集中管理图形脚本的宏

Macros for Centralized Management of Graphics Scripts

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1 用户接口 User Interface

本宏包设计用于集中管理 LaTeX 图形脚本，以便维护。

This package is designed to centrally manage LaTeX graphics scripts for easier maintenance.

`\newdraw`

Updated: 2026-01-27

`\newdraw {⟨图形索引⟩} {⟨图形脚本⟩}`

`\newdraw {⟨graphics-index⟩} {⟨graphics-script⟩}`

用于创建图形脚本，并将其与指定的图形索引关联。为避免意外覆盖已有内容，本命令会检查图形索引是否已经存在；如果索引已被使用，则报告错误，并保留原有图形脚本。带星号的版本则不执行重复索引检查，允许覆盖已有图形脚本。

The command creates a graphics script and associates it with the specified graphics index. To prevent accidental overwriting, it checks whether the index already exists. If the index is already in use, an error is reported and the existing graphics script is preserved. The starred version skips the duplicate-index check and allows an existing graphics script to be overwritten.

`\usedraw`

Updated: 2026-01-27

`\usedraw {⟨图形索引⟩}`

`\usedraw {⟨graphics-index⟩}`

用于执行与指定图形索引关联的图形脚本。如果指定的索引不存在，则报告错误。带星号的版本在调用不存在的图形索引时不报告错误，也不执行任何内容。

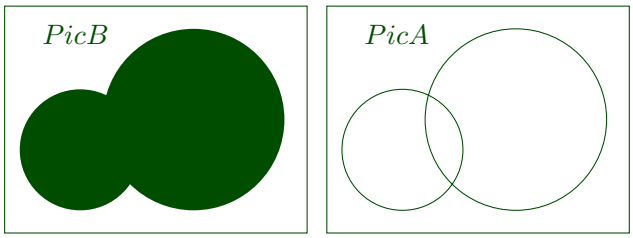
The command executes the graphics script associated with the specified graphics index. If the specified index does not exist, an error is reported. The starred version suppresses the error when the specified graphics index does not exist and produces no output in that case.

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例如，以下示例：For example, the following example:

```
\ExplSyntaxOn
\newdraw{sampleA}
  {
    \draw_begin:
      \color_select:n { green!30!black }
      \draw_path_rectangle:nn { 0cm, 0cm } { 4cm, 3cm }
      \draw_path_circle:nn { 1cm, 1.1cm } { 0.8cm }
      \draw_path_circle:nn { 2.5cm, 1.5cm } { 1.2cm }
      \draw_path_use_clear:n { stroke }
      \hbox_set:Nn \l_tmpa_box { $PicA$ }
      \draw_box_use:Nn \l_tmpa_box { 0.5cm, 2.5cm }
    \draw_end:
  }
\newdraw{sampleB}
  {
    \draw_begin:
      \color_select:n { green!30!black }
      \draw_path_rectangle:nn { 0cm, 0cm } { 4cm, 3cm }
      \draw_path_use_clear:n { stroke }
      \draw_path_circle:nn { 1cm, 1.1cm } { 0.8cm }
      \draw_path_circle:nn { 2.5cm, 1.5cm } { 1.2cm }
      \draw_path_use_clear:n { fill }
      \hbox_set:Nn \l_tmpa_box { $PicB$ }
      \draw_box_use:Nn \l_tmpa_box { 0.5cm, 2.5cm }
    \draw_end:
  }
\usedraw{sampleB}\ \ \usedraw{sampleA}
\ExplSyntaxOff
```

将输出：Will result:



`\showdraw` `\showdraw [*]`

`\cleardraw` `\cleardraw`

显示或清空已添加的图形。星号版本会显示索引及图形本身。

Display or clear added graphics. The starred version shows both indices and graphics.

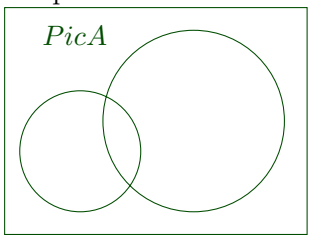
不带星号的版本（`\showdraw`）效果如下：The without star version results:

已保存的图形有：sampleA；sampleB；

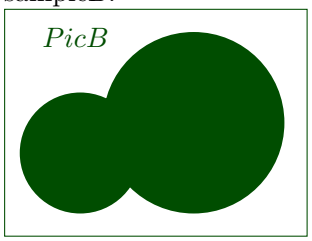
带星号的版本（`\showdraw*`）效果如下：The without star version results:

已保存的图形如下：

sampleA:



sampleB:



\setfigurewidth

New: 2025-12-25

\setfigurewidth {⟨宽度列表⟩}
\setfigurewidth {⟨*wd-clist*⟩}

设置并排排版两张或三张图形时的各图形的宽度比例。{⟨宽度列表⟩} 是一个长度为 2 或 3 的逗号分隔的列表，每个元素代表一张图形其相对于当前文本宽度的比例。注意，图形之间包含一个 0.05 倍的文本宽度，即逗号列表之和不应当大于 $1-0.05(n-1)$。
Set the width ratios of each figure when typesetting two or three figures side by side. {⟨*wd-clist*⟩} is a comma-separated list of length 2 or 3, where each element represents the ratio of the corresponding figure relative to the current text width. Note that there is a gap of 0.05 times the text width between adjacent figures, meaning the sum of the values in the comma-separated list should not exceed $1-0.05(n-1)$.

TEX 黑客笔记 TEX hackers note

这个命令用于修改 \addfiguredbl、\addfigurethr 命令插入的图形的默认宽度。

This command is used to modify the default widths of the figures inserted by the \addfiguredbl and \addfigurethr commands.

\addfigure
\addfiguredbl
\addfigurethr

Updated: 2025-12-25

\addfigure {⟨图形索引⟩} [⟨图形标签⟩] {⟨图形标题⟩}
\addfigure {⟨*graph-index*⟩} [⟨*graph-label*⟩] {⟨*graph-title*⟩}

使用浮动体添加插图。插图内容为 {⟨图形索引⟩} 关联的图形，插图标题由 {⟨图形标题⟩} 指定。本命令会自动为插图添加标签（fig:{⟨图形标签⟩}），{⟨图形标签⟩} 默认与 {⟨图形索引⟩} 一致。对于多个图形，每个图形的参数完全一致。
Using a floating environment to add illustrations. The content of the illustration corresponds to the graphic associated with {⟨*graph-index*⟩}, and the caption is specified by {⟨*graph-title*⟩}. This command automatically adds a label to the illustration (fig: {⟨*graph-label*⟩}), where {⟨*graph-label*⟩} defaults to {⟨*graph-index*⟩}. For multiple graphics, the parameters for each graphic are completely consistent.

TEX 黑客笔记 TEX hackers note

单个图形始终独立整个文本宽度，多个图形则按 \setfigurewidth 指定的比例排版。对于两个图形的场景，还可以使用可选参数（参数一）来临时指定图形的宽度。

A single figure always occupies the full text width independently, while multiple figures are typeset according to the ratios specified by \setfigurewidth. For the scenario with two figures, an optional parameter (Parameter 1) can also be used to temporarily specify the widths of the figures.

例如，以下示例：For example, the following example:

```
\setfigurewidth { 0.3,  0.3 }
\setfigurewidth { 0.27, 0.27, 0.27 }
\addfigure    {sampleA} [addfigure]      {\cs{addfigure} 的效果}
```

```
\addfiguredbl {sampleA} [addfiguredbl.1] {两张图的效果 1}
              {sampleB} [addfiguredbl.2] {两张图的效果 2}
\addfigurethr {sampleA} [addfigurethr.1] {三张图的效果 1}
              {sampleB} [addfigurethr.2] {三张图的效果 2}
              {sampleA} [addfigurethr.3] {三张图的效果 3}
```

将输出图 1 ~ 6。will output pic 1 ~ 6.

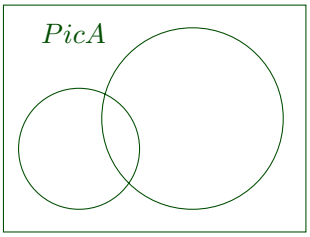


图 1: `\addfigure` 的效果

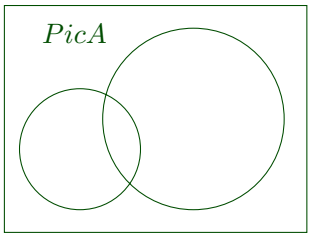


图 2: 两张图的效果 1

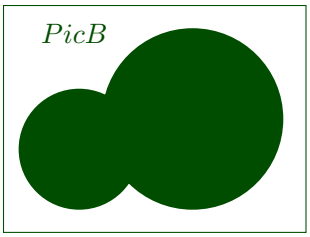


图 3: 两张图的效果 2

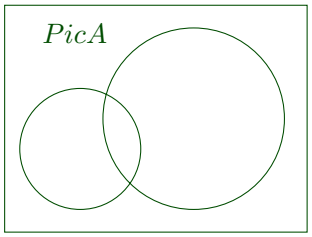


图 4: 三张图的效果 1

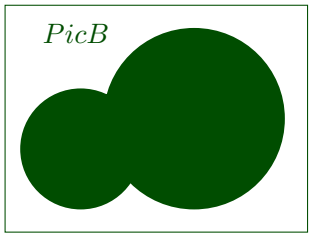


图 5: 三张图的效果 2

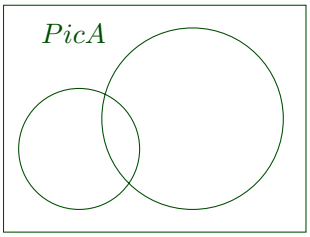


图 6: 三张图的效果 3

\addfiguretable
\addtablefigure

\addtablefigure {⟨表格数据⟩} [⟨表格标签⟩] {⟨表格标题⟩} {⟨图形的三个参数...⟩}

\addtablefigure {⟨*table-data*⟩} [⟨*table-label*⟩] {⟨*table-title*⟩} {⟨*draw-args...*⟩}

New: 2026-01-28

使用浮动体并排添加表格与插图。表格内容为 {⟨表格数据⟩}，表格标题由 {⟨表格标题⟩} 指定。本命令会自动为表格添加标签（tab:{⟨表格标签⟩}）。对于图形，其参数与 \addfigure 的参数完全一致。

Use a floating environment to place a table and an illustration side by side. The table content is specified by {⟨*table data*⟩}, and the table caption is given by {⟨*table caption*⟩}. This command will automatically add a label to the table (tab:{⟨*table label*⟩}). For graphic, the parameters are exactly the same as those of \addfigure.

TEX 黑客笔记 TEX hackers note

表格与图形的宽度分配使用类似 \addfiguredbl 的原理。本命令需要开启 table 选项，并会加载 caption 宏包。

The width distribution between the table and the graphic follows a principle similar to \addfiguredbl. This command requires the table option to be enabled and then will load the caption package.

警告：并排图表为单一浮动体内部排版，不等价于独立 table 浮动体，仅保证编号正确。

Warning: When figures and tables are placed side by side, they are arranged inside a single floating environment. This does not create independent table floats; only the table counter and numbering are preserved.

2 代码实现 Implementation

2.1 初始化 Init

```
⟨*package⟩
⟨@@=drawmgr⟩
\ExplSyntaxOn
\NeedsTeXFormat{LaTeX2e}
\ProvidesExplPackage{drawmgr}{2026-11-17}{0.4}
  {Centralized Management of Graphics Scripts}
```

2.2 变量 Variable

\g__drawmgr_scripts_prop
\g__drawmgr_wd_dbl_clist
\g__drawmgr_wd_thr_clist
\l__drawmgr_wd_clist

变量定义：

```
\prop_new:N   \g__drawmgr_scripts_prop
\clist_new:N  \g__drawmgr_wd_dbl_clist
\clist_new:N  \g__drawmgr_wd_thr_clist
\clist_new:N  \l__drawmgr_wd_clist

\clist_set:Nn \g__drawmgr_wd_dbl_clist { 0.475, 0.475 }
\clist_set:Nn \g__drawmgr_wd_thr_clist { 0.3, 0.3, 0.3 }
```

(*End of definition for* `\g__drawmgr_scripts_prop` *and others.*)

2.3 选项 Options

\g__drawmgr_language_int
\g__drawmgr_language_str
\g__drawmgr_table_bool

定义选项相关的变量：

```
\int_new:N  \g__drawmgr_language_int
\str_new:N  \g__drawmgr_language_str
\bool_new:N \g__drawmgr_table_bool
```

(*End of definition for* `\g__drawmgr_language_int`, `\g__drawmgr_language_str`, *and* `\g__drawmgr_table_bool`.)

drawmgr/preamble

定义宏包选项：

```
\keys_define:nn { drawmgr / preamble }
  {
    language  .str_gset:N = \g__drawmgr_language_str,
    language  .initial:n  = {zh-CN},
    language  .usage:n    = {load},
    table     .bool_set:N = \g__drawmgr_table_bool,
    table     .initial:n  = {false},
    table     .default:n  = {true},
    table     .usage:n    = {load}
  }
```

处理选项：

```
\ProcessKeyOptions [ drawmgr / preamble ]
\str_case_e:nnF { \str_casefold:V \g__drawmgr_language_str }
  {
    {en}    { \int_gset:Nn \g__drawmgr_language_int {1} }
    {zh-cn} { \int_gset:Nn \g__drawmgr_language_int {2} }
    {zh}    { \int_gset:Nn \g__drawmgr_language_int {2} }
    {cn}    { \int_gset:Nn \g__drawmgr_language_int {2} }
  }
  { \int_gset:Nn \g__drawmgr_language_int {2} }
\bool_if:NT \g__drawmgr_table_bool
  { \RequirePackage { caption  } }
```

(*End of definition for* `drawmgr/preamble`. *This variable is documented on page* ??.)

2.4 消息 Message

常见的错误消息。

```
\int_compare:nNnTF {\g__drawmgr_language_int} = {1}
  {
    \msg_new:nnn {drawmgr} {unknown_draw_index}  {Unknown draw index: <#1>}
    \msg_new:nnn {drawmgr} {already_exist_index} {Already existing index: <#1>}
    \msg_new:nnn {drawmgr} {args_count_mismatch} {Argument count mismatch: <#1>}
  }
  {
    \msg_new:nnn {drawmgr} {unknown_draw_index}  {未知的图形索引：<#1>}
    \msg_new:nnn {drawmgr} {already_exist_index} {已使用的图形索引：<#1>}
    \msg_new:nnn {drawmgr} {args_count_mismatch} {参数个数错误：<#1>}
  }
```

2.5 命令 Command

2.5.1 核心 Core

\newdraw
\usedraw
\showdraw
\cleardraw

定义保存、使用、显示、清空图形脚本：

```
\NewDocumentCommand \newdraw { s m +m }
  {
    \IfBooleanTF {#1}
      { \prop_gput:Nnn \g__drawmgr_scripts_prop { #2 } { #3 } }
      {
        \prop_if_in:NnTF \g__drawmgr_scripts_prop {#2}
          { \msg_error:nnn {drawmgr} {already_exist_index} {#2} }
```

```
          { \prop_gput:Nnn \g__drawmgr_scripts_prop { #2 } { #3 } }
      }
  }
\NewDocumentCommand \usedraw { s m }
  {
    \prop_if_in:NnTF \g__drawmgr_scripts_prop { #2 }
      { \prop_item:Nn \g__drawmgr_scripts_prop { #2 } }
      {
        \IfBooleanF {#1}
          { \msg_error:nnn {drawmgr} {unknown_draw_index} {#2} }
      }
  }
\NewDocumentCommand \showdraw { s }
  {
    \IfBooleanTF { #1 }
      {
        \int_compare:nNnTF {\g__drawmgr_language_int} = {1}
          { The~saved~graphics~are~as~follows:~\par }
          { 已保存的图形如下：\par }
        \prop_map_inline:Nn \g__drawmgr_scripts_prop
          { ##1: \par ##2 \par }
      }
      {
        \int_compare:nNnTF {\g__drawmgr_language_int} = {1}
          { Saved~graphics:~ }
          { 已保存的图形有： }
        \prop_map_inline:Nn \g__drawmgr_scripts_prop
          { ##1 ; }
      }
  }
\NewDocumentCommand \cleardraw { }
  { \prop_gclear:N \g__drawmgr_scripts_prop }
```

(*End of definition for* `\newdraw` *and others. These functions are documented on page* 1.)

2.5.2 浮动体 Float

`\setfigurewidth` 设置图形宽度：

```
\NewDocumentCommand \setfigurewidth { m }
  {
    \clist_set:Nn \l__drawmgr_wd_clist { #1 }
    \int_case:nnF { \clist_count:N \l__drawmgr_wd_clist }
      {
```

```
        {2}  { \clist_gset:Nn \g__drawmgr_wd_dbl_clist { #1 } }
        {3}  { \clist_gset:Nn \g__drawmgr_wd_thr_clist { #1 } }
      }
      { \msg_error:nnn {drawmgr} {args_count_mismatch} {#1} }
  }
```

(*End of definition for* `\setfigurewidth`. *This function is documented on page* 4.)

`\__drawmgr_insert_rule:` 向文档中插入分隔标尺：

```
\cs_new_protected:Npn \__drawmgr_insert_rule:
  { \rule{ 0.05\textwidth } { 0pt } }
```

(*End of definition for* `\__drawmgr_insert_rule:`.)

`\__drawmgr_insert_draw:nnnn` 向文档中插入图片（#1 图形宽度；#2 图形索引；#3 图形标签；#4 图形标题名）：

`\__drawmgr_insert_draw_aux:nnnn`

```
\cs_new_protected:Nn \__drawmgr_insert_draw_aux:nnnn
  {
    \begin{minipage}[t]{ #1\textwidth }
      \centering
      \usedraw{#2}
      \caption{#4}
      \label{fig:#3}
    \end{minipage}
  }
\cs_new:Nn \__drawmgr_insert_draw:nnnn
  {
    \IfNoValueTF {#3}
      { \__drawmgr_insert_draw_aux:nnnn {#1} {#2} {#2} {#4} }
      { \__drawmgr_insert_draw_aux:nnnn {#1} {#2} {#3} {#4} }
  }
\cs_generate_variant:Nn \__drawmgr_insert_draw:nnnn { Vnnn }
```

(*End of definition for* `\__drawmgr_insert_draw:nnnn` *and* `\__drawmgr_insert_draw_aux:nnnn`.)

`\__drawmgr_insert_table:nnnn` 向文档中插入表格（#1 表格宽度；#2 表格内容；#3 表格标签；#4 表格标题名）：

`\__drawmgr_insert_table_aux:nnnn`

```
\cs_new_protected:Nn \__drawmgr_insert_table_aux:nnnn
  {
    \begin{minipage}[b]{ #1\textwidth }
      \centering
      \captionof{table}{#4}
      \label{tab:#3}
      #2
    \end{minipage}
```

```
  }
\cs_new:Nn \__drawmgr_insert_table:nnnn
  {
    \IfNoValueTF {#3}
      { \__drawmgr_insert_table_aux:nnnn {#1} {#2} {#4} {#4} }
      { \__drawmgr_insert_table_aux:nnnn {#1} {#2} {#3} {#4} }
  }
\cs_generate_variant:Nn \__drawmgr_insert_table:nnnn { Vnnn }
```

(*End of definition for* `\__drawmgr_insert_table:nnnn` *and* `\__drawmgr_insert_table_aux:nnnn`.)

`\addfigure` 用于（并排）插入单张、两张或三张图片：

`\addfiguredbl`

`\addfigurethr`

```
\NewDocumentCommand \addfigure {  m o m }
  {
    \begin{figure}[!htbp]
      \centering
      \__drawmgr_insert_draw:nnnn {1} {#1} {#2} {#3}
    \end{figure}
  }
\NewDocumentCommand \addfiguredbl { o m o m m o m }
  {
    \IfNoValueTF {#1}
      { \clist_set_eq:NN \l__drawmgr_wd_clist \g__drawmgr_wd_dbl_clist }
      { \clist_set:Nn \l__drawmgr_wd_clist {#1} }
    \begin{figure}[!htbp]
      \centering
      \str_set:Ne \l_tmpa_str { \clist_item:Nn \l__drawmgr_wd_clist { 1 } }
      \__drawmgr_insert_draw:Vnnn \l_tmpa_str {#2} {#3} {#4}
      \__drawmgr_insert_rule:
      \str_set:Ne \l_tmpa_str { \clist_item:Nn \l__drawmgr_wd_clist { 2 } }
      \__drawmgr_insert_draw:Vnnn \l_tmpa_str {#5} {#6} {#7}
    \end{figure}
  }
\NewDocumentCommand \addfigurethr { m o m m o m m o m }
  {
    \clist_set_eq:NN \l__drawmgr_wd_clist \g__drawmgr_wd_thr_clist
    \begin{figure}[!htbp]
      \centering
      \str_set:Ne \l_tmpa_str { \clist_item:Nn \l__drawmgr_wd_clist { 1 } }
      \__drawmgr_insert_draw:Vnnn \l_tmpa_str {#1} {#2} {#3}
      \__drawmgr_insert_rule:
      \str_set:Ne \l_tmpa_str { \clist_item:Nn \l__drawmgr_wd_clist { 2 } }
      \__drawmgr_insert_draw:Vnnn \l_tmpa_str {#4} {#5} {#6}
```

```
      \__drawmgr_insert_rule:
      \str_set:Ne \l_tmpa_str { \clist_item:Nn \l__drawmgr_wd_clist { 3 } }
      \__drawmgr_insert_draw:Vnnn \l_tmpa_str {#7} {#8} {#9}
    \end{figure}
  }
```

(*End of definition for* `\addfigure`, `\addfiguredbl`, *and* `\addfigurethr`. *These functions are documented on page* 4.)

`\addfiguretable` `\addtablefigure` 用于并排图片与表格：

```
\NewDocumentCommand \addfiguretable { o m o m +m o m }
  {
    \IfNoValueTF {#1}
      { \clist_set_eq:NN \l__drawmgr_wd_clist \g__drawmgr_wd_dbl_clist }
      { \clist_set:Nn \l__drawmgr_wd_clist {#1} }
    \begin{figure}[!htbp]
      \centering
      \str_set:Ne \l_tmpa_str { \clist_item:Nn \l__drawmgr_wd_clist { 1 } }
      \__drawmgr_insert_draw:Vnnn  \l_tmpa_str {#2} {#3} {#4}
      \__drawmgr_insert_rule:
      \str_set:Ne \l_tmpa_str { \clist_item:Nn \l__drawmgr_wd_clist { 2 } }
      \__drawmgr_insert_table:nnnn \l_tmpa_str {#5} {#6} {#7}
    \end{figure}
  }
\NewDocumentCommand \addtablefigure { o +m o m m o m }
  {
    \IfNoValueTF {#1}
      { \clist_set_eq:NN \l__drawmgr_wd_clist \g__drawmgr_wd_dbl_clist }
      { \clist_set:Nn \l__drawmgr_wd_clist {#1} }
    \begin{figure}[!htbp]
      \centering
      \str_set:Ne \l_tmpa_str { \clist_item:Nn \l__drawmgr_wd_clist { 1 } }
      \__drawmgr_insert_table:nnnn \l_tmpa_str {#2} {#3} {#4}
      \__drawmgr_insert_rule:
      \str_set:Ne \l_tmpa_str { \clist_item:Nn \l__drawmgr_wd_clist { 2 } }
      \__drawmgr_insert_draw:Vnnn  \l_tmpa_str {#5} {#6} {#7}
    \end{figure}
  }
\bool_if:NF \g__drawmgr_table_bool
  {
    \cs_undefine:N \addfiguretable
    \cs_undefine:N \addtablefigure
  }
```

(*End of definition for* `\addfiguretable` *and* `\addtablefigure`. *These functions are documented on page 6.*)

```
\ExplSyntaxOff
⟨/package⟩
```

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