

The `picture` package

Heiko Oberdiek
<oberdiek@uni-freiburg.de>

2007/04/11 v1.1

Abstract

There are macro and environment arguments that expect numbers that will internally be multiplied with `\unitlength`. This package extends the syntax of these arguments that `dimens` with calculation support can be added for these arguments.

Contents

1	User interface	1
1.1	Introduction	1
1.2	Options	2
1.3	Example	2
1.4	Supported packages	2
2	Implementation	2
2.1	Identification	2
2.2	Options	2
2.3	Calculation method	3
2.3.1	Method <code>calc</code>	3
2.3.2	Method <code>etex</code>	4
2.3.3	Method <code>plain</code>	4
2.3.4	Help macros	4
2.4	Redefinitions	5
2.4.1	<code>L^AT_EX</code> base macros	5
2.4.2	Package <code>pspicture</code>	6
3	Installation	6
3.1	Download	6
3.2	Bundle installation	6
3.3	Package installation	6
3.4	Refresh file name databases	7
3.5	Some details for the interested	7
4	History	7
	[2006/08/26 v1.0]	7
	[2007/04/11 v1.1]	7
5	Index	8

1 User interface

1.1 Introduction

The environment `picture` and macros such as `\put`, `\line`, `\vector` and other macros have arguments that expect numbers that are used as factor for

`\unitlength`. This package redefines such macros and adds code that detects whether such an argument is given as number or as length. In the latter case, the length is used directly without multiplying with `\unitlength`.

1.2 Options

Depending on the available features, also length expressions can be given. Option `calc` loads package `calc`. Then expressions of these package may be used. Otherwise `etex` wraps the length argument inside `\dimexpr...\relax`, if ε -TeX is available. Otherwise option `plain` uses plain assignments without calculation support.

The default is `calc` if package `calc` is loaded before package `picture`. If you specify option `calc` the loading of `calc` is ensured. Otherwise package `picture` looks whether `\dimexpr` is available and uses then option `etex` as default. If ε -TeX also could not be found, then `plain` is used.

1.3 Example

```

1 (*example)
2 \documentclass{article}
3
4 \usepackage[calc]{picture}
5
6 \begin{document}
7
8 \setlength{\unitlength}{1pt}
9
10 \begin{picture}(\widthof{Hello World}, 10mm)
11   \put(0, 0){\makebox(0,0)[lb]{Hello World}}%
12   \put(0, \heightof{Hello World} + \fboxsep){%
13     \line(1, 0){\widthof{Hello World}}}%
14   }%
15   \put(\widthof{Hello World}, 10mm){%
16     \line(0, -1){10mm}%
17   }%
18 \end{picture}
19
20 \end{document}
21 /example

```

1.4 Supported packages

Package `pspicture` is supported, but it must be loaded before package `picture`.

New macros can be supported by `\picture@redefine`. The first argument is the macro which contains the arguments in its parameter text that you want to support by package `picture`. The second argument contains the parameter text. Change `#` to `&` for the arguments in question. Examples (already used by package `picture`):

```

\picture@redefine\put{(&1,&2)}
\picture@redefine\line{(#1,#2)&3}

```

2 Implementation

2.1 Identification

```

22 (*package)
23 \NeedsTeXFormat{LaTeX2e}
24 \ProvidesPackage{picture}%
25   [2007/04/11 v1.1 Dimens for picture macros (HO)]%

```

2.2 Options

```

26 \def\Pc@calcname{calc}
27 \def\Pc@etexname{etex}
28 \def\Pc@plainname{plain}

\Pc@method Macro \Pc@method stores the method to use for calculations. Check which features
are available and set the default for \Pc@method.

29 \@ifpackageloaded{calc}{%
30   \let\Pc@method\Pc@calcname
31 }{%
32   \begingroup\expandafter\expandafter\expandafter\endgroup
33   \expandafter\ifx\csname dimexpr\endcsname\relax
34     \let\Pc@method\Pc@plainname
35   \else
36     \let\Pc@method\Pc@etexname
37   \fi
38 }

39 \DeclareOption{plain}{%
40   \let\Pc@method\Pc@plainname
41 }
42 \DeclareOption{etex}{%
43   \begingroup\expandafter\expandafter\expandafter\endgroup
44   \expandafter\ifx\csname dimexpr\endcsname\relax
45     \PackageError{picture}{%
46       e-TeX is not available%
47     }\@ehc
48   \else
49     \let\Pc@method\Pc@etexname
50   \fi
51 }
52 \DeclareOption{calc}{%
53   \let\Pc@method\Pc@calcname
54 }
55 \ProcessOptions*
56 \begingroup
57   \let\on@line\@empty
58   \PackageInfo{picture}{Calculation method: \Pc@method}%
59 \endgroup

```

2.3 Calculation method

```

60 \ifx\Pc@method\Pc@calcname
61   \RequirePackage{calc}%
62 \fi

```

2.3.1 Method calc

```

63 \ifx\Pc@method\Pc@calcname
64   \def\Pc@tokslength#1{%
65     \begingroup
66       \let\calc@error\Pc@calc@error
67       \setlength\dimen@{#1\unitlength}\Pc@next\Pc@nil{#1}%
68     }%
69     \let\Pc@Org@calc@error\calc@error
70     \def\Pc@calc@error#1{%
71       \expandafter\ifx\expandafter\unitlength\noexpand#1\relax
72         \def\calc@next##1!{%
73           \endgroup
74           \aftergroup\afterassignment
75           \aftergroup\Pc@next
76         }%
77       \else
78         \@ReturnAfterFi{%
79           \Pc@Org@calc@error{#1}%

```

```

80      }%
81      \fi
82  }%
83  \expandafter\@firstofone
84 \else
85  \expandafter\@gobble
86 \fi
87 {%
88  \long\def\@ReturnAfterFi#1\fi{\fi#1}%
89 }

```

2.3.2 Method etex

```

90 \ifx\Pc@method\Pc@etexname
91  \def\Pc@tokslength#1{%
92    \begingroup
93      \afterassignment\Pc@next
94      \dimen@=\dimexpr#1\unitlength\Pc@nil{#1}%
95  }%
96 \fi

```

2.3.3 Method plain

```

97 \ifx\Pc@method\Pc@plainname
98  \def\Pc@tokslength#1{%
99    \begingroup
100      \afterassignment\Pc@next
101      \dimen@=#1\unitlength\Pc@nil{#1}%
102  }%
103 \fi

```

2.3.4 Help macros

```

104 \def\Pc@next#1\Pc@nil#2{%
105  \ifx\#1\%
106    \endgroup
107    \Pc@addtoks{{#2}}%
108  \else
109    \expandafter\endgroup
110    \expandafter\Pc@addtoks\expandafter{%
111      \expandafter{\the\dimen@\@gobble}%
112    }%
113  \fi
114 }

```

\Pc@nil \Pc@nil must not have the meaning of \relax because of \dimexpr.

```

115 \let\Pc@nil\message

```

\Pc@addtoks

```

116 \def\Pc@addtoks#1{%
117  \toks@=\expandafter{\the\toks@#1}%
118 }

```

\Pc@init

```

119 \def\Pc@init#1{%
120  \begingroup
121  \toks@={#1}%
122 }

```

\Pc@finish

```

123 \def\Pc@finish#1{%
124  \expandafter\endgroup
125  \expandafter#1\the\toks@
126 }

```

2.4 Redefinitions

```

\picture@redefine #1: command name
#2: parameter text, length parameter with & instead of #

127 \def\picture@redefine#1#2{%
128   \begingroup
129     \edef\reserved@a{%
130       \noexpand\noexpand
131       \expandafter\noexpand
132       \csname PcOrg@\expandafter\@gobble\string#1\endcsname
133     }%
134     \toks0{#1}%
135     \Pc@first#2&0%
136 }

\Pc@first

137 \def\Pc@first#1&{%
138   \toks1={#1}%
139   \toks2={\Pc@init{#1}}%
140   \Pc@scanlength
141 }

\Pc@scanlength #1: number of length parameter or zero

142 \def\Pc@scanlength#1{%
143   \ifcase#1 %
144     \expandafter\Pc@last
145   \else
146     \toks1=\expandafter{\the\toks1 ###1}%
147     \toks2=\expandafter{\the\toks2 \Pc@tokslength{###1}}%
148     \expandafter\Pc@scannext
149   \fi
150 }

\Pc@scannext

151 \def\Pc@scannext#1&{%
152   \ifx\#1\%
153   \else
154     \toks1=\expandafter{\the\toks1 #1}%
155     \toks2=\expandafter{\the\toks2 \Pc@addtoks{#1}}%
156   \fi
157   \Pc@scanlength
158 }

\Pc@last

159 \def\Pc@last{%
160   \edef\x{%
161     \endgroup
162     \let\reserved@a\the\toks0 %
163     \def\the\toks0 \the\toks1 {%
164       \the\toks2 %
165       \noexpand\Pc@finish\reserved@a
166     }%
167   }%
168   \x
169 }

```

2.4.1 L^AT_EX base macros

```

170 \picture@redefine\@picture{(&1,&2)(&3,&4)}
171 \picture@redefine\put{(&1,&2)}
172 \picture@redefine\multiput{(&1,&2)}
173 \picture@redefine\@multiput{(&1,&2)}

```

```

174 \picture@redefine\line{(#1,#2)&3}
175 \picture@redefine\vector{(#1,#2)&3}
176 \picture@redefine\dashbox{&1(&2,&3)}
177 \picture@redefine\@circle{&1}
178 \picture@redefine\@dot{&1}
179 \picture@redefine\@bezier{#1(&2,&3)(&4,&5)(&6,&7)}
180 \picture@redefine\@makepicbox{(&1,&2)}

```

2.4.2 Package pspicture

Package `pspicture` changes the signature of `\@oval` by adding an optional argument.

```

181 \ifpackageloaded{pspicture}{%
182   \picture@redefine\@oval{[&1](&2,&3)}%
183   \picture@redefine\Line{(&1,&2)}%
184   \picture@redefine\Curve{(&1,&2)}%
185   \picture@redefine\Vector{(&1,&2)}%
186 }{
187   \picture@redefine\@oval{(&1,&2)}%
188 }
189 \end{package}

```

3 Installation

3.1 Download

Package. This package is available on CTAN¹:

[CTAN:macros/latex/contrib/oberdiek/picture.dtx](http://ftp.ctan.org/tex-archive/macros/latex/contrib/oberdiek/picture.dtx) The source file.

[CTAN:macros/latex/contrib/oberdiek/picture.pdf](http://ftp.ctan.org/tex-archive/macros/latex/contrib/oberdiek/picture.pdf) Documentation.

Bundle. All the packages of the bundle ‘oberdiek’ are also available in a TDS compliant ZIP archive. There the packages are already unpacked and the documentation files are generated. The files and directories obey the TDS standard.

[CTAN:macros/latex/contrib/oberdiek/oberdiek-tds.zip](http://ftp.ctan.org/tex-archive/macros/latex/contrib/oberdiek/oberdiek-tds.zip)

3.2 Bundle installation

Unpacking. Unpack the `oberdiek-tds.zip` in the TDS tree (also known as `texmf` tree) of your choice. Example (linux):

```
unzip oberdiek-tds.zip -d ~/texmf
```

Script installation. Check the directory `TDS:scripts/oberdiek/` for scripts that need further installation steps. Package `attachfile2` comes with the Perl script `pdfatfi.pl` that should be installed in such a way that it can be called as `pdfatfi`. Example (linux):

```

chmod +x scripts/oberdiek/pdfatfi.pl
cp scripts/oberdiek/pdfatfi.pl /usr/local/bin/

```

3.3 Package installation

Unpacking. The `.dtx` file is a self-extracting docstrip archive. The files are extracted by running the `.dtx` through plain-`TEX`:

```
tex picture.dtx
```

¹<http://ftp.ctan.org/tex-archive/>

TDS. Now the different files must be moved into the different directories in your installation TDS tree (also known as `texmf` tree):

<code>picture.sty</code>	→	<code>tex/latex/oberdiek/picture.sty</code>
<code>picture.pdf</code>	→	<code>doc/latex/oberdiek/picture.pdf</code>
<code>picture-example.tex</code>	→	<code>doc/latex/oberdiek/picture-example.tex</code>
<code>picture.dtx</code>	→	<code>source/latex/oberdiek/picture.dtx</code>

If you have a `docstrip.cfg` that configures and enables `docstrip`'s TDS installing feature, then some files can already be in the right place, see the documentation of `docstrip`.

3.4 Refresh file name databases

If your `TEX` distribution (`teTEX`, `mikTEX`, ...) relies on file name databases, you must refresh these. For example, `teTEX` users run `texhash` or `mktextlsr`.

3.5 Some details for the interested

Attached source. The PDF documentation on CTAN also includes the `.dtx` source file. It can be extracted by AcrobatReader 6 or higher. Another option is `pdftk`, e.g. unpack the file into the current directory:

```
pdftk picture.pdf unpack_files output .
```

Unpacking with `LATEX`. The `.dtx` chooses its action depending on the format:

plain-`TEX`: Run `docstrip` and extract the files.

`LATEX`: Generate the documentation.

If you insist on using `LATEX` for `docstrip` (really, `docstrip` does not need `LATEX`), then inform the autodetect routine about your intention:

```
latex \let\install=y\input{picture.dtx}
```

Do not forget to quote the argument according to the demands of your shell.

Generating the documentation. You can use both the `.dtx` or the `.drv` to generate the documentation. The process can be configured by the configuration file `ltxdoc.cfg`. For instance, put this line into this file, if you want to have A4 as paper format:

```
\PassOptionsToClass{a4paper}{article}
```

An example follows how to generate the documentation with `pdfLATEX`:

```
pdflatex picture.dtx
makeindex -s gind.ist picture.idx
pdflatex picture.dtx
makeindex -s gind.ist picture.idx
pdflatex picture.dtx
```

4 History

[2006/08/26 v1.0]

- First released version. (First start of the project was June/July 2002.)

[2007/04/11 v1.1]

- Line ends sanitized.

5 Index

Numbers written in *italic* refer to the page where the corresponding entry is described; numbers underlined refer to the code line of the definition; numbers in roman refer to the code lines where the entry is used.

Symbols	O
\@ReturnAfterFi 78, 88	\on@line 57
\@bezier 179	
\@circle 177	P
\@dot 178	\PackageError 45
\@ehc 47	\PackageInfo 58
\@empty 57	\Pc@addtoks 107, 110, <u>116</u> , 155
\@firstofone 83	\Pc@calc@error 66, 70
\@gobble 85, <u>111</u> , 132	\Pc@calcname 26, 30, 53, 60, 63
\@ifpackageloaded 29, 181	\Pc@etexname 27, 36, 49, 90
\@imakepicbox 180	\Pc@finish <u>123</u> , 165
\@multiput 173	\Pc@first <u>135</u> , <u>137</u>
\@oval 182, 187	\Pc@init <u>119</u> , 139
\@picture 170	\Pc@last 144, <u>159</u>
\\ 105, 152	\Pc@method 29, 40, 49, 53, 58, 60, 63, 90, 97
A	\Pc@next 67, 75, 93, 100, 104
\afterassignment 74, 93, 100	\Pc@nil 67, 94, 101, 104, <u>115</u>
\aftergroup 74, 75	\Pc@plainname 28, 34, 40, 97
B	\Pc@scanlength 140, <u>142</u> , 157
\begin 6, 10	\Pc@scannext 148, <u>151</u>
C	\Pc@tokslength 64, 91, 98, 147
\calc@error 66, 69	\PcOrg@calc@error 69, 79
\calc@next 72	\picture@redefine <u>127</u> , 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 182, 183, 184, 185, 187
\csname 33, 44, 132	\ProcessOptions 55
\Curve 184	\ProvidesPackage 24
D	\put 11, 12, 15, 171
\dashbox 176	R
\DeclareOption 39, 42, 52	\RequirePackage 61
\dimen@ 67, 94, 101, 111	\reserved@a 129, 162, 165
\dimexpr 94	
\documentclass 2	S
E	\setlength 8, 67
\end 18, 20	T
\endcsname 33, 44, 132	\the 111, 117, 125, 146, 147, 154, 155, 162, 163, 164
F	\toks 134, 138, 139, 146, 147, 154, 155, 162, 163, 164
\fboxsep 12	\toks@ 117, 121, 125
H	
\heightof 12	U
I	\unitlength 8, 67, 71, 94, 101
\ifcase 143	\usepackage 4
\ifx . 33, 44, 60, 63, 71, 90, 97, 105, 152	
L	V
\Line 183	\Vector 185
\line 13, 16, 174	\vector 175
M	W
\makebox 11	\widthof 10, 13, 15
\message 115	
\multiput 172	X
N	\x 160, 168
\NeedsTeXFormat 23	