

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 `fnyambol` > 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 `\pageref*`, for using `hyperref` but suppressing links, are supported.

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

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

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Save per page about 200 ml water, 2 g CO₂ and 2 g wood: Therefore please print only if this is really necessary.

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1 Introduction

This package puts the labels `LastPage` (`\AtEndDocument`) (like the `LastPage` package of 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 label `TotPages` of the `TotPages` package, but 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 `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. (See also L^AT_EX 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 `fnyambol` > 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.

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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 9.3.4 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.

2 Usage

Just load the package placing

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

in the preamble of your $\text{\LaTeX} 2_{\epsilon}$ source file (about `\AtEndDocument` see subsection 3.1) 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, `\pageref*{...}`
`\lastpageref*` 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 numbering 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`¹ must be > 0 and < 10 and those printed in `alph`² and `Alph`³ must be > 0 and < 27 . After page Z \LaTeX *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.
```

¹ *, †, ‡, §, ¶, ||, **, ††, ‡‡

² 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

³ 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` ($= -2147483647$).

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 \LaTeX capacity even for smaller numbers – in the example file this happens at about 6 500.)
(If you have a document with more than 6 500 pages, you might think about splitting it in volumes. And page “numbers” with about 100 digits are probably not easy to grasp for the reader, too.)

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

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

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

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

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

fnsymbolmult When option `fnsymbolmult=false` is **not** given (i.e. `fnsymbolmult` or `fnsymbolmult=true` or no `fnsymbolmult` option at all), after 5 (¶) the page “number” is continued with the doubled “number” of the first, second, third,... page (`*`, `††`, `‡‡`, `§§`, `¶¶`), and after the tenth page the “number” is tripled (`***`, `†††`,...). Compile the `pagesLTS-example.tex` with `pdf \LaTeX` and see the resulting pdf file.
Before `*` (page 1) the page “numbers” are continued with `0`, `-*`, `-†`,..., `-¶`, `-***`, `-†††`,...
If this is not wanted, set option `fnsymbolmult=false`, and `pageLTS` 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 $\text{\LaTeX}_{2\epsilon}$ arabic (page) numbers are possible up to $\text{MAX} = 2\,147\,483\,647$ (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 2341 times ¶) the $\text{\LaTeX}_{2\epsilon}$ capacity is exceeded, depending on the remaining file and its use of \TeX capacity, of course. (If you have a document with more than 11 705 pages, you might think about splitting it in volumes. And page “numbers” with 2341 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
`RomanMulti` (< 1), i.e. 0, -i, -ii, -iii, -iv, ... and 0, -I, -II, -III, -IV, ..., respectively.
Again the $\mathrm{T}_{\mathrm{E}}\mathrm{X}$ capacity will be exceeded before $\pm \mathrm{MAX} = \pm 2\,147\,483\,647$, 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 `pageLTS` will do nothing and allow the user to change the page “number”. (But if the user does not do anything at all, $\mathrm{L}^{\mathrm{A}}\mathrm{T}_{\mathrm{E}}\mathrm{X}$ will just ignore the values - not even a warning is given.)

2.1.4 Arabic page numbers

`Arabic page numbers` In $\mathrm{L}^{\mathrm{A}}\mathrm{T}_{\mathrm{E}}\mathrm{X} 2_{\varepsilon}$ arabic (page) numbers are already possible between $-\mathrm{MAX} \dots \mathrm{MAX}$, where $\mathrm{MAX} = 2\,147\,483\,647$ (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 3.1) 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 3.1).

`LastPages` When more than one page numbering scheme is used, neither `LastPage` nor `VeryLastPage` give the total **number** of pages. For
`page number` 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.<page numbering scheme>.<number></code> , e.g. <code>\lastpageref{pagesLTS.Roman.1}</code> , where <code><number></code> is the occurrence of the page numbering scheme. For details please see page 10.
<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.
<code>\pagenumbering</code>	<h2>2.3 \pagenumbering{...}</h2> <h3>2.3.1 If \pagenumbering{...} is not used</h3> <p>When the <code>pagesLTS</code> package is used, but <code>\pagenumbering{...}</code> (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 <code>pagesLTS</code> package tries to determine the page numbering scheme at the first shipout, but success is not guaranteed. Thus please use <code>\pagenumbering{...}</code> at the beginning of your document!</p> <p>Without <code>\pagenumbering{<something>}</code> (<code><something></code> e.g. = arabic) at the beginning of the document, the page numbers might be given in arabic <i>by (class) default</i>, but the <code>pagesLTS</code> package does not know about this without <code>\pagenumbering{arabic}</code>. –</p> <p>The label <code>pagesLTS.0</code> is created at the first page even if no <code>\pagenumbering{...}</code> command is given. Maybe have a look at the <code>.aux</code> file after compiling your document to detect further labels (of other packages, too).</p>

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 `<numbering scheme>` is e. g. arabic, roman, Roman, alph, Alph,....
`pagesLTS.roman`
`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 3.4! (And if the number format is unknown to `LATEX`, the pages will have no number, and therefore cannot be referenced. You might be able to help yourself by using the `hyperref` package and manually placing `\hypertargets` and `\hrefs`.)

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
scheme . number

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, 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
scheme . number
.local.cnt

```
\lastpages{<page numbering scheme>}{<number>},
where <page numbering scheme> is e.g. Roman, arabic,... and <number> the “sector” number, e.g. \lastpages{Roman}{2}.
(Internally, the counter has the format pagesLTS.<page numbering scheme>.<number>.local.cnt.)
```

If you used the page numbering scheme Roman for three times, you could say

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

to get

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

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

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

In your document the code

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

creates footers like

“DRAFT September 12, 2010 page V (5) of VII + 35 = 42 pages”

or

“DRAFT September 12, 2010 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 `\AtEndDocument`

The output of a \LaTeX 2_ϵ 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.

3.2 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 \LaTeX 2_ϵ 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 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 the floats at the end, then load in the reverse order. Independent from the order of `pagesLTS` and `endfloat`, you will still need the modified⁴ version of `endfloat`.

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

Other \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 \LaTeX 2_ϵ !**

3.3 `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. 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` [2010/06/18 v6.81g] 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`

⁴The “new” version is nearly 15 years old, so it might be time to update to this version, if you did not do it already.

and thereby reintroduces it again (`hyperref` should probably check for the version of this `lastpage` package and/or whether the `pagesLTS` package was also loaded.)

3.4 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 \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`.)

3.5 Page counter overflow

Without the use of the `alphalph` package, the

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

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

`MAX = 2147483647`

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

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

3.6 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 skew up – and quite totally for that. So, you have been warned!

- There can be a counter overflow, see preceding subsection 3.5.
- Adobe Acrobat Reader 9.3.4 does not show the correct page names for all pages with `fnsymbol` page numbering scheme:

page number	page name	shown by the Reader	with <code>alphalph</code> package and with <code>pagesLTS</code> package with <code>fnsymbolmult</code> option
-1	LaTeX Error		—*
0	(ignored by L ^A T _E 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 `alphalph` package and the `pagesLTS` package with `fnsymbolmult` option are used, page names like —*, 0, *, ** are also presented correctly by the Reader.

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. ε -TeX), here is a list of some possible alternatives:

`LastPage`

- The `LastPage` package also provides the `LastPage` label (but not `VeryLastPage` or `LastPages`). If you only want this and have a quite limited amount of TeX resources, you might want to use that package instead.
- If L^AT_EX 2.09 is still used, and if you are unable to switch to L^AT_EX 2_ε, the L^AT_EX 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).

`nofm.sty`

- “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^AT_EX, 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!

`count1to`

- You may want to have a look at the `count1to` package.

`zref`

- The `zref` package of Heiko Oberdiek requires ε -TeX. `pagesLTS` does not require ε -TeX, but if you already have ε -TeX, you may have a look at the extensive `zref` package, whether it suits your needs better (or additionally or whatsoever).

(You programmed or found another alternative, which is available at 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{alphalph}[2010/04/18]% v2.3
5 \usepackage{lipsum}[2005/01/26]% v1.0
6 \usepackage[draft]{showkeys}[2007/08/07]% v3.15
7 %%      Use final instead of draft to hide the keys. %%
8 \usepackage{hyperref}[2010/06/18]% v6.81g
9 \hypersetup{
10  extension=pdf,%
11  plainpages=false,%
12  pdfpagelabels=true,%
13  hyperindex=false,%
14  pdflang={en},%
15  pdftitle={pagesLTS package example},%
16  pdfauthor={Hans-Martin Muench},%
17  pdfsubject={Example for the pagesLTS package},%
18  pdfkeywords={LaTeX, pagesLTS, Hans-Martin Muench},%
19  pdfview=Fit,%
20  pdfstartview=Fit,%
21  pdfpagelayout=SinglePage,%
22  bookmarksopen=true%
23 }
24 \usepackage[pagecontinue=true,alphMult=ab,AlphMulti=AB,fnsymbolmult=true,romanMult=true,RomanMulti=true]{pagesLTS}[2010/09/12]% v1.1j
25 %% These are the default options. %%
26 \makeatletter
27   \renewcommand{\@evenfoot}{%
28     {Page \thepage\ (\thecurrentpage; local: \thecurrentpagelocal) of %
29     \lastpageref{pagesLTS.roman}(\lastpageref{pagesLTS.roman.local}) + %
30     \lastpageref{pagesLTS.Roman}(\lastpageref{pagesLTS.Roman.local}) + %
31     \lastpageref{pagesLTS.arabic}(\lastpageref{pagesLTS.arabic.local}) + %
32     \lastpageref{pagesLTS.fnsymbol}(\lastpageref{pagesLTS.fnsymbol.local}) + %
33     \lastpageref{pagesLTS.alph}(\lastpageref{pagesLTS.alph.local}) + %
34     \lastpageref{pagesLTS.Alph}(\lastpageref{pagesLTS.Alph.local}) = %
35     \lastpageref{LastPages} pages.%
36   }
37   \renewcommand{\@oddfoot}{\@evenfoot}
38   \def\pagesLTSexampleArabic{3}
39   \def\pagesLTSexamplealph{23}
40   \gdef\unit#1{\mathord{\thinspace\mathrm{#1}}}%
41 \makeatother
42 \listfiles
43 \begin{document}
44 \pagenumbering{roman}
```



```

45 %% Note the first \pagenumbering immediately behind \begin{document}. %%
46
47 %%\addtocounter{page}{-2} %%
48
49 \section*{Example for pagesLTS}
50 \addcontentsline{toc}{section}{Example for pagesLTS}
51 \markboth{Example for pagesLTS}{Example for pagesLTS}
52
53 This example demonstrates the most common uses of package\
54 \textsf{pagesLTS}, v1.1j as of 2010/09/12 (HMM).\
55 The used options were \texttt{pagecontinue=true},
56 \texttt{alphMult=ab}, \texttt{AlphMulti=AB}, \linebreak
57 \texttt{fnsymbolmult=true},
58 \texttt{romanMult=true}, and \texttt{RomanMulti=true}
59 (the default ones).\
60 For more details please see the documentation!\
61
62 \label{keys} To hide the \pageref{keys}{\quad} use option
63 \texttt{final} instead of \texttt{draft} with the \textsf{showkeys}
64 package (or remove the package call from the preamble of
65 this document).\
66
67 \textbf{Hyperlinks or not:} If the \textsf{hyperref} package is loaded,
68 the references are also hyperlinked:\
69 \smallskip
70 Page \thepage\ (\thecurrentpage; local: \thecurrentpagelocal) of %
71 \lastpageref{pagesLTS.roman}(\lastpageref{pagesLTS.roman.local}) + %
72 \lastpageref{pagesLTS.Roman}(\lastpageref{pagesLTS.Roman.local}) + %
73 \lastpageref{pagesLTS.arabic}(\lastpageref{pagesLTS.arabic.local}) + %
74 \lastpageref{pagesLTS.fnsymbol}(\lastpageref{pagesLTS.fnsymbol.local}) + %
75 \lastpageref{pagesLTS.alph}(\lastpageref{pagesLTS.alph.local}) + %
76 \lastpageref{pagesLTS.Alph}(\lastpageref{pagesLTS.Alph.local}) = %
77 \lastpageref{LastPages} pages.\
78 If the \textsf{hyperref} package is loaded, but the hyperlinks of the
79 references shall be suppressed, \texttt{\textbackslash pageref*{...}}
80 and \texttt{\textbackslash lastpageref*{...}} can be used:\
81 Page \thepage\ (\thecurrentpage; local: \thecurrentpagelocal) of %
82 \lastpageref*{pagesLTS.roman}(\lastpageref*{pagesLTS.roman.local}) + %
83 \lastpageref*{pagesLTS.Roman}(\lastpageref*{pagesLTS.Roman.local}) + %
84 \lastpageref*{pagesLTS.arabic}(\lastpageref*{pagesLTS.arabic.local}) + %
85 \lastpageref*{pagesLTS.fnsymbol}(\lastpageref*{pagesLTS.fnsymbol.local}) + %
86 \lastpageref*{pagesLTS.alph}(\lastpageref*{pagesLTS.alph.local}) + %
87 \lastpageref*{pagesLTS.Alph}(\lastpageref*{pagesLTS.Alph.local}) = %
88 \lastpageref*{LastPages} pages.\
89
90 \textbf{Trademarks} appear throughout this example without any

```

```

91 trademark symbol; they are the property of their respective
92 trademark owner. There is no intention of infringement; the
93 usage is to the benefit of the trademark owner.\\
94
95 \textbf{Tip}: Use \textit{logical page numbers} for
96 the display of the pdf!\\
97 (In Adobe Reader 9.3.4: \underline{E}dit $>$
98 Prefere\underline{n}ces (Ctrl+k) $>$ Page Display $>$
99 Page Content and Information $>$ Use logical page
100 \nolinebreak{\underline{n}umbers.})\\
101
102 You want negative page numbers? Not only arabic, but even roman,
103 Roman, alph, Alph or fnsymbol ones? No problem, e.\,g. just give a\\
104 \texttt{\textbackslash addtocounter\{page\}\{- \textit{some number}\}}
105 in the source code of this example file (or uncomment the prepared
106 line)!
107
108 \bigskip
109
110 Save per page about $200\unit{ml}$ water, $2\unit{g}$ CO$_{2}$
111 and $2\unit{g}$ wood:\\
112 Therefore please print only if this is really necessary.
113
114 \pagebreak
115
116 \tableofcontents
117
118 \newpage
119
120 \pagenumbering{roman}
121 % in case the page numbering is changed before,
122 % otherwise pagesLTS.current.local.roman on this page
123 % would be undefined
124
125 \section{roman}
126
127 \noindent (\texttt{roman} page numbering was started before,
128 because the page numbering scheme was needed to start at
129 the first page, of course.)\\
130
131 \noindent First page (\texttt{\textbackslash lastpageref\{pagesLTS.0\}}):
132 \lastpageref{pagesLTS.0}\\
133
134 \noindent The page (\texttt{\textbackslash thepage}): \thepage \\
135
136 \noindent Current page (\texttt{\textbackslash theCurrentPage}),

```

```

137 i.\,e. counted continuously from the first page): \theCurrentPage \\
138 You can get this also in other formats:
139 \roman{CurrentPage}, \Roman{CurrentPage}, \arabic{CurrentPage},
140 \fnsymbol{CurrentPage}, \alph{CurrentPage}, \Alph{CurrentPage}.
141
142 \noindent CurrentPageLocal (\texttt{\textbackslash theCurrentPageLocal}),
143 i.\,e. counted continuously from the first page of the
144 current page numbering scheme): \theCurrentPageLocal \\
145 You can get also this in other formats, too:
146 \roman{pagesLTS.current.local.roman}, \Roman{pagesLTS.current.local.roman},
147 \arabic{pagesLTS.current.local.roman}, \fnsymbol{pagesLTS.current.local.roman},
148 \alph{pagesLTS.current.local.roman}, \Alph{pagesLTS.current.local.roman},
149 but probably it only makes sense if page numbering scheme and format are
150 the same, e.\,g.\\
151 \texttt{\textbackslash Roman\{pagesLTS.current.local.Roman\}}\\
152 or \texttt{\textbackslash Alph\{pagesLTS.current.local.Alph\}}.\ %
153 \texttt{\textbackslash arabic\{\ldots \}}\ could make sense
154 even if combined with another page numbering scheme.
155 And this is exactly what \texttt{\textbackslash theCurrentPageLocal} does:\\
156 \nolinebreak{\texttt{\textbackslash def\textbackslash theCurrentPageLocal%
157 \{\textbackslash arabic\{pagesLTS.current.local.\textbackslash pagesLTS@pnc\}\}}.}\\
158
159 \noindent Last roman page (pagesLTS.roman): \lastpageref{pagesLTS.roman}{\hskip4em }
160 (There are \lastpageref{pagesLTS.roman.local} pages with roman numbers.)\\
161
162 \noindent Last Roman page (pagesLTS.Roman): \lastpageref{pagesLTS.Roman}{\hskip3em }
163 (There are \lastpageref{pagesLTS.Roman.local}~pages with Roman numbers:\\
164 \lastpages{Roman}{1}~pages in the first Roman sector
165 (\pageref{Roman}{\hskip3em }-\lastpageref{pagesLTS.Roman.1}{\hskip3em }),\\
166 \lastpages{Roman}{2}~pages in the second Roman sector
167 (\pageref{Roman2}{\hskip3em }-\lastpageref{pagesLTS.Roman.2}{\hskip3em }), and\\
168 \lastpages{Roman}{3}~pages in the third Roman sector
169 (\pageref{Roman3}{\hskip3em }-\lastpageref{pagesLTS.Roman.3}{\hskip3em }).\
170
171 When the option \texttt{pagecontinue=false} is used with the
172 \textsf{pagesLTS} package, the
173 \texttt{\textbackslash lastpageref\{pagesLTS.Roman\}} will point
174 to the same page as before, but this will have a lower number.\\
175 The \texttt{\textbackslash lastpageref\{pagesLTS.Roman.local\}}
176 will not change, because the number of pages does not change
177 (only the page numbers).\\
178
179 \noindent Last arabic page (pagesLTS.arabic): \lastpageref{pagesLTS.arabic}{\hskip5em }
180 (There are only \lastpageref{pagesLTS.arabic.local} pages with arabic numbers,
181 because an \texttt{\textbackslash addtocounter\{page\}\{\pagesLTSexampleArabic\}} was used.)\\
182

```

```

183 \noindent Last fnsymbol page (pagesLTS.fnsymbol): \lastpageref{pagesLTS.fnsymbol} \\
184 (\texttt{\textbackslash lastpageref\{pagesLTS.fnsymbol\}} -- never
185 \texttt{\textbackslash pageref\{pagesLTS.fnsymbol\}}!\)\
186 (There are \lastpageref{pagesLTS.fnsymbol.local} pages with fnsymbol numbers.)\
187
188 \noindent Last alph page (pagesLTS.alph): \lastpageref{pagesLTS.alph}{\hskip4em }
189 (There are only \lastpageref{pagesLTS.alph.local} pages with alph numbers,
190 because an \texttt{\textbackslash addtocounter\{page\}\{pagesLTSexamplealph\}} was used.)\
191
192 \noindent Last Alph page (pagesLTS.Alph): \lastpageref{pagesLTS.Alph}{\hskip4em }
193 (There are \lastpageref{pagesLTS.Alph.local} pages with Alph numbers.)\
194
195 \noindent Last page's \textit{name} (LastPage): \lastpageref{LastPage}\
196
197 \noindent Very last page's \textit{name} (VeryLastPage): \lastpageref{VeryLastPage}\
198 (\texttt{lastpage} and \texttt{VeryLastPage} are identical, unless
199 a package with output \linebreak
200 \texttt{\textbackslash AtEndDocument} after the \textsf{pagesLTS} package
201 was added.)\
202
203 \noindent Last page's \textit{number} (LastPages): \lastpageref{LastPages}{\hskip3em }
204 (=total number of pages)\
205
206 \lipsum[1-3]
207
208 \newpage
209
210 \pagenumbering{Roman}
211
212 \section{Roman\label{Roman}}
213 \subsection{Common Roman page numbering}
214
215 \noindent First page (\texttt{\textbackslash lastpageref\{pagesLTS.0\}}):
216 \lastpageref{pagesLTS.0}\
217
218 \noindent The page (\texttt{\textbackslash thepage}): \thepage \
219
220 \noindent Current page (\texttt{\textbackslash theCurrentPage}),
221 i.\,e. counted continuously from the first page): \theCurrentPage \
222
223 \noindent CurrentPageLocal (\texttt{\textbackslash theCurrentPageLocal}),
224 i.\,e. counted continuously from the first page of the
225 current page numbering scheme): \theCurrentPageLocal \
226
227 \noindent Last roman page (pagesLTS.roman): \lastpageref{pagesLTS.roman}{\hskip4em }
228 (There are \lastpageref{pagesLTS.roman.local} pages with roman numbers.)\

```

229
 230 \noindent Last Roman page (pagesLTS.Roman): \lastpageref{pagesLTS.Roman}{\hskip3em }
 231 (There are \lastpageref{pagesLTS.Roman.local}~pages with Roman numbers:\\
 232 \lastpages{Roman}{1}~pages in the first Roman sector
 233 (\pageref{Roman}{\hskip3em }-\lastpageref{pagesLTS.Roman.1}{\hskip3em }),\\
 234 \lastpages{Roman}{2}~pages in the second Roman sector
 235 (\pageref{Roman2}{\hskip3em }-\lastpageref{pagesLTS.Roman.2}{\hskip3em }), and\\
 236 \lastpages{Roman}{3}~pages in the third Roman sector
 237 (\pageref{Roman3}{\hskip3em }-\lastpageref{pagesLTS.Roman.3}{\hskip3em }).\\
 238
 239 \noindent Last arabic page (pagesLTS.arabic): \lastpageref{pagesLTS.arabic}{\hskip5em }
 240 (There are only \lastpageref{pagesLTS.arabic.local} pages with arabic numbers,
 241 because an \texttt{\textbackslash addtocounter\{page\}\{\pagesLTSexampleArabic\}} was used.)\\
 242
 243 \noindent Last fnsymbol page (pagesLTS.fnsymbol): \lastpageref{pagesLTS.fnsymbol} \\
 244 (\texttt{\textbackslash lastpageref\{pagesLTS.fnsymbol\}} -- never
 245 \texttt{\textbackslash pageref\{pagesLTS.fnsymbol\}}!)\\
 246 (There are \lastpageref{pagesLTS.fnsymbol.local} pages with fnsymbol numbers.)\\
 247
 248 \noindent Last alph page (pagesLTS.alph): \lastpageref{pagesLTS.alph}{\hskip4em }
 249 (There are only \lastpageref{pagesLTS.alph.local} pages with alph numbers,
 250 because an \texttt{\textbackslash addtocounter\{page\}\{\pagesLTSexamplealph\}} was used.)\\
 251
 252 \noindent Last Alph page (pagesLTS.Alph): \lastpageref{pagesLTS.Alph}{\hskip4em }
 253 (There are \lastpageref{pagesLTS.Alph.local} pages with Alph numbers.)\\
 254
 255 \noindent Last page's \textit{name} (LastPage): \lastpageref{LastPage}\\
 256
 257 \noindent Very last page's \textit{name} (VeryLastPage): \lastpageref{VeryLastPage}\\
 258 (\texttt{LastPage} and \texttt{VeryLastPage} are identical, unless
 259 a package with output \linebreak
 260 \texttt{\textbackslash AtEndDocument} after the \textsf{pagesLTS} package
 261 was added.)\\
 262
 263 \noindent Last page's \textit{number} (LastPages): \lastpageref{LastPages}{\hskip3em }
 264 (=total number of pages)\\
 265
 266 \lipsum[1-4]
 267
 268 \newpage
 269
 270 \subsection{Last page of first Roman sector}
 271 \texttt{\textbackslash lastpageref\{pagesLTS.Roman\}} does \textbf{not}
 272 refer to this page (but there: \lastpageref{pagesLTS.Roman}),
 273 because the option \texttt{pagecontinue=true}
 274 was chosen. When a reference to this page is wanted,\\

```

275 \texttt{\textbackslash lastpageref\{pagesLTS.Roman.1\}}
276 can be used: \lastpageref{pagesLTS.Roman.1}.\
277
278 \bigskip
279 There are \lastpages{Roman}{1}~pages
280 (\texttt{\textbackslash lastpages\{Roman\}\{1\}})
281 in this first Roman sector.\
282 The Roman page numbering scheme is continued later in
283 section~\ref{Roman2})!
284
285 \newpage
286
287 \pagenumbering{arabic}
288
289 \section{arabic}
290
291 \subsection{Standard page numbering}
292
293 \noindent First page (\texttt{\textbackslash lastpageref\{pagesLTS.0\}}):
294 \lastpageref{pagesLTS.0}.\
295
296 \noindent The page (\texttt{\textbackslash thepage}): \thepage \
297
298 \noindent Current page (\texttt{\textbackslash theCurrentPage}),
299 i.\,e. counted continuously from the first page): \theCurrentPage \
300
301 \noindent CurrentPageLocal (\texttt{\textbackslash theCurrentPageLocal}),
302 i.\,e. counted continuously from the first page of the
303 current page numbering scheme): \theCurrentPageLocal \
304
305 \noindent Last roman page (pagesLTS.roman): \lastpageref{pagesLTS.roman}\{\hskip4em }
306 (There are \lastpageref{pagesLTS.roman.local} pages with roman numbers.)\
307
308 \noindent Last Roman page (pagesLTS.Roman): \lastpageref{pagesLTS.Roman}\{\hskip3em }
309 (There are \lastpageref{pagesLTS.Roman.local}~pages with Roman numbers:\
310 \lastpages{Roman}{1}~pages in the first Roman sector
311 (\pageref{Roman}\{\hskip3em }-\lastpageref{pagesLTS.Roman.1}\{\hskip3em }),\
312 \lastpages{Roman}{2}~pages in the second Roman sector
313 (\pageref{Roman2}\{\hskip3em }-\lastpageref{pagesLTS.Roman.2}\{\hskip3em }), and\
314 \lastpages{Roman}{3}~pages in the third Roman sector
315 (\pageref{Roman3}\{\hskip3em }-\lastpageref{pagesLTS.Roman.3}\{\hskip3em }).\
316
317 \noindent Last arabic page (pagesLTS.arabic): \lastpageref{pagesLTS.arabic}\{\hskip5em }
318 (There are only \lastpageref{pagesLTS.arabic.local} pages with arabic numbers,
319 because an \texttt{\textbackslash addtocounter\{page\}\{\pagesLTSexampleArabic\}} was used.)\
320

```

```

321 \noindent Last fnsymbol page (pagesLTS.fnsymbol): \lastpageref{pagesLTS.fnsymbol} \\
322 (\texttt{\textbackslash lastpageref\{pagesLTS.fnsymbol\}} -- never
323 \texttt{\textbackslash pageref\{pagesLTS.fnsymbol\}}!\)\
324 (There are \lastpageref{pagesLTS.fnsymbol.local} pages with fnsymbol numbers.)\
325
326 \noindent Last alph page (pagesLTS.alph): \lastpageref{pagesLTS.alph}{\hskip4em }
327 (There are only \lastpageref{pagesLTS.alph.local} pages with alph numbers,
328 because an \texttt{\textbackslash addtocounter\{page\}\{\pagesLTSexamplealph\}} was used.)\
329
330 \noindent Last Alph page (pagesLTS.Alph): \lastpageref{pagesLTS.Alph}{\hskip4em }
331 (There are \lastpageref{pagesLTS.Alph.local} pages with Alph numbers.)\
332
333 \noindent Last page's \textit{name} (LastPage): \lastpageref{LastPage}\
334
335 \noindent Very last page's \textit{name} (VeryLastPage): \lastpageref{VeryLastPage}\
336 (\texttt{LastPage} and \texttt{VeryLastPage} are identical, unless
337 a package with output \linebreak
338 \texttt{\textbackslash AtEndDocument} after the \textsf{pagesLTS} package
339 was added.)\
340
341 \noindent Last page's \textit{number} (LastPages): \lastpageref{LastPages}{\hskip3em }
342 (=total number of pages)\
343
344 \lipsum[1-4]
345 \newpage
346
347 \subsection[Empty page style]{Also an empty page style is no problem\ %
348 for the current or total page count}
349
350 \bigskip
351
352 \thispagestyle{empty}
353
354 \noindent First page (\texttt{\textbackslash lastpageref\{pagesLTS.0\}}):
355 \lastpageref{pagesLTS.0}\
356
357 \noindent The page (\texttt{\textbackslash thepage}): \thepage \
358
359 \noindent Current page (\texttt{\textbackslash theCurrentPage}),
360 i.\,e. counted continuously from the first page): \theCurrentPage \
361
362 \noindent CurrentPageLocal (\texttt{\textbackslash theCurrentPageLocal}),
363 i.\,e. counted continuously from the first page of the
364 current page numbering scheme): \theCurrentPageLocal \
365
366 \noindent Last roman page (pagesLTS.roman): \lastpageref{pagesLTS.roman}{\hskip4em }

```

367 (There are \lastpageref{pagesLTS.roman.local} pages with roman numbers.)\\
 368
 369 \noindent Last Roman page (pagesLTS.Roman): \lastpageref{pagesLTS.Roman}{\hskip3em }
 370 (There are \lastpageref{pagesLTS.Roman.local}~pages with Roman numbers:\\
 371 \lastpages{Roman}{1}~pages in the first Roman sector
 372 (\pageref{Roman}{\hskip3em }-\lastpageref{pagesLTS.Roman.1}{\hskip3em }),\\
 373 \lastpages{Roman}{2}~pages in the second Roman sector
 374 (\pageref{Roman2}{\hskip3em }-\lastpageref{pagesLTS.Roman.2}{\hskip3em }), and\\
 375 \lastpages{Roman}{3}~pages in the third Roman sector
 376 (\pageref{Roman3}{\hskip3em }-\lastpageref{pagesLTS.Roman.3}{\hskip3em }).\\
 377
 378 \noindent Last arabic page (pagesLTS.arabic): \lastpageref{pagesLTS.arabic}{\hskip5em }
 379 (There are only \lastpageref{pagesLTS.arabic.local} pages with arabic numbers,
 380 because an \texttt{\textbackslash addtocounter\{page\}\{\pagesLTSexampleArabic\}} was used.)\\
 381
 382 \noindent Last fnsymbol page (pagesLTS.fnsymbol): \lastpageref{pagesLTS.fnsymbol} \\
 383 (\texttt{\textbackslash lastpageref\{pagesLTS.fnsymbol\}} -- never
 384 \texttt{\textbackslash pageref\{pagesLTS.fnsymbol\}}!)\\
 385 (There are \lastpageref{pagesLTS.fnsymbol.local} pages with fnsymbol numbers.)\\
 386
 387 \noindent Last alph page (pagesLTS.alph): \lastpageref{pagesLTS.alph}{\hskip4em }
 388 (There are only \lastpageref{pagesLTS.alph.local} pages with alph numbers,
 389 because an \texttt{\textbackslash addtocounter\{page\}\{\pagesLTSexamplealph\}} was used.)\\
 390
 391 \noindent Last Alph page (pagesLTS.Alph): \lastpageref{pagesLTS.Alph}{\hskip4em }
 392 (There are \lastpageref{pagesLTS.Alph.local} pages with Alph numbers.)\\
 393
 394 \noindent Last page's \textit{name} (LastPage): \lastpageref{LastPage}\\
 395
 396 \noindent Very last page's \textit{name} (VeryLastPage): \lastpageref{VeryLastPage}\\
 397 (\texttt{LastPage} and \texttt{VeryLastPage} are identical, unless
 398 a package with output \linebreak
 399 \texttt{\textbackslash AtEndDocument} after the \textsf{pagesLTS} package
 400 was added.)\\
 401
 402 \noindent Last page's \textit{number} (LastPages): \lastpageref{LastPages}{\hskip3em }
 403 (=total number of pages)\\
 404
 405 \lipsum[1-4]
 406
 407 \newpage
 408
 409 \subsection[addtocounter, setcounter]{Neither\ %
 410 \texttt{\textbackslash addtocounter\{page\}} or\ %
 411 \texttt{\textbackslash setcounter\{page\}} is a problem for the\ %
 412 current or total page numbers}


```

413
414 (Here is an \texttt{\textbackslash addtocounter\{page\}\{\pagesLTExampleArabic\}}
415 in the source code.)\\
416 \addtocounter{page}{\pagesLTExampleArabic}
417
418 \noindent The page (from \texttt{\textbackslash thepage} command): \thepage \\
419
420 \noindent Current page (from \texttt{\textbackslash theCurrentPage}\ %
421 command), i.\,e. counted continuously from the first page): \theCurrentPage \\
422
423 \noindent CurrentPageLocal (from \texttt{\textbackslash theCurrentPageLocal}\ %
424 command), i.\,e. counted continuously from the first page of the
425 current page numbering scheme): \theCurrentPageLocal\\
426
427 \noindent Last page's number (LastPages): \lastpageref{LastPages}{\hskip3em }
428 (= total number of pages)\\
429
430 \lipsum[1-7]
431
432 \newpage
433
434 \pagenumbering{fnsymbol}
435
436 \section{fnsymbol}
437
438 Adobe Acrobat Reader 9.3.4 does not show the correct page names
439 for all pages with \texttt{fnsymbol} page numbering scheme:
440
441 \begin{tabular}{c|c|c|c}
442 page number & page name & & shown by the Reader & \textsf{alphalph} & \\ \hline
443 $-1$ & \texttt{\LaTeX Error} & & & & \ensuremath {- *} & \\
444 $0$ & (ignored by \LaTeX) & & & & 0 & \\
445 $1$ & \ensuremath {*} & & & & \ensuremath {*} & \\
446 $2$ & \ensuremath {\dag} & & & & \ensuremath {\dag} & \\
447 $3$ & \ensuremath {\ddag} & & & & \ensuremath {\ddag} & \\
448 $4$ & \ensuremath {\mathsection} & & & & \ensuremath {\mathsection} & \\
449 $5$ & \ensuremath {\mathparagraph} & & & & \ensuremath {\mathparagraph} & \\
450 $6$ & \ensuremath {\delimiter "026B30D} & & "026B30D & & \ensuremath {**} & \\
451 $7$ & \ensuremath {**} & & ** & & \ensuremath {\dag \dag} & \\
452 $8$ & \ensuremath {\dag \dag} & & & & \ensuremath {\ddag \ddag} & \\
453 $9$ & \ensuremath {\ddag \ddag} & & & & \ensuremath {\mathsection \mathsection} & \\
454 $10$ & \texttt{\LaTeX Error} & & & & \ensuremath {\mathparagraph \mathparagraph} & \\
455 $11$ & \texttt{\LaTeX Error} & & & & \ensuremath {***} & \\
456 $12$ & \texttt{\LaTeX Error} & & & & \ensuremath {\dag \dag \dag} & \\
457 \end{tabular}
458

```

```

459 \noindent and so on, while at least the (\ldots\ of \ldots ) part
460 of the page number is displayed correctly.\\
461
462 \bigskip
463
464 Without option \texttt{fnsymbolmult=true} of the \textsf{pagesLTS} package
465 (and the help of Heiko Oberdiek's \textsf{alphalph} package),
466 after page~9
467 (\textquotedblleft \ensuremath {\ddagger \ddagger } \textquotedblright )
468 (and also for negative page numbers) there would just appear a
469 \begin{quote}
470 \begin{verbatim}
471 LaTeX Error: Counter too large
472 See the LaTeX manual or LaTeX Companion for explanation.
473 You've lost some text. Try typing <return> to proceed.
474 If that doesn't work, type X <return> to quit.
475 \end{verbatim}
476 \end{quote}
477 Now the page numbers after 5 (\ensuremath {\mathparagraph }) are
478 continued with the doubled \textquotedblleft number\textquotedblright\ of
479 the first, second, third,\ldots\ page (\ensuremath {**},
480 \ensuremath {\dagger \dagger }, \ensuremath {\ddagger \ddagger },
481 \ensuremath {\mathsection \mathsection },
482 \ensuremath {\mathparagraph \mathparagraph } ),
483 and after the tenth page the \textquotedblleft number\textquotedblright\ is
484 tripled (\ensuremath {***}, \ensuremath {\dagger \dagger \dagger },\ldots).
485 Page zero is named 0 and negative pages just named like the positive ones
486 with addition of a minus sign~($-$).
487
488 \bigskip
489
490 \noindent First page (\texttt{\textbackslash lastpageref\{pagesLTS.0\}}):
491 \lastpageref{pagesLTS.0}\\
492
493 \noindent The page (\texttt{\textbackslash thepage}): \thepage \\
494
495 \noindent Current page (\texttt{\textbackslash theCurrentPage}),
496 i.\.,e. counted continuously from the first page): \theCurrentPage \\
497
498 \noindent CurrentPageLocal (\texttt{\textbackslash theCurrentPageLocal}),
499 i.\.,e. counted continuously from the first page of the
500 current page numbering scheme): \theCurrentPageLocal \\
501
502 \noindent Last roman page (pagesLTS.roman): \lastpageref{pagesLTS.roman}{\hskip4em }
503 (There are \lastpageref{pagesLTS.roman.local} pages with roman numbers.)\\
504

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505 \noindent Last Roman page (pagesLTS.Roman): \lastpageref{pagesLTS.Roman}{\hskip3em }
506 (There are \lastpageref{pagesLTS.Roman.local}~pages with Roman numbers:\\
507 \lastpages{Roman}{1}~pages in the first Roman sector
508 (\pageref{Roman}{\hskip3em }-\lastpageref{pagesLTS.Roman.1}{\hskip3em }),\\
509 \lastpages{Roman}{2}~pages in the second Roman sector
510 (\pageref{Roman2}{\hskip3em }-\lastpageref{pagesLTS.Roman.2}{\hskip3em }), and\\
511 \lastpages{Roman}{3}~pages in the third Roman sector
512 (\pageref{Roman3}{\hskip3em }-\lastpageref{pagesLTS.Roman.3}{\hskip3em }).\\
513
514 \noindent Last arabic page (pagesLTS.arabic): \lastpageref{pagesLTS.arabic}{\hskip5em }
515 (There are only \lastpageref{pagesLTS.arabic.local} pages with arabic numbers,
516 because an \texttt{\textbackslash addtocounter\{page\}\{\pagesLTSexampleArabic\}} was used.)\\
517
518 \noindent Last fnsymbol page (pagesLTS.fnsymbol): \lastpageref{pagesLTS.fnsymbol} \\
519 (\texttt{\textbackslash lastpageref\{pagesLTS.fnsymbol\}} -- never
520 \texttt{\textbackslash pageref\{pagesLTS.fnsymbol\}}!)\\
521 (There are \lastpageref{pagesLTS.fnsymbol.local} pages with fnsymbol numbers.)\\
522
523 \noindent Last alph page (pagesLTS.alph): \lastpageref{pagesLTS.alph}{\hskip4em }
524 (There are only \lastpageref{pagesLTS.alph.local} pages with alph numbers,
525 because an \texttt{\textbackslash addtocounter\{page\}\{\pagesLTSexamplealph\}} was used.)\\
526
527 \noindent Last Alph page (pagesLTS.Alph): \lastpageref{pagesLTS.Alph}{\hskip4em }
528 (There are \lastpageref{pagesLTS.Alph.local} pages with Alph numbers.)\\
529
530 \noindent Last page's \textit{name} (LastPage): \lastpageref{LastPage}\\
531
532 \noindent Very last page's \textit{name} (VeryLastPage): \lastpageref{VeryLastPage}\\
533 (\texttt{LastPage} and \texttt{VeryLastPage} are identical, unless
534 a package with output \linebreak
535 \texttt{\textbackslash AtEndDocument} after the \textsf{pagesLTS} package
536 was added.)\\
537
538 \noindent Last page's \textit{number} (LastPages): \lastpageref{LastPages}{\hskip3em }
539 (=total number of pages)\\
540
541 \lipsum[1-60]
542
543 \newpage
544
545 \pagenumbering{Roman}
546
547 \section{Roman - again!\label{Roman2}}
548
549 The page number would start with
550 \textquotedblleft I\textquotedblright\ again -- but

```

```

551 for the \textsf{pagesLTS} package (with option \texttt{pagecontinue=true},
552 or with option just \texttt{pagecontinue}, or even just
553 \nolinebreak{with\textbf{out}} option \texttt{pagecontinue=false}).
554 This package remembered the
555 (\arabic{pagesLTS.double.Roman}-1)\footnote{OK, here\ %
556 you have to compute this value for yourself, but\ %
557 subtracting one should be managable for \TeX nicians.} pages already
558 done in Roman output, and therefore continues with page
559 \textquotedblleft \thepage \textquotedblright .\
560 If you want to start with \textquotedblleft I\textquotedblright\ all
561 over again, you will have two pages with the same name,
562 but nevertheless you can do this by using option \texttt{pagecontinue=false}
563 or a \texttt{\textbackslash setcounter\{page\}\{1\}}\ here
564 (not demonstrated in this example file).\
565
566 \noindent First page (\texttt{\textbackslash lastpageref\{pagesLTS.0\}}):
567 \lastpageref{pagesLTS.0}\
568
569 \noindent The page (\texttt{\textbackslash thepage}): \thepage \
570
571 \noindent Current page (\texttt{\textbackslash theCurrentPage}),
572 i.\,e. counted continuously from the first page): \theCurrentPage \
573
574 \noindent CurrentPageLocal (\texttt{\textbackslash theCurrentPageLocal}),
575 i.\,e. counted continuously from the first page of the
576 current page numbering scheme): \theCurrentPageLocal \
577
578 \noindent Last roman page (pagesLTS.roman): \lastpageref{pagesLTS.roman}{\hskip4em }
579 (There are \lastpageref{pagesLTS.roman.local} pages with roman numbers.)\
580
581 \noindent Last Roman page (pagesLTS.Roman): \lastpageref{pagesLTS.Roman}{\hskip3em }
582 (There are \lastpageref{pagesLTS.Roman.local}~pages with Roman numbers:\
583 \lastpages{Roman}{1}~pages in the first Roman sector
584 (\pageref{Roman}{\hskip3em }-\lastpageref{pagesLTS.Roman.1}{\hskip3em }),\
585 \lastpages{Roman}{2}~pages in the second Roman sector
586 (\pageref{Roman2}{\hskip3em }-\lastpageref{pagesLTS.Roman.2}{\hskip3em }), and\
587 \lastpages{Roman}{3}~pages in the third Roman sector
588 (\pageref{Roman3}{\hskip3em }-\lastpageref{pagesLTS.Roman.3}{\hskip3em }).\
589
590 \noindent Last arabic page (pagesLTS.arabic): \lastpageref{pagesLTS.arabic}{\hskip5em }
591 (There are only \lastpageref{pagesLTS.arabic.local} pages with arabic numbers,
592 because an \texttt{\textbackslash addtocounter\{page\}\{\pagesLTSEXampleArabic\}} was used.)\
593
594 \noindent Last fnsymbol page (pagesLTS.fnsymbol): \lastpageref{pagesLTS.fnsymbol} \
595 (\texttt{\textbackslash lastpageref\{pagesLTS.fnsymbol\}} -- never
596 \texttt{\textbackslash pageref\{pagesLTS.fnsymbol\}}!)\

```

```

597 (There are \lastpageref{pagesLTS.fnsymbol.local} pages with fnsymbol numbers.)\\
598
599 \noindent Last alph page (pagesLTS.alph): \lastpageref{pagesLTS.alph}{\hskip4em }
600 (There are only \lastpageref{pagesLTS.alph.local} pages with alph numbers,
601 because an \texttt{\textbackslash addtocounter\{page\}\{\pagesLTSexamplealph\}} was used.)\\
602
603 \noindent Last Alph page (pagesLTS.Alph): \lastpageref{pagesLTS.Alph}{\hskip4em }
604 (There are \lastpageref{pagesLTS.Alph.local} pages with Alph numbers.)\\
605
606 \noindent Last page's \textit{name} (LastPage): \lastpageref{LastPage}\\
607
608 \noindent Very last page's \textit{name} (VeryLastPage): \lastpageref{VeryLastPage}\\
609 (\texttt{LastPage} and \texttt{VeryLastPage} are identical, unless
610 a package with output \linebreak
611 \texttt{\textbackslash AtEndDocument} after the \textsf{pagesLTS} package
612 was added.)\\
613
614 \noindent Last page's \textit{number} (LastPages): \lastpageref{LastPages}{\hskip3em }
615 (=total number of pages)\\
616
617 \lipsum[1-6]
618
619 \newpage
620
621 \texttt{\textbackslash lastpageref\{pagesLTS.Roman\}} does \textbf{not}
622 refer to this page (but there: \lastpageref{pagesLTS.Roman}),
623 because the option \texttt{pagecontinue=true}
624 was chosen. When a reference to this page is wanted,\\
625 \texttt{\textbackslash lastpageref\{pagesLTS.Roman.2\}}
626 can be used: \lastpageref{pagesLTS.Roman.2}.\\
627
628 \bigskip
629 There are \lastpages{Roman}{2}~pages
630 (\texttt{\textbackslash lastpages\{Roman\}\{2\}})
631 in this second Roman sector.\\
632 The Roman page numbering scheme is continued later in
633 section~\ref{Roman3})!
634
635 \newpage
636
637 \pagenumbering{alph}
638
639 \section{alph\label{alph}}
640
641 \noindent First page (\texttt{\textbackslash lastpageref\{pagesLTS.0\}}):
642 \lastpageref{pagesLTS.0}\\

```

```

643
644 \noindent The page (\texttt{\textbackslash thepage}): \thepage \\
645
646 \noindent Current page (\texttt{\textbackslash theCurrentPage}),
647 i.\,e. counted continuously from the first page): \theCurrentPage \\
648
649 \noindent CurrentPageLocal (\texttt{\textbackslash theCurrentPageLocal}),
650 i.\,e. counted continuously from the first page of the
651 current page numbering scheme): \theCurrentPageLocal \\
652
653 \noindent Last roman page (pagesLTS.roman): \lastpageref{pagesLTS.roman}{\hskip4em }
654 (There are \lastpageref{pagesLTS.roman.local} pages with roman numbers.)\\
655
656 \noindent Last Roman page (pagesLTS.Roman): \lastpageref{pagesLTS.Roman}{\hskip3em }
657 (There are \lastpageref{pagesLTS.Roman.local}~pages with Roman numbers:\\
658 \lastpages{Roman}{1}~pages in the first Roman sector
659 (\pageref{Roman}{\hskip3em }-\lastpageref{pagesLTS.Roman.1}{\hskip3em }),\\
660 \lastpages{Roman}{2}~pages in the second Roman sector
661 (\pageref{Roman2}{\hskip3em }-\lastpageref{pagesLTS.Roman.2}{\hskip3em }), and\\
662 \lastpages{Roman}{3}~pages in the third Roman sector
663 (\pageref{Roman3}{\hskip3em }-\lastpageref{pagesLTS.Roman.3}{\hskip3em }).\\
664
665 \noindent Last arabic page (pagesLTS.arabic): \lastpageref{pagesLTS.arabic}{\hskip5em }
666 (There are only \lastpageref{pagesLTS.arabic.local} pages with arabic numbers,
667 because an \texttt{\textbackslash addtocounter\{page\}\{\pagesLTSexampleArabic\}} was used.)\\
668
669 \noindent Last fnsymbol page (pagesLTS.fnsymbol): \lastpageref{pagesLTS.fnsymbol} \\
670 (\texttt{\textbackslash lastpageref\{pagesLTS.fnsymbol\}} -- never
671 \texttt{\textbackslash pageref\{pagesLTS.fnsymbol\}}!)\\
672 (There are \lastpageref{pagesLTS.fnsymbol.local} pages with fnsymbol numbers.)\\
673
674 \noindent Last alph page (pagesLTS.alph): \lastpageref{pagesLTS.alph}{\hskip4em }
675 (There are only \lastpageref{pagesLTS.alph.local} pages with alph numbers,
676 because an \texttt{\textbackslash addtocounter\{page\}\{\pagesLTSexamplealph\}} was used.)\\
677
678 \noindent Last Alph page (pagesLTS.Alph): \lastpageref{pagesLTS.Alph}{\hskip4em }
679 (There are \lastpageref{pagesLTS.Alph.local} pages with Alph numbers.)\\
680
681 \noindent Last page's \textit{name} (LastPage): \lastpageref{LastPage}\\
682
683 \noindent Very last page's \textit{name} (VeryLastPage): \lastpageref{VeryLastPage}\\
684 (\texttt{LastPage} and \texttt{VeryLastPage} are identical, unless
685 a package with output \linebreak
686 \texttt{\textbackslash AtEndDocument} after the \textsf{pagesLTS} package
687 was added.)\\
688

```

```

689 \noindent Last page's \textit{number} (LastPages): \lastpageref{LastPages}{\hskip3em }
690 (=total number of pages)\
691
692 \lipsum[1-4]
693
694 \newpage
695
696 Without option \texttt{alphMult=ab} of the \textsf{pagesLTS} (and the help of
697 Heiko Oberdiek's \textsf{alphalph} package), after page
698 \textquotedblleft z\textquotedblright\ there would just appear a
699 \begin{quote}
700 \begin{verbatim}
701 LaTeX Error: Counter too large
702 See the LaTeX manual or LaTeX Companion for explanation.
703 You've lost some text. Try typing <return> to proceed.
704 If that doesn't work, type X <return> to quit.
705 \end{verbatim}
706 \end{quote}
707 Now the page numbers are continued aa, ab, ac,\ldots\ (aa, bb, cc,\ldots\ is
708 also possible, see the \textsf{pagesLTS} documentation).\
709 To demonstrate this, we add a\
710 \texttt{\textbackslash addtocounter\{page\}\{\pagesLTSexamplealph\}}\
711 in the source code here.
712
713 \addtocounter{page}{\pagesLTSexamplealph}
714
715 \bigskip
716
717 \lipsum[1-18]
718
719 \newpage
720
721 \pagenumbering{Roman}
722
723 \section{Roman - third time!\label{Roman3}}
724
725 The page number would start with
726 \textquotedblleft I\textquotedblright\ again -- but
727 for the \textsf{pagesLTS} package (with option \texttt{pagecontinue=true},
728 or with option just \texttt{pagecontinue}, or even just
729 \nolinebreak[with\textbf{out}] option \texttt{pagecontinue=false}).
730 This package remembered the
731 (\arabic{pagesLTS.double.Roman}-1)\footnote{OK, here\ %
732 you have to compute this value for yourself, but\ %
733 subtracting one should be manageable for \TeX nicians.} pages already
734 done in Roman output, and therefore continues with page

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```

735 \textquotedblleft \thepage \textquotedblright .\\
736 If you want to start with \textquotedblleft I\textquotedblright\ all
737 over again, you will have (at least) two pages with the same name,
738 but nevertheless you can do this by using option
739 \texttt{pagecontinue=false} instead of \texttt{pagecontinue=true}
740 (not demonstrated here).\\
741
742 \noindent First page (\texttt{\textbackslash lastpageref\{pagesLTS.0\}}):
743 \lastpageref{pagesLTS.0}\\
744
745 \noindent The page (\texttt{\textbackslash thepage}): \thepage \\
746
747 \noindent Current page (\texttt{\textbackslash theCurrentPage}),
748 i.\,e. counted continuously from the first page): \theCurrentPage \\
749
750 \noindent CurrentPageLocal (\texttt{\textbackslash theCurrentPageLocal}),
751 i.\,e. counted continuously from the first page of the
752 current page numbering scheme): \theCurrentPageLocal \\
753
754 \noindent Last roman page (pagesLTS.roman): \lastpageref{pagesLTS.roman}{\hskip4em }
755 (There are \lastpageref{pagesLTS.roman.local} pages with roman numbers.)\\
756
757 \noindent Last Roman page (pagesLTS.Roman): \lastpageref{pagesLTS.Roman}{\hskip3em }
758 (There are \lastpageref{pagesLTS.Roman.local}~pages with Roman numbers:\\
759 \lastpages{Roman}{1}~pages in the first Roman sector
760 (\pageref{Roman}{\hskip3em }-\lastpageref{pagesLTS.Roman.1}{\hskip3em }),\\
761 \lastpages{Roman}{2}~pages in the second Roman sector
762 (\pageref{Roman2}{\hskip3em }-\lastpageref{pagesLTS.Roman.2}{\hskip3em }), and\\
763 \lastpages{Roman}{3}~pages in the third Roman sector
764 (\pageref{Roman3}{\hskip3em }-\lastpageref{pagesLTS.Roman.3}{\hskip3em }).\\
765
766 \noindent Last arabic page (pagesLTS.arabic): \lastpageref{pagesLTS.arabic}{\hskip5em }
767 (There are only \lastpageref{pagesLTS.arabic.local} pages with arabic numbers,
768 because an \texttt{\textbackslash addtocounter\{page\}\{\pagesLTSexampleArabic\}} was used.)\\
769
770 \noindent Last fnsymbol page (pagesLTS.fnsymbol): \lastpageref{pagesLTS.fnsymbol} \\
771 (\texttt{\textbackslash lastpageref\{pagesLTS.fnsymbol\}} -- never
772 \texttt{\textbackslash pageref\{pagesLTS.fnsymbol\}}!)\\
773 (There are \lastpageref{pagesLTS.fnsymbol.local} pages with fnsymbol numbers.)\\
774
775 \noindent Last alph page (pagesLTS.alph): \lastpageref{pagesLTS.alph}{\hskip4em }
776 (There are only \lastpageref{pagesLTS.alph.local} pages with alph numbers,
777 because an \texttt{\textbackslash addtocounter\{page\}\{\pagesLTSexamplealph\}} was used.)\\
778
779 \noindent Last Alph page (pagesLTS.Alph): \lastpageref{pagesLTS.Alph}{\hskip4em }
780 (There are \lastpageref{pagesLTS.Alph.local} pages with Alph numbers.)\\

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781
782 \noindent Last page's \textit{name} (LastPage): \lastpageref{LastPage}\\
783
784 \noindent Very last page's \textit{name} (VeryLastPage): \lastpageref{VeryLastPage}\\
785 (\texttt{LastPage} and \texttt{VeryLastPage} are identical, unless
786 a package with output \linebreak
787 \texttt{\textbackslash AtEndDocument} after the \textsf{pagesLTS} package
788 was added.)\\
789
790 \noindent Last page's \textit{number} (LastPages): \lastpageref{LastPages}{\hskip3em }
791 (=total number of pages)\\
792
793 \lipsum[1-3]
794
795 \newpage
796
797 \lastpageref{pagesLTS.Roman}
798 (\texttt{\textbackslash lastpageref\{pagesLTS.Roman\}})
799 \textbf{does} refers to this page, because the option
800 \texttt{pagecontinue=true} was chosen. Also\\
801 \texttt{\textbackslash lastpageref\{pagesLTS.Roman.3\}}
802 can be used: \lastpageref{pagesLTS.Roman.3}.\\
803
804 \bigskip
805
806 There are \lastpages{Roman}{3}~pages
807 (\texttt{\textbackslash lastpages\{Roman\}\{3\}})
808 in this third Roman sector.\\
809
810 \newpage
811
812 \pagenumbering{Alph}
813
814 \section{Alph}
815
816 \noindent First page (\texttt{\textbackslash lastpageref\{pagesLTS.0\}}):
817 \lastpageref{pagesLTS.0}\\
818
819 \noindent The page (\texttt{\textbackslash thepage}): \thepage \\
820
821 \noindent Current page (\texttt{\textbackslash theCurrentPage}),
822 i.\,e. counted continuously from the first page): \theCurrentPage \\
823
824 \noindent CurrentPageLocal (\texttt{\textbackslash theCurrentPageLocal}),
825 i.\,e. counted continuously from the first page of the
826 current page numbering scheme): \theCurrentPageLocal \\

```

827
 828 \noindent Last roman page (pagesLTS.roman): \lastpageref{pagesLTS.roman}{\hskip4em }
 829 (There are \lastpageref{pagesLTS.roman.local} pages with roman numbers.)\\
 830
 831 \noindent Last Roman page (pagesLTS.Roman): \lastpageref{pagesLTS.Roman}{\hskip3em }
 832 (There are \lastpageref{pagesLTS.Roman.local}~pages with Roman numbers:\\
 833 \lastpages{Roman}{1}~pages in the first Roman sector
 834 (\pageref{Roman}{\hskip3em }-\lastpageref{pagesLTS.Roman.1}{\hskip3em }),\\
 835 \lastpages{Roman}{2}~pages in the second Roman sector
 836 (\pageref{Roman2}{\hskip3em }-\lastpageref{pagesLTS.Roman.2}{\hskip3em }), and\\
 837 \lastpages{Roman}{3}~pages in the third Roman sector
 838 (\pageref{Roman3}{\hskip3em }-\lastpageref{pagesLTS.Roman.3}{\hskip3em }).\\
 839
 840 \noindent Last arabic page (pagesLTS.arabic): \lastpageref{pagesLTS.arabic}{\hskip5em }
 841 (There are only \lastpageref{pagesLTS.arabic.local} pages with arabic numbers,
 842 because an \texttt{\textbackslash addtocounter\{page\}\{\pagesLTSEXampleArabic\}} was used.)\\
 843
 844 \noindent Last fnsymbol page (pagesLTS.fnsymbol): \lastpageref{pagesLTS.fnsymbol} \\
 845 (\texttt{\textbackslash lastpageref\{pagesLTS.fnsymbol\}} -- never
 846 \texttt{\textbackslash pageref\{pagesLTS.fnsymbol\}}!)\\
 847 (There are \lastpageref{pagesLTS.fnsymbol.local} pages with fnsymbol numbers.)\\
 848
 849 \noindent Last alph page (pagesLTS.alph): \lastpageref{pagesLTS.alph}{\hskip4em }
 850 (There are only \lastpageref{pagesLTS.alph.local} pages with alph numbers,
 851 because an \texttt{\textbackslash addtocounter\{page\}\{\pagesLTSEXamplealph\}} was used.)\\
 852
 853 \noindent Last Alph page (pagesLTS.Alph): \lastpageref{pagesLTS.Alph}{\hskip4em }
 854 (There are \lastpageref{pagesLTS.Alph.local} pages with Alph numbers.)\\
 855
 856 \noindent Last page's \textit{name} (LastPage): \lastpageref{LastPage}\\
 857
 858 \noindent Very last page's \textit{name} (VeryLastPage): \lastpageref{VeryLastPage}\\
 859 (\texttt{LastPage} and \texttt{VeryLastPage} are identical, unless
 860 a package with output \linebreak
 861 \texttt{\textbackslash AtEndDocument} after the \textsf{pagesLTS} package
 862 was added.)\\
 863
 864 \noindent Last page's \textit{number} (LastPages): \lastpageref{LastPages}{\hskip3em }
 865 (=total number of pages)\\
 866
 867 \lipsum[1-3]
 868
 869 Without option \texttt{alphMulti=AB} of the \textsf{pagesLTS} (and the help of
 870 Heiko Oberdiek's \textsf{alphalph} package), after page
 871 \textquotedblleft Z\textquotedblright there would just appear a
 872 \begin{quote}

```

873 \begin{verbatim}
874 LaTeX Error: Counter too large
875 See the LaTeX manual or LaTeX Companion for explanation.
876 You've lost some text. Try typing <return> to proceed.
877 If that doesn't work, type X <return> to quit.
878 \end{verbatim}
879 \end{quote}
880 Now the page numbers are continued AA, AB, AC,\ldots\ (AA, BB, CC,\ldots\ is
881 also possible, see the \textsf{pagesLTS} documentation).\
882 This is not demonstrated here, but see section~\ref{alph}.
883
884 \newpage
885
886 \section{The End}
887
888 \noindent First page (\texttt{\textbackslash lastpageref\{pagesLTS.0\}}):
889 \lastpageref{pagesLTS.0}\
890
891 \noindent The page (\texttt{\textbackslash thepage}): \thepage \
892
893 \noindent Current page (\texttt{\textbackslash theCurrentPage}),
894 i.\,e. counted continuously from the first page): \theCurrentPage \
895
896 \noindent CurrentPageLocal (\texttt{\textbackslash theCurrentPageLocal}),
897 i.\,e. counted continuously from the first page of the
898 current page numbering scheme): \theCurrentPageLocal \
899
900 \noindent Last roman page (pagesLTS.roman): \lastpageref{pagesLTS.roman}{\hskip4em }
901 (There are \lastpageref{pagesLTS.roman.local} pages with roman numbers.)\
902
903 \noindent Last Roman page (pagesLTS.Roman): \lastpageref{pagesLTS.Roman}{\hskip3em }
904 (There are \lastpageref{pagesLTS.Roman.local}~pages with Roman numbers:\
905 \lastpages{Roman}{1}~pages in the first Roman sector
906 (\pageref{Roman}{\hskip3em }-\lastpageref{pagesLTS.Roman.1}{\hskip3em }),\
907 \lastpages{Roman}{2}~pages in the second Roman sector
908 (\pageref{Roman2}{\hskip3em }-\lastpageref{pagesLTS.Roman.2}{\hskip3em }), and\
909 \lastpages{Roman}{3}~pages in the third Roman sector
910 (\pageref{Roman3}{\hskip3em }-\lastpageref{pagesLTS.Roman.3}{\hskip3em }).\
911
912 \noindent Last arabic page (pagesLTS.arabic): \lastpageref{pagesLTS.arabic}{\hskip5em }
913 (There are only \lastpageref{pagesLTS.arabic.local} pages with arabic numbers,
914 because an \texttt{\textbackslash addtocounter\{page\}\{\pagesLTSEXampleArabic\}} was used.)\
915
916 \noindent Last fnsymbol page (pagesLTS.fnsymbol): \lastpageref{pagesLTS.fnsymbol} \
917 (\texttt{\textbackslash lastpageref\{pagesLTS.fnsymbol\}} -- never
918 \texttt{\textbackslash pageref\{pagesLTS.fnsymbol\}}!)\

```

```

919 (There are \lastpageref{pagesLTS.fnsymbol.local} pages with fnsymbol numbers.)\\
920
921 \noindent Last alph page (pagesLTS.alph): \lastpageref{pagesLTS.alph}{\hskip4em }
922 (There are only \lastpageref{pagesLTS.alph.local} pages with alph numbers,
923 because an \texttt{\textbackslash addtocounter\{page\}\{\pagesLTSexamplealph\}} was used.)\\
924
925 \noindent Last Alph page (pagesLTS.Alph): \lastpageref{pagesLTS.Alph}{\hskip4em }
926 (There are \lastpageref{pagesLTS.Alph.local} pages with Alph numbers.)\\
927
928 \noindent Last page's \textit{name} (LastPage): \lastpageref{LastPage}\\
929
930 \noindent Very last page's \textit{name} (VeryLastPage): \lastpageref{VeryLastPage}\\
931 (\texttt{LastPage} and \texttt{VeryLastPage} are identical, unless
932 a package with output \linebreak
933 \texttt{\textbackslash AtEndDocument} after the \textsf{pagesLTS} package
934 was added.)\\
935
936 \noindent Last page's \textit{number} (LastPages): \lastpageref{LastPages}{\hskip3em }
937 (=total number of pages)\\
938
939 \medskip
940
941 \noindent Page \thepage\ (\theCurrentPage; local: \theCurrentPageLocal) of %
942 \lastpageref{pagesLTS.roman} (\lastpageref{pagesLTS.roman.local}) + %
943 \lastpageref{pagesLTS.Roman} (\lastpageref{pagesLTS.Roman.local}) + %
944 \lastpageref{pagesLTS.arabic} (\lastpageref{pagesLTS.arabic.local}) + %
945 \lastpageref{pagesLTS.fnsymbol} (\lastpageref{pagesLTS.fnsymbol.local}) + %
946 \lastpageref{pagesLTS.alph} (\lastpageref{pagesLTS.alph.local}) + %
947 \lastpageref{pagesLTS.Alph} (\lastpageref{pagesLTS.Alph.local}) = %
948 \lastpageref{LastPages} pages.
949
950 \end{document}
951 \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^AT_EX 2_ε and announcing the name and version of this package.

```
952 \*package)
953 \NeedsTeXFormat{LaTeX2e}[1994/06/01]
954 \ProvidesPackage{pagesLTS}[2010/09/12 v1.1j
955           Refers to special pages' numbers/names (HMM)]%
956
```

A short description of the `pagesLTS` package:

```
957 %% Allows for things like\
958 %% |Page \thepage\ (\theCurrentPage; local: \theCurrentPageLocal) of %
959 %% \lastpageref{pagesLTS.roman}(\lastpageref{pagesLTS.roman.local}) + %
960 %% \lastpageref{pagesLTS.Roman}(\lastpageref{pagesLTS.Roman.local}) + %
961 %% \lastpageref{pagesLTS.arabic}(\lastpageref{pagesLTS.arabic.local}) + %
962 %% \lastpageref{pagesLTS.fnsymbol}(\lastpageref{pagesLTS.fnsymbol.local}) + %
963 %% \lastpageref{pagesLTS.alph}(\lastpageref{pagesLTS.alph.local}) + %
964 %% \lastpageref{pagesLTS.Alph}(\lastpageref{pagesLTS.Alph.local}) = %
965 %% \lastpageref{LastPages} pages.|\
966 %% to get\
967 %% 'Page d (57; local: 4) of ii(2) + XX(20) + *(1) + 30(30) + e(5) + C(3) = 61 pages.'.
968
```

For its `\AfterLastShipout` command we need the `atveryend` package of Heiko Oberdiek (see subsection 7.1):

```
969 \RequirePackage{atveryend}[2010/03/24]% v1.5
```

For its `\EveryShipout` command we need the `everyshi` package of Martin Schröder (see subsection 7.1):

```
970 \RequirePackage{everyshi}[2001/05/15]%v 3.00
```

For the handling of the options we need the `kvoptions` package of Heiko Oberdiek (see subsection 7.1):

```
971 \RequirePackage{kvoptions}[2010/02/22]% v3.7
```

The `undolabl` package of H.-Martin Münch, with code from **Ulrich Diez**, (see subsection 7.1) is needed to overwrite labels, when the same page numbering scheme is used twice (or even more often).

```
972 \RequirePackage{undolabl}[2010/09/12]% v1.0g
```

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

```
973 %% pagesLTS package uses Prelim@EveryShipout code from the
974 %% prelim2e package [2009/05/29 v1.3] by Martin Schröder, thanks!
975
```

About the `prelim2e` package of Martin Schröder see subsection 7.1.

A last information for the user(s):

```
976 %% pagesLTS may work with earlier versions of those packages,  
977 %% but this was not tested. Please consider updating your packages  
978 %% to the most recent version (if they are not already the most  
979 %% recent version).  
980
```

See subsection 7.1 about how to get them.

The very old version 2.0 (and earlier) of the `endfloat` package actually redefined the `\enddocument` command, and so interfered drastically with the \LaTeX 2_ϵ 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.

```
981 %% The recent version of the endfloat package is v2.4i as of 1995/10/11.  
982 %% The pagesLTS package is not fully compatible with version 2.0  
983 %% (and earlier) of the endfloat package, because those versions  
984 %% redefined the \enddocument command.  
985
```

The options are introduced:

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

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

```
996 \def\pagesLTS@zero{0}  
997 \def\pagesLTS@one{1}  
998
```

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.

```
999 \ifpagesLTS@pagecontinue%  
1000   \PackageInfo{pagesLTS}{Option pagecontinue enabled\MessageBreak%  
1001     (maybe by default):\MessageBreak%  
1002     The pagesLTS package will continue the page numbering,\MessageBreak%  
1003     when the same page numbering scheme is used twice.\MessageBreak%  
1004 }
```

```

1004     If you do not want this, call pagesLTS with option\MessageBreak%
1005     pagecontinue=false\MessageBreak%
1006     (or use \ setcounter{page}=1).\MessageBreak%
1007   }%
1008 \else%
1009   \PackageWarningNoLine{pagesLTS}{Option pagecontinue is false:\MessageBreak%
1010     The pagesLTS package was used, but the option\MessageBreak%
1011     pagecontinue was set to false.\MessageBreak%
1012     If you want the page numbers to be continued,\MessageBreak%
1013     when the same page numbering scheme is used twice,\MessageBreak%
1014     please call pagesLTS with option pagecontinue=true,\MessageBreak%
1015     otherwise the page number is reset to one each time\MessageBreak%
1016     the page numbering scheme is changed.\MessageBreak%
1017     For details please see the documentation!\MessageBreak%
1018   }%
1019 \fi%
1020

```

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 choosen 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 choosen 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 flase: `alphMult=0`, `AlphMulti=0`, `fnsymbolmult=false`.

```

1021 \def\pagesLTS@ab{ab}
1022 \def\pagesLTS@bb{bb}
1023 \def\pagesLTS@ABi{AB}
1024 \def\pagesLTS@BBi{BB}
1025 \def\pagesLTS@messageaMz{Option alphMult=0 found:\MessageBreak%
1026   The pagesLTS package was used, but the option\MessageBreak%
1027   alphMult was set to 0 (zero).\MessageBreak%
1028   If you want the page numbers to be extended\MessageBreak%
1029   after z, you have to organize this yourself now.\MessageBreak%
1030   For automatic continuation, please use the\MessageBreak%
1031   alphalph package and call pagesLTS\MessageBreak%
1032   with option alphMult=ab (for aa, ab, ac, ad,...) or\MessageBreak%
1033   with option alphMult=bb (for aa, bb, cc, dd,...).\MessageBreak%
1034   For details please see the documentation!\MessageBreak%
1035 }
1036 \def\pagesLTS@messageAMiz{Option AlphMulti=0 found:\MessageBreak%
1037   The pagesLTS package was used, but the option\MessageBreak%
1038   AlphMulti was set to 0 (zero).\MessageBreak%
1039   If you want the page numbers to be extended\MessageBreak%
1040   after Z, you have to organize this yourself now.\MessageBreak%
1041   For automatic continuation, please use the\MessageBreak%
1042   alphalph package and call pagesLTS\MessageBreak%

```

```

1043   with option AlphMulti=AB (for AA, AB, AC, AD,...) or\MessageBreak%
1044   with option AlphMulti=BB (for AA, BB, CC, DD,...).\MessageBreak%
1045   For details please see the documentation!\MessageBreak%
1046 }
1047 \def\pagesLTS@messagefsmz{Option fnsymbolmult is set to false:\MessageBreak%
1048   The pagesLTS package was used, but the option\MessageBreak%
1049   fnsymbolmult was set to false.\MessageBreak%
1050   If you want the page numbering of the footnotesymbol\MessageBreak%
1051   scheme to be extended using the alphalph package,\MessageBreak%
1052   please call pagesLTS with option fnsymbolmult=true,\MessageBreak%
1053   otherwise page numbers of the footnotesymbol scheme\MessageBreak%
1054   greater than nine will need to be defined otherwise.\MessageBreak%
1055   For details please see the documentation!\MessageBreak%
1056 }
1057
1058 \ifx\pagesLTS@alphMult\pagesLTS@ab%
1059   \relax%
1060 \else%
1061   \ifx\pagesLTS@alphMult\pagesLTS@bb%
1062     \relax%
1063   \else%
1064     \ifx\pagesLTS@alphMult\pagesLTS@zero%
1065       \PackageWarningNoLine{pagesLTS}{\pagesLTS@messageaMz }%
1066     \else%
1067       \PackageError{pagesLTS}{Unknown option value}%
1068       {The pagesLTS package was used with option\MessageBreak%
1069       alphMult= \pagesLTS@alphMult . Only values\MessageBreak%
1070       ab, bb, and 0 (zero) are valid.\MessageBreak%
1071       The default ab is set.\MessageBreak%
1072       For details please see the documentation!\MessageBreak%
1073       }%
1074     \setkeys{pagesLTS}{alphMult=ab}%
1075   \fi%
1076 \fi%
1077 \fi%
1078
1079 \ifx\pagesLTS@AlphMulti\pagesLTS@ABi%
1080   \relax%
1081 \else%
1082   \ifx\pagesLTS@AlphMulti\pagesLTS@BBi%
1083     \relax%
1084   \else%
1085     \ifx\pagesLTS@AlphMulti\pagesLTS@zero%
1086       \PackageWarningNoLine{pagesLTS}{\pagesLTS@messageAMiz }%
1087     \else%
1088       \PackageError{pagesLTS}{Unknown option value}%

```



```

1089 {The pagesLTS package was used with option\MessageBreak%
1090 AlphMulti= \pagesLTS@AlphMulti . Only values\MessageBreak%
1091 AB, BB, and 0 (zero) are valid.\MessageBreak%
1092 The default AB is set.\MessageBreak%
1093 For details please see the documentation!\MessageBreak%
1094 }%
1095 \setkeys{pagesLTS}{AlphMulti=AB}%
1096 \fi%
1097 \fi%
1098 \fi%
1099

```

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

```

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

```

Same for the Roman page numbering scheme.

```

1122 \ifpagesLTS@RomanMulti%
1123 \PackageInfo{pagesLTS}{Option RomanMulti enabled\MessageBreak%
1124 (maybe by default):\MessageBreak%
1125 The pagesLTS package will extend the page numbering\MessageBreak%
1126 of the Roman scheme below I with\MessageBreak%
1127 0, -I, -II, -III, -IV,...\MessageBreak%
1128 If you do not want this, call pagesLTS with option\MessageBreak%
1129 RomanMulti=false.\MessageBreak%
1130 }%
1131 \else%

```

```

1132 \PackageWarningNoLine{pagesLTS}{Option RomanMulti is set to false:\MessageBreak%
1133 The pagesLTS package was used, but the option\MessageBreak%
1134 RomanMulti was set to false.\MessageBreak%
1135 If you want the page numbering of the Roman scheme\MessageBreak%
1136 to be extended below i,\MessageBreak%
1137 please call pagesLTS with option RomanMulti=true,\MessageBreak%
1138 otherwise zero and negative page numbers of the\MessageBreak%
1139 Roman scheme will need to be defined otherwise.\MessageBreak%
1140 For details please see the documentation!\MessageBreak%
1141 }%
1142 \fi%
1143

```

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

```

1144 \ifpagesLTS@fnsymbolmult%
1145 \PackageInfo{pagesLTS}{Option fnsymbolmult enabled\MessageBreak%
1146 (maybe by default):\MessageBreak%
1147 The pagesLTS package will extend the page numbering\MessageBreak%
1148 of the footnotesymbol scheme using the alphalph\MessageBreak%
1149 package.\MessageBreak%
1150 If you do not want this, call pagesLTS with option\MessageBreak%
1151 fnsymbolmult=false.\MessageBreak%
1152 }%
1153 \else%
1154 \PackageWarningNoLine{pagesLTS}{\pagesLTS@messagefsmz }%
1155 \fi%
1156

```

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

```

1157 \def\pagesLTS@pnc{0}
1158 \def\pagesLTS@called{0}
1159 \def\pagesLTS@fns{fnsymbol}
1160 \def\pagesLTS@alph{alph}
1161 \def\pagesLTS@Alph{Alph}
1162 \def\pagesLTS@AlphAlph{0}
1163 \def\pagesLTS@hyper{0}
1164 \def\pagesLTS@rerun{0}
1165 \def\pagesLTS@eso{0}
1166 \def\pagesLTS@esov{0}
1167 \def\lastpageref{\lastpagereftxt}
1168 \def\pagesLTS@undolable{none}

```

```

1169 \def\pagesLTS@messageNPN{%
1170   The pagesLTS package was used, but\MessageBreak%
1171   \textbackslash pagenumbering\MessageBreak%
1172   was not called at the beginning of the document\MessageBreak%
1173   (maybe earlier or later).\MessageBreak%
1174   Please use \textbackslash pagenumbering\MessageBreak%
1175   (with an argument like arabic, roman, Roman,\MessageBreak%
1176   fnsymbol, alph, or Alph) at the beginning\MessageBreak%
1177   of your document! Otherwise your document\MessageBreak%
1178   will probably compile, but the pagesLTS\MessageBreak%
1179   package might not be able to get all labels\MessageBreak%
1180   for the references to the respective pages\MessageBreak%
1181   right.\MessageBreak%
1182 }
1183

```

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

```

1184 \let\OrigPagenumbering\pagenumbering
1185

```

Defining some new counters (and doing related things):

```

1186 \newcounter{CurrentPage}
1187 \setcounter{CurrentPage}{1}
1188 \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.

```

1189 \newcounter{pagesLTS.pagenr}

```

The `pagesLTS.fnsymbol` and `pagesLTS.fnsymbol.local` need to already have been defined when they are used.

```

1190 \newcounter{pagesLTS.fnsymbol}
1191 \newcounter{pagesLTS.fnsymbol.local}

```

The counter `pagesLTS.fnsymbol.cont` is for the number of pages with `fnsymbol` page numbering scheme which have been put out at the time the value of the counter is read.

```

1192 \newcounter{pagesLTS.fnsymbol.cont}

```

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.

```

1193 \newcounter{pagesLTS.current.local.0}
1194 \setcounter{pagesLTS.current.local.0}{1}

```

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

```

1195 \newcounter{pagesLTS.pnc.0}
1196

```

`\xroman` When `\roman{...}` is used with a value < 1 , L^AT_EX just ignores this (see subsection 3.5). Here we provide a command `\xroman{...}` (expanded roman), which gives the usual `\roman` numbers (i, ii, iii, iv,...) for positive values, $-|\dots|$ (i.e. -i, -ii, -iii, -iv,...) for negative values, and 0 for all other values (which should be zero).

```
1197 \newcommand{\xroman}[1]{%
1198   \ifnum\value{#1}>0 %
1199     \roman{#1}%
1200   \else%
1201     \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).

```
1202     -\romannumeral\number-\arabic{#1}
1203   \else%
1204     0%
1205   \fi%
1206 \fi%
1207 }
1208
```

`\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`.⁵ Therefore we have a look at L^AT_EX’s own `\@Roman\FOOcounter`, `\def\@Roman#1{\expandafter\@slowromancap\romannumeral #1@}`, and use `\@slowromancap`, which is a fully expandable macro, to do the trick for this: “

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

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

```
1209 \newcommand{\XRoman}[1]{%
1210   \ifnum\value{#1}>0 %
1211     \Roman{#1}%
1212   \else%
1213     \ifnum\value{#1}<0 %
1214       -\expandafter\@slowromancap\romannumeral\number-\arabic{#1}@%
1215     \else%
1216       0%
1217     \fi%
1218   \fi%
```

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

```
1219 }
1220
```

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

```
1221 \newcommand{\XXRoman}[1]{\XRoman{#1}}%
1222 \PackageError{pagesLTS}{Old command \string\XXRoman\space found}{Replaced by \string\XRoman.}%
1223 }
1224
```

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

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

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

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

```

```
1225 \newcommand{\pagesLTS@ifcounter}[1]{%
1226 \ifundefined{c@#1}{\newcounter{#1}}{\relax}%
1227 }
1228
```

`\lastpages` We provide a command to give the number of pages in a sector of a split page numbering scheme (see page 10, `pagesLTS.<page numbering scheme>.<number>.local.cnt`):

```
1229 \newcommand{\lastpages}[2]{%
1230 \pagesLTS@ifcounter{pagesLTS.#1.#2.local.cnt}%
1231 \arabic{pagesLTS.#1.#2.local.cnt}%
1232 }
1233
```

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

```
1234 \newcommand{\pagesLTS@writelabel}[1]{%
1235   \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`.

```
1236   \pagesLTS@putlabel{pagesLTS.#1}{\thepage}{1}
1237   \addtocounter{page}{-1}%
1238   \ifx\pagesLTS@pnc\pagesLTS@zero%
1239     \relax%
```

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

```
1240   \else%
1241     \addtocounter{page}{+1}%
1242     \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.

```
1243   \addtocounter{page}{-1}%
1244   \fi%
1245 }
1246
```

`\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 44.

```
1247
1248 %% The following code is from Heiko Oberdiek [2010/04/18], %%
1249 %% expanding his alphalph package [2010/04/18] v2.3. (Thanks!) %%
1250 \newcommand*{\erroralphalph}[2]{%
1251   \ifnum\value{#2}>0 %
1252     #1{\value{#2}}%
1253   \else
1254     \ifnum\value{#2}<0 %
1255       -#1{\expandafter\@gobble\the\value{#2}}%
1256     \else
1257       0%
```

```

1258   \fi
1259   \fi
1260 }
1261 %% End of code from Heiko Oberdiek
1262 %% Check and Error/Warning messages have been moved to
1263 %% \EveryShipout, because messages inside e. g. the \pageref
1264 %% command can cause trouble.
1265

```

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

```

1266
1267 \newcommand{\expandPagenumbering}[1]{%
1268   \let\Origthepage\thepage%
1269   \def\pagesLTS@tmpC{arabic}%
1270   \ifx\pagesLTS@pnc\pagesLTS@tmpC%
1271     \relax%

```

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

```

1272   \else%
1273     \def\pagesLTS@tmpC{roman}%
1274     \ifx\pagesLTS@pnc\pagesLTS@tmpC%
1275       \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 44) expands the usable roman page numbers to values below 1 (i, I, respectively), see subsection 2.1.3.

```

1276       \renewcommand*{\thepage}{\xroman{page}}%
1277       \fi%
1278   \else%
1279     \def\pagesLTS@tmpC{Roman}%
1280     \ifx\pagesLTS@pnc\pagesLTS@tmpC%
1281       \ifpagesLTS@RomanMulti%

```

The same for `\Roman` page numbering, expanded by `\XRoman` (see page 44).

```

1282       \renewcommand*{\thepage}{\XRoman{page}}%
1283       \fi%
1284   \else%
1285     \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.

```

1286     \ifx\pagesLTS@alphMult\pagesLTS@ab%
1287       \renewcommand*{\thepage}{\erroralphalph{\alphalph}{page}}%
1288     \else \ifx\pagesLTS@alphMult\pagesLTS@bb%
1289       \renewcommand*{\thepage}{\erroralphalph{\alphMult}{page}}%
1290     \fi%

```

```

1291      \fi%
1292    \else%
1293      \ifx\pagesLTS@pnc\pagesLTS@Alph%
1294        \ifx\pagesLTS@AlphMulti\pagesLTS@ABi%
1295          \renewcommand*{\thepage}{\erroralphalph{\AlphAlph}{page}}%
1296        \else \ifx\pagesLTS@AlphMulti\pagesLTS@BBi%
1297          \renewcommand*{\thepage}{\erroralphalph{\AlphMult}{page}}%
1298        \fi%
1299      \fi%
1300    \else%
1301      \ifx\pagesLTS@pnc\pagesLTS@fns%

```

Same for \fnsymbol page numbers.

```

1302      \ifpagesLTS@fnsymbolmult%
1303        \renewcommand*{\thepage}{\erroralphalph{\fnsymbolmult}{page}}%
1304      \fi%
1305    \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.

```

1306      \PackageError{pagesLTS}{unknown page numbering scheme}{%
1307        The pagesLTS package encountered the unknown\MessageBreak%
1308        page numbering scheme\MessageBreak%
1309        ‘#1’. \MessageBreak%
1310        If this is no typing mistake, it might work\MessageBreak%
1311        - or it might not work.\MessageBreak%
1312        \@ehc%
1313      }
1314    \fi%
1315  \fi%
1316 \fi%
1317 \fi%
1318 \fi%
1319 \fi%
1320 \let\pagesLTS@tmpC\undefined%
1321 }
1322

```


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

```
1323 \renewcommand{\pagenumbering}[1]{%
```

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

```
1324 \edef\pagesLTS@tmpA{#1}%
1325 \ifx\pagesLTS@pnc\pagesLTS@tmpA%
1326 \relax%
1327 \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.

```
1328 \ifnum \value{CurrentPage}>1%
1329 \addtocounter{page}{-1}%
1330 \addtocounter{pagesLTS.current.local.\pagesLTS@pnc}{-1}%
```

For the case that the page numbering scheme is or will be splitted, 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.

```
1331 \newcounter{pagesLTS.\pagesLTS@pnc.\arabic{pagesLTS.pnc.\pagesLTS@pnc}.local.count}%
1332 \setcounter{pagesLTS.\pagesLTS@pnc.\arabic{pagesLTS.pnc.\pagesLTS@pnc}.local.count}{%
1333 \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`.

```
1334 \ifx\pagesLTS@pnc\pagesLTS@fns%
1335 \ifnum \value{pagesLTS.pnc.\pagesLTS@pnc}>1%
1336 \mathchardef\pagesLTS@tmpa=\arabic{pagesLTS.pnc.0}%
1337 \setcounter{pagesLTS.pnc.0}{\value{pagesLTS.pnc.\pagesLTS@pnc}}%
1338 \addtocounter{pagesLTS.pnc.0}{-1}%
1339 \addtocounter{pagesLTS.\pagesLTS@pnc.\arabic{pagesLTS.pnc.\pagesLTS@pnc}.local.count}{%
1340 -\value{pagesLTS.\pagesLTS@pnc.\arabic{pagesLTS.pnc.0}.local.count}}%
1341 \setcounter{pagesLTS.pnc.0}{\pagesLTS@tmpa}%
1342 \fi%
```

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

```
1343 \else%
1344 \pagesLTS@writelabel{\pagesLTS@pnc.\arabic{pagesLTS.pnc.\pagesLTS@pnc}}%
```

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

```
1345 \ifnum \value{pagesLTS.pnc.\pagesLTS@pnc}<2%
```

an unnumbered label is also written:

```
1346      \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).

```
1347      \else%
1348      \mathchardef\pagesLTS@tmpa=\arabic{pagesLTS.pnc.0}%
1349      \setcounter{pagesLTS.pnc.0}{\value{pagesLTS.pnc.\pagesLTS@pnc}}%
1350      \addtocounter{pagesLTS.pnc.0}{-1}%
1351      \pagesLTS@ifcounter{pagesLTS.\pagesLTS@pnc.done}%
1352      \addtocounter{pagesLTS.\pagesLTS@pnc.done}{%
1353      \value{pagesLTS.\pagesLTS@pnc.\arabic{pagesLTS.pnc.0}.local.count}}%
1354      \addtocounter{pagesLTS.\pagesLTS@pnc.\arabic{pagesLTS.pnc.\pagesLTS@pnc}.local.count}{%
1355      -\value{pagesLTS.\pagesLTS@pnc.done}}%
1356      \setcounter{pagesLTS.pnc.0}{\pagesLTS@tmpa}%
1357      \fi%
```

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

```
1358      \if@filesw%
1359      \immediate\write\@auxout{\string
1360      \pagesLTS@ifcounter{pagesLTS.\pagesLTS@pnc.\arabic{pagesLTS.pnc.\pagesLTS@pnc}.local.cnt}}%
1361      \fi%
1362      \edef\pagesLTS@tmpB{\arabic{pagesLTS.\pagesLTS@pnc.\arabic{pagesLTS.pnc.\pagesLTS@pnc}.local.count}}%
1363      \if@filesw%
1364      \immediate\write\@auxout{\string
1365      \setcounter{pagesLTS.\pagesLTS@pnc.\arabic{pagesLTS.pnc.\pagesLTS@pnc}.local.cnt}{\pagesLTS@tmpB}}%
1366      \fi%
1367      \fi%
```

For further code for the case of `fnsymbol` please see below (`\lastpagereftext`, page 53). The last page number is saved, in case the same page numbering scheme is continued later.

```
1368      \pagesLTS@ifcounter{pagesLTS.double.\pagesLTS@pnc}%
1369      \setcounter{pagesLTS.double.\pagesLTS@pnc}{\value{page}}%
```

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

```
1370      \addtocounter{pagesLTS.current.local.\pagesLTS@pnc}{+1}%
1371      \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:

```
1372      \global\edef\pagesLTS@pnc{#1}%
```

The new page numbering scheme is now started for real:

```
1373      \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.

```
1374 \expandPagenumbering{#1}
```

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

```
1375 \pagesLTS@ifcounter{pagesLTS.pnc.\pagesLTS@pnc}%
```

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

```
1376 \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):

```
1377 \pagesLTS@ifcounter{pagesLTS.double.\pagesLTS@pnc}%
```

```
1378 \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.

```
1379 \ifpagesLTS@pagecontinue%
```

```
1380 \setcounter{page}{\value{pagesLTS.double.\pagesLTS@pnc}}%
```

```
1381 \else%
```

```
1382 \setcounter{page}{1}%
```

```
1383 \fi%
```

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

```
1384 \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.

```
1385 \ifnum \value{pagesLTS.double.\pagesLTS@pnc}=1%
```

```
1386 \setcounter{pagesLTS.current.local.\pagesLTS@pnc}{1}%
```

```
1387 \fi%
```

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

```
1388 \else%
```

```
1389 %% before the first page has shipped out
```

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

```
1390 \global\edef\pagesLTS@pnc{#1}%
```

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

```
1391 \countdef\c@page=0 \c@page=1
1392 \def\c1@page{}
1393 \global\c@page \@ne
1394 \global\def\thepage{\csname \expandafter @\pagesLTS@pnc \endcsname \c@page}%
```

If a page numbering scheme is used, which is not known by L^AT_EX, 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.

```
1395 \expandPagenumbering{#1}
```

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

```
1396 \pagesLTS@ifcounter{pagesLTS.pnc.\pagesLTS@pnc}%
1397 \setcounter{pagesLTS.pnc.\pagesLTS@pnc}{1}%
1398 \pagesLTS@ifcounter{pagesLTS.double.\pagesLTS@pnc}%
1399 \setcounter{pagesLTS.double.\pagesLTS@pnc}{1}%
1400 \pagesLTS@ifcounter{pagesLTS.current.local.\pagesLTS@pnc}%
1401 \setcounter{pagesLTS.current.local.\pagesLTS@pnc}{1}%
1402 \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:

```
1403 \gdef\pagesLTS@called{1}%
1404 \fi%
```

We do not need the temporary definitions any more.

```
1405 \let\pagesLTS@tmpA\undefined%
1406 \let\pagesLTS@tmpB\undefined%
1407 }
1408
```

`\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 of Heiko Oberdiek)

```
1409 % analogous to \HyPsd@pageref from the hyperref package of Heiko Oberdiek:
1410 \def\lastpagereftxt#1{\pagesLTS@pageref#1*\END}
1411
```

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

```
1412 \def\pagesLTS@pageref#1*#2\END{%
1413 \ifx\\#2\\ no star
```

```

1414 \pagesLTS@@@pageref{#1}%
1415 \else% star
1416 \expandafter\pagesLTS@@@pagerefstar%
1417 \fi%
1418 }
1419
1420 \def\pagesLTS@@@pageref#1{\lastpagereftext{#1}}
1421 \def\pagesLTS@@@pagerefstar#1{\lastpagereftextstar{#1}}
1422

```

`\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}`.

```

1423 \newcommand{\lastpagereftext}[1]{%
1424 \def\pagesLTS@tmpA{#1}%
1425 \def\pagesLTS@tmpB{pagesLTS.fnsymbol.local}%
1426 \ifx\pagesLTS@tmpA\pagesLTS@tmpB%
1427 \ifx\pagesLTS@hyper\pagesLTS@one%
1428 \href{\#pagesLTS.fnsymbol.local.\arabic{pagesLTS.fnsymbol.local}}%
1429 {\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).

```

1430 \else \arabic{pagesLTS.fnsymbol.local}%
1431 \fi%

```

Otherwise just the common `\pageref` is applied:

```

1432 \else%
1433 \pageref{#1}%
1434 \fi%

```

We do not need the temporary definitions any more.

```

1435 \let\pagesLTS@tmpA\undefined%
1436 \let\pagesLTS@tmpB\undefined%
1437 }
1438

```

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

```

1439 \newcommand{\lastpagereftextstar}[1]{%
1440 \def\pagesLTS@tmpA{#1}%
1441 \def\pagesLTS@tmpB{pagesLTS.fnsymbol.local}%
1442 \ifx\pagesLTS@tmpA\pagesLTS@tmpB%
1443 \arabic{pagesLTS.fnsymbol.local}%
1444 \else%

```

```

1445 \ifx\pagesLTS@hyper\pagesLTS@one%
1446 \pageref*{#1}%
1447 \else%

```

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

```

1448 \pageref{#1}%
1449 \fi%
1450 \fi%
1451 \let\pagesLTS@tmpA\undefined%
1452 \let\pagesLTS@tmpB\undefined%
1453 }
1454

```

`\lastpagereferend` When the `hyperref` package is used and the page numbering scheme of the last page is `fnsymbol`, `\lastpageref` is defined as `\lastpagereferend`. 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:

```

1455 \def\lastpagereferend#1{\pagesLTS@@pagereferend#1*\END}
1456
1457 \def\pagesLTS@@pagereferend#1*#2\END{%
1458 \ifx\#2\% no star
1459 \pagesLTS@@@pagereferend{#1}%
1460 \else% star
1461 \expandafter\pagesLTS@@@pagereferendstar%
1462 \fi%
1463 }
1464
1465 \def\pagesLTS@@@pagereferend#1{\l@stpagereferend{#1}}
1466 \def\pagesLTS@@@pagereferendstar#1{\l@stpagereferendstar{#1}}
1467

```

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

```

1468 \newcommand{\l@stpagereferend}[1]{%
1469 \def\pagesLTS@tmpA{#1}%
1470 \def\pagesLTS@tmpB{pagesLTS.fnsymbol.local}%
1471 \ifx\pagesLTS@tmpA\pagesLTS@tmpB%
1472 \ifx\pagesLTS@hyper\pagesLTS@one%
1473 \href{\#pagesLTS.fnsymbol.local.\arabic{pagesLTS.fnsymbol.local}}{%
1474 {\arabic{pagesLTS.fnsymbol.local}}}%
1475 \else \arabic{pagesLTS.fnsymbol.local}%
1476 \fi%
1477 \else%
1478 \def\pagesLTS@tmpB{pagesLTS.fnsymbol}%
1479 \ifx\pagesLTS@tmpA\pagesLTS@tmpB%
1480 \ifx\pagesLTS@hyper\pagesLTS@one%

```

```

1481     \href{\#pagesLTS.fnsymbol.local.\arabic{pagesLTS.fnsymbol.local}}}%
1482     {\pagesLTS.lastpage}%
1483   \else \pageref{pagesLTS.fnsymbol}%
1484   \fi%
1485 \else%
1486   \def\pagesLTS@tmpB{LastPage}%
1487   \ifx\pagesLTS@tmpA\pagesLTS@tmpB%
1488     \ifx\pagesLTS@hyper\pagesLTS@one%
1489       \href{\#pagesLTS.fnsymbol.local.\pagesLTS@eso}%
1490       {\pagesLTS.lastpage}%
1491     \else \pageref{LastPage}%
1492     \fi%
1493   \else%
1494     \def\pagesLTS@tmpB{VeryLastPage}%
1495     \ifx\pagesLTS@tmpA\pagesLTS@tmpB%
1496       \ifx\pagesLTS@hyper\pagesLTS@one%
1497         \href{\#pagesLTS.fnsymbol.local.\arabic{pagesLTS.fnsymbol.local}}}%
1498         {\pagesLTS.lastpage}%
1499       \else \pageref{VeryLastPage}%
1500       \fi%
1501     \else%
1502       \def\pagesLTS@tmpB{LastPages}%
1503       \ifx\pagesLTS@tmpA\pagesLTS@tmpB%
1504         \ifx\pagesLTS@hyper\pagesLTS@one%
1505           \href{\#pagesLTS.fnsymbol.local.\arabic{pagesLTS.fnsymbol.local}}}%
1506           {\arabic{pagesLTS.pagenr}}}%
1507         \else \pageref{LastPages}%
1508         \fi%
1509       \else%
1510         \pageref{#1}%
1511       \fi%
1512     \fi%
1513   \fi%
1514 \fi%
1515 \fi%

```

We do not need the temporary definitions any more.

```

1516 \let\pagesLTS@tmpA\undefined%
1517 \let\pagesLTS@tmpB\undefined%
1518 }
1519

```

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

```

1520 \newcommand{\l@stpagerefendstar}[1]{%
1521   \def\pagesLTS@tmpA{#1}%
1522   \def\pagesLTS@tmpB{pagesLTS.fnsymbol.local}%
1523   \ifx\pagesLTS@tmpA\pagesLTS@tmpB%
1524     \arabic{pagesLTS.fnsymbol.local}%
1525   \else%
1526     \def\pagesLTS@tmpB{pagesLTS.fnsymbol}%
1527     \ifx\pagesLTS@tmpA\pagesLTS@tmpB%
1528       \ifx\pagesLTS@hyper\pagesLTS@one%
1529         \pageref*{pagesLTS.fnsymbol}%
1530       \else \pageref{pagesLTS.fnsymbol}%
1531     \fi%
1532   \else%
1533     \def\pagesLTS@tmpB{LastPage}%
1534     \ifx\pagesLTS@tmpA\pagesLTS@tmpB%
1535       \ifx\pagesLTS@hyper\pagesLTS@one%
1536         \pageref*{LastPage}%
1537       \else \pageref{LastPage}%
1538     \fi%
1539   \else%
1540     \def\pagesLTS@tmpB{VeryLastPage}%
1541     \ifx\pagesLTS@tmpA\pagesLTS@tmpB%
1542       \ifx\pagesLTS@hyper\pagesLTS@one%
1543         \pageref*{VeryLastPage}%
1544       \else \pageref{VeryLastPage}%
1545     \fi%
1546   \else%
1547     \def\pagesLTS@tmpB{LastPages}%
1548     \ifx\pagesLTS@tmpA\pagesLTS@tmpB%
1549       \ifx\pagesLTS@hyper\pagesLTS@one%
1550         \pageref*{LastPages}%
1551       \else \pageref{LastPages}%
1552     \fi%
1553   \else%
1554     \ifx\pagesLTS@hyper\pagesLTS@one%
1555       \pageref*{#1}%
1556     \else \pageref{#1}%
1557     \fi%
1558   \fi%
1559 \fi%
1560 \fi%
1561 \fi%
1562 \fi%
1563 \let\pagesLTS@tmpA\undefined%
1564 \let\pagesLTS@tmpB\undefined%
```



```

1565 }
1566

```

`\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`:

```

1567 % somewhat analogous to \overridelabel from the undolabl package:
1568 \newcommand\overrideLTSlabel[2]{%
1569   \@bsphack
1570   \ifnum \value{pagesLTS.pnc}.\pagesLTS@pnc>1%
1571     \edef\pagesLTStmpA{#1}%
1572     \edef\pagesLTStmpB{pagesLTS.\pagesLTS@pnc.local}%
1573     \ifx\pagesLTStmpA\pagesLTStmpB%
1574       \immediate\write\@auxout{\string\undonewlabel{#1}\string\relax}%
1575       \@overriddenmessage s{#1}%
1576     \fi%
1577   \fi%
1578   \pagesLTS@putlabel{#1}{#2}{0}%
1579   \@esphack
1580 }
1581

```

`esLTS@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^AT_EX 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.

```

1582 \newcommand{\@pagesLTS@Prelim@EveryShipout}{%
1583 %% The following code is from the prelim2e package          %%
1584 %% [2009/05/29 v1.3] by Martin Schr\"{o}der (Thanks!):      %%
1585   \bgroup
1586   \dimen\z@=\wd\@cclv
1587   \dimen\@ne=\ht\@cclv
1588   \dimen\tw@=\dp\@cclv
1589   \dimen\thr@@=\dimen1
1590   \advance\dimen\thr@@ by \dimen\tw@
1591   \global\setbox\@cclv\vbox to \dimen\thr@@{%
1592     \hb@xt@\dimen\z@{%
1593       \box\@cclv%
1594       \hss%
1595     }%
1596     \vbox to \z@{%
1597       \hb@xt@\dimen\z@{%
1598         \let\protect\relax
1599 %% 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.

```

1600         \ifx\pagesLTS@pnc\pagesLTS@fns%
1601             \addtocounter{pagesLTS.fnsymbol.cont}{1}%
1602             \ifx\pagesLTS@hyper\pagesLTS@one%
1603                 \phantomsection%
1604                 \hypertarget{pagesLTS.fnsymbol.local.\arabic{pagesLTS.fnsymbol.cont}}{}%
1605             \fi%
1606             \ifnum \pagesLTS@esov=\pagesLTS@zero%
1607                 \label{pagesLTS.fnsymbol}%
1608             \else%
1609                 \overridelabel{pagesLTS.fnsymbol}%
1610             \fi%
1611         \else%
1612             \ifx\pagesLTS@hyper\pagesLTS@one%
1613                 \phantomsection%
1614             \fi%
1615             \if@filesw%
1616                 \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.

```

1617             \addtocounter{page}{+1}%
1618             \overrideLTSlabel{pagesLTS.\pagesLTS@pnc.local}{\theCurrentPageLocal}%
1619             \addtocounter{page}{-1}%
1620         \fi%
1621     \fi%
1622 %% Code from prelim2e package again:                %%
1623     }%
1624     \vss%
1625     }%
1626     \vss%
1627     }%
1628     \wd\@cclv=\dimen\z@
1629     \ht\@cclv=\dimen\@ne
1630     \dp\@cclv=\dimen\tw@
1631 \egroup
1632 %% End of code from the prelim2e package.            %%
1633 }
1634

```

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

```
1635 \EveryShipout{%
1636   \ifnum\value{page}>0%
1637     \relax%
1638   \else
1639     \ifnum\value{page}=0%
1640       \PackageWarning{pagesLTS}{%
1641         Counter 'page' is zero!\MessageBreak%
1642         If the page numbering scheme is not arabic\MessageBreak%
1643         and further not extended\MessageBreak%
1644         (see Page counter overflow in the pagesLTS\MessageBreak%
1645         documentation), without other measures\MessageBreak%
1646         this will lead to a counter overflow.\MessageBreak%
1647       }
1648     \else%
1649       \ifnum\value{page}<0%
1650         \PackageWarning{pagesLTS}{%
1651           Counter 'page' is negative: '\the\value{page}'!\MessageBreak%
1652           If the page numbering scheme is not arabic\MessageBreak%
1653           and further not extended\MessageBreak%
1654           (see Page counter overflow in the pagesLTS\MessageBreak%
1655           documentation), without other measures\MessageBreak%
1656           this will lead to a counter overflow.\MessageBreak%
1657         }
1658       \else%
1659         \PackageError{pagesLTS}{%
1660           Counter 'page' does not have a recognized value:\MessageBreak%
1661           '\the\value{page}'\MessageBreak%
1662           \@ehd \MessageBreak%
1663         }
1664       \fi%
1665     \fi%
1666   \fi%
```

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

```
1667 \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).

```
1668 \@ifundefined{Hy@Warning}{% hyperref not loaded
1669 }{% hyperref loaded
1670 \gdef\pagesLTS@hyper{1}%
1671 }%
```

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

```
1672 \ifx\pagesLTS@called\pagesLTS@zero
```

If it was not defined (i.e. `\pagesLTS@called` is zero), the user is 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.

```
1673 \PackageError{pagesLTS}{pagenumbering missing}{\pagesLTS@messageNPN }%
```

We save the current value of the page,

```
1674 \mathchardef\pagesLTS@tmpD=\arabic{page}%
```

determine the current page numbering scheme,

```
1675 %% Code from Andres L\{o}h, Universiteit Utrecht (NL) %%
1676 \def\extract#1{\expandafter\extract@ #1\END}
1677 \def\extract@#1\csname @#2\endcsname#3\END{#2}
1678 \edef\pagesLTS@tmpQ{\extract\thepage}%
1679 %% End of code from Andres L\{o}h %%
1680 \let\pagesLTS@tmpP\pagesLTS@tmpQ%
```

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

```
1681 \def\pagesLTS@pnc{0}%
```

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

```
1682 \pagenumbering{\pagesLTS@tmpP}%
```

This resets the page to one (if option `pagecontinue=false` was choosen), 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.

```
1683 \setcounter{page}{\pagesLTS@tmpD}%
1684 \fi%
```

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

```
1685 \pagesLTS@writelabel{0}%
1686 \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).

```
1687 \ifx\pagesLTS@pnc\pagesLTS@fns%
1688   \@pagesLTS@Prelim@EveryShipout%
1689   \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.

```
1690 \else%
1691   \ifnum \value{pagesLTS.pnc.\pagesLTS@pnc}>1%
1692     \@pagesLTS@Prelim@EveryShipout%
1693   \fi%
1694 \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).

```
1695 \addtocounter{CurrentPage}{1}%
1696 \addtocounter{pagesLTS.current.local.\pagesLTS@pnc}{1}%
1697 }
1698
```

`\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.

```
1699 \newcommand{\pagesLTS@putlabelhyper}[2]{%
1700   \ifHy@pageanchor \relax%
1701   \else%
```

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

```
1702   \PackageError{pagesLTS}{hyperref option pageanchor disabled}{%
1703     The \string\lastpageref{#1} link doesn't work\MessageBreak%
1704     using hyperref with disabled option 'pageanchor'.\MessageBreak%
1705   }%
1706 \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.

```
1707 %% The following code is from the hyperref package      %%
1708 %% [2010/04/17 v6.80x; newer versions are available]      %%
1709 %% by Heiko Oberdiek (Big Thanks!).                      %%
1710 \if@filesn
1711   \begingroup
```

```

1712 \let\@number\@firstofone
1713 \ifHy@pageanchor
1714 \ifHy@hypertextnames
1715 \ifHy@plainpages
1716 \def\Hy@temp{\arabic{page}}%
1717 \else
1718 \Hy@unicodedefalse
1719 %% Code not from hyperref package: %%
1720 %% The following lines are modified from the hyperref package. %%
1721 %% Without the modification, after the first shipout "PD1" is %%
1722 %% inserted each time |\pdfstringdef\Hy@temp{\thepage}| is %%
1723 %% executed (if |fnsymbol| is not used). %%
1724 \ifnum \value{CurrentPage}=1%
1725 \ifx\pagesLTS@pnc\pagesLTS@fns%
1726 \pdfstringdef\Hy@temp{\thepage}%
1727 \else%
1728 \def\Hy@temp{\thepage}%
1729 \fi%
1730 \else%
1731 \pdfstringdef\Hy@temp{\thepage}%
1732 \fi%
1733 %% Code from hyperref package again: %%
1734 \fi
1735 \else
1736 \def\Hy@temp{\the\Hy@pagecounter}%
1737 \fi
1738 \fi
1739 %% End of code from the hyperref package. %%
1740 %% (The following four lines are modified %%
1741 %% from the hyperref package.) %%
1742 \immediate\write\@auxout{\string
1743 \newlabel{#1}{{}{#2}}{\ifHy@pageanchor page.\Hy@temp\fi}{}}%
1744 \endgroup%
1745 \fi%
1746 }
1747

```

\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.

```

1748 \newcommand{\pagesLTS@putlabel}[3]{%
1749 \addtocounter{page}{-1}%

```

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

```

1750 \ifx\pagesLTS@hyper\pagesLTS@one%
1751 \pagesLTS@putlabelhyper{#1}{#2}%
1752 \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.

```

1753 \if@fileswh%
1754 \ifnum \value{pagesLTS.pnc.\pagesLTS@pnc}<2%
1755 \immediate\write\@auxout{\string
1756 \newlabel{#1}{{}{#2}}}%
1757 \else%
1758 \edef\pagesLTStmpA{#1}%
1759 \edef\pagesLTStmpB{pagesLTS.\pagesLTS@pnc.local}%
1760 \ifx\pagesLTStmpA\pagesLTStmpB%
1761 \edef\pagesLTStmpA{#3}%
1762 \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.

```

1763 \immediate\write\@auxout{\string
1764 \undonewlabel{#1}}}%
1765 \fi%
1766 \fi%
1767 \immediate\write\@auxout{\string
1768 \newlabel{#1}{{}{#2}}}%
1769 \fi%
1770 \fi%
1771 \fi%

```

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

```

1772 \addtocounter{page}{+1}%
1773 }
1774

```

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

```

1775 \newcommand{\pagesLTS@putlabels}{%
1776 \addtocounter{page}{-1}%
1777 \addtocounter{CurrentPage}{-1}%
1778 \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.

```

1779 \ifx\pagesLTS@pnc\pagesLTS@zero%
1780 \PackageWarning{pagesLTS}{No page numbering scheme found:\MessageBreak%
1781 \pagesLTS@messageNPN }%

```

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

```

1782 \else%
1783 \pagesLTS@writelabel{\pagesLTS@pnc.\arabic{pagesLTS.pnc.\pagesLTS@pnc}}%

```

```

1784 \ifnum \value{pagesLTS.pnc}.\pagesLTS@pnc}<2%
1785 \ifx\pagesLTS@pnc\pagesLTS@fns%
1786 \relax%
1787 \else%
1788 \pagesLTS@writelabel{\pagesLTS@pnc}%
1789 \fi%
1790 \fi%
1791 \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).

```

1792 \addtocounter{page}{+1}%
1793 \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:

```

1794 \addtocounter{CurrentPage}{1}%
1795 \addtocounter{pagesLTS.current.local}.\pagesLTS@pnc}{1}%
1796 }
1797

```

`\AtBeginDocument` `\AtBeginDocument` it is checked whether writing into an `.aux`-file is allowed. The `pagesLTS` package cannot be used without that!

```

1798 \AtBeginDocument{%
1799 \if@files\relax%
1800 \else%
1801 \PackageError{pagesLTS}{No auxiliary file allowed.}%
1802 {The pagesLTS package was not allowed to write to an .aux file.\MessageBreak%
1803 This package does not work without access to an .aux file.\MessageBreak%
1804 Press Ctrl+Z to exit.\MessageBreak%
1805 }%
1806 \fi%

```

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 1995/10/10, it is the recent version (as of the time of last revision of this documentation: 1995/10/11 v2.4i).

```

1807 \@ifpackage{endfloat}%
1808 {\@ifpackagelater{endfloat}{1992/03/31}% April 1992 v2.0
1809 {\@ifpackagelater{endfloat}{1995/10/10}{% 1995/10/11 v2.4i
1810 \relax}%

```

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


```

1811 {\PackageWarningNoLine{pagesLTS}{Old endfloat package detected:\MessageBreak%
1812     There is a newer version of the endfloat package available.\MessageBreak%
1813     Please consider updating your version.\MessageBreak%
1814     The pagesLTS package might be incompatible with\MessageBreak%
1815     your current endfloat package.\MessageBreak%
1816 }%
1817 }%

```

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

```

1818 {\PackageError{pagesLTS}{Incompatible, very old endfloat package detected.}%
1819 {The very old version 2.0 (and earlier) of the\MessageBreak%
1820     endfloat package actually redefined the \ enddocument,\MessageBreak%
1821     and so interferred drastically with the LaTeX2e commands\MessageBreak%
1822     which make use of \ AtEndDocument.\MessageBreak%
1823     Newer versions of the endfloat package exists\MessageBreak%
1824     (at least: v2.4i as of 1995/10/11)\MessageBreak%
1825     in modern documentation form,\MessageBreak%
1826     which should be available from CTAN.\MessageBreak%
1827     Please update your endfloat package\MessageBreak%
1828     for use with the pagesLTS package.\MessageBreak %
1829 }%
1830 }%
1831 }%
1832 }{}%

```

It is checked whether the old lastpage package was loaded.
(If it was loaded indeed, the \lastpage@putlabel is “killed”, see subsection 3.3.)

```

1833 \@ifpackageloaded{lastpage}%
1834 {\@ifpackagelater{lastpage}{2010/07/28}% 2010/07/29 v1.2a
1835   {\@ifpackagelater{lastpage}{2010/09/11}% 2010/09/12 v1.2e
1836     {\PackageWarning{pagesLTS}{lastpage package detected.\MessageBreak%
1837       With pagesLTS package in use, lastpage has no function.\MessageBreak%
1838       Just remove the lastpage package from your document.\MessageBreak%
1839     }%
1840   }{%
1841     \PackageWarning{pagesLTS}{Old lastpage package detected.\MessageBreak%
1842       With pagesLTS package in use, lastpage has no function.\MessageBreak%
1843       Just remove the lastpage package from your document.\MessageBreak%
1844       At least update it!\MessageBreak%
1845     }%
1846   }%
1847 }{%
1848   \PackageWarning{pagesLTS}{Incompatible package lastpage detected:\MessageBreak%
1849     Package pagesLTS was loaded, but also an old\MessageBreak%
1850     version of the lastpage package.\MessageBreak%
1851     pagesLTS has all functionality of the lastpage\MessageBreak%

```

```

1852     package (and more), so just remove the lastpage\MessageBreak%
1853     package from your document.\MessageBreak%
1854     (At least update it!)\MessageBreak%
1855     pagesLTS will now ''kill'' the lastpage@putlabel\MessageBreak%
1856     command of the lastpage package.\MessageBreak%
1857 }%
1858 \gdef\lastpage@putlabel{\relax}%
1859 }%
1860 }{}%

```

Further it is checked whether the `alphalph` package is loaded.

```

1861 \@ifpackageloaded{alphalph}%
1862 {\PackageInfo{pagesLTS}{Package alphalph detected.\MessageBreak%
1863   pagesLTS supports alphalph. Congratulations!\MessageBreak%
1864 }%

```

Unfortunately, `\@ifpackageloaded` cannot be used any later (cf. L^AT_EX bug 2335, Synopsis: Proposal for `\@ifpackageloaded`, <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:

```

1865 \global\def\pagesLTS@AlphAlph{1}%

```

The commands are defined accordingly.

```

1866 \newalphalph{\AlphMult}[mult]{\@Alph}{26}%
1867 \newalphalph{\alphMult}[mult]{\@alph}{26}%
1868 \newalphalph{\fnsymbolmult}[mult]{\@fnsymbol}{5}%
1869 }%

```

If the `alphalph` package is not detected, it is checked whether no options are choosen, which would require that package.

```

1870 {\ifx\pagesLTS@alphMult\pagesLTS@zero%
1871   \PackageWarning{pagesLTS}{\pagesLTS@messageaMz }%
1872   \else%
1873     \PackageError{pagesLTS}{Package alphalph not loaded}%
1874     {Package alphalph was not loaded, but package pagesLTS\MessageBreak%
1875       was called without option alphMult=0 (zero).\MessageBreak%
1876       Either load package alphalph,\MessageBreak%
1877       or give option alphMult=0 (zero) to the pagesLTS package.\MessageBreak%
1878     }%
1879   \fi%
1880   \ifx\pagesLTS@AlphMulti\pagesLTS@zero%
1881     \PackageWarning{pagesLTS}{\pagesLTS@messageAMiz }%
1882     \relax%
1883   \else%
1884     \PackageError{pagesLTS}{Package alphalph not loaded}%
1885     {Package alphalph was not loaded, but package pagesLTS\MessageBreak%
1886       was called without option AlphMulti=0 (zero).\MessageBreak%
1887     Either load package alphalph,\MessageBreak%

```

```

1888         or give option AlphMulti=0 (zero) to the pagesLTS package.\MessageBreak%
1889     }%
1890 \fi%
1891 \ifpagesLTS@fnsymbolmult%
1892     \PackageError{pagesLTS}{Package alphalph not loaded}%
1893     {Package alphalph was not loaded, but package pagesLTS\MessageBreak%
1894     was called without option fnsymbolmult=false.\MessageBreak%
1895     Either load package alphalph,\MessageBreak%
1896     or give option fnsymbolmult=false to the pagesLTS package.\MessageBreak%
1897 }%
1898 \else%
1899     \PackageWarning{pagesLTS}{\pagesLTS@messagefsmz }%
1900 \fi%
1901 }%

```

Further it is checked whether the hyperref package is loaded.

```

1902 \@ifpackageloaded{hyperref}%
1903     {\PackageInfo{pagesLTS}{Package hyperref detected.\MessageBreak%
1904     pagesLTS supports hyperref. Congratulations!\MessageBreak%
1905     }%
1906     \global\def\pagesLTS@hyper{1}%

```

and whether the pdfpages package is loaded:

```

1907     \@ifpackageloaded{pdfpages}%
1908     {\PackageWarning{pagesLTS}{Package pdfpages detected.\MessageBreak%
1909     Using hyperref with pdfpages can cause problems. See\MessageBreak%
1910     ftp://ftp.ctan.org/tex-archive/macros/latex/contrib/pax/\MessageBreak%
1911     for project pax (PDFAnnotExtractor).\MessageBreak%
1912     }%
1913     }\relax}%

```

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

```

1914     \@ifpackageloaded{undolabl}%
1915     {\@ifpackagelater{undolabl}{2010/07/14}% 2010/07/15 v1.0d
1916     {\@ifpackagelater{undolabl}{2010/09/11}% 2010/09/12 v1.0g
1917     {% recent version as of the time of last revision of this package: OK
1918     }{% old, but not obsolete version
1919     \PackageWarningNoLine{pagesLTS}{Old version of undolabl package used.\MessageBreak%
1920     See ftp://ftp.ctan.org/tex-archive/macros/latex/contrib/undolabl/ \MessageBreak%
1921     for a new version.\MessageBreak%
1922     }%
1923     }
1924     }\PackageError{pagesLTS}{Incompatible, obsolete version of undolabl package used.}{%
1925     See ftp://ftp.ctan.org/tex-archive/macros/latex/contrib/undolabl/ \MessageBreak%
1926     for a new version.\MessageBreak%
1927     Type X <return> to quit.\MessageBreak%
1928     }%

```

```

1929     }
1930   }\PackageError{pagesLTS}{Package undolabl missing}{%
1931     Package undolabl not found.\MessageBreak%
1932     The pagesLTS package needs the undolabl package.\MessageBreak%
1933     See e.g.\MessageBreak%
1934     ftp://ftp.ctan.org/tex-archive/macros/latex/contrib/undolabl/ \MessageBreak%
1935     Type X <return> to quit.\MessageBreak%
1936   }%
1937 }

```

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

```

1938   \@ifpackagelater{hyperref}{2010/06/17}{% 2010/06/18 v6.81g
1939     \relax}{%
1940     \PackageWarningNoLine{pagesLTS}{Old hyperref package detected:\MessageBreak%
1941       There is a newer version of the\MessageBreak%
1942       hyperref package available.\MessageBreak%
1943       Please consider updating your version.\MessageBreak%
1944     }%
1945   }%
1946   %% pagesLTS supports the use of the package hyperref by
1947   %% Heiko Oberdiek (hyperref version 2010/06/18 v6.81g).
1948   %% pagesLTS may work with earlier versions of this packages,
1949   %% but this was not tested.
1950 }%

```

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

```

1951   {\PackageWarning{pagesLTS}{Package hyperref NOT detected.\MessageBreak%
1952     pagesLTS would support hyperref. The page references\MessageBreak%
1953     will NOT be hyperlinked!\MessageBreak }%
1954   }%

```

We want the rerun-hint (see below) to appear after e.g. the listfiles, and therefore append it (`\pagesLTS@rerunwarning`) to `\@dofilelist` (trick found in Harald Harders' `fnbreak` package, thanks!):

```

1955   \newcommand\pagesLTS@dofilelist{%
1956     \let\pagesLTS@dofilelist\@dofilelist%
1957     \def\@dofilelist{\pagesLTS@dofilelist\pagesLTS@rerunwarning}%
1958   }
1959

```

Initially, we define `\pagesLTS@rerunwarning` to be empty:

```

1960 \newcommand\pagesLTS@rerunwarning{}%
1961 \let\pagesLTS@rerunwarning\relax%
1962

```

`\AtEndDocument` `\AtEndDocument` we put in a `\message` to show, in what order things (which were called) are done (see subsection 3.1).

```
1963 \AtEndDocument{%
1964   \message{AED: pagesLTS setting LastPage ^^J}}%
```

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

```
1965 \clearpage%
1966 \ifx\pagesLTS@pnc\pagesLTS@fns%
1967   \def\pagesLTS@tmpA{\arabic{pagesLTS.fnsymbol.local}}%
1968   \ifnum \pagesLTS@eso=\pagesLTS@tmpA%
1969     \gdef\pagesLTS@rerun{0}%
1970   \else%
1971     \gdef\pagesLTS@rerun{1}%
1972   \fi%
1973   \if@files%
1974     \immediate\write\@auxout{\string
1975       \gdef\string\pagesLTS@eso{\pagesLTS@tmpA}}%
1976   \fi%
1977 \fi%
1978 \pagesLTS@putlabel{LastPage}{\thepage}{1}}%
```

We do not need the temporary definition any more.

```
1979 \let\pagesLTS@tmpA\undefined%
1980 }
1981
```

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

```
1982 \AfterLastShipout{%
```

The number of pages with the `fnsymbol` page numbering scheme, `\pagesLTS@esov`, is saved via the `.aux` file:

```
1983 \if@files%
1984   \immediate\write\@auxout{\string
1985     \setcounter{pagesLTS.fnsymbol.local}{\pagesLTS@esov}}%
1986 \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`.

```
1987 \ifx\pagesLTS@hyper\pagesLTS@one%
1988   \ifx\pagesLTS@pnc\pagesLTS@fns%
1989     \if@files%
1990       \immediate\write\@auxout{\string
1991         \gdef\string\lastpageref{\string\lastpagerefend}}%
1992     \fi%
1993   \fi%
1994 \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:

```

1995 \pagesLTS@ifcounter{pagesLTS.\pagesLTS@pnc.\arabic{pagesLTS.pnc.\pagesLTS@pnc}.local.count}%
1996 \setcounter{pagesLTS.\pagesLTS@pnc.\arabic{pagesLTS.pnc.\pagesLTS@pnc}.local.count}{%
1997 \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.)

```

1998 \addtocounter{pagesLTS.\pagesLTS@pnc.\arabic{pagesLTS.pnc.\pagesLTS@pnc}.local.count}{-1}
1999 \ifnum \value{pagesLTS.pnc.\pagesLTS@pnc}>1%
2000 \mathchardef\pagesLTS@tmpD=\arabic{pagesLTS.pnc.0}%
2001 \setcounter{pagesLTS.pnc.0}{\value{pagesLTS.pnc.\pagesLTS@pnc}}%
2002 \addtocounter{pagesLTS.pnc.0}{-1}%
2003 \addtocounter{pagesLTS.\pagesLTS@pnc.\arabic{pagesLTS.pnc.\pagesLTS@pnc}.local.count}{%
2004 -\value{pagesLTS.\pagesLTS@pnc.\arabic{pagesLTS.pnc.0}.local.count}}%
2005 \setcounter{pagesLTS.pnc.0}{\pagesLTS@tmpD}%
2006 \fi%
2007 \if@files%
2008 \immediate\write\@auxout{\string
2009 \pagesLTS@ifcounter{pagesLTS.\pagesLTS@pnc.\arabic{pagesLTS.pnc.\pagesLTS@pnc}.local.cnt}}%
2010 \edef\pagesLTS@tmpA{\arabic{pagesLTS.\pagesLTS@pnc.\arabic{pagesLTS.pnc.\pagesLTS@pnc}.local.count}}%
2011 \immediate\write\@auxout{\string
2012 \setcounter{pagesLTS.\pagesLTS@pnc.\arabic{pagesLTS.pnc.\pagesLTS@pnc}.local.cnt}{\pagesLTS@tmpA}}%
2013 \let\pagesLTS@tmpA\undefined%
2014 \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.

```

2015 \addtocounter{page}{-1}%
2016 \edef\pagesLTS@tmpA{\thepage}%
2017 \if@files%
2018 \immediate\write\@auxout{\string
2019 \gdef\string\pagesLTS.lastpage{\pagesLTS@tmpA}}%
2020 \fi%
2021 \addtocounter{page}{+1}%
2022 \addtocounter{CurrentPage}{-1}%
2023 \def\pagesLTS@tmpB{\arabic{CurrentPage}}%
2024 \if@files%
2025 \immediate\write\@auxout{\string
2026 \setcounter{pagesLTS.pagenr}{\pagesLTS@tmpB}}%
2027 \fi%
2028 \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.

```

2029 \message{AED: pagesLTS setting VeryLastPage via AfterLastShipout ^^J}%
2030 \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.

```

2031 \message{AED: pagesLTS setting LastPages via AfterLastShipout ^^J}%
2032 \pagesLTS@putlabels%

```

We do not need the temporary definitions any more.

```

2033 \let\pagesLTS@tmpA\undefined%
2034 \let\pagesLTS@tmpB\undefined%
2035 }
2036

```

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

“The code is called after the `.aux` file is closed and read in again. It is the place for final checks, rerun hints, final messages.”

(`atveryend` package of Heiko Oberdiek, v1.5 as of 2010/03/24)

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.

```

2037 \AtVeryEndDocument{%
2038   \ifx\pagesLTS@rerun\pagesLTS@one%
2039     \def\pagesLTS@rerunwarning{%
2040       \PackageWarningNoLine{pagesLTS}{Label(s) may have changed.\MessageBreak%
2041         Rerun to get cross-references right.\MessageBreak%
2042       }%
2043     }%
2044   \fi%
2045 }
2046
2047 \</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:

- **T_EX**Format L^AT_EX 2_ε, 1994/06/01, v2_ε: **CTAN**:
- document class ltxdoc, 2007/11/11, v2.0u, **CTAN:macros/latex/base/ltxdoc.dtx**
- package holtxdoc, 2010/04/24, v0.19, **CTAN:macros/latex/contrib/oberdiek/holtxdoc.dtx**
- package hypdoc, 2010/03/26, v1.9, **CTAN:macros/latex/contrib/oberdiek/hypdoc.dtx**
- package geometry, 2010/07/13, v5.5, **CTAN:macros/latex/contrib/geometry/geometry.dtx**

pagesLTS.sty The **pagesLTS.sty** for L^AT_EX 2_ε (i. e. all documents using the **pagesLTS** package) requires:

- **T_EX**Format L^AT_EX 2_ε, 1994/06/01, v2_ε, **CTAN**:
- package atveryend, 2010/03/24, v1.5, **CTAN:macros/latex/contrib/oberdiek/atveryend.dtx**
- package everyshi, 2001/05/15, v3.00, **CTAN:macros/latex/contrib/ms/everyshi.dtx**
- package kvoptions, 2010/02/22, v3.7, **CTAN:macros/latex/contrib/oberdiek/kvoptions.dtx**
- package undolabl, 2010/09/12, v1.0g, **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 alphas, 2010/04/18, v2.3, **CTAN:macros/latex/contrib/oberdiek/alphas.dtx**
- package lipsum, 2005/01/26, v1.0, **CTAN:macros/latex/contrib/lipsum/lipsum.dtx**
- package showkeys, 2007/08/07, v3.15, **CTAN:macros/latex/required/tools/showkeys.dtx**
- package hyperref, 2010/06/18, v6.81g, **CTAN:macros/latex/contrib/hyperref.zip**
- package pagesLTS, 2010/09/12, v1.1j, **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 The **papermas** package is not required, but requires itself the the **pagesLTS** package and can be considered as kind of add-on:

- package papermas, 2010/07/29, v1.0d, **CTAN:macros/latex/contrib/papermas/papermas.dtx**

endfloat	<p>The endfloat package is not required, but because the pagesLTS package is incompatible with very old versions of the endfloat package (see subsection 3.2), here the recent one is listed:</p> <ul style="list-style-type: none"> - package endfloat, 1995/10/11, v2.4i, CTAN:macros/latex/contrib/endfloat/endfloat.dtx
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"> - package prelim2e, 2009/05/29, v1.3, CTAN:macros/latex/contrib/ms/prelim2e.dtx
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"> - package fancyhdr, 2005/03/22, v3.2, CTAN:macros/latex/contrib/fancyhdr.zip - package nccfancyhdr, 2004/12/07, v1.1, CTAN:macros/latex/contrib/ncctools/source/nccfancyhdr.dtx
fnbreak	<p>Harald Harders' fnbreak (footnote break warning) package is neither required nor used here, but because the trick to give rerun warnings <i>after</i> e.g. the \listfiles was taken from it, the package is listed here:</p> <ul style="list-style-type: none"> - package fnbreak, 2010/08/09, v1.20, CTAN:macros/latex/contrib/fnbreak.zip
countlto nofm totpages lastpage zref	<p>As possible alternatives in section 4 there are listed</p> <ul style="list-style-type: none"> - package countlto, 2009/05/24, v2.1, CTAN:macros/latex/contrib/ms/countlto.dtx - package nofm, 1991/02/25, v?., ftp://tug.ctan.org/pub/tex-archive/obsolete/macros/latex209/contrib/misc/nofm.sty does not work with e.g. hyperref - package totpages, 2005/09/19, v2.00, CTAN:macros/latex/contrib/totpages/totpages.dtx - package lastpage, 1994/07/20, v0.1b, CTAN:macros/latex/contrib/lastpage/lastpage.dtx - package zref, 2010/05/01, v2.17, CTAN:macros/latex/contrib/oberdiek/zref.dtx
Oberdiek holtxdoc atveryend kvoptions alphalph zref	<p>All packages of Heiko Oberdiek's bundle 'oberdiek' (especially holtxdoc, atveryend, kvoptions, alphalph, zref) are also available in a TDS compliant ZIP archive: CTAN:install/macros/latex/contrib/oberdiek.tds.zip.</p> <p>Warning: holtxdoc, 2010/04/24 v0.19, requires the packages</p> <ul style="list-style-type: none"> - hypdoc, 2010/03/26, v1.9 - hyperref, 2010/03/30, v6.80u (latest: 2010/06/18, v6.81g) - pdftexcmds, 2010/04/01, v0.9 - ltxcmds, 2010/03/09, v1.4 (latest: 2010/04/26, v1.7) - hologo, 2010/04/24, v1.2

- array (latest: 2008/09/09, v2.4c)

(or more recent versions) and does neither work with nor check for earlier versions!

(It is probably best to download [CTAN:install/macros/latex/contrib/oberdiek.tds.zip](#) and use this, because the packages in there should be both recent and compatible.)

Münch Packages of mine (alphabetically ordered):

hrefhide 2010/07/29, v1.0d, [CTAN:macros/latex/contrib/hrefhide/hrefhide.dtx](#) and
[CTAN:install/macros/latex/contrib/hrefhide.tds.zip](#)

That package allows to “hide” some (hyperlinked) text when printing the document while keeping the layout.

lastpage 2010/09/12, v1.2e, [CTAN:macros/latex/contrib/lastpage/lastpage.dtx](#) and
[CTAN:install/macros/latex/contrib/lastpage.tds.zip](#)

That package allows to refer to the (maybe not so) last page. *The package was originally invented by Jeffrey P. Goldberg.* The `pagesLTS` package is much more mighty, but needs more resources (e.g. new counters).

pagesLTS 2010/09/12, v1.1j, [CTAN:macros/latex/contrib/pagesLTS/pagesLTS.dtx](#) and
[CTAN:install/macros/latex/contrib/pagesLTS.tds.zip](#)

The package described in this very documentation:

This package allows to refer to the (very) last page, gives the total number of pages, references to special pages, facilitates the use of nearly any pagenumbers you like (e.g. negative `Roman` numbers or more than `Z` pages with `Alph` page numbering), and works even with `fnsymbol` page numbers.

papermas 2010/07/29, v1.0d, [CTAN:macros/latex/contrib/papermas/papermas.dtx](#) and
[CTAN:install/macros/latex/contrib/papermas.tds.zip](#)

That package allows to compute the number of sheets of paper needed to print a document as well as the mass of that printed version of the document. Further that package allows to compute “base to the power of exponent” inside \LaTeX .

undolabl 2010/09/12, v1.0g, [CTAN:macros/latex/contrib/undolabl/undolabl.dtx](#) and
[CTAN:install/macros/latex/contrib/undolabl.tds.zip](#)

That package allows to override existing labels, especially automatically generated ones. *The main code of that package was invented by Ulrich Diez (eu.angelion@web.de) and first published in the `news:comp.text.tex` newsgroup at Sun, 20 Apr 2008 16:39:26 +0200, with subject: Re: How to undefine/overwrite a label? (see e.g. <http://groups.google.de/group/comp.text.tex/msg/5ba8d4722e5cd326?dmode=source> as well as <http://groups.google.de/group/comp.text.tex/msg/af6cfe93917097da?dmode=source>).*

7.2 Package, unpacking TDS

Package. This package is available on **CTAN**: (when searching on CTAN, look for `pageslts` instead of `pagesLTS`).

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>ltxdoc.cfg</code>	The L ^A T _E X documentation configuration file, also for generating the documentation.
<code>pagesLTS.sty</code>	The <code>.sty</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 T_EX:

```
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/muench/pagesLTS.sty</code>
<code>pagesLTS.pdf</code>	→ <code>doc/latex/muench/pagesLTS.pdf</code>
<code>pagesLTS-example.tex</code>	→ <code>doc/latex/muench/pagesLTS-example.tex</code>
<code>pagesLTS-example.pdf</code>	→ <code>doc/latex/muench/pagesLTS-example.pdf</code>
<code>pagesLTS.dtx</code>	→ <code>source/latex/muench/pagesLTS.dtx</code>

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

7.3 Refresh file name databases

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

7.4 Some details for the interested

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

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

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

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

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

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

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

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

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

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

7.5 Compiling the example

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

```
latex pagesLTS-example.tex
```

or (recommended)

```
pdflatex pagesLTS-example.tex
```

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

8 Acknowledgements

I (H.-Martin Münch) would like to thank Jeffrey P. Goldberg (jeffrey+news at goldmark dot org) 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. Further I would like to thank Heiko Oberdiek (heiko dot oberdiek at googlemail dot com) 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 (martin at oneiros dot de) for his `prelim2e` package, from which I got the `Prelim@EveryShipout` code, Ulrich Diez (eu.angelion at web dot de) for his code for the `undolabl` package, which allows overwriting of labels, Andres Löh (andres at cs dot uu dot nl) 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 \TeX .

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}{\the\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](http://groups.google.com/group/comp.text.tex/msg/4407493da9c747f0?dmode=source), 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** 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^AT_EX209.
- Replacement of `\filedate`, `-version`, `-name`,... because of L^AT_EX 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` of 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_EX 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)]

- 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]

- 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]

- `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]

- 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]

- 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]

- Version 1.1e had a bug: `AlphAlph` was replaced by `alphalph` (because that package is named like this), but this was done also in commands and definitions - now reverted.
- The recent version of the Adobe Reader is 9.3.3 (instead of 9.3.1).

[2010/08/12 v1.1g]

- 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]

- 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]

- 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]

- Bug fix: L^AT_EX 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.

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: J and Y are not missing in the index, but no commands beginning with these letters have been used in this `pagesLTS` package.

10 Index

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