

# Section name references in L<sup>A</sup>T<sub>E</sub>X\*

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<https://github.com/latex3/hyperref/issues>

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## Documentation overview for hyperref

The documentation for package `hyperref` consists of several files:

[Manual](#) The **USER MANUAL** (also available as HTML).

[ChangeLog](#) This file records the version history.

[Bookmark talk, slides](#) Slides for the talk “PDF information and navigation elements with hyperref, pdfTeX and thumbpdf” at EuroT<sub>E</sub>X 1999.

[Bookmark talk, paper](#) The paper version of the talk.

Source code documentation:

[hyperref.dtx](#) This is the source code documentation for hyperref.

[backref.dtx](#) “Back referencing from bibliographical citations”

 [nameref.dtx](#) “Section name references in L<sup>A</sup>T<sub>E</sub>X” (this file)

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## 1 Introduction

Cross-referencing to include the *name* of the section, rather than just the number or page. This works by redefining some of the inside L<sup>A</sup>T<sub>E</sub>X macros, so it is vulnerable to future changes.

## 2 History

Sebastian Rahtz, for Lou Burnard, March 15th 1994;  
 SPQR CERN July 1994;  
 Last mod. Sept. 3th MG;  
 Sept. 19th SPQR;  
 April 11th 1995 SPQR (added section formatting hook);  
 April 14th 1995 SPQR (compatibility with hyperref);  
 June 22 1995 SPQR (removed typeout from Sectionformat);  
 September 22 1997 added varioref hacks by Corey Minyard;  
 September 28th changes by David Carlisle.  
 More recent changes are recorded in ChangeLog.

The versions before 2009/11/27 v2.32 did not expand the title strings (of `\section`, `\caption`, ...). Then the behaviour switched to expanding, because this allows to remove unwanted macros (`\label`, ...). Despite this method is used in package `titleref` and class `memoir`, the first feedbacks let me conclude that this is not robust enough. Therefore I wrote package `getttitlestring` that uses the non-expanding method as default. It also allows me to use this package in package `zref-titleref`. See the package documentation of package `getttitlestring` how to change the method. It also provides a hook to remove additional unwanted macros, not supported by the package. Example:

```
\usepackage{getttitlestring}
\GetTitleStringDisableCommands{%
  \let\mylabel\@gobble
  \renewcommand\myindex[2]{}%
}
```

## 3 Implementation

```
1 (*package)
2 \RequirePackage{refcount}[2006/02/12]
3 \RequirePackage{getttitlestring}[2009/12/18]
4 \RequirePackage{ltxcmds}[2009/12/12]
```

We redefine `\label` so that it also writes the name of the current section to the `.aux` file; if the name ends in a dot, we zap it. To allow for the `hyperref` package, also write fourth and fifth fields (empty by default; used for cross-ref name, and file).

```
\NR@strip@period
5 \def\NR@strip@period#1.\ltx@empty#2\@nil{#1}
```

`\strip@period` Macro `\strip@period` was removed in `nameref` 2012/07/28 v2.41 and reinserted in 2012/07/31 v2.42 for compatibility reasons with package `subfig`.

```

6 \def\strip@period#1.\relax#2\@@@{#1}

7 \def\NR@sanitize@labelname{%
8   \@onelevel@sanitize\@currentlabelname
9   \edef\@currentlabelname{%
10     \expandafter\NR@strip@period\@currentlabelname
11     \ltx@empty.\ltx@empty\@nil
12   }%
13 }

```

### 3.1 `\label` stuff

Here is tested, whether package `showkeys` is loaded. But if option `final` is used, the macros of `showkeys` are not defined, so we have to check an additional test.

```

\ifNR@showkeys
14 \newif\ifNR@showkeys
15 \NR@showkeysfalse
16 \@ifpackageloaded{showkeys}{%
17   \begingroup
18     \@ifundefined{SK@@label}{%
19       }{%
20         \global\NR@showkeystrue
21       }%
22   \endgroup
23 }{}

\label@hook
24 \providecommand*\label@hook{}
25 \ltx@GlobalAppendToMacro{\label@hook}{%
26   \NR@sanitize@labelname
27 }

\label
28 \def\label#1{%
29   \@bsphack
30   \begingroup
31     \def\label@name{#1}%
32     \label@hook
33     \protected@write\@auxout{}{%
34       \string\newlabel{#1}{%
35         {\@currentlabel}%
36         {\thepage}%
37         {\@currentlabelname}%
38         {\@currentHref}}}%
39     }%
40   }%
41   \endgroup
42   \@esphack
43 }%
44 \ifNR@showkeys

```

```

45 \def\label#1{%
46   \@bsphack
47   \SK@\SK@@label{#1}%
48   \begingroup
49     \def\label@name{#1}%
50     \label@hook
51     \protected@write\@auxout{}\{%
52       \string\newlabel{#1}{\%
53         {\@currentlabel}%
54         {\thepage}%
55         {\@currentlabelname}%
56         {\@currentHref}{}}%
57     }%
58   }%
59 \endgroup
60 \@esphack
61 }%
62 \fi

\ltx@label

63 \let\ltx@label\label

Needed for the subeqnarray package.

\slabel

64 \@ifundefined{slabel}{}{%
65   \def\slabel#1{%
66     \@bsphack
67     \if@filesw
68       \begingroup
69         \def\label@name{#1}%
70         \label@hook
71         \let\thepage\relax
72         \def\protect{\noexpand\noexpand\noexpand}%
73         \edef\@tempa{%
74           \write\@auxout{%
75             \string\newlabel{#1}{\%
76               {\thesubequation}%
77               {\thepage}%
78               {\@currentlabelname}%
79               {\@currentHref}{}}%
80           }%
81         }%
82       }%
83     \expandafter\endgroup
84     \@tempa
85     \if@nobreak\ifvmode\nobreak\fi\fi
86   \fi
87   \@esphack
88 }%
89 }

```

Overload an AMS L<sup>A</sup>T<sub>E</sub>X command, which uses `\newlabel`. Sigh!

`\@writetocindents@`

```

90 \def\@writetocindentsof{%
91   \begingroup
92   \@for\@tempa:=-1,0,1,2,3\do{%
93     \immediate\write\@auxout{%
94       \string\newlabel{tocindent\@tempa}{%
95         \csname r@tocindent\@tempa\endcsname}{\}\{\}\}%
96     }%
97   }%
98 }%
99 \endgroup
100 }

```

### 3.2 Changes of section macros

Add to the underlying section heading macros so that they note the section name for use by label.

If a section heading or the like has a `\label` in it, we need to extract it, or subsequent processing breaks.

`\NR@getttitle`

```

101 \def\NR@getttitle#1{%
102   \GetTitleString{#1}%
103   \let\@currentlabelname\GetTitleStringResult
104 }

```

First the numbered sections. While we are about it, put in a useful section formatting macro.

`\NR@sect`

```

105 \let\NR@sect\@sect
106 \newcounter{section@level}

```

`\@sect`

```

107 \def\@sect#1#2#3#4#5#6[#7]#8{%
108   \setcounter{section@level}{#2}%
109   \NR@getttitle{#7}%
110   \NR@sect{#1}{#2}{#3}{#4}{#5}{#6}[#7]{\Sectionformat{#8}{#2}}%
111 }

```

and now the unnumbered ones

`\NR@ssect`

```

112 \let\NR@ssect\@ssect

```

`\NR@ssect`

```

113 \def\@ssect#1#2#3#4#5{%
114   \NR@getttitle{#5}%
115   \NR@ssect{#1}{#2}{#3}{#4}{\Sectionformat{#5}{#1}}%
116 }

```

Support for class memoir.

```

117 \ltx@ifundefined{ifheadnameref}{%

```

```

118 }{%
119 \ltx@ifundefined{M@sect}{%
120 }{%
121 \let\NRorg@M@sect\M@sect
122 \def\M@sect#1#2#3#4#5#6[#7][#8]{%
123 \ifheadnameref
124 \NR@getttitle{#8}%
125 \else
126 \NR@getttitle{#7}%
127 \fi
128 \NRorg@M@sect{#1}{#2}{#3}{#4}{#5}{#6}[#{#7}][#{#8}]%
129 }%
130 }%
131 }

```

Parts and chapters are treated differently. sigh. \@part and \@spart are \long because of class memoir.

```

132 \let\NR@part\@part
133 \long\def\@part[#1]#2{%
134 \NR@getttitle{#1}%
135 \NR@part[#{#1}]{#2}%
136 }
137 \let\NR@spart\@spart
138 \long\def\@spart#1{%
139 \NR@getttitle{#1}%
140 \NR@spart{#1}%
141 }
142 \let\NR@chapter\@chapter
143 \def\@chapter[#1]#2{%
144 \NR@getttitle{#1}%
145 \NR@chapter[#{#1}]{#2}%
146 }
147 \@ifclassloaded{memoir}{%
148 \ltx@ifundefined{ifheadnameref}{%
149 }{%
150 \def\@chapter[#1]#2{%
151 \ltx@ifundefined{ch@pt@c}{%
152 \NR@getttitle{#1}%
153 }{%
154 \ifx\ch@pt@c\ltx@empty
155 \NR@getttitle{#2}%
156 \else
157 \def\NR@temp{#1}%
158 \ifx\NR@temp\ltx@empty
159 \expandafter\NR@getttitle\expandafter{\ch@pt@c}%
160 \else
161 \ifheadnameref
162 \NR@getttitle{#1}%
163 \else
164 \expandafter\NR@getttitle\expandafter{\ch@pt@c}%
165 \fi
166 \fi
167 \fi
168 }%

```

```

169     \NR@chapter[{#1}]{#2}%
170   }%
171 }%
172 }{}
173 \let\NR@schapter\@schapter
174 \def\@schapter#1{%
175   \NR@getttitle{#1}%
176   \NR@schapter{#1}%
177 }

Captions
178 \AtBeginDocument{%
179   \@ifpackageloaded{hyperref}{%
180     \@ifpackagelater{hyperref}{2009/12/05}\@gobble\@firstofone
181   }\@firstofone
182   {%
183     \let\NR@@caption\@caption
184     \long\def\@caption#1[#2]{%
185       \NR@getttitle{#2}%
186       \NR@@caption{#1}[{#2}]%
187     }%
188   }%

189   \@ifpackageloaded{longtable}{%
190     \let\NRorg@LT@c@ption\LT@c@ption
191     \def\LT@c@ption#1[#2]#3{%
192       \NRorg@LT@c@ption{#1}[{#2}]{#3}%
193     }
194     \def\@tempa{#2}%
195     \ifx\@tempa\@empty
196       \NR@getttitle{#2}%
197     \fi
198   }%
199 }{}%

Environment ‘description’.
200 \ltx@ifundefined{descriptionlabel}{%
201 }{%
202   \let\NRorg@descriptionlabel\descriptionlabel
203   \def\descriptionlabel#1{%
204     \NR@getttitle{#1}%
205     \NRorg@descriptionlabel{#1}%
206   }%
207 }%
208 }

Compatibility for package titlesec.
209 \AtBeginDocument{%
210   \@ifpackageloaded{titlesec}{%
211     \let\NRorg@ttl@sect@i\ttl@sect@i
212     \def\ttl@sect@i#1#2[#3]#4{%
213       \NR@getttitle{#4}%
214       \NRorg@ttl@sect@i{#1}{#2}[{#3}]{#4}%
215     }%
216   }{}%
217 }

```

### 3.2.1 Class beamer

```

218 \@ifclassloaded{beamer}{%
219   \def\NR@PatchBeamer#1{%
220     \expandafter\let\csname NRorg@beamer@#1\expandafter\endcsname
221       \csname beamer@#1\endcsname
222     \begingroup
223       \edef\x{\endgroup
224         \long\def\expandafter\noexpand\csname beamer@#1\endcsname
225           [####1]{% hash-ok
226             \noexpand\NR@getttitle{####1}%
227             \expandafter\noexpand\csname NRorg@beamer@#1\endcsname
228               [{####1}]%
229           }%
230       }%
231       \x
232   }%
233   \NR@PatchBeamer{section}%
234   \NR@PatchBeamer{subsection}%
235   \NR@PatchBeamer{subsubsection}%

```

Theorem names.

```

236   \addtobeamertemplate{theorem begin}{%
237     \expandafter\NR@getttitle\expandafter{\inserttheoremaddition}%
238   }{}%
239   \@ifdefinable{\NRorg@beamer@descriptionitem}{%
240     \let\NRorg@beamer@descriptionitem\beamer@descriptionitem
241     \renewcommand{\beamer@descriptionitem}[1]{%
242       \NR@getttitle{#1}%
243       \NRorg@beamer@descriptionitem{#1}%
244     }%
245   }%
246 }{}

```

### 3.2.2 Theorems

```

247 \ltx@ifundefined{@opargbegintheorem}{-}{%
248   \let\NRorg@opargbegintheorem\@opargbegintheorem
249   \def\@opargbegintheorem#1#2#3{%
250     \NR@getttitle{#3}%
251     \NRorg@opargbegintheorem{#1}{#2}{#3}%
252   }%
253 }
254 \AtBeginDocument{%
255   \@ifpackageloaded{amsthm}{%
256     \let\NRorg@begintheorem\@begintheorem
257     \begingroup
258       \edef\x{\macro:\string#1\string#2[\string#3]}%
259       \@onelevel@sanitize\x
260       \def\y#1->#2\@nil{#1}%
261       \edef\z{\expandafter\y\meaning\@begintheorem->\@nil}%
262       \@onelevel@sanitize\z
263     \expandafter\endgroup
264     \ifx\x\z
265       \def\@begintheorem#1#2[#3]{%
266         \NR@getttitle{#3}%

```

```

267      \NRorg@begintheorem{#1}{#2}[#{3}]%
268      }%
269      \fi
270    }{}%
271 }

```

### 3.3 Referencing stuff

We default the label and hypertext reference to be empty.

```

272 \providecommand*\@currentlabelname{}
273 \providecommand*\@currentHref{}

```

Since the second part of the preserved reference now has five parts (number, page, name, hypertext reference and file), we need extra utility macros:

```

\@firstoffive
274 \long\def\@firstoffive#1#2#3#4#5{#1}

\@secondoffive
275 \long\def\@secondoffive#1#2#3#4#5{#2}

\@thirdoffive
276 \long\def\@thirdoffive#1#2#3#4#5{#3}

\@fourthoffive
277 \long\def\@fourthoffive#1#2#3#4#5{#4}

\@offive
278 \long\def\@fifthoffive#1#2#3#4#5{#5}

```

We have to redefine `\ref` and `\pageref` to know about extra reference elements. Make them robust, and compatible with Babel. The Babel switch is mimicked if not already defined. Some support for package `showkeys` is implemented. If option `notref` of that package is set, `\SK@ref` has the meaning of `\@empty`.

```

\@safe@activetrue
279 \providecommand*\@safe@activetrue{}%

\@safe@activesfalse
280 \providecommand*\@safe@activesfalse{}%

\NR@setref
281 \def\NR@setref#1{%
282   \begingroup
283     \@safe@activetrue
284     \expandafter
285   \endgroup
286   \expandafter\NR@@setref\csname r@#1\endcsname
287 }

\NR@@setref
288 \def\NR@@setref#1{%
289   \ifx\@undefined#1%
290     \let#1\relax

```

```

291 \fi
292 \@setref#1%
293 }

\T@ref
294 \def\T@ref#1{%
295   \NR@setref{#1}\@firstoffive{#1}%
296 }%

\T@pageref
297 \def\T@pageref#1{%
298   \NR@setref{#1}\@secondoffive{#1}%
299 }%

300 \ifNR@showkeys
301   \ifx\SK@ref\@empty
302   \else

\T@ref
303   \def\T@ref#1{%
304     \@safe@activetrue
305     \SK@\SK@@ref{#1}%
306     \@safe@activetrue
307     \NR@setref{#1}\@firstoffive{#1}%
308   }%

\T@pageref
309   \def\T@pageref#1{%
310     \@safe@activetrue
311     \SK@\SK@@ref{#1}%
312     \@safe@activetrue
313     \NR@setref{#1}\@secondoffive{#1}%
314   }%

315 \fi
316 \fi

Package hyperref uses its own definitions of \ref and \pageref because it extends
the syntax by the star form. \DeclareRobustCommand is used by hyperref. Pack-
age nameref can be loaded before, after hyperref or after hyperref's definitions in
\AtBeginDocument.

317 \@ifpackageloaded{hyperref}{%
318 }{%

\ref
319 \DeclareRobustCommand{\ref}{\T@ref}%

\pageref
320 \DeclareRobustCommand{\pageref}{\T@pageref}%

321 }

```

### 3.4 Usage and frontend

Access the (third) name part with `\nameref`;

`\T@nameref`

```

322 \def\T@nameref#1{%
323   \begingroup
324     \let\label\@gobble
325     \NR@setref{#1}\@thirdoffive{#1}%
326   \endgroup
327 }%
328 \ifNR@showkeys
329   \ifx\SK@ref\@empty
330   \else
331     \def\T@nameref#1{%
332       \@safe@activetrue
333       \SK@\SK@@ref{#1}%
334       \@safe@activesfalse
335       \begingroup
336         \let\label\@gobble
337         \NR@setref{#1}\@thirdoffive{#1}%
338       \endgroup
339     }%
340   \fi
341 \fi

342 %\@ifclassloaded{memoir}{%
343 %  \ltx@ifundefined{@mem@titlerefno link}\ltx@secondoftwo{%
344 %    \ltx@ifundefined{@mem@titleref}\ltx@secondoftwo\ltx@firstoftwo
345 %  }%
346 %}\ltx@secondoftwo
347 %}%
348 % \DeclareRobustCommand*\nameref{%
349 %   \@ifstar\@mem@titlerefno link\@mem@titleref
350 % }%
351 %}%

```

`\nameref`

```

352 \DeclareRobustCommand*\nameref{%
353   \@ifstar\T@nameref\T@nameref
354 }%
355 %}

```

`\Nameref` An extended form which gives title and page number.

```

356 \def\Nameref#1{\nameref{#1}' on page~\pageref{#1}}

```

`\Sectionformat` The default for `\Sectionformat`

```

357 \providecommand\Sectionformat[2]{#1}

```

### 3.5 Package ifthen support

Package ifthen's `\isodd` does not work with `\pageref` because of the extra link and the star form. Therefore we need an expandable variant.

Unfortunately there is no hook in `\ifthenelse` in order to provide expandable versions without link of `\ref` and `\pageref`. As possible target I could only find `\begingroup`:

```

358 \@ifpackageloaded{ifthen}{%
359   \let\NROrg@ifthenelse\ifthenelse
360   \def\ifthenelse{%
361     \let\begingroup\NR@TE@begingroup
362     \NROrg@ifthenelse
363   }%
364   \let\NROrg@begingroup\begingroup
365   \def\NR@TE@begingroup{%
366     \let\begingroup\NROrg@begingroup
367     \begingroup
368     \def\ref##1{\getrefbykeydefault{##1}{-}{??}}%
369     \def\pageref##1{\getrefbykeydefault{##1}{page}{0}}%
370   }%
371 }{}

```

### 3.6 Compatibility with varioref

[This section was derived by Corey Minyard [minyard@acm.org](mailto:minyard@acm.org) from the `varioref` package] Changed in 2019-09-12 by Frank Mittelbach to adapt to changes in `varioref`

```

372 \AtBeginDocument{%
373   \ifx\csname @vppageref\endcsname\relax
374   \else
375   %FMI

```

Test if we are using the new `varioref` ...

```

376   \ifdefined\vp@gerefstar
377   \let\NR@@vppageref\@vppageref
378   \else
379     \def\NR@@vppageref#1[#2]#3{%
380       \leavevmode\unskip
381       \global\advance\c@vrcnt\@ne
382       \@ifundefined{r@the\c@vrcnt @vr}%
383       {\@namedef{r@the\c@vrcnt @vr}{??}{??}{-}{-}}{%
384       \edef\@tempa{%
385         \expandafter\expandafter\expandafter
386         \@secondoffive\csname r@the\c@vrcnt @vr\endcsname
387       }%
388       \@ifundefined{r@the\c@vrcnt @xvr}%
389       {\@namedef{r@the\c@vrcnt @xvr}{??}{??}{-}{-}}{%
390       \edef\@tempb{%
391         \expandafter\expandafter\expandafter
392         \@secondoffive\csname r@the\c@vrcnt @xvr\endcsname
393       }%
394       {%
395         \let\@currentlabel\@empty
396         \expandafter\label\expandafter{the\c@vrcnt @xvr}%
397       }%
398       \ifx\@tempa\@tempb

```

```

399 \else
400 \vref@err{%
401 \noexpand\vref at page boundary %
402 \@tempb-\@tempa\space (may loop)%
403 }%
404 \fi
405 \@ifundefined{r@#3}{\@namedef{r@#3}{\{?\}\{?\}\{-\}\{?\}\{?\}}}%
406 \edef\thevpagerefnum{%
407 \expandafter\expandafter\expandafter
408 \@secondoffive\csname r@#3\endcsname
409 }%
410 \ifx\vref@space\@undefined
411 \space
412 \else
413 \vref@space
414 \fi
415 \ifx\@tempa\thevpagerefnum
416 #1%
417 \else
418 #2%
419 \is@pos@number\thevpagerefnum{%
420 \is@pos@number\@tempa{%
421 \@tempcnta\@tempa
422 \advance\@tempcnta\@ne
423 }{%
424 \@tempcnta\maxdimen
425 }%
426 \ifnum \thevpagerefnum =\@tempcnta
427 \ifodd\@tempcnta
428 \if@twoside
429 \reftextfaceafter
430 \else
431 \reftextafter
432 \fi
433 \else
434 \reftextafter
435 \fi
436 \else
437 \advance\@tempcnta-2 %
438 \ifnum \thevpagerefnum =\@tempcnta
439 \ifodd\@tempcnta
440 \reftextbefore
441 \else
442 \if@twoside
443 \reftextfacebefore
444 \else
445 \reftextbefore
446 \fi
447 \fi
448 \else
449 \reftextfaraway{#3}%
450 \fi
451 \fi
452 }{%

```

```

453         \reftextfaraway{#3}%
454     }%
455 \fi
456 {%
457     \let\@currentlabel\@empty
458     \expandafter\label\expandafter{\the\c@vrcnt @vr}%
459 }%
460 }%
461 \fi
462 %FM - end mod
463 \def\@vpageref#1[#2]#3{%
464     \begingroup
465     \csname @safe@activestrue\endcsname
466     \edef\x{#3}%
467     \@onelevel@sanitize\x
468     \toks@{%
469         \NR@vpageref{#1}[[#2]]%
470     }%
471     \edef\x{\endgroup
472         \the\toks@{\x}%
473     }%
474     \x
475 }%
476 \DeclareRobustCommand\vnameref[1]{%
477     \unskip~\nameref{#1}%
478     \@vpageref[\unskip]{#1}%
479 }%
480 \fi
481 }

482 \@ifundefined{@Refstar}{%
483     \def\T@Ref#1{%
484         \NR@setref{#1}\NR@MakeUppercaseFirstOfFive{#1}%
485     }%
486     \def\NR@MakeUppercaseFirstOfFive#1#2#3#4#5{%
487         \MakeUppercase#1%
488     }%
489 }{}%
490 \AtBeginDocument{%
491     \@ifpackageloaded{varioref}{%
492         \@ifundefined{@Refstar}{%
493             \DeclareRobustCommand*\Ref{[1]}{%
494                 \T@Ref{#1}%
495             }%
496         }{}%
497     }{}%
498 }%

```

### 3.7 Support for package listings

```

499 \AtBeginDocument{%
500     \@ifpackageloaded{listings}{%
501         \let\NR@Org@lst@MakeCaption\lst@MakeCaption
502         \def\lst@MakeCaption{%
503             \ifx\lst@label\@empty

```

```

504     \else
505         \let\@currentlabelname\lst@@caption
506     \fi
507     \NROrg@lst@MakeCaption
508 }%
509 }{}%
510 }
511 \end{package}

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