

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

Sebastian Rahtz

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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).

**README** The **README** file (also available as text file). Here information is collected that is not yet in the manual: new features, package compatibility, limitations, known problems, ...

**ChangeLog** This file records the version history (also available as text file).

**Options** This file provides a short option summary.

**Bookmark talk, slides** Slides for the talk “PDF information and navigation elements with hyperref, pdfTeX and thumbpdf” at EuroTeX 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 variorref 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 `gettitlestring` 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 `gettitlestring` how to change the method. It also provides a hook to remove additional unwanted macros, not supported by the package. Example:

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

## 3 Implementation

```
1 (*package)
2 \RequirePackage{refcount}[2006/02/12]
3 \RequirePackage{gettitlestring}[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).

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

### 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.

```

6 \newif\ifNR@showkeys
7 \NR@showkeysfalse
8 \Qifpackageloaded{showkeys}{%
9   \begingroup
10    \Qifundefined{SK@@label}{%
11      }{%
12        \global\NR@showkeystrue
13      }%
14    \endgroup
15 }{%
16 \def\label#1{%
17   \Qbsphack
18   \begingroup
19     \Qonelevel@sanitize\Qcurrentlabelname
20     \edef\Qcurrentlabelname{%
21       \expandafter\strip@period\Qcurrentlabelname\relax.\relax\Q@@%
22     }%
23     \protected@write\Qauxout{}{%
24       \string\newlabel{#1}{%
25         {\Qcurrentlabelname}%
26         {\thepage}%
27         {\Qcurrentlabelname}%
28         {\QcurrentHref}{}%
29       }%
30     }%
31   \endgroup
32   \Qesphack
33 }%
34 \ifNR@showkeys
35   \def\label#1{%
36     \Qbsphack
37     \SK@\SK@@label{#1}%
38     \begingroup
39       \Qonelevel@sanitize\Qcurrentlabelname
40       \edef\Qcurrentlabelname{%
41         \expandafter\strip@period\Qcurrentlabelname\relax.\relax\Q@@%
42       }%
43       \protected@write\Qauxout{}{%
44         \string\newlabel{#1}{%
45           {\Qcurrentlabelname}%
46           {\thepage}%
47           {\Qcurrentlabelname}%
48           {\QcurrentHref}{}%
49         }%
50       }%
51     \endgroup
52     \Qesphack
53   }%
54 \fi
55 \let\ltx@label\label

```

Needed for the *subeqnarray* package.

```

56 \Qifundefined{slabel}{ }{%
57   \def\slabel#1{%
58     \Qbsphack
59     \if@filesw
60       {%

```

```

61      \@onellevel@sanitize@\@currentlabelname
62      \edef@\@currentlabelname{%
63          \expandafter\strip@period@\@currentlabelname\relax.\relax\@@@%
64      }%
65      \let\thepage\relax
66      \def\protect{\noexpand\noexpand\noexpand}%
67      \edef@\tempa{%
68          \write@\auxout{%
69              \string\newlabel{#1}{%
70                  {\thesubequation}%
71                  {\thepage}%
72                  {\@currentlabelname}%
73                  {\@currentHref}{}%
74              }%
75          }%
76      }%
77      \expandafter
78  }%
79      \tempa
80      \if@nobreak\ifvmode\nobreak\fi\fi
81      \fi
82      \esphack
83  }%
84 }

```

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

```

85 \def@\writetocidents@{%
86   \begingroup
87   \for@\tempa:=-1,0,1,2,3\do{%
88     \immediate\write@\auxout{%
89       \string\newlabel{tocindent}\@tempa{%
90         \csname r@tocindent\@tempa\endcsname{}{}{}{}%
91       }%
92     }%
93   }%
94   \endgroup
95 }

```

### 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.

```

96 \def\NR@gettitle#1{%
97   \GetTitleString{#1}%
98   \let@\currentlabelname\GetTitleStringResult
99 }

```

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

```

100 \let\NR@sect@\sect
101 \newcounter{section@level}
102 \def@\sect#1#2#3#4#5#6[#7]#8{%
103   \setcounter{section@level}{#2}%
104   \NR@gettitle{#7}%
105   \NR@sect{#1}{#2}{#3}{#4}{#5}{#6}[{#7}]{\Sectionformat{#8}{#2}}%

```

```

106 }
and now the unnumbered ones
107 \let\NR@ssect\@sect
108 \def\@sect#1#2#3#4#5{%
109   \NR@gettitle{#5}%
110   \NR@ssect{#1}{#2}{#3}{#4}{\Sectionformat{#5}{#1}}%
111 }

```

Support for class memoir.

```

112 \ltx@ifundefined{ifheadnameref}{%
113 }{%
114   \ltx@ifundefined{M@sect}{%
115     }{%
116     \let\NRorg@M@sect\@sect
117     \def\M@sect#1#2#3#4#5#6[#7][#8]{%
118       \ifheadnameref
119         \NR@gettitle{#8}%
120       \else
121         \NR@gettitle{#7}%
122       \fi
123       \NRorg@M@sect{#1}{#2}{#3}{#4}{#5}{#6}[{#7}][{#8}]%
124     }%
125   }%
126 }

```

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

```

127 \let\NR@part\@part
128 \long\def\@part[#1]#2{%
129   \NR@gettitle{#1}%
130   \NR@part[{#1}]{#2}%
131 }
132 \let\NR@spart\@spart
133 \long\def\@spart#1{%
134   \NR@gettitle{#1}%
135   \NR@spart{#1}%
136 }
137 \let\NR@chapter\@chapter
138 \def\@chapter[#1]#2{%
139   \NR@gettitle{#1}%
140   \NR@chapter[{#1}]{#2}%
141 }
142 \ifclassloaded{memoir}{%
143   \ltx@ifundefined{ifheadnameref}{%
144     }{%
145       \def\@chapter[#1]#2{%
146         \ltx@ifundefined{ch@pt@c}{%
147           \NR@gettitle{#1}%
148         }{%
149           \ifx\ch@pt@c\ltx@empty
150             \NR@gettitle{#2}%
151           \else
152             \def\NR@temp{#1}%
153             \ifx\NR@temp\ltx@empty
154               \expandafter\NR@gettitle\expandafter{\ch@pt@c}%
155             \else
156               \ifheadnameref

```

```

157           \NR@getttitle{#1}%
158           \else
159           \expandafter\NR@getttitle\expandafter{\ch@pt@c}%
160           \fi
161           \fi
162           \fi
163       }%
164   \NR@chapter[{-#1}]{#2}%
165 }%
166 }%
167 }{%
168 \let\NR@schapter@schapter
169 \def@schapter#1{%
170   \NR@getttitle{#1}%
171   \NR@schapter{#1}%
172 }

```

### Captions

```

173 \AtBeginDocument{%
174   \@ifpackageloaded{hyperref}{%
175     \@ifpackagelater{hyperref}{2009/12/05}\@gobble\@firstofone
176   }\@firstofone
177 }%
178   \let\NR@@caption\@caption
179   \long\def\@caption#1[#2]{%
180     \NR@getttitle{#2}%
181     \NR@@caption{#1}[{#2}]%
182   }%
183 }%
184 \@ifpackageloaded{longtable}{%
185   \let\NRorg@LT@c@option\LT@c@option
186   \def\LT@c@option#1[#2]#3{%
187     \NRorg@LT@c@option{#1}[{#2}]{#3}%
188     \def\@tempa{#2}%
189     \ifx\@tempa\@empty
190     \else
191       \NR@getttitle{#2}%
192     \fi
193   }%
194 }{}%

```

### Environment ‘description’.

```

195 \ltx@ifundefined{descriptionlabel}{%
196 }{%
197   \let\NRorg@descriptionlabel\descriptionlabel
198   \def\descriptionlabel#1{%
199     \NR@getttitle{#1}%
200     \NRorg@descriptionlabel{#1}%
201   }%
202 }%
203 }

```

### Compatibility for package titlesec.

```

204 \AtBeginDocument{%
205   \@ifpackageloaded{titlesec}{%
206     \let\NRorg@ttl@sect@i\ttl@sect@i
207     \def\ttl@sect@i#1#2[#3]{#4}{%
208       \NR@getttitle{#4}%

```

```

209      \NRorg@ttl@sect@i{#1}{#2}[{#3}]{#4}%
210      }%
211  }{}%
212 }

```

### 3.2.1 Class beamer

```

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

```

### 3.2.2 Theorems

```

232 \ltx@ifUndefined{@opargbegintheorem}{}{%
233   \let\NRorg@opargbegintheorem\@opargbegintheorem
234   \def@opargbegintheorem#1#2#3{%
235     \NR@getttitle{#3}%
236     \NRorg@opargbegintheorem{#1}{#2}{#3}%
237   }%
238 }
239 \AtBeginDocument{%
240   \ifpackageloaded{amsthm}{%
241     \let\NRorg@begintheorem\@begintheorem
242     \begingroup
243     \edef\x{macro:\string#1\string#2[\string#3]}%
244     \c@onelvel@sanitize\x
245     \def\y#1->#2\@nil{#1}%
246     \edef\z{\expandafter\y\meaning\@begintheorem->\@nil}%
247     \c@onelvel@sanitize\z
248     \expandafter\endgroup
249     \ifx\x\z
250       \def\@begintheorem#1#2[#3]{%
251         \NR@getttitle{#3}%
252         \NRorg@begintheorem{#1}{#2}[{#3}]%
253       }%
254     \fi
255   }{}%
256 }

```

## 3.3 Referencing stuff

We default the label and hypertext reference to be empty.

```
257 \providecommand*\@currentlabelname{}
```

```
258 \providetcommand*\@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:

```
259 \long\def\@firstoffive#1#2#3#4#5{#1}
260 \long\def\@secondoffive#1#2#3#4#5{#2}
261 \long\def\@thirdoffive#1#2#3#4#5{#3}
262 \long\def\@fourthoffive#1#2#3#4#5{#4}
263 \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`.

```
264 \providetcommand*\@safe@activestruel{\}%
265 \providetcommand*\@safe@activesfalse{\}%
266 \def\NR@setref#1{%
267   \begingroup
268     \@safe@activestruel
269     \expandafter
270   \endgroup
271   \expandafter\NR@@setref\csname r@#1\endcsname
272 }
273 \def\NR@@setref#1{%
274   \ifx\@undefined#1%
275     \let#1\relax
276   \fi
277   \@setref#1%
278 }
279 \def\T@ref#1{%
280   \NR@setref{#1}\@firstoffive{#1}%
281 }%
282 \def\T@pageref#1{%
283   \NR@setref{#1}\@secondoffive{#1}%
284 }%
285 \ifNR@showkeys
286   \ifx\SK@ref\empty
287   \else
288     \def\T@ref#1{%
289       \@safe@activestruel
290       \SK@\SK@@ref{#1}%
291       \@safe@activesfalse
292       \NR@setref{#1}\@firstoffive{#1}%
293     }%
294     \def\T@pageref#1{%
295       \@safe@activestruel
296       \SK@\SK@@ref{#1}%
297       \@safe@activesfalse
298       \NR@setref{#1}\@secondoffive{#1}%
299     }%
300   \fi
301 }
```

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

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

```

303 }{%
304   \DeclareRobustCommand{\ref}{\T@ref}%
305   \DeclareRobustCommand{\pageref}{\T@pageref}%
306 }

```

### 3.4 Usage and frontend

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

```

307 \def\T@nameref#1{%
308   \begingroup
309   \let\label\gobble
310   \NR@setref{\#1}\@thirdoffive{\#1}%
311   \endgroup
312 }%
313 \ifNR@showkeys
314   \ifx\SK@ref\empty
315   \else
316     \def\T@nameref#1{%
317       \csname\activestrue
318       \SK@\SK@ref{\#1}%
319       \activesfalse
320       \begingroup
321         \let\label\gobble
322         \NR@setref{\#1}\@thirdoffive{\#1}%
323       \endgroup
324     }%
325   \fi
326 \fi
327 %\@ifclassloaded{memoir}{%
328 %  \ltx@ifundefined{\mem@titlerefno link}\ltx@secondoftwo{%
329 %    \ltx@ifundefined{\mem@titleref}\ltx@secondoftwo\ltx@firstoftwo
330 %  }%
331 %}\ltx@secondoftwo
332 %}%
333 % \DeclareRobustCommand*\nameref{%
334 %   \ifstar\mem@titlerefno link\mem@titleref
335 % }%
336 %}%
337 \DeclareRobustCommand*\nameref{%
338   \ifstar\T@nameref\T@nameref
339 }%
340 %}

```

An extended form which gives title and page number.

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

The default for `\Sectionformat`

```
342 \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`:

```
343 \ifpackageloaded{ifthen}{%
```

```

344 \let\NROrg@ifthenelse\ifthenelse
345 \def\ifthenelse{%
346   \let\begingroup\NR@TE@begingroup
347   \NROrg@ifthenelse
348 }%
349 \let\NROrg@begingroup\begingroup
350 \def\NR@TE@begingroup{%
351   \let\begingroup\NROrg@begingroup
352   \begingroup
353   \def\ref##1{\getrefbykeydefault{##1}{}{??}}%
354   \def\pageref##1{\getrefbykeydefault{##1}{page}{0}}%
355 }%
356 }{}
```

### 3.6 Compatibility with varioref

[This section was derived by Corey Minyard [minyard@acm.org](mailto:minyard@acm.org) from the varioref package]

```

357 \AtBeginDocument{%
358   \ifx\csname @vpageref\endcsname\relax
359   \else
360     \def\@vpageref#1[#2]#3{%
361       \begingroup
362         \csname @safe@activestruet\endcsname
363         \edef\x{#3}%
364         \onelevel@sanitize\x
365         \toks@{%
366           \NR@vpageref{#1}[{#2}]%
367         }%
368         \edef\x{\endgroup
369           \the\toks@\{x\}%
370         }%
371         \x
372     }%
373     \def\NR@vpageref#1[#2]#3{%
374       \leavevmode\unskip
375       \global\advance\c@vrcnt\@ne
376       \@ifundefined{r@\the\c@vrcnt @vr}%
377         {\@namedef{r@\the\c@vrcnt @vr}{{??}{??}{--}{--}}{}}%
378       \edef@\tempa{%
379         \expandafter\expandafter\expandafter
380         \@secondoffive\csname r@\the\c@vrcnt @vr\endcsname
381       }%
382       \@ifundefined{r@\the\c@vrcnt @xvr}%
383         {\@namedef{r@\the\c@vrcnt @xvr}{{??}{??}{--}{--}}{}}%
384       \edef@\tempb{%
385         \expandafter\expandafter\expandafter
386         \@secondoffive\csname r@\the\c@vrcnt @xvr\endcsname
387       }%
388     }%
389     \let@\currentlabel\@empty
390     \expandafter\label\expandafter{\the\c@vrcnt @xvr}%
391   }%
392   \ifx@\tempa@\tempb
393   \else
394     \vref@err{%
395       \noexpand\vref at page boundary %
```

```

396          \@tempb-\@tempa\space (may loop)%
397      }%
398  \fi
399  \@ifundefined{r@#3}{\@namedef{r@#3}{{?}{?}{?}{?}{?}}}{%
400  \edef\thevpagerefnum{%
401      \expandafter\expandafter\expandafter
402      \@secondoffive\csname r@#3\endcsname
403  }%
404  \ifx\vref@space\@undefined
405      \space
406  \else
407      \vref@space
408  \fi
409  \ifx\@tempa\thevpagerefnum
410      #1%
411  \else
412      #2%
413  \is@pos@number\thevpagerefnum{%
414      \is@pos@number\@tempa{%
415          \@tempcnta\@tempa
416          \advance\@tempcnta\@ne
417      }%
418      \@tempcnta\maxdimen
419  }%
420  \ifnum \thevpagerefnum =\@tempcnta
421      \ifodd\@tempcnta
422          \if@twoside
423              \reftextfaceafter
424          \else
425              \reftextafter
426          \fi
427          \else
428              \reftextafter
429          \fi
430      \else
431          \advance\@tempcnta-2 %
432          \ifnum \thevpagerefnum =\@tempcnta
433              \ifodd\@tempcnta
434                  \reftextbefore
435              \else
436                  \if@twoside
437                      \reftextfacebefore
438                  \else
439                      \reftextbefore
440                  \fi
441              \fi
442          \else
443              \reftextfaraway{#3}%
444          \fi
445      \fi
446  }%
447      \reftextfaraway{#3}%
448  }%
449 \fi
450 {%
451     \let\@currentlabel\@empty
452     \expandafter\label\expandafter{\the\c@vrcnt @vr}%

```

```

453      }%
454      }%
455      \DeclareRobustCommand{\nameref}[1]{%
456          \unskip\name{#1}%
457          \vphantom{\unskip[\name]}\#1}%
458      }%
459  \fi
460 }

461 \@ifundefined{@Refstar}{%
462   \def\T@Ref#1{%
463     \NR@setref{#1}\NR@MakeUppercaseFirstOfFive{#1}%
464   }%
465   \def\NR@MakeUppercaseFirstOfFive#1#2#3#4#5{%
466     \MakeUppercase#1%
467   }%
468 }{%
469 \AtBeginDocument{%
470   \ifpackageloaded{varioref}{%
471     \ifundefined{@Refstar}{%
472       \DeclareRobustCommand*\{\Ref}[1]{%
473         \T@Ref{#1}%
474       }%
475     }{%
476   }{%
477 }

```

### 3.7 Support for listings

```

478 \AtBeginDocument{%
479   \ifpackageloaded{listings}{%
480     \let\NR@org@lst@MakeCaption\lst@MakeCaption
481     \def\lst@MakeCaption{%
482       \ifx\lst@label\empty
483       \else
484         \let\@currentlabelname\lst@caption
485       \fi
486       \NR@org@lst@MakeCaption
487     }%
488   }{%
489 }
490 
```

## 4 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; numbers in roman refer to the code lines where the entry is used.

<b>Symbols</b>		
\@@@ . . . . .	5, 21, 41, 63	\@caption . . . . . 178, 179
\@@vpageref . . . . .	360	\@chapter . . . . . 137, 138, 145
\@auxout . . . . .	23, 43, 68, 88	\@currentHref . . . . . 28, 48, 73, 258
\@begintheorem . . . . .		\@currentlabel . . . . . 25, 45, 389, 451
\@bsphack . . . . .	17, 36, 58	\@currentlabelname . . . . .
		19, 20, 21, 27, 39, 40, 41, 47, 61, 62, 63, 72, 98, 257, 484
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\@firstoffive . . . . .	259, 280, 292	\advance . . . . .	375, 416, 431	215, 216, 219,
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