

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 \LaTeX 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 pdfT_EX 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{}` (`= \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   [2007/06/06 v1.5 At begin shipout hook (H0)]

```

3.2 Catcodes

```

90 \expandafter\edef\csname AtBegShi@End\endcsname{%
91   \catcode40 \the\catcode40\relax % (
92   \catcode41 \the\catcode41\relax % )
93   \catcode44 \the\catcode44\relax % ,
94   \catcode45 \the\catcode45\relax % -
95   \catcode46 \the\catcode46\relax % .
96   \catcode58 \the\catcode58\relax % :
97   \catcode61 \the\catcode61\relax % =
98   \catcode64 \the\catcode64\relax % @
99   \catcode94 \the\catcode94\relax % ^
100  \catcode96 \the\catcode96\relax % '
101  \noexpand\endinput
102 }
103 \catcode40 12 % (
104 \catcode41 12 % )
105 \catcode44 12 % ,
106 \catcode45 12 % -
107 \catcode46 12 % .
108 \catcode58 12 % :
109 \catcode61 12 % =
110 \catcode64 11 % @
111 \catcode94 7 % ^
112 \catcode96 12 % '

```

3.3 Preparations

```

113 \begingroup\expandafter\expandafter\expandafter\endgroup
114 \expandafter\ifx\csname RequirePackage\endcsname\relax
115   \input infwarerr.sty\relax
116 \else
117   \RequirePackage{infwarerr}%
118 \fi

\AtBegShi@CheckDefinable

119 \begingroup\expandafter\expandafter\expandafter\endgroup
120 \expandafter\ifx\csname @ifdefinable\endcsname\relax
121   \def\AtBegShi@CheckDefinable#1{%
122     \ifcase\ifx#1\relax
123       \@ne
124     \else
125       \ifx#1\@undefined
126         \@ne
127       \else
128         \z@
129       \fi
130     \fi
131     \errmessage{%
132       Package atbegshi: \string#1\space
133       is already defined%
134     }%
135   \endgroup
136 \fi
137 }%
138 \else
139   \def\AtBegShi@CheckDefinable#1{%
140     \@ifdefinable{#1}{}%
141   }%
142 \fi

143 \newif\ifAtBegShi@Discarded

\AtBeginShipoutDiscard

144 \AtBegShi@CheckDefinable\AtBeginShipoutDiscard
145 \def\AtBeginShipoutDiscard{%
146   \deadcycles=\z@
147   \global\AtBegShi@Discardedtrue
148 }

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

\AtBegShi@Shipout

157 \def\AtBegShi@Shipout{%
158 X \begingroup
159 X \setbox\AtBeginShipoutBox=\hbox\bgroup
160 X \kern\p@
161 E \edef\AtBegShi@GroupLevel{\number\currentgrouplevel}%
162 \afterassignment\AtBegShi@Test
163 X \global
164 \setbox\AtBeginShipoutBox=%
165 }
```

\AtBegShi@Test

```
166 \def\AtBegShi@Test{%
167 X \ifdim\lastkern=\z@
168 E \ifnum\AtBegShi@GroupLevel<\currentgrouplevel
169 \expandafter\aftergroup
170 \fi
171 \AtBegShi@Output
172 }
```

\AtBegShi@Output

```
173 \def\AtBegShi@Output{%
174 X \egroup
175 X \endgroup
176 \ifvoid\AtBeginShipoutBox
177 \@PackageWarning{atbegshi}{Ignoring void shipout box}%
178 \else
179 \let\AtBegShi@OrgProtect\protect
180 \csname set@typeset@protect\endcsname
181 \global\AtBegShi@Discardedfalse
182 \AtBegShi@Hook
183 \AtBegShi@HookNext
184 \gdef\AtBegShi@HookNext{}%
185 \ifAtBegShi@Discarded
186 \@PackageInfoNoLine{atbegshi}{Shipout page discarded}%
187 \global\AtBegShi@Discardedfalse
188 \begingroup
189 \setbox\AtBeginShipoutBox\box\AtBeginShipoutBox
190 \endgroup
191 \let\protect\AtBegShi@OrgProtect
192 \else
193 \AtBegShi@First
194 \let\protect\AtBegShi@OrgProtect
195 \AtBegShi@OrgShipout\box\AtBeginShipoutBox
196 \fi
197 \fi
198 }

199 \catcode'\X=11 %
200 \catcode'\E=11 %
```

\AtBegShi@First

```
201 \def\AtBegShi@First{%
202 \begingroup
203 \def\@empty{}%
204 \ifx\AtBegShi@HookFirst\@empty
205 \else
206 \setbox\z@=\vbox{%
207 \begingroup
208 \AtBegShi@HookFirst
209 \endgroup
210 }%
211 \wd\z@=\z@
212 \ht\z@=\z@
213 \dp\z@=\z@
214 \global\setbox\AtBeginShipoutBox=\vbox{%
215 \baselineskip\z@skip
216 \lineskip\z@skip
217 \lineskiplimit\z@
218 \copy\z@
219 \copy\AtBeginShipoutBox
220 }%
221 \fi
```

```

222     \global\let\AtBegShi@First\@empty
223     \global\let\AtBeginShipoutFirst\AtBegShi@FirstDisabled
224 \endgroup
225 }

\AtBegShi@Hook
226 \gdef\AtBegShi@Hook{}

\AtBegShi@HookNext
227 \gdef\AtBegShi@HookNext{}

\AtBegShi@HookFirst
228 \gdef\AtBegShi@HookFirst{}

\AtBeginShipout
229 \AtBegShi@CheckDefinable\AtBeginShipout
230 \def\AtBeginShipout{%
231     \AtBegShi@AddHook\AtBegShi@Hook
232 }

\AtBeginShipoutNext
233 \AtBegShi@CheckDefinable\AtBeginShipoutNext
234 \def\AtBeginShipoutNext{%
235     \AtBegShi@AddHook\AtBegShi@HookNext
236 }

\AtBeginShipoutFirst
237 \AtBegShi@CheckDefinable\AtBeginShipoutFirst
238 \def\AtBeginShipoutFirst{%
239     \AtBegShi@AddTo\AtBegShi@HookFirst
240 }

\AtBegShi@FirstDisabled
241 \long\def\AtBegShi@FirstDisabled#1{%
242     \@PackageWarning{atbegshi}{%
243         First page is already shipped out, ignoring\MessageBreak
244         \string\AtBeginShipoutFirst
245     }%
246 }

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

\AtBegShi@AddHook
258 \long\def\AtBegShi@AddHook#1#2{%
259     \AtBegShi@AddTo#1{\AtBegShi@Item{#2}}%
260 }

```

\AtBegShi@Item

```

261 \long\def\AtBegShi@Item#1{%
262   \ifAtBegShi@Discarded
263   \else
264     #1%
265     \ifvoid\AtBeginShipoutBox
266       \@PackageWarning{atbegshi}{%
267         Shipout box was voided by hook,\MessageBreak
268         ignoring shipout box%
269       }%
270     \AtBeginShipoutDiscard
271   \fi
272 \fi
273 }

```

\AtBeginShipoutInit

```

274 \AtBegShi@CheckDefinable\AtBeginShipoutInit
275 \def\AtBeginShipoutInit{%
276   \csname newbox\endcsname\AtBeginShipoutBox
277   \AtBegShi@CheckDefinable\AtBegShi@OrgShipout
278   \global\let\AtBegShi@OrgShipout\shipout
279   \global\let\shipout\AtBegShi@Shipout
280   \gdef\AtBeginShipoutInit{}%
281 }

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

```

3.4 Positioning

```

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

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

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

```

```

315     \picture(0,0)\relax
316     \begingroup\expandafter\expandafter\expandafter\endgroup
317     \expandafter\ifx\csname unitlength\endcsname\relax
318     \else
319         \unitlength=1pt\relax
320     \fi
321     \ignorespaces
322 }%
323 \def\AtBegShi@EndPicture{%
324     \endpicture
325     \endgroup
326 }%
327 \else
328     \endgroup
329     \def\AtBegShi@BeginPicture{%
330         \setbox0=\hbox\bgroup
331         \begingroup
332         \ignorespaces
333     }%
334     \def\AtBegShi@EndPicture{%
335         \endgroup
336         \egroup
337         \ht0=0pt\relax
338         \dp0=0pt\relax
339         \copy0 %
340     }%
341 \fi

342 \def\AtBeginShipoutUpperLeft#1{%
343     \global\setbox\AtBeginShipoutBox=\hbox{%
344         \rlap{%
345             \kern-\AtBegShi@horigin\relax
346             \vbox to 0pt{%
347                 \kern-\AtBegShi@vorigin\relax
348                 \kern-\ht\AtBeginShipoutBox
349                 \AtBegShi@BeginPicture
350                 #1%
351                 \AtBegShi@EndPicture
352                 \vss
353             }%
354         }%
355     \box\AtBeginShipoutBox
356 }%
357 }

```

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.

```

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

```

3.5.1 Package crop

Fix of method and box.

```

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

```

```

430         }%
431         \def\CROP@ship{%
432             \ifvoid\AtBeginShipoutBox
433             \else
434                 \setbox\AtBeginShipoutBox=\vbox{%
435                     \CROP@shiplist
436                 }%
437                 \expandafter\CROP@shipout
438                 \expandafter\box
439                 \expandafter\AtBeginShipoutBox
440             \fi
441         }%
442         \@PackageInfoNoLine{atbegshi}{Package 'crop' patched}%
443         \begingroup
444         \fi
445     \fi
446 \fi
447 \fi
448 \endgroup
449 \let\AtBegShi@PatchCrop\relax
450 }
451 \ifpackageloaded{crop}{%
452     \AtBegShi@PatchCrop
453 }{%
454     \AtBeginDocument{\AtBegShi@PatchCrop}%
455 }

```

3.5.2 Package everyshi

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

```

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

```

```

488         \fi
489     \fi
490 \fi\fi\fi\fi\fi\fi
491 \ifx\AtBegShi@found\relax
492 \else
493     \expandafter\endgroup
494     \expandafter\def\AtBegShi@found{%
495         \edef\AtBegShi@GroupLevel{\number\currentgrouplevel}%
496         \afterassignment\@EveryShipout@Test
497         \setbox\AtBeginShipoutBox=%
498     }%
499     \def\@EveryShipout@Test{%
500         \ifnum\AtBegShi@GroupLevel=\currentgrouplevel
501         \else
502             \expandafter\aftergroup
503             \fi
504         \AtBegShi@Everyshi@Output
505     }%
506     \def\AtBegShi@Everyshi@Output{%
507         \ifvoid\AtBeginShipoutBox
508         \else
509             \global\setbox\@cclv\box\AtBeginShipoutBox
510             \expandafter\@EveryShipout@Output
511             \fi
512     }%
513     \@PackageInfoNoLine{atbegshi}{Package 'everyshi' patched}%
514     \begingroup
515     \fi
516 \fi
517 \endgroup
518 \let\AtBegShi@PatchEveryshi\relax
519 }
520 \ifpackageloaded{everyshi}{%
521     \AtBegShi@PatchEveryshi
522 }{%
523     \AtBeginDocument{\AtBegShi@PatchEveryshi}%
524 }

```

3.5.3 Class memoir

Fix of method and box.

```

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

```

```

546 \else
547 \mem@oldshipout\vbox{%
548 \trimmarks
549 \unvbox\@cclv
550 }%
551 \fi
552 }%
553 \ifx\AtBegShi@Memoir@shipi\mem@shipi
554 \ifcase\ifx\AtBegShi@Memoir@shipiiA\mem@shipii
555 \z@
556 \else
557 \ifx\AtBegShi@Memoir@shipiiB\mem@shipii
558 \z@
559 \else
560 \@ne
561 \fi
562 \fi
563 \let\AtBegShi@found\relax
564 \ifx\shipout\AtBegShi@Memoir@shipout
565 \def\AtBegShi@found{\shipout}%
566 \else\ifx\AtBegShi@OrgShipout\AtBegShi@Memoir@shipout
567 \def\AtBegShi@found{\AtBegShi@OrgShipout}%
568 \else\ifx\CROP@shipout\AtBegShi@Memoir@shipout
569 \def\AtBegShi@found{\CROP@shipout}%
570 \else\ifx\GPTorg@shipout\AtBegShi@Memoir@shipout
571 \def\AtBegShi@found{\GPTorg@shipout}%
572 \else\ifx\THBorg@shipout\AtBegShi@Memoir@shipout
573 \def\AtBegShi@found{\THBorg@shipout}%
574 \else\ifx\@EveryShipout@Org@Shipout\AtBegShi@Memoir@shipout
575 \def\AtBegShi@found{\@EveryShipout@Org@Shipout}%
576 \fi\fi\fi\fi\fi\fi
577 \ifx\AtBegShi@found\relax
578 \else
579 \expandafter\endgroup
580 \expandafter\def\AtBegShi@found{%
581 \edef\AtBegShi@GroupLevel{\number\currentgrouplevel}%
582 \afterassignment\mem@shipi
583 \setbox\AtBeginShipoutBox=%
584 }%
585 \def\mem@shipi{%
586 \ifnum\AtBegShi@GroupLevel=\currentgrouplevel
587 \else
588 \expandafter\aftergroup
589 \fi
590 \mem@shipii
591 }%
592 \def\mem@shipii{%
593 \ifvoid\AtBeginShipoutBox
594 \else
595 \setbox\AtBeginShipoutBox=\vbox{%
596 \trimmarks
597 \ifvbox\AtBeginShipoutBox
598 \unvbox\AtBeginShipoutBox
599 \else
600 \box\AtBeginShipoutBox
601 \fi
602 }%
603 \expandafter\mem@oldshipout
604 \expandafter\box
605 \expandafter\AtBeginShipoutBox
606 \fi
607 }%

```

```

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

```

4 Test

```

623 (*test1)
624 \input atbegshi.sty\relax
625 \def\msg#{\immediate\write16}
626 \msg{File: atbegshi-test1.tex 2007/06/06 v1.5 Test file for plain-TeX}
627 \def\testmsg#1#2{%
628     \msg{***
629     \msg{*** Test with box (#1), expected page output [#2]}}%
630 }
631
632 \newbox\voidbox
633 \def\void{\box\voidbox}
634 \begingroup
635     \setbox\voidbox=\void
636 \endgroup
637
638 \count0=0\relax
639 \AtBeginShipout{%
640     \global\advance\count0 by 1\relax
641     \msg{* Inside \string\AtBeginShipout: [\the\count0]}}%
642 }
643
644 \AtBeginShipoutFirst{%
645     \msg{* Inside \string\AtBeginShipoutFirst}%
646     Hello World%
647 }
648
649 \testmsg{\string\null}{1}
650 \shipout\null
651
652 \AtBeginShipoutFirst{%
653     This is too late%
654 }
655
656 \testmsg{void}{}
657 \shipout\void
658
659 \testmsg{\string\copy255 (not void)}{2}
660 \setbox255\hbox{\vrule height 10bp width 10bp}
661 \shipout\copy255 %
662
663 \testmsg{\string\copy255 (again)}{3}
664 \shipout\copy255 %
665

```

```

666 \testmsg{\string\box255}{4}
667 \shipout\box255 %
668
669 \testmsg{\string\box255 (again)}{}
670 \shipout\box255 %
671
672 \testmsg{\string\hbox}{5}
673 \shipout\hbox{\vrule height 5bp width 20bp}
674
675 \testmsg{\string\vbox}{6}
676 \shipout\vbox{\hrule height 20bp width 5bp}
677
678 \testmsg{\string\null, voided by hook}{}
679 \def\VoidBox{%
680   \begingroup
681     \setbox\AtBeginShipoutBox=\box\AtBeginShipoutBox
682   \endgroup
683 }
684 \AtBeginShipout{\VoidBox}
685 \shipout\null
686 \def\VoidBox{}
687
688 \msg{*** \string\begingroup}
689 \begingroup
690   \testmsg{void}{}%
691   \shipout\void
692 \msg{*** \string\endgroup}
693 \endgroup
694
695 \msg{*** \string\begingroup}
696 \begingroup
697   \testmsg{void}{}%
698   \shipout\void
699   \testmsg{\string\null}{8}%
700   \shipout\null
701 \msg{*** \string\endgroup}
702 \endgroup
703
704 \testmsg{output routine}{9}
705 Hello World
706 \vfill
707 \eject
708
709 \testmsg{\string\null\space(discarded)}{}
710 \AtBeginShipout{%
711   \msg{* Inside \string\AtBeginShipout: DISCARD}%
712   \AtBeginShipoutDiscard
713 }
714 \shipout\null
715
716 \end
717 </test1>

718 <*test2>
719 \NeedsTeXFormat{LaTeX2e}
720 \ProvidesFile{atbegshi-test2.tex}[2007/06/06 v1.5 Test file for LaTeX]
721 \RequirePackage{color}
722 \pagecolor{yellow}
723 \documentclass[a5paper,showtrims]{memoir}
724 \usepackage{atbegshi}
725 \AtBeginShipout{%
726   \setbox\AtBeginShipoutBox=\vbox{%
727     \vbox to 0pt{%

```

```

728      \kern-1.5in %
729      \hbox to 0pt{%
730        \kern-1.5in %
731        \color{blue}%
732        \rule{1in}{1in}%
733        \hss
734      }%
735      \vss
736    }%
737    \hrule
738    \hbox{\vrule\box\AtBeginShipoutBox\vrule}%
739    \hrule
740  }%
741 }
742 \usepackage{eso-pic}
743 \makeatletter
744 \@EveryShipout@Init
745 \let\@EveryShipout@Init\relax
746 \makeatother
747 \AddToShipoutPicture{%
748   \hspace{.52\paperwidth}%
749   \colorbox{cyan}{%
750     \rule{0mm}{\paperheight}%
751     \hspace{.48\paperwidth}%
752   }%
753 }

```

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

```

754 \expandafter\let\csname ver@crop.sty\endcsname\relax
755 \usepackage[color=red,cross,a4,center]{crop}
756 \begin{document}
757 \shipout\null
758 \shipout\box\csname voidb@x\endcsname
759 \section{Hello World}
760 \end{document}
761 </test2>

```

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](#)

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
```

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/
```

5.3 Package installation

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

```
tex atbegshi.dtx
```

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
atbegshi-test1.tex  → doc/latex/oberdiek/atbegshi-test1.tex
atbegshi-test2.tex  → doc/latex/oberdiek/atbegshi-test2.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 \TeX distribution (te \TeX , mik \TeX , ...) relies on file name databases, you must refresh these. For example, te \TeX 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 \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{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 pdfL^AT_EX:

```
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 -T_EX 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`.

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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