

The atveryend package

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2009/12/11 v1.3

Abstract

This L^AT_EX package provides two hooks for `\end{document}` that are executed after the hook of `\AtEndDocument`. `\AfterLastShipout` can be used for code that is to be executed right after the last `\clearpage` before the `..aux` file is closed. `\AtVeryEndDocument` is used for code after closing and final reading of the `..aux` file.

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1 Documentation

There are packages (e.g. `hyperref` [4], `lastpage` [6]) that want to call code after the typesetting is done, for example to remember the last page number. `LATEX` provides the hook `\AtEndDocument` (`clsguide` [1]). There are packages that use this hook to do their job for typesetting pages (e.g. `endfloat` emits the floats here [2]). Also a user might provide additional code in `\AtEndDocument`. Therefore packages have to call

in `\AtEndDocument` to get after the last shipout page. But this is not too reliable, because the right timing is important between packages that want or have to do things before the last page is output and packages that only work properly if they can reach the point after the last shipout.

Therefore the task of this package is to provide additional hooks for `\end{document}`. All hooks are called after the hook of `\AtEndDocument`.

`\BeforeClearDocument {<code>}`

The code is called before the final `\clearpage` in `\enddocument`. However it is unknown, whether the last page is already shipped out or if this will be triggered by the final `\clearpage`.

`\AfterLastShipout {<code>}`

The code is called after the final `\clearpage` of `\enddocument` before the main `..aux` file is closed. This is the right place to remember the last page in the `..aux` file, for instance.

`\AtVeryEndDocument {<code>}`

The code is called after the `..aux` file is closed and read in again. It is the place for final checks, rerun hints, final messages.

1.1 Related work

Package `scrfile`: Markus Kohm has written package `scrfile` (part of KOMA-Script [5]) that provides hooks `\BeforeClosingMainAux` and after `\AfterReadingMainAux`. They have the same function as the hooks of this package. In fact this package uses them, if they are available.

Class `revtex4-1`: This class calls `\clear@document` in `\enddocument` that wraps the final call of `\clearpage`. Thus it can be used as hook to call stuff after that `\clearpage`. This is also done by this package.

Package `etoolbox`: It provides `\AfterEndDocument`, a hook right before `\deadcycles` or `\@@end` [3].

This package tries to combine as many approaches as possible:

- It looks for a known `\enddocument` and redefines it.
- Hooks that are provided by others are used (package `scrfile` or class `revtex4-1`).
- It redefines `\@checkend` and `\@dofilelist` to insert the hooks similar to `packagescrfile`.
- The hook execution is wrapped in a macro that is redefined by its first call to prevent calling the hook more than once.

2 Implementation

```
1 (*package)
```

Reload check, especially if the package is not used with \LaTeX .

```
2 \begingroup
3 \catcode44 12 % ,
4 \catcode45 12 % -
5 \catcode46 12 % .
```

```

6 \catcode58 12 % :
7 \catcode64 11 % @
8 \catcode123 1 % {
9 \catcode125 2 % }
10 \expandafter\let\expandafter\x\csname ver@atveryend.sty\endcsname
11 \ifx\x\relax % plain-TeX, first loading
12 \else
13 \def\empty{}%
14 \ifx\x\empty % LaTeX, first loading,
15 % variable is initialized, but \ProvidesPackage not yet seen
16 \else
17 \catcode35 6 % #
18 \expandafter\ifx\csname PackageInfo\endcsname\relax
19 \def\x#1#2{%
20 \immediate\write-1{Package #1 Info: #2.}%
21 }%
22 \else
23 \def\x#1#2{\PackageInfo{#1}{#2, stopped}}%
24 \fi
25 \x{atveryend}{The package is already loaded}%
26 \aftergroup\endinput
27 \fi
28 \fi
29 \endgroup

```

Package identification:

```

30 \begingroup
31 \catcode35 6 % #
32 \catcode40 12 % (
33 \catcode41 12 % )
34 \catcode44 12 % ,
35 \catcode45 12 % -
36 \catcode46 12 % .
37 \catcode47 12 % /
38 \catcode58 12 % :
39 \catcode64 11 % @
40 \catcode91 12 % [
41 \catcode93 12 % ]
42 \catcode123 1 % {
43 \catcode125 2 % }
44 \expandafter\ifx\csname ProvidesPackage\endcsname\relax
45 \def\x#1#2#3[#4]{\endgroup
46 \immediate\write-1{Package: #3 #4}%
47 \xdef#1{#4}%
48 }%
49 \else
50 \def\x#1#2[#3]{\endgroup
51 #2[#{#3}]%
52 \ifx#1\@undefined
53 \xdef#1{#3}%
54 \fi
55 \ifx#1\relax
56 \xdef#1{#3}%
57 \fi
58 }%
59 \fi
60 \expandafter\x\csname ver@atveryend.sty\endcsname
61 \ProvidesPackage{atveryend}%
62 [2009/12/11 v1.3 Hooks at very end of document (H0)]
63 \begingroup
64 \catcode123 1 % {
65 \catcode125 2 % }
66 \def\x{\endgroup

```

```

67 \expandafter\edef\csname AtVeryEnd@AtEnd\endcsname{%
68 \catcode35 \the\catcode35\relax
69 \catcode64 \the\catcode64\relax
70 \catcode123 \the\catcode123\relax
71 \catcode125 \the\catcode125\relax
72 }%
73 }%
74 \x
75 \catcode35 6 % #
76 \catcode64 11 % @
77 \catcode123 1 % {
78 \catcode125 2 % }
79 \def\TMP@EnsureCode#1#2{%
80 \edef\AtVeryEnd@AtEnd{%
81 \AtVeryEnd@AtEnd
82 \catcode#1 \the\catcode#1\relax
83 }%
84 \catcode#1 #2\relax
85 }
86 \TMP@EnsureCode{9}{10}% (tab)
87 \TMP@EnsureCode{39}{12}% '
88 \TMP@EnsureCode{40}{12}% (
89 \TMP@EnsureCode{41}{12}% )
90 \TMP@EnsureCode{42}{12}% *
91 \TMP@EnsureCode{45}{12}% -
92 \TMP@EnsureCode{46}{12}% .
93 \TMP@EnsureCode{47}{12}% /
94 \TMP@EnsureCode{61}{12}% =
95 \TMP@EnsureCode{62}{12}% >
96 \TMP@EnsureCode{96}{12}% '
97 \g@addto@macro{\AtVeryEnd@AtEnd}{\endinput}%

```

2.1 Hooks

ryEnd@BeforeClearDocumentHook

```
98 \let\AtVeryEnd@BeforeClearDocumentHook\@empty
```

tVeryEnd@AfterLastShipoutHook

```
99 \let\AtVeryEnd@AfterLastShipoutHook\@empty
```

VeryEnd@AtVeryEndDocumentHook

```
100 \let\AtVeryEnd@AtVeryEndDocumentHook\@empty
```

\BeforeClearDocument

```

101 \newcommand*{\BeforeClearDocument}{%
102 \g@addto@macro\AtVeryEnd@BeforeClearDocumentHook
103 }

```

\AfterLastShipout

```

104 \newcommand*{\AfterLastShipout}{%
105 \g@addto@macro\AtVeryEnd@AfterLastShipoutHook
106 }

```

\AtVeryEndDocument

```

107 \newcommand*{\AtVeryEndDocument}{%
108 \g@addto@macro\AtVeryEnd@AtVeryEndDocumentHook
109 }

```

\Call@BeforeClearDocument

```

110 \newcommand*{\Call@BeforeClearDocument}{%
111 \let\BeforeClearDocument\@firstofone

```

```

112 \ifx\AtVeryEnd@BeforeClearDocumentHook\@empty
113   \PackageInfo{atveryend}{Empty hook 'BeforeClearDocument'}%
114 \else
115   \PackageInfo{atveryend}{Executing hook 'BeforeClearDocument'}%
116   \AtVeryEnd@AfterLastShipoutHook
117 \fi
118 \global\let\AtVeryEnd@BeforeClearDocumentHook\@undefined
119 \global\let\Call@BeforeClearDocument\relax
120 }

```

`\Call@AfterLastShipout`

```

121 \newcommand*{\Call@AfterLastShipout}{%
122   \let\AfterLastShipout\@firstofone
123   \ifx\AtVeryEnd@AfterLastShipoutHook\@empty
124     \PackageInfo{atveryend}{Empty hook 'AfterLastShipout'}%
125   \else
126     \PackageInfo{atveryend}{Executing hook 'AfterLastShipout'}%
127     \AtVeryEnd@AfterLastShipoutHook
128   \fi
129   \global\let\AtVeryEnd@AfterLastShipoutHook\@undefined
130   \global\let\Call@AfterLastShipout\relax
131 }

```

`\Call@AtVeryEndDocument`

```

132 \newcommand*{\Call@AtVeryEndDocument}{%
133   \let\AtVeryEndDocument\@firstofone
134   \ifx\AtVeryEnd@AtVeryEndDocumentHook\@empty
135     \PackageInfo{atveryend}{Empty hook 'AtVeryEndDocument'}%
136   \else
137     \PackageInfo{atveryend}{Executing hook 'AtVeryEndDocument'}%
138     \AtVeryEnd@AtVeryEndDocumentHook
139   \fi
140   \global\let\AtVeryEnd@AtVeryEndDocumentHook\@undefined
141   \global\let\Call@AtVeryEndDocument\relax
142 }

```

2.2 Redefining `\enddocument`

This approach looks for known versions of `\enddocument` and redefines it. Class `seminar` and package `slidesec` are not checked, because there would be too much combinations to check.

2.2.1 L^AT_EX kernel

`\AtVeryEnd@test@standard`

```

143 \def\AtVeryEnd@test@standard{%
144   \let\AtEndDocument\@firstofone
145   \@enddocumenthook
146   \@checkend{document}%
147   \clearpage
148   \begingroup
149     \if@filesw
150       \immediate\closeout\@mainaux
151       \let\@setckpt\@gobbletwo
152       \let\@newl@bel\@testdef
153       \@tempswafalse
154       \makeatletter
155       \input\jobname.aux %
156     \fi
157     \@dofilelist
158     \ifdim \font@submax >\fontsubfuzz\relax

```

```

159     \@font@warning{Size substitutions with differences\MessageBreak
160         up to \font@submax\space have occurred.\@gobbletwo}%
161     \fi
162     \@defaultsubs
163     \@refundefined
164     \if@filesw
165         \ifx \@multiplelabels \relax
166             \if@tempswa
167                 \@latex@warning@no@line{Label(s) may have changed. %
168                     Rerun to get cross-references right}%
169             \fi
170         \else
171             \@multiplelabels
172         \fi
173     \fi
174 \endgroup
175 \deadcycles\z@
176 \@@end
177 }

```

tVeryEnd@enddocument@standard

```

178 \def\AtVeryEnd@enddocument@standard{%
179     \let\AtEndDocument\@firstofone
180     \@enddocumenthook
181     \@checkend{document}%
182     \Call@BeforeClearDocument
183     \clearpage
184     \Call@AfterLastShipout
185     \begingroup
186         \if@filesw
187             \immediate\closeout\@mainaux
188             \let\@setckpt\@gobbletwo
189             \let\@newl@bel\@testdef
190             \@tempwafalse
191             \makeatletter
192             \input\jobname.aux %
193         \fi
194         \Call@AtVeryEndDocument
195         \@dofilelist
196         \ifdim \font@submax >\fontsubfuzz\relax
197             \@font@warning{Size substitutions with differences\MessageBreak
198                 up to \font@submax\space have occurred.\@gobbletwo}%
199         \fi
200         \@defaultsubs
201         \@refundefined
202         \if@filesw
203             \ifx \@multiplelabels \relax
204                 \if@tempswa
205                     \@latex@warning@no@line{Label(s) may have changed. %
206                         Rerun to get cross-references right}%
207                 \fi
208             \else
209                 \@multiplelabels
210             \fi
211         \fi
212     \endgroup
213     \deadcycles\z@
214     \@@end
215 }

```

2.2.2 Package booklet, file 2up.tex

\AtVeryEnd@test@booklet

```
216 \expandafter\def\expandafter\AtVeryEnd@test@booklet\expandafter{%
217   \expandafter\twoclearpage
218   \AtVeryEnd@test@standard
219 }
```

AtVeryEnd@enddocument@booklet

```
220 \expandafter\def\expandafter\AtVeryEnd@enddocument@booklet\expandafter{%
221   \expandafter\twoclearpage
222   \AtVeryEnd@enddocument@standard
223 }
```

2.2.3 Class dinbrief

\AtVeryEnd@test@dinbrief

```
224 \def\AtVeryEnd@test@dinbrief{%
225   \@checkend{document} %
226   \newpage
227   \begingroup
228     \if@filesw
229       \ifnum\c@labelgen>0 %
230         \immediate\closeout\@mainlbl
231         \makeatletter
232         \input \jobname@lbl\relax
233         \clearpage
234       \fi
235       \immediate\closeout\@mainaux
236     \fi
237   \endgroup
238   \deadcycles\z@
239   \@@end
240 }
```

tVeryEnd@enddocument@dinbrief

```
241 \def\AtVeryEnd@enddocument@dinbrief{%
242   \@checkend{document}%
243   \Call@BeforeClearDocument
244   \newpage
245   \Call@AfterLastShipout
246   \begingroup
247     \if@filesw
248       \ifnum\c@labelgen>\z@
249         \immediate\closeout\@mainlbl
250         \makeatletter
251         \input \jobname@lbl\relax
252         \clearpage
253       \fi
254       \immediate\closeout\@mainaux
255     \fi
256   \Call@AtVeryEndDocument
257   \endgroup
258   \deadcycles\z@
259   \@@end
260 }
```

2.2.4 Class combine

\AtVeryEnd@test@combine

```
261 \def\AtVeryEnd@test@combine{%
```



```

262 \@enddocumenthook
263 \@checkend{document}%
264 \clearpage
265 \begingroup
266   \if@filesw
267     \immediate\closeout\@mainaux
268     \immediate\closeout\@partaux
269     \let\@setckpt\@gobbletwo
270     \let\@newl@bel\@testdef
271     \@tempswafalse
272     \makeatletter \input\c@lmainauxfile %% change here
273   \fi
274   \c@lenddoca %% a replacement
275   \@refundefined
276 \endgroup
277 \deadcycles\z@
278 \@@end
279 }

```

AtVeryEnd@enddocument@combine

```

280 \def\AtVeryEnd@enddocument@combine{%
281   \@enddocumenthook
282   \@checkend{document}%
283   \Call@BeforeClearDocument
284   \clearpage
285   \Call@AfterLastShipout
286   \begingroup
287     \if@filesw
288       \immediate\closeout\@mainaux
289       \immediate\closeout\@partaux
290       \let\@setckpt\@gobbletwo
291       \let\@newl@bel\@testdef
292       \@tempswafalse
293       \makeatletter \input\c@lmainauxfile %% change here
294     \fi
295     \Call@AtVeryEndDocument
296     \c@lenddoca %% a replacement
297     \@refundefined
298   \endgroup
299   \deadcycles\z@
300   \@@end
301 }

```

2.2.5 Class jpsj2

\AtVeryEnd@test@jpsj

```

302 \def\AtVeryEnd@test@jpsj{%
303   \if@lastpagebalancing
304     \global\let\@outputdblcol=\balancing@outputdblcol
305   \fi
306   \@checkend{document}%
307   \clearpage
308   \begingroup
309     \if@filesw
310       \immediate\closeout\@mainaux
311       \def\global\@namedef##1##2{%
312         \def\newlabel{\@testdef r}%
313         \def\bibcite{\@testdef b}%
314       \@tempswafalse
315       \makeatletter
316       \input \jobname.aux %
317       \if@tempwa

```

```

318         \@warning{%
319             Label(s) may have changed. %
320             Rerun to get cross-references right%
321         }%
322     \fi
323 \fi
324 \endgroup
325 \deadcycles\z@
326 \@@end
327 }

\AtVeryEnd@enddocument@jpsj
328 \def\AtVeryEnd@enddocument@jpsj{%
329     \if@lastpagebalancing
330         \global\let\@outputdblcol=\balancing@outputdblcol
331     \fi
332     \@checkend{document}%
333     \Call@BeforeClearDocument
334     \clearpage
335     \Call@AfterLastShipout
336     \begingroup
337         \if@filesw
338             \immediate\closeout\@mainaux
339             \def\global\@namedef##1##2{%
340                 \def\newlabel{\@testdef r}%
341                 \def\bibcite{\@testdef b}%
342                 \@tempwafalse
343                 \makeatletter
344                 \input \jobname.aux %
345                 \if@tempswa
346                     \@warning{%
347                         Label(s) may have changed. %
348                         Rerun to get cross-references right%
349                     }%
350                 \fi
351             \fi
352             \Call@AtVeryEndDocument
353         \endgroup
354         \deadcycles\z@
355         \@@end
356     }

```

2.2.6 Testing and redefining

\AtVeryEnd@Test

```

357 \def\AtVeryEnd@Test#1#2{%
358     \expandafter\ifx\csname AtVeryEnd@test@#2\endcsname#1%
359         \expandafter\let\expandafter#1%
360         \csname AtVeryEnd@enddocument@#2\endcsname
361     \begingroup
362         \let\on@line\@empty
363         \PackageInfo{atveryend}{%
364             \string#1 detected (#2)%
365         }%
366     \endgroup
367     \expandafter\AtVeryEnd@SkipToNil
368 \fi
369 }

```

\AtVeryEnd@SkipToNil

```

370 \def\AtVeryEnd@SkipToNil#1\@nil{}

```

\AtVeryEnd@RedefEndDocument

```

371 \def\AtVeryEnd@RedefEndDocument#1{%
372   \ifx#1\@undefined
373   \else
374     \AtVeryEnd@Test#1{standard}%
375     \AtVeryEnd@Test#1{booklet}%
376     \AtVeryEnd@Test#1{dinbrief}%
377     \AtVeryEnd@Test#1{combine}%
378     \AtVeryEnd@Test#1{jpsj}%
379     \AtVeryEnd@SkipToNil
380     \@nil
381   \fi
382 }

383 \AtVeryEnd@RedefEndDocument\enddocument
384 \AtVeryEnd@RedefEndDocument\AP@enddocument % afterpage.sty
385 \AtVeryEnd@RedefEndDocument\hyper@back@cite@enddocument % htx-bc.sty
386 \AtVeryEnd@RedefEndDocument\hyper@enddocument % hyper.sty
387 \AtVeryEnd@RedefEndDocument\hyper@fn@enddocument % hyper.sty
388 \AtVeryEnd@RedefEndDocument\cweb@save@enddocument % cweb.cls
389 \AtVeryEnd@RedefEndDocument\prev@enddocument % flushend.sty
390 \AtVeryEnd@RedefEndDocument\endorigdocument % gaceta.cls
391 \AtVeryEnd@RedefEndDocument\keependdoc % aguplus.sty
392 \AtVeryEnd@RedefEndDocument\EMenddocument % t-angles.sty
393 \AtVeryEnd@RedefEndDocument\docmute@enddocument % docmute.sty
394 \AtVeryEnd@RedefEndDocument\@a@enddocument % al latex.sty
395 \AtVeryEnd@RedefEndDocument\enddocumentasusual % frenchle.sty
396 \AtVeryEnd@RedefEndDocument\old@enddocument % uwthesis.cls

```

2.3 Using hooks of other packages

2.3.1 Package scrfile

```

397 \AtBeginDocument{%
398   \@ifpackageloaded{scrfile}{%
399     \@ifundefined{BeforeClosingMainAux}{}{%
400       \BeforeClosingMainAux{\Call@AfterLastShipout}%
401     }%
402     \@ifundefined{AfterReadingMainAux}{}{%
403       \AfterReadingMainAux{\Call@AtVeryEndDocument}%
404     }%
405   }{}%

```

2.3.2 Package etoolbox

```

406 \@ifpackageloaded{etoolbox}{%
407   \@ifundefined{AfterEndDocument}{}{%
408     \AfterEndDocument{\Call@AtVeryEndDocument}%
409   }%
410 }{}%

```

2.4 Hack into \enddocument

```

411 \def\AtVeryEnd@document{document}%
412 \def\AtVeryEnd@RedefCheckEnd{%
413   \expandafter\def\expandafter\@checkend
414   \expandafter##\expandafter1\expandafter{%
415     \@checkend{##1}%
416     \def\AtVeryEnd@temp{##1}%
417     \ifx\AtVeryEnd@temp\AtVeryEnd@document
418       \let\AtVeryEnd@OrgClearpage\clearpage
419       \def\clearpage{%
420         \let\clearpage\AtVeryEnd@OrgClearpage
421         \Call@BeforeClearDocument

```

```

422         \clearpage
423         \Call@AfterLastShipout
424     }%
425     \fi
426 }%
427 \aftergroup\AtVeryEnd@RedefCheckEnd
428 }%
429 \AtEndDocument{%
430     \AtVeryEnd@RedefCheckEnd
431 }%
432 }

433 \AtEndDocument{%
434     \@ifundefined{@dofilelist}{%
435         \gdef@dofilelist{\Call@AtVeryEndDocument}%
436     }{%
437         \begingroup
438         \toks@\expandafter{\@dofilelist}%
439         \xdef@dofilelist{%
440             \noexpand\Call@AtVeryEndDocument
441             \the\toks@
442         }%
443         \endgroup
444     }%
445 }

```

2.5 Class letter

The class letter and some similar classes insert material (`\@startlabels`) at the end of the document. However, this method violates a precondition of this package that the `\clearpage` in `\enddocument` is the final call with no material at later times. Therefore we move the label making from the `..aux` file to `\AtEndDocument`.

```

446 \def\AtVeryEnd@temp{%
447     \AtBeginDocument{%
448         \let\@startlabels\startlabels
449         \let\@mlabel\mlabel
450         \if@filesw
451             \immediate\write\@mainaux{\string\@startlabels}%
452         \fi
453     }%
454     \AtEndDocument{%
455         \if@filesw
456             \immediate\write\@mainaux{\string\clearpage}%
457         \fi
458     }%
459 }

460 \ifx\makelabels\AtVeryEnd@temp
461 \else
462     \expandafter\AtVeryEnd@AtEnd
463 \fi
464 \let\AtVeryEnd@PatchLetter=N%
465 \begingroup\expandafter\expandafter\expandafter\endgroup
466 \expandafter\ifx\csname endletter\endcsname\relax
467 \else
468     \long\def\AtVeryEnd@TestEndLetter#1\@auxout#2#3\AtVeryEnd@Nil{%
469         \def\AtVeryEnd@temp{#2}%
470         \ifx\AtVeryEnd@temp\@empty
471             \else
472                 \@onelevel@sanitize\AtVeryEnd@temp
473                 \edef\AtVeryEnd@StringMlabel{%
474                     \string\string
475                     \string\@mlabel

```

```

476     \expandafter\@gobble\string\{%
477 }%
478 \def\AtVeryEnd@CatchFirst##1##2##3##4##5##6##7##8{%
479     ##1##2##3##4##5##6##7##8\AtVeryEnd@CatchSecond
480 }%
481 \def\AtVeryEnd@CatchSecond##1##2##3##4##5##6##7##8##9\@nil{%
482     ##1##2##3##4##5##6##7##8%
483 }%
484 \edef\AtVeryEnd@temp{%
485     \expandafter\AtVeryEnd@CatchFirst\AtVeryEnd@temp
486     {}{}{}{}{}{}{}{}%
487     {}{}{}{}{}{}{}{}%
488     \@nil
489 }%
490 \ifx\AtVeryEnd@temp\AtVeryEnd@StringMlabel
491     \expandafter\def\expandafter\endletter\expandafter{%
492         \endletter
493         \begingroup
494             \let\=\relax
495             \let\protect\@unexpandable@protect
496             \let\@mlabel=\relax
497             \edef\x{\endgroup
498                 \noexpand\AtEndDocument{%
499                     \@gobble#2%
500                 }%
501             }%
502             \x
503         }%
504         \let\AtVeryEnd@PatchLetter=Y%
505     \fi
506 \fi
507 }%
508 \expandafter\AtVeryEnd@TestEndLetter\endletter
509 \@auxout{}\AtVeryEnd@Nil
510 \fi
511 \ifx\AtVeryEnd@PatchLetter Y%
512     \begingroup
513         \let\on@line\@empty
514         \PackageInfo{atveryend}{%
515             \@backslashchar makelabels detected. %
516             Moving labels\MessageBreak
517             from '.aux' file to \@backslashchar AtEndDocument%
518         }%
519     \endgroup
520 \def\makelabels{%
521     \AtBeginDocument{%
522         \let\@startlabels\startlabels
523         \let\@mlabel\mlabel
524     }%
525 }%
526 \AtEndDocument{%
527     \@ifundefined{@startlabels}{%
528     }{%
529         \clearpage
530         \@startlabels
531     }%
532 }%
533 \AfterLastShipout{%
534     \let\@startlabels\relax
535     \let\@mlabel\@gobbletwo
536 }%
537 \else

```

```

538 \PackageWarningNoLine{atveryend}{%
539   \@backslashchar makelabels detected, but labels cannot\MessageBreak
540   be moved to \@backslashchar AtEndDocument, because\MessageBreak
541   \@backslashchar endletter is not in expected form%
542 }%
543 \fi
544 \AtVeryEnd@AtEnd
545 \end{package}

```

3 Test

3.1 Catcode checks for loading

```

546 \test1
547 \catcode'\{=1 %
548 \catcode'\}=2 %
549 \catcode'\#=6 %
550 \catcode'\@=11 %
551 \expandafter\ifx\csname count@\endcsname\relax
552   \countdef\count@=255 %
553 \fi
554 \expandafter\ifx\csname @gobble\endcsname\relax
555   \long\def\@gobble#1{%
556 \fi
557 \expandafter\ifx\csname @firstofone\endcsname\relax
558   \long\def\@firstofone#1{#1}%
559 \fi
560 \expandafter\ifx\csname loop\endcsname\relax
561   \expandafter\@firstofone
562 \else
563   \expandafter\@gobble
564 \fi
565 {%
566   \def\loop#1\repeat{%
567     \def\body{#1}%
568     \iterate
569   }%
570   \def\iterate{%
571     \body
572     \let\next\iterate
573   \else
574     \let\next\relax
575   \fi
576   \next
577 }%
578 \let\repeat=\fi
579 }%
580 \def\RestoreCatcodes{}
581 \count@=0 %
582 \loop
583   \edef\RestoreCatcodes{%
584     \RestoreCatcodes
585     \catcode\the\count@=\the\catcode\count@\relax
586   }%
587 \ifnum\count@<255 %
588   \advance\count@ 1 %
589 \repeat
590
591 \def\RangeCatcodeInvalid#1#2{%
592   \count@=#1\relax
593   \loop

```

```

594 \catcode\count@=15 %
595 \ifnum\count@<#2\relax
596 \advance\count@ 1 %
597 \repeat
598 }
599 \expandafter\ifx\csname LoadCommand\endcsname\relax
600 \def\LoadCommand{\input atveryend.sty\relax}%
601 \fi
602 \def\Test{%
603 \RangeCatcodeInvalid{0}{47}%
604 \RangeCatcodeInvalid{58}{64}%
605 \RangeCatcodeInvalid{91}{96}%
606 \RangeCatcodeInvalid{123}{255}%
607 \catcode'\@=12 %
608 \catcode'\=0 %
609 \catcode'\{=1 %
610 \catcode'\}=2 %
611 \catcode'\#=6 %
612 \catcode'\[=12 %
613 \catcode'\]=12 %
614 \catcode'\%=14 %
615 \catcode'\ =10 %
616 \catcode\13=5 %
617 \LoadCommand
618 \RestoreCatcodes
619 }
620 \Test
621 \csname @@end\endcsname
622 \end
623 </test1>

```

4 Installation

4.1 Download

Package. This package is available on CTAN¹:

[CTAN:macros/latex/contrib/oberdiek/atveryend.dtx](#) The source file.

[CTAN:macros/latex/contrib/oberdiek/atveryend.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 \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
```

¹<http://ftp.ctan.org/tex-archive/>

Script installation. Check the directory `TDS:scripts/oberdiek/` for scripts that need further installation steps. Package `attachfile2` comes with the Perl script `pdfatfi.pl` that should be installed in such a way that it can be called as `pdfatfi`. Example (linux):

```
chmod +x scripts/oberdiek/pdfatfi.pl
cp scripts/oberdiek/pdfatfi.pl /usr/local/bin/
```

4.3 Package installation

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

```
tex atveryend.dtx
```

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

```
atveryend.sty      → tex/generic/oberdiek/atveryend.sty
atveryend.pdf      → doc/latex/oberdiek/atveryend.pdf
test/atveryend-test1.tex → doc/latex/oberdiek/test/atveryend-test1.tex
atveryend.dtx      → source/latex/oberdiek/atveryend.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 \TeX distribution (te \TeX , mi \TeX , ...) relies on file name databases, you must refresh these. For example, te \TeX users run `texhash` or `mktextlsr`.

4.5 Some details for the interested

Attached source. The PDF documentation on CTAN also includes the `.dtx` source file. It can be extracted by AcrobatReader 6 or higher. Another option is `pdftk`, e.g. unpack the file into the current directory:

```
pdftk atveryend.pdf unpack_files output .
```

Unpacking with \LaTeX . The `.dtx` chooses its action depending on the format:
plain- \TeX : Run `docstrip` and extract the files.

\LaTeX : Generate the documentation.

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

```
latex \let\install=y\input{atveryend.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 pdf \LaTeX :

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


5 Acknowledgement

Arthur Ogawa: He proposed the new API with `\AfterLastShipout` and gave me much feedback, comprehensive class/package lists, many suggestions and comments.

6 References

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- [6] Jeff Goldberg: *The lastpage package*; 1994/07/20 v0.1b; [CTAN:macros/latex/contrib/lastpage/lastpage.pdf](#).
- [7] APS, AIP, Arthur Orgawa; ReVTeX 4.1; 2009/10/13 v4.1; <http://authors.aps.org/revtex4/>.

7 History

[2009/12/06 v1.0]

- The first version.

[2009/12/07 v1.1]

- Bug fixes.

[2009/12/09 v1.2]

- Additional support of classes and packages.

[2009/12/11 v1.3]

- Patch for letter like classes that puts label into the ‘.aux’ file.
- Hook `\BeforeClearDocument` added (request from Arthur Ogawa).
- Patch of `\clear@document` removed (Arthur Ogawa).
- A nested `\AtBeginDocument` removed.

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