

# The `pageslts` package

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## Abstract

This 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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# 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 XI (11.0.1) enable:

Edit > Preferences (Ctrl+k) > 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>E</sub>X 2<sub>ε</sub> 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>E</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  $\pm 55\,834\,558$  is allowed, but when printed will exceed the L<sup>A</sup>T<sub>E</sub>X 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 pdfL<sup>A</sup>T<sub>E</sub>X 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 L<sup>A</sup>T<sub>E</sub>X 2<sub>ε</sub> 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 L<sup>A</sup>T<sub>E</sub>X 2<sub>ε</sub> capacity is exceeded, depending on the remaining file and its use of T<sub>E</sub>X 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  $\pm \text{MAX} = \pm 2\,147\,483\,647$ , 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 <sub>$\epsilon$</sub>  arabic (page) numbers are already possible between  $-\text{MAX} \dots \text{MAX}$ , where  $\text{MAX} = 2\,147\,483\,647$  (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.  
`page number` 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` 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.

<code>\theCurrentPage</code>	<code>\theCurrentPage</code> gives the current total/absolute page, in contrast to <code>\thepage</code> , which gives only the page <i>name</i> 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 <code>\theCurrentPage</code> is 16, whereas <code>\thepage</code> is 9. When the page “number” (name) is manipulated by <code>\addtocounter{page}{...}</code> or <code>\setcounter{page}{...}</code> , <code>\theCurrentPage</code> ignores this. Because <code>CurrentPage</code> is a normal counter, you can also say e.g. <code>\Roman{CurrentPage}</code> to get the value in Roman page numbering scheme (e.g. VIII for 8).
<code>\theCurrentPageLocal</code>	<code>\theCurrentPageLocal</code> gives the current (arabic) number of pages in the current page numbering scheme. <code>\thepage</code> and <code>\theCurrentPageLocal</code> are different e.g. when <code>\addtocounter{page}{...}</code> or <code>\setcounter{page}{...}</code> were used. <code>\theCurrentPageLocal</code> can be printed in other formats, e.g. <code>\roman{pagesLTS.current.local.roman}</code> , but probably it only makes sense if page numbering scheme and format are the same, e.g. <code>\Roman{pagesLTS.current.local.Roman}</code> or <code>\Alph{pagesLTS.current.local.Alph}</code> . <code>\arabic{pagesLTS.current.local....}</code> probably make sense even when combined with another page numbering scheme. And this is exactly what <code>\theCurrentPageLocal</code> does: <code>\def\theCurrentPageLocal{\arabic{pagesLTS.current.local.\pagesLTS@pnc}}.</code>
<code>pagesLTS. page numbering scheme . number</code>	If you want to refer to the last page of the first, second,... use of a page numbering scheme, you can refer to <code>pagesLTS.&lt;page numbering scheme&gt;.&lt;number&gt;</code> , e.g. <code>\lastpageref{pagesLTS.Roman.1}</code> , where <code>&lt;number&gt;</code> is the occurrence of the page numbering scheme. For details please see page 9.
<code>\lastpageref</code>	For pages with the <code>fnsymbol</code> page numbering scheme, <code>\lastpageref{...}</code> instead of <code>\pageref{...}</code> <i>must</i> be used. This is required for pages somewhere inside of the document as well as the (very) last page(s). Because <code>\lastpageref{...}</code> is a synonym for <code>\pageref{...}</code> , where no <code>fnsymbol</code> page numbering scheme is used, it is save(r) to use it for all references to labels provided by the <code>pageslts</code> 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 `\pageref{pagesLTS.fnsymbol}`.  
`pagesLTS.alph` 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 L<sup>A</sup>T<sub>E</sub>X, 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

```
pagesLTS. page numbering \lastpages{<page numbering scheme>}{<number>},
scheme . number where <page numbering scheme> is e.g. Roman, arabic,... and <number> the “sector” number, e.g. \lastpages{Roman}{2}.
.local.cnt (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 January 28, 2013      page V (5) of VII + 35 = 42 pages”*

or

*“DRAFT January 28, 2013      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  $\text{\LaTeX 2}_\epsilon$  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  $\text{\LaTeX}$ , 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`.)

### 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  $\text{\TeX}$  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 subsubsections 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 XI (11.0.1) does not show the correct page names for all pages with `fnsymbol` page numbering scheme:

page number	page name	shown by the Reader	
		without alphanth &	with pageslts
-2	LaTeX Error		—
-1	LaTeX Error		—*
0	(ignored by L <sup>A</sup> T <sub>E</sub> X)		0
1	*	*	*
2	†		
3	‡		
4	§		
5	¶		
6		"026B30D	**
7	**	**	
8	††		
9	‡‡		
10	LaTeX Error		
11	LaTeX Error		* * *
12	LaTeX Error		

and so on, while at least the (... of ...) part of the page number is displayed correctly (see page 4, tip about logical page numbers). When the `alphanth` package and the `pageslts` package with `fnsymbolmult` option are used, page names like —\*, 0, \*, \*\* are also presented correctly by the Reader. (Adobe Reader X even got the other 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.  $\varepsilon$ -T<sub>E</sub>X), 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 T<sub>E</sub>X 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<sub>ε</sub>, 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 (CTAN:) 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  $\varepsilon$ -T<sub>E</sub>X. `pageslts` does not require  $\varepsilon$ -T<sub>E</sub>X, but if you already have  $\varepsilon$ -T<sub>E</sub>X, 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 CTAN:?)

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}
3 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
4 \usepackage{lipsum}[2011/04/14]% v1.2
5 \usepackage[draft]{showkeys}[2007/08/07]% v3.15
6 %%      Use final instead of draft to hide the keys. %%
7 \usepackage{hyperref}[2012/11/06]% v6.83m
8 \hypersetup{
9   extension=pdf,%
10  plainpages=false,%
11  pdfpagelabels=true,%
12  hyperindex=false,%
13  pdflang={en},%
14  pdftitle={pageslts package example},%
15  pdfauthor={Hans-Martin Muench},%
16  pdfsubject={Example for the pageslts package},%
17  pdfkeywords={LaTeX, pageslts, H.-Martin Muench},%
18  pdfview=Fit,%
19  pdfstartview=Fit,%
20  pdfpagelayout=SinglePage,%
21  bookmarksopen=true%
22 }
23 \usepackage[pagecontinue=true,alphMult=ab,AlphMulti=AB,fnsymbolmult=true,romanMult=true,RomanMulti=true]{pageslts}[2013/01/28]% v1.2b
24 %% These are the default options. %%
25 \makeatletter
26   \renewcommand{\@evenfoot}{%
27     {Page \thepage\ (\thecurrentPage; local: \thecurrentPageLocal) of %
28     \lastpageref{pagesLTS.roman}(\lastpageref{pagesLTS.roman.local}) + %
29     \lastpageref{pagesLTS.Roman}(\lastpageref{pagesLTS.Roman.local}) + %
30     \lastpageref{pagesLTS.arabic}(\lastpageref{pagesLTS.arabic.local}) + %
31     \lastpageref{pagesLTS.fnsymbol}(\lastpageref{pagesLTS.fnsymbol.local}) + %
32     \lastpageref{pagesLTS.alph}(\lastpageref{pagesLTS.alph.local}) + %
33     \lastpageref{pagesLTS.Alph}(\lastpageref{pagesLTS.Alph.local}) = %
34     \lastpageref{LastPages} pages.%
35   }
36   \renewcommand{\@oddfoot}{\@evenfoot}
37   \def\pagesLTsexampleArabic{3}
38   \def\pagesLTsexamplealph{23}
39   \gdef\unit#1{\mathord{\thinspace\mathrm{#1}}}%
40 \makeatother
41 \listfiles
42 \begin{document}
43 \pagenumbering{roman}
44 %% Note the first \pagenumbering immediately behind \begin{document}! %%
45 %%\addtocounter{page}{-2} %%

```



```

46
47 \section*{Example for pageslts}
48 \addcontentsline{toc}{section}{Example for pageslts}
49 \markboth{Example for pageslts}{Example for pageslts}
50
51 This example demonstrates the most common uses of package\\
52 \textsf{pageslts}, v1.2b as of 2013/01/28 (HMM).\\
53 The used options were \texttt{pagecontinue=true},
54 \texttt{alphMult=ab}, \texttt{AlphMulti=AB}, \linebreak
55 \texttt{fnsymbolmult=true},
56 \texttt{romanMult=true}, and \texttt{RomanMulti=true}
57 (the default ones).\\
58 For more details please see the documentation!\\
59
60 \label{keys} To hide the \pageref{keys}{\quad } use option
61 \texttt{final} instead of \texttt{draft} with the \textsf{showkeys}
62 package (or remove the package call from the preamble of
63 this document).\\
64
65 \textbf{Hyperlinks or not:} If the \textsf{hyperref} package is loaded,
66 the references are also hyperlinked:\\
67 \smallskip
68 Page \thepage\ (\theCurrentPage; local: \theCurrentPageLocal) of %
69 \lastpageref{pagesLTS.roman}(\lastpageref{pagesLTS.roman.local}) + %
70 \lastpageref{pagesLTS.Roman}(\lastpageref{pagesLTS.Roman.local}) + %
71 \lastpageref{pagesLTS.arabic}(\lastpageref{pagesLTS.arabic.local}) + %
72 \lastpageref{pagesLTS.fnsymbol}(\lastpageref{pagesLTS.fnsymbol.local}) + %
73 \lastpageref{pagesLTS.alph}(\lastpageref{pagesLTS.alph.local}) + %
74 \lastpageref{pagesLTS.Alph}(\lastpageref{pagesLTS.Alph.local}) = %
75 \lastpageref{LastPages} pages.\\
76 If the \textsf{hyperref} package is loaded, but the hyperlinks of the
77 references shall be suppressed, \verb|\pageref*{...}|
78 and \verb|\lastpageref*{...}| can be used:\\
79 Page \thepage\ (\theCurrentPage; local: \theCurrentPageLocal) of %
80 \lastpageref*{pagesLTS.roman}(\lastpageref*{pagesLTS.roman.local}) + %
81 \lastpageref*{pagesLTS.Roman}(\lastpageref*{pagesLTS.Roman.local}) + %
82 \lastpageref*{pagesLTS.arabic}(\lastpageref*{pagesLTS.arabic.local}) + %
83 \lastpageref*{pagesLTS.fnsymbol}(\lastpageref*{pagesLTS.fnsymbol.local}) + %
84 \lastpageref*{pagesLTS.alph}(\lastpageref*{pagesLTS.alph.local}) + %
85 \lastpageref*{pagesLTS.Alph}(\lastpageref*{pagesLTS.Alph.local}) = %
86 \lastpageref*{LastPages} pages.\\
87
88 \textbf{Trademarks} appear throughout this example without any
89 trademark symbol; they are the property of their respective
90 trademark owner. There is no intention of infringement; the
91 usage is to the benefit of the trademark owner.\\
92

```

```

93 \textbf{Tip}: Use \textit{logical page numbers} for
94 the display of the pdf!\\
95 (In Adobe Reader XI (11.0.1): \underline{E}dit $>$
96 Prefere\underline{n}ces (Ctrl+k) $>$ Page Display $>$
97 Page Content and Information $>$ Use logical page
98 \nolinebreak{\underline{n}umbers.})\\
99
100 You want negative page numbers? Not only arabic, but even roman,
101 Roman, alph, Alph or fnsymbol ones? No problem, e.\,g. just give a\\
102 \verb|\addtocounter{page}{|-\textit{some number}\verb|}| in the
103 source code of this example file (or uncomment the prepared line)!
104
105 \bigskip
106
107 Save per page about $200\unit{ml}$ water, $2\unit{g}$ CO$_{2}$
108 and $2\unit{g}$ wood:\\
109 Therefore please print only if this is really necessary.
110
111 \pagebreak
112
113 \tableofcontents
114
115 \newpage
116
117 \pagenumbering{roman}
118 %% in case the page numbering is changed before,
119 %% otherwise pagesLTS.current.local.roman on this page
120 %% would be undefined
121
122 \section{roman}
123
124 \noindent (\texttt{roman} page numbering was started before,
125 because the page numbering scheme was needed to start at
126 the first page, of course.)\\
127
128 \noindent First page (\verb|\lastpageref{pagesLTS.0}|):
129 \lastpageref{pagesLTS.0}\\
130
131 \noindent The page (\verb|\thepage|): \thepage \\
132
133 \noindent Current page (\verb|\thecurrentpage|),
134 i.\,e. counted continuously from the first page): \thecurrentpage \\
135 You can get this also in other formats:
136 \roman{CurrentPage}, \Roman{CurrentPage}, \arabic{CurrentPage},
137 \fnsymbol{CurrentPage}, \alph{CurrentPage}, \Alph{CurrentPage}.
138
139 \noindent CurrentPageLocal (\verb|\thecurrentpagelocal|),

```

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

```

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

```

234 \noindent Last fnsymbol page (pagesLTS.fnsymbol): \lastpageref{pagesLTS.fnsymbol} \\
 235 (\verb|\lastpageref{pagesLTS.fnsymbol}| -- never \verb|\pageref{pagesLTS.fnsymbol}|!)\\
 236 (There are \lastpageref{pagesLTS.fnsymbol.local} pages with fnsymbol numbers.)\\
 237

238 \noindent Last alph page (pagesLTS.alph): \lastpageref{pagesLTS.alph}{\hskip4em }
 239 (There are only \lastpageref{pagesLTS.alph.local} pages with alph numbers,
 240 because an \verb|\addtocounter{page}{|\pagesLTSexamplealph\verb|}| was used.)\\
 241

242 \noindent Last Alph page (pagesLTS.Alph): \lastpageref{pagesLTS.Alph}{\hskip4em }
 243 (There are \lastpageref{pagesLTS.Alph.local} pages with Alph numbers.)\\
 244

245 \noindent Last page's \textit{name} (LastPage): \lastpageref{LastPage}\\
 246

247 \noindent Very last page's \textit{name} (VeryLastPage): \lastpageref{VeryLastPage}\\
 248 (\texttt{LastPage} and \texttt{VeryLastPage} are identical, unless
 249 a package with output \linebreak
 250 \verb|\AtEndDocument| after the \textsf{pageslts} package was added.)\\
 251

252 \noindent Last page's \textit{number} (LastPages): \lastpageref{LastPages}{\hskip3em }
 253 (=total number of pages)\\
 254

255 \lipsum[1-4]
 256

257 \newpage
 258

259 \subsection{Last page of first Roman sector}
 260 \verb|\lastpageref{pagesLTS.Roman}| does \textbf{not}
 261 refer to this page (but there: \lastpageref{pagesLTS.Roman}),
 262 because the option \texttt{pagecontinue=true}
 263 was chosen. When a reference to this page is wanted,\\
 264 \verb|\lastpageref{pagesLTS.Roman.1}| can be used: \lastpageref{pagesLTS.Roman.1}.\\
 265

266 \bigskip
 267 There are \lastpages{Roman}{1}~pages (\verb|\lastpages{Roman}{1}|)
 268 in this first Roman sector.\\
 269 The Roman page numbering scheme is continued later in section~\ref{Roman2})!
 270

271 \newpage
 272

273 \pagenumbering{arabic}
 274

275 \section{arabic}
 276

277 \subsection{Standard page numbering}
 278

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

```

281
282 \noindent The page (\verb|\thepage|): \thepage \\
283
284 \noindent Current page (\verb|\theCurrentPage|),
285 i.\,e. counted continuously from the first page): \theCurrentPage \\
286
287 \noindent CurrentPageLocal (\verb|\theCurrentPageLocal|),
288 i.\,e. counted continuously from the first page of the
289 current page numbering scheme): \theCurrentPageLocal \\
290
291 \noindent Last roman page (pagesLTS.roman): \lastpageref{pagesLTS.roman}{\hskip4em }
292 (There are \lastpageref{pagesLTS.roman.local} pages with roman numbers.)\\
293
294 \noindent Last Roman page (pagesLTS.Roman): \lastpageref{pagesLTS.Roman}{\hskip3em }
295 (There are \lastpageref{pagesLTS.Roman.local}~pages with Roman numbers:\\
296 \lastpages{Roman}{1}~pages in the first Roman sector
297 (\pageref{Roman}{\hskip3em }-\lastpageref{pagesLTS.Roman.1}{\hskip3em }),\\
298 \lastpages{Roman}{2}~pages in the second Roman sector
299 (\pageref{Roman2}{\hskip3em }-\lastpageref{pagesLTS.Roman.2}{\hskip3em }), and\\
300 \lastpages{Roman}{3}~pages in the third Roman sector
301 (\pageref{Roman3}{\hskip3em }-\lastpageref{pagesLTS.Roman.3}{\hskip3em }).\\
302
303 \noindent Last arabic page (pagesLTS.arabic): \lastpageref{pagesLTS.arabic}{\hskip5em }
304 (There are only \lastpageref{pagesLTS.arabic.local} pages with arabic numbers,
305 because an \verb|\addtocounter{page}{\pagesLTSexampleArabic\verb|}| was used.)\\
306
307 \noindent Last fnsymbol page (pagesLTS.fnsymbol): \lastpageref{pagesLTS.fnsymbol} \\
308 (\verb|\lastpageref{pagesLTS.fnsymbol}| -- never \verb|\pageref{pagesLTS.fnsymbol}|!)\\
309 (There are \lastpageref{pagesLTS.fnsymbol.local} pages with fnsymbol numbers.)\\
310
311 \noindent Last alph page (pagesLTS.alph): \lastpageref{pagesLTS.alph}{\hskip4em }
312 (There are only \lastpageref{pagesLTS.alph.local} pages with alph numbers,
313 because an \verb|\addtocounter{page}{\pagesLTSexamplealph\verb|}| was used.)\\
314
315 \noindent Last Alph page (pagesLTS.Alph): \lastpageref{pagesLTS.Alph}{\hskip4em }
316 (There are \lastpageref{pagesLTS.Alph.local} pages with Alph numbers.)\\
317
318 \noindent Last page's \textit{name} (LastPage): \lastpageref{LastPage}\\
319
320 \noindent Very last page's \textit{name} (VeryLastPage): \lastpageref{VeryLastPage}\\
321 (\texttt{LastPage} and \texttt{VeryLastPage} are identical, unless
322 a package with output \linebreak
323 \verb|\AtEndDocument| after the \textsf{pagesLTS} package was added.)\\
324
325 \noindent Last page's \textit{number} (LastPages): \lastpageref{LastPages}{\hskip3em }
326 (=total number of pages)\\
327

```

```

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

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```

375 (There are \lastpageref{pagesLTS.Alph.local} pages with Alph numbers.)\\
376
377 \noindent Last page's \textit{name} (LastPage): \lastpageref{LastPage}\\
378
379 \noindent Very last page's \textit{name} (VeryLastPage): \lastpageref{VeryLastPage}\\
380 (\texttt{LastPage} and \texttt{VeryLastPage} are identical, unless
381 a package with output \linebreak
382 \verb|\AtEndDocument| after the \textsf{pageslts} package was added.)\\
383
384 \noindent Last page's \textit{number} (LastPages): \lastpageref{LastPages}{\hskip3em }
385 (=total number of pages)\\
386
387 \lipsum[1-4]
388
389 \newpage
390
391 \subsection[addtocounter, setcounter]{Neither\ %
392 \texttt{\textbackslash addtocounter\{page\}} nor\ %
393 \texttt{\textbackslash setcounter\{page\}} is a problem for the\ %
394 current or total page numbers}
395
396 (Here is an \verb|\addtocounter{page}{\pagesLTsexampleArabic\verb|}|
397 in the source code.)\\
398 \addtocounter{page}{\pagesLTsexampleArabic}
399
400 \noindent The page (from \verb|\thepage| command): \thepage \\
401
402 \noindent Current page (from \verb|\theCurrentPage|\ %
403 command), i.\,e. counted continuously from the first page): \theCurrentPage \\
404
405 \noindent CurrentPageLocal (from \verb|\theCurrentPageLocal|\ %
406 command), i.\,e. counted continuously from the first page of the
407 current page numbering scheme): \theCurrentPageLocal\\
408
409 \noindent Last page's number (LastPages): \lastpageref{LastPages}{\hskip3em }
410 (= total number of pages)\\
411
412 \lipsum[1-7]
413
414 \newpage
415
416 \pagenumbering{fnsymbol}
417
418 \section{fnsymbol}
419
420 Adobe Reader XI (11.0.1) does not show the correct page names
421 for all pages with \texttt{fnsymbol} page numbering scheme:

```



```

422
423 \begin{center}
424 \begin{tabular}{c|c|c|c}
425 page & page & \multicolumn{2}{c|}{shown by the Reader} & \\
426 number & name & without & & \multicolumn{1}{c|}{with} & \\
427 & & \multicolumn{2}{c|}{\textsf{alphalph}} & \& \textsf{pageslts}} & \hline
428 $-2$ & \texttt{LaTeX Error} & & & \ensuremath {-\ } & \\
429 $-1$ & \texttt{LaTeX Error} & & & \ensuremath {-\ *} & \\
430 $0$ & (ignored by \LaTeX) & & & 0 & \\
431 $1$ & \ensuremath {\*} & & * & \ensuremath {\*} & \\
432 $2$ & \ensuremath {\dag} & & & & \\
433 $3$ & \ensuremath {\ddag} & & & & \\
434 $4$ & \ensuremath {\mathsection} & & & & \\
435 $5$ & \ensuremath {\mathparagraph} & & & & \\
436 $6$ & \ensuremath {\delimiter "026B30D} & & "026B30D & \ensuremath {\**} & \\
437 $7$ & \ensuremath {\**} & & ** & & \\
438 $8$ & \ensuremath {\dag \dag} & & & & \\
439 $9$ & \ensuremath {\ddag \ddag} & & & & \\
440 $10$ & \texttt{LaTeX Error} & & & & \\
441 $11$ & \texttt{LaTeX Error} & & & \ensuremath {\***} & \\
442 $12$ & \texttt{LaTeX Error} & & & & \\
443 \end{tabular}
444 \end{center}
445
446 \noindent and so on, while at least the (\ldots\ of \ldots ) part
447 of the page number is displayed correctly.\\
448
449 \bigskip
450
451 Without option \texttt{fnsymbolmult=true} of the \textsf{pageslts} package
452 (and the help of \textsc{Heiko Oberdiek}'s \textsf{alphalph} package),
453 after page~9 (\textquotedblleft \ensuremath {\ddag \ddag} \textquotedblright )
454 (and also for negative page numbers) there would just appear a
455 \begin{quote}
456 \begin{verbatim}
457 LaTeX Error: Counter too large
458 See the LaTeX manual or LaTeX Companion for explanation.
459 You've lost some text. Try typing <return> to proceed.
460 If that doesn't work, type X <return> to quit.
461 \end{verbatim}
462 \end{quote}
463 Now the page numbers after 5 (\ensuremath {\mathparagraph} ) are
464 continued with the doubled \textquotedblleft number\textquotedblright\ of
465 the first, second, third,\ldots\ page (\ensuremath {\**},
466 \ensuremath {\dag \dag}, \ensuremath {\ddag \ddag},
467 \ensuremath {\mathsection \mathsection},
468 \ensuremath {\mathparagraph \mathparagraph} ),

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469 and after the tenth page the \textquotedblleft number\textquotedblright\ is
470 tripled (\ensuremath {***}, \ensuremath {\dagger \dagger \dagger },\ldots).
471 Page zero is named 0 and negative pages just named like the positive ones
472 with addition of a minus sign~($-$).
473
474 \bigskip
475
476 \noindent First page (\verb|\lastpageref{pagesLTS.0}|):
477 \lastpageref{pagesLTS.0}\\
478
479 \noindent The page (\verb|\thepage|): \thepage \\
480
481 \noindent Current page (\verb|\theCurrentPage|),
482 i.\,e. counted continuously from the first page): \theCurrentPage \\
483
484 \noindent CurrentPageLocal (\verb|\theCurrentPageLocal|),
485 i.\,e. counted continuously from the first page of the
486 current page numbering scheme): \theCurrentPageLocal \\
487
488 \noindent Last roman page (pagesLTS.roman): \lastpageref{pagesLTS.roman}{\hskip4em }
489 (There are \lastpageref{pagesLTS.roman.local} pages with roman numbers.)\\
490
491 \noindent Last Roman page (pagesLTS.Roman): \lastpageref{pagesLTS.Roman}{\hskip3em }
492 (There are \lastpageref{pagesLTS.Roman.local}~pages with Roman numbers:\\
493 \lastpages{Roman}{1}~pages in the first Roman sector
494 (\pageref{Roman}{\hskip3em }-\lastpageref{pagesLTS.Roman.1}{\hskip3em }),\\
495 \lastpages{Roman}{2}~pages in the second Roman sector
496 (\pageref{Roman2}{\hskip3em }-\lastpageref{pagesLTS.Roman.2}{\hskip3em }), and\\
497 \lastpages{Roman}{3}~pages in the third Roman sector
498 (\pageref{Roman3}{\hskip3em }-\lastpageref{pagesLTS.Roman.3}{\hskip3em }).\ \\
499
500 \noindent Last arabic page (pagesLTS.arabic): \lastpageref{pagesLTS.arabic}{\hskip5em }
501 (There are only \lastpageref{pagesLTS.arabic.local} pages with arabic numbers,
502 because an \verb|\addtocounter{page}{|\pagesLTSexampleArabic\verb|}| was used.)\\
503
504 \noindent Last fnsymbol page (pagesLTS.fnsymbol): \lastpageref{pagesLTS.fnsymbol} \\
505 (\verb|\lastpageref{pagesLTS.fnsymbol}| -- never \verb|\pageref{pagesLTS.fnsymbol}|!)\\
506 (There are \lastpageref{pagesLTS.fnsymbol.local} pages with fnsymbol numbers.)\\
507
508 \noindent Last alph page (pagesLTS.alph): \lastpageref{pagesLTS.alph}{\hskip4em }
509 (There are only \lastpageref{pagesLTS.alph.local} pages with alph numbers,
510 because an \verb|\addtocounter{page}{|\pagesLTSexamplealph\verb|}| was used.)\\
511
512 \noindent Last Alph page (pagesLTS.Alph): \lastpageref{pagesLTS.Alph}{\hskip4em }
513 (There are \lastpageref{pagesLTS.Alph.local} pages with Alph numbers.)\\
514
515 \noindent Last page's \textit{name} (LastPage): \lastpageref{LastPage}\\

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516
517 \noindent Very last page's \textit{name} (VeryLastPage): \lastpageref{VeryLastPage}\\
518 (\texttt{LastPage} and \texttt{VeryLastPage} are identical, unless
519 a package with output \linebreak
520 \verb|\AtEndDocument| after the \textsf{pageslts} package was added.)\\
521
522 \noindent Last page's \textit{number} (LastPages): \lastpageref{LastPages}{\hskip3em }
523 (=total number of pages)\\
524
525 \lipsum[1-60]
526
527 \newpage
528
529 \pagenumbering{Roman}
530
531 \section{Roman - again!\label{Roman2}}
532
533 The page number would start with \textquotedblleft I\textquotedblright\ again --
534 but for the \textsf{pageslts} package (with option \texttt{pagecontinue=true},
535 or with option just \texttt{pagecontinue}, or even just
536 \nolinebreak{with\textbf{out}} option \texttt{pagecontinue=false}).
537 This package remembered the (\arabic{pagesLTS.double.Roman}-1)\footnote{%
538 OK, here you have to compute this value for yourself, but\ %
539 subtracting one should be manageable for \TeX{}nicians.} pages already
540 done in Roman output, and therefore continues with page
541 \textquotedblleft \thepage \textquotedblright .\\
542 If you want to start with \textquotedblleft I\textquotedblright\ all
543 over again, you will have two pages with the same name,
544 but nevertheless you can do this by using option \texttt{pagecontinue=false}
545 or a \verb|\setcounter{page}{1}| here (not demonstrated in this example file).\\
546
547 \noindent First page (\verb|\lastpageref{pagesLTS.0}|):
548 \lastpageref{pagesLTS.0}\\
549
550 \noindent The page (\verb|\thepage|): \thepage \\
551
552 \noindent Current page (\verb|\theCurrentPage|),
553 i.\,e. counted continuously from the first page: \theCurrentPage \\
554
555 \noindent CurrentPageLocal (\verb|\theCurrentPageLocal|),
556 i.\,e. counted continuously from the first page of the
557 current page numbering scheme): \theCurrentPageLocal \\
558
559 \noindent Last roman page (pagesLTS.roman): \lastpageref{pagesLTS.roman}{\hskip4em }
560 (There are \lastpageref{pagesLTS.roman.local} pages with roman numbers.)\\
561
562 \noindent Last Roman page (pagesLTS.Roman): \lastpageref{pagesLTS.Roman}{\hskip3em }

```

563 (There are \lastpageref{pagesLTS.Roman.local}~pages with Roman numbers:\\  
 564 \lastpages{Roman}{1}~pages in the first Roman sector  
 565 (\pageref{Roman}{\hskip3em }-\lastpageref{pagesLTS.Roman.1}{\hskip3em }),\\  
 566 \lastpages{Roman}{2}~pages in the second Roman sector  
 567 (\pageref{Roman2}{\hskip3em }-\lastpageref{pagesLTS.Roman.2}{\hskip3em }), and\\  
 568 \lastpages{Roman}{3}~pages in the third Roman sector  
 569 (\pageref{Roman3}{\hskip3em }-\lastpageref{pagesLTS.Roman.3}{\hskip3em }).\\  
 570  
 571 \noindent Last arabic page (pagesLTS.arabic): \lastpageref{pagesLTS.arabic}{\hskip5em }  
 572 (There are only \lastpageref{pagesLTS.arabic.local} pages with arabic numbers,  
 573 because an \verb|\addtocounter{page}{\pagesLTSexampleArabic\verb|}| was used.)\\  
 574  
 575 \noindent Last fnsymbol page (pagesLTS.fnsymbol): \lastpageref{pagesLTS.fnsymbol} \\  
 576 (\verb|\lastpageref{pagesLTS.fnsymbol}| -- never  
 577 \verb|\pageref{pagesLTS.fnsymbol}|!)\\  
 578 (There are \lastpageref{pagesLTS.fnsymbol.local} pages with fnsymbol numbers.)\\  
 579  
 580 \noindent Last alph page (pagesLTS.alph): \lastpageref{pagesLTS.alph}{\hskip4em }  
 581 (There are only \lastpageref{pagesLTS.alph.local} pages with alph numbers,  
 582 because an \verb|\addtocounter{page}{\pagesLTSexamplealph\verb|}| was used.)\\  
 583  
 584 \noindent Last Alph page (pagesLTS.Alph): \lastpageref{pagesLTS.Alph}{\hskip4em }  
 585 (There are \lastpageref{pagesLTS.Alph.local} pages with Alph numbers.)\\  
 586  
 587 \noindent Last page's \textit{name} (LastPage): \lastpageref{LastPage}\\  
 588  
 589 \noindent Very last page's \textit{name} (VeryLastPage): \lastpageref{VeryLastPage}\\  
 590 (\texttt{LastPage} and \texttt{VeryLastPage} are identical, unless  
 591 a package with output \linebreak  
 592 \verb|\AtEndDocument| after the \textsf{pageslts} package was added.)\\  
 593  
 594 \noindent Last page's \textit{number} (LastPages): \lastpageref{LastPages}{\hskip3em }  
 595 (=total number of pages)\\  
 596  
 597 \lipsum[1-6]  
 598  
 599 \newpage  
 600  
 601 \verb|\lastpageref{pagesLTS.Roman}| does \textbf{not}  
 602 refer to this page (but there: \lastpageref{pagesLTS.Roman}),  
 603 because the option \texttt{pagecontinue=true}  
 604 was chosen. When a reference to this page is wanted,\\  
 605 \verb|\lastpageref{pagesLTS.Roman.2}| can be used: \lastpageref{pagesLTS.Roman.2}.\\  
 606  
 607 \bigskip  
 608 There are \lastpages{Roman}{2}~pages (\verb|\lastpages{Roman}{2}|) in this  
 609 second Roman sector.\\

```

610 The Roman page numbering scheme is continued later in section~\ref{Roman3})!
611
612 \newpage
613
614 \pagenumbering{alph}
615
616 \section{alph\label{alph}}
617
618 \noindent First page (\verb|\lastpageref{pagesLTS.0}|):
619 \lastpageref{pagesLTS.0}\\
620
621 \noindent The page (\verb|\thepage|): \thepage \\
622
623 \noindent Current page (\verb|\theCurrentPage|),
624 i.\,e. counted continuously from the first page): \theCurrentPage \\
625
626 \noindent CurrentPageLocal (\verb|\theCurrentPageLocal|),
627 i.\,e. counted continuously from the first page of the
628 current page numbering scheme): \theCurrentPageLocal \\
629
630 \noindent Last roman page (pagesLTS.roman): \lastpageref{pagesLTS.roman}{\hskip4em }
631 (There are \lastpageref{pagesLTS.roman.local} pages with roman numbers.)\\
632
633 \noindent Last Roman page (pagesLTS.Roman): \lastpageref{pagesLTS.Roman}{\hskip3em }
634 (There are \lastpageref{pagesLTS.Roman.local}~pages with Roman numbers:\\
635 \lastpages{Roman}{1}~pages in the first Roman sector
636 (\pageref{Roman}{\hskip3em }-\lastpageref{pagesLTS.Roman.1}{\hskip3em }),\\
637 \lastpages{Roman}{2}~pages in the second Roman sector
638 (\pageref{Roman2}{\hskip3em }-\lastpageref{pagesLTS.Roman.2}{\hskip3em }), and\\
639 \lastpages{Roman}{3}~pages in the third Roman sector
640 (\pageref{Roman3}{\hskip3em }-\lastpageref{pagesLTS.Roman.3}{\hskip3em }).\ \\
641
642 \noindent Last arabic page (pagesLTS.arabic): \lastpageref{pagesLTS.arabic}{\hskip5em }
643 (There are only \lastpageref{pagesLTS.arabic.local} pages with arabic numbers,
644 because an \verb|\addtocounter{page}{\pagesLTSexampleArabic\verb|}| was used.)\\
645
646 \noindent Last fnsymbol page (pagesLTS.fnsymbol): \lastpageref{pagesLTS.fnsymbol} \\
647 (\verb|\lastpageref{pagesLTS.fnsymbol}| -- never \verb|\pageref{pagesLTS.fnsymbol}|!)\\
648 (There are \lastpageref{pagesLTS.fnsymbol.local} pages with fnsymbol numbers.)\\
649
650 \noindent Last alph page (pagesLTS.alph): \lastpageref{pagesLTS.alph}{\hskip4em }
651 (There are only \lastpageref{pagesLTS.alph.local} pages with alph numbers,
652 because an \verb|\addtocounter{page}{\pagesLTSexamplealph\verb|}| was used.)\\
653
654 \noindent Last Alph page (pagesLTS.Alph): \lastpageref{pagesLTS.Alph}{\hskip4em }
655 (There are \lastpageref{pagesLTS.Alph.local} pages with Alph numbers.)\\
656

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```

657 \noindent Last page's \textit{name} (LastPage): \lastpageref{LastPage}\\
658
659 \noindent Very last page's \textit{name} (VeryLastPage): \lastpageref{VeryLastPage}\\
660 (\texttt{LastPage} and \texttt{VeryLastPage} are identical, unless
661 a package with output \linebreak
662 \verb|\AtEndDocument| after the \textsf{pageslts} package was added.)\\
663
664 \noindent Last page's \textit{number} (LastPages): \lastpageref{LastPages}{\hskip3em }
665 (=total number of pages)\\
666
667 \lipsum[1-4]
668
669 \newpage
670
671 Without option \texttt{alphMult=ab} of the \textsf{pageslts} (and the help of
672 \textsc{Heiko Oberdiek's} \textsf{alphalph} package), after page
673 \textquotedblleft z\textquotedblright\ there would just appear a
674 \begin{quote}
675 \begin{verbatim}
676 LaTeX Error: Counter too large
677 See the LaTeX manual or LaTeX Companion for explanation.
678 You've lost some text. Try typing <return> to proceed.
679 If that doesn't work, type X <return> to quit.
680 \end{verbatim}
681 \end{quote}
682 Now the page numbers are continued aa, ab, ac,\ldots\ (aa, bb, cc,\ldots\ is
683 also possible, see the \textsf{pageslts} documentation).\\
684 To demonstrate this, we add a\\
685 \verb|\addtocounter{page}{\pagesLTSexamplealph\verb|}|\\
686 in the source code here.
687
688 \addtocounter{page}{\pagesLTSexamplealph}
689
690 \bigskip
691
692 \lipsum[1-18]
693
694 \newpage
695
696 \pagenumbering{Roman}
697
698 \section{Roman - third time!\label{Roman3}}
699
700 The page number would start with
701 \textquotedblleft I\textquotedblright\ again -- but
702 for the \textsf{pageslts} package (with option \texttt{pagecontinue=true},
703 or with option just \texttt{pagecontinue}, or even just

```

```

704 \nolinebreak{with\textbf{out}} option \texttt{pagecontinue=false}).
705 This package remembered the
706 (\arabic{pagesLTS.double.Roman}-1)\footnote{OK, here\ %
707 you have to compute this value for yourself, but\ %
708 subtracting one should be managable for \TeX nicians.} pages already
709 done in Roman output, and therefore continues with page
710 \textquotedblleft \thepage \textquotedblright .\\
711 If you want to start with \textquotedblleft I\textquotedblright\ all
712 over again, you will have (at least) two pages with the same name,
713 but nevertheless you can do this by using option
714 \texttt{pagecontinue=false} instead of \texttt{pagecontinue=true}
715 (not demonstrated here).\\
716
717 \noindent First page (\verb|\lastpageref{pagesLTS.0}|):
718 \lastpageref{pagesLTS.0}\\
719
720 \noindent The page (\verb|\thepage|): \thepage \\
721
722 \noindent Current page (\verb|\theCurrentPage|),
723 i.\,e. counted continuously from the first page): \theCurrentPage \\
724
725 \noindent CurrentPageLocal (\verb|\theCurrentPageLocal|),
726 i.\,e. counted continuously from the first page of the
727 current page numbering scheme): \theCurrentPageLocal \\
728
729 \noindent Last roman page (pagesLTS.roman): \lastpageref{pagesLTS.roman}{\hskip4em }
730 (There are \lastpageref{pagesLTS.roman.local} pages with roman numbers.)\\
731
732 \noindent Last Roman page (pagesLTS.Roman): \lastpageref{pagesLTS.Roman}{\hskip3em }
733 (There are \lastpageref{pagesLTS.Roman.local}~pages with Roman numbers:\\
734 \lastpages{Roman}{1}~pages in the first Roman sector
735 (\pageref{Roman}{\hskip3em }-\lastpageref{pagesLTS.Roman.1}{\hskip3em }),\\
736 \lastpages{Roman}{2}~pages in the second Roman sector
737 (\pageref{Roman2}{\hskip3em }-\lastpageref{pagesLTS.Roman.2}{\hskip3em }), and\\
738 \lastpages{Roman}{3}~pages in the third Roman sector
739 (\pageref{Roman3}{\hskip3em }-\lastpageref{pagesLTS.Roman.3}{\hskip3em }).\\
740
741 \noindent Last arabic page (pagesLTS.arabic): \lastpageref{pagesLTS.arabic}{\hskip5em }
742 (There are only \lastpageref{pagesLTS.arabic.local} pages with arabic numbers,
743 because an \verb|\addtocounter{page}{\pagesLTSexampleArabic\verb|}| was used.)\\
744
745 \noindent Last fnsymbol page (pagesLTS.fnsymbol): \lastpageref{pagesLTS.fnsymbol} \\
746 (\verb|\lastpageref{pagesLTS.fnsymbol}| -- never \verb|\pageref{pagesLTS.fnsymbol}|!)\\
747 (There are \lastpageref{pagesLTS.fnsymbol.local} pages with fnsymbol numbers.)\\
748
749 \noindent Last alph page (pagesLTS.alph): \lastpageref{pagesLTS.alph}{\hskip4em }
750 (There are only \lastpageref{pagesLTS.alph.local} pages with alph numbers,

```

751 because an `\verb|\addtocounter{page}{|\pagesLTSexamplealph\verb|}|` was used.)\\  
752  
753 `\noindent Last Alph page (pagesLTS.Alph): \lastpageref{pagesLTS.Alph}{\hskip4em }`  
754 `(There are \lastpageref{pagesLTS.Alph.local} pages with Alph numbers.)\\`  
755  
756 `\noindent Last page's \textit{name} (LastPage): \lastpageref{LastPage}\\`  
757  
758 `\noindent Very last page's \textit{name} (VeryLastPage): \lastpageref{VeryLastPage}\\`  
759 `(\texttt{LastPage} and \texttt{VeryLastPage} are identical, unless`  
760 `a package with output \linebreak`  
761 `\verb|\AtEndDocument| after the \textsf{pageslts} package was added.)\\`  
762  
763 `\noindent Last page's \textit{number} (LastPages): \lastpageref{LastPages}{\hskip3em }`  
764 `(=total number of pages)\\`  
765  
766 `\lipsum[1-3]`  
767  
768 `\newpage`  
769  
770 `\lastpageref{pagesLTS.Roman}`  
771 `(\verb|\lastpageref{pagesLTS.Roman}|)`  
772 `\textbf{does} refers to this page, because the option`  
773 `\texttt{pagecontinue=true} was chosen. Also\\`  
774 `\verb|\lastpageref{pagesLTS.Roman.3}| can be used: \lastpageref{pagesLTS.Roman.3}.\\`  
775  
776 `\bigskip`  
777  
778 `There are \lastpages{Roman}{3}~pages (\verb|\lastpages{Roman}{3}|) in this`  
779 `third Roman sector.\\`  
780  
781 `\newpage`  
782  
783 `\pagenumbering{Alph}`  
784  
785 `\section{Alph}`  
786  
787 `\noindent First page (\verb|\lastpageref{pagesLTS.0}|):`  
788 `\lastpageref{pagesLTS.0}\\`  
789  
790 `\noindent The page (\verb|\thepage|): \thepage \\`  
791  
792 `\noindent Current page (\verb|\theCurrentPage|),`  
793 `i.\,e. counted continuously from the first page): \theCurrentPage \\`  
794  
795 `\noindent CurrentPageLocal (\verb|\theCurrentPageLocal|),`  
796 `i.\,e. counted continuously from the first page of the`  
797 `current page numbering scheme): \theCurrentPageLocal \\`



```

798
799 \noindent Last roman page (pagesLTS.roman): \lastpageref{pagesLTS.roman}{\hskip4em }
800 (There are \lastpageref{pagesLTS.roman.local} pages with roman numbers.)\\
801
802 \noindent Last Roman page (pagesLTS.Roman): \lastpageref{pagesLTS.Roman}{\hskip3em }
803 (There are \lastpageref{pagesLTS.Roman.local}~pages with Roman numbers:\\
804 \lastpages{Roman}{1}~pages in the first Roman sector
805 (\pageref{Roman}{\hskip3em }-\lastpageref{pagesLTS.Roman.1}{\hskip3em }),\\
806 \lastpages{Roman}{2}~pages in the second Roman sector
807 (\pageref{Roman2}{\hskip3em }-\lastpageref{pagesLTS.Roman.2}{\hskip3em }), and\\
808 \lastpages{Roman}{3}~pages in the third Roman sector
809 (\pageref{Roman3}{\hskip3em }-\lastpageref{pagesLTS.Roman.3}{\hskip3em }).\\
810
811 \noindent Last arabic page (pagesLTS.arabic): \lastpageref{pagesLTS.arabic}{\hskip5em }
812 (There are only \lastpageref{pagesLTS.arabic.local} pages with arabic numbers,
813 because an \verb|\addtocounter{page}{|\pagesLTSexampleArabic\verb|}| was used.)\\
814
815 \noindent Last fnsymbol page (pagesLTS.fnsymbol): \lastpageref{pagesLTS.fnsymbol} \\
816 (\verb|\lastpageref{pagesLTS.fnsymbol}| -- never \verb|\pageref{pagesLTS.fnsymbol}|!)\\
817 (There are \lastpageref{pagesLTS.fnsymbol.local} pages with fnsymbol numbers.)\\
818
819 \noindent Last alph page (pagesLTS.alph): \lastpageref{pagesLTS.alph}{\hskip4em }
820 (There are only \lastpageref{pagesLTS.alph.local} pages with alph numbers,
821 because an \verb|\addtocounter{page}{|\pagesLTSexamplealph\verb|}| was used.)\\
822
823 \noindent Last Alph page (pagesLTS.Alph): \lastpageref{pagesLTS.Alph}{\hskip4em }
824 (There are \lastpageref{pagesLTS.Alph.local} pages with Alph numbers.)\\
825
826 \noindent Last page's \textit{name} (LastPage): \lastpageref{LastPage}\\
827
828 \noindent Very last page's \textit{name} (VeryLastPage): \lastpageref{VeryLastPage}\\
829 (\texttt{LastPage} and \texttt{VeryLastPage} are identical, unless
830 a package with output \linebreak
831 \verb|\AtEndDocument| after the \textsf{pageslts} package was added.)\\
832
833 \noindent Last page's \textit{number} (LastPages): \lastpageref{LastPages}{\hskip3em }
834 (=total number of pages)\\
835
836 \lipsum[1-3]
837
838 Without option \texttt{alphMulti=AB} of the \textsf{pageslts} (and the help of
839 \textsc{Heiko Oberdiek's} \textsf{alphalph} package), after page
840 \textquotedblleft Z\textquotedblright there would just appear a
841 \begin{quote}
842 \begin{verbatim}
843 LaTeX Error: Counter too large
844 See the LaTeX manual or LaTeX Companion for explanation.

```

```

845 You've lost some text. Try typing <return> to proceed.
846 If that doesn't work, type X <return> to quit.
847 \end{verbatim}
848 \end{quote}
849 Now the page numbers are continued AA, AB, AC,\ldots\ (AA, BB, CC,\ldots\ is
850 also possible, see the \textsf{pageslts} documentation).\
851 This is not demonstrated here, but see section~\ref{alph}.
852
853 \newpage
854
855 \section{The End}
856
857 \noindent First page (\verb|\lastpageref{pagesLTS.0}|):
858 \lastpageref{pagesLTS.0}\
859
860 \noindent The page (\verb|\thepage|): \thepage \
861
862 \noindent Current page (\verb|\thecurrentpage|),
863 i.\,e. counted continuously from the first page): \thecurrentpage \
864
865 \noindent CurrentPageLocal (\verb|\thecurrentpagelocal|),
866 i.\,e. counted continuously from the first page of the
867 current page numbering scheme): \thecurrentpagelocal \
868
869 \noindent Last roman page (pagesLTS.roman): \lastpageref{pagesLTS.roman}{\hskip4em }
870 (There are \lastpageref{pagesLTS.roman.local} pages with roman numbers.)\
871
872 \noindent Last Roman page (pagesLTS.Roman): \lastpageref{pagesLTS.Roman}{\hskip3em }
873 (There are \lastpageref{pagesLTS.Roman.local}~pages with Roman numbers:\
874 \lastpages{Roman}{1}~pages in the first Roman sector
875 (\pageref{Roman}{\hskip3em }-\lastpageref{pagesLTS.Roman.1}{\hskip3em }),\
876 \lastpages{Roman}{2}~pages in the second Roman sector
877 (\pageref{Roman2}{\hskip3em }-\lastpageref{pagesLTS.Roman.2}{\hskip3em }), and\
878 \lastpages{Roman}{3}~pages in the third Roman sector
879 (\pageref{Roman3}{\hskip3em }-\lastpageref{pagesLTS.Roman.3}{\hskip3em }).\
880
881 \noindent Last arabic page (pagesLTS.arabic): \lastpageref{pagesLTS.arabic}{\hskip5em }
882 (There are only \lastpageref{pagesLTS.arabic.local} pages with arabic numbers,
883 because an \verb|\addtocounter{page}{\pagesLTSexampleArabic\verb|}| was used.)\
884
885 \noindent Last fnsymbol page (pagesLTS.fnsymbol): \lastpageref{pagesLTS.fnsymbol} \
886 (\verb|\lastpageref{pagesLTS.fnsymbol}| -- never \verb|\pageref{pagesLTS.fnsymbol}|!)\
887 (There are \lastpageref{pagesLTS.fnsymbol.local} pages with fnsymbol numbers.)\
888
889 \noindent Last alph page (pagesLTS.alph): \lastpageref{pagesLTS.alph}{\hskip4em }
890 (There are only \lastpageref{pagesLTS.alph.local} pages with alph numbers,
891 because an \verb|\addtocounter{page}{\pagesLTSexamplealph\verb|}| was used.)\

```

```

892
893 \noindent Last Alph page (pagesLTS.Alph): \lastpageref{pagesLTS.Alph}{\hskip4em }
894 (There are \lastpageref{pagesLTS.Alph.local} pages with Alph numbers.)\\
895
896 \noindent Last page's \textit{name} (LastPage): \lastpageref{LastPage}\\
897
898 \noindent Very last page's \textit{name} (VeryLastPage): \lastpageref{VeryLastPage}\\
899 (\texttt{LastPage} and \texttt{VeryLastPage} are identical, unless
900 a package with output \linebreak
901 \verb|\AtEndDocument| after the \textsf{pageslts} package was added.)\\
902
903 \noindent Last page's \textit{number} (LastPages): \lastpageref{LastPages}{\hskip3em }
904 (=total number of pages)\\
905
906 \medskip
907
908 \noindent Page \thepage\ (\theCurrentPage; local: \theCurrentPageLocal) of %
909 \lastpageref{pagesLTS.roman} (\lastpageref{pagesLTS.roman.local}) + %
910 \lastpageref{pagesLTS.Roman} (\lastpageref{pagesLTS.Roman.local}) + %
911 \lastpageref{pagesLTS.arabic} (\lastpageref{pagesLTS.arabic.local}) + %
912 \lastpageref{pagesLTS.fnsymbol} (\lastpageref{pagesLTS.fnsymbol.local}) + %
913 \lastpageref{pagesLTS.alph} (\lastpageref{pagesLTS.alph.local}) + %
914 \lastpageref{pagesLTS.Alph} (\lastpageref{pagesLTS.Alph.local}) = %
915 \lastpageref{LastPages} pages.
916
917 \end{document}
918 \end{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.

```
919 \*package
920 \NeedsTeXFormat{LaTeX2e}[2011/06/27]
921 \ProvidesPackage{pageslts}[2013/01/28 v1.2b
922     Refers to special pages' numbers/names (HMM)]
923
```

A short description of the pageslts package:

```
924 %% Allows for things like\\
925 %% |Page \thepage\ (\theCurrentPage; local: \theCurrentPageLocal) of %
926 %% \lastpageref{pagesLTS.roman}(\lastpageref{pagesLTS.roman.local}) + %
927 %% \lastpageref{pagesLTS.Roman}(\lastpageref{pagesLTS.Roman.local}) + %
928 %% \lastpageref{pagesLTS.arabic}(\lastpageref{pagesLTS.arabic.local}) + %
929 %% \lastpageref{pagesLTS.fnsymbol}(\lastpageref{pagesLTS.fnsymbol.local}) + %
930 %% \lastpageref{pagesLTS.alph}(\lastpageref{pagesLTS.alph.local}) + %
931 %% \lastpageref{pagesLTS.Alph}(\lastpageref{pagesLTS.Alph.local}) = %
932 %% \lastpageref{LastPages} pages.!\
933 %% to get\\
934 %% 'Page d (57; local: 4) of ii(2) + XX(20) + *(1) + 30(30) + e(5) + C(3) = 61 pages.'.
935
```

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@deds and not defined to p@gesLTSlo@deds by another package). This check might work only for the second and following compilation runs.

```
936 \@ifpackageloaded{pagesLTS}{%
937   \def\pagesLTS@doubleload{p@gesLTSlo@deds}
938   \ifx\pagesLTS@loaded\pagesLTS@doubleload%
939     \PackageError{pageslts}{Requested pagesLTS instead of pageslts}{%
940       You have requested package ‘pagesLTS’. This package is now named ‘pageslts’.\MessageBreak%
941       Requesting ‘pagesLTS’ as well as ‘pageslts’ leads to loading the same package.\MessageBreak%
942       twice (and results in errors). Loading of ‘pageslts’ will therefore be.\MessageBreak%
943       abandoned now. To fix this problem, please look in the \jobname.log file for.\MessageBreak%
944       LaTeX Warning: You have requested package ‘pagesLTS’,.\MessageBreak%
945       \space \space \space \space \space \space \space \space \space \space \space \space \space
946       \space \space but the package provides ‘pageslts’.\MessageBreak%
947       and change the package call in the calling style/document.\MessageBreak%
948       If a style file made the mistake, please inform its maintainer and/or the.\MessageBreak%
949       maintainer of the pageslts package about it (after making sure you have.\MessageBreak%
950       the recent version of that style file).\MessageBreak%
951       Thank you and sorry for the inconvenience!\MessageBreak%
```

```

952     }
953   \endinput
954 \fi
955 }{% \relax
956 }
957
958 \gdef\pagesLTS@loaded{p@gesLTSlo@ded}
959

```

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

```

960 \RequirePackage{atveryend}[2011/06/30]%      v1.8

```

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

```

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

```

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

```

962 \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):

```

963 \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).

```

964 \RequirePackage{undolabl}[2012/01/01]%      v1.0k

```

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

```

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

```

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

```

966 %% pageslts package uses Prelim@EveryShipout code from the
967 %% prelim2e package [2009/05/29 v1.3] by Martin Schr\{"o}der, thanks!
968

```

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

A last information for the user(s):

```

969 %% pageslts may work with earlier versions of those packages,
970 %% but this was not tested. Please consider updating your packages
971 %% to the most recent version (if they are not already the most
972 %% recent version).
973

```

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  $\text{\LaTeX} 2_{\epsilon}$  commands which make use of `\AtEndDocument`. Newer versions of `endfloat` exists (at the time of writing this documentation: v2.4i as of 1995/10/11) in modern documentation form, which are available from [CTAN](#): (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.

```

974 %% The recent version of the endfloat package is v2.4i as of 1995/10/11.
975 %% The pageslts package is not fully compatible with version 2.0
976 %% (and earlier) of the endfloat package, because those versions
977 %% redefined the \enddocument command.
978

```

The options are introduced:

```

979 \SetupKeyvalOptions{family = pagesLTS,prefix = pagesLTS@}
980 \DeclareBoolOption[true]{pagecontinue}% \pagesLTS@pagecontinue
981 \DeclareStringOption[ab]{alphMult}
982 \DeclareStringOption[AB]{AlphMulti}
983 \DeclareBoolOption[true]{romanMult}
984 \DeclareBoolOption[true]{RomanMulti}
985 \DeclareBoolOption[true]{fnsymbolmult}
986
987 \ProcessKeyvalOptions*
988

```

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

```

989 \def\pagesLTS@zero{0}
990 \def\pagesLTS@one{1}
991 \def\pagesLTS@two{2}
992 \def\pagesLTS@three{3}
993

```

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.

```

994 \ifpagesLTS@pagecontinue%
995   \PackageInfo{pageslts}{Option pagecontinue enabled\MessageBreak%
996     (maybe by default):\MessageBreak%
997     The pageslts package will continue the page numbering,\MessageBreak%
998     when the same page numbering scheme is used twice.\MessageBreak%
999     If you do not want this, call pageslts with option\MessageBreak%
1000     pagecontinue=false (or use \string\setcounter{page}=1).\MessageBreak%
1001   }
1002 \else

```

```

1003 \PackageWarningNoLine{pageslts}{Option pagecontinue is false:\MessageBreak%
1004   The pageslts package was used, but the option\MessageBreak%
1005   pagecontinue was set to false.\MessageBreak%
1006   If you want the page numbers to be continued,\MessageBreak%
1007   when the same page numbering scheme is used twice,\MessageBreak%
1008   please call pageslts with option pagecontinue=true,\MessageBreak%
1009   otherwise the page number is reset to one each time\MessageBreak%
1010   the page numbering scheme is changed.\MessageBreak%
1011   For details please see the documentation!\MessageBreak%
1012 }
1013 \fi
1014

```

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`.

```

1015 \def\pagesLTS@ab{ab}
1016 \def\pagesLTS@bb{bb}
1017 \def\pagesLTS@ABi{AB}
1018 \def\pagesLTS@BBi{BB}
1019
1020 \ifx\pagesLTS@alphMult\pagesLTS@ab%
1021   \ifpagesLTS@pagecontinue% \relax
1022   \else
1023     \PackageWarningNoLine{pageslts}{Option pagecontinue=false used,\MessageBreak%
1024       but not alphMult=0.\MessageBreak%
1025       Now setting alphMult=0.\MessageBreak%
1026     }
1027     \setkeys{pagesLTS}{alphMult=0}
1028   \fi
1029 \else
1030   \ifx\pagesLTS@alphMult\pagesLTS@bb%
1031     \ifpagesLTS@pagecontinue% \relax
1032     \else
1033       \PackageWarningNoLine{pageslts}{Option pagecontinue=false used,\MessageBreak%
1034         but not alphMult=0.\MessageBreak%
1035         Now setting alphMult=0.\MessageBreak%
1036       }
1037       \setkeys{pagesLTS}{alphMult=0}
1038     \fi
1039   \else
1040     \ifx\pagesLTS@alphMult\pagesLTS@zero%
1041       \PackageWarningNoLine{pageslts}{%
1042         Option alphMult=0 found:\MessageBreak%

```

```

1043     The pageslts package was used, but the option\MessageBreak%
1044     alphMult was set to 0 (zero).\MessageBreak%
1045     If you want the page numbers to be extended\MessageBreak%
1046     after z, you have to organize this yourself now.\MessageBreak%
1047     For automatic continuation, please use the\MessageBreak%
1048     alphalph package and call pageslts\MessageBreak%
1049     with option alphMult=ab (for aa, ab, ac, ad,...) or\MessageBreak%
1050     with option alphMult=bb (for aa, bb, cc, dd,...).\MessageBreak%
1051     For details please see the documentation!\MessageBreak%
1052   }
1053   \else
1054     \PackageError{pageslts}{Unknown option value}{%
1055       The pageslts package was used with option\MessageBreak%
1056       alphMult= \pagesLTS@alphMult . Only values\MessageBreak%
1057       ab, bb, and 0 (zero) are valid.\MessageBreak%
1058       The default ab is set.\MessageBreak%
1059       For details please see the documentation!\MessageBreak%
1060     }
1061     \setkeys{pagesLTS}{alphMult=ab}
1062   \fi
1063 \fi
1064 \fi
1065
1066 \ifx\pagesLTS@AlphMulti\pagesLTS@ABi%
1067   \ifpagesLTS@pagecontinue% \relax
1068   \else
1069     \PackageWarningNoLine{pageslts}{Option pagecontinue=false used,\MessageBreak%
1070       but not AlphMulti=0.\MessageBreak%
1071       Now setting AlphMulti=0.\MessageBreak%
1072     }
1073     \setkeys{pagesLTS}{AlphMulti=0}
1074   \fi
1075 \else
1076   \ifx\pagesLTS@AlphMulti\pagesLTS@BBi%
1077     \ifpagesLTS@pagecontinue% \relax
1078     \else
1079       \PackageWarningNoLine{pageslts}{Option pagecontinue=false used,\MessageBreak%
1080         but not AlphMulti=0.\MessageBreak%
1081         Now setting AlphMulti=0.\MessageBreak%
1082       }
1083       \setkeys{pagesLTS}{AlphMulti=0}
1084     \fi
1085   \else

```



```

1086 \ifx\pagesLTS@AlphMulti\pagesLTS@zero%
1087 \PackageWarningNoLine{pageslts}{%
1088 Option AlphMulti=0 found:\MessageBreak%
1089 The pageslts package was used, but the option\MessageBreak%
1090 AlphMulti was set to 0 (zero).\MessageBreak%
1091 If you want the page numbers to be extended\MessageBreak%
1092 after Z, you have to organize this yourself now.\MessageBreak%
1093 For automatic continuation, please use the\MessageBreak%
1094 alphalph package and call pageslts\MessageBreak%
1095 with option AlphMulti=AB (for AA, AB, AC, AD,...) or\MessageBreak%
1096 with option AlphMulti=BB (for AA, BB, CC, DD,...).\MessageBreak%
1097 For details please see the documentation!\MessageBreak%
1098 }
1099 \else
1100 \PackageError{pageslts}{Unknown option value}{%
1101 The pageslts package was used with option\MessageBreak%
1102 AlphMulti= \pagesLTS@AlphMulti . Only values\MessageBreak%
1103 AB, BB, and 0 (zero) are valid.\MessageBreak%
1104 The default AB is set.\MessageBreak%
1105 For details please see the documentation!\MessageBreak%
1106 }
1107 \setkeys{pagesLTS}{AlphMulti=AB}
1108 \fi
1109 \fi
1110 \fi
1111

```

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

```

1112 \ifx\pagesLTS@alphMult\pagesLTS@zero% \relax
1113 \else \RequirePackage{alphalph}[2011/05/13]% v2.4
1114 \fi
1115
1116 \ifx\pagesLTS@AlphMulti\pagesLTS@zero% \relax
1117 \else \RequirePackage{alphalph}[2011/05/13]% v2.4
1118 \fi
1119
1120 \ifpagesLTS@fnsymbolmult%
1121 \RequirePackage{alphalph}[2011/05/13]% v2.4
1122 \fi
1123

```

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

```

1124 \ifpagesLTS@romanMult%
1125 \ifpagesLTS@pagecontinue% \relax
1126 \else
1127 \PackageWarningNoLine{pageslts}{Option pagecontinue=false used,\MessageBreak%
1128 but also romanMult.\MessageBreak%
1129 Now setting romanMult=false.\MessageBreak%

```

```

1130     }
1131     \setkeys{pagesLTS}{romanMult=false}
1132   \fi
1133 \fi
1134 \ifpagesLTS@romanMult%
1135   \PackageInfo{pageslts}{Option romanMult enabled\MessageBreak%
1136     (maybe by default):\MessageBreak%
1137     The pageslts package will extend the page numbering\MessageBreak%
1138     of the roman scheme below i with\MessageBreak%
1139     0, -i, -ii, -iii, -iv,...\MessageBreak%
1140     If you do not want this, call pageslts with option\MessageBreak%
1141     romanMult=false.\MessageBreak%
1142   }
1143 \else
1144   \PackageWarningNoLine{pageslts}{Option romanMult is set to false:\MessageBreak%
1145     The pageslts package was used, but the option\MessageBreak%
1146     romanMult was set to false.\MessageBreak%
1147     If you want the page numbering of the roman scheme\MessageBreak%
1148     to be extended below i,\MessageBreak%
1149     please call pageslts with option romanMult=true,\MessageBreak%
1150     otherwise zero and negative page numbers of the\MessageBreak%
1151     roman scheme will need to be defined otherwise.\MessageBreak%
1152     For details please see the documentation!\MessageBreak%
1153   }
1154 \fi
1155

```

Same for the Roman page numbering scheme.

```

1156 \ifpagesLTS@RomanMulti%
1157   \ifpagesLTS@pagecontinue% \relax
1158   \else
1159     \PackageWarningNoLine{pageslts}{Option pagecontinue=false used,\MessageBreak%
1160       but also RomanMulti.\MessageBreak%
1161       Now setting RomanMulti=false.\MessageBreak%
1162     }
1163     \setkeys{pagesLTS}{RomanMulti=false}
1164   \fi
1165 \fi
1166 \ifpagesLTS@RomanMulti%
1167   \PackageInfo{pageslts}{Option RomanMulti enabled\MessageBreak%
1168     (maybe by default):\MessageBreak%
1169     The pageslts package will extend the page numbering\MessageBreak%
1170     of the Roman scheme below I with\MessageBreak%
1171     0, -I, -II, -III, -IV,...\MessageBreak%
1172     If you do not want this, call pageslts with option\MessageBreak%
1173     RomanMulti=false.\MessageBreak%
1174   }
1175 \else

```

```

1176 \PackageWarningNoLine{pageslts}{Option RomanMulti is set to false:\MessageBreak%
1177   The pageslts package was used, but the option\MessageBreak%
1178   RomanMulti was set to false.\MessageBreak%
1179   If you want the page numbering of the Roman scheme\MessageBreak%
1180   to be extended below i,\MessageBreak%
1181   please call pageslts with option RomanMulti=true,\MessageBreak%
1182   otherwise zero and negative page numbers of the\MessageBreak%
1183   Roman scheme will need to be defined otherwise.\MessageBreak%
1184   For details please see the documentation!\MessageBreak%
1185 }
1186 \fi
1187

```

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

```

1188 \ifpagesLTS@fnsymbolmult%
1189   \ifpagesLTS@pagecontinue% \relax
1190   \else
1191     \PackageWarningNoLine{pageslts}{Option pagecontinue=false used,\MessageBreak%
1192      but also fnsymbolmult.\MessageBreak%
1193      Now setting fnsymbolmult=false.\MessageBreak%
1194     }
1195     \setkeys{pagesLTS}{fnsymbolmult=false}
1196   \fi
1197 \fi
1198 \ifpagesLTS@fnsymbolmult%
1199   \PackageInfo{pageslts}{Option fnsymbolmult enabled\MessageBreak%
1200    (maybe by default):\MessageBreak%
1201    The pageslts package will extend the page numbering\MessageBreak%
1202    of the footnotesymbol scheme using the alphalph\MessageBreak%
1203    package.\MessageBreak%
1204    If you do not want this, call pageslts with option\MessageBreak%
1205    fnsymbolmult=false.\MessageBreak%
1206   }
1207 \else
1208   \PackageWarningNoLine{pageslts}{%
1209    Option fnsymbolmult is set to false:\MessageBreak%
1210    The pageslts package was used, but the option\MessageBreak%
1211    fnsymbolmult was set to false.\MessageBreak%
1212    If you want the page numbering of the footnotesymbol\MessageBreak%
1213    scheme to be extended using the alphalph package,\MessageBreak%
1214    please call pageslts with option fnsymbolmult=true,\MessageBreak%
1215    otherwise page numbers of the footnotesymbol scheme\MessageBreak%
1216    greater than nine will need to be defined otherwise.\MessageBreak%
1217    For details please see the documentation!\MessageBreak%
1218   }
1219 \fi
1220

```

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

```

1221 \def\pagesLTS@pnc{0}
1222 \def\pagesLTS@called{0}
1223 \def\pagesLTS@fns{fnsymbol}
1224 \def\pagesLTS@alph{alph}
1225 \def\pagesLTS@Alph{Alph}
1226 \def\pagesLTS@AlphAlph{0}
1227 \def\pagesLTS@hyper{0}
1228 \def\pagesLTS@nameref{0}
1229 \def\pagesLTS@rerun{0}
1230 \def\pagesLTS@eso{0}
1231 \def\pagesLTS@esov{0}
1232 \def\lastpageref{\lastpagereftxt}
1233 \def\pagesLTS@undolable{none}
1234 \def\pncmissing{0}
1235 \def\pagesLTS@SK{0}
1236 \def\pagesLTS@messageNPN{%
1237   The pageslts package was used, but\MessageBreak%
1238   \string\pagenumbering \MessageBreak%
1239   was not called at the beginning of the document\MessageBreak%
1240   (maybe earlier or later).\MessageBreak%
1241   Please use \string\pagenumbering \MessageBreak%
1242   (with an argument like arabic, roman, Roman,\MessageBreak%
1243   fnsymbol, alph, or Alph) at the beginning\MessageBreak%
1244   of your document! Otherwise your document\MessageBreak%
1245   will probably compile, but the pageslts\MessageBreak%
1246   package might not be able to get all labels\MessageBreak%
1247   for the references to the respective pages\MessageBreak%
1248   right.\MessageBreak%
1249 }
1250

```

It is checked whether writing into an .aux-file is allowed. The pageslts package cannot be used without that! If it is allowed, we define \pagesLTS@loaded as p@gesLTSnotlo@d@ed for the next run.

```

1251 \if@files\ \relax
1252 \else
1253   \PackageError{pageslts}{No auxiliary file allowed.}{%
1254     The pageslts package was not allowed to write to an .aux file.\MessageBreak
1255     This package does not work without access to an .aux file.\MessageBreak
1256     Press Ctrl+Z to exit.\MessageBreak
1257   }
1258 \fi
1259

```

\pagenumbering      To keep the original meaning of \pagenumbering:

```

1260 \LetLtxMacro{\OrigPagenumbering}{\pagenumbering}
1261

```

Defining some new counters (and doing related things):

```
1262 \newcounter{CurrentPage}
1263 \setcounter{CurrentPage}{1}
1264 \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.

```
1265 \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.

```
1266 \newcounter{pagesLTS.current.local.0}
1267 \setcounter{pagesLTS.current.local.0}{1}
```

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

```
1268 \newcounter{pagesLTS.pnc.0}
1269
```

`\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).

```
1270 \newcommand{\xroman}[1]{%
1271   \ifnum\value{#1}>0%
1272     \roman{#1}%
1273   \else%
1274     \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`).

```
1275     -\romannumeral\number-\arabic{#1}%
1276   \else%
1277     0%
1278   \fi%
1279 \fi%
1280 }
1281
```

`\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 L<sup>A</sup>T<sub>E</sub>X Kernel File m ltcounts.dtx 105 Counters and Lengths).

```
1282 \newcommand{\XRoman}[1]{%
1283   \ifnum\value{#1}>0%
1284     \Roman{#1}%
1285   \else%
1286     \ifnum\value{#1}<0%
1287       -\expandafter\@slowromancap\romannumeral\number-\arabic{#1}@%
1288     \else%
1289       0%
1290     \fi%
1291   \fi%
1292 }
1293
```

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

```
1294 \newcommand{\XXRoman}[1]{\XRoman{#1}%
1295   \PackageError{pageslts}{Old command \string\XXRoman\space found}{Replaced by \string\XRoman.}%
1296 }
1297
```

`\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 L<sup>A</sup>T<sub>E</sub>X Kernel File w ltpageno.dtx 52 Page Numbering), which is defined as

---

<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}}

1298 \newcommand{\pagesLTS@ifcounter}[1]{%
1299   \@ifundefined{c@#1}{\newcounter{#1}}{\relax}%
1300 }
1301

```

`\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`):

```

1302 \newcommand{\lastpages}[2]{%
1303   \pagesLTS@ifcounter{pagesLTS.#1.#2.local.cnt}%
1304   \arabic{pagesLTS.#1.#2.local.cnt}%
1305 }
1306

```

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

```

1307 \newcommand{\pagesLTS@writelabel}[1]{%
1308   \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}{{}{VIII}}{page.VIII}{}
is written, thus \lastpageref{pagesLTS.Roman} prints VIII and links to page.VIII.

1309   \pagesLTS@putlabel{pagesLTS.#1}{\thepage}{1}
1310   \addtocounter{page}{-1}%
1311   \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,

```

1312   \else%
1313     \addtocounter{page}{+1}%
1314     \pagesLTS@putlabel{pagesLTS.#1.local}{\theCurrentPageLocal}{1}

```

otherwise write into the .aux file something like

`\newlabel{pagesLTS.arabic.local}{{}{5}}{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.

```

1315     \addtocounter{page}{-1}%
1316     \fi%
1317   }
1318

```

`\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.

```

1319
1320 %% The following code is from Heiko Oberdiek [2010/04/18],          %%
1321 %% expanding his alphalph package as of 2010/04/18, v2.3. (Thanks!)  %%
1322 \newcommand*{\erroralphalph}[2]{%
1323   \ifnum\value{#2}>0%
1324     #1{\value{#2}}%
1325   \else%
1326     \ifnum\value{#2}<0%
1327       -#1{\expandafter\@gobble\the\value{#2}}%
1328     \else%
1329       0%
1330     \fi%
1331   \fi%
1332 }
1333 %% End of code from Heiko Oberdiek                                  %%
1334 %% Check and Error/Warning messages have been moved to \EveryShipout, %%
1335 %% because messages inside e.g. the \pageref command can cause trouble. %%
1336

```

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

```

1337
1338 \newcommand{\expandPagenumbering}[1]{%
1339   \let\OrigthePage\thePage%
1340   \def\pagesLTS@tmpC{arabic}%
1341   \ifx\pagesLTS@pnc\pagesLTS@tmpC% \relax

```

`\arabic` already supports negative numbers and zero ( $-MAX \dots MAX$ , where  $MAX = 2\,147\,483\,647$ ).

```

1342   \else%
1343     \def\pagesLTS@tmpC{roman}%
1344     \ifx\pagesLTS@pnc\pagesLTS@tmpC%
1345       \ifpagesLTS@romanMult%

```

`\erroralphalph{\roman}{page}` cannot be used, because `-\roman{\expandafter\@gobble\the\value{page}}` does not work. If option `romanMult` is not false, `\xroman` (see page 45) expands the usable roman page numbers to values below 1 (i, I, respectively), see subsection 2.1.3.

```

1346     \renewcommand*{\thePage}{\xroman{page}}%
1347   \fi%
1348   \else%
1349     \def\pagesLTS@tmpC{Roman}%

```



```

1350 \ifx\pagesLTS@pnc\pagesLTS@tmpC%
1351 \ifpagesLTS@RomanMulti%

```

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

```

1352 \renewcommand*{\thepage}{\XRoman{page}}%
1353 \fi%
1354 \else%
1355 \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.

```

1356 \ifx\pagesLTS@alphMult\pagesLTS@ab%
1357 \renewcommand*{\thepage}{\erroralphalph{\alphalph}{page}}%
1358 \else \ifx\pagesLTS@alphMult\pagesLTS@bb%
1359 \renewcommand*{\thepage}{\erroralphalph{\alphMult}{page}}%
1360 \fi%
1361 \fi%
1362 \else%
1363 \ifx\pagesLTS@pnc\pagesLTS@Alph%
1364 \ifx\pagesLTS@AlphMulti\pagesLTS@ABi%
1365 \renewcommand*{\thepage}{\erroralphalph{\AlphAlph}{page}}%
1366 \else \ifx\pagesLTS@AlphMulti\pagesLTS@BBi%
1367 \renewcommand*{\thepage}{\erroralphalph{\AlphMult}{page}}%
1368 \fi%
1369 \fi%
1370 \else%
1371 \ifx\pagesLTS@pnc\pagesLTS@fns%

```

Same for \fnsymbol page numbers.

```

1372 \ifpagesLTS@fnsymbolmult%
1373 \renewcommand*{\thepage}{\erroralphalph{\fnsymbolmult}{page}}%
1374 \fi%
1375 \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.

```

1376 \PackageError{pageslts}{unknown page numbering scheme}{%
1377 The pageslts package encountered the unknown\MessageBreak%
1378 page numbering scheme\MessageBreak%
1379 ‘#1’. \MessageBreak%
1380 If this is no typing mistake, it might work\MessageBreak%
1381 - or it might not work.\MessageBreak%
1382 \@ehc%
1383 }
1384 \fi%
1385 \fi%

```

```

1386     \fi%
1387     \fi%
1388     \fi%
1389     \fi%
1390     \let\pagesLTS@tmpC\undefined%
1391   }
1392

```

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

```

1393 \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 exists yet, it is created here.

```

1394   \edef\pagesLTS@tmpA{#1}%
1395   \ifx\pagesLTS@pnc\pagesLTS@fns%
1396     \pagesLTS@ifcounter{pagesLTS.fnsymbol.local}%
1397     \fi%
1398   \ifx\pagesLTS@tmpA\pagesLTS@fns%
1399     \pagesLTS@ifcounter{pagesLTS.fnsymbol.local}%
1400     \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.

```

1401   \ifx\pagesLTS@pnc\pagesLTS@tmpA% \relax
1402   \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.

```

1403     \ifnum \value{CurrentPage}>1%
1404       \addtocounter{page}{-1}%
1405       \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.

```

1406     \newcounter{pagesLTS.\pagesLTS@pnc.\arabic{pagesLTS.pnc.\pagesLTS@pnc}.local.count}%
1407     \setcounter{pagesLTS.\pagesLTS@pnc.\arabic{pagesLTS.pnc.\pagesLTS@pnc}.local.count}{%
1408       \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`.

```

1409 \ifx\pagesLTS@pnc\pagesLTS@fns%
1410 \ifnum \value{pagesLTS.pnc.\pagesLTS@pnc}>1%
1411 \mathchardef\pagesLTS@tmpa=\arabic{pagesLTS.pnc.0}%
1412 \setcounter{pagesLTS.pnc.0}{\value{pagesLTS.pnc.\pagesLTS@pnc}}%
1413 \addtocounter{pagesLTS.pnc.0}{-1}%
1414 \addtocounter{pagesLTS.\pagesLTS@pnc.\arabic{pagesLTS.pnc.\pagesLTS@pnc}.local.count}{%
1415 -\value{pagesLTS.\pagesLTS@pnc.\arabic{pagesLTS.pnc.0}.local.count}}%
1416 \setcounter{pagesLTS.pnc.0}{\pagesLTS@tmpa}%
1417 \fi%

```

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

```

1418 \else%
1419 \pagesLTS@writelabel{\pagesLTS@pnc.\arabic{pagesLTS.pnc.\pagesLTS@pnc}}%

```

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

```

1420 \ifnum \value{pagesLTS.pnc.\pagesLTS@pnc}<2%

```

an unnumbered label is also written:

```

1421 \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).

```

1422 \else%
1423 \mathchardef\pagesLTS@tmpa=\arabic{pagesLTS.pnc.0}%
1424 \setcounter{pagesLTS.pnc.0}{\value{pagesLTS.pnc.\pagesLTS@pnc}}%
1425 \addtocounter{pagesLTS.pnc.0}{-1}%
1426 \pagesLTS@ifcounter{pagesLTS.\pagesLTS@pnc.done}%
1427 \addtocounter{pagesLTS.\pagesLTS@pnc.done}{%
1428 \value{pagesLTS.\pagesLTS@pnc.\arabic{pagesLTS.pnc.0}.local.count}}%
1429 \addtocounter{pagesLTS.\pagesLTS@pnc.\arabic{pagesLTS.pnc.\pagesLTS@pnc}.local.count}{%
1430 -\value{pagesLTS.\pagesLTS@pnc.done}}%
1431 \setcounter{pagesLTS.pnc.0}{\pagesLTS@tmpa}%
1432 \fi%

```

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

```

1433 \if@files%
1434 \immediate\write\@auxout{\string
1435 \pagesLTS@ifcounter{pagesLTS.\pagesLTS@pnc.\arabic{pagesLTS.pnc.\pagesLTS@pnc}.local.cnt}}%
1436 \fi%
1437 \edef\pagesLTS@tmpB{\arabic{pagesLTS.\pagesLTS@pnc.\arabic{pagesLTS.pnc.\pagesLTS@pnc}.local.count}}%
1438 \if@files%
1439 \immediate\write\@auxout{\string
1440 \setcounter{pagesLTS.\pagesLTS@pnc.\arabic{pagesLTS.pnc.\pagesLTS@pnc}.local.cnt}{\pagesLTS@tmpB}}%
1441 \fi%
1442 \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.

```
1443 \pagesLTS@ifcounter{pagesLTS.double.\pagesLTS@pnc}%
1444 \setcounter{pagesLTS.double.\pagesLTS@pnc}{\value{page}}%
```

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

```
1445 \addtocounter{pagesLTS.current.local.\pagesLTS@pnc}{+1}%
1446 \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:

```
1447 \xdef\pagesLTS@pnc{#1}%
```

The new page numbering scheme is now started for real:

```
1448 \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 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.

```
1449 \expandPagenumbering{#1}
```

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

```
1450 \pagesLTS@ifcounter{pagesLTS.pnc.\pagesLTS@pnc}%
```

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

```
1451 \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):

```
1452 \pagesLTS@ifcounter{pagesLTS.double.\pagesLTS@pnc}%
1453 \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.

```
1454 \ifpagesLTS@pagecontinue%
1455 \setcounter{page}{\value{pagesLTS.double.\pagesLTS@pnc}}%
1456 \else%
1457 \setcounter{page}{1}%
1458 \fi%
```

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

```
1459 \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.

```
1460 \ifnum \value{pagesLTS.double.\pagesLTS@pnc}=1%
1461 \setcounter{pagesLTS.current.local.\pagesLTS@pnc}{1}%
1462 \fi%
```

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

```
1463 \else%
1464 %% before the first page has shipped out
```

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

```
1465 \xdef\pagesLTS@pnc{#1}%
```

and the page numbering scheme set by the original page numbering command (1994/05/19 v1.1a LaTeX Kernel File `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:

```
1466 \countdef\c@page=0 \c@page=1
1467 \def\cl@page{}
1468 \global\c@page \@ne
1469 \global\def\thepage{\csname \expandafter @\pagesLTS@pnc \endcsname \c@page}%
```

If a page numbering scheme is used, which is not known by L<sup>A</sup>T<sub>E</sub>X, 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.

```
1470 \expandPagenumbering{#1}
```

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

```
1471 \pagesLTS@ifcounter{pagesLTS.pnc.\pagesLTS@pnc}%
1472 \setcounter{pagesLTS.pnc.\pagesLTS@pnc}{1}%
1473 \pagesLTS@ifcounter{pagesLTS.double.\pagesLTS@pnc}%
1474 \setcounter{pagesLTS.double.\pagesLTS@pnc}{1}%
1475 \pagesLTS@ifcounter{pagesLTS.current.local.\pagesLTS@pnc}%
1476 \setcounter{pagesLTS.current.local.\pagesLTS@pnc}{1}%
1477 \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:

```
1478 \gdef\pagesLTS@called{1}%
1479 \fi%
```

We do not need the temporary definitions any more.

```
1480 \let\pagesLTS@tmpA\undefined%
1481 \let\pagesLTS@tmpB\undefined%
1482 }
1483
```

**\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)

```
1484 %% analogous to \HyPsd@pageref from the hyperref package by Heiko Oberdiek:
1485 \def\lastpagereftxt#1{\pagesLTS@pageref#1*END}
1486
```

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

```
1487 \def\pagesLTS@pageref#1*#2END{%
1488   \ifx\#2\% no star
1489     \pagesLTS@@pageref{#1}%
1490   \else% star
1491     \expandafter\pagesLTS@@pagerefstar%
1492   \fi%
1493 }
1494
1495 \def\pagesLTS@@pageref#1{\lastpagereftext{#1}}
1496 \def\pagesLTS@@pagerefstar#1{\lastpagereftextstar{#1}}
1497
```

**\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.)

```
1498 \newcommand{\lastpagereftext}[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     \ifx\pagesLTS@hyper\pagesLTS@one%
1504       \href{\#pagesLTS.fnsymbol.local.\arabic{pagesLTS.fnsymbol.local}}%
1505       {\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).

```
1506   \else \arabic{pagesLTS.fnsymbol.local}%
1507   \fi%

```

Otherwise just the common `\pageref` is applied:

```
1508 \else%
1509   \pageref{#1}%
1510 \fi%
```

We do not need the temporary definitions any more.

```
1511 \let\pagesLTS@tmpA\undefined%
1512 \let\pagesLTS@tmpB\undefined%
1513 }
1514
```

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

```
1515 \newcommand{\lastpagereftextstar}[1]{%
1516   \def\pagesLTS@tmpA{#1}%
1517   \def\pagesLTS@tmpB{\pagesLTS.fnsymbol.local}%
1518   \ifx\pagesLTS@tmpA\pagesLTS@tmpB%
1519     \pagesLTS@ifcounter{\pagesLTS.fnsymbol.local}%
1520     \arabic{\pagesLTS.fnsymbol.local}%
1521   \else%
1522     \ifx\pagesLTS@hyper\pagesLTS@one%
1523       \pageref*{#1}%
1524     \else%
```

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

```
1525     \pageref{#1}%
1526   \fi%
1527 \fi%
1528 \let\pagesLTS@tmpA\undefined%
1529 \let\pagesLTS@tmpB\undefined%
1530 }
1531
```

`\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:

```
1532 \def\lastpagerefend#1{\pagesLTS@@pagerefend#1*\END}
1533
1534 \def\pagesLTS@@pagerefend#1*#2\END{%
1535   \ifx\\#2\\% no star
1536     \pagesLTS@@pagerefend{#1}%
1537   \else% star
1538     \expandafter\pagesLTS@@pagerefendstar%
1539   \fi%
1540 }
1541
```

```

1542 \def\pagesLTS@@@pagerefend#1{\l@stpagerefend{#1}}
1543 \def\pagesLTS@@@pagerefendstar#1{\l@stpagerefendstar{#1}}
1544

```

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

```

1545 \newcommand{\l@stpagerefend}[1]{%
1546   \def\pagesLTS@tmpA{#1}%
1547   \def\pagesLTS@tmpB{pagesLTS.fnsymbol.local}%
1548   \ifx\pagesLTS@tmpA\pagesLTS@tmpB%
1549     \pagesLTS@ifcounter{pagesLTS.fnsymbol.local}%
1550     \ifx\pagesLTS@hyper\pagesLTS@one%
1551       \href{\#pagesLTS.fnsymbol.local.\arabic{pagesLTS.fnsymbol.local}}%
1552       {\arabic{pagesLTS.fnsymbol.local}}%
1553     \else \arabic{pagesLTS.fnsymbol.local}%
1554     \fi%
1555   \else%
1556     \def\pagesLTS@tmpB{pagesLTS.fnsymbol}%
1557     \ifx\pagesLTS@tmpA\pagesLTS@tmpB%
1558       \ifx\pagesLTS@hyper\pagesLTS@one%
1559         \href{\#pagesLTS.fnsymbol.local.\arabic{pagesLTS.fnsymbol.local}}%
1560         {\pagesLTS.lastpage}%
1561       \else \pageref{pagesLTS.fnsymbol}%
1562       \fi%
1563     \else%
1564       \def\pagesLTS@tmpB{LastPage}%
1565       \ifx\pagesLTS@tmpA\pagesLTS@tmpB%
1566         \ifx\pagesLTS@hyper\pagesLTS@one%
1567           \href{\#pagesLTS.fnsymbol.local.\pagesLTS@eso}%
1568           {\pagesLTS.lastpage}%
1569         \else \pageref{LastPage}%
1570         \fi%
1571       \else%
1572         \def\pagesLTS@tmpB{VeryLastPage}%
1573         \ifx\pagesLTS@tmpA\pagesLTS@tmpB%
1574           \ifx\pagesLTS@hyper\pagesLTS@one%
1575             \href{\#pagesLTS.fnsymbol.local.\arabic{pagesLTS.fnsymbol.local}}%
1576             {\pagesLTS.lastpage}%
1577           \else \pageref{VeryLastPage}%
1578           \fi%
1579         \else%
1580           \def\pagesLTS@tmpB{LastPages}%
1581           \ifx\pagesLTS@tmpA\pagesLTS@tmpB%
1582             \ifx\pagesLTS@hyper\pagesLTS@one%
1583               \href{\#pagesLTS.fnsymbol.local.\arabic{pagesLTS.fnsymbol.local}}%
1584               {\arabic{pagesLTS.pagenr}}%
1585             \else \pageref{LastPages}%
1586             \fi%

```



```

1587         \else%
1588         \pageref{#1}%
1589         \fi%
1590     \fi%
1591 \fi%
1592 \fi%
1593 \fi%

```

We do not need the temporary definitions any more.

```

1594 \let\pagesLTS@tmpA\undefined%
1595 \let\pagesLTS@tmpB\undefined%
1596 }
1597

```

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

```

1598 \newcommand{\l@stpagerefendstar}[1]{%
1599   \def\pagesLTS@tmpA{#1}%
1600   \def\pagesLTS@tmpB{\pagesLTS.fnsymbol.local}%
1601   \ifx\pagesLTS@tmpA\pagesLTS@tmpB%
1602     \pagesLTS@ifcounter{\pagesLTS.fnsymbol.local}%
1603     \arabic{\pagesLTS.fnsymbol.local}%
1604   \else%
1605     \def\pagesLTS@tmpB{\pagesLTS.fnsymbol}%
1606     \ifx\pagesLTS@tmpA\pagesLTS@tmpB%
1607       \ifx\pagesLTS@hyper\pagesLTS@one%
1608         \pageref*{\pagesLTS.fnsymbol}%
1609       \else \pageref{\pagesLTS.fnsymbol}%
1610       \fi%
1611     \else%
1612       \def\pagesLTS@tmpB{LastPage}%
1613       \ifx\pagesLTS@tmpA\pagesLTS@tmpB%
1614         \ifx\pagesLTS@hyper\pagesLTS@one%
1615           \pageref*{LastPage}%
1616         \else \pageref{LastPage}%
1617         \fi%
1618       \else%
1619         \def\pagesLTS@tmpB{VeryLastPage}%
1620         \ifx\pagesLTS@tmpA\pagesLTS@tmpB%
1621           \ifx\pagesLTS@hyper\pagesLTS@one%
1622             \pageref*{VeryLastPage}%
1623           \else \pageref{VeryLastPage}%
1624           \fi%
1625         \else%

```

```

1626 \def\pagesLTS@tmpB{LastPages}%
1627 \ifx\pagesLTS@tmpA\pagesLTS@tmpB%
1628 \ifx\pagesLTS@hyper\pagesLTS@one%
1629 \pageref*{LastPages}%
1630 \else \pageref{LastPages}%
1631 \fi%
1632 \else%
1633 \ifx\pagesLTS@hyper\pagesLTS@one%
1634 \pageref*{#1}%
1635 \else \pageref{#1}%
1636 \fi%
1637 \fi%
1638 \fi%
1639 \fi%
1640 \fi%
1641 \fi%
1642 \let\pagesLTS@tmpA\undefined%
1643 \let\pagesLTS@tmpB\undefined%
1644 }
1645

```

`\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`:

```

1646 % somewhat analogous to \overridelabel from the undolabl package:
1647 \newcommand\overrideLTSlabel[2]{%
1648 \bsphack
1649 \ifnum \value{pagesLTS.pnc.\pagesLTS@pnc}>1%
1650 \edef\pagesLTStmpA{#1}%
1651 \edef\pagesLTStmpB{pagesLTS.\pagesLTS@pnc.local}%
1652 \ifx\pagesLTStmpA\pagesLTStmpB%
1653 \immediate\write\@auxout{\string\undonewlabel{#1}\string\relax}%
1654 \overriddenmessage s{#1}%
1655 \fi%
1656 \fi%
1657 \pagesLTS@putlabel{#1}{#2}{0}%
1658 \esphack%
1659 }
1660

```

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.

```

1661 \newcommand{\@pagesLTS@Prelim@EveryShipout}{%
1662 %% The following code is from the prelim2e package          %%
1663 %% [2009/05/29 v1.3] by Martin Schr\"{o}der (Thanks!):      %%
1664   \bgroup
1665     \dimen\z@=\wd\@cclv
1666     \dimen\@ne=\ht\@cclv
1667     \dimen\tw@=\dp\@cclv
1668     \dimen\thr@=\dimen1
1669     \advance\dimen\thr@@ by \dimen\tw@
1670     \global\setbox\@cclv\vbox to \dimen\thr@@{%
1671       \hb@xt@\dimen\z@{%
1672         \box\@cclv%
1673         \hss%
1674       }%
1675       \vbox to \z@{%
1676         \hb@xt@\dimen\z@{%
1677           \let\protect\relax
1678 %% 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.

```

1679     \ifx\pagesLTS@pnc\pagesLTS@fns%
1680       \pagesLTS@ifcounter{pagesLTS.fnsymbol.cont}%
1681       \addtocounter{pagesLTS.fnsymbol.cont}{1}%
1682       \ifx\pagesLTS@hyper\pagesLTS@one%
1683         \phantomsection%
1684         \hypertarget{pagesLTS.fnsymbol.local.\arabic{pagesLTS.fnsymbol.cont}}{}%
1685       \fi%
1686       \ifnum \pagesLTS@esov=\pagesLTS@zero%
1687         \label{pagesLTS.fnsymbol}%
1688       \else%
1689         \overridelabel{pagesLTS.fnsymbol}%
1690       \fi%
1691     \else%
1692       \ifx\pagesLTS@hyper\pagesLTS@one%
1693         \phantomsection%
1694       \fi%
1695       \if@files%
1696         \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.

```

1697         \addtocounter{page}{+1}%
1698         \overrideLTSlabel{pagesLTS.\pagesLTS@pnc.local}{\theCurrentPageLocal}%
1699         \addtocounter{page}{-1}%
1700     \fi%
1701 \fi%
1702 %% Code from prelim2e package again:                %%
1703     }%
1704     \vss%
1705     }%
1706     \vss%
1707 }%
1708 \wd\@cclv=\dimen\z@
1709 \ht\@cclv=\dimen\@ne
1710 \dp\@cclv=\dimen\tw@
1711 \egroup
1712 %% End of code from the prelim2e package.            %%
1713 }
1714
```

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

```

1715 \EveryShipout{%
1716   \ifnum\value{page}>0% \relax
1717   \else%
1718     \ifnum\value{page}=0%
1719       \PackageWarning{pageslts}{%
1720         Counter ‘page’ is zero!\MessageBreak%
1721         If the page numbering scheme is not arabic!\MessageBreak%
1722         and further not extended!\MessageBreak%
1723         (see Page counter overflow in the pageslts!\MessageBreak%
1724         documentation), without other measures!\MessageBreak%
1725         this will lead to a counter overflow.\MessageBreak%
1726       }%
1727     \else%
1728       \ifnum\value{page}<0%
1729         \PackageWarning{pageslts}{%
1730           Counter ‘page’ is negative: ‘\the\value{page}’!\MessageBreak%
1731           If the page numbering scheme is not arabic!\MessageBreak%
1732           and further not extended!\MessageBreak%
1733           (see Page counter overflow in the pageslts!\MessageBreak%
1734           documentation), without other measures!\MessageBreak%
1735           this will lead to a counter overflow.\MessageBreak%
1736         }%
1737       \else%
1738         \PackageError{pageslts}{%
1739           Counter ‘page’ does not have a recognized value:\MessageBreak%

```

```

1740      '\the\value{page}'\MessageBreak%
1741      \@ehd \MessageBreak%
1742    }%
1743    \fi%
1744    \fi%
1745    \fi%

```

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

```

1746    \ifnum \value{CurrentPage}=1% This is the first shipout!

```

`\AtBeginDocument` it is checked whether the `hyperref` package is loaded,

`\@ifpackageloaded{hyperref}{\gdef\pagesLTS@hyper{1}}{}`.

`\@ifpackageloaded` cannot be used later than `\AtBeginDocument`.

SEBASTIAN BANK found a case, when this check is not sufficient. Using a class with

```

\usepackage{lastpage}

```

```

\AtBeginDocument{\usepackage{hyperref}}

```

leads to failed detection of the `hyperref` package, because `\AtBeginDocument` *first* the check for `hyperref` is performed, and *then* `hyperref` is loaded. As mentioned above, `\@ifpackageloaded` cannot be used later, so here we do not check for the `hyperref` package again, but for its `\Hy@Warning` command. In version 1.1h of the `pageslts` package, it was checked for the `\hyperref` command, but as it turned out, `tcilatex` *is* defining that. If some other package or user is defining `\Hy@Warning`, `pageslts` will falsely assume, that `hyperref` has been loaded, but by my humble opinion, defining `\Hy@Warning` does not make sense and is bad style (except definition by the `hyperref` package itself, of course).

```

1747    \@ifundefined{Hy@Warning}{% hyperref not loaded
1748    }{% hyperref loaded
1749    \gdef\pagesLTS@hyper{1}%
1750    }%

```

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

```

1751    \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.

```

1752    \global\def\pncmissing{1}%

```

We save the current value of the page,

```
1753      \mathchardef\pagesLTS@tmpD=\arabic{page}%
```

determine the current page numbering scheme,

```
1754 %% Code from Andres L\{o}h, Universiteit Utrecht (NL)      %%
1755      \def\extract#1{\expandafter\extract@ #1\END}%
1756      \def\extract@#1\csname @#2\endcsname#3\END{#2}%
1757      \edef\pagesLTS@tmpQ{\extract\thepage}%
1758 %% End of code from Andres L\{o}h                          %%
1759      \let\pagesLTS@tmpP\pagesLTS@tmpQ%
```

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

```
1760      \def\pagesLTS@pnc{0}%
```

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

```
1761      \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.

```
1762      \setcounter{page}{\pagesLTS@tmpD}%
1763      \fi%
```

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

```
1764      \pagesLTS@writelabel{0}%
1765      \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).

```
1766      \ifx\pagesLTS@pnc\pagesLTS@fns%
1767      \@pagesLTS@Prelim@EveryShipout%
1768      \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.

```
1769      \else%
1770      \ifnum \value{pagesLTS.pnc.\pagesLTS@pnc}>1%
1771      \@pagesLTS@Prelim@EveryShipout%
1772      \fi%
1773      \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).

```

1774 \addtocounter{CurrentPage}{1}%
1775 \addtocounter{pagesLTS.current.local.\pagesLTS@pnc}{1}%
1776 }
1777

```

`\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.

```

1778 \newcommand{\pagesLTS@putlabelhyper}[2]{%
1779   \ifHy@pageanchor \relax%
1780   \else%

```

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

```

1781   \PackageError{pagesLTS}{hyperref option pageanchor disabled}{%
1782     The \string\lastpageref{#1} link doesn't work\MessageBreak%
1783     using hyperref with disabled option 'pageanchor'.\MessageBreak%
1784   }%
1785 \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.

```

1786 %% The following code is from the hyperref package           %%
1787 %% [2010/04/17 v6.80x; newer versions are available]         %%
1788 %% by Heiko Oberdiek (Big Thanks!).                           %%
1789 \if@filesw                                                    %%
1790   \begingroup
1791     \let\@number\@firstofone
1792     \ifHy@pageanchor
1793       \ifHy@hypertextnames
1794         \ifHy@plainpages
1795           \def\Hy@temp{\arabic{page}}%
1796         \else
1797           \Hy@unicodetfalse
1798 %% Code not from hyperref package:                             %%
1799 %% The following lines are modified from the hyperref package. %%
1800 %% Without the modification, after the first shipout "PD1" is %%
1801 %% inserted each time |\pdfstringdef\Hy@temp{\thepage}| is    %%
1802 %% executed (if |fnsymbol| is not used).                       %%
1803     \ifnum \value{CurrentPage}=1%
1804       \ifx\pagesLTS@pnc\pagesLTS@fns%
1805         \pdfstringdef\Hy@temp{\thepage}%
1806       \else%
1807         \def\Hy@temp{\thepage}%
1808     \fi%

```

```

1809         \else%
1810         \pdfstringdef\Hy@temp{\thepage}%
1811         \fi%
1812 %% Code from hyperref package again:                %%
1813         \fi
1814         \else
1815         \def\Hy@temp{\the\Hy@pagecounter}%
1816         \fi
1817         \fi
1818 %% End of code from the hyperref package.            %%
1819 %% (The following four lines are modified            %%
1820 %% from the hyperref package.)                      %%
1821         \immediate\write\@auxout{\string
1822         \newlabel{#1}{{}{#2}}{\ifHy@pageanchor page.\Hy@temp\fi}}}%
1823         \endgroup%
1824         \fi%
1825     }
1826

```

\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.

```

1827 \newcommand{\pagesLTS@putlabel}[3]{%
1828     \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.

```

1829 \ifx\pagesLTS@SK\pagesLTS@one%
1830     \message{^^J}%
1831     \message{Package pageslts Warning: Package showkeys without option final loaded,}%
1832     \ifnum\value{pagesLTS.pagenr}<1%
1833         \message{(pageslts)                but label #1 on page \thepage\space(about \theCurrentPage)}%
1834     \else%
1835         \message{(pageslts)                but label #1 on page \thepage\space(about \theCurrentPage\space of \arabic{pagesLTS.pagenr})}%
1836     \fi%
1837     \message{(pageslts)                    cannot be shown, because pageslts does not use \string\label,}%
1838     \message{(pageslts)                    but writes directly to the \jobname.aux file. ^^J}%
1839 \fi%

```

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

```

1840 \ifx\pagesLTS@hyper\pagesLTS@one%
1841     \pagesLTS@putlabelhyper{#1}{#2}%
1842 \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.

```
1843 \if@files%
1844 \ifnum \value{pagesLTS.pnc}.\pagesLTS@pnc}<2%
```

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

```
1845 \ifx\pagesLTS@nameref\pagesLTS@one%
1846 \immediate\write\@auxout{\string
1847 \newlabel{#1}{\{#\2\}\{#\3\}\{#\4\}\{#\5\}}}%
1848 \else%
1849 \immediate\write\@auxout{\string
1850 \newlabel{#1}{\{#\2\}}}%
1851 \fi%
1852 \else%
1853 \edef\pagesLTStmpA{#1}%
1854 \edef\pagesLTStmpB{pagesLTS.\pagesLTS@pnc.local}%
1855 \ifx\pagesLTStmpA\pagesLTStmpB%
1856 \edef\pagesLTStmpA{#3}%
1857 \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.

```
1858 \immediate\write\@auxout{\string
1859 \undonewlabel{#1}}}%
1860 \fi%
1861 \fi%
1862 \ifx\pagesLTS@nameref\pagesLTS@one%
1863 \immediate\write\@auxout{\string
1864 \newlabel{#1}{\{#\2\}\{#\3\}\{#\4\}\{#\5\}}}%
1865 \else%
1866 \immediate\write\@auxout{\string
1867 \newlabel{#1}{\{#\2\}}}%
1868 \fi%
1869 \fi%
1870 \fi%
1871 \fi%
```

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

```
1872 \addtocounter{page}{+1}%
1873 }
1874
```

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

```
1875 \newcommand{\pagesLTS@putlabels}{%
1876   \addtocounter{page}{-1}%
1877   \addtocounter{CurrentPage}{-1}%
1878   \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.

```
1879   \ifx\pagesLTS@pnc\pagesLTS@zero%
1880     \PackageWarning{pagesLTS}{No page numbering scheme found:\MessageBreak%
1881       \pagesLTS@messageNPN }%
```

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

```
1882   \else%
1883     \pagesLTS@writelabel{\pagesLTS@pnc.\arabic{pagesLTS.pnc.\pagesLTS@pnc}}%
1884     \ifnum \value{pagesLTS.pnc.\pagesLTS@pnc}<2%
1885       \ifx\pagesLTS@pnc\pagesLTS@fns% \relax
1886       \else%
1887         \pagesLTS@writelabel{\pagesLTS@pnc}%
1888       \fi%
1889     \fi%
1890   \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).

```
1891   \addtocounter{page}{+1}%
1892   \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:

```
1893   \addtocounter{CurrentPage}{+1}%
1894   \addtocounter{pagesLTS.current.local.\pagesLTS@pnc}{1}%
1895 }
1896
```

`\AtBeginDocument` `\AtBeginDocument` we write into the aux file regarding the double loading of the package. Then it is checked whether the `endfloat` package is 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).

```

1897 \AtBeginDocument{%
1898   \if@files%
1899     \immediate\write\@auxout{\string\gdef\string\pagesLTS@loaded{\pagesLTSnotloaded}}%
1900   \fi%
1901   \@ifpackageloaded{endfloat}%
1902     {\@ifpackagelater{endfloat}{1992/03/31}% April 1992 v2.0
1903       {\@ifpackagelater{endfloat}{2011/12/24}{% 2011/12/25 v2.5d
1904         \relax}%

```

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

```

1905     {\PackageWarningNoLine{pageslts}{Old endfloat package detected:\MessageBreak%
1906       There is a newer version of the endfloat package available.\MessageBreak%
1907       Please consider updating your version.\MessageBreak%
1908       The pageslts package might be incompatible with\MessageBreak%
1909       your current endfloat package.\MessageBreak%
1910     }%
1911   }%

```

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

```

1912     {\PackageError{pageslts}{Incompatible, very old endfloat package detected.}%
1913     {\The very old version 2.0 (and earlier) of the\MessageBreak%
1914       endfloat package actually redefined the \ enddocument,\MessageBreak%
1915       and so interfered drastically with the LaTeX2e commands\MessageBreak%
1916       which make use of \ AtEndDocument.\MessageBreak%
1917       Newer versions of the endfloat package exists\MessageBreak%
1918       (at least: v2.5d as of 2011/12/25)\MessageBreak%
1919       in modern documentation form,\MessageBreak%
1920       which should be available from CTAN.\MessageBreak%
1921       Please update your endfloat package\MessageBreak%
1922       for use with the pageslts package.\MessageBreak %
1923     }%
1924   }%
1925 }%
1926 }{}%

```

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

```

1927 \ifpackage{lastpage}%
1928   {\ifpackagelater{lastpage}{2010/07/28}% 2010/07/29 v1.2a
1929     {\ifpackagelater{lastpage}{2013/01/27}% 2013/01/28 v1.21
1930       {\PackageWarning{pageslts}{lastpage package detected.\MessageBreak%
1931         With pageslts package in use, lastpage has no function.\MessageBreak%
1932         Just remove the lastpage package from your document.\MessageBreak%
1933       }%
1934     }{%
1935       \PackageWarning{pageslts}{Old lastpage package detected.\MessageBreak%
1936         With pageslts package in use, lastpage has no function.\MessageBreak%
1937         Just remove the lastpage package from your document.\MessageBreak%
1938         At least update it!\MessageBreak%
1939       }%
1940     }%
1941   }{%
1942     \PackageWarning{pageslts}{Incompatible package lastpage detected:\MessageBreak%
1943       Package pageslts was loaded, but also an old\MessageBreak%
1944       version of the lastpage package.\MessageBreak%
1945       pageslts has all functionality of the lastpage\MessageBreak%
1946       package (and more), so just remove the lastpage\MessageBreak%
1947       package from your document.\MessageBreak%
1948       (At least update it!)\MessageBreak%
1949       pageslts will now ‘kill’ the lastpage@putlabel\MessageBreak%
1950       command of the lastpage package.\MessageBreak%
1951     }%
1952     \gdef\lastpage@putlabel{\relax}%
1953   }%
1954 }{%}
```

Further it is checked whether the alphalph package is loaded.  
 Unfortunately, \ifpackage{lastpage} cannot be used any later (cf. L<sup>A</sup>T<sub>E</sub>X bug 2335, Synopsis: Proposal for \ifpackage{lastpage}, <http://www.latex-project.org/cgi-bin/ltxbugs2html?category=LaTeX&responsible=anyone&state=open&keyword=&pr=latex%2F2335&search=>), therefore the result must be saved:

```

1955 \ifpackage{alphalph}%
1956   {\global\def\pagesLTS@AlphAlph{1}}%
```

The commands are defined accordingly.

```

1957 \newalphalph{\AlphMult}[mult]{\@Alph}{26}%
1958 \newalphalph{\alphMult}[mult]{\@alph}{26}%
1959 \newalphalph{\fnsymbolmult}[mult]{\@fnsymbol}{5}%
1960 }{% \relax
1961 }
```

Further it is checked whether the hyperref package is loaded:

```
1962 \ifpackageloaded{hyperref}%  
1963 {\gdef\pagesLTS@hyper{1}%
```

and whether the pdfpages package is loaded:

```
1964 \ifpackageloaded{pdfpages}%  
1965 {\PackageWarningNoLine{pageslts}{Package pdfpages detected.\MessageBreak%  
1966 Using hyperref with pdfpages can cause problems. See\MessageBreak%  
1967 ftp://ftp.ctan.org/tex-archive/\MessageBreak%  
1968 macros/latex/contrib/pax/\MessageBreak%  
1969 for project pax (PDFAnnotExtractor)%  
1970 }%  
1971 }{% \relax  
1972 }%
```

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

```
1973 \ifpackageloaded{undolabl}%  
1974 {\ifpackagelater{undolabl}{2010/07/14}% 2010/07/15 v1.0d  
1975 {\ifpackagelater{undolabl}{2011/12/31}% 2012/01/01 v1.0k  
1976 {% recent version as of the time of last revision of this package: OK  
1977 }{% old, but not obsolete version  
1978 \PackageWarningNoLine{pageslts}{Old version of undolabl package used.\MessageBreak%  
1979 See ftp://ftp.ctan.org/tex-archive/macros/latex/contrib/undolabl/ \MessageBreak%  
1980 for a new version.\MessageBreak%  
1981 }%  
1982 }  
1983 }{\PackageError{pageslts}{Incompatible, obsolete version of undolabl package used.}{%  
1984 See ftp://ftp.ctan.org/tex-archive/macros/latex/contrib/undolabl/ \MessageBreak%  
1985 for a new version.\MessageBreak%  
1986 Type X <return> to quit.\MessageBreak%  
1987 }%  
1988 }  
1989 }{\PackageError{pageslts}{Package undolabl missing}{%  
1990 Package undolabl not found.\MessageBreak%  
1991 The pageslts package needs the undolabl package.\MessageBreak%  
1992 See e.g.\MessageBreak%  
1993 ftp://ftp.ctan.org/tex-archive/macros/latex/contrib/undolabl/ \MessageBreak%  
1994 Type X <return> to quit.\MessageBreak%  
1995 }%  
1996 }
```

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

```

1997 \ifpackagelater{hyperref}{2012/11/05}{% 2012/11/06 v6.83m
1998 \relax}{%
1999 \PackageWarningNoLine{pageslts}{Old hyperref package detected:\MessageBreak%
2000 There is a newer version of the\MessageBreak%
2001 hyperref package available.\MessageBreak%
2002 Please consider updating your version.\MessageBreak%
2003 }%
2004 }%
2005 %% pageslts supports the use of the package hyperref by
2006 %% Heiko Oberdiek (hyperref version 2012/11/06 v6.83m).
2007 %% pageslts may work with earlier versions of this packages,
2008 %% but this was not tested.
2009 }%

```

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

```

2010 {\PackageWarning{pageslts}{Package hyperref NOT detected.\MessageBreak%
2011 pageslts would support hyperref. The page references\MessageBreak%
2012 will NOT be hyperlinked!\MessageBreak }%
2013 }%

```

If the nameref package has been loaded the check must be done here and the result remembered, because it cannot be checked after `\AtBeginDocument`. The check is needed because `\xpackage{nameref}` uses `\newlabel` with five instead of two arguments.

```

2014 \ifpackageloaded{nameref}%
2015 {\gdef\pagesLTS@nameref{1}%
2016 }{% relax, \pagesLTS@nameref stays 0
2017 }%

```

If the showkeys package has been loaded in `draft` mode, warnings about missing label boxes will be issued (see p. 64), but because it cannot be checked for showkeys after `\AtBeginDocument`, the check must be done here and the result remembered.

```

2018 \ifpackageloaded{showkeys}{%
2019 \ifpackagewith{showkeys}{final}{\relax}{\gdef\pagesLTS@SK{1}}%
2020 }{% \relax
2021 }%
2022 }
2023

```

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

```

2024 \AtEndDocument{%
2025 \ifx\pncmissing\pagesLTS@one%
2026 \PackageError{pageslts}{pagenumbering scheme missing}{\pagesLTS@messageNPN }%
2027 \fi%

```

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

```

2028 \message{^^J%
2029 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.

```

2030 \clearpage%
2031 \ifx\pagesLTS@pnc\pagesLTS@fns%
2032   \def\pagesLTS@tmpA{\arabic{pagesLTS.fnsymbol.local}}%
2033   \ifnum \pagesLTS@eso=\pagesLTS@tmpA%
2034     \gdef\pagesLTS@rerun{0}%
2035   \else%
2036     \gdef\pagesLTS@rerun{1}%
2037   \fi%
2038   \if@filesw%
2039     \immediate\write\@auxout{\string
2040       \gdef\string\pagesLTS@eso{\pagesLTS@tmpA}}%
2041   \fi%
2042 \fi%
2043 \pagesLTS@putlabel{LastPage}{\thepage}{1}%

```

We do not need the temporary definition any more.

```

2044 \let\pagesLTS@tmpA\undefined%
2045 }
2046

```

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

```

2047 \AfterLastShipout{%

```

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

```

2048 \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):

```

2049 \ifx\pagesLTS@esov\pagesLTS@zero%
2050 \else%
2051   \immediate\write\@auxout{\string
2052     \pagesLTS@ifcounter{pagesLTS.fnsymbol.local}}%
2053   \immediate\write\@auxout{\string
2054     \setcounter{pagesLTS.fnsymbol.local}{\pagesLTS@esov}}%
2055 \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`.

```

2056 \ifx\pagesLTS@hyper\pagesLTS@one%
2057   \ifx\pagesLTS@pnc\pagesLTS@fns%
2058     \immediate\write\@auxout{\string
2059       \gdef\string\lastpageref{\string\lastpagerefend}}%
2060   \fi%
2061 \fi%
2062 \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:

```

2063 \pagesLTS@ifcounter{pagesLTS.\pagesLTS@pnc.\arabic{pagesLTS.pnc.\pagesLTS@pnc}.local.count}%
2064 \setcounter{pagesLTS.\pagesLTS@pnc.\arabic{pagesLTS.pnc.\pagesLTS@pnc}.local.count}{%
2065   \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.)

```

2066 \addtocounter{pagesLTS.\pagesLTS@pnc.\arabic{pagesLTS.pnc.\pagesLTS@pnc}.local.count}{-1}
2067 \ifnum \value{pagesLTS.pnc.\pagesLTS@pnc}>1%
2068   \mathchardef\pagesLTS@tmpD=\arabic{pagesLTS.pnc.0}%
2069   \setcounter{pagesLTS.pnc.0}{\value{pagesLTS.pnc.\pagesLTS@pnc}}%
2070   \addtocounter{pagesLTS.pnc.0}{-1}%
2071   \addtocounter{pagesLTS.\pagesLTS@pnc.\arabic{pagesLTS.pnc.\pagesLTS@pnc}.local.count}{%
2072     -\value{pagesLTS.\pagesLTS@pnc.\arabic{pagesLTS.pnc.0}.local.count}}%
2073   \setcounter{pagesLTS.pnc.0}{\pagesLTS@tmpD}%
2074 \fi%
2075 \if@filesw%
2076   \immediate\write\@auxout{\string
2077     \pagesLTS@ifcounter{pagesLTS.\pagesLTS@pnc.\arabic{pagesLTS.pnc.\pagesLTS@pnc}.local.cnt}}%
2078   \edef\pagesLTS@tmpA{\arabic{pagesLTS.\pagesLTS@pnc.\arabic{pagesLTS.pnc.\pagesLTS@pnc}.local.count}}%
2079   \immediate\write\@auxout{\string
2080     \setcounter{pagesLTS.\pagesLTS@pnc.\arabic{pagesLTS.pnc.\pagesLTS@pnc}.local.cnt}{\pagesLTS@tmpA}}%
2081   \let\pagesLTS@tmpA\undefined%
2082 \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.

```

2083 \addtocounter{page}{-1}%
2084 \edef\pagesLTS@tmpA{\thepage}%
2085 \if@filesw%
2086   \immediate\write\@auxout{\string
2087     \gdef\string\pagesLTS.lastpage{\pagesLTS@tmpA}}%
2088 \fi%
2089 \addtocounter{page}{+1}%
2090 \addtocounter{CurrentPage}{-1}%
2091 \edef\pagesLTS@tmpB{\arabic{CurrentPage}}%
2092 \if@filesw%
2093   \immediate\write\@auxout{\string
2094     \setcounter{pagesLTS.pagenr}{\pagesLTS@tmpB}}%
2095 \fi%
2096 \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.

```
2097 \message{^^J%
2098   AED: pageslts setting VeryLastPage via AfterLastShipout ^^J}%
2099 \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.

```
2100 \message{^^J%
2101   AED: pageslts setting LastPages via AfterLastShipout ^^J}%
2102 \pagesLTS@putlabels%
2103 \typeout{^^J}%
2104 \ifodd\pagesLTS@tmpB%
2105   \@PackageInfoNoLine{pageslts}{Total number of pages is odd}%
2106 \else%
2107   \@PackageInfoNoLine{pageslts}{Total number of pages is even}%
2108 \fi%
2109 \typeout{^^J}%
```

We do not need the temporary definitions any more.

```
2110 \let\pagesLTS@tmpA\undefined%
2111 \let\pagesLTS@tmpB\undefined%
2112 }
2113
```

`\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 `pdfLATEX` are done, `pdfLATEX` will be happy and will not complain about changed labels. But indeed, a *third* run is necessary and indicated by the warning message below.

```
2114 \AtEndAfterFileList{%
2115   \ifx\pagesLTS@rerun\pagesLTS@one%
2116     \PackageWarningNoLine{pageslts}{%
2117       Label(s) may have changed.\MessageBreak%
2118       Rerun to get cross-references right%
2119     }%
2120 \fi%
2121 }
2122
2123 \end{package}
```

## 7 Installation

### 7.1 Downloads

Everything should be available on **CTAN**: <ftp://ftp.ctan.org/tex-archive/>, but may need additional packages themselves.

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

- `TEXFormat LATEX 2ε`, 2011/06/27, v2<sub>ε</sub>: **CTAN**:
- document class `ltxdoc`, 2007/11/11, v2.0u, **CTAN:macros/latex/base/ltxdoc.dtx**
- package `hltxdoc`, 2012/03/21, v0.24, **CTAN:macros/latex/contrib/oberdiek/hltxdoc.dtx**
- package `hypdoc`, 2011/08/19, v1.11, **CTAN:macros/latex/contrib/oberdiek/hypdoc.dtx**
- package `geometry`, 2010/09/12, v5.6, **CTAN:macros/latex/contrib/geometry/geometry.dtx**
- package `ulem`, 2012/05/18, no version number given, **CTAN:macros/latex/contrib/ulem/**

`pageslts.sty` The `pageslts.sty` for `LATEX 2ε` (i. e. all documents using the `pageslts` package) requires:

- `TEXFormat LATEX 2ε`, 2011/06/27, v2<sub>ε</sub>, **CTAN**:
- package `atveryend`, 2011/06/30, v1.8, **CTAN:macros/latex/contrib/oberdiek/atveryend.dtx**
- package `everyshi`, 2001/05/15, v3.00, **CTAN:macros/latex/contrib/ms/everyshi.dtx**
- package `kvoptions`, 2011/06/30, v3.11, **CTAN:macros/latex/contrib/oberdiek/kvoptions.dtx**
- package `letltxmacro`, 2010/09/02, v1.4, **CTAN:macros/latex/contrib/oberdiek/letltxmacro.dtx**
- package `rerunfilecheck`, 2011/04/15, v1.7, **CTAN:macros/latex/contrib/oberdiek/rerunfilecheck.dtx**
- package `undolabl`, 2012/01/01, v1.0k, **CTAN:macros/latex/contrib/undolabl/undolabl.dtx**

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

- class `article`, 2007/10/19, v1.4h, from `classes.dtx`: **CTAN:macros/latex/base/classes.dtx**
- package `alphalph`, 2011/05/13, v2.4, **CTAN:macros/latex/contrib/oberdiek/alphalph.dtx**
- package `lipsum`, 2011/04/14, v1.2, **CTAN:macros/latex/contrib/lipsum/lipsum.dtx**
- package `showkeys`, 2007/08/07, v3.15, **CTAN:macros/latex/required/tools/showkeys.dtx**
- package `hyperref`, 2012/11/06, v6.83m, **CTAN:macros/latex/contrib/hyperref.zip**
- package `pageslts`, 2013/01/28, v1.2b, **CTAN:macros/latex/contrib/pageslts/pageslts.dtx**

(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	<p>The papermas package is not required, but requires itself the the pageslts package and can be considered as kind of add-on:</p> <ul style="list-style-type: none"> <li>- package papermas, 2011/08/22, v1.0h, <a href="#">CTAN:macros/latex/contrib/papermas/papermas.dtx</a></li> </ul>
endfloat	<p>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:</p> <ul style="list-style-type: none"> <li>- package endfloat, 2011/12/25, v2.5d, <a href="#">CTAN:macros/latex/contrib/endfloat/endfloat.dtx</a></li> </ul>
prelim2e	<p>The prelim2e package is not required either, but because Prelim@EveryShipout code was taken from that package, it is listed, too:</p> <ul style="list-style-type: none"> <li>- package prelim2e, 2009/05/29, v1.3, <a href="#">CTAN:macros/latex/contrib/ms/prelim2e.dtx</a></li> </ul>
fancyhdr nccfancyhdr	<p>Neither fancyhdr nor nccfancyhdr package is required (the lastpage package used its predecessor fancyheadings), but because they were mentioned, also they are listed here:</p> <ul style="list-style-type: none"> <li>- package fancyhdr, 2005/03/22, v3.2, <a href="#">CTAN:macros/latex/contrib/fancyhdr.zip</a></li> <li>- package nccfancyhdr, 2004/12/07, v1.1, <a href="#">CTAN:macros/latex/contrib/ncctools/source/nccfancyhdr.dtx</a></li> </ul>
lastpage totpages totcount nofm countlto zref	<p>As possible alternatives in section 4 there are listed</p> <ul style="list-style-type: none"> <li>- package lastpage, 2013/01/28, v1.2l, <a href="#">CTAN:macros/latex/contrib/lastpage/lastpage.dtx</a></li> <li>- package totpages, 2005/09/19, v2.00, <a href="#">CTAN:macros/latex/contrib/totpages/totpages.dtx</a></li> <li>- package totcount, 2011/01/25, v1.2, <a href="#">CTAN:macros/latex/contrib/totcount/totcount.dtx</a></li> <li>- package nofm, 1991/02/25, v?., <a href="http://tug.ctan.org/pub/tex-archive/obsolete/macros/latex209/contrib/misc/nofm.sty">ftp://tug.ctan.org/pub/tex-archive/obsolete/macros/latex209/contrib/misc/nofm.sty</a>, does not work with e.g. hyperref</li> <li>- package countlto, 2009/05/24, v2.1, <a href="#">CTAN:macros/latex/contrib/ms/countlto.dtx</a></li> <li>- package zref, 2012/04/04, v2.24, <a href="#">CTAN:macros/latex/contrib/oberdiek/zref.dtx</a></li> </ul>
Oberdiek alphalph atveryend holtxdoc letltxmacro kvoptions rerunfilecheck zref	<p>All packages of HEIKO OBERDIEK's bundle 'oberdiek' (especially alphalph, atveryend, holtxdoc, letltxmacro, kvoptions, rerunfilecheck, and zref) are also available in a TDS compliant ZIP archive: <a href="#">CTAN:install/macros/latex/contrib/oberdiek.tds.zip</a>.</p> <p>It is probably best to download and use this, because the packages in there should be both recent and compatible.</p>
Münch	<p>A list of my packages can be found at <a href="http://www.Uni-Bonn.de/~uzs5pv/LaTeX.html">http://www.Uni-Bonn.de/~uzs5pv/LaTeX.html</a>.</p>

## 7.2 Package, unpacking TDS

**Package.** This package is available on [CTAN](#):

[CTAN:macros/latex/contrib/pageslts/pageslts.dtx](#)

The source file.

[CTAN:macros/latex/contrib/pageslts/pageslts.pdf](#)

The documentation.

[CTAN:macros/latex/contrib/pageslts/pageslts-example.pdf](#)

The compiled example file, as it should look like.

[CTAN:macros/latex/contrib/pageslts/README](#)

The README file.

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

[CTAN: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  $\mathrm{T\!E\!X}$ :

```
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  $\text{\TeX}$  distribution (te $\text{\TeX}$ , mik $\text{\TeX}$ ,...) relies on file name databases, you must refresh these. For example, te $\text{\TeX}$  users run `texhash` or `mktexlsr`.

### 7.4 Some details for the interested

**Unpacking with  $\text{\LaTeX}$ .** The `.dtx` chooses its action depending on the format:

**plain  $\text{\TeX}$ :** Run `docstrip` and extract the files.

**$\text{\LaTeX}$ :** Generate the documentation.

If you insist on using  $\text{\LaTeX}$  for `docstrip` (really, `docstrip` does not need  $\text{\LaTeX}$ ), 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 $\text{\LaTeX}$ :

```
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.

## 9 History

[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`, 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>X209.
- 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`.
- Alternatives listing (section 4).
- Listing of T<sub>E</sub>X sources (subsection 7.1).
- A lot (!) of details.
- 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 (and new ones have been included probably) - 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.
- Updated references to other packages.
- TDS locations updated.
- 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`.
- Updated references to other packages: `hyperref`, `undolabl`, and **papermas**.
- Added a list of my other packages.

#### [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).
- Corrected the given location of the `pagesLTS.tds.zip` file at CTAN.
- Updated references to other packages: `hyperref` and `undolabl`.
- Updated to 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?)
- The usual correction of typos and minor details in 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).
- There is a new version of the used `geometry` package: 2010/07/13, v5.5.
- 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: `AlphAlpha` was replaced by `alphalph` (because that package is named like this), but this was done also in commands and definitions - now reverted.
- The recent version of the Adobe Reader ~~is~~ was 9.3.3 (instead of 9.3.1).

### [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: L<sup>A</sup>T<sub>E</sub>X 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` pagenumbersing scheme is used, the respective counters are not defined, saving three counters.
- Updated to version 2010/09/13 v6.81n of the `hyperref` package (which needs two more counters than the old 2010/06/18 v6.81g version).
- 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 v1.1l 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.
- `lastpage` package has a new version: 2010/09/24 v1.2f.

### [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 “new” version v2.4i of the `endfloat` package is now 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.
- Replaced the list of my packages with a link to a web page list of those, which has the advantage of showing the recent versions of all those packages.
- There is a new version of the used `geometry` package: 2010/09/12, v5.6.
- There ~~is~~ was a new version of the `hyperref` package: 2010/12/16, v6.81z.
- 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.
- There is a new version of the `lastpage` package: 2011/02/01, v1.2g.
- There is a new version of the used `undolabl` package: 2011/02/01, v1.0h.
- There ~~is~~ was a new version of the `papermas` package: 2011/02/01, v1.0e.
- 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 v1.1l 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 recent version.
- There ~~is~~ was a new version of the `hyperref` package: 2011/03/09, v6.82d.
- The recent version of the Adobe Reader ~~is~~ was X (10.0.1) (instead of 10.0.0).
- Some minor details.

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

- There ~~is~~ was a new version of the `lipsum` package: 2011/02/08, v1.1.
- Documentation and ReadMe bug fix: This `pagesLTS` package is located at [CTAN:macros/latex/contrib/pageslts/](http://CTAN:macros/latex/contrib/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.
- There is a new version of the **ulem** package: 2011/03/18 (no version number given).
- There is a new version of the **lipsum** package: 2011/04/14, v1.2.
- There ~~is~~ was a new version of the used **hyperref** package: 2011/04/17, v6.82g.
- **\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**.
- The recent version of the Adobe Reader ~~is~~ was 10.1.0 (instead of 10.0.1).
- 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.
- There is a new version of the **papermas** package: 2011/08/08, v1.0g.
- There is a new version of the **undolabl** package: 2011/08/08, v1.0j.
- There is a new version of the **lastpage** package: 2011/08/08, v1.2i.
- 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. (It probably does, but there is no guarantee.)
- Replaced **\let** by **\LetLtxMacro**.
- New versions of Adobe Reader and of the packages **alphalph**, **atveryend**, **endfloat**, **holtxdoc**, **hypdoc**, **hyperref**, **kvoptions**, **lastpage**, **papermas**, **ulem**, **undolabl**, and **zref** have become available.
- 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.

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.

Symbols	
<code>\@Alph</code> .....	1957
<code>\@alph</code> .....	1958
<code>\@auxout</code> ...	1434, 1439, 1653, 1821, 1846, 1849, 1858, 1863, 1866, 1899, 2039, 2051, 2053, 2058, 2076, 2079, 2086, 2093
<code>\@cclv</code> .....	1665, 1666, 1667, 1670, 1672, 1708, 1709, 1710
<code>\@evenfoot</code> .....	26, 36
<code>\@firstofone</code> .....	1791
<code>\@fnsymbol</code> .....	1959
<code>\@gobble</code> .....	1327
<code>\@ifpackagelater</code> ....	1902, 1903, 1928, 1929, 1974, 1975, 1997
<code>\@ifpackageloaded</code> .....	936, 1901, 1927, 1955, 1962, 1964, 1973, 2014, 2018
<code>\@ifpackagewith</code> .....	2019
<code>\@number</code> .....	1791
<code>\@oddfoot</code> .....	36
<code>\@overriddenmessage</code> .....	1654
<code>\@pagesLTS@Prelim@EveryShipout</code> .....	1661, 1767, 1771
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