

The atbegshi package

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Abstract

This package is a modern reimplementaion of package `everyshi` without the burden of compatibility. It makes use of ε -TeX's if available. Both L^AT_EX and plain-TeX are supported.

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1 Documentation

Package `atbegshi` redefines `\shipout` to insert hooks for user code that is executed before the page is shipped out. The code may modify or even discard the output page. Three hooks are implemented:

1. A hook that is executed for every page, see `\AtBeginShipout`
2. A hook that is executed for the next page only, see `\AtBeginShipoutNext`
3. A hook that is only executed for the first page, see `\AtBeginShipoutFirst`

The hooks are executed in this order. The following three macros provide the user interface for adding code to these hooks:

`\AtBeginShipout {⟨code⟩}`

Execute the `⟨code⟩` for every page. The page contents is held in box register `\AtBeginShipoutBox` and may be modified. Use `\AtBeginShipoutDiscard` if you want to discard the page.

Note: Package `everyshi` uses box register 255. With package `atbegshi` you must use `\AtBeginShipoutBox` instead.

If `LaTeX` calls `\shipout` in `\@outputpage` (part of its output routine), the meaning of `\protect` is `\noexpand`. `LaTeX` sets `\protect` to the appropriate `\@typeset@protect` in the box that is shipped out. This is too late for the hooks, they are called earlier in the redefined `\shipout`. Therefore package `atbegshi` sets `\protect` to `\@typeset@protect` before it calls the hooks. (In `\EveryShipout` of package `everyshi` the user is responsible for the correct setting of `\protect`.)

`\AtBeginShipoutNext {⟨code⟩}`

This reimplements package `everyshi`'s `\AtNextShipout`. The `⟨code⟩` is executed at shipout time of the next page only. It is just a convenience macro, it can be easily replaced by something like:

```

\newcommand{\MyShipoutHook}{}%
\AtBeginShipout{\MyShipoutHook}
\gdef\MyShipoutHook{%
  ... do something with next page ...
\gdef\MyShipoutHook{}%
}

```

(This can be necessary, if hook order does matter).

`\AtBeginShipoutFirst {<code>}`

This reimplements L^AT_EX's `\AtBeginDvi`. This hook is usually used for `\special` commands that include PostScript header files. The `\code` is directly executed in a `\vbox` that is put at the beginning of the output page. Dealing with the output box `\AtBeginShipoutBox` is not necessary and not permitted here.

`\AtBeginShipoutDiscard`

This macro notifies package `atbegshi` that the output page is discarded. The remaining hook code and the remaining hooks are not executed and the page is thrown away. Also `\deadcycles` is cleared to zero like an ordinary `\shipout` would do.

`\AtBeginShipoutInit`

Usually the redefinition of `\shipout` is delayed by `\AtBeginDocument` (if this macro exists). This can be too late, if other packages also redefines `\shipout` and the order does matter. `\AtBeginShipoutInit` forces the immediate redefinition of `\shipout`.

`\AtBeginShipoutUpperLeft {<background material>}`

This is a macro that puts material in the background of box `\AtBeginShipoutbox`. The `<background material>` is set in an `\hbox`, the reference point is the upper left corner of the output page. In case of pdf_TE_X in PDF mode, the settings of `\pdfhorigin` and `\pdfvorigin` are respected.

For L^AT_EX users the `<background material>` is set inside a `picture` environment:

```
\begin{picture}(0,0)
  \setlength{\unitlength}{1pt}%
  <background material>
\end{picture}
```

1.1 Example

In this example we put a circle in the background in the middle of the paper.

```
1 <*example>
2 \documentclass[a4paper]{article}
3 \usepackage{color}
4 \usepackage{atbegshi}
```

Package `picture` makes life a little easier, because we can now also use length specifications in `picture`'s commands.

```
5 \usepackage{picture}
```

Now we draw the circle in the middle of the paper. `\put` moves downwards, because the origin is at the top of the page, not at its bottom.

```
6 \AtBeginShipout{%
7   \AtBeginShipoutUpperLeft{%
8     \put(0.5\paperwidth,-0.5\paperheight){\circle{10}}%
9   }%
10 }
11 \begin{document}
12 \section{Hello World}
13 \newpage
14 \AtBeginShipoutNext{%
15   \AtBeginShipoutUpperLeft{%
```

```

16   \color{red}%
17   \put(0,-0.5\paperheight){\line(1,0){\paperwidth}}%
18   \put(0.5\paperwidth, 0){\line(0,-1){\paperheight}}%
19 }%
20 }
21 Only on this page we add a red cross.
22 \newpage
23 This page has the circle only.
24 \par
25 \vspace{\fill}
26 The next page will be discarded.
27 \newpage
28 \AtBeginShipoutNext{%
29   \AtBeginShipoutDiscard
30 }
31 This page is discarded.
32 \newpage
33 The last page.
34 \end{document}
35 \example

```

2 Method of `\shipout` overloading

2.1 `\shipout`

The \TeX primitive command `\shipout` takes a box specification and puts the box as a new page in the output file. There are two kinds of box specifications:

Direct boxes: They are given by `\hbox`, `\vbox`, or `\vtop`,
e.g. `\shipout\hbox{Hello World}`.

Indirect boxes: `\box` or `\copy` references a box register by number. The box register contains the contents of the box.

Note: `\box` also clears the box register globally.

Then we have to differentiate between void and empty boxes:

Void: Initially or after `\box` there is no box in the box register. In this cases the box register is not empty, but *void*.

Empty: A box with empty contents, such as `\hbox{}` ($= \text{\null}$) or `\vbox{}` is an *empty \hbox* or *empty \vbox* . If a box register holds such a box, the box still exists, therefore the box register is *not void*.

2.2 `\afterassignment`

We want to overload `\shipout` to do something with the box. It is quite impossible to do this reliable by catching the box using macro arguments. The variety of box specifications is too large, Examples:

```

\shipout\null
\shipout\vbox{...}
\shipout\vtop\bgroup ... \egroup
\shipout\box255

```

Even worse, the braces don't need to be balanced:

```

\shipout\hbox\bgroup}
\shipout\vbox{\egroup

```

Happily TeX provides a reliable way via `\afterassignment`. It takes a macro name and executes it just after the assignment.

Now we can redefine `\shipout`. The box specification that follows `\shipout` is caught by `\setbox`. This is an assignment to a box register. `\afterassignment` notifies TeX, that we want to call `\@test` right after the assignment:

```
\shipout :=
  \afterassignment\@test
  \setbox\mybox=
```

We have seen different box specifications. Indirect boxes are easy to understand:

```
\shipout\box0 ⇒ \setbox\mybox=\box0 \@test
```

However direct boxes can have arbitrary contents with lots of other assignments. It would be quite unpredictable if TeX would put `\@test` after the first of such an assignment or after the box specification if the box lacks of assignments. Therefore TeX puts `\@test` right at the beginning of the box specification, e.g:

```
\shipout\hbox{Hello World}
⇒ \setbox\mybox=\hbox{\@test Hello World}
```

2.3 Test for direct or indirect boxes

Now we want to execute `\@test`, but where are we? We can be after the completed box assignment, if `\shipout` was called with an indirect box. Or we are right at the beginning of a direct box.

2.3.1 With ε -TeX

With the ε -TeX's extensions the answer is very easy: Being inside the direct box means that we are inside a new group. The new primitive command `\currentgrouplevel` tells how deeply the groups are currently nested. Macro `\@test` just compares the previously stored group level with the current one:

```
\shipout :=
  \edef\saved@grouplevel{\number\currentgrouplevel}
  \afterassignment\@test
  \setbox\mybox=

\@test :=
  \ifnum\saved@grouplevel=\currentgrouplevel
    % case: indirect box, the assignment is completed
    \@output
  \else
    % case: direct box, we are inside the box
    \aftergroup\@outbox
  \fi
```

2.3.2 Without ε -TeX

Life becomes complicate without ε -TeX. We cannot ask the group level. However, if we are inside a direct box, the box register `\mybox` is not yet changed by `\setbox`. Thus we need a special initial value and compare it in `\@test` with the current value of the box.

What can be used as initial value? Arbitrary box contents cannot be compared. TeX only tells us a few properties:

- Box type: `\ifhbox`, `\ifvbox`
- Dimensions: `\wd`, `\ht`, `\dp`
- Voidness: `\ifvoid`

Unhappily all these qualities even combined are not sufficient for constructing an initial box value, because `\shipout` can be called with a box that is accidentally just the same as the chosen initial value.

Nevertheless we have two alternatives for an initial value:

- A box of some type with some funny settings that are unlikely to occur in real life, e.g a height of `4911sp-\maxdimen`.
- A void box.

A collision between this initial value and an indirect `\shipout` box with just the same value is possible. Then `\@test` will make a wrong decision that it is executed inside a direct box and delays `\@output` by `\aftergroup`. Thus `\@output` is not called at the place we want. In contrary, the result is an uncertainty about the place:

- `\shipout` is used in a group that perhaps closes some pages later. A bad place for `\@output`.
- Without a surrounding group `\aftergroup` effectively kills its argument.

In the first case of a box with special dimensions we can even loose the page. However in the case of the void box, this effect is even desired, because the original `\shipout` does not output void boxes. All we have to do is to ensure that our box `\mybox` is always void except for the phase when the overloaded `\shipout` is executed. And secondly we must keep this semantics of `\shipout` for the void case in our macros, namely `\@output`.

```
\shipout :=
% trick to get a void box \mybox
\begingroup
\setbox\mybox=\box\mybox
\endgroup
\afterassignment\@test
\setbox\mybox=

\@test :=
\ifvoid\mybox
\aftergroup\@output
\else
\@output
\fi
```

The nasty case is `\shipout\box\voidb@x` where the indirect box is void and that must not generate an output page. If a surrounding group is missing the output is ignored because of `\aftergroup`. Otherwise output is called some time later when the surrounding group closes. But `\mybox` is void outside the execution phase of the redefined `\shipout`. Also `\@output` checks for a void box and cancels the page output. The disadvantage remains that the hook in `\@output` is called for a page that will not be output.

2.3.3 `\lastkern` method

At the beginning of a new box, there is no `\kern`, the contents of the box is still empty and `\lastkern` returns 0pt. This can be used to distinguish between direct and indirect boxes: We execute `\setbox` in a box with a preceding non-zero kern. After an indirect box, `\lastkern` sees this kern, otherwise it returns 0pt.

```
\shipout :=
\begingroup
\setbox\mybox=\hbox\bgroup
\kern1pt
\afterassignment\shipout@test
```

```

\global\setbox\mybox=
\@test :=
\ifdim\lastkern=0pt
% direct box
\aftergroup\egroup
\aftergroup\endgroup
\aftergroup\@output
\else
\egroup
\endgroup
\@output
\fi

```

We have two `\setbox` commands. The first creates a controlled context box where we can safely insert a `\kern`. We get rid of this temporarily used context box by putting the local `\setbox` in a group.

After the group we want to have our shipout box in `\mybox`. Therefore we use a global assignment here.

2.4 Output

With or without ε -TeX we ensure the original behaviour of `\shipout` that void boxes do not generate output pages.

Now we can place the hook `\@hook` for the user code that wants to manipulate the output box.

```

\@output :=
\ifvoid\mybox
% cancel output of void box
\else
\@hook
\ifvoid\mybox
% user code in \@hook could has voided the box
\else
\original@shipout\box\mybox
\fi
\fi

```

2.5 Separate box register

So far we have said nothing about the box number of `\mybox`. The following case that outputs the same page twice shows that we are not free in the use of the box register:

```
\shipout\copy<num> \shipout\box<num>
```

We manipulate the box by the hook and without ε -TeX the box must even be voided. However, the use case above requires that the box contents does not change at all. Therefore we must reserve a separate box register to avoid collisions with user box registers.

Note: Box register number 255 is special for the output routine, because TeX complains if this box is not voided by the output routine. However, this requirement does not apply to `\shipout` at all. In fact `\shipout` does not change any box register. This is usually done by a call of `\box`, but the output routine can do it later *after* invoking of `\shipout`.

2.6 Summary

2.6.1 With ε -TeX

Putting the pieces together we get for ε -TeX:

```

\newbox\mybox
\let\original@shipout\shipout

\shipout :=
  \edef\saved@grouplevel{\number\currentgrouplevel}
  \afterassignment\@test
  \setbox\mybox=

\@test :=
  \ifnum\saved@grouplevel<\currentgrouplevel
    \expandafter\aftergroup
  \fi
  \@output

\@output :=
  \ifvoid\mybox
    % cancel output of void box
  \else
    \@hook
    \ifvoid\mybox
      % user code in \@hook could have voided the box
    \else
      \original@shipout\box\mybox
    \fi
  \fi

```

2.6.2 Without ε -T_EX, traditional way

And for T_EX without ε -T_EX:

```

\newbox\mybox
\begin{group}
  \setbox\mybox=\box\mybox % ensure \mybox is void
\end{group}
\let\original@shipout\shipout

\shipout :=
  % trick to get a void box \mybox
  \begin{group}
    \setbox\mybox=\box\mybox
  \end{group}
  \afterassignment\@test
  \setbox\mybox=

\@test :=
  \ifvoid\mybox
    \expandafter\aftergroup
  \fi
  \@output

\@output :=
  \ifvoid\mybox
    % cancel output of void box
  \else
    \@hook
    \ifvoid\mybox
      % user code in \@hook could have voided the box
    \else
      \original@shipout\box\mybox
    \fi
  \fi

```


2.6.3 `\lastkern` method

And for \TeX without $\varepsilon\text{-TeX}$ using the `\lastkern` method:

```
\newbox\mybox
\let\original@shipout\shipout

\shipout :=
  \begingroup
  \setbox\mybox=\hbox\bgroup
  \kern1pt
  \afterassignment\@test
  \setbox\mybox=

\@test :=
  \ifdim\lastkern=0pt
    \expandafter\aftergroup
  \fi
  \@output

\@output :=
  \egroup
  \endgroup
  \ifvoid\mybox
    % cancel output of void box
  \else
    \@hook
    \ifvoid\mybox
      % user code in \@hook could have voided the box
    \else
      \original@shipout\box\mybox
    \fi
  \fi
```

3 Implementation

Package `atbegshi` uses $\varepsilon\text{-TeX}$'s `\currentgrouplevel`, if it is available. Otherwise the `\lastkern` method is used.

```
36 <*package>
```

3.1 Reload check and package identification

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

```
37 \begingroup
38 \catcode44 12 % ,
39 \catcode45 12 % -
40 \catcode46 12 % .
41 \catcode58 12 % :
42 \catcode64 11 % @
43 \expandafter\let\expandafter\x\csname ver@atbegshi.sty\endcsname
44 \ifcase 0%
45   \ifx\x\relax % plain
46   \else
47     \ifx\x\empty % LaTeX
48     \else
49       1%
50     \fi
51   \fi
52 \else
53   \expandafter\ifx\csname PackageInfo\endcsname\relax
54     \def\x#1#2{%
```

```

55     \immediate\write-1{Package #1 Info: #2.}%
56   }%
57   \else
58     \def\x#1#2{\PackageInfo{#1}{#2, stopped}}%
59   \fi
60   \x{atbegshi}{The package is already loaded}%
61   \endgroup
62   \expandafter\endinput
63 \fi
64 \endgroup

```

Package identification:

```

65 \begingroup
66   \catcode40 12 % (
67   \catcode41 12 % )
68   \catcode44 12 % ,
69   \catcode45 12 % -
70   \catcode46 12 % .
71   \catcode47 12 % /
72   \catcode58 12 % :
73   \catcode64 11 % @
74   \expandafter\ifx\csname ProvidesPackage\endcsname\relax
75     \def\x#1#2#3[#4]{\endgroup
76       \immediate\write-1{Package: #3 #4}%
77       \xdef#1{#4}%
78     }%
79   \else
80     \def\x#1#2[#3]{\endgroup
81       #2[{#3}]%
82       \ifx#1\relax
83         \xdef#1{#3}%
84       \fi
85     }%
86   \fi
87   \expandafter\x\csname ver@atbegshi.sty\endcsname
88   \ProvidesPackage{atbegshi}%
89   [2007/09/09 v1.6 At begin shipout hook (H0)]

```

3.2 Catcodes

```

90 \expandafter\edef\csname AtBegShi@AtEnd\endcsname{%
91   \catcode64 \the\catcode64\relax
92 }
93 \catcode64 11 % @
94 \def\TMP@EnsureCode#1#2{%
95   \edef\AtBegShi@AtEnd{%
96     \AtBegShi@AtEnd
97     \catcode#1 \the\catcode#1\relax
98   }%
99   \catcode#1 #2\relax
100 }
101 \TMP@EnsureCode{40}{12}% (
102 \TMP@EnsureCode{41}{12}% )
103 \TMP@EnsureCode{44}{12}% ,
104 \TMP@EnsureCode{45}{12}% -
105 \TMP@EnsureCode{47}{12}% /
106 \TMP@EnsureCode{46}{12}% .
107 \TMP@EnsureCode{58}{12}% :
108 \TMP@EnsureCode{61}{12}% =
109 \TMP@EnsureCode{94}{7}% ^ (superscript)
110 \TMP@EnsureCode{96}{12}% ‘

```

3.3 Preparations

```

111 \begingroup\expandafter\expandafter\expandafter\endgroup
112 \expandafter\ifx\csname RequirePackage\endcsname\relax
113   \input infwarerr.sty\relax
114 \else
115   \RequirePackage{infwarerr}[2007/09/09]%
116 \fi

```

\AtBegShi@CheckDefinable

```

117 \begingroup\expandafter\expandafter\expandafter\endgroup
118 \expandafter\ifx\csname @ifdefinable\endcsname\relax
119   \def\AtBegShi@CheckDefinable#1{%
120     \ifcase\ifx#1\relax
121       \@ne
122     \else
123       \ifx#1\@undefined
124         \@ne
125       \else
126         \z@
127       \fi
128     \fi
129     \errmessage{%
130       Package atbegshi: \string#1\space
131       is already defined%
132     }%
133   \endgroup
134 \fi
135 }%
136 \else
137   \def\AtBegShi@CheckDefinable#1{%
138     \@ifdefinable{#1}{}%
139   }%
140 \fi

141 \newif\ifAtBegShi@Discarded

```

\AtBeginShipoutDiscard

```

142 \AtBegShi@CheckDefinable\AtBeginShipoutDiscard
143 \def\AtBeginShipoutDiscard{%
144   \deadcycles=\z@
145   \global\AtBegShi@Discardedtrue
146 }

147 \begingroup\expandafter\expandafter\expandafter\endgroup
148 \expandafter\ifx\csname currentgrouplevel\endcsname\relax
149   \catcode'X=9 % ignore
150   \catcode'E=14 % comment
151 \else
152   \catcode'X=14 % comment
153   \catcode'E=9 % ignore
154 \fi

```

\AtBegShi@Shipout

```

155 \def\AtBegShi@Shipout{%
156 X \begingroup
157 X \setbox\AtBeginShipoutBox=\hbox\bgroup
158 X \kern\p@
159 E \edef\AtBegShi@GroupLevel{\number\currentgrouplevel}%
160 \afterassignment\AtBegShi@Test
161 X \global
162 \setbox\AtBeginShipoutBox=%
163 }

```

\AtBegShi@Test

```
164 \def\AtBegShi@Test{%
165 X \ifdim\lastkern=\z@
166 E \ifnum\AtBegShi@GroupLevel<\currentgrouplevel
167 \expandafter\aftergroup
168 \fi
169 \AtBegShi@Output
170 }
```

\AtBegShi@Output

```
171 \def\AtBegShi@Output{%
172 X \egroup
173 X \endgroup
174 \ifvoid\AtBeginShipoutBox
175 \@PackageWarning{atbegshi}{Ignoring void shipout box}%
176 \else
177 \let\AtBegShi@OrgProtect\protect
178 \csname set@typeset@protect\endcsname
179 \global\AtBegShi@Discardedfalse
180 \AtBegShi@Hook
181 \AtBegShi@HookNext
182 \gdef\AtBegShi@HookNext{}%
183 \ifAtBegShi@Discarded
184 \@PackageInfoNoLine{atbegshi}{Shipout page discarded}%
185 \global\AtBegShi@Discardedfalse
186 \begingroup
187 \setbox\AtBeginShipoutBox\box\AtBeginShipoutBox
188 \endgroup
189 \let\protect\AtBegShi@OrgProtect
190 \else
191 \AtBegShi@First
192 \let\protect\AtBegShi@OrgProtect
193 \AtBegShi@OrgShipout\box\AtBeginShipoutBox
194 \fi
195 \fi
196 }

197 \catcode'\X=11 %
198 \catcode'\E=11 %
```

\AtBegShi@First

```
199 \def\AtBegShi@First{%
200 \begingroup
201 \def\@empty{}%
202 \ifx\AtBegShi@HookFirst\@empty
203 \else
204 \setbox\z@=\vbox{%
205 \begingroup
206 \AtBegShi@HookFirst
207 \endgroup
208 }%
209 \wd\z@=\z@
210 \ht\z@=\z@
211 \dp\z@=\z@
212 \global\setbox\AtBeginShipoutBox=\vbox{%
213 \baselineskip\z@skip
214 \lineskip\z@skip
215 \lineskiplimit\z@
216 \copy\z@
217 \copy\AtBeginShipoutBox
218 }%
219 \fi
```

```

220     \global\let\AtBegShi@First\@empty
221     \global\let\AtBeginShipoutFirst\AtBegShi@FirstDisabled
222 \endgroup
223 }

\AtBegShi@Hook
224 \gdef\AtBegShi@Hook{}

\AtBegShi@HookNext
225 \gdef\AtBegShi@HookNext{}

\AtBegShi@HookFirst
226 \gdef\AtBegShi@HookFirst{}

\AtBeginShipout
227 \AtBegShi@CheckDefinable\AtBeginShipout
228 \def\AtBeginShipout{%
229     \AtBegShi@AddHook\AtBegShi@Hook
230 }

\AtBeginShipoutNext
231 \AtBegShi@CheckDefinable\AtBeginShipoutNext
232 \def\AtBeginShipoutNext{%
233     \AtBegShi@AddHook\AtBegShi@HookNext
234 }

\AtBeginShipoutFirst
235 \AtBegShi@CheckDefinable\AtBeginShipoutFirst
236 \def\AtBeginShipoutFirst{%
237     \AtBegShi@AddTo\AtBegShi@HookFirst
238 }

\AtBegShi@FirstDisabled
239 \long\def\AtBegShi@FirstDisabled#1{%
240     \@PackageWarning{atbegshi}{%
241         First page is already shipped out, ignoring\MessageBreak
242         \string\AtBeginShipoutFirst
243     }%
244 }

\AtBegShi@AddTo
245 \begingroup\expandafter\expandafter\expandafter\endgroup
246 \expandafter\ifx\csname g@addto@macro\endcsname\relax
247     \long\def\AtBegShi@AddTo#1#2{%
248         \begingroup
249             \toks\z@\expandafter{#1#2}%
250             \xdef#1{\the\toks\z@}%
251         \endgroup
252     }%
253 \else
254     \let\AtBegShi@AddTo\g@addto@macro
255 \fi

\AtBegShi@AddHook
256 \long\def\AtBegShi@AddHook#1#2{%
257     \AtBegShi@AddTo#1{\AtBegShi@Item{#2}}%
258 }

```

\AtBegShi@Item

```

259 \long\def\AtBegShi@Item#1{%
260   \ifAtBegShi@Discarded
261   \else
262     #1%
263     \ifvoid\AtBeginShipoutBox
264       \@PackageWarning{atbegshi}{%
265         Shipout box was voided by hook,\MessageBreak
266         ignoring shipout box%
267       }%
268       \AtBeginShipoutDiscard
269     \fi
270   \fi
271 }

```

\AtBeginShipoutInit

```

272 \AtBegShi@CheckDefinable\AtBeginShipoutInit
273 \def\AtBeginShipoutInit{%
274   \csname newbox\endcsname\AtBeginShipoutBox
275   \AtBegShi@CheckDefinable\AtBegShi@OrgShipout
276   \global\let\AtBegShi@OrgShipout\shipout
277   \global\let\shipout\AtBegShi@Shipout
278   \gdef\AtBeginShipoutInit{}%
279 }

280 \begingroup\expandafter\expandafter\expandafter\endgroup
281 \expandafter\ifx\csname AtBeginDocument\endcsname\relax
282   \AtBeginShipoutInit
283 \else
284   \AtBeginDocument{\AtBeginShipoutInit}%
285 \fi

```

3.4 Positioning

```

286 \begingroup\expandafter\expandafter\expandafter\endgroup
287 \expandafter\ifx\csname RequirePackage\endcsname\relax
288   \input ifpdf.sty\relax
289 \else
290   \RequirePackage{ifpdf}\relax
291 \fi

292 \ifpdf
293   \def\AtBegShi@horigin{\pdfhorigin}%
294   \def\AtBegShi@vorigin{\pdfvorigin}%
295 \else
296   \def\AtBegShi@horigin{72.27pt}%
297   \def\AtBegShi@vorigin{72.27pt}%
298 \fi

299 \begingroup
300 \ifcase
301   \expandafter\ifx\csname picture\endcsname\relax
302     1%
303   \else
304     \expandafter\ifx\csname endpicture\endcsname\relax
305       1%
306     \else
307       0%
308     \fi
309   \fi
310 \endgroup
311 \def\AtBegShi@BeginPicture{%
312   \begingroup

```

```

313     \picture(0,0)\relax
314     \begingroup\expandafter\expandafter\expandafter\endgroup
315     \expandafter\ifx\csname unitlength\endcsname\relax
316     \else
317         \unitlength=1pt\relax
318     \fi
319     \ignorespaces
320 }%
321 \def\AtBegShi@EndPicture{%
322     \endpicture
323     \endgroup
324 }%
325 \else
326     \endgroup
327     \def\AtBegShi@BeginPicture{%
328         \setbox0=\hbox\bgroup
329         \begingroup
330         \ignorespaces
331     }%
332     \def\AtBegShi@EndPicture{%
333         \endgroup
334         \egroup
335         \ht0=0pt\relax
336         \dp0=0pt\relax
337         \copy0 %
338     }%
339 \fi
340 \def\AtBeginShipoutUpperLeft#1{%
341     \global\setbox\AtBeginShipoutBox=\hbox{%
342         \rlap{%
343             \kern-\AtBegShi@horigin\relax
344             \vbox to 0pt{%
345                 \kern-\AtBegShi@vorigin\relax
346                 \kern-\ht\AtBeginShipoutBox
347                 \AtBegShi@BeginPicture
348                 #1%
349                 \AtBegShi@EndPicture
350                 \vss
351             }%
352         }%
353         \box\AtBeginShipoutBox
354     }%
355 }

```

3.5 Patches

Patches for L^AT_EX packages that redefine `\shipout`. L^AT_EX is now supposed to use ε -T_EX. Thus we do not patch, without L^AT_EX and ε -T_EX.

```

356 \def\AtBegShi@AbortIfUndefined#1{%
357     \begingroup\expandafter\expandafter\expandafter\endgroup
358     \expandafter\ifx\csname#1\endcsname\relax
359         \AtBegShi@AtEnd
360     \expandafter\endinput
361 \fi
362 }
363 \AtBegShi@AbortIfUndefined{currentgrouplevel}
364 \AtBegShi@AbortIfUndefined{AtBeginDocument}
365 \AtBegShi@AbortIfUndefined{@ifpackageloaded}
366 \AtBegShi@AbortIfUndefined{@ifclassloaded}

```

3.5.1 Package crop

Fix of method and box.

```

367 \def\AtBegShi@PatchCrop{%
368   \begingroup
369   \def\AtBegShi@Crop@shipout{%
370     \afterassignment\CROP@ship
371     \setbox\@cclv=%
372   }%
373   \def\AtBegShi@Crop@ship{%
374     \ifvoid\@cclv
375       \expandafter\aftergroup
376       \fi
377     \CROP@@ship
378   }%
379   \def\AtBegShi@Crop@shiplist{%
380     \lineskip\z@
381     \lineskiplimit\z@
382     \baselineskip\z@
383     \CROP@kernel
384     \box\@cclv
385   }%
386   \def\AtBegShi@Crop@@ship{%
387     \CROP@shipout\vbox{%
388       \CROP@shiplist
389     }%
390   }%
391   \ifx\AtBegShi@Crop@ship\CROP@ship
392     \ifx\AtBegShi@Crop@shiplist\CROP@shiplist
393       \ifx\AtBegShi@Crop@@ship\CROP@@ship
394         \let\AtBegShi@found\relax
395         \ifx\shipout\AtBegShi@Crop@shipout
396           \def\AtBegShi@found{\shipout}%
397         \else\ifx\AtBegShi@OrgShipout\AtBegShi@Crop@shipout
398           \def\AtBegShi@found{\AtBegShi@OrgShipout}%
399         \else\ifx\@EveryShipout@Org@Shipout\AtBegShi@Crop@shipout
400           \def\AtBegShi@found{\@EveryShipout@Org@Shipout}%
401         \else\ifx\GPTorg@shipout\AtBegShi@Crop@shipout
402           \def\AtBegShi@found{\GPTorg@shipout}%
403         \else\ifx\THBorg@shipout\AtBegShi@Crop@shipout
404           \def\AtBegShi@found{\THBorg@shipout}%
405         \else\ifx\mem@oldshipout\AtBegShi@Crop@shipout
406           \def\AtBegShi@found{\mem@oldshipout}%
407         \fi\fi\fi\fi\fi\fi
408         \ifx\AtBegShi@found\relax
409           \else
410             \expandafter\endgroup
411             \expandafter\def\AtBegShi@found{%
412               \edef\AtBegShi@GroupLevel{\number\currentgrouplevel}%
413               \afterassignment\CROP@ship
414               \setbox\AtBeginShipoutBox=%
415             }%
416             \def\CROP@ship{%
417               \ifnum\AtBegShi@GroupLevel=\currentgrouplevel
418               \else
419                 \expandafter\aftergroup
420                 \fi
421               \CROP@@ship
422             }%
423             \def\CROP@shiplist{%
424               \lineskip\z@
425               \lineskiplimit\z@
426               \baselineskip\z@
427               \CROP@kernel
428               \box\AtBeginShipoutBox

```



```

429         }%
430         \def\CROP@ship{%
431             \ifvoid\AtBeginShipoutBox
432             \else
433                 \setbox\AtBeginShipoutBox=\vbox{%
434                     \CROP@shiplist
435                 }%
436                 \expandafter\CROP@shipout
437                 \expandafter\box
438                 \expandafter\AtBeginShipoutBox
439             \fi
440         }%
441         \@PackageInfoNoLine{atbegshi}{Package 'crop' patched}%
442         \begingroup
443         \fi
444     \fi
445 \fi
446 \fi
447 \endgroup
448 \let\AtBegShi@PatchCrop\relax
449 }
450 \ifpackageloaded{crop}{%
451     \AtBegShi@PatchCrop
452 }{%
453     \AtBeginDocument{\AtBegShi@PatchCrop}%
454 }

```

3.5.2 Package everyshi

Fix of method. Use of box 255 is not changed.

```

455 \def\AtBegShi@PatchEveryshi{%
456     \begingroup
457     \long\def\AtBegShi@Everyshi@shipout{%
458         \afterassignment\@EveryShipout@Test
459         \global\setbox\@cclv= %
460     }%
461     \long\def\AtBegShi@Everyshi@Test{%
462         \ifvoid\@cclv\relax
463             \aftergroup\@EveryShipout@Output
464         \else
465             \@EveryShipout@Output
466         \fi
467     }%
468     \ifx\AtBegShi@Everyshi@Test\@EveryShipout@Test
469         \let\AtBegShi@found\relax
470         \ifx\shipout\AtBegShi@Everyshi@shipout
471             \def\AtBegShi@found{\shipout}%
472         \else\ifx\AtBegShi@OrgShipout\AtBegShi@Everyshi@shipout
473             \def\AtBegShi@found{\AtBegShi@OrgShipout}%
474         \else\ifx\CROP@shipout\AtBegShi@Everyshi@shipout
475             \def\AtBegShi@found{\CROP@shipout}%
476         \else\ifx\GPTorg@shipout\AtBegShi@Everyshi@shipout
477             \def\AtBegShi@found{\GPTorg@shipout}%
478         \else\ifx\THBorg@shipout\AtBegShi@Everyshi@shipout
479             \def\AtBegShi@found{\THBorg@shipout}%
480         \else\ifx\mem@oldshipout\AtBegShi@Everyshi@shipout
481             \def\AtBegShi@found{\mem@oldshipout}%
482         \else
483             \expandafter\ifx\cename @EveryShipout@Org@Shipout\endcename
484             \relax
485             \ifx\@EveryShipout@Shipout\AtBegShi@Everyshi@shipout
486                 \def\AtBegShi@found{\@EveryShipout@Shipout}%

```

```

487         \fi
488     \fi
489     \fi\fi\fi\fi\fi\fi
490     \ifx\AtBegShi@found\relax
491     \else
492         \expandafter\endgroup
493         \expandafter\def\AtBegShi@found{%
494             \edef\AtBegShi@GroupLevel{\number\currentgrouplevel}%
495             \afterassignment\@EveryShipout@Test
496             \setbox\AtBeginShipoutBox=%
497         }%
498         \def\@EveryShipout@Test{%
499             \ifnum\AtBegShi@GroupLevel=\currentgrouplevel
500             \else
501                 \expandafter\aftergroup
502             \fi
503             \AtBegShi@Everyshi@Output
504         }%
505         \def\AtBegShi@Everyshi@Output{%
506             \ifvoid\AtBeginShipoutBox
507             \else
508                 \global\setbox\@cclv\box\AtBeginShipoutBox
509                 \expandafter\@EveryShipout@Output
510             \fi
511         }%
512         \@PackageInfoNoLine{atbegshi}{Package 'everyshi' patched}%
513         \begingroup
514     \fi
515 \fi
516 \endgroup
517 \let\AtBegShi@PatchEveryshi\relax
518 }
519 \@ifpackageloaded{everyshi}{%
520     \AtBegShi@PatchEveryshi
521 }{%
522     \AtBeginDocument{\AtBegShi@PatchEveryshi}%
523 }

```

3.5.3 Class memoir

Fix of method and box.

```

524 \def\AtBegShi@PatchMemoir{%
525     \begingroup
526     \def\AtBegShi@Memoir@shipout{%
527         \afterassignment\mem@shipi
528         \setbox\@cclv=%
529     }%
530     \def\AtBegShi@Memoir@shipi{%
531         \ifvoid\@cclv
532             \expandafter\aftergroup
533         \fi
534         \mem@shipii
535     }%
536     \def\AtBegShi@Memoir@shipiiA{%
537         \mem@oldshipout\vbox{%
538             \trimmarks
539             \unvbox\@cclv
540         }%
541     }%
542     \def\AtBegShi@Memoir@shipiiB{%
543         \ifvoid\@cclv
544             \mem@oldshipout\box\@cclv

```

```

545 \else
546 \mem@oldshipout\vbox{%
547 \trimmarks
548 \unvbox\@cclv
549 }%
550 \fi
551 }%
552 \ifx\AtBegShi@Memoir@shipi\mem@shipi
553 \ifcase\ifx\AtBegShi@Memoir@shipiiA\mem@shipii
554 \z@
555 \else
556 \ifx\AtBegShi@Memoir@shipiiB\mem@shipii
557 \z@
558 \else
559 \@ne
560 \fi
561 \fi
562 \let\AtBegShi@found\relax
563 \ifx\shipout\AtBegShi@Memoir@shipout
564 \def\AtBegShi@found{\shipout}%
565 \else\ifx\AtBegShi@OrgShipout\AtBegShi@Memoir@shipout
566 \def\AtBegShi@found{\AtBegShi@OrgShipout}%
567 \else\ifx\CROP@shipout\AtBegShi@Memoir@shipout
568 \def\AtBegShi@found{\CROP@shipout}%
569 \else\ifx\GPTorg@shipout\AtBegShi@Memoir@shipout
570 \def\AtBegShi@found{\GPTorg@shipout}%
571 \else\ifx\THBorg@shipout\AtBegShi@Memoir@shipout
572 \def\AtBegShi@found{\THBorg@shipout}%
573 \else\ifx\@EveryShipout@Org@Shipout\AtBegShi@Memoir@shipout
574 \def\AtBegShi@found{\@EveryShipout@Org@Shipout}%
575 \fi\fi\fi\fi\fi\fi
576 \ifx\AtBegShi@found\relax
577 \else
578 \expandafter\endgroup
579 \expandafter\def\AtBegShi@found{%
580 \edef\AtBegShi@GroupLevel{\number\currentgrouplevel}%
581 \afterassignment\mem@shipi
582 \setbox\AtBeginShipoutBox=%
583 }%
584 \def\mem@shipi{%
585 \ifnum\AtBegShi@GroupLevel=\currentgrouplevel
586 \else
587 \expandafter\aftergroup
588 \fi
589 \mem@shipii
590 }%
591 \def\mem@shipii{%
592 \ifvoid\AtBeginShipoutBox
593 \else
594 \setbox\AtBeginShipoutBox=\vbox{%
595 \trimmarks
596 \ifvbox\AtBeginShipoutBox
597 \unvbox\AtBeginShipoutBox
598 \else
599 \box\AtBeginShipoutBox
600 \fi
601 }%
602 \expandafter\mem@oldshipout
603 \expandafter\box
604 \expandafter\AtBeginShipoutBox
605 \fi
606 }%

```

```

607         \@PackageInfoNoLine{atbegshi}{Class 'memoir' patched}%
608         \begingroup
609         \fi
610         \fi
611         \fi
612     \endgroup
613     \let\AtBegShi@PatchMemoir\relax
614 }
615 \@ifclassloaded{memoir}{%
616     \AtBegShi@PatchMemoir
617 }{%
618     \AtBeginDocument{\AtBegShi@PatchMemoir}%
619 }
620 \AtBegShi@AtEnd
621 \end{package}

```

4 Test

4.1 Catcode checks for loading

```

622 (*test1)
623 \catcode'\@=11 %
624 \def\RestoreCatcodes{}
625 \count@=0 %
626 \loop
627     \edef\RestoreCatcodes{%
628         \RestoreCatcodes
629         \catcode\the\count@=\the\catcode\count@\relax
630     }%
631 \ifnum\count@<255 %
632     \advance\count@\@ne
633 \repeat
634
635 \def\RangeCatcodeInvalid#1#2{%
636     \count@=#1\relax
637     \loop
638         \catcode\count@=15 %
639     \ifnum\count@<#2\relax
640         \advance\count@\@ne
641     \repeat
642 }
643 \def\Test{%
644     \RangeCatcodeInvalid{0}{47}%
645     \RangeCatcodeInvalid{58}{64}%
646     \RangeCatcodeInvalid{91}{96}%
647     \RangeCatcodeInvalid{123}{255}%
648     \catcode'\@=12 %
649     \catcode'\=0 %
650     \catcode'\{=1 %
651     \catcode'\}=2 %
652     \catcode'\#=6 %
653     \catcode'\[=12 %
654     \catcode'\]=12 %
655     \catcode'\%=14 %
656     \catcode'\ =10 %
657     \catcode13=5 %
658     \input atbegshi.sty\relax
659     \RestoreCatcodes
660 }
661 \Test
662 \csname @@end\endcsname

```

```

663 \end
664 </test1>
665 <test2>
666 \input atbegshi.sty\relax
667 \def\msg#\{ \immediate\write16}
668 \msg{File: atbegshi-test2.tex 2007/09/09 v1.6 Test file for plain-TeX}
669 \def\testmsg#1#2{%
670   \msg{ }%
671   \msg{*** Test with box (#1), expected page output [#2]]}% hash-ok
672 }
673
674 \newbox\voidbox
675 \def\void{\box\voidbox}
676 \begingroup
677   \setbox\voidbox=\void
678 \endgroup
679
680 \count0=0\relax
681 \AtBeginShipout{%
682   \global\advance\count0 by 1\relax
683   \msg{* Inside \string\AtBeginShipout: [\the\count0]]}%
684 }
685
686 \AtBeginShipoutFirst{%
687   \msg{* Inside \string\AtBeginShipoutFirst}%
688   Hello World%
689 }
690
691 \testmsg{\string\null}{1}
692 \shipout\null
693
694 \AtBeginShipoutFirst{%
695   This is too late%
696 }
697
698 \testmsg{void}{ }
699 \shipout\void
700
701 \testmsg{\string\copy255 (not void)}{2}
702 \setbox255\hbox{\vrule height 10bp width 10bp}
703 \shipout\copy255 %
704
705 \testmsg{\string\copy255 (again)}{3}
706 \shipout\copy255 %
707
708 \testmsg{\string\box255}{4}
709 \shipout\box255 %
710
711 \testmsg{\string\box255 (again)}{ }
712 \shipout\box255 %
713
714 \testmsg{\string\hbox}{5}
715 \shipout\hbox{\vrule height 5bp width 20bp}
716
717 \testmsg{\string\vbox}{6}
718 \shipout\vbox{\hrule height 20bp width 5bp}
719
720 \testmsg{\string\null, voided by hook}{ }
721 \def\VoidBox{%
722   \begingroup
723     \setbox\AtBeginShipoutBox=\box\AtBeginShipoutBox
724   \endgroup

```

```

725 }
726 \AtBeginShipout{\VoidBox}
727 \shipout\null
728 \def\VoidBox{}
729
730 \msg{*** \string\beginngroup}
731 \beginngroup
732   \testmsg{void}{}%
733   \shipout\void
734 \msg{*** \string\endgroup}
735 \endgroup
736
737 \msg{*** \string\beginngroup}
738 \beginngroup
739   \testmsg{void}{}%
740   \shipout\void
741   \testmsg{\string\null}{8}%
742   \shipout\null
743 \msg{*** \string\endgroup}
744 \endgroup
745
746 \testmsg{output routine}{9}
747 Hello World
748 \vfill
749 \eject
750
751 \testmsg{\string\null\space(discarded)}{ }
752 \AtBeginShipout{%
753   \msg{* Inside \string\AtBeginShipout: DISCARD}%
754   \AtBeginShipoutDiscard
755 }
756 \shipout\null
757
758 \end
759 </test2>
760 <*test3>
761 \NeedsTeXFormat{LaTeX2e}
762 \ProvidesFile{atbegshi-test3.tex}[2007/09/09 v1.6 Test file for LaTeX]
763 \RequirePackage{color}
764 \pagecolor{yellow}
765 \documentclass[a5paper,showtrims]{memoir}
766 \usepackage{atbegshi}
767 \AtBeginShipout{%
768   \setbox\AtBeginShipoutBox=\vbox{%
769     \vbox to 0pt{%
770       \kern-1.5in %
771       \hbox to 0pt{%
772         \kern-1.5in %
773         \color{blue}%
774         \rule{1in}{1in}%
775         \hss
776       }%
777       \vss
778     }%
779     \hrule
780     \hbox{\vrule\box\AtBeginShipoutBox\vrule}%
781     \hrule
782   }%
783 }
784 \usepackage{eso-pic}
785 \makeatletter
786 \@EveryShipout@Init

```

```

787 \let\@EveryShipout@Init\relax
788 \makeatother
789 \AddToShipoutPicture{%
790   \hspace{.52\paperwidth}%
791   \colorbox{cyan}{%
792     \rule{0mm}{\paperheight}%
793     \hspace{.48\paperwidth}%
794   }%
795 }

```

Newer versions of class memoir emulate package crop and prevents its loading. This is undone in next line for this test file.

```

796 \expandafter\let\csname ver@crop.sty\endcsname\relax
797 \usepackage[color=red,cross,a4,center]{crop}
798 \begin{document}
799 \shipout\null
800 \shipout\box\csname voidb@x\endcsname
801 \section{Hello World}
802 \end{document}
803 </test3>

```

5 Installation

5.1 Download

Package. This package is available on CTAN¹:

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

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

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

5.2 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. 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/

```

5.3 Package installation

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

```
tex atbegshi.dtx
```

¹<http://ftp.ctan.org/tex-archive/>

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

```
atbegshi.sty      → tex/generic/oberdiek/atbegshi.sty
atbegshi.pdf      → doc/latex/oberdiek/atbegshi.pdf
atbegshi-example.tex → doc/latex/oberdiek/atbegshi-example.tex
test/atbegshi-test1.tex → doc/latex/oberdiek/test/atbegshi-test1.tex
test/atbegshi-test2.tex → doc/latex/oberdiek/test/atbegshi-test2.tex
test/atbegshi-test3.tex → doc/latex/oberdiek/test/atbegshi-test3.tex
atbegshi.dtx      → source/latex/oberdiek/atbegshi.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`.

5.4 Refresh file name databases

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

5.5 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 atbegshi.pdf unpack_files output .
```

Unpacking with $\text{L}^{\text{A}}\text{T}_{\text{E}}\text{X}$. The `.dtx` chooses its action depending on the format:

plain- $\text{T}_{\text{E}}\text{X}$: Run `docstrip` and extract the files.

$\text{L}^{\text{A}}\text{T}_{\text{E}}\text{X}$: Generate the documentation.

If you insist on using $\text{L}^{\text{A}}\text{T}_{\text{E}}\text{X}$ for `docstrip` (really, `docstrip` does not need $\text{L}^{\text{A}}\text{T}_{\text{E}}\text{X}$), then inform the autodetect routine about your intention:

```
latex \let\install=y\input{atbegshi.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 $\text{L}^{\text{A}}\text{T}_{\text{E}}\text{X}$` :

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

6 History

[2007/04/17 v1.0]

- First version.

[2007/04/18 v1.1]

- New method based on `\lastkern` is used if ε -TeX is missing.
- `\AtBeginShipoutDiscard` also resets `\deadcycles`.

[2007/04/19 v1.2]

- `\AtBeginShipoutEarly` removed for simplification reasons.
- Forgotten definition of `\AtBegShi@Info` added.
- Patches for packages `crop` and `everyshi` and class `memoir` added.

[2007/04/26 v1.3]

- Use of package `infwarerr`.
- Catcode section after generic header.

[2007/04/27 v1.4]

- Small optimizations.

[2007/06/06 v1.5]

- `\AtBeginShipoutUpperLeft` added.
- Example added.
- Fix in second test file for newer version of `memoir`.

[2007/09/09 v1.6]

- Catcode section rewritten.

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

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