The **eso-pic** package[*]

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1 Introduction

This package makes it easy to add some picture commands to every page at absolute positions.

2 Usage

See also the example LaTeX documents (`eso-*.tex`).

2.1 Basic commands for adding LaTeX stuff to the page background

\AddToShipoutPictureBG — All the picture commands which are parameters of an `\AddToShipoutPictureBG` command will be added to the internal macro `\ESO@HookIBG`. This macro is part of a zero-length `picture` environment with basepoint at the lower left corner of the page (default) or at the upper left corner (package option "texcoord"). The `picture` environment will be shipped out at every new page.

\AddToShipoutPictureBG* — `\AddToShipoutPictureBG*` works like `\AddToShipoutPictureBG` but only for the current page. It used the internal macro `\ESO@HookIIBG` which contents will be removed automatically.

For compatibility the macros `\AddToShipoutPicture` and `\AddToShipoutPicture*` are aliases for `\AddToShipoutPictureBG` and `\AddToShipoutPictureBG*`.

\AddToShipoutPictureFG
\AddToShipoutPictureFG* — Works like `\AddToShipoutPictureBG` but the picture commands are on the top oft the normal document content.

\ClearShipoutPictureBG — A call of `\ClearShipoutPictureBG` clears the contents of `\ESO@HookIBG`.

For compatibility the macro `\ClearShipoutPicture` is an alias for `\ClearShipoutPictureBG`.

\ClearShipoutPictureFG — A call of `\ClearShipoutPictureFG` clears the contents of `\ESO@HookIFG`.

\LenToUnit — Allows a length as parameter to a picture command. Note that this macro is no more necessary when using `\usepackage{picture}`.

\gridSetup — `\gridSetup[`⟨*gridunitname*⟩`]{`⟨*gridunit*⟩`}{`⟨*labelfactor*⟩`}{`⟨*griddelta*⟩`}` `{`⟨*gridDelta*⟩`}{`⟨*gap*⟩`}`. For details see the implementation section.

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[*]This document corresponds to **eso-pic** v2.0d, dated 2013/10/06.

<div style="text-align: right">

`\AtPageUpperLeft`
`\AtPageLowerLeft`
`\AtPageCenter`
`\AtTextUpperLeft`
`\AtTextLowerLeft`
`\AtTextCenter`
`\AtStockUpperLeft`
`\AtStockLowerLeft`
`\AtStockCenter`

</div>

Helper macros for easier positioning on the page.

2.2 Package options

Option	Value	Comments
pscoord	empty or *true, false*	The zero point of the coordinate system is the lower left corner of the page (the default).
texcoord	empty or *true, false*	The zero point of the coordinate system is the upper left corner of the page.
grid	empty or *true, false*	A grid is drawing; default: false.
gridunit	*mm, in, bp, pt*	Distance between gridlines are multiples of `gridunit`. default: mm.
gridcolor	a valid color name	Color of the main gridlines; default: black
subgridcolor	a valid color name	Color of the subgridlines; default: black.
subgridstyle	*solid* or *dotted*	'dotted' is very slow! default: solid.
colorgrid	empty or *true, false*	Shortcut for 'grid=true', 'gridcolor=red' and 'subgridcolor=green'; default: false.
dvips	empty or *true, false*	Is also true if the package option dvips is used by color or graphics. If true package eepic is loaded for better performance of dotted lines.

3 Implementation

3.1 The main functionality

```
1 \RequirePackage{atbegshi}
```

<div style="text-align: right">

`\LenToUnit`

</div>

```
2 \providecommand*\LenToUnit[1]{#1\@gobble}
```

<div style="text-align: right">

`\ESO@isMEMOIR`

</div>

Support for the memoir class.

```
3 \newcommand\ESO@isMEMOIR[2]{#2}
4 \@ifclassloaded{memoir}{\renewcommand\ESO@isMEMOIR[2]{#1}}{}
```

<div style="text-align: right">

`\AtPageUpperLeft`

</div>

```
5 \newcommand\AtPageUpperLeft[1]{%
6   \put(0,\LenToUnit{-\ESO@yoffsetI}){#1}%
7 }
```

<div style="text-align: right">

`\AtPageLowerLeft`

</div>

```
8 \newcommand\AtPageLowerLeft[1]{\AtPageUpperLeft{%
9   \put(0,\LenToUnit{-\paperheight}){#1}}}
```

<div style="text-align: right">

`\AtPageCenter`

</div>

```
10 \newcommand\AtPageCenter[1]{\AtPageUpperLeft{%
11   \put(\LenToUnit{.5\paperwidth},\LenToUnit{-.5\paperheight}){#1}}%
12 }
```

\AtStockLowerLeft

```
13 \newcommand\AtStockLowerLeft{}
14 \ESO@isMEMOIR{%
15   \renewcommand\AtStockLowerLeft[1]{%
16     \begingroup
17       \@tempdima=-\stockwidth
18       \advance\@tempdima\trimedge
19       \advance\@tempdima\paperwidth
20       \if@twoside\ifodd\c@page\else
21         \@tempdima=-\trimedge
22       \fi\fi
23       \@tempdimb=-\stockheight
24       \advance\@tempdimb\paperheight
25       \advance\@tempdimb\trimtop
26       \AtPageLowerLeft{%
27         \put(\LenToUnit{\@tempdima},\LenToUnit{\@tempdimb}){#1}%
28       }%
29     \endgroup
30   }
31 }{%
32   \let\AtStockLowerLeft=\AtPageLowerLeft
33 }
```

\AtStockUpperLeft

```
34 \newcommand\AtStockUpperLeft{}
35 \ESO@isMEMOIR{%
36   \renewcommand\AtStockUpperLeft[1]{%
37     \AtStockLowerLeft{%
38       \put(0,\LenToUnit{\stockheight}){#1}%
39     }%
40   }%
41 }{%
42   \let\AtStockUpperLeft=\AtPageUpperLeft
43 }
```

\AtStockCenter

```
44 \newcommand\AtStockCenter{}
45 \ESO@isMEMOIR{%
46   \renewcommand\AtStockCenter[1]{%
47     \AtStockLowerLeft{%
48       \put(\LenToUnit{.5\stockwidth},\LenToUnit{.5\stockheight}){#1}%
49     }%
50   }%
51 }{%
52   \let\AtStockCenter=\AtPageCenter
53 }
```

\AtTextUpperLeft

```
54 \ESO@isMEMOIR{%
55   \newcommand\AtTextUpperLeft[1]{%
56     \begingroup
57       \ifodd\c@page
58         \@tempdima=\spinemargin
59       \else
```

```
60        \@tempdima=\paperwidth
61        \advance\@tempdima-\textwidth
62        \advance\@tempdima-\spinemargin
63      \fi
64      \@tempdimb=-\uppermargin
65      \AtPageUpperLeft{%
66        \put(\LenToUnit{\@tempdima},\LenToUnit{\@tempdimb}){#1}%
67      }%
68    \endgroup
69  }
70 }{%
71  \newcommand\AtTextUpperLeft[1]{%
72    \begingroup
73      \@tempdima=1in\relax
74      \if@twoside
75        \ifodd\c@page
76          \advance\@tempdima\oddsidemargin
77        \else
78          \advance\@tempdima\evensidemargin
79        \fi
80      \else
81        \advance\@tempdima\oddsidemargin
82      \fi
83      \@tempdimb=-1in\relax
84      \advance\@tempdimb-\topmargin
85      \advance\@tempdimb-\headheight
86      \advance\@tempdimb-\headsep
87      \AtPageUpperLeft{%
88        \put(\LenToUnit{\@tempdima},\LenToUnit{\@tempdimb}){#1}%
89      }%
90    \endgroup
91  }
92 }
```

\AtTextLowerLeft

```
93 \newcommand\AtTextLowerLeft[1]{\AtTextUpperLeft{%
94  \put(0,\LenToUnit{-\textheight}){#1}}}
```

\AtTextCenter

```
95 \newcommand\AtTextCenter[1]{\AtTextUpperLeft{%
96  \put(\LenToUnit{.5\textwidth},\LenToUnit{-.5\textheight}){#1}}}
```

\ESO@HookIBG
\ESO@HookIIBG
\ESO@HookIIIBG
\ESO@HookIFG
\ESO@HookIIFG

```
97 \newcommand{\ESO@HookIBG}{}
98 \newcommand{\ESO@HookIIBG}{}
99 \newcommand{\ESO@HookIIIBG}{}
100 \newcommand{\ESO@HookIFG}{}
101 \newcommand{\ESO@HookIIFG}{}
102 \newcommand{\ESO@HookI}{}
103 \newcommand{\ESO@HookII}{}
104 \newcommand{\ESO@HookIII}{}
105 \let\ESO@HookI=\ESO@HookIBG
106 \let\ESO@HookII=\ESO@HookIIBG
107 \let\ESO@HookIII=\ESO@HookIIIBG
```

\AddToShipoutPictureBG	
\AddToShipoutPictureFG	108 \newcommand{\AddToShipoutPictureBG}{%

```
108 \newcommand{\AddToShipoutPictureBG}{%
109   \@ifstar{\g@addto@macro\ESO@HookIIBG}{\g@addto@macro\ESO@HookIBG}}
110 \newcommand{\AddToShipoutPicture}{}
111 \let\AddToShipoutPicture=\AddToShipoutPictureBG
```

\AddToShipoutPictureFG

```
112 \newcommand{\AddToShipoutPictureFG}{%
113   \@ifstar{\g@addto@macro\ESO@HookIIFG}{\g@addto@macro\ESO@HookIFG}}
```

\ClearShipoutPictureBG
\ClearShipoutPicture
\ClearShipoutPictureFG

```
114 \newcommand{\ClearShipoutPictureBG}{\global\let\ESO@HookIBG\@empty}
115 \newcommand{\ClearShipoutPicture}{}
116 \let\ClearShipoutPicture=\ClearShipoutPictureBG
117 \newcommand{\ClearShipoutPictureFG}{\global\let\ESO@HookIFG\@empty}
```

\AtBeginShipout (see package atbegshi)
\AtBeginShipoutUpperLeft
\AtBeginShipoutUpperLeftForeground

```
118 \ESO@isMEMOIR{%
119   \AtBeginShipout{%
120     \@tempdima=-\trimedge
121     \advance\@tempdima-\paperwidth
122     \advance\@tempdima\stockwidth
123     \if@twoside\ifodd\c@page\else
124       \advance\@tempdima2\trimedge
125       \advance\@tempdima\paperwidth
126       \advance\@tempdima-\stockwidth
127     \fi\fi
128     \@tempdimb=\ESO@yoffsetI
129     \advance\@tempdimb-\trimtop
130     \nointerlineskip
131     \AtBeginShipoutUpperLeft{%
132       \put(\LenToUnit{\@tempdima},\LenToUnit{\@tempdimb}){%
133         \ESO@HookIIIBG\ESO@HookIBG\ESO@HookIIBG
134         \global\let\ESO@HookIIBG\@empty
135       }%
136     }%
137     \AtBeginShipoutUpperLeftForeground{%
138       \put(\LenToUnit{\@tempdima},\LenToUnit{\@tempdimb}){%
139         \ESO@HookIFG\ESO@HookIIFG
140         \global\let\ESO@HookIIFG\@empty
141       }%
142     }%
143   }
144 }{%
145   \AtBeginShipout{%
146     \nointerlineskip
147     \AtBeginShipoutUpperLeft{%
148       \put(0,\LenToUnit{\ESO@yoffsetI}){%
149         \ESO@HookIIIBG\ESO@HookIBG\ESO@HookIIBG
150         \global\let\ESO@HookIIBG\@empty
151       }%
152     }%
153     \AtBeginShipoutUpperLeftForeground{%
154       \put(0,\LenToUnit{\ESO@yoffsetI}){%
```

5

```
155        \ESO@HookIFG\ESO@HookIIFG
156        \global\let\ESO@HookIIFG\@empty
157      }%
158    }%
159  }
160 }
```

3.2 The background grid

```
161 \RequirePackage{keyval}
```

Initialising some macros
```
162 \newif\ifESO@dvips\ESO@dvipsfalse \newif\ifESO@grid\ESO@gridfalse
163 \newif\ifESO@texcoord\ESO@texcoordfalse
164 \newcommand*\ESO@gridunitname{}
165 \newcommand*\ESO@gridunit{}
166 \newcommand*\ESO@labelfactor{}
167 \newcommand*\ESO@griddelta{}\newcommand*\ESO@griddeltaY{}
168 \newcommand*\ESO@gridDelta{}\newcommand*\ESO@gridDeltaY{}
169 \newcommand*\ESO@gridcolor{}
170 \newcommand*\ESO@subgridcolor{}
171 \newcommand*\ESO@subgridstyle{dotted}% ???
172 \newcommand*\ESO@gap{}
173 \newcommand*\ESO@yoffsetI{}\newcommand*\ESO@yoffsetII{}
174 \newcommand*\ESO@gridlines{\thinlines}
175 \newcommand*\ESO@subgridlines{\thinlines}
176 \newcommand*\ESO@hline[1]{\ESO@subgridlines\line(1,0){#1}}
177 \newcommand*\ESO@vline[1]{\ESO@subgridlines\line(0,1){#1}}
178 \newcommand*\ESO@Hline[1]{\ESO@gridlines\line(1,0){#1}}
179 \newcommand*\ESO@Vline[1]{\ESO@gridlines\line(0,1){#1}}
180 \newcommand\ESO@fcolorbox[3]{\fbox{#3}}
181 \newcommand\ESO@color[1]{}
182 \newcommand\ESO@colorbox[2]{%
183   \begingroup
184     \fboxrule=\z@\fbox{#2}%
185   \endgroup
186 }
```

\gridSetup
```
187 \newcommand\gridSetup[6][]{%
188   \edef\ESO@gridunitname{#1}\edef\ESO@gridunit{#2}
189   \edef\ESO@labelfactor{#3}\edef\ESO@griddelta{#4}
190   \edef\ESO@gridDelta{#5}\edef\ESO@gap{#6}}
```

All the key-value options
```
191 \define@key{ESO}{texcoord}[true]{\csname ESO@texcoord#1\endcsname}
192 \define@key{ESO}{pscoord}[true]{\csname @tempswa#1\endcsname
193   \if@tempswa\ESO@texcoordfalse\else\ESO@texcoordtrue\fi}
194 \define@key{ESO}{dvips}[true]{\csname ESO@dvips#1\endcsname}
195 \define@key{ESO}{grid}[true]{\csname ESO@grid#1\endcsname
196   \setkeys{ESO}{gridcolor=black,subgridcolor=black}}
197 \define@key{ESO}{colorgrid}[true]{\csname ESO@grid#1\endcsname
198   \setkeys{ESO}{gridcolor=red,subgridcolor=green}}
199 \define@key{ESO}{gridcolor}{\def\ESO@gridcolor{#1}}
200 \define@key{ESO}{subgridcolor}{\def\ESO@subgridcolor{#1}}
```

```
201 \define@key{ESO}{subgridstyle}{\def\ESO@subgridstyle{#1}}%
202 \define@key{ESO}{gridunit}{%
203   \def\@tempa{#1}
204   \def\@tempb{bp}
205   \ifx\@tempa\@tempb
206     \gridSetup[\@tempa]{1bp}{1}{10}{50}{2}
207   \else
208     \def\@tempb{pt}
209     \ifx\@tempa\@tempb
210       \gridSetup[\@tempa]{\p@}{1}{10}{50}{2}
211     \else
212       \def\@tempb{in}
213       \ifx\@tempa\@tempb
214         \gridSetup[\@tempa]{.1in}{.1}{2}{10}{.5}
215       \else
216         \gridSetup[mm]{1mm}{1}{5}{20}{1}
217       \fi
218     \fi
219   \fi
220 }
221 \setkeys{ESO}{subgridstyle=solid,pscoord=true,gridunit=mm}
```

\ProcessOptionsWithKV   This macro can process package options using 'key=value' syntax.

```
222 \def\ProcessOptionsWithKV#1{%
223   \let\@tempc\@empty
224   \@for\CurrentOption:=\@classoptionslist\do{%
225     \@ifundefined{KV@#1@\CurrentOption}%
226     {}{\edef\@tempc{\@tempc,\CurrentOption,}}}%
227   \edef\@tempc{%
228     \noexpand\setkeys{#1}{\@tempc\@ptionlist{\@currname.\@currext}}}%
229   \@tempc
230   \AtEndOfPackage{\let\@unprocessedoptions\relax}}%

231 \ProcessOptionsWithKV{ESO}%
```

\ESO@div   Divides length #1 by #2 × \ESO@gridunit and adds one. Result is in \@tempcnta.

```
232 \newcommand\ESO@div[2]{%
233   \@tempdima=#1\relax\@tempdimb=\ESO@gridunit\relax
234   \@tempdimb=#2\@tempdimb\divide\@tempdima by \@tempdimb
235   \@tempcnta\@tempdima\advance\@tempcnta\@ne}

236 \@ifundefined{colorbox}{%
237   \IfFileExists{xcolor.sty}{\RequirePackage{xcolor}}%
238     {\RequirePackage{color}}%
239 }{}%
240 \let\ESO@color=\color
241 \renewcommand\ESO@colorbox[2]{%
242   \begingroup
243     \fboxsep=.4ex %
244     \colorbox{#1}{#2}%
245   \endgroup
246 }
247 \renewcommand\ESO@fcolorbox[3]{%
248   \begingroup
```

```
249      \fboxsep=.5ex %
250      \fcolorbox{#1}{#2}{#3}%
251    \endgroup
252 }
253 \AtBeginDocument{%
254    \ESO@dvipsfalse
255    \@ifundefined{Gin@driver}{}%
256    {%
257      \ifx\Gin@driver\@empty\else%
258        \filename@parse{\Gin@driver}\def\reserved@a{dvips}%
259        \ifx\filename@base\reserved@a\ESO@dvipstrue\fi
260      \fi
261    }%
262    \ifESO@dvips\def\@tempb{eepic}\else\def\@tempb{epic}\fi
263    \def\@tempa{dotted}%\def\ESO@gap{\LenToUnit{6\@wholewidth}}%
264    \ifx\@tempa\ESO@subgridstyle
265      \IfFileExists{\@tempb.sty}%
266      {%
267        \RequirePackage{\@tempb}
268        \renewcommand*\ESO@hline[1]{\ESO@subgridlines\dottedline{\ESO@gap}%
269          (0,0)(##1,0)}
270        \renewcommand*\ESO@vline[1]{\ESO@subgridlines\dottedline{\ESO@gap}%
271          (0,0)(0,##1)}
272      }{}
273    \else
274      \ifx\ESO@gridcolor\ESO@subgridcolor
275        \renewcommand*\ESO@gridlines{\thicklines}
276      \fi
277    \fi
278 }
279 \ifESO@texcoord
280    \def\ESO@yoffsetI{\z@}\def\ESO@yoffsetII{-\paperheight}
281    \edef\ESO@griddeltaY{-\ESO@griddelta}\edef\ESO@gridDeltaY{-\ESO@gridDelta}
282 \else
283    \def\ESO@yoffsetI{-\paperheight}\def\ESO@yoffsetII{\z@}
284    \edef\ESO@griddeltaY{\ESO@griddelta}\edef\ESO@gridDeltaY{\ESO@gridDelta}
285 \fi
```

\ESO@gridpicture

```
286 \newcommand\ESO@gridpicture{%
287    \begingroup
288      \setlength\unitlength{\ESO@gridunit}%
289      \ESO@color{\ESO@subgridcolor}%
```
— horizontal subgrid lines —
```
290      \ESO@div{\paperheight}{\ESO@griddelta}%
291      \multiput(0,0)(0,\ESO@griddeltaY){\@tempcnta}%
292        {\ESO@hline{\LenToUnit{\paperwidth}}}%
```
— vertical subgrid lines —
```
293      \ESO@div{\paperwidth}{\ESO@griddelta}%
294      \multiput(0,\LenToUnit{\ESO@yoffsetII})(\ESO@griddelta,0){\@tempcnta}%
295        {\ESO@vline{\LenToUnit{\paperheight}}}%
296      \ESO@color{\ESO@gridcolor}%
```

— horizontal grid lines —

```
297     \ESO@div{\paperheight}{\ESO@gridDelta}%
298     \multiput(0,0)(0,\ESO@gridDeltaY){\@tempcnta}%
299       {\ESO@Hline{\LenToUnit{\paperwidth}}}%
```

— vertical grid lines —

```
300     \ESO@div{\paperwidth}{\ESO@gridDelta}%
301     \multiput(0,\LenToUnit{\ESO@yoffsetII})(\ESO@gridDelta,0){\@tempcnta}%
302       {\ESO@Vline{\LenToUnit{\paperheight}}}%
```

— horizontal numbers —

```
303     \fontsize{10}{12}\normalfont%
304     \ESO@div{\paperwidth}{\ESO@gridDelta}%
305     \multiput(0,\ESO@gridDeltaY)(\ESO@gridDelta,0){\@tempcnta}{%
306       \@tempcntb=\@tempcnta\advance\@tempcntb-\@multicnt
307       \ifnum\@tempcntb>1\relax
308         \multiply\@tempcntb by \ESO@gridDelta\relax
309         \@tempdima=\@tempcntb sp\@tempdima=\ESO@labelfactor\@tempdima
310         \@tempcntb=\@tempdima%
311         \makebox(0,0)[c]{\ESO@colorbox{white}{\the\@tempcntb}}%
312       \fi}%
```

— vertical numbers —

```
313     \ifx\ESO@gridunitname\@empty\def\@tempa{0}\else\def\@tempa{1}\fi
314     \ESO@div{\paperheight}{\ESO@gridDelta}%
315     \multiput(\ESO@gridDelta,0)(0,\ESO@gridDeltaY){\@tempcnta}{%
316       \@tempcntb=\@tempcnta\advance\@tempcntb-\@multicnt%
317       \ifnum\@tempcntb>\@tempa\relax
318         \multiply\@tempcntb by \ESO@gridDelta\relax%
319         \@tempdima=\@tempcntb sp\@tempdima=\ESO@labelfactor\@tempdima
320         \@tempcntb=\@tempdima
321         \makebox(0,0)[c]{\ESO@colorbox{white}{\the\@tempcntb}}%
322       \fi
323     }%
```

— the unit label —

```
324     \ifx\ESO@gridunitname\@empty\else
325       \thicklines\fboxrule=\@wholewidth
326       \put(\ESO@gridDelta,\ESO@gridDeltaY){\makebox(0,0)[c]{%
327         \ESO@fcolorbox{\ESO@gridcolor}{white}{%
328           \textbf{\ESO@gridunitname}}}}%
329     \fi
330     \normalcolor%
331   \endgroup
332 }
```

Add the grid to the shipout picture (`\ESO@HookIIIBG` is independed from the user commands `\AddToShipoutPictureBG` and `\AddToShipoutPictureBG*`).

```
333 \ifESO@grid\g@addto@macro\ESO@HookIFG{\ESO@gridpicture}\fi
```