

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 X (10.0.0) 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 3.2) and place a `\pagenumbering{...}` with appropriate argument (e.g. arabic, roman, Roman, fnsymbol, alph, or Alph) right behind `\begin{document}` (see subsection 2.3.1)!

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

`\pageref*` If the `hyperref` package is used, the references are hyperlinked to their aims. If these hyperlinks shall be suppressed, `\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 (< 1), i.e. 0, -i, -ii, -iii, -iv, ... and 0, -I, -II, -III, -IV, ..., respectively.

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

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

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

`page number`
`number of pages` `\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 9.
<code>\lastpageref</code>	For pages with the <code>fnsymbol</code> page numbering scheme, <code>\lastpageref{...}</code> instead of <code>\pageref{...}</code> <i>must</i> be used. This is required for pages somewhere inside of the document as well as the (very) last page(s). Because <code>\lastpageref{...}</code> is a synonym for <code>\pageref{...}</code> , where no <code>fnsymbol</code> page numbering scheme is used, it is save(r) to use it for all references to labels provided by the <code>pagesLTS</code> package.
<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> <h3>2.3.2 If \pagenumbering{...} is used once</h3> <p><code>pagesLTS.0</code> At the first page a label <code>pagesLTS.0</code> is created. If <code>\pagenumbering{...}</code> is used right after <code>\begin{document}</code>, this is much easier for the <code>pagesLTS</code> package (and chances for successful placing of all labels are much higher).</p>

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 3.6! (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` 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
`scheme . number` refer to `pagesLTS.<page numbering scheme>.<number>`, e. g. `\lastpageref{pagesLTS.Roman.1}`, where `<number>` is the occurrence of the page numbering scheme.

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

When you want to give the number of pages of each “sector” of the page numbering scheme, you can use

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

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

to get

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

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

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

In your document the code

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

creates footers like

“DRAFT February 1, 2011 page V (5) of VII + 35 = 42 pages”

or

“DRAFT February 1, 2011 page 10 (17) of VII + 35 = 42 pages”

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

Code like

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

produces output like

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

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

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

2.4 `papermas(s)` package

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

3 A few warnings

3.1 Hyperref and repeated page numbers

When two (or more) different page numbering schemes are used, or the page number is reset, or for any other reason there are two pages with the same number (maybe in different format, e.g. 1 and I), and `hyperref` has not been configured right, this can cause problems. Use `hyperref` with `plainpages=false` and `pdfpagelabels=true`, and everything should be fine. More details can be found at <http://www.tex.ac.uk/cgi-bin/texfaq2html?label=pdfpagelabels>.

3.2 `\AtEndDocument`

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

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

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

The very old version 2.0 (and earlier) of the `endfloat` package actually redefined the `\enddocument` command, and so interfered drastically with the $\text{\LaTeX} 2_{\epsilon}$ commands which make use of `\AtEndDocument`. Newer versions of `endfloat` 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 $\text{\LaTeX} 209$ (!) packages also seem to like to redefine `\enddocument`. In addition to the old `endfloat`, `harvard` comes to mind. All of these will need to be modified swiftly. **If possible, update to $\text{\LaTeX} 2_{\epsilon}$!**

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

3.4 showkeys package

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

3.5 lastpage package

This package first started as a revision of the `lastpage` package of Jeffrey P. Goldberg (jeffrey+news at goldmark dot org), but it became obvious that a replacement was needed. 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` [2010/12/16 v6.81z] package results in multiply definitions of the `LastPage` label. While the `pagesLTS` package cancels the command `\lastpage@putlabel` from the old `lastpage` package (because it does this itself, and better), `hyperref` redefines `\lastpage@putlabel` and thereby reintroduces it again (`hyperref` should probably check for the version of this `lastpage` package and/or whether the `pagesLTS` package was also loaded.)

3.6 Using an unknown page numbering scheme

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

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

3.7 Page counter overflow

Without the use of the `alphalph` package, the

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

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

`MAX = 2147483647`

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

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

3.8 Using the `fnsymbol` page numbering scheme

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

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

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

- There can be a counter overflow, see preceding subsection 3.7.
- Adobe Reader X (10.0.0) 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
		without <code>alphalph</code> &	with <code>pagesLTS</code>	
-2	LaTeX Error		–	–†
-1	LaTeX Error		–*	–*
0	(ignored by <code>LaTeX</code>)		0	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}[2010/12/16]% v6.81z
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}[2011/02/01]% v1.1m
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}, v1.1m as of 2011/02/01 (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 X (10.0.0): \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\}\{\pagesLTSEXampleArabic\}}
415 in the source code.)\\
416 \addtocounter{page}{\pagesLTSEXampleArabic}
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 Reader X (10.0.0) does not show the correct page names
439 for all pages with \texttt{fnsymbol} page numbering scheme:
440
441 \begin{center}
442 \begin{tabular}{c|c|c|c|c}
443 page & page & \multicolumn{2}{c|}{c|}{shown by the Reader} & & & & & \\
444 number & name & without & & with & & & & \\
445 & & & \multicolumn{2}{c|}{c|}{\textsf{alphalph}} & \& \textsf{pagesLTS}} & & \texttt{fnsymbolmult} option & \\
446 $-2$ & \texttt{LaTeX Error} & & & \ensuremath {-\ } & \ensuremath {-\ \dagger } & & & \\
447 $-1$ & \texttt{LaTeX Error} & & & \ensuremath {- *} & \ensuremath {- *} & & & \\
448 $0$ & (ignored by \LaTeX) & & & 0 & 0 & & & \\
449 $1$ & \ensuremath {*} & & * & \ensuremath {*} & \ensuremath {*} & & & \\
450 $2$ & \ensuremath {\dagger } & & & & \ensuremath {\dagger } & & & \\
451 $3$ & \ensuremath {\ddagger } & & & & \ensuremath {\ddagger } & & & \\
452 $4$ & \ensuremath {\mathsection } & & & & \ensuremath {\mathsection } & & & \\
453 $5$ & \ensuremath {\mathparagraph } & & & & \ensuremath {\mathparagraph } & & & \\
454 $6$ & \ensuremath {\delimiter "026B30D } & & "026B30D & \ensuremath {**} & \ensuremath {**} & & & \\
455 $7$ & \ensuremath {**} & & ** & & \ensuremath {\dagger \dagger } & & & \\
456 $8$ & \ensuremath {\dagger \dagger } & & & & \ensuremath {\ddagger \ddagger } & & & \\
457 $9$ & \ensuremath {\ddagger \ddagger } & & & & \ensuremath {\mathsection \mathsection } & & & \\
458 $10$ & \texttt{LaTeX Error} & & & & \ensuremath {\mathparagraph \mathparagraph } & & &

```

```

459 $11$ & \texttt{LaTeX Error} & & \ensuremath {***} & \ensuremath {***} \\
460 $12$ & \texttt{LaTeX Error} & & & \ensuremath {\dag \dag \dag } \\
461 \end{tabular}
462 \end{center}
463
464 \noindent and so on, while at least the (\ldots\ of \ldots ) part
465 of the page number is displayed correctly.\\
466
467 \bigskip
468
469 Without option \texttt{fnsymbolmult=true} of the \textsf{pagesLTS} package
470 (and the help of Heiko Oberdiek's \textsf{alphalph} package),
471 after page~9
472 (\textquotedblleft \ensuremath {\ddag \dag } \textquotedblright )
473 (and also for negative page numbers) there would just appear a
474 \begin{quote}
475 \begin{verbatim}
476 LaTeX Error: Counter too large
477 See the LaTeX manual or LaTeX Companion for explanation.
478 You've lost some text. Try typing <return> to proceed.
479 If that doesn't work, type X <return> to quit.
480 \end{verbatim}
481 \end{quote}
482 Now the page numbers after 5 (\ensuremath {\mathparagraph }) are
483 continued with the doubled \textquotedblleft number\textquotedblright\ of
484 the first, second, third,\ldots\ page (\ensuremath {**},
485 \ensuremath {\dag \dag }, \ensuremath {\ddag \dag },
486 \ensuremath {\mathsection \mathsection },
487 \ensuremath {\mathparagraph \mathparagraph } ),
488 and after the tenth page the \textquotedblleft number\textquotedblright\ is
489 tripled (\ensuremath {***}, \ensuremath {\dag \dag \dag },\ldots).
490 Page zero is named 0 and negative pages just named like the positive ones
491 with addition of a minus sign~($-$).
492
493 \bigskip
494
495 \noindent First page (\texttt{\textbackslash lastpageref\{pagesLTS.0\}}):
496 \lastpageref{pagesLTS.0}\\
497
498 \noindent The page (\texttt{\textbackslash thepage}): \thepage \\
499
500 \noindent Current page (\texttt{\textbackslash theCurrentPage}),
501 i.\,e. counted continuously from the first page): \theCurrentPage \\
502
503
504

```

```

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

```

```

551
552 \pagenumbering{Roman}
553
554 \section{Roman - again!\label{Roman2}}
555
556 The page number would start with
557 \textquotedblleft I\textquotedblright\ again -- but
558 for the \textsf{pagesLTS} package (with option \texttt{pagecontinue=true},
559 or with option just \texttt{pagecontinue}, or even just
560 \nolinebreak[with\textbf{out}] option \texttt{pagecontinue=false}).
561 This package remembered the
562 (\arabic{pagesLTS.double.Roman}-1)\footnote{OK, here\ %
563 you have to compute this value for yourself, but\ %
564 subtracting one should be manageable for \TeX nicians.} pages already
565 done in Roman output, and therefore continues with page
566 \textquotedblleft \thepage \textquotedblright .\\
567 If you want to start with \textquotedblleft I\textquotedblright\ all
568 over again, you will have two pages with the same name,
569 but nevertheless you can do this by using option \texttt{pagecontinue=false}
570 or a \texttt{\textbackslash setcounter\{page\}\{1\}}\ here
571 (not demonstrated in this example file).\\
572
573 \noindent First page (\texttt{\textbackslash lastpageref\{pagesLTS.0\}}):
574 \lastpageref{pagesLTS.0}\\
575
576 \noindent The page (\texttt{\textbackslash thepage}): \thepage \\
577
578 \noindent Current page (\texttt{\textbackslash theCurrentPage}),
579 i.\,e. counted continuously from the first page): \theCurrentPage \\
580
581 \noindent CurrentPageLocal (\texttt{\textbackslash theCurrentPageLocal}),
582 i.\,e. counted continuously from the first page of the
583 current page numbering scheme): \theCurrentPageLocal \\
584
585 \noindent Last roman page (pagesLTS.roman): \lastpageref{pagesLTS.roman}{\hskip4em }
586 (There are \lastpageref{pagesLTS.roman.local} pages with roman numbers.)\\
587
588 \noindent Last Roman page (pagesLTS.Roman): \lastpageref{pagesLTS.Roman}{\hskip3em }
589 (There are \lastpageref{pagesLTS.Roman.local}~pages with Roman numbers:\\
590 \lastpages{Roman}{1}~pages in the first Roman sector
591 (\pageref{Roman}{\hskip3em }-\lastpageref{pagesLTS.Roman.1}{\hskip3em }),\\
592 \lastpages{Roman}{2}~pages in the second Roman sector
593 (\pageref{Roman2}{\hskip3em }-\lastpageref{pagesLTS.Roman.2}{\hskip3em }), and\\
594 \lastpages{Roman}{3}~pages in the third Roman sector
595 (\pageref{Roman3}{\hskip3em }-\lastpageref{pagesLTS.Roman.3}{\hskip3em }).\\
596

```

```

597 \noindent Last arabic page (pagesLTS.arabic): \lastpageref{pagesLTS.arabic}{\hskip5em }
598 (There are only \lastpageref{pagesLTS.arabic.local} pages with arabic numbers,
599 because an \texttt{\textbackslash addtocounter\{page\}\{\pagesLTSEXampleArabic\}} was used.)\
600
601 \noindent Last fnsymbol page (pagesLTS.fnsymbol): \lastpageref{pagesLTS.fnsymbol} \
602 (\texttt{\textbackslash lastpageref\{pagesLTS.fnsymbol\}} -- never
603 \texttt{\textbackslash pageref\{pagesLTS.fnsymbol\}}!\)\
604 (There are \lastpageref{pagesLTS.fnsymbol.local} pages with fnsymbol numbers.)\
605
606 \noindent Last alph page (pagesLTS.alph): \lastpageref{pagesLTS.alph}{\hskip4em }
607 (There are only \lastpageref{pagesLTS.alph.local} pages with alph numbers,
608 because an \texttt{\textbackslash addtocounter\{page\}\{\pagesLTSEXamplealph\}} was used.)\
609
610 \noindent Last Alph page (pagesLTS.Alph): \lastpageref{pagesLTS.Alph}{\hskip4em }
611 (There are \lastpageref{pagesLTS.Alph.local} pages with Alph numbers.)\
612
613 \noindent Last page's \textit{name} (LastPage): \lastpageref{LastPage}\
614
615 \noindent Very last page's \textit{name} (VeryLastPage): \lastpageref{VeryLastPage}\
616 (\texttt{LastPage} and \texttt{VeryLastPage} are identical, unless
617 a package with output \linebreak
618 \texttt{\textbackslash AtEndDocument} after the \textsf{pagesLTS} package
619 was added.)\
620
621 \noindent Last page's \textit{number} (LastPages): \lastpageref{LastPages}{\hskip3em }
622 (=total number of pages)\
623
624 \lipsum[1-6]
625
626 \newpage
627
628 \texttt{\textbackslash lastpageref\{pagesLTS.Roman\}} does \textbf{not}
629 refer to this page (but there: \lastpageref{pagesLTS.Roman}),
630 because the option \texttt{pagecontinue=true}
631 was chosen. When a reference to this page is wanted,\
632 \texttt{\textbackslash lastpageref\{pagesLTS.Roman.2\}}
633 can be used: \lastpageref{pagesLTS.Roman.2}.\
634
635 \bigskip
636 There are \lastpages{Roman}{2}~pages
637 (\texttt{\textbackslash lastpages\{Roman\}\{2\}})
638 in this second Roman sector.\
639 The Roman page numbering scheme is continued later in
640 section~\ref{Roman3})!
641
642 \newpage

```

```

643
644 \pagenumbering{alph}
645
646 \section{alph\label{alph}}
647
648 \noindent First page (\texttt{\textbackslash lastpageref\{pagesLTS.0\}}):
649 \lastpageref{pagesLTS.0}\\
650
651 \noindent The page (\texttt{\textbackslash thepage}): \thepage \\
652
653 \noindent Current page (\texttt{\textbackslash theCurrentPage}),
654 i.\,e. counted continuously from the first page): \theCurrentPage \\
655
656 \noindent CurrentPageLocal (\texttt{\textbackslash theCurrentPageLocal}),
657 i.\,e. counted continuously from the first page of the
658 current page numbering scheme): \theCurrentPageLocal \\
659
660 \noindent Last roman page (pagesLTS.roman): \lastpageref{pagesLTS.roman}{\hskip4em }
661 (There are \lastpageref{pagesLTS.roman.local} pages with roman numbers.)\\
662
663 \noindent Last Roman page (pagesLTS.Roman): \lastpageref{pagesLTS.Roman}{\hskip3em }
664 (There are \lastpageref{pagesLTS.Roman.local}~pages with Roman numbers:\\
665 \lastpages{Roman}{1}~pages in the first Roman sector
666 (\pageref{Roman}{\hskip3em }-\lastpageref{pagesLTS.Roman.1}{\hskip3em }),\\
667 \lastpages{Roman}{2}~pages in the second Roman sector
668 (\pageref{Roman2}{\hskip3em }-\lastpageref{pagesLTS.Roman.2}{\hskip3em }), and\\
669 \lastpages{Roman}{3}~pages in the third Roman sector
670 (\pageref{Roman3}{\hskip3em }-\lastpageref{pagesLTS.Roman.3}{\hskip3em }).\\
671
672 \noindent Last arabic page (pagesLTS.arabic): \lastpageref{pagesLTS.arabic}{\hskip5em }
673 (There are only \lastpageref{pagesLTS.arabic.local} pages with arabic numbers,
674 because an \texttt{\textbackslash addtocounter\{page\}\{\pagesLTSexampleArabic\}} was used.)\\
675
676 \noindent Last fnsymbol page (pagesLTS.fnsymbol): \lastpageref{pagesLTS.fnsymbol} \\
677 (\texttt{\textbackslash lastpageref\{pagesLTS.fnsymbol\}} -- never
678 \texttt{\textbackslash pageref\{pagesLTS.fnsymbol\}}!)\\
679 (There are \lastpageref{pagesLTS.fnsymbol.local} pages with fnsymbol numbers.)\\
680
681 \noindent Last alph page (pagesLTS.alph): \lastpageref{pagesLTS.alph}{\hskip4em }
682 (There are only \lastpageref{pagesLTS.alph.local} pages with alph numbers,
683 because an \texttt{\textbackslash addtocounter\{page\}\{\pagesLTSexamplealph\}} was used.)\\
684
685 \noindent Last Alph page (pagesLTS.Alph): \lastpageref{pagesLTS.Alph}{\hskip4em }
686 (There are \lastpageref{pagesLTS.Alph.local} pages with Alph numbers.)\\
687
688 \noindent Last page's \textit{name} (LastPage): \lastpageref{LastPage}\\

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```

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

```

```

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

```



```

781
782 \noindent Last alph page (pagesLTS.alph): \lastpageref{pagesLTS.alph}{\hskip4em }
783 (There are only \lastpageref{pagesLTS.alph.local} pages with alph numbers,
784 because an \texttt{\textbackslash addtocounter\{page\}\{\pagesLTSexamplealph\}} was used.)\\
785
786 \noindent Last Alph page (pagesLTS.Alph): \lastpageref{pagesLTS.Alph}{\hskip4em }
787 (There are \lastpageref{pagesLTS.Alph.local} pages with Alph numbers.)\\
788
789 \noindent Last page's \textit{name} (LastPage): \lastpageref{LastPage}\\
790
791 \noindent Very last page's \textit{name} (VeryLastPage): \lastpageref{VeryLastPage}\\
792 (\texttt{LastPage} and \texttt{VeryLastPage} are identical, unless
793 a package with output \linebreak
794 \texttt{\textbackslash AtEndDocument} after the \textsf{pagesLTS} package
795 was added.)\\
796
797 \noindent Last page's \textit{number} (LastPages): \lastpageref{LastPages}{\hskip3em }
798 (=total number of pages)\\
799
800 \lipsum[1-3]
801
802 \newpage
803
804 \lastpageref{pagesLTS.Roman}
805 (\texttt{\textbackslash lastpageref\{pagesLTS.Roman\}})
806 \textbf{does} refers to this page, because the option
807 \texttt{pagecontinue=true} was chosen. Also\\
808 \texttt{\textbackslash lastpageref\{pagesLTS.Roman.3\}}
809 can be used: \lastpageref{pagesLTS.Roman.3}\\.\\
810
811 \bigskip
812
813 There are \lastpages{Roman}{3}~pages
814 (\texttt{\textbackslash lastpages\{Roman\}\{3\}})
815 in this third Roman sector.\\
816
817 \newpage
818
819 \pagenumbering{Alph}
820
821 \section{Alph}
822
823 \noindent First page (\texttt{\textbackslash lastpageref\{pagesLTS.0\}}):
824 \lastpageref{pagesLTS.0}\\
825
826 \noindent The page (\texttt{\textbackslash thepage}): \thepage \\

```

```

827
828 \noindent Current page (\texttt{\textbackslash theCurrentPage}),
829 i.\,e. counted continuously from the first page): \theCurrentPage \\
830
831 \noindent CurrentPageLocal (\texttt{\textbackslash theCurrentPageLocal}),
832 i.\,e. counted continuously from the first page of the
833 current page numbering scheme): \theCurrentPageLocal \\
834
835 \noindent Last roman page (pagesLTS.roman): \lastpageref{pagesLTS.roman}{\hskip4em }
836 (There are \lastpageref{pagesLTS.roman.local} pages with roman numbers.)\\
837
838 \noindent Last Roman page (pagesLTS.Roman): \lastpageref{pagesLTS.Roman}{\hskip3em }
839 (There are \lastpageref{pagesLTS.Roman.local}~pages with Roman numbers:\\
840 \lastpages{Roman}{1}~pages in the first Roman sector
841 (\pageref{Roman}{\hskip3em }-\lastpageref{pagesLTS.Roman.1}{\hskip3em }),\\
842 \lastpages{Roman}{2}~pages in the second Roman sector
843 (\pageref{Roman2}{\hskip3em }-\lastpageref{pagesLTS.Roman.2}{\hskip3em }), and\\
844 \lastpages{Roman}{3}~pages in the third Roman sector
845 (\pageref{Roman3}{\hskip3em }-\lastpageref{pagesLTS.Roman.3}{\hskip3em }).\\
846
847 \noindent Last arabic page (pagesLTS.arabic): \lastpageref{pagesLTS.arabic}{\hskip5em }
848 (There are only \lastpageref{pagesLTS.arabic.local} pages with arabic numbers,
849 because an \texttt{\textbackslash addtocounter\{page\}\{\pagesLTSexampleArabic\}} was used.)\\
850
851 \noindent Last fnsymbol page (pagesLTS.fnsymbol): \lastpageref{pagesLTS.fnsymbol} \\
852 (\texttt{\textbackslash lastpageref\{pagesLTS.fnsymbol\}} -- never
853 \texttt{\textbackslash pageref\{pagesLTS.fnsymbol\}}!)\\
854 (There are \lastpageref{pagesLTS.fnsymbol.local} pages with fnsymbol numbers.)\\
855
856 \noindent Last alph page (pagesLTS.alph): \lastpageref{pagesLTS.alph}{\hskip4em }
857 (There are only \lastpageref{pagesLTS.alph.local} pages with alph numbers,
858 because an \texttt{\textbackslash addtocounter\{page\}\{\pagesLTSexamplealph\}} was used.)\\
859
860 \noindent Last Alph page (pagesLTS.Alph): \lastpageref{pagesLTS.Alph}{\hskip4em }
861 (There are \lastpageref{pagesLTS.Alph.local} pages with Alph numbers.)\\
862
863 \noindent Last page's \textit{name} (LastPage): \lastpageref{LastPage}\\
864
865 \noindent Very last page's \textit{name} (VeryLastPage): \lastpageref{VeryLastPage}\\
866 (\texttt{LastPage} and \texttt{VeryLastPage} are identical, unless
867 a package with output \linebreak
868 \texttt{\textbackslash AtEndDocument} after the \textsf{pagesLTS} package
869 was added.)\\
870
871 \noindent Last page's \textit{number} (LastPages): \lastpageref{LastPages}{\hskip3em }
872 (=total number of pages)\\

```

```

873
874 \lipsum[1-3]
875
876 Without option \texttt{alphMulti=AB} of the \textsf{pagesLTS} (and the help of
877 Heiko Oberdiek's \textsf{alphalph} package), after page
878 \textquotedblleft Z\textquotedblright\ there would just appear a
879 \begin{quote}
880 \begin{verbatim}
881 LaTeX Error: Counter too large
882 See the LaTeX manual or LaTeX Companion for explanation.
883 You've lost some text. Try typing <return> to proceed.
884 If that doesn't work, type X <return> to quit.
885 \end{verbatim}
886 \end{quote}
887 Now the page numbers are continued AA, AB, AC,\ldots\ (AA, BB, CC,\ldots\ is
888 also possible, see the \textsf{pagesLTS} documentation).\
889 This is not demonstrated here, but see section~\ref{alph}.
890
891 \newpage
892
893 \section{The End}
894
895 \noindent First page (\texttt{\textbackslash lastpageref\{pagesLTS.0\}}):
896 \lastpageref{pagesLTS.0}\
897
898 \noindent The page (\texttt{\textbackslash thepage}): \thepage \
899
900 \noindent Current page (\texttt{\textbackslash theCurrentPage}),
901 i.\,e. counted continuously from the first page): \theCurrentPage \
902
903 \noindent CurrentPageLocal (\texttt{\textbackslash theCurrentPageLocal}),
904 i.\,e. counted continuously from the first page of the
905 current page numbering scheme): \theCurrentPageLocal \
906
907 \noindent Last roman page (pagesLTS.roman): \lastpageref{pagesLTS.roman}{\hskip4em }
908 (There are \lastpageref{pagesLTS.roman.local} pages with roman numbers.)\
909
910 \noindent Last Roman page (pagesLTS.Roman): \lastpageref{pagesLTS.Roman}{\hskip3em }
911 (There are \lastpageref{pagesLTS.Roman.local}~pages with Roman numbers:\
912 \lastpages{Roman}{1}~pages in the first Roman sector
913 (\pageref{Roman}{\hskip3em }-\lastpageref{pagesLTS.Roman.1}{\hskip3em }),\
914 \lastpages{Roman}{2}~pages in the second Roman sector
915 (\pageref{Roman2}{\hskip3em }-\lastpageref{pagesLTS.Roman.2}{\hskip3em }), and\
916 \lastpages{Roman}{3}~pages in the third Roman sector
917 (\pageref{Roman3}{\hskip3em }-\lastpageref{pagesLTS.Roman.3}{\hskip3em }).\
918

```

```

919 \noindent Last arabic page (pagesLTS.arabic): \lastpageref{pagesLTS.arabic}{\hskip5em }
920 (There are only \lastpageref{pagesLTS.arabic.local} pages with arabic numbers,
921 because an \texttt{\textbackslash addtocounter\{page\}\{\pagesLTSEXampleArabic\}} was used.)\
922
923 \noindent Last fnsymbol page (pagesLTS.fnsymbol): \lastpageref{pagesLTS.fnsymbol} \
924 (\texttt{\textbackslash lastpageref\{pagesLTS.fnsymbol\}} -- never
925 \texttt{\textbackslash pageref\{pagesLTS.fnsymbol\}}!\)\
926 (There are \lastpageref{pagesLTS.fnsymbol.local} pages with fnsymbol numbers.)\
927
928 \noindent Last alph page (pagesLTS.alph): \lastpageref{pagesLTS.alph}{\hskip4em }
929 (There are only \lastpageref{pagesLTS.alph.local} pages with alph numbers,
930 because an \texttt{\textbackslash addtocounter\{page\}\{\pagesLTSEXamplealph\}} was used.)\
931
932 \noindent Last Alph page (pagesLTS.Alph): \lastpageref{pagesLTS.Alph}{\hskip4em }
933 (There are \lastpageref{pagesLTS.Alph.local} pages with Alph numbers.)\
934
935 \noindent Last page's \textit{name} (LastPage): \lastpageref{LastPage}\
936
937 \noindent Very last page's \textit{name} (VeryLastPage): \lastpageref{VeryLastPage}\
938 (\texttt{LastPage} and \texttt{VeryLastPage} are identical, unless
939 a package with output \linebreak
940 \texttt{\textbackslash AtEndDocument} after the \textsf{pagesLTS} package
941 was added.)\
942
943 \noindent Last page's \textit{number} (LastPages): \lastpageref{LastPages}{\hskip3em }
944 (=total number of pages)\
945
946 \medskip
947
948 \noindent Page \thepage\ (\theCurrentPage; local: \theCurrentPageLocal) of %
949 \lastpageref{pagesLTS.roman} (\lastpageref{pagesLTS.roman.local}) + %
950 \lastpageref{pagesLTS.Roman} (\lastpageref{pagesLTS.Roman.local}) + %
951 \lastpageref{pagesLTS.arabic} (\lastpageref{pagesLTS.arabic.local}) + %
952 \lastpageref{pagesLTS.fnsymbol} (\lastpageref{pagesLTS.fnsymbol.local}) + %
953 \lastpageref{pagesLTS.alph} (\lastpageref{pagesLTS.alph.local}) + %
954 \lastpageref{pagesLTS.Alph} (\lastpageref{pagesLTS.Alph.local}) = %
955 \lastpageref{LastPages} pages.
956
957 \end{document}
958 \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.

```
959 \*package)
960 \NeedsTeXFormat{LaTeX2e}[1994/06/01]
961 \ProvidesPackage{pagesLTS}[2010/09/27 v1.1m
962           Refers to special pages' numbers/names (HMM)]%
963
```

A short description of the `pagesLTS` package:

```
964 %% Allows for things like\
965 %% |Page \thepage\ (\theCurrentPage; local: \theCurrentPageLocal) of %
966 %% \lastpageref{pagesLTS.roman}(\lastpageref{pagesLTS.roman.local}) + %
967 %% \lastpageref{pagesLTS.Roman}(\lastpageref{pagesLTS.Roman.local}) + %
968 %% \lastpageref{pagesLTS.arabic}(\lastpageref{pagesLTS.arabic.local}) + %
969 %% \lastpageref{pagesLTS.fnsymbol}(\lastpageref{pagesLTS.fnsymbol.local}) + %
970 %% \lastpageref{pagesLTS.alph}(\lastpageref{pagesLTS.alph.local}) + %
971 %% \lastpageref{pagesLTS.Alph}(\lastpageref{pagesLTS.Alph.local}) = %
972 %% \lastpageref{LastPages} pages.|\
973 %% to get\
974 %% 'Page d (57; local: 4) of ii(2) + XX(20) + *(1) + 30(30) + e(5) + C(3) = 61 pages.'.
975
```

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

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

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

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

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

```
978 \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).

```
979 \RequirePackage{undolabl}[2011/02/01]% v1.0h
```

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

```
980 %% pagesLTS package uses Prelim@EveryShipout code from the
981 %% prelim2e package [2009/05/29 v1.3] by Martin Schröder, thanks!
982
```

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

A last information for the user(s):

```
983 %% pagesLTS may work with earlier versions of those packages,  
984 %% but this was not tested. Please consider updating your packages  
985 %% to the most recent version (if they are not already the most  
986 %% recent version).  
987
```

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.

```
988 %% The recent version of the endfloat package is v2.4i as of 1995/10/11.  
989 %% The pagesLTS package is not fully compatible with version 2.0  
990 %% (and earlier) of the endfloat package, because those versions  
991 %% redefined the \enddocument command.  
992
```

The options are introduced:

```
993 \SetupKeyvalOptions{family = pagesLTS,prefix = pagesLTS@}  
994 \DeclareBoolOption[true]{pagecontinue} % \pagesLTS@pagecontinue  
995 \DeclareStringOption[ab]{alphMult}  
996 \DeclareStringOption[AB]{AlphMulti}  
997 \DeclareBoolOption[true]{romanMult}  
998 \DeclareBoolOption[true]{RomanMulti}  
999 \DeclareBoolOption[true]{fnsymbolmult}  
1000  
1001 \ProcessKeyvalOptions*  
1002
```

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

```
1003 \def\pagesLTS@zero{0}  
1004 \def\pagesLTS@one{1}  
1005
```

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.

```
1006 \ifpagesLTS@pagecontinue%  
1007   \PackageInfo{pagesLTS}{Option pagecontinue enabled\MessageBreak%  
1008     (maybe by default):\MessageBreak%  
1009     The pagesLTS package will continue the page numbering,\MessageBreak%  
1010     when the same page numbering scheme is used twice.\MessageBreak%  
1011 }
```

```

1011     If you do not want this, call pagesLTS with option\MessageBreak%
1012     pagecontinue=false\MessageBreak%
1013     (or use \ setcounter{page}=1).\MessageBreak%
1014 }%
1015 \else%
1016 \PackageWarningNoLine{pagesLTS}{Option pagecontinue is false:\MessageBreak%
1017     The pagesLTS package was used, but the option\MessageBreak%
1018     pagecontinue was set to false.\MessageBreak%
1019     If you want the page numbers to be continued,\MessageBreak%
1020     when the same page numbering scheme is used twice,\MessageBreak%
1021     please call pagesLTS with option pagecontinue=true,\MessageBreak%
1022     otherwise the page number is reset to one each time\MessageBreak%
1023     the page numbering scheme is changed.\MessageBreak%
1024     For details please see the documentation!\MessageBreak%
1025 }%
1026 \fi%
1027

```

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

```

1028 \def\pagesLTS@ab{ab}
1029 \def\pagesLTS@bb{bb}
1030 \def\pagesLTS@ABi{AB}
1031 \def\pagesLTS@BBi{BB}
1032 \def\pagesLTS@messageaMz{Option alphMult=0 found:\MessageBreak%
1033     The pagesLTS package was used, but the option\MessageBreak%
1034     alphMult was set to 0 (zero).\MessageBreak%
1035     If you want the page numbers to be extended\MessageBreak%
1036     after z, you have to organize this yourself now.\MessageBreak%
1037     For automatic continuation, please use the\MessageBreak%
1038     alphalph package and call pagesLTS\MessageBreak%
1039     with option alphMult=ab (for aa, ab, ac, ad,...) or\MessageBreak%
1040     with option alphMult=bb (for aa, bb, cc, dd,...).\MessageBreak%
1041     For details please see the documentation!\MessageBreak%
1042 }
1043 \def\pagesLTS@messageAMiz{Option AlphMulti=0 found:\MessageBreak%
1044     The pagesLTS package was used, but the option\MessageBreak%
1045     AlphMulti was set to 0 (zero).\MessageBreak%
1046     If you want the page numbers to be extended\MessageBreak%
1047     after Z, you have to organize this yourself now.\MessageBreak%
1048     For automatic continuation, please use the\MessageBreak%
1049     alphalph package and call pagesLTS\MessageBreak%

```

```

1050 with option AlphMulti=AB (for AA, AB, AC, AD,...) or\MessageBreak%
1051 with option AlphMulti=BB (for AA, BB, CC, DD,...).\MessageBreak%
1052 For details please see the documentation!\MessageBreak%
1053 }
1054 \def\pagesLTS@messagefsmz{Option fnsymbolmult is set to false:\MessageBreak%
1055 The pagesLTS package was used, but the option\MessageBreak%
1056 fnsymbolmult was set to false.\MessageBreak%
1057 If you want the page numbering of the footnotesymbol\MessageBreak%
1058 scheme to be extended using the alphalph package,\MessageBreak%
1059 please call pagesLTS with option fnsymbolmult=true,\MessageBreak%
1060 otherwise page numbers of the footnotesymbol scheme\MessageBreak%
1061 greater than nine will need to be defined otherwise.\MessageBreak%
1062 For details please see the documentation!\MessageBreak%
1063 }
1064
1065 \ifx\pagesLTS@alphMult\pagesLTS@ab%
1066 \relax%
1067 \else%
1068 \ifx\pagesLTS@alphMult\pagesLTS@bb%
1069 \relax%
1070 \else%
1071 \ifx\pagesLTS@alphMult\pagesLTS@zero%
1072 \PackageWarningNoLine{pagesLTS}{\pagesLTS@messageaMz }%
1073 \else%
1074 \PackageError{pagesLTS}{Unknown option value}%
1075 {The pagesLTS package was used with option\MessageBreak%
1076 alphMult= \pagesLTS@alphMult . Only values\MessageBreak%
1077 ab, bb, and 0 (zero) are valid.\MessageBreak%
1078 The default ab is set.\MessageBreak%
1079 For details please see the documentation!\MessageBreak%
1080 }%
1081 \setkeys{pagesLTS}{alphMult=ab}%
1082 \fi%
1083 \fi%
1084 \fi%
1085
1086 \ifx\pagesLTS@AlphMulti\pagesLTS@ABi%
1087 \relax%
1088 \else%
1089 \ifx\pagesLTS@AlphMulti\pagesLTS@BBi%
1090 \relax%
1091 \else%
1092 \ifx\pagesLTS@AlphMulti\pagesLTS@zero%
1093 \PackageWarningNoLine{pagesLTS}{\pagesLTS@messageAMiz }%
1094 \else%
1095 \PackageError{pagesLTS}{Unknown option value}%

```



```

1096 {The pagesLTS package was used with option\MessageBreak%
1097 AlphMulti= \pagesLTS@AlphMulti . Only values\MessageBreak%
1098 AB, BB, and 0 (zero) are valid.\MessageBreak%
1099 The default AB is set.\MessageBreak%
1100 For details please see the documentation!\MessageBreak%
1101 }%
1102 \setkeys{pagesLTS}{AlphMulti=AB}%
1103 \fi%
1104 \fi%
1105 \fi%
1106

```

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

```

1107 \ifpagesLTS@romanMult%
1108 \PackageInfo{pagesLTS}{Option romanMult enabled\MessageBreak%
1109 (maybe by default):\MessageBreak%
1110 The pagesLTS package will extend the page numbering\MessageBreak%
1111 of the roman scheme below i with\MessageBreak%
1112 0, -i, -ii, -iii, -iv,...\MessageBreak%
1113 If you do not want this, call pagesLTS with option\MessageBreak%
1114 romanMult=false.\MessageBreak%
1115 }%
1116 \else%
1117 \PackageWarningNoLine{pagesLTS}{Option romanMult is set to false:\MessageBreak%
1118 The pagesLTS package was used, but the option\MessageBreak%
1119 romanMult was set to false.\MessageBreak%
1120 If you want the page numbering of the roman scheme\MessageBreak%
1121 to be extended below i,\MessageBreak%
1122 please call pagesLTS with option romanMult=true,\MessageBreak%
1123 otherwise zero and negative page numbers of the\MessageBreak%
1124 roman scheme will need to be defined otherwise.\MessageBreak%
1125 For details please see the documentation!\MessageBreak%
1126 }%
1127 \fi%
1128

```

Same for the Roman page numbering scheme.

```

1129 \ifpagesLTS@RomanMulti%
1130 \PackageInfo{pagesLTS}{Option RomanMulti enabled\MessageBreak%
1131 (maybe by default):\MessageBreak%
1132 The pagesLTS package will extend the page numbering\MessageBreak%
1133 of the Roman scheme below I with\MessageBreak%
1134 0, -I, -II, -III, -IV,...\MessageBreak%
1135 If you do not want this, call pagesLTS with option\MessageBreak%
1136 RomanMulti=false.\MessageBreak%
1137 }%
1138 \else%

```

```

1139 \PackageWarningNoLine{pagesLTS}{Option RomanMulti is set to false:\MessageBreak%
1140 The pagesLTS package was used, but the option\MessageBreak%
1141 RomanMulti was set to false.\MessageBreak%
1142 If you want the page numbering of the Roman scheme\MessageBreak%
1143 to be extended below i,\MessageBreak%
1144 please call pagesLTS with option RomanMulti=true,\MessageBreak%
1145 otherwise zero and negative page numbers of the\MessageBreak%
1146 Roman scheme will need to be defined otherwise.\MessageBreak%
1147 For details please see the documentation!\MessageBreak%
1148 }%
1149 \fi%
1150

```

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

```

1151 \ifpagesLTS@fnsymbolmult%
1152 \PackageInfo{pagesLTS}{Option fnsymbolmult enabled\MessageBreak%
1153 (maybe by default):\MessageBreak%
1154 The pagesLTS package will extend the page numbering\MessageBreak%
1155 of the footnotesymbol scheme using the alphalph\MessageBreak%
1156 package.\MessageBreak%
1157 If you do not want this, call pagesLTS with option\MessageBreak%
1158 fnsymbolmult=false.\MessageBreak%
1159 }%
1160 \else%
1161 \PackageWarningNoLine{pagesLTS}{\pagesLTS@messagefsmz }%
1162 \fi%
1163

```

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

```

1164 \def\pagesLTS@pnc{0}
1165 \def\pagesLTS@called{0}
1166 \def\pagesLTS@fns{fnsymbol}
1167 \def\pagesLTS@alph{alph}
1168 \def\pagesLTS@Alph{Alph}
1169 \def\pagesLTS@AlphAlph{0}
1170 \def\pagesLTS@hyper{0}
1171 \def\pagesLTS@rerun{0}
1172 \def\pagesLTS@eso{0}
1173 \def\pagesLTS@esov{0}
1174 \def\lastpageref{\lastpagereftxt}
1175 \def\pagesLTS@undolable{none}
1176 \def\pncmissing{0}
1177 \def\pagesLTS@SK{0}

```

```

1178 \def\pagesLTS@messageNPN{%
1179   The pagesLTS package was used, but\MessageBreak%
1180   \textbackslash pagenumbering\MessageBreak%
1181   was not called at the beginning of the document\MessageBreak%
1182   (maybe earlier or later).\MessageBreak%
1183   Please use \textbackslash pagenumbering\MessageBreak%
1184   (with an argument like arabic, roman, Roman,\MessageBreak%
1185   fnsymbol, alph, or Alph) at the beginning\MessageBreak%
1186   of your document! Otherwise your document\MessageBreak%
1187   will probably compile, but the pagesLTS\MessageBreak%
1188   package might not be able to get all labels\MessageBreak%
1189   for the references to the respective pages\MessageBreak%
1190   right.\MessageBreak%
1191 }
1192

```

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

```

1193 \let\OrigPagenumbering\pagenumbering
1194

```

Defining some new counters (and doing related things):

```

1195 \newcounter{CurrentPage}
1196 \setcounter{CurrentPage}{1}
1197 \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.

```

1198 \newcounter{pagesLTS.pagenr}

```

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

```

1199 \newcounter{pagesLTS.current.local.0}
1200 \setcounter{pagesLTS.current.local.0}{1}

```

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

```

1201 \newcounter{pagesLTS.pnc.0}
1202

```

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

```

1203 \newcommand{\xroman}[1]{%
1204   \ifnum\value{#1}>0%
1205     \roman{#1}%
1206   \else%
1207     \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).

```

1208     -\romannumeral\number-\arabic{#1}%
1209   \else%
1210     0%
1211   \fi%
1212 \fi%
1213 }
1214

```

`\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).

```

1215 \newcommand{\XRoman}[1]{%
1216   \ifnum\value{#1}>0%
1217     \Roman{#1}%
1218   \else%
1219     \ifnum\value{#1}<0%
1220       -\expandafter\@slowromancap\romannumeral\number-\arabic{#1}@%
1221     \else%
1222       0%
1223     \fi%
1224   \fi%

```

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

```
1225 }
1226
```

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

```
1227 \newcommand{\XXRoman}[1]{\XRoman{#1}}%
1228 \PackageError{pagesLTS}{Old command \string\XXRoman\space found}{Replaced by \string\XRoman.}%
1229 }
1230
```

`\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}}
```

```
1231 \newcommand{\pagesLTS@ifcounter}[1]{%
1232 \ifundefined{c@#1}{\newcounter{#1}}{\relax}%
1233 }
1234
```

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

```
1235 \newcommand{\lastpages}[2]{%
1236 \pagesLTS@ifcounter{pagesLTS.#1.#2.local.cnt}%
1237 \arabic{pagesLTS.#1.#2.local.cnt}%
1238 }
1239
```

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

```
1240 \newcommand{\pagesLTS@writelabel}[1]{%
1241   \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`.

```
1242   \pagesLTS@putlabel{pagesLTS.#1}{\thepage}{1}
1243   \addtocounter{page}{-1}%
1244   \ifx\pagesLTS@pnc\pagesLTS@zero%
1245     \relax%
```

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

```
1246   \else%
1247     \addtocounter{page}{+1}%
1248     \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.

```
1249   \addtocounter{page}{-1}%
1250   \fi%
1251 }
1252
```

`\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.

```
1253
1254 %% The following code is from Heiko Oberdiek [2010/04/18], %%
1255 %% expanding his alphalph package [2010/04/18] v2.3. (Thanks!) %%
1256 \newcommand*{\erroralphalph}[2]{%
1257   \ifnum\value{#2}>0%
1258     #1{\value{#2}}%
1259   \else%
1260     \ifnum\value{#2}<0%
1261       -#1{\expandafter\@gobble\the\value{#2}}%
1262     \else%
1263       0%
```

```

1264   \fi%
1265   \fi%
1266 }
1267 %% End of code from Heiko Oberdiek          %%
1268 %% Check and Error/Warning messages have been moved to %%
1269 %% \EveryShipout, because messages inside e. g. the \pageref %%
1270 %% command can cause trouble.                %%
1271

```

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

```

1272
1273 \newcommand{\expandPagenumbering}[1]{%
1274   \let\Origthepage\thepage%
1275   \def\pagesLTS@tmpC{arabic}%
1276   \ifx\pagesLTS@pnc\pagesLTS@tmpC%
1277     \relax%

```

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

```

1278   \else%
1279     \def\pagesLTS@tmpC{roman}%
1280     \ifx\pagesLTS@pnc\pagesLTS@tmpC%
1281       \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.

```

1282       \renewcommand*{\thepage}{\xroman{page}}%
1283       \fi%
1284     \else%
1285       \def\pagesLTS@tmpC{Roman}%
1286       \ifx\pagesLTS@pnc\pagesLTS@tmpC%
1287         \ifpagesLTS@RomanMulti%

```

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

```

1288       \renewcommand*{\thepage}{\XRoman{page}}%
1289       \fi%
1290     \else%
1291       \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.

```

1292       \ifx\pagesLTS@alphMult\pagesLTS@ab%
1293       \renewcommand*{\thepage}{\erroralphalph{\alphalph}{page}}%
1294     \else \ifx\pagesLTS@alphMult\pagesLTS@bb%
1295       \renewcommand*{\thepage}{\erroralphalph{\alphMult}{page}}%
1296     \fi%

```

```

1297         \fi%
1298     \else%
1299         \ifx\pagesLTS@pnc\pagesLTS@Alph%
1300             \ifx\pagesLTS@AlphMulti\pagesLTS@ABi%
1301                 \renewcommand*{\thepage}{\erroralphalph{\AlphAlph}{page}}%
1302             \else \ifx\pagesLTS@AlphMulti\pagesLTS@BBi%
1303                 \renewcommand*{\thepage}{\erroralphalph{\AlphMult}{page}}%
1304             \fi%
1305         \fi%
1306     \else%
1307         \ifx\pagesLTS@pnc\pagesLTS@fns%

```

Same for \fnsymbol page numbers.

```

1308         \ifpagesLTS@fnsymbolmult%
1309             \renewcommand*{\thepage}{\erroralphalph{\fnsymbolmult}{page}}%
1310         \fi%
1311     \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.

```

1312         \PackageError{pagesLTS}{unknown page numbering scheme}{%
1313             The pagesLTS package encountered the unknown\MessageBreak%
1314             page numbering scheme\MessageBreak%
1315             ‘#1’. \MessageBreak%
1316             If this is no typing mistake, it might work\MessageBreak%
1317             - or it might not work.\MessageBreak%
1318             \@ehc%
1319         }
1320     \fi%
1321 \fi%
1322 \fi%
1323 \fi%
1324 \fi%
1325 \fi%
1326 \let\pagesLTS@tmpC\undefined%
1327 }
1328

```


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

```
1329 \renewcommand{\pagenumbering}[1]{%
```

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

```
1330 \edef\pagesLTS@tmpA{#1}%
1331 \ifx\pagesLTS@pnc\pagesLTS@fns%
1332 \pagesLTS@ifcounter{pagesLTS.fnsymbol.local}%
1333 \fi%
1334 \ifx\pagesLTS@tmpA\pagesLTS@fns%
1335 \pagesLTS@ifcounter{pagesLTS.fnsymbol.local}%
1336 \fi%
```

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

```
1337 \ifx\pagesLTS@pnc\pagesLTS@tmpA%
1338 \relax%
1339 \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.

```
1340 \ifnum \value{CurrentPage}>1%
1341 \addtocounter{page}{-1}%
1342 \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.

```
1343 \newcounter{pagesLTS.\pagesLTS@pnc.\arabic{pagesLTS.pnc.\pagesLTS@pnc}.local.count}%
1344 \setcounter{pagesLTS.\pagesLTS@pnc.\arabic{pagesLTS.pnc.\pagesLTS@pnc}.local.count}{%
1345 \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`.

```
1346 \ifx\pagesLTS@pnc\pagesLTS@fns%
1347 \ifnum \value{pagesLTS.pnc.\pagesLTS@pnc}>1%
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 \addtocounter{pagesLTS.\pagesLTS@pnc.\arabic{pagesLTS.pnc.\pagesLTS@pnc}.local.count}{%
1352 -\value{pagesLTS.\pagesLTS@pnc.\arabic{pagesLTS.pnc.0}.local.count}}%
```

```

1353      \setcounter{pagesLTS.pnc.0}{\pagesLTS@tmpa}%
1354      \fi%

```

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

```

1355      \else%
1356      \pagesLTS@writelabel{\pagesLTS@pnc.\arabic{pagesLTS.pnc.\pagesLTS@pnc}}%

```

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

```

1357      \ifnum \value{pagesLTS.pnc.\pagesLTS@pnc}<2%

```

an unnumbered label is also written:

```

1358      \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).

```

1359      \else%
1360      \mathchardef\pagesLTS@tmpa=\arabic{pagesLTS.pnc.0}%
1361      \setcounter{pagesLTS.pnc.0}{\value{pagesLTS.pnc.\pagesLTS@pnc}}%
1362      \addtocounter{pagesLTS.pnc.0}{-1}%
1363      \pagesLTS@ifcounter{pagesLTS.\pagesLTS@pnc.done}%
1364      \addtocounter{pagesLTS.\pagesLTS@pnc.done}{%
1365        \value{pagesLTS.\pagesLTS@pnc.\arabic{pagesLTS.pnc.0}.local.count}}%
1366      \addtocounter{pagesLTS.\pagesLTS@pnc.\arabic{pagesLTS.pnc.\pagesLTS@pnc}.local.count}{%
1367        -\value{pagesLTS.\pagesLTS@pnc.done}}%
1368      \setcounter{pagesLTS.pnc.0}{\pagesLTS@tmpa}%
1369      \fi%

```

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

```

1370      \if@files%
1371      \immediate\write\@auxout{\string
1372        \pagesLTS@ifcounter{pagesLTS.\pagesLTS@pnc.\arabic{pagesLTS.pnc.\pagesLTS@pnc}.local.cnt}}%
1373      \fi%
1374      \edef\pagesLTS@tmpB{\arabic{pagesLTS.\pagesLTS@pnc.\arabic{pagesLTS.pnc.\pagesLTS@pnc}.local.count}}%
1375      \if@files%
1376      \immediate\write\@auxout{\string
1377        \setcounter{pagesLTS.\pagesLTS@pnc.\arabic{pagesLTS.pnc.\pagesLTS@pnc}.local.cnt}{\pagesLTS@tmpB}}%
1378      \fi%
1379      \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.

```

1380      \pagesLTS@ifcounter{pagesLTS.double.\pagesLTS@pnc}%
1381      \setcounter{pagesLTS.double.\pagesLTS@pnc}{\value{page}}%

```

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

```
1382 \addtocounter{pagesLTS.current.local.\pagesLTS@pnc}{+1}%
1383 \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:

```
1384 \global\edef\pagesLTS@pnc{#1}%
```

The new page numbering scheme is now started for real:

```
1385 \OrigPagenumbering{#1}%
```

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

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

```
1386 \expandPagenumbering{#1}
```

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

```
1387 \pagesLTS@ifcounter{pagesLTS.pnc.\pagesLTS@pnc}%
```

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

```
1388 \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):

```
1389 \pagesLTS@ifcounter{pagesLTS.double.\pagesLTS@pnc}%
1390 \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.

```
1391 \ifpagesLTS@pagecontinue%
1392 \setcounter{page}{\value{pagesLTS.double.\pagesLTS@pnc}}%
1393 \else%
1394 \setcounter{page}{1}%
1395 \fi%
```

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

```
1396 \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.

```
1397 \ifnum \value{pagesLTS.double.\pagesLTS@pnc}=1%
1398 \setcounter{pagesLTS.current.local.\pagesLTS@pnc}{1}%
1399 \fi%
```

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

```
1400   \else%
1401     %% before the first page has shipped out
```

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

```
1402   \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:

```
1403   \countdef\c@page=0 \c@page=1
1404   \def\c1@page{}
1405   \global\c@page \@ne
1406   \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.

```
1407   \expandPagenumbering{#1}
```

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

```
1408   \pagesLTS@ifcounter{pagesLTS.pnc.\pagesLTS@pnc}%
1409   \setcounter{pagesLTS.pnc.\pagesLTS@pnc}{1}%
1410   \pagesLTS@ifcounter{pagesLTS.double.\pagesLTS@pnc}%
1411   \setcounter{pagesLTS.double.\pagesLTS@pnc}{1}%
1412   \pagesLTS@ifcounter{pagesLTS.current.local.\pagesLTS@pnc}%
1413   \setcounter{pagesLTS.current.local.\pagesLTS@pnc}{1}%
1414   \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:

```
1415   \gdef\pagesLTS@called{1}%
1416   \fi%
```

We do not need the temporary definitions any more.

```
1417   \let\pagesLTS@tmpA\undefined%
1418   \let\pagesLTS@tmpB\undefined%
1419   }
1420
```

`\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)

```
1421 % analogous to \HyPsd@pageref from the hyperref package of Heiko Oberdiek:
1422 \def\lastpagereftxt#1{\pagesLTS@@pageref#1*}END}
1423
```

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

```
1424 \def\pagesLTS@@pageref#1*#2\END{%
1425   \ifx\#2\% no star
1426     \pagesLTS@@pageref{#1}%
1427   \else% star
1428     \expandafter\pagesLTS@@pagerefstar%
1429   \fi%
1430 }
1431
1432 \def\pagesLTS@@pageref#1{\lastpagereftext{#1}}
1433 \def\pagesLTS@@pagerefstar#1{\lastpagereftextstar{#1}}
1434
```

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

```
1435 \newcommand{\lastpagereftext}[1]{%
1436   \def\pagesLTS@tmpA{#1}%
1437   \def\pagesLTS@tmpB{pagesLTS.fnsymbol.local}%
1438   \ifx\pagesLTS@tmpA\pagesLTS@tmpB%
1439     \pagesLTS@ifcounter{pagesLTS.fnsymbol.local}%
1440     \ifx\pagesLTS@hyper\pagesLTS@one%
1441       \href{\#pagesLTS.fnsymbol.local.\arabic{pagesLTS.fnsymbol.local}}{%
1442         {\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).

```
1443   \else \arabic{pagesLTS.fnsymbol.local}%
1444   \fi%
```

Otherwise just the common `\pageref` is applied:

```
1445   \else%
1446     \pageref{#1}%
1447   \fi%
```

We do not need the temporary definitions any more.

```

1448 \let\pagesLTS@tmpA\undefined%
1449 \let\pagesLTS@tmpB\undefined%
1450 }
1451

```

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

```

1452 \newcommand{\lastpagereftextstar}[1]{%
1453   \def\pagesLTS@tmpA{#1}%
1454   \def\pagesLTS@tmpB{\pagesLTS.fnsymbol.local}%
1455   \ifx\pagesLTS@tmpA\pagesLTS@tmpB%
1456     \pagesLTS@ifcounter{\pagesLTS.fnsymbol.local}%
1457     \arabic{\pagesLTS.fnsymbol.local}%
1458   \else%
1459     \ifx\pagesLTS@hyper\pagesLTS@one%
1460       \pageref*{#1}%
1461     \else%

```

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

```

1462       \pageref{#1}%
1463     \fi%
1464   \fi%
1465   \let\pagesLTS@tmpA\undefined%
1466   \let\pagesLTS@tmpB\undefined%
1467 }
1468

```

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

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

```

1469 \def\lastpagerefend#1{\pagesLTS@@pagerefend#1*\END}
1470
1471 \def\pagesLTS@@pagerefend#1*#2\END{%
1472   \ifx\\#2\\% no star
1473     \pagesLTS@@@pagerefend{#1}%
1474   \else% star
1475     \expandafter\pagesLTS@@@pagerefendstar%
1476   \fi%
1477 }
1478
1479 \def\pagesLTS@@@pagerefend#1{\l@stpagerefend{#1}}
1480 \def\pagesLTS@@@pagerefendstar#1{\l@stpagerefendstar{#1}}
1481

```

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

```
1482 \newcommand{\l@stpagerefend}[1]{%
1483   \def\pagesLTS@tmpA{#1}%
1484   \def\pagesLTS@tmpB{\pagesLTS.fnsymbol.local}%
1485   \ifx\pagesLTS@tmpA\pagesLTS@tmpB%
1486     \pagesLTS@ifcounter{\pagesLTS.fnsymbol.local}%
1487     \ifx\pagesLTS@hyper\pagesLTS@one%
1488       \href{\#pagesLTS.fnsymbol.local.\arabic{\pagesLTS.fnsymbol.local}}%
1489       {\arabic{\pagesLTS.fnsymbol.local}}%
1490     \else \arabic{\pagesLTS.fnsymbol.local}%
1491     \fi%
1492   \else%
1493     \def\pagesLTS@tmpB{\pagesLTS.fnsymbol}%
1494     \ifx\pagesLTS@tmpA\pagesLTS@tmpB%
1495       \ifx\pagesLTS@hyper\pagesLTS@one%
1496         \href{\#pagesLTS.fnsymbol.local.\arabic{\pagesLTS.fnsymbol.local}}%
1497         {\pagesLTS.lastpage}%
1498       \else \pageref{\pagesLTS.fnsymbol}%
1499       \fi%
1500     \else%
1501       \def\pagesLTS@tmpB{LastPage}%
1502       \ifx\pagesLTS@tmpA\pagesLTS@tmpB%
1503         \ifx\pagesLTS@hyper\pagesLTS@one%
1504           \href{\#pagesLTS.fnsymbol.local.\pagesLTS@eso}%
1505           {\pagesLTS.lastpage}%
1506         \else \pageref{LastPage}%
1507         \fi%
1508       \else%
1509         \def\pagesLTS@tmpB{VeryLastPage}%
1510         \ifx\pagesLTS@tmpA\pagesLTS@tmpB%
1511           \ifx\pagesLTS@hyper\pagesLTS@one%
1512             \href{\#pagesLTS.fnsymbol.local.\arabic{\pagesLTS.fnsymbol.local}}%
1513             {\pagesLTS.lastpage}%
1514           \else \pageref{VeryLastPage}%
1515           \fi%
1516         \else%
1517           \def\pagesLTS@tmpB{LastPages}%
1518           \ifx\pagesLTS@tmpA\pagesLTS@tmpB%
1519             \ifx\pagesLTS@hyper\pagesLTS@one%
1520               \href{\#pagesLTS.fnsymbol.local.\arabic{\pagesLTS.fnsymbol.local}}%
1521               {\arabic{\pagesLTS.pagenr}}%
1522             \else \pageref{LastPages}%
1523             \fi%
1524           \else%
1525             \pageref{#1}%
1526           \fi%
```

```

1527     \fi%
1528     \fi%
1529     \fi%
1530     \fi%

```

We do not need the temporary definitions any more.

```

1531 \let\pagesLTS@tmpA\undefined%
1532 \let\pagesLTS@tmpB\undefined%
1533 }
1534

```

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

```

1535 \newcommand{\l@stpagerefendstar}[1]{%
1536   \def\pagesLTS@tmpA{#1}%
1537   \def\pagesLTS@tmpB{pagesLTS.fnsymbol.local}%
1538   \ifx\pagesLTS@tmpA\pagesLTS@tmpB%
1539     \pagesLTS@ifcounter{pagesLTS.fnsymbol.local}%
1540     \arabic{pagesLTS.fnsymbol.local}%
1541   \else%
1542     \def\pagesLTS@tmpB{pagesLTS.fnsymbol}%
1543     \ifx\pagesLTS@tmpA\pagesLTS@tmpB%
1544       \ifx\pagesLTS@hyper\pagesLTS@one%
1545         \pageref*{pagesLTS.fnsymbol}%
1546       \else \pageref{pagesLTS.fnsymbol}%
1547       \fi%
1548     \else%
1549       \def\pagesLTS@tmpB{LastPage}%
1550       \ifx\pagesLTS@tmpA\pagesLTS@tmpB%
1551         \ifx\pagesLTS@hyper\pagesLTS@one%
1552           \pageref*{LastPage}%
1553         \else \pageref{LastPage}%
1554         \fi%
1555       \else%
1556         \def\pagesLTS@tmpB{VeryLastPage}%
1557         \ifx\pagesLTS@tmpA\pagesLTS@tmpB%
1558           \ifx\pagesLTS@hyper\pagesLTS@one%
1559             \pageref*{VeryLastPage}%
1560           \else \pageref{VeryLastPage}%
1561           \fi%
1562         \else%
1563           \def\pagesLTS@tmpB{LastPages}%
1564           \ifx\pagesLTS@tmpA\pagesLTS@tmpB%
1565             \ifx\pagesLTS@hyper\pagesLTS@one%
1566               \pageref*{LastPages}%
1567             \else \pageref{LastPages}%
1568             \fi%

```



```

1569         \else%
1570         \ifx\pagesLTS@hyper\pagesLTS@one%
1571         \pageref*{#1}%
1572         \else \pageref{#1}%
1573         \fi%
1574     \fi%
1575 \fi%
1576 \fi%
1577 \fi%
1578 \fi%
1579 \let\pagesLTS@tmpA\undefined%
1580 \let\pagesLTS@tmpB\undefined%
1581 }
1582

```

`\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`:

```

1583 % somewhat analogous to \overridelabel from the undolabl package:
1584 \newcommand\overrideLTSlabel[2]{%
1585     \@bsphack
1586     \ifnum \value{pagesLTS.pnc.\pagesLTS@pnc}>1%
1587         \edef\pagesLTStmpA{#1}%
1588         \edef\pagesLTStmpB{pagesLTS.\pagesLTS@pnc.local}%
1589         \ifx\pagesLTStmpA\pagesLTStmpB%
1590             \immediate\write\@auxout{\string\undonewlabel{#1}\string\relax}%
1591             \@overriddenmessage s{#1}%
1592         \fi%
1593     \fi%
1594     \pagesLTS@putlabel{#1}{#2}{0}%
1595     \@esphack%
1596 }
1597

```

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.

```

1598 \newcommand{\@pagesLTS@Prelim@EveryShipout}{%
1599 %% The following code is from the prelim2e package          %%
1600 %% [2009/05/29 v1.3] by Martin Schr\"{o}der (Thanks!):      %%
1601   \bgroup
1602     \dimen\z@=\wd\@cclv
1603     \dimen\@ne=\ht\@cclv
1604     \dimen\tw@=\dp\@cclv
1605     \dimen\thr@@=\dimen1
1606     \advance\dimen\thr@@ by \dimen\tw@
1607     \global\setbox\@cclv\vbox to \dimen\thr@@{%
1608       \hb@xt@\dimen\z@{%
1609         \box\@cclv%
1610         \hss%
1611       }%
1612     \vbox to \z@{%
1613       \hb@xt@\dimen\z@{%
1614         \let\protect\relax
1615 %% 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.

```

1616   \ifx\pagesLTS@pnc\pagesLTS@fns%
1617     \pagesLTS@ifcounter{pagesLTS.fnsymbol.cont}%
1618     \addtocounter{pagesLTS.fnsymbol.cont}{1}%
1619     \ifx\pagesLTS@hyper\pagesLTS@one%
1620       \phantomsection%
1621       \hypertarget{pagesLTS.fnsymbol.local.\arabic{pagesLTS.fnsymbol.cont}}{}%
1622     \fi%
1623     \ifnum \pagesLTS@esov=\pagesLTS@zero%
1624       \label{pagesLTS.fnsymbol}%
1625     \else%
1626       \overridelabel{pagesLTS.fnsymbol}%
1627     \fi%
1628   \else%
1629     \ifx\pagesLTS@hyper\pagesLTS@one%
1630       \phantomsection%
1631     \fi%
1632     \if@filesw%
1633       \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.

```

1634         \addtocounter{page}{+1}%
1635         \overrideLTSlabel{pagesLTS.\pagesLTS@pnc.local}{\theCurrentPageLocal}%
1636         \addtocounter{page}{-1}%
1637     \fi%
1638 \fi%
1639 %% Code from prelim2e package again:                %%
1640     }%
1641     \vss%
1642 }%
1643 \vss%
1644 }%
1645 \wd\@cclv=\dimen\z@
1646 \ht\@cclv=\dimen\@ne
1647 \dp\@cclv=\dimen\tw@
1648 \egroup
1649 %% End of code from the prelim2e package.            %%
1650 }
1651
```

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

```

1652 \EveryShipout{%
1653     \ifnum\value{page}>0%
1654         \relax%
1655     \else%
1656         \ifnum\value{page}=0%
1657             \PackageWarning{pagesLTS}{%
1658                 Counter ‘page’ is zero!\MessageBreak%
1659                 If the page numbering scheme is not arabic\MessageBreak%
1660                 and further not extended\MessageBreak%
1661                 (see Page counter overflow in the pagesLTS\MessageBreak%
1662                 documentation), without other measures\MessageBreak%
1663                 this will lead to a counter overflow.\MessageBreak%
1664             }%
1665         \else%
1666             \ifnum\value{page}<0%
1667                 \PackageWarning{pagesLTS}{%
1668                     Counter ‘page’ is negative: ‘\the\value{page}’!\MessageBreak%
1669                     If the page numbering scheme is not arabic\MessageBreak%
1670                     and further not extended\MessageBreak%
1671                     (see Page counter overflow in the pagesLTS\MessageBreak%
1672                     documentation), without other measures\MessageBreak%
1673                     this will lead to a counter overflow.\MessageBreak%
1674                 }%
1675             \else%

```

```

1676 \PackageError{pagesLTS}{%
1677 Counter 'page' does not have a recognized value:\MessageBreak%
1678 '\the\value{page}'\MessageBreak%
1679 \@ehd \MessageBreak%
1680 }%
1681 \fi%
1682 \fi%
1683 \fi%

```

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

```

1684 \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).

```

1685 \@ifundefined{Hy@Warning}{% hyperref not loaded
1686 }{% hyperref loaded
1687 \gdef\pagesLTS@hyper{1}%
1688 }%

```

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

```

1689 \ifx\pagesLTS@called\pagesLTS@zero%

```

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

```

1690 \global\def\pncmissing{1}%

```

We save the current value of the page,

```

1691 \mathchardef\pagesLTS@tmpD=\arabic{page}%

```

determine the current page numbering scheme,

```
1692 %% Code from Andres L\{o}h, Universiteit Utrecht (NL) %%
1693 \def\extract#1{\expandafter\extract@ #1\END}%
1694 \def\extract@#1\csname @#2\endcsname#3\END{#2}%
1695 \edef\pagesLTS@tmpQ{\extract\thepage}%
1696 %% End of code from Andres L\{o}h %%
1697 \let\pagesLTS@tmpP\pagesLTS@tmpQ%
```

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

```
1698 \def\pagesLTS@pnc{0}%
```

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

```
1699 \pagenumbering{\pagesLTS@tmpP}%
```

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

```
1700 \setcounter{page}{\pagesLTS@tmpD}%
1701 \fi%
```

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

```
1702 \pagesLTS@writelabel{0}%
1703 \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).

```
1704 \ifx\pagesLTS@pnc\pagesLTS@fns%
1705 \@pagesLTS@Prelim@EveryShipout%
1706 \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.

```
1707 \else%
1708 \ifnum \value{pagesLTS.pnc.\pagesLTS@pnc}>1%
1709 \@pagesLTS@Prelim@EveryShipout%
1710 \fi%
1711 \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).

```
1712 \addtocounter{CurrentPage}{1}%
```

```

1713 \addtocounter{pagesLTS.current.local.\pagesLTS@pnc}{1}%
1714 }
1715

```

\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.

```

1716 \newcommand{\pagesLTS@putlabelhyper}[2]{%
1717   \ifHy@pageanchor \relax%
1718   \else%

```

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

```

1719   \PackageError{pagesLTS}{hyperref option pageanchor disabled}{%
1720     The \string\lastpageref{#1} link doesn't work\MessageBreak%
1721     using hyperref with disabled option 'pageanchor'.\MessageBreak%
1722   }%
1723 \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.

```

1724 %% The following code is from the hyperref package          %%
1725 %% [2010/04/17 v6.80x; newer versions are available]        %%
1726 %% by Heiko Oberdiek (Big Thanks!).                          %%
1727 \if@filesw
1728   \begingroup
1729     \let\@number\@firstofone
1730     \ifHy@pageanchor
1731       \ifHy@hypertextnames
1732         \ifHy@plainpages
1733           \def\Hy@temp{\arabic{page}}%
1734         \else
1735           \Hy@unicodedefalse
1736 %% Code not from hyperref package:                             %%
1737 %% The following lines are modified from the hyperref package. %%
1738 %% Without the modification, after the first shipout "PD1" is %%
1739 %% inserted each time |\pdfstringdef\Hy@temp{\thepage}| is    %%
1740 %% executed (if |fnsymbol| is not used).                       %%
1741       \ifnum \value{CurrentPage}=1%
1742         \ifx\pagesLTS@pnc\pagesLTS@fns%
1743           \pdfstringdef\Hy@temp{\thepage}%
1744         \else%
1745           \def\Hy@temp{\thepage}%
1746         \fi%
1747       \else%
1748         \pdfstringdef\Hy@temp{\thepage}%
1749       \fi%

```

```

1750 %% Code from hyperref package again: %%
1751     \fi
1752     \else
1753         \def\Hy@temp{\the\Hy@pagecounter}%
1754     \fi
1755     \fi
1756 %% End of code from the hyperref package. %%
1757 %% (The following four lines are modified %%
1758 %% from the hyperref package.) %%
1759     \immediate\write\@auxout{\string
1760         \newlabel{#1}{#2}{\ifHy@pageanchor page.\Hy@temp\fi}{}}%
1761     \endgroup%
1762 \fi%
1763 }
1764

```

`\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.

```

1765 \newcommand{\pagesLTS@putlabel}[3]{%
1766     \addtocounter{page}{-1}%

```

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

```

1767 \ifx\pagesLTS@SK\pagesLTS@one%
1768     \message{^^J}%
1769     \message{Package pagesLTS Warning: Package showkeys without option final loaded,}%
1770     \ifnum\value{pagesLTS.pagenr}<1%
1771         \message{(pagesLTS)                but label #1 on page \thepage\space(about \theCurrentPage)}%
1772     \else%
1773         \message{(pagesLTS)                but label #1 on page \thepage\space(about \theCurrentPage\space of \arabic{pagesLTS.pagenr})}%
1774     \fi%
1775     \message{(pagesLTS)                cannot be shown, because pagesLTS does not use \string\label,}%
1776     \message{(pagesLTS)                but writes directly to the \jobname.aux file. ^^J}%
1777 \fi%

```

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

```

1778 \ifx\pagesLTS@hyper\pagesLTS@one%
1779     \pagesLTS@putlabelhyper{#1}{#2}%
1780 \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.

```

1781 \if@files%
1782 \ifnum \value{pagesLTS.pnc}.\pagesLTS@pnc<2%
1783 \immediate\write\@auxout{\string
1784 \newlabel{#1}{{}{#2}}}%
1785 \else%
1786 \edef\pagesLTStmpA{#1}%
1787 \edef\pagesLTStmpB{pagesLTS.\pagesLTS@pnc.local}%
1788 \ifx\pagesLTStmpA\pagesLTStmpB%
1789 \edef\pagesLTStmpA{#3}%
1790 \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.

```

1791 \immediate\write\@auxout{\string
1792 \undonewlabel{#1}}%
1793 \fi%
1794 \fi%
1795 \immediate\write\@auxout{\string
1796 \newlabel{#1}{{}{#2}}}%
1797 \fi%
1798 \fi%
1799 \fi%

```

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

```

1800 \addtocounter{page}{+1}%
1801 }
1802

```


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

```
1803 \newcommand{\pagesLTS@putlabels}{%
1804   \addtocounter{page}{-1}%
1805   \addtocounter{CurrentPage}{-1}%
1806   \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.

```
1807   \ifx\pagesLTS@pnc\pagesLTS@zero%
1808     \PackageWarning{pagesLTS}{No page numbering scheme found:\MessageBreak%
1809       \pagesLTS@messageNPN }%
```

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

```
1810   \else%
1811     \pagesLTS@writelabel{\pagesLTS@pnc.\arabic{pagesLTS.pnc.\pagesLTS@pnc}}%
1812     \ifnum \value{pagesLTS.pnc.\pagesLTS@pnc}<2%
1813       \ifx\pagesLTS@pnc\pagesLTS@fns%
1814         \relax%
1815       \else%
1816         \pagesLTS@writelabel{\pagesLTS@pnc}%
1817       \fi%
1818     \fi%
1819   \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).

```
1820   \addtocounter{page}{+1}%
1821   \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:

```
1822   \addtocounter{CurrentPage}{+1}%
1823   \addtocounter{pagesLTS.current.local.\pagesLTS@pnc}{1}%
1824 }
1825
```

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

```
1826 \AtBeginDocument{%
1827   \if@filesw \relax%
1828   \else%
1829     \PackageError{pagesLTS}{No auxiliary file allowed.}%
1830     {The pagesLTS package was not allowed to write to an .aux file.\MessageBreak%
1831     This package does not work without access to an .aux file.\MessageBreak%
1832     Press Ctrl+Z to exit.\MessageBreak%
1833   }%
1834 \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).

```
1835 \@ifpackageloaded{endfloat}%
1836   {\@ifpackagelater{endfloat}{1992/03/31}% April 1992 v2.0
1837   {\@ifpackagelater{endfloat}{1995/10/10}{% 1995/10/11 v2.4i
1838     \relax}%
```

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

```
1839   {\PackageWarningNoLine{pagesLTS}{Old endfloat package detected:\MessageBreak%
1840   There is a newer version of the endfloat package available.\MessageBreak%
1841   Please consider updating your version.\MessageBreak%
1842   The pagesLTS package might be incompatible with\MessageBreak%
1843   your current endfloat package.\MessageBreak%
1844   }%
1845   }%
```

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

```
1846   {\PackageError{pagesLTS}{Incompatible, very old endfloat package detected.}%
1847   {The very old version 2.0 (and earlier) of the\MessageBreak%
1848   endfloat package actually redefined the \ enddocument,\MessageBreak%
1849   and so interferred drastically with the LaTeX2e commands\MessageBreak%
1850   which make use of \ AtEndDocument.\MessageBreak%
1851   Newer versions of the endfloat package exists\MessageBreak%
1852   (at least: v2.4i as of 1995/10/11)\MessageBreak%
1853   in modern documentation form,\MessageBreak%
1854   which should be available from CTAN.\MessageBreak%
1855   Please update your endfloat package\MessageBreak%
1856   for use with the pagesLTS package.\MessageBreak %
1857   }%
1858   }%
1859   }%
1860   }{}%
```

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

```

1861 \@ifpackageloaded{lastpage}%
1862   {\@ifpackagelater{lastpage}{2010/07/28}% 2010/07/29 v1.2a
1863     {\@ifpackagelater{lastpage}{2011/01/31}% 2011/02/01 v1.2g
1864       {\PackageWarning{pagesLTS}{lastpage package detected.\MessageBreak%
1865         With pagesLTS package in use, lastpage has no function.\MessageBreak%
1866         Just remove the lastpage package from your document.\MessageBreak%
1867       }%
1868     }{%
1869       \PackageWarning{pagesLTS}{Old lastpage package detected.\MessageBreak%
1870         With pagesLTS package in use, lastpage has no function.\MessageBreak%
1871         Just remove the lastpage package from your document.\MessageBreak%
1872         At least update it!\MessageBreak%
1873       }%
1874     }%
1875   }{%
1876     \PackageWarning{pagesLTS}{Incompatible package lastpage detected:\MessageBreak%
1877       Package pagesLTS was loaded, but also an old\MessageBreak%
1878       version of the lastpage package.\MessageBreak%
1879       pagesLTS has all functionality of the lastpage\MessageBreak%
1880       package (and more), so just remove the lastpage\MessageBreak%
1881       package from your document.\MessageBreak%
1882       (At least update it!)\MessageBreak%
1883       pagesLTS will now ''kill'' the lastpage@putlabel\MessageBreak%
1884       command of the lastpage package.\MessageBreak%
1885     }%
1886     \gdef\lastpage@putlabel{\relax}%
1887   }%
1888 }{}%
```

Further it is checked whether the alphas package is loaded.

```

1889 \@ifpackageloaded{alphas}%
1890   {\PackageInfo{pagesLTS}{Package alphas detected.\MessageBreak%
1891     pagesLTS supports alphas. Congratulations!\MessageBreak%
1892   }%

```

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:

```

1893 \global\def\pagesLTS@AlphaAlpha{1}%

```

The commands are defined accordingly.

```

1894 \newalphalph{\AlphaMult}[mult]{\@Alpha}{26}%
1895 \newalphalph{\alphaMult}[mult]{\@alpha}{26}%
1896 \newalphalph{\fnsymbolmult}[mult]{\@fnsymbol}{5}%

```

1897 }%

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

```
1898 {\ifx\pagesLTS@alphMult\pagesLTS@zero%
1899   \PackageWarning{pagesLTS}{\pagesLTS@messageaMz }%
1900   \else%
1901     \PackageError{pagesLTS}{Package alphanth not loaded}%
1902     {Package alphanth was not loaded, but package pagesLTS\MessageBreak%
1903     was called without option alphMult=0 (zero).\MessageBreak%
1904     Either load package alphanth,\MessageBreak%
1905     or give option alphMult=0 (zero) to the pagesLTS package.\MessageBreak%
1906     }%
1907   \fi%
1908   \ifx\pagesLTS@AlphMulti\pagesLTS@zero%
1909     \PackageWarning{pagesLTS}{\pagesLTS@messageAMiz }%
1910     \relax%
1911     \else%
1912       \PackageError{pagesLTS}{Package alphanth not loaded}%
1913       {Package alphanth was not loaded, but package pagesLTS\MessageBreak%
1914       was called without option AlphMulti=0 (zero).\MessageBreak%
1915       Either load package alphanth,\MessageBreak%
1916       or give option AlphMulti=0 (zero) to the pagesLTS package.\MessageBreak%
1917       }%
1918     \fi%
1919     \ifpagesLTS@fnsymbolmult%
1920       \PackageError{pagesLTS}{Package alphanth not loaded}%
1921       {Package alphanth was not loaded, but package pagesLTS\MessageBreak%
1922       was called without option fnsymbolmult=false.\MessageBreak%
1923       Either load package alphanth,\MessageBreak%
1924       or give option fnsymbolmult=false to the pagesLTS package.\MessageBreak%
1925       }%
1926     \else%
1927       \PackageWarning{pagesLTS}{\pagesLTS@messagefsmz }%
1928     \fi%
1929   }%
```

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

```
1930 \@ifpackageloaded{hyperref}%
1931   {\PackageInfo{pagesLTS}{Package hyperref detected.\MessageBreak%
1932   pagesLTS supports hyperref. Congratulations!\MessageBreak%
1933   }%
1934   \global\def\pagesLTS@hyper{1}%
```

and whether the `pdfpages` package is loaded:

```
1935   \@ifpackageloaded{pdfpages}%
1936     {\PackageWarning{pagesLTS}{Package pdfpages detected.\MessageBreak%
1937     Using hyperref with pdfpages can cause problems. See\MessageBreak%
```

```

1938      ftp://ftp.ctan.org/tex-archive/macros/latex/contrib/pax/\MessageBreak%
1939      for project pax (PDFAnnotExtractor).\MessageBreak%
1940      }%
1941      }{\relax}%

```

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

```

1942      \@ifpackagelater{undolabl}%
1943      {\@ifpackagelater{undolabl}{2010/07/14}% 2010/07/15 v1.0d
1944      {\@ifpackagelater{undolabl}{2011/01/31}% 2011/02/01 v1.0h
1945      {% recent version as of the time of last revision of this package: OK
1946      }{% old, but not obsolete version
1947      \PackageWarningNoLine{pagesLTS}{Old version of undolabl package used.\MessageBreak%
1948      See ftp://ftp.ctan.org/tex-archive/macros/latex/contrib/undolabl/ \MessageBreak%
1949      for a new version.\MessageBreak%
1950      }%
1951      }
1952      }{\PackageError{pagesLTS}{Incompatible, obsolete version of undolabl package used.}{%
1953      See ftp://ftp.ctan.org/tex-archive/macros/latex/contrib/undolabl/ \MessageBreak%
1954      for a new version.\MessageBreak%
1955      Type X <return> to quit.\MessageBreak%
1956      }%
1957      }
1958      }{\PackageError{pagesLTS}{Package undolabl missing}{%
1959      Package undolabl not found.\MessageBreak%
1960      The pagesLTS package needs the undolabl package.\MessageBreak%
1961      See e.g.\MessageBreak%
1962      ftp://ftp.ctan.org/tex-archive/macros/latex/contrib/undolabl/ \MessageBreak%
1963      Type X <return> to quit.\MessageBreak%
1964      }%
1965      }

```

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

```

1966      \@ifpackagelater{hyperref}{2010/12/15}% 2010/12/16 v6.81z
1967      \relax}{%
1968      \PackageWarningNoLine{pagesLTS}{Old hyperref package detected:\MessageBreak%
1969      There is a newer version of the\MessageBreak%
1970      hyperref package available.\MessageBreak%
1971      Please consider updating your version.\MessageBreak%
1972      }%
1973      }%
1974      %% pagesLTS supports the use of the package hyperref by
1975      %% Heiko Oberdiek (hyperref version 2010/12/16 v6.81z).
1976      %% pagesLTS may work with earlier versions of this packages,
1977      %% but this was not tested.
1978      }%

```

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

```
1979   {\PackageWarning{pagesLTS}{Package hyperref NOT detected.\MessageBreak%
1980     pagesLTS would support hyperref. The page references\MessageBreak%
1981     will NOT be hyperlinked!\MessageBreak }%
1982   }%
```

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

```
1983   \@ifpackageloaded{showkeys}{%
1984     \@ifpackagewith{showkeys}{final}{\relax}{\gdef\pagesLTS@SK{1}}%
1985   }{\relax}%
```

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!):

```
1986   \newcommand\pagesLTS@dofilelist{%
1987     \let\pagesLTS@dofilelist\@dofilelist%
1988     \def\@dofilelist{\pagesLTS@dofilelist\pagesLTS@rerunwarning}%
1989   }
1990
```

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

```
1991 \newcommand\pagesLTS@rerunwarning{%
1992 \let\pagesLTS@rerunwarning\relax%
1993
```

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

```
1994 \AtEndDocument{%
1995   \ifx\pncmissing\pagesLTS@one%
1996     \PackageError{pagesLTS}{pagenumbering scheme missing}{\pagesLTS@messageNPN }%
1997   \fi%
```

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

```
1998   \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.

```
1999   \clearpage%
2000   \ifx\pagesLTS@pnc\pagesLTS@fns%
2001     \def\pagesLTS@tmpA{\arabic{pagesLTS.fnsymbol.local}}%
2002     \ifnum \pagesLTS@eso=\pagesLTS@tmpA%
2003       \gdef\pagesLTS@rerun{0}%
2004     \else%
2005       \gdef\pagesLTS@rerun{1}%
2006     \fi%
```

```

2007 \if@files%
2008 \immediate\write\@auxout{\string
2009 \gdef\string\pagesLTS@eso{\pagesLTS@tmpA}}%
2010 \fi%
2011 \fi%
2012 \pagesLTS@putlabel{LastPage}{\thepage}{1}}%

```

We do not need the temporary definition any more.

```

2013 \let\pagesLTS@tmpA\undefined%
2014 }
2015

```

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

```

2016 \AfterLastShipout{%

```

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

```

2017 \if@files%

```

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

```

2018 \ifx\pagesLTS@esov\pagesLTS@zero%
2019 \else%
2020 \immediate\write\@auxout{\string
2021 \pagesLTS@ifcounter{pagesLTS.fnsymbol.local}}%
2022 \immediate\write\@auxout{\string
2023 \setcounter{pagesLTS.fnsymbol.local}{\pagesLTS@esov}}%
2024 \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`.

```

2025 \ifx\pagesLTS@hyper\pagesLTS@one%
2026 \ifx\pagesLTS@pnc\pagesLTS@fns%
2027 \immediate\write\@auxout{\string
2028 \gdef\string\lastpageref{\string\lastpagerefend}}%
2029 \fi%
2030 \fi%
2031 \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:

```

2032 \pagesLTS@ifcounter{pagesLTS.\pagesLTS@pnc.\arabic{pagesLTS.pnc.\pagesLTS@pnc}.local.count}%
2033 \setcounter{pagesLTS.\pagesLTS@pnc.\arabic{pagesLTS.pnc.\pagesLTS@pnc}.local.count}{%
2034 \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.)

```

2035 \addtocounter{pagesLTS.\pagesLTS@pnc.\arabic{pagesLTS.pnc.\pagesLTS@pnc}.local.count}{-1}

```

```

2036 \ifnum \value{pagesLTS.pnc.\pagesLTS@pnc}>1%
2037 \mathchardef\pagesLTS@tmpD=\arabic{pagesLTS.pnc.0}%
2038 \setcounter{pagesLTS.pnc.0}{\value{pagesLTS.pnc.\pagesLTS@pnc}}%
2039 \addtocounter{pagesLTS.pnc.0}{-1}%
2040 \addtocounter{pagesLTS.\pagesLTS@pnc.\arabic{pagesLTS.pnc.\pagesLTS@pnc}.local.count}{%
2041 -\value{pagesLTS.\pagesLTS@pnc.\arabic{pagesLTS.pnc.0}.local.count}}%
2042 \setcounter{pagesLTS.pnc.0}{\pagesLTS@tmpD}%
2043 \fi%
2044 \if@files%
2045 \immediate\write\@auxout{\string
2046 \pagesLTS@ifcounter{pagesLTS.\pagesLTS@pnc.\arabic{pagesLTS.pnc.\pagesLTS@pnc}.local.cnt}}%
2047 \edef\pagesLTS@tmpA{\arabic{pagesLTS.\pagesLTS@pnc.\arabic{pagesLTS.pnc.\pagesLTS@pnc}.local.count}}%
2048 \immediate\write\@auxout{\string
2049 \setcounter{pagesLTS.\pagesLTS@pnc.\arabic{pagesLTS.pnc.\pagesLTS@pnc}.local.cnt}{\pagesLTS@tmpA}}%
2050 \let\pagesLTS@tmpA\undefined%
2051 \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.

```

2052 \addtocounter{page}{-1}%
2053 \edef\pagesLTS@tmpA{\thepage}%
2054 \if@files%
2055 \immediate\write\@auxout{\string
2056 \gdef\string\pagesLTS.lastpage{\pagesLTS@tmpA}}%
2057 \fi%
2058 \addtocounter{page}{+1}%
2059 \addtocounter{CurrentPage}{-1}%
2060 \def\pagesLTS@tmpB{\arabic{CurrentPage}}%
2061 \if@files%
2062 \immediate\write\@auxout{\string
2063 \setcounter{pagesLTS.pagenr}{\pagesLTS@tmpB}}%
2064 \fi%
2065 \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.

```

2066 \message{AED: pagesLTS setting VeryLastPage via AfterLastShipout ^^J}%
2067 \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.

```

2068 \message{AED: pagesLTS setting LastPages via AfterLastShipout ^^J}%
2069 \pagesLTS@putlabels%

```

We do not need the temporary definitions any more.

```

2070 \let\pagesLTS@tmpA\undefined%

```



```

2071 \let\pagesLTS@tmpB\undefined%
2072 }
2073

```

`\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.

```

2074 \AtVeryEndDocument{%
2075   \ifx\pagesLTS@rerun\pagesLTS@one%
2076     \def\pagesLTS@rerunwarning{%
2077       \PackageWarningNoLine{pagesLTS}{Label(s) may have changed.\MessageBreak%
2078         Rerun to get cross-references right.\MessageBreak%
2079       }%
2080     }%
2081   \fi%
2082 }
2083
2084 \end{package}

```

7 Installation

7.1 Downloads

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

pagesLTS.dtx For unpacking the **pagesLTS.dtx** file and constructing the documentation it is required:

- **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, 2010/09/12, v5.6, **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, 2010/12/16, v6.81z, **CTAN:macros/latex/contrib/hyperref.zip**
- package pagesLTS, 2011/02/01, v1.1m, **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, 2011/02/01, v1.0e, **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 3.3), 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	<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
lastpage zref	<ul style="list-style-type: none"> - 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: 2010/12/16, v6.81z) - 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 A list of my packages can be found at <http://www.Uni-Bonn.de/~uzs5pv/LaTeX.html>.

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>.style</code> file.
<code>pagesLTS-example.tex</code>	The example file.

For required other packages, see the preceding subsection.

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

```
pagesLTS.sty      → tex/latex/pagesLTS.sty
pagesLTS.pdf      → doc/latex/pagesLTS.pdf
pagesLTS-example.tex → doc/latex/pagesLTS-example.tex
pagesLTS-example.pdf → doc/latex/pagesLTS-example.pdf
pagesLTS.dtx      → source/latex/pagesLTS.dtx
```

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

7.4 Some details for the interested

Unpacking with \LaTeX . The `.dtx` chooses its action depending on the format:

plain \TeX : Run `docstrip` and extract the files.

\LaTeX : Generate the documentation.

If you insist on using \LaTeX for `docstrip` (really, `docstrip` does not need \LaTeX), then inform the autotdetect 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 \LaTeX` :

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

7.5 Compiling the example

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

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

or (recommended)

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

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

8 Acknowledgements

I (H.-Martin Münch) would like to thank Jeffrey P. Goldberg (`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~~ was 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: \LaTeX issued a “Label(s) may have changed. Rerun to get cross-references right.”-warning, even if labels had not changed but were overwritten.
- Starred version of `\lastpageref` for suppressing hyperlinks introduced.
- A lot of details.

[2010/09/22 v1.1k]

- When no `fnsymbol` pagenumbersing scheme is used, the respective counters are not defined, saving three counters.
- Updated to version 2010/09/13 v6.81n of the `hyperref` package (which needs two more counters than the old 2010/06/18 v6.81g version).
- Moved the package from `.../latex/muench/pagesLTS/...` to `.../latex/pagesLTS/...`
(Please make sure that the old version of the `pagesLTS` package was properly uninstalled from your system.)

[2010/09/27 v1.1l]

- Bug fix: `\PackageError{pagesLTS}{pagenumbering missing}{\pagesLTS@messageNPN }` had to be moved to the outside of `\EveryShipout`, because it wrote its message into the document instead to the screen and the `.log`-file.
- Updated to version 2010/04/24 v0.19 of the `holtxdoc` package.
- `lastpage` package has a new version: 2010/09/24 v1.2f.

[2011/02/01 v1.1m]

- Added a new warning subsection about `hyperref` and repeated page numbers.
- Bug fix: Missing % after `-\romannumeral\number-\arabic{#1}` added.
- The “new” version v2.4i of the `endfloat` package is now even older than 15 years.
- Put a warning in the documentation as well as in the `log`-file and at the screen during compilation about the `showkeys` package.
(The labels of the `pagesLTS` package cannot be shown by the `showkeys` package.)
- Bug fix: In some situations a rerun warning was given even if no rerun was necessary.
- Replaced the list of my packages with a link to a web page list of those, which has the advantage of showing the recent versions of all those packages.
- There is a new version of the used `geometry` package: 2010/09/12, v5.6.
- There is a new version of the `hyperref` package: 2010/12/16, v6.81z.

- The recent version of the Adobe Reader is X (10.0.0) (instead of 9.3.3). Its handling of special page numbers was improved.
- The option `alphMult` is now set to `ab` by default.
- The option `AlphMulti` is now set to `AB` by default.
- There is a new version of the `lastpage` package: 2011/02/01, v1.2g.
- There is a new version of the used `undolabl` package: 2011/02/01, v1.0h.
- There is a new version of the `papermas` package: 2011/02/01, v1.0e.
- Some 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: `Y` is not missing in the index, but no command beginning with this letter has been used in this `pagesLTS` package.

10 Index

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