

# The picture package

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## 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.

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\*Please report any issues at <https://github.com/ho-tex/picture/issues>

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## 1 Change in version 2.0

Most of the functionality of this package is no longer needed, as the L<sup>A</sup>T<sub>E</sub>X definitions provides support for dimensions in the arguments of `picture` and macros such as `\put`, `\line`, `\vector` out of the box. The exception is the support for the syntax of the `calc` package. Input like `\put(0,\widthof{text})` will *not* work with the kernel commands.

Starting with version 2 this package is disabled by default and does nothing. If support for the `calc` is wanted, the loading of the previous version of the `picture` can be forced with any of the following variants:

```
\usepackage{picture} [=v1]
\usepackage[calc]{picture} [=v1]
\usepackage[calc]{picture}
```

The last option can also be used if the `picture` has already been loaded without or without some other option. There will be no option clash error and the package will revert to the old behaviour.

## 2 User interface of version 1.7

### 2.1 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`.

### 2.2 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  $\varepsilon$ -T<sub>E</sub>X 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  $\varepsilon$ -T<sub>E</sub>X also could not be found, then `plain` is used.

## 2.3 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 \end{example}
```

## 2.4 Supported packages

Packages `pspicture` and `pict2e` are supported, but they 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}
```

## 3 Implementation

### 3.1 Identification

```
22 (*package)
23 \NeedsTeXFormat{LaTeX2e}
24 \ProvidesPackage{picture}%
25   [2026-03-07 v2 Dimens for picture macros (H0)]%
```

### 3.2 Release handling

```
26 \providecommand\DeclareRelease[3]{}
27 \providecommand\DeclareCurrentRelease[2]{}
28 \DeclareRelease{v1}{0000-00-00}{picture-2024-01-11.sty}
29 \DeclareCurrentRelease{}{2024-01-11}
```

### 3.3 Option

```
30 \def\Pc@calcname{calc}
31 \def\Pc@load@frozen@version
32 {
33   \RequirePackage{calc}%
34   \RequirePackage[calc]{picture-2024-01-11}%
35 }
36 \DeclareKeys
37 {
38   calc .code:n = \Pc@load@frozen@version,
```

```

39   calc .usage:n= preamble,
40   plain.code:n={},
41   etex .code:n={}
42 }
43
44 \ProcessKeyOptions
45 \AtBeginDocument{
46   \ifx\Pc@method\Pc@calcname
47   \else
48   {
49     \PackageWarning{picture}
50     {The picture package has been disabled as most\MessageBreak
51     of its functionality is now provided by LaTeX directly.\MessageBreak
52     To force the loading of the previous version use\MessageBreak
53     ‘\string\usepackage\string{picture}\string} [=v1] ‘\MessageBreak
54     or
55     ‘\string\usepackage[calc]\string{picture}\string}‘
56     }
57     {}
58   }
59 \fi}

```

i/packagei

### 3.4 Identification of version 1

```

60 (*packagev1)
61 \NeedsTeXFormat{LaTeX2e}
62 \ProvidesPackage{picture-2024-01-11}%
63 [2024/01/11 version1.7 Dimens for picture macros (HO)]%

```

### 3.5 Options

```

64 \def\Pc@calcname{calc}
65 \def\Pc@etexname{etex}
66 \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`.

```

67 \@ifpackageloaded{calc}{%
68   \let\Pc@method\Pc@calcname
69 }{%
70   \begingroup\expandafter\expandafter\expandafter\endgroup
71   \expandafter\ifx\csname dimexpr\endcsname\relax
72     \let\Pc@method\Pc@plainname
73   \else
74     \let\Pc@method\Pc@etexname
75   \fi
76 }

77 \DeclareOption{plain}{%
78   \let\Pc@method\Pc@plainname
79 }
80 \DeclareOption{etex}{%
81   \begingroup\expandafter\expandafter\expandafter\endgroup
82   \expandafter\ifx\csname dimexpr\endcsname\relax
83     \PackageError{picture}{%
84       e-TeX is not available%
85     }\@ehc
86   \else
87     \let\Pc@method\Pc@etexname
88   \fi
89 }
90 \DeclareOption{calc}{%
91   \let\Pc@method\Pc@calcname

```

```

92 }
93 \ProcessOptions*
94 \begingroup
95 \let\on@line\@empty
96 \PackageInfo{picture}{Calculation method: \Pc@method}%
97 \endgroup

```

### 3.6 Calculation method

```

98 \ifx\Pc@method\Pc@calcname
99 \RequirePackage{calc}%
100 \fi

```

#### 3.6.1 Method calc

```

101 \ifx\Pc@method\Pc@calcname
102 \def\Pc@tokslength#1{%
103 \begingroup
104 \let\calc@error\Pc@calc@error
105 \setlength\dimen@{#1\unitlength}\Pc@next\Pc@nil{#1}%
106 }%
107 \let\Pc@Org@calc@error\calc@error
108 \@ifpackagelater{calc}{2007/08/22}{% v4.3
109 \def\Pc@calc@error#1{%
110 \expandafter\ifx\expandafter\unitlength\noexpand#1\relax
111 \def\calc@next##1!{%
112 \endgroup
113 \aftergroup\afterassignment
114 \aftergroup\Pc@next
115 }%
116 \expandafter\@firstoftwo
117 \else
118 \expandafter\@secondoftwo
119 \fi
120 {%
121 \calc@next{#1}%
122 }{%
123 \Pc@Org@calc@error{#1}%
124 }%
125 }%
126 }{%
127 \def\Pc@calc@error#1{%
128 \expandafter\ifx\expandafter\unitlength\noexpand#1\relax
129 \def\calc@next##1!{%
130 \endgroup
131 \aftergroup\afterassignment
132 \aftergroup\Pc@next
133 }%
134 \expandafter\@gobble
135 \else
136 \expandafter\@firstofone
137 \fi
138 {%
139 \Pc@Org@calc@error{#1}%
140 }%
141 }%
142 }%
143 \fi

```

#### 3.6.2 Method etex

```

144 \ifx\Pc@method\Pc@etexname
145 \def\Pc@tokslength#1{%
146 \begingroup

```

```

147     \afterassignment\Pc@next
148     \dimen@=\dimexpr#1\unitlength\Pc@nil{#1}%
149 }%
150 \fi

```

### 3.6.3 Method plain

```

151 \ifx\Pc@method\Pc@plainname
152 \def\Pc@tokslength#1{%
153     \begingroup
154     \afterassignment\Pc@next
155     \dimen@=#1\unitlength\Pc@nil{#1}%
156 }%
157 \fi

```

### 3.6.4 Help macros

```

158 \def\Pc@next#1\Pc@nil#2{%
159     \ifx\#1\%
160     \endgroup
161     \Pc@addtoks{#2}%
162 \else
163     \expandafter\endgroup
164     \expandafter\Pc@addtoks\expandafter{%
165     \expandafter{\the\dimen@}%
166     }%
167 \fi
168 }

```

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

```

169 \let\Pc@nil\message

```

\Pc@addtoks

```

170 \def\Pc@addtoks#1{%
171     \toks@=\expandafter{\the\toks@#1}%
172 }

```

\Pc@init

```

173 \def\Pc@init#1{%
174     \begingroup
175     \toks@={#1}%
176 }

```

\Pc@finish

```

177 \def\Pc@finish#1{%
178     \expandafter\endgroup
179     \expandafter#1\the\toks@
180 }

```

## 3.7 Redefinitions

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

```

181 \def\picture@redefine#1#2{%
182     \begingroup
183     \edef\reserved@a{%
184     \noexpand\noexpand
185     \expandafter\noexpand
186     \csname PcOrg@\expandafter@gobble\string#1\endcsname
187     }%
188     \toks0{#1}%
189     \Pc@first#2&0%
190 }

```

```

\PC@first
191 \def\PC@first#1&{%
192   \toks1={#1}%
193   \toks2={\PC@init{#1}}%
194   \PC@scanlength
195 }

```

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

```

196 \def\PC@scanlength#1{%
197   \ifcase#1 %
198     \expandafter\PC@last
199   \else
200     \toks1=\expandafter{\the\toks1 ###1}%
201     \toks2=\expandafter{\the\toks2 \PC@tokslength{###1}}%
202     \expandafter\PC@scannext
203   \fi
204 }

```

**\PC@scannext**

```

205 \def\PC@scannext#1&{%
206   \ifx\#1\%
207   \else
208     \toks1=\expandafter{\the\toks1 #1}%
209     \toks2=\expandafter{\the\toks2 \PC@addtoks{#1}}%
210   \fi
211   \PC@scanlength
212 }

```

**\PC@last**

```

213 \def\PC@last{%
214   \edef\x{%
215     \endgroup
216     \let\reserved@a\the\toks0 %
217     \def\the\toks0 \the\toks1 {%
218       \the\toks2 %
219       \noexpand\PC@finish\reserved@a
220     }%
221   }%
222   \x
223 }

```

### 3.7.1 $\LaTeX$ base macros

```

224 \picture@redefine\@picture{(&1,&2)(&3,&4)}
225 \picture@redefine\put{(&1,&2)}
226 \picture@redefine\multiput{(&1,&2)}
227 \picture@redefine\@multiput{(&1,&2)}
228 \picture@redefine\line{(#1,#2)&3}
229 \picture@redefine\vector{(#1,#2)&3}
230 \picture@redefine\dashbox{&1(&2,&3)}
231 \picture@redefine\@circle{&1}
232 \picture@redefine\@dot{&1}
233 \picture@redefine\@bezier{#1(&2,&3)(&4,&5)(&6,&7)}
234 \picture@redefine\@imakepicbox{(&1,&2)}

```

### 3.7.2 Package `pspicture`

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

```

235 \@ifpackageloaded{pspicture}{%
236   \picture@redefine\@oval[[&1](&2,&3)]%
237   \picture@redefine\Line{(&1,&2)}%
238   \picture@redefine\Curve{(&1,&2)}%

```

```

239 \picture@redefine\Vector{(&1,&2)}%
240 }{%
241 \picture@redefine\oval{(&1,&2)}%
242 }

```

### 3.7.3 Package pict2e

Additions suggested in <https://github.com/ho-tex/picture/issues/1>

```

243 \@ifpackageloaded{pict2e}{%
244 \AtBeginDocument{%
245 \picture@redefine\cbezier{[#1](&2,&3)(&4,&5)(&6,&7)(&8,&9)}%
246 }
247 \picture@redefine\pIle@arc@0{(#1,#2)&3}
248 \picture@redefine\polyline{(&1,&2)}
249 \picture@redefine\@polyline{(&1,&2)}
250 \picture@redefine\@polygon{(&1,&2)}
251 \picture@redefine\@@polygon{(&1,&2)}
252 \picture@redefine\moveto{(&1,&2)}
253 \picture@redefine\lineto{(&1,&2)}
254 \picture@redefine\curveto{(&1,&2)(&3,&4)(&5,&6)}
255 }{}

```

## 3.8 Check package loading order

\PC@checkpackage

```

256 \def\PC@checkpackage#1{%
257 \@ifpackageloaded{#1}{%
258 }{%
259 \AtBeginDocument{%
260 \@ifpackageloaded{#1}{%
261 \PackageWarningNoLine{picture}{%
262 Package ‘#1’ is loaded after ‘picture’.\MessageBreak
263 Load package ‘picture’ afterwards to get full support%
264 \MessageBreak
265 of its additional syntax with length specifications%
266 }%
267 }{}%
268 }%
269 }%
270 }

271 \PC@checkpackage{pict2e}
272 \PC@checkpackage{pspicture}

273 </packagev1>

```

## 4 Installation

### 4.1 Download

**Package.** This package is available on CTAN<sup>1</sup>:

[CTAN:macros/latex/contrib/picture/picture.dtx](#) The source file.

[CTAN:macros/latex/contrib/picture/picture.pdf](#) Documentation.

### 4.2 Package installation

**Unpacking.** Run tex or latex on the .ins

```
tex picture.dtx
```

---

<sup>1</sup>[CTAN:pkg/picture](#)

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

```
picture.sty           → tex/latex/picture/picture.sty
picture-2024-01-11.sty → tex/latex/picture/picture-2024-01-11.sty
picture.pdf           → doc/latex/picture/picture.pdf
picture-example.tex   → doc/latex/picture/picture-example.tex
picture.dtx           → source/latex/picture/picture.dtx
```

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`.

### 4.3 Refresh file name databases

If your  $\text{T}_{\text{E}}\text{X}$  distribution ( $\text{T}_{\text{E}}\text{X}$  Live,  $\text{M}\text{i}\text{K}\text{T}_{\text{E}}\text{X}$ , ...) relies on file name databases, you must refresh these. For example,  $\text{T}_{\text{E}}\text{X}$  Live users run `texhash` or `mktextlsr`.

**Generating the documentation.** You can use the `.dtx`. 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
```

## 5 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.

### [2008/11/26 v1.2]

- Package `pict2e` added to documentation section “Supported packages”.
- Package order of supported packages is checked.

### [2009/10/11 v1.3]

- Fix because of new version v4.3 of package `calc`.

### [2016/05/16 v1.4]

- Documentation updates.

### [2019/12/09 v1.5]

- Documentation updates.

[2020-04-22 v1.6]

- Added definitions for pict2e (<https://github.com/ho-tex/picture/issues/1>)

[2024-01-11 v1.7]

- Remove a now unneeded `\@gobble`, requires LaTeX 2020-10-01 (<https://github.com/ho-tex/picture/issues/2>)

[2026-03-07 v2.0]

- Package is disabled unless the `calc` option is required.

## 6 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; plain numbers refer to the code lines where the entry is used.

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