

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.

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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>}
\setcounter{\<name of your counter>}{\<name of your length>}
\edef\gridinterval{\<name of your length>}
```

`\gridbase` 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 `\edef` the `\gridbase` to the y-pos of that position.

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

Most time you don't need to change `\gridinterval` and `\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.

<code>\savepos</code>	<code>\savepos{⟨unique name⟩}</code> saves informations about the current position to the aux-file. These informations are read at next L ^A T _E X run and may be used (see <code>\the...</code> commands below) then. The <code>⟨unique name⟩</code> has to be a position name, that is unique for all saved position informations of the current document.
<code>\vskipnextgrid</code>	This command moves to the next grid position. To achieve this, a position information is saved at this and used at next L ^A T _E X run. The used name of the position information is <code>vb!⟨number of skip⟩</code> . <code>⟨number of skip⟩</code> is the number of the current <code>\vskipnextgrid</code> usage. Counter <code>gridcnt</code> is used to number the usage of <code>\vskipnextgrid</code> .
<code>\thegridinfo</code>	<code>\thegridinfo{⟨name⟩}</code> outputs <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>
<code>\theposinfo</code>	<code>\theposinfo{⟨name⟩}</code> outputs <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>
<code>\theypos</code>	<code>\theypos{⟨name⟩}</code> outputs the y-coordinate of the named position.

2 Implementation

	<code>1 ⟨package⟩\ProvidesPackage{gridset}[\fileversion\space (package)]</code>
<code>\gridbase</code> <code>\gridinterval</code>	These contain the grid information. <code>\gridbase</code> is a integer number representing the absolute y coordinate of the upper end of the grid relative to the same reference point <code>\pdfsavepos</code> uses. <code>\gridinterval</code> is a integer number representing the distance of two grid lines. The unit is 'scaled point' (sp) both time.
	<code>2 \newcommand*{\gridbase}{}</code>
	<code>3 \newcommand*{\gridinterval}{}</code>

`\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.

```

4 \AtBeginDocument{%
5   \ifdim\pdfpageheight=\z@
6     \pdfpageheight=\pageheight
7   \fi
8   \ifdim\pdfpagewidth=\z@
9     \pdfpagewidth=\pagewidth
10  \fi
11  \begingroup
12    \@tempdima=\dimexpr \pdfpageheight - \topmargin - 1in
13                      - \headheight - \headsep
14                      - \topskip \relax
15    \@tempcnta=\@tempdima
16    \xdef\gridbase{\the\@tempcnta}%
17    \@tempcnta=\baselineskip
18    \xdef\gridinterval{\the\@tempcnta}%
19  \endgroup
20 }

```

`\savepos` Save current position on the page to the aux-file. The argument is a unique name 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.

```

21 \newcommand*{\savepos}[1]{%
22   \begingroup
23     \pdfsavepos
24     \protected@write\@auxout{%
25       \protect\newpos{#1}{\the\count\z@}{\gridbase}{\gridinterval}{%
26         \noexpand\number\pdflastxpos
27       }{%
28         \noexpand\number\pdflastypos
29       }%
30     }%
31   \endgroup
32 }

```

`\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 pdfT_EX user manual for more information.

```

33 \newcommand*{\newpos}[6]{%
34   \grid@unique@test{#1}{#2}%
35   \expandafter\global\@namedef{pos@#1@page}{#2}%
36   \expandafter\global\@namedef{pos@#1@base}{#3}%
37   \expandafter\global\@namedef{pos@#1@interval}{#4}%
38   \expandafter\global\@namedef{pos@#1@x}{#5}%
39   \expandafter\global\@namedef{pos@#1@y}{#6}%
40   \begingroup
41     \@tempcnta=\numexpr \@nameuse{pos@#1@base} - \@nameuse{pos@#1@y}\relax
42     \@tempcnta=\numexpr \@tempcnta + \@nameuse{pos@#1@interval} - 1\relax
43     \divide\@tempcnta by\@nameuse{pos@#1@interval}\relax
44     \expandafter\xdef\csname pos@#1@line\endcsname{\the\@tempcnta}%
45     \@tempcnta=\numexpr \@tempcnta * \@nameuse{pos@#1@interval}\relax
46     \expandafter\xdef\csname pos@#1@offset\endcsname{\the\@tempcnta}%
47     \@tempcnta=\numexpr \@nameuse{pos@#1@y}
48       - ( \@nameuse{pos@#1@base} - \@tempcnta )\relax
49     \expandafter\let\expandafter\@tempa\csname pos@#1@vskip\endcsname%
50     \expandafter\xdef\csname pos@#1@vskip\endcsname{\the\@tempcnta}%
51     \expandafter\ifx\csname pos@#1@vskip\endcsname\@tempa\else
52       \grid@ReRunMessage
53     \fi
54   \endgroup
55 }
```

```

\grid@unique@test A very simple test to warn if a position name isn't unique.
56 \newcommand*\grid@unique@test}[2]{%
57 \expandafter\ifx\csname pos@#1@page\endcsname\relax\else
58   \PackageError{gridset}{position '#1' is not unique.\@gobble}{%
59     You have used the position name '#1' you are using on page
60     '#2'\MessageBreak
61     already on page '\csname pos@#1@page\endcsname'.\MessageBreak
62     You should stop processing, remove the aux-files and correct the
63     names.\MessageBreak
64     If you'd continue, this will result in grid position
65     failures.\MessageBreak
66     that won't be reported!}%
67 \fi
68 }
69 \AtBeginDocument{%
70 \global\let\grid@unique@test\@gobble
71 }

\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.
72 \newcommand*\grid@ReRunMessage{}
73 \AtBeginDocument{%
74 \renewcommand*\grid@ReRunMessage{%
75   \PackageWarningNoLine{gridset}{Grid position labels may have
76     changed.\MessageBreak
77     Rerun to get grid positions right}%
78 \global\let\grid@ReRunMessage\relax
79 }%
80 }

\vskipnextgrid Move to next grid position. The counter gridcnt is used to give every move to
gridcnt 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.
81 \newcounter{gridcnt}
82 \newcommand*\vskipnextgrid}{%
83 \begingroup
84   \stepcounter{gridcnt}\edef\@tempa{vp!\thegridcnt}%
85   \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!
86   \leavevmode\savepos{\@tempa}%
87   \expandafter\ifx\csname pos@\@tempa @vskip\endcsname\relax
88   \else
89   \expandafter\ifnum \csname pos@\@tempa @vskip\endcsname =\z@\else

```

```

90     \PackageInfo{gridset}{%
91         vmode \string\vskip\csname pos@\@tempa @vskip\endcsname sp%
92     }%
93     \vskip -\parskip\vskip -\baselineskip
94     \expandafter\vskip\csname pos@\@tempa @vskip\endcsname sp\relax
95     \fi
96     \fi
97     \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.

```

98     \parskip=\z@
99     \savepos{vp!\thegridcnt}%
100    \expandafter\ifx\csname pos@\@tempa @vskip\endcsname\relax
101    \else
102    \expandafter\ifnum \csname pos@\@tempa @vskip\endcsname =\z@\else
103    \PackageInfo{gridset}{%
104        hmode \string\vskip\csname pos@\@tempa @vskip\endcsname sp%
105    }%
106    \vskip -\baselineskip
107    \expandafter\vskip\csname pos@\@tempa @vskip\endcsname sp\relax
108    \iftwoside
109        \expandafter\ifodd\csname pos@\@tempa @page\endcsname\relax
110            \leavevmode\hskip \dimexpr - 1in - \oddsidemargin - \parindent
111                + \csname pos@\@tempa @x\endcsname sp\relax
112        \else
113            \leavevmode\hskip \dimexpr - 1in - \evensidemargin - \parindent
114                + \csname pos@\@tempa @x\endcsname sp\relax
115        \fi
116    \else
117        \leavevmode\hskip \dimexpr - 1in - \oddsidemargin - \parindent
118            + \csname pos@\@tempa @x\endcsname sp\relax
119    \fi
120    \fi
121    \fi
122    \fi
123    \endgroup
124 }

```

(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 125 \newcommand*\thegridinfo}[1]{%
\theypos 126   page=\@nameuse{pos@#1@page},
127   base=\@nameuse{pos@#1@base},
128   interval=\@nameuse{pos@#1@interval},
129   x=\@nameuse{pos@#1@x},

```

```

130 y=\@nameuse{pos@#1@y}%
131 }
132 \newcommand*\theposinfo[1]{%
133 y=\@nameuse{pos@#1@y},
134 gridline=\@nameuse{pos@#1@line},
135 gridoffset=\@nameuse{pos@#1@offset},
136 movedown=\@nameuse{pos@#1@vskip}%
137 }
138 \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.

```

139 \documentclass[a4paper,12pt]{article}
140 \usepackage{gridset}
141 \usepackage{blindtext}
142 \raggedbottom
143
144 \pagestyle{myheadings}
145
146 \begin{document}
147 \markright{gridbase=\gridbase, gridinterval=\gridinterval\ without move down}%
148 \newcounter{Zeile}%
149 \makeatletter
150 \@whilenum \value{Zeile}<40\do {%
151   \stepcounter{Zeile}%
152   \theZeile. Zeile:
153   \savepos{\thepage.\theZeile}\thegridinfo{\thepage.\theZeile}\par
154 }%
155 \makeatother
156 \clearpage
157 \setcounter{Zeile}{0}
158 \makeatletter
159 \@whilenum \value{Zeile}<20\do {%
160   \stepcounter{Zeile}%
161   \theZeile. Zeile:
162   \savepos{\thepage.\theZeile}\theposinfo{\thepage.\theZeile}\par
163 }%
164 \makeatother
165 \clearpage
166 \parskip=.5\baselineskip
167 \setcounter{Zeile}{0}
168 \makeatletter
169 \@whilenum \value{Zeile}<20\do {%
170   \stepcounter{Zeile}%
171   \theZeile. Zeile:
172   \savepos{\thepage.\theZeile}\theposinfo{\thepage.\theZeile}\par

```

```

173 }%
174 \makeatother
175 \clearpage
176 \markright{gridbase=\gridbase, gridinterval=\gridinterval\ with real move down
177 at vmode}%
178 \parskip=.5\baselineskip
179 \setcounter{Zeile}{0}
180 \makeatletter
181 \@whilenum \value{Zeile}<25\do {%
182   \stepcounter{Zeile}%
183   \vskipnextgrid\theZeile. Zeile: \theposinfo{vp!\thegridcnt}\par
184 }%
185 \makeatother
186 \clearpage
187 \markright{gridbase=\gridbase, gridinterval=\gridinterval\ with real move down
188 at hmode}%
189 \parskip=.5\baselineskip
190 \setcounter{Zeile}{0}
191 \makeatletter
192 \@whilenum \value{Zeile}<25\do {%
193   \stepcounter{Zeile}%
194   \theZeile. Zeile: \vskipnextgrid\theposinfo{vp!\thegridcnt}\par
195 }%
196 \makeatother
197 \clearpage
198 \parskip=0pt
199 \blindtext
200 \begin{itemize}
201 \item Test
202 \item Test
203 \end{itemize}
204 \vskipnextgrid\theposinfo{vp!\thegridcnt}\blindtext
205
206 \end{document}

```