The **pageslts** package

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Abstract

This LaTeX package puts the labels `LastPage` (`\AddToHook{enddocument/afterlastpage}`, formerly `\AtEndDocument`) and `VeryLastPage` (also `\AddToHook{enddocument/afterlastpage}`, but formerly `\AfterLastShipout`) into the `.aux` file, allowing the user to refer to the 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. – The name of the **pageslts** package refers to **L**ast, **T**otal, and page numbering **S**chemes pages. `pagesLTS` was a former name of this package.

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: ∗, †, ‡, §,...),
gobble (Maybe `\thispagestyle{empty}` is more useful?),
silly (from the sillypage package).

This package first started as a revision of the `lastpage` package of **Jeffrey P. Goldberg** (Thanks!), but then it was deemed necessary to provide a separate, enhanced package. After updates of the kernel and the package, `lastpage` now does what it is supposed to do.

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Contents

1 Introduction

This package puts the labels `LastPage` (`\AddToHook{enddocument/afterlastpage}`, formerly `\AtEndDocument`; same as the `LastPage` package) and `VeryLastPage` (also `\AddToHook{enddocument/afterlastpage}`, but formerly `\AfterLastShipout`) into the `.aux` file, allowing the user to refer to the 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), https://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. Also to this label it can be referred. 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: ∗, †, ‡, §,...),
gobble (Maybe `\thispagestyle{empty}` is more useful?),
silly (from the sillypage package).

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.

Trademarks appear throughout this documentation 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.

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

- In Adobe Acrobat Reader Continuous Release 2024.005.20320 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!

2 Usage

Just load the package by placing

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

in the preamble of your LaTeX source file 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 (https://ctan.org/pkg/fancyhdr) or nccfancyhdr (https://ctan.org/pkg/nccfancyhdr) package, or redefinitions of the page headings and footings to get a reference to the last page.

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

2.1 Options

options The pageslts package takes the following options:

2.1.1 pagecontinue

pagecontinue When option pagecontinue=false is **not** given (i. e. pagecontinue or pagecontinue=true or no pagecontinue option at all), at each \pagenumbering{...} command the number of the page 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 a user option to choose between the two continuations), but instead only gives an error:

---

[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

```
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.
```

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

Nevertheless, some TeX capacity will be exceeded well before the $2\,147\,483\,647^{\text{th}}$ page.

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

ab After page z, the page "numbers" continue with aa, ab, ac, ad,..., and before a with 0, -a, -b,..., -z, -aa, -ab,....

bb After page z, the page "numbers" continue with aa, bb, cc, dd,..., and before a with 0, -a, -b,..., -z, -aa, -bb,....

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,..., and before A with 0, -A, -B,..., -Z, -AA, -AB,....

BB After page Z, the page "numbers" continue with AA, BB, CC, DD,..., and before A with 0, -A, -B,..., -Z, -AA, -BB,....

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 (but `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` and see the resulting `pdf` file.

Before ∗ (page 1) the page "numbers" are continued with $0, -\ast, -\dagger,\ldots, -\P, -\ast\ast, -\dagger\dagger,\ldots$
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.)

2.1.3 romanMult, RomanMulti

`romanMult` The options `romanMult(= true)` and `RomanMulti(= true)` expand the `\roman` and `\Roman` page numbering scheme to values below one
`RomanMulti` (< 1), i.e. 0, -i, -ii, -iii, -iv,... and 0, -I, -II, -III, -IV,..., respectively.
Again the TeX capacity will be exceeded well before $\pm$ `MAX` $= \pm 2\,147\,483\,647$. 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 those values – not even a warning will be issued!)

2.1.4 Arabic page numbers

Arabic page numbers In LaTeX arabic (page) numbers are already possible between `-MAX...MAX`, where `MAX` $= 2\,147\,483\,647$ (cf. the `alphalph` package), without any expansion necessary.

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 `\AddToHook{enddocument/afterlastpage}` (formerly: `\AtEndDocument`) this package defines a label, `LastPage`, which the user can refer to with the `\lastpageref{LastPage}` command. In former times `\pageref{LastPage}` did not work when used together with the `hyperref` package and the `fnsymbol` page numbering scheme. This should work now.

VeryLastPage `\AddToHook{enddocument/afterlastpage}` (formerly: `\AfterLastShipout`) the label `VeryLastPage` is defined, which the user can also refer to with the `\lastpageref{VeryLastPage}` command. With the new kernel hooks `LastPage` as well as `VeryLastPage` point to the last page indeed.

LastPages When more than one page numbering scheme is used, neither `LastPage` nor `VeryLastPage` give the total **number** of pages. For example,
page number 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,
number of pages and this is given by the reference to `LastPage`s: `\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 automatically reset to one (without option `pagecontinue`). This is done by `\setcounter{page}{1}`, thus this is ignored, too.)

totpages `\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 in the hook `enddocument/afterlastpage`, therefore `\lastpageref{LastPages}` is safer to really get the total page number.

\@abspage@last Nowadays the kernel provides `\@abspage@last`, which contains the number of pages.

\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 an-

other page numbering scheme. And this is exactly what `\theCurrentPageLocal` does: `\def\theCurrentPageLocal{\arabic{pagesLTS.current.local.\pagesLTS@pnc}}`.

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

`\lastpageref` — In former times for pages with the `fnsymbol` page numbering scheme, `\lastpageref{...}` instead of `\pageref{...}` had to be used. `\lastpageref` can be used for all pages.

`\pagenumbering`
2.3 \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`	Additionally, at the last page of each page numbering scheme a label `pagesLTS.<numbering scheme>` is placed, where `<numbering`
`pagesLTS.roman`	`scheme>` is e.g. arabic, roman, Roman, alph, Alph, fnsymbol, silly, gobble,….
`pagesLTS.Roman`	Additional page numbering schemes are unknown for pageslts, see .
`pagesLTS.alph`	
`pagesLTS.Alph`	
`pagesLTS.fnsymbol`	
`pagesLTS.silly`	
`pagesLTS.gobble`	

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

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

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

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

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

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

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

```
Last Roman page (pagesLTS.Roman): \lastpageref{pagesLTS.Roman}\newline
There are \lastpageref{pagesLTS.Roman.local}~pages with Roman numbers:\newline
\lastpages{Roman}{1}~pages in the first Roman sector
(\pageref{Roman} -- \lastpageref{pagesLTS.Roman.1}),\newline
\lastpages{Roman}{2}~pages in the second Roman sector
(\pageref{Roman2} -- \lastpageref{pagesLTS.Roman.2}), and\newline
\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 June 5, 2025*   page V (5) of VII + 35 = 42 pages"

or

"*DRAFT June 5, 2025*   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. https://ctan.org/pkg/papermas

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 https://texfaq.org/FAQ-pdfpagelabels.

3.2 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 always use `\label`, but sometimes writes directly into the `\jobname.aux`-file, and this is generally done <u>after</u> the according page has shipped out, therefore no box can be placed on the <u>preceding</u> page. At least pageslts gives a warning, that showkeys cannot present the respective label.

3.3 lastpage package

This package first started as a revision of the lastpage package of JEFFREY P. GOLDBERG (jeffrey+news at goldmark dot org), but then I deemed a replacement necessary 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. It is also possible to load both packages (if recent versions are used).

3.4 Using an unknown page numbering scheme

While at the time of the latest revision of the pageslts package no other page numbering schemes (e. g. Greek, Hebraic) 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 special 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. Especially 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 `\phantomsectin`s and `\label{...}`s or even `\hypertarget`s and `\href`s.

3.5 Page counter overflow

<u>WITHOUT (!)</u> 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 T_EX 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`

" (alphalph package manual, 2019/12/09, v2.6, first table, p. 2).

Please see subsubsections 2.1.2 and 2.1.3 for instructions how to overcome these limitations – except $\pm$MAX: When this is exceeded via `\setcounter{<name>}{` something greater than MAX (or smaller then $-$MAX) `}`, then the error

```
! Number too big.
I can only go up to 2147483647='17777777777="7FFFFFFF,
so I'm using that number instead of yours.
```

will arise. But if the counter has a value of $2\,147\,483\,647 = $ MAX, and `\addtocounter{<name>}{+1}` is tried, no error is issued, but `\arabic{<name>}` prints -2147483648, and further `\addtocounter{<name>}{+1}`s give -2147483647, -2147483646 and so on.
For a counter value of $-2\,147\,483\,647 = -$MAX and `\addtocounter{<name>}{-1}`s after -2147483647 it is printed -2147483648, 2147483647, 2147483646 and so on (without any message in the `log` file about any possible issue).

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 your system has (e.g. TeX, LaTeX2e, ε-TeX, LaTeX-format as recent as 2024-11-01 or newer), here is a list of some possible alternatives:

LaTeX-kernel - The number of pages is nowadays available via `\@abspage@last`, `\thetotalpages`, and `\PreviousTotalPages` from the kernel, but when more than one page numbering scheme is used (for example pages I to X and then 1 to 10, thus number of pages "20", but name of the last page "10"), or when or the fnsymbol page numbering scheme is used, or another package has output after this package, or the page numbers exceed a certain range, there might be issues. (Is the total number of pages wanted? Or is the name of the last page sought?)
`\the\ReadonlyShipoutCounter` contains the number of currently shipped out pages, i.e. current page minus one.

LastPage - The `lastpage` package also provides the `LastPage` label (but not `VeryLastPage` or `LastPages`). If you only want this and/or have a quite limited amount of TeX resources, you might want to use that package instead. It includes versions for older LaTeX-kernels and even for LaTeX2.09.
https://ctan.org/pkg/lastpage

totpages - The `totpages` package provides a `totpages` label similar to `LastPages`, but `\AtEndDocument` instead of hook `enddocument/afterlastpage`. 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) (which can be achieved also with the papermas package (see subsection 2.4).
https://ctan.org/pkg/totpages

totalcount - The totalcount package provides `\totalpages`. If there are only arabic page numbers consecutively running from 1 to the last page, this works. But for example

```
\documentclass{article}
\usepackage[page]{totalcount}
\pagenumbering{Roman}
\begin{document}
\addtocounter{page}{49}
Page \thepage{} of \totalpages
\end{document}
```

prints "Page L of 50", where the number of pages is one (and no hyperlink is provided to the last page even if hyperref is used).
https://ctan.org/pkg/totalcount

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 for example by `\addtocounter`.
https://ctan.org/pkg/totcount

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

https://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://CTAN.org) location of a **working** (!) version, please send me an e-mail, thanks!

count1to - The count1to package "sets `\count1` to `\count8` with the values of page to subparagraph. `\count9` is used to flag odd pages. . . . [T]he code for the TotalPages label" (package manual, 2024-06-13) has been removed from the current package version.
https://ctan.org/pkg/count1to

zref - The zref package "implements an extensible referencing system" (package manual, 2023-09-14).
https://ctan.org/pkg/zref

memoir - The memoir <u>class</u> provides `\thelastpage` (page number printed on last page) and `\thelastsheet` (number of pages).

(You programmed or found another alternative, which is available at https://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.)

5   Example

```
 1 ⟨∗example⟩
 2 \documentclass[british]{article}[2025/01/22]% v1.4n
 3 \usepackage{lipsum}[2021-09-20]% v2.7
 4 \usepackage[draft]{showkeys}[2024/05/23]% v3.21
 5 %%       Use final instead of draft to hide the keys. %%
 6 \usepackage[pdfpagelabels=true,hyperindex=false]{hyperref}[2024-11-05]% v7.01l
 7 \makeatletter
 8 \@ifpackageloaded{hyperref}{% Hypertext links for LaTeX
 9 \hypersetup{extension=pdf,%
10 plainpages=false,%
11 pdflang={en},%
12 pdftitle={pageslts package example},%
13 pdfauthor={H.-Martin Muench},%
14 pdfsubject={Example for the pageslts package},%
15 pdfkeywords={LaTeX, pageslts},%
16 pdfview=Fit,%
17 pdfstartview=Fit,%
18 pdfpagelayout=SinglePage,%
19 bookmarksopen=true%
20 }}{\usepackage{url}[2013/09/16]}% v3.4
21 \makeatother
22 \usepackage[pagecontinue=true,alphMult=ab,AlphMulti=AB,fnsymbolmult=true,%
23 romanMult=true,RomanMulti=true]{pageslts}[2025-06-05]% v2.0e
24 %% These are the default options. %%
25
26 \makeatletter
27   \renewcommand{\@evenfoot}%
28   {Page \thepage\ (\theCurrentPage; local: \theCurrentPageLocal) of %
29    \lastpageref{pagesLTS.roman}(\lastpageref{pagesLTS.roman.local}) + %
30    \ifpagesLTS@pagecontinue%
31      \lastpageref{pagesLTS.Roman}(\lastpageref{pagesLTS.Roman.local}) %
32    \else%
33      \{\lastpageref{pagesLTS.Roman.1}%
34       +\lastpageref{pagesLTS.Roman.2}%
35       +\lastpageref{pagesLTS.Roman.3}%
36      (\lastpages{Roman}{1}+\lastpages{Roman}{2}+\lastpages{Roman}{3}=%
37       \the\numexpr%
38        \csname c@pagesLTS.Roman.1.local.cnt\endcsname%
39       +\csname c@pagesLTS.Roman.2.local.cnt\endcsname%
40       +\csname c@pagesLTS.Roman.3.local.cnt\endcsname%
41       \relax)\} %
42    \fi + %
43    \lastpageref{pagesLTS.arabic}(\lastpageref{pagesLTS.arabic.local}) + %
44    \lastpageref{pagesLTS.fnsymbol}(\lastpageref{pagesLTS.fnsymbol.local}) + %
```

```
45      \lastpageref{pagesLTS.alph}(\lastpageref{pagesLTS.alph.local}) + %
46      \lastpageref{pagesLTS.gobble}(\lastpageref{pagesLTS.gobble.local}) + %
47      \lastpageref{pagesLTS.Alph}(\lastpageref{pagesLTS.Alph.local}) = %
48      \lastpageref{LastPages} pages.%
49    }
50    \renewcommand{\@oddfoot}{\@evenfoot}
51    \def\pagesLTSexampleArabic{3}
52    \def\pagesLTSexamplealph{23}
53 \makeatother
54 \setlength{\parindent}{0pt}
55 \listfiles
56 \begin{document}
57 \pagenumbering{roman}
58 %% Note the first \pagenumbering immediately behind \begin{document}! %%
59 %%\addtocounter{page}{-2} %%
60 \section*{Example for pageslts}
61 \addcontentsline{toc}{section}{Example for pageslts}
62 \markboth{Example for pageslts}{Example for pageslts}
63
64 This example demonstrates the most common uses of package\newline
65 \textsf{pageslts}, v2.0e as of 2025-06-05 (HMM);\newline
66 \url{https://ctan.org/pkg/pageslts}.\bigskip
67
68 The used options were \texttt{pagecontinue=true},
69 \texttt{alphMult=ab}, \texttt{AlphMulti=AB}, \linebreak
70 \texttt{fnsymbolmult=true},
71 \texttt{romanMult=true}, and \texttt{RomanMulti=true}
72 (the default\linebreak ones).~-- For more details please see the documentation!\bigskip
73
74 \label{keys} To hide the \pageref{keys}{\qquad } use option
75 \texttt{final} instead of \texttt{draft} with the \textsf{showkeys}
76 package (or remove the package call from the preamble of
77 this document).\bigskip
78
79 \textbf{Hyperlinks or not:} If the \textsf{hyperref} package is loaded,
80 the references are also hyperlinked:\bigskip
81 \smallskip
82 Page \thepage\ (\theCurrentPage; local: \theCurrentPageLocal) of %
83 \lastpageref{pagesLTS.roman}(\lastpageref{pagesLTS.roman.local}) + %
84 \makeatletter%
85 \ifpagesLTS@pagecontinue%
86   \lastpageref{pagesLTS.Roman}(\lastpageref{pagesLTS.Roman.local}) %
87 \else%
88   \{\lastpageref{pagesLTS.Roman.1}%
89   +\lastpageref{pagesLTS.Roman.2}%
90   +\lastpageref{pagesLTS.Roman.3}%
```

```
91    (\lastpages{Roman}{1}+\lastpages{Roman}{2}+\lastpages{Roman}{3}=%
92     \the\numexpr%
93      \csname c@pagesLTS.Roman.1.local.cnt\endcsname%
94     +\csname c@pagesLTS.Roman.2.local.cnt\endcsname%
95     +\csname c@pagesLTS.Roman.3.local.cnt\endcsname%
96     \relax)\} %
97 \fi + %
98 \makeatother%
99 \lastpageref{pagesLTS.arabic}(\lastpageref{pagesLTS.arabic.local}) + %
100 \lastpageref{pagesLTS.fnsymbol}(\lastpageref{pagesLTS.fnsymbol.local}) + %
101 \lastpageref{pagesLTS.alph}(\lastpageref{pagesLTS.alph.local}) + %
102 \lastpageref{pagesLTS.Alph}(\lastpageref{pagesLTS.Alph.local}) = %
103 \lastpageref{LastPages} pages.\bigskip
104 If the \textsf{hyperref} package is loaded, but the hyperlinks of the
105 references shall be suppressed, \verb|\pageref*{...}|
106 and \verb|\lastpageref*{...}| can be used:\\[0.5\baselineskip]
107 Page \thepage\ (\theCurrentPage; local: \theCurrentPageLocal) of %
108 \lastpageref*{pagesLTS.roman}(\lastpageref*{pagesLTS.roman.local}) + %
109 \makeatletter%
110 \ifpagesLTS@pagecontinue%
111   \lastpageref*{pagesLTS.Roman}(\lastpageref*{pagesLTS.Roman.local}) %
112 \else%
113   \{\lastpageref*{pagesLTS.Roman.1}%
114   +\lastpageref*{pagesLTS.Roman.2}%
115   +\lastpageref*{pagesLTS.Roman.3}%
116   (\lastpages{Roman}{1}+\lastpages{Roman}{2}+\lastpages{Roman}{3}=%
117    \the\numexpr%
118     \csname c@pagesLTS.Roman.1.local.cnt\endcsname%
119    +\csname c@pagesLTS.Roman.2.local.cnt\endcsname%
120    +\csname c@pagesLTS.Roman.3.local.cnt\endcsname%
121    \relax)\} %
122 \fi + %
123 \makeatother%
124 \lastpageref*{pagesLTS.arabic}(\lastpageref*{pagesLTS.arabic.local}) + %
125 \lastpageref*{pagesLTS.fnsymbol}(\lastpageref*{pagesLTS.fnsymbol.local}) + %
126 \lastpageref*{pagesLTS.alph}(\lastpageref*{pagesLTS.alph.local}) + %
127 \lastpageref*{pagesLTS.Alph}(\lastpageref*{pagesLTS.Alph.local}) = %
128 \lastpageref*{LastPages} pages.\bigskip
129
130 \textbf{Trademarks} appear throughout this example without any
131 trademark symbol; they are the property of their respective
132 trademark owner. There is no intention of infringement; the
133 usage is to the benefit of the trademark owner.\bigskip
134
135 \textbf{Tip}: Use \textit{logical page numbers} for the display of the pdf
136 (in Adobe Acrobat Reader Continuous Release 2024.005.20320:\newline
```

```
137 Edit $>$ Preferences $>$ Categories: Page Display $>$
138 Page Content and Information: Use logical page numbers)!\bigskip
139
140 You want negative page numbers? Not only arabic, but even roman,
141 Roman, alph, Alph or fnsymbol ones? No problem, e.\,g.~just give a\newline
142 \verb|\addtocounter{page}{|-\textit{some number}\verb|}| in the
143 source code of this example file (or uncomment the prepared line)!
144 \newpage
145 \tableofcontents
146 \newpage%
147 \makeatletter%
148 \def\pagesLTS@tmpC{roman}%
149 \ifx\pagesLTS@pnc\pagesLTS@tmpC%
150 \else\pagenumbering{roman}%
151 %% in case the page numbering is changed before,
152 %% otherwise pagesLTS.current.local.roman on this page would be undefined
153 \fi%
154 \makeatother%
155 \section{roman}
156
157 (\textttt{roman} page numbering was started before,
158 because the page numbering scheme was needed to start at
159 the first page, of course.)\bigskip
160
161 First page (\verb|\lastpageref{pagesLTS.0}|):
162 \lastpageref{pagesLTS.0}\bigskip
163
164 The page (\verb|\thepage|): \thepage \bigskip
165
166 Current page (\verb|\theCurrentPage|),
167 i.\,e.~counted continuously from the first\linebreak page):~\theCurrentPage \bigskip
168 You can get this also in other formats:
169 \roman{CurrentPage}, \Roman{CurrentPage}, \arabic{CurrentPage},
170 \fnsymbol{CurrentPage}, \alph{CurrentPage}, \Alph{CurrentPage}.
171
172 CurrentPageLocal (\verb|\theCurrentPageLocal|),
173 i.\,e.~counted continuously from the first page of the
174 current page numbering scheme (if option pagecontinue=false: sector)):
175 \theCurrentPageLocal\newline
176 You can get also this in other formats, too:
177 \roman{pagesLTS.current.local.roman}, \Roman{pagesLTS.current.local.roman},
178 \arabic{pagesLTS.current.local.roman}, \fnsymbol{pagesLTS.current.local.roman},
179 \alph{pagesLTS.current.local.roman}, \Alph{pagesLTS.current.local.roman},
180 but probably it only makes sense if page numbering scheme and format are
181 the same, e.\,g.\newline
182 \verb|\Roman{pagesLTS.current.local.Roman}|\newline
```

```
183 or \verb|\Alph{pagesLTS.current.local.Alph}|. \verb|\arabic{...}| could
184 make sense even if combined with another page numbering scheme.
185 And this is exactly what \verb|\theCurrentPageLocal| does:\newline
186 \nolinebreak{\verb|\def\theCurrentPageLocal{\arabic{pagesLTS.current.local.\pagesLTS@pnc}}|.}\bigskip
187
188 Last roman page (pagesLTS.roman): \lastpageref{pagesLTS.roman}{\hskip4em }
189 (There are \lastpageref{pagesLTS.roman.local} pages with roman numbers.)\bigskip
190
191 Last Roman page (pagesLTS.Roman): \lastpageref{pagesLTS.Roman}{\hskip3em }%
192 \makeatletter%
193 \ifpagesLTS@pagecontinue%
194   (There are \lastpageref{pagesLTS.Roman.local}~pages with Roman numbers:\newline
195 \else%
196   (There are %
197   \lastpages{Roman}{1}+\lastpages{Roman}{2}+\lastpages{Roman}{3}=%
198   \the\numexpr%
199     \csname c@pagesLTS.Roman.1.local.cnt\endcsname%
200   +\csname c@pagesLTS.Roman.2.local.cnt\endcsname%
201   +\csname c@pagesLTS.Roman.3.local.cnt\endcsname%
202   \relax~pages with Roman numbers:\newline
203 \fi%
204 \makeatother%
205 \lastpages{Roman}{1}~pages in the first Roman sector
206 (\pageref{Roman}{\hskip3em }-\lastpageref{pagesLTS.Roman.1}{\hskip3em }),\newline
207 \lastpages{Roman}{2}~pages in the second Roman sector
208 (\pageref{Roman2}{\hskip3em }-\lastpageref{pagesLTS.Roman.2}{\hskip3em }), and\newline
209 \lastpages{Roman}{3}~pages in the third Roman sector
210 (\pageref{Roman3}{\hskip3em }-\lastpageref{pagesLTS.Roman.3}{\hskip3em }).)\bigskip
211
212 When the option \texttt{pagecontinue=false} is used with the
213 \textsf{pageslts} package, the \verb|\lastpageref{pagesLTS.Roman}| will
214 point to the same page as before, but this will have a lower number.
215 And if that page number was also present in a preceding sector,
216 the link will go to that page. (Several pages with the same number\ldots)\newline
217 The \verb|\lastpageref{pagesLTS.Roman.local}| will refer only to the number
218 of pages in the last sector. To get the total number of Roman pages, %
219 \begin{verbatim}
220 \the\numexpr \csname c@pagesLTS.Roman.1.local.cnt\endcsname%
221  +\csname c@pagesLTS.Roman.2.local.cnt\endcsname%
222  +\csname c@pagesLTS.Roman.3.local.cnt\endcsname%
223 \relax%
224 \end{verbatim}%
225 would be necessary.\bigskip
226
227 Last arabic page (pagesLTS.arabic): \lastpageref{pagesLTS.arabic}{\hskip5em }
228 (There are only \lastpageref{pagesLTS.arabic.local} pages with arabic numbers,
```

```
229 because an \verb|\addtocounter{page}{|\pagesLTSexampleArabic\verb|}| was used.)\bigskip
230
231 Last fnsymbol page (pagesLTS.fnsymbol): \lastpageref{pagesLTS.fnsymbol}\newline
232 (better \verb|\lastpageref{pagesLTS.fnsymbol}| than just\newline
233 \verb|\pageref{pagesLTS.fnsymbol}|!)\newline
234 (There are \lastpageref{pagesLTS.fnsymbol.local} pages with fnsymbol numbers.)\bigskip
235
236 Last alph page (pagesLTS.alph): \lastpageref{pagesLTS.alph}{\hskip4em }
237 (There are only \lastpageref{pagesLTS.alph.local} pages with alph numbers,
238 because an \verb|\addtocounter{page}{|\pagesLTSexamplealph\verb|}| was used.)\bigskip
239
240 Last Alph page (pagesLTS.Alph): \lastpageref{pagesLTS.Alph}{\hskip4em }
241 (There are \lastpageref{pagesLTS.Alph.local} pages with Alph numbers.)\bigskip
242
243 Last page's \textit{name} (LastPage): \lastpageref{LastPage}\bigskip
244
245 Very last page's \textit{name} (VeryLastPage): \lastpageref{VeryLastPage}\newline
246 (\texttt{LastPage} and \texttt{VeryLastPage} are now identical, because both are now done
247 \verb|\AddToHook{enddocument/afterlastpage}| instead of formerly\newline
248 \verb|\AtEndDocument| and \verb|\AfterLastShipout|, which were different.)\bigskip
249
250 Last page's \textit{number} (LastPages): \lastpageref{LastPages}{\hskip3em }
251 (=~total number of pages)
252 \newpage
253 \pagenumbering{Roman}
254 \section{Roman\label{Roman}}
255 \subsection{Common Roman page numbering}
256
257 First page (\verb|\lastpageref{pagesLTS.0}|):
258 \lastpageref{pagesLTS.0}\bigskip
259
260 The page (\verb|\thepage|): \thepage\bigskip
261
262 Current page (\verb|\theCurrentPage|),
263 i.\,e.~counted continuously from the first page): \theCurrentPage\bigskip
264
265 CurrentPageLocal (\verb|\theCurrentPageLocal|),
266 i.\,e.~counted continuously from the first page of the
267 current page numbering scheme (if option pagecontinue=false: sector)): \theCurrentPageLocal \bigskip
268
269 Last roman page (pagesLTS.roman): \lastpageref{pagesLTS.roman}{\hskip4em }
270 (There are \lastpageref{pagesLTS.roman.local} pages with roman numbers.)\bigskip
271
272 Last Roman page (pagesLTS.Roman): \lastpageref{pagesLTS.Roman}{\hskip3em }%
273 \makeatletter%
274 \ifpagesLTS@pagecontinue%
```

```
275    (There are \lastpageref{pagesLTS.Roman.local}~pages with Roman numbers:\newline
276 \else%
277    (There are %
278    \lastpages{Roman}{1}+\lastpages{Roman}{2}+\lastpages{Roman}{3}=%
279     \the\numexpr%
280      \csname c@pagesLTS.Roman.1.local.cnt\endcsname%
281     +\csname c@pagesLTS.Roman.2.local.cnt\endcsname%
282     +\csname c@pagesLTS.Roman.3.local.cnt\endcsname%
283     \relax~pages with Roman numbers:\newline
284 \fi%
285 \makeatother%
286 \lastpages{Roman}{1}~pages in the first Roman sector
287 (\pageref{Roman}{\hskip3em }-\lastpageref{pagesLTS.Roman.1}{\hskip3em }),\newline
288 \lastpages{Roman}{2}~pages in the second Roman sector
289 (\pageref{Roman2}{\hskip3em }-\lastpageref{pagesLTS.Roman.2}{\hskip3em }), and\newline
290 \lastpages{Roman}{3}~pages in the third Roman sector
291 (\pageref{Roman3}{\hskip3em }-\lastpageref{pagesLTS.Roman.3}{\hskip3em }).)\bigskip
292
293 When the option \texttt{pagecontinue=false} is used with the
294 \textsf{pageslts} package, the \verb|\lastpageref{pagesLTS.Roman}| will
295 point to the same page as before, but this will have a lower number.
296 And if that page number was also present in a preceding sector,
297 the link will go to that page. (Several pages with the same number\ldots)\newline
298 The \verb|\lastpageref{pagesLTS.Roman.local}| will refer only to the number
299 of pages in the last sector. To get the total number of Roman pages, %
300 \begin{verbatim}
301 \the\numexpr \csname c@pagesLTS.Roman.1.local.cnt\endcsname%
302  +\csname c@pagesLTS.Roman.2.local.cnt\endcsname%
303  +\csname c@pagesLTS.Roman.3.local.cnt\endcsname%
304 \relax%
305 \end{verbatim}%
306 would be necessary.
307 \pagebreak
308
309 Last arabic page (pagesLTS.arabic): \lastpageref{pagesLTS.arabic}{\hskip5em }
310 (There are only \lastpageref{pagesLTS.arabic.local} pages with arabic numbers,
311 because an \verb|\addtocounter{page}{|\pagesLTSexampleArabic\verb|}| was used.)\bigskip
312
313 Last fnsymbol page (pagesLTS.fnsymbol): \lastpageref{pagesLTS.fnsymbol}\newline
314 (better \verb|\lastpageref{pagesLTS.fnsymbol}| than just\newline
315 \verb|\pageref{pagesLTS.fnsymbol}|!)\bigskip
316
317 (There are \lastpageref{pagesLTS.fnsymbol.local} pages with fnsymbol numbers.)\bigskip
318
319 Last alph page (pagesLTS.alph): \lastpageref{pagesLTS.alph}{\hskip4em }
320 (There are only \lastpageref{pagesLTS.alph.local} pages with alph numbers,
```

```
321 because an \verb|\addtocounter{page}{|\pagesLTSexamplealph\verb|}| was used.)\bigskip
322
323 Last Alph page (pagesLTS.Alph): \lastpageref{pagesLTS.Alph}{\hskip4em }
324 (There are \lastpageref{pagesLTS.Alph.local} pages with Alph numbers.)\bigskip
325
326 Last page's \textit{name} (LastPage): \lastpageref{LastPage}\bigskip
327
328 Very last page's \textit{name} (VeryLastPage): \lastpageref{VeryLastPage}\newline
329 (\texttt{LastPage} and \texttt{VeryLastPage} are now identical, because both are now done
330 \verb|\AddToHook{enddocument/afterlastpage}| instead of formerly\newline
331 \verb|\AtEndDocument| and \verb|\AfterLastShipout|, which were different.)\bigskip
332
333 Last page's \textit{number} (LastPages): \lastpageref{LastPages}{\hskip3em }
334 (=~total number of pages)
335
336 \newpage
337 \subsection{Last page of first Roman sector}
338 \verb|\lastpageref{pagesLTS.Roman}| does \textbf{not}
339 refer to this page (but there: \lastpageref{pagesLTS.Roman}).
340 When a reference to this page is wanted,\newline
341 \verb|\lastpageref{pagesLTS.Roman.1}| can be used: \lastpageref{pagesLTS.Roman.1}.\bigskip
342
343 There are \lastpages{Roman}{1}~pages (\verb|\lastpages{Roman}{1}|)
344 in this first Roman sector.\newline
345 The Roman page numbering scheme is continued later in section~\ref{Roman2})!
346
347 \newpage
348 \pagenumbering{arabic}
349 \section{arabic}
350 \subsection{Standard page numbering}
351
352 First page (\verb|\lastpageref{pagesLTS.0}|):
353 \lastpageref{pagesLTS.0}\bigskip
354
355 The page (\verb|\thepage|): \thepage \bigskip
356
357 Current page (\verb|\theCurrentPage|),
358 i.\,e.~counted continuously from the first page): \theCurrentPage \bigskip
359
360 CurrentPageLocal (\verb|\theCurrentPageLocal|),
361 i.\,e.~counted continuously from the first page of the
362 current page numbering scheme (if option pagecontinue=false: sector)): \theCurrentPageLocal \bigskip
363
364 Last roman page (pagesLTS.roman): \lastpageref{pagesLTS.roman}{\hskip4em }
365 (There are \lastpageref{pagesLTS.roman.local} pages with roman numbers.)\bigskip
366
```

```
367 Last Roman page (pagesLTS.Roman): \lastpageref{pagesLTS.Roman}{\hskip3em }%
368 \makeatletter%
369 \ifpagesLTS@pagecontinue%
370   (There are \lastpageref{pagesLTS.Roman.local}~pages with Roman numbers:\newline
371 \else%
372   (There are %
373   \lastpages{Roman}{1}+\lastpages{Roman}{2}+\lastpages{Roman}{3}=%
374    \the\numexpr%
375     \csname c@pagesLTS.Roman.1.local.cnt\endcsname%
376    +\csname c@pagesLTS.Roman.2.local.cnt\endcsname%
377     +\csname c@pagesLTS.Roman.3.local.cnt\endcsname%
378    \relax~pages with Roman numbers:\newline
379 \fi%
380 \makeatother%
381 \lastpages{Roman}{1}~pages in the first Roman sector
382 (\pageref{Roman}{\hskip3em }-\lastpageref{pagesLTS.Roman.1}{\hskip3em }),\newline
383 \lastpages{Roman}{2}~pages in the second Roman sector
384 (\pageref{Roman2}{\hskip3em }-\lastpageref{pagesLTS.Roman.2}{\hskip3em }), and\newline
385 \lastpages{Roman}{3}~pages in the third Roman sector
386 (\pageref{Roman3}{\hskip3em }-\lastpageref{pagesLTS.Roman.3}{\hskip3em }).)\bigskip
387
388 When the option \texttt{pagecontinue=false} is used with the
389 \textsf{pageslts} package, the \verb|\lastpageref{pagesLTS.Roman}| will
390 point to the same page as before, but this will have a lower number.
391 And if that page number was also present in a preceding sector,
392 the link will go to that page. (Several pages with the same number\ldots)\newline
393 The \verb|\lastpageref{pagesLTS.Roman.local}| will refer only to the number
394 of pages in the last sector. To get the total number of Roman pages, %
395 \begin{verbatim}
396 \the\numexpr \csname c@pagesLTS.Roman.1.local.cnt\endcsname%
397  +\csname c@pagesLTS.Roman.2.local.cnt\endcsname%
398  +\csname c@pagesLTS.Roman.3.local.cnt\endcsname%
399 \relax%
400 \end{verbatim}%
401 would be necessary.
402 \pagebreak
403
404 Last arabic page (pagesLTS.arabic): \lastpageref{pagesLTS.arabic}{\hskip5em }
405 (There are only \lastpageref{pagesLTS.arabic.local} pages with arabic numbers,
406 because an \verb|\addtocounter{page}{|\pagesLTSexampleArabic\verb|}| was used.)\bigskip
407
408 Last fnsymbol page (pagesLTS.fnsymbol): \lastpageref{pagesLTS.fnsymbol}\newline
409 (better \verb|\lastpageref{pagesLTS.fnsymbol}| than just\newline
410 \verb|\pageref{pagesLTS.fnsymbol}|!)\bigskip
411
412 (There are \lastpageref{pagesLTS.fnsymbol.local} pages with fnsymbol numbers.)\bigskip
```

```
413
414 Last alph page (pagesLTS.alph): \lastpageref{pagesLTS.alph}{\hskip4em }
415 (There are only \lastpageref{pagesLTS.alph.local} pages with alph numbers,
416 because an \verb|\addtocounter{page}{|\pagesLTSexamplealph\verb|}| was used.)\bigskip
417
418 Last Alph page (pagesLTS.Alph): \lastpageref{pagesLTS.Alph}{\hskip4em }
419 (There are \lastpageref{pagesLTS.Alph.local} pages with Alph numbers.)\bigskip
420
421 Last page's \textit{name} (LastPage): \lastpageref{LastPage}\bigskip
422
423 Very last page's \textit{name} (VeryLastPage): \lastpageref{VeryLastPage}\newline
424 (\texttt{LastPage} and \texttt{VeryLastPage} are now identical, because both are now done
425 \verb|\AddToHook{enddocument/afterlastpage}| instead of formerly\newline
426 \verb|\AtEndDocument| and \verb|\AfterLastShipout|, which were different.)\bigskip
427
428 Last page's \textit{number} (LastPages): \lastpageref{LastPages}{\hskip3em }
429 (=~total number of pages)
430
431 \newpage
432 \thispagestyle{empty}
433 \subsection[Empty page style]{Also an empty page style is no problem %
434 for the current or total page count}
435
436 \bigskip
437
438 First page (\verb|\lastpageref{pagesLTS.0}|):
439 \lastpageref{pagesLTS.0}\bigskip
440
441 The page (\verb|\thepage|): \thepage \bigskip
442
443 Current page (\verb|\theCurrentPage|),
444 i.\,e.~counted continuously from the first page): \theCurrentPage \bigskip
445
446 CurrentPageLocal (\verb|\theCurrentPageLocal|),
447 i.\,e.~counted continuously from the first page of the
448 current page numbering scheme (if option pagecontinue=false: sector)): \theCurrentPageLocal \bigskip
449
450 Last roman page (pagesLTS.roman): \lastpageref{pagesLTS.roman}{\hskip4em }
451 (There are \lastpageref{pagesLTS.roman.local} pages with roman numbers.)\bigskip
452
453 Last Roman page (pagesLTS.Roman): \lastpageref{pagesLTS.Roman}{\hskip3em }%
454 \makeatletter%
455 \ifpagesLTS@pagecontinue%
456   (There are \lastpageref{pagesLTS.Roman.local}~pages with Roman numbers:\newline
457 \else%
458   (There are %
```

```
459    \lastpages{Roman}{1}+\lastpages{Roman}{2}+\lastpages{Roman}{3}=%
460     \the\numexpr%
461      \csname c@pagesLTS.Roman.1.local.cnt\endcsname%
462     +\csname c@pagesLTS.Roman.2.local.cnt\endcsname%
463     +\csname c@pagesLTS.Roman.3.local.cnt\endcsname%
464     \relax~pages with Roman numbers:\newline
465 \fi%
466 \makeatother%
467 \lastpages{Roman}{1}~pages in the first Roman sector
468 (\pageref{Roman}{\hskip3em }-\lastpageref{pagesLTS.Roman.1}{\hskip3em }),\newline
469 \lastpages{Roman}{2}~pages in the second Roman sector
470 (\pageref{Roman2}{\hskip3em }-\lastpageref{pagesLTS.Roman.2}{\hskip3em }), and\newline
471 \lastpages{Roman}{3}~pages in the third Roman sector
472 (\pageref{Roman3}{\hskip3em }-\lastpageref{pagesLTS.Roman.3}{\hskip3em }).)\newline
473
474 When the option \texttt{pagecontinue=false} is used with the
475 \textsf{pageslts} package, the \verb|\lastpageref{pagesLTS.Roman}| will
476 point to the same page as before, but this will have a lower number.
477 And if that page number was also present in a preceding sector,
478 the link will go to that page. (Several pages with the same number\ldots)\newline
479 The \verb|\lastpageref{pagesLTS.Roman.local}| will refer only to the number
480 of pages in the last sector. To get the total number of Roman pages, %
481 \begin{verbatim}
482 \the\numexpr \csname c@pagesLTS.Roman.1.local.cnt\endcsname%
483  +\csname c@pagesLTS.Roman.2.local.cnt\endcsname%
484  +\csname c@pagesLTS.Roman.3.local.cnt\endcsname%
485 \relax%
486 \end{verbatim}%
487 would be necessary.
488 \pagebreak
489
490 Last arabic page (pagesLTS.arabic): \lastpageref{pagesLTS.arabic}{\hskip5em }
491 (There are only \lastpageref{pagesLTS.arabic.local} pages with arabic numbers,
492 because an \verb|\addtocounter{page}{|\pagesLTSexampleArabic\verb|}| was used.)\bigskip
493
494 Last fnsymbol page (pagesLTS.fnsymbol): \lastpageref{pagesLTS.fnsymbol}\newline
495 (better \verb|\lastpageref{pagesLTS.fnsymbol}| than just\newline
496 \verb|\pageref{pagesLTS.fnsymbol}|!)\bigskip
497
498 (There are \lastpageref{pagesLTS.fnsymbol.local} pages with fnsymbol numbers.)\bigskip
499
500 Last alph page (pagesLTS.alph): \lastpageref{pagesLTS.alph}{\hskip4em }
501 (There are only \lastpageref{pagesLTS.alph.local} pages with alph numbers,
502 because an \verb|\addtocounter{page}{|\pagesLTSexamplealph\verb|}| was used.)\bigskip
503
504 Last Alph page (pagesLTS.Alph): \lastpageref{pagesLTS.Alph}{\hskip4em }
```

```
505 (There are \lastpageref{pagesLTS.Alph.local} pages with Alph numbers.)\bigskip
506
507 Last page's \textit{name} (LastPage): \lastpageref{LastPage}\bigskip
508
509 Very last page's \textit{name} (VeryLastPage): \lastpageref{VeryLastPage}\newline
510 (\texttt{LastPage} and \texttt{VeryLastPage} are now identical, because both are now done
511 \verb|\AddToHook{enddocument/afterlastpage}| instead of formerly\newline
512 \verb|\AtEndDocument| and \verb|\AfterLastShipout|, which were different.)\bigskip
513
514 Last page's \textit{number} (LastPages): \lastpageref{LastPages}{\hskip3em }
515 (=~total number of pages)
516
517 \newpage
518 \subsection[addtocounter, setcounter]{Neither %
519 \texttt{\textbackslash addtocounter\{page\}} nor %
520 \texttt{\textbackslash setcounter\{page\}} is a problem for the %
521 current or total page numbers}
522
523 (Here is an \verb|\addtocounter{page}{|\pagesLTSexampleArabic\verb|}|
524 in the source code.)
525 \addtocounter{page}{\pagesLTSexampleArabic}\bigskip
526
527 The page (from \verb|\thepage| command): \thepage \bigskip
528
529 Current page (from \verb|\theCurrentPage|\ %
530 command), i.\,e.~counted continuously from the first page): \theCurrentPage \bigskip
531
532 CurrentPageLocal (from \verb|\theCurrentPageLocal|\ %
533 command), i.\,e.~counted continuously from the first page of the
534 current page numbering scheme (if option pagecontinue=false: sector)): \theCurrentPageLocal \bigskip
535
536 Last page's number (LastPages): \lastpageref{LastPages}{\hskip3em }
537 (= total number of pages)
538
539 \newpage
540 \pagenumbering{fnsymbol}
541 \section{fnsymbol}
542
543 Without option \texttt{fnsymbolmult=true} of the \textsf{pageslts} package
544 (and the help of the \textsf{alphalph} package),
545 after page~9 (\textquotedblleft \ensuremath {\ddagger \ddagger }\textquotedblright )
546 (and also for negative page numbers) there would just appear a
547 \begin{quote}
548 \begin{verbatim}
549 LaTeX Error: Counter too large
550 See the LaTeX manual or LaTeX Companion for explanation.
```

```
551 You've lost some text.  Try typing  <return>  to proceed.
552 If that doesn't work, type  X <return>  to quit.
553 \end{verbatim}
554 \end{quote}
555 Now the page numbers after 5 (\ensuremath {\mathparagraph }) are
556 continued  with the doubled \textquotedblleft number\textquotedblright{} of
557 the first, second, third,\ldots\ page (\ensuremath {**},
558 \ensuremath {\dagger \dagger }, \ensuremath {\ddagger \ddagger },
559 \ensuremath {\mathsection \mathsection },
560 \ensuremath {\mathparagraph \mathparagraph }),
561 and after the tenth page the \textquotedblleft number\textquotedblright{} is
562 tripled (\ensuremath {***}, \ensuremath {\dagger \dagger \dagger },\ldots).
563 Page zero is named 0 and negative pages are just named like the positive ones
564 with addition of a minus \mbox{sign ($-$).}
565
566 \bigskip
567
568 For testing purposes, try:
569
570 \begin{small}
571 \begin{verbatim}
572 \documentclass{article}
573 \usepackage[plainpages=false,pageanchor=true,pdfpagelabels=true]{hyperref}
574 \usepackage{pageslts}
575 \pagenumbering{fnsymbol}
576 \begin{document}
577 First page.\newpage
578 \verb|\lastpageref{pagesLTS.0}               | \lastpageref{pagesLTS.0}               \par
579 \verb|\lastpageref{pagesLTS.0.local}         | \lastpageref{pagesLTS.0.local}         \par
580 \verb|\lastpageref{LastPage}                 | \lastpageref{LastPage}                 \par
581 \verb|\lastpageref{VeryLastPage}             | \lastpageref{VeryLastPage}             \par
582 \verb|\lastpageref{pagesLTS.fnsymbol.1}      | \lastpageref{pagesLTS.fnsymbol.1}      \par
583 \verb|\lastpageref{pagesLTS.fnsymbol.1.local} | \lastpageref{pagesLTS.fnsymbol.1.local} \par
584 \verb|\lastpageref{pagesLTS.fnsymbol}        | \lastpageref{pagesLTS.fnsymbol}        \par
585 \verb|\lastpageref{pagesLTS.fnsymbol.local}  | \lastpageref{pagesLTS.fnsymbol.local}  \par
586 \verb|\lastpageref{LastPages}                | \lastpageref{LastPages}                \par
587 \verb|\pagesLTSlastpage                      | \pagesLTSlastpage
588 \newpage
589 Last page.
590 \end{document}
591 \end{verbatim}
592 \end{small}
593 \newpage
594
595 First page (\verb|\lastpageref{pagesLTS.0}|):
596 \lastpageref{pagesLTS.0}\bigskip
```

```
597
598 The page (\verb|\thepage|): \thepage \bigskip
599
600 Current page (\verb|\theCurrentPage|),
601 i.\,e.~counted continuously from the first page): \theCurrentPage \bigskip
602
603 CurrentPageLocal (\verb|\theCurrentPageLocal|),
604 i.\,e.~counted continuously from the first page of the
605 current page numbering scheme (if option pagecontinue=false: sector)): \theCurrentPageLocal \bigskip
606
607 Last roman page (pagesLTS.roman): \lastpageref{pagesLTS.roman}{\hskip4em }
608 (There are \lastpageref{pagesLTS.roman.local} pages with roman numbers.)\bigskip
609
610 Last Roman page (pagesLTS.Roman): \lastpageref{pagesLTS.Roman}{\hskip3em }%
611 \makeatletter%
612 \ifpagesLTS@pagecontinue%
613   (There are \lastpageref{pagesLTS.Roman.local}~pages with Roman numbers:\newline
614 \else%
615   (There are %
616  \lastpages{Roman}{1}+\lastpages{Roman}{2}+\lastpages{Roman}{3}=%
617   \the\numexpr%
618    \csname c@pagesLTS.Roman.1.local.cnt\endcsname%
619   +\csname c@pagesLTS.Roman.2.local.cnt\endcsname%
620   +\csname c@pagesLTS.Roman.3.local.cnt\endcsname%
621   \relax~pages with Roman numbers:\newline
622 \fi%
623 \makeatother%
624 \lastpages{Roman}{1}~pages in the first Roman sector
625 (\pageref{Roman}{\hskip3em }-\lastpageref{pagesLTS.Roman.1}{\hskip3em }),\newline
626 \lastpages{Roman}{2}~pages in the second Roman sector
627 (\pageref{Roman2}{\hskip3em }-\lastpageref{pagesLTS.Roman.2}{\hskip3em }), and\newline
628 \lastpages{Roman}{3}~pages in the third Roman sector
629 (\pageref{Roman3}{\hskip3em }-\lastpageref{pagesLTS.Roman.3}{\hskip3em }).)\bigskip
630
631 When the option \texttt{pagecontinue=false} is used with the
632 \textsf{pageslts} package, the \verb|\lastpageref{pagesLTS.Roman}| will
633 point to the same page as before, but this will have a lower number.
634 And if that page number was also present in a preceding sector,
635 the link will go to that page. (Several pages with the same number\ldots)\newline
636 The \verb|\lastpageref{pagesLTS.Roman.local}| will refer only to the number
637 of pages in the last sector. To get the total number of Roman pages, %
638 \begin{verbatim}
639 \the\numexpr \csname c@pagesLTS.Roman.1.local.cnt\endcsname%
640  +\csname c@pagesLTS.Roman.2.local.cnt\endcsname%
641  +\csname c@pagesLTS.Roman.3.local.cnt\endcsname%
642 \relax%
```

```
643 \end{verbatim}%
644 would be necessary.\bigskip
645
646 Last arabic page (pagesLTS.arabic): \lastpageref{pagesLTS.arabic}{\hskip5em }
647 (There are only \lastpageref{pagesLTS.arabic.local} pages with arabic numbers,
648 because an \verb|\addtocounter{page}{|\pagesLTSexampleArabic\verb|}| was used.)\bigskip
649
650 Last fnsymbol page (pagesLTS.fnsymbol): \lastpageref{pagesLTS.fnsymbol}\newline
651 (better \verb|\lastpageref{pagesLTS.fnsymbol}| than just\newline
652 \verb|\pageref{pagesLTS.fnsymbol}|!)\bigskip
653
654 (There are \lastpageref{pagesLTS.fnsymbol.local} pages with fnsymbol numbers.)\bigskip
655
656 Last alph page (pagesLTS.alph): \lastpageref{pagesLTS.alph}{\hskip4em }
657 (There are only \lastpageref{pagesLTS.alph.local} pages with alph numbers,
658 because an \verb|\addtocounter{page}{|\pagesLTSexamplealph\verb|}| was used.)\bigskip
659
660 Last Alph page (pagesLTS.Alph): \lastpageref{pagesLTS.Alph}{\hskip4em }
661 (There are \lastpageref{pagesLTS.Alph.local} pages with Alph numbers.)\bigskip
662
663 Last page's \textit{name} (LastPage): \lastpageref{LastPage}\bigskip
664
665 Very last page's \textit{name} (VeryLastPage): \lastpageref{VeryLastPage}\newline
666 (\texttt{LastPage} and \texttt{VeryLastPage} are now identical, because both are now done
667 \verb|\AddToHook{enddocument/afterlastpage}| instead of formerly\newline
668 \verb|\AtEndDocument| and \verb|\AfterLastShipout|, which were different.)\bigskip
669
670 Last page's \textit{number} (LastPages): \lastpageref{LastPages}{\hskip3em }
671 (=~total number of pages)\bigskip
672
673 \lipsum[1-58]
674
675 \newpage
676 \pagenumbering{Roman}
677 \section{Roman -- again!\label{Roman2}}
678
679 The page number starts with \textquotedblleft I\textquotedblright{} again for
680 option just \texttt{pagecontinue=false}, but for option \texttt{pagecontinue=true},
681 or with option just \texttt{pagecontinue}, or even just
682 \nolinebreak{with\textbf{out}} option \texttt{pagecontinue=false}
683 the page numbers are continued.
684
685 This package remembered the
686 $\arabic{pagesLTS.double.Roman}-1$,
687 i.\,e.~\the\numexpr\value{pagesLTS.double.Roman}-1\relax, pages
688 already done in Roman output, and therefore continues with page
```

```
689 \textquotedblleft\Roman{pagesLTS.double.Roman}\textquotedblright{} in
690 case of option \texttt{pagecontinue}.\newline
691 If you want to start with \textquotedblleft I\textquotedblright{} all
692 over again, you will have two pages with the same name,
693 but nevertheless you can do this by using option \texttt{pagecontinue=false}
694 or a \verb|\setcounter{page}{1}|\ here (not demonstrated in this example file).\bigskip
695
696 There was the question: \textquotedblleft With option \verb|pagecontinue=false|,
697 how do I get the number of pages in each number block (e.\,g.~in the first Roman section,
698 second Roman section, third Roman section) with just one command?\textquotedblright
699 \begin{verbatim}
700 \makeatletter%
701 \theCurrentPageLocal~of~\lastpageref*{%
702 pagesLTS.\pagesLTS@pnc.\arabic{pagesLTS.pnc.\pagesLTS@pnc}.local}%
703 \makeatother%
704 \end{verbatim}
705 provides this. Here: %
706 \makeatletter%
707 \theCurrentPageLocal~of~%
708 \lastpageref*{pagesLTS.\pagesLTS@pnc.\arabic{pagesLTS.pnc.\pagesLTS@pnc}.local}\newline%
709 \makeatother%
710 for \verb|pagecontinue=true| is \verb|4 of 8| (including %
711 \makeatletter%
712 $\the\numexpr\csname c@pagesLTS.double.Roman\endcsname -1\relax$ %
713 from the first Roman section,
714 $\the\csname c@pagesLTS.double.Roman\endcsname\relax
715  =\the\numexpr\csname c@pagesLTS.double.Roman\endcsname -1\relax% first section
716 +1% first page of this second section
717 $, $\the\numexpr\csname c@pagesLTS.double.Roman\endcsname -1+%
718 \csname c@pagesLTS.Roman.2.local.cnt\endcsname\relax%
719 =\the\numexpr\csname c@pagesLTS.double.Roman\endcsname -1\relax+%
720 \the\numexpr\csname c@pagesLTS.Roman.2.local.cnt\endcsname\relax$)\newline
721 \makeatother%
722 and for \verb|pagecontinue=false| is \verb|1 of 5| .\bigskip
723
724 \verb|pagesLTS.\pagesLTS@pnc.\arabic{pagesLTS.pnc.\pagesLTS@pnc}.local| is:
725 \begin{description}
726 \item[-] \verb|pagesLTS| just identifies this counter to belong to the pageslts package.
727 \item[-] \verb|\pagesLTS@pnc| is the Current Page Numbering scheme, i.\,e.~here it would be \verb|Roman|.
728 \item[-] \verb|\arabic{pagesLTS.pnc.\pagesLTS@pnc}| is the value of counter\newline
729          \verb|pagesLTS.pnc.\pagesLTS@pnc| printed in arabic numbers (1, 2, 3, ...) -- see below.
730 \item[-] \verb|local|: Local there are 5 pages with Roman numbering in this example, globally there are
731          $3+5+4=12$~pages with Roman numbering in this example, and the local numbers are wanted.
732 \end{description}
733 The counter \verb|pagesLTS.pnc.\pagesLTS@pnc| gives the number of the\newline
734 \verb|\pagesLTS@pnc| page numbering scheme currently used, i.\,e.~we have consecutivly\newpage
```

```
\begin{verbatim}
pagesLTS.pnc.roman    = 1
pagesLTS.pnc.Roman    = 1
pagesLTS.pnc.arabic   = 1
pagesLTS.pnc.fnsymbol = 1
pagesLTS.pnc.Roman    = 2
pagesLTS.pnc.alph     = 1
pagesLTS.pnc.Roman    = 3
pagesLTS.pnc.Alph     = 1
\end{verbatim}
So, \verb|pagesLTS.pnc.Roman| changes from $1$ to $2$ automatically
when doing the second \verb|\pagenumbering{Roman}|,
and changes from $2$ to $3$ for the third\newline
\verb|\pagenumbering{Roman}|.\bigskip

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

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

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

CurrentPageLocal (\verb|\theCurrentPageLocal|),
i.\,e.~counted continuously from the first page of the
current page numbering scheme (if option pagecontinue=false: sector)): \theCurrentPageLocal \bigskip

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


Last Roman page (pagesLTS.Roman): \lastpageref{pagesLTS.Roman}{\hskip3em }%
\makeatletter%
\ifpagesLTS@pagecontinue%
  (There are \lastpageref{pagesLTS.Roman.local}~pages with Roman numbers:\newline
\else%
  (There are %
 \lastpages{Roman}{1}+\lastpages{Roman}{2}+\lastpages{Roman}{3}=%
  \the\numexpr%
   \csname c@pagesLTS.Roman.1.local.cnt\endcsname%
  +\csname c@pagesLTS.Roman.2.local.cnt\endcsname%
  +\csname c@pagesLTS.Roman.3.local.cnt\endcsname%
  \relax~pages with Roman numbers:\newline
\fi%
\makeatother%
\lastpages{Roman}{1}~pages in the first Roman sector
```

```
781 (\pageref{Roman}{\hskip3em }-\lastpageref{pagesLTS.Roman.1}{\hskip3em }),\newline
782 \lastpages{Roman}{2}~pages in the second Roman sector
783 (\pageref{Roman2}{\hskip3em }-\lastpageref{pagesLTS.Roman.2}{\hskip3em }), and\newline
784 \lastpages{Roman}{3}~pages in the third Roman sector
785 (\pageref{Roman3}{\hskip3em }-\lastpageref{pagesLTS.Roman.3}{\hskip3em }).)\bigskip
786
787 When the option \texttt{pagecontinue=false} is used with the
788 \textsf{pageslts} package, the \verb|\lastpageref{pagesLTS.Roman}| will
789 point to the same page as before, but this will have a lower number.
790 And if that page number was also present in a preceding sector,
791 the link will go to that page. (Several pages with the same number\ldots)\newline
792 The \verb|\lastpageref{pagesLTS.Roman.local}| will refer only to the number
793 of pages in the last sector. To get the total number of Roman pages, %
794 \begin{verbatim}
795 \the\numexpr \csname c@pagesLTS.Roman.1.local.cnt\endcsname%
796  +\csname c@pagesLTS.Roman.2.local.cnt\endcsname%
797  +\csname c@pagesLTS.Roman.3.local.cnt\endcsname%
798 \relax%
799 \end{verbatim}%
800 would be necessary.\bigskip
801
802 Last arabic page (pagesLTS.arabic): \lastpageref{pagesLTS.arabic}{\hskip5em }
803 (There are only \lastpageref{pagesLTS.arabic.local} pages with arabic numbers,
804 because an \verb|\addtocounter{page}{|\pagesLTSexampleArabic\verb|}| was used.)\bigskip
805
806 Last fnsymbol page (pagesLTS.fnsymbol): \lastpageref{pagesLTS.fnsymbol}\newline
807 (\verb|\lastpageref{pagesLTS.fnsymbol}| -- never
808 \verb|\pageref{pagesLTS.fnsymbol}|!)\newline
809 (There are \lastpageref{pagesLTS.fnsymbol.local} pages with fnsymbol numbers.)\bigskip
810
811 Last alph page (pagesLTS.alph): \lastpageref{pagesLTS.alph}{\hskip4em }
812 (There are only \lastpageref{pagesLTS.alph.local} pages with alph numbers,
813 because an \verb|\addtocounter{page}{|\pagesLTSexamplealph\verb|}| was used.)\bigskip
814
815 Last Alph page (pagesLTS.Alph): \lastpageref{pagesLTS.Alph}{\hskip4em }
816 (There are \lastpageref{pagesLTS.Alph.local} pages with Alph numbers.)\bigskip
817
818 Last page's \textit{name} (LastPage): \lastpageref{LastPage}\bigskip
819
820 Very last page's \textit{name} (VeryLastPage): \lastpageref{VeryLastPage}\newline
821 (\texttt{LastPage} and \texttt{VeryLastPage} are now identical, because both are now done
822 \verb|\AddToHook{enddocument/afterlastpage}| instead of formerly\newline
823 \verb|\AtEndDocument| and \verb|\AfterLastShipout|, which were different.)\bigskip
824
825 Last page's \textit{number} (LastPages): \lastpageref{LastPages}{\hskip3em }
826 (=~total number of pages)\bigskip
```

```
827
828 \lipsum[1-6]
829
830 \newpage
831
832 \verb|\lastpageref{pagesLTS.Roman}| does \textbf{not}
833 refer to this page (but there: \lastpageref{pagesLTS.Roman})
834 for option \texttt{pagecontinue=true}. When a reference to this page is wanted,\newline
835 \verb|\lastpageref{pagesLTS.Roman.2}| can be used: \lastpageref{pagesLTS.Roman.2}.\newline
836 When the option \texttt{pagecontinue=false} is used with the
837 \textsf{pageslts} package, the \verb|\lastpageref{pagesLTS.Roman}| will
838 point to the same page as before, but this will have a lower number.
839 And if that page number was also present in a preceding sector,
840 the link will go to that page. (Several pages with the same number\ldots)\newline
841 The \verb|\lastpageref{pagesLTS.Roman.local}| will refer only to the number
842 of pages in the last sector. To get the total number of Roman pages, %
843 \begin{verbatim}
844 \the\numexpr \csname c@pagesLTS.Roman.1.local.cnt\endcsname%
845  +\csname c@pagesLTS.Roman.2.local.cnt\endcsname%
846  +\csname c@pagesLTS.Roman.3.local.cnt\endcsname%
847 \relax%
848 \end{verbatim}%
849 would be necessary.\bigskip
850
851 There are \lastpages{Roman}{2}~pages (\verb|\lastpages{Roman}{2}|) in this
852 second Roman sector.\newline
853 The Roman page numbering scheme is continued later in section~\ref{Roman3})!
854
855 \newpage
856 \pagenumbering{alph}
857 \section{alph\label{alph}}
858
859 First page (\verb|\lastpageref{pagesLTS.0}|):
860  \lastpageref{pagesLTS.0}\bigskip
861
862 The page (\verb|\thepage|): \thepage \bigskip
863
864 Current page (\verb|\theCurrentPage|),
865 i.\,e.~counted continuously from the first page): \theCurrentPage \bigskip
866
867 CurrentPageLocal (\verb|\theCurrentPageLocal|),
868 i.\,e.~counted continuously from the first page of the
869 current page numbering scheme (if option pagecontinue=false: sector)): \theCurrentPageLocal \bigskip
870
871 Last roman page (pagesLTS.roman): \lastpageref{pagesLTS.roman}{\hskip4em }
872 (There are \lastpageref{pagesLTS.roman.local} pages with roman numbers.)\bigskip
```

```
873
874 Last Roman page (pagesLTS.Roman): \lastpageref{pagesLTS.Roman}{\hskip3em }%
875 \makeatletter%
876 \ifpagesLTS@pagecontinue%
877   (There are \lastpageref{pagesLTS.Roman.local}~pages with Roman numbers:\newline
878 \else%
879   (There are %
880   \lastpages{Roman}{1}+\lastpages{Roman}{2}+\lastpages{Roman}{3}=%
881    \the\numexpr%
882     \csname c@pagesLTS.Roman.1.local.cnt\endcsname%
883   +\csname c@pagesLTS.Roman.2.local.cnt\endcsname%
884   +\csname c@pagesLTS.Roman.3.local.cnt\endcsname%
885   \relax~pages with Roman numbers:\newline
886 \fi%
887 \makeatother%
888 \lastpages{Roman}{1}~pages in the first Roman sector
889 (\pageref{Roman}{\hskip3em }-\lastpageref{pagesLTS.Roman.1}{\hskip3em }),\newline
890 \lastpages{Roman}{2}~pages in the second Roman sector
891 (\pageref{Roman2}{\hskip3em }-\lastpageref{pagesLTS.Roman.2}{\hskip3em }), and\newline
892 \lastpages{Roman}{3}~pages in the third Roman sector
893 (\pageref{Roman3}{\hskip3em }-\lastpageref{pagesLTS.Roman.3}{\hskip3em }).)\bigskip
894
895 When the option \texttt{pagecontinue=false} is used with the
896 \textsf{pageslts} package, the \verb|\lastpageref{pagesLTS.Roman}| will
897 point to the same page as before, but this will have a lower number.
898 And if that page number was also present in a preceding sector,
899 the link will go to that page. (Several pages with the same number\ldots)\newline
900 The \verb|\lastpageref{pagesLTS.Roman.local}| will refer only to the number
901 of pages in the last sector. To get the total number of Roman pages, %
902 \begin{verbatim}
903 \the\numexpr \csname c@pagesLTS.Roman.1.local.cnt\endcsname%
904  +\csname c@pagesLTS.Roman.2.local.cnt\endcsname%
905  +\csname c@pagesLTS.Roman.3.local.cnt\endcsname%
906 \relax%
907 \end{verbatim}%
908 would be necessary.\bigskip
909
910 Last arabic page (pagesLTS.arabic): \lastpageref{pagesLTS.arabic}{\hskip5em }
911 (There are only \lastpageref{pagesLTS.arabic.local} pages with arabic numbers,
912 because an \verb|\addtocounter{page}{|\pagesLTSexampleArabic\verb|}| was used.)\bigskip
913
914 Last fnsymbol page (pagesLTS.fnsymbol): \lastpageref{pagesLTS.fnsymbol}\newline
915 (better \verb|\lastpageref{pagesLTS.fnsymbol}| than just\newline
916 \verb|\pageref{pagesLTS.fnsymbol}|!)\bigskip
917
918 (There are \lastpageref{pagesLTS.fnsymbol.local} pages with fnsymbol numbers.)\bigskip
```

```
919
920 Last alph page (pagesLTS.alph): \lastpageref{pagesLTS.alph}{\hskip4em }
921 (There are only \lastpageref{pagesLTS.alph.local} pages with alph numbers,
922 because an \verb|\addtocounter{page}{|\pagesLTSexamplealph\verb|}| was used.)\bigskip
923
924 Last Alph page (pagesLTS.Alph): \lastpageref{pagesLTS.Alph}{\hskip4em }
925 (There are \lastpageref{pagesLTS.Alph.local} pages with Alph numbers.)\bigskip
926
927 Last page's \textit{name} (LastPage): \lastpageref{LastPage}\bigskip
928
929 Very last page's \textit{name} (VeryLastPage): \lastpageref{VeryLastPage}\newline
930 (\texttt{LastPage} and \texttt{VeryLastPage} are now identical, because both are now done
931 \verb|\AddToHook{enddocument/afterlastpage}| instead of formerly\newline
932 \verb|\AtEndDocument| and \verb|\AfterLastShipout|, which were different.)\bigskip
933
934 Last page's \textit{number} (LastPages): \lastpageref{LastPages}{\hskip3em }
935 (=~total number of pages)
936
937 \newpage
938
939 Without option \texttt{alphMult=ab} of the \textsf{pageslts} (and the help of the
940 \textsf{alphalph} package), after page \textquotedblleft z\textquotedblright{} there
941 would just appear a
942 \begin{quote}
943 \begin{verbatim}
944 LaTeX Error: Counter too large
945 See the LaTeX manual or LaTeX Companion for explanation.
946 You've lost some text.  Try typing  <return>  to proceed.
947 If that doesn't work, type  X <return>  to quit.
948 \end{verbatim}
949 \end{quote}
950 Now the page numbers are continued aa, ab, ac,\ldots\ (aa, bb, cc,\ldots\ is
951 also possible, see the \textsf{pageslts} documentation).\newline
952 To demonstrate this, we add a\newline
953 \verb|\addtocounter{page}{|\pagesLTSexamplealph\verb|}|\newline
954 in the source code here.
955
956 \addtocounter{page}{\pagesLTSexamplealph}
957
958 \bigskip
959
960 \lipsum[1-18]
961
962 \newpage
963 \pagenumbering{Roman}
964 \section{Roman - third time!\label{Roman3}}
```

35

```
965
966 The page number starts with \textquotedblleft I\textquotedblright{} again for
967 option just \texttt{pagecontinue=false}, but for option \texttt{pagecontinue=true},
968 or with option just \texttt{pagecontinue}, or even just
969 \nolinebreak{with\textbf{out}} option \texttt{pagecontinue=false}
970 the page numbers are continued.
971
972 This package remembered the
973 $\arabic{pagesLTS.double.Roman}-1$,
974 i.\,e.~\the\numexpr\value{pagesLTS.double.Roman}-1\relax, pages
975 already done in%
976 \begin{description}
977 \item[-] for \texttt{pagecontinue=false}: the preceding Roman sector,
978 \item[-] for \texttt{pagecontinue=true}: all Roman sectors,
979 \end{description}%
980 and therefore continues with the appropriate page in case of option \texttt{pagecontinue}.\newline
981 If you want to start with \textquotedblleft I\textquotedblright{} all
982 over again, you will have two pages with the same name,
983 but nevertheless you can do this by using option \texttt{pagecontinue=false}
984 or a \verb|\setcounter{page}{1}|\ here (not demonstrated in this example file).\bigskip
985
986 First page (\verb|\lastpageref{pagesLTS.0}|):
987  \lastpageref{pagesLTS.0}\bigskip
988
989 The page (\verb|\thepage|): \thepage \bigskip
990
991 Current page (\verb|\theCurrentPage|),
992 i.\,e.~counted continuously from the first page): \theCurrentPage \bigskip
993
994 CurrentPageLocal (\verb|\theCurrentPageLocal|),
995 i.\,e.~counted continuously from the first page of the
996 current page numbering scheme (if option pagecontinue=false: sector)): \theCurrentPageLocal \bigskip
997
998 Last roman page (pagesLTS.roman): \lastpageref{pagesLTS.roman}{\hskip4em }
999 (There are \lastpageref{pagesLTS.roman.local} pages with roman numbers.)\bigskip
1000
1001 Last Roman page (pagesLTS.Roman): \lastpageref{pagesLTS.Roman}{\hskip3em }%
1002 \makeatletter%
1003 \ifpagesLTS@pagecontinue%
1004   (There are \lastpageref{pagesLTS.Roman.local}~pages with Roman numbers:\newline
1005 \else%
1006   (There are %
1007 \lastpages{Roman}{1}+\lastpages{Roman}{2}+\lastpages{Roman}{3}=%
1008  \the\numexpr%
1009  \csname c@pagesLTS.Roman.1.local.cnt\endcsname%
1010  +\csname c@pagesLTS.Roman.2.local.cnt\endcsname%
```

```
1011    +\csname c@pagesLTS.Roman.3.local.cnt\endcsname%
1012    \relax~pages with Roman numbers:\newline
1013 \fi%
1014 \makeatother%
1015 \lastpages{Roman}{1}~pages in the first Roman sector
1016 (\pageref{Roman}{\hskip3em }-\lastpageref{pagesLTS.Roman.1}{\hskip3em }),\newline
1017 \lastpages{Roman}{2}~pages in the second Roman sector
1018 (\pageref{Roman2}{\hskip3em }-\lastpageref{pagesLTS.Roman.2}{\hskip3em }), and\newline
1019 \lastpages{Roman}{3}~pages in the third Roman sector
1020 (\pageref{Roman3}{\hskip3em }-\lastpageref{pagesLTS.Roman.3}{\hskip3em }).)\bigskip
1021
1022 When the option \texttt{pagecontinue=false} is used with the
1023 \textsf{pageslts} package, the \verb|\lastpageref{pagesLTS.Roman}| will
1024 point to the same page as before, but this will have a lower number.
1025 And if that page number was also present in a preceding sector,
1026 the link will go to that page. (Several pages with the same number\ldots)\newline
1027 The \verb|\lastpageref{pagesLTS.Roman.local}| will refer only to the number
1028 of pages in the last sector. To get the total number of Roman pages, %
1029 \begin{verbatim}
1030 \the\numexpr \csname c@pagesLTS.Roman.1.local.cnt\endcsname%
1031  +\csname c@pagesLTS.Roman.2.local.cnt\endcsname%
1032  +\csname c@pagesLTS.Roman.3.local.cnt\endcsname%
1033 \relax%
1034 \end{verbatim}%
1035 would be necessary.\bigskip
1036
1037 Last arabic page (pagesLTS.arabic): \lastpageref{pagesLTS.arabic}{\hskip5em }
1038 (There are only \lastpageref{pagesLTS.arabic.local} pages with arabic numbers,
1039 because an \verb|\addtocounter{page}{|\pagesLTSexampleArabic\verb|}| was used.)\bigskip
1040
1041 Last fnsymbol page (pagesLTS.fnsymbol): \lastpageref{pagesLTS.fnsymbol}\newline
1042 (better \verb|\lastpageref{pagesLTS.fnsymbol}| than just\newline
1043 \verb|\pageref{pagesLTS.fnsymbol}|!)\bigskip
1044
1045 (There are \lastpageref{pagesLTS.fnsymbol.local} pages with fnsymbol numbers.)\bigskip
1046
1047 Last alph page (pagesLTS.alph): \lastpageref{pagesLTS.alph}{\hskip4em }
1048 (There are only \lastpageref{pagesLTS.alph.local} pages with alph numbers,
1049 because an \verb|\addtocounter{page}{|\pagesLTSexamplealph\verb|}| was used.)\bigskip
1050
1051 Last Alph page (pagesLTS.Alph): \lastpageref{pagesLTS.Alph}{\hskip4em }
1052 (There are \lastpageref{pagesLTS.Alph.local} pages with Alph numbers.)\bigskip
1053
1054 Last page's \textit{name} (LastPage): \lastpageref{LastPage}\bigskip
1055
1056 Very last page's \textit{name} (VeryLastPage): \lastpageref{VeryLastPage}\newline
```

```
1057 (\texttt{LastPage} and \texttt{VeryLastPage} are now identical, because both are now done
1058 \verb|\AddToHook{enddocument/afterlastpage}| instead of formerly\newline
1059 \verb|\AtEndDocument| and \verb|\AfterLastShipout|, which were different.)\bigskip
1060
1061 Last page's \textit{number} (LastPages): \lastpageref{LastPages}{\hskip3em }
1062 (=~total number of pages)
1063 \newpage
1064 \lipsum[1-3]
1065 \newpage
1066
1067 \lastpageref{pagesLTS.Roman} (\verb|\lastpageref{pagesLTS.Roman}|)
1068 \textbf{does} refers to this page.\newline
1069 Also \verb|\lastpageref{pagesLTS.Roman.3}|
1070 give the right name of the page, but if \verb|pagecontinue=false| was chosen,
1071 it might point to another page with the same name!
1072 \lastpageref{pagesLTS.Roman.3}.\bigskip
1073
1074 \bigskip
1075
1076 There are \lastpages{Roman}{3}~pages (\verb|\lastpages{Roman}{3}|) in this
1077 third Roman sector.
1078
1079 \newpage
1080 \pagenumbering{gobble}
1081 \section{gobble}
1082
1083 Well. You can use \verb|gobble| as page numbering scheme. It gobbles the page numbers,
1084 i.\,e.~there is no page number. Maybe \verb|\thispagestyle{empty}| is more useful?
1085 Do not expect to be able to make working references to pages without page number,
1086 and do expect to get
1087 \begin{verbatim}
1088 pdfTeX warning (ext4): destination with the same identifier
1089 (name{page.}) has been already used, duplicate ignored
1090 <to be read again>
1091 \end{verbatim}
1092
1093 The page (\verb|\thepage|): \thepage{} (There is a nothing between two spaces there.)\bigskip
1094
1095 Current page (\verb|\theCurrentPage|),
1096 i.\,e.~counted continuously from the first page): \theCurrentPage \bigskip
1097
1098 CurrentPageLocal (\verb|\theCurrentPageLocal|),
1099 i.\,e.~counted continuously from the first page of the
1100 current page numbering scheme (if option pagecontinue=false: sector)): \theCurrentPageLocal \bigskip
1101
1102 There are \lastpageref*{pagesLTS.gobble.local} pages with gobbled numbers (i.\,e.~without numbers).
```

```
1103
1104 \bigskip
1105
1106 For testing purposes, try:
1107
1108 \begin{small}
1109 \begin{verbatim}
1110 \documentclass{article}
1111 \usepackage[plainpages=false,pageanchor=true,pdfpagelabels=true]{hyperref}
1112 \usepackage{pageslts}
1113 \pagenumbering{gobble}
1114 \begin{document}
1115 First page.\newpage
1116 \verb|\lastpageref{pagesLTS.0}            | \lastpageref{pagesLTS.0}            \par
1117 \verb|\lastpageref{pagesLTS.0.local}      | \lastpageref{pagesLTS.0.local}      \par
1118 \verb|\lastpageref{LastPage}             | \lastpageref{LastPage}             \par
1119 \verb|\lastpageref{VeryLastPage}         | \lastpageref{VeryLastPage}         \par
1120 \verb|\lastpageref{pagesLTS.gobble.1}     | \lastpageref{pagesLTS.gobble.1}     \par
1121 \verb|\lastpageref{pagesLTS.gobble.1.local} | \lastpageref{pagesLTS.gobble.1.local} \par
1122 \verb|\lastpageref{pagesLTS.gobble}       | \lastpageref{pagesLTS.gobble}       \par
1123 \verb|\lastpageref{pagesLTS.gobble.local}  | \lastpageref{pagesLTS.gobble.local}  \par
1124 \verb|\lastpageref{LastPages}            | \lastpageref{LastPages}            \par
1125 \verb|\pagesLTSlastpage                  | \pagesLTSlastpage
1126 \newpage
1127 Last page.
1128 \end{document}
1129 \end{verbatim}
1130 \end{small}
1131 \newpage
1132
1133 \pagenumbering{Alph}
1134 \section{Alph}
1135
1136 First page (\verb|\lastpageref{pagesLTS.0}|):
1137  \lastpageref{pagesLTS.0}\bigskip
1138
1139 The page (\verb|\thepage|): \thepage \bigskip
1140
1141 Current page (\verb|\theCurrentPage|),
1142 i.\,e.~counted continuously from the first page): \theCurrentPage \bigskip
1143
1144 CurrentPageLocal (\verb|\theCurrentPageLocal|),
1145 i.\,e.~counted continuously from the first page of the
1146 current page numbering scheme (if option pagecontinue=false: sector)): \theCurrentPageLocal \bigskip
1147
1148 Last roman page (pagesLTS.roman): \lastpageref{pagesLTS.roman}{\hskip4em }
```

```
1149 (There are \lastpageref{pagesLTS.roman.local} pages with roman numbers.)\bigskip
1150
1151 Last Roman page (pagesLTS.Roman): \lastpageref{pagesLTS.Roman}{\hskip3em }%
1152 \makeatletter%
1153 \ifpagesLTS@pagecontinue%
1154   (There are \lastpageref{pagesLTS.Roman.local}~pages with Roman numbers:\newline
1155 \else%
1156   (There are %
1157   \lastpages{Roman}{1}+\lastpages{Roman}{2}+\lastpages{Roman}{3}=%
1158    \the\numexpr%
1159     \csname c@pagesLTS.Roman.1.local.cnt\endcsname%
1160    +\csname c@pagesLTS.Roman.2.local.cnt\endcsname%
1161    +\csname c@pagesLTS.Roman.3.local.cnt\endcsname%
1162    \relax~pages with Roman numbers:\newline
1163 \fi%
1164 \makeatother%
1165 \lastpages{Roman}{1}~pages in the first Roman sector
1166 (\pageref{Roman}{\hskip3em }-\lastpageref{pagesLTS.Roman.1}{\hskip3em }),\newline
1167 \lastpages{Roman}{2}~pages in the second Roman sector
1168 (\pageref{Roman2}{\hskip3em }-\lastpageref{pagesLTS.Roman.2}{\hskip3em }), and\newline
1169 \lastpages{Roman}{3}~pages in the third Roman sector
1170 (\pageref{Roman3}{\hskip3em }-\lastpageref{pagesLTS.Roman.3}{\hskip3em }).)\bigskip
1171
1172 When the option \texttt{pagecontinue=false} is used with the
1173 \textsf{pageslts} package, the \verb|\lastpageref{pagesLTS.Roman}| will
1174 point to the same page as before, but this will have a lower number.
1175 And if that page number was also present in a preceding sector,
1176 the link will go to that page. (Several pages with the same number\ldots)\newline
1177 The \verb|\lastpageref{pagesLTS.Roman.local}| will refer only to the number
1178 of pages in the last sector. To get the total number of Roman pages, %
1179 \begin{verbatim}
1180 \the\numexpr \csname c@pagesLTS.Roman.1.local.cnt\endcsname%
1181  +\csname c@pagesLTS.Roman.2.local.cnt\endcsname%
1182  +\csname c@pagesLTS.Roman.3.local.cnt\endcsname%
1183 \relax%
1184 \end{verbatim}%
1185 would be necessary.\bigskip
1186
1187 Last arabic page (pagesLTS.arabic): \lastpageref{pagesLTS.arabic}{\hskip5em }
1188 (There are only \lastpageref{pagesLTS.arabic.local} pages with arabic numbers,
1189 because an \verb|\addtocounter{page}{|\pagesLTSexampleArabic\verb|}| was used.)\bigskip
1190
1191 Last fnsymbol page (pagesLTS.fnsymbol): \lastpageref{pagesLTS.fnsymbol}\newline
1192 (better \verb|\lastpageref{pagesLTS.fnsymbol}| than just\newline
1193 \verb|\pageref{pagesLTS.fnsymbol}|!)\newline
1194
```

```
1195 (There are \lastpageref{pagesLTS.fnsymbol.local} pages with fnsymbol numbers.)\bigskip
1196
1197 Last alph page (pagesLTS.alph): \lastpageref{pagesLTS.alph}{\hskip4em }
1198 (There are only \lastpageref{pagesLTS.alph.local} pages with alph numbers,
1199 because an \verb|\addtocounter{page}{|\pagesLTSexamplealph\verb|}| was used.)\bigskip
1200
1201 Last Alph page (pagesLTS.Alph): \lastpageref{pagesLTS.Alph}{\hskip4em }
1202 (There are \lastpageref{pagesLTS.Alph.local} pages with Alph numbers.)\bigskip
1203
1204 Last page's \textit{name} (LastPage): \lastpageref{LastPage}\bigskip
1205
1206 Very last page's \textit{name} (VeryLastPage): \lastpageref{VeryLastPage}\newline
1207 (\texttt{LastPage} and \texttt{VeryLastPage} are now identical, because both are now done
1208 \verb|\AddToHook{enddocument/afterlastpage}| instead of formerly\newline
1209 \verb|\AtEndDocument| and \verb|\AfterLastShipout|, which were different.)\bigskip
1210
1211 Last page's \textit{number} (LastPages): \lastpageref{LastPages}{\hskip3em }
1212 (=~total number of pages)
1213 \newpage
1214
1215 Without option \texttt{alphMulti=AB} of the \textsf{pageslts}
1216 (and the help of the \textsf{alphalph} package), after page
1217 \textquotedblleft Z\textquotedblright{} there would just appear~a
1218 \begin{quote}
1219 \begin{verbatim}
1220 LaTeX Error: Counter too large
1221 See the LaTeX manual or LaTeX Companion for explanation.
1222 You've lost some text.  Try typing  <return>  to proceed.
1223 If that doesn't work, type  X <return>  to quit.
1224 \end{verbatim}
1225 \end{quote}
1226 Now the page numbers are continued AA, AB, AC,\ldots\ (AA, BB, CC,\ldots\ is
1227 also possible, see the \textsf{pageslts} documentation).\newline
1228 This is not demonstrated here, but see section~\ref{alph}.
1229 \newpage
1230
1231 \section{silly}
1232 The sillypage package, \url{https://ctan.org/pkg/sillypage}, provides the
1233 page\-numbering scheme \verb|silly|, which is not demonstrated here
1234 but works with the pageslts package, i.\,e.~the references
1235 all show the right (page) number and link to the right page.\bigskip
1236
1237 This is \textbf{not} demonstrated here (discussing gobbled page numbers
1238 is silly enough), but for testing purposes, try:
1239
1240 \begin{small}
```

```
1241 \begin{verbatim}
1242 \documentclass{article}
1243 \usepackage[plainpages=false,pageanchor=true,pdfpagelabels=true]{hyperref}
1244 \usepackage{pageslts}
1245 \usepackage{sillypage}
1246 \pagenumbering{silly}
1247 \begin{document}
1248 First page.\newpage
1249 \verb|\lastpageref{pagesLTS.0}              | \lastpageref{pagesLTS.0}              \par
1250 \verb|\lastpageref{pagesLTS.0.local}        | \lastpageref{pagesLTS.0.local}        \par
1251 \verb|\lastpageref{LastPage}               | \lastpageref{LastPage}               \par
1252 \verb|\lastpageref{VeryLastPage}           | \lastpageref{VeryLastPage}           \par
1253 \verb|\lastpageref{pagesLTS.silly.1}       | \lastpageref{pagesLTS.silly.1}       \par
1254 \verb|\lastpageref{pagesLTS.silly.1.local} | \lastpageref{pagesLTS.silly.1.local} \par
1255 \verb|\lastpageref{pagesLTS.silly}         | \lastpageref{pagesLTS.silly}         \par
1256 \verb|\lastpageref{pagesLTS.silly.local}   | \lastpageref{pagesLTS.silly.local}   \par
1257 \verb|\lastpageref{LastPages}              | \lastpageref{LastPages}              \par
1258 \verb|\pagesLTSlastpage                    | \pagesLTSlastpage
1259 \newpage
1260 Page \theCurrentPage\newpage
1261 Page \theCurrentPage\newpage
1262 Page \theCurrentPage\newpage
1263 Page \theCurrentPage\newpage
1264 Page \theCurrentPage\newpage
1265 Page \theCurrentPage\newpage
1266 Page \theCurrentPage\newpage
1267 Page \theCurrentPage\newpage
1268 Page \theCurrentPage\newpage
1269 Page \theCurrentPage\newpage
1270 Page \theCurrentPage\newpage
1271 Page \theCurrentPage\newpage
1272 Page \theCurrentPage : Last page.
1273 \end{document}
1274 \end{verbatim}
1275 \end{small}
1276 \newpage
1277
1278 \section{The End}
1279
1280 First page (\verb|\lastpageref{pagesLTS.0}|):
1281 \lastpageref{pagesLTS.0}\bigskip
1282
1283 The page (\verb|\thepage|): \thepage \bigskip
1284
1285 Current page (\verb|\theCurrentPage|),
1286 i.\,e.~counted continuously from the first page): \theCurrentPage \bigskip
```

```
1287
1288 CurrentPageLocal (\verb|\theCurrentPageLocal|),
1289 i.\,e.~counted continuously from the first page of the
1290 current page numbering scheme (if option pagecontinue=false: sector)): \theCurrentPageLocal \bigskip
1291
1292 Last roman page (pagesLTS.roman): \lastpageref{pagesLTS.roman}{\hskip4em }
1293 (There are \lastpageref{pagesLTS.roman.local} pages with roman numbers.)\bigskip
1294
1295 Last Roman page (pagesLTS.Roman): \lastpageref{pagesLTS.Roman}{\hskip3em }%
1296 \makeatletter%
1297 \ifpagesLTS@pagecontinue%
1298   (There are \lastpageref{pagesLTS.Roman.local}~pages with Roman numbers:\newline
1299 \else%
1300   (There are %
1301   \lastpages{Roman}{1}+\lastpages{Roman}{2}+\lastpages{Roman}{3}=%
1302    \the\numexpr%
1303     \csname c@pagesLTS.Roman.1.local.cnt\endcsname%
1304    +\csname c@pagesLTS.Roman.2.local.cnt\endcsname%
1305    +\csname c@pagesLTS.Roman.3.local.cnt\endcsname%
1306    \relax~pages with Roman numbers:\newline
1307 \fi%
1308 \makeatother%
1309 \lastpages{Roman}{1}~pages in the first Roman sector
1310 (\pageref{Roman}{\hskip3em }-\lastpageref{pagesLTS.Roman.1}{\hskip3em }),\newline
1311 \lastpages{Roman}{2}~pages in the second Roman sector
1312 (\pageref{Roman2}{\hskip3em }-\lastpageref{pagesLTS.Roman.2}{\hskip3em }), and\newline
1313 \lastpages{Roman}{3}~pages in the third Roman sector
1314 (\pageref{Roman3}{\hskip3em }-\lastpageref{pagesLTS.Roman.3}{\hskip3em }).)\bigskip
1315
1316 When the option \texttt{pagecontinue=false} is used with the
1317 \textsf{pageslts} package, the \verb|\lastpageref{pagesLTS.Roman}| will
1318 point to the same page as before, but this will have a lower number.
1319 And if that page number was also present in a preceding sector,
1320 the link will go to that page. (Several pages with the same number\ldots)\newline
1321 The \verb|\lastpageref{pagesLTS.Roman.local}| will refer only to the number
1322 of pages in the last sector. To get the total number of Roman pages, %
1323 \begin{verbatim}
1324 \the\numexpr \csname c@pagesLTS.Roman.1.local.cnt\endcsname%
1325  +\csname c@pagesLTS.Roman.2.local.cnt\endcsname%
1326  +\csname c@pagesLTS.Roman.3.local.cnt\endcsname%
1327 \relax%
1328 \end{verbatim}%
1329 would be necessary.\bigskip
1330
1331 Last arabic page (pagesLTS.arabic): \lastpageref{pagesLTS.arabic}{\hskip5em }
1332 (There are only \lastpageref{pagesLTS.arabic.local} pages with arabic numbers,
```

```
1333 because an \verb|\addtocounter{page}{|\pagesLTSexampleArabic\verb|}| was used.)\bigskip
1334
1335 Last fnsymbol page (pagesLTS.fnsymbol): \lastpageref{pagesLTS.fnsymbol}\newline
1336 (better \verb|\lastpageref{pagesLTS.fnsymbol}| than just\newline
1337 \verb|\pageref{pagesLTS.fnsymbol}|!)\bigskip
1338
1339 (There are \lastpageref{pagesLTS.fnsymbol.local} pages with fnsymbol numbers.)\bigskip
1340
1341 Last alph page (pagesLTS.alph): \lastpageref{pagesLTS.alph}{\hskip4em }
1342 (There are only \lastpageref{pagesLTS.alph.local} pages with alph numbers,
1343 because an \verb|\addtocounter{page}{|\pagesLTSexamplealph\verb|}| was used.)\bigskip
1344
1345 Last gobble page (pagesLTS.gobble: \lastpageref{pagesLTS.gobble}{\hskip4em }
1346 Yes, there is neither page number nor link, because everything got gobbled.
1347 (There is \lastpageref*{pagesLTS.gobble.local} page with gobbled number (i.\,e.~without number).)\bigskip
1348
1349 Last Alph page (pagesLTS.Alph): \lastpageref{pagesLTS.Alph}{\hskip4em }
1350 (There are \lastpageref{pagesLTS.Alph.local} pages with Alph numbers.)\bigskip
1351
1352 Silly page numbers are possible but were not demonstrated in this example.
1353 \newpage
1354
1355 Last page's \textit{name} (LastPage): \lastpageref{LastPage}\bigskip
1356
1357 Very last page's \textit{name} (VeryLastPage): \lastpageref{VeryLastPage}\newline
1358 (\texttt{LastPage} and \texttt{VeryLastPage} are now identical, because both are now done
1359 \verb|\AddToHook{enddocument/afterlastpage}| instead of formerly\newline
1360 \verb|\AtEndDocument| and \verb|\AfterLastShipout|, which were different.)\bigskip
1361
1362 Last page's \textit{number} (LastPages): \lastpageref{LastPages}{\hskip3em }
1363 (=~total number of pages)
1364 \end{document}
1365 ⟨/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_ε, format version at least 2024-11-01, and announcing the name and version of this package.

```
1366 ⟨*package⟩
```

```
1367 \NeedsTeXFormat{LaTeX2e}[2024-11-01]
1368 \ProvidesPackage{pageslts}[2025-06-05 v2.0e Refers to special pages' numbers/names (HMM)]
1369
```

A short description of the pageslts package:

```
1370 %% Allows for things like\par
1371 %% |Page \thepage\ (\theCurrentPage; local: \theCurrentPageLocal) of %
1372 %%  \lastpageref{pagesLTS.roman}(\lastpageref{pagesLTS.roman.local}) + %
1373 %%  \lastpageref{pagesLTS.Roman}(\lastpageref{pagesLTS.Roman.local}) + %
1374 %%  \lastpageref{pagesLTS.arabic}(\lastpageref{pagesLTS.arabic.local}) + %
1375 %%  \lastpageref{pagesLTS.fnsymbol}(\lastpageref{pagesLTS.fnsymbol.local}) + %
1376 %%  \lastpageref{pagesLTS.alph}(\lastpageref{pagesLTS.alph.local}) + %
1377 %%  \lastpageref{pagesLTS.Alph}(\lastpageref{pagesLTS.Alph.local}) = %
1378 %%  \lastpageref{LastPages} pages.|\par
1379 %% to get\par
1380 %% 'Page d (57; local: 4) of ii(2) + XX(20) + *(1) + 30(30) + e(5) + C(3) = 61 pages.'.
1381
```

For the handling of the options we use the kernel commands:

```
1382 \DeclareKeys[pagesLTS]
1383  {alphMult      .store = \pagesLTS@alphMult ,
1384   alphMult      .usage = preamble ,
1385   AlphMulti     .store = \pagesLTS@AlphMulti ,
1386   AlphMulti     .usage = preamble ,
1387   pagecontinue  .if    = pagesLTS@pagecontinue ,
1388   pagecontinue  .usage = load ,
1389   romanMult     .if    = pagesLTS@romanMult ,
1390   romanMult     .usage = load ,
1391   RomanMulti    .if    = pagesLTS@RomanMulti ,
1392   RomanMulti    .usage = load ,
1393   fnsymbolmult  .if    = pagesLTS@fnsymbolmult ,
1394   fnsymbolmult  .usage = load
1395  }
1396
1397 \SetKeys[pagesLTS]{alphMult=ab,AlphMulti=AB,pagecontinue=true,romanMult=true,RomanMulti=true,fnsymbolmult=true}
1398
1399 \DeclareUnknownKeyHandler[pagesLTS]{%
1400   \PackageError{pageslts}{Unknown option "\CurrentOption"}{%
```

```
1401      LaTeX has been asked to set an option called\MessageBreak%
1402      '#1' \if\relax\detokenize{#2}\relax\else with value '#2'\fi\MessageBreak%
1403      but the package "pageslts" has not created an option with this name.\MessageBreak%
1404      Try typing  <return>  to proceed.\MessageBreak%
1405      If that doesn't work, type  X <return>  to quit.%
1406    }%
1407    }
1408
1409 \ProcessKeyOptions[pagesLTS]
1410
```

This package really does not work with an old LaTeX format without hooks, or without ε-TeX, or with a pagesLTS.sty file, or with version 2.0 from 1992 of the endfloats package, or hyperref from 2015 and so on. Assuming that nobody would combine those old things with a modern LaTeX format, we request a recent format and do not check for the rest.

```
1411 \@ifl@t@r\fmtversion{2024-11-01}{}{\PackageError{pageslts}{%
1412   LaTeX format 2024-11-01 or newer needed}{%
1413   Needed LaTeX format version: 2024-11-01 or newer.\MessageBreak%
1414   Found\space\space LaTeX format version: \fmtversion.\MessageBreak%
1415   Please update your TeX distribution!\MessageBreak%
1416   Loading of pageslts package is aborted.}
1417   \expandafter\endinput}
1418
```

The undolabl package (see subsection 7.1) is needed to overwrite labels, when the same page numbering scheme is used twice (or even more often).

```
1419 \RequirePackage{undolabl}[2024-12-05]
1420 \IfPackageLoadedTF{undolabl}{\IfPackageAtLeastF{undolabl}{2024-12-05}{%
1421   \PackageError{pageslts}{undolabl package version too old}{%
1422     Required version: 2024-12-05 v1.0n or newer,\MessageBreak%
1423     found version:\space\space\space\space\csname ver@undolabl.sty\endcsname.%
1424 }}}{\PackageError{pageslts}{undolabl package not loaded}{%
1425     The undolabl package is required by pageslts but was not loaded.}%
1426   }
1427
```

For comparisons, zero, one, two and three are defined (\z@, \@ne and so on do not work for this) and for the page numbering scheme handling some definitions are made.

```
1428 \def\pagesLTS@zero{0}
1429 \def\pagesLTS@one{1}
1430 \def\pagesLTS@two{2}
1431 \def\pagesLTS@three{3}
1432 \def\pagesLTS@ab{ab}
1433 \def\pagesLTS@bb{bb}
1434 \def\pagesLTS@ABi{AB}
1435 \def\pagesLTS@BBi{BB}
1436
```

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.

```
1437 \ifpagesLTS@pagecontinue
1438   \PackageNoteNoLine{pageslts}{Option pagecontinue enabled (maybe by default):\MessageBreak%
1439     The pageslts package will continue the page numbering,\MessageBreak%
1440     when the same page numbering scheme is used twice.\MessageBreak%
1441     If you do not want this, call pageslts with option\MessageBreak%
1442     pagecontinue=false (or use \string\setcounter{page}=1)}
1443 \else
1444   \PackageNoteNoLine{pageslts}{Option pagecontinue is false:\MessageBreak%
1445     The pageslts package was used, but the option\MessageBreak%
1446     pagecontinue was set to false.\MessageBreak%
1447     If you want the page numbers to be continued,\MessageBreak%
1448     when the same page numbering scheme is used twice,\MessageBreak%
1449     please call pageslts with option pagecontinue=true,\MessageBreak%
1450     otherwise the page number is reset to one each time\MessageBreak%
1451     the page numbering scheme is changed}
1452 \fi
1453
```

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`.

```
1454 \ifx\pagesLTS@alphMult\pagesLTS@ab%
1455 \else
1456   \ifx\pagesLTS@alphMult\pagesLTS@bb%
1457   \else
1458     \ifx\pagesLTS@alphMult\pagesLTS@zero%
1459       \PackageNoteNoLine{pageslts}{%
1460         Option alphMult=0 found:\MessageBreak%
1461         The pageslts package was used, but the option\MessageBreak%
1462         alphMult was set to 0 (zero).\MessageBreak%
1463         If you want the page numbers to be extended\MessageBreak%
1464         after z, you have to organize this yourself now.\MessageBreak%
1465         For automatic continuation, please use the\MessageBreak%
1466         alphalph package and call pageslts\MessageBreak%
1467         with option alphMult=ab (for aa, ab, ac, ad,...) or\MessageBreak%
1468         with option alphMult=bb (for aa, bb, cc, dd,...)}
1469     \else
1470       \PackageError{pageslts}{Unknown option value}{%
1471         The pageslts package was used with option\MessageBreak%
```

```
1472        alphMult=\meaning\pagesLTS@alphMult .\MessageBreak%
1473        Only values 'ab', 'bb', and '0' (zero) are valid.\MessageBreak%
1474        Now the default 'ab' is being set.}
1475      \SetKeys[pagesLTS]{alphMult=ab}
1476    \fi
1477  \fi
1478 \fi
1479
1480 \ifx\pagesLTS@AlphMulti\pagesLTS@ABi%
1481 \else
1482   \ifx\pagesLTS@AlphMulti\pagesLTS@BBi%
1483   \else
1484     \ifx\pagesLTS@AlphMulti\pagesLTS@zero%
1485       \PackageNoteNoLine{pageslts}{%
1486         Option AlphMulti=0 found:\MessageBreak%
1487         The pageslts package was used, but the option\MessageBreak%
1488         AlphMulti was set to 0 (zero).\MessageBreak%
1489         If you want the page numbers to be extended\MessageBreak%
1490         after Z, you have to organize this yourself now.\MessageBreak%
1491         For automatic continuation, please use the\MessageBreak%
1492         alphalph package and call pageslts\MessageBreak%
1493         with option AlphMulti=AB (for AA, AB, AC, AD,...) or\MessageBreak%
1494         with option AlphMulti=BB (for AA, BB, CC, DD,...)}
1495     \else
1496       \PackageError{pageslts}{Unknown option value}{%
1497         The pageslts package was used with option\MessageBreak%
1498         AlphMulti=\meaning\pagesLTS@AlphMulti .\MessageBreak%
1499         Only values 'AB', 'BB', and '0' (zero) are valid.\MessageBreak%
1500         The default 'AB' is set.}
1501       \SetKeys[pagesLTS]{AlphMulti=AB}
1502     \fi
1503   \fi
1504 \fi
1505
```

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

```
1506 \ifx\pagesLTS@alphMult\pagesLTS@zero\else\RequirePackage{alphalph}[2019/12/09]\fi
1507 \ifx\pagesLTS@AlphMulti\pagesLTS@zero\else\RequirePackage{alphalph}[2019/12/09]\fi
1508 \ifpagesLTS@fnsymbolmult\RequirePackage{alphalph}[2019/12/09]\fi
1509
```

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

```
1510 \ifpagesLTS@romanMult
1511   \PackageNoteNoLine{pageslts}{Option romanMult enabled (maybe by default):\MessageBreak%
1512     The pageslts package will extend the page numbering\MessageBreak%
1513     of the roman scheme below i with\MessageBreak%
1514      0, -i, -ii, -iii, -iv,...\MessageBreak%
```

```
1515        If you do not want this, call pageslts with option\MessageBreak%
1516        romanMult=false}
1517 \else
1518   \PackageNoteNoLine{pageslts}{Option romanMult is set to false:\MessageBreak%
1519        The pageslts package was used, but the option\MessageBreak%
1520        romanMult was set to false.\MessageBreak%
1521        If you want the page numbering of the roman scheme\MessageBreak%
1522        to be extended below i,\MessageBreak%
1523        please call pageslts with option romanMult=true,\MessageBreak%
1524        otherwise zero and negative page numbers of the\MessageBreak%
1525        roman scheme will need to be defined otherwise}
1526 \fi
1527
```

Same for the Roman page numbering scheme.

```
1528 \ifpagesLTS@RomanMulti
1529   \PackageNoteNoLine{pageslts}{Option RomanMulti enabled (maybe by default):\MessageBreak%
1530        The pageslts package will extend the page numbering\MessageBreak%
1531        of the Roman scheme below I with\MessageBreak%
1532        0, -I, -II, -III, -IV,...\MessageBreak%
1533        If you do not want this, call pageslts with option\MessageBreak%
1534        RomanMulti=false}
1535 \else
1536   \PackageNoteNoLine{pageslts}{Option RomanMulti is set to false:\MessageBreak%
1537        The pageslts package was used, but the option\MessageBreak%
1538        RomanMulti was set to false.\MessageBreak%
1539        If you want the page numbering of the Roman scheme\MessageBreak%
1540        to be extended below i,\MessageBreak%
1541        please call pageslts with option RomanMulti=true,\MessageBreak%
1542        otherwise zero and negative page numbers of the\MessageBreak%
1543        Roman scheme will need to be defined otherwise}
1544 \fi
1545
```

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

```
1546 \ifpagesLTS@fnsymbolmult
1547   \PackageNoteNoLine{pageslts}{Option fnsymbolmult enabled (maybe by default):\MessageBreak%
1548        The pageslts package will extend the page numbering\MessageBreak%
1549        of the footnotesymbol scheme using the alphalph\MessageBreak%
1550        package.\MessageBreak%
1551        If you do not want this, call pageslts with option\MessageBreak%
1552        fnsymbolmult=false}
1553 \else
1554   \PackageNoteNoLine{pageslts}{%
1555        Option fnsymbolmult is set to false:\MessageBreak%
1556        The pageslts package was used, but the option\MessageBreak%
1557        fnsymbolmult was set to false.\MessageBreak%
```

```
1558      If you want the page numbering of the footnotesymbol\MessageBreak%
1559      scheme to be extended using the alphalph package,\MessageBreak%
1560      please call pageslts with option fnsymbolmult=true,\MessageBreak%
1561      otherwise page numbers of the footnotesymbol scheme\MessageBreak%
1562      greater than nine will need to be defined otherwise}
1563 \fi
1564
```

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

```
1565 \def\pagesLTS@pnc{0}
1566 \def\pagesLTS@called{0}
1567 \def\pagesLTS@fns{fnsymbol}
1568 \def\pagesLTS@alph{alph}
1569 \def\pagesLTS@Alph{Alph}
1570 \def\pagesLTS@gobble{gobble}
1571 \def\pagesLTS@silly{silly}
1572 \def\pagesLTS@rerun{0}
1573 \def\pagesLTS@esoFs{0}
1574 \def\pagesLTS@esovFs{0}
1575 \def\pagesLTS@esoSy{0}
1576 \def\pagesLTS@esovSy{0}
1577 \def\pagesLTS@esoGbl{0}
1578 \def\pagesLTS@esovGbl{0}
1579 \def\lastpageref{\lastpagereftxt}
1580 \def\pagesLTS@undolable{none}
1581 \def\pncmissing{0}
1582 \def\pagesLTS@messageNPN{%
1583 The pageslts package was used, but\MessageBreak%
1584 \string\pagenumbering \MessageBreak%
1585 was not called at the beginning of the document\MessageBreak%
1586 (maybe earlier or later).\MessageBreak%
1587 Please use \string\pagenumbering \MessageBreak%
1588 (with an argument like arabic, roman, Roman,\MessageBreak%
1589 fnsymbol, alph, Alph, gobble,\MessageBreak%
1590 or silly (requiring sillypage package))\MessageBreak%
1591 at the beginning of your document!\MessageBreak%
1592 Otherwise your document will probably compile,\MessageBreak%
1593 but the pageslts package might not be able\MessageBreak%
1594 to get all labels for the references\MessageBreak%
1595 to the respective pages right.\MessageBreak%
1596 }
1597
```

Defining some new counters (and doing related things):

```
1598 \newcounter{CurrentPage}
1599 \setcounter{CurrentPage}{1}
1600 \def\theCurrentPageLocal{\arabic{pagesLTS.current.local.\pagesLTS@pnc}}
```

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

```
1601 \newcounter{pagesLTS.pagenr}
1602 \setcounter{pagesLTS.pagenr}{1}
```

While generally `\pagesLTS@providecounter{pagesLTS.current.local.\pagesLTS@pnc}` is used, for the beginning of the document `pagesLTS.current.local.0` is predefined. (A `\pagesLTS@providecounter{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.

```
1603 \newcounter{pagesLTS.current.local.0}
1604 \setcounter{pagesLTS.current.local.0}{1}
```

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

```
1605 \newcounter{pagesLTS.pnc.0}
```

Also a scratch counter is defined, `\pagesLTSlastpage` and `\pagesLTSlastpageHy` are predefined (e. g. for computations in the first compilation run), and the obsolete `\pagesLTS.lastpage` points to the new `\pagesLTSlastpage`.

```
1606 \newcounter{pagesLTS.tmpcounter}
1607 \def\pagesLTSlastpage{1}
1608 \def\pagesLTSlastpageHy{1}
1609 \def\pagesLTS.lastpage{\pagesLTSlastpage}
1610
```

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

```
1611 \newcommand{\xroman}[1]{%
1612   \ifnum\value{#1}>0%
1613     \roman{#1}%
1614   \else%
1615     \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).

```
1616       -\romannumeral\number-\arabic{#1}%
1617     \else%
1618       0%
1619     \fi%
1620   \fi%
1621   }
1622
```

\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.[4] 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
> }" (2021/11/08 Version v1.1n LaTeX Kernel File 21: ltcounts.dtx Counters and Lengths).

```
1623 \newcommand{\XRoman}[1]{%
1624   \ifnum\value{#1}>0%
1625     \Roman{#1}%
1626   \else%
1627     \ifnum\value{#1}<0%
1628       -\expandafter\@slowromancap\romannumeral\number-\arabic{#1}@%
1629     \else%
1630       0%
1631     \fi%
1632   \fi%
1633   }
1634
```

\pagesLTS@providecounter We provide a way to create counters like

pagesLTS.pnc. page numbering scheme

pagesLTS.double. page numbering scheme

PageCurrentLocal. page numbering scheme

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

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

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

for all page numbering schemes, even those not supported by the current original \pagenumbering (2020/12/05 Version v1.1a LaTeX Kernel File 33 ltpageno.dtx Page Numbering), which is

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

```
1635 \newcommand{\pagesLTS@providecounter}[1]{\@ifundefined{c@#1}{\newcounter{#1}}{}}
```

---

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

The command `\pagesLTS@ifcounter` is obsolete, but if a document was compiled using an older version of the pageslts package, the command will still be in the `.aux` file. (Following code will be removed in some future version.)

```
1636 \NewCommandCopy{\pagesLTS@ifcounter}{\pagesLTS@providecounter}
1637 \AddToHook{begindocument}{%
```

This hook is executed after the `.aux` file has been read, so there should be no following `\pagesLTS@ifcounter`.

```
1638     \AddToHookWithArguments{cmd/pagesLTS@ifcounter/before}{%
1639       \PackageError{pageslts}{Old command \string\pagesLTS@ifcounter\space used}{%
1640         Replace by \string\pagesLTS@providecounter.}%
1641     }%
1642   }
1643
```

\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`):

```
1644 \newcommand{\lastpages}[2]{%
1645   \pagesLTS@providecounter{pagesLTS.#1.#2.local.cnt}%
1646   \arabic{pagesLTS.#1.#2.local.cnt}%
1647 }
1648
```

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

```
1649 \newcommand{\pagesLTS@writelabel}[1]{%
1650   \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`.

```
1651   \pagesLTS@putlabel{pagesLTS.#1}{\thepage}{1}%
```

`\addtocounter{page}{-1}` is skipped, because another `\pagesLTS@putlabel` follows.

```
1652   \ifx\pagesLTS@pnc\pagesLTS@zero%
```

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

```
1653   \else%
```

otherwise write into the `.aux` file something like
`\newlabel{pagesLTS.arabic.local}{{}{6}{}{page.9}{}}`,
thus `\lastpageref{pagesLTS.arabic.local}` prints 6 and links to `page.9`.

`\addtocounter{page}{+1}` is skipped, because we skipped the `\addtocounter{page}{-1}` above.

```
1654       \pagesLTS@putlabel{pagesLTS.#1.local}{\theCurrentPageLocal}{1}%
```

\addtocounter{page}{-1} immediately after the \pagesLTS@putlabel is skipped, because we do that outside of the \ifx \else \fi.

```
1655    \fi%
1656    \addtocounter{page}{-1}%
1657    }
1658
```

\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 51.

```
1659
1660 %% The following code is from Heiko Oberdiek [2010/04/18],                    %%
1661 %% expanding his alphalph package as of 2010/04/18, v2.3. (Thanks!)           %%
1662 \newcommand*{\erroralphalph}[2]{%
1663    \ifnum\value{#2}>0%
1664      #1{\value{#2}}%
1665    \else%
1666      \ifnum\value{#2}<0%
1667        -#1{\expandafter\@gobble\the\value{#2}}%
1668      \else%
1669        0%
1670      \fi%
1671    \fi%
1672    }
1673 %% End of code from Heiko Oberdiek                                             %%
1674 %% Check and Error/Warning messages have been moved to hook "shipout/foreground" %%
1675 %% because messages inside e.g. the \pageref command can cause trouble.       %%
1676
```

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

```
1677
1678 \newcommand{\expandPagenumbering}[1]{%
1679   \let\Origthepage\thepage%
1680   \def\pagesLTS@tmpC{arabic}%
1681   \ifx\pagesLTS@pnc\pagesLTS@tmpC%
```

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

```
1682   \else%
1683     \def\pagesLTS@tmpC{roman}%
1684     \ifx\pagesLTS@pnc\pagesLTS@tmpC%
1685       \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 51) expands the usable roman page numbers to values below 1 (i, I, respectively), see subsubsection 2.1.3.

```
1686         \renewcommand*{\thepage}{\xroman{page}}%
1687       \fi%
1688     \else%
1689       \def\pagesLTS@tmpC{Roman}%
1690       \ifx\pagesLTS@pnc\pagesLTS@tmpC%
```

The same for `\Roman` page numbering, expanded by `\XRoman` (see page 51). When the romanbar package has been loaded, the page format is changed accordingly.

```
1691         \IfPackageLoadedTF{romanbarpagenumber}{%
1692           \ifpagesLTS@RomanMulti%
1693             \renewcommand*{\thepage}{\Roman@bar{\XRoman{page}}}%
1694           \else%
1695             \renewcommand*{\thepage}{\Roman@bar{\Roman{page}}}%
1696           \fi%
1697         }{\ifpagesLTS@RomanMulti%
1698           \renewcommand*{\thepage}{\XRoman{page}}%
1699           \fi%
1700         }%
1701       \else%
1702         \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.

```
1703         \ifx\pagesLTS@alphMult\pagesLTS@ab%
1704           \renewcommand*{\thepage}{\erroralphalph{\alphalph}{page}}%
1705         \else%
1706           \ifx\pagesLTS@alphMult\pagesLTS@bb%
1707             \renewcommand*{\thepage}{\erroralphalph{\alphMult}{page}}%
1708           \fi%
1709         \fi%
```

```
1710          \else%
1711            \ifx\pagesLTS@pnc\pagesLTS@Alph%
1712              \ifx\pagesLTS@AlphMulti\pagesLTS@ABi%
1713                \renewcommand*{\thepage}{\erroralphalph{\AlphAlph}{page}}%
1714              \else%
1715                \ifx\pagesLTS@AlphMulti\pagesLTS@BBi%
1716                  \renewcommand*{\thepage}{\erroralphalph{\AlphMult}{page}}%
1717                \fi%
1718              \fi%
1719            \else%
1720              \ifx\pagesLTS@pnc\pagesLTS@fns%
```

Same for `\fnsymbol` page numbers.

```
1721                \ifpagesLTS@fnsymbolmult%
1722                  \renewcommand*{\thepage}{\erroralphalph{\fnsymbolmult}{page}}%
1723                \fi%
1724              \else%
```

For silly page numbers (from the sillypage package), `\thepage` is `\csname @silly\endcsname \c@page`, i. e. `\@silly \c@page` – no change needed.

```
1725                \ifx\pagesLTS@pnc\pagesLTS@silly%
1726                \else%
```

For gobble page numbers, `\thepage` is `\csname @gobble\endcsname \c@page`, i. e. `\@gobble \c@page` and `\@gobble` is `\long\def \@gobble #1{}`, i. e. `\thepage` is `{}`. This is OK, but hyperref does not create links when there is no linktext. Thus we give `\null` as text for the page number, which prints as nothing but makes hyperref happy – although not happy enough yet: `\null` expands to `\hbox {}`, and hyperref complains

```
Package hyperref Warning: Token not allowed in a PDF string (Unicode):
(hyperref)                removing '\hbox' on input line <something>.

Package hyperref Warning: Token not allowed in a PDF string (PDFDocEncoding):
(hyperref)                removing '\hbox' on input line <something>.
```

To make hyperref extra happy, we tell it to not use `\null` as PDF string.

```
1727                  \ifx\pagesLTS@pnc\pagesLTS@gobble%
1728                    \IfPackageLoadedT{hyperref}{%
1729                      \renewcommand*{\thepage}{\texorpdfstring{\null}{{}}%
1730                      \csname @gobble\endcsname \c@page}}%
1731                  \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.

```
1732                    \PackageError{pageslts}{unknown page numbering scheme}{%
1733                      The pageslts package encountered the unknown\MessageBreak%
1734                      page numbering scheme\MessageBreak%
1735                      \meaning#1. \MessageBreak%
```

```
1736                      If this is no typing mistake, it might work\MessageBreak%
1737                      - or it might not work.\MessageBreak%
1738                      \@ehc}%
1739    \fi\fi\fi\fi\fi\fi\fi\fi%
1740    \let\pagesLTS@tmpC\undefined%
1741    }
1742
```

\pagenumbering To keep the original meaning of \pagenumbering:

```
1743 \NewCommandCopy{\OrigPagenumbering}{\pagenumbering}
1744
```

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

```
1745 \renewcommand{\pagenumbering}[1]{%
```

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

```
1746    \edef\pagesLTS@tmpA{#1}%
1747    \ifx\pagesLTS@pnc\pagesLTS@tmpA%
1748    \else%
```

If the requested page numbering scheme, #1, is \pagesLTS@fns, i.e. fnsymbol, the counter**pagesLTS.fnsymbol.local** is needed. If it does not exists yet, it is created here. Same for the silly and gobble page numbering schemes.

```
1749        \ifx\pagesLTS@tmpA\pagesLTS@fns%
1750          \pagesLTS@providecounter{pagesLTS.fnsymbol.local}%
1751        \fi%
1752        \ifx\pagesLTS@tmpA\pagesLTS@silly%
1753          \IfPackageLoadedF{sillypage}{\PackageError{pageslts}{%
1754            silly pagenumbering requested, sillypage package not loaded}{%
1755            When using \string\pagenumbering{silly},\MessageBreak%
1756            load the sillypage package.}}%
1757          \pagesLTS@providecounter{pagesLTS.silly.local}%
1758        \fi%
1759        \ifx\pagesLTS@tmpA\pagesLTS@gobble%
1760          \pagesLTS@providecounter{pagesLTS.gobble.local}%
1761        \fi%
```

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.

```
1762        \ifnum\value{CurrentPage}>1%
1763          \addtocounter{page}{-1}%
1764          \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.

```
1765        \newcounter{pagesLTS.\pagesLTS@pnc.\arabic{pagesLTS.pnc.\pagesLTS@pnc}.local.count}%
1766        \setcounter{pagesLTS.\pagesLTS@pnc.\arabic{pagesLTS.pnc.\pagesLTS@pnc}.local.count}{%
1767          \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). The same is done for the `silly` and `gobble` page numbers.

```
1768        \ifx\pagesLTS@pnc\pagesLTS@fns%
1769          \ifnum\value{pagesLTS.pnc.\pagesLTS@pnc}>1%
1770            \setcounter{pagesLTS.tmpcounter}{\numexpr\value{pagesLTS.pnc.\pagesLTS@pnc}-1\relax}%
1771            \addtocounter{pagesLTS.\pagesLTS@pnc.\arabic{pagesLTS.pnc.\pagesLTS@pnc}.local.count}{%
1772              -\value{pagesLTS.\pagesLTS@pnc.\arabic{pagesLTS.tmpcounter}.local.count}}%
1773          \fi%
1774        \else%
1775          \ifx\pagesLTS@pnc\pagesLTS@silly%
1776            \ifnum\value{pagesLTS.pnc.\pagesLTS@pnc}>1%
1777              \setcounter{pagesLTS.tmpcounter}{\numexpr\value{pagesLTS.pnc.\pagesLTS@pnc}-1\relax}%
1778              \addtocounter{pagesLTS.\pagesLTS@pnc.\arabic{pagesLTS.pnc.\pagesLTS@pnc}.local.count}{%
1779                -\value{pagesLTS.\pagesLTS@pnc.\arabic{pagesLTS.tmpcounter}.local.count}}%
1780            \fi%
1781          \else%
1782            \ifx\pagesLTS@pnc\pagesLTS@gobble%
1783              \ifnum\value{pagesLTS.pnc.\pagesLTS@pnc}>1%
1784                \setcounter{pagesLTS.tmpcounter}{\numexpr\value{pagesLTS.pnc.\pagesLTS@pnc}-1\relax}%
1785                \addtocounter{pagesLTS.\pagesLTS@pnc.\arabic{pagesLTS.pnc.\pagesLTS@pnc}.local.count}{%
1786                  -\value{pagesLTS.\pagesLTS@pnc.\arabic{pagesLTS.tmpcounter}.local.count}}%
1787              \fi%
1788            \else%
```

If the page numbering scheme is *neither* `fnsymbol` *nor* `silly` *nor* `gobble` and if the page numbering scheme was *not* used before, an unnumbered label is also written:

```
1789              \ifnum\value{pagesLTS.pnc.\pagesLTS@pnc}<2%
1790                \pagesLTS@writelabel{\pagesLTS@pnc}%
1791              \fi%
1792            \fi%
1793          \fi%
```

For all page numbering schemes: 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 – except if option `pagenumbering=false` has been chosen, because then the pagenumbers are reset anyway.

```
1794          \ifnum\value{pagesLTS.pnc.\pagesLTS@pnc}>1%
1795            \ifpagesLTS@pagecontinue%
1796              \setcounter{pagesLTS.tmpcounter}{\numexpr\value{pagesLTS.pnc.\pagesLTS@pnc}-1\relax}%
1797              \pagesLTS@providecounter{pagesLTS.\pagesLTS@pnc.done}%
1798              \addtocounter{pagesLTS.\pagesLTS@pnc.done}{%
1799                \value{pagesLTS.\pagesLTS@pnc.\arabic{pagesLTS.tmpcounter}.local.count}}%
```

```
1800          \addtocounter{pagesLTS.\pagesLTS@pnc.\arabic{pagesLTS.pnc.\pagesLTS@pnc}.local.count}{%
1801              -\value{pagesLTS.\pagesLTS@pnc.done}}%
1802          \fi%
1803        \fi%
```

A numbered label is written:

```
1804          \pagesLTS@writelabel{\pagesLTS@pnc.\arabic{pagesLTS.pnc.\pagesLTS@pnc}}%
```

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:

```
1805        \if@filesw%
1806          \immediate\write\@auxout{\string
1807            \pagesLTS@providecounter{pagesLTS.\pagesLTS@pnc.\arabic{pagesLTS.pnc.\pagesLTS@pnc}.local.cnt}}%
1808          \edef\pagesLTS@tmpB{\arabic{pagesLTS.\pagesLTS@pnc.\arabic{pagesLTS.pnc.\pagesLTS@pnc}.local.count}}%
1809          \immediate\write\@auxout{\string
1810            \setcounter{pagesLTS.\pagesLTS@pnc.\arabic{pagesLTS.pnc.\pagesLTS@pnc}.local.cnt}{\pagesLTS@tmpB}}%
1811        \fi%
1812      \fi%
```

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

```
1813        \pagesLTS@providecounter{pagesLTS.double.\pagesLTS@pnc}%
1814        \setcounter{pagesLTS.double.\pagesLTS@pnc}{\value{page}}%
```

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

```
1815        \addtocounter{pagesLTS.current.local.\pagesLTS@pnc}{+1}%
1816        \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:

```
1817        \xdef\pagesLTS@pnc{#1}%
```

If option `pagecontinue=false` was chosen, the local page count is reset to 1.

```
1818        \ifpagesLTS@pagecontinue%
1819        \else%
1820          \pagesLTS@providecounter{pagesLTS.current.local.\pagesLTS@pnc}%
1821          \setcounter{pagesLTS.current.local.\pagesLTS@pnc}{1}%
1822        \fi%
```

The new page numbering scheme is now started for real:

```
1823        \OrigPagenumbering{#1}%
```

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

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

```
1824        \expandPagenumbering{#1}%
```

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

```
1825        \pagesLTS@providecounter{pagesLTS.pnc.\pagesLTS@pnc}%
```

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

```
1826        \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):

```
1827        \pagesLTS@providecounter{pagesLTS.double.\pagesLTS@pnc}%
1828        \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.

```
1829        \ifpagesLTS@pagecontinue%
1830          \setcounter{page}{\value{pagesLTS.double.\pagesLTS@pnc}}%
1831        \else%
1832          \setcounter{page}{1}%
1833        \fi%
```

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

```
1834        \pagesLTS@providecounter{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.

```
1835        \ifnum\value{pagesLTS.double.\pagesLTS@pnc}=1%
1836          \setcounter{pagesLTS.current.local.\pagesLTS@pnc}{1}%
1837        \fi%
```

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

```
1838        \else%
1839        \ifx\pagesLTS@pnc\pagesLTS@zero\relax%
1840        \else%
```

`\pagenumbering{...}` has been called more than once before the end of the first page (probably in the preamble). Let us reset the earlier `\pagenumbering`s, which should not have any effect anyway:

```
1841          \PackageNoteNoLine{pageslts}{%
1842            \string\pagenumbering\space used more than once before the end\MessageBreak%
1843            of the first page, maybe in the preamble.\MessageBreak%
1844            Resetting all unused page numbering schemes now}%
1845          \setcounter{pagesLTS.pnc.\pagesLTS@pnc}{0}%
1846          \setcounter{pagesLTS.double.\pagesLTS@pnc}{0}%
1847          \setcounter{pagesLTS.current.local.\pagesLTS@pnc}{0}%
1848        \fi%
```

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

```
1849        \xdef\pagesLTS@pnc{#1}%
```

and the page numbering scheme set by the original page numbering command, which resets the page number to one, but at the first page continuation does not make sense.

```
1850        \OrigPagenumbering{#1}%
```

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.

```
1851        \expandPagenumbering{#1}%
```

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

```
1852        \pagesLTS@providecounter{pagesLTS.pnc.\pagesLTS@pnc}%
1853        \setcounter{pagesLTS.pnc.\pagesLTS@pnc}{1}%
1854        \pagesLTS@providecounter{pagesLTS.double.\pagesLTS@pnc}%
1855        \setcounter{pagesLTS.double.\pagesLTS@pnc}{1}%
1856        \pagesLTS@providecounter{pagesLTS.current.local.\pagesLTS@pnc}%
1857        \setcounter{pagesLTS.current.local.\pagesLTS@pnc}{1}%
1858      \fi%
```

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

```
1859      \gdef\pagesLTS@called{1}%
1860    \fi%
```

We do not need the temporary definitions any more.

```
1861    \let\pagesLTS@tmpA\undefined%
1862    \let\pagesLTS@tmpB\undefined%
1863    }
1864
```

`\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

```
1865 %% analogous to \HyPsd@pageref from the hyperref package:
1866 \def\lastpagereftxt#1{\pagesLTS@@pageref#1*\END}
1867
```

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

```
1868 \def\pagesLTS@@pageref#1*#2\END{%
1869   \ifx\\#2\\% no star
1870     \pagesLTS@@@pageref{#1}%
1871   \else% star
1872     \expandafter\pagesLTS@@@pagerefstar%
1873   \fi%
1874 }
1875
```

```
1876 \def\pagesLTS@@@pageref#1{\lastpagereftext{#1}}
1877 \def\pagesLTS@@@pagerefstar#1{\lastpagereftextstar{#1}}
1878
```

\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.)

```
1879 \newcommand{\lastpagereftext}[1]{%
1880   \def\pagesLTS@tmpA{#1}%
1881   \def\pagesLTS@tmpB{pagesLTS.fnsymbol.local}%
1882   \ifx\pagesLTS@tmpA\pagesLTS@tmpB%
1883     \pagesLTS@providecounter{pagesLTS.fnsymbol.local}%
1884     \IfPackageLoadedTF{hyperref}{%
1885       \href{\#pagesLTS.fnsymbol.local.\arabic{pagesLTS.fnsymbol.local}}%
1886         {\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).

```
1887       }{\arabic{pagesLTS.fnsymbol.local}}%
1888   \else%
```

Same for silly pagenumbering:

```
1889     \def\pagesLTS@tmpB{pagesLTS.silly.local}%
1890     \ifx\pagesLTS@tmpA\pagesLTS@tmpB%
1891       \pagesLTS@providecounter{pagesLTS.silly.local}%
1892       \IfPackageLoadedTF{hyperref}{%
1893         \href{\#pagesLTS.silly.local.\arabic{pagesLTS.silly.local}}%
1894           {\arabic{pagesLTS.silly.local}}%
1895       }{\arabic{pagesLTS.silly.local}}%
```

and for gobble pagenumbering:

```
1896     \else%
1897       \def\pagesLTS@tmpB{pagesLTS.gobble.local}%
1898       \ifx\pagesLTS@tmpA\pagesLTS@tmpB%
1899         \pagesLTS@providecounter{pagesLTS.gobble.local}%
1900         \IfPackageLoadedTF{hyperref}{%
1901           \href{\#pagesLTS.gobble.local.\arabic{pagesLTS.gobble.local}}%
1902             {\arabic{pagesLTS.gobble.local}}%
1903         }{\arabic{pagesLTS.gobble.local}}%
```

Otherwise just the common \pageref is applied:

```
1904       \else%
1905         \pageref{#1}%
1906       \fi%
```

```
1907      \fi%
1908    \fi%
```

We do not need the temporary definitions any more.

```
1909    \let\pagesLTS@tmpA\undefined%
1910    \let\pagesLTS@tmpB\undefined%
1911    }
1912
```

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

```
1913 \newcommand{\lastpagereftextstar}[1]{%
1914    \def\pagesLTS@tmpA{#1}%
1915    \def\pagesLTS@tmpB{pagesLTS.fnsymbol.local}%
1916    \ifx\pagesLTS@tmpA\pagesLTS@tmpB%
1917       \pagesLTS@providecounter{pagesLTS.fnsymbol.local}%
1918       \arabic{pagesLTS.fnsymbol.local}%
1919    \else%
1920     \def\pagesLTS@tmpB{pagesLTS.silly.local}%
1921     \ifx\pagesLTS@tmpA\pagesLTS@tmpB%
1922        \pagesLTS@providecounter{pagesLTS.silly.local}%
1923        \arabic{pagesLTS.silly.local}%
1924     \else%
1925      \def\pagesLTS@tmpB{pagesLTS.gobble.local}%
1926      \ifx\pagesLTS@tmpA\pagesLTS@tmpB%
1927         \pagesLTS@providecounter{pagesLTS.gobble.local}%
1928         \arabic{pagesLTS.gobble.local}%
```

There is no \pageref* without hyperref.

```
1929        \else%
1930         \IfPackageLoadedTF{hyperref}{\pageref*{#1}}{\pageref{#1}}%
1931        \fi%
1932      \fi%
1933    \fi%
1934    \let\pagesLTS@tmpA\undefined%
1935    \let\pagesLTS@tmpB\undefined%
1936    }
1937
```

\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:

```
1938 \newcommand\overrideLTSlabel[2]{%
1939    \@bsphack%
1940    \if@filesw%
1941      \edef\pagesLTS@tmpC{#1}%
1942      \edef\pagesLTS@tmpD{pagesLTS.\pagesLTS@pnc.local}%
1943      \ifx\pagesLTS@tmpC\pagesLTS@tmpD%
```

```
1944         \ifnum\value{pagesLTS.pnc.\pagesLTS@pnc}>1%
1945           \immediate\write\@auxout{\string\undonewlabel{#1}}\@overriddenmessage s{#1}%
1946         \else%
1947           \edef\pagesLTS@tmpD{fnsymbol}%
1948           \ifx\pagesLTS@pnc\pagesLTS@tmpD%
1949             \immediate\write\@auxout{\string\undonewlabel{#1}}\@overriddenmessage s{#1}%
1950           \fi%
1951           \edef\pagesLTS@tmpD{gobble}%
1952           \ifx\pagesLTS@pnc\pagesLTS@tmpD%
1953             \immediate\write\@auxout{\string\undonewlabel{#1}}\@overriddenmessage s{#1}%
1954           \fi%
1955           \edef\pagesLTS@tmpD{silly}%
1956           \ifx\pagesLTS@pnc\pagesLTS@tmpD%
1957             \immediate\write\@auxout{\string\undonewlabel{#1}}\@overriddenmessage s{#1}%
1958           \fi%
1959         \fi%
1960       \fi%
1961       \pagesLTS@putlabel{#1}{#2}{0}%
1962     \fi%
1963     \@esphack%
1964     }
1965
```

\pagesLTS@EveryShipout Because we cannot make references to pages with fnsymbol page "numbers" manually with hyperref, we use \phantomsection s and refer to one of those. But because we do not know how many \phantomsection s and \section* s are introduced by the user (or other packages; cf. LaTeX bug 2298: knowing level of section*, https://www.latex-project.org/cgi-bin/ltxbugs2html?pr=latex/2298&introduction=yes&state=open), we cannot refer to the last one as we did with the pages.

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.

```
1966 \newcommand{\pagesLTS@EveryShipout}{%
1967   \begingroup%
1968     \ifx\pagesLTS@pnc\pagesLTS@fns%
1969       \pagesLTS@providecounter{pagesLTS.fnsymbol.cont}%
1970       \addtocounter{pagesLTS.fnsymbol.cont}{1}%
1971       \IfPackageLoadedT{hyperref}{\phantomsection%
1972         \hypertarget{pagesLTS.fnsymbol.local.\arabic{pagesLTS.fnsymbol.cont}}{}%
1973         }%
1974       \ifnum\pagesLTS@esovFs=\pagesLTS@zero%
1975         \if@filesw\label{pagesLTS.fnsymbol}\fi%
1976         \pagesLTS@putlabel{pagesLTS.fnsymbol.local}{\theCurrentPageLocal}{0}%
1977       \else%
1978         \overridelabel{pagesLTS.fnsymbol}%
```

```
1979        \overrideLTSlabel{pagesLTS.fnsymbol.local}{\theCurrentPageLocal}%
1980      \fi%
1981    \else%
```

Same with `silly` page "numbers":

```
1982      \ifx\pagesLTS@pnc\pagesLTS@silly%
1983        \pagesLTS@providecounter{pagesLTS.silly.cont}%
1984        \addtocounter{pagesLTS.silly.cont}{1}%
1985        \IfPackageLoadedT{hyperref}{\phantomsection%
1986          \hypertarget{pagesLTS.silly.local.\arabic{pagesLTS.silly.cont}}{}%
1987          }%
1988        \ifnum\pagesLTS@esovSy=\pagesLTS@zero%
1989          \if@filesw\label{pagesLTS.silly}\fi%
1990          \pagesLTS@putlabel{pagesLTS.silly.local}{\theCurrentPageLocal}{0}%
1991        \else%
1992          \overridelabel{pagesLTS.silly}%
1993          \overrideLTSlabel{pagesLTS.silly.local}{\theCurrentPageLocal}%
1994        \fi%
1995      \else%
```

and with `gobble` page "numbers":

```
1996          \ifx\pagesLTS@pnc\pagesLTS@gobble%
1997            \pagesLTS@providecounter{pagesLTS.gobble.cont}%
1998            \addtocounter{pagesLTS.gobble.cont}{1}%
1999            \IfPackageLoadedT{hyperref}{\phantomsection%
2000              \hypertarget{pagesLTS.gobble.local.\arabic{pagesLTS.gobble.cont}}{}%
2001              }%
2002            \ifnum\pagesLTS@esovGbl=\pagesLTS@zero%
2003              \if@filesw\label{pagesLTS.gobble}\fi%
2004              \pagesLTS@putlabel{pagesLTS.gobble.local}{\theCurrentPageLocal}{0}%
2005            \else%
2006              \overridelabel{pagesLTS.gobble}%
2007              \overrideLTSlabel{pagesLTS.gobble.local}{\theCurrentPageLocal}%
2008            \fi%
2009          \else%
2010            \IfPackageLoadedT{hyperref}{\phantomsection}%
2011            \if@filesw%
2012              \overridelabel{pagesLTS.\pagesLTS@pnc}%
2013              \overrideLTSlabel{pagesLTS.\pagesLTS@pnc.local}{\theCurrentPageLocal}%
2014    \fi\fi\fi\fi%
2015  \endgroup%
2016  }
2017
```

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

```
2018 \AddToHook{shipout/foreground}{%
2019  \ifnum\value{page}>0%
2020  \else%
2021    \ifnum\value{page}=0%
2022      \PackageWarning{pageslts}{%
2023        Counter 'page' is zero!\MessageBreak%
2024        If the page numbering scheme is not arabic\MessageBreak%
2025        and further not extended\MessageBreak%
2026        (see Page counter overflow in the pageslts\MessageBreak%
2027        documentation), without other measures\MessageBreak%
2028        this will lead to a counter overflow.\MessageBreak%
2029      }%
2030    \else%
2031      \ifnum\value{page}<0%
2032        \PackageWarning{pageslts}{%
2033          Counter 'page' is negative: '\the\value{page}'!\MessageBreak%
2034          If the page numbering scheme is not arabic\MessageBreak%
2035          and further not extended\MessageBreak%
2036          (see Page counter overflow in the pageslts\MessageBreak%
2037          documentation), without other measures\MessageBreak%
2038          this will lead to a counter overflow.\MessageBreak%
2039        }%
2040      \else%
2041        \PackageError{pageslts}{Counter page has no recognized value}{%
2042          Counter 'page' does not have a recognized value:\MessageBreak%
2043          '\the\value{page}'\MessageBreak%
2044          \@ehd\MessageBreak%
2045          }%
2046      \fi%
2047    \fi%
2048  \fi%
```

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

```
2049  \ifnum\value{CurrentPage}=1%
```

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

```
2050    \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 using the begindocument/end hook. 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 (\AddToHook{enddocument/afterlastpage}). 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.

```
2051        \gdef\pncmissing{1}%
```

We save the current value of the page,

```
2052        \setcounter{pagesLTS.tmpcounter}{\value{page}}%
```

determine the current page numbering scheme,

```
2053 %% Code from Andres L\"{o}h, Universiteit Utrecht (NL) %%
2054        \def\extract#1{\expandafter\extract@ #1\END}%
2055        \def\extract@#1\csname @#2\endcsname#3\END{#2}%
2056        \edef\pagesLTS@tmpQ{\extract\thepage}%
2057 %% End of code from Andres L\"{o}h                      %%
```

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

```
2058        \def\pagesLTS@pnc{0}%
```

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

```
2059        \expandafter\pagenumbering\expandafter{\pagesLTS@tmpQ}%
```

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 2024?) Therefore we revert this here and set the page number to its value, which was saved before the \pagenumbering command.

```
2060        \setcounter{page}{\value{pagesLTS.tmpcounter}}%
2061      \fi%
```

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

```
2062        \pagesLTS@writelabel{0}%
2063      \fi%
```

If the current page numbering scheme \pagesLTS@pnc is \pagesLTS@fns (which is defined as fnsymbol), the label is set by \pagesLTS@EveryShipout (see just above), and \pagesLTS@esovFs 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).

```
2064    \ifx\pagesLTS@pnc\pagesLTS@fns%
2065      \pagesLTS@EveryShipout%
2066      \xdef\pagesLTS@esovFs{\arabic{pagesLTS.fnsymbol.cont}}%
2067    \else%
```

Same for silly page "number":

```
2068      \ifx\pagesLTS@pnc\pagesLTS@silly%
2069        \pagesLTS@EveryShipout%
2070        \xdef\pagesLTS@esovSy{\arabic{pagesLTS.silly.cont}}%
2071      \else%
```

and for `gobble` page "number":

```
2072        \ifx\pagesLTS@pnc\pagesLTS@gobble%
2073          \pagesLTS@EveryShipout%
2074          \xdef\pagesLTS@esovGbl{\arabic{pagesLTS.gobble.cont}}}%
```

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

```
2075        \else%
2076          \ifnum\value{pagesLTS.pnc.\pagesLTS@pnc}>1%
2077            \pagesLTS@EveryShipout%
2078  \fi\fi\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).

```
2079  \addtocounter{CurrentPage}{1}%
2080  \addtocounter{pagesLTS.current.local.\pagesLTS@pnc}{1}%
2081  }
2082
```

We use some code from the lastpage package:

\protected@iwrite We need an \immediate\protected@write. Just \immediate\write had led to errors, for example when packages like babel-greek re-defined \roman.

```
2083 %% Code provided by Prof. Enrico Gregorio at https://tex.stackexchange.com/a/542425
2084 \long\def\protected@iwrite#1#2#3{%
2085   \begingroup%
2086   #2%
2087   \let\protect\@unexpandable@protect%
2088   \edef\reserved@a{\immediate\write#1{#3}}%
2089   \reserved@a%
2090   \endgroup%
2091   \if@nobreak\ifvmode\nobreak\fi\fi%
2092 }
2093
```

\pagesLTS@makeHy Just once we need the page from \@currentHpage without any "page." (\pagesLTS@makeHy is identical to \lastpage@makeHy except of the used namings – well, being identical depends on the versions of the packages):

```
2094 \newcommand{\pagesLTS@makeHy}{%
```

\gdef\pagesLTS@Hy{}, but that was already done before this command.

```
2095   \xdef\pagesLTS@Hptest{Doc-Start}%
2096   \ifx\pagesLTS@Hptest\@currentHpage\relax%
2097     \gdef\pagesLTS@Hy{\@currentHpage}%
2098   \else%
2099     \edef\pagesLTS@Hptest{\@currentHpage}%
2100     \ifx\pagesLTS@Hptest\empty\relax%
```

then \gdef\pagesLTS@Hy{}, but that was already done before this command.

```
2101    \else%
2102      \edef\pagesLTS@Hptest{page.}%
2103      \ifx\@currentHpage\pagesLTS@Hptest\relax%
2104        \ifx\pagesLTS@pnc\pagesLTS@gobble%
2105          \PackageNoteNoLine{pageslts}{%
2106            With gobbled page numbers "\string\@currentHpage "\MessageBreak%
2107            is just "page." without number.\MessageBreak%
2108            "\string\pagesLTSlastpageHy " is now let empty}%
2109        \else%
2110          \PackageWarningNoLine{pageslts}{%
2111            \string\@currentHpage\space is just "page." without number.\MessageBreak%
2112            \string\pagesLTSlastpageHy\space is now let empty}%
2113        \fi%
```

then in both cases \gdef\pagesLTS@Hy{}, but that was already done before this command.

```
2114      \else%
```

\@currentHpage should be page.<some number>, \pagesLTS@rmpage removes the "page.".
Next compilation run, \pagesLTSlastpageHy gets defined via the aux file. If we arrived at this place, but the definition is still empty, then \@currentHpage has some unexpected content.

```
2115        \gdef\pagesLTS@Hy{\pagesLTS@rmpage{\@currentHpage}}%
2116        \ifx\pagesLTSlastpageHy\empty\relax%
2117          \PackageWarningNoLine{pageslts}{%
2118            \string\@currentHpage\space is\MessageBreak%
2119            \meaning\@currentHpage\MessageBreak%
2120            not beginning with "page.",\MessageBreak%
2121            \string\pagesLTSlastpageHy\space is now let empty}%
2122    \fi\fi\fi\fi%
2123    }%
2124
```

\pagesLTS@rmpage \pagesLTS@rmpage removes the "page.".

```
2125 %% Code provided by David Carlisle at https://tex.stackexchange.com/a/721877
2126 \def\pagesLTS@rmpage#1{%
2127   \expandafter\xpagesLTS@rmpage\expanded{#1}\xpagesLTS@rmpage page.%
2128   \xpagesLTS@rmpage\xxpagesLTS@rmpage{#1}}
2129 \def\xpagesLTS@rmpage #1page.#2\xpagesLTS@rmpage#3\xxpagesLTS@rmpage#4{%
2130   \if$\detokenize{#1}$#2%\else#4
2131   \fi}
2132
```

\else#4 means, that it did not start with page., and whatever it is, we cannot use this #4 for \pagesLTS@Hy.

\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.

```
2133 \newcommand{\pagesLTS@putlabel}[3]{%
2134   \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.

```
2135   \IfPackageLoadedT{showkeys}{%
2136     \IfPackageLoadedWithOptionsF{showkeys}{final}{%
2137       \ifnum\value{pagesLTS.pagenr}<1%
2138         \PackageWarningNoLine{pageslts}{%
2139           Package showkeys without option final loaded,\MessageBreak%
2140           but label #1 on page \thepage\space(about \theCurrentPage)\MessageBreak%
2141           cannot be shown, because pageslts does not use \string\label,\MessageBreak%
2142           but writes directly to the \jobname.aux file}%
2143       \else%
2144         \PackageWarningNoLine{pageslts}{%
2145           Package showkeys without option final loaded,\MessageBreak%
2146           but label #1 on page \thepage\space(about \theCurrentPage\space of \arabic{pagesLTS.pagenr})\MessageBreak%
2147           cannot be shown, because pageslts does not use \string\label,\MessageBreak%
2148           but writes directly to the \jobname.aux file}%
2149       \fi%
2150     }%
2151   }%
2152   \IfPackageLoadedTF{hyperref}{%
```

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 (\protected@iwrite).

```
2153     \ifHy@pageanchor\else%
```

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

```
2154       \PackageWarningNoLine{pagesLTS}{%
2155         The \string\lastpageref{#1} link does not work\MessageBreak%
2156         using hyperref with disabled option 'pageanchor'.\MessageBreak%
2157         Better enable 'pageanchor' or use\MessageBreak%
2158         \string\lastpageref*{...} (not generating a link)%
2159       }%
2160     \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.

```
2161      \if@filesw%
2162        \begingroup%
2163          \protected@iwrite\@auxout{}{\string\newlabel{#1}{%
2164            {\@currentlabel}{#2}{\@currentlabelname}%
2165            {\ifx\pagesLTS@pnc\pagesLTS@fns%
2166              \@currentHref%
2167             \else\ifx\pagesLTS@pnc\pagesLTS@silly%
2168                \@currentHref%
2169                \else\ifx\pagesLTS@pnc\pagesLTS@gobble%
2170                  \@currentHref%
2171                  \else\ifHy@pageanchor\@currentHpage\fi%
2172              \fi\fi\fi%
2173            }%
2174            {\@kernel@reserved@label@data}}}%
2175        \endgroup%
2176      \fi%
2177    }{%
```

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

```
2178      \if@filesw%
2179        \ifnum\value{pagesLTS.pnc.\pagesLTS@pnc}<2%
2180            \protected@iwrite\@auxout{}{\string\newlabel{#1}{%
2181              {\@currentlabel}{#2}{\@currentlabelname}%
2182              {\@currentHref}{\@kernel@reserved@label@data}}%
2183            }%
2184        \else%
2185          \edef\pagesLTS@tmpC{#1}%
2186          \edef\pagesLTS@tmpD{pagesLTS.\pagesLTS@pnc.local}%
2187          \ifx\pagesLTS@tmpC\pagesLTS@tmpD%
2188            \edef\pagesLTS@tmpC{#3}%
2189            \ifx\pagesLTS@tmpC\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.

```
2190              \immediate\write\@auxout{\string\undonewlabel{#1}}%
2191            \fi%
2192          \fi%
2193          \protected@iwrite\@auxout{}{\string\newlabel{#1}{%
2194            {\@currentlabel}{#2}{\@currentlabelname}%
2195            {\@currentHref}{\@kernel@reserved@label@data}}%
2196          }%
2197        \fi%
2198      \fi%
```

```
2199    }%
```

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

```
2200    \addtocounter{page}{+1}%
2201    }
2202
```

\pagesLTS@putlabels   \pagesLTS@putlabels writes labels and calls \pagesLTS@putlabel{LastPages}{\theCurrentPage}{1}.

```
2203 \newcommand{\pagesLTS@putlabels}{%
2204    \IfFormatAtLeastF{2025-06-01}{\addtocounter{page}{-1}}%
2205    \addtocounter{CurrentPage}{-1}%
2206    \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.

```
2207    \ifx\pagesLTS@pnc\pagesLTS@zero%
2208      \PackageWarningNoLine{pagesLTS}{No page numbering scheme found:\MessageBreak%
2209        \pagesLTS@messageNPN}%
```

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

```
2210    \else%
2211      \pagesLTS@writelabel{\pagesLTS@pnc.\arabic{pagesLTS.pnc.\pagesLTS@pnc}}%
2212      \ifnum\value{pagesLTS.pnc.\pagesLTS@pnc}<2%
2213        \ifx\pagesLTS@pnc\pagesLTS@fns%
2214        \else\ifx\pagesLTS@pnc\pagesLTS@silly%
2215          \else\ifx\pagesLTS@pnc\pagesLTS@gobble%
2216            \else\pagesLTS@writelabel{\pagesLTS@pnc}%
2217    \fi\fi\fi\fi\fi%
```

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

```
2218    \IfFormatAtLeastF{2025-06-01}{\addtocounter{page}{+1}}%
2219    \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 these two lines cancel each other and therefore they just can be skipped. But the other counters have to be increased again:

```
2220    \addtocounter{CurrentPage}{+1}%
2221    \addtocounter{pagesLTS.current.local.\pagesLTS@pnc}{+1}%
2222    }
2223
```

```
2224 \AddToHook{begindocument/end}{%
```

Checking, whether lastpage and pageslts have both been loaded.

```
2225   \IfPackageLoadedT{lastpage}{%
2226     \PackageNoteNoLine{pageslts}{Packages lastpage and pageslts used:\MessageBreak%
2227       Are you sure that you want to load both packages?}%
2228     }%
```

It is checked whether the hyperref package, if loaded, is recent enough:

```
2229   \IfPackageLoadedTF{hyperref}{%
2230     \ProvideTextCommand{\textasteriskcentered}{PD1}{*}%
2231     \IfPackageAtLeastF{hyperref}{2024-11-05}{%
2232       \PackageError{pageslts}{hyperref package version too old}{%
2233         Required version: 2024-11-05 v7.01l or newer,\MessageBreak%
2234         found version:\space\space\space\space\csname ver@hyperref.sty\endcsname.}}%
2235   }{\PackageNoteNoLine{pageslts}{Package hyperref not loaded.\MessageBreak%
2236       pageslts would support hyperref.\MessageBreak%
2237       The page references will NOT be hyperlinked}%
2238     }%
```

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

```
2239   \IfPackageLoadedT{alphalph}{%
2240     \newalphalph{\AlphMult}[mult]{\@Alph}{26}%
2241     \newalphalph{\alphMult}[mult]{\@alph}{26}%
2242     \newalphalph{\fnsymbolmult}[mult]{\@fnsymbol}{5}%
2243     }%
```

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.

```
2244   \if@filesw%
2245   \else%
2246     \IfPackageLoadedTF{tikz}{%
2247       \PackageWarning{pageslts}%
2248         {It was not allowed to write to an\MessageBreak%
2249          .aux file. This package does not work without access\MessageBreak%
2250          to an .aux file.\MessageBreak%
2251          It is OK if the .aux file was already updated\MessageBreak%
2252          by a previous compiler run\MessageBreak%
2253          and would not have changed anyway.\MessageBreak%
2254         }%
2255     }{\PackageError{pageslts}{No writing to auxiliary file allowed}%
2256         {It was not allowed to write to an .aux file.\MessageBreak%
2257          This package does not work without access to an .aux file.\MessageBreak%
```

```
2258            Press Ctrl+Z to exit.\MessageBreak%
2259            But it is OK if the .aux file was already updated\MessageBreak%
2260            by previous compiler runs\MessageBreak%
2261            and would not have changed anyway.\MessageBreak%
2262            (In that case just press Enter or Return\MessageBreak%
2263            to continue the compilation.)\MessageBreak%
2264          }%
2265        }%
2266    \fi%
2267    }
2268
```

We do check whether showkeys has been loaded (<u>before</u> pageslts!) in a mode to show the labels:

```
2269 \def\pagesLTS@skld{0}
2270 \IfPackageLoadedT{showkeys}{\IfPackageLoadedWithOptionsF{showkeys}{final}{%
2271    \def\pagesLTS@skld{1}}%
2272    }%
2273
```

\AddToHook{enddocument/afterlastpage} it is checked whether the showkeys package was loaded after the check performed before, in which case an error message is issued.

```
2274 \AddToHook{enddocument/afterlastpage}{%
2275    \IfPackageLoadedT{showkeys}{\IfPackageLoadedWithOptionsF{showkeys}{final}{%
2276      \ifx\pagesLTS@skld\pagesLTS@one\relax%
2277      \else\PackageError{pageslts}{Package showkeys loaded after pageslts}{%
2278        The showkeys package with option "final" has been loaded\MessageBreak%
2279        after the pageslts package.\MessageBreak%
2280        Please first load showkeys and then pageslts}%
2281      \fi}%
2282    }%
```

We also give the error message about the missing (i.e. not found) page numbering scheme, which could not be given in hook shipout/foreground.

```
2283    \ifx\pncmissing\pagesLTS@one\relax%
2284      \PackageError{pageslts}{pagenumbering scheme missing}{\pagesLTS@messageNPN}%
2285    \fi%
```

Then we put in an info to show, in what order things (which were called) are done.

```
2286    \PackageInfo{pageslts}{enddocument/afterlastpage (AED): pageslts setting LastPage}%
```

After this we remember the page number (if fnsymbol or silly or gobble), and after that we place the LastPage label.

```
2287    \ifx\pagesLTS@pnc\pagesLTS@fns%
2288      \def\pagesLTS@tmpA{\arabic{pagesLTS.fnsymbol.local}}%
2289      \ifnum\pagesLTS@esoFs=\pagesLTS@tmpA%
2290        \gdef\pagesLTS@rerun{0}%
2291      \else%
```

```
2292        \gdef\pagesLTS@rerun{1}%
2293      \fi%
2294      \if@filesw%
2295        \immediate\write\@auxout{\string\gdef\string\pagesLTS@esoFs{\pagesLTS@tmpA}}%
2296      \fi%
2297    \else%
2298      \ifx\pagesLTS@pnc\pagesLTS@silly%
2299        \def\pagesLTS@tmpA{\arabic{pagesLTS.silly.local}}%
2300        \ifnum\pagesLTS@esoSy=\pagesLTS@tmpA%
2301          \gdef\pagesLTS@rerun{0}%
2302        \else%
2303          \gdef\pagesLTS@rerun{1}%
2304        \fi%
2305        \if@filesw%
2306          \immediate\write\@auxout{\string\gdef\string\pagesLTS@esoSy{\pagesLTS@tmpA}}%
2307        \fi%
2308      \else%
2309        \ifx\pagesLTS@pnc\pagesLTS@gobble%
2310          \def\pagesLTS@tmpA{\arabic{pagesLTS.gobble.local}}%
2311          \ifnum\pagesLTS@esoGbl=\pagesLTS@tmpA%
2312            \gdef\pagesLTS@rerun{0}%
2313          \else%
2314            \gdef\pagesLTS@rerun{1}%
2315          \fi%
2316          \if@filesw%
2317            \immediate\write\@auxout{\string\gdef\string\pagesLTS@esoGbl{\pagesLTS@tmpA}}%
2318    \fi\fi\fi\fi%
2319    \IfFormatAtLeastT{2025-06-01}{\addtocounter{page}{+1}}%
2320    \pagesLTS@putlabel{LastPage}{\thepage}{1}%
2321    \IfFormatAtLeastT{2025-06-01}{\addtocounter{page}{-1}}%
```

We do not need the temporary definition any more.

```
2322    \let\pagesLTS@tmpA\undefined%
```

The number of pages with the `fnsymbol` page numbering scheme, `\pagesLTS@esovFs`, and the number of pages with the `silly` page numbering scheme, `\pagesLTS@esovSy`, and the number of pages with the `gobble` page numbering scheme, `\pagesLTS@esovGbl`, are saved via the `.aux` file (if it is not zero, respectively):

```
2323    \if@filesw%
2324      \ifx\pagesLTS@esovFs\pagesLTS@zero\relax%
2325      \else%
2326        \immediate\write\@auxout{\string\pagesLTS@providecounter{pagesLTS.fnsymbol.local}}%
2327        \immediate\write\@auxout{\string\setcounter{pagesLTS.fnsymbol.local}{\pagesLTS@esovFs}}%
2328      \fi%
2329      \ifx\pagesLTS@esovSy\pagesLTS@zero\relax%
2330      \else%
2331        \immediate\write\@auxout{\string\pagesLTS@providecounter{pagesLTS.silly.local}}%
```

```
2332        \immediate\write\@auxout{\string\setcounter{pagesLTS.silly.local}{\pagesLTS@esovSy}}%
2333      \fi%
2334      \ifx\pagesLTS@esovGbl\pagesLTS@zero\relax%
2335      \else%
2336        \immediate\write\@auxout{\string\pagesLTS@providecounter{pagesLTS.gobble.local}}%
2337        \immediate\write\@auxout{\string\setcounter{pagesLTS.gobble.local}{\pagesLTS@esovGbl}}%
2338      \fi%
2339    \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:

```
2340    \pagesLTS@providecounter{pagesLTS.\pagesLTS@pnc.\arabic{pagesLTS.pnc.\pagesLTS@pnc}.local.count}%
2341    \setcounter{pagesLTS.\pagesLTS@pnc.\arabic{pagesLTS.pnc.\pagesLTS@pnc}.local.count}{%
2342      \value{pagesLTS.current.local.\pagesLTS@pnc}}%
```

And we are one page after the last one (hook `enddocument/afterlastpage`!), so we go back one page.

```
2343    \addtocounter{pagesLTS.\pagesLTS@pnc.\arabic{pagesLTS.pnc.\pagesLTS@pnc}.local.count}{-1}%
2344    \ifnum\value{pagesLTS.pnc.\pagesLTS@pnc}>1%
2345      \setcounter{pagesLTS.tmpcounter}{\value{pagesLTS.pnc.\pagesLTS@pnc}}%
2346      \@tempcnta=\value{pagesLTS.tmpcounter}\relax%
2347      \loop%
2348        \ifnum\@tempcnta>1\relax%
2349          \addtocounter{pagesLTS.tmpcounter}{-1}%
2350          \addtocounter{pagesLTS.\pagesLTS@pnc.\arabic{pagesLTS.pnc.\pagesLTS@pnc}.local.count}{%
2351            -\value{pagesLTS.\pagesLTS@pnc.\arabic{pagesLTS.tmpcounter}.local.count}}%
2352          \@tempcnta=\value{pagesLTS.tmpcounter}\relax%
2353      \repeat%
2354    \fi%
2355    \if@filesw%
2356      \immediate\write\@auxout{\string
2357        \pagesLTS@providecounter{pagesLTS.\pagesLTS@pnc.\arabic{pagesLTS.pnc.\pagesLTS@pnc}.local.cnt}}%
2358      \edef\pagesLTS@tmpA{\arabic{pagesLTS.\pagesLTS@pnc.\arabic{pagesLTS.pnc.\pagesLTS@pnc}.local.count}}%
2359      \immediate\write\@auxout{\string
2360        \setcounter{pagesLTS.\pagesLTS@pnc.\arabic{pagesLTS.pnc.\pagesLTS@pnc}.local.cnt}{\pagesLTS@tmpA}}%
2361    \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.

```
2362    \IfFormatAtLeastF{2025-06-01}{\addtocounter{page}{-1}}%
2363    \def\pagesLTS@tmpA{\thepage}%
2364    \if@filesw%
2365      \protected@iwrite\@auxout{}{\string\gdef\string\pagesLTSlastpage{\pagesLTS@tmpA}}%
2366      \gdef\pagesLTS@Hy{}%
2367      \IfPackageLoadedT{hyperref}{\ifHy@pageanchor\pagesLTS@makeHy\fi}%
2368      \protected@iwrite\@auxout{}{\string\gdef\string\pagesLTSlastpageHy{\pagesLTS@Hy}}%
2369    \fi%
```

```
2370    \IfFormatAtLeastF{2025-06-01}{\addtocounter{page}{-1}}%
2371    \addtocounter{CurrentPage}{-1}%
2372    \edef\pagesLTS@tmpB{\arabic{CurrentPage}}%
2373    \if@filesw%
2374      \immediate\write\@auxout{\string\setcounter{pagesLTS.pagenr}{\pagesLTS@tmpB}}%
2375    \fi%
2376    \addtocounter{CurrentPage}{+1}%
```

The `VeryLastPage` label is set here. Before the introduction of the hook mechanism in the kernel, `\lastpageref{VeryLastPage}` could point to a later page then `\lastpageref{LastPage}`. `LastPage` and `VeryLastPage` should now be identical, but for backward compatibility we keep both.

```
2377    \PackageInfo{pageslts}{enddocument/afterlastpage (AED): pageslts setting VeryLastPage}%
2378    \IfFormatAtLeastT{2025-06-01}{\addtocounter{page}{+1}}%
2379    \pagesLTS@putlabel{VeryLastPage}{\thepage}{1}%
2380    \IfFormatAtLeastT{2025-06-01}{\addtocounter{page}{-1}}%
```

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

```
2381    \PackageInfo{pageslts}{enddocument/afterlastpage (AED): pageslts setting LastPages}%
2382    \pagesLTS@putlabels%
2383    \ifodd\pagesLTS@tmpB%
2384      \PackageNoteNoLine{pageslts}{Total number of pages is odd}%
2385    \else%
2386      \PackageNoteNoLine{pageslts}{Total number of pages is even}%
2387    \fi%
2388    }
2389
```

\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. With the hook mechanism it does not matter whether the command to be patched is defined.

```
2390 \AddToHook{cmd/frontmatter/before}{%
2391    \xdef\pagesLTS@FMBpncn{\pagesLTS@pnc}%
2392    \xdef\pagesLTS@FMBpncp{\arabic{pagesLTS.current.local.\pagesLTS@pnc}}%
2393    }
2394
```

At the beginning of the \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.
At the end of the \frontmatter the named checks are performed and in case of the named problem an error message is given.

```
2395 \AddToHook{cmd/frontmatter/after}{%
2396   \xdef\pagesLTS@FMEpncn{\pagesLTS@pnc}%
2397   \ifx\pagesLTS@FMBpncn\pagesLTS@FMEpncn%
2398   \else%
2399     \ifx\pagesLTS@FMBpncn\pagesLTS@zero%
2400     \else%
2401       \ifx\pagesLTS@FMBpncp\pagesLTS@one%
2402         \PackageWarning{pageslts}{\string\pagenumbering\space before \string\frontmatter:\MessageBreak%
2403           Do not use \string\pagenumbering{\pagesLTS@FMBpncn} before \string\frontmatter\MessageBreak%
2404           on the same page!\MessageBreak%
2405           \string\frontmatter\space (re)defines the page numbering scheme to \pagesLTS@FMEpncn ,\MessageBreak%
2406           thus earlier use of \string\pagenumbering{\pagesLTS@FMBpncn} %
2407           on the same page is useless anyway\MessageBreak}%
2408       \fi%
2409     \fi%
2410   \fi%
2411   }
2412
```

The hook `enddocument/info` is even later:

> "This hook is meant to receive code that write final information messages to the terminal. It follows immediately after the previous hook"

(Frank Mittelbach (2024-11-25): LaTeX's hook management, lthooks-code.pdf, p. 28) `enddocument/afteraux`. 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 <u>third</u> run is necessary and indicated by the warning message below.

```
2413 \AddToHook{enddocument/info}{%
2414   \ifx\pagesLTS@rerun\pagesLTS@one%
2415     \PackageWarningNoLine{pageslts}{Label(s) may have changed.\MessageBreak%
2416       Rerun to get cross-references right}%
2417   \fi%
2418   }
2419
2420 ⟨/package⟩
```

7 Installation

7.1 Downloads

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

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

- TEXFormat LaTeX 2_ε 2024-11-01: https://CTAN.org

- document class ltxdoc, 2024/02/08, v2.1j, https://ctan.org/pkg/ltxdoc

- package holtxdoc, 2019/12/09, v0.30, https://ctan.org/pkg/holtxdoc

- package hypdoc, 2023-10-26, v1.19, https://ctan.org/pkg/hypdoc

- package geometry, 2020/01/02, v5.9, https://ctan.org/pkg/geometry

- package ulem, 2019-11-18, no version number given, https://ctan.org/pkg/ulem

pageslts.sty The `pageslts.sty` for LaTeX $2_\varepsilon \geq$ 2024-11-01 (i.e. all documents using the pageslts package) requires:

- TEX Format LaTeX 2_ε 2024-11-01, https://CTAN.org

- package undolabl, 2024-12-05, v1.0n, https://ctan.org/pkg/undolabl

- if any of the options `alphMult`, `AlphMulti`, or `fnsymbolmult` is used: package alphalph, 2019/12/09, v2.6, https://ctan.org/pkg/alphalph

- if \pagenumbering{silly} shall be used, the sillypage package must be loaded, 2024-07-23, v1.7, https://www.ctan.org/pkg/sillypage

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

- class article, 2025/01/22, v1.4n, from classes.dtx: https://ctan.org/pkg/classes

- package alphalph, 2019/12/09, v2.6, https://ctan.org/pkg/alphalph

- package lipsum, 2021-09-20, v2.7, https://ctan.org/pkg/lipsum

- package showkeys, 2024/05/23, v3.21, https://ctan.org/pkg/showkeys

- package hyperref, 2025-05-20, v7.01m, https://ctan.org/pkg/hyperref

- package pageslts, 2025-06-05, v2.0e, https://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?)

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

7.2 Package, unpacking TDS

Package.   This package is available on https://CTAN.org.

https://mirror.ctan.org/macros/latex/contrib/pageslts/pageslts.dtx
  The source file.

https://mirror.ctan.org/macros/latex/contrib/pageslts/pageslts.pdf
  The documentation.

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

https://mirror.ctan.org/macros/latex/contrib/pageslts/README
  The README file.

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

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

which additionally contains
pageslts.ins	The `ins`tallation file.
pageslts.drv	The `driver` to generate the documentation.
pageslts.sty	The `sty`le file.
pageslts-example.tex	The example file.

For required other packages please 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 (TeX Live, MiKTeX, ...) relies on file name databases, you must refresh these. For example, TeX Live 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 a 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

9 History

[1994/06/17, lastpage]

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

[1994/06/25, lastpage]

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

[1994/07/20, lastpage]

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

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

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

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

- lastpage v1.1: Proposed `LastPages` label by H.-Martin Münch on `news:comp.text.tex`, see e. g. https://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`
  https://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.

- Several typing mistakes have been corrected - both in the `sty`le 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.

[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 a packaging error.)

- Corrected Message format in pagesLTS.`ins`.

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

- Added the `\@ifclassloaded{revtex4}` code for `\lastpage@putlabel` (changed to `\pagesLTS@putlabelhyper`) from the hyperref package **as comment**.

- In the documentation added the explanation of the occurrence of multiply definitions of the `LastPage` label with lastpage, pagesLTS, hyperref package (in that order).

- Updated to (then) new version of undolabl package [2010/07/15] v1.0d, which uses `\undonewlabel` with only one instead of two arguments.

- Added a warning message, if hyperref *and* pdfpages were *both* used.

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

- Removed lastpage209.sty, because it is now contained in the lastpage.`dtx` file, v ≥ 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].

- Version handling for undolabl package updated.

- Included a `\CheckSum`.

[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.

[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.

[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.

[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/....

[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 option `alphMult` is now set to `ab` by default.

- The option `AlphMulti` is now set to `AB` by default.

[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://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}` 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 https://tex.stackexchange.com/q/95541/6865, thanks to Michał Herman!) Fixed. [Later in the kernel *all* labels got defined to have five arguments.]

- 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 <u>after</u> `\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.)

[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 pageslts works with earlier versions of LaTeX.

- 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.

[2024-11-20 v2.0a]

- Kernel-updates broke the package, the package was repaired and updated to the new kernel-code; ports from lastpage.

- Removed `\unit`.

- Removed `\XXRoman` (deprecated at least since 2015).

- Removed code from/need for packages prelim2e, ltxcmds, atveryend, etoolbox, everyshi, letltxmacro, and rerunfilecheck.

- Removed checks for available ε-TeX, endfloats package from 1992, pagesLTS package from 2011, hyperref from 2015 etc.

- Renamed `\pagesLTS@ifcounter` to `\pagesLTS@providecounter`.

- Renamed `\pagesLTS.lastpage` to `\pagesLTSlastpage`.

[2024-12-07 v2.0b]

- Bug fix: `pagecontinue=false` did not reset everything always fully correct.

- Instead of requiring the kvoptions package, kernel commands are used.

- Now compatible with the romanbarpagenumber package, even independent of loading order.

- When more than one `\pagenumbering` command is given before the end of the first page (maybe in the preamble), all but the last `\pagenumbering` are ignored (as also LaTeX would naturally do).

- The saved `\OrigPagenumbering` is used in both places now instead of the plain definition from the kernel, so any change before the pageslts package is taken into account.

- Changed the section 4: Alternatives, mirroring the one from the current lastpage package.

- For cases when `\@currentHpage` is just `page.`, the warning text has been corrected.

- Page numbering scheme `silly` (from sillypage package) now works.

- Page numbering scheme `gobble` now works. (Is that silly?!)

- Added `\ProvideTextCommand{\textasteriskcentered}{PD1}{*}`.

- Missing `\if@filesw` `\fi` added.

- Recent undolabl package ($\geq$ 2024-12-05 v1.0n) required!

[2024-12-23 v2.0c]

- Bug fix: Error handling for missing `\pagenumbering` now needs two `\expandafter`s.

[2025-01-10 2.0d]

- Bug fix: One `\Roman@bar{page}` must be `\Roman@bar{\Roman{page}}`.

- Several typing mistakes have been corrected, used format and package versions have been updated.

[2025-06-05 v2.0e]

- Since LaTeX-format 2025-06-01 after shipping the last page all further `\write`s are made `\immediate`, requiring some adjusted `\addtocounter{page}{-1}` and `\addtocounter{page}{+1}` here.

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.)

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.