

# 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  $\text{\LaTeX}$  documents (`eso-*.tex`).

### 2.1 Basic commands for adding $\text{\LaTeX}$ stuff to the page background

<code>\AddToShipoutPictureBG</code>	All the picture commands which are parameters of an <code>\AddToShipoutPictureBG</code> command will be added to the internal macro <code>\ESO@HookIBG</code> . This macro is part of a zero-length <code>picture</code> environment with basepoint at the lower left corner of the page (default) or at the upper left corner (package option "texcoord"). The <code>picture</code> environment will be shipped out at every new page.
<code>\AddToShipoutPictureBG*</code>	<code>\AddToShipoutPictureBG*</code> works like <code>\AddToShipoutPictureBG</code> but only for the current page. It used the internal macro <code>\ESO@HookIIBG</code> which contents will be removed automatically. For compatibility the macros <code>\AddToShipoutPicture</code> and <code>\AddToShipoutPicture*</code> are aliases for <code>\AddToShipoutPictureBG</code> and <code>\AddToShipoutPictureBG*</code> .
<code>\AddToShipoutPictureFG</code>	Works like <code>\AddToShipoutPictureBG</code> but the picture commands are on the top of the normal document content.
<code>\AddToShipoutPictureFG*</code>	
<code>\ClearShipoutPictureBG</code>	A call of <code>\ClearShipoutPictureBG</code> clears the contents of <code>\ESO@HookIBG</code> . For compatibility the macro <code>\ClearShipoutPicture</code> is an alias for <code>\ClearShipoutPictureBG</code> .
<code>\ClearShipoutPictureFG</code>	A call of <code>\ClearShipoutPictureFG</code> clears the contents of <code>\ESO@HookIFG</code> .
<code>\LenToUnit</code>	Allows a length as parameter to a picture command. Note that this macro is no more necessary when using <code>\usepackage{picture}</code> .
<code>\gridSetup</code>	<code>\gridSetup[\langle gridunitname \rangle]{\langle gridunit \rangle}{\langle labelfactor \rangle}{\langle griddelta \rangle}{\langle gridDelta \rangle}{\langle gap \rangle}</code> . For details see the implementation section.

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\*This document corresponds to `eso-pic` v2.0b, dated 2010/06/08.

\AtPageUpperLeft      Helper macros for easier positioning on the page.

\AtPageLowerLeft

\AtPageCenter

\AtTextUpperLeft

\AtTextLowerLeft

\AtTextCenter

\AtStockUpperLeft

\AtStockLowerLeft

\AtStockCenter

## 2.2 Package options

Option	Value	Comments
pscoord	empty or <i>true</i> , <i>false</i>	The zero point of the coordinate system is the lower left corner of the page (the default).
texcoord	empty or <i>true</i> , <i>false</i>	The zero point of the coordinate system is the upper left corner of the page.
grid	empty or <i>true</i> , <i>false</i>	A grid is drawing; default: false.
gridunit	<i>mm</i> , <i>in</i> , <i>bp</i> , <i>pt</i>	Distance between gridlines are multiples of <b>gridunit</b> . 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	<i>solid</i> or <i>dotted</i>	‘dotted’ is very slow! default: solid.
colorgrid	empty or <i>true</i> , <i>false</i>	Shortcut for ‘grid=true’, ‘gridcolor=red’ and ‘subgridcolor=green’; default: false.
dvips	empty or <i>true</i> , <i>false</i>	Is also true if the package option <b>dvips</b> is used by <b>color</b> or <b>graphics</b> . If true package <b>eeepic</b> is loaded for better performance of dotted lines.

## 3 Implementation

### 3.1 The main functionality

```

1 \RequirePackage{atbegshi}

\LenToUnit

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

\ESO@isMEMOIR Support for the memoir class.
3 \newcommand\ESO@isMEMOIR[2]{#2}
4 \@ifclassloaded{memoir}{\renewcommand\ESO@isMEMOIR[2]{#1}}{}

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

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

\AtPageCenter
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        \ifodd\c@page
75          \advance\@tempdima\oddsidemargin
76        \else
77          \advance\@tempdima\evensidemargin
78        \fi
79        \@tempdimb=-1in\relax
80        \advance\@tempdimb-\topmargin
81        \advance\@tempdimb-\headheight
82        \advance\@tempdimb-\headsep
83        \AtPageUpperLeft{%
84          \put(\LenToUnit{\@tempdima},\LenToUnit{\@tempdimb}){#1}%
85        }%
86      \endgroup
87    }
88  }

\AtTextLowerLeft
89 \newcommand\AtTextLowerLeft[1]{\AtTextUpperLeft{%
90   \put(0,\LenToUnit{-\textheight}){#1}}}

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

\ESO@HookIBG
\ESO@HookIIBG 93 \newcommand{\ESO@HookIBG}{-}
\ESO@HookIIIBG 94 \newcommand{\ESO@HookIIBG}{-}
\ESO@HookIFG 95 \newcommand{\ESO@HookIIIBG}{-}
\ESO@HookIIFG 96 \newcommand{\ESO@HookIFG}{-}
97 \newcommand{\ESO@HookIIFG}{-}
98 \newcommand{\ESO@HookI}{-}
99 \newcommand{\ESO@HookII}{-}
100 \newcommand{\ESO@HookIII}{-}
101 \let\ESO@HookI=\ESO@HookIBG
102 \let\ESO@HookII=\ESO@HookIIBG
103 \let\ESO@HookIII=\ESO@HookIIIBG

\AddToShipoutPictureBG
\AddToShipoutPictureFG 104 \newcommand{\AddToShipoutPictureBG}{%
105   \ifstar{\g@addto@macro\ESO@HookIIBG}{\g@addto@macro\ESO@HookIBG}}

```

```

106 \newcommand{\AddToShipoutPicture}{}
107 \let\AddToShipoutPicture=\AddToShipoutPictureBG

\AddToShipoutPictureFG
108 \newcommand{\AddToShipoutPictureFG}{%
109   \@ifstar{\g@addto@macro\ESO@HookIIFG}{\g@addto@macro\ESO@HookIFG}}

\ClearShipoutPictureBG
\ClearShipoutPicture 110 \newcommand{\ClearShipoutPictureBG}{\global\let\ESO@HookIBG\@empty}
\ClearShipoutPictureFG 111 \newcommand{\ClearShipoutPicture}{}
112 \let\ClearShipoutPicture=\ClearShipoutPictureBG
113 \newcommand{\ClearShipoutPictureFG}{\global\let\ESO@HookIFG\@empty}

\AtBeginShipout (see package atbegshi)
\AtBeginShipoutUpperLeft 114 \ESO@isMEMOIR{%
inShipoutUpperLeftForeground 115   \AtBeginShipout{%
116     \@tempdima=-\trimedge
117     \advance\@tempdima-\paperwidth
118     \advance\@tempdima\stockwidth
119     \if@twoside\ifodd\c@page\else
120       \advance\@tempdima2\trimedge
121       \advance\@tempdima\paperwidth
122       \advance\@tempdima-\stockwidth
123     \fi\fi
124     \@tempdimb=\ESO@yoffsetI
125     \advance\@tempdimb-\trintop
126     \nointerlineskip
127     \AtBeginShipoutUpperLeft{%
128       \put(\LenToUnit{\@tempdima},\LenToUnit{\@tempdimb}){%
129         \ESO@HookIIIBG\ESO@HookIBG\ESO@HookIIBG
130         \global\let\ESO@HookIIBG\@empty
131       }%
132     }%
133     \AtBeginShipoutUpperLeftForeground{%
134       \put(\LenToUnit{\@tempdima},\LenToUnit{\@tempdimb}){%
135         \ESO@HookIBG\ESO@HookIIBG
136         \global\let\ESO@HookIIBG\@empty
137       }%
138     }%
139   }
140 }{%
141   \AtBeginShipout{%
142     \nointerlineskip
143     \AtBeginShipoutUpperLeft{%
144       \put(0,\LenToUnit{\ESO@yoffsetI}){%
145         \ESO@HookIIIBG\ESO@HookIBG\ESO@HookIIBG
146         \global\let\ESO@HookIIBG\@empty
147       }%
148     }%
149     \AtBeginShipoutUpperLeftForeground{%
150       \put(0,\LenToUnit{\ESO@yoffsetI}){%
151         \ESO@HookIFG\ESO@HookIIFG
152         \global\let\ESO@HookIIFG\@empty
153       }%

```

```

154     }%
155   }
156 }

```

### 3.2 The background grid

```

157 \RequirePackage{keyval}

Initialising some macros
158 \newif\ifESO@dvips\ESO@dvipsfalse \newif\ifESO@grid\ESO@gridfalse
159 \newif\ifESO@texcoord\ESO@texcoordfalse
160 \newcommand*\ESO@gridunitname{}
161 \newcommand*\ESO@gridunit{}
162 \newcommand*\ESO@labelfactor{}
163 \newcommand*\ESO@griddelta{}\newcommand*\ESO@griddeltaY{}
164 \newcommand*\ESO@gridDelta{}\newcommand*\ESO@gridDeltaY{}
165 \newcommand*\ESO@gridcolor{}
166 \newcommand*\ESO@subgridcolor{}
167 \newcommand*\ESO@subgridstyle{dotted}% ???
168 \newcommand*\ESO@gap{}
169 \newcommand*\ESO@yoffsetI{}\newcommand*\ESO@yoffsetII{}
170 \newcommand*\ESO@gridlines{\thinline}
171 \newcommand*\ESO@subgridlines{\thinline}
172 \newcommand*\ESO@hline[1]{\ESO@subgridlines\line(1,0){#1}}
173 \newcommand*\ESO@vline[1]{\ESO@subgridlines\line(0,1){#1}}
174 \newcommand*\ESO@Hline[1]{\ESO@gridlines\line(1,0){#1}}
175 \newcommand*\ESO@Vline[1]{\ESO@gridlines\line(0,1){#1}}
176 \newcommand\ESO@fcolorbox[4][\fbox{#4}]{}
177 \newcommand\ESO@color[1]{}
178 \newcommand\ESO@colorbox[3][\fbox{#3}]{}
179 \begingroup
180   \fboxrule=\z@\fbox{#3}%
181 \endgroup
182 }

\gridSetup
183 \newcommand\gridSetup[6][\fbox{#3}]{}
184 \edef\ESO@gridunitname{#1}\edef\ESO@gridunit{#2}
185 \edef\ESO@labelfactor{#3}\edef\ESO@griddelta{#4}
186 \edef\ESO@gridDelta{#5}\edef\ESO@gap{#6}

```

All the key-value options

```

187 \define@key{ESO}{texcoord}[true]{\csname ESO@texcoord#1\endcsname}
188 \define@key{ESO}{pscoord}[true]{\csname @tempwa#1\endcsname
189   \if@tempwa\ESO@texcoordfalse\else\ESO@texcoordtrue\fi}
190 \define@key{ESO}{dvips}[true]{\csname ESO@dvips#1\endcsname}
191 \define@key{ESO}{grid}[true]{\csname ESO@grid#1\endcsname}
192 \setkeys{ESO}{gridcolor=black,subgridcolor=black}
193 \define@key{ESO}{colorgrid}[true]{\csname ESO@grid#1\endcsname}
194 \setkeys{ESO}{gridcolor=red,subgridcolor=green}
195 \define@key{ESO}{gridcolor}{\def\ESO@gridcolor{#1}}
196 \define@key{ESO}{subgridcolor}{\def\ESO@subgridcolor{#1}}
197 \define@key{ESO}{subgridstyle}{\def\ESO@subgridstyle{#1}}%
198 \define@key{ESO}{gridunit}{\def\ESO@gridunit{#1}}%
199 \def\@tempa{#1}

```

```

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

```

`\ProcessOptionsWithKV` This macro can process package options using ‘key=value’ syntax.

```

218 \def\ProcessOptionsWithKV#1{%
219   \let\@tempc\@empty
220   \@for\CurrentOption:=\@classoptionslist\do{%
221     \@ifundefined{KV@#1\CurrentOption}%
222     {}{\edef\@tempc{\@tempc,\CurrentOption,}}}%
223   \edef\@tempc{%
224     \noexpand\setkeys{#1}{\@tempc\@optionlist{\@currname.\@currentt}}}%
225   \@tempc
226   \AtEndOfPackage{\let\@unprocessedoptions\relax}}%
227 \ProcessOptionsWithKV{ESO}%

```

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

```

228 \newcommand\ESO@div[2]{%
229   \@tempdima=#1\relax\@tempdimb=\ESO@gridunit\relax
230   \@tempdimb=#2\@tempdimb\divide\@tempdima by \@tempdimb
231   \@tempcnta\@tempdima\advance\@tempcnta\@ne}

232 \@ifundefined{colorbox}{%
233   \IfFileExists{xcolor.sty}{\RequirePackage{xcolor}}%
234   {\RequirePackage{color}}}%
235 }{}%
236 \let\ESO@color=\color
237 \let\ESO@colorbox=\colorbox
238 \let\ESO@fcolorbox=\fcolorbox
239 \AtBeginDocument{%
240   \ESO@dvijsfalse
241   \@ifundefined{Gin@driver}{}%
242   {%
243     \ifx\Gin@driver\@empty\else%
244       \filename@parse{\Gin@driver}\def\reserved@a{dvips}%
245       \ifx\filename@base\reserved@a\ESO@dvijstrue\fi
246     \fi
247   }%

```

```

248 \ifESO@dvi\def\@tempb{eepic}\else\def\@tempb{epic}\fi
249 \def\@tempa{dotted}%\def\ESO@gap{\LenToUnit{6\@wholewidth}}%
250 \ifx\@tempa\ESO@subgridstyle
251 \IfFileExists{\@tempb.sty}%
252 {%
253 \RequirePackage{\@tempb}
254 \renewcommand*\ESO@hline[1]{\ESO@subgridlines\dottedline{\ESO@gap}%
255 (0,0)(\#1,0)}
256 \renewcommand*\ESO@vline[1]{\ESO@subgridlines\dottedline{\ESO@gap}%
257 (0,0)(0,\#1)}
258 }{}
259 \else
260 \ifx\ESO@gridcolor\ESO@subgridcolor
261 \renewcommand*\ESO@gridlines{\thicklines}
262 \fi
263 \fi
264 }
265 \ifESO@texcoord
266 \def\ESO@yoffsetI{\z@}\def\ESO@yoffsetII{-\paperheight}
267 \edef\ESO@griddeltaY{-\ESO@griddelta}\edef\ESO@gridDeltaY{-\ESO@gridDelta}
268 \else
269 \def\ESO@yoffsetI{-\paperheight}\def\ESO@yoffsetII{\z@}
270 \edef\ESO@griddeltaY{\ESO@griddelta}\edef\ESO@gridDeltaY{\ESO@gridDelta}
271 \fi

```

\ESO@gridpicture

```

272 \newcommand\ESO@gridpicture{%
273 \begin{group}
274 \setlength\unitlength{\ESO@gridunit}%
275 \ESO@color{\ESO@subgridcolor}%
276 — horizontal subgrid lines —
277 \ESO@div{\paperheight}{\ESO@griddelta}%
278 \multiput(0,0)(0,\ESO@griddeltaY){\@tempcnta}%
279 {\ESO@hline{\LenToUnit{\paperwidth}}}%
280 — vertical subgrid lines —
281 \ESO@div{\paperwidth}{\ESO@griddelta}%
282 \multiput(0,\LenToUnit{\ESO@yoffsetII})(\ESO@griddelta,0){\@tempcnta}%
283 {\ESO@vline{\LenToUnit{\paperheight}}}%
284 \ESO@color{\ESO@gridcolor}%
285 — horizontal grid lines —
286 \ESO@div{\paperheight}{\ESO@gridDelta}%
287 \multiput(0,0)(0,\ESO@gridDeltaY){\@tempcnta}%
288 {\ESO@Hline{\LenToUnit{\paperwidth}}}%
289 — vertical grid lines —
290 \ESO@div{\paperwidth}{\ESO@gridDelta}%
291 \multiput(0,\LenToUnit{\ESO@yoffsetII})(\ESO@gridDelta,0){\@tempcnta}%
292 {\ESO@Vline{\LenToUnit{\paperheight}}}%
293 — horizontal numbers —
294 \fontsize{10}{12}\normalfont%
295 \ESO@div{\paperwidth}{\ESO@gridDelta}%
296 \multiput(0,\ESO@gridDeltaY)(\ESO@gridDelta,0){\@tempcnta}{%

```



```

292 \tempcntb=\tempcnta\advance\tempcntb-\multicnt
293 \ifnum\tempcntb>1\relax
294 \multiply\tempcntb by \ESO@gridDelta\relax
295 \tempdima=\tempcntb sp\tempdima=\ESO@labelfactor\tempdima
296 \tempcntb=\tempdima%
297 \makebox(0,0)[c]{\ESO@colorbox{white}{\the\tempcntb}}%
298 \fi}%
— vertical numbers —
299 \ifx\ESO@gridunitname\empty\def\tempa{0}\else\def\tempa{1}\fi
300 \ESO@div{\paperheight}{\ESO@gridDelta}%
301 \multiput(\ESO@gridDelta,0)(0,\ESO@gridDeltaY){\tempcnta}{%
302 \tempcntb=\tempcnta\advance\tempcntb-\multicnt%
303 \ifnum\tempcntb>\tempa\relax
304 \multiply\tempcntb by \ESO@gridDelta\relax%
305 \tempdima=\tempcntb sp\tempdima=\ESO@labelfactor\tempdima
306 \tempcntb=\tempdima%
307 \makebox(0,0)[c]{\ESO@colorbox{white}{\the\tempcntb}}%
308 \fi
309 }%
— the unit label —
310 \ifx\ESO@gridunitname\empty\else
311 \thicklines\fbboxrule=\@wholewidth
312 \put(\ESO@gridDelta,\ESO@gridDeltaY){\makebox(0,0)[c]{%
313 \ESO@fcolorbox{\ESO@gridcolor}{white}{%
314 \textbf{\ESO@gridunitname}}}%
315 \fi
316 \normalcolor%
317 \endgroup
318 }

```

Add the grid to the shipout picture (\ESO@HookIIIIBG is independent from the user commands \AddToShipoutPictureBG and \AddToShipoutPictureBG\*).

```

319 \ifESO@grid\g@addto@macro\ESO@HookIIIIBG{\ESO@gridpicture}\fi

```