

Semi-Manual Grid Setting Using `gridset`*

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Abstract

Grid setting—also known as strict in-register setting—is something, that should be done for a lot of documents but is not easy using L^AT_EX. Package `gridset` helps to get the information needed for grid setting. It does not implement auto grid setting, but there is a command `\vskipnextgrid`, that moves to the next grid position. This may be enough under some circumstances. In other circumstances it may fail. So `gridset` is only one more step for grid setting not a complete solution.

Important Note: This package should have been never released, because it was only a very quick implementation of an idea. You should not use it for any productive purpose. It has been made for testing only. I would prefer to retire it from any distribution. Nevertheless I know few persons using the package. So it will be still there but without any support!

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1 User Manual

`\gridinterval` This macro contains a number without unit! The number is the distance between two grid lines in unit ‘scale points’ (sp). You may set it so another value using, e.g.

```
\newlength{\<name of your length>}
\setlength{\<name of your length>}{\<new length value>}
\newcounter{\<name of your counter>}
```

*This is an alpha version! Don’t use it! Only test it! There’s no support and everything may change!

	$\backslash\text{setcounter}\{\backslash\langle\textit{name of your counter}\rangle\}\{\backslash\langle\textit{name of your length}\rangle\}$ $\backslash\text{edef}\backslash\text{gridinterval}\{\backslash\langle\textit{name of your length}\rangle\}$
$\backslash\text{gridbase}$	<p>This macro contains an integer number, that represents the y-coordinate of the upper start of the grid. If you want to change it, just save a position and $\backslash\text{edef}$ the $\backslash\text{gridbase}$ to the y-pos of that position.</p> <p>Most time you don't need to change $\backslash\text{gridinterval}$ and $\backslash\text{gridposition}$, because they are initialized to a base line grid at start of first page. Because of this, it doesn't matter, that changing them is not really user friendly.</p>
$\backslash\text{SavePos}$ $\backslash\text{savepos}$	<p>$\backslash\text{SavePos}\{\langle\textit{unique name}\rangle\}$ saves informations about the current position to the aux-file. These informations are read at next L^AT_EX run and may be used (see $\backslash\text{the}\dots$ commands below) then. The $\langle\textit{unique name}\rangle$ has to be a position name, that is unique for all saved position informations of the current document. Note that the command has been renamed from $\backslash\text{savepos}$ to $\backslash\text{SavePos}$ in release 0.2, because LuaT_EX since 0.85 uses $\backslash\text{savepos}$ as a new primitive. On other engines the old name $\backslash\text{savepos}$ is still available.</p>
$\backslash\text{vskipnextgrid}$	<p>This command moves to the next grid position. To achieve this, a position information is saved at this and used at next L^AT_EX run. The used name of the position information is $\text{vb!}\langle\textit{number of skip}\rangle$. $\langle\textit{number of skip}\rangle$ is the number of the current $\backslash\text{vskipnextgrid}$ usage. Counter gridcnt is used to number the usage of $\backslash\text{vskipnextgrid}$.</p>
$\backslash\text{thegridinfo}$	<p>$\backslash\text{thegridinfo}\{\langle\textit{name}\rangle\}$ outputs</p> <ul style="list-style-type: none"> • arabic page number of the named position, • grid base, that was valid saving the information of the named position, • grid interval, that was valid saving the information of the named position, • x-coordinate of the named position, • y-coordinate of the named position. <p>The coordinates and intervals are numbers without units. The unit is 'scale points' (sp).</p>
$\backslash\text{theposinfo}$	<p>$\backslash\text{theposinfo}\{\langle\textit{name}\rangle\}$ outputs</p> <ul style="list-style-type: none"> • y-coordinate of the named position, • grid line number (first is 0) of the next grid position, • offset of the next grid position from grid base, • distance to the next grid position. <p>The coordinates, offsets and distances are numbers without units. The unit is 'scale points' (sp).</p>
$\backslash\text{theypos}$	<p>$\backslash\text{theypos}\{\langle\textit{name}\rangle\}$ outputs the y-coordinate of the named position.</p>

2 Implementation

`gridset@luaorpdf` We need some locals because LuaTeX changed the names of several primitives inherited from PDFTeX.

`\gridset@pageheight`

`\gridset@pagewidth` 1 \newcommand*{\gridset@luaorpdf}[1]{%

`\gridset@savepos` 2 \expandafter\newcommand\csname gridset@#1\endcsname{}%

`\gridset@lastxpos` 3 \ifcsname pdf#1\endcsname

`\gridset@lastypos` 4 \expandafter\let\csname gridset@#1\expandafter\endcsname

5 \csname pdf#1\endcsname

6 \else

7 \ifcsname #1\endcsname

8 \expandafter\let\csname gridset@#1\expandafter\endcsname

9 \csname #1\endcsname

10 \else

11 \PackageError{gridset}{%

12 neither \expandafter\string\csname #1\endcsname\space

13 nor \xpdfafter\string\csname pdf#1\endcsname\space

14 defined%

15 }{This package needs either PDFTeX or LuaTeX or XeTeX.}%

16 \fi

17 \fi

18 }

19 \gridset@luaorpdf{pageheight}

20 \gridset@luaorpdf{pagewidth}

21 \gridset@luaorpdf{savepos}

22 \gridset@luaorpdf{lastxpos}

23 \gridset@luaorpdf{lastypos}

`\gridbase` These contain the grid information. `\gridbase` is a integer number representing

`\gridinterval` the absolute y coordinate of the upper end of the grid relative to the same reference point `\pdfsavepos` uses. `\gridinterval` is a integer number representing the distance of two grid lines. The unit is ‘scaled point’ (sp) both time.

24 \newcommand*{\gridbase}{}

25 \newcommand*{\gridinterval}{}

`\gridbase` and `\gridinterval` need to be initialized at the start of the first page (fixme: shouldn’t this be done at the start of every page?). We use this occasion to also initialize `\pdfpageheight` and `\pdfpagewidth` if this hasn’t been done already.

26 \AtBeginDocument{%

27 \ifdim\gridset@pageheight=\z@

28 \gridset@pageheight=\paperheight

29 \fi

30 \ifdim\gridset@pagewidth=\z@

31 \gridset@pagewidth=\paperwidth

32 \fi

33 \begingroup

34 \@tempdima=\dimexpr \gridset@pageheight - \topmargin - 1in

35 - \headheight - \headsep

```

36             - \topskip \relax
37     \@tempcnta=\@tempdima
38     \xdef\gridbase{\the\@tempcnta}%
39     \@tempcnta=\baselineskip
40     \xdef\gridinterval{\the\@tempcnta}%
41 \endgroup
42 }

```

\savepos Save current position on the page to the aux-file. The argument is a unique name
\SavePos for the position. The saved informations are:

- the name of the position,
- the arabic page number of the page with the position,
- the grid base, that was valid for this position,
- the grid interval, that was valid for this position,
- the x-coordinate of the absolute position,
- the y-coordinate of the absolute position.

```

43 \newcommand*{\SavePos}[1]{%
44   \begingroup
45     \gridset@savepos
46     \protected@write\@auxout{}{%
47       \protect\newpos{#1}{\the\count\z@}{\gridbase}{\gridinterval}{%
48         \noexpand\number\gridset@lastxpos
49       }{%
50         \noexpand\number\gridset@lastypos
51       }%
52     }%
53   \endgroup
54 }
55 \ifx\savepos\gridset@savepos
56   \PackageInfo{gridset}{LuaTeX detected.\MessageBreak
57     Note, gridset command is \string\SavePos\MessageBreak
58     but not \string\savepos, which is\MessageBreak
59     a LuaTeX primitive
60   }%
61 \else
62   \PackageInfo{gridset}{\string\savepos\space defined as an alias of
63     \string\SavePos}%
64   \newcommand*{\savepos}{\SavePos}%
65 \fi

```

\newpos This is the command, that has been written to the aux-file. Reading the aux-file it defines several position dependant macros to store the position information. Reading the aux-file while **\begindocument** a double definition test is done. Reading the aux-file while **\enddocument** a test is done, if the position has been changed

and notes the user about needed additional L^AT_EX runs. (fixme: shouldn't the test be done with the x- and the y-coordinate instead of the vskip only?) The defined macros are:

`\pos@<position name>@page` the arabic page number of the position

`\pos@<position name>@base` the valid grid base while saving the position

`\pos@<position name>@interval` the valid grid interval while saving the position

`\pos@<position name>@x` the x-coordinate of the position

`\pos@<position name>@y` the y-coordinate of the position

`\pos@<position name>@line` the number of the next grid line for the position (first grid line has number 0)

`\pos@<position name>@offset` distance of the next grid line from the grid base

`\pos@<position name>@vskip` distance to the next grid line for the position

All values are integers. The unit to all values is ‘scaled points’ (sp). See `\pdfsavepos` at the pdf_T_EX user manual for more information.

```

66 \newcommand*{\newpos}[6]{%
67   \grid@unique@test{#1}{#2}%
68   \expandafter\global\@namedef{pos@#1@page}{#2}%
69   \expandafter\global\@namedef{pos@#1@base}{#3}%
70   \expandafter\global\@namedef{pos@#1@interval}{#4}%
71   \expandafter\global\@namedef{pos@#1@x}{#5}%
72   \expandafter\global\@namedef{pos@#1@y}{#6}%
73   \begingroup
74     \@tempcnta=\numexpr \@nameuse{pos@#1@base} - \@nameuse{pos@#1@y}\relax
75     \@tempcnta=\numexpr \@tempcnta + \@nameuse{pos@#1@interval} - 1\relax
76     \divide\@tempcnta by\@nameuse{pos@#1@interval}\relax
77     \expandafter\xdef\csname pos@#1@line\endcsname{\the\@tempcnta}%
78     \@tempcnta=\numexpr \@tempcnta * \@nameuse{pos@#1@interval}\relax
79     \expandafter\xdef\csname pos@#1@offset\endcsname{\the\@tempcnta}%
80     \@tempcnta=\numexpr \@nameuse{pos@#1@y}
81       - ( \@nameuse{pos@#1@base} - \@tempcnta )\relax
82     \expandafter\let\expandafter\@tempa\csname pos@#1@vskip\endcsname%
83     \expandafter\xdef\csname pos@#1@vskip\endcsname{\the\@tempa}%
84     \expandafter\ifx\csname pos@#1@vskip\endcsname\@tempa\else
85       \grid@ReRunMessage
86     \fi
87   \endgroup
88 }
```

`\grid@unique@test` A very simple test to warn if a position name isn't unique.

```

89 \newcommand*{\grid@unique@test}[2]{%
90   \expandafter\ifx\csname pos@#1@page\endcsname\relax\else
```

```

91 \PackageError{gridset}{position '#1' is not unique.\@gobble}{%
92   You have used the position name '#1' you are using on page
93   '#2'\MessageBreak
94   already on page '\csname pos@#1@page\endcsname'.\MessageBreak
95   You should stop processing, remove the aux-files and correct the
96   names.\MessageBreak
97   If you'd continue, this will result in grid position
98   failures.\MessageBreak
99   that won't be reported!}%
100 \fi
101 }
102 \AtBeginDocument{%
103   \global\let\grid@unique@test\@gobble
104 }

```

`\grid@ReRunMessage` The change test will be done for each `\newpos` but one user information at the end of the document should be enough. So we use a message macro, that destroys itself after first usage.

```

105 \newcommand*\grid@ReRunMessage{}
106 \AtBeginDocument{%
107   \renewcommand*\grid@ReRunMessage{%
108     \PackageWarningNoLine{gridset}{Grid position labels may have
109     changed.\MessageBreak
110     Rerun to get grid positions right}%
111     \global\let\grid@ReRunMessage\relax
112   }%
113 }

```

`\vskipnextgrid` Move to next grid position. The counter `gridcnt` is used to give every move to position a unique position name. The names are '`vp!<number of the move to position>`'. You may use this to get informations e.g. about the last move to position.

```

114 \newcounter{gridcnt}
115 \newcommand*\vskipnextgrid{%
116   \begingroup
117     \stepcounter{gridcnt}\edef\@tempa{vp!\thegridcnt}%
118     \ifvmode

```

`\pdfsavepos` in vertical mode is a problem, because the base line alignment will be done at least at paragraph breaking. Because of this, we have to leave the vertical mode and do it then. But remark: If you change the base line skip e.g. changing the font size, the next line would not be grid aligned!

```

119     \leavevmode\SavePos{\@tempa}%
120     \expandafter\ifx\csname pos@\@tempa @vskip\endcsname\relax
121     \else
122     \expandafter\ifnum \csname pos@\@tempa @vskip\endcsname =\z@\else
123     \PackageInfo{gridset}{%
124       vmode \string\vskip\csname pos@\@tempa @vskip\endcsname sp%
125     }%

```

```

126         \vskip -\parskip\vskip -\baselineskip
127         \expandafter\vskip\csname pos@\@tempa @vskip\endcsname sp\relax
128     \fi
129 \fi
130 \else
\pdfsavepos in horizontal mode is a problem too, because we have to enter the
vertical mode to do vertical skips. Because of this, the remark is the same like the
vertical mode remark.
131     \parskip=\z@
132     \SavePos{vp!\thegridcnt}%
133     \expandafter\ifx\csname pos@\@tempa @vskip\endcsname\relax
134     \else
135     \expandafter\ifnum \csname pos@\@tempa @vskip\endcsname =\z@\else
136     \PackageInfo{gridset}{%
137     hmode \string\vskip\csname pos@\@tempa @vskip\endcsname sp%
138     }%
139     \vskip -\baselineskip
140     \expandafter\vskip\csname pos@\@tempa @vskip\endcsname sp\relax
141     \if@twoside
142     \expandafter\ifodd\csname pos@\@tempa @page\endcsname\relax
143     \leavevmode\hskip \dimexpr - 1in - \oddsidemargin - \parindent
144     + \csname pos@\@tempa @x\endcsname sp\relax
145     \else
146     \leavevmode\hskip \dimexpr - 1in - \evensidemargin - \parindent
147     + \csname pos@\@tempa @x\endcsname sp\relax
148     \fi
149     \else
150     \leavevmode\hskip \dimexpr - 1in - \oddsidemargin - \parindent
151     + \csname pos@\@tempa @x\endcsname sp\relax
152     \fi
153 \fi
154 \fi
155 \fi
156 \endgroup
157 }

```

(fixme: A better solution would be to first move and then set the position. But that solution needs some more tests and maybe some more ideas, because after moving the position is on grid and so the saved x-pos would be on grid.)

`\thegridinfo` Some informations about the grid (valid for a position) or the position.

```

\theposinfo 158 \newcommand*{\thegridinfo}[1]{%
\theypos 159   page=\@nameuse{pos@#1@page},
160   base=\@nameuse{pos@#1@base},
161   interval=\@nameuse{pos@#1@interval},
162   x=\@nameuse{pos@#1@x},
163   y=\@nameuse{pos@#1@y}%
164 }
165 \newcommand*{\theposinfo}[1]{%

```

```

166 y=\@nameuse{pos@#1@y},
167 gridline=\@nameuse{pos@#1@line},
168 gridoffset=\@nameuse{pos@#1@offset},
169 movedown=\@nameuse{pos@#1@vskip}%
170 }
171 \newcommand*{\theypos}[1]{\@nameuse{pos@#1@y}}

```

3 Example

You may try the following example document. You have to do several L^AT_EX runs until no new rerun warning occurs.

```

172 \documentclass[a4paper,12pt]{article}
173 \usepackage{gridset}
174 \usepackage{blindtext}
175 \raggedbottom
176
177 \pagestyle{myheadings}
178
179 \begin{document}
180 \markright{gridbase=\gridbase, gridinterval=\gridinterval\ without move down}%
181 \newcounter{Zeile}%
182 \makeatletter
183 \@whilenum \value{Zeile}<40\do {%
184   \stepcounter{Zeile}%
185   \theZeile. Zeile:
186   \SavePos{\thepage.\theZeile}\thegridinfo{\thepage.\theZeile}\par
187 }%
188 \makeatother
189 \clearpage
190 \setcounter{Zeile}{0}
191 \makeatletter
192 \@whilenum \value{Zeile}<20\do {%
193   \stepcounter{Zeile}%
194   \theZeile. Zeile:
195   \SavePos{\thepage.\theZeile}\theposinfo{\thepage.\theZeile}\par
196 }%
197 \makeatother
198 \clearpage
199 \parskip=.5\baselineskip
200 \setcounter{Zeile}{0}
201 \makeatletter
202 \@whilenum \value{Zeile}<20\do {%
203   \stepcounter{Zeile}%
204   \theZeile. Zeile:
205   \SavePos{\thepage.\theZeile}\theposinfo{\thepage.\theZeile}\par
206 }%
207 \makeatother
208 \clearpage

```



```

209 \markright{gridbase=\gridbase, gridinterval=\gridinterval\ with real move down
210 at vmode}%
211 \parskip=.5\baselineskip
212 \setcounter{Zeile}{0}
213 \makeatletter
214 \@whilenum \value{Zeile}<25\do {%
215   \stepcounter{Zeile}%
216   \vskipnextgrid\theZeile. Zeile: \theposinfo{vp!\thegridcnt}\par
217 }%
218 \makeatother
219 \clearpage
220 \markright{gridbase=\gridbase, gridinterval=\gridinterval\ with real move down
221 at hmode}%
222 \parskip=.5\baselineskip
223 \setcounter{Zeile}{0}
224 \makeatletter
225 \@whilenum \value{Zeile}<25\do {%
226   \stepcounter{Zeile}%
227   \theZeile. Zeile: \vskipnextgrid\theposinfo{vp!\thegridcnt}\par
228 }%
229 \makeatother
230 \clearpage
231 \parskip=0pt
232 \blindtext
233 \begin{itemize}
234 \item Test
235 \item Test
236 \end{itemize}
237 \vskipnextgrid\theposinfo{vp!\thegridcnt}\blindtext
238
239 \end{document}

```

Change History

v0.2		
\SavePos: new name	4	\gridset@pageheight: new internal because of
prepared for LuaTeX 0.85	4	LuaTeX 0.85
\gridbase: prepared for		\gridset@pagewidth: new internal because of LuaTeX 0.85
LuaTeX 0.85	3	
\gridinterval: prepared for		\gridset@savepos: new internal because of LuaTeX 0.85
LuaTeX 0.85	3	
\gridset@lastxpos: new internal because of LuaTeX 0.85	2	\savepos: macro renamed
\gridset@lastypos: new internal because of LuaTeX 0.85	2	gridset@luaorpdf: new internal because of LuaTeX 0.85