The pageslts package

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Abstract

This LaTeX package puts the labels `LastPage` (`\AtEndDocument`) and `VeryLastPage` (`\AfterLastShipout`) into the `.aux` file, allowing the user to refer to the (very) last page of a document. This might be particularly useful in places like headers or footers. When more than one page numbering scheme is used, these references do not give the total *number* of pages. For this case the label `LastPages` is introduced. Additionally, at the last page of each page numbering scheme a label `pagesLTS.<numbering scheme>` is placed, where `<numbering scheme>` is e. g. arabic, roman, Roman, alph, or Alph. For fnsymbol please use `\lastpageref{pagesLTS.fnsymbol}` instead of `\pageref{pagesLTS.fnsymbol}`. When the same numbering scheme is used twice, the page numbers are either reset to one or continued automatically, depending on the option given when the package is called. The command `\theCurrentPage` prints the current total/absolute page number – in contrast to `\thepage`, which gives only the page *name* in the current page numbering scheme. `\theCurrentPageLocal` gives the current number of pages in the current page numbering scheme. `\thepage` and `\theCurrentPageLocal` are different e. g. when `\addtocounter{page}{...}` or `\setcounter{page}{...}` were used. At the first page of the document a label `pagesLTS.0` is created. This label can be referred to, too. Further labels are provided for special cases.
The alphalph package is supported, i. e. page numbers alph or Alph > 26 and fnsymbol > 9 can be used (with according options set). Even zero and negative page numbers can be used with `arabic`, `alph`, `Alph`, `roman`, `Roman`, and `fnsymbol` page numbering (with alphalph package and according options).
`\pageref*` and `\lastpageref*`, for using hyperref but suppressing links, are supported.

Please make sure to first deinstall the obsolete pagesLTS package before installing this pageslts package!
(There is at least one operating system which otherwise automatically renames `pageslts` to `pagesLTS`.)
Right after `\begin{document}` a `\pagenumbering{...}` should be called – with the appropriate argument out of e. g.
arabic (Arabic numerals: 1, 2, 3, 4,...),
roman (Lowercase Roman numerals: i, ii, iii, iv,...), Roman (Uppercase Roman numerals: I, II, III, IV,...),
alph (Lowercase letters: a, b, c, d,...), Alph (Uppercase letters: A, B, C, D,...),
fnsymbol (Footnote symbols: ∗, †, ‡, §,...).
This package first started as a revision of the lastpage package of **Jeffrey P. Goldberg** (Thanks!), but then it became obvious that a replacement was needed.
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Save per page about 200 ml water, 2 g CO_2 and 2 g wood: Therefore please print only if this is really necessary.

Contents

1 Introduction

This package puts the labels `LastPage` (`\AtEndDocument`) (same as my LastPage package, invented by Jeffrey P. Goldberg) and `VeryLastPage` (`\AfterLastShipout`) into the `.aux` file, allowing the user to refer to the (very) last page of a document via `\lastpageref{LastPage}` and `\lastpageref{VeryLastPage}`. This might be particularly useful in places like headers or footers. When more than one page numbering scheme is used, these references do not give the total *number* of pages. For this case the label `LastPages` is introduced (similar to the label `TotPages` of the TotPages package, but the label `LastPages` is set later in the document). Additionally, at the last page of each page numbering scheme a label `pagesLTS.<`*numbering scheme*`>` is placed, where `<`*numbering scheme*`>` is e. g. arabic, roman, Roman, alph, or Alph. For 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 LaTeX bug 3421: 3rd page is even (twoside, titlepage, abstract), http://www.latex-project.org/cgi-bin/ltxbugs2html?category=LaTeX&responsible=anyone&state=anything&keyword=pagenumber&pr=latex%2F3421&search=.) At the first page of the document a label `pagesLTS.0` is created. This label can be referred to, too. Further labels are provided for special cases.
The alphalph package is supported, i. e. page numbers `alph` or `Alph` > 26 and `fnsymbol` > 9 can be used (with the according options set). Even zero or negative page numbers can be used with `arabic`, `alph`, `Alph`, and `fnsymbol` page numbering (with alphalph package and according options), and zero `roman` and `Roman` pages, too.

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

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

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`logical page numbers`

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

- In Adobe Reader DC 2015.008.20082 enable:
  Edit > Preferences > Categories: Page Display > Page Content and Information: Use logical page numbers
- Use the hyperref package with option `plainpages=false`.

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

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

2 Usage

Just load the package placing

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

in the preamble of your LaTeX 2ε 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 subsubsection 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*` `\lastpageref*`

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

2.1 Options

`options`

The pageslts package takes the following options:

2.1.1 pagecontinue

`pagecontinue`

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

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

2.1.2 alphMult, AlphMulti, fnsymbolmult

The page number printed in `fnsymbol`[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 (= −21 474 836 47).

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

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

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

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

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

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

`fnsymbolmult` When option `fnsymbolmult=false` is **not** given (i. e. `fnsymbolmult` or `fnsymbolmult=true` or no `fnsymbolmult` option at all), after 5 (¶) the page "number" is continued with the doubled "number" of the first, second, third,... page (∗∗, ††, ‡‡, §§, ¶¶), and after the tenth page the "number" is tripled (∗ ∗ ∗, † † †,...). Compile the pageslts-example.tex with pdfLaTeX and see the resulting `pdf` file.
Before ∗ (page 1) the page "numbers" are continued with 0, −∗, −†,..., −¶, − ∗ ∗, − † †,...
If this is not wanted, set option `fnsymbolmult=false`, and pageslts will do nothing and allow the user to change the page "number". (But if the user does not do anything at all, the
`LaTeX Error: Counter too large`
will appear again.)
While in LaTeX 2ε arabic (page) numbers are possible up to `MAX` = 2 147 483 647 (cf. the alphalph package),
`\erroralphalph{\fnsymbolmult}{...}` numbers are possible up to 10 737 415 only. If this number is not only used internally but printed, after number about 11 705 (which is 2 341 times ¶) the LaTeX 2ε capacity is exceeded, depending on the remaining file and its use of TeX capacity, of course. (If you have a document with more than 11 705 pages, you might think about splitting it in volumes. And page "numbers" with 2 341 digits are probably not easy to grasp for the reader, too.)

2.1.3 romanMult, RomanMulti

romanMult
RomanMulti

The options `romanMult(=true)` and `RomanMulti(=true)` expand the `\roman` and `\Roman` page numbering scheme to values below one (< 1), i. e. 0, -i, -ii, -iii, -iv,... and 0, -I, -II, -III, -IV,..., respectively.
Again the TEX capacity will be exceeded before $\pm$ `MAX` $= \pm 2\,147\,483\,647$, and even if $1\,000\,000\,000$ is internally possible, this would print $1\,000\,000$ times the letter m (or M), which would require either very small print or quite huge paper size.
(If you have a document with so many pages, you might think about splitting it in volumes. And page "numbers" with thousands of digits are probably not easy to grasp for the reader, too.)
If the expansion below 1 is not wanted, set options `romanMult=false` and/or `RomanMulti=false`, and pageslts will do nothing and allow the user to change the page "number". (But if the user does not do anything at all, LATEX will just ignore the values - not even a warning will be issued.)

2.1.4 Arabic page numbers

Arabic page numbers

In LATEX 2_ε arabic (page) numbers are already possible between `-MAX...MAX`, where `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. subsubsection 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
page number
number of pages

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

\theCurrentPage

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

\theCurrentPageLocal

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

agesLTS. page numbering scheme . number

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

\lastpageref

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

2.3 \pagenumbering{...}

\pagenumbering

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

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

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

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

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

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

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

Everything from the preceding subsubsections 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
pagesLTS.roman
pagesLTS.Roman
pagesLTS.alph
pagesLTS.Alph
pagesLTS.fnsymbol

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,. . . .
For the **fnsymbol** page numbering scheme \lastpageref{pagesLTS.fnsymbol} is needed instead of \pageref{pagesLTS.fnsymbol}. You can and should use \lastpageref{...} also for the other page numbering schemes.

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 subsubsections 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.

agesLTS. page numbering scheme . number

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

If you want to refer to the first page of a page numbering scheme, just place a label there, e. g.

```
\pagenumbering{Roman}
\section{Section title\label{RomanSection}}
```

(You know where you use `\pagenumbering{...}` and this is the pageslts package, not the firstpage one).

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

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 December 21, 2015* page V (5) of VII + 35 = 42 pages"

or

"*DRAFT December 21, 2015* page 10 (17) of VII + 35 = 42 pages"

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

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

produces output like

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

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

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

2.4 papermas(s) package

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

3 A few warnings

3.1 Hyperref and repeated page numbers

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

3.2 \AtEndDocument

The output of a LaTeX 2ε 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 LaTeX 2ε commands which make use of `\AtEndDocument`. Newer versions of endfloat exist (at the time of writing this documentation: v2.5d as of 2011/12/25) in modern documentation form, which should be available from the same source where you received this file, see subsection 7.1.
A note is placed in the style file at the `\RequirePackage` section, and later it is even checked whether a (very) old endfloat package is in use. If it is, a warning or even an error message is given, depending on endfloat version. This assumes, that the old versions of endfloat at least gave a version date, of course.
If you want your `LastPage` to label the last page of these end floats, you need to load pageslts after loading endfloat, or to use `VeryLastPage` instead. If, on the other hand, you want `LastPage` to refer to the (not so) last page, exclusive of the floats at the end, then load in the reverse order. Independent from the order of pageslts and endfloat, you will still need the modified[4] version of endfloat.
Using the `LastPages` (*s*!) label should get you to the last page in all cases: `\lastpageref{LastPages}`.

Other LaTeX209 (!) packages also seem to like to redefine `\enddocument`. In addition to the old endfloat, harvard comes to mind. All of these will need to be modified swiftly. **If possible, update to LaTeX 2ε!**

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

3.4 showkeys package

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

3.5 lastpage package

This package first started as a revision of the lastpage package of Jeffrey P. Goldberg (jeffrey+news at goldmark dot org), but it became obvious that a replacement was needed to accomplish what this package does. For backward compatibility, a label named `LastPage` is provided. Thus `\usepackage{lastpage}` can be replaced by
`\usepackage[pagecontinue=false,%`
`alphMult=0,AlphMulti=0,fnsymbolmult=false,romanMult=false,RomanMulti=false]{pageslts}`,
if the behaviour of the lastpage package should be simulated. Using **old** (!) versions of the lastpage before the pageslts before the hyperref [2012/11/06 v6.83m] package results in multiply definitions of the `LastPage` label. While the pageslts package cancels the command `\lastpage@putlabel` from the old lastpage package (because it does this itself, and better), hyperref redefines `\lastpage@putlabel` and thereby reintroduces it again (hyperref should probably check for the version of the lastpage package and/or whether the pageslts package was also loaded.)

3.6 Using an unknown page numbering scheme

I do not know whether LaTeX 2_ε 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 `\hypertarget`s and `\href`s.)

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'
`\arabic`	`-MAX..MAX`		
`\roman`, `\Roman`	`1..MAX`	`-MAX..0`	
`\alph`, `\Alph`	`1..26`	0	`-MAX..-1, 27..MAX`
`\fnsymbol`	`1..9`	0	`-MAX..-1, 10..MAX`

`MAX` = `2147483647`

" (Heiko Oberdiek: The alphalph package, 2010/04/18, v2.3, first table, p. 2).
Please see subsubsections 2.1.2 and 2.1.3 for instructions how to overcome these limitations.

3.8 Using the fnsymbol page numbering scheme

Using the `fnsymbol` page numbering scheme can result in problems – big ones!
When using this page numbering scheme, it is very important to use `\lastpageref{...}` instead of `\pageref{...}` for any link to any label provided by the pageslts package.
While the pageslts package tries really very hard to circumvent any problem, other packages might screw up – and quite totally for that. So, you have been warned!

- There can be a counter overflow, see preceding subsection 3.7.

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

4 Alternatives

There are similar packages, which do (or do not) similar things. As I neither know what exactly you want to accomplish when using this package (e. g. page number vs. page name, hyperlinks or not), nor what resources you have (e. g. 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 LATEX2.09 is still used, and if you are unable to switch to LATEX 2ε, the LATEX2.09 compatible lastpage209.sty can be used (which is also contained in the recent LastPage package).

`totpages`

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

`totcount`

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

`nofm`

- "There is a package nofm.sty available, but some versions of it are defective, and most don't work with fancyhdr because they take over the complete page layout." (Piet van Oostrum: Page layout in LATEX, March 2, 2004, section 16; fancyhdr.pdf) nofm as of 1991/02/25 (without version number), available at
  http://mirror.ctan.org/obsolete/macros/latex209/contrib/misc/nofm.sty,
  does not work with e. g. hyperref, redefines `\enddocument` as well as `\@oddhead`, `\@evenhead`, `\@oddfoot`, and `\@evenfoot`. If you know the (https://www.CTAN.org) location of a **working** (!) version, please send me an e-mail, thanks!

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

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

5 Example

```
⟨*example⟩
\documentclass[british]{article}[2014/09/29]% v1.4h
\usepackage{lipsum}[2014/07/27]%              v1.3
\usepackage[draft]{showkeys}[2014/10/28]%     v3.17
%%      Use final instead of draft to hide the keys. %%
\usepackage{hyperref}[2012/11/06]%            v6.83m
\hypersetup{%
 extension=pdf,%
 plainpages=false,%
 pdfpagelabels=true,%
 hyperindex=false,%
 pdflang={en},%
 pdftitle={pageslts package example},%
 pdfauthor={Hans-Martin Muench},%
 pdfsubject={Example for the pageslts package},%
 pdfkeywords={LaTeX, pageslts, H.-Martin Muench},%
 pdfview=Fit,%
 pdfstartview=Fit,%
 pdfpagelayout=SinglePage,%
 bookmarksopen=true%
}
\usepackage[pagecontinue=true,alphMult=ab,AlphMulti=AB,fnsymbolmult=true,%
 romanMult=true,RomanMulti=true]{pageslts}[2015/12/21]% v1.2f
%% These are the default options. %%

\makeatletter
  \renewcommand{\@evenfoot}%
   {Page \thepage\ (\theCurrentPage; local: \theCurrentPageLocal) of %
    \lastpageref{pagesLTS.roman}(\lastpageref{pagesLTS.roman.local}) + %
    \lastpageref{pagesLTS.Roman}(\lastpageref{pagesLTS.Roman.local}) + %
    \lastpageref{pagesLTS.arabic}(\lastpageref{pagesLTS.arabic.local}) + %
    \lastpageref{pagesLTS.fnsymbol}(\lastpageref{pagesLTS.fnsymbol.local}) + %
    \lastpageref{pagesLTS.alph}(\lastpageref{pagesLTS.alph.local}) + %
    \lastpageref{pagesLTS.Alph}(\lastpageref{pagesLTS.Alph.local}) = %
    \lastpageref{LastPages} pages.%
   }
  \renewcommand{\@oddfoot}{\@evenfoot}
  \def\pagesLTSexampleArabic{3}
  \def\pagesLTSexamplealph{23}
  \gdef\unit#1{\mathord{\thinspace\mathrm{#1}}}%
\makeatother

\listfiles

\begin{document}
```

```
\pagenumbering{roman}
%% Note the first \pagenumbering immediately behind \begin{document}! %%
%%\addtocounter{page}{-2} %%

\section*{Example for pageslts}
\addcontentsline{toc}{section}{Example for pageslts}
\markboth{Example for pageslts}{Example for pageslts}

This example demonstrates the most common uses of package\\
\textsf{pageslts}, v1.2f as of 2015/12/21 (HMM).\\
The used options were \texttt{pagecontinue=true},
\texttt{alphMult=ab}, \texttt{AlphMulti=AB}, \linebreak
\texttt{fnsymbolmult=true},
\texttt{romanMult=true}, and \texttt{RomanMulti=true}
(the default ones).\\
For more details please see the documentation!\\

\label{keys} To hide the \pageref{keys}{\qquad } use option
\texttt{final} instead of \texttt{draft} with the \textsf{showkeys}
package (or remove the package call from the preamble of
this document).\\

\textbf{Hyperlinks or not:} If the \textsf{hyperref} package is loaded,
the references are also hyperlinked:\\
\smallskip
Page \thepage\ (\theCurrentPage; local: \theCurrentPageLocal) of %
\lastpageref{pagesLTS.roman}(\lastpageref{pagesLTS.roman.local}) + %
\lastpageref{pagesLTS.Roman}(\lastpageref{pagesLTS.Roman.local}) + %
\lastpageref{pagesLTS.arabic}(\lastpageref{pagesLTS.arabic.local}) + %
\lastpageref{pagesLTS.fnsymbol}(\lastpageref{pagesLTS.fnsymbol.local}) + %
\lastpageref{pagesLTS.alph}(\lastpageref{pagesLTS.alph.local}) + %
\lastpageref{pagesLTS.Alph}(\lastpageref{pagesLTS.Alph.local}) = %
\lastpageref{LastPages} pages.\\
If the \textsf{hyperref} package is loaded, but the hyperlinks of the
references shall be suppressed, \verb|\pageref*{...}|
and \verb|\lastpageref*{...}| can be used:\\
Page \thepage\ (\theCurrentPage; local: \theCurrentPageLocal) of %
\lastpageref*{pagesLTS.roman}(\lastpageref*{pagesLTS.roman.local}) + %
\lastpageref*{pagesLTS.Roman}(\lastpageref*{pagesLTS.Roman.local}) + %
\lastpageref*{pagesLTS.arabic}(\lastpageref*{pagesLTS.arabic.local}) + %
\lastpageref*{pagesLTS.fnsymbol}(\lastpageref*{pagesLTS.fnsymbol.local}) + %
\lastpageref*{pagesLTS.alph}(\lastpageref*{pagesLTS.alph.local}) + %
\lastpageref*{pagesLTS.Alph}(\lastpageref*{pagesLTS.Alph.local}) = %
\lastpageref*{LastPages} pages.\\


\textbf{Trademarks} appear throughout this example without any
```

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

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

You want negative page numbers? Not only arabic, but even roman,
Roman, alph, Alph or fnsymbol ones? No problem, e.\,g. just give a\\
\verb|\addtocounter{page}{|-\textit{some number}\verb|}| in the
source code of this example file (or uncomment the prepared line)!

\bigskip

Save per page about $200\unit{ml}$ water, $2\unit{g}$ CO$_{2}$
and $2\unit{g}$ wood:\\
Therefore please print only if this is really necessary.

\pagebreak

\tableofcontents

\newpage

\pagenumbering{roman}
%% in case the page numbering is changed before,
%% otherwise pagesLTS.current.local.roman on this page
%% would be undefined

\section{roman}

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

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

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

\noindent Current page (\verb|\theCurrentPage|),
i.\,e. counted continuously from the first page): \theCurrentPage \\
You can get this also in other formats:
\roman{CurrentPage}, \Roman{CurrentPage}, \arabic{CurrentPage},
\fnsymbol{CurrentPage}, \alph{CurrentPage}, \Alph{CurrentPage}.
```

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

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

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

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

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

\lipsum[1-3]

\newpage

\pagenumbering{Roman}

\section{Roman\label{Roman}}
\subsection{Common Roman page numbering}

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

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

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

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

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

\noindent Last Roman page (pagesLTS.Roman): \lastpageref{pagesLTS.Roman}{\hskip3em }
(There are \lastpageref{pagesLTS.Roman.local}~pages with Roman numbers:\\
\lastpages{Roman}{1}~pages in the first Roman sector
(\pageref{Roman}{\hskip3em }-\lastpageref{pagesLTS.Roman.1}{\hskip3em }),\\
\lastpages{Roman}{2}~pages in the second Roman sector
(\pageref{Roman2}{\hskip3em }-\lastpageref{pagesLTS.Roman.2}{\hskip3em }), and\\
\lastpages{Roman}{3}~pages in the third Roman sector
(\pageref{Roman3}{\hskip3em }-\lastpageref{pagesLTS.Roman.3}{\hskip3em }).\\

\noindent Last arabic page (pagesLTS.arabic): \lastpageref{pagesLTS.arabic}{\hskip5em }
(There are only \lastpageref{pagesLTS.arabic.local} pages with arabic numbers,
```

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

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

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

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

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

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

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

\lipsum[1-4]

\newpage

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

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

\newpage

\pagenumbering{arabic}

\section{arabic}

\subsection{Standard page numbering}
```

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

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

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

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

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

\noindent Last Roman page (pagesLTS.Roman): \lastpageref{pagesLTS.Roman}{\hskip3em }
(There are \lastpageref{pagesLTS.Roman.local}~pages with Roman numbers:\\
\lastpages{Roman}{1}~pages in the first Roman sector
(\pageref{Roman}{\hskip3em }-\lastpageref{pagesLTS.Roman.1}{\hskip3em }),\\
\lastpages{Roman}{2}~pages in the second Roman sector
(\pageref{Roman2}{\hskip3em }-\lastpageref{pagesLTS.Roman.2}{\hskip3em }), and\\
\lastpages{Roman}{3}~pages in the third Roman sector
(\pageref{Roman3}{\hskip3em }-\lastpageref{pagesLTS.Roman.3}{\hskip3em }).\\

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

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

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

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

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

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

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

```
(=~total number of pages)\\

\lipsum[1-4]
\newpage

\subsection[Empty page style]{Also an empty page style is no problem %
for the current or total page count}

\bigskip

\thispagestyle{empty}

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

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

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

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

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

\noindent Last Roman page (pagesLTS.Roman): \lastpageref{pagesLTS.Roman}{\hskip3em }
(There are \lastpageref{pagesLTS.Roman.local}~pages with Roman numbers:\\
\lastpages{Roman}{1}~pages in the first Roman sector
(\pageref{Roman}{\hskip3em }-\lastpageref{pagesLTS.Roman.1}{\hskip3em }),\\
\lastpages{Roman}{2}~pages in the second Roman sector
(\pageref{Roman2}{\hskip3em }-\lastpageref{pagesLTS.Roman.2}{\hskip3em }), and\\
\lastpages{Roman}{3}~pages in the third Roman sector
(\pageref{Roman3}{\hskip3em }-\lastpageref{pagesLTS.Roman.3}{\hskip3em }).\\

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

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

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

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

```
Adobe Reader DC 2015.008.20082 does not show the correct page names
for all pages with \texttt{fnsymbol} page numbering scheme,
while at least the (\ldots\ of \ldots )  part of the page number is displayed correctly.
(Adobe Reader~X even got all pages right.)

\bigskip

Without option \texttt{fnsymbolmult=true} of the \textsf{pageslts} package
(and the help of \textsc{Heiko Oberdiek}'s \textsf{alphalph} package),
after page~9 (\textquotedblleft \ensuremath {\ddagger \ddagger }\textquotedblright )
(and also for negative page numbers) there would just appear a
\begin{quote}
\begin{verbatim}
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.
\end{verbatim}
\end{quote}
Now the page numbers after 5 (\ensuremath {\mathparagraph }) are
continued  with the doubled \textquotedblleft number\textquotedblright{} of
the first, second, third,\ldots\ page (\ensuremath {**},
\ensuremath {\dagger \dagger }, \ensuremath {\ddagger \ddagger },
\ensuremath {\mathsection \mathsection },
\ensuremath {\mathparagraph \mathparagraph }),
and after the tenth page the \textquotedblleft number\textquotedblright{} is
tripled (\ensuremath {***}, \ensuremath {\dagger \dagger \dagger },\ldots).
Page zero is named 0 and negative pages just named like the positive ones
with addition of a minus sign~($-$).

\bigskip

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

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

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

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

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

```

```
\noindent Last Roman page (pagesLTS.Roman): \lastpageref{pagesLTS.Roman}{\hskip3em }
(There are \lastpageref{pagesLTS.Roman.local}~pages with Roman numbers:\\
\lastpages{Roman}{1}~pages in the first Roman sector
(\pageref{Roman}{\hskip3em }-\lastpageref{pagesLTS.Roman.1}{\hskip3em }),\\
\lastpages{Roman}{2}~pages in the second Roman sector
(\pageref{Roman2}{\hskip3em }-\lastpageref{pagesLTS.Roman.2}{\hskip3em }), and\\
\lastpages{Roman}{3}~pages in the third Roman sector
(\pageref{Roman3}{\hskip3em }-\lastpageref{pagesLTS.Roman.3}{\hskip3em }).\\

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

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

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

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

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

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

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

\lipsum[1-60]

\newpage

\pagenumbering{Roman}

\section{Roman - again!\label{Roman2}}

The page number would start with \textquotedblleft I\textquotedblright{} again --
but for the \textsf{pageslts} package (with option \texttt{pagecontinue=true},
or with option just \texttt{pagecontinue}, or even just
\nolinebreak{with\textbf{out}} option \texttt{pagecontinue=false}).
This package remembered the (\arabic{pagesLTS.double.Roman}-1)\footnote{%
```

```
OK, here you have to compute this value for yourself, but %
subtracting one should be manageable for \TeX{}nicians.} pages already
done in Roman output, and therefore continues with page
\textquotedblleft \thepage \textquotedblright .\\
If you want to start with \textquotedblleft I\textquotedblright{} all
over again, you will have two pages with the same name,
but nevertheless you can do this by using option \texttt{pagecontinue=false}
or a \verb|\setcounter{page}{1}|\ here (not demonstrated in this example file).\\

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

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

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

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

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

\noindent Last Roman page (pagesLTS.Roman): \lastpageref{pagesLTS.Roman}{\hskip3em }
(There are \lastpageref{pagesLTS.Roman.local}~pages with Roman numbers:\\
\lastpages{Roman}{1}~pages in the first Roman sector
(\pageref{Roman}{\hskip3em }-\lastpageref{pagesLTS.Roman.1}{\hskip3em }),\\
\lastpages{Roman}{2}~pages in the second Roman sector
(\pageref{Roman2}{\hskip3em }-\lastpageref{pagesLTS.Roman.2}{\hskip3em }), and\\
\lastpages{Roman}{3}~pages in the third Roman sector
(\pageref{Roman3}{\hskip3em }-\lastpageref{pagesLTS.Roman.3}{\hskip3em }).\\

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

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

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

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

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

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

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

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

\lipsum[1-6]

\newpage

\verb|\lastpageref{pagesLTS.Roman}| does \textbf{not}
refer to this page (but there: \lastpageref{pagesLTS.Roman}),
because the option \texttt{pagecontinue=true}
was chosen. When a reference to this page is wanted,\\
\verb|\lastpageref{pagesLTS.Roman.2}| can be used: \lastpageref{pagesLTS.Roman.2}.\\

\bigskip
There are \lastpages{Roman}{2}~pages (\verb|\lastpages{Roman}{2}|) in this
second Roman sector.\\
The Roman page numbering scheme is continued later in section~\ref{Roman3})!

\newpage

\pagenumbering{alph}

\section{alph\label{alph}}

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

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

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

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

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

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

```
If that doesn't work, type  X <return>  to quit.
\end{verbatim}
\end{quote}
Now the page numbers are continued aa, ab, ac,\ldots\ (aa, bb, cc,\ldots\ is
also possible, see the \textsf{pageslts} documentation).\\
To demonstrate this, we add a\\
\verb|\addtocounter{page}{|\pagesLTSexamplealph\verb|}|\\
in the source code here.

\addtocounter{page}{\pagesLTSexamplealph}

\bigskip

\lipsum[1-18]

\newpage

\pagenumbering{Roman}

\section{Roman - third time!\label{Roman3}}

The page number would start with
\textquotedblleft I\textquotedblright{} again -- but
for the \textsf{pageslts} package (with option \texttt{pagecontinue=true},
or with option just \texttt{pagecontinue}, or even just
\nolinebreak{with\textbf{out}} option \texttt{pagecontinue=false}).
This package remembered the
(\arabic{pagesLTS.double.Roman}-1)\footnote{OK, here %
you have to compute this value for yourself, but %
subtracting one should be managable for \TeX nicians.} pages already
done in Roman output, and therefore continues with page
\textquotedblleft \thepage \textquotedblright .\\
If you want to start with \textquotedblleft I\textquotedblright{} all
over again, you will have (at least) two pages with the same name,
but nevertheless you can do this by using option
\texttt{pagecontinue=false} instead of \texttt{pagecontinue=true}
(not demonstrated here).\\

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

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

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

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

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

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

\noindent Last Roman page (pagesLTS.Roman): \lastpageref{pagesLTS.Roman}{\hskip3em }
(There are \lastpageref{pagesLTS.Roman.local}~pages with Roman numbers:\\
\lastpages{Roman}{1}~pages in the first Roman sector
(\pageref{Roman}{\hskip3em }-\lastpageref{pagesLTS.Roman.1}{\hskip3em }),\\
\lastpages{Roman}{2}~pages in the second Roman sector
(\pageref{Roman2}{\hskip3em }-\lastpageref{pagesLTS.Roman.2}{\hskip3em }), and\\
\lastpages{Roman}{3}~pages in the third Roman sector
(\pageref{Roman3}{\hskip3em }-\lastpageref{pagesLTS.Roman.3}{\hskip3em }).\\

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

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

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

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

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

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

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

\lipsum[1-3]

\newpage

\lastpageref{pagesLTS.Roman}
(\verb|\lastpageref{pagesLTS.Roman}|)
\textbf{does} refers to this page, because the option
```

```
\texttt{pagecontinue=true} was chosen. Also\\
\verb|\lastpageref{pagesLTS.Roman.3}| can be used: \lastpageref{pagesLTS.Roman.3}.\\

\bigskip

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

\newpage

\pagenumbering{Alph}

\section{Alph}

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

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

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

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

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

\noindent Last Roman page (pagesLTS.Roman): \lastpageref{pagesLTS.Roman}{\hskip3em }
(There are \lastpageref{pagesLTS.Roman.local}~pages with Roman numbers:\\
\lastpages{Roman}{1}~pages in the first Roman sector
(\pageref{Roman}{\hskip3em }-\lastpageref{pagesLTS.Roman.1}{\hskip3em }),\\
\lastpages{Roman}{2}~pages in the second Roman sector
(\pageref{Roman2}{\hskip3em }-\lastpageref{pagesLTS.Roman.2}{\hskip3em }), and\\
\lastpages{Roman}{3}~pages in the third Roman sector
(\pageref{Roman3}{\hskip3em }-\lastpageref{pagesLTS.Roman.3}{\hskip3em }).\\

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

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

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

```
(There are only \lastpageref{pagesLTS.alph.local} pages with alph numbers,
because an \verb|\addtocounter{page}{|\pagesLTSexamplealph\verb|}| was used.)\\

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

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

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

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

\lipsum[1-3]

Without option \texttt{alphMulti=AB} of the \textsf{pageslts} (and the help of
\textsc{Heiko Oberdiek's} \textsf{alphalph} package), after page
\textquotedblleft Z\textquotedblright{} there would just appear a
\begin{quote}
\begin{verbatim}
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.
\end{verbatim}
\end{quote}
Now the page numbers are continued AA, AB, AC,\ldots\ (AA, BB, CC,\ldots\ is
also possible, see the \textsf{pageslts} documentation).\\
This is not demonstrated here, but see section~\ref{alph}.

\newpage

\section{The End}

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

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

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

\noindent CurrentPageLocal (\verb|\theCurrentPageLocal|),
i.\,e. counted continuously from the first page of the
```

```
current page numbering scheme): \theCurrentPageLocal \\

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

\noindent Last Roman page (pagesLTS.Roman): \lastpageref{pagesLTS.Roman}{\hskip3em }
(There are \lastpageref{pagesLTS.Roman.local}~pages with Roman numbers:\\
\lastpages{Roman}{1}~pages in the first Roman sector
(\pageref{Roman}{\hskip3em }-\lastpageref{pagesLTS.Roman.1}{\hskip3em }),\\
\lastpages{Roman}{2}~pages in the second Roman sector
(\pageref{Roman2}{\hskip3em }-\lastpageref{pagesLTS.Roman.2}{\hskip3em }), and\\
\lastpages{Roman}{3}~pages in the third Roman sector
(\pageref{Roman3}{\hskip3em }-\lastpageref{pagesLTS.Roman.3}{\hskip3em }).\\

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

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

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

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

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

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

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

\medskip

\noindent Page \thepage\ (\theCurrentPage; local: \theCurrentPageLocal) of %
\lastpageref{pagesLTS.roman} (\lastpageref{pagesLTS.roman.local}) + %
\lastpageref{pagesLTS.Roman} (\lastpageref{pagesLTS.Roman.local}) + %
\lastpageref{pagesLTS.arabic} (\lastpageref{pagesLTS.arabic.local}) + %
\lastpageref{pagesLTS.fnsymbol} (\lastpageref{pagesLTS.fnsymbol.local}) + %
\lastpageref{pagesLTS.alph} (\lastpageref{pagesLTS.alph.local}) + %
```

```
\lastpageref{pagesLTS.Alph} (\lastpageref{pagesLTS.Alph.local}) = %
\lastpageref{LastPages} pages.

\end{document}
```
⟨/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 LaTeX 2$_\varepsilon$ and announcing the name and version of this package.

897 ⟨*package⟩

```
898 \NeedsTeXFormat{LaTeX2e}[2015/01/01]
899 \ProvidesPackage{pageslts}[2015/12/21 v1.2f
900             Refers to special pages' numbers/names (HMM)]
901
```

A short description of the pageslts package:

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

The package is now named 'pageslts' but had been named 'pagesLTS' before. LaTeX does not load a package two times, but it is case sensitive, i. e. would load 'pageslts' and 'pagesLTS', resulting in possible problems. Therefore we check for a loaded 'pagesLTS' package (assuming `\pagesLTS@loaded` is not `p@gesLTSlo@ded` and not defined to `p@gesLTSlo@ded` by another package). This check might work only for the second and following compilation runs.

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

```
    }
   \endinput
 \fi
 }{% \relax
  }

\gdef\pagesLTS@loaded{p@gesLTSlo@ded}

```

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

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

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

```
\RequirePackage{atveryend}[2011/06/30]%      v1.8
\AtBeginDocument{%
 %% https://tex.stackexchange.com/a/45654/6865
 %% and https://tex.stackexchange.com/q/261445/6865
 \def\pagesLTS@etb{etoolbox.sty}%
 \let\pagesLTS@ave\@empty%
 \@for\@pageslts@currname:=\@filelist\do{%
   \ifx\@pageslts@currname\pagesLTS@etb\relax%
     \def\pagesLTS@ave{atveryend.sty}%
   \fi%
   \ifx\@pageslts@currname\pagesLTS@ave%
     \@ifpackagelater{atveryend}{2015/08/01}{%\relax
       \PackageInfo{pageslts}{etoolbox package loaded before atveryend package\MessageBreak%
         With atveryend version 1.8 of 2011/06/30 this caused a problem,\MessageBreak%
         which is probably solved in the new version used here.\MessageBreak%
         To play it safe, you could load the atveryend package\MessageBreak%
         before the etoolbox package.\MessageBreak%
         }%
      }{% else
        \PackageError{pageslts}{etoolbox package loaded before atveryend package}{%
          You can use both packages, but when etoolbox is loaded before atveryend,\MessageBreak%
          atveryend no longer detects \string\enddocument\space\MessageBreak%
          and hook "AtVeryVeryEnd" is not executed.\MessageBreak%
          Just load the atveryend package before the etoolbox package!\MessageBreak%
          }%
       }%
   \fi%
 }%
}

```

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

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

For its \LetLtxMacro command we need the letltxmacro package by Heiko Oberdiek (see subsection 7.1):

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

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

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

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

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

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

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

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

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

```

About the prelim2e package by Martin Schröder see subsection 7.1.

A last information for the user(s):

```
%% pageslts may work with earlier versions of LaTeX2e and those packages,
%% but this was not tested. Please consider updating your LaTeX
%% and packages to the most recent version (if they are not already
%% the most recent version).
```

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: v2.5d as of 2011/12/25) in modern documentation form, which are available from https://www.CTAN.org (see subsection 7.1). A note is placed here, and later it is checked whether a (very) old endfloat package is in use. If it is, a warning or even an error message is given, depending on endfloat version. This assumes, that the old versions of endfloat at least gave a version date, of course.

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

```

The options are introduced:

```
\SetupKeyvalOptions{family = pagesLTS,prefix = pagesLTS@}
\DeclareBoolOption[true]{pagecontinue}% \pagesLTS@pagecontinue
\DeclareStringOption[ab]{alphMult}
\DeclareStringOption[AB]{AlphMulti}
\DeclareBoolOption[true]{romanMult}
\DeclareBoolOption[true]{RomanMulti}
\DeclareBoolOption[true]{fnsymbolmult}

\ProcessKeyvalOptions*

```

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

```
\def\pagesLTS@zero{0}
\def\pagesLTS@one{1}
\def\pagesLTS@two{2}
\def\pagesLTS@three{3}

```

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.

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

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

```

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

```
\def\pagesLTS@ab{ab}
\def\pagesLTS@bb{bb}
\def\pagesLTS@ABi{AB}
\def\pagesLTS@BBi{BB}

\ifx\pagesLTS@alphMult\pagesLTS@ab%
\else
  \ifx\pagesLTS@alphMult\pagesLTS@bb%
  \else
    \ifx\pagesLTS@alphMult\pagesLTS@zero%
      \PackageWarningNoLine{pageslts}{%
        Option alphMult=0 found:\MessageBreak%
        The pageslts package was used, but the option\MessageBreak%
        alphMult was set to 0 (zero).\MessageBreak%
        If you want the page numbers to be extended\MessageBreak%
        after z, you have to organize this yourself now.\MessageBreak%
        For automatic continuation, please use the\MessageBreak%
        alphalph package and call pageslts\MessageBreak%
        with option alphMult=ab (for aa, ab, ac, ad,...) or\MessageBreak%
        with option alphMult=bb (for aa, bb, cc, dd,...).\MessageBreak%
        For details please see the documentation!%
       }
    \else
      \PackageError{pageslts}{Unknown option value}{%
        The pageslts package was used with option\MessageBreak%
        alphMult= \pagesLTS@alphMult . Only values\MessageBreak%
        ab, bb, and 0 (zero) are valid.\MessageBreak%
        The default ab is set.\MessageBreak%
```

```
        For details please see the documentation!%
       }
      \setkeys{pagesLTS}{alphMult=ab}
    \fi
  \fi
\fi

\ifx\pagesLTS@AlphMulti\pagesLTS@ABi%
\else
  \ifx\pagesLTS@AlphMulti\pagesLTS@BBi%
  \else
    \ifx\pagesLTS@AlphMulti\pagesLTS@zero%
      \PackageWarningNoLine{pageslts}{%
        Option AlphMulti=0 found:\MessageBreak%
        The pageslts package was used, but the option\MessageBreak%
        AlphMulti was set to 0 (zero).\MessageBreak%
        If you want the page numbers to be extended\MessageBreak%
        after Z, you have to organize this yourself now.\MessageBreak%
        For automatic continuation, please use the\MessageBreak%
        alphalph package and call pageslts\MessageBreak%
        with option AlphMulti=AB (for AA, AB, AC, AD,...) or\MessageBreak%
        with option AlphMulti=BB (for AA, BB, CC, DD,...).\MessageBreak%
        For details please see the documentation!%
       }
    \else
      \PackageError{pageslts}{Unknown option value}{%
        The pageslts package was used with option\MessageBreak%
        AlphMulti= \pagesLTS@AlphMulti . Only values\MessageBreak%
        AB, BB, and 0 (zero) are valid.\MessageBreak%
        The default AB is set.\MessageBreak%
        For details please see the documentation!%
       }
      \setkeys{pagesLTS}{AlphMulti=AB}
    \fi
  \fi
\fi

```

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

```
\ifx\pagesLTS@alphMult\pagesLTS@zero% \relax
\else \RequirePackage{alphalph}[2011/05/13]% v2.4
\fi

\ifx\pagesLTS@AlphMulti\pagesLTS@zero% \relax
\else \RequirePackage{alphalph}[2011/05/13]% v2.4
\fi

\ifpagesLTS@fnsymbolmult%
```

```
  \RequirePackage{alphalph}[2011/05/13]% v2.4
\fi
```

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

```
\ifpagesLTS@romanMult%
  \PackageInfo{pageslts}{Option romanMult enabled\MessageBreak%
    (maybe by default):\MessageBreak%
    The pageslts package will extend the page numbering\MessageBreak%
    of the roman scheme below i with\MessageBreak%
     0, -i, -ii, -iii, -iv,...\MessageBreak%
    If you do not want this, call pageslts with option\MessageBreak%
    romanMult=false.\MessageBreak%
  }
\else
  \PackageWarningNoLine{pageslts}{Option romanMult is set to false:\MessageBreak%
  The pageslts package was used, but the option\MessageBreak%
  romanMult was set to false.\MessageBreak%
  If you want the page numbering of the roman scheme\MessageBreak%
  to be extended below i,\MessageBreak%
  please call pageslts with option romanMult=true,\MessageBreak%
  otherwise zero and negative page numbers of the\MessageBreak%
  roman scheme will need to be defined otherwise.\MessageBreak%
  For details please see the documentation!\MessageBreak%
  }
\fi
```

Same for the Roman page numbering scheme.

```
\ifpagesLTS@RomanMulti%
  \PackageInfo{pageslts}{Option RomanMulti enabled\MessageBreak%
    (maybe by default):\MessageBreak%
    The pageslts package will extend the page numbering\MessageBreak%
    of the Roman scheme below I with\MessageBreak%
    0, -I, -II, -III, -IV,...\MessageBreak%
    If you do not want this, call pageslts with option\MessageBreak%
    RomanMulti=false.\MessageBreak%
   }
\else
  \PackageWarningNoLine{pageslts}{Option RomanMulti is set to false:\MessageBreak%
    The pageslts package was used, but the option\MessageBreak%
    RomanMulti was set to false.\MessageBreak%
    If you want the page numbering of the Roman scheme\MessageBreak%
    to be extended below i,\MessageBreak%
    please call pageslts with option RomanMulti=true,\MessageBreak%
    otherwise zero and negative page numbers of the\MessageBreak%
    Roman scheme will need to be defined otherwise.\MessageBreak%
    For details please see the documentation!\MessageBreak%
```

```
   }
\fi
```

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

```
\ifpagesLTS@fnsymbolmult%
  \PackageInfo{pageslts}{Option fnsymbolmult enabled\MessageBreak%
    (maybe by default):\MessageBreak%
    The pageslts package will extend the page numbering\MessageBreak%
    of the footnotesymbol scheme using the alphalph\MessageBreak%
    package.\MessageBreak%
    If you do not want this, call pageslts with option\MessageBreak%
    fnsymbolmult=false.\MessageBreak%
   }
\else
  \PackageWarningNoLine{pageslts}{%
    Option fnsymbolmult is set to false:\MessageBreak%
    The pageslts package was used, but the option\MessageBreak%
    fnsymbolmult was set to false.\MessageBreak%
    If you want the page numbering of the footnotesymbol\MessageBreak%
    scheme to be extended using the alphalph package,\MessageBreak%
    please call pageslts with option fnsymbolmult=true,\MessageBreak%
    otherwise page numbers of the footnotesymbol scheme\MessageBreak%
    greater than nine will need to be defined otherwise.\MessageBreak%
    For details please see the documentation!\MessageBreak%
   }
\fi
```

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

```
\def\pagesLTS@pnc{0}
\def\pagesLTS@called{0}
\def\pagesLTS@fns{fnsymbol}
\def\pagesLTS@alph{alph}
\def\pagesLTS@Alph{Alph}
\def\pagesLTS@rerun{0}
\def\pagesLTS@eso{0}
\def\pagesLTS@esov{0}
\def\lastpageref{\lastpagereftxt}
\def\pagesLTS@undolable{none}
\def\pncmissing{0}
\def\pagesLTS@SK{0}
\def\pagesLTS@messageNPN{%
 The pageslts package was used, but\MessageBreak%
 \string\pagenumbering \MessageBreak%
 was not called at the beginning of the document\MessageBreak%
 (maybe earlier or later).\MessageBreak%
 Please use \string\pagenumbering \MessageBreak%
```

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

```

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

```
\AtBeginDocument{%
  \if@filesw%
```

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

```
  \else%
    \@ifpackageloaded{tikz}{%
      \PackageWarning{pageslts}%
        {It was not allowed to write to an\MessageBreak%
         .aux file. This package does not work without access\MessageBreak%
         to an .aux file.\MessageBreak%
         It is OK if the .aux file was already updated\MessageBreak%
         by a previouse compiler run\MessageBreak%
         and would not have changed anyway.\MessageBreak%
        }%
    }{\PackageError{pageslts}{No writing to auxiliary file allowed}%
        {It was not allowed to write to an .aux file.\MessageBreak%
         This package does not work without access to an .aux file.\MessageBreak%
         Press Ctrl+Z to exit.\MessageBreak%
         But it is OK if the .aux file was already updated\MessageBreak%
         by previouse compiler runs\MessageBreak%
         and would not have changed anyway.\MessageBreak%
         (In that case just press Enter or Return\MessageBreak%
         to continue the compilation.)\MessageBreak%
        }%
     }%
  \fi%
  }

```

\pagenumbering To keep the original meaning of \pagenumbering:

```
\LetLtxMacro{\OrigPagenumbering}{\pagenumbering}
```

Defining some new counters (and doing related things):

```
\newcounter{CurrentPage}
\setcounter{CurrentPage}{1}
\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.

```
\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.

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

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

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

`\xroman` When `\roman{...}` is used with a value < 1, LaTeX 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, $-|\ldots|$ (i. e. -i, -ii, -iii, -iv,...) for negative values, and 0 for all other values (which should be zero).

```
\newcommand{\xroman}[1]{%
  \ifnum\value{#1}>0%
    \roman{#1}%
  \else%
    \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).

```
      -\romannumeral\number-\arabic{#1}%
    \else%
      0%
    \fi%
  \fi%
  }
```

\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 LaTeX'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 ltcounts.dtx 105 Counters and Lengths).

```
\newcommand{\XRoman}[1]{%
  \ifnum\value{#1}>0%
    \Roman{#1}%
  \else%
    \ifnum\value{#1}<0%
      -\expandafter\@slowromancap\romannumeral\number-\arabic{#1}@%
    \else%
      0%
    \fi%
  \fi%
  }
```

\XXRoman

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

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

\pagesLTS@ifcounter

We provide a way to create counters like

pagesLTS.pnc. page numbering scheme

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

pagesLTS.double. page numbering scheme

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

PageCurrentLocal. page numbering scheme

- PageCurrentLocal.<page numbering scheme>, e. g. PageCurrentLocal.Roman,

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

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

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

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

`\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`):

```
\newcommand{\lastpages}[2]{%
  \pagesLTS@ifcounter{pagesLTS.#1.#2.local.cnt}%
  \arabic{pagesLTS.#1.#2.local.cnt}%
  }
```

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

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

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

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

```
  \else%
    \addtocounter{page}{+1}%
    \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.

```
    \addtocounter{page}{-1}%
  \fi%
  }
```

\erroralphalph

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

```
%% The following code is from Heiko Oberdiek [2010/04/18],              %%
%% expanding his alphalph package as of 2010/04/18, v2.3. (Thanks!)     %%
\newcommand*{\erroralphalph}[2]{%
  \ifnum\value{#2}>0%
    #1{\value{#2}}%
  \else%
    \ifnum\value{#2}<0%
      -#1{\expandafter\@gobble\the\value{#2}}%
    \else%
      0%
    \fi%
  \fi%
  }
%% End of code from Heiko Oberdiek                                      %%
%% Check and Error/Warning messages have been moved to \EveryShipout,   %%
%% because messages inside e.g. the \pageref command can cause trouble. %%
```

\expandPagenumbering

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

```
\newcommand{\expandPagenumbering}[1]{%
  \let\Origthepage\thepage%
  \def\pagesLTS@tmpC{arabic}%
  \ifx\pagesLTS@pnc\pagesLTS@tmpC% \relax
```

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

```
  \else%
    \def\pagesLTS@tmpC{roman}%
    \ifx\pagesLTS@pnc\pagesLTS@tmpC%
      \ifpagesLTS@romanMult%
```

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

```
        \renewcommand*{\thepage}{\xroman{page}}%
      \fi%
    \else%
      \def\pagesLTS@tmpC{Roman}%
```

```
      \ifx\pagesLTS@pnc\pagesLTS@tmpC%
        \ifpagesLTS@RomanMulti%
```

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

```
          \renewcommand*{\thepage}{\XRoman{page}}%
        \fi%
      \else%
        \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.

```
          \ifx\pagesLTS@alphMult\pagesLTS@ab%
            \renewcommand*{\thepage}{\erroralphalph{\alphalph}{page}}%
          \else \ifx\pagesLTS@alphMult\pagesLTS@bb%
                  \renewcommand*{\thepage}{\erroralphalph{\alphMult}{page}}%
                \fi%
          \fi%
        \else%
          \ifx\pagesLTS@pnc\pagesLTS@Alph%
            \ifx\pagesLTS@AlphMulti\pagesLTS@ABi%
              \renewcommand*{\thepage}{\erroralphalph{\AlphAlph}{page}}%
            \else \ifx\pagesLTS@AlphMulti\pagesLTS@BBi%
                    \renewcommand*{\thepage}{\erroralphalph{\AlphMult}{page}}%
                  \fi%
            \fi%
          \else%
            \ifx\pagesLTS@pnc\pagesLTS@fns%
```

Same for `\fnsymbol` page numbers.

```
              \ifpagesLTS@fnsymbolmult%
                \renewcommand*{\thepage}{\erroralphalph{\fnsymbolmult}{page}}%
              \fi%
            \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.

```
              \PackageError{pageslts}{unknown page numbering scheme}{%
                The pageslts package encountered the unknown\MessageBreak%
                page numbering scheme\MessageBreak%
                `#1'. \MessageBreak%
                If this is no typing mistake, it might work\MessageBreak%
                - or it might not work.\MessageBreak%
                \@ehc%
                }
            \fi%
          \fi%
```

```
        \fi%
      \fi%
    \fi%
  \fi%
  \let\pagesLTS@tmpC\undefined%
  }
```

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

```
\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 counterpagesLTS.fnsymbol.local is needed. If it does not exists yet, it is created here.

```
  \edef\pagesLTS@tmpA{#1}%
  \ifx\pagesLTS@pnc\pagesLTS@fns%
    \pagesLTS@ifcounter{pagesLTS.fnsymbol.local}%
  \fi%
  \ifx\pagesLTS@tmpA\pagesLTS@fns%
    \pagesLTS@ifcounter{pagesLTS.fnsymbol.local}%
  \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.

```
  \ifx\pagesLTS@pnc\pagesLTS@tmpA% \relax
  \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.

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

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

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

```
    \ifx\pagesLTS@pnc\pagesLTS@fns%
      \ifnum \value{pagesLTS.pnc.\pagesLTS@pnc}>1%
        \mathchardef\pagesLTS@tmpa=\arabic{pagesLTS.pnc.0}%
        \setcounter{pagesLTS.pnc.0}{\value{pagesLTS.pnc.\pagesLTS@pnc}}%
        \addtocounter{pagesLTS.pnc.0}{-1}%
        \addtocounter{pagesLTS.\pagesLTS@pnc.\arabic{pagesLTS.pnc.\pagesLTS@pnc}.local.count}{%
          -\value{pagesLTS.\pagesLTS@pnc.\arabic{pagesLTS.pnc.0}.local.count}}%
        \setcounter{pagesLTS.pnc.0}{\pagesLTS@tmpa}%
      \fi%
```

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

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

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

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

an unnumbered label is also written:

```
        \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).

```
      \else%
        \mathchardef\pagesLTS@tmpa=\arabic{pagesLTS.pnc.0}%
        \setcounter{pagesLTS.pnc.0}{\value{pagesLTS.pnc.\pagesLTS@pnc}}%
        \addtocounter{pagesLTS.pnc.0}{-1}%
        \pagesLTS@ifcounter{pagesLTS.\pagesLTS@pnc.done}%
        \addtocounter{pagesLTS.\pagesLTS@pnc.done}{%
          \value{pagesLTS.\pagesLTS@pnc.\arabic{pagesLTS.pnc.0}.local.count}}%
        \addtocounter{pagesLTS.\pagesLTS@pnc.\arabic{pagesLTS.pnc.\pagesLTS@pnc}.local.count}{%
          -\value{pagesLTS.\pagesLTS@pnc.done}}%
        \setcounter{pagesLTS.pnc.0}{\pagesLTS@tmpa}%
      \fi%
```

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

```
      \if@filesw%
        \immediate\write\@auxout{\string
          \pagesLTS@ifcounter{pagesLTS.\pagesLTS@pnc.\arabic{pagesLTS.pnc.\pagesLTS@pnc}.local.cnt}}%
      \fi%
      \edef\pagesLTS@tmpB{\arabic{pagesLTS.\pagesLTS@pnc.\arabic{pagesLTS.pnc.\pagesLTS@pnc}.local.count}}%
      \if@filesw%
        \immediate\write\@auxout{\string
          \setcounter{pagesLTS.\pagesLTS@pnc.\arabic{pagesLTS.pnc.\pagesLTS@pnc}.local.cnt}{\pagesLTS@tmpB}}%
      \fi%
    \fi%
```

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

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

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

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

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

The new page numbering scheme is now started for real:

```
\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.

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

Counters like pagesLTS.pnc.Roman are introduced:

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

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

```
\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):

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

```
\ifpagesLTS@pagecontinue%
  \setcounter{page}{\value{pagesLTS.double.\pagesLTS@pnc}}%
\else%
  \setcounter{page}{1}%
\fi%
```

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

```
\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.

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

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

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

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

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

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

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

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

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

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

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

```
      \pagesLTS@ifcounter{pagesLTS.pnc.\pagesLTS@pnc}%
      \setcounter{pagesLTS.pnc.\pagesLTS@pnc}{1}%
      \pagesLTS@ifcounter{pagesLTS.double.\pagesLTS@pnc}%
      \setcounter{pagesLTS.double.\pagesLTS@pnc}{1}%
      \pagesLTS@ifcounter{pagesLTS.current.local.\pagesLTS@pnc}%
      \setcounter{pagesLTS.current.local.\pagesLTS@pnc}{1}%
    \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:

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

We do not need the temporary definitions any more.

```
  \let\pagesLTS@tmpA\undefined%
  \let\pagesLTS@tmpB\undefined%
  }
```

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

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

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

```
\def\pagesLTS@@pageref#1*#2\END{%
  \ifx\\#2\\% no star
    \pagesLTS@@@pageref{#1}%
  \else% star
    \expandafter\pagesLTS@@@pagerefstar%
  \fi%
}

\def\pagesLTS@@@pageref#1{\lastpagereftext{#1}}
\def\pagesLTS@@@pagerefstar#1{\lastpagereftextstar{#1}}
```

\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.)

```
\newcommand{\lastpagereftext}[1]{%
  \def\pagesLTS@tmpA{#1}%
  \def\pagesLTS@tmpB{pagesLTS.fnsymbol.local}%
  \ifx\pagesLTS@tmpA\pagesLTS@tmpB%
    \pagesLTS@ifcounter{pagesLTS.fnsymbol.local}%
    \ltx@ifpackageloaded{hyperref}{%
      \href{\#pagesLTS.fnsymbol.local.\arabic{pagesLTS.fnsymbol.local}}%
        {\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).

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

Otherwise just the common \pageref is applied:

```
  \else%
    \pageref{#1}%
  \fi%
```

We do not need the temporary definitions any more.

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

```
}
```

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

```
\newcommand{\lastpagereftextstar}[1]{%
  \def\pagesLTS@tmpA{#1}%
  \def\pagesLTS@tmpB{pagesLTS.fnsymbol.local}%
  \ifx\pagesLTS@tmpA\pagesLTS@tmpB%
     \pagesLTS@ifcounter{pagesLTS.fnsymbol.local}%
     \arabic{pagesLTS.fnsymbol.local}%
  \else%
```

There is no `\pageref*` without hyperref.

```
    \ltx@ifpackageloaded{hyperref}{\pageref*{#1}}{\pageref{#1}}%
  \fi%
  \let\pagesLTS@tmpA\undefined%
  \let\pagesLTS@tmpB\undefined%
  }
```

`\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:

```
\def\lastpagerefend#1{\pagesLTS@@pagerefend#1*\END}

\def\pagesLTS@@pagerefend#1*#2\END{%
  \ifx\\#2\\% no star
    \pagesLTS@@@pagerefend{#1}%
  \else% star
    \expandafter\pagesLTS@@@pagerefendstar%
  \fi%
}

\def\pagesLTS@@@pagerefend#1{\l@stpagerefend{#1}}
\def\pagesLTS@@@pagerefendstar#1{\l@stpagerefendstar{#1}}
```

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

```
\newcommand{\l@stpagerefend}[1]{%
  \def\pagesLTS@tmpA{#1}%
  \def\pagesLTS@tmpB{pagesLTS.fnsymbol.local}%
  \ifx\pagesLTS@tmpA\pagesLTS@tmpB%
    \pagesLTS@ifcounter{pagesLTS.fnsymbol.local}%
    \ltx@ifpackageloaded{hyperref}{%
      \href{\#pagesLTS.fnsymbol.local.\arabic{pagesLTS.fnsymbol.local}}%
```

```
      {\arabic{pagesLTS.fnsymbol.local}}%
   }{\arabic{pagesLTS.fnsymbol.local}}%
\else%
  \def\pagesLTS@tmpB{pagesLTS.fnsymbol}%
  \ifx\pagesLTS@tmpA\pagesLTS@tmpB%
    \ltx@ifpackageloaded{hyperref}{%
      \href{\#pagesLTS.fnsymbol.local.\arabic{pagesLTS.fnsymbol.local}}%
        {\pagesLTS.lastpage}%
     }{\pageref{pagesLTS.fnsymbol}}%
  \else%
    \def\pagesLTS@tmpB{LastPage}%
    \ifx\pagesLTS@tmpA\pagesLTS@tmpB%
      \ltx@ifpackageloaded{hyperref}{%
        \href{\#pagesLTS.fnsymbol.local.\pagesLTS@eso}%
          {\pagesLTS.lastpage}%
       }{\pageref{LastPage}}%
    \else%
      \def\pagesLTS@tmpB{VeryLastPage}%
      \ifx\pagesLTS@tmpA\pagesLTS@tmpB%
        \ltx@ifpackageloaded{hyperref}{%
          \href{\#pagesLTS.fnsymbol.local.\arabic{pagesLTS.fnsymbol.local}}%
            {\pagesLTS.lastpage}%
         }{\pageref{VeryLastPage}}%
      \else%
        \def\pagesLTS@tmpB{LastPages}%
        \ifx\pagesLTS@tmpA\pagesLTS@tmpB%
          \ltx@ifpackageloaded{hyperref}{%
            \href{\#pagesLTS.fnsymbol.local.\arabic{pagesLTS.fnsymbol.local}}%
              {\arabic{pagesLTS.pagenr}}%
           }{\pageref{LastPages}}%
        \else%
          \pageref{#1}%
        \fi%
      \fi%
    \fi%
  \fi%
\fi%
```

We do not need the temporary definitions any more.

```
\let\pagesLTS@tmpA\undefined%
\let\pagesLTS@tmpB\undefined%
}
```

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

```
\newcommand{\l@stpagerefendstar}[1]{%
  \def\pagesLTS@tmpA{#1}%
  \def\pagesLTS@tmpB{pagesLTS.fnsymbol.local}%
  \ifx\pagesLTS@tmpA\pagesLTS@tmpB%
    \pagesLTS@ifcounter{pagesLTS.fnsymbol.local}%
    \arabic{pagesLTS.fnsymbol.local}%
  \else%
    \def\pagesLTS@tmpB{pagesLTS.fnsymbol}%
    \ifx\pagesLTS@tmpA\pagesLTS@tmpB%
      \ltx@ifpackageloaded{hyperref}{\pageref*{pagesLTS.fnsymbol}}{%
        \pageref{pagesLTS.fnsymbol}}%
    \else%
      \def\pagesLTS@tmpB{LastPage}%
      \ifx\pagesLTS@tmpA\pagesLTS@tmpB%
        \ltx@ifpackageloaded{hyperref}{\pageref*{LastPage}}{\pageref{LastPage}}%
      \else%
        \def\pagesLTS@tmpB{VeryLastPage}%
        \ifx\pagesLTS@tmpA\pagesLTS@tmpB%
          \ltx@ifpackageloaded{hyperref}{\pageref*{VeryLastPage}}{%
            \pageref{VeryLastPage}}%
        \else%
          \def\pagesLTS@tmpB{LastPages}%
          \ifx\pagesLTS@tmpA\pagesLTS@tmpB%
            \ltx@ifpackageloaded{hyperref}{\pageref*{LastPages}}{\pageref{LastPages}}%
          \else%
            \ltx@ifpackageloaded{hyperref}{\pageref*{#1}}{\pageref{#1}}%
            \fi%
          \fi%
        \fi%
      \fi%
    \fi%
  \fi%
  \let\pagesLTS@tmpA\undefined%
  \let\pagesLTS@tmpB\undefined%
  }
```

\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:

```
% somewhat analogous to \overridelabel from the undolabl package:
\newcommand\overrideLTSlabel[2]{%
  \@bsphack
    \ifnum \value{pagesLTS.pnc.\pagesLTS@pnc}>1%
      \edef\pagesLTStmpA{#1}%
      \edef\pagesLTStmpB{pagesLTS.\pagesLTS@pnc.local}%
      \ifx\pagesLTStmpA\pagesLTStmpB%
          \immediate\write\@auxout{\string\undonewlabel{#1}}%
          \@overriddenmessage s{#1}%
      \fi%
    \fi%
    \pagesLTS@putlabel{#1}{#2}{0}%
  \@esphack%
  }

```

LTS@Prelim@EveryShipout

Because we cannot make references to pages with fnsymbol page "numbers" manually with hyperref, we use \phantomsections and refer to one of those. But because we do not know how many \phantomsections and \section*s are introduced by the user (or other packages; cf. LaTeX 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.

```
\newcommand{\@pagesLTS@Prelim@EveryShipout}{%
%% The following code is from the prelim2e package              %%
%% [2009/05/29 v1.3] by Martin Schr\"{o}der (Thanks!):          %%
  \bgroup
    \dimen\z@=\wd\@cclv
    \dimen\@ne=\ht\@cclv
    \dimen\tw@=\dp\@cclv
    \dimen\thr@@=\dimen1
    \advance\dimen\thr@@ by \dimen\tw@
    \global\setbox\@cclv\vbox to \dimen\thr@@{%
      \hb@xt@\dimen\z@{%
        \box\@cclv%
        \hss%
        }%
      \vbox to \z@{%
        \hb@xt@\dimen\z@{%
          \let\protect\relax
%% 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.

```
          \ifx\pagesLTS@pnc\pagesLTS@fns%
            \pagesLTS@ifcounter{pagesLTS.fnsymbol.cont}%
            \addtocounter{pagesLTS.fnsymbol.cont}{1}%
            \ltx@ifpackageloaded{hyperref}{%
              \phantomsection%
              \hypertarget{pagesLTS.fnsymbol.local.\arabic{pagesLTS.fnsymbol.cont}}{}%
              }{}%
            \ifnum \pagesLTS@esov=\pagesLTS@zero%
              \label{pagesLTS.fnsymbol}%
            \else%
              \overridelabel{pagesLTS.fnsymbol}%
            \fi%
          \else%
            \ltx@ifpackageloaded{hyperref}{\phantomsection}{}%
            \if@filesw%
              \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.

```
              \addtocounter{page}{+1}%
                \overrideLTSlabel{pagesLTS.\pagesLTS@pnc.local}{\theCurrentPageLocal}%
              \addtocounter{page}{-1}%
            \fi%
          \fi%
%% Code from prelim2e package again:                          %%
        }%
        \vss%
      }%
      \vss%
    }%
    \wd\@cclv=\dimen\z@
    \ht\@cclv=\dimen\@ne
    \dp\@cclv=\dimen\tw@
  \egroup
%% End of code from the prelim2e package.                     %%
  }

```

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

```
\EveryShipout{%
  \ifnum\value{page}>0% \relax
  \else%
    \ifnum\value{page}=0%
      \PackageWarning{pageslts}{%
        Counter ‘page’ is zero!\MessageBreak%
        If the page numbering scheme is not arabic\MessageBreak%
        and further not extended\MessageBreak%
        (see Page counter overflow in the pageslts\MessageBreak%
        documentation), without other measures\MessageBreak%
        this will lead to a counter overflow.\MessageBreak%
      }%
    \else%
      \ifnum\value{page}<0%
        \PackageWarning{pageslts}{%
          Counter ‘page’ is negative: ‘\the\value{page}’!\MessageBreak%
          If the page numbering scheme is not arabic\MessageBreak%
          and further not extended\MessageBreak%
          (see Page counter overflow in the pageslts\MessageBreak%
          documentation), without other measures\MessageBreak%
          this will lead to a counter overflow.\MessageBreak%
        }%
      \else%
        \PackageError{pageslts}{%
          Counter ‘page’ does not have a recognized value:\MessageBreak%
          ‘\the\value{page}’\MessageBreak%
          \@ehd \MessageBreak%
          }%
      \fi%
    \fi%
  \fi%
```

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

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

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

```
    \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.

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

We save the current value of the page,

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

determine the current page numbering scheme,

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

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

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

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

```
      \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.

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

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

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

```
  \ifx\pagesLTS@pnc\pagesLTS@fns%
    \@pagesLTS@Prelim@EveryShipout%
    \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.

```
  \else%
    \ifnum \value{pagesLTS.pnc.\pagesLTS@pnc}>1%
      \@pagesLTS@Prelim@EveryShipout%
    \fi%
  \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).

```
  \addtocounter{CurrentPage}{1}%
  \addtocounter{pagesLTS.current.local.\pagesLTS@pnc}{1}%
  }
```

\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.

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

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

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

```
%% The following code is from the hyperref package             %%
%% [2010/04/17 v6.80x; newer versions are available]           %%
%% by Heiko Oberdiek (Big Thanks!).                           %%
  \if@filesw
    \begingroup
      \let\@number\@firstofone
      \ifHy@pageanchor
        \ifHy@hypertexnames
          \ifHy@plainpages
            \def\Hy@temp{\arabic{page}}%
          \else
            \Hy@unicodefalse
%% Code not from hyperref package:                            %%
%% The following lines are modified from the hyperref package. %%
%% Without the modification, after the first shipout "PD1" is  %%
%% inserted each time |\pdfstringdef\Hy@temp{\thepage}| is     %%
%% executed (if |fnsymbol| is not used).                      %%
            \ifnum \value{CurrentPage}=1%
              \ifx\pagesLTS@pnc\pagesLTS@fns%
                \pdfstringdef\Hy@temp{\thepage}%
              \else%
                \def\Hy@temp{\thepage}%
              \fi%
```

```
            \else%
              \pdfstringdef\Hy@temp{\thepage}%
            \fi%
%% Code from hyperref package again:                              %%
          \fi
        \else
          \def\Hy@temp{\the\Hy@pagecounter}%
        \fi
      \fi
%% End of code from the hyperref package.                         %%
%% (The following four lines are modified                         %%
%%  from the hyperref package.)                                   %%
      \immediate\write\@auxout{\string
        \newlabel{#1}{{}{#2}{}{\ifHy@pageanchor page.\Hy@temp\fi}{}}}%
    \endgroup%
  \fi%
  }

```

\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.

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

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

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

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

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

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

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

```
        \ltx@ifpackageloaded{nameref}{%
          \immediate\write\@auxout{\string\newlabel{#1}{{}{#2}{}{}{}}}}{% else
          \immediate\write\@auxout{\string\newlabel{#1}{{}{#2}}}}%
      \else%
        \edef\pagesLTStmpA{#1}%
        \edef\pagesLTStmpB{pagesLTS.\pagesLTS@pnc.local}%
        \ifx\pagesLTStmpA\pagesLTStmpB%
          \edef\pagesLTStmpA{#3}%
          \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.

```
            \immediate\write\@auxout{\string\undonewlabel{#1}}%
          \fi%
        \fi%
        \ltx@ifpackageloaded{nameref}{%
          \immediate\write\@auxout{\string\newlabel{#1}{{}{#2}{}{}{}}}}{% else
          \immediate\write\@auxout{\string\newlabel{#1}{{}{#2}}}}%
      \fi%
    \fi%
  }%
```

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

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

```

\pagesLTS@putlabels

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

```
\newcommand{\pagesLTS@putlabels}{%
  \addtocounter{page}{-1}%
  \addtocounter{CurrentPage}{-1}%
  \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.

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

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

```
  \else%
    \pagesLTS@writelabel{\pagesLTS@pnc.\arabic{pagesLTS.pnc.\pagesLTS@pnc}}%
    \ifnum \value{pagesLTS.pnc.\pagesLTS@pnc}<2%
      \ifx\pagesLTS@pnc\pagesLTS@fns% \relax
      \else%
        \pagesLTS@writelabel{\pagesLTS@pnc}%
      \fi%
    \fi%
  \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).

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

```
  \addtocounter{CurrentPage}{+1}%
  \addtocounter{pagesLTS.current.local.\pagesLTS@pnc}{1}%
  }
```

\AtBeginDocument

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

```
\AtBeginDocument{%
  \if@filesw%
    \immediate\write\@auxout{\string\gdef\string\pagesLTS@loaded{p@gesLTSnotlo@ded}}%
  \fi%
  \@ifpackageloaded{endfloat}%
   {\@ifpackagelater{endfloat}{1992/03/31}% April 1992 v2.0
    {\@ifpackagelater{endfloat}{2011/12/24}{% 2011/12/25 v2.5d
       \relax}%
```

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

```
     {\PackageWarningNoLine{pageslts}{Old endfloat package detected:\MessageBreak%
        There is a newer version of the endfloat package available.\MessageBreak%
        Please consider updating your version.\MessageBreak%
        The pageslts package might be incompatible with\MessageBreak%
        your current endfloat package.\MessageBreak%
      }%
     }%
```

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

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

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

```
\@ifpackageloaded{lastpage}%
 {\@ifpackagelater{lastpage}{2010/07/28}% 2010/07/29 v1.2a
    {\@ifpackagelater{lastpage}{2013/01/27}% 2013/01/28 v1.2l
       {\PackageWarning{pageslts}{lastpage package detected.\MessageBreak%
         With pageslts package in use, lastpage has no function.\MessageBreak%
         Just remove the lastpage package from your document.\MessageBreak%
         }%
       }{%
       \PackageWarning{pageslts}{Old lastpage package detected.\MessageBreak%
         With pageslts package in use, lastpage has no function.\MessageBreak%
         Just remove the lastpage package from your document.\MessageBreak%
         At least update it!\MessageBreak%
         }%
       }%
    }{%
     \PackageWarning{pageslts}{Incompatible package lastpage detected:\MessageBreak%
       Package pageslts was loaded, but also an old\MessageBreak%
       version of the lastpage package.\MessageBreak%
       pageslts has all functionality of the lastpage\MessageBreak%
       package (and more), so just remove the lastpage\MessageBreak%
       package from your document.\MessageBreak%
       (At least update it!)\MessageBreak%
       pageslts will now ''kill'' the lastpage@putlabel\MessageBreak%
       command of the lastpage package.\MessageBreak%
     }%
     \gdef\lastpage@putlabel{\relax}%
    }%
 }{}%
```

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

```
\ltx@ifpackageloaded{alphalph}%
  {\newalphalph{\AlphMult}[mult]{\@Alph}{26}%
   \newalphalph{\alphMult}[mult]{\@alph}{26}%
   \newalphalph{\fnsymbolmult}[mult]{\@fnsymbol}{5}%
  }{}%
```

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

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

and whether the pdfpages package is loaded:

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

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

```
    \@ifpackageloaded{undolabl}%
      {\@ifpackagelater{undolabl}{2010/07/14}%    2010/07/15 v1.0d
         {\@ifpackagelater{undolabl}{2015/03/29}% 2015/03/29 v1.0l
            {% recent version as of the time of last revision of this package: OK
            }{% old, but not obsolete version
              \PackageWarningNoLine{pageslts}{Old version of undolabl package used.\MessageBreak%
                See https://www.ctan.org/pkg/undolabl\MessageBreak%
                for a new version.\MessageBreak%
               }%
            }
         }{\PackageError{pageslts}{Incompatible, obsolete version of undolabl package used.}{%
             See https://www.ctan.org/pkg/undolabl\MessageBreak%
             for a new version.\MessageBreak%
             Type  X <return>  to quit.\MessageBreak%
            }%
         }
      }{\PackageError{pageslts}{Package undolabl missing}{%
          Package undolabl not found.\MessageBreak%
          The pageslts package needs the undolabl package.\MessageBreak%
          See https://www.ctan.org/pkg/undolabl\MessageBreak%
          Type  X <return>  to quit.\MessageBreak%
          }%
      }
```

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

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

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

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

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.

```
\ltx@ifpackageloaded{showkeys}{%
  \@ifpackagewith{showkeys}{final}{}{\gdef\pagesLTS@SK{1}}}{% else \relax
  }%
}

```

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

```
\AtEndDocument{%
  \ltx@ifpackageloaded{showkeys}{%
    \ifx\pagesLTS@SK\pagesLTS@one\relax%
    \else%
      \providecommand*\pagesLTS@sklf[1]{}%
      \ifx\showkeyslabelformat\pagesLTS@sklf\relax%
      \else%
        \PackageError{pageslts}{Package showkeys loaded after pageslts}{%
          The showkeys package with option "final" has been loaded\MessageBreak%
          after the pageslts package.\MessageBreak%
          Please first load showkeys and then pageslts}%
      \fi%
    \fi%
  }{% else no showcase, \relax
  }%
```

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

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

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

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

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

```
\clearpage%
\ifx\pagesLTS@pnc\pagesLTS@fns%
  \def\pagesLTS@tmpA{\arabic{pagesLTS.fnsymbol.local}}%
  \ifnum \pagesLTS@eso=\pagesLTS@tmpA%
    \gdef\pagesLTS@rerun{0}%
  \else%
    \gdef\pagesLTS@rerun{1}%
  \fi%
  \if@filesw%
    \immediate\write\@auxout{\string\gdef\string\pagesLTS@eso{\pagesLTS@tmpA}}%
  \fi%
\fi%
\pagesLTS@putlabel{LastPage}{\thepage}{1}%
```

We do not need the temporary definition any more.

```
\let\pagesLTS@tmpA\undefined%
}
```

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

```
\AfterLastShipout{%
```

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

```
  \if@filesw%
```

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

```
    \ifx\pagesLTS@esov\pagesLTS@zero%
    \else%
      \immediate\write\@auxout{\string
        \pagesLTS@ifcounter{pagesLTS.fnsymbol.local}}%
      \immediate\write\@auxout{\string
        \setcounter{pagesLTS.fnsymbol.local}{\pagesLTS@esov}}%
    \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`.

```
  \ltx@ifpackageloaded{hyperref}{%
    \ifx\pagesLTS@pnc\pagesLTS@fns%
        \immediate\write\@auxout{\string
          \gdef\string\lastpageref{\string\lastpagerefend}}%
    \fi%
   }{}%
\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:

```
\pagesLTS@ifcounter{pagesLTS.\pagesLTS@pnc.\arabic{pagesLTS.pnc.\pagesLTS@pnc}.local.count}%
\setcounter{pagesLTS.\pagesLTS@pnc.\arabic{pagesLTS.pnc.\pagesLTS@pnc}.local.count}{%
  \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.)

```
\addtocounter{pagesLTS.\pagesLTS@pnc.\arabic{pagesLTS.pnc.\pagesLTS@pnc}.local.count}{-1}
\ifnum \value{pagesLTS.pnc.\pagesLTS@pnc}>1%
  \mathchardef\pagesLTS@tmpD=\arabic{pagesLTS.pnc.0}%
  \setcounter{pagesLTS.pnc.0}{\value{pagesLTS.pnc.\pagesLTS@pnc}}%
  \@tempcnta=\value{pagesLTS.pnc.0}\relax%
  \loop%
    \ifnum\@tempcnta>1\relax%
      \addtocounter{pagesLTS.pnc.0}{-1}%
      \addtocounter{pagesLTS.\pagesLTS@pnc.\arabic{pagesLTS.pnc.\pagesLTS@pnc}.local.count}{%
        -\value{pagesLTS.\pagesLTS@pnc.\arabic{pagesLTS.pnc.0}.local.count}}%
      \@tempcnta=\value{pagesLTS.pnc.0}\relax%
  \repeat%
  \setcounter{pagesLTS.pnc.0}{\pagesLTS@tmpD}%
\fi%
\if@filesw%
  \immediate\write\@auxout{\string
    \pagesLTS@ifcounter{pagesLTS.\pagesLTS@pnc.\arabic{pagesLTS.pnc.\pagesLTS@pnc}.local.cnt}}%
  \edef\pagesLTS@tmpA{\arabic{pagesLTS.\pagesLTS@pnc.\arabic{pagesLTS.pnc.\pagesLTS@pnc}.local.count}}%
  \immediate\write\@auxout{\string
    \setcounter{pagesLTS.\pagesLTS@pnc.\arabic{pagesLTS.pnc.\pagesLTS@pnc}.local.cnt}{\pagesLTS@tmpA}}%
  \let\pagesLTS@tmpA\undefined%
\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.

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

```
      \gdef\string\pagesLTS.lastpage{\pagesLTS@tmpA}}%
  \fi%
  \addtocounter{page}{+1}%
  \addtocounter{CurrentPage}{-1}%
  \edef\pagesLTS@tmpB{\arabic{CurrentPage}}%
  \if@filesw%
    \immediate\write\@auxout{\string
      \setcounter{pagesLTS.pagenr}{\pagesLTS@tmpB}}%
  \fi%
  \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.

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

```
  \message{^^J%
    AED: pageslts setting LastPages via AfterLastShipout ^^J}%
  \pagesLTS@putlabels%
  \typeout{^^J}%
  \ifodd\pagesLTS@tmpB%
    \@PackageInfoNoLine{pageslts}{Total number of pages is odd}%
  \else%
    \@PackageInfoNoLine{pageslts}{Total number of pages is even}%
  \fi%
  \typeout{^^J}%
```

We do not need the temporary definitions any more.

```
  \let\pagesLTS@tmpA\undefined%
  \let\pagesLTS@tmpB\undefined%
  }
```

\AtEndAfterFileList

\AtEndAfterFileList{...} is even later:

> "After the .aux file closing and reading LaTeX prints the file list if requested by \listfiles. Then this hook is executed."

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

```
\AtEndAfterFileList{%
  \ifx\pagesLTS@rerun\pagesLTS@one%
    \PackageWarningNoLine{pageslts}{%
      Label(s) may have changed.\MessageBreak%
      Rerun to get cross-references right%
     }%
  \fi%
  }

```

\frontmatter

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

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

```
\newcommand{\pagesLTS@ifundefinedorrelax}[1]{%
  % Modified Markus Kohm code for use without e-TeX
  \begingroup\expandafter\expandafter\expandafter\endgroup
  \expandafter\ifx\csname #1\endcsname\relax%
    \expandafter\ifx\csname #1\endcsname\relax%
      \expandafter\expandafter\expandafter\@firstoftwo
    \else%
      \expandafter\expandafter\expandafter\@secondoftwo
    \fi%
  \else%
    \expandafter\@firstoftwo
  \fi%
  }

\pagesLTS@ifundefinedorrelax{frontmatter}{% \relax
}{% else
  \ltx@GlobalPrependToMacro{\frontmatter}{\pagesLTS@prefrontmatter}%
  \ltx@GlobalAppendToMacro{\frontmatter}{\pagesLTS@postfrontmatter}%
```

```
}
```

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

```
\newcommand{\pagesLTS@prefrontmatter}{%
  \xdef\pagesLTS@FMBpncn{\pagesLTS@pnc}%
  \xdef\pagesLTS@FMBpncp{\arabic{pagesLTS.current.local.\pagesLTS@pnc}}%
  }
```

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

```
\newcommand{\pagesLTS@postfrontmatter}{%
  \xdef\pagesLTS@FMEpncn{\pagesLTS@pnc}%
  \ifx\pagesLTS@FMBpncn\pagesLTS@FMEpncn%
  \else%
    \ifx\pagesLTS@FMBpncn\pagesLTS@zero%
    \else%
      \ifx\pagesLTS@FMBpncp\pagesLTS@one%
        \PackageError{pageslts}{\string\pagenumbering\space before \string\frontmatter}{%
          Do not use \string\pagenumbering{\pagesLTS@FMBpncn} before \string\frontmatter \MessageBreak%
          on the same page!\MessageBreak%
          \string\frontmatter\space (re)defines the page numbering scheme to \pagesLTS@FMEpncn , \MessageBreak%
          thus earlier use of \string\pagenumbering{\pagesLTS@FMBpncn} on the same page is useless anyway.}%
      \fi%
    \fi%
  \fi%
}
```

⟨/package⟩

7 Installation

7.1 Downloads

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

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

- TEXFormat LATEX 2ε: https://www.CTAN.org
- document class ltxdoc, 2015-03-26, 2.0w, https://www.ctan.org/pkg/ltxdoc
- package holtxdoc, 2012/03/21, v0.24, https://www.ctan.org/pkg/holtxdoc
- package hypdoc, 2011/08/19, v1.11, https://www.ctan.org/pkg/hypdoc
- package geometry, 2010/09/12, v5.6, https://www.ctan.org/pkg/geometry
- package ulem, 2012/05/18, no version number given, https://www.ctan.org/pkg/ulem

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

- TEX Format LATEX 2ε, https://www.CTAN.org
- package atveryend, 2011/06/30, v1.8, https://www.ctan.org/pkg/atveryend
- package everyshi, 2001/05/15, v3.00, https://www.ctan.org/pkg/everyshi
- package kvoptions, 2011/06/30, v3.11, https://www.ctan.org/pkg/kvoptions
- package letltxmacro, 2010/09/02, v1.4, https://www.ctan.org/pkg/letltxmacro
- package ltxcmds, 2011/11/09, v1.22, https://www.ctan.org/pkg/ltxcmds
- package rerunfilecheck, 2011/04/15, v1.7, https://www.ctan.org/pkg/rerunfilecheck
- package undolabl, 2015/03/29, v1.0l, https://www.ctan.org/pkg/undolabl

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

- class article, 2014/09/29, v1.4h, from classes.dtx: https://www.ctan.org/pkg/classes
- package alphalph, 2011/05/13, v2.4, https://www.ctan.org/pkg/alphalph
- package lipsum, 2014/07/27, v1.3, https://www.ctan.org/pkg/lipsum
- package showkeys, 2014/10/28, v3.17, https://www.ctan.org/pkg/showkeys
- package hyperref, 2012/11/06, v6.83m, https://www.ctan.org/pkg/hyperref
- package pageslts, 2015/12/21, v1.2f, https://www.ctan.org/pkg/pageslts
  (Well, it is the example file for this package, and because you are reading the documentation for the pageslts package, it can be assumed that you already have some version of it – is it the current one?)

papermas

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

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

endfloat

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

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

prelim2e

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

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

fancyhdr
nccfancyhdr

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

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

lastpage
totpages
totcount
nofm
count1to
zref

As possible alternatives in section 4 there are listed

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

Oberdiek
alphalph
atveryend
holtxdoc
letltxmacro
ltxcmds
kvoptions
rerunfilecheck
zref
hyperref
Münch

All packages of Heiko Oberdiek's bundle 'oberdiek' (especially alphalph, atveryend, holtxdoc, letltxmacro, ltxcmds, kvoptions, rerunfilecheck, and zref) are also available in a TDS compliant ZIP archive:
http://mirrors.ctan.org/install/macros/latex/contrib/oberdiek.tds.zip.
It is probably best to download and use this, because the packages in there are quite probably both recent and compatible among themselves.

hyperref is not included in that bundle and needs to be downloaded separately,
http://mirrors.ctan.org/install/macros/latex/contrib/hyperref.tds.zip.

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

7.2 Package, unpacking TDS

Package. This package is available on CTAN.org.

http://mirrors.ctan.org/macros/latex/contrib/pageslts/pageslts.dtx
: The source file.

http://mirrors.ctan.org/macros/latex/contrib/pageslts/pageslts.pdf
: The documentation.

http://mirrors.ctan.org/macros/latex/contrib/pageslts/pageslts-example.pdf
: The compiled example file, as it should look like.

http://mirrors.ctan.org/macros/latex/contrib/pageslts/README
: The README file.

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

http://mirror.ctan.org/install/macros/latex/contrib/pageslts.tds.zip
: Everything in TDS compliant, compiled format.

which additionally contains

pageslts.ins	The installation file.
pageslts.drv	The driver to generate the documentation.
pageslts.sty	The `.style` file.
pageslts-example.tex	The example file.

For required other packages see the preceding subsection.

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

```
tex pageslts.dtx
```

About generating the documentation see paragraph 7.4 below.

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

```
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 (teTEX, mikTEX,...) relies on file name databases, you must refresh these. For example, teTEX 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 autodetect routine about your intention:

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

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

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

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

An example follows how to generate the documentation with pdfLATEX:

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

7.5 Compiling the example

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

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

or (recommended)

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

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

8 Acknowledgements

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

9 History

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

[1994/06/17, lastpage]

- lastpage v0.99a: First shot by Jeffrey P. Goldberg.

[1994/06/25, lastpage]

- lastpage v0.1b: Last version number created by Jeffrey P. Goldberg.

[1994/07/20, lastpage]

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

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

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

[2010/02/18, lastpage]

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

[2010/05/15 v1.0 pagesLTS]

- pagesLTS Complete rewriting of the package, so as to work with **more than one page numbering scheme**; using `\AtVeryEnd` for `VeryLastPage`; upgrade from fancyheadings to fancyhdr package, then removed the need for a fancyhdr package at all.
- Rewriting of the package, so as to work with the fnsymbol page numbering scheme (even on the last page).
- Introduction of kvoptions into this package.
- Check for incompatible endfloat package.
- lastpage209.sty for LaTeX209 .
- Replacement of `\filedate`, `-version`, `-name`,... because of LaTeX bug 2705:
  Synopsis: Possible problem with `\fileversion` and `\filedate`
  http://www.latex-project.org/cgi-bin/ltxbugs2html?category=LaTeX&responsible=anyone&state=anything&keyword=lastpage&pr=latex%2F2705&search=
- alphalph support included.
- Page numbering extension `\erroralph` by Heiko Oberdiek included.
- (Page-) Numbering extension for `roman` and `Roman` numbers included.
- Incompatible, old lastpage package "killed".
- Example `pagesLTS-example.tex` added.
- Alternatives listing (section 4).
- Listing of TeX sources (subsection 7.1).
- Complete rewriting of the documentation.
- Everything in DTX framework.
- New package name: pagesLTS for Last, Total, and page numbering Schemes pages.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

[2010/09/27 v1.1l pagesLTS]

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

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

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

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

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

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

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

[2011/08/08 v1.2a]

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

[2013/01/28 v1.2b]

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

[2014/01/19 v1.2c]

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

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

[2015/08/02 v1.2d]

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

[2015/08/17 v1.2e]

- Bug fix, see https://tex.stackexchange.com/q/261445/6865, thank you to Prof. Enrico Gregorio for providing the fix and to Dr. Clea F. Rees for bringing this to my attention.

[2015/12/21 v1.2f]

- Replaced `\next` with `\@pageslts@currname`.
- Bug fix, see https://tex.stackexchange.com/q/140235/6865. If the bug had been actually reported (instead of waiting until I see the question), I would have fixed it earlier, of course.
- Changed minor details like fixing urls in the manual.

When you find a mistake or have a suggestion for an improvement of this package, please send an e-mail to the maintainer, thanks!
(Please see BUG REPORTS in the README.)

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

10 Index

Numbers written in italic refer to the page where the corresponding entry is described; numbers underlined refer to the code line of the definition; plain numbers refer to the code lines where the entry is used.

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