

# The hopatch package

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## Abstract

This packages provides a wrapper to various package hooks provided by other packages or classes, but does not define own hooks.

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## 1 Documentation

Sometimes I want to add code right after a package has been loaded. Examples are bug fixes, adaptations, or added features as needed by package `hyperref`, for instance.

Unhappily  $\LaTeX$  does not provide this kind of hook. `\AtEndOfPackage` can be used inside the package only, because  $\LaTeX$  clears the hook right before it loads the package.

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\*Please report any issues at <https://github.com/ho-tex/oberdiek/issues>

Table 1: After package hooking

Macro	Provider
<code>\AfterPackage</code>	package scrfile [5]
<code>\AtEndOfPackageFile</code>	package filehook [2]
<code>\AtEndPackage</code>	class memoir [4]

Table 2: After begin document hooking

Macro	Provider
<code>\AtBeginDocument</code>	L <sup>A</sup> T <sub>E</sub> X’s kernel
<code>\AtEndPreamble</code>	package etoolbox [1]
<code>\AfterEndPreamble</code>	package etoolbox

However, there are already many packages and classes that provide hooks that are executed after the package is loaded, see table 1.

Package `hopatch` can be used without the packages of table 1. But for an early executing right after a package is loaded, one of the following class or packages should be loaded before using `\hopatch@AfterPackage`:

- package filehook
- package scrfile
- class memoir

Therefore I skip writing a new package for hooking into L<sup>A</sup>T<sub>E</sub>X’s package management and use this package to provide a wrapper to patch a package after it is loaded.

`\hopatch@AfterPackage {\langle package \rangle} {\langle patch code \rangle}`

If the package is already loaded, the `\langle patch code \rangle` is executed immediately. Otherwise the `\langle patch code \rangle` is stored in a command and tried at later locations until the package is available.

The patch is tried in the following order:

1. If the package is already loaded, the patch is applied immediately. Further locations are not tried.
2. `\AtEndPackage`, provided by class memoir [4], and `\AfterPackage`, provided by package scrfile [5], are called right after the package file is input before the hook of L<sup>A</sup>T<sub>E</sub>X’s `\AtEndOfPackage`.
3. `\AtEndOfPackageFile`, provided by package filehook [2], is called after the package is loaded and after the hook of L<sup>A</sup>T<sub>E</sub>X’s `\AtEndOfPackage`.
4. `\AtEndPreamble`, provided by package etoolbox [1], is called at the beginning of `\begin{document}` before the hook of L<sup>A</sup>T<sub>E</sub>X’s `\AtBeginDocument`.
5. `\AtBeginDocument`, provided by L<sup>A</sup>T<sub>E</sub>X.
6. `\AfterEndDocument`, provided by package etoolbox [1], is called at the very end of `\begin{document}`. Preamble commands are already forbidden there.

Because of the various locations the patch code is restricted to limitations:

- Preamble commands, see L<sup>A</sup>T<sub>E</sub>X's `\@onlypreamble` throw an error if used after `\begin{document}`. This is already the case for `\AfterEndDocument`. Therefore preamble commands are forbidden in the patching code. There are four exceptions `\ifpackageloaded`, `\ifclassloaded`, `\ifpackagelater` and `\ifclasslater`. They are redefined during `\AfterEndDocument` using the counterparts of package `ltxcmds` [3].
- `\AfterPackage` of package `scrfile` and `\AtEndPackage` of class `memoir` call the hook before L<sup>A</sup>T<sub>E</sub>X's `\AtEndOfPackage`.

## 2 Implementation

```
1 \<{*package}
```

### 2.1 Catcodes and package identification

```
2 \begingroup\catcode61\catcode48\catcode32=10\relax%
3 \catcode13=5 % ^~M
4 \endlinechar=13 %
5 \catcode123=1 % {
6 \catcode125=2 % }
7 \catcode64=11 % @
8 \def\x{\endgroup
9 \expandafter\edef\csname H0patch@AtEnd\endcsname{%
10 \endlinechar=\the\endlinechar\relax
11 \catcode13=\the\catcode13\relax
12 \catcode32=\the\catcode32\relax
13 \catcode35=\the\catcode35\relax
14 \catcode61=\the\catcode61\relax
15 \catcode64=\the\catcode64\relax
16 \catcode123=\the\catcode123\relax
17 \catcode125=\the\catcode125\relax
18 }%
19 }%
20 \x\catcode61\catcode48\catcode32=10\relax%
21 \catcode13=5 % ^~M
22 \endlinechar=13 %
23 \catcode35=6 % #
24 \catcode64=11 % @
25 \catcode123=1 % {
26 \catcode125=2 % }
27 \def\TMP@EnsureCode#1#2{%
28 \edef\H0patch@AtEnd{%
29 \H0patch@AtEnd
30 \catcode#1=\the\catcode#1\relax
31 }%
32 \catcode#1=#2\relax
33 }
34 \TMP@EnsureCode{40}{12}% (
35 \TMP@EnsureCode{41}{12}% )
36 \TMP@EnsureCode{43}{12}% +
37 \TMP@EnsureCode{46}{12}% .
38 \TMP@EnsureCode{47}{12}% /
39 \TMP@EnsureCode{91}{12}% [
40 \TMP@EnsureCode{93}{12}% ]
41 \edef\H0patch@AtEnd{\H0patch@AtEnd\noexpand\endinput}
```

Package identification.

```
42 \NeedsTeXFormat{LaTeX2e}
43 \ProvidesPackage{hopatch}%
44 [2016/05/16 v1.3 Wrapper for package hooks (HO)]
```

## 2.2 Resources

```
45 \begingroup\expandafter\expandafter\expandafter\endgroup
46 \expandafter\ifx\csname RequirePackage\endcsname\relax
47   \def\TMP@RequirePackage#1[#2]{%
48     \begingroup\expandafter\expandafter\expandafter\endgroup
49     \expandafter\ifx\csname ver@#1.sty\endcsname\relax
50       \input #1.sty\relax
51     \fi
52   }%
53   \TMP@RequirePackage{ltxcmds}[2010/12/12]%
54 \else
55   \RequirePackage{ltxcmds}[2010/12/12]%
56 \fi
```

\HOpatch@counter

```
57 \def\HOpatch@counter{0}%
```

\HOpatch@StepCounter

```
58 \ltx@ifundefined{numexpr}{%
59   \def\HOpatch@StepCounter{%
60     \begingroup
61       \count@\HOpatch@counter\relax
62       \advance\count@\ltx@one\relax
63     \edef\x{\endgroup
64       \noexpand\def\noexpand\HOpatch@counter{\the\count@}%
65     }%
66     \x
67   }%
68 }{%
69   \def\HOpatch@StepCounter{%
70     \edef\HOpatch@counter{%
71       \the\numexpr\HOpatch@counter+\ltx@one\relax
72     }%
73   }%
74 }
```

\HOpatch@list

```
75 \def\HOpatch@list{}
```

\HOpatch@Add

```
76 \def\HOpatch@Add{%
77   \ltx@LocalAppendToMacro\HOpatch@list
78 }
```

## 2.3 Package patching

\hopatch@AfterPackage

```
79 \def\hopatch@AfterPackage#1{%
80   \ltx@ifpackageloaded{#1}{%
81     \ltx@firstofone
82   }{%
83     \HOpatch@AfterPackage{#1}%
84   }%
```

85 }

\HOpatch@AfterPackage

```
86 \def\HOpatch@AfterPackage#1{%
87   \edef\HOpatch@temp{#1}%
88   \HOpatch@StepCounter
89   \expandafter\HOpatch@@AfterPackage
90   \csname HOpatch@\HOpatch@counter\expandafter\endcsname{%
91     \HOpatch@temp
92   }%
93 }
```

\HOpatch@@AfterPackage

```
94 \def\HOpatch@@AfterPackage#1#2#3{%
95   \begingroup
96     \toks@{#3}%
97     \xdef\HOpatch@gtemp{%
98       \noexpand\ltx@ifpackageloaded{#2}{%
99         \noexpand\let\noexpand#1\noexpand\relax
100       \the\toks@
101     }{%}%
102   }%
103 \endgroup
104 \let#1\HOpatch@gtemp
105 \HOpatch@Add#1%
106 \HOpatch@Try{AfterPackage}{#2}#1%
107 \HOpatch@Try{AtEndPackage}{#2}#1%
108 \HOpatch@Try{AtEndOfPackageFile}{#2}#1%
109 }
```

\HOpatch@Try

```
110 \def\HOpatch@Try#1#2#3{%
111   \ltx@ifundefined{#1}{}{}%
112   \csname #1\endcsname{#2}{#3}%
113 }%
114 }

115 \AtBeginDocument{\HOpatch@list}
116 \ltx@ifundefined{AtEndPreamble}{}{}%
117 \ltx@ifundefined{@endpreamblehook}{}{%
118   \AtEndPreamble{\HOpatch@list}%
119 }%
120 }

121 \ltx@ifundefined{AfterEndPreamble}{}{%
122   \ltx@ifundefined{@afterendpreamblehook}{}{%
123     \AfterEndPreamble{%
124       \let\HOpatch@OrgIfPackageLoaded\ifpackageloaded
125       \let\HOpatch@OrgIfPackageLater\ifpackagelater
126       \let\HOpatch@OrgIfClassLoaded\ifclassloaded
127       \let\HOpatch@OrgIfClassLater\ifclasslater
128       \let\@ifpackageloaded\ltx@ifpackageloaded
129       \let\@ifpackagelater\ltx@ifpackagelater
130       \let\@ifclassloaded\ltx@ifclassloaded
131       \let\@ifclasslater\ltx@ifclasslater
132       \HOpatch@list
133       \let\@ifpackageloaded\HOpatch@OrgIfPackageLoaded
134       \let\@ifpackagelater\HOpatch@OrgIfPackageLater
135       \let\@ifclassloaded\HOpatch@OrgIfClassLoaded
```

```

136 \let\@ifclasslater\HOpatch@OrgIfClassLater
137 }%
138 }%
139 }
140 \HOpatch@AtEnd%
141 </package>

```

### 3 Test

```

142 <*test1>
143 \def\LoadCommand{\RequirePackage{hopatch}[2016/05/16]}
144 </test1>

```

#### 3.1 Catcode checks for loading

```

145 <*test1>
146 \catcode`\{=1 %
147 \catcode`\}=2 %
148 \catcode`\#=6 %
149 \catcode`\@=11 %
150 \expandafter\ifx\csname count@endcsname\relax
151 \countdef\count@=255 %
152 \fi
153 \expandafter\ifx\csname @gobble@endcsname\relax
154 \long\def\@gobble#1{}%
155 \fi
156 \expandafter\ifx\csname @firstofone@endcsname\relax
157 \long\def\@firstofone#1{#1}%
158 \fi
159 \expandafter\ifx\csname loop@endcsname\relax
160 \expandafter\@firstofone
161 \else
162 \expandafter\@gobble
163 \fi
164 {%
165 \def\loop#1\repeat{%
166 \def\body{#1}%
167 \iterate
168 }%
169 \def\iterate{%
170 \body
171 \let\next\iterate
172 \else
173 \let\next\relax
174 \fi
175 \next
176 }%
177 \let\repeat=\fi
178 }%
179 \def\RestoreCatcodes{
180 \count@=0 %
181 \loop
182 \edef\RestoreCatcodes{%
183 \RestoreCatcodes
184 \catcode\the\count@=\the\catcode\count@\relax
185 }%
186 \ifnum\count@<255 %

```

```

187 \advance\count@ 1 %
188 \repeat
189
190 \def\RangeCatcodeInvalid#1#2{%
191 \count@=#1\relax
192 \loop
193 \catcode\count@=15 %
194 \ifnum\count@<#2\relax
195 \advance\count@ 1 %
196 \repeat
197 }
198 \def\RangeCatcodeCheck#1#2#3{%
199 \count@=#1\relax
200 \loop
201 \ifnum#3=\catcode\count@
202 \else
203 \errmessage{%
204 Character \the\count@\space
205 with wrong catcode \the\catcode\count@\space
206 instead of \number#3%
207 }%
208 \fi
209 \ifnum\count@<#2\relax
210 \advance\count@ 1 %
211 \repeat
212 }
213 \def\space{ }
214 \expandafter\ifx\csname LoadCommand\endcsname\relax
215 \def\LoadCommand{\input hopatch.sty\relax}%
216 \fi
217 \def\Test{%
218 \RangeCatcodeInvalid{0}{47}%
219 \RangeCatcodeInvalid{58}{64}%
220 \RangeCatcodeInvalid{91}{96}%
221 \RangeCatcodeInvalid{123}{255}%
222 \catcode\@=12 %
223 \catcode\|=0 %
224 \catcode\%=14 %
225 \LoadCommand
226 \RangeCatcodeCheck{0}{36}{15}%
227 \RangeCatcodeCheck{37}{37}{14}%
228 \RangeCatcodeCheck{38}{47}{15}%
229 \RangeCatcodeCheck{48}{57}{12}%
230 \RangeCatcodeCheck{58}{63}{15}%
231 \RangeCatcodeCheck{64}{64}{12}%
232 \RangeCatcodeCheck{65}{90}{11}%
233 \RangeCatcodeCheck{91}{91}{15}%
234 \RangeCatcodeCheck{92}{92}{0}%
235 \RangeCatcodeCheck{93}{96}{15}%
236 \RangeCatcodeCheck{97}{122}{11}%
237 \RangeCatcodeCheck{123}{255}{15}%
238 \RestoreCatcodes
239 }
240 \Test
241 \csname @@end\endcsname
242 \end
243 \test1)
244 \test2)

```

```

245 \NeedsTeXFormat{LaTeX2e}
246 \providecommand\variant{0}
247 \RequirePackage{filecontents}
248 \begin{filecontents}{foo.sty}
249 \ProvidesPackage{foo}
250 \def\msg#\{\immediate\write16}
251 \def\foo#1{%
252   \msg{\fooformat{#1}}%
253 }
254 \def\fooformat#1{[#1]}% hash-ok
255 \foo{* Executing foo at package loading}
256 \end{filecontents}
257
258 \ifnum\variant=1 %
259   \documentclass{memoir}%
260 \else
261   \documentclass{article}%
262 \fi
263
264 \ifcase\variant\relax
265 \or % 1
266 \or % 2
267   \usepackage{etoolbox}%
268 \or % 3
269   \usepackage{scrfile}%
270 \or % 4
271   \usepackage{filehook}%
272 \fi
273
274 \AtBeginDocument{\foo{* AtBeginDocument before hopatch}}
275 \usepackage{hopatch}
276 \AtBeginDocument{\foo{* AtBeginDocument after hopatch}}
277
278 \makeatletter
279 \hopatch@AfterPackage{foo}{%
280   \def\fooformat#1{<<#1>>}%
281 }
282 \makeatother
283
284 \AtBeginDocument{\foo{* AtBeginDocument before foo}}
285 \usepackage{foo}
286 \AtBeginDocument{\foo{* AtBeginDocument after foo}}
287
288 \foo{* Executing in preamble}
289
290 \begin{document}
291 \foo{* Executing in document}
292 \end{document}
293 </test2>

```

## 4 Installation

### 4.1 Download

**Package.** This package is available on CTAN<sup>1</sup>:

[CTAN:macros/latex/contrib/oberdiek/hopatch.dtx](https://ctan.org/ctan/packages/macros/latex/contrib/oberdiek/hopatch.dtx) The source file.

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<sup>1</sup>[CTAN:pkg/hopatch](https://ctan.org/ctan/packages/macros/latex/contrib/oberdiek/hopatch.dtx)



[CTAN:macros/latex/contrib/oberdiek/hopatch.pdf](#) Documentation.

**Bundle.** All the packages of the bundle ‘oberdiek’ are also available in a TDS compliant ZIP archive. There the packages are already unpacked and the documentation files are generated. The files and directories obey the TDS standard.

[CTAN:install/macros/latex/contrib/oberdiek.tds.zip](#)

*TDS* refers to the standard “A Directory Structure for  $\text{\TeX}$  Files” ([CTAN:tds/tds.pdf](#)). Directories with `texmf` in their name are usually organized this way.

## 4.2 Bundle installation

**Unpacking.** Unpack the `oberdiek.tds.zip` in the TDS tree (also known as `texmf` tree) of your choice. Example (linux):

```
unzip oberdiek.tds.zip -d ~/texmf
```

**Script installation.** Check the directory `TDS:scripts/oberdiek/` for scripts that need further installation steps.

## 4.3 Package installation

**Unpacking.** The `.dtx` file is a self-extracting `docstrip` archive. The files are extracted by running the `.dtx` through plain  $\text{\TeX}$ :

```
tex hopatch.dtx
```

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

```
hopatch.sty      → tex/latex/oberdiek/hopatch.sty
hopatch.pdf      → doc/latex/oberdiek/hopatch.pdf
test/hopatch-test1.tex → doc/latex/oberdiek/test/hopatch-test1.tex
test/hopatch-test2.tex → doc/latex/oberdiek/test/hopatch-test2.tex
hopatch.dtx      → source/latex/oberdiek/hopatch.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`.

## 4.4 Refresh file name databases

If your  $\text{\TeX}$  distribution (`te $\text{\TeX}$` , `mik $\text{\TeX}$` , ...) relies on file name databases, you must refresh these. For example, `te $\text{\TeX}$`  users run `texhash` or `mktextlsr`.

## 4.5 Some details for the interested

**Unpacking with  $\text{\LaTeX}$ .** The `.dtx` chooses its action depending on the format:  
**plain  $\text{\TeX}$ :** Run `docstrip` and extract the files.

**$\text{\LaTeX}$ :** Generate the documentation.

If you insist on using  $\text{\LaTeX}$  for `docstrip` (really, `docstrip` does not need  $\text{\LaTeX}$ ), then inform the autodetect routine about your intention:

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

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

**Generating the documentation.** You can use both the `.dtx` or the `.drv` to generate the documentation. The process can be configured by the configuration file `ltxdoc.cfg`. For instance, put this 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 pdfL<sup>A</sup>T<sub>E</sub>X:

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

## 5 References

- [1] Philipp Lehman: *The etoolbox Package* 2011-01-03.  
[CTAN:macros/latex/contrib/etoolbox/etoolbox.pdf](http://CTAN:macros/latex/contrib/etoolbox/etoolbox.pdf)
- [2] Martin Scharrer: *The filehook Package*; 2011-01-09.  
[CTAN:macros/latex/contrib/filehook/filehook.pdf](http://CTAN:macros/latex/contrib/filehook/filehook.pdf)
- [3] Heiko Oberdiek: *The ltxcmds Package*; 2010-12-12.  
[CTAN:macros/latex/contrib/oberdiek/ltxcmds.pdf](http://CTAN:macros/latex/contrib/oberdiek/ltxcmds.pdf)
- [4] Peter Wilson, Lars Madsen: *The Memoir Class for Configurable Typesetting, User Guide*; 2010. [CTAN:macros/latex/contrib/memoir/memman.pdf](http://CTAN:macros/latex/contrib/memoir/memman.pdf)
- [5] Markus Kohm, Jens-Uwe Morawski: *The Guide KOMA-Script*; 2011-01-20.  
[CTAN:macros/latex/contrib/koma-script/scrguien.pdf](http://CTAN:macros/latex/contrib/koma-script/scrguien.pdf)

## 6 History

**[2011/01/30 v1.0]**

- First public version.

**[2011/06/24 v1.1]**

- Fix the use of `\AtEndPreamble` and `\AfterEndPreamble`. They are redefined by package `etoolbox` after their hooks are used and generate an error message then.

**[2012/05/28 v1.2]**

- Fix for use without  $\varepsilon$ -T<sub>E</sub>X (thanks Gordon Lee).

**[2016/05/16 v1.3]**

- Documentation updates.

## 7 Index

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

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