by the original `\pagenumbering` command. But the `hyperref` package only then works with crazy page names, if the references to those pages are given in a certain way, thus the combination of a new page numbering scheme, the `hyperref` and the `pageslts` package might not work. – The `pageslts` package by itself also works with schemes, which the original `\pagenumbering{...}` does not recognize, but because the original `\pagenumbering{...}` is called by the `pageslts` package, this might cause an error, see subsection 3.6! (And if the number format is unknown to  $\text{\LaTeX}$ , the pages will have no number, and therefore cannot be referenced. You might be able to help yourself by using the `hyperref` package and manually placing `\hypertargets` and `\hrefs`.)

### 2.3.4 If the same `\pagenumbering{...}` scheme is used more than once

Everything from the preceding subsections applies and additionally the following:

`pagecontinue` If the same page numbering scheme is used twice (or even more often) in one document (e.g. in the frontmatter Roman: I–V, in the mainmatter arabic: 1–20, and in the backmatter again Roman: VI–X), the second time it is used, the page numbering is either continued (option `pagecontinue` or `pagecontinue=true` or no option `pagecontinue`; the default) or reset to one (option `pagecontinue=false`). It is even possible to use a page numbering scheme more than twice.

`pagesLTS. page numbering` If you want to refer to the last page of the first, second,... use of a page numbering scheme, page V in the example above,  
`scheme . number` you can refer to `pagesLTS.<page numbering scheme>.<number>`, e.g. `\lastpageref{pagesLTS.Roman.1}`, where `<number>` is the occurrence of the page numbering scheme.

If you want to refer to the first page of a page numbering scheme, just place a label there, e. g.  
`\pagenumbering{Roman}`  
`\section{Section title\label{RomanSection}}`  
 (You know where you use `\pagenumbering{...}` and this is the `pageslts` package, not the `firstpage` one).

When you want to give the number of pages of each “sector” of the page numbering scheme, you can use  
`\lastpages{<page numbering scheme>}{<number>}`,  
 where `<page numbering scheme>` is e. g. Roman, arabic,... and `<number>` the “sector” number, e. g. `\lastpages{Roman}{2}`.  
 (Internally, the counter has the format `pagesLTS.<page numbering scheme>.<number>.local.cnt`.)  
 If you used the page numbering scheme Roman for three times, you could say

```
Last Roman page (pagesLTS.Roman): \lastpageref{pagesLTS.Roman}\
There are \lastpageref{pagesLTS.Roman.local}~pages with Roman numbers:\
\lastpages{Roman}{1}~pages in the first Roman sector
(\pageref{Roman} -- \lastpageref{pagesLTS.Roman.1}),\
\lastpages{Roman}{2}~pages in the second Roman sector
(\pageref{Roman2} -- \lastpageref{pagesLTS.Roman.2}), and\
\lastpages{Roman}{3}~pages in the third Roman sector
(\pageref{Roman3} -- \lastpageref{pagesLTS.Roman.3}).\
```

to get

```
Last Roman page (pagesLTS.Roman): VIII
There are 8 pages with Roman numbers:
3 pages in the first Roman sector (I – III),
4 pages in the second Roman sector (IV – VII), and
3 pages in the third Roman sector (VIII – X).
```

(see e. g. the compiled `pageslts-example` file).

If you want to continue one page numbering scheme, but later on (third use of it, or for another page numbering scheme) want to reset the page number, just say `\setcounter{page}{1}` there.

In your document the code

```
\makeatletter
\renewcommand{\@evenfoot}{%
  {\normalsize\slshape DRAFT \today\hfil \upshape page {\thepage} (\theCurrentPage) of\ %
   \lastpageref{pagesLTS.Roman} + \lastpageref{pagesLTS.arabic}\ = \lastpageref{LastPages} pages%
  }
\renewcommand{\@oddfoot}{\@evenfoot}
\makeatother
```

creates footers like

*“DRAFT August 17, 2015      page V (5) of VII + 35 = 42 pages”*

or

*“DRAFT August 17, 2015      page 10 (17) of VII + 35 = 42 pages”*

in the compiled document (cf. the `pageslts-example` file).

Code like

```
This book has \lastpageref{pagesLTS.Roman}+\lastpageref{pagesLTS.arabic} pages %
(\lastpageref{LastPages} pages in total).
```

produces output like

This book has X+85 pages (95 pages in total).

(when using the `hyperref` package, the references are even hyperlinked).

If `\addtocounter{page}{...}` or `\setcounter{page}{...}` have been used, the local version of `CurrentPage` can be used, `\theCurrentPageLocal`, see subsection 2.2.

## 2.4 `papermas(s)` package

There is a kind of an add-on to this package, the `papermas` package, which can be used to compute the number of sheets of paper needed to print a document (you can print more than one page of a document on one sheet of paper) as well as the approximate mass of the printout. Please see the 7.1 subsection.

## 3 A few warnings

### 3.1 Hyperref and repeated page numbers

When two (or more) different page numbering schemes are used, or the page number is reset, or for any other reason there are two pages with the same number (maybe in different format, e. g. 1 and I), and `hyperref` has not been configured right, this can cause problems. Use `hyperref` with `plainpages=false` and `pdfpagelabels=true`, and everything should be fine.

More details can be found at <http://www.tex.ac.uk/cgi-bin/texfaq2html?label=pdfpagelabels>.

### 3.2 `\AtEndDocument`

The output of a  $\text{\LaTeX} 2_{\epsilon}$  run is not independent of the order in which packages are loaded. It is often the case that the same formats for which one must put tables and figure at the end, are the ones in which endnotes are also required. If one wants to use `\AtEndDocument` here as well (as done for `\lastpageref{LastPage}`), then it is easy to get to three separate uses of `\AtEndDocument` (assuming one uses this for the endnotes as well). Clearly it is not safe for any package writer or user to assume that no material will follow what they put into `\AtEndDocument`. Therefore a message, which begins with `AED`, is included in every usage of `\AtEndDocument`, and it is tried to minimize any side effects the usage may have.

As now HEIKO OBERDIEK's `atveryend` package is used, the references `\lastpageref{VeryLastPage}` and `\lastpageref{LastPages}` should work all right. About how to get the `atveryend` package, please see subsection 7.1.

### 3.3 Interaction with very old versions of the `endfloat` package

The very old version 2.0 (and earlier) of the `endfloat` package actually redefined the `\enddocument` command, and so interfered drastically with the  $\text{\LaTeX} 2_{\epsilon}$  commands which make use of `\AtEndDocument`. Newer versions of `endfloat` exist (at the time of writing this documentation: v2.5d as of 2011/12/25) in modern documentation form, which should be available from the same source where you received this file, see subsection 7.1.

A note is placed in the style file at the `\RequirePackage` section, and later it is even checked whether a (very) old `endfloat` package is in use. If it is, a warning or even an error message is given, depending on `endfloat` version. This assumes, that the old versions of `endfloat` at least gave a version date, of course.

If you want your `LastPage` to label the last page of these end floats, you need to load `pageslts` after loading `endfloat`, or to use `VeryLastPage` instead. If, on the other hand, you want `LastPage` to refer to the (not so) last page, exclusive of the floats at the end, then load in the reverse order. Independent from the order of `pageslts` and `endfloat`, you will still need the modified<sup>4</sup> version of `endfloat`.

Using the `LastPages` (`s!`) label should get you to the last page in all cases: `\lastpageref{LastPages}`.

Other  $\text{\LaTeX} 209$  (!) packages also seem to like to redefine `\enddocument`. In addition to the old `endfloat`, `harvard` comes to mind. All of these will need to be modified swiftly. **If possible, update to  $\text{\LaTeX} 2_{\epsilon}$ !**

---

<sup>4</sup>New versions are available for over 15 years now, so it might be time to update, if you did not do it already.

### 3.4 showkeys package

When the showkeys package has been loaded in `draft` mode, in the margin for each label a box is displayed with the name of the label. showkeys accomplishes this by redefining `\label`, but `pageslts` does not use `\label`, but writes directly to the `\jobname.aux`-file, and this is generally done after the according page has shipped out, therefore no box can be placed on the preceding page. At least `pageslts` gives a warning, that showkeys cannot present the respective label.

### 3.5 lastpage package

This package first started as a revision of the `lastpage` package of JEFFREY P. GOLDBERG (jeffrey+news at goldmark dot org), but it became obvious that a replacement was needed to accomplish what this package does. For backward compatibility, a label named `LastPage` is provided. Thus `\usepackage{lastpage}` can be replaced by

```
\usepackage[pagecontinue=false,%
```

```
alphMult=0,AlphMulti=0,fnsymbolmult=false,romanMult=false,RomanMulti=false]{pageslts},
```

if the behaviour of the `lastpage` package should be simulated. Using `old` (!) versions of the `lastpage` before the `pageslts` before the `hyperref` [2012/11/06 v6.83m] package results in multiply definitions of the `LastPage` label. While the `pageslts` package cancels the command `\lastpage@putlabel` from the old `lastpage` package (because it does this itself, and better), `hyperref` redefines `\lastpage@putlabel` and thereby reintroduces it again (`hyperref` should probably check for the version of the `lastpage` package and/or whether the `pageslts` package was also loaded.)

### 3.6 Using an unknown page numbering scheme

I do not know whether  $\LaTeX 2_{\epsilon}$  can handle another page numbering scheme (e. g. Hebraic), but if you want to use it, this should be no problem for the `pageslts` package. But the original `\pagenumbering{...}` as well as the `hyperref` package (if used) might want to vote against it, especially when used together with the `pageslts` package. Especially especially (*sic!*) if the last page uses this new page numbering scheme, you should check everything double (at least).

(And if the number format is unknown to  $\LaTeX$ , the pages will have no number, and therefore cannot be referenced. You might be able to help yourself by using the `hyperref` package and manually placing `\hypertargets` and `\hrefs`.)

### 3.7 Page counter overflow

Without the use of the `alphalph` package, the

“ranges of supported counter values are more or less restricted. Only `\arabic` can be used with any counter value  $\TeX$  supports.

Presentation command	Supported domain	Ignored values	Error message ‘Counter too large’
<code>\arabic</code>	<code>-MAX..MAX</code>		
<code>\roman</code> , <code>\Roman</code>	<code>1..MAX</code>	<code>-MAX..0</code>	
<code>\alph</code> , <code>\Alph</code>	<code>1..26</code>	<code>0</code>	<code>-MAX..-1</code> , <code>27..MAX</code>
<code>\fnsymbol</code>	<code>1..9</code>	<code>0</code>	<code>-MAX..-1</code> , <code>10..MAX</code>

`MAX = 2147483647`

” (HEIKO OBERDIEK: The `alphalph` package, 2010/04/18, v2.3, first table, p. 2).

Please see subsections [2.1.2](#) and [2.1.3](#) for instructions how to overcome these limitations.

### 3.8 Using the `fnsymbol` page numbering scheme

Using the `fnsymbol` page numbering scheme can result in problems – big ones!

**When using this page numbering scheme, it is very important to use `\lastpageref{...}` instead of `\pageref{...}` for any link to any label provided by the `pageslts` package.**

While the `pageslts` package tries really very hard to circumvent any problem, other packages might screw up – and quite totally for that. So, you have been warned!

- There can be a counter overflow, see preceding subsection [3.7](#).
- Adobe Reader DC 2015.008.20082 does not show the correct page names for all pages with `fnsymbol` page numbering scheme (see the example file), while at least the (... of ...) part of the page number is displayed correctly (see page [4](#), tip about logical page numbers). When the `alphalph` package and the `pageslts` package with `fnsymbolmult` option are used, more page names are presented correctly by the Reader. (Adobe Reader X even got all pages right.)

## 4 Alternatives

There are similar packages, which do (or do not) similar things. As I neither know what exactly you want to accomplish when using this package (e. g. page number vs. page name, hyperlinks or not), nor what resources you have (e. g.  $\varepsilon$ -TeX), here is a list of some possible alternatives:

### LastPage

- The `LastPage` package also provides the `LastPage` label (but not `VeryLastPage` or `LastPages`). If you only want this and have a quite limited amount of TeX resources, you might want to use that package instead.
- If L<sup>A</sup>T<sub>E</sub>X 2.09 is still used, and if you are unable to switch to L<sup>A</sup>T<sub>E</sub>X 2 $\varepsilon$ , the L<sup>A</sup>T<sub>E</sub>X 2.09 compatible `lastpage209.sty` can be used (which is also contained in the recent `LastPage` package).

### totpages

- The `totpages` package provides a `totpages` label similar to `LastPages`, but `\AtEndDocument` instead of `\AfterLastShipout`. Therefore you should stay with `pageslts`. The `totpages` package additionally computes the number of paper sheets needed to (double) print the document (with one, two, three, . . . pages on one sheet of paper). This can also be accomplished with the `papermas` package.

### totcount

- The `totcount` package provides the last value of a counter, thus also the value of the `page` counter. You do not get a hyperlink to the last page, only the numerical value of the last page name is given (i. e. `X+72` pages gives 72 instead of 82 as total number of pages), and the number of pages can be changed e. g. by `\addtocounter`.

### nofm

- “There is a package `nofm.sty` available, but some versions of it are defective, and most don’t work with `fancyhdr` because they take over the complete page layout.” (PIET VAN OOSTRUM: Page layout in L<sup>A</sup>T<sub>E</sub>X, March 2, 2004, section 16; `fancyhdr.pdf`) `nofm` as of 1991/02/25 (without version number), available at <ftp://tug.ctan.org/pub/tex-archive/obsolete/macros/latex209/contrib/misc/nofm.sty>, does not work with e. g. `hyperref`, redefines `\enddocument` as well as `\@oddhead`, `\@evenhead`, `\@oddfoot`, and `\@evenfoot`. If you know the (<https://www.CTAN.org>) location of a **working** (!) version, please send me an e-mail, thanks!

### countlto

- You may want to have a look at the `countlto` package.

### zref

- The `zref` package of HEIKO OBERDIEK requires  $\varepsilon$ -TeX. `pageslts` does not require  $\varepsilon$ -TeX, but if you already have  $\varepsilon$ -TeX, you may have a look at the extensive `zref` package, whether it suits your needs better (or additionally or whatsoever).

(You programmed or found another alternative, which is available at <https://www.CTAN.org>?

OK, send an e-mail to me with the name, location at CTAN, and a short notice, and I will probably include it in the list above.)

About how to get those packages, please see subsection 7.1.

## 5 Example

```
1 \example
2 \documentclass[british]{article}[2014/09/29]% v1.4h
3 \usepackage{lipsum}[2014/07/27]% v1.3
4 \usepackage[draft]{showkeys}[2014/10/28]% v3.17
5 %% Use final instead of draft to hide the keys. %%
6 \usepackage{hyperref}[2012/11/06]% v6.83m
7 \hypersetup{
8 extension=pdf,%
9 plainpages=false,%
10 pdfpagelabels=true,%
11 hyperindex=false,%
12 pdflang={en},%
13 pdftitle={pageslts package example},%
14 pdfauthor={Hans-Martin Muench},%
15 pdfsubject={Example for the pageslts package},%
16 pdfkeywords={LaTeX, pageslts, H.-Martin Muench},%
17 pdfview=Fit,%
18 pdfstartview=Fit,%
19 pdfpagelayout=SinglePage,%
20 bookmarksopen=true%
21 }
22 \usepackage[pagecontinue=true,alphMult=ab,AlphMulti=AB,fnsymbolmult=true,%
23 romanMult=true,RomanMulti=true]{pageslts}[2015/08/17]% v1.2e
24 %% These are the default options. %%
25
26 \makeatletter
27 \renewcommand{\@evenfoot}{%
28 {Page \thepage\ (\theCurrentPage; local: \theCurrentPageLocal) of %
29 \lastpageref{pagesLTS.roman}(\lastpageref{pagesLTS.roman.local}) + %
30 \lastpageref{pagesLTS.Roman}(\lastpageref{pagesLTS.Roman.local}) + %
31 \lastpageref{pagesLTS.arabic}(\lastpageref{pagesLTS.arabic.local}) + %
32 \lastpageref{pagesLTS.fnsymbol}(\lastpageref{pagesLTS.fnsymbol.local}) + %
33 \lastpageref{pagesLTS.alph}(\lastpageref{pagesLTS.alph.local}) + %
34 \lastpageref{pagesLTS.Alph}(\lastpageref{pagesLTS.Alph.local}) = %
35 \lastpageref{LastPages} pages.%
36 }
37 \renewcommand{\@oddfoot}{\@evenfoot}
38 \def\pagesLTSexampleArabic{3}
39 \def\pagesLTSexamplealph{23}
40 \gdef\unit#1{\mathord{\thinspace\mathrm{#1}}}%
41 \makeatother
42
43 \listfiles
44
45 \begin{document}
```



```

46 \pagenumbering{roman}
47 %% Note the first \pagenumbering immediately behind \begin{document}! %%
48 %%\addtocounter{page}{-2} %%
49
50 \section*{Example for pageslts}
51 \addcontentsline{toc}{section}{Example for pageslts}
52 \markboth{Example for pageslts}{Example for pageslts}
53
54 This example demonstrates the most common uses of package\
55 \textsf{pageslts}, v1.2e as of 2015/08/17 (HMM).\
56 The used options were \texttt{pagecontinue=true},
57 \texttt{alphMult=ab}, \texttt{AlphMulti=AB}, \linebreak
58 \texttt{fnsymbolmult=true},
59 \texttt{romanMult=true}, and \texttt{RomanMulti=true}
60 (the default ones).\
61 For more details please see the documentation!\
62
63 \label{keys} To hide the \pageref{keys}{\quad } use option
64 \texttt{final} instead of \texttt{draft} with the \textsf{showkeys}
65 package (or remove the package call from the preamble of
66 this document).\
67
68 \textbf{Hyperlinks or not:} If the \textsf{hyperref} package is loaded,
69 the references are also hyperlinked:\
70 \smallskip
71 Page \thepage\ (\theCurrentPage; local: \theCurrentPageLocal) of %
72 \lastpageref{pagesLTS.roman}(\lastpageref{pagesLTS.roman.local}) + %
73 \lastpageref{pagesLTS.Roman}(\lastpageref{pagesLTS.Roman.local}) + %
74 \lastpageref{pagesLTS.arabic}(\lastpageref{pagesLTS.arabic.local}) + %
75 \lastpageref{pagesLTS.fnsymbol}(\lastpageref{pagesLTS.fnsymbol.local}) + %
76 \lastpageref{pagesLTS.alph}(\lastpageref{pagesLTS.alph.local}) + %
77 \lastpageref{pagesLTS.Alph}(\lastpageref{pagesLTS.Alph.local}) = %
78 \lastpageref{LastPages} pages.\
79 If the \textsf{hyperref} package is loaded, but the hyperlinks of the
80 references shall be suppressed, \verb|\pageref*{...}|
81 and \verb|\lastpageref*{...}| can be used:\
82 Page \thepage\ (\theCurrentPage; local: \theCurrentPageLocal) of %
83 \lastpageref*{pagesLTS.roman}(\lastpageref*{pagesLTS.roman.local}) + %
84 \lastpageref*{pagesLTS.Roman}(\lastpageref*{pagesLTS.Roman.local}) + %
85 \lastpageref*{pagesLTS.arabic}(\lastpageref*{pagesLTS.arabic.local}) + %
86 \lastpageref*{pagesLTS.fnsymbol}(\lastpageref*{pagesLTS.fnsymbol.local}) + %
87 \lastpageref*{pagesLTS.alph}(\lastpageref*{pagesLTS.alph.local}) + %
88 \lastpageref*{pagesLTS.Alph}(\lastpageref*{pagesLTS.Alph.local}) = %
89 \lastpageref*{LastPages} pages.\
90
91
92 \textbf{Trademarks} appear throughout this example without any

```

93 trademark symbol; they are the property of their respective  
94 trademark owner. There is no intention of infringement; the  
95 usage is to the benefit of the trademark owner.\\

96  
97 \textbf{Tip}: Use \textit{logical page numbers}  
98 for the display of the pdf (in Adobe Reader DC 2015.008.20082:  
99 Edit \$>\$ Preferences \$>\$ Categories: Page Display \$>\$  
100 Page Content and Information: Use logical page numbers)!\\

101  
102 You want negative page numbers? Not only arabic, but even roman,  
103 Roman, alph, Alph or fnsymbol ones? No problem, e.\,g. just give a\\

104 \verb|\addtocounter{page}{-\textit{some number}\verb|}| in the  
105 source code of this example file (or uncomment the prepared line)!

106  
107 \bigskip

108  
109 Save per page about \$200\unit{ml}\$ water, \$2\unit{g}\$ CO\$\_{2}\$  
110 and \$2\unit{g}\$ wood:\\

111 Therefore please print only if this is really necessary.

112  
113 \pagebreak

114  
115 \tableofcontents

116  
117 \newpage

118  
119 \pagenumbering{roman}

120 %% in case the page numbering is changed before,  
121 %% otherwise pagesLTS.current.local.roman on this page  
122 %% would be undefined

123  
124 \section{roman}

125  
126 \noindent (\texttt{roman} page numbering was started before,  
127 because the page numbering scheme was needed to start at  
128 the first page, of course.)\\

129  
130 \noindent First page (\verb|\lastpageref{pagesLTS.0}|):  
131 \lastpageref{pagesLTS.0}\\

132  
133 \noindent The page (\verb|\thepage|): \thepage \\

134  
135 \noindent Current page (\verb|\theCurrentPage|),  
136 i.\,e. counted continuously from the first page): \theCurrentPage \\

137 You can get this also in other formats:

138 \roman{CurrentPage}, \Roman{CurrentPage}, \arabic{CurrentPage},  
139 \fnsymbol{CurrentPage}, \alph{CurrentPage}, \Alph{CurrentPage}.

140  
141 \noindent CurrentPageLocal (\verb|\theCurrentPageLocal|),  
142 i.\,e. counted continuously from the first page of the  
143 current page numbering scheme): \theCurrentPageLocal \\  
144 You can get also this in other formats, too:  
145 \roman{pagesLTS.current.local.roman}, \Roman{pagesLTS.current.local.roman},  
146 \arabic{pagesLTS.current.local.roman}, \fnsymbol{pagesLTS.current.local.roman},  
147 \alph{pagesLTS.current.local.roman}, \Alph{pagesLTS.current.local.roman},  
148 but probably it only makes sense if page numbering scheme and format are  
149 the same, e.\,g.\\  
150 \verb|\Roman{pagesLTS.current.local.Roman}|\\  
151 or \verb|\Alph{pagesLTS.current.local.Alph}|. \verb|\arabic{...}| could  
152 make sense even if combined with another page numbering scheme.  
153 And this is exactly what \verb|\theCurrentPageLocal| does:\\  
154 \nolinebreak{\verb|\def\theCurrentPageLocal{\arabic{pagesLTS.current.local.\pagesLTS@pnc}}|.}\\  
155  
156 \noindent Last roman page (pagesLTS.roman): \lastpageref{pagesLTS.roman}{\hskip4em }  
157 (There are \lastpageref{pagesLTS.roman.local} pages with roman numbers.)\\  
158  
159 \noindent Last Roman page (pagesLTS.Roman): \lastpageref{pagesLTS.Roman}{\hskip3em }  
160 (There are \lastpageref{pagesLTS.Roman.local}~pages with Roman numbers:\\  
161 \lastpages{Roman}{1}~pages in the first Roman sector  
162 (\pageref{Roman}{\hskip3em }-\lastpageref{pagesLTS.Roman.1}{\hskip3em }),\\  
163 \lastpages{Roman}{2}~pages in the second Roman sector  
164 (\pageref{Roman2}{\hskip3em }-\lastpageref{pagesLTS.Roman.2}{\hskip3em }), and\\  
165 \lastpages{Roman}{3}~pages in the third Roman sector  
166 (\pageref{Roman3}{\hskip3em }-\lastpageref{pagesLTS.Roman.3}{\hskip3em }).\\  
167  
168 When the option \texttt{pagecontinue=false} is used with the  
169 \textsf{pageslts} package, the \verb|\lastpageref{pagesLTS.Roman}| will  
170 point to the same page as before, but this will have a lower number.\\  
171 The \verb|\lastpageref{pagesLTS.Roman.local}| will not change,  
172 because the number of pages does not change (only the page numbers).\\  
173  
174 \noindent Last arabic page (pagesLTS.arabic): \lastpageref{pagesLTS.arabic}{\hskip5em }  
175 (There are only \lastpageref{pagesLTS.arabic.local} pages with arabic numbers,  
176 because an \verb|\addtocounter{page}{\pagesLTSexampleArabic\verb|}| was used.)\\  
177  
178 \noindent Last fnsymbol page (pagesLTS.fnsymbol): \lastpageref{pagesLTS.fnsymbol} \\  
179 (\verb|\lastpageref{pagesLTS.fnsymbol}| -- never \verb|\pageref{pagesLTS.fnsymbol}|!)\\  
180 (There are \lastpageref{pagesLTS.fnsymbol.local} pages with fnsymbol numbers.)\\  
181  
182 \noindent Last alph page (pagesLTS.alph): \lastpageref{pagesLTS.alph}{\hskip4em }  
183 (There are only \lastpageref{pagesLTS.alph.local} pages with alph numbers,  
184 because an \verb|\addtocounter{page}{\pagesLTSexamplealph\verb|}| was used.)\\  
185  
186 \noindent Last Alph page (pagesLTS.Alph): \lastpageref{pagesLTS.Alph}{\hskip4em }

```

187 (There are \lastpageref{pagesLTS.Alph.local} pages with Alph numbers.)\\
188
189 \noindent Last page's \textit{name} (LastPage): \lastpageref{LastPage}\\
190
191 \noindent Very last page's \textit{name} (VeryLastPage): \lastpageref{VeryLastPage}\\
192 (\texttt{lastpage} and \texttt{VeryLastPage} are identical, unless
193 a package with output \linebreak
194 \verb|\AtEndDocument| after the \textsf{pageslts} package was added.)\\
195
196 \noindent Last page's \textit{number} (LastPages): \lastpageref{LastPages}{\hskip3em }
197 (=total number of pages)\\
198
199 \lipsum[1-3]
200
201 \newpage
202
203 \pagenumbering{Roman}
204
205 \section{Roman\label{Roman}}
206 \subsection{Common Roman page numbering}
207
208 \noindent First page (\verb|\lastpageref{pagesLTS.0}|):
209 \lastpageref{pagesLTS.0}\\
210
211 \noindent The page (\verb|\thepage|): \thepage \\
212
213 \noindent Current page (\verb|\theCurrentPage|),
214 i.\,e. counted continuously from the first page): \theCurrentPage \\
215
216 \noindent CurrentPageLocal (\verb|\theCurrentPageLocal|),
217 i.\,e. counted continuously from the first page of the
218 current page numbering scheme): \theCurrentPageLocal \\
219
220 \noindent Last roman page (pagesLTS.roman): \lastpageref{pagesLTS.roman}{\hskip4em }
221 (There are \lastpageref{pagesLTS.roman.local} pages with roman numbers.)\\
222
223 \noindent Last Roman page (pagesLTS.Roman): \lastpageref{pagesLTS.Roman}{\hskip3em }
224 (There are \lastpageref{pagesLTS.Roman.local}~pages with Roman numbers:\\
225 \lastpages{Roman}{1}~pages in the first Roman sector
226 (\pageref{Roman}{\hskip3em }-\lastpageref{pagesLTS.Roman.1}{\hskip3em }),\\
227 \lastpages{Roman}{2}~pages in the second Roman sector
228 (\pageref{Roman2}{\hskip3em }-\lastpageref{pagesLTS.Roman.2}{\hskip3em }), and\\
229 \lastpages{Roman}{3}~pages in the third Roman sector
230 (\pageref{Roman3}{\hskip3em }-\lastpageref{pagesLTS.Roman.3}{\hskip3em }).\
231
232 \noindent Last arabic page (pagesLTS.arabic): \lastpageref{pagesLTS.arabic}{\hskip5em }
233 (There are only \lastpageref{pagesLTS.arabic.local} pages with arabic numbers,

```

234 because an `\verb|\addtocounter{page}{\pagesLTsexampleArabic\verb|}` was used.)\

235

236 `\noindent Last fnsymbol page (pagesLTS.fnsymbol): \lastpageref{pagesLTS.fnsymbol} \`

237 `(\verb|\lastpageref{pagesLTS.fnsymbol}| -- never \verb|\pageref{pagesLTS.fnsymbol}|!)\`

238 (There are `\lastpageref{pagesLTS.fnsymbol.local}` pages with fnsymbol numbers.)\

239

240 `\noindent Last alph page (pagesLTS.alph): \lastpageref{pagesLTS.alph}{\hskip4em }`

241 (There are only `\lastpageref{pagesLTS.alph.local}` pages with alph numbers,

242 because an `\verb|\addtocounter{page}{\pagesLTsexamplealph\verb|}` was used.)\

243

244 `\noindent Last Alph page (pagesLTS.Alph): \lastpageref{pagesLTS.Alph}{\hskip4em }`

245 (There are `\lastpageref{pagesLTS.Alph.local}` pages with Alph numbers.)\

246

247 `\noindent Last page's \textit{name} (LastPage): \lastpageref{LastPage}\`

248

249 `\noindent Very last page's \textit{name} (VeryLastPage): \lastpageref{VeryLastPage}\`

250 `(\texttt{LastPage} and \texttt{VeryLastPage} are identical, unless`

251 a package with output `\linebreak`

252 `\verb|\AtEndDocument| after the \textsf{pageslts} package was added.)\`

253

254 `\noindent Last page's \textit{number} (LastPages): \lastpageref{LastPages}{\hskip3em }`

255 `(=total number of pages)\`

256

257 `\lipsum[1-4]`

258

259 `\newpage`

260

261 `\subsection{Last page of first Roman sector}`

262 `\verb|\lastpageref{pagesLTS.Roman}| does \textbf{not}`

263 refer to this page (but there: `\lastpageref{pagesLTS.Roman}`),

264 because the option `\texttt{pagecontinue=true}`

265 was chosen. When a reference to this page is wanted,\

266 `\verb|\lastpageref{pagesLTS.Roman.1}| can be used: \lastpageref{pagesLTS.Roman.1}.\`

267

268 `\bigskip`

269 There are `\lastpages{Roman}{1}`~pages (`\verb|\lastpages{Roman}{1}|`)

270 in this first Roman sector.\

271 The Roman page numbering scheme is continued later in section~`\ref{Roman2}`!

272

273 `\newpage`

274

275 `\pagenumbering{arabic}`

276

277 `\section{arabic}`

278

279 `\subsection{Standard page numbering}`

280

```

281 \noindent First page (\verb|\lastpageref{pagesLTS.0}|):
282 \lastpageref{pagesLTS.0}\  

283
284 \noindent The page (\verb|\thepage|): \thepage \  

285
286 \noindent Current page (\verb|\theCurrentPage|),
287 i.\,e. counted continuously from the first page): \theCurrentPage \  

288
289 \noindent CurrentPageLocal (\verb|\theCurrentPageLocal|),
290 i.\,e. counted continuously from the first page of the
291 current page numbering scheme): \theCurrentPageLocal \  

292
293 \noindent Last roman page (pagesLTS.roman): \lastpageref{pagesLTS.roman}{\hskip4em }
294 (There are \lastpageref{pagesLTS.roman.local} pages with roman numbers.)\  

295
296 \noindent Last Roman page (pagesLTS.Roman): \lastpageref{pagesLTS.Roman}{\hskip3em }
297 (There are \lastpageref{pagesLTS.Roman.local}~pages with Roman numbers:\
298 \lastpages{Roman}{1}~pages in the first Roman sector
299 (\pageref{Roman}{\hskip3em }-\lastpageref{pagesLTS.Roman.1}{\hskip3em }),\  

300 \lastpages{Roman}{2}~pages in the second Roman sector
301 (\pageref{Roman2}{\hskip3em }-\lastpageref{pagesLTS.Roman.2}{\hskip3em }), and\  

302 \lastpages{Roman}{3}~pages in the third Roman sector
303 (\pageref{Roman3}{\hskip3em }-\lastpageref{pagesLTS.Roman.3}{\hskip3em }).\
304
305 \noindent Last arabic page (pagesLTS.arabic): \lastpageref{pagesLTS.arabic}{\hskip5em }
306 (There are only \lastpageref{pagesLTS.arabic.local} pages with arabic numbers,
307 because an \verb|\adddtocounter{page}{\pagesLTSexampleArabic\verb|}| was used.)\  

308
309 \noindent Last fnsymbol page (pagesLTS.fnsymbol): \lastpageref{pagesLTS.fnsymbol} \  

310 (\verb|\lastpageref{pagesLTS.fnsymbol}| -- never \verb|\pageref{pagesLTS.fnsymbol}|!)\  

311 (There are \lastpageref{pagesLTS.fnsymbol.local} pages with fnsymbol numbers.)\  

312
313 \noindent Last alph page (pagesLTS.alph): \lastpageref{pagesLTS.alph}{\hskip4em }
314 (There are only \lastpageref{pagesLTS.alph.local} pages with alph numbers,
315 because an \verb|\adddtocounter{page}{\pagesLTSexamplealph\verb|}| was used.)\  

316
317 \noindent Last Alph page (pagesLTS.Alph): \lastpageref{pagesLTS.Alph}{\hskip4em }
318 (There are \lastpageref{pagesLTS.Alph.local} pages with Alph numbers.)\  

319
320 \noindent Last page's \textit{name} (LastPage): \lastpageref{LastPage}\  

321
322 \noindent Very last page's \textit{name} (VeryLastPage): \lastpageref{VeryLastPage}\  

323 (\texttt{LastPage} and \texttt{VeryLastPage} are identical, unless
324 a package with output \linebreak
325 \verb|\AtEndDocument| after the \textsf{pagesLTS} package was added.)\  

326
327 \noindent Last page's \textit{number} (LastPages): \lastpageref{LastPages}{\hskip3em }

```

```

328 (=total number of pages)\
329
330 \lipsum[1-4]
331 \newpage
332
333 \subsection[Empty page style]{Also an empty page style is no problem %
334 for the current or total page count}
335
336 \bigskip
337
338 \thispagestyle{empty}
339
340 \noindent First page (\verb|\lastpageref{pagesLTS.0}|):
341 \lastpageref{pagesLTS.0}\
342
343 \noindent The page (\verb|\thepage|): \thepage \
344
345 \noindent Current page (\verb|\thecurrentpage|),
346 i.\,e. counted continuously from the first page): \thecurrentpage \
347
348 \noindent CurrentPageLocal (\verb|\thecurrentpagelocal|),
349 i.\,e. counted continuously from the first page of the
350 current page numbering scheme): \thecurrentpagelocal \
351
352 \noindent Last roman page (pagesLTS.roman): \lastpageref{pagesLTS.roman}{\hskip4em }
353 (There are \lastpageref{pagesLTS.roman.local} pages with roman numbers.)\
354
355 \noindent Last Roman page (pagesLTS.Roman): \lastpageref{pagesLTS.Roman}{\hskip3em }
356 (There are \lastpageref{pagesLTS.Roman.local}~pages with Roman numbers:\
357 \lastpages{Roman}{1}~pages in the first Roman sector
358 (\pageref{Roman}{\hskip3em }-\lastpageref{pagesLTS.Roman.1}{\hskip3em }),\
359 \lastpages{Roman}{2}~pages in the second Roman sector
360 (\pageref{Roman2}{\hskip3em }-\lastpageref{pagesLTS.Roman.2}{\hskip3em }), and\
361 \lastpages{Roman}{3}~pages in the third Roman sector
362 (\pageref{Roman3}{\hskip3em }-\lastpageref{pagesLTS.Roman.3}{\hskip3em }).\
363
364 \noindent Last arabic page (pagesLTS.arabic): \lastpageref{pagesLTS.arabic}{\hskip5em }
365 (There are only \lastpageref{pagesLTS.arabic.local} pages with arabic numbers,
366 because an \verb|\addtocounter{page}{\pagesLTSexampleArabic\verb|}| was used.)\
367
368 \noindent Last fnsymbol page (pagesLTS.fnsymbol): \lastpageref{pagesLTS.fnsymbol} \
369 (\verb|\lastpageref{pagesLTS.fnsymbol}| -- never \verb|\pageref{pagesLTS.fnsymbol}|!)\
370 (There are \lastpageref{pagesLTS.fnsymbol.local} pages with fnsymbol numbers.)\
371
372 \noindent Last alph page (pagesLTS.alph): \lastpageref{pagesLTS.alph}{\hskip4em }
373 (There are only \lastpageref{pagesLTS.alph.local} pages with alph numbers,
374 because an \verb|\addtocounter{page}{\pagesLTSexamplealph\verb|}| was used.)\

```

```

375
376 \noindent Last Alph page (pagesLTS.Alph): \lastpageref{pagesLTS.Alph}{\hskip4em }
377 (There are \lastpageref{pagesLTS.Alph.local} pages with Alph numbers.)\\
378
379 \noindent Last page's \textit{name} (LastPage): \lastpageref{LastPage}\\
380
381 \noindent Very last page's \textit{name} (VeryLastPage): \lastpageref{VeryLastPage}\\
382 (\texttt{LastPage} and \texttt{VeryLastPage} are identical, unless
383 a package with output \linebreak
384 \verb|\AtEndDocument| after the \textsf{pageslts} package was added.)\\
385
386 \noindent Last page's \textit{number} (LastPages): \lastpageref{LastPages}{\hskip3em }
387 (=total number of pages)\\
388
389 \lipsum[1-4]
390
391 \newpage
392
393 \subsection[addtocounter, setcounter]{Neither %
394 \texttt{\textbackslash addtocounter\{page\}} nor %
395 \texttt{\textbackslash setcounter\{page\}} is a problem for the %
396 current or total page numbers}
397
398 (Here is an \verb|\addtocounter{page}{\pagesLTsexampleArabic\verb|}|
399 in the source code.)\\
400 \addtocounter{page}{\pagesLTsexampleArabic}
401
402 \noindent The page (from \verb|\thepage| command): \thepage \\
403
404 \noindent Current page (from \verb|\theCurrentPage| %
405 command), i.\,e. counted continuously from the first page): \theCurrentPage \\
406
407 \noindent CurrentPageLocal (from \verb|\theCurrentPageLocal| %
408 command), i.\,e. counted continuously from the first page of the
409 current page numbering scheme): \theCurrentPageLocal\\
410
411 \noindent Last page's number (LastPages): \lastpageref{LastPages}{\hskip3em }
412 (= total number of pages)\\
413
414 \lipsum[1-7]
415
416 \newpage
417
418 \pagenumbering{fnsymbol}
419
420 \section{fnsymbol}
421

```



422 Adobe Reader DC 2015.008.20082 does not show the correct page names  
423 for all pages with `\texttt{fnsymbol}` page numbering scheme,  
424 while at least the (`\ldots\` of `\ldots`) part of the page number is displayed correctly.  
425 (Adobe Reader~X even got all pages right.)  
426  
427 `\bigskip`  
428  
429 Without option `\texttt{fnsymbolmult=true}` of the `\textsf{pageslts}` package  
430 (and the help of `\textsc{Heiko Oberdiek}`'s `\textsf{alphalph}` package),  
431 after page~9 (`\textquotedblleft \ensuremath {\ddagger \dagger } \textquotedblright`)  
432 (and also for negative page numbers) there would just appear a  
433 `\begin{quote}`  
434 `\begin{verbatim}`  
435 LaTeX Error: Counter too large  
436 See the LaTeX manual or LaTeX Companion for explanation.  
437 You've lost some text. Try typing `<return>` to proceed.  
438 If that doesn't work, type `X <return>` to quit.  
439 `\end{verbatim}`  
440 `\end{quote}`  
441 Now the page numbers after 5 (`\ensuremath {\mathparagraph }`) are  
442 continued with the doubled `\textquotedblleft number\textquotedblright{}` of  
443 the first, second, third,`\ldots\` page (`\ensuremath {**}`),  
444 `\ensuremath {\dagger \dagger }`, `\ensuremath {\ddagger \dagger }`,  
445 `\ensuremath {\mathsection \mathsection }`,  
446 `\ensuremath {\mathparagraph \mathparagraph }`),  
447 and after the tenth page the `\textquotedblleft number\textquotedblright{}` is  
448 tripled (`\ensuremath {***}`, `\ensuremath {\dagger \dagger \dagger }`,`\ldots`).  
449 Page zero is named 0 and negative pages just named like the positive ones  
450 with addition of a minus sign~(`-$-$`).  
451  
452 `\bigskip`  
453  
454 `\noindent First page (\verb|\lastpageref{pagesLTS.0}|):`  
455 `\lastpageref{pagesLTS.0}\`  
456  
457 `\noindent The page (\verb|\thepage|): \thepage \`  
458  
459 `\noindent Current page (\verb|\theCurrentPage|),`  
460 `i.\,e. counted continuously from the first page): \theCurrentPage \`  
461  
462 `\noindent CurrentPageLocal (\verb|\theCurrentPageLocal|),`  
463 `i.\,e. counted continuously from the first page of the`  
464 `current page numbering scheme): \theCurrentPageLocal \`  
465  
466 `\noindent Last roman page (pagesLTS.roman): \lastpageref{pagesLTS.roman}{\hskip4em }`  
467 `(There are \lastpageref{pagesLTS.roman.local} pages with roman numbers.)\`  
468

```

469 \noindent Last Roman page (pagesLTS.Roman): \lastpageref{pagesLTS.Roman}{\hskip3em }
470 (There are \lastpageref{pagesLTS.Roman.local}~pages with Roman numbers:\
471 \lastpages{Roman}{1}~pages in the first Roman sector
472 (\pageref{Roman}{\hskip3em }-\lastpageref{pagesLTS.Roman.1}{\hskip3em }),\
473 \lastpages{Roman}{2}~pages in the second Roman sector
474 (\pageref{Roman2}{\hskip3em }-\lastpageref{pagesLTS.Roman.2}{\hskip3em }), and\
475 \lastpages{Roman}{3}~pages in the third Roman sector
476 (\pageref{Roman3}{\hskip3em }-\lastpageref{pagesLTS.Roman.3}{\hskip3em }).\
477
478 \noindent Last arabic page (pagesLTS.arabic): \lastpageref{pagesLTS.arabic}{\hskip5em }
479 (There are only \lastpageref{pagesLTS.arabic.local} pages with arabic numbers,
480 because an \verb|\addtocounter{page}{\pagesLTSexampleArabic\verb|}| was used.)\
481
482 \noindent Last fnsymbol page (pagesLTS.fnsymbol): \lastpageref{pagesLTS.fnsymbol} \
483 (\verb|\lastpageref{pagesLTS.fnsymbol}| -- never \verb|\pageref{pagesLTS.fnsymbol}|!)\
484 (There are \lastpageref{pagesLTS.fnsymbol.local} pages with fnsymbol numbers.)\
485
486 \noindent Last alph page (pagesLTS.alph): \lastpageref{pagesLTS.alph}{\hskip4em }
487 (There are only \lastpageref{pagesLTS.alph.local} pages with alph numbers,
488 because an \verb|\addtocounter{page}{\pagesLTSexamplealph\verb|}| was used.)\
489
490 \noindent Last Alph page (pagesLTS.Alph): \lastpageref{pagesLTS.Alph}{\hskip4em }
491 (There are \lastpageref{pagesLTS.Alph.local} pages with Alph numbers.)\
492
493 \noindent Last page's \textit{name} (LastPage): \lastpageref{LastPage}\
494
495 \noindent Very last page's \textit{name} (VeryLastPage): \lastpageref{VeryLastPage}\
496 (\texttt{LastPage} and \texttt{VeryLastPage} are identical, unless
497 a package with output \linebreak
498 \verb|\AtEndDocument| after the \textsf{pageslts} package was added.)\
499
500 \noindent Last page's \textit{number} (LastPages): \lastpageref{LastPages}{\hskip3em }
501 (=total number of pages)\
502
503 \lipsum[1-60]
504
505 \newpage
506
507 \pagenumbering{Roman}
508
509 \section{Roman - again!\label{Roman2}}
510
511 The page number would start with \textquotedblleft I\textquotedblright{} again --
512 but for the \textsf{pageslts} package (with option \texttt{pagecontinue=true},
513 or with option just \texttt{pagecontinue}, or even just
514 \nolinebreak{with\textbf{out}} option \texttt{pagecontinue=false}).
515 This package remembered the (\arabic{pagesLTS.double.Roman}-1)\footnote{%

```

```

516 OK, here you have to compute this value for yourself, but %
517 subtracting one should be manageable for \TeX{}nicians.} pages already
518 done in Roman output, and therefore continues with page
519 \textquotedblleft \thepage \textquotedblright .\
520 If you want to start with \textquotedblleft I\textquotedblright{} all
521 over again, you will have two pages with the same name,
522 but nevertheless you can do this by using option \texttt{pagecontinue=false}
523 or a \verb|\setcounter{page}{1}|\ here (not demonstrated in this example file).\
524
525 \noindent First page (\verb|\lastpageref{pagesLTS.0}|):
526 \lastpageref{pagesLTS.0}\
527
528 \noindent The page (\verb|\thepage|): \thepage \
529
530 \noindent Current page (\verb|\theCurrentPage|),
531 i.\,e. counted continuously from the first page): \theCurrentPage \
532
533 \noindent CurrentPageLocal (\verb|\theCurrentPageLocal|),
534 i.\,e. counted continuously from the first page of the
535 current page numbering scheme): \theCurrentPageLocal \
536
537 \noindent Last roman page (pagesLTS.roman): \lastpageref{pagesLTS.roman}{\hskip4em }
538 (There are \lastpageref{pagesLTS.roman.local} pages with roman numbers.)\
539
540 \noindent Last Roman page (pagesLTS.Roman): \lastpageref{pagesLTS.Roman}{\hskip3em }
541 (There are \lastpageref{pagesLTS.Roman.local}~pages with Roman numbers:\
542 \lastpages{Roman}{1}~pages in the first Roman sector
543 (\pageref{Roman}{\hskip3em }-\lastpageref{pagesLTS.Roman.1}{\hskip3em }),\
544 \lastpages{Roman}{2}~pages in the second Roman sector
545 (\pageref{Roman2}{\hskip3em }-\lastpageref{pagesLTS.Roman.2}{\hskip3em }), and\
546 \lastpages{Roman}{3}~pages in the third Roman sector
547 (\pageref{Roman3}{\hskip3em }-\lastpageref{pagesLTS.Roman.3}{\hskip3em }).\
548
549 \noindent Last arabic page (pagesLTS.arabic): \lastpageref{pagesLTS.arabic}{\hskip5em }
550 (There are only \lastpageref{pagesLTS.arabic.local} pages with arabic numbers,
551 because an \verb|\addtocounter{page}{\pagesLTSexampleArabic\verb|}| was used.)\
552
553 \noindent Last fnsymbol page (pagesLTS.fnsymbol): \lastpageref{pagesLTS.fnsymbol} \
554 (\verb|\lastpageref{pagesLTS.fnsymbol}| -- never
555 \verb|\pageref{pagesLTS.fnsymbol}|!)\
556 (There are \lastpageref{pagesLTS.fnsymbol.local} pages with fnsymbol numbers.)\
557
558 \noindent Last alph page (pagesLTS.alph): \lastpageref{pagesLTS.alph}{\hskip4em }
559 (There are only \lastpageref{pagesLTS.alph.local} pages with alph numbers,
560 because an \verb|\addtocounter{page}{\pagesLTSexamplealph\verb|}| was used.)\
561
562 \noindent Last Alph page (pagesLTS.Alph): \lastpageref{pagesLTS.Alph}{\hskip4em }

```

563 (There are \lastpageref{pagesLTS.Alph.local} pages with Alph numbers.)\\

564

565 \noindent Last page's \textit{name} (LastPage): \lastpageref{LastPage} \\

566

567 \noindent Very last page's \textit{name} (VeryLastPage): \lastpageref{VeryLastPage} \\

568 (\texttt{LastPage} and \texttt{VeryLastPage} are identical, unless

569 a package with output \linebreak

570 \verb|\AtEndDocument| after the \textsf{pageslts} package was added.) \\

571

572 \noindent Last page's \textit{number} (LastPages): \lastpageref{LastPages}{\hskip3em }

573 (=total number of pages) \\

574

575 \lipsum[1-6]

576

577 \newpage

578

579 \verb|\lastpageref{pagesLTS.Roman}| does \textbf{not}

580 refer to this page (but there: \lastpageref{pagesLTS.Roman}),

581 because the option \texttt{pagecontinue=true}

582 was chosen. When a reference to this page is wanted, \\

583 \verb|\lastpageref{pagesLTS.Roman.2}| can be used: \lastpageref{pagesLTS.Roman.2}. \\

584

585 \bigskip

586 There are \lastpages{Roman}{2}~pages (\verb|\lastpages{Roman}{2}|) in this

587 second Roman sector. \\

588 The Roman page numbering scheme is continued later in section~\ref{Roman3})!

589

590 \newpage

591

592 \pagenumbering{alph}

593

594 \section{alph\label{alph}}

595

596 \noindent First page (\verb|\lastpageref{pagesLTS.0}|):

597 \lastpageref{pagesLTS.0} \\

598

599 \noindent The page (\verb|\thepage|): \thepage \\

600

601 \noindent Current page (\verb|\theCurrentPage|),

602 i.\,e. counted continuously from the first page): \theCurrentPage \\

603

604 \noindent CurrentPageLocal (\verb|\theCurrentPageLocal|),

605 i.\,e. counted continuously from the first page of the

606 current page numbering scheme): \theCurrentPageLocal \\

607

608 \noindent Last roman page (pagesLTS.roman): \lastpageref{pagesLTS.roman}{\hskip4em }

609 (There are \lastpageref{pagesLTS.roman.local} pages with roman numbers.) \\

```

610
611 \noindent Last Roman page (pagesLTS.Roman): \lastpageref{pagesLTS.Roman}{\hskip3em }
612 (There are \lastpageref{pagesLTS.Roman.local}~pages with Roman numbers:\
613 \lastpages{Roman}{1}~pages in the first Roman sector
614 (\pageref{Roman}{\hskip3em }-\lastpageref{pagesLTS.Roman.1}{\hskip3em }),\
615 \lastpages{Roman}{2}~pages in the second Roman sector
616 (\pageref{Roman2}{\hskip3em }-\lastpageref{pagesLTS.Roman.2}{\hskip3em }), and\
617 \lastpages{Roman}{3}~pages in the third Roman sector
618 (\pageref{Roman3}{\hskip3em }-\lastpageref{pagesLTS.Roman.3}{\hskip3em }).\
619
620 \noindent Last arabic page (pagesLTS.arabic): \lastpageref{pagesLTS.arabic}{\hskip5em }
621 (There are only \lastpageref{pagesLTS.arabic.local} pages with arabic numbers,
622 because an \verb|\adddtocounter{page}{\pagesLTSexampleArabic\verb|}| was used.)\
623
624 \noindent Last fnsymbol page (pagesLTS.fnsymbol): \lastpageref{pagesLTS.fnsymbol} \
625 (\verb|\lastpageref{pagesLTS.fnsymbol}| -- never \verb|\pageref{pagesLTS.fnsymbol}|!)\
626 (There are \lastpageref{pagesLTS.fnsymbol.local} pages with fnsymbol numbers.)\
627
628 \noindent Last alph page (pagesLTS.alph): \lastpageref{pagesLTS.alph}{\hskip4em }
629 (There are only \lastpageref{pagesLTS.alph.local} pages with alph numbers,
630 because an \verb|\adddtocounter{page}{\pagesLTSexamplealph\verb|}| was used.)\
631
632 \noindent Last Alph page (pagesLTS.Alph): \lastpageref{pagesLTS.Alph}{\hskip4em }
633 (There are \lastpageref{pagesLTS.Alph.local} pages with Alph numbers.)\
634
635 \noindent Last page's \textit{name} (LastPage): \lastpageref{LastPage}\
636
637 \noindent Very last page's \textit{name} (VeryLastPage): \lastpageref{VeryLastPage}\
638 (\texttt{LastPage} and \texttt{VeryLastPage} are identical, unless
639 a package with output \linebreak
640 \verb|\AtEndDocument| after the \textsf{pageslts} package was added.)\
641
642 \noindent Last page's \textit{number} (LastPages): \lastpageref{LastPages}{\hskip3em }
643 (=total number of pages)\
644
645 \lipsum[1-4]
646
647 \newpage
648
649 Without option \texttt{alphMult=ab} of the \textsf{pageslts} (and the help of
650 \textsc{Heiko Oberdiek's} \textsf{alphalph} package), after page
651 \textquotedblleft z\textquotedblright{} there would just appear a
652 \begin{quote}
653 \begin{verbatim}
654 LaTeX Error: Counter too large
655 See the LaTeX manual or LaTeX Companion for explanation.
656 You've lost some text. Try typing <return> to proceed.

```

```

657 If that doesn't work, type X <return> to quit.
658 \end{verbatim}
659 \end{quote}
660 Now the page numbers are continued aa, ab, ac,\ldots\ (aa, bb, cc,\ldots\ is
661 also possible, see the \textsf{pageslts} documentation).\
662 To demonstrate this, we add a\
663 \verb|\addtocounter{page}{\pagesLTsexamplealph\verb|}|\
664 in the source code here.
665
666 \addtocounter{page}{\pagesLTsexamplealph}
667
668 \bigskip
669
670 \lipsum[1-18]
671
672 \newpage
673
674 \pagenumbering{Roman}
675
676 \section{Roman - third time!\label{Roman3}}
677
678 The page number would start with
679 \textquotedblleft I\textquotedblright\ again -- but
680 for the \textsf{pageslts} package (with option \texttt{pagecontinue=true},
681 or with option just \texttt{pagecontinue}, or even just
682 \nolinebreak{with\textbf{out}} option \texttt{pagecontinue=false}).
683 This package remembered the
684 (\arabic{pagesLTS.double.Roman}-1)\footnote{OK, here %
685 you have to compute this value for yourself, but %
686 subtracting one should be manageable for \TeX nicians.} pages already
687 done in Roman output, and therefore continues with page
688 \textquotedblleft \thepage \textquotedblright .\
689 If you want to start with \textquotedblleft I\textquotedblright\ all
690 over again, you will have (at least) two pages with the same name,
691 but nevertheless you can do this by using option
692 \texttt{pagecontinue=false} instead of \texttt{pagecontinue=true}
693 (not demonstrated here).\
694
695 \noindent First page (\verb|\lastpageref{pagesLTS.0}|):
696 \lastpageref{pagesLTS.0}\
697
698 \noindent The page (\verb|\thepage|): \thepage \
699
700 \noindent Current page (\verb|\theCurrentPage|),
701 i.\,e. counted continuously from the first page): \theCurrentPage \
702
703 \noindent CurrentPageLocal (\verb|\theCurrentPageLocal|),

```

704 i.\,e. counted continuously from the first page of the  
705 current page numbering scheme): \theCurrentPageLocal \\

706

707 \noindent Last roman page (pagesLTS.roman): \lastpageref{pagesLTS.roman}{\hskip4em }  
708 (There are \lastpageref{pagesLTS.roman.local} pages with roman numbers.)\\

709

710 \noindent Last Roman page (pagesLTS.Roman): \lastpageref{pagesLTS.Roman}{\hskip3em }  
711 (There are \lastpageref{pagesLTS.Roman.local}~pages with Roman numbers:\\

712 \lastpages{Roman}{1}~pages in the first Roman sector  
713 (\pageref{Roman}{\hskip3em }-\lastpageref{pagesLTS.Roman.1}{\hskip3em }),\\

714 \lastpages{Roman}{2}~pages in the second Roman sector  
715 (\pageref{Roman2}{\hskip3em }-\lastpageref{pagesLTS.Roman.2}{\hskip3em }), and\\

716 \lastpages{Roman}{3}~pages in the third Roman sector  
717 (\pageref{Roman3}{\hskip3em }-\lastpageref{pagesLTS.Roman.3}{\hskip3em }).\

718

719 \noindent Last arabic page (pagesLTS.arabic): \lastpageref{pagesLTS.arabic}{\hskip5em }  
720 (There are only \lastpageref{pagesLTS.arabic.local} pages with arabic numbers,  
721 because an \verb|\addtocounter{page}{\pagesLTSexampleArabic\verb|}| was used.)\\

722

723 \noindent Last fnsymbol page (pagesLTS.fnsymbol): \lastpageref{pagesLTS.fnsymbol} \\

724 (\verb|\lastpageref{pagesLTS.fnsymbol}| -- never \verb|\pageref{pagesLTS.fnsymbol}|!)\

725 (There are \lastpageref{pagesLTS.fnsymbol.local} pages with fnsymbol numbers.)\\

726

727 \noindent Last alph page (pagesLTS.alph): \lastpageref{pagesLTS.alph}{\hskip4em }  
728 (There are only \lastpageref{pagesLTS.alph.local} pages with alph numbers,  
729 because an \verb|\addtocounter{page}{\pagesLTSexamplealph\verb|}| was used.)\\

730

731 \noindent Last Alph page (pagesLTS.Alph): \lastpageref{pagesLTS.Alph}{\hskip4em }  
732 (There are \lastpageref{pagesLTS.Alph.local} pages with Alph numbers.)\\

733

734 \noindent Last page's \textit{name} (LastPage): \lastpageref{LastPage}\\

735

736 \noindent Very last page's \textit{name} (VeryLastPage): \lastpageref{VeryLastPage}\\

737 (\texttt{LastPage} and \texttt{VeryLastPage} are identical, unless  
738 a package with output \linebreak  
739 \verb|\AtEndDocument| after the \textsf{pageslts} package was added.)\\

740

741 \noindent Last page's \textit{number} (LastPages): \lastpageref{LastPages}{\hskip3em }  
742 (=total number of pages)\\

743

744 \lipsum[1-3]

745

746 \newpage

747

748 \lastpageref{pagesLTS.Roman}

749 (\verb|\lastpageref{pagesLTS.Roman}|)

750 \textbf{does} refers to this page, because the option

751 \texttt{pagecontinue=true} was chosen. Also\\

752 \verb|\lastpageref{pagesLTS.Roman.3}| can be used: \lastpageref{pagesLTS.Roman.3}.\\

753

754 \bigskip

755

756 There are \lastpages{Roman}{3}~pages (\verb|\lastpages{Roman}{3}|) in this

757 third Roman sector.\\

758

759 \newpage

760

761 \pagenumbering{Alph}

762

763 \section{Alph}

764

765 \noindent First page (\verb|\lastpageref{pagesLTS.0}|):

766 \lastpageref{pagesLTS.0}\\.\\

767

768 \noindent The page (\verb|\thepage|): \thepage \\

769

770 \noindent Current page (\verb|\theCurrentPage|),

771 i.\,e. counted continuously from the first page): \theCurrentPage \\

772

773 \noindent CurrentPageLocal (\verb|\theCurrentPageLocal|),

774 i.\,e. counted continuously from the first page of the

775 current page numbering scheme): \theCurrentPageLocal \\

776

777 \noindent Last roman page (pagesLTS.roman): \lastpageref{pagesLTS.roman}{\hskip4em }

778 (There are \lastpageref{pagesLTS.roman.local} pages with roman numbers.)\\

779

780 \noindent Last Roman page (pagesLTS.Roman): \lastpageref{pagesLTS.Roman}{\hskip3em }

781 (There are \lastpageref{pagesLTS.Roman.local}~pages with Roman numbers:\\

782 \lastpages{Roman}{1}~pages in the first Roman sector

783 (\pageref{Roman}{\hskip3em }-\lastpageref{pagesLTS.Roman.1}{\hskip3em }),\\

784 \lastpages{Roman}{2}~pages in the second Roman sector

785 (\pageref{Roman2}{\hskip3em }-\lastpageref{pagesLTS.Roman.2}{\hskip3em }), and\\

786 \lastpages{Roman}{3}~pages in the third Roman sector

787 (\pageref{Roman3}{\hskip3em }-\lastpageref{pagesLTS.Roman.3}{\hskip3em }).\

788

789 \noindent Last arabic page (pagesLTS.arabic): \lastpageref{pagesLTS.arabic}{\hskip5em }

790 (There are only \lastpageref{pagesLTS.arabic.local} pages with arabic numbers,

791 because an \verb|\addtocounter{page}{\pagesLTSexampleArabic\verb|}| was used.)\\

792

793 \noindent Last fnsymbol page (pagesLTS.fnsymbol): \lastpageref{pagesLTS.fnsymbol} \\

794 (\verb|\lastpageref{pagesLTS.fnsymbol}| -- never \verb|\pageref{pagesLTS.fnsymbol}|!)\\

795 (There are \lastpageref{pagesLTS.fnsymbol.local} pages with fnsymbol numbers.)\\

796

797 \noindent Last alph page (pagesLTS.alph): \lastpageref{pagesLTS.alph}{\hskip4em }



```

798 (There are only \lastpageref{pagesLTS.alph.local} pages with alph numbers,
799 because an \verb|\addtocounter{page}{|\pagesLTSexamplealph\verb|}| was used.)\
800
801 \noindent Last Alph page (pagesLTS.Alph): \lastpageref{pagesLTS.Alph}{\hskip4em }
802 (There are \lastpageref{pagesLTS.Alph.local} pages with Alph numbers.)\
803
804 \noindent Last page's \textit{name} (LastPage): \lastpageref{LastPage}\
805
806 \noindent Very last page's \textit{name} (VeryLastPage): \lastpageref{VeryLastPage}\
807 (\texttt{LastPage} and \texttt{VeryLastPage} are identical, unless
808 a package with output \linebreak
809 \verb|\AtEndDocument| after the \textsf{pageslts} package was added.)\
810
811 \noindent Last page's \textit{number} (LastPages): \lastpageref{LastPages}{\hskip3em }
812 (=total number of pages)\
813
814 \lipsum[1-3]
815
816 Without option \texttt{alphMulti=AB} of the \textsf{pageslts} (and the help of
817 \textsc{Heiko Oberdiek's} \textsf{alphalph} package), after page
818 \textquotedblleft Z\textquotedblright there would just appear a
819 \begin{quote}
820 \begin{verbatim}
821 LaTeX Error: Counter too large
822 See the LaTeX manual or LaTeX Companion for explanation.
823 You've lost some text. Try typing <return> to proceed.
824 If that doesn't work, type X <return> to quit.
825 \end{verbatim}
826 \end{quote}
827 Now the page numbers are continued AA, AB, AC,\ldots\ (AA, BB, CC,\ldots\ is
828 also possible, see the \textsf{pageslts} documentation).\
829 This is not demonstrated here, but see section~\ref{alph}.
830
831 \newpage
832
833 \section{The End}
834
835 \noindent First page (\verb|\lastpageref{pagesLTS.0}|):
836 \lastpageref{pagesLTS.0}\
837
838 \noindent The page (\verb|\thepage|): \thepage \
839
840 \noindent Current page (\verb|\theCurrentPage|),
841 i.\,e. counted continuously from the first page): \theCurrentPage \
842
843 \noindent CurrentPageLocal (\verb|\theCurrentPageLocal|),
844 i.\,e. counted continuously from the first page of the

```

```

845 current page numbering scheme): \theCurrentPageLocal \\
846
847 \noindent Last roman page (pagesLTS.roman): \lastpageref{pagesLTS.roman}{\hskip4em }
848 (There are \lastpageref{pagesLTS.roman.local} pages with roman numbers.)\\
849
850 \noindent Last Roman page (pagesLTS.Roman): \lastpageref{pagesLTS.Roman}{\hskip3em }
851 (There are \lastpageref{pagesLTS.Roman.local}~pages with Roman numbers:\\
852 \lastpages{Roman}{1}~pages in the first Roman sector
853 (\pageref{Roman}{\hskip3em }-\lastpageref{pagesLTS.Roman.1}{\hskip3em }),\\
854 \lastpages{Roman}{2}~pages in the second Roman sector
855 (\pageref{Roman2}{\hskip3em }-\lastpageref{pagesLTS.Roman.2}{\hskip3em }), and\\
856 \lastpages{Roman}{3}~pages in the third Roman sector
857 (\pageref{Roman3}{\hskip3em }-\lastpageref{pagesLTS.Roman.3}{\hskip3em }).\
858
859 \noindent Last arabic page (pagesLTS.arabic): \lastpageref{pagesLTS.arabic}{\hskip5em }
860 (There are only \lastpageref{pagesLTS.arabic.local} pages with arabic numbers,
861 because an \verb|\addtocounter{page}{\pagesLTSEXampleArabic\verb|}| was used.)\\
862
863 \noindent Last fnsymbol page (pagesLTS.fnsymbol): \lastpageref{pagesLTS.fnsymbol} \\
864 (\verb|\lastpageref{pagesLTS.fnsymbol}| -- never \verb|\pageref{pagesLTS.fnsymbol}|!)\\
865 (There are \lastpageref{pagesLTS.fnsymbol.local} pages with fnsymbol numbers.)\\
866
867 \noindent Last alph page (pagesLTS.alph): \lastpageref{pagesLTS.alph}{\hskip4em }
868 (There are only \lastpageref{pagesLTS.alph.local} pages with alph numbers,
869 because an \verb|\addtocounter{page}{\pagesLTSEXamplealph\verb|}| was used.)\\
870
871 \noindent Last Alph page (pagesLTS.Alph): \lastpageref{pagesLTS.Alph}{\hskip4em }
872 (There are \lastpageref{pagesLTS.Alph.local} pages with Alph numbers.)\\
873
874 \noindent Last page's \textit{name} (LastPage): \lastpageref{LastPage}\\
875
876 \noindent Very last page's \textit{name} (VeryLastPage): \lastpageref{VeryLastPage}\\
877 (\texttt{LastPage} and \texttt{VeryLastPage} are identical, unless
878 a package with output \linebreak
879 \verb|\AtEndDocument| after the \textsf{pageslts} package was added.)\\
880
881 \noindent Last page's \textit{number} (LastPages): \lastpageref{LastPages}{\hskip3em }
882 (=total number of pages)\\
883
884 \medskip
885
886 \noindent Page \thepage\ (\theCurrentPage; local: \theCurrentPageLocal) of %
887 \lastpageref{pagesLTS.roman} (\lastpageref{pagesLTS.roman.local}) + %
888 \lastpageref{pagesLTS.Roman} (\lastpageref{pagesLTS.Roman.local}) + %
889 \lastpageref{pagesLTS.arabic} (\lastpageref{pagesLTS.arabic.local}) + %
890 \lastpageref{pagesLTS.fnsymbol} (\lastpageref{pagesLTS.fnsymbol.local}) + %
891 \lastpageref{pagesLTS.alph} (\lastpageref{pagesLTS.alph.local}) + %

```

```
892 \lastpageref{pagesLTS.Alph} (\lastpageref{pagesLTS.Alph.local}) = %
893 \lastpageref{LastPages} pages.
894
895 \end{document}
896 \example
```

## 6 The implementation

(This and the source code of the example file are the reasons for printing the documentation in landscape format instead of portrait.)

We start off by checking that we are loading into L<sup>A</sup>T<sub>E</sub>X 2<sub>ε</sub> and announcing the name and version of this package.

```
897 (*package)
898 \NeedsTeXFormat{LaTeX2e}[2015/01/01]
899 \ProvidesPackage{pageslts}[2015/08/17 v1.2e
900           Refers to special pages' numbers/names (HMM)]
901
```

A short description of the pageslts package:

```
902 %% Allows for things like\\
903 %% |Page \thepage\ (\theCurrentPage; local: \theCurrentPageLocal) of %
904 %% \lastpageref{pagesLTS.roman}(\lastpageref{pagesLTS.roman.local}) + %
905 %% \lastpageref{pagesLTS.Roman}(\lastpageref{pagesLTS.Roman.local}) + %
906 %% \lastpageref{pagesLTS.arabic}(\lastpageref{pagesLTS.arabic.local}) + %
907 %% \lastpageref{pagesLTS.fnsymbol}(\lastpageref{pagesLTS.fnsymbol.local}) + %
908 %% \lastpageref{pagesLTS.alph}(\lastpageref{pagesLTS.alph.local}) + %
909 %% \lastpageref{pagesLTS.Alph}(\lastpageref{pagesLTS.Alph.local}) = %
910 %% \lastpageref{LastPages} pages.!\
911 %% to get\\
912 %% 'Page d (57; local: 4) of ii(2) + XX(20) + *(1) + 30(30) + e(5) + C(3) = 61 pages.'.
913
```

The package is now named ‘pageslts’ but had been named ‘pagesLTS’ before. L<sup>A</sup>T<sub>E</sub>X does not load a package two times, but it is case sensitive, i. e. would load ‘pageslts’ and ‘pagesLTS’, resulting in possible problems. Therefore we check for a loaded ‘pagesLTS’ package (assuming `\pagesLTS@loaded` is not `p@gesLTSlo@d`ed and not defined to `p@gesLTSlo@d`ed by another package). This check might work only for the second and following compilation runs.

```
914 \@ifpackageloaded{pagesLTS}{%
915   \def\pagesLTS@doubleload{p@gesLTSlo@d}
916   \ifx\pagesLTS@loaded\pagesLTS@doubleload%
917     \PackageError{pageslts}{Requested pagesLTS instead of pageslts}{%
918       You have requested package ‘pagesLTS’. This package is now named ‘pageslts’.\MessageBreak%
919       Requesting ‘pagesLTS’ as well as ‘pageslts’ leads to loading the same package\MessageBreak%
920       twice (and results in errors). Loading of ‘pageslts’ will therefore be\MessageBreak%
921       abandoned now. To fix this problem, please look in the \jobname.log file for\MessageBreak%
922       LaTeX Warning: You have requested package ‘pagesLTS’,\MessageBreak%
923       \space \space \space \space \space \space \space \space \space \space \space \space%
924       \space \space but the package provides ‘pageslts’.\MessageBreak%
925       and change the package call in the calling style/document.\MessageBreak%
926       If a style file made the mistake, please inform its maintainer and/or the\MessageBreak%
927       maintainer of the pageslts package about it (after making sure you have\MessageBreak%
928       the recent version of that style file).\MessageBreak%
929       Thank you and sorry for the inconvenience!\MessageBreak%
```

```

930 }
931 \endinput
932 \fi
933 }{% \relax
934 }
935
936 \gdef\pagesLTS@loaded{p@gesLTSlo@deds}
937

```

For `\ltx@ifpackageloaded` the `ltxcmds` package is needed, also by HEIKO OBERDIEK (see subsection 7.1):

```

938 \RequirePackage{ltxcmds}[2011/11/09]%      v1.22

```

For its `\AfterLastShipout` (as well as its `\AtEndAfterFileList`) command we need the `atveryend` package by HEIKO OBERDIEK (see subsection 7.1):

```

939 \RequirePackage{atveryend}[2011/06/30]%      v1.8
940 \AtBeginDocument{%
941   %% https://tex.stackexchange.com/a/45654/6865
942   %% and https://tex.stackexchange.com/q/261445/6865
943   \def\pagesLTS@etb{etoolbox.sty}%
944   \let\pagesLTS@ave@empty%
945   \@for\next:=\@filelist\do{%
946     \ifx\next\pagesLTS@etb\relax%
947       \def\pagesLTS@ave{atveryend.sty}%
948     \fi%
949     \ifx\next\pagesLTS@ave%
950       \@ifpackagelater{atveryend}{2015/08/01}{%\relax
951         \PackageInfo{pageslts}{etoolbox package loaded before atveryend package\MessageBreak%
952           With atveryend version 1.8 of 2011/06/30 this caused a problem,\MessageBreak%
953           which is probably solved in the new version used here.\MessageBreak%
954           To play it safe, you could load the atveryend package\MessageBreak%
955           before the etoolbox package.\MessageBreak%
956         }%
957       }{% else
958         \PackageError{pageslts}{etoolbox package loaded before atveryend package}{%
959           You can use both packages, but when etoolbox is loaded before atveryend,\MessageBreak%
960           atveryend no longer detects \string\enddocument\space\MessageBreak%
961           and hook "AtVeryVeryEnd" is not executed.\MessageBreak%
962           Just load the atveryend package before the etoolbox package!\MessageBreak%
963         }%
964       }%
965     \fi%
966   }%
967 }
968

```

For its `\EveryShipout` command we need the `everyshi` package by MARTIN SCHRÖDER (see subsection 7.1):

```

969 \RequirePackage{everyshi}[2001/05/15]%      v3.00

```

For its `\LetLtxMacro` command we need the `letltxmacro` package by HEIKO OBERDIEK (see subsection 7.1):

```
970 \RequirePackage{letltxmacro}[2010/09/02]% v1.4
```

For the handling of the options we need the `kvoptions` package also by HEIKO OBERDIEK (see subsection 7.1):

```
971 \RequirePackage{kvoptions}[2011/06/30]% v3.11
```

The `undolabl` package of H.-MARTIN MÜNCH (i. e. myself), with code from ULRICH DIEZ, (see subsection 7.1) is needed to overwrite labels, when the same page numbering scheme is used twice (or even more often).

```
972 \RequirePackage{undolabl}[2015/03/29]% v1.01
```

We use the `rerunfilecheck` package by HEIKO OBERDIEK to make sure that the user gets and sees the rerun warnings (if any).

```
973 \RequirePackage{rerunfilecheck}[2011/04/15]% v1.7
```

We must not forget to give the source of `Prelim@EveryShipout`:

```
974 %% pageslts package uses Prelim@EveryShipout code from the
975 %% prelim2e package [2009/05/29 v1.3] by Martin Schröder, thanks!
976
```

About the `prelim2e` package by MARTIN SCHRÖDER see subsection 7.1.

A last information for the user(s):

```
977 %% pageslts may work with earlier versions of those packages,
978 %% but this was not tested. Please consider updating your packages
979 %% to the most recent version (if they are not already the most
980 %% recent version).
981
```

See subsection 7.1 about how to get them.

The very old version 2.0 (and earlier) of the `endfloat` package actually redefined the `\enddocument` command, and so interfered drastically with the  $\LaTeX 2_{\epsilon}$  commands which make use of `\AtEndDocument`. Newer versions of `endfloat` exists (at the time of writing this documentation: v2.5d as of 2011/12/25) in modern documentation form, which are available from <https://www.CTAN.org> (see subsection 7.1). A note is placed here, and later it is checked whether a (very) old `endfloat` package is in use. If it is, a warning or even an error message is given, depending on `endfloat` version. This assumes, that the old versions of `endfloat` at least gave a version date, of course.

```

982 %% The recent version of the endfloat package is v2.5d as of 2011/12/25.
983 %% The pageslts package is not fully compatible with version 2.0
984 %% (and earlier) of the endfloat package, because those versions
985 %% redefined the \enddocument command.
986

```

The options are introduced:

```

987 \SetupKeyvalOptions{family = pagesLTS,prefix = pagesLTS@}
988 \DeclareBoolOption[true]{pagecontinue}% \pagesLTS@pagecontinue
989 \DeclareStringOption[ab]{alphMult}
990 \DeclareStringOption[AB]{AlphMulti}
991 \DeclareBoolOption[true]{romanMult}
992 \DeclareBoolOption[true]{RomanMulti}
993 \DeclareBoolOption[true]{fnsymbolmult}
994
995 \ProcessKeyvalOptions*
996

```

For comparisons, zero, one, two and three are defined (`\z@`, `\@one` and so on do not work for this).

```

997 \def\pagesLTS@zero{0}
998 \def\pagesLTS@one{1}
999 \def\pagesLTS@two{2}
1000 \def\pagesLTS@three{3}
1001

```

The traditional behaviour is a reset of the page number to one, each time the page numbering scheme changes. The option `pagecontinue` changes this to a continuation with the number/name following the last page number/name of the same page numbering scheme. The user is informed accordingly.

```

1002 \ifpagesLTS@pagecontinue%
1003   \PackageInfo{pageslts}{Option pagecontinue enabled\MessageBreak%
1004     (maybe by default):\MessageBreak%
1005     The pageslts package will continue the page numbering,\MessageBreak%
1006     when the same page numbering scheme is used twice.\MessageBreak%
1007     If you do not want this, call pageslts with option\MessageBreak%
1008     pagecontinue=false (or use \string\setcounter{page}=1).\MessageBreak%
1009   }
1010 \else

```

```

1011 \PackageWarningNoLine{pageslts}{Option pagecontinue is false:\MessageBreak%
1012   The pageslts package was used, but the option\MessageBreak%
1013   pagecontinue was set to false.\MessageBreak%
1014   If you want the page numbers to be continued,\MessageBreak%
1015   when the same page numbering scheme is used twice,\MessageBreak%
1016   please call pageslts with option pagecontinue=true,\MessageBreak%
1017   otherwise the page number is reset to one each time\MessageBreak%
1018   the page numbering scheme is changed.\MessageBreak%
1019   For details please see the documentation%
1020 }
1021 \fi
1022

```

The page number printed in `alph` or in `Alph` page numbering scheme had to be  $> 0$  and  $< 27$ . Now the `alphalph` package allows to extend the numbering scheme (not only for pages). Because some users prefer `aa`, `ab`, `ac`, `ad`,... and some `aa`, `bb`, `cc`, `dd`,..., both schemes can be chosen via the options. The `fnsymbol` page numbering scheme was restricted to values  $> 0$  and  $< 10$ . The `alphalph` package allows to extend this page numbering scheme, too. Option `fnsymbolmult` can be chosen with the `pageslts` package. If no extension is wished (or another extension is wished and implemented manually), `pageslts` can be called with options set to 0 (zero) and false: `alphMult=0`, `AlphMulti=0`, `fnsymbolmult=false`.

```

1023 \def\pagesLTS@ab{ab}
1024 \def\pagesLTS@bb{bb}
1025 \def\pagesLTS@ABi{AB}
1026 \def\pagesLTS@BBi{BB}
1027
1028 \ifx\pagesLTS@alphMult\pagesLTS@ab%
1029 \else
1030   \ifx\pagesLTS@alphMult\pagesLTS@bb%
1031   \else
1032     \ifx\pagesLTS@alphMult\pagesLTS@zero%
1033       \PackageWarningNoLine{pageslts}{%
1034         Option alphMult=0 found:\MessageBreak%
1035         The pageslts package was used, but the option\MessageBreak%
1036         alphMult was set to 0 (zero).\MessageBreak%
1037         If you want the page numbers to be extended\MessageBreak%
1038         after z, you have to organize this yourself now.\MessageBreak%
1039         For automatic continuation, please use the\MessageBreak%
1040         alphalph package and call pageslts\MessageBreak%
1041         with option alphMult=ab (for aa, ab, ac, ad,...) or\MessageBreak%
1042         with option alphMult=bb (for aa, bb, cc, dd,...).\MessageBreak%
1043         For details please see the documentation!%
1044       }
1045     \else
1046       \PackageError{pageslts}{Unknown option value}{%
1047         The pageslts package was used with option\MessageBreak%
1048         alphMult= \pagesLTS@alphMult . Only values\MessageBreak%
1049         ab, bb, and 0 (zero) are valid.\MessageBreak%
1050         The default ab is set.\MessageBreak%

```



```

1051     For details please see the documentation!%
1052   }
1053   \setkeys{pagesLTS}{alphMult=ab}
1054   \fi
1055 \fi
1056 \fi
1057
1058 \ifx\pagesLTS@AlphMulti\pagesLTS@ABi%
1059 \else
1060   \ifx\pagesLTS@AlphMulti\pagesLTS@BBi%
1061   \else
1062     \ifx\pagesLTS@AlphMulti\pagesLTS@zero%
1063       \PackageWarningNoLine{pageslts}{%
1064         Option AlphMulti=0 found:\MessageBreak%
1065         The pageslts package was used, but the option\MessageBreak%
1066         AlphMulti was set to 0 (zero).\MessageBreak%
1067         If you want the page numbers to be extended\MessageBreak%
1068         after Z, you have to organize this yourself now.\MessageBreak%
1069         For automatic continuation, please use the\MessageBreak%
1070         alphalph package and call pageslts\MessageBreak%
1071         with option AlphMulti=AB (for AA, AB, AC, AD,...) or\MessageBreak%
1072         with option AlphMulti=BB (for AA, BB, CC, DD,...).\MessageBreak%
1073         For details please see the documentation!%
1074       }
1075     \else
1076       \PackageError{pageslts}{Unknown option value}{%
1077         The pageslts package was used with option\MessageBreak%
1078         AlphMulti= \pagesLTS@AlphMulti . Only values\MessageBreak%
1079         AB, BB, and 0 (zero) are valid.\MessageBreak%
1080         The default AB is set.\MessageBreak%
1081         For details please see the documentation!%
1082       }
1083     \setkeys{pagesLTS}{AlphMulti=AB}
1084   \fi
1085 \fi
1086 \fi
1087

```

If `alph` or `Alph` or `fnsymbol` page numbers shall be continued, the `alphalph` package is required.

```

1088 \ifx\pagesLTS@alphMult\pagesLTS@zero% \relax
1089 \else \RequirePackage{alphalph}[2011/05/13]% v2.4
1090 \fi
1091
1092 \ifx\pagesLTS@AlphMulti\pagesLTS@zero% \relax
1093 \else \RequirePackage{alphalph}[2011/05/13]% v2.4
1094 \fi
1095
1096 \ifpagesLTS@fnsymbolmult%

```

For the roman page numbering scheme, it is just the choice of an extension by pageslts or not.

```

1100 \ifpagesLTS@romanMult%
1101   \PackageInfo{pageslts}{Option romanMult enabled\MessageBreak%
1102     (maybe by default):\MessageBreak%
1103     The pageslts package will extend the page numbering\MessageBreak%
1104     of the roman scheme below i with\MessageBreak%
1105     0, -i, -ii, -iii, -iv,...\MessageBreak%
1106     If you do not want this, call pageslts with option\MessageBreak%
1107     romanMult=false.\MessageBreak%
1108   }
1109 \else
1110   \PackageWarningNoLine{pageslts}{Option romanMult is set to false:\MessageBreak%
1111     The pageslts package was used, but the option\MessageBreak%
1112     romanMult was set to false.\MessageBreak%
1113     If you want the page numbering of the roman scheme\MessageBreak%
1114     to be extended below i,\MessageBreak%
1115     please call pageslts with option romanMult=true,\MessageBreak%
1116     otherwise zero and negative page numbers of the\MessageBreak%
1117     roman scheme will need to be defined otherwise.\MessageBreak%
1118     For details please see the documentation!\MessageBreak%
1119   }
1120 \fi
1121
```

Same for the Roman page numbering scheme.

```

1122 \ifpagesLTS@RomanMulti%
1123   \PackageInfo{pageslts}{Option RomanMulti enabled\MessageBreak%
1124     (maybe by default):\MessageBreak%
1125     The pageslts package will extend the page numbering\MessageBreak%
1126     of the Roman scheme below I with\MessageBreak%
1127     0, -I, -II, -III, -IV,...\MessageBreak%
1128     If you do not want this, call pageslts with option\MessageBreak%
1129     RomanMulti=false.\MessageBreak%
1130   }
1131 \else
1132   \PackageWarningNoLine{pageslts}{Option RomanMulti is set to false:\MessageBreak%
1133     The pageslts package was used, but the option\MessageBreak%
1134     RomanMulti was set to false.\MessageBreak%
1135     If you want the page numbering of the Roman scheme\MessageBreak%
1136     to be extended below i,\MessageBreak%
1137     please call pageslts with option RomanMulti=true,\MessageBreak%
1138     otherwise zero and negative page numbers of the\MessageBreak%
1139     Roman scheme will need to be defined otherwise.\MessageBreak%
1140     For details please see the documentation!\MessageBreak%

```

```

1141   }
1142 \fi
1143

```

For the footnotesymbol page numbering scheme, it is also just the choice of a extension by pageslts or not.

```

1144 \ifpagesLTS@fnsymbolmult%
1145   \PackageInfo{pageslts}{Option fnsymbolmult enabled\MessageBreak%
1146     (maybe by default):\MessageBreak%
1147     The pageslts package will extend the page numbering\MessageBreak%
1148     of the footnotesymbol scheme using the alphas\MessageBreak%
1149     package.\MessageBreak%
1150     If you do not want this, call pageslts with option\MessageBreak%
1151     fnsymbolmult=false.\MessageBreak%
1152   }
1153 \else
1154   \PackageWarningNoLine{pageslts}{%
1155     Option fnsymbolmult is set to false:\MessageBreak%
1156     The pageslts package was used, but the option\MessageBreak%
1157     fnsymbolmult was set to false.\MessageBreak%
1158     If you want the page numbering of the footnotesymbol\MessageBreak%
1159     scheme to be extended using the alphas package,\MessageBreak%
1160     please call pageslts with option fnsymbolmult=true,\MessageBreak%
1161     otherwise page numbers of the footnotesymbol scheme\MessageBreak%
1162     greater than nine will need to be defined otherwise.\MessageBreak%
1163     For details please see the documentation!\MessageBreak%
1164   }
1165 \fi
1166

```

Now defining some variables, place-holders, and abbreviations:

```

1167 \def\pagesLTS@pnc{0}
1168 \def\pagesLTS@called{0}
1169 \def\pagesLTS@fns{fnsymbol}
1170 \def\pagesLTS@alph{alph}
1171 \def\pagesLTS@Alph{Alph}
1172 \def\pagesLTS@rerun{0}
1173 \def\pagesLTS@eso{0}
1174 \def\pagesLTS@esov{0}
1175 \def\lastpageref{\lastpagereftxt}
1176 \def\pagesLTS@undolable{none}
1177 \def\pncmissing{0}
1178 \def\pagesLTS@SK{0}
1179 \def\pagesLTS@messageNPN{%
1180   The pageslts package was used, but\MessageBreak%
1181   \string\pagenumbering \MessageBreak%
1182   was not called at the beginning of the document\MessageBreak%
1183   (maybe earlier or later).\MessageBreak%
1184   Please use \string\pagenumbering \MessageBreak%

```

```

1185 (with an argument like arabic, roman, Roman,\MessageBreak%
1186 fnsymbol, alph, or Alph) at the beginning\MessageBreak%
1187 of your document! Otherwise your document\MessageBreak%
1188 will probably compile, but the pageslts\MessageBreak%
1189 package might not be able to get all labels\MessageBreak%
1190 for the references to the respective pages\MessageBreak%
1191 right.\MessageBreak%
1192 }
1193

```

It is checked whether writing to files is allowed. The `pageslts` package cannot be used without that! Some packages (e.g. `tikz` and `selectp`) sometimes prevent the output to the aux file. In that case a warning or an error message is issued. This is no problem as long as there is/was another compilation run where the labels can/could be processed via the aux file. If it is allowed to write to the aux file, we define `\pagesLTS@loaded` as `p@gesLTSnotlo@d`ed for the next compilation run.

```

1194 \AtBeginDocument{%
1195   \if@filesw%

```

```

then \relax.

```

When writing to files is not allowed, nothing can be done. But when the labels were already processed via the aux file, nothing needs to be done (if enough compilation runs have been done before).

```

1196   \else%
1197     \@ifpackageloaded{tikz}{%
1198       \PackageWarning{pageslts}%
1199         {It was not allowed to write to an\MessageBreak%
1200          .aux file. This package does not work without access\MessageBreak%
1201          to an .aux file.\MessageBreak%
1202          It is OK if the .aux file was already updated\MessageBreak%
1203          by a previous compiler run\MessageBreak%
1204          and would not have changed anyway.\MessageBreak%
1205         }%
1206     }{\PackageError{pageslts}{No writing to auxiliary file allowed}%
1207      {It was not allowed to write to an .aux file.\MessageBreak%
1208       This package does not work without access to an .aux file.\MessageBreak%
1209       Press Ctrl+Z to exit.\MessageBreak%
1210       But it is OK if the .aux file was already updated\MessageBreak%
1211       by previous compiler runs\MessageBreak%
1212       and would not have changed anyway.\MessageBreak%
1213       (In that case just press Enter or Return\MessageBreak%
1214       to continue the compilation.)\MessageBreak%
1215      }%
1216   }%
1217   \fi%
1218 }
1219

```

`\pagenumbering` To keep the original meaning of `\pagenumbering`:

```

1220 \LetLtxMacro{\OrigPagenumbering}{\pagenumbering}

```

Defining some new counters (and doing related things):

```
1222 \newcounter{CurrentPage}
1223 \setcounter{CurrentPage}{1}
1224 \def\theCurrentPageLocal{\arabic{pagesLTS.current.local.\pagesLTS@pnc}}
```

The counter `pagesLTS.pagenr` is for saving the total page number of the last page in the `.aux` file.

```
1225 \newcounter{pagesLTS.pagenr}
```

While generally `\pagesLTS@ifcounter{pagesLTS.current.local.\pagesLTS@pnc}` is used, for the beginning of the document `pagesLTS.current.local.0` is predefined. (A `\pagesLTS@ifcounter{pagesLTS.current.local.\pagesLTS@pnc}` could be used for this, too, but we know that `pagesLTS.current.local.0` was not defined, so we can just do the definition here.) And the first local page gets the number one.

```
1226 \newcounter{pagesLTS.current.local.0}
1227 \setcounter{pagesLTS.current.local.0}{1}
```

And the same again for `pagesLTS.pnc.0`.

```
1228 \newcounter{pagesLTS.pnc.0}
1229
```

`\xroman` When `\roman{...}` is used with a value  $< 1$ , L<sup>A</sup>T<sub>E</sub>X just ignores this (see subsection 3.7). Here we provide a command `\xroman{...}` (expanded roman), which gives the usual `\roman` numbers (i, ii, iii, iv, ...) for positive values, `-|...|` (i. e. -i, -ii, -iii, -iv, ...) for negative values, and 0 for all other values (which should be zero).

```
1230 \newcommand{\xroman}[1]{%
1231   \ifnum\value{#1}>0%
1232     \roman{#1}%
1233   \else%
1234     \ifnum\value{#1}<0%
```

`\arabic{#1}` gives the arabic number of argument `#1`, which is negative here (for example  $-7$ ), “-” puts another minus sign in front of it (for example  $--7$ ), `\number` removes all unnecessary preceding zeros, plus and minus signs (for example 7), `\romannumeral` turns it into a roman number (for example vii), and “-” puts the minus sign back in front of it (for example -vii).

```
1235     -\romannumeral\number-\arabic{#1}%
1236   \else%
1237     0%
1238   \fi%
1239 \fi%
1240 }
1241
```

`\XRoman` `\XRoman` does the same for uppercase `\Roman` numbers. `-\uppercase{\romannumeral\number-\arabic{#1}}` cannot be used, because the result in the example is `-\uppercase{vii}` and not `-VII`.<sup>5</sup> Therefore we have a look at L<sup>A</sup>T<sub>E</sub>X's own `\@Roman\FOOcounter`,

```
\def\@Roman#1{\expandafter\@slowromancap\romannumeral #1@},
```

and use `\@slowromancap`, which is a fully expandable macro, to do the trick for this:

```
\def\@slowromancap#1{\ifx @#1% then terminate
\else
\if i#1I\else\if v#1V\else\if x#1X\else\if l#1L\else\if
c#1C\else\if d#1D\else \if m#1M\else#1\fi\fi\fi\fi\fi\fi\fi
\expandafter\@slowromancap
\fi
}
```

” (1998/05/16 Version v1.1g LaTeX Kernel File m ltcounets.dtx 105 Counters and Lengths).

```
1242 \newcommand{\XRoman}[1]{%
1243   \ifnum\value{#1}>0%
1244     \Roman{#1}%
1245   \else%
1246     \ifnum\value{#1}<0%
1247       -\expandafter\@slowromancap\romannumeral\number-\arabic{#1}@%
1248     \else%
1249       0%
1250     \fi%
1251   \fi%
1252 }
1253
```

`\XXRoman` In older versions `\XXRoman` was used. For compatibility, it is forwarded to `\XRoman` and an error message is given.

```
1254 \newcommand{\XXRoman}[1]{\XRoman{#1}%
1255   \PackageError{pageslts}{Old command \string\XXRoman\space found}{Replaced by \string\XRoman.}%
1256 }
1257
```

`\pagesLTS@ifcounter` We provide a way to create counters like

```
pagesLTS.pnc. page - pagesLTS.pnc.<page numbering scheme>, e.g. pagesLTS.pnc.Roman,
  numbering scheme
pagesLTS.double. page - pagesLTS.double.<page numbering scheme>, e.g. pagesLTS.double.Roman,
  numbering scheme
PageCurrentLocal. page - PageCurrentLocal.<page numbering scheme>, e.g. PageCurrentLocal.Roman,
  numbering scheme
```

for all page numbering schemes, even those not supported by the current original `\pagenumbering` (1994/05/19 v1.1a LaTeX Kernel File w ltpageno.dtx 52 Page Numbering), which is

---

<sup>5</sup>This does not matter for the print out, but for the display of the logical page numbers as well as the `.aux` file.

```

\countdef\c@page=0 \c@page=1
\def\cl@page{}
\def\pagenumbering#1{%
  \global\c@page \@ne \gdef\thepage{\csname @#1\endcsname
\c@page}}

```

```

1258 \newcommand{\pagesLTS@ifcounter}[1]{%
1259   \@ifundefined{c@#1}{\newcounter{#1}}{\relax}%
1260 }
1261

```

`\lastpages` We provide a command to give the number of pages in a sector of a split page numbering scheme (see page 9, `pagesLTS.<page numbering scheme>.<number>.local.cnt`):

```

1262 \newcommand{\lastpages}[2]{%
1263   \pagesLTS@ifcounter{pagesLTS.#1.#2.local.cnt}%
1264   \arabic{pagesLTS.#1.#2.local.cnt}%
1265 }
1266

```

`\pagesLTS@writelabel` At last defining the writing of a label:

```

1267 \newcommand{\pagesLTS@writelabel}[1]{%
1268   \addtocounter{page}{+1}%

```

`\addtocounter{page}{+1}` because `\pagesLTS@putlabel` includes an `\addtocounter{page}{-1}`, which is not necessary here.

Into the `.aux` file something like

```

\newlabel{pagesLTS.Roman}{\theCurrentPageLocal}{page.VIII}

```

is written, thus `\lastpageref{pagesLTS.Roman}` prints VIII and links to page.VIII.

```

1269 \pagesLTS@putlabel{pagesLTS.#1}{\thepage}{1}
1270 \addtocounter{page}{-1}%
1271 \ifx\pagesLTS@pnc\pagesLTS@zero% \relax

```

i. e. if the current page numbering scheme is “0”, i. e. before the first `\pagenumbering{...}` command, do nothing,

```

1272 \else%
1273   \addtocounter{page}{+1}%
1274   \pagesLTS@putlabel{pagesLTS.#1.local}{\theCurrentPageLocal}{1}

```

otherwise write into the `.aux` file something like

```

\newlabel{pagesLTS.arabic.local}{\theCurrentPageLocal}{page.8}

```

thus `\lastpageref{pagesLTS.arabic.local}` prints 5 and links to page.8. Here (and in the example file) it is not “print 8 and link to page.8”, because `\addtocounter{page}{3}` has been used, thus the page with “number” (name) 8 is the **fifth** (= 8 – 3) page.

```

1275   \addtocounter{page}{-1}%
1276   \fi%
1277 }
1278

```

`\erroralphalph` `\erroralphalph` extends the “numbers” of counters to zero and negative values for representations usually not supporting this: `\alphalph`, `\AlphAlph`, and `\fnsymbolmult` of the `alphalph` package. `\alph`, `\Alph`, and `\fnsymbol` would not support “numbers” below one. `\arabic` already supports negative numbers and zero. `\roman` and `\Roman` support neither negative numbers nor zero, but are expanded in this package (`\xroman` and `\XRoman`), see page 45.

```

1279
1280 %% The following code is from Heiko Oberdiek [2010/04/18],          %%
1281 %% expanding his alphalph package as of 2010/04/18, v2.3. (Thanks!) %%
1282 \newcommand*\erroralphalph[2]{%
1283   \ifnum\value{#2}>0%
1284     #1{\value{#2}}%
1285   \else%
1286     \ifnum\value{#2}<0%
1287       -#1{\expandafter\@gobble\the\value{#2}}%
1288     \else%
1289       0%
1290     \fi%
1291   \fi%
1292 }
1293 %% End of code from Heiko Oberdiek                                %%
1294 %% Check and Error/Warning messages have been moved to \EveryShipout, %%
1295 %% because messages inside e.g. the \pageref command can cause trouble. %%
1296

```

`\expandPagenumbering` Here the `\erroralphalph` command is called with the appropriate arguments for each page numbering scheme.

```

1297
1298 \newcommand*\expandPagenumbering[1]{%
1299   \let\OrigthePage\thePage%
1300   \def\pagesLTS@tmpC{arabic}%
1301   \ifx\pagesLTS@pnc\pagesLTS@tmpC% \relax
1302     \arabic already supports negative numbers and zero (-MAX...MAX, where MAX = 2 147 483 647).
1303   \else%
1304     \def\pagesLTS@tmpC{roman}%
1305     \ifx\pagesLTS@pnc\pagesLTS@tmpC%
1306       \ifpagesLTS@romanMult%
1307         \erroralphalph{\roman}{page} cannot be used, because -\roman{\expandafter\@gobble\the\value{page}} does not
1308         work. If option romanMult is not false, \xroman (see page 45) expands the usable roman page numbers to values below 1 (i, I,
1309         respectively), see subsection 2.1.3.
1306         \renewcommand*\thePage{\xroman{page}}%
1307       \fi%
1308     \else%
1309       \def\pagesLTS@tmpC{Roman}%

```



```

1310 \ifx\pagesLTS@pnc\pagesLTS@tmpC%
1311 \ifpagesLTS@RomanMulti%

```

The same for \Roman page numbering, expanded by \XRoman (see page 45).

```

1312 \renewcommand*{\thepage}{\XRoman{page}}%
1313 \fi%
1314 \else%
1315 \ifx\pagesLTS@pnc\pagesLTS@alph%

```

\alph and \Alph page numberings are expanded to negative and zero values, and to values greater than “z” or “Z” with the alphalph package. – If \pagesLTS@alphMult was zero, nothing is done.

```

1316 \ifx\pagesLTS@alphMult\pagesLTS@ab%
1317 \renewcommand*{\thepage}{\erroralphalph{\alphalph}{page}}%
1318 \else \ifx\pagesLTS@alphMult\pagesLTS@bb%
1319 \renewcommand*{\thepage}{\erroralphalph{\alphMult}{page}}%
1320 \fi%
1321 \fi%
1322 \else%
1323 \ifx\pagesLTS@pnc\pagesLTS@Alph%
1324 \ifx\pagesLTS@AlphMulti\pagesLTS@ABi%
1325 \renewcommand*{\thepage}{\erroralphalph{\AlphAlph}{page}}%
1326 \else \ifx\pagesLTS@AlphMulti\pagesLTS@BBi%
1327 \renewcommand*{\thepage}{\erroralphalph{\AlphMult}{page}}%
1328 \fi%
1329 \fi%
1330 \else%
1331 \ifx\pagesLTS@pnc\pagesLTS@fns%

```

Same for \fnsymbol page numbers.

```

1332 \ifpagesLTS@fnsymbolmult%
1333 \renewcommand*{\thepage}{\erroralphalph{\fnsymbolmult}{page}}%
1334 \fi%
1335 \else%

```

If the used page numbering scheme has not been recognized by the pageslts package so far, we can do nothing, and problems might result.

```

1336 \PackageError{pageslts}{unknown page numbering scheme}{%
1337 The pageslts package encountered the unknown\MessageBreak%
1338 page numbering scheme\MessageBreak%
1339 ‘#1’. \MessageBreak%
1340 If this is no typing mistake, it might work\MessageBreak%
1341 - or it might not work.\MessageBreak%
1342 \@ehc%
1343 }
1344 \fi%
1345 \fi%

```

```

1346     \fi%
1347     \fi%
1348     \fi%
1349     \fi%
1350     \let\pagesLTS@tmpC\undefined%
1351   }
1352

```

`\pagenumbering` Now for the **new** version of the `\pagenumbering` command:

```

1353 \renewcommand{\pagenumbering}[1]{%

```

If the current page numbering scheme, `\pagesLTS@pnc`, or the requested page numbering scheme, `#1`, is `\pagesLTS@fns`, i. e. `fnsymbol`, the counter `pagesLTS.fnsymbol.local` is needed. If it does not exist yet, it is created here.

```

1354   \edef\pagesLTS@tmpA{#1}%
1355   \ifx\pagesLTS@pnc\pagesLTS@fns%
1356     \pagesLTS@ifcounter{pagesLTS.fnsymbol.local}%
1357   \fi%
1358   \ifx\pagesLTS@tmpA\pagesLTS@fns%
1359     \pagesLTS@ifcounter{pagesLTS.fnsymbol.local}%
1360   \fi%

```

If the current page numbering scheme, `\pagesLTS@pnc`, and the requested page numbering scheme, `#1`, is the same one, nothing further is done, otherwise the real action begins.

```

1361   \ifx\pagesLTS@pnc\pagesLTS@tmpA% \relax
1362   \else%

```

The next code is executed, when we are at a page after the first one. This distinction is done for two reasons: On the one hand, `\pagenumbering` could be called *before* `\begin{document}` (where the current page should not be greater than one), and on the other hand we go one page back to aim all references to that page. Obviously at the first page there is no going backward.

```

1363     \ifnum \value{CurrentPage}>1%
1364       \addtocounter{page}{-1}%
1365       \addtocounter{pagesLTS.current.local.\pagesLTS@pnc}{-1}%

```

For the case that the page numbering scheme is or will be split, like e. g. the Roman one in the `pageslts-example.tex`, a counter like `pagesLTS.Roman.1.local.count` (or `pagesLTS.Roman.2.local.count`, `pagesLTS.Roman.3.local.count`,...) is introduced and set to the number of the local page.

```

1366     \newcounter{pagesLTS.\pagesLTS@pnc.\arabic{pagesLTS.pnc.\pagesLTS@pnc}.local.count}%
1367     \setcounter{pagesLTS.\pagesLTS@pnc.\arabic{pagesLTS.pnc.\pagesLTS@pnc}.local.count}{%
1368       \value{pagesLTS.current.local.\pagesLTS@pnc}}%

```

If the page numbering scheme is `fnsymbol`, and if it *was* used before, from said counter the number of pages of the preceding uses of the same page numbering scheme, `pagesLTS.\pagesLTS@pnc.done`, is subtracted (same as for the other schemes, see below). Instead of introducing a new counter (which can be problematic, when the number of available counters is limited), we borrow the `pagesLTS.pnc.0` counter, i. e. we save its value to `\pagesLTS@tmpa`, (ab)use the counter, and then set it back to its former value as saved in `\pagesLTS@tmpa`.

```

1369 \ifx\pagesLTS@pnc\pagesLTS@fns%
1370 \ifnum \value{pagesLTS.pnc.\pagesLTS@pnc}>1%
1371 \mathchardef\pagesLTS@tmpa=\arabic{pagesLTS.pnc.0}%
1372 \setcounter{pagesLTS.pnc.0}{\value{pagesLTS.pnc.\pagesLTS@pnc}}%
1373 \addtocounter{pagesLTS.pnc.0}{-1}%
1374 \addtocounter{pagesLTS.\pagesLTS@pnc.\arabic{pagesLTS.pnc.\pagesLTS@pnc}.local.count}{%
1375 -\value{pagesLTS.\pagesLTS@pnc.\arabic{pagesLTS.pnc.0}.local.count}}%
1376 \setcounter{pagesLTS.pnc.0}{\pagesLTS@tmpa}%
1377 \fi%

```

If the page numbering scheme is *not* fnsymbol, a numbered label is written:

```

1378 \else%
1379 \pagesLTS@writelabel{\pagesLTS@pnc.\arabic{pagesLTS.pnc.\pagesLTS@pnc}}%

```

If the page numbering scheme was *not* used before,

```

1380 \ifnum \value{pagesLTS.pnc.\pagesLTS@pnc}<2%

```

an unnumbered label is also written:

```

1381 \pagesLTS@writelabel{\pagesLTS@pnc}%

```

If the page numbering scheme *was* used before, from said counter the number of pages of the preceding uses of the same page numbering scheme, `pagesLTS.\pagesLTS@pnc.done`, is subtracted. Instead of introducing a new counter (which can be problematic, when the number of available counters is limited), we again borrow the `pagesLTS.pnc.0` counter (see above).

```

1382 \else%
1383 \mathchardef\pagesLTS@tmpa=\arabic{pagesLTS.pnc.0}%
1384 \setcounter{pagesLTS.pnc.0}{\value{pagesLTS.pnc.\pagesLTS@pnc}}%
1385 \addtocounter{pagesLTS.pnc.0}{-1}%
1386 \pagesLTS@ifcounter{pagesLTS.\pagesLTS@pnc.done}%
1387 \addtocounter{pagesLTS.\pagesLTS@pnc.done}{%
1388 \value{pagesLTS.\pagesLTS@pnc.\arabic{pagesLTS.pnc.0}.local.count}}%
1389 \addtocounter{pagesLTS.\pagesLTS@pnc.\arabic{pagesLTS.pnc.\pagesLTS@pnc}.local.count}{%
1390 -\value{pagesLTS.\pagesLTS@pnc.done}}%
1391 \setcounter{pagesLTS.pnc.0}{\pagesLTS@tmpa}%
1392 \fi%

```

The values are written to the `.aux` file (if writing is allowed: `\if@filesw`), because they must be available at the beginning of the document:

```

1393 \if@filesw%
1394 \immediate\write\@auxout{\string
1395 \pagesLTS@ifcounter{pagesLTS.\pagesLTS@pnc.\arabic{pagesLTS.pnc.\pagesLTS@pnc}.local.cnt}}%
1396 \fi%
1397 \edef\pagesLTS@tmpB{\arabic{pagesLTS.\pagesLTS@pnc.\arabic{pagesLTS.pnc.\pagesLTS@pnc}.local.count}}%
1398 \if@filesw%
1399 \immediate\write\@auxout{\string
1400 \setcounter{pagesLTS.\pagesLTS@pnc.\arabic{pagesLTS.pnc.\pagesLTS@pnc}.local.cnt}{\pagesLTS@tmpB}}%
1401 \fi%
1402 \fi%

```

For further code for the case of `fnsymbol` please see below (`\lastpagereftext`, page 54). The last page number is saved, in case the same page numbering scheme is continued later.

```
1403     \pagesLTS@ifcounter{pagesLTS.double.\pagesLTS@pnc}%
1404     \setcounter{pagesLTS.double.\pagesLTS@pnc}{\value{page}}%
```

We went back one page, so we must go forward again:

```
1405     \addtocounter{pagesLTS.current.local.\pagesLTS@pnc}{+1}%
1406     \addtocounter{page}{+1}%
```

The page numbering scheme `\pagesLTS@pnc` is now set to the new one, given by the user as argument with the `\pagenumbering{...}` command:

```
1407     \xdef\pagesLTS@pnc{#1}%
```

The new page numbering scheme is now started for real:

```
1408     \OrigPagenumbering{#1}%
```

If a page numbering scheme not known by the original `\pagenumbering{...}` command is used, an error will arise here - but maybe without error message.

If page numbering schem `\alph`, `\Alph`, or `\fnsymbol` is used, `pageslts` extends the page numbers according to the given options, using the `alphalph` package. `\arabic` does not need any expansion. `\roman` and `\Roman` at least receive a definition for zero.

```
1409     \expandPagenumbering{#1}%
```

Counters like `pagesLTS.pnc.Roman` are introduced:

```
1410     \pagesLTS@ifcounter{pagesLTS.pnc.\pagesLTS@pnc}%
```

The saved number of times this page numbering scheme was used is increased by one:

```
1411     \addtocounter{pagesLTS.pnc.\pagesLTS@pnc}{1}%
```

Now defining the counter `pagesLTS.double.\pagesLTS@pnc`, if it did not exist already, adding 1, because this is the first page of it (or another one, if the scheme is continued):

```
1412     \pagesLTS@ifcounter{pagesLTS.double.\pagesLTS@pnc}%
1413     \addtocounter{pagesLTS.double.\pagesLTS@pnc}{1}%
```

The page number is continued, if the option `pagecontinue=false` is **not** set, otherwise it is reset to one. Note that neither the local nor the current counter are reset, as they contain the real *values* and not the *names* of the pages.

```
1414     \ifpagesLTS@pagecontinue%
1415         \setcounter{page}{\value{pagesLTS.double.\pagesLTS@pnc}}%
1416     \else%
1417         \setcounter{page}{1}%
1418     \fi%
```

If it does not exist already, the counter `pagesLTS.current.local.\pagesLTS@pnc` (e.g. `pagesLTS.current.local.Roman`) is created.

```
1419     \pagesLTS@ifcounter{pagesLTS.current.local.\pagesLTS@pnc}%
```

If `pagesLTS.double.\pagesLTS@pnc` of the current page numbering scheme is equal to one, this is the first page of this page numbering scheme. Then `pagesLTS.current.local.\pagesLTS@pnc` (which was zero) is set to one.

```
1420     \ifnum \value{pagesLTS.double.\pagesLTS@pnc}=1%
1421         \setcounter{pagesLTS.current.local.\pagesLTS@pnc}{1}%
1422     \fi%
```

Otherwise, i. e. if `\value{CurrentPage}` is not  $>1$ , i. e. before the first page has shipped out:

```
1423     \else%
1424         %% before the first page has shipped out
```

The current page numbering scheme is defined by the argument of `\pagenumbering{...}`, which the user gave:

```
1425     \xdef\pagesLTS@pnc{#1}%
```

and the page numbering scheme set by the original page numbering command (1994/05/19 v1.1a LaTeX Kernel File `w lt-pageno.dtx` 52 Page Numbering), which resets the page number to one, but at the first page continuation does not make sense). Well, nearly the original page numbering command: `\OrigPagenumbering{\pagesLTS@pnc}` does not work, so we “expand” the `\OrigPagenumbering` command:

```
1426     \global\c@page \@ne\relax%
1427     \global\def\thepage{\csname \expandafter @\pagesLTS@pnc \endcsname \c@page}%
```

If a page numbering scheme is used, which is not known by  $\LaTeX$ , an error might arise here – but maybe without error message.

If page numbering scheme `\alph`, `\Alph`, or `\fnsymbol` is used, `pageslts` extends the page numbers according to the given options, using the `alphalph` package. `\arabic` does not need any expansion. `\roman` and `\Roman` at least receive a definition for zero.

```
1428     \expandPagenumbering{#1}
```

We are at the first page, so the page counters are set to one:

```
1429     \pagesLTS@ifcounter{pagesLTS.pnc.\pagesLTS@pnc}%
1430         \setcounter{pagesLTS.pnc.\pagesLTS@pnc}{1}%
1431     \pagesLTS@ifcounter{pagesLTS.double.\pagesLTS@pnc}%
1432         \setcounter{pagesLTS.double.\pagesLTS@pnc}{1}%
1433     \pagesLTS@ifcounter{pagesLTS.current.local.\pagesLTS@pnc}%
1434         \setcounter{pagesLTS.current.local.\pagesLTS@pnc}{1}%
1435     \fi%
```

Whether `\pagenumbering{...}` is called in the preamble, `\AtBeginDocument`, right after `\begin{document}`, or somewhere in the document, we want to remember *whether* it was called at all:

```
1436     \gdef\pagesLTS@called{1}%
1437     \fi%
```

We do not need the temporary definitions any more.

```
1438     \let\pagesLTS@tmpA\undefined%
1439     \let\pagesLTS@tmpB\undefined%
1440 }
1441
```

`\lastpageref*` If `hyperref` is used, but (some) references to some last page shall not be hyperlinked, a command `\lastpageref*` (analogous to `\pageref*`) is needed. Therefore we define (analogous to `\HyPsd@pageref` from the `hyperref` package by HEIKO OBERDIEK)

```
1442 %% analogous to \HyPsd@pageref from the hyperref package by Heiko Oberdiek:
1443 \def\lastpagereftxt#1{\pagesLTS@@pageref#1*}
1444
```

Macro `\pagesLTSpageref` checks, whether a star is present (analogous to `\HyPsd@@pageref` again from the `hyperref` package of HEIKO OBERDIEK):

```
1445 \def\pagesLTS@@pageref#1*#2\END{%
1446   \ifx\#2\% no star
1447   \pagesLTS@@pageref{#1}%
1448   \else% star
1449   \expandafter\pagesLTS@@pagerefstar%
1450   \fi%
1451 }
1452
1453 \def\pagesLTS@@pageref#1{\lastpagereftext{#1}}
1454 \def\pagesLTS@@pagerefstar#1{\lastpagereftextstar{#1}}
1455
```

`\lastpagereftext` When `\lastpageref` is used somewhere inside the `txt` (text), i.e. not at the last page, it is defined as `\lastpagereftxt` (see above). When the page numbering scheme is `fnsymbol`, and the `hyperref` package has been loaded, a `hyperref` instead of a label is used for the reference to `pagesLTS.fnsymbol.local.\arabic{pagesLTS.fnsymbol.local}`. (And if the `pagesLTS.fnsymbol.local` counter did not exist yet, it is created here.)

```
1456 \newcommand{\lastpagereftext}[1]{%
1457   \def\pagesLTS@tmpA{#1}%
1458   \def\pagesLTS@tmpB{pagesLTS.fnsymbol.local}%
1459   \ifx\pagesLTS@tmpA\pagesLTS@tmpB%
1460     \pagesLTS@ifcounter{pagesLTS.fnsymbol.local}%
1461     \ltx@ifpackageloaded{hyperref}{%
1462       \href{\#pagesLTS.fnsymbol.local.\arabic{pagesLTS.fnsymbol.local}}%
1463       {\arabic{pagesLTS.fnsymbol.local}}%

```

When the page numbering scheme is `fnsymbol`, but the `hyperref` package has *not* been loaded, just the arabic number of the `pagesLTS.fnsymbol.local` counter is given (because there will be no hyperlink anyway).

```
1464   }{\arabic{pagesLTS.fnsymbol.local}}%
```

Otherwise just the common `\pageref` is applied:

```
1465   \else%
1466   \pageref{#1}%
1467   \fi%
```

We do not need the temporary definitions any more.

```
1468 \let\pagesLTS@tmpA\undefined%
1469 \let\pagesLTS@tmpB\undefined%
```

```
1470 }
1471
```

`\lastpagereftextstar` And the same for the starred version, where no hyperlink is generated:

```
1472 \newcommand{\lastpagereftextstar}[1]{%
1473   \def\pagesLTS@tmpA{#1}%
1474   \def\pagesLTS@tmpB{pagesLTS.fnsymbol.local}%
1475   \ifx\pagesLTS@tmpA\pagesLTS@tmpB%
1476     \pagesLTS@ifcounter{pagesLTS.fnsymbol.local}%
1477     \arabic{pagesLTS.fnsymbol.local}%
1478   \else%
```

There is no `\pageref*` without `hyperref`.

```
1479   \ltx@ifpackageloaded{hyperref}{\pageref*{#1}}{\pageref{#1}}%
1480   \fi%
1481   \let\pagesLTS@tmpA\undefined%
1482   \let\pagesLTS@tmpB\undefined%
1483 }
1484
```

`\lastpagerefend` When the `hyperref` package is used and the page numbering scheme of the last page is `fnsymbol`, `\lastpageref` is defined as `\lastpagerefend`. Hyperrefs instead of labels are used for the reference to `fnsymbol` pages (including the last one).

Again it must be discriminated between unstarred form and starred form:

```
1485 \def\lastpagerefend#1{\pagesLTS@@pagerefend#1*END}
1486
1487 \def\pagesLTS@@pagerefend#1*#2\END{%
1488   \ifx\#2\% no star
1489     \pagesLTS@@pagerefend{#1}%
1490   \else% star
1491     \expandafter\pagesLTS@@pagerefendstar%
1492   \fi%
1493 }
1494
1495 \def\pagesLTS@@pagerefend#1{\l@stpagerefend{#1}}
1496 \def\pagesLTS@@pagerefendstar#1{\l@stpagerefendstar{#1}}
1497
```

`\l@stpagerefend` The unstarred form (i. e. with hyperlinks, if `hyperref` is loaded, otherwise without hyperlinks):

```
1498 \newcommand{\l@stpagerefend}[1]{%
1499   \def\pagesLTS@tmpA{#1}%
1500   \def\pagesLTS@tmpB{pagesLTS.fnsymbol.local}%
1501   \ifx\pagesLTS@tmpA\pagesLTS@tmpB%
1502     \pagesLTS@ifcounter{pagesLTS.fnsymbol.local}%
1503     \ltx@ifpackageloaded{hyperref}{%
1504       \href{\#pagesLTS.fnsymbol.local.\arabic{pagesLTS.fnsymbol.local}}%
```

```

1505     {\arabic{pagesLTS.fnsymbol.local}}%
1506   }\arabic{pagesLTS.fnsymbol.local}}%
1507 \else%
1508   \def\pagesLTS@tmpB{pagesLTS.fnsymbol}%
1509   \ifx\pagesLTS@tmpA\pagesLTS@tmpB%
1510     \ltx@ifpackageloaded{hyperref}{%
1511       \href{\#pagesLTS.fnsymbol.local.\arabic{pagesLTS.fnsymbol.local}}%
1512         {\pagesLTS.lastpage}%
1513     }\pageref{pagesLTS.fnsymbol}}%
1514 \else%
1515   \def\pagesLTS@tmpB{LastPage}%
1516   \ifx\pagesLTS@tmpA\pagesLTS@tmpB%
1517     \ltx@ifpackageloaded{hyperref}{%
1518       \href{\#pagesLTS.fnsymbol.local.\pagesLTS@eso}%
1519         {\pagesLTS.lastpage}%
1520     }\pageref{LastPage}}%
1521 \else%
1522   \def\pagesLTS@tmpB{VeryLastPage}%
1523   \ifx\pagesLTS@tmpA\pagesLTS@tmpB%
1524     \ltx@ifpackageloaded{hyperref}{%
1525       \href{\#pagesLTS.fnsymbol.local.\arabic{pagesLTS.fnsymbol.local}}%
1526         {\pagesLTS.lastpage}%
1527     }\pageref{VeryLastPage}}%
1528 \else%
1529   \def\pagesLTS@tmpB{LastPages}%
1530   \ifx\pagesLTS@tmpA\pagesLTS@tmpB%
1531     \ltx@ifpackageloaded{hyperref}{%
1532       \href{\#pagesLTS.fnsymbol.local.\arabic{pagesLTS.fnsymbol.local}}%
1533         {\arabic{pagesLTS.pagenr}}%
1534     }\pageref{LastPages}}%
1535 \else%
1536   \pageref{#1}%
1537 \fi%
1538 \fi%
1539 \fi%
1540 \fi%
1541 \fi%

```

We do not need the temporary definitions any more.

```

1542 \let\pagesLTS@tmpA\undefined%
1543 \let\pagesLTS@tmpB\undefined%
1544 }
1545

```



`\l@stpagerefendstar` And the starred form, without hyperlinks, even if `hyperref` is loaded, otherwise (i. e. without loaded `hyperref`) this command is not called:

```
1546 \newcommand{\l@stpagerefendstar}[1]{%
1547   \def\pagesLTS@tmpA{#1}%
1548   \def\pagesLTS@tmpB{pagesLTS.fnsymbol.local}%
1549   \ifx\pagesLTS@tmpA\pagesLTS@tmpB%
1550     \pagesLTS@ifcounter{pagesLTS.fnsymbol.local}%
1551     \arabic{pagesLTS.fnsymbol.local}%
1552   \else%
1553     \def\pagesLTS@tmpB{pagesLTS.fnsymbol}%
1554     \ifx\pagesLTS@tmpA\pagesLTS@tmpB%
1555       \ltx@ifpackageloaded{hyperref}{\pageref*{pagesLTS.fnsymbol}}{%
1556         \pageref{pagesLTS.fnsymbol}}%
1557     \else%
1558       \def\pagesLTS@tmpB{LastPage}%
1559       \ifx\pagesLTS@tmpA\pagesLTS@tmpB%
1560         \ltx@ifpackageloaded{hyperref}{\pageref*{LastPage}}{\pageref{LastPage}}%
1561       \else%
1562         \def\pagesLTS@tmpB{VeryLastPage}%
1563         \ifx\pagesLTS@tmpA\pagesLTS@tmpB%
1564           \ltx@ifpackageloaded{hyperref}{\pageref*{VeryLastPage}}{%
1565             \pageref{VeryLastPage}}%
1566         \else%
1567           \def\pagesLTS@tmpB{LastPages}%
1568           \ifx\pagesLTS@tmpA\pagesLTS@tmpB%
1569             \ltx@ifpackageloaded{hyperref}{\pageref*{LastPages}}{\pageref{LastPages}}%
1570           \else%
1571             \ltx@ifpackageloaded{hyperref}{\pageref*{#1}}{\pageref{#1}}%
1572           \fi%
1573         \fi%
1574       \fi%
1575     \fi%
1576   \fi%
1577 \fi%
1578 \let\pagesLTS@tmpA\undefined%
1579 \let\pagesLTS@tmpB\undefined%
1580 }
1581
```

`\overrideLTSlabel` `\overridelabel` from the `undolabl` package just `\undonewlabels` a label and places a new `\label{#1}`, but we need to place a `\pagesLTS@putlabel{#1}{#2}`, therefore we need another command instead of (but somewhat similar to) `\overridelabel`:

```

1582 % somewhat analogous to \overridelabel from the undolabl package:
1583 \newcommand\overrideLTSlabel[2]{%
1584   \@bsphack
1585   \ifnum \value{pagesLTS.pnc.\pagesLTS@pnc}>1%
1586     \edef\pagesLTStmpA{#1}%
1587     \edef\pagesLTStmpB{pagesLTS.\pagesLTS@pnc.local}%
1588     \ifx\pagesLTStmpA\pagesLTStmpB%
1589       \immediate\write\@auxout{\string\undonewlabel{#1}}%
1590       \@overriddenmessage s{#1}%
1591     \fi%
1592   \fi%
1593   \pagesLTS@putlabel{#1}{#2}{0}%
1594   \@esphack%
1595 }
1596

```

`LTS@Prelim@EveryShipout` Because we cannot make references to pages with `fnsymbol` page “numbers” manually with `hyperref`, we use `\phantomsections` and refer to one of those. But because we do not know how many `\phantomsections` and `\section*s` are introduced by the user (or other packages; cf. L<sup>A</sup>T<sub>E</sub>X bug 2298: knowing level of `section*`, <http://www.latex-project.org/cgi-bin/ltxbugs2html?category=LaTeX&responsible=anyone&state=open&keyword=&pr=latex%2F2298&search=>), we cannot refer to the last one as we did with the pages.

```

1597 \newcommand{\@pagesLTS@Prelim@EveryShipout}{%
1598 %% The following code is from the prelim2e package           %%
1599 %% [2009/05/29 v1.3] by Martin Schröder (Thanks!):          %%
1600   \bgroup
1601     \dimen\z@=\wd\@cclv
1602     \dimen\@ne=\ht\@cclv
1603     \dimen\tw@=\dp\@cclv
1604     \dimen\thr@@=\dimen1
1605     \advance\dimen\thr@@ by \dimen\tw@
1606     \global\setbox\@cclv\vbox to \dimen\thr@@{%
1607       \hb@xt@\dimen\z@{%
1608         \box\@cclv%
1609         \hss%
1610       }%
1611       \vbox to \z@{%
1612         \hb@xt@\dimen\z@{%
1613           \let\protect\relax
1614 %% Code not from prelim2e package:                               %%

```

Therefore each page with `fnsymbol` page “number” receives a `\phantomsection` and a label, which includes a number increased by one for each page. This is done for `pagesLTS.fnsymbol.local.\arabic{pagesLTS.fnsymbol.cont}` as well as `pagesLTS.fnsymbol`, `pagesLTS.\pagesLTS@pnc`, and `pagesLTS.\pagesLTS@pnc.local`. In case an older label already existed, it is overwritten by an `\overridelabel` command.

```

1615 \ifx\pagesLTS@pnc\pagesLTS@fns%
1616 \pagesLTS@ifcounter{pagesLTS.fnsymbol.cont}%
1617 \addtocounter{pagesLTS.fnsymbol.cont}{1}%
1618 \ltx@ifpackageloaded{hyperref}{%
1619 \phantomsection%
1620 \hypertarget{pagesLTS.fnsymbol.local.\arabic{pagesLTS.fnsymbol.cont}}{}%
1621 }{}%
1622 \ifnum \pagesLTS@esov=\pagesLTS@zero%
1623 \label{pagesLTS.fnsymbol}%
1624 \else%
1625 \overridelabel{pagesLTS.fnsymbol}%
1626 \fi%
1627 \else%
1628 \ltx@ifpackageloaded{hyperref}{\phantomsection}{}%
1629 \if@files%
1630 \overridelabel{pagesLTS.\pagesLTS@pnc}%

```

We need to go forward one page (and later backward again), because `\overrideLTSlabel` calls a `\pagesLTS@putlabel`, and that one uses `\addtocounter{page}{-1}... \addtocounter{page}{+1}`, which is not needed here.

```

1631 \addtocounter{page}{+1}%
1632 \overrideLTSlabel{pagesLTS.\pagesLTS@pnc.local}{\theCurrentPageLocal}%
1633 \addtocounter{page}{-1}%
1634 \fi%
1635 \fi%
1636 %% Code from prelim2e package again: %%
1637 }%
1638 \vss%
1639 }%
1640 \vss%
1641 }%
1642 \wd\@cclv=\dimen\z@
1643 \ht\@cclv=\dimen\@ne
1644 \dp\@cclv=\dimen\tw@
1645 \egroup
1646 %% End of code from the prelim2e package. %%
1647 }
1648

```

`\EveryShipout` At the end of each shipout, the following commands are executed:

```
1649 \EveryShipout{%
1650   \ifnum\value{page}>0% \relax
1651   \else%
1652     \ifnum\value{page}=0%
1653       \PackageWarning{pageslts}{%
1654         Counter 'page' is zero!\MessageBreak%
1655         If the page numbering scheme is not arabic\MessageBreak%
1656         and further not extended\MessageBreak%
1657         (see Page counter overflow in the pageslts\MessageBreak%
1658         documentation), without other measures\MessageBreak%
1659         this will lead to a counter overflow.\MessageBreak%
1660       }%
1661     \else%
1662       \ifnum\value{page}<0%
1663         \PackageWarning{pageslts}{%
1664           Counter 'page' is negative: '\the\value{page}'!\MessageBreak%
1665           If the page numbering scheme is not arabic\MessageBreak%
1666           and further not extended\MessageBreak%
1667           (see Page counter overflow in the pageslts\MessageBreak%
1668           documentation), without other measures\MessageBreak%
1669           this will lead to a counter overflow.\MessageBreak%
1670         }%
1671       \else%
1672         \PackageError{pageslts}{%
1673           Counter 'page' does not have a recognized value:\MessageBreak%
1674           '\the\value{page}'\MessageBreak%
1675           \@ehd \MessageBreak%
1676         }%
1677       \fi%
1678     \fi%
1679   \fi%
```

If the `CurrentPage` is equal to one, this is the first shipout.

```
1680 \ifnum \value{CurrentPage}=1% This is the first shipout!
```

We check whether some page numbering scheme was defined by `\pagenumbering{...}` (as it should be!):

```
1681 \ifx\pagesLTS@called\pagesLTS@zero%
```

If it was not defined (i. e. `\pagesLTS@called` is zero), the user should be informed, that a `\pagenumbering{...}` is missing behind `\begin{document}`. Of course, it is possible that some package did some pages of output with `\AtBeginDocument`. In that case, one `\pagenumbering{...}` before `\begin{document}` and one `\pagenumbering{...}` (with the same argument, of course!) behind `\begin{document}` could help somewhat. When `\PackageError` was used here, the error message was not written to the screen and the `.log`-file, but into the document. Therefore we just make a note to give the error message later (`\AtEndDocument`). At that time unfortunately most of the document has already been compiled (or did not compile due to this error), but I do not know how to change that.

```
1682 \global\def\pncmissing{1}%
```

We save the current value of the page,

```
1683 \mathchardef\pagesLTS@tmpD=\arabic{page}%
```

determine the current page numbering scheme,

```
1684 %% Code from Andres L\{o}h, Universiteit Utrecht (NL) %%
1685 \def\extract#1{\expandafter\extract@ #1\END}%
1686 \def\extract@#1\csname @#2\endcsname#3\END{#2}%
1687 \edef\pagesLTS@tmpQ{\extract\thepage}%
1688 %% End of code from Andres L\{o}h %%
1689 \let\pagesLTS@tmpP\pagesLTS@tmpQ%
```

set the current page numbering scheme to 0 (because before the beginning of the document it should be 0),

```
1690 \def\pagesLTS@pnc{0}%
```

and then issue a `\pagenumbering` command with the determined page numbering scheme as argument:

```
1691 \pagenumbering{\pagesLTS@tmpP}%
```

This resets the page to one (if option `pagecontinue=false` was chosen), but because we do not start a new page numbering scheme here but manifest a page numbering scheme, which the user forgot to define, the page number should not have been reset to one. (This is the first page, but maybe the user wants it to have page number 2001?) Therefore we revert this here and set the page number to its value, which was saved before the `\pagenumbering` command.

```
1692 \setcounter{page}{\pagesLTS@tmpD}%
1693 \fi%
```

We are at the first page, so we put the label here.

```
1694 \pagesLTS@writelabel{0}%
1695 \fi%
```

If the current page numbering scheme `\pagesLTS@pnc` is `\pagesLTS@fns` (which is defined as `fnsymbol`), the label is set by `\@pagesLTS@Prelim@EveryShipout` (see just above), and `\pagesLTS@esov` is set to the (real) number (not the name) of this page numbering scheme, `\arabic{pagesLTS.fnsymbol.cont}`.

When no more pages with `fnsymbol` page “number” are shipped out, the value remains fixed and we have our reference to the last page of the `fnsymbol` page numbering range. (At least we will have that reference after some more work, see below).

```
1696 \ifx\pagesLTS@pnc\pagesLTS@fns%
1697 \@pagesLTS@Prelim@EveryShipout%
1698 \gdef\pagesLTS@esov{\arabic{pagesLTS.fnsymbol.cont}}%
```

When another page numbering scheme was reused (in the example file `Roman`), we also need to apply `\@pagesLTS@Prelim@EveryShipout`, because otherwise we would get multiply defined labels.

```
1699 \else%
1700 \ifnum \value{pagesLTS.pnc.\pagesLTS@pnc}>1%
1701 \@pagesLTS@Prelim@EveryShipout%
1702 \fi%
1703 \fi%
```

The `CurrentPage` as well as the `pagesLTS.current.local.\pagesLTS@pnc` are advanced by one (because one page was shipped out and the next is about to begin).

```
1704 \addtocounter{CurrentPage}{1}%
1705 \addtocounter{pagesLTS.current.local.\pagesLTS@pnc}{1}%
1706 }
1707
```

`\pagesLTS@putlabelhyper` Here the labels are set, if the `hyperref` package was loaded. Simply using `\label` would not work, because labels wait for the output routines to work, and there may not be any more invocations of the output routines. To force the write out we need to do an `\immediate` write.

```
1708 \newcommand{\pagesLTS@putlabelhyper}[2]{%
1709 \ifHy@pageanchor \relax%
1710 \else%
```

If the `hyperref` package is used, but `pageanchors` are disabled, the hyperlinking will not work.

```
1711 \PackageError{pagesLTS}{hyperref option pageanchor disabled}{%
1712 The \string\lastpageref{#1} link doesn't work\MessageBreak%
1713 using hyperref with disabled option 'pageanchor'.\MessageBreak%
1714 }%
1715 \fi
```

If use of the `.aux`-file is allowed, the label for `LastPage` is written into that file, the page reference depending on the options, which where set for the `hyperref` package.

```
1716 %% The following code is from the hyperref package           %%
1717 %% [2010/04/17 v6.80x; newer versions are available]         %%
1718 %% by Heiko Oberdiek (Big Thanks!).                          %%
1719 \if@filesw                                                    %%
1720 \begingroup                                                    %%
1721 \let\@number\@firstofone                                       %%
1722 \ifHy@pageanchor                                              %%
1723 \ifHy@hypertextnames                                          %%
1724 \ifHy@plainpages                                             %%
1725 \def\Hy@temp{\arabic{page}}%                                  %%
1726 \else                                                         %%
1727 \Hy@unicodefalse                                             %%
1728 %% Code not from hyperref package:                             %%
1729 %% The following lines are modified from the hyperref package. %%
1730 %% Without the modification, after the first shipout "PD1" is %%
1731 %% inserted each time |\pdfstringdef\Hy@temp{\thepage}| is    %%
1732 %% executed (if |fnsymbol| is not used).                       %%
1733 \ifnum \value{CurrentPage}=1%                                   %%
1734 \ifx\pagesLTS@pnc\pagesLTS@fns%                                %%
1735 \pdfstringdef\Hy@temp{\thepage}%                               %%
1736 \else%                                                         %%
1737 \def\Hy@temp{\thepage}%                                       %%
1738 \fi%                                                           %%
```

```

1739         \else%
1740         \pdfstringdef\Hy@temp{\thepage}%
1741         \fi%
1742 %% Code from hyperref package again:                %%
1743         \fi
1744         \else
1745         \def\Hy@temp{\the\Hy@pagecounter}%
1746         \fi
1747         \fi
1748 %% End of code from the hyperref package.            %%
1749 %% (The following four lines are modified            %%
1750 %% from the hyperref package.)                      %%
1751         \immediate\write\@auxout{\string
1752         \newlabel{#1}{{}{#2}}{\ifHy@pageanchor page.\Hy@temp\fi}{}}%
1753         \endgroup%
1754         \fi%
1755     }
1756

```

`\pagesLTS@putlabel` Since the page has been put out, we are on the page after that page. We therefore subtract one from the page counter.

```

1757 \newcommand{\pagesLTS@putlabel}[3]{%
1758   \addtocounter{page}{-1}%

```

When the `showkeys` package has been loaded in `draft` mode, in the margin for each label a box is displayed with the name of the label. `showkeys` accomplishes this by redefining `\label`, but `pageslts` does not use `\label`, but writes directly to the `\jobname.aux`-file, and this is generally done after the according page has shipped out, therefore no box can be placed on the preceding page. At least `pageslts` gives a warning, that `showkeys` cannot present the respective label.

```

1759 \ifx\pagesLTS@SK\pagesLTS@one\relax%
1760   \message{^^J}%
1761   \message{Package pageslts Warning: Package showkeys without option final loaded,}%
1762   \ifnum\value{pagesLTS.pagenr}<1%
1763     \message{(pageslts)                but label #1 on page \thepage\space(about \theCurrentPage)}%
1764   \else%
1765     \message{(pageslts)                but label #1 on page \thepage\space(about \theCurrentPage\space of \arabic{pagesLTS.pagenr})}%
1766   \fi%
1767   \message{(pageslts)                cannot be shown, because pageslts does not use \string\label,}%
1768   \message{(pageslts)                but writes directly to the \jobname.aux file. ^^J}%
1769 \fi%

```

If the `hyperref` package is used, the format of the labels is somewhat longer.

```

1770 \ltx@ifpackageloaded{hyperref}{\pagesLTS@putlabelhyper{#1}{#2}}{% else

```

If the `hyperref` package is not used, there will be no hyperlinks, and the label is written in the way of the old `lastpage` package. But we must remember to undo the label first, if it already exists.

```
1771 \if@filesw%
1772 \ifnum \value{pagesLTS.pnc.\pagesLTS@pnc}<2%
```

When the `nameref` package is used, `\newlabel` needs five instead of two arguments:

```
1773 \ltx@ifpackageloaded{nameref}{%
1774 \immediate\write\@auxout{\string\newlabel{#1}{}{#2}{}{}}}{% else
1775 \immediate\write\@auxout{\string\newlabel{#1}{}{#2}}}{%
1776 \else%
1777 \edef\pagesLTStmpA{#1}%
1778 \edef\pagesLTStmpB{pagesLTS.\pagesLTS@pnc.local}%
1779 \ifx\pagesLTStmpA\pagesLTStmpB%
1780 \edef\pagesLTStmpA{#3}%
1781 \ifx\pagesLTStmpA\pagesLTS@one%
```

Only when the third argument of `\pagesLTS@putlabel` is 1, we do need to undo the label. Otherwise there is no label to undo, and the `undolabl` package would give an error.

```
1782 \immediate\write\@auxout{\string\undonewlabel{#1}}%
1783 \fi%
1784 \fi%
1785 \ltx@ifpackageloaded{nameref}{%
1786 \immediate\write\@auxout{\string\newlabel{#1}{}{#2}{}{}}}{% else
1787 \immediate\write\@auxout{\string\newlabel{#1}{}{#2}}}{%
1788 \fi%
1789 \fi%
1790 }%
```

After the writeout we restore the page number again, since there might be other things still to be done.

```
1791 \addtocounter{page}{+1}%
1792 }
1793
```



`\pagesLTS@putlabels` `\pagesLTS@putlabels` is nearly identical to `\pagesLTS@putlabelV`:

```
1794 \newcommand{\pagesLTS@putlabels}{%
1795   \addtocounter{page}{-1}%
1796   \addtocounter{CurrentPage}{-1}%
1797   \addtocounter{pagesLTS.current.local.\pagesLTS@pnc}{-1}%
```

If `\pagenumbering{...}` has not been used, `\pagesLTS@pnc` is still zero (0, `\pagesLTS@zero`), and the according warning message is given.

```
1798   \ifx\pagesLTS@pnc\pagesLTS@zero%
1799     \PackageWarning{pagesLTS}{No page numbering scheme found:\MessageBreak%
1800       \pagesLTS@messageNPN }%
```

otherwise the numbered label is written, and if the page numbering scheme was not used before, the unnumbered label is written, too.

```
1801   \else%
1802     \pagesLTS@writelabel{\pagesLTS@pnc.\arabic{pagesLTS.pnc.\pagesLTS@pnc}}%
1803     \ifnum \value{pagesLTS.pnc.\pagesLTS@pnc}<2%
1804       \ifx\pagesLTS@pnc\pagesLTS@fns% \relax
1805       \else%
1806         \pagesLTS@writelabel{\pagesLTS@pnc}%
1807       \fi%
1808     \fi%
1809   \fi%
```

Before the label for the `LastPages` can be put, we must advance one page again, because `\pagesLTS@putlabel` itself goes back one page (and at its end forward again).

```
1810   \addtocounter{page}{+1}%
1811   \pagesLTS@putlabel{LastPages}{\theCurrentPage}{1}%
```

Here should follow a

```
\addtocounter{page}{-1},
```

but we have to remember to increase the page counters again, which were decreased at the start of this `\pagesLTS@putlabels` command, and that would include

```
\addtocounter{page}{+1},
```

therefore this two lines cancel each other and therefore just can be skipped. But the other counters have to be increased:

```
1812   \addtocounter{CurrentPage}{+1}%
1813   \addtocounter{pagesLTS.current.local.\pagesLTS@pnc}{1}%
1814   }
1815
```

`\AtBeginDocument` `\AtBeginDocument` we write into the aux file regarding the double loading of the package. Then it is checked whether the `endfloat` package has been loaded, whether it is newer than March 1992 (i.e. at least April 1992 v2.0), in which case it is compatible with this `pageslts` package.  
 If it is even newer than 2011/12/24, it is the recent version (as of the time of last revision of this documentation: 2011/12/25 v2.5d).

```

1816 \AtBeginDocument{%
1817   \if@filesw%
1818     \immediate\write\auxout{\string\gdef\string\pagesLTS@loaded{pagesLTSnotloaded}}%
1819   \fi%
1820 \ifpackageloaded{endfloat}%
1821   {\@ifpackagelater{endfloat}{1992/03/31}% April 1992 v2.0
1822    {\@ifpackagelater{endfloat}{2011/12/24}{% 2011/12/25 v2.5d
1823     \relax}%

```

If it is compatible, but not the recent version, a warning is given:

```

1824   {\PackageWarningNoLine{pageslts}{Old endfloat package detected:\MessageBreak%
1825    There is a newer version of the endfloat package available.\MessageBreak%
1826    Please consider updating your version.\MessageBreak%
1827    The pageslts package might be incompatible with\MessageBreak%
1828    your current endfloat package.\MessageBreak%
1829   }%
1830  }%

```

If it is so very old, that it is not compatible, an Error message is given:

```

1831   {\PackageError{pageslts}{Incompatible, very old endfloat package detected.}%
1832    {The very old version 2.0 (and earlier) of the\MessageBreak%
1833     endfloat package actually redefined the \string\enddocument ,\MessageBreak%
1834     and so interfered drastically with the LaTeX2e commands\MessageBreak%
1835     which make use of \string\AtEndDocument .\MessageBreak%
1836     Newer versions of the endfloat package exists\MessageBreak%
1837     (at least: v2.5d as of 2011/12/25)\MessageBreak%
1838     in modern documentation form,\MessageBreak%
1839     which should be available from CTAN.\MessageBreak%
1840     Please update your endfloat package\MessageBreak%
1841     for use with the pageslts package.\MessageBreak %
1842   }%
1843  }%
1844 }%
1845 }{}%

```

It is checked whether the old lastpage package has been loaded.  
(If it has been loaded indeed, the \lastpage@putlabel is “killed”, see subsection 3.5.)

```
1846 \ifpackage{lastpage}%
1847   {\@ifpackagelater{lastpage}{2010/07/28}% 2010/07/29 v1.2a
1848     {\@ifpackagelater{lastpage}{2013/01/27}% 2013/01/28 v1.21
1849       {\PackageWarning{pageslts}{lastpage package detected.\MessageBreak%
1850         With pageslts package in use, lastpage has no function.\MessageBreak%
1851         Just remove the lastpage package from your document.\MessageBreak%
1852         }%
1853       }%
1854     \PackageWarning{pageslts}{Old lastpage package detected.\MessageBreak%
1855       With pageslts package in use, lastpage has no function.\MessageBreak%
1856       Just remove the lastpage package from your document.\MessageBreak%
1857       At least update it!\MessageBreak%
1858       }%
1859     }%
1860   }%
1861   \PackageWarning{pageslts}{Incompatible package lastpage detected:\MessageBreak%
1862     Package pageslts was loaded, but also an old\MessageBreak%
1863     version of the lastpage package.\MessageBreak%
1864     pageslts has all functionality of the lastpage\MessageBreak%
1865     package (and more), so just remove the lastpage\MessageBreak%
1866     package from your document.\MessageBreak%
1867     (At least update it!)\MessageBreak%
1868     pageslts will now ‘kill’ the lastpage@putlabel\MessageBreak%
1869     command of the lastpage package.\MessageBreak%
1870   }%
1871   \gdef\lastpage@putlabel{\relax}%
1872   }%
1873 }%
```

Further it is checked whether the alphalph package has been loaded. If that is the case, the commands are defined accordingly.

```
1874 \ltx@ifpackage{alphalph}%
1875   {\newalphalph{\AlphMult}[mult]{\@Alph}{26}%
1876     \newalphalph{\alphMult}[mult]{\@alph}{26}%
1877     \newalphalph{\fnsymbolmult}[mult]{\@fnsymbol}{5}%
1878   }%
```

Further it is checked whether the hyperref package has been loaded:

```
1879 \ltx@ifpackageloaded{hyperref}{%
```

and whether the pdfpages package is loaded:

```
1880 \@ifpackageloaded{pdfpages}%
1881 {\PackageWarningNoLine{pageslts}{Package pdfpages detected.\MessageBreak%
1882 Using hyperref with pdfpages can cause problems. See\MessageBreak%
1883 https://www.ctan.org/pkg/pax\MessageBreak%
1884 for the Pdf Annotations eXtractor, pax.\MessageBreak%
1885 }%
1886 }{% \relax
1887 }%
```

The undolabl package has been updated and now uses \undonewlabel with only one argument.

```
1888 \@ifpackageloaded{undolabl}%
1889 {\@ifpackagelater{undolabl}{2010/07/14}% 2010/07/15 v1.0d
1890 {\@ifpackagelater{undolabl}{2015/03/29}% 2015/03/29 v1.0l
1891 {% recent version as of the time of last revision of this package: OK
1892 }{% old, but not obsolete version
1893 \PackageWarningNoLine{pageslts}{Old version of undolabl package used.\MessageBreak%
1894 See https://www.ctan.org/pkg/undolabl\MessageBreak%
1895 for a new version.\MessageBreak%
1896 }%
1897 }
1898 }{\PackageError{pageslts}{Incompatible, obsolete version of undolabl package used.}{%
1899 See https://www.ctan.org/pkg/undolabl\MessageBreak%
1900 for a new version.\MessageBreak%
1901 Type X <return> to quit.\MessageBreak%
1902 }%
1903 }
1904 }{\PackageError{pageslts}{Package undolabl missing}{%
1905 Package undolabl not found.\MessageBreak%
1906 The pageslts package needs the undolabl package.\MessageBreak%
1907 See https://www.ctan.org/pkg/undolabl\MessageBreak%
1908 Type X <return> to quit.\MessageBreak%
1909 }%
1910 }
```

Additionally a version check of the available hyperref package is performed and if need be a warning is issued:

```

1911 \@ifpackagelater{hyperref}{2012/11/05}{% 2012/11/06 v6.83m
1912 \relax}{%
1913 \PackageWarningNoLine{pageslts}{Old hyperref package detected:\MessageBreak%
1914 There is a newer version of the\MessageBreak%
1915 hyperref package available:\MessageBreak%
1916 https://www.ctan.org/pkg/hyperref\MessageBreak%
1917 Please consider updating your version.\MessageBreak%
1918 }%
1919 }%
1920 %% pageslts supports the use of the package hyperref by
1921 %% Heiko Oberdiek (hyperref version 2012/11/06 v6.83m).
1922 %% pageslts may work with earlier versions of this packages,
1923 %% but this was not tested.
1924 }{%

```

If no hyperref package in use is detected, a warning is issued, too:

```

1925 \PackageWarning{pageslts}{Package hyperref NOT detected.\MessageBreak%
1926 pageslts would support hyperref. The page references\MessageBreak%
1927 will NOT be hyperlinked!\MessageBreak }%
1928 }%

```

If the showkeys package has been loaded in draft mode, warnings about missing label boxes will be issued (see p. 63), but because it cannot be checked for showkeys after `\AtBeginDocument`, the check must be done here and the result remembered.

```

1929 \ltx@ifpackageloaded{showkeys}{%
1930 \@ifpackagewith{showkeys}{final}{\gdef\pagesLTS@SK{1}}{% else \relax
1931 }%
1932 }
1933

```

`\AtEndDocument` `\AtEndDocument` the check is repeated. If showkeys was loaded after the check performed before, an error message is issued.

```

1934 \AtEndDocument{%
1935 \ltx@ifpackageloaded{showkeys}{%
1936 \ifx\pagesLTS@SK\pagesLTS@one\relax%
1937 \else%
1938 \providecommand*\pagesLTS@sklf[1]{%
1939 \ifx\showkeyslabelformat\pagesLTS@sklf\relax%
1940 \else%
1941 \PackageError{pageslts}{Package showkeys loaded after pageslts}{%
1942 The showkeys package with option "final" has been loaded\MessageBreak%
1943 after the pageslts package.\MessageBreak%
1944 Please first load showkeys and then pageslts}%
1945 \fi%
1946 \fi%
1947 }{% else no showcase, \relax
1948 }%

```

We also give the error message about the missing (i. e. not found) page numbering scheme, which could not be given in `\EveryShipout`.

```
1949 \ifx\pncmissing\pagesLTS@one\relax%
1950   \PackageError{pageslts}{pagenumbering scheme missing}{\pagesLTS@messageNPN }%
1951 \fi%
```

Then we put in a `\message` to show, in what order things (which were called) are done (see subsection 3.2).

```
1952 \message{^^J%
1953   AED: pageslts setting LastPage ^^J}%
```

After this we issue a `\clearpage` to put out all floats, which are still floating, remember the page number (if `fnsymbol`), and after that we place the `LastPage` label.

```
1954 \clearpage%
1955 \ifx\pagesLTS@pnc\pagesLTS@fns%
1956   \def\pagesLTS@tmpA{\arabic{pagesLTS.fnsymbol.local}}%
1957   \ifnum \pagesLTS@eso=\pagesLTS@tmpA%
1958     \gdef\pagesLTS@rerun{0}%
1959   \else%
1960     \gdef\pagesLTS@rerun{1}%
1961   \fi%
1962   \if@filesw%
1963     \immediate\write\@auxout{\string\gdef\string\pagesLTS@eso{\pagesLTS@tmpA}}%
1964   \fi%
1965 \fi%
1966 \pagesLTS@putlabel{LastPage}{\thepage}{1}%
```

We do not need the temporary definition any more.

```
1967 \let\pagesLTS@tmpA\undefined%
1968 }
1969
```

`\AfterLastShipout` `\AfterLastShipout` is a command from HEIKO OBERDIEK's `atveryend` package (see above).

```
1970 \AfterLastShipout{%
```

If writing to the `.aux` file is allowed:

```
1971 \if@filesw%
```

The number of pages with the `fnsymbol` page numbering scheme, `\pagesLTS@esov`, is saved via the `.aux` file (if it is not zero):

```
1972 \ifx\pagesLTS@esov\pagesLTS@zero%
1973 \else%
1974   \immediate\write\@auxout{\string
1975     \pagesLTS@ifcounter{pagesLTS.fnsymbol.local}}%
1976   \immediate\write\@auxout{\string
1977     \setcounter{pagesLTS.fnsymbol.local}{\pagesLTS@esov}}%
1978 \fi%
```

If the `hyperref` package is in use, and the page numbering scheme of the last page is `fnsymbol`, everything is quite more complicated. Therefore `\lastpageref` is switched from simple `\lastpagereftxt` to the more difficult `\lastpagerefend`.

```

1979 \ltx@ifpackageloaded{hyperref}{%
1980   \ifx\pagesLTS@pnc\pagesLTS@fns%
1981     \immediate\write\@auxout{\string
1982       \gdef\string\lastpageref{\string\lastpagerefend}}%
1983   \fi%
1984 }{%
1985 \fi%
```

At the call of a `\pagenumbering{...}` command, everything for a split page numbering scheme is organized. For the last page numbering scheme, there is no `\pagenumbering{...}` command at the end, so we need to handle this here:

```

1986 \pagesLTS@ifcounter{pagesLTS.\pagesLTS@pnc.\arabic{pagesLTS.pnc.\pagesLTS@pnc}.local.count}%
1987 \setcounter{pagesLTS.\pagesLTS@pnc.\arabic{pagesLTS.pnc.\pagesLTS@pnc}.local.count}{%
1988   \value{pagesLTS.current.local.\pagesLTS@pnc}}%
```

And we are one page after the last one (`\AfterLastShipout!`), so we go back one page. (We again borrow the `pagesLTS.pnc.0` counter for the computations instead of defining yet another one.)

```

1989 \addtocounter{pagesLTS.\pagesLTS@pnc.\arabic{pagesLTS.pnc.\pagesLTS@pnc}.local.count}{-1}
1990 \ifnum \value{pagesLTS.pnc.\pagesLTS@pnc}>1%
1991   \mathchardef\pagesLTS@tmpD=\arabic{pagesLTS.pnc.0}%
1992   \setcounter{pagesLTS.pnc.0}{\value{pagesLTS.pnc.\pagesLTS@pnc}}%
1993   \@tempcnta=\value{pagesLTS.pnc.0}\relax%
1994   \loop%
1995     \ifnum\@tempcnta>1\relax%
1996       \addtocounter{pagesLTS.pnc.0}{-1}%
1997       \addtocounter{pagesLTS.\pagesLTS@pnc.\arabic{pagesLTS.pnc.\pagesLTS@pnc}.local.count}{%
1998         -\value{pagesLTS.\pagesLTS@pnc.\arabic{pagesLTS.pnc.0}.local.count}}%
1999       \@tempcnta=\value{pagesLTS.pnc.0}\relax%
2000     \repeat%
2001   \setcounter{pagesLTS.pnc.0}{\pagesLTS@tmpD}%
2002 \fi%
2003 \if@filesw%
2004   \immediate\write\@auxout{\string
2005     \pagesLTS@ifcounter{pagesLTS.\pagesLTS@pnc.\arabic{pagesLTS.pnc.\pagesLTS@pnc}.local.cnt}}%
2006   \edef\pagesLTS@tmpA{\arabic{pagesLTS.\pagesLTS@pnc.\arabic{pagesLTS.pnc.\pagesLTS@pnc}.local.count}}%
2007   \immediate\write\@auxout{\string
2008     \setcounter{pagesLTS.\pagesLTS@pnc.\arabic{pagesLTS.pnc.\pagesLTS@pnc}.local.cnt}{\pagesLTS@tmpA}}%
2009   \let\pagesLTS@tmpA\undefined%
2010 \fi%
```

We need to save (via the `.aux` file) the page name `\thepage` and the page number `\arabic{CurrentPage}` of the last page, in case the last page has `fnsymbol` page numbering scheme.

```

2011 \addtocounter{page}{-1}%
2012 \edef\pagesLTS@tmpA{\thepage}%
2013 \if@filesw%
2014   \immediate\write\@auxout{\string
```

```

2015 \gdef\string\pagesLTS.lastpage{\pagesLTS@tmpA}}%
2016 \fi%
2017 \addtocounter{page}{+1}%
2018 \addtocounter{CurrentPage}{-1}%
2019 \edef\pagesLTS@tmpB{\arabic{CurrentPage}}%
2020 \if@filesw%
2021 \immediate\write\@auxout{\string
2022 \setcounter{pagesLTS.pagenr}{\pagesLTS@tmpB}}%
2023 \fi%
2024 \addtocounter{CurrentPage}{+1}%

```

The `VeryLastPage` label is set here, and when `\lastpageref{VeryLastPage}` instead of `\lastpageref{LastPage}` is used, it should really point to the last page. `LastPage` and `VeryLastPage` should be identical, unless a package was active with output `\AtEndDocument` *after* the `pageslts` package.

```

2025 \message{^^J%
2026 AED: pageslts setting VeryLastPage via AfterLastShipout ^^J}%
2027 \pagesLTS@putlabel{VeryLastPage}{\thepage}{1}%

```

The `LastPages` label is set here, and `\lastpageref{LastPages}` gives the total number of pages and points to the (very) last page.

```

2028 \message{^^J%
2029 AED: pageslts setting LastPages via AfterLastShipout ^^J}%
2030 \pagesLTS@putlabels%
2031 \typeout{^^J}%
2032 \ifodd\pagesLTS@tmpB%
2033 \@PackageInfoNoLine{pageslts}{Total number of pages is odd}%
2034 \else%
2035 \@PackageInfoNoLine{pageslts}{Total number of pages is even}%
2036 \fi%
2037 \typeout{^^J}%

```

We do not need the temporary definitions any more.

```

2038 \let\pagesLTS@tmpA\undefined%
2039 \let\pagesLTS@tmpB\undefined%
2040 }
2041

```



`\AtEndAfterFileList` `\AtEndAfterFileList{...}` is even later:

“After the `.aux` file closing and reading  $\LaTeX$  prints the file list if requested by `\listfiles`. Then this hook is executed.”

(`atveryend` package of HEIKO OBERDIEK, v1.7 as of 2011/04/23, newer version available.) Here it is used for a rerun hint. For example if the page numbering scheme of the last page of the `pageslts-example.tex` file is changed to `fnsymbol` and two runs of `pdf $\LaTeX$`  are done, `pdf $\LaTeX$`  will be happy and will not complain about changed labels. But indeed, a *third* run is necessary and indicated by the warning message below.

```
2042 \AtEndAfterFileList{%
2043   \ifx\pagesLTS@rerun\pagesLTS@one%
2044     \PackageWarningNoLine{pageslts}{%
2045       Label(s) may have changed.\MessageBreak%
2046       Rerun to get cross-references right%
2047     }%
2048   \fi%
2049 }
2050
```

`\frontmatter` `\frontmatter` often contains `\pagenumbering`, but for some unknown reason there are problems when another `\pagenumbering` with different page numbering scheme has been used before on the same page. (This would not make any sense anyway, because one page can only have one page numbering scheme.) This problem does not occur when two `\pagenumbering` commands are used inside normal text. Thus we need to check whether `\frontmatter` has been defined, whether it changes the page numbering scheme, and whether the page numbering scheme before `\frontmatter` was initiated at the same page.

We need an `\ifundefined`, which neither requires  $\varepsilon$ - $\TeX$  nor defines the command, which is to be tested, to `\relax` (in which case it would be no longer undefined for further tests). For this we use code from MARKUS KOHM similar to his `\scr@ifundefinedorrelax` from `scrbase.sty` of the KOMA script bundle, but without the necessity to use  $\varepsilon$ - $\TeX$ :

```
2051 \newcommand{\pagesLTS@ifundefinedorrelax}[1]{%
2052   % Modified Markus Kohm code for use without e-TeX
2053   \begingroup\expandafter\expandafter\expandafter\endgroup
2054   \expandafter\ifx\csname #1\endcsname\relax%
2055     \expandafter\ifx\csname #1\endcsname\relax%
2056       \expandafter\expandafter\expandafter\@firstoftwo
2057     \else%
2058       \expandafter\expandafter\expandafter\@secondoftwo
2059     \fi%
2060   \else%
2061     \expandafter\@firstoftwo
2062   \fi%
2063 }
2064
2065 \pagesLTS@ifundefinedorrelax{frontmatter}{% \relax
2066 }{% else
2067   \ltx@GlobalPrependToMacro{\frontmatter}{\pagesLTS@prefrontmatter}%
2068   \ltx@GlobalAppendToMacro{\frontmatter}{\pagesLTS@postfrontmatter}%

```

```
2069 }
2070
```

`pagesLTS@prefrontmatter` At the beginning of the real (i.e. unchanged) `\frontmatter` (FMB), we remember the current (c) page numbering (pn) scheme: its name (n) and page number (p). `\pagesLTS@FMBpncp` would be 1 if the according `\pagenumbering` command was used on the same page at the `\frontmatter`.

```
2071 \newcommand{\pagesLTS@prefrontmatter}{%
2072   \xdef\pagesLTS@FMBpncn{\pagesLTS@pnc}%
2073   \xdef\pagesLTS@FMBpncp{\arabic{\pagesLTS.current.local.\pagesLTS@pnc}}%
2074 }
2075
```

`pagesLTS@postfrontmatter` The named checks are performed and in case of the named problem an error message is given. Any idea how to automatically solve this issue?

```
2076 \newcommand{\pagesLTS@postfrontmatter}{%
2077   \xdef\pagesLTS@FMEpncn{\pagesLTS@pnc}%
2078   \ifx\pagesLTS@FMBpncn\pagesLTS@FMEpncn%
2079     \else%
2080       \ifx\pagesLTS@FMBpncn\pagesLTS@zero%
2081         \else%
2082           \ifx\pagesLTS@FMBpncp\pagesLTS@one%
2083             \PackageError{pageslts}{\string\pagenumbering\space before \string\frontmatter}{%
2084               Do not use \string\pagenumbering{\pagesLTS@FMBpncn} before \string\frontmatter \MessageBreak%
2085               on the same page!\MessageBreak%
2086               \string\frontmatter\space (re)defines the page numbering scheme to \pagesLTS@FMEpncn , \MessageBreak%
2087               thus earlier use of \string\pagenumbering{\pagesLTS@FMBpncn} on the same page is useless anyway.}%
2088             \fi%
2089           \fi%
2090         \fi%
2091 }
2092
2093 \end{package}
```

## 7 Installation

### 7.1 Downloads

Everything is available at <https://www.ctan.org>, but may need additional packages themselves.

`pageslts.dtx` For unpacking the `thumbs.dtx` file and constructing the documentation it is required:

- T<sub>E</sub>X Format L<sup>A</sup>T<sub>E</sub>X 2<sub>ε</sub>: <https://www.CTAN.org>
- document class `ltxdoc`, 2015-03-26, 2.0w, <https://www.ctan.org/pkg/ltxdoc>
- package `holtxdoc`, 2012/03/21, v0.24, <https://www.ctan.org/pkg/holtxdoc>
- package `hypdoc`, 2011/08/19, v1.11, <https://www.ctan.org/pkg/hypdoc>
- package `geometry`, 2010/09/12, v5.6, <https://www.ctan.org/pkg/geometry>
- package `ulem`, 2012/05/18, no version number given, <https://www.ctan.org/pkg/ulem>

`pageslts.sty` The `pageslts.sty` for L<sup>A</sup>T<sub>E</sub>X 2<sub>ε</sub> (i. e. all documents using the `pageslts` package) requires:

- T<sub>E</sub>X Format L<sup>A</sup>T<sub>E</sub>X 2<sub>ε</sub>, <https://www.CTAN.org>
- package `atveryend`, 2011/06/30, v1.8, <https://www.ctan.org/pkg/atveryend>
- package `everyshi`, 2001/05/15, v3.00, <https://www.ctan.org/pkg/everyshi>
- package `kvoptions`, 2011/06/30, v3.11, <https://www.ctan.org/pkg/kvoptions>
- package `letltxmacro`, 2010/09/02, v1.4, <https://www.ctan.org/pkg/letltxmacro>
- package `ltxcmds`, 2011/11/09, v1.22, <https://www.ctan.org/pkg/ltxcmds>
- package `rerunfilecheck`, 2011/04/15, v1.7, <https://www.ctan.org/pkg/rerunfilecheck>
- package `undolabl`, 2015/03/29, v1.0l, <https://www.ctan.org/pkg/undolabl>

`pageslts-example.tex` The `pageslts-example.tex` requires the same files as all documents using the `pageslts` package, and additionally:

- class `article`, 2014/09/29, v1.4h, from `classes.dtx`: <https://www.ctan.org/pkg/classes>
- package `alphalph`, 2011/05/13, v2.4, <https://www.ctan.org/pkg/alphalph>
- package `lipsum`, 2014/07/27, v1.3, <https://www.ctan.org/pkg/lipsum>
- package `showkeys`, 2014/10/28, v3.17, <https://www.ctan.org/pkg/showkeys>
- package `hyperref`, 2012/11/06, v6.83m, <https://www.ctan.org/pkg/hyperref>
- package `pageslts`, 2015/08/17, v1.2e, <https://www.ctan.org/pkg/pageslts>

(Well, it is the example file for this package, and because you are reading the documentation for the `pageslts` package, it can be assumed that you already have some version of it – is it the current one?)

papermas The papermas package is not required, but requires itself the the pageslts package and can be considered as kind of add-on:

- package papermas, 2011/08/22, v1.0h, <https://www.ctan.org/pkg/papermas>

endfloat The endfloat package is not required, but because the pageslts package is incompatibel with very old versions of the endfloat package (see subsection 3.3), here the recent one is listed:

- package endfloat, 2011/12/25, v2.5d, <https://www.ctan.org/pkg/endfloat>

prelim2e The prelim2e package is not required either, but because Prelim@EveryShipout code was taken from that package, it is listed, too:

- package prelim2e, 2009/05/29, v1.3, <https://www.ctan.org/pkg/prelim2e>

fancyhdr Neither fancyhdr nor nccfancyhdr package is required (the lastpage package used its predecessor fancyheadings), but because nccfancyhdr they were mentioned, also they are listed here:

- package fancyhdr, <https://www.ctan.org/pkg/fancyhdr>
- package nccfancyhdr, <https://www.ctan.org/pkg/nccfancyhdr>

lastpage As possible alternatives in section 4 there are listed

totpages

totcount

nofm

count1to

zref

- package lastpage, 2015/03/29, v1.2m, <https://www.ctan.org/pkg/lastpage>
- package totpages, 2005/09/19, v2.00, <https://www.ctan.org/pkg/totpages>
- package totcount, 2011/01/25, v1.2, <https://www.ctan.org/pkg/totcount>
- package nofm, 1991/02/25, without version number, <ftp://tug.ctan.org/pub/tex-archive/obsolete/macros/latex209/contrib/misc/nofm.sty>, does not work with e. g. hyperref
- package count1to, 2009/05/24, v2.1, <https://www.ctan.org/pkg/count1to>
- package zref, 2012/04/04, v2.24, <https://www.ctan.org/pkg/zref>

Oberdiek All packages of HEIKO OBERDIEK's bundle 'oberdiek' (especially alphalph, atveryend, holtxdoc, letltxmacro, ltxcmds, kvoptions, rerunfilecheck, and zref) are also available in a TDS compliant ZIP archive:

alphalph <http://mirrors.ctan.org/install/macros/latex/contrib/oberdiek.tds.zip>.

atveryend It is probably best to download and use this, because the packages in there are quite probably both recent and compatible among

holtxdoc themselves.

letltxmacro hyperref is not included in that bundle and needs to be downloaded separately,

ltxcmds <http://mirrors.ctan.org/install/macros/latex/contrib/hyperref.tds.zip>.

kvoptions A hyperlinked list of my (other) packages can be found at <https://www.ctan.org/author/muench-hm>.

rerunfilecheck

zref

hyperref

Münch

## 7.2 Package, unpacking TDS

**Package.** This package is available on [CTAN.org](http://CTAN.org).

<http://mirrors.ctan.org/macros/latex/contrib/pageslts/pageslts.dtx>

The source file.

<http://mirrors.ctan.org/macros/latex/contrib/pageslts/pageslts.pdf>

The documentation.

<http://mirrors.ctan.org/macros/latex/contrib/pageslts/pageslts-example.pdf>

The compiled example file, as it should look like.

<http://mirrors.ctan.org/macros/latex/contrib/pageslts/README>

The README file.

There is also a `thumbs.tds.zip` available:

<http://mirror.ctan.org/install/macros/latex/contrib/pageslts.tds.zip>

Everything in TDS compliant, compiled format.

which additionally contains

<code>pageslts.ins</code>	The installation file.
<code>pageslts.drv</code>	The driver to generate the documentation.
<code>pageslts.sty</code>	The <code>.style</code> file.
<code>pageslts-example.tex</code>	The example file.

For required other packages see the preceding subsection.

**Unpacking.** The `.dtx` file is a self-extracting `docstrip` archive. The files are extracted by running the `.dtx` through plain  $\TeX$ :

```
tex pageslts.dtx
```

About generating the documentation see paragraph 7.4 below.

**TDS.** Now the different files must be moved into the different directories in your installation TDS tree (also known as `texmf` tree):

<code>pageslts.sty</code>	→ <code>tex/latex/pageslts.sty</code>
<code>pageslts.pdf</code>	→ <code>doc/latex/pageslts.pdf</code>
<code>pageslts-example.tex</code>	→ <code>doc/latex/pageslts-example.tex</code>
<code>pageslts-example.pdf</code>	→ <code>doc/latex/pageslts-example.pdf</code>
<code>pageslts.dtx</code>	→ <code>source/latex/pageslts.dtx</code>

If you have a `docstrip.cfg` that configures and enables `docstrip`'s TDS installing feature, then some files can already be in the right place, see the documentation of `docstrip`.

### 7.3 Refresh file name databases

If your  $\text{T}_{\text{E}}\text{X}$  distribution (te $\text{T}_{\text{E}}\text{X}$ , mik $\text{T}_{\text{E}}\text{X}$ ,...) relies on file name databases, you must refresh these. For example, te $\text{T}_{\text{E}}\text{X}$  users run `texhash` or `mktextlsr`.

### 7.4 Some details for the interested

**Unpacking with  $\text{L}^{\text{A}}\text{T}_{\text{E}}\text{X}$ .** The `.dtx` chooses its action depending on the format:

**plain  $\text{T}_{\text{E}}\text{X}$ :** Run `docstrip` and extract the files.

**$\text{L}^{\text{A}}\text{T}_{\text{E}}\text{X}$ :** Generate the documentation.

If you insist on using  $\text{L}^{\text{A}}\text{T}_{\text{E}}\text{X}$  for `docstrip` (really, `docstrip` does not need  $\text{L}^{\text{A}}\text{T}_{\text{E}}\text{X}$ ), then inform the autodetect routine about your intention:

```
latex \let\install=y\input{pageslts.dtx}
```

Do not forget to quote the argument according to the demands of your shell.

**Generating the documentation.** You can use both the `.dtx` or the `.drv` to generate the documentation. The process can be configured by the configuration file `ltxdoc.cfg`. For instance, put the following line into this file, if you want to have A4 as paper format:

```
\PassOptionsToClass{a4paper}{article}
```

An example follows how to generate the documentation with pdf $\text{L}^{\text{A}}\text{T}_{\text{E}}\text{X}$ :

```
pdflatex pageslts.dtx
makeindex -s gind.ist pageslts.idx
pdflatex pageslts.dtx
makeindex -s gind.ist pageslts.idx
pdflatex pageslts.dtx
```

### 7.5 Compiling the example

The example file, `pageslts-example.tex`, can be compiled via

```
latex pageslts-example.tex
```

or (recommended)

```
pdflatex pageslts-example.tex
```

and will need *at least* (!) three compiler runs to get all references right.

## 8 Acknowledgements

I (H.-Martin Münch) would like to thank JEFFREY P. GOLDBERG for inventing the `lastpage` package. This package first started as a revision of the `lastpage` package, but it became obvious that a replacement was needed to accomplish what this package does. Further I would like to thank HEIKO OBERDIEK for providing the `\erroralphalph` command as well as a lot (!) of useful packages (from which I also got everything I know about creating a file in `dtx` format, ok, say it: copying), MARTIN SCHRÖDER for his `prelim2e` package, from which I got the `Prelim@EveryShipout` code, ULRICH DIEZ for his code for the `undolabl` package, which allows overwriting of labels, ANDRES LÖH for the code to determine the current page numbering scheme, and the `news:comp.text.tex` and `news:de.comp.text.tex` newsgroups for their help in all things T<sub>E</sub>X. For bug reports I thank Michał Herman, kwikwi, Joshua Ellis, and Dr. Clea F. Rees. For telling me how to fix a bug (and for all his shared wisdom at <https://tex.stackexchange.com>) thanks go to Prof. Enrico Gregorio.

## 9 History

Some old versions have been archived at <http://ctanhg.scharrer-online.de/pkg/pageslts.html>.

### [1994/06/17, `lastpage`]

- `lastpage` v0.99a: First shot by JEFFREY P. GOLDBERG.

### [1994/06/25, `lastpage`]

- `lastpage` v0.1b: Last version number created by JEFFREY P. GOLDBERG.

### [1994/07/20, `lastpage`]

- `lastpage` v0.1b (again): Documentation updated by JEFFREY P. GOLDBERG.  
The main source code of the `lastpage` package 1994/07/20 v0.1b was:

```
\NeedsTeXFormat{LaTeX2e}[1994/06/01]
\ProvidesPackage{lastpage}[1994/07/20 v0.1b
  LaTeX2e package for refs to last page number (JPG)]
\def\lastpage@putlabel{\addtocounter{page}{-1}%
  \immediate\write\auxout{\string
  \newlabel{LastPage}{-}{\thepage}}}%
\addtocounter{page}{1}
\AtEndDocument{%
  \message{AED: lastpage setting LastPage}%
  \clearpage\lastpage@putlabel}%
\endinput
```

and then `hyperref` and `revtex` even redefine `\lastpage@putlabel`.

## [2010/02/18, **lastpage**]

- `lastpage` v1.1: Proposed `LastPages` label by H.-Martin Münch on [news:comp.text.tex](mailto:news:comp.text.tex), see e. g. <http://groups.google.com/group/comp.text.tex/msg/4407493da9c747f0?dmode=source>; now available in this `pageslts` package.

## [2010/05/15 **v1.0 pagesLTS**]

- `pagesLTS` Complete rewriting of the package, so as to work with **more than one page numbering scheme**; using `\AtVeryEnd` for `VeryLastPage`; upgrade from `fancyheadings` to `fancyhdr` package, then removed the need for a `fancyhdr` package at all.
- Rewriting of the package, so as to work with the `fnsymbol` page numbering scheme (even on the last page).
- Introduction of `kvoptions` into this package.
- Check for incompatible `endfloat` package.
- `lastpage209.sty` for L<sup>A</sup>T<sub>E</sub>X<sub>209</sub> .
- Replacement of `\filedate`, `-version`, `-name`,... because of L<sup>A</sup>T<sub>E</sub>X bug 2705:  
Synopsis: Possible problem with `\fileversion` and `\filedate`  
<http://www.latex-project.org/cgi-bin/ltxbugs2html?category=LaTeX&responsible=anyone&state=anything&keyword=lastpage&pr=latex%2F2705&search=>
- `alphalph` support included.
- Page numbering extension `\erroralph` by HEIKO OBERDIEK included.
- (Page-) Numbering extension for `roman` and `Roman` numbers included.
- Incompatible, old `lastpage` package “killed”.
- Example `pagesLTS-example.tex` added.
- Alternatives listing (section 4).
- Listing of T<sub>E</sub>X sources (subsection 7.1).
- Complete rewriting of the documentation.
- Everything in DTX framework.
- New package name: `pagesLTS` for Last, Total, and page numbering Schemes pages.

## [2010/06/01 **v1.1(a) pagesLTS**]

- Abstract changed: Negative `roman` and `Roman` page numbers are now possible.
- Some references to other packages have been updated.
- Several typing mistakes have been corrected - both in the `style` file as well as in this documentation.



### [2010/06/03 v1.1b pagesLTS]

- Corrected a bug in `\XXRoman`, where `\roman` instead of `\Roman` had been used.
- New `papermas` package mentioned.
- Several changes in the documentation and the Readme file.

### [2010/06/24 v1.1c pagesLTS]

- `holtxdoc` warning in `drv` updated.
- Removed CRLF line endings from the `dtx` file.
- Corrected the location of the package at CTAN. (In this version TDS was still missing due to packaging error.)
- Corrected Message format in `pagesLTS.ins`.
- Updates to the documentation.

### [2010/07/15 v1.1d pagesLTS]

- Added the `\@ifclassloaded{revtex4}` code for `\lastpage@putlabel` (changed to `\pagesLTS@putlabelhyper`) from the `hyperref` package as **comment** - what is the meaning of that code?
- In the documentation added the explanation of the occurrence of multiply definitions of the `LastPage` label with `lastpage`, `pagesLTS`, `hyperref` package (in that order).
- Updated to (then) new version of `undolabl` package [2010/07/15] v1.0d, which uses `\undonewlabel` with only one instead of two arguments.
- Added a warning message, if `hyperref` and `pdfpages` are *both* used. (Should not `hyperref` give this warning?)
- Updates to the documentation.

### [2010/07/29 v1.1e pagesLTS]

- Removed `lastpage209.sty`, because it is now contained in the `lastpage.dtx` file,  $v \geq 1.2a$ .
- Removed the `\@ifclassloaded{revtex4}` code for `\lastpage@putlabel`.
- Handling of `lastpage` package adapted to updated version 1.2(a).
- Corrected error in `lastpage` code [1994/07/20 v0.1b] given in [9 History](#).
- Version handling for `undolabl` package updated.
- Included a `\Checksum`.
- Some minor details.

### [2010/08/08 v1.1f pagesLTS]

- Version 1.1e had a bug: `AlphAlph` was replaced by `alphalph` (because that package is named like this), but this was done also in commands and definitions - now reverted.
- Updates to the documentation.

### [2010/08/12 v1.1g pagesLTS]

- Now the rerun warning is given *after* e. g. the `\listfiles`, increasing the chance of the user to read it (trick found in HARALD HARDERS' `fnbreak` package, thanks!).

### [2010/08/23 v1.1h pagesLTS]

- Renamed `\XXRoman` to `\XRoman`.
- Reduced the number of needed counters.
- Removed wrong `%` from the driver file.
- Changed the `\unit` definition (got rid of an old `\rm`).
- Without use of the `hyperref` package, labels of type `pagesLTS.<page numbering scheme>.local` became multiply defined. Now an `\undolabl` was inserted.
- Diverse details.

### [2010/08/25 v1.1i pagesLTS]

- Bug fix: `tcilatex` defines the `\hyperref` command, therefore for `hyperref` package detection this had to be changed to `\Hy@Warning`.

### [2010/09/12 v1.1j pagesLTS]

- Bug fix:  $\LaTeX$  issued a “Label(s) may have changed. Rerun to get cross-references right.”-warning, even if labels had not changed but were overwritten.
- Starred version of `\lastpageref` for suppressing hyperlinks introduced.
- A lot of details.

### [2010/09/22 v1.1k pagesLTS]

- When no `fnsymbol` pagenummering scheme is used, the respective counters are not defined, saving three counters.
- Moved the package from `.../latex/muench/pagesLTS/...` to `.../latex/pagesLTS/...`  
(Please make sure that the old version of the `pagesLTS` package was properly uninstalled from your system.)

### [2010/09/27 v1.11 pagesLTS]

- Bug fix: `\PackageError{pagesLTS}{pagenumbering missing}{\pagesLTS@messageNPN }` had to be moved to the outside of `\EveryShipout`, because it wrote its message into the document instead to the screen and the `.log`-file.
- Updated to version 2010/04/24 v0.19 of the `holtxdoc` package.

### [2011/02/01 v1.1m pagesLTS]

- Added a new warning subsection about `hyperref` and repeated page numbers.
- Bug fix: Missing `%` after `-\romannumeral\number-\arabic{#1}` added.
- The (then) new version v2.4i of the `endfloat` package was then even older than 15 years.
- Put a warning in the documentation as well as in the `log`-file and at the screen during compilation about the `showkeys` package. (The labels of the `pagesLTS` package cannot be shown by the `showkeys` package.)
- Bug fix: In some situations a rerun warning was given even if no rerun was necessary.
- The recent version of the Adobe Reader ~~is~~ was X (10.0.0) (instead of 9.3.3). Its handling of special page numbers was improved.
- The option `alphMult` is now set to `ab` by default.
- The option `AlphMulti` is now set to `AB` by default.
- Some details.

### [2011/03/16 v1.1n pagesLTS]

- Bug fix: Handling of option `pagecontinue=false` changed. When `pagecontinue=false` was used, but also a `alphMult`, `AlphMulti`, `fnsymbolmult`, `romanMult` or `RomanMulti` option other than 0 or `false`, respectively, was used, the page numbering *was* continued/extended. Now a warning is issued in case of such option clash and `pagecontinue=false` is heeded, disabling all continuation.
- Bug fix: `\ProvidesPackage{pagesLTS}` contained an older date (2010/09/27 of v1.11 instead of 2011/02/01 of v1.1m).
- Bug fix: The `ulem` package is needed to generate the documentation from the `pagesLTS.dtx` file, but was not listed as necessary package.
- Bug fix: One reference to an outdated version of `undolabl` package, replaced by the (then) recent version.
- Some minor details.

### [2011/03/17 v1.1o pagesLTS]

- Documentation and ReadMe bug fix: This pagesLTS package is located at <https://www.ctan.org/pkg/pageslts> instead of .../pagesLTS/.
- There is a new (possible) alternative package, `totcount`, see section 4.
- Bug fix: There was a reference to `lastpage` 1994/07/20, v0.1b, instead of the current version.

### [2011/08/08 v1.2a]

- **Renamed the package from `pagesLTS` to `pageslts` (keeping family, prefix, internal commands,... as `pagesLTS`).** Added checking against double loading as `pagesLTS` and `pageslts`.
- The `holtxdoc` package was fixed (recent: 2011/02/04, v0.21), therefore the warning in `drv` could be removed.
- `\AtEndAfterFileList` from the then new version of the `atveryend` package, 2011/04/23, v1.7, by HEIKO OBERDIEK, is now used for the rerun hint instead of appending to `\@dofilelist`.
- Now defining 2: `\def\pagesLTS@two{2}` (for example for the `thumbs` package) and 3: `\def\pagesLTS@three{3}`.
- Replaced `\texttt{\textbackslash...}` by `|\...|` in the `dtx` and by `\verb|\...|` in the example (where possible).
- When the `alphalph` package is needed, it is loaded via `\RequirePackage` instead of crashing with an error message.
- A lot of details (also in the documentation).

### [2013/01/28 v1.2b]

- Updated to T<sub>E</sub>X live 2012 (for compiling the documentation and example) and installed the available updates. Therefore I can no longer test whether `pageslts` works with earlier versions of L<sup>A</sup>T<sub>E</sub>X.
- Replaced `\let` by `\LetLtxMacro`.
- The `nameref` package redefines `\label` to have five arguments instead of two, therefore `\newlabel{LastPage}{\thepage}` instead of `\newlabel{LastPage}{\thepage}` must be used. (Bug reported at <http://tex.stackexchange.com/q/95541/6865>, thanks to Michał Herman!) Fixed.
- Updates to a lot of details, also in the documentation.

### [2014/01/19 v1.2c]

- Bug: missing loop, fix: inserted.
- Bug: when option `pagecontinue=false` was set, the extension of the page numbering schemes was disabled by mistake, fixed.
- Now using `\ltx@ifpackageloaded` from the `ltxcmds` package for checking (even after `\AtBeginDocument`) whether a package has been loaded.

- Bug: incompatibility with `lineno` because of a mistake in the redefined `\pagenumbering`, fixed. (Bug reported by kwikwi, thanks!)
- Bug: When `\pagenumbering` preceded `\frontmatter` on the same page but with different argument than the `\pagenumbering`, which was inside `\frontmatter`, then some labelling got mixed up. (Also this bug reported by kwikwi, thanks!) While this is not fixed automatically, now an appropriate error message is given. (Two different page numbering schemes on the same page make no sense anyway.)
- Updates of minor details.

### [2015/08/02 v1.2d]

- Updated to T<sub>E</sub>X Live 2015 (for compiling the documentation and example) and installed the available updates. Therefore I can no longer test whether `thumbs` works with earlier versions of L<sup>A</sup>T<sub>E</sub>X. (It probably does, but there is no guarantee.)
- A `ifundefinedorrelax` similar to the one from `scrbase.sty` of the KOMA script bundle as 2013/12/19 v3.12 is used now, without the need for  $\varepsilon$ -T<sub>E</sub>X.
- New versions of Adobe Reader and of some packages have become available.
- Changed the message (type) to be displayed if writing to files is disallowed (as pointed out by Joshua Ellis, thanks!).
- Updates to several details, also in the documentation.

### [2015/08/17 v1.2e]

- Bug fix, see <https://tex.stackexchange.com/q/261445/6865>, thank you to PROF. ENRICO GREGORIO for providing the fix and to DR. CLEA F. REES for bringing this to my attention.

When you find a mistake or have a suggestion for an improvement of this package, please send an e-mail to the maintainer, thanks!

(Please see BUG REPORTS in the README.)

Note: Y is not missing in the following index, but no command beginning with this letter has been used in this `pageslts` package.

# 10 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; plain numbers refer to the code lines where the entry is used.

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