

# First aid for external files and packages that need updating

Frank Mittelbach, L<sup>A</sup>T<sub>E</sub>X Project

2026-03-12

## Abstract

This file contains some first aid for packages or classes that require updates because of internal changes to L<sup>A</sup>T<sub>E</sub>X but that aren't yet reflected in the package/class code.

## Contents

<b>1</b>	<b>Introduction</b>	<b>2</b>
1.1	Minor kernel fixes . . . . .	2
<b>2</b>	<b>The Implementation</b>	<b>2</b>
2.1	The filehook package first aid . . . . .	3
2.2	The dinbrief class first aid . . . . .	5
2.3	The unicode-math package first aid . . . . .	5
2.4	The pgfpages and pgfmorepages first aid . . . . .	5
2.5	The babel package . . . . .	6
2.6	The songs package first aid . . . . .	6
2.7	The crop package first aid . . . . .	6
2.8	The bigfoot first aid . . . . .	7
2.9	marginfix first aid . . . . .	7
2.10	ulem first aid . . . . .	8
2.11	varwidth first aid . . . . .	8
2.12	The german class first aid . . . . .	9
2.13	The underscore first aid . . . . .	9
2.14	The acro package first aid . . . . .	10
2.15	The chemformula package first aid . . . . .	10
2.16	The chemnum package first aid . . . . .	10
2.17	The cleveref package first aid . . . . .	10
2.18	The arydshln package first aid . . . . .	12
2.19	The calc package first aid . . . . .	13
2.20	First aid after retiring the legacy mark mechanism . . . . .	13
2.21	First aid for morewrites . . . . .	14
2.22	First aid for AMS classes . . . . .	14
2.23	The cellspace package first aid . . . . .	15

# 1 Introduction

Over the years package writers have hooked into various parts of internal  $\text{\LaTeX}$  commands (largely because proper interfaces were missing in important places) and if we are now gradually adding such interfaces these internal commands do change and as a result patching into them stops working.

As part of making such internal changes the  $\text{\LaTeX}$  Project team attempts to check for such usage in packages, alert the package maintainers and ensures that the packages get updated alongside the core  $\text{\LaTeX}$  system. However it is not always possible to get packages that will fail with a new kernel updated in time and if that is the case we try to provide a temporary fix in this file for them. Once the package gets updated the fix will then be removed again.

For that reason, it is put into a separate bundle so that we can update it easily without requiring the CTAN maintainers to install a new full  $\text{\LaTeX}$  system just because we take out (or add) a fix for a package here.

In the best case scenario the file documented here should be empty. In practice it will probably always contain one or the other fix while we are waiting for the package to get updated.

**Important notice:** The fixes provided here are not meant to be a permanent solution, but are only provided to support the transition period. They are (usually) neither complete nor necessarily the best solution! Furthermore, as they are done from the “outside”, they usually add some burden and slow down  $\text{\LaTeX}$  processing, even if the package/class is not used in the document.

We will therefore remove such code as soon as possible again. In practice this means that if some package never gets updated/corrected, then it will eventually fail to work, because after one or at most two  $\text{\LaTeX}$  releases we will take out the transition code to ensure that this “first aid patching” doesn’t get out of bounds.

## 1.1 Minor kernel fixes

If we encounter issues with the kernel code that should get fixed before the next main release we normally generate a patch release for  $\text{\LaTeX}$ . However, depending on the complexity of the fix we might first add the fix here and generate a full patch release only when a number of such issues have accumulated. This way we lessen the impact on CTAN maintainers because for each tach release we have to make and distribute also a matching development release.

# 2 The Implementation

This file is meant to be loaded during format generation which is why we give it the extension `.ltx`.

```
1 <*kernel>
2 \def\LaTeXFirstAidDate{2026-03-12}
3 \def\LaTeXFirstAidVersion{v1.1x}
4 \ProvidesFile{latex2e-first-aid-for-external-files.ltx}
5           [\LaTeXFirstAidDate\space \LaTeXFirstAidVersion\space
```

`\FirstAidNeededT` This is a very simple help to ensure that we only apply first aid to an unmodified package or class. It only works in the case the file has already been loaded and the `\csname \ver@#1.#2` got defined (holding the current date, version, and short description info). We then compare its content to a frozen string and make the modification `#3` only if both agree. If they differ we assume that the package/class in question got updated by its maintainer.

```

7 \ExplSyntaxOn
8 \cs_new:Npn\FirstAidNeededT#1#2#3{
9   \exp_args:Nce\str_if_eq:onTF{ver@#1.#2}{#3}
10    { \typeout{==>~ First~ Aid~ for~ #1.#2~ applied! } }
11    { \typeout{==>~ First~ Aid~ for~ #1.#2~ no~ longer~ applied!^^J
12      \@spaces Expected:^^J
13      \@spaces\@spaces #3^^J
14      \@spaces but~ found:^^J
15      \@spaces\@spaces \use:c{ver@#1.#2}^^J
16      \@spaces so~ I'm~ assuming~ it~ got~ fixed.
17    } }
18   \exp_args:Nce\str_if_eq:onT{ver@#1.#2}{#3}
19 }
20 \ExplSyntaxOff
21 </kernel>

```

## 2.1 The filehook package first aid

The filehook package implements hooks into file loading commands. These days this is already provided by the kernel albeit not with the same user interface. Until that package gets updated (to use the kernel interfaces) we provide a substitution. This does not offer all hooks from filehook but all that have been used in packages available in T<sub>E</sub>X Live.

Note that this doesn't fix `currfile` because that package uses filehook but relies on the internals of the old implementation.

The package has now got an update so we aren't activating the first aid. However, at the moment it basically bypasses the new hook mechanism and puts the old hooks in thereby disabling, for example, the possibility to re-order code through rules.

We therefore keep `filehook-ltx.sty` around as a guideline for further updates.

Replacing filehook with a leaner version would then work like this:

```

22 <(*kernel)
23 %\declare@file@substitution{filehook.sty}{filehook-ltx.sty}
24 </kernel>

```

What follows is a simplified (partial) implementation of the filehook interfaces. Not implemented are:

```

\AtBeginOfFiles      \AtEndOfFiles
\AtBeginOfInputs     \AtEndOfInputs
\AtBeginOfInputFile  \AtEndOfInputFile
25 <(*filehook-ltx)

```

```

26 \newcommand\AtBeginOfEveryFile [1]
27   {\AddToHook{file/before}{#1}}
28 \newcommand\AtEndOfEveryFile [1]
29   {\AddToHook{file/after}{#1}}

30 \newcommand\AtBeginOfIncludes [1]
31   {\AddToHook{include/before}{#1}}
32 \newcommand\AtEndOfIncludes [1]
33   {\AddToHook{include/end}{#1}}
34 \newcommand\AfterIncludes [1]
35   {\AddToHook{include/after}{#1}}

36 \newcommand\AtBeginOfPackages [1]
37   {\AddToHook{package/before}{#1}}
38 \newcommand\AtEndOfPackages [1]
39   {\AddToHook{package/after}{#1}}

40 \newcommand\AtBeginOfClasses [1]
41   {\AddToHook{class/before}{#1}}
42 \newcommand\AtEndOfClasses [1]
43   {\AddToHook{class/after}{#1}}

44 \newcommand\AtBeginOfFile [2]
45   {\AddToHook{file/#1/before}{#2}}
46 \newcommand\AtEndOfFile [2]
47   {\AddToHook{file/#1/after}{#2}}

```

Some commands offered a starred form

```

48 \DeclareDocumentCommand \AtBeginOfPackageFile {smm}
49   {\IfBooleanTF{#1}%
50     {\@ifpackageloaded{#2}%
51       {#3}%
52       {\AddToHook{package/#2/before}{#3}}}%
53     {\AddToHook{package/#2/before}{#3}}%
54   }

55 \DeclareDocumentCommand \AtEndOfPackageFile {smm}
56   {\IfBooleanTF{#1}%
57     {\@ifpackageloaded{#2}%
58       {#3}%
59       {\AddToHook{package/#2/after}{#3}}}%
60     {\AddToHook{package/#2/after}{#3}}%
61   }

```

Are the \* forms here of any use? I know they are use 3–4 times on CTAN but I wonder if those are real or mistaken usages.

```

62 \DeclareDocumentCommand \AtBeginOfClassFile {smm}
63   {\IfBooleanTF{#1}%
64     {\@ifclassloaded{#2}%
65       {#3}%
66       {\AddToHook{class/#2/before}{#3}}}%
67     {\AddToHook{class/#2/before}{#3}}%
68   }

69 \DeclareDocumentCommand \AtEndOfClassFile {smm}
70   {\IfBooleanTF{#1}%
71     {\@ifclassloaded{#2}%
72       {#3}%

```

```

73         {\AddToHook{class/#2/after}{#3}}}%
74     {\AddToHook{class/#2/after}{#3}}%
75 }
76 \newcommand\AtBeginOfIncludeFile [2]
77   {\AddToHook{include/#1/before}{#2}}
78 \newcommand\AtEndOfIncludeFile [2]
79   {\AddToHook{include/#1/end}{#2}}
80 \newcommand\AfterIncludeFile [2]
81   {\AddToHook{include/#1/after}{#2}}
82 </filehook-ltx>
83 <*kernel>

```

## 2.2 The `dinbrief` class first aid

Again a case of a no longer correct `\endgroup` in document. Here the fix is simply though.

```

84 \AddToHook{file/dinbrief.cls/after}[firstaid]{%
85   \FirstAidNeededT{dinbrief}{cls}{2000/03/02 LaTeX2e class}%
86   {\AddToHook{env/document/begin}{\begingroup}}%
87 }

```

## 2.3 The `unicode-math` package first aid

If `unicode-math` is used together with `doc` there is a problem because it changes the mathcodes without adjusting the use in `doc` that assume standard settings. Could be fixed on either side, but as `unicode-math` is derivating from the standard, the right place is probably a fix in this package. For now we do it here. See [github/820](https://github.com/TeXmacs/820).

```

88 \AddToHook{package/unicode-math/after}{%
89   \AddToHook{cmd/mod@math@codes/after}{\mathcode'\|=28796 }}

```

## 2.4 The `pgfpages` and `pgfmorepages` first aid

`pgfpages` alters the `\shipout` primitive to support multiple page up scenarios. If used together with `atbegshi` that worked because the alterations done by `atbegshi` came later and so used the new definition provide by `pgfpages`. Now that the code from `atbegshi` is already in the kernel this further redefinition doesn't happen with the result that the change to `\shipout` comes to late and breaks the kernel processes.

```

90 \ExplSyntaxOn
91 \AddToHook{file/pgfpages.sty/after}[firstaid]{

```

Undo overwriting `\shipout`:

```

92   \cs_gset_eq:NN \shipout \pgfpages@originalshipout

```

Instead overwrite the L3 programming layer name of the primitive. This is really an absolute no-go, but for now the simplest solution to keep the original code running.

It will be replaced when the “configuration points” interface for L<sup>A</sup>T<sub>E</sub>X becomes available. At that point the package will be able to set up a different strategy for doing shipouts and without the need to overwrite a primitive (which it did in the past and which we do below) and then this code here can be taken out again.

```

93 \cs_set_eq:NN \pgfpages@originalshipout \tex_shipout:D
94 \cs_set_eq:NN \tex_shipout:D \pgfpages@interceptshipout
95 }
96 \ExplSyntaxOff

```

Same issue with `pgfmorepages` but slightly different implementation (sigh).

```

97 \ExplSyntaxOn
98 \AddToHook{file/pgfmorepages.sty/after}[firstaid]{
99   \cs_set_nopar:Npn \pgfhookintoshipout {
100     \cs_set_eq:NN \pgfpages@originalshipout \tex_shipout:D
101     \cs_set_eq:NN \tex_shipout:D \pgfpages@interceptshipout
102   }
103 }
104 \ExplSyntaxOff

```

## 2.5 The `babel` package

Turn off the `babel` hack.

```

105 \AddToHook{file/babel.sty/before}[firstaid]{\def\BabelCaseHack{}}

```

## 2.6 The `songs` package first aid

The `songs` package uses `\obeylines` and redefines `\par` for special effect. this no longer works in L<sup>A</sup>T<sub>E</sub>X 2022-06-01 (gh issue 367). The following fixes at least one failure.

```

106 \AddToHook{file/songs.sty/after}[firstaid]{%
107   \FirstAidNeededT{songs}{sty}{2018/09/12 v3.1 Songs package}%
108   {%
109     \renewcommand\SB@obeylines{%
110       \let\obeyedline\SB@par%
111       \obeylines%
112       \let\@par\SB@par%
113     }}%
114 }

```

## 2.7 The `crop` package first aid

The `crop` packages fails currently due to two L<sup>A</sup>T<sub>E</sub>X changes: It doesn't know that `\stockheight` and `\stockwidth` are now defined, and doesn't take into account that `\rlap` is robust (<https://github.com/rrthomas/crop/issues/2>). The first is addressed by setting the dimension if they are zero or negative. For the second we locally change the meaning of `\protect`

```

115 \AddToHook{file/crop.sty/after}[firstaid]{%
116   \FirstAidNeededT{crop}{sty}{2017/11/19 1.10 crop marks (mf)}%
117   {%
118     \ifdim\stockwidth > 0pt \else \stockwidth\paperwidth \fi
119     \ifdim\stockheight > 0pt \else \stockheight\paperheight \fi
120     \renewcommand*\CROP@genreflect[1]{%
121       \leavevmode
122       \dimen0\CROP@horigin
123       \kern2\dimen0
124       \begingroup

```

```

125 \set@typeset@protect %change protect
126 \reflectbox{%
127     \hb@xt@\paperwidth{%
128         \vbox to\paperheight{%
129             #1%
130             \vss
131         }%
132     \hss
133 }%
134 }%
135 \endgroup
136 }
137 }%
138 }

```

## 2.8 The bigfoot first aid

The **bigfoot** packages makes the assumption that two `\newinsert` allocations have a recognisable order in their numbers, the second one has a lower number. This was correct in the classic  $\text{\TeX}$  implementation but with the extended allocation possibilities of all modern engines is no longer the case and there is a point where the allocations take a “jump” breaking the ordering assumption. These days we are fairly close to that point and depending on how many packages are loaded before **bigfoot** the package breaks.

This firstaid therefore jumps over the problematical point by pushing the count allocation to a safe value if necessary.

```

139 \AddToHook{file/bigfoot.sty/after}{%
140     \ifnum\count10<\insecunt
141         \global\count10=\insecunt
142     \fi

```

We also correct a bug that **bigfoot** tries to shift mark registers, but in  $\text{\LaTeX}$  (at least since 2015) the allocation number is not 266, so it does that to a random number of mark registers (which sometimes blows up depending on the value in 266).

```

143 \def\FN@allmarks#1{\@elt{#1}%
144     \ifnum#1<\count256 %<--- problem: 266 isn't the counter for marks
145         \expandafter\FN@allmarks\expandafter{\number\numexpr#1+\@ne}%
146     \fi}%
147 }

```

## 2.9 marginfix first aid

The **marginfix** package tries to patch `\@combinefloats` but with 2025-06 the kernel doesn't use this any longer but uses `\@outputbox@attachfloats` instead.

```

148 \AddToHook{file/marginfix.sty/after}[firstaid]{%
149     \FirstAidNeededT{marginfix}{sty}%
150     {2020/05/06 v1.2 Fix Margin Paragraphs}%
151     {\let \@outputbox@attachfloats \@combinefloats}%
152 }

```

## 2.10 ulem first aid

In 2020 we fixed various kernel commands to accept `calc` syntax. The `ulem` package redefines some internals and that now conflicts with the new definitions as they involve an extra group. So we alter the definition of `\@hspace` if `ulem` was loaded. This is not perfect, obviously, so it will go out the moment `ulem` gets adjusted.

```
153 \AddToHook{file/ulem.sty/after}[firstaid]{%
154   \def\@hspace#1{\begingroup\setlength\skip@{#1}%
155     \edef\x{\endgroup\hskip\the\skip@\relax}\x}%
156 }
```

## 2.11 varwidth first aid

The `varwidth` package does a lot of low-level paragraph manipulation assuming traditional  $\TeX$  paragraphs. However, with the paragraph hooks we end up with one extra glue `Opt` item on the vertical list and if that isn't removed then the package doesn't find its penalties.

So this needs to be removed as well by adding an additional `\unskip`.

```
157 \AddToHook{file/varwidth.sty/after}[firstaid]{%
158   \FirstAidNeededT{varwidth}{sty}%
159     {2009/03/30 ver 0.92; \space Variable-width minipages}%
160   {%
161 \def\@vwid@sift{%
162   \skip@\lastskip\unskip
163   \ifdim\lastskip=\z@\unskip\fi % <---- the first aid here (not just unskip)
164   \dimen@\lastkern\unkern
165   \count@\lastpenalty\unpenalty
166   \setbox\z@\lastbox
167   \ifvoid\z@ \advance\sift@deathcycles\@ne \else \sift@deathcycles\z@ \fi
168   \ifnum\sift@deathcycles>33
169     \let\@vwid@sift\relax
170     \PackageWarning{varwidth}{Failed to reprocess entire contents}%
171   \fi
172   \ifnum\count@=\@vwid@preeqp \@vwid@eqmodefalse\fi
173   \ifnum\count@=\@vwid@posteqp \@vwid@eqmodetrue\fi
174   \ifnum\count@=\@vwid@toppen % finished
175     \let\@vwid@sift\relax
176   \else\ifnum\count@=\@vwid@offsets
177     \@vwid@setoffsets
178   \else
179     \ifnum\count@=\@vwid@postw
180     \else
181       \@vwid@resetb % reset box \z@ or measure it
182     \fi
183     \@vwid@append
184   \fi\fi
185   \@vwid@sift}%
186   }%
187 }
```



## 2.12 The german class first aid

Handling of \protected UTF-8

```

188 \AddToHook{file/german.sty/after}[firstaid]{%
189   \FirstAidNeededT{german}{sty}{1998/07/08 v2.5e Support for writing german texts (br)}
190   {%
191   \let\grmn@active@dq@\@active@dq
192   \def\@active@dq{\protect\grmn@active@dq}%
193   \germanTeX
194   }%
195   }

196 \AddToHook{file/ngerman.sty/after}[firstaid]{%
197   \FirstAidNeededT{ngerman}{sty}{1998/07/08 v2.5e Support for writing german texts (br)}
198   {%
199   \let\grmn@active@dq@\@active@dq
200   \def\@active@dq{\protect\grmn@active@dq}%
201   \ngermanTeX
202   }%
203   }

204 </kernel>

```

## 2.13 The underscore first aid

The `underscore` package makes the underscore active. This means that the underscore can not be used in label and references unless the package option `strings` is used (which patches a selection of problematic commands like `\label` and `\ref`) or `babel` is used which redefines<sup>1</sup> a selection of problematic commands like `\@testdef` or `\@newl@bel`.

With the new property commands the work-around do not work. We therefore make the underscore protected and use `\ifincsname` to allow its use in csnames.

```

205 <*underscore-ltx>
206 \ProvidesPackage{underscore-ltx}[2023/09/20 LaTeX firstaid to make underscore protected ]
207 \begingroup
208   \catcode'\_=\active
209   \protected\gdef _{%
210     \ifincsname %
211       \string_%
212     \else
213       \ifx\protect\@typeset@protect
214         \ifmmode \sb \else \BreakableUnderscore \fi
215       \else
216         \ifx\protect\@unexpandable@protect \noexpand_%
217         \else \protect_%
218       \fi\fi
219     \fi
220   }
221   \global\let\ActiveUnderscore=_
222 \endgroup
223 </underscore-ltx>

```

---

<sup>1</sup>unless the recommended option `safe=none` is used

```

224 <*kernel>
225 \AddToHook{file/underscore.sty/after}[firstaid]{%
226   \FirstAidNeededT{underscore}{sty}{2006/09/13}{\RequirePackage{underscore-ltx}}
227 </kernel>
228 <*kernel>

```

## 2.14 The `acro` package first aid

The package does not declare a `prop`, which causes an issue with newer routines in `expl3`.

```

229 \AddToHook{package/acro/after}[firstaid]{%
230   \FirstAidNeededT{acro}{sty}{2022/04/01 v3.8 typeset acronyms
231     and other abbreviations (CN)}
232   {\UseName{prop_new:c}{l__acro_tmpa_prop}}%

```

With the 2024 June release of L<sup>A</sup>T<sub>E</sub>X it will also fail to patch `\endlongtable` and therefore errors when loading. However, the patch it tries never worked (because it was setting a local boolean at a point where it was more or less immediately reset). Thus, rather than fixing the patch approach (which requires to surround the patch with `\ExplSyntaxOn \catcode'\_ =10\_ and \ExplSyntaxOff`) we simply disable the patch for now.

```

233   \acsetup{patch/longtable=false}%
234 }%
235 }

```

## 2.15 The `chemformula` package first aid

Package `chemformula` uses `l3keys2e` for option processing. This used to be made available as `chemformula` also loads `xfrac`, which loaded `l3keys2e`. However, `xfrac` has now been updated to use the newer kernel method if available, so loading `chemformula` fails.

```

236 \AddToHook{package/chemformula/before}[firstaid]{%
237   \RequirePackage{l3keys2e}%
238 }

```

## 2.16 The `chemnum` package first aid

The package does not declare a `prop`, which causes an issue with newer routines in `expl3`.

```

239 \AddToHook{package/chemnum/after}[firstaid]{%
240   \FirstAidNeededT{chemnum}{sty}{2021/01/21 v1.3a a comprehensive
241     approach for the numbering of chemical compounds (CN)}
242   {\UseName{prop_new:c}{l__chemnum_tmpa_prop}}%
243 }

```

## 2.17 The `cleveref` package first aid

The `cleveref` package expects only two data containers for its internal `\newlabel` command. This fails if `xr-hyper` is used which expands every `\newlabel` to five data container and puts the file name into the last one.

```

244 \AddToHook{package/cleveref/after}[firstaid]{%

```

```

245 \FirstAidNeededT{cleveref}{sty}{2018/03/27 v0.21.4 Intelligent cross-referencing}
246 {%

```

This are the two commands which retrieve the data from the label info. We change them to expect five arguments.

```

247 \def\cref@getref#1#2{%
248 \expandafter\let\expandafter#2\csname r@#1@cref\endcsname%
249 \expandafter\expandafter\expandafter\def%
250 \expandafter\expandafter\expandafter#2%
251 \expandafter\expandafter\expandafter{%
252 \expandafter\@firstoffive#2}}% <----- five
253 \def\cpageref@getref#1#2{%
254 \expandafter\let\expandafter#2\csname r@#1@cref\endcsname%
255 \expandafter\expandafter\expandafter\def%
256 \expandafter\expandafter\expandafter#2%
257 \expandafter\expandafter\expandafter{%
258 \expandafter\@secondoffive#2}}% <----- five

```

We also need to redefine the internal label commands of cleveref. This must be done after cleveref has made its changes in `begindocument` so we add it to the same hook using the hook label used by cleveref. This way it is guaranteed to overwrite the definitions.

```

259 \AddToHook{begindocument}[cleveref]{%
260 \def\label@noarg#1{%
261 \cref@old@label{#1}%
262 \bsphack%
263 \protected@edef\@tempa{{page}{\the\c@page}}% <--- should be protected
264 \setcounter{page}{1}%
265 \protected@edef\@tempb{\thepage}% <--- should be protected
266 \expandafter\setcounter\@tempa%
267 \cref@constructprefix{page}{\cref@result}%
268 \protected@write\@auxout{%
269 {\string\newlabel{#1@cref}{\cref@currentlabel}%
270 {\@tempb}{\arabic{page}}{\cref@result}\thepage}{-}{-}}% <----- five
271 \esphack}%
272 \def\label@optarg[#1]#2{%
273 \cref@old@label{#2}%
274 \bsphack%
275 \protected@edef\@tempa{{page}{\the\c@page}}% <--- should be protected
276 \setcounter{page}{1}%
277 \protected@edef\@tempb{\thepage}% <--- should be protected
278 \expandafter\setcounter\@tempa%
279 \cref@constructprefix{page}{\cref@result}%
280 \protected@edef\cref@currentlabel{%
281 \expandafter\cref@override@label@type%
282 \cref@currentlabel\@nil{#1}}%
283 \protected@write\@auxout{%
284 {\string\newlabel{#2@cref}{\cref@currentlabel}%
285 {\@tempb}{\arabic{page}}{\cref@result}\thepage}{-}{-}}% <----- five
286 \esphack}%
287 }

```

cleveref patches and redefines `\refstepcounter` so that a call updates its data. This fails if like e.g. in `longtable` the counter is stepped with `\@kernel@refstepcounter`. We therefore move the data setup into the label hook. As the hook is in a group we

have to smuggle the data out of it. <https://tex.stackexchange.com/a/722909/2388> and issue #1393

```

288     \newcommand\firstaid@cref@smugglelabel{\let\cref@currentlabel\cref@gcurrentlabel@temp}
289     \newcommand\firstaid@cref@updatelabeldata[1]{%
290       \cref@constructprefix{#1}{\cref@result}%
291       \ifundefined{cref@#1@alias}%
292         {\def\@tempa{#1}}%
293         {\def\@tempa{\csname cref@#1@alias\endcsname}}%
294       \protected@xdef\cref@gcurrentlabel@temp{%
295         [\@tempa][\arabic{#1}][\cref@result]%
296         \csname p@#1\expandafter\endcsname\csname the#1\endcsname}%
297       \aftergroup\firstaid@cref@smugglelabel
298     }

```

we test if \@currentcounter is empty for unnumbered sections

```

299     \newif\iftag@
300     \AddToHook{label}[firstaid/cleveref]
301     {\ifx
302       \@currentcounter\@empty
303     \else
304       \iftag@\else
305       \firstaid@cref@updatelabeldata{\@currentcounter}%
306     \fi
307     \fi}

```

Due to a bug correction in amsmath a patch in cleveref fails in LaTeX 2025-06-01, see gh 1684

```

308     \AddToHook{begindocument}[cleveref]
309     {
310       \IfPackageAtLeastT{amsmath}{2025-05-18}
311       {
312         \def\ltx@label#1{\cref@label{#1}}
313         \def\label@in@display@noarg#1{\cref@old@label@in@display{#1}}
314         \def\label@in@mmeasure@noarg#1{%
315           \begingroup
316             \measuring@false%
317             \cref@old@label@in@display{#1}%
318           \endgroup}%
319       }
320     }
321     }%
322 }

```

## 2.18 The arydshln package first aid

Making two internal commands robust to avoid expansion while constructing the array preamble.

```

323 \AddToHook{package/arydshln/after}[firstaid]{%
324   \FirstAidNeededT{arydshln}{sty}{2019/02/21 v1.76 }
325   {%
326 % add \protected
327 \protected\def\adl@vlineL#1#2#3#4{\adl@ivline#4\@nil{#1}{#2}%
328   \xdef\adl@colsL{\adl@colsL
329     \@elt{#3}{\number\@tempcnta}{\number\@tempcntb}%

```

```

330             {\adl@dashcolor}{\adl@gapcolor}}}%
331 \protected\def\adl@@vlineR#1#2#3#4{\adl@ivline#4\@nil{#1}{#2}%
332     \xdef\adl@colsR{%
333         \@elt{#3}{\number\@tempcnta}{\number\@tempcntb}%
334         {\adl@dashcolor}{\adl@gapcolor}%
335         \adl@colsR}}%
336 \let\adl@act@@vlineL\adl@@vlineL
337 \let\adl@act@@vlineR\adl@@vlineR
338 \def\endtabular{\endarray \egroup}
339 }%
340 }

```

## 2.19 The calc package first aid

The `calc` is not an external package, but for now we are removing a newly introduced incompatibility with `zref-perpage` here. At some point `amstext`, `zref-perpage`, `calc`, ... all need to be synced so that they do not overwrite the `\stepcounter` definition but safely hook into the kernel code. But that requires suitable hooks there, so has to wait.

`zref-perpage` already handles `amstext`'s `\iffirstchoice@` in `\stepcounter` so the fix in `calc` should not be applied at `begindocument`. We therefore void it.

```

341 \AddToHook{begindocument}[calc-noop]{}
342 \AddToHook{package/zref-perpage/after}{%
343     \DeclareHookRule{begindocument}{calc-noop}{voids}{calc}}

```

## 2.20 First aid after retiring the legacy mark mechanism

With the June 2025 release of L<sup>A</sup>T<sub>E</sub>X the legacy mark mechanism using `\@themark` with exactly two mark components has been removed and replaced by a more general mechanism. This affects a few packages and classes that had patched into the legacy code to extend it or to completely replace it. For now we do our best to keep that working, but mid-term all packages have to update to the new mechanism (and avoid low-level patching) in order to remain compatible with future adjustments.

For an analysis of the current situation see the github issues 1724 at <https://github.com/latex3/latex2e/issues/1724>.

We provide a dummy definition for `\@themark` because some classes expect it to be around. This prevents low-level errors but only helps if the class in question otherwise fully implement its own mark interface (as for example the AMS classes do).

```

344 \def\@themark{ }{}
345 \AddToHook{class/smfart/after}[firstaid]{%
346     \FirstAidNeededT{smfart}{cls}{2021/03/28 v1.6
347     Classe LaTeX pour les articles publies par la SMF}
348     {%
349         \def\leftmark{\expandafter\@leftmark\botmark\@empty\@empty}%
350         \def\rightmark{\expandafter\@rightmark\firstmark\@empty\@empty}%
351     }}
352 \AddToHook{class/smfbook/after}[firstaid]{%
353     \FirstAidNeededT{smfbook}{cls}{2021/03/28 v1.6
354     Classe LaTeX pour les monographies editees par la SMF}

```

```

355     {%
356       \def\leftmark{\expandafter\@leftmark\botmark\@empty\@empty}%
357       \def\rightmark{\expandafter\@rightmark\firstmark\@empty\@empty}%
358     }}

```

## 2.21 First aid for morewrites

A recent change in L<sup>A</sup>T<sub>E</sub>X breaks the `morewrites` package. Below is a possible fix for this. This may not be the final version which is why it is currently placed here (largely to avoid to distribute another full dev release for no good reason).

```

359 \ExplSyntaxOn
360 \cs_set:Npn \__shipout_force_immediate_writes: {
361   \cs_gset_eq:NN \iow_shipout:Nn \iow_now:Nn
362   \cs_gset_eq:NN \lua_shipout:n \lua_now:n
363   \cs_gset_eq:NN \__kernel_write_saved: \write
364   \cs_gset:Npn \write {\immediate \__kernel_write_saved:}
365   \global\advance\c@page\m@ne
366 }
367 \ExplSyntaxOff

```

## 2.22 First aid for AMS classes

Some time ago L<sup>A</sup>T<sub>E</sub>X fully switched to the new mark mechanism. However, the AMS classes still overwrite some, but not all, of the mark commands, i.e., `\leftmark`, `\rightmark`, and `\markboth`, assuming the old mechanism, and this way leaving it in an inconsistent state. We therefore switch the definitions back. The classes should simply stop making these redefinitions (which for a long time serve no purpose).

To support alias counter we must adapt `\@ynthm` in `amsthm` and for the three classes `amsart`, `amsbook` and `amsproc`. This has to be done early enough so that `\newtheorem` calls in the preamble work correctly. As `cleveref` undoes the definition we have to restore them after the package again.

```

368 \ExplSyntaxOn
369 \AddToHook{class/amsart/after}{
370   \DeclareRobustCommand*\markboth[2]{%
371     \mark_insert:nn{2e-left}{#1}
372     \mark_insert:nn{2e-right}{#2}
373     \tl_if_empty:nF{#2}{ \mark_insert:nn{2e-right-nonempty}{#2} }
374   }
375   \cs_set:Npn \leftmark {\mark_use_last:nn{page}{2e-left}}
376   \cs_set:Npn \rightmark {\mark_use_first:nn{page}{2e-right}}
377 }
378 \AddToHook{class/amsproc/after}{
379   \DeclareRobustCommand*\markboth[2]{%
380     \mark_insert:nn{2e-left}{#1}
381     \mark_insert:nn{2e-right}{#2}
382     \tl_if_empty:nF{#2}{ \mark_insert:nn{2e-right-nonempty}{#2} }
383   }
384   \cs_set:Npn \leftmark {\mark_use_last:nn{page}{2e-left}}
385   \cs_set:Npn \rightmark {\mark_use_first:nn{page}{2e-right}}
386 }

```

The `amsbook` class would require different adjustments (`\@secmark` would need to use the new mechanism) but with this class the overwriting still more or less works so we leave it alone for now.

```

387 \newcommand\@amsthm@reset@ynthm
388 {
389   \def\@ynthm##1[##2]##3{%
390     \ifx\relax##2\relax
391       \def\@tempa{\@oparg{\@xthm{##1}{##3}}{}}%
392     \else
393       \ifundefined{c@##2}{%
394         \def\@tempa{\@nocounterr{##2}}%
395       }{%
396         \newcounteralias{##1}{##2}% UF
397         \toks@{##3}%
398         \@xp\xdef\csname##1\endcsname{%
399           \@nx\@thm{%
400             \let\@nx\thm@swap
401             \if S\thm@swap\@nx\@firstoftwo\else\@nx\@gobble\fi
402             \@xp\@nx\csname th@the\thm@style\endcsname}%
403             {##1}{\the\toks@}}% UF changed
404           \let\@tempa\relax
405         }%
406       \fi
407     \@tempa}
408     \let\@amsthm@saved@ynthm\@ynthm
409   }
410 \AddToHook{package/amsthm/after}[firstaid/aliascounter]
411 {
412   \@amsthm@reset@ynthm
413   \AddToHook{package/cleveref/after}[firstaid/aliascounter]{\let\@ynthm\@amsthm@saved@ynthm}
414 }
415 \AddToHook{class/amsart/after}[firstaid/aliascounter]
416 {
417   \@amsthm@reset@ynthm
418   \AddToHook{package/cleveref/after}[firstaid/aliascounter]{\let\@ynthm\@amsthm@saved@ynthm}
419 }
420 \AddToHook{class/amsbook/after}[firstaid/aliascounter]
421 {
422   \@amsthm@reset@ynthm
423   \AddToHook{package/cleveref/after}{\let\@ynthm\@amsthm@saved@ynthm}
424 }
425 \AddToHook{class/amsproc/after}[firstaid/aliascounter]
426 {
427   \@amsthm@reset@ynthm
428   \AddToHook{package/cleveref/after}[firstaid/aliascounter]{\let\@ynthm\@amsthm@saved@ynthm}
429 }
430 \ExplSyntaxOff

```

## 2.23 The `cellspace` package first aid

Since this package doesn't seem to see updates we add a firstaid for now, so that it becomes usable again.

```

431 \AddToHook{package/cellspace/after}[firstaid]{%

```

```

432 \FirstAidNeededT{cellspace}{sty}{2022/01/04 v1.9.0 Spacing table cells (JN)}%
433 {\let\@startpbox@action\@startpbox}%
434 }
435 </kernel>

```

## 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.

Symbols	292, 293, 295,	115, 139, 148,
\@active@dq . . . . .	391, 394, 404, 407	153, 157, 188,
. 191, 192, 199, 200	\@tempb 265, 270, 277, 285	196, 225, 229,
\@amsthm@reset@ynthm	\@tempcnta . . . 329, 333	236, 239, 244,
. . . . . 387,	\@tempcntb . . . 329, 333	259, 300, 308,
412, 417, 422, 427	\@themark . . . . . 344	323, 341, 342,
\@amsthm@saved@ynthm	\@thm . . . . . 399	345, 352, 369,
. . . . . 408,	\@typeset@protect . 213	378, 410, 413,
413, 418, 423, 428	\@unexpandable@protect	415, 418, 420,
\@auxout . . . . . 268, 283	. . . . . 216	423, 425, 428, 431
\@bsphack . . . . . 262, 274	\@vwid@append . . . . 183	\adl@@vlineL . . 327, 336
\@combinefloats . . . 151	\@vwid@eqmodefalse . 172	\adl@@vlineR . . 331, 337
\@currentcounter . .	\@vwid@eqmodetrue . 173	\adl@act@@vlineL . . 336
. . . . . 302, 305	\@vwid@offsets . . . . 176	\adl@act@@vlineR . . 337
\@elt . . . . . 143, 329, 333	\@vwid@posteqp . . . . 173	\adl@colsL . . . . . 328
\@empty . . . . . 302,	\@vwid@postw . . . . . 179	\adl@colsR . . . 332, 335
349, 350, 356, 357	\@vwid@preeqp . . . . . 172	\adl@dashcolor . 330, 334
\@esphack . . . . . 271, 286	\@vwid@resetb . . . . . 181	\adl@gapcolor . . 330, 334
\@firstoffive . . . . . 252	\@vwid@setoffsets . 177	\adl@ivline . . . 327, 331
\@firstoftwo . . . . . 401	\@vwid@sift . . . . .	\advance . . . . . 167, 365
\@gobble . . . . . 401	. 161, 169, 175, 185	\aftergroup . . . . . 297
\@hspace . . . . . 154	\@vwid@toppen . . . . . 174	\AfterIncludeFile . . 80
\@ifclassloaded . 64, 71	\@xp . . . . . 398, 402	\AfterIncludes . . . . 34
\@ifpackageloaded 50, 57	\@xthm . . . . . 391	\arabic . . . 270, 285, 295
\@ifundefined . 291, 393	\@ynthm . . . 389, 408,	\AtBeginOfClasses . . 40
\@leftmark . . . 349, 356	413, 418, 423, 428	\AtBeginOfClassFile 62
\@ne . . . . . 145, 167	\_ . . . 208, 360, 363, 364	\AtBeginOfEveryFile 26
\@nil . . . . . 282, 327, 331	\  . . . . . 89	\AtBeginOfFile . . . . 44
\@nocounterr . . . . . 394		\AtBeginOfIncludeFile
\@cnx . . 399, 400, 401, 402	<b>A</b>	. . . . . 76
\@oparg . . . . . 391	\acsetup . . . . . 233	\AtBeginOfIncludes . . 30
\@outputbox@attachfloats	\active . . . . . 208	\AtBeginOfPackageFile
. . . . . 151	\ActiveUnderscore . 221	. . . . . 48
\@par . . . . . 112	\AddToHook . . 27, 29,	\AtBeginOfPackages . . 36
\@rightmark . . . 350, 357	31, 33, 35, 37,	\AtEndOfClasses . . . 42
\@secondoffive . . . . 258	39, 41, 43, 45,	\AtEndOfClassFile . . 69
\@spaces 12, 13, 14, 15, 16	47, 52, 53, 59,	\AtEndOfEveryFile . . 28
\@startpbox . . . . . 433	60, 66, 67, 73,	\AtEndOfFile . . . . . 46
\@startpbox@action . 433	74, 77, 79, 81,	\AtEndOfIncludeFile 78
\@tempa . . . . . 263,	84, 86, 88, 89,	\AtEndOfIncludes . . 32
266, 275, 278,	91, 98, 105, 106,	\AtEndOfPackageFile 55



\AtEndOfPackages .. 38	247, 249, 253, 255, 260, 272, 292, 293, 312, 313, 314, 327, 331, 338, 344, 349, 350, 356, 357, 389, 391, 394	\firstmark ... 350, 357 \FN@allmarks .. 143, 145
B		
\BabelCaseHack .... 105	313, 314, 327, 331, 338, 344, 349, 350, 356, 357, 389, 391, 394	G
\begingroup .... 86, 124, 154, 207, 315		\gdef ..... 209 \germanTeX ..... 193 \global ... 141, 221, 365 \grmn@active@dq@ .. . 191, 192, 199, 200
\botmark ..... 349, 356		
\BreakableUnderscore .....	\dimen ..... 122, 123 \dimen@ ..... 164	
..... 214		
C		
\c@page ... 263, 275, 365	E	H
\catcode ..... 208	\edef ..... 155 \egroup ..... 338 \else ..... 118, 119, 167, 176, 178, 180, 212, 214, 215, 217, 303, 304, 392, 401 \endarray ..... 338 \endcsname 248, 254, 293, 296, 398, 402 \endgroup ..... 135, 155, 222, 318 \endtabular ..... 338 \exp ..... 9, 18 \expandafter ..... 145, 248, 249, 250, 251, 252, 254, 255, 256, 257, 258, 266, 278, 281, 296, 349, 350, 356, 357 \ExplSyntaxOff .... 20, 96, 104, 367, 430 \ExplSyntaxOn ..... 7, 90, 97, 359, 368	\hb@xt@ ..... 127 \hskip ..... 155 \hss ..... 132
\count .... 140, 141, 144		I
\count@ ... 165, 172, 173, 174, 176, 179		\if ..... 401 \IfBooleanTF ..... 49, 56, 63, 70 \ifdim .... 118, 119, 163 \ifincsname ..... 210 \ifmmode ..... 214 \ifnum ..... 140, 144, 168, 172, 173, 174, 176, 179 \IfPackageAtLeastT . 310 \iftag@ ..... 299, 304 \ifvoid ..... 167 \ifx .. 213, 216, 301, 390 \immediate ..... 364 \in@sc@unt .... 140, 141 \iow ..... 361
\cpageref@getref .. 253		
\cref@constructprefix .....		
..... 267, 279, 290		
\cref@currentlabel .		
..... 269, 280, 282, 284, 288		
\cref@gcurrentlabel@temp .....		
..... 288, 294		
\cref@getref ..... 247		
\cref@label ..... 312		
\cref@old@label 261, 273		
\cref@old@label@in@display .....		
..... 313, 317		
\cref@override@label@type .....		
..... 281		
\cref@result 267, 270, 279, 285, 290, 295		
\CROP@genreflect .. 120		K
\CROP@horigin ..... 122		\kern ..... 123
\cs ..... 8, 92, 93, 94, 99, 100, 101, 360, 361, 362, 363, 364, 375, 376, 384, 385		L
\csname ... 248, 254, 293, 296, 398, 402	F	\label@in@display@noarg .....
	\fi ..... 118, 119, 142, 146, 163, 167, 171, 172, 173, 182, 184, 214, 218, 219, 306, 307, 401, 406	..... 313 \label@in@mmmeasure@noarg .....
		..... 314 \label@noarg ..... 260 \label@optarg ..... 272 \lastbox ..... 166 \lastkern ..... 164 \lastpenalty ..... 165 \lastskip .... 162, 163 \LaTeXFirstAidDate 2, 5 \LaTeXFirstAidVersion .....
D		..... 3, 5
\declare@file@substitution .....	\firstaid@cref@smugglelabel .....	
..... 23	..... 288, 297	
\DeclareDocumentCommand .....	\firstaid@cref@update@label .....	
..... 48, 55, 62, 69	..... 289, 305	
\DeclareHookRule .. 343	\FirstAidNeededT ..	
\DeclareRobustCommand .....	... 7, 85, 107, 116, 149, 158, 189, 197, 226, 230, 240, 245, 324, 346, 353, 432	
..... 370, 379		\leavevmode ..... 121 \leftmark ..... 349, 356, 375, 384 \let ..... 110, 112, 151, 169, 175,
\def ..... 2, 3, 105, 143, 154, 161, 192, 200,		

191, 199, 221, 248, 254, 288, 336, 337, 400, 404, 408, 413, 418, 423, 428, 433	\ltr@label . . . . . 312	\pgfpages@interceptshipout\skip@ . . . . . 154, 155, 162 . . . . . 94, 101	\space . . . . . 5, 159
\lua . . . . . 362		\pgfpages@originalshipout . . . . . 92, 93, 100	\stockheight . . . . . 119
<b>M</b>		\protect . . . . . 192, 200, 213, 216, 217	\stockwidth . . . . . 118
\m@ne . . . . . 365		\protected . . . . . . 209, 326, 327, 331	\string . . . 211, 269, 284
\mark . 371, 372, 373, 375, 376, 380, 381, 382, 384, 385		\protected@edef 263, 265, 275, 277, 280	<b>T</b>
\markboth . . . . 370, 379		\protected@write . . . . . . . 268, 283	\tex . . . . 93, 94, 100, 101
\mathcode . . . . . 89		\protected@xdef . . . 294	\the . . . . . 155, 263, 275, 402, 403
\measuring@false . . 316		\ProvidesFile . . . . . 4	\thepage . . . . . . 265, 270, 277, 285
		\ProvidesPackage . . 206	\thm@style . . . . . 402
<b>N</b>			\thm@swap . . . . 400, 401
\newcommand . . . . . . 26, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, 76, 78, 80, 288, 289, 387		<b>R</b>	\tl . . . . . 373, 382
\newcounteralias . . 396		\reflectbox . . . . . 126	\toks@ . . . . . 397, 403
\newif . . . . . 299		\relax . . . . . 155, 169, 175, 390, 404	\typeout . . . . . 10, 11
\newlabel . . . . 269, 284		\renewcommand . 109, 120	<b>U</b>
\ngermanTeX . . . . . 201		\RequirePackage 226, 237	\unkern . . . . . 164
\noexpand . . . . . 216		\rightmark . . . . . . 350, 357, 376, 385	\unpenalty . . . . . 165
\number . . . 145, 329, 333		<b>S</b>	\unskip . . . . . 162, 163
\numexpr . . . . . 145		\sb . . . . . 214	\use . . . . . 15
<b>O</b>		\SB@@par . . . . . 112	\UseName . . . . . 232, 242
\obeyedline . . . . . 110		\SB@obeylines . . . . 109	<b>V</b>
\obeylines . . . . . 111		\SB@par . . . . . 110	\vbox . . . . . 128
<b>P</b>		\set@typeset@protect . . . . . 125	\vss . . . . . 130
\PackageWarning . . . 170		\setbox . . . . . 166	<b>W</b>
\paperheight . . 119, 128		\setcounter . . . . . . 264, 266, 276, 278	\write . . . . . 363, 364
\paperwidth . . . 118, 127		\setlength . . . . . 154	<b>X</b>
\pgfhookintoshipout 99		\shipout . . . . . 92	\x . . . . . 155
		\sift@deathcycles . . . . . . . 167, 168	\xdef . . . . . 328, 332, 398
			<b>Z</b>
			\z@ . . 163, 166, 167, 181