

interfaces

interfaces with keys for other packages

FC

2011/01/19 – version 2.9 – release – pgf v2.1 / pgf v2.0 compatible

Abstract

`interfaces` provides a small number of user friendly macros to access features implemented in frequently used packages. Most of the macros are based on `pgfkeys`, hence the “key=value” syntax.

`interfaces` is mainly based on `pgfkeys`¹ and `scrfile` for its different modules are loaded `\AfterPackage`. ϵ -TeX is required of course... Each interface is actually made as a separate module, which is loaded automatically after its *master package*. Adding `\usepackage{interfaces}` into your document preamble will make all modules active (*ie.* they will be loaded or not, depending on your document preamble). If you prefer not to use all modules, you can load them separately as a package, for example, type: `\usepackage{interfaces-titlesec}` *after* `\usepackage{titlesec}`. A better way is to add `\usepackage{interfaces-base}` to your preamble, and then: `\LoadInterface{titlesec,tocloft}` indifferently before or after `\usepackage{titlesec,tocloft}`. Another possibility to restrict the modules is to give them as options for the main package: `\usepackage[titlesec,tocloft]{interfaces}`.

`interfaces-base` is a mandatory “module”. It loads `interfaces-scrfile`, `interfaces-etoolbox`² and `interfaces-pgfkeys`: those are the *system-layer* of `interfaces`.

Example

```
\pagesetup[document]{%
  rules=.5pt,
  foot/left/odd=\arabic{page},
  foot/right/even=\arabic{page}/\pageref{LastPage},
  head/font=\color{gray}{.85}\bfseries\small,
  head/left/even=\leftmark,
  head/left=\thefirstmarks{MiniSection},% interfaces-marks
}
\pagesetup[plain]{% for chapters...
  pagestyle=document,% preloaded settings
  head=,
  foot/left/odd = \roman{page},
  norules, head/rule=.4pt
  head/center=This is the title,
}
\sectionformat\section[hang]{
  label=\arabic{section},
  labelsep=,
  font=\bfseries\Large,
  bookmark={bold,color=blue},% interfaces-bookmark
  top=6pt plus3pt minus2pt,
  bottom=3pt plus2pt,
  break=\marksthecs{section}{lastsectiontoc},% interfaces-hybmsec
  mark=\marksthe{section}{#1},% interfaces-marks
}
\sectionformat\subsection[hang]{
  label=, labelsep=,
  font=\bfseries,
  bookmark=italic,
  top*=1.2,% a 120% scaling
  bottom+=0pt plus4pt,% add to previous value
  mark=\markright{#1},
}

\sectionformat\MiniSection{% new sectionning command
  class=straight[\subparagraph],
  shape=block,
  label=,
  top=3pt plus2pt, bottom=1pt,
  font=\bfseries\sffamily,
  bookmark=off,% or false or none
  break=\allowbreak,
  mark=\marksthe{MiniSection}{#1},% see interfaces-marks
}
\bottomtitles=.2\textheight
\tocsetup{
  depth=3, title=Contents, pagenumbers=on,
  pagestyle=plain,% first page style: tocloftpagestyle
  title/top=1.5ex plus.5ex,
  title/bottom=0pt,
  section/indent=1em,
  section/number/width=1.5em,
  section/font+=\larger\bfseries,% append to previous setting
  section/leaders,section/dotsep,
  subsection/indent=2em,
  subsection/number/width=2.5em,
  subsubsection/font=\scriptsize,
  subsubsection/leaders,subsection/dotsep,% default values
  subsubsection/pagenumbers=off,% no page numbers
  subsubsection/dotsep=,% no leader
  columns=2,% same as twocolumns
  columns/sep=.5em,
  columns/rule/width=1pt,columns/rule/color=blue,
  label=toc,% gives a label to the t.o.c.
  bookmark={text=Contents,bold},% interfaces-bookmark
}
\tableofcontents

\mainmatter \pagestyle{document}
```

This documentation is produced with the DocStrip utility.

- To get the package, run: `etex interfaces.dtx`
- To get the documentation run (thrice): `pdflatex interfaces.dtx`
- To get the index, run: `makeindex -s gind.ist interfaces.idx`

The .dtx file is embedded into this pdf file thank to embedfile by H. Oberdiek.

1. `pgfkeys`: CTAN:graphics/pgf/base/generic/pgf/utilities
2. All macros in `interfaces-etoolbox` are defined with `\providecommand` except `\removefromstart` which is used by `\repeatcell`.

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1 Interface L^AT_EX

```
\changeont { encoding | enc = changes \fontencoding
              family | fam = changes \fontfamily
              series | ser = changes \fontseries
              shape | sha = changes \fontshape
              size | size* | size+ | size- = changes the font size (default unit is pt)
baselineskip | baselineskip* + - | skip = changes the \baselineskip for the font
linespread | linespread* + - | spread = changes the line spread (a real value) }
```

Example: adds 5pt to the font size (pt is added if not specified) and scale the linespread by 130%:
`\changeont{ size+ = 5,spread* = 1.3}` (`\selectfont` is included in the macro).
If a key is not specified, the current value remains.
Finally, `\changeont` is compatible with `hyperref` thank to `\pdfstringdefDisableCommands`.

2 Interface TikZ (🔗pgfmanual)

```
\usetikz { basic=..., loads tikz with libraries calc, arrows, scopes and backgrounds
           all=..., loads tikz with all packages, pgf-modules and TikZ-libraries
           any other key=..., loads tikz and the specified package, module or library
           using \usepackage, \usepgfmodule or \usetikzlibrary }
```

`\usetikz` is a facility provided to load `pgf`, `tikz`, `pgf-modules`, and `tikz-libraries`, without the need to know if you must use `\usepackage` or `\usepgfmodule` or `\usetikzlibrary`.
Keys `shorten>` and `shorten<` have been set as aliases to `shorten >` and `shorten <` (original with space) and keys `shorten<>` and `shorten <>` have been set to style `shorten >` and `shorten <`.
`\usetikz` does not parse options. If you are used to load `pgf` with option (f.ex. `version=0.96`), please use the syntax:
`\PassOptionsToPackage{version=0.96}{pgf}`

~~~~~ MEMO ~~~~~

| TikZ/pgf package                                              | pgfmodules     | TikZ libraries                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                |
|---------------------------------------------------------------|----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| pgf<br>pgfmath<br>pgfcalendar<br>pgfplots<br>pgfpages<br>tikz | matrix<br>plot | arrows<br>chains<br>er<br>scopes<br>snakes<br>shapes<br>shapes.misc<br>shapes.geometric<br>shapes.arrows<br>shapes.multipart<br>shapes.callouts<br>shapes.symbols<br>shapes.gates.logic.US<br>shapes.gates.logic.IEC<br>decorations<br>decorations.pathmorphing | decorations.pathreplacing<br>decorations.shapes<br>decorations.text<br>decorations.markings<br>decorations.fractals<br>decorations.footprints<br>positioning,trees<br>automata<br>patterns<br>fadings<br>shadows<br>through<br>backgrounds<br>petri<br>fit<br>mindmap<br>folding<br>plohandlers<br>plotmarks<br>calc<br>matrix |

sorry for the blank cell, but I didn't get out with `colortbl` and the `\multicolumn` entry...

```

\papergraduate[options]    displays a graduated paper on the whole page background,
                             or inside a pgfpicture :
\papergraduate [           x = unit for x axis (default is 1cm),
                             y = unit for y axis (default is 1cm),
                             unit = sets both x and y,
                             xcolor = color for horizontal graduations (default is magenta),
                             ycolor = color for vertical graduations (default is cyan)
                             color = sets both xcolor and ycolor
                             xrule = true (default) or false: displays the horizontal rule or not,
                             yrule = true (default) or false: displays the vertical rule or not,
                             xrule/font [+,* ] = font for the labels on the horizontal rule
                             yrule/font [+,* ] = font for the labels on the vertical rule
                             norule = don't display the rules
                             opacity = opacity for the graduations (default = .25)
                             text opacity = opacity for the rules labels (default =.8)
                             (coordinate)      (coordinate);

```

`\papergraduate` is close to TikZ grid path and displays a real graduated paper.

When used *outside* of a `pgfpicture`, `\papergraduate` alone draws a graduated paper as a wallpaper on the current page background (on this page with  $x = 1in$  and  $y = 1in$ ).

The code is fast because based on T<sub>E</sub>X primitive `\leaders` (faster than `grid`).

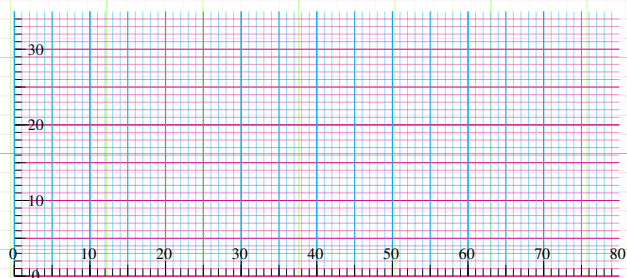
Examples:

```

\tikz{
  \coordinate (A) at (0,0);
  \papergraduate [opacity=.9]
    (A)      ++ (8cm,3.5cm); }

or \papergraduate (A) to ++ (8cm,3.5cm);
or \papergraduate (A) -- ++ (8cm,3.5cm);

```



### 3 Interface `titlesec`: `\sectionformat`

```
\sectionformat{\section} {   class=..., page|top|straight [\sup-level]
                           shape=..., hang|block|display|runin|leftmargin|rightmargin|
                             drop|wrap|frame|runinifempty
                           font|format=..., label=..., labelsep|sep=...,
                             left=..., right=..., top=..., bottom=...,
                             before=..., after=...,
                             mark=..., break=..., thesection=..., }
```

`\sectionformat` is a pgfkeys-command for replacement of both `\titleformat` and `\titlespacing`. If a key is not given, its value remains the same while with `\titleformat` or `\titlespacing`, you must specify all values in a rigid order... Moreover, `\sectionformat` can be used concurrently with `\titleformat` and `\titlespacing` (although `\sectionformat` is deemed more comfortable, this allows to quickly modify some files written without `interfaces`.)

Keys corresponding to  $\text{\TeX}$  code (`font`, `before` or `after`) are associated with starred keys and `+` keys: they append their content to the previous value. Ex: `font+={\larger}` adds `\larger` to the previous settings.

For dimensions or skips, the `+` key adds, the `-` key subtract and the `*` key scales.

|                                          |                               | MEMO                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|------------------------------------------|-------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>class</code>                       | name of the class             | <code>page</code> =like standard <code>\part</code><br><code>top</code> =like standard <code>\chapter</code><br><code>straight</code> =like standard <code>\section</code> etc.<br>example: <code>\sectionformat\subchapter{class=straight[\chapter]}</code>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <code>shape</code>                       | shape                         | <code>hang</code> =hanging label (like <code>\section</code> )<br><code>block</code> =paragraph without formatting (for centered titles)<br><code>display</code> =like standard <code>\chapter</code><br><code>runin</code> =like standard <code>\paragraph</code><br><code>leftmargin</code> =left margin<br><code>rightmargin</code> =right margin<br><code>drop</code> =wraps the text around the title (the first paragraph should be longer than the title, otherwise, they overlap)<br><code>wrap</code> =like <code>drop</code> but the space reserved for the title is variable<br><code>frame</code> =like <code>display</code> +puts the title in frame<br><code>runinifempty</code> = <code>hang</code> but no label if the title is empty |
| <code>font=</code> <code>format</code>   | format for title              | applied to the label and the title                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <code>label</code>                       | title label                   | ex: <code>\arabic{section}</code>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <code>sep =</code> <code>labelsep</code> | space between label and title |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <code>left</code>                        | left margin                   | a glue: horizontal space before                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <code>right</code>                       | right margin                  | a glue: horizontal space after                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <code>top</code>                         | vertical space before         | a glue: vertical space before                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <code>bottom</code>                      | vertical space after          | a glue: vertical space after                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <code>mark</code>                        | macro with 1 parameter        | ex <code>\sectionmark</code> : redefines <code>\...mark#1...</code> (the argument is the title)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <code>break</code>                       | parameterless macro           | ex <code>\sectionbreak</code> to be executed just before the section command                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <code>thesection</code>                  | toc and ref labels            | redefines <code>\thesection</code><br><code>\thesection</code> , <code>\thesubsection</code> etc.. are used to print references and the label in the table of contents                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <code>before</code>                      | code before title body        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <code>after</code>                       | code after title body         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

If the bookmark package is loaded, with `interfaces-bookmark`, the following keys are defined for each section:

|                              |                       |                                                                                                                   |
|------------------------------|-----------------------|-------------------------------------------------------------------------------------------------------------------|
| <code>bookmark/bold</code>   | bold bookmark text    | the text of the bookmark for that sectionning command will be <b>bold</b>                                         |
| <code>bookmark/italic</code> | italic bookmark text  | the text of the bookmark for that sectionning command will be in <i>italic</i>                                    |
| <code>bookmark/color</code>  | colored bookmark text | the text of the bookmark for that sectionning command will be <b>colorized</b>                                    |
| <code>bookmark/off</code>    | disable the bookmark  | no bookmark for that sectionning command alternatively you may set <code>bookmark/level</code> to a huge value... |
| <code>bookmark/style</code>  | use a <i>style</i>    | the <i>style</i> must be previously declared with <code>\bookmarkdefinestyle</code>                               |
| <code>bookmark/level</code>  | level of the bookmark | defines <code>\toclevel@{sectionname}</code> , see bookmark documentation                                         |

The syntax: `\sectionformat\subsection{bookmark={bold,italic,color=green,on,view=FitB}}` also works.

→ Key *bookmark* is an example of a key defined with the handler */is multiple choice*.

The starred keys `bold*`, `italic*`, `color*` and `off*` are also provided. For example:

```
\sectionformat\section{
  after=\sectionformat\subsection{bookmark/color*=red}
}
```

makes the bookmarks corresponding to the first subsection in each section to be **red**. If you ascertain that there is no bookmark between the one corresponding to the section and the one corresponding to its first subsection, then this is the same as: “`after=\bookmarksetup{color*=red}`”.

### ~~~~~ EXAMPLE ~~~~~

---

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|
| <pre>\sectionformat\section[hang]{%   font=\bfseries\scshape,   label=\Roman{chapter}\ \textbullet\ \arabic{section},   labelsep=\widthof{\textbullet},   bottom=1ex plus.4ex minus.2ex,   top+=3pt,   mark=\markright{#1},% =&gt; this defines \def\sectionmark#1{\markright{#1}}   break=\goodbreak,%    =&gt; this defines \def\sectionbreak{\goodbreak}   thesection=\Roman{chapter}.\arabic{section}, % redefines \def\thesection{...}   bookmark={bold,color=blue} }</pre> | <pre>this is the same as:  shape = hang</pre> |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|

---

`titlesec` provides *extended settings* for numberless (*ie.* starred) sections with the syntax:

```
\titleformat{name=\section,numberless}{...}
```

One swallow does not a summer make, `interfaces-titlesec` does not provides this feature in a key=value stuff but just type:

```
\sectionformat\section*{ key=value }
```

to give to your `\section*` command a special format. Keys `label` and `labelsep` are not ignored, this means that `\section*` can be defined in a way it produces a numbered section! Albeit, this would be weird because the `<section>` counter is not updated for starred sections...

Presently, `\sectionformat` does not implement the *extended settings* of `titlesec` for odd and even pages.

However, it is always possible to use `\sectionformat` concurrently with `\titleformat` and `\titlespacing`. A better way to use different settings for odd and even pages is the use of `\ifthispageodd` from the KOMA-Script classes, or the features provided by `changepage.sty`, which is almost the same: actually `titlesec` test oddity of the **page** counter (*ie.* `TeX \count register nr 0`) while oddity of `\pageref` should be tested... Hence the decision I came not to implement different settings for odd and even pages in `\sectionformat`.

```
\bottomtitles{<glue|percentage of \textheight>}
```

This globally sets the value of `\bottomtitlespace` (see `titlesec` documentation):

```
\bottomtitles{.2}          sets \bottomtitlespace to .2\textheight
\bottomtitles=.2\textheight is the same
```

You can globally set a negativ value: `\bottomtitles = -1` to allow bottom titles.



## 4 Interface `hyperref`

```
\raisedhyperdef[⟨raised dimen⟩]{⟨category⟩}{⟨name⟩}{⟨text⟩}
```

Package `hyperref` provides `\hyperdef` and `\Hy@raisedlink` but no easy way to insert a “raised link” with `\hyperdef` (or `\hypertarget`).

`\raisedhyperdef` can be used exactly like `\hyperdef`, but the pdf-anchor will be raised of the specified dimension.

## 5 Interface `bookmark`

A few new keys appear with `interfaces` for the command `\bookmarksetup`:

```
\bookmarksetup {   bold* = ..., will make the bookmark text bold, but only for the very next bookmark
                  italic* = ..., idem for italic
                  color* = ..., idem for color: the previous color will be restored after the next bookmark
                  disable = ..., will disable the bookmarks (the same as \bookmarksetup{depth=-2})
                  disable* = ..., will disable only the very next bookmark                }
```

Furthermore the following code:

```
\sectionformat\section{bookmark={bold,color=blue}}
\bookmarksetup{color*=red}
\section{A lovely red, bold bookmark here!}
\section{And the following bookmark is blue and bold}
```

will produce a bookmark with attributes: `color=red,bold=true`. In other words, the starred keys of `\bookmarksetup` overwrite the “default” settings of `\sectionformat` for the very next bookmark.

*Note that this code requires `titlesec`, `bookmark`, `interfaces-titlesec` and `interfaces-bookmark`.*

Three new keys are added to the `\bookmark` command:

```
\bookmark{   pageref = the destination of the bookmark is the page referenced
             ref      = the destination of the bookmark is the anchor associated to the reference
             atend    = the bookmark will be inserted at the end of the document                }
```

I admit those keys will not be used very often... but imagine you want to put a bookmark at the end, which points to the table of contents, then:

```
\bookmark[ref=TableOfContents,atend]{Back To Contents}
```

Provided that the label `TableOfContents` has been defined, for example with `\sim\tocsetup`, if `tocloft` and `interfaces-tocloft` are loaded:

```
\tocsetup{label=TableOfContents}   \tableofcontents
```

The `atend` key requires of course that the package `bookmark` was loaded with the `[atend]` option (otherwise, `bookmark.sty` gives a warning).



## 6 Interface `hypbmsec`

The features provided by `interfaces-hypbmsec` are now independant of `titlesec` and `interfaces-titlesec`.

Package `hypbmsec` provides extended sectionning commands with the syntax:

```
\section(out)[toc]{title}      or      \section[toc](out){title}
      (out)   is used for the bookmark (outline)
```

Where:    `[toc]`    for the table of contents and the marks  
           `{title}`    to typeset the section title in the document

Internally, `hypbmsec` defines `\hbs@bmstring` (the string used for the bookmark entry) and `\hbs@tocstring` (the string used for the table of contents and the marks).

`interfaces` takes advantage of this and defines:

```
\lastsectiontitle      expands to the title of the last \section
\lastsectionbookmark    expands to the text of the bookmark for the last \section
\lastsectiontoc         expands to the entry of the last \section in the table of contents
\lastsectionanchor      expands to the anchor name of the last \section if hyperref is used
```

Macros for each sectionning command are defined:

```
\lastparttitle          \lastchaptertitle
\lastsectiontitle       \lastsubsectiontitle      \lastsubsubsectiontitle
\lastparagraphtitle     \lastsubparagraphtitle
```

with their `...bookmark` and `...toc` counterparts.

Assignment to those macros is automatic. More precisely, `\lastsectiontitle` is defined **after** `\sectionbreak` and **before** `\sectionmark`: this means that in the fields `after` or `mark` of `\sectionformat`, `\lastsectiontitle` has been updated yet. While in the fields `before`, and `break`, `\lastsectiontitle` is not yet updated. (For chapters, this is the same if `titlesec` formats the chapter titles, *ie.* if `\sectionformat\chapter` or `\titleformat\chapter` has been invoked. Otherwise, `\lastchaptertitle`, `\lastchapterbookmark` and `\lastchaptertoc` are set at `\stepcounter{chapter}`.).

Values are automatically reset to `\relax` when a section of a superior level is created.

This feature has been implemented essentially to make the use of a `\mark` command at `\sectionbreak` easier. Mark at `\sectionbreak` is important to get the correct behaviour for marks described in `interfaces-marks` (page 13 under `\ifmarksequal`). With this feature, when a new `\section` is created, `\lastsubsection` is reset to `\relax` therefore, `\marksthecs{<subsection>}{<lastsubsection>}` will not mark anything.

Another possibility is shown in this document: the header is clickable and has been defined with:

```
\sectionformat\section{
      mark=\marksthe{section}{#1}
      \marksthecs{sectionanchor}{lastsectionanchor}
}
\pagesetup{
      head/right=\hyperref{}{}{\thefirstmarks{sectionanchor}}
                      {\thefirstmarks{section}}
}
```

## 7 Interface `tocloft` : `\tocsetup`, `\lofsetup`, `\lotsetup` and `\listofsetup`

Setting the keys overwrites the previous value, unless the `+` key (append code/add for dimensions), the `-` key (subtract) or the starred-key\* (scale dimensions) is used. `\tocsetup` settings apply to `\tableofcontents` and also to `\shorttableofcontents` (package `shorttoc`). `\tocsetup` can be invoked more than once in a document...

```
\tocsetup{
    depth=\setcounter{tocdepth} This is a LATEX rather than tocloft's ...
    With interfaces you can change the t.o.c. depth anywhere inside your
    document, just like bookmarks depths (two runs are required)

    title|contentsname=redefines \contentsname
    title/top|title/top+|title/top-|title/top*=vertical space before the title (set|add|subtract|scale)
    title/bottom|title/bottom+ etc.=vertical space after the title
    title/font|title/font+|title/format=the title font (set|append code)
    title/color|title/font/color=the color of the title (may also be defined in the key title/font)
    title/after|title/after+=hook to execute just after the title (\cftaftertocitle...)
    parskip|parskip+|parskip-|parskip*|parsep=modifies (or add to) \cftparskip
    dotsep=modifies \cftdotsep if no dimen is specified, mu is assumed, otherwise, conversion
    to mu  $\approx 1em/18$  is supplied. Default value is  $4.5mu$  and blank value is the same as
    \cftnodots
    dot=modifies \cftdot, the dot used for leaders produced by \cftdotfill
    pagestyle=page style for the first page (\tocloftpagestyle)
    mark=the mark command: \cftmarktoc
    example: \chaptermark\contentsname

    before|before*|after|after*=hooks to execute before or after the command \tableofcontents
    twocolumns|columns|multicol=twocolumns=true is the same as columns=2 Makes a multicolumn table
    of contents. Package multicol is required!

    columns/sep|columns/sep+|columnsep etc.=sets (or add) a <dimen> to \columnsep
    columns/rule|columns/rule+|columnseprule etc.=sets (or add) a <dimen> to \columnseprule
    columns/color|columnseprulecolor=modifies \columnseprulecolor
    multicolsep|multicolsep+ etc.=modifies (or add) a <glue> to \multicolsep
    \multicolsep is the space added before and after multicol environ-
    ment. Its default value is 0pt plus 4pt minus 3pt.

    multicol/begin|twocolumns/before=hooks just after \begin{multicols} ...
    multicol/end|twocolumns/after=... and before \end{multicols}

    label=the label for reference to the table of contents
    ref=the reference printed by \ref when referencing the table of contents
    (default is \contentsname. In any case, \nameref prints \contentsname.).

    bookmark/text=the bookmark text for the table of contents (if empty, no bookmark is set)
    bookmark/bold|bookmark/italic|bookmark/color=the bookmark style for the table of contents
    bookmark/level=the bookmark level: either a number or section or chapter
    Default is chapter, or section if the class does not provide chapters.
}
```

`bookmark` key and sub-keys are available only if the package `bookmark` is loaded with `interfaces-bookmark`.

The following keys apply to each section levels. Section level names are : `part` / `chap` or `chapter` / `sec` or `section` / `subsec` or `subsection` / `subsubsec` or `subsubsection` / `para` or `paragraph` / `subpara` or `subparagraph` / `fig` or `figure` / `subfig` or `subfigure` / `tab` or `table` / `subtab` or `subtable`.  
`¶` may be one of those names (see `tocloft` documentation).

```
\tocsetup{
    ¶/top|¶/top+|¶/skip|¶/beforekip=modifies (or add to) the vertical <glue> before an entry
    ¶/indent|¶/indent+|¶/indent-|¶/indent*=modifies (or add etc.) the indentation of the entry
    ¶/font|¶/font+=the font of the ¶ section title
    ¶/color|¶/font/color=the color of the ¶ section title (overwrites linkcolor if hyper-linked)
    ¶/number/width|number/width+ etc.|numwidth=modifies the space allowed to typeset the title numbers
    ¶/number/before|number/before+|presnum=code before the section number (see pseudo code below)
    ¶/number/after|number/after+|aftersnum=code after the section number (see pseudo code below)
    ¶/title/before|title/before+|aftersnumb=code before the title (ie. after the section number box)
    ¶/leader|¶/leaders=modifies the leader: the default is \cftdotfill{\cft¶dotsep}
    ¶/dotsep=the space (in mu) between dots in the leader. Default is \cftdotsep and
    blank value is the same as \cftnodots
    ¶/pagefont|¶/page/font|¶/page/number/font=modifies the font used to typeset the page number
    ¶/page/number/color|¶/page/number/font/color=the color of the page numbers for this section (overwrites linkcolor if
    the page number if hyper-linked)
    ¶/page/after|¶/pagenumber/after|afterpnum=macro expanded after the page number is typeset
}
```

~~~~~ MEMO ~~~~~

numbered entries are typeset with this pseudo code:

```
{\cftXfont {\cftXpresnum SNUM\cftXaftersnum\hfil} \cftXaftersnumb TITLE}%
{\cftXleader}{\cftXpagefont PAGE}\cftXafterpnum\par
```

and for not numbered entries:

```
{\cftXfont TITLE}{\cftXleader}{\cftXpagefont PAGE}\cftXafterpnum\par}
```

`\lofsetup` and `\lotsetup` behave the same.

`\listofsetup{<list-name>}{<key=value>}`

This command is provided to setup the parameters of user-defined lists created with `tocloft`'s `\newlistof` and printed with `\listofX` (where `X` is the name given to the list). The keys are the same as `\tocsetup`, and the sub-keys correspond to the entries. In fact:

- `\tocsetup` is a shortcut for `\listofsetup{toc}`
- `\lofsetup` is a shortcut for `\listofsetup{lof}` and
- `\lotsetup` is a shortcut for `\listofsetup{lot}`

Example:

```
\newlistof[section]{answer}{ans}{List of Answers}
\newlistentry[answer]{subanswer}{ans}{1}
\listofsetup{ans}{
  depth=2,
  title=List of Answers of the section,% modifies the title
  title/font=\Huge,
  answer/font=\Large\bfseries,
  subanswer/font=\large\itshape,
  answer/dotsep=3mu,
  subanswer/dotsep=,
  subanswer/pagenumbers=off,
}
\addcontentsline{ans}{answer}{\numberline{1}First answer}
\addcontentsline{ans}{subanswer}{\numberline{1.1}First sub-answer}
\listofanswer
```

} preferably in
the preamble

% can be changed inside the document body

% font spec.

% no dot

8 Interface `fancyhdr`: `\pagesetup`

| | | |
|--|--|---|
| <code>\pagesetup[⟨pagestyle-name⟩]{</code> | | |
| <code>norule norules</code> | | set <code>\headrulewidth</code> and <code>\footrulewidth</code> to 0pt |
| <code>rule rule/width[* + -]=...</code> | | set <code>\headrulewidth</code> and <code>\footrulewidth</code> to a given value |
| <code>rule/color=...</code> | <code>rule/font=...</code> | To change the rule font/color |
| <code>headrule=...</code> | <code>footrule=...</code> | redefines <code>\headrule</code> and <code>\footrule</code> (no value restores default) |
| <code>head/rule/width=...</code> | <code>foot/rule/width=...</code> | dimensions |
| <code>head/rule/color=...</code> | <code>foot/rule/color=...</code> | for head and foot rules separately |
| <code>head/rule/font=...</code> | <code>foot/rule/font=...</code> | <i>idem</i> |
| <code>head=...</code> | <code>foot=...</code> | header and footer (<code>\fancyhead</code> / <code>\fancyfoot</code>) |
| <code>left=...</code> | <code>center=...</code> | <code>right=...</code> , by position |
| <code>head/left=...</code> | <code>head/center=...</code> | <code>head/right=...</code> , for one side documents |
| <code>foot/left=...</code> | <code>foot/center=...</code> | <code>foot/right=...</code> , <i>idem</i> |
| <code>head/left/even=...</code> | <code>head/left/odd=...</code> | for two side documents |
| <i>etc.</i> | <i>etc.</i> | <i>etc.</i> |
| <code>foot/right/even=...</code> | <code>foot/right/odd=...</code> | |
| <code>inner=...</code> | <code>head/inner=...</code> | <code>foot/inner=...</code> , <i>inner</i> is an alias for <code>right/even</code> , <code>left/odd</code> |
| <code>outer=...</code> | <code>head/outer=...</code> | <code>foot/outer=...</code> , <i>outer</i> is an alias for <code>left/even</code> , <code>right/odd</code> |
| <code>offset=...</code> | | changes <code>\fancyhfoffset</code> |
| <code>head/offset=...</code> | <code>foot/offset=...</code> | |
| <code>left/offset=...</code> | <code>right/offset=...</code> | |
| <code>head/left/even/offset=...</code> | <code>head/left/odd/offset=...</code> | for two side documents |
| <i>etc.</i> | <i>etc.</i> | <i>etc.</i> |
| <code>foot/right/even/offset=...</code> | <code>foot/right/odd/offset=...</code> | for two side documents |
| <code>inner/offset=...</code> | <code>head/inner/offset=...</code> | <code>foot/inner/offset=...</code> , <i>inner</i> is an alias for <code>right/even</code> , <code>left/odd</code> |
| <code>outer/offset=...</code> | <code>head/outer/offset=...</code> | <code>foot/outer/offset=...</code> , <i>outer</i> is an alias for <code>left/even</code> , <code>right/odd</code> |
| <code>pagestyle=...</code> | | load the settings of another page style |
| <code>\pagesetup* [⟨pagestyle-name⟩]{key = value}</code> | | |

`\pagesetup` resets all headers and footers, rules etc. and modifies the current (active) page style depending on the `key=value` pairs. `\pagesetup[⟨page-style⟩]` defines (or redefines) a page style, starting from default values. When a key is specified with no value, the default is used (f. ex. `head/rule` will be `.4pt` and `foot/rule` will be `0pt`).

`\pagesetup*` does not reset current values: keys that are not specified remains the same.

`\pagesetup* [⟨page-style⟩]` defines or redefines `⟨page-style⟩`; the normal form starts from scratch, while the starred form `\pagesetup*` keeps previous values if they are not overwritten, and if the `⟨page-style⟩` exists, of course.

`foot/left/odd` is the same as `odd/foot/left` etc. but `twoside` option is not checked... Even pages are ignored in `oneside` documents: this is `LATEX`, not `fancyhdr` nor `interfaces-fancyhdr`.

As usual, for dimensions or glues, `+`, `-` and `*` keys are provided for addition, subtraction and scaling. And for code (font keys) the `+` and `*` keys are provided: both append their content to the previous value.

9 Interface marks

`interfaces-marks` provides a few macros to make easier the use of ε -TeX `\marks` registers. ε -TeX defines 32 768 marks registers, making the use of them far more comfortable than “old” \LaTeX `\markboth`, `\markright`, `\leftmark` and `\rightmark`. Who gets the correct – I mean *expected* – result with such commands ? Not me, I can say !

```
\marksthe{<named-mark>}{<content>}
\marksthecs{<named-mark>}{<cs-name>}
```

`\marksthe{<section>}{<content>}` will mark `<content>` into a mark register referenced by the control sequence `\marks@<section>`. **<content> is not expanded** (You can expand before `\marksthe` if you need it).

If the mark `\marks@<section>` is not defined, then a new mark register is allocated (with `etex-\newmarks`).

`\marksthecs{<subsubsection>}{<cs-name>}` will similarly mark the unexpanded content of `\cs-name` by means of the marks register `\marks@<subsubsection>`. `<cs-name>` is really the *name of the control sequence*, not the control sequence itself. If `\cs-name` is undefined or `\relax`, nothing is marked, making `\marksthecs` suitable to use with `\lastsectiontitle` *etc.* at `\sectionbreak` (see [interfaces-hypbmsec](#) p. 9).

```
\thefirstmarks{<named-mark>}EXPANDABLE
\thebotmarks{<named-mark>}EXPANDABLE
\thetopmarks{<named-mark>}EXPANDABLE
```

`\thefirstmarks{<chapter>}` expands to `\firstmarks\marks@<chapter>` (this is expandable in exactly one step of expansion), *ie.* either the content of the first invocation of `\marksthe{<chapter>}` on the current page, if `\marks` was used on the current page, or the last invocation of `\marks` if no marks occurs on the current page.

`\thebotmarks{<chapter>}` expands to `\botmarks\marks@<chapter>` *ie.* the content of the last invocation of `\marksthe{<chapter>}` (the most recent `\marks`).

`\thetopmarks{<chapter>}` expands to `\topmarks\marks@<chapter>` and this is the content of `\botmarks` at the time \TeX shipped out the last page.

If there is no mark or if the mark register does not exist, expansion is null (*ie.* nothing is done).

Those commands can be used in headers and footers, f.ex:

```
\sectionformat\section{
  mark=\marksthe{section}{\arabic{section}\hskip.4em\textendash\hskip.4em#1}}
\pagesetup{head/right=\thefirstmarks{section}}
```

```
\getthemarks\firstmarks|\botmarks|\topmarks{<named-mark>}{\control-sequence}
\getthefirstmarks{<named-mark>}{\control-sequence}
\getthebotmarks{<named-mark>}{\control-sequence}
\getthetopmarks{<named-mark>}{\control-sequence}
```

You may wish to retrieve the values of `\firstmarks`, `\botmarks` or `\topmarks` into a macro. This is the purpose of these commands: `\control-sequence` is defined as a parameterless macro whose replacement text is the content of the specified marks register.

If the marks register `\marks@<named-mark>` does not exist, the meaning of `\control-sequence` is undefined.

```
\ifmarksequal{\firstmarks}{\topmarks}{named-mark}{\true}{\false}
```

Pretty often, we want to compare the botmarks with firstmarks or the topmarks, to adapt the header and/or footer in case those marks are equal or different, *ie.* in case the page contains a new section title or not:

`\ifmarksequal` expands conditionnally code `{\true}` only if the specified marks register to compare are equal, otherwise `{\false}`.

- `\firstmarks=\botmarks` ⇔ there is at most one section title on the current page;
- `\topmarks=\botmarks` ⇔ there is no section title on the current page;
- `\firstmarks=\topmarks` ⇔ the last section title continues on the current page.

Those assertions are true only if you mark the section title at `\sectionmark` and at `\sectionbreak`: this is easy when using `interfaces-hybmsec`: `\sectionformat\subsection{break=\markthecs{subsection}{lastsubsection}{toc}}`.

If the marks register `\marks@<named-mark>` does not exist, the `{\false}` part is expanded.

10 Interface `makecell` : `\repeatcell`

`makecell` provides `\eline`, `\nline`, `\Xrows` to fill a table with empty cells, or repeated rows.

`interfaces` extends the possibility with `\repeatcell`. Although it is of general use, `\repeatcell` should be used softly in order to keep the `.tex` document intelligible (see the examples below).

While repeating cells, `\repeatcell` can also make calculations with:

- `\numexpr`,
- `\pgfmath` (\leadsto `\usetikz{pgfmath}` required in preamble)
- `$$\FPeval$$` (`\usepackage{fp}` required in preamble) \Rightarrow use `round` to display the results!

Inside formulas `\row` expands to the current row, `\column` to the current column number (`\row` and `\column` are 1-based and relative to `\repeatcell`).

```
\countvalues{<comma separated list>}
```

`\countvalues{<comma separated list>}` expands to the number of values in the list. This is also the number of steps a \LaTeX `\@for` loop would do on the list: in other words, **empty values are counted**. `\countvalues` is provided to allow you to adjust automatically the number of columns of a tabular, depending on your data, with the `*` operator: `\begin{tabular}{*{\countvalues\list}{c}}`.

`\countvalue` is purely expandable in one expansion step. The `<comma separated list>` is expanded once, exactly like in \LaTeX `\@for` (*hint*: you can put `\empty` before, to avoid expansion).

```
\repeatcell[<alignment>]{<columns>}{ ← number of columns or comma separated list of values
    text = the text to be inserted (repeated) in each cell
    font = the font inside the cell
    rows = the number of rows (default is 1 row) or a comma separated list of value:
           {one, two, three, four, etc.} Empty values are not ignored.
    cr|end = the end-of-row sequence (default is \\ but you may want \crrc\hline or
           \tabularnewline...)
           end of row sequence is never inserted after the last row.
    text/row1 | text/row2 | text/row3 etc. = If you want to change the text on the specified rows
    text/col1 | text/col2 | text/col3 etc. = If you want to change the text on the specified columns
    font/row1 | font/row2 | font/row3 etc. = If you want to change the font on the specified rows
    font/col1 | font/col2 | font/col3 etc. = If you want to change the font on the specified columns
    cr/row1 | cr/row2 | cr/row3 etc. = If you want to change the end-of-line sequence on the specified rows
    transpose = Do you wish to invert rows and columns ? Then transpose=true ☺.
    any other key = can be used to make calculations using \numexpr or $\pgfmathparse$
                   or $$\FPeval$$ . Pay attention to put your formula inside curly brackets
                   {$formula$} if it contains a comma , or an equal = sign! }
```

☞ If `[<alignment>]` is specified, then each cell is placed into a `\makecell[<alignment>]` command.

☞ If both `text/row<i>` and `text/col<i>` are specified for the same cell, then `makecell \diaghead` is used to display the values in a diagonally divided cell.

☞ If you want to see (in the `.log` file) the code introduced into the tabular (or array) by `\repeatcell` type `\let\itf@message=\message` before `\repeatcell`.

Formulas: if you say: `x = $sin(10*\column)$` for example, then the formula is evaluated in each cell with `\pgfmath`. The result is stored into the control sequence `\x` and can be used in `text` or in any other following formula. The order in which the computed keys are given determines the order of evaluation... *of course!*

If you specify the number of columns (*resp.* of rows) as an integer, then `\repeatcell` works exactly as if you gave it a list of integers `{1, 2, 3, 4, ..., p}`.

If you specify the rows as a comma separated list of values, the following sequences are also admissible in `text`:

`\R\row` refer to the value of the list for the current row. `\r` is the same (unless you defined a formula named `r`).
`\R{<n>}` to the value of the list for row `{<n>}`

If the number of rows is specified as an integer, then `\R\row`, `\r` and `\row` are equal (to the current row index).

Similarly if you specify the columns as a comma separated list of values, the following sequences are provided:

`\C\column` refer to the value of the list for the current column. `\c` is the same, unless you defined a formula named `c`.
`\C{<m>}` to the value of the list for column `{<m>}`

If the number of columns is specified as an integer, then `\C\row`, `\c` and `\col` are equal (to the current column index).

If the values in the lists are numeric, `\R`, `\C`, `\r` and `\c` can be used in formulas as well, *of course...*

~~~~~ A few examples are better than a 10 pages description ! ~~~~~

## 10.1 † Conversion to scaled points

```
\def\listofunits{ pt , cm , mm , bp , dd , pc , in , cc ,sp }
\begin{tabu}{|>{\bfseries}c|*9{X[mc]}|} \hline
\thead{units}
& \repeatcell[c]{\listofunits{ text = \c, font=\bfseries } \\\ \hline
\thead{value in\ scaled\ points}
& \repeatcell{\listofunits{%
    sp =\number\dimexpr 1\c\relax,
    text=\numprint[sp]\sp} \\\ \hline
\end{tabu}
```

| units                  | pt        | cm           | mm         | bp        | dd        | pc         | in           | cc         | sp   |
|------------------------|-----------|--------------|------------|-----------|-----------|------------|--------------|------------|------|
| value in scaled points | 65 536 sp | 1 864 679 sp | 186 467 sp | 65 781 sp | 70 124 sp | 786 432 sp | 4 736 286 sp | 841 489 sp | 1 sp |

## 10.2 † Variable length cell

```
\newcommand\FAMILY[3]{%
\begin{tabu}{to .4\linewidth{|*3{X[mc]}|} \hline
Mother & Father & Children \\\ \hline
#1 & #2 & \makecell{\repeatcell{#3}{text=\c, transpose} \\\ \hline
\end{tabu}}
\FAMILY{Johanne}{Georg}{Priscilla, John, Tom}
\FAMILY{Nout}{Geb}{Isis, Osiris, Seth, Nephthys}
```

| Mother  | Father | Children                           |
|---------|--------|------------------------------------|
| Johanne | Georg  | Priscilla<br>John<br>Tom           |
| Mother  | Father | Children                           |
| Nout    | Geb    | Isis<br>Osiris<br>Seth<br>Nephthys |



### 10-3 † Empty rows

```
\begin{tabu}{*6{c}} \hline
\repeatcell 6{ text/col1=\row , rows=4, end=\\ \hline } \\ \hline
\end{tabu}
```

|   |  |  |  |  |  |
|---|--|--|--|--|--|
| 1 |  |  |  |  |  |
| 2 |  |  |  |  |  |
| 3 |  |  |  |  |  |
| 4 |  |  |  |  |  |

```
\begin{tabu}{*4{c}} \hline
\repeatcell 6{ text/col1=\row , rows=4, end=\\ \hline , transpose} \\ \hline
\end{tabu}
```

|   |   |   |   |
|---|---|---|---|
| 1 | 2 | 3 | 4 |
|   |   |   |   |
|   |   |   |   |
|   |   |   |   |
|   |   |   |   |

### 10-4 † color palette

```
\begin{tabu}{*4c}
\repeatcell {8}{\transpose=true, rows=4,
red = {\$round(\c/8*255,0)$},
greeni = \red, bluei = \red,
greenii = {\$round(255-\red,0)$}, blueii = \red,
greeniii = \red, blueiii = {\$round(255-\red,0)$},
greeniv = \greenii, blueiv = \blueiii,
text/row1={\cellcolor[RGB]{\red,\greeni,\bluei}(\red,\greeni,\bluei)},
text/row2={\cellcolor[RGB]{\red,\greenii,\blueii}(\red,\greenii,\blueii)},
text/row3={\cellcolor[RGB]{\red,\greeniii,\blueiii}(\red,\greeniii,\blueiii)},
text/row4={\cellcolor[RGB]{\red,\greeniv,\blueiv}(\red,\greeniv,\blueiv)}}
\end{tabu}
```

|               |               |               |               |
|---------------|---------------|---------------|---------------|
| (32,32,32)    | (32,223,32)   | (32,32,223)   | (32,223,223)  |
| (64,64,64)    | (64,191,64)   | (64,64,191)   | (64,191,191)  |
| (96,96,96)    | (96,159,96)   | (96,96,159)   | (96,159,159)  |
| (128,128,128) | (128,127,128) | (128,128,127) | (128,127,127) |
| (159,159,159) | (159,96,159)  | (159,159,96)  | (159,96,96)   |
| (191,191,191) | (191,64,191)  | (191,191,64)  | (191,64,64)   |
| (223,223,223) | (223,32,223)  | (223,223,32)  | (223,32,32)   |
| (255,255,255) | (255,0,255)   | (255,255,0)   | (255,0,0)     |

**Note:** `makecell` interact very badly with `colortbl`. Therefore, with `\cellcolor` or `\rowcolor`, the optional [*alignment*] parameter of `\repeatcell` does not give good results... `colortbl` remain a rather rough package, and deserve a finer implementation... in future.

### 10-5 † tabularcalc-like tables (with `dcolumn` package) and `pgfmth`

```
\def\listofx{ -4 , -2 , 0 , 2.25 , 7 }
\begin{tabu}{c<{\bottopstrut}*{5}{|D..{5.5}}|} \hline
\rowfont{\large\color{blue}}
x & \repeatcell\listofx{ text=\C\column } & \hline\hline
f(x)=2x-3 & \repeatcell\listofx{ fx = 2*\c-3, text=\fx } & \hline
x^2 & \repeatcell\listofx{ xsquare = \C\column^2, text = \xsquare } & \hline
h(x) = \sqrt{x^2+1} & \repeatcell\listofx{ x=\C\column, hx = {\$sqrt(pow(\x,2)+1)$}, text = \hx } & \hline
\end{tabu}
```

|                         |         |         |         |         |         |
|-------------------------|---------|---------|---------|---------|---------|
| $x$                     | -4      | -2      | 0       | 2.25    | 7       |
| $f(x) = 2x - 3$         | -11.0   | -7.0    | -3.0    | 1.5     | 11.0    |
| $x^2$                   | -16.0   | -4.0    | 0.0     | 5.0625  | 49.0    |
| $h(x) = \sqrt{x^2 + 1}$ | 4.12310 | 2.23606 | 1.00000 | 2.46221 | 7.07106 |

$\pgfmth$  computations

|                         |           |          |          |         |          |
|-------------------------|-----------|----------|----------|---------|----------|
| $x$                     | -4        | -2       | 0        | 2.25    | 7        |
| $f(x) = 2x - 3$         | -11.00000 | -7.00000 | -3.00000 | 1.50000 | 11.00000 |
| $x^2$                   | 16.00000  | 4.00000  | 0.00000  | 5.06250 | 49.00000 |
| $h(x) = \sqrt{x^2 + 1}$ | 4.12311   | 2.23607  | 1.00000  | 2.46221 | 7.07107  |

And the same with  $\FPeval$  (`fp` package)

## 10.6 † Double entry array: the Body Mass Index

```

\def\weightlist{weight in kg, 30, 45, 50, 55, 60, 65, 70, 80, 90, 95, 100, 110, 120}
\def\heightlist{height in cm, 190, 180, 170, 160, 150, 140, 130}
\colorlet{denutrition}{Crimson} \colorlet{skinniness}{yellow} \colorlet{normal}{LawnGreen}
\colorlet{obesity}{Moccasin} \colorlet{serious obesity}{DarkOrange} \colorlet{morbid obesity}{Fuchsia}
\newcommand*\mycolor[1]{\cellcolor{#1}}
\ifdim#1pt<17pt denutrition\else \ifdim#1pt<19pt skinniness\else \ifdim#1pt<26pt normal\else
\ifdim#1pt<30pt obesity\else \ifdim#1pt<35pt serious obesity\else morbid obesity\fi\fi\fi\fi\fi}}

\begin{tabu}{*{\countvalues\heightlist}{|c|}} \hline
\repeatcell \heightlist {%
  rows = \weightlist,
  height = \ifnum\column>1 \c\else 1\fi,
  weight = \ifnum\row>1 \r\else 1\fi,
  BMI = {\$round(\weight/((\height/100)^2),1)\$},
  text = \mycolor{\BMI}\BMI,
  text/row1 = \c, font/row1 = \color{NavyBlue}, cr/row1 = \\ \hline,
  text/col1 = \r, font/col1 = \color{DarkViolet},
} \\ \hline
\end{tabu}\quad
\begin{tabu}{|c|}
\repeatcell{denutrition,skinniness,normal,obesity,serious obesity,morbid obesity}{%
  text=\cellcolor{\c}{\c},\transpose,font=\large\bfseries\bottomstrut}
\end{tabu}

```

| height in cm \ weight in kg | 190  | 180  | 170  | 160  | 150  | 140  | 130  |
|-----------------------------|------|------|------|------|------|------|------|
| 30                          | 8.3  | 9.3  | 10.4 | 11.7 | 13.3 | 15.3 | 17.8 |
| 45                          | 12.5 | 13.9 | 15.6 | 17.6 | 20.0 | 23.0 | 26.6 |
| 50                          | 13.9 | 15.4 | 17.3 | 19.5 | 22.2 | 25.5 | 29.6 |
| 55                          | 15.2 | 17.0 | 19.0 | 21.5 | 24.4 | 28.1 | 32.5 |
| 60                          | 16.6 | 18.5 | 20.8 | 23.4 | 26.7 | 30.6 | 35.5 |
| 65                          | 18.0 | 20.1 | 22.5 | 25.4 | 28.9 | 33.2 | 38.5 |
| 70                          | 19.4 | 21.6 | 24.2 | 27.3 | 31.1 | 35.7 | 41.4 |
| 80                          | 22.2 | 24.7 | 27.7 | 31.3 | 35.6 | 40.8 | 47.3 |
| 90                          | 24.9 | 27.8 | 31.1 | 35.2 | 40.0 | 45.9 | 53.3 |
| 95                          | 26.3 | 29.3 | 32.9 | 37.1 | 42.2 | 48.5 | 56.2 |
| 100                         | 27.7 | 30.9 | 34.6 | 39.1 | 44.4 | 51.0 | 59.2 |
| 110                         | 30.5 | 34.0 | 38.1 | 43.0 | 48.9 | 56.1 | 65.1 |
| 120                         | 33.2 | 37.0 | 41.5 | 46.9 | 53.3 | 61.2 | 71.0 |

|                        |
|------------------------|
| <b>denutrition</b>     |
| <b>skinniness</b>      |
| <b>normal</b>          |
| <b>obesity</b>         |
| <b>serious obesity</b> |
| <b>morbid obesity</b>  |

| weight in kg \ height in cm | 30   | 45   | 50   | 55   | 60   | 65   | 70   | 80   | 90   | 95   | 100  | 110  | 120  |
|-----------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| 190                         | 8.3  | 12.5 | 13.9 | 15.2 | 16.6 | 18.0 | 19.4 | 22.2 | 24.9 | 26.3 | 27.7 | 30.5 | 33.2 |
| 180                         | 9.3  | 13.9 | 15.4 | 17.0 | 18.5 | 20.1 | 21.6 | 24.7 | 27.8 | 29.3 | 30.9 | 34.0 | 37.0 |
| 170                         | 10.4 | 15.6 | 17.3 | 19.0 | 20.8 | 22.5 | 24.2 | 27.7 | 31.1 | 32.9 | 34.6 | 38.1 | 41.5 |
| 160                         | 11.7 | 17.6 | 19.5 | 21.5 | 23.4 | 25.4 | 27.3 | 31.3 | 35.2 | 37.1 | 39.1 | 43.0 | 46.9 |
| 150                         | 13.3 | 20.0 | 22.2 | 24.4 | 26.7 | 28.9 | 31.1 | 35.6 | 40.0 | 42.2 | 44.4 | 48.9 | 53.3 |
| 140                         | 15.3 | 23.0 | 25.5 | 28.1 | 30.6 | 33.2 | 35.7 | 40.8 | 45.9 | 48.5 | 51.0 | 56.1 | 61.2 |
| 130                         | 17.8 | 26.6 | 29.6 | 32.5 | 35.5 | 38.5 | 41.4 | 47.3 | 53.3 | 56.2 | 59.2 | 65.1 | 71.0 |

The same with `\transpose`

*Note that `fp` computation can be time consuming...* depending on the formula and the number of cells to fill in. While preparing first such a table, give to the computed keys a constant value, and plug the formulas only when you are satisfied with the displayed tabular...

## 11 Interface `enumitem` : `\setlist`

```
\setlist [environment,level,environment,level,etc.]{
    label= the label to be used
    font= the label font
    -----
    topsep= vertical space before the list
    partopsep= vertical space
    parsep= value of \parskip inside the list
    itemsep= vertical space between two items
    -----
    leftmargin= the list left margin
    rightmargin= the list right margin
    listparindent= the value of \parindent inside the list
    labelwidth= the width of the label box
    labelsep= horizontal space between label and following text
    itemindent= the indentation of the items
}
\setlist* [{environment,level,environment,level,etc.}]{key=value}
```

Enumerated lists, description lists or itemize lists can be defined by `enumitem` with the command `\newlist`.

For example: `\newlist{mylegal}{enumerate}{10}`

The list can be customized with `\setlist`, for example:

```
\setlist[mylegal,1]{label*=\arabic*.}
\setlist[mylegal,2]{label*=\arabic*.}
\setlist[mylegal,3]{label*=\roman*)}
```

With `interfaces-enumitem` you may specify more than one level at a time in `\setlist`, (and even more than one environment at a time):

```
\setlist[mylegal,1,2]{label*=\arabic*.}
\setlist[mylegal,3]{label*=\roman*)}
```

A list can also be **modified** with `\setlist*`: keys that are not specified remain the same.

```
\setlist*[mylegal,1,2,3]{align=left,leftmargin=*}
```

or

```
\setlist*[mylegal]{align=left,leftmargin=*}
```

### `\interitem`

Just like  $\mathcal{S}$  `\intertext` in math formulæ, `\interitem` allows to put some non intended text inside a list environment. Example:

```
\begin{enumerate}[label=\roman*)\,,parsep=0pt]
\item First item in the enumerate env
\interitem or (intertext)
\item Second item
\end{enumerate}
```

The example give in real world:

i) First item in the enumerate env  
or: (intertext)  
ii) Second item

And the following follows...

## 12 Interface truncate

The package `truncate` by Donal Arseneau provides the command:

```
\truncate[⟨TruncateMarker⟩]{⟨width⟩}{⟨text⟩}
```

to trunc the given  $\langle text \rangle$  to the specified  $\langle width \rangle$ , by means of  $\langle TruncateMarker \rangle$  if the the truncation occurs.

```
\truncetext[⟨TruncateMarker⟩]{⟨width⟩}{⟨text⟩}
```

`\truncetext` is the same as `\truncate` but it leaves  $\{text\}$  to its natural width if it has not to be truncated (*ie.* if  $\langle width \rangle \leq \text{width of } \langle text \rangle$ ). Example:

|                          |                                                 |                                                                                               |
|--------------------------|-------------------------------------------------|-----------------------------------------------------------------------------------------------|
| <code>truncate:</code>   | <code>\truncate{⟨5cm⟩}{⟨Hello world!⟩}</code>   | <div style="border: 1px solid black; padding: 2px; display: inline-block;">Hello word!</div>  |
| <code>truncetext:</code> | <code>\truncetext{⟨5cm⟩}{⟨Hello world!⟩}</code> | <div style="border: 1px solid black; padding: 2px; display: inline-block;">Hello world!</div> |

This corresponds to the `[fit]` option of the `truncate` package.

```
\htruncadjust{⟨total width⟩}[⟨x1,x2,...,xn⟩]{⟨text1,text2,...,textn⟩}
```

This macro will measure the width of  $text_1, text_2, \dots, text_n$  and adjust them for truncation:

| text     | width | adusted width                                                                           | $\gamma$ (truncated?)                                                                    | Returned width                                                              |
|----------|-------|-----------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|
| $text_1$ | $w_1$ | $w'_i = \min\left(w_1, \frac{x_1}{\sum x_i} \times \langle total\ width \rangle\right)$ | $\gamma_1 = \begin{cases} 1 & \text{if } w'_1 < w_1 \\ 0 & \text{otherwise} \end{cases}$ | $\omega_1 = w'_1 + \gamma_1 \cdot \Phi \cdot \frac{x_1}{\sum \gamma_i x_i}$ |
| $text_2$ | $w_2$ | $w'_i = \min\left(w_2, \frac{x_2}{\sum x_i} \times \langle total\ width \rangle\right)$ | $\gamma_2 = \begin{cases} 1 & \text{if } w'_2 < w_2 \\ 0 & \text{otherwise} \end{cases}$ | $\omega_2 = w'_2 + \gamma_2 \cdot \Phi \cdot \frac{x_2}{\sum \gamma_i x_i}$ |
| $text_3$ | $w_3$ | $w'_i = \min\left(w_3, \frac{x_3}{\sum x_i} \times \langle total\ width \rangle\right)$ | $\gamma_3 = \begin{cases} 1 & \text{if } w'_3 < w_3 \\ 0 & \text{otherwise} \end{cases}$ | $\omega_3 = w'_3 + \gamma_3 \cdot \Phi \cdot \frac{x_3}{\sum \gamma_i x_i}$ |
| $text_4$ | $w_4$ | $w'_i = \min\left(w_4, \frac{x_4}{\sum x_i} \times \langle total\ width \rangle\right)$ | $\gamma_4 = \begin{cases} 1 & \text{if } w'_4 < w_4 \\ 0 & \text{otherwise} \end{cases}$ | $\omega_4 = w'_4 + \gamma_4 \cdot \Phi \cdot \frac{x_4}{\sum \gamma_i x_i}$ |
|          |       | $\Phi = \text{freespace} = \langle total\ width \rangle - \sum w'_i$                    |                                                                                          | $\sum \omega_i \leq \langle total\ width \rangle$                           |

Another example of a tabular made with `\repeatcell`

The widths can be accessed with `\htruncwidth{⟨i⟩}` and then:

```
\truncetext[⟨TruncateMarker⟩]{\htruncwidth{⟨i⟩}}{⟨texti⟩}.
```

$x_i$  can be any real number provided that  $\sum_i x_i \leq 16383 = \text{maxdimen}$  in points.

Measuring the widths occur inside a `\hbox`, thus  $text_1, \dots, text_n$  can contain macros, non expandable material *etc.*. For example:

`\htruncadjust{4cm}[2,1]{Hello,world}` will prepare the widths so that their sum does not exceed 4 centimeters, and  $w_1 = 2 \times w_2$ .

`\htruncadjust{4cm}[2,1,2]{The,World,Is flat}` will prepare the widths so that their sum does not exceed 4 centimeters, and  $w_1 = w_3 = 2 \times w_2$ .

If the optional parameters  $x_i$  are not given, then they are equal to the natural width of  $\{text_1, \dots, text_n\}$ . In other words,  $text_1, \dots, text_n$  are truncated to a width proportional to their natural widths. (And the sum of their widths will not exceed  $\langle total\ width \rangle$ ).

This macro has been designed to cleverly truncate the text of headers, when they contain titles on both sides... Usually then, there are only two pieces of text whose width have to be adjusted for truncation...

```
\htruncadjust{3cm}{first quite long,second short,third}      % natural widths
\truncetext{\htruncwidth{1}}{first quite long}
\truncetext{\htruncwidth{2}}{second short}
\truncetext{\htruncwidth{3}}{third}
```

→ first quite...second...t... (39.05698pt, 33.65436pt, 12.64691pt, total=85.35825pt).

```
\htruncadjust{3cm}[3,2,2]{first quite long,second short,third} % first is 3/2 of the two others
```

→ first quite...secon...third (41.01503pt, 27.34372pt, 17.00078pt, total=85.35953pt).

## 13 Interface `appendix` and the appendices environment

`appendix` provides a way to write appendices inside an environment. This feature is suitable for short appendices like the one included in this document. `interfaces-appendix` gives an easier control on some parameter for the appendix with standard (optional) key names.

---

```
\begin{appendices}[%
  section = section | chapter,      alternatively, the key chapter is provided
  title = the appendix title,       if left blank, title is removed: [page] option of appendix
  intoc = true | false,             put an entry in t.o.c. ?
  intoc/title = the entry in t.o.c.] if blank, no title in t.o.c., if no value: the appendix title
  appendix content ...
\end{appendices}
```

---

## 14 Interface `embedfile` : `\embedthisfile`

`\embedthisfile`  
`\embedthisfile*`

`\embedthisfile` will embed into the final `.pdf` file, the current `.tex` file and all `.tex` files that are included (with `\include`) in it. If `\includeonly` is used, the only files embedded (*ie.* attached) to the `.pdf` file are the ones specified by `\includeonly`.

`\embedthisfile*` embeds only the main file.

This macro could disappear from `interfaces-embedfile` if it is added to the main package... Depending on Mr Oberdiek moods 😊.

## 15 Interface `environ`

`environ` defines `\Renewenvirom` but I found out it was usefull to have `\ReNewEnviron` (note the case!)

Therefore: `\let\ReNewEnviron\RenewEnviron` is made by `interfaces` (`\AfterPackage{environ}`).

## 16 Interface `umrand`

`umrand` defines the macro `\ifnotempty` which is already defined with a different meaning in `etextools`. `interfaces` provides a turn around to avoid redefinition.

For this turn around, `interfaces` must be loaded before `umrand` (because we use `\BeforePackage{umrand}`). This is – really – the only exception!

## 17 Interface `pgfkeys` (📖 `pgfmanual`)

`pgfkeys`'s the base of all... wonderful and inimitable! ☺

The following handlers allows to build fairly quickly a `key=value` interface for commands in almost any case:

### ~~~~~ SUMMARY ~~~~~

|                                                                                    |                                                                                                                                                                                                                         |
|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>/.blank</code>                                                               | Replaces blank value by another value.                                                                                                                                                                                  |
| <code>/.is private</code>                                                          | Throws an error if the key is used in an assignment                                                                                                                                                                     |
| <code>/.store in cs</code> <code>/.estore in cs</code>                             | Like <code>/.store in</code> but with <code>\csname...\endcsname</code>                                                                                                                                                 |
| <code>/.true</code> <code>/.false</code><br><code>/.on</code> <code>/.off</code>   | <code>/.is choice</code> shortcut for boolean keys                                                                                                                                                                      |
| <code>/.is multiple choice</code>                                                  | Like <code>/.is choice</code> but more than one choice can be selected at a time                                                                                                                                        |
| <code>/.is enum</code>                                                             | <code>/.is choice</code> shortcut for enumerated keys<br>also provides the <code>/key/.number</code> key to get the numeric index of the selected choice.                                                               |
| <code>/.store as code</code><br><code>/.estore as code</code>                      | Stores the given value in the key itself. <code>+</code> and <code>*</code> keys both append code.<br>The same but stores the <i>expanded value</i> .                                                                   |
| <code>/.store as code in cs</code><br><code>/.estore as code in cs</code>          | Stores the given value in a cs-name rather than in the key. <code>+</code> and <code>*</code> keys both append code.<br>The same but stores the <i>expanded value</i> .                                                 |
| <code>/.store as color</code><br><code>/.store as color command</code>             | Stores the color in the key itself.<br>The same but stores the color <i>command</i> .                                                                                                                                   |
| <code>/.store as color in cs</code><br><code>/.store as color command in cs</code> | Stores the color in a cs-name rather than in the key.<br>The same but stores the color <i>command</i> .                                                                                                                 |
| <code>/.store as number</code><br><code>/.estore as number</code>                  | Stores an integer in the key ( <code>-</code> <code>+</code> and <code>*</code> keys are provided to add, subtract and multiply).                                                                                       |
| <code>/.store as number in cs</code><br><code>/.estore as number in cs</code>      | The same, but stores into a cs-name rather than in the key.                                                                                                                                                             |
| <code>/.store in counter cs</code>                                                 | The same, but stores into a $\TeX$ counter.                                                                                                                                                                             |
| <code>/.store as glue</code><br><code>/.estore as glue</code>                      | Stores a glue expression in the key ( <code>+</code> <code>-</code> and <code>*</code> keys are provided to add, subtract or scale).<br>The same, but stores the <i>computed value</i> of the glue, not its expression. |
| <code>/.store as glue in cs</code><br><code>/.estore as glue in cs</code>          | The same, but stores in a given cs-name rather than in the key itself.                                                                                                                                                  |
| <code>/.store in skip cs</code>                                                    | The same, but stores the glue inside a $\TeX$ <code>\skip</code> register.                                                                                                                                              |
| <code>/.store as dimen</code><br><code>/.estore as dimen</code>                    | Store a dimen expression in the key (with <code>+</code> <code>-</code> and <code>*</code> keys to add, subtract or scale).<br>The same, but stores the <i>computed value</i> of the dimen, not its expression.         |
| <code>/.store as dimen in cs</code><br><code>/.estore as dimen in cs</code>        | The same, but stores in a given cs-name rather than in the key itself.                                                                                                                                                  |
| <code>/.store in dimen cs</code>                                                   | Stores the dimension into a $\TeX$ <code>\dimen</code> register rather than in a macro.                                                                                                                                 |
| <code>/.alias</code>                                                               | Creates an alias for the key.                                                                                                                                                                                           |
| <code>/.alias*</code>                                                              | The same, but also creates the alias for the <code>+</code> , <code>-</code> and <code>*</code> keys if they exist.                                                                                                     |

The command `\pgfkeysmeaning` is provided (with `\providecommand`): it expands to the meaning of the given `pgfkey`.

### 17.1 † Handler definition: `/.blank`

A new handler `/.blank` is defined to allow automatic replacement of empty or blank values by the “default” value specified:

```
\pgfkeys{/base/path/my key/.code=The key #1,%
         /base/path/my key/.default=has its default value!,%
         /base/path/my key/.blank=was left blank!}
\pgfkeys{/base/path/my key,           produces The key has its default value!
         /base/path/my key=}          produces The key was left blank!
```

The following make blank value behave the same as default :

```
\pgfkeys{/base/path/my key/.blank=\pgfkeysnovalue}
```

And If you wish to forbid blank values you can add:

```
\pgfkeys{/base/path/my key/.value required}
```

With `interfaces-pgfkeys` it is also possible to give a `/.default` or/and a `/.blank` value to a handler, or on the other hand to say that a handler must have (`/.value required`) or does not suffer (`/.value forbidden`) a value. (this feature was not implemented in `pgfkeys.code.tex`).

## 17.2 † Handler definition: `/.is private`

This handler is mainly addressed to package writers. A private key does not suffer any assignment: this is a package constant:

```
\pgfkeys{/base/path/@my key/.is private=mypackage}
```

Then any assignment to `@my key` will throw an error, explaining that `@my key` is private to the package `mypackage`.

Similarly, there is a `/.is private to class` handler (for `\ClassError` instead of `\PackageError`).

## 17.3 † Handler definition: `/.store in cs` and `/.estore in cs`

A new handler `/.store in cs` is defined to store the value of a key in a named control sequence:

```
\pgfkeys{%
  /base/path/my key/.store in cs=some word,% will define : \some word"
}
```

## 17.4 † Handlers definition: `/.true`, `/.false`, `/.on` and `/.off`

A key of type `/.true` or `/.false` can take the only values `true` or `false` and its default value is `true` (unless `/.default=false` is explicitly given to `\pgfkeys`).

Similarly, a key of type `/.on` or `/.off` can take the only values `on` or `off` and its default value is `on` (unless `/.default=off` is explicitly given to `\pgfkeys`).

These are shortcuts and a special case of `/.is choice` keys:

```
\pgfkeys{
  my key/.true = code if the value is true,
  my key/.false = code if the value is false,
  my key2/.on = code if the value is on,
  my key2/.off = code if the value is off      }
}
```

## 17.5 † Handler definition: `/.is multiple choice`

A key defined with `/.is multiple choice` behaves like a `/.is choice` key but more than one choice can be selected at a time:

```
\pgfkeys{/path/.cd,
  format/.is multiple choice,
  format/bold/.code= ...,
  format/italic/.code= ...,
  format/color/.code= ...      }
```

Possible values for key `format` are restricted to subkeys: `bold`, `italic` and `color`. But unlike simple `/.is choice` keys, it is possible to use:

```
\pgfkeys{/path/format={bold,italic,color=...}}
this is the same as:
\pgfkeys{/path/format=bold,/path/format=italic,path/format={color=...}}
```

The bookmark key of `\sectionformat` (in `interfaces-titlesec`) is a good example.

## 17.6 † Handler definition: `/.is enum`

A key defined with `/.is enum` behaves like a `/.is choice` key: its possible values are limited to sub-keys. The name of the selected sub-key is stored into the key.

```
\pgfkeys{/path/.cd,
  enumKey/.is enum={one,two,three}
}
```

`enumKey` can be one or two or three and nothing else.

```
\pgfkeys{ enumKey=two }
```

assigns two to the value of the key: `\pgfkeysvalueof{enumKey}` is two.



`\pgfkeysvalueof{enumKey/.number}` is 1 (zero based index)

### 17.7 † Handlers definition: `/.store as code`, `/.estore as code`

This handler stores the value given to the key in the key itself. Furthermore, a starred key `*` and a `+` keys are defined such that they append their value to the stored key.

```
\pgfkeys{/test/.store as code,
          /test=some code,
          /test+= the following follows...      }
```

Defines the key `/test` so that `\pgfkeysvalueof{/test}` expands to `some code`. `/test+` appends “the following follows” to the previous value of the key. (`/test*` does the same).

If you prefer not to have star keys `*`, or `+` keys, or only one of these, just say, for example:

```
\pgfkeys{/test/.store as code=+}
```

*This feature is very important for `interfaces`: almost any `font` keys are defined with the handler `/.store as code`.*

*A note for programmers:* `/.store as code` defines three keys: `test`, `test+` and `test*`. (The two former are the same). The “append code” keys (`+` and `*`) call the *main key* `test`. This is handy because if you append code to the *main key* (with `pgfkeys /.add code` or `/.append code`) then this code will be expanded also in case the `+` or `*` keys are called.

There is also a `/.estore as code` handler which expands the given code before storing it in the key.

### 17.8 † Handlers definition: `/.store as code in cs=<cs-name>`, `/.estore as code in cs=<cs-name>`

This handler works like `/.store as code`: the content is stored in the `cs-name` given as value for the handler, but not inside the key itself (useful for `key=value` interfaces to other packages).

The `+` and `*` keys are provided: both append their value to the content of the given control sequence.

Typically, `/font` keys are defined this way for interface with other packages.

There is also a `/.estore as code in cs` handler which expands the given code before storing it in the `<cs-name>`.

### 17.9 † Handler definition: `/.store as color`

When specifying a color, did you say:

```
color=\color{yellow}      color=\normalcolor
color=blue                 color=[rgb]{1,0,0}
```

In any case, `/.store as color` will transform the value as follow:

```
color=yellow              color=default defined by interfaces if not already
color=blue                 color=[rgb]{1,0,0} defined \AtBeginDocument
```

In any case, `/.store as color command` will transform the value as follow:

```
color=\normalcolor        color=\color{yellow}
color=\color{blue}         color=\color[rgb]{1,0,0}
```

Please! Dont write: `\def\myBlue{blue} color=\myBlue`.

Use `\colorlet{myBlue}{blue}` instead, or `\definecolor`.

As for code, the color is stored inside the key.

### 17.10 † Handler definition: `/.store as color in cs=<cs-name>`

The same as `/.store as color`, but the color is stored in the given control sequence, rather than in the key itself.

There is also a `/.store as color command in cs` handler. It is used to set the value to `\columnseprulecolor` by the key `columns/rule/color` of `\tocsetup`.

**17.11 † Handlers definition: `/.store as number,/.estore as number`****17.12 † Handlers definition: `/.store as number in cs,/.estore as number in cs`****17.13 † Handler definition: `/.store as glue`**

This is quite the same as `/.store as code`, but the given code is surrounded by `\glueexpr...\relax...` and is stored inside the key.

Furthermore:

the `+` key adds to the length: `\glueexpr old value + < argument > \relax`.  
 the `-` key subtracts: `\glueexpr old value - < argument > \relax`  
 the `*` key scales: `\glueexpr old value * < argument > \relax`

The `<argument>` is **not expanded** but the content of the key is ready to be used in place of a length. Scaling of two forms are allowed: *fractionnal* and *real*. *Real* scaling is converted to a fraction of 65536:

```
\pgfkeys{/test/.store as glue,
          /test=12pt plus5pt,
          /test*=.5,
          /test+=\parskip,
          /test*=4/6
        }
\pgfkeysmeaning{/test}
```

→ macro:->`\glueexpr \glueexpr \glueexpr \glueexpr 12pt plus5pt\relax *32768/65536\relax +\glueexpr \parskip \relax \relax *4/6\relax`

The value of `\parskip` is not expanded at `\pgfkeys` time, but only when the value of the key is used (for an assignment...)

There is also a handler called `/.estore as glue` if you really want the value to be expanded (with `\the`) at the time of `\pgfkeys` setting.

**17.14 † New handler: `/.store as dimen`**

Just like `/.store as glue` but with `\dimexpr` instead of `\glueexpr`.

There is also a `/.estore as dimen` handler, for immediate expansion.

**17.15 † New handler: `/.store as glue in cs=<cs-name>`**

This is like `/.store as glue` but the value is assigned to a macro whose name is given, rather than in the key itself. Expansion *does not* occur `\pgfkeys` time: the macro contains the glue definition in `\glueexpr...\relax` expressions.

`+` (to add) `-` (to subtract) and `*` (to scale) keys are provided.

There is also a `/.estore as glue in cs` handler, and expansion occurs when the key is set.

**17.16 † New handler: `/.store as dimen in cs=<cs-name>`**

Just like `/.store as glue in cs` but with `\dimexpr` instead of `\glueexpr`.

**17.17 † New handler: `/.estore as dimen in cs=<cs-name>`**

This handler as a particularity: if the value is given without dimension, `pt` is assumed (that is... points).

This is the way the key `size` is defined for the command `\changeFont` (in `interfaces-LaTeX`). `size` defines `\f@size`, the macro used by `LATEX` to store the font size (and `size+` adds, `size-` subtracts, `size*` scales). But `\f@size` is stored in points, without the mention of the dimension: `pt`.

With its default units in `pt`, `/.estore as dimen in cs` is the handler of the situation:

## 18 Interface etoolbox - etoolbox-like commands

May be they will be added to etoolbox.sty one day or another... and disappear from `interfaces` ☹.

### 18-1 † New macros provided with `\providecommand`

|                                                     |                                                          |
|-----------------------------------------------------|----------------------------------------------------------|
| <code>\removefrom &lt;hook&gt;{&lt;code&gt;}</code> | <code>\removefromstart&lt;hook&gt;{&lt;code&gt;}</code>  |
| <code>\gremovefrom&lt;hook&gt;{&lt;code&gt;}</code> | <code>\gremovefromstart&lt;hook&gt;{&lt;code&gt;}</code> |
| <code>\eremovefrom&lt;hook&gt;{&lt;code&gt;}</code> | <code>\eremovefromstart&lt;hook&gt;{&lt;code&gt;}</code> |
| <code>\xremovefrom&lt;hook&gt;{&lt;code&gt;}</code> | <code>\xremovefromstart&lt;hook&gt;{&lt;code&gt;}</code> |

`\removefrom` removes the first occurrence of `{<code>}` from a `<hook>`. The command is robust.


`{<code>}` should not contain groups: `{...}` but parameter characters are allowed, which need not to be doubled. The match for `{<code>}` inside the replacement text of `<hook>` is category-code sensitiv.


If the first occurrence of `{<code>}` into `<hook>` has been removed


then `\ifin@` is set to `\iftrue`  
 otherwise `\ifin@` is set to `\iffalse` (`<hook>` does not contain `{<code>}`).

this allows loops of the form:

```
\in@true
\@whilesw\ifin@\fi{\removefrom<hook>{<code>}}
```

 `\eremovefrom` and `\xremovefrom` expand `{<code>}` before trying to remove it from `<hook>`. Only `{<code>}` is expanded, the current replacement text of `<hook>` is not.

 `g` and `x` versions make the assignment to `<hook>` global.

 `\removefromstart` remove `{<code>}` only if it appears at the very beginning of `<hook>`.

## 19 Interface scrfile

### 19-1 † Star forms for `\BeforeFile` and `\AfterFile`

`scrfile` provides `\BeforeFile` and `\AfterFile` in order to execute some code when a file is loaded. The hooks are automatically reset to `\relax` after the file has been loaded, in other words, they are expanded at most one only time. This can be avoided by using `\BeforeFile*` and `\AfterFile*`, for example:

```
\BeforeFile*{\jobname.toc}{\begin{multicols}{2}}
\AfterFile*{\jobname.toc}{\end{multicols}}
```

The hooks *before* and *after* will be executed **every time** `\jobname.toc` is loaded.

This feature is used in `\tocsetup{twocolumns}`.

### 19-2 † Allowing `\BeforeFile` and `\AfterFile` when `\@input` is invoked

The hooks `\BeforeFile` and `\AfterFile` are executed only when the file is loaded with `\InputIfFileExists`: indeed this macro is redefined by `scrfile`.

`interfaces` redefine `\@input` in order to execute those hooks also in case `\@input` is used: this is useful because `.toc` files are input with `\@input` rather than with `\InputIfFileExists`.

## 20 List of corrected or patched commands

Here is the complete list of patched commands in other packages.

The modification occurs only if the given module of `interfaces` is loaded. For example, `\addcontentsline` is modified only if packages `titlesec` and `bookmark` are loaded, **and if** `interfaces-titlesec` and `interfaces-bookmark` are loaded.

20.1 † `LaTeX`

|   | Patched command                                                                                                              | Type | Importance                          | Module                           | ref. page |
|---|------------------------------------------------------------------------------------------------------------------------------|------|-------------------------------------|----------------------------------|-----------|
| ❶ | <code>\@pkgextension</code><br><code>\@clsextension</code><br><code>\@ifpackageloaded</code><br><code>\@ifclassloaded</code> |      | minor<br>optimisation or correction | <a href="#">interfaces-LaTeX</a> | 82        |

Those commands are replaced by their equivalent in the package `ltxcmds`:

```
\ltx@pkgextension \ltx@clsextension \ltx@ifpackageloaded \ltx@ifclassloaded
```

This is because `LaTeX` defines those commands `\@onlypreamble`, while the equivalent macros in `ltxcmds` can be used inside `document` as well.

|   | Patched command               | Type           | Importance                      | Module                                                                     | ref. page |
|---|-------------------------------|----------------|---------------------------------|----------------------------------------------------------------------------|-----------|
| ❷ | <code>\addcontentsline</code> | <i>prepend</i> | important<br>but no side effect | <a href="#">interfaces-titlesec</a><br><a href="#">interfaces-bookmark</a> | 44        |

`\addcontentsline` does a lot a thing and in particular it expands the `\bookmark` command (if the `bookmark` package is loaded, otherwise it's `hyperref`). As long as `\sectionformat` can drive the attributes of the bookmark for each section, it is necessary to expand `\bookmarksetup` with the right options before the section-bookmark is written.

This is achived by `\itf@ttl@BKM`, placed at the beginning of `\addcontentsline`.

|   | Patched command      | Type | Importance                      | Module                             | ref. page |
|---|----------------------|------|---------------------------------|------------------------------------|-----------|
| ❸ | <code>\@input</code> |      | important<br>but no side effect | <a href="#">interfaces-scrfile</a> | 83        |

The `\input` primitive (same as `LaTeX` control sequence `\@@input`) is surrounded by `\scr@load@hook{before}...\scr@load@hook{after}`:

Original:

```
\def\@input#1{\IfFileExists{#1}
{\@input\@filef@und}
{\typeout{No file #1.}}}%
}%
```

Modified:

```
\renewcommand*\@input[1]{\IfFileExists{#1}
{\scr@load@hook{before}{#1}%
\@input\@filef@und
\scr@load@hook{after}{#1}}
{\typeout{No file #1.}}}%
}%
```

20.2 † `bookmark \bookmark`

|   | Patched command        | Type         | Importance | Module                              | ref. page |
|---|------------------------|--------------|------------|-------------------------------------|-----------|
| ❹ | <code>\bookmark</code> | <i>modif</i> | important  | <a href="#">interfaces-bookmark</a> | 46        |

The `*` keys for `\bookmarksetup` (*italic\**, *color\**, *bold\**, and *disable\**) are local to the group, but govern only the very next bookmark.

After the bookmark has been written, previous values must be restored at the end of each group until the same group level as the one in which the `*` option has been set is reached (if this group is the main group, level 0, then a global assignment is made).

Well... this is done at `\write`: `\immediate\write{the bookmark entry}` is replaced by `\itf@BKM@write{the bookmark entry}` to check first:

- 1) is the bookmark disable ?
- 2) is it necessary to restore previous values after write (*ie.* `\aftergroup`) ?

20.3 † `tocloft \newlistof`

|   | Patched command         | Type | Importance                      | Module                             | ref. page |
|---|-------------------------|------|---------------------------------|------------------------------------|-----------|
| ❺ | <code>\newlistof</code> |      | important<br>but no side effect | <a href="#">interfaces-tocloft</a> |           |

20.4 † `colortbl`

|   | Patched command        | Type         | Importance                      | Module                              | ref. page |
|---|------------------------|--------------|---------------------------------|-------------------------------------|-----------|
| ❻ | <code>\CT@cellc</code> | <i>corr.</i> | important<br>but no side effect | <a href="#">interfaces-makecell</a> | 78        |

`colortbl` modifies the preamble of tabulars: it put each cell in a box, sets the color and then displays the box. The example shown page 16 does not work without a minor modification: the color specification must be expanded short before their usage.

Original:

```
\def\CT@cellc#1[#2]#3{%
\expandafter\gdef\expandafter\CT@cell@color\expandafter{%
\expandafter\CT@color#1{[#2]}{#3}%
\global\let\CT@cell@color\relax
}}
```

Modified:

```
\def\CT@cellc#1[#2]#3{% #1 is either \@firstofone or \@gobble, [#2]#3 = color spec
\edef\CT@cell@color{\noexpand\CT@color#1{[#2]}{#3}%
\global\let\noexpand\CT@cell@color\relax}%
}
```

Remember `arydshn` must be loaded after `colortbl` (this is not due to `interfaces`, but to the fact that both redefine `\@classz` from the array package).

20.5 ↗ `hypbmsec`

|   | Patched command                                   | Type         | Importance                      | Module                                                                     | ref. page |
|---|---------------------------------------------------|--------------|---------------------------------|----------------------------------------------------------------------------|-----------|
| ⑦ | <code>\hbs@do</code><br><code>\hbs@process</code> | <i>redef</i> | important<br>but no side effect | <a href="#">interfaces-hypbmsec</a><br><a href="#">interfaces-titlesec</a> | 48        |

In order to get `\lastsectiontitle`, `\lastsectionbookmark` and `\lastsectiontoc` updated at the right place (*ie. after* `\sectionbreak` and *before* `\sectionmark`), some `interfaces`-macros have to be executed:

- at the beginning of `\hbs@do` → to get the word section or subsection *etc.*.
- at the beginning of `\hbs@process` → to store the next section title, bookmark and toc

20.6 ↗ `enumitem`

|   | Patched command       | Type         | Importance                          | Module                              | ref. page |
|---|-----------------------|--------------|-------------------------------------|-------------------------------------|-----------|
| ⑧ | <code>\setlist</code> | <i>redef</i> | minor<br>optimisation or correction | <a href="#">interfaces-enumitem</a> | 78        |

`\setlist` is redefined by `interfaces-enumitem` in order to extend the syntax.

20.7 ↗ `pgfkeys.code.tex`

|   | Patched command                                                  | Type         | Importance | Module                             | ref. page |
|---|------------------------------------------------------------------|--------------|------------|------------------------------------|-----------|
| ⑨ | <code>\pgfkeys@unpack</code><br><code>\pgfkeys@case@three</code> | <i>redef</i> | important  | <a href="#">interfaces-pgfkeys</a> | 84        |

`\pgfkeys@unpack` is modified to handle the case of the `/.blank` handler: this is here that the value is conditionnally compared against `/.default`, `/.blank` or `/.value required`.

`\pgfkeys@case@three` is modified to allow handlers to have `/.default`, `/.blank` or `/.value required` values.

`\pgfkeys@exp@call`: missed a pair of braces around the value in `\pgfkeysalso`. Thus the code could break if the value contains an equal sign or a comma. Fixed.

## 21 Implementation

### 21.1 † Interfaces

The package namespace is `itf@`.

```
1 <*package>
2 \NeedsTeXFormat{LaTeX2e}[2005/12/01]
3 \ProvidesPackage{interfaces}
4   [2011/01/19 v2.9 - pgfkeys interfaces - pgf 2.0 et 2.1 (FC)]
```

#### 21.1.1 Requirements

```
5 \RequirePackage{interfaces-base}
```

#### 21.1.2 The package options / list of interfaces

```
6 \DeclareOption{LaTeX}{\AtEndOfPackage{\LoadInterface{LaTeX}}}
7 \DeclareOption{marks}{\AtEndOfPackage{\LoadInterface{marks}}}
8 \def\itf@tp#1{%
9   \DeclareOption{#1}{\AtEndOfPackage{\LoadInterface{#1}}}%
10}% \itf@tp
11 \itf@tp{titlesec}
12 \itf@tp{hyperref}
13 \itf@tp{bookmark}
14 \itf@tp{fancyhdr}
15 \itf@tp{tocloft}
16 \itf@tp{makecell}
17 \itf@tp{enumitem}
18 \itf@tp{hypbmsec}
19 \itf@tp{environ}
20 \itf@tp{truncate}
21 \itf@tp{appendix}
22 \itf@tp{embedfile}
23 \if\relax\@ptionlist{interfaces.sty}\relax % no option given
24   \ExecuteOptions\@declaredoptions      % all interfaces are active
25 \fi
26 \ProcessOptions
27 </package>
```

### 21.2 † Interfaces-base

```
28 <*base>
29 \ProvidesPackage{interfaces-base}
30   [2011/01/19 v2.9 Interfaces core system layer (FC)]
31 \RequirePackage{etex,ltxcmds,etoolbox,pgfkeys,scrfile,infwarerr}
32 \AtEndOfPackage{%
33   \RequirePackage{interfaces-etoolbox}%
34   \RequirePackage{interfaces-scrfile}%
35   \RequirePackage{interfaces-pgfkeys}
36   \RequirePackage{interfaces-tikz}%
37   \RequirePackage{interfaces-umrand}% There is a \BeforePackage here !
38}% \AtEndOfPackage
```

`\LoadInterface` Mechanic of `interfaces`: each module is loaded `\AfterPackage`.

```
39 \newrobustcmd*\LoadInterface[1]{%
40   \@for\itf@tp:=#1\do{%
41     \expandafter\ifx\csname\ifcsname\itf@tp\endcsname
42       \itf@tp\else relax\fi\endcsname\marks
43       \RequirePackage{interfaces-marks}%
44     \else\expandafter\ifx\csname\ifcsname\itf@tp\endcsname
45       \itf@tp\else relax\fi\endcsname\LaTeX
46       \RequirePackage{interfaces-LaTeX}%
47     \else
```

```

48      \expandafter\itf@LoadInterface\expandafter{\itf@tp}%
49      \fi\fi}%
50}% \LoadInterface
51 \@onlypreamble\LoadInterface
52 \newrobustcmd*\itf@LoadInterface[1]{\ltx@ifpackageloaded{interfaces-#1}
53   {}
54   {\AfterPackage*{#1}{\RequirePackage{interfaces-#1}}}%
55}% \itf@LoadInterface

56 \newrobustcmd*\itf@Check@Package[1]{\itf@pgfkeys\ltx@ifpackageloaded{#1}
57   {}
58   {\PackageError{interfaces-#1}
59     {The package ‘#1’ must be loaded before ‘interfaces-#1’
60     \MessageBreak Please refer to ‘interfaces.pdf’ document
61     \MessageBreak for correct usage of the ‘interfaces’ package}\@ehd
62   }%
63}% \itf@Check@Package

```

`\itf@AfterPackage` This is `\AfterPackage*` but it works inside document. `ltxcmds` provides `\ltx@ifpackageloaded` to check if a package is loaded and – unlike L<sup>A</sup>T<sub>E</sub>X’s `\ifpackageloaded` – this macros is not restricted to the document preamble.

```

64 \newrobustcmd*\itf@AfterPackage[1]{%
65   \csname\ltx@ifpackageloaded{#1}\ltx@secondoftwo\endcsname{@AfterPackage}\endcsname{#1}%
66}% \itf@AfterPackage

```

### 21.2.1 Interfaces patches

First a warning for loading `arydshln` after `colortbl`. Those packages does not interact properly.

```

67 \AfterPackage{colortbl}{%
68   {\ltx@ifpackageloaded{arydshln}
69     {@PackageWarningNoLine{interfaces-base}
70       {The package arydshln should be loaded after colortbl
71       \MessageBreak because both redefine \string\@classz}}%
72     {}}%
73}% \AfterPackage colortbl

```

`\itf@preapptocmd` The need for this macro has risen to make `\itf@patch` simpler.

This is also more secure to do `\pretocmd` and `\apptocmd` in the same time, for the result (success or failure) is always the same for both.

```

74 \newrobustcmd*\itf@preapptocmd[5]{%
75   \pretocmd#1{#2}%
76   {\apptocmd#1{#3}%
77     {#4}%
78     {#5}}%
79   {#5}%
80}% \itf@preapptocmd

```

`\itf@patch` `\itf@patch` is used as a prefix to `\pretocmd`, `\apptocmd` and `\patchcmd`.

It’s main purpose is to keep the information (`\PackageInfo`) in the case `\usepackage{interfaces}` has been put in a `\dump` format.

`\PackageInfo` is then deferred `\AtBeginDocument` time...

```

81 \def\itf@patch{\@makeother\#\futurelet\itf@tp\itf@patch@}
82 \def\itf@patch@{\csname itf@patch@%
83   \ifx\itf@tp\patchcmd inside\else
84   \ifx\itf@tp\itf@preapptocmd inside\else
85   boundary\fi\fi
86   \endcsname
87}% \itf@patch@
88 \def\itf@patch@boundary#1#2#3#4#5{%
89   \catcode'\#=#6%
90   \let\itf@tp#2%

```



```

91  #1\itf@tp{#3}%
92  {\let#2\itf@tp
93   \AtBeginDocument{#4}% in order to keep this info even after \dump
94  }
95  {#5}%
96}% \itf@patch@boundary (for \pretocmd and \apptocmd)
97\def\itf@patch@inside#1#2#3#4#5#6{%
98  \catcode'\#6%
99  \let\itf@tp#2%
100  #1\itf@tp{#3}{#4}%
101  {\ifx#1\patchcmd \itf@patch@inside@{#1}{#3}{#4}\fi
102   \let#2\itf@tp
103   \AtBeginDocument{#5}%
104  }
105  {#6}%
106}% \itf@patch@inside (for \patchcmd)
107\def\itf@patch@inside@#1#2#3{%
108  \loop
109    \let\@tempa \itf@tp
110    #1\itf@tp{#2}{#3}{}}}%
111    \unless\ifx \@tempa\itf@tp
112  \repeat
113}% \itf@patch@inside@

```

### 21.2.2 Helper macros

```

114 \newskip\itf@sk
115 \newmuskip\itf@musk
116 \newtoks\itf@tk
117 \newcount\itf@cnt

```

`\itf@strip@at` `\itf@strip@at` removes all until `@` while `\itf@strip@dot` removes the fractional part.

```

\itf@strip@dot
118%%  H E L P E R   M A C R O S
119 \begingroup\makeatother
120  \csgdef\itf@strip@at{#1@{}}
121 \endgroup
122 \def\itf@strip@dot#1.#2\@nil{#1}

```

`\itf@expandonceifcs` This macro is used to expand or not a comma separated list.

USAGE: `\itf@expandonceifcs\macrotest`

`\macrotest` is expanded once and its first token  $\tau$  is placed into a temporary macro `\itf@tp`.

If `\macrotest` equals `\itf@tp`: `\macrotest` is composed of that only token  $\tau$ , otherwise we leave and do nothing.

Then we test `\noexpandr` against `\relax` with `\ifcat`. If false  $\tau$  cannot be a macro then we leave.

Then we test if  $\tau$  is expandable: `\ifx\tau=\expandafter\tau`,  $\tau$  is not expandable and we leave. (may be `\def\tau{\tau}` but it's not *expandable*!).

Otherwise,  $\tau$  is expandable and `\macrotest` contains a single expandable token. Thus `\macrotest` shall be expanded once: `\let\macrotest=\tau`.

```

123 \def\itf@expandonceifcs#1{\expandafter\itf@exp@ndonceifcs\expandafter#1#1Q\@nnil}
124 \def\itf@exp@ndonceifcs#1#2#3\@nnil{%
125   \def\itf@tp{#2}%
126   \ifx\itf@tp#1%
127     \ifcat\relax\noexpand#2%
128       \expandafter\expandafter\expandafter\remove@to@nnil
129       \expandafter\ifx\expandafter#2#2\@nnil\else\@nnil\let#1#2\fi
130   \fi\fi
131}% \itf@exp@ndonceifcs

```

### 21.2.3 Numbers

`\itf@number` `\itf@number` tries to get a number from its argument, and stores the result into the TeX count register given as first argument. Same syntax as `LATEX\@defaultunits`.

A number is an integer that can be assigned to a count register, may be followed by one or more `\relax`.

```

132%% GET A NUMBER (if possible)
133%% USAGE: \itf@number\count<text>\relax\@nnil (like \@defaultunits)
134\def\itf@number#1#2\relax\@nnil{% \relax is to mimick the syntax of \@defaultunits
135  \afterassignment\itf@number@#1\number0#2\relax\itf@number@
136 }
137\def\itf@number@#1\relax#2\itf@number@{%
138  \ifblank{#1}
139    {\itf@number@@{#2}\itf@number@@\@nnil
140     \csname ltx@\ifx\@let@token\itf@number@@
141       first\else second\fi oftwo\endcsname}
142    \ltx@secondoftwo
143 }% \itf@number@
144\def\itf@number@@#1{\futurelet\@let@token\itf@number@@@}
145\def\itf@number@@@{%
146  \csname \ifx\@let@token\relax itf@number@@
147    \else remove@to@nnil%
148    \fi \endcsname
149 }% \itf@number@@@

```

### 21.2.4 Units and math units

`\itf@setlength` To be able to write: `\pgfkeys{key=\widthof{some text}}` (package `calc`), `interfaces-base` defines `\itf@setlength`:

```

150\protected\def\itf@setlength#1#2{#1\glueexpr#2\relax}

```

`\itf@units@scale` For multiplication of units: `\glueexpr...\relax*\itf@units@scale<scaling factor>!`

The scaling factor can be a fraction or a real number. Real numbers are approximated by a fraction of 65536.

```

151%% glue * 1.5 = glue * 98302 / 65536
152%% glue * 3/2 = glue * 3/2
153\def\itf@units@scale#1!{\itf@units@scale@normalize#1/\@nnil/\@nil}
154\def\itf@units@scale@normalize#1/#2/#3\@nil{%
155  \ifx#2\@nnil \number\dimexpr#1pt\relax/65536
156  \else#1/#2
157  \fi
158 }% \itf@units@scale@normalize
159\def\itf@units@scaleNoCalc#1!{\itf@units@scale@normalizeNoCalc#1/\@nnil/\@nil}
160\let\itf@units@scale@normalizeNoCalc \itf@units@scale@normalize

```

`\itf@setlength@calc` The version for the `calc` package. `calc` removes stretch and shrink components of glues when a scaling operation is done using `\real` or `\ratio`. This limitation is lifted for `key=value` assignments.

`\itf@units@scale@normalize@calc` The version of `\itf@units@scale@normalize` when using the `calc` package.

`\ratio` is used.

```

161\protected\def\itf@setlength@calc#1#2{\begingroup
162  \let\calc@multiply@by@real \itf@calc@multiply@by@real
163  \let\calc@Adimen \itf@calc@Askip \let\calc@Bdimen \itf@calc@Bskip
164  \setlength{#1}{#2}%
165  \expandafter\endgroup\expandafter#1\the#1\relax
166 }% \itf@setlength@calc
167\def\itf@units@scale@normalize@calc#1/#2/#3\@nil{%
168  \ifx#2\@nnil 1*\ratio{\dimexpr#1pt\relax}\p@
169  \else
170    1*\ratio{\dimexpr#1pt\relax}/{\dimexpr#2pt\relax}%
171  \fi
172 }% \itf@units@scale@normalize@calc
173\def\itf@calc@multiply@by@real#1{%
174  \calc@Bdimen\glueexpr\calc@B*\number\dimexpr#1pt\relax/65536\relax

```

```

174 \calc@B\calc@Bdimen
175}% \itf@calc@multiply@by@real
176\AfterPackage*{calc}{%
177 \newskip\itf@calc@Askip \newskip\itf@calc@Bskip
178 \let\itf@setlength \itf@setlength@calc
179 \let\itf@units@scale@normalize \itf@units@scale@normalize@calc
180}% AfterPackage calc

```

`\itf@strip@mu` This is the equivalent of L<sup>A</sup>T<sub>E</sub>X's `\strip@pt` but for math units:

```

181%% U N I T S F O R D I M E N S
182\def\itf@strip@mu{\expandafter\itf@rem@mu\the}
183{%
184 \@makeother\M\@makeother\U
185 \lowercase{%
186 \gdef\itf@rem@mu#1.#2MU{#1\ifnum#2>\z@.#2\fi}%
187}}%

```

`\itf@units@pttomu`  $1mu$  is exactly  $1em/18$  where the *em* is taken from `\textfont2`.

`\itf@units@mutopt` Thus the scaling: `\fontdimen6\textfont2 * 100/1800`.

```

188%% \skip = \itf@units@mutopt \muskip
189\def\itf@units@pttomu#1{\gluetomu\glueexpr
190 \glueexpr#1\relax*1800/%
191 \expandafter\itf@strip@dot\the\dimexpr
192 \fontdimen6\textfont2*100\relax.\@nil
193 \relax
194}% \itf@units@pttomu
195\def\itf@units@mutopt#1{\glueexpr
196 \mutogluemueexpr#1\relax*
197 \expandafter\itf@strip@dot\the\dimexpr
198 \fontdimen6\textfont2*100\relax.\@nil/1800
199 \relax
200}% \itf@units@mutopt

```

`\itf@units@mu` Forces a dimension to be expressed in terms of math units (*mu*), convert if needed. `\cftdotsep` in `tocloft` is expressed in math units.

```

201%% \muskip = \itf@units@mu{ \skip or \muskip or number}
202{%
203 \@makeother\P\@makeother\T\@makeother\S\@makeother\B
204 \@makeother\C\@makeother\M\@makeother\D\@makeother\I\@makeother\N
205 \lowercase{%
206 \gdef\itf@units@mu#1#2{\begingroup
207 \edef\itf@tp{#2}%
208 \@tfor\x:={PT}{pt}{PC}{pc}{IN}{in}{BP}{bp}%
209 {CM}{cm}{MM}{mm}{DD}{dd}{CC}{cc}{SP}{sp}\do{%
210 \@expandtwoargs\in@\x\itf@tp\ifin@\@break@tfor\fi
211 }%
212 \expandafter\endgroup
213 \ifin@
214 #1=\itf@units@pttomu{#2}%
215 \else
216 \@defaultunits#1 #2mu\relax\@nnil
217 \fi
218}% \itf@units@mu
219}}

```

`\itf@units@pt` Conversely, forces a unit to be expressed in terms of points. Convert (from *mu*) if needed.

```

220%% \skip = \itf@units@pt( \muskip or \skip or number )
221{%
222 \@makeother\M\@makeother\U
223 \lowercase{%
224 \gdef\itf@units@pt#1#2{\begingroup
225 \@expandtwoargs\in@{MU}{#2}%
226 \ifin@\else\@expandtwoargs\in@{mu}{#2}\fi

```

```

227 \expandafter\endgroup
228 \ifin@
229 #1=\itf@units@mutopt{#2}%
230 \else
231 \@defaultunits#1 #2pt\relax\@nnil
232 \fi
233 }}}} \itf@units@pt

```

### 21.2.5 Default color

A trick about `\normalcolor`, which refers to `\default@color`:

`\default@color` is not expressed in terms of a color model. Therefore, it is not possible to convert it into a universally correct parameter for the `\color` command. That’s why, for example, `\bookmark` ignore blank parameter for `color`: because it can do nothing with `\normalcolor` !

Solution: if a color named “default” has been defined in the preamble, then it is used as the default color. Otherwise, we define, `\AtBeginDocument` a color named “default”

If `xcolor` is loaded, an assignment: `\colorlet{default}{.}` is made `\AtBeginDocument`. If only `color` is loaded, then `\color{default}` means `\color{\default@color}` (this syntax is not admissible with `xcolor`, but it works with `color`).

```

234 \AtBeginDocument{%
235   \ltx@ifpackageloaded{xcolor}
236     {\@ifundefinedcolor{default}
237       {\colorlet{default}{.}}
238       {}}%
239   {\ltx@ifpackageloaded{color}
240     {\@ifundefined{\string\color @default}
241       {\expandafter\def\csname\string\color @default\endcsname{\default@color}}
242       {}}%
243   {}}%
244 }

245 </base>

```

## 21.3 Interface L<sup>A</sup>T<sub>E</sub>X

```

246 <*LaTeX>
247 \ProvidesPackage{interfaces-LaTeX}
248 [2011/01/19 v2.9 pgfkeys macros for LaTeX (FC)]
249 \RequirePackage{interfaces-base}
250 \itf@pgfkeys

```

### 21.3.1 `\changeFont`

`\changeFont` First use of `\pgfkeys` handlers `/.store as glue in cs`, `/.estore as dimen in cs`... The handlers create the `+` `-` and `*` keys automatically. As far as the `+` `-` and `*` keys invoke the main key, it is possible to `/.append code` to the main key, without taking care of the `+` `-` and `*` keys.

The `/.alias*` handler creates the aliases for the main key and the `+` `-` and `*` keys in one shot.

```

251 \newrobustcmd*\changeFont[1]{\itf@pgfkeys
252   \pgfqkeys{/itf/LaTeX/changeFont}{#1}\selectfont
253 }% \changeFont
254 \AfterPackage*{hyperref}
255   {\pdfstringdefDisableCommands{\let\changeFont\@gobble}}

256 \pgfqkeys{/itf/LaTeX/changeFont}{%
257   encoding/.code=\fontencoding{#1},encoding/.value required,%
258   enc/.alias=encoding,%
259   family/.code=\fontfamily{#1},family/.value required,%
260   fam/.alias=family,%
261   series/.code=\fontseries{#1},series/.value required,%
262   ser/.alias=series,%

```

```

263   shape/.code=\fontshape{#1},shape/.value required,%
264   sha/.alias=shape,%
265   size/.estore as dimen in cs=f@size,%
266   size/.append code=\set@fontsize\f@linespread\f@size\f@baselineskip,%
267   siz/.alias*=size,%
268   baselineskip/.estore as glue in cs=f@baselineskip,%
269   baselineskip/.append code=\set@fontsize\f@linespread\f@size\f@baselineskip,%
270   skip/.alias*=baselineskip,%
271   @linespread/.estore as dimen,%
272   @linespread/.append code=
273     \pgfkeysgetvalue{/itf/LaTeX/changefont/@linespread}\pgfkeys@temp
274     \ifx\pgfkeys@temp\empty \let\pgfkeys@temp \p@ \fi
275     \edef\f@linespread{\expandafter\rem@pt\pgfkeys@temp}%
276     \set@fontsize\f@linespread\f@size\f@baselineskip,%
277   @linespread/.initial=\p@,%
278   linespread/.code=@defaultunits\itf@sk #1pt\relax\@nnil
279     \pgfkeysalso{/itf/LaTeX/changefont/@linespread=\itf@sk},%
280   linespread+/.code=@defaultunits\itf@sk #1pt\relax\@nnil
281     \pgfkeysalso{/itf/LaTeX/changefont/@linespread+=\itf@sk},%
282   linespread-/.code=@defaultunits\itf@sk #1pt\relax\@nnil
283     \pgfkeysalso{/itf/LaTeX/changefont/@linespread-=\itf@sk},%
284   linespread*/.alias=@linespread*,%
285   spread/.alias*=linespread,%
286}% \pgfkeys definitions for \changefont
287\itf@AfterPackage{color}{%
288  \pgfkeysifdefined{/itf/LaTeX/changefont/color/.@cmd}{%
289    {\pgfkeys{/itf/LaTeX/changefont/color/.code=\color{#1}}}%
290}% AfterPackage color
291\itf@AfterPackage{xcolor}{%
292  \pgfkeysifdefined{/itf/LaTeX/changefont/color/.@cmd}{%
293    {\pgfkeys{/itf/LaTeX/changefont/color/.code=\color{#1}}}%
294}% AfterPackage xcolor
295</LaTeX>

```

## 21.4 Interface TikZ ()

```

296<*tikz>
297\ProvidesPackage{interfaces-tikz}
298  [2011/01/19 v2.9 load tikz libraries easily (FC)]
299\RequirePackage{interfaces-base}
300\itf@pgfkeys

```

### 21.4.1 Catcode verifications

Some languages (french) changes the catcode of punctuations symbols: `:` and `!` are active, and this is bad for `tikz` calculations.

`\tikzset{every picture/.style=\@makeother...}` solves the problem.

```

301%% Some catcode checking
302\AfterPackage*{tikz}{%
303  \AtEndPreamble{%
304    \tikzset{every picture/.add style={%
305      /utils/exec={\@makeother\!\@makeother\:\}}}%
306  }%
307}%

```

### 21.4.2 List of pgf/TikZ packages and libraries

`\alltikzpackages` Record “modules” that must be loaded with `\usepackage`:

```

308\newcommand*\alltikzpackages{%
309  tikz,pgf,pgfcore,pgfcalendar,pgffor,pgfkeys,pgfpages,pgfrcs,xxcolor,%
310  pgfplots,pgfsys,

```

```

311 pgfpict2e,fp%%,%          + fp required for fixedpointarithmetic
312%% tikzexternal,%% needs special setup
313%% pgfmath,% pgfmath should not be loaded twice (\pgfmathdeclarefunction)
314}% \alltikzpackages

```

`\allpgfmodules` Record modules that must be loaded with `\usepgfmodule`:

```

315 \newcommand*\allpgfmodules{datavisualization,%
316 decorations,%
317 matrix,%
318 oo,%
319 parser,%
320 plot,%
321 shapes,%
322 snakes%
323 %%sorting% bug in pgfmodulesorting.code.tex
324}% \allpgfmodules

```

`\alltikzlibraries` Record modules that must be loaded with `\usetikzlibrary`.

If a module is not found in any of the three lists `\alltikzpackage`, `\allpgfmodules`, and `\alltikzlibraries` then `\usetikzlibrary` is used by default.

```

325 \newcommand*\alltikzlibraries{3d,%
326 arrows,%
327 automata,%
328 backgrounds,%
329 calc,%
330 calendar,%
331 chains,%
332 circuits,%
333 circuits.ee,%
334 circuits.ee.IEC,%
335 circuits.logic,%
336 circuits.logic.CDH,%
337 circuits.logic.IEC,%
338 circuits.logic.US,%
339 datavisualization,%
340 datavisualization.3d,%
341 datavisualization.barcharts,%
342 datavisualization.formats.functions,%
343 datavisualization.polar,%
344 datavisualization.sparklines,%
345 decorations,%
346 decorations.footprints,%
347 decorations.fractals,%
348 decorations.markings,%
349 decorations.pathmorphing,%
350 decorations.pathreplacing,%
351 decorations.shapes,%
352 decorations.text,%
353 er,%
354 %%external,% needs special setup
355 fadings,%
356 fit,%
357 fixedpointarithmetic,%
358 folding,%
359 fpu,%
360 graphs,%
361 graphs.basic,%
362 intersections,%
363 lindenmayersystems,%
364 matrix,%
365 mindmap,%
366 patterns,%
367 petri,%
368 plohandlers,%

```

```

369 plotmarks,%
370 positioning,%
371 scopes,%
372 shadings,%
373 shadows,%
374 shapes,%
375 shapes.arrows,%
376 shapes.callouts,%
377 shapes.gates.logic.IEC,%
378 shapes.gates.logic.US,%
379 shapes.geometric,%
380 shapes.misc,%
381 shapes.multipart,%
382 shapes.symbols,%
383 snakes,%
384 spy,%
385 svg.path,%
386 through,%
387 topaths,%
388 trees,%
389 turtle%
390}% \alltikzlibraries

```

### 21.4.3 pgfkeys definitions for `\usetikz`

```

391 \pgfkeys{/itf/tikz}{%
392   basic/.code={%
393     \usetikzlibrary{calc,%           for coordinate calculations
394                     arrows,%        for arrows
395                     backgrounds,%   for framed
396                     scopes,%       for scopes and shortcut : { [scope] ... }
397                     shapes,%       for ellipse shapes of nodes
398   },%
399   },%
400   basic/.value forbidden,% \alltikzpackages
401   base/.alias=basic,%
402   all/.code={%
403     \expandafter\RequirePackage\expandafter{\alltikzpackages}%
404     \expandafter\usepgfmodule\expandafter{\allpgfmodules}% see pgfcorescopes.code.tex
405     \expandafter\usetikzlibrary\expandafter{\alltikzlibraries}% from: tikz.code.tex
406   },%
407   .unknown/.code=\itf@usetikzcode\pgfkeyscurrentname
408}% \pgfkeys for \usetikz

```

`\usetikz`

```

409 \newrobustcmd*\usetikz[1]{%
410   \RequirePackage{tikz}%
411   \ifblank{#1}
412     {\pgfkeys{/itf/tikz}{all}}
413     {\pgfkeys{/itf/tikz}{#1}}%
414   \itf@usetikzsetup
415}% \usetikz

```

`\itf@usetikzsetup`

```

416 \def\itf@usetikzsetup{\itf@pgfkeys
417   \pgfkeysifdefined{/tikz/shorten>}{}{%
418     \pgfkeys{/tikz/shorten>/.alias=tikz/shorten >}}%
419   \pgfkeysifdefined{/tikz/shorten<}{}{%
420     \pgfkeys{/tikz/shorten</.alias=tikz/shorten <}}%
421   \pgfkeysifdefined{/tikz/shorten <>}{}{%
422     \pgfkeys{/tikz/shorten <>/.style={/tikz/shorten >={##1},/tikz/shorten <={##1}}}%
423   \pgfkeysifdefined{/tikz/shorten<>}{}{%
424     \pgfkeys{/tikz/shorten<>/.alias=tikz/shorten <>}}%

```



425 }%

`\itf@usetikzcode` For unknown keys: when a library is referenced.

```

426 \newrobustcmd* \itf@usetikzcode[1]{\begingroup
427   \edef\x{%
428     \noexpand\in@{, #1, }{\, \alltikzpackages,}%
429     \noexpand\ifin@ \noexpand\usepackage{#1}%
430     \noexpand\else
431       \noexpand\in@{, #1, }{\, \allpgfmodules,}%
432       \noexpand\ifin@ \noexpand\usepgfmodule{#1}%
433       \noexpand\else \noexpand\usetikzlibrary{#1}% \usetikzlibrary by default
434       \noexpand\fi
435     \noexpand\fi
436   }\expandafter\endgroup\x
437 }% \itf@usetikzcode

```

#### 21.4.4 `\papergraduate`

`\papergraduate`

```

438 \newrobustcmd* \papergraduate[1][x=1cm,y=1cm]{%
439   \ifpgfpicture \expandafter \itf@papergraduate
440   \else \expandafter \itf@wallpapergraduate
441   \fi{#1}%
442 }% \papergraduate
443 \pgfqkeys{/itf/tikz/papergraduate}{%
444   xcolor/.store as color,%
445   xcolor/.default=magenta,%
446   ycolor/.store as color,%
447   ycolor/.default=cyan,%
448   color/.style={xcolor={#1},ycolor={#1}},%
449   opacity/.initial=.25,opacity/.default=.25,opacity/.blank=.25,%
450   x/.initial=1cm,x/.default=1cm,%
451   y/.initial=1cm,y/.default=1cm,%
452   unit/.style={x={#1},y={#1}},%
453   units/.alias=unit,xy/.alias=unit,%
454   xrule/.true=\pgfkeyslet{/itf/tikz/papergraduate/hasHrule}\@firstofone,%
455   xrule/.false=\pgfkeyslet{/itf/tikz/papergraduate/hasHrule}\@gobble,%
456   xrule/on/.alias=xrule/true,xrule/off/.alias=xrule/false,%
457   Hrule/.alias=xrule,%
458   xrule/font/.store as code,%
459   xrule/font/.default=\tiny,%
460   Hrule/font/.alias=xrule/font,%
461   yrule/.true=\pgfkeyslet{/itf/tikz/papergraduate/hasVrule}\@firstofone,%
462   yrule/.false=\pgfkeyslet{/itf/tikz/papergraduate/hasVrule}\@gobble,%
463   yrule/on/.alias=yrule/true,yrule/off/.alias=yrule/false,%
464   Vrule/.alias=yrule,%
465   yrule/font/.store as code,%
466   yrule/font/.default=\tiny,%
467   Vrule/font/.alias=yrule/font,%
468   font/.style={xrule/font={#1},yrule/font={#1}},%
469   rule/font/.alias=font,%
470   text opacity/.initial=.8,%
471   text opacity/.default=.8,text opacity/.blank=.8,%
472   norule/.style={xrule=false,yrule=false},%
473   norules/.alias=norule,%
474   @reset/.style={font,xrule,yrule,color,unit,opacity},%
475 }% keys for \papergraduate options
476 \def\itf@graduation@vert[#1]#2#3#4#5{%
477   \node at (0,0) [{inner sep=0pt,outer sep=0pt,anchor=south west,
478     color=\pgfkeysvalueof{/itf/tikz/papergraduate/ycolor},#1}] {%
479     \rlap{\hbox to#2{\leaders \hbox to\dimexpr\pgf@yy/#4{%
480       \kern-\dimexpr#5/2\relax\vrule height#3 depth\z@ width#5}\hss}}}%
481 \def\itf@graduation@horiz[#1]#2#3#4#5{

```

```

482 \node at (0,0) [{inner sep=0pt,outer sep=0pt,anchor=north west,yscale=-1,
483                 color=\pgfkeysvalueof{/itf/tikz/papergraduate/xcolor},#1}] {%
484     \rlap{\vbox to\dimexpr#3\{\leaders \vbox to\dimexpr\pgf@xx/#4\%
485         \kern-\dimexpr#5/2\relax\hrule width#2 depth0pt height#5\}\vss}}}}
486 \def\itf@wallpapergraduate #1{%
487     \tikz[remember picture,overlay]}{%
488     \pgfkeys{/itf/tikz/papergraduate}{@reset,#1}%
489     \begin{scope}[{shift=(current page.south west),
490                 x=\pgfkeysvalueof{/itf/tikz/papergraduate/x},%
491                 y=\pgfkeysvalueof{/itf/tikz/papergraduate/y},%
492                 text opacity=\pgfkeysvalueof{/itf/tikz/papergraduate/opacity}}}%
493     \itf@paper@graduate \paperwidth \paperheight
494     \end{scope}}%
495}% \itf@wallpapergraduate
496 \def\itf@papergraduate@coord#1;%
497     \path #1 node
498         {\def\itf@tp##1##2##3##4\@nil{\gdef\itf@tp{{##2}{##3}}}%
499         }\expandafter\itf@tp\pgf@interrupt@path \@nil};
500}% \itf@papergraduate@coord
501 \def\itf@papergraduate #1#2;{%
502     \itf@papergraduate@coord #2;
503     \@tempdima \pgf@x           \@tempdimb \pgf@y
504     \expandafter\pgfqpoint \itf@tp
505     \@tempdimc \pgf@x
506     \advance\pgf@x -\@tempdima \pgf@x\ifdim\pgf@x<\z@-\fi\pgf@x
507     \@tempdima \@tempdimc \@tempdimc \pgf@y
508     \advance\pgf@y -\@tempdimb \pgf@y\ifdim\pgf@y<\z@-\fi\pgf@y
509     \@tempdimb \@tempdimc
510     \pgfkeys{/itf/tikz/papergraduate}{@reset,#1}%
511     \edef\itf@tp{%
512         \noexpand\begin{scope}[{shift=({\the\@tempdima,\the\@tempdimb})},%
513                                 x=\pgfkeysvalueof{/itf/tikz/papergraduate/x},%
514                                 y=\pgfkeysvalueof{/itf/tikz/papergraduate/y},%
515                                 text opacity=\pgfkeysvalueof{/itf/tikz/papergraduate/opacity}}}%
516         \noexpand\itf@paper@graduate {\the \pgf@x}{\the \pgf@y}%
517         \noexpand\end{scope}}%
518     }\itf@tp \global\let\itf@tp \relax
519}}% \paper@graduate
520 \def\itf@paper@graduate#1#2{\hfuzz\maxdimen\v fuzz\hfuzz\hbadness\@M\vbadness\hbadness
521     \itf@graduation@horiz [text opacity/.expanded={\tikz@textopacity/2}] {#1}{#2}{10}{.1pt};%
522     \itf@graduation@horiz []{#1}{#2}{2}{.1pt};% opacity=.25
523     \itf@graduation@horiz []{#1}{#2}{1}{.2pt};
524     \pgfkeysvalueof{/itf/tikz/papergraduate/hasVrule}{%
525         \itf@graduation@horiz [black,nearly opaque] {1mm}{#2}{10}{.1pt};% opacity=.75
526         \itf@graduation@horiz [black,nearly opaque] {1.5mm}{#2}{2}{.1pt};
527         \itf@graduation@horiz [black,opaque] {2mm}{#2}{1}{.1pt};
528         \begin{scope}[inner sep=0pt,outer sep=0pt,%
529             text opacity=\pgfkeysvalueof{/itf/tikz/papergraduate/text opacity},%
530             font=\pgfkeysvalueof{/itf/tikz/papergraduate/yrule/font}}%
531             \foreach \y in {0,1,...,\the\dimexpr#2*\p@/\pgf@xx}
532                 \node [yshift=\y\pgf@xx,xshift=3mm] at (0,0) {\the\numexpr\y*10};
533         \end{scope}}%
534     \itf@graduation@vert [text opacity/.expanded={\tikz@textopacity/2}] {#1}{#2}{10}{.1pt};
535     \itf@graduation@vert [] {#1}{#2}{2}{.1pt};
536     \itf@graduation@vert [] {#1}{#2}{1}{.2pt};
537     \pgfkeysvalueof{/itf/tikz/papergraduate/hasHrule}{%
538         \itf@graduation@vert [black,nearly opaque] {#1}{1mm}{10}{.1pt};
539         \itf@graduation@vert [black,nearly opaque] {#1}{1.5mm}{2}{.1pt};
540         \itf@graduation@vert [black,opaque] {#1}{2mm}{1}{.1pt};
541         \begin{scope}[inner sep=0pt,outer sep=0pt,%
542             text opacity=\pgfkeysvalueof{/itf/tikz/papergraduate/text opacity},%
543             font=\pgfkeysvalueof{/itf/tikz/papergraduate/xrule/font}}%
544             \foreach \x in {0,1,...,\the\dimexpr#1*\p@/\pgf@yy}
545                 \node [xshift=\x\pgf@yy,yshift=3mm] at (0,0) {\the\numexpr\x*10};
546         \end{scope}}%

```

```
547}% \itf@paper@graduate
548</tikz>
```

## 21.5 † Interface `titlesec`: `\sectionformat`

```
549<*titlesec>
550\ProvidesPackage{interfaces-titlesec}
551 [2011/01/19 v2.9 pgfkeys macros for titlesec (FC)]
552\RequirePackage{interfaces-base}
553\RequirePackage{auxhook}% <fix for \ttl@append (odd/even pages)>
554\RequirePackage{getttitlestring}
555\itf@Check@Package{titlesec}
```

### 21.5.1 `titlesec` modifications

```
556%% t i t l e s e c "p a t c h e s"
557\robustify\titleclass \robustify\titleformat \robustify\titlespacing
558\AddLineBeginMainAux{%
559 \string\providecommand\string\ttl@append[2]{}%
560 }
561\BeforeFile*{ttlkeys.def}{%
562 \expandafter\edef\csname itf@ttlkeys.def\endcsname{%
563 \catcode32 \the\catcode32\relax
564 \catcode37 \the\catcode37\relax
565 \endlinechar\the\endlinechar\relax}%
566 \catcode37 14\relax % percent=comment (inside .dtx files...)
567 \catcode32 9\relax % ignore spaces
568 \endlinechar\m@ne % and line feeds
569 }
570\AfterFile*{ttlkeys.def}{\csname itf@ttlkeys.def\endcsname}%
```

`\ttl@runinifempty` A “new” shape which behaves like **hang** but no paragraph break is inserted if the title is empty. Hence the name: **runinifempty**.

```
571%%-----
572%% runinifempty => like hang but no paragraph break (like runin) if title is empty
573\def\ttlh@runinifempty{%
574 \csname ttlh@ifx\ttl@savetitle@empty runin\else hang\fi\endcsname
575}% \ttlh@runinifempty
```

### 21.5.2 `\sectionformat`

```
\sectionformat \sectionformat\subsection* [<shape>]{<key=value>}

576\newrobustcmd*\sectionformat[1]{\@ifstar
577 {\itf@sectionformat{#1}{/*}}
578 {\itf@sectionformat{#1}{}}}%
579}% \sectionformat
580\def\itf@sectionformat#1#2{\@testopt
581 {\expandafter\expandafter\expandafter%
582 \itf@sectionformat\expandafter@gobble\string#1\@nil{#2}}}%
583}% \sectionformat
584\def\itf@sectionformat#1\@nil#2[#3]#4{\itf@pgfkeys@ifblank{#3}
585 {\pgfkeys{/itf/titlesec/#1#2}
586 {/itf/titlesec/@setup={#1}{#2},#4,/itf/titlesec/@update={#1}{#2}}}
587 {\pgfkeys{/itf/titlesec/#1#2}
588 {/itf/titlesec/@setup={#1}{#2},#4,shape={#3},/itf/titlesec/@update={#1}{#2}}}%
589}% \itf@ttl@sectionformat
```

`\itf@ttl@setup` Macros used to retrieve the values set by `\titleformat` and/or `\titlespacing`. This allows to use `\sectionformat` concurrently with `\titleformat` and `\titlespacing` provided by `titlesec`.

```
\itf@ttl@getformat
\itf@ttl@getspacing
590%% private keys @setup and @update
591\pgfkeys{/itf/titlesec}{%
592 @setup/.code 2 args=\itf@ttl@setup{#1}{#2},%
```

```

593   @update/.code 2 args=\expandafter\itf@ttl@update
594               \csname#1\endcsname{/itf/titlesec/#1}{#2}%
595 }
596 \newrobustcmd*\itf@ttl@setup[2]{%
597   \pgfkeysifdefined{/itf/titlesec/#1#2/shape}{%
598     {\itf@ttl@newsection{#1}{#2}}%
599   \ifcsundef{ttls@#1#2}{}% no previous spacing settings
600     {\expandafter\expandafter\expandafter%
601       \itf@ttl@getspacing\csname ttls@#1#2\endcsname{/itf/titlesec/#1#2}}%
602   \ifcsundef{ttmlf@#1#2}{}% no previous format settings
603     {\ifttl@explicit
604       \expandafter\expandafter\expandafter%
605       \itf@ttl@getformat\csname ttmlf@#1#2\endcsname{/itf/titlesec/#1#2}%
606     }else
607       \expandafter\expandafter\expandafter%
608       \itf@ttl@getformat\csname ttmlf@#1#2\endcsname{/itf/titlesec/#1#2}%
609     \fi}%
610}% \itf@ttl@setup
611 \def\itf@ttl@setkey#1#2{\begingroup
612   \def\x{\pgfkeysvalueof{#1}}\def\y{#2}%
613   \expandafter\endgroup\ifx\x\y\else
614     \pgfkeyssetvalue{#1}{#2}\fi
615}% \itf@ttl@setkey
616 \def\itf@ttl@getspacing#1#2#3#4#5#6{%
617   \itf@ttl@setkey{#6/left}{#1}%
618   \itf@ttl@setkey{#6/right}{#2}%
619   \itf@ttl@setkey{#6/top}{#3}%
620   \itf@ttl@setkey{#6/bottom}{#4}%
621   \itf@ttl@setkey{#6/indent first}{#5}%
622}% \itf@ttl@getspacing
623 \def\itf@ttl@getformat#1#2{%
624   \csname ltx@\ifx\pgfkeysvalueof#1first\else second\fi oftwo\endcsname
625     {\itf@ttl@get@format{}}
626     {\itf@ttl@get@format{#1}{#2}}%
627}% \itf@ttl@getformat
628 \def\itf@ttl@get@format#1#2#3#4#5#6#7{%
629   \if\relax\detokenize{#1}\relax\else
630     \pgfkeysEsetvalue{#7/shape}{\expandafter\itf@strip@at\string#1}%
631     \fi
632     \itf@ttl@setkey{#7/font}{#2}%
633     \itf@ttl@setkey{#7/label}{#3}%
634     \itf@ttl@setkey{#7/sep}{#4}%
635     \itf@ttl@setkey{#7/before}{#5}%
636     \itf@ttl@setkey{#7/after}{#6}%
637}% \itf@ttl@get@format

```

`\itf@ttl@update` This macros plugs the values set before with `\pgfkeys` into the special macros `\ttmlf@<section>` (for format) and `\ttls@<section>` (for spacing).

```

638 \newrobustcmd*\itf@ttl@update[3]{%
639   \ifblank{#3}
640     {\ttl@getkeys{#1}{titlesec}}
641     {\ttl@getkeys{name=#1,numberless}{titlesec}}%
642   \pgfkeysgetvalue{#2#3/shape}\itf@tp
643   \ifcsundef{ttmlh@\itf@tp}
644     {\begingroup \makeatletter
645       \InputIfFileExists{\itf@tp.tss}{}%
646       \PackageError{titlesec}{Unknown shape}%
647         {Shapes are defined in files with extension tss\MessageBreak
648           Either you have misspelled the shape\MessageBreak
649           or there is no a \itf@tp.tss file}}%
650     \endgroup}
651   {}%
652   \ifttl@explicit \begingroup
653     \pgfkeysgetvalue{#2#3/before}\pgfkeys@temp

```

```

654     \toks@ \expandafter{\pgfkeys@temp}%
655     \edef\x{\endgroup\def\noexpand\itf@tp###1{\the\toks@}}%
656     \x \pgfkeyslet{#2#3/before@cmd}\itf@tp
657     \@temptokena{\csdef{ttl@ttl@a}##1}%
658     \the\@temptokena{%
659         \pgfkeysvalueof{#2#3/shape@cs}%
660         {\pgfkeysvalueof{#2#3/font}}%
661         {\pgfkeysvalueof{#2#3/label}}%
662         {\pgfkeysvalueof{#2#3/sep}}%
663         {\pgfkeysvalueof{#2#3/before@cmd}}{##1}%
664         {\pgfkeysvalueof{#2#3/after}}}%
665     \else\@temptokena{\csdef{ttl@ttl@a}}%
666     \the\@temptokena{%
667         \pgfkeysvalueof{#2#3/shape@cs}%
668         {\pgfkeysvalueof{#2#3/font}}%
669         {\pgfkeysvalueof{#2#3/label}}%
670         {\pgfkeysvalueof{#2#3/sep}}%
671         {\pgfkeysvalueof{#2#3/before}}%
672         {\pgfkeysvalueof{#2#3/after}}}%
673     \fi
674     \csname ttl@compat\ttl@a\endcsname
675     \ttl@spacing@ii
676     {\pgfkeysvalueof{#2#3/indent first}}%
677     {\pgfkeysvalueof{#2#3/left}}%
678     {\pgfkeysvalueof{#2#3/top}}%
679     {\pgfkeysvalueof{#2#3/bottom}}%
680     {\pgfkeysvalueof{#2#3/right}}%
681 }% \itf@ttl@update

```

`\itf@ttl@titleclass` This macro calls `\titleclass` to either:

- change the class of an existing sectionning command;

or:

- create a new sectionning command.

```

682 %%-----
683 %%   t i t l e c l a s s
684 \newrobustcmd* \itf@ttl@titleclass{\@ifstar
685   {\itf@ttl@titleclass@i*}
686   {\itf@ttl@titleclass@i}}%
687 }% \itf@ttl@titleclass
688 \def\itf@ttl@titleclass@i#1#2#3[#4]#5\@nil{\ifblank{#4}
689   {%
690     \expandafter\titleclass\csname#2\endcsname{#3}%
691   }
692   {%
693     \expandafter\titleclass\csname#2\endcsname{#3}[#4]% #4 = sup-level
694     \if\relax#1\relax % not starred
695       \expandafter\expandafter\expandafter%
696       \itf@ttl@titleclass@ii\expandafter\@gobble\string#4\relax{#2}% \@addtoreset...
697     \fi
698   }%
699   \expandafter\providecommand\csname l@#2\endcsname[2]{}% no entry in toc
700 }% \itf@ttl@titleclass@i
701 \def\itf@ttl@titleclass@ii#1\relax#2{%
702   \ifcsundef{c@#2}
703     {\newcounter{#2}[#1]}% creates counter for #1
704     {\@addtoreset{#2}{#1}}%
705   \csxdef{the#2}{%
706     \expandafter\noexpand\csname the#1\endcsname
707     .\noexpand\@arabic\expandafter\noexpand\csname c@#2\endcsname
708   }% \the#2
709   \ifcsundef{l@#1}{%
710     \expandafter\providecommand\csname l@#2\endcsname[2]{%
711       \csname l@#1\endcsname{##1}{##2}%
712     }% \l@#2 = \l@newsection is (by default) the same as \l@sup-level

```



```

713  }%
714}% \itf@ttl@titleclass@ii

\itf@ttl@createsection      If \sectionformat is invoked with an unknown sectionning command (ie. an undefined macro as
first argument) then \itf@ttl@createsection is expanded in order to:

    1) create the new sectionning command with \titleclass,
    2) create the pgfkeys keys for this section,
    3) do some additionnal setup if interfaces-hypbmsec and/or interfaces-tocloft are loaded.

715%%-----
716%%   C r e a t i n g   n e w   s e c t i o n s
717\def\itf@ttl@createsection#1{% sectionning command undefined: temporarily defined
718  \expandafter\titleclass\csname#1\endcsname{straight}[*]%      in straight class
719  \itf@AfterPackage{hypbmsec}{%
720    \AfterPreamble{%
721      \csletcs{hbs@#1}{#1}%
722      \csxdef{#1}{\noexpand\hbs@do\expandafter\noexpand\csname hbs@#1\endcsname}%
723    }%
724  }%
725  \itf@AfterPackage{interfaces-tocloft}{%
726    \itf@cft@newsection{toc}{#1}%
727  }%
728  \itf@AfterPackage{interfaces-hypbmsec}{%
729    \expandafter\let\csname last#1title\endcsname\relax
730    \expandafter\let\csname last#1bookmark\endcsname\relax
731    \expandafter\let\csname last#1toc\endcsname\relax
732  }%
733}% \itf@ttl@createsection

```

### 21.5.3 Keys for `\sectionformat`

`\itf@ttl@newsection` This macro creates the pgfkeys keys for each sectionning command.

The pgfkeys keys are not created at once, but only when `\sectionformat` is invoked first.

```

734%%-----
735%%   D e f i n i n g   k e y s   f o r   e a c h   s e c t i o n
736\def\itf@ttl@newsection#1#2{% #1=section, #2=/* or empty
737  \ifcsundef{#1}% sectionning command undefined: temporarily defined in straight class
738    {\itf@ttl@createsection{#1}}
739    {}%
740  \ifblank{#2}{%
741    \pgfqkeys{/itf/titlesec/#1}{% these keys do not exist for starred sections
742      class/.code=\itf@ttl@titleclass{#1}##1[]\@nil,% with \@addtoreset
743      class/.value required,% if sup-level is given
744      class*/.code=\itf@ttl@titleclass*{#1}##1[]\@nil,% without \@addtoreset
745      class*/.value required,% even if sup-level is given
746      shape/.initial=,% initial shapes set by titlesec.sty for not numbered sections.
747      the#1/.store in cs=the#1,%
748      the#1/.default=\pgfkeysvalueof{/itf/titlesec/#1/label},%
749    }%
750    {% starred section: unless titlesec, we do not put the default shape to hang,
751    \pgfkeysifdefined{/itf/titlesec/#1/shape}%but to the shape of the not starred
752      {\pgfkeysgetvalue{/itf/titlesec/#1/shape}\itf@tp}% sectionning command
753      {\def\itf@tp{hang}}}%
754    \pgfkeyslet{/itf/titlesec/#1#2/shape}\itf@tp%
755  }%
756  \pgfqkeys{/itf/titlesec/#1#2}{%
757    shape/.value required,%
758    shape@cs/.initial=
759    \csname ttlh@\pgfkeysvalueof{/itf/titlesec/#1#2/shape}\endcsname,% constant
760    shape@cs/.is private=interfaces-titlesec,% constant
761    font/.store as code,%
762    format/.alias*=font,%

```

```

763     label/.store as code,%
764     sep/.estore as glue,%
765     labelsep/.alias*=sep,%
766     before/.store as code,%
767     before@cmd/.is private=interfaces-titlesec,%
768     after/.store as code,%
769     indent first/.true=\pgfkeyssetvalue{/itf/titlesec/#1#2/indent first}{\@ne},%
770     indent first/.false=\pgfkeyssetvalue{/itf/titlesec/#1#2/indent first}{\z@},%
771     identfirst/.alias=indent first,%
772     indent first=true,%
773     left/.estore as glue,%
774     top/.estore as glue,%
775     bottom/.estore as glue,%
776     right/.estore as glue,%
777     break/.code=\ifblank{##1}
778         {\cslet{#1break}\@empty}
779         {\protected\csdef{#1break}{##1}},%
780     break*/.code=\protected\csappto{#1break}{##1},%
781     break+/.alias=break*,%
782     mark/.code=\ifblank{##1}
783         {\cslet{#1mark}\@gobble}
784         {\protected\long\csdef{#1mark}####1{##1}},%
785     mark/.default=,%
786 }% \pgfkeys
787 \ifblank{#2}{% no default marks for starred (numberless) \section*
788 \itf@AfterPackage{interfaces-marks}{% requires interfaces-marks
789     \pgfkeys{/itf/titlesec/#1/mark/.default=\markthe{#1}{##1}}}%
790 }% AfterPackage interfaces-mark
791 \itf@AfterPackage{interfaces-bookmark}{% requires interfaces-bookmark
792 \pgfkeys{/itf/titlesec/#1}{% does not exist for starred sections
793     bookmark/.is multiple choice,%
794     bookmark/level/.estore in cs=toclevel@#1,% depth of the bookmark
795     bookmark/level/.default=\ifcsvoid{tlll@#1}{99}{\csuse{tlll@#1}},%
796     bookmark/level/.blank=\ifcsvoid{toclevel@#1}
797         {\ifcsvoid{tlll@#1}{99}{\csuse{tlll@#1}}}{\csuse{toclevel@#1}},%
798     bookmark/toclevel/.alias=bookmark/level,%
799     bookmark/bold/.code=\ifblank{##1}
800         {\pgfkeyslet{/itf/titlesec/#1/bookmark/bold}\@empty}
801         {\pgfkeyssetvalue{/itf/titlesec/#1/bookmark/bold}{bold=##1}},%
802     bookmark/bold/.default=true,%
803     bookmark/bold*/.code=\ifblank{##1}
804         {\pgfkeyslet{/itf/titlesec/#1/bookmark/bold*}\@empty}
805         {\pgfkeyssetvalue{/itf/titlesec/#1/bookmark/bold*}{bold*=##1}},%
806     bookmark/bold*/.default=true,%
807     bookmark/italic/.code=\ifblank{##1}
808         {\pgfkeyslet{/itf/titlesec/#1/bookmark/italic}\@empty}
809         {\pgfkeyssetvalue{/itf/titlesec/#1/bookmark/italic}{italic=##1}},%
810     bookmark/italic/.default=true,%
811     bookmark/italic*/.code=\ifblank{##1}
812         {\pgfkeyslet{/itf/titlesec/#1/bookmark/italic*}\@empty}
813         {\pgfkeyssetvalue{/itf/titlesec/#1/bookmark/italic*}{italic*=##1}},%
814     bookmark/italic*/.default=true,%
815     bookmark/color/.code=\ifblank{##1}
816         {\pgfkeyslet{/itf/titlesec/#1/bookmark/color}\@empty}
817         {\pgfkeyssetvalue{/itf/titlesec/#1/bookmark/color}{color=##1}},%
818     bookmark/color/.default=,%
819     bookmark/color*/.code=\ifblank{##1}
820         {\pgfkeyslet{/itf/titlesec/#1/bookmark/color*}\@empty}
821         {\pgfkeyssetvalue{/itf/titlesec/#1/bookmark/color*}{color*=##1}},%
822     bookmark/color*/.default=,%
823     bookmark/on/.code=\pgfkeyssetvalue{/itf/titlesec/#1/bookmark/on}{disable=false},%
824     bookmark/on/.value forbidden,%
825     bookmark/off/.code=\pgfkeyssetvalue{/itf/titlesec/#1/bookmark/on}{disable=true},%
826     bookmark/off/.value forbidden,%
827     bookmark/none/.alias=bookmark/off,%

```



```

828 bookmark/on*/.code=\pgfkeyssetvalue{/itf/titlesec/#1/bookmark/on*}{disable*=false,},%
829 bookmark/off*/.code=\pgfkeyssetvalue{/itf/titlesec/#1/bookmark/on*}{disable*=true,},%
830 bookmark/none*/.alias=bookmark/off*,%
831 bookmark/disable*/.alias=bookmark/off*,%
832 bookmark/style/.code=\ifblank{##1}
833   {\pgfkeyslet{/itf/titlesec/#1/bookmark/style}\@empty}
834   {\pgfkeyssetvalue{/itf/titlesec/#1/bookmark/style}{style=##1,}},%
835 bookmark/style/.default=,%
836 bookmark/.unknown/.code=\pgfkeysEsetvalue{/itf/titlesec/#1/bookmark/other}
837   {\pgfkeyscurrentname={##1}},%
838 bookmark/bold/.initial=,%
839 bookmark/bold*/.initial=,%
840 bookmark/italic/.initial=,%
841 bookmark/italic*/.initial=,%
842 bookmark/color/.initial=,%
843 bookmark/color*/.initial=,%
844 bookmark/on/.initial=,%
845 bookmark/on*/.initial=,%
846 bookmark/style/.initial=,%
847 }}% \AfterPackage*{interfaces-bookmark}
848 }% not starred (numberless) \section
849 {}% starred/numberless \section*: do not create the keys
850 }% \itf@ttl@newsection

```

`\addcontentsline` (patch) This modification of `\addcontentsline` occurs only if both `interfaces-bookmark` and `interfaces-titlesec` are loaded. Implementation of the `bookmark` key and sub-keys of `\sectionformat` for each sectioning command.

```

851 %% bookmarks styles for sectioning commands:
852 \@makeother\#
853 \itf@AfterPackage{interfaces-bookmark}{%
854   \itf@patch\itf@preapptocmd\addcontentsline           % #2=section name in
855     {\begingroup\itf@ttl@BKM{/itf/titlesec/#2/bookmark}}% \addcontentsline
856     {\endgroup}
857     {\@PackageInfoNoLine{interfaces-titlesec}
858       {\string\addcontentsline\space successfully patched!}}
859     {\@PackageWarningNoLine{interfaces-titlesec}
860       {Patch of \string\addcontentsline\space failed
861         \MessageBreak bookmark-style specs for sections
862         \MessageBreak will be unavailable}}}%
863 }% AfterPackage interfaces-bookmark
864 \catcode'\#=6
865 \def\itf@ttl@BKM#1{%
866   \pgfkeysifdefined{#1/.@cmd}
867   {%
868     \edef\itf@tp{% do nothing if the keys are not set (shortcut)
869       \pgfkeysvalueof{#1/bold}%
870       \pgfkeysvalueof{#1/bold*}%
871       \pgfkeysvalueof{#1/italic}%
872       \pgfkeysvalueof{#1/italic*}%
873       \pgfkeysvalueof{#1/color}%
874       \pgfkeysvalueof{#1/color*}%
875       \pgfkeysvalueof{#1/on}%
876       \pgfkeysvalueof{#1/on*}%
877       \pgfkeysvalueof{#1/style}}%
878   \ifx\itf@tp\@empty
879   \else
880     \global\pgfkeyslet{#1/bold*}\@empty
881     \global\pgfkeyslet{#1/italic*}\@empty
882     \global\pgfkeyslet{#1/color*}\@empty
883     \global\pgfkeyslet{#1/on*}\@empty
884     \expandafter\bookmarksetup\expandafter{\itf@tp}%
885     \pgfkeysifdefined{/itf/bookmark/*}%
886     {% \bookmarksetup{color*=} overwrites \sectionformat...{bookmark/color*=}
887     \pgfkeysgetvalue{/itf/bookmark/*}\itf@tp

```

```

888         \expandafter\bookmarksetup\expandafter{\itf@tp}%
889     }
890     {}%
891     \fi}
892     {}%
893 }% \itf@ttl@BKM

```

### 21.5.4 `\bottomtitles`

`\bottomtitles` This is a “skip command”: it can be assigned a number or a skip.

```

894 %%-----
895 %%   b o t t o m t i t l e s
896 \newrobustcmd*\bottomtitles{\@ifnextchar\bgroup
897   \itf@setbottomtitlespace
898   {\afterassignment\itf@set@bottomtitle@space\itf@sk}%
899 }% \bottomtitles
900 \def\itf@setbottomtitlespace#1{%
901   \@defaultunits\itf@sk#1\textheight\relax\@nnil
902   \itf@set@bottomtitle@space
903 }% \itf@setbottomtitlespace
904 \def\itf@set@bottomtitle@space{\xdef\bottomtitlespace{\the\dimexpr\itf@sk}}
905 </titlesec>

```

### 21.6 Interface `hyperref`

```

906 <*\hyperref>
907 \ProvidesPackage{interfaces-hyperref}
908   [2011/01/19 v2.9 provides raised hyperdef (FC)]
909 \RequirePackage{interfaces-base}
910 \itf@Check@Package{hyperref}

```

`\raisedhyperdef` The anchor is made with `\Hy@raisedlink`. The raised amount is used in `\HyperRaiseLinkHook`:

```

911 \newrobustcmd\raisedhyperdef[4][\begingroup
912   \ifblank{#1}
913   {}
914   {%
915     \expandafter\def\expandafter\HyperRaiseLinkHook\expandafter{%
916       \expandafter\def\expandafter\HyperRaiseLinkHook
917         \expandafter{\HyperRaiseLinkHook}% restore current definition
918       \HyperRaiseLinkHook
919       \advance\noexpand\HyperRaiseLinkLength by\dimexpr#1\relax\relax}%
920   }%
921   \ifx \\\#2\\\def \Hy@AnchorName {#3}\else
922     \def \Hy@AnchorName {#2.#3}%
923   \fi
924   \ltx@leavevmode
925   \Hy@raisedlink{\hyper@anchorstart{\Hy@AnchorName}\hyper@anchorend}%
926   \endgroup
927   #4%
928 }% \raisedhyperdef
929 </hyperref>

```

### 21.7 Interface `bookmark`

```

930 <*\bookmark>
931 \ProvidesPackage{interfaces-bookmark}
932   [2011/01/19 v2.9 more control on bookmarks (FC)]
933 \RequirePackage{interfaces-base}
934 \RequirePackage{interfaces-hyperref}
935 \RequirePackage{refcount}
936 \itf@Check@Package{bookmark}

```

\\bookmark (patch) Implementation of `disable`, and starred keys `*` (previous values must be restored after `\write`):

```

937 \expandafter\itf@patch\expandafter\patchcmd\curname\string\bookmark\endcsname
938   {\immediate\write\@mainaux}{\itf@BKM@write}
939   {\@PackageInfoNoLine{interfaces-bookmark}
940     {\expandafter\string\curname\string\bookmark\endcsname\space
941       successfully patched!}}
942   {\@PackageWarningNoLine{interfaces-bookmark}
943     {Command \expandafter\string\curname\string\bookmark\endcsname\space
944       could not be patched\MessageBreak
945       Loading of interfaces-bookmark is canceled}%
946     \endinput}

```

### 21.7.1 star keys\* definitions

```

947 \global\let\itf@BKM@enable\@ne % 0 = disable*, 1=enable, \@M = disable
948 \pgfqkeys{/itf/bookmark}{%
949   disable/.true=\global\let\itf@BKM@enable\@M,%
950   disable/.false=\global\let\itf@BKM@enable\@ne,%
951   disable*/.true=\global\let\itf@BKM@enable\z@,%
952   disable*/.false=\global\let\itf@BKM@enable\@ne,%
953   atend/.true=\ifnum\itf@BKM@enable>0\edef\itf@BKM@enable{\number-\itf@BKM@enable}\fi,%
954   atend/.false=\ifnum\itf@BKM@enable<0\edef\itf@BKM@enable{\number-\itf@BKM@enable}\fi,%
955   bold*/.true=\pgfqkeys{/itf/bookmark}{@save={bold=true}},%
956   bold*/.false=\pgfqkeys{/itf/bookmark}{@save={bold=false}},%
957   bold*/@blank/.code=\pgfqkeys{/itf/bookmark/@restore}{bold},%
958   bold*/.blank=@blank,%
959   italic*/.true=\pgfqkeys{/itf/bookmark}{@save={italic=true}},%
960   italic*/.false=\pgfqkeys{/itf/bookmark}{@save={italic=false}},%
961   italic*/@blank/.code=\pgfqkeys{/itf/bookmark/@restore}{italic},%
962   italic*/.blank=@blank,%
963   color*/.code={\ifblank{#1}
964     {\pgfqkeys{/itf/bookmark/@restore}{color}}
965     {\pgfqkeys{/itf/bookmark}{@save={color={#1}}}}}%
966 },%
967 @save/.code={%
968   \pgfkeysifdefined{/itf/bookmark/@save/color}{%
969     {\pgfkeyslet{/itf/bookmark/@save/color}\BKM@color}%
970   \pgfkeysifdefined{/itf/bookmark/@save/FontStyle}{%
971     {\pgfkeyslet{/itf/bookmark/@save/FontStyle}\BS@BKM@FontStyle}%
972   \pgfkeysifdefined{/itf/bookmark/@save/grouplevel}{%
973     {\pgfkeysEsetvalue{/itf/bookmark/@save/grouplevel}{\the\currentgrouplevel}}%
974   \pgfkeysaddvalue{/itf/bookmark/*}{\z@,#1}%
975   \bookmarksetup{#1}%
976 },%
977 @restore/color/.code=%
978   \pgfkeysifdefined{/itf/bookmark/@save/color}
979     {\pgfkeysgetvalue{/itf/bookmark/@save/color}\BKM@color}
980     {},%
981 @restore/FontStyle/.code=%
982   \pgfkeysifdefined{/itf/bookmark/@save/FontStyle}
983     {\pgfkeysgetvalue{/itf/bookmark/@save/FontStyle}\BS@BKM@FontStyle}
984     {},%
985 @restore/.code={%
986   \pgfkeysifdefined{/itf/bookmark/@save/color}
987     {\pgfkeysgetvalue{/itf/bookmark/@save/color}\BKM@color}
988     {}%
989   \pgfkeysifdefined{/itf/bookmark/@save/FontStyle}
990     {\pgfkeysgetvalue{/itf/bookmark/@save/FontStyle}\BS@BKM@FontStyle}
991     {}%
992   \pgfkeysifdefined{/itf/bookmark/@save/grouplevel}
993     {% shortcut: \bookmarksetup{bold*} called inside main group (level 0)
994     \ifnum\pgfkeysvalueof{/itf/bookmark/@save/grouplevel}=\z@
995       \global\pgfkeyslet{/itf/bookmark/@save/FontStyle}\@undefined

```

```

996         \global\pgfkeyslet{/itf/bookmark/@save/color}\@undefined
997         \global\pgfkeyslet{/itf/bookmark/@save/grouplevel}\@undefined
998         \global\pgfkeyslet{/itf/bookmark/*}\@undefined
999         \global\let\BKM@color\BKM@color
1000        \global\let\BS@BKM@FontStyle\BS@BKM@FontStyle
1001        \else % restore after each group as needed
1002        \pgfkeyslet{/itf/bookmark/@save/FontStyle}\@undefined
1003        \pgfkeyslet{/itf/bookmark/@save/color}\@undefined
1004        \pgfkeyslet{/itf/bookmark/*}\@undefined
1005        \ifnum\currentgrouplevel>z@
1006        \aftergroup\itf@BKM@restore
1007        \else
1008        \pgfkeyslet{/itf/bookmark/@save/grouplevel}\@undefined
1009        \fi\fi
1010        }
1011        {}%
1012    },%
1013    @restore/bold/.code={% bold is "hidden" in \BS@BKM@FontStyle
1014        \beginingroup
1015        \edef\itf@tp{\bookmarkget{bold}}%
1016        \pgfqkeys{/itf/bookmark/@restore}{FontStyle}%
1017        \count@=\bookmarkget{bold}%
1018        \edef\itf@tp{\endgroup
1019            \ifnum\itf@tp=\count@
1020            \else \noexpand\bookmarksetup{%
1021                bold\ifcase\count@ =false\fi}\fi
1022            }\itf@tp},%
1023    @restore/italic/.code={% italic is "hidden" in \BS@BKM@FontStyle
1024        \beginingroup
1025        \edef\itf@tp{\bookmarkget{italic}}%
1026        \pgfqkeys{/itf/bookmark/@restore}{FontStyle}%
1027        \count@=\bookmarkget{italic}%
1028        \edef\itf@tp{\endgroup
1029            \ifnum\itf@tp=\count@
1030            \else \noexpand\bookmarksetup{%
1031                italic\ifcase\count@ =false\fi}\fi
1032            }\itf@tp},%
1033    }
1034    \def\itf@BKM@restore{%
1035        \pgfkeysifdefined{/itf/bookmark/@save/grouplevel}
1036        {\pgfkeysalso{/itf/bookmark/@restore}}
1037        {}%
1038    }% \itf@BKM@restore
1039    %% Plug the BKM keys in the interfaces pgfkeys (not efficient but quickly written...)
1040    \define@key{BKM}{disable}[true]{\itf@pgfkeys\pgfkeysalso{/itf/bookmark/disable={#1}}}
1041    \define@key{BKM}{disable*}[true]{\itf@pgfkeys\pgfkeysalso{/itf/bookmark/disable*={#1}}}
1042    \define@key{BKM}{bold*}[true]{\itf@pgfkeys\pgfkeysalso{/itf/bookmark/bold*={#1}}}
1043    \define@key{BKM}{italic*}[true]{\itf@pgfkeys\pgfkeysalso{/itf/bookmark/italic*={#1}}}
1044    \define@key{BKM}{color*}[]{\itf@pgfkeys\pgfkeysalso{/itf/bookmark/color*={#1}}}
1045    \define@key{BKM}{atend}[true]{\itf@pgfkeys\pgfkeysalso{/itf/bookmark/atend={#1}}}%

```

`\itf@BKM@write`      1) check if the bookmark is disable  
                          2) restore previous values in case starred\* keys have been set.

```

1046 \def\itf@BKM@write#1{%
1047     \aftergroup\itf@BKM@restore
1048     \ifcase\itf@BKM@enable
1049         \global\let\itf@BKM@enable\@ne
1050     \or
1051         \immediate\write\@mainaux{#1}%
1052     \else
1053         \ifcase -\itf@BKM@enable % (case -0 = 0 tested before)
1054         \or % (case -1 = enable but At End)
1055         \let\itf@BKM@enable\@ne
1056         \edef\itf@tp{\immediate\write\@mainaux{#1}}%

```

```

1057      \expandafter\BookmarkAtEnd\expandafter{\itf@tp}%
1058      \fi
1059      \fi
1060 }% \itf@BKM@write

```

### 21.7.2 `ref` and `pageref` keys

`\itf@BKM@pageref`

```

1061 %% pageref= key for \bookmark (using refcount : \getpagerefnnumber)
1062 \def\itf@BKM@pageref[#1]{%
1063   \expandafter\itf@BKM@@pageref
1064   \csname r@#1\endcsname{#1}%
1065 }% \itf@BKM@pageref
1066 \def\itf@BKM@@pageref#1#2{%
1067   \ifx#1\relax
1068     \protect\G@refundefinedtrue
1069     \@latex@warning{%
1070       Hyper reference ‘#2’ on page \thepage \space undefined
1071       \MessageBreak for bookmark destination page
1072     }%
1073   \fi
1074   \edef\BKM@page{\getrefbykeydefault{#2}{page}{1}}%
1075 }% \itf@BKM@@pageref
1076 \define@key{BKM}{pageref}{%
1077   \Hy@babelnormalise\itf@BKM@pageref[{#1}]}

```

`\itf@BKM@ref`

```

1078 %% ref= key for \bookmark
1079 \def\itf@BKM@ref[#1]{%
1080   \expandafter\itf@BKM@@ref
1081   \csname r@#1\endcsname{#1}%
1082 }% \itf@BKM@ref
1083 \def\itf@BKM@@ref#1#2{%
1084   \ifx#1\relax
1085     \protect\G@refundefinedtrue
1086     \@latex@warning{%
1087       Hyper reference ‘#2’ on page \thepage \space undefined
1088       \MessageBreak for bookmark destination
1089     }%
1090     \def\BKM@dest{??}%
1091   \else
1092     \edef\BKM@dest{\expandafter\@fourthoffive#1\@empty\@empty}%
1093   \fi
1094 }% \BKM@@ref
1095 \define@key{BKM}{ref}{%
1096   \Hy@babelnormalise\itf@BKM@ref[{#1}]}
1097 </bookmark>

```

## 21.8 † Interface `hypbmsec`

### 21.8.1 `interfaces-hypbmsec`

```

1098 <*hypbmsec>
1099 \ProvidesPackage{interfaces-hypbmsec}
1100   [2011/01/19 v2.9 lastsection,title,anchor, etc. (FC)]
1101 \RequirePackage{interfaces-base}
1102 \RequirePackage{getttitlestring}
1103 \itf@Check@Package{hypbmsec}

```

`\hbs@do` (patch)

```

1104 \def\itf@hbs@do#1{%
1105   \xdef\itf@hbs@currentname{\expandafter\itf@strip@at\string#1}%

```

```

1106 \let\hbs@tocstring\relax % <for starred sections>
1107 \let\hbs@bmstring\relax % <for starred sections>
1108 \@ifstar
1109     {\itf@hbs@ssect#1}%
1110     {\let\hbs@seccmd=#1\hbs@checkarg}%
1111 }% \itf@hbs@do
1112 \let\hbs@do\itf@hbs@do

```

\hbs@process (patch)

```

1113 \itf@patch\pretocmd\hbs@process{%
1114     \itf@hbs@process{#1}%
1115 }%
1116 {\@PackageInfoNoLine{interfaces-hybpmsec}
1117     {\string\hbs@process\space successfully patched}}
1118 {\@PackageWarningNoLine{interfaces-hybpmsec}
1119     {Command \string\hbs@process\space could not be patched
1120     \MessageBreak loading of 'interfaces-hybpmsec' aborted
1121     \MessageBreak \string\lastsection\space will not work}%
1122     \endinput}%

```

\itf@hbs@ssect For starred sections:

```

1123 \long\def\itf@hbs@ssect#1#2{% starred section
1124     \itf@Not@titlesec#1
1125     {\expandafter\itf@hbs@last@starred\expandafter{\itf@hbs@currentname}{#2}}
1126     {\let\itf@hbs@last\itf@hbs@last@starred@ttl}% <expanded at \ttl@finmarks>
1127     #1*{#2}%
1128 }% \itf@hbs@ssect

```

\itf@hbs@process For non-starred sections:

```

1129 \long\def\itf@hbs@process#1{% not starred
1130     \itf@Not@titlesec \hbs@seccmd
1131     {%
1132         \ifdefined\hyper@anchor
1133             \expandafter\itf@hbs@last@nostar@nottl@Hy\expandafter{\itf@hbs@currentname}{#1}%
1134         \else
1135             \expandafter\itf@hbs@last@nostar@nottl\expandafter{\itf@hbs@currentname}{#1}%
1136         \fi
1137     }%
1138     {\let\itf@hbs@last \itf@hbs@last@nostar@ttl}% <expanded at \ttl@finmarks>
1139 }% \itf@hbs@process

```

\itf@hbs@last@starred Update the values of \lastsectiontitle *etc.* for starred sections:

```

1140 \long\def\itf@hbs@last@starred#1#2{% <expanded immediately>
1141     \GetTitleString{#2}\let\itf@hbs@currenttitle\GetTitleStringResult
1142     \begingroup
1143         \let\@elt \itf@resetlastsections
1144         \globaldefs \@ne
1145         \expandafter\let\csname last#1title\endcsname\itf@hbs@currenttitle
1146         \expandafter\let\csname last#1toc\endcsname\@empty
1147         \expandafter\let\csname last#1bookmark\endcsname\@empty
1148         \expandafter\let\csname last#1anchor\endcsname\relax
1149         \let\lastsectionname \itf@hbs@currentname
1150         \csname cl@#1\endcsname
1151     \endgroup
1152 }% \itf@hbs@last@starred
1153 \def\itf@hbs@last@starred@ttl{% <expanded at \ttl@finmarks>
1154     \global\let\itf@hbs@last \@empty
1155     \expandafter\itf@hbs@last@starred
1156     \expandafter\itf@hbs@currentname \expandafter{\ttl@savetitle}%
1157 }% \itf@hbs@last@starred@ttl

```

\itf@hbs@last@nostar Update de values of \lastsectiontitle *etc.* for non-starred sections:

```

1158 \long\def\itf@hbs@last@nostar#1#2{%
1159     \GetTitleString{#2}\let\itf@hbs@currenttitle\GetTitleStringResult
1160     \let\itf@hbs@last@nostar@nottl@Hy

```



```

1160 \begingroup
1161 \let\@elt \itf@resetlastsections
1162 \globaldefs \@ne
1163 \expandafter\let\csname last#1title\endcsname\itf@hbs@currenttitle
1164 \expandafter\let\csname last#1toc\endcsname\expandafter\endcsname
1165 \csname \ifx\hbs@tocstring\relax
1166 \itf@hbs@currenttitle\else hbs@tocstring\fi \endcsname
1167 \expandafter\let\csname last#1bookmark\endcsname\expandafter\endcsname
1168 \csname \ifx\hbs@bmstring\relax
1169 \last#1toc\else hbs@bmstring\fi \endcsname
1170 \expandafter\let\csname last#1anchor\endcsname\HyperLocalCurrentHref
1171 \let\lastsectionname \itf@hbs@currentname
1172 \csname cl@#1\endcsname
1173 \endgroup
1174}% \itf@hbs@last@starred
1175\def\itf@hbs@last@nostar@ttl{% <expanded at \ttl@finmarks>
1176 \global\let\itf@hbs@last \@empty
1177 \expandafter\itf@hbs@last@nostar
1178 \expandafter\itf@hbs@currentname \expandafter{\ttl@savetitle}%
1179}% \itf@hbs@last@nostar@ttl
1180\long\def\itf@hbs@last@nostar@nottl#1#2{% <expanded at \cl@section>
1181 \expandafter\let\expandafter\itf@hbs@cl@ORI\csname cl@#1\endcsname
1182 \expandafter\def\csname cl@#1\endcsname{%
1183 \expandafter\let\csname cl@#1\endcsname\itf@hbs@cl@ORI
1184 \itf@hbs@cl@ORI
1185 \itf@hbs@last@nostar {#1}{#2}}%
1186}% \itf@hbs@last@nostar@nottl
1187\long\def\itf@hbs@last@nostar@nottl@Hy#1#2{% <expanded at \hyper@anchorend>
1188 \begingroup
1189 \toks@\expandafter{%
1190 \expandafter\def\expandafter\hyper@anchorend
1191 \expandafter{\hyper@anchorend}%
1192 \itf@hbs@last@nostar{#1}{#2}}%
1193 \edef\x{\endgroup
1194 \def\noexpand\hyper@anchorend{\the\toks@}%
1195 }\x
1196}% \itf@hbs@last@nostar@nottl@Hy

```

`\itf@Not@titlesec` Expands to `\@firstoftwo` if the section is not formatted by a class of `titlesec` package. Otherwise (`titlesec` formats the given section): expands to `\@secondoftwo`.

```

1197\def\itf@Not@titlesec#1{\@firstoftwo}
1198\AfterPackage*{titlesec}{%
1199\def\itf@Not@titlesec#1{\begingroup
1200 \onelevel@sanitize#1%
1201 \edef\@tempa{\noexpand\in@
1202 {\noexpand\@nil \string\ttl@}
1203 {\noexpand\@nil #1}%
1204 }\@tempa
1205 \expandafter\endgroup
1206 \ifin@ \expandafter\@secondoftwo
1207 \else \expandafter\@firstoftwo
1208 \fi
1209}% \itf@Not@titlesec
1210}% AfterPackage titlesec

```

`\ttl@finmarks` When `titlesec` is used, assignments to `\lastsectiontitle`, `\lastsubsection toc` *etc.* are done at this point.

```

1211\AfterPackage*{titlesec}{%
1212\expandafter\def\expandafter\ttl@finmarks\expandafter{%
1213 \expandafter\itf@hbs@last \ttl@finmarks}%
1214\let\itf@hbs@last \@empty
1215}% AfterPackage

```



`\itf@resetlastsections` Assignments are global (`\globaldefs=1`).

```

1216 \def\itf@resetlastsections#1{%
1217   \expandafter\let\csname last#1title\endcsname\relax
1218   \expandafter\let\csname last#1toc\endcsname\relax
1219   \expandafter\let\csname last#1bookmark\endcsname\relax
1220   \expandafter\let\csname last#1anchor\endcsname\relax
1221   \csname cl@#1\endcsname
1222 }% \itf@resetlastsections

1223 \let\lastsectionname\relax
1224 \@for\itf@tp:=part,section,subsection,subsubsection,paragraph,subparagraph%
1225   \do{\expandafter\let\csname last\itf@tp title\endcsname\relax
1226     \expandafter\let\csname last\itf@tp toc\endcsname\relax
1227     \expandafter\let\csname last\itf@tp bookmark\endcsname\relax
1228     \expandafter\let\csname last\itf@tp anchor\endcsname\relax
1229   }%
1230 \AtBeginDocument{\ifundef\chapter{}
1231   {\let\lastchaptertitle\relax
1232     \let\lastchaptertoc\relax
1233     \let\lastchapterbookmark\relax
1234     \let\lastchapteranchor\relax}%
1235 }%

1236 </hypbmsec>

```

## 21.9 Interface `fancyhdr` : `\pagesetup`

```

1237 < *fancyhdr>
1238 \ProvidesPackage{interfaces-fancyhdr}
1239   [2011/01/19 v2.9 pgfkeys macros for fancyhdr (FC)]
1240 \RequirePackage{interfaces-base}
1241 \itf@Check@Package{fancyhdr}
1242 \robustify\fancyhf
1243 \robustify\fancyhfoffset

```

### 21.9.1 `\pagesetup`

`\pagesetup`

```

1244 \newrobustcmd*\pagesetup{%
1245   \let\fancy@gb1\relax % Just in case...
1246   \@ifstar
1247     {\itf@pagesetup{}}
1248     {\itf@pagesetup{reset,}}%
1249 }% \pagesetup
1250 \def\itf@pagesetup#1{\@testopt
1251   {\itf@pagesetup{#1}}}%
1252 }% \itf@pagesetup
1253 \def\itf@pagesetup#1[#2]#3{\ifblank{#2}
1254   {% modifies the current page style
1255     \itf@pgfkeys\pgfqkeys{/itf/fancyhdr}{#1#3}\relax\ps@@fancy}%
1256   {% defines or modifies a given page style
1257     \ifblank{#1}
1258       \csappto% star form: keep existing value (if not overwritten)
1259       \csdef% no star form: overwrite (+ reset at \pagestyle time)
1260       {\ps@#2}{\itf@pgfkeys\pgfqkeys{/itf/fancyhdr}{#1#3}\relax\ps@@fancy}%
1261   }%
1262 }% \itf@pagesetup
1263 \pgfqkeys{/itf/pagesetup}{%
1264   @current/.is private=interfaces-fancyhdr,%
1265   @style/.is private=interfaces-fancyhdr,%
1266 }

```

`\pagestyle`

```

1267 \renewrobustcmd*\pagestyle[1]{\ifcsundef{ps@#1}

```

```

1268   {\itf@undefinedpagestyle{#1}}
1269   {\csname ps@#1\endcsname}%
1270 }% \pagestyle

```

`\thispagestyle`

```

1271 \renewrobustcmd*\thispagestyle[1]{\ifcsundef{ps@#1}
1272   {\itf@undefinedpagestyle{#1}}
1273   {\global\@specialpagetrue\gdef\@specialstyle{#1}}}%
1274 }% \thispagestyle
1275 \newcommand*\itf@undefinedpagestyle[1]{%
1276   \@latex@error{Undefined page style: #1
1277   \MessageBreak your command will be ignored}\@eha
1278 }% \itf@undefinedpagestyle

```

## 21.9.2 Keys for `\pagesetup`

```

1279 \pgfkeys{%
1280   /handlers/.fancy@hf/.code=%
1281   \edef\itf@tp{\pgfkeyscurrentpath}%
1282   \pgfkeysalso{\pgfkeyscurrentpath/.store as code}%
1283   \pgfkeysalso{\pgfkeyscurrentpath/.append code/.expanded=%
1284     \csdef{f@ncy#1}{%
1285       \noexpand\pgfkeysvalueof{\itf@tp/font}
1286       \noexpand\pgfkeysvalueof{\itf@tp}\noexpand\strut}},%
1287 }% handler for fancyhdr interface
1288 \pgfqkeys{/itf/fancyhdr}{% keys for \pagesetup
1289   code/.code={#1},% execution at expansion of \ps@... => \pgfqkeys{...,code={...},...}
1290   pagestyle/.style={code=\pagestyle{#1}},%
1291   page style/.alias=pagestyle,%
1292   load style/.alias=pagestyle,%
1293   head/rule/.store as dimen in cs=headrulewidth,%
1294   head/rule/.default=.4pt,%
1295   head/rule/.blank=\z@,%
1296   head/rulewidth/.alias*=head/rule,%
1297   headrulewidth/.alias*=head/rule,%
1298   head/rule/width/.alias*=head/rule,%
1299   head/rule/font/.store as code,%
1300   head/rule/color/.style={head/rule/font+=\color{#1}},%
1301   headruler/.code=%
1302     \let\headrule\pgfkeyscurrentvalue
1303     \ifx\headrule\@empty\else
1304       \preto\headrule{\bgroup\pgfkeysvalueof{/itf/fancyhdr/head/rule/font}}%
1305       \appto\headrule{\egroup}%
1306     \fi,%
1307   headruler/.default=%
1308     \if@fancyplain\let\headrulewidth\plainheadrulewidth\fi
1309     \hrule\@height\headrulewidth \@width\headwidth
1310     \vskip-\headrulewidth\relax,%
1311   headrule/.alias=headruler,%
1312   headrule,% sets default
1313   foot/rule/.store as dimen in cs=footrulewidth,%
1314   foot/rule/.default=.4pt,%
1315   foot/rule/.blank=\z@,%
1316   foot/rulewidth/.alias*=foot/rule,%
1317   footrulewidth/.alias*=foot/rule,%
1318   foot/rule/width/.alias*=foot/rule,%
1319   foot/rule/font/.store as code,%
1320   foot/rule/color/.style={foot/rule/font+=\color{#1}},%
1321   footruler/.code=%
1322     \let\footrule\pgfkeyscurrentvalue
1323     \ifx\footrule\@empty\else
1324       \preto\footrule{\bgroup\pgfkeysvalueof{/itf/fancyhdr/head/rule/font}}%
1325       \appto\footrule{\egroup}

```

```

1326 \fi,%
1327 footruler/.default=%
1328 \if@fancyplain\let\footrulewidth\plainfootrulewidth\fi
1329 \vskip-2\footrulewidth
1330 \hrule\@height\footrulewidth \@width\headwidth\vskip\footrulewidth,%
1331 footrule/.alias=footruler,%
1332 footrule,% sets default
1333 rule/.style={head/rule={#1},foot/rule={#1}},%
1334 rule+/.style={head/rule+={#1},foot/rule+={#1}},%
1335 rule-/.style={head/rule-={#1},foot/rule-={#1}},%
1336 rule*/.style={head/rule*={#1},foot/rule*={#1}},%
1337 rules/.alias*=rule,rulewidth/.alias*=rule,%
1338 rule/width/.alias*=rule,rules/width/.alias*=rule,%
1339 norule/.style={rule=\z@},%
1340 norule/.value forbidden,%
1341 norules/.alias=norule,%
1342 rule/font/.style={head/rule/font={#1},foot/rule/font={#1}},%
1343 rule/font+/.style={head/rule/font+={#1},foot/rule/font+={#1}},%
1344 rule/font*/.alias=rule/font+,%
1345 rules/font/.alias=rule/font,%
1346 rules/font+/.alias=rule/font+,%
1347 rules/font*/.alias=rule/font+,%
1348 rule/color/.style={head/rule/color={#1},foot/rule/color={#1}},%
1349 rules/color/.alias=rule/color,%
1350 foot/rule/skip/.estore as glue in cs=footruleskip,%
1351 foot/rule/skip/.default=.3\normalbaselineskip,%
1352 foot/rule/skip/.blank=\z@,%
1353 foot/ruleskip/.alias*=foot/rule/skip,%
1354 footruleskip/.alias*=foot/rule/skip,%
1355 font/.style={head/font={#1},foot/font={#1}},%
1356 font+/.style={head/font+={#1},foot/font+={#1}},%
1357 font*/.alias=font+,%
1358 color/.style={head/color={#1},foot/color={#1}},%
1359 head/rule/color={#1},foot/rule/color={#1}},%
1360 head/.style={head/left={#1},head/center={#1},head/right={#1}},%
1361 head+/.style={head/left+={#1},head/center+={#1},head/right+={#1}},%
1362 head*/.alias=head+,%
1363 head/font/.style={head/left/font={#1},head/center/font={#1},head/right/font={#1}},%
1364 head/font+/.style={head/left/font+={#1},head/center/font+={#1},head/right/font+={#1}},%
1365 head/font*/.alias=head/font+,%
1366 head/color/.style={head/left/color={#1},head/center/color={#1},head/right/color={#1}},%
1367 head/rule/color={#1}},%
1368 nohead/.style={head=,head/font=,head/rule=,head/rule/font=},%
1369 foot/.style={foot/left={#1},foot/center={#1},foot/right={#1}},%
1370 foot+/.style={foot/left+={#1},foot/center+={#1},foot/right+={#1}},%
1371 foot*/.alias=foot+,%
1372 foot/font/.style={foot/left/font={#1},foot/center/font={#1},foot/right/font={#1}},%
1373 foot/font+/.style={foot/left/font+={#1},foot/center/font+={#1},foot/right/font+={#1}},%
1374 foot/font*/.alias=foot/font+,%
1375 foot/color/.style={foot/left/color={#1},foot/center/color={#1},foot/right/color={#1}},%
1376 foot/rule/color={#1}},%
1377 nofoot/.style={foot=,foot/font=,foot/rule=,foot/rule/font=},%
1378 left/.style={head/left={#1},foot/left={#1}},%
1379 left+/.style={head/left+={#1},foot/left+={#1}},%
1380 left*/.alias=left+,%
1381 left/font/.style={head/left/font={#1},foot/left/font={#1}},%
1382 left/font+/.style={head/left/font+={#1},foot/left/font+={#1}},%
1383 left/font*/.alias=left/font+,%
1384 left/color/.style={head/left/color={#1},foot/left/color={#1}},%
1385 center/.style={head/center={#1},foot/center={#1}},%
1386 center+/.style={head/center+={#1},foot/center+={#1}},%
1387 center*/.alias=center+,%
1388 center/font/.style={head/center/font={#1},foot/center/font={#1}},%
1389 center/font+/.style={head/center/font+={#1},foot/center/font+={#1}},%
1390 center/font*/.alias=center/font+,%

```

```

1391     center/color/.style={head/center/color={#1},foot/center/color={#1}},%
1392 right/.style={head/right={#1},foot/right={#1}},%
1393 right+/.style={head/right+={#1},foot/right+={#1}},%
1394 right*/.alias=right+,%
1395     right/font/.style={head/right/font={#1},foot/right/font={#1}},%
1396     right/font+/.style={head/right/font+={#1},foot/right/font+={#1}},%
1397     right/font*/.alias=right/font+,%
1398     right/color/.style={head/right/color={#1},foot/right/color={#1}},%
1399 head/left/.style={head/left/even={#1},head/left/odd={#1}},%
1400 head/left+/.style={head/left/even+={#1},head/left/odd+={#1}},%
1401 head/left*/.alias=head/left+,%
1402     head/left/font/.style={head/left/even/font={#1},head/left/odd/font={#1}},%
1403     head/left/font+/.style={head/left/even/font+={#1},head/left/odd/font+={#1}},%
1404     head/left/font*/.alias=head/left/font+,%
1405     head/left/color/.style={head/left/even/color={#1},head/left/odd/color={#1}},%
1406     left/head/.alias*=head/left,%
1407     left/head/font/.alias*=head/left/font,%
1408     left/head/color/.alias=head/left/color,%
1409 head/center/.style={head/center/even={#1},head/center/odd={#1}},%
1410 head/center+/.style={head/center/even+={#1},head/center/odd+={#1}},%
1411 head/center*/.alias=head/center+,%
1412     head/center/font/.style={head/center/even/font={#1},head/center/odd/font={#1}},%
1413     head/center/font+/.style={head/center/even/font+={#1},head/center/odd/font+={#1}},%
1414     head/center/font*/.alias=head/center/font+,%
1415     head/center/color/.style={head/center/even/color={#1},head/center/odd/color={#1}},%
1416     center/head/.alias*=head/center,%
1417     center/head/font/.alias*=head/center/font,%
1418     center/head/color/.alias=head/center/color,%
1419 head/right/.style={head/right/even={#1},head/right/odd={#1}},%
1420 head/right+/.style={head/right/even+={#1},head/right/odd+={#1}},%
1421 head/right*/.alias=head/right+,%
1422     head/right/font/.style={head/right/even/font={#1},head/right/odd/font={#1}},%
1423     head/right/font+/.style={head/right/even/font+={#1},head/right/odd/font+={#1}},%
1424     head/right/font*/.alias=head/right/font+,%
1425     head/right/color/.style={head/right/even/color={#1},head/right/odd/color={#1}},%
1426     right/head/.alias*=head/right,%
1427     right/head/font/.alias*=head/right/font,%
1428     right/head/color/.alias=head/right/color,%
1429 foot/left/.style={foot/left/even={#1},foot/left/odd={#1}},%
1430 foot/left+/.style={foot/left/even+={#1},foot/left/odd+={#1}},%
1431 foot/left*/.alias=foot/left+,%
1432     foot/left/font/.style={foot/left/even/font={#1},foot/left/odd/font={#1}},%
1433     foot/left/font+/.style={foot/left/even/font+={#1},foot/left/odd/font+={#1}},%
1434     foot/left/font*/.alias=foot/left/font+,%
1435     foot/left/color/.style={foot/left/even/color={#1},foot/left/odd/color={#1}},%
1436     left/foot/.alias*=foot/left,%
1437     left/foot/font/.alias*=foot/left/font,%
1438     left/foot/color/.alias=foot/left/color,%
1439 foot/center/.style={foot/center/even={#1},foot/center/odd={#1}},%
1440 foot/center+/.style={foot/center/even+={#1},foot/center/odd+={#1}},%
1441 foot/center*/.alias=foot/center,%
1442     foot/center/font/.style={foot/center/even/font={#1},foot/center/odd/font={#1}},%
1443     foot/center/font+/.style={foot/center/even/font+={#1},foot/center/odd/font+={#1}},%
1444     foot/center/font*/.alias=foot/center/font+,%
1445     foot/center/color/.style={foot/center/even/color={#1},foot/center/odd/color={#1}},%
1446     center/foot/.alias*=foot/center,%
1447     center/foot/font/.alias*=foot/center/font,%
1448     center/foot/color/.alias=foot/center/color,%
1449 foot/right/.style={foot/right/even={#1},foot/right/odd={#1}},%
1450 foot/right+/.style={foot/right/even+={#1},foot/right/odd+={#1}},%
1451 foot/right*/.alias=foot/right+,%
1452     foot/right/font/.style={foot/right/even/font={#1},foot/right/odd/font={#1}},%
1453     foot/right/font+/.style={foot/right/even/font+={#1},foot/right/odd/font+={#1}},%
1454     foot/right/font*/.alias=foot/right/font+,%
1455     foot/right/color/.style={foot/right/even/color={#1},foot/right/odd/color={#1}},%

```

```

1456         right/foot/.alias*=foot/right,%
1457         right/foot/font/.alias*=foot/right/font,%
1458         right/foot/color/.alias=foot/right/color,%
1459     head/left/odd/.fancy@hf=olh,%
1460     head/left/odd/font/.store as code,%
1461     head/left/odd/color/.style={head/left/odd/font+=\color{#1}},%
1462         head/odd/left/.alias*=head/left/odd,%
1463         odd/head/left/.alias*=head/left/odd,%
1464         odd/left/head/.alias*=head/left/odd,%
1465         left/odd/head/.alias*=head/left/odd,%
1466         left/head/odd/.alias*=head/left/odd,%
1467         head/odd/left/font/.alias*=head/left/odd/font,%
1468         odd/head/left/font/.alias*=head/left/odd/font,%
1469         odd/left/head/font/.alias*=head/left/odd/font,%
1470         left/odd/head/font/.alias*=head/left/odd/font,%
1471         left/head/odd/font/.alias*=head/left/odd/font,%
1472         head/odd/left/color/.alias=head/left/odd/color,%
1473         odd/head/left/color/.alias=head/left/odd/color,%
1474         odd/left/head/color/.alias=head/left/odd/color,%
1475         left/odd/head/color/.alias=head/left/odd/color,%
1476         left/head/odd/color/.alias=head/left/odd/color,%
1477     head/center/odd/.fancy@hf=och,%
1478     head/center/odd/font/.store as code,%
1479     head/center/odd/color/.style={head/center/odd/font+=\color{#1}},%
1480         head/odd/center/.alias*=head/center/odd,%
1481         odd/head/center/.alias*=head/center/odd,%
1482         odd/center/head/.alias*=head/center/odd,%
1483         center/odd/head/.alias*=head/center/odd,%
1484         center/head/odd/.alias*=head/center/odd,%
1485         head/odd/center/font/.alias*=head/center/odd/font,%
1486         odd/head/center/font/.alias*=head/center/odd/font,%
1487         odd/center/head/font/.alias*=head/center/odd/font,%
1488         center/odd/head/font/.alias*=head/center/odd/font,%
1489         center/head/odd/font/.alias*=head/center/odd/font,%
1490         head/odd/center/color/.alias=head/center/odd/color,%
1491         odd/head/center/color/.alias=head/center/odd/color,%
1492         odd/center/head/color/.alias=head/center/odd/color,%
1493         center/odd/head/color/.alias=head/center/odd/color,%
1494         center/head/odd/color/.alias=head/center/odd/color,%
1495     head/right/odd/.fancy@hf=orh,%
1496     head/right/odd/font/.store as code,%
1497     head/right/odd/color/.style={head/right/odd/font+=\color{#1}},%
1498         head/odd/right/.alias*=head/right/odd,%
1499         odd/head/right/.alias*=head/right/odd,%
1500         odd/right/head/.alias*=head/right/odd,%
1501         right/odd/head/.alias*=head/right/odd,%
1502         right/head/odd/.alias*=head/right/odd,%
1503         head/odd/right/font/.alias*=head/right/odd/font,%
1504         odd/head/right/font/.alias*=head/right/odd/font,%
1505         odd/right/head/font/.alias*=head/right/odd/font,%
1506         right/odd/head/font/.alias*=head/right/odd/font,%
1507         right/head/odd/font/.alias*=head/right/odd/font,%
1508         head/odd/right/color/.alias=head/right/odd/color,%
1509         odd/head/right/color/.alias=head/right/odd/color,%
1510         odd/right/head/color/.alias=head/right/odd/color,%
1511         right/odd/head/color/.alias=head/right/odd/color,%
1512         right/head/odd/color/.alias=head/right/odd/color,%
1513     head/left/even/.fancy@hf=elh,%
1514     head/left/even/font/.store as code,%
1515     head/left/even/color/.style={head/left/even/font+=\color{#1}},%
1516         head/even/left/.alias*=head/left/even,%
1517         even/head/left/.alias*=head/left/even,%
1518         even/left/head/.alias*=head/left/even,%
1519         left/even/head/.alias*=head/left/even,%
1520         left/head/even/.alias*=head/left/even,%

```



```

1521         head/even/left/font/.alias*=head/left/even/font,%
1522         even/head/left/font/.alias*=head/left/even/font,%
1523         even/left/head/font/.alias*=head/left/even/font,%
1524         left/even/head/font/.alias*=head/left/even/font,%
1525         left/head/even/font/.alias*=head/left/even/font,%
1526         head/even/left/color/.alias=head/left/even/color,%
1527         even/head/left/color/.alias=head/left/even/color,%
1528         even/left/head/color/.alias=head/left/even/color,%
1529         left/even/head/color/.alias=head/left/even/color,%
1530         left/head/even/color/.alias=head/left/even/color,%
1531     head/center/even/.fancy@hf=ech,%
1532     head/center/even/font/.store as code,%
1533     head/center/even/color/.style={head/center/even/font+=\color{#1}},%
1534         head/even/center/.alias*=head/center/even,%
1535         even/head/center/.alias*=head/center/even,%
1536         even/center/head/.alias*=head/center/even,%
1537         center/even/head/.alias*=head/center/even,%
1538         center/head/even/.alias*=head/center/even,%
1539         head/even/center/font/.alias*=head/center/even/font,%
1540         even/head/center/font/.alias*=head/center/even/font,%
1541         even/center/head/font/.alias*=head/center/even/font,%
1542         center/even/head/font/.alias*=head/center/even/font,%
1543         center/head/even/font/.alias*=head/center/even/font,%
1544         head/even/center/color/.alias=head/center/even/color,%
1545         even/head/center/color/.alias=head/center/even/color,%
1546         even/center/head/color/.alias=head/center/even/color,%
1547         center/even/head/color/.alias=head/center/even/color,%
1548         center/head/even/color/.alias=head/center/even/color,%
1549     head/right/even/.fancy@hf=erh,%
1550     head/right/even/font/.store as code,%
1551     head/right/even/color/.style={head/right/even/font+=\color{#1}},%
1552         head/even/right/.alias*=head/right/even,%
1553         even/head/right/.alias*=head/right/even,%
1554         even/right/head/.alias*=head/right/even,%
1555         right/even/head/.alias*=head/right/even,%
1556         right/head/even/.alias*=head/right/even,%
1557         head/even/right/font/.alias*=head/right/even/font,%
1558         even/head/right/font/.alias*=head/right/even/font,%
1559         even/right/head/font/.alias*=head/right/even/font,%
1560         right/even/head/font/.alias*=head/right/even/font,%
1561         right/head/even/font/.alias*=head/right/even/font,%
1562         head/even/right/color/.alias=head/right/even/color,%
1563         even/head/right/color/.alias=head/right/even/color,%
1564         even/right/head/color/.alias=head/right/even/color,%
1565         right/even/head/color/.alias=head/right/even/color,%
1566         right/head/even/color/.alias=head/right/even/color,%
1567     foot/left/odd/.fancy@hf=olf,%
1568     foot/left/odd/font/.store as code,%
1569     foot/left/odd/color/.style={foot/left/odd/font+=\color{#1}},%
1570         foot/odd/left/.alias*=foot/left/odd,%
1571         odd/foot/left/.alias*=foot/left/odd,%
1572         odd/left/foot/.alias*=foot/left/odd,%
1573         left/odd/foot/.alias*=foot/left/odd,%
1574         left/foot/odd/.alias*=foot/left/odd,%
1575         foot/odd/left/font/.alias*=foot/left/odd/font,%
1576         odd/foot/left/font/.alias*=foot/left/odd/font,%
1577         odd/left/foot/font/.alias*=foot/left/odd/font,%
1578         left/odd/foot/font/.alias*=foot/left/odd/font,%
1579         left/foot/odd/font/.alias*=foot/left/odd/font,%
1580         foot/odd/left/color/.alias=foot/left/odd/color,%
1581         odd/foot/left/color/.alias=foot/left/odd/color,%
1582         odd/left/foot/color/.alias=foot/left/odd/color,%
1583         left/odd/foot/color/.alias=foot/left/odd/color,%
1584         left/foot/odd/color/.alias=foot/left/odd/color,%
1585     foot/center/odd/.fancy@hf=ocf,%

```

```

1586 foot/center/odd/font/.store as code,%
1587 foot/center/odd/color/.style={foot/center/odd/font+=\color{#1}},%
1588 foot/odd/center/.alias*=foot/center/odd,%
1589 odd/foot/center/.alias*=foot/center/odd,%
1590 odd/center/foot/.alias*=foot/center/odd,%
1591 center/odd/foot/.alias*=foot/center/odd,%
1592 center/foot/odd/.alias*=foot/center/odd,%
1593 foot/odd/center/font/.alias*=foot/center/odd/font,%
1594 odd/foot/center/font/.alias*=foot/center/odd/font,%
1595 odd/center/foot/font/.alias*=foot/center/odd/font,%
1596 center/odd/foot/font/.alias*=foot/center/odd/font,%
1597 center/foot/odd/font/.alias*=foot/center/odd/font,%
1598 foot/odd/center/color/.alias*=foot/center/odd/color,%
1599 odd/foot/center/color/.alias*=foot/center/odd/color,%
1600 odd/center/foot/color/.alias*=foot/center/odd/color,%
1601 center/odd/foot/color/.alias*=foot/center/odd/color,%
1602 center/foot/odd/color/.alias*=foot/center/odd/color,%
1603 foot/right/odd/.fancy@hf=orf,%
1604 foot/right/odd/font/.store as code,%
1605 foot/right/odd/color/.style={foot/right/odd/font+=\color{#1}},%
1606 foot/odd/right/.alias*=foot/right/odd,%
1607 odd/foot/right/.alias*=foot/right/odd,%
1608 odd/right/foot/.alias*=foot/right/odd,%
1609 right/odd/foot/.alias*=foot/right/odd,%
1610 right/foot/odd/.alias*=foot/right/odd,%
1611 foot/odd/right/font/.alias*=foot/right/odd/font,%
1612 odd/foot/right/font/.alias*=foot/right/odd/font,%
1613 odd/right/foot/font/.alias*=foot/right/odd/font,%
1614 right/odd/foot/font/.alias*=foot/right/odd/font,%
1615 right/foot/odd/font/.alias*=foot/right/odd/font,%
1616 foot/odd/right/color/.alias*=foot/right/odd/color,%
1617 odd/foot/right/color/.alias*=foot/right/odd/color,%
1618 odd/right/foot/color/.alias*=foot/right/odd/color,%
1619 right/odd/foot/color/.alias*=foot/right/odd/color,%
1620 right/foot/odd/color/.alias*=foot/right/odd/color,%
1621 foot/left/even/.fancy@hf=elf,%
1622 foot/left/even/font/.store as code,%
1623 foot/left/even/color/.style={foot/left/even/font+=\color{#1}},%
1624 foot/even/left/.alias*=foot/left/even,%
1625 even/foot/left/.alias*=foot/left/even,%
1626 even/left/foot/.alias*=foot/left/even,%
1627 left/even/foot/.alias*=foot/left/even,%
1628 left/foot/even/.alias*=foot/left/even,%
1629 foot/even/left/font/.alias*=foot/left/even/font,%
1630 even/foot/left/font/.alias*=foot/left/even/font,%
1631 even/left/foot/font/.alias*=foot/left/even/font,%
1632 left/even/foot/font/.alias*=foot/left/even/font,%
1633 left/foot/even/font/.alias*=foot/left/even/font,%
1634 foot/even/left/color/.alias*=foot/left/even/color,%
1635 even/foot/left/color/.alias*=foot/left/even/color,%
1636 even/left/foot/color/.alias*=foot/left/even/color,%
1637 left/even/foot/color/.alias*=foot/left/even/color,%
1638 left/foot/even/color/.alias*=foot/left/even/color,%
1639 foot/center/even/.fancy@hf=ecf,%
1640 foot/center/even/font/.store as code,%
1641 foot/center/even/color/.style={foot/center/even/font+=\color{#1}},%
1642 foot/even/center/.alias*=foot/center/even,%
1643 even/foot/center/.alias*=foot/center/even,%
1644 even/center/foot/.alias*=foot/center/even,%
1645 center/even/foot/.alias*=foot/center/even,%
1646 center/foot/even/.alias*=foot/center/even,%
1647 foot/even/center/font/.alias*=foot/center/even/font,%
1648 even/foot/center/font/.alias*=foot/center/even/font,%
1649 even/center/foot/font/.alias*=foot/center/even/font,%
1650 center/even/foot/font/.alias*=foot/center/even/font,%

```



```

1651         center/foot/even/font/.alias*=foot/center/even/font,%
1652         foot/even/center/color/.alias=foot/center/even/color,%
1653         even/foot/center/color/.alias=foot/center/even/color,%
1654         even/center/foot/color/.alias=foot/center/even/color,%
1655         center/even/foot/color/.alias=foot/center/even/color,%
1656         center/foot/even/color/.alias=foot/center/even/color,%
1657     foot/right/even/.fancy@hf=erf,%
1658     foot/right/even/font/.store as code,%
1659     foot/right/even/color/.style={foot/right/even/font+=\color{#1}},%
1660         foot/even/right/.alias*=foot/right/even,%
1661         even/foot/right/.alias*=foot/right/even,%
1662         even/right/foot/.alias*=foot/right/even,%
1663         right/even/foot/.alias*=foot/right/even,%
1664         right/foot/even/.alias*=foot/right/even,%
1665         foot/even/right/font/.alias*=foot/right/even/font,%
1666         even/foot/right/font/.alias*=foot/right/even/font,%
1667         even/right/foot/font/.alias*=foot/right/even/font,%
1668         right/even/foot/font/.alias*=foot/right/even/font,%
1669         right/foot/even/font/.alias*=foot/right/even/font,%
1670         foot/even/right/color/.alias=foot/right/even/color,%
1671         even/foot/right/color/.alias=foot/right/even/color,%
1672         even/right/foot/color/.alias=foot/right/even/color,%
1673         right/even/foot/color/.alias=foot/right/even/color,%
1674         right/foot/even/color/.alias=foot/right/even/color,%
1675     foot/inner/.style={foot/right/even={#1},foot/left/odd={#1}},%
1676     foot/inner+/.style={foot/right/even+={#1},foot/left/odd+={#1}},%
1677     foot/inner*/.alias=foot/inner+,%
1678     foot/inner/font/.style={foot/right/even/font={#1},foot/left/odd/font={#1}},%
1679     foot/inner/color/.style={foot/right/even/color={#1},foot/left/odd/color={#1}},%
1680     foot/inner/font+/.style={foot/right/even/font+={#1},foot/left/odd/font+={#1}},%
1681     foot/inner/font*/.alias=foot/inner/font+,%
1682         inner/foot/.alias*=foot/inner,%
1683         inner/foot/font/.alias*=foot/inner/font,%
1684         inner/foot/color/.alias=foot/inner/color,%
1685     foot/outer/.style={foot/left/even={#1},foot/right/odd={#1}},%
1686     foot/outer+/.style={foot/left/even+={#1},foot/right/odd+={#1}},%
1687     foot/outer*/.alias=foot/outer+,%
1688     foot/outer/font/.style={foot/left/even/font={#1},foot/right/odd/font={#1}},%
1689     foot/outer/color/.style={foot/left/even/color={#1},foot/right/odd/color={#1}},%
1690     foot/outer/font+/.style={foot/left/even/font+={#1},foot/right/odd/font+={#1}},%
1691     foot/outer/font*/.alias=foot/outer/font+,%
1692         outer/foot/.alias*=foot/outer,%
1693         outer/foot/font/.alias*=foot/outer/font,%
1694         outer/foot/color/.alias=foot/outer/color,%
1695     head/inner/.style={head/right/even={#1},head/left/odd={#1}},%
1696     head/inner+/.style={head/right/even+={#1},head/left/odd+={#1}},%
1697     head/inner*/.alias=head/inner+,%
1698     head/inner/font/.style={head/right/even/font={#1},head/left/odd/font={#1}},%
1699     head/inner/color/.style={head/right/even/color={#1},head/left/odd/color={#1}},%
1700     head/inner/font+/.style={head/right/even/font+={#1},head/left/odd/font+={#1}},%
1701     head/inner/font*/.alias=head/inner/font+,%
1702         inner/head/.alias*=head/inner,%
1703         inner/head/font/.alias*=head/inner/font,%
1704         inner/head/color/.alias=head/inner/color,%
1705     head/outer/.style={head/left/even={#1},head/right/odd={#1}},%
1706     head/outer+/.style={head/left/even+={#1},head/right/odd+={#1}},%
1707     head/outer*/.alias=head/outer+,%
1708     head/outer/font/.style={head/left/even/font={#1},head/right/odd/font={#1}},%
1709     head/outer/color/.style={head/left/even/color={#1},head/right/odd/color={#1}},%
1710     head/outer/font+/.style={head/left/even/font+={#1},head/right/odd/font+={#1}},%
1711     head/outer/font*/.alias=head/outer/font+,%
1712         outer/head/.alias*=head/outer,%
1713         outer/head/font/.alias*=head/outer/font,%
1714         outer/head/color/.alias=head/outer/color,%
1715     inner/.style={foot/inner={#1},head/inner={#1}},%

```

```

1716 inner+/.style={foot/inner+=#{1},head/inner+=#{1}},%
1717 inner*/.alias=inner+,%
1718 inner/font/.style={foot/inner/font=#{1},head/inner/font=#{1}},%
1719 inner/font+/.style={foot/inner/font+=#{1},head/inner/font+=#{1}},%
1720 inner/font*/.alias=inner/font+,%
1721 inner/color/.style={foot/inner/color=#{1},head/inner/color=#{1}},%
1722 outer/.style={foot/outer=#{1},head/outer=#{1}},%
1723 outer+/.style={foot/outer+=#{1},head/outer+=#{1}},%
1724 outer*/.alias=outer+,%
1725 outer/font/.style={foot/outer/font=#{1},head/outer/font=#{1}},%
1726 outer/font+/.style={foot/outer/font+=#{1},head/outer/font+=#{1}},%
1727 outer/font*/.alias=outer/font+,%
1728 outer/color/.style={foot/outer/color=#{1},head/outer/color=#{1}},%
1729 offset/.style={head/offset=#{1},foot/offset=#{1}},%
1730 offset+/.style={head/offset+=#{1},foot/offset+=#{1}},%
1731 offset-/.style={head/offset-=#{1},foot/offset-=#{1}},%
1732 offset*/.style={head/offset*=#{1},foot/offset*=#{1}},%
1733 head/offset/.style={head/left/offset=#{1},head/right/offset=#{1}},%
1734 head/offset+/.style={head/left/offset+=#{1},head/right/offset+=#{1}},%
1735 head/offset-/.style={head/left/offset-=#{1},head/right/offset-=#{1}},%
1736 head/offset*/.style={head/left/offset*=#{1},head/right/offset*=#{1}},%
1737 offset/head/.alias*=head/offset,%
1738 foot/offset/.style={foot/left/offset=#{1},foot/right/offset=#{1}},%
1739 foot/offset+/.style={foot/left/offset+=#{1},foot/right/offset+=#{1}},%
1740 foot/offset-/.style={foot/left/offset-=#{1},foot/right/offset-=#{1}},%
1741 foot/offset*/.style={foot/left/offset*=#{1},foot/right/offset*=#{1}},%
1742 offset/foot/.alias*=foot/offset,%
1743 odd/offset/.style={left/odd/offset=#{1},right/odd/offset=#{1}},%
1744 odd/offset+/.style={left/odd/offset+=#{1},right/odd/offset+=#{1}},%
1745 odd/offset-/.style={left/odd/offset-=#{1},right/odd/offset-=#{1}},%
1746 offset/odd/.alias*=odd/offset,%
1747 even/offset/.style={left/even/offset=#{1},right/even/offset=#{1}},%
1748 even/offset+/.style={left/even/offset+=#{1},right/even/offset+=#{1}},%
1749 even/offset-/.style={left/even/offset-=#{1},right/even/offset-=#{1}},%
1750 offset/even/.alias*=even/offset,%
1751 left/offset/.style={foot/left/offset=#{1},head/left/offset=#{1}},%
1752 left/offset+/.style={foot/left/offset+=#{1},head/left/offset+=#{1}},%
1753 left/offset-/.style={foot/left/offset-=#{1},head/left/offset-=#{1}},%
1754 left/offset*/.style={foot/left/offset*=#{1},head/left/offset*=#{1}},%
1755 offset/left/.alias*=left/offset,%
1756 left/even/offset/.style={foot/left/even/offset=#{1},head/left/even/offset=#{1}},%
1757 left/even/offset+/.style={foot/left/even/offset+=#{1},head/left/even/offset+=#{1}},%
1758 left/even/offset-/.style={foot/left/even/offset-=#{1},head/left/even/offset-=#{1}},%
1759 left/even/offset*/.style={foot/left/even/offset*=#{1},head/left/even/offset*=#{1}},%
1760 left/offset/even/.alias*=left/even/offset,%
1761 even/left/offset/.alias*=left/even/offset,%
1762 even/offset/left/.alias*=left/even/offset,%
1763 offset/even/left/.alias*=left/even/offset,%
1764 offset/left/even/.alias*=left/even/offset,%
1765 left/odd/offset/.style={foot/left/odd/offset=#{1},head/left/odd/offset=#{1}},%
1766 left/odd/offset+/.style={foot/left/odd/offset+=#{1},head/left/odd/offset+=#{1}},%
1767 left/odd/offset-/.style={foot/left/odd/offset-=#{1},head/left/odd/offset-=#{1}},%
1768 left/odd/offset*/.style={foot/left/odd/offset*=#{1},head/left/odd/offset*=#{1}},%
1769 left/offset/odd/.alias*=left/odd/offset,%
1770 odd/left/offset/.alias*=left/odd/offset,%
1771 odd/offset/left/.alias*=left/odd/offset,%
1772 offset/odd/left/.alias*=left/odd/offset,%
1773 offset/left/odd/.alias*=left/odd/offset,%
1774 right/offset/.style={foot/right/offset=#{1},head/right/offset=#{1}},%
1775 right/offset+/.style={foot/right/offset+=#{1},head/right/offset+=#{1}},%
1776 right/offset-/.style={foot/right/offset-=#{1},head/right/offset-=#{1}},%
1777 right/offset*/.style={foot/right/offset*=#{1},head/right/offset*=#{1}},%
1778 offset/right/.alias*=right/offset,%
1779 right/even/offset/.style={foot/right/even/offset=#{1},head/right/even/offset=#{1}},%
1780 right/even/offset+/.style={foot/right/even/offset+=#{1},head/right/even/offset+=#{1}},%

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1781 right/even/offset/.style={foot/right/even/offset={#1},head/right/even/offset={#1}},%
1782 right/even/offset*/.style={foot/right/even/offset*={#1},head/right/even/offset*={#1}},%
1783 right/offset/even/.alias*=right/even/offset,%
1784 even/right/offset/.alias*=right/even/offset,%
1785 even/offset/right/.alias*=right/even/offset,%
1786 offset/even/right/.alias*=right/even/offset,%
1787 offset/right/even/.alias*=right/even/offset,%
1788 right/odd/offset/.style={foot/right/odd/offset={#1},head/right/odd/offset={#1}},%
1789 right/odd/offset+/.style={foot/right/odd/offset+={#1},head/right/odd/offset+={#1}},%
1790 right/odd/offset-/.style={foot/right/odd/offset-={#1},head/right/odd/offset-={#1}},%
1791 right/odd/offset*/.style={foot/right/odd/offset*={#1},head/right/odd/offset*={#1}},%
1792 right/offset/odd/.alias*=right/odd/offset,%
1793 odd/right/offset/.alias*=right/odd/offset,%
1794 odd/offset/right/.alias*=right/odd/offset,%
1795 offset/odd/right/.alias*=right/odd/offset,%
1796 offset/right/odd/.alias*=right/odd/offset,%
1797 head/left/offset/.style={head/left/even/offset={#1},head/left/odd/offset={#1}},%
1798 head/left/offset+/.style={head/left/even/offset+={#1},head/left/odd/offset+={#1}},%
1799 head/left/offset-/.style={head/left/even/offset-={#1},head/left/odd/offset-={#1}},%
1800 head/left/offset*/.style={head/left/even/offset*={#1},head/left/odd/offset*={#1}},%
1801 head/offset/left/.alias*=head/left/offset,%
1802 left/head/offset/.alias*=head/left/offset,%
1803 left/offset/head/.alias*=head/left/offset,%
1804 offset/head/left/.alias*=head/left/offset,%
1805 offset/left/head/.alias*=head/left/offset,%
1806 head/right/offset/.style={head/right/even/offset={#1},head/right/odd/offset={#1}},%
1807 head/right/offset+/.style={head/right/even/offset+={#1},head/right/odd/offset+={#1}},%
1808 head/right/offset-/.style={head/right/even/offset-={#1},head/right/odd/offset-={#1}},%
1809 head/right/offset*/.style={head/right/even/offset*={#1},head/right/odd/offset*={#1}},%
1810 head/offset/right/.alias*=head/right/offset,%
1811 right/head/offset/.alias*=head/right/offset,%
1812 right/offset/head/.alias*=head/right/offset,%
1813 offset/head/right/.alias*=head/right/offset,%
1814 offset/right/head/.alias*=head/right/offset,%
1815 foot/left/offset/.style={foot/left/even/offset={#1},foot/left/odd/offset={#1}},%
1816 foot/left/offset+/.style={foot/left/even/offset+={#1},foot/left/odd/offset+={#1}},%
1817 foot/left/offset-/.style={foot/left/even/offset-={#1},foot/left/odd/offset-={#1}},%
1818 foot/left/offset*/.style={foot/left/even/offset*={#1},foot/left/odd/offset*={#1}},%
1819 foot/offset/left/.alias*=foot/left/offset,%
1820 left/foot/offset/.alias*=foot/left/offset,%
1821 left/offset/foot/.alias*=foot/left/offset,%
1822 offset/foot/left/.alias*=foot/left/offset,%
1823 offset/left/foot/.alias*=foot/left/offset,%
1824 foot/right/offset/.style={foot/right/even/offset={#1},foot/right/odd/offset={#1}},%
1825 foot/right/offset+/.style={foot/right/even/offset+={#1},foot/right/odd/offset+={#1}},%
1826 foot/right/offset-/.style={foot/right/even/offset-={#1},foot/right/odd/offset-={#1}},%
1827 foot/right/offset*/.style={foot/right/even/offset*={#1},foot/right/odd/offset*={#1}},%
1828 foot/offset/right/.alias*=foot/right/offset,%
1829 right/foot/offset/.alias*=foot/right/offset,%
1830 right/offset/foot/.alias*=foot/right/offset,%
1831 offset/foot/right/.alias*=foot/right/offset,%
1832 offset/right/foot/.alias*=foot/right/offset,%
1833 head/left/even/offset/.store in skip cs=fancy0@elh,%
1834 head/left/even/offset/.append code=\fancy@setoffs,%
1835 head/even/offset/left/.alias*=head/left/even/offset,%
1836 head/even/left/offset/.alias*=head/left/even/offset,%
1837 head/offset/even/left/.alias*=head/left/even/offset,%
1838 head/offset/left/even/.alias*=head/left/even/offset,%
1839 head/left/offset/even/.alias*=head/left/even/offset,%
1840 left/head/offset/even/.alias*=head/left/even/offset,%
1841 left/head/even/offset/.alias*=head/left/even/offset,%
1842 left/offset/head/even/.alias*=head/left/even/offset,%
1843 left/offset/even/head/.alias*=head/left/even/offset,%
1844 left/even/offset/head/.alias*=head/left/even/offset,%
1845 left/even/head/offset/.alias*=head/left/even/offset,%

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1846      even/head/offset/left/.alias*=head/left/even/offset,%
1847      even/head/left/offset/.alias*=head/left/even/offset,%
1848      even/offset/head/left/.alias*=head/left/even/offset,%
1849      even/offset/left/head/.alias*=head/left/even/offset,%
1850      even/left/offset/head/.alias*=head/left/even/offset,%
1851      even/left/head/offset/.alias*=head/left/even/offset,%
1852      offset/head/left/even/.alias*=head/left/even/offset,%
1853      offset/head/even/left/.alias*=head/left/even/offset,%
1854      offset/left/head/even/.alias*=head/left/even/offset,%
1855      offset/left/even/head/.alias*=head/left/even/offset,%
1856      offset/even/left/head/.alias*=head/left/even/offset,%
1857      offset/even/head/left/.alias*=head/left/even/offset,%
1858      head/left/odd/offset/.store in skip cs=fancy0@olh,%
1859      head/left/odd/offset/.append code=\fancy@setoffs,%
1860      head/odd/offset/left/.alias*=head/left/odd/offset,%
1861      head/odd/left/offset/.alias*=head/left/odd/offset,%
1862      head/offset/odd/left/.alias*=head/left/odd/offset,%
1863      head/offset/left/odd/.alias*=head/left/odd/offset,%
1864      head/left/offset/odd/.alias*=head/left/odd/offset,%
1865      left/head/offset/odd/.alias*=head/left/odd/offset,%
1866      left/head/odd/offset/.alias*=head/left/odd/offset,%
1867      left/offset/head/odd/.alias*=head/left/odd/offset,%
1868      left/offset/odd/head/.alias*=head/left/odd/offset,%
1869      left/odd/offset/head/.alias*=head/left/odd/offset,%
1870      left/odd/head/offset/.alias*=head/left/odd/offset,%
1871      odd/head/offset/left/.alias*=head/left/odd/offset,%
1872      odd/head/left/offset/.alias*=head/left/odd/offset,%
1873      odd/offset/head/left/.alias*=head/left/odd/offset,%
1874      odd/offset/left/head/.alias*=head/left/odd/offset,%
1875      odd/left/offset/head/.alias*=head/left/odd/offset,%
1876      odd/left/head/offset/.alias*=head/left/odd/offset,%
1877      offset/head/left/odd/.alias*=head/left/odd/offset,%
1878      offset/head/odd/left/.alias*=head/left/odd/offset,%
1879      offset/left/head/odd/.alias*=head/left/odd/offset,%
1880      offset/left/odd/head/.alias*=head/left/odd/offset,%
1881      offset/odd/left/head/.alias*=head/left/odd/offset,%
1882      offset/odd/head/left/.alias*=head/left/odd/offset,%
1883      head/right/even/offset/.store in skip cs=fancy0@erh,%
1884      head/right/even/offset/.append code=\fancy@setoffs,%
1885      head/even/offset/right/.alias*=head/right/even/offset,%
1886      head/even/right/offset/.alias*=head/right/even/offset,%
1887      head/offset/even/right/.alias*=head/right/even/offset,%
1888      head/offset/right/even/.alias*=head/right/even/offset,%
1889      head/right/offset/even/.alias*=head/right/even/offset,%
1890      right/head/offset/even/.alias*=head/right/even/offset,%
1891      right/head/even/offset/.alias*=head/right/even/offset,%
1892      right/offset/head/even/.alias*=head/right/even/offset,%
1893      right/offset/even/head/.alias*=head/right/even/offset,%
1894      right/even/offset/head/.alias*=head/right/even/offset,%
1895      right/even/head/offset/.alias*=head/right/even/offset,%
1896      even/head/offset/right/.alias*=head/right/even/offset,%
1897      even/head/right/offset/.alias*=head/right/even/offset,%
1898      even/offset/head/right/.alias*=head/right/even/offset,%
1899      even/offset/right/head/.alias*=head/right/even/offset,%
1900      even/right/offset/head/.alias*=head/right/even/offset,%
1901      even/right/head/offset/.alias*=head/right/even/offset,%
1902      offset/head/right/even/.alias*=head/right/even/offset,%
1903      offset/head/even/right/.alias*=head/right/even/offset,%
1904      offset/right/head/even/.alias*=head/right/even/offset,%
1905      offset/right/even/head/.alias*=head/right/even/offset,%
1906      offset/even/right/head/.alias*=head/right/even/offset,%
1907      offset/even/head/right/.alias*=head/right/even/offset,%
1908      head/right/odd/offset/.store in skip cs=fancy0@orh,%
1909      head/right/odd/offset/.append code=\fancy@setoffs,%
1910      head/odd/offset/right/.alias*=head/right/odd/offset,%

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1911     head/odd/right/offset/.alias*=head/right/odd/offset,%
1912     head/offset/odd/right/.alias*=head/right/odd/offset,%
1913     head/offset/right/odd/.alias*=head/right/odd/offset,%
1914     head/right/offset/odd/.alias*=head/right/odd/offset,%
1915     right/head/offset/odd/.alias*=head/right/odd/offset,%
1916     right/head/odd/offset/.alias*=head/right/odd/offset,%
1917     right/offset/head/odd/.alias*=head/right/odd/offset,%
1918     right/offset/odd/head/.alias*=head/right/odd/offset,%
1919     right/odd/offset/head/.alias*=head/right/odd/offset,%
1920     right/odd/head/offset/.alias*=head/right/odd/offset,%
1921     odd/head/offset/right/.alias*=head/right/odd/offset,%
1922     odd/head/right/offset/.alias*=head/right/odd/offset,%
1923     odd/offset/head/right/.alias*=head/right/odd/offset,%
1924     odd/offset/right/head/.alias*=head/right/odd/offset,%
1925     odd/right/offset/head/.alias*=head/right/odd/offset,%
1926     odd/right/head/offset/.alias*=head/right/odd/offset,%
1927     offset/head/right/odd/.alias*=head/right/odd/offset,%
1928     offset/head/odd/right/.alias*=head/right/odd/offset,%
1929     offset/right/head/odd/.alias*=head/right/odd/offset,%
1930     offset/right/odd/head/.alias*=head/right/odd/offset,%
1931     offset/odd/right/head/.alias*=head/right/odd/offset,%
1932     offset/odd/head/right/.alias*=head/right/odd/offset,%
1933     foot/left/even/offset/.store in skip cs=fancy0@elf,%
1934     foot/left/even/offset/.append code=\fancy@setoffs,%
1935     foot/even/offset/left/.alias*=foot/left/even/offset,%
1936     foot/even/left/offset/.alias*=foot/left/even/offset,%
1937     foot/offset/even/left/.alias*=foot/left/even/offset,%
1938     foot/offset/left/even/.alias*=foot/left/even/offset,%
1939     foot/left/offset/even/.alias*=foot/left/even/offset,%
1940     left/foot/offset/even/.alias*=foot/left/even/offset,%
1941     left/foot/even/offset/.alias*=foot/left/even/offset,%
1942     left/offset/foot/even/.alias*=foot/left/even/offset,%
1943     left/offset/even/foot/.alias*=foot/left/even/offset,%
1944     left/even/offset/foot/.alias*=foot/left/even/offset,%
1945     left/even/foot/offset/.alias*=foot/left/even/offset,%
1946     even/foot/offset/left/.alias*=foot/left/even/offset,%
1947     even/foot/left/offset/.alias*=foot/left/even/offset,%
1948     even/offset/foot/left/.alias*=foot/left/even/offset,%
1949     even/offset/left/foot/.alias*=foot/left/even/offset,%
1950     even/left/offset/foot/.alias*=foot/left/even/offset,%
1951     even/left/foot/offset/.alias*=foot/left/even/offset,%
1952     offset/foot/left/even/.alias*=foot/left/even/offset,%
1953     offset/foot/even/left/.alias*=foot/left/even/offset,%
1954     offset/left/foot/even/.alias*=foot/left/even/offset,%
1955     offset/left/even/foot/.alias*=foot/left/even/offset,%
1956     offset/even/left/foot/.alias*=foot/left/even/offset,%
1957     offset/even/foot/left/.alias*=foot/left/even/offset,%
1958     foot/left/odd/offset/.store in skip cs=fancy0@olf,%
1959     foot/left/odd/offset/.append code=\fancy@setoffs,%
1960     foot/odd/offset/left/.alias*=foot/left/odd/offset,%
1961     foot/odd/left/offset/.alias*=foot/left/odd/offset,%
1962     foot/offset/odd/left/.alias*=foot/left/odd/offset,%
1963     foot/offset/left/odd/.alias*=foot/left/odd/offset,%
1964     foot/left/offset/odd/.alias*=foot/left/odd/offset,%
1965     left/foot/offset/odd/.alias*=foot/left/odd/offset,%
1966     left/foot/odd/offset/.alias*=foot/left/odd/offset,%
1967     left/offset/foot/odd/.alias*=foot/left/odd/offset,%
1968     left/offset/odd/foot/.alias*=foot/left/odd/offset,%
1969     left/odd/offset/foot/.alias*=foot/left/odd/offset,%
1970     left/odd/foot/offset/.alias*=foot/left/odd/offset,%
1971     odd/foot/offset/left/.alias*=foot/left/odd/offset,%
1972     odd/foot/left/offset/.alias*=foot/left/odd/offset,%
1973     odd/offset/foot/left/.alias*=foot/left/odd/offset,%
1974     odd/offset/left/foot/.alias*=foot/left/odd/offset,%
1975     odd/left/offset/foot/.alias*=foot/left/odd/offset,%

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1976         odd/left/foot/offset/.alias*=foot/left/odd/offset,%
1977         offset/foot/left/odd/.alias*=foot/left/odd/offset,%
1978         offset/foot/odd/left/.alias*=foot/left/odd/offset,%
1979         offset/left/foot/odd/.alias*=foot/left/odd/offset,%
1980         offset/left/odd/foot/.alias*=foot/left/odd/offset,%
1981         offset/odd/left/foot/.alias*=foot/left/odd/offset,%
1982         offset/odd/foot/left/.alias*=foot/left/odd/offset,%
1983     foot/right/even/offset/.store in skip cs=fancy0@erf,%
1984         foot/right/even/offset/.append code=\fancy@setoffs,%
1985         foot/even/offset/right/.alias*=foot/right/even/offset,%
1986         foot/even/right/offset/.alias*=foot/right/even/offset,%
1987         foot/offset/even/right/.alias*=foot/right/even/offset,%
1988         foot/offset/right/even/.alias*=foot/right/even/offset,%
1989         foot/right/offset/even/.alias*=foot/right/even/offset,%
1990         right/foot/offset/even/.alias*=foot/right/even/offset,%
1991         right/foot/even/offset/.alias*=foot/right/even/offset,%
1992         right/offset/foot/even/.alias*=foot/right/even/offset,%
1993         right/offset/even/foot/.alias*=foot/right/even/offset,%
1994         right/even/offset/foot/.alias*=foot/right/even/offset,%
1995         right/even/foot/offset/.alias*=foot/right/even/offset,%
1996         even/foot/offset/right/.alias*=foot/right/even/offset,%
1997         even/foot/right/offset/.alias*=foot/right/even/offset,%
1998         even/offset/foot/right/.alias*=foot/right/even/offset,%
1999         even/offset/right/foot/.alias*=foot/right/even/offset,%
2000         even/right/offset/foot/.alias*=foot/right/even/offset,%
2001         even/right/foot/offset/.alias*=foot/right/even/offset,%
2002         offset/foot/right/even/.alias*=foot/right/even/offset,%
2003         offset/foot/even/right/.alias*=foot/right/even/offset,%
2004         offset/right/foot/even/.alias*=foot/right/even/offset,%
2005         offset/right/even/foot/.alias*=foot/right/even/offset,%
2006         offset/even/right/foot/.alias*=foot/right/even/offset,%
2007         offset/even/foot/right/.alias*=foot/right/even/offset,%
2008     foot/right/odd/offset/.store in skip cs=fancy0@orf,%
2009         foot/right/odd/offset/.append code=\fancy@setoffs,%
2010         foot/odd/offset/right/.alias*=foot/right/odd/offset,%
2011         foot/odd/right/offset/.alias*=foot/right/odd/offset,%
2012         foot/offset/odd/right/.alias*=foot/right/odd/offset,%
2013         foot/offset/right/odd/.alias*=foot/right/odd/offset,%
2014         foot/right/offset/odd/.alias*=foot/right/odd/offset,%
2015         right/foot/offset/odd/.alias*=foot/right/odd/offset,%
2016         right/foot/odd/offset/.alias*=foot/right/odd/offset,%
2017         right/offset/foot/odd/.alias*=foot/right/odd/offset,%
2018         right/offset/odd/foot/.alias*=foot/right/odd/offset,%
2019         right/odd/offset/foot/.alias*=foot/right/odd/offset,%
2020         right/odd/foot/offset/.alias*=foot/right/odd/offset,%
2021         odd/foot/offset/right/.alias*=foot/right/odd/offset,%
2022         odd/foot/right/offset/.alias*=foot/right/odd/offset,%
2023         odd/offset/foot/right/.alias*=foot/right/odd/offset,%
2024         odd/offset/right/foot/.alias*=foot/right/odd/offset,%
2025         odd/right/offset/foot/.alias*=foot/right/odd/offset,%
2026         odd/right/foot/offset/.alias*=foot/right/odd/offset,%
2027         offset/foot/right/odd/.alias*=foot/right/odd/offset,%
2028         offset/foot/odd/right/.alias*=foot/right/odd/offset,%
2029         offset/right/foot/odd/.alias*=foot/right/odd/offset,%
2030         offset/right/odd/foot/.alias*=foot/right/odd/offset,%
2031         offset/odd/right/foot/.alias*=foot/right/odd/offset,%
2032         offset/odd/foot/right/.alias*=foot/right/odd/offset,%
2033     head/inner/offset/.style={head/right/even/offset={#1},head/left/odd/offset={#1}},%
2034     head/inner/offset+/.style={head/right/even/offset+={#1},head/left/odd/offset+={#1}},%
2035     head/inner/offset-/.style={head/right/even/offset-={#1},head/left/odd/offset-={#1}},%
2036     head/inner/offset*/.style={head/right/even/offset*={#1},head/left/odd/offset*={#1}},%
2037         head/offset/inner/.alias*=head/inner/offset,%
2038         offset/head/inner/.alias*=head/inner/offset,%
2039         offset/inner/head/.alias*=head/inner/offset,%
2040         inner/head/offset/.alias*=head/inner/offset,%

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2041     inner/offset/head/.alias*=head/inner/offset,%
2042     head/outer/offset/.style={head/left/even/offset={#1},head/right/odd/offset={#1}},%
2043     head/outer/offset+/.style={head/left/even/offset+={#1},head/right/odd/offset+={#1}},%
2044     head/outer/offset-/.style={head/left/even/offset-={#1},head/right/odd/offset-={#1}},%
2045     head/outer/offset*/.style={head/left/even/offset*={#1},head/right/odd/offset*={#1}},%
2046     head/offset/outer/.alias*=head/outer/offset,%
2047     offset/head/outer/.alias*=head/outer/offset,%
2048     offset/outer/head/.alias*=head/outer/offset,%
2049     outer/head/offset/.alias*=head/outer/offset,%
2050     outer/offset/head/.alias*=head/outer/offset,%
2051     foot/inner/offset/.style={foot/right/even/offset={#1},foot/left/odd/offset={#1}},%
2052     foot/inner/offset+/.style={foot/right/even/offset+={#1},foot/left/odd/offset+={#1}},%
2053     foot/inner/offset-/.style={foot/right/even/offset-={#1},foot/left/odd/offset-={#1}},%
2054     foot/inner/offset*/.style={foot/right/even/offset*={#1},foot/left/odd/offset*={#1}},%
2055     foot/offset/inner/.alias*=foot/inner/offset,%
2056     offset/foot/inner/.alias*=foot/inner/offset,%
2057     offset/inner/foot/.alias*=foot/inner/offset,%
2058     inner/foot/offset/.alias*=foot/inner/offset,%
2059     inner/offset/foot/.alias*=foot/inner/offset,%
2060     foot/outer/offset/.style={foot/left/even/offset={#1},foot/right/odd/offset={#1}},%
2061     foot/outer/offset+/.style={foot/left/even/offset+={#1},foot/right/odd/offset+={#1}},%
2062     foot/outer/offset-/.style={foot/left/even/offset-={#1},foot/right/odd/offset-={#1}},%
2063     foot/outer/offset*/.style={foot/left/even/offset*={#1},foot/right/odd/offset*={#1}},%
2064     foot/offset/outer/.alias*=foot/outer/offset,%
2065     offset/foot/outer/.alias*=foot/outer/offset,%
2066     offset/outer/foot/.alias*=foot/outer/offset,%
2067     outer/foot/offset/.alias*=foot/outer/offset,%
2068     outer/offset/foot/.alias*=foot/outer/offset,%
2069     inner/offset/.style={foot/inner/offset={#1},head/inner/offset={#1}},%
2070     inner/offset+/.style={foot/inner/offset+={#1},head/inner/offset+={#1}},%
2071     inner/offset-/.style={foot/inner/offset-={#1},head/inner/offset-={#1}},%
2072     inner/offset*/.style={foot/inner/offset*={#1},head/inner/offset*={#1}},%
2073     offset/inner/.alias*=inner/offset,%
2074     outer/offset/.style={foot/outer/offset={#1},head/outer/offset={#1}},%
2075     outer/offset+/.style={foot/outer/offset+={#1},head/outer/offset+={#1}},%
2076     outer/offset-/.style={foot/outer/offset-={#1},head/outer/offset-={#1}},%
2077     outer/offset*/.style={foot/outer/offset*={#1},head/outer/offset*={#1}},%
2078     offset/outer/.alias*=outer/offset,%
2079     reset/.style={norule,head=,foot=,offset=\z@,foot/rule/skip,rule/font=,font=},%
2080     reset/.value forbidden,%
2081 }% keys for \pagesetup (stored into token \itf@tk)
2082 \AtBeginDocument{%
2083 \ifdim\headwidth<\z@
2084 %% This catches the case that \headwidth hasn't been initialized and the
2085 %% case that the user added something to \headwidth in the expectation that
2086 %% it was initialized to \textwidth. We compensate this now. This loses if
2087 %% the user intended to multiply it by a factor. But that case is more
2088 %% likely done by saying something like \headwidth=1.2\textwidth.
2089 %% The doc says you have to change \headwidth after the first call to
2090 %% \pagestyle{fancy}. This code is just to catch the most common cases were
2091 %% that requirement is violated.
2092 \global\advance\headwidth123456789sp\global\advance\headwidth\textwidth
2093 \fi}
2094 </fancyhdr>

```

## 21.10 † marks

```

2095 <marks>
2096 \ProvidesPackage{interfaces-marks}
2097 [2011/01/19 v2.9 easier use of e-TeX marks (FC)]
2098 \RequirePackage{interfaces-base}

```

\marksthe

```

2099 \newrobustcmd\marksthe[2]{%
2100 \ifcsname marks@#1\endcsname \else \itf@marks@new{#1}\fi

```



```
2101    {\toks@{#2}\expandafter\marks\csname marks@#1\endcsname{\the\toks@}}%
2102}% \marksthe
```

`\marksthecs`

```
2103 \newrobustcmd*\marksthecs[2]{%
2104   \ifcsname marks@#1\endcsname \else \itf@marks@new{#1}\fi
2105   \ifcsundef{#2}
2106     {}
2107     {\{\toks@\expandafter\expandafter\expandafter{%
2108       \csname #2\endcsname}%
2109       \expandafter\marks\csname marks@#1\endcsname{\the\toks@}}}%
2110}% \marksthecs
```

`\itf@marks@new`

```
2111 \def\itf@marks@new#1{%
2112   \expandafter\newmarks\csname marks@#1\endcsname
2113   \PackageInfo{interfaces-marks}{marks ‘#1’ defined}%
2114}% \itf@marks@new
```

`\thefirstmarks` Purely expandable in exactly one step of expansion.

`\thebotmarks`

`\thetopmarks`

```
2115 \newcommand*\thefirstmarks[1]{\romannumeral
2116   \ifcsname marks@#1\endcsname \expandafter\z@
2117     \firstmarks\csname marks@#1\expandafter\endcsname
2118   \else \expandafter\z@
2119   \fi
2120}% \thefirstmarks
2121 \newcommand*\thebotmarks[1]{\romannumeral
2122   \ifcsname marks@#1\endcsname \expandafter\z@
2123     \botmarks\csname marks@#1\expandafter\endcsname
2124   \else \expandafter\z@
2125   \fi
2126}% \thebotmarks
2127 \newcommand*\thetopmarks[1]{\romannumeral
2128   \ifcsname marks@#1\endcsname \expandafter\z@
2129     \topmarks\csname marks@#1\expandafter\endcsname
2130   \else \expandafter\z@
2131   \fi
2132}% \thetopmarks
```

`\getthemarks` `\getthemarks\firstmarks{<named-mark>}\result`

```
2133%% \getthemarks\firstmarks{section}\macro
2134 \newrobustcmd*\getthemarks[3]{%
2135   \ifcsname marks@#2\endcsname
2136     \edef#3{\unexpanded\expandafter{#1\csname marks@#2\endcsname}}%
2137   \else \let#3\@undefined
2138   \fi
2139}% \getthemarks
```

`\getthefirstmarks` `\getthefirstmarks{<named-mark>}\result`: shortcut for `\getthemarks\firstmarks`

`\getthebotmarks`

`\getthetopmarks`

```
2140 \newrobustcmd*\getthefirstmarks{\getthemarks\firstmarks}
2141 \newrobustcmd*\getthebotmarks{\getthemarks\botmarks}
2142 \newrobustcmd*\getthetopmarks{\getthemarks\topmarks}
```

`\ifmarksequal`

```
2143%% \ifmarksequal\firstmarks\botmarks{subsection}{ true }{ false }
2144 \newrobustcmd*\ifmarksequal[3]{%
2145   \begingroup
2146     \getthemarks{#1}{#3}\x
2147     \getthemarks{#2}{#3}\y
2148     \expandafter\endgroup
2149     \csname ltx@\ifdefined\x\ifdefined\y
```

```

2150      \ifx\x\y first\else
2151      second\fi\else second\fi\else second\fi
2152      oftwo\endcsname
2153 }% \ifmarksequal

2154 </marks>

```

## 21.11 Interface `tocloft`: `\tocsetup`, `\lofsetup`, `\lotsetup` and `\listofsetup`

```

2155 <*tocloft>
2156 \ProvidesPackage{interfaces-tocloft}
2157 [2011/01/19 v2.9 pgfkeys macros for tocloft (FC)]
2158 \RequirePackage{interfaces-base}
2159 \itf@Check@Package{tocloft}

```

```

\tocsetup The user commands.
\lofsetup
\lotsetup
\listofsetup
2160 \newrobustcmd\tocsetup[1]{%
2161   \AfterPreamble{\itf@pgfkeys\pgfqkeys{/itf/tocloft/toc}{#1}}%
2162 }% \tocsetup
2163 \newrobustcmd\lofsetup[1]{%
2164   \AfterPreamble{\itf@pgfkeys\pgfqkeys{/itf/tocloft/lof}{#1}}%
2165 }% \lofsetup
2166 \newrobustcmd\lotsetup[1]{%
2167   \AfterPreamble{\itf@pgfkeys\pgfqkeys{/itf/tocloft/lot}{#1}}%
2168 }% \lotsetup
2169 \newrobustcmd\listofsetup[2]{%
2170   \AfterPreamble{\itf@pgfkeys\pgfqkeys{/itf/tocloft/#1}{#2}}%
2171 }% \listofsetup

```

`\itf@cft@newlistof` This macro creates the keys for toc, lof and lot, and is able to create the keys for each new list created with `tocloft`'s `\newlistof`.

```

2172 \def\itf@cft@newlistof#1#2#3{% #1=toc/lof (ext.), #2=entry (\newlistof only), #3=title (\newlistof)
2173   \pgfqkeys{/itf/tocloft/#1}{%
2174     depth/.store in counter cs=c@#1depth,%
2175     depth/.append code=\expandafter\global\csname c@#1depth\endcsname
2176                           \csname c@#1depth\endcsname
2177       \addtocontents{#1}{\csname c@#1depth\endcsname
2178                           \the\csname c@#1depth\endcsname\relax},%
2179     #1depth/.alias*=depth,%
2180     pagestyle/.code=\tocloftpagestyle{##1},%
2181     parskip/.store in skip cs=cftparskip,%
2182     parsep/.alias=parskip,%
2183     mark/.store in cs=cftmark#1,%
2184     marks/.alias=mark,%
2185     mark=,%
2186     label/.store as code,%
2187     ref/.store as code,%
2188     ref/.initial=\csname cft#1title\endcsname,% overwritten (toc,lof,lot)
2189     ref/.default=\csname cft#1title\endcsname,% overwritten (toc,lof,lot)
2190     ref/.blank=\pgfkeysnovalue,%
2191     title/.store as code in cs=cft#1title,% overwritten below for toc, lof and lot
2192     title/top/.store in skip cs=cftbefore#1titleskip,%
2193     beforetitleskip/.alias*=title/top,%
2194     title/bottom/.store in skip cs=cftafter#1titleskip,%
2195     aftertitleskip/.alias*=title/bottom,%
2196     title/font/.store as code in cs=cft#1titlefont,%
2197     title/format/.alias*=title/font,%
2198     title/color/.store as color,%
2199     title/color/.append code=\pgfkeysalso{/itf/tocloft/#1/title/font+=%
2200       \color{\pgfkeysvalueof{/itf/tocloft/#1/title/color}}},%
2201     title/font/color/.alias=title/color,%
2202     title/format/color/.alias=title/color,%
2203     title/after/.store as code in cs=cftafter#1title,%
2204     title/command/.code=\csdef{@cftmake#1title}####1{##1},%

```

```

2205 dotsep/.code=\itf@units@mu\itf@mus{##1}% converts to mu
2206 \edef\cftdotsep{\itf@strip@mu\itf@mus},%
2207 dotsep/.default=4.5mu,%
2208 dotsep/.blank=\cftnodots,%
2209 dot/.store in=\cftdot,%
2210 before/.store as code,%
2211 after/.store as code,%
2212 columns/before@hook/.is private=interfaces-tocloft,%
2213 columns/after@hook/.is private=interfaces-tocloft,%
2214 columns/before@hook/.initial=,%
2215 columns/after@hook/.initial=,%
2216 columns/.code={\ltx@ifpackageloaded{multicol}}{%
2217 \pgfkeysEsetvalue\pgfkeyscurrentkey{\number##1}%
2218 \ifnum\number##1>\@ne
2219 \pgfkeysgetvalue{/itf/tocloft/#1/columns/before@hook}\itf@tp
2220 \ifx\itf@tp\@empty
2221 \pgfkeyssetvalue{/itf/tocloft/#1/columns/before@hook}{%
2222 \begingroup
2223 \multicolsep\pgfkeysvalueof{/itf/tocloft/#1/multicolsep}\relax
2224 \columnsep\pgfkeysvalueof{/itf/tocloft/#1/columns/sep}\relax
2225 \columnseprule\pgfkeysvalueof{/itf/tocloft/#1/columns/rule}\relax
2226 \begin{multicols}{\pgfkeysvalueof{/itf/tocloft/#1/columns}}%
2227 \pgfkeysgetvalue{/itf/tocloft/#1/columns/rule/color}\columnseprulecolor
2228 \pgfkeysvalueof{/itf/tocloft/#1/multicols/begin}%
2229 }%
2230 \pgfkeyssetvalue{/itf/tocloft/#1/columns/after@hook}{%
2231 \pgfkeysvalueof{/itf/tocloft/#1/multicols/end}%
2232 \end{multicols}
2233 \endgroup
2234 }%
2235 \fi
2236 \else
2237 \pgfkeyslet\pgfkeyscurrentkey\@ne
2238 \pgfkeyslet{/itf/tocloft/#1/columns/before@hook}\@empty
2239 \pgfkeyslet{/itf/tocloft/#1/columns/after@hook}\@empty
2240 \fi}
2241 {\PackageError{interfaces-tocloft}
2242 {Key ‘columns’: package multicol is required}\@eha}%
2243 },%
2244 columns/.default=2,columns/.blank=1,%
2245 multicol/.alias=columns,%
2246 multicols/.alias=columns,%
2247 twocolumns/.true=\pgfkeysalso{columns=2},%
2248 twocolumns/.false=\pgfkeysalso{columns=1},%
2249 columns/rule/.estore as dimen,%
2250 columns/rule/.default=\columnseprule,%
2251 columns/rule,% assign default
2252 columnseprule/.alias*=columns/rule,%
2253 columns/rule/width/.alias*=columns/rule,%
2254 columns/sep/.estore as dimen,%
2255 columns/sep/.default=\columnsep,%
2256 columns/sep/.blank=10\p@,%
2257 columns/sep,% assign default
2258 columnsep/.alias*=columns/sep,%
2259 columns/rule/color/.store as color command,%
2260 columns/rule/color,% assign default (\normalcolor)
2261 columnseprulecolor/.alias*=columns/rule/color,%
2262 columns/rulecolor/.alias*=columns/rule/color,%
2263 columns/color/.alias*=columns/rule/color,%
2264 multicolsep/.estore as glue,%
2265 multicolsep/.default=0pt plus4pt minus3pt,%
2266 multicolsep,% sets default
2267 multicols/begin/.initial=,multicols/begin/.default=,%
2268 multicols/before/.alias=multicols/begin,%
2269 multicols/end/.initial=,multicols/end/.default=,%

```

```

2270         multicols/after/.alias=multicols/end,%
2271     }% \pgfkeys
2272     \itf@AfterPackage{interfaces-bookmark}{%
2273     \def\itf@tocloft@bookmark@handler##1##2{%
2274         \pgfkeysEaddvalue{/itf/tocloft/##1/bookmark}{},{,##2}%
2275         \pgfkeysgetvalue{/itf/tocloft/##1/bookmark/text}\itf@tp
2276         \ifx \itf@tp@empty
2277             \pgfkeyssetvalue{/itf/tocloft/##1/bookmark/text}\contentsname \fi}%
2278     \pgfkeys{/itf/tocloft/#1}%
2279     bookmark/.is multiple choice,%
2280     bookmark/bold/.true=\itf@tocloft@bookmark@handler{#1}{bold=true},%
2281     bookmark/bold/.false=\itf@tocloft@bookmark@handler{#1}{bold=false},%
2282     bookmark/italic/.true=\itf@tocloft@bookmark@handler{#1}{italic=true},%
2283     bookmark/italic/.false=\itf@tocloft@bookmark@handler{#1}{italic=false},%
2284     bookmark/color/.code=\itf@tocloft@bookmark@handler{#1}{color={#1}},%
2285     bookmark/level/.code=\pgfkeysEsetvalue{/itf/tocloft/#1/bookmark/level}{%
2286         \ifcsname toclevel@##1\endcsname
2287             \csname toclevel@##1\endcsname
2288             \else##1\fi}%
2289     \itf@tocloft@bookmark@handler{#1}{},%
2290     bookmark/level/.default=-1,%
2291     bookmark/level/.initial=-1,%
2292     bookmark/text/.store as code,%
2293     bookmark/text/.default=\contentsname,%
2294     bookmark/.unknown/.code=\pgfkeysEaddvalue{/itf/tocloft/#1/bookmark}
2295         {}{\pgfkeyscurrentname={#1}},%
2296     bookmark/.initial=,%
2297     }% \pgfkeys
2298     }% AfterPackage interfaces-bookmark
2299     %% while making a format \jobname is expanded to the name of the format...
2300     %% Therefore, the following commands must be expanded \AtEndPreamble
2301     \AfterPreamble{%
2302         \BeforeFile{\jobname.#1}{%
2303             \pgfkeysvalueof{/itf/tocloft/#1/before}%
2304             \pgfkeysvalueof{/itf/tocloft/#1/columns/before@hook}%
2305         }%
2306         \AfterFile{\jobname.#1}{%
2307             \pgfkeysvalueof{/itf/tocloft/#1/columns/after@hook}%
2308             \pgfkeysvalueof{/itf/tocloft/#1/after}%
2309         }%
2310     }%
2311     \ifcsname #1setup\endcsname\else
2312         \pgfkeys{/itf/tocloft/#1}{%
2313             title={#3},%
2314             pagenumbers/.true=\@cftpnumon{#2},%
2315             pagenumbers/.false=\@cftpnumoff{#2},%
2316             pagenumbers/on/.alias=pagenumbers/true,%
2317             pagenumbers/off/.alias=pagenumbers/false,%
2318             pagenumber/.alias=pagenumbers,%
2319         }%
2320         \expandafter\pretocmd\csname @cftmake#1title\expandafter\endcsname
2321             \expandafter{\expandafter\itf@tocloft\csname cft#1title\endcsname{#1}{listof#2}}
2322         {\@PackageInfoNoLine{interfaces-tocloft}
2323             {\expandafter\string\csname @cftmake#1title\endcsname\space
2324                 successfully augmented}}
2325         {\@PackageWarningNoLine{interfaces-tocloft}
2326             {\expandafter\string\csname @cftmake#1title\endcsname\space
2327                 \space could not be patched
2328                 \MessageBreak Keys label and bookmark won't work for \string\listofsetup}}}%
2329     \fi
2330 }% \itf@cft@newlistof

```

Then create the keys for toc, lof, and lot:

```
2331 \itf@cft@newlistof{toc}{}{}
```

```

2332 \itf@cft@newlistof{lof}{}{}
2333 \itf@cft@newlistof{lot}{}{}

2334 %% Specific to toc only -----
2335 \pgfqkeys{/itf/tocloft/toc}{%
2336   title/.store as code in cs=contentsname,%
2337   contentsname/.alias=title,%
2338   ref/.initial=\contentsname,%
2339   ref/.default=\contentsname,%
2340   pagenumbers/.style={% boolean key
2341     part/pagenumbers={#1},chapter/pagenumbers={#1},section/pagenumbers={#1},%
2342     subsubsection/pagenumbers={#1},subsubsection/pagenumbers={#1},%
2343     paragraph/pagenumbers={#1},subparagraph/pagenumbers={#1},%
2344     pagenumber/.alias=pagenumbers,%
2345 }%
2346 %% Specific to lof and lot -----
2347 \pgfqkeys{/itf/tocloft/lof}{%
2348   title/.store as code in cs=listfigurename,%
2349   listfigurename/.alias=title,%
2350   ref/.initial=\listfigurename,%
2351   ref/.default=\listfigurename,%
2352 }%
2353 \pgfqkeys{/itf/tocloft/lot}{%
2354   title/.store as code in cs=listtablename,%
2355   listtablename/.alias=title,%
2356   ref/.initial=\listtablename,%
2357   ref/.default=\listtablename,%
2358 }%
2359 \if@cftsubfigopt
2360 \pgfqkeys{/itf/tocloft}{%
2361   lof/pagenumbers/.style={figure/pagenumbers={#1},subfigure/pagenumbers={#1}},%
2362   lof/pagenumber/.alias=lof/pagenumbers,%
2363   lot/pagenumbers/.style={figure/pagenumbers={#1},subfigure/pagenumbers={#1}},%
2364   lot/pagenumber/.alias=lot/pagenumbers,%
2365 }%
2366 \else
2367 \pgfqkeys{/itf/tocloft}{%
2368   lof/pagenumbers/.style={figure/pagenumbers={#1}},%
2369   lof/pagenumber/.alias=lof/pagenumbers,%
2370   lot/pagenumbers/.style={figure/pagenumbers={#1}},%
2371   lot/pagenumber/.alias=lot/pagenumbers,%
2372 }%
2373 \fi

```

`\itf@cft@sectionname` This macro converts subsection into subsec *etc.* because of `tocloft` command names:  
`\cftbeforesubsecskip`, `\cftsubsecindent` *etc.*

And the keys are either **subsec** or **subsection**.

```

2374 \def\itf@cft@name#1.#2.#3\@nil{cft#1\itf@cft@secname{#2}#3}
2375 \def\itf@cft@secname#1{%
2376   \expandafter\itf@cft@sec@name\csname#1\endcsname{#1}%
2377 }% \itf@cft@secname
2378 \def\itf@cft@sec@name#1#2{%
2379   \ifx#1\relax #2\else
2380     \ifx#1\section sec\else
2381       \ifx#1\subsection subsec\else
2382         \ifx#1\subsubsection subsubsec\else
2383           \ifx#1\paragraph para\else
2384             \ifx#1\subparagraph subpara\else
2385               \ifx#1\figure fig\else
2386                 \ifx#1\subsubfigure subfig\else
2387                   \ifx#1\table tab\else
2388                     \ifx#1\subtable subtab\else
2389                       \ifx#1\chapter chap\else
2390                         #2\fi

```

```

2391 \fi\fi\fi\fi\fi\fi\fi\fi\fi\fi
2392 }% \itf@cft@section@name

2393 %% tocloft setup for tables sections :
2394 \pgfkeys{%
2395 /handlers/.cft@def/.style={%
2396 \pgfkeyscurrentpath/.store in cs=\itf@cft@name #1\@nil},%
2397 /handlers/.cft@code/.style={%
2398 \pgfkeyscurrentpath/.store as code in cs=\itf@cft@name #1\@nil},%
2399 /handlers/.cft@length/.style={%
2400 \pgfkeyscurrentpath/.store in skip cs=\itf@cft@name #1\@nil},%
2401 }

```

`\itf@cft@newsection` This macro creates the keys for each sectionning command.

```

2402 \def\itf@cft@newsection{\itf@cft@new@section{\itf/tocloft}}
2403 \def\itf@cft@new@section#1#2#3{% #2 = toc | lof | lot, #3=part / chap / sec / subsec etc.
2404 \pgfkeys{#1/#2/#3}%
2405 skip/.cft@length=before.#3.skip,%
2406 beforeskip/.alias*=skip,%
2407 top/.alias*=skip,%
2408 indent/.cft@length=.#3.indent,%
2409 font/.cft@code=.#3.font,%
2410 font/.append code=\pgfkeysalso{/itf/tocloft/#2/#3/pagenummer/font={##1}},%
2411 format/.alias*=font,%
2412 color/.store as color,%
2413 color/.append code=\pgfkeysalso{/itf/tocloft/#2/#3/font+={%
2414 \color{\pgfkeysvalueof{/itf/tocloft/#2/#3/color}}}%
2415 \ifdefined\hypersetup \hypersetup{%
2416 linkcolor=\pgfkeysvalueof{/itf/tocloft/#2/#3/color}}}%
2417 \fi}},%
2418 font/color/.alias=color,%
2419 format/color/.alias=color,%
2420 number/width/.cft@length=.#3.numwidth,%
2421 numwidth/.alias*=number/width,%
2422 presnum/.cft@code=.#3.presnum,%
2423 number/before/.alias*=presnum,%
2424 aftersnum/.cft@code=.#3.aftersnum,%
2425 number/after/.alias*=aftersnum,%
2426 aftersnumb/.cft@code=.#3.aftersnumb,%
2427 title/before/.alias*=aftersnumb,%
2428 leader/.cft@def=.#3.leader,%
2429 leader/.default=\cftdotfill{\csname\itf@cft@name.#3.dotsep\@nil\endcsname},%
2430 leaders/.alias=leader,%
2431 dotsep/.code={\ifx\pgfkeyscurrentvalue\pgfkeysnovalue@text
2432 \csdef{\itf@cft@name.#3.dotsep\@nil}{\cftdotsep}%
2433 \else
2434 \itf@units@mu\itf@musk{##1}%
2435 \csdef{\itf@cft@name.#3.dotsep\@nil}{\itf@strip@mu\itf@musk}%
2436 \fi},%
2437 dotsep/.blank=\cftnodots,%
2438 nodots/.code=\csdef{\itf@cft@name.#3.dotsep\@nil}{\cftnodots},%
2439 nodots/.value forbidden,%
2440 pagefont/.cft@code=.#3.pagefont,%
2441 page/font/.alias*=pagefont,%
2442 pagenummer/font/.alias*=pagefont,%
2443 pagenumbers/font/.alias*=pagefont,%
2444 page/color/.store as color,%
2445 page/color/.append code=\pgfkeysalso{/itf/tocloft/#2/#3/pagefont+={%
2446 \color{\pgfkeysvalueof{/itf/tocloft/#2/#3/page/color}}}%
2447 \ifdefined\hypersetup \hypersetup{%
2448 linkcolor=\pgfkeysvalueof{/itf/tocloft/#2/#3/page/color}}}%
2449 \fi}},%
2450 pagenummer/color/.alias=page/color,%
2451 pagenumbers/color/.alias=page/color,%
2452 page/font/color/.alias=page/color,%

```



```

2453         pagenumber/font/color/.alias=page/color,%
2454         pagenumbers/font/color/.alias=page/color,%
2455         afterpnum/.cft@code=.#3.afterpnum,%
2456         page/after/.alias*=afterpnum,%
2457         pagenumber/after/.alias*=afterpnum,%
2458         pagenumbers/.on=\@cftpnumon{\itf@cft@secname{#3}},%
2459         pagenumbers/.off=\@cftpnumoff{\itf@cft@secname{#3}},%
2460         pagenumber/.alias=pagenumbers,%
2461     }% \pgfqkeys
2462 }% \itf@cft@new@section

2463 \@for\itf@tp:=part, chap, chapter, sec, section, subsec, subsection,%
2464         subsubsec, subsubsection, para, paragraph, subpara, subparagraph%
2465     \do{\edef\itf@tp{\noexpand\itf@cft@newsection{toc}{\itf@tp}}\itf@tp}%
2466 \if@cftsubfigopt
2467     \@for\itf@tp:=fig, figure, subfig, subfigure%
2468         \do{\edef\itf@tp{\noexpand\itf@cft@newsection{lof}{\itf@tp}}\itf@tp}%
2469     \@for\itf@tp:=tab, table, subtab, subtable%
2470         \do{\edef\itf@tp{\noexpand\itf@cft@newsection{lot}{\itf@tp}}\itf@tp}%
2471 \else
2472     \@for\itf@tp:=fig, figure%
2473         \do{\edef\itf@tp{\noexpand\itf@cft@newsection{lof}{\itf@tp}}\itf@tp}%
2474     \@for\itf@tp:=tab, table%
2475         \do{\edef\itf@tp{\noexpand\itf@cft@newsection{lot}{\itf@tp}}\itf@tp}%
2476 \fi

\@cftmaketoctitle (patch)
\@cftmakeloftitle (patch)
\@cftmakelottitle (patch)
\@newlistof (patch)
2477 \itf@patch\pretocmd\@cftmaketoctitle
2478 {\itf@tocloft\contentsname{toc}{tableofcontents}}
2479 {\@PackageInfoNoLine{interfaces-tocloft}
2480     {\string\@cftmaketoctitle\space successfully augmented}}
2481 {\@PackageWarningNoLine{interfaces-tocloft}
2482     {\string\@cftmaketoctitle\space could not be patched}
2483     \MessageBreak label and bookmark keys for \string\tocsetup\space won't work}}%
2484 \itf@patch\pretocmd\@cftmakeloftitle
2485 {\itf@tocloft\listfigurename{lof}{listoffigures}}
2486 {\@PackageInfoNoLine{interfaces-tocloft}
2487     {\string\@cftmakeloftitle\space successfully augmented}}
2488 {\@PackageWarningNoLine{interfaces-tocloft}
2489     {\string\@cftmakeloftitle\space could not be patched}
2490     \MessageBreak label and bookmark keys for \string\lofsetup\space won't work}}%
2491 \itf@patch\pretocmd\@cftmakelottitle
2492 {\itf@tocloft\listtablename{lot}{listoftables}}
2493 {\@PackageInfoNoLine{interfaces-tocloft}
2494     {\string\@cftmakelottitle\space successfully augmented}}
2495 {\@PackageWarningNoLine{interfaces-tocloft}
2496     {\string\@cftmakelottitle\space could not be patched}
2497     \MessageBreak label and bookmark keys for \string\lotsetup\space won't work}}%
2498 \expandafter\itf@patch\expandafter\patchcmd\csname\string\newlistof\endcsname
2499     {#4}{\csname cft#3title\endcsname}
2500     {\@PackageInfoNoLine{interfaces-tocloft}
2501         {\string\newlistof\space successfully patched}}
2502     {\@PackageWarningNoLine{interfaces-tocloft}
2503         {\string\newlistof\space could not be patched}
2504         \MessageBreak \string\listofsetup\space will not work}}%
2505 \expandafter\itf@patch\expandafter\apptocmd\csname\string\newlistof\endcsname
2506     {\itf@cft@newlistof{#3}{#2}{#4}}
2507     {\@PackageInfoNoLine{interfaces-tocloft}
2508         {\string\newlistof\space successfully augmented}}
2509     {\@PackageWarningNoLine{interfaces-tocloft}
2510         {\string\newlistof\space could not be patched}
2511         \MessageBreak \string\listofsetup\space will not work}}%
2512 \expandafter\itf@patch\expandafter\apptocmd\csname\string\newlistentry\endcsname
2513     {\itf@cft@newsection{#3}{#2}}
2514     {\@PackageInfoNoLine{interfaces-tocloft}

```

```

2515      {\string\newlistentry\space successfully augmented}}
2516      {\@PackageWarningNoLine{interfaces-tocloft}
2517      {\string\newlistentry\space could not be patched
2518      \MessageBreak \string\listofsetup\space will not work}}

```

`\itf@cft@label` `\itf@cft@label` insert the anchor for the table of contents and makes the label (if the key `label` of `\tocsetup`, `\lofsetup` etc. has been set to a non empty value.

```

2519 \def\itf@tocloft#1#2#3{%
2520   \expandafter\def\expandafter#1\expandafter{%
2521     \expandafter\itf@cft@label
2522     \expandafter#1\expandafter{#1}{#2}{#3}}%
2523 }% \itf@tocloft
2524 \long\def\itf@cft@label#1#2#3#4{%
2525   \def#1{#2}% restore original
2526   \begingroup
2527   \pgfkeysifdefined{/itf/tocloft/#3/bookmark}
2528   {%
2529     \raisedhyperdef{interfaces}{#4}{#2}%
2530     \pgfkeysgetvalue{/itf/tocloft/#3/bookmark/text}\itf@tp
2531     \ifx \itf@tp@empty \else
2532       \pgfkeysgetvalue{/itf/tocloft/#3/bookmark}\@tempa
2533       \expandafter\bookmark\expandafter[%
2534         \expandafter{\@tempa,
2535           dest=interfaces.#4,%
2536           level=\pgfkeysvalueof{/itf/tocloft/#3/bookmark/level}%
2537           }]{\pgfkeysvalueof{/itf/tocloft/#3/bookmark/text}}%
2538       \global\BKM@startatroottrue
2539     \fi}
2540   {#2}%
2541   \pgfkeysgetvalue{/itf/tocloft/#3/label}\itf@tp
2542   \ifx \itf@tp@empty \else
2543     \def\@currentHref{interfaces.#4}%
2544     \pgfkeysgetvalue{/itf/tocloft/#3/ref}\@currentlabel
2545     \def\@currentlabelname{#2}%
2546     \label{\pgfkeysvalueof{/itf/tocloft/#3/label}}%
2547   \fi
2548   \endgroup
2549   \gdef\itf@tp{\def#1{#2}\global\let\itf@tp \relax}% restore original
2550   \aftergroup\itf@tp % simple group introduced by tocloft to print \contentsname
2551 }% \itf@cft@label

2552 </tocloft>

```

## 21.12 Interface `makecell`: `\repeatcell`

```

2553 <*makecell>
2554 \ProvidesPackage{interfaces-makecell}
2555   [2011/01/19 v2.9 repeatcell to fill in tabulars (FC)]
2556 \RequirePackage{interfaces-base}
2557 \itf@Check@Package{makecell}
2558 \edef\itf@AtEnd{\catcode126 \the\catcode126}% 126 = ~
2559 \AtEndOfPackage{\itf@AtEnd}
2560 \catcode126 \active % 126 = ~

```

### 21.12.1 countvalues

`\countvalues`

```

2561 \def\countvalues#1{\number\numexpr
2562   \expandafter\itf@countvalues\expandafter0#1,\countvalues\@nnil
2563 }% \countvalues
2564 \def\itf@countvalues#1#2,#3{%
2565   \ifx\countvalues#3%
2566     +#1\expandafter\remove@to@nnil
2567   \else

```

```

2568      +1\expandafter\itf@countvalues
2569      \fi#3%
2570}% \itf@countvalues

\itf@getvalue

2571\def\itf@getvalue #1{\romannumeral -'\q
2572  \expandafter\itf@getvalue \expandafter0#1,\itf@getvalue}
2573\def\itf@getvalue#1#2\itf@getvalue #3{\itf@getvalue@{#1}{#3-1}#2\itf@getvalue\@nnil}
2574\def\itf@getvalue@{#1#2#3,#4}%
2575  \ifnum \numexpr#1=\numexpr#2\relax
2576    #3\expandafter\remove@to@nnil
2577  \else\ifx\itf@getvalue#4\@empty
2578    \expandafter\expandafter
2579    \expandafter\remove@to@nnil
2580  \else \expandafter\expandafter
2581    \expandafter\itf@getvalue@
2582  \fi\fi{#1+1}{#2}#4%
2583}% \itf@getvalue@

```

### 21.12.2 `\repeatcell`

`\repeatcell`

```

2584\newif\ifitf@celltranspose
2585\newrobustcmd*\repeatcell{\begingroup \iffalse{\fi \ifnum0='}\fi \itf@repeatcell}
2586\newrobustcmd*\itf@repeatcell[3][]{%
2587  \ifblank{#1}% alignment option ?
2588    {\let\itf@makecell\@firstofone}
2589    {\def\itf@makecell##1{\noexpand\makecell[{#1}]{##1}}}%
2590  \countdef\itf@col=100% local
2591  \countdef\itf@row=101% local
2592  \countdef\itf@cnt=102% local
2593  \toksdef\itf@cell=1% local
2594  \itf@pgfkeys
2595  \pgfqkeys{/itf/makecell/repeatcell}{@reset={#2},#3}%
2596  \toks@{\ifnum0='}\fi \endgroup}% local
2597  \ifnum\itf@row>\z@ % number
2598    \edef\itf@rowloop{\noexpand\@whilenum\itf@row<\the\itf@row}%
2599    \def\itf@cell@init{\def\r{\row}\let\R\@empty}%
2600  \else % list
2601    \def\itf@rowloop{\@for\r:=\itf@rows}%
2602    \expandafter\def\expandafter\itf@cell@init\expandafter{%
2603      \expandafter\def\expandafter\R\expandafter{%
2604        \expandafter\itf@getvalue\expandafter{\expandafter\@empty\itf@rows}}}%
2605  \fi
2606  \ifnum\itf@col>\z@ % number
2607    \edef\itf@colloop{\noexpand\@whilenum\itf@col<\the\itf@col}%
2608    \expandafter\def\expandafter\itf@cell@init\expandafter{%
2609      \itf@cell@init\def\c{\column}\let\C\@empty}%
2610  \else % list
2611    \def\itf@colloop{\@for\c:=\itf@cols}%
2612    \expandafter\expandafter\expandafter\def
2613      \expandafter\expandafter\expandafter\itf@cell@init
2614      \expandafter\expandafter\expandafter{%
2615      \expandafter\itf@cell@init
2616      \expandafter\def\expandafter\C\expandafter{%
2617        \expandafter\itf@getvalue\expandafter{\expandafter\@empty\itf@cols}}}%
2618  \fi
2619  \itf@cell@init % in case they are used in formulas
2620  \ifitf@celltranspose
2621    \itf@col\z@
2622    \itf@colloop\do{%
2623      \ifnum\itf@col>\z@
2624      \pgfkeysifdefined{/itf/makecell/repeatcell/cr/row\the\itf@col}%

```

```

2625         {\pgfkeysgetvalue{/itf/makecell/repeatcell/cr/row\the\itf@col}\itf@thecr}
2626         {\pgfkeysgetvalue{/itf/makecell/repeatcell/cr}\itf@thecr}%
2627         \toks@\expandafter{\the\expandafter\toks@ \itf@thecr}%
2628         \fi
2629         \advance\itf@col\@ne
2630         \itf@row\z@
2631         \itf@rowloop\do{%
2632             \advance\itf@row\@ne
2633             \ifnum\itf@row>\@ne
2634                 \toks@\expandafter{\the\toks@&}%
2635             \fi
2636             \toks@\expandafter{\the\expandafter\toks@ \itf@cell@init}%
2637             \itf@cell@insert}% rows loop
2638     }% cols loop
2639 \else
2640 \itf@row\z@
2641 \itf@rowloop\do{%
2642     \ifnum\itf@row>\z@
2643         \pgfkeysifdefined{/itf/makecell/repeatcell/cr/row\the\itf@row}%
2644         {\pgfkeysgetvalue{/itf/makecell/repeatcell/cr/row\the\itf@row}\itf@thecr}
2645         {\pgfkeysgetvalue{/itf/makecell/repeatcell/cr}\itf@thecr}%
2646         \toks@\expandafter{\the\expandafter\toks@ \itf@thecr}%
2647     \fi
2648     \advance\itf@row\@ne
2649     \itf@col\z@
2650     \itf@colloop\do{%
2651         \advance\itf@col\@ne
2652         \ifnum\itf@col>\@ne
2653             \toks@\expandafter{\the\toks@&}%
2654         \fi
2655         \toks@\expandafter{\the\expandafter\toks@ \itf@cell@init}%
2656         \itf@cell@insert}% cols loop
2657     }% rows loop
2658 \fi
2659 \itf@message{Code introduced by repeatcell in the \@currentvir:^^}
2660         \the\toks@}% (to see the code...)
2661 \the\toks@ \ignorespaces
2662 }% \itf@repeatcell

```

\itf@message

```
2663 \let\itf@message \@gobble
```

Now the keys for `\repeatcell`:

```

2664 \def\itf@cell@rowcolkey{%
2665     \removefromstart\pgfkeyscurrentname{row}%
2666     \ifin@ \else
2667         \removefromstart\pgfkeyscurrentname{col}%
2668     \fi
2669     \ifin@
2670         \itf@number\itf@cnt\pgfkeyscurrentname\relax\@nnil
2671         {\pgfkeyslet\pgfkeyscurrentkey\pgfkeyscurrentvalue}
2672         \in@false
2673     \fi
2674     \ifin@ \else
2675         \pgfkeysvalueof{/errors/unknown key/.@cmd}\pgfkeyscurrentkey
2676                                     \pgfkeyscurrentvalue
2677                                     \pgfeov
2678     \fi
2679 }% \itf@cell@rowcolkey
2680 \pgfqkeys{/itf/makecell/repeatcell}{%
2681     font/.store in=\itf@cellfont,%
2682     font/.unknown/.code=\itf@cell@rowcolkey,%
2683     text/.store in=\itf@celltext,%
2684     text/.default=\ifdefined\C\C\column\fi,%

```

```

2685 text/.unknown/.code=\itf@cell@rowcolkey,%
2686 cr/.initial=\\,%
2687 cr/.default=\crr,cr/.blank=\\,%
2688 end/.alias=cr,%
2689 cr/.unknown/.code=\itf@cell@rowcolkey,%
2690 rows/.code=\itf@number\itf@row#1\relax\@nnil
2691         {\ifnum\itf@row<\z@\itf@row\@ne\fi}
2692         {\itf@row\z@
2693         \def\itf@rows{#1}\itf@expandonceifcs\itf@rows},%
2694 rows/.default=1,rows/.blank=1,%
2695 @cols/.is private=interfaces-makecell,%
2696 column/.is private=interfaces-makecell,%
2697 row/.is private=interfaces-makecell,%
2698 transpose/.is if=itf@celltranspose,%
2699 .unknown/.code=%
2700     \ifx\pgfkeyscurrentvalue\pgfkeysnovalue@text \itf@cell@formulaerror{}\z@ \fi
2701     \ifx\pgfkeyscurrentvalue\@empty \itf@cell@formulaerror{}\@ne \fi
2702     \pgfkeysifdefined{\pgfkeyscurrentkey/@calc}%
2703         {\itf@cell@formulaerror{}\tw@}
2704         {\pgfkeyslet{\pgfkeyscurrentkey/@calc}\relax}%
2705     \itf@cell@getformula{#1}%
2706     \pgfkeysEaddvalue{/itf/makecell/repeatcell/@calc}{%
2707         {\the\toks@ \expandafter \noexpand \csname \pgfkeyscurrentname \endcsname}%
2708         \expandafter \let \csname \pgfkeyscurrentname \endcsname \@undefined,%
2709 @reset/.code=% #1 are the columns
2710     \itf@celltransposefalse
2711     \let\itf@celltext\@empty
2712     \let\itf@cellfont\@empty
2713     \pgfkeyssetvalue{/itf/makecell/repeatcell/cr}{\\}%
2714     \itf@row\@ne
2715     \pgfkeyssetvalue{/itf/makecell/repeatcell/@calc}{%
2716         \itf@cell@numcalc\itf@col\column
2717         \itf@cell@numcalc\itf@row\row}%
2718     \itf@number\itf@col#1\relax\@nnil
2719     {\ifnum\itf@col<\z@\itf@col\@ne\fi}
2720     {\itf@col\z@
2721     \def\itf@cols{#1}\itf@expandonceifcs\itf@cols},%
2722 }% keys for \repeatcell

```

`\itf@cell@getformula` Determines whether the formula should be evaluated with `\numexpr`, with `\pgfmath$` or `$$\FPeval$$`:

```

2723 \def\itf@cell@getformula#1{%
2724     \itf@cell@getformula #1$$$ \itf@cell@getformula $\relax\@nnil
2725     \expandafter\ifx\expandafter\toks@\the\toks@
2726         \itf@cell@formulaerror{#1}\thr@@
2727     \fi
2728 }% \itf@cell@getformula
2729 \def\itf@cell@getformula #1$#2$#3$#4$#5$#6{%
2730     \toks@{\toks@}%
2731     \ifx\itf@cell@getformula #4%
2732         \toks@{\itf@cell@numcalc{#1}}%
2733     \else\ifx $#4%
2734         \ifx\itf@cell@getformula #6%
2735             \ifdefined\pgfmathparse\else\itf@cell@formulaerror{#2}4\fi
2736             \toks@{\itf@cell@pgfcalc{#2}}%
2737         \else\ifx $#6%
2738             \ifdefined\FPeval\else\itf@cell@formulaerror{#3}5\fi
2739             \toks@{\itf@cell@FPcalc{#3}}%
2740         \fi\fi
2741     \fi\fi\remove@to@nnil
2742 }% \itf@cell@getformula
2743 \def\itf@cell@formulaerror#1#2{%
2744     \def\itf@tp{#1}\@onelevel@sanitize\itf@tp
2745     \ifcase#2% 0
2746     \PackageError{interfaces-makecell}

```

```

2747     {Missing formula for key \pgfkeyscurrentname!}\@ehd
2748   \or %1
2749   \PackageError{interfaces-makecell}
2750     {Computed key \pgfkeyscurrentname\space wes left blank!}\@ehd
2751   \or %2
2752   \PackageError{interfaces-makecell}
2753     {Duplicate definition for computed key \pgfkeyscurrentname
2754     \MessageBreak\string\repeatcell\space will redefine the key}\@eha
2755   \or %3
2756   \PackageError{interfaces-makecell}
2757     {Incorrect formula in \string\repeatcell
2758     \MessageBreak Check: \itf@tp
2759     \MessageBreak Take care of commas and equal signs...}\@ehd
2760   \or %4
2761   \PackageError{interfaces-makecell}
2762     {Formula: \itf@tp
2763     \MessageBreak requires \string\pgfmathparse:\space\string\usetikz{pgfmath}}\@ehd
2764   \or %5
2765   \PackageError{interfaces-makecell}
2766     {Formula: \itf@tp
2767     \MessageBreak requires \string\FPeval:\space\string\usepackage{fp}}\@ehd
2768   \else
2769   \PackageError{interfaces-makecell}
2770     {Impossible value!}\@ehd
2771   \fi
2772 }% \itf@cell@formulaerror

```



```

\itf@cell@calc
\itf@cell@numcalc 2773 \protected\def\itf@cell@calc#1#2{%
\itf@cell@pgfcalc 2774   \edef#1{\def\noexpand#1{#2}}%
\itf@cell@FPcalc 2775   \toks@ \expandafter{\the\expandafter\toks@ #1}%
2776   #1%
2777 }% \itf@cell@calc
2778 \protected\def\itf@cell@numcalc#1#2{%
2779   \itf@cell@calc#2{\number\numexpr#1}%
2780 }% \itf@cell@numcalc
2781 \protected\def\itf@cell@pgfcalc#1#2{%
2782   \pgfmathparse{#1}%
2783   \itf@cell@calc#2\pgfmathresult
2784 }% \itf@cell@pgfcalc
2785 \protected\def\itf@cell@FPcalc#1#2{%
2786   \begingroup
2787   \hfuzz\maxdimen \vfuzz\hfuzz \hbadness\@M \vbadness\hbadness
2788   \everypar{}\tracinglostchars\z@
2789   \setbox\z@\vbox{\FPeval introduces some weird code, hence the calculation in a \vbox
2790     \FPeval\FPresult{#1}%
2791     \expandafter}\expandafter\endgroup
2792     \expandafter\itf@cell@calc\expandafter#2\expandafter{\FPresult}%
2793 }% \itf@cell@FPcalc

\itf@cell@insert Insert a cell (into the temporary \toks@ token register):

2794 \def\itf@cell@getifdefined#1#2{%
2795   \pgfkeysifdefined{/itf/makecell/repeatcell/#1}
2796     {\pgfkeysgetvalue{/itf/makecell/repeatcell/#1}#2}
2797     {\let#2\@empty}%
2798 }%
2799 \def\itf@cell@insert{%
2800   \pgfkeysvalueof{/itf/makecell/repeatcell/@calc}%
2801   \ifx\R\@empty\else
2802     \toks@ \expandafter{\the\expandafter\toks@
2803       \expandafter\def\expandafter\r\expandafter{\r}}%
2804   \fi
2805   \ifx\C\@empty\else
2806     \toks@ \expandafter{\the\expandafter\toks@
2807       \expandafter\def\expandafter\c\expandafter{\c}}%
2808   \fi
2809   \itf@cell@getifdefined{font/row\the\itf@row}\itf@cellfontrow
2810   \itf@cell@getifdefined{font/col\the\itf@col}\itf@cellfontcol
2811   \itf@cell@getifdefined{text/row\the\itf@row}\itf@cellrow
2812   \itf@cell@getifdefined{text/col\the\itf@col}\itf@cellcol
2813   \toks@ \expandafter{\the\expandafter\toks@ \itf@cellfont}%
2814   \ifx\itf@cellrow\@empty
2815     \ifx\itf@cellcol\@empty
2816       \itf@cell\expandafter\expandafter\expandafter{%
2817         \expandafter\itf@cellfontcol \itf@cellfontrow}%
2818       \let\itf@tp\itf@celltext
2819     \else
2820       \itf@cell\expandafter{\itf@cellfontcol}%
2821       \let\itf@tp\itf@cellcol
2822     \fi
2823   \else
2824     \ifx\itf@cellcol\@empty
2825       \itf@cell\expandafter{\itf@cellfontrow}%
2826       \let\itf@tp\itf@cellrow
2827     \else
2828       \itf@cell{}%
2829       \ifitf@celltranspose
2830         \edef\itf@tp{\noexpand\itf@diaghead(-2,1)%
2831           {\expandonce\itf@cellfontrow\expandonce\itf@cellrow}
2832           {\expandonce\itf@cellfontcol\expandonce\itf@cellcol}}%

```

```

2833         \else
2834         \edef\itf@tp{\noexpand\itf@diaghead(-2,1)%
2835             {\expandonce\itf@cellfontcol\expandonce\itf@cellcol}
2836             {\expandonce\itf@cellfontrow\expandonce\itf@cellrow}}}%
2837         \fi
2838     \fi
2839 \fi
2840 \itf@cell\expandafter{\the\expandafter\itf@cell \itf@tp}%
2841 \edef\itf@tp{\itf@makecell{\the\itf@cell}}%
2842 \toks@\expandafter{\the\expandafter\toks@ \itf@tp}%
2843 }% \itf@cell@insert

```

`\itf@diaghead` A helper macro to makecell's `\diaghead`

```

2844 \def\itf@diaghead(#1)#2#3{%
2845     \begingroup
2846     \edef\itf@tp{\endgroup
2847         \noexpand\diaghead({#1}){\unexpanded{#2 #3}}}%
2848         {\unexpanded{#2}}
2849         {\unexpanded{#3}}}%
2850     }\itf@tp
2851 }% \itf@diaghead

```

### 21.12.3 `colortbl`: patch for `\CT@cellc`

`\CT@cellc`

```

2852 \AfterPackage*{colortbl}{%
2853 \def\CT@cellc#1[#2]#3{% #1 is either \@firstofone or \@gobble, [#2]#3 = color spec
2854     \xdef\CT@cell@color{\noexpand\CT@color#1[{[#2]]}{#3}}%
2855     \global\let\noexpand\CT@cell@color\relax}%
2856 }}
2857 \makecell

```

## 21.13 † Interface `enumitem` : `\setlist`

```

2858 (*enumitem)
2859 \ProvidesPackage{interfaces-enumitem}
2860 [2011/01/19 v2.9 more control on lists (FC)]
2861 \RequirePackage{interfaces-base}
2862 \itf@Check@Package{enumitem}

```

`\interitem` Like `amstext \intertext`, `\interitem` allows to add some non indented text inside a list environment:

```

2863 \providerobustcmd*\interitem{%
2864     \item[]\hskip-\leftmargin
2865 }% \interitem

```

`\setlist` (extension, star form)

```

2866 \renewrobustcmd*\setlist{\begingroup \@ifstar
2867     {\let\do\csgappto \itf@setlist}
2868     {\let\do\csgdef \itf@setlist}%
2869 }% \setlist
2870 \newrobustcmd*\itf@setlist[2][0]{%
2871     \let\enit@a\@empty
2872     \let\enit@b\@empty
2873     \@for\x:=#1\do{%
2874         \ifx\x\@empty\else
2875             \itf@number\count@\x\relax\@nnil
2876             {\edef\enit@b{\enit@b,\the\count@}}
2877             {\edef\enit@a{\enit@a,\x}}%
2878         \fi}%
2879     \ifx\enit@a\@empty\def\enit@a{list}\fi
2880     \ifx\enit@b\@empty\def\enit@b{0}\fi
2881     \@for\@:=\enit@a\do{%

```

```

2882      \ifx\@empty\else
2883      \@for\b:=\enit@b\do{%
2884        \ifx\b\@empty\else
2885        \ifcsundef{end\@}
2886          {\expandafter\itf@setlist@error\expandafter{\@}}
2887          {\do{enit@@\@a\romannumeral\b}{, #2}}%
2888        \fi}%
2889      \fi}
2890    \endgroup
2891 }% \itf@setlist
2892 \def\itf@setlist@error#1{%
2893   \PackageError{interfaces-enumitem}
2894     {Environment ‘#1’ is undefined
2895     \MessageBreak Use \string\newlist\space before \string\setlist
2896     \MessageBreak Your command will be ignored}\@eha
2897 }% \itf@setlist@error
2898 </enumitem>

```

## 21.14 † Interface `truncate`

```

2899 <*truncate>
2900 \ProvidesPackage{interfaces-truncate}

```

`\truncetext` `\truncetext` is like `\truncate` but leaves the text to its natural width if possible.

```

2901 \newrobustcmd\truncetext[3][\TruncateMarker]{% do nothing if width of #3 is less than #2
2902   \begingroup
2903     \hbadness\maxdimen\hfuzz\vsize
2904     \setbox\z@=\hbox to\dimexpr#2\relax\bgroup\color@begingroup
2905                                     \ignorespaces#3\unskip
2906                                     \color@endgroup\egroup
2907     \ifnum\badness>\@M \truncate[{#1}]{#2}{#3}%
2908 %%      \def\next{\truncate[{#1}]{#2}{#3}}%
2909     \else #3%\def\next{#3}%
2910     \fi
2911   \endgroup
2912 }% \truncetext

```

`\htruncadjust`

```

2913 \newrobustcmd\htruncadjust[1]{\@testopt
2914   {\itf@htruncadjust{#1}}}%
2915 }% \htruncadjust
2916 \long\def\itf@htruncadjust#1[#2]#3{%#1=total width, #2=[x_1..x_n], #3=text_1..text_n
2917   \begingroup
2918     \let\itf@trunc@width\@empty
2919     \let\itf@istruncated\@gobble % to remove the first comma
2920     \let\the@dimen\relax
2921     \count@ \z@ \dimen@ \z@
2922     \ifblank{#2}% no optional [x_1,...,x_n] parameters
2923       {%
2924         \@for\x:=#3\do{%
2925           \advance \count@ \@ne
2926           \setbox\z@\hbox\bgroup\color@begingroup
2927                                   \ignorespaces\x\unskip
2928                                   \color@endgroup\egroup
2929           \dimen\count@ = \wd\z@
2930           \toks\count@\expandafter{\the\dimen\count@}%
2931           \advance\dimen@ \dimen\count@}%
2932       }
2933     {%
2934       \@for\x:=#2\do{%
2935         \advance \count@ \@ne
2936         \toks\count@\expandafter{x\p@}%
2937         \advance\dimen@ \x\p@
2938         \dimen\count@ -\@ne\p@}%

```

```

2939 }%
2940 \advance\count@\@ne \dimendef\itf@freespace=\count@
2941 \advance\count@\@ne \dimendef\itf@tempdim=\count@
2942 \advance\count@\@ne \dimendef\itf@sum=\count@
2943 \count@\z@
2944 \itf@freespace\z@ % free space left when  $w_i < x_i/\text{sum}(x_i) * \text{total}$ 
2945 \@for\x:=#3\do{%
2946   \advance \count@ \@ne
2947   \ifdim\dimen@=\z@ \else
2948     \ifdim \dimen\count@<\z@ % not measured before
2949       \setbox\z@\hbox\bgroup\color@begingroup
2950       \ignorespaces\x\unskip
2951       \color@endgroup\egroup
2952       \dimen\count@ = \wd\z@
2953     \fi
2954     \itf@tempdim = \itf@scaledimen{#1}*\the\toks\count@/\dimen@relax
2955     \ifdim \dimen\count@ > \itf@tempdim
2956       \dimen\count@ = \itf@tempdim
2957       \edef\itf@istruncated{\itf@istruncated,\the\count@}%
2958       \advance\itf@sum by\the\toks\count@
2959     \else
2960       \advance\itf@freespace \itf@tempdim
2961       \advance\itf@freespace -\dimen\count@
2962     \fi
2963   \fi
2964   \edef\itf@trunc@width{\itf@trunc@width\the\count@\the@dimen\the\count@}}%
2965 }%
2966 %% Free space=\the\itf@freespace\par
2967 \ifdim\itf@freespace > \z@ % reinsert free space proportionally
2968   \ifx\itf@istruncated@gobble\else
2969     \@for\x:=\itf@istruncated\do{%
2970       \advance\dimen\x by\itf@scaledimen\itf@freespace*\the\toks\x/\itf@sumrelax
2971     }%
2972   \fi\fi
2973 \def\the@dimen{\the\dimen}%
2974 \edef\itf@trunc@width{\itf@trunc@width}%
2975 \expandafter\endgroup
2976 \expandafter\def
2977   \expandafter\itf@trunc@width
2978   \expandafter{\itf@trunc@width}%
2979 %% total=\the\dimexpr#1\relax
2980 }% \itf@htruncadjust
2981 \def\itf@scalefactor#1#2{\strip@pt\dimexpr#1*65536/#2\relax}
2982 \def\itf@scaledimen#1*#2/#3\relax{%
2983   \dimexpr\itf@scalefactor{#2}{#3}\dimexpr#1\relax\relax
2984 }% \itf@scaledimen

```

\htruncwidth

```

2985 \newcommand*\htruncwidth[1]{% purely expandable
2986   \expandafter\itf@htruncwidth\itf@trunc@width\relax\relax@nnil{#1}%
2987 }% \htruncwidth
2988 \def\itf@htruncwidth#1#2#3@nnil#4{%
2989   \ifx\relax#1\itf@trunc@nosuchwidth{#4}%
2990   \else\ifnum#1=#4
2991     #2%
2992   \else
2993     \itf@htruncwidth#3@nnil{#4}%
2994   \fi\fi
2995 }% \itf@htruncwidth
2996 \def\itf@trunc@nosuchwidth#1{%
2997   \PackageError{interfaces-truncate}
2998     {You requested the width for text nr#1
2999     \MessageBreak but there is no such text
3000     \MessageBreak Therefore no such width!}\@ehd

```

```
3001 }% \itf@trunc@nosuchwidth
```

```
3002 </truncate>
```

## 21.15 Interface `appendix` and the appendices environment

```
3003 <*appendix>
```

```
3004 \ProvidesPackage{interfaces-appendix}
```

```
3005 [2011/01/19 v2.9 easy control of appendices environment (FC)]
```

```
3006 \RequirePackage{interfaces-base}
```

```
3007 \itf@Check@Package{appendix}
```

\appendices

```
3008 \let\itf@appendices@pp\appendices
```

```
3009 \let\itf@endappendices@pp\endappendices
```

```
3010 \let\itf@appendices@pp\appendices
```

```
3011 \let\itf@endappendices@pp\endappendices
```

```
3012 \renewenvironment{appendices}[1][{}]{%
```

```
3013   \pgfqkeys{/itf/appendix/appendices}{#1}%
```

```
3014   \itf@appendices@pp
```

```
3015   }
```

```
3016   {\itf@endappendices@pp}%
```

```
3017 \pgfqkeys{/itf/appendix/appendices}{%
```

```
3018   title/.store as code in cs=appendixpagename,%
```

```
3019   title/.append code=\ifx\appendixpagename\@empty \@dopage@ppfalse
```

```
3020   \else \@dopage@pptrue\fi,%
```

```
3021   title/.value required,%
```

```
3022   intoc/.is if=@dotoc@pp,%
```

```
3023   intoc/title/.store as code in cs=appendixtocname,%
```

```
3024   intoc/title/.append code=\ifx\appendixtocname\@empty \@dotoc@ppfalse
```

```
3025   \else \@dotoc@pptrue\fi,%
```

```
3026   intoc/title/.default=\pgfkeysvalueof{/itf/appendix/appendices/title},%
```

```
3027   section/.is enum={section,chapter},%
```

```
3028   section/.append code={\@chapter@ppfalse
```

```
3029     \ifnum\pgfkeysvalueof{/itf/appendix/appendices/section/.number}=\z@
```

```
3030     \else \ifundef\chapter
```

```
3031       {\PackageWarning{interfaces-appendix}
```

```
3032         {You asked chapter-style appendices but your
```

```
3033         \MessageBreak current class does not provide chapters!}}
```

```
3034         \@chapter@pptrue
```

```
3035       \fi},%
```

```
3036   chapter/.style={section=chapter},%
```

```
3037   chapter/.value forbidden,%
```

```
3038 }% keys for appendices environment
```

```
3039 </appendix>
```

## 21.16 Interface `embedfile` : `\embedthisfile`

```
3040 <*embedfile>
```

```
3041 \ProvidesPackage{interfaces-embedfile}
```

```
3042 [2011/01/19 v2.9 easy macros to embed files into pdf (FC)]
```

```
3043 \RequirePackage{interfaces-base}
```

```
3044 \itf@Check@Package{embedfile}
```

```
3045 \newrobustcmd*\embedthisfile{\@ifstar
```

```
3046   \embedthisfile@main
```

```
3047   \embedthisfile@all
```

```
3048 }% \embedthisfile
```

```
3049 \@onlypreamble\embedthisfile
```

```
3050 \def\embedthisfile@main{\embedfile{\jobname.tex}}
```

```
3051 \def\embedthisfile@all{%
```

```
3052   \embedthisfile@main
```

```
3053   \AfterPreamble{%
```

```
3054     \ltx@ifundefined{@listfiles}
```

```

3055      {\let\@listfiles\@empty}% to avoid: \global\let\@filelist\relax in \document
3056      {}}%
3057  }%
3058  \gpreto\@enddocumenthook{%
3059      \let\do\itf@EmbedOne
3060      \expandafter\docsvlist\expandafter{\@filelist}%
3061  }%
3062 }% \embedthisfile@all
3063 \def\itf@EmbedOne#1{\itf@Embed@ne#1.tex\@nil}
3064 \def\itf@Embed@ne#1.tex#2\@nil{%
3065     \ltx@ifundefined{cp@#1}
3066     {}
3067     {\ifblank{#2}
3068     {}
3069     {\embedfile{#1.tex}}}%
3070 }% \itf@Embed@ne
3071 </embedfile>

```

### 21.17 Interface `environ`

```

3072 <*environ>
3073 \ProvidesPackage{interfaces-environ}
3074     [2011/01/19 v2.9 ReNewEnviron = RenewEnviron (FC)]
3075 \RequirePackage{interfaces-base}
3076 \AfterPackage{environ}{
3077     \ifundef\ReNewEnviron
3078     {\let\ReNewEnviron\RenewEnviron}
3079     {}}%
3080 }%
3081 </environ>

```

### 21.18 Interface `umrand`

```

3082 <*umrand>
3083 \ProvidesPackage{interfaces-umrand}
3084     [2011/01/19 v2.9 patch for umrand.sty ifnotempty (FC)]
3085 \RequirePackage{interfaces-base}
3086 \BeforePackage{umrand}{%
3087     \let\itf@newif\newif
3088     \def\itf@tp{\ifnotempty}%
3089     \def\newif#1{\def\x{#1}\ifx\x\itf@tp \expandafter\@gobble
3090         \else\expandafter\ltx@newif\fi{#1}}%
3091 }
3092 \AfterPackage{umrand}{%
3093     \let\newif\itf@newif
3094     \let\itf@newif\@undefined
3095 }
3096 </umrand>

```

### 21.19 Interface `scrfile`

```

3097 <*scrfile>
3098 \ProvidesPackage{interfaces-scrfile}
3099     [2011/01/19 v2.9 scrfile hooks improved (FC)]
3100 \RequirePackage{interfaces-base}

```

`\@pkgextension` In L<sup>A</sup>T<sub>E</sub>X they are defined `\@onlypreamble`. So we use the `ltxcmds` equivalents:

```

\@clsextension
3101 \AfterEndPreamble{%
3102     \let\@pkgextension\ltx@pkgextension
3103     \let\@clsextension\ltx@clsextension
3104     \let\@ifpackageloaded\ltx@ifpackageloaded
3105     \let\@ifclassloaded\ltx@ifclassloaded
3106 }

```

`\scrload@hook`



```

3107 \renewrobustcmd*\scr@load@hook[2]{%
3108   \csuse{#2-@#1}%
3109   \ifcsname#2-@#1-\string\keep\endcsname\else\global\csundef{#2-@#1}\fi
3110}% \scr@load@hook

\scr@set@load@hook (optimisation)

3111 \renewrobustcmd*\scr@set@load@hook[2]{\csgappto{#2-@#1}}

\BeforeFile Addition of star forms *: the hooks are not canceled after input (in case a file is input more than once...)
\AfterFile
3112 \renewrobustcmd*\BeforeFile{\@ifstar
3113   {\itf@s@LoadFile{before}}
3114   {\itf@LoadFile{before}}}%
3115}% \BeforeFile
3116 \renewrobustcmd*\AfterFile{\@ifstar
3117   {\itf@s@LoadFile{after}}
3118   {\itf@LoadFile{after}}}%
3119}% \AfterFile

3120 \def\itf@s@LoadFile#1#2{%
3121   \global\cslet{#2-@#1-\string\keep}\@empty
3122   \scr@set@load@hook{#1}{#2}%
3123}% \itf@s@LoadFile
3124 \def\itf@LoadFile#1#2{%
3125   \global\csundef{#2-@#1-\string\keep}%
3126   \scr@set@load@hook{#1}{#2}%
3127}% \itf@LoadFile

\@input (patch) This modification allows \@input to behaves like \InputIfFileExists as far as hooks are concerned.

3128 \renewcommand*\@input[1]{\IfFileExists{#1}
3129   {\scr@load@hook{before}{#1}%
3130    \@input\@filef@und
3131    \scr@load@hook{after}{#1}}%
3132   {\typeout{No file #1.}}%
3133}% \@input

3134 </scrfile>

```

## 21.20 † Interface `pgfkeys` (📖 [pgfmanual](#))

```

3135 <*pgfkeys>
3136 \ProvidesPackage{interfaces-pgfkeys}
3137   [2011/01/19 v2.9 pgfkeys handlers definitions (FC)]
3138 \RequirePackage{interfaces-base}
3139 \ifdefined\pgfkeys@ifexecutehandler % pgf version 2.1
3140 \def\itf@pgfkeys{%
3141   \global\let\pgfkeys@unpack \itf@pgfkeys@unpack
3142   \global\let\pgfkeys@case@three \itf@pgfkeys@case@three
3143   \global\let\pgfkeys@case@three@handleall\itf@pgfkeys@case@three@handleall
3144}% \itf@pgfkeys
3145 \else
3146 \def\itf@pgfkeys{%
3147   \global\let\pgfkeys@unpack \itf@pgfkeys@unpack
3148   \global\let\pgfkeys@case@three \itf@pgfkeys@case@three
3149   \global\let\pgfkeys@addvalue \itf@pgfkeys@addvalue
3150   \global\let\pgfkeys@exp@call \itf@pgfkeys@exp@call
3151}% \itf@pgfkeys
3152 \fi
3153 \AtBeginDocument{\itf@pgfkeys \let\itf@pgfkeys \relax}

```

### Some new `pgfkeys` macros

`\pgfkeysmeaning`

```

3154 \providecommand*\pgfkeysmeaning[1]{\pgfkeysifdefined{#1}
3155   {\expandafter\meaning\csname pgfk@#1\endcsname}
3156   {\meaning\@undefined}%

```

```

3157}% \pgfkeysmeaning
\pgfkeysvalueof@unexpanded
3158\def\pgfkeysvalueof@unexpanded#1{%
3159  \unexpanded\expandafter\expandafter\expandafter{%
3160    \csname pgfk@#1\endcsname}%
3161}% \pgfkeysvalueof@unexpanded

```

### Some `pgfkeys` macros redefinition/corrections

`\pgfkeysaddvalue` (bug correction) Bug in `\pgfkeysaddvalue` for `pgf v2.0`, fixed in `v2.1`

```

3162\ifdefined\pgfkeys@ifexecutehandler \else % pgf v2.1: bug fixed
3163\def\itf@pgfkeysaddvalue#1#2#3{% (pgf v2.0: bug in pgfkeys.code.tex)
3164  \edef\pgfkeys@global@temp{%
3165    \unexpanded{#2}%
3166    \ifcsname pgfk@#1\endcsname
3167      \unexpanded\expandafter\expandafter\expandafter{%
3168        \csname pgfk@#1\endcsname}%
3169    \fi
3170    \unexpanded{#3}}%
3171  \pgfkeyslet{#1}\pgfkeys@global@temp
3172}% \itf@pgfkeysaddvalue
3173\fi

```

```

\pgfkeysEsetvalue
\pgfkeysEaddvalue
3174\ifdefined\pgfkeys@ifexecutehandler \long \fi % pgf version 2.1
3175\def\pgfkeysEsetvalue#1#2{%
3176  \expandafter\edef\csname pgfk@#1\endcsname{#2}%
3177}% \pgfkeysEsetvalue
3178\ifdefined\pgfkeys@ifexecutehandler \long \fi % pgf v2.1
3179\def\pgfkeysEaddvalue#1#2#3{% \csepreappto{pgfk@#1}{#2}{#3}
3180  \edef\pgfkeys@global@temp{%
3181    #2%
3182    \ifcsname pgfk@#1\endcsname
3183      \unexpanded\expandafter\expandafter\expandafter{%
3184        \csname pgfk@#1\endcsname}%
3185    \fi
3186    #3}%
3187  \pgfkeyslet{#1}\pgfkeys@global@temp
3188}% \pgfkeysEaddvalue

```

`\pgfkeys@exp@call` Missed the braces around the argument (in case the argument contains a comma or an = sign...):

```

3189%% missed a pair of braces around the argument in pgfkeys.code.tex (pgf v2.0)
3190%% ( the code could break if it contains = or , )
3191\ifdefined\pgfkeys@ifexecutehandler\else % (bug corrected in pgf v2.1)
3192  \def\itf@pgfkeys@exp@call#1{\pgfkeysalso{\pgfkeyscurrentpath={#1}}}%
3193\fi

```

### Handlers `/.blank`

```

3194%% The value is now checked by \itf@pgfkeys@default@blank@required:
3195\ifdefined\pgfkeys@ifexecutehandler \long \fi % pgf v2.1
3196\def\itf@pgfkeys@unpack#1=#2=#3\pgfkeys@stop{%
3197  \pgfkeys@spdef\pgfkeyscurrentkey{#1}%
3198  \edef\pgfkeyscurrentkey{\pgfkeyscurrentkey}%
3199  \ifx\pgfkeyscurrentkey\pgfkeys@empty
3200    % Skip
3201  \else%
3202    \pgfkeys@add@path@as@needed
3203    \pgfkeys@spdef\pgfkeyscurrentvalue{#2}%
3204    \itf@pgfkeys@default@blank@required % <FC>
3205    \pgfkeyscurrentkey % <FC>

```

```

3206                                     \pgfkeys@case@one % <FC>
3207   \fi
3208 }% \itf@pgfkeys@unpack

\itf@pgfkeys@default@blank@required                                     Handle the case: /.@def → /.@blank → /.@def ...

3209 \def\itf@pgfkeys@default@blank@required#1#2{%
3210   \ifx\pgfkeyscurrentvalue\pgfkeysnovalue@text% Hmm... no value
3211     \pgfkeysifdefined{#1/.@def}%
3212       {\pgfkeysgetvalue{#1/.@def}\pgfkeyscurrentvalue}
3213       {}% no default, so leave it
3214   \fi
3215   \ifx\pgfkeyscurrentvalue\@empty
3216     \pgfkeysifdefined{#1/.@blank}
3217       {\pgfkeysgetvalue{#1/.@blank}\pgfkeyscurrentvalue}
3218       {}% no /.blank specified
3219   \ifx\pgfkeyscurrentvalue\pgfkeysnovalue@text% in case /.blank -> \pgfkeysnovalue
3220     \pgfkeysifdefined{#1/.@def}%
3221       {\pgfkeysgetvalue{#1/.@def}\pgfkeyscurrentvalue}
3222       {}% no default, so leave it
3223   \fi\fi
3224   \ifx\pgfkeyscurrentvalue\pgfkeysvaluerequired
3225     \pgfkeysvalueof{/errors/value required/.@cmd}\pgfkeyscurrentkey
3226                                           \pgfkeyscurrentvalue
3227                                           \pgfeov
3228   \else
3229     #2%
3230   \fi
3231 }% \itf@pgfkeys@default@blank@required

```

### Allowing `/.default` values (and `/.blank` values) for handlers:

```

3232 %% To handle the cases of: /handler/.default= /handler/.blank= /handler/.value required,
3233 %% it is necessary to redefine \pgfkeys@case@three
3234 \def\itf@pgfkeys@case@three{%
3235   \pgfkeys@split@path
3236   \pgfkeysifdefined{/handlers/\pgfkeyscurrentname/.@cmd}{
3237     {%
3238       \itf@pgfkeys@default@blank@required{/handlers/\pgfkeyscurrentname}%
3239       {\pgfkeysgetvalue{/handlers/\pgfkeyscurrentname/.@cmd}\pgfkeys@code
3240        \expandafter\pgfkeys@code\pgfkeyscurrentvalue\pgfeov}%
3241     }
3242     \pgfkeys@unknown % no handler, thus the key is unknown
3243 }% \itf@pgfkeys@case@three
3244 \ifdefined\pgfkeys@ifexecutehandler
3245   \let\itf@pgfkeys@case@three@handleall \itf@pgfkeys@case@three
3246 \fi

```

### Loading interfaces modifications for `pgfkeys`

```

3247 \itf@pgfkeys

```

### Handler definition: `/.alias`, `/.blank`

```

3248 \pgfkeys{%
3249   /handlers/.alias/.code=\itf@pgfkeys@ifaliasexists{#1}{%
3250     \pgfkeysedef\pgfkeyscurrentpath{%
3251       \noexpand\pgfkeysalso{\pgfkeysdefaultpath#1={##1}}},%
3252     /handlers/.alias/.value required,%
3253     /handlers/.blank/.code=\pgfkeyssetvalue{\pgfkeyscurrentpath/.@blank}{#1},%
3254     /handlers/.blank/.default=\pgfkeysnovalue,%
3255 }% /.alias and /.blank
3256 \def\itf@pgfkeys@ifaliasexists#1#2{%

```

```

3257 \pgfkeysifdefined{\pgfkeysdefaultpath#1/.@cmd}{#2}
3258     {\pgfkeysifdefined{\pgfkeysdefaultpath#1}
3259      {#2}
3260      {\itf@pgfkeys@aliaserror{#1}}}}%
3261}% \itf@pgfkeys@ifaliasexists
3262\def\itf@pgfkeys@aliaserror#1{%
3263  \PackageError{interfaces-pgfkeys}
3264    {You want the key \pgfkeyscurrentpath\space
3265    \MessageBreak to be an alias for \pgfkeysdefaultpath#1
3266    \MessageBreak but the key \pgfkeysdefaultpath#1
3267    \MessageBreak is not defined!}\@eha\@gobble
3268}% \itf@pgfkeys@aliaserror

```

**Handler definition: `/.alias*`** For use with handlers `/.store as glue` or `/.store as glue in cs` etc.. when a handler defines key with `*` version and/or `+` version and/or `-` versions.

Then, the `/.alias*` handler is a facility to create aliases for starred `*`, `+`, `-` keys in a batch (as long as the alias exists, of course).

```

3269 \pgfkeys{
3270   /handlers/.alias*/.code=\itf@pgfkeys@ifaliasexists{#1}{%
3271     \pgfkeysedef\pgfkeyscurrentpath{\noexpand\pgfkeysalso{\pgfkeysdefaultpath#1={##1}}}%
3272     \@tfor\x:=+-%\do{%
3273       \pgfkeysifdefined{\pgfkeysdefaultpath#1\x/.@cmd}
3274       {\pgfkeysedef{\pgfkeyscurrentpath\x}{%
3275         \noexpand\pgfkeysalso{\pgfkeysdefaultpath#1\x={##1}}}}
3276       }%
3277     }},%
3278   /handlers/.alias*/.value required,%
3279}% /.alias*

```

**Handler definition: `/.is private`**

```

3280 \pgfkeys{%
3281   /handlers/.is private/.code=\pgfkeysdef\pgfkeyscurrentpath{%
3282     \PackageError{#1}{Key \pgfkeyscurrentkey\space is private
3283     \MessageBreak and should not be modified}\@ehd},%
3284   /handlers/.is private to class/.code=\pgfkeysdef\pgfkeyscurrentpath{%
3285     \ClassError{#1}{Key \pgfkeyscurrentkey\space is private
3286     \MessageBreak and should not be modified}\@ehd}%
3287}% /.is private

```

**Handlers definition: `/.true` `/.false` `/.on` `/.off`**

```

3288 \def\itf@pgfkeys@choice[#1]#2#3{%
3289   \pgfkeys{\pgfkeyscurrentpath/.cd,%
3290     .is choice,%
3291     #2/.code={#3},%
3292     .default/.expanded=\@firstoftwo#1}%
3293}% \itf@pgfkeys@choice
3294 \pgfkeys{%
3295   /handlers/.true/.code=\itf@pgfkeys@choice[true]{false}[true]{#1},%
3296   /handlers/.false/.code=\itf@pgfkeys@choice[true]{false}[false]{#1},%
3297   /handlers/.on/.code=\itf@pgfkeys@choice[on]{off}[on]{#1},%
3298   /handlers/.off/.code=\itf@pgfkeys@choice[on]{off}[off]{#1},%
3299}% /.true /.false

```

**Handlers definition: `/.store in cs/.estore in cs` etc.**

```

3300 \pgfkeys{%
3301   /handlers/.store in cs/.code=\pgfkeysdef\pgfkeyscurrentpath{\csdef{#1}{##1}},%
3302   /handlers/.estore in cs/.code=\pgfkeysdef\pgfkeyscurrentpath{\csedef{#1}{##1}},%
3303}% /.store in cs

```

**Handler definition: `/.store as code`**

```

3304%% /.store as code handlers
3305 \pgfkeys{%
3306   /handlers/.store as code/.code={%
3307     \pgfkeysedef\pgfkeyscurrentpath{%
3308       \noexpand\pgfkeyslet{\pgfkeyscurrentpath}\noexpand\pgfkeyscurrentvalue}%
3309     \pgfkeyslet\pgfkeyscurrentpath\@empty
3310     \pgfkeyslet{\pgfkeyscurrentpath/.@def}\@empty
3311     \@tfor\x:=#1\do{%
3312       \pgfkeysedef{\pgfkeyscurrentpath\x}{%
3313         \noexpand\pgfkeysalso{\pgfkeyscurrentpath/.expanded={%
3314           \noexpand\pgfkeysvalueof@unexpanded{\pgfkeyscurrentpath}%
3315           \noexpand\unexpanded{##1}}}%
3316       \pgfkeyslet{\pgfkeyscurrentpath\x/.@def}\@empty
3317     }},%
3318   /handlers/.store as code/.default=*,%
3319}% /.store as code

```

**Handler definition: `/.estore as code`**

```

3320 \pgfkeys{%
3321   /handlers/.estore as code/.code={%
3322     \pgfkeysedef\pgfkeyscurrentpath{%
3323       \noexpand\pgfkeysEsetvalue{\pgfkeyscurrentpath}{##1}}%
3324     \pgfkeyslet\pgfkeyscurrentpath\@empty
3325     \@tfor\x:=#1\do{%
3326       \pgfkeysedef{\pgfkeyscurrentpath\x}{%
3327         \noexpand\pgfkeysalso{\pgfkeyscurrentpath/.expanded={%
3328           \noexpand\pgfkeysvalueof@unexpanded{\pgfkeyscurrentpath}%
3329           \noexpand\unexpanded{##1}}}%
3330       }},%
3331   /handlers/.estore as code/.default=*,%
3332}% /.estore as code

```

**Handler definition: `/.store as code in cs=<cs-name>`**

```

3333 \pgfkeys{%
3334   /handlers/.store as code in cs/.code={%
3335     \pgfkeysdef\pgfkeyscurrentpath{%
3336       \ifx\pgfkeyscurrentvalue\pgfkeysnovalue@text
3337       \else\csdef{#1}{##1}\fi}%
3338     \@tfor\x:=*\do{%
3339       \pgfkeysedef{\pgfkeyscurrentpath\x}{%
3340         \noexpand\pgfkeysalso{\pgfkeyscurrentpath/.expanded={%
3341           \noexpand\ifcsname#1\endcsname
3342           \noexpand\expandafter\noexpand\expandonce
3343           \noexpand\csname#1\endcsname
3344           \noexpand\fi
3345           \noexpand\unexpanded{##1}}}%
3346       \pgfkeyslet{\pgfkeyscurrentpath\x/.@def}\@empty
3347     }},%
3348   /handlers/.store as code in cs/.value required,%
3349}% /.store as code in cs
3350 \pgfkeys{%
3351   /handlers/.estore as code in cs/.code={%

```

```

3352 \pgfkeysdef\pgfkeyscurrentpath{%
3353 \ifx\pgfkeyscurrentvalue\pgfkeysnovalue@text
3354 \else\csedef{##1}{##1}\fi}%
3355 \@tfor\x:=*+\do{%
3356 \pgfkeysedef\pgfkeyscurrentpath\x}{%
3357 \noexpand\pgfkeysalso{\pgfkeyscurrentpath/.expanded=%
3358 \noexpand\ifcsname#1\endcsname
3359 \noexpand\expandafter\noexpand\expandonce
3360 \noexpand\csname#1\endcsname
3361 \noexpand\fi
3362 \noexpand\unexpanded{##1}}}%
3363 }},% default if \pgfkeysnovalue which expands to \@empty
3364 /handlers/.estore as code in cs/.value required,%
3365 }% /.estore as code in cs

```

#### Handler definition: `/.store as color`

```

3366 \protected\def\itf@pgfk@color#1#2\@nil{%
3367 \ifx\@let@token\color
3368 \def\pgfkeyscurrentvalue{#2}%
3369 \else\ifx\@let@token\normalcolor
3370 \def\pgfkeyscurrentvalue{default}%
3371 \else\ifx\@let@token\pgfkeysnovalue
3372 \def\pgfkeyscurrentvalue{default}%
3373 \fi\fi\fi
3374 }% \itf@pgfk@color
3375 \pgfkeys{%
3376 /handlers/.store as color/.code=%
3377 \pgfkeysedef\pgfkeyscurrentpath{%
3378 \futurelet\noexpand\@let@token\itf@pgfk@color
3379 ##1\noexpand\pgfkeysnovalue\noexpand\@nil
3380 \noexpand\pgfkeyslet{\pgfkeyscurrentpath}\noexpand\pgfkeyscurrentvalue}%
3381 }% /.store as color

```

#### Handler definition: `/.store as color in cs=<cs-name>`

```

3382 \pgfkeys{%
3383 /handlers/.store as color in cs/.code=%
3384 \pgfkeysedef\pgfkeyscurrentpath{%
3385 \futurelet\noexpand\@let@token\itf@pgfk@color
3386 ##1\noexpand\pgfkeysnovalue\noexpand\@nil
3387 \cslet{##1}\noexpand\pgfkeyscurrentvalue}%
3388 }% /.store as color in cs

```

#### Handler definition: `/.store as color command`

```

3389 \protected\def\itf@pgfk@colorcmd#1\@nil{%
3390 \ifcat @\noexpand\@let@token
3391 \def\pgfkeyscurrentvalue{\color{#1}}%
3392 \else\ifcat 0\noexpand\@let@token
3393 \def\pgfkeyscurrentvalue{\color{#1}}%
3394 \else\ifx\@let@token\@nil
3395 \let\pgfkeyscurrentvalue\normalcolor
3396 \fi\fi\fi
3397 }% \itf@pgfk@colorcmd
3398 \pgfkeys{%
3399 /handlers/.store as color command/.code=%
3400 \pgfkeysedef\pgfkeyscurrentpath{%
3401 \futurelet\noexpand\@let@token\itf@pgfk@colorcmd
3402 ##1\noexpand\@nil
3403 \noexpand\pgfkeyslet{\pgfkeyscurrentpath}\noexpand\pgfkeyscurrentvalue}%
3404 \pgfkeyssetvalue{\pgfkeyscurrentpath/.@def}\normalcolor
3405 }% /.store as color command

```



**Handler definition: `/.store as color command in cs=<cs-name>`**

```

3406 \pgfkeys{%
3407   /handlers/.store as color command in cs/.code=%
3408     \pgfkeysdef\pgfkeyscurrentpath{%
3409       \futurelet\noexpand\@let@token\itf@pgfk@colorcmd
3410       ##1\noexpand\@nil
3411       \cslet{##1}\noexpand\pgfkeyscurrentvalue}%
3412     \pgfkeyssetvalue{\pgfkeyscurrentpath/.@def}\normalcolor
3413 }% /.store as color command in cs

```

**Handler definition `/.store as number`**

```

3414 \pgfkeys{%
3415   /handlers/.store as number/.code={%
3416     \pgfkeysdef\pgfkeyscurrentpath{%
3417       \noexpand\pgfkeyssetvalue{\pgfkeyscurrentpath}{\numexpr##1\relax}}%
3418     \pgfkeyslet\pgfkeyscurrentpath\z@
3419     \pgfkeyslet{\pgfkeyscurrentpath/.@def}\z@
3420     \pgfkeyslet{\pgfkeyscurrentpath/.@blank}\z@
3421     \@tfor\x:=#1\do{%
3422       \pgfkeysdef{\pgfkeyscurrentpath\x}{%
3423         \noexpand\pgfkeysalso{\pgfkeyscurrentpath/.expanded=%
3424           \noexpand\pgfkeysvalueof@unexpanded{\pgfkeyscurrentpath}%
3425           \x
3426           \numexpr\unexpanded{##1}\relax}}%
3427       \pgfkeysEsetvalue{\pgfkeyscurrentpath\x/.@def}{\if*\x\@ne\else\z@\fi}%
3428       \pgfkeysEsetvalue{\pgfkeyscurrentpath\x/.@blank}{\if*\x\@ne\else\z@\fi}%
3429     }},%
3430   /handlers/.store as number/.default=+-*,%
3431 }% /.store as number

```

**`/.store as number in cs` Handler definition: `/.store as number in cs`**

```

3432 \pgfkeys{%
3433   /handlers/.store as number in cs/.code={%
3434     \pgfkeysdef\pgfkeyscurrentpath{%
3435       \ifx\pgfkeyscurrentvalue\pgfkeysnovalue@text
3436       \else\csdef{##1}{\numexpr##1\relax}\fi}%
3437     \pgfkeyslet{\pgfkeyscurrentpath/.@blank}\z@
3438     \@tfor\x:=+-*\do{%
3439       \pgfkeysdef{\pgfkeyscurrentpath\x}{%
3440         \letcs\noexpand\pgfkeys@temp{%
3441           \noexpand\ifcsname#1\endcsname
3442             #1\noexpand\else\if*\x\@ne\else\z@\fi\noexpand\fi}%
3443         \edef\noexpand\pgfkeys@temp{%
3444           \noexpand\pgfkeysalso{\pgfkeyscurrentpath={%
3445             \noexpand\expandonce\noexpand\pgfkeys@temp
3446             \x
3447             \numexpr\noexpand\unexpanded{##1}\relax}}%
3448           }\noexpand\pgfkeys@temp}%
3449         \pgfkeysEsetvalue{\pgfkeyscurrentpath\x/.@def}{\if*\x\@ne\else\z@\fi}%
3450         \pgfkeysEsetvalue{\pgfkeyscurrentpath\x/.@blank}{\if*\x\@ne\else\z@\fi}%
3451       }},%
3452   /handlers/.store as number in cs/.value required,%
3453 }% /.store as number in cs

```

**Handler definition: `/.estore as number`**

```

3454 \pgfkeys{%
3455   /handlers/.estore as number/.code={%
3456     \pgfkeysdef\pgfkeyscurrentpath{%
3457       \noexpand\pgfkeyssetvalue{\pgfkeyscurrentpath}{%
3458         \noexpand\number\numexpr##1\relax}}%
3459     \pgfkeyslet\pgfkeyscurrentpath\z@
3460     \pgfkeyslet{\pgfkeyscurrentpath/.@def}\z@
3461     \pgfkeyslet{\pgfkeyscurrentpath/.@blank}\z@
3462     \@tfor\x:=#1\do{%
3463       \pgfkeysdef{\pgfkeyscurrentpath\x}{%
3464         \noexpand\pgfkeysalso{\pgfkeyscurrentpath=%
3465           \noexpand\pgfkeysvalueof{\pgfkeyscurrentpath}%
3466           \x
3467           \numexpr##1\relax}}%
3468     }},%
3469   /handlers/.estore as number/.default=+-*,%
3470}% /.estore as number

```

**Handler definition: `/.estore as number in cs`**

```

3471 \pgfkeys{%
3472   /handlers/.estore as number in cs/.code={%
3473     \pgfkeysdef\pgfkeyscurrentpath{%
3474       \ifx\pgfkeyscurrentvalue\pgfkeysnovalue@text
3475       \else\csedef{#1}{\number\numexpr##1\relax}\fi}%
3476     \pgfkeyslet{\pgfkeyscurrentpath/.@blank}\z@
3477     \@tfor\x:=+-*\do{%
3478       \pgfkeysdef{\pgfkeyscurrentpath\x}{%
3479         \noexpand\pgfkeysalso{\pgfkeyscurrentpath=%
3480           \noexpand\csname\noexpand\ifcsname#1\endcsname
3481             #1\noexpand\else\if*\x @ne\else z@\fi\noexpand\fi\endcsname
3482           \x
3483           \numexpr##1\relax}}%
3484       \pgfkeysEsetvalue{\pgfkeyscurrentpath\x/.@def}{\if*\x@ne\else z@\fi}%
3485       \pgfkeysEsetvalue{\pgfkeyscurrentpath\x/.@blank}{\if*\x@ne\else z@\fi}%
3486     }},%
3487   /handlers/.estore as number in cs/.value required,%
3488}% /.estore as number in cs

```

**Handler definition: `/.store in counter cs`** `/.store in count cs` is exactly the same.

```

3489 \pgfkeys{%
3490   /handlers/.store in counter cs/.code={%
3491     \pgfkeysdef\pgfkeyscurrentpath{%
3492       \ifx\pgfkeyscurrentvalue\pgfkeysnovalue@text
3493       \else\csname#1\endcsname\numexpr##1\relax\fi}%
3494     \pgfkeyslet{\pgfkeyscurrentpath/.@blank}\z@
3495     \@tfor\x:=+-*\do{%
3496       \pgfkeysdef{\pgfkeyscurrentpath\x}{%
3497         \noexpand\pgfkeysalso{\pgfkeyscurrentpath=%
3498           \noexpand\csname\noexpand\ifcsname#1\endcsname
3499             #1\noexpand\else\if*\x @ne\else z@\fi\noexpand\fi\endcsname
3500           \x
3501           \numexpr##1\relax}}%
3502       \pgfkeysEsetvalue{\pgfkeyscurrentpath\x/.@def}{\if*\x@ne\else z@\fi}%
3503       \pgfkeysEsetvalue{\pgfkeyscurrentpath\x/.@blank}{\if*\x@ne\else z@\fi}%
3504     }},%
3505   /handlers/.store in counter cs/.value required,%
3506}% /.store in counter cs
3507 \pgfkeys{%
3508   /handlers/.store in count cs/.code={%
3509     \pgfkeysdef\pgfkeyscurrentpath{%

```

```

3510      \ifx\pgfkeyscurrentvalue\pgfkeysnovalue@text
3511      \else\csname#1\endcsname\numexpr##1\relax\fi}%
3512      \pgfkeyslet{\pgfkeyscurrentpath/.@blank}\z@
3513      \@tfor\x:=+-*\do{%
3514          \pgfkeysedef{\pgfkeyscurrentpath\x}{%
3515              \noexpand\pgfkeysalso{\pgfkeyscurrentpath=%
3516                  \noexpand\csname\noexpand\ifcsname#1\endcsname
3517                      #1\noexpand\else\if*\x @ne\else z@\fi\noexpand\fi\endcsname
3518                  \x
3519                  \numexpr##1\relax}}}%
3520      \pgfkeysEsetvalue{\pgfkeyscurrentpath\x/.@def}{\if*\x@ne\else z@\fi}%
3521      \pgfkeysEsetvalue{\pgfkeyscurrentpath\x/.@blank}{\if*\x@ne\else z@\fi}%
3522      }},%
3523      /handlers/.store in count cs/.value required,%
3524      }% /.store in count cs

```

### Handlers definition: `/.store as glue`

```

3525 \pgfkeys{%
3526     /handlers/.store as glue/.code={%
3527         \pgfkeysedef\pgfkeyscurrentpath{%
3528             \noexpand\pgfkeyssetvalue{\pgfkeyscurrentpath}{\glueexpr##1\relax}}}%
3529         \pgfkeyslet\pgfkeyscurrentpath\z@skip
3530         \pgfkeyslet{\pgfkeyscurrentpath/.@def}\z@skip
3531         \pgfkeyslet{\pgfkeyscurrentpath/.@blank}\z@skip
3532         \@tfor\x:=#1\do{%
3533             \pgfkeysedef{\pgfkeyscurrentpath\x}{%
3534                 \noexpand\pgfkeysalso{\pgfkeyscurrentpath/.expanded=%
3535                     \noexpand\pgfkeysvalueof@unexpanded{\pgfkeyscurrentpath}%
3536                     \x
3537                     \if*\x\noexpand\itf@units@scaleNoCalc##1!
3538                     \else\glueexpr\noexpand\unexpanded{##1}\relax\fi}}}%
3539         \pgfkeysEsetvalue{\pgfkeyscurrentpath\x/.@def}{\if*\x@ne\else z@skip\fi}%
3540         \pgfkeysEsetvalue{\pgfkeyscurrentpath\x/.@blank}{\if*\x@ne\else z@skip\fi}%
3541         }},%
3542     /handlers/.store as glue/.default=+-*,%
3543 }% /.store as glue

```

### Handlers definition: `/.store as glue in cs=<cs-name>`

```

3544 \pgfkeys{%
3545     /handlers/.store as glue in cs/.code={%
3546         \pgfkeysdef\pgfkeyscurrentpath{%
3547             \ifx\pgfkeyscurrentvalue\pgfkeysnovalue@text
3548             \else\csdef{#1}{\glueexpr##1\relax}\fi}%
3549         \pgfkeyslet{\pgfkeyscurrentpath/.@blank}\z@skip
3550         \@tfor\x:=+-*\do{%
3551             \pgfkeysedef{\pgfkeyscurrentpath\x}{%
3552                 \letcs\noexpand\pgfkeys@temp{%
3553                     \noexpand\ifcsname#1\endcsname
3554                         #1\noexpand\else z@skip\noexpand\fi}%
3555                 \edef\noexpand\pgfkeys@temp{%
3556                     \noexpand\noexpand\noexpand\pgfkeysalso{\pgfkeyscurrentpath=%
3557                         \noexpand\expandonce\noexpand\pgfkeys@temp
3558                         \x
3559                         \if*\x\noexpand\itf@units@scaleNoCalc##1!
3560                         \else\glueexpr\noexpand\unexpanded{##1}\relax\fi}}}%
3561                 }\noexpand\pgfkeys@temp}%
3562         \pgfkeysEsetvalue{\pgfkeyscurrentpath\x/.@def}{\if*\x@ne\else z@skip\fi}%
3563         \pgfkeysEsetvalue{\pgfkeyscurrentpath\x/.@blank}{\if*\x@ne\else z@skip\fi}%
3564         }},%
3565     /handlers/.store as glue in cs/.value required,%
3566 }% /.store as glue in cs

```

**Handlers definition: `/.estore as glue`**

```

3567 \pgfkeys{%
3568   /handlers/.estore as glue/.code={%
3569     \pgfkeysdef\pgfkeyscurrentpath{%
3570       \if@setlength\itf@sk{##1}%
3571       \noexpand\pgfkeysEsetvalue\pgfkeyscurrentpath{%
3572         \noexpand\the\itf@sk}%
3573       \pgfkeyslet\pgfkeyscurrentpath\z@skip
3574       \pgfkeyslet\pgfkeyscurrentpath/.@def\z@skip
3575       \pgfkeyslet\pgfkeyscurrentpath/.@blank\z@skip
3576       \@tfor\x:=#1\do{%
3577         \pgfkeysdef\pgfkeyscurrentpath\x{%
3578           \noexpand\pgfkeysalso\pgfkeyscurrentpath=%
3579           \noexpand\pgfkeysvalueof\pgfkeyscurrentpath\x
3580           \if*\x \noexpand\itf@units@scale##1!
3581           \else\glueexpr##1\relax\fi}%
3582       \pgfkeysEsetvalue\pgfkeyscurrentpath\x/.@def\if*\x@ne\else\z@skip\fi}%
3583       \pgfkeysEsetvalue\pgfkeyscurrentpath\x/.@blank\if*\x@ne\else\z@skip\fi}%
3584     }},%
3585   /handlers/.estore as glue/.default=+--*,%
3586 }% /.estore as glue

```

**Handlers definition: `/.estore as glue in cs=<cs-name>`**

```

3587 \pgfkeys{%
3588   /handlers/.estore as glue in cs/.code={%
3589     \pgfkeysdef\pgfkeyscurrentpath{%
3590       \ifx\pgfkeyscurrentvalue\pgfkeysnovalue@text
3591       \else\if@setlength\itf@sk{##1}%
3592         \csdef{##1}\the\itf@sk\fi}%
3593     \pgfkeyslet\pgfkeyscurrentpath/.@blank\z@skip
3594     \@tfor\x:=+--*\do{%
3595       \pgfkeysdef\pgfkeyscurrentpath\x{%
3596         \noexpand\pgfkeysalso\pgfkeyscurrentpath=%
3597         \noexpand\csname\noexpand\ifcsname#1\endcsname
3598         #1\noexpand\else \z@skip\noexpand\fi\endcsname
3599         \x
3600         \if*\x\noexpand\itf@units@scale##1!
3601         \else\glueexpr##1\relax\fi}%
3602     \pgfkeysEsetvalue\pgfkeyscurrentpath\x/.@def\if*\x@ne\else\z@skip\fi}%
3603     \pgfkeysEsetvalue\pgfkeyscurrentpath\x/.@blank\if*\x@ne\else\z@skip\fi}%
3604   }},%
3605   /handlers/.etore as glue in cs/.value required,%
3606 }% /.estore as glue in cs

```

**Handlers definition: `/.store in skip cs`** This is a variant of `/.estore as glue in cs` when the control sequence in a `\skip` (*ie.* a length). The skip is given by its name, not as a control sequence.

```

3607 \pgfkeys{%
3608   /handlers/.store in skip cs/.code={%
3609     \pgfkeysdef\pgfkeyscurrentpath{%
3610       \ifx\pgfkeyscurrentvalue\pgfkeysnovalue@text
3611       \else\expandafter\itf@setlength\csname#1\endcsname{##1}\fi}%
3612     \pgfkeyslet\pgfkeyscurrentpath/.@blank\z@skip
3613     \@tfor\x:=+--*\do{%
3614       \pgfkeysdef\pgfkeyscurrentpath\x{%
3615         \noexpand\pgfkeysalso\pgfkeyscurrentpath=%
3616         \csname#1\endcsname % should have been defined as a skip (not expandable)
3617         \x
3618         \if*\x\noexpand\itf@units@scale##1!
3619         \else\glueexpr##1\relax\fi}%
3620     \pgfkeysEsetvalue\pgfkeyscurrentpath\x/.@def\if*\x@ne\else\z@skip\fi}%

```

```

3621 \pgfkeysEsetvalue{\pgfkeyscurrentpath\x/.@blank}{\if*x\@ne\else\z@skip\fi}%
3622 }},%
3623 /handlers/.store in skip cs/.value required,%
3624 }% /.store in skip cs

```

### Handlers definition: `/.store as dimen`

```

3625 \pgfkeys{%
3626 /handlers/.store as dimen/.code={%
3627 \pgfkeysedef\pgfkeyscurrentpath{%
3628 \noexpand\pgfkeyssetvalue{\pgfkeyscurrentpath}{\dimexpr##1\relax}}%
3629 \pgfkeyslet\pgfkeyscurrentpath\z@
3630 \pgfkeyslet{\pgfkeyscurrentpath/.@def}\z@
3631 \pgfkeyslet{\pgfkeyscurrentpath/.@blank}\z@
3632 \@tfor\x:=#1\do{%
3633 \pgfkeysedef{\pgfkeyscurrentpath\x}{%
3634 \noexpand\pgfkeysalso{\pgfkeyscurrentpath/.expanded={%
3635 \noexpand\pgfkeysvalueof@unexpanded{\pgfkeyscurrentpath}%
3636 \x
3637 \if*x\ \noexpand\itf@units@scaleNoCalc##1!
3638 \else\dimexpr\noexpand\unexpanded{##1}\relax\fi}}%
3639 \pgfkeysEsetvalue{\pgfkeyscurrentpath\x/.@def}{\if*x\@ne\else\z@\fi}%
3640 \pgfkeysEsetvalue{\pgfkeyscurrentpath\x/.@blank}{\if*x\@ne\else\z@\fi}%
3641 }},%
3642 /handlers/.store as dimen/.default=+-*,%
3643 }% /.store as dimen

```

### Handlers definition: `/.store as dimen in cs=<cs-name>`

```

3644 \pgfkeys{%
3645 /handlers/.store as dimen in cs/.code={%
3646 \pgfkeysdef\pgfkeyscurrentpath{%
3647 \ifx\pgfkeyscurrentvalue\pgfkeysnovalue@text
3648 \else\csdef{#1}{\dimexpr##1\relax}\fi}%
3649 \pgfkeyslet{\pgfkeyscurrentpath/.@blank}\z@
3650 \@tfor\x:=+-*\do{%
3651 \pgfkeysedef{\pgfkeyscurrentpath\x}{%
3652 \letcs\noexpand\pgfkeys@temp{%
3653 \noexpand\ifcsname#1\endcsname
3654 #1\noexpand\else \z@\noexpand\fi}%
3655 \edef\noexpand\pgfkeys@temp{%
3656 \noexpand\noexpand\noexpand\pgfkeysalso{\pgfkeyscurrentpath={%
3657 \noexpand\expandonce\noexpand\pgfkeys@temp
3658 \x
3659 \if*\x\noexpand\itf@units@scaleNoCalc##1!
3660 \else\dimexpr\noexpand\unexpanded{##1}\relax\fi}}%
3661 }\noexpand\pgfkeys@temp}%
3662 \pgfkeysEsetvalue{\pgfkeyscurrentpath\x/.@def}{\if*x\@ne\else\z@\fi}%
3663 \pgfkeysEsetvalue{\pgfkeyscurrentpath\x/.@blank}{\if*x\@ne\else\z@\fi}%
3664 }},%
3665 /handlers/.store as dimen in cs/.value required,%
3666 }% /.store as dimen in cs {csname}{+-*}

```

### Handlers definition: `/.estore as dimen`

```

3667 \pgfkeys{%
3668 /handlers/.estore as dimen/.code={%
3669 \pgfkeysedef\pgfkeyscurrentpath{%
3670 \itf@setlength\itf@sk{##1}%
3671 \noexpand\pgfkeysEsetvalue{\pgfkeyscurrentpath}{%
3672 \noexpand\the\dimexpr\itf@sk}}%
3673 \pgfkeyslet\pgfkeyscurrentpath\z@

```



```

3674 \pgfkeyslet{\pgfkeyscurrentpath/.@def}\z@
3675 \pgfkeyslet{\pgfkeyscurrentpath/.@blank}\z@
3676 \@tfor\x:=#1\do{%
3677     \pgfkeysedef{\pgfkeyscurrentpath\x}{%
3678         \noexpand\pgfkeysalso{\pgfkeyscurrentpath=%
3679             \noexpand\pgfkeysvalueof{\pgfkeyscurrentpath}\x
3680             \if*\x \noexpand\itf@units@scale##1!
3681             \else \dimexpr##1\relax\fi}%
3682     \pgfkeysEsetvalue{\pgfkeyscurrentpath\x/.@def}{\if*\x@ne\else\z@\fi}%
3683     \pgfkeysEsetvalue{\pgfkeyscurrentpath\x/.@blank}{\if*\x@ne\else\z@\fi}%
3684     },%
3685 /handlers/.estore as dimen/.default=+-%,
3686}% /.estore as dimen

```

**Handlers definition:** `/.estore as dimen in cs=<cs-name>`

```

3687 \pgfkeys{%
3688     /handlers/.estore as dimen in cs/.code={%
3689         \pgfkeysdef\pgfkeyscurrentpath{%
3690             \ifx\pgfkeyscurrentvalue\pgfkeysnovalue@text
3691             \else \itf@setlength\itf@sk{##1}%
3692             \csedef{#1}{\the\dimexpr\itf@sk\fi}%
3693         \pgfkeyslet{\pgfkeyscurrentpath/.@blank}\z@
3694         \@tfor\x:=+-%\do{%
3695             \pgfkeysedef{\pgfkeyscurrentpath\x}{%
3696                 \noexpand\ifcsname#1\endcsname
3697                 \noexpand\@defaultunits \itf@sk
3698                 \noexpand\csname#1\endcsname pt\relax\noexpand\@nnil
3699                 \noexpand\else \itf@sk \z@ \noexpand\fi
3700                 \if*\x
3701                     \itf@setlength\itf@sk {\itf@sk*\noexpand\itf@units@scale##1!}%
3702                 \else
3703                     \noexpand\@defaultunits\@tempdima ##1pt \relax\noexpand\@nnil
3704                     \advance\itf@sk\x \@tempdima
3705                 \fi
3706                 \noexpand\pgfkeysalso{\pgfkeyscurrentpath=\itf@sk}}%
3707             \pgfkeysEsetvalue{\pgfkeyscurrentpath\x/.@def}{\if*\x@ne\else\z@\fi}%
3708             \pgfkeysEsetvalue{\pgfkeyscurrentpath\x/.@blank}{\if*\x@ne\else\z@\fi}%
3709         },%
3710     /handlers/.etore as dimen in cs/.value required,%
3711}% /.estore as dimen in cs

```

**Handlers definition:** `/.store in dimen cs` This is a variant of `/.store as dimen in cs` when the control sequence in a `\dimen`. The `dimen` is given by its name, not as a control sequence.

```

3712 \pgfkeys{%
3713     /handlers/.store in dimen cs/.code={%
3714         \pgfkeysdef\pgfkeyscurrentpath{%
3715             \ifx\pgfkeyscurrentvalue\pgfkeysnovalue@text
3716             \else\expandafter\itf@setlength\csname#1\endcsname{##1}\fi}%
3717         \pgfkeyslet{\pgfkeyscurrentpath/.@blank}\z@
3718         \@tfor\x:=+-%\do{%
3719             \pgfkeysedef{\pgfkeyscurrentpath\x}{%
3720                 \if*\x \else
3721                 \noexpand\@defaultunits\itf@sk ##1pt \relax\noexpand\@nnil
3722                 \fi
3723                 \noexpand\pgfkeysalso{\pgfkeyscurrentpath=%
3724                     \csname#1\endcsname % has been defined as a dimen (not expandable)
3725                     \x
3726                     \if*\x \noexpand\itf@units@scale##1!
3727                     \else\itf@sk\fi}}%
3728             \pgfkeysEsetvalue{\pgfkeyscurrentpath\x/.@def}{\if*\x@ne\else\z@\fi}%
3729             \pgfkeysEsetvalue{\pgfkeyscurrentpath\x/.@blank}{\if*\x@ne\else\z@\fi}%

```



```

3730    }},%
3731    /handlers/.store in dimen cs/.value required,%
3732}% /.store in dimen cs

```

### Handlers definition: `/.is multiple choice`

```

3733 \pgfkeys{%
3734   /handlers/.is multiple choice/.code=%
3735   \pgfkeys{\pgfkeyscurrentpath/.cd,%
3736   .unknown/.style={%
3737     /errors/unknown choice value=\pgfkeyscurrentkey\pgfkeyscurrentvalue},%
3738   .code=\expandafter\pgfkeys\expandafter{\pgfkeyscurrentkey/.cd,###1}%
3739   },%
3740   /handlers/.is multiple choice/.value forbidden,%
3741}% /.is multiple choice

```

### Handlers definition: `/.is enum`

```

3742 \pgfkeys{%
3743   /handlers/.is enum/.code={%
3744     \itf@cnt\z@
3745     \@for\x:=\pgfkeyscurrentvalue\do{%
3746       \pgfkeysedef{\pgfkeyscurrentpath/\x}{%
3747         \noexpand\pgfkeyssetvalue{\pgfkeyscurrentpath}{\x}%
3748         \noexpand\pgfkeyssetvalue{\pgfkeyscurrentpath/.number}{\the\itf@cnt}}%
3749       \ifnum\itf@cnt=\z@
3750         \pgfkeyslet{\pgfkeyscurrentpath/.@def}\x
3751         \pgfkeyslet{\pgfkeyscurrentpath/.@blank}\x
3752       \fi
3753       \advance\itf@cnt\@ne
3754     }%
3755     \pgfkeysalso{\pgfkeyscurrentpath/.is choice}},%
3756   /handlers/.is enum/.value required,%
3757}% /.is enum

3758 \pgfkeys

```

## 21.21 Interface **etoolbox** - etoolbox-like commands

```

3759 (*etoolbox)
3760 \ProvidesPackage{interfaces-etoolbox}
3761   [2011/01/19 v2.9 more etoolbox-like commands (FC)]
3762 \RequirePackage{interfaces-base}
3763 \begingroup\catcode'\&=3
3764   \long\gdef\etb@doitem#1&\do{#1}}
3765 \endgroup

```

```

\preappto
\epreappto
\gpreappto
\xpappto
3766 \providerobustcmd\preappto[3]{%
3767   \edef#1{\unexpanded{#2}\ifdefined#1\expandonce#1\fi\unexpanded{#3}}%
3768}% \preappto
3769 \providerobustcmd\epreappto[3]{%
3770   \edef#1{#2\ifdefined#1\expandonce#1\fi#3}%
3771}% \epreappto
3772 \providerobustcmd*\gpreappto{\global\preappto}
3773 \providerobustcmd*\xpappto{\global\epreappto}

\cspreappto
\csepreappto
\csgpreappto
\csxpappto
3774 \providerobustcmd*\cspreappto[1]{%
3775   \csname itf@\ifcsname#1\endcsname
3776     preappto\else defpreapp\fi\expandafter\endcsname
3777     \csname#1\endcsname

```

```

3778 }% \cspreappto
3779 \long\def\itf@preappto#1#2#3{\edef#1{#2\expandonce#1#3}}
3780 \long\def\itf@defpreapp#1#2#3{\edef#1{#2#3}}
3781 \providerobustcmd*\csepreappto[1]{%
3782   \csname itf@{ifcsname#1\endcsname
3783     preappto\else defpreapp\fi\expandafter\endcsname
3784       \csname#1\endcsname
3785 }% \csepreappto
3786 \providerobustcmd*\csgpreappto{\global\cspreappto}
3787 \providerobustcmd*\csxpreappto{\global\csepreappto}

\removefrom
\eremovefrom 3788 \providerobustcmd\removefrom[2]{\in@false
\gremovefrom 3789   \long\def\itf@tp##1\itf@tp{%
\xremovefrom 3790     \in@true
3791       \edef#1{\unexpanded{##1}}%
3792   }\expandafter\itf@removefrom\expandafter{#1}{#2}%
3793 }% \removefrom
3794 \providerobustcmd\eremovefrom[2]{\begingroup
3795   \edef\x{\endgroup\removefrom\noexpand#1{#2}%
3796   }\x
3797 }% \eremovefrom
3798 \providerobustcmd\gremovefrom[2]{%
3799   \removefrom{#1}{#2}%
3800   \global\let#1=#1%
3801 }% \gremovefrom
3802 \providerobustcmd\xremovefrom[2]{%
3803   \eremovefrom{#1}{#2}%
3804   \global\let#1=#1%
3805 }% \xremovefrom

\itf@removefrom

3806 \long\def\itf@removefrom#1#2{% removes #2 (code) from #1 (hook)
3807   \def\in@##1#2##2\in@{\itf@tp##1#2\in@@}%
3808   \def\in@@##1\in@@##2\in@@{%
3809     \ifx\in@##2\else##1\fi
3810   }\expandafter\in@@\in@@#1\itf@tp\in@@#2\in@\in@@
3811 }% \itf@removefrom

\removefromstart
\eremovefromstart 3812 \newrobustcmd\removefromstart[2]{\in@false
\gremovefromstart 3813   \long\def\itf@tp##1\itf@tp{%
\xremovefromstart 3814     \in@true
3815       \edef#1{\unexpanded{##1}}%
3816   }\expandafter\itf@removefromstart\expandafter{#1}{#2}%
3817 }% \removefromstart
3818 \providerobustcmd\eremovefromstart[2]{\begingroup
3819   \edef\x{\endgroup\removefromstart\noexpand#1{#2}%
3820   }\x
3821 }% \eremovefromstart
3822 \providerobustcmd\gremovefromstart[2]{%
3823   \removefromstart{#1}{#2}%
3824   \global\let#1=#1%
3825 }% \gremovefromstart
3826 \providerobustcmd\xremovefromstart[2]{%
3827   \eremovefromstart{#1}{#2}%
3828   \global\let#1=#1%
3829 }% \xremovefromstart

\itf@removefromstart

3830 \long\def\itf@removefromstart#1#2{% removes #2 (code) from #1 (hook)
3831   \long\def\in@##1#2##2\in@{\##1\in@\itf@tp##2\in@@}%
3832   \long\def\in@@##1\in@@##2\in@@{%

```

```
3833      \ifx\in@##1\fi
3834      }\expandafter\in@@\in@#1\itf@tp\in@@#2\in@
3835}% \itf@removefromstart

3836</etoolbox>
```

## 22 History

### [2001/01/19 v2.9]

- Modification of the syntax of `\papergraduate` to allow the same syntax as `\path`.  
+ optional arguments for this command.
- Some correction on `\tocsetup`: `\tocsetup{bookmark=bold}` (for example) will automatically set `\tocsetup{title=\contentsname}` in no key title has been set. Therefore, a bookmark is set for the table of contents...

### [2011/01/17 v2.8]

- New: `\papergraduate` in [interfaces-TikZ](#).

### [2010/12/27 v2.6]

- `\tocsetup`:  
A few new aliases for keys.  
Key `columns/sep` didn't work. Fixed.
- Generated file `interfaces-hypbmsec.code.tex` is empty since version [v2.5](#).
- Fixed a bug in `\usetikz{all}`: `pgfmath` should not be loaded twice because of `\pgfmathdeclarefunction...`  
+ `pgfmodulesorting.code.tex` removed: bug in the code...
- [interfaces-TikZ](#): keys `shorten>`, `shorten<`, and `shorten<>`.
- Optimisation.

### [2010/12/07 v2.5]

- `\sectionformat` now works with the `explicit` option of package `titlesec`. (in [interfaces-titlesec](#))
- Compatibility with `calc` package as been implemented for `pgfkeys` handlers:

```
/.estore as dimen          /.estore as dimen in cs      /.store in dimen cs
/.estore as glue           /.estore as glue in cs       /.store in skip cs
```

As a result, it is now possible to write:

```
\sectionformat\section{labelsep=\widthof{ some text }}
\tocsetup{ section/pagenumbers/width=\widthof{ 00.00\enspace } }
```

For scaling operations, [interfaces](#) keeps the shrink and stretch components of glues, while `calc` discard them.

- `\listofsetup` now works properly ([interfaces-tocloft](#)).
- Some `+` and `*` keys added to [interfaces-fancyhdr](#).
- Fix a bug of `titlesec` when inside `.dtx` files: `\input{ttlkeys.def}` shall be done with `%` as a comment character (`\BeforeFile...\AfterFile` does the trick).

### [2010/11/26 v2.4]

- [interfaces-fancyhdr](#): complete key set for header, footer and offset settings  
Now keys like `foot/inner` or `head/outer/offset` are available (ouf!).
- [interfaces-hypbmsec](#) has been completely rewritten and is now independant of `titlesec` and `interfaces-titlesec`.  
`\lastsectiontitle` *etc.* are defined by the mean of `\GetTitleString` (from H.O. eponym package).  
[interfaces-hypbmsec](#) now provides `\lastsectionanchor` when used with `hyperref`.
- [interfaces-marks](#) revisited: expandable macros `\thefirstmarks`, `\thebotmarks` and `\thetopmarks` are now expandable in exactly one step of expansion.  
`\marksthe` and `\marksthecs` does not use `\unexpanded` (better for the `.log` file to see the marks).  
Optimization for `\getthemarks` with incidence on `\ifmarksequal`.
- `\repeatcell`: modification of the code. `&` alignment tab character is not activated and the “dirty trick” (according to D. Knuth) `\iffalse{\fi \ifnum0='}\fi` is used instead.
- `\htruncadjust` produced an error when used with empty text arguments – fixed.

- Modification in `\bottomtitles: \bottomtitlespace` should be stored as a `dimen`, not a `skip`.
- `\removefromstart` is now a `\long` macro.

**[2010/11/21 v2.3]**

- `interfaces-fancyhdr` : new keys and new aliases for header, footer and offset settings.

**[2010/11/16 v2.2]**

- Fix a bug in `interfaces-tocloft` (key `section/dotsep`).

**[2010/11/15 v2.1]**

- Improved default and blank values for bookmark levels, based on `\ttl@{section-name}`
- Correction of a bug in `\setlist`: missed a comma
- Correction of a bug in `interfaces-fancyhdr` (fixed in `./fancy@hf` handler).

**[2010/10/31 v2.0]**

- Compatibility of `interfaces-pgfkeys` with `pgf` version 2.1
- Modification of the key `depth` for `\tocsetup` to be able to change the t.o.c. depth anywhere inside the document (just like bookmarks depths).
- handler `./defcounter` has been replaced by more powerful `./store in counter cs`

**[2010/10/27 v1.2]**

- `interfaces-hypbmsec` needed some corrections.
- The offset keys for `fancyhdr` didn't work. Fixed.
- Correction of conversion `pt` to `mu` (catcodes...)
- Added microtype to the documentation...

**[2010/10/20 v1.0]**

- First version.

## Appendix: README (for CTAN)

The `interfaces` package provides a small number of macros to modify the settings of a large number of parameters provided by Most Frequently Used Package (MFUP) for typesetting beautiful document with  $\LaTeX$ .

`interfaces` is organised as different modules which are loaded after the master package is loaded. Each module can be loaded separately.

`\sectionformat`: interface for package `titlesec` to modifies the titles produced by the sectionning commands (and their bookmarks).

`\pagesetup`: interface for package `fancyhdr` to modify the current page style or create new page styles.

`\tocsetup`: interface for package `tocloft` to fine tune the aspect of the table of contents, list of figures / of tables. `\tocsetup` also applies to `\shorttableofcontents` provided by the `shorttoc` package.

`\repeatcell`: to create 'dynamic' tabulars, possibly with formula computation (`\numexpr`, `\pgfmathparse` or `\FPeval` formulas can be plugged in the tabular or array).

`\rowfont`: to modify the font and/or the alignment of each cell in a tabular/array row.

+ some macros to make easier the use of  $\varepsilon$ - $\TeX$  `\marks` registers (useful with `\sectionformat` and `\pagesetup`).

`interfaces` is mainly based on `scrfile.sty` (provided in the Koma-Script bundle, but Koma-Script classes are not required), on `pgfkeys` and `etoolbox`.

**interfaces** defines some pgfkeys handlers designed specially to make key-value interface for other packages. Using those handlers allows to make an interface in a few minutes...

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