

# 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  $\varepsilon$ -TeX's if available. Both L<sup>A</sup>T<sub>E</sub>X 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 `LaTeX`'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`.

## 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  $\text{\TeX}$  would put  $\text{\@test}$  after the first of such an assignment or after the box specification if the box lacks of assignments. Therefore  $\text{\TeX}$  puts  $\text{\@test}$  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  $\text{\@test}$ , but where are we? We can be after the completed box assignment, if  $\text{\shipout}$  was called with an indirect box. Or we are right at the beginning of a direct box.

### 2.3.1 With $\varepsilon\text{-TeX}$

With the  $\varepsilon\text{-TeX}$ 's extensions the answer is very easy: Being inside the direct box means that we are inside a new group. The new primitive command  $\text{\currentgrouplevel}$  tells how deeply the groups are currently nested. Macro  $\text{\@test}$  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 $\varepsilon\text{-TeX}$

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

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

- Box type:  $\text{\ifhbox}$ ,  $\text{\ifvbox}$
- Dimensions:  $\text{\wd}$ ,  $\text{\ht}$ ,  $\text{\dp}$
- Voidness:  $\text{\ifvoid}$

Unhappily all these qualities even combined are not sufficient for constructing an initial box value, because  $\text{\shipout}$  can be called with a box that is accidentally just the same as the choosen 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 0 pt. 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 0 pt.

```
\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  $\varepsilon$ -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  $\varepsilon$ -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 $\varepsilon$ -TeX

Putting the pieces together we get for  $\varepsilon$ -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 $\varepsilon$ -T<sub>E</sub>X, traditional way

And for T<sub>E</sub>X without  $\varepsilon$ -T<sub>E</sub>X:

```

\newbox\mybox
\begingroup
\setbox\mybox=\box\mybox % ensure \mybox is void
\endgroup
\let\original@shipout\shipout

\shipout :=
% trick to get a void box \mybox
\begingroup
\setbox\mybox=\box\mybox
\endgroup
\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 T<sub>E</sub>X without  $\varepsilon$ -T<sub>E</sub>X 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  $\epsilon$ -TeX's `\currentgrouplevel`, if it is available. Otherwise the `\lastkern` method is used.

```
1 < *package >
```

#### 3.1 Reload check and package identification

Reload check, especially if the package is not used with L<sup>A</sup>T<sub>E</sub>X.

```

2 \begingroup
3 \catcode44 12 % ,
4 \catcode45 12 % -
5 \catcode46 12 % .
6 \catcode58 12 % :
7 \catcode64 11 % @
8 \expandafter\let\expandafter\x\csname ver@atbegshi.sty\endcsname
9 \ifcase 0%
10 \ifx\x\relax % plain
11 \else
12 \ifx\x\empty % LaTeX
13 \else
14 1%
15 \fi
16 \fi
17 \else
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{atbegshi}{The package is already loaded}%

```



```

26     \endgroup
27     \expandafter\endinput
28 \fi
29 \endgroup
Package identification:
30 \begingroup
31   \catcode44 12 % ,
32   \catcode45 12 % -
33   \catcode46 12 % .
34   \catcode58 12 % :
35   \catcode64 11 % @
36   \expandafter\ifx\csname ProvidesPackage\endcsname\relax
37     \def\x#1#2#3[#4]{\endgroup
38       \immediate\write-1{Package: #3 #4}%
39       \xdef#1{#4}%
40     }%
41   \else
42     \def\x#1#2[#3]{\endgroup
43       #2[#{#3}]%
44       \ifx#1\relax
45         \xdef#1{#3}%
46       \fi
47     }%
48   \fi
49 \expandafter\x\csname ver@atbegshi.sty\endcsname
50 \ProvidesPackage{atbegshi}%
51 [2007/04/27 v1.4 At begin shipout hook (H0)]

```

### 3.2 Catcodes

```

52 \expandafter\edef\csname AtBegShi@End\endcsname{%
53   \catcode40 \the\catcode40\relax % (
54   \catcode41 \the\catcode41\relax % )
55   \catcode44 \the\catcode44\relax % ,
56   \catcode45 \the\catcode45\relax % -
57   \catcode46 \the\catcode46\relax % .
58   \catcode58 \the\catcode58\relax % :
59   \catcode61 \the\catcode61\relax % =
60   \catcode64 \the\catcode64\relax % @
61   \catcode94 \the\catcode94\relax % ^
62   \catcode96 \the\catcode96\relax % '
63   \noexpand\endinput
64 }
65 \catcode40 12 % (
66 \catcode41 12 % )
67 \catcode44 12 % ,
68 \catcode45 12 % -
69 \catcode46 12 % .
70 \catcode58 12 % :
71 \catcode61 12 % =
72 \catcode64 11 % @
73 \catcode94 7 % ^
74 \catcode96 12 % '

```

### 3.3 Preparations

\AtBegShi@Warning

```

75 \begingroup\expandafter\expandafter\expandafter\endgroup
76 \expandafter\ifx\csname RequirePackage\endcsname\relax
77   \input infwarerr.sty\relax
78 \else
79   \RequirePackage{infwarerr}%

```

```

80 \fi

\AtBegShi@CheckDefinable

81 \begingroup\expandafter\expandafter\expandafter\endgroup
82 \expandafter\ifx\csname @ifdefinable\endcsname\relax
83   \def\AtBegShi@CheckDefinable#1{%
84     \ifcase\ifx#1\relax
85       \@ne
86     \else
87       \ifx#1\@undefined
88         \@ne
89       \else
90         \z@
91       \fi
92     \fi
93     \errmessage{%
94       Package atbegshi: \string#1\space
95       is already defined%
96     }%
97   \endgroup
98 \fi
99 }%
100 \else
101   \def\AtBegShi@CheckDefinable#1{%
102     \@ifdefinable{#1}{}%
103   }%
104 \fi

105 \newif\ifAtBegShi@Discarded

\AtBeginShipoutDiscard

106 \AtBegShi@CheckDefinable\AtBeginShipoutDiscard
107 \def\AtBeginShipoutDiscard{%
108   \deadcycles=\z@
109   \global\AtBegShi@Discardedtrue
110 }

111 \begingroup\expandafter\expandafter\expandafter\endgroup
112 \expandafter\ifx\csname currentgrouplevel\endcsname\relax
113   \catcode'X=9 % ignore
114   \catcode'E=14 % comment
115 \else
116   \catcode'X=14 % comment
117   \catcode'E=9 % ignore
118 \fi

\AtBegShi@Shipout

119 \def\AtBegShi@Shipout{%
120 X \begingroup
121 X \setbox\AtBeginShipoutBox=\hbox\bgroup
122 X \kern\p@
123 E \edef\AtBegShi@GroupLevel{\number\currentgrouplevel}%
124 \afterassignment\AtBegShi@Test
125 X \global
126 \setbox\AtBeginShipoutBox=%
127 }

\AtBegShi@Test

128 \def\AtBegShi@Test{%
129 X \ifdim\lastkern=\z@
130 E \ifnum\AtBegShi@GroupLevel<\currentgrouplevel
131   \expandafter\aftergroup

```

```

132 \fi
133 \AtBegShi@Output
134 }

\AtBegShi@Output
135 \def\AtBegShi@Output{%
136 X \egroup
137 X \endgroup
138 \ifvoid\AtBeginShipoutBox
139 \PackageWarning{atbegshi}{Ignoring void shipout box}%
140 \else
141 \let\AtBegShi@OrgProtect\protect
142 \csname set@typeset@protect\endcsname
143 \global\AtBegShi@Discardedfalse
144 \AtBegShi@Hook
145 \AtBegShi@HookNext
146 \gdef\AtBegShi@HookNext{%
147 \ifAtBegShi@Discarded
148 \PackageInfoNoLine{atbegshi}{Shipout page discarded}%
149 \global\AtBegShi@Discardedfalse
150 \begingroup
151 \setbox\AtBeginShipoutBox\box\AtBeginShipoutBox
152 \endgroup
153 \let\protect\AtBegShi@OrgProtect
154 \else
155 \AtBegShi@First
156 \let\protect\AtBegShi@OrgProtect
157 \AtBegShi@OrgShipout\box\AtBeginShipoutBox
158 \fi
159 \fi
160 }

161 \catcode'\X=11 %
162 \catcode'\E=11 %

\AtBegShi@First
163 \def\AtBegShi@First{%
164 \begingroup
165 \def\@empty{%
166 \ifx\AtBegShi@HookFirst\@empty
167 \else
168 \setbox\z@=\vbox{%
169 \begingroup
170 \AtBegShi@HookFirst
171 \endgroup
172 }%
173 \wd\z@=\z@
174 \ht\z@=\z@
175 \dp\z@=\z@
176 \global\setbox\AtBeginShipoutBox=\vbox{%
177 \baselineskip\z@skip
178 \lineskip\z@skip
179 \lineskiplimit\z@
180 \copy\z@
181 \copy\AtBeginShipoutBox
182 }%
183 \fi
184 \global\let\AtBegShi@First\@empty
185 \global\let\AtBeginShipoutFirst\AtBegShi@FirstDisabled
186 \endgroup
187 }

\AtBegShi@Hook

```

```

188 \gdef\AtBegShi@Hook{}

\AtBegShi@HookNext
189 \gdef\AtBegShi@HookNext{}

\AtBegShi@HookFirst
190 \gdef\AtBegShi@HookFirst{}

\AtBeginShipout
191 \AtBegShi@CheckDefinable\AtBeginShipout
192 \def\AtBeginShipout{%
193   \AtBegShi@AddHook\AtBegShi@Hook
194 }

\AtBeginShipoutNext
195 \AtBegShi@CheckDefinable\AtBeginShipoutNext
196 \def\AtBeginShipoutNext{%
197   \AtBegShi@AddHook\AtBegShi@HookNext
198 }

\AtBeginShipoutFirst
199 \AtBegShi@CheckDefinable\AtBeginShipoutFirst
200 \def\AtBeginShipoutFirst{%
201   \AtBegShi@AddTo\AtBegShi@HookFirst
202 }

\AtBegShi@FirstDisabled
203 \long\def\AtBegShi@FirstDisabled#1{%
204   \@PackageWarning{atbegshi}{%
205     First page is already shipped out, ignoring\MessageBreak
206     \string\AtBeginShipoutFirst
207   }%
208 }

\AtBegShi@AddTo
209 \begingroup\expandafter\expandafter\expandafter\endgroup
210 \expandafter\ifx\csname g@addto@macro\endcsname\relax
211   \long\def\AtBegShi@AddTo#1#2{%
212     \begingroup
213       \toks\z@\expandafter{#1#2}%
214       \xdef#1{\the\toks\z@}%
215     \endgroup
216   }%
217 \else
218   \let\AtBegShi@AddTo\g@addto@macro
219 \fi

\AtBegShi@AddHook
220 \long\def\AtBegShi@AddHook#1#2{%
221   \AtBegShi@AddTo#1{\AtBegShi@Item{#2}}%
222 }

\AtBegShi@Item
223 \long\def\AtBegShi@Item#1{%
224   \ifAtBegShi@Discarded
225   \else
226     #1%
227   \ifvoid\AtBeginShipoutBox
228     \@PackageWarning{atbegshi}{%
229       Shipout box was voided by hook,\MessageBreak

```

```

230         ignoring shipout box%
231     }%
232     \AtBeginShipoutDiscard
233     \fi
234 \fi
235 }

\AtBeginShipoutInit

236 \AtBegShi@CheckDefinable\AtBeginShipoutInit
237 \def\AtBeginShipoutInit{%
238     \csname newbox\endcsname\AtBeginShipoutBox
239     \AtBegShi@CheckDefinable\AtBegShi@OrgShipout
240     \global\let\AtBegShi@OrgShipout\shipout
241     \global\let\shipout\AtBegShi@Shipout
242     \gdef\AtBeginShipoutInit{}%
243 }

244 \begingroup\expandafter\expandafter\expandafter\endgroup
245 \expandafter\ifx\csname AtBeginDocument\endcsname\relax
246     \AtBeginShipoutInit
247 \else
248     \AtBeginDocument{\AtBeginShipoutInit}%
249 \fi

```

### 3.4 Patches

Patches for L<sup>A</sup>T<sub>E</sub>X packages that redefine `\shipout`. L<sup>A</sup>T<sub>E</sub>X is now supposed to use  $\varepsilon$ -T<sub>E</sub>X. Thus we do not patch, without L<sup>A</sup>T<sub>E</sub>X and  $\varepsilon$ -T<sub>E</sub>X.

```

250 \def\AtBegShi@AbortIfUndefined#1{%
251     \begingroup\expandafter\expandafter\expandafter\endgroup
252     \expandafter\ifx\csname#1\endcsname\relax
253         \expandafter\AtBegShi@End
254     \fi
255 }
256 \AtBegShi@AbortIfUndefined{currentgrouplevel}
257 \AtBegShi@AbortIfUndefined{AtBeginDocument}
258 \AtBegShi@AbortIfUndefined{@ifpackageloaded}
259 \AtBegShi@AbortIfUndefined{@ifclassloaded}

```

#### 3.4.1 Package crop

Fix of method and box.

```

260 \def\AtBegShi@PatchCrop{%
261     \begingroup
262         \def\AtBegShi@Crop@shipout{%
263             \afterassignment\CROP@ship
264             \setbox\@cclv=%
265         }%
266         \def\AtBegShi@Crop@ship{%
267             \ifvoid\@cclv
268                 \expandafter\aftergroup
269             \fi
270             \CROP@@ship
271         }%
272         \def\AtBegShi@Crop@shiplist{%
273             \lineskip\z@
274             \lineskiplimit\z@
275             \baselineskip\z@
276             \CROP@kernel
277             \box\@cclv
278         }%
279         \def\AtBegShi@Crop@@ship{%

```

```

280     \CROP@shipout\vbox{%
281     \CROP@shiplist
282     }%
283 }%
284 \ifx\AtBegShi@Crop@ship\CROP@ship
285 \ifx\AtBegShi@Crop@shiplist\CROP@shiplist
286 \ifx\AtBegShi@Crop@@@ship\CROP@@@ship
287 \let\AtBegShi@found\relax
288 \ifx\shipout\AtBegShi@Crop@shipout
289 \def\AtBegShi@found{\shipout}%
290 \else\ifx\AtBegShi@OrgShipout\AtBegShi@Crop@shipout
291 \def\AtBegShi@found{\AtBegShi@OrgShipout}%
292 \else\ifx\@EveryShipout@Org@Shipout\AtBegShi@Crop@shipout
293 \def\AtBegShi@found{\@EveryShipout@Org@Shipout}%
294 \else\ifx\GPTorg@shipout\AtBegShi@Crop@shipout
295 \def\AtBegShi@found{\GPTorg@shipout}%
296 \else\ifx\THBorg@shipout\AtBegShi@Crop@shipout
297 \def\AtBegShi@found{\THBorg@shipout}%
298 \else\ifx\mem@oldshipout\AtBegShi@Crop@shipout
299 \def\AtBegShi@found{\mem@oldshipout}%
300 \fi\fi\fi\fi\fi
301 \ifx\AtBegShi@found\relax
302 \else
303 \expandafter\endgroup
304 \expandafter\def\AtBegShi@found{%
305 \edef\AtBegShi@GroupLevel{\number\currentgrouplevel}%
306 \afterassignment\CROP@ship
307 \setbox\AtBeginShipoutBox=%
308 }%
309 \def\CROP@ship{%
310 \ifnum\AtBegShi@GroupLevel=\currentgrouplevel
311 \else
312 \expandafter\aftergroup
313 \fi
314 \CROP@@@ship
315 }%
316 \def\CROP@shiplist{%
317 \lineskip\z@
318 \lineskiplimit\z@
319 \baselineskip\z@
320 \CROP@kernel
321 \box\AtBeginShipoutBox
322 }%
323 \def\CROP@@@ship{%
324 \ifvoid\AtBeginShipoutBox
325 \else
326 \setbox\AtBeginShipoutBox=\vbox{%
327 \CROP@shiplist
328 }%
329 \expandafter\CROP@shipout
330 \expandafter\box
331 \expandafter\AtBeginShipoutBox
332 \fi
333 }%
334 \@PackageInfoNoLine{atbegshi}{Package 'crop' patched}%
335 \begingroup
336 \fi
337 \fi
338 \fi
339 \fi
340 \endgroup
341 \let\AtBegShi@PatchCrop\relax

```

```

342 }
343 \@ifpackageloaded{crop}{%
344   \AtBegShi@PatchCrop
345 }{%
346   \AtBeginDocument{\AtBegShi@PatchCrop}%
347 }

```

### 3.4.2 Package everyshi

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

```

348 \def\AtBegShi@PatchEveryshi{%
349   \begingroup
350     \long\def\AtBegShi@Everyshi@shipout{%
351       \afterassignment\@EveryShipout@Test
352       \global\setbox\@cclv= %
353     }%
354     \long\def\AtBegShi@Everyshi@Test{%
355       \ifvoid\@cclv\relax
356         \aftergroup\@EveryShipout@Output
357       \else
358         \@EveryShipout@Output
359       \fi
360     }%
361     \ifx\AtBegShi@Everyshi@Test\@EveryShipout@Test
362       \let\AtBegShi@found\relax
363       \ifx\shipout\AtBegShi@Everyshi@shipout
364         \def\AtBegShi@found{\shipout}%
365       \else\ifx\AtBegShi@OrgShipout\AtBegShi@Everyshi@shipout
366         \def\AtBegShi@found{\AtBegShi@OrgShipout}%
367       \else\ifx\CROP@shipout\AtBegShi@Everyshi@shipout
368         \def\AtBegShi@found{\CROP@shipout}%
369       \else\ifx\GPTorg@shipout\AtBegShi@Everyshi@shipout
370         \def\AtBegShi@found{\GPTorg@shipout}%
371       \else\ifx\THBorg@shipout\AtBegShi@Everyshi@shipout
372         \def\AtBegShi@found{\THBorg@shipout}%
373       \else\ifx\mem@oldshipout\AtBegShi@Everyshi@shipout
374         \def\AtBegShi@found{\mem@oldshipout}%
375       \else
376         \expandafter\ifx\csname @EveryShipout@Org@Shipout\endcsname
377           \relax
378           \ifx\@EveryShipout@Shipout\AtBegShi@Everyshi@shipout
379             \def\AtBegShi@found{\@EveryShipout@Shipout}%
380           \fi
381         \fi
382       \fi\fi\fi\fi\fi\fi
383       \ifx\AtBegShi@found\relax
384       \else
385         \expandafter\endgroup
386         \expandafter\def\AtBegShi@found{%
387           \edef\AtBegShi@GroupLevel{\number\currentgrouplevel}%
388           \afterassignment\@EveryShipout@Test
389           \setbox\AtBeginShipoutBox=%
390         }%
391         \def\@EveryShipout@Test{%
392           \ifnum\AtBegShi@GroupLevel=\currentgrouplevel
393           \else
394             \expandafter\aftergroup
395           \fi
396           \AtBegShi@Everyshi@Output
397         }%
398         \def\AtBegShi@Everyshi@Output{%
399           \ifvoid\AtBeginShipoutBox

```

```

400         \else
401         \global\setbox\@cclv\box\AtBeginShipoutBox
402         \expandafter\@EveryShipout@Output
403         \fi
404     }%
405     \@PackageInfoNoLine{atbegshi}{Package 'everyshi' patched}%
406     \begingroup
407     \fi
408     \fi
409 \endgroup
410 \let\AtBegShi@PatchEveryshi\relax
411 }
412 \@ifpackageloaded{everyshi}{%
413     \AtBegShi@PatchEveryshi
414 }{%
415     \AtBeginDocument{\AtBegShi@PatchEveryshi}%
416 }

```

### 3.4.3 Class memoir

Fix of method and box.

```

417 \def\AtBegShi@PatchMemoir{%
418     \begingroup
419     \def\AtBegShi@Memoir@shipout{%
420         \afterassignment\mem@shipi
421         \setbox\@cclv=%
422     }%
423     \def\AtBegShi@Memoir@shipi{%
424         \ifvoid\@cclv
425         \expandafter\aftergroup
426         \fi
427         \mem@shipii
428     }%
429     \def\AtBegShi@Memoir@shipiiA{%
430         \mem@oldshipout\vbox{%
431             \trimmarks
432             \unvbox\@cclv
433         }%
434     }%
435     \def\AtBegShi@Memoir@shipiiB{%
436         \ifvoid\@cclv
437         \mem@oldshipout\box\@cclv
438     \else
439         \mem@oldshipout\vbox{%
440             \trimmarks
441             \unvbox\@cclv
442         }%
443     \fi
444     }%
445     \ifx\AtBegShi@Memoir@shipi\mem@shipi
446     \ifcase\ifx\AtBegShi@Memoir@shipiiA\mem@shipii
447         \z@
448     \else
449         \ifx\AtBegShi@Memoir@shipiiB\mem@shipii
450         \z@
451     \else
452         \@ne
453     \fi
454     \fi
455     \let\AtBegShi@found\relax
456     \ifx\shipout\AtBegShi@Memoir@shipout
457     \def\AtBegShi@found{\shipout}%

```



```

458 \else\ifx\AtBegShi@OrgShipout\AtBegShi@Mmemoir@shipout
459 \def\AtBegShi@found{\AtBegShi@OrgShipout}%
460 \else\ifx\CROP@shipout\AtBegShi@Mmemoir@shipout
461 \def\AtBegShi@found{\CROP@shipout}%
462 \else\ifx\GPTorg@shipout\AtBegShi@Mmemoir@shipout
463 \def\AtBegShi@found{\GPTorg@shipout}%
464 \else\ifx\THBorg@shipout\AtBegShi@Mmemoir@shipout
465 \def\AtBegShi@found{\THBorg@shipout}%
466 \else\ifx\@EveryShipout@Org@Shipout\AtBegShi@Mmemoir@shipout
467 \def\AtBegShi@found{\@EveryShipout@Org@Shipout}%
468 \fi\fi\fi\fi\fi\fi
469 \ifx\AtBegShi@found\relax
470 \else
471 \expandafter\endgroup
472 \expandafter\def\AtBegShi@found{%
473 \edef\AtBegShi@GroupLevel{\number\currentgrouplevel}%
474 \afterassignment\mem@shipi
475 \setbox\AtBeginShipoutBox=%
476 }%
477 \def\mem@shipi{%
478 \ifnum\AtBegShi@GroupLevel=\currentgrouplevel
479 \else
480 \expandafter\aftergroup
481 \fi
482 \mem@shipii
483 }%
484 \def\mem@shipii{%
485 \ifvoid\AtBeginShipoutBox
486 \else
487 \setbox\AtBeginShipoutBox=\vbox{%
488 \trimmarks
489 \ifvbox\AtBeginShipoutBox
490 \unvbox\AtBeginShipoutBox
491 \else
492 \box\AtBeginShipoutBox
493 \fi
494 }%
495 \expandafter\mem@oldshipout
496 \expandafter\box
497 \expandafter\AtBeginShipoutBox
498 \fi
499 }%
500 \@PackageInfoNoLine{atbegshi}{Class 'memoir' patched}%
501 \begingroup
502 \fi
503 \fi
504 \fi
505 \endgroup
506 \let\AtBegShi@PatchMemoir\relax
507 }
508 \ifclassloaded{memoir}{%
509 \AtBegShi@PatchMemoir
510 }{%
511 \AtBeginDocument{\AtBegShi@PatchMemoir}%
512 }
513 \AtBegShi@End
514 \end{package}

```

## 4 Test

```

515 \test1

```

```

516 \input atbegshi.sty\relax
517 \def\msg#\{\immediate\write16}
518 \msg{File: atbegshi-test1.tex 2007/04/27 v1.4 Test file for plain-TeX}
519 \def\testmsg#1#2{%
520   \msg{}%
521   \msg{*** Test with box (#1), expected page output [#2]}}%
522 }
523
524 \newbox\voidbox
525 \def\void{\box\voidbox}
526 \begingroup
527   \setbox\voidbox=\void
528 \endgroup
529
530 \count0=0\relax
531 \AtBeginShipout{%
532   \global\advance\count0 by 1\relax
533   \msg{* Inside \string\AtBeginShipout: [\the\count0]}}%
534 }
535
536 \AtBeginShipoutFirst{%
537   \msg{* Inside \string\AtBeginShipoutFirst}}%
538   Hello World%
539 }
540
541 \testmsg{\string\null}{1}
542 \shipout\null
543
544 \AtBeginShipoutFirst{%
545   This is too late%
546 }
547
548 \testmsg{void}{1}
549 \shipout\void
550
551 \testmsg{\string\copy255 (not void)}{2}
552 \setbox255\hbox{\vrule height 10bp width 10bp}
553 \shipout\copy255 %
554
555 \testmsg{\string\copy255 (again)}{3}
556 \shipout\copy255 %
557
558 \testmsg{\string\box255}{4}
559 \shipout\box255 %
560
561 \testmsg{\string\box255 (again)}{5}
562 \shipout\box255 %
563
564 \testmsg{\string\hbox}{5}
565 \shipout\hbox{\vrule height 5bp width 20bp}
566
567 \testmsg{\string\vbox}{6}
568 \shipout\vbox{\hrule height 20bp width 5bp}
569
570 \testmsg{\string\null, voided by hook}{1}
571 \def\VoidBox{%
572   \begingroup
573     \setbox\AtBeginShipoutBox=\box\AtBeginShipoutBox
574   \endgroup
575 }
576 \AtBeginShipout{\VoidBox}
577 \shipout\null

```

```

578 \def\VoidBox{}
579
580 \msg{*** \string\beginpgroup}
581 \beginpgroup
582   \testmsg{void}{}%
583   \shipout\void
584 \msg{*** \string\endpgroup}
585 \endpgroup
586
587 \msg{*** \string\beginpgroup}
588 \beginpgroup
589   \testmsg{void}{}%
590   \shipout\void
591   \testmsg{\string\null}{8}%
592   \shipout\null
593 \msg{*** \string\endpgroup}
594 \endpgroup
595
596 \testmsg{output routine}{9}
597 Hello World
598 \vfill
599 \eject
600
601 \testmsg{\string\null\space(discarded)}{}
602 \AtBeginShipout{%
603   \msg{* Inside \string\AtBeginShipout: DISCARD}%
604   \AtBeginShipoutDiscard
605 }
606 \shipout\null
607
608 \end
609 \test1
610 (*test2)
611 \NeedsTeXFormat{LaTeX2e}
612 \ProvidesFile{atbegshi-test2.tex}[2007/04/27 v1.4 Test file for LaTeX]
613 \RequirePackage{color}
614 \pagecolor{yellow}
615 \documentclass[a5paper,showtrims]{memoir}
616 \usepackage{atbegshi}
617 \AtBeginShipout{%
618   \setbox\AtBeginShipoutBox=\vbox{%
619     \vbox to 0pt{%
620       \kern-1.5in %
621       \hbox to 0pt{%
622         \kern-1.5in %
623         \color{blue}%
624         \rule{1in}{1in}%
625         \hss
626       }%
627       \vss
628     }%
629     \hrule
630     \hbox{\vrule\box\AtBeginShipoutBox\vrule}%
631     \hrule
632   }%
633 }
634 \usepackage{eso-pic}
635 \makeatletter
636 \@EveryShipout@Init
637 \let\@EveryShipout@Init\relax
638 \makeatother
639 \AddToShipoutPicture{%

```

```

640 \hspace{.52\paperwidth}%
641 \colorbox{cyan}{%
642   \rule{0mm}{\paperheight}%
643   \hspace{.48\paperwidth}%
644 }%
645 }
646 \usepackage[color=red,cross,a4,center]{crop}
647 \begin{document}
648 \shipout\null
649 \shipout\box\csname voidb@x\endcsname
650 \section{Hello World}
651 \end{document}
652 </test2>

```

## 5 Installation

### 5.1 Download

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

[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
```

**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-test1.tex	→	doc/latex/oberdiek/atbegshi-test1.tex
atbegshi-test2.tex	→	doc/latex/oberdiek/atbegshi-test2.tex
atbegshi.dtx	→	source/latex/oberdiek/atbegshi.dtx

---

<sup>1</sup>[ftp://ftp.ctan.org/tex-archive/](http://ftp.ctan.org/tex-archive/)

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 (`teTeX`, `mikTeX`, ...) relies on file name databases, you must refresh these. For example, `teTeX` 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 `pdf $\LaTeX$` :

```
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  $\epsilon$ - $\TeX$  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.

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