The mdframed package [1]

auto-split frame environment

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The standard methods for framing text (`\fbox` or `\fcolorbox`) require you to handle page breaks by hand, meaning that you have to split the `\fbox` into two. The present package defines the environment `mdframed` which automatically deals with pagebreaks in framed text.

By defining new environments the user may choose between several individual designs.

Linked files: `mdframed-example-default.pdf` `mdframed-example-tikz.pdf` `mdframed-example-pstricks.pdf` `mdframed-example-texsx.pdf`

FYI: I create a repository for `mdframed` on github where you can download the current development status.

Contents

1. Motivation

Many users wish to (further) emphasize lemmata, definitions, proofs, etc. The package `mdframed` allows you to create environments with breakable frames. I think an example is the best way to demonstrate its properties.

Theorem 1.1 (Pythagorean theorem) *In any right triangle, the area of the square whose side is the hypotenuse is equal to the sum of the areas of the squares whose sides are the two legs.*

[1] Extending the package `framed.sty`

$$a^2 + b^2 = c^2$$

The frame was defined with the following settings.

```
\newmdtheoremenv[outerlinewidth=2,leftmargin=40,%
      rightmargin=40,backgroundcolor=yellow,%
      outerlinecolor=blue,innertopmargin=0pt,%
      splittopskip=\topskip,skipbelow=\baselineskip,%
      skipabove=\baselineskip,ntheorem]{theorem}%
      {Theorem}[section]
\begin{theorem}[Pythagorean theorem]
...
\end{theorem}
```

2. Syntax

Loadings `mdframed`

The package itself loads the packages

- `kvoptions`,
- `xparse` (new),
- `etoolbox` and
- `color`.

Depending on the options `mdframed` will load

- `xcolor`,
- `tikz` or
- `pstricks`.

Load the package as usual:

```
\usepackage[<GLOBAL OPTIONS>]{mdframed}
```

Only the option `framemethod` should be loaded by the optional argument of `\usepackage`. All other options should be loaded with `\mdfsetup` or related environments. The package should be loaded after `amsthm` if you need the package.

Provided environment

The package defines only one environment with the following syntax:

```
\begin{mdframed}[<LOCAL OPTIONS>]
    <CONTENT>
\end{mdframed}
```

To create own environments with `mdframed` see section 4.

Autodetecting floats

`mdframed` detects whether the environment is used inside `float` or `minipage` environments. If you use `mdframed` in such an environment `mdframed` will use the option `nobreak` automatically.

Twoside-mode

If you are using `mdframed` inside `twoside`-mode you can set the option `innermargin` and `outermargin` (see section 5.2.1). The length will be ignored if you use the option `usetwoside`.

3. The frames

Normally you can say `mdframed` draws only some lines. To allow page breaks the following designs are supported. If you load the package with `framemethod=default` you can only draw a single line. Inside the gray box the text will be printed.

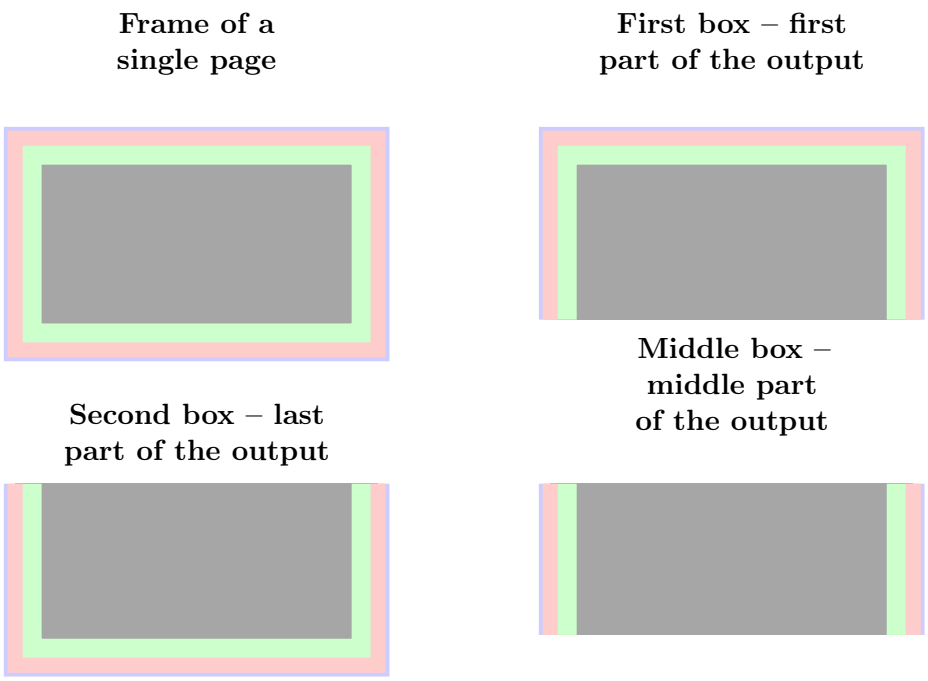

Figure 1: The basic frames

4. Commands

The following commands should countenance your by the handling with `mdframed`

`\newmdenv`

The command has the following syntax:

```
\newmdenv[<MDFRAMED OPTIONS>]{Name of the environment}
```

In this way you can simply use:

```
\newmdenv[linecolor=red,frametitle=Infobox]{infobox}
...
\begin{infobox}[backgroundcolor=yellow]
  foo foo foo foo foo foo
\end{infobox}
```

`\renewmdenv`

By using this command you can redefine environments which are created by `\newmdenv`.

`\surroundwithmdframed`

Sometimes you have predefined environments. This commands allows you to set an `environment` surround this predefined environment. To set a `mdframed` around the environment `verbatim` you can simple say without changing the original name.

```
\surroundwithmdframed[linewidth=2pt]{verbatim}
```

`\mdflength`

If you want to work with length defined by `mdframed` (for example `innerleftmargin`) you can now simple use the command `\mdflength`.

```
Some Text \hspace{\mdflength{innerleftmargin}} Some Text

\the\mdflength{innerleftmargin}
```

`\mdfsetup`

To set the options you can use the optional argument of `\usepackage` or you can use the command `\mdfsetup` which is not limited to the preamble. Inside a group the settings work only local.

At this point I want to recommend the using of the command `\mdfsetup` instead of setting package option via the optional argument of `\usepackage`. So you are avoiding breaking of non robust commands.[2]

`\mdfdefinestyle`

`\mdfdefinestyle` allows the user to define different styles and use as an option of `mdframed` via `style`. The option `style` is explained in section 5.2.3.

Here a small example:

```
\mdfdefinestyle{mystyle}{leftmargin=0pt,%
                         linecolor=blue}
....
\begin{mdframed}[style=mystyle]
  foo
\end{mdframed}
```

`\mdfapptodefinestyle`

This commands allows to expand a defined style.[3]

5. Options

The package provides various options to manipulate frames. In the following section all options are listed. Some internal macros which can be manipulated are not shown in this documentation. The listed options are divided in global and local options. The global options can not be used inside `\mdfsetup`.

[2] Thanks to Heiko Oberdiek and Philipp Stephani kvoptions-Declaration von Optionen schlägt fehl

[3] Thanks to Martin Scharrer and Enrico Gregorio:
http://tex.stackexchange.com/questions/34684/argument-of-setkeys

5.1. Global Options

The following options are only global options.

`xcolor` default=`none`

By setting this key, the package `xcolor` will be loaded with the given value(s). Without any value `mdframed` loads the package `color` without any options. If the package `xcolor` is already loaded the given option will be ignored. I recommend to load `xcolor` before `mdframed`.

`framemethod` default=`default`

With this key you can change the way frames are drawn. You can decide whether the frame is drawn with

1. LaTeX-commands `\hrule`, `\vrule`, `\rule`,
2. `TikZ` (the package `TikZ` will be loaded) or
3. `PSTricks` (the package `pstricks` will be loaded).

The option `framemethod` requires a string. Allowed combinations are listed in the following table.

Table 1: Allowed keys for `framemethod`

Method	Allowed keys
LaTeX-commands	`default, tex, latex, none, 0`
TikZ	`tikz, pgf, 1`
PSTricks	`pstricks, ps, postscript, 2`

FYI
It is independently whether the `method` is written with no, one or more capital letter.

Note
The manipulation of the frames depends on the option `framemethod`. For further information see below.

5.2. Global and Local Options

The options listed below can be set globally or locally and they are not limited to the preamble. I tried to define self explained names.

5.2.1. Options with lengths

In figure (2) you can see the adjustable lengths (compare also figure (1)) which will be described below. All lengths accept two kinds of input. The first one is a length (e.g. 2pt) and the second one is a number (e.g. 2) which will be multiplied by `1 defaultunit`. The figure shows three different colored frames.

I know that the predefined lengths are not well prepared. Maybe I will change it later.

`defaultunit` default=`pt`

see the sentence above.

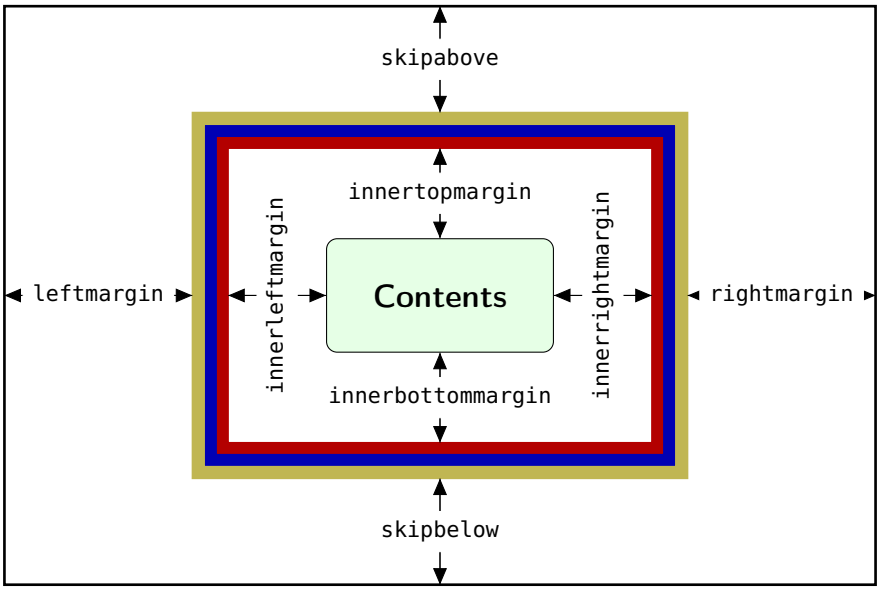

Figure 2: adjustable lengths of `mdframed`

`skipabove` default=`0pt`

Sets an additional skip above the frame.

`skipbelow` default=`0pt`

Sets an additional skip below the frame.

`margin`

This option is not longer supported. Use `leftmargin` and `rightmargin` instead.

`leftmargin` default=`0pt`

Sets the length of the left margin of the environment. This option has an effect only in singleside-mode or, in twoside-mode, if the option `usetwoside=false` has been given. See also options `outermargin` and `innermargin`.

`rightmargin` default=`0pt`

Sets the length of the right margin of the environment. This option has an effect only in singleside-mode or, in twoside-mode, if the option `usetwoside=false` has been given. See also options `outermargin` and `innermargin`.

`innerleftmargin` default=`10pt`

Sets the length of the inner left margin of the environment.

`innerrightmargin` default=`10pt`

Sets the length of the inner right margin of the environment.

`innertopmargin` default=`.4\baselineskip`

Sets the length of the inner top margin of the environment.

`innerbottommargin` default=`.4\baselineskip`

Sets the length of the inner bottom margin of the environment.

The following lengths are not shown in figure (2).

`userdefinedwidth` default=`0pt`

Sets the width of the whole `mdframed` environment. The width represent the width including the line width and the inner margins. The outer margins will be ignored.

`outermargin`

Sets the length of the outer margin. This option is only available in `twoside`-mode.

`innermargin`

Sets the length of the inner margin. This option is only available in `twoside`-mode.

`splittopskip` default=`0pt`

Sets the length of the skip above the split part of the environment.

`splitbottomskip` default=`0pt`

Sets the length of the skip below the split part of the environment.

`linewidth` default=`0.4pt`

Sets the width of the line around the environment.

`roundcorner` default=`0pt`

Sets the size of the radius of the corners of the frames.
This works only with `framemethod=TikZ or PSTricks`.

`innerlinewidth` default=`0pt`

Sets the width of the inner line around the environment.
This works only with `framemethod=TikZ or PSTricks`.

`outerlinewidth` default=`0pt`

Sets the width of the outer line around the environment.
This works only with `framemethod=TikZ or PSTricks`.

`middlelinewidth` default=`linewidth`

Sets the width of the middle line around the environment.
This works only with `framemethod=TikZ`.

5.2.2. Colored Options

`linecolor` default=`black`

Sets the color of the line around the environment.

`backgroundcolor` default=`white`

Sets the color of the background of the environment.

`fontcolor` default=`black`

Sets the color of the contents of the environment.

`innerlinecolor` default=`linecolor`

Sets the color of the inner line around the environment.
This works only with `framemethod=TikZ or PSTricks`.

`middlelinecolor` default=`linecolor`

Sets the color of the middle line around the environment.
This works only with `framemethod=TikZ or PSTricks`.

`outerlinecolor` default=`linecolor`

Sets the color of the outer line around the environment.
This works only with `framemethod=TikZ or PSTricks`.

5.2.3. General options

`everyline` default=`false`

Allows to draw a bottom and a top line at splitted frames.

`font` default=`{}`

Sets the font of the environment.

`ntheorem` default=`false`

Before setting this boolean key, you have to load the package `ntheorem`. With this option you set the values `\theorempreskipamount` and `\theorempostskipamount` to 0 pt.

`nobreak` default=`false`

Sometimes it is useful to prevent a frame from splitting. The `nobreak` option is used for this purpose. If you activate this option you can enable it by setting `nobreak=false`.

`usetwoside` default=`true`

If you set the twoside option you can work with `outermargin`. This option disable this and you work with `leftmargin` and `rightmargin`.

`needspace` default=`0pt`

Sometimes it is useful to set a minimum height before a frame should be splitted. For such cases you can use `needspace`. The option requires a length which sets the minimum height before a frame will be splitted.

`style`

If you define a special style with `\mdfdefinestyle` you can use the key `style` to load the style. `mdframed` has no predefined styles yet.

`settings` default=`none`

This option allows the user to commit some macros. An example is shown in the example files.

`align` default=`left`

Sometimes it is useful to align the environment itself. For this you have the option `align` which can be set to the following strings:

- `left`,
- `right` and
- `center`.

The alignments `left` or `right` depend on the given lengths `leftmargin` and `rightmargin`. Later I will present an example to demonstrate my bad English explanation.

`shadow` default=`false`

Draw a shadow. The shadow doesn't influence the bounding box so the shadow can be drawn in the margin without any overfull box. Note if you are using the TikZ you must load the library. `mdframed` doesn't do the job to avoid double loading of a library.

`shadowsize` default=`8 pt`

Specify the size of the shadow.

`shadowcolor` default=`black!50`

Specify the color of the shadow.

`pstrickssetting` default=`none`

With this key you can pass several options to `\psset`. For example if you want all lines dashed you will have to set `pstrickssetting={linestyle=dashed}`. It is very important to put the options of `pstrickssetting` in brackets.
This works only with `framemethod=PSTricks`.

`pstricksappsetting` default=`none`

`mdframed` works with defined style for the different elements. By using `\addtopsstyle` in combination with this option you can expand the definition. The predefined styles are

- `mdfbackgroundstyle`
- `mdfframetitlebackgroundstyle`
- `mdfouterlinestyle`
- `mdfinnerlinestyle`
- `mdfmiddlelinestyle`

Before you change one please have a look at the file `md-frame-2.mdf` to see the settings.
This works only with `framemethod=PSTricks`.

`tikzsetting` default=`none`

With this key you can pass several options to `\tikzset`. Some examples are listed in the next section. It is very important to put the options of `tikzsetting` in brackets.
This works only with `framemethod=TikZ`.

`apptotikzsetting` default=`none`

With this key you can add several options to `tikzsetting`. This key based on the idea of manipulation of predefined keys of `mdframed`. The package `mdframed` defines via `\tikzset` the following keys to draw frames.

- `\tikzset{mdfbox/.style}`
- `\tikzset{mdfcorners/.style}`
- `\tikzset{mdfbackground/.style}`
- `\tikzset{mdfinnerline/.style}`
- `\tikzset{mdfouterline/.style}`
- `\tikzset{mdfmiddleline/.style}`
- `\tikzset{mdfframetitlerule/.style}`
- `\tikzset{mdfframetitlebackground/.style}`
- `\tikzset{mdfshadow/.style}`

Before you change one please have a look at the file `md-frame-1.mdf` to see the settings.
This works only with `framemethod=TikZ`.

`singleextra` default=`{}`

With this key you can put extra material to the drawing environment of `mdframed` only for a non splitted frame.
This works only with `framemethod=TikZ and PSTricks`.

`firstextra` default=`{}`

With this key you can put extra material to the drawing environment of `mdframed` only for the first part of the splitted frame.
This works only with `framemethod=TikZ and PSTricks`.

`middleextra` default=`{}`

With this key you can put extra material to the drawing environment of `mdframed` only for the middle part of the splitted frame.
This works only with `framemethod=TikZ and PSTricks`.

`secondextra` default=`{}`

With this key you can put extra material to the drawing environment of `mdframed` only for the second part of the splitted frame.
This works only with `framemethod=TikZ and PSTricks`.

5.3. Hidden Lines

`topline` default=`true`

Draws a line at the top.

`bottomline` default=`true`

Draws a line at the bottom.

`leftline` default=`true`

Draws a line on the left.

`rightline` default=`true`

Draws a line on the right.

`hidealllines` default=`false`

With this option you can decide whether all lines should be drawn or not.

5.4. Frametitle

In this section all relevant options of the frame title will be presented. They are not divided in their properties.

`frametitle` default=`none`

The environment gets a title. To set a title use `frametitle={The Title of the frame}` as an option of the environment.

`frametitlefont` default=`\normalfont\bfseries`

Sets the format of the `frametitle`.

`frametitlealignment` default=`\raggedleft`

Align the `frametitle`. This option must be set via `\mdfsetup`.

`frametitlerule` default=`false`

Set this key to `true` to get a line between the frame title and the text.

`frametitlerulewidth` default=`.2pt`

Sets the width of the line between the text and the title of `mdframed`.

`frametitleaboveskip` default=`5pt`

Sets the skip of the frame title to the margin above of `mdframed`.

`frametitlebelowskip` default=`5pt`

Sets the skip of the frame title to the rule of the frame title.

`frametitlebackgroundcolor` default=`white`

Sets the color of the background of the frametitle

FYI and Note

`mdframed` can't handle page breaks inside the frametitle well. If you get a page break please have a closer look to the output.

If a frame title is given the optional length `innertopmargin` is set between the rule under the frame title and the contents of `mdframed`.

`repeatframetitle` default=`false`

Repeat the frame title on every frame. The feature is currently not well implemented!!!

5.5. Theorems

In this section is described which commands can help you to define theorem environments with `mdframed`.

`\newmdtheoremenv`

Since the package is often used to highlight theorem environments, I have created a command[4] to simplify this process. The command has the following syntax:

```
\newmdtheoremenv[<mdframed-options>]{<envname>}%
                [<numberedlike>]{<caption>}[<within>]
```

The last four arguments are equivalent to the command `\newtheorem`. Only the first optional argument is able to pass `mdframed`-options. A simple example is:

```
\theoremstyle{<some style>}
\newmdtheoremenv[linecolor=blue]{lemma}%
                {Lemma}[section]
...
\begin{lemma}[Some title]
  foo foo foo foo foo foo
\end{lemma}
```

So far there is no `\renewmdtheoremenv`!

`\mdtheorem`

This is a special kind of `\newtheorem`. The command has the following syntax.

```
\mdtheorem[<mdframed-options>]{<envname>}%
                [<numberedlike>]{<caption>}[<within>]
```

As you can see the arguments are equal to `\newtheorem` but the command ignores every `\theoremstyle`. This is based on the following behavior.

The command `\mdtheorem` creates two environments based on the given first mandatory argument. The first environment is named like the given argument and creates a numbered theorem. The second environment is named like the first mandatory argument with a star. This environment has the same formating but isn't numbered.

The syntax of the new defined environments is equal to the normal theorem environments.

```
\begin{environment}[optional title]
  ...
\end{environment}
```

What happened? The caption of the command will be set as the frame title. In this way all options of the frame title are available. Furthermore `mdframed` provides additional options explained below.

`theoremseparator` default=`{:}`

Sets the separator of the caption and the title of the theorem. The `theoremseparator` will be printed only if an theorem title is given.

[4] Thanks to Martin Scharrer and Enrico Gregorio:
Own command to create new environment

`theoremtitlefont` default=`{}`

Via the option `frametitlefont` you can manipulate the font of the frame title. The option `theoremtitlefont` allows to set a different font to the title of the theorem.

`theoremspace` `\space`

Sets the space after `theoremseparator`.

Examples can be found in the attached files.

5.6. Footnotes

Inside the environment you can use the command `\footnote` as usual. `mdframed` uses the syntax of environment `minipage` with the same counter.

Every footnote text will be collected inside a box and will be displayed at the end of the environment `mdframed`.

`footnotedistance` default= `\bigskipamount`

The length is the distance between the end of the environment `mdframed` and the displaying of the `\footnoterule`.

`footnoteinside` default=`true`

The position of the footnotes can be changed with the option `footnoteinside`. The footnotes will be displayed at the end of the environment but you can decide whether the output is inside `mdframed` or after.

Note

The output of the footnotes with the option `footnoteinside=false` are not in a splitted frame. I think it isn't useful because the first line of a new page shouldn't be a footnote.

6. Examples

I outsource the examples in four files to limit the documentation. The files are

`mdframed-example-default`
Demonstration of examples created with `framemethod=default`.

`mdframed-example-tikz`
Demonstration of examples created with `framemethod=TikZ`.

`mdframed-example-pstricks`
Demonstration of examples created with `framemethod=pstricks`.

`mdframed-example-texsx`
Demonstration of examples like interaction with `listings`

The examples are often not equivalent but normally they can be adapted to another method. So I really recommend to have a look to all example files.

The Korean TEXGroup created a very nice presentation. I want to show the link because it's really a great work: kts 2012 mdframed.

7. Errors, Warnings and Messages

The package `mdframed` provides different errors, warnings and messages in the `log`-file. Some LaTeX-editors like TeXMaker or TeXStudio have a special tab for errors and warnings but not for messages. So you should look in the `log-File` itself.

The following errors and warnings are generated by `mdframed`.

> The package ... does not exist but
> needed by **mdframed**

To avoid this problem you should install the required packages which are listed in section 2.

> package option **style** is depreciated
> use **framemethod** instead **style**

With version 0.9d `mdframed` changed the meaning of the option `style`. The option is used to load a defined style by `\mdfdefinestyle`. Instead use `framemethod` (see section 5.1).

> Unknown **framemethod** .... **mdframed**

The input string for the option `framemethod` is unkown. See section 5.1.

> You have not loaded **ntheorem** yet

To use the option `ntheorem` you have to load the package `ntheorem`.

> You have only a width of 3cm

The package `mdframed` calculates the width of the contents based on the given options. If the width of the contents is smaller than 3 cm you will get this warnings. You should change the settings to get a greater width.

> You got a bad break
> you have to change it manually
> by changing the **text**, the space
> or something else

Sometimes you have enough vertical space for the rules and the space between the rules and the contents but not for the contents itself. In this situation you will get this warning because the contents of this box is empty. You have the possibility to change the settings or include a `\clearpage` in front of the environment `mdframed`. So far I have no idea how to avoid such things.

> You got a bad break
> because the split box is empty
> You have to change the page **settings**
> like enlargethispage or something else
> You got a bad break

See the explanation above.

> You got a bad break
> because the last split box is empty
> You have to change the **settings**

The same reason as above but only in the last box.

> Option ... is already consumed
> and has no effect on input line ...

If you set a global option inside the document body you will get this warning.

8. Known Problems

In this section I will collect known problems. In case you encounter any further problems, please drop me an email, marco.daniel at mada-nada.de.

Do you have any ideas / wishes on further extensions to this package? Please let me know!

1. So far the environment isn't compatible with the package `gmverb`.
2. If you load the package `picins` the frame will no be splitted. That based on a problem of the package 'picins' which defines `\@captype` global. To work with the package picins you can use the following hack.

```
\usepackage{picins}
\makeatletter
\let\@captype\@undefined
\def\newcaption{%
  \begingroup%
    \def\@captype{figure}%
    \refstepcounter\@captype\@dblarg{\@newcaption\@captype}%
  \endgroup%
}
\makeatother
```

9. ToDo

It is important to update the documentation

1. see "Known Problems".
2. So far it isn't possible to combine the environment `\begin{multicols}` of the package `multicol` with `mdframed` with the whole option list.
3. Create new styles.
4. Improve page breaks.
5. Improve footnotes.
6. Improve documentation and examples.
7. Create styles for `frametitle`.
8. Create an inline version of `mdframed` that's works like `\fbox`
9. Add `\ht\strutbox` to file `md-frame-1.mdf`

10. Acknowledgements

Dick Nickalls; Dietrich Grau; Piazza Luca; Jobst Hoffmann; Martin Scharrer; Enrico Gregorio; Heiko Oberdiek; Philipp Stephani.

Thanks for proofreading
Alan Munn and Nahid Shajari
I hope I forgot nobody.

A. More information

In the following section I want to present how to create your own frame.

A.1. How does `mdframed` work?

With the environment `\begin{mdframed}` ... `\end{mdframed}` the whole contents will be saved in a `\savebox` called `\mdf@splitbox@one`. After the calculation of the width and the height of the `\mdf@splitbox@one` (done by `mdframed.sty`) the box will be set sequently (done by `md-frame-X.mdf`). The following figure demonstrates this.

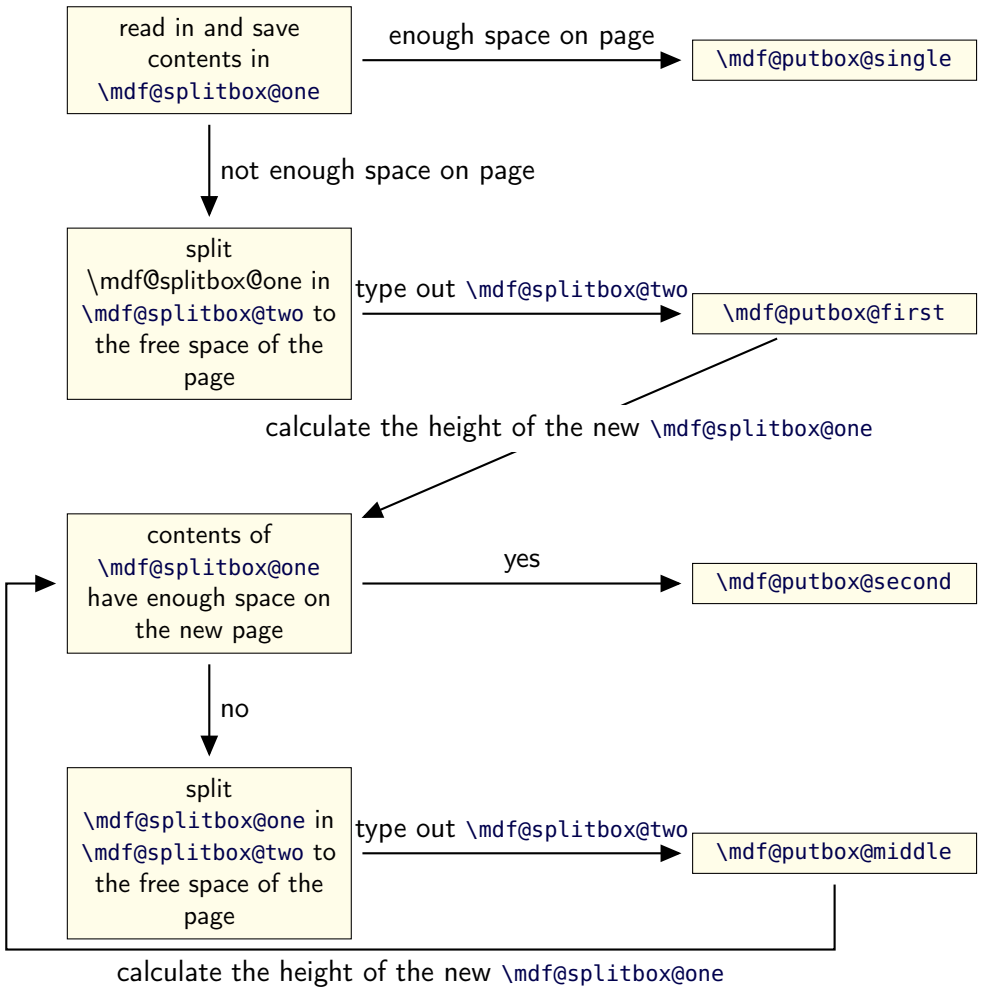

Figure 3: Setting the contents of `mdframed`

The width of the contents is the result of the settings of `leftmargin`, `rightmargin`, `linewidth`, `innerleftmargin` and `innerrightmargin` (see figure (2)).

A.2. The Framecommands

The package `mdframed` knows four kinds of "Framecommand". These commands tell LaTeX how to set the contents of `mdframed`.

`\mdf@putbox@single` This command sets the contents of a single unsplit frame.

`\mdf@putbox@first` This command sets the contents of the first frame of a split frame.

`\mdf@putbox@middle` This command sets the contents of the middle frame of a split frame.

`\mdf@putbox@second` This command sets the contents of the last frame of a split frame.

Using the explained commands we give an example. The command `\box` uses the contents of the savebox and types them out.

First we want to type out the single box without any settings (but with the calculated width).

```
\makeatletter
  \def\mdf@putbox@single{\box\mdf@splitbox@one}
\makeatother
```

I am using the command `\leftline` to start the "Framecommands" at the left.

```
\makeatletter
  \def\mdf@putbox@single{\leftline{\box\mdf@splitbox@one}}
\makeatother
```

Now you have to know how the lengths are named. Every length which can be modified by the options has the following syntax:

```
\mdf@<Name of the Length>@length
```

For example the leftmargin is:

```
\mdf@leftmargin@length
```

To create only a line at the left with the correct `leftmargin` you can set `\mdf@putboxsingle` as follows

```
\makeatletter
\def\mdf@putbox@single{%
            \leftline{%
                  \hspace*{\mdf@leftmargin@length}%
                  \rule[-\dp\mdf@splitbox@one]{\mdf@linewidth}%
                        {\ht\mdf@splitbox@one+\dp\mdf@splitbox@one}%
                  \box\mdf@splitbox@one
            }%
}
\makeatother
```

In this way you can do what you want. If you create your own style you can save the file as `md-frame-X.mdf`. `X` must be an integer. In this way you can use the option `framemethod` to load the file by setting `framemethod=X`.

A.3. Revision history

Version 1.4e submitted DD MM 2012
• fixed bug (Thanks Nicolas Roy) • expanded documentation (Thanks Martin Wilhelm Leidig) • added options `singleextra`, `firstextra`, `middleextra` and `secondextra` • expanded examples

Version 1.4d submitted 30 Mar 2012
• fixed bug (Thanks Nicolas Roy) • added approach to documentation to work with `picins` • new implementation of option `hidealllines`, now you can set `\mdfsetup{hidealllines=true,leftline=true}` printing only the left line (inspired by Tobias Schwan) • added option `everyline` to draw a top and bottom line at splitted frames

Version 1.4 submitted 4 Mar 2012
• fixed bug in combination with `\marginpar` (Thanks Juan Carlos Trujillo Ortega) • fixed bug with option `font` • fixed bug inside `frametitle` (Thanks Yi, Hoze) • removed unnessary groups (Thanks Yi, Hoze) • changed the definition of `listings` to allow copy paste of the examples

Version 1.3a submitted 5 Feb 2012
• fixed bug (Thanks to Dietrich Grau)

Version 1.3 submitted 4 Feb 2012
• fixed documentation (Thanks to Dietrich Grau) • added option `shadow` • improved handling `\parindent` and `\parskip` (Thanks to Enrico Gregorio and Joseph Wright)

Version 1.2 submitted 8 Jan 2012
• fixed documentation (Thanks to Dietrich Grau) • fixed bug in combination with `amsthm` • fixed bug in `\newmdtheoremenv` • defined new styles via `\newpsstyle`
This works only with `framemethod=PSTricks`. • added new commands for interaction with `TikZ` and `PSTricks` • expand frame title option by option `frametitlerule`, `frametitlerulewidth` `frametitlefont`, `frametitleaboveskip`, `frametitlebelowskip`, `frametitlealignment` • removed limitation of three lines for PSTricks • defined new commands `\surroundwithmdframed`, `\mdflength`, `\mdtheorem` • load `xparse` by default • changed internal names • expanded examples

Version 1.0b submitted 9 Dec 2011
• fixes documentation (Thanks to Dietrich Grau) • fixes bug in `\newmdtheoremenv` • fixes bug with overfull boxes (Thanks to Dietrich Grau) • defined `\newpsstylemdfbackgroundstyle` and `mdflinestyle`
This works only with `framemethod=PSTricks`. • created dtx-file (Thanks to Kevin Godby) • added `\@parboxrestore` to `\mdf@lrbox`

Version 1.0 submitted 13 Nov 2011
• add option `userdefinedwidth` • add option `align` • add option `apptotikzsetting` • create new command `\mdfapptodefinestyle` • changed internal algorithm • removed calc instead using ε-TEX `\dimexpr` • expand documentation • trying to fixe problems with `xcolor` • fixed bug with `framemethod=pstricks` • create file `mdframed-example-default` • create file `mdframed-example-tikz` • create file `mdframed-example-pstricks` • create file `mdframed-example-texsx` (texsx stands for tex stackexchange)

Version 0.9g submitted 08 Oct 2011
• fixed documentation • added small footnote compatibility

Version 0.9f submitted 04 Oct 2011
• fixes bugs (thanks to Lars Madsen) • added option `hidealllines` • fixed documentation

Version 0.9e submitted 11 Sep 2011
• working with `twoside` modus

Version 0.9d submitted 10 Sep 2011
• changed the meaning of the option `style`!!! (inspired by Lars Madsen) • added option `framemethod` (inspired by Lars Madsen) • added options `needspace` (inspired by Lars Madsen) • added new command `\mdfdefinestyle` (inspired by Lars Madsen) • fixes documentation • renamed `md-frame-3.mdf` to `md-frame-2.mdf`

Version 0.9b submitted 7 Sep 2011
• fixes bugs in `\newmdtheoremenv` (Thanks to Enrico Gregorio)

Version 0.9a submitted 5 Sep 2011
• fixes bugs (Thanks to Lars Madson) • expanded documentation (added revision history)

Version 0.9 submitted 4 Sep 2011
• added option `nobreak` • detecting float environments to prevent split calculation • expand documentation (Thanks to Alan Munn)

Version 0.8a
• fixes bugs • fixes documentation

Version 0.8 submitted 22 Aug 2011
• added commands: `\newmdenv`, `\renewmdenv`, `\newmdtheoremenv` • fixes bugs • fixes documentation

Version 0.7a submitted 6 August 2011
• added option `frametitle` • added option `frametitlefont` • allow twolumn-mode • changed the calculation • added option `tikzsetting` • added options for hidden lines for all styles • fixes bugs

Version 0.6a submitted 22 Dec 2010
• fixes bugs • added `\mdfsetup` • expanded documentation

B. Implementation

And finally, here's how it all works...

B.1. The Explanation of mdframed.sty

Id : *mdframed.dtx*3722012 − 04 − 0519 : 09 : 11*Zmarco Rev* : 372 *Author* : *marco*
Date : 2012 − 04 − 0521 : 09 : 11 + 0200(*Do*, 05.*Apr*2012)

```
\mdversion
\mdframedpackagename
\mdf@maindate@svn
```

Set package information

```
\def\mdversion{v1.5}
\def\mdframedpackagename{mdframed}
\def\mdf@maindate@svn$#1: #2 #3 #4-#5-#6 #7 #8${#4/#5/#6\space }

\NeedsTeXFormat{LaTeX2e}
\ProvidesPackage{mdframed}%
     [\mdf@maindate@svn$Id: mdframed.dtx 372 2012-04-05 19:09:11Z marco $%
      \mdversion: \mdframedpackagename]
```

```
\mdf@PackageWarning
\mdf@PackageInfo
\mdf@LoadFile@IfExist
```

Set short form of `\PackageWarning`, `\PackageInfo` and `IfFileExists` in combination with `\RequirePackage`.

```
\newcommand*\mdf@PackageWarning[1]{\PackageWarning{\mdframedpackagename}{#1}}
\newcommand*\mdf@PackageInfo[1]{\PackageInfo{\mdframedpackagename}{#1}}
\newcommand*\mdf@LoadFile@IfExist[1]{%
 \IfFileExists{#1.sty}{%
          \RequirePackage{#1}%
        }{%
        \mdf@PackageWarning{The file #1 does not exist\MessageBreak
                            but needed by \mdframedpackagename\MessageBreak
                            see documentation fo further information
                            }%
       }
}
```

Loading required packages

```
\RequirePackage{kvoptions}
\RequirePackage{xparse}
\RequirePackage{etoolbox}[2011/01/03]
\RequirePackage{zref-abspage}
\RequirePackage{color}
```

Set the family and the prefix of all options. (see documentation of `kvoptions`

```
\SetupKeyvalOptions{family=mdf,prefix=mdf@}
```

```
\mdf@iflength
\mdf@iflength@check
\mdf@iflength@check
```

Command which checks the input of length options. If the length option is only a number the `defaultunit` will be used. Syntax: `\mdf@iflength{<Input>}{<length>}{<no length>}`

```
\newlength{\mdf@templength}
\def\mdf@iflength#1{%
  \afterassignment\mdf@iflength@check%
  \mdf@templength=#1\mdf@defaultunit\relax\relax
  \expandafter\endgroup\next
}
\def\mdf@iflength@check#1{%
  \begingroup
  \ifx\relax#1\@empty
    \def\next{\@secondoftwo}
  \else
    \def\next{\@firstoftwo}
    \expandafter\mdf@iflength@cleanup
  \fi
}
\def\mdf@iflength@cleanup#1\relax{}
```

`\mdf@dolist`

Loop used by `mdframed`.

```
\DeclareListParser*{\mdf@dolist}{,}
```

`\mdf@option@length`
`\mdf@define@key@length`

Command to define a new length width a default value.
`\mdf@option@length{<Laengenbezeichnung>}{<Defaultwert>}`

```
\newrobustcmd*{\mdf@option@length}[2]{%
 \expandafter\newlength\csname mdf@#1@length\endcsname%
 \expandafter\setlength\csname mdf@#1@length\endcsname{#2}%
 }
```

Command to create a new length option.`\mdf@define@key@length{<Bezeichnungder Option der Laenge>}`

```
\newrobustcmd*{\mdf@define@key@length}[1]{%
   \define@key{mdf}{#1}{%
      \def\@tempa{##1}
      \mdf@iflength{\@tempa}%
       {\csxdef{mdfl@#1}{\the\mdf@templength}}%
       {\csxdef{mdfl@#1}{\the\mdf@templength}}%
       \expandafter\setlength\csname mdf@#1@length\endcsname{\csname mdfl@#1\endcsname}%
   }%
}
```

`\mdf@do@lengthoption`
`\mdf@lengthoption@doubledo`

The loop of `\mdf@dolist` expected one argument. So I have to define to commands to allow a loop with two arguments. The separation for the input is `==`.

```
\def\mdf@do@lengthoption#1{%
  \mdf@lengthoption@doubledo#1\@nil%
}
\def\mdf@lengthoption@doubledo#1==#2\@nil{%
```

```
60    \mdf@option@length{#1}{#2}%
61    \mdf@define@key@length{#1}%
62 }
```

\mdf@do@stringoption
\mdf@stringoption@doubledo

Same as \mdf@do@lengthoption and \mdf@lengthoption@doubledo.

```
63 \def\mdf@do@stringoption#1{%
64    \mdf@stringoption@doubledo#1\@nil%
65 }
66 \def\mdf@stringoption@doubledo#1==#2\@nil{%
67    \expandafter\gdef\csname mdf@#1\endcsname{#2}%
68    \define@key{mdf}{#1}{%
69       \csdef{mdf@#1}{##1}%
70    }%
71 }
```

\mdf@do@booloption
\mdf@booloption@doubledo

Same as \mdf@do@lengthoption and \mdf@lengthoption@doubledo.

```
72 \def\mdf@do@booloption#1{%
73    \mdf@booloption@doubledo#1\@nil%
74 }
75 \def\mdf@booloption@doubledo#1==#2\@nil{%
76    \newbool{mdf@#1}\setbool{mdf@#1}{#2}%
77    \define@key{mdf}{#1}[#2]{%
78       \setbool{mdf@#1}{##1}%
79    }%
80 }
```

\mdf@do@alignoption
\mdf@alignoption@tripledo

Same as \mdf@do@lengthoption and \mdf@lengthoption@doubledo. Here three arguments are required.

```
81 \def\mdf@do@alignoption#1{%
82    \mdf@alignoption@tripledo#1\@nil%
83 }
84 \def\mdf@alignoption@tripledo#1==#2==#3\@nil{%
85    \csdef{mdf@align@#1@left}{\null\hspace*{#2}}%
86    \csdef{mdf@align@#1@right}{\hspace*{#3}\null}%
87 }
```

Start declaration of options

```
88 \newcounter{mdf@globalstyle@cnt}
89 \defcounter{mdf@globalstyle@cnt}{0}
90 \newcommand*\mdfglobal@style{0}
```

Only provide to be backward compatible

```
91 \define@key{mdf}{style}{%
92        \mdf@PackageWarning{package option style is depreciated^^J
93                            use framemethod instead\MessageBreak}%
94        \renewcommand*\mdfglobal@style{#1}%
```

```
        \defcounter{mdf@globalstyle@cnt}{#1}%
         \ifcase\value{mdf@globalstyle@cnt}\relax
             %0 <- kein Grafikpaket
          \or\mdf@LoadFile@IfExist{tikz}%
          \or\mdf@LoadFile@IfExist{pstricks-add}%
          \or\defcounter{mdf@globalstyle@cnt}{2}%
              \mdf@LoadFile@IfExist{pst-node}%
          \or\mdf@LoadFile@IfExist{pst-node}%
          \else\mdf@PackageWarning{Unknown global style \value{mdf@globalstyle@cnt}}%
        \fi%
}
```

\mdf@framemethod

```
\providecommand*\mdf@framemethod{}
\def\mdf@framemethod@i{}%
\def\mdf@framemethod@ii{}%
\def\mdf@framemethod@iii{}%

\define@key{mdf}{framemethod}[default]{%
  \lowercase{\def\mdf@tempa{#1}}
  \forcsvlist{\listadd\mdf@framemethod@i}{default,tex,latex,none,0}
  \forcsvlist{\listadd\mdf@framemethod@ii}{pgf,tikz,1}
  \forcsvlist{\listadd\mdf@framemethod@iii}{pstricks,ps,2,postscript}
  \xifinlist{\mdf@tempa}{\mdf@framemethod@i}%
     {\def\mdf@@framemethod{default}\defcounter{mdf@globalstyle@cnt}{0}}%
     {\xifinlist{\mdf@tempa}{\mdf@framemethod@ii}%
         {\def\mdf@@framemethod{tikz}\defcounter{mdf@globalstyle@cnt}{1}}%
         {\xifinlist{\mdf@tempa}{\mdf@framemethod@iii}%
             {\def\mdf@@framemethod{pstricks}\defcounter{mdf@globalstyle@cnt}{2}}%
             {%
              \mdf@LoadFile@IfExist{#1}%
             }%
         }%
     }%
  \ifcase\value{mdf@globalstyle@cnt}\relax%
         %0 <- kein Grafikpaket
     \or\mdf@LoadFile@IfExist{tikz}%
     \or\mdf@LoadFile@IfExist{pst-node}%
     \or\mdf@LoadFile@IfExist{pst-node}%
  \fi%
}
```

\mdf@do@lengthoption

Here the declaration of the length option. The input method is explained above.

```
\mdf@dolist{\mdf@do@lengthoption}{%
   {skipabove==\z@},%
   {skipbelow==\z@},%
   {leftmargin==\z@},%
   {rightmargin==\z@},%
   {innerleftmargin==10pt},%
   {innerrightmargin==10pt},%
```

```
    {innertopmargin==0.4\baselineskip},%
    {innerbottommargin==0.4\baselineskip},%
    {splittopskip==\z@},%
    {splitbottomskip==\z@},%
    {outermargin==\z@},%
    {innermargin==\z@},%
    {linewidth==0.4pt},%
    {innerlinewidth==\z@},%
    {middlelinewidth==\expandafter\mdf@linewidth@length},%
    {outerlinewidth==\z@},%
    {roundcorner==\z@},%
    {footenotedistance==\medskipamount},
    {userdefinedwidth==\linewidth},
    {frametitleaboveskip==5pt},
    {frametitlebelowskip==5pt},
    {frametitlerulewidth==.2pt},
    {frametitleleftmargin==10pt},%
    {frametitlerightmargin==10pt},%
    {shadowsize==8pt},%
}
```

\mdf@do@lengthoption

Here the declaration of the string option. The input method is explained above.

```
\mdf@dolist{\mdf@do@stringoption}{%
    {frametitle=={}},%
    {defaultunit==pt},%
    {linecolor==black},%
    {backgroundcolor==white},%
    {fontcolor==black},%
    {frametitlefontcolor==black},%
    {innerlinecolor==\mdf@linecolor},%
    {outerlinecolor==\mdf@linecolor},%
    {middlelinecolor==\mdf@linecolor},%
    {psroundlinecolor==\mdf@backgroundcolor},%
    {frametitlerulecolor==\mdf@linecolor},
    {frametitlebackgroundcolor==\mdf@backgroundcolor},%
    {shadowcolor==black!50},%
    {settings=={}},%
    {frametitlesettings=={}},%
    {font=={}},%
    {frametitlefont==\normalfont\bfseries},%
    {printheight==none},%
    {alignment=={}},%
    {frametitlealignment=={}},%
    {theoremseparator=={:}},%
    {theoremcountersep=={.}},%
    {theoremtitlefont=={}},%
    {theoremspace=={\space}},%
    {singleextra=={}},%\mdf@singleextra
    {firstextra=={}},%\mdf@firstextra
    {middleextra=={}},%\mdf@middleextra
    {secondextra=={}},%\mdf@secondextra
}
```

\mdf@do@booloption

Here the declaration of the string option. The input method is explained above.

```
\mdf@dolist{\mdf@do@booloption}{%
    {ntheorem==false},%
    {topline==true},%
    {leftline==true},%
    {bottomline==true},%
    {rightline==true},%
    {frametitletopline==true},%
    {frametitleleftline==true},%
    {frametitlebottomline==true},%
    {frametitlerightline==true},%
%    {hidealllines==false},%
    {frametitlerule==false},%
    {nobreak==false},%
    {footnoteinside==true},%
    {usetwoside==true},%
    {repeatframetitle==false},%Noch nicht richtig implementiert
    {shadow==false},%
    {everyline==false},%
}
%%special boolflag hidealllines:
\newbool{mdf@hidealllines}%
\define@key{mdf}{hidealllines}[false]{%
\setbool{mdf@hidealllines}{#1}%
 \ifbool{mdf@hidealllines}{%
   \setkeys{mdf}{leftline=false,topline=false,rightline=false,bottomline=false}%
 }{}%
}
```

\mdf@do@alignoption

Here the declaration of the align option. The input method is explained above.

```
\mdf@dolist{\mdf@do@alignoption}{%
    {left==\mdf@leftmargin@length==\z@},%
    {center==\fill==\fill},%
    {right==\fill==\mdf@rightmargin@length},%
    {outer==\fill==\mdf@rightmargin@length},%not supported yet
    {outer==\mdf@leftmargin@length==\fill},%not supported yet
}
```

\mdf@align
\mdf@makeboxalign@left
\mdf@makeboxalign@right
\mdf@makeboxalign@right

Set the alignment.

```
\newcommand*\mdf@align{}%
\newcommand*\mdf@makeboxalign@left{\null\hspace*{\mdf@leftmargin@length}}%
\newcommand*\mdf@makeboxalign@right{}%
\define@key{mdf}{align}[left]{%
   \ifcsundef{mdf@align@#1@left}{%
       \mdf@PackageWarning{Unknown alignment #1\MessageBreak}%
```

```
230         \letcs\mdf@makeboxalign@left{mdf@align@left@left}%
231         \letcs\mdf@makeboxalign@right{mdf@align@left@right}%
232     }{%
233         \def\mdf@makeboxalign@left{\csuse{mdf@align@#1@left}}%
234         \def\mdf@makeboxalign@right{\csuse{mdf@align@#1@right}}%
235     }%
236 }
```

\mdf@tikzset@local
\mdf@psset@local

Option to pass options to tikz or pstricks

```
237 \def\mdf@tikzset@local{\tikzset{tikzsetting/.style={}}}
238 \define@key{mdf}{tikzsetting}{%
239   \def\mdf@tikzset@local{\tikzset{tikzsetting/.style={#1}}}%
240 }
241 \define@key{mdf}{apptotikzsetting}{%
242   \appto\mdf@tikzset@local{#1}%
243 }
244 \def\mdf@psset@local{}
245 \define@key{mdf}{pstrickssetting}{%
246   \def\mdf@psset@local{#1}
247 }
248 \def\mdfpstricks@appendsettings{}
249 \define@key{mdf}{pstricksappsetting}{%
250   \def\mdfpstricks@appendsettings{#1}%
251 }
252
```

\mdf@xcolor

Problem width xcolor. This part must be reworked!

```
253 \def\mdf@xcolor{}
254 \define@key{mdf}{xcolor}[none]{%
255   \def\@tempa{#1}%
256   \@ifpackageloaded{xcolor}{%
257      \let\mdf@xcolor\@empty %ignoriere die Eingabe der Optionen
258      \def\@tempa{}%
259      }{}%
260   \ifx\relax\@tempa\relax\else
261      \PassOptionsToPackage{\mdf@xcolor}{xcolor}%
262       \RequirePackage{xcolor}%
263   \fi%
264 }%
```

\mdf@needspace

Defining the option needspace

```
265 \define@key{mdf}{needspace}[\z@]{%
266     \begingroup%
267        \setlength{\dimen@}{#1}%
268        \vskip\z@\@plus\dimen@%
269        \penalty -100\vskip\z@\@plus -\dimen@%
270        \vskip\dimen@%
```

```
        \penalty 9999%
        \vskip -\dimen@%
        \vskip\z@skip % hide the previous |\vskip| from |\addvspace|
      \endgroup%
}

\DeclareDefaultOption{%
   \mdf@PackageWarning{Unknown Option '\CurrentOption' for mdframed}}
\ProcessKeyvalOptions*\relax
```

\mdfsetup

Short form of \setkeys{mdf}

```
\newrobustcmd*{\mdfsetup}{\setkeys{mdf}}
```

\mdf@style

Redefinition of the option style to use the key in combination with mdfdefinedstyle.

```
\define@key{mdf}{style}{%
  \ifcsundef{mdf@definestyle@#1}{%
    \mdf@PackageWarning{Unknown definedstyle #1^^J
                        You have to define a style ^^J
                        via \string\mdfdefinedstyle\MessageBreak
                       }%
   }%
   {\expandafter\expandafter\expandafter\mdfsetup%
    \expandafter\expandafter\expandafter{\csname mdf@definestyle@#1\endcsname}}%
}%
```

\mdf@print@space

Option to type out the free vertical space of the current page.

```
\let\mdf@PackageNoInfo\@gobble
\newrobustcmd*\mdf@ifstrequal@expand{%
\expandafter\ifstrequal\expandafter{\mdf@printheight}%
}
\newrobustcmd*\mdf@print@space{%
  %case "none"
  \mdf@ifstrequal@expand{none}{\def\mdf@tempa{NoInfo}}{%
      %case "info"
      \mdf@ifstrequal@expand{info}{\def\mdf@tempa{Info}}{%
         %case "warning"
         \mdf@ifstrequal@expand{warning}{\def\mdf@tempa{Warning}}{%
            %case "unknown"
            \mdf@PackageWarning{Unknown key for printheight=\mdf@printheight^^J
                                use none, info or warning}%
             \def\mdf@tempa{none}%
         }%
      }%
  }%
\def\mdf@PackageInfoSpace{\csname mdf@Package\mdf@tempa\endcsname}%
}
```

\new...

Initialize all commands and length which will we used later

```
\newsavebox\mdf@frametitlebox
\newsavebox\mdf@footnotebox
\newsavebox\mdf@splitbox@one
\newsavebox\mdf@splitbox@two
\newlength\mdfsplitboxwidth
\newlength\mdfsplitboxtotalwidth
\newlength\mdfsplitboxheight
\newlength\mdfsplitboxdepth
\newlength\mdfsplitboxtotalheight
\newlength\mdfframetitleboxwidth
\newlength\mdfframetitleboxtotalwidth
\newlength\mdfframetitleboxheight
\newlength\mdfframetitleboxdepth
\newlength\mdfframetitleboxtotalheight
\newlength\mdffootnoteboxwidth
\newlength\mdffootnoteboxtotalwidth
\newlength\mdffootnoteboxheight
\newlength\mdffootnoteboxdepth
\newlength\mdffootnoteboxtotalheight

\newlength\mdftotallinewidth

\newlength\mdfboundingboxwidth
\newlength\mdfboundingboxtotalwidth

\newlength\mdfboundingboxheight
\newlength\mdfboundingboxdepth
\newlength\mdfboundingboxtotalheight

\newlength\mdf@freevspace@length
\newlength\mdf@horizontalwidthofbox@length
\newlength\mdf@verticalmarginwhole@length

% Command to expand the tikz code. (see md-frame-1.mdf)
\newrobustcmd\mdfcreateextratikz{}

```

\mdf@lrbox
\endmdf@lrbox

Modification of the default \lrbox and \endlrbox

```

\def\mdf@lrbox#1{%
%%patch to work with amsthm
  \mdf@patchamsthm
%%end patch
  \edef\mdf@restoreparams{%
   \parindent=\the\parindent \parskip=\the\parskip}
  \setbox#1\vbox\bgroup
   \color@begingroup%
    \mdf@horizontalmargin@equation%
```

```
    \columnwidth=\hsize%
    \textwidth=\hsize%
    \@parboxrestore%
    \mdf@restoreparams%
    %SETZE
    \@afterindentfalse%
    \@afterheading%
    %STREICHE
    %\@doendpe
}

\def\endmdf@lrbox{\color@endgroup\egroup}

```

\mdf@ignorevbadness
\mdf@restorevbadness

Avoiding warnings during the splitting process by `\vsplit`. see How to avoid underfull vbox in combination with `\vsplit`?

```
\newrobustcmd*\mdf@ignorevbadness{%
   \edef\mdf@currentvbadness{\the\vbadness}%
   \vbadness=\@M%
   \afterassignment\mdf@restorevbadness}
\newrobustcmd*\mdf@restorevbadness{\vbadness=\mdf@currentvbadness\relax}
```

\mdf@patchamsth

The package `amsthm` provides a not compatible starting of theorem. So I have to change the header of amsthm.

```
\@ifpackageloaded{amsthm}{%
 \newrobustcmd\mdf@patchamsthm{%
     \let\mdf@deferred@thm@head\deferred@thm@head
     \patchcmd{\deferred@thm@head}{\indent}{}{}{}
     }%
 }{\let\mdf@patchamsthm\relax}%
```

\mdf@trivlist
\endmdf@trivlist

Modification of the default `\trivlist` and `\endtrivlist`.

```
\def\mdf@trivlist#1{%
  \setlength{\topsep}{#1}%
  \partopsep\z@%
  \parsep\z@%
  \@nmbrlistfalse%
  \@trivlist%
  \labelwidth\z@%
  \leftmargin\z@%
  \itemindent\z@%
  \let\@itemlabel\@empty%
  \def\makelabel##1{##1}%
%%  \item\leavevmode\hrule \@height\z@ \@width\linewidth\relax%
%%  \item\mbox{}\relax% second version
```

```
  \item\relax% first Version
}
\let\endmdf@trivlist\endtrivlist
\patchcmd\endmdf@trivlist\@endparenv\mdf@endparenv{}{}
\def\mdf@endparenv{%
  \addpenalty\@endparpenalty\addvspace\mdf@skipbelow@length\@endpetrue}

```

`\mdf@makebox@out`
`\mdf@makebox@in`

```
\newrobustcmd*\mdf@makebox@out[2][\linewidth]{%
 \noindent\hb@xt@\z@{%
    \noindent\makebox[\dimexpr #1\relax][l]{#2}%
 \hss}%
}%
\newrobustcmd*\mdf@makebox@in[2][\mdf@userdefinedwidth@length]{%
 \noindent\makebox[\dimexpr #1\relax][l]{#2}%
}
```

`\mdfdefinestyle`
`\mdfapptodefinestyle`

See explanation of this commands above.

```
\newrobustcmd*\mdfdefinestyle[2]{%
  \csdef{mdf@definestyle@#1}{#2}%
}
\newrobustcmd*\mdfapptodefinestyle[2]{%
 \ifcsundef{mdf@definestyle@#1}%
   {\mdf@PackageWarning{Unknown style #1}}%
   {\csappto{mdf@definestyle@#1}{,#2}}%
}
```

`\mdflength`
`\surroundwithmdframed`

Helper macros to work with mdframed

```
\newrobustcmd*{\mdflength}[1]{\csuse{mdf@#1@length}}

\newrobustcmd*{\surroundwithmdframed}[2][]{%
  \BeforeBeginEnvironment{#2}{\begin{mdframed}[#1]}%
  \AfterEndEnvironment{#2}{\end{mdframed}}%
}
```

`\newmdenv`
`\renewmdenv`
`\newmdtheoremenv`
`\mdtheorem`

Defining of the new environment defintions.

```
\newrobustcmd*\newmdenv[2][]{%
  \newenvironment{#2}{%
```

```
    \mdfsetup{#1}%
    \begin{mdframed}%
   }{%
    \end{mdframed}%
  }%
}
\newrobustcmd*\renewmdenv[2][]{%
  \expandafter\let\csname #2\endcsname\relax%
  \expandafter\let\csname end#2\endcsname\relax%
  \newmdenv[#1]{#2}%
  }%


\DeclareDocumentCommand\newmdtheoremenv{O{} m o m o }{%
 \ifboolexpr{ test {\IfNoValueTF {#3}} and test {\IfNoValueTF {#5}} }%
   {\newtheorem{#2}{#4}}{%
    \IfValueTF{#3}{\newtheorem{#2}[#3]{#4}}{}%
    \IfValueTF{#5}{\newtheorem{#2}{#4}[#5]}{}%
   }%
  \BeforeBeginEnvironment{#2}{%
    \begin{mdframed}[#1]}%
  \AfterEndEnvironment{#2}{%
    \end{mdframed}}%
}

\DeclareDocumentCommand{\mdtheorem}{ O{} m o m o }%
 {\ifcsdef{#2}%
   {\mdf@PackageWarning{Environment #2 already exits\MessageBreak}}%
   {%
    \IfNoValueTF {#3}%
     {%#3 not given -- number relationship
      \IfNoValueTF {#5}
        {%#3+#5 not given
        \@definecounter{#2}%
        \expandafter\xdef\csname the#2\endcsname{\@thmcounter{#2}}
        \newenvironment{#2}[1][]{%
          \refstepcounter{#2}
          \ifstrempty{##1}%
            {\let\@temptitle\relax}%
            {%
             \def\@temptitle{\mdf@theoremseparator%
                             \mdf@theoremspace%
                             \mdf@theoremtitlefont%
                             ##1}%
            }
          \begin{mdframed}[#1,frametitle={\strut#4\ \csname the#2\endcsname\@temptitle}]}%
          {\end{mdframed}}%
        \newenvironment{#2*}[1][]{%
          \ifstrempty{##1}{\let\@temptitle\relax}{\def\@temptitle{:\ ##1}}
          \begin{mdframed}[#1,frametitle={\strut#4\@temptitle}]}%
          {\end{mdframed}}%
        }%
        {%#5 given -- reset counter
        \@definecounter{#2}\@newctr{#2}[#5]%
        \expandafter\xdef\csname the#2\endcsname{\@thmcounter{#2}}
        \expandafter\xdef\csname the#2\endcsname{%
```

```
480               \expandafter\noexpand\csname the#5\endcsname \@thmcountersep
481                  \@thmcounter{#2}}%
482         \newenvironment{#2}[1][]{%
483           \refstepcounter{#2}
484           \ifstrempty{##1}%
485             {\let\@temptitle\relax}%
486             {%
487              \def\@temptitle{\mdf@theoremseparator%
488                              \mdf@theoremspace%
489                              \mdf@theoremtitlefont%
490                              ##1}%
491              }
492           \begin{mdframed}[#1,frametitle={\strut#4\ \csname the#2\endcsname\@temptitle}]}%
493           {\end{mdframed}}%
494         \newenvironment{#2*}[1][]{%
495           \ifstrempty{##1}%
496             {\let\@temptitle\relax}%
497             {%
498              \def\@temptitle{\mdf@theoremseparator%
499                              \mdf@theoremspace%
500                              \mdf@theoremtitlefont%
501                              ##1}%
502              }
503           \begin{mdframed}[#1,frametitle={\strut#4\@temptitle}]}%
504           {\end{mdframed}}%
505         }%
506      }%
507      {%#3 given -- number relationship
508         \global\@namedef{the#2}{\@nameuse{the#3}}%
509         \newenvironment{#2}[1][]{%
510           \refstepcounter{#3}
511           \ifstrempty{##1}%
512             {\let\@temptitle\relax}%
513             {%
514              \def\@temptitle{\mdf@theoremseparator%
515                              \mdf@theoremspace%
516                              \mdf@theoremtitlefont%
517                              ##1}%
518              }
519           \begin{mdframed}[#1,frametitle={\strut#4\ \csname the#2\endcsname\@temptitle}]}%
520           {\end{mdframed}}%
521         \newenvironment{#2*}[1][]{%
522           \ifstrempty{##1}{\let\@temptitle\relax}{\def\@temptitle{:\ ##1}}
523           \begin{mdframed}[#1,frametitle={\strut#4\@temptitle}]}%
524           {\end{mdframed}}%
525      }%
526    }%
527 }
528
```

\mdfframedtitleenv
\mdf@@frametitle
\mdf@setopt@body
\mdf@setopt@title

Default definition of the frame tile used by mdframed.

```
%TESTVERSION
% \newrobustcmd*\mdf@setopt@title{%
%  \ifbool{mdf@frametitlerule}{\booltrue{mdf@bottomline}}{\boolfalse{mdf@bottomline}}%
% \let\ifmdf@leftline\ifmdf@frametitleleftline%
% \let\ifmdf@topline\ifmdf@frametitletopline%
% \let\ifmdf@rightline\ifmdf@frametitlerightline%
% \let\ifmdf@bottomline\ifmdf@frametitlebottomline%
%  \mdfsetup{innerbottommargin=\mdf@titlebelowskip@length,%
%            innertopmargin=\mdf@titleaboveskip@length,%
%            middlelinecolor=\mdf@frametitlerulecolor,%
%            backgroundcolor=\mdf@frametitlebackgroundcolor,%
%            middlelinewidth=\mdf@frametitlerulewidth@length,%
%            innerleftmargin=\mdf@frametitleleftmargin@length,%
%            innerrightmargin=\mdf@frametitlerightmargin@length,%
%            alignment=\mdf@frametitlealignment,
%            skipbelow=\z@}%
% \def\mdf@linecolor@bottom{\color{\mdf@frametitlebottomrulecolor}}%
% \mdf@frametitlesettings%
% }
%
% \newrobustcmd*\mdf@setopt@body{%
%  \mdfsetup{topline=false,skipabove=\z@}%
%  \unskip\nointerlineskip%
% }
%
% \newrobustcmd\mdfframedtitleenv[1]{%
%  \begingroup
%   \mdf@setopt@title
%   \color@setgroup
%    \mdf@frametitlefont
%    \mdf@lrbox{\mdf@splitbox@one}%
%      \mdf@frametitlealignment
%       #1\par\unskip
%    \endmdf@lrbox
%   \mdf@ignorevbadness
%   \global\setbox\mdf@frametitlebox\vbox{\unvbox\mdf@splitbox@one}%
%   \mdf@ignorevbadness
%   \global\setbox\mdf@splitbox@one\vbox{\unvcopy\mdf@frametitlebox}%
%   \detected@mdf@put@frame%
%   \color@endgroup%
%  \endgroup
% }
\newrobustcmd\mdfframedtitleenv[1]{%
  \color@begingroup%%
    \mdf@lrbox{\mdf@frametitlebox}%
       \mdf@frametitlealignment%
       \color{\mdf@frametitlefontcolor}%
           \normalfont\mdf@frametitlefont{#1}\par\unskip
    \endmdf@lrbox%
   \mdf@ignorevbadness%
   \global\setbox\mdf@frametitlebox\vbox{\unvbox\mdf@frametitlebox}%
   \global\mdfframetitleboxwidth=\wd\mdf@frametitlebox\relax%
   \global\mdfframetitleboxheight=\ht\mdf@frametitlebox\relax%
   \global\mdfframetitleboxdepth=\dp\mdf@frametitlebox\relax%
   \global\mdfframetitleboxtotalheight=\dimexpr\ht\mdf@frametitlebox+\dp\mdf@frametitlebox
```

```
            +\mdf@frametitleaboveskip@length+\mdf@frametitlebelowskip@length\relax%
   \color@endgroup%
}

\newrobustcmd*\mdf@@frametitle{%
    \mdfframedtitleenv{\mdf@frametitle}%
}

\newrobustcmd*\mdf@@frametitle@use{%
   \begingroup
   \parskip\z@
   \parindent\z@
   \offinterlineskip
   \mdf@ignorevbadness%
   \global\setbox\mdf@splitbox@one\vbox{%
       \unvcopy\mdf@frametitlebox%
       \mdf@@frametitlerule%
       \unvbox\mdf@splitbox@one
    }%
   \mdf@ignorevbadness%
   \global\setbox\mdf@splitbox@one\vbox{%
       \unvbox\mdf@splitbox@one}%
   \endgroup
   \mdfsetup{innertopmargin=\mdf@frametitleaboveskip@length}%
}
```

\mdf@checkntheorem

Command which checks only ntheorem. Later I will support also thmtools.

```
\newrobustcmd*\mdf@checkntheorem{%
  \ifbool{mdf@ntheorem}%
    {\ifundef{\theorempreskipamount}%
          {\mdf@PackageWarning{You have not loaded ntheorem yet}}%
          {\setlength{\theorempreskipamount}{\z@}%
           \setlength{\theorempostskipamount}{\z@}%
    }%
  }{}%
}
```

\mdf@footnoterule
\mdf@footnoteoutput
\mdf@footnoteinput

Support for footnotes.

```
\newrobustcmd*\mdf@footnoterule{%
    \kern0\p@%
    \hrule \@width 1in \kern 2.6\p@}
\newrobustcmd*\mdf@footnoteoutput{%
     \ifvoid\@mpfootins\else
          \nobreak%
          \vskip\mdf@footenotedistance@length%
          \normalcolor%
          \mdf@footnoterule
          \unvbox\@mpfootins
```

```
    \fi%
}
\newrobustcmd*\mdf@footnoteinput{%
   \def\@mpfn{mpfootnote}%
   \def\thempfn{\thempfootnote}%
   \c@mpfootnote\z@%
   \let\@footnotetext\@mpfootnotetext%
}
```

\mdf@load@style
\mdf@styledefinition

Load the method to draw the frame and set style definition.

```
\newrobustcmd*\mdf@load@style{%
\ifcase\value{mdf@globalstyle@cnt}\relax%
    \input{md-frame-0.mdf}%
 \or\input{md-frame-1.mdf}%
 \or\input{md-frame-2.mdf}%
 \or\input{md-frame-3.mdf}%
 \else%
    \IfFileExists{md-frame-\value{mdf@globalstyle@cnt}.mdf}%
    {\input{md-frame-\value{mdf@globalstyle@cnt}.mdf}}%
    {%
     \input{md-frame-0.mdf}%
     \mdf@PackageWarning{The style number \value{mdf@globalstyle@cnt} does not exist^^J
                         mdframed ues instead style=0 \mdframedpackagename}%
    }%
\fi%
}%
\mdf@load@style

\newrobustcmd*\mdf@styledefinition{%AVOID!!!
    \ifnumequal{\value{mdf@globalstyle@cnt}}{0}%
    {\deflength{\mdf@innerlinewidth@length}{\z@}%
     \deflength{\mdf@middlelinewidth@length}{\mdf@linewidth@length}%
     \deflength{\mdf@outerlinewidth@length}{\z@}%
     \let\mdf@innerlinecolor\mdf@linecolor%
     \let\mdf@middlelinecolor\mdf@linecolor%
     \let\mdf@outerlinecolor\mdf@linecolor%
    }{}%
%   \ifnumequal{\value{mdf@globalstyle@cnt}}{2}%
%   {\deflength{\mdf@innerlinewidth@length}{\z@}%
%    \deflength{\mdf@middlelinewidth@length}{\mdf@linewidth@length}%
%    \deflength{\mdf@outerlinewidth@length}{\z@}%
%    \let\mdf@innerlinecolor\mdf@linecolor%
%   }{}%
%   \ifnumequal{\value{mdf@globalstyle@cnt}}{3}%
%   {\deflength{\mdf@innerlinewidth@length}{\z@}%
%    \deflength{\mdf@middlelinewidth@length}{\mdf@linewidth@length}%
%    \deflength{\mdf@outerlinewidth@length}{\z@}%
%    \let\mdf@innerlinecolor\mdf@linecolor%
%   }{}%
}
```

`\detected@mdf@put@frame`

Detect whether inside a non breakable environment.

```
\let\mdf@reserved@a\@empty
\newrobustcmd*\detected@mdf@put@frame{%
  \ifmdf@nobreak%Option nobreak=true?
     \def\mdf@reserved@a{\mdf@put@frame@standalone}%
  \else
     \def\mdf@reserved@a{\mdf@put@frame}%
     \ifx\@captype\@undefined
         \def\mdf@reserved@a{\mdf@put@frame}%
     \else
         \mdf@PackageInfo{mdframed inside float  ^^J
                          mdframed uses option nobreak \mdframedpackagename}%
         \def\mdf@reserved@a{\mdf@put@frame@standalone}%
     \fi
%%     \ifnum\@floatpenalty<0\relax%Detecting float
%%        \if@twocolumn%
%%           \ifx\@captype\@undefined
%%              \def\mdf@reserved@a{\mdf@put@frame}%
%%           \else
%%               \mdf@PackageInfo{mdframed inside float  ^^J
%%                                mdframed uses option nobreak \mdframedpackagename}%
%%               \def\mdf@reserved@a{\mdf@put@frame@standalone}%
%%           \fi
%%        \else
%%           \mdf@PackageInfo{mdframed inside float  ^^J
%%                            mdframed uses option nobreak \mdframedpackagename}%
%%           \def\mdf@reserved@a{\mdf@put@frame@standalone}%
%%        \fi%
%%     \fi%
     \if@minipage%
          \mdf@PackageInfo{mdframed inside minipage  ^^J
                           mdframed uses option nobreak \mdframedpackagename}%
          \def\mdf@reserved@a{\mdf@put@frame@standalone}%
     \fi%
     \ifinner%
          \mdf@PackageInfo{mdframed inside a box ^^J
                           mdframed uses option nobreak \mdframedpackagename}%
          \def\mdf@reserved@a{\mdf@put@frame@standalone}%
     \fi%
  \fi%
\mdf@reserved@a%
}
```

`\mdf@hidealllines@check`

```
\newrobustcmd*\mdf@hidealllines@check{%
 \ifbool{mdf@hidealllines}{%
    \boolfalse{mdf@leftline}\boolfalse{mdf@rightline}%
    \boolfalse{mdf@topline}\boolfalse{mdf@bottomline}%
    \boolfalse{mdf@frametitleleftline}\boolfalse{mdf@frametitlerightline}%
    \boolfalse{mdf@frametitletopline}\boolfalse{mdf@frametitlebottomline}%
  }{}%
```

```
}
```

\mdframed
\mdframed@ii
\mdframed@i

That the user environement.

```
\newenvironment{mdframed}[1][]{%
\color@begingroup%
   \mdfsetup{userdefinedwidth=\linewidth,#1}%
%%%   \mdf@hidealllines@check%
   \mdf@twoside@checklength%
   \let\width\z@%
   \let\height\z@%
   \mdf@checkntheorem%
   \mdf@styledefinition%
   \mdf@footnoteinput%
   \color{\mdf@fontcolor}%
   \mdf@font%
   \ifvmode\nointerlineskip\fi%
   \mdf@trivlist{\mdf@skipabove@length}%%
   \ifdefempty{\mdf@frametitle}{}{\mdf@@frametitle}%
   \mdf@settings%
   \mdf@lrbox{\mdf@splitbox@one}%
  }%
  {\par\unskip\ifvmode\nointerlineskip\hrule \@height\z@ \@width\hsize\fi%%
    \ifmdf@footnoteinside%
      \def\mdf@reserveda{%
        \mdf@footnoteoutput%
        \endmdf@lrbox%
        \ifdefempty{\mdf@frametitle}{}{\mdf@@frametitle@use}
        \detected@mdf@put@frame}%
    \else%
      \def\mdf@reserveda{%
        \endmdf@lrbox%
        \ifdefempty{\mdf@frametitle}{}{\mdf@@frametitle@use}
        \detected@mdf@put@frame%
        \mdf@footnoteoutput%
        }%
    \fi%
    \mdf@reserveda%
    \endmdf@trivlist%
\color@endgroup\@doendpe%
}
```

\mdf@twoside@checklength
\mdf@zref@label
\if@mdf@pageodd
\mdf@pageisodd
\mdf@pageiseven
\mdf@@setzref

The whole bunch is used to work width twoside mode and uses the correct margins.

```
\newtoggle{md:checktwoside}
\settoggle{md:checktwoside}{false}
\newrobustcmd*\mdf@twoside@checklength{%
 \if@twoside
   \ifbool{mdf@usetwoside}%
      {\mdf@PackageInfo{mdframed works in twoside mode}%
       \settoggle{md:checktwoside}{true}%
       \setlength\mdf@rightmargin@length{\mdf@outermargin@length}%
       \setlength\mdf@leftmargin@length{\mdf@innermargin@length}%
      }%
      {\mdf@PackageInfo{mdframed inside twoside mode but\MessageBreak
                        works with oneside mode}%
       \settoggle{md:checktwoside}{false}%
      }%
 \fi%
}

\newcounter{mdf@zref@counter}%keine doppelten laebes
\zref@newprop*{mdf@pagevalue}[0]{\number\value{page}}
\zref@addprop{\ZREF@mainlist}{mdf@pagevalue}
\newrobustcmd*\mdf@zref@label{%
   \stepcounter{mdf@zref@counter}
   \zref@label{mdf@pagelabel-\number\value{mdf@zref@counter}}%
}
\newrobustcmd*\if@mdf@pageodd{%
     \zref@refused{mdf@pagelabel-\the\value{mdf@zref@counter}}%
     \ifodd\zref@extract{mdf@pagelabel-\the\value{mdf@zref@counter}}{mdf@pagevalue}%
        \setlength\mdf@rightmargin@length{\mdf@outermargin@length}%
        \setlength\mdf@leftmargin@length{\mdf@innermargin@length}%
     \else
        \setlength\mdf@rightmargin@length{\mdf@innermargin@length}%
        \setlength\mdf@leftmargin@length{\mdf@outermargin@length}%
     \fi%
}
\newrobustcmd*\mdf@@setzref{%
 \iftoggle{md:checktwoside}{\mdf@zref@label\if@mdf@pageodd}{}%
}
```

\mdf@freepagevspace

```
\newrobustcmd*\mdf@freepagevspace{%
     \penalty\@M \vskip 2\baselineskip
     \penalty9999 \vskip -2\baselineskip
     \penalty9999
     \ifdimequal{\pagegoal}{\maxdimen}%
          {\mdf@freevspace@length\vsize}%
          {\mdf@freevspace@length=\pagegoal\relax%
           \advance\mdf@freevspace@length by -\pagetotal\relax%
           \addtolength\mdf@freevspace@length{\dimexpr-\parskip\relax}\relax%
          }%
}
```

\mdf@advancelength@horizontalmargin@add
\mdf@horizontalspaceofbox
\mdf@horizontalmargin@equation

Width of the box

```
\newrobustcmd*\mdf@advancelength@horizontalmargin@sub[1]{%
  \advance\mdf@horizontalspaceofbox by -\csname mdf@#1@length\endcsname\relax%
}
\newlength\mdf@horizontalspaceofbox
\newrobustcmd*\mdf@horizontalmargin@equation{%
    \setlength{\mdf@horizontalspaceofbox}{\mdf@userdefinedwidth@length}%
    \mdf@dolist{\mdf@advancelength@horizontalmargin@sub}{%
             leftmargin,outerlinewidth,middlelinewidth,%
             innerlinewidth,innerleftmargin,innerrightmargin,%
             innerlinewidth,middlelinewidth,outerlinewidth,%
             rightmargin}%
    \notbool{mdf@leftline}{%
                \advance\mdf@horizontalspaceofbox by \mdf@innerlinewidth@length\relax%
                \advance\mdf@horizontalspaceofbox by \mdf@middlelinewidth@length\relax%
                \advance\mdf@horizontalspaceofbox by \mdf@outerlinewidth@length\relax%
           }{}%
    \notbool{mdf@rightline}{%
                \advance\mdf@horizontalspaceofbox by \mdf@innerlinewidth@length\relax%
                \advance\mdf@horizontalspaceofbox by \mdf@middlelinewidth@length\relax%
                \advance\mdf@horizontalspaceofbox by \mdf@outerlinewidth@length\relax%
           }{}%
    \ifdimless{\mdf@horizontalspaceofbox}{3cm}%
              {\mdf@PackageWarning{You have only a width of 3cm}}{}
    \hsize=\mdf@horizontalspaceofbox%
}
```

\mdf@keeplines@single

horizontal space in relation of the lines.

```
\newrobustcmd*\mdf@keeplines@single{%
  \notbool{mdf@topline}{%
      \advance\mdf@verticalmarginwhole@length by -\mdf@innerlinewidth@length%
      \advance\mdf@verticalmarginwhole@length by -\mdf@middlelinewidth@length%
      \advance\mdf@verticalmarginwhole@length by -\mdf@outerlinewidth@length%
     }{}%
  \notbool{mdf@bottomline}{%
      \advance\mdf@verticalmarginwhole@length by -\mdf@innerlinewidth@length%
      \advance\mdf@verticalmarginwhole@length by -\mdf@middlelinewidth@length%
      \advance\mdf@verticalmarginwhole@length by -\mdf@outerlinewidth@length%
     }{}%
}
```

\mdf@advancelength@verticalmarginwhole
\mdf@advancelength@freevspace@sub
\mdf@advancelength@freevspace@add

Loop macros to calculate the height. Used by \mdf@dolist.

```
\newrobustcmd*\mdf@advancelength@verticalmarginwhole[1]{%
  \advance\mdf@verticalmarginwhole@length by \csname mdf@#1@length\endcsname\relax%
```

```
}
\newrobustcmd*\mdf@advancelength@freevspace@sub[1]{%
  \advance\dimen@ by -\csname mdf@#1@length\endcsname\relax%
}
\newrobustcmd*\mdf@advancelength@freevspace@add[1]{%
  \advance\dimen@ by \csname mdf@#1@length\endcsname\relax%
}
```

\mdf@reset

Reset changes

```
\protected@edef\mdf@reset{\boxmaxdepth\the\boxmaxdepth
                          \splittopskip\the\splittopskip}%
```

\mdf@put@frame@standalone

Output of mdframed inside a non breakable environement.

```
\newrobustcmd*\mdf@put@frame@standalone{\relax%
   \ifvoid\mdf@splitbox@one\relax
      \mdf@PackageWarning{The environment is empty\MessageBreak}%
      \let\mdf@reserved@a\relax%
   \else
      %Hier berechnung Box-Inhalt+Rahmen oben und unten
      \setlength{\mdf@verticalmarginwhole@length}%
                {\dimexpr\ht\mdf@splitbox@one+\dp\mdf@splitbox@one\relax}%
      \mdf@dolist{\mdf@advancelength@verticalmarginwhole}{%
                  outerlinewidth,middlelinewidth,innerlinewidth,innertopmargin,
                  innerbottommargin,innerlinewidth,middlelinewidth,outerlinewidth}%
      \mdf@keeplines@single%
      \def\mdf@reserved@a{\mdf@putbox@single}%
   \fi
   \mdf@reserved@a%
}
```

\mdf@put@frame

Output of mdframed inside a breakable environement. The comparison are onyl check whether the contents must be split or not.

```
\def\mdf@put@frame{\relax%
\ifvoid\mdf@splitbox@one\relax
\mdf@PackageWarning{The environment is empty\MessageBreak}%
\let\mdf@reserved@a\relax%
\else
  \setlength\mdfboundingboxwidth{\wd\mdf@splitbox@one}%
  \mdf@print@space%
  \mdf@freepagevspace%gives \mdf@freevspace@length
  \mdf@PackageInfoSpace{\the\mdf@freevspace@length before the beginning of \MessageBreak
                        the environment ending on input line \MessageBreak}%
   \ifdimless{\mdf@freevspace@length}{2\baselineskip}
             {\mdf@PackageInfo{Not enough space on this page}
              \vfill\eject%
              \def\mdf@reserved@a{\mdf@put@frame}%
             }{%
               %Hier berechnung Box-Inhalt+Rahmen oben und unten
```

```
              \setlength{\mdf@verticalmarginwhole@length}%
                          {\dimexpr\ht\mdf@splitbox@one+\dp\mdf@splitbox@one\relax}%
              \mdf@dolist{\mdf@advancelength@verticalmarginwhole}{%
                     outerlinewidth,middlelinewidth,innerlinewidth,innertopmargin,
                     innerbottommargin,innerlinewidth,middlelinewidth,outerlinewidth}%
            \mdf@keeplines@single%
            \ifdimless{\mdf@verticalmarginwhole@length}{\mdf@freevspace@length}%
               {%passt auf Seite%
                 \begingroup
                  \mdf@@setzref
                   \mdf@putbox@single%
                 \endgroup
                \let\mdf@reserved@a\relax}%
               {\def\mdf@reserved@a{\mdf@put@frame@i}}%passt nicht auf Seite
            }%
\fi
\mdf@reserved@a%
}
```

`\mdf@put@frame@i`

Output of the first splitted box.

```
\def\mdf@put@frame@i{%Box muss gesplittet werden -- Ausgabe der ersten Teilbox
 %Berechnung der Splittgroesse -- Linien und Abstand oben
 %\vbox to 0pt{}%
 %\rlap{\smash{\the\mdf@freevspace@length}}%\hrule \@height\z@ \@width\hsize
 \mdf@freepagevspace%gives \mdf@freevspace@length
 %Berechnung ob nur oberen Linien nur auf die Seite passe
 \dimen@=\the\mdf@freevspace@length%
 \dimen@i=\mdf@innertopmargin@length%
 \advance\dimen@i by \mdf@innerlinewidth@length%
 \advance\dimen@i by \mdf@middlelinewidth@length%
 \advance\dimen@i by \mdf@outerlinewidth@length%
 \advance\dimen@i by 2\baselineskip%
 \ifdimless{\dimen@}{\dimen@i}%
   {\hrule \@height\z@ \@width\hsize%
    \vfill\eject%
    \def\mdf@reserved@a{\mdf@put@frame}%
   }{%
    \mdf@freepagevspace%
    \dimen@=\the\mdf@freevspace@length%
    \mdf@dolist{\mdf@advancelength@freevspace@sub}{%calculate with \dimen@
              outerlinewidth,middlelinewidth,innerlinewidth,%
              innertopmargin,splitbottomskip}%
    \ifbool{mdf@everyline}{%
      \ifbool{mdf@bottomline}{%
               \advance\dimen@ by -\mdf@innerlinewidth@length%
               \advance\dimen@ by -\mdf@middlelinewidth@length%
               \advance\dimen@ by -\mdf@outerlinewidth@length%
          }{}%
        }{}%
    \ifbool{mdf@topline}{}{%
               \advance\dimen@ by \mdf@innerlinewidth@length%
               \advance\dimen@ by \mdf@middlelinewidth@length%
```

```
943              \advance\dimen@ by \mdf@outerlinewidth@length%
944           }%
945     \advance\dimen@.8\pageshrink
946     \ifdimless{\ht\mdf@splitbox@one+\dp\mdf@splitbox@one}{\dimen@}%
947        {\mdf@PackageWarning{You got a bad break\MessageBreak
948                             you have to change it manually\MessageBreak
949                                  by changing the text, the space\MessageBreak
950                                  or something else}%
951         \advance\dimen@ by -1.8\baselineskip\relax%
952        }{}%
953 %       \advance\dimen@ by -1pt\relax%Box darf nicht zu Groß werden.
954        \splitmaxdepth\z@ \splittopskip\mdf@splittopskip@length%
955        \mdf@ignorevbadness%
956        \setbox\mdf@splitbox@two\vsplit\mdf@splitbox@one to \dimen@
957        \setbox\mdf@splitbox@two\vbox{\unvbox\mdf@splitbox@two}%
958        \setbox\mdf@splitbox@one\vbox{\unvbox\mdf@splitbox@one}%
959        \ifbool{mdf@repeatframetitle}{%
960                   \setbox\mdf@splitbox@one\vbox{%
961                        \vbox to \mdf@splittopskip@length{\hsize\z@}
962                        %\par\unskip\nointerlineskip
963                        \unvcopy\mdf@frametitlebox%
964                        \mdf@@frametitlerule%
965                        \vbox to\dimexpr
966                               -\mdf@splittopskip@length+\ht\strutbox+\dp\strutbox
967                               +\mdf@innertopmargin@length\relax{\hsize\z@}%
968                        \unvbox\mdf@splitbox@one}%
969                }{}%
970        \ifdimgreater{\ht\mdf@splitbox@two+\dp\mdf@splitbox@two}{\dimen@}%
971          {%Falsch gesplittet
972           \mdf@PackageInfo{Box was splittet wrong\MessageBreak}%
973           \dimen@i=\dimen@
974            \advance\dimen@ by -\ht\mdf@splitbox@two
975            \advance\dimen@ by -\dp\mdf@splitbox@two
976            \advance\dimen@i by 0.5\dimen@
977           \splittopskip\z@%
978           \setbox\mdf@splitbox@one\vbox{\unvbox\mdf@splitbox@two%
979                        %benoetigt um Tiefe zu haben
980                        \hrule \@height\dp\strutbox \@width\z@
981                        \unvbox\mdf@splitbox@one}
982           \splittopskip\mdf@splittopskip@length%
983           \mdf@ignorevbadness%
984           \setbox\mdf@splitbox@two\vsplit\mdf@splitbox@one to \dimen@i
985           \setbox\mdf@splitbox@two\vbox{\unvbox\mdf@splitbox@two}%
986           \setbox\mdf@splitbox@one\vbox{\unvbox\mdf@splitbox@one}%
987           \ifdimgreater{\ht\mdf@splitbox@two+\dp\mdf@splitbox@two}{\dimen@}%
988                        {%
989                         \splittopskip\z@\mdf@ignorevbadness%%
990                         \setbox\mdf@splitbox@one\vbox{\unvbox\mdf@splitbox@two%
991                                                       %benoetigt um Tiefe zu haben
992                                                      \hrule \@height\dp\strutbox \@width\z@
993                                                      \unvbox\mdf@splitbox@one}%
994                         \mdf@ignorevbadness%
995                         \setbox\mdf@splitbox@one\vbox{\unvbox\mdf@splitbox@one}%
996                         }{}%
997        \ifbool{mdf@repeatframetitle}{%
998                   \setbox\mdf@splitbox@one\vbox{%
```

```
                        \vbox to \mdf@splittopskip@length{\hsize\z@}
                        %\par\unskip\nointerlineskip
                        \unvcopy\mdf@frametitlebox%
                        \mdf@@frametitlerule%
                        \vbox to\dimexpr
                               -\mdf@splittopskip@length+\ht\strutbox+\dp\strutbox
                               +\mdf@innertopmargin@length\relax{\hsize\z@}%
                        \unvbox\mdf@splitbox@one}%
              }{}%
           }{}%
       \ifvoid\mdf@splitbox@one
         \mdf@PackageWarning{You got a bad break\MessageBreak
                             because the splittet box is empty\MessageBreak
                             You have to change the page settings\MessageBreak
                             like enlargethispage or something else}%
         \setbox\mdf@splitbox@one\vbox{\unvbox\mdf@splitbox@two}%
         \setbox\mdf@splitbox@one\vbox{\unvbox\mdf@splitbox@one}%
         \enlargethispage{\baselineskip}%
         \def\mdf@reserved@a{\mdf@put@frame}%
       \fi
       \ifvoid\mdf@splitbox@two%%pruefe, ob erste Box leer ist
        {\hrule \@height\f@size pt \@width\z@%
         \hrule \@height\z@ \@width\hsize}%
%         \vfill\eject%
%        \vskip\baselineskip
%        {\hrule \@height\z@ \@width\hsize}
        %
        \def\mdf@reserved@a{\mdf@put@frame}%
       \else
        \ifdimequal{\ht\mdf@splitbox@two}{0pt}%
          {\hrule \@height\z@ \@width\hsize%
           \vfill\eject%
           \setbox\mdf@splitbox@one\vbox{\unvbox\mdf@splitbox@two\unvbox\mdf@splitbox@one}
           \def\mdf@reserved@a{\mdf@put@frame}%
          }%
          {%
          \begingroup%
             \mdf@@setzref
             \mdf@putbox@first%%%Groesse des Splittens passt
          \endgroup%
          \hrule \@height\z@ \@width\hsize%
          \vfill\eject%
          \def\mdf@reserved@a{\mdf@put@frame@ii}%
          }%
       \fi%
      }%
\mdf@reserved@a%
}
```

`\mdf@put@frame@ii`

Output of the middle and last box.

```
\def\mdf@put@frame@ii{%Ausgabe der mittleren Box(en) wenn vorhanden
  \setlength{\mdf@freevspace@length}{\vsize}%
  \setlength{\dimen@}{\dimexpr\ht\mdf@splitbox@one+\dp\mdf@splitbox@one\relax}%
```

```
\mdf@dolist{\mdf@advancelength@freevspace@add}{%used \dimen@
              outerlinewidth,middlelinewidth,innerlinewidth,%
              innerbottommargin}%%%Addition der Linien unten
 \ifbool{mdf@everyline}{%
    \ifbool{mdf@topline}{%
             \advance\dimen@ by \mdf@innerlinewidth@length%
             \advance\dimen@ by \mdf@middlelinewidth@length%
             \advance\dimen@ by \mdf@outerlinewidth@length%
         }{}%
      }{}%
 \ifbool{mdf@bottomline}{}{%
             \advance\dimen@ by -\mdf@innerlinewidth@length%
             \advance\dimen@ by -\mdf@middlelinewidth@length%
             \advance\dimen@ by -\mdf@outerlinewidth@length%
       \relax}%
 \ifdimgreater{\dimen@}{\mdf@freevspace@length}%
  {%
   \advance\mdf@freevspace@length by -\mdf@splitbottomskip@length\relax%
   \advance\mdf@freevspace@length by .5\ht\strutbox\relax%
   \ifbool{mdf@everyline}{%
     \ifbool{mdf@topline}{%
             \advance\mdf@freevspace@length by -\mdf@innerlinewidth@length%
             \advance\mdf@freevspace@length by -\mdf@middlelinewidth@length%
             \advance\mdf@freevspace@length by -\mdf@outerlinewidth@length%
         }{}%
     \ifbool{mdf@bottomline}{%
             \advance\mdf@freevspace@length by -\mdf@innerlinewidth@length%
             \advance\mdf@freevspace@length by -\mdf@middlelinewidth@length%
             \advance\mdf@freevspace@length by -\mdf@outerlinewidth@length%
       \relax}{}%
      }{}%
      \splitmaxdepth\z@ \splittopskip\mdf@splittopskip@length%
      \mdf@ignorevbadness%
      \setbox\mdf@splitbox@two\vsplit\mdf@splitbox@one to \mdf@freevspace@length%
      \setbox\mdf@splitbox@two\vbox{\unvbox\mdf@splitbox@two}%PRUEFEN!!!
      \setbox\mdf@splitbox@one\vbox{\unvbox\mdf@splitbox@one}%PRUEFEN!!!!
     \ifbool{mdf@repeatframetitle}{%
                \setbox\mdf@splitbox@one\vbox{%
                     \vbox to \mdf@splittopskip@length{\hsize\z@}
                     %\par\unskip\nointerlineskip
                     \unvcopy\mdf@frametitlebox%
                     \mdf@@frametitlerule%
                     \vbox to\dimexpr
                            -\mdf@splittopskip@length+\ht\strutbox+\dp\strutbox
                            +\mdf@innertopmargin@length\relax{\hsize\z@}%
                     \unvbox\mdf@splitbox@one}%
             }{}%
      \ifvoid\mdf@splitbox@one\relax%
         \mdf@PackageWarning{You got a bad break\MessageBreak
                             because the split box is empty\MessageBreak
                             You have to change the settings}%
        \setbox\mdf@splitbox@one{\unvbox\mdf@splitbox@two}%
        \def\mdf@reserved@a{\enlargethispage{\baselineskip}\mdf@put@frame@ii}%
      \else
        \begingroup
         \mdf@@setzref
```

```
            \mdf@putbox@middle%
          \endgroup
          \hrule \@height\z@ \@width\hsize
          \vfill\eject
          \def\mdf@reserved@a{\mdf@put@frame@ii}%
        \fi
    }%Hier die Ausgabe der mittleren Box
    {\ifvoid\mdf@splitbox@one
          \mdf@PackageWarning{You got a bad break\MessageBreak
                              because the last split box is empty\MessageBreak
                              You have to change the settings}%%
          \setbox\mdf@splitbox@one\vbox{\unvbox\mdf@splitbox@one\hrule \@height\z@ \@width\mdfbounding
     \fi%
     \ifdimless{\ht\mdf@splitbox@one}{1sp}{%
          \mdf@PackageWarning{You got a bad break\MessageBreak
                              because the last split box is empty\MessageBreak
                              You have to change the settings}%
           %\hb@xt@\z@{\box\mdf@splitbox@one}%
           \let\mdf@reserved@a\relax%
           \setbox\mdf@splitbox@one\vbox{\unvbox\mdf@splitbox@one\hrule \@height\z@ \@width\mdfboundin
        }{}%
        \begingroup%
          \mdf@@setzref
          \mdf@putbox@second%
          \hrule \@height\z@ \@width\hsize%
        \endgroup%
        \let\mdf@reserved@a\relax%
    }%Hier kommt die Ausgabe der letzten Box
  \mdf@reserved@a%
}

```

```
\mdf@test@ltrb
\mdf@test@ltr
\mdf@test@ltb
\mdf@test@trb
\mdf@test@lrb
\mdf@test@lb
\mdf@test@rb
\mdf@test@tr
\mdf@test@lt
\mdf@test@lr
\mdf@test@tb
\mdf@test@l
\mdf@test@r
\mdf@test@t
\mdf@test@b
\mdf@test@noline
```

Short forms of checking the option which lines should be drawn.

```
%%%%    _____t_____
%%%%   |           |
%%%%   |           |
%%%%   |           |
%%%%  l|           |r
%%%%   |           |
```

```
%%%%   |           |
%%%%   |___________|
%%%%         b
%%Zusammenhaenge abfragen:
\newrobustcmd*\mdf@test@ltrb{%
    \ifboolexpr{ (bool {mdf@topline}) and (bool {mdf@bottomline})
                 and (bool {mdf@leftline}) and (bool {mdf@rightline})}}
%3-set
\newrobustcmd*\mdf@test@ltr{%
    \ifboolexpr{ (bool {mdf@topline}) and not (bool {mdf@bottomline})
                 and (bool {mdf@leftline}) and (bool {mdf@rightline})}}
\newrobustcmd*\mdf@test@ltb{%
    \ifboolexpr{ (bool {mdf@topline}) and (bool {mdf@bottomline})
                 and (bool {mdf@leftline}) and not (bool {mdf@rightline})}}
\newrobustcmd*\mdf@test@trb{%
    \ifboolexpr{ (bool {mdf@topline}) and (bool {mdf@bottomline})
                 and not (bool {mdf@leftline}) and (bool {mdf@rightline})}}
\newrobustcmd*\mdf@test@lrb{%
    \ifboolexpr{ not (bool {mdf@topline}) and (bool {mdf@bottomline})
                 and (bool {mdf@leftline}) and (bool {mdf@rightline})}}
%2-set
\newrobustcmd*\mdf@test@lb{%
    \ifboolexpr{ not (bool {mdf@topline}) and (bool {mdf@bottomline})
                 and (bool {mdf@leftline}) and not (bool {mdf@rightline})}}
\newrobustcmd*\mdf@test@rb{%
    \ifboolexpr{ not (bool {mdf@topline}) and (bool {mdf@bottomline})
                 and not (bool {mdf@leftline}) and (bool {mdf@rightline})}}
\newrobustcmd*\mdf@test@tr{%
    \ifboolexpr{ (bool {mdf@topline}) and not (bool {mdf@bottomline})
                 and not (bool {mdf@leftline}) and (bool {mdf@rightline})}}
\newrobustcmd*\mdf@test@lt{%
    \ifboolexpr{ (bool {mdf@topline}) and not (bool {mdf@bottomline})
                 and (bool {mdf@leftline}) and not (bool {mdf@rightline})}}
\newrobustcmd*\mdf@test@lr{%
    \ifboolexpr{not (bool {mdf@topline}) and not (bool {mdf@bottomline})
                 and (bool {mdf@leftline}) and (bool {mdf@rightline})}}
\newrobustcmd*\mdf@test@tb{%
    \ifboolexpr{ (bool {mdf@topline}) and (bool {mdf@bottomline})
                 and not (bool {mdf@leftline}) and not (bool {mdf@rightline})}}
%Einzellinien
\newrobustcmd*\mdf@test@l{%
    \ifboolexpr{ not (bool {mdf@topline}) and not (bool {mdf@bottomline})
                 and (bool {mdf@leftline}) and not (bool {mdf@rightline})}}
\newrobustcmd*\mdf@test@r{%
    \ifboolexpr{ not (bool {mdf@topline}) and not (bool {mdf@bottomline})
                 and not (bool {mdf@leftline}) and (bool {mdf@rightline})}}
\newrobustcmd*\mdf@test@t{%
    \ifboolexpr{ (bool {mdf@topline}) and not (bool {mdf@bottomline})
                 and not (bool {mdf@leftline}) and not (bool {mdf@rightline})}}
\newrobustcmd*\mdf@test@b{%
    \ifboolexpr{ not (bool {mdf@topline}) and (bool {mdf@bottomline})
                 and not (bool {mdf@leftline}) and not (bool {mdf@rightline})}}
%keine Linien
\newrobustcmd*\mdf@test@noline{%
    \ifboolexpr{ not (bool {mdf@topline}) and not (bool {mdf@bottomline})
                 and not (bool {mdf@leftline}) and not (bool {mdf@rightline})}}
```

```
\newrobustcmd*\mdf@test@single{%
    \ifboolexpr{ not (test {\mdf@test@ltrb} or test {\mdf@test@ltr} or
                  test {\mdf@test@ltb} or test {\mdf@test@trb} or
                  test {\mdf@test@lrb}  or test {\mdf@test@lb} or
                  test {\mdf@test@rb} or test {\mdf@test@tr} or
                  test {\mdf@test@lt} ) }}
%

\DisableKeyvalOption[action=warning,package=mdframed]{mdf}{framemethod}%
\DisableKeyvalOption[action=warning,package=mdframed]{mdf}{xcolor}%

 \endinput
```

B.2. The Explanation of md-frame-0.mdf

```
%% Style file for mdframed for package option 'framemethod=default'
%%
%% This package may be distributed under the terms of the LaTeX Project
%% Public License, as described in lppl.txt in the base LaTeX distribution.
%% Either version 1.0 or, at your option, any later version.
%%
%%
%%$Id: mdframed.dtx 372 2012-04-05 19:09:11Z marco $
%
```

```
\mdframedOpackagename
\mdf@frameOdate@svn
```

local settings

```
\def\mdframedOpackagename{md-frame-0}
\def\mdf@frameOdate@svn$#1: #2 #3 #4-#5-#6 #7 #8${#4/#5/#6\space }
\ProvidesFile{md-frame-0.mdf}%
    [\mdf@frameOdate@svn$Id: mdframed.dtx 372 2012-04-05 19:09:11Z marco $%
     \mdversion: \mdframedOpackagename]
```

```
\mdf@background@default
\mdf@linecolor@default
\mdf@linecolor@bottom
```

short command

```
\def\mdf@background@default{\color{\mdf@backgroundcolor}}
\def\mdf@frametitlebackground@default{\color{\mdf@frametitlebackgroundcolor}}
\def\mdf@shadow@default{\color{\mdf@shadowcolor}}
\def\mdf@innerlinecolor@default{\color{\mdf@innerlinecolor}}
\def\mdf@middlelinecolor@default{\color{\mdf@middlelinecolor}}
\def\mdf@outerlinecolor@default{\color{\mdf@outerlinecolor}}
\def\mdf@frametitlerulecolor@default{\color{\mdf@frametitlerulecolor}}
\let\mdf@linecolor@default\mdf@middlelinecolor@default
\def\mdf@@frametitlerule{%
  \ifbool{mdf@frametitlerule}{%
   \vbox to \mdf@frametitlerulewidth@length {\hsize\mdfframetitleboxwidth%
     \par\unskip\vskip\mdf@frametitlebelowskip@length%
     \rlap{\noindent\hspace*{-\mdf@innerleftmargin@length}%
     \mdf@frametitlerulecolor@default%
     \rule{\dimexpr\mdfframetitleboxwidth%
```

```
            +\mdf@innerleftmargin@length
            +\mdf@innerrightmargin@length\relax
           }{\mdf@frametitlerulewidth@length}%
       }}%
  }{}
  \par\unskip\vskip\mdf@innertopmargin@length%
}%
```

```
\mdf@putbox@single
\mdf@frame@background@single
\mdf@frame@topandbottomline@single
\mdf@frame@leftline@single
\mdf@frame@rightline@single
\mdf@frame@rightline@single
```

The frame of of a non splitted contents of mdframed

```
\def\mdf@frame@background@single{%
  \ifbool{mdf@shadow}{%
   \rlap{\smash{\mdf@shadow@default%
     \rule[\dimexpr-\mdfboundingboxdepth
                   -\mdf@shadowsize@length
                   \ifbool{mdf@bottomline}{-\mdf@middlelinewidth@length}{}\relax]%
          {\dimexpr\mdfboundingboxtotalwidth
                   +\mdf@shadowsize@length
                   \ifbool{mdf@rightline}{+\mdf@middlelinewidth@length}{}\relax}%
          {\dimexpr\mdfboundingboxtotalheight
                   +\mdf@shadowsize@length
                   \ifbool{mdf@bottomline}{+\mdf@middlelinewidth@length}{}\relax}%
     }%
  }}{}%
  \rlap{\mdf@background@default%
     \rule[-\mdfboundingboxdepth]%
          {\mdfboundingboxtotalwidth}%
          {\mdfboundingboxtotalheight}%
     }%
}%
\def\mdf@frame@frametitlebackground@single{%
  \rlap{\mdf@frametitlebackground@default%
     \rule[\dimexpr-\mdfboundingboxdepth+\mdfboundingboxtotalheight-\mdfframetitleboxtotalheight\relax]
          {\mdfboundingboxtotalwidth}%
          {\mdfframetitleboxtotalheight}%
   }%
}%

\def\mdf@frame@topline@single{%
  \rlap{\mdf@linecolor@default%
     \ifbool{mdf@topline}{%
          \rule[\dimexpr\mdfboundingboxheight-\mdfboundingboxdepth%
                        +\mdf@innerbottommargin@length+\mdf@innertopmargin@length\relax]%
               {\mdfboundingboxtotalwidth}%
               {\mdf@middlelinewidth@length}}%
         {}%
  }%
}%
\def\mdf@frame@bottomline@single{%
```

```
  \rlap{\ifbool{mdf@leftline}{\hspace*{-\mdf@middlelinewidth@length}}{}\mdf@linecolor@default%
     \ifbool{mdf@bottomline}{%
         \rule[\dimexpr-\mdfboundingboxdepth-\mdf@middlelinewidth@length\relax]%
              {\dimexpr\mdfboundingboxtotalwidth
                       \ifbool{mdf@rightline}{+\mdf@middlelinewidth@length}{}%
                       \ifbool{mdf@leftline}{+\mdf@middlelinewidth@length}{}\relax}%
              {\mdf@middlelinewidth@length}}%
         {}%
  }%
}%
\def\mdf@frame@leftline@single{%
  \llap{\mdf@linecolor@default%
     \rule[-\mdfboundingboxdepth]%
          {\mdf@middlelinewidth@length}%
          {\dimexpr\mdfboundingboxtotalheight%
           \ifbool{mdf@topline}{+\mdf@middlelinewidth@length}{}\relax}%
  }%
}%
\def\mdf@frame@rightline@single{%
  \rlap{\mdf@linecolor@default%
     \hspace*{\mdfboundingboxwidth}%
     \hspace*{\mdf@innerrightmargin@length}%
     \rule[\dimexpr-\mdfboundingboxdepth%
           \relax]%
          {\mdf@middlelinewidth@length}%
          {\dimexpr\mdfboundingboxtotalheight%
           +\ifbool{mdf@topline}{\mdf@middlelinewidth@length}{0pt}\relax}%
  }%
}%
\def\mdf@putbox@single{%%%%% Ausgabe der ungesplitteten Gesamtbox
  \ifvoid\mdf@splitbox@one
  \else%
    \mdf@makebox@out{%
      \mdf@makeboxalign@left%
      \setlength{\mdfboundingboxwidth}{%
                   {\wd\mdf@splitbox@one}%
      \setlength{\mdfboundingboxtotalwidth}{%
                   {\dimexpr\mdfboundingboxwidth+\mdf@innerleftmargin@length%
                    +\mdf@innerrightmargin@length\relax}%
      \setlength{\mdfboundingboxheight}{%
                   {\dimexpr\ht\mdf@splitbox@one+\dp\mdf@splitbox@one\relax}%
      \setlength{\mdfboundingboxdepth}{%
                   {\dimexpr\dp\mdf@splitbox@one+\mdf@innerbottommargin@length\relax}%
      \setlength{\mdfboundingboxtotalheight}{%
                   {\dimexpr\mdfboundingboxheight+\mdf@innertopmargin@length%
                    +\mdf@innerbottommargin@length\relax}%
      \setlength{\mdftotallinewidth}{%
                   \dimexpr\mdf@innerlinewidth@length+\mdf@middlelinewidth@length%
                   +\mdf@outerlinewidth@length}%
      \noindent%
      \setlength{\@tempdima}{\dimexpr\mdfboundingboxtotalwidth%
                              +\ifbool{mdf@leftline}%
                                      {\mdf@middlelinewidth@length}{\z@}%
                              +\ifbool{mdf@rightline}%
                                      {\mdf@middlelinewidth@length}{\z@}\relax}%
      \mdf@makebox@in[\@tempdima]{%
```

```
        \null%
        \ifbool{mdf@leftline}{%
           \hspace*{\mdftotallinewidth}%
           \mdf@frame@leftline@single%
            }{}%
        \mdf@frame@topline@single%
        \mdf@frame@background@single%
        \mdf@frame@bottomline@single%
        \ifdefempty{\mdf@frametitle}{}{\mdf@frame@frametitlebackground@single}%
        \hspace*{\mdf@innerleftmargin@length}%
        \ifbool{mdf@rightline}{%
           \mdf@frame@rightline@single%
         }{}%
        {\box\mdf@splitbox@one}%
    }%
    \mdf@makeboxalign@right%
  }%
  \fi%
}
```

```
\mdf@putbox@first
\mdf@frame@background@first
\mdf@frame@leftline@first
\mdf@frame@topline@first
\mdf@frame@rightline@first
```

The first frame of of a splitted contents of mdframed

```
\def\mdf@frame@background@first{%
  \ifbool{mdf@shadow}{%
   \rlap{\smash{\mdf@shadow@default%
     \rule[\dimexpr-\mdfboundingboxdepth
                    -\mdf@shadowsize@length\relax]%
          {\dimexpr\mdfboundingboxtotalwidth
                    +\mdf@shadowsize@length
                    \ifbool{mdf@rightline}{+\mdf@middlelinewidth@length}{}\relax}%
          {\dimexpr\mdfboundingboxtotalheight
                    +\mdf@shadowsize@length\relax}%
     }%
  }}{}%
  \rlap{\mdf@background@default%
     \rule[-\mdfboundingboxdepth]%
          {\mdfboundingboxtotalwidth}%
          {\mdfboundingboxtotalheight}%
  }%
}%
\def\mdf@frame@frametitlebackground@first{%
 \ifdimless{\mdfframetitleboxtotalheight}{\mdfboundingboxtotalheight}%
  {%
   \rlap{\mdf@frametitlebackground@default%
     \rule[\dimexpr-\mdfboundingboxdepth+\mdfboundingboxtotalheight-\mdfframetitleboxtotalheight\relax]
          {\mdfboundingboxtotalwidth}%
          {\mdfframetitleboxtotalheight}%
     }%
   \global\mdfframetitleboxtotalheight=-\p@\relax%
  }{\mdf@PackageWarning{You got a page break inside the frame title\MessageBreak
```

```
                      Current this isn't well supported}%
    \rlap{\mdf@frametitlebackground@default%
       \rule[-\mdfboundingboxdepth]%
            {\mdfboundingboxtotalwidth}%
            {\mdfboundingboxtotalheight}%
     }%
   \global\mdfframetitleboxtotalheight=\dimexpr\mdfframetitleboxtotalheight
                    -\mdfboundingboxheight
                    +\mdf@frametitlebelowskip@length
                    +.5\baselineskip-1pt
%                    +\dp\strutbox
                    \relax%
  }%
}%
\def\mdf@frame@leftline@first{%
  \llap{\mdf@linecolor@default%
     \rule[-\mdfboundingboxdepth]%
          {\mdf@middlelinewidth@length}%
          {\dimexpr\mdfboundingboxtotalheight%
            +\ifbool{mdf@topline}{\mdf@middlelinewidth@length}{0pt}\relax}%
  }%
}%
\def\mdf@frame@topline@first{%
  \rlap{\mdf@linecolor@default%
     \rule[\dimexpr\mdfboundingboxheight-\mdfboundingboxdepth+%
            \mdf@splitbottomskip@length+\mdf@innertopmargin@length\relax]%
          {\mdfboundingboxtotalwidth}%
          {\mdf@middlelinewidth@length}%
  }%
}
\def\mdf@frame@rightline@first{%
  \rlap{\mdf@linecolor@default\hspace*{\mdfboundingboxwidth}%
     \hspace*{\mdf@innerrightmargin@length}%
     \rule[-\mdfboundingboxdepth]%
          {\mdf@middlelinewidth@length}%
          {\dimexpr\mdfboundingboxtotalheight%
            +\ifbool{mdf@topline}{\mdf@middlelinewidth@length}{0pt}\relax}%
  }%
}%
\def\mdf@frame@bottomline@first{%
  \rlap{\ifbool{mdf@leftline}{\hspace*{-\mdf@middlelinewidth@length}}{}\mdf@linecolor@default%
     \ifbool{mdf@bottomline}{%
         \rule[\dimexpr-\mdfboundingboxdepth-\mdf@middlelinewidth@length\relax]%
              {\dimexpr\mdfboundingboxtotalwidth
                       \ifbool{mdf@rightline}{+\mdf@middlelinewidth@length}{}%
                       \ifbool{mdf@leftline}{+\mdf@middlelinewidth@length}{}\relax}%
              {\mdf@middlelinewidth@length}}%
         {}%
  }%
}%
\def\mdf@putbox@first{%%%% Ausgabe der Teilbox 1
  \ifvoid\mdf@splitbox@two
  \else%
    \mdf@makebox@out[\linewidth]{%
      \mdf@makeboxalign@left%
      \setlength{\mdfboundingboxwidth}{\wd\mdf@splitbox@two}%
```

```
      \setlength{\mdfboundingboxtotalwidth}%
                  {\dimexpr\mdfboundingboxwidth+\mdf@innerleftmargin@length%
                           +\mdf@innerrightmargin@length\relax}%
      \setlength{\mdfboundingboxheight}{\dimexpr\ht\mdf@splitbox@two+\dp\mdf@splitbox@two\relax}%
      \setlength{\mdfboundingboxdepth}%
                  {\dimexpr\dp\mdf@splitbox@two+\mdf@splitbottomskip@length\relax}%
      \setlength{\mdfboundingboxtotalheight}%
                  {\dimexpr\mdfboundingboxheight+\mdf@innertopmargin@length%
                          +\mdf@splitbottomskip@length\relax}%
      \setlength{\@tempdima}%
                  {\dimexpr\mdfboundingboxtotalwidth%
                          +\ifbool{mdf@leftline}{\mdf@middlelinewidth@length}{\z@}%
                          +\ifbool{mdf@rightline}{\mdf@middlelinewidth@length}{\z@}%
                   \relax}%
      \mdf@makebox@in[\@tempdima]{%
        \null%
        \ifbool{mdf@leftline}{%
           \hspace*{\mdf@middlelinewidth@length}%
           \mdf@frame@leftline@first}{}%
        \ifbool{mdf@everyline}%
               {\mdf@frame@bottomline@first}{}%
        \ifbool{mdf@topline}{%
            \mdf@frame@topline@first}{}%
        \mdf@frame@background@first%
        \ifdefempty{\mdf@frametitle}{}{\mdf@frame@frametitlebackground@first}%
        \hspace*{\mdf@innerleftmargin@length}%
        \ifbool{mdf@rightline}{%
            \mdf@frame@rightline@first}{}%
        {\box\mdf@splitbox@two}%
    }%
    \mdf@makeboxalign@right%
  }%
 \fi%
}
```

```
\mdf@putbox@second
\mdf@frame@background@second
\mdf@frame@leftline@second
\mdf@frame@bottomline@second
\mdf@frame@rightline@second
```

The last frame of of a splitted contents of mdframed

```
\def\mdf@frame@background@second{%
  \ifbool{mdf@shadow}{%
   \rlap{\smash{\mdf@shadow@default%
     \rule[\dimexpr-\mdfboundingboxdepth
                  -\mdf@shadowsize@length
                  \ifbool{mdf@bottomline}{-\mdf@middlelinewidth@length}{}\relax]%
          {\dimexpr\mdfboundingboxtotalwidth
                  +\mdf@shadowsize@length
                  \ifbool{mdf@rightline}{+\mdf@middlelinewidth@length}{}\relax}%
          {\dimexpr\mdfboundingboxtotalheight
                  +\mdf@shadowsize@length\relax}%
    }%
  }}{}%
```

```
  \rlap{\mdf@background@default%
     \rule[-\mdfboundingboxdepth]%
          {\mdfboundingboxtotalwidth}%
          {\mdfboundingboxtotalheight}%
  }%
}%
\def\mdf@frame@frametitlebackground@second{%
 \ifdimless{\mdfframetitleboxtotalheight}{\z@}%
  {}%
  {\rlap{\mdf@frametitlebackground@default%
     \rule[\dimexpr-\mdfboundingboxdepth+\mdfboundingboxtotalheight-\mdfframetitleboxtotalheight\relax]
          {\mdfboundingboxtotalwidth}%
          {\mdfframetitleboxtotalheight}%
    }%
  }%
}%
\def\mdf@frame@leftline@second{%
  \llap{\mdf@linecolor@default%
     \rule[-\mdfboundingboxdepth]%
          {\mdf@middlelinewidth@length}%
          {\dimexpr\mdfboundingboxtotalheight}%
  }%
}%
\def\mdf@frame@bottomline@second{%
  \rlap{\ifbool{mdf@leftline}{\hspace*{-\mdf@middlelinewidth@length}}{}\mdf@linecolor@default%
     \rule[\dimexpr-\mdfboundingboxdepth-\mdf@middlelinewidth@length\relax]%
               {\dimexpr\mdfboundingboxtotalwidth
                        \ifbool{mdf@rightline}{+\mdf@middlelinewidth@length}{}
                        \ifbool{mdf@leftline}{+\mdf@middlelinewidth@length}{}\relax}%
          {\mdf@middlelinewidth@length}%
  }%
}%
\def\mdf@frame@rightline@second{%
  \rlap{\mdf@linecolor@default\hspace*{\mdfboundingboxwidth}%
     \hspace*{\mdf@innerrightmargin@length}%
     \rule[-\mdfboundingboxdepth]%
          {\mdf@middlelinewidth@length}%
          {\mdfboundingboxtotalheight}%
  }%
}%
\def\mdf@frame@topline@second{%
  \rlap{\ifbool{mdf@leftline}{\hspace*{-\mdf@middlelinewidth@length}}{}\mdf@linecolor@default%
     \ifbool{mdf@topline}{%
          \rule[\dimexpr\mdfboundingboxheight-\mdfboundingboxdepth%
                        +\mdf@innerbottommargin@length\relax]%
                {\dimexpr\mdfboundingboxtotalwidth
                        \ifbool{mdf@rightline}{+\mdf@middlelinewidth@length}{}%
                        \ifbool{mdf@leftline}{+\mdf@middlelinewidth@length}{}\relax
                }%
               {\mdf@middlelinewidth@length}}%
         {}%
  }%
}%

\def\mdf@putbox@second{%
  \ifvoid\mdf@splitbox@one%
```

```
\else
 \mdf@makebox@out{%
    \mdf@makeboxalign@left%
    \setlength{\mdfboundingboxwidth}{\wd\mdf@splitbox@one}%
    \setlength{\mdfboundingboxtotalwidth}%
                {\dimexpr\mdfboundingboxwidth+\mdf@innerleftmargin@length%
                     +\mdf@innerrightmargin@length\relax}%
    \setlength{\mdfboundingboxheight}{\dimexpr\ht\mdf@splitbox@one+\dp\mdf@splitbox@one\relax}%
    \setlength{\mdfboundingboxdepth}%
                {\dimexpr\dp\mdf@splitbox@one+\mdf@innerbottommargin@length\relax}%
    \setlength{\mdfboundingboxtotalheight}%
                {\dimexpr\mdfboundingboxheight+\mdf@innerbottommargin@length\relax}%
    \setlength{\@tempdima}{\dimexpr\mdfboundingboxtotalwidth%
                           +\ifbool{mdf@leftline}{\mdf@middlelinewidth@length}{\z@}%
                           +\ifbool{mdf@rightline}{\mdf@middlelinewidth@length}{\z@}%
                          \relax}%
    \mdf@makebox@in[\@tempdima]{%
    \null%
      \ifbool{mdf@leftline}{%
         \hspace*{\mdf@middlelinewidth@length}%
         \mdf@frame@leftline@second}{}%
      \ifbool{mdf@everyline}%
             {\mdf@frame@topline@second}{}%
      \mdf@frame@background@second%
      \ifbool{mdf@bottomline}{%
          \mdf@frame@bottomline@second}{}%
      \ifdefempty{\mdf@frametitle}{}{\mdf@frame@frametitlebackground@second}%
      \hspace*{\mdf@innerleftmargin@length}%
      \ifbool{mdf@rightline}{%
          \mdf@frame@rightline@second}{}%
      {\box\mdf@splitbox@one}%
   }%
   \mdf@makeboxalign@right%
 }%
 \fi%
}%
```

```
\mdf@putbox@middle
\mdf@frame@background@middle
\mdf@frame@leftline@middle
\mdf@frame@rightline@middle
```

The last frame of of a splitted contents of mdframed

```
\def\mdf@frame@leftline@middle{%
  \llap{\mdf@linecolor@default%
     \rule[-\mdfboundingboxdepth]%
          {\mdf@middlelinewidth@length}%
          {\mdfboundingboxtotalheight}%
  }%
}%
\def\mdf@frame@background@middle{%
  \ifbool{mdf@shadow}{%
   \rlap{\smash{\mdf@shadow@default%
     \rule[\dimexpr-\mdfboundingboxdepth
                   -\mdf@shadowsize@length\relax]%
```

```
          {\dimexpr\mdfboundingboxtotalwidth
                   +\mdf@shadowsize@length
                   \ifbool{mdf@rightline}{+\mdf@middlelinewidth@length}{}\relax}%
          {\dimexpr\mdfboundingboxtotalheight\relax}%
     }%
  }}{}%
  \rlap{\mdf@background@default%
     \rule[-\mdfboundingboxdepth]%
          {\mdfboundingboxtotalwidth}%
          {\mdfboundingboxtotalheight}%
  }%
}%
\def\mdf@frame@frametitlebackground@middle{%
 \ifdimless{\mdfframetitleboxtotalheight}{\z@}%
  {}%
  {\rlap{\mdf@frametitlebackground@default%
     \rule[\dimexpr-\mdfboundingboxdepth+\mdfboundingboxtotalheight-\mdfframetitleboxtotalheight\relax]
          {\mdfboundingboxtotalwidth}%
          {\mdfframetitleboxtotalheight}%
    }%
   \global\mdfframetitleboxtotalheight=-\p@\relax%
  }%
}%
\def\mdf@frame@rightline@middle{%
  \rlap{\mdf@linecolor@default\hspace*{\mdfboundingboxwidth}%
     \hspace*{\mdf@innerrightmargin@length}%
     \rule[-\mdfboundingboxdepth]%
          {\mdf@middlelinewidth@length}%
          {\mdfboundingboxtotalheight}%
  }%
}%
\def\mdf@frame@topline@middle{%
  \rlap{\ifbool{mdf@leftline}{\hspace*{-\mdf@middlelinewidth@length}}{}\mdf@linecolor@default%
     \ifbool{mdf@topline}{%
          \rule[\dimexpr\mdfboundingboxtotalheight-\mdfboundingboxdepth\relax]%
                {\dimexpr\mdfboundingboxtotalwidth
                       \ifbool{mdf@rightline}{+\mdf@middlelinewidth@length}{}%
                       \ifbool{mdf@leftline}{+\mdf@middlelinewidth@length}{}\relax
                }%
               {\mdf@middlelinewidth@length}}%
         {}%
  }%
}%
\def\mdf@frame@bottomline@middle{%
  \rlap{\ifbool{mdf@leftline}{\hspace*{-\mdf@middlelinewidth@length}}{}\mdf@linecolor@default%
     \ifbool{mdf@bottomline}{%
         \rule[\dimexpr-\mdfboundingboxdepth-\mdf@middlelinewidth@length\relax]%
              {\dimexpr\mdfboundingboxtotalwidth
                       \ifbool{mdf@rightline}{+\mdf@middlelinewidth@length}{}%
                       \ifbool{mdf@leftline}{+\mdf@middlelinewidth@length}{}\relax}%
              {\mdf@middlelinewidth@length}}%
         {}%
  }%
}%

\def\mdf@putbox@middle{%
```

```
 \ifvoid\mdf@splitbox@two%
 \else
  \mdf@makebox@out{%
     \mdf@makeboxalign@left%
     \setlength{\mdfboundingboxwidth}{\wd\mdf@splitbox@two}%
     \setlength{\mdfboundingboxtotalwidth}%
                  {\dimexpr\mdfboundingboxwidth+\mdf@innerleftmargin@length%
                          +\mdf@innerrightmargin@length\relax}%
     \setlength{\mdfboundingboxheight}{\dimexpr\ht\mdf@splitbox@two+\dp\mdf@splitbox@two\relax}%
     \setlength{\mdfboundingboxdepth}%
                  {\dimexpr\dp\mdf@splitbox@two+\mdf@splitbottomskip@length\relax}%
     \setlength{\mdfboundingboxtotalheight}%
                  {\dimexpr\mdfboundingboxheight+\mdf@splitbottomskip@length\relax}%
     \setlength{\@tempdima}{\dimexpr\mdfboundingboxtotalwidth%
                            +\ifbool{mdf@leftline}{\mdf@middlelinewidth@length}{\z@}%
                            +\ifbool{mdf@rightline}{\mdf@middlelinewidth@length}{\z@}%
                   \relax}%
     \mdf@makebox@in[\@tempdima]{%
       \null%
       \ifbool{mdf@leftline}{%
          \hspace*{\mdf@middlelinewidth@length}%
          \mdf@frame@leftline@middle}{}%
       \mdf@frame@background@middle%
       \ifbool{mdf@everyline}%
             {\mdf@frame@topline@middle}{}%
       \ifdefempty{\mdf@frametitle}{}{\mdf@frame@frametitlebackground@middle}%
       \ifbool{mdf@everyline}%
             {\mdf@frame@bottomline@middle}{}%
       \hspace*{\mdf@innerleftmargin@length}%
       \ifbool{mdf@rightline}{%
           \mdf@frame@rightline@middle}{}%
          {\box\mdf@splitbox@two}%
   }%
   \mdf@makeboxalign@right%
  }
  \fi%
}

 \endinput
```

B.3. The Explanation of md-frame-1.mdf

```
%% Style file for mdframed for package option ‘framemethod=default‘
%%
%% This package may be distributed under the terms of the LaTeX Project
%% Public License, as described in lppl.txt in the base LaTeX distribution.
%% Either version 1.0 or, at your option, any later version.
%%
%%
%%$Id: mdframed.dtx 372 2012-04-05 19:09:11Z marco $
%
```

```
\mdframedIpackagename
\mdf@frameIdate@svn
```

local settings

```
\def\mdframedIpackagename{md-frame-1}
\def\mdf@frameIdate@svn$#1: #2 #3 #4-#5-#6 #7 #8${#4/#5/#6\space }
\ProvidesFile{md-frame-1.mdf}%
          [\mdf@frameIdate@svn$Id: mdframed.dtx 372 2012-04-05 19:09:11Z marco $ %
           \mdversion: \mdframedIpackagename]
%
```

`\mdf@tikz@settings`

Define settings for tikz

```
%Allgemeine Einstellungen fuer tikz
\def\mdf@tikz@settings{%
%
  \tikzset{mdfbox/.style={anchor=south west,%
                          inner sep=0pt,%
                          outer sep=0pt,%
                          \mdf@fontcolor,}}% anchor der Ausgabebox ist unten links
  \tikzset{mdfcorners/.style={rounded corners=\mdf@roundcorner@length}}%
  \tikzset{mdfbackground/.style={fill=\mdf@backgroundcolor,%
                                 draw=\mdf@backgroundcolor}}%
  \tikzset{mdfframetitlebackground/.style={fill=\mdf@frametitlebackgroundcolor,%
                                 draw=none,%
                                 rounded corners={max(\mdf@roundcorner@length%
                                               -\mdf@innerlinewidth@length%
                                               -.5\mdf@middlelinewidth@length,0)}}}%
%
  \tikzset{mdfouterline/.style={}}%
% nur wenn outerlinewidth>0 wird aussere Linie gezeichnet
  \ifdimgreater{\mdf@outerlinewidth@length}{\z@}
    {\tikzset{mdfouterline/.append style={%
      draw=\mdf@outerlinecolor,%
      line width=2\mdf@outerlinewidth@length+\mdf@middlelinewidth@length}}}{}%
%
  \tikzset{mdfinnerline/.style={}}%
% nur wenn innerlinewidth>0 wird innere Linie gezeichnet
  \ifdimgreater{\mdf@innerlinewidth@length}{\z@}
    {\tikzset{mdfinnerline/.append style={%
      draw=\mdf@innerlinecolor,%
      line width=2\mdf@innerlinewidth@length+\mdf@middlelinewidth@length}}}{}%
%
  \tikzset{mdfshadow/.style={drop shadow={%
                               shadow xshift=\mdf@shadowsize@length-2pt,
                               shadow yshift=-\mdf@shadowsize@length+2pt,
                               fill=\mdf@shadowcolor,
                               every shadow }}}%
%
  \mdf@tikzset@local
  \tikzset{mdfmiddleline/.style={}}%
% nur wenn middlelinewidth>0 wird mittlere Linie gezeichnet
  \ifdimgreater{\mdf@middlelinewidth@length}{\z@}
    {\tikzset{mdfmiddleline/.append style={%
      preaction={draw=\mdf@middlelinecolor,%
                 line width=\mdf@middlelinewidth@length},%
      line width=\mdf@middlelinewidth@length,%
      tikzsetting}}%
```

```
    }{}%
}%
```

\mdf@tikzbox@tfl
\mdf@tikzbox@otl

Befehle fuer Ausgabe von Rahmen und Hintergrund

```
\newrobustcmd*\mdf@tikzbox@tfl[1]{%three or four borders
    \clip(0,0)rectangle(\mdfboundingboxwidth,\mdfboundingboxheight);%
    \begin{scope}[mdfcorners]%
       \clip[preaction=mdfouterline]%
            [postaction=mdfbackground]%
            [postaction=mdfinnerline]#1;%
    \end{scope}%
    \path[mdfmiddleline,mdfcorners]#1;
  }%


\newrobustcmd*\mdf@tikzbox@otl[2]{%one or two borders
    \clip(0,0)rectangle(\mdfboundingboxwidth,\mdfboundingboxheight);%
    \begin{scope}
       \path[mdfouterline,mdfcorners]#1;%
       \clip[postaction=mdfbackground]#2;%
       \path[mdfinnerline,mdfcorners]#1;%
    \end{scope}%
    \path[mdfmiddleline,mdfcorners]#1;}%
```

\mdf@put@frametitlerule

frametitlerule with tikz

```
\tikzset{mdfframetitlerule/.style={%
   draw=none,
   fill=\mdf@frametitlerulecolor,
  }%
}
\def\mdf@@frametitlerule{%
  \ifbool{mdf@frametitlerule}{%
   \vbox{\hsize0pt
     \par\unskip\vskip\mdf@frametitlebelowskip@length
     \noindent\rlap{\hspace*{-\mdf@innerleftmargin@length}%
     \begingroup%
     \pgfmathsetlength{\dimen@}{\mdfframetitleboxwidth+\mdf@innerleftmargin@length+\mdf@innerrightmargi
     \tikz\draw[mdfframetitlerule] (0,0)%
               rectangle (\dimen@,\mdf@frametitlerulewidth@length);
     \endgroup}
   }%
  }{}
  \par\unskip\vskip\mdf@innertopmargin@length%
}%
```

\mdf@putbox@single

Output of the non breakable contents.

```
% Info zu den verwendeten Punkten:
% O ist die untere linke Ecke der Mitte der middleline
% P ist die obere rechte Ecke der Mitte der middleline
% A ist der Punkt fuer den anchor (d.h. die untere linke Ecke) der Ausgabebox
%
\def\mdf@putbox@single{%
  \ifvoid\mdf@splitbox@one
  \else%
   \mdf@makebox@out{%
    \mdf@makeboxalign@left%
    \mdf@tikz@settings%
%
    \setlength\mdfboundingboxwidth{\wd\mdf@splitbox@one}%
    \advance\mdfboundingboxwidth by \mdf@innerleftmargin@length\relax%
    \advance\mdfboundingboxwidth by \mdf@innerrightmargin@length\relax%
    \ifbool{mdf@leftline}{%
      \advance\mdfboundingboxwidth by \mdf@innerlinewidth@length\relax%
      \advance\mdfboundingboxwidth by \mdf@middlelinewidth@length\relax%
      \advance\mdfboundingboxwidth by \mdf@outerlinewidth@length\relax}{}%
    \ifbool{mdf@rightline}{%
      \advance\mdfboundingboxwidth by \mdf@innerlinewidth@length\relax%
      \advance\mdfboundingboxwidth by \mdf@middlelinewidth@length\relax%
      \advance\mdfboundingboxwidth by \mdf@outerlinewidth@length\relax}{}%
%
    \setlength\mdfboundingboxheight{\dimexpr\ht\mdf@splitbox@one+\dp\mdf@splitbox@one\relax}%
    \advance\mdfboundingboxheight by \mdf@innertopmargin@length\relax%
    \advance\mdfboundingboxheight by \mdf@innerbottommargin@length\relax%
    \ifbool{mdf@topline}{%
      \advance\mdfboundingboxheight by \mdf@innerlinewidth@length\relax%
      \advance\mdfboundingboxheight by \mdf@middlelinewidth@length\relax%
      \advance\mdfboundingboxheight by \mdf@outerlinewidth@length\relax}{}%
    \ifbool{mdf@bottomline}{%
      \advance\mdfboundingboxheight by \mdf@innerlinewidth@length\relax%
      \advance\mdfboundingboxheight by \mdf@middlelinewidth@length\relax%
      \advance\mdfboundingboxheight by \mdf@outerlinewidth@length\relax}{}%
    \mdf@makebox@in[\mdfboundingboxwidth]{%
    \null%
    \begin{tikzpicture}[remember picture]%
      \pgfmathsetlengthmacro\mdf@Ax{+\mdf@innerleftmargin@length}%
      \pgfmathsetlengthmacro\mdf@Ay{+\mdf@innerbottommargin@length}%
      \pgfmathsetlengthmacro\mdf@Ox{+0pt}%
      \pgfmathsetlengthmacro\mdf@Oy{+0pt}%
      \pgfmathsetlengthmacro\mdf@Px{+\mdfboundingboxwidth}%
      \pgfmathsetlengthmacro\mdf@Py{+\mdfboundingboxheight}%
      \ifbool{mdf@leftline}%
        {%
         \pgfmathsetlengthmacro\mdf@Ax%
              {\mdf@Ax+\mdf@outerlinewidth@length+%
               \mdf@middlelinewidth@length+\mdf@innerlinewidth@length}%
         \pgfmathsetlengthmacro\mdf@Ox%
              {\mdf@Ox+\mdf@outerlinewidth@length+0.5\mdf@middlelinewidth@length}%
        }{}%
      \ifbool{mdf@rightline}%
        {%
         \pgfmathsetlengthmacro\mdf@Px%
```

```
1847              {\mdf@Px-\mdf@outerlinewidth@length-0.5\mdf@middlelinewidth@length}%
1848        }{}%
1849      \ifbool{mdf@bottomline}%
1850        {%
1851         \pgfmathsetlengthmacro\mdf@Ay%
1852              {\mdf@Ay+\mdf@outerlinewidth@length+\mdf@middlelinewidth@length%
1853                +\mdf@innerlinewidth@length}%
1854         \pgfmathsetlengthmacro\mdf@Oy%
1855              {\mdf@Oy+\mdf@outerlinewidth@length+0.5\mdf@middlelinewidth@length}%
1856        }{}%
1857      \ifbool{mdf@topline}%
1858        {%
1859         \pgfmathsetlengthmacro\mdf@Py%
1860              {\mdf@Py-\mdf@outerlinewidth@length-0.5\mdf@middlelinewidth@length}%
1861        }{}%
1862 %
1863      \coordinate(O)at(\mdf@Ox,\mdf@Oy);%
1864      \coordinate(P)at(\mdf@Px,\mdf@Py);%
1865 %
1866      \ifbool{mdf@shadow}
1867         {\path[mdfshadow,mdfcorners](O) rectangle (P);}{}%
1868 %
1869     \begin{scope}[use as bounding box]
1870      \mdf@test@ltrb{\mdf@tikzbox@tfl{(O)--(O|-P)--(P)--(P|-O)--cycle}}{}%
1871 %
1872      \mdf@test@ltb{\mdf@tikzbox@tfl{(P|-O)--(O)--(O|-P)--(P)}}{}%
1873      \mdf@test@trb{\mdf@tikzbox@tfl{(O|-P)--(P)--(P|-O)--(O)}}{}%
1874      \mdf@test@ltr{\mdf@tikzbox@tfl{(O)--(O|-P)--(P)--(P|-O)}}{}%
1875      \mdf@test@lrb{\mdf@tikzbox@tfl{(P-|O)--(O)--(O-|P)--(P)}}{}%
1876 %
1877      \mdf@test@lb{\mdf@tikzbox@otl{(P|-O)--(O)--(O|-P)}%
1878                                   {(P)--(P|-O)[mdfcorners]--(O)--(O|-P)}%
1879                }{}%
1880      \mdf@test@rb{\mdf@tikzbox@otl{(P)--(P|-O)--(O)}%
1881                                   {(O|-P)--(P)[mdfcorners]--(P|-O)--(O)}%
1882                }{}%
1883      \mdf@test@tr{\mdf@tikzbox@otl{(O-|P)--(P)--(P-|O)}%
1884                                   {(O)--(O|-P)[mdfcorners]--(P)--(P|-O)}%
1885                }{}%
1886      \mdf@test@lt{\mdf@tikzbox@otl{(O)--(O|-P)--(P)}%
1887                                   {(P|-O)--(O)[mdfcorners]--(O|-P)--(P)}%
1888                }{}%
1889      \mdf@test@lr{\mdf@tikzbox@otl{(O)--(O|-P)(P)--(P|-O)}%
1890                                   {(O)rectangle(P)}%
1891                }{}%
1892      \mdf@test@tb{\mdf@tikzbox@otl{(O)--(O-|P)(O|-P)--(P)}%
1893                                   {(O)rectangle(P)}%
1894                }{}%
1895 %
1896      \mdf@test@l{\mdf@tikzbox@otl{(O)--(O|-P)}%
1897                                   {(O)rectangle(P)}%
1898                }{}%
1899      \mdf@test@r{\mdf@tikzbox@otl{(O-|P)--(P)}%
1900                                   {(O)rectangle(P)}%
1901                }{}%
1902      \mdf@test@t{\mdf@tikzbox@otl{(O|-P)--(P)}%
```

```
                                {(O)rectangle(P)}%
                }{}%
      \mdf@test@b{\mdf@tikzbox@otl{(O)--(O-|P)}%
                                {(O)rectangle(P)}%
                }{}%
%
      \mdf@test@noline{\path[mdfbackground,mdfcorners](O)rectangle(P);}{}%
%
        %Frametitlebackground
          \drawbrackgroundframetitle@single
%
      \node[mdfbox]at(\mdf@Ax,\mdf@Ay){\box\mdf@splitbox@one};% Ausgabebox einfuegen
     \end{scope}
     %HIER KOMMT EIN WEITERES MAKRO
     \mdf@singleextra
     \mdfcreateextratikz
    \end{tikzpicture}%
    }%
   \mdf@makeboxalign@right%
  }%
 \fi
}%
\def\drawbrackgroundframetitle@single{%
 \ifdefempty{\mdf@frametitle}{}{%
   \drawbrackgroundframetitle@@single%
 }%
}%
\def\drawbrackgroundframetitle@@single{%
       \begin{scope}%background frame title
        \ifbool{mdf@leftline}{
         \pgfmathsetlengthmacro\mdf@Ox%
             {\mdf@Ox+\mdf@innerlinewidth@length+0.5\mdf@middlelinewidth@length}
         }{}%
        \ifbool{mdf@rightline}{%
         \pgfmathsetlengthmacro\mdf@Px%
             {\mdf@Px-\mdf@innerlinewidth@length-0.5\mdf@middlelinewidth@length}
         }{}%
        \ifbool{mdf@topline}{%
         \pgfmathsetlengthmacro\mdf@Py%
             {\mdf@Py-\mdf@innerlinewidth@length-0.5\mdf@middlelinewidth@length}
         }{}%
         \pgfmathsetlengthmacro\mdf@Fy
             {\mdf@Py-\mdfframetitleboxtotalheight}
         \path[mdfframetitlebackground]
             (\mdf@Ox,\mdf@Fy) -- (\mdf@Ox,\mdf@Py)%
             --(\mdf@Px,\mdf@Py) --(\mdf@Px,\mdf@Fy);
       \end{scope}
}
```

`\mdf@putbox@first`

Output of the first breakable contents.

```
\def\drawbrackgroundframetitle@first{%
 \ifdefempty{\mdf@frametitle}{}{%
  \ifdimgreater{\mdfboundingboxheight}{\mdfframetitleboxtotalheight}%
```

```
 {%
  \drawbrackgroundframetitle@@first
  \pgfmathsetlength{\global\mdfframetitleboxtotalheight}{-\p@}%
 }{\mdf@PackageWarning{You got a page break inside the frame title\MessageBreak
                       Currently this isn't well supported}%
   \drawbrackgroundframetitle@@first
   \pgfmathsetlength{\global\mdfframetitleboxtotalheight}%
                  {\mdfframetitleboxtotalheight-\mdfboundingboxheight-
                   \mdf@innerlinewidth@length-0.5\mdf@middlelinewidth@length%
                   +\mdf@frametitlebelowskip@length+\mdf@splitbottomskip@length+\mdf@splittopskip@leng
                   +\dp\strutbox%
                   }%
 }%
}%
%
\def\drawbrackgroundframetitle@@first{%
 \begin{scope}%background frame title
       \ifbool{mdf@leftline}{%
        \pgfmathsetlengthmacro\mdf@Ox%
            {\mdf@Ox+\mdf@innerlinewidth@length+0.5\mdf@middlelinewidth@length}
        }{}%
       \ifbool{mdf@rightline}{%
        \pgfmathsetlengthmacro\mdf@Px%
            {\mdf@Px-\mdf@innerlinewidth@length-0.5\mdf@middlelinewidth@length}
        }{}%
       \ifbool{mdf@topline}{%
        \pgfmathsetlengthmacro\mdf@Py%
            {\mdf@Py-\mdf@innerlinewidth@length-0.5\mdf@middlelinewidth@length}
        }{}%
        \pgfmathsetlengthmacro\mdf@Fy
            {max(0,\mdf@Py-\mdfframetitleboxtotalheight)}
        \path[mdfframetitlebackground]
            (\mdf@Ox,\mdf@Fy) -- (\mdf@Ox,\mdf@Py)%
            --(\mdf@Px,\mdf@Py) --(\mdf@Px,\mdf@Fy);
      \end{scope}%
}%
%
\def\mdf@putbox@first{%
  \ifvoid\mdf@splitbox@two
  \else%
   \mdf@makebox@out{%
    \mdf@makeboxalign@left%
    \mdf@tikz@settings%
    \setlength\mdfboundingboxwidth{\wd\mdf@splitbox@two}%
    \advance\mdfboundingboxwidth by \mdf@innerleftmargin@length\relax%
    \advance\mdfboundingboxwidth by \mdf@innerrightmargin@length\relax%
    \ifbool{mdf@leftline}{%
      \advance\mdfboundingboxwidth by \mdf@innerlinewidth@length\relax%
      \advance\mdfboundingboxwidth by \mdf@middlelinewidth@length\relax%
      \advance\mdfboundingboxwidth by \mdf@outerlinewidth@length\relax}{}%
    \ifbool{mdf@rightline}{%
      \advance\mdfboundingboxwidth by \mdf@innerlinewidth@length\relax%
      \advance\mdfboundingboxwidth by \mdf@middlelinewidth@length\relax%
      \advance\mdfboundingboxwidth by \mdf@outerlinewidth@length\relax}{}%
    \setlength\mdfboundingboxheight{\dimexpr\ht\mdf@splitbox@two+\dp\mdf@splitbox@two\relax}%
```

```
    \advance\mdfboundingboxheight by \mdf@innertopmargin@length\relax%
    \advance\mdfboundingboxheight by \mdf@splitbottomskip@length\relax%
    \ifbool{mdf@topline}{%
      \advance\mdfboundingboxheight by \mdf@innerlinewidth@length\relax%
      \advance\mdfboundingboxheight by \mdf@middlelinewidth@length\relax%
      \advance\mdfboundingboxheight by \mdf@outerlinewidth@length\relax}{}%
%%%%%%%%%
    \ifbool{mdf@everyline}{%
     \ifbool{mdf@bottomline}{%
      \advance\mdfboundingboxheight by \mdf@innerlinewidth@length\relax%
      \advance\mdfboundingboxheight by \mdf@middlelinewidth@length\relax%
      \advance\mdfboundingboxheight by \mdf@outerlinewidth@length\relax}{}%
     }{}%
%%%%%%%%%%%%%%
    %\ifdimequal{\pagegoal}{\maxdimen}{\enlargethispage{\baselineskip}}{}% ???
    \ifdimgreater{\pagegoal-\maxdimen}{0pt}{}{\enlargethispage{\baselineskip}}%
    \mdf@makebox@in[\mdfboundingboxwidth]{%
    \null%
    \begin{tikzpicture}[remember picture]
      \pgfmathsetlengthmacro\mdf@Ax{+\mdf@innerleftmargin@length}%
      \pgfmathsetlengthmacro\mdf@Ay{+\mdf@splitbottomskip@length}%
      \pgfmathsetlengthmacro\mdf@Ox{+0pt}%
      \pgfmathsetlengthmacro\mdf@Oy{+0pt}%
      \pgfmathsetlengthmacro\mdf@Px{+\mdfboundingboxwidth}%
      \pgfmathsetlengthmacro\mdf@Py{+\mdfboundingboxheight}%
      \ifbool{mdf@leftline}
        {%
         \pgfmathsetlengthmacro\mdf@Ax%
              {\mdf@Ax+\mdf@outerlinewidth@length+%
               \mdf@middlelinewidth@length+\mdf@innerlinewidth@length}%
         \pgfmathsetlengthmacro\mdf@Ox%
              {\mdf@Ox+\mdf@outerlinewidth@length+0.5\mdf@middlelinewidth@length}%
        }{}%
      \ifbool{mdf@rightline}{%
          \pgfmathsetlengthmacro\mdf@Px%
              {\mdf@Px-\mdf@outerlinewidth@length-0.5\mdf@middlelinewidth@length}%
        }{}%
      \ifbool{mdf@topline}{%
          \pgfmathsetlengthmacro\mdf@Py%
              {\mdf@Py-\mdf@outerlinewidth@length-0.5\mdf@middlelinewidth@length}%
        }{}%
%%
     \ifbool{mdf@everyline}{%
      \ifbool{mdf@bottomline}%
        {%
         \pgfmathsetlengthmacro\mdf@Ay%
              {\mdf@Ay+\mdf@outerlinewidth@length+\mdf@middlelinewidth@length%
                +\mdf@innerlinewidth@length}%
         \pgfmathsetlengthmacro\mdf@Oy%
              {\mdf@Oy+\mdf@outerlinewidth@length+0.5\mdf@middlelinewidth@length}%
        }{}%
      \ifbool{mdf@topline}%
        {%
         \pgfmathsetlengthmacro\mdf@Py%
              {\mdf@Py-\mdf@outerlinewidth@length-0.5\mdf@middlelinewidth@length}%
        }{}%
```

```
    }{}%
%%
     \coordinate(O)at(\mdf@Ox,\mdf@Oy);%
     \coordinate(P)at(\mdf@Px,\mdf@Py);%
     \ifbool{mdf@shadow}
        {\path[mdfshadow] (O) -- (O|-P) to[mdfcorners] (P) -- (P|-O) -- (O);}{}%
    \begin{scope}[use as bounding box]
%%%%%%%%%%%
   \ifbool{mdf@everyline}{%
     \mdf@test@ltrb{\mdf@tikzbox@tfl{(O)--(O|-P)--(P)--(P|-O)--cycle}}{}%
     \mdf@test@ltb{\mdf@tikzbox@tfl{(P|-O)--(O)--(O|-P)--(P)}}{}%
     \mdf@test@trb{\mdf@tikzbox@tfl{(O|-P)--(P)--(P|-O)--(O)}}{}%
     \mdf@test@ltr{\mdf@tikzbox@tfl{(O)--(O|-P)--(P)--(P|-O)}}{}%
     \mdf@test@lrb{\mdf@tikzbox@tfl{(P-|O)--(O)--(O-|P)--(P)}}{}%
     \mdf@test@lb{\mdf@tikzbox@otl{(P|-O)--(O)--(O|-P)}%
                                  {(P)--(P|-O)[mdfcorners]--(O)--(O|-P)}%
                }{}%
     \mdf@test@rb{\mdf@tikzbox@otl{(P)--(P|-O)--(O)}%
                                  {(O|-P)--(P)[mdfcorners]--(P|-O)--(O)}%
                }{}%
     \mdf@test@tr{\mdf@tikzbox@otl{(O-|P)--(P)--(P-|O)}%
                                  {(O)--(O|-P)[mdfcorners]--(P)--(P|-O)}%
                }{}%
     \mdf@test@lt{\mdf@tikzbox@otl{(O)--(O|-P)--(P)}%
                                  {(P|-O)--(O)[mdfcorners]--(O|-P)--(P)}%
                }{}%
     \mdf@test@lr{\mdf@tikzbox@otl{(O)--(O|-P)(P)--(P|-O)}%
                                  {(O)rectangle(P)}%
                }{}%
     \mdf@test@tb{\mdf@tikzbox@otl{(O)--(O-|P)(O|-P)--(P)}%
                                  {(O)rectangle(P)}%
                }{}%
     \mdf@test@l{\mdf@tikzbox@otl{(O)--(O|-P)}%
                                  {(O)rectangle(P)}%
                }{}%
     \mdf@test@r{\mdf@tikzbox@otl{(O-|P)--(P)}%
                                  {(O)rectangle(P)}%
                }{}%
     \mdf@test@t{\mdf@tikzbox@otl{(O|-P)--(P)}%
                                  {(O)rectangle(P)}%
                }{}%
     \mdf@test@b{\mdf@tikzbox@otl{(O)--(O-|P)}%
                                  {(O)rectangle(P)}%
                }{}%
     \mdf@test@noline{\path[mdfbackground,mdfcorners](O)rectangle(P);}{}%
   }{
     \ifboolexpr{test {\mdf@test@ltrb} or test {\mdf@test@ltr}}%
       {\mdf@tikzbox@tfl{(O)--(O|-P)--(P)--(P|-O)}}%
       {}%
     \ifboolexpr{test {\mdf@test@ltb} or test {\mdf@test@lt}}%
       {\mdf@tikzbox@otl{(O)--(O|-P)--(P)}{(P|-O)--(O)[mdfcorners]--(O|-P)--(P)}}%
       {}%
     \ifboolexpr{test {\mdf@test@trb} or test {\mdf@test@tr}}%
       {\mdf@tikzbox@otl{(O-|P)--(P)--(P-|O)}{(O)--(O|-P)[mdfcorners]--(P)--(P|-O)}}%
       {}%
     \ifboolexpr{test {\mdf@test@lrb} or test {\mdf@test@lr}}%
```

```
        {\mdf@tikzbox@otl{(O)--(O|-P)(P)--(P|-O)}{(O)rectangle(P)}}%
        {}%
      \ifboolexpr{test {\mdf@test@tb} or test {\mdf@test@t}}%
        {\mdf@tikzbox@otl{(O|-P)--(P)}{(O)rectangle(P)}}%
        {}%
      \ifboolexpr{test {\mdf@test@lb} or test {\mdf@test@l}}%
        {\mdf@tikzbox@otl{(O)--(O|-P)}{(O)rectangle(P)}}%
        {}%
      \ifboolexpr{test {\mdf@test@rb} or test {\mdf@test@r}}%
        {\mdf@tikzbox@otl{(O-|P)--(P)}{(O)rectangle(P)}}%
        {}%
      \mdf@test@b{\path[mdfbackground](O)rectangle(P);}{}%
      \mdf@test@noline{\path[mdfbackground,mdfcorners](O)--(O|-P)--(P)--(P|-O);}{}%
    }
%%%%%%%%%%%%
      \drawbrackgroundframetitle@first
      \node[mdfbox]at(\mdf@Ax,\mdf@Ay){\box\mdf@splitbox@two};% Ausgabebox einfuegen
     \end{scope}
     %HIER KOMMT EIN WEITERES MAKRO
     \mdf@firstextra
     \mdfcreateextratikz%
    \end{tikzpicture}%
    }%
   \mdf@makeboxalign@right%
  }%
 \fi
}%
```

`\mdf@putbox@middle`

Output of the middle breakable contents.

```
\def\drawbrackgroundframetitle@middle{%
 \ifdefempty{\mdf@frametitle}{}{%
  \ifdimless{\mdfframetitleboxtotalheight}{\z@}
  {}{%
   \drawbrackgroundframetitle@@middle%
   \pgfmathsetlength{\global\mdfframetitleboxtotalheight}{-\p@}%
  }%
 }%
}%
%
\def\drawbrackgroundframetitle@@middle{%
       \begin{scope}%background frame title
        \ifbool{mdf@leftline}{
         \pgfmathsetlengthmacro\mdf@Ox%
             {\mdf@Ox+\mdf@innerlinewidth@length+0.5\mdf@middlelinewidth@length}
         }{}%
        \ifbool{mdf@rightline}{%
         \pgfmathsetlengthmacro\mdf@Px%
             {\mdf@Px-\mdf@innerlinewidth@length-0.5\mdf@middlelinewidth@length}
         }{}%
         \pgfmathsetlengthmacro\mdf@Fy
             {\mdf@Py-\mdfframetitleboxtotalheight}
         \path[mdfframetitlebackground,rounded corners=\z@]
             (\mdf@Ox,\mdf@Fy) -- (\mdf@Ox,\mdf@Py)%
```

```
            --(\mdf@Px,\mdf@Py) --(\mdf@Px,\mdf@Fy);
      \end{scope}
}%
%
\def\drawbrackgroundframetitle@@middle{%
      \begin{scope}%background frame title
       \ifbool{mdf@leftline}{
        \pgfmathsetlengthmacro\mdf@Ox%
            {\mdf@Ox+\mdf@innerlinewidth@length+0.5\mdf@middlelinewidth@length}
        }{}%
       \ifbool{mdf@rightline}{%
        \pgfmathsetlengthmacro\mdf@Px%
            {\mdf@Px-\mdf@innerlinewidth@length-0.5\mdf@middlelinewidth@length}
        }{}%
        \pgfmathsetlengthmacro\mdf@Fy
            {\mdf@Py-\mdfframetitleboxtotalheight}
        \path[mdfframetitlebackground,rounded corners=\z@]
            (\mdf@Ox,\mdf@Fy) -- (\mdf@Ox,\mdf@Py)%
            --(\mdf@Px,\mdf@Py) --(\mdf@Px,\mdf@Fy);
      \end{scope}
}%
\def\mdf@putbox@middle{%
  \ifvoid\mdf@splitbox@two
  \else%
       \mdf@makebox@out{%
    \mdf@makeboxalign@left%
    \mdf@tikz@settings%
    \setlength\mdfboundingboxwidth{\wd\mdf@splitbox@two}%
    \advance\mdfboundingboxwidth by \mdf@innerleftmargin@length\relax%
    \advance\mdfboundingboxwidth by \mdf@innerrightmargin@length\relax%
    \ifbool{mdf@leftline}{%
      \advance\mdfboundingboxwidth by \mdf@innerlinewidth@length\relax%
      \advance\mdfboundingboxwidth by \mdf@middlelinewidth@length\relax%
      \advance\mdfboundingboxwidth by \mdf@outerlinewidth@length\relax}{}%
    \ifbool{mdf@rightline}{%
      \advance\mdfboundingboxwidth by \mdf@innerlinewidth@length\relax%
      \advance\mdfboundingboxwidth by \mdf@middlelinewidth@length\relax%
      \advance\mdfboundingboxwidth by \mdf@outerlinewidth@length\relax}{}%
    \setlength\mdfboundingboxheight{\dimexpr\ht\mdf@splitbox@two+\dp\mdf@splitbox@two\relax}%
    \advance\mdfboundingboxheight by \mdf@splitbottomskip@length\relax%
%%%%%%%%%
    \ifbool{mdf@everyline}{%
     \ifbool{mdf@topline}{%
      \advance\mdfboundingboxheight by \mdf@innerlinewidth@length\relax%
      \advance\mdfboundingboxheight by \mdf@middlelinewidth@length\relax%
      \advance\mdfboundingboxheight by \mdf@outerlinewidth@length\relax}{}%
     \ifbool{mdf@bottomline}{%
      \advance\mdfboundingboxheight by \mdf@innerlinewidth@length\relax%
      \advance\mdfboundingboxheight by \mdf@middlelinewidth@length\relax%
      \advance\mdfboundingboxheight by \mdf@outerlinewidth@length\relax}{}%
     }{}%
%%%%%%%%%%%%%%
    \mdf@makebox@in[\mdfboundingboxwidth]{%
    \null%
    \begin{tikzpicture}[remember picture]
      \pgfmathsetlengthmacro\mdf@Ax{+\mdf@innerleftmargin@length}%
```

```
      \pgfmathsetlengthmacro\mdf@Ay{+\mdf@splitbottomskip@length}%
      \pgfmathsetlengthmacro\mdf@Ox{+0pt}%
      \pgfmathsetlengthmacro\mdf@Oy{+0pt}%
      \pgfmathsetlengthmacro\mdf@Px{+\mdfboundingboxwidth}%
      \pgfmathsetlengthmacro\mdf@Py{+\mdfboundingboxheight}%
      \ifbool{mdf@leftline}%
        {%
         \pgfmathsetlengthmacro\mdf@Ax%
              {\mdf@Ax+\mdf@outerlinewidth@length+%
               \mdf@middlelinewidth@length+\mdf@innerlinewidth@length}%
         \pgfmathsetlengthmacro\mdf@Ox%
              {\mdf@Ox+\mdf@outerlinewidth@length+0.5\mdf@middlelinewidth@length}%
         }{}%
      \ifbool{mdf@rightline}%
         {%
          \pgfmathsetlengthmacro\mdf@Px%
              {\mdf@Px-\mdf@outerlinewidth@length-0.5\mdf@middlelinewidth@length}%
         }{}%
%%
     \ifbool{mdf@everyline}{%
      \ifbool{mdf@bottomline}%
        {%
         \pgfmathsetlengthmacro\mdf@Ay%
              {\mdf@Ay+\mdf@outerlinewidth@length+\mdf@middlelinewidth@length%
                +\mdf@innerlinewidth@length}%
         \pgfmathsetlengthmacro\mdf@Oy%
              {\mdf@Oy+\mdf@outerlinewidth@length+0.5\mdf@middlelinewidth@length}%
        }{}%
      \ifbool{mdf@topline}%
        {%
         \pgfmathsetlengthmacro\mdf@Py%
              {\mdf@Py-\mdf@outerlinewidth@length-0.5\mdf@middlelinewidth@length}%
        }{}%
     }{}%
%%
      \coordinate(O)at(\mdf@Ox,\mdf@Oy);%
      \coordinate(P)at(\mdf@Px,\mdf@Py);%
      \ifbool{mdf@shadow}
         {\path[mdfshadow](O) rectangle (P);}{}%
     \begin{scope}[use as bounding box]
%%%%%%%%%%%%
    \ifbool{mdf@everyline}{%
      \mdf@test@ltrb{\mdf@tikzbox@tfl{(O)--(O|-P)--(P)--(P|-O)--cycle}}{}%
      \mdf@test@ltb{\mdf@tikzbox@tfl{(P|-O)--(O)--(O|-P)--(P)}}{}%
      \mdf@test@trb{\mdf@tikzbox@tfl{(O|-P)--(P)--(P|-O)--(O)}}{}%
      \mdf@test@ltr{\mdf@tikzbox@tfl{(O)--(O|-P)--(P)--(P|-O)}}{}%
      \mdf@test@lrb{\mdf@tikzbox@tfl{(P-|O)--(O)--(O-|P)--(P)}}{}%
      \mdf@test@lb{\mdf@tikzbox@otl{(P|-O)--(O)--(O|-P)}%
                                   {(P)--(P|-O)[mdfcorners]--(O)--(O|-P)}%
                }{}%
      \mdf@test@rb{\mdf@tikzbox@otl{(P)--(P|-O)--(O)}%
                                   {(O|-P)--(P)[mdfcorners]--(P|-O)--(O)}%
                }{}%
      \mdf@test@tr{\mdf@tikzbox@otl{(O-|P)--(P)--(P-|O)}%
                                   {(O)--(O|-P)[mdfcorners]--(P)--(P|-O)}%
                }{}%
```

```
      \mdf@test@lt{\mdf@tikzbox@otl{(O)--(O|-P)--(P)}%
                                   {(P|-O)--(O)[mdfcorners]--(O|-P)--(P)}%
                  }{}%
      \mdf@test@lr{\mdf@tikzbox@otl{(O)--(O|-P)(P)--(P|-O)}%
                                   {(O)rectangle(P)}%
                  }{}%
      \mdf@test@tb{\mdf@tikzbox@otl{(O)--(O-|P)(O|-P)--(P)}%
                                   {(O)rectangle(P)}%
                  }{}%
      \mdf@test@l{\mdf@tikzbox@otl{(O)--(O|-P)}%
                                   {(O)rectangle(P)}%
                  }{}%
      \mdf@test@r{\mdf@tikzbox@otl{(O-|P)--(P)}%
                                   {(O)rectangle(P)}%
                  }{}%
      \mdf@test@t{\mdf@tikzbox@otl{(O|-P)--(P)}%
                                   {(O)rectangle(P)}%
                  }{}%
      \mdf@test@b{\mdf@tikzbox@otl{(O)--(O-|P)}%
                                   {(O)rectangle(P)}%
                  }{}%
      \mdf@test@noline{\path[mdfbackground,mdfcorners](O)rectangle(P);}{}%
    }{
      \ifboolexpr{bool {mdf@leftline} and bool {mdf@rightline}}%
                {\mdf@tikzbox@otl{(O)--(O|-P)(P)--(P|-O)}{(O)rectangle(P)}}{}%
      \ifboolexpr{bool {mdf@leftline} and not (bool {mdf@rightline})}%
                {\mdf@tikzbox@otl{(O)--(O|-P)}{(O)rectangle(P)}}{}%
      \ifboolexpr{not (bool {mdf@leftline}) and bool {mdf@rightline}}%
                {\mdf@tikzbox@otl{(P)--(P|-O)}{(O)rectangle(P)}}{}%
      \ifboolexpr{not (bool {mdf@leftline}) and not (bool {mdf@rightline})}%
                {\path[mdfbackground](O)rectangle(P);}{}%
    }
%%%%%%%%
      \drawbrackgroundframetitle@middle
      \node[mdfbox]at(\mdf@Ax,\mdf@Ay){\box\mdf@splitbox@two};% Ausgabebox einfuegen
     \end{scope}
     \mdf@middleextra
     %HIER KOMMT EIN WEITERES MAKRO
     \mdfcreateextratikz
    \end{tikzpicture}%
    }%
   \mdf@makeboxalign@right%
  }%
 \fi
}%
```

\mdf@putbox@second

Output of the last breakable contents.

```
\def\drawbrackgroundframetitle@second{%
 \ifdefempty{\mdf@frametitle}{}{%
  \ifdimless{\mdfframetitleboxtotalheight}{\z@}
  {}{%
   \drawbrackgroundframetitle@@second%
  }%
```

```
 }%
}%
%
\def\drawbrackgroundframetitle@@second{%
       \begin{scope}%background frame title
        \ifbool{mdf@leftline}{
         \pgfmathsetlengthmacro\mdf@Ox%
             {\mdf@Ox+\mdf@innerlinewidth@length+0.5\mdf@middlelinewidth@length}
         }{}%
        \ifbool{mdf@rightline}{%
         \pgfmathsetlengthmacro\mdf@Px%
             {\mdf@Px-\mdf@innerlinewidth@length-0.5\mdf@middlelinewidth@length}
         }{}%
         \pgfmathsetlengthmacro\mdf@Fy
             {\mdf@Py-\mdfframetitleboxtotalheight}
         \path[mdfframetitlebackground,rounded corners=\z@]
             (\mdf@Ox,\mdf@Fy) -- (\mdf@Ox,\mdf@Py)%
             --(\mdf@Px,\mdf@Py) --(\mdf@Px,\mdf@Fy);
       \end{scope}
}%
\def\mdf@putbox@second{%
  \ifvoid\mdf@splitbox@one
  \else%
        \mdf@makebox@out{%
    \mdf@makeboxalign@left%
    \mdf@tikz@settings%
    \setlength\mdfboundingboxwidth{\wd\mdf@splitbox@one}%
    \advance\mdfboundingboxwidth by \mdf@innerleftmargin@length\relax%
    \advance\mdfboundingboxwidth by \mdf@innerrightmargin@length\relax%
    \ifbool{mdf@leftline}{%
      \advance\mdfboundingboxwidth by \mdf@innerlinewidth@length\relax%
      \advance\mdfboundingboxwidth by \mdf@middlelinewidth@length\relax%
      \advance\mdfboundingboxwidth by \mdf@outerlinewidth@length\relax}{}%
    \ifbool{mdf@rightline}{%
      \advance\mdfboundingboxwidth by \mdf@innerlinewidth@length\relax%
      \advance\mdfboundingboxwidth by \mdf@middlelinewidth@length\relax%
      \advance\mdfboundingboxwidth by \mdf@outerlinewidth@length\relax}{}%
    \setlength\mdfboundingboxheight{\dimexpr\ht\mdf@splitbox@one+\dp\mdf@splitbox@one\relax}%
    \advance\mdfboundingboxheight by \mdf@innerbottommargin@length\relax%
    \ifbool{mdf@bottomline}{%
      \advance\mdfboundingboxheight by \mdf@innerlinewidth@length\relax%
      \advance\mdfboundingboxheight by \mdf@middlelinewidth@length\relax%
      \advance\mdfboundingboxheight by \mdf@outerlinewidth@length\relax}{}%
%%%%%%%%%
    \ifbool{mdf@everyline}{%
     \ifbool{mdf@topline}{%
      \advance\mdfboundingboxheight by \mdf@innerlinewidth@length\relax%
      \advance\mdfboundingboxheight by \mdf@middlelinewidth@length\relax%
      \advance\mdfboundingboxheight by \mdf@outerlinewidth@length\relax}{}%
     }{}%
%%%%%%%%%%%%%%
    \mdf@makebox@in[\mdfboundingboxwidth]{%
    \null%
    \begin{tikzpicture}[remember picture]
      \pgfmathsetlengthmacro\mdf@Ax{+\mdf@innerleftmargin@length}%
      \pgfmathsetlengthmacro\mdf@Ay{+\mdf@innerbottommargin@length}%
```

```
      \pgfmathsetlengthmacro\mdf@Ox{+0pt}%
      \pgfmathsetlengthmacro\mdf@Oy{+0pt}%
      \pgfmathsetlengthmacro\mdf@Px{+\mdfboundingboxwidth}%
      \pgfmathsetlengthmacro\mdf@Py{+\mdfboundingboxheight}%
      \ifbool{mdf@leftline}%
        {%
         \pgfmathsetlengthmacro\mdf@Ax%
              {\mdf@Ax+\mdf@outerlinewidth@length+%
               \mdf@middlelinewidth@length+\mdf@innerlinewidth@length}%
          \pgfmathsetlengthmacro\mdf@Ox%
              {\mdf@Ox+\mdf@outerlinewidth@length+0.5\mdf@middlelinewidth@length}%
         }{}%
      \ifbool{mdf@rightline}%
         {%
          \pgfmathsetlengthmacro\mdf@Px%
              {\mdf@Px-\mdf@outerlinewidth@length-0.5\mdf@middlelinewidth@length}%
         }{}%
      \ifbool{mdf@bottomline}%
         {%
          \pgfmathsetlengthmacro\mdf@Ay%
              {\mdf@Ay+\mdf@outerlinewidth@length+%
               \mdf@middlelinewidth@length+\mdf@innerlinewidth@length}%
          \pgfmathsetlengthmacro\mdf@Oy%
              {\mdf@Oy+\mdf@outerlinewidth@length+0.5\mdf@middlelinewidth@length}%
         }{}%
%%
     \ifbool{mdf@everyline}{%
      \ifbool{mdf@topline}%
        {%
         \pgfmathsetlengthmacro\mdf@Py%
              {\mdf@Py-\mdf@outerlinewidth@length-0.5\mdf@middlelinewidth@length}%
        }{}%
     }{}%
%%
      \coordinate(O)at(\mdf@Ox,\mdf@Oy);%
      \coordinate(P)at(\mdf@Px,\mdf@Py);%
      \ifbool{mdf@shadow}
         {\path[mdfshadow]  (O|-P) to[mdfcorners] (O) to[mdfcorners] (P|-O) -- (P) -- (O|-P);}{}%
     \begin{scope}[use as bounding box]
%%%%%%%%%%%
    \ifbool{mdf@everyline}{%
      \mdf@test@ltrb{\mdf@tikzbox@tfl{(O)--(O|-P)--(P)--(P|-O)--cycle}}{}%
      \mdf@test@ltb{\mdf@tikzbox@tfl{(P|-O)--(O)--(O|-P)--(P)}}{}%
      \mdf@test@trb{\mdf@tikzbox@tfl{(O|-P)--(P)--(P|-O)--(O)}}{}%
      \mdf@test@ltr{\mdf@tikzbox@tfl{(O)--(O|-P)--(P)--(P|-O)}}{}%
      \mdf@test@lrb{\mdf@tikzbox@tfl{(P-|O)--(O)--(O-|P)--(P)}}{}%
      \mdf@test@lb{\mdf@tikzbox@otl{(P|-O)--(O)--(O|-P)}%
                                   {(P)--(P|-O)[mdfcorners]--(O)--(O|-P)}%
                 }{}%
      \mdf@test@rb{\mdf@tikzbox@otl{(P)--(P|-O)--(O)}%
                                   {(O|-P)--(P)[mdfcorners]--(P|-O)--(O)}%
                 }{}%
      \mdf@test@tr{\mdf@tikzbox@otl{(O-|P)--(P)--(P-|O)}%
                                   {(O)--(O|-P)[mdfcorners]--(P)--(P|-O)}%
                 }{}%
      \mdf@test@lt{\mdf@tikzbox@otl{(O)--(O|-P)--(P)}%
```

```
                                {(P|-O)--(O)[mdfcorners]--(O|-P)--(P)}%
              }{}%
    \mdf@test@lr{\mdf@tikzbox@otl{(O)--(O|-P)(P)--(P|-O)}%
                                {(O)rectangle(P)}%
              }{}%
    \mdf@test@tb{\mdf@tikzbox@otl{(O)--(O-|P)(O|-P)--(P)}%
                                {(O)rectangle(P)}%
              }{}%
    \mdf@test@l{\mdf@tikzbox@otl{(O)--(O|-P)}%
                                {(O)rectangle(P)}%
              }{}%
    \mdf@test@r{\mdf@tikzbox@otl{(O-|P)--(P)}%
                                {(O)rectangle(P)}%
              }{}%
    \mdf@test@t{\mdf@tikzbox@otl{(O|-P)--(P)}%
                                {(O)rectangle(P)}%
              }{}%
    \mdf@test@b{\mdf@tikzbox@otl{(O)--(O-|P)}%
                                {(O)rectangle(P)}%
              }{}%
    \mdf@test@noline{\path[mdfbackground,mdfcorners](O)rectangle(P);}{}%
  }{%
    \ifboolexpr{test {\mdf@test@ltrb} or test {\mdf@test@lrb}}%
      {\mdf@tikzbox@tfl{(P-|O)--(O)--(O-|P)--(P)}}%
      {}%
    \ifboolexpr{test {\mdf@test@ltb} or test {\mdf@test@lb}}%
      {\mdf@tikzbox@otl{(P-|O)--(O)--(O-|P)}{(P)--(P|-O)[mdfcorners]--(O)--(O|-P)}}%
      {}%
    \ifboolexpr{test {\mdf@test@trb} or test {\mdf@test@rb}}%
      {\mdf@tikzbox@otl{(P)--(P|-O)--(O)}{(O|-P)--(P)[mdfcorners]--(P|-O)--(O)}}%
      {}%
    \ifboolexpr{test {\mdf@test@ltr} or test {\mdf@test@lr}}%
      {\mdf@tikzbox@otl{(O)--(O|-P)(P)--(P|-O)}{(O)rectangle(P)}}%
      {}%
    \ifboolexpr{test {\mdf@test@tb} or test {\mdf@test@b}}%
      {\mdf@tikzbox@otl{(O)--(O-|P)}{(O)rectangle(P)}}%
      {}%
    \ifboolexpr{test {\mdf@test@lt} or test {\mdf@test@l}}%
      {\mdf@tikzbox@otl{(O)--(O|-P)}{(O)rectangle(P)}}%
      {}%
    \ifboolexpr{test {\mdf@test@tr} or test {\mdf@test@r}}%
      {\mdf@tikzbox@otl{(O-|P)--(P)}{(O)rectangle(P)}}%
      {}%
    \mdf@test@t{\path[mdfbackground,mdfcorners](O|-P)--(O)--(O-|P)--(P);}{}%
    \mdf@test@noline{\path[mdfbackground,mdfcorners](O|-P)--(O)--(O-|P)--(P);}{}%
  }%
    \drawbrackgroundframetitle@second
    \node[mdfbox] at (\mdf@Ax,\mdf@Ay){\box\mdf@splitbox@one};% Ausgabebox einfuegen
   \end{scope}
    \mdf@secondextra
   %HIER KOMMT EIN WEITERES MAKRO
   \mdfcreateextratikz
  \end{tikzpicture}%
  }%
 \mdf@makeboxalign@right%
}%
```

```
\fi
}%

\endinput
```

B.4. The Explanation of md-frame-2.mdf / md-frame-3.mdf

```
%% Style file for mdframed for package option 'framemethod=default'
%%
%% This package may be distributed under the terms of the LaTeX Project
%% Public License, as described in lppl.txt in the base LaTeX distribution.
%% Either version 1.0 or, at your option, any later version.
%%
%%
%%$Id: mdframed.dtx 372 2012-04-05 19:09:11Z marco $
%
```

```
\mdframedIIpackagename
\mdf@frameIIdate@svn
```

local settings

```
\def\mdframedIIpackagename{md-frame-2}
\def\mdf@frameIIdate@svn$#1: #2 #3 #4-#5-#6 #7 #8${#4/#5/#6\space }
\ProvidesFile{md-frame-2.mdf}%
         [\mdf@frameIIdate@svn$Id: mdframed.dtx 372 2012-04-05 19:09:11Z marco $ %
          \mdversion: \mdframedIIpackagename]
```

```
\mdf@ptlength@to@pscode
\ptTps
```

Command to calculate a latex length to postscript

```
\def\mdf@ptlength@to@pscode#1{\pst@number{#1} \pst@number\psxunit div }
\def\mdf@ptlength@to@pscode@length#1{\pst@number{\csname mdf@#1@length\endcsname} \pst@number\psxunit d
\let\ptTps\mdf@ptlength@to@pscode\relax
\let\ptTpsL\mdf@ptlength@to@pscode@length\relax
```

```
\mdfbackgroundstyle
\mdflinestyle
\mdfframetitlerule
\mdfframetitlebackground
```

background and line settings for pstricks

```
\def\mdfpstricks@settings{%expand by \addtopsstyle
  \newpsstyle{mdfbackgroundstyle}%
    {linecolor=\mdf@backgroundcolor,fillstyle=solid,%
     fillcolor=\mdf@backgroundcolor,linestyle=none,%
    ,dimen=middle,%
    }%
%
  \newpsstyle{mdfframetitlebackgroundstyle}{%
     linecolor=\mdf@frametitlebackgroundcolor,
     fillcolor=\mdf@frametitlebackgroundcolor,
     fillstyle=solid,linestyle=none,
     linearc=\ifdimgreater{\mdf@roundcorner@length%
```

```
                          -\mdf@innerlinewidth@length%
                          -.5\mdf@middlelinewidth@length}
                         {\z@}{\dimexpr\mdf@roundcorner@length%
                          -\mdf@innerlinewidth@length%
                          -.5\mdf@middlelinewidth@length}{\z@},
  }
%
  \newpsstyle{mdfouterlinestyle}{linestyle=none}%
  \ifdimgreater{\mdf@outerlinewidth@length}{\z@}
    {\newpsstyle{mdfouterlinestyle}{%
      linecolor=\mdf@outerlinecolor,%
      linewidth=\dimexpr2\mdf@outerlinewidth@length+\mdf@middlelinewidth@length\relax,
      dimen=middle,
      }}{}%
%
  \newpsstyle{mdfinnerlinestyle}{linestyle=none}%
  \ifdimgreater{\mdf@innerlinewidth@length}{\z@}%
    {\newpsstyle{mdfinnerlinestyle}{%
      linecolor=\mdf@innerlinecolor,%
      linewidth=\dimexpr2\mdf@innerlinewidth@length+\mdf@middlelinewidth@length\relax,
      dimen=middle,
      }}{}%
%
  \newpsstyle{mdfmiddlelinestyle}{linestyle=none}%
  \newpsstyle{mdfshadow}{shadow=true,shadowcolor=\mdf@shadowcolor,shadowsize=\mdf@shadowsize@length}%
  \ifdimgreater{\mdf@middlelinewidth@length}{\z@}%
    {\newpsstyle{mdfmiddlelinestyle}{%
      linewidth=\mdf@middlelinewidth@length,%
      linecolor=\mdf@middlelinecolor,dimen=middle
      }}{}%
\mdfpstricks@appendsettings
}%
%
\newrobustcmd*\mdf@pstricksbox@fl[2]{%four lines
  \psframe[style=mdfouterlinestyle](#1)(#2)%aussen=3mm
  \psframe[style=mdfbackgroundstyle](#1)(#2)%Hintergrund
  \psclip{\psframe[style=mdfmiddlelinestyle](#1)(#2)}
   \psframe[style=mdfinnerlinestyle](#1)(#2)%innere=3mm
  \endpsclip
  \psframe[style=mdfmiddlelinestyle](#1)(#2)%mittlere=2mm
  }%
\newrobustcmd*\mdf@pstricksbox@tl[1]{%three lines
  \psline[style=mdfouterlinestyle]#1%aussen=3mm
  \psline[style=mdfbackgroundstyle]#1%Hintergrund
  \psclip{\psline[style=mdfmiddlelinestyle]#1}
    \psline[style=mdfinnerlinestyle]#1%innere=3mm
  \endpsclip
  \psline[style=mdfmiddlelinestyle]#1%mittlere=2mm
  }%
\newrobustcmd*\mdf@pstricksbox@tcl[2]{%two combined lines
%%#1 background comple
%%#2 line path
  \psline[style=mdfouterlinestyle]#2%aussen=3mm
  \psline[style=mdfbackgroundstyle]#2%Hintergrund
  \psclip{\pscustom[linestyle=none]{
          \psline[style=mdfmiddlelinestyle]#2
```

```
          \psline[linestyle=none,linearc=0pt]#1}
          }
    \psframe[style=mdfbackgroundstyle,linearc=0pt](mdf@O)(mdf@P)%Hintergrund
    \psline[style=mdfinnerlinestyle]#2%innere=3mm
  \endpsclip
  \psline[style=mdfmiddlelinestyle]#2%mittlere=2mm
}%
\newrobustcmd*\mdf@pstricksbox@tncl[2]{%two not combined lines
 \begingroup
  \psset{linearc=0pt}
  \psline[style=mdfouterlinestyle](mdf@O)#1%aussen=3mm
  \psline[style=mdfouterlinestyle](mdf@P)#2%aussen=3mm
  \psclip{
    \pscustom[linestyle=none]{%
        \psline[style=mdfmiddlelinestyle](mdf@O)#1%mittlere=2mm
        \psline[linestyle=none](mdf@O)#2
        \psline[style=mdfmiddlelinestyle](mdf@P)#2%mittlere=2mm
        \psline[linestyle=none](mdf@P)#1
      }%
    }%
    \psframe[style=mdfbackgroundstyle,linearc=0pt](mdf@O)(mdf@P)%Hintergrund
    \psline[style=mdfinnerlinestyle](mdf@O)#1%innere=3mm
    \psline[style=mdfinnerlinestyle](mdf@P)#2%innere=3mm
  \endpsclip
  \psline[style=mdfmiddlelinestyle](mdf@O)#1%mittlere=2mm
  \psline[style=mdfmiddlelinestyle](mdf@P)#2%mittlere=2mm
 \endgroup
}%
\newrobustcmd*\mdf@pstricksbox@ol[1]{%one line
 \begingroup
  \psset{linearc=0pt}
  \psline[style=mdfouterlinestyle]#1%aussen=3mm
  \psline[style=mdfbackgroundstyle]#1%Hintergrund
  \psclip{\pscustom[linestyle=none]{
          \psline[style=mdfmiddlelinestyle]#1
          \psframe[linestyle=none,fillstyle=none,dimen=inner](mdf@O)(mdf@P)
          }}
    \psframe[style=mdfbackgroundstyle](mdf@O)(mdf@P)
    \psline[style=mdfinnerlinestyle]#1%innere=3mm
  \endpsclip
  \psline[style=mdfmiddlelinestyle]#1%mittlere=2mm
 \endgroup%
}%

%
\newpsstyle{mdfframetitlerule}{%
   linecolor=\mdf@frametitlerulecolor,%
   fillcolor=\mdf@frametitlerulecolor,%
   fillstyle=solid,dimen=outer,%
}
%
```

`\mdf@put@frametitlerule`

frametitlerule with pstricks

```
\def\mdf@@frametitlerule{%
  \ifbool{mdf@frametitlerule}{%
   \vbox{\hsize0pt
     \par\unskip\vskip\mdf@frametitlebelowskip@length
     \noindent\rlap{%
     \begingroup%
     \begin{pspicture}(0,0)(0,\mdf@frametitlerulewidth@length)
      \psframe[style=mdfframetitlerule](!\ptTpsL{innerleftmargin} neg 0)%
                                (! \ptTpsL{innerrightmargin}
                                   \ptTps{\mdfframetitleboxwidth} add \ptTpsL{frametitlerulewidth})
     \end{pspicture}
     \endgroup}
   }%
  }{}
  \par\unskip\vskip\mdf@innertopmargin@length%
}%
%
% \begin{macro}{mdf@putbox@single}
% Single output
%    \begin{macrocode}
% Info zu den verwendeten Punkten:
% O ist die untere linke Ecke der Mitte der middleline
% P ist die obere rechte Ecke der Mitte der middleline
% A ist der Punkt fuer den anchor (d.h. die untere linke Ecke) der Ausgabebox
\def\mdf@putbox@single{%
  \ifvoid\mdf@splitbox@one
  \else%
   \mdf@makebox@out{%
     \mdf@makeboxalign@left%
    \setlength\mdfboundingboxwidth{\wd\mdf@splitbox@one}%
    \advance\mdfboundingboxwidth by \mdf@innerleftmargin@length\relax%
    \advance\mdfboundingboxwidth by \mdf@innerrightmargin@length\relax%
    \ifbool{mdf@leftline}{%
      \advance\mdfboundingboxwidth by \mdf@innerlinewidth@length\relax%
      \advance\mdfboundingboxwidth by \mdf@middlelinewidth@length\relax%
      \advance\mdfboundingboxwidth by \mdf@outerlinewidth@length\relax}{}%
    \ifbool{mdf@rightline}{%
      \advance\mdfboundingboxwidth by \mdf@innerlinewidth@length\relax%
      \advance\mdfboundingboxwidth by \mdf@middlelinewidth@length\relax%
      \advance\mdfboundingboxwidth by \mdf@outerlinewidth@length\relax}{}%
%
    \setlength\mdfboundingboxheight{\dimexpr\ht\mdf@splitbox@one+\dp\mdf@splitbox@one\relax}%
    \advance\mdfboundingboxheight by \mdf@innerbottommargin@length\relax%
    \advance\mdfboundingboxheight by \mdf@innertopmargin@length\relax%
    \ifbool{mdf@topline}{%
      \advance\mdfboundingboxheight by \mdf@innerlinewidth@length\relax%
      \advance\mdfboundingboxheight by \mdf@middlelinewidth@length\relax%
      \advance\mdfboundingboxheight by \mdf@outerlinewidth@length\relax}{}%
    \ifbool{mdf@bottomline}{%
      \advance\mdfboundingboxheight by \mdf@innerlinewidth@length\relax%
      \advance\mdfboundingboxheight by \mdf@middlelinewidth@length\relax%
      \advance\mdfboundingboxheight by \mdf@outerlinewidth@length\relax}{}%
%
   \setlength\mdftotallinewidth{\dimexpr\mdf@innerlinewidth@length%
                                +\mdf@middlelinewidth@length
                                +\mdf@outerlinewidth@length\relax}%
```

```
    \psset{unit=1truecm}%
    \mdf@makebox@in[\mdfboundingboxwidth]{%
      \null%
      \begin{pspicture}(0,0)(\mdfboundingboxwidth,\mdfboundingboxheight)
       \mdfpstricks@settings%
       \psset{linearc=\mdf@roundcorner@length,cornersize=absolut,}%
       \expandafter\psset\expandafter{\mdf@psset@local}%
       \pnode(\mdf@innerleftmargin@length,\mdf@innerbottommargin@length){mdf@A}
       \pnode(0,0){mdf@O}
       \pnode(\mdfboundingboxwidth,\mdfboundingboxheight){mdf@P}
       \ifbool{mdf@leftline}%
         {%
         \nodexn{(mdf@A)+(\mdf@outerlinewidth@length,0)
                         +(\mdf@middlelinewidth@length,0)
                         +(\mdf@innerlinewidth@length,0)}{mdf@A}%
         \nodexn{(mdf@O)+(\mdf@outerlinewidth@length,0)
                         +0.5(\mdf@middlelinewidth@length,0)}{mdf@O}%
       }{}%
      \ifbool{mdf@rightline}%
        {%
         \nodexn{(mdf@P)-(\mdf@outerlinewidth@length,0)
                         -0.5(\mdf@middlelinewidth@length,0)}{mdf@P}%
        }{}%
      \ifbool{mdf@bottomline}%
        {%
         \nodexn{(mdf@A)+(0,\mdf@outerlinewidth@length)
                         +(0,\mdf@middlelinewidth@length)
                         +(0,\mdf@innerlinewidth@length)}{mdf@A}%
         \nodexn{(mdf@O)+(0,\mdf@outerlinewidth@length)
                         +0.5(0,\mdf@middlelinewidth@length)}{mdf@O}%
        }{}%
      \ifbool{mdf@topline}%
        {%
         \nodexn{(mdf@P)-(0,\mdf@outerlinewidth@length)
                         -0.5(0,\mdf@middlelinewidth@length)}{mdf@P}
        }{}%
      \ifbool{mdf@shadow}
          {\psframe[style=mdfshadow](mdf@O)(mdf@P)}{}
%       \psclip{%
        %Four lines
         \mdf@test@ltrb{\mdf@pstricksbox@fl{mdf@O}{mdf@P}}{}
        %three lines
         \mdf@test@ltb{\mdf@pstricksbox@tl{(mdf@P|mdf@O)(mdf@O)(mdf@O|mdf@P)(mdf@P)}}{}
         \mdf@test@trb{\mdf@pstricksbox@tl{(mdf@O)(mdf@P|mdf@O)(mdf@P)(mdf@O|mdf@P)}}{}
         \mdf@test@ltr{\mdf@pstricksbox@tl{(mdf@O)(mdf@O|mdf@P)(mdf@P)(mdf@P|mdf@O)}}{}%
         \mdf@test@lrb{\mdf@pstricksbox@tl{(mdf@O|mdf@P)(mdf@O)(mdf@P|mdf@O)(mdf@P)}}{}%
        %two lines combinded
         \mdf@test@lb{\mdf@pstricksbox@tcl{(mdf@P|mdf@O)(mdf@P)(mdf@O|mdf@P)}%
                                          {(mdf@O|mdf@P)(mdf@O)(mdf@P|mdf@O)}}{}
         \mdf@test@rb{\mdf@pstricksbox@tcl{(mdf@P)(mdf@O|mdf@P)(mdf@O)}%
                                          {(mdf@O)(mdf@P|mdf@O)(mdf@P)}}{}
         \mdf@test@tr{\mdf@pstricksbox@tcl{(mdf@P|mdf@O)(mdf@O)(mdf@O|mdf@P)}%
                                          {(mdf@O|mdf@P)(mdf@P)(mdf@P|mdf@O)}}{}
         \mdf@test@lt{\mdf@pstricksbox@tcl{(mdf@O)(mdf@P|mdf@O)(mdf@P)}%
                                          {(mdf@O)(mdf@O|mdf@P)(mdf@P)}}{}
        %two lines not combinded combinded
```

```
          \mdf@test@lr{\mdf@pstricksbox@tncl{(mdf@O|mdf@P)}{(mdf@P|mdf@O)}
                      }{}
          \mdf@test@tb{\mdf@pstricksbox@tncl{(mdf@P|mdf@O)}{(mdf@O|mdf@P)}
                      }{}
        %single line
         \mdf@test@l{\mdf@pstricksbox@ol{(mdf@O)(mdf@O|mdf@P)}}{}
         \mdf@test@r{\mdf@pstricksbox@ol{(mdf@P)(mdf@P|mdf@O)}}{}
         \mdf@test@t{\mdf@pstricksbox@ol{(mdf@P)(mdf@O|mdf@P)}}{}
         \mdf@test@b{\mdf@pstricksbox@ol{(mdf@O)(mdf@P|mdf@O)}}{}
        %no line
         \mdf@test@noline{\psframe[style=mdfbackgroundstyle](mdf@O)(mdf@P)}{}
%         }
        %Frametitlebackground
          \drawbrackgroundframetitle@single
        %output%
          \rput[bl](mdf@A){\box\mdf@splitbox@one}
%          \psdot(mdf@A)\uput[90](mdf@A){mdf at A}
%          \psdot(mdf@P)\uput[90](mdf@P){mdf at P}
%          \psdot(mdf@O)\uput[90](mdf@O){mdf at O}
%
%         \endpsclip
          \mdf@singleextra
       \end{pspicture}%
    }%
   \mdf@makeboxalign@right%
  }%
 \fi
}%
\def\drawbrackgroundframetitle@single{%
 \ifdefempty{\mdf@frametitle}{}{%
   \drawbrackgroundframetitle@@single%
 }%
}%
\def\drawbrackgroundframetitle@@single{%
 \begingroup%
  \ifbool{mdf@leftline}{%
       \nodexn{(mdf@O)+(\mdf@innerlinewidth@length,0)
               +0.5(\mdf@middlelinewidth@length,0)}{mdf@O}%
       }{}%
  \ifbool{mdf@rightline}{%
       \nodexn{(mdf@P)-(\mdf@innerlinewidth@length,0)
               -0.5(\mdf@middlelinewidth@length,0)}{mdf@P}%
       }{}%
  \ifbool{mdf@topline}{%
       \nodexn{(mdf@P)-(0,\mdf@innerlinewidth@length)
               -0.5(0,\mdf@middlelinewidth@length)}{mdf@P}%
       }{}%
  \nodexn{(mdf@P)-(0,\mdfframetitleboxtotalheight)}{mdf@F}%
  \psline[style=mdfframetitlebackgroundstyle](mdf@O|mdf@F)(mdf@O|mdf@P)
                                             (mdf@P)(mdf@P|mdf@F)%
 \endgroup
}
```

\mdf@putbox@first

First output

```
\def\mdf@putbox@first{%
  \ifvoid\mdf@splitbox@two
  \else%
   \mdf@makebox@out{%
     \mdf@makeboxalign@left%
     %\ifbool{mdf@leftline}{\hspace*{\mdf@middlelinewidth@length}}{}%
    \setlength\mdfboundingboxwidth{\wd\mdf@splitbox@two}%
    \advance\mdfboundingboxwidth by \mdf@innerleftmargin@length\relax%
    \advance\mdfboundingboxwidth by \mdf@innerrightmargin@length\relax%
    \ifbool{mdf@leftline}{%
      \advance\mdfboundingboxwidth by \mdf@innerlinewidth@length\relax%
      \advance\mdfboundingboxwidth by \mdf@middlelinewidth@length\relax%
      \advance\mdfboundingboxwidth by \mdf@outerlinewidth@length\relax}{}%
    \ifbool{mdf@rightline}{%
      \advance\mdfboundingboxwidth by \mdf@innerlinewidth@length\relax%
      \advance\mdfboundingboxwidth by \mdf@middlelinewidth@length\relax%
      \advance\mdfboundingboxwidth by \mdf@outerlinewidth@length\relax}{}%
    \setlength\mdfboundingboxheight{\dimexpr\ht\mdf@splitbox@two+\dp\mdf@splitbox@two\relax}%
    \advance\mdfboundingboxheight by \mdf@innertopmargin@length\relax%
    \advance\mdfboundingboxheight by \mdf@splitbottomskip@length\relax%
    \ifbool{mdf@topline}{%
      \advance\mdfboundingboxheight by \mdf@innerlinewidth@length\relax%
      \advance\mdfboundingboxheight by \mdf@middlelinewidth@length\relax%
      \advance\mdfboundingboxheight by \mdf@outerlinewidth@length\relax}{}%
%%%%%%%%%
    \ifbool{mdf@everyline}{%
     \ifbool{mdf@bottomline}{%
      \advance\mdfboundingboxheight by \mdf@innerlinewidth@length\relax%
      \advance\mdfboundingboxheight by \mdf@middlelinewidth@length\relax%
      \advance\mdfboundingboxheight by \mdf@outerlinewidth@length\relax}{}%
     }{}%
%%%%%%%%%%%%%
     \psset{linearc=\mdf@roundcorner@length,cornersize=absolute}%
     \expandafter\psset\expandafter{\mdf@psset@local}%
     \mdf@makebox@in[\mdfboundingboxwidth]{%
      \null%
      \psset{unit=1truecm}%
      \ifdimgreater{\mdfboundingboxheight}{\vsize}
       {\begin{pspicture}(0,0)(\mdfboundingboxwidth,\vsize)}
       {\begin{pspicture}(0,0)(\mdfboundingboxwidth,\mdfboundingboxheight)}
        \mdfpstricks@settings%
        \psset{linearc=\mdf@roundcorner@length,cornersize=absolut,}%
        \expandafter\psset\expandafter{\mdf@psset@local}%
        \pnode(\mdf@innerleftmargin@length,\mdf@splitbottomskip@length){mdf@A}
        \pnode(0,0){mdf@O}
        \pnode(\mdfboundingboxwidth,\mdfboundingboxheight){mdf@P}
        \ifbool{mdf@leftline}%
          {%
          \nodexn{(mdf@A)+(\mdf@outerlinewidth@length,0)
                         +(\mdf@middlelinewidth@length,0)
                         +(\mdf@innerlinewidth@length,0)}{mdf@A}
          \nodexn{(mdf@O)+(\mdf@outerlinewidth@length,0)
                         +0.5(\mdf@middlelinewidth@length,0)}{mdf@O}
         }{}%
       \ifbool{mdf@rightline}%
```

```
          {%
           \nodexn{(mdf@P)-(\mdf@outerlinewidth@length,0)
                           -0.5(\mdf@middlelinewidth@length,0)}{mdf@P}
          }{}%
        \ifbool{mdf@topline}%
          {%
           \nodexn{(mdf@P)-(0,\mdf@outerlinewidth@length)
                           -0.5(0,\mdf@middlelinewidth@length)}{mdf@P}
          }{}%
%%%%%%%%%%%
       \ifbool{mdf@everyline}{%
        \ifbool{mdf@bottomline}%
          {%
           \nodexn{(mdf@A)+(0,\mdf@outerlinewidth@length)
                           +(0,\mdf@middlelinewidth@length)
                           +(0,\mdf@innerlinewidth@length)}{mdf@A}%
           \nodexn{(mdf@O)+(0,\mdf@outerlinewidth@length)
                           +0.5(0,\mdf@middlelinewidth@length)}{mdf@O}%
          }{}%
       }{}%
%%%%%%%%%%
        \ifbool{mdf@shadow}
            {\pscustom[style=mdfshadow,linestyle=none]{%
                 \psline[linejoin=2,linecap=1,](mdf@P|mdf@O)(mdf@P)(mdf@O|mdf@P)%
                 \psline[linejoin=2,linecap=1,linearc=\z@](mdf@O|mdf@P)(mdf@O)(mdf@P|mdf@O)
                 \closedshadow
                 }
            }{}
%      \psclip{
%%%%%%%%%%%%%
     \ifbool{mdf@everyline}{%
          %Four lines
           \mdf@test@ltrb{\mdf@pstricksbox@fl{mdf@O}{mdf@P}}{}
          %three lines
           \mdf@test@ltb{\mdf@pstricksbox@tl{(mdf@P|mdf@O)(mdf@O)(mdf@O|mdf@P)(mdf@P)}}{}
           \mdf@test@trb{\mdf@pstricksbox@tl{(mdf@O)(mdf@P|mdf@O)(mdf@P)(mdf@O|mdf@P)}}{}
           \mdf@test@ltr{\mdf@pstricksbox@tl{(mdf@O)(mdf@O|mdf@P)(mdf@P)(mdf@P|mdf@O)}}{}%
           \mdf@test@lrb{\mdf@pstricksbox@tl{(mdf@O|mdf@P)(mdf@O)(mdf@P|mdf@O)(mdf@P)}}{}%
          %two lines combinded
           \mdf@test@lb{\mdf@pstricksbox@tcl{(mdf@P|mdf@O)(mdf@P)(mdf@O|mdf@P)}%
                                            {(mdf@O|mdf@P)(mdf@O)(mdf@P|mdf@O)}}{}
           \mdf@test@rb{\mdf@pstricksbox@tcl{(mdf@P)(mdf@O|mdf@P)(mdf@O)}%
                                            {(mdf@O)(mdf@P|mdf@O)(mdf@P)}}{}
           \mdf@test@tr{\mdf@pstricksbox@tcl{(mdf@P|mdf@O)(mdf@O)(mdf@O|mdf@P)}%
                                            {(mdf@O|mdf@P)(mdf@P)(mdf@P|mdf@O)}}{}
           \mdf@test@lt{\mdf@pstricksbox@tcl{(mdf@O)(mdf@P|mdf@O)(mdf@P)}%
                                            {(mdf@O)(mdf@O|mdf@P)(mdf@P)}}{}
          %two lines not combinded combinded
           \mdf@test@lr{\mdf@pstricksbox@tncl{(mdf@O|mdf@P)}{(mdf@P|mdf@O)}
                       }{}
           \mdf@test@tb{\mdf@pstricksbox@tncl{(mdf@P|mdf@O)}{(mdf@O|mdf@P)}
                       }{}
         %single line
           \mdf@test@l{\mdf@pstricksbox@ol{(mdf@O)(mdf@O|mdf@P)}}{}
           \mdf@test@r{\mdf@pstricksbox@ol{(mdf@P)(mdf@P|mdf@O)}}{}
           \mdf@test@t{\mdf@pstricksbox@ol{(mdf@P)(mdf@O|mdf@P)}}{}
```

```
          \mdf@test@b{\mdf@pstricksbox@ol{(mdf@O)(mdf@P|mdf@O)}}{}
         %no line
          \mdf@test@noline{\psframe[style=mdfbackgroundstyle](mdf@O)(mdf@P)}{}%
      }{%
       %Four or Three lines
        \ifboolexpr{test {\mdf@test@ltrb} or test {\mdf@test@ltr}}%
         {\mdf@pstricksbox@tl{(mdf@O)(mdf@O|mdf@P)(mdf@P)(mdf@P|mdf@O)}}%
         {}%
       %two combinded lines
       \ifboolexpr{test {\mdf@test@ltb} or test {\mdf@test@lt}}
                  {\mdf@pstricksbox@tcl{(mdf@O)(mdf@P|mdf@O)(mdf@P)}%
                                       {(mdf@O)(mdf@O|mdf@P)(mdf@P)}}{}
       \ifboolexpr{test {\mdf@test@trb} or test {\mdf@test@tr}}%
                  {\mdf@pstricksbox@tcl{(mdf@P|mdf@O)(mdf@O)(mdf@O|mdf@P)}%
                                       {(mdf@O|mdf@P)(mdf@P)(mdf@P|mdf@O)}}{}
       %two not combinded lines
       \ifboolexpr{test {\mdf@test@lrb} or test {\mdf@test@lr}}%
                  {\mdf@pstricksbox@tncl{(mdf@O|mdf@P)}{(mdf@P|mdf@O)}}{}
       %single line
       \ifboolexpr{test {\mdf@test@tb} or test {\mdf@test@t}}%
                  {\mdf@pstricksbox@ol{(mdf@P)(mdf@O|mdf@P)}}{}
       \ifboolexpr{test {\mdf@test@lb} or test {\mdf@test@l}}%
                  {\mdf@pstricksbox@ol{(mdf@O)(mdf@O|mdf@P)}}{}
       \ifboolexpr{test {\mdf@test@rb} or test {\mdf@test@r}}%
                  {\mdf@pstricksbox@ol{(mdf@P)(mdf@P|mdf@O)}}{}
       %no line
       \mdf@test@b{\psframe[style=mdfbackgroundstyle](mdf@O)(mdf@P)}{}%
       \mdf@test@noline{\psframe[style=mdfbackgroundstyle](mdf@O)(mdf@P)}{}%
      }%
%      }
      %Frametitlebackground
        \drawbrackgroundframetitle@first
       %output%
        \rput[bl](mdf@A){\box\mdf@splitbox@two}
%       \psdot(mdf@A)\uput[90](mdf@A){mdf at A}
%       \psdot(mdf@P)\uput[90](mdf@P){mdf at P}
%       \psdot(mdf@O)\uput[90](mdf@O){mdf at O}
%     \endpsclip
       \mdf@firstextra
      \end{pspicture}
     }%
    \mdf@makeboxalign@right%
   }%
  \fi
}%
\def\drawbrackgroundframetitle@first{%
 \ifdefempty{\mdf@frametitle}{}{%
   \ifdimgreater{\mdfboundingboxheight}{\mdfframetitleboxtotalheight}%
  {%
   \drawbrackgroundframetitle@@first
   \global\mdfframetitleboxtotalheight=-\p@%
  }{\mdf@PackageWarning{You got a page break inside the frame title\MessageBreak
                        Currently this isn't well supported}%
    \drawbrackgroundframetitle@@first
    \global\mdfframetitleboxtotalheight=\dimexpr\mdfframetitleboxtotalheight
                     -\mdfboundingboxheight
```

```
                    -\mdf@innerlinewidth@length-0.5\mdf@middlelinewidth@length%
                    +\mdf@frametitlebelowskip@length+\mdf@splitbottomskip@length
                    +\mdf@splittopskip@length
                    +\dp\strutbox\relax%
  }%
 }%
}%
\def\drawbrackgroundframetitle@@first{%
 \begingroup%
  \ifbool{mdf@leftline}{%
       \nodexn{(mdf@O)+(\mdf@innerlinewidth@length,0)
               +0.5(\mdf@middlelinewidth@length,0)}{mdf@O}%
       }{}%
  \ifbool{mdf@rightline}{%
       \nodexn{(mdf@P)-(\mdf@innerlinewidth@length,0)
               -0.5(\mdf@middlelinewidth@length,0)}{mdf@P}%
       }{}%
  \ifbool{mdf@topline}{%
       \nodexn{(mdf@P)-(0,\mdf@innerlinewidth@length)
               -0.5(0,\mdf@middlelinewidth@length)}{mdf@P}%
       }{}%
 \ifdimgreater{\mdfboundingboxheight}{\mdfframetitleboxtotalheight}
    {\nodexn{(mdf@P)-(0,\mdfframetitleboxtotalheight)}{mdf@F}}%
    {\nodexn{(mdf@O)}{mdf@F}}%
  \psline[style=mdfframetitlebackgroundstyle](mdf@O|mdf@F)(mdf@O|mdf@P)
                                              (mdf@P)(mdf@P|mdf@F)%
 \endgroup
}
```

\mdf@putbox@middle

Middle output

```
\def\mdf@putbox@middle{%
  \ifvoid\mdf@splitbox@two
  \else%
   \mdf@makebox@out{%
    \mdf@makeboxalign@left%
%     \ifbool{mdf@leftline}{\hspace*{\mdf@middlelinewidth@length}}{}%
    \setlength\mdfboundingboxwidth{\wd\mdf@splitbox@two}%
    \advance\mdfboundingboxwidth by \mdf@innerleftmargin@length\relax%
    \advance\mdfboundingboxwidth by \mdf@innerrightmargin@length\relax%
    \ifbool{mdf@leftline}{%
      \advance\mdfboundingboxwidth by \mdf@innerlinewidth@length\relax%
      \advance\mdfboundingboxwidth by \mdf@middlelinewidth@length\relax%
      \advance\mdfboundingboxwidth by \mdf@outerlinewidth@length\relax}{}%
    \ifbool{mdf@rightline}{%
      \advance\mdfboundingboxwidth by \mdf@innerlinewidth@length\relax%
      \advance\mdfboundingboxwidth by \mdf@middlelinewidth@length\relax%
      \advance\mdfboundingboxwidth by \mdf@outerlinewidth@length\relax}{}%
    \setlength\mdfboundingboxheight{\dimexpr\ht\mdf@splitbox@two+\dp\mdf@splitbox@two\relax}%
    \advance\mdfboundingboxheight by \mdf@splitbottomskip@length\relax%
%%%%%%%%%
    \ifbool{mdf@everyline}{%
     \ifbool{mdf@topline}{%
      \advance\mdfboundingboxheight by \mdf@innerlinewidth@length\relax%
```

```
      \advance\mdfboundingboxheight by \mdf@middlelinewidth@length\relax%
      \advance\mdfboundingboxheight by \mdf@outerlinewidth@length\relax}{}%
     \ifbool{mdf@bottomline}{%
      \advance\mdfboundingboxheight by \mdf@innerlinewidth@length\relax%
      \advance\mdfboundingboxheight by \mdf@middlelinewidth@length\relax%
      \advance\mdfboundingboxheight by \mdf@outerlinewidth@length\relax}{}%
     }{}%
%%%%%%%%%%%%%%%
     \psset{unit=1truecm}%
     \mdf@makebox@in[\mdfboundingboxwidth]{%
      \null%
      \ifdimgreater{\mdfboundingboxheight}{\vsize}
       {\begin{pspicture}(0,0)(\mdfboundingboxwidth,\vsize)}
       {\begin{pspicture}(0,0)(\mdfboundingboxwidth,\mdfboundingboxheight)}
        \mdfpstricks@settings%
        \psset{linearc=0pt,cornersize=absolut,}%
        \expandafter\psset\expandafter{\mdf@psset@local}%
        %%%%
        \pnode(\mdf@innerleftmargin@length,\mdf@splitbottomskip@length){mdf@A}
        \pnode(0,0){mdf@O}
        \pnode(\mdfboundingboxwidth,\mdfboundingboxheight){mdf@P}
        \ifbool{mdf@leftline}%
          {%
          \nodexn{(mdf@A)+(\mdf@outerlinewidth@length,0)
                          +(\mdf@middlelinewidth@length,0)
                          +(\mdf@innerlinewidth@length,0)}{mdf@A}
          \nodexn{(mdf@O)+(\mdf@outerlinewidth@length,0)
                          +0.5(\mdf@middlelinewidth@length,0)}{mdf@O}
          }{}%
       \ifbool{mdf@rightline}%
          {%
           \nodexn{(mdf@P)-(\mdf@outerlinewidth@length,0)
                          -0.5(\mdf@middlelinewidth@length,0)}{mdf@P}
          }{}%
      %%
%%%%%%%%%%%
      \ifbool{mdf@everyline}{%
       \ifbool{mdf@bottomline}%
          {%
           \nodexn{(mdf@A)+(0,\mdf@outerlinewidth@length)
                          +(0,\mdf@middlelinewidth@length)
                          +(0,\mdf@innerlinewidth@length)}{mdf@A}%
           \nodexn{(mdf@O)+(0,\mdf@outerlinewidth@length)
                          +0.5(0,\mdf@middlelinewidth@length)}{mdf@O}%
          }{}%
       \ifbool{mdf@topline}%
          {%
           \nodexn{(mdf@P)-(0,\mdf@outerlinewidth@length)
                          -0.5(0,\mdf@middlelinewidth@length)}{mdf@P}
          }{}%
       }{}%
%%%%%%%%%%
      %%
      \ifbool{mdf@shadow}
         {\psframe[style=mdfshadow](mdf@O)(mdf@P)}{}
%%%%%%%%%%%%%
```

```
    \ifbool{mdf@everyline}{%
         %Four lines
          \mdf@test@ltrb{\mdf@pstricksbox@fl{mdf@O}{mdf@P}}{}
         %three lines
          \mdf@test@ltb{\mdf@pstricksbox@tl{(mdf@P|mdf@O)(mdf@O)(mdf@O|mdf@P)(mdf@P)}}{}
          \mdf@test@trb{\mdf@pstricksbox@tl{(mdf@O)(mdf@P|mdf@O)(mdf@P)(mdf@O|mdf@P)}}{}
          \mdf@test@ltr{\mdf@pstricksbox@tl{(mdf@O)(mdf@O|mdf@P)(mdf@P)(mdf@P|mdf@O)}}{}%
          \mdf@test@lrb{\mdf@pstricksbox@tl{(mdf@O|mdf@P)(mdf@O)(mdf@P|mdf@O)(mdf@P)}}{}%
         %two lines combinded
          \mdf@test@lb{\mdf@pstricksbox@tcl{(mdf@P|mdf@O)(mdf@P)(mdf@O|mdf@P)}%
                                           {(mdf@O|mdf@P)(mdf@O)(mdf@P|mdf@O)}}{}
          \mdf@test@rb{\mdf@pstricksbox@tcl{(mdf@P)(mdf@O|mdf@P)(mdf@O)}%
                                           {(mdf@O)(mdf@P|mdf@O)(mdf@P)}}{}
          \mdf@test@tr{\mdf@pstricksbox@tcl{(mdf@P|mdf@O)(mdf@O)(mdf@O|mdf@P)}%
                                           {(mdf@O|mdf@P)(mdf@P)(mdf@P|mdf@O)}}{}
          \mdf@test@lt{\mdf@pstricksbox@tcl{(mdf@O)(mdf@P|mdf@O)(mdf@P)}%
                                           {(mdf@O)(mdf@O|mdf@P)(mdf@P)}}{}
         %two lines not combinded combinded
          \mdf@test@lr{\mdf@pstricksbox@tncl{(mdf@O|mdf@P)}{(mdf@P|mdf@O)}
                      }{}
          \mdf@test@tb{\mdf@pstricksbox@tncl{(mdf@P|mdf@O)}{(mdf@O|mdf@P)}
                      }{}
        %single line
         \mdf@test@l{\mdf@pstricksbox@ol{(mdf@O)(mdf@O|mdf@P)}}{}
         \mdf@test@r{\mdf@pstricksbox@ol{(mdf@P)(mdf@P|mdf@O)}}{}
         \mdf@test@t{\mdf@pstricksbox@ol{(mdf@P)(mdf@O|mdf@P)}}{}
         \mdf@test@b{\mdf@pstricksbox@ol{(mdf@O)(mdf@P|mdf@O)}}{}
        %no line
         \mdf@test@noline{\psframe[style=mdfbackgroundstyle](mdf@O)(mdf@P)}{}%
     }{%
      \ifboolexpr{bool {mdf@leftline} and bool {mdf@rightline}}%
                {\mdf@pstricksbox@tncl{(mdf@O|mdf@P)}{(mdf@P|mdf@O)}}{}%
      \ifboolexpr{bool {mdf@leftline} and not (bool {mdf@rightline})}%
                {\mdf@pstricksbox@ol{(mdf@O)(mdf@O|mdf@P)}}{}%
      \ifboolexpr{not (bool {mdf@leftline}) and bool {mdf@rightline}}%
                {\mdf@pstricksbox@ol{(mdf@P)(mdf@P|mdf@O)}}{}%
      \ifboolexpr{not (bool {mdf@leftline}) and not (bool {mdf@rightline})}%
                {\psframe[style=mdfbackgroundstyle](mdf@O)(mdf@P)}{}%
    }%
     %Frametitlebackground
       \drawbrackgroundframetitle@middle
      %output%
       \rput[bl](mdf@A){\box\mdf@splitbox@two}
%       \psdot(mdf@A)\uput[90](mdf@A){mdf at A}
%       \psdot(mdf@P)\uput[90](mdf@P){mdf at P}
%       \psdot(mdf@O)\uput[90](mdf@O){mdf at O}
      \mdf@middleextra
     \end{pspicture}%
    }%
   \mdf@makeboxalign@right%
  }%
 \fi
}%
\def\drawbrackgroundframetitle@middle{%
 \ifdefempty{\mdf@frametitle}{}{%
  \ifdimless{\mdfframetitleboxtotalheight}{\z@}
```

```
  {}{%
    \drawbrackgroundframetitle@@middle
    \global\mdfframetitleboxtotalheight=-\p@\relax%
  }%
 }%
}%
\def\drawbrackgroundframetitle@@middle{%
 \begingroup%
  \ifbool{mdf@leftline}{%
       \nodexn{(mdf@O)+(\mdf@innerlinewidth@length,0)
               +0.5(\mdf@middlelinewidth@length,0)}{mdf@O}%
       }{}%
  \ifbool{mdf@rightline}{%
       \nodexn{(mdf@P)-(\mdf@innerlinewidth@length,0)
               -0.5(\mdf@middlelinewidth@length,0)}{mdf@P}%
       }{}%
  \nodexn{(mdf@P)-(0,\mdfframetitleboxtotalheight)}{mdf@F}%
  \psline[style=mdfframetitlebackgroundstyle,linearc=\z@](mdf@O|mdf@F)(mdf@O|mdf@P)
                                          (mdf@P)(mdf@P|mdf@F)%
 \endgroup
}
```

\mdf@putbox@second

Last output

```
\def\mdf@putbox@second{
  \ifvoid\mdf@splitbox@one
  \else%
   \mdf@makebox@out{%
     \mdf@makeboxalign@left%
%     \ifbool{mdf@leftline}{\hspace*{\mdf@middlelinewidth@length}}{}%
    \setlength\mdfboundingboxwidth{\wd\mdf@splitbox@one}%
    \advance\mdfboundingboxwidth by \mdf@innerleftmargin@length\relax%
    \advance\mdfboundingboxwidth by \mdf@innerrightmargin@length\relax%
    \ifbool{mdf@leftline}{%
      \advance\mdfboundingboxwidth by \mdf@innerlinewidth@length\relax%
      \advance\mdfboundingboxwidth by \mdf@middlelinewidth@length\relax%
      \advance\mdfboundingboxwidth by \mdf@outerlinewidth@length\relax}{}%
    \ifbool{mdf@rightline}{%
      \advance\mdfboundingboxwidth by \mdf@innerlinewidth@length\relax%
      \advance\mdfboundingboxwidth by \mdf@middlelinewidth@length\relax%
      \advance\mdfboundingboxwidth by \mdf@outerlinewidth@length\relax}{}%
    \setlength\mdfboundingboxheight{\dimexpr\ht\mdf@splitbox@one+\dp\mdf@splitbox@one\relax}%
    \advance\mdfboundingboxheight by \mdf@innerbottommargin@length\relax%
    \ifbool{mdf@bottomline}{%
      \advance\mdfboundingboxheight by \mdf@innerlinewidth@length\relax%
      \advance\mdfboundingboxheight by \mdf@middlelinewidth@length\relax%
      \advance\mdfboundingboxheight by \mdf@outerlinewidth@length\relax}{}%
%%%%%%%%%
    \ifbool{mdf@everyline}{%
     \ifbool{mdf@topline}{%
      \advance\mdfboundingboxheight by \mdf@innerlinewidth@length\relax%
      \advance\mdfboundingboxheight by \mdf@middlelinewidth@length\relax%
      \advance\mdfboundingboxheight by \mdf@outerlinewidth@length\relax}{}%
     }{}%
```

```
%%%%%%%%%%%%%%
    \psset{unit=1truecm}%
  \mdf@makebox@in[\mdfboundingboxwidth]{%
     \null%
     \begin{pspicture}(0,0)(\mdfboundingboxwidth,\mdfboundingboxheight)
      \mdfpstricks@settings%
      \psset{linearc=\mdf@roundcorner@length,cornersize=absolut,}%
      \expandafter\psset\expandafter{\mdf@psset@local}%
      \pnode(\mdf@innerleftmargin@length,\mdf@innerbottommargin@length){mdf@A}
      \pnode(0,0){mdf@O}
      \pnode(\mdfboundingboxwidth,\mdfboundingboxheight){mdf@P}
      \ifbool{mdf@leftline}%
        {%
        \nodexn{(mdf@A)+(\mdf@outerlinewidth@length,0)
                        +(\mdf@middlelinewidth@length,0)
                        +(\mdf@innerlinewidth@length,0)}{mdf@A}
        \nodexn{(mdf@O)+(\mdf@outerlinewidth@length,0)
                        +0.5(\mdf@middlelinewidth@length,0)}{mdf@O}
        }{}%
      \ifbool{mdf@rightline}%
        {%
         \nodexn{(mdf@P)-(\mdf@outerlinewidth@length,0)
                        -0.5(\mdf@middlelinewidth@length,0)}{mdf@P}
        }{}%
      \ifbool{mdf@bottomline}%
        {%
         \nodexn{(mdf@A)+(0,\mdf@outerlinewidth@length)
                        +(0,\mdf@middlelinewidth@length)
                        +(0,\mdf@innerlinewidth@length)}{mdf@A}
         \nodexn{(mdf@O)+(0,\mdf@outerlinewidth@length)
                        +0.5(0,\mdf@middlelinewidth@length)}{mdf@O}
        }{}%
%%%%%%%%%%
     \ifbool{mdf@everyline}{%
      \ifbool{mdf@topline}%
        {%
         \nodexn{(mdf@P)-(0,\mdf@outerlinewidth@length)
                        -0.5(0,\mdf@middlelinewidth@length)}{mdf@P}
        }{}%
      }{}%
%%%%%%%%%%
     %%
      \ifbool{mdf@shadow}
          {\pscustom[style=mdfshadow,linestyle=none]{%
               \psline[linejoin=2,linecap=1,](mdf@O|mdf@P)(mdf@O)(mdf@P|mdf@O)(mdf@P)%
               \psline[linejoin=2,linecap=1,linearc=\z@](mdf@O|mdf@P)(mdf@P)
               \closedshadow
               }
           }{}
%%%%%%%%%%%%%
   \ifbool{mdf@everyline}{%
       %Four lines
        \mdf@test@ltrb{\mdf@pstricksbox@fl{mdf@O}{mdf@P}}{}
       %three lines
        \mdf@test@ltb{\mdf@pstricksbox@tl{(mdf@P|mdf@O)(mdf@O)(mdf@O|mdf@P)(mdf@P)}}{}
        \mdf@test@trb{\mdf@pstricksbox@tl{(mdf@O)(mdf@P|mdf@O)(mdf@P)(mdf@O|mdf@P)}}{}
```

```
3245          \mdf@test@ltr{\mdf@pstricksbox@tl{(mdf@O)(mdf@O|mdf@P)(mdf@P)(mdf@P|mdf@O)}}{}%
3246          \mdf@test@lrb{\mdf@pstricksbox@tl{(mdf@O|mdf@P)(mdf@O)(mdf@P|mdf@O)(mdf@P)}}{}%
3247         %two lines combinded
3248          \mdf@test@lb{\mdf@pstricksbox@tcl{(mdf@P|mdf@O)(mdf@P)(mdf@O|mdf@P)}%
3249                                           {(mdf@O|mdf@P)(mdf@O)(mdf@P|mdf@O)}}{}
3250          \mdf@test@rb{\mdf@pstricksbox@tcl{(mdf@P)(mdf@O|mdf@P)(mdf@O)}%
3251                                           {(mdf@O)(mdf@P|mdf@O)(mdf@P)}}{}
3252          \mdf@test@tr{\mdf@pstricksbox@tcl{(mdf@P|mdf@O)(mdf@O)(mdf@O|mdf@P)}%
3253                                           {(mdf@O|mdf@P)(mdf@P)(mdf@P|mdf@O)}}{}
3254          \mdf@test@lt{\mdf@pstricksbox@tcl{(mdf@O)(mdf@P|mdf@O)(mdf@P)}%
3255                                           {(mdf@O)(mdf@O|mdf@P)(mdf@P)}}{}
3256         %two lines not combinded combinded
3257          \mdf@test@lr{\mdf@pstricksbox@tncl{(mdf@O|mdf@P)}{(mdf@P|mdf@O)}
3258                       }{}
3259          \mdf@test@tb{\mdf@pstricksbox@tncl{(mdf@P|mdf@O)}{(mdf@O|mdf@P)}
3260                       }{}
3261        %single line
3262         \mdf@test@l{\mdf@pstricksbox@ol{(mdf@O)(mdf@O|mdf@P)}}{}
3263         \mdf@test@r{\mdf@pstricksbox@ol{(mdf@P)(mdf@P|mdf@O)}}{}
3264         \mdf@test@t{\mdf@pstricksbox@ol{(mdf@P)(mdf@O|mdf@P)}}{}
3265         \mdf@test@b{\mdf@pstricksbox@ol{(mdf@O)(mdf@P|mdf@O)}}{}
3266        %no line
3267         \mdf@test@noline{\psframe[style=mdfbackgroundstyle](mdf@O)(mdf@P)}{}%
3268      }{%
3269       %Four + Three
3270       \ifboolexpr{test {\mdf@test@ltrb} or test {\mdf@test@lrb}}%
3271         {\mdf@pstricksbox@tl{(mdf@O|mdf@P)(mdf@O)(mdf@P|mdf@O)(mdf@P)}}{}%
3272      %Two combinded
3273       \ifboolexpr{test {\mdf@test@ltb} or test {\mdf@test@lb}}%
3274         {\mdf@pstricksbox@tcl{(mdf@P|mdf@O)(mdf@P)(mdf@O|mdf@P)}%
3275                                           {(mdf@O|mdf@P)(mdf@O)(mdf@P|mdf@O)}}{}
3276       \ifboolexpr{test {\mdf@test@trb} or test {\mdf@test@rb}}%
3277         {\mdf@pstricksbox@tcl{(mdf@P)(mdf@O|mdf@P)(mdf@O)}%
3278                                           {(mdf@O)(mdf@P|mdf@O)(mdf@P)}}{}
3279      %Two not combinded
3280       \ifboolexpr{test {\mdf@test@ltr} or test {\mdf@test@lr}}%
3281         {\mdf@pstricksbox@tncl{(mdf@O|mdf@P)}{(mdf@P|mdf@O)}}{}%
3282      %one line
3283       \ifboolexpr{test {\mdf@test@tb} or test {\mdf@test@b}}%
3284         {\mdf@pstricksbox@ol{(mdf@O)(mdf@P|mdf@O)}}{}
3285       \ifboolexpr{test {\mdf@test@lt} or test {\mdf@test@l}}%
3286         {\mdf@pstricksbox@ol{(mdf@O)(mdf@O|mdf@P)}}{}
3287       \ifboolexpr{test {\mdf@test@tr} or test {\mdf@test@r}}%
3288         {\mdf@pstricksbox@ol{(mdf@P)(mdf@P|mdf@O)}}{}
3289      %no line
3290       \mdf@test@t{\psframe[style=mdfbackgroundstyle](mdf@O)(mdf@P)}{}%
3291       \mdf@test@noline{\psframe[style=mdfbackgroundstyle](mdf@O)(mdf@P)}{}%
3292     }%
3293      %Frametitlebackground
3294        \drawbrackgroundframetitle@second
3295       %output%
3296        \rput[bl](mdf@A){\box\mdf@splitbox@one}
3297       \mdf@secondextra
3298 %       \psdot(mdf@A)\uput[90](mdf@A){mdf at A}
3299 %       \psdot(mdf@P)\uput[90](mdf@P){mdf at P}
3300 %       \psdot(mdf@O)\uput[90](mdf@O){mdf at O}
```

```
     \end{pspicture}%
    }%
   \mdf@makeboxalign@right%
  }%
 \fi
}%
\def\drawbrackgroundframetitle@second{%
 \ifdefempty{\mdf@frametitle}{}{%
   \ifdimless{\mdfframetitleboxtotalheight}{\z@}
  {}{%
    \drawbrackgroundframetitle@@second
  }%
 }%
}%
\def\drawbrackgroundframetitle@@second{%
 \begingroup%
  \ifbool{mdf@leftline}{%
       \nodexn{(mdf@O)+(\mdf@innerlinewidth@length,0)
               +0.5(\mdf@middlelinewidth@length,0)}{mdf@O}%
       }{}%
  \ifbool{mdf@rightline}{%
       \nodexn{(mdf@P)-(\mdf@innerlinewidth@length,0)
               -0.5(\mdf@middlelinewidth@length,0)}{mdf@P}%
       }{}%
  \nodexn{(mdf@P)-(0,\mdfframetitleboxtotalheight)}{mdf@F}%
  \psline[style=mdfframetitlebackgroundstyle,linearc=\z@](mdf@O|mdf@F)(mdf@O|mdf@P)
                                                (mdf@P)(mdf@P|mdf@F)%
 \endgroup
}


 \endinput
%eof
```

C. The file mdframed-example-default

```
%Documenation of the package mdframed
%%$Id: mdframed.dtx 372 2012-04-05 19:09:11Z marco $
\setcounter{errorcontextlines}{999}
\documentclass[parskip=false,english,11pt]{ltxmdf}
\ltxmdfsetifoot  $Id: mdframed.dtx 372 2012-04-05 19:09:11Z marco $

\usepackage{showexpl}
\lstset{style=lstltxmdf,explpreset={pos=b,rframe={}},}

\newcommand\Loadedframemethod{default}
\usepackage[framemethod=\Loadedframemethod]{mdframed}

\title{The \Pack{mdframed} package}
\subtitle{Examples for \Opt{framemethod=\Loadedframemethod}}
\author{\href{mailto:marco.daniel@mada-nada.de}{Marco Daniel}}
\date{\mdfdateID$Id: mdframed.dtx 372 2012-04-05 19:09:11Z marco $}
\version{\mdversion}
\introduction{In this document I collect various examples for \Opt{framemethod=\Loadedframemethod}.
Some presented examples are more or less exorbitant.}

```

```
\mdfsetup{skipabove=\topskip,skipbelow=\topskip}
\newrobustcmd\ExampleText{%
        An \textit{inhomogeneous linear} differential equation has the form
         \begin{align}
            L[v ] = f,
         \end{align}
        where $L$ is a linear differential operator, $v$ is
        the dependent variable, and $f$ is a given non-zero
        function of the independent variables alone.
}

\newcounter{examplecount}
\setcounter{examplecount}{0}
\renewcommand\thesubsection{}
\newcommand\Examplesec[1]{%
\stepcounter{examplecount}%
\subsection{Example~\arabic{examplecount}~--~#1\relax}%
}

\begin{document}
\maketitle
\section{Loading}
In the preamble only the package \Pack{mdframed} width the option \Opt{framemethod=\Loadedframemethod}

{\large\color{red!50!black}
\NOTE Every \Cmd{global} inside the examples is necessary to work with the package \Pack{showexpl}.}

\section{Examples}
All examples have the following settings:

\begin{tltxmdfexample}
\mdfsetup{skipabove=\topskip,skipbelow=\topskip}
\newrobustcmd\ExampleText{%
An \textit{inhomogeneous linear} differential equation
has the form
\begin{align}
L[v ] = f,
\end{align}
where $L$ is a linear differential operator, $v$ is
the dependent variable, and $f$ is a given non-zero
function of the independent variables alone.
}
\end{tltxmdfexample}
\clearpage
\Examplesec{very simple}
\begin{LTXexample}
\global\mdfdefinestyle{exampledefault}{%
     linecolor=red,linewidth=3pt,%
     leftmargin=1cm,rightmargin=1cm
}
\begin{mdframed}[style=exampledefault]
\ExampleText
\end{mdframed}
\end{LTXexample}

\Examplesec{hidden line + frame title}
```

```
\begin{LTXexample}
\global\mdfapptodefinestyle{exampledefault}{%
 topline=false,rightline=true,bottomline=false}
\begin{mdframed}[style=exampledefault,frametitle={Inhomogeneous linear}]
\ExampleText
\end{mdframed}
\end{LTXexample}
\clearpage

\Examplesec{colored frame title}
\begin{LTXexample}

\global\mdfapptodefinestyle{exampledefault}{%
   rightline=true,innerleftmargin=10,innerrightmargin=10,
   frametitlerule=true,frametitlerulecolor=green,
   frametitlebackgroundcolor=yellow,
   frametitlerulewidth=2pt}
\begin{mdframed}[style=exampledefault,frametitle={Inhomogeneous linear}]
\ExampleText
\end{mdframed}
\end{LTXexample}

\Examplesec{framed picture which is centered}
\begin{LTXexample}
\begin{mdframed}[userdefinedwidth=6cm,align=center,
                 linecolor=blue,linewidth=4pt]
\includegraphics[width=\linewidth]{donald-duck}
\end{mdframed}
\end{LTXexample}

\clearpage
\Examplesec{Theorem environments}
\begin{LTXexample}
\mdfdefinestyle{theoremstyle}{%
     linecolor=red,linewidth=2pt,%
     frametitlerule=true,%
     frametitlebackgroundcolor=gray!20,
     innertopmargin=\topskip,
   }
\mdtheorem[style=theoremstyle]{definition}{Definition}
\begin{definition}
\ExampleText
\end{definition}
\begin{definition}[Inhomogeneous linear]
\ExampleText
\end{definition}
\begin{definition*}[Inhomogeneous linear]
\ExampleText
\end{definition*}
\end{LTXexample}


\clearpage
\Examplesec{theorem with separate header and the help of TikZ (complex)}
\begin{LTXexample}
\newcounter{theo}[section]
```

```
\newenvironment{theo}[1][]{%
 \stepcounter{theo}%
  \ifstrempty{#1}%
  {\mdfsetup{%
    frametitle={%
       \tikz[baseline=(current bounding box.east),outer sep=0pt]
        \node[anchor=east,rectangle,fill=blue!20]
        {\strut Theorem~\thetheo};}}
  }%
  {\mdfsetup{%
     frametitle={%
       \tikz[baseline=(current bounding box.east),outer sep=0pt]
        \node[anchor=east,rectangle,fill=blue!20]
        {\strut Theorem~\thetheo:~#1};}}%
   }%
   \mdfsetup{innertopmargin=10pt,linecolor=blue!20,%
             linewidth=2pt,topline=true,
             frametitleaboveskip=\dimexpr-\ht\strutbox\relax,}
   \begin{mdframed}[]\relax%
   }{\end{mdframed}}
\begin{theo}[Inhomogeneous Linear]
\ExampleText
\end{theo}

\begin{theo}
\ExampleText
\end{theo}
\end{LTXexample}

\clearpage
\Examplesec{hide only a part of a line}
The example below is inspired by the following post on StackExchange \href{http://tex.stackexchange.com
\begin{LTXexample}
\makeatletter
\newlength{\interruptlength}
\setlength{\interruptlength}{2.5ex}
\newrobustcmd\overlaplines{%
 \appto\mdf@frame@leftline@single{%
   \llap{\color{white}%
      \rule[\dimexpr-\mdfboundingboxdepth+\interruptlength\relax]%
           {\mdf@middlelinewidth@length}%
           {\dimexpr\mdfboundingboxtotalheight%
            \ifbool{mdf@topline}{+\mdf@middlelinewidth@length}{}
            -2\interruptlength\relax}%
   }%
 }%
 \appto\mdf@frame@rightline@single{%
   \rlap{\color{white}%
      \hspace*{\mdfboundingboxwidth}%
      \hspace*{\mdf@innerrightmargin@length}%
      \rule[\dimexpr-\mdfboundingboxdepth%
            +\interruptlength\relax]%
           {\mdf@middlelinewidth@length}%
           {\dimexpr\mdfboundingboxtotalheight%
            +\ifbool{mdf@topline}{\mdf@middlelinewidth@length}{0pt}
            -2\interruptlength\relax}%
```

```
   }%
 }%
}
\makeatother
\overlaplines

\begin{mdframed}[linecolor=blue,linewidth=8pt]
\ExampleText
\end{mdframed}
\end{LTXexample}
\end{document}
 \endinput
```

D. The file mdframed-example-tikz

```
%Documenation of the package mdframed
%%$Id: mdframed.dtx 372 2012-04-05 19:09:11Z marco $
\setcounter{errorcontextlines}{999}
\documentclass[parskip=false,english,11pt]{ltxmdf}
\ltxmdfsetifoot  $Id: mdframed.dtx 372 2012-04-05 19:09:11Z marco $


\usepackage{showexpl}
\lstset{style=lstltxmdf,explpreset={pos=b,rframe={}},}

\newcommand\Loadedframemethod{TikZ}
\usepackage[framemethod=\Loadedframemethod]{mdframed}

\title{The \Pack{mdframed} package}
\subtitle{Examples for \Opt{framemethod=\Loadedframemethod}}
\author{\href{mailto:marco.daniel@mada-nada.de}{Marco Daniel}}
\date{\mdfdateID$Id: mdframed.dtx 372 2012-04-05 19:09:11Z marco $}
\version{\mdversion}
\introduction{In this document I collect various examples for \Opt{framemethod=\Loadedframemethod}.
Some presented examples are more or less exorbitant.}

\mdfsetup{skipabove=\topskip,skipbelow=\topskip}
\newrobustcmd\ExampleText{%
        An \textit{inhomogeneous linear} differential equation has the form
         \begin{align}
            L[v ] = f,
         \end{align}
        where $L$ is a linear differential operator, $v$ is
        the dependent variable, and $f$ is a given non-zero
        function of the independent variables alone.
}

\newcounter{examplecount}
\setcounter{examplecount}{0}
\renewcommand\thesubsection{}
\newcommand\Examplesec[1]{%
\stepcounter{examplecount}%
\subsection{Example~\arabic{examplecount}~---~#1\relax}%
}

\begin{document}
```

```
\maketitle
\section{Loading}
In the preamble only the package \Pack{mdframed} width the option \Opt{framemethod=\Loadedframemethod}

{\large\color{red!50!black}
\NOTE Every \Cmd{global} inside the examples is necessary to work with the package \Pack{showexpl}.}

\section{Examples}
All examples have the following settings:

\begin{tltxmdfexample}
\mdfsetup{skipabove=\topskip,skipbelow=\topskip}
\newrobustcmd\ExampleText{%
An \textit{inhomogeneous linear} differential equation
has the form
\begin{align}
L[v ] = f,
\end{align}
where $L$ is a linear differential operator, $v$ is
the dependent variable, and $f$ is a given non-zero
function of the independent variables alone.
}
\end{tltxmdfexample}
\clearpage
\ExampleText{round corner}
\begin{LTXexample}
\global\mdfdefinestyle{exampledefault}{%
     outerlinewidth=5pt,innerlinewidth=0pt,
     outerlinecolor=red,roundcorner=5pt
}
\begin{mdframed}[style=exampledefault]
\ExampleText
\end{mdframed}
\end{LTXexample}

\Examplesec{hidden line + frame title}
\begin{LTXexample}
\global\mdfapptodefinestyle{exampledefault}{%
 topline=false,leftline=false,}
\begin{mdframed}[style=exampledefault,frametitle={Inhomogeneous linear}]
\ExampleText
\end{mdframed}
\end{LTXexample}
\clearpage
\Examplesec{framed picture which is centered}
\begin{LTXexample}
\begin{mdframed}[userdefinedwidth=6cm,align=center,
                 linecolor=blue,middlelinewidth=4pt,roundcorner=5pt]
\includegraphics[width=\linewidth]{donald-duck}
\end{mdframed}
\end{LTXexample}

\Examplesec{Gimmick}
\begin{LTXexample}
\mdfsetup{splitbottomskip=0.8cm,splittopskip=0cm,
          innerrightmargin=2cm,innertopmargin=1cm,%
```

```
3629          innerlinewidth=2pt,outerlinewidth=2pt,
3630          middlelinewidth=10pt,backgroundcolor=red,
3631          linecolor=blue,middlelinecolor=gray,
3632          tikzsetting={draw=yellow,line width=3pt,%
3633                    dashed,%
3634                    dash pattern= on 10pt off 3pt},
3635          rightline=false,bottomline=false}
3636 \begin{mdframed}
3637 \ExampleText
3638 \end{mdframed}
3639 \end{LTXexample}
3640
3641 \Examplesec{complex example with TikZ}
3642
3643 \begin{tltxmdfexample}
3644 \tikzstyle{titregris} =
3645     [draw=gray, thick, fill=white, shading = exersicetitle, %
3646      text=gray, rectangle, rounded corners, right,minimum height=.7cm]
3647
3648 \pgfdeclarehorizontalshading{exersicebackground}{100bp}
3649          {color(0bp)=(green!40); color(100bp)=(black!5)}
3650
3651 \pgfdeclarehorizontalshading{exersicetitle}{100bp}
3652          {color(0bp)=(red!40);color(100bp)=(black!5)}
3653
3654 \newcounter{exercise}
3655 \renewcommand*\theexercise{Exercise~n\arabic{exercise}}
3656 \makeatletter
3657 \def\mdf@@exercisepoints{}%new mdframed key:
3658 \define@key{mdf}{exercisepoints}{%
3659    \def\mdf@@exercisepoints{#1}
3660 }
3661 \makeatother
3662
3663 \mdfdefinestyle{exercisestyle}{%
3664   outerlinewidth=1pt,innerlinewidth=0pt,
3665   roundcorner=2pt,linecolor=gray,
3666   tikzsetting={shading = exersicebackground},
3667   innertopmargin=1.2\baselineskip,
3668   skipabove={\dimexpr0.5\baselineskip+\topskip\relax},
3669   needspace=3\baselineskip,
3670   frametitlefont=\sffamily\bfseries,
3671   settings={\global\stepcounter{exercise}},
3672   singleextra={%
3673         \node[titregris,xshift=1cm] at (P-|O) %
3674            {~\mdf@frametitlefont{\theexercise}~};
3675       \ifdefempty{\mdf@@exercisepoints}%
3676       {}%
3677       {\node[titregris,left,xshift=-1cm] at (P)%
3678         {~\mdf@frametitlefont{\mdf@@exercisepoints points}~};}%
3679    },
3680   firstextra={%
3681         \node[titregris,xshift=1cm] at (P-|O) %
3682            {~\mdf@frametitlefont{\theexercise}~};
3683       \ifdefempty{\mdf@@exercisepoints}%
3684       {}%
```

```
      {\node[titregris,left,xshift=-1cm] at (P)%
        {~\mdf@frametitlefont{\mdf@@exercisepoints points}~};}%
   },
}
\begin{mdframed}[style=exercisestyle,]
\ExampleText
\end{mdframed}

\begin{mdframed}[style=exercisestyle,exercisepoints=10]
\ExampleText
\end{mdframed}
\end{tltxmdfexample}
\clearpage
\Examplesec{Theorem environments}
\begin{LTXexample}
\mdfdefinestyle{theoremstyle}{%
     linecolor=red,linewidth=2pt,%
     frametitlerule=true,%
     apptotikzsetting={\tikzset{mdfframetitlebackground/.append style={%
                         shade,left color=white, right color=blue!20}}},
     frametitlerulecolor=green!60,
     frametitlerulewidth=1pt,
     innertopmargin=\topskip,
   }
\mdtheorem[style=theoremstyle]{definition}{Definition}
\begin{definition}[Inhomogeneous linear]
\ExampleText
\end{definition}
\begin{definition*}[Inhomogeneous linear]
\ExampleText
\end{definition*}
\end{LTXexample}

\end{document}
 \endinput
```

E. The file mdframed-example-pstricks

```
%Documenation of the package mdframed
%%$Id: mdframed.dtx 372 2012-04-05 19:09:11Z marco $
\setcounter{errorcontextlines}{999}
\documentclass[parskip=false,english,11pt]{ltxmdf}
\ltxmdfsetifoot$Id: mdframed.dtx 372 2012-04-05 19:09:11Z marco $

\lstDeleteShortInline{|}
\newcommand\Loadedframemethod{PSTricks}
\usepackage[framemethod=\Loadedframemethod]{mdframed}

\usepackage{showexpl}
\lstset{style=lstltxmdf,explpreset={pos=b,rframe={}},}

\title{The \Pack{mdframed} package}
\subtitle{Examples for \Opt{framemethod=\Loadedframemethod}}
\author{\href{mailto:marco.daniel@mada-nada.de}{Marco Daniel}}
\date{\mdfdateID$Id: mdframed.dtx 372 2012-04-05 19:09:11Z marco $}
\version{\mdversion}
```

```
\introduction{In this document I collect various examples for \Opt{framemethod=\Loadedframemethod}.
Some presented examples are more or less exorbitant.}

\mdfsetup{skipabove=\topskip,skipbelow=\topskip}
\newrobustcmd\ExampleText{%
        An \textit{inhomogeneous linear} differential equation has the form
         \begin{align}
            L[v ] = f,
         \end{align}
        where $L$ is a linear differential operator, $v$ is
        the dependent variable, and $f$ is a given non-zero
        function of the independent variables alone.
}

\newcounter{examplecount}
\setcounter{examplecount}{0}
\renewcommand\thesubsection{}
\newcommand\Examplesec[1]{%
\stepcounter{examplecount}%
\subsection{Example~\arabic{examplecount}~--~#1\relax}%
}

\begin{document}
\maketitle
\section{Loading}
In the preamble only the package \Pack{mdframed} width the option \Opt{framemethod=\Loadedframemethod}

{\large\color{red!50!black}
\NOTE Every \Cmd{global} inside the examples is necessary to work with the package \Pack{showexpl}.}
X
\section{Examples}
All examples have the following settings:

\begin{tltxmdfexample}
\mdfsetup{skipabove=\topskip,skipbelow=\topskip}
\newrobustcmd\ExampleText{%
An \textit{inhomogeneous linear} differential equation
has the form
\begin{align}
L[v ] = f,
\end{align}
where $L$ is a linear differential operator, $v$ is
the dependent variable, and $f$ is a given non-zero
function of the independent variables alone.
}
\end{tltxmdfexample}
\clearpage

\Examplesec{very simple}
\begin{LTXexample}
\global\mdfdefinestyle{exampledefault}{%
     linecolor=red,middlelinewidth=3pt,%
     leftmargin=1cm,rightmargin=1cm
}
\begin{mdframed}[style=exampledefault,roundcorner=5]
\ExampleText
```

```
\end{mdframed}
\end{LTXexample}

\Examplesec{hidden line + frame title}
\begin{LTXexample}
\global\mdfapptodefinestyle{exampledefault}{%
 topline=false,rightline=false,bottomline=false,
 frametitlerule=true,innertopmargin=6pt,
 outerlinewidth=6pt,outerlinecolor=blue,
 pstricksappsetting={\addtopsstyle{mdfouterlinestyle}{linestyle=dashed}},
 innerlinecolor=yellow,innerlinewidth=5pt}%
\begin{mdframed}[style=exampledefault,frametitle={Inhomogeneous linear}]
\ExampleText
\end{mdframed}
\end{LTXexample}

\clearpage

\Examplesec{Dash Lines}
\begin{LTXexample}
\global\mdfdefinestyle{exampledefault}{%
   pstrickssetting={linestyle=dashed,},linecolor=red,linewidth=5pt}
\begin{mdframed}[style=exampledefault,]
\ExampleText
\end{mdframed}
\end{LTXexample}

\Examplesec{Double Lines}
\begin{LTXexample}
\global\mdfdefinestyle{exampledefault}{%
   pstrickssetting={doubleline=true,doublesep=6pt},
   linecolor=red,linewidth=5pt,middlelinewidth=4pt}
\begin{mdframed}[style=exampledefault,]
\ExampleText
\end{mdframed}
\end{LTXexample}

\Examplesec{Shadow frame}
\begin{LTXexample}
\newmdenv[shadow=true,
          shadowsize=11pt,
          linewidth=8pt,
          frametitlerule=true,
          roundcorner=10pt,
          ]{myshadowbox}
\begin{myshadowbox}[frametitle={Inhomogeneous linear}]
\ExampleText
\end{myshadowbox}
\end{LTXexample}
\end{document}
 \endinput
```

F. The file mdframed-example-texsx

```
%Documenation of the package mdframed
%%$Id: mdframed.dtx 372 2012-04-05 19:09:11Z marco $
```

```
\setcounter{errorcontextlines}{999}
\documentclass[parskip=false,english,11pt,ltxlipsum]{ltxmdf}
\ltxmdfsetifoot  $Id: mdframed.dtx 372 2012-04-05 19:09:11Z marco $


\usepackage{showexpl}
\lstset{style=lstltxmdf,explpreset={pos=b,rframe={}},}
\usepackage{tikz}
\usetikzlibrary{calc,arrows}
\newcommand\Loadedframemethod{tikz}
\usepackage[framemethod=\Loadedframemethod]{mdframed}

\title{The \Pack{mdframed} package}
\subtitle{Examples for \Opt{framemethod=\Loadedframemethod}}
\author{\href{mailto:marco.daniel@mada-nada.de}{Marco Daniel}}
\date{\mdfdateID$Id: mdframed.dtx 372 2012-04-05 19:09:11Z marco $}
\version{\mdversion}
\introduction{In this document I collect various examples for \Opt{framemethod=\Loadedframemethod}.
Some presented examples are more or less exorbitant.}

\mdfsetup{skipabove=\topskip,skipbelow=\topskip}
\newrobustcmd\ExampleText{%
        An \textit{inhomogeneous linear} differential equation has the form
         \begin{align}
            L[v ] = f,
         \end{align}
        where $L$ is a linear differential operator, $v$ is
        the dependent variable, and $f$ is a given non-zero
        function of the independent variables alone.
}

\newcounter{examplecount}
\setcounter{examplecount}{0}
\renewcommand\thesubsection{}
\newcommand\Examplesec[1]{%
\stepcounter{examplecount}%
\subsection{Example~\arabic{examplecount}~--~#1\relax}%
}

\begin{document}
\maketitle
\section{Loading}
In the preamble only the package \Pack{mdframed} width the option \Opt{framemethod=\Loadedframemethod}

{\large\color{red!50!black}
\NOTE Every \Cmd{global} inside the examples is necessary to work with the package \Pack{showexpl}.}

\section{Examples}
All examples have the following settings:

\begin{tltxmdfexample}
\mdfsetup{skipabove=\topskip,skipbelow=\topskip}
\newrobustcmd\ExampleText{%
An \textit{inhomogeneous linear} differential equation
has the form
\begin{align}
```

```
L[v ] = f,
\end{align}
where $L$ is a linear differential operator, $v$ is
the dependent variable, and $f$ is a given non-zero
function of the independent variables alone.
}
\end{tltxmdfexample}
\clearpage
\Examplesec{Package listings}
The example below is inspired by the following post on StackExchange \href{http://tex.stackexchange.com

Here the solution which can be decorate as usual.

\begin{tltxmdfexample}[moretexcs={BeforeBeginEnvironment,AfterEndEnvironment},morekeywords={lstlisting}
\BeforeBeginEnvironment{lstlisting}{%
    \begin{mdframed}[<modification>]%
    \vspace{-0.7em}}
\AfterEndEnvironment{lstlisting}{%
    \vspace{-0.5em}%
    \end{mdframed}}
\end{tltxmdfexample}

With the new command \Cmd{surroundwithmdframed} you can use
\begin{tltxmdfexample}[moretexcs={BeforeBeginEnvironment,AfterEndEnvironment},morekeywords={lstlisting}
\surroundwithmdframed{listings}
\end{tltxmdfexample}

\Examplesec{Package multicol}
How I wrote in \enquote{Known Problems} you can't combine \Pack{multicol}  with \Pack{mdframed}. In a s
\begin{LTXexample}
\begin{multicols}{2}
\lipsum[1]
\begin{mdframed}
\ExampleText
\end{mdframed}
\lipsum[2]
\end{multicols}
\end{LTXexample}
\clearpage
\twocolumn[\Examplesec{Working in twocolumn mode}]
\begin{tltxmdfexample}
\twocolumn[%
  \Examplesec{Working in
          twocolumn mode}]
\lipsum[1]\lipsum[2]
\begin{mdframed}[%
   leftmargin=10pt,%
   rightmargin=10pt,%
   linecolor=red,
   backgroundcolor=yellow]
\ExampleText
\end{mdframed}
\lipsum[2]
\end{tltxmdfexample}
\lipsum[1]\lipsum[2]
\begin{mdframed}[leftmargin=10pt,%
```

```
                rightmargin=10pt,%
                linecolor=red,
                backgroundcolor=yellow]
\ExampleText
\end{mdframed}
\lipsum[2]
\clearpage
\onecolumn
\Examplesec{Working inside enumerate}
\begin{LTXexample}
Text Text Text Text Text Text Text Text
\begin{enumerate}
\item in the following \ldots
      \begin{mdframed}[linecolor=blue,linewidth=2]
         \ExampleText
      \end{mdframed}
\item \lipsum[2]
\end{enumerate}
Text Text Text Text Text Text
\end{LTXexample}
\clearpage
\Examplesec{digression-environement inspired by Tobias Schwan}
\begin{lstlisting}
\usetikzlibrary{calc,arrows}
\tikzset{
   excursus arrow/.style={%
      line width=2pt,
      draw=gray!40,
      rounded corners=2ex,
   },
   excursus head/.style={
      fill=white,
      font=\bfseries\sffamily,
      text=gray!80,
      anchor=base west,
   },
}
\mdfdefinestyle{digressionarrows}{%
 singleextra={%
      \path let \p1=(P), \p2=(O) in (\x2,\y1) coordinate (Q);
      \path let \p1=(Q), \p2=(O) in (\x1,{(\y1-\y2)/2}) coordinate (M);
      \path [excursus arrow, round cap-to]
         ($(O)+(5em,0ex)$) -| (M) |- %
         ($(Q)+(12em,0ex)$) .. controls +(0:16em) and +(185:6em) .. %
         ++(23em,2ex);
      \node [excursus head] at ($(Q)+(2.5em,-0.75pt)$) {Digression};},
 firstextra={%
      \path let \p1=(P), \p2=(O) in (\x2,\y1) coordinate (Q);
      \path [excursus arrow,-to]
         (O) |- %
         ($(Q)+(12em,0ex)$) .. controls +(0:16em) and +(185:6em) .. %
         ++(23em,2ex);
      \node [excursus head] at ($(Q)+(2.5em,-2pt)$) {Digression};},
 secondextra={%
      \path let \p1=(P), \p2=(O) in (\x2,\y1) coordinate (Q);
      \path [excursus arrow,round cap-]
```

```
4015         ($(O)+(5em,0ex)$) -| (Q);},
4016  middleextra={%
4017       \path let \p1=(P), \p2=(O) in (\x2,\y1) coordinate (Q);
4018       \path [excursus arrow]
4019          (O) -- (Q);},
4020    middlelinewidth=2.5em,middlelinecolor=white,
4021    hidealllines=true,topline=true,
4022    innertopmargin=0.5ex,
4023    innerbottommargin=2.5ex,
4024    innerrightmargin=2pt,
4025    innerleftmargin=2ex,
4026    skipabove=0.87\baselineskip,
4027    skipbelow=0.62\baselineskip,
4028 }
4029
4030 \begin{mdframed}[style=digressionarrows]
4031          \ExampleText
4032 \end{mdframed}
4033 \end{lstlisting}
4034
4035 \tikzset{
4036    excursus arrow/.style={%
4037       line width=2pt,
4038       draw=gray!40,
4039       rounded corners=2ex,
4040    },
4041    excursus head/.style={
4042       fill=white,
4043       font=\bfseries\sffamily,
4044       text=gray!80,
4045       anchor=base west,
4046    },
4047 }
4048 \mdfdefinestyle{digressionarrows}{%
4049  singleextra={%
4050       \path let \p1=(P), \p2=(O) in (\x2,\y1) coordinate (Q);
4051       \path let \p1=(Q), \p2=(O) in (\x1,{(\y1-\y2)/2}) coordinate (M);
4052       \path [excursus arrow, round cap-to]
4053          ($(O)+(5em,0ex)$) -| (M) |- %
4054          ($(Q)+(12em,0ex)$) .. controls +(0:16em) and +(185:6em) .. %
4055          ++(23em,2ex);
4056       \node [excursus head] at ($(Q)+(2.5em,-0.75pt)$) {Digression};},
4057  firstextra={%
4058       \path let \p1=(P), \p2=(O) in (\x2,\y1) coordinate (Q);
4059       \path [excursus arrow,-to]
4060          (O) |- %
4061          ($(Q)+(12em,0ex)$) .. controls +(0:16em) and +(185:6em) .. %
4062          ++(23em,2ex);
4063       \node [excursus head] at ($(Q)+(2.5em,-2pt)$) {Digression};},
4064  secondextra={%
4065       \path let \p1=(P), \p2=(O) in (\x2,\y1) coordinate (Q);
4066       \path [excursus arrow,round cap-]
4067          ($(O)+(5em,0ex)$) -| (Q);},
4068  middleextra={%
4069       \path let \p1=(P), \p2=(O) in (\x2,\y1) coordinate (Q);
4070       \path [excursus arrow]
```

```
        (O) -- (Q);},
  middlelinewidth=2.5em,middlelinecolor=white,
  hidealllines=true,topline=true,
  innertopmargin=0.5ex,
  innerbottommargin=2.5ex,
  innerrightmargin=2pt,
  innerleftmargin=2ex,
  skipabove=0.87\baselineskip,
  skipbelow=0.62\baselineskip,
}

\begin{mdframed}[style=digressionarrows]
        \ExampleText
\end{mdframed}
\end{document}
 \endinput
```

G. Change History

H. Index

The index only collect package relevant words.

H

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L

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