

The `gridpapers` package

Robert McNees* and Leo C. Stein†

v1.0.2 from 2021/03/27

All development happens at the repo: <https://github.com/mcnees/LaTeX-Graph-Paper>.

1 Introduction

Make your own quadrille, graph, hex, etc. paper! Uses the PGF/TikZ package for L^AT_EX, which should be part of any modern T_EX installation. Lots of preset defaults to get started with ease, yet all colors and spacing are customizable.

There are example .tex files in the `examples` directory to help get you started with customization. Each tex file has an almost-empty body, with a `\usepackage` statement that you can customize. For example, `engineer-pad.tex` looks like this:

```
engineer-pad.tex
1 \documentclass{article}
2
3 \usepackage[pattern=majmin, colorset=engineer]{gridpapers}
4
5 \begin{document}
6 \thispagestyle{empty}
7 ~
8 \end{document}
```

(The `~` in the body forces a non-empty body, or else latex wouldn't generate a PDF).

2 Usage

2.1 Options

Your graph paper is configured through a number of key/value options to the `\usepackage` command. Let's go through these options.

`pattern={name}`
Default: `std`

Which of the predefined patterns to use for the page or textarea background. The current list of pattern names is: `std`, `stdeight`, `majmin`, `dot`, `hex`, `hexup`, `tri`, `iso`, `lightcone`, `ruled`, `doubleruled`. We describe each of these patterns in Sec. 2.2. Patterns come with

*rmcnees@luc.edu; [@mcnees](https://twitter.com/mcnees)

†leo.stein@gmail.com; [@duetosymmetry](https://twitter.com/duetosymmetry)

default page geometry (size and margins; see `geometry`), and default ‘fullness’ (whether they fill the page or not; see options `fullpage` and `textarea`).

<code>colorset={\name}</code> Default: <code>std</code>	Color presets. Valid color preset names are: <code>std</code> , <code>precocious</code> , <code>ghostly</code> , <code>brickred</code> , <code>engineer</code> , <code>plumpad</code> . A preset determines the <code>majorcolor</code> , <code>minorcolor</code> , and <code>bgcolor</code> all at once. But, you can start from a preset and then override some colors.
<code>majorcolor={\color}</code>	Override the preset “major” color. This can be a named color, or using the syntax from <code>xcolor</code> to mix colors together.
<code>minorcolor={\color}</code>	Override the preset “minor” color. As above.
<code>bgcolor={\color}</code>	Override the preset background color. As above.
<code>patternsize={\length}</code>	Override the preset pattern size. The meaning of this length argument is different for each pattern; see Sec. 2.2 for more.
<code>dotsize={\length}</code> Default: <code>.7pt</code>	Controls the size of the dots themselves for <code>pattern=dot</code> .
<code>fullpage</code>	Make the pattern fill the whole page.
<code>textarea</code>	Make the pattern fill only the text area of the document. At most one of the <code>fullpage</code> or <code>textarea</code> can be specified. If one is specified, it will override the default ‘fullness’ setting of the pattern.
<code>geometry={\geometry spec}</code>	Page geometry specification, using the syntax of the <code>geometry</code> package. This specification will override the pattern’s default page geometry. However, if the <code>geometry</code> package was loaded before <code>gridpapers</code> , this option will be ignored.

2.2 Patterns

The current set of patterns:

<code>std</code>	Quadrille, ten squares per inch. The <code>patternsize</code> option controls the side of a square. Default is <code>patternsize=0.1in</code> .
<code>stdeight</code>	Quadrille, eight squares per inch. The <code>patternsize</code> option controls the side of a square. Default is <code>patternsize=0.125in</code> .
<code>majmin</code>	Graph paper, eight squares per inch with a major grid every half-inch. The <code>patternsize</code> option controls the side of a small square (the larger squares are four times bigger). Default is <code>patternsize=0.125in</code> .
<code>dot</code>	Grid of dots. The size of an individual dot is set by <code>dotsize</code> . The <code>patternsize</code> option controls the distance between dots. Default is <code>patternsize=0.1in</code> .
<code>hex</code>	Grid of hexagons. The <code>patternsize</code> option controls the side length of a hexagon. Default is <code>patternsize=0.1666in</code> .
<code>hexup</code>	Grid of hexagons, rotated 90 degrees from the default orientation. The <code>patternsize</code> option controls the side length of a hexagon. Default is <code>patternsize=0.1666in</code> .
<code>tri</code>	Triangle grid. The <code>patternsize</code> option controls the side length of a triangle. Default is <code>patternsize=0.25in</code> .
<code>iso</code>	Isometric grid. The <code>patternsize</code> option controls the side length of a triangle. Default is <code>patternsize=0.25in</code> .

<code>lightcone</code>	A grid with light cones (45° lines) on a square grid. The <code>patternsizesize</code> option controls the side of a horizontal square (not the tipped squared). Default is <code>patternsizesize=0.25in</code> .
<code>ruled</code>	Ruled page with bold lines. The <code>patternsizesize</code> option controls the vertical distance between lines. Default is <code>patternsizesize=0.2in</code> .
<code>doubleruled</code>	Ruled page with bold lines alternating with light lines. The <code>patternsizesize</code> option controls the vertical distance between neighboring lines. Default is <code>patternsizesize=0.125in</code> .

3 Examples

3.1 Plenty of customization

Let's say you want to use the `tri` pattern, which by default fills the page. But you want it to fill just the text area of an A4 page with 2cm margins, and you want the triangles to be .75cm long. Finally, you like the colors of the engineer set, but want a white background. Then you would write:

```
\usepackage[pattern=tri,
  patternsizesize=0.75cm,
  textarea,
  colorset=engineer,
  bgcolor=white,
  geometry={a4paper, margin=2cm}]{gridpapers}
```

3.2 Custom colors

Using named or blended custom colors is demonstrated in the example file `custom-colors.tex`:

```
----- custom-colors.tex -----
1 \documentclass{article}
2
3 \usepackage{xcolor}
4
5 % See the documentation of the xcolor package to learn about different
6 % color models for specifying colors
7 \definecolor{mydeepgreen}{rgb}{0.07, 0.56, 0.04}
8
9 % You can easily mix colors by using the ! syntax from xcolor. Here
10 % we use it to mix 40% of our color with 60% white.
11 \usepackage[pattern=majmin,
12   majorcolor=mydeepgreen,
13   minorcolor={mydeepgreen!40}]{gridpapers}
14
15 \begin{document}
16 \thispagestyle{empty}
17 ~
18 \end{document}
```

4 Implementation

```
1 \NeedsTeXFormat{LaTeX2e}[1994/06/01]
2 \ProvidesPackage{gridpapers}
3   [2021/03/27 v1.0.2 Graph paper backgrounds]
4
5 \RequirePackage{xkeyval}
6 \RequirePackage{kvoptions}
7 \RequirePackage{xcolor}
8 \RequirePackage{tikz}
9 \usetikzlibrary{patterns.meta,calc}
10 \RequirePackage{tikzpagenodes}
11 %% everypage has been superseded -- try to use the new builtin
12 %% approach, but fall back to everypage-1x if needed
13 %% This code is roughly taken from the new everypage code
14 \@ifundefined{AddToHook}{%
15   \IfFileExists{everypage-1x.sty}{%
16     %% If everypage is new enough to complain, avoid the complaints
17     \RequirePackage{everypage-1x}
18   }{\RequirePackage{everypage}}
19 }{%
20   \newcommand*\AddEverypageHook[1]{%
21     \AddToHook{shipout/background}{\put(1in,-1in){#1}}
22   }
23 \RequirePackage{pagecolor}
24
25 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
26 %% Option parsing
27 %% Declare switches for processing the options.
28
29 \newif\ifGP@geometrypreviouslyloaded
30 \newif\ifGP@fullnessset
31 \newif\ifGP@fullpage
32 \newif\ifGP@textarea
33 \GP@geometrypreviouslyloadedfalse
34 \GP@fullnesssetfalse
35 \GP@fullpagefalse
36 \GP@textareafalse
37
38 \SetupKeyvalOptions{%
39   family=GP,%
40   prefix=GP@%
41 }
42
43 \DeclareStringOption[std]{pattern}
44 \DeclareStringOption[std]{colorset}
45
46 \DeclareStringOption{majorcolor}
47 \DeclareStringOption{minorcolor}
48 \DeclareStringOption{bgcolor}
49
50 \DeclareStringOption{patternsizesize}
51 \DeclareStringOption[.7pt]{dotsizesize}
52
53 \DeclareVoidOption{fullpage}{\GP@fullpagetrue}
54 \DeclareVoidOption{textareatruetrue}{\GP@textareatrue}
55
56 \DeclareStringOption{geometry}
57
```

```

58 \ProcessKeyvalOptions*
59
60 %% Can only have one of fullpage or textarea
61 \ifGP@fullpage
62   \ifGP@textarea
63     \PackageError{gridpapers}{%
64       Can not specify both fullpage and textarea, please remove one option}{%
65       \fi
66     \GP@fullnesssettrue
67 \fi
68
69 \ifGP@textarea
70   \GP@fullnesssettrue
71 \fi
72
73 %% We keep track of this to know whether or not we would be overriding
74 %% a previously-set page geometry
75 \@ifpackageloaded{geometry}
76   {\GP@geometrypreviouslyloadedtrue}
77   {\GP@geometrypreviouslyloadedfalse}
78   \PassOptionsToPackage{\GPOpt@geometry}{geometry}%
79   \RequirePackage{geometry}%
80 }
81
82 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
83 %% Actual package code
84 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
85
86 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
87 %% Some nice colors.
88 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
89 \definecolor{plum}{rgb}{0.36078, 0.20784, 0.4}
90 \definecolor{chameleon}{rgb}{0.30588, 0.60392, 0.023529}
91 \definecolor{cornflower}{rgb}{0.12549, 0.29020, 0.52941}
92 \definecolor{scarlet}{rgb}{0.8, 0, 0}
93 \definecolor{brick}{rgb}{0.64314, 0, 0}
94 \definecolor{sunrise}{rgb}{0.80784, 0.36078, 0}
95 \definecolor{rosiebg}{RGB}{250,247,232}
96 \definecolor{rosiegrid}{RGB}{186,137,113}
97
98 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
99 %% The color to use for the null directions when drawing lightcones.
100 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
101 \colorlet{lightlines}{scarlet!30}
102
103 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
104 %% Pre-defined Color schemes
105 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
106 %% Here are some pre-defined color schemes for the paper background
107 %% and the major and minor grid lines. These are switched by using
108 %% the option colorset=<name>. The allowed values for colorset are in
109 %% the list below.
110 \define@choicekey*{GP}{colorset}[\val\nr]%
111 %% Allowed values for colorset:
112 {std,precocious,ghostly,brickred,engineer,plumpad}[std]{%
113   \ifcase\nr\relax
114     %% std
115     \colorlet{minorcolor}{cornflower!30}
116     \colorlet{majorcolor}{cornflower!50}

```

```

117   \colorlet{bgcolor}{white}
118   \or
119   %% precocious
120   \colorlet{minorcolor}{rosiegrid!50}
121   \colorlet{majorcolor}{rosiegrid}
122   \colorlet{bgcolor}{rosiebg}
123   \or
124   %% ghostly
125   \colorlet{minorcolor}{gray!15}
126   \colorlet{majorcolor}{gray!20}
127   \colorlet{bgcolor}{white}
128   \or
129   %% brickred
130   \colorlet{minorcolor}{brick!35}
131   \colorlet{majorcolor}{brick!60}
132   \colorlet{bgcolor}{scarlet!8}
133   \or
134   %% engineer
135   \colorlet{minorcolor}{chameleon!50}
136   \colorlet{majorcolor}{chameleon!80}
137   \colorlet{bgcolor}{chameleon!10}
138   \or
139   %% plumpad
140   \colorlet{minorcolor}{cornflower!40}
141   \colorlet{majorcolor}{cornflower!70}
142   \colorlet{bgcolor}{plum!10}
143   \fi
144 }
145
146 %% Get the specified color set from the options
147 \def\@setkeyhelper#1#2{%
148   \setkeys{GP}{#2=#1}
149 }
150 \expandafter\@setkeyhelper\expandafter{\GPOpt@colorset}{colorset}
151
152 %% If the user further specified majorcolor, minorcolor, and/or
153 %% bgcolor, we now override the selected colorset
154 \ifx\GPOpt@majorcolor\@empty
155 \else
156   \colorlet{majorcolor}{\GPOpt@majorcolor}
157 \fi
158 \ifx\GPOpt@minorcolor\@empty
159 \else
160   \colorlet{minorcolor}{\GPOpt@minorcolor}
161 \fi
162 \ifx\GPOpt@bgcolor\@empty
163 \else
164   \colorlet{bgcolor}{\GPOpt@bgcolor}
165 \fi
166
167 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
168 %% The size parameter -- different meanings for different patterns
169 %% Will be reset by pattern code
170 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
171 \newcommand{\GP@patternsizesize}{0.1in}
172
173 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
174 %% This section sets up a routine for filling a shape with
175 %% hexagons. Uses code from:

```

```

176 %% http://tex.stackexchange.com/questions/6019/drawing-hexagons/6128#6128
177 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
178
179 %% We have to delay this definition until after \GP@patterns size
180 %% redefined (by the pattern selection and/or user override)
181 \newcommand{\GP@declarehexpat}{
182 \tikzdeclarepattern{
183   name=hexagons,
184   type=uncolored,
185   bounding box={(0,0) and (3*\GP@patterns size,0.866025*2*\GP@patterns size)},
186   tile size={(3*\GP@patterns size,0.866025*2*\GP@patterns size)},
187   parameters={\tikzhexrotate},
188   tile transformation={rotate=\tikzhexrotate},
189   defaults={
190     rotate/.store in=\tikzhexrotate,rotate=0,
191   },
192   code={
193     \pgfsetlinewidth{0.6pt}
194     \pgftransformshift{\pgfpoint{0mm}{0.866025*\GP@patterns size}}
195     \pgfpathmoveto{\pgfpoint{0mm}{0mm}}
196     \pgfpathlineto{\pgfpoint{0.5*\GP@patterns size}{0mm}}
197     \pgfpathlineto{\pgfpoint{\GP@patterns size}{-0.866025*\GP@patterns size}}
198     \pgfpathlineto{\pgfpoint{2*\GP@patterns size}{-0.866025*\GP@patterns size}}
199     \pgfpathlineto{\pgfpoint{2.5*\GP@patterns size}{0mm}}
200     \pgfpathlineto{\pgfpoint{3*\GP@patterns size}{0mm}}
201     \pgfpathmoveto{\pgfpoint{0.5*\GP@patterns size}{0mm}}
202     \pgfpathlineto{\pgfpoint{\GP@patterns size}{0.866025*\GP@patterns size}}
203     \pgfpathlineto{\pgfpoint{2*\GP@patterns size}{0.866025*\GP@patterns size}}
204     \pgfpathlineto{\pgfpoint{2.5*\GP@patterns size}{0mm}}
205     \pgfusepath{stroke}
206   }
207 }
208 }
209
210
211 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
212 %% This section sets up a routine for filling a shape with
213 %% triangles.
214 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
215
216 %% We have to delay this definition until after \GP@patterns size is
217 %% redefined (by the pattern selection and/or user override)
218 \newcommand{\GP@declaretripat}{
219 \tikzdeclarepattern{
220   name=triangles,
221   type=uncolored,
222   bounding box={(0,0) and (\GP@patterns size,2*0.866025*\GP@patterns size)},
223   tile size={(\GP@patterns size,2*0.866025*\GP@patterns size)},
224   parameters={\tikztrirotate},
225   tile transformation={rotate=\tikztrirotate},
226   defaults={
227     rotate/.store in=\tikztrirotate,rotate=0,
228   },
229   code={
230     \pgfsetlinewidth{0.6pt}
231     \pgfpathmoveto{\pgfpoint{0mm}{0mm}}
232     \pgfpathlineto{\pgfpoint{\GP@patterns size}{2*0.866025*\GP@patterns size}}
233     \pgfpathlineto{\pgfpoint{0mm}{2*0.866025*\GP@patterns size}}
234     \pgfpathmoveto{\pgfpoint{0mm}{0.866025*\GP@patterns size}}

```

```

235     \pgfpathlineto{\pgfpoint{\GP@patternsize}{0.8660254*\GP@patternsize}}
236     \pgfpathmoveto{\pgfpoint{0mm}{2*0.8660254*\GP@patternsize}}
237     \pgfpathlineto{\pgfpoint{\GP@patternsize}{0mm}}
238     \pgfpathlineto{\pgfpoint{0mm}{0mm}}
239     \pgfusepath{stroke}
240 }
241 }
242 }
243
244 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
245 %% This section sets up a routine for filling the squares in a
246 %% grid with null lines.
247 %% %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
248 %% TODO Still can't figure out the correct pattern shift!!
249 \newcommand{\GP@declarelightconepat}{
250 \pgfkeys{
251   /pgf/pattern keys/myshift/.store in=\myshift,
252   /pgf/pattern keys/myshift/.initial={(0,0)},
253 }
254 \tikzdeclarepattern{
255   name=lightcones,
256   type=uncolored,
257   parameters={\myshift},
258   bounding box={(0,0) and (\GP@patternsize,\GP@patternsize)},
259   tile size={(\GP@patternsize, \GP@patternsize)},
260   tile transformation={
261     shift=\myshift,
262   },
263   defaults={
264     myshift/.store in=\myshift,myshift={(0,0)},
265   },
266   code={
267     %% TODO Make the dashing an option
268     \tikzset{lightlines/.style={line width=0.4pt,dash=on 0.05cm off 0.05cm phase 0.025cm}}
269     \draw [lightlines] (0,0) -- (\GP@patternsize,\GP@patternsize);
270     \draw [lightlines] (0,\GP@patternsize) -- (\GP@patternsize,0);
271   },
272 }
273 }
274 %% \pgfdeclarepatternformonly
275 %%   {lightcones}% name
276 %%   {\pgfpointorigin}% lower left
277 %%   {\pgfpoint{\GP@patternsize}{\GP@patternsize}}% upper right
278 %%   {\pgfpoint{\GP@patternsize}{\GP@patternsize}}% tile size
279 %%   {% shape description
280 %%     \pgfsetlinewidth{0.4pt}
281 %%     %% TODO Make an option
282 %%     %Comment out this line for solid lines on light cones, instead of dashes.
283 %%     \pgfsetdash{{0.05cm}{0.05cm}}{0.025cm}
284 %%     \pgfpathmoveto{\pgfpoint{0in}{0in}}
285 %%     \pgfpathlineto{\pgfpoint{\GP@patternsize}{\GP@patternsize}}
286 %%     \pgfpathmoveto{\pgfpoint{0in}{\GP@patternsize}}
287 %%     \pgfpathlineto{\pgfpoint{\GP@patternsize}{0in}}
288 %%     \pgfusepath{stroke}
289 %%   }
290
291 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
292 %% This section sets up a routine for filling a region with dots
293 %% Slightly modified version of code added by Leo

```



```

294 %% Stein (@duetosymmetry on Twitter).
295 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
296 %% We have to delay this definition until after \GP@patternsiz is
297 %% redefined (by the pattern selection and/or user override)
298 \newcommand{\GP@declaredotpat}{
299 \pgfdeclarepatternformonly
300 {dotgrid}%% name
301 {\pgfpoint{-0.5*\GP@patternsiz}{-0.5*\GP@patternsiz}}%% lower left
302 {\pgfpoint{0.5*\GP@patternsiz}{0.5*\GP@patternsiz}}%% upper right
303 {\pgfpoint{\GP@patternsiz}{\GP@patternsiz}}%% tile size
304 {%% shape description
305 \pgfpathcircle{\pgfpoint{0pt}{0pt}}{\GP@dotsiz}
306 \pgfusepath{fill}
307 }
308 }
309
310 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
311 %% Begin pattern execution infrastructure
312 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
313
314 %% This inner code will be set by the choicekey pattern=...
315 \newcommand{\GP@innerpatterncode}{}
316 %% This is the "outer" code to hook into every page
317 \newcommand{\GP@patterncode}{% No blank lines in this code!
318 \begin{tikzpicture}[remember picture, overlay]
319 %%
320 %% Change "thin" to "very thin" if the lines are too thick.
321 \tikzset{
322 minorgrid/.style={minorcolor, thin},
323 majorgrid/.style={majorcolor, thin},
324 }
325 \ifGP@fullpage%
326 \coordinate (a) at (current page.south west);
327 \coordinate (b) at (current page.north east);
328 \else%
329 \coordinate (a) at (current page text area.south west);
330 \coordinate (b) at (current page text area.north east);
331 \fi
332 %%
333 \GP@innerpatterncode%
334 %%
335 \end{tikzpicture}
336 }
337
338 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
339 %% Begin pattern definition code
340 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
341
342 \define@boolkey{GP}{patterndefaultfullness}{}
343 \newcommand{\GP@patterndefaultgeometry}{}
344 \newcommand{\GP@patterndefaultsize}{}
345
346 %% Pattern-definer-helper
347 %% The interface is:
348 %% \GP@setpattern
349 %% {<true for default fullpage, false for default textarea>}
350 %% {<default geometry config>}
351 %% {<default pattern size>} %% NOTE, not tile length
352 %% {<contents of inner pattern code>}

```

```

353 \newcommand{\GP@setpattern}[4]{%
354 \setkeys{GP}{patterndefaultfullness=#1}
355 \renewcommand{\GP@patterndefaultgeometry}{#2}
356 \renewcommand{\GP@patterndefaultsize}{#3}
357 \renewcommand{\GP@innerpatterncode}{#4}
358 }
359
360 \define@choicekey*{GP}{pattern}[\val\nr]%
361 %% Allowed values for pattern:
362 {std,stdeight,majmin,dot,hex,hexup,tri,iso,lightcone,ruled,doubleruled}{%
363 \ifcase\nr\relax
364 %% std
365 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
366 %% Quadrille, ten squares per inch.
367 %% %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
368 \GP@setpattern{false}{letterpaper, margin=0.2in}{0.1in}{%
369 %% Draw a grid with 10 squares per inch.
370 \draw[style=minorgrid, shift={(a)}] (0,0) grid [step=\GP@patternsiz] (b);
371 %%
372 %% Draw a frame around the grid.
373 \draw[style=majorgrid] (a) rectangle (b);
374 }
375 \or
376 %% stdeight
377 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
378 %% Quadrille, eight squares per inch.
379 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
380 \GP@setpattern{false}{letterpaper, margin=0.1875in}{0.125in}{%
381 %% Draw a grid with 10 squares per inch.
382 \draw[style=minorgrid, shift={(a)}] (0,0) grid [step=\GP@patternsiz] (b);
383 %%
384 %% Draw a frame around the grid.
385 \draw[style=majorgrid] (a) rectangle (b);
386 }
387 \or
388 %% majmin
389 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
390 %% Graph paper, eight squares per inch with a major grid
391 %% every half-inch.
392 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
393 \GP@setpattern{false}{letterpaper, margin=0.25in}{0.125in}{%
394 %% Draw a grid with 10 squares per inch.
395 \draw[style=minorgrid, shift={(a)}] (0,0) grid [step=\GP@patternsiz] (b);
396 %%
397 \draw[style=majorgrid, shift={(a)}] (0,0) grid [step=4*\GP@patternsiz] (b);
398 %%
399 %% Draw a frame around the grid.
400 \draw[style=majorgrid] (a) rectangle (b);
401 }
402 \or
403 %% dot
404 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
405 %% Dot grid
406 %% Slightly modified version of code added by Leo
407 %% Stein (@duetosymmetry).
408 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
409 \GP@setpattern{true}{0.1in}{%
410 \fill [pattern=dotgrid,pattern color=minorcolor] (a) rectangle (b);
411 }

```

```

412 \or
413 %% hex
414 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
415 %% Hex grid
416 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
417 \GP@setpattern{true}{0.1666in}{%
418 \fill [pattern=hexagons,pattern color=minorcolor] (a) rectangle (b);
419 }
420 \or
421 %% hexup
422 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
423 %% Hex-up grid
424 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
425 \GP@setpattern{true}{0.1666in}{%
426 \fill [pattern={hexagons[rotate=90]},pattern color=minorcolor] (a) rectangle (b);
427 }
428 \or
429 %% tri
430 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
431 %% Triangle grid, adjust triangle size in the preamble
432 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
433 \GP@setpattern{true}{0.25in}{%
434 \fill [pattern=triangles,pattern color=minorcolor] (a) rectangle (b);
435 }
436 \or
437 %% iso
438 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
439 %% Isometric grid
440 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
441 \GP@setpattern{true}{0.25in}{%
442 \fill [pattern={triangles[rotate=90]}, pattern color=minorcolor] (a) rectangle (b);
443 }
444 \or
445 %% lightcone
446 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
447 %% A grid with light cones.
448 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
449 \GP@setpattern{false}{letterpaper, margin=.125in}{0.25in}{%
450 %% Draw a grid with 4 squares per inch.
451 \draw[style=minorgrid, shift={(a)}] (0,0) coordinate grid [step=\GP@patternsiz] (b);
452 %%
453 %% Draw a border around the grid.
454 \draw[style=majorgrid, pattern={lightcones[myshift={(a)}]}, pattern color=lightlines] (a) rectangle (b);
455 }
456 \or
457 %% ruled
458 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
459 %% Ruled page with bold lines every 0.2in or 0.25in
460 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
461 \GP@setpattern{false}{letterpaper, body={8in,10.8in}}{0.2in}{%
462 %% Draw a ruled page with lines every 0.2in
463 \draw[style=majorgrid, shift={(a)}] (0,0) grid [ystep=\GP@patternsiz, xstep=\paperwidth] (b);
464 %% Draw a frame around the grid.
465 \draw[style=majorgrid] (a) rectangle (b);
466 }
467 \or
468 %% doubleruled
469 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
470 %% Ruled page with bold lines every 0.25in and light lines

```

```

471 %% every 0.125 in.
472 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
473 \GP@setpattern{false}{letterpaper, margin=.25in}{0.125in}{%
474 %% Draw a ruled pattern with thin lines every 0.125 in and bold lines every 0.25 in.
475 \draw[style=minorgrid, shift={(a)}] (0,0) grid [ystep=\GP@patternsizel, xstep=\paperwidth] (b);
476 %%
477 \draw[style=majorgrid, shift={(a)}] (0,0) grid [ystep=2*\GP@patternsizel, xstep=\paperwidth] (b);
478 %%
479 %% Draw a frame around the grid.
480 \draw[style=majorgrid] (a) rectangle (b);
481 }
482 \fi
483 }
484
485 %% Use the passed package option to set the above key
486 \expandafter\@setkeyhelper\expandafter{\GP@opt@pattern}{pattern}
487
488 %% Determine whether or not to (re)set fullpage vs textarea
489 \ifGP@fullnessset
490 %% Respect their choice
491 \else
492 %% Reset the value of \GP@fullpage based on the pattern's default
493 %% There's probably a more idiomatic way to do this but I can't
494 %% figure it out
495 \ifKV@GP@patterndefaultfullness
496 \GP@fullpagetrue
497 \else
498 \GP@fullpagefalse
499 \fi
500 \fi
501
502 %% Determine whether or not to fiddle with the page geometry
503 \ifGP@geometrypreviouslyloaded
504 %% Respect their previous choice
505 \PackageWarning{gridpapers}'geometry' package was previously loaded, will not use pattern default
506 \else
507 %% Use the pattern's defaults,
508 \expandafter\geometry\expandafter{\GP@patterndefaultgeometry}
509 %% And then override with any more specific settings passed by the user
510 \expandafter\geometry\expandafter{\GP@opt@geometry}
511 \fi
512
513 %% Determine the correct pattern length
514 \ifx\GP@opt@patternsizel\empty
515 % Use the pattern's preferred length
516 \renewcommand{\GP@patternsizel}{\GP@patterndefaultsize}
517 \else
518 % Override with the user's choice
519 \renewcommand{\GP@patternsizel}{\GP@opt@patternsizel}
520 \fi
521
522 %% Now that everything has been set up, we can finally define the
523 %% patterns with the correct lengths.
524 \GP@declarehexpat
525 \GP@declaretripat
526 \GP@declarelightconepat
527 \GP@declaredotpat
528
529 %% Set the background color.

```

```
530 \AtBeginDocument{\pagecolor{bgcolor}}
531 %% Actually hook it in!
532 \AddEverypageHook{%
533 \GP@patterncode%
534 }
535
536 \endinput
```

Change History

v1.0.0		v1.0.2
General: Converted to DTX file	1	
v1.0.1		General: Replace triangle and hexagon
General: Hotfix: old installs don't have		code to allow rotated grids, add
everypage-1x, use everypage	1	'ghostly' colorset
		1